

410E Backhoe Loader Repair

TECHNICAL MANUAL

TM1611 22JUL10 (ENGLISH)

For complete service information also see:

410E Backhoe Loader Repair (Complete)	TM1611
410E Backhoe Loader Operation and Test (Complete).....	TM1610
POWERTECH® 4.5 L (4045) Engine	CTM104
Alternators and Starting Motors	CTM77
Front Wheel Drive Axles APL-2025.....	CTM4509

**Worldwide Construction
And Forestry Division**
LITHO IN U.S.A.

Introduction

Foreword

This manual is written for an experienced technician. Essential tools required in performing certain service work are identified in this manual and are recommended for use.

Live with safety: Read the safety messages in the introduction of this manual and the cautions presented throughout the text of the manual.



This is the safety-alert symbol. When you see this symbol on the machine or in this manual, be alert to the potential for personal injury.

Technical manuals are divided in two parts: repair and operation and tests. Repair sections tell how to repair the components. Operation and tests sections help you identify the majority of routine failures quickly.

Information is organized in groups for the various components requiring service instruction. At the beginning of each group are summary listings of all applicable essential tools, service equipment and tools, other materials needed to do the job, service parts kits, specifications, wear tolerances, and torque values.

Technical Manuals are concise guides for specific machines. They are on-the-job guides containing only the vital information needed for diagnosis, analysis, testing, and repair.

Fundamental service information is available from other sources covering basic theory of operation, fundamentals of troubleshooting, general maintenance, and basic type of failures and their causes.

See DB1990 Service Publications Catalog to order a complete Technical Manual (TM) or a Technical Manual Section (TMS). A complete Repair manual includes the following sections:

- TMS161100 Section 00 General Information
- TMS161101 Sections 01—02 Wheels and Axles
- TMS161103 Sections 03—06 Transmission and Engine
- TMS161109 Sections 09—11 Steering and Brakes
- TMS161116 Sections 16—17 Electrical System and Frame
- TMS161118 Sections 18—20 Operator's Station and Sheet Metal
- TMS161121 Sections 21, 31, 33 Main Hydraulics

TX,INTR,SS3531 -19-11DEC96-1/1

John Deere Dealers

IMPORTANT: Please remove this page and route through your service department.

Listed below is a brief explanation of “WHAT” was change and “WHY” it was changed.

These sectionalized manuals were revised to include the following changes:

1. Section 00:
To include any specifications, oil capacity and miscellaneous changes.
2. Section 01—02:
Miscellaneous wheel specification changes and service brake check added.
3. Section 03—06:
Transmission clutch pack bottom of gear to top of drum distance specification change, miscellaneous changes in charge pump and manifold plate solenoids procedures.
4. Engine flywheel turning tool number change. Fan cap screw torque added.
5. Section 09—11:
Steering valve manual check valve change. Miscellaneous brake valve changes.
6. Section 16—17:
Torque added to engine coolant temperature switch.
7. Section 18—20:
Cab side window torque and thread lock and sealer added. Bushings added to guide on upper rear window. Air suspension seat procedure added.
8. Section 21, 31 and 33:
Torque added to hydraulic pump unloader relief valve. Cooler options added. Multi-purpose bucket and lines added. Shim as required added to bucket links-to-cylinder. Loader control relief valves torques, graphics and procedure changes. Loader cylinder miscellaneous changes. Backhoe linkage changes. Backhoe boom swing lock arms and locking pin added. Stabilizer valve linkage updates and serial number breaks. Miscellaneous changes to extensible dipperstick and sideshift frame locking pistons. Backhoe control relief valves torques, graphics and procedure changes. Backhoe cylinders serial number breaks and procedure changes. Extendible dipperstick disassemble and assemble procedure added.

CED, TX03399, 5903 -19-13JAN00-1/1

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TX, TM, FAX -19-03JUL01-1/1

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Original Instructions. All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

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Section 00 General Information

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Handle Fluids Safely—Avoid Fires

When you work around fuel, do not smoke or work near heaters or other fire hazards.

Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers.

Make sure machine is clean of trash, grease, and debris.

Do not store oily rags; they can ignite and burn spontaneously.



TS227—UN—23AUG88

DX,FLAME -19-29SEP98-1/1

Prevent Battery Explosions

Keep sparks, lighted matches, and open flame away from the top of battery. Battery gas can explode.

Never check battery charge by placing a metal object across the posts. Use a volt-meter or hydrometer.

Do not charge a frozen battery; it may explode. Warm battery to 16°C (60°F).



TS204—UN—23AUG88

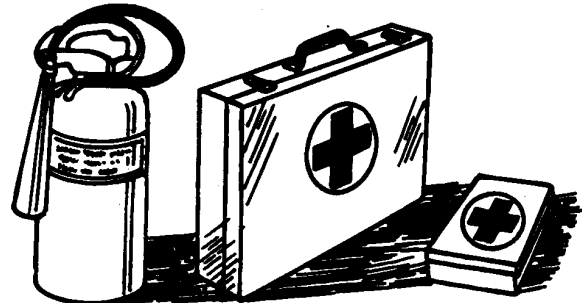
DX,SPARKS -19-03MAR93-1/1

Prepare for Emergencies

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.



TS291—UN—23AUG88

DX,FIRE2 -19-03MAR93-1/1

Prevent Acid Burns

Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

Avoid the hazard by:

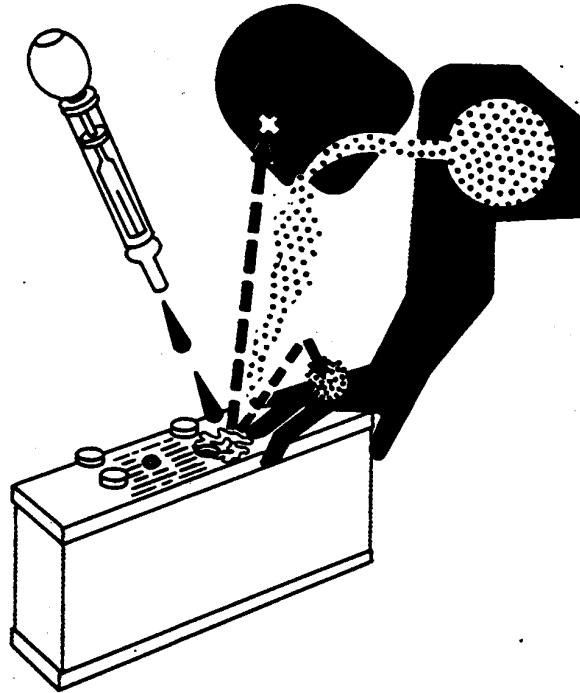
1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

If you spill acid on yourself:

1. Flush your skin with water.
2. Apply baking soda or lime to help neutralize the acid.
3. Flush your eyes with water for 15—30 minutes. Get medical attention immediately.

If acid is swallowed:

1. Do not induce vomiting.
2. Drink large amounts of water or milk, but do not exceed 2 L (2 quarts).
3. Get medical attention immediately.



TS203—UN—23AUG88

DX,POISON -19-21APR93-1/1

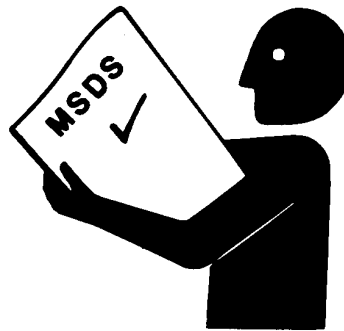
Handle Chemical Products Safely

Direct exposure to hazardous chemicals can cause serious injury. Potentially hazardous chemicals used with John Deere equipment include such items as lubricants, coolants, paints, and adhesives.

A Material Safety Data Sheet (MSDS) provides specific details on chemical products: physical and health hazards, safety procedures, and emergency response techniques.

Check the MSDS before you start any job using a hazardous chemical. That way you will know exactly what the risks are and how to do the job safely. Then follow procedures and recommended equipment.

(See your John Deere dealer for MSDS's on chemical products used with John Deere equipment.)



TS1132—UN—26NOV90

DX,MSDS,NA -19-03MAR93-1/1

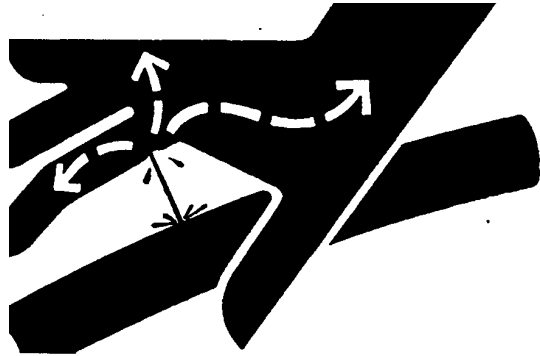
Avoid High-Pressure Fluids

Escaping fluid under pressure can penetrate the skin causing serious injury.

Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.

Search for leaks with a piece of cardboard. Protect hands and body from high-pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available in English from Deere & Company Medical Department in



X9811 —UN—23AUG88

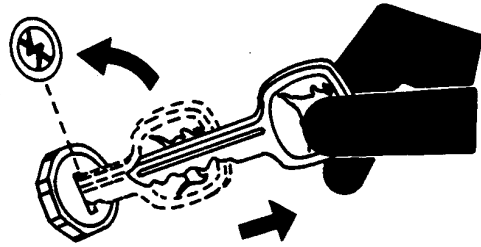
Moline, Illinois, U.S.A., by calling 1-800-822-8262 or +1 309-748-5636.

DX,FLUID -19-20AUG09-1/1

Park Machine Safely

Before working on the machine:

- Lower all equipment to the ground.
- Stop the engine and remove the key.
- Disconnect the battery ground strap.
- Hang a "DO NOT OPERATE" tag in operator station.



TS230 —UN—24MAY89

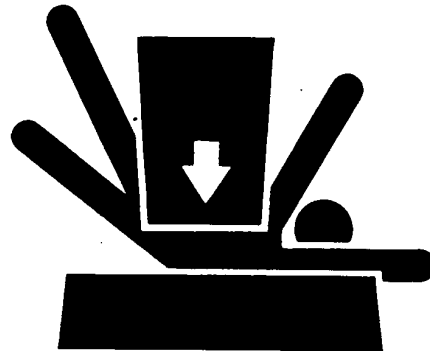
DX,PARK -19-04JUN90-1/1

Support Machine Properly

Always lower the attachment or implement to the ground before you work on the machine. If the work requires that the machine or attachment be lifted, provide secure support for them. If left in a raised position, hydraulically supported devices can settle or leak down.

Do not support the machine on cinder blocks, hollow tiles, or props that may crumble under continuous load. Do not work under a machine that is supported solely by a jack. Follow recommended procedures in this manual.

When implements or attachments are used with a machine, always follow safety precautions listed in the implement or attachment operator's manual.



TS229 —UN—23AUG88

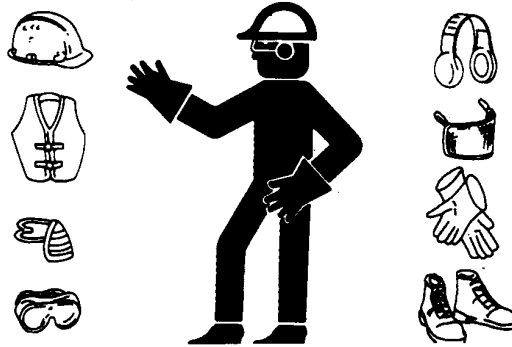
DX,LOWER -19-24FEB00-1/1

Safety Information

Wear Protective Clothing

Wear close fitting clothing and safety equipment appropriate to the job.

Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating machine.



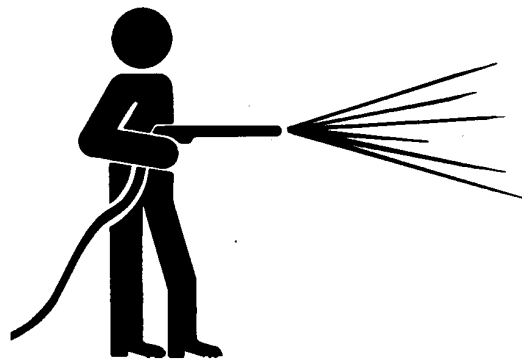
TS206—UN—23AUG88

DX,WEAR2 -19-03MAR93-1/1

Work in Clean Area

Before starting a job:

- Clean work area and machine.
- Make sure you have all necessary tools to do your job.
- Have the right parts on hand.
- Read all instructions thoroughly; do not attempt shortcuts.



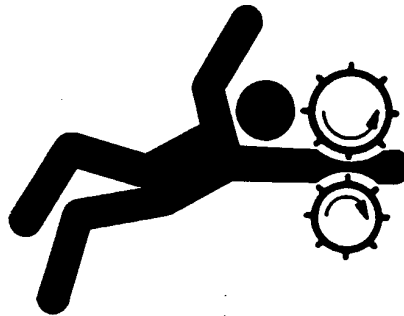
T6642EJ—UN—18OCT88

DX,CLEAN -19-04JUN90-1/1

Service Machines Safely

Tie long hair behind your head. Do not wear a necktie, scarf, loose clothing, or necklace when you work near machine tools or moving parts. If these items were to get caught, severe injury could result.

Remove rings and other jewelry to prevent electrical shorts and entanglement in moving parts.



TS228—UN—23AUG88

DX,LOOSE -19-04JUN90-1/1

Safety Information

Work In Ventilated Area

Engine exhaust fumes can cause sickness or death. If it is necessary to run an engine in an enclosed area, remove the exhaust fumes from the area with an exhaust pipe extension.

If you do not have an exhaust pipe extension, open the doors and get outside air into the area.

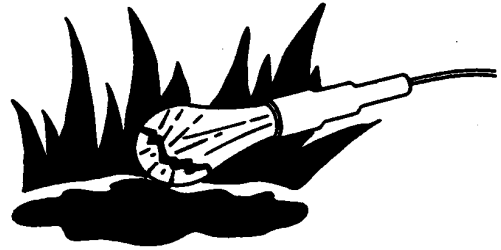


TS220 —UN—23AUG88

DX,AIR -19-17FEB99-1/1

Illuminate Work Area Safely

Illuminate your work area adequately but safely. Use a portable safety light for working inside or under the machine. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.

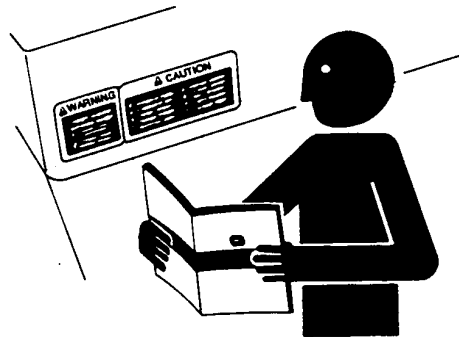


TS223 —UN—23AUG88

DX,LIGHT -19-04JUN90-1/1

Replace Safety Signs

Replace missing or damaged safety signs. See the machine operator's manual for correct safety sign placement.



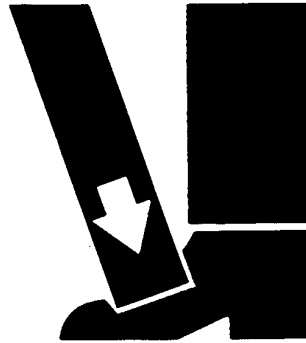
TS201 —UN—23AUG88

DX,SIGNS1 -19-04JUN90-1/1

Use Proper Lifting Equipment

Lifting heavy components incorrectly can cause severe injury or machine damage.

Follow recommended procedure for removal and installation of components in the manual.



TS226—JUN—23AUG88

DX,LIFT -19-04JUN90-1/1

Remove Paint Before Welding or Heating

Avoid potentially toxic fumes and dust.

Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.

Remove paint before heating:

- Remove paint a minimum of 100 mm (4 in.) from area to be affected by heating. If paint cannot be removed, wear an approved respirator before heating or welding.
- If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.
- If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

Do not use a chlorinated solvent in areas where welding will take place.



TS220—JUN—23AUG88

Do all work in an area that is well ventilated to carry toxic fumes and dust away.

Dispose of paint and solvent properly.

DX,PAINT -19-24JUL02-1/1

Avoid Heating Near Pressurized Fluid Lines

Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders. Do not heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials. Pressurized lines can accidentally burst when heat goes beyond the immediate flame area.



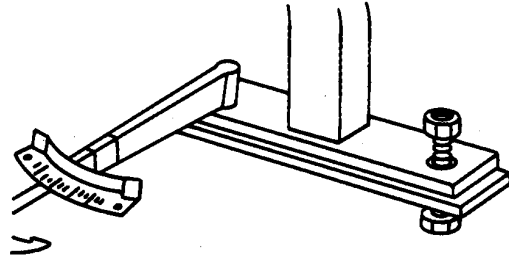
TS953—JUN—15MAY90

DX,TORCH -19-10DEC04-1/1

Keep ROPS Installed Properly

Make certain all parts are reinstalled correctly if the roll-over protective structure (ROPS) is loosened or removed for any reason. Tighten mounting bolts to proper torque.

The protection offered by ROPS will be impaired if ROPS is subjected to structural damage, is involved in an overturn incident, or is in any way altered by welding, bending, drilling, or cutting. A damaged ROPS should be replaced, not reused.



TS212—UN—23AUG88

DX,ROPS3 -19-03MAR93-1/1

Service Tires Safely

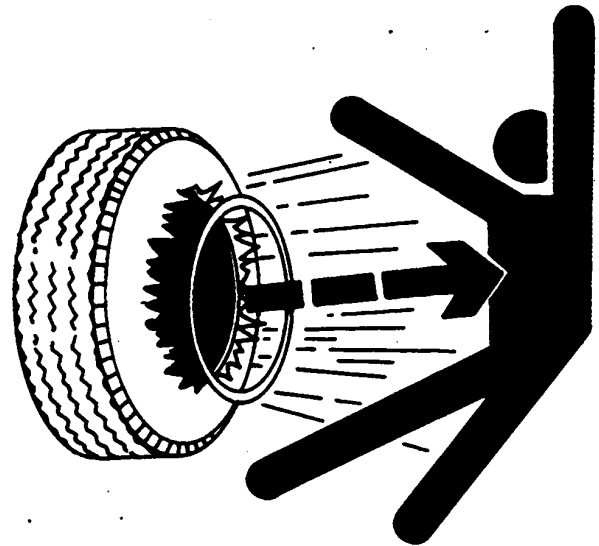
Explosive separation of a tire and rim parts can cause serious injury or death.

Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job.

Always maintain the correct tire pressure. Do not inflate the tires above the recommended pressure. Never weld or heat a wheel and tire assembly. The heat can cause an increase in air pressure resulting in a tire explosion. Welding can structurally weaken or deform the wheel.

When inflating tires, use a clip-on chuck and extension hose long enough to allow you to stand to one side and NOT in front of or over the tire assembly. Use a safety cage if available.

Check wheels for low pressure, cuts, bubbles, damaged rims or missing lug bolts and nuts.



TS211—UN—23AUG88

DX,RIM -19-24AUG90-1/1

Practice Safe Maintenance

Understand service procedure before doing work. Keep area clean and dry.

Never lubricate, service, or adjust machine while it is moving. Keep hands, feet, and clothing from power-driven parts. Disengage all power and operate controls to relieve pressure. Lower equipment to the ground. Stop the engine. Remove the key. Allow machine to cool.

Securely support any machine elements that must be raised for service work.

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil, or debris.

On self-propelled equipment, disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.

On towed implements, disconnect wiring harnesses from tractor before servicing electrical system components or welding on machine.



TS218 —UN—23AUG88

DX,SERV -19-17FEB99-1/1

Use Proper Tools

Use tools appropriate to the work. Makeshift tools and procedures can create safety hazards.

Use power tools only to loosen threaded parts and fasteners.

For loosening and tightening hardware, use the correct size tools. DO NOT use U.S. measurement tools on metric fasteners. Avoid bodily injury caused by slipping wrenches.

Use only service parts meeting John Deere specifications.



TS779 —UN—08NOV89

DX,REPAIR -19-17FEB99-1/1

Dispose of Waste Properly

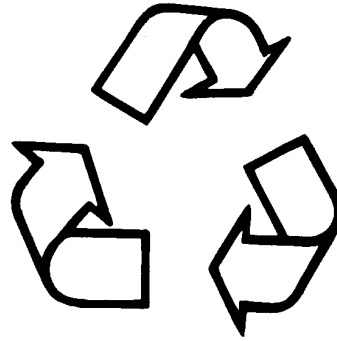
Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with John Deere equipment include such items as oil, fuel, coolant, brake fluid, filters, and batteries.

Use leakproof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.

Do not pour waste onto the ground, down a drain, or into any water source.

Air conditioning refrigerants escaping into the air can damage the Earth's atmosphere. Government regulations may require a certified air conditioning service center to recover and recycle used air conditioning refrigerants.

Inquire on the proper way to recycle or dispose of waste from your local environmental or recycling center, or from your John Deere dealer.



TS1133 —UN—26NOV90

DX,DRAIN -19-03MAR93-1/1

Live With Safety

Before returning machine to customer, make sure machine is functioning properly, especially the safety systems. Install all guards and shields.

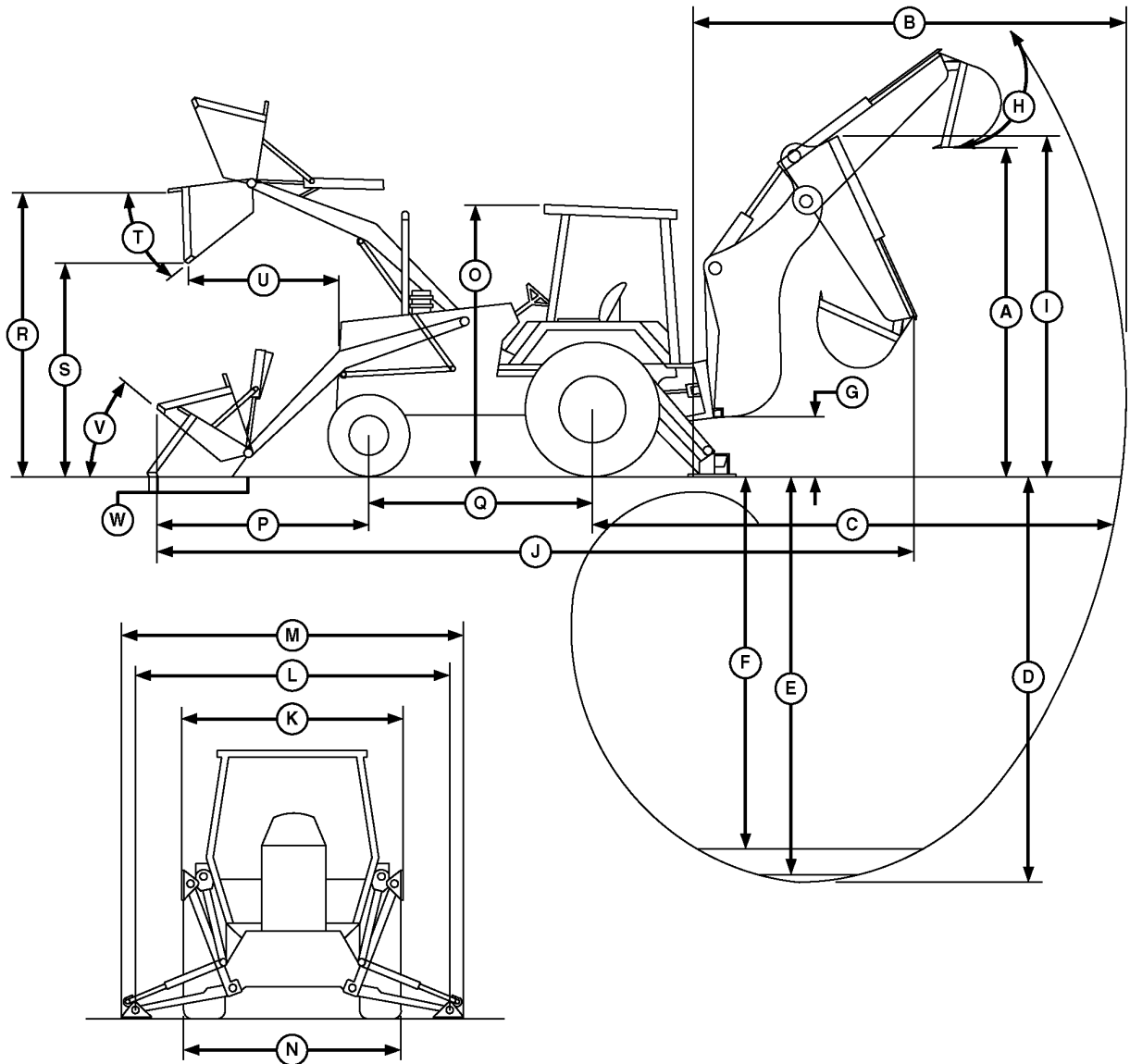


TS231 —19—07OCT88

DX,LIVE -19-25SEP92-1/1

Safety Information

410E Backhoe Loader Dimensions



T115805

T115805—UN—11JUN98

NOTE: Specifications and design subject to change without notice. Whenever applicable, specifications are in accordance with SAE Standards unless otherwise noted, these specifications are based on a standard machine with 19.5L-24, 8PR, R4

rear tires; 11L-16, 12PR, F3 front tires; 0.86 m³ (1.12 cu yd) loader bucket; 610 mm (24 in.) backhoe bucket; ROPS/FOPS; full fuel tank and 79 kg (175 lb) operator.

Item	Measurement	Specification
A—Loading Height, Truck Loading Position		
Backhoe w/o Ext. Dipperstick	Height	3.81 m (12 ft 6 in.)

Continued on next page

TX,110,BD2412 -19-10JUN98-1/5

General Specifications

Item	Measurement	Specification
Backhoe w/Ext. Dipperstick Retracted	Height	3.86 m (12 ft 8 in.)
Backhoe w/Ext. Dipperstick Extended	Height	4.72 m (15 ft 6 in.)
B—Reach from Center of Swing Mast		
Backhoe w/o Ext. Dipperstick	Distance	5.99 m (19 ft 8 in.)
Backhoe w/Ext. Dipperstick Retracted	Distance	6.07 m (19 ft 11 in.)
Backhoe w/Ext. Dipperstick Extended	Distance	7.21 m (23 ft 8 in.)
C—Reach From center of Rear Axle		
Backhoe w/o Ext. Dipperstick	Distance	7.11 m (23 ft 4 in.)
Backhoe w/Ext. Dipperstick Retracted	Distance	7.19 m (23 ft 7 in.)
Backhoe w/Ext. Dipperstick Extended	Distance	8.33 m (27 ft 4 in.)
D—Maximum Digging Depth		
Backhoe w/o Ext. Dipperstick	Depth	4.83 m (15 ft 10 in.)
Backhoe w/Ext. Dipperstick Retracted	Depth	4.90 m (16 ft 1 in.)
Backhoe w/Ext. Dipperstick Extended	Depth	6.10 m (20 ft 0 in.)
E—Digging Depth (SAE)—610 mm (2 ft) Flat Bottom		
Backhoe w/o Ext. Dipperstick	Distance	4.78 m (15 ft 8 in.)
Backhoe w/Ext. Dipperstick Retracted	Distance	4.85 m (15 ft 11 in.)
Backhoe w/Ext. Dipperstick Extended	Distance	6.07 m (19 ft 11 in.)
F—Digging Depth (SAE)—2440 mm (8 ft) Flat Bottom		
Backhoe w/o Ext. Dipperstick	Distance	4.45 m (14 ft 7 in.)
Backhoe w/Ext. Dipperstick Retracted	Distance	4.55 m (14 ft 11 in.)
Backhoe w/Ext. Dipperstick Extended	Distance	5.82 m (19 ft 1 in.)
G—Ground Clearance Minimum		
Backhoe w/o Ext. Dipperstick	Clearance	356 mm (14 in.)
Backhoe w/Ext. Dipperstick Retracted	Clearance	356 mm (14 in.)
Backhoe w/Ext. Dipperstick Extended	Clearance	356 mm (14 in.)

Continued on next page

TX,110,BD2412 -19-10JUN98-2/5

General Specifications

Item	Measurement	Specification
H—Bucket Rotation		
Backhoe w/o Ext. Dipperstick	Rotation	190°
Backhoe w/Ext. Dipperstick Retracted	Rotation	190°
Backhoe w/Ext. Dipperstick Extended	Rotation	190°
I—Transport Height		
Backhoe	Height	3.94 m (12 ft 11 in.)
J—Overall Length, Transport		
Backhoe	Length	7.29 m (23 ft 11 in.)
K—Stabilizer Width, Transport		
Backhoe	Width	2.18 m (7 ft 2 in.)
L—Stabilizer Spread, Operating		
Backhoe	Width	3.10 m (10 ft 2 in.)
M—Overall Width, Stabilizer Spread (Less Loader Bucket)		
Backhoe	Width	3.53 m (11 ft 7 in.)
N—Width Over Tires		
Backhoe	Width	2.18 m (7 ft 2 in.)
O—Height to Cab/ROPS Top		
Backhoe	Height	2.82 m (9 ft 3 in.)
P—Front Wheel to Loader Dig Position		
Backhoe	Distance	2.10 m (6 ft 11 in.)
Q—Wheelbase		
Backhoe	Length	2.10 m (6 ft 10 in.)
R—Maximum Height to Loader Bucket Hinge Pin		
Heavy Duty Long Lip 0.86 m ³ (1.12 yd ³)	Height	3.35 m (11 ft 0 in.)
Heavy Duty Long Lip 1.0 m ³ (1.30 yd ³)	Height	3.35 m (11 ft 0 in.)
Multipurpose 0.76 m ³ (1.00 yd ³)	Height	3.35 m (11 ft 0 in.)
S—Dump Clearance, Loader Bucket at 45°		
Heavy Duty Long Lip 0.86 m ³ (1.12 yd ³)	Clearance	2.69 m (8 ft 10 in.)
Heavy Duty Long Lip 1.0 m ³ (1.30 yd ³)	Clearance	2.67 m (8 ft 9 in.)
Multipurpose 0.76 m ³ (1.00 yd ³)	Clearance	2.64 m (8 ft 8 in.)
T—Maximum Loader Bucket Dump Angle		
Heavy Duty Long Lip 0.86 m ³ (1.12 yd ³)	Angle	45°

Continued on next page

TX,110,BD2412 -19-10JUN98-3/5

General Specifications

Item	Measurement	Specification
Heavy Duty Long Lip 1.0 m ³ (1.30 yd ³)	Angle	45°
Multipurpose 0.76 m ³ (1.00 yd ³)	Angle	45°
U—Reach at Full Height, Loader Bucket at 45°		
Heavy Duty Long Lip 0.86 m ³ (1.12 yd ³)	Distance	762 mm (30.0 in.)
Heavy Duty Long Lip 1.0 m ³ (1.30 yd ³)	Distance	787 mm (31.0 in.)
Multipurpose 0.76 m ³ (1.00 yd ³)	Distance	818 mm (32.2 in.)
V—Loader Bucket Rollback at Ground Level		
Heavy Duty Long Lip 0.86 m ³ (1.12 yd ³)	Angle	40°
Heavy Duty Long Lip 1.0 m ³ (1.30 yd ³)	Angle	40°
Multipurpose 0.76 m ³ (1.00 yd ³)	Angle	40°
W—Dig Below Ground—Loader Bucket Level		
Heavy Duty Long Lip 0.86 m ³ (1.12 yd ³)	Depth	170 mm (6.7 in.)
Heavy Duty Long Lip 1.0 m ³ (1.30 yd ³)	Depth	157 mm (6.2 in.)
Multipurpose 0.76 m ³ (1.00 yd ³)	Depth	150 mm (5.9 in.)
Digging Force, Bucket Cylinder		
Backhoe w/o Ext. Dipperstick	Force	65.8 kN (14,801 lb)
Backhoe w/Ext. Dipperstick Retracted	Force	66.7 kN (15,010 lb)
Backhoe w/Ext. Dipperstick Extended	Force	66.7 kN (15,010 lb)
Digging Force, Crowd Cylinder		
Backhoe w/o Ext. Dipperstick	Force	38.9 kN (8741 lb)
Backhoe w/Ext. Dipperstick Retracted	Force	37.6 kN (8446 lb)
Backhoe w/Ext. Dipperstick Extended	Force	26.6 kN (5980 lb)
Swing Arc		
Backhoe w/o Ext. Dipperstick	Rotation	180°
Backhoe w/Ext. Dipperstick Retracted	Rotation	180°
Backhoe w/Ext. Dipperstick Extended	Rotation	180°
Bucket Rotation		
Backhoe w/o Ext. Dipperstick	Rotation	190°

Continued on next page

TX,110,BD2412 -19-10JUN98-4/5

General Specifications

Item	Measurement	Specification
Backhoe w/Ext. Dipperstick Retracted	Rotation	190°
Backhoe w/Ext. Dipperstick Extended	Rotation	190°
Stabilizer Angle Rearward		
Backhoe w/o Ext. Dipperstick	Angle	18°
Backhoe w/Ext. Dipperstick Retracted	Angle	18°
Backhoe w/Ext. Dipperstick Extended	Angle	18°

TX,110,BD2412 -19-10JUN98-5/5

General Specifications

410E Backhoe Loader Specifications

Item	Measurement	Specification
Engine—John Deere 4045T		
Rated Power @ 2200 rpm	Power	SAE gross 73 kW (98 hp)
Rated Power @ 2200 rpm	Power	SAE net 67 kW (90 hp)
Cylinders	Quantity	4
Displacement	Volume	4.52 L (276 in. ³)
Engine Torque Rise	Torque	34%
Maximum Engine Net Torque	Torque	389 N·m (287 lb·ft)
Electrical System	Voltage	12-volt
Alternator	Amperage	65 amps
Alternator with Cab	Amperage	95 amps

Item	Measurement	Specification
Forward Travel Speeds ¹ with Manual Transmission		
Gear 1	Speed	5.8 km/h (3.6 mph)
Gear 2	Speed	9.5 km/h (5.9 mph)
Gear 3	Speed	23.2 km/h (14.4 mph)
Gear 4	Speed	39.3 km/h (24.4 mph)

Item	Measurement	Specification
Reverse Travel Speeds ¹ with Manual Transmission		
Gear 1	Speed	6.4 km/h (4.0 mph)
Gear 2	Speed	10.6 km/h (6.6 mph)
Gear 3	Speed	25.9 km/h (16.1 mph)
Gear 4	Speed	43.8 km/h (27.2 mph)

Item	Measurement	Specification
Forward Travel Speeds ¹ with Powershift Transmission		
Gear 1	Speed	5.8 km/h (3.6 mph)
Gear 2	Speed	9.5 km/h (5.9 mph)
Gear 3	Speed	23.2 km/h (14.4 mph)
Gear 4	Speed	39.3 km/h (24.4 mph)

NOTE: With powershift transmission, third and fourth gear speeds are the same in reverse.

Item	Measurement	Specification
Reverse Travel Speeds ¹ with Powershift Transmission		
Gear 1	Speed	6.4 km/h (4.0 mph)
Gear 2	Speed	10.6 km/h (6.0 mph)

Continued on next page

TX,115,BG331 -19-30SEP97-1/2

General Specifications

Item	Measurement	Specification
Gear 3	Speed	25.9 km/h (16.1 mph)
Gear 4	Speed	43.8 km/h (27.2 mph)
Item	Measurement	Specification
Steering: Hydrostatic Power		
Non-Powered Axle Curb Turning Radius—Brakes Applied	Radius	3.56 m (11 ft 8 in.)
Non-Powered Axle Curb Turning Radius—Without Brakes	Radius	4.04 m (13 ft 3 in.)
Non-Powered Axle Bucket Clearance Circle—Brakes Applied	Radius	9.65 m (31 ft 8 in.)
Non-Powered Axle Bucket Clearance Circle—Without Brakes	Radius	10.59 m (34 ft 10 in.)
Non-Powered Axle Steering Wheel Turns—Stop to Stop	Quantity	2.3—3.0 turns
Powered Axle (MFWD) Curb Turning Radius—Brakes Applied	Radius	3.56 m (11 ft 8 in.)
Powered Axle (MFWD) Curb Turning Radius—Without Brakes	Radius	4.04 m (13 ft 3 in.)
Powered Axle Bucket Clearance Circle—Brakes Applied	Radius	9.65 m (31 ft 8 in.)
Powered Axle Bucket Clearance Circle—Without Brakes	Radius	10.59 m (34 ft 9 in.)
Non-Powered Axle Steering Wheel Turns—Stop to Stop	Quantity	2.5 turns
Item	Measurement	Specification
Hydraulic System: Closed Center		
Main Pressure Relief Setting	Pressure	25 000 kPa (3625 psi)
Flow @ 2200 rpm, Backhoe	Flow Rate	159 L/min. (42 gpm)
Flow @ 2200 rpm, Loader	Flow Rate	159 L/min. (42 gpm)

¹With standard 19.5L-24 rear tires.

General Specifications

Other Information—410E Backhoe Loader

Hydraulic system:

- Axial piston pump
- 10 micron replaceable element return oil filter

Final drives:

- Heavy-duty inboard mounted planetary
- Evenly distributes axle shock loads over three oil cooled gears

Brakes:

- Hydraulic wet disk
- Mounted inboard
- Self-adjusting
- Self-equalizing

Park brake:

- Independent system
- Spring applied
- Hydraulically released
- Controlled by an electric switch on the side console

Transmission:

- 4-speed helical gear

- Synchronized collar shift transmission with hydraulic reverser
- Torque converter 280 mm (11 in.) with 2.12:1 stall ratio

Lubrication:

- Pressure system with spin-on filter
- Air cleaner
- Dual stage dry, with element and precleaner

Tires:

- Front w/o MFWD—14.5/75-16.1, 10PR F3
- Front w/o MFWD—11L-16, 12PR F3
- Front with MFWD—12.5/80, 10PR
- Rear w/o MFWD—19.5L-24, 10PR R4
- Rear w/o MFWD—21L-24, 10PR R4
- Rear with MFWD—19.5L-24, 10PR R4
- Rear with MFWD—21L-24, 10PR R4

Operator Control:

- Backhoe w/o Ext. Dipperstick
 - Two Levers
- Backhoe w/Ext. Dipperstick Retracted
 - Right Foot Treadle
- Backhoe w/Ext. Dipperstick Retracted
 - Right Foot Treadle

CED,OUO1032,1006 -19-09JUN98-1/1

410E Backhoe Loader Weight

Item	Measurement	Specification
Transporting		
SAE Operating Weight with ROPS	Weight	5806 kg (12,800 lb)
Cab Added	Weight	263 kg (580 lb)
MFWD with Tires Added	Weight	168 kg (370 lb)
Extendible Dipperstick	Weight	200 kg (440 lb)
Optional Front Counterweight	Weight	181 kg (400 lb)
Optional Front Counterweight	Weight	295 kg (650 lb)

TX,110,BD2420 -19-06DEC96-1/1

General Specifications

410E Backhoe and Loader Buckets

Loader:	Width		Heaped Capacity		Weight	
	mm	(In.)	m ³	(Cu Yd)	kg	lb
Heavy duty long lip	2340	(92)	1.00	(1.30)	476	(1050)
	2340	(92)	1.15	(1.50)	540	(1190)
Multipurpose	2340	(92)	0.96	(1.25)	703	(1550)

Backhoe:	Width		Heaped Capacity		Weight	
	mm	(In.)	m ³	(Cu Ft)	kg	(lb)
Standard duty	610	(24)	0.21	(7.5)	159	(350)
Heavy duty with lift loops	305	(12)	0.09	(3.3)	134	(295)
	457	(18)	0.14	(5.1)	152	(335)
	610	(24)	0.21	(7.5)	181	(400)
	762	(30)	0.25	(8.8)	191	(420)
	914	(36)	0.35	(12.5)	231	(510)
Extra Heavy Duty	457	(18)	0.14	(5.1)	164	(362)
	610	(24)	0.21	(7.5)	193	(425)
	610	(24)	0.25	(8.8)	206	(455)
	762	(30)	0.28	(10.0)	215	(475)
Ditch cleaning	914	(36)	0.35	(12.5)	231	(510)

TX,110,BD2212 -19-15JUN98-1/1

410E Backhoe Loader Drain and Refill Capacities

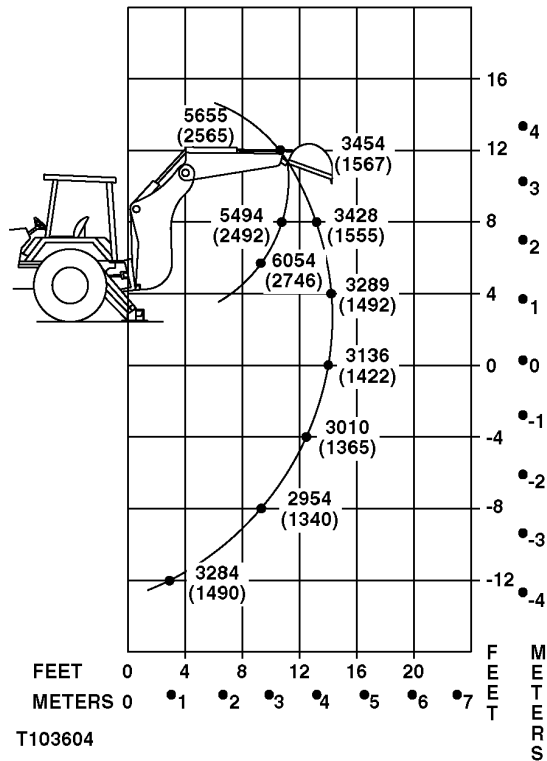
Item	Measurement	Specification
Engine Coolant	Capacity	16 L (17 qt)
Engine Oil (including filter)	Capacity	12.8 L (13.5 qt)
Torque Converter and Transmission System	Capacity	14 L (15 qt)
Rear Axle (S.N. —851673)	Capacity	13 L (14 qt)
Rear Axle (S.N. 851674—)	Capacity	16 L (17 qt)
MFWD Front Axle Housing	Capacity	6.5 L (7 qt)
MFWD Front Wheel Planetary Housing (each)	Capacity	1 L (1.1 qt)
Fuel Tank	Capacity	136 L (36 gal)
Hydraulic System Reservoir	Capacity	37 L (39 qt)

TX,115,BG332 -19-01NOV99-1/1

410E Backhoe Loader Lifting Capacities—Standard Dipperstick

Lifting capacity ratings are made with bucket hinge pin, loader bucket and stabilizers on firm, level ground. Lift capacities are hydraulically limited. Lifting capacities are 87 percent of the maximum lift over any point on the swing arc and do not exceed 75 percent of the tipping load. Angle between boom and ground is 65 degrees. Machine is equipped with 610 mm (24 in.) standard bucket, standard or extendible dipperstick, and standard equipment.

NOTE: Loader bucket on ground significantly improves side stability, therefore improving lift capacity to the side. Lift capacity over the rear is not affected.

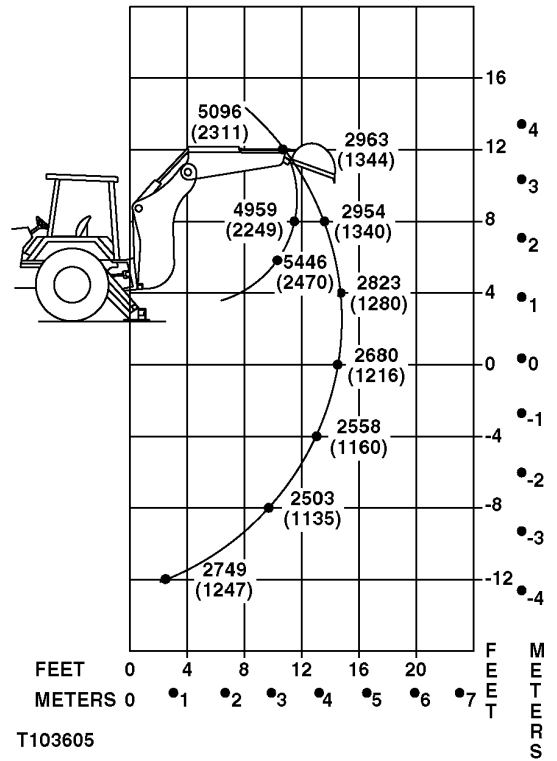


Lift Capacity, Backhoe with Standard Dipperstick
Based on SAE J31 (Except with Loader Bucket on Ground)

T105558—19—04DEC96

TX,110,BD2416 -19-06DEC96-1/1

410E Backhoe Loader Lifting Capacities—Extendible Dipperstick (Retracted)



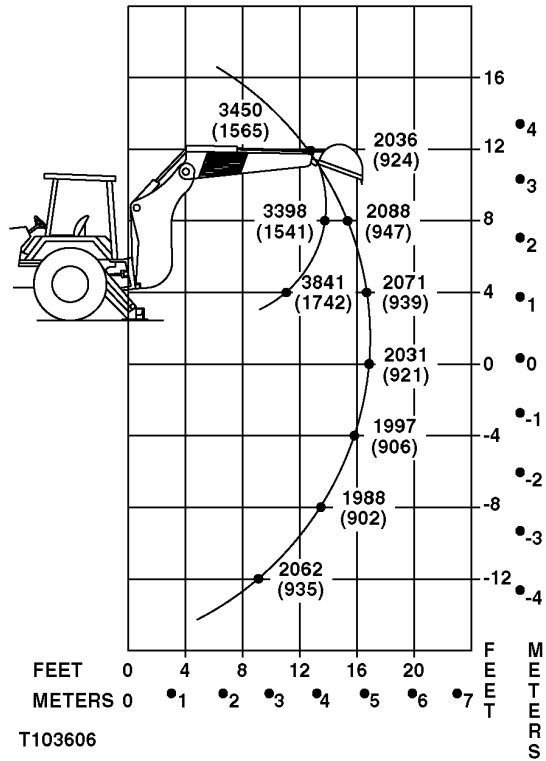
T103605

*Lift Capacity, Backhoe with Extendible Dipperstick, Retracted
Based on SAE J31 (Except with Loader Bucket on Ground)*

T105559 -19-04DEC96

TX,110,BD2417 -19-06DEC96-1/1

410E Backhoe Loader Lifting Capacities—Extendible Dipperstick (Extended)



T103606

Lift Capacity, Backhoe with Extendible Dipperstick, Retracted Based on SAE J31 (Except with Loader Bucket on Ground)

T105560—19—04DEC96

TX,110,BD2418 -19-06DEC96-1/1

Hardware Torque Specifications

Check cap screws and nuts to be sure they are tight. If hardware is loose, tighten to torque shown on the following charts unless a special torque is specified.

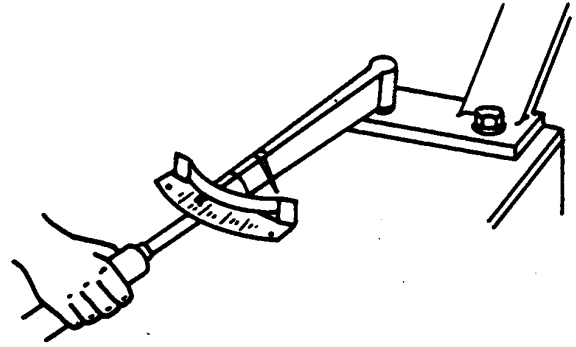
TX,03,SS3508 -19-01AUG94-1/1

ROPS Torque Specifications

⚠ CAUTION: Make certain all parts are reinstalled correctly if the roll-over protective structure (ROPS) is loosened or removed for any reason. Tighten mounting bolts to proper torque.

The protection offered by ROPS will be impaired if ROPS is subjected to structural damage, is involved in an overturn incident, or is in any way altered. A damaged ROPS should be replaced, not reused.

When installation of equipment on a machine necessitates loosening or removing ROPS, mounting bolts must be tightened to specification.



TS176 -UN-23AUG88

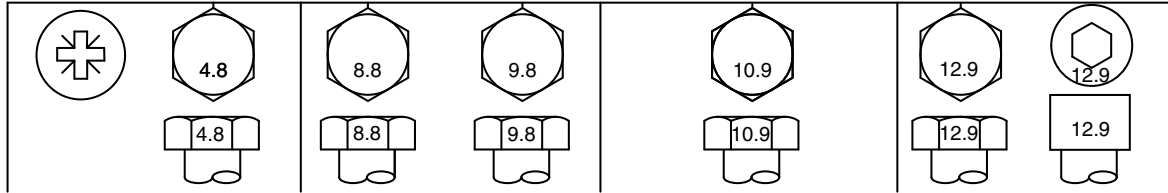
Item	Measurement	Specification
ROPS Mounting Bolts	Torque	420 ± 84 N·m (310 ± 62 lb-ft)

TX,03,SS3509 -19-14JAN00-1/1

Torque Values

Metric Bolt and Screw Torque Values

TS1670 —UN—01MAY03



Bolt or Screw	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Lubricated ^a		Dry ^b		Lubricated ^a		Dry ^b		Lubricated ^a		Dry ^b		Lubricated ^a		Dry ^b	
Size	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.
M6	4.7	42	6	53	8.9	79	11.3	100	13	115	16.5	146	15.5	137	19.5	172
									N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.
M8	11.5	102	14.5	128	22	194	27.5	243	32	23.5	40	29.5	37	27.5	47	35
			N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.								
M10	23	204	29	21	43	32	55	40	63	46	80	59	75	55	95	70
	N·m	lb.-ft.														
M12	40	29.5	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	63	46	80	59	120	88	150	110	175	130	220	165	205	150	260	190
M16	100	74	125	92	190	140	240	175	275	200	350	255	320	235	400	300
M18	135	100	170	125	265	195	330	245	375	275	475	350	440	325	560	410
M20	190	140	245	180	375	275	475	350	530	390	675	500	625	460	790	580
M22	265	195	330	245	510	375	650	480	725	535	920	680	850	625	1080	800
M24	330	245	425	315	650	480	820	600	920	680	1150	850	1080	800	1350	1000
M27	490	360	625	460	950	700	1200	885	1350	1000	1700	1250	1580	1160	2000	1475
M30	660	490	850	625	1290	950	1630	1200	1850	1350	2300	1700	2140	1580	2700	2000
M33	900	665	1150	850	1750	1300	2200	1625	2500	1850	3150	2325	2900	2150	3700	2730
M36	1150	850	1450	1075	2250	1650	2850	2100	3200	2350	4050	3000	3750	2770	4750	3500

Torque values listed are for general use only, based on the strength of the bolt or screw. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For stainless steel fasteners or for nuts on U-bolts, see the tightening instructions for the specific application. Tighten plastic insert or crimped steel type lock nuts by turning the nut to the dry torque shown in the chart, unless different instructions are given for the specific application.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class. Replace fasteners with the same or higher property class. If higher property class fasteners are used, tighten these to the strength of the original. Make sure fastener threads are clean and that you properly start thread engagement. When possible, lubricate plain or zinc plated fasteners other than lock nuts, wheel bolts or wheel nuts, unless different instructions are given for the specific application.

^a"Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or M20 and larger fasteners with JDM F13C zinc flake coating.

^b"Dry" means plain or zinc plated without any lubrication, or M6 to M18 fasteners with JDM F13B zinc flake coating.

DX.TORQ2 -19-08DEC09-1/1

Additional Metric Cap Screw Torque Values

⚠ CAUTION: Use only metric tools on metric hardware. Other tools may not fit properly. They may slip and cause injury.

Check tightness of cap screws periodically. Torque values listed are for general use only. Do not use these values if a different torque value or tightening procedure is listed for a specific application.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

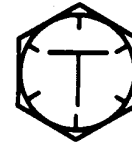
Make sure fastener threads are clean and you properly start thread engagement. This will prevent them from failing when tightening.

Tighten cap screws having lock nuts to approximately 50 percent of amount shown in chart.

^aMETRIC CAP SCREW TORQUE VALUES

Nominal Dia	T-Bolt		H-Bolt		M-Bolt	
	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft
8	29	21	20	15	10	7
10	63	46	45	33	20	15
12	108	80	88	65	34	25
14	176	130	137	101	54	40
16	265	195	206	152	78	58
18	392	289	294	217	118	87
20	539	398	392	289	167	125
22	735	542	539	398	216	159
24	931	687	686	506	274	202
27	1372	1012	1029	759	392	289
30	1911	1410	1421	1049	539	398
33	2548	1890	1911	1410	735	542
36	3136	2314	2401	1772	931	687

^aTorque tolerance is ±10%.



T6873AA



T6873AB



T6873AC

T6873AA —UN—18OCT88

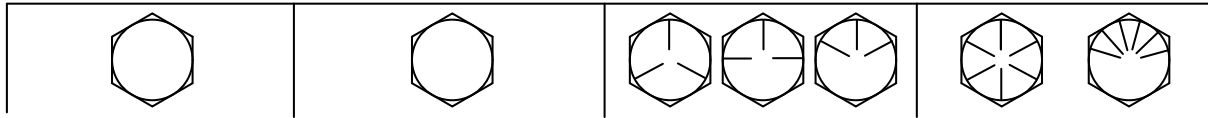
T6873AB —UN—18OCT88

T6873AC —UN—18OCT88

Torque Values

Unified Inch Bolt and Screw Torque Values

TS1671 —UN—01MAY03



Bolt or Screw Size	SAE Grade 1				SAE Grade 2 ^a				SAE Grade 5, 5.1 or 5.2				SAE Grade 8 or 8.2			
	Lubricated ^b		Dry ^c		Lubricated ^b		Dry ^c		Lubricated ^b		Dry ^c		Lubricated ^b		Dry ^c	
	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.
1/4	3.7	33	4.7	42	6	53	7.5	66	9.5	84	12	106	13.5	120	17	150
													N·m	lb.-ft.	N·m	lb.-ft.
5/16	7.7	68	9.8	86	12	106	15.5	137	19.5	172	25	221	28	20.5	35	26
									N·m	lb.-ft.	N·m	lb.-ft.				
3/8	13.5	120	17.5	155	22	194	27	240	35	26	44	32.5	49	36	63	46
			N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.								
7/16	22	194	28	20.5	35	26	44	32.5	56	41	70	52	80	59	100	74
	N·m	lb.-ft.														
1/2	34	25	42	31	53	39	67	49	85	63	110	80	120	88	155	115
9/16	48	35.5	60	45	76	56	95	70	125	92	155	115	175	130	220	165
5/8	67	49	85	63	105	77	135	100	170	125	215	160	240	175	305	225
3/4	120	88	150	110	190	140	240	175	300	220	380	280	425	315	540	400
7/8	190	140	240	175	190	140	240	175	490	360	615	455	690	510	870	640
1	285	210	360	265	285	210	360	265	730	540	920	680	1030	760	1300	960
1-1/8	400	300	510	375	400	300	510	375	910	670	1150	850	1450	1075	1850	1350
1-1/4	570	420	725	535	570	420	725	535	1280	945	1630	1200	2050	1500	2600	1920
1-3/8	750	550	950	700	750	550	950	700	1700	1250	2140	1580	2700	2000	3400	2500
1-1/2	990	730	1250	930	990	730	1250	930	2250	1650	2850	2100	3600	2650	4550	3350

Torque values listed are for general use only, based on the strength of the bolt or screw. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For plastic insert or crimped steel type lock nuts, for stainless steel fasteners, or for nuts on U-bolts, see the tightening instructions for the specific application. Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Replace fasteners with the same or higher grade. If higher grade fasteners are used, tighten these to the strength of the original. Make sure fastener threads are clean and that you properly start thread engagement. When possible, lubricate plain or zinc plated fasteners other than lock nuts, wheel bolts or wheel nuts, unless different instructions are given for the specific application.

^aGrade 2 applies for hex cap screws (not hex bolts) up to 6 in (152 mm) long. Grade 1 applies for hex cap screws over 6 in. (152 mm) long, and for all other types of bolts and screws of any length.

^b"Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or 7/8 in. and larger fasteners with JDM F13C zinc flake coating.

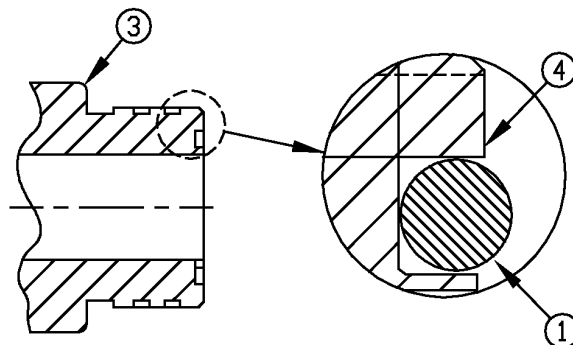
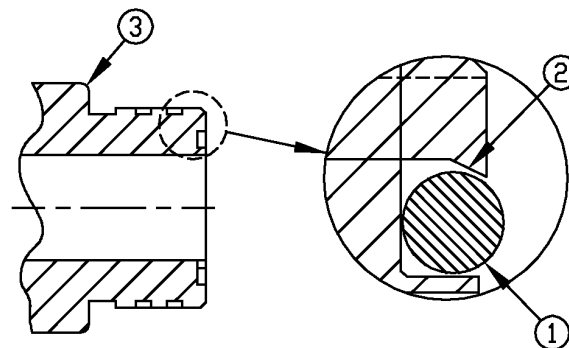
^c"Dry" means plain or zinc plated without any lubrication, or 1/4 to 3/4 in. fasteners with JDM F13B zinc flake coating.

DX,TORQ1 -19-08DEC09-1/1

O-Ring Groove Connections

Face seal grooves (2 and 4) on fittings (3) should be identified before the O-ring (1) is installed into the fitting (use a O-ring pick to feel for the dovetail edge). Applying petroleum jelly on an O-ring to install it in a Standard Groove is appropriate. However, do not use petroleum jelly or grease on an O-ring to install it into a Half Dovetail Groove (Captive O-ring Groove). If petroleum jelly is used in a Half Dovetail groove, the jelly could push the O-ring out of the groove before the fitting is tighten.

- 1— O-Ring
- 2— Half Dovetail Groove
- 3— Fitting
- 4— Standard Groove



T127838

Face Seal Groves

T127838 —UN—31JAN00

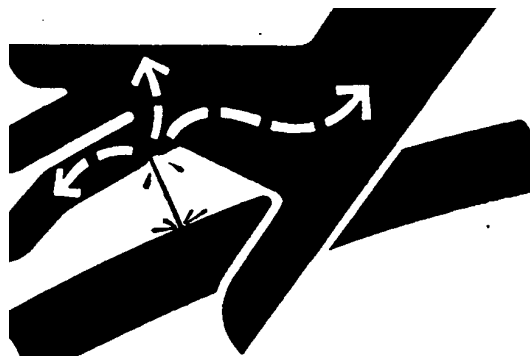
CED, TX03768, 2691 -19-01FEB00-1/1

Check Oil Lines And Fittings

CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury may call the Deere & Company Medical Department in Moline, Illinois, or other knowledgeable medical source.

Check all oil lines, hoses, and fittings regularly for leaks or damage. Make sure all clamps are in position and tight. Make sure hoses are not twisted or touching moving machine parts. If abrasion or wear occurs, replace immediately.



Tubing with dents may cause the oil to overheat. If you find tubing with dents, install new tubing immediately.

IMPORTANT: Tighten fittings as specified in torque chart.

When you tighten connections, use two wrenches to prevent bending or breaking tubing and fittings.

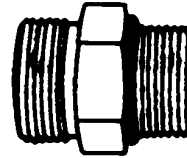
X9811 —UN—23AUG88

TX,03,SS3513 -19-01AUG94-1/1

Service Recommendations for O-Ring Boss Fittings

Straight Fitting

1. Inspect O-ring boss seat for dirt or defects.
2. Lubricate O-ring with petroleum jelly. Place electrical tape over threads to protect O-ring. Slide O-ring over tape and into O-ring groove of fitting. Remove tape.
3. Tighten fitting to torque value shown on chart.



T6249AE —UN—18OCT88

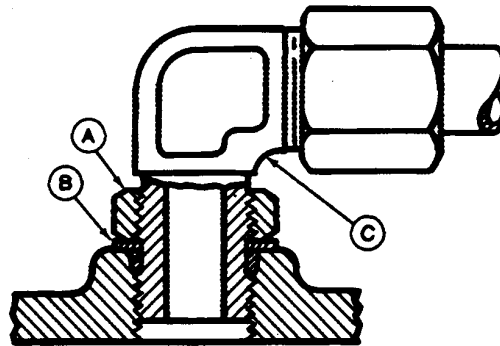
04T,90,K66 -19-29SEP99-1/2

Angle Fitting

1. Back-off lock nut (A) and back-up washer (B) completely to head-end (C) of fitting.
2. Turn fitting into threaded boss until back-up washer contacts face of boss.
3. Turn fitting head-end counterclockwise to proper index (maximum of one turn).

NOTE: Do not allow hoses to twist when tightening fittings.

4. Hold fitting head-end with a wrench and tighten locknut and back-up washer to proper torque value.



T6520AB —UN—18OCT88

STRAIGHT FITTING OR SPECIAL NUT TORQUE CHART

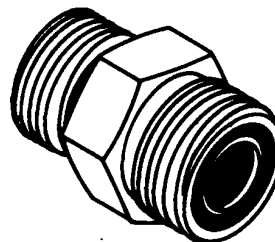
Thread Size	N-m	lb-ft
3/8-24 UNF	8	6
7/16-20 UNF	12	9
1/2-20 UNF	16	12
9/16-18 UNF	24	18
3/4-16 UNF	46	34
7/8-14 UNF	62	46
1-1/16-12 UN	102	75
1-3/16-12 UN	122	90
1-5/16-12 UN	142	105
1-5/8-12 UN	190	140
1-7/8-12 UN	217	160

NOTE: Torque tolerance is $\pm 10\%$.

04T,90,K66 -19-29SEP99-2/2

Service Recommendations for Flat Face O-Ring Seal Fittings

1. Inspect the fitting sealing surfaces. They must be free of dirt or defects.
2. Inspect the O-ring. It must be free of damage or defects.
3. Lubricate O-rings and install into groove using petroleum jelly to hold in place.
4. Push O-ring into the groove with plenty of petroleum jelly so O-ring is not displaced during assembly.
5. Index angle fittings and tighten by hand pressing joint together to insure O-ring remains in place.
6. Tighten fitting or nut to torque value shown on the chart per dash size stamped on the fitting. Do not allow hoses to twist when tightening fittings.



T6243AD —UN—18OCT88

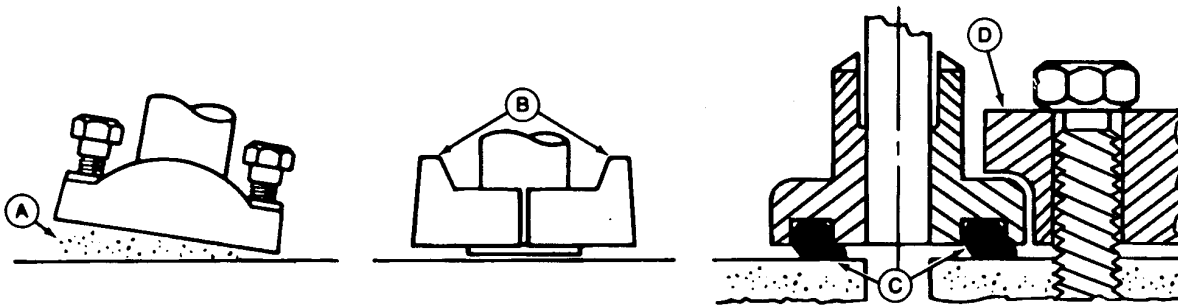
FLAT FACE O-RING SEAL FITTING TORQUE

Nominal Tube O.D.		Dash Size	Thread Size in.	Swivel Nut		Bulkhead Nut	
mm	in.			N·m	lb-ft	N·m	lb-ft
6.35	0.250	-4	9/16-18	16	12	5.0	3.5
9.52	0.375	-6	11/16-16	24	18	9.0	6.5
12.70	0.500	-8	13/16-16	50	37	17.0	12.5
15.88	0.625	-10	1-14	69	51	17.0	12.5
19.05	0.750	-12	1 3/16-12	102	75	17.0	12.5
22.22	0.875	-14	1 3/16-12	102	75	17.0	12.5
25.40	1.000	-16	1 7/16-12	142	105	17.0	12.5
31.75	1.250	-20	1 11/16-12	190	140	17.0	12.5
38.10	1.500	-24	2-12	217	160	17.0	12.5

NOTE: Torque tolerance is +15 -20%.

TX,03,SS3515 -19-01AUG94-1/1

Service Recommendations for Metric Series Four Bolt Flange Fitting



T6890BB—UN—01MAR90

A—Sealing Surface

B—Split Flange

C—Pinched O-Ring

D—Single Piece Flange

1. Clean sealing surfaces (A). Inspect. Scratches cause leaks. Roughness causes seal wear. Out-of-flat causes seal extrusion. If defects cannot be polished out, replace component.
2. Install the correct O-ring (and backup washer if required) into groove using petroleum jelly to hold it in place.
3. Split flange: Loosely assemble split flange (B) halves. Make sure split is centrally located and perpendicular to the port. Hand tighten cap screws to hold parts in place. Do not pinch O-ring (C).
4. Single piece flange (D): Place hydraulic line in center of flange and install four cap screws. Flange must be centrally located on port. Hand tighten cap screws to hold flange in place. Do not pinch O-ring.
5. After components are properly positioned and cap screws are hand tightened, tighten one cap screw, then tighten the diagonally opposite cap screw. Tighten two remaining cap screws. Tighten all cap screws as specified in the chart below.

DO NOT use air wrenches. DO NOT tighten one cap screw fully before tightening the others. DO NOT over tighten.

^aTORQUE CHART

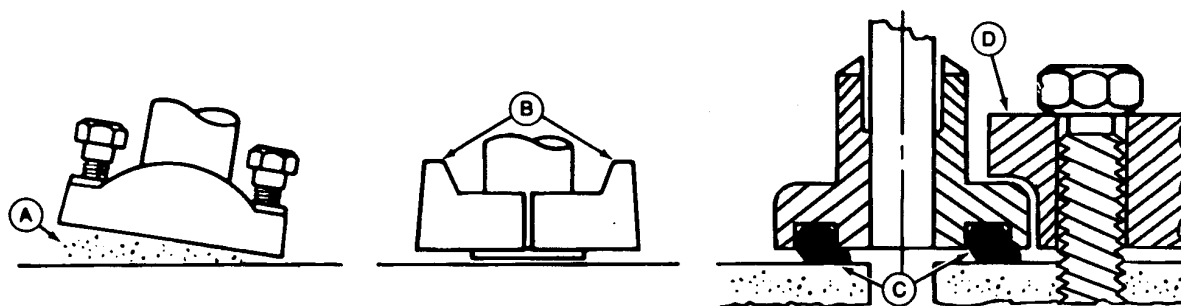
^b Thread	N·m	lb·ft
M6	12	9
M8	30	22
M10	57	42
M12	95	70
M14	157	116
M16	217	160
M18	334	246
M20	421	318

^aTolerance $\pm 10\%$. The torques given are enough for the given size connection with the recommended working pressure. Increasing cap screw torque beyond these amounts will result in flange and cap screw bending and connection failures.

^bMetric standard thread.

04T,90,K175 -19-29SEP99-1/1

Service Recommendations For Inch Series Four Bolt Flange Fittings



A—Sealing Surface

B—Split Flange

C—Pinched O-Ring

D—Single Piece Flange

1. Clean sealing surfaces (A). Inspect. Scratches cause leaks. Roughness causes seal wear. Out-of-flat causes seal extrusion. If defects cannot be polished out, replace component.
2. Install O-ring (and backup washer if required) into groove using petroleum jelly to hold it in place.
3. Split flange: Loosely assemble split flange (B) halves. Make sure split is centrally located and perpendicular to port. Hand tighten cap screws to hold parts in place. Do not pinch O-ring (C).
4. Single piece flange (D): Place hydraulic line in center of flange and install cap screws. Flange must be centrally located on port. Hand tighten cap screws to hold flange in place. Do not pinch O-ring.
5. Tighten one cap screw, then tighten the diagonally opposite cap screw. Tighten two remaining cap screws. Tighten all cap screws as specified in the chart below.

DO NOT use air wrenches. DO NOT tighten one cap screw fully before tightening the others. DO NOT over tighten.

TORQUE CHART					
Nominal Flange Size	Cap Screw Size	N-m		lb-ft	
		Min	Max	Min	Max
1/2	5/16-18 UNC	20	31	15	23
3/4	3/8-16 UNC	28	54	21	40
1	3/8-16 UNC	37	54	27	40
1-1/4	7/16-14 UNC	47	85	35	63
1-1/2	1/2-13 UNC	62	131	46	97
2	1/2-13 UNC	73	131	54	97
2-1/2	1/2-13 UNC	107	131	79	97
3	5/8-11 UNC	158	264	117	195
3-1/2	5/8-11 UNC	158	264	117	195
4	5/8-11 UNC	158	264	117	195
5	5/8-11 UNC	158	264	117	195

T6890BB—UN—01MAR90

04T,90,K174 -19-01AUG94-1/1

Torque Values

Diesel Fuel

Consult your local fuel distributor for properties of the diesel fuel available in your area.

In general, diesel fuels are blended to satisfy the low temperature requirements of the geographical area in which they are marketed.

Diesel fuels specified to EN 590 or ASTM D975 are recommended. Renewable diesel fuel produced by hydrotreating animal fats and vegetable oils is basically identical to petroleum diesel fuel. Renewable diesel that meets EN 590 or ASTM D975 is acceptable for use at all percentage mixture levels.

Required Fuel Properties

In all cases, the fuel shall meet the following properties:

Cetane number of 43 minimum. Cetane number greater than 47 is preferred, especially for temperatures below -20°C (-4°F) or elevations above 1500 m (5000 ft).

Cold Filter Plugging Point (CFPP) should be at least 5°C (9°F) below the expected lowest temperature or **Cloud Point** below the expected lowest ambient temperature.

Fuel lubricity should pass a maximum scar diameter of 0.45 mm as measured by ASTM D6079 or ISO 12156-1.

Sulfur Content for Interim Tier 4 and EU Stage IIIB Engines

- Diesel fuel quality and fuel sulfur content must comply with all existing emissions regulations for the area in which the engine operates.
- Use **ONLY** ultra low sulfur diesel (ULSD) fuel with a maximum of 0.0015% (15 mg/kg) sulfur content.

Sulfur Content for Other Engines

- Diesel fuel quality and fuel sulfur content must comply with all existing emissions regulations for the area in which the engine operates.
- Use of diesel fuel with sulfur content less than 0.10% (1000 mg/kg) is **STRONGLY** recommended.
- Use of diesel fuel with sulfur content 0.10% (1000 mg/kg) to 0.50% (5000 mg/kg) may result in **REDUCED** oil and filter change intervals. Refer to table in Diesel Engine Oil and Filter Service Intervals.
- **BEFORE** using diesel fuel with sulfur content greater than 0.50% (5000 mg/kg), contact your John Deere dealer.

IMPORTANT: Do not mix used diesel engine oil or any other type of lubricating oil with diesel fuel.

Improper fuel additive usage may cause damage on fuel injection equipment of diesel engines.

DX,FUEL1 -19-03AUG09-1/1

Low Sulfur Diesel Fuel Conditioner

When possible, use existing fuel formulations for engines used off-highway. This fuel will not require any additives to provide good performance and engine reliability. However, many local fuel distributors will not carry both low and regular sulfur diesel fuels.

If the local fuel distributor will supply only low sulfur fuel, order and use John Deere PREMIUM DIESEL FUEL

CONDITIONER. It provides lubricating properties along with other useful benefits, such as cetane improver, anti-oxidant, fuel stabilizer, corrosion inhibitor and others. John Deere PREMIUM DIESEL FUEL CONDITIONER is specifically for use with low sulfur fuels. Nearly all other diesel fuel conditioners only improve cold weather flow and stabilize long-term fuel storage. They do not contain the lubrication additives needed by rotary fuel injection pumps.

TX,04,SS3519 -19-20OCT93-1/1

Handling and Storing Diesel Fuel

⚠ CAUTION: Handle fuel carefully. Do not fill the fuel tank when engine is running.

DO NOT smoke while you fill the fuel tank or service the fuel system.

Fill the fuel tank at the end of each day's operation to prevent water condensation and freezing during cold weather.

Keep all storage tanks as full as practicable to minimize condensation.

Ensure that all fuel tank caps and covers are installed properly to prevent moisture from entering.

Monitor water content of the fuel regularly.

When using bio-diesel fuel, the fuel filter may require more frequent replacement due to premature plugging.

Check engine oil level daily prior to starting engine. A rising oil level may indicate fuel dilution of the engine oil.

IMPORTANT: The fuel tank is vented through the filler cap. If a new filler cap is required, always replace it with an original vented cap.

When fuel is stored for an extended period or if there is a slow turnover of fuel, add a fuel conditioner to stabilize the fuel and prevent water condensation. Contact your fuel supplier for recommendations.

DX,FUEL4 -19-19DEC03-1/1

Do Not Use Galvanized Containers

IMPORTANT: Diesel fuel stored in galvanized containers reacts with zinc coating on the container to form zinc flakes. If fuel contains water, a zinc gel will also form. The gel and flakes will quickly plug fuel filters and damage fuel injectors and fuel pumps.

DO NOT USE a galvanized container to store diesel fuel.

Store fuel in:

- plastic containers.
- aluminum containers.
- specially coated steel containers made for diesel fuel.

DO NOT USE brass-coated containers: brass is an alloy of copper and zinc.

TX,04,SS3521 -19-04JUN90-1/1

Heavy Duty Diesel Engine Coolant

The engine cooling system is filled to provide year-round protection against corrosion and cylinder liner pitting, and winter freeze protection to -37°C (-34°F). If protection at lower temperatures is required, consult your John Deere dealer for recommendations.

John Deere COOL-GARD™ II Premix Coolant is preferred.

John Deere COOL-GARD II Premix is available in a concentration of 50% ethylene glycol.

Additional Recommended Coolants

The following engine coolants are also recommended:

- John Deere COOL-GARD II Concentrate in a 40% to 60% mixture of concentrate with quality water.
- John Deere COOL-GARD Premix (available in a concentration of 50% ethylene glycol).
- John Deere COOL-GARD Concentrate in a 40% to 60% mixture of concentrate with quality water.
- John Deere COOL-GARD PG Premix (available in a concentration of 55% propylene glycol).

John Deere COOL-GARD II Premix and COOL-GARD II Concentrate coolants do not require use of supplemental coolant additives.

John Deere COOL-GARD Premix, COOL-GARD Concentrate, and COOL-GARD PG Premix do not require use of supplemental coolant additives, except for periodic replenishment of additives during the drain interval.

Use John Deere COOL-GARD PG Premix when a non-toxic coolant formulation is required.

Other Coolants

It is possible that John Deere COOL-GARD II, COOL-GARD, and COOL-GARD PG coolants are

COOL-GARD is a trademark of Deere & Company

unavailable in the geographical area where service is performed.

If these coolants are unavailable, use a coolant concentrate or prediluted coolant intended for use with heavy duty diesel engines and with a minimum of the following chemical and physical properties:

- Is formulated with a quality nitrite-free additive package.
- Provides cylinder liner cavitation protection according to either the John Deere Cavitation Test Method or a fleet study run at or above 60% load capacity.
- Protects the cooling system metals (cast iron, aluminum alloys, and copper alloys such as brass) from corrosion.

The additive package must be part of one of the following coolant mixtures:

- ethylene glycol or propylene glycol base prediluted (40% to 60%) heavy duty coolant
- ethylene glycol or propylene glycol base heavy duty coolant concentrate in a 40% to 60% mixture of concentrate with quality water

Water Quality

Water quality is important to the performance of the cooling system. Distilled, deionized, or demineralized water is recommended for mixing with ethylene glycol and propylene glycol base engine coolant concentrate.

IMPORTANT: Do not use cooling system sealing additives or antifreeze that contains sealing additives.

Do not mix ethylene glycol and propylene glycol base coolants.

Do not use coolants that contain nitrites.

DX,COOL3 -19-03NOV08-1/1

Fuel Tank

CAUTION: Handle fuel carefully. If the engine is hot or running, DO NOT fill the fuel tank. DO NOT smoke while you fill fuel tank or work on fuel system.

To avoid condensation, fill the fuel tank at the end of each day's operation. Shut off engine before filling.

Item	Measurement	Specification
Fuel Tank	Capacity	136 L (36 gal)

TX,04,SS3523 -19-20SEP96-1/1

Diesel Engine Oil

Use oil viscosity based on the expected air temperature range during the period between oil changes.

John Deere Plus-50™ II oil is preferred.

John Deere Plus-50™ is also recommended.

Other oils may be used if they meet one or more of the following:

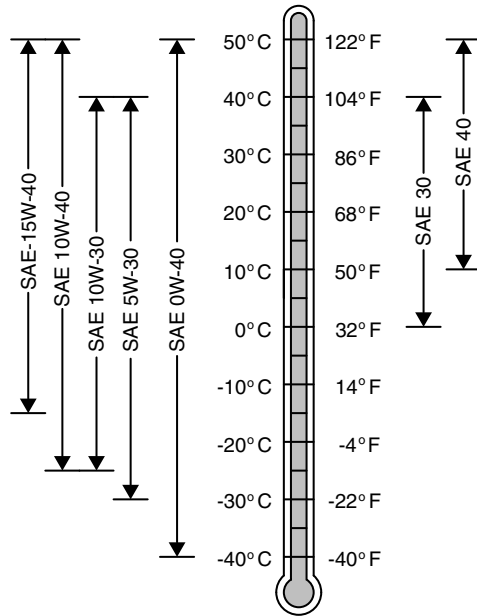
- John Deere Torq-Gard Supreme™
- API Service Category CJ-4
- API Service Category CI-4 PLUS
- API Service Category CI-4
- API Service Category CH-4
- API Service Category CG-4
- API Service Category CF-4
- ACEA Oil Sequence E9
- ACEA Oil Sequence E7
- ACEA Oil Sequence E6
- ACEA Oil Sequence E5
- ACEA Oil Sequence E4
- ACEA Oil Sequence E3
- ACEA Oil Sequence E2

If oils meeting API CG-4, API CF-4, or ACEA E2 are used, reduce the service interval by 50%.

Multi-viscosity diesel engine oils are preferred.

Diesel fuel quality and fuel sulfur content must comply with all existing emissions regulations for the area in which the engine operates.

*Plus-50 is a trademark of Deere & Company
Torq-Gard Supreme is a trademark of Deere & Company*



Oil Viscosities for Air Temperature Ranges

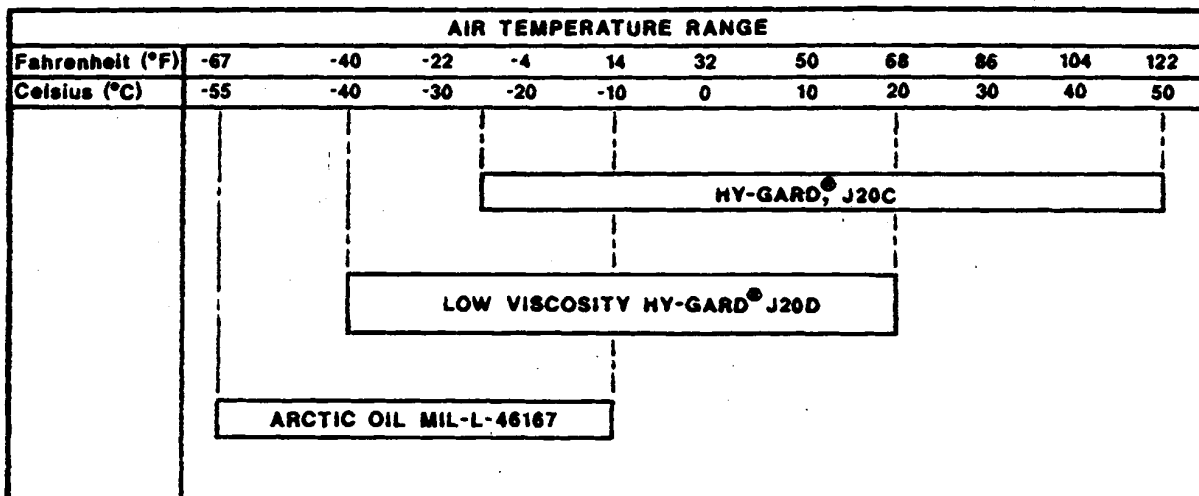
If diesel fuel with sulfur content greater than 0.50% (5000 mg/kg) is used, reduce the service interval by 50%.

DO NOT use diesel fuel with sulfur content greater than 1.00% (10 000 mg/kg).

TS1687—UN—18JUL07

DX.ENOIL -19-03AUG09-1/1

Transmission, Axle, and Mechanical Front Wheel Drive Oil



T103849-19-19SEP96

Depending on the expected air temperature range between oil changes, use oil viscosity shown on the chart above.

JOHN DEERE HY-GARD® TRANSMISSION AND HYDRAULIC OIL IS RECOMMENDED because it is specifically formulated to minimize brake chatter, and to provide maximum protection against mechanical wear.

HY-GARD is a trademark of Deere & Company

You may also use oils which meet minimum John Deere standards, or other oils meeting John Deere Standard JDM J20C and J20D.

Oils meeting MIL-L46167A may be used as arctic oil.

TX,04,SS3525 -19-30NOV98-1/1

Hydraulic Oil

TX,04,SS3526 -19-27NOV91-1/1

		AIR TEMPERATURE RANGE							
Fahrenheit (°F)	-67	-40	-22	-4	14	32	50	68	
Celsius (°C)	-55	-40	-30	-20	-10	0	10	20	
						HY-GARD [®] J20C			
					LOW VISCOSITY HY-GARD [®] J20D				
	ARCTIC OIL, MIL-L-46167								

TM1611 (22JUL10)

00-0004-6

410E Backhoe Loader

PN=46

TX 04 SS3526 -19-27NOV/91-2/1

Fuels and Lubricants

Depending on the expected air temperature range between oil changes, use oil viscosity shown on the chart above.

JOHN DEERE HY-GARD® TRANSMISSION AND HYDRAULIC OIL IS RECOMMENDED because it is

HY-GARD is a trademark of Deere & Company

specifically formulated to minimize brake chatter, and to provide maximum protection against mechanical wear.

You may also use oils which meet minimum John Deere standards, or other oils meeting John Deere Standard JDM J20C and J20D.

Oils meeting MIL-L-46167A may be used as arctic oil.

TX,04,SS3526 -19-27NOV91-3/1

Grease

Use grease based on NLGI consistency numbers and the expected air temperature range during the service interval.

John Deere SD POLYUREA GREASE is preferred.

The following greases are also recommended

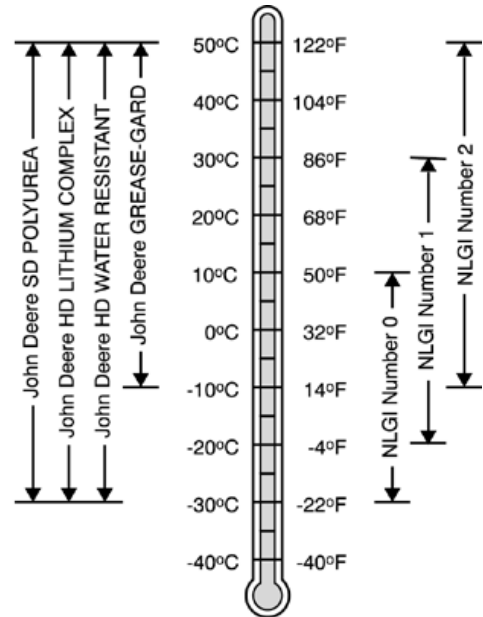
- John Deere HD LITHIUM COMPLEX GREASE
- John Deere HD WATER RESISTANT GREASE
- John Deere GREASE-GARD™

Other greases may be used if they meet the following:

NLGI Performance Classification GC-LB

IMPORTANT: Some types of grease thickeners are not compatible with others. Consult your grease supplier before mixing different types of grease.

GREASE-GARD is a trademark of Deere & Company



DX,GRE1 -19-07NOV03-1/1

Grease for Extendible Dipperstick, Sideshift Frame, and Stabilizer Leg Wear Strips

SAE Multipurpose Grease with Extreme Pressure (EP) performance and containing 3 to 5 per cent molybdenum disulfide (preferred).

TX,00,SS3882 -19-07MAR97-1/1

Alternative and Synthetic Lubricants

Conditions in certain geographical areas may require lubricant recommendations different from those printed in this manual.

Some John Deere brand coolants and lubricants may not be available in your location.

Synthetic lubricants may be used if they meet the performance requirements as shown in this manual.

The temperature limits and service intervals shown in this manual apply to both conventional and synthetic oils.

Re-refined base stock products may be used if the finished lubricant meets the performance requirements.

Avoid mixing different brands or types of oils. Oil manufacturers blend base stock and additives to create their oils and to meet certain specifications and performance requirements. Mixing different oils can interfere with proper functioning of these formulations and degrade lubricant performance.

Consult your authorized John Deere dealer to obtain specific information and recommendations.

DX,ALTER -19-11NOV09-1/1

Lubricant Storage

Your equipment can operate at top efficiency only when clean lubricants are used.

Use clean containers to handle all lubricants.

Whenever possible, store lubricants and containers in an area protected from dust, moisture, and other contamination. Store containers on their side to avoid water and dirt accumulation.

Make certain that all containers are properly marked to identify their contents.

Properly dispose of all old containers and any residual lubricant they may contain.

DX,LUBST -19-18MAR96-1/1

Mixing of Lubricants

In general, avoid mixing different brands or types of oil. Oil manufacturers blend additives in their oils to meet certain specifications and performance requirements.

Mixing different oils can interfere with the proper functioning of these additives and degrade lubricant performance.

Consult your John Deere dealer to obtain specific information and recommendations.

DX,LUBMIX -19-18MAR96-1/1

Section 01 Wheels

Contents

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Remove and Install	01-0110-4

Contents

Group 0110

Powered or Non-Powered Wheels and Fastenings

Service Equipment and Tools

European Microfiche Tool Catalog (MTC). Some tools may be available from a local supplier.

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or from the

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CED, TX03399, 5615 -19-03DEC99-1/3

Shop Stand

Used to support unit while removing and installing wheels.

CED, TX03399, 5615 -19-03DEC99-2/3

Heavy Duty Wheel Lift

Used to remove and install wheels.

CED, TX03399, 5615 -19-03DEC99-3/3

Specifications

Item	Measurement	Specification
Rear Wheel	Weight	141 kg (310 lb) without fluid
	Weight	420 kg (930 lb) with fluid
Rear Wheel Cap Screws (19.5L x 24 or 21L x 24 Tire Size)	Torque	495 ± 99 N·m (365 ± 73 lb-ft)
Front Wheel	Weight	50 kg (110 lb) without fluid
	Weight	186 kg (411 lb) with fluid
Front Wheel-to-Hub Cap Screw without MFWD (11L x 16 Tire Size)	Torque	136 N·m (100 lb-ft)
Front Wheel-to-Hub Cap Screw without MFWD (14.5/75 -16.1 Tire Size) (S.N. —876058)	Torque	136 + 20 - 68 N·m (100 + 15 - 50 lb-ft)
Front Wheel-to-Hub Cap Screw without MFWD (14.5/75 -16.1 Tire Size) (S.N. 876059—)	Torque	290 ± 58 N·m (214 ± 42 lb-ft)
Front Wheel-to-Hub Nut With MFWD (12.5/80-18 Tire Size)	Torque	300 N·m (220 lb-ft)

CED, TX03399, 5617 -19-03DEC99-1/1

Remove and Install Rear Wheel Assembly

CAUTION: Rear wheel weighs approximately 141 kg (310 lb) without fluid; 420 kg (930 lb) with fluid.

1. Loosen cap screws (B) before lifting wheel off ground.
2. Raise machine and put shop stands under main frame.
3. Put wheel lift (A) under wheel. Fasten safety chain around upper portion of tire.

Specification

Rear Wheel—Weight..... 141 kg (310 lb) without fluid
Weight 420 kg (930 lb) with fluid

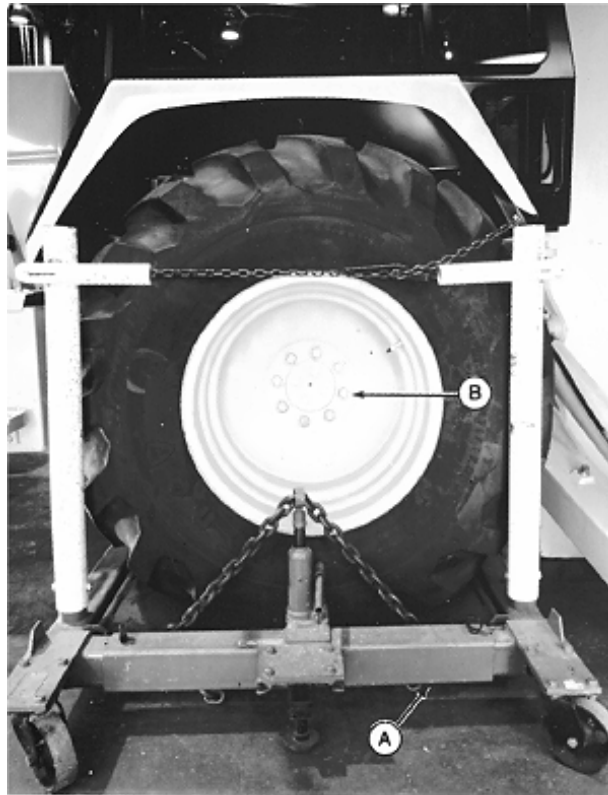
4. Remove cap screws (B). Pull wheel assembly away from axle.
5. Inspect all parts for damage; replace parts as necessary.
6. Thoroughly clean cap screws, washers, mounting surfaces and tapped holes in flanged axle. Use compressed air to dry all parts and tapped holes.
7. Install wheel using wheel lift (A).
8. Install and snug tighten cap screws (B). Lower machine to the ground.

IMPORTANT: If a power wrench is used, be sure that cap screws are engaged to prevent stripping. Operate wrench slowly to prevent thread damage.

9. Tighten cap screws to specification.

Specification

Rear Wheel Cap Screws
(19.5L x 24 or 21L x 24
Tire Size) —Torque..... 495 ± 99 N·m (365 ± 73 lb-ft)



T7527AJ—UN—10MAY91

A—Wheel Lift

B—Cap Screws

TX,01,YY2157 -19-29NOV99-1/1

Remove and Install Front Wheel Assembly

CAUTION: Front wheel weighs approximately 50 kg (110 lb) without fluid or 186 kg (411 lb) with fluid.

1. Loosen cap screws or nuts for MFWD machines.
2. Lift wheel off ground and put shop stand under axle housing.
3. Put wheel lift under wheel. Fasten safety chain around upper portion of tire.

Specification

Front Wheel—Weight.....50 kg (110 lb) without fluid
Weight186 kg (411 lb) with fluid

4. Remove cap screws. Pull wheel assembly away from axle.
5. Inspect all parts for damage; replace parts as necessary.
6. Clean lug nuts and tapped studs. Use compressed air to dry all parts.

IMPORTANT: If a power wrench is used, be sure that lug nuts are engaged to prevent stripping. Operate wrench slowly to prevent thread damage.

7. Install wheel assembly. Install nuts or cap screws and tighten to specification.

Specification

Front Wheel-to-Hub
Cap Screw without
MFWD (11L x 16 Tire
Size)—Torque..... 136 N·m (100 lb-ft)



T6382BJ —UN—27MAR90

Front Wheel-to-Hub
Cap Screw without
MFWD (14.5/75
-16.1Tire Size) (S.N.
—876058)—Torque..... 136 + 20 - 68 N·m (100 + 15 - 50 lb-ft)

Front Wheel-to-Hub
Cap Screw without
MFWD (14.5/75
-16.1Tire Size) (S.N.
876059)—Torque..... 290 ± 58 N·m (214 ± 42 lb-ft)

Specification

Front Wheel-to-Hub Nut
With MFWD (12.5/80-18
Tire Size) —Torque..... 300 N·m (220 lb-ft)

8. Lower machine to the ground.

TXD300DS3032 -19-29NOV99-1/1

Remove and Install Tire

⚠ CAUTION: Explosive separation of a tire and rim parts can cause serious injury or death.

Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job.

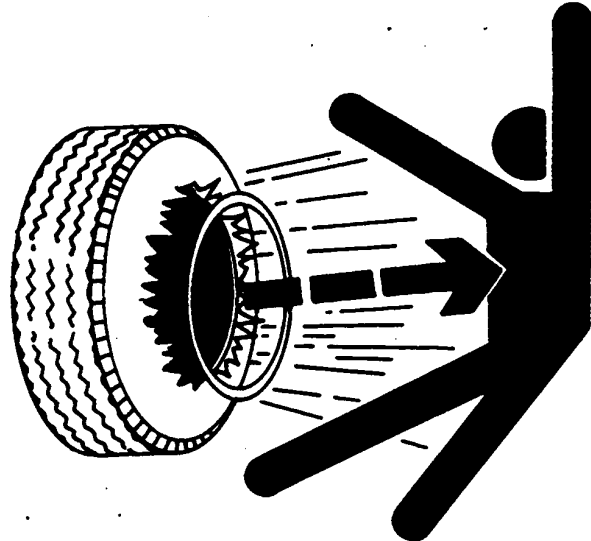
Always maintain the correct tire pressure. Do not inflate the tires above the recommended pressure. Never weld or heat a wheel and tire assembly. The heat can cause an increase in air pressure resulting in a tire explosion. Welding can structurally weaken or deform the wheel.

When inflating tires, use a clip-on chuck and extension hose long enough to allow you to stand to one side and NOT in front of or over the tire assembly. Use a safety cage if available.

Check wheels for low pressure, cuts, bubbles, damaged rims or missing lug bolts and nuts.

NOTE: See John Deere Off-The-Road Tire Maintenance Manual to remove tire from wheel.

1. The tire can be removed without removing the wheel from the machine.



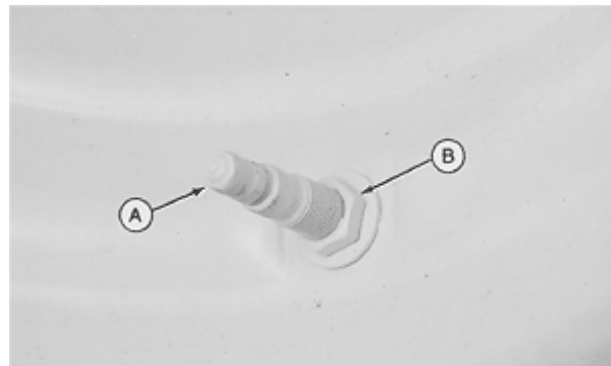
TSZ11 —UN—23AUG88

TX,01,YY2142 -19-30JAN97-1/4

2. Always completely deflate tire by removing the valve core (A) from valve before attempting any demounting operation. Check valve stem by running a probe through it to make sure the valve stem is not plugged. Remove valve nut (B).

A—Valve Core

B—Valve Nut



T91801 —UN—13FEB90

Continued on next page

TX,01,YY2142 -19-30JAN97-2/4

3. Inspect all parts for damage; replace parts as necessary.
4. Make sure all parts are clean and free from rust or grease before assembly.
5. To prevent slipping of the wheel under load, the inside and outside of wheel must be free of paint, rust, oil, grease, dirt or other foreign material before installation.
6. Install valve stem in rim base and tighten valve core housing finger tight.

⚠ CAUTION: Serious bodily injury can occur from explosion when mounting and inflating tires if safe procedures are not followed.

7. Before mounting tire on rim, add soap lubricant to bead of the tire.
8. Clear area of all persons.

A—Rim
B—Valve Core

C—Side Flange



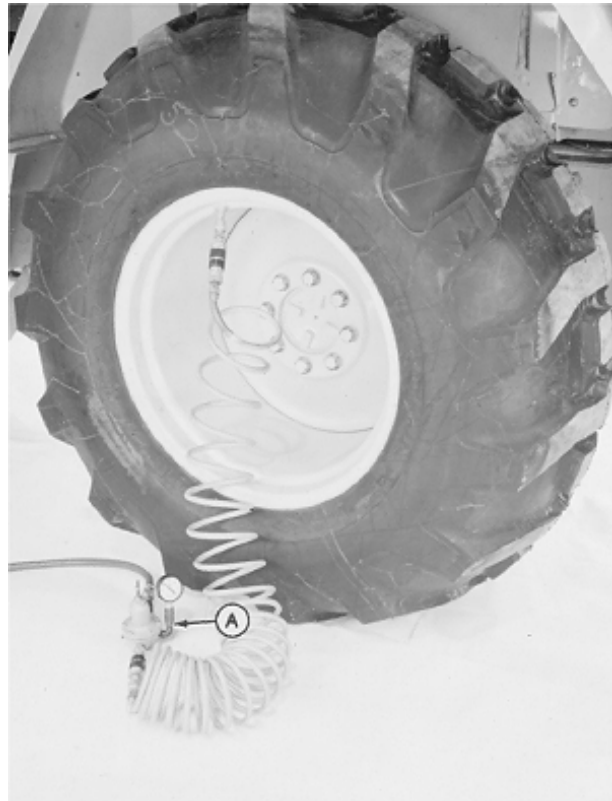
T91802—UN—13FEB90

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TX,01,YY2142 -19-30JAN97-3/4

9. Turn tire so valve stem is positioned at 12 o'clock. Use a pressure regulating valve with clip-on chuck and extension hose long enough to allow you to stand to one side and NOT in front of tire while inflating.
10. Use only recommended air pressure. Pressure over this limit can cause an explosion.
11. Add air until side flange of tire slides out against rim.

**A—Pressure Regulating Valve
with Clip-On Chuck**



T91803—JUN—13FEB90

TX,01,YY2142 -19-30JAN97-4/4

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Group 0225 Input Drive Shafts and U-Joints

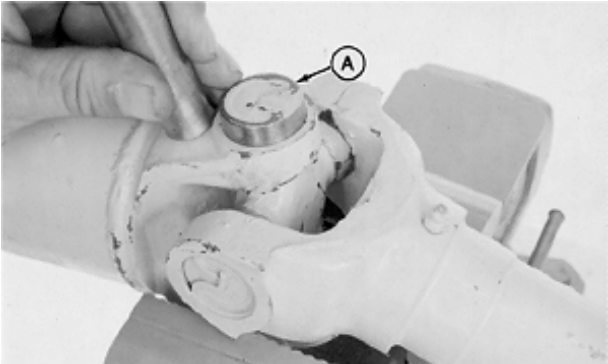
Specifications		
Item	Measurement	Specification
Drive Shaft U-Joint Strap-to-Yoke Cap Screws	Torque	40 N·m (30 lb-ft)

CED,TX03399,5621 -19-03DEC99-1/1

Remove and Install Drive Shaft

NOTE: Cap screws used in front and rear drive shaft are not reusable. Replace cap screws.

1. Remove four cap screw at front axle. Slide drive shaft from spline. For rear drive shaft remove eight cap screws.
2. Remove grease fitting and snap rings.
3. Put shaft in vice. Move shaft down, using a brass rod, until bearing assembly (A) is about halfway out.
4. Remove bearing assembly and U-joint. Replace parts if necessary.

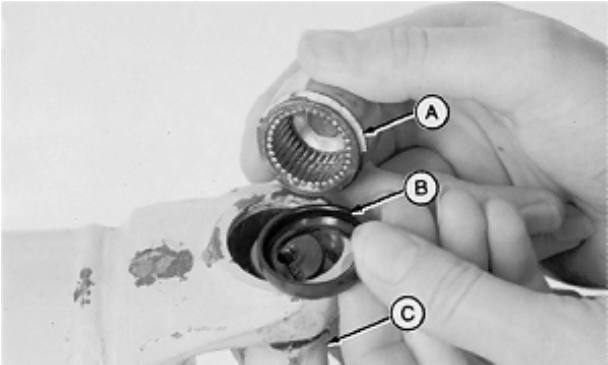


T94751 —UN—05FEB90

TX,0225,SS3076 -19-04DEC98-1/2

5. Rollers (A) and seal (B) must be installed correctly. Apply multi-purpose grease on rollers to aid in assembly.
6. Install U-joint (C).
7. Push bearing assemblies into yoke just far enough to install snap ring. Install snap ring.
8. Install grease fitting.
9. Install drive shaft. Install cap screws and tighten to specification.

Specification	
Drive Shaft U-Joint Strap-to-Yoke Cap Screws—Torque.....	40 N·m (30 lb-ft)



T94754 —UN—05FEB90

TX,0225,SS3076 -19-04DEC98-2/2

Input Drive Shafts and U-Joints

Group 0230 Non-Powered Wheel Axles

Service Equipment and Tools

European Microfiche Tool Catalog (MTC). Some tools may be available from a local supplier.

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or from the

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CED, TX03399, 5622 -19-03DEC99-1/2

Bushing, Bearing and Seal Driver Set..... D01045AA Used to remove and install bushings.

CED, TX03399, 5622 -19-03DEC99-2/2

Other Material

Number	Name	Use
TY15969 (U.S.)	Retaining Compound (Maximum Strength)	Apply to new tie rod bushings.
TY9479 (Canadian)		
680 (LOCTITE®)		

LOCTITE is a registered trademark of Loctite Corp.

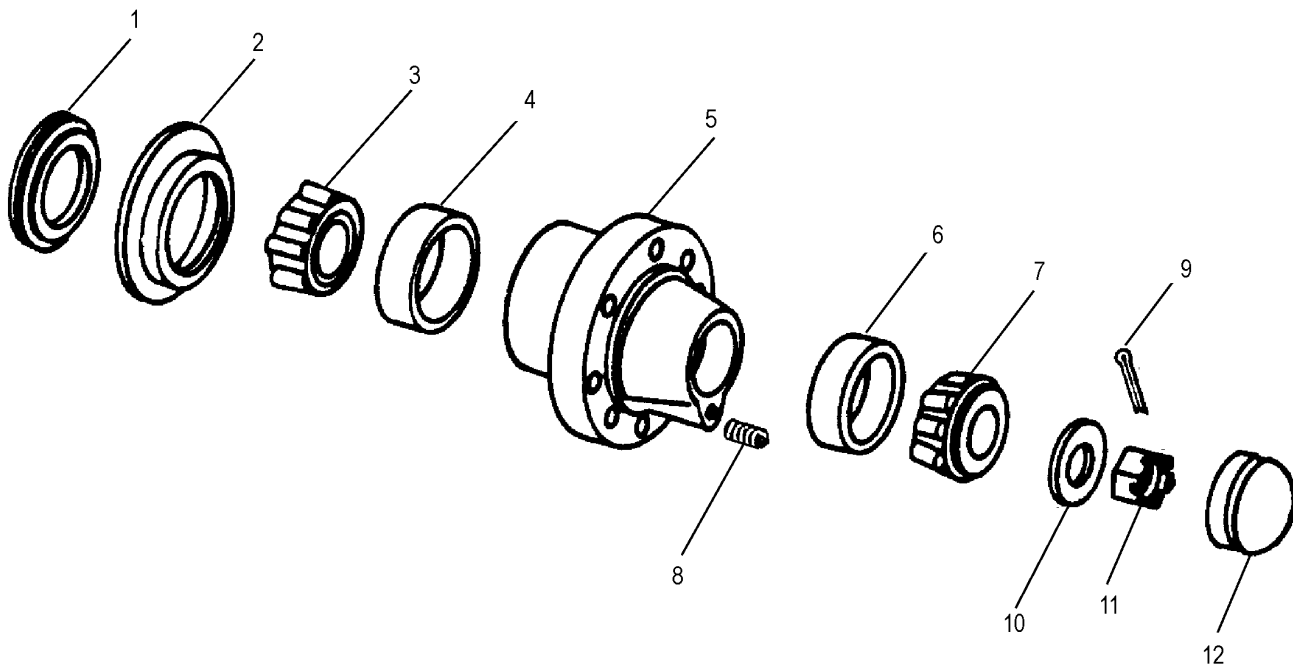
CED, TX03399, 5623 -19-03DEC99-1/1

Specifications

Item	Measurement	Specification
King Pin Bushings	Distance	Flush to 3 mm (0.01 in.) below inner surface of axle casting
Wheel Bearing Castellated Nut	Torque	47 N·m (35 lb-ft), then turn out to nearest cotter pin slot.
Front Wheel Toe-In	Distance	6 ± 3 mm (0.24 ± 0.12 in.)
Tie Rod End Clamp Cap Screws and Nuts	Torque	95 N·m (70 lb-ft)

CED, TX03399, 5624 -19-03DEC99-1/1

Remove and Install Hub Assembly



T106983—UN—03FEB97

T106983

- | | | | |
|-----------------------|----------------|-----------------------|---------------------|
| 1— Seal | 4— Bearing Cup | 7— Outer Bearing Cone | 10— Washer |
| 2— Seal Cup | 5— Hub | 8— Set Screw | 11— Castellated Nut |
| 3— Inner Bearing Cone | 6— Bearing Cup | 9— Cotter Pin | 12— Cap |

1. Remove front wheel. (See Remove and Install Front Wheel Assembly in Section 01, Group 0110.)
2. Remove cap (12).
3. Remove cotter pin (9) and nut (11).
4. Remove washer (10), bearing cone (7) and hub (5).
5. Remove bearing cone (3) and seal (1).
6. Remove seal cup (2).
7. Remove all old grease. Clean parts in solvent. Allow to air dry.
8. Inspect bearing cones and cups for pitting, discoloration, or scoring. Check seal for damage or brittleness. Replace parts if necessary.

NOTE: Remove bearing cups only if replacement is necessary.

9. Remove bearing cups (4 and 6) using a brass drift.
10. Install new outer and inner bearing cups using a press. Install cups tight against shoulder in hub.
11. Pack inner and outer bearing cones (3 and 7) with multi-purpose grease.

12. Install inner bearing cone (3).
13. Install seal cup (2) using a press.

NOTE: Use a piece of pipe with the following approximate dimensions to install seal (1).

- Length—152 mm (6 in.)
- OD—70 mm (2-3/4 in.)
- ID—63.5 mm (2-1/2 in.)

14. Install seal (1) until tight against shoulder with flat side of seal facing away from hub.
15. Fill space between inner bearing cone and seal with multi-purpose grease. Apply grease to lips of seal.
16. Install hub (5) onto knuckle spindle.
17. Install outer bearing cone (7), washer (10), and castellated nut (11).
18. Tighten castellated nut to specification.

Specification

Wheel Bearing
Castellated
Nut—Torque..... 47 N·m (35 lb-ft)

Continued on next page

TX,0230,SS3067 -19-04DEC98-1/2

Non-Powered Wheel Axles

19. Rotate hub several times and tighten castellated nut again to specification.
20. Loosen castellated nut just enough to install cotter pin. If hole in knuckle spindle is aligned with slot in nut when nut is tightened to specification, loosen castellated nut one slot and install cotter pin.

21. Remove set screw (8) and install a grease fitting.
22. Inject multi-purpose grease into hub until grease begins to come through outer bearing cone.
23. Install cap.

TX,0230,SS3067 -19-04DEC98-2/2

Remove and Install Spindle and Knuckle Assembly

1. Remove hub. (See Remove and Install Hub Assembly in this group.)
2. Remove cotter pin (23) and pin (30) to disconnect tie rod.
3. Remove cap screw (14).
4. Remove king pin using a soft steel rod.
5. Remove knuckle (29) with thrust washers (18 and 19).
6. Inspect thrust washers (18 and 19) and spring pin (20) for wear or damage. Remove spring pin only if replacement is necessary.
7. Inspect all parts for wear or damage, including axle bushings.
8. Remove seal from upper pivot bore.
9. Remove upper and lower bushings using disks from Bushing, Bearing and Seal Driver Set.
10. Apply retaining compound to outside surface of new bushings. Install bushings flush to 3 mm (0.01 in.) below inner surface of axle casting.

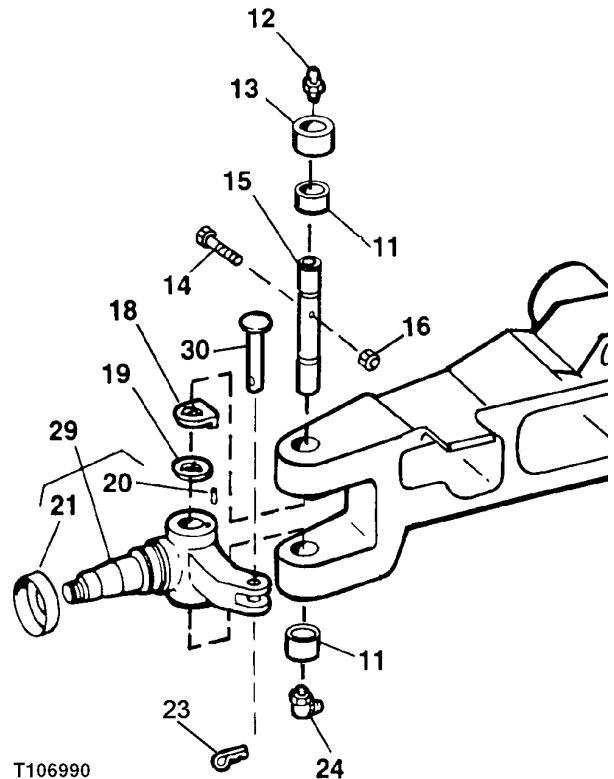
Specification

King Pin
 Bushings—Distance..... Flush to 3 mm (0.01 in.)
 below inner surface of axle casting

11. Install new seals tight against bushings.
12. Install new knuckle spring pin, if removed.
13. Install thrust washers and knuckle.
14. Install king pin.
15. Install and tighten cap screw (14) to specification.

Specification

Wheel Bearing
 Castellated
 Nut—Torque..... 47 N·m (35 lb-ft), then
 turn out to nearest cotter pin slot.



T106990

T106990 —UN—12AUG98

- | | |
|-------------------|-------------------|
| 11— Bushing | 19— Thrust Washer |
| 12— Grease Zerk | 20— Spring Pin |
| 13— Seal | 21— Dust Shield |
| 14— Cap Screw | 23— Cotter Pin |
| 15— King Pin | 24— Grease Zerk |
| 16— Lock Nut | 29— Knuckle |
| 18— Thrust Washer | 30— Pin |

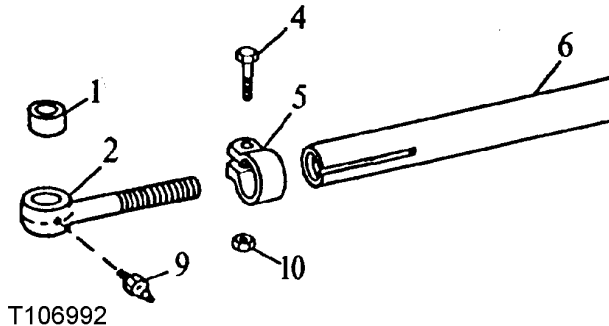
16. Align tie rod to install pin and cotter pin.
17. Install hub. (See Remove and Install Hub Assembly in this group).

TX,02,YY2143 -19-04DEC98-1/1

Remove and Install Tie Rod

1. Remove pins and tie rod (2) from machine.
2. Remove and install bushing (1) using disks from the Bushing, Bearing and Seal Driver Set.
3. Install tie rod and pins.

- | | |
|----------------|----------------|
| 1— Bushing | 6— Tube |
| 2— Tie Rod End | 9— Grease Zerk |
| 4— Cap Screw | 10— Nut |
| 5— Clip | |



T106992

T106992—UN—05FEB97

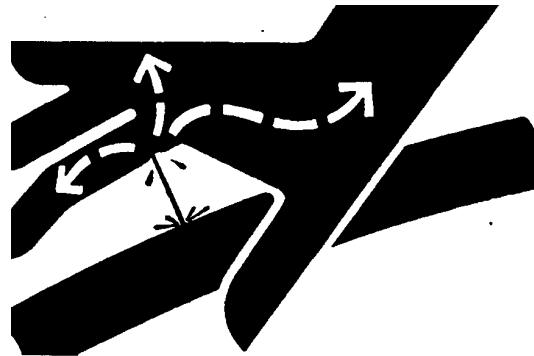
TX,02,YY2145 -19-01FEB97-1/1

Remove and Install Non-Powered Front Axle

1. Install shop stands under main frame.
2. Remove counterweights if equipped.
3. Raise loader and install boom lock bar.

⚠ CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.



4. Operate all hydraulic controls to release pressure.
5. Remove both front wheels. (See procedure in Section 01, Group 0110.)
6. Tag and disconnect steering cylinder lines. Close all openings using caps and plugs.
7. Put a service jack under axle.

X9811—UN—23AUG88

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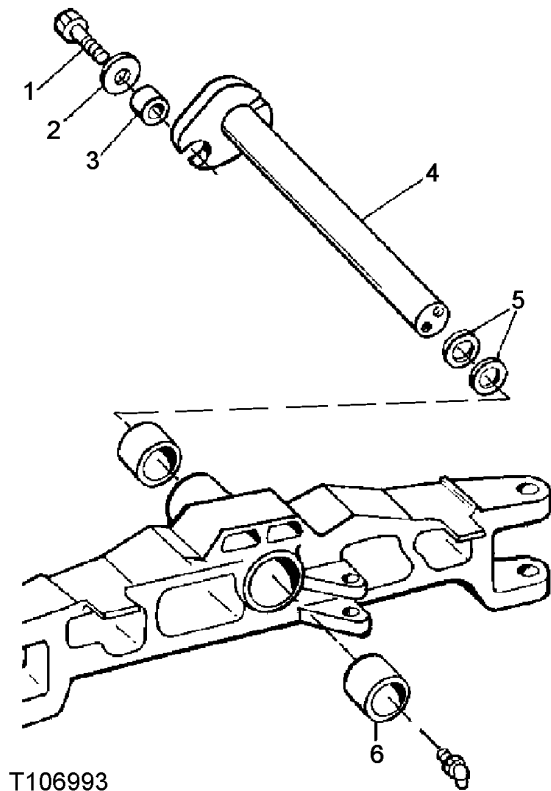
TX,0230,SS3072 -19-16SEP98-1/2

Non-Powered Wheel Axles

8. Remove cap screw (1), washer (2) and bushing (3).
9. Remove lubrication lines from rear of pin (4) and head end of steering cylinder.
10. Remove pin and axle.
11. Remove and save shims, if used.
12. Inspect pivot bushings (6). Remove if worn or damaged.
13. Surfaces must be free of grease, oil, dirt or paint.
14. Apply retaining compound (maximum strength) on outside surface of new bushings.
15. Install new bushings flush to 0.8 mm (0.03 in.) below the outer surface of the axle.
16. Install as many shims as will fit between axle and support.
17. Install pin (4) and cap screw (1).
18. Connect lubrication and hydraulic lines.
19. Install front wheels (see Remove and Install Front Wheel Assembly in Section 01, Group 0110).

1— Cap Screw
2— Washer
3— Bushing

4— Pin
5— Thrust Washer (as required)
6— Bushing (2 used)



T106993

T106993 —UN—05FEB97

TX,0230,SS3072 -19-16SEP98-2/2

Adjust Non-Powered Front Axle Toe-In

1. Measure distance from ground to hub center (A). At this height, mark front and rear of tire at the center of the tread.
2. Measure distance (B and C) between front and rear marks.
3. Front marks must be 6 ± 3 mm (0.24 ± 0.12 in.) less than the rear marks.

Specification

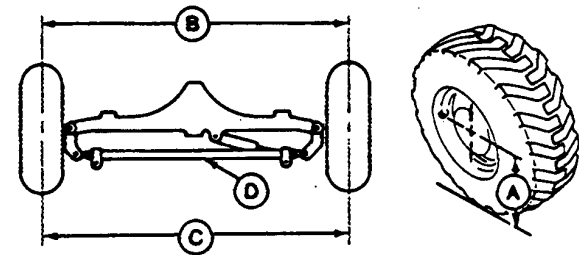
Front Wheel
Toe-In—Distance..... 6 ± 3 mm (0.24 ± 0.12 in.)

4. To adjust toe-in, loosen both tie rod clamps and turn tie rod. After adjustment, tip clamps 45° down toward rear of machine.

5. Tighten clamp cap screws and nuts to specification.

Specification

Tie Rod End Clamp
Cap Screws and
Nuts—Torque..... 95 N·m (70 lb·ft)



A—Center of Hub
B—Front of Tire Width

C—Rear of Tire Width
D—Tie Rod

T6382JW —UN—02NOV88

TX,0230,SS3074 -19-11DEC95-1/1

Non-Powered Wheel Axles

Group 0240 Powered Wheel Axle (MFWD)

Service Equipment and Tools

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or from the

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European microfiche Tool Catalog (MTC). Some tools may be available from a local supplier.

CED, TX03399, 5626 -19-03DEC99-1/2

Low Lift Jack..... JT01642A

Used to remove and install MFWD axle.

CED, TX03399, 5626 -19-03DEC99-2/2

Other Material

Number	Name	Use
TY15969 (U.S.)	Retaining Compound (Maximum Strength)	Apply to OD of MFWD axle bushings.
TY9479 (Canadian)		
680 (LOCTITE®)		

LOCTITE is a registered trademark of Loctite Corp.

CED, TX03399, 5627 -19-03DEC99-1/1

Specifications

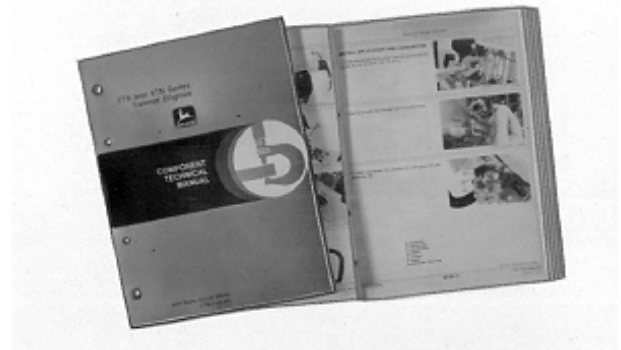
Item	Measurement	Specification
MFWD Axle Pivot	End Play	0—1.5 mm (0—0.060 in.)
MFWD Drive Shaft U-Joint Strap-to-Axle Yoke Cap Screw	Torque	41 N·m (30 lb-ft)
Front Wheel Toe-In	Distance	6 ± 3 mm (1/4 ± 1/8 in.)

CED, TX03399, 5628 -19-03DEC99-1/1

Front Wheel Drive Axles—Use CTM4509

For complete repair information, the component technical manual (CTM) is also required.

Use the CTM in conjunction with this machine manual.



TS225—UN—17JAN89

TX, 02, YY2147 -19-04FEB97-1/1

Remove and Install Powered Front Axle

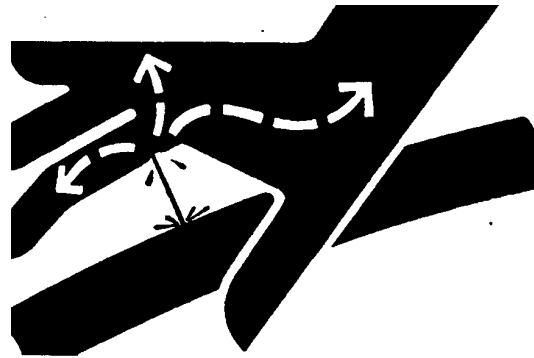
1. Raise loader and install boom lock bar.

⚠ CAUTION: Total machine weight is 4854 kg (10700 lb). Use appropriate lifting device and floor stands.

2. Raise and support front of machine. Position floor stands under main frame—one at each side.
3. Remove front wheels. (See Remove and Install Front Wheel Assembly in Section 01, Group 0110.)

⚠ CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type



of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

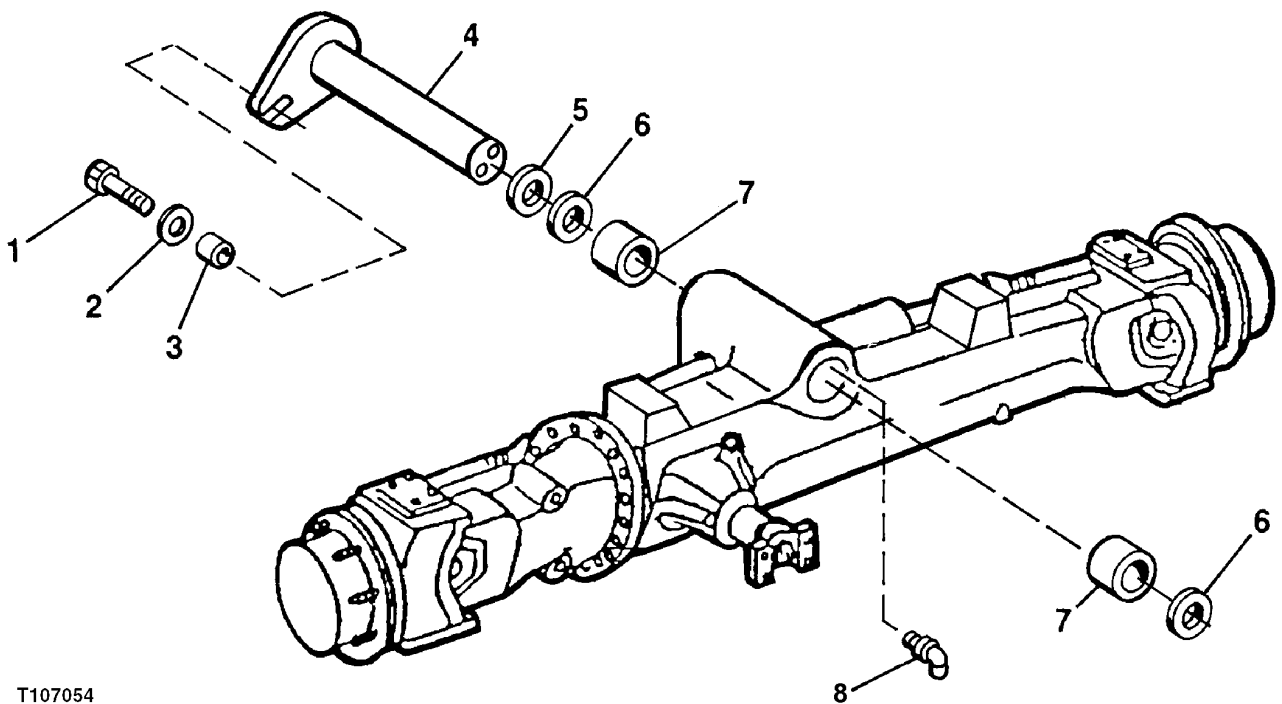
4. Operate all hydraulic control valves to release pressure in hydraulic system. Disconnect steering cylinder lines. Close all openings with caps or plugs.
5. Remove cap screws to disconnect drive shaft.

Continued on next page

TX,02,BD2750 -19-16APR97-1/3

X9811—UN—23AUG88

Powered Wheel Axle (MFWD)



T107054

1— Cap Screw
2— Washer

3— Bushing
4— Pin

5— Thrust Washer (as required)
6— Thrust Washer (2 used)

7— Bushing (2 used)
8— Adapter (2 used)

T107054 —UN—12AUG88

Continued on next page

TX.02.BD2750 -19-16APR97-2/3

Powered Wheel Axle (MFWD)

6. Position a low lift jack under center of front axle. Attach the adjustable-grip arms and safety chains of the low lift jack to the axle housing.
7. Remove cap screw (1), washer (2) and bushing (3).
8. Disconnect two lubrication lines from adapters (8).
9. Remove pin (4), thrust washers (5 and 6) and axle assembly.
10. Inspect bushings (7) for wear or damage. Remove only if replacement is necessary.
11. Put retaining compound on new bushings.
12. Raise axle into position under front frame assembly. Install thrust washers (5) as required between pin (4) and frame until axle pivot end play is within specification.

Specification

MFWD Axle Pivot—End
Play.....0—1.5 mm (0—0.060 in.)

13. Apply multi-purpose grease on pin (4). Install pin into bore. Install two adapters (8) and connect lubrication lines.
14. Install mounting hardware (1—3).
15. Install drive shaft. Tighten cap screws to specification.
16. Connect steering cylinder lines.
17. Install front wheels and lower machine to ground. (See Remove and Install Front Wheel Assembly in Section 01, Group 0110.)
18. Remove boom lock bar and lower loader.

Specification

MFWD Drive
Shaft U-Joint
Strap-to-Axle Yoke Cap
Screw—Torque..... 41 N·m (30 lb·ft)

TX,02.BD2750 -19-16APR97-3/3

Adjust MFWD Axle Toe-In

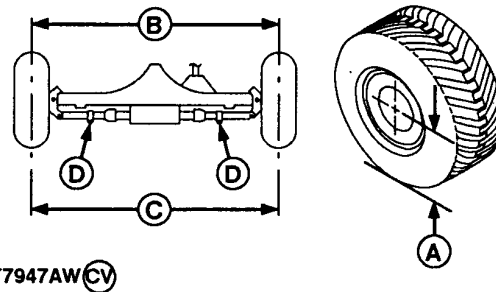
1. With the wheels in straight ahead position, measure distance from ground to hub center (A). At this height, mark front and rear of tire at the center of the tread.
2. Measure distances (B and C) between front and rear marks.
3. Front marks must be 6 ± 3 mm ($1/4 \pm 1/8$ in.) less than the rear marks.

Specification

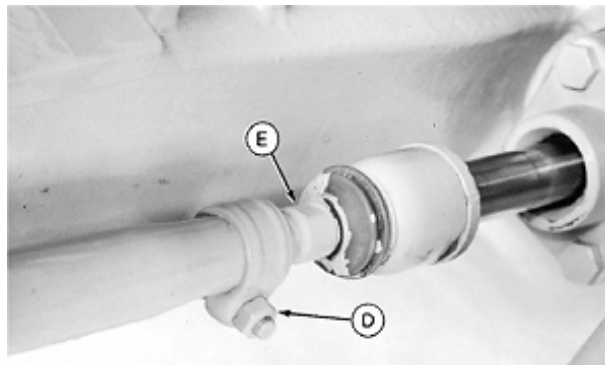
Front Wheel
Toe-In—Distance..... 6 ± 3 mm ($1/4 \pm 1/8$ in.)

4. To adjust toe-in, loosen both tie rod clamp cap screws and nuts (D) and turn each tie rod (E) equally until toe-in is adjusted to specification.
5. Tighten clamp cap screws and nuts.

A—Center of Hub
B—Rear of Tire Width
C—Front of Tire Width
D—Cap Screw and Nut (2 used)
E—Tie Rod



T7947AW(CV)



T7947AW —UN—15MAR93

T7947AX —UN—11MAR93

TX0240BD1053 -19-27JAN94-1/1

Group 0250

Axle Shaft, Bearings and Reduction Gears

Essential Tools

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or from the European Microfiche Tool Catalog (MTC).

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CED, TX03399, 5629 -19-03DEC99-1/6

Axle Spanner Nut Wrench JDG1056 Use to remove axle nut.

CED, TX03399, 5629 -19-03DEC99-2/6

Ring Gauge JDG1138 Used to extend spring pins.

CED, TX03399, 5629 -19-03DEC99-3/6

Axle Seal Installer JDG1059 Used to drive seal into housing.

CED, TX03399, 5629 -19-03DEC99-4/6

Rolling Torque and Backlash Bar JDG712A Used to measure backlash.

CED, TX03399, 5629 -19-03DEC99-5/6

Axle Sleeve Installer JDG1058 Used to press axle into sleeve.

CED, TX03399, 5629 -19-03DEC99-6/6

Service Equipment and Tools

European Microfiche Tool Catalog (MTC). Some tools may be available from a local supplier.

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or from the

SERVICEGARD is a trademark of Deere & Company

WS68074, 00036FA -19-14JUL10-1/5

Low Lift Jack JT01642A Used to remove and install rear axle.

WS68074, 00036FA -19-14JUL10-2/5

Low Lift Jack JT01642A Used to remove and install MFWD axle.

WS68074, 00036FA -19-14JUL10-3/5

¹Axle Mounting Bracket DFT1146 Used to mount axle to engine stand.

¹*Fabricated tool, dealer made. (See Group 0299 for instructions to make tool.)*

Continued on next page

WS68074, 00036FA -19-14JUL10-4/5

Axle Shaft, Bearings and Reduction Gears

¹Axle Rolling Torque Bar.....DFT1147 Used to determine axle rolling torque.

¹Fabricated tool, dealer made. (See Group 0299 for instructions to make tool.)

WS68074,00036FA -19-14JUL10-5/5

Other Material

Number	Name	Use
TY16285 (U.S.) CXTY16285 (Canadian) 7649 (LOCTITE®)	Cure Primer	Cures surfaces prior to application of adhesives or sealants.
T43512 (U.S.) TY9473 (Canadian) 242 (LOCTITE)	Thread Lock and Sealer (Medium Strength)	Apply to threads of pinion shaft. Apply to cap screw threads of brake retainers. Apply to threads of axle shaft spanner nut.
TY16021 (U.S.) TY9484 (Canadian) 17430 (LOCTITE®)	High Flex Form-In-Place Gasket	Apply to ID of axle sleeve.

LOCTITE is a registered trademark of Loctite Corp.

CED,TX03399,5631 -19-03DEC99-1/1

Specifications

Item	Measurement	Specification
Rear Axle		
Service Brake Disk	Thickness	5 mm (0.197 in.) Minimum
Rear Axle Mounting Cap Screws	Torque	620 N·m (457 lb-ft)
Pinion Shaft Bearings	Rolling Drag Torque	0.5—1.0 N·m (4—9 lb-in.)
Pinion Shaft Nut	Torque	600 N·m (442 lb-ft)
To Determine Shim Pack Dimension for Piston Travel	Distance	1.2 + 0.1 — 0 mm (0.047 + 0.004 — 0 in.)
To Determine Shim Pack Dimension for Park Brake Spring Plate	Distance	8.7 ± 0.2 mm (0.343 ± 0.008 in.)
Park Brake Cover Cap Screws	Torque	46 N·m (34 lb-ft)
Park Brake Housing Cap Screws	Torque	46 N·m (34 lb-ft)
Sleeve-to-Flange End	Distance	100 mm (4 in.)
Park Brake Manual Release Cap Screws	Depth	27 + 1 — 0 mm (1.06 + 0.039 — 0 in.)
Park Brake Slip Check (Brake Must Not Slip at This Setting)	Torque	530 N·m (391 lb-ft)
Differential Housing Cap Screws	Torque	185 N·m (136 lb-ft)
Axle Housing Cap Screws	Torque	195 N·m (144 lb-ft)
Ring Gear	Backlash	0.15—0.25 mm (0.006—0.010 in.)
Brake Housing Guide Pins	Depth	40.6 + 0 — 0.6 mm (1.59 + 0 — 0.023 in.)
Brake Retainer Cap Screw	Torque	9.5 N·m (84 lb-in.)
Inner Axle Bearing	Rolling Drag Torque	6.5—8 N·m (58—71 lb-in.)
Planet Carrier	End play	0.1—0.4 mm (0.003—0.015 in.)

CED, TX03399, 5632 -19-03DEC99-1/1

Inspect Service Brakes

NOTE: The service brake inspection ports are located at the front of the rear axle.

1. Remove plugs (A) from inspection port (C).

NOTE: If axle is removed from machine, skip steps 2 and 3 and apply hydraulic pressure directly to axle service brake ports using a manually operated hydraulic pump.

2. Start engine. Do not release park brake.
3. Apply the service brakes.

NOTE: When the service brakes are applied, gap (B) will equal the overall thickness of brake disk (E).

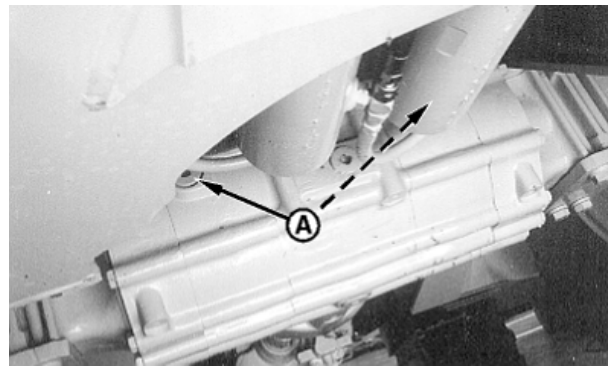
A piece of metal bar stock with a thickness of 5 mm (0.197 in.) can be used as a gauge to check gap (B). If the 5 mm (0.197 in.) gauge cannot fit between two separator disks (D), replace brake disks. (See Disassemble Rear Axle in this group.)

4. Check gap (B) between two separator disks (D) using a feeler gauge.
5. Replace brake disks if gap (B) is less than 5 mm (0.197 in.).

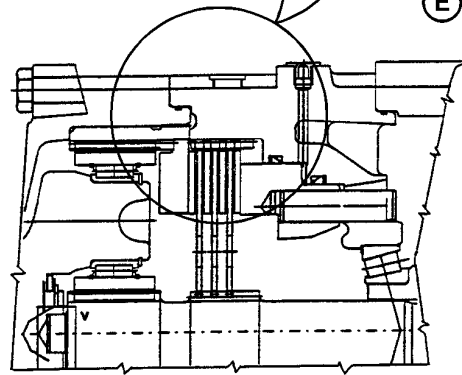
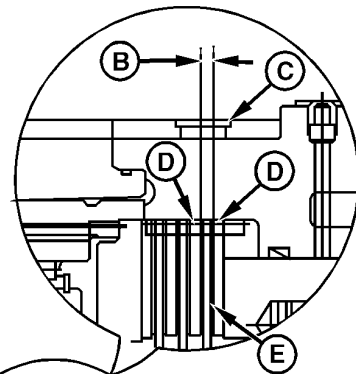
Rear Axle—Specification

Service Brake
 Disk—Thickness..... 5 mm (0.197 in.) Minimum
 (See Disassemble Rear Axle in Group 0250.)

- | | |
|--|-----------------------------------|
| A —Plugs | D —Separator Disk (4 used) |
| B —Gap [5 mm (0.197 in.) minimum] | E —Brake Disk (3 used) |
| C —Inspection Port | |



T115644 —UN—01JUN98



T115634

T115634 —UN—01JUN98

Remove and Install Rear Axle

CAUTION: Total machine weight is 4854 kg (10700 lb). Use appropriate lifting device and floor stands.

1. Raise and support rear of machine. Position floor stands under main frame—one at each side.
2. Remove both rear wheels. (See Remove and Install Rear Wheel Assembly in Group 0110.)

NOTE: The approximated capacity of rear axle is 13 L (14 qt).

3. Drain rear axle.
4. Disconnect hydraulic lines to service brakes (1), differential lock (2) and park brake (3) from top of axle housing. Close all hydraulic lines opening using caps and plugs.
5. Position a low lift jack under center of rear axle. Attach the adjustable-grip arms and safety chains of the low lift jack to the axle housing.
6. Remove four cap screws (4) on each side of axle and lower axle from machine.
7. Repair axle as necessary. (See Disassemble Rear Axle in this group.)
8. Install rear axle using low lift jack.
9. Install and tighten axle mounting cap screws (4) to specification.

Specification

Rear Axle Mounting Cap

Screws—Torque..... 620 N·m (457 lb-ft)

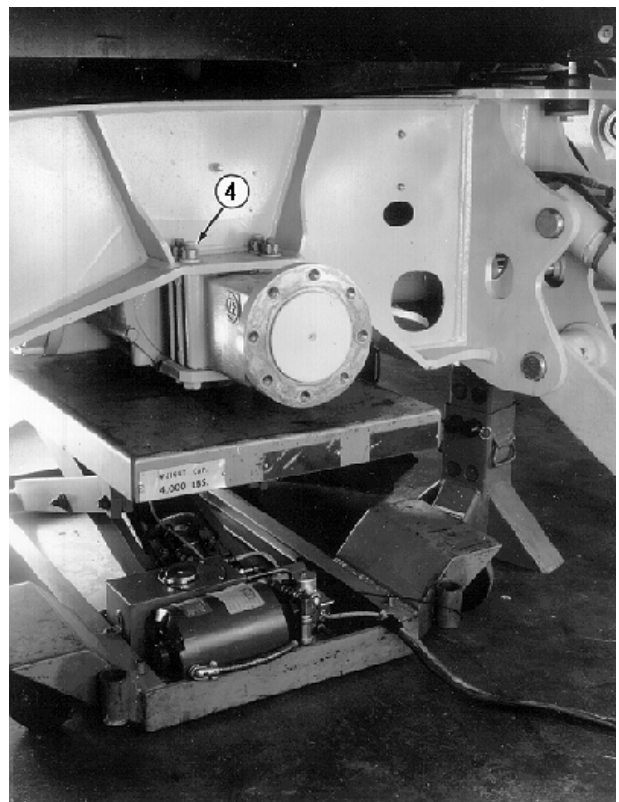
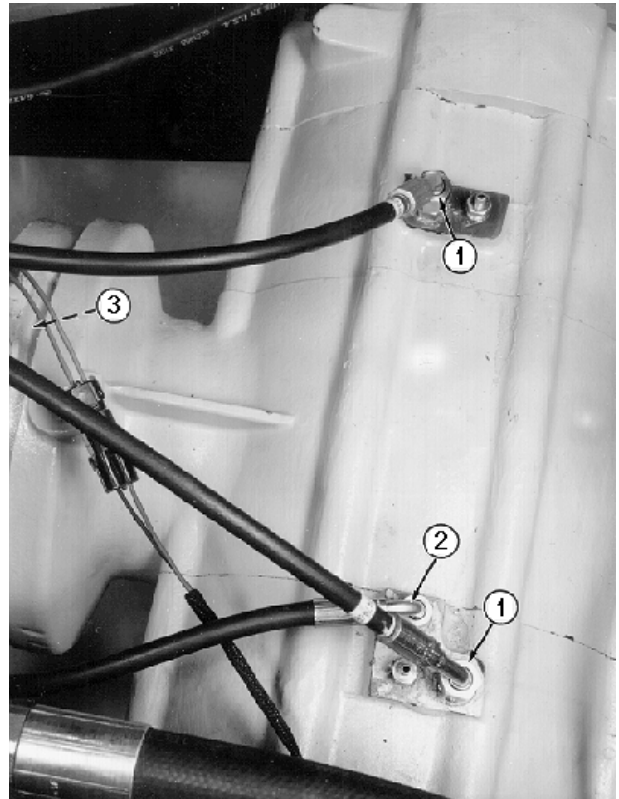
10. Connect hydraulic lines to service brakes, differential lock, and park brake.
11. Install rear wheels and lower machine to ground. (See Remove and Install Rear Wheel Assembly in Group 0110.)

NOTE: It will take approximately five minutes for oil to settle into outer housing when oil is warm.

12. Install drain plug. Fill axle to proper level. (See Fuels and Lubricants in Group 0004.)

Wait five to ten minutes for oil to settle. Recheck level and add as necessary. If oil is cold, settle time may increase.

- | | |
|-------------------------------------|------------------------------|
| 1— Service Brake Hydraulic Line | 3— Park Brake Hydraulic Line |
| 2— Differential Lock Hydraulic Line | 4— Cap Screw (4 used) |



T107305 —UN—15FEB97

T107300 —UN—15FEB97

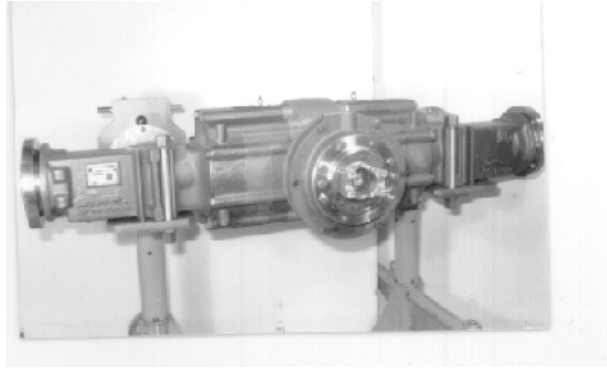
CED,OUO1040,1006 -19-04DEC98-1/1

Disassemble Rear Axle

1. Remove axle from machine. (See procedure in this group.)

NOTE: Repair procedure for the left and right outer axle housings are the same.

2. Attach lifting strap and hoist to right axle housing.
3. Remove eight cap screws and two nuts with lock washers from right axle housing. Carefully separate axle housing from brake housing using a hoist.
4. Install axle housing on engine stand using DFT1146 Axle Mounting Bracket. (See procedure to make tool in Group 0299.)



T105071 —JUN—14JAN97

WS68074,00036FB -19-14JUL10-1/24

NOTE: The right side axle housing and brake housing MUST be removed if any repairs are being done to differential or pinion. Differential lock piston can be repaired by removing the left axle housing.

Carrier shown removed for illustration purposes.

5. Remove snap ring from one planetary gear.



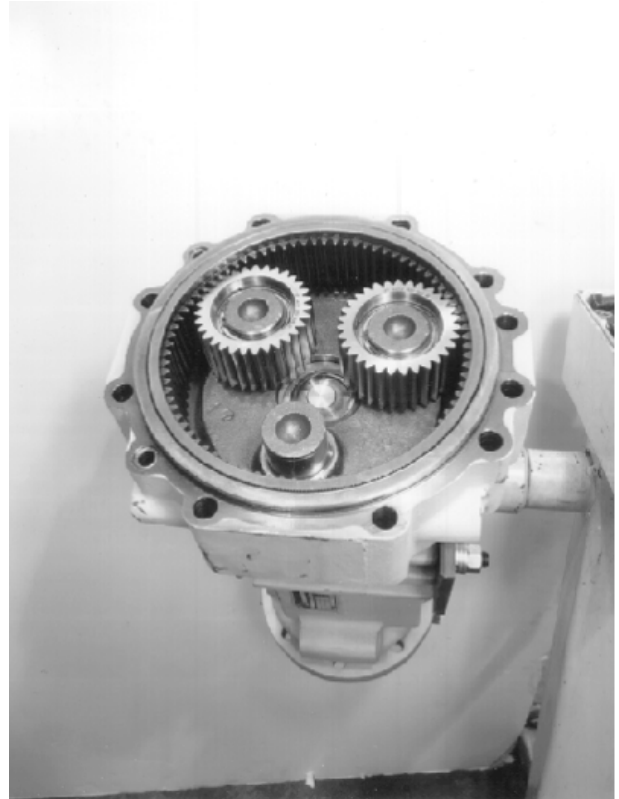
T105075 —JUN—14JAN97

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WS68074,00036FB -19-14JUL10-2/24

Axle Shaft, Bearings and Reduction Gears

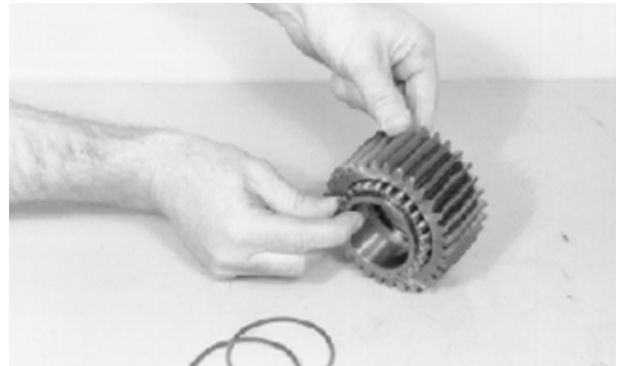
6. Remove planetary gear from carrier using a puller or rolled-head pry bars.
7. Release snap ring retaining planetary carrier to axle and remove carrier from housing.
8. Remove remaining planetary gears from carrier as necessary.



T107738 —UN—28FEB97

WS68074,00036FB -19-14JUL10-3/24

9. Remove snap ring and thrust washer to disassemble bearing.

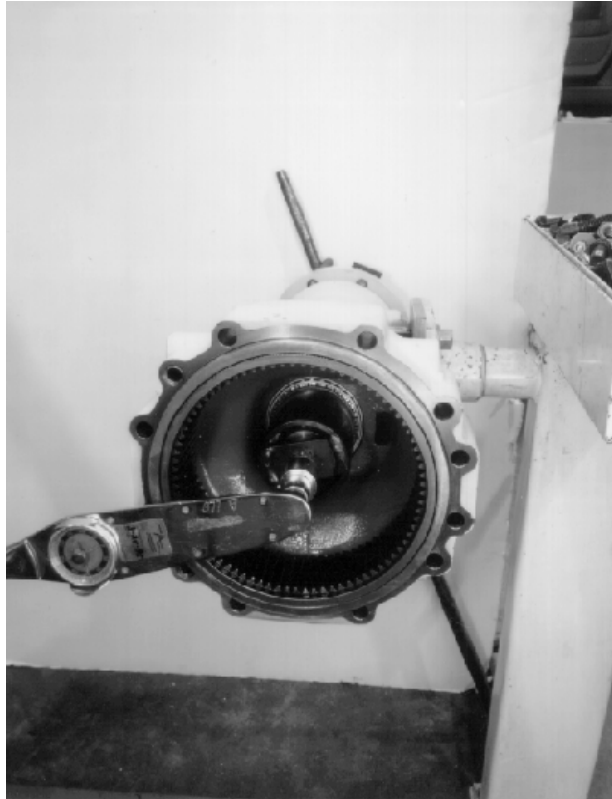


T105078 —UN—14JAN97

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WS68074,00036FB -19-14JUL10-4/24

10. Install two eye bolts and bar to retain axle. Remove axle nut using JDG1056 Axle Spanner Nut Wrench.



T107739 —UN—28FEB97

WS68074,00036FB -19-14JUL10-5/24

11. Remove axle from housing using a hoist.

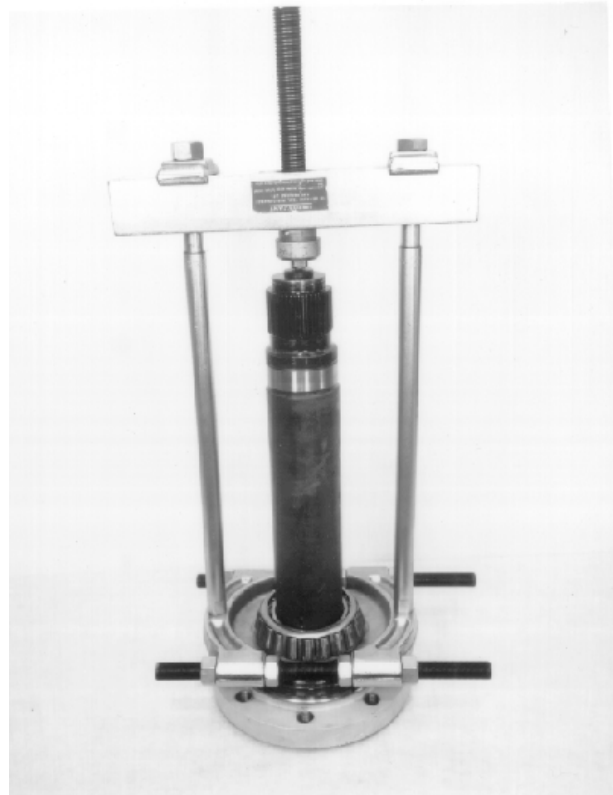


T105082 —UN—14JAN97

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WS68074,00036FB -19-14JUL10-6/24

12. Remove axle bearing using a puller.



T107740 —UN—28FEB97

WS68074,00036FB -19-14JUL10-7/24

13. Remove and discard seal sleeve.

NOTE: Remove brass plug ONLY if axle housing, brake housing, center housing, differential, sun pinion shaft, axle shaft, or ring and pinion are replaced.

14. If necessary, remove (brass) stop on end of axle shaft by drilling and tapping stop. Install slide hammer and remove stop. Discard stop.



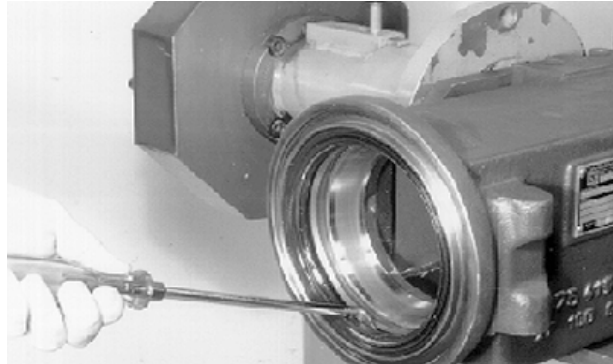
T105084 —UN—14JAN97

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WS68074,00036FB -19-14JUL10-8/24

Axle Shaft, Bearings and Reduction Gears

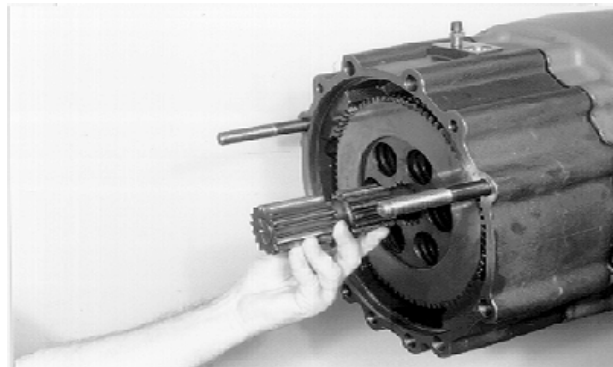
15. Remove and discard shaft seal. If necessary, use a brass rod to drive outer bearing races from axle housing.



T105085—UN—14JAN97

WS68074,00036FB -19-14JUL10-9/24

16. Remove sun gear shaft from differential.



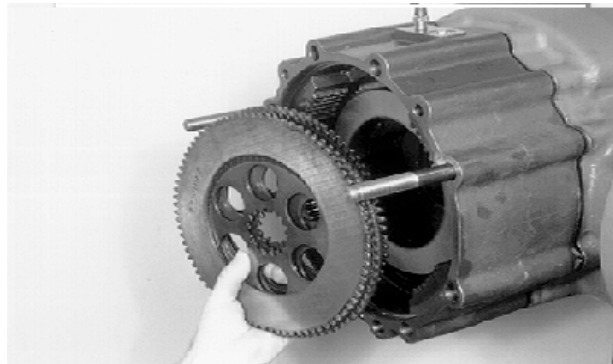
T105086—UN—14JAN97

WS68074,00036FB -19-14JUL10-10/24

17. Remove backing plate, brake disks, and separator plates from housing.
18. Inspect parts for wear or damage. Check thickness of brake disk. Replace if less than specification.

Specification

Brake Disk—Thickness..... 5 mm (0.197 in.) Minimum



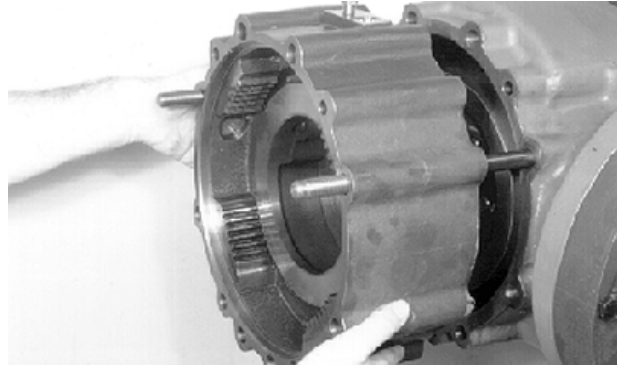
T105087—UN—14JAN97

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WS68074,00036FB -19-14JUL10-11/24

Axle Shaft, Bearings and Reduction Gears

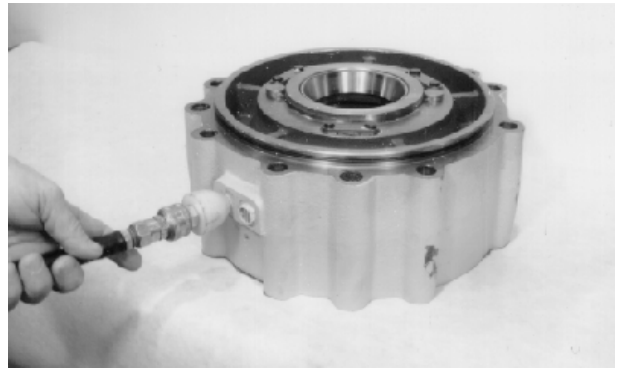
19. Scribe a line between brake housing and differential housing to aid assembly. Remove brake housing from differential housing.



T105088 —UN—14JAN97

WS68074.00036FB -19-14JUL10-12/24

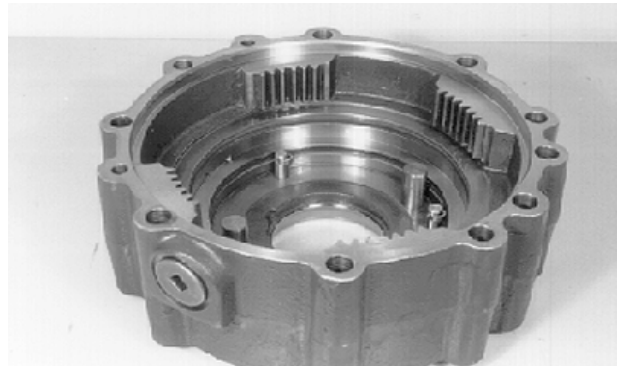
20. Remove piston from housing using compressed air or hydraulic hand pump.



T107763 —UN—28FEB97

WS68074.00036FB -19-14JUL10-13/24

21. Remove O-rings and backup rings from brake housing.

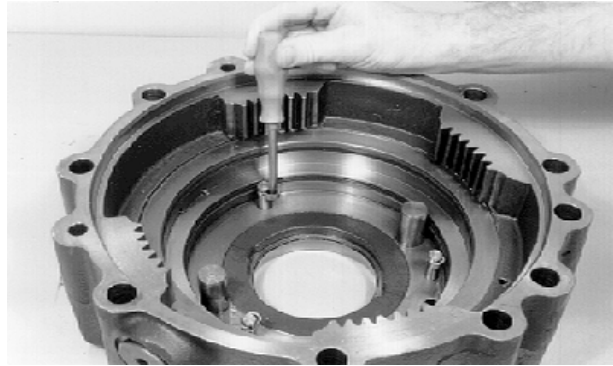


T105090 —UN—14JAN97

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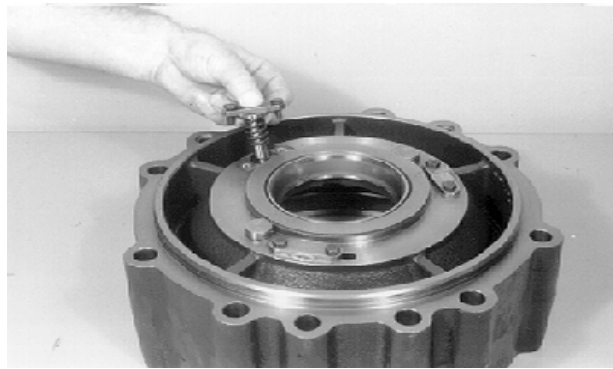
22. Remove split ring from brake adjusters.



T105091 —UN—14JAN97

WS68074,00036FB -19-14JUL10-15/24

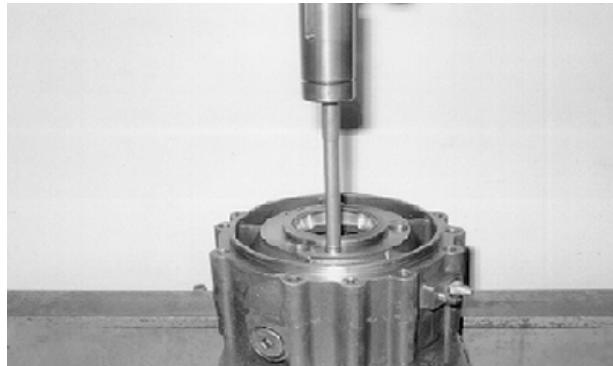
23. Remove cap screws, clips, spring and pins.



T105093 —UN—14JAN97

WS68074,00036FB -19-14JUL10-16/24

24. Remove guide pins (if necessary) from brake housing using a press.



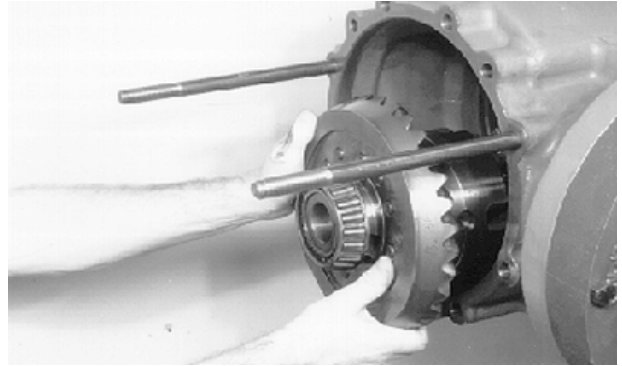
T105094 —UN—14JAN97

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WS68074,00036FB -19-14JUL10-17/24

Axle Shaft, Bearings and Reduction Gears

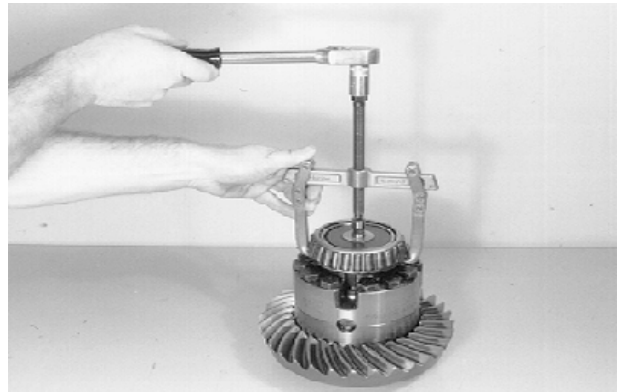
25. Remove differential.



T105095 —UN—14JAN97

WS68074,00036FB -19-14JUL10-18/24

26. Remove both bearings from differential using a puller.

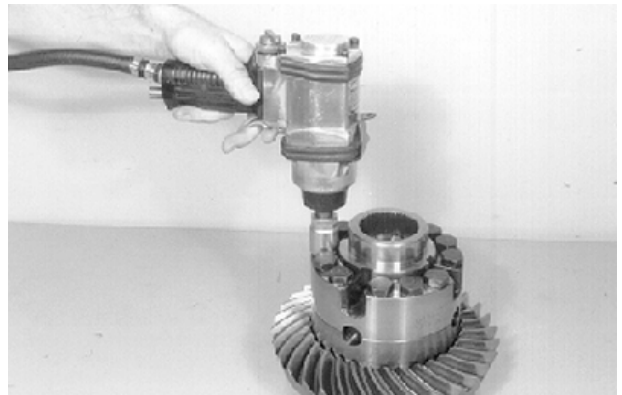


T105096 —UN—14JAN97

WS68074,00036FB -19-14JUL10-19/24

27. Scribe a line on differential housings to aid assembly.

28. Remove cap screws from differential.



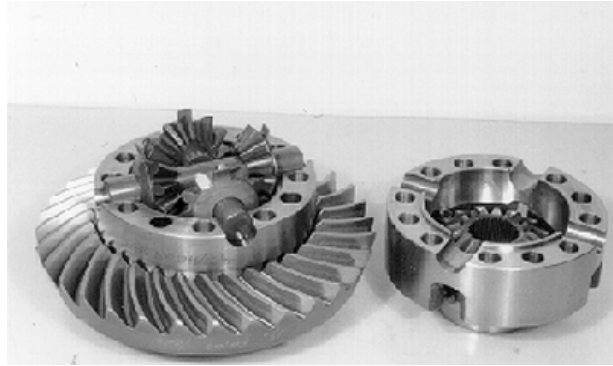
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WS68074,00036FB -19-14JUL10-20/24

Axle Shaft, Bearings and Reduction Gears

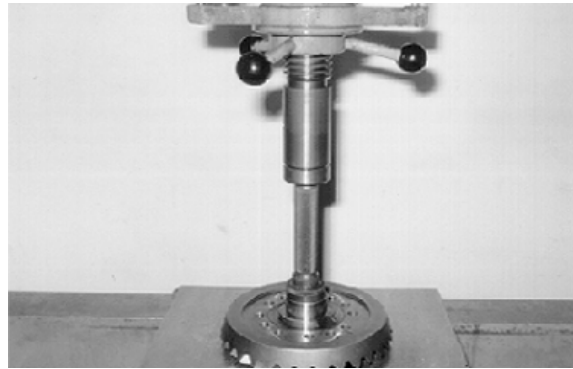
29. Note location of tabs on thrust washers. Remove pinion assembly.



T105098 —UN—14JAN97

WS68074,00036FB -19-14JUL10-21/24

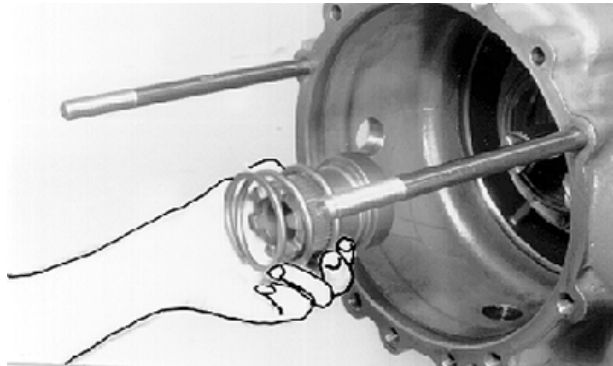
30. Remove ring gear from differential housing (if required) using a press.



T105099 —UN—14JAN97

WS68074,00036FB -19-14JUL10-22/24

31. Remove spring, differential lock, and thrust bearing.



T105100 —UN—14JAN97

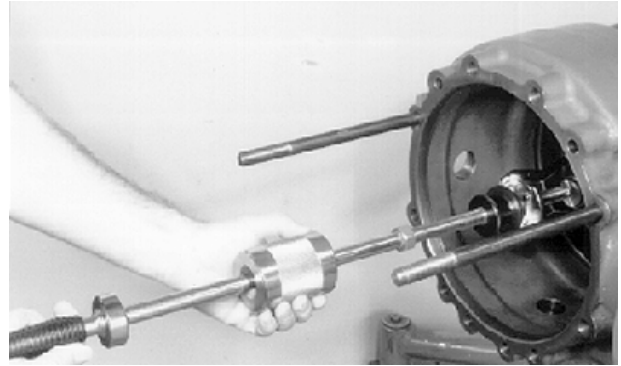
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WS68074,00036FB -19-14JUL10-23/24

Axle Shaft, Bearings and Reduction Gears

NOTE: A hand operated hydraulic pump can be used to remove differential lock piston.

32. Remove sun gear shaft and differential lock piston.
33. Remove differential outer bearing race using a puller and slide hammer.



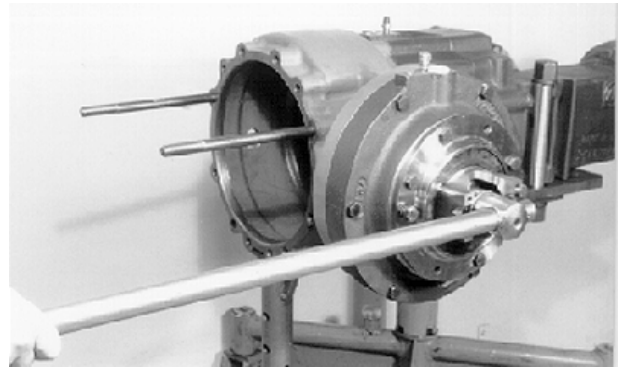
T105103 —UN—14JAN97

WS68074,00036FB -19-14JUL10-24/24

Disassemble and Assemble Park Brake

NOTE: To aid disassembly, remove lock nut on pinion shaft before releasing park brake cap screws. A pipe wrench can also be used to retain drive flange, if necessary.

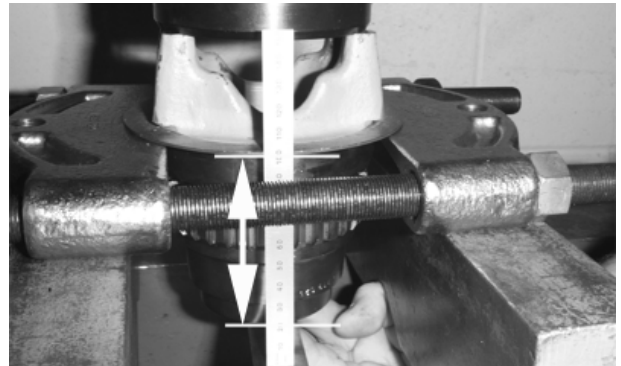
1. Remove lock nut from pinion shaft.
2. Remove drive flange from pinion shaft.



T105105 —UN—14JAN97

TX,02,YY2215 -19-24NOV99-1/42

3. Remove sleeve from drive flange (if necessary) using a knife edge puller and a press.



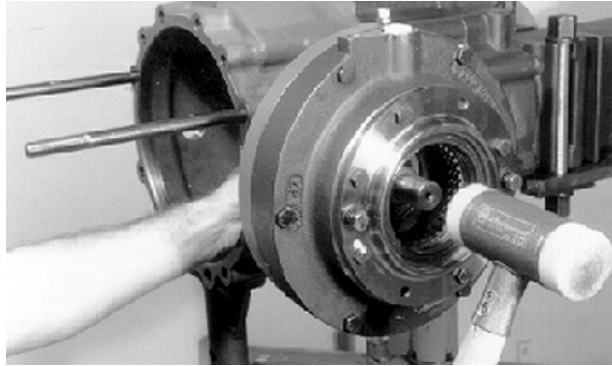
T108145B —UN—13MAR97

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TX,02,YY2215 -19-24NOV99-2/42

Axle Shaft, Bearings and Reduction Gears

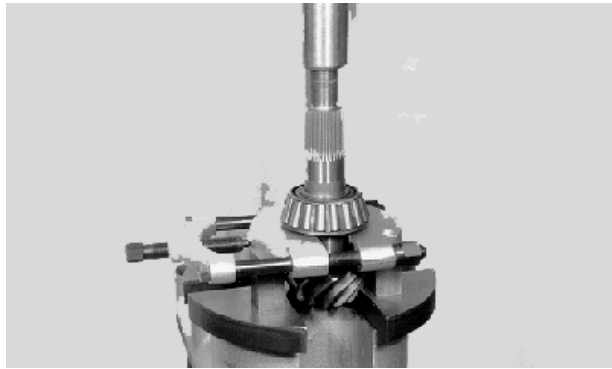
4. Drive pinion shaft from park brake housing using a soft mallet.



T105106 —UN—14JAN97

TX,02,YY2215 -19-24NOV99-3/42

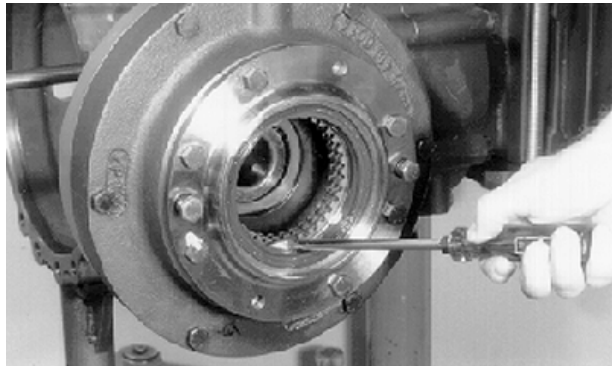
5. Remove adjusting ring from shaft.
6. Remove bearing from pinion shaft using a knife edge puller.



T105108 —UN—14JAN97

TX,02,YY2215 -19-24NOV99-4/42

7. Remove pinion shaft seal from housing.



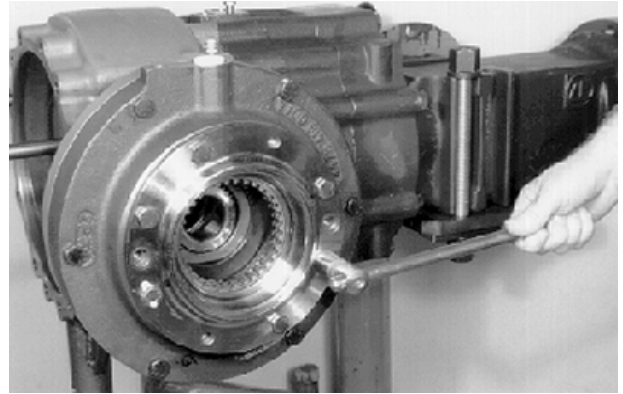
T105109 —UN—14JAN97

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TX,02,YY2215 -19-24NOV99-5/42

Axle Shaft, Bearings and Reduction Gears

8. Scribe a line on park brake cover and housing to aid assembly. Loosen lock nuts and remove towing cap screws.
9. Remove evenly the remaining cap screws that fasten park brake cover to housing while releasing pressure on park brake disk.



T105110 —UN—14JAN97

TX,02,YY2215 -19-24NOV99-6/42

10. Remove park brake piston from brake housing.



T105112 —UN—14JAN97

TX,02,YY2215 -19-24NOV99-7/42

11. Remove sealing rings and guide pins with O-rings from piston.



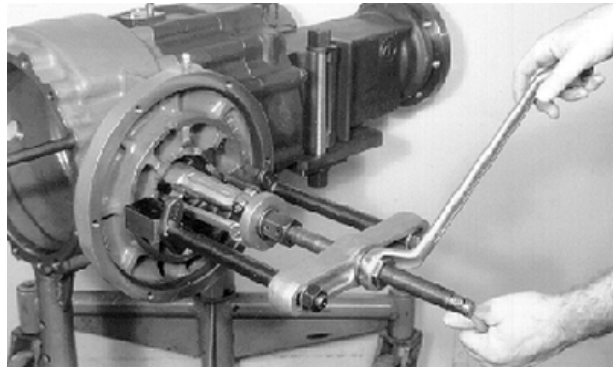
T105113 —UN—14JAN97

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TX,02,YY2215 -19-24NOV99-8/42

Axle Shaft, Bearings and Reduction Gears

12. Remove outer bearing race from housing using a puller.

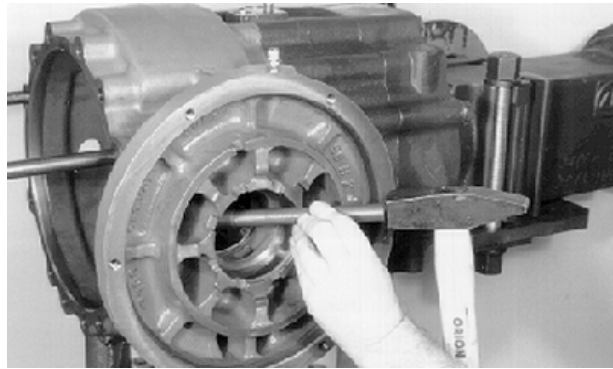


T105115—UN—14JAN97

TX,02,YY2215 -19-24NOV99-9/42

NOTE: Be careful not to damage shims behind bearing cup during removal.

13. Drive bearing cup from housing using a brass rod.



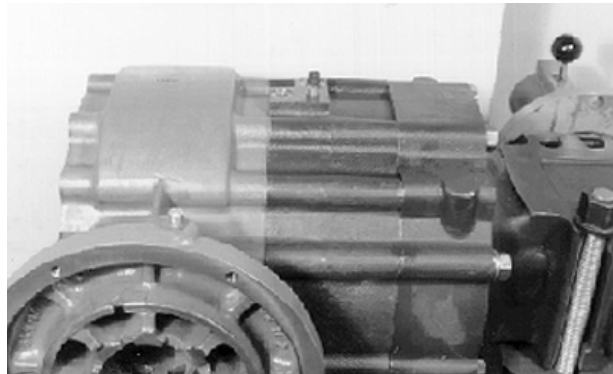
T105116—UN—14JAN97

TX,02,YY2215 -19-24NOV99-10/42

NOTE: If ring gear or pinion shaft are damaged, both parts MUST be replaced as an assembly.

14. Record dimension (X) located on top center of rear axle housing.

EXAMPLE OF DIMENSION X	
(X) Equals	173.24 mm (6.82 in.)



T105118—UN—14JAN97

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TX,02,YY2215 -19-24NOV99-11/42

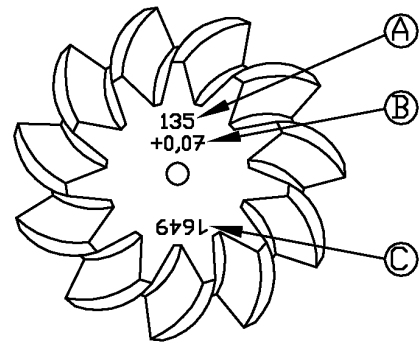
NOTE: An etched number (C) at end of the pinion shaft is used to identify the pinion shaft with the ring gear. The etched numbers on both components should match.

The stamped number (A) on the end of the pinion shaft is used for calculating the number of shims required (dimension Y). In addition to the stamped number, a tolerance number (B) may be etched on the end of some pinion shafts. The tolerance should be added to (or subtracted from) the stamped number as necessary.

EURO STYLE	U.S. STYLE
0,005	0.005
0,007	0.007

T116978

Examples of Euro Style Numbers and U.S. Equivalent



15. ¹Record dimension (I) (stamped on end of pinion shaft).

EXAMPLE OF DIMENSION (I)	
Dimension (I) Equals	135 mm (5.3 in.) ¹

A—Stamped Number C—Etched Match Set Number
 B—Etched Tolerance Number

¹If a tolerance number (B) is etched on end of the pinion shaft, add the tolerance to (or subtract from) the stamped number (as necessary) to determine dimension (I).

TX,02,YY2215 -19-24NOV99-12/42

T116978 —19—28AUG98

T117043 —19—10SEP98

16. Measure and record complete bearing width—dimension (II).

EXAMPLE OF DIMENSION (II)	
Dimension (II) Equals	36.54 mm (1.43 in.)

17. Determine number of shims required behind pinion shaft inner bearing race. See Examples A and B.

EXAMPLE A:	
Dimension (I)	135 mm (5.31 in.)
Plus dimension (II)	+ 36.54 mm (1.43 in.)
Equals dimension (Y)	= 171.54 mm (6.74 in.)

EXAMPLE B:	
Dimension (X)	173.24 mm (6.82 in.)
Minus dimension (Y)	— 171.54 mm (6.75 in.)
Equals shim pack	= 1.70 mm (0.07 in.)



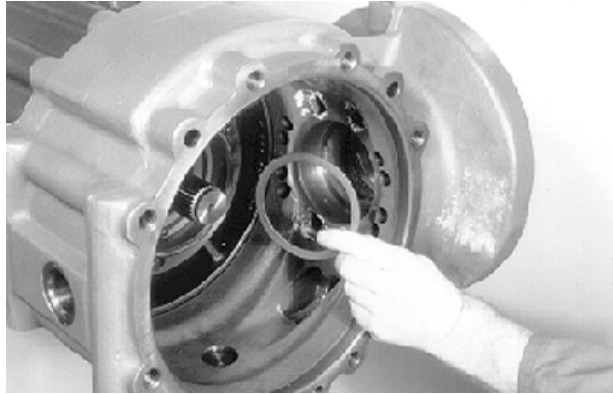
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TX,02,YY2215 -19-24NOV99-13/42

T108058 —JUN—11MAR97

Axle Shaft, Bearings and Reduction Gears

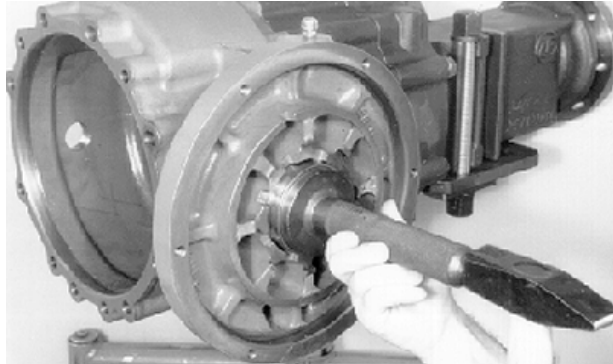
18. Install shims and inner bearing race in housing.



T105121 —JUN—14JAN97

TX,02,YY2215 -19-24NOV99-14/42

19. Install outer bearing race until bottomed in bore.



T105123 —JUN—14JAN97

TX,02,YY2215 -19-24NOV99-15/42

20. Heat inner roller bearing and install on pinion shaft. Be sure bearing is bottomed on shoulder of pinion shaft.



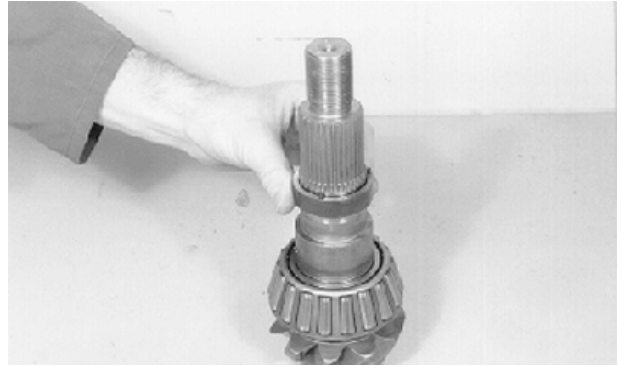
T105124 —JUN—14JAN97

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TX,02,YY2215 -19-24NOV99-16/42

Axle Shaft, Bearings and Reduction Gears

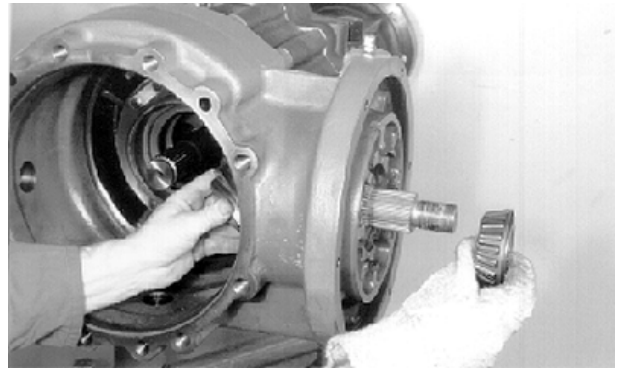
21. Extend spring pins on JGD1138 Gauge Ring and install on pinion shaft.



T105125 —JUN—14JAN97

TX,02,YY2215 -19-24NOV99-17/42

22. Heat outer pinion shaft bearing. Install pinion shaft and bearing until bottomed.

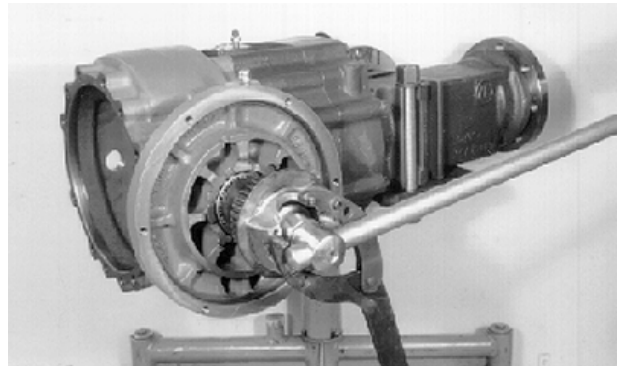


T106461 —JUN—16JAN97

TX,02,YY2215 -19-24NOV99-18/42

NOTE: Rotate pinion shaft several times in both directions as nut is gradually tightened to seat bearings.

23. Install drive flange, washer and nut. Retain drive flange with a pipe wrench and tighten nut.



T106462 —JUN—16JAN97

Continued on next page

TX,02,YY2215 -19-24NOV99-19/42

Axle Shaft, Bearings and Reduction Gears

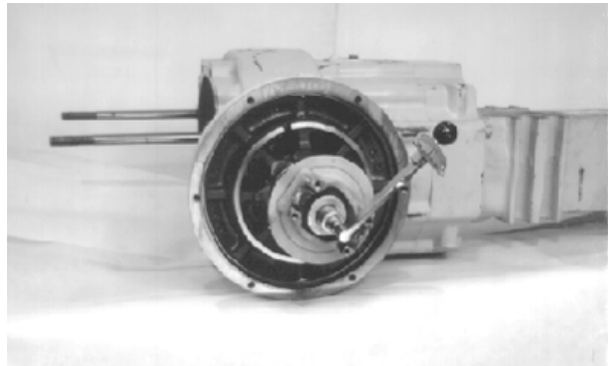
NOTE: If new bearings are installed, tighten nut to obtain a rolling drag torque at the higher end of specification.

24. Establish rolling drag torque.

Specification

Pinion Shaft
Bearings—Rolling Drag
Torque..... 0.5—1.0 N·m (4—9 lb-in.)

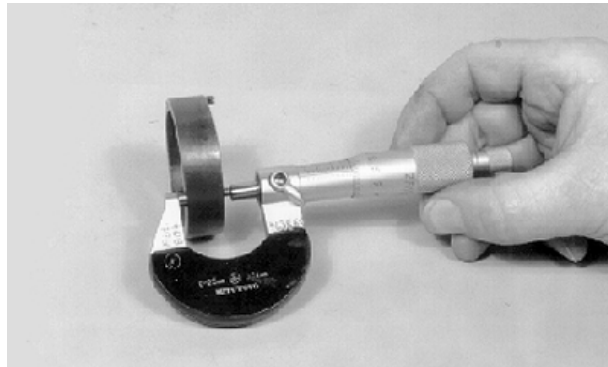
25. Loosen nut and remove pinion shaft again.



T108099 —UN—12MAR97

TX,02,YY2215 -19-24NOV99-20/42

26. Remove gauge ring and measure the height of the spacer ring to be installed on pinion shaft.



T106465 —UN—16JAN97

TX,02,YY2215 -19-24NOV99-21/42

NOTE: Rotate pinion shaft several times in both directions as nut is tightened to seat bearings.

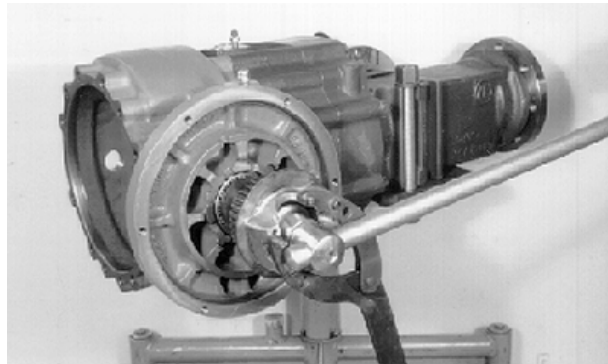
27. Install pinion shaft, spacer ring, bearing and drive flange. Install washer and nut on shaft. Tighten nut to specification.

Specification

Pinion Shaft
Nut—Torque..... 600 N·m (442 lb-ft)

28. Check rolling drag torque again.

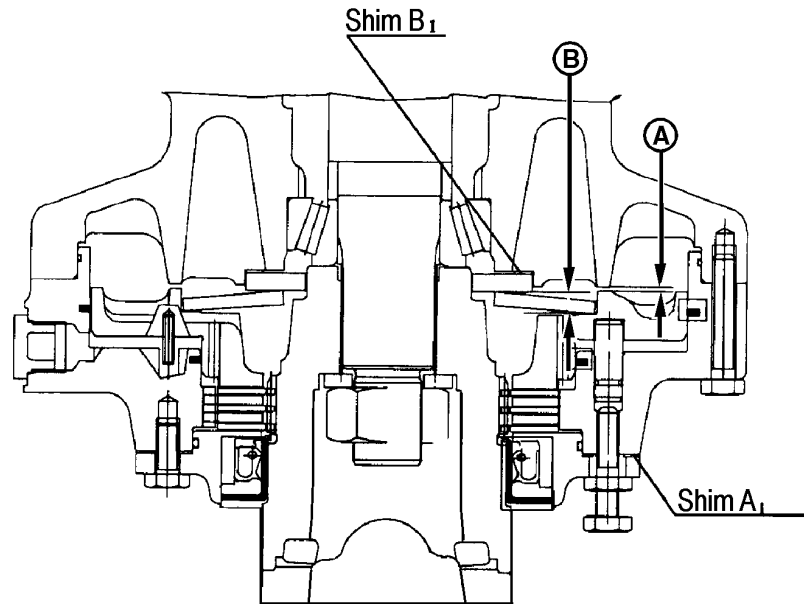
29. Remove nut and drive flange from pinion shaft.



T106462 —UN—16JAN97

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TX,02,YY2215 -19-24NOV99-22/42



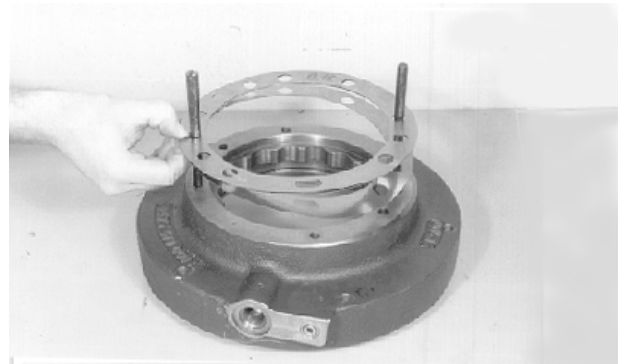
T111372

NOTE: For correct operation of the park brake, it is **IMPORTANT** that the following measurements be accurate.

30. Use the following steps to determine the shim pack required behind the park brake cover. Shims (A₁) are used to obtain dimension (A) 1.2 + 0.1 — 0 mm (0.047 + 0.004 — 0 in.) which allows correct piston travel when brake is released. Install a nominal shim pack of 0.9 mm (0.035 in.).

Specification

To Determine Shim Pack	
Dimension for Piston	
Travel—Distance.....	1.2 + 0.1 — 0 mm (0.047 + 0.004 — 0 in.)
To Determine Shim Pack	
Dimension for Park Brake	
Spring Plate—Distance.....	8.7 ± 0.2 mm (0.343 ± 0.008 in.)



A —1.2 + 0.1 — 0 mm (0.047 + 0.004 — 0 in.)	B —8.7 ± 0.2 mm (0.343 ± 0.008 in.)
A1 —Shims	B1 —Shims

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TX,02,YY2215 -19-24NOV99-23/42

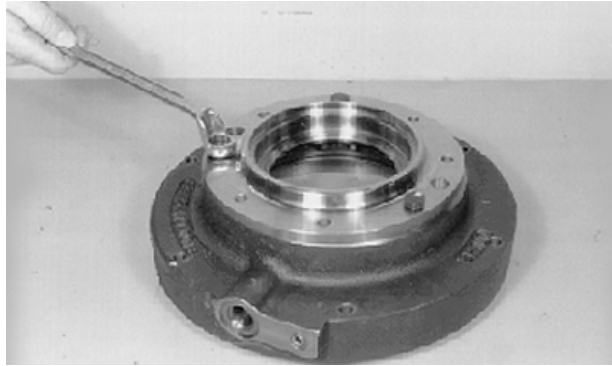
T111372 —UN—13NOV98

T106468 —UN—16JAN97

Axle Shaft, Bearings and Reduction Gears

NOTE: Sealing rings and O-rings **MUST** be removed from cover and piston before measurements are taken.

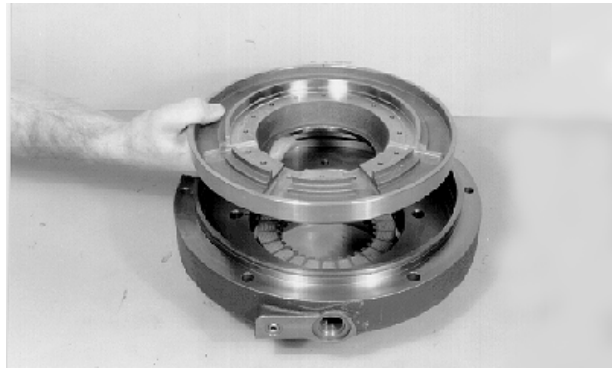
31. Install park brake front cover and three cap screws.



T106469 —UN—16JAN97

TX,02,YY2215 -19-24NOV99-24/42

32. Install brake disks, plates, and piston to park brake housing.



T106471 —UN—16JAN97

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TX,02,YY2215 -19-24NOV99-25/42

33. Use gauge blocks and a depth gauge to determine dimension I. Raised piston shoulder (1) minus flange mounting surface (2) equals dimension I. Record measurement.

EXAMPLE OF DIMENSION I	
Raised piston shoulder minus flange mounting surface	3.62 mm (0.142 in.)

34. Using gauge blocks, measure distance to flange mounting surface (4) and subtract distance to inner ring surface (3). This equals dimension II.

NOTE: Axle may be positioned so park brake housing is on top (pinion shaft pointing up) for ease in making measurement.

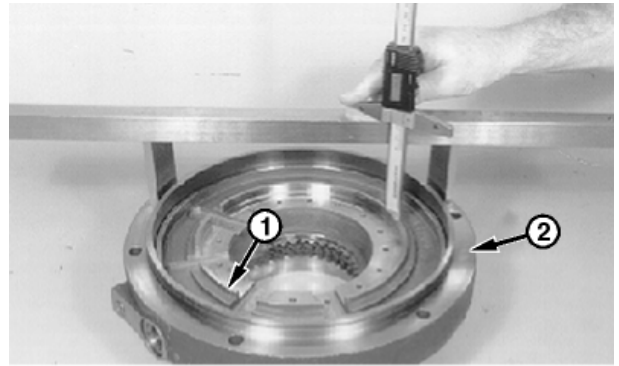
EXAMPLE OF DIMENSION II	
Flange mounting surface minus inner ring surface	1.78 mm (0.070 in.)

35. Dimension I minus dimension II equals amount of piston travel when brake is released.

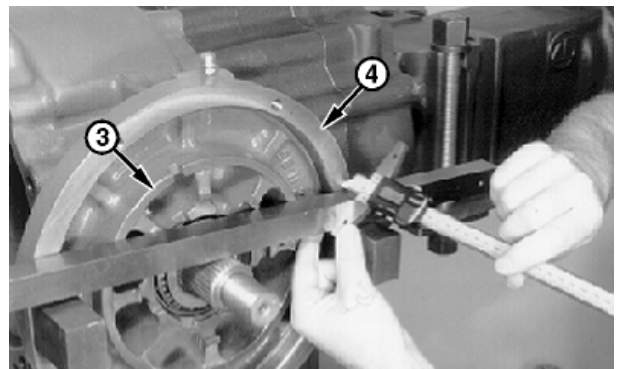
NOTE: In the Example C, a shim adjustment IS REQUIRED.

EXAMPLE C	
Dimension I	3.62 mm (0.142 in.)
Minus dimension II	— 1.78 mm (0.070 in.)
Piston Travel (A)	= 1.84 mm (0.072 in.)

Adjust shim pack (A₁) as necessary (refer to step 30) to obtain allowable piston travel.



T111376 —UN—17SEP97

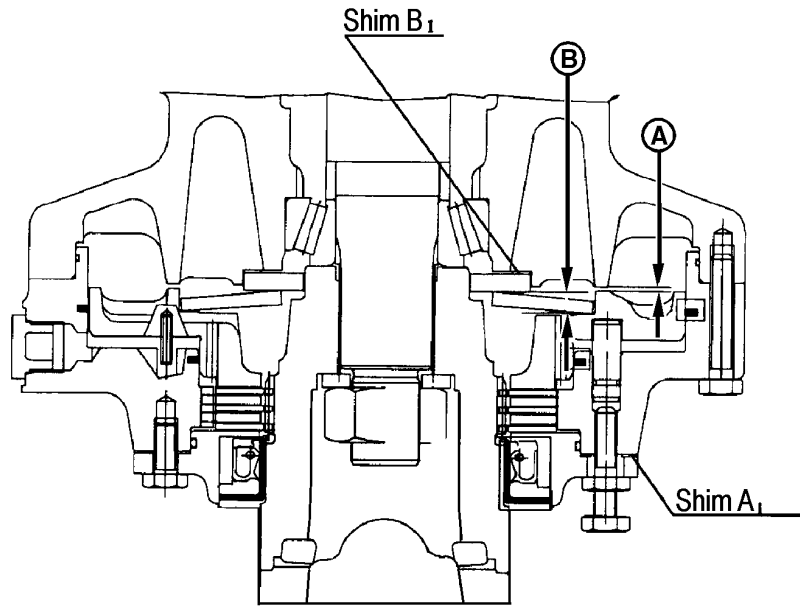


T111375 —UN—17SEP97

- 1— Piston Shoulder
- 2— Flange Mounting Surface (Park Brake Housing)
- 3— Inner Ring Surface
- 4— Flange Mounting Surface (Axle Housing)

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TX,02,YY2215 -19-24NOV99-26/42



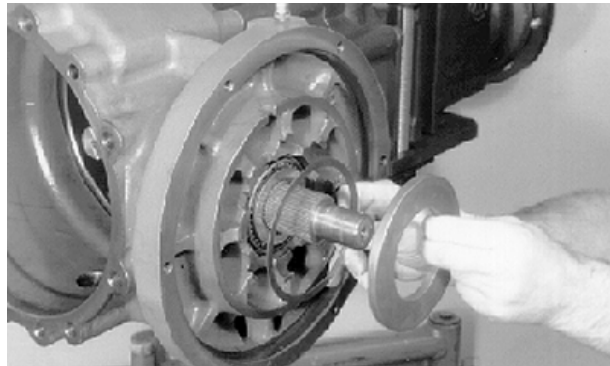
T111372

T111372 —UN—13NOV98

NOTE: Axle may be positioned so park brake housing is on top (pinion shaft pointing up) to ease in making measurement. Shim pack (B₁) is used to set the required preload on spring plate.

36. Use the following steps to determine the shim pack required behind spring plate (B₁). Install a nominal shim pack of 1.10 mm (0.043 in.) and spring plate in park brake housing.

A — $1.8 + 0.1 - 0$ mm (0.071 + 0.004 — 0 in.)	B — 8.6 ± 0.1 mm (0.339 ± 0.0039 in.)
A1 —Shims	B1 —Shims



T106474 —UN—16JAN97

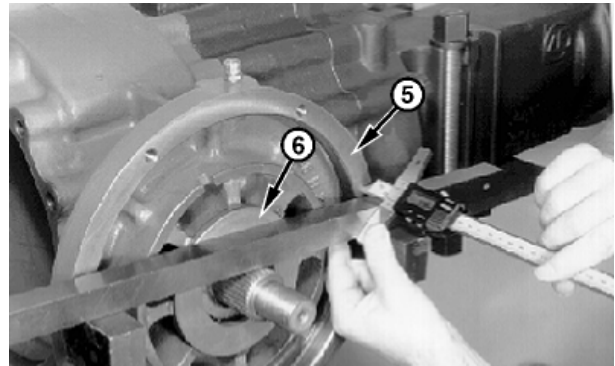
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TX,02,YY2215 -19-24NOV99-27/42

37. Using gauge blocks, measure distance to flange mounting surface (5) and subtract distance to spring plate (6). This equals dimension I.

EXAMPLE OF DIMENSION I	
Flange mounting surface minus spring plate distance	4.46 mm (0.175 in.)

5— Flange Mounting Surface (Axle Housing) 6— Spring Plate



T111374 —UN—12SEP97

TX,02,YY2215 -19-24NOV99-28/42

38. Use gauge blocks and a depth gauge to determine dimension II. Distance to piston (spring washer contact area) (7) minus distance to flange mounting surface (8) equals dimension II.

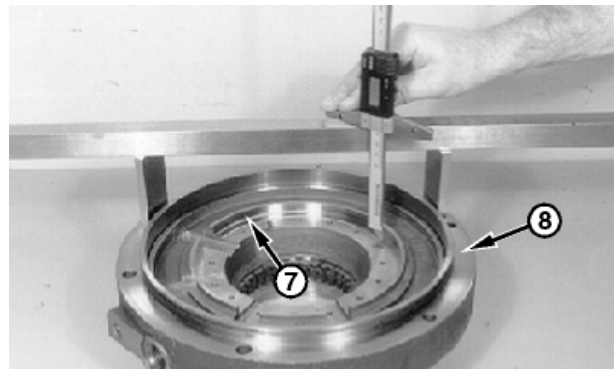
EXAMPLE OF DIMENSION II	
Piston (spring washer contact area) distance minus flange mounting surface distance	13.80 mm (0.543 in.)

39. Dimension II minus dimension I equals dimension (B).

Adjust shim pack (B₁) (as necessary) behind spring plate to obtain spring preload installation dimension (B) of 8.7 ± 0.2 mm (0.343 ± 0.008 in.).

NOTE: In the Example D, a shim adjustment IS REQUIRED because dimension (B) should be within 8.7 ± 0.2 mm (0.343 ± 0.008 in.).

EXAMPLE D	
Dimension II	13.80 (0.543 in.)
Minus dimension I	— 4.46 mm (0.175 in.)
Spring Preload (B)	= 9.34 mm (0.368 in.)



T111373 —UN—12SEP97

7— Spring Washer Contact Area

8— Flange Mounting Surface (Park Brake Housing)

40. Remove piston, brake disks and plates, cover and shims.

TX,02,YY2215 -19-24NOV99-29/42

41. Install required shim pack and O-ring on cover.



T106477 —UN—16JAN97

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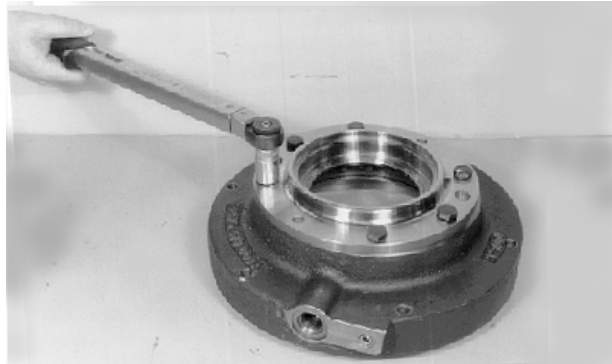
TX,02,YY2215 -19-24NOV99-30/42

Axle Shaft, Bearings and Reduction Gears

42. Install cover and cap screws to park brake housing.
Tighten cap screws to specification.

Specification

Park Brake Cover Cap
Screws—Torque..... 46 N·m (34 lb-ft)



T106478 —UN—16JAN97

TX,02,YY2215 -19-24NOV99-31/42

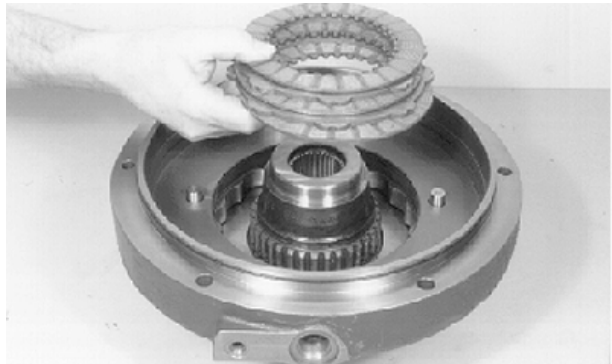
43. Apply petroleum jelly on O-rings and install on pins.
Install pins and sealing rings in park brake housing.
Grooves on sealing rings MUST face each other.



T106479 —UN—16JAN97

TX,02,YY2215 -19-24NOV99-32/42

44. Install drive flange, brake disks, and plates to park brake housing.



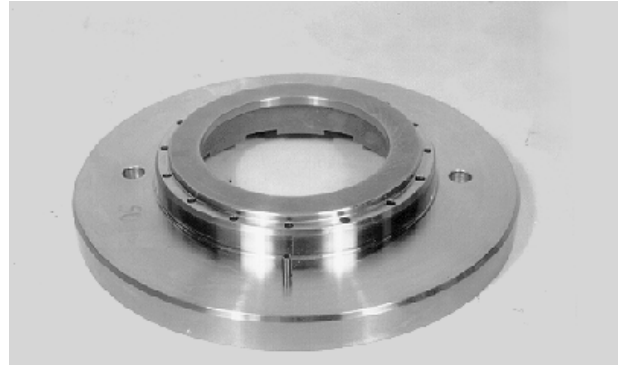
T106481 —UN—16JAN97

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TX,02,YY2215 -19-24NOV99-33/42

Axle Shaft, Bearings and Reduction Gears

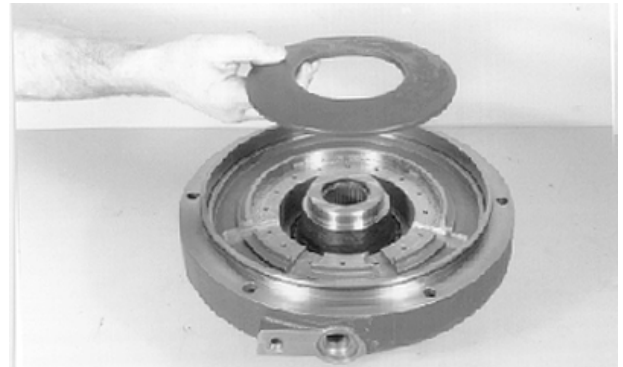
- 45. Install spring pin in piston until bottomed.
- 46. Install piston in brake housing.



T106482 —UN—16JAN97

TX,02,YY2215 -19-24NOV99-34/42

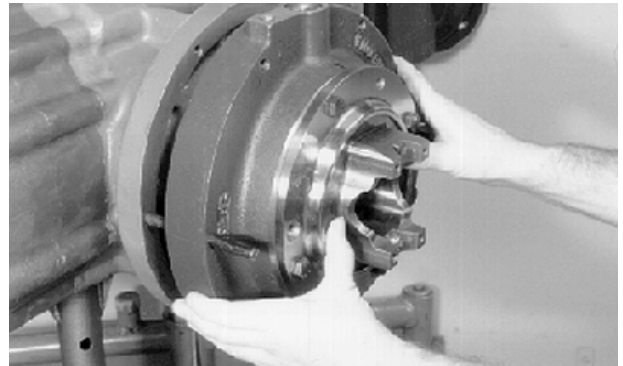
- 47. Install spring washer. Apply petroleum jelly to O-ring and install on flange of park brake housing.
- 48. Install shim pack (B₁, determined earlier) and spring plate.



T106486 —UN—16JAN97

TX,02,YY2215 -19-24NOV99-35/42

- 49. Install two guide pins to differential housing. Align scribe mark and install park brake assembly.



T106488 —UN—16JAN97

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TX,02,YY2215 -19-24NOV99-36/42

Axle Shaft, Bearings and Reduction Gears

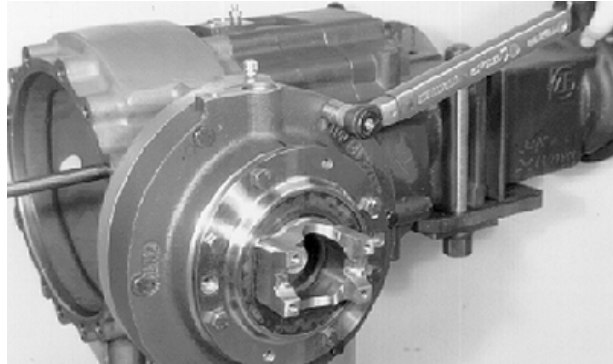
50. Install and tighten cap screws evenly. Tighten cap screws to specification. DO NOT install the manual brake release cap screws.

Specification

Park Brake Housing Cap
Screws—Torque..... 46 N·m (34 lb-ft)

NOTE: Due to the preload of the spring washer the park brake disks and plates will be held in position.

51. Remove drive flange from park brake housing.



T106489 —UN—16JAN97

TX,02,YY2215 -19-24NOV99-37/42

52. Install shaft seal with lip of seal facing brake plates. Seal can be driven even with shoulder of housing using JDG1059. Seal must be installed 1.5 ± 0.5 mm (0.059 ± 0.020 in.) below shoulder. This can be done by using a washer and a brass drift. Position the drift over a part of the washer and the shoulder and gently tap seal until drift is bottomed on shoulder.



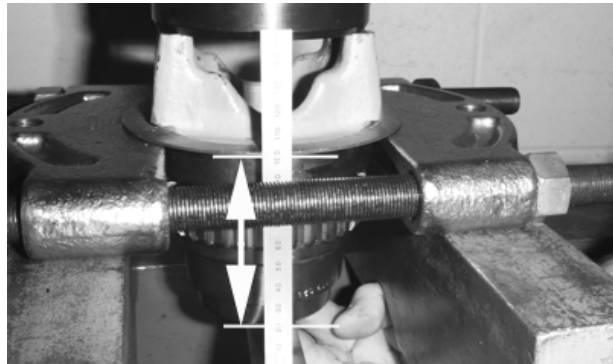
T106490 —UN—16JAN97

TX,02,YY2215 -19-24NOV99-38/42

53. Install sleeve on drive flange (as shown) 100 mm (4 in.) from flange end using a knife edge puller and a press.

Specification

Sleeve-to-Flange
End—Distance..... 100 mm (4 in.)

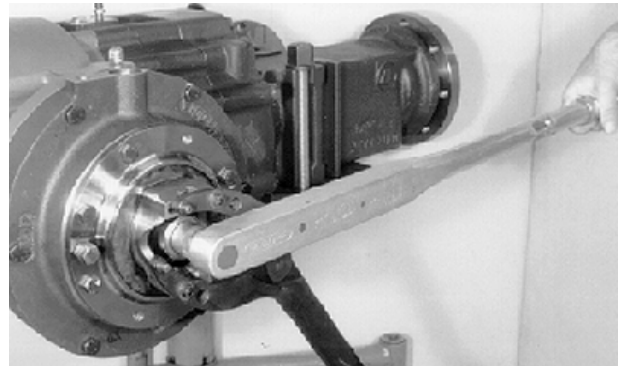


T108145B —UN—13MAR97

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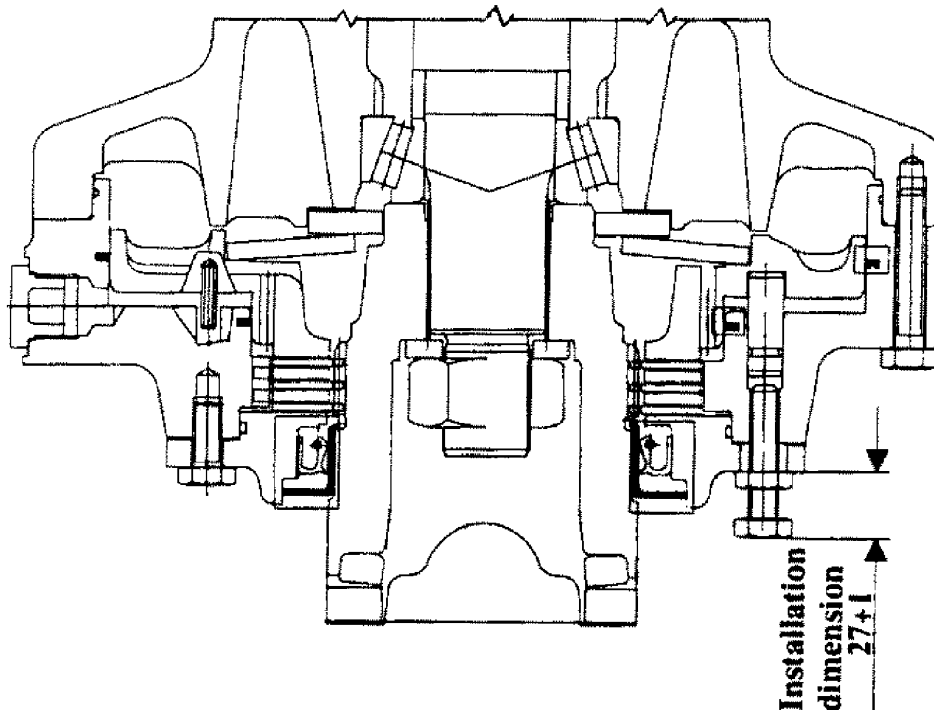
TX,02,YY2215 -19-24NOV99-39/42

54. Apply cure primer, then thread lock and sealer (medium strength) to pinion shaft threads. Install drive flange and washer. Install and tighten nut to 600 N·m (442 lb-ft).



T1106491 —UN—16JAN97

TX,02,YY2215 -19-24NOV99-40/42



T1108090

55. Install manual brake released cap screws with lock nut. Cap screws must be installed to specification.

Tighten lock nut.

Specification

Park Brake Manual	
Release Cap	
Screws—Depth.....	27 + 1 — 0 mm (1.06 + 0.039 — 0 in.)

T1108090 —19—12MAR97

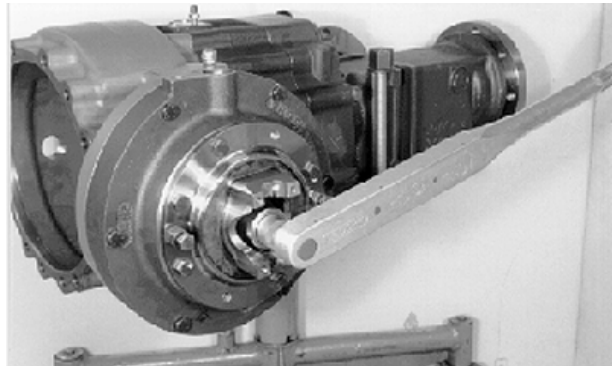
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TX,02,YY2215 -19-24NOV99-41/42

56. Install a torque wrench set to 530 N·m (391 lb-ft) on shaft nut. Attempt to turn in a clockwise direction. Park brake must not slip.

Specification

Park Brake Slip Check
 (Brake Must Not Slip at
 This Setting)—Torque..... 530 N·m (391 lb-ft)



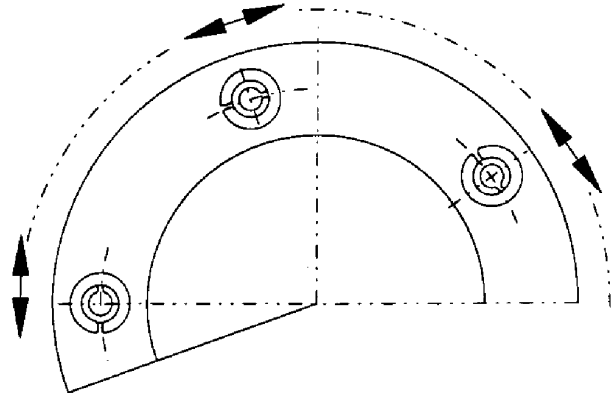
T106493 —JUN—16JAN97

TX,02,YY2215 -19-24NOV99-42/42

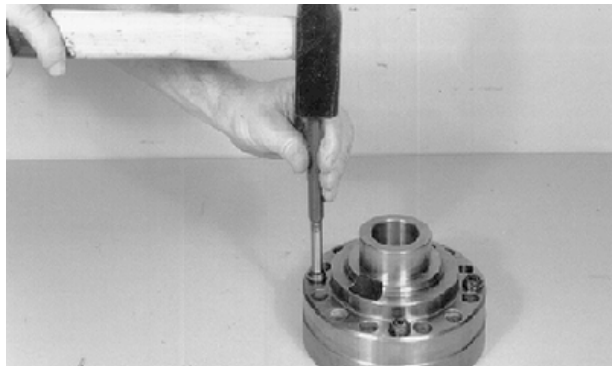
Assemble Rear Axle

NOTE: Spring pins can be removed (if necessary) by tapping threads in each pin (1/4 in. tap inner pin, 1/2 in. tap outer pin). Install slide hammer and remove pins from bore.

1. Install spring pins (if removed) into blind holes of differential hub. Note slot on outer spring pin **MUST** be located as shown. Install inner spring pin with slot 180° from outer pin.



T108091 —JUN—19MAR97



T106495 —JUN—16JAN97

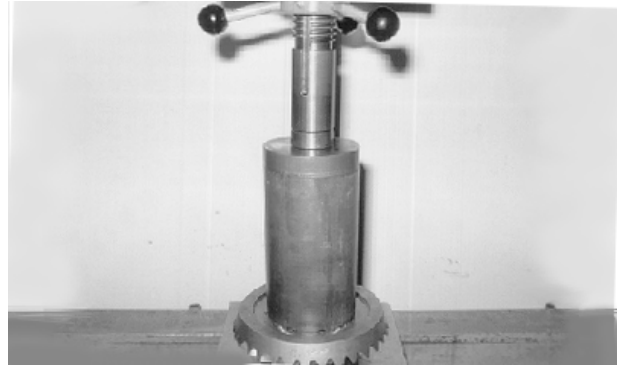
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WS68074.00036FC -19-14JUL10-1/49

Axle Shaft, Bearings and Reduction Gears

NOTE: Make sure spring pins are aligned with bores in bevel gear.

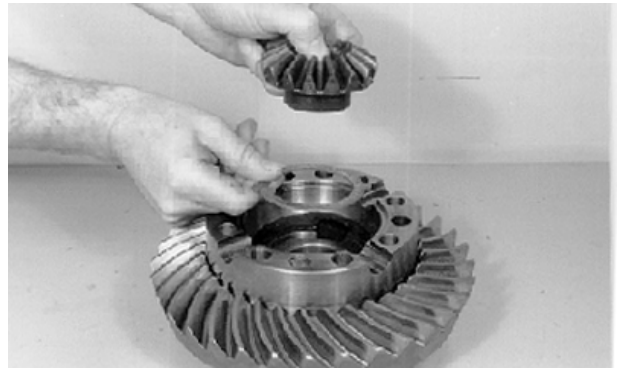
2. Press ring gear on differential hub until bottomed.



T106496 —JUN—16JAN97

WS68074,00036FC -19-14JUL10-2/49

3. Install thrust washer and side gear.



T106497 —JUN—16JAN97

WS68074,00036FC -19-14JUL10-3/49

4. Install pinion assembly. Note thrust washers on outer edge of pinion gears must be installed with locking tabs upward.

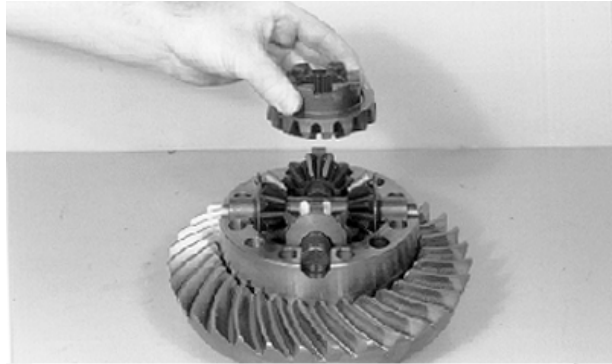


T106498 —JUN—16JAN97

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WS68074,00036FC -19-14JUL10-4/49

5. Install side gear.

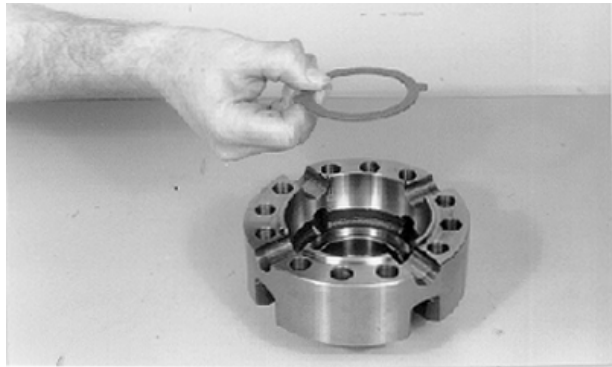


T106499 —UN—16JAN97

WS68074.00036FC -19-14JUL10-5/49

NOTE: Locking tabs on thrust washer MUST engage slots on housing.

6. Install thrust washer and differential housing.



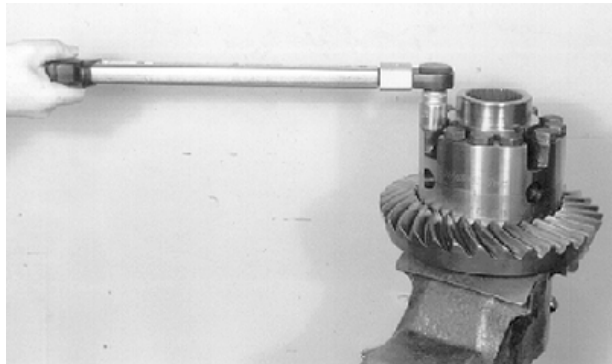
T106500 —UN—16JAN97

WS68074.00036FC -19-14JUL10-6/49

7. Install and tighten cap screws to specification.

Specification

Differential Housing Cap
Screws—Torque..... 185 N·m (136 lb-ft)



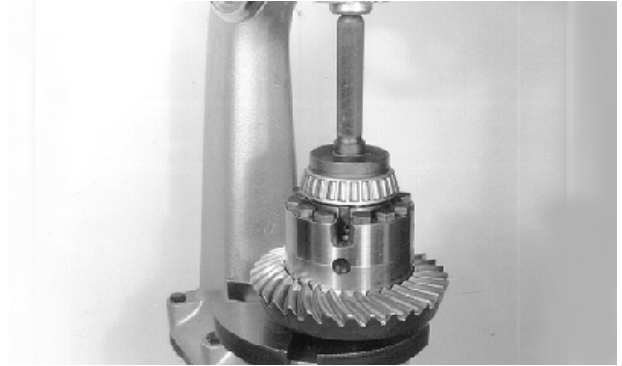
T106502 —UN—16JAN97

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WS68074.00036FC -19-14JUL10-7/49

Axle Shaft, Bearings and Reduction Gears

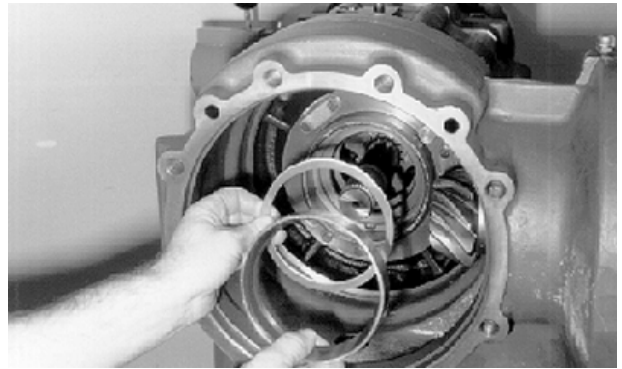
8. Press both bearing inner races until bottomed on shoulder.



T106503 —UN—16JAN97

WS68074,00036FC -19-14JUL10-8/49

9. Install a nominal shim pack of 1.25 mm (0.049 in.) and outer bearing race.

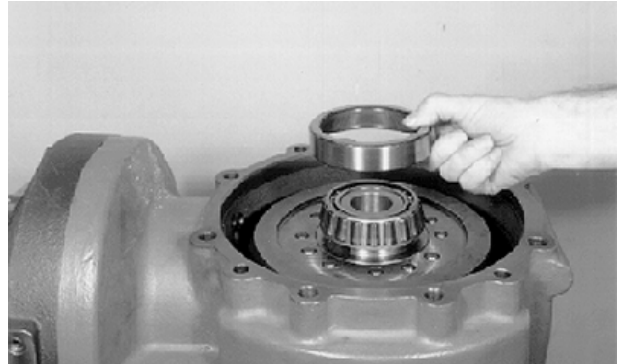


T106505 —UN—16JAN97

WS68074,00036FC -19-14JUL10-9/49

10. Position axle housing as shown and install differential assembly and outer bearing race.

NOTE: At this point, some backlash should be felt between pinion shaft and ring gear. If necessary, add shims until some backlash can be felt.



T106507 —UN—16JAN97

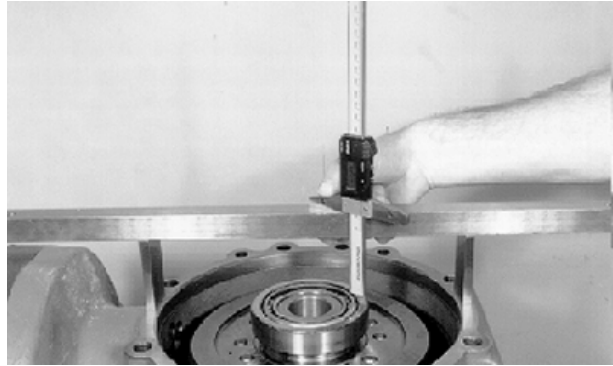
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WS68074,00036FC -19-14JUL10-10/49

Axle Shaft, Bearings and Reduction Gears

11. Measure and record dimension I using gauge blocks and a depth gauge.

EXAMPLE OF DIMENSION (I)	
Flange mounting surface-to-bearing outer race	7.30 mm (0.287 in.)

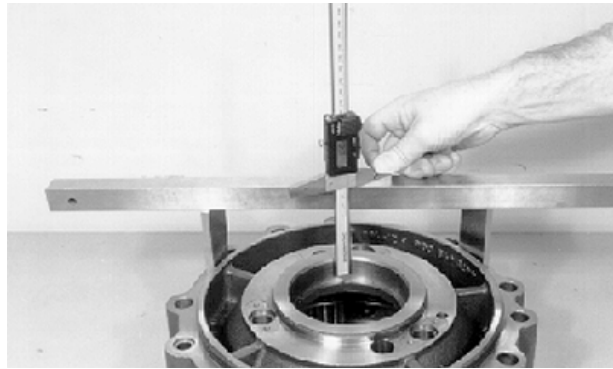


T106508 —UN—16JAN97

WS68074,00036FC -19-14JUL10-11/49

12. Measure and record dimension II.

EXAMPLE OF DIMENSION (II)	
Brake housing flange-to-shoulder of outer bearing race	8.50 mm (0.335 in.)

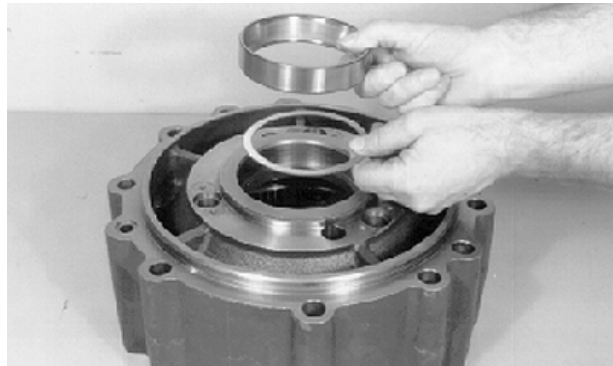


T106509 —UN—16JAN97

WS68074,00036FC -19-14JUL10-12/49

13. Adjust shim pack (as necessary) behind differential bearing. Round off dimension to the nearest shim size.

EXAMPLE E	
Dimension II	8.50 mm (0.334 in.)
Minus dimension I	— 7.30 mm (0.287 in.)
Difference	1.20 mm (0.047 in.)
Plus required bearing preload	+ 0.10 mm (0.003 in.)
Equals total differential bearing shim pack	= 1.30 mm (0.050 in.)



T106510 —UN—16JAN97

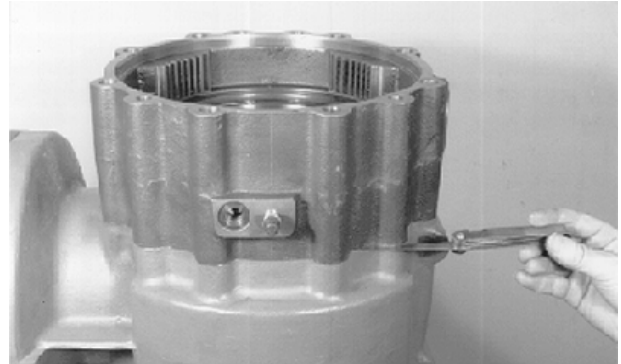
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WS68074,00036FC -19-14JUL10-13/49

14. Install brake housing.

NOTE: If shim pack has been correctly determined, there will be a gap between differential housing and brake housing. (Example: shim pack 1.30 mm (0.051 in.) equal a gap 0.1 mm (0.004 in.))

15. Check for gap between differential housing and brake housing using a feeler gauge.



T106512 —JUN—16JAN97

WS68074,00036FC -19-14JUL10-14/49

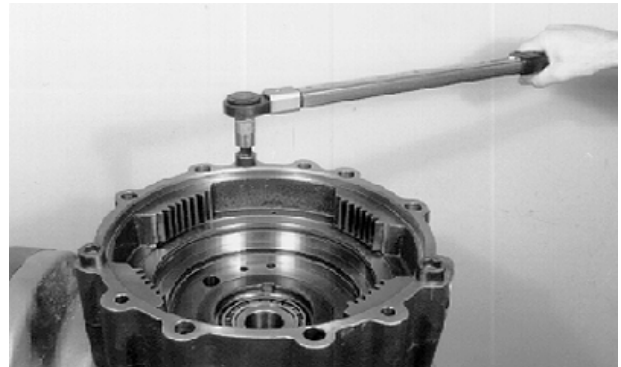
NOTE: O-ring on flange of brake housing must be removed to determine measurements for shim pack.

16. Install three cap screws between brake housing and differential housing. Tighten cap screws to specification.

Specification

Axle Housing Cap
Screws—Torque..... 195 N·m (144 lb-ft)

This will assure that ring gear and pinion are in proper alignment to determine backlash.



T106513 —JUN—16JAN97

WS68074,00036FC -19-14JUL10-15/49

17. Install JDG712A rolling torque and backlash bar.

NOTE: Straightedge of JDG712A tool indicates position to record backlash.

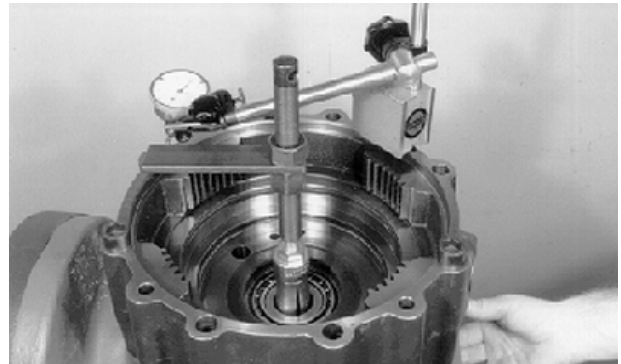
18. Install a dial indicator so it's positioned approximately 100 mm from center to correspond to the outer tooth diameter of the ring gear.

Specification

Ring Gear—Backlash..... 0.15—0.25 mm (0.006—0.010 in.)

- Too little backlash—install thicker shim behind outer bearing cup in step 9. The shim thickness for bearing preload shown in step 13 must be reduced accordingly.
- Too much backlash—install thinner shim behind outer bearing cup in step 9. The shim thickness for bearing preload shown in step 13 must be increased accordingly.

19. Remove three cap screws and brake housing.



T106515 —JUN—16JAN97

20. After final shim pack thickness is determined, disassemble housing and install O-rings on flange and pilot of axle housings.

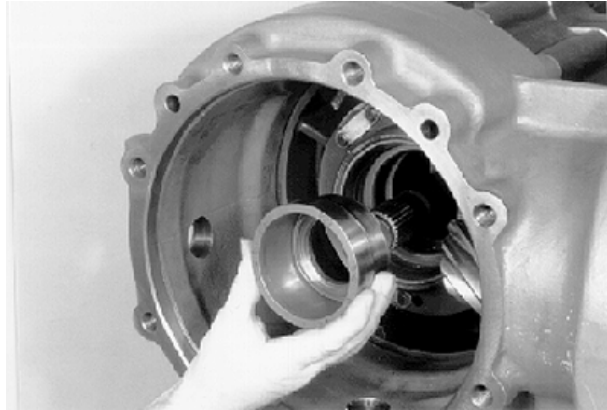
21. To verify measurements are correct, check gear tooth contact pattern. (See procedure in this group.)

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WS68074,00036FC -19-14JUL10-16/49

Axle Shaft, Bearings and Reduction Gears

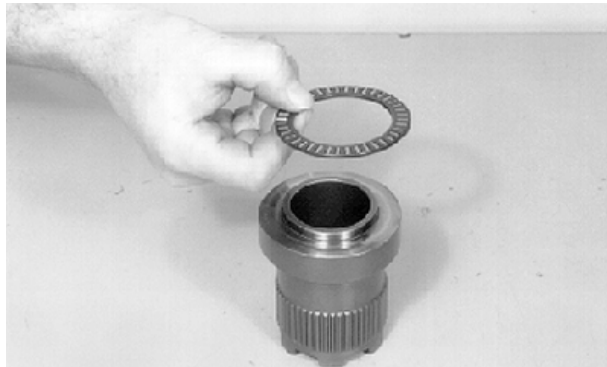
- 22. Install differential lock piston seals into housing.
- 23. Install piston into housing until bottomed.



T106517 —UN—16JAN97

WS68074,00036FC -19-14JUL10-17/49

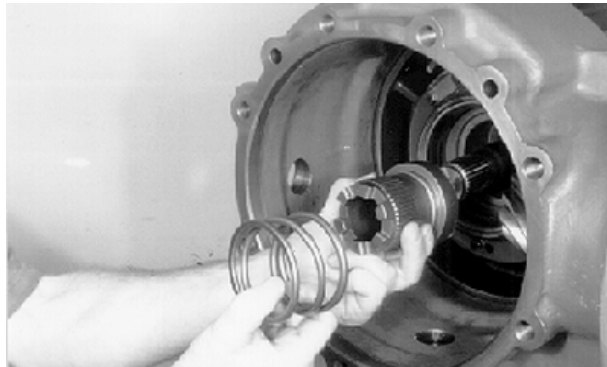
- 24. Apply petroleum jelly to thrust washer and install on differential lock.



T106566 —UN—17JAN97

WS68074,00036FC -19-14JUL10-18/49

- 25. Install differential lock and spring.
- 26. Install differential assembly.



T106567 —UN—17JAN97

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WS68074,00036FC -19-14JUL10-19/49

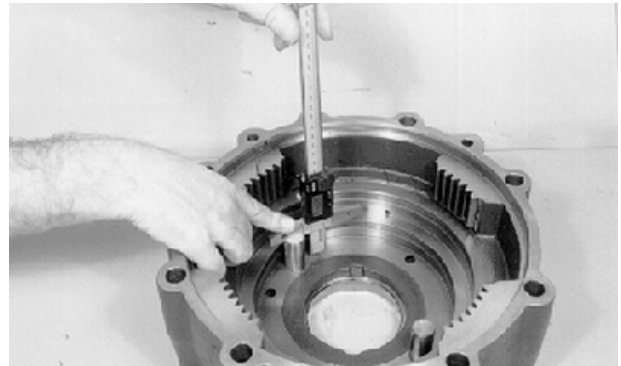
Axle Shaft, Bearings and Reduction Gears

27. Install guide pins (if removed) to specified depth, as shown.

Specification

Brake Housing Guide

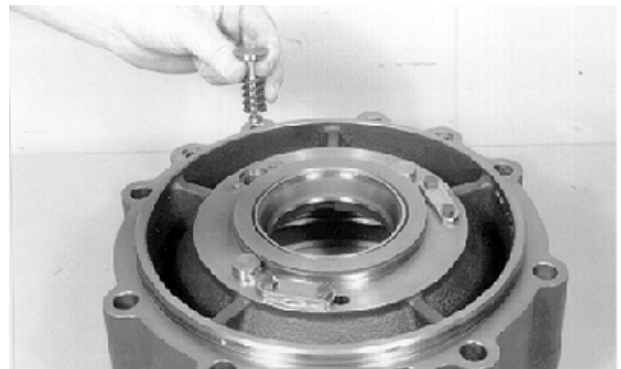
Pins—Depth.....40.6 + 0 — 0.6 mm (1.59 + 0 — 0.023 in.)



T106569 —UN—17JAN97

WS68074.00036FC -19-14JUL10-20/49

28. Install springs and pins to brake housing.



T106570 —UN—17JAN97

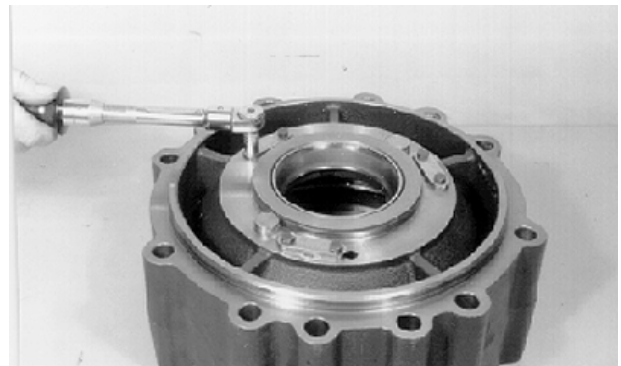
WS68074.00036FC -19-14JUL10-21/49

29. Apply cure primer, then thread lock and sealer (medium strength) to cap screw threads. Install retaining clips and cap screws. Tighten cap screws to specification.

Specification

Brake Retainer Cap

Screw—Torque..... 9.5 N·m (84 lb-in.)



T106571 —UN—17JAN97

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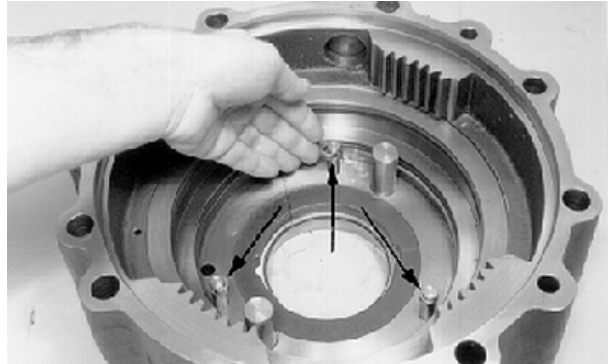
WS68074.00036FC -19-14JUL10-22/49

Axle Shaft, Bearings and Reduction Gears

30. Install sealing rings with groove of ring facing each other toward the pressure chamber. Install backup rings in groove away from pressure chamber.
31. Apply petroleum jelly to split rings and install on brake adjusters.

IMPORTANT: Center the split rings on pins before installing the brake piston.

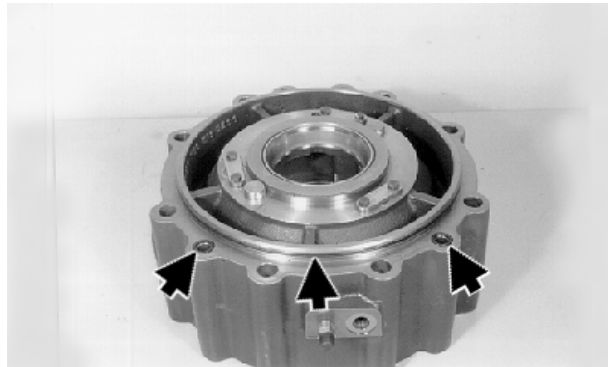
32. Carefully install the brake piston until it is bottomed.



T106573 —UN—17JAN97

WS68074,00036FC -19-14JUL10-23/49

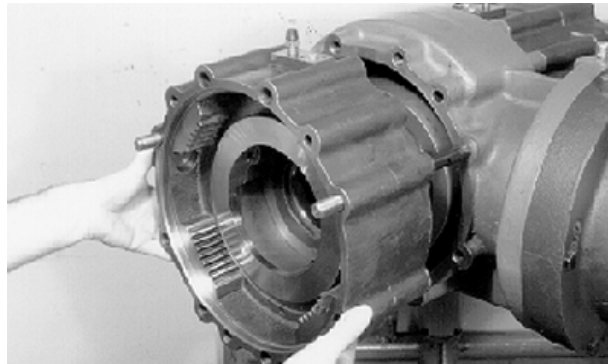
33. Apply petroleum jelly to O-rings and install on brake housing as shown.



T106575 —UN—17MAR97

WS68074,00036FC -19-14JUL10-24/49

34. Align scribe marks and install brake housing. Install three cap screws to hold brake housing in place. Cap screws will be removed later when axle housing is installed.



T106577 —UN—17JAN97

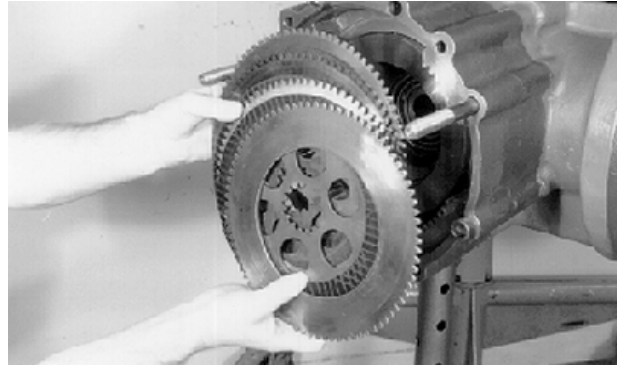
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WS68074,00036FC -19-14JUL10-25/49

IMPORTANT: Make sure brake piston is fully bottomed in park brake housing before installing brake separator plates and disks.

NOTE: Thick separator plates 4 mm (0.157 in.) should be installed in center of pack and thin separator plates 3 mm (0.118 in.) at outside of pack.

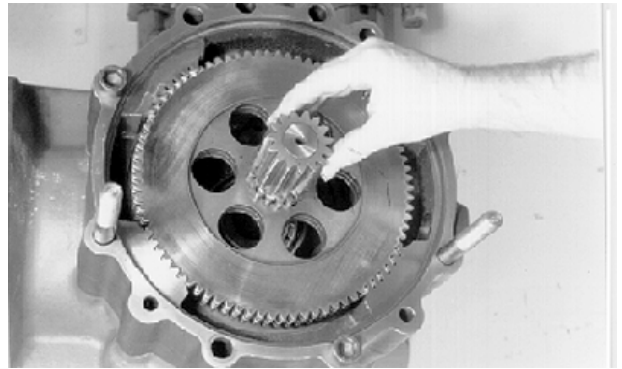
35. Alternately install four separator plates and three brake disks.



T106580 —UN—17JAN97

WS68074.00036FC -19-14JUL10-26/49

36. Install sun gear shaft.



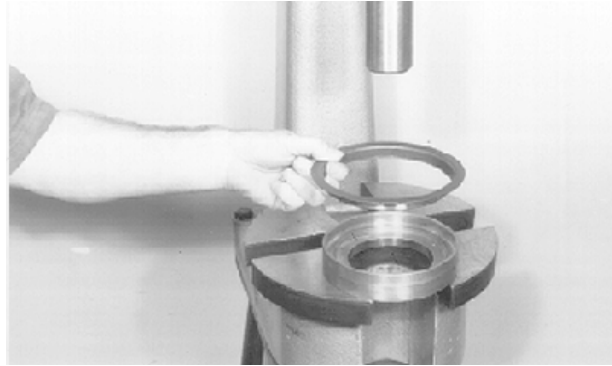
T106581 —UN—17JAN97

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WS68074.00036FC -19-14JUL10-27/49

Axle Shaft, Bearings and Reduction Gears

- 37. Apply cure primer, then high flex form-in-place gasket to ID of axle sleeve.
- 38. Install sleeve in JDG1058 sleeve installer. Press axle into sleeve until installer is bottomed against shoulder of axle.



T106582 —UN—17JAN97



T106583 —UN—17JAN97

WS68074,00036FC -19-14JUL10-28/49

- 39. Heat roller bearing and install on axle until it is bottomed against shoulder.



T106584 —UN—17JAN97

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WS68074,00036FC -19-14JUL10-29/49

Axle Shaft, Bearings and Reduction Gears

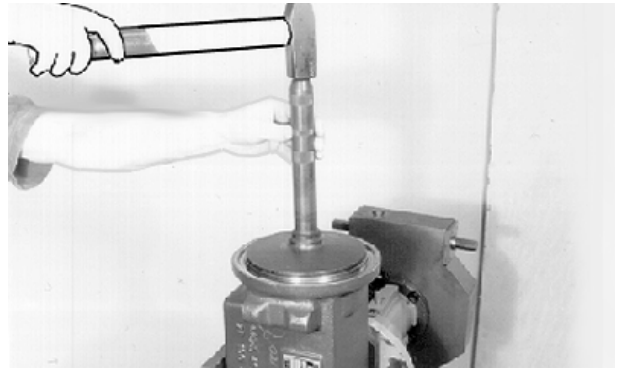
40. Install both axle housing bearing races until bottomed.



T106585 —UN—17JAN97

WS68074.00036FC -19-14JUL10-30/49

41. Install axle seal with lips of seal facing toward brake housing using a JDG1059 Axle Seal Installer.



T106586 —UN—21MAR97

WS68074.00036FC -19-14JUL10-31/49

42. Install axle shaft using a hoist.

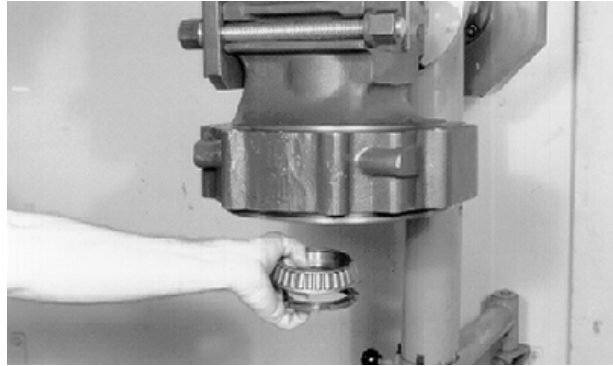


T105082 —UN—14JAN97

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WS68074.00036FC -19-14JUL10-32/49

43. Install bearing and washer.
44. Apply thread lock and sealer (medium strength) to spanner nut. Install nut with chamfer toward bearing and tighten finger tight.



T106568 —UN—17JAN97

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WS68074,00036FC -19-14JUL10-33/49

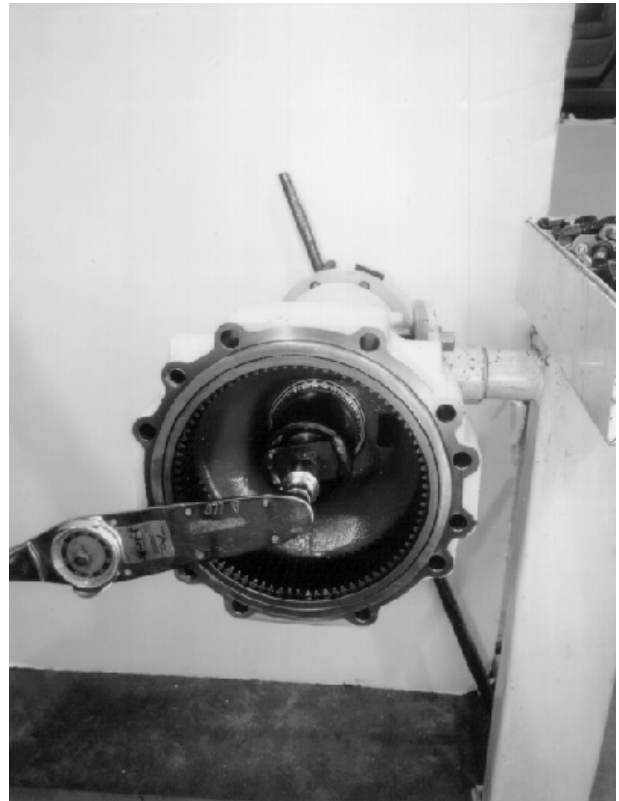
NOTE: While tightening spanner nut, rotate shaft in both directions several times to seat bearings.

If new bearings have been installed, set rolling torque to higher end of specification.

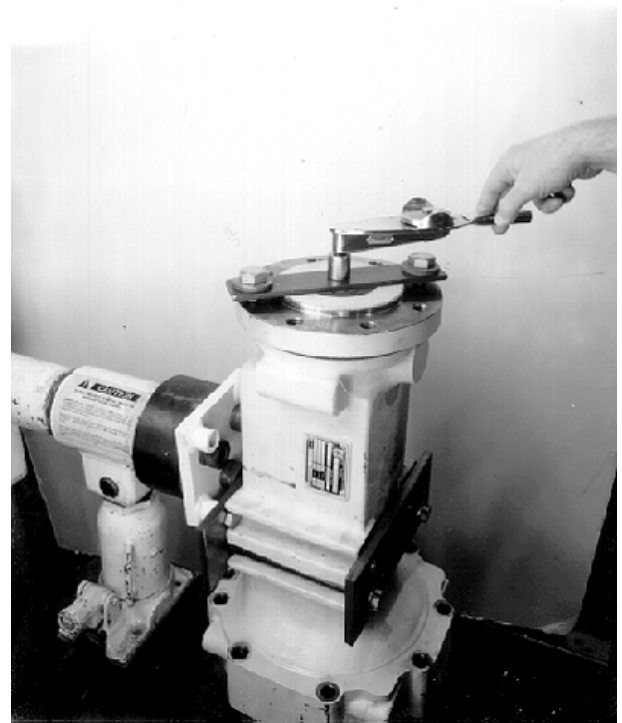
45. Install two eye bolts and DFT1147 Axle Rolling Torque Bar (see procedure to make tool in Group 0299) on axle flange.
46. Install a bar through eye bolts to hold axle from turning.
47. Tighten spanner nut, then check rolling drag torque using a torque wrench and JDG1056 axle spanner nut wrench. Tighten spanner nut until rolling drag torque is within specification.

Specification

Inner Axle	
Bearing—Rolling Drag	
Torque.....	6.5—8 N·m (58—71 lb-in.)



T107739 —UN—28FEB97



T108289 —UN—18MAR97

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WS68074.00036FC -19-14JUL10-34/49

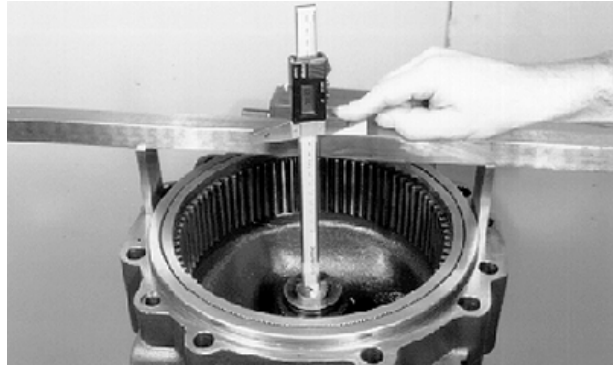
Axle Shaft, Bearings and Reduction Gears

48. If stop was not removed, go to step 55. Use the followings steps to determine the number of shims required behind the (brass) stop (if removed) on the end of the sun gear shaft:

NOTE: If necessary, old stop can be removed by drilling and tapping stop. If removed, a new stop must be installed during assembly.

49. Measure and record dimension I.

EXAMPLE OF DIMENSION (I)	
Flange mounting surface-to-shoulder at bottom of axle stop	78.40 mm (3.086 in.)



T106592 —JUN—17JAN97

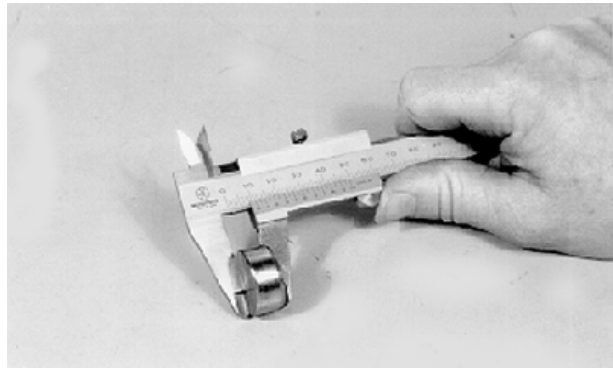
WS68074,00036FC -19-14JUL10-35/49

50. Measure and record height of new stop.

EXAMPLE OF DIMENSION (II)	
Height of stop	11.00 mm (0.433 in.)

51. Record differential dimension.

EXAMPLE F1	
Dimension I	78.40 mm (3.086 in.)
Minus dimension II	— 11.00 mm (0.433 in.)
Equals differential dimension	= 67.40 mm (2.653 in.)



T106593 —JUN—17JAN97

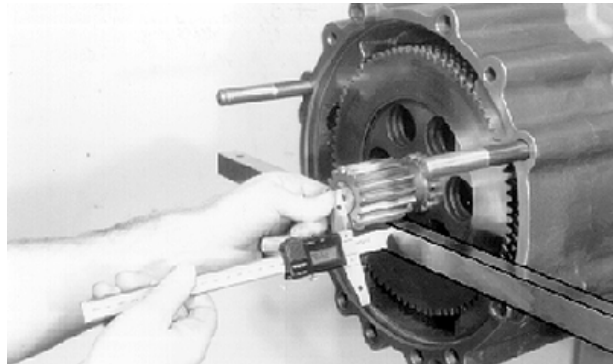
WS68074,00036FC -19-14JUL10-36/49

52. Measure and record dimension III.

EXAMPLE OF DIMENSION (III)	
Sun shaft-to-brake housing flange distance	63.90 (2.516 in.)

53. Record installation dimension.

EXAMPLE F2	
Dimension III	63.90 mm (2.516 in.)
Plus end play of sun gear shaft	+ 1.00 mm (0.039 in.)
Equals installation dimension	= 64.90 mm (2.555 in.)



T106594 —JUN—17JAN97

Continued on next page

WS68074,00036FC -19-14JUL10-37/49

54.

Install shims in bore on end of axle.

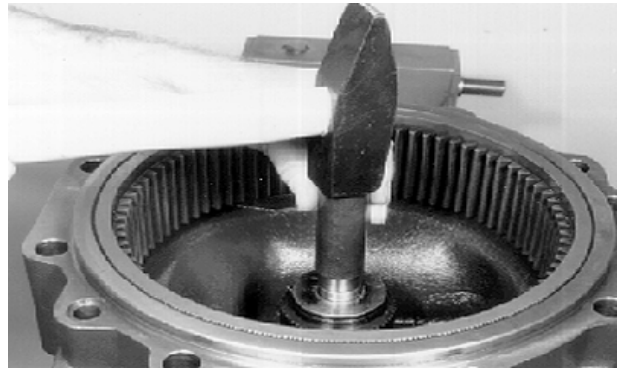
EXAMPLE F3	
Differential dimension (Example F1)	67.40 mm (2.653 in.)
Minus installation dimension (Example F2)	— 64.90 mm (2.555 in.)
Equals shim pack behind axle stop	= 2.50 mm (0.098 in.)



T106595 —UN—17JAN97

WS68074,00036FC -19-14JUL10-38/49

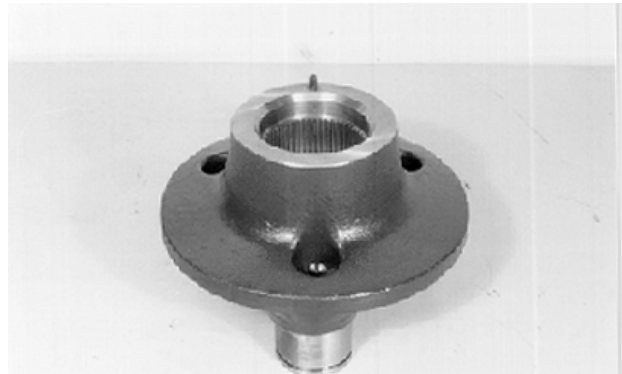
55. Install stop in end of axle until bottomed using a brass drift.



T106596 —UN—17JAN97

WS68074,00036FC -19-14JUL10-39/49

56. Install spring pin in planetary carrier.



T106597 —UN—17JAN97

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WS68074,00036FC -19-14JUL10-40/49

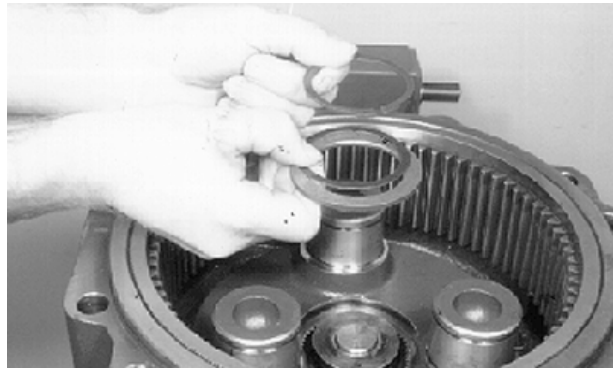
57. Install planetary carrier on axle shaft. Make sure spring pin on carrier engages one of the notches on the spanner nut.



T106598 —UN—17JAN97

WS68074,00036FC -19-14JUL10-41/49

58. Install thrust washer and snap ring.



T106600 —UN—17JAN97

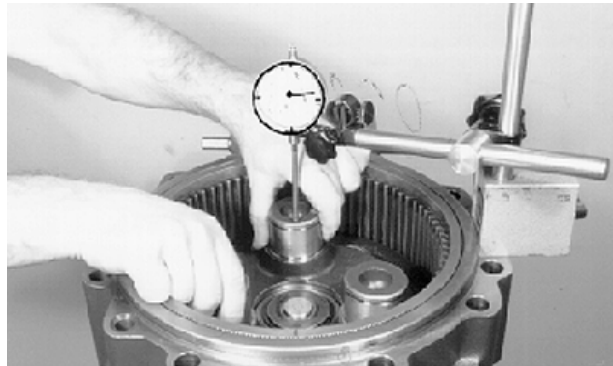
WS68074,00036FC -19-14JUL10-42/49

59. Install dial indicator and measure planet carrier end play.

Specification

Planet Carrier—End
play.....0.1—0.4 mm (0.003—0.015 in.)

60. Install shims (as necessary) under snap ring to adjust end play.

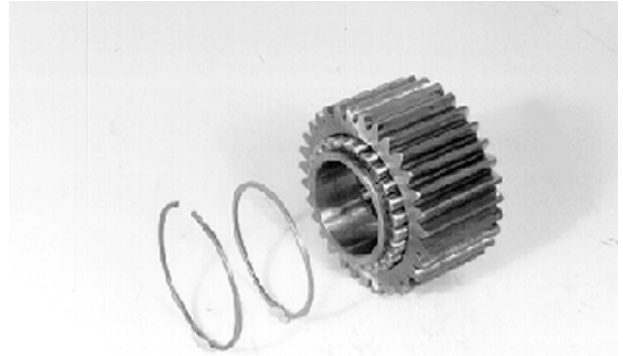


T106601 —UN—17JAN97

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WS68074,00036FC -19-14JUL10-43/49

61. Assemble roller bearings, thrust washer, and snap ring on planetary gear.

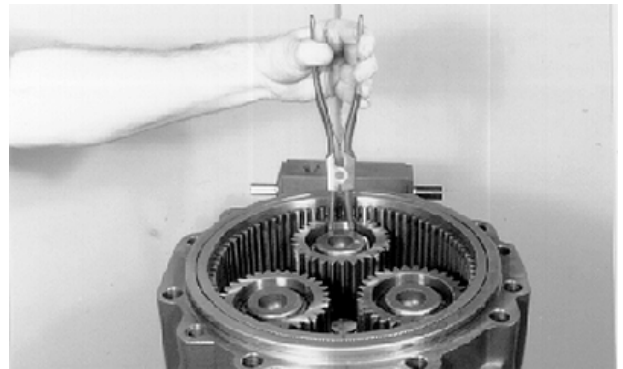


T106602 —UN—17JAN97

WS68074.00036FC -19-14JUL10-44/49

IMPORTANT: Planetary gears MUST be installed on carrier with large radius of bearing inner race toward the planetary carrier.

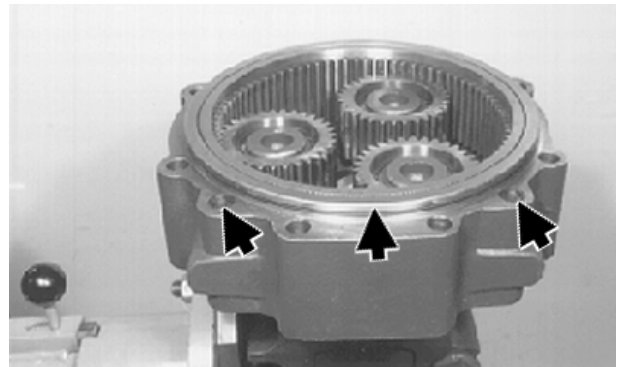
62. Heat planetary gears and install on carrier with large radius of bearing inner race toward the planetary carrier.
63. Install snap ring.



T106604 —UN—17JAN97

WS68074.00036FC -19-14JUL10-45/49

64. Install O-rings on axle housing as indicated.



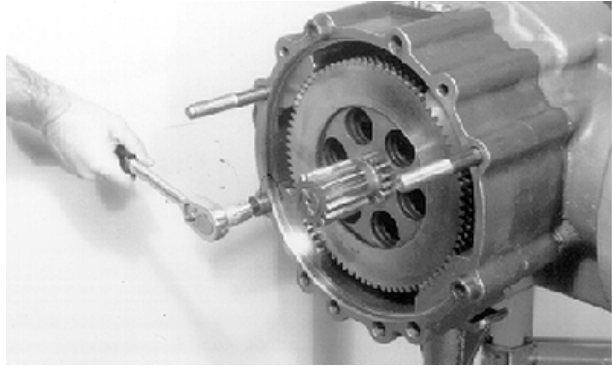
T106605 —UN—18MAR97

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WS68074.00036FC -19-14JUL10-46/49

Axle Shaft, Bearings and Reduction Gears

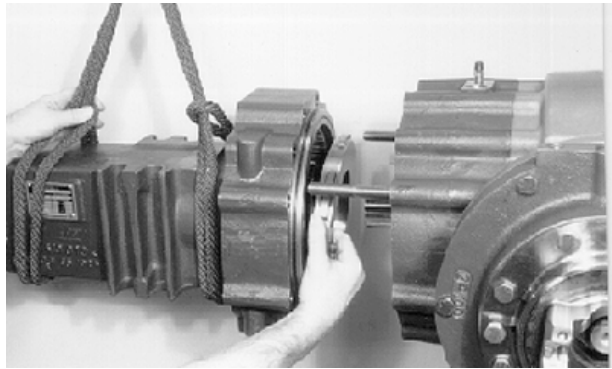
65. Remove three cap screws retaining brake housing.



T106606 —UN—17JAN97

WS68074,00036FC -19-14JUL10-47/49

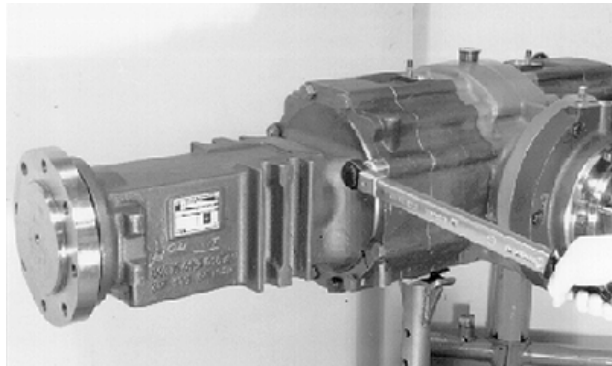
66. Install backing plate with machined side toward brake disk. Carefully install axle housing on guide pins until bottomed.



T106607 —UN—17JAN97

WS68074,00036FC -19-14JUL10-48/49

67. Install and tighten nuts and cap screws to specification.

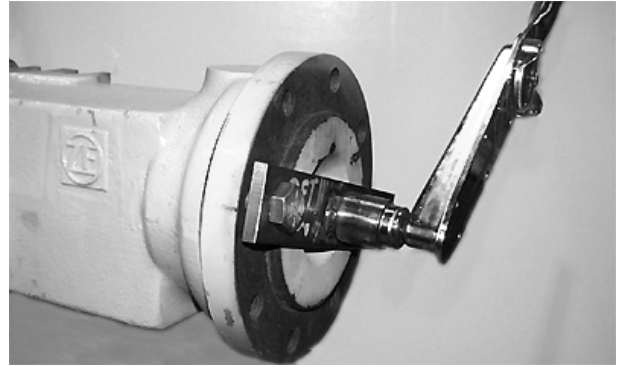


T106608 —UN—17JAN97

WS68074,00036FC -19-14JUL10-49/49

Check Service Brakes After Assembly

1. Install two cap screws and DFT1147 Axle Rolling Torque Bar (see Group 0299 for instruction to make tool) on axle flange.



T126796B —UN—15DEC99

WS68074,00036FD -19-14JUL10-1/2

2. With park brake "ON", install a porta-power to both service brake fittings (1) to pressurize to specifications (this is to move piston down).

Specification

Service Brake—Pressure.....5516 ± 965 kPa (55 ± 10) (800 ± 140 psi)

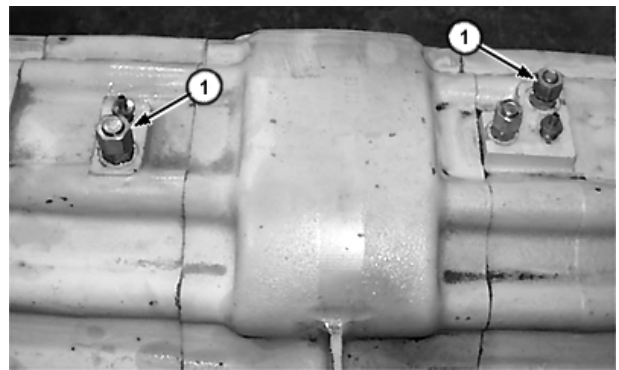
3. Release pressure.

4. Check rolling drag torque using a torque wrench. Maximum torque after releasing pressure is 217 N·m (160 lb-ft).

Specification

Axle Service Brakes—Rolling Drag Torque..... 217 N·m (160 lb-ft)

If exceeding specification value, release park brake by using mechanical release screws.



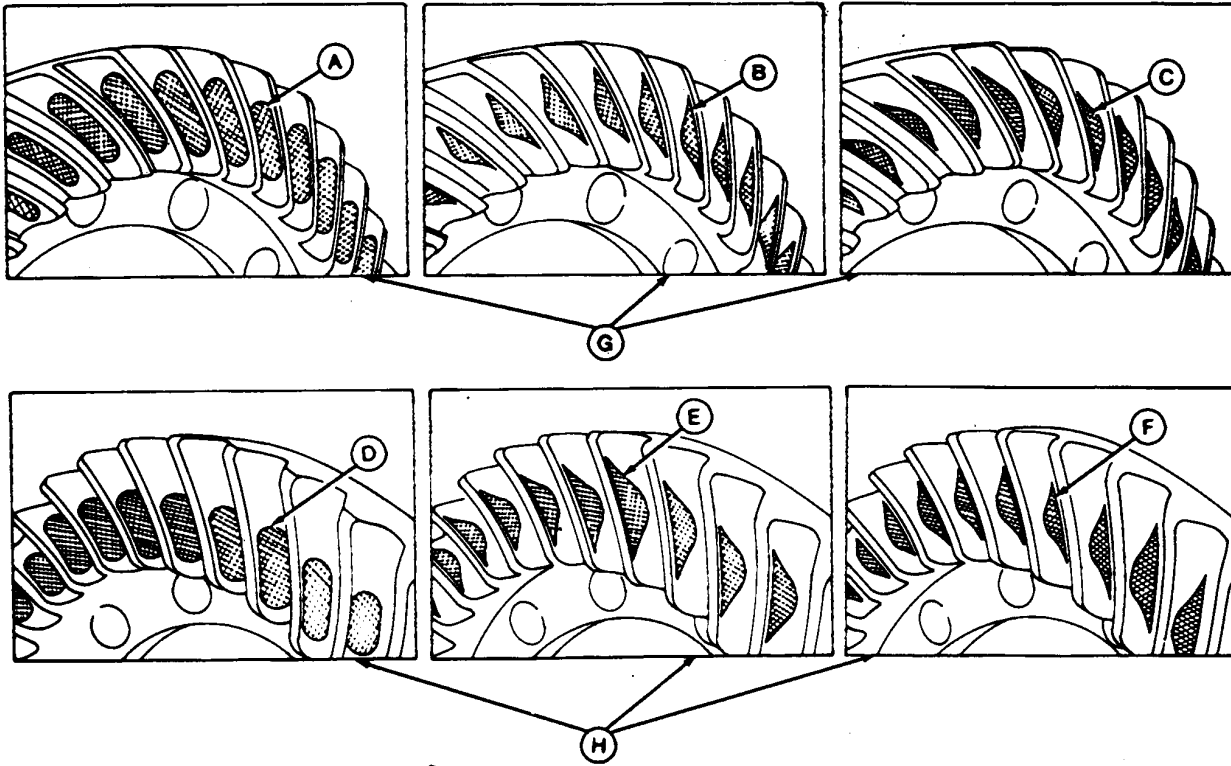
T126800B —UN—15DEC99

**1— Service Brake Line Fitting
(2 used)**

Measure torque on both axles, the axle with the higher value indicates that the problem is in that axle.

WS68074,00036FD -19-14JUL10-2/2

Check Gear Tooth Contact Pattern



- | | | | |
|--------------------------------|--------------------------------|--------------------------------|------------------------|
| A—Ideal Tooth Contact Pattern | C—Cone Point Must Be Increased | E—Cone Point Must Be Decreased | G—Coast Side (Concave) |
| B—Cone Point Must Be Decreased | D—Ideal Tooth Contact Pattern | F—Cone Point Must Be Increased | H—Drive Side (Convex) |

IMPORTANT: Gear tooth contact pattern must be checked on the coast side and drive side with a load applied. The pattern may be correct on the drive side and incorrect on the coast side causing the differential to “whine” when it is not engaged.

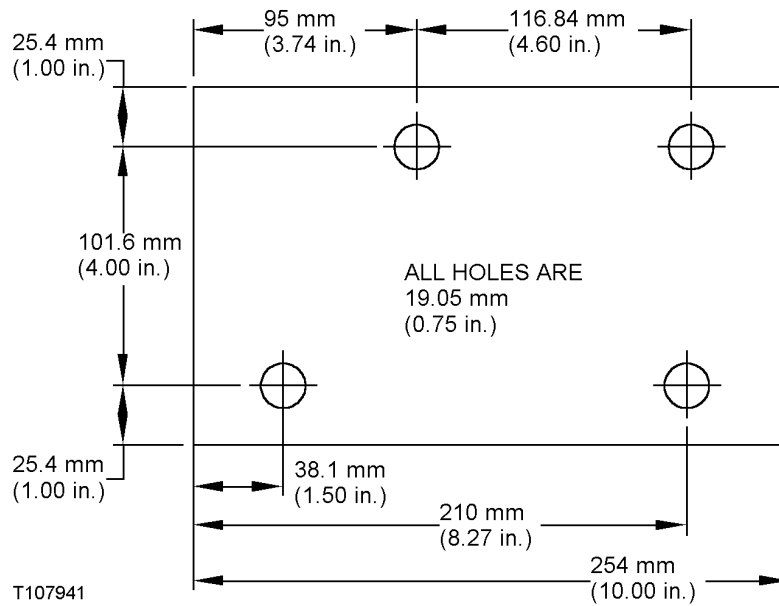
1. Apply grease to several teeth of ring gear with a load applied.

2. Apply pressure to park brake using a hydraulic hand pump or park brake release screws. If park brake release screws are used, return them to original position after test is complete.
3. Turn pinion in both directions to determine gear-tooth contact pattern. If pattern is not correct, cone point distance must be increased or decreased.

T94966—UN—18APR89

CED,OUO1010,229 -19-01SEP06-1/1

DFT1146 Axle Mounting Bracket



Used to install axle in engine stand (2 used).

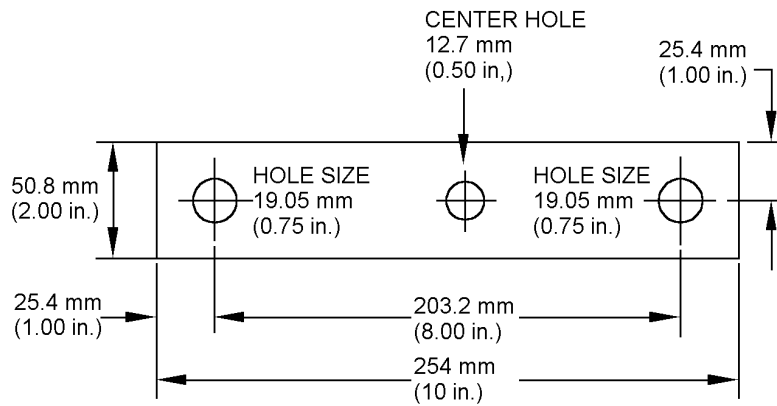
1/2 in. 1020 Steel

Material Required:

TX,02,SS3944 -19-01SEP06-1/1

T107941 -19-17MAR97

DFT1147 Axle Rolling Torque Bar



Used to determine axle rolling torque.

3/8 in. 1020 Steel

Material required:

TX,02,SS3945 -19-01SEP06-1/1

T107942 -19-17MAR97

Dealer Fabricated Tools

Section 03 Transmission

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Group 0300 Removal and Installation

Specifications

Item	Measurement	Specification
Hydraulic Pump	Weight	30 kg (65 lb) Approximate
Transmission	Weight	227 kg (500 lb) Approximate
Transmission-to-Flywheel Housing Cap Screws	Torque	73 N·m (54 lb-ft)
Converter-to-Flywheel Housing Cap Screws	Torque	73 N·m (54 lb-ft)

CED,TX03399,5634 -19-06DEC99-1/1

Remove and Install Transmission

1. Raise machine approximately 864 mm (34 in.) off the floor.
2. Put floor stands under machine.
3. Remove hydraulic reservoir for ease of disassembly and assembly. (See Remove and Install Reservoir in Section 21 Group 2160.)
4. Drain transmission. The approximate capacity is 15 L (4 gal).
5. Remove dipstick fill tube.
6. Remove floor mat and access cover in cab to remove shift lever.

CAUTION: To avoid injury from escaping fluid under pressure, relieve the pressure in the system before disconnecting or connecting hydraulic or other lines. Tighten all connections before applying pressure.

NOTE: Cab removed for clarity of photo to give proper location. Wiring, oil cooler line and clamping can be done through cowl. Disconnect lines under the machine.

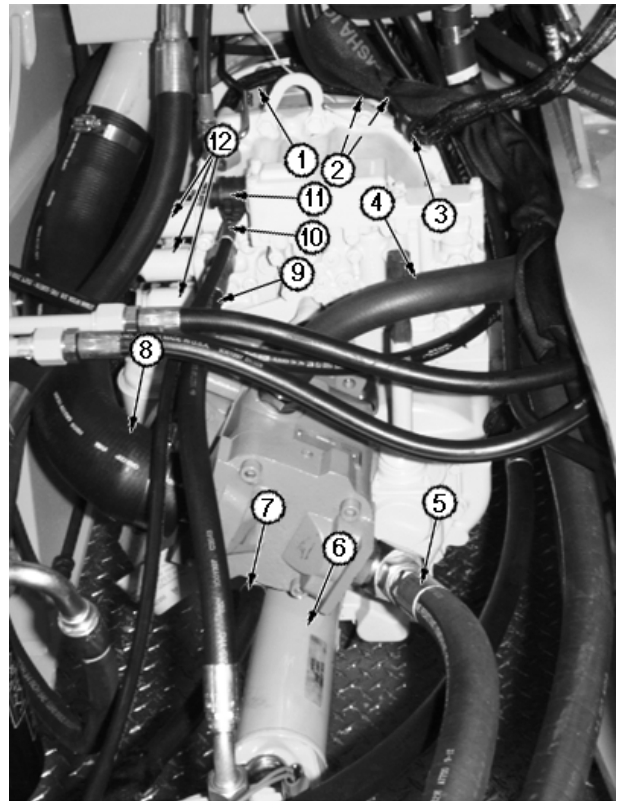
7. Disconnect (1—5, 7 and 9—12). Remove suction line (8) and front and rear drive shafts (6).

CAUTION: Hydraulic pump weighs approximately 30 kg (65 lb).

8. Remove hydraulic pump.

Specification

Hydraulic Pump—Weight..... 30 kg (65 lb) Approximate



Manual Shift Transmission Shown

- | | |
|--|---|
| 1— Transmission Temperature Sender Lead | 7— Hydraulic Pump-to-Load Sense Shuttle Check Valve |
| 2— Oil Cooler Line (2 used) | 8— Hydraulic Pump Suction Line |
| 3— Clamps (Remove as required) | 9— Park Brake Line |
| 4— Hydraulic Pump-to-Reservoir | 10— Differential Lock Line |
| 5— Hydraulic Pump-to-Backhoe Valve Inlet Cap | 11— Shift Modulation Wiring Connector |
| 6— Front and Rear Drive Shaft | 12— Solenoid Connector (3 used with MFWD) (2 used without MFWD) |

T108305B—UN—20MAR97

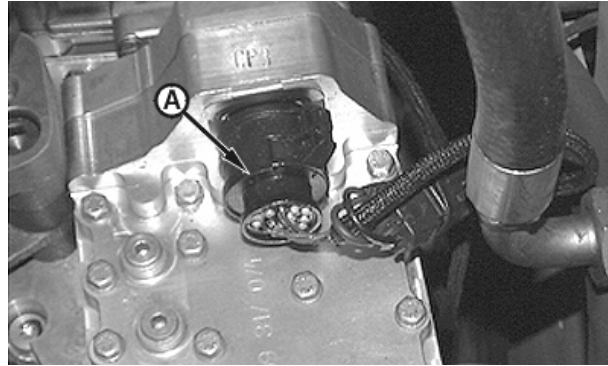
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CED,OUO1017,95 -19-04DEC98-1/5

Removal and Installation

9. Disconnect wire harness connector (A) from shift valve.

A—Shift Valve Wire Harness Connector

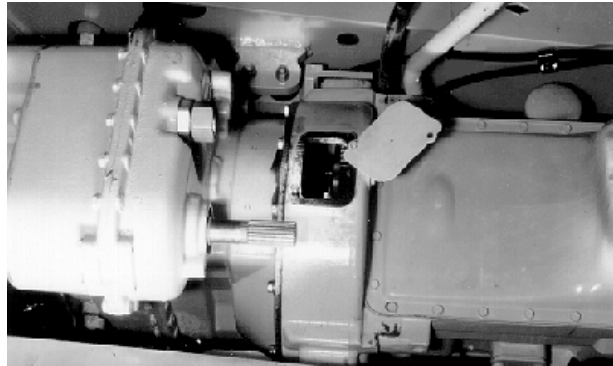


T117881C —UN—19OCT98

Powershift Models Only

CED,OUO1017,95 -19-04DEC98-2/5

10. Remove access plate on flywheel housing. Remove four cap screws that hold the torque converter to flywheel.
11. Install a chain and hoist through cowl and reservoir opening to bracket on transmission.



T1100289 —UN—06FEB97

Continued on next page

CED,OUO1017,95 -19-04DEC98-3/5

CAUTION: Transmission weights approximately 227 kg (500 lb).

When removing transmission care must be taken with torque converter. Torque converter could fall out of housing.

12. Remove twelve transmission to flywheel housing cap screws. Slide transmission with torque converter back and down on a lifting table with wheels. Block transmission to stabilize on the table. Carefully wheel out transmission on right side of machine.

Specification

Transmission—Weight..... 227 kg (500 lb) Approximate

13. Install transmission and twelve cap screws. Tighten cap screws to specification.

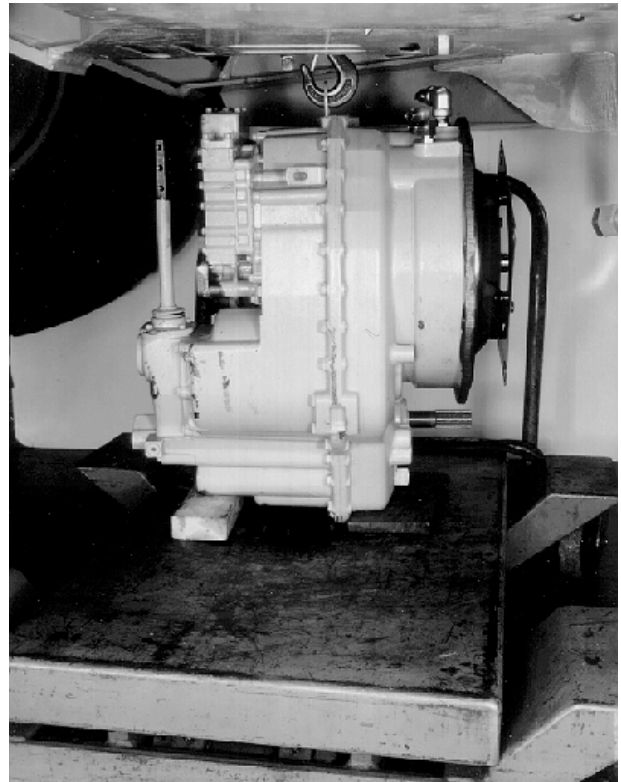
Specification

Transmission-to-Flywheel Housing Cap Screws—Torque..... 73 N·m (54 lb-ft)

14. Install four cap screws, torque converter to flywheel. Tighten cap screw to specification. Install access cover.

Specification

Converter-to-Flywheel Housing Cap Screws—Torque..... 73 N·m (54 lb-ft)



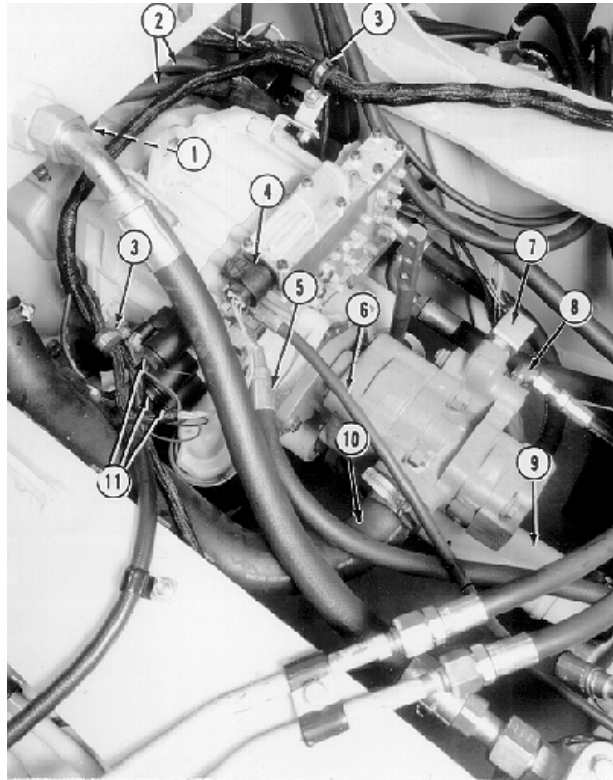
T100290—JUN—06FEB97

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CED,OUO1017,95 -19-04DEC98-4/5

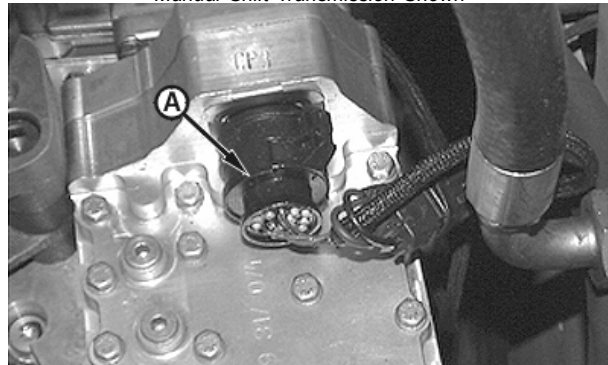
Removal and Installation

15. Install pump. Connect parts (1—5 and 7—12)
16. Install dipstick fill tube.
17. Install front and rear drive shafts (6) see procedure in Group 0325.
18. Connect wire harness connector (A) to shift valve.
19. Install shift lever, access cover and floor mat.
20. Install hydraulic reservoir (see Remove and Install Hydraulic Reservoir in Section 21 Group 2160).



T100288—UN—06FEB97

Manual Shift Transmission Shown



T117681C—UN—19OCT98

Powershift Models Only

CED,OUO1017,95 -19-04DEC98-5/5

Group 0315 Controls Linkage

Other Material

Number	Name	Use
T43512 (U.S.) TY9473 (Canadian) 242 (LOCTITE®)	Thread Lock and Sealer (Medium Strength)	Apply to reverse control switch-to-column.
TY21517 (U.S.) NA (Canadian) 454 (LOCTITE®)	Instant Gel Adhesive	Apply to threads on shift lever knob.
TY16285 (U.S.) CXTY16285 (Canadian) 7649 (LOCTITE®)	Cure Primer	Apply to surfaces of shift lever housing.
TY16021 (U.S.) TY9484 (Canadian) 17430 (LOCTITE®)	High Flex Form-In-Place Gasket	Apply to surface of shift housing-to-transmission.

LOCTITE is a registered trademark of Loctite Corp.

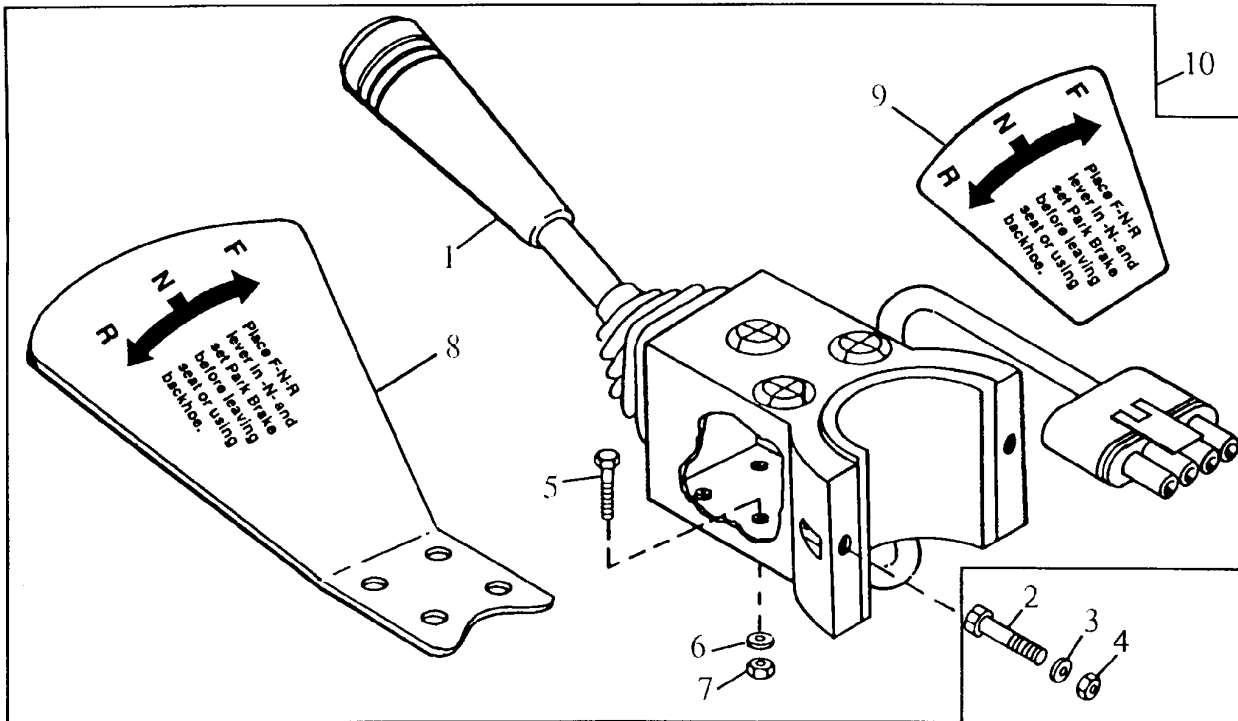
CED,TX03399,5597 -19-25OCT99-1/1

Specifications

Item	Measurement	Specification
Reverse Control Switch Assembly-to-Steering Column Cap Screws	Torque	7.2 N·m (64 lb-in.)
Shift Cover-to-Shift Control Housing	Torque	9.5 N·m (84 lb-in.)
End of Shift Rails-to-Face of Shift Housing	Distance	85 mm (3.35 in.) Approximate
Shift Control Housing Cap Screws-to-Transmission	Torque	23 N·m (204 lb-in.)
Shift Control Housing Plugs	Torque	25 N·m (216 lb-in.)
Shift Control Detent Plugs	Torque	25 N·m (216 lb-in.)

CED,TX03399,5598 -19-25OCT99-1/1

Remove and Install Reverser Control



T107750

T107750—UN—27FEB97

- 1— Reverser Control Switch
- 2— Cap Screw (2 used)
- 3— Washer (2 used)

- 4— Nut (2 used)
- 5— Cap Screw (4 used)
- 6— Washer (as required)

- 7— Lock Nut (4 used)
- 8— Guard
- 9— Label (FNR)

- 10— Reverser Control Switch Assembly

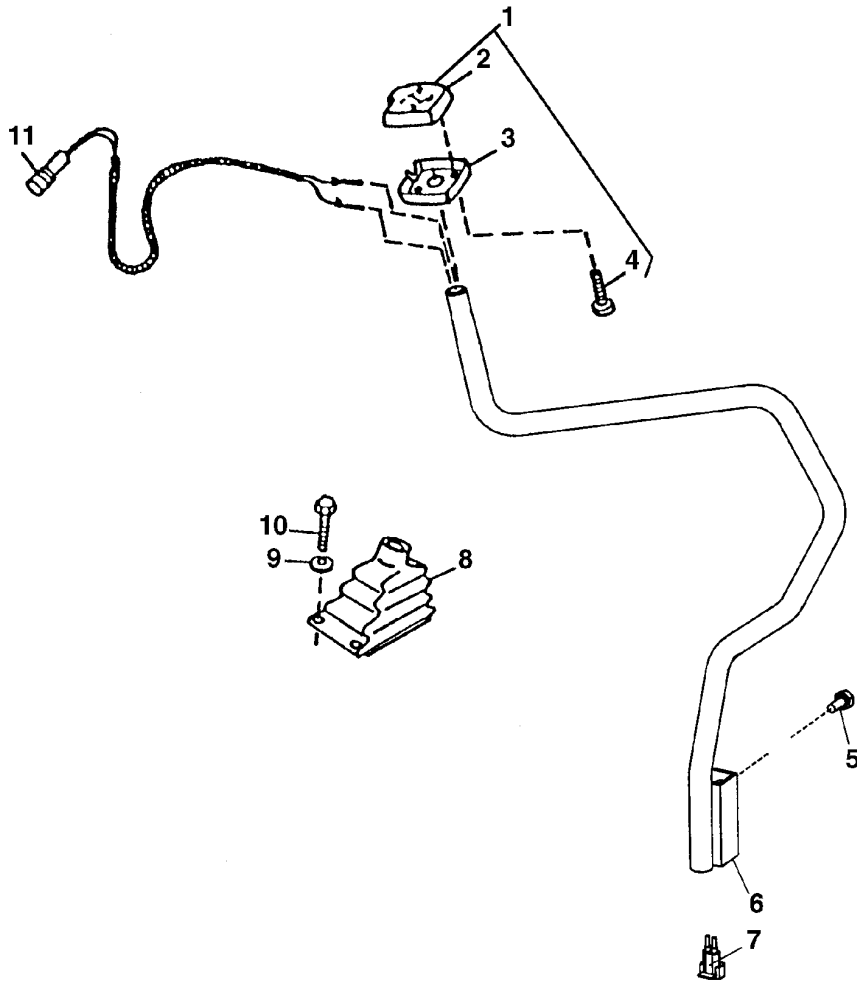
Apply thread lock and sealer (medium strength) to reverser control switch-to-column. Tighten cap screws (2) to specification.

Specification

Reverse Control Switch	
Assembly-to-Steering	
Column Cap	
Screws—Torque.....	7.2 N·m (64 lb-in.)

TX,0315,SS3805 -19-27FEB97-1/1

Remove and Install Transmission Shifter Lever



T107751

- 1— Knob
- 2— Handle
- 3— Handle

- 4— Cap Screw (2 used)
- 5— Cap Screw (2 used)
- 6— Gearshift Lever

- 7— Connector
- 8— Boot
- 9— Washer (4 used)

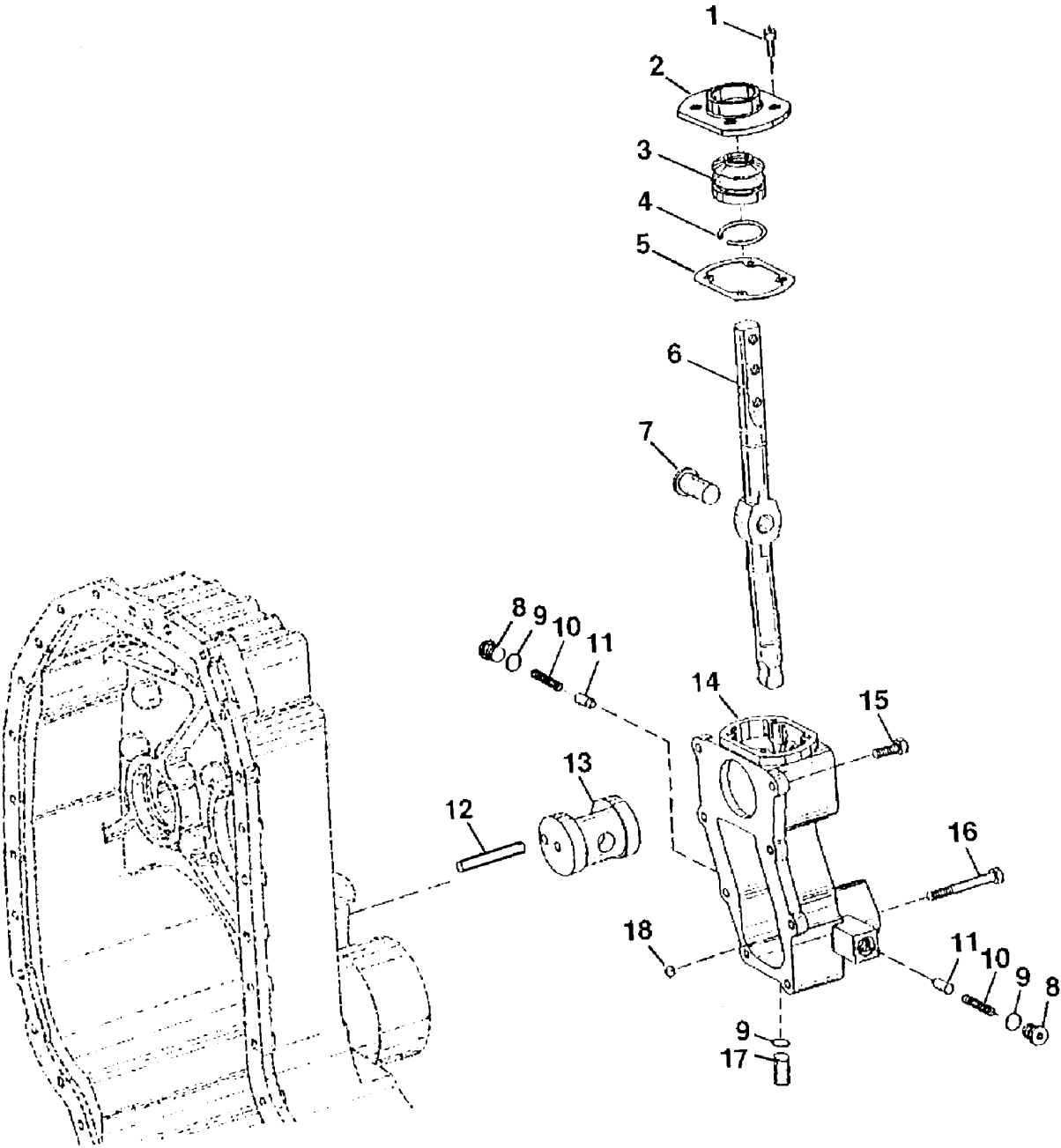
- 10— Self-Locking Screw
- 11— Shift Lever Switch

Apply gel instant adhesive to threads on shift lever knob.

TX.0315,SS3806 -19-27FEB97-1/1

T107751 —UN—27FEB97

Remove Shifter Lever and Housing



T108075

T108075—UN—11MAR97

Continued on next page

TX.0315.SS3025 -19-25OCT99-1/4

Controls Linkage

1— Cap Screw (4 used)
2— Cover
3— Boot
4— Snap Ring
5— Gasket

6— Lever
7— Pivot
8— Plug (2 used)
9— O-Ring (3 used)
10— Spring (2 used)

11— Detent (2 used)
12— Dowel Pin
13— Pivot
14— Housing
15— Cap Screw (6 used)

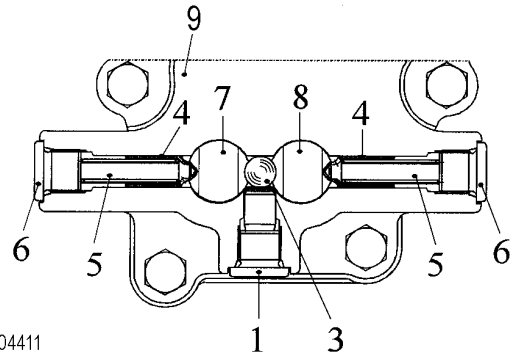
16— Cap Screw (2 used)
17— Plug with Dowel
18— Ball

TX,0315,SS3025 -19-25OCT99-2/4

NOTE: Shift housing can be removed on machine.
Transmission shown removed for clarity of photo.

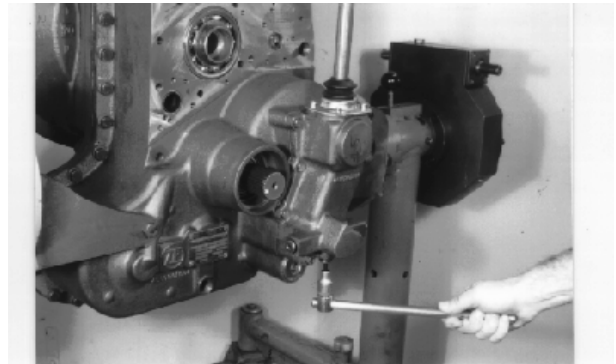
1. Drain transmission.
2. Remove floor mat and access cover in cab.
3. Disconnect wiring connector on shift lever.
4. Remove cap screws to remove top of shift lever.
5. Shift gearshift lever in neutral position. From under the machine, remove plug with dowel (1) and ball.
6. Remove both detent plugs (6). Remove springs (5) and detent pins (4).

1— Plug with O-Ring and Dowel	6— Plug with O-Ring (2 used)
3— Ball	7— Shift Rail (3rd/4th Speed)
4— Detent Pin (2 used)	8— Shift Rail (1st/2nd Speed)
5— Spring (2 used)	9— Shift Control Housing



T104411

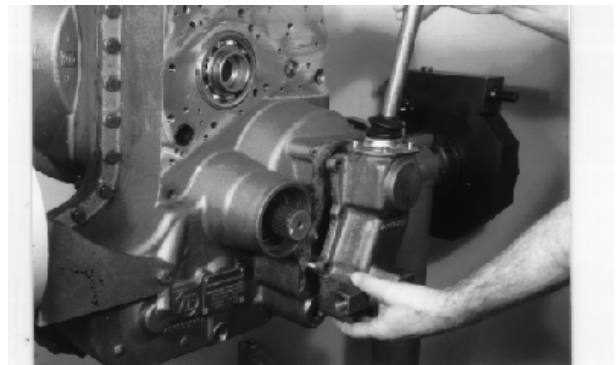
T104411—UN—03MAR97



T101347—UN—04JUN96

TX,0315,SS3025 -19-25OCT99-3/4

7. Remove cap screws and remove shift control housing.

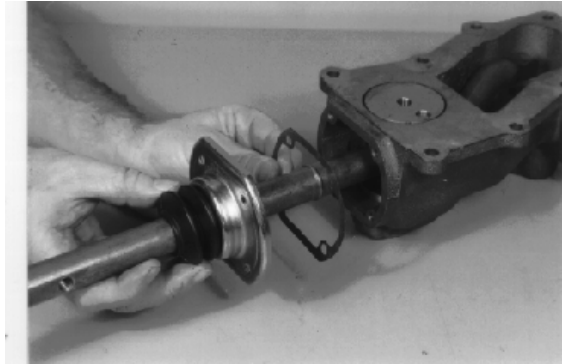


T101348—UN—04JUN96

TX,0315,SS3025 -19-25OCT99-4/4

Disassemble and Assemble Shift Lever and Housing

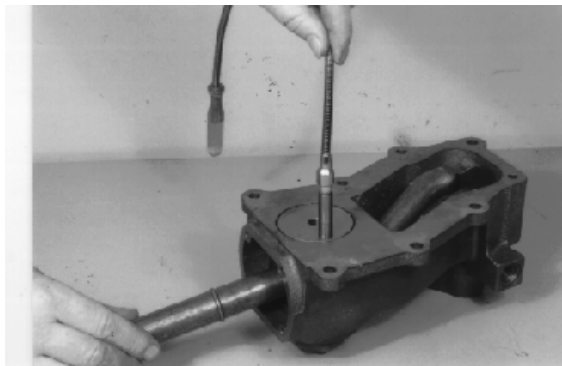
1. Remove cover screws.
2. Remove boot, cover, and flat gasket.



T101349—UN—04JUN96

TX,0315,SS3419 -19-15OCT96-1/8

3. Remove straight pin using a magnet.

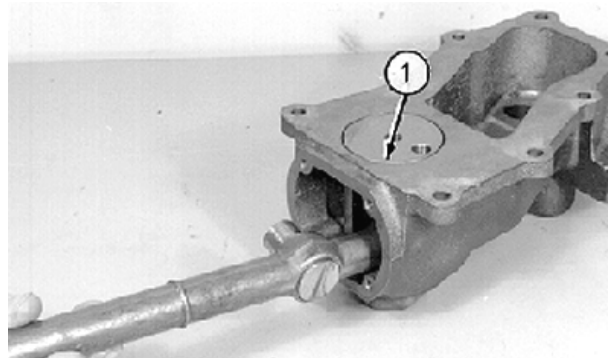


T101350—UN—04JUN96

TX,0315,SS3419 -19-15OCT96-2/8

4. Remove gear shift lever out of the housing and remove shift pivot (1).

1—Shift Pivot



T101351—UN—15OCT96

Continued on next page

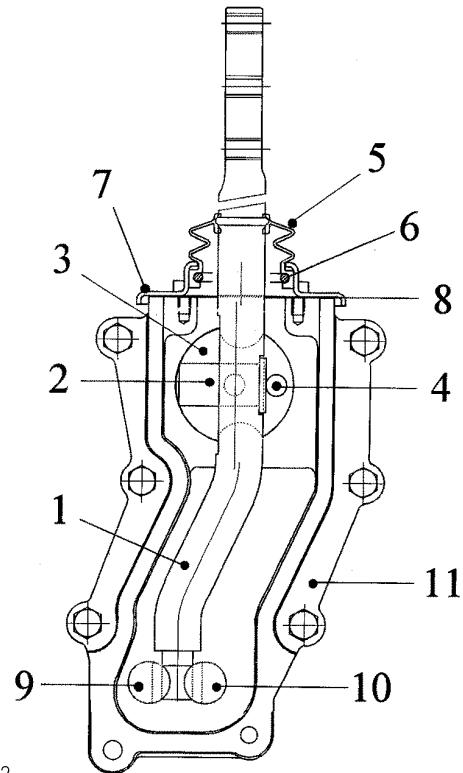
TX,0315,SS3419 -19-15OCT96-3/8

Controls Linkage

NOTE: For the following steps, (5—9), refer to this art for the keys which are called out in the procedure.

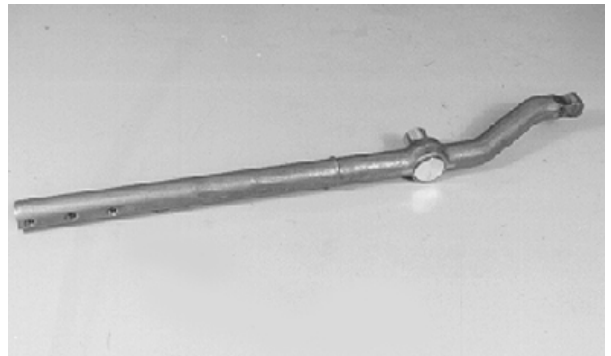
5. Install bolt (2) into gearshift lever (1).

- | | |
|--------------------|--------------------------------|
| 1— Gearshift Lever | 7— Cover |
| 2— Pivot Pin | 8— Flat Gasket |
| 3— Shift Pivot | 9— Shift Rail (3rd/4th Speed) |
| 4— Pin | 10— Shift Rail (1st/2nd Speed) |
| 5— Boot | 11— Shift Control Housing |
| 6— Snap Ring | |



T104412

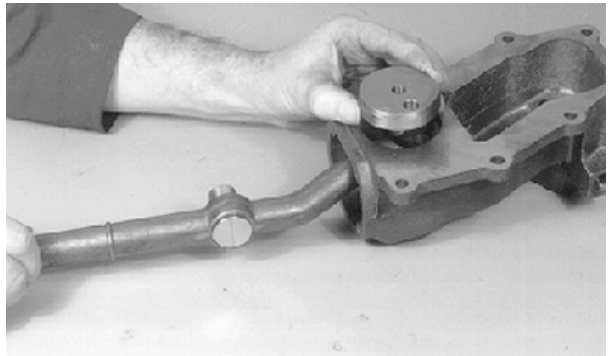
T104412 —UN—15OCT96



T104724 —UN—31OCT96

TX,0315,SS3419 -19-15OCT96-4/8

6. Install shift pivot (3) into the shift control housing (11) at the same time as installing gearshift lever (1) (refer to previous line drawing for keys).



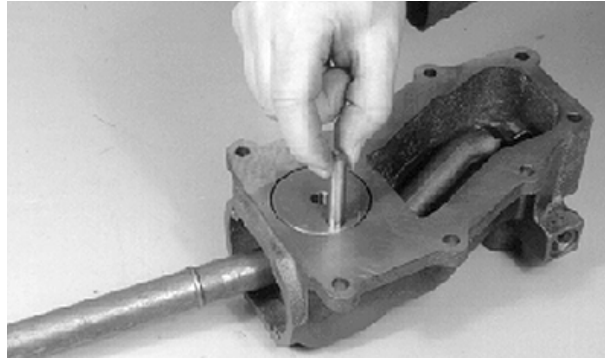
T104457 —UN—17OCT96

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TX,0315,SS3419 -19-15OCT96-5/8

Controls Linkage

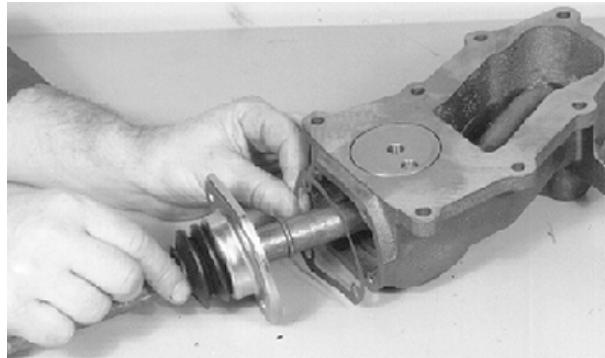
7. Install pin (4) in the shift pivot (3) (refer to previous line drawing for keys).



T104458 —UN—17OCT96

TX,0315,SS3419 -19-15OCT96-6/8

8. Install snap ring (6) into the groove of the boot (5). Apply alcohol to boot mounting face. Push boot into cover (7) (refer to previous line drawing for keys).
9. Assemble gasket (8) and cover (7) (refer to previous line drawing for keys).



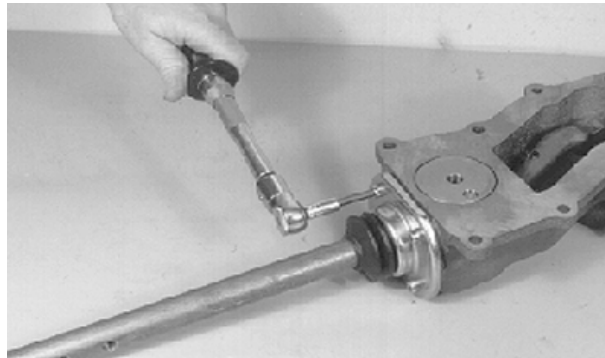
T104460 —UN—17OCT96

TX,0315,SS3419 -19-15OCT96-7/8

10. Install four cap screws and tighten to specification.

Specification

Shift Cover-to-
Shift Control
Housing—Torque..... 9.5 N·m (84 lb-in.)



T104461 —UN—17OCT96

TX,0315,SS3419 -19-15OCT96-8/8

Install Shift Lever and Housing

1. With shift rails in neutral position, check dimension from end of shift rails to face of housing. Dimension should be approximately 85 mm (3.35 in.)

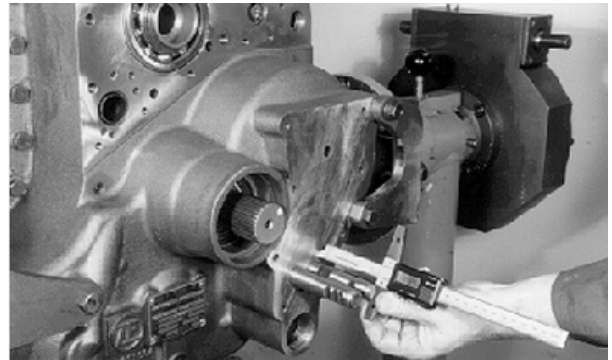
Specification

End of Shift
Rails-to-Face of Shift
Housing—Distance.....85 mm (3.35 in.) Approximate

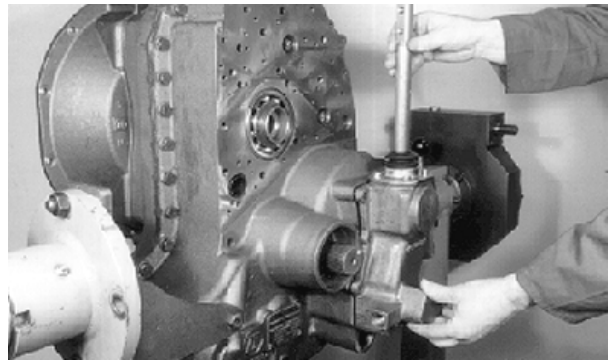
2. Apply cure primer to surfaces of shift lever housing.
3. Apply High Flex Form-In-Place Gasket to surface of housing.
4. Install housing assembly on shift rails. Make sure gearshift lever contacts detents in shift rails. Install and tighten eight cap screws to specification.

Specification

Shift Control Housing
Cap Screws-to-
Transmission—Torque..... 23 N·m (204 lb-in.)



T104462 —UN—17OCT96



T104463 —UN—17OCT96

Continued on next page

TX,0315,SS3420 -19-21OCT99-1/2

Controls Linkage

5. Check neutral shifting position of the shift rails. Install ball (3) and plug with O-ring and dowel (1). Tighten plug to specification.

Specification

Shift Control Housing
Plugs—Torque..... 25 N·m (216 lb-in.)

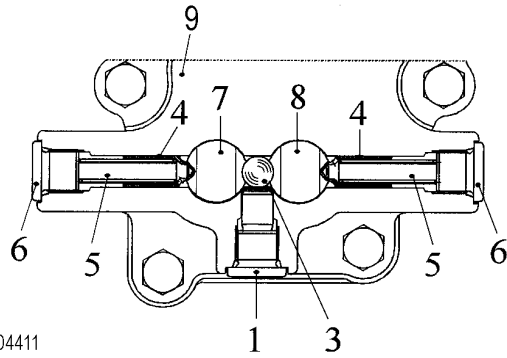
6. Install (4 and 5). Install detent plugs. Tighten plugs to specification. Check shifting function in all speeds.

Specification

Shift Control Detent
Plugs—Torque..... 25 N·m (216 lb-in.)

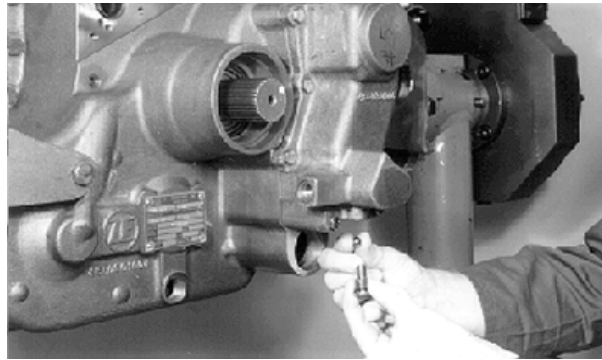
7. Install upper shift lever and connect wiring connector.
8. Install access cover and floor mat.

- | | |
|-------------------------------|-------------------------------|
| 1— Plug with O-Ring and Dowel | 6 — Plug with O-Ring (2 used) |
| 3— Ball | 7— Shift Rail (1st/2nd Speed) |
| 4— Detent Pin (2 used) | 9— Shift Control Housing |
| 5— Spring (2 used) | |

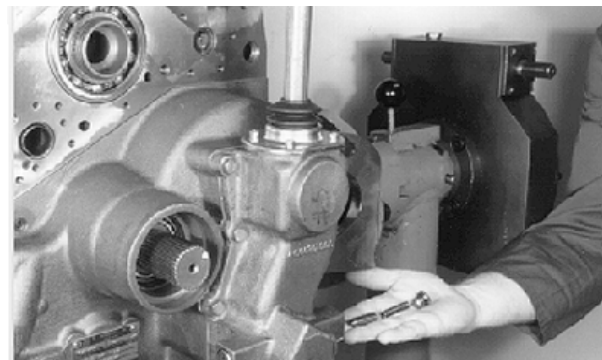


T104411

T104411 —UN—03MAR97



T104465 —UN—17OCT96



T104417 —UN—16OCT96

TX,0315,SS3420 -19-21OCT99-2/2

Group 0325 Input Drive Shafts and U-Joint

Specifications

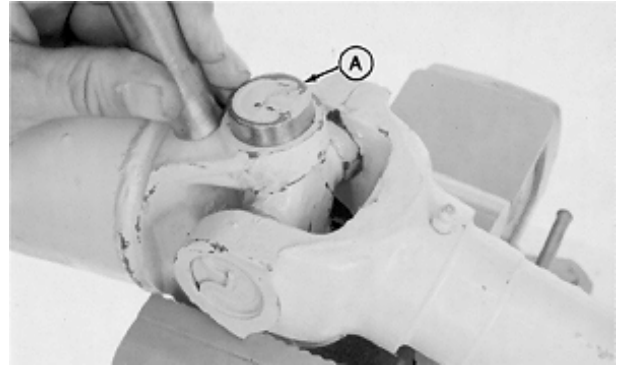
Item	Measurement	Specification
Drive Shafts		
Drive Shaft Cap Screws	Torque	40 N·m (30 lb-ft)

CED, TX03399, 5635 -19-06DEC99-1/1

Remove and Install Drive Shaft

NOTE: Cap screws used in front and rear driveshaft are not reusable. Replace cap screws.

1. Remove four cap screw at front axle. Slide drive shaft from spline. For rear drive shaft remove eight cap screws.
2. Remove grease fitting and snap rings.
3. Put shaft in vise. Move shaft down, using a brass rod, until bearing assembly (A) is about halfway out.
4. Remove bearing assembly (A) and U-joint (B). Replace parts if necessary.



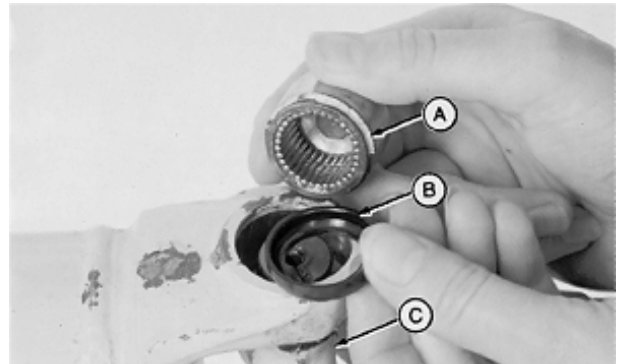
T94751 —UN—05FEB90

TX,0325,SS3026 -19-23OCT95-1/2

5. Rollers (A) and seal (B) must be installed correctly. Apply multi-purpose grease on rollers to aid in assembly.
6. Install U-joint (C).
7. Push bearing assemblies into yoke just far enough to install snap ring. Install snap ring.
8. Install grease fitting and grease.

NOTE: Drive shaft cap screws are not reusable.

9. Install drive shaft. Install cap screws and tighten to specification.



T94754 —UN—05FEB90

A—Rollers
B—Seal

C—U-Joint

Drive Shafts—Specification

Drive Shaft Cap	
Screws—Torque.....	40 N·m (30 lb-ft)

TX,0325,SS3026 -19-23OCT95-2/2

Input Drive Shafts and U-Joint

Group 0350 Gears, Shafts, Bearings, and Powershift Clutches

Essential Tools

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or from the European Microfiche Tool Catalog (MTC).

SERVICEGARD is a trademark of Deere & Company

WS68074,00036FE -19-14JUL10-1/4

Shaft Seal Installer JDG1057 Used to install shaft seal MFWD shaft.

WS68074,00036FE -19-14JUL10-2/4

Powershift Clutch Pack Snap Ring Removal and Installation Tool..... DFT1162¹ Used to remove and install clutch pack snap rings.

¹Dealer Fabricated Tool. See Group 0399 for instructions to make tool.

WS68074,00036FE -19-14JUL10-3/4

MFWD Shaft Snap Ring Removal and Installation Tool DFT1163¹ Used to remove and install MFWD shaft snap rings on powershift transmission.

¹Dealer Fabricated Tool. See Group 0399 for instructions to make tool.

WS68074,00036FE -19-14JUL10-4/4

Service Equipment and Tools

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or from the

European Microfiche Tool Catalog (MTC). Some tools may be available from a local supplier.

SERVICEGARD is a trademark of Deere & Company

WS68074,0003702 -19-14JUL10-1/3

Repair Stand—Manual Shift..... D01003AA Used to disassemble and assemble transmission.

WS68074,0003702 -19-14JUL10-2/3

Transmission Support Bracket—Manual Shift¹ ...DFT1143 Used to support transmission in repair stand.

¹Fabricated tool, dealer made. (See Section 0399 for instructions to make tool.)

WS68074,0003702 -19-14JUL10-3/3

Other Material

Number	Name	Use
TY16285 (U.S.) CXTY16285 (Canadian) 7649 (LOCTITE®)	Cure Primer	<p>Apply to threads of oil supply tube cap screws.</p> <p>Apply to threads of the idler shaft shield cap screws.</p> <p>Apply to threads of the MFWD shield cap screws.</p> <p>Apply to threads of oil suction tube socket head screws.</p> <p>Apply to converter metal outer shell.</p> <p>Apply to mating surfaces of converter housing and transmission case.</p> <p>Apply to mating surfaces of transmission case halves.</p> <p>Apply to mating surfaces of shift lever housings and transmission.</p> <p>Apply to cap that is inserted into output flange.</p> <p>Used to clean socket head screws.</p> <p>Apply to MFWD plate socket head screws.</p> <p>Apply to MFWD shaft cap screws on power shift transmission.</p> <p>Used to clean seal bore in converter housing.</p> <p>Used to clean seal protector.</p>

LOCTITE is a trademark of Loctite Corp.

CED, TX03399, 5923 -19-21FEB00-1/1

Other Material

Number	Name	Use
T43512 (U.S.) TY9473 (Canadian) 242 (LOCTITE®)	Thread Lock and Sealer (Medium Strength)	Apply to threads of oil supply tube cap screws.
		Apply to threads of the idler shaft shield cap screws.
		Apply to threads of the MFWD shield cap screws.
		Apply to threads of oil suction tube socket head screws.
		Apply to converter seal metal outer shell.
		Apply to cap that is inserted into output flange.
		Apply to threads of oil supply tubes socket head screws.
		Apply to MFWD plate socket head screws
		Apply to MFWD shaft cap screws on powershift transmission.
TY16021 (U.S.) TY9484 (Canadian) 17430 (LOCTITE®)	High Flex Form-In-Place Gasket	Apply to mating surfaces of converter housing and transmission case.
		Apply to mating surfaces of transmission case halves.
		Apply to mating surfaces of transmission and shift lever housings.

LOCTITE is a registered trademark of Loctite Corp.

CED, TX03399, 5924 -19-21FEB00-1/1

Specifications

Item	Measurement	Specification
End Plate Snap Ring	Thickness	2.0 mm (0.079 in.)
	Thickness	2.5 mm (0.098 in.)
	Thickness	3.0 mm (0.118 in.)
	Thickness	3.5 mm (0.138 in.)
	Thickness	4.0 mm (0.157 in.)
Clutch Pack Plate	Distance	2.5—3.2 mm (0.098—0.126 in.)
Reverse and Forward Clutch Pack Top of Drum-to-Hub Clearance	Distance	5—7 mm (0.197—0.276 in.)
Synchronizer Assembly Measurement Using Feeler Gauge	Distance	0.60 mm (0.024 in.)
Synchronizer Hub Snap Ring	Thickness	1.8 mm (0.071 in.)
	Thickness	1.9 mm (0.075 in.)
	Thickness	2.0 mm (0.079 in.)
	Thickness	2.1 mm (0.083 in.)
	Thickness	2.2 mm (0.087 in.)
Oil Supply Tube Cap Screw	Torque	23 N·m (204 lb-in.)
Idler Shaft Shield Cap Screws	Torque	23 N·m (204 lb-in.)
MFWD Shield Cap Screws	Torque	23 N·m (17 lb-ft)
Oil Suction Tube Socket Head Screws	Torque	23 N·m (204 lb-in.)
Torque Converter Bushing	ID	55.05—55.08 mm (2.167—2.169 in.) Finished ID
Stator Shaft Cap Screws	Torque	46 N·m (34 lb-ft)
Converter Housing Cap Screws	Torque	46 N·m (34 lb-ft)
Transmission Case Half-to- Transmission Case Half Cap Screws	Torque	46 N·m (34 lb-ft)
End of Shift Shaft-to-Face of Transmission Housing	Distance	85 mm (3.35 in.) Approximate
Shift Lever Housing-to-Transmission Case Cap Screws	Torque	23 N·m (204 lb-in.)
Shift Lever Housing Plugs	Torque	25 N·m (221 lb-in.)
Transmission Control Valve Manifold Plate	Torque	23 N·m (204 lb-in.)
Converter Housing-to-Top of Plate	Distance	59 mm (2.3 in.) Approximate
Bleeder Plug	Torque	28 N·m (21 lb-ft)
Drain Plug	Torque	35 N·m (26 lb-ft)
Low Range Forward and Reverse Clutch Pack Plate	Distance	2.5—3.2 mm (0.098—0.126 in.)
Third Speed Clutch Pack Plate	Distance	1.2—1.8 mm (0.047—0.071 in.)
First Speed Clutch Pack Plate	Distance	2.0—3.0 mm (0.079—0.118 in.)

Continued on next page

CED.TX03399.5639 -19-06DEC99-1/2

Item	Measurement	Specification
Second Speed and High Range Forward Clutch Pack Plate	Distance	1.2—1.8 mm (0.047—0.071 in.)
MFWD Oil Tube Banjo Bolt	Torque	45 N·m (33 lb-ft)
MFWD Plate Socket Head Screws	Torque	23 N·m (204 lb-in.)
MFWD Shaft Shield Socket Head Screws	Torque	9.5 N·m (84 lb-in)
Transmission Case Housing Cap Screws	Torque	46 N·m (34 lb-ft)
Transmission Manifold Plate TORX® Head Screws	Torque	23 N·m (204 lb-in.)

TORX is a registered trademark of Camcar/Textron

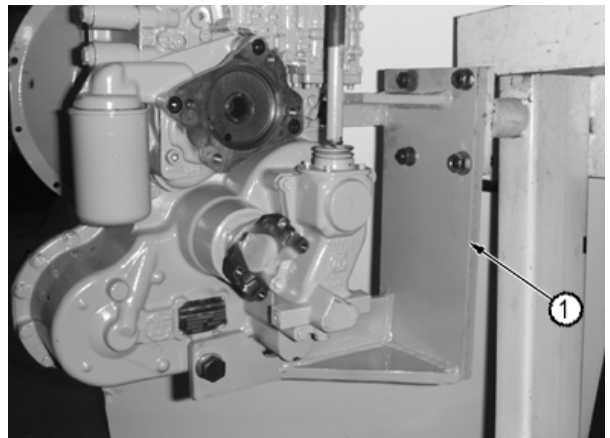
CED, TX03399, 5639 -19-06DEC99-2/2

Remove Outer Components to Disassemble Manual Shift Transmission

NOTE: All bearing cups in transmission case can either be a loose fit or tight fit. If not replacing bearing cones or cups, make sure to keep them together as a matched set. Mark or identify as needed.

1. Install transmission in D01003AA Repair Stand using DFT1143 Transmission Support Bracket (1). (See Group 0399 for instructions to make tool).

1— Transmission Support Bracket



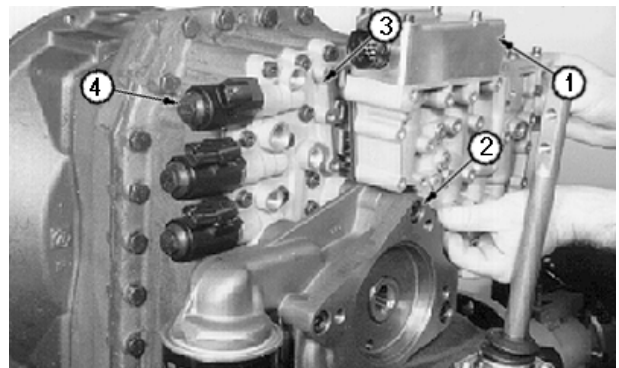
T104753 —UN—31OCT96

WS68074,0003703 -19-14JUL10-1/10

2. Remove control valve, charge pump, manifold plate and solenoids (see Group 0360 for disassembly and assembly of components).

1— Control Valve
2— Charge Pump

3— Manifold Plate
4— Solenoid (3 used with MFWD) (2 used without MFWD)



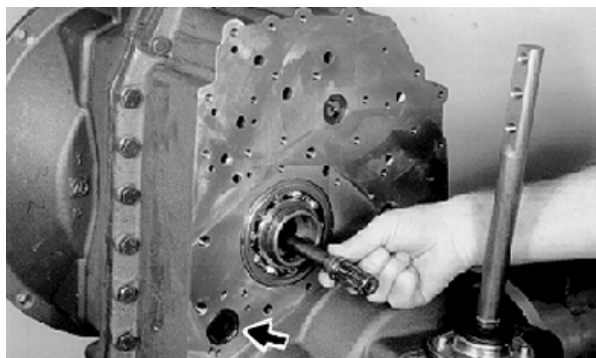
T101330 —UN—06FEB97

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WS68074,0003703 -19-14JUL10-2/10

Gears, Shafts, Bearings, and Powershift Clutches

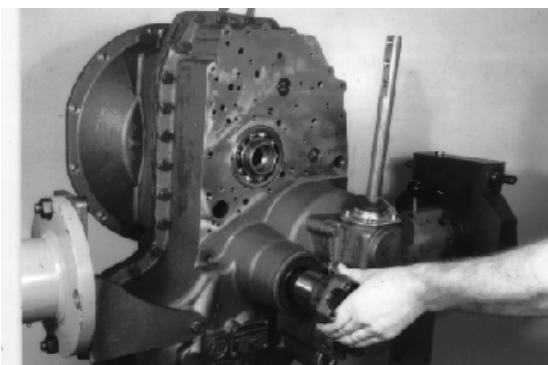
3. Remove central shaft out of the turbine shaft.



T101341 —JUN—16OCT96

WS68074.0003703 -19-14JUL10-3/10

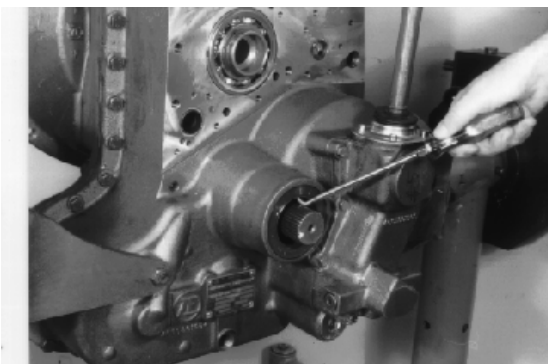
4.
Remove rear output yoke.



T101342 —JUN—04JUN96

WS68074.0003703 -19-14JUL10-4/10

5.
Remove shaft seal.

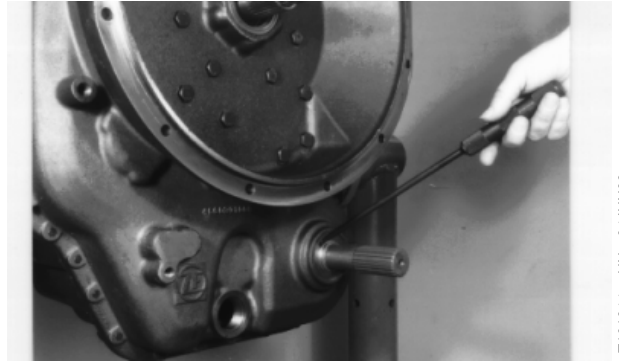


T101343 —JUN—04JUN96

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WS68074.0003703 -19-14JUL10-5/10

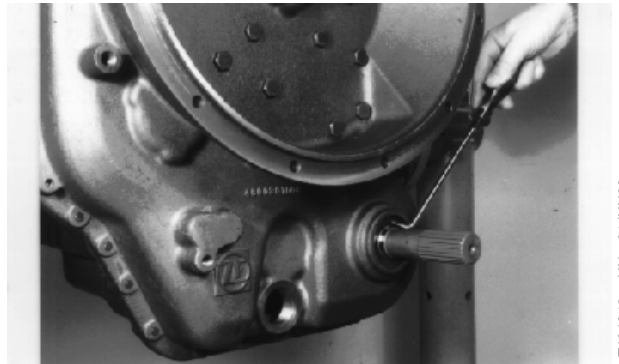
6. Remove cover plate. Cover plate will be damaged. Replace with new cover plate.



T101344 —UN—04JUN96

WS68074,0003703 -19-14JUL10-6/10

7. Remove shaft seal.



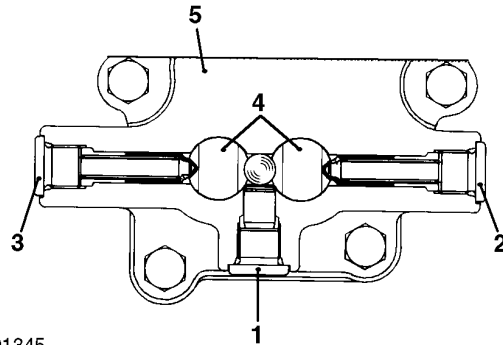
T101346 —UN—04JUN96

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WS68074,0003703 -19-14JUL10-7/10

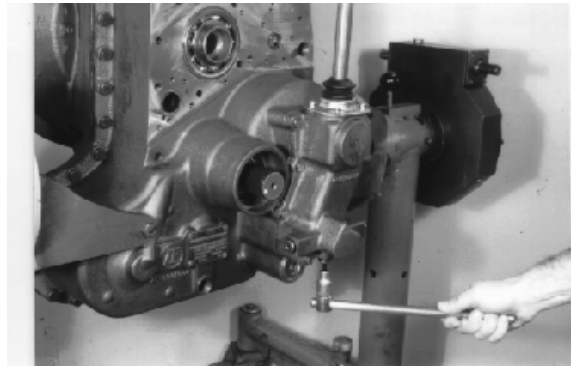
8. Shift gearshift lever into neutral position.
9. Remove plug with dowel (1) and ball.
10. Remove detent plugs (2 and 3). Remove springs and detent pins.

- | | |
|-------------------------------|------------------------|
| 1— Plug with O-Ring and Dowel | 4— Shift Rails |
| 2— Detent Plug | 5— Shift Lever Housing |
| 3— Detent Plug | |



T101345

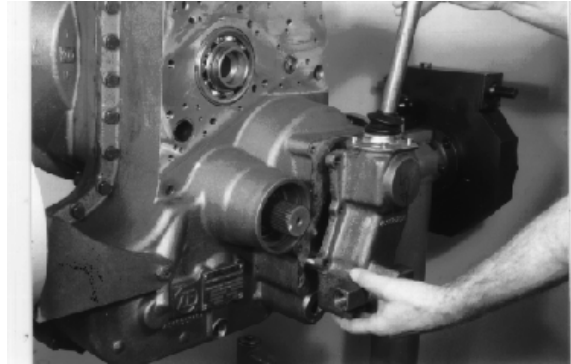
T101345 —UN—04JUN96



T101347 —UN—04JUN96

WS68074.0003703 -19-14JUL10-8/10

11. Remove cap screws. Remove shift lever housing. (For disassembly of shift lever housing, see Group 0315.)

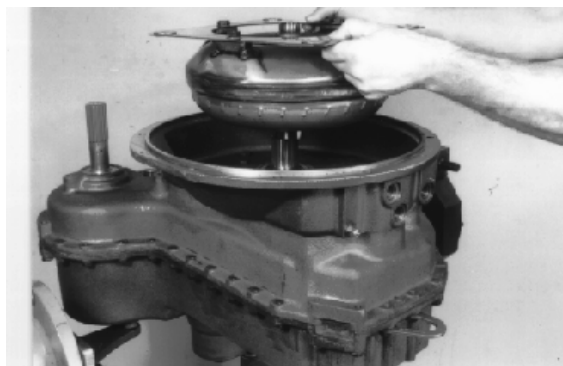


T101348 —UN—04JUN96

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WS68074.0003703 -19-14JUL10-9/10

12. Remove torque converter. (See Section 06, Group 0651 for disassembly.)

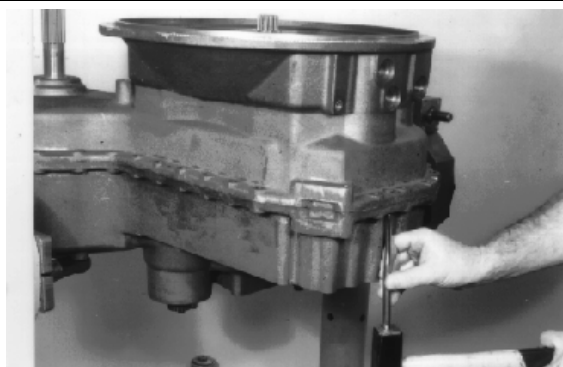


T101352 —UN—04JUN96

WS68074.0003703 -19-14JUL10-10/10

Disassemble Converter Side of Case—Manual Shift

1. Drive out two dowel pins. Remove one dowel pin.



T101353 —UN—04JUN96

CED,OUO1032,1320 -19-08SEP98-1/8

2. Remove case screws.



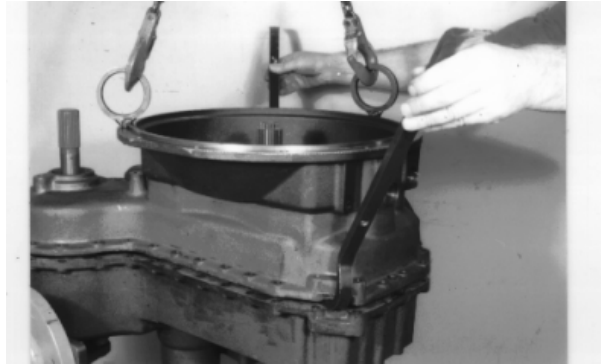
T101480 —UN—04JUN96

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CED,OUO1032,1320 -19-08SEP98-2/8

Gears, Shafts, Bearings, and Powershift Clutches

3. Install two eye bolts in case. Using chain and hoist pry housing loose from remaining dowel and separate sections.



T101481—UN—04JUN96

CED,OUO1032,1320 -19-08SEP98-3/8

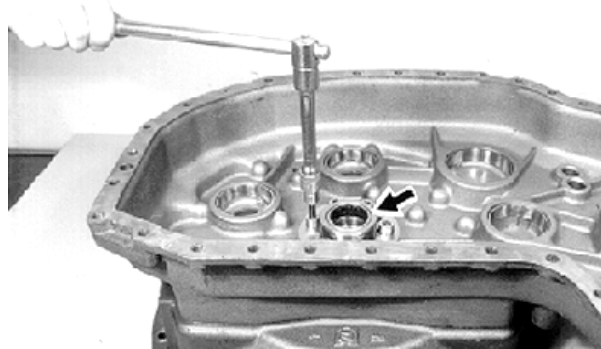
4. Loosen screw on converter housing. If necessary, remove shaft seal (arrow).



T101521—UN—17OCT96

CED,OUO1032,1320 -19-08SEP98-4/8

5. Loosen torque converter stator shaft screws and pull stator shaft out.
6. Inspect needle bearing (arrow) and replace if necessary. When installing, press on stamped side of bearing only.



T101522—UN—17OCT96

Continued on next page

CED,OUO1032,1320 -19-08SEP98-5/8

IMPORTANT: If either the bearing cone or cup requires replacement, replace both as a set.

7. Remove bearing cups if necessary.



T101523 —UN—28JUN96

CED,OUO1032,1320 -19-08SEP98-6/8

8. Install eyebolts. Using chain and hoist remove transmission case from converter housing.



T101524 —UN—28JUN96

CED,OUO1032,1320 -19-08SEP98-7/8

NOTE: Torque converter bushing must be reamed after installation to 55.05—55.08 mm (2.167—2.169 in.). See Assemble Converter Side of Case—Manual Shift, in this group, for correct installation procedure.

9. Inspect and replace torque converter bushing (arrow) if necessary. (See Assemble Converter Side of Case—Manual Shift, in this group, for correct installation of bushing).

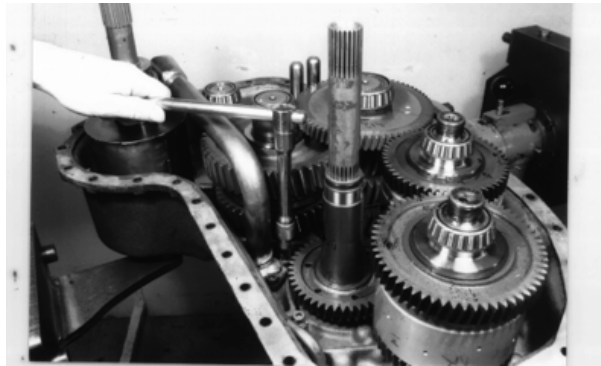


T108083B —UN—11MAR97

CED,OUO1032,1320 -19-08SEP98-8/8

Remove Oil Suction Tube—Manual Shift

1. Loosen oil suction tube screw.
2. Remove oil suction tube.



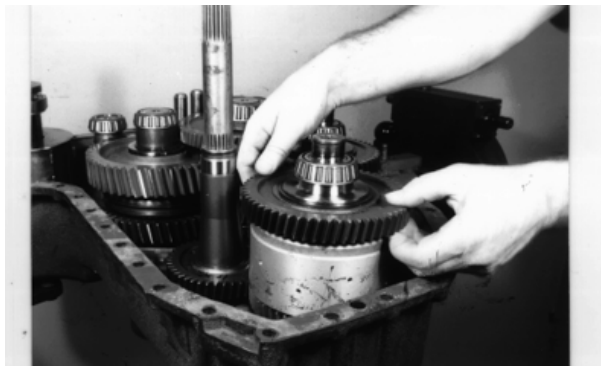
T101525—UN—28JUN96

CED,OUO1032,1321 -19-01SEP06-1/1

Remove Reverse and Forward Clutch Packs—Manual Shift

IMPORTANT: Clutch pack assemblies, reverse and forward, must be installed back into the same bore as removed. Mark clutch pack assemblies front and back before removing.

1. Mark and remove reverse pack assembly.
2. Mark and remove forward clutch pack assembly.

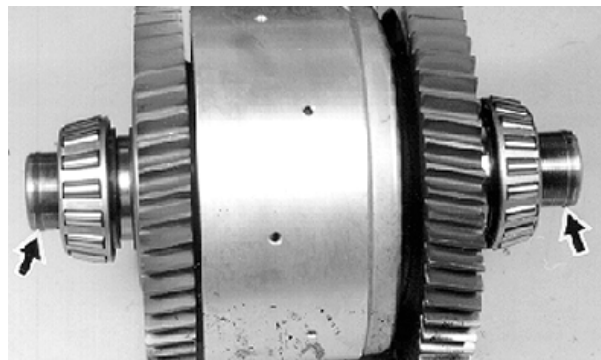


T101526—UN—28JUN96

CED,OUO1032,1322 -19-01SEP06-1/1

Disassemble and Assemble Reverse or Forward Clutch Pack—Manual Shift

1. Remove sealing rings (arrows).
2. Remove bearings (press fit), one on each side.



T101527—UN—17OCT96

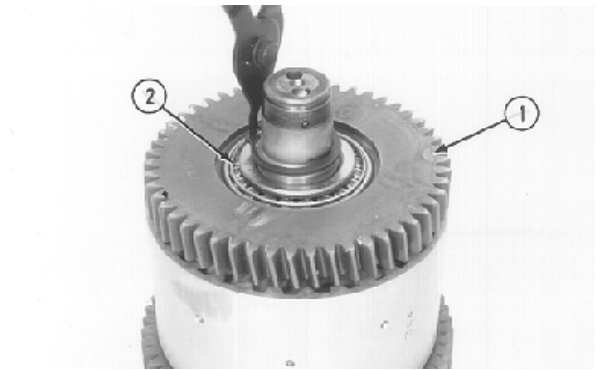
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WS68074,00036F1 -19-14JUL10-1/20

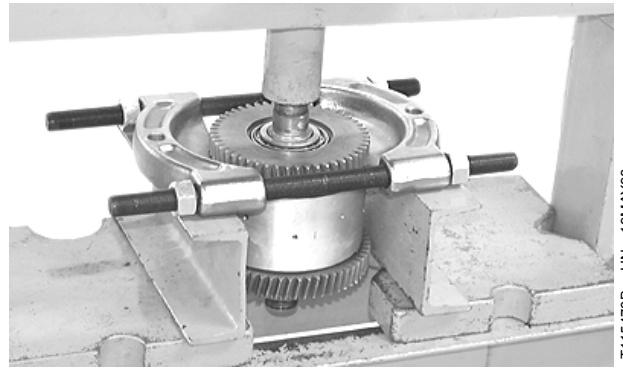
3. Remove snap ring.
4. Remove hub (1) and bearing cone (2) using a knife-edge puller and a press.

A—Hub

B—Bearing Cone



T101529 —UN—27FEB97



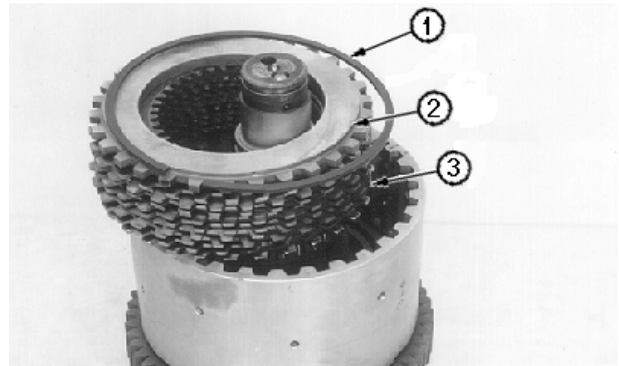
T115473B —UN—19MAY98

WS68074,00036F1 -19-14JUL10-2/20

5. Remove snap ring(s) (1).
6. Remove end plate (2), plates and disks (3).

A—Snap Ring (as required)
B—End Plate

C—Plates and Disks (9 used)



T101531 —UN—27FEB97

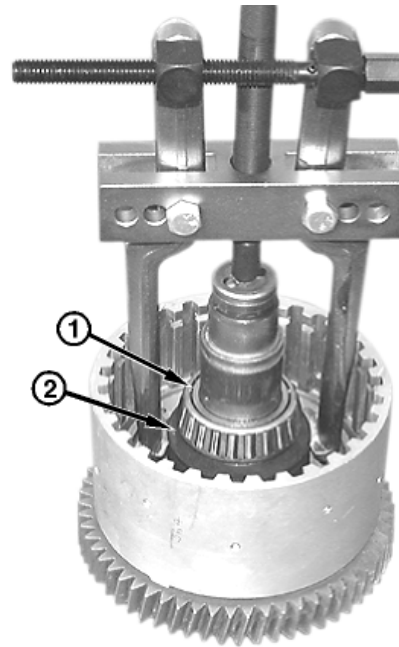
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WS68074,00036F1 -19-14JUL10-3/20

7. Install a puller so it grasps the second Belleville washer from the bottom (sixth from the bearing cone). Remove bearing cone (1).

1—Bearing Cone

2—Belleville Washer (7 used)



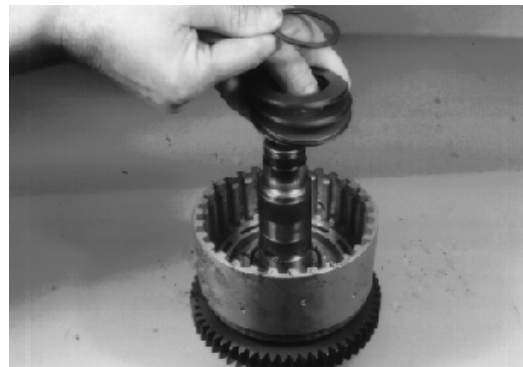
T115474B—UN—19MAY98

WS68074.00036F1 -19-14JUL10-4/20

8. Remove flat washer and Belleville washers.

IMPORTANT: Replace worn or damaged Belleville washers.

9. Inspect Belleville washers for wear or damage. Replace if necessary.

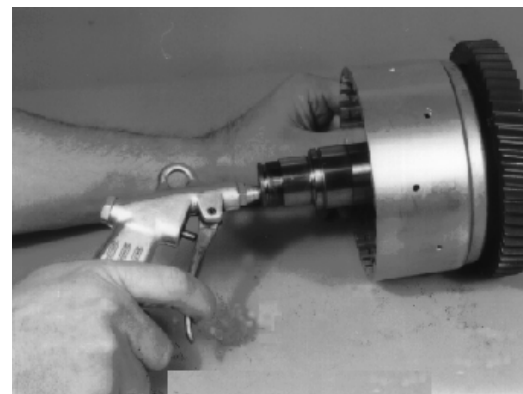


T101535—UN—08JUL96

WS68074.00036F1 -19-14JUL10-5/20

IMPORTANT: Gear, drum, and shaft are serviced as an assembly. Do not take apart or damage will occur.

10. Remove piston from shaft using compressed air.



T101536—UN—08JUL96

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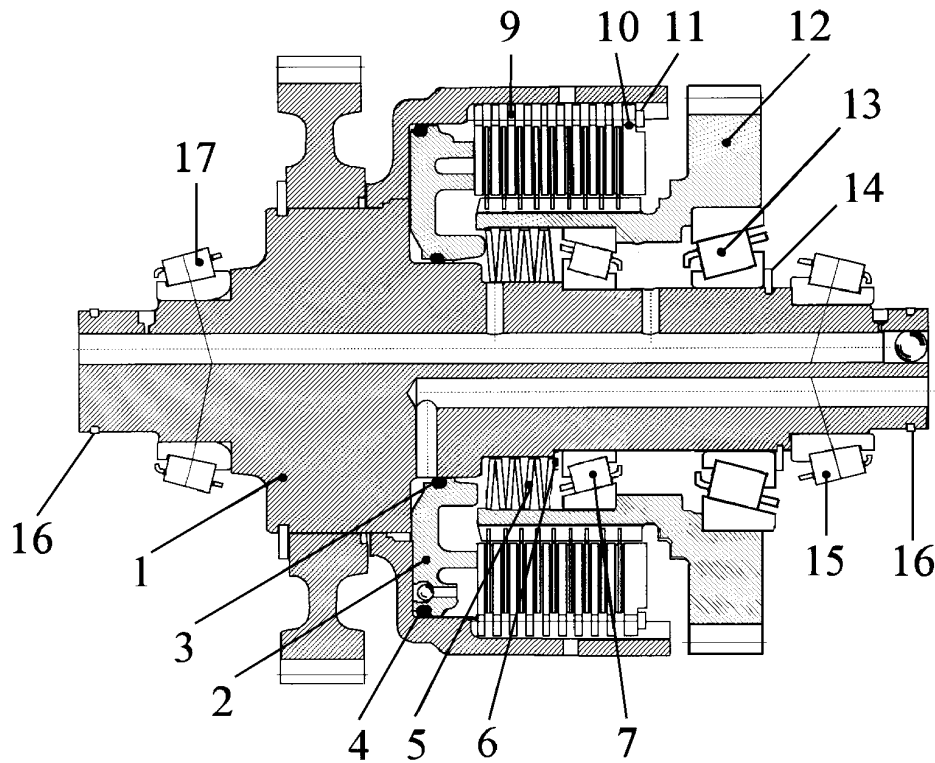
WS68074.00036F1 -19-14JUL10-6/20

11. Remove O-rings from piston. Ball (arrow) in piston must move freely in bore.



T101537—UN—05NOV96

WS68074,00036F1 -19-14JUL10-7/20



T104522

- | | | | |
|-------------------------|-------------------------------|----------------------|---------------------------|
| 1— Gear, Drum and Shaft | 5— Belleville Washer (7 used) | 10— End Plate | 14— Snap Ring |
| 2— Piston with Ball | 6— Flat Washer | 11— Snap Ring (shim) | 15— Roller Bearing |
| 3— O-Ring | 7— Roller Bearing | 12— Hub | 16— Sealing Ring (2 used) |
| 4— O-Ring | 9— Plate and Disk (9 used) | 13— Roller Bearing | 17— Roller Bearing |

12. Check all oil passages with compressed air.

Continued on next page

WS68074,00036F1 -19-14JUL10-8/20

T104522—UN—03MAR97

Gears, Shafts, Bearings, and Powershift Clutches

NOTE: *Inspect O-rings before installing piston. If O-rings are damaged, leakage in the pack will occur.*

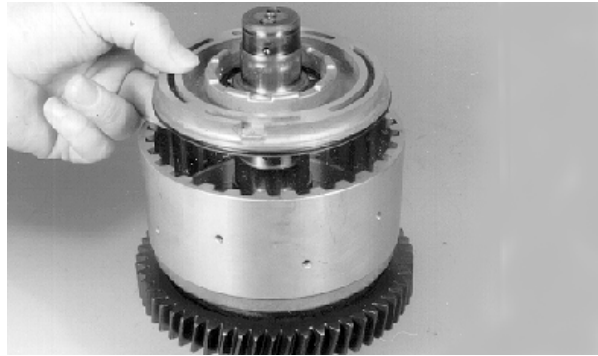
13. Install new O-rings on piston. Apply petroleum jelly on O-rings. Check that bleeder valve ball (arrow) moves freely in bore.



T101537—UN—06NOV96

WS68074,00036F1 -19-14JUL10-9/20

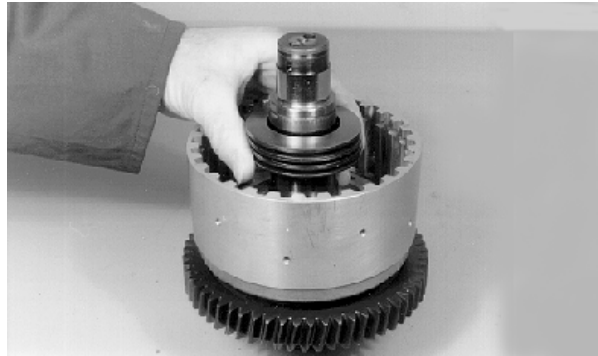
14. Apply clean transmission oil to surface of shaft and hub. Install piston.



T104688—UN—31OCT96

WS68074,00036F1 -19-14JUL10-10/20

15. Apply petroleum jelly to Belleville washers to aid in assembly. Install one Belleville washer with its concave side down, toward piston. Install remaining six Belleville washers in pairs with concave sides facing each other.

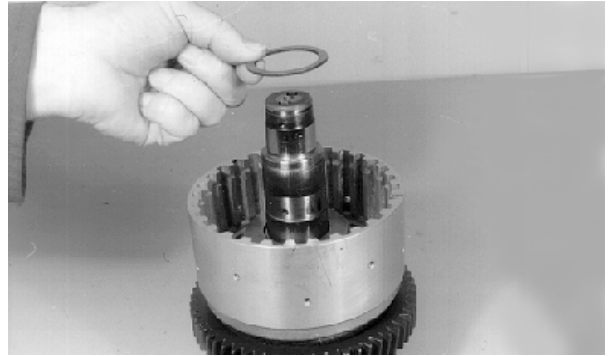


T104689—UN—31OCT96

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WS68074,00036F1 -19-14JUL10-11/20

16. Apply petroleum jelly to flat washer. Install washer.



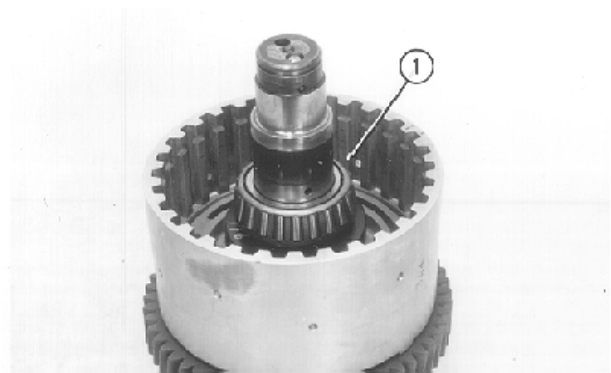
T104690 —UN—31OCT96

WS68074,00036F1 -19-14JUL10-12/20

17. Using heat or a press, install bearing (1) until it bottoms on shaft shoulder.

18. Check Belleville washers for proper location.

1— Bearing



T101533 —UN—27FEB97

Continued on next page

WS68074,00036F1 -19-14JUL10-13/20

19. Check plate clearance:

- a. Starting with a plate, alternately install dry plates and disks.
- b. Install end plate (10) and snap ring (11).
- c. Using a depth gauge, measure the distance from drum edge to end plate. Record this measurement as dimension 1.
- d. Using screwdrivers, pry up on end plate and measure distance from end plate to top of drum surface. Record this measurement as dimension 2.
- e. Subtract dimension 2 from dimension 1. Example:

Dimension 1	9.80 mm (0.39 in.)
Dimension 2	— 7.10 mm (0.28 in.)
Difference	= 2.70 mm (0.11 in.)

NOTE: Snap ring (11) is available in the following thicknesses:

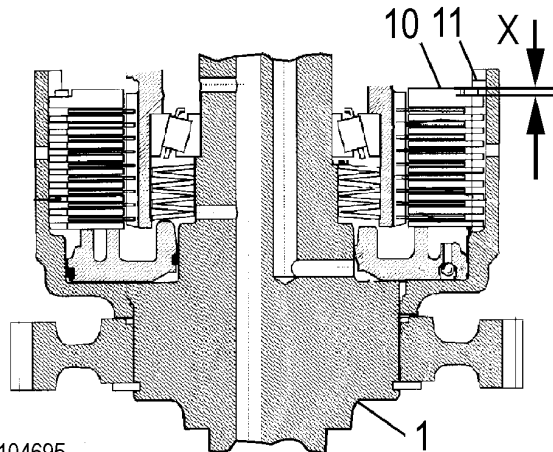
	Specification
End Plate Snap	
Ring—Thickness.....	2.0 mm (0.079 in.)
Thickness	2.5 mm (0.098 in.)
Thickness	3.0 mm (0.118 in.)
Thickness	3.5 mm (0.138 in.)
Thickness	4.0 mm (0.157 in.)

- f. Clearance should be 2.5—3.2 mm (0.098—0.126 in.). Determine correct thickness and number of snap rings to be used to obtain this clearance.

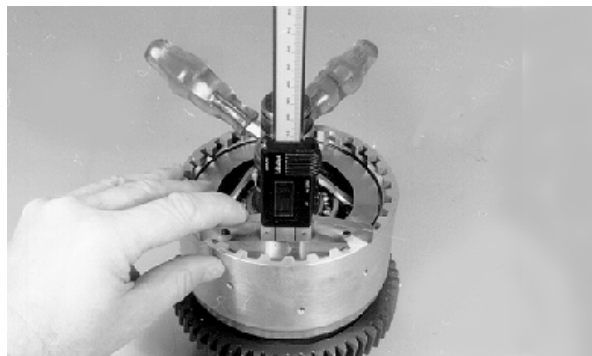
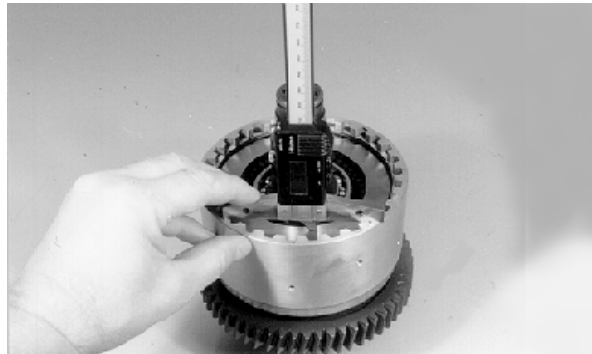
	Specification
Clutch Pack	
Plate—Distance.....	2.5—3.2 mm (0.098—0.126 in.)

- g. Remove snap ring, end plate, plates and disks.

X—End Plate Specification 10— End Plate
1— Shaft with Hub 11— Snap Ring



T104695



T104695 —UN—03MAR97

T104696 —UN—31OCT96

T104697 —UN—31OCT96

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WS68074,00036F1 -19-14JUL10-14/20

IMPORTANT: Always keep bearing cones and bearing cups as a matched set. If either the bearing cone or cup requires replacement, replace both as a set.

20. Inspect hub bearing cups (A). Replace if necessary.

IMPORTANT: Clutch disks must be soaked in oil for 30 minutes prior to installation or premature wear to clutch pack may occur.

21. Soak clutch disks in oil for approximately 30 minutes prior to installation.

22. Starting with a plate, alternately install plates and presoaked disks (D).

NOTE: If more than one snap ring is installed, stagger the snap ring openings.

23. Install end plate (C) and correct thickness and quantity of snap ring(s) (B) determined in step 19.

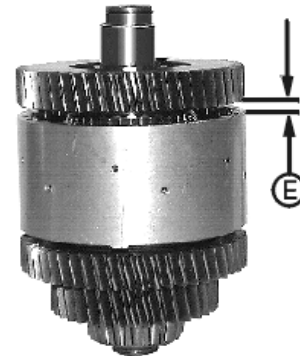
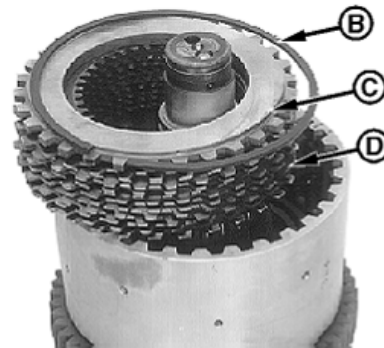
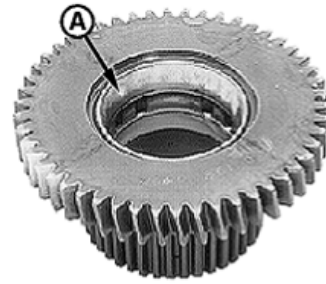
IMPORTANT: If gear hub is not fully engaged into plates and disks, damage to disks will result when installing outer bearings.

24. Install gear hub by engaging all plates and disks. Gear hub is fully engaged into plates and disks when distance (E) (bottom of gear to top of drum) is to specification.

Specification

Reverse and Forward
Clutch Pack Top
of Drum-to-Hub
Clearance—Distance.....5—7 mm (0.197—0.276 in.)

- A—Bearing Cups
- B—Snap Ring
- C—End Plate
- D—Plates and Disks
- E—Distance from Gear to Drum



Continued on next page

WS68074.00036F1 -19-14JUL10-15/20

T117248 —UN—24SEP98

T117249 —UN—24SEP98

T118308B —UN—12NOV98

IMPORTANT: Do not preload the bearing. Hub must rotate relatively easily without any end play.

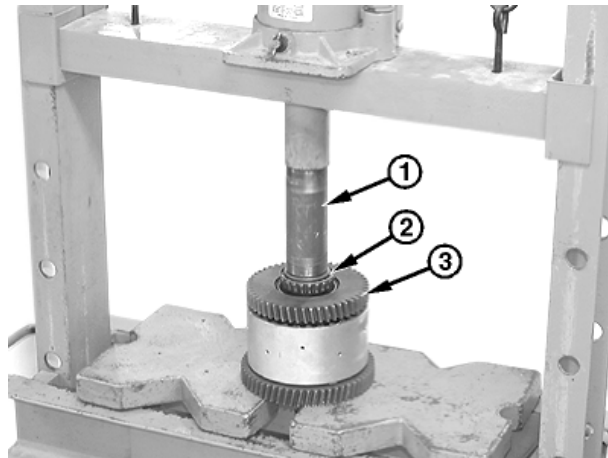
Use a hand press to install bearing cone (2). A motorized press will not provide the control needed to properly install the bearing.

25. Install bearing cone (2) using piece of pipe (1) and a hand press (do not use a motorized press). Push the bearing cone on the shaft until bearing rollers just contact the outer race.

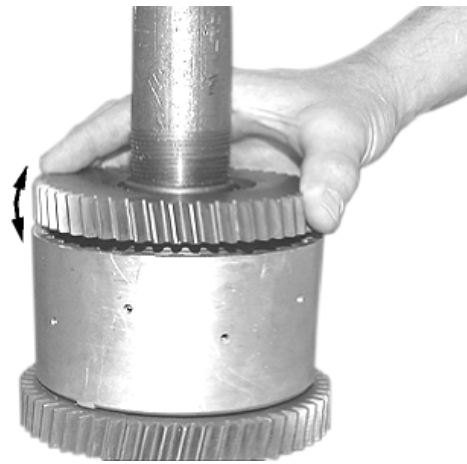
Check for end play by rocking hub (3) up and down. Slowly push the bearing on the shaft while rocking the hub until no end play can be felt. Do not preload the bearing.

1— Piece of Pipe
2— Bearing Cone

3— Hub



T115475B—UN—19MAY98



T115476B—UN—18MAY98

WS68074,00036F1 -19-14JUL10-16/20

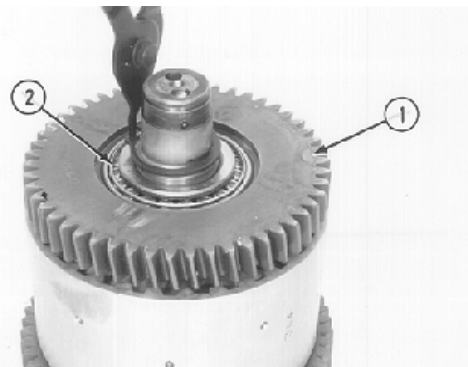
IMPORTANT: Use snap ring with correct thickness. Snap ring should have a thickness that fits the exposed width of the snap ring groove.

NOTE: The snap ring thickness is available in increments of 0.1 mm (0.004 in.), from 2.5 mm (0.098 in.) to 3.2 mm (0.126 in.)

26. Install snap ring.

1— Hub

2— Bearing

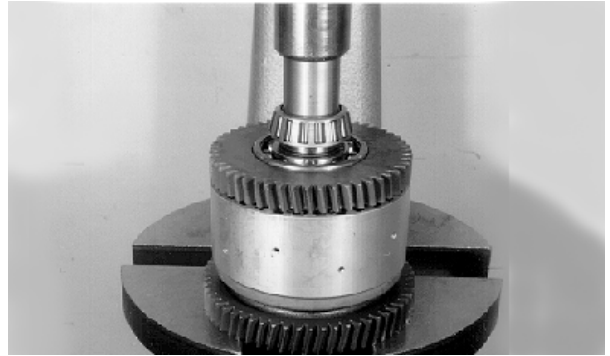


T101529—UN—27FEB97

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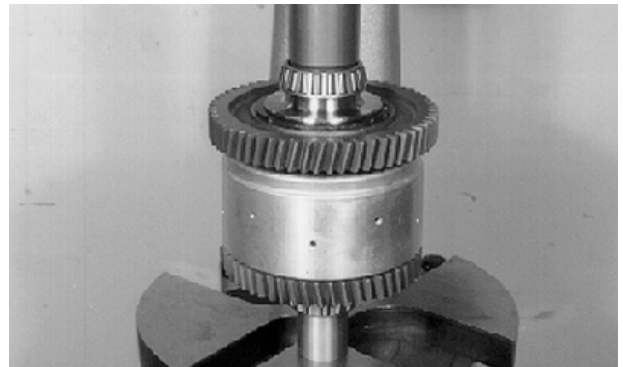
27. Using a press or heat, install roller bearing with its inner race against shaft shoulder.



T104702—UN—31OCT96

WS68074,00036F1 -19-14JUL10-18/20

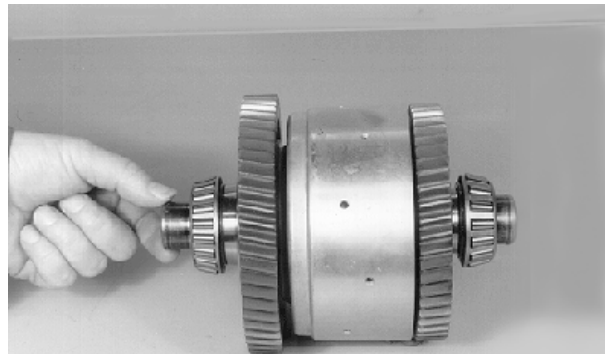
28. Turn assembly over and support on bearing inner race with a suitable support. Using a press or heat, install roller bearing with its inner race against shaft shoulder.



T104703—UN—06FEB97

WS68074,00036F1 -19-14JUL10-19/20

29. Install sealing rings.

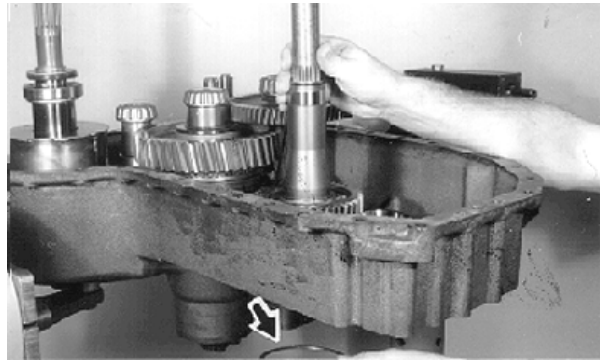


T104704—UN—31OCT96

WS68074,00036F1 -19-14JUL10-20/20

Remove Drive Shaft—Manual Shift

Remove snap ring (arrow) out of the groove of the ball bearing from bottom side of shaft. Remove drive shaft.

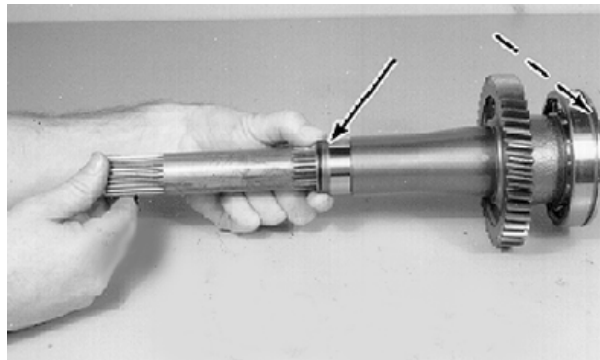


T101540 —UN—22OCT96

CED,OUO1032,1324 -19-01SEP06-1/1

Disassemble and Assemble Drive Shaft—Manual Shift

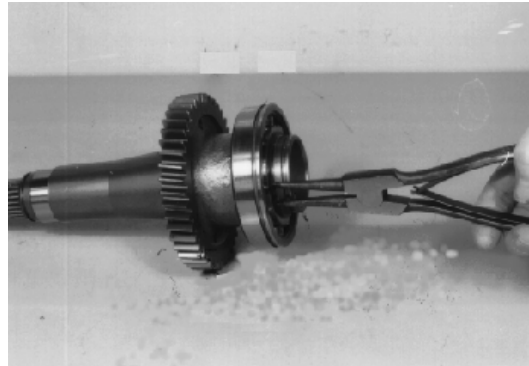
1. Remove sealing rings (arrows).



T101541 —UN—22OCT96

CED,OUO1032,1325 -19-01SEP06-1/5

2. Remove snap ring.

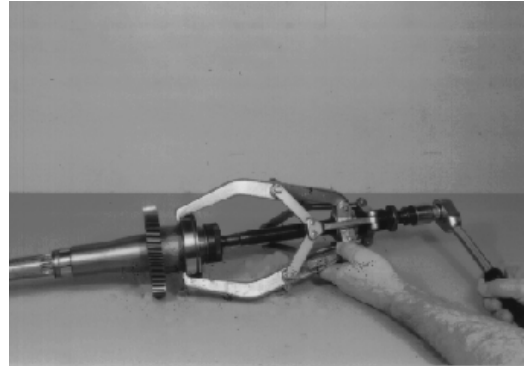


T101542 —UN—08JUL96

Continued on next page

CED,OUO1032,1325 -19-01SEP06-2/5

3. Remove ball bearing.



T1101543 —UN—08JUL96

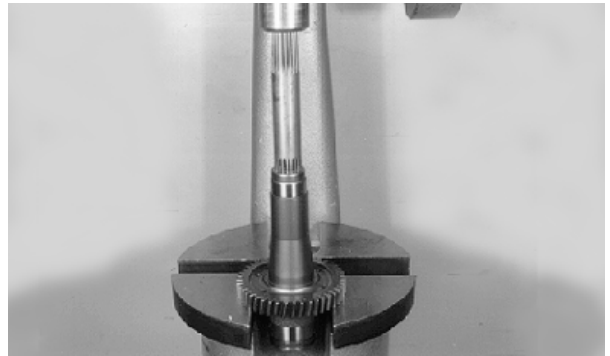
CED,OU01032,1325 -19-01SEP06-3/5

NOTE: Drive shaft (1), turbine shaft (2), and snap ring (3) are serviced as an assembly only.

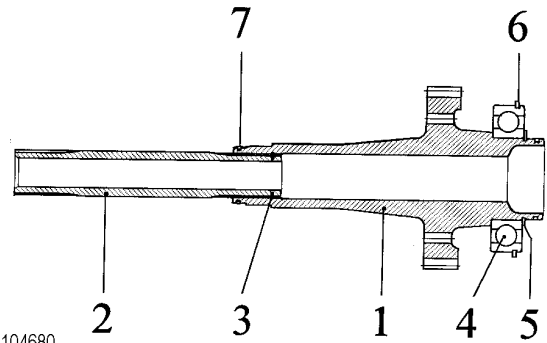
4. Press ball bearing (4) on drive shaft (1) until snap ring groove is visible.

- 1— Drive Shaft
- 2— Turbine Shaft
- 3— Snap Ring
- 4— Ball Bearing

- 5— Snap Ring
- 6— Snap Ring
- 7— Sealing Ring



T1104679 —UN—30OCT96

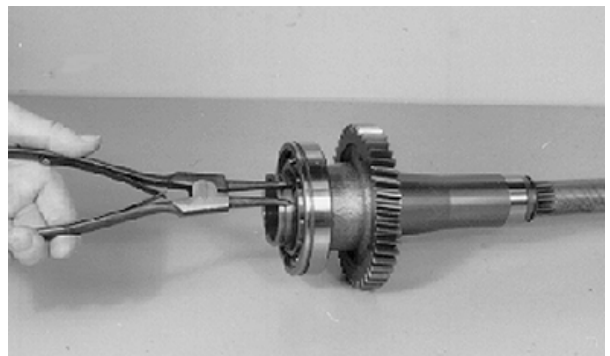


T1104680

T1104680 —UN—31OCT96

CED,OU01032,1325 -19-01SEP06-4/5

5. Install snap ring.



T1104682 —UN—30OCT96

CED,OU01032,1325 -19-01SEP06-5/5

Remove Rear Output Shaft with Synchronizer—Manual Shift

1. Remove intermediate gear (along with bearing inner race) from intermediate shaft (3rd/4th speed). Gear and bearing are a press fit.



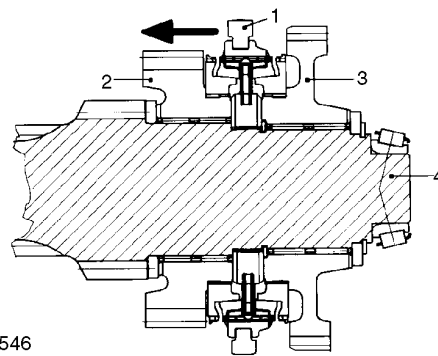
T101544—UN—08JUL96

CED,OUO1032,1326 -19-01SEP06-1/3

2. Position shift fork (1) in shifting position (3rd speed, see arrow) and hold it in position when pulling out the output shaft.

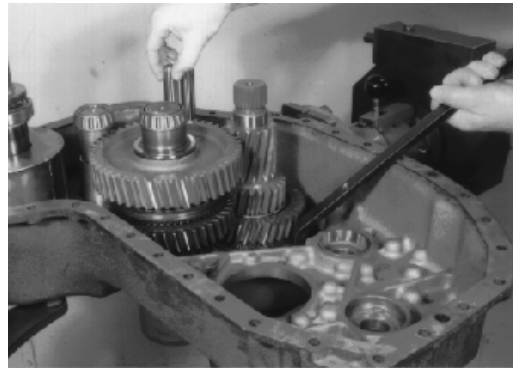
1— Shift Fork
2— Third Speed Gear

3— Fourth Speed Gear
4— Rear Output Shaft



T101546

T101546—UN—08JUL96

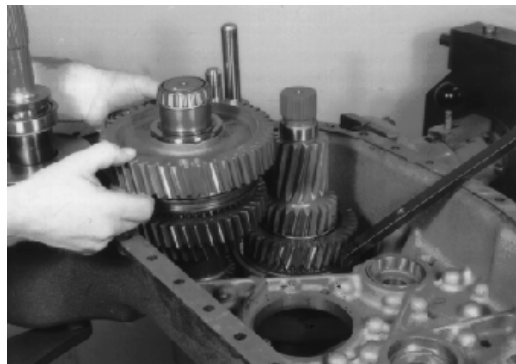


T101547—UN—08JUL96

Continued on next page

CED,OUO1032,1326 -19-01SEP06-2/3

3. Remove rear output shaft and shift rail.

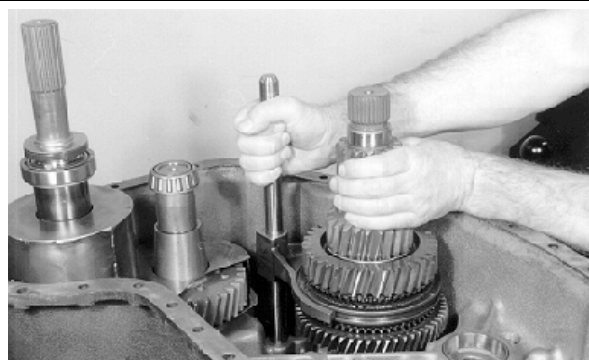


T101548 —UN—08JUL96

CED,OUO1032,1326 -19-01SEP06-3/3

Remove Intermediate Shaft with Synchronizer—Manual Shift

Remove intermediate shaft (3rd/4th speed) along with shift rail out of transmission case.



T102243 —UN—25SEP96

CED,OUO1032,1327 -19-01SEP06-1/1

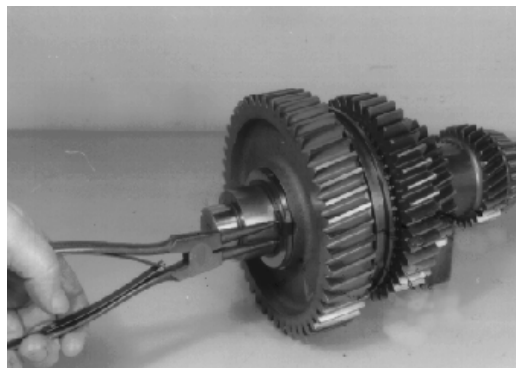
Disassemble Rear Output or Intermediate Shaft with Synchronizer—Manual Shift

NOTE: The disassembly and assembly of the intermediate shaft and rear output shaft are similar. Rear output shaft shown unless otherwise indicated.

1. Remove bearing (press fit).

NOTE: Mark the snap ring on top side for correct installation.

2. Remove snap ring. Mark the top side of snap ring for correct reassembly.



T101890 —UN—09JUL96

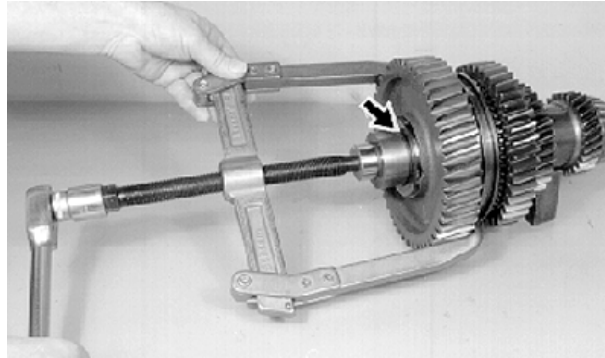
Continued on next page

CED,OUO1032,1328 -19-01SEP06-1/11

Gears, Shafts, Bearings, and Powershift Clutches

3. Using a gear puller, carefully remove shaft washer (arrow) and gear:

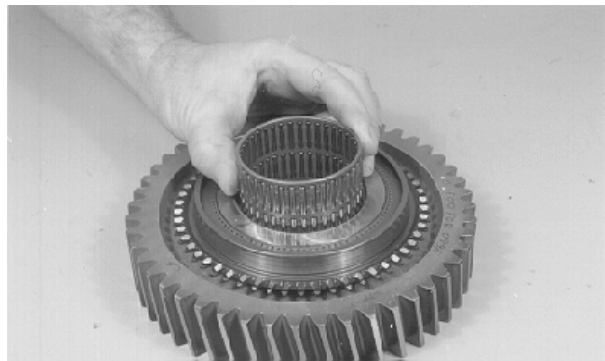
- Rear output shaft — 1st speed gear.
- Intermediate shaft — 4th speed gear.



T102234 —UN—24OCT96

CED,OUO1032,1328 -19-01SEP06-2/11

4. Remove needle bearing from gear.

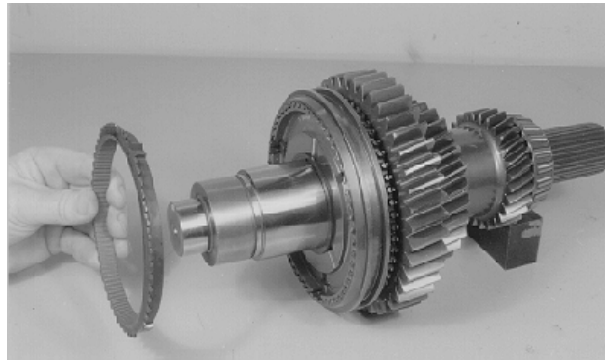


T102235 —UN—25SEP96

CED,OUO1032,1328 -19-01SEP06-3/11

NOTE: If not replacing synchronizer assembly, mark synchronizer ring for correct installation.

5. Remove synchronizer ring.

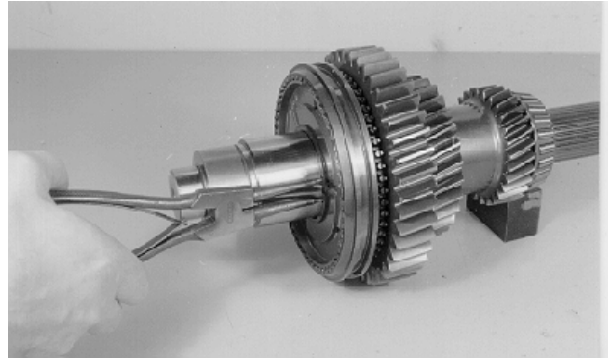


T102236 —UN—25SEP96

Continued on next page

CED,OUO1032,1328 -19-01SEP06-4/11

6. Remove snap ring.

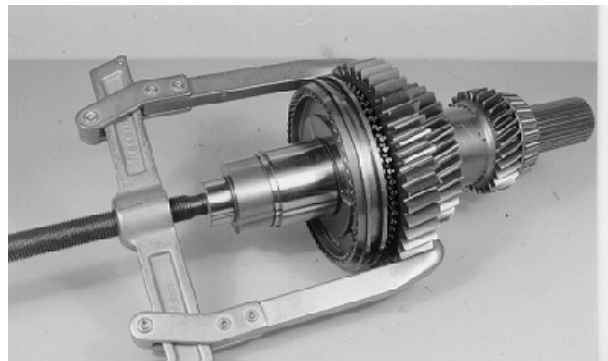


T102237—UN—25SEP96

CED,OUO1032,1328 -19-01SEP06-5/11

NOTE: When removing gear, small compression springs and detents may come out.

7. Remove synchronizing assembly with gear.



T102238—UN—25SEP96

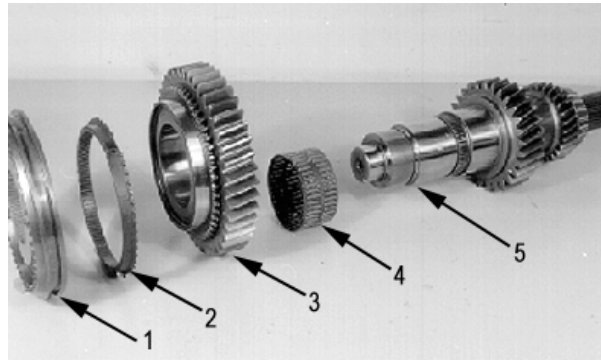
Continued on next page

CED,OUO1032,1328 -19-01SEP06-6/11

8. Disassemble components.

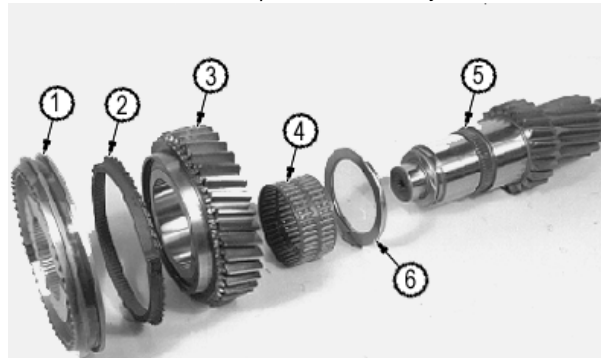
- 1— Synchronizer Hub Assembly
- 2— Synchronizer Ring
- 3— Gear (2nd Speed)

- 4— Needle Bearing
- 5— Rear Output Shaft
- 6— Washer (Intermediate Shaft Only)



Rear Output Shaft Assembly

T102239 —UN—24OCT96



Intermediate Shaft Assembly

T102252 —UN—31OCT96

CED,OUO1032,1328 -19-01SEP06-7/11

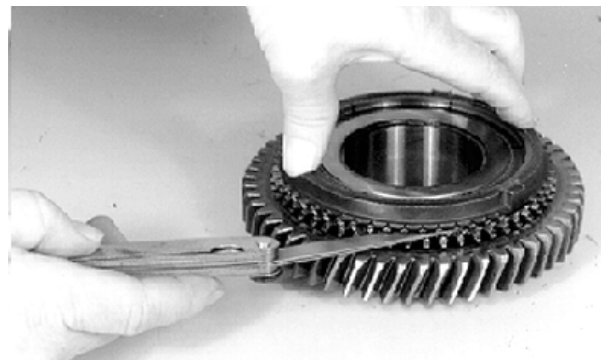
9. Check for wear by measuring with feeler gauge. Position synchronizer ring on the synchronizer hub and collar assembly (make sure they are in mesh) and press down on synchronizer ring. Measure as shown (X). If measurement is less than 0.60 mm (0.024 in.), replace synchronizer assembly.

Specification

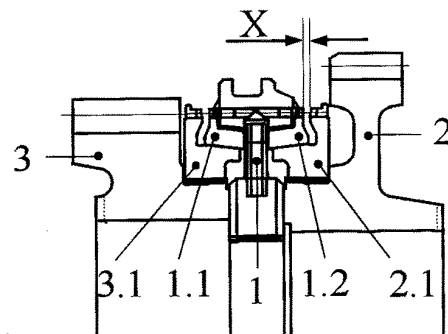
Synchronizer Assembly
 Measurement
 Using Feeler
 Gauge—Distance..... 0.60 mm (0.024 in.)

- 1— Synchronizer Detent
- 1.1— Synchronizer Ring
- 1.2— Synchronizer Ring
- 2— Gear

- 2.1— Clutch Body
- 3— Gear
- 3.1— Clutch Body



T102277 —UN—08OCT96



T102278

T102278 —UN—10OCT96

Continued on next page

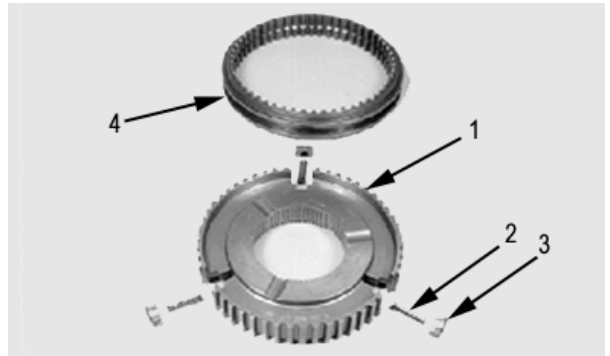
CED,OUO1032,1328 -19-01SEP06-8/11

NOTE: The following parts are serviced as an assembly only.

10. Inspect parts.

1— Hub
2— Spring

3— Detent
4— Collar



T102240 —UN—24OCT96

CED,OUO1032,1328 -19-01SEP06-9/11

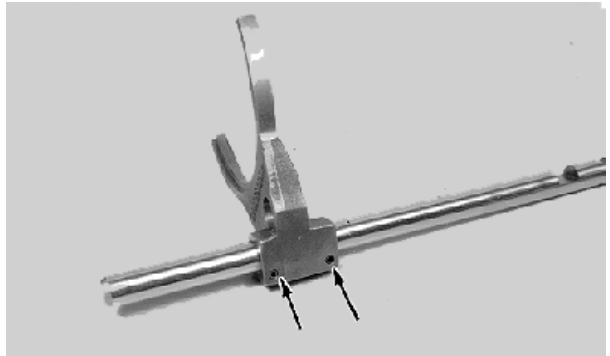
11. Remove bearing (rear output shaft only). Bearing is a press fit.



T102241 —UN—25SEP96

CED,OUO1032,1328 -19-01SEP06-10/11

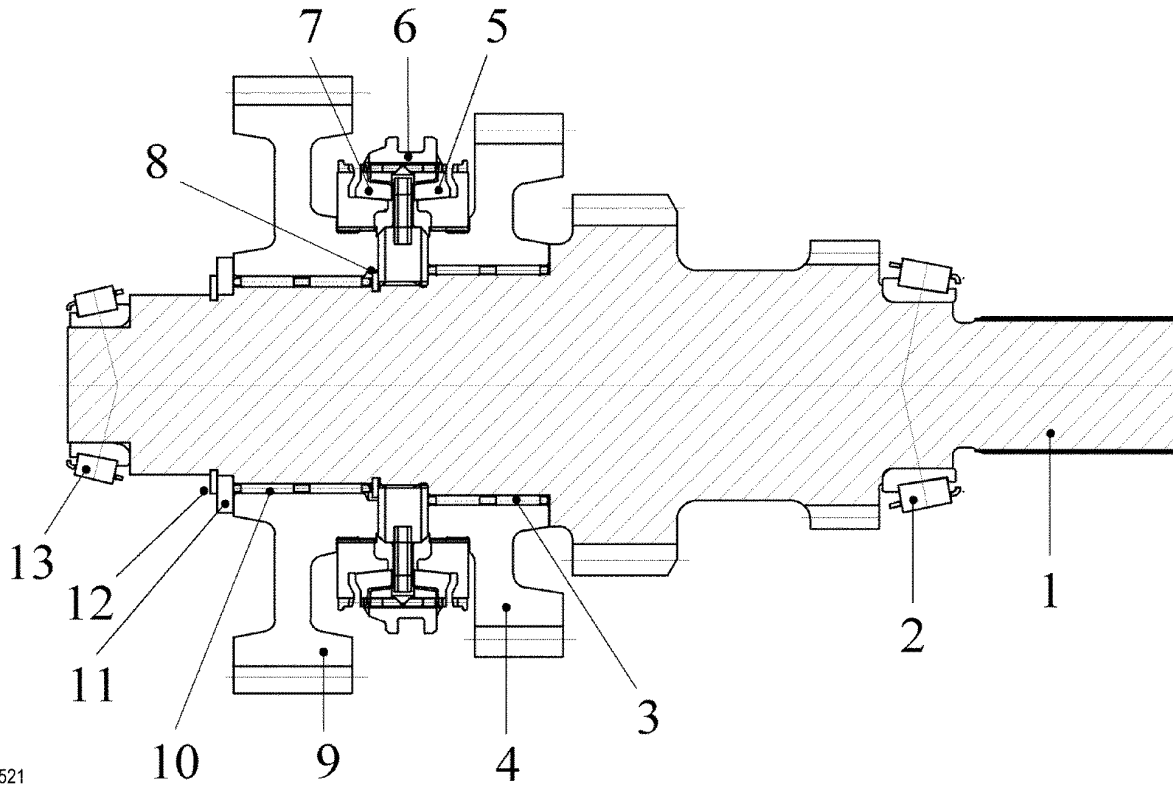
12. Drive out roll pins (arrows) and pull shift fork from shift rail.



T102242 —UN—24OCT96

CED,OUO1032,1328 -19-01SEP06-11/11

Rear Output Shaft—Cross Section View—Manual Shift



T104521

Rear Output Shaft

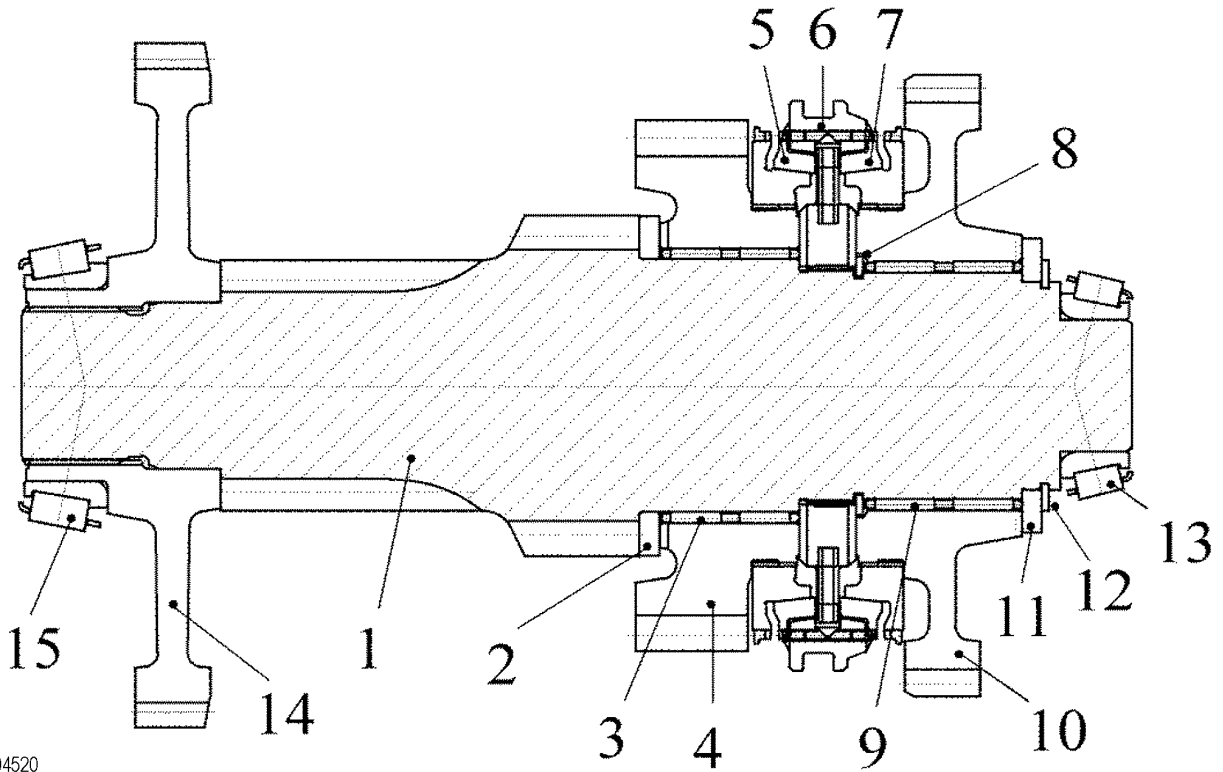
- | | | | |
|----------------------|----------------------|---------------------|--------------------|
| 1— Rear Output Shaft | 5— Synchronizer Ring | 9— Gear (1st Speed) | 13— Roller Bearing |
| 2— Roller Bearing | 6— Collar | 10— Needle Bearing | |
| 3— Needle Bearing | 7— Synchronizer Ring | 11— Washer | |
| 4— Gear (2nd Speed) | 8— Snap Ring | 12— Snap Ring | |

Reference this art to identify components when assembling an intermediate shaft.

CED,OUO1032,1329 -19-01SEP06-1/1

T104521 —UN—30OCT96

Intermediate Shaft—Cross Section View—Manual Shift



T104520

Intermediate Shaft

- | | | | |
|-----------------------|------------------------|----------------------|-----------------------|
| 1— Intermediate Shaft | 5— Synchronizer Ring | 9— Needle Bearing | 13— Roller Bearing |
| 2— Washer | 6— Synchronizer Collar | 10— Gear (4th Speed) | 14— Intermediate Gear |
| 3— Needle Bearing | 7— Synchronizer Ring | 11— Washer | 15— Roller Bearing |
| 4— Gear (3rd Speed) | 8— Snap Ring | 12— Snap Ring | |

Reference this art to identify components when assembling an intermediate shaft.

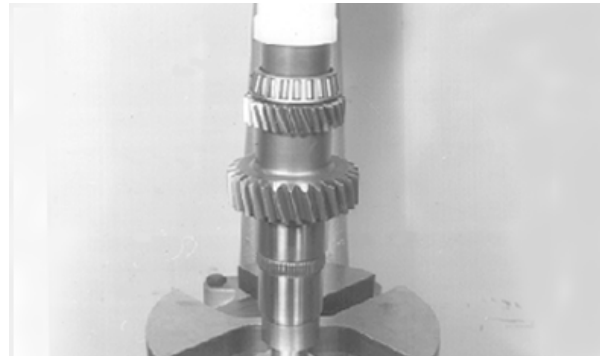
CED.OU01032,1330 -19-01SEP06-1/1

T104520—UN—18OCT96

Assemble Rear Output or Intermediate Shaft—Manual Shift

NOTE: Assembly of the intermediate shaft and rear output shaft are similar. Rear output shaft shown unless otherwise indicated.

1. Press roller bearing onto shaft and against shaft shoulder. Install needle bearing for 2nd speed gear on shaft.

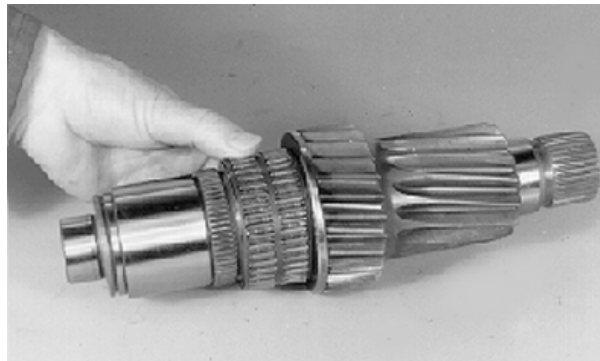


T104660—UN—29OCT96

Rear Output Shaft Only

CED,OUO1032,1331 -19-25OCT99-1/15

2. Install washer and needle bearing for 3rd speed gear on shaft.

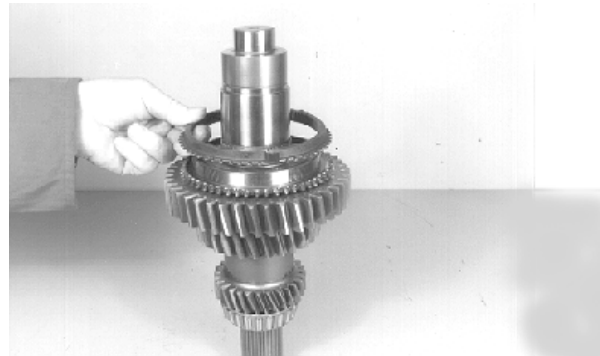


T104569—UN—22OCT96

Intermediate Shaft Only

CED,OUO1032,1331 -19-25OCT99-2/15

3. Install gear:
 - For rear output shaft — 2nd speed gear.
 - For intermediate shaft — 3rd speed gear.
4. Install synchronizer ring. Align marks made during disassembly if reusing ring.



T104662—UN—29OCT96

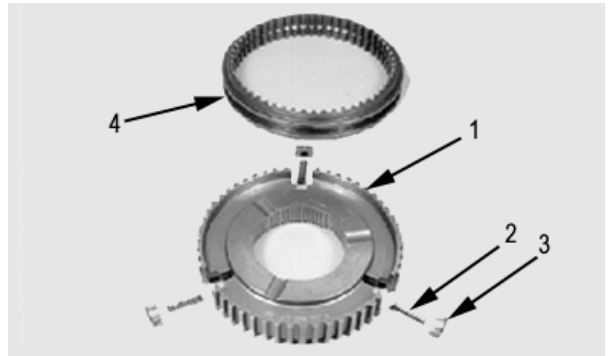
Continued on next page

CED,OUO1032,1331 -19-25OCT99-3/15

NOTE: The synchronizer hub assembly parts shown are serviced as an assembly only.

5. Inspect parts of synchronizer hub assembly.

- | | |
|-----------|-----------|
| 1— Hub | 3— Detent |
| 2— Spring | 4— Collar |



T 102240 —UN—24OCT96

CED,OUO1032,1331 -19-25OCT99-4/15

6. Press synchronizer hub on shaft and against shaft shoulder.
7. Rotate synchronizer ring so its tabs fit in recesses of synchronizer hub.



T 104664 —UN—29OCT96

CED,OUO1032,1331 -19-25OCT99-5/15

8. Install synchronizer assembly sliding collar over hub. Insert synchronizer assembly springs and detents (3 used) into hub.



T 104665 —UN—29OCT96

Continued on next page

CED,OUO1032,1331 -19-25OCT99-6/15

9. Install second synchronizer ring. Align marks made during disassembly if reusing ring.



T104666—UN—29OCT96

CED,OUO1032,1331 -19-25OCT99-7/15

NOTE: Zero clearance is desired between synchronizer hub and snap ring. If unable to obtain zero clearance, use next smaller snap ring.

10. Determine correct thickness of snap ring. Install the thickest snap ring that will fit into groove of shaft at base of synchronizer hub. Snap ring must seat properly.

NOTE: Snap ring is available in the following thicknesses.

Specification

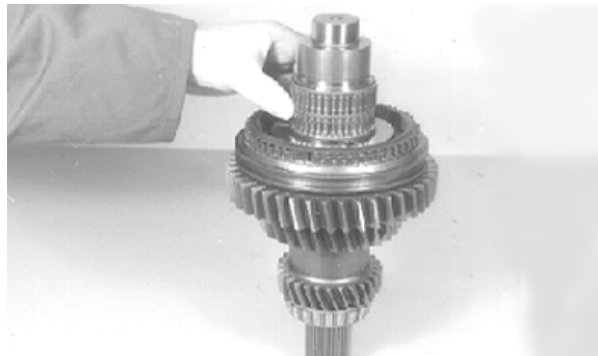
Synchronizer Hub Snap	
Ring—Thickness.....	1.8 mm (0.071 in.)
Thickness	1.9 mm (0.075 in.)
Thickness	2.0 mm (0.079 in.)
Thickness	2.1 mm (0.083 in.)
Thickness	2.2 mm (0.087 in.)



T104667—UN—29OCT96

CED,OUO1032,1331 -19-25OCT99-8/15

11. Install remaining needle bearing.



T104668—UN—29OCT96

Continued on next page

CED,OUO1032,1331 -19-25OCT99-9/15

12. Install gear:

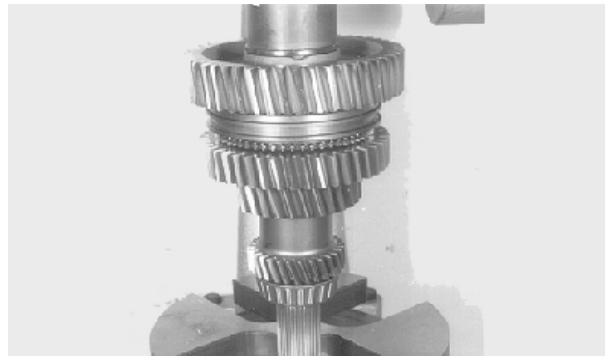
- For rear output shaft — 1st speed.
- For intermediate shaft — 4th speed.



T104669 —UN—29OCT96

CED,OUO1032,1331 -19-25OCT99-10/15

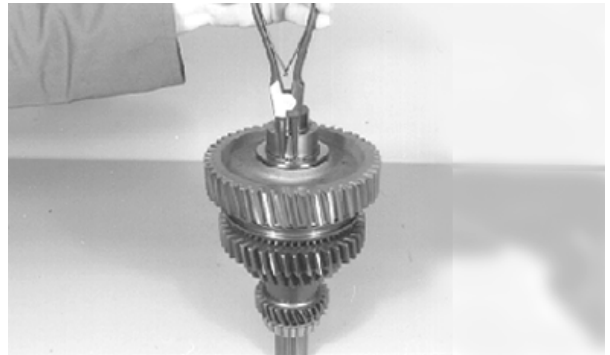
13. Press shaft washer onto shaft and against shoulder.



T104670 —UN—29OCT96

CED,OUO1032,1331 -19-25OCT99-11/15

14. Install snap ring.

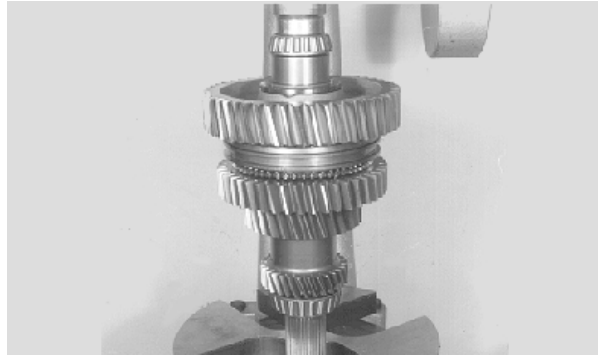


T104671 —UN—29OCT96

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CED,OUO1032,1331 -19-25OCT99-12/15

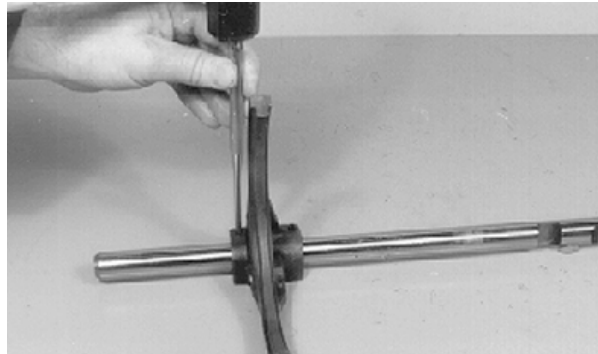
15. Press bearing onto shaft and against shoulder.



T104672 —UN—29OCT96

CED,OUO1032,1331 -19-25OCT99-13/15

16. Install shift fork on shift rail. Install roll pins (2 used).

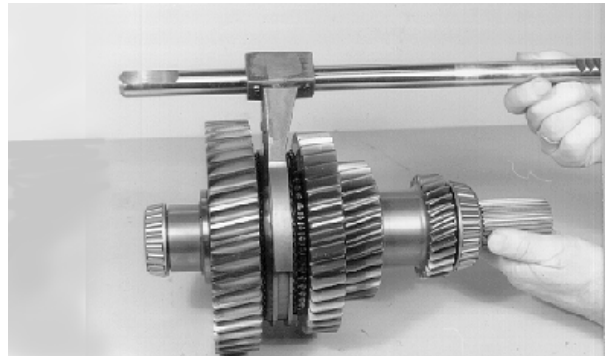


T104673 —UN—29OCT96

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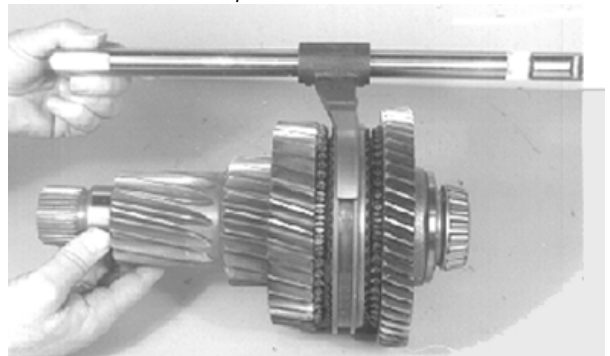
CED,OUO1032,1331 -19-25OCT99-14/15

17. Place shift fork on shaft as shown.



T104674 —UN—29OCT96

Rear Output Shaft with Shift Fork

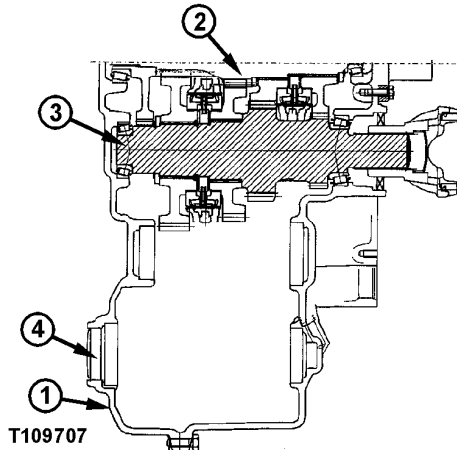


T104658 —UN—29OCT96

Intermediate Shaft with Shift Fork

CED,OUO1032,1331 -19-25OCT99-15/15

Remove MFWD Output Shaft (If Equipped)—Manual Shift

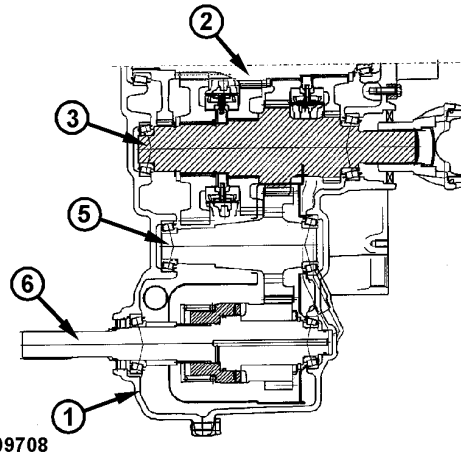


Without MFWD

1— Transmission Case
2— Intermediate Shaft

3— Rear Output Shaft
4— Cap

T109707 —UN—03JUL97



With MFWD

5— Idler Shaft

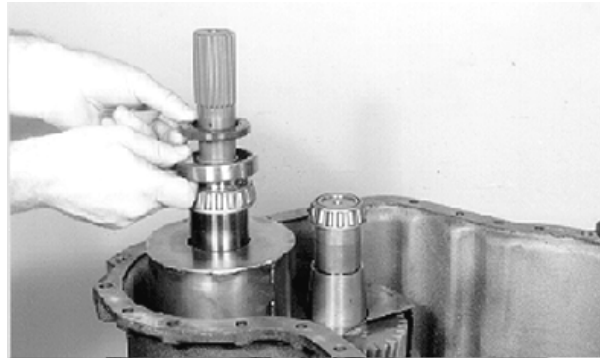
6— MFWD Output Shaft

T109708 —UN—03JUL97

CED,OUO1032,1332 -19-01SEP06-1/2

NOTE: Shaft seal shown in photo was removed during removal of the cover plate.

1. Remove bearing cup.
2. Remove bearing. Bearing is a press fit.
3. Remove cap screws holding shield and remove MFWD shaft from transmission case.



T102258 —UN—09OCT96

CED,OUO1032,1332 -19-01SEP06-2/2

Disassemble MFWD Shaft (If Equipped)—Manual Shift

1. Remove sleeve.

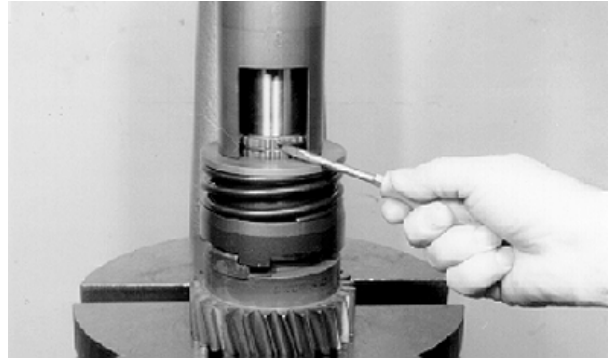


T102262 —UN—09OCT96

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CED,OUO1032,1333 -19-01SEP06-1/8

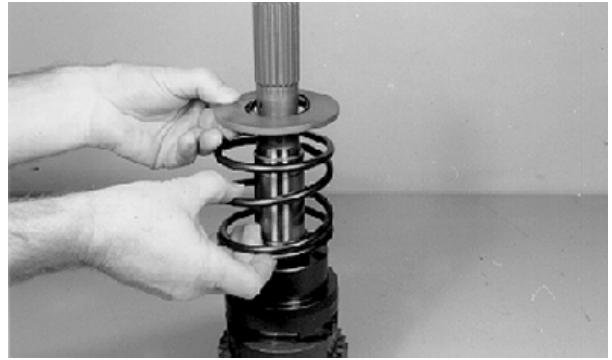
- Using a press and tubing with a window slot, compress spring. Remove snap ring through window and then slowly release pressure.



T102263—UN—09OCT96

CED,OUO1032,1333 -19-01SEP06-2/8

- Remove backing plate and compression spring.



T102264—UN—09OCT96

CED,OUO1032,1333 -19-01SEP06-3/8

- Push sliding sleeve out of the sealing seat and remove.



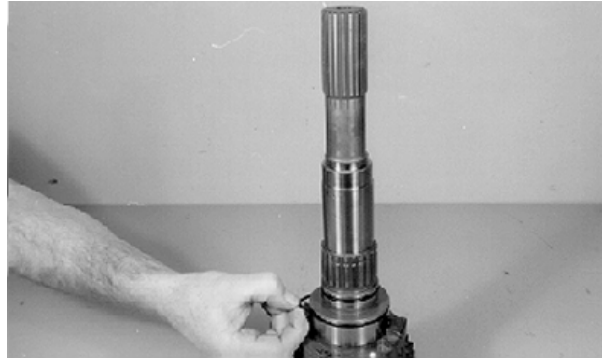
T102265—UN—09OCT96

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CED,OUO1032,1333 -19-01SEP06-4/8

Gears, Shafts, Bearings, and Powershift Clutches

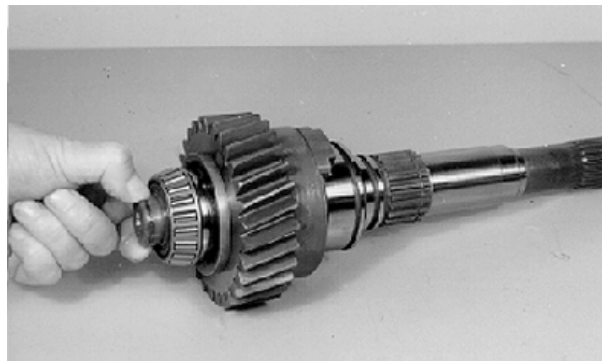
5. Remove both O-rings.



T102266 —UN—09OCT96

CED,OUO1032,1333 -19-01SEP06-5/8

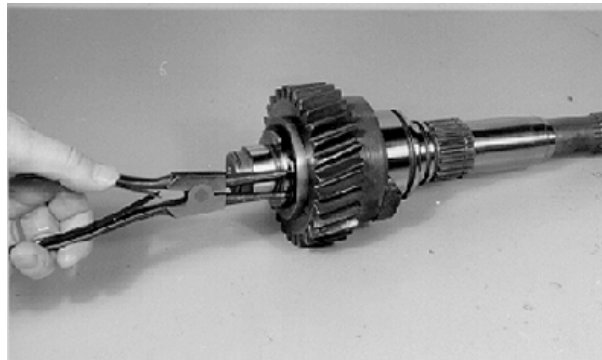
6. Remove sealing ring.
7. Remove bearing. Bearing is a press fit.



T102267 —UN—09OCT96

CED,OUO1032,1333 -19-01SEP06-6/8

8. Remove snap ring.

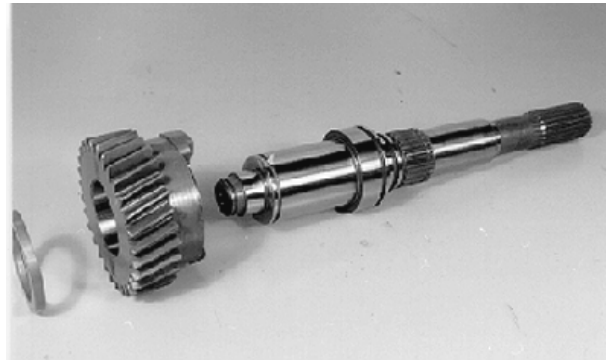


T102269 —UN—09OCT96

Continued on next page

CED,OUO1032,1333 -19-01SEP06-7/8

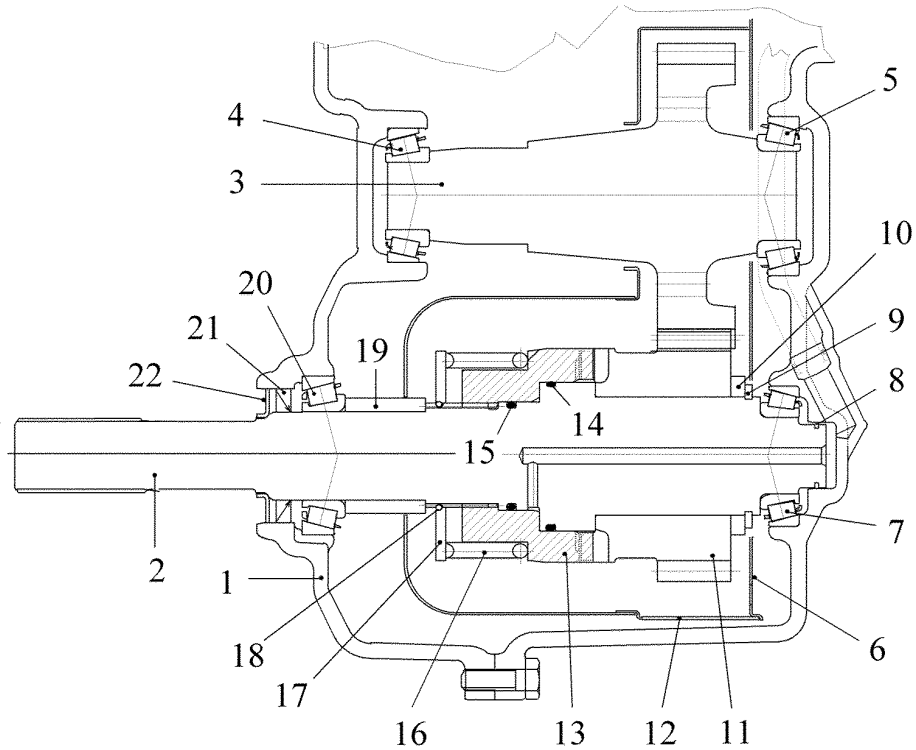
9. Remove thrust washer and gear.



T102270—UN—09OCT96

CED,OUO1032,1333 -19-01SEP06-8/8

MFWD Shaft—Cross Section View—Manual Shift



T104519

- | | | | |
|----------------------|-------------------|------------------------|-----------------------|
| 1— Transmission Case | 7— Roller Bearing | 13— Sliding Sleeve | 19— Sleeve |
| 2— MFWD Output Shaft | 8— Sealing Ring | 14— O-Ring | 20— Roller Bearing |
| 3— Idler Shaft | 9— Snap Ring | 15— O-Ring | 21— Shaft Seal |
| 4— Roller Bearing | 10— Thrust Washer | 16— Compression Spring | 22— Cap (Cover Sheet) |
| 5— Roller Bearing | 11— Gear | 17— Backing Plate | |
| 6— Shield | 12— Shield | 18— Snap Ring | |

Use art to assist in reassembly of MFWD shaft.

CED,OUO1032,1333 -19-01SEP06-1/1

T104519—UN—18OCT96

Assemble MFWD Shaft (If Equipped)—Manual Shift

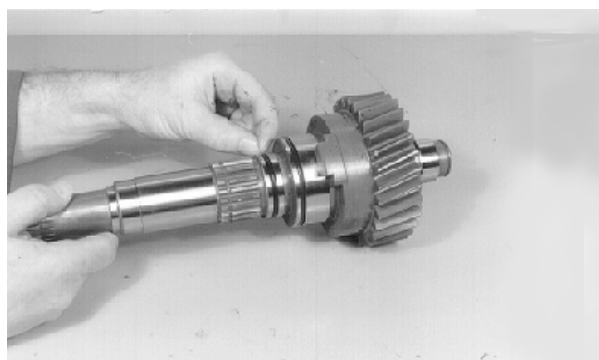
1. Install gear and thrust washer on shaft. Install snap ring.



T104559 —UN—22OCT96

CED,OUO1032,1335 -19-25OCT99-1/7

2. Install O-rings.



T104560 —UN—22OCT96

CED,OUO1032,1335 -19-25OCT99-2/7

3. Apply oil on sealing surfaces of the sliding sleeve. Install sliding sleeve until engaged with spur gear.

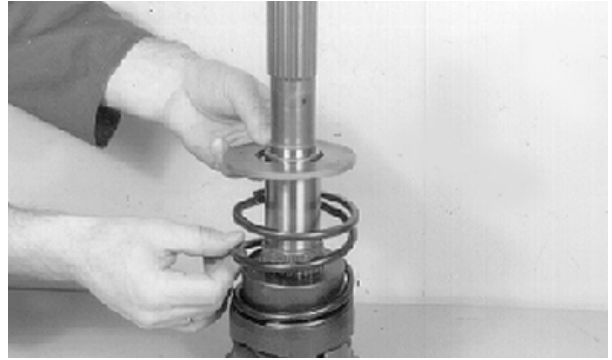


T104561 —UN—22OCT96

Continued on next page

CED,OUO1032,1335 -19-25OCT99-3/7

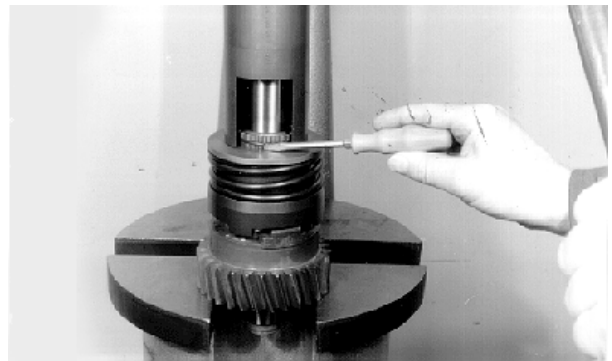
4. Install spring, backing plate and snap ring.



T104562—UN—22OCT96

CED,OUO1032,1335 -19-25OCT99-4/7

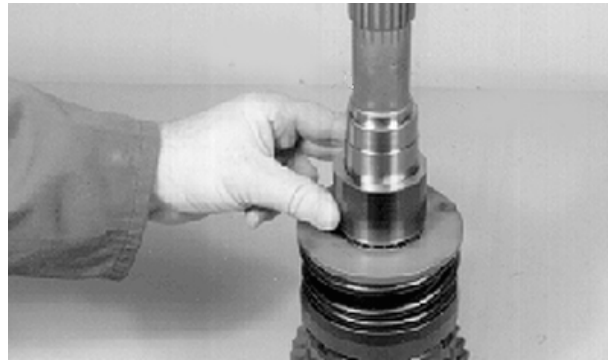
5. Using a press and tubing with a slotted window, compress spring and backing plate until snap ring groove is accessible. Then install snap ring into groove of shaft through window and slowly release pressure.



T104563—UN—22OCT96

CED,OUO1032,1335 -19-25OCT99-5/7

6. Install sleeve.



T104564—UN—22OCT96

Continued on next page

CED,OUO1032,1335 -19-25OCT99-6/7

7. Install bearing (bearing is a press fit). Install sealing ring.

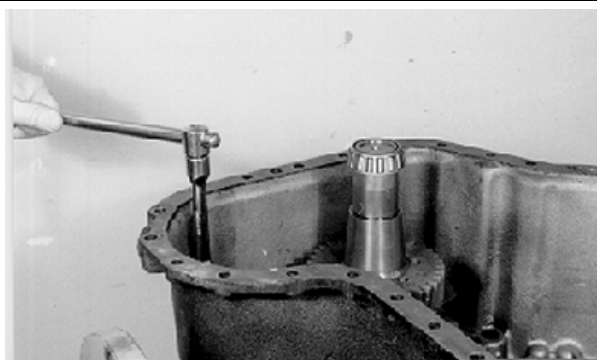


T104565 —UN—22OCT96

CED,OUO1032,1336 -19-25OCT99-7/7

Remove, Disassemble, and Assemble Idler Shaft—Manual Shift

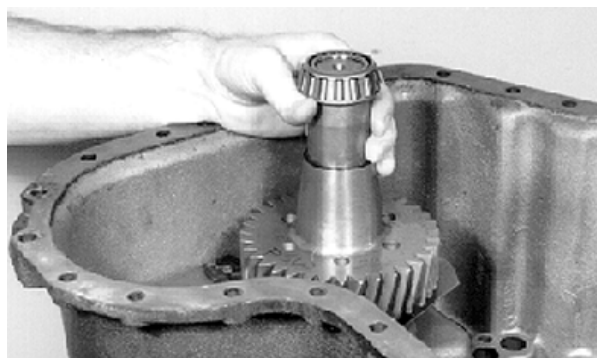
1. Loosen cap screws on idler shaft shield.



T102272 —UN—10OCT96

CED,OUO1032,1336 -19-01SEP06-1/3

2. Remove idler shaft and shield.
3. Remove bearings from both ends of shaft. Bearings are a press fit.
4. Press new bearings onto shaft.

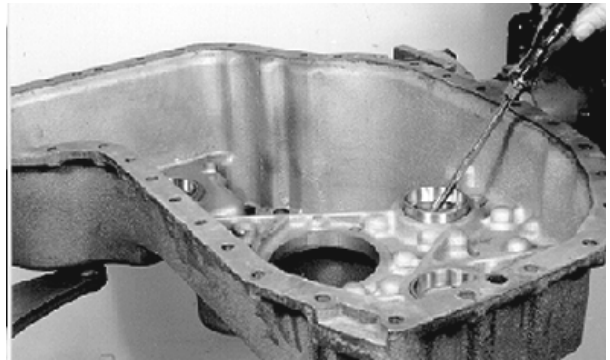


T102273 —UN—10OCT96

Continued on next page

CED,OUO1032,1336 -19-01SEP06-2/3

- Remove cup from transmission case.



T102275—UN—09OCT96

CED,OUO1032,1336 -19-01SEP06-3/3

Remove and Install Oil Supply Tube—Manual Shift

- Remove cap screws.
- Remove oil supply tube with O-rings.
- Install new O-rings on oil supply tube.
- Install oil supply tube in transmission case.
- Apply cure primer, then thread lock and sealer (medium strength) to threads of cap screws. Tighten cap screws to specification.



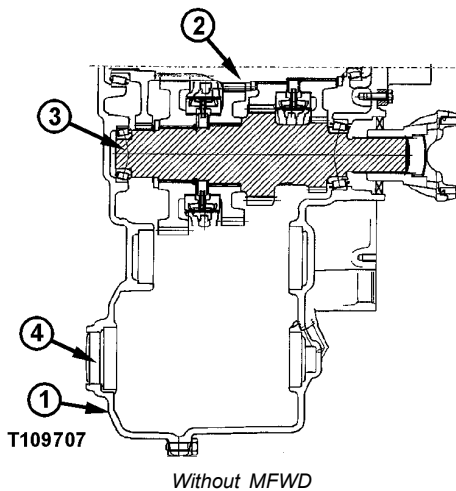
T102276—UN—09OCT96

Specification

Oil Supply Tube Cap
Screw—Torque..... 23 N·m (17 lb-ft)

CED,OUO1032,1337 -19-08SEP98-1/1

Install Idler and MFWD Shafts to Assemble Transmission (If Equipped)—Manual Shift

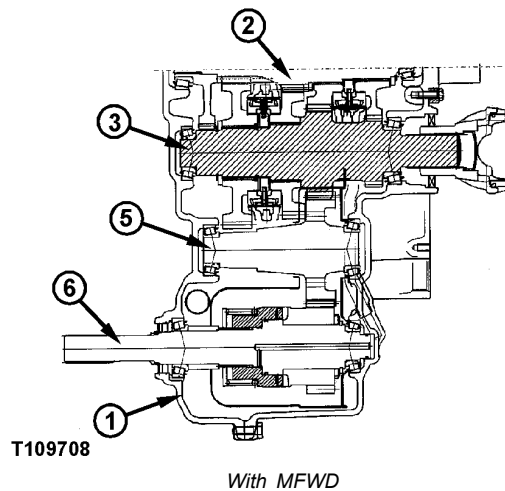


T109707

Without MFWD

- | | |
|-----------------------|----------------------|
| 1— Transmission Case | 3— Rear Output Shaft |
| 2— Intermediate Shaft | 4— Cap |

T109707—UN—03JUL97



T109708

With MFWD

- | |
|----------------------|
| 5— Idler Shaft |
| 6— MFWD Output Shaft |

T109708—UN—03JUL97

Continued on next page

CED,OUO1032,1338 -19-25OCT99-1/7

1. Assemble shield on idler shaft.
2. Press both bearings on idler shaft.

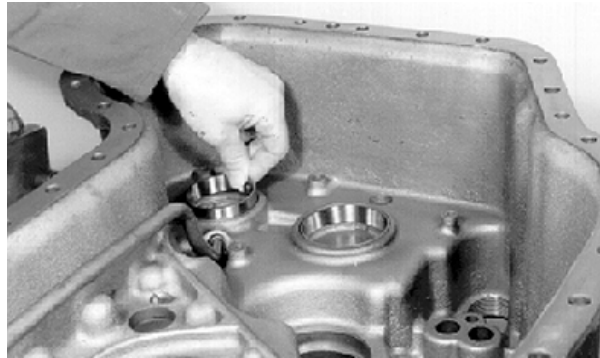


T104556 —UN—22OCT96

CED,OUO1032,1338 -19-25OCT99-2/7

NOTE: A bearing and a cup are a matched set. If either requires replacement, both must be replaced.

3. Install idler shaft bearing cup and MFWD shaft bearing cup into bores until bottomed.



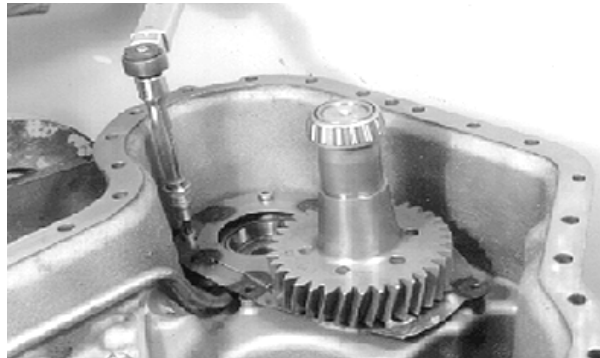
T104557 —UN—22OCT96

CED,OUO1032,1338 -19-25OCT99-3/7

4. Install idler shaft and shield into case. Apply cure primer, then thread lock and sealer (medium strength) to threads of cap screws. Tighten cap screws to specification.

Specification

Idler Shaft Shield Cap
Screws—Torque..... 23 N·m (204 lb-in.)

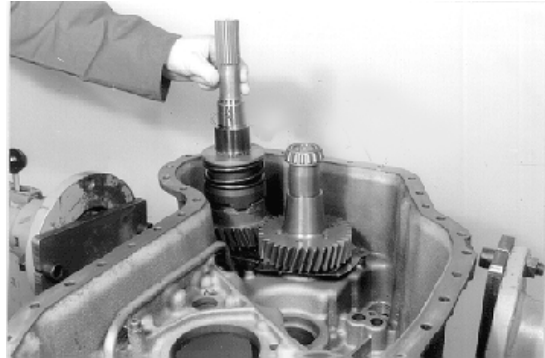


T104558 —UN—22OCT96

Continued on next page

CED,OUO1032,1338 -19-25OCT99-4/7

5. Install MFWD shaft into case.



T104566—UN—22OCT96

CED,OUO1032,1338 -19-25OCT99-5/7

6. Install shield on MFWD shaft. Apply cure primer, then thread lock and sealer (medium strength) to threads of cap screws. Tighten cap screws to specification.

Specification

MFWD Shield Cap
Screws—Torque..... 23 N·m (204 lb-in.)



T104567—UN—22OCT96

CED,OUO1032,1338 -19-25OCT99-6/7

- ⚠ CAUTION:** If using oil to heat the bearing, **DO NOT** heat oil over 182°C (360°F). Oil fumes or oil can ignite above 193°C (380°F). Use a thermometer. **DO NOT** allow a flame or heating element to come in direct contact with the oil. Heat the oil in a well-ventilated area. Plan a safe handling procedure to avoid burns.

7. Heat bearing to 121°C (250°F) using an oven. Install bearing on shaft.



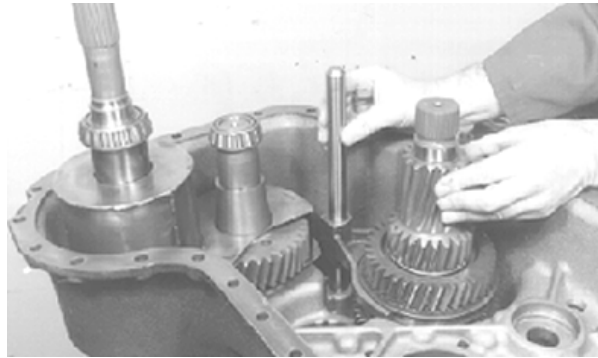
T104568—UN—22OCT96

CED,OUO1032,1338 -19-25OCT99-7/7

Install Intermediate and Rear Output Shafts—Manual Shift

NOTE: Keep bearings and cups as a matched set if not replacing.

1. Install bearing cups. Install intermediate shaft with shift rail (shift fork positioned in sliding collar).

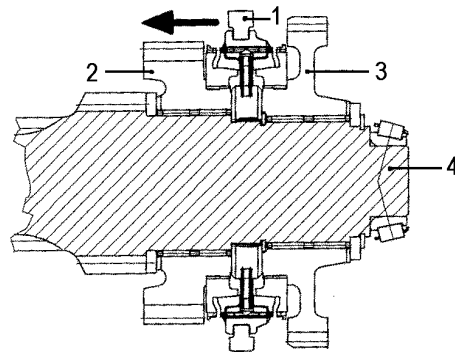


T104659—UN—29OCT96

CED,OUO1032,1339 -19-01SEP06-1/5

2. Install rear output shaft while holding shift fork (1) in 3rd speed position (arrow).

- | | |
|--------------------|--------------------|
| 1—Shift Fork | 3—Gear (4th Speed) |
| 2—Gear (3rd Speed) | 4—Idler Shaft |



T104675

Intermediate Shaft

T104675—UN—30OCT96

CED,OUO1032,1339 -19-01SEP06-2/5

3. Hold in position while installing rear output shaft.

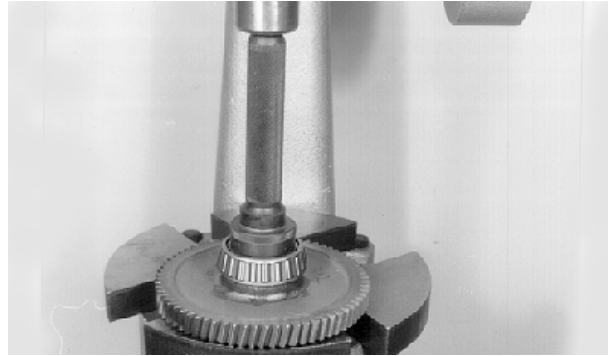


T104676—UN—05NOV96

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CED,OUO1032,1339 -19-01SEP06-3/5

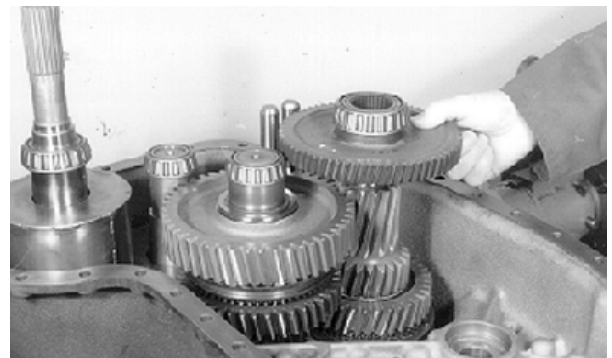
4. Press bearing inner race on gear.



T104677 —UN—05NOV96

CED,OUO1032,1339 -19-01SEP06-4/5

5. Install gear and bearing on intermediate shaft.

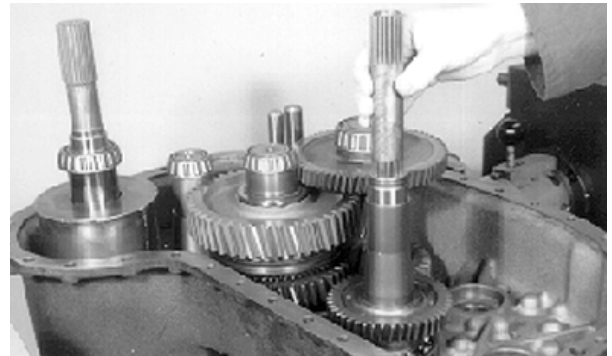


T104678 —UN—31OCT96

CED,OUO1032,1339 -19-01SEP06-5/5

Install Drive Shaft—Manual Shift

1. Install drive shaft.



T104683 —UN—30OCT96

Continued on next page

CED,OUO1032,1340 -19-01SEP06-1/3

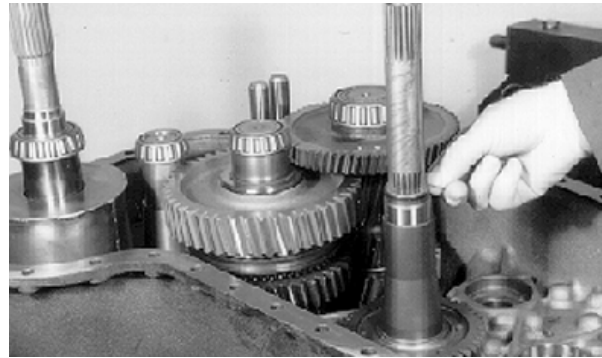
2. Install snap ring into groove of ball bearing.



T104684—UN—03FEB97

CED,OUO1032,1340 -19-01SEP06-2/3

3. Install snap ring.



T104685—UN—30OCT96

CED,OUO1032,1340 -19-01SEP06-3/3

Install Forward and Reverse Clutch Packs—Manual Shift

NOTE: Keep bearings and cups as a matched set if not replacing.

1. Install bearing cups.



T104706—UN—31OCT96

Continued on next page

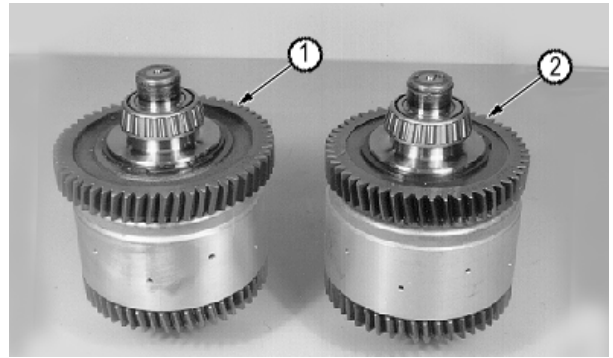
CED,OUO1032,1341 -19-25OCT99-1/4

Gears, Shafts, Bearings, and Powershift Clutches

2. Reverse clutch pack (1) has 58 teeth and the forward clutch pack (2) has 52 teeth.

1— Reverse Clutch Pack

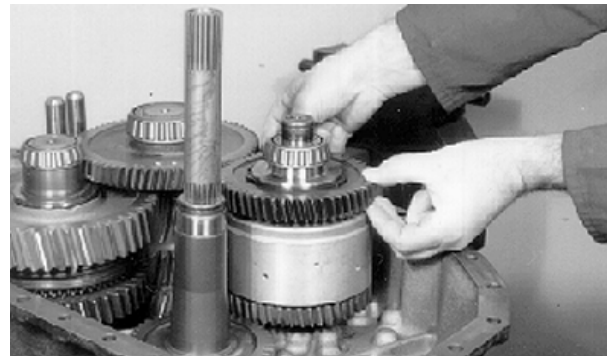
2— Forward Clutch Pack



T104705 —UN—05NOV96

CED,OUO1032,1341 -19-25OCT99-2/4

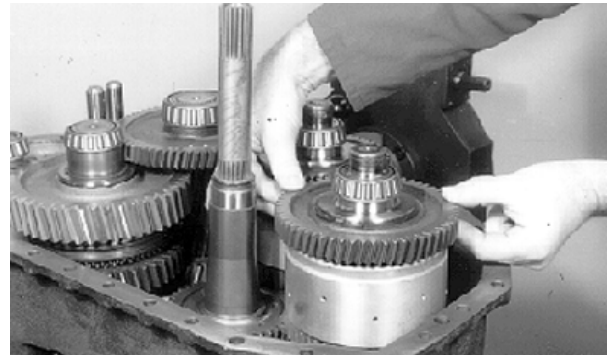
3. Install forward clutch pack.



T104707 —UN—31OCT96

CED,OUO1032,1341 -19-25OCT99-3/4

4. Install reverse clutch pack.



T104708 —UN—31OCT96

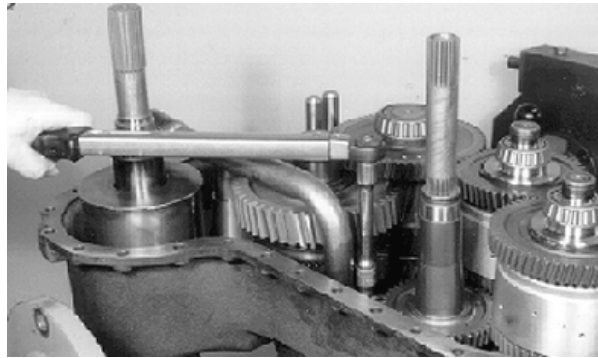
CED,OUO1032,1341 -19-25OCT99-4/4

Install Oil Suction Tube—Manual Shift

Install oil suction tube with O-ring. Apply cure primer, then thread lock and sealer (medium strength) to threads of cap screws. Install cap screws and tighten to specification.

Specification

Oil Suction Tube Socket
 Head Screws—Torque..... 23 N·m (204 lb-in.)



T104709 —UN—31OCT96

CED,OUO1032,1342 -19-08SEP98-1/1

Assemble Converter Side of Case—Manual Shift

NOTE: Torque converter bushing must be reamed after installation. Have a qualified machinist ream the bushing in a machine shop.

1. Install bushing, bottom in bore.
2. Install transmission cover on converter housing. Install two cap screws to hold housings together. Ream bushing to specification.

Specification

Torque Converter
 Bushing—ID.....55.05—55.08 mm
 (2.167—2.169 in.) Finished ID



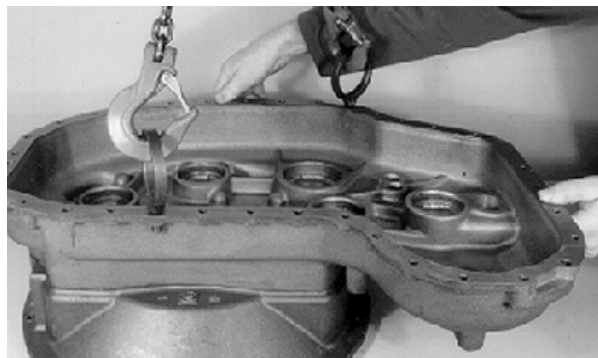
T104710 —UN—31OCT96

3. Clean both housings.

4. Install shaft seal with sealing lip facing the oil chamber. Apply grease on sealing lip. Apply cure primer, then thread lock and sealer (medium strength) to metal outer shell.

CED,OUO1032,1343 -19-25OCT99-1/10

5. Install two aligning screws into transmission case.
6. Apply cure primer to mating surfaces of the converter housing and transmission case.
7. Apply High Flex Form-in-Place Gasket to mating surfaces of the converter housing and transmission case.
8. Install eyebolts in case. Using chain and hoist, install transmission case on converter housing.

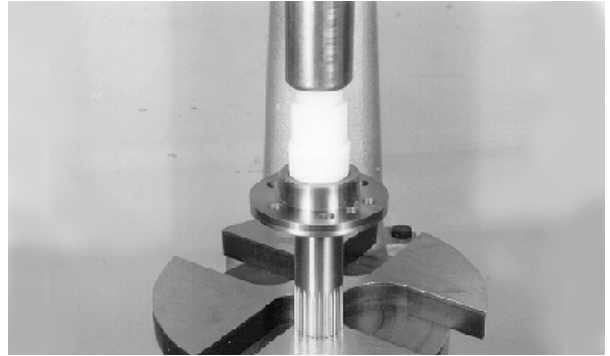


T104711 —UN—31OCT96

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CED,OUO1032,1343 -19-25OCT99-2/10

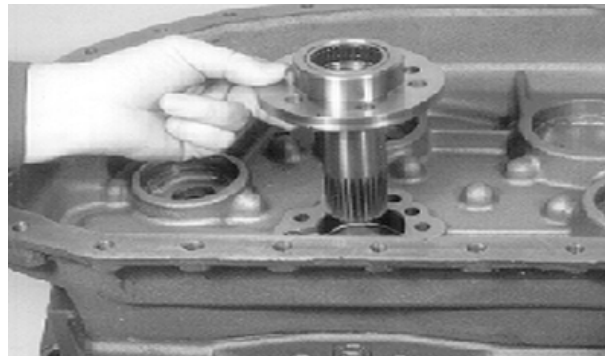
9. Install needle bearing into stator shaft with thick collar to the outside. Press on stamped side of bearing.



T104712 —UN—31OCT96

CED,OUO1032,1343 -19-25OCT99-3/10

10. Install stator shaft.



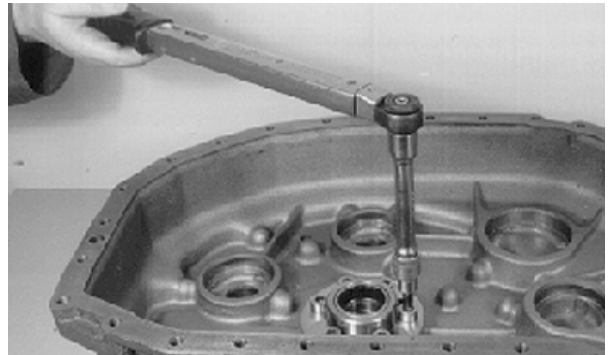
T104713 —UN—31OCT96

CED,OUO1032,1343 -19-25OCT99-4/10

11. Install stator shaft cap screws. Tighten cap screws to specification.

Specification

Stator Shaft Cap
Screws—Torque..... 46 N·m (34 lb-ft)



T104714 —UN—31OCT96

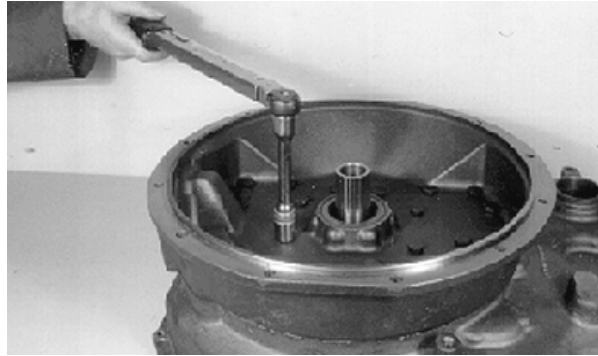
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CED,OUO1032,1343 -19-25OCT99-5/10

12. Remove aligning screws and install converter housing cap screws. Tighten cap screws to specification.

Specification

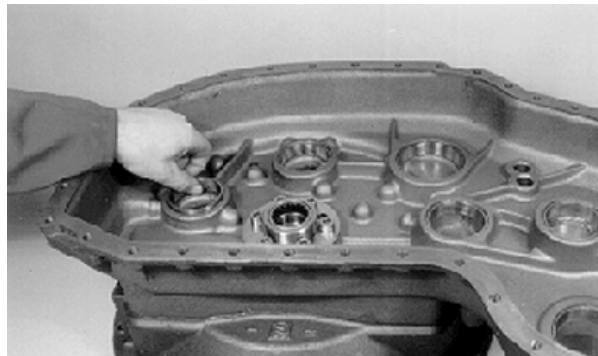
Converter Housing Cap
Screws—Torque..... 46 N·m (34 lb-ft)



T104715—UN—31OCT96

CED,OUO1032,1343 -19-25OCT99-6/10

13. Install new bearing cups or ensure old bearing cups are returned to same bore with matching bearing cones.



T104717—UN—31OCT96

CED,OUO1032,1343 -19-25OCT99-7/10

14. Install eyebolts and a hoist.
15. Apply cure primer to mating surfaces of the transmission case halves.
16. Apply High Flex Form-in-Place Gasket to the mating surfaces of the two transmission case halves. Check the sealing ring positions of the different shafts.
17. Align the dowel holes.

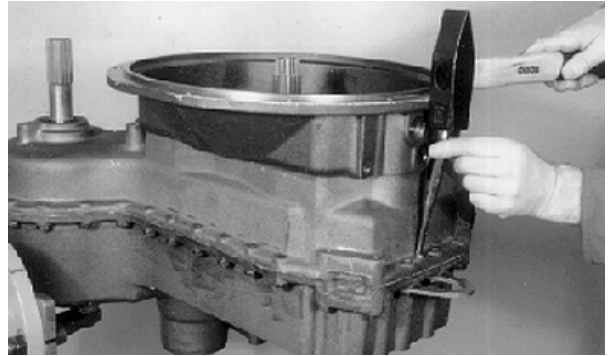


T104718—UN—31OCT96

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CED,OUO1032,1343 -19-25OCT99-8/10

18. Install dowels and cap screws.



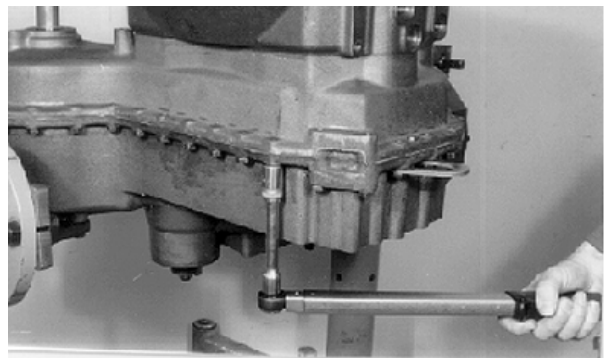
T104719 —UN—31OCT96

CED,OUO1032,1343 -19-25OCT99-9/10

19. Tighten cap screws to specification.

Specification

Transmission Case
 Half-to-Transmission
 Case Half Cap
 Screws—Torque..... 46 N·m (34 lb-ft)



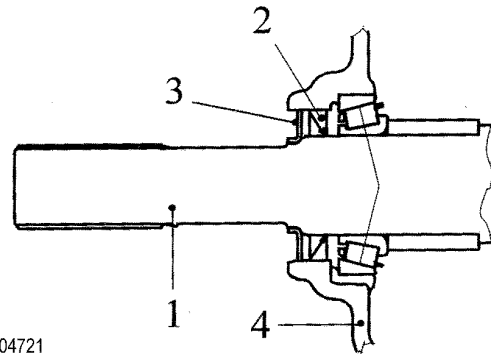
T104720 —UN—31OCT96

CED,OUO1032,1343 -19-25OCT99-10/10

Install Outer Components to Assemble Transmission—Manual Shift

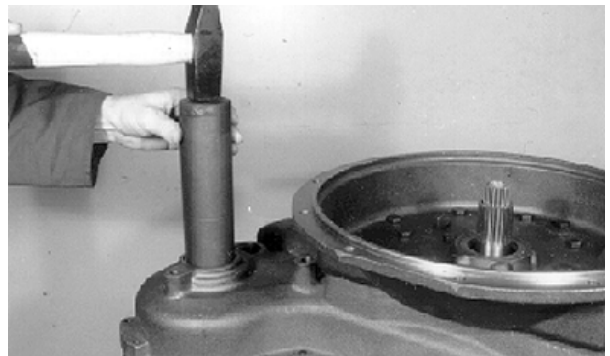
1. Apply a one-to-one mixture of alcohol and water to outer shell and rubber.
2. Using JDG1057 Shaft Seal Installer, install shaft seal (2) with the sealing lip facing the oil chamber.
3. Install new cap (3) against shaft shoulder.

1— MFWD Output Shaft 3— Cap (Cover Plate)
 2— Shaft Seal 4— Transmission Case



T104721

T104721 —UN—31OCT96



T104722 —UN—31OCT96

Continued on next page

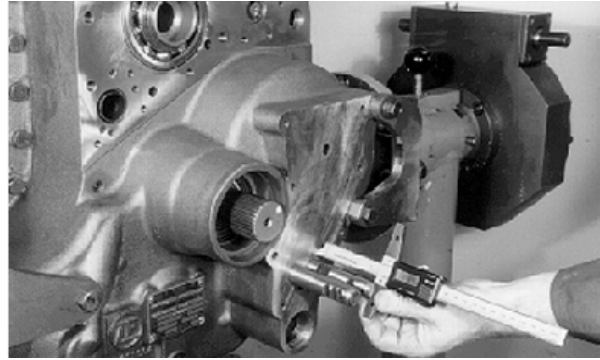
CED,OUO1032,1344 -19-25OCT99-1/17

Gears, Shafts, Bearings, and Powershift Clutches

4. Install both shift rails (neutral position). Using a depth gauge, measure from end of shaft to face of housing. Measurement should be to specification.

Specification

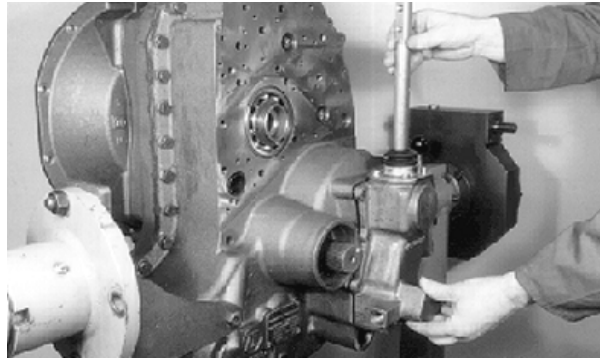
End of Shift Shaft-to-Face
of Transmission
Housing—Distance.....85 mm (3.35 in.) Approximate



T104462—UN—17OCT96

CED,OUO1032,1344 -19-25OCT99-2/17

5. Apply cure primer to mating surfaces of transmission and shift lever housings. Install shift lever housing while installing shift lever into the rail recess.
6. Apply High Flex Form-in-Place Gasket to mating surfaces of transmission and shift lever housings. Install shift lever housing while installing shift lever into the rail recess.



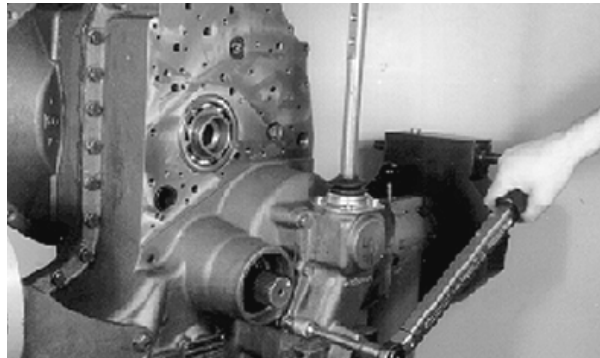
T104463—UN—17OCT96

CED,OUO1032,1344 -19-25OCT99-3/17

7. Install cap screws and tighten to specification.

Specification

Shift Lever Housing-to-
Transmission Case Cap
Screws—Torque..... 23 N·m (204 lb·in.)



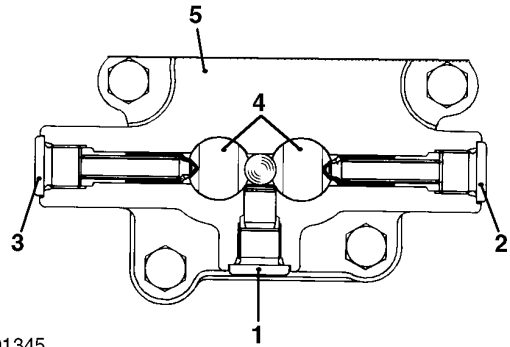
T104464—UN—17OCT96

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CED,OUO1032,1344 -19-25OCT99-4/17

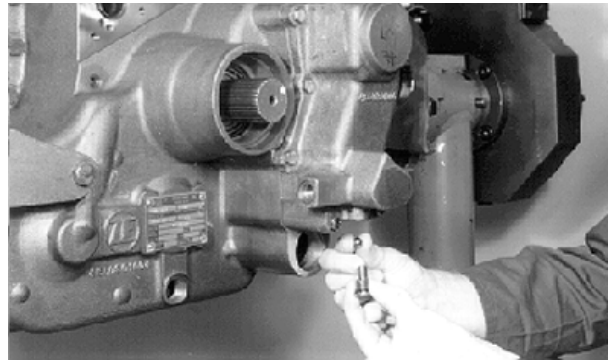
8. Install ball and plug with O-ring and dowel (1).

- 1— Plug with O-Ring and Dowel
- 2— Detent Plug
- 3— Detent Plug
- 4— Shift Rails
- 5— Shift Lever Housing



T101345

T101345—UN—04JUN96



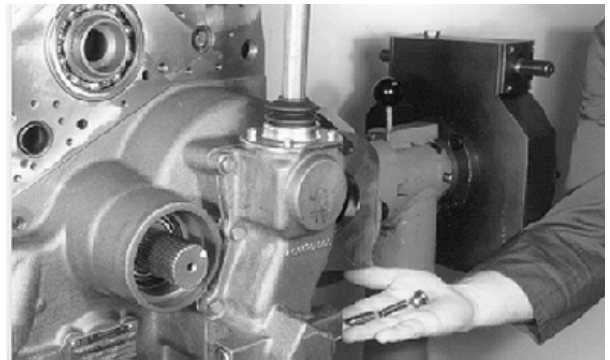
T104465—UN—17OCT96

CED,OUO1032,1344 -19-25OCT99-5/17

9. Install detent pin, compression spring and plug with O-ring on both sides of shift lever housing. Check shifting function for all speeds. Tighten plugs to specification.

Specification

Shift Lever Housing	
Plugs—Torque.....	25 N-m (221 lb-in.)



T104417—UN—16OCT96

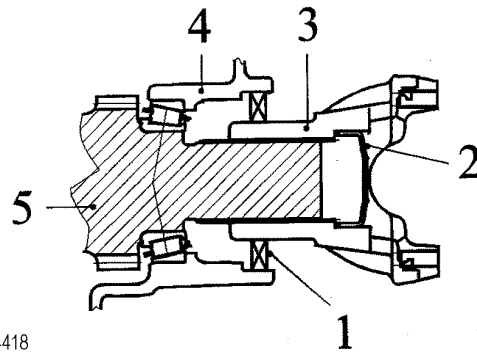
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CED,OUO1032,1344 -19-25OCT99-6/17

10. Apply a one-to-one mixture of alcohol and water to the rubber-coated outer shell of shaft seal.

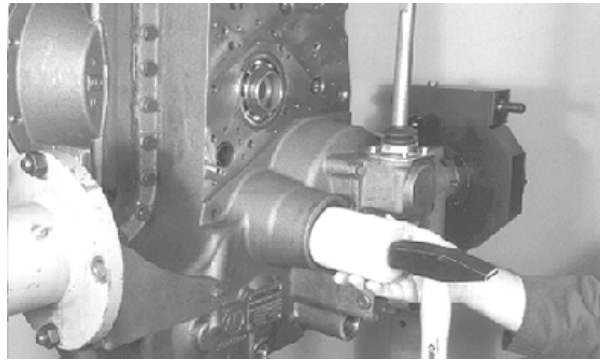
11. Install shaft seal (1) so sealing lip is toward the transmission case. Push seal into transmission housing bore until outer surface of seal is into bore approximately 3 mm (0.118 in.).

- 1— Shaft Seal
- 2— Cap
- 3— Output Flange
- 4— Transmission Case
- 5— Rear Output Shaft



T104418

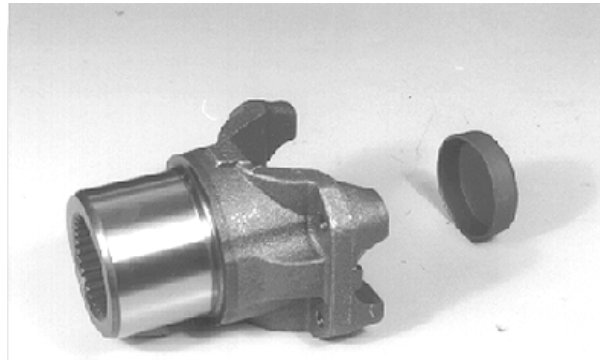
T104418 —UN—16OCT96



T104419 —UN—16OCT96

CED,OUO1032,1344 -19-25OCT99-7/17

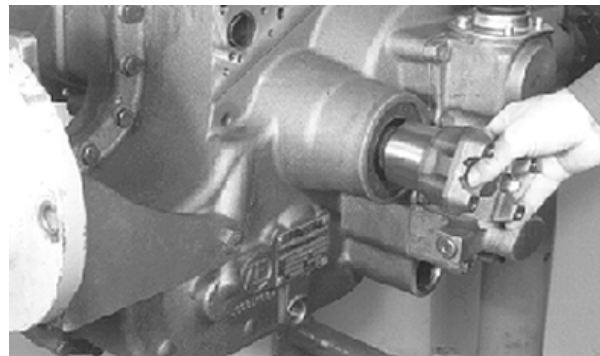
12. Apply cure primer, then thread lock and sealer (medium strength) to cap. Insert cap into output flange.



T104420 —UN—16OCT96

CED,OUO1032,1344 -19-25OCT99-8/17

13. Install output flange.

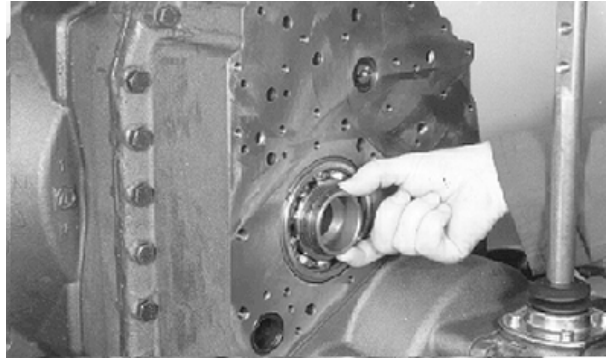


T104421 —UN—16OCT96

Continued on next page

CED,OUO1032,1344 -19-25OCT99-9/17

14. Position drive shaft against shoulder. Install sealing ring.

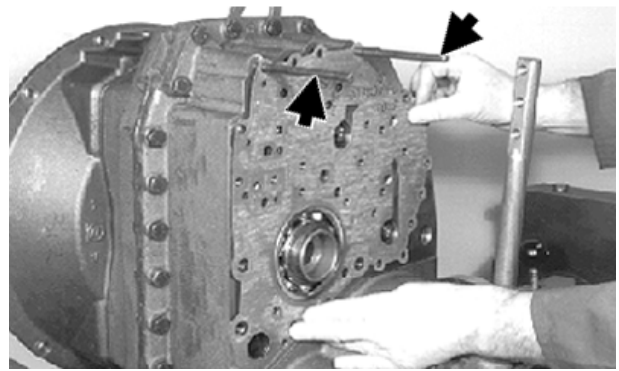


T104424 —UN—16OCT96

CED,OUO1032,1344 -19-25OCT99-10/17

NOTE: For complete control valve removal, installation, disassembly, and assembly instructions, see Group 0360.

15. Install two M8 dowels (arrows).
16. Install flat gasket.



T104425 —UN—04FEB97

Continued on next page

CED,OUO1032,1344 -19-25OCT99-11/17

17. Install manifold plate.

18. Install cap screws. Starting with inside cap screws first and continuing to the outside. Tighten cap screws to specification.

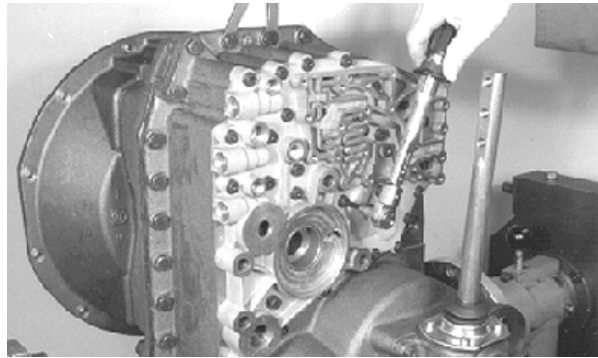
Specification

Transmission Control
 Valve Manifold
 Plate—Torque..... 23 N·m (204 lb-in.)

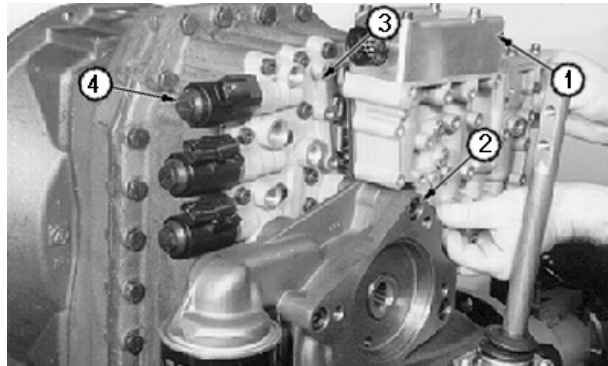
NOTE: After machine has been operated a short time at operating temperature, recheck torque specifications.

19. Install solenoids (4), control valve (1) and charge pump (2). (See removal and installation procedures for these components in Group 0360.)

- | | |
|------------------|----------------------|
| 1— Control Valve | 3— Manifold Plate |
| 2— Charge Pump | 4— Solenoid (3 used) |



T104426 —UN—16OCT96



T101330 —UN—06FEB97

CED,OUO1032,1344 -19-25OCT99-12/17

20. While carefully mating splines, install torque converter on transmission.



T104452 —UN—17OCT96

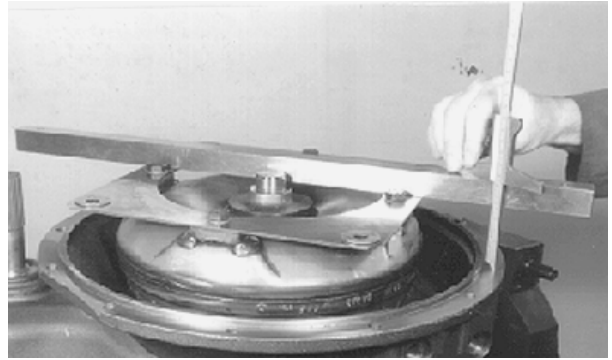
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CED,OUO1032,1344 -19-25OCT99-13/17

21. Check distance from converter housing to top of plate.

Specification

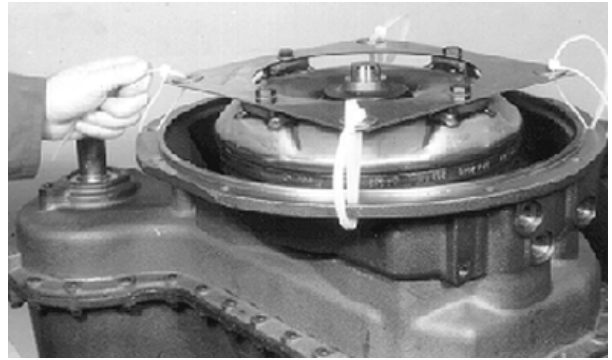
Converter Housing-to-
Top of Plate—Distance.....59 mm (2.3 in.) Approximate



T104453—UN—17OCT96

CED,OUO1032,1344 -19-25OCT99-14/17

22. If transporting, install tie bands to secure converter.



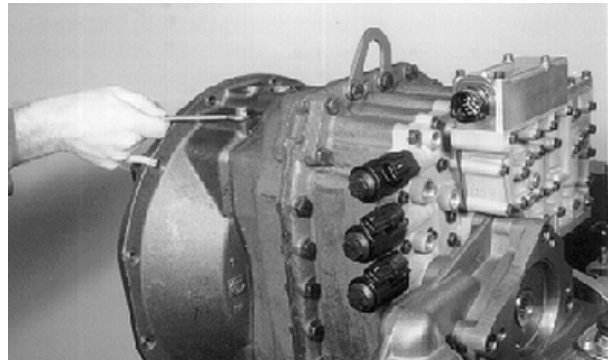
T104454—UN—17OCT96

CED,OUO1032,1344 -19-25OCT99-15/17

23. Install bleeder if removed. Tighten plug (with O-ring) to specification.

Specification

Bleeder Plug—Torque..... 28 N·m (21 lb-ft)



T104455—UN—17OCT96

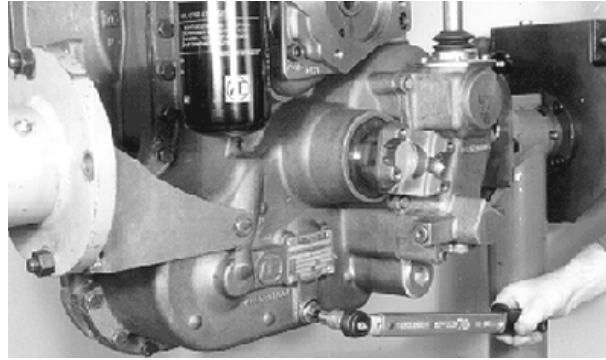
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CED,OUO1032,1344 -19-25OCT99-16/17

24. Install drain plug. Tighten to specification.

Specification

Drain Plug—Torque..... 35 N·m (26 lb-ft)



T104456 —UN—17OCT96

CED,OUO1032,1344 -19-25OCT99-17/17

Remove Outer Components to Disassemble Powershift Transmission

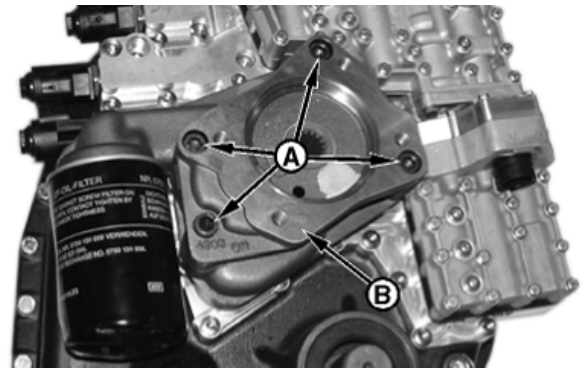
NOTE: All bearing cups in transmission case can either be a loose fit or tight fit. If not replacing bearing cones or cups, make sure to keep them together as a matched set. Mark or identify as needed.

1. Put transmission on bench and block assembly.

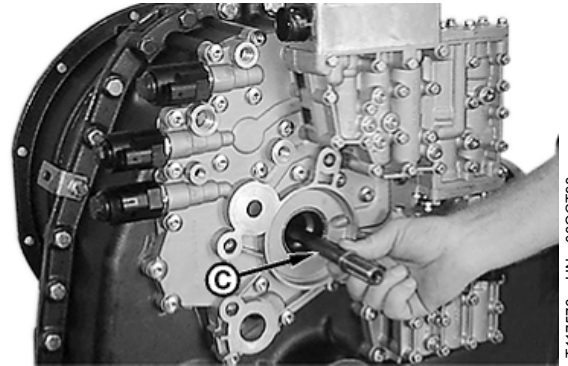
NOTE: See Group 0360 for disassembly and assembly of components.

2. Remove four socket head screws (A) and lift off transmission pump (B).
3. Remove pump drive shaft (C).
4. Remove four cap screws (F), nineteen cap screws (D) and remove control valve (E).
5. Remove fifteen cap screws (G) and lift off shift valve (H).

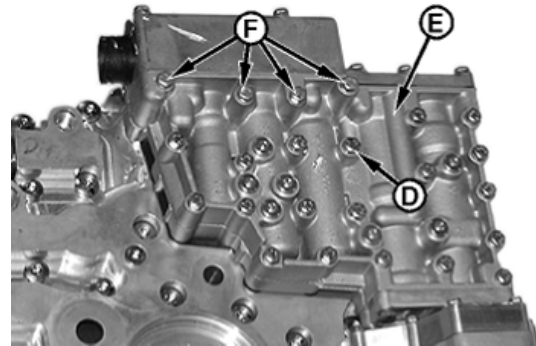
A—Socket Head Screw (4 used)	E—Control Valve
B—Transmission Pump	F—Cap Screw (4 used)
C—Pump Drive Shaft	G—Cap Screw (15 used)
D—Cap Screw (19 used)	H—Shift Valve



T117565B —UN—08OCT98



T117576 —UN—08OCT98



T117566B —UN—08OCT98



T117567B —UN—08OCT98

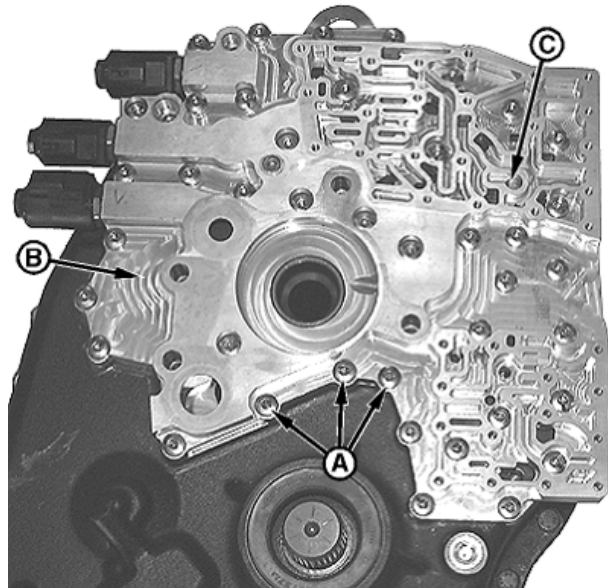
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CED,OUO1032,1002 -19-05OCT98-1/2

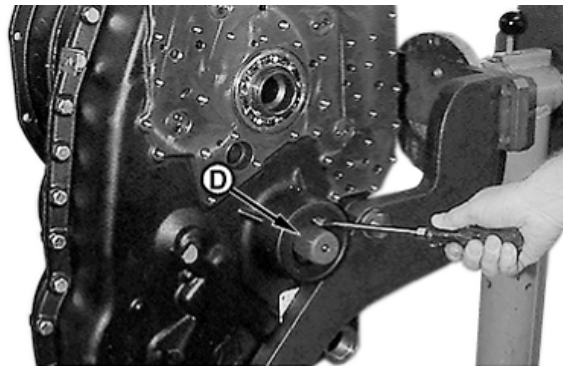
6. Remove forty-three TORX® head screws (A) and carefully lift off manifold (B), making sure to not lose check ball and spring (C) under manifold.
7. Remove shaft seal (D).
8. Turn transmission over so converter side is facing up and block accordingly.
9. Remove torque converter and plate assembly (E).

A—TORX® Head Screw (43 used)
B—Manifold
C—Check Ball and Spring

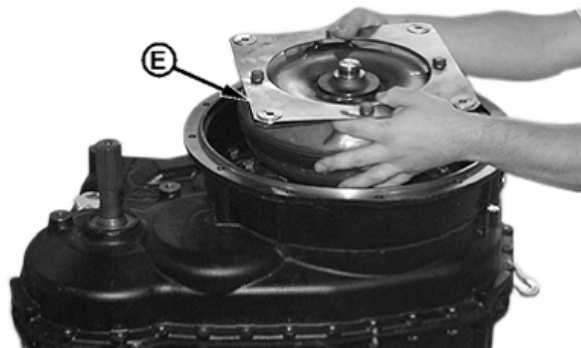
D—Seal
E—Torque Converter



T117568B —UN—08OCT98



T117577 —UN—08OCT98



T117568B —UN—08OCT98

TORX is a registered trademark of Camcar/Textron

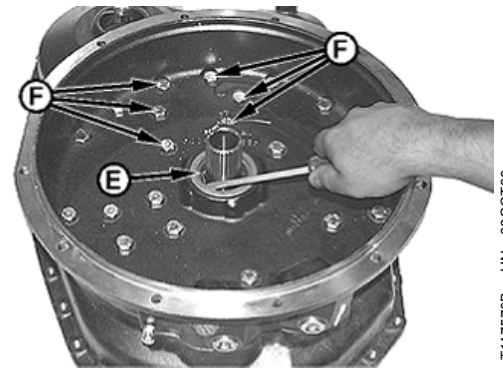
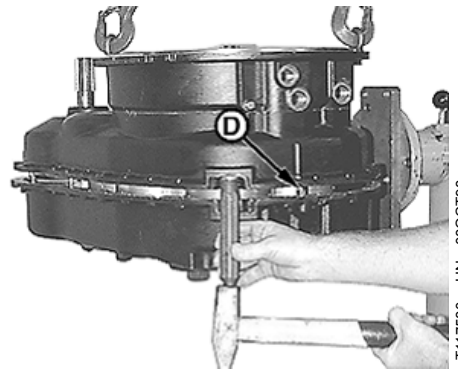
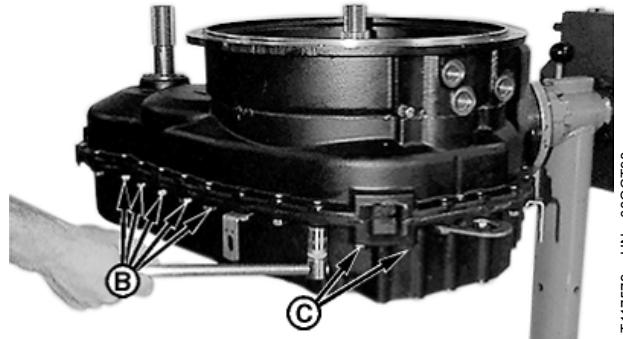
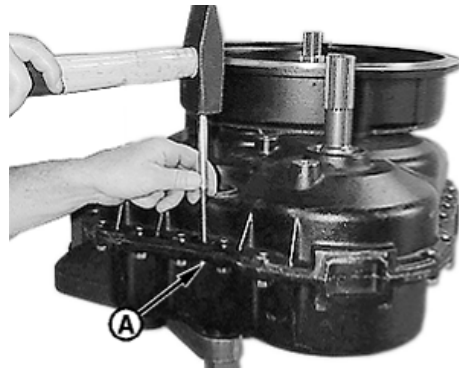
CED,OUO1032,1002 -19-05OCT98-2/2

Disassemble Converter Side of Case—Powershift

1. Drive dowel pin (A) out of case halves.
2. Remove twenty-eight cap screws (B).
3. Remove six cap screws (C).
4. Install two eye bolts in case. Attach a chain and hoist to eye bolts and separate case halves by tapping housing loose from dowel pin (D).
5. Remove seal (E).
6. Remove twenty-three cap screws (F).

A—Dowel Pin
B—Cap Screw (28 used)
C—Cap Screw (6 used)

D—Dowel Pin
E—Seal
F—Cap Screw (23 used)



Continued on next page

CED,OUO1032,1003 -19-05OCT98-1/2

7. Remove six socket head screws (A) and pull stator shaft out.

8. Inspect bushing (B) and replace if necessary.

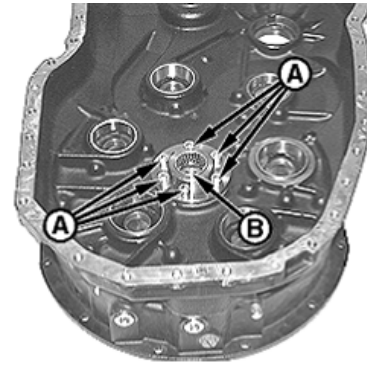
IMPORTANT: If either the bearing cone or cup requires replacement, replace both as a set.

9. Remove bearing cups (C), if necessary.

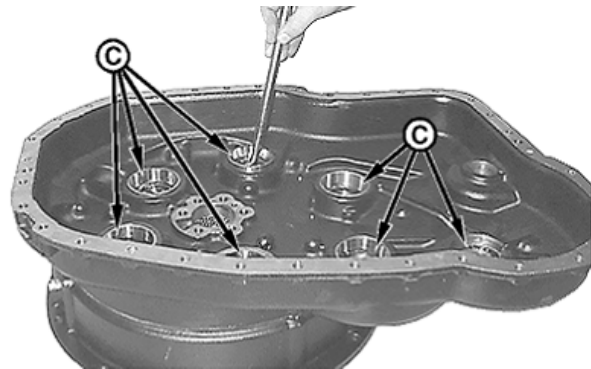
10. Install eyebolts. Using chain and hoist, remove transmission case (D) from converter housing (E).

11. Inspect and replace torque converter bushing (arrow), if necessary. (See Assemble Converter Side of Case—Powershift, in this group, for correct installation of bushing.)

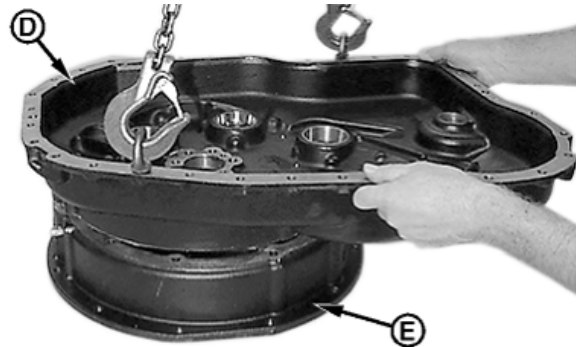
- | | |
|------------------------------|---------------------|
| A—Socket Head Screw (6 used) | D—Transmission Case |
| B—Bushing | E—Converter Housing |
| C—Bearing Cup (7 used) | |



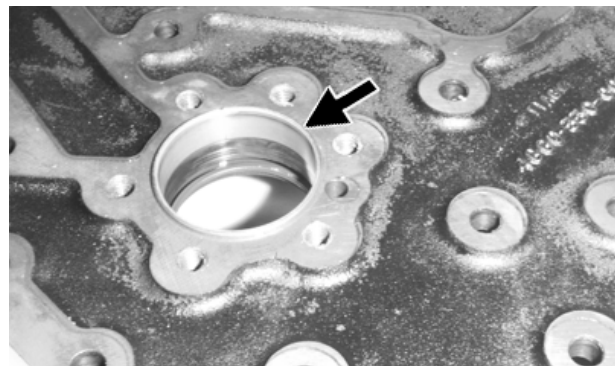
T117571B—UN—08OCT98



T117581—UN—08OCT98



T117582—UN—08OCT98



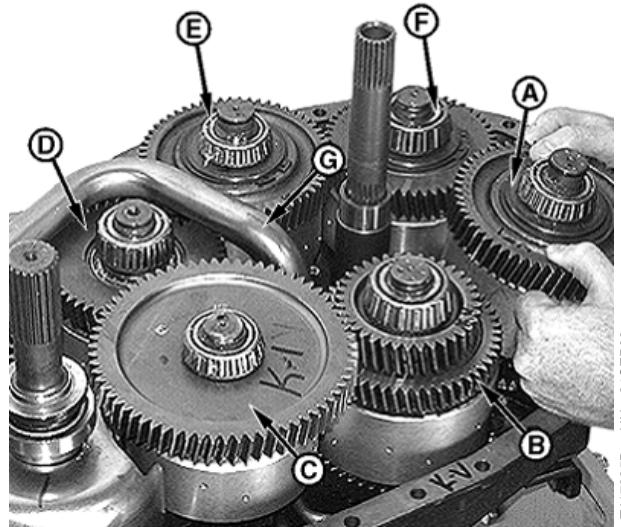
T108083B—UN—11MAR97

CED,OUO1032,1003 -19-05OCT98-2/2

Remove Low Range Forward, Reverse and Third Speed Clutch Packs—Powershift

1. Mark clutch pack and transmission case for aid of assembly, before removing clutch packs from case.
2. Remove reverse clutch pack (A) by lifting out of transmission case.
3. Remove first speed (C) and low range forward (B) clutch packs.
4. Remove screws from oil suction tube (G).
5. Moving oil suction tube (G) slightly, remove second speed clutch pack (E) and then remove third speed clutch pack (D).

- | | |
|---------------------------------|----------------------------------|
| A—Reverse Clutch Pack | E—Second Speed Clutch Pack |
| B—Low Range Forward Clutch Pack | F—High Range Forward Clutch Pack |
| C—First Speed Clutch Pack | G—Oil Suction Tube |
| D—Third Speed Clutch Pack | |



T117235B—UN—24SEP98

CED,OUO1017,89 -19-01DEC98-1/1

Disassemble and Assemble Low Range Forward, Reverse and Third Speed Clutch Packs—Powershift

NOTE: Reverse clutch pack is shown for disassembly and assembly procedures. Disassembly and assembly procedures are the same for low range forward and third speed clutch packs.

1. Remove sealing rings (A).
2. Remove bearings (B) from shaft. Bearings are a press fit.

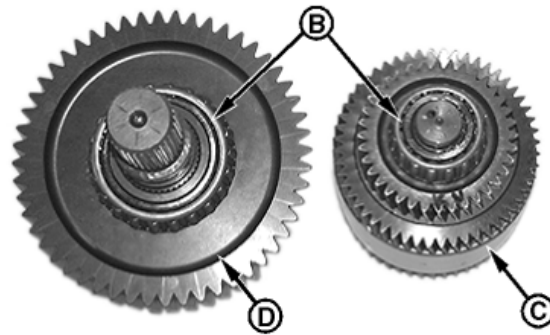
NOTE: On clutch packs low range forward (C) and third speed (D), bearing (B) is recessed in the gear. Destroying the bearing is required for removal.

3. Remove snap ring (E).

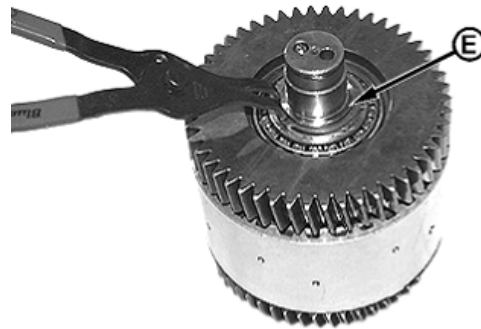
- | | |
|---------------------------------|---------------------------|
| A—Sealing Ring (2 used) | D—Third Speed Clutch Pack |
| B—Bearing | E—Snap Ring |
| C—Low Range Forward Clutch Pack | |



T117236B—UN—24SEP98



T117237B—UN—24SEP98



T117238B—UN—24SEP98

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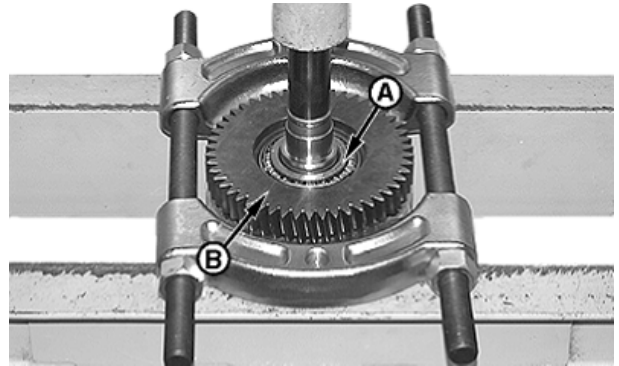
WS68074.00036F9 -19-14JUL10-1/17

4. Press bearing (A) and gear hub assembly (B) off of shaft and hub assembly.
5. Remove snap ring (C), end plate (D), and plates and disks (E).

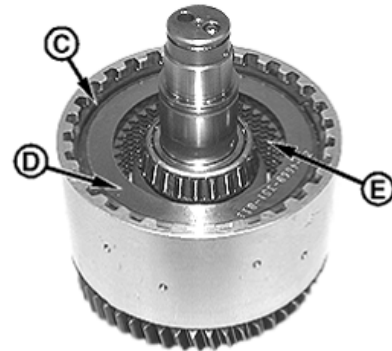
NOTE: Clutch packs low range forward and reverse have nine plates (F) and nine disks (G). Third speed clutch pack has six plates and six disks.

A—Bearing
 B—Gear Hub Assembly
 C—Snap Ring
 D—End Plate

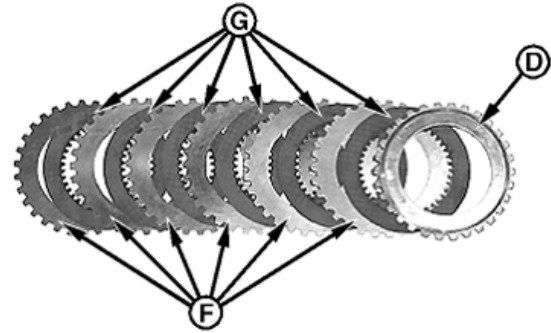
E—Clutch Plate and Disk
 F—Clutch Plate
 G—Clutch Disk



T117239B—UN—24SEP98



T117240B—UN—24SEP98



T117241B—UN—24SEP98

Continued on next page

WS68074,00036F9 -19-14JUL10-2/17

6. Install a puller so it grasps the second Belleville washer (A) from the bottom (sixth from the bearing cone). Remove bearing (B).

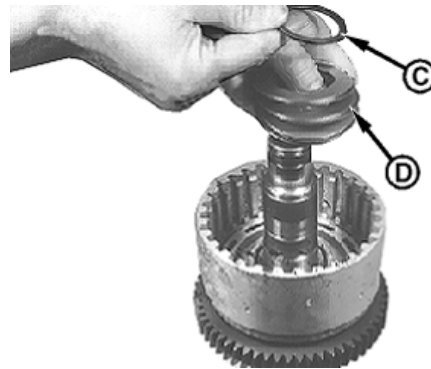
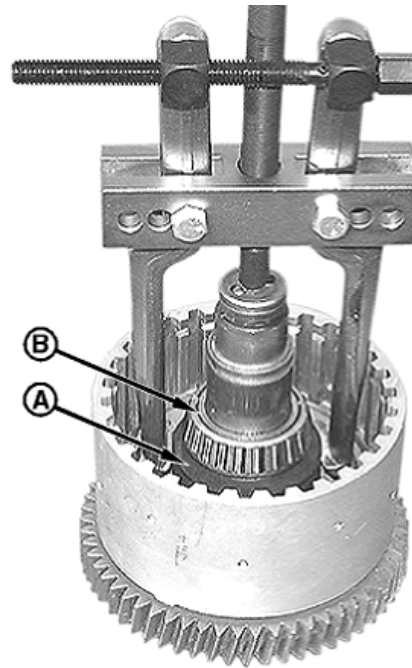
7. Remove flat washer (C) and Belleville washers (D).

IMPORTANT: Replace worn or damaged Belleville washers.

8. Inspect Belleville washers for wear or damage. Replace if necessary.

A—Belleville Washer (7 used)
B—Bearing

C—Flat Washer
D—Belleville Washer (7 used)



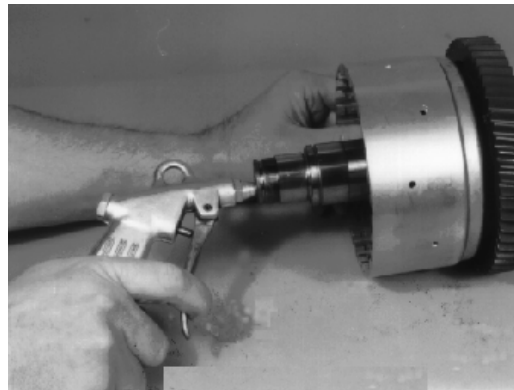
T115474C—UN—24SEP98

T117245—UN—24SEP98

WS68074.00036F9 -19-14JUL10-3/17

IMPORTANT: Gear, drum, and shaft are serviced as an assembly. Do not take apart or damage will occur.

9. Remove piston from shaft using compressed air.



T101536—UN—08JUL96

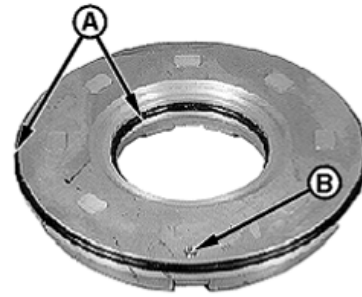
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WS68074.00036F9 -19-14JUL10-4/17

10. Remove O-rings (A) from piston. Ball (B) in piston must move freely in bore.

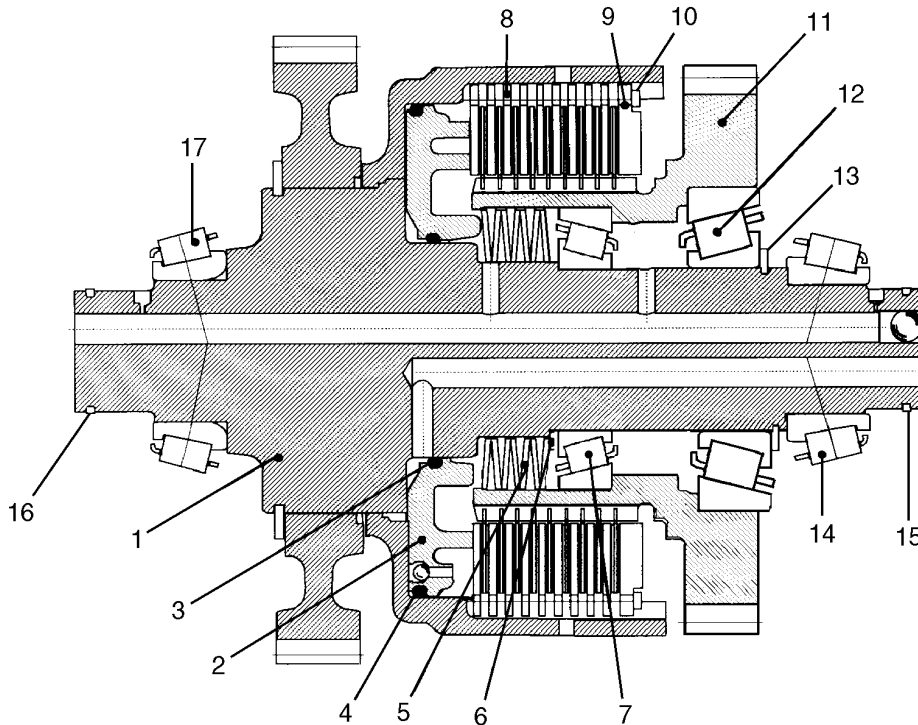
A—O-Rings

B—Bleeder Valve Ball



T117246 —UN—24SEP98

WS68074,00036F9 -19-14JUL10-5/17



T117252

1— Gear, Drum and Shaft
2— Piston with Ball
3— O-Ring
4— O-Ring
5— Belleville Washer (7 used)

6— Flat Washer
7— Roller Bearing
8— Plates and Disks
9— End Plate
10— Snap Ring (shim)

11— Hub
12— Roller Bearing
13— Snap Ring
14— Roller Bearing
15— Sealing Ring (2 used)

16— Sealing Ring
17— Roller Bearing

NOTE: Low range forward and reverse clutch packs have nine plates and nine disks. Third speed clutch pack has six plates and six disks.

11. Check all oil passages with compressed air.

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WS68074,00036F9 -19-14JUL10-6/17

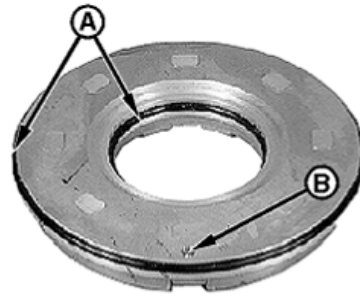
T117252 —UN—24SEP98

NOTE: Inspect O-rings before installing piston. If O-rings are damaged, leakage in the pack will occur.

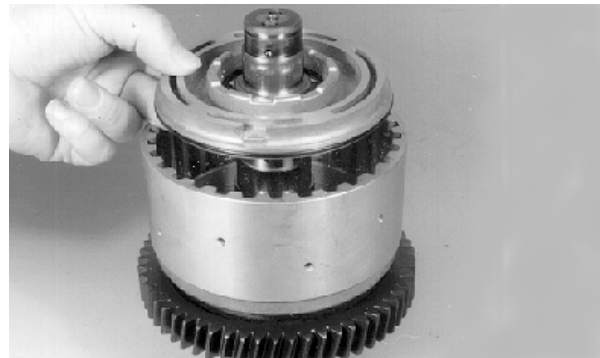
12. Install new O-rings (A) on piston. Apply petroleum jelly on O-rings (A). Check that bleeder valve ball (B) moves freely in bore.
13. Apply clean transmission oil to surface of shaft and hub. Install piston.

A—O-Rings

B—Bleeder Valve Ball



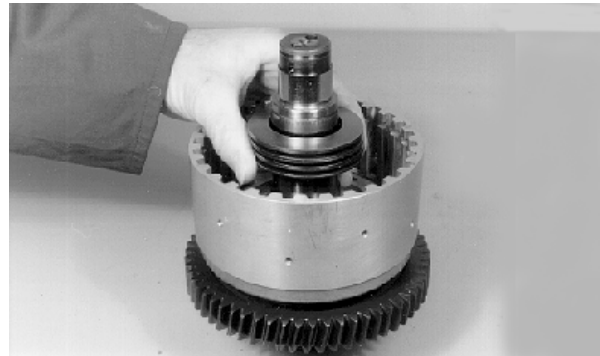
T117246 —UN—24SEP98



T104688 —UN—31OCT96

WS68074.00036F9 -19-14JUL10-7/17

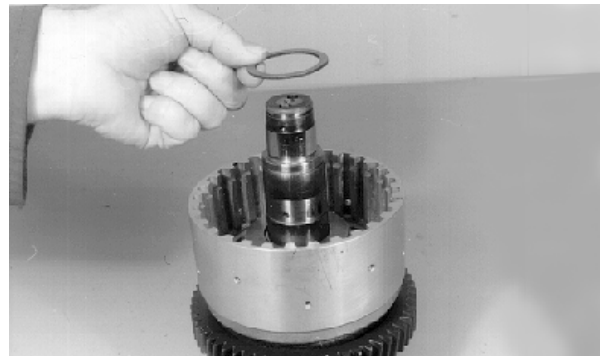
14. Apply petroleum jelly to Belleville washers to aid in assembly. Install one Belleville washer with its concave side down, toward piston. Install remaining Belleville washers (six washers for low range forward and reverse clutch packs and four washers for third speed clutch pack) in pairs with concave sides facing each other.



T104689 —UN—31OCT96

WS68074.00036F9 -19-14JUL10-8/17

15. Apply petroleum jelly to flat washer and install washer.



T104690 —UN—31OCT96

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WS68074.00036F9 -19-14JUL10-9/17

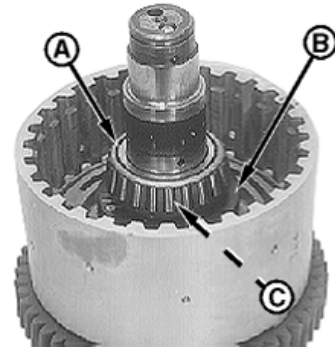
16. Using heat or a press, install bearing (A) until it bottoms on shaft shoulder.

17. Check Belleville washers (B) for proper location.

A—Bearing

C—Shoulder

B—Belleville Washer (7 used)



T117247 —UN—24SEP98

Continued on next page

WS68074,00036F9 -19-14JUL10-10/17

18. Check plate clearance:

IMPORTANT: Low Range Forward and Reverse clutch packs use waved disks. All other clutch packs use flat disks. Identify the correct disks for each clutch pack by the part number stamped on each disk. Use of the incorrect disks will cause high drag, overheating, premature wear and possible clutch pack burn up.

- Starting with a plate, alternately install dry plates and disks.
- Install end plate (A) and snap ring (B).
- Using a depth gauge, measure the distance from drum edge to end plate. Record this measurement as dimension 1.
- Using screwdrivers, pry up on end plate and measure distance from end plate to top of drum surface. Record this measurement as dimension 2.
- Subtract dimension 2 from dimension 1. Example:

Dimension 1	9.80 mm (0.39 in.)
Dimension 2	— 7.10 mm (0.28 in.)
Difference	= 2.70 mm (0.11 in.)

NOTE: Snap ring (B) is available in the following thicknesses:

Specification

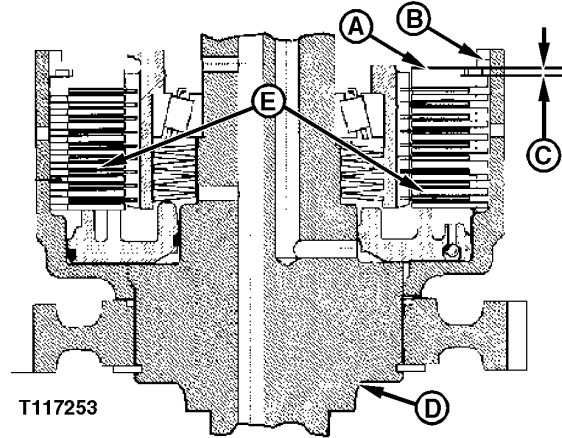
End Plate Snap	
Ring—Thickness.....	2.0 mm (0.079 in.)
Thickness	2.5 mm (0.098 in.)
Thickness	3.0 mm (0.118 in.)
Thickness	3.5 mm (0.138 in.)
Thickness	4.0 mm (0.157 in.)

- Determine correct thickness and number of snap rings to be used to obtain this specification.

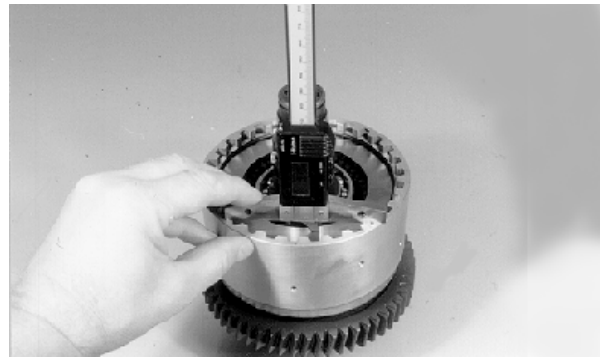
Specification

Low Range Forward and Reverse Clutch Pack	
Plate—Distance.....	2.5—3.2 mm (0.098—0.126 in.)
Third Speed Clutch Pack	
Plate—Distance.....	1.2—1.8 mm (0.047—0.071 in.)

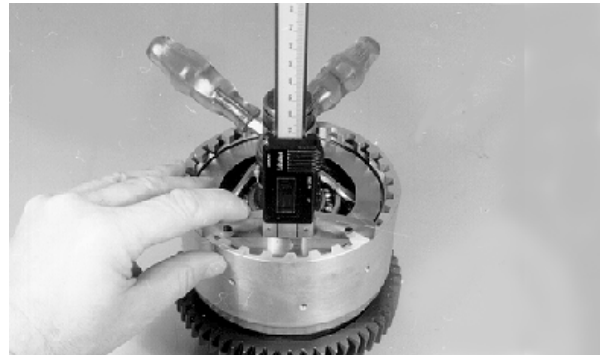
- Remove snap ring (B), end plate (A), and plates and disks (E).



T117253 —UN—24SEP98



T104696 —UN—31OCT96



T104697 —UN—31OCT96

A—End Plate
B—Snap Ring
C—End Plate Specification

D—Shaft with Hub
E—Plates and Disks

Continued on next page

WS68074,00036F9 -19-14JUL10-11/17

NOTE: Keep bearing cups and bearing cones as a matched set if not replacing.

19. Inspect hub bearing cups (A). Replace if necessary.
20. Soak disks in oil for approximately 30 minutes prior to installation. Starting with a plate, alternately install plates and disks (D).

NOTE: Low range forward and reverse clutch packs use nine plates and nine disks. Third speed clutch pack uses six plates and six disks.

NOTE: If more than one snap ring is installed, stagger the snap ring openings.

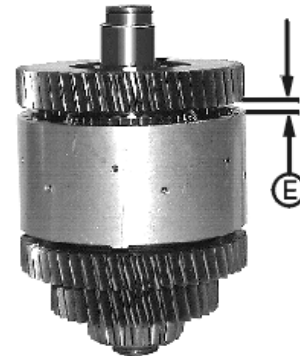
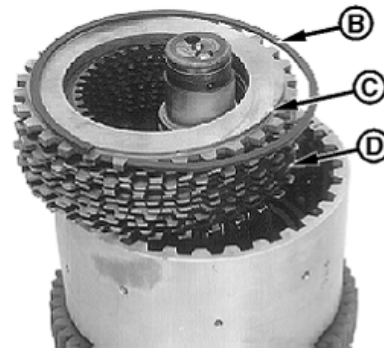
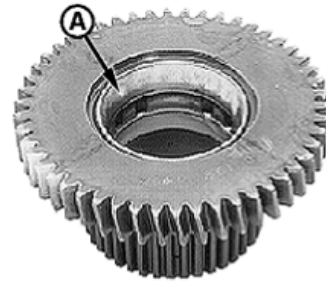
21. Install end plate (C) and correct thickness of snap ring(s) (B) determined in step 18.

IMPORTANT: If gear hub is not fully engaged into plates and disks, damage to disks will result when installing outer bearings.

22. Install gear hub by engaging all plates and disks. Gear hub is fully engaged into plates and disks when distance (E) (bottom of gear to top of drum) is 8.5—10.5 mm (0.34—0.41 in.) for third speed clutch and 7—8 mm (0.28—0.32 in.) for reverse and low range forward.

A—Bearing Cups
B—Snap Ring
C—End Plate

D—Plates and Disks
E—Distance from Gear to Drum



T117248 —UN—24SEP98

T117249 —UN—24SEP98

T118308B —UN—12NOV98

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WS68074.00036F9 -19-14JUL10-12/17

IMPORTANT: Do not preload the bearing. Hub must rotate relatively easily without any end play.

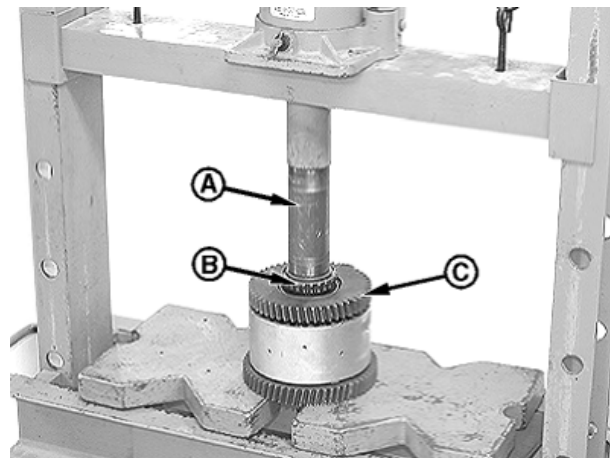
Use a hand press to install bearing cone (B). A motorized press will not provide the control needed to properly install the bearing.

23. Install bearing cone (B) using piece of pipe (A) and a hand press (do not use a motorized press). Press the bearing cone on the shaft until bearing rollers just contact the outer race.

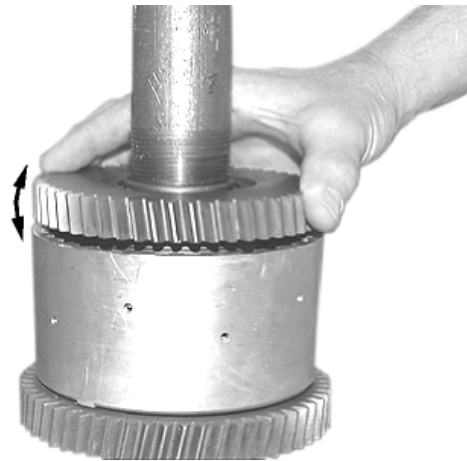
Check for end play by rocking gear hub (C) up and down. Slowly push the bearing on the shaft while rocking the gear hub until no end play can be felt. Do not preload the bearing.

A—Piece of Pipe
B—Bearing Cone

C—Gear Hub



T115475C—UN—24SEP98



T115476B—UN—18MAY98

WS68074,00036F9 -19-14JUL10-13/17

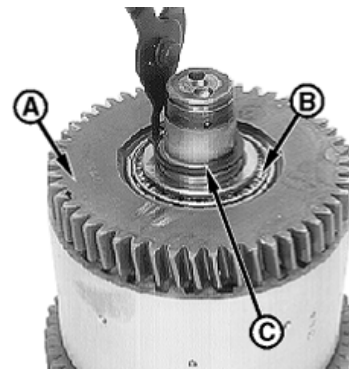
IMPORTANT: Use snap ring with correct thickness. Snap ring should have a thickness that fits the exposed width of the snap ring groove.

NOTE: The snap ring thickness is available in increments of 0.1 mm, from 2.5 mm to 3.2 mm.

24. Install snap ring (C).

A—Gear Hub
B—Bearing

C—Snap Ring

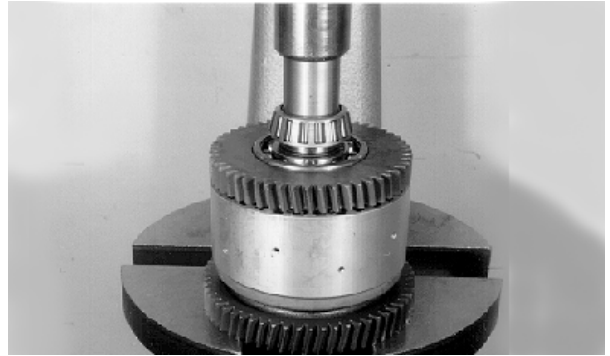


T117250—UN—24SEP98

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WS68074,00036F9 -19-14JUL10-14/17

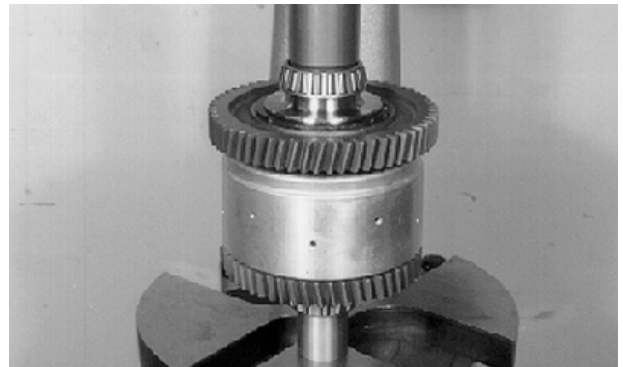
25. Using a press or heat, install roller bearing with its inner race against shaft shoulder.



T104702 —UN—31OCT96

WS68074.00036F9 -19-14JUL10-15/17

26. Turn assembly over and support on bearing inner race with a suitable support. Using a press or heat, install roller bearing with its inner race against shaft shoulder.



T104703 —UN—06FEB97

WS68074.00036F9 -19-14JUL10-16/17

27. Install sealing rings (A).

A—Sealing Ring



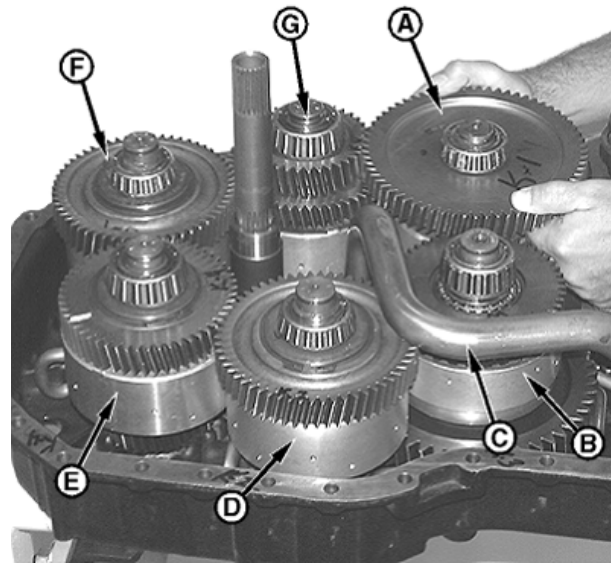
T117251B —UN—24SEP98

WS68074.00036F9 -19-14JUL10-17/17

Remove First Speed, Second Speed, and High Range Forward Clutch Packs—Powershift

1. Remove first speed clutch pack (A).
2. Remove screws holding pickup tube (C) to case.
3. Move pickup tube (C) slightly and remove second speed clutch pack (D).
4. Lift up reverse clutch pack (F) slightly and remove high range forward clutch pack (E).

A—First Speed Clutch Pack	E—High Range Forward Clutch Pack
B—Third Speed Clutch Pack	F—Reverse Clutch Pack
C—Oil Pickup Tube	G—Low Range Forward Clutch Pack
D—Second Speed Clutch Pack	



T117283B —UN—24SEP98

CED,OUO1017,90 -19-01SEP06-1/1

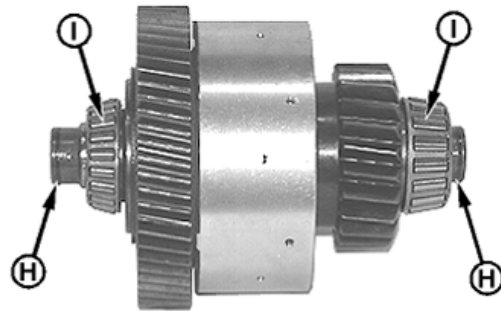
Disassemble and Assemble First Speed, Second Speed, and High Range Forward Clutch Packs—Powershift

NOTE: Second speed clutch pack is shown for disassembly and assembly procedures. Disassembly and assembly of first speed and high range forward clutch packs are the same.

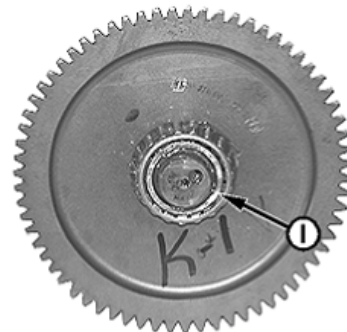
1. Remove sealing rings (H).
2. Remove bearings (I). Bearings are a press fit.

NOTE: First speed clutch pack requires destroying the bearings for removal.

H—Sealing Rings	I—Bearings
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T117284B —UN—24SEP98



T117285B —UN—24SEP98

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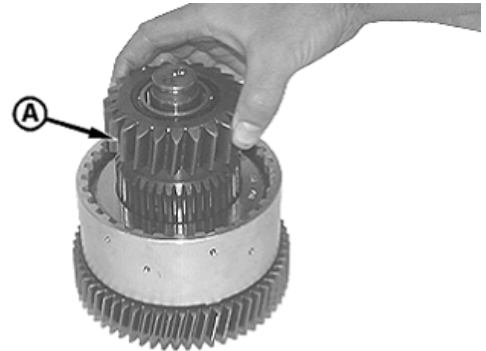
WS68074,00036FF -19-14JUL10-1/12

3. Lift gear hub (A) out of clutch pack with upper bearing and spacer in gear hub.
4. Remove lower bearing (B) and washer (C).
5. Remove snap ring (D).
6. Remove snap ring (E), backing plate (F), and plates and disks (G).

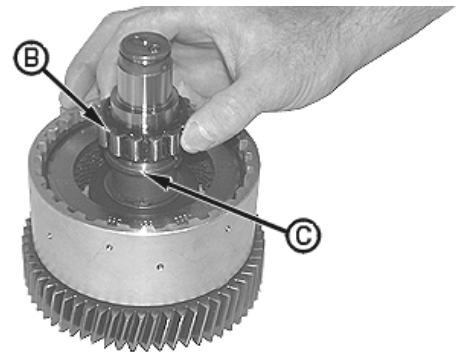
NOTE: Second speed and high range forward clutch packs have six plates (H) and six disks (I). First speed clutch pack has ten plates (H) and ten disks (I).

A—Gear Hub
 B—Bearing
 C—Washer
 D—Snap Ring
 E—Snap Ring

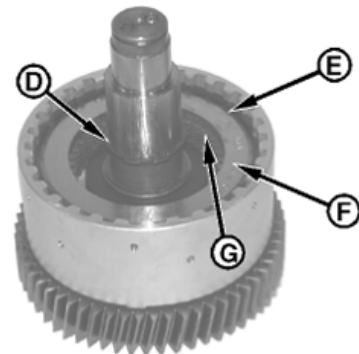
F—Backing Plate
 G—Plates and Disks
 H—Plates
 I—Disks



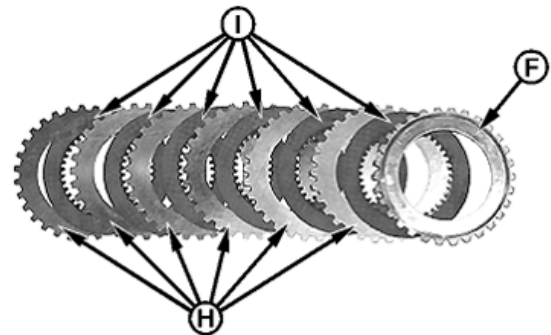
T117286B—UN—24SEP98



T117287B—UN—19OCT98



T117288B—UN—24SEP98



T117241C—UN—24SEP98

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WS68074.00036FF -19-14JUL10-2/12

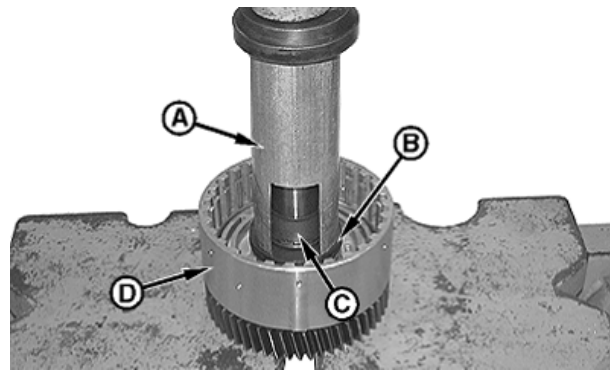
7. Support gear hub assembly (D) in press. Using DFT1162 Powershift Clutch Pack Snap Ring Removal and Installation Tool (A), (see Group 0399 for instructions to make tool) compress Belleville washers (B) and remove snap ring (C).

8. Remove flat washer (E) and Belleville washers (F).

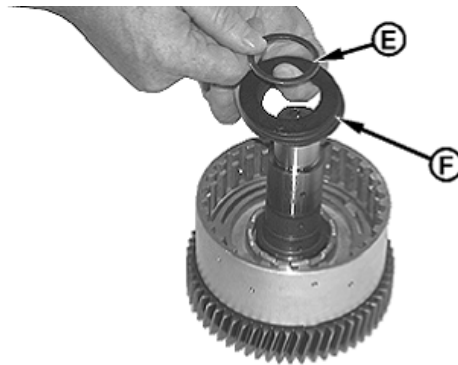
IMPORTANT: Replace worn or damaged Belleville washers.

9. Inspect Belleville washers for wear or damage. Replace if necessary.

- | | |
|--|------------------------------|
| A—DFT1162 Powershift Clutch Pack Snap Ring Removal and Installation Tool | D—Gear Hub Assembly |
| B—Belleville Washers | E—Flat Washer |
| C—Snap Ring | F—Belleville Washer (5 used) |



T117289B—UN—24SEP98

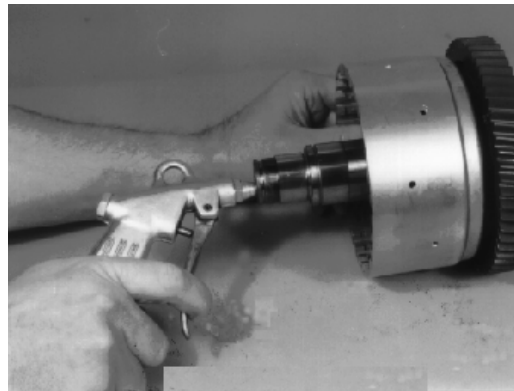


T117290B—UN—24SEP98

WS68074,00036FF -19-14JUL10-3/12

IMPORTANT: Gear, drum, and shaft are serviced as an assembly. Do not take apart or damage will occur.

10. Remove piston from shaft using compressed air.



T101536—UN—08JUL96

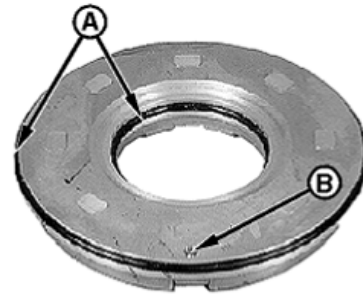
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WS68074,00036FF -19-14JUL10-4/12

11. Remove O-rings (A) from piston. Bleeder valve ball (B) in piston must move freely in bore.

A—O-Rings

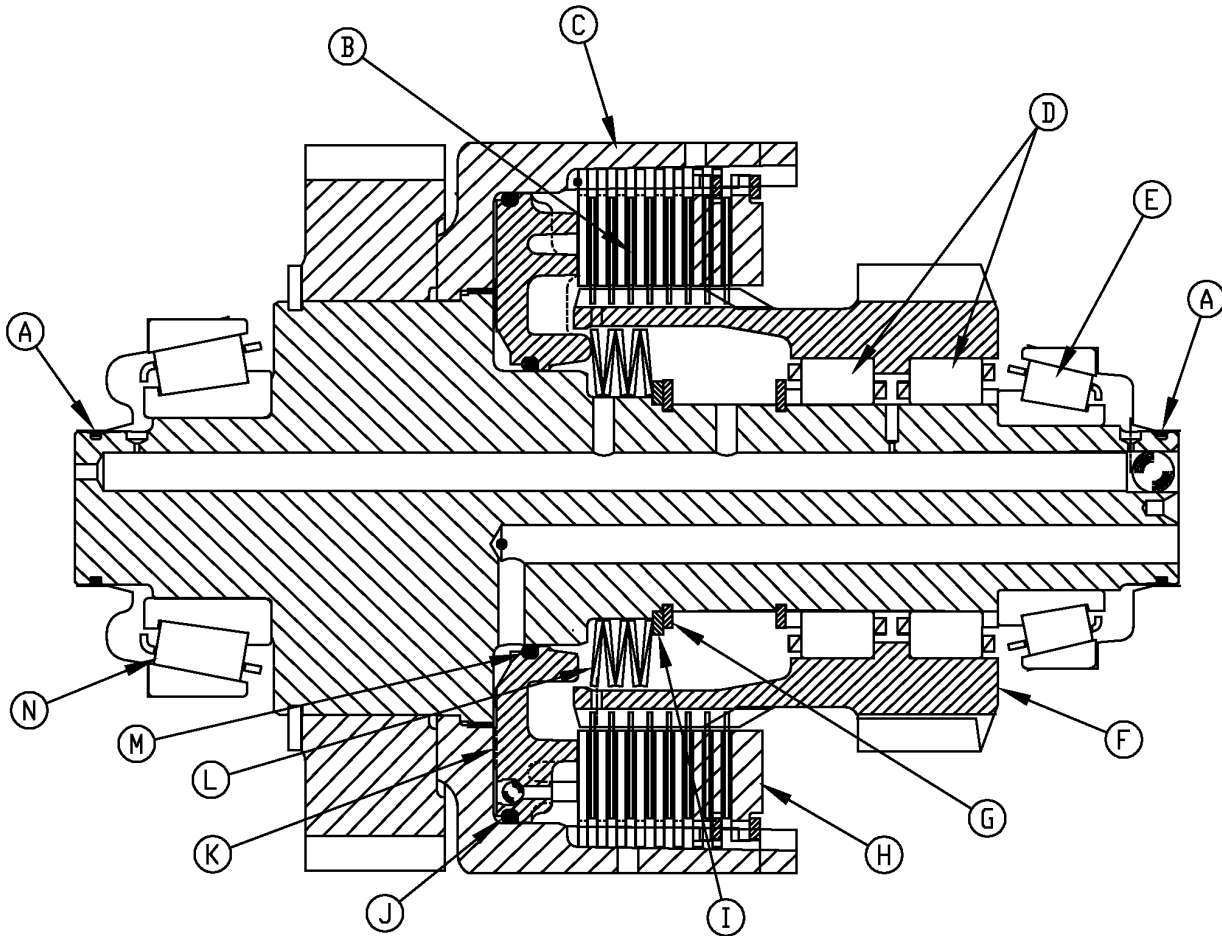
B—Bleeder Valve Ball



T117246 —UN—24SEP98

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WS68074,00036FF -19-14JUL10-5/12



T117282

T117282—UN—24SEP98

- | | | | |
|---------------------------|--------------------------|------------------------------|--------------------------|
| A—Sealing Ring (2 used) | E—Tapered Roller Bearing | I—Washer | M—O-Ring |
| B—Plates and Disks | F—Hub | J—O-Ring | N—Tapered Roller Bearing |
| C—Gear, Drum and Shaft | G—Snap Ring | K—Piston with Ball | |
| D—Roller Bearing (2 used) | H—End Plate | L—Belleville Washer (5 used) | |

12. Check all oil passages with compressed air.

NOTE: First speed clutch pack uses ten plates and ten disks (B). Second speed and high range forward clutch packs use six plates and six disks (B).

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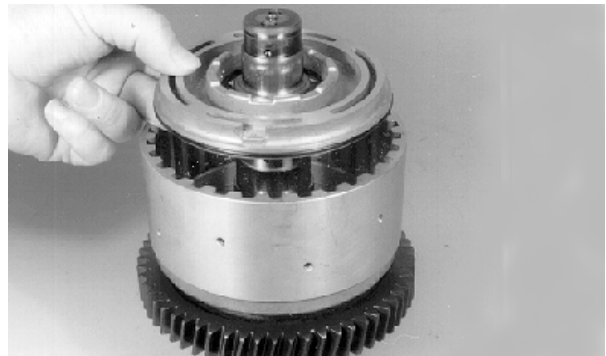
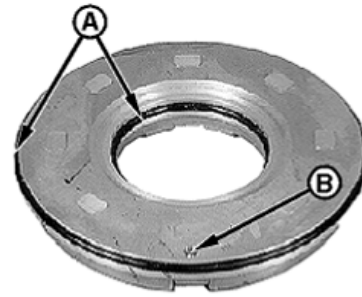
WS68074,00036FF -19-14JUL10-6/12

NOTE: Inspect O-rings before installing piston. If O-rings are damaged, leakage in the pack will occur.

13. Install new O-rings (A) on piston. Apply petroleum jelly on O-rings. Check that bleeder valve ball (B) moves freely in bore.
14. Apply clean transmission oil to surface of shaft and hub. Install piston.
15. Apply petroleum jelly to Belleville washers (C) to aid in assembly. Install one Belleville washer with its concave side down, toward piston. Install remaining four Belleville washers in pairs with concave sides facing each other.
16. Install washer (D).

A—O-Rings
B—Bleeder Valve Ball

C—Belleville washer (5 used)
D—Washer



T117246 —UN—24SEP98

T104688 —UN—31OCT96

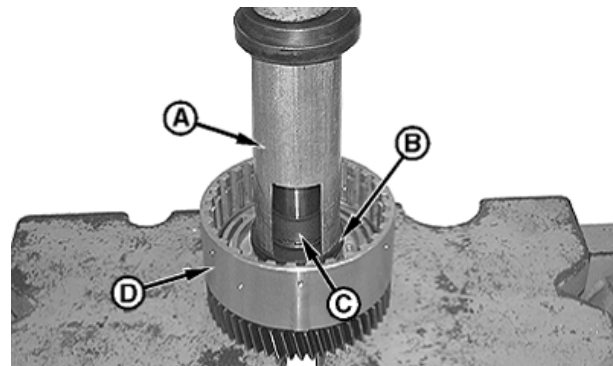
T117290C —UN—08OCT98

WS68074,00036FF -19-14JUL10-7/12

17. Support gear hub assembly (D) in press. Using DFT1162 Powershift Clutch Pack Snap Ring Removal and Installation Tool (A), (see Group 0399 for instructions to make tool) compress Belleville washers (B) and install snap ring (C).

A—DFT1162 Powershift Clutch Pack Snap Ring Removal and Installation Tool
B—Belleville Washers

C—Snap Ring
D—Gear Hub Assembly



T117289B —UN—24SEP98

Continued on next page

WS68074,00036FF -19-14JUL10-8/12

18. Check plate clearance:

IMPORTANT: Low Range Forward and Reverse clutch packs use waved disks. All other clutch packs use flat disks. Identify the correct disks for each clutch pack by the part number stamped on each disk. Use of the incorrect disks will cause high drag, overheating, premature wear and possible clutch pack burn up.

- Starting with a plate, alternately install dry plates and disks.
- Install end plate (A) and snap ring (B).
- Using a depth gauge, measure the distance from drum edge to end plate. Record this measurement as dimension 1.
- Using screwdrivers, pry up on end plate (A) and measure distance from end plate to top of drum surface. Record this measurement as dimension 2.
- Subtract dimension 2 from dimension 1. Example:

Dimension 1	9.80 mm (0.39 in.)
Dimension 2	— 7.10 mm (0.28 in.)
Difference	= 2.70 mm (0.11 in.)

NOTE: Snap ring (B) is available in the following thicknesses:

Specification

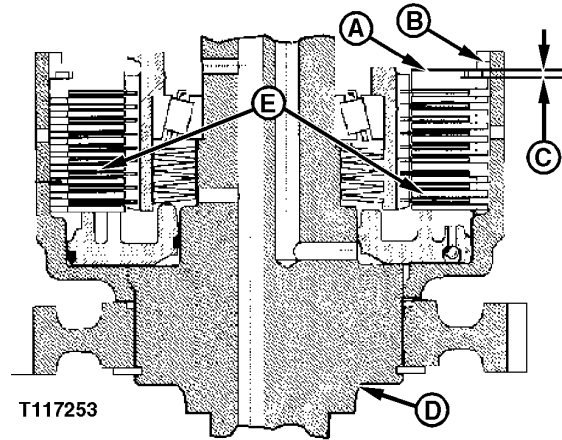
End Plate Snap	
Ring—Thickness.....	2.0 mm (0.079 in.)
Thickness	2.5 mm (0.098 in.)
Thickness	3.0 mm (0.118 in.)
Thickness	3.5 mm (0.138 in.)
Thickness	4.0 mm (0.157 in.)

- Determine correct thickness and number of snap rings to be used to obtain this specification.

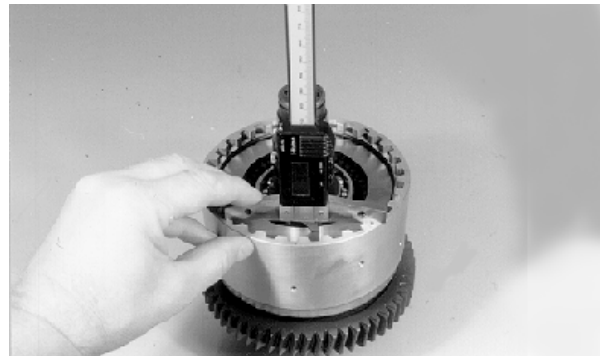
Specification

First Speed Clutch Pack	
Plate—Distance.....	2.0—3.0 mm (0.079—0.118 in.)
Second Speed and High Range Forward Clutch Pack	
Plate—Distance.....	1.2—1.8 mm (0.047—0.071 in.)

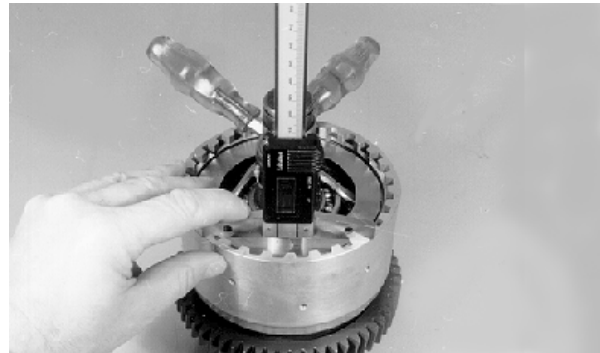
- Remove snap ring (B), end plate (A), plates and disks (E).



T117253 —UN—24SEP98



T104696 —UN—31OCT96



T104697 —UN—31OCT96

A—End Plate
B—Snap Ring
C—End Plate Specification

D—Gear Hub Assembly
E—Plates and Disks

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WS68074.00036FF -19-14JUL10-9/12

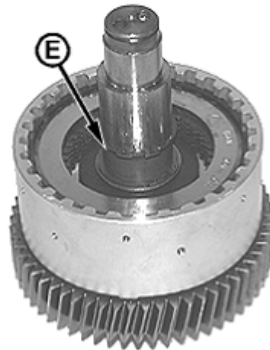
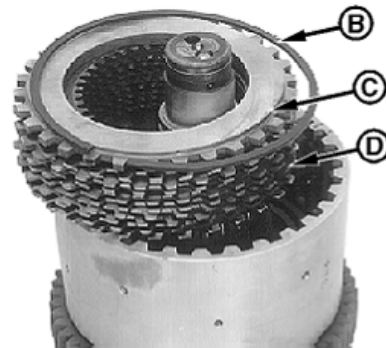
NOTE: Keep bearings in same location on gear hub shaft if not replacing.

19. Inspect bearing and hub bearing surface (A). Replace if necessary.
20. Soak disks in oil for approximately 30 minutes prior to installation. Starting with a plate, alternately install plates and disks (D).

NOTE: If more than one snap ring is installed, stagger the snap ring openings.

21. Install end plate (C) and correct thickness of snap ring(s) (B) determined in step 18.
22. Install snap ring (E).

A —Bearing and Hub Bearing Surface	D —Plates and Disks
B —Snap Ring (as required)	E —Snap Ring
C —End Plate	



T117291B —UN—24SEP98

T117249 —UN—24SEP98

T117292B —UN—24SEP98

Continued on next page

WS68074.00036FF -19-14JUL10-10/12

23. Install spacer (A) so it rests on snap ring (D).
24. Install bearing (B) making sure bearing is installed with the bottom of rollers (C) on spacer (A).

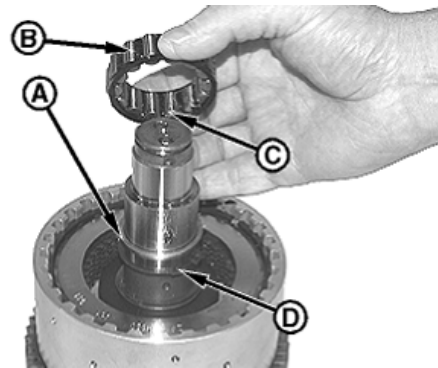
IMPORTANT: If gear hub is not fully engaged into plates and disks, damage to disks will result when installing outer bearings.

25. Install gear hub (E) over bearing (B) by engaging all plates and disks (F). Gear hub is fully engaged into plates and disks when distance (I) (bottom of gear to top of drum) is 7 mm for first speed clutch, 15 mm for second speed clutch, and 19 mm for high range forward clutch.

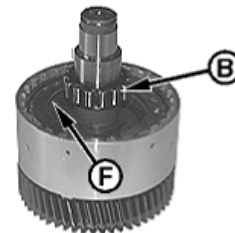
26. Install upper bearing (G) into gear hub (E) and spacer (H) on top of bearing.

A—Spacer
 B—Bearing
 C—Rollers
 D—Snap Ring
 E—Gear Hub

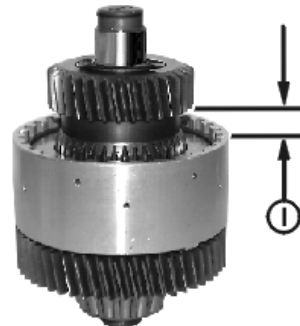
F—Plates and Disks
 G—Upper Bearing
 H—Spacer
 I—Distance from Gear Hub to Drum



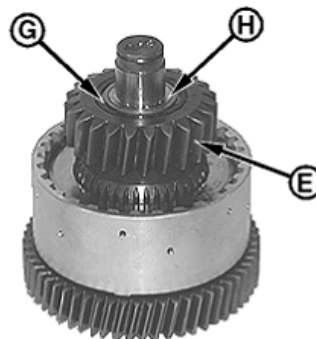
T117295B—UN—24SEP98



T117294B—UN—24SEP98



T118307B—UN—12NOV98



T117295B—UN—24SEP98

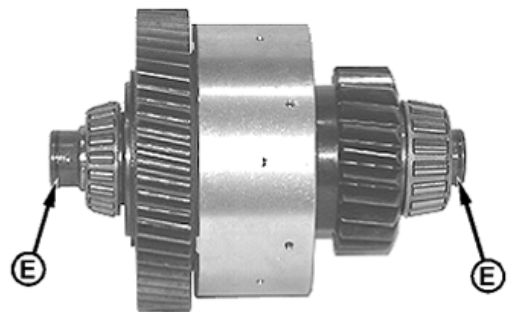
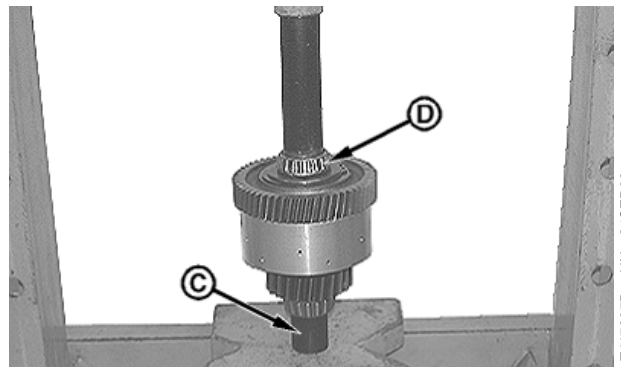
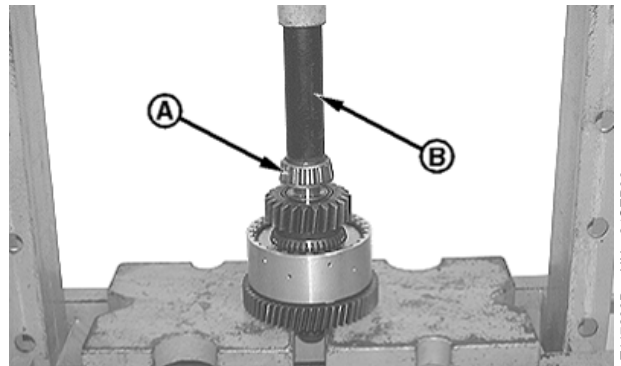
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WS68074,00036FF -19-14JUL10-11/12

27. Press on inner race of bearing (A) using a pipe (B) until inner race contacts shaft shoulder.
28. Turn assembly over and support bearing inner race with a short pipe (C). Press on inner race of bearing (D) until inner race contacts shaft shoulder.
29. Install sealing rings (E).

A—Bearing
B—Pipe
C—Short Pipe

D—Bearing
E—Sealing Rings



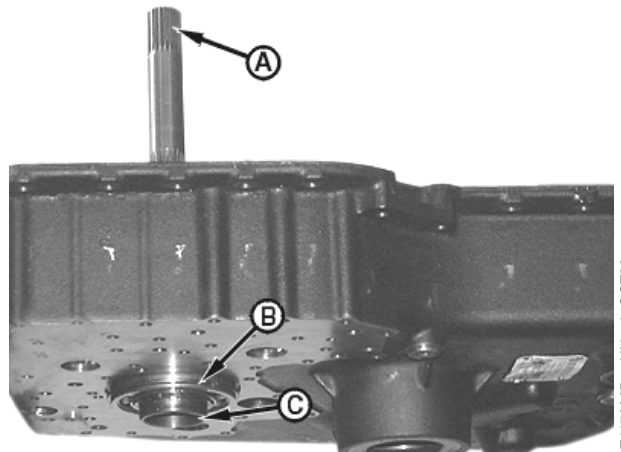
WS68074,00036FF -19-14JUL10-12/12

Remove Drive Shaft—Powershift

Using a soft-face hammer, tap on top of shaft (A) until snap ring (B) is exposed. Remove snap ring (B). Tap on bottom of shaft (C) and knock shaft out of case.

A—Top of Shaft
B—Snap Ring

C—Bottom of Shaft



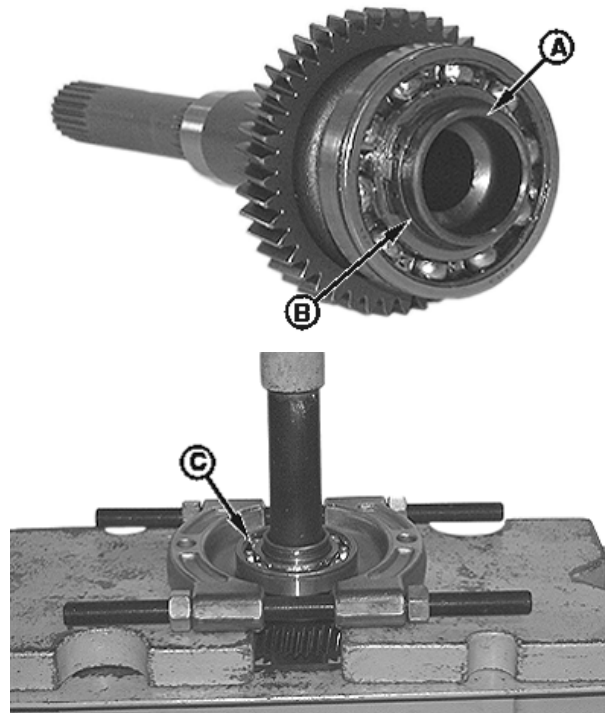
CED,OUO1032,729 -19-01SEP06-1/1

Disassemble and Assemble Drive Shaft—Powershift

1. Remove sealing ring (A).
2. Remove snap ring (B).
3. Put shaft in press and remove bearing (C) from shaft.

A—Sealing Ring
B—Snap Ring

C—Bearing



T117307B—UN—22SEP98

T117306B—UN—22SEP98

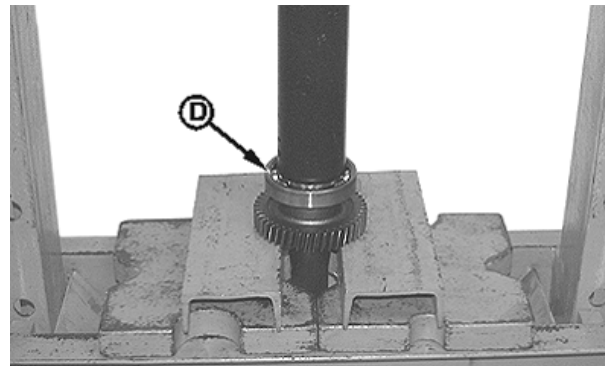
CED,OUO1032,730 -19-01SEP06-1/3

NOTE: Drive shaft (A), turbine shaft (B) and snap ring (C) are serviced as an assembly only.

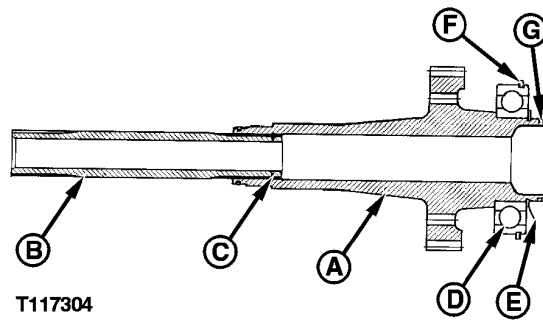
4. Press ball bearing (D) on drive shaft (A) until snap ring groove is visible.

A—Drive Shaft
B—Turbine Shaft
C—Snap Ring
D—Ball Bearing

E—Snap Ring
F—Snap Ring
G—Sealing Ring



T117305B—UN—22SEP98



T117304

T117304—UN—22SEP98

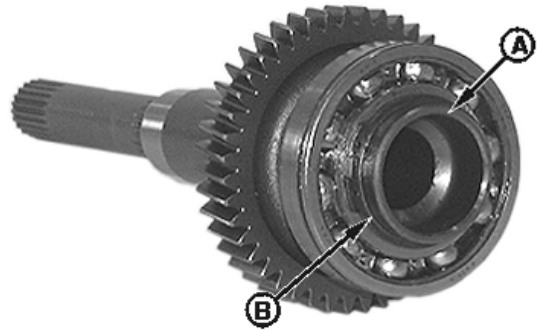
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CED,OUO1032,730 -19-01SEP06-2/3

5. Install snap ring (B).
6. Install sealing ring (A).

A—Sealing Ring

B—Snap Ring



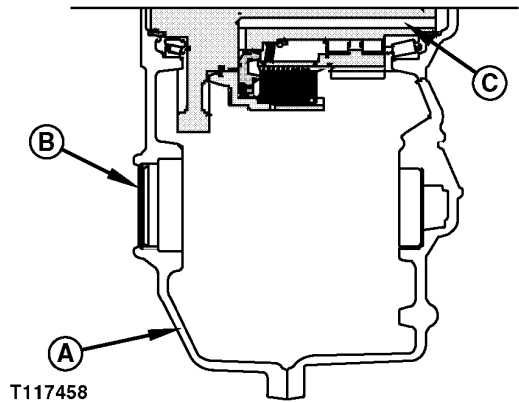
T117307B —UN—22SEP98

CED,OUO1032,730 -19-01SEP06-3/3

Remove MFWD Output Shaft (If Equipped)—Powershift

A—Transmission Case
B—Cap

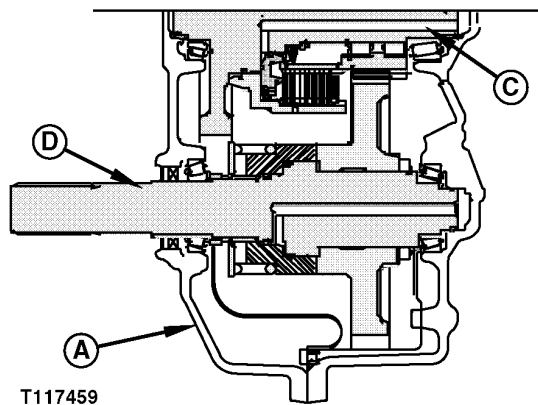
C—K1 Clutch Pack
D—MFWD Output Shaft



T117458

Without MFWD

T117458 —UN—29SEP98



T117459

With MFWD

T117459 —UN—29SEP98

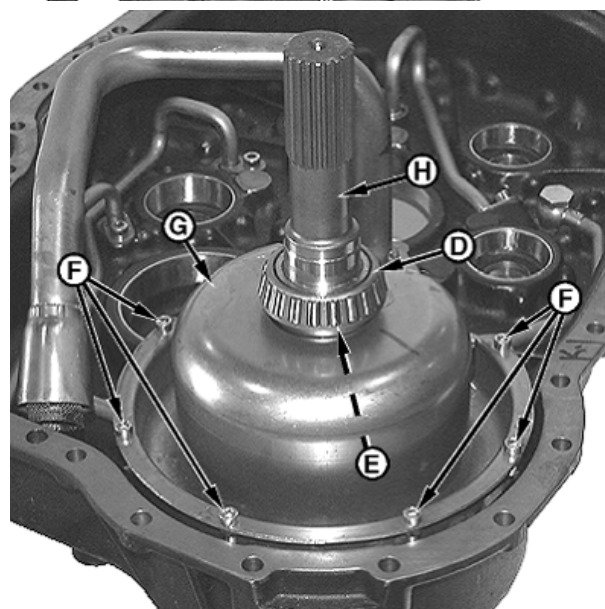
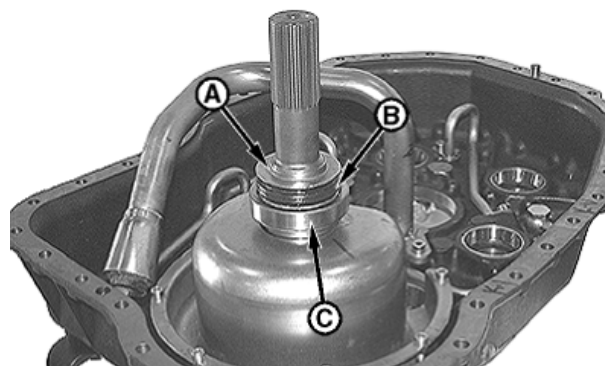
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CED,OUO1032,731 -19-01SEP06-1/2

1. Remove seal guard (A), seal (B) and bearing cup (C).
2. Remove bearing (D) and sleeve (E).
3. Remove six socket head screws (F).
4. Remove cover (G) and lift out MFWD shaft (H).

A—Seal Guard
B—Seal
C—Bearing Cup

E—Sleeve
F—Socket Head Screws
G—Cover
H—MFWD Shaft



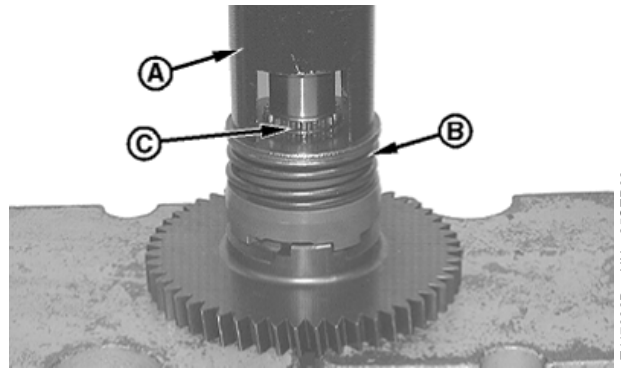
CED,OUO1032,731 -19-01SEP06-2/2

Disassemble MFWD Shaft (If Equipped)—Powershift

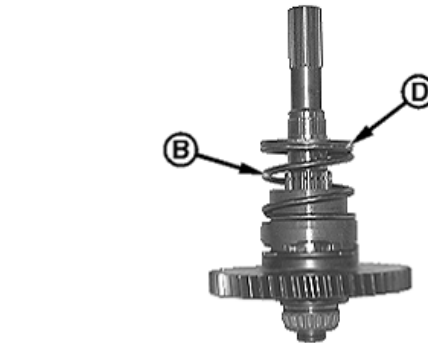
1. Using a press and DFT1163 MFWD Shaft Snap Ring Removal and Installation Tool (A), (see Group 0399 for instructions to make tool) compress spring (B) and remove snap ring (C). Slowly release pressure.
2. Remove backing plate (D) and compression spring (B).
3. Lightly pry up on sliding sleeve (E) and lift up off of shaft.

A—DFT1163 MFWD Shaft
Snap Ring Removal and
Installation Tool
B—Spring
C—Snap Ring

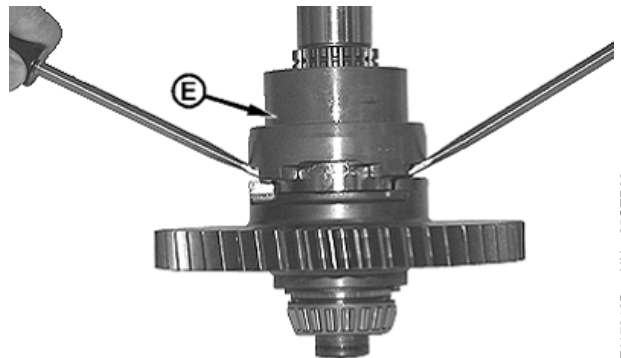
D—Backing Plate
E—Sliding Sleeve



T117338B —UN—25SEP98



T117339B —UN—25SEP98



T117340B —UN—25SEP98

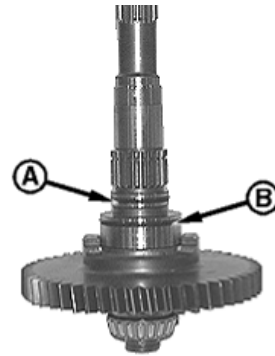
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WS68074,0003700 -19-14JUL10-1/2

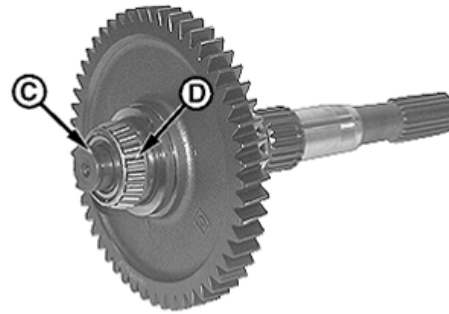
4. Remove O-rings (A and B).
5. Remove sealing ring (C).
6. Remove bearing (D). Bearing is a press fit.
7. Remove snap ring (E).
8. Remove thrust washer (F) and gear (G) off of shaft (H).

A—O-Ring
B—O-Ring
C—Sealing Ring
D—Bearing

E—Snap Ring
F—Thrust Washer
G—Gear
H—Shaft



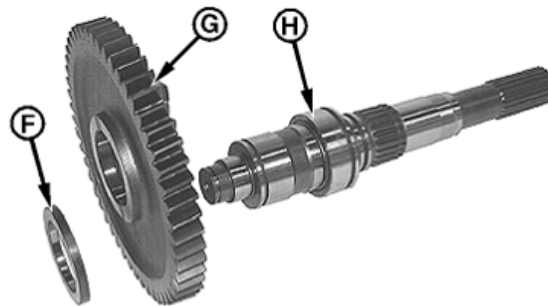
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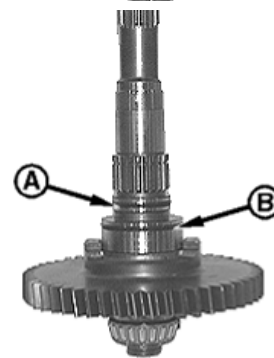
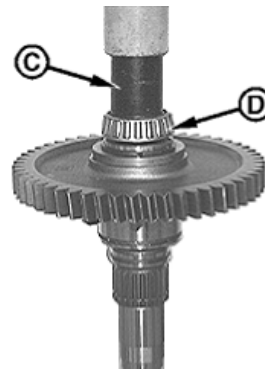
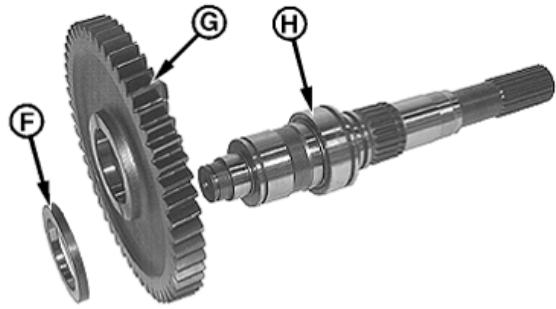
WS68074,0003700 -19-14JUL10-2/2

Assemble MFWD Shaft (If Equipped)—Powershift

1. Install gear (G) and thrust washer (F) on shaft (H).
2. Install snap ring (E).
3. Put shaft (H) in press. Using a short piece of pipe (C), press bearing (D) onto shaft.
4. Install O-rings (A and B).

A—O-Ring
 B—O-Ring
 C—Pipe
 D—Bearing

E—Snap Ring
 F—Thrust Washer
 G—Gear
 H—Shaft



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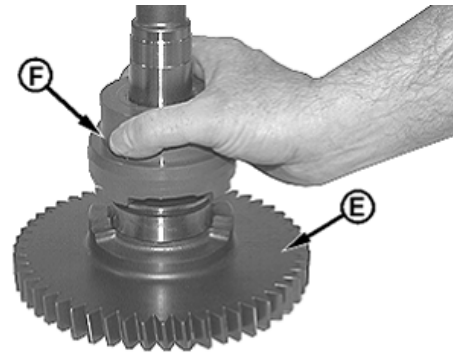
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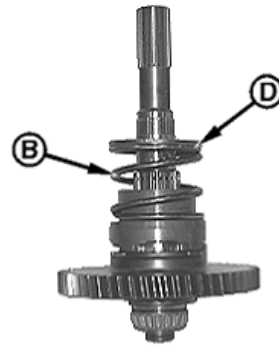
WS68074,0003701 -19-14JUL10-1/2

5. Oil sealing surfaces of sliding sleeve (F). Install sliding sleeve until engaged with spur gear (E).
6. Install spring (B) and backing plate (D).
7. Press spring (B) down using DFT1163 MFWD Shaft Snap Ring Removal and Installation Tool (A) (see Group 0399 for instructions to make tool). Install snap ring (C) into groove of shaft.
8. Install cover (G) and spacer (H).
9. Press bearing (I) onto MFWD shaft.
10. Install new sealing ring on end of shaft.

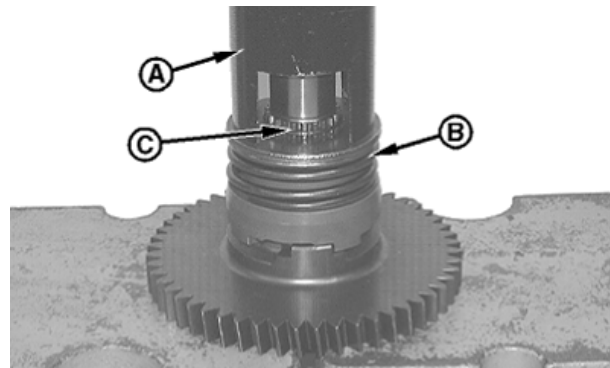
- | | |
|--|------------------|
| A—DFT1163 MFWD Shaft
Snap Ring Removal and
Installation Tool | F—Sliding Sleeve |
| B—Spring | G—Cover |
| C—Snap Ring | H—Spacer |
| D—Backing Plate | I— Bearing |
| E—Spur Gear | |



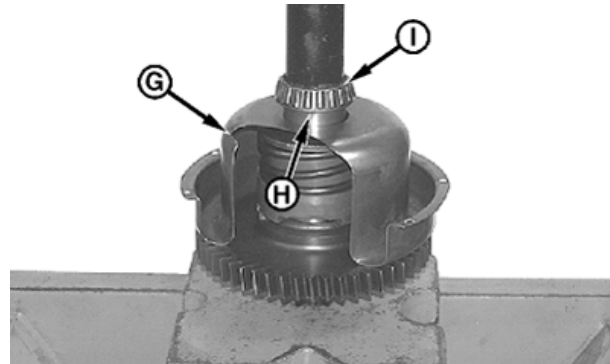
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T117339B —UN—25SEP98



T117338B —UN—25SEP98



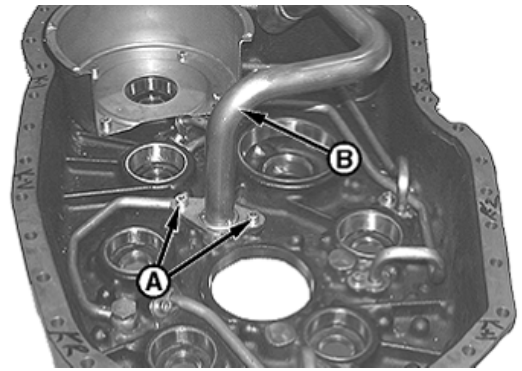
T117814B —UN—15OCT98

WS68074,0003701 -19-14JUL10-2/2

Remove Oil Suction Tube—Powershift

1. Remove socket head screws (A).
2. Remove oil suction tube (B).

A—Socket Head Screw (2 used) B—Oil Suction Tube



T117368B —UN—26SEP98

CED,OUO1032,734 -19-01SEP06-1/1

Remove and Install Oil Supply Tubes—Powershift

1. Remove four socket head screws (A) and remove plate (B).
2. Remove socket head screws (G) and remove lines. For MFWD line (C), remove banjo bolt (H), sealing rings (I) and socket head screw.

NOTE: Keep bearings and cups as a matched set if not replacing.

3. Remove bearing cups (K).
4. Replace O-rings (J) and sealing washers (I) for MFWD line. Apply petroleum jelly to O-rings (J) and install tubes in case.
5. Clean threads of socket head screws with cure primer and apply thread lock and sealer (medium strength) to threads. Install and tighten to specification.

Specification

Oil Supply Tubes Socket
Head Screws—Torque..... 23 N·m (204 lb-in.)

6. For MFWD (C) tube, install sealing rings (I) and tighten banjo bolt (H) to specification.

Specification

MFWD Oil Tube Banjo
Bolt—Torque..... 45 N·m (33 lb-ft)

7. Install plate (B).
8. Clean threads of socket head screws (A) with cure primer and apply thread lock and sealer (medium strength) to threads of screws (A) and tighten to specification.

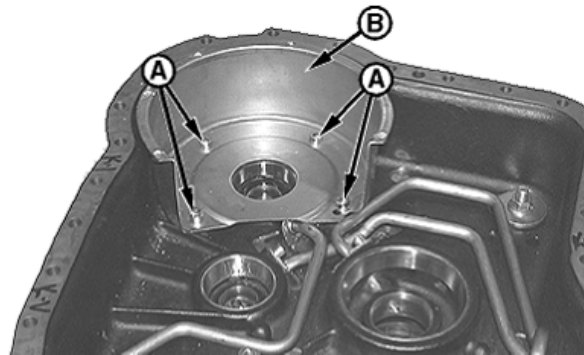
Specification

MFWD Plate Socket
Head Screws—Torque..... 23 N·m (204 lb-in.)

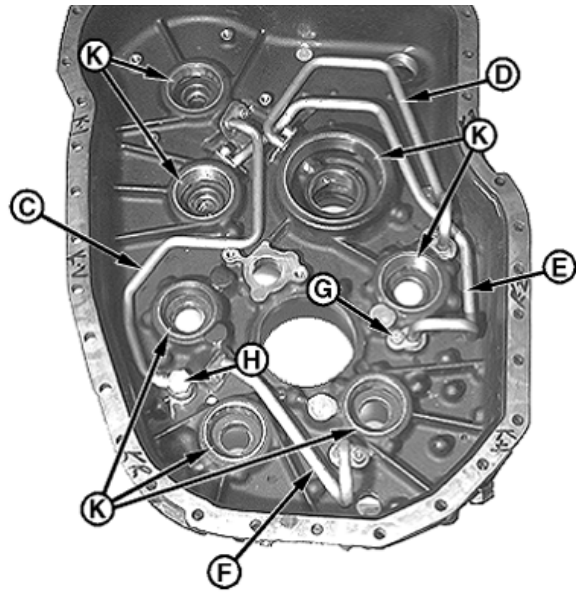
NOTE: Install bearing cups in same place if not replacing.

9. Install bearing cups (K).

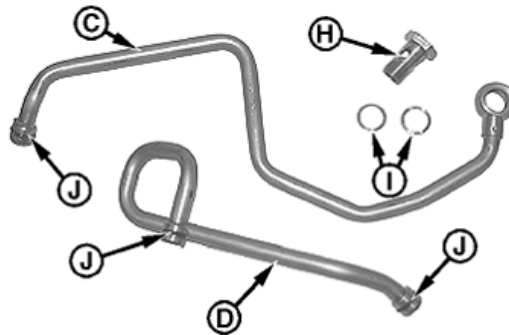
- | | |
|------------------------------|------------------------------|
| A—Socket Head Screw (4 used) | G—Socket Head Screw (7 used) |
| B—Plate | H—Banjo Bolt |
| C—MFWD Line | I—Sealing Ring (2 used) |
| D—Third Speed Clutch Line | J—O-Ring (7 used) |
| E—First Speed Clutch Line | K—Bearing Cup (7 used) |
| F—Low Range Forward Line | |



T117370B—UN—25SEP98



T117371B—UN—25SEP98



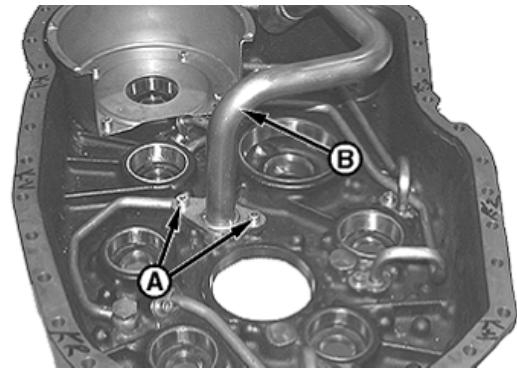
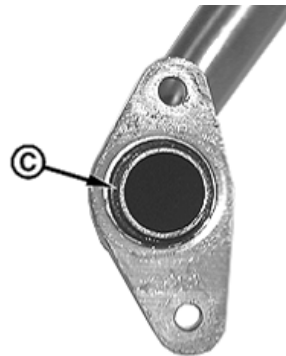
T117372B—UN—25SEP98

CED,OUO1032,735 -19-25OCT99-1/1

Install Oil Suction Tube—Powershift

1. Replace O-ring (C).
2. Install tube (B) in bore. Do not install socket head screws (A) at this time.

A—Socket Head Screw (2 used) C—O-Ring
B—Oil Suction Tube



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CED,OUO1032,736 -19-01SEP06-1/1

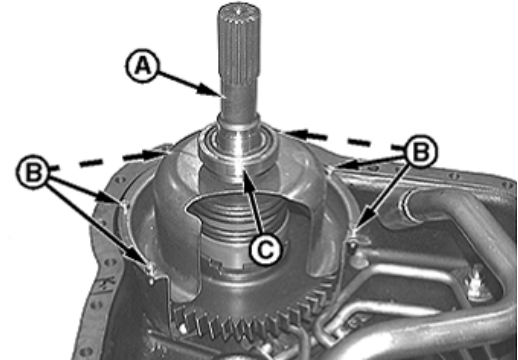
Install MFWD Shaft to Assemble Transmission (If Equipped)—Powershift

1. Install MFWD shaft assembly (A) into transmission case.
2. Clean threads of socket head screws (B) with cure primer and apply thread lock and sealer (medium strength) to threads.
3. Install six socket head screws (B) through shield and tighten to specification.

Specification

MFWD Shaft
Shield Socket Head
Screws—Torque..... 9.5 N·m (84 lb-in)

4. Install bearing cup (C).



A—MFWD Shaft Assembly C—Bearing Cup
B—Socket Head Screw (6 used)

T117464B —UN—29SEP98

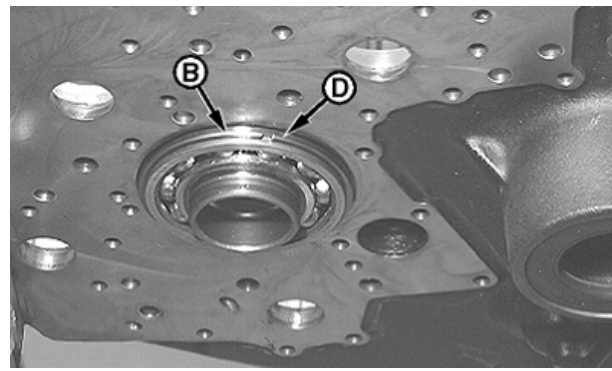
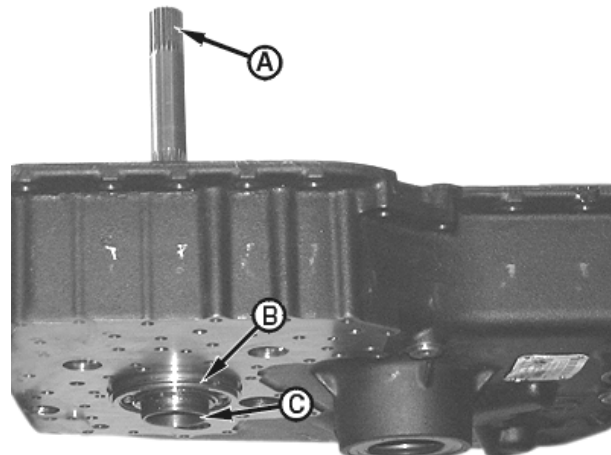
CED,OUO1032,737 -19-25OCT99-1/1

Install Drive Shaft—Powershift

1. Using a soft hammer, tap on top of shaft (A) until snap ring groove in bearing is visible.
2. Install snap ring (B).
3. Tap on bottom of shaft (C) until snap ring (B) bottoms out on recess in transmission case (D).

A—Top of Shaft
B—Snap Ring

C—Bottom of Shaft
D—Case Recess



CED,OUO1032,738 -19-01SEP06-1/1

Install Clutch Packs—Powershift

NOTE: Sealing rings must be on clutch packs before installation.

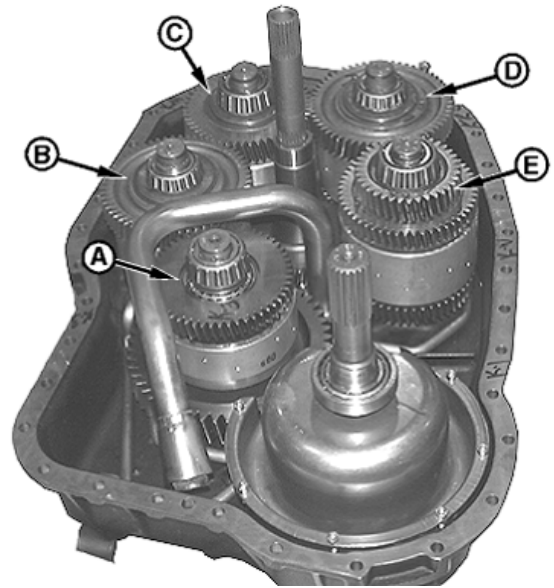
1. Install third speed clutch pack (A).
2. Install clutch packs in order, high range forward (C), second speed (B), low range forward (E) and reverse (D).
3. Clean socket head screws (F) with cure primer and apply thread lock and sealer (medium strength) to threads.
4. Install socket head cap screws (F) and tighten to specification.

Specification

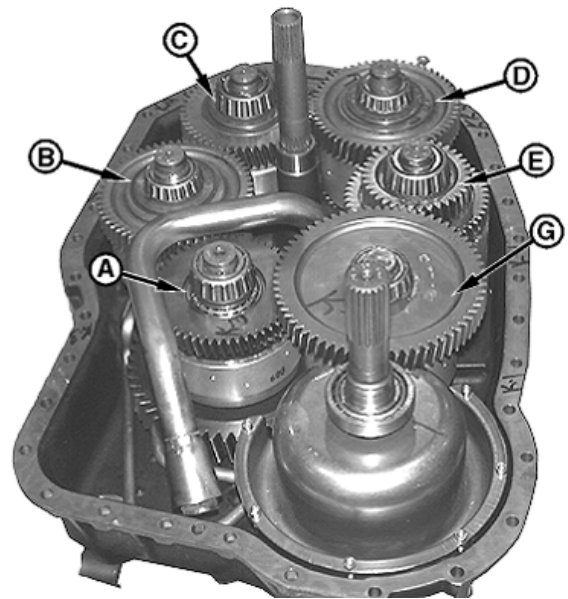
Oil Suction Tube Socket
 Head Screws—Torque..... 23 N·m (204 lb-in.)

5. Install first speed clutch pack (G).

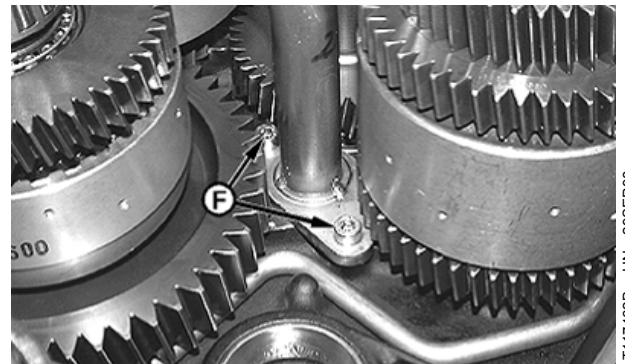
- | | |
|---|--|
| A—Third Speed Clutch Pack | E—Low Range Forward Clutch Pack |
| B—Second Speed Clutch Pack | F—Socket Head Screw (2 used) |
| C—High Range Forward Clutch Pack | G—First Speed Clutch Pack |
| D—Reverse Clutch Pack | |



T117460B—UN—28SEP98



T117461B—UN—28SEP98



T117462B—UN—29SEP98

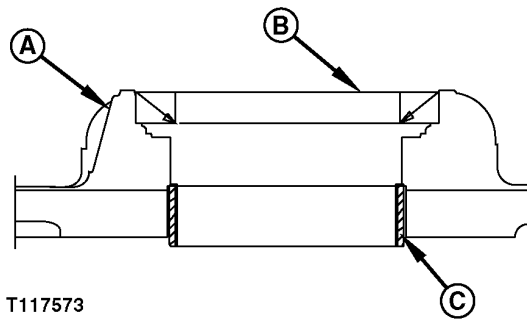
CED,OUO1032,739 -19-25OCT99-1/1

Assemble Converter Side of Case—Powershift

1. Using a bushing driver, install bushing (C) in bottom of bore of converter housing (A).
2. Lightly oil inside of bushing.
3. Clean seal bore in converter housing (A) with cure primer.
4. Apply cure primer, then thread lock and sealer (medium strength) to metal outer shell of seal (B). Install shaft seal with sealing lip facing the oil chamber. Apply grease on sealing lip.

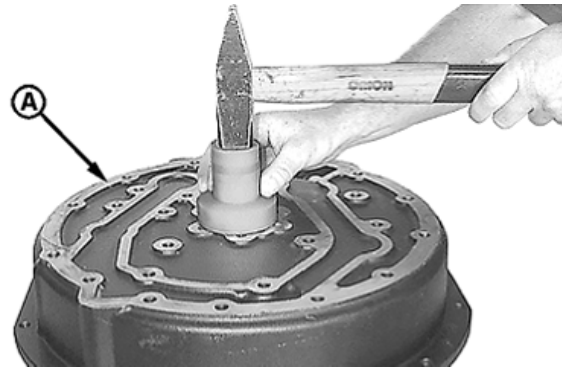
A—Converter Housing
B—Seal

C—Bushing



T117573

T117573 —UN—08OCT98



T117583 —UN—08OCT98



T117584 —UN—08OCT98

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CED,OUO1032,1004 -19-25OCT99-1/4

5.

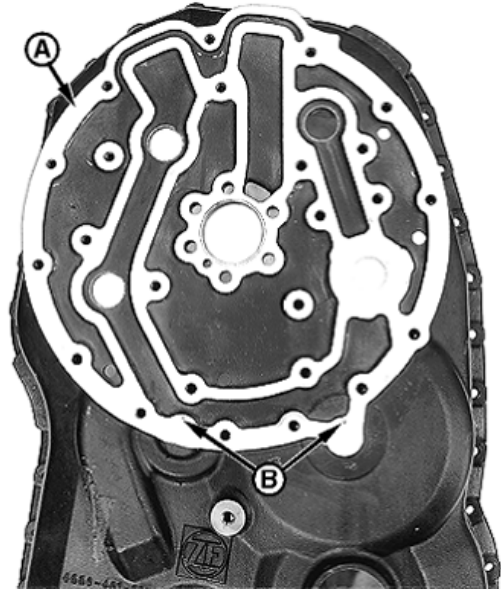
Apply cure primer to mating surfaces of the converter housing and transmission case (A).

IMPORTANT: Sealer must not restrict oil flow through oil passages (B) in transmission case (A).

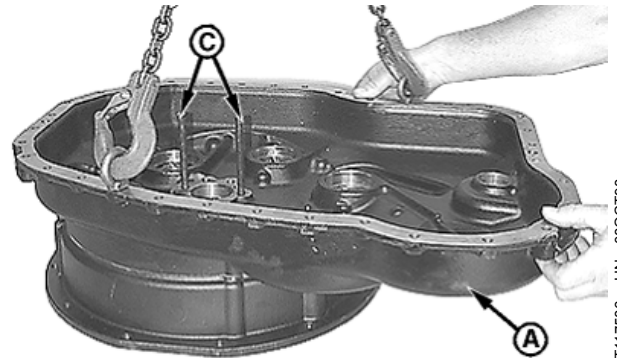
6. Apply High Flex Form-in-Place Gasket to mating surface of the transmission case.
7. Install two aligning screws (C) into transmission case (A).
8. Install eyebolts in case. Attach chain and hoist to eye bolts and install transmission case on converter housing.
9. Install bushing (E) into stator shaft (D). Press on bushing until it bottoms out in stator shaft (D).

A—Transmission Case
B—Oil Holes
C—Aligning Screws

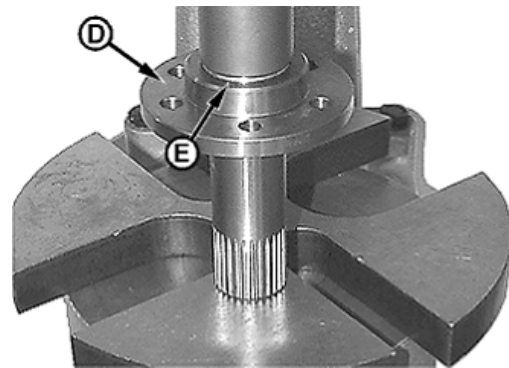
D—Stator Shaft
E—Bushing



T117585 —UN—08OCT98



T117586 —UN—08OCT98



T117587 —UN—08OCT98

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CED,OUO1032,1004 -19-25OCT99-2/4

10. Install stator shaft (A).

11. Install stator shaft cap screws (B). Tighten cap screws to specification.

Specification

Stator Shaft Cap
Screws—Torque..... 46 N·m (34 lb-ft)

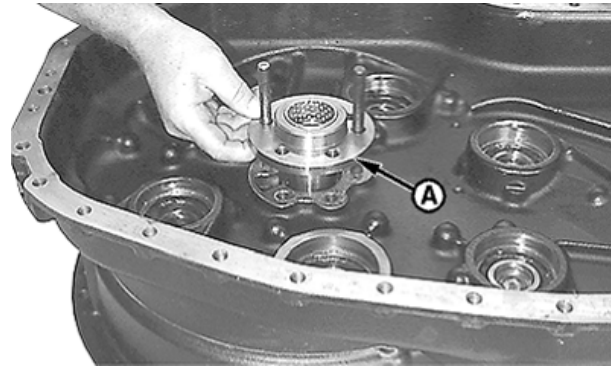
12. Remove aligning screws and install converter housing cap screws (C). Tighten cap screws to specification.

Specification

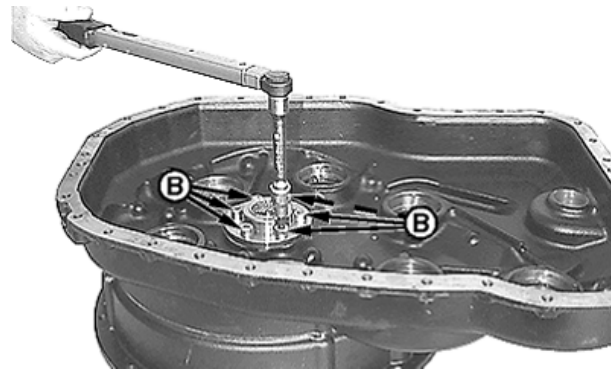
Converter Housing Cap
Screws—Torque..... 46 N·m (34 lb-ft)

13. Install new bearing cups (D) or ensure old bearing cups are returned to same bore with matching bearing cones.

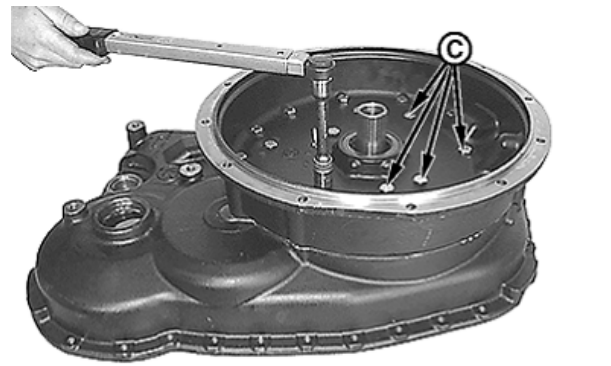
- A—Stator Shaft
- B—Cap Screw (6 used)
- C—Cap Screw (23 used)
- D—Bearing Cup (7 used)



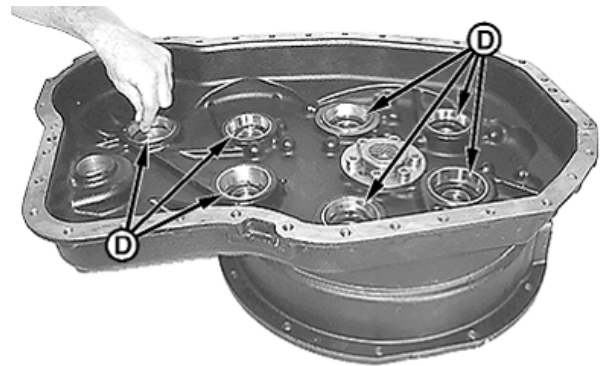
T117588 —UN—08OCT98



T117589 —UN—08OCT98



T117590 —UN—08OCT98



T117591 —UN—08OCT98

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CED,OUO1032,1004 -19-25OCT99-3/4

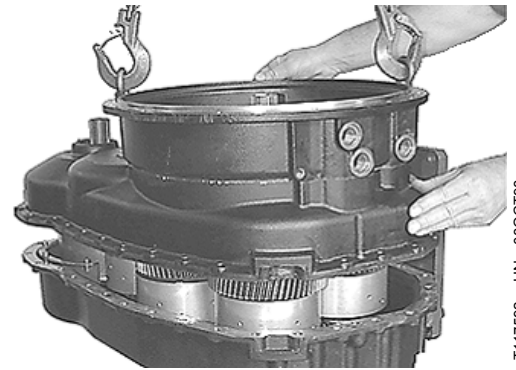
14. Install eyebolts in converter housing and attach to hoist.
15. Clean mating surfaces of transmission case halves with cure primer.
16. Apply High Flex Form-in-Place Gasket to the surfaces of transmission case halves. Check the sealing ring positions of the different shafts.
17. Align the dowel holes.
18. Install dowel pin (A) and pound in until flush with case.
19. Install cap screws (B and C). Tighten cap screws to specification.

Specification

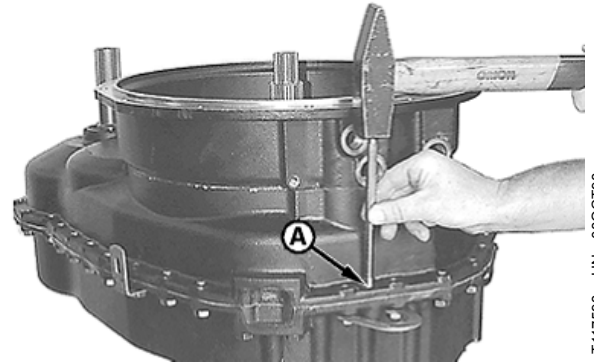
Transmission Case	
Housing Cap	
Screws—Torque.....	46 N·m (34 lb-ft)

A—Dowel Pin
B—Cap Screw (28 used)

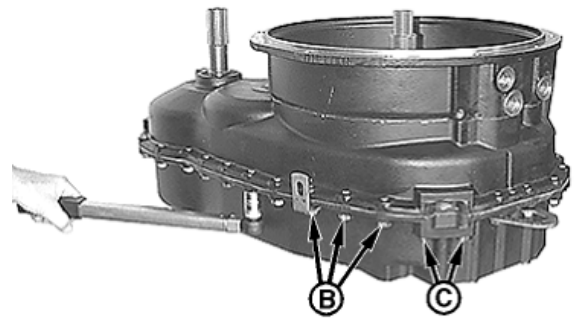
C—Cap Screw (6 used)



T 117592 —UN—08OCT98



T 117593 —UN—08OCT98



T 117594 —UN—08OCT98

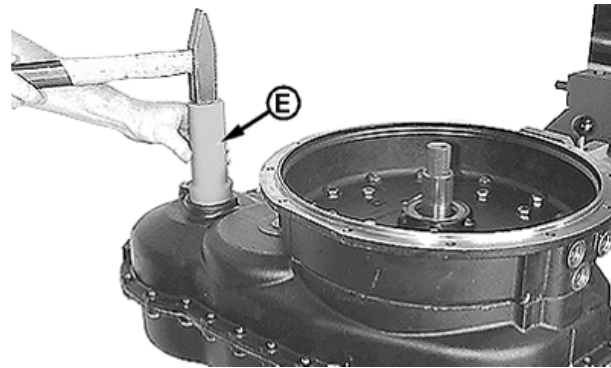
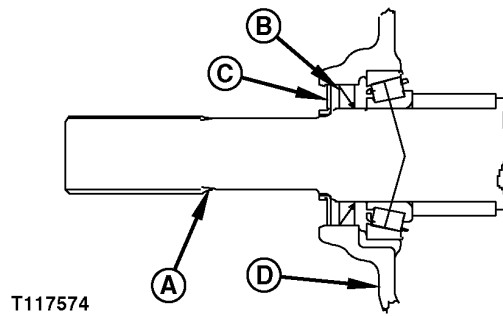
CED,OUO1032,1004 -19-25OCT99-4/4

Install Outer Components to Assemble Transmission—Powershift

1. Apply a one-to-one mixture of alcohol and water to outer shell and rubber of seal.
2. Using a shaft seal installer (E), install shaft seal (B) with the sealing lip facing the oil chamber.
3. Install new cap (C) against shaft shoulder.

A—MFWD Output Shaft
B—Shaft Seal
C—Cap (Cover Plate)

D—Transmission Case
E—Seal Installer



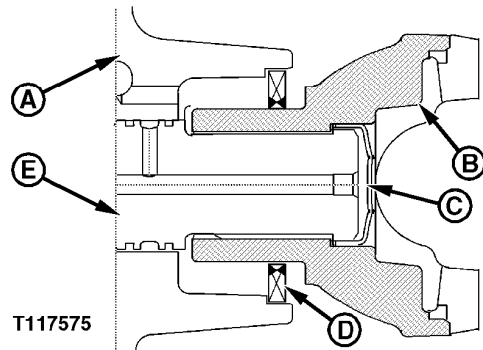
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CED,OUO1032,1005 -19-25OCT99-1/5

4. Apply a one-to-one mixture of alcohol and water to the rubber-coated outer shell of shaft seal.
5. Using a shaft seal installer (F), install shaft seal (D) so sealing lip is toward the transmission case. Push seal into transmission housing bore until outer surface of seal is into bore approximately 3 mm (0.118 in.).
6. Clean seal protector with cure primer and apply thread lock and sealer (medium strength) to seal protector. Insert seal protector into output flange.

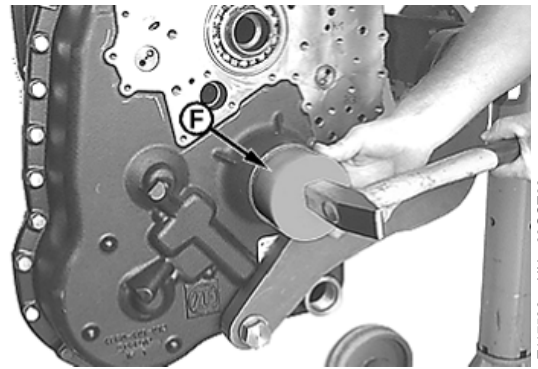
A—Transmission Case
B—Output Flange
C—Cap

D—Seal
E—Rear Output Shaft
F—Seal Installer

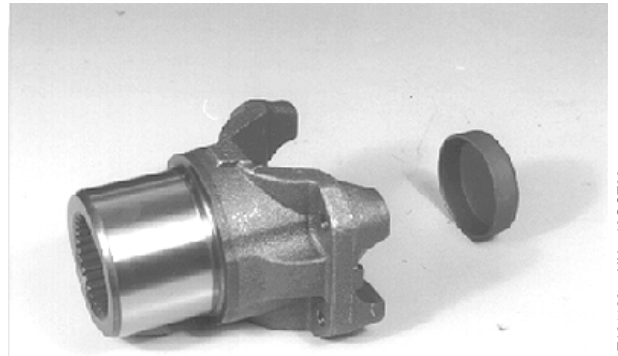


T117575

T117575 —UN—09OCT98



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T104420 —UN—16OCT96

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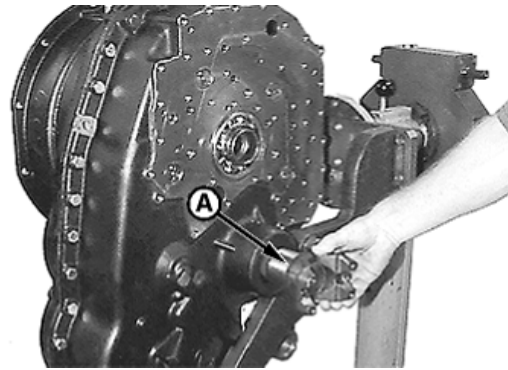
7. Install output flange (A).
8. Install two M8 dowels (B).

NOTE: Use petroleum jelly or grease to hold gasket and check ball and spring in place during assembly.

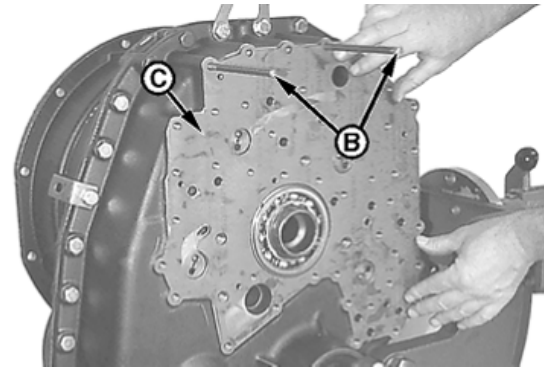
9. Install gasket (C) on transmission case.
10. Insert check ball (D) and spring (E) in manifold plate.

A—Output Flange
B—M8 Dowels
C—Gasket

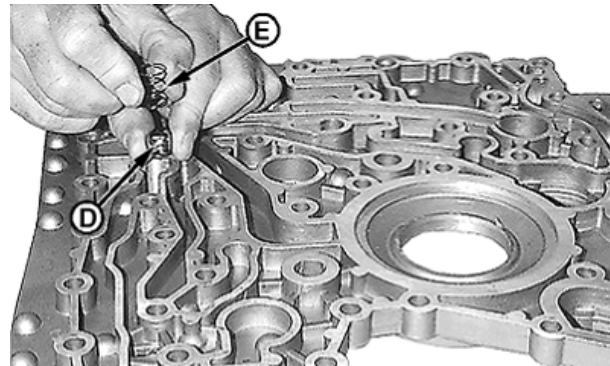
D—Check Ball
E—Spring



T117597—UN—09OCT98



T117598—UN—09OCT98



T117599—UN—09OCT98

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CED,OUO1032,1005 -19-25OCT99-3/5

11. Install manifold plate (B). Make sure check ball and spring (F) are in place.
12. Install TORX® head screws (A). Starting with inside cap screws first and continuing to the outside, tighten cap screws to specification.

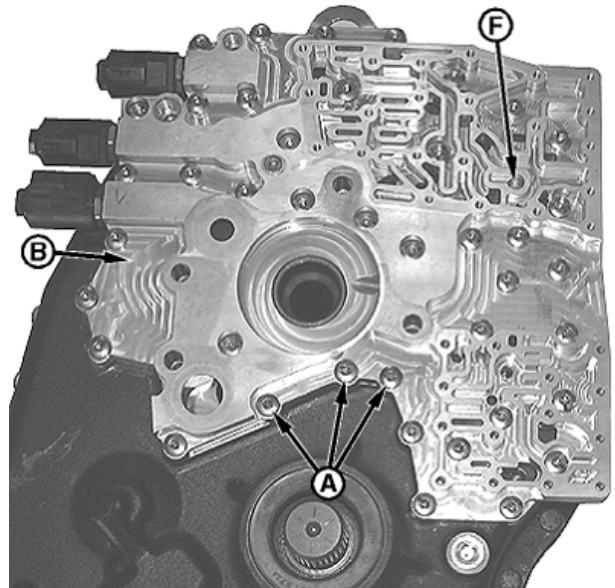
Specification

Transmission Manifold
 Plate TORX® Head
 Screws—Torque..... 23 N·m (204 lb-in.)

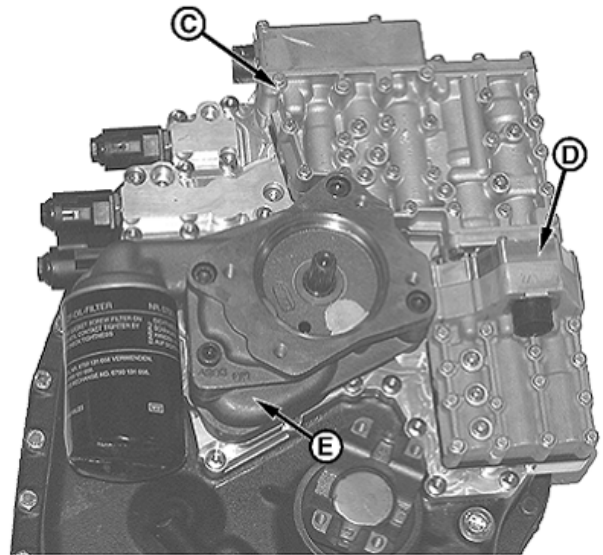
13. Install control valve (C), shift valve (D), and charge pump (E). (See procedures in Group 0360.) After machine has been operated a short time at operating temperature, recheck torque specifications.
14. Install torque converter on transmission by carefully mating splines on shaft into torque converter.

A—Cap Screw (43 used)
B—Manifold Plate
C—Control Valve

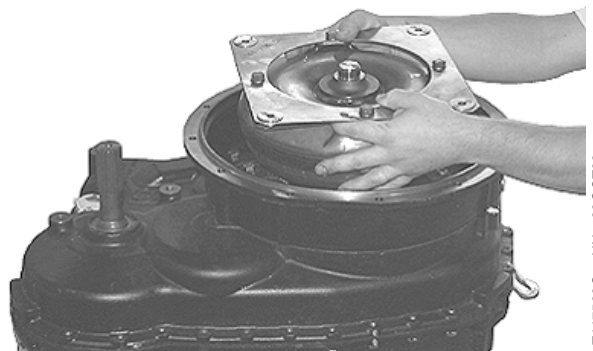
D—Shift Valve
E—Charge Pump
F—Check Ball and Spring



T117568C—UN—15OCT98



T117572B—UN—09OCT98



T117569C—UN—09OCT98

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15. Check distance from converter housing (A) to top of plate (B).

Specification

Converter Housing-to-
Top of Plate—Distance.....59 mm (2.3 in.) Approximate

16. If transporting, install tie bands (C) to secure converter.

17. Install bleeder (D) if removed. Tighten plug (with O-ring) to specification.

Specification

Bleeder Plug—Torque..... 28 N·m (21 lb-ft)

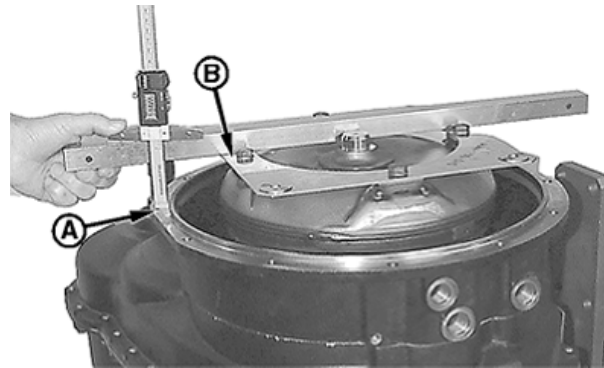
18. Install drain plug. Tighten to specification.

Specification

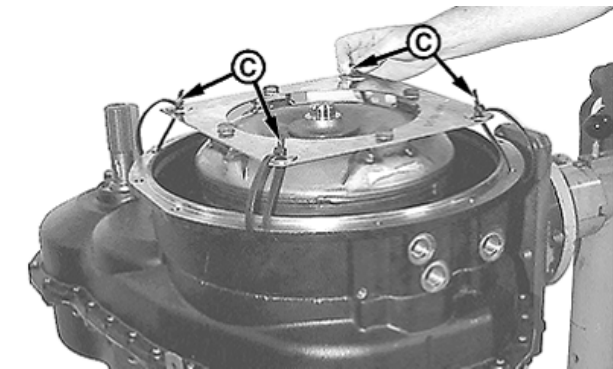
Drain Plug—Torque..... 35 N·m (26 lb-ft)

A—Converter Housing
B—Plate
C—Tie Band (4 used)

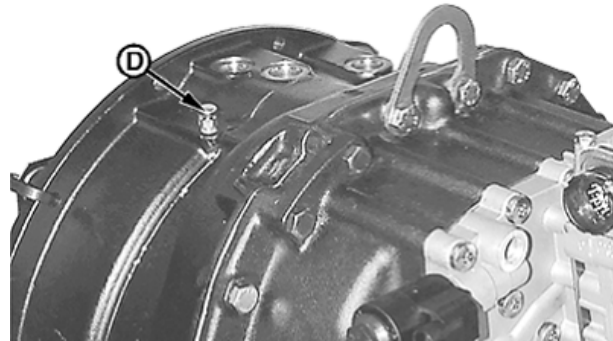
D—Bleeder
E—Drain Plug



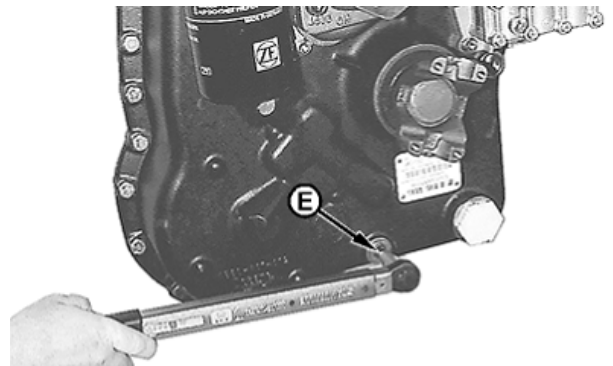
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T117601—UN—09OCT98



T117602—UN—09OCT98



T117603—UN—09OCT98

CED,OUO1032,1005 -19-25OCT99-5/5

Group 0360 Hydraulic System

Other Material

Number	Name	Use
TY16285 (U.S.) CXTY16285 (Canadian) 7649 (LOCTITE®)	Cure Primer	Apply to threads of orifice in the control valve. Apply to charge pump cap screws. Used to clean threads of set screw.
T43512 (U.S.) TY9473 (Canadian) 242 (LOCTITE®)	Thread Lock and Sealer (Medium Strength)	Apply a small drop to threads of orifice in the control valve. Apply to charge pump cap screws.

LOCTITE is a trademark of Loctite Corp.

CED,TX03399,5640 -19-06DEC99-1/1

Specifications

Item	Measurement	Specification
Control Valve Cap Screws	Torque	9.5 N·m (84 lb-in.)
Control Valve Orifice (Set Screw)	Torque	2.4 N·m (21 lb-in.)
Transmission Control Valve Solenoids Retaining Plate Cap Screws	Torque	6 N·m (53 lb-in.)
Control Valve Upper Cover Cap Screws	Torque	9.5 N·m (84 lb-in.)
Control Valve Orifice Plug	Torque	6 N·m (53 lb-in.)
Charge Pump-to-Transmission Socket Head Screws	Torque	115 N·m (85 lb-ft)
Manifold Plate Solenoid	Torque	6 N·m (53 lb-in.)
Control Valve Retaining Plate Cap Screws	Torque	6 N·m (53 lb-in.)
Shift Valve Cap Screws	Torque	9.5 N·m (84 lb-in.)
Solenoid Socket Head Screws	Torque	6 N·m (53 lb-in.)
Solenoid Valve Retaining Clip Cap Screws	Torque	5.5 N·m (47 lb-in.)
Solenoid Valve Plugs	Torque	6 N·m (53 lb-in.)
Manifold Plate Solenoid Valves	Torque	27 N·m (20 lb-ft)
Solenoids	Torque	6 N·m (53 lb-in.)

CED,OUO1002,640 -19-06JAN99-1/1

Remove and Install Control Valve—Manual Shift

NOTE: Control valve solenoids on top of valve can be removed in machine to repair valve sections. Remove cowl to gain access to top of valve.

1. Remove floor mat and access cover in cab/ROPS.
2. Disconnect solenoid connector at valve.
3. Remove cap screws and remove valve.
4. Install valve and new gaskets. Align using dowels.

5. Install cap screws in control valve finger tight. Starting in the middle and working out in a spiral direction, tighten cap screws to specification.

Specification

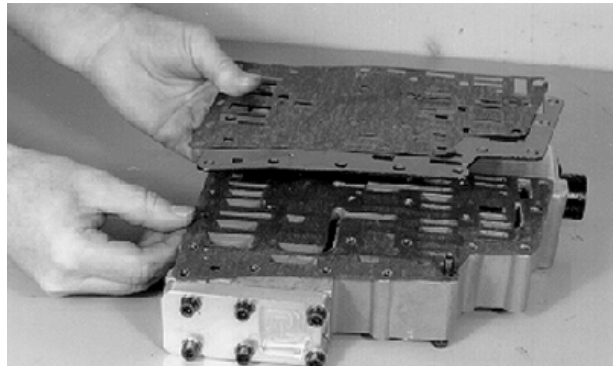
Control Valve Cap
Screws—Torque..... 9.5 N·m (84 lb-in.)

6. Connect solenoid connector.
7. Install access cover and floor mat.

TX,0360,SS3807 -19-25OCT99-1/1

Disassemble and Assemble Control Valve—Manual Shift

1. Mark gaskets for ease of assembly and remove flat gasket (2 pieces) and intermediate plate.

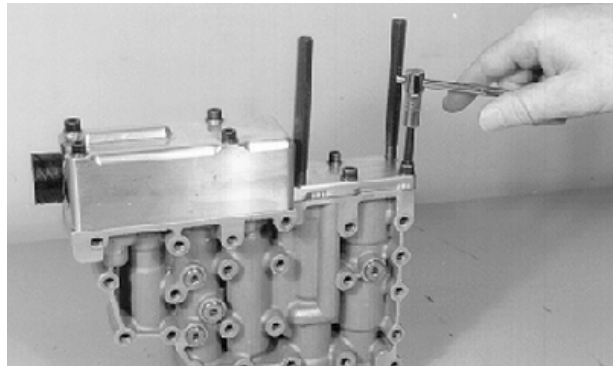


T106683—UN—17JAN97

WS68074,00036EC -19-14JUL10-1/27

⚠ CAUTION: Cover is spring loaded. Care must be taken when removing cover.

2. Remove two cap screws and replace with (M6) threaded dowels with nuts. Loosen remaining cap screws evenly. Cover is spring loaded; slowly back off nuts from dowel.



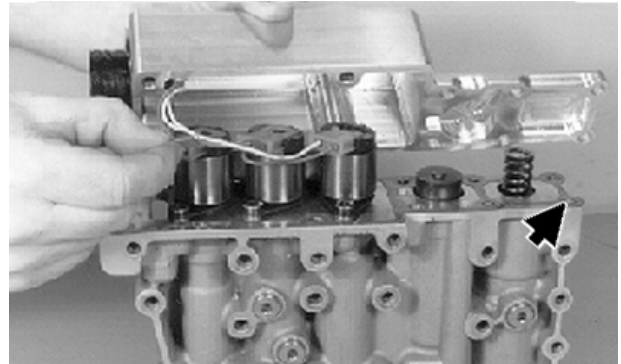
T106684—UN—17JAN97

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WS68074,00036EC -19-14JUL10-2/27

Hydraulic System

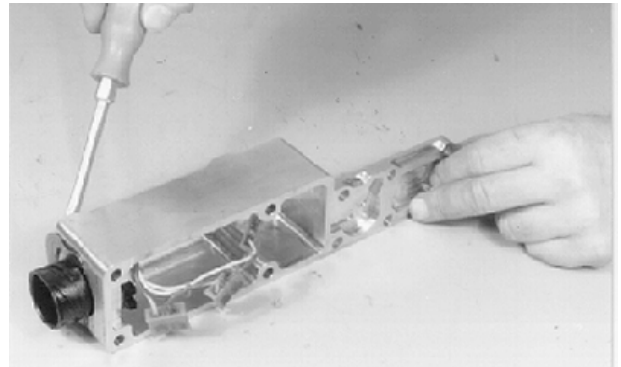
3. Remove cover and disconnect wiring for solenoid valves. Remove gasket (arrow).



T106685 —UN—05FEB97

WS68074,00036EC -19-14JUL10-3/27

4. Remove retaining plate and remove harness.



T106686 —UN—17JAN97

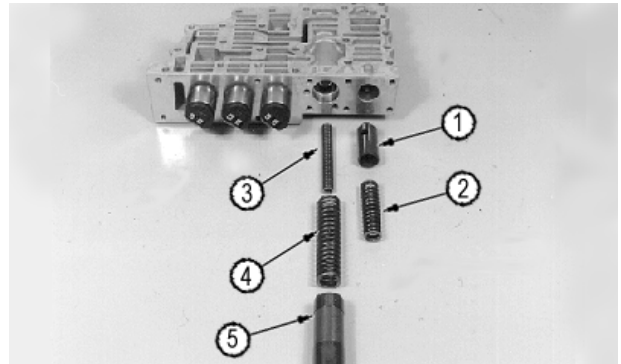
WS68074,00036EC -19-14JUL10-4/27

NOTE: Modulation shims not shown.

A 1 mm (0.039 in.) thick shim is equal to 42 kPa (0.42 bar) (6 psi). (See Modulation Valve Pressure Test in Operation and Test Manual, Section 9020, Group 25.)

5. Remove parts (1—5). Cover (on machine) can be removed to access modulation shims.

- | | |
|----------------------------|----------------------|
| 1— Converter Relief Spool | 4— Modulation Spring |
| 2— Converter Relief Spring | 5— Modulation Spool |
| 3— Modulation Spring | |



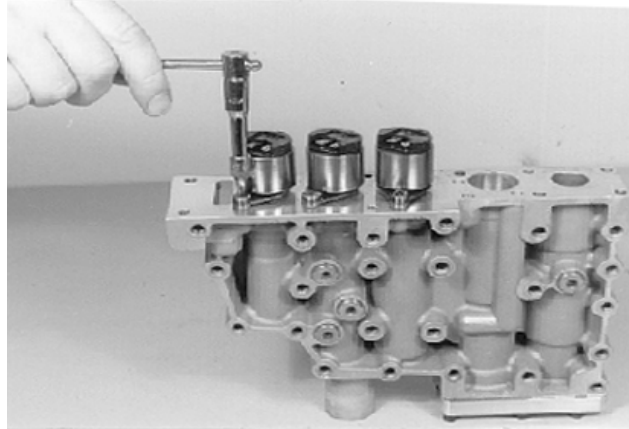
T106687 —UN—05FEB97

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WS68074,00036EC -19-14JUL10-5/27

⚠ CAUTION: Middle solenoid is spring loaded. Care must be taken when removing.

6. Remove solenoid valves.



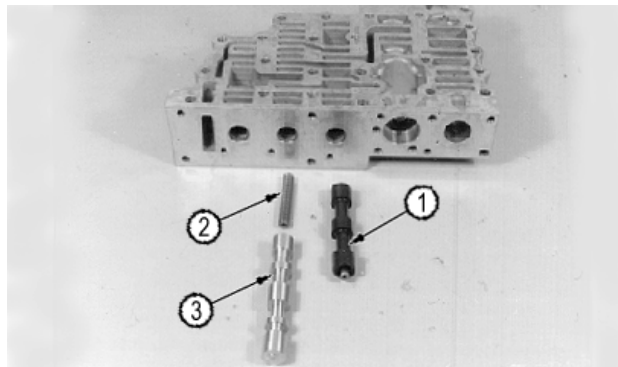
T106688 —UN—17JAN97

WS68074,00036EC -19-14JUL10-6/27

NOTE: Make sure spools are installed in the right ports. Identify or mark prior to removal.

7. Remove parts (1—3).

- 1— Forward and Reverse Shift Valve Spool
- 2— Neutral Shift Valve Spring
- 3— Neutral Shift Valve Spool



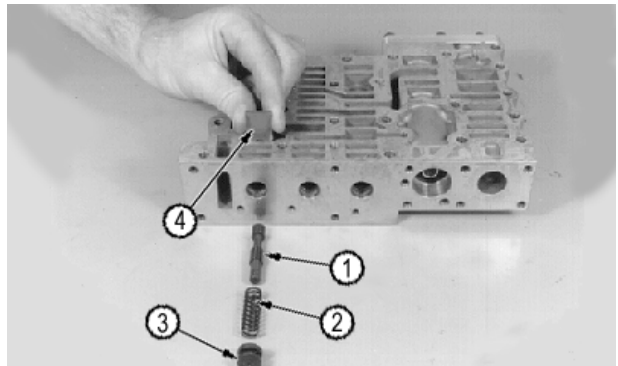
T106689 —UN—06FEB97

WS68074,00036EC -19-14JUL10-7/27

8. Remove retaining plate (4).

9. Remove parts (1—3).

- 1— Pressure Reducing Valve Spool
- 2— Spring
- 3— Plug
- 4— Retaining Plate



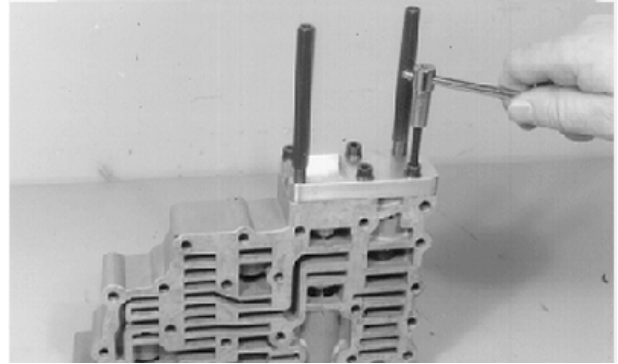
T106690 —UN—06FEB97

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WS68074,00036EC -19-14JUL10-8/27

⚠ CAUTION: Cover is spring loaded. Use care when removing cover.

- Remove two cap screws and install two threaded dowels (M6) with nuts. Loosen nuts uniformly. Remove cap screws, cover and gasket.



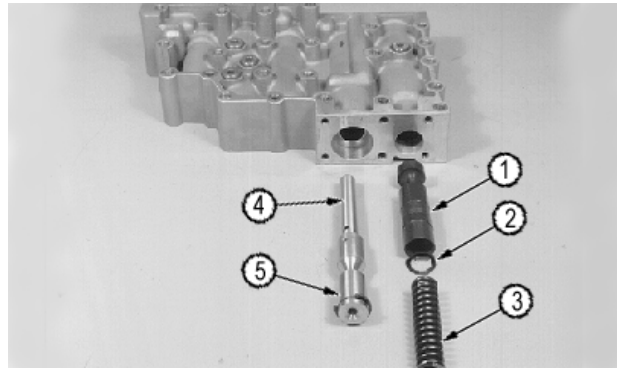
T106691—UN—17JAN97

WS68074,00036EC -19-14JUL10-9/27

NOTE: One pressure regulating valve shim is equal to 115 kPa (1.15 bar) (17 psi). Measure shim thickness and select appropriate shim. See System Pressure Test in Section 9020, Group 25 of Operation and Test Manual.

- Remove parts (1—5). Cover (on machine) can be removed to access regulating valve spool shim(s).

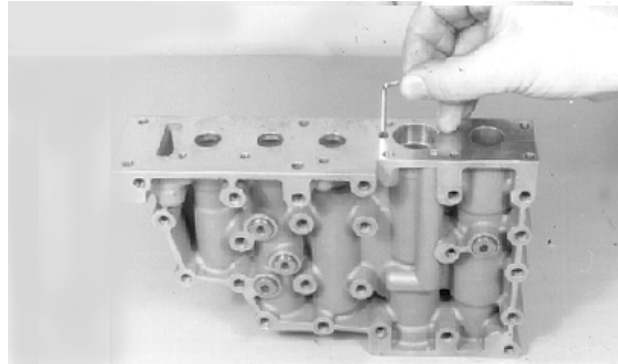
- | | |
|------------------------------------|---------------------|
| 1— Pressure Regulating Valve Spool | 4— Modulation Spool |
| 2— Shim (as required) | 5— Retaining Ring |
| 3— Spring | |



T106692—UN—08FEB97

WS68074,00036EC -19-14JUL10-10/27

- Remove orifice. Check passage of orifice.

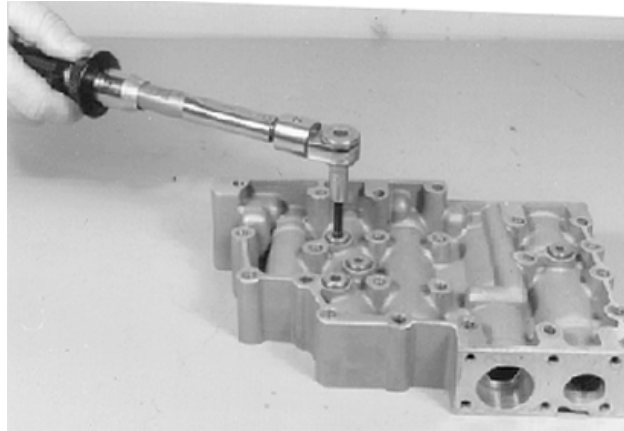


T106693—UN—17JAN97

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WS68074,00036EC -19-14JUL10-11/27

13. Remove plugs with O-rings.

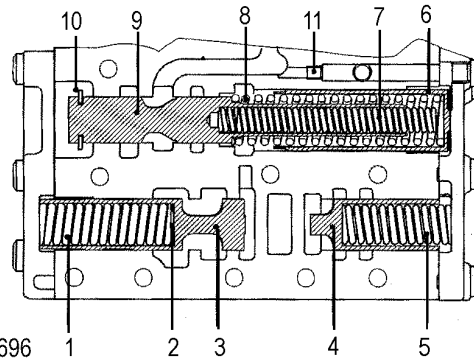


T106695 —UN—17JAN97

WS68074,00036EC -19-14JUL10-12/27

14. Inspect all parts. Apply clean oil to all components.

- | | |
|-------------------------------------|----------------------------|
| 1— Pressure Regulating Valve Spring | 7— Spring |
| 2— Shim | 8— Spring |
| 3— Spool | 9— Spool |
| 4— Converter Relief Valve Spool | 10— Retaining Ring |
| 5— Spring | 11— Orifice (Set Screw M5) |
| 6— Modulation Valve Piston | |



T106696

T106696 —UN—17JAN97

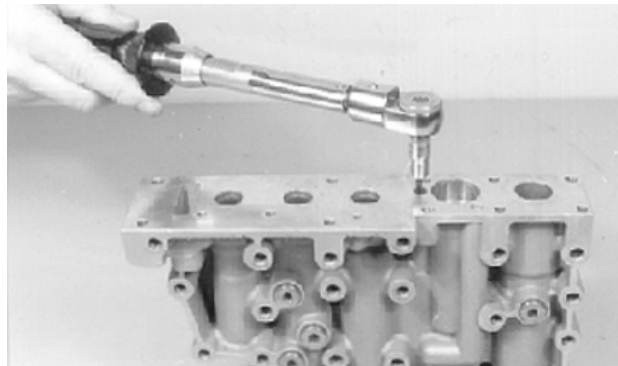
WS68074,00036EC -19-14JUL10-13/27

15. Apply cure primer, then thread lock and sealer (medium strength) to threads of orifice set screw.

16. Install orifice. Tighten to specification

Specification

Control Valve Orifice (Set Screw)—Torque..... 2.4 N·m (21 lb·in.)



T106697 —UN—17JAN97

Continued on next page

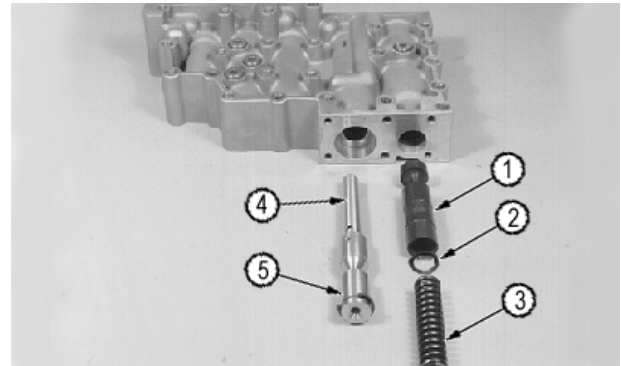
WS68074,00036EC -19-14JUL10-14/27

17. Install parts (1—5).

Shim Adjustment: Cover (on machine) can be removed to access modulation valve shims and regulating valve spool shim(s).

For modulation valve, a 1 mm (0.039 in.) thick shim is equal to 43 kPa (0.42 bar) (6 psi). Measure shim thickness and select appropriate shim. (See Modulation Valve Pressure Test in Section 9020, Group 25 of Operation and Test Manual.)

For pressure regulating valve, one shim is equal to 115 kPa (1.15 bar) (17 psi). Measure shim thickness and select appropriate shim. (See System Pressure Test in Section 9020, Group 25 of Operation and Test Manual.)



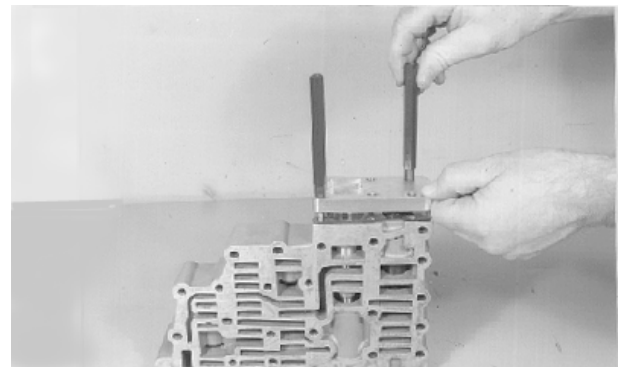
1— Pressure Regulating Valve Spool
 2— Shim (as required)
 3— Spring
 4— Modulation Spool
 5— Retaining Ring

T106692 —UN—06FEB97

WS68074,00036EC -19-14JUL10-15/27

18. Install gasket and cover.

19. Install two threaded dowels (M6) with nuts. Tighten nuts evenly.



T106699 —UN—17JAN97

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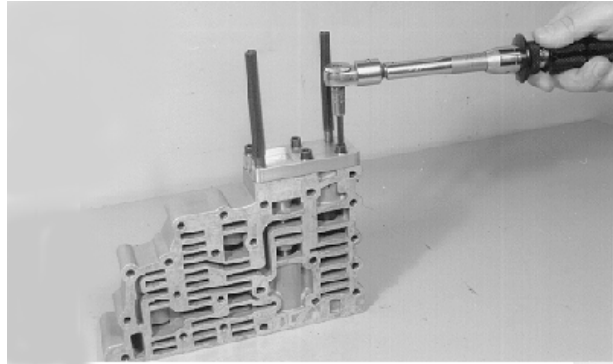
WS68074,00036EC -19-14JUL10-16/27

Hydraulic System

20. Install washers and cap screws. Remove threaded dowels and nuts. Tighten cap screws to specification.

Specification

Control Valve Cap
Screws—Torque..... 9.5 N·m (84 lb-in.)

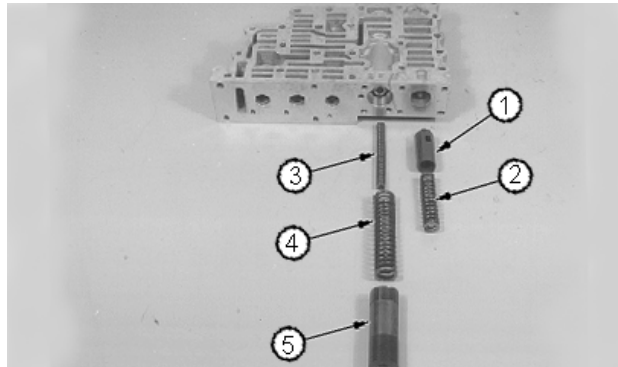


T106700—UN—17JAN97

WS68074,00036EC -19-14JUL10-17/27

21. Install parts (1—5).

- | | |
|----------------------------|----------------------|
| 1— Converter Relief Spool | 4— Modulation Spring |
| 2— Converter Relief Spring | 5— Modulation Spool |
| 3— Modulation Spring | |



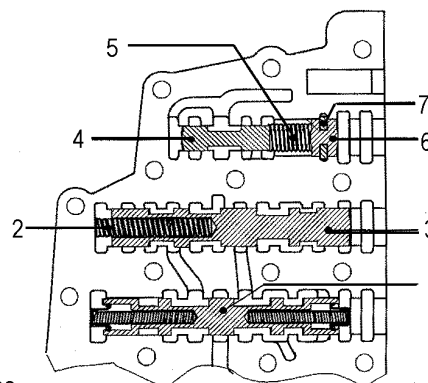
T106701—UN—06FEB97

WS68074,00036EC -19-14JUL10-18/27

22. Inspect all parts. Put clean oil on all components.

23. Use this art as reference for the forward and reverse shift valve, neutral shift valve and pressure reducing valve.

- | | |
|---|--------------------|
| 1— Forward/Reverse Shift Valve Spool with Springs | 5— Spring |
| 2— Neutral Shift Valve Spring | 6— Plug |
| 3— Spool | 7— Retaining Plate |
| 4— Pressure Reducing Valve Spool | |



T106702

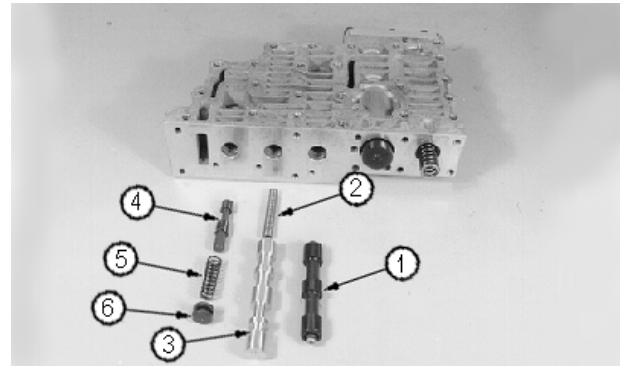
T106702—UN—17JAN97

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WS68074,00036EC -19-14JUL10-19/27

24. Install parts (1—6).

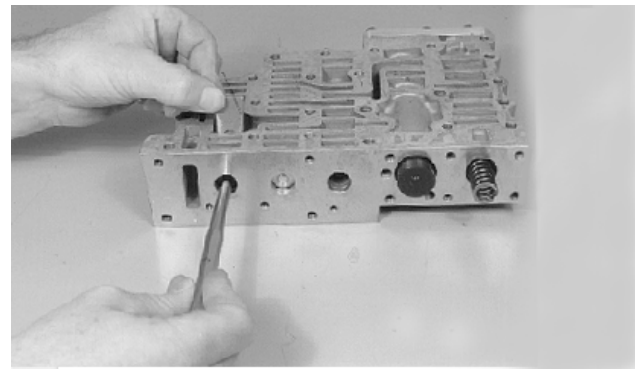
- | | |
|--|-------------------------------------|
| 1— Forward/Reverse Shift
Valve Spool with Springs | 4— Pressure Reducing Valve
Spool |
| 2— Neutral Shift Valve Spring | 5— Spring |
| 3— Spool | 6— Plug |



T1106703 —UN—06FEB97

WS68074,00036EC -19-14JUL10-20/27

25. Using a punch, push plug in until retaining plate slips into groove of plug.



T1106704 —UN—17JAN97

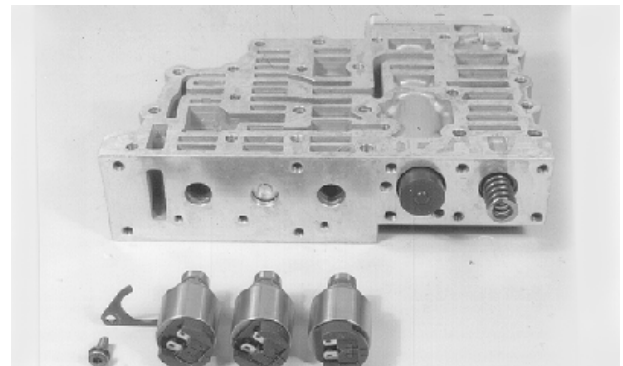
WS68074,00036EC -19-14JUL10-21/27

26. Install three solenoid valves with connectors positioned for installation of harness.

27. Install three retaining plates with flat side toward valve body and three cap screws with washers. Tighten cap screws to specification.

Specification

- | | |
|----------------------|-------------------|
| Transmission Control | |
| Valve Solenoids | |
| Retaining Plate Cap | |
| Screws—Torque..... | 6 N·m (53 lb-in.) |



T1106705 —UN—17JAN97

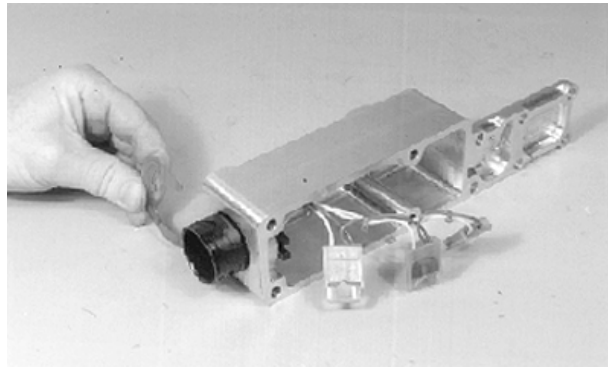
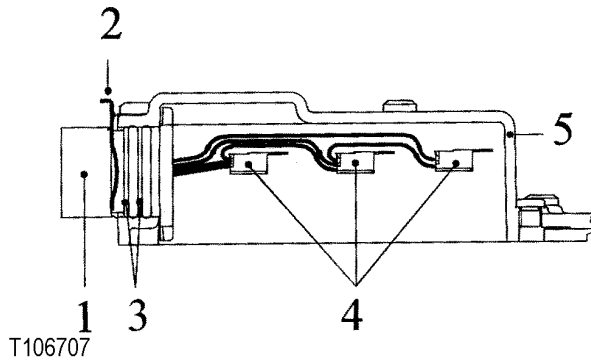
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WS68074,00036EC -19-14JUL10-22/27

28. Install harness and retaining plate with tabs up.

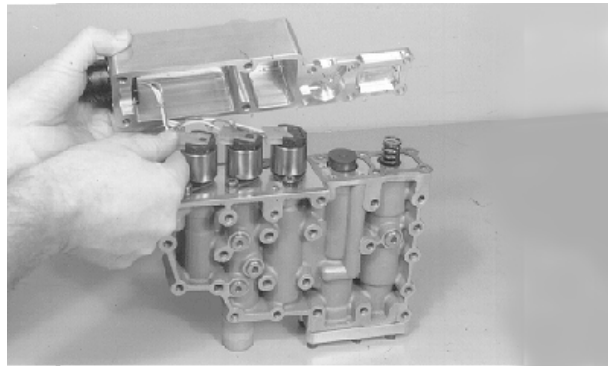
- 1— Harness
- 2— Retaining Plate
- 3— Sealing Ring

- 4— Plug (3 used)
- 5— Cover



WS68074,00036EC -19-14JUL10-23/27

29. Install gasket and connect harness with solenoid connectors.



Continued on next page

WS68074,00036EC -19-14JUL10-24/27

Hydraulic System

30. Install cover.
31. Using threaded dowels (M6) with nuts, tighten nuts evenly until cover bottoms.
32. Install cap screws and tighten to specification.

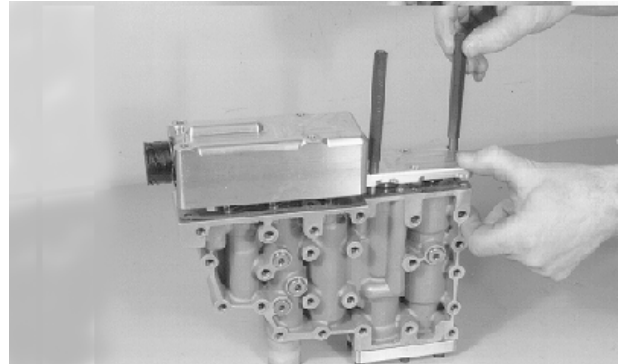
Specification

Control Valve
Upper Cover Cap
Screws—Torque..... 9.5 N·m (84 lb-in.)

33. Install orifice plug on top side of valve housing cover if removed (this plug is used for access to orifice without taking cover off). Tighten plug to specification.

Specification

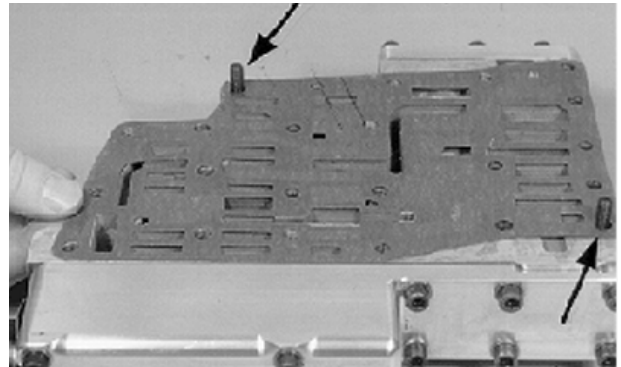
Control Valve Orifice
Plug—Torque..... 6 N·m (53 lb-in.)



T106710 —UN—17JAN97

WS68074,00036EC -19-14JUL10-25/27

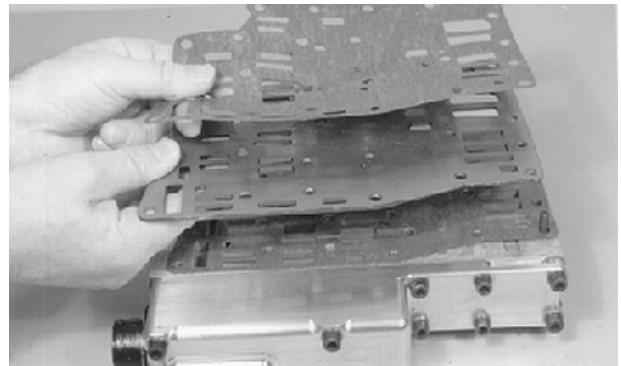
34. Install two cap screws (arrows) to aid in aligning the gaskets.
35. Apply petroleum jelly to first gasket.



T106712 —UN—17JAN97

WS68074,00036EC -19-14JUL10-26/27

36. Install intermediate plate and second gasket.



T106713 —UN—17JAN97

WS68074,00036EC -19-14JUL10-27/27

Remove and Install Transmission Charge Pump—Manual Shift

1. Remove hydraulic pump. See Remove and Install Hydraulic Pump in Section 21, Group 2160.
2. Remove charge pump cap screws and remove charge pump and shaft.
3. Install dowels into manifold plate to guide charge pump when installing.

NOTE: Make sure stop is pushed down until it contacts needle bearing assembly. Stop must remain in place while installing pump.

4. Install pump and shaft (shaft installed in pump) into transmission drive shaft, aligning pump on dowels. Apply cure primer, then thread lock and sealer (medium strength) to threads of cap screws. Tighten cap screws to specification.

Specification

Charge Pump-to-Transmission Socket Head Screws—Torque.....115 N·m (85 lb-ft)

5. Install hydraulic pump. See Remove and Install Hydraulic Pump in Section 21, Group 2160.

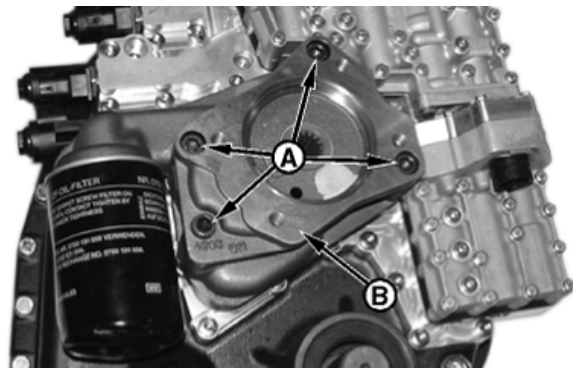
TX,0360,SS3808 -19-25OCT99-1/1

Remove and Install Transmission Charge Pump—Powershift

NOTE: For disassembly and assembly of charge pump see procedure in this group.

1. Remove hydraulic pump. See Remove and Install Hydraulic Pump in Section 21, Group 2160.
2. Remove charge pump socket head screws (A) and remove charge pump (B) and shaft.
3. Install dowels into manifold plate to guide charge pump when installing.

NOTE: Make sure stop is pushed down until it contacts needle bearing assembly. Stop must remain in place while installing pump.



T117565B—UN—08OCT98

A—Socket Head Screw (4 used) B—Pump

Specification

Charge Pump-to-Transmission Socket Head Screws—Torque.....115 N·m (85 lb-ft)

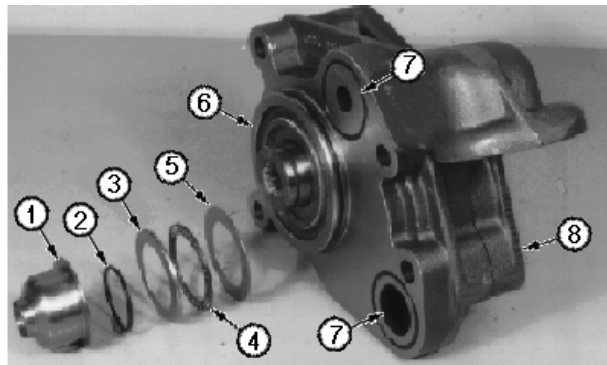
5. Install hydraulic pump. See Remove and Install Hydraulic Pump in Section 21, Group 2160.

CED,OUO1032,1015 -19-25OCT99-1/1

Disassemble and Assemble Transmission Charge Pump—Manual Shift and Powershift

1. Remove parts (1—7).

- | | |
|----------|-----------------|
| 1—Stop | 5—Thrust Washer |
| 2—O-Ring | 6—O-Ring |
| 3—Disk | 7—O-Ring |
| 4—Needle | 8—Pump Assembly |



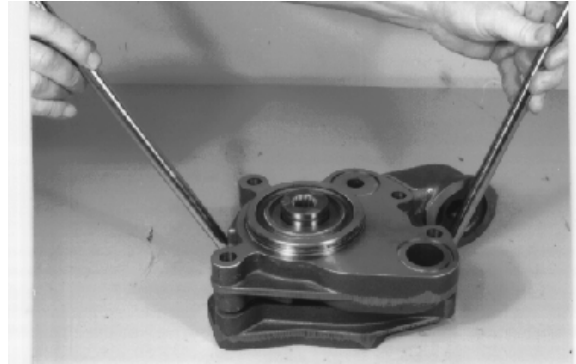
T101334—UN—07FEB97

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TX,0360,SS3656 -19-01SEP06-1/12

Hydraulic System

2. Separate pump halves.

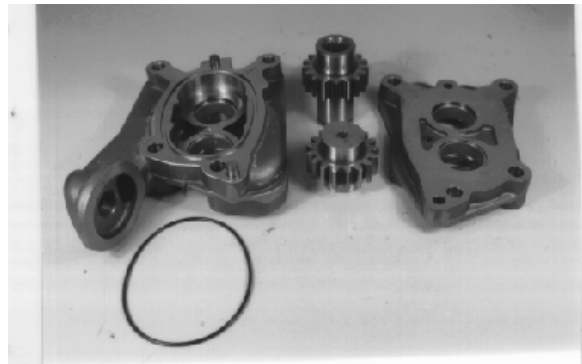


T101335 —UN—04JUN96

TX,0360,SS3656 -19-01SEP06-2/12

NOTE: The pump O-ring is serviceable. The pump gears and housings are serviced as an assembly only.

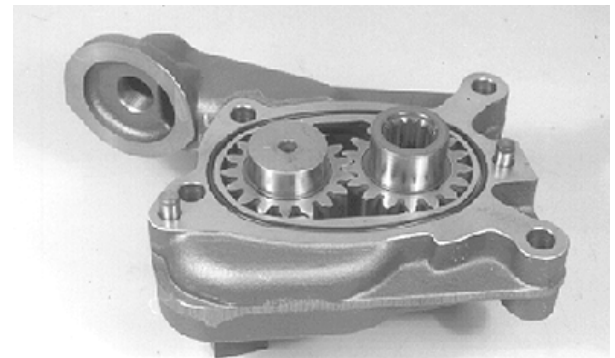
3. Mark gears to aid in assembly. Inspect pump gears and housings. Replace gears and housings as an assembly.
4. Replace O-ring.



T101336 —UN—04JUN96

TX,0360,SS3656 -19-01SEP06-3/12

5. Oil components of the pump.
6. Install parts in pump housing.



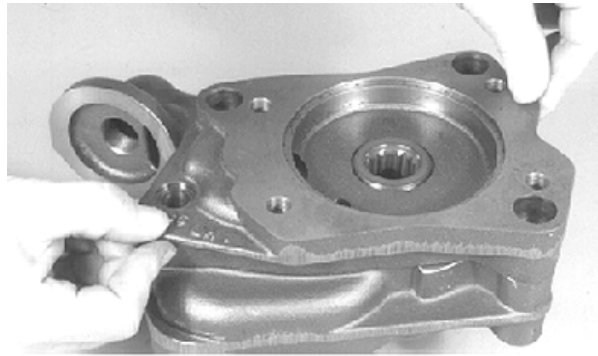
T104431 —UN—16OCT96

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TX,0360,SS3656 -19-01SEP06-4/12

Hydraulic System

7. Install pump cover.



T104432 —UN—16OCT96

TX,0360,SS3656 -19-01SEP06-5/12

8. Install O-rings.

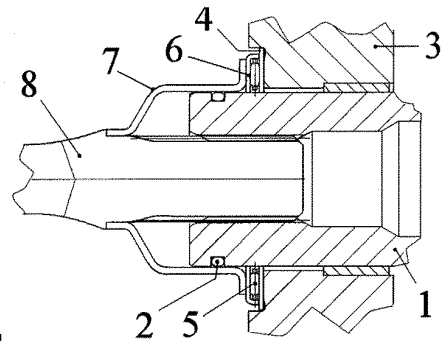


T104433 —UN—16OCT96

TX,0360,SS3656 -19-01SEP06-6/12

9. Use this art for reference when assembling.

- | | |
|-----------------------|-------------------|
| 1— Pump Gear (2 used) | 5— Needle Bearing |
| 2— O-Ring | 6— Disk |
| 3— Pump Housing | 7— Stop |
| 4— Washer | 8— Shaft |



T104434

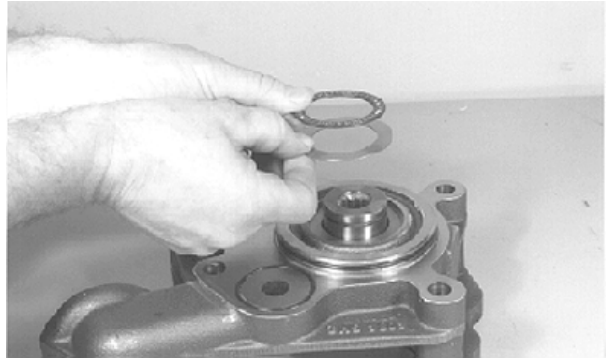
T104434 —UN—16OCT96

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TX,0360,SS3656 -19-01SEP06-7/12

Hydraulic System

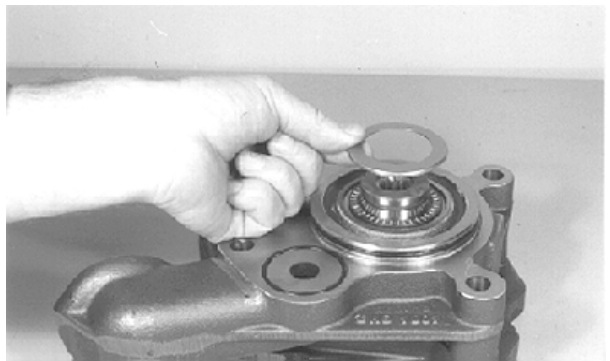
10. Install washer and needle bearing.



T104436—UN—16OCT96

TX,0360,SS3656 -19-01SEP06-8/12

11. Install disk. (See previous line art for position of disk).



T104437—UN—16OCT96

TX,0360,SS3656 -19-01SEP06-9/12

12. Install and lubricate O-ring.

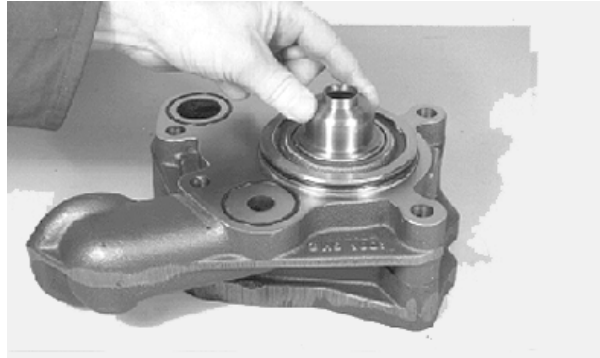


T104438—UN—16OCT96

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TX,0360,SS3656 -19-01SEP06-10/12

13. Install stop. Stop must be pushed down until it contacts needle bearing assembly. Stop must also remain in this position during pump installation on transmission manifold.



T104439 —UN—16OCT96

TX,0360,SS3656 -19-01SEP06-11/12

14. Install shaft.



T104440 —UN—17OCT96

TX,0360,SS3656 -19-01SEP06-12/12

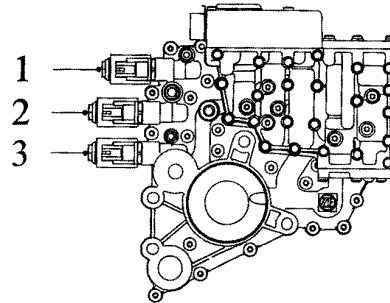
Remove and Install Manifold Plate Solenoids—Manual Shift

NOTE: Transmission shown removed for illustration purposes.

If removing solenoid with transmission installed on machine, remove transmission shift lever and floor plate to access the solenoids.

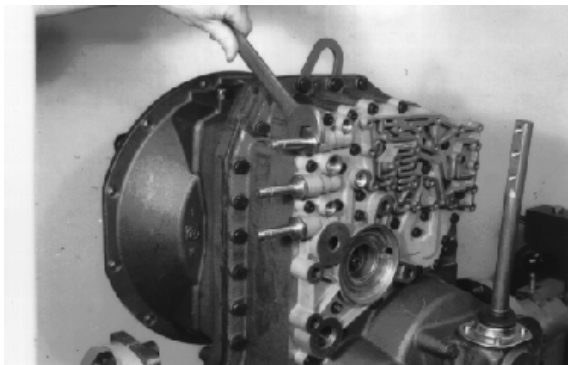
1. Locate solenoid (1—3).

- 1—Differential Lock Solenoid
- 2—Park Brake Solenoid
- 3—MFWD Solenoid (If Equipped)



T104427

T104427 —UN—16OCT96



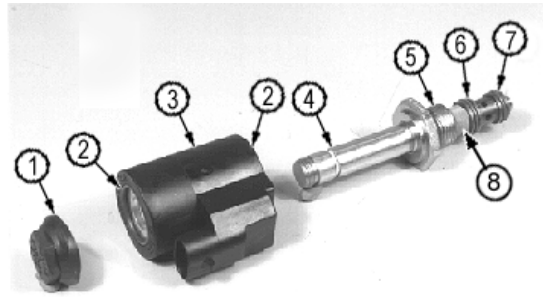
T101338 —UN—04JUN96

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CED,OUO1032,1016 -19-21OCT99-1/2

Hydraulic System

2. Remove cap nut (1), solenoid coil (3), and O-rings (2).
3. Remove valve body (4) and O-rings (5—7).
4. Inspect and replace parts as necessary.
5. Inspect screen (8), clean if necessary.
6. Install O-rings on valve body.
7. Install valve body in manifold assembly.
8. Install solenoid coil.
9. Install O-rings in cap. Install cap on solenoid coil and tighten to specification.



Specification	
Solenoid Cap (Nut)—Torque.....	6 N·m (53 lb-in.)

- 1— Cap Nut
- 2— O-Ring (2 used)
- 3— Solenoid Coil
- 4— Valve Body

- 5— O-Ring
- 6— O-Ring
- 7— O-Ring
- 8— Screen

T125353—UN—21OCT99

CED.OUO1032,1016 -19-21OCT99-2/2

Remove and Install Control Valve—Powershift

NOTE: Control valve solenoids on top of valve can be removed in machine to repair valve sections. Remove cowl to gain access to top of valve.

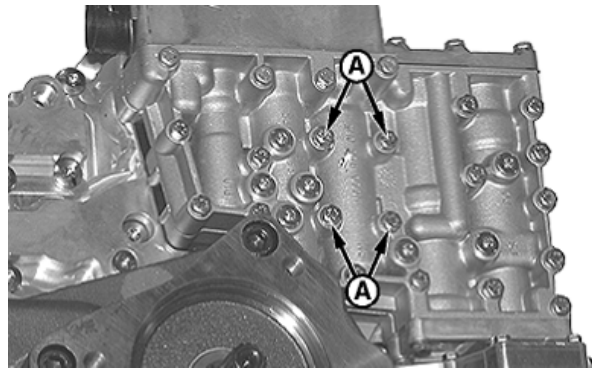
1. Remove floor mat and access cover in cab/ROPS.
2. Disconnect solenoid connector at valve.
3. Remove cap screws (A) and remove valve.
4. Install M6 dowels (C) and install gasket (B).
5. Install intermediate plate (D) over gasket (B).
6. Align gasket (E) and install over intermediate plate (D).
7. Install valve on dowels. Install cap screws (A) in control valve and tighten finger-tight.
8. Starting in the middle and working out in a spiral direction, tighten cap screws to specification.

Specification

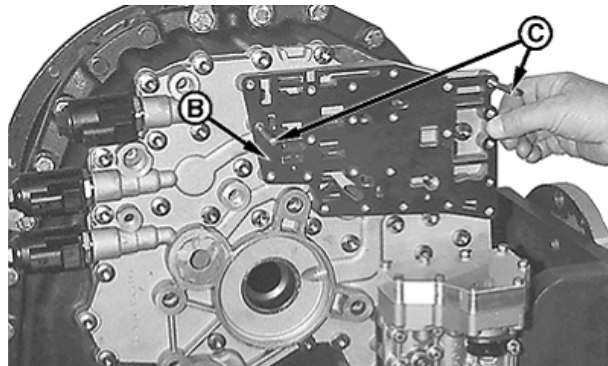
Control Valve Cap
Screws—Torque..... 9.5 N·m (84 lb-in.)

9. Connect solenoid connector.
10. Install access cover and floor mat.

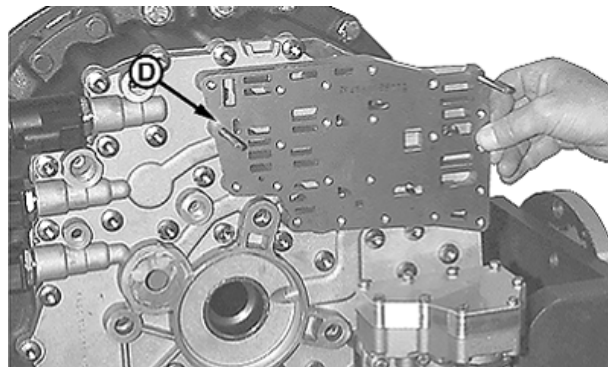
A—Cap Screw (23 used) **D**—Intermediate Plate
B—Gasket **E**—Gasket
C—M6 Dowel (2 used)



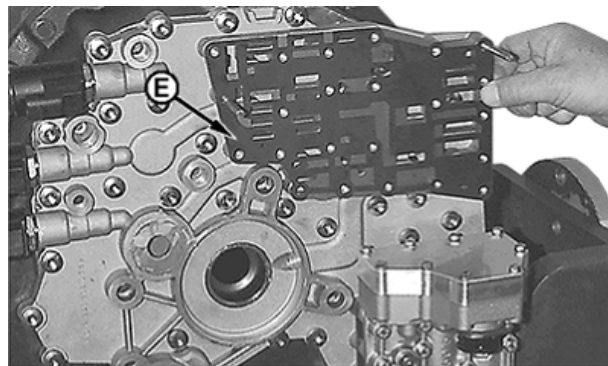
T117682B—UN—12OCT98



T117654—UN—12OCT98



T117655—UN—12OCT98

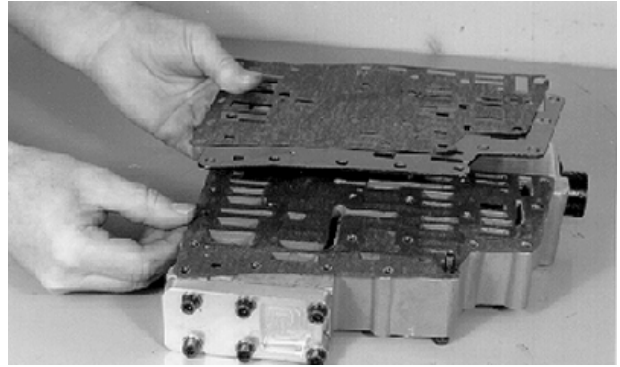


T117656—UN—12OCT98

CED,OUO1032,1009 -19-09OCT98-1/1

Disassemble and Assemble Control Valve—Powershift

1. Mark gaskets for ease of assembly and remove flat gasket (2 pieces) and intermediate plate.

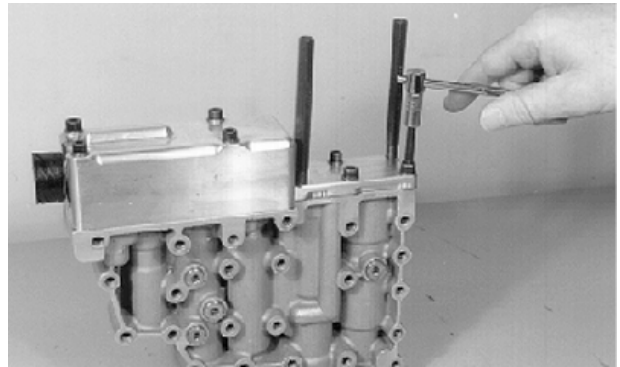


T106683 —UN—17JAN97

CED,OUO1032,1010 -19-09OCT98-1/25

⚠ CAUTION: Cover is spring loaded. Care must be taken when removing cover.

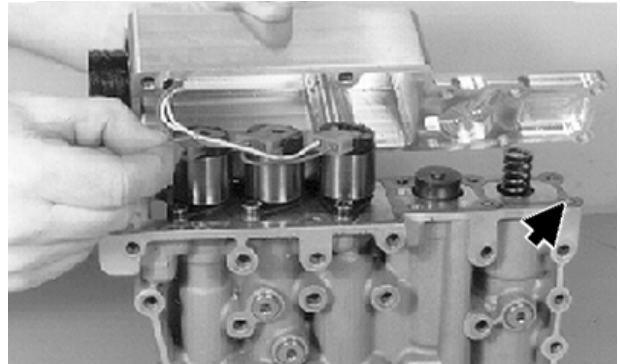
2. Remove two cap screws and replace with (M6) threaded dowels with nuts. Loosen remaining cap screws evenly. Cover is spring loaded; slowly back off nuts from dowel.



T106684 —UN—17JAN97

CED,OUO1032,1010 -19-09OCT98-2/25

3. Remove cover and disconnect wiring for solenoid valves. Remove gasket (arrow).

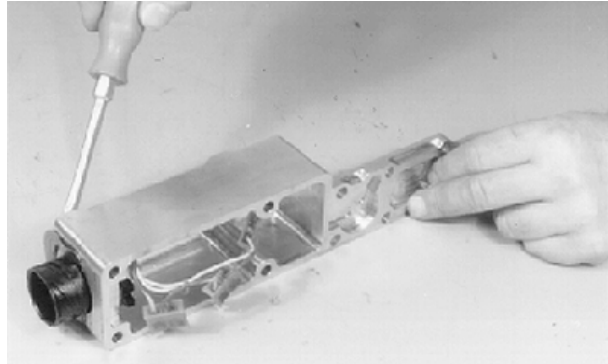


T106685 —UN—05FEB97

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CED,OUO1032,1010 -19-09OCT98-3/25

4. Remove retaining plate and remove harness.



T106686—UN—17JAN97

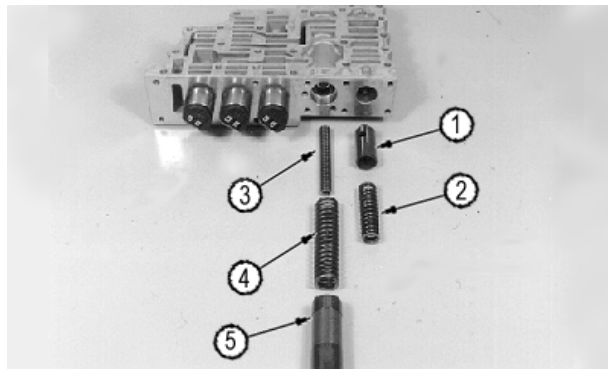
CED,OUO1032,1010 -19-09OCT98-4/25

NOTE: Modulation shims not shown.

A 1 mm (0.039 in.) thick shim is equal to 42 kPa (0.42 bar) (6 psi). (See Modulation Valve Pressure Test in Operation and Test Manual, Group 9020-25.)

5. Remove parts (1—5). Cover (on machine) can be removed to access modulation shims.

- | | |
|----------------------------|----------------------|
| 1— Converter Relief Spool | 4— Modulation Spring |
| 2— Converter Relief Spring | 5— Modulation Spool |
| 3— Modulation Spring | |

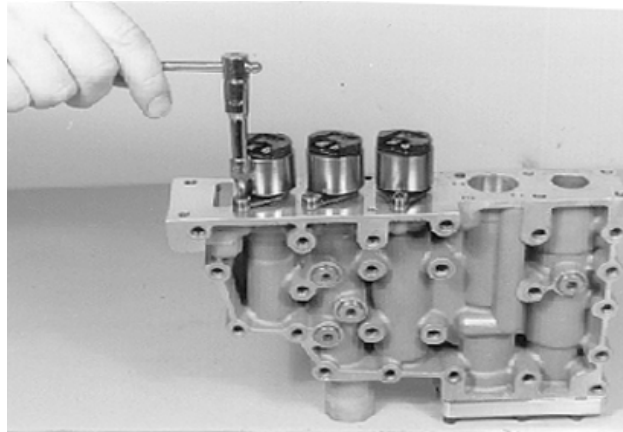


T106687—UN—08FEB97

CED,OUO1032,1010 -19-09OCT98-5/25

⚠ CAUTION: Middle solenoid is spring loaded. Care must be taken when removing.

6. Remove solenoid valves.



T106688—UN—17JAN97

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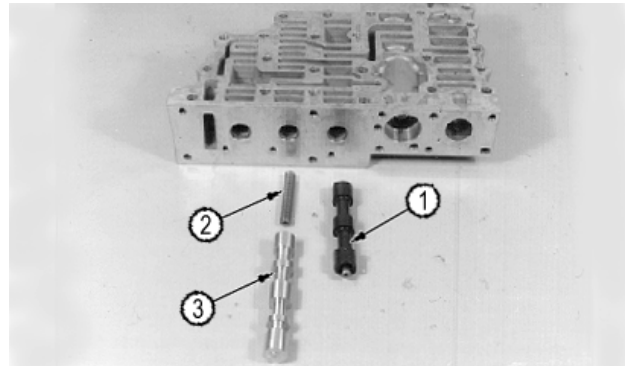
CED,OUO1032,1010 -19-09OCT98-6/25

Hydraulic System

NOTE: Make sure spools are installed in the right ports. Identify or mark prior to removal.

7. Remove parts (1—3).

- | | |
|---|------------------------------|
| 1— Forward and Reverse Shift
Valve Spool | 3— Neutral Shift Valve Spool |
| 2— Neutral Shift Valve Spring | |



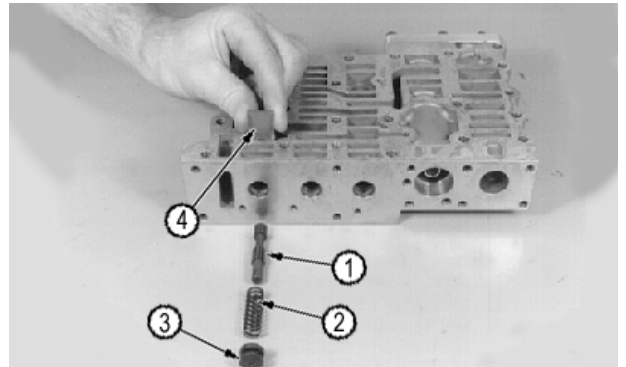
T106689 —UN—06FEB97

CED,OUO1032,1010 -19-09OCT98-7/25

8. Remove retaining plate (4).

9. Remove parts (1—3).

- | | |
|-------------------------------------|--------------------|
| 1— Pressure Reducing Valve
Spool | 3— Plug |
| 2— Spring | 4— Retaining Plate |

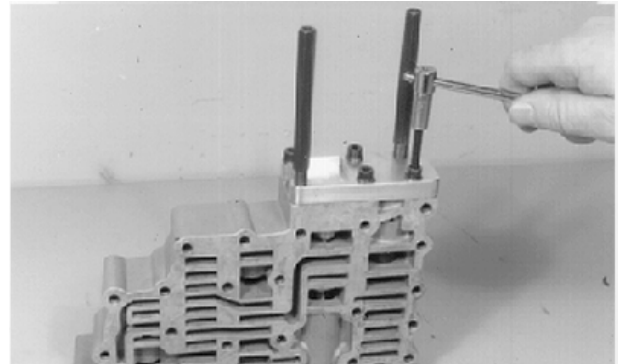


T106690 —UN—06FEB97

CED,OUO1032,1010 -19-09OCT98-8/25

CAUTION: Cover is spring loaded. Use care when removing cover.

10. Remove two cap screws and install two threaded dowels (M6) with nuts. Loosen nuts uniformly. Remove cap screws, cover and gasket.



T106691 —UN—17JAN97

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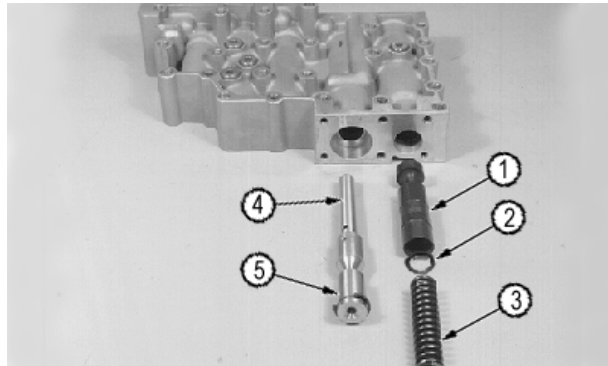
CED,OUO1032,1010 -19-09OCT98-9/25

Hydraulic System

NOTE: One pressure regulating valve shim is equal to 115 kPa (1.15 bar) (17 psi). Measure shim thickness and select appropriate shim. (See System Pressure Test in Section 9020, Group 25 of Operation and Test Manual.)

11. Remove parts (1—5). Cover (on machine) can be removed to access regulating valve spool shim(s).

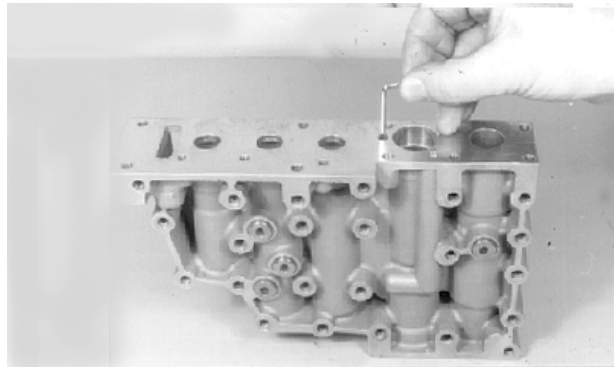
- | | |
|-----------------------------------|--------------------|
| 1—Pressure Regulating Valve Spool | 4—Modulation Spool |
| 2—Shim (as required) | 5—Retaining Ring |
| 3—Spring | |



T106692—UN—06FEB97

CED,OUO1032,1010 -19-09OCT98-10/25

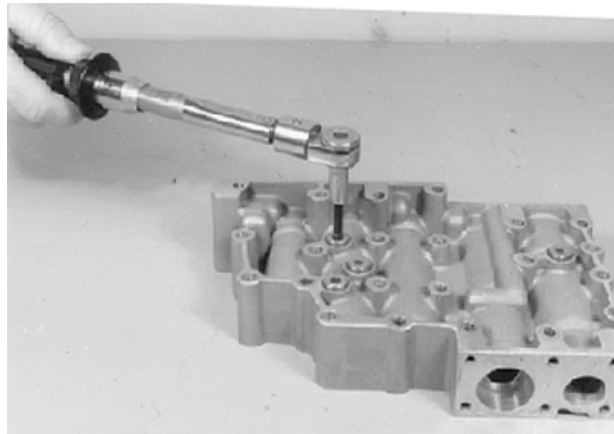
12. Remove orifice. Check passage of orifice.



T106693—UN—17JAN97

CED,OUO1032,1010 -19-09OCT98-11/25

13. Remove plugs with O-rings.



T106695—UN—17JAN97

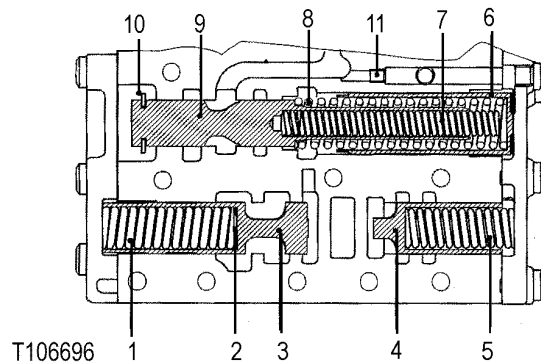
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CED,OUO1032,1010 -19-09OCT98-12/25

Hydraulic System

14. Inspect all parts. Apply clean oil to all components.

- | | |
|-------------------------------------|----------------------------|
| 1— Pressure Regulating Valve Spring | 7— Spring |
| 2— Shim | 8— Spring |
| 3— Spool | 9— Spool |
| 4— Converter Relief Valve Spool | 10— Retaining Ring |
| 5— Spring | 11— Orifice (Set Screw M5) |
| 6— Modulation Valve Piston | |



T106696

T106696 —UN—17JAN97

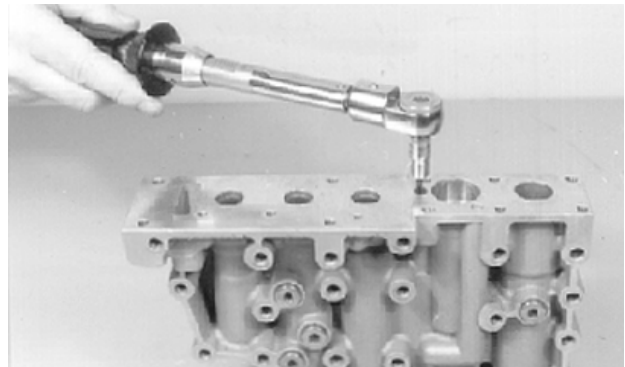
CED,OUO1032,1010 -19-09OCT98-13/25

15. Clean threads of set screw with cure primer and apply thread lock and sealer (medium strength) to threads.

16. Install orifice. Tighten to specification

Specification

Control Valve Orifice (Set Screw)—Torque..... 2.4 N·m (21 lb-in.)



T106697 —UN—17JAN97

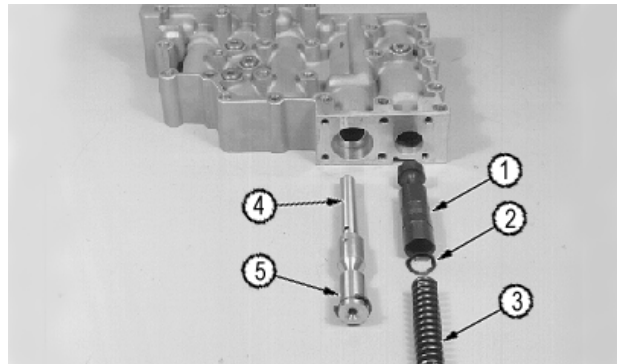
CED,OUO1032,1010 -19-09OCT98-14/25

17. Install parts (1—5).

Shim Adjustment: Cover (on machine) can be removed to access modulation valve shims and regulating valve spool shim(s).

For modulation valve, a 1 mm (0.039 in.) thick shim is equal to 43 kPa (0.42 bar) (6 psi). Measure shim thickness and select appropriate shim. (See Modulation Valve Pressure Test in Section 9020, Group 25 of Operation and Test Manual.)

For pressure regulating valve, one shim is equal to 115 kPa (1.15 bar) (17 psi). Measure shim thickness and select appropriate shim. (See System Pressure Test in Section 9020, Group 25 of Operation and Test Manual.)



- | | |
|------------------------------------|---------------------|
| 1— Pressure Regulating Valve Spool | 4— Modulation Spool |
| 2— Shim (as required) | 5— Retaining Ring |
| 3— Spring | |

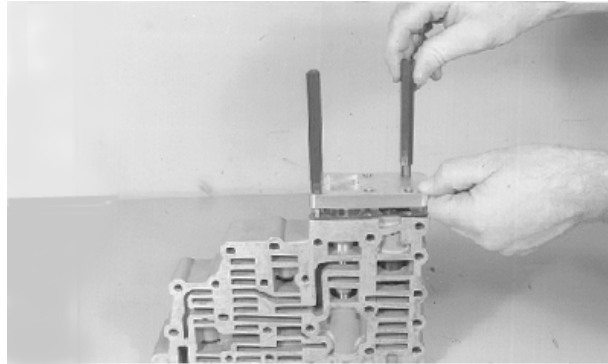
T106692 —UN—06FEB97

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CED,OUO1032,1010 -19-09OCT98-15/25

Hydraulic System

- 18. Install gasket and cover.
- 19. Install two threaded dowels (M6) with nuts. Tighten nuts evenly.



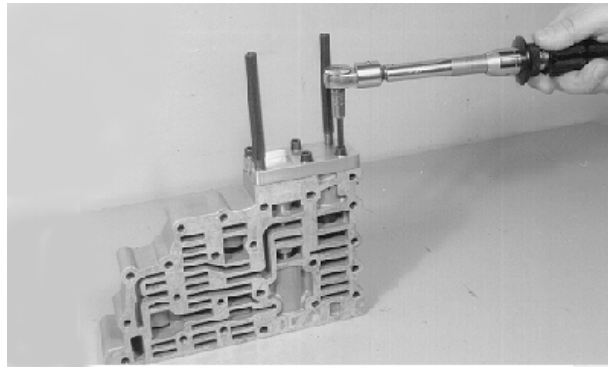
T106699 —UN—17JAN97

CED,OUO1032,1010 -19-09OCT98-16/25

- 20. Install washers and cap screws. Remove threaded dowels and nuts. Tighten cap screws to specification.

Specification

Control Valve Cap
Screws—Torque..... 9.5 N·m (84 lb-in.)

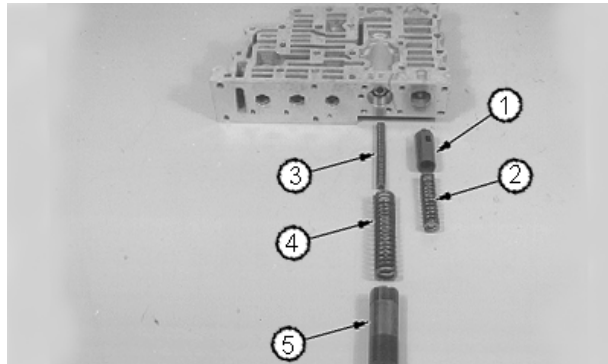


T106700 —UN—17JAN97

CED,OUO1032,1010 -19-09OCT98-17/25

- 21. Install parts (1—5).

- 1— Converter Relief Spool
- 2— Converter Relief Spring
- 3— Modulation Spring
- 4— Modulation Spring
- 5— Modulation Spool



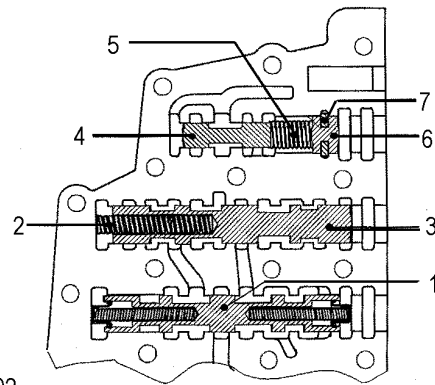
T106701 —UN—06FEB97

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CED,OUO1032,1010 -19-09OCT98-18/25

22. Inspect all parts. Put clean oil on all components.
23. Use this art as reference for the forward and reverse shift valve, neutral shift valve and pressure reducing valve.

- | | |
|---|--------------------|
| 1— Forward/Reverse Shift Valve Spool with Springs | 5— Spring |
| 2— Neutral Shift Valve Spring | 6— Plug |
| 3— Spool | 7— Retaining Plate |
| 4— Pressure Reducing Valve Spool | |



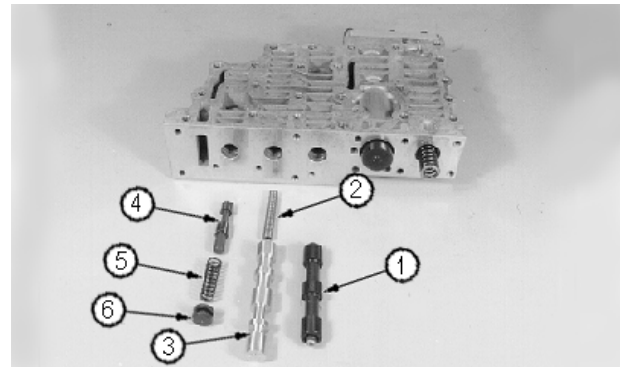
T106702

T106702 —UN—17JAN97

CED,OUO1032,1010 -19-09OCT98-19/25

24. Install parts (1—6).

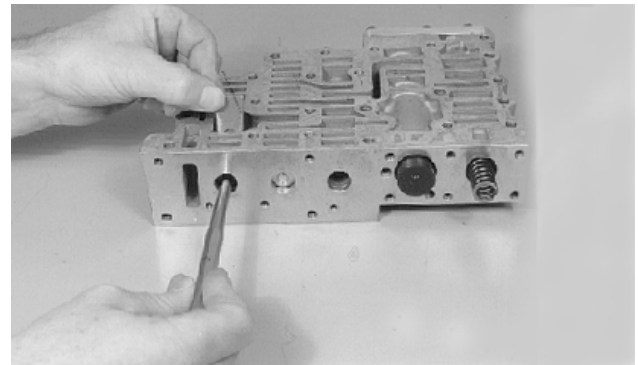
- | | |
|---|----------------------------------|
| 1— Forward/Reverse Shift Valve Spool with Springs | 4— Pressure Reducing Valve Spool |
| 2— Neutral Shift Valve Spring | 5— Spring |
| 3— Spool | 6— Plug |



T106703 —UN—08FEB97

CED,OUO1032,1010 -19-09OCT98-20/25

25. Using a punch, push plug in until retaining plate slips into groove of plug.



T106704 —UN—17JAN97

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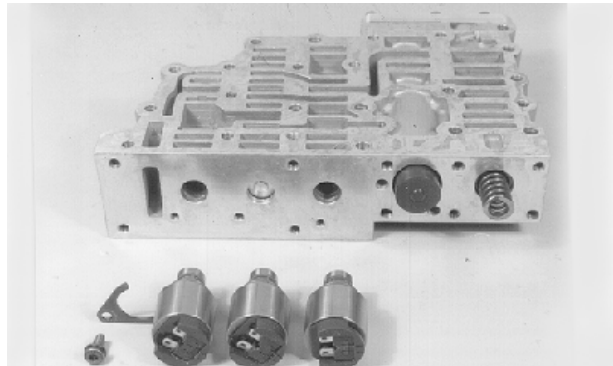
CED,OUO1032,1010 -19-09OCT98-21/25

Hydraulic System

- 26. Install three solenoid valves with connectors positioned for installation of harness.
- 27. Install three retaining plates with flat side toward valve body and three cap screws with washers. Tighten cap screws to specification.

Specification

Control Valve
Retaining Plate Cap
Screws—Torque..... 6 N·m (53 lb-in.)

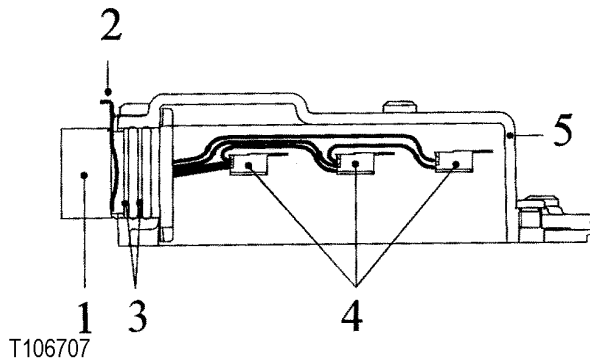


T106705—UN—17JAN97

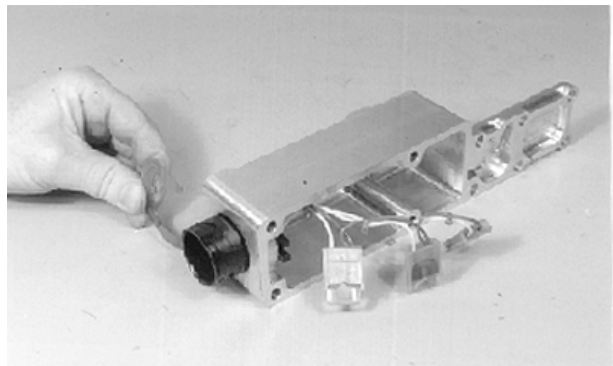
CED,OUO1032,1010 -19-09OCT98-22/25

- 28. Install harness and retaining plate with tabs up.

- 1—Harness
- 2—Retaining Plate
- 3—Sealing Ring
- 4—Plug (3 used)
- 5—Cover



T106707—UN—17JAN97



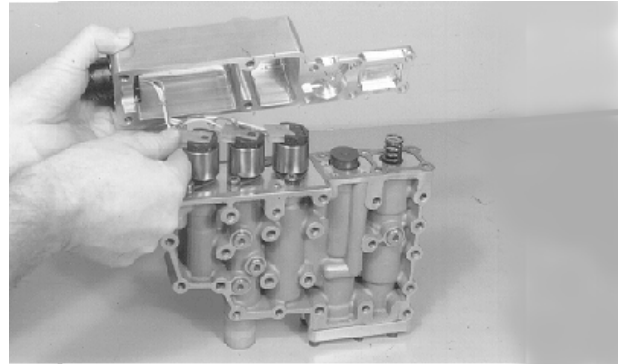
T106706—UN—17JAN97

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CED,OUO1032,1010 -19-09OCT98-23/25

Hydraulic System

- 29. Install gasket and connect harness with solenoid connectors.



T106709 —UN—17JAN97

CED,OUO1032,1010 -19-09OCT98-24/25

- 30. Install cover.
- 31. Using threaded dowels (M6) with nuts, tighten nuts evenly until cover bottoms.
- 32. Install cap screws and tighten to specification.

Specification

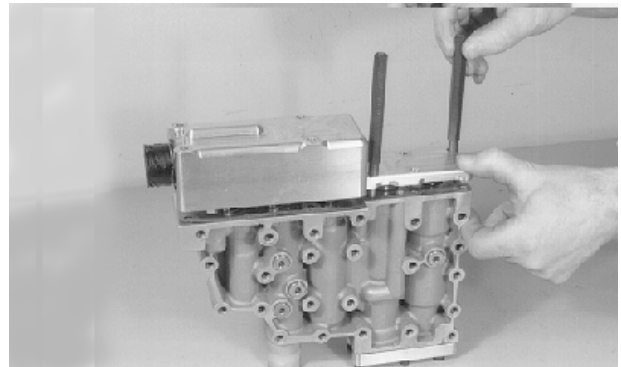
Control Valve Cap
Screws—Torque..... 9.5 N·m (84 lb-in.)

- 33. Install orifice plug on top side of valve housing cover if removed (this plug is used for access to orifice without taking cover off). Tighten plug to specification.

Specification

Control Valve Orifice
Plug—Torque..... 6 N·m (53 lb-in.)

- 34. Install control valve. (See procedure in this group.)



T106710 —UN—17JAN97

CED,OUO1032,1010 -19-09OCT98-25/25

Remove and Install Shift Valve—Powershift

1. Disconnect wire connector (A).
2. Remove cap screws (B) and remove shift valve (C).
3. Install two M6 dowels (G).

NOTE: Grease or petroleum jelly can be used to hold gaskets in place.

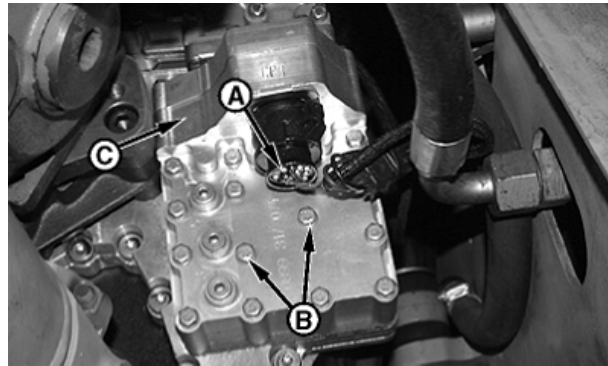
4. Install gasket (D) first, intermediate plate (E) and gasket (F).
5. Install shift valve (C).
6. Install cap screws (B) starting from the center and working out. Tighten cap screws to specification.

Specification

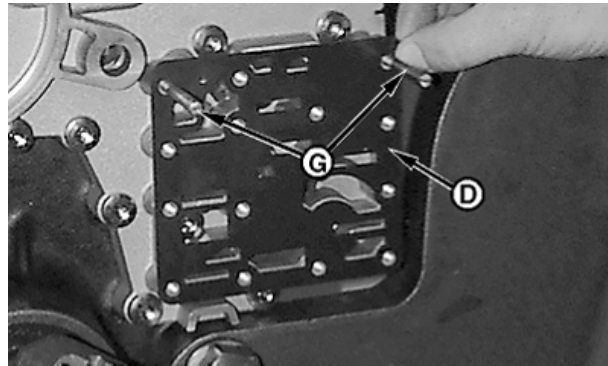
Shift Valve Cap
Screws—Torque..... 9.5 N·m (84 lb-in.)

7. Connect wire connector (A).

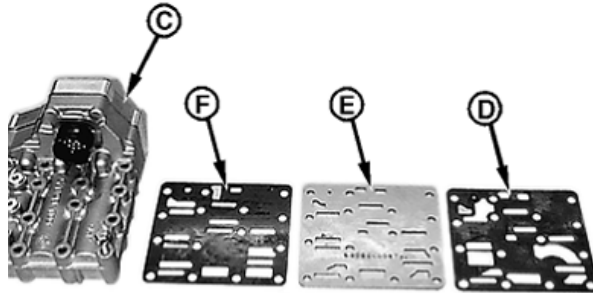
- | | |
|------------------------------|-----------------------------|
| A—Wire Connector | E—Intermediate Plate |
| B—Cap Screw (14 used) | F—Gasket |
| C—Shift Valve | G—M6 Dowel (2 used) |
| D—Gasket | |



T117681B—UN—12OCT98



T117657—UN—12OCT98



T117658—UN—12OCT98

CED,OUO1032,1011 -19-09OCT98-1/1

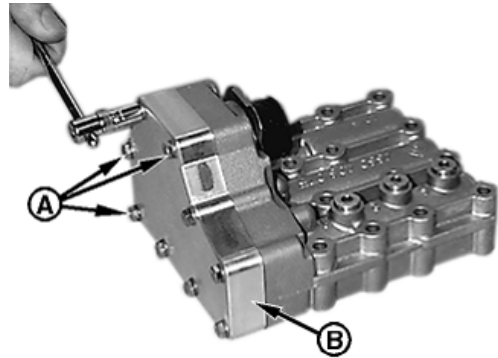
Disassemble and Assemble Shift Valve—Powershift

1. Remove cap screws (A) and remove cover (B).
2. Remove wire connectors (C) from solenoids (D).
3. Remove retainer clip (E) and remove harness and connector (F).

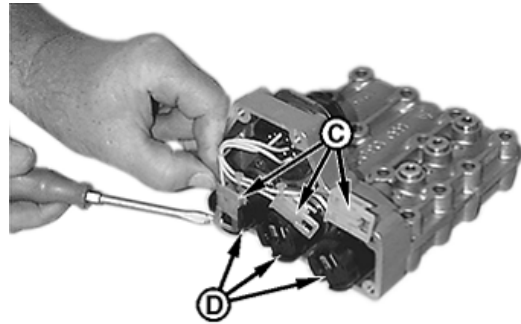
NOTE: Solenoid valves are spring loaded.

4. Remove socket head screws (G), retainers (H) and solenoids (D).

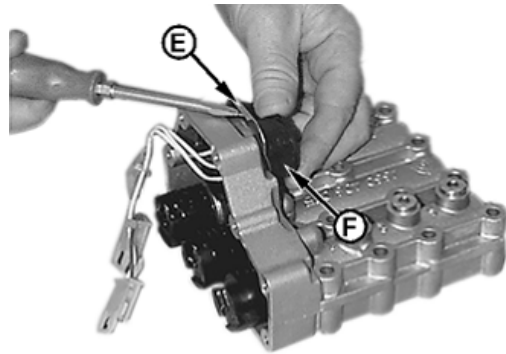
- | | |
|---------------------------|------------------------------|
| A—Cap Screw (8 used) | E—Retainer Clip |
| B—Cover | F—Harness and Connector |
| C—Wire Connector (3 used) | G—Socket Head Screw (3 used) |
| D—Solenoid (3 used) | H—Retainer (3 used) |



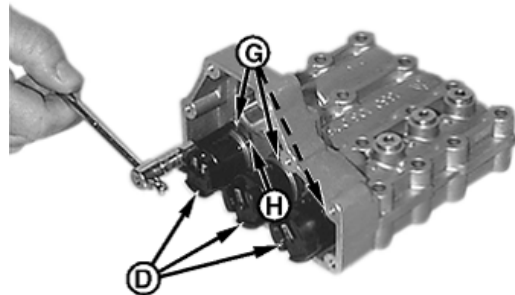
T117659—UN—12OCT98



T117660—UN—12OCT98



T117661—UN—12OCT98



T117662—UN—12OCT98

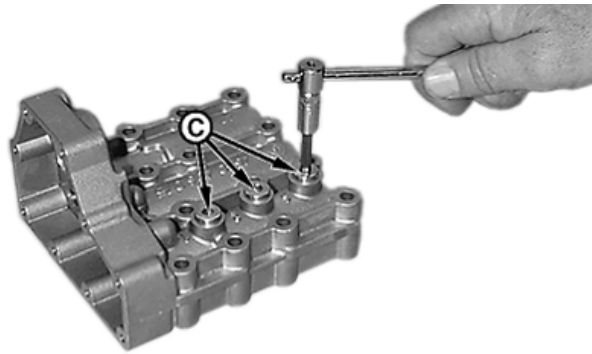
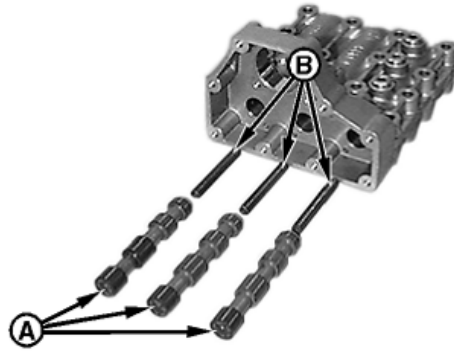
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CED,OUO1032,1012 -19-01SEP06-1/5

NOTE: Do not interchange spools into different ports of valve.

5. Remove spools (A) and springs (B).
6. Remove all screw plugs (C) and O-rings.

A—Shift Valve Spool (3 used) C—Plug (3 used)
B—Spring (3 used)

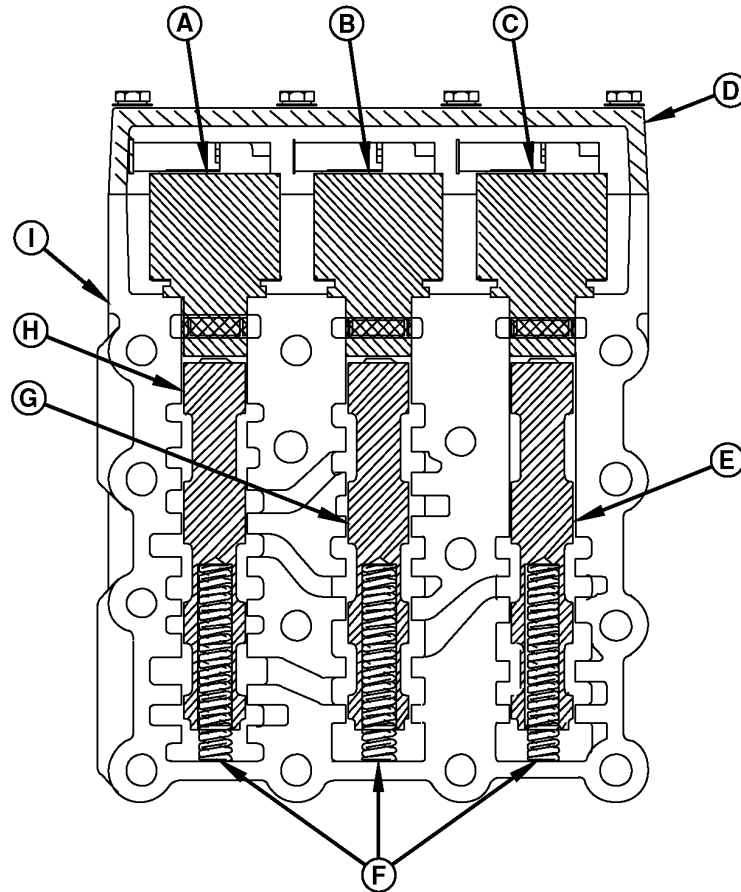


T117663 —UN—12OCT98

T117664 —UN—12OCT98

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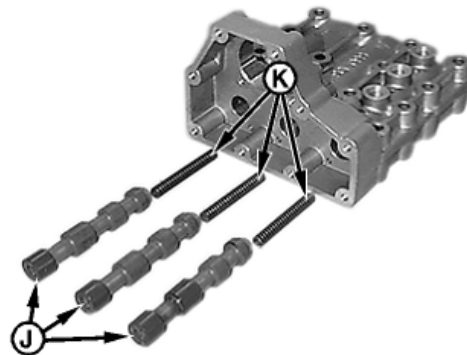
CED,OUO1032,1012 -19-01SEP06-2/5



T117683

7. Install shift valve spools (J) and springs (K).

- | | |
|-----------------------------|-------------------------------|
| A—Speed Solenoid Valve 3 | G—Speed Shift Valve Spool 2 |
| B—Speed Solenoid Valve 2 | H—Speed Shift Valve Spool 3 |
| C—Speed Solenoid Valve 1 | I— Valve Block |
| D—Cover | J— Shift Valve Spool (3 used) |
| E—Speed Shift Valve Spool 1 | K—Spring (3 used) |
| F—Spring (3 used) | |



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CED,OUO1032,1012 -19-01SEP06-3/5

T117683 —UN—12OCT98

T117665 —UN—12OCT98

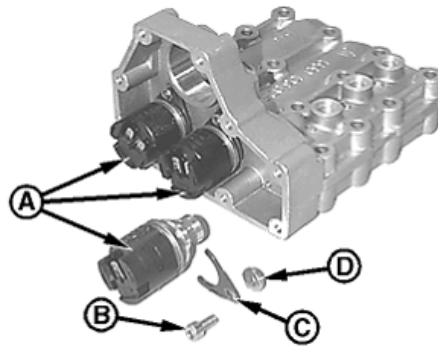
8. Install solenoids (A) in valve.
9. Fasten solenoid using socket head screw (B), retainer clip (C) and washer (D). Washer fits between valve body and retainer clip (C).
10. Solenoids (A) must be positioned so solenoid terminals are pointing toward harness connector (E).
11. Tighten socket head screws (B) to specification.

Specification

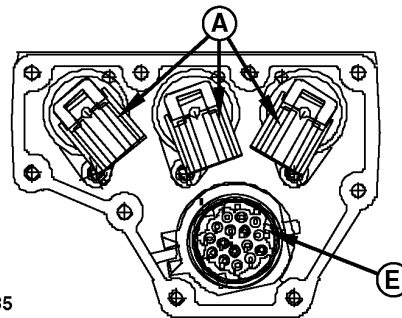
Solenoid Socket Head
Screws—Torque..... 6 N·m (53 lb-in.)

12. Install harness connector (E) with sealing rings (F).

- | | |
|------------------------------|-------------------------|
| A—Solenoid (3 used) | D—Washer (3 used) |
| B—Socket Head Screw (3 used) | E—Harness Connector |
| C—Retainer Clip (3 used) | F—Sealing Ring (2 used) |

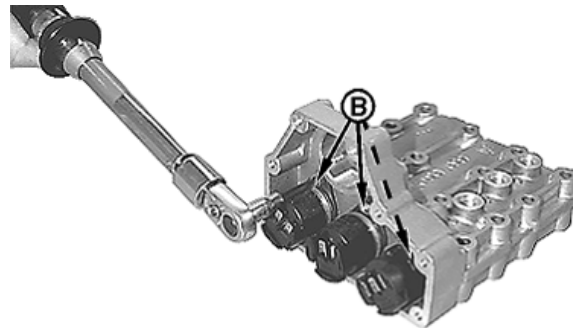


T117666 —UN—12OCT98

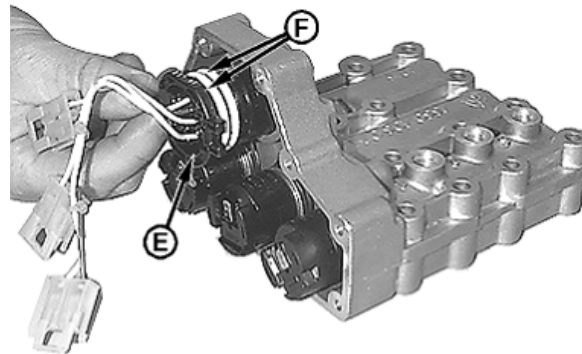


T117685

T117685 —UN—12OCT98



T117667 —UN—12OCT98



T117668 —UN—12OCT98

Continued on next page

CED,OUO1032,1012 -19-01SEP06-4/5

13. Install retaining clip (A).
14. Install wire connectors (B).
15. Install gasket (C).
16. Install cover (D).
17. Install cap screws (E) and tighten to specification.

Specification

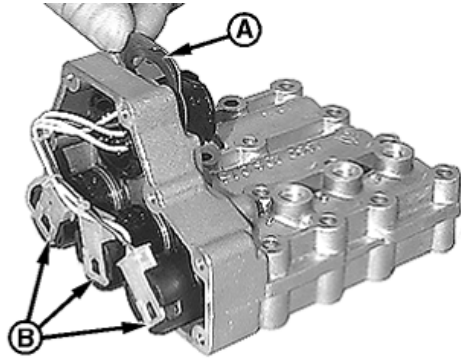
Solenoid Valve
 Retaining Clip Cap
 Screws—Torque..... 5.5 N·m (47 lb-in.)

18. Install plugs (F). Tighten to specification.

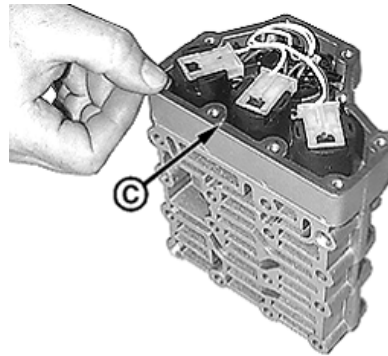
Specification

Solenoid Valve
 Plugs—Torque..... 6 N·m (53 lb-in.)

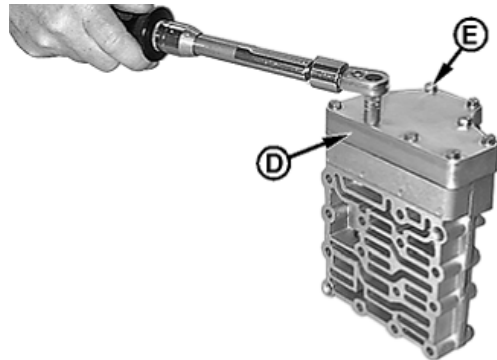
- | | |
|----------------------------------|-----------------------------|
| A—Retaining Clip | D—Cover |
| B—Wire Connector (3 used) | E—Cap Screw (9 used) |
| C—Gasket | F—Plug (3 used) |



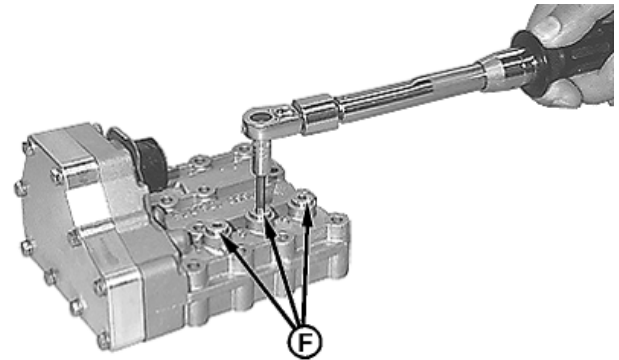
T117669 —UN—12OCT98



T 117670 —UN—12OCT98



T 117671 —UN—12OCT98



T117672 —UN—12OCT98

CED,OU01032,1012 -19-01SEP06-5/5

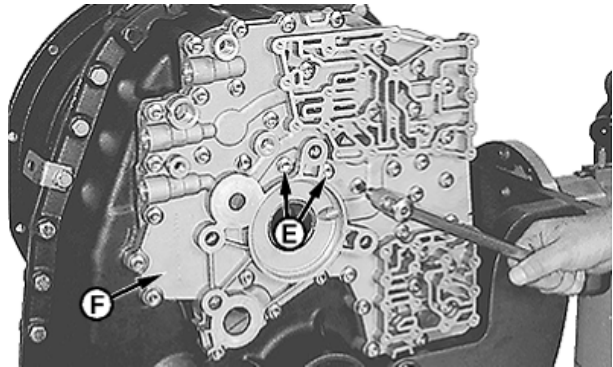
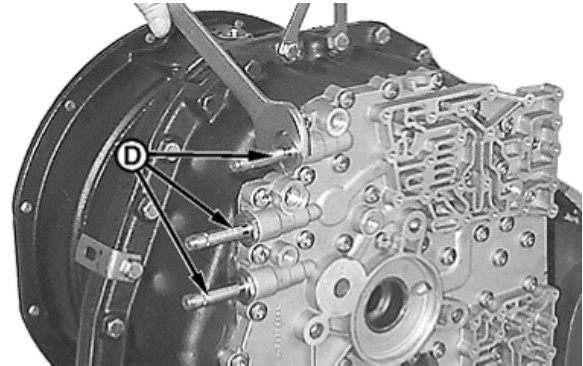
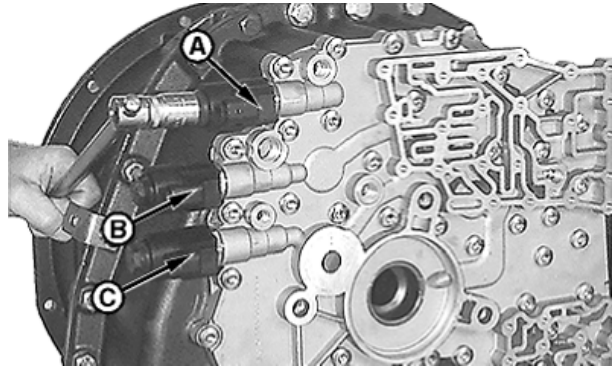
Remove and Install Manifold Plate and Solenoids—Powershift

NOTE: Transmission shown removed for illustration purposes.

If removing solenoid with transmission installed on machine, remove transmission shift lever and floor plate to access the solenoids.

1. Remove charge pump, control valve, and shift valve. (See procedures in this group.)
2. Loosen screw plugs of solenoid valves (A—C) and pull off solenoid coils with O-rings.
3. Remove valve bodies and O-rings (D).
4. Remove TORX® head screws (E) and remove manifold plate (F).

A—Differential Lock Solenoid	D—Valve Body (3 used)
B—Park Brake Solenoid	E—TORX® Screw (43 used)
C—MFWD Solenoid (if equipped)	F—Manifold Plate



TORX is a registered trademark of Camcar/Textron

Continued on next page

CED,OUTX782,536 -19-21OCT99-1/3

NOTE: Use petroleum jelly or grease to hold gasket and check ball and spring in place during assembly.

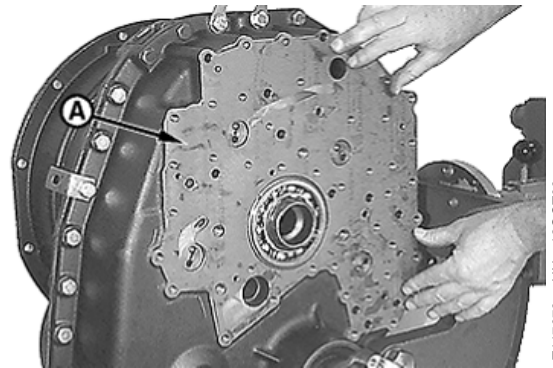
5. Install gasket (A) on transmission case.
6. Install check ball (B) and spring (C) in manifold plate.
7. Install manifold plate (D). Make sure check ball (B) and spring (C) are in place.
8. Install TORX® head screws (E). Starting with inside cap screws first and continuing to the outside, tighten cap screws to specification.

Specification

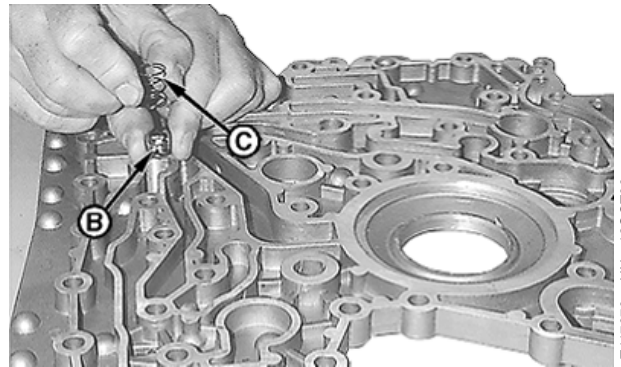
Transmission Manifold
 Plate TORX® Head
 Screws—Torque..... 23 N·m (204 lb-in.)

A—Gasket
B—Check Ball
C—Spring

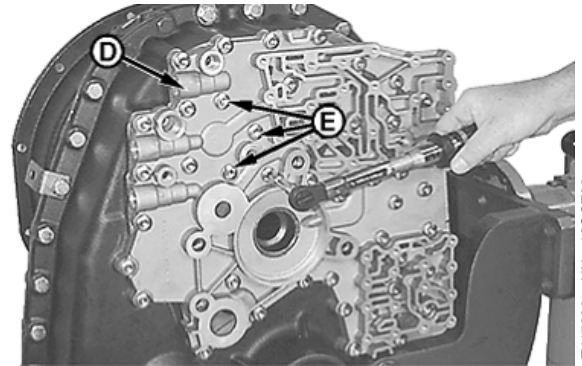
D—Manifold Plate
E—TORX® Head Screw (43 used)



T117678 —UN—12OCT98



T117679 —UN—12OCT98



T117680 —UN—12OCT98

TORX is a registered trademark of Camcar/Textron

Continued on next page

CED,OUTX782,536 -19-21OCT99-2/3

9. Install valve bodies and O-rings (D).

10. Tighten to specification.

Specification

Manifold Plate Solenoid
Valves Bodies—Torque..... 27 N·m (240 lb-in.)

11. Install solenoids (A—C).

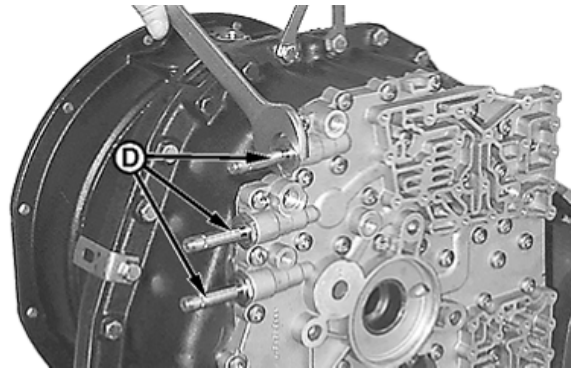
12. Tighten solenoids to specification.

Specification

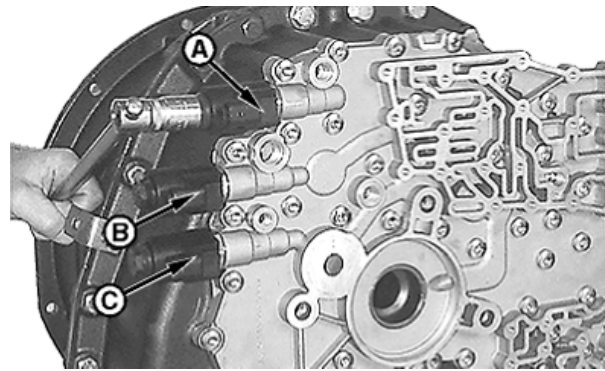
Solenoids—Torque..... 6 N·m (53 lb-in.)

13. Install shift valve, control valve, and charge pump. (See procedures in this group.)

A—Differential Lock Solenoid **C—MFWD Solenoid**
B—Park Brake Solenoid **D—Valve Body**



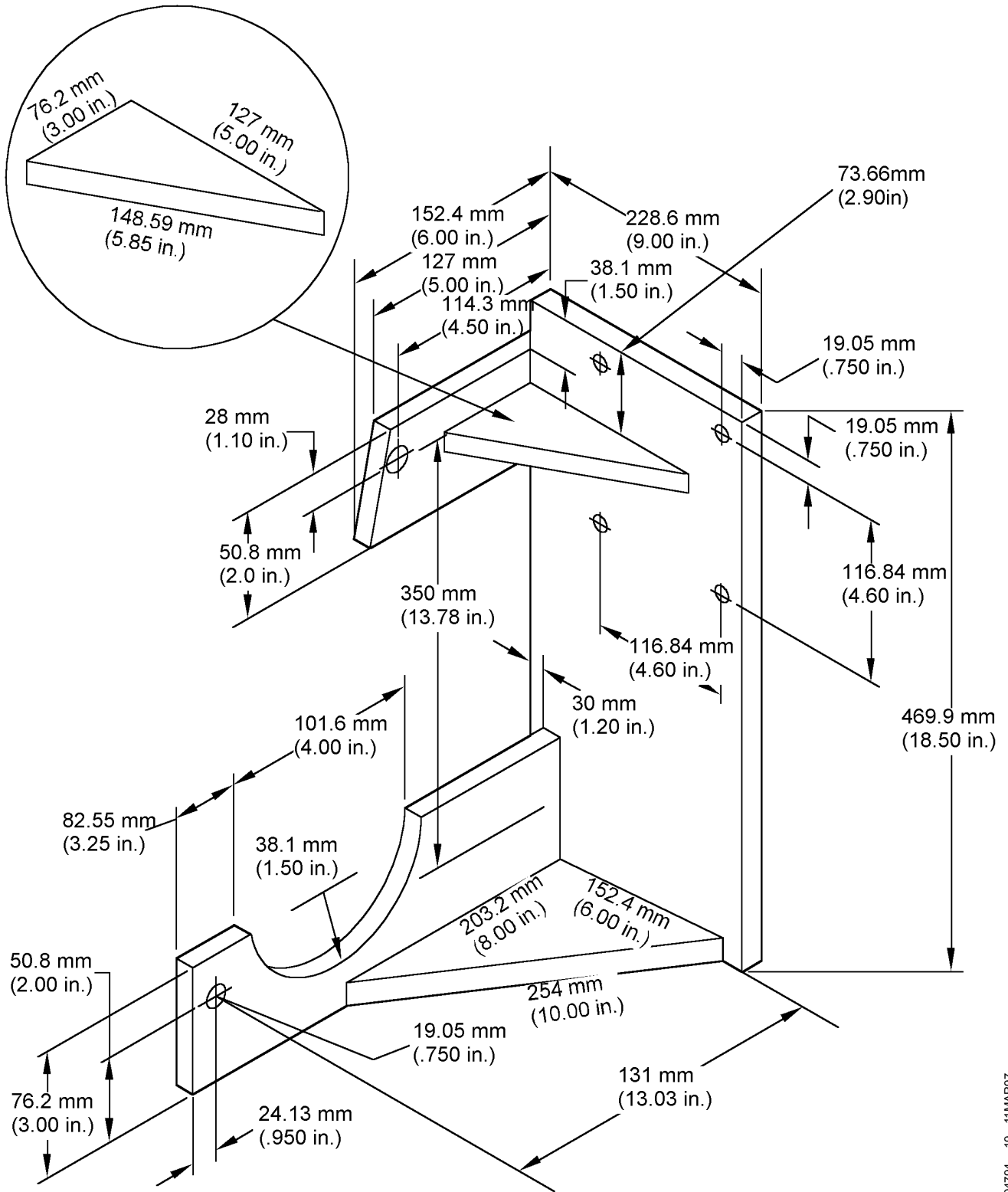
T117674—UN—12OCT98



T117673—UN—12OCT98

CED.OUTX782,536 -19-21OCT99-3/3

DFT1143 Transmission Support Bracket



T104794

ALL HOLES ARE 19.05 mm(0.75 in.)

Transmission Support Bracket is used to hold transmission in repair stand.

Material required:

Continued on next page

TX.0399,SS3029 -19-01SEP06-1/2

T104794 -19-11MAR97

Dealer Fabricated Tools

- 1/2 in. 1020 Steel

- 7/8 in. O-Ring Plug (2 used) drilled for 5/8 in. cap screws. Used to mount bracket to transmission.

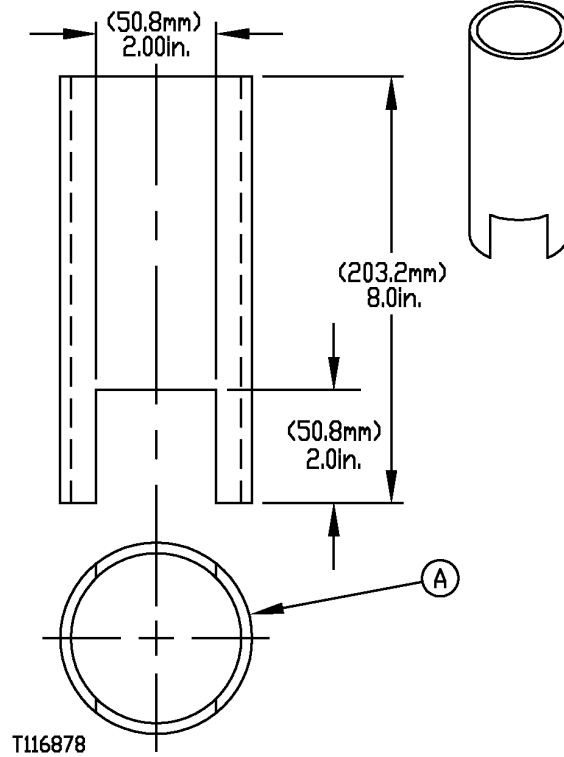
TX,0399,SS3029 -19-01SEP06-2/2

DFT1162 Powershift Clutch Pack Snap Ring Removal and Installation Tool

Used to remove and install snap rings in powershift clutch packs.

Material required:

- 2 in. ID x 8 in. Long Pipe



T116878 -19-20AUG98

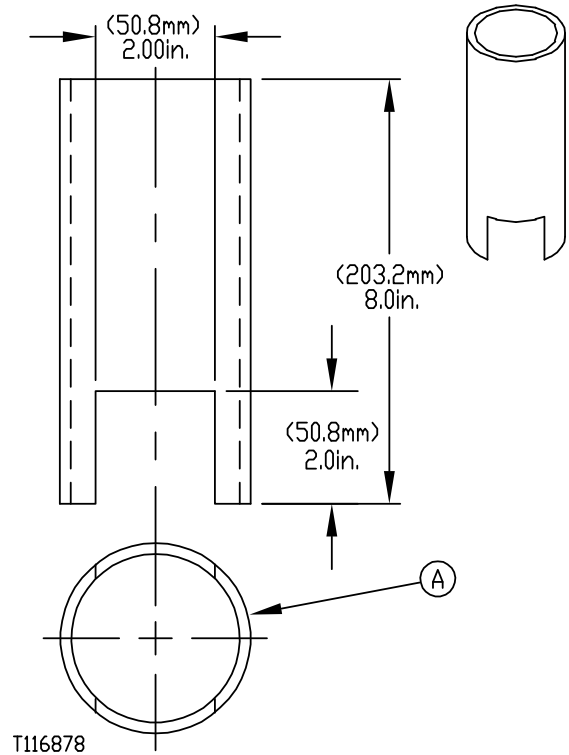
AG,OUO1032,728 -19-18SEP98-1/1

DFT1163 MFWD Snap Ring Removal and Installation Tool

Used to remove and install snap rings in MFWD shaft assembly

Material required:

- 3 in. ID x 6 in. Long Pipe



DFT1163 Tool

TX1073634 —UN—06APR10

CED,OUO1017,71 -19-29MAR10-1/1

Dealer Fabricated Tools

Section 04 Engine

Contents

	Page
Group 0400—Removal and Installation	
Essential Tools.....	04-0400-1
Specifications	04-0400-1
PowerTech 4.5 L (4045) John Deere Engine—Use CTM104	04-0400-2
Engine	
Remove and Install	04-0400-2
Group 0499—Dealer Fabricated Tools	
DFT1145 Transmission Holding Bracket	04-0499-1

Contents

Group 0400 Removal and Installation

Essential Tools

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or from the European Microfiche Tool Catalog (MTC).

SERVICEGARD is a trademark of Deere & Company

WS68074.0003705 -19-14JUL10-1/4

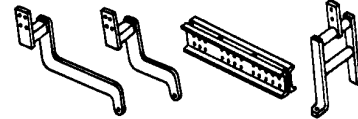
Engine Lifting Bracket..... JDG393

Used to remove and install engine.

Load-Positioning Sling..... D01043AA

Used to remove and install engine.

T6606AD —UN—18OCT88



T8015AG —UN—01JUN93

T8015AG (CV)



WS68074.0003705 -19-14JUL10-2/4

Transmission Holding Bracket..... DFT1145¹

Used to support transmission while removing engine.

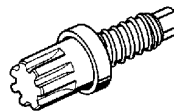
¹Dealer Fabricated Tool. See Group 0499 for instructions to make tool.

WS68074.0003705 -19-14JUL10-3/4

Flywheel Turning Tool..... JDG820

Used to turn flywheel when installing torque converter cap screws.

RG7056 —UN—17JUN05



WS68074.0003705 -19-14JUL10-4/4

Specifications

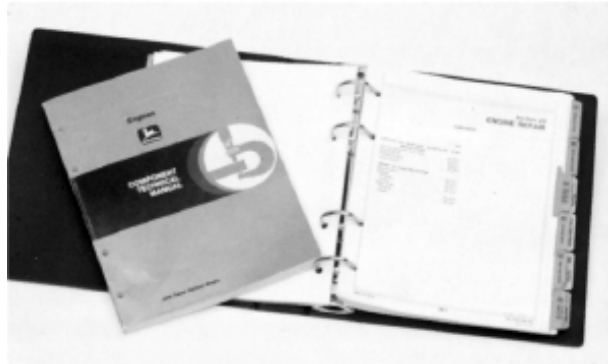
Item	Measurement	Specification
Engine	Weight	404 kg (890 lb) Approximate
Transmission-to-Engine Flywheel Housing Cap Screws	Torque	73 N·m (54 lb-ft)
Engine Mounting Front and Rear Cap Screws	Torque	130 N·m (96 lb-ft)
Torque Converter Flex Plate-to-Flywheel Housing Cap Screws	Torque	73 N·m (54 lb-ft)

CED,TX03399,5642 -19-06DEC99-1/1

PowerTech 4.5 L (4045) John Deere Engine—Use CTM104

For additional engine information, the component technical manual (CTM) is also required. See PowerTech 4.5 L (4045) John Deere Engine . (CTM104.)

Use the CTM in conjunction with this machine manual.



M44215—UN—07SEP88

TX,05,SS3179 -19-05AUG96-1/1

Remove and Install Engine

1. Raise loader boom and install locking bar.
2. Disconnect negative (—) battery cable.
3. Remove grille, muffler stack, pre-cleaner, engine side shields, support bars, hood, muffler and air cleaner.
4. Remove reservoir. See Remove and Install Reservoir in Section 21, Group 2160.

CAUTION: Explosive release of fluids from pressurized cooling system can cause serious burns.

Shut off engine. Remove filler cap only when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.



NOTE: Radiator capacity is approximately 16 L (17 qt).

Continued on next page

WS68074,0003704 -19-14JUL10-1/15

TS281—UN—23AUG88

Removal and Installation

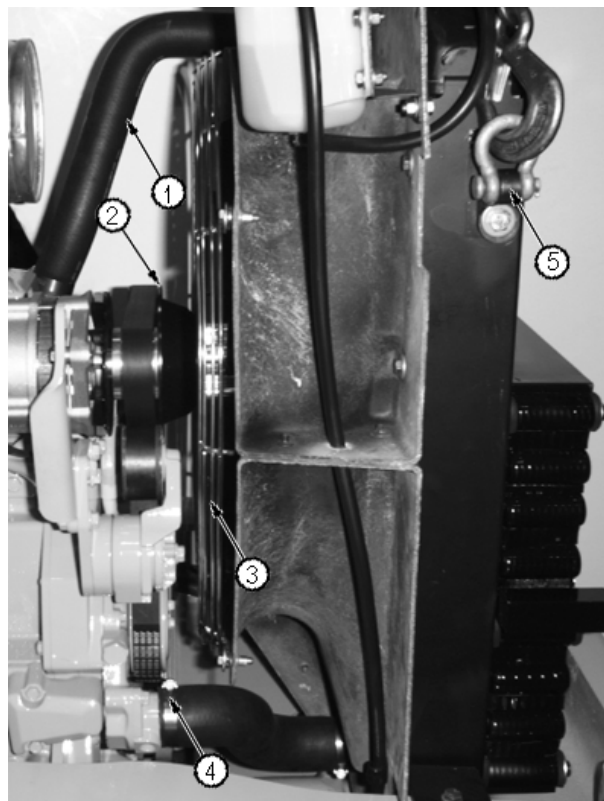
5. Drain radiator.

NOTE: If equipped with air conditioning, disconnect condenser from radiator, compressor and receiver/dryer. Lay components to the side.

6. Disconnect hoses (1, 2 and 4). Remove fan guard (3).

7. Install lifting brackets (5) on radiator.

- | | |
|--|------------------------|
| 1— Upper Radiator Hose | 4— Lower Radiator Hose |
| 2— Air Circulating Hose from Fan Shroud (Cab Only) | 5— Lift Brackets |
| 3— Fan Guard | |



Continued on next page

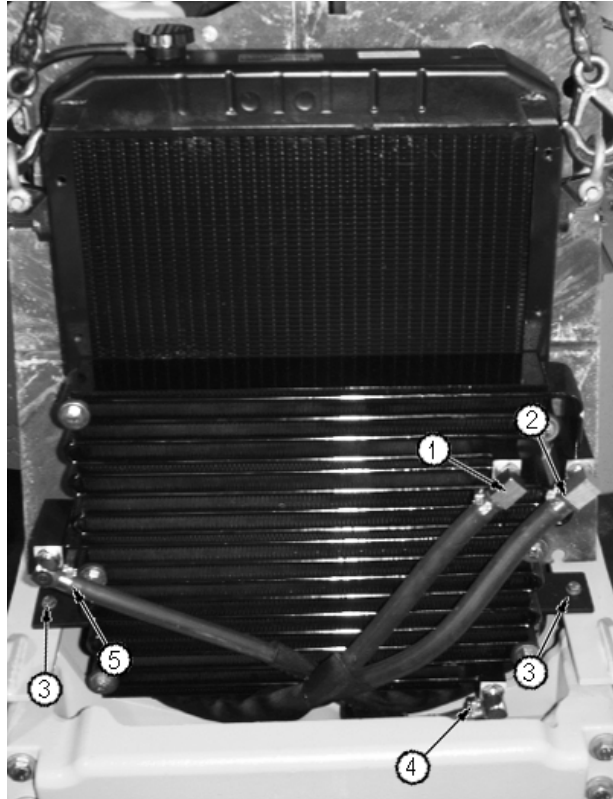
WS68074,0003704 -19-14JUL10-2/15

T107524B —UN—20FEB97

Removal and Installation

8. Disconnect lines (1, 2, 4, and 5).
9. Remove two cap screws (3) to remove radiator and oil cooler.
10. Disconnect speed control linkage.

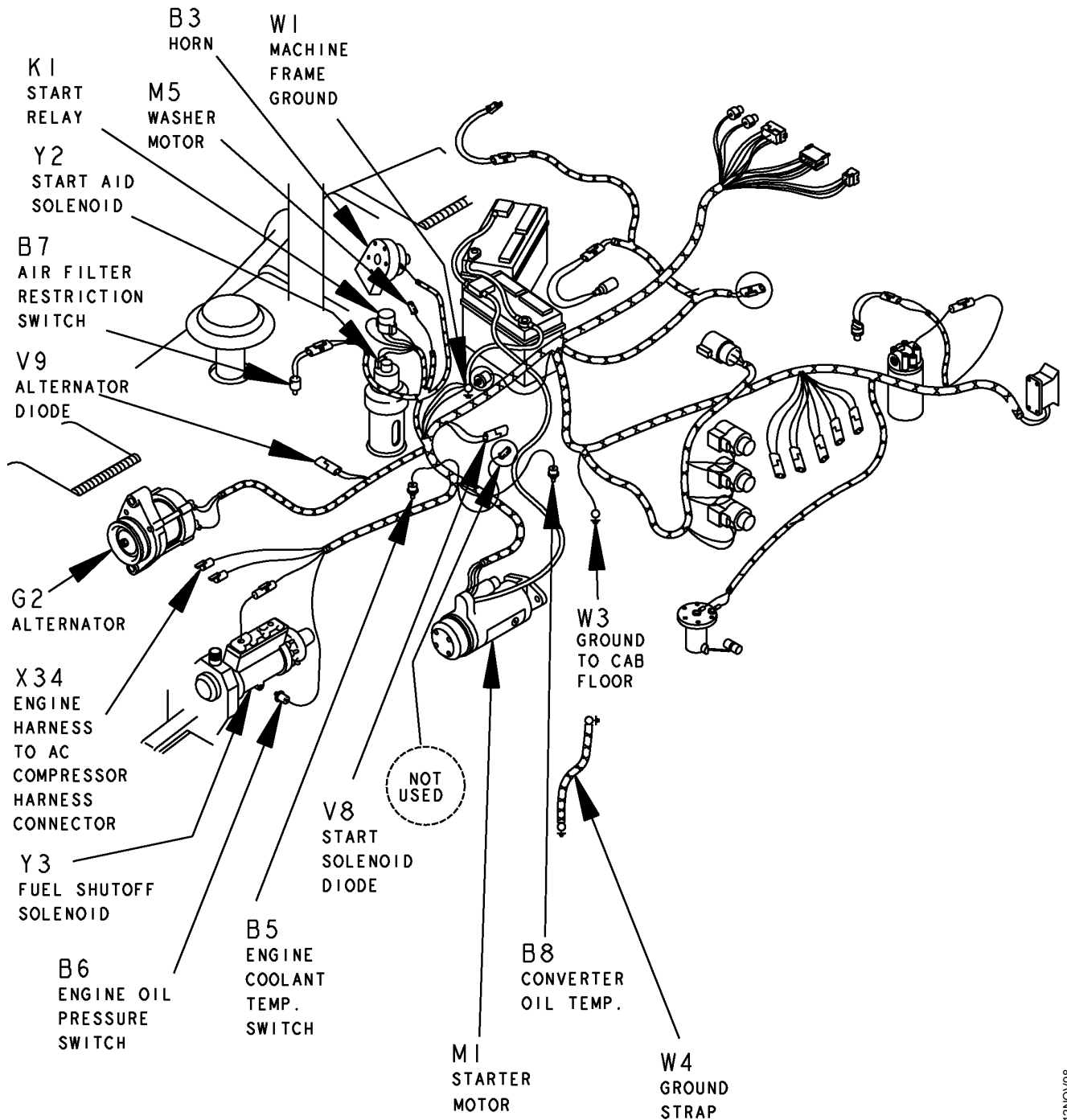
- | | |
|--|---|
| 1— Transmission Oil Cooler
Line-to-Transmission | 4— Hydraulic Oil Cooler
Line-to-Hydraulic Filter |
| 2— Transmission Oil Cooler
Line-to-Transmission | 5— Hydraulic Oil Cooler
Line-to-Reservoir |
| 3— Cap Screw (2 used) | |



T107525B —UN—20FEB97

Continued on next page

WS68074,0003704 -19-14JUL10-3/15



ENGINE HARNESS - COMPONENTS

T118429

T118429—UN—12NOV98

Continued on next page

WS68074,0003704 -19-14JUL10-4/15

Removal and Installation

W1—Machine Frame Ground	B7—Air Filter Restriction Switch	B6—Engine Oil Pressure Switch	W4—Ground Strap
B3—Horn	V9—Alternator	B5—Engine Coolant Temperature Switch	W3—Ground To Cab Floor
M5—Washer Motor	G2—Alternator	V8—Start Solenoid Diode	
K1—Start Relay	X34—Engine Harness To AC Compressor Harness	M1—Starter Motor	
Y2—Start Aid Solenoid	Y3—Fuel Shutoff Solenoid	B8—Converter Oil Temperature	

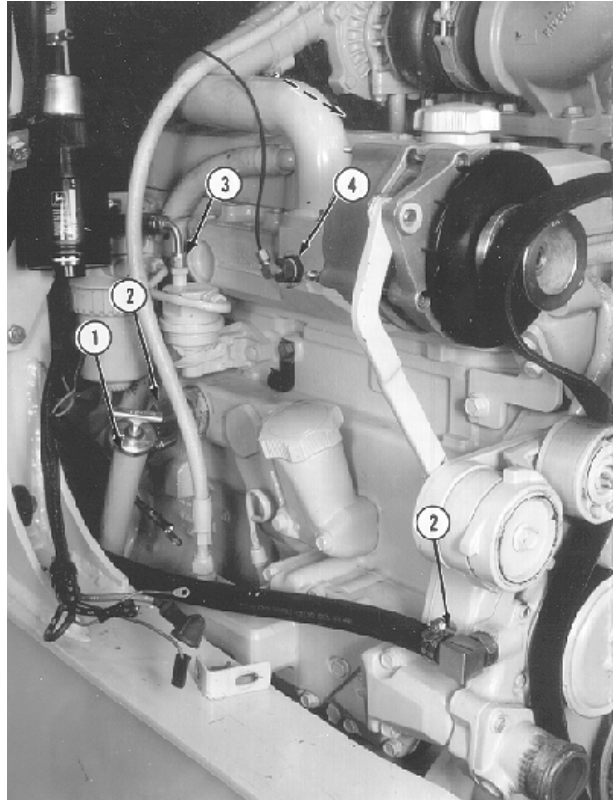
11. Disconnect electrical components from engine harness as shown.

WS68074.0003704 -19-14JUL10-5/15

12. Disconnect lines (2, 3 and 4). Cap all lines.

13. Remove dipstick tube (1) from transmission.

1—Transmission Dipstick	3—Fuel Line
2—Heater Line (2 used)	4—Start Aid Line

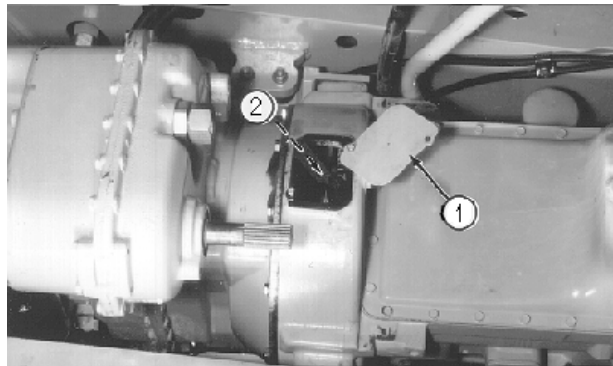


T106163—UN—25FEB97

WS68074.0003704 -19-14JUL10-6/15

14. Remove access cover (1) and remove four cap screws (2) on torque converter flex plate to flywheel.

1—Access Cover	2—Cap Screws
----------------	--------------



T106164—UN—25FEB97

Continued on next page

WS68074.0003704 -19-14JUL10-7/15

Removal and Installation

15. Install JDG393 Lifting Bracket (1) and D01043AA Load Positioning Sling (2) to engine.
16. Remove front and rear engine mounting cap screws.

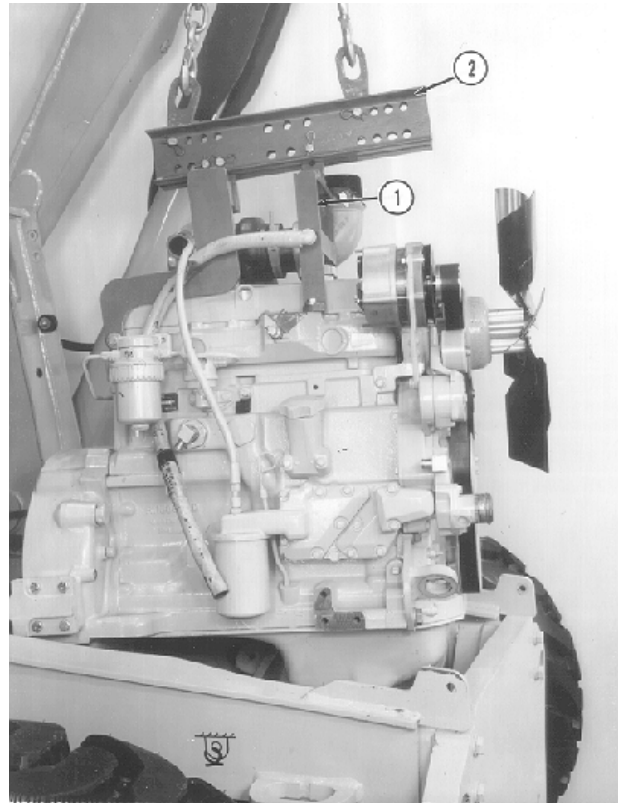
⚠ CAUTION: Engine weighs approximately 404 kg (890 lb).

17. Raise engine and tilt until there is enough clearance so oil pan clears frame.

Specification

Engine—Weight..... 404 kg (890 lb) Approximate

- | | |
|---------------------------|------------------------------------|
| 1— JDG393 Lifting Bracket | 2— D01043AA Load Positioning Sling |
|---------------------------|------------------------------------|



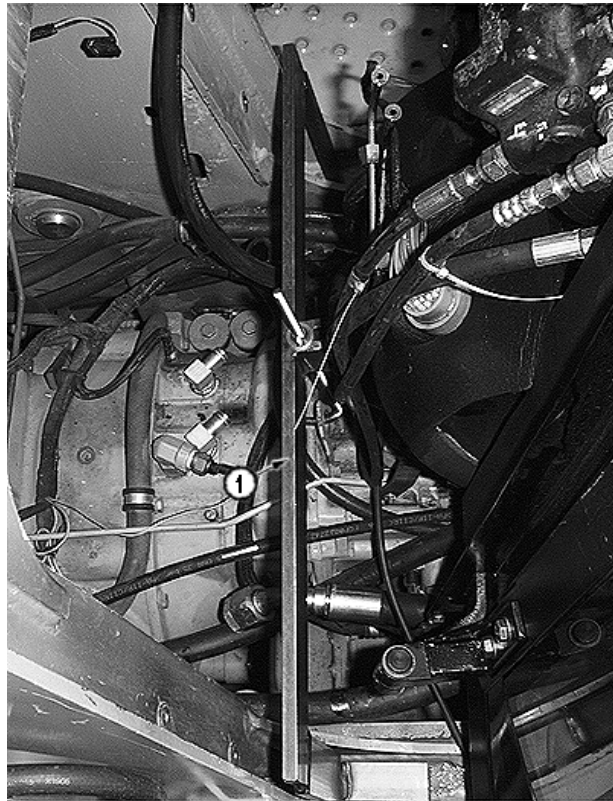
T106156 —UN—25FEB97

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WS68074,0003704 -19-14JUL10-8/15

18. Install DFT1145 Transmission Holding Bracket (1). Adjust bracket until there is pressure on it.
 19. Remove transmission to engine flywheel housing cap screws.
- IMPORTANT: When removing engine, take care not to damage torque converter flex plate.**
20. Remove engine.

1—DFT1145 Transmission Holding Bracket



T107892B—UN—11MAR97

WS68074.0003704 -19-14JUL10-9/15

21. Install engine.
22. Install transmission to engine flywheel housing cap screws (12 used). Tighten cap screws to specification.

Specification

Transmission-to-Engine
Flywheel Housing Cap
Screws—Torque..... 73 N·m (54 lb-ft)

23. Install engine mounting cap screws with rubber mounts front and rear. Tighten front and rear cap screws to specification.

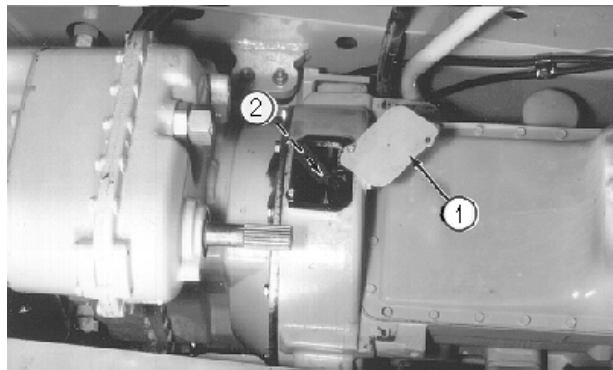
Specification

Engine Mounting
Front and Rear Cap
Screws—Torque..... 130 N·m (96 lb-ft)

24. Install JDG820 Flywheel Turning Tool. Install four cap screws (2) on torque converter flex plate to flywheel. Tighten cap screws to specification. Install access cover (1).

Specification

Torque Converter Flex
Plate-to-Flywheel
Housing Cap
Screws—Torque..... 73 N·m (54 lb-ft)



1— Access Cover

2— Cap Screw (4 used)

T106154—UN—25FEB97

Continued on next page

WS68074.0003704 -19-14JUL10-10/15

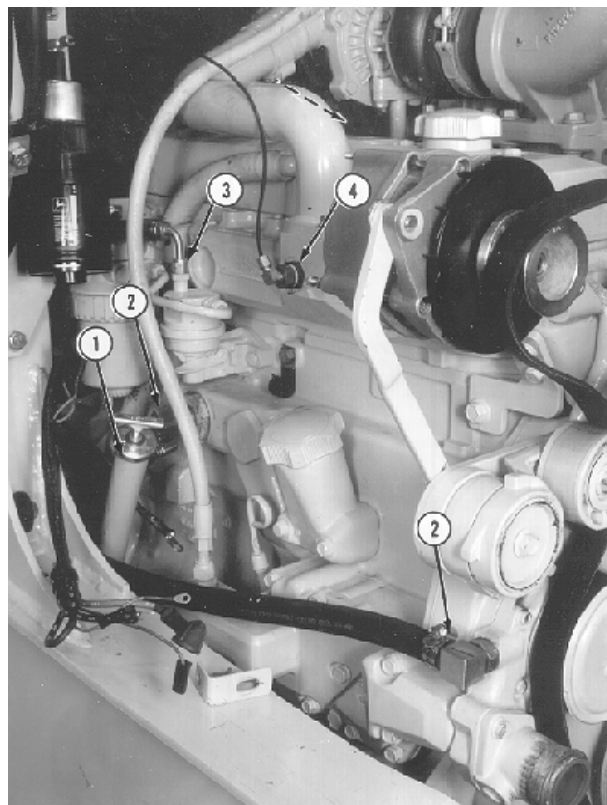
Removal and Installation

25. Install lines (2, 3 and 4). Cap all lines.

26. Install dipstick tube (1) to transmission.

1— Transmission Dipstick
2— Heater Line (2 used)

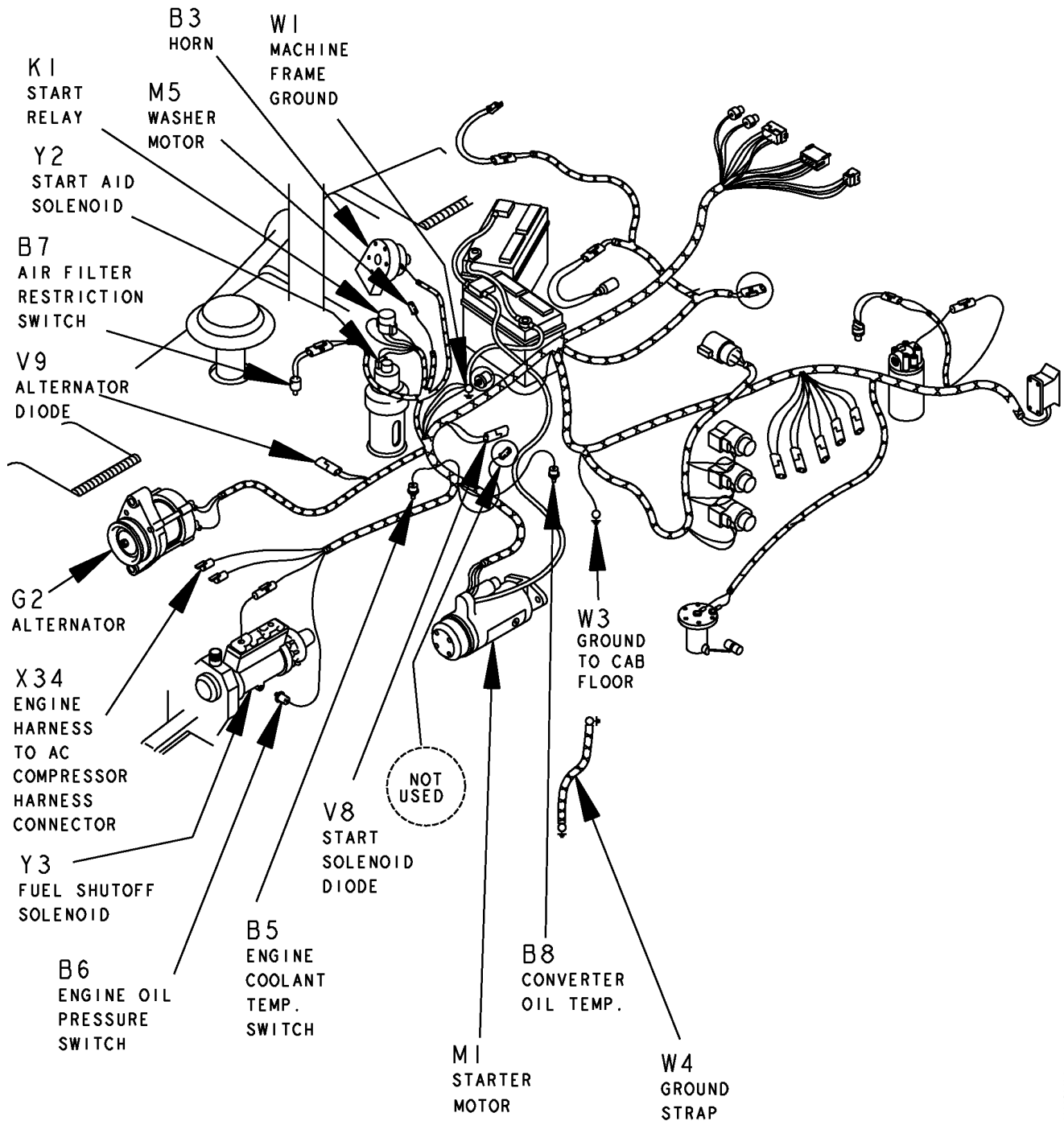
3— Fuel Line
4— Start Aid Line



T106153 —UN—25FEB97

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WS68074,0003704 -19-14JUL10-11/15



ENGINE HARNESS - COMPONENTS

T118429

T118429 —UN—12NOV98

Continued on next page

WS68074,0003704 -19-14JUL10-12/15

Removal and Installation

W1—Machine Frame Ground
B3—Horn
M5—Washer Motor
K1—Start Relay
Y2—Start Aid Solenoid
B7—Air Filter Restriction Switch
V9—Alternator
G2—Alternator
X34— Engine Harness To AC Compressor Harness
Y3—Fuel Shutoff Solenoid
B6—Engine Oil Pressure Switch
W4—Ground Strap
B5—Engine Coolant Temperature Switch
W3—Ground To Cab Floor
V8—Start Solenoid Diode
M1—Starter Motor
B8—Converter Oil Temperature

27. Connect engine harness to electrical components as shown.

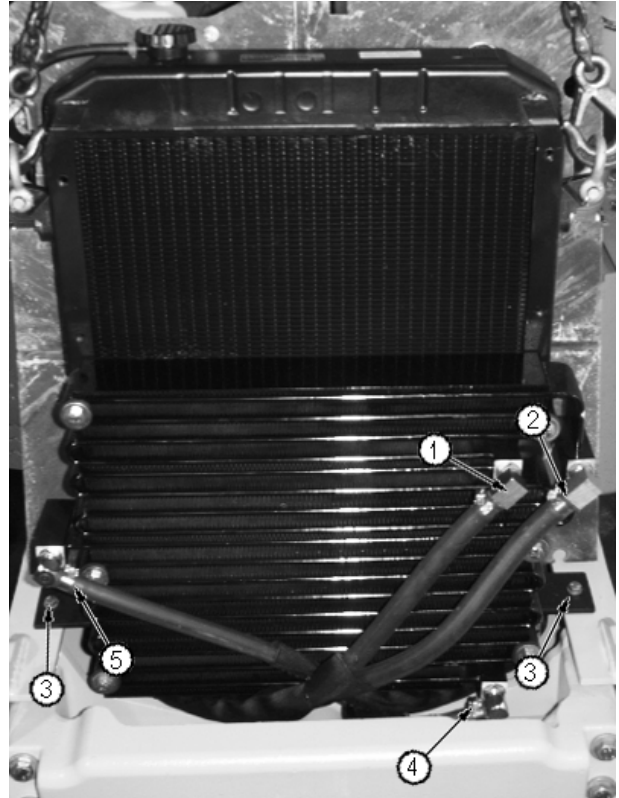
28. Connect speed control linkage.

WS68074,0003704 -19-14JUL10-13/15

29. Install radiator and oil cooler. Install radiator cap screws (3) and tighten.

30. Connect lines (1, 2, 4, and 5).

1— Transmission Oil Cooler Line-to-Transmission
2— Transmission Oil Cooler Line-to-Transmission
3— Cap Screw (2 used)
4— Hydraulic Oil Cooler Line-to-Hydraulic Filter
5— Hydraulic Oil Cooler Line-to-Reservoir



T107525B—UN—20FEB97

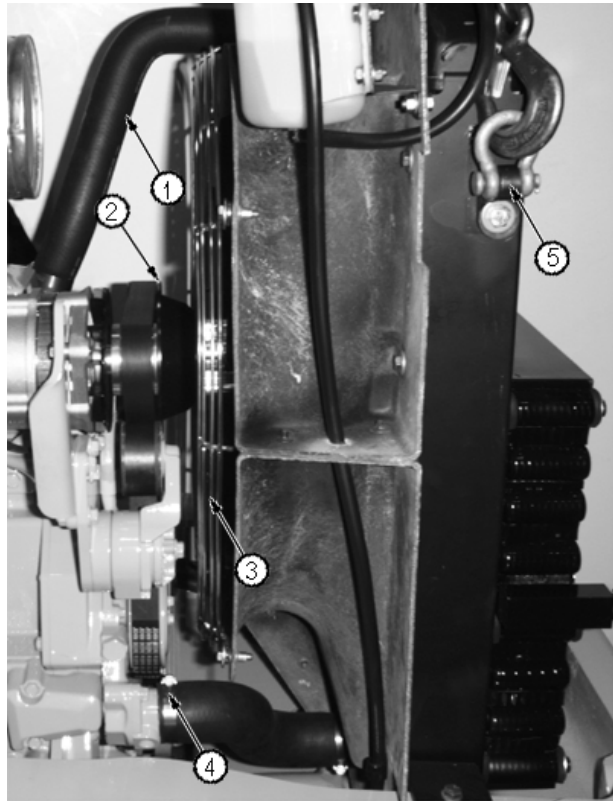
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WS68074,0003704 -19-14JUL10-14/15

Removal and Installation

31. Install fan guard (3). Connect hoses (1, 2 and 4).
32. Install air conditioning components if equipped.
33. Install reservoir. See Remove and Install Reservoir in Section 21, Group 2160.
34. Install air cleaner, muffler, hood, support bars, engine side shields, pre-cleaner, muffler stack and grille.
35. Fill radiator. Check engine, transmission and hydraulic reservoir oil levels. See Section 00, Group 0002 for capacities.
36. Start engine and check for oil leaks. Install grille and side shields.

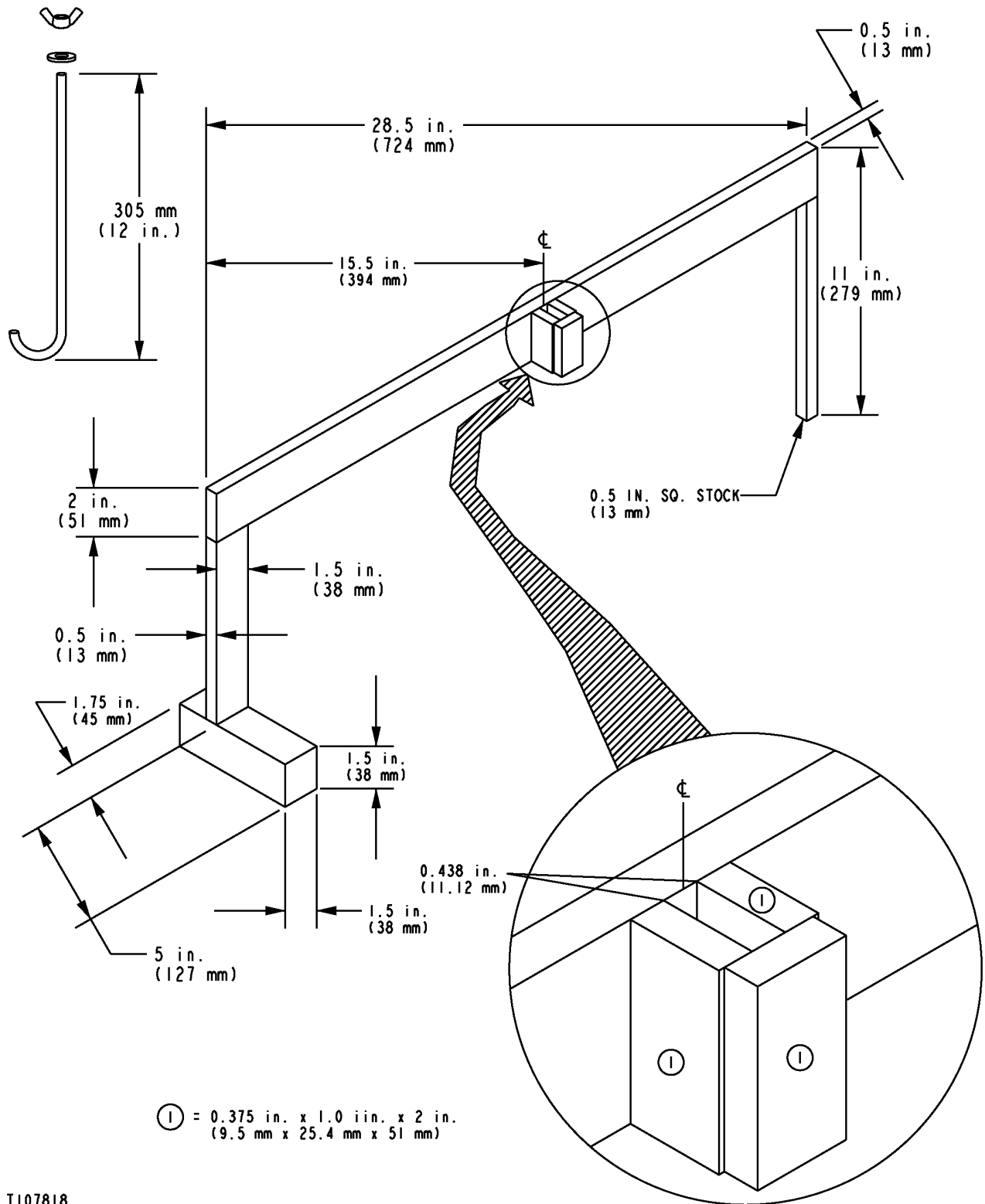
- | | |
|--|------------------------|
| 1— Upper Radiator Hose | 4— Lower Radiator Hose |
| 2— Air Circulating Hose from Fan Shroud (Cab Only) | 5— Lift Brackets |
| 3— Fan Guard | |



T107524B —UN—20FEB97

WS68074,0003704 -19-14JUL10-15/15

DFT1145 Transmission Holding Bracket



T107818

Transmission Holding Bracket is used to hold transmission in place while removing engine.

Material Required:

Continued on next page

TX,04,QQ8840 -19-21FEB97-1/2

T107818 -19-10MAR97

Dealer Fabricated Tools

- 1020 Steel
- 7/8 in. Wing Nut (1 used)

- 3/8 in. Flat Washer (1 used)
- 3/8 in. Ready Rod

TX,04,QQ8840 -19-21FEB97-2/2

Section 05 Engine Auxiliary Systems

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Remove and Install	05-0560-2

Contents

Specifications

Item	Measurement	Specification
Coolant Heater Lock Nut	Torque	34 N·m (25 lb-ft)

CED,TX03399,5643 -19-06DEC99-1/1

Remove and Install Coolant Heater

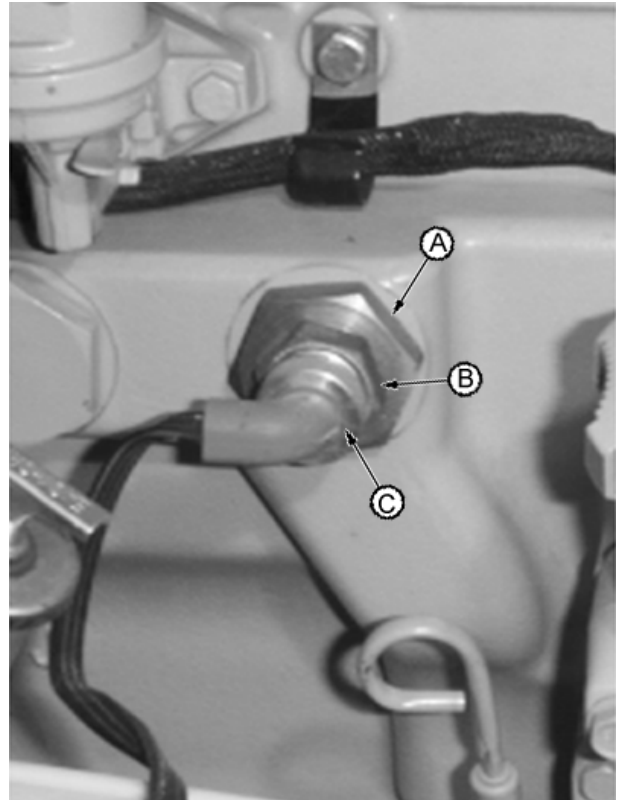
1. Drain coolant. Cooling system capacity is approximately 16 L (17 qt).
2. Disconnect cord (C) from heater assembly.
3. Loosen lock nut (B).
4. Remove adapter (A) and heater element from cylinder block.

⚠ CAUTION: TEST COOLANT HEATER IN LIQUID ONLY. DO NOT plug coolant heater into electrical power unless heating element is immersed in coolant. Sheath could burst and result in personal injury.

5. Inspect and replace parts as necessary.

A—Adapter
B—Lock Nut

C—Cord



T107710B—UN—25FEB97

TX,05,QQ8842 -19-23OCT95-1/3

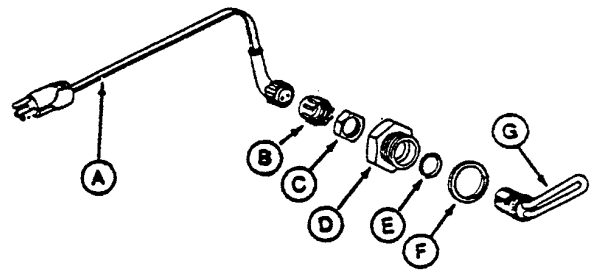
6. Install heater element (G) into engine block.
7. Install and tighten the adapter (D).
8. Turn element until element contacts with casting. Move element to the center position.
9. Hold element in centered position and tighten nut (C) to specification.

Specification

Coolant Heater Lock
Nut—Torque..... 34 N·m (25 lb-ft)

A—Cord
B—Cap
C—Nut
D—Adapter

E—Gasket
F—O-Ring
G—Heater Element



T105617—UN—06DEC96

Continued on next page

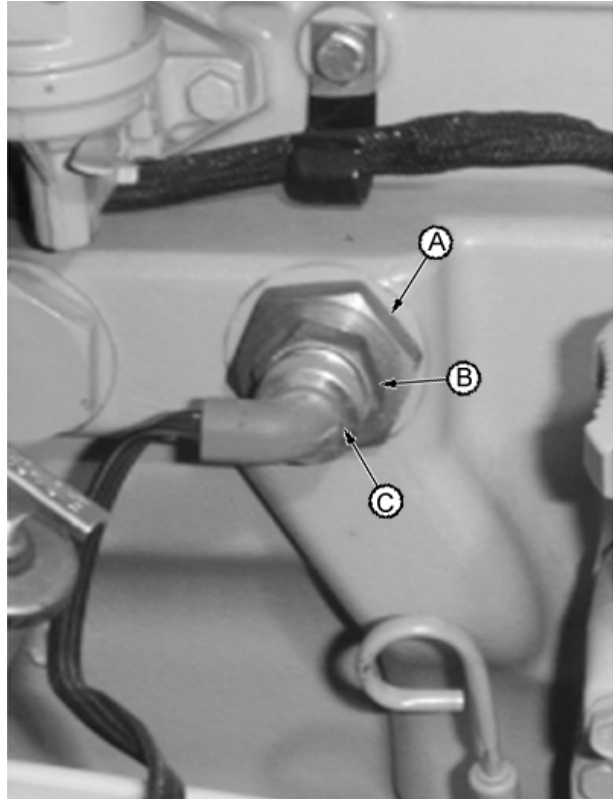
TX,05,QQ8842 -19-23OCT95-2/3

Cold Weather Starting Aid

10. Install cord (C) and secure with plastic tie bands.
11. Refill engine and radiator with coolant to proper level.
(See Fuels and Lubricants in Section 00, Group 0002 for capacities).

A—Adapter
B—Lock Nut

C—Cord



T107710B—UN—26FEB97

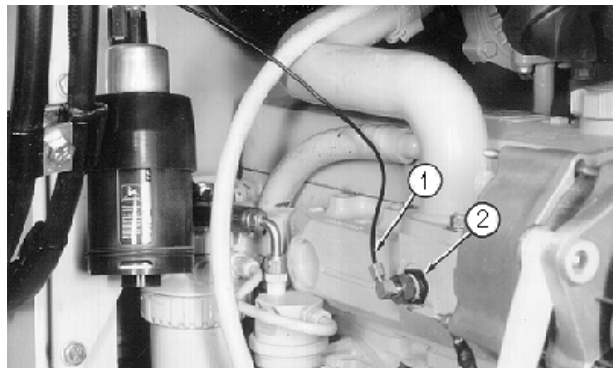
TX,05,QQ8842 -19-23OCT95-3/3

Remove and Install Starting Aid Nozzle

1. Remove engine side shield.
2. Disconnect starting aid tube (1).
3. Remove nozzle holder (2) from air inlet.

1—Starting Aid Tube

2—Nozzle Holder



T106232—UN—26FEB97

Continued on next page

TX,05,QQ8843 -19-09JAN97-1/3

Cold Weather Starting Aid

4. Remove nozzle from holder.
5. Clean or replace nozzle as required.



T88491 —UN—21OCT88

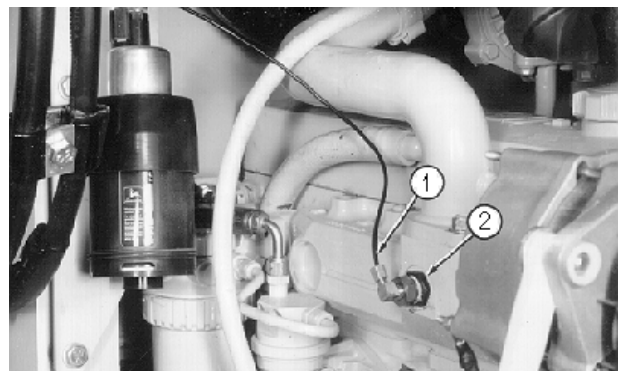
TX,05,QQ8843 -19-09JAN97-2/3

NOTE: Arrow on nozzle holder indicates direction of nozzle.

6. Install nozzle holder in air inlet with arrow pointing up.
7. Install starting aid tube to nozzle holder.
8. Install engine side shield.

1— Starting Aid Tube

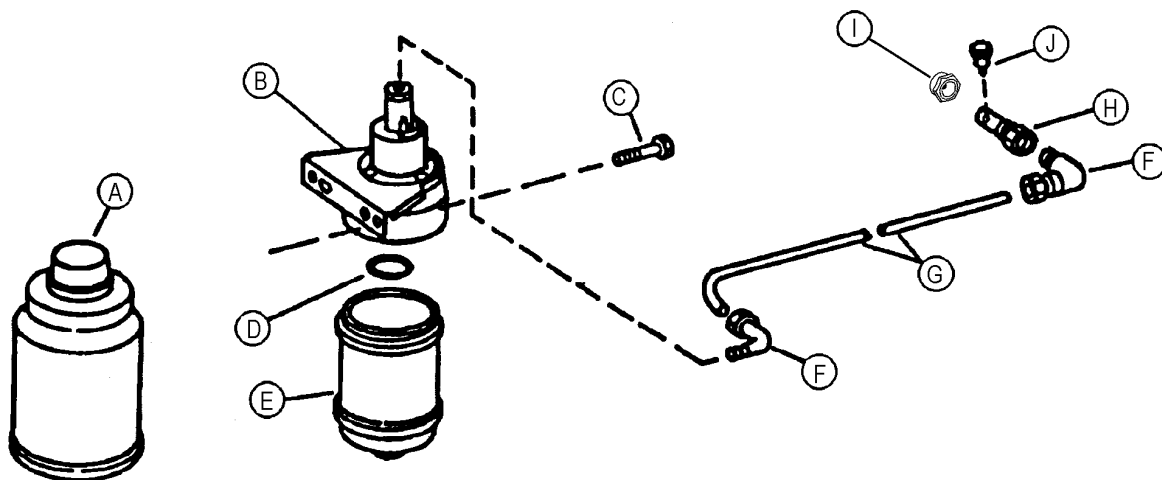
2— Nozzle Holder



T106232 —UN—26FEB97

TX,05,QQ8843 -19-09JAN97-3/3

Remove and Install Starting Aid Solenoid



T105132

A—Starting Fluid Can
B—Solenoid
C—Cap Screw (2 used)

D—O-Ring
E—Container
F—Elbow Fitting (2 used)

G—Tube
H—Nozzle Holder
I—Adapter

J—Nozzle

1. Remove right engine shield.
2. Remove starting fluid can (A).
3. Disconnect wiring lead and starting aid tube (G).
4. Remove cap screws (C) and solenoid (B).
5. Install solenoid and cap screws.
6. Connect starting aid tube (G) and wiring lead.
7. Install starting fluid can and engine shield.

TX,05,QQ8844 -19-07JAN97-1/1

T105132 —UN—13NOV/96

Specifications

Item	Measurement	Specification
Fan Cap Screws	Torque	73 N·m (54 lb-ft)
Radiator Mounting Cap Screws	Torque	34 N·m (25 lb-ft)

CED, TX03399, 5644 -19-06DEC99-1/1

Remove and Install Fan

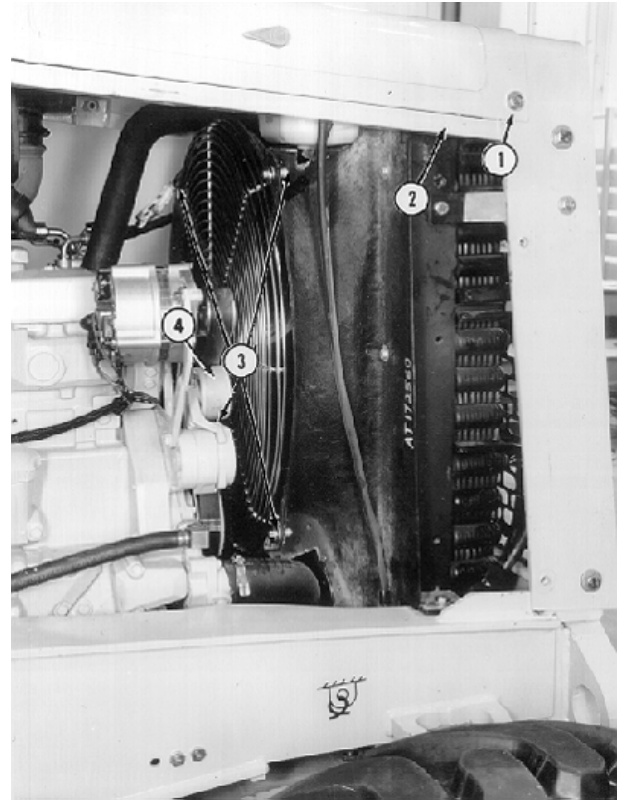
1. Raise loader boom and install boom lock bar.
2. Remove engine side shields.
3. Loosen hood cap screws (1) and push up.
4. Remove support bar (2).
5. Remove cap screws (3) on fan guard. Rotate fan guard to opening and remove.
6. Loosen belt self-adjuster to loosen fan belt.
7. Remove cap screws (5).
8. Remove fan (6) and fan spacer (7).
9. Install spacer (7) and fan (6). Install cap screws (5) and tighten.

Specification

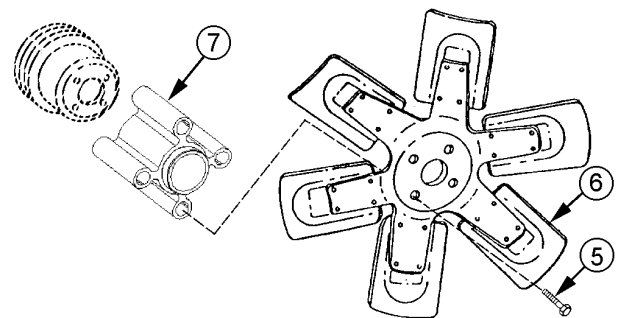
Fan Cap
Screws—Torque..... 73 N·m (54 lb-ft)

10. Tighten fan belt with belt adjuster.
11. Install parts (3, 2 and 1).

- | | |
|-----------------------|-----------------------|
| 1— Hood Cap Screws | 5— Cap Screw (4 used) |
| 2— Support Bar | 6— Fan |
| 3— Cap Screw (4 used) | 7— Spacer |
| 4— Belt Adjuster | |



T108174—UN—27FEB97



T107724

T107724—UN—28FEB97

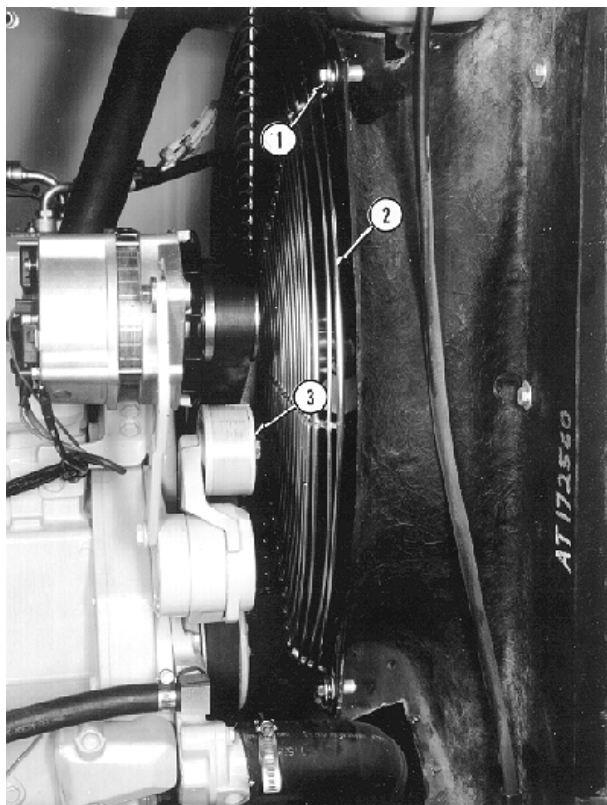
TX.05.QQ8845 -19-25OCT99-1/1

Remove and Install Fan Belt

1. Raise boom and install locking bar.
2. Remove side shields.
3. Remove four cap screws (1) from fan guard (2) and rotate guard to opening.
4. Using a wrench, pull adjustment pulley (3) forward and slide fan belt over fan blades.
5. Remove fan belt.
6. Install fan belt. Belt is self-adjusting.
7. Locate fan guard to proper position and tighten cap screws.
8. Install side shields.

1— Cap Screw (4 used)
2— Fan Guard

3— Adjustment Pulley



T106222—UN—27FEB97

TX,05,QQ8846 -19-09JAN97-1/1

Remove and Install Radiator

1. Remove hood, side shields, and support bars

⚠ CAUTION: Explosive release of fluids from pressurized cooling system can cause serious burns.

Shut off engine. Remove filler cap only when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.

2. Drain coolant from radiator. Approximate capacity of cooling system is 16 L (17 qt).



TS281—UN—23AUG88

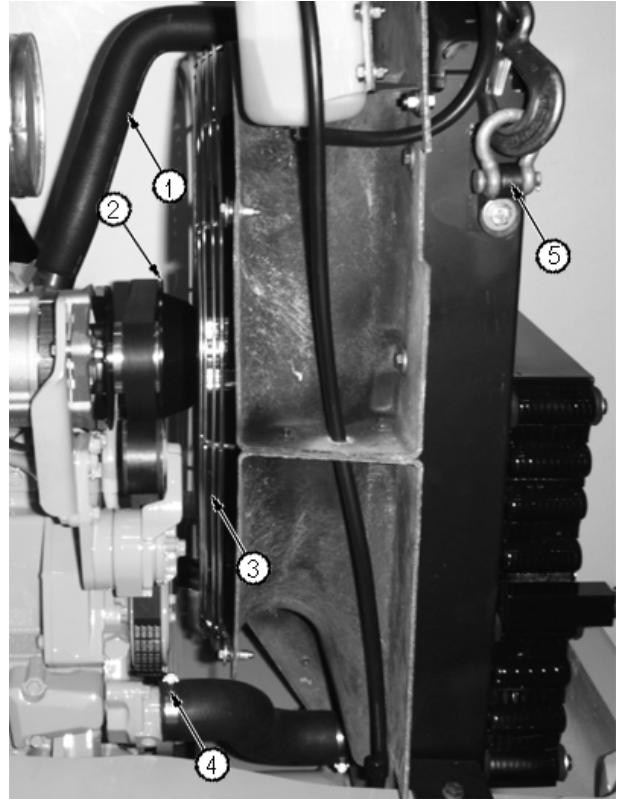
Continued on next page

TX,05,QQ8847 -19-17SEP98-1/3

Cooling Systems

3. Disconnect upper and lower radiator hoses (1 and 4).
4. Install lifting brackets (5).

- | | |
|---|------------------------|
| 1— Upper Radiator Hose | 4— Lower Radiator Hose |
| 2— Air Circulating Hose from
Fan Shroud (Cab Only) | 5— Lift Brackets |
| 3— Fan Guard | |



T107524B —UN—20FEB97

Continued on next page

TX,05,QQ8847 -19-17SEP98-2/3

5. Remove four cap screws and set condenser to side (if equipped).
6. Remove six cap screws (A) and let transmission/hydraulic oil coolers hang down.
7. Remove six cap screws to remove shroud.

⚠ CAUTION: Use a lifting device for heavy component.

8. Remove two cap screws (B). Remove radiator.
9. Install radiator. Tighten cap screws (B).
10. Install shroud to radiator. Tighten cap screws to specification.

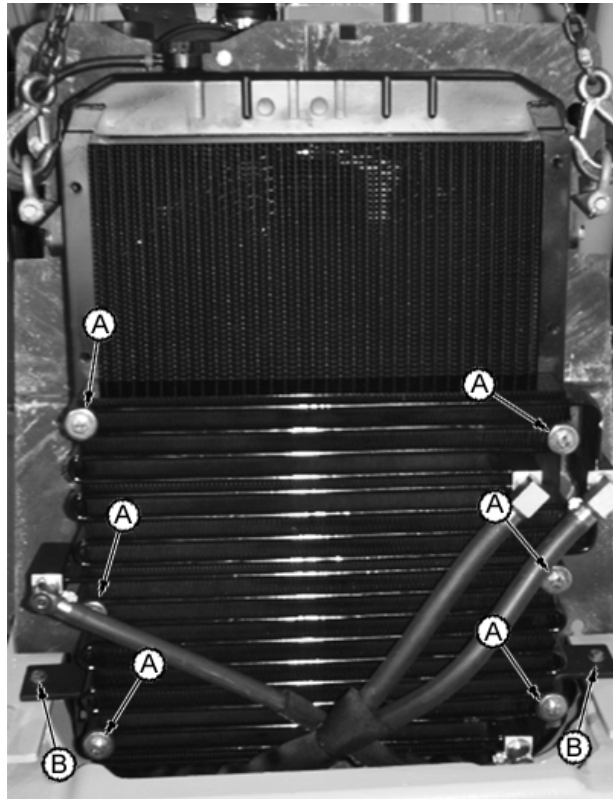
Specification

Radiator Mounting Cap
Screws—Torque..... 34 N·m (25 lb-ft)

11. Connect upper and lower radiator hoses.
12. Install oil coolers and condenser (if equipped). Tighten cap screws.
13. Install support bars, side shields and hood.
14. Fill radiator to proper level. (See Section 00, Group 0002.)

A—Cap Screw (6 used)

B—Cap Screw (2 used)



T107741B—UN—27FEB97

TX,05,QQ8847 -19-17SEP98-3/3

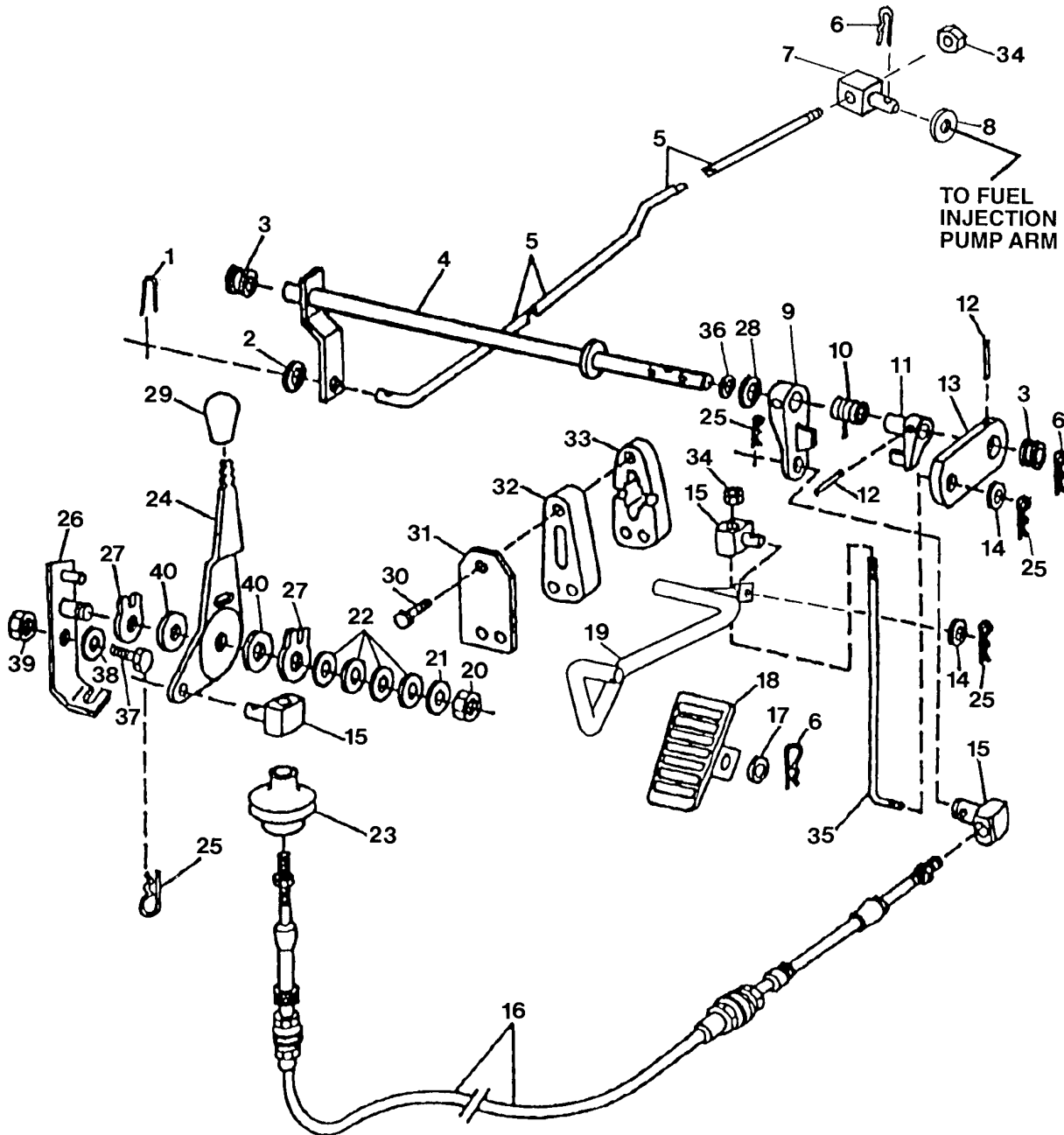
Group 0515 Speed Controls

Specifications

Item	Measurement	Specification
Inner and Outer Blocks-to-Firewall Cap Screws	Torque	80 N·m (60 lb-ft)
Pivot Bracket and Instrument Panel Cap Screws	Torque	63 N·m (46 lb-ft)

CED,TX03399,5645 -19-06DEC99-1/1

Disassemble and Assemble Speed Control Linkage



T118430

T118430—UN—12NOV98

Continued on next page

TX,05,QQ8848 -19-23OCT95-1/2

Speed Controls

1— Cotter Pin	11— Arm	21— Washer	31— Plate
2— Washer	12— Spring Pin (2 used)	22— Disk Spring (4 used)	32— Support
3— Grommet (2 used)	13— Lever	23— Boot	33— Support
4— Shaft	14— Washer (2 used)	24— Lever	34— Nut (2 used)
5— Rod	15— Swivel (3 used)	25— Cotter Pin (4 used)	35— Rod
6— Cotter Pin (3 used)	16— Push Pull Cable	26— Bracket	36— Washer
7— Swivel	17— Washer	27— Plate (2 used)	37— Cap Screw
8— Washer	18— Pedal	28— Washer	38— Washer
9— Arm	19— Rod	29— Knob	39— Lock Nut
10— Spring	20— Lock Nut	30— Cap Screw (3 used)	40— Washer (2 used)

1. Disassemble parts.
2. Inspect for worn or damaged parts. Replace if necessary.
3. Assemble parts.
4. Tighten cap screws (30 and 37) to specification.

Specification

Inner and Outer
 Blocks-to-Firewall Cap
 Screws—Torque..... 80 N·m (60 lb-ft)

- Pivot Bracket and
 Instrument Panel Cap
 Screws—Torque..... 63 N·m (46 lb-ft)
5. Adjust speed control lever (24). (See Operation and Test Manual, Section 9010, Group 20.)
 6. Adjust speed control linkage. (See Operation and Test Manual, Section 9010, Group 20.)

TX,05,QQ8848 -19-23OCT95-2/2

Speed Controls

Group 0520 Intake System

Essential Tools

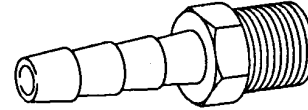
NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or from the European Microfiche Tool Catalog (MTC).

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CED, TX03399, 5646 -19-06DEC99-1/2

Inlet Air Adapter..... JDG51 T7947AD —UN—05MAR93

Used to apply air pressure to intake system for leak checks.



CED, TX03399, 5646 -19-06DEC99-2/2

Service Equipment and Tools

European Microfiche Tool Catalog (MTC). Some tools may be available from a local supplier.

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or from the

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CED, TX03399, 5647 -19-06DEC99-1/2

Air Regulator with Gauge

Used to test air intake.

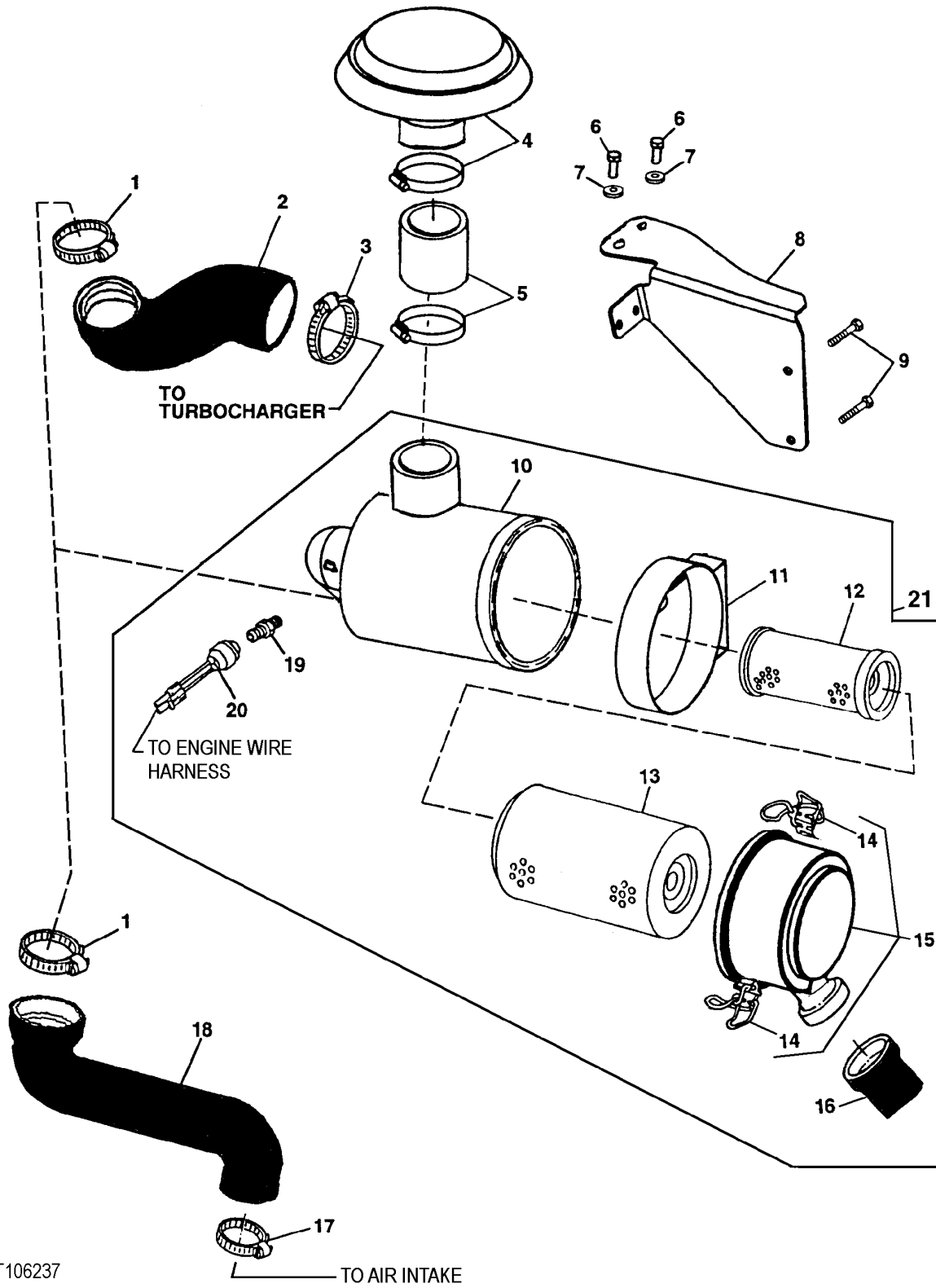
CED, TX03399, 5647 -19-06DEC99-2/2

Specifications

Item	Measurement	Specification
Clamp from Hose Air Cleaner Housing	Torque	3.4 N·m (30 lb-in.).
Regulated Air	Pressure	13.8—20.7 kPa (0.13—0.21 bar) (2—3 psi)

CED, TX03399, 5648 -19-06DEC99-1/1

Remove and Install Air Cleaner



T106237

T106237-19-13JAN97

Continued on next page

Intake System

- | | | | |
|---|---|--|--|
| <ul style="list-style-type: none"> 1—Clamp 2—Hose 3—Clamp 4—Cap 5—Tube 6—Cap Screw (2 used) | <ul style="list-style-type: none"> 7—Washer (2 used) 8—Plate 9—Cap Screw (2 used) 10—Air Cleaner Housing 11—Band 12—Secondary Element | <ul style="list-style-type: none"> 13—Primary Element 14—Latch (3 used) 15—Cover 16—Valve 17—Clamp 18—Hose | <ul style="list-style-type: none"> 19—Fitting 20—Sensor 21—Air Cleaner Assembly |
|---|---|--|--|

1. Remove precleaner, muffler extension, side shields, and hood.
2. Remove and install parts as needed.
3. Inspect elements for wear or damage and replace as necessary.
4. Install parts.
5. Tighten hose clamp (1) until air intake hose deforms around clamp band 3.4 N·m (30 lb-in.)

Specification

Clamp from
Hose Air Cleaner
Housing—Torque..... 3.4 N·m (30 lb-in.).

6. Tighten hose clamp (5) to 3.4 N·m (30 lb-in.).
7. Test air intake system. (See procedure in this group.)

TX,05,QQ8852 -19-28FEB97-2/2

Air Intake System Leakage Test

IMPORTANT: Anytime the air intake system is opened it must be tested for leaks before the machine is returned to service.

1. Remove air cleaner cover and main filter element.
2. Put a plastic bag over safety element and install main element and cover.
3. Remove plug or ether start aid from air intake tube and install JDG51 Inlet Air adapter (A).
4. Connect air pressure regulator to adapter using hose and fitting.

CAUTION: Plastic bag can be sucked into engine if engine is started when trying to close valves.

5. Pressurize air intake system to specifications. If system cannot be pressurized, turn engine slightly to close valves. Check plastic bag.

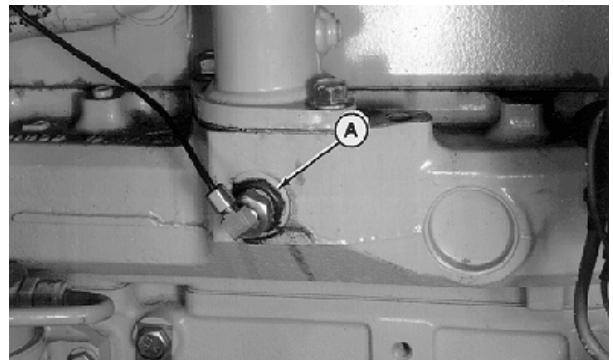
Specification

Regulated
Air—Pressure..... 13.8—20.7 kPa (0.13—0.21 bar) (2—3 psi)

6. Spray soap solution over all connections from the air cleaner to the turbocharger or air inlet to check for leaks. Repair all leaks.



T5906AP—UN—23FEB89



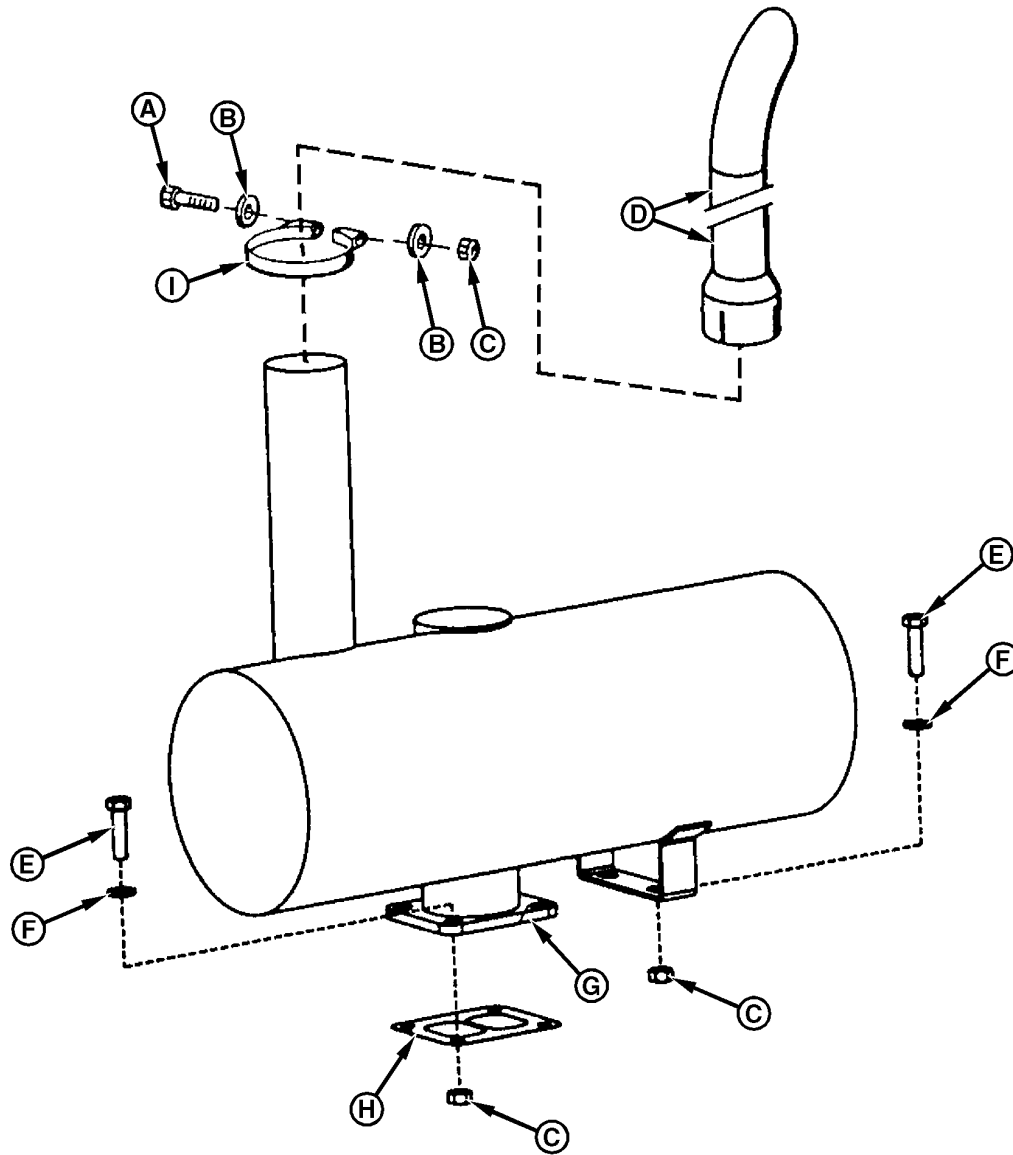
T103547—UN—05SEP96

A—JDG51 Inlet Air Adapter

TX,05,QQ8853 -19-12AUG96-1/1

Intake System

Remove And Install Muffler



T117949

A—Cap Screw
B—Washer (2 used)
C—Nut (6 used)

D—Exhaust Pipe
E—Cap Screw (5 used)
F—Washer (5 used)

G—Muffler
H—Gasket
I—Clamp

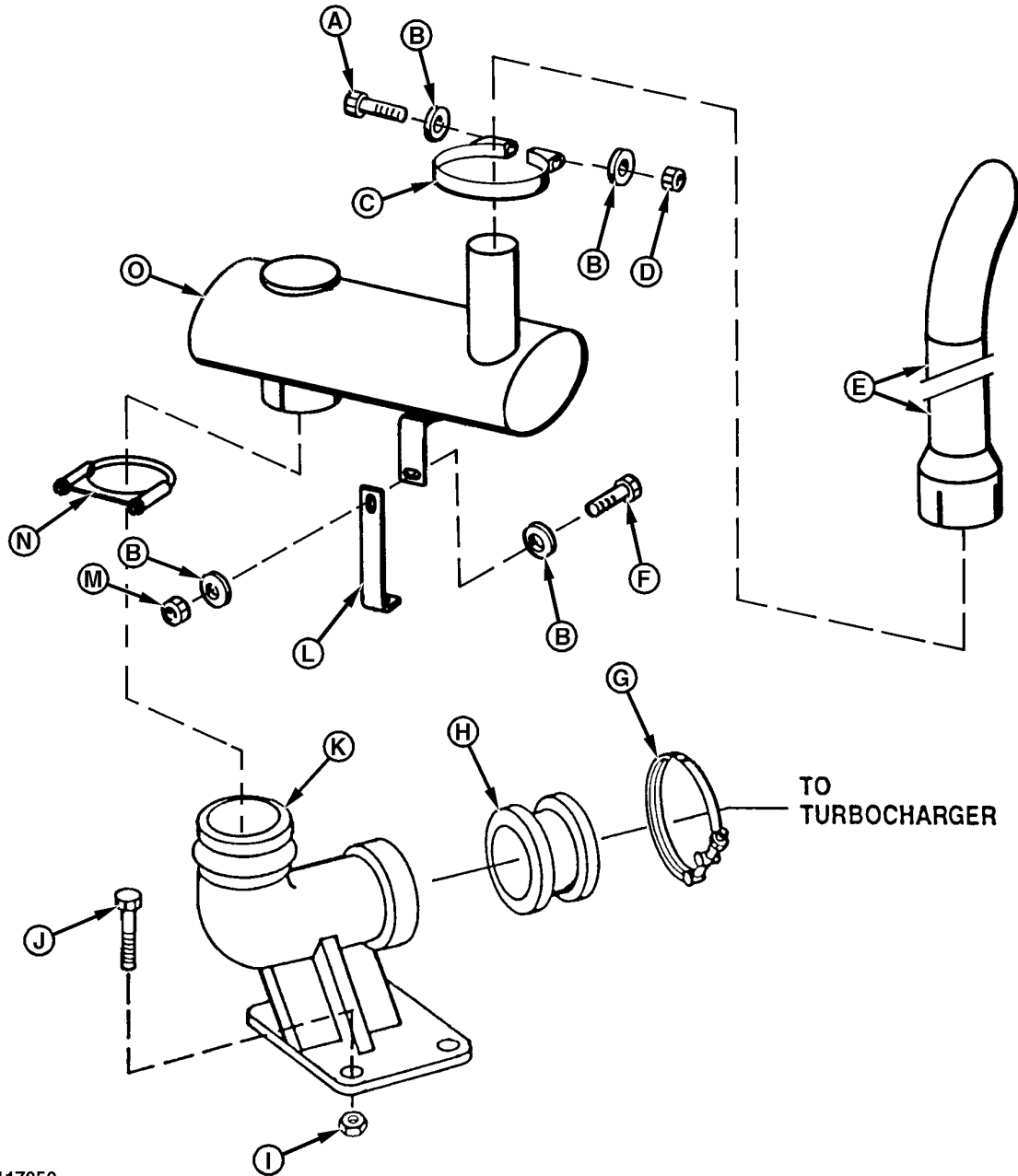
1. Remove parts as shown.

2. Repair or replace, and install parts as required.

AG,OUMX001.2 -19-19OCT98-1/1

T117949—UN—21OCT98

Remove And Install Muffler With Turbocharger—If Equipped



T117950

T117950—JUN—21OCT98

A—Cap Screw
 B—Washer (4 used)
 C—Clamp
 D—Nut

E—Exhaust Pipe
 F—Cap Screw
 G—Clamp
 H—Adapter

I— Flange Nut (4 used)
 J— Cap Screw (4 used)
 K—Pipe Elbow
 L—Bracket

M—Nut
 N—Clamp
 O—Muffler

1. Remove parts as shown.

2. Repair or replace, and install parts as required.

AG,OUMX001,1 -19-19OCT98-1/1

Group 0560 External Fuel Supply System

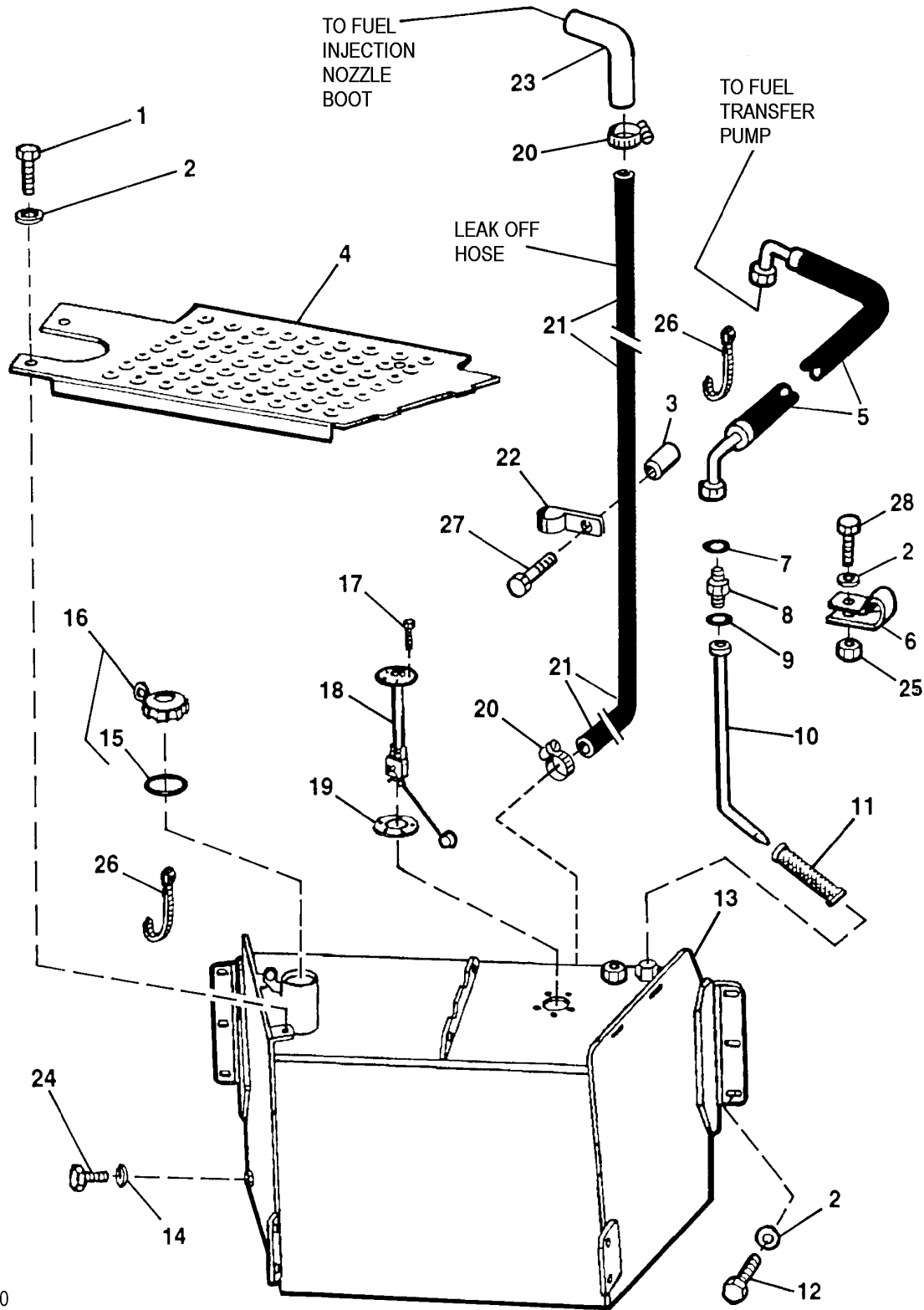
Other Material

Number	Name	Use
TY6304 (U.S.) TY9484 (Canadian) 515 (LOCTITE®)	Flexible Sealant	Apply between fuel tank and fuel tank gasket.
TY9375 (U.S.) TY9480 (Canadian) 592 (LOCTITE®)	Pipe Sealant with TEFLON®	Apply to threads of fuel tank union fitting.
TY16285 (U.S.) CXTY16285 (Canadian) 7649 (LOCTITE®)	Cure Primer	Apply to fuel sender sealing surface.
		Apply to threads of fuel tank drain screw.
T43512 (U.S.) TY9473 (Canadian) 242 (LOCTITE®)	Thread Lock and Sealer (Medium Strength)	Apply to threads of fuel tank drain screw.

*LOCTITE is a registered trademark of Loctite Corp.
TEFLON is a registered trademark of Du Pont Co.*

CED,TX03399,5651 -19-06DEC99-1/1

Remove and Install Fuel Tank



T106260

T106260-19-13JAN97

Continued on next page

TX,05,QQ8855-19-25OCT99-1/2

External Fuel Supply System

- 1— Cap Screw (3 used)
- 2— Washer (10 used)
- 3— Spacer
- 4— Plate
- 5— Hose
- 6— Clip
- 7— O-Ring (2 used)

- 8— Fitting
- 9— O-Ring
- 10— Tube
- 11— Strainer
- 12— Cap Screw (6 used)
- 13— Fuel Tank
- 14— Washer

- 15— Gasket
- 16— Cap
- 17— Screw (5 used)
- 18— Fuel Sender
- 19— Gasket
- 20— Clamp (2 used)
- 21— Hose

- 22— Clamp
- 23— Line
- 24— Drain Screw
- 25— Nut
- 26— Tie Band (2 used)
- 27— Cap Screw
- 28— Cap Screw

1. Remove step plate (4).
2. Disconnect fuel sender (18) wiring leads.
3. Disconnect hoses (5 and 21).
4. Remove cap screw (24) and drain fuel tank.
Approximate capacity of fuel tank is 106 L (28 gal).

⚠ CAUTION: The approximate weight of fuel tank is 56 kg (124 lb). Use a suitable lifting device.

5. Remove cap screws (12). Remove fuel tank using a hoist.

Specification

Fuel Tank—Weight..... 56 kg (124 lb) Approximate

6. Replace parts as necessary.
7. Install fuel tank. Tighten cap screws (12) to specification.

Specification

Fuel Tank Cap
Screws—Torque..... 59 N·m (44 lb-ft)

8. Apply flexible sealant to tank surface where gasket (19) connects to tank (13).
9. Apply pipe sealant with teflon on threads of union fitting (8).
10. Apply cure primer to fuel sender (18) sealing surface.
11. Apply cure primer, then thread lock and sealer (medium strength) to threads of drain screw (24).
12. Connect hoses (5 and 21).
13. Connect wiring leads to fuel sender (18). Install step plate (4).

TX.05.QQ8855 -19-25OCT99-2/2

External Fuel Supply System

**Section 06
Torque Converter**

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Torque Converter

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Torque Converter

Disassemble and Assemble06-0651-1

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Group 0651 Turbine, Gears and Shaft

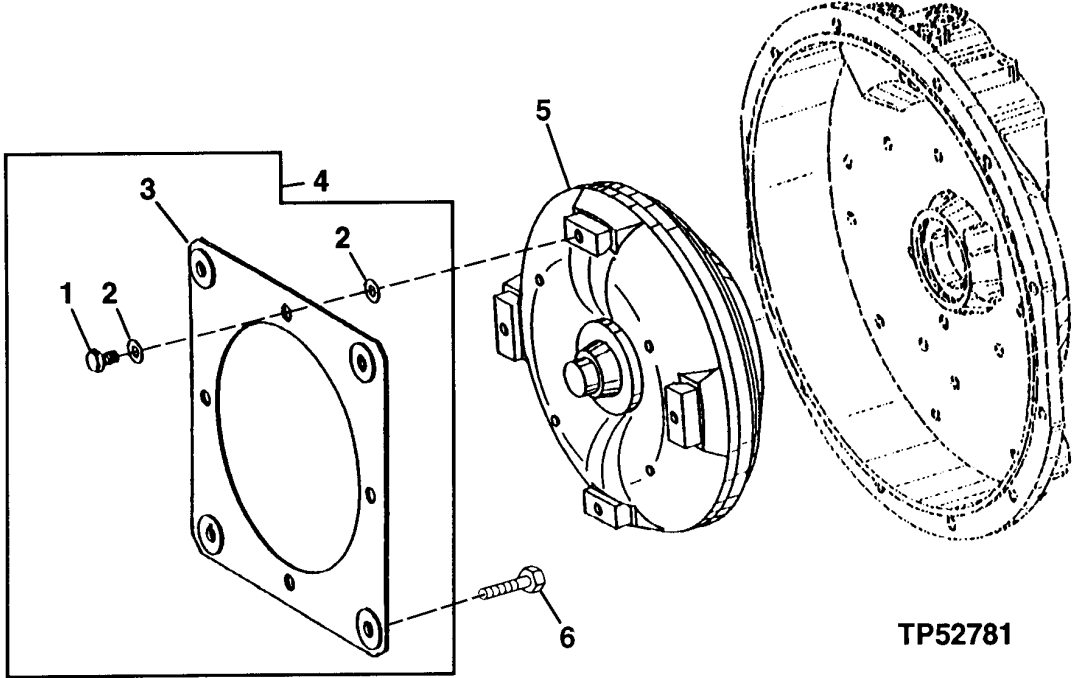
Remove and Install Torque Converter

NOTE: Torque converter has no internal service parts. If replacement is necessary, install a new torque converter.

Remove and install torque converter. (See Remove and Install Transmission in Group 0300, for disassembly see 0350.)

TX,06,QQ8856 -19-14JAN97-1/1

Disassemble and Assemble Torque Converter



TP52781

1— Cap Screw (4 used)
2— Plate (8 used)

3— Plate (2 used)
4— Plate

5— Torque Converter
6— Cap Screw

1. Disassemble parts as shown.

2. Inspect torque converter and replace if damaged.

NOTE: Torque converter has no internal service parts. If replacement is necessary, install a new torque converter.

3. Assemble parts as shown.

TX,06,QQ8857 -19-28FEB97-1/1

TP52781—UN—21OCT96

Turbine, Gears and Shaft

**Section 09
Steering System**

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Contents

Group 0960 Hydraulic System

Service Equipment and Tools

European Microfiche Tool Catalog (MTC). Some tools may be available from a local supplier.

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or from the

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CED,TX03399,5658 -19-06DEC99-1/3

Adjustable Spanner Wrench..... D05270ST Remove and install steering cylinder spanner nut.

CED,TX03399,5658 -19-06DEC99-2/3

Bushing, Bearing and Seal Driver Set..... D01044AA Used to remove and install steering cylinder bushings.

CED,TX03399,5658 -19-06DEC99-3/3

Other Material

Number	Name	Use
TY16285 (U.S.) CXTY16285 (Canadian) 764 (LOCTITE®)	Cure Primer	To clean lower splines of steering column.
		Clean spanner nut and rod guide threads
AT124243 (U.S.)	SILASTIC 732®	Apply to lower splines of steering column.
		Apply to steering column splines.
TY9370 (U.S.) TY9477 (Canadian) 242 (LOCTITE)	Thread Lock and Sealer (Medium Strength)LOCTITE ® Products	Apply to rod guide threads.
PT569 (U.S.)	NEVER-SEEZ®	Apply to steering cylinder bushings.

*LOCTITE is a registered trademark of Loctite Corp.
SILASTIC is a registered trademark of Dow-Corning Corp.
NEVER-SEEZ is a registered trademark of Emhart Chemical Group*

CED,TX03399,5660 -19-06DEC99-1/1

Hydraulic System

Specifications

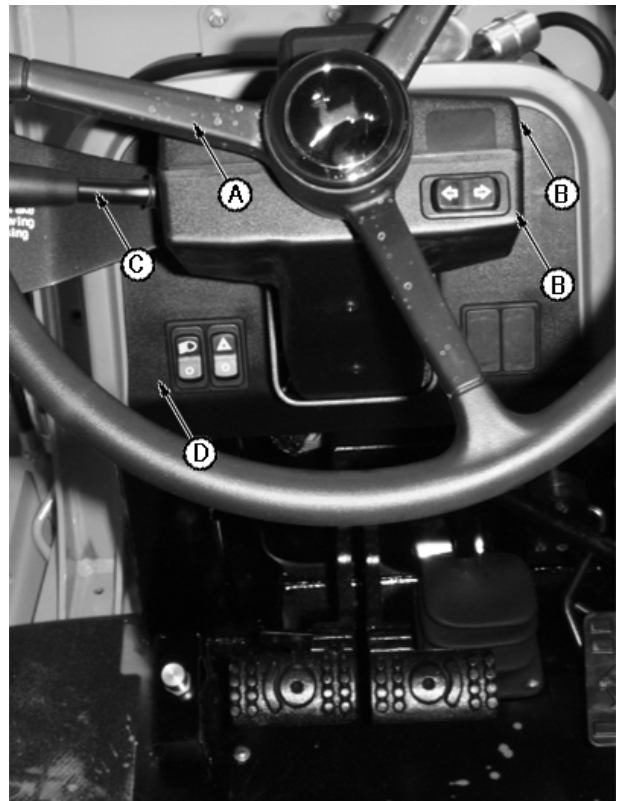
Item	Measurement	Specification
Steering Column-to-Valve Cap Screw	Torque	30 N·m (22 lb-ft)
Steering Wheel Nut	Torque	48 N·m (35 lb-ft)
Regulating Valve Cap Screws	Torque	60 ± 4 N·m (44 ± 3 lb-ft)
Pressure Regulating Value Plug	Torque	33.9—54.2 N·m (25—40 lb-ft)
Steering Valve End Cap, Cap Screw (Initial Sequence)	Torque	11—17 N·m (100—150 lb-in.)
Steering Valve End Cap, Cap Screw (Final Sequence)	Torque	25—31 N·m (225—275 lb-in.)
Check Valve Plug	Torque	11 N·m (98 lb-in.)
Piston-to-Rod Lock Nut	Torque	50 N·m (37 lb-ft) + 1/12 turn (30°)
Non-Powered Axle Steering Cylinder Bushings	Depth	6.5 mm (0.26 in.)
End Cap, Cap Screws	Torque	280 N·m (206 lb-ft)
Ball Joint-to-Piston Rod	Torque	250 N·m (184 lb-ft)
Relief Valve Spring	Free Length	56.4 mm (2.22 in.) Approximate
	Length at 72.3—85.6 N (16.25—19.25 lb force) Minimum	35.7 mm (1.407 in.)

CED, TX03399, 5656 -19-06DEC99-1/1

Remove and Install Steering Column

1. Remove (A—D).
2. Disconnect harness connectors from rocker switches.

A—Steering Wheel
 B—Top and Bottom Column Covers
 C—FNR/Range Lever
 D—Instrument Panel Covers



T107303B —UN—13FEB97

TX,09,QQ8697 -19-06DEC99-1/2

NOTE: Tilt steering machines have socket-head screws instead of cap screws.

3. Remove four cap screws (A). Remove steering column.

NOTE: Tilt steering machines have a spacer with a large and small diameter side. The small diameter side is toward the steering valve; the large diameter side is toward steering column. Non-tilt has a plain spacer.

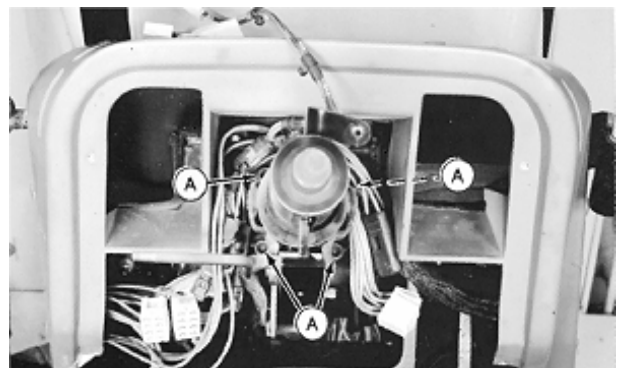
4. Be sure spacer is installed in bracket before installing steering column.
5. Apply cure primer, then apply AT124242 SILASTIC 732® adhesive sealant on lower splines of steering column.
6. Install steering column. Wire harness must be above steering column. Install and tighten cap screws to specifications.

Specification

Steering Column-to-Valve
 Cap Screw—Torque..... 30 N·m (22 lb-ft)

7. Install instrument panel and connect harness to rocker switches.

SILASTIC is a registered trademark of Dow-Corning Corp.



T78836G —UN—21JAN93

A—Cap Screws (4 used)

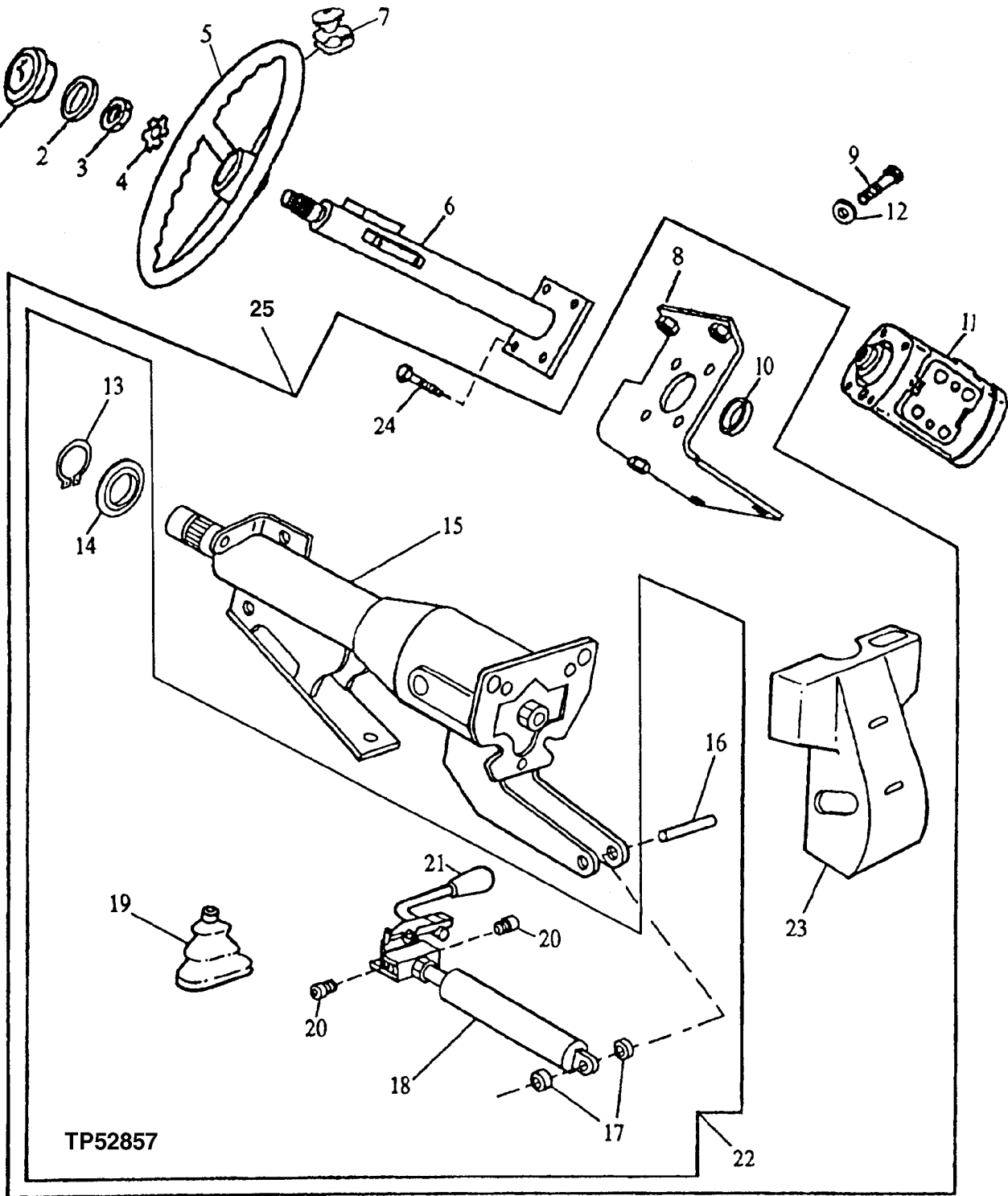
8. Install FNR/range lever, bottom and top column covers and steering wheel with lock washer and nut. Tighten steering wheel nut to specifications and bend at least one tab of lock washer against flat of nut.

Specification

Steering Wheel
 Nut—Torque..... 48 N·m (35 lb-ft)

TX,09,QQ8697 -19-06DEC99-2/2

Disassemble and Assemble Tilt Steering Wheel and Column



TP52857—UN—11DEC96

Continued on next page

TX.09.QQ9689-19-14.JAN97-1/2

Hydraulic System

- | | | | |
|--|---|---|---|
| 1— Cap
2— O-Ring
3— Nut
4— Lock Washer
5— Steering Wheel
6— Steering Column (Non-Tilt)
7— Knob | 8— Bracket
9— Cap Screw (4 used)
10— Washer
11— Steering Valve
12— Washer (4 used)
13— Snap Ring *
14— Seal * | 15— Steering Column *
16— Dowel Pin *
17— Spacer (2 used) *
18— Cylinder
19— Cover
20— Shoulder Screw (2 used) *
21— Knob | 22— Tilt Steering Column Kit
23— Lower Column
24— Cap Screw (4 used)
25— Tilt Steering Kit |
|--|---|---|---|

*NOTE: Parts followed by an * are serviced only in tilt steering column kits.*

1. Remove parts as necessary.
2. Replace as necessary.

3. Tighten cap screws (24) to specification.

Specification

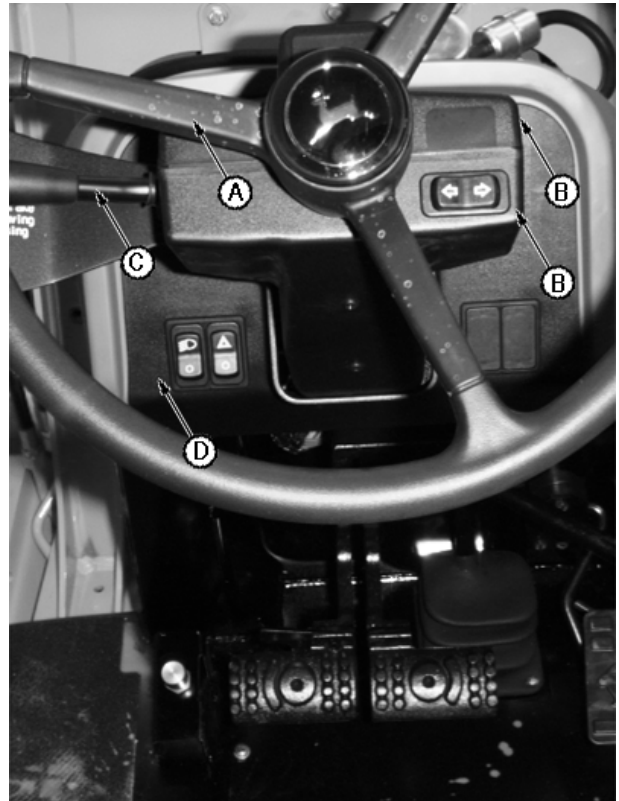
Steering Column-to-Valve
 Cap Screw—Torque..... 30 N·m (22 lb-ft)

TX,09,QQ9689 -19-14JAN97-2/2

Remove and Install Steering Valve

1. Remove steering wheel (A), top and bottom column cover (B), and instrument panel (D).
2. Disconnect wire leads to rocker switches.

- | | |
|--------------------------------|---------------------------|
| A—Steering Wheel | C—FNR/Range Lever |
| B—Top and Bottom Column Covers | D—Instrument Panel Covers |



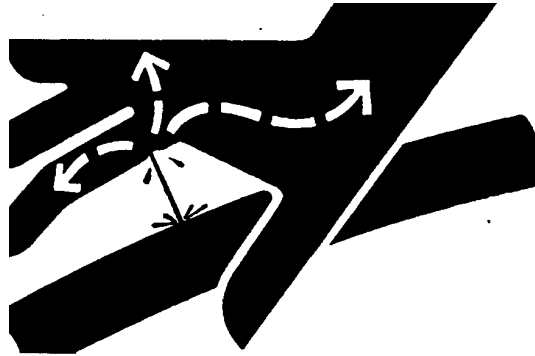
T1107303B —UN—13FEB97

Continued on next page

TX,09,QQ9690 -19-14JAN97-1/4

⚠ CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.



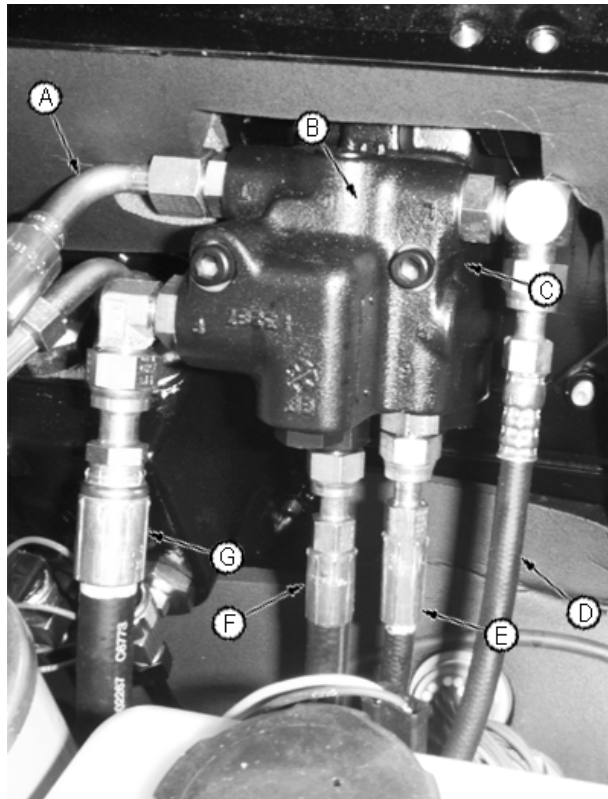
X9811 —UN—23AUG88

3. Operate all hydraulic control valves to release Pressure in the hydraulic system.

TX,09,QQ9690 -19-14JAN97-2/4

4. Remove cowl and disconnect hoses (A, D—G) from steering valve/pressure regulating valve. Close all openings with caps and plugs.

- | | |
|--|---|
| A—Steering Valve “T”
Port-to-Reservoir | E—Steering Valve “R”
Port-to-Steering Cylinder
Rod End Line |
| B—Steering Pressure
Regulating Valve | F—Steering Valve “LS” Port
from Loader Control Valve
LS Circuit |
| C—Steering Valve | G—Steering Valve Pressure
“P” Port from Backhoe
Valve |
| D—Steering Valve “L”
Port-to-Steering Cylinder
Head End Line | |



T108452B —UN—26MAR97

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TX,09,QQ9690 -19-14JAN97-3/4

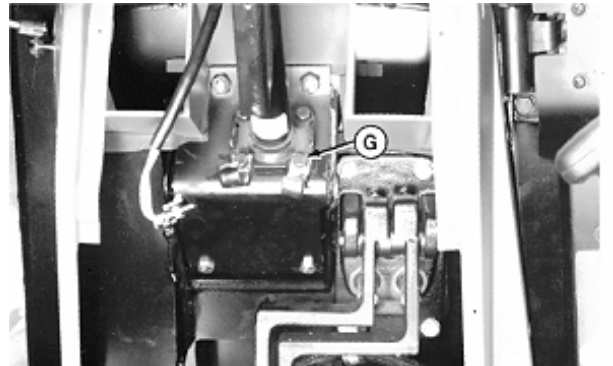
Hydraulic System

NOTE: Tilt steering machines have socket head screws instead of cap screws.

5. Remove cap screws (G) to remove steering column and valve.

NOTE: Tilt steering machines have a spacer with a large and small diameter side. The small diameter side is towards the steering valve, the large diameter side is towards the steering column. Non-tilt has a plain spacer.

6. Be sure spacer is installed in bracket before installing steering column.
7. Apply a 3 mm (1/8 in.) bead of adhesive sealant around lower splines of steering column.
8. Install steering column and valve using cap screws or socket head screws. Tighten to specification.



T7528A1 —UN—02MAY91

G—Cap Screws

Specification

Specification	
Steering Column-to-Valve	
Cap Screw—Torque.....	30 N·m (22 lb-ft)

Steering Wheel	
Nut—Torque.....	48 N·m (35 lb-ft)

9. Connect hydraulic lines to valve and install instrument panel, column covers and steering wheel. Tighten steering wheel nut to specification.

TX,09,QQ9690 -19-14JAN97-4/4

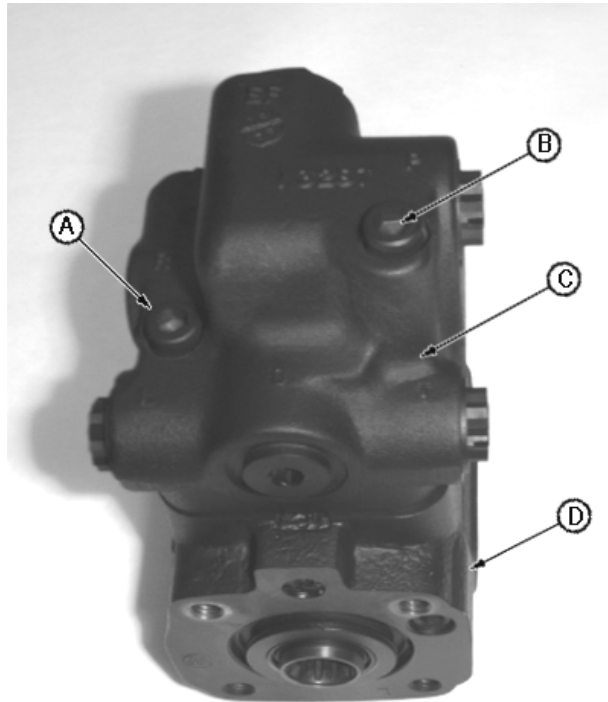
Remove and Install Pressure Regulating Valve from Steering Valve

1. Remove cap screws (A) and (B). Remove pressure regulating valve (C) from steering valve (D).
2. Inspect screen (E) for contaminants and four O-rings for damage. Only four O-rings and screen are in service kit.
3. Install regulating valve (C) to steering valve (D). Tighten cap screws (A and B) to specification.

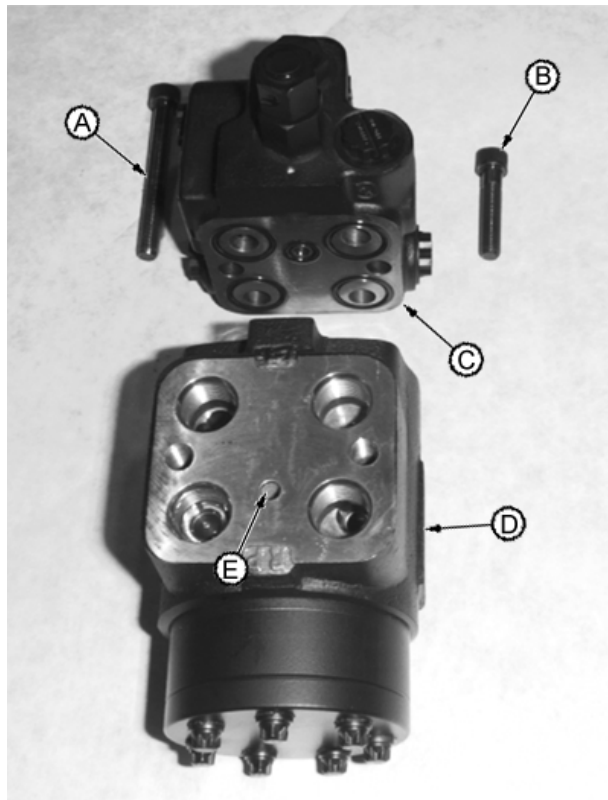
Specification

Regulating Valve Cap
Screws—Torque..... $60 \pm 4 \text{ N}\cdot\text{m}$ ($44 \pm 3 \text{ lb}\cdot\text{ft}$)

- | | |
|-----------------------------|------------------|
| A—Cap Screw | D—Steering Valve |
| B—Cap Screw | E—Screen |
| C—Pressure Regulating Valve | |



T108463B —UN—24MAR97



T108629B —UN—31MAR97

TX,09,QQ9691 -19-31MAR97-1/1

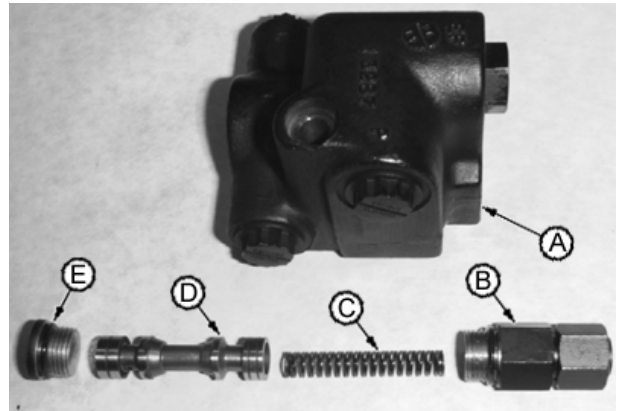
Disassemble and Assemble Pressure Regulating Valve

1. Remove parts (B—E).
2. Inspect parts. Spring (C) and plug and O-ring (B) are serviceable.
3. Install parts (B—E). Tighten parts (B and E) to specifications.

Specification

Pressure Regulating
 Value Plug—Torque..... 33.9—54.2 N·m (25—40 lb·ft)

- | | |
|-----------------------------------|----------------------|
| A—Regulating Valve Housing | D—Spool |
| B—Special Fitting/O-Ring | E—Plug/O-Ring |
| C—Spring | |



T108630B —UN—31MAR97

TX,09,QQ9692 -19-31MAR97-1/1

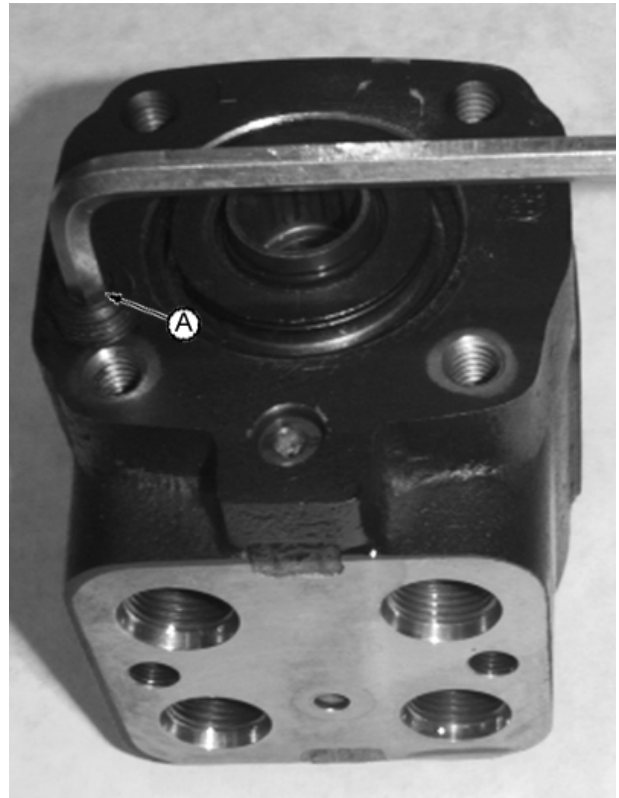
Disassemble Steering Valve

IMPORTANT: Perform all service on steering valve in a clean isolated work area. Use proper tools, cleaning material and lubricants.

NOTE: The manual steering check valve on earlier machines is removed from the shaft side of the valve. The manual steering check valve on later machines is removed through the gerotor (meter) end of the valve as indicated in the procedure.

1. Remove plug (A) on earlier machines to remove check valve assembly.

- A—Plug**



Steering Valve—Earlier Machines

T108631B —UN—31MAR97

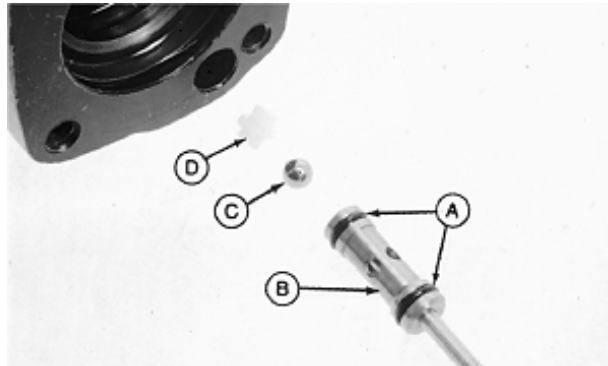
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TX,09,QQ9693 -19-20JUN01-1/13

Hydraulic System

2. On earlier machines, remove check ball seat (B) using a No. 10-24 machine screw.
3. Remove O-rings (A).
4. Remove steel ball (C) and spacer (D).
5. Inspect steel ball and seat for wear or damage.

A—O-Ring (2 used) **C—Steel Ball**
B—Check Ball Seat **D—Spacer**



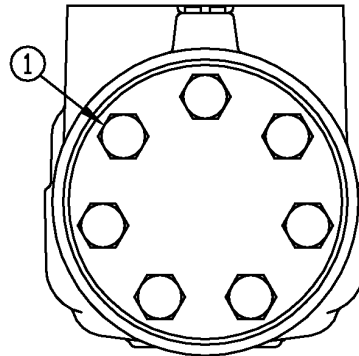
Manual Steering Check Valve—Earlier Machines

T5835AO —UN—24OCT88

TX,09,QQ9693 -19-20JUN01-2/13

6. On later machines, remove cap screw (1). Remove parts (2—4).

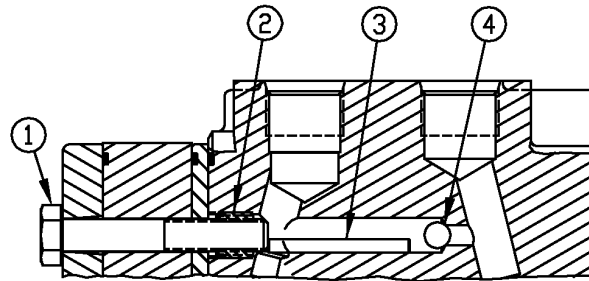
1—Cap Screw **3—Pin**
2—Sleeve **4—Steel Ball**



T127351

Gerotor End of Steering Valve—Later Machines

T127351 —UN—12JAN00



T127352

Manual Steering Check Valve—Later Machines

T127352 —UN—12JAN00

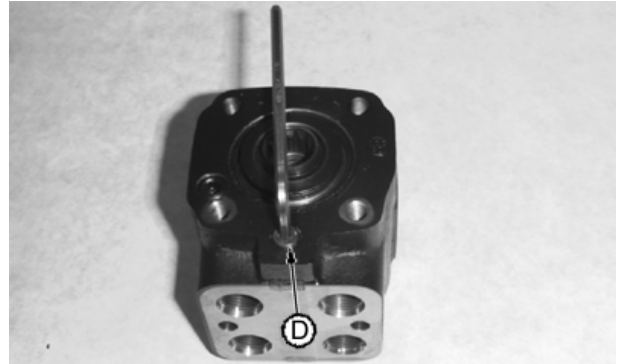
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TX,09,QQ9693 -19-20JUN01-3/13

Hydraulic System

NOTE: After removing plug (D) from the steering valve and then removing the spring and poppet, take note how the parts are assembled.

7. Remove plug (D) and parts spring and poppet.
8. Inspect parts for wear or damage.



T108632B —UN—31MAR97

TX,09,QQ9693 -19-20JUN01-4/13

9. Remove snap ring.



T108634B —UN—31MAR97

Continued on next page

TX,09,QQ9693 -19-20JUN01-5/13

10. Remove seal gland bushing assembly.



T84970 —UN—24OCT88

TX,09,QQ9693 -19-20JUN01-6/13

11. Remove quad ring seal from gland bushing.



T81080 —UN—07DEC88

TX,09,QQ9693 -19-20JUN01-7/13

12. Remove oil seal.



T87425 —UN—24OCT88

Continued on next page

TX,09,QQ9693 -19-20JUN01-8/13

13. Remove O-ring.



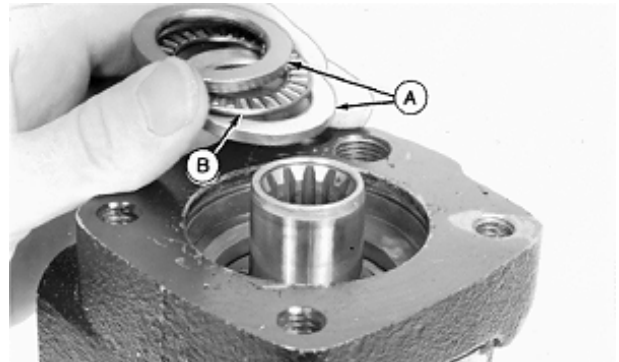
T108635B—UN—31MAR97

TX,09,QQ9693 -19-20JUN01-9/13

14. Remove races (A) and thrust bearing (B).

A—Bearing Race (2 used)

B—Thrust Bearing



T84972—UN—24OCT88

Continued on next page

TX,09,QQ9693 -19-20JUN01-10/13

15. Remove cap screws to remove gerotor assembly.

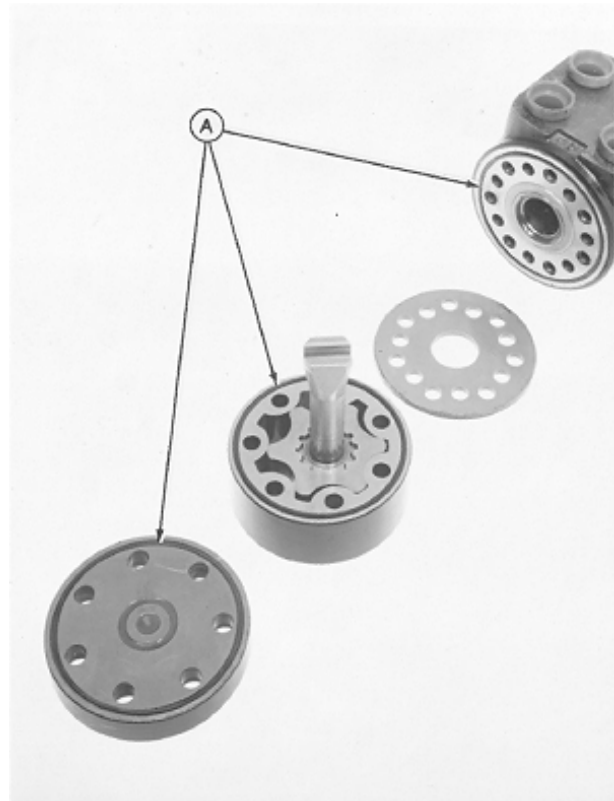


T108751B —UN—31MAR97

TX,09,QQ9693 -19-20JUN01-11/13

16. Remove three O-rings (A).

A—O-Rings (3 used)



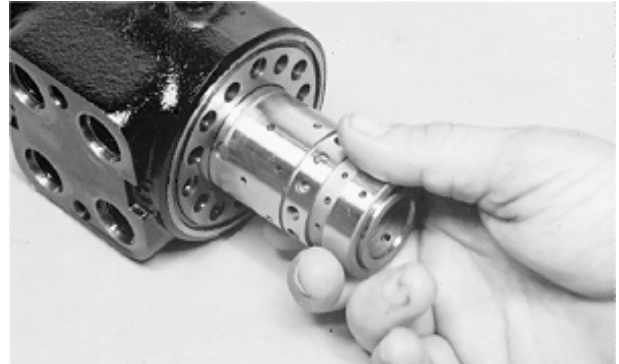
T92294 —UN—24OCT88

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TX,09,QQ9693 -19-20JUN01-12/13

IMPORTANT: If it is necessary to remove spool and sleeve assembly from housing for cleaning, be careful to prevent these parts from binding. Tolerances in this area are very close and when replacement is necessary the steering valve must be ordered as an assembly.

17. To prevent binding, turn the spool and sleeve assembly as it is removed from housing. Do not disassemble the spool and sleeve assembly.

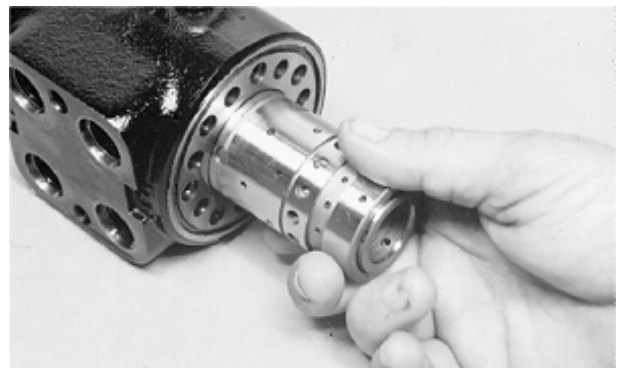


T6193AG —UN—29MAR90

TX,09,QQ9693 -19-20JUN01-13/13

Assemble Steering Valve

1. Thoroughly clean all parts. Apply clean hydraulic oil to all internal parts.
2. Use a steering valve seal repair kit when assembling the steering valve.
3. To prevent binding, turn the spool and sleeve assembly as it is installed.

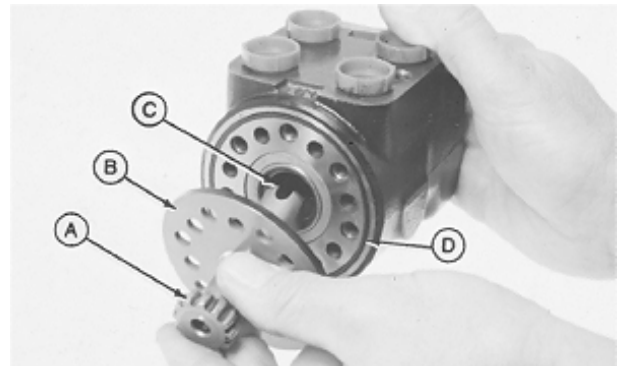


T6193AG —UN—29MAR90

TX,09,QQ8702 -19-12JAN00-1/14

4. Install O-ring (D).
5. Install control end drive shaft (A) and wear plate (B). Slot (C) must engage pin in spool and sleeve assembly.

A—Control End Drive Shaft **C—Slot**
B—Wear Plate **D—O-Ring**



T92295 —UN—24OCT88

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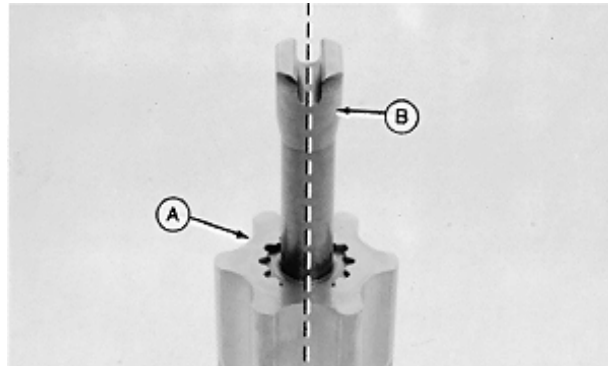
TX,09,QQ8702 -19-12JAN00-2/14

IMPORTANT: For correct operation, the drive shaft must be installed into gerotor star so groove is in alignment with one of the roots of gerotor star teeth.

6. Install gerotor star (A) on drive shaft so root of tooth is in alignment with groove in the end of drive shaft (B).

A—Gerotor Star

B—Drive Shaft



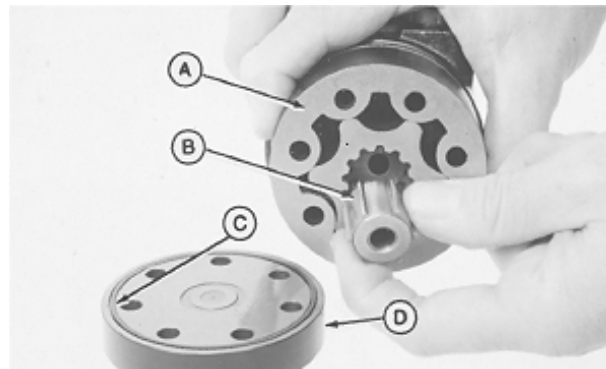
T5835AG—UN—24OCT88

TX,09,QQ8702 -19-12JAN00-3/14

7. Install O-ring (C) into gerotor ring (A) and end cap (D).
8. Install gerotor ring and spacer (B).
9. Install end cap.
10. Clean and dry cap screws before installing.

A—Gerotor Ring
B—Spacer

C—O-Ring (2 used)
D—End Cap



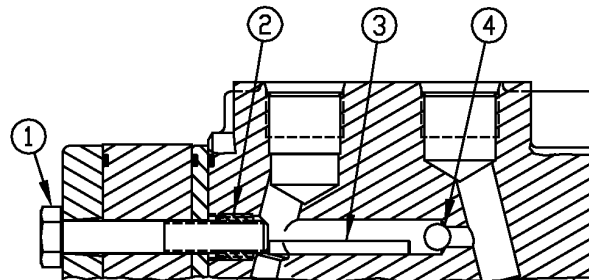
T92297—UN—24OCT88

TX,09,QQ8702 -19-12JAN00-4/14

11. On later machines install manual steering check valve parts (4, 3, and 2).

1—Cap Screw
2—Sleeve

3—Pin
4—Ball



T127352

Manual Steering Check Valve—Later Machines

T127352—UN—12JAN00

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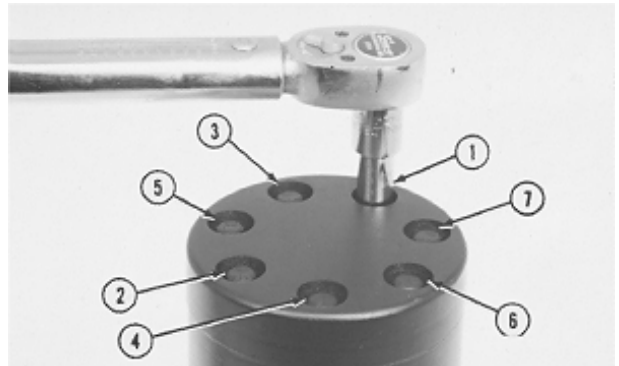
TX,09,QQ8702 -19-12JAN00-5/14

IMPORTANT: Any cap screw can be tightened first, but the sequence shown must be followed.

12. Install and tighten the cap screws to specified torque using sequence (1 through 7) shown:

Specification

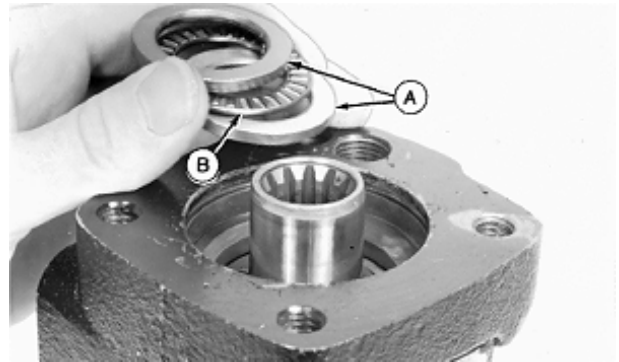
Steering Valve End	
Cap, Cap Screw (Initial Sequence)—Torque.....	11—17 N·m (100—150 lb-in.)
Steering Valve End	
Cap, Cap Screw (Final Sequence)—Torque.....	25—31 N·m (225—275 lb-in.)



T92290 —UN—24OCT88

TX,09,QQ8702 -19-12JAN00-6/14

13. Install races (A) and thrust bearing (B).



T84972 —UN—24OCT88

TX,09,QQ8702 -19-12JAN00-7/14

14. Install O-ring.



T84971 —UN—24OCT88

Continued on next page

TX,09,QQ8702 -19-12JAN00-8/14

Hydraulic System

15. Install oil seal with lip of seal opposite bottom of bore using 30 mm and 24 mm disks.

Push oil seal to the bottom of bore.

Apply petroleum jelly to lip of seal.



T87433 —UN—24OCT88

TX,09,QQ8702 -19-12JAN00-9/14

16. Install quad ring seal. Apply petroleum jelly to seal.



T81080 —UN—07DEC88

TX,09,QQ8702 -19-12JAN00-10/14

17. Install seal gland bushing assembly.



T84970 —UN—24OCT88

Continued on next page

TX,09,QQ8702 -19-12JAN00-11/14

18. Install snap ring.



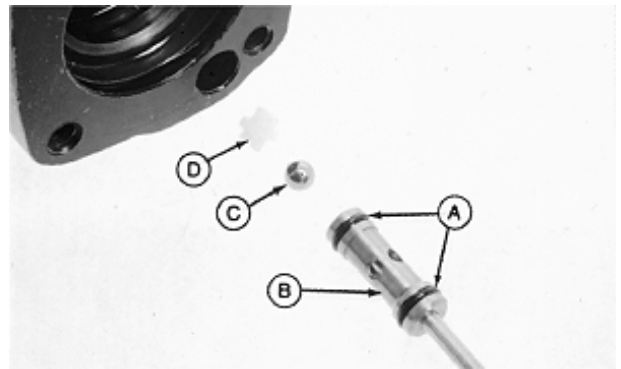
T84969 —UN—24OCT88

TX,09,QQ8702 -19-12JAN00-12/14

- 19. On earlier machines, install spacer (D) and steel ball (C).
- 20. Install new O-rings (A).
- 21. Install check ball seat (B).

A—O-Ring (2 used)
B—Check Ball Seat

C—Steel Ball
D—Spacer



Manual Steering Check Valve—Earlier Machines

T5835AO —UN—24OCT88

TX,09,QQ8702 -19-12JAN00-13/14

22. On earlier machines, install and tighten plug to specification. After tightening, plug must be even with or below surface.

Specification

Check Valve
Plug—Torque..... 11 N·m (98 lb-in.)



Tighten Plug—Earlier Machines

T87413 —UN—24OCT88

TX,09,QQ8702 -19-12JAN00-14/14

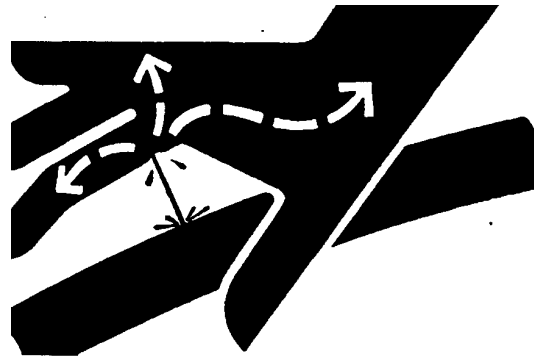
Remove and Install Non-Powered Axle Steering Cylinder

NOTE: Steering cylinder can be serviced on machine.

1. Lift left end of axle until it contacts stop. Position shop stand under axle.

CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable



X9811 —UN—23AUG88

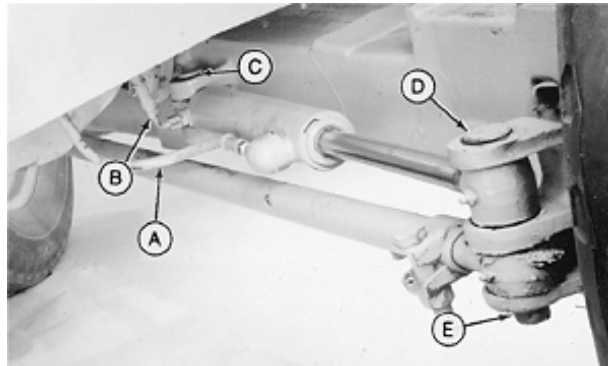
medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

2. Operate all hydraulic control valves to release pressure in the hydraulic system.

TX,09,QQ9695 -19-24FEB94-1/2

3. Disconnect lines (A and B). Close all openings using caps and plugs.
4. Remove cotter pin (E) and pins (C and D) to remove cylinder.
5. Disassemble and repair cylinder as necessary. (See procedure in this group.)
6. Install cylinder using pins and cotter pins.
7. Connect lines.

A—Steering Cylinder Rod End-to-Steering Valve Port R Line	D—Pin
B—Steering Cylinder Head End-to-Steering Valve Port L Line	E—Cotter Pin (2 used)
C—Pin	



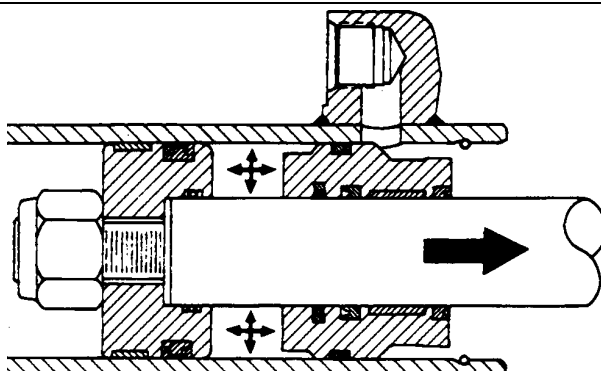
T6195A1 —UN—29MAR90

TX,09,QQ9695 -19-24FEB94-2/2

Disassemble Non-Powered Axle Steering Cylinder

IMPORTANT: Extend rod to remove oil or air between the rod piston and rod guide. Excessive amount of trapped oil or air will force seals to expand making disassembly more difficult.

1. Extend rod so rod piston is approximately 25.4 mm (1 in.) from rod guide.



T6190AS —UN—19OCT88

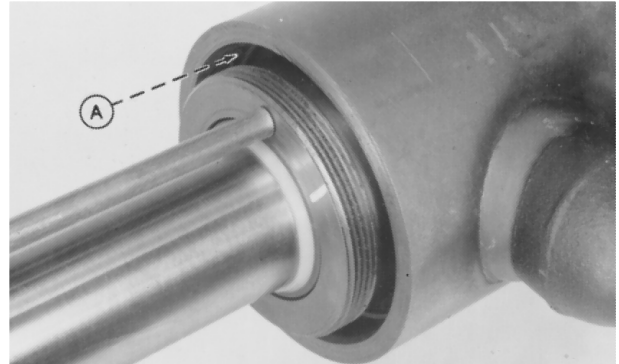
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TX,09,QQ9696 -19-17JUL02-1/6

Hydraulic System

2. Move rod guide rearward, using a wooden dowel or brass drift, just enough to remove snap ring (A). Remove snap ring. Do not damage rod guide threads or seal.

A—Snap Ring



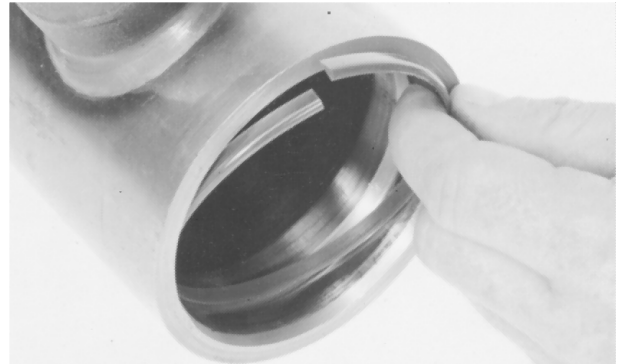
T6119AM —UN—12APR91

TX,09,QQ9696 -19-17,JUL02-2/6

NOTE: Filler rings (used for disassembly only) are installed between spanner nut and rod guide to aid in disassembly.

NOTE: Rod piston assembly removed for clarity of photograph.

3. Install filler ring in snap ring groove.
4. Remove rod and piston assembly.



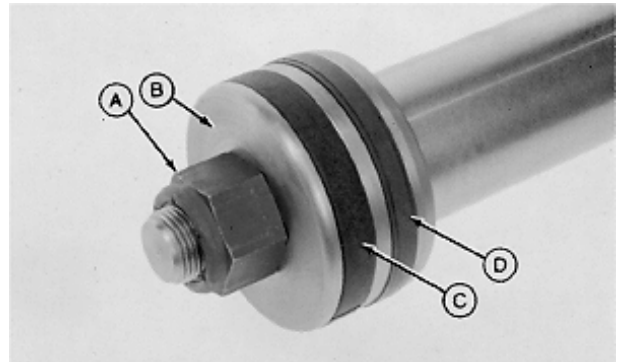
T6119AN —UN—19OCT88

TX,09,QQ9696 -19-17,JUL02-3/6

5. Remove nut (A) to remove piston (B).
6. Remove wear ring (C) and cap seals (D).

**A—Nut
B—Piston**

**C—Wear Ring
D—Cap Seals**



T6172BQ —UN—19OCT88

Continued on next page

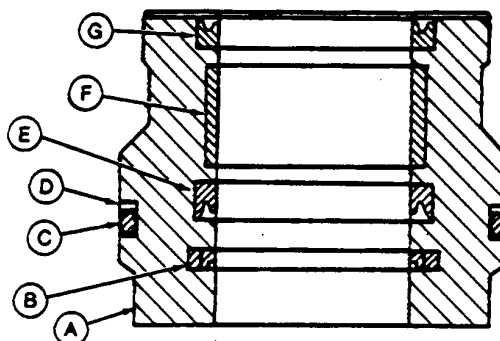
TX,09,QQ9696 -19-17,JUL02-4/6

Hydraulic System

- Remove rod guide (A).
- Remove O-ring (C), backup ring (D), seals (B, E and G) and wear ring (F).

A—Rod Guide
B—Seal
C—O-Ring
D—Backup Ring

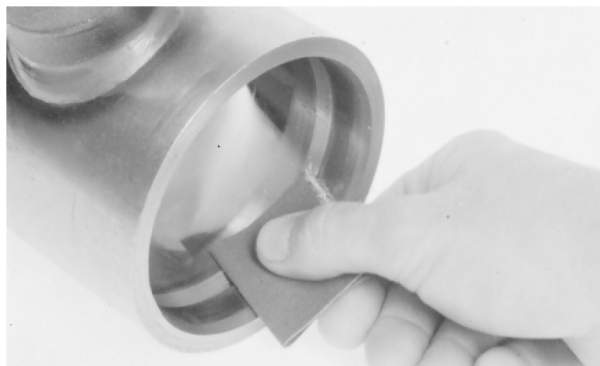
E—Seal
F—Wear Ring
G—Seal



T6119AK—UN—19OCT88

TX,09,QQ9696 -19-17JUL02-5/6

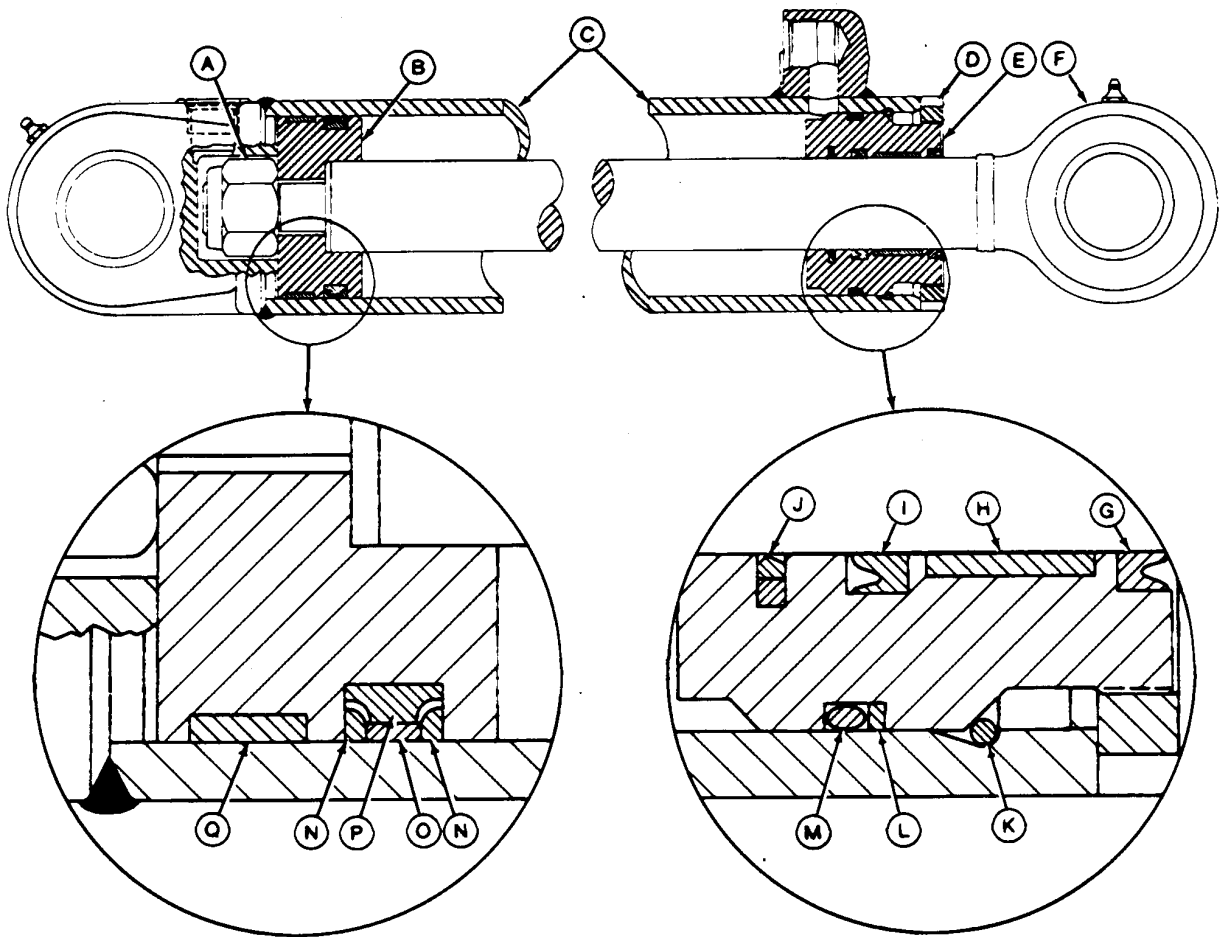
- Inspect snap ring groove. If necessary, clean groove of nicks or burrs.



T6119AO—UN—19OCT88

TX,09,QQ9696 -19-17JUL02-6/6

Cross Section of Non-Powered Axle Steering Cylinder



A—Nut
B—Piston
C—Barrel
D—Nut
E—Rod Guide

F—Rod
G—Wiper Seal
H—Wear Ring
I—Rod Seal
J—Buffer Seal

K—Snap Ring
L—Backup Ring
M—O-Ring
N—Backup Ring (2 used)
O—Cap Seal

P—Expander Seal
Q—Wear Ring

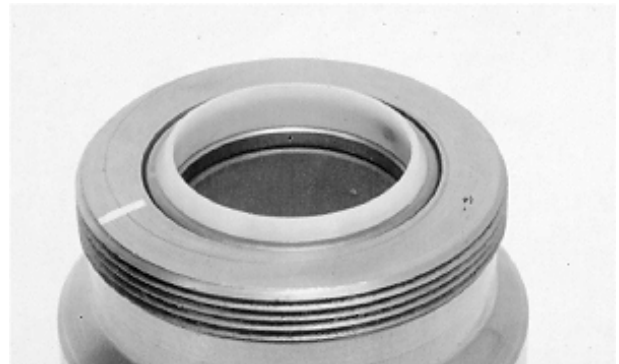
TX,09,QQ9697 -19-21SEP94-1/1

T6223AZ —UN—26MAY89

Assemble Non-Powered Axle Steering Cylinder

Use a cylinder repair kit when assembling rebuildable cylinder. Before assembling, apply clean hydraulic oil to all internal parts.

1. Install wiper seal. Push seal to bottom of bore.



Continued on next page

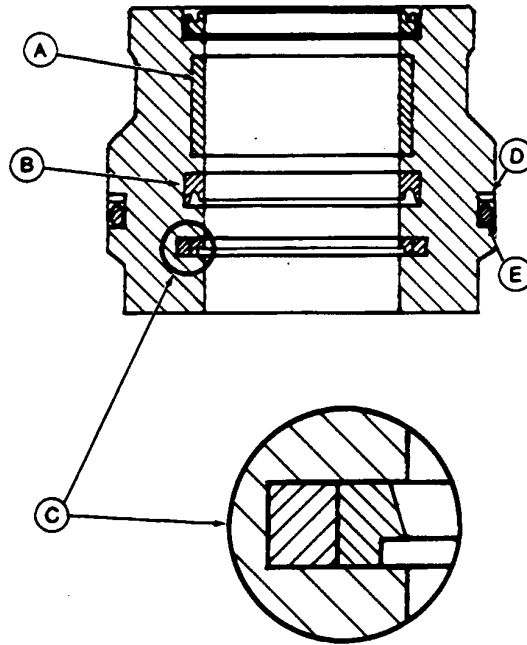
TX,09,QQ9698 -19-06DEC99-1/12

T6122AA —UN—19OCT88

2. Install seals (B and C).
3. Install wear ring (A).
4. Install backup ring (D) and O-ring (E).

A—Wear Ring
B—Seal
C—Seal

D—Backup Ring
E—O-Ring

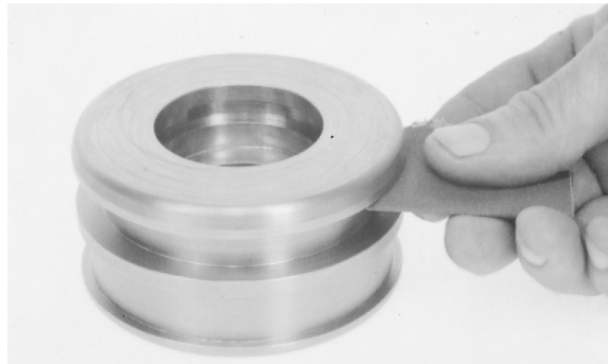


T6126AN —UN—27OCT88

TX,09,QQ9698 -19-06DEC99-2/12

IMPORTANT: To prevent damage of cap seal during assembly, the lands on piston must be clean and free of nicks or burrs.

5. Inspect the piston lands. If necessary, clean lands of any nicks or burrs that can cut cap seal.



T6122AB —UN—19OCT88

Continued on next page

TX,09,QQ9698 -19-06DEC99-3/12

Hydraulic System

6. Install seal expander.

NOTE: The cap seal can be made more pliable by warming it with your hands or by putting seal in hot water for approximately 5 minutes.

Once started, install cap seal as quickly as possible to keep the amount of time that seal is stretched to a minimum.

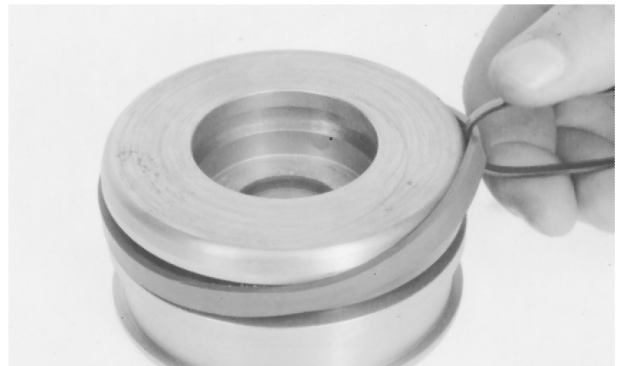
7. Push seal on end of piston.



T6122AC —UN—06AUG90

TX,09,QQ9698 -19-06DEC99-4/12

8. Install a plastic tie band around cap seal with the smooth side against seal.
9. Pull cap seal across land into position over seal expander using the plastic tie band.



T6122AE —UN—19OCT88

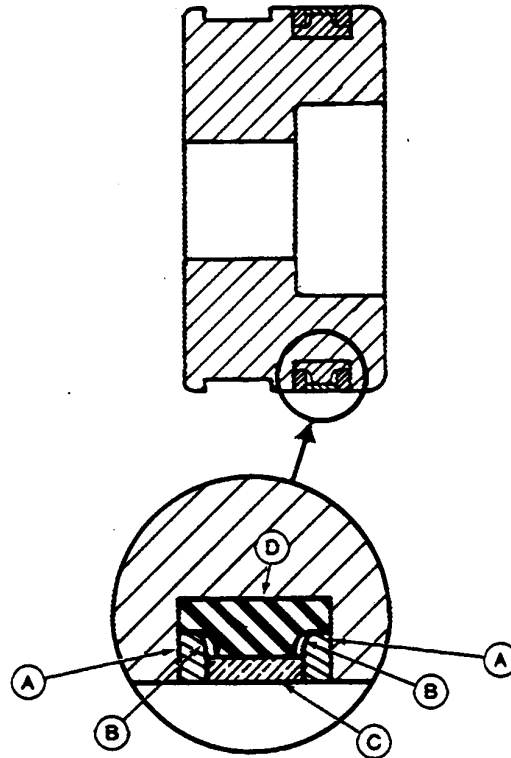
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TX,09,QQ9698 -19-06DEC99-5/12

IMPORTANT: For proper fit, the backup rings must be installed with the radius toward seal expander.

10. Install backup rings (A) with radius (B) toward seal expander (D).
11. Check if cap seal is loose; seal must fit tight against seal expander and not turn. If seal can be turned, it has been stretched too much and can be damaged during assembly into barrel.

A—Backup Ring (2 used) C—Cap Seal
B—Radius D—Seal Expander



T6126A0—JUN—19OCT88

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TX,09,QQ9698 -19-06DEC99-6/12

Hydraulic System

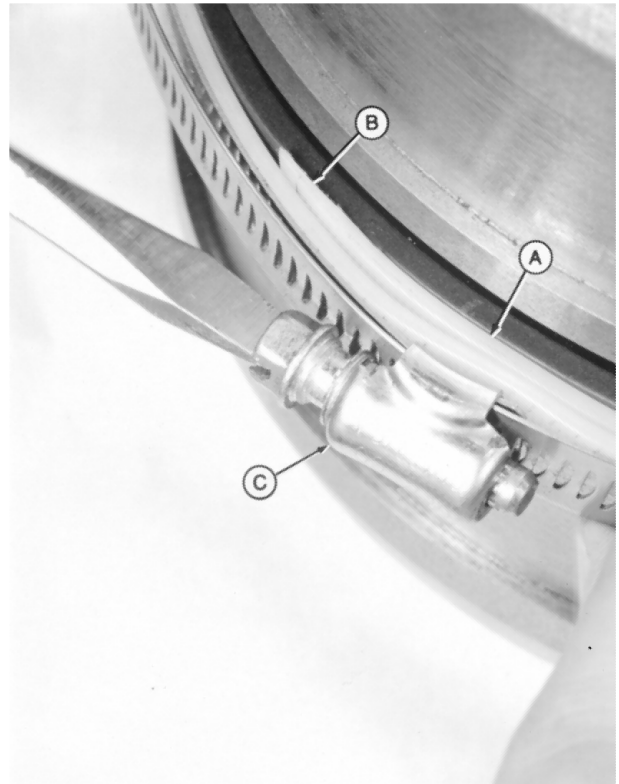
12. If necessary, shrink cap seal to its original size using a ring compressor or a plastic tie band (A) and hose clamp (C).

When using a ring compressor, put a piece of shim stock between cap seal and compressor at the joint so it does not damage seal.

When using a plastic tie band and hose clamp, grind a taper (B) on one end of tie band. Install tie band with the taper against cap seal. Before tightening the hose clamp, tie band must be under hose clamp all around piston.

A—Plastic Tie Band
B—Taper

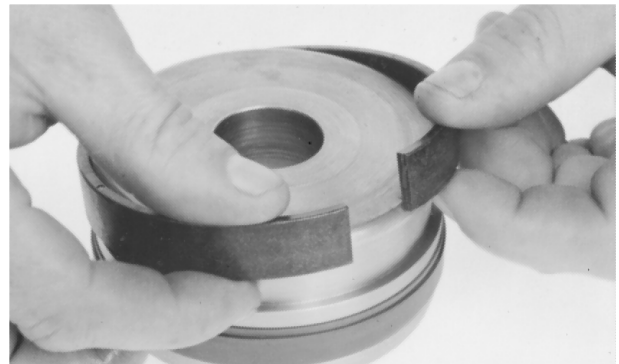
C—Hose Clamp



T86565 —UN—09NOV88

TX,09,QQ9698 -19-06DEC99-7/12

13. Install wear ring.



T6122AF —UN—19OCT88

Continued on next page

TX,09,QQ9698 -19-06DEC99-8/12

Hydraulic System

14. Install nut, snap ring, rod guide, and piston assembly on rod.

15. Install and tighten nut to 50 N·m (37 lb-ft) + 1/12 turn or 30° rotation.

Specification

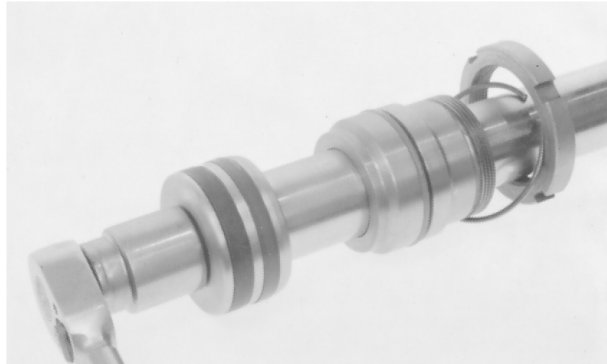
Piston-to-Rod Lock

Nut—Torque..... 50 N·m (37 lb-ft) + 1/12 turn (30°)

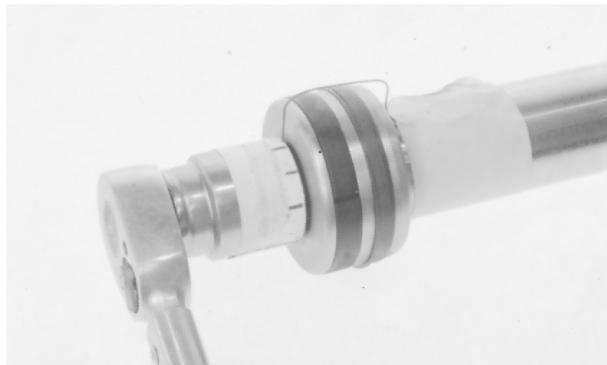
16. Put tape around a socket. Make marks on the tape to divide the socket into twelfths.

17. Put a piece of wire on the rod, over the piston, to point to one of the marks.

18. Tighten nut one mark (1/12 turn or 30° rotation).



T6172BP—UN—19OCT88



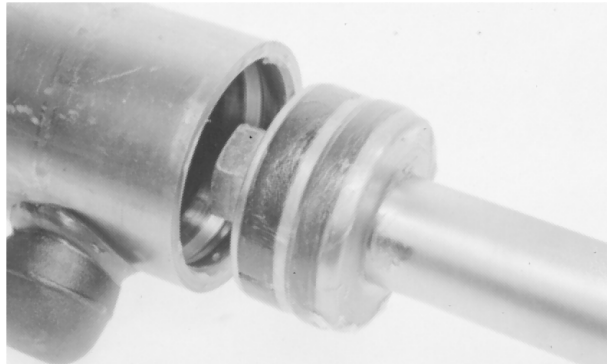
T6172BR—UN—19OCT88

TX,09,QQ9698 -19-06DEC99-9/12

19. Apply petroleum jelly on seals and chamfer of barrel. Apply a light coat of clear hydraulic oil to rod guide threads and threads of spanner nut.

IMPORTANT: To prevent seal damage, the barrel, piston, and rod must be in alignment during installation.

20. Carefully push piston and rod guide into barrel. Keep piston and rod guide together.

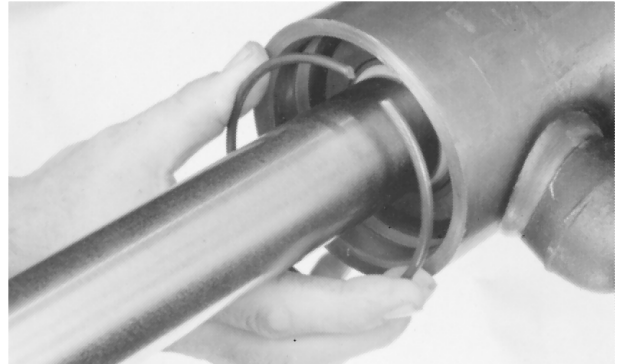


T6122AH—UN—19OCT88

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TX,09,QQ9698 -19-06DEC99-10/12

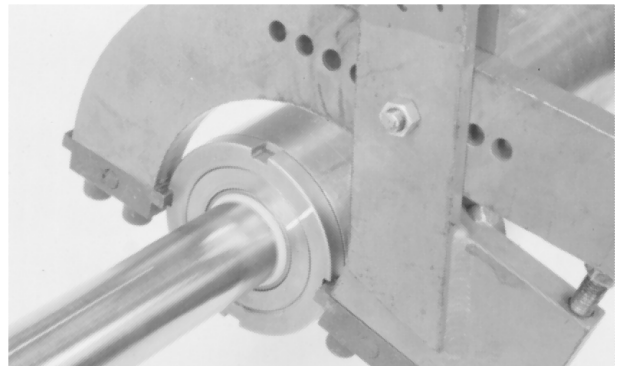
21. Push rod guide into barrel just enough to install snap ring. Install snap ring.
22. Pull rod guide against snap ring.
23. Apply a light film of oil to ID of barrel at void between rod guide and spanner nut to help minimize rust.
24. Place filler ring between rod guide and spanner nut.



T6 133AE —UN—27OCT88

TX,09,QQ9698 -19-06DEC99-11/12

25. Clean spanner nut and rod guide threads using cure primer.
Apply thread lock and sealer (medium strength) to threads.
26. Install nut and tighten nut until rod guide and marks on nut, made before disassembly, align. Be sure nut is tight.



T8119AR —UN—27OCT88

TX,09,QQ9698 -19-06DEC99-12/12

Remove and Install Steering Cylinder Bushings

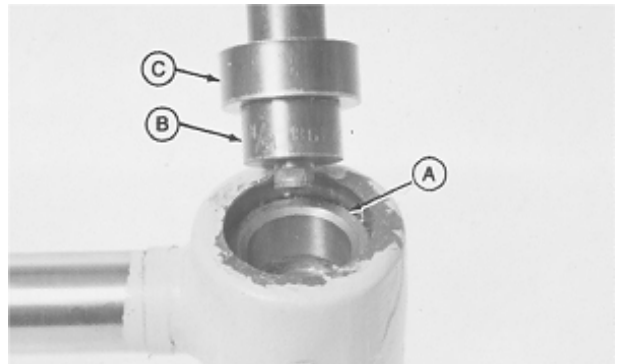
1. Remove and install bushing (A) using D01044AA Bushing, Bearing and Seal Driver Set (B and C). Install new bushing 6.5 mm (0.26 in.) below surface.

Specification

Non-Powered Axle
Steering Cylinder
Bushings—Depth..... 6.5 mm (0.26 in.)

2. Apply NEVER-SEEZ® lubricant or equivalent on bushings.

A—Bushing
B—Disc from Bushing, Bearing and Seal Driver Set
C—Disc from Bushing, Bearing and Seal Driver Set

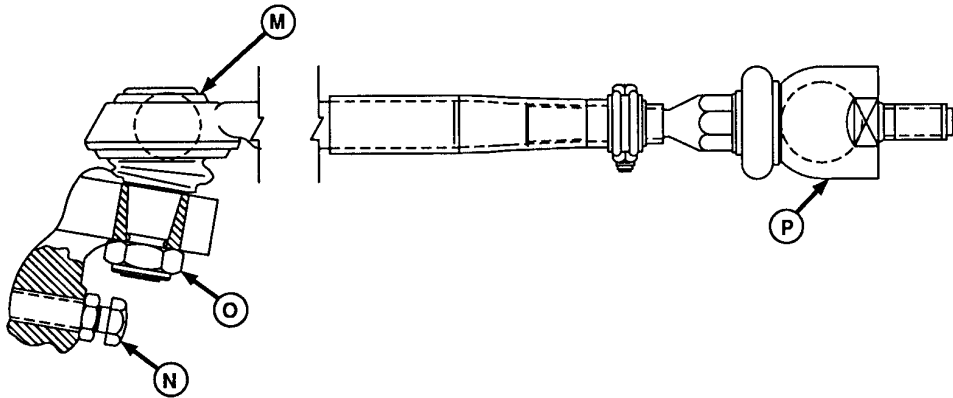
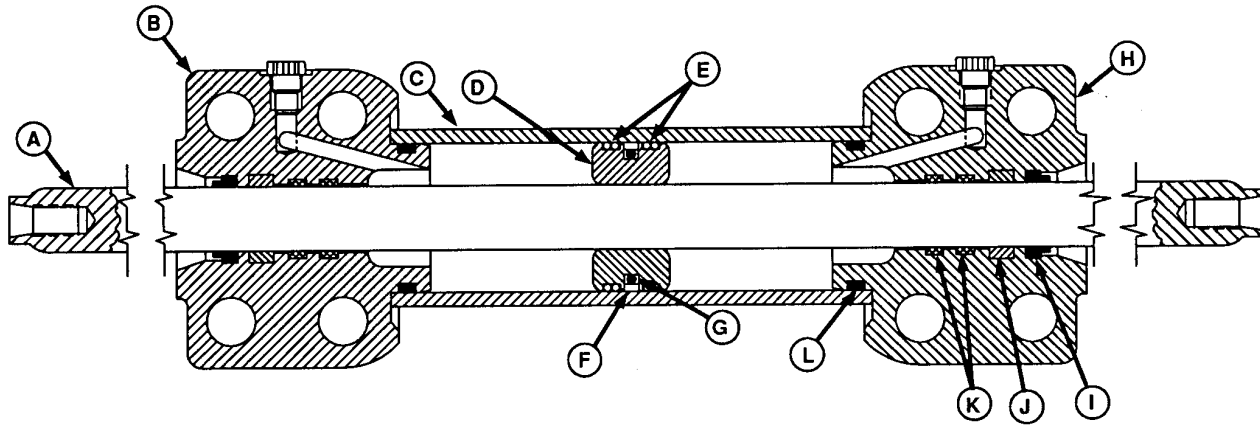


T92309 —UN—08FEB90

NEVER-SEEZ is a registered trademark of Emhart Chemical Group

TX,09,QQ8707 -19-03NOV98-1/1

Cross Section of APL-2025 MFWD Axle Steering Cylinder



T8155AN ©

A—Piston Rod
B—Right End Cap
C—Cylinder Barrel
D—Piston

E—Guide Rings (2 used)
F—O-Ring
G—Oil Seal
H—Left End Cap

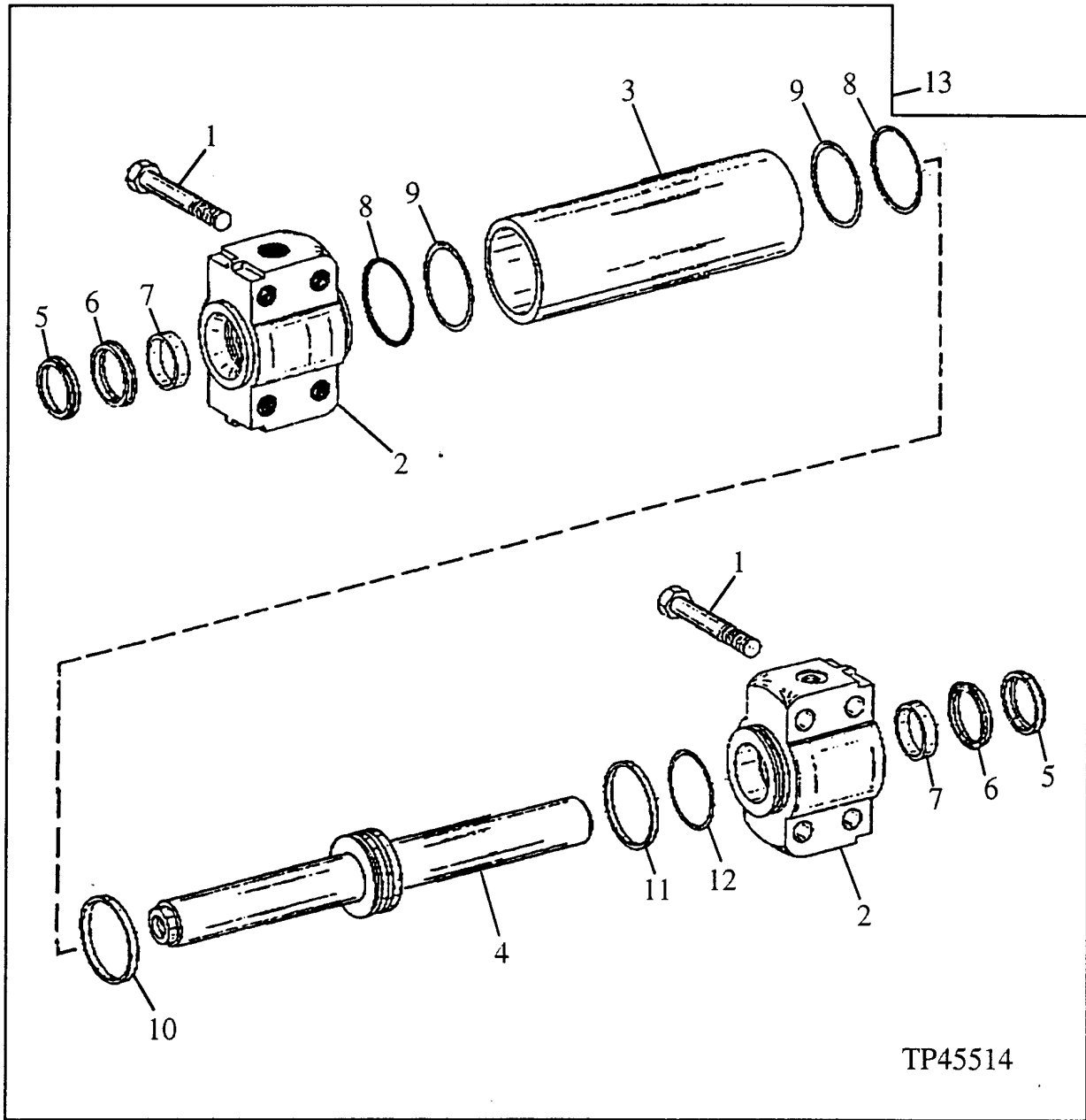
I—Wiper Seal (2 used)
J—Grooved Ring (2 used)
K—Guide Ring (4 used)
L—O-Ring (2 used)

M—Tie Rod (2 used)
N—Steering Stop Adjust Screws
(2 used)
O—Lock Nut (2 used)
P—Ball Joint (2 used)

T8155AN —UN—14/JUN94

TX,09,QQ9700 -19-01SEP06-1/1

Disassemble and Assemble APL-2025 MFWD Axle Steering Cylinder



1— Cap Screw (8 used)
 2— Cylinder Cap (2 used)

5— Seal (2 used)
 6— Seal (2 used)
 7— Guide (2 used)
 8— O-Ring (2 used)

9— Ring (2 used)
 10— Seal
 11— Guide
 12— O-Ring

13— Cylinder

TP45514

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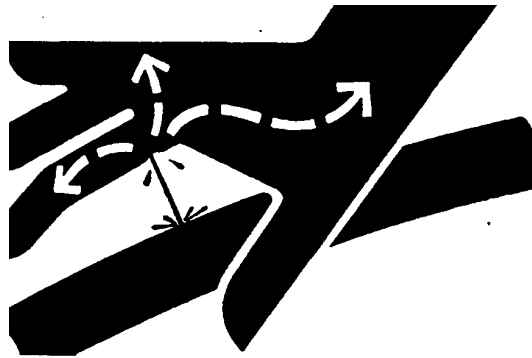
TX,09,QQ9701 -19-07DEC99-1/11

TP45514 —UN—29SEP94

CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

NOTE: Steering cylinder can be serviced on machine. Axle shown removed for clarity of photograph.



1. Operate all hydraulic control valves to release pressure in hydraulic system.

X9811 —UN—23AUG88

TX,09,QQ9701 -19-07DEC99-2/11

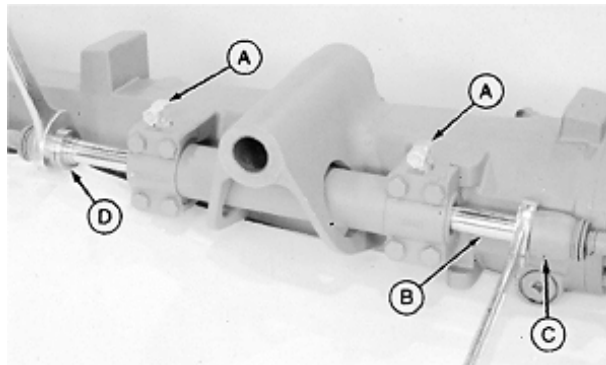
2. Disconnect hoses from cylinder end cap fittings (A). Close openings using caps and plugs.

IMPORTANT: To avoid damaging seals, do not overheat piston rod. Use a butane torch with low flame. Stop before heat reaches seals.

NOTE: Wrench flats on left end of piston rod are covered by stop collar. Remove left ball joint first if stop collars are installed on piston rod.

3. Heat left end of piston rod (B) near ball joint (C) to break down sealant on threads. Hold ball joint on right side of cylinder to loosen and disconnect left ball joint.

If equipped, remove stop collar (D) from left end of piston rod to put a wrench on flats of rod. Heat right ball joint to loosen and disconnect it from tie rod.



A—Fitting (2 used)
B—Piston Rod

C—Ball Joint (2 used)
D—Steering Stop Collar (2 used)

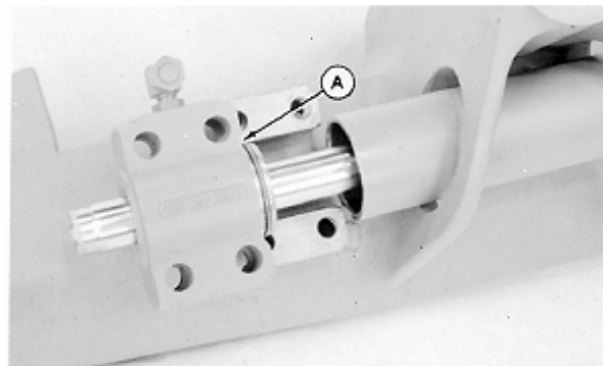
T8172AT —UN—06FEB94

TX,09,QQ9701 -19-07DEC99-3/11

NOTE: Cylinder is full of oil. Have a container available to catch oil.

4. Remove four cap screws to remove end cap (A).

A—End Cap



T8155AP —UN—10JAN94

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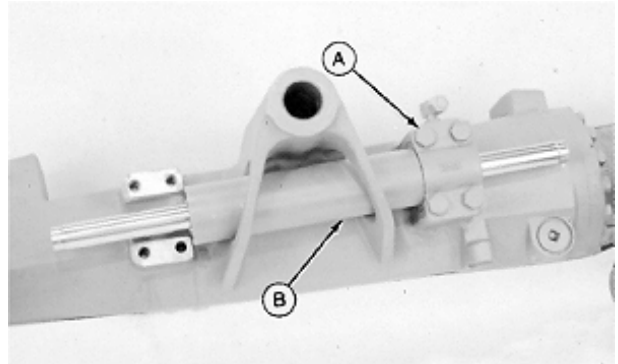
TX,09,QQ9701 -19-07DEC99-4/11

Hydraulic System

- Remove four cap screws (A) to remove end cap and cylinder assembly (B).
- Remove other end cap from cylinder.

A—Cap Screws (4 used)

B—Cylinder Assembly



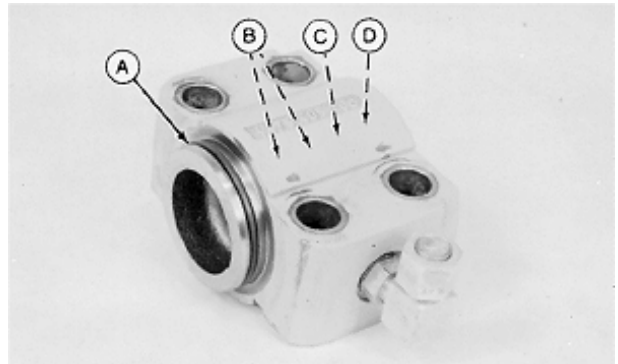
T8155AQ—UN—10JAN94

TX,09,QQ9701 -19-07DEC99-5/11

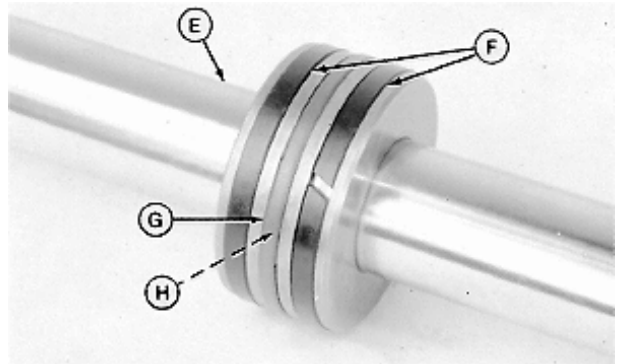
- Replace parts (A—D) as necessary.
- Pull piston assembly from cylinder.
- Replace parts (E—H) as necessary.

A—O-Ring (2 used)
B—Guide Ring (4 used)
C—Grooved Ring (2 used)
D—Wiper Seal (2 used)

E—Piston Rod
F—Guide Ring (2 used)
G—Oil Seal
H—O-Ring



T8155AR—UN—10JAN94



T8155AS—UN—10JAN94

Continued on next page

TX,09,QQ9701 -19-07DEC99-6/11

NOTE: The piston seal can be made more pliable by warming it with your hands or by putting seal in hot water for approximately five minutes. Once started, install piston seal as quickly as possible to keep the amount of time the seal is stretched to a minimum.

10. Install a plastic tie band (A) around piston seal (B) with the smooth side against seal. Position seal over piston (C).

11. Shrink piston seal to original size:

a. Ring Compressor Method.

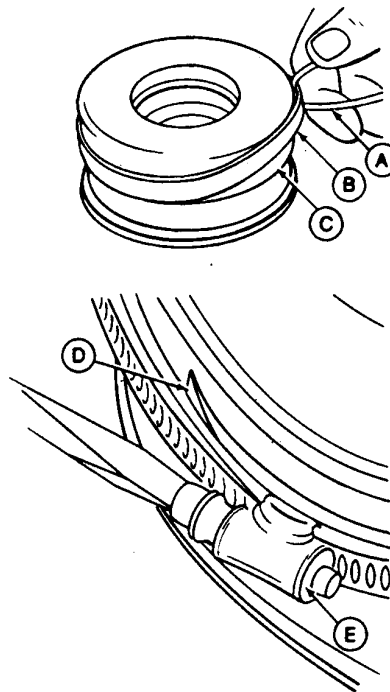
Install ring compressor with shim stock between piston seal and compressor to protect seal. Tighten ring compressor to compress cap seal.

NOTE: The plastic tie band must be long enough to wrap once around piston and then overlap slightly.

b. Hose Clamp Method.

Cut the head off a plastic tie band of appropriate length. Grind a taper on the cut end. Install hose clamp (E) and tie band with taper (D) against piston seal. Tighten hose clamp to compress cap seal.

NOTE: Before tightening hose clamp, make sure tie band is under hose clamp all around piston.



A—Tie Band
B—Piston Seal
C—Piston

D—Tapered End
E—Hose Clamp

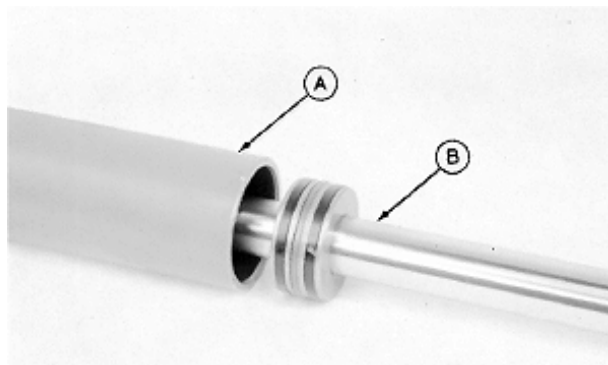
T6684AB—UN—19OCT88

TX,09,QQ9701 -19-07DEC99-7/11

12. Install rod and piston assembly (B) into cylinder barrel (A). Care should be used not to damage piston guide rings or oil seal during installation.

A—Cylinder Barrel

B—Rod and Piston Assembly



T8155AT—UN—10JAN94

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TX,09,QQ9701 -19-07DEC99-8/11

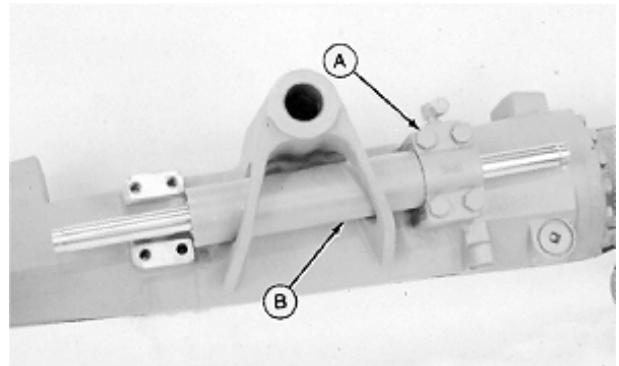
Hydraulic System

13. Install end cap on one end of cylinder and piston rod. Push end cap into cylinder barrel (B).

14. Install cylinder assembly on axle. Install cap screws (A).

A—Cap Screws

B—Cylinder Barrel



T8155AQ—UN—10JAN94

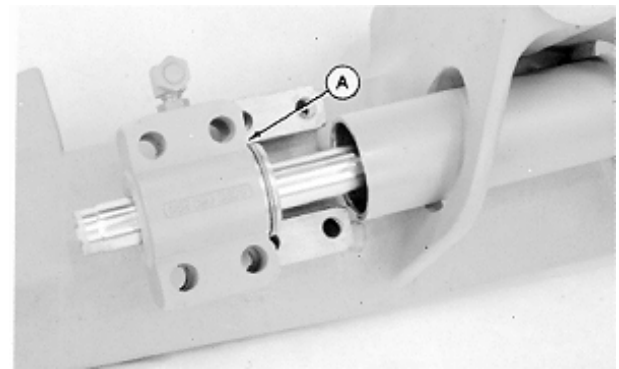
TX,09,QQ9701 -19-07DEC99-9/11

15. Install remaining end cap (A) and cap screws. Tighten cap screws to specification.

Specification

End Cap, Cap
Screws—Torque..... 280 N·m (206 lb-ft)

A—End Cap



T8155AP—UN—10JAN94

TX,09,QQ9701 -19-07DEC99-10/11

16. If equipped, install steering stop collar on cylinder rod with smaller OD end toward cylinder.

17. Apply cure primer, then apply thread lock and sealer (medium strength) to first three threads of ball joint (C). Connect ball joint to piston rod (B) and tighten to specification.

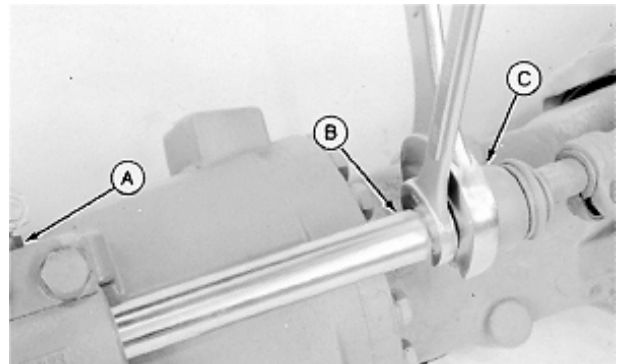
Specification

Ball Joint-to-Piston
Rod—Torque..... 250 N·m (184 lb-ft)

18. Connect hydraulic lines to end cap fittings (A).

A—Fitting (2 used)
B—Piston Rod

C—Ball Joint (2 used)



T8155AO—UN—10JAN94

TX,09,QQ9701 -19-07DEC99-11/11

Adjust Tracking Angle for MFWD Axle

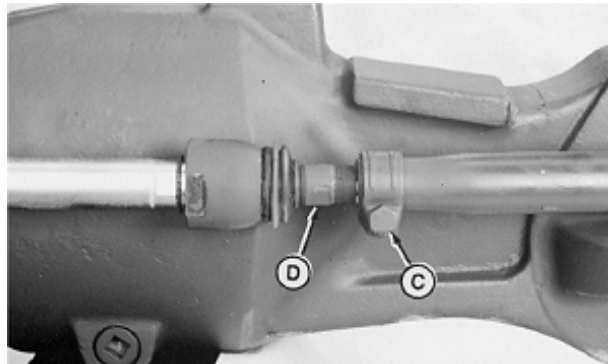
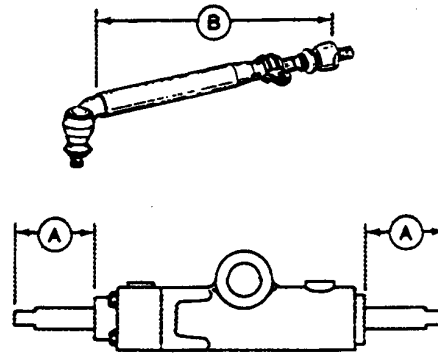
1. Move piston rod until distances (A) at each end of cylinder are equal.
2. Measure both tie rod lengths (B).

If necessary, disconnect tie rod from steering knuckle and loosen cap screw (C). Turn tie rod on or off ball joint stud (D) until both tie rods are equal length within 1 mm (0.04 in.). Fasten tie rod to steering knuckle.

3. With axle installed on machine, check and adjust toe-in and steering stop screws. (See Group 0240.)

A—Piston Rod Centered Distance
B—Tie Rod Length

C—Cap Screw
D—Ball Joint Stud



T6382JX—UN—25MAY88

T6382JZ—UN—05APR90

TX,09,QQ9703 -19-12MAR93-1/1

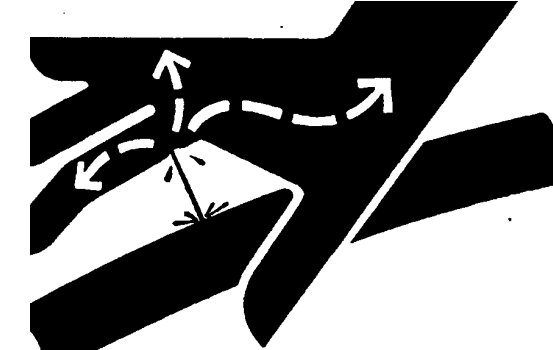
Remove and Install Priority Valve

NOTE: Steering priority valve is located inside engine compartment on left rear wall.

1. Raise loader boom and install boom lock bar.

CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.



2. Operate all hydraulic control valves to release pressure in hydraulic system.
3. Remove left engine side guard.

X9811—UN—23AUG88

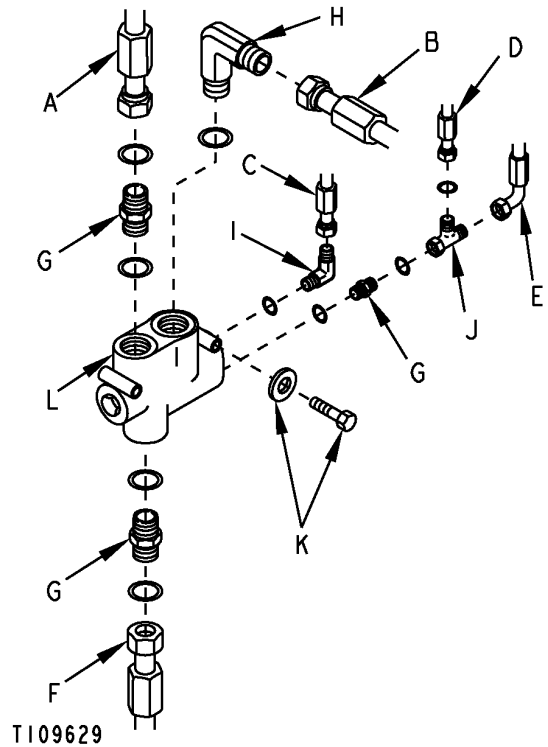
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TX,09,BD2861 -19-23MAY97-1/2

Hydraulic System

4. Disconnect lines (A—F). Cap or plug all openings.
5. Remove cap screws and washers (K) and priority valve (L).
6. Install priority valve (L) on fire wall. Install cap screws and washers (K).
7. Connect lines (A—F).
8. Install left engine side guard.

- | | |
|--|---|
| <p>A—Priority Valve-to-Steering Valve P Port Line</p> <p>B—Priority Valve-to-Hydraulic Control Valve Inlet Port Line</p> <p>C—Priority Valve-to-Steering Valve LS Port Line</p> <p>D—Priority Valve-to-Hydraulic Reservoir Return Line</p> <p>E—Priority Valve-to-Brake Valve Line</p> <p>F—Main Hydraulic Pump-to-Priority Valve Line</p> | <p>G—Fitting (3 used)</p> <p>H—Elbow Fitting</p> <p>I—Elbow Fitting</p> <p>J—Tee Fitting</p> <p>K—Cap Screw and Washer (2 used)</p> <p>L—Priority Valve</p> |
|--|---|



T109629

T109629 —UN—04JUN97

TX,09,BD2861 -19-23MAY97-2/2

Disassemble and Assemble Priority Valve

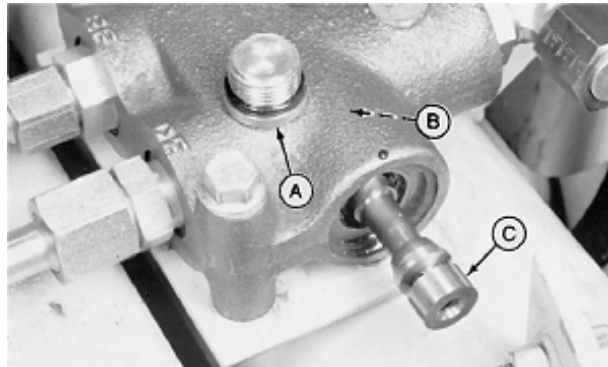
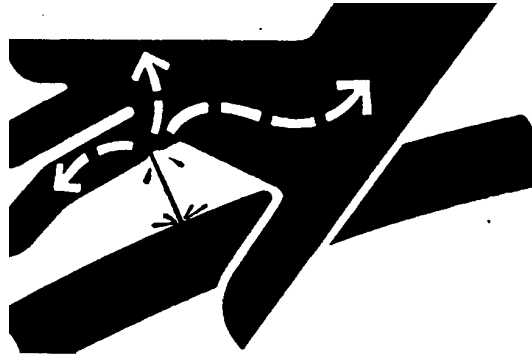
⚠ CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

NOTE: Priority valve can be disassembled on unit.

1. Operate all hydraulic control valves to release pressure in hydraulic system.
2. Remove plug (A) to remove spring (B) and spool (C).

A—Plug
B—Spring
C—Spool



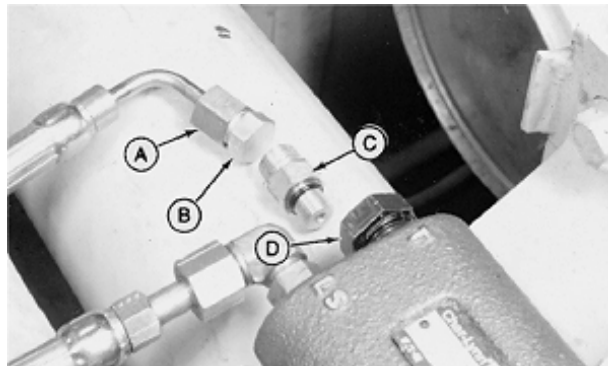
X9811 —UN—23AUG88

T6196AB —UN—29MAR90

TX,09,BD2862 -19-07NOV98-1/3

3. Disconnect line (A). Install plug (B).
4. Remove fitting (C) to remove relief valve (D).
5. Install valve, fitting and line.

A—Line
B—Plug
C—Fitting
D—Relief Valve



T6196AC —UN—29MAR90

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TX,09,BD2862 -19-07NOV98-2/3

6. Install spring (B), spool (C) and plug (A).

Specification

Relief Valve

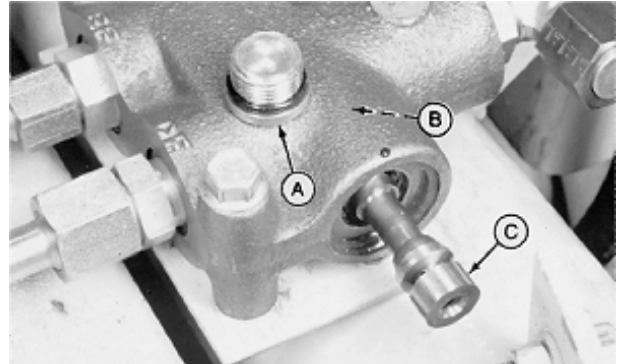
Spring—Free Length.....56.4 mm (2.22 in.) Approximate
Length at 72.3—85.6 N
(16.25—19.25 lb force)

Minimum..... 35.7 mm (1.407 in.)

7. If new relief valve or spring (B) has been installed, test valve. (See Priority Valve Test in Group 9025 of Operation and Test Manual.)

A—Plug
B—Spring

C—Spool



T6196AB—UN—29MAR90

TX,09,BD2862 -19-07NOV98-3/3

Hydraulic System

Section 10 Service Brakes

Contents

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Disassemble and Assemble Lines	10-1060-6
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Disassemble MICO Power Boost	
Brake Valve (S.N. 887379—)	10-1060-10
Assemble MICO Power Boost	
Brake Valve (S.N. 887379—)	10-1060-12
Brake Pedals	
Adjust	10-1060-14
Bleeding Brakes	10-1060-16

Contents

External Service Brake Inspection

NOTE: The service brake inspection ports are located at the front of the rear axle.

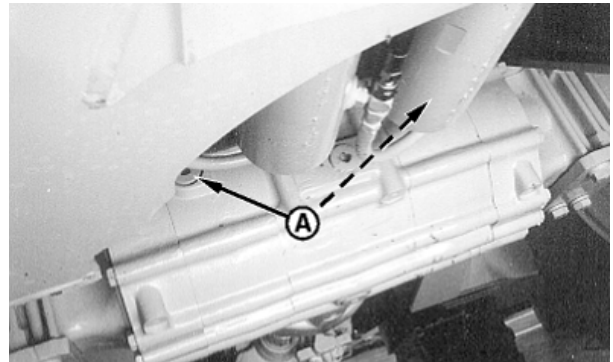
1. Remove plugs (A) from inspection port (C).
2. Start engine. Do not release park brake.
3. Apply the service brakes.

NOTE: Gap (B) equals the overall thickness of brake disk (E) when service brake is applied.

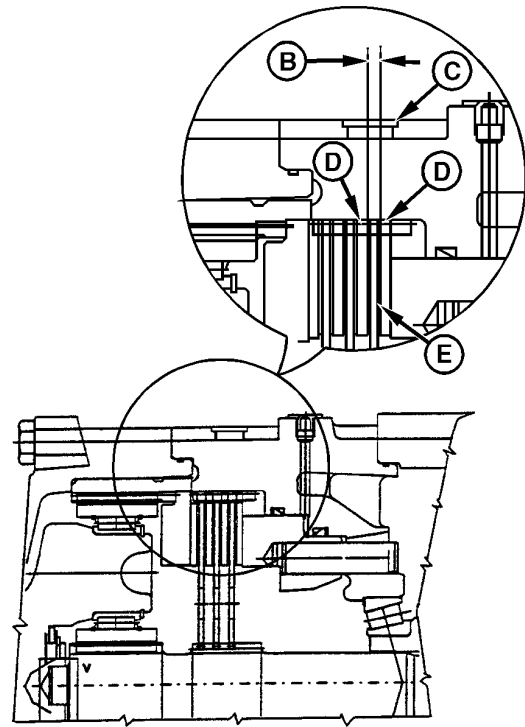
A piece of metal bar stock with a thickness of 5 mm (0.197 in.) can be used as a gauge to check gap (B). If the 5 mm (0.197 in.) gauge cannot fit between two separator disks (D), replace brake disks. (See Disassemble Rear Axle in Group 02-0250.)

4. Check gap (B) between two separator disks (D) using a feeler gauge.
5. Replace brake disks if gap (B) is less than 5 mm (0.197 in.). (See Disassemble Rear Axle in Group 02-0250.)

A—Plugs	D—Separator Disk (4 used)
B—Gap [5 mm (0.197 in.) minimum]	E—Brake Disk (3 used)
C—Inspection Port	



T115644—UN—01JUN98



T115634

T115634—UN—01JUN98

CED,OUO1010,197 -19-28MAY98-1/1

Remove and Install Brake Disk and Pressure Plate

NOTE: Service brakes are part of rear axle.

See Section 02, Group 0250 Remove and Install Rear Axle for repair of service brakes.

TX,10,QQ9704 -19-18FEB97-1/1

Active Elements

Group 1060 Hydraulic System

Service Equipment and Tools

European Microfiche Tool Catalog (MTC). Some tools may be available from a local supplier.

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or from the

SERVICEGARD is a trademark of Deere & Company

CED,TX03399,5661 -19-06DEC99-1/2

Bushing, Bearing and Seal Driver Set..... D01044AA Remove bushings from brake pedals.

CED,TX03399,5661 -19-06DEC99-2/2

Other Material

Number	Name	Use
TY16285 (U.S.) CXTY16285 (Canadian) 7649 (LOCTITE®)	Cure Primer	Apply to threads of plug
T43513 (U.S.) TY9474 (Canadian) 271 (LOCTITE®)	Thread Lock and Sealer (High Strength)	Apply to threads of plug
PT569 (U.S.)	John Deere NEVERSEEZ® Lubricant	Apply to brake pedal bushings.

*LOCTITE is a trademark of Loctite Corp.
NEVERSEEZ is a registered trademark of the Emhart Chemical Group*

CED,TX03399,5663 -19-06DEC99-1/1

Specifications

Item	Measurement	Specification
John Deere Brake Valve (S.N. —887378)		
Piston Springs	Length	196.0 mm (7.7 in.)
Piston Springs	Test Length at 160 ± 16 N (36 ± 4 lb force)	150 mm (5.9 in.)
Equalizing Valve Spring	Free Length	20 mm (0.79 in.) Approximate
Equalizing Valve Spring	Test Length at 0.67 ± 0.1 N (0.15 ± 0.027 lb force)	0.28 in. (0.027 mm)
Check Valve Seats	Torque	34 N·m (25 lb-ft)
Left Brake Pedal Adjustment	Force and Position	44.5 N (10 lb force) Minimum. [If pedal starts to settle, turn right cap screw out (counterclockwise) until the settling stops. Turn the right cap screw an additional 1/3 turn (two wrench flats) out (counterclockwise).]
Right Brake Pedal Adjustment	Force and Position	44.5 N (10 lb force) Minimum. [If pedal starts to settle, turn the left cap screw out (counterclockwise) until settling stops. Turn the left cap screw an additional 1/3 turn (two wrench flats) out (counterclockwise).]
Brake Pedal	Feel/Distance	Solid within 19 mm (0.75 in.) of travel
Engine	RPM	1500
Brake Pedal	Travel	Firm within 133 mm (5.25 in.) after 10 second wait cycle

CED, TX03399, 5664 -19-17MAY00-1/1

Remove and Install John Deere Brake Valve (S.N. —887378)

See Remove and Install MICO Brake Valve (S.N. 887379—) for later Serial Number tractors.

1. Operate all controls to release all hydraulic pressure.
2. Remove cowl cover. (See procedure in Group 1910.)

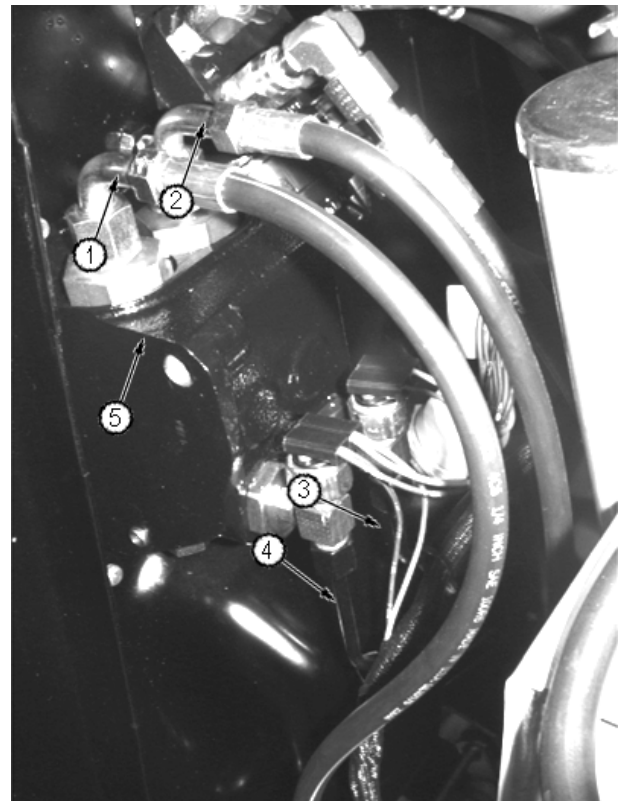
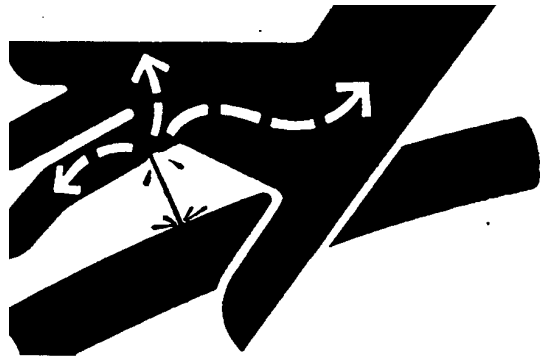
⚠ CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

3. Disconnect lines (1—4) from brake valve (5).
4. Plug and cap all openings.
5. Remove four cap screws and remove brake valve and pedals.
6. Disassemble and repair valve as needed. (See procedure in this group.)

NOTE: Fill brake valve with oil and bleed out air before installing on machine.

7. Install brake valve and pedals.
8. Install four cap screws.
9. Connect lines (1—4) to brake valve (5).
10. Install cowl cover.
11. Bleed brakes. (See procedure in this group.)



1— Outlet to Reservoir 4— Outlet to Right Brake
 2— Inlet to Hydraulic Oil Cooler 5— Brake Valve
 3— Outlet to Left Brake

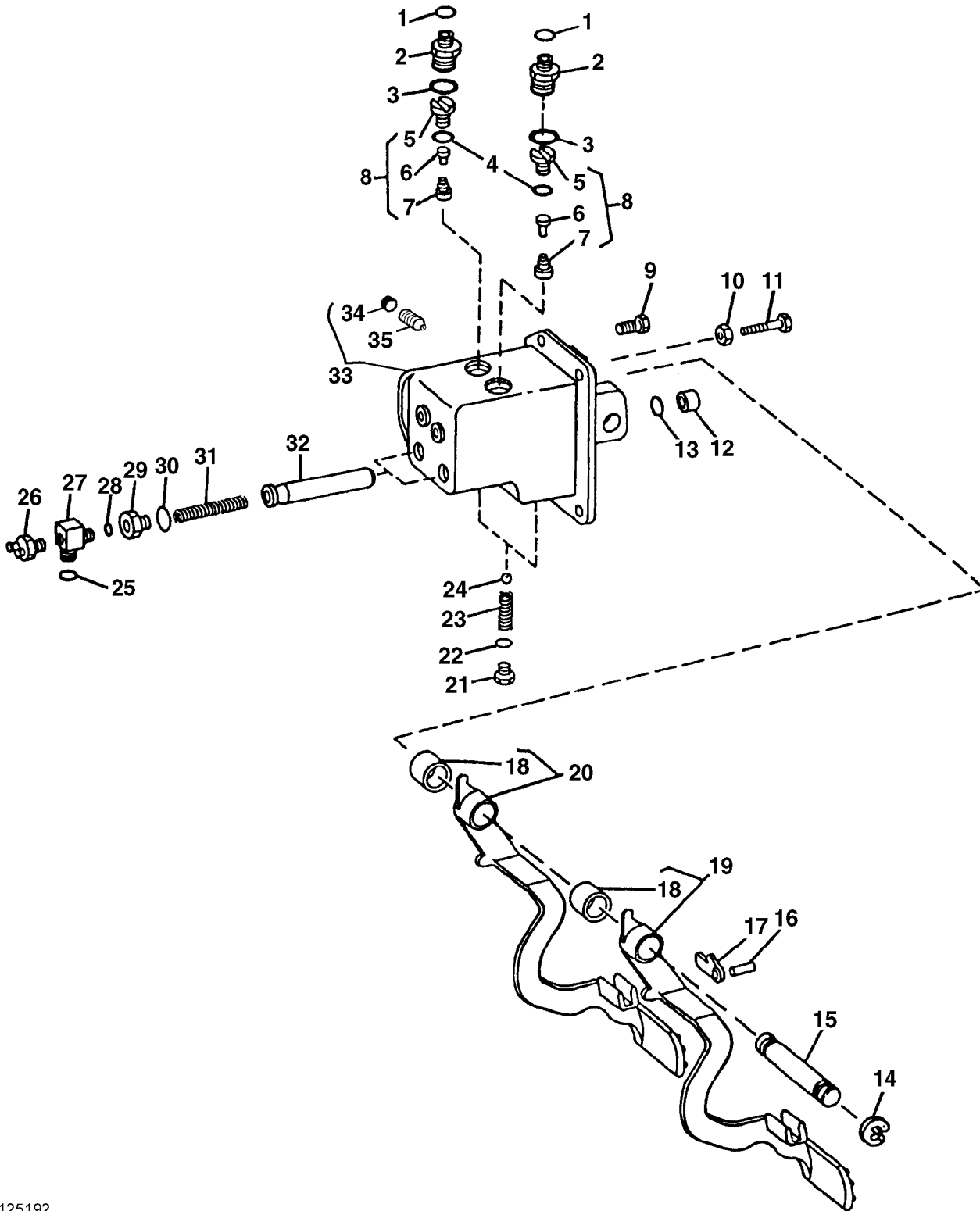
X8811 —UN—23AUG88

T1 07340B —UN—10APR97

WS68074.00036F2 -19-14JUL10-1/1

Disassemble and Assemble John Deere Brake Valve (S.N.—887378)

See Disassemble MICO Power Boost Brake Valve (S.N.
887379—) for later serial number tractors.



T125192

Continued on next page

TX,10,QQ9709 -19-17MAY00-1/2

Hydraulic System

- 1— O-Ring (2 used)
- 2— Adapter (2 used)
- 3— O-Ring (2 used)
- 4— O-Ring (2 used)
- 5— Seat (2 used)
- 6— Valve (2 used)
- 7— Spring (2 used)
- 8— Check Valve (2 used)
- 9— Cap Screw (4 used)

- 10— Nut (2 used)
- 11— Cap Screw (2 used)
- 12— Wiper Seal (2 used)
- 13— Lip Seal (2 used)
- 14— Snap Ring (2 used)
- 15— Shaft
- 16— Spring Pin
- 17— Arm
- 18— Bushing (2 used)

- 19— Left Pedal
- 20— Right Pedal
- 21— Fitting (2 used)
- 22— O-Ring (2 used)
- 23— Spring (2 used)
- 24— Ball (2 used)
- 25— O-Ring (2 used)
- 26— Stop Light Switch (2 used)
- 27— Fitting (2 used)

- 28— O-Ring (2 used)
- 29— Fitting (2 used)
- 30— O-Ring (2 used)
- 31— Spring (2 used)
- 32— Piston (2 used)
- 33— Brake Housing
- 34— Pipe Plug
- 35— Orifice (Non Serviceable)

NOTE: When servicing brake valve, install all of the brake valve kit parts.

1. Remove snap ring (14) and shaft (15) and remove brake pedals (19 and 20).
2. Remove bushing (18) from brake pedals using D01044AA Bushing, Bearing and Seal Driver Set.
3. Remove parts (25—32).
4. Inspect springs (31) for wear or broken coils. Check the compression rate of springs.

Brake Valve—Specification

Piston Springs—Length..... 196.0 mm (7.7 in.)
 Piston Springs—Test
 Length at 160 ± 16 N (36
 ± 4 lb force)..... 150 mm (5.9 in.)

5. Remove parts (21—24).
6. Inspect parts for wear. Check the compression rate of springs.

Brake Valve—Specification

Equalizing Valve
 Spring—Free Length.....20 mm (0.79 in.) Approximate
 Equalizing Valve
 Spring—Test Length
 at 0.67 ± 0.1 N (0.15 ±
 0.02 lb force)..... 7 mm (0.28 in.)

7. Remove paint from pistons (32).
8. Remove parts (12 and 13).
9. Remove adapter (2) and remove check valve assembly (8).
10. Remove parts (5—7) from check valve assembly.

NOTE: Orifice (35) is part of the housing and is non serviceable

11. Inspect parts for damage. Inspect orifice (35) in housing. Clean orifice with compress air.

NEVERSEEZ is a registered trademark of the Emhart Chemical Group

12. Replace all O-rings.
 13. Clean and dry all parts. Put clean hydraulic oil on all internal parts for assembly.
 14. Apply thread lock and sealer (high strength) to threads of plug (34). Install and tighten plug until plug is even with or below housing surface.
 15. Install valve (6) head first into seat (5).
 16. Install small end of spring (7) onto valve (6).
- IMPORTANT: Check valves (8) can be damaged if installed with pistons (32) in place.**
17. Install check valve assembly (8) with drag link socket. Tighten seats to specification.

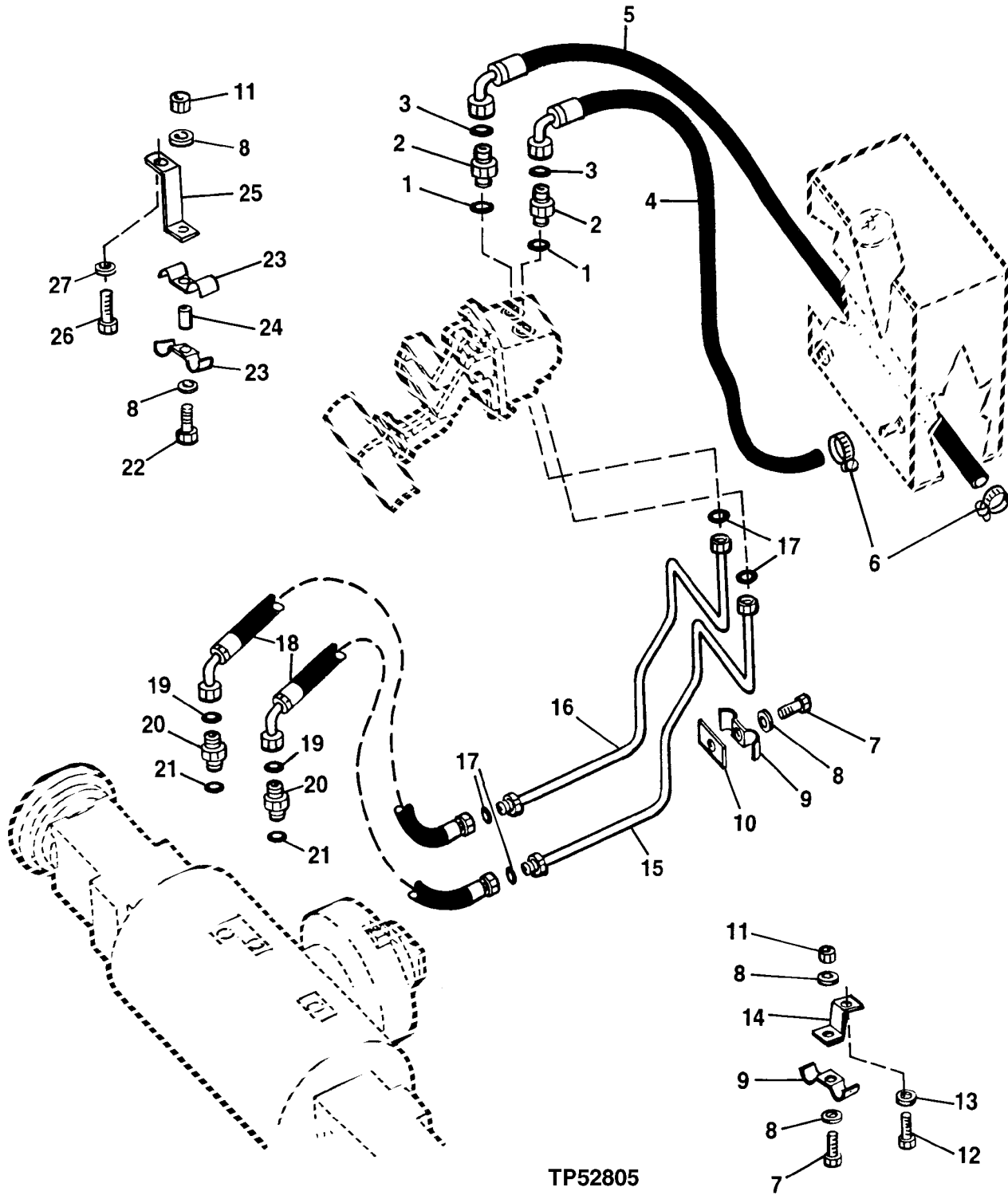
Specification

Check Valve
 Seats—Torque..... 34 N·m (25 lb-ft)

18. Adapter (2) should not be installed until valve is adjusted.
19. Install oil seal (12) with lip of seal toward outside of housing with 29 mm disk until seal bottoms in bore.
20. Put petroleum jelly on lip of seal.
21. Install piston lip seal (13) with lip facing in.
22. Put clean hydraulic oil on pistons (32) and install.
23. Install parts (25—31) and parts (21—24).
24. Install bushing into brake pedal even with hub face of pedal using 17 and 25 mm disks.
25. Put NEVERSEEZ® or equivalent on bushings.
26. Install brake pedals, shaft (15) and snap ring (14).
27. Adjust brake pedal. (See procedure in this group.)

TX,10,QQ9709 -19-17MAY00-2/2

Disassemble and Assemble Brake Valve Lines (S.N.—887378)



TP52805—UN—24SEP96

Continued on next page

Hydraulic System

- | | | | |
|-----------------------|--------------------|-----------------------------|-------------------------|
| 1— O-Ring (2 used) | 8— Washer (5 used) | 15— Brake Line | 22— Cap Screw |
| 2— Adapter (2 used) | 9— Clamp (2 used) | 16— Brake Line | 23— Half Clamp (2 used) |
| 3— O-Ring (2 used) | 10— Strap | 17— O-Ring (4 used) | 24— Washer |
| 4— Hydraulic Hose | 11— Nut (2 used) | 18— Hydraulic Hose (2 used) | 25— Strap |
| 5— Hydraulic Hose | 12— Cap Screw | 19— O-Ring (2 used) | 26— Cap Screw |
| 6— Clamp (2 used) | 13— Washer | 20— Adapter (2 used) | 27— Washer |
| 7— Cap Screw (2 used) | 14— Strap | 21— O-Ring (2 used) | |

1. Disassemble parts as shown.
2. Inspect for worn or damaged parts.
3. Assemble parts as shown.

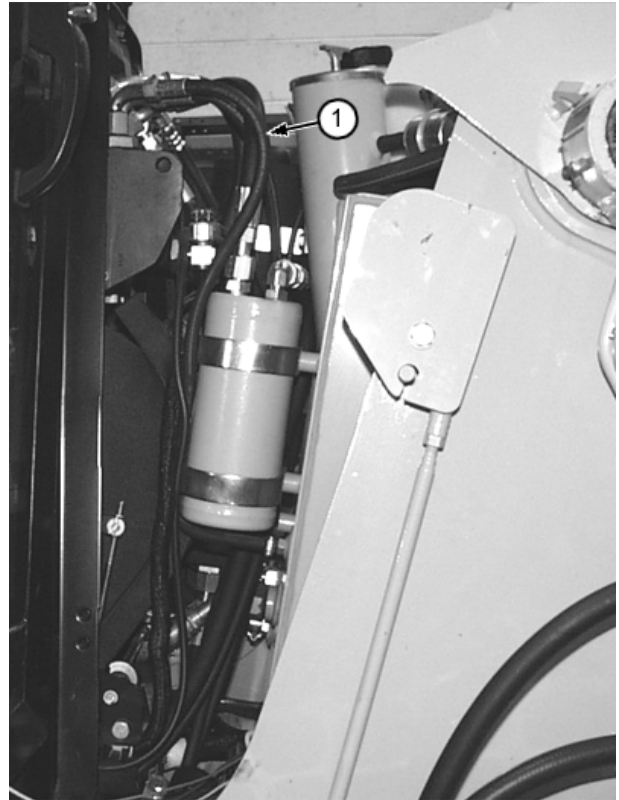
TX,10,QQ9710 -19-17MAY00-2/2

Remove and Install MICO Brake Valve (S.N. 887379—)

See Remove and Install John Deere Brake Valve (S.N. —887378) for early serial number tractors.

Item	Measurement	Specification
Pedal To Piston	Clearance	0.13mm -0.38mm (0.005in. - 0.015in.)

1. Operate all controls to release all hydraulic pressure.
2. Remove cowl cover. (See procedure in Group 1910.)
3. Lower all equipment to the ground and shut the engine off. Release hydraulic pressure in the machine by moving control levers.



T130719B—UN—02MAY00

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WS68074,00036F3 -19-14JUL10-1/3

Hydraulic System

T129385—UN—04MAY00

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WS68074.00036F3 -19-14JUL10-2/3

Hydraulic System

1— Straight Fitting	11— O-Ring	21— 90° Swivel Elbow	31— Hydraulic Hose
2— O-Ring (2 used)	12— O-Ring	22— Pedal/Bracket Assembly	32— Hydraulic Reservoir Hose
3— O-Ring (3 used)	13— O-Ring	23— Left Brake Line	33— Hydraulic Reservoir Hose
4— Hydraulic Hose	14— T-Fitting	24— Right Brake Line	34— Brake Switch (2 used)
5— Fitting (2 used)	15— Adapter	25— O-Ring (4 used)	35— Cap Screw
6— T-Fitting (2 used) (315SE only)	16— O-Ring	26— Cooler Return Fitting	36— Brake Valve Pistons
7— Hose Clamp	17— Diffuser	27— O-Ring	37— Cooler Return Port
8— T-Fitting	18— Hydraulic Hose	28— Brake Valve	38— Rear Transmission Port
9— Hydraulic Hose	19— Cap Screw	29— Cap Screw (2 used)	
10— Transmission Oil Cooler Return	20— Washer (7 used)	30— Fitting (2 used)	

4. Remove cab floor plate.
5. Remove cowl to access brake valve hoses.
6. Disconnect hoses from brake valve.
7. Plug and cap all openings.
8. Remove four cap screws and remove brake valve and pedals.
9. Disassemble and repair valve as needed. (See procedure in this group.)

NOTE: Fill brake valve with oil and bleed out air before installing on machine.

NOTE: Use bottom valve to pedal bracket cap screw (35) as a rest and install other two cap screws (29).

10. Install brake valve (28) with two cap screws (29), one cap screw (35) and three washers (20). Tighten pedal bracket cap screws (19) to 73 ± 14 N·m (54 ± 10 lb-ft). Tighten brake valve cap screws (29 and 35) to 73 ± 14 N·m (54 ± 10 lb-ft).
11. Connect hoses to brake valve.
12. Adjust pedal to piston clearance to specification.

Specification

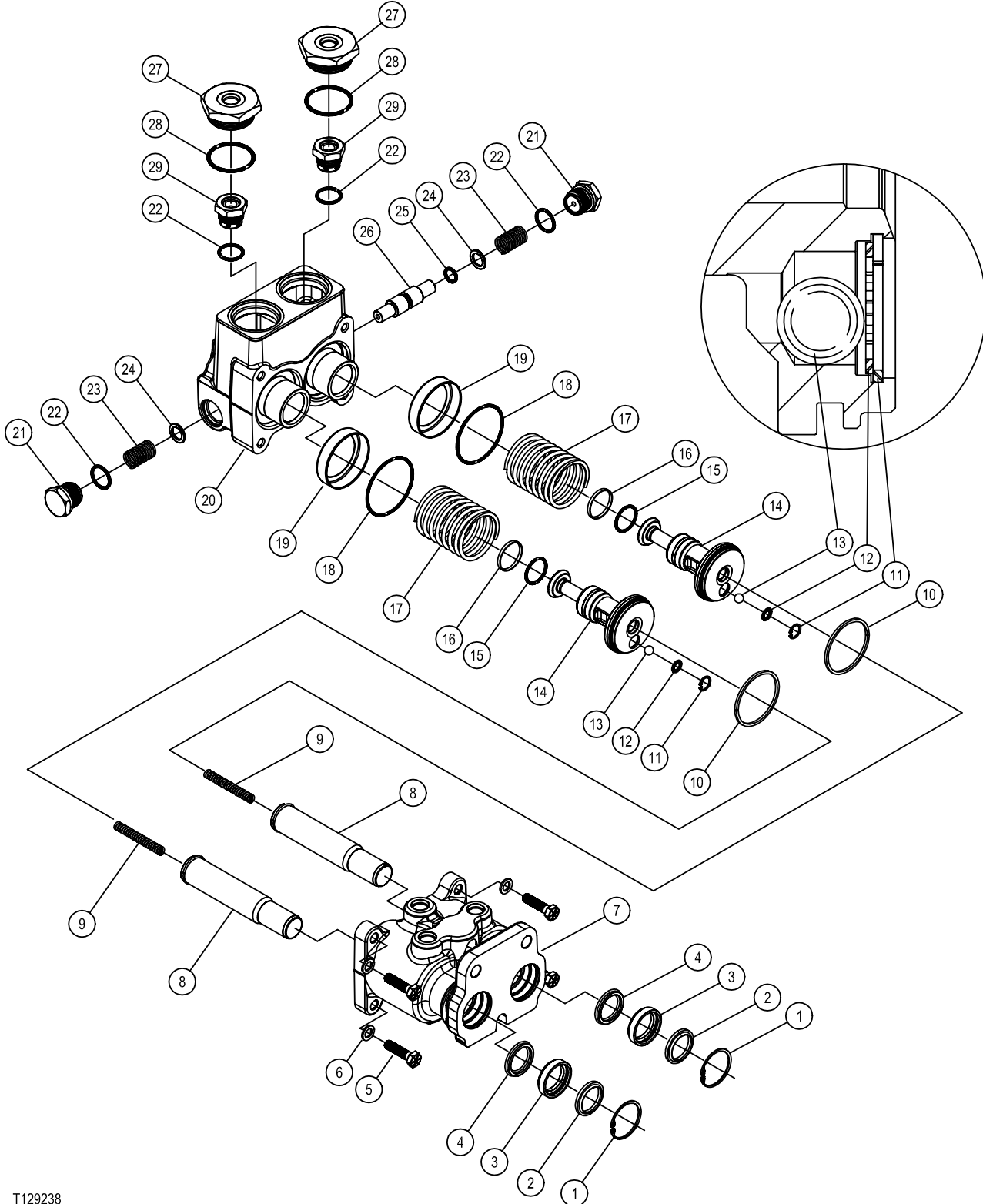
Pedal To	
Piston—Clearance.....	0.13mm - 0.38mm (0.005in. - 0.015in.)

13. Install cowl cover.
14. Bleed brakes. (See procedure in this group.)

WS68074.00036F3 -19-14JUL10-3/3

Disassemble MICO Power Boost Brake Valve (S.N. 887379—)

See Disassemble and Assemble John Deere Brake Valve (S.N.—887378) for earlier serial number tractors.



T129238

T129238—UN—16MAR00

Continued on next page

Hydraulic System

1— Retaining Ring (2 used)	9— Spring (2 used)	17— Spring (2 used)	25— O-Ring
2— Retainer (2 used)	10— Piston Ring (2 used)	18— O-Ring (2 used)	26— Spool
3— Cap Screw (4 used)	11— Retaining Ring (2 used)	19— Retainer (2 used)	27— Reservoir Plug (2 used)
4— Seal (2 used)	12— Washer (2 used)	20— Housing	28— O-Ring (2 used)
5— Cap Screw (4 used)	13— Ball (2 used)	21— Plug (2 used)	29— Tip Valve Assembly (2 used)
6— Washer (4 used)	14— Piston (2 used)	22— O-Ring (4 used)	
7— Housing	15— O-Ring (2 used)	23— Spring (2 used)	
8— Push Rod with Ring (2 used)	16— Seal (2 used)	24— Washer (2 used)	

1. Remove plugs (27) from housing (20). Remove O-rings (28) from plugs (27).
2. Remove valve assemblies (29) from housing (20). Remove O-rings (22)
3. Housings (7 and 20) are under spring tension, to separate housing halves, position mounting flange on housing (7) face down and clamp in a vise. Apply downward pressure on housing (20) while evenly loosening four cap screws (5) and washers (6) while carefully separating housing halves.
4. Remove springs (9), piston (14) assemblies, springs (17), O-rings (18) and retainers (19).
5. Remove retainer ring (11), washer (12) and ball (13) from pistons (14).
6. Remove piston ring (10), seal (16) and O-ring (15) from pistons (14).

NOTE: Do not remove retaining rings from push rods (8).

7. Remove push rods (8) from housing (7).

NOTE: Retainer (3) is Loctite in place and need not be removed to service seals (2 and 4).

8. Carefully remove wiper seal (2) by inserting a small screw driver along the outer parameter of wiper seal (2) and prying out. Remove seal (4) using a dull pointed pick tool being careful not to scratch housing bore.
9. Check retainers (3) for wear; if necessary, remove retaining rings (1) and seals (2 and 4). With housing (7) flange face down in a vise, use a plastic or wooden dowel through housing (7) bore to evenly tap on retainers (3) to remove (using an inside bearing puller form housing (7) flange end can also be used to remove retainers (3).
10. Remove plugs (21), springs (23) and washers (24) from housing (20). Remove O-rings (22) from plugs (21).

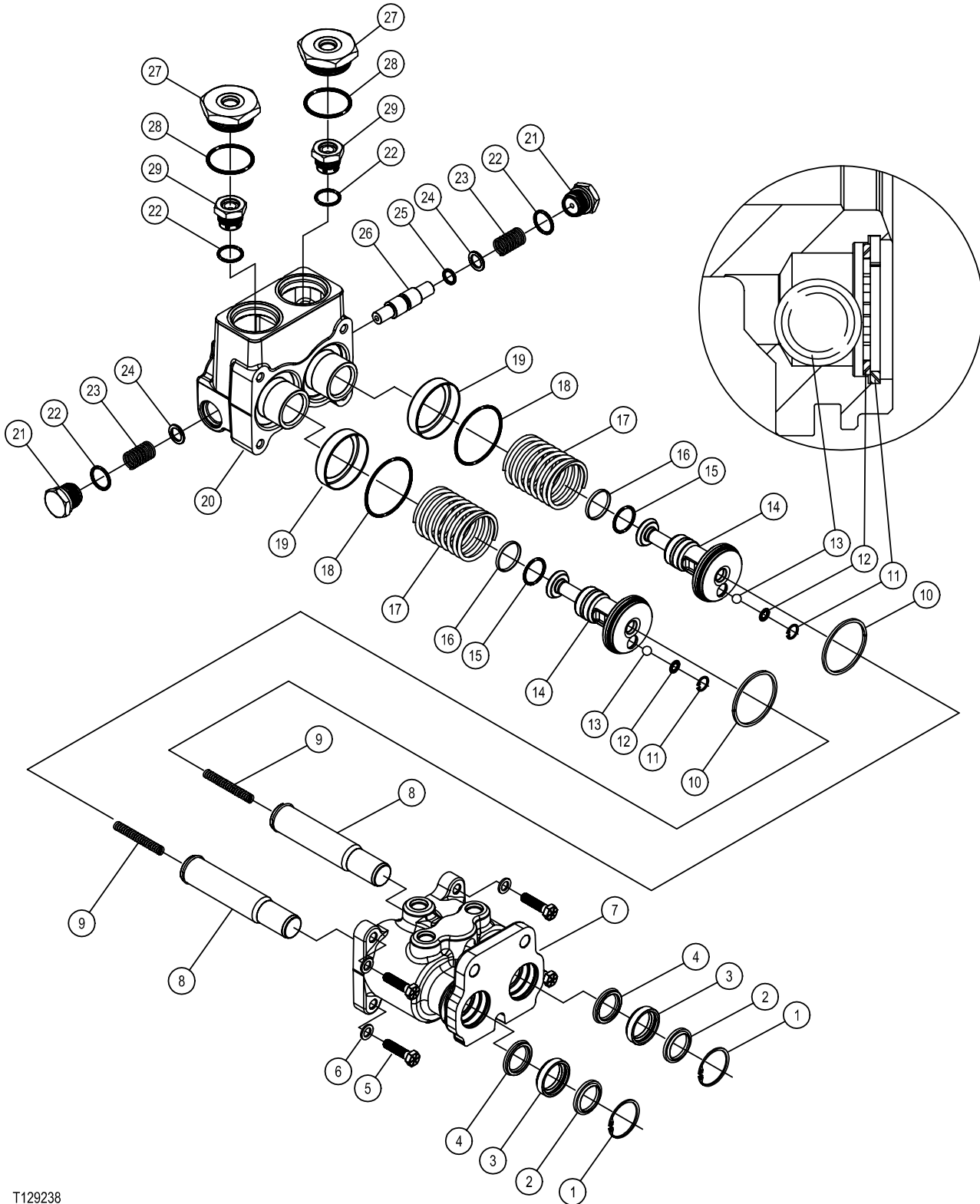
NOTE: Be careful not to scratch or mar spool (26) or housing bore.

11. Use a plastic or wooden dowel to carefully remove spool (26) from housing (20). Remove O-ring (25) from spool (26).

See Assemble MICO Power Boost Brake Valve (S.N. 887379—).

CED, TX03768, 2715 -19-11MAY00-2/2

Assemble MICO Power Boost Brake Valve (S.N. 887379—)



T129238

T129238—UN—16MAR00

Continued on next page

CED.TX03768.2716 -19-11MAY00-1/2

Hydraulic System

- | | | | |
|--------------------------------|-----------------------------|-----------------------|---------------------------------|
| 1— Retaining Ring (2 used) | 9— Spring (2 used) | 17— Spring (2 used) | 25— O-Ring |
| 2— Retainer (2 used) | 10— Piston Ring (2 used) | 18— O-Ring (2 used) | 26— Spool |
| 3— Cap Screw (4 used) | 11— Retaining Ring (2 used) | 19— Retainer (2 used) | 27— Reservoir Plug (2 used) |
| 4— Seal (2 used) | 12— Washer (2 used) | 20— Housing | 28— O-Ring (2 used) |
| 5— Cap Screw (4 used) | 13— Ball (2 used) | 21— Plug (2 used) | 29— Tip-Valve Assembly (2 used) |
| 6— Washer (4 used) | 14— Piston (2 used) | 22— O-Ring (4 used) | |
| 7— Housing | 15— O-Ring (2 used) | 23— Spring (2 used) | |
| 8— Push Rod with Ring (2 used) | 16— Seal (2 used) | 24— Washer (2 used) | |

1. Thoroughly clean housings and all parts with clean solvent and allow to dry before proceeding. Lubricate all rubber components with clean fluid used in the system.

NOTE: Be careful not to scratch or mar spool (26) or housing bore.

2. Install new O-ring (25) on spool (26). Carefully install spool (26) in housing (20).

3.

Specification

MICO Brake Valve

Plugs—Torque..... 54—62 N·m (40—45 lb-ft.)

Install new O-rings (22) on plugs (21). Install washers (24), springs (23) and plugs (21) in housing (20). Be sure washers (24) are properly positioned over spool (26). Tighten plugs (21).

NOTE: Note direction of cups (4) and wiper seals (2).

4. Install new seals (4), new wiper seals (2) and retaining rings (1) in housing (7).

5. If retainers (3) are being replaced, install new seals (4). Place a thin coat of bearing grease on outside diameter of new retainers (3) and carefully tap into place. Install new wiper seals (2) and retaining rings (1).

NOTE: Be sure the cut on piston rings (10) is position correctly when installed into housing (7) bores.

6. Install piston ring (10) and new O-ring (15) on pistons (14).

NOTE: Seals (16) will stretch and become oversized when being installed. These seals must be resized before final assembly. To resize seals (16), lubricate seals (16), pistons (14) and housing (20) bores with clean type fluid used in the system.

7. Install seal (16) in pistons (14) groove over top O-rings (15). Carefully insert each piston (14) assembly in the proper housing (20) bore being careful not to extrude seal (16). Allow each piston (14) assembly to remain in the housing bores for at least 10 minutes. Proceed to next step while waiting.

8. Rub clean type fluid used in the system on the outer diameter of pistons (8) and housing (7) bores. Fully insert pistons (8) into housing (7) bores.

9. Place springs (9) into pistons (8).

10. Install retainer (19) in housing (20). Install new O-ring (18) over retainers (19).

NOTE: Be sure the cut on piston rings (10) are installed with the cut facing the outside when installed into housing (7) bores.

11. Remove piston (14) assemblies from housing (20) bores and install in housing (7) bores until bottomed on pistons (8).

12. Installed springs (17). Place housing (20) over springs (17) and align housing (20) bores with pistons (14) (be careful not do damage seals (16).)

13. While applying downward pressure on housing (20), install two cap screws (5) and washers (6) diagonal from each other and finger tighten to hold the assembly together.

14. Install the remaining two cap screws (5) and washers (6). Evenly tighten the four cap screws (5).

Specification

MICO Brake Valve

Assemblies Cap

screws—Torque..... 30—38 N·m (22—25 lb-ft.)

IMPORTANT: Prevent possible damage to Tip-valve assemblies, push pistons (8) in approximately 1/2 in. into bores before installing Tip valve assemblies.

15. Install O-ring (22) on Tip valve assemblies (29). While installing valve assemblies (29) in housing (20), push pistons (8) in approximately 1/2 in. Tighten valve assemblies (29).

Specification

MICO Brake Tip-Valve

Assemblies—Torque..... 40.6—47.5 N·m (30—35 lb-ft.)

16. Install new O-rings (28) on plugs (27) in housing (20) and tighten.

Specification

MICO Brake Valve

Plugs—Torque..... 61—81.4 N·m (45—60 lb-ft.)

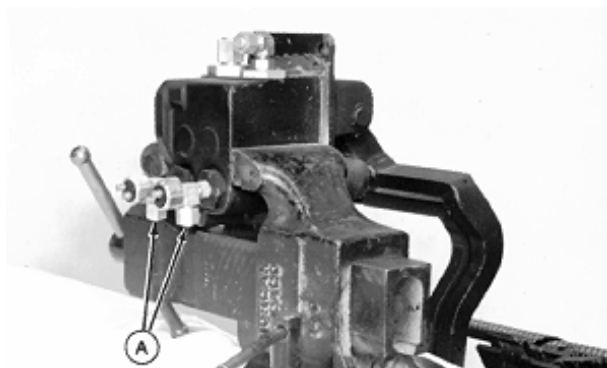
17. Install valve on the machine.

CED, TX03768, 2716 -19-11MAY00-2/2

Adjust Brake Pedals

1. Remove brake valve from machine. (See procedure in this group.)
2. Clamp brake valve level in bench vise.
3. Install caps (A). Fill brake valve reservoir with oil. (See Fuel and Lubricants in Group 0004.)

A—Caps

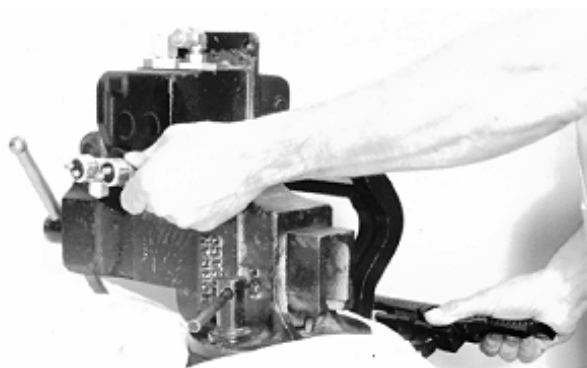


T7407AU —UN—30OCT90

CED,OUO1010,428 -19-27MAR00-1/4

IMPORTANT: DO NOT allow pedal to return abruptly before the stop screws are adjusted. Check valves could be damaged if stop screws are not properly adjusted.

4. Remove left cap and hold finger over end to stop oil flow. Slowly pump left pedal until air is purged. Install cap and repeat procedure on other side. Refill reservoir.



T7407AT —UN—30OCT90

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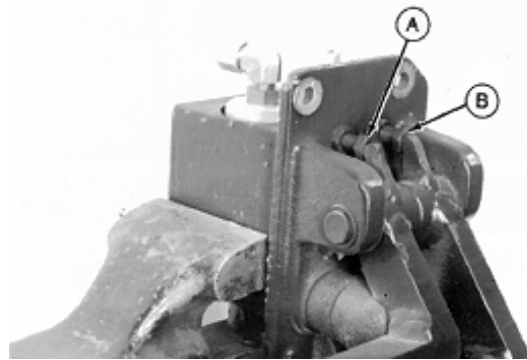
CED,OUO1010,428 -19-27MAR00-2/4

5. Adjust right brake pedal cap screw (B) so brake piston is fully extended from the housing and brake pedal arm is tight against the piston.
6. Apply a minimum of 44.5 N (10 lb) force to the left brake pedal. If the pedal starts to settle, turn right cap screw (B) out (counterclockwise) until the settling stops. Turn the right cap screw (B) and additional 1/3 turn (two wrench flats) out (counterclockwise).

Specification

Left Brake Pedal
 Adjustment—Force and
 Position.....44.5 N
 (10 lb) Minimum. [If pedal starts to settle, turn right cap screw out (counterclockwise) until the settling stops. Turn the right cap screw and additional 1/3 turn (two wrench flats) out (counterclockwise).]

7. Adjust left brake pedal cap screw (A) so brake piston is fully extended from the housing and brake pedal arm is tight against the piston.
8. Apply a minimum of 44.5 N (10 lb) force to right brake pedal. If pedal starts to settle, turn the left cap screw (A) out (counterclockwise) until settling stops. Turn the left cap screw (A) an additional 1/3 turn (two wrench flats) out (counterclockwise).



A—Left Brake Pedal Cap Screw (Stop) B—Right Brake Pedal Cap Screw (Stop)

Specification

Right Brake Pedal
 Adjustment—Force and
 Position.....44.5 N (10 lb) Minimum. [If pedal starts to settle, turn the left cap screw out (counterclockwise) until settling stops. Turn the left cap screw an additional 1/3 turn (two wrench flats) out (counterclockwise).]

9. After both pedals have been adjusted, align pedals by turning cap screws for the highest pedal a maximum of 1/6 turn (one wrench flat) out (counterclockwise). Tighten jam nut to lock both “stop” cap screws.

CED,OOU1010,428 -19-27MAR00-3/4

T7407AS—UN—30OCT90

10. Remove cap (A). A steady stream of oil must flow to indicate that check valve is in "open" position with pedals up. Depress pedal up to 13 mm (0.5 in.) and flow must stop, which indicates that check valve is in "closed" position and sealing. Slowly release pedal; pedal must return to stop screw by return spring force alone. Install cap. Repeat for other side. Fill reservoir.

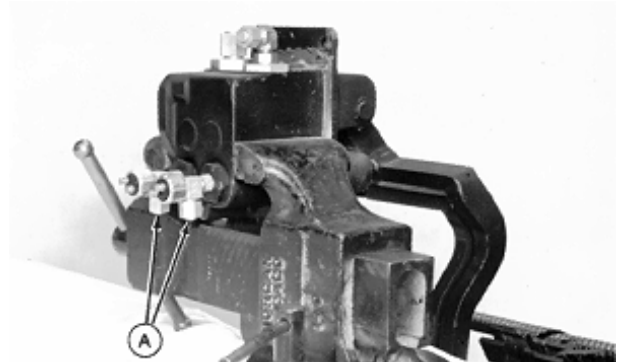
NOTE: If oil does not flow, readjust valve stop screws. If flow does not stop with pedal depressed, inspect or replace check valve.

NOTE: This is a check to see if checked valves are closing; checking pedal travel is done after lines are attached to rear axle in the Bleeding the Brakes repair story in this Group.

11. Depress one brake pedal. Brake pedal must be solid within first 19 mm (0.75 in.) of pedal travel. Repeat for other pedal.

Specification

Brake Pedal—Feel/Dis-
 tance.....Solid within 19 mm (0.75 in.) of travel



A—Caps

NOTE: Excessive pedal travel indicates air in brake valve; repeat step 4.

CED,OOU1010,428 -19-27MAR00-4/4

T7407AU—UN—30OCT90

Bleeding Brakes

John Deere Brake Valve (Two hoses connected to top of valve)(S.N.—887378)

CAUTION: Do not operate machine if pedal travel exceeds 133 mm (5.25 in.) while applying 267 N (60 lb-force). Operating machine with excessive brake travel could cause brakes not to stop machine on first application.

NOTE: Air will "gravity bleed" from brake system through brake valve without use of bleed screws. Brake lines must be inclined toward brake valve.

Low ambient temperature or aeration of oil will slow bleed process.

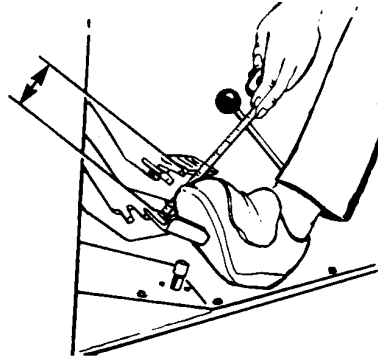
1. Engage park brake. Lock brake pedals together to bleed both brakes.
2. Run engine at high speed and cycle backhoe bucket cylinder to fill brake reservoir.
3. Release brake pedals completely and wait a minimum of 10 seconds.
4. Repeat steps 2 and 3 until a firm pedal is obtained with pedal travel within specification distance of 133 mm (5.25 in.) or less. Brakes will continue to self-bleed as you operate machine and pedal firmness should improve.
5. If unable to obtain firm brake pedal, inspect lines and connections for leakage. If no external leaks, test axle. Do Service Brake Leakage Test. (See procedure in Section 9020, Group 25 in Operation and Test Manual.)

MICO Brake Valve (Five hoses connected to top of valve)(S.N. 887379—)

All fittings must be inspected for leaks and tightened if leaks occur. To manually bleed the brakes, go to "Method One". If you have a vacuum device, go to "Method Two".

Air will "gravity bleed" from brake system through brake valve without use of bleed screws. Brake lines must be inclined toward brake valve.

Low ambient temperature or aeration of oil will slow bleed process.



T6638AE—UN—26OCT88

Method One:

1. Engage park brake. Run engine at fast idle. Dump and curl backhoe bucket five times.
2. Run engine at low idle. Pump left-hand brake pedal five times, allowing two seconds between each pump for air to escape.
3. Repeat steps 1 and 2 until the left-hand pedal is solid.
4. Pump right-hand pedal until pedal is solid, then both pedals together until pedals are solid.
5. Check pedal travel.

Specification

Dual Brake Pedal	
Travel—Max. Distance.....	95 mm (3.75 in.)
Single Brake Pedal	
Travel—Max. Distance.....	114 mm (4.5 in.)

Method Two:

1. Engage park brake. Connect a vacuum to breather port on hydraulic reservoir. After 10 minutes, disconnect air pressure.
2. Leave hose from breather port to vacuum device connected until brake circuit is filled with oil. Both pedals should become solid.
3. Check pedal travel (use specifications from Method One).

CED,TX03768,2725 -19-11MAY00-1/1

**Section 11
Park Brake**

Contents

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Group 1111—Active Elements

Park Brake

Remove and Install11-1111-1

Contents

**Group 1111
Active Elements**

Remove and Install Park Brake

NOTE: Park brake is part of rear axle.

See Group 0250 Remove and Install Rear Axle for
Remove and Install of Park Brake.

TX,11,QQ9713 -19-18FEB97-1/1

Active Elements

Section 16 Electrical Systems

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Group 1671 Batteries, Support, and Cables

Service Equipment and Tools

European Microfiche Tool Catalog (MTC). Some tools may be available from a local supplier.

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or from the

SERVICEGARD is a trademark of Deere & Company

CED,OUO1002,760 -19-15JAN99-1/4

Battery Post/Clamp CleanerJT05838 Clean battery post and clamp.

CED,OUO1002,760 -19-15JAN99-2/4

Coolant/Battery TesterJT05460 Check specific gravity of electrolyte in batteries.

CED,OUO1002,760 -19-15JAN99-3/4

Battery Load TesterJT05832 Check battery capacity.

CED,OUO1002,760 -19-15JAN99-4/4

Specifications

Item	Measurement	Specification
Battery Cable Cap Screw	Torque	9.2 N·m (82 lb-in.)

CED,OUO1002,688 -19-12JAN99-1/1

Service Batteries Carefully

CAUTION: Battery gas can explode. Keep sparks and flames away from batteries. Use a flashlight to check battery electrolyte level.

Never check battery charge by placing a metal object across the posts. Use a voltmeter or hydrometer.

Always remove grounded (—) battery clamp first and replace it last.

Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

Avoid the hazard by:

1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Using proper jump start procedure.

If you spill acid on yourself:

1. Flush your skin with water.
2. Apply baking soda or lime to help neutralize the acid.
3. Flush your eyes with water for 15—30 minutes. Get medical attention immediately.

If acid is swallowed:

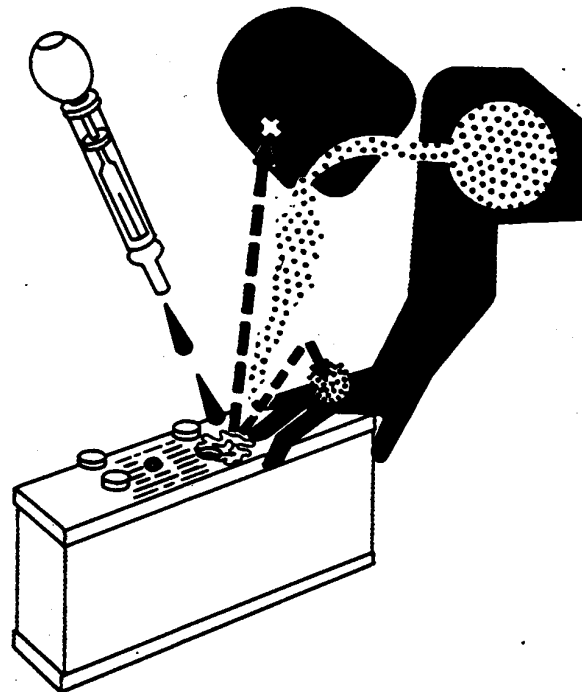
1. Do not induce vomiting.
2. Drink large amounts of water or milk, but do not exceed 1.9 L (2 quarts).
3. Get medical attention immediately.

If electrolyte spills on the floor, use one of the following mixtures to neutralize the acid: 0.5 kg (1 lb) baking soda in 4 L (1 gal) water, or 0.47 L (1 pt) household ammonia in 4 L (1 gal) water.

IMPORTANT: Electrolyte can damage paint and metal surfaces of your machine. Do not overfill the battery cells.



TS204—UN—23AUG88



TS203—UN—23AUG88

04T,90,K153 -19-01SEP06-1/1

Procedure for Testing Batteries

Visual Check

1. Check for damage such as cracked or broken case and electrolyte leakage.
If damage is seen, replace battery.
2. Check electrolyte level. (See procedure in this group)
If low, add distilled water to specified level and charge battery.
3. Check terminals for corrosion.
If corroded, clean using a wire brush or battery post cleaner such as JT05838 Battery Post/Clamp Cleaner.
4. Check posts for looseness.
If posts are loose, replace battery.

Hydrometer Test

1. Check specific gravity with a hydrometer or battery tester such as JT05460 Coolant/Battery Tester.

2. Record specific gravity reading for each cell.

If high and low readings vary LESS than 0.050 and average specific gravity is between 1.225 and 1.280, battery is fully charged, go to LOAD TEST.

If high and low readings vary LESS than 0.050 and average specific gravity is LESS than 1.225, charge battery and repeat test. If average specific gravity is still LESS than 1.225, replace both batteries.

If high and low readings vary MORE than 0.050, charge battery and repeat test. If high and low readings still vary MORE than 0.050, replace both batteries.

Load Test

Check battery capacity with a load tester such as JT05832 Battery Load Tester. Follow tester manufacturer's instructions for proper load test procedures.

If one battery fails load test, replace both batteries.

TX,16,QQ9315 -19-01SEP95-1/1

Electrolyte Checking Specific Gravity

CAUTION: Battery gas can explode. Keep sparks and flames away from batteries. Use a flashlight to check battery electrolyte level.

Never check battery charge by placing a metal object across the posts. Use a voltmeter or hydrometer.

Always remove grounded (—) battery clamp first and replace it last.

Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

Avoid the hazard by:

1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Using proper jump start procedure.

If you spill acid on yourself:

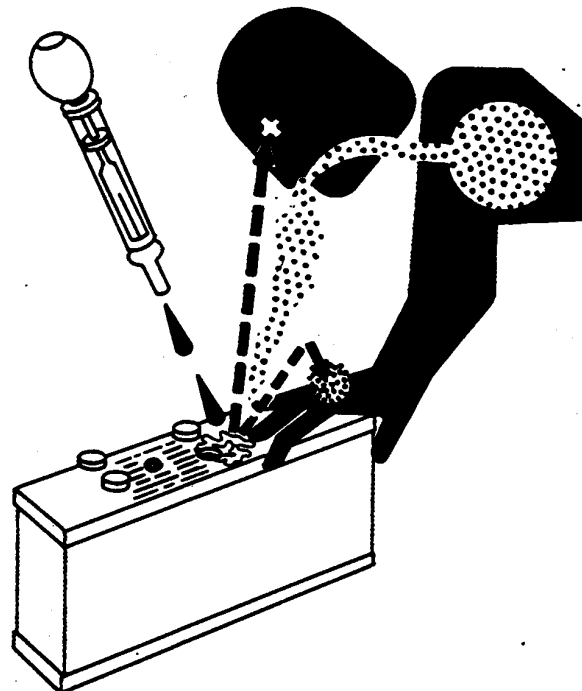
1. Flush your skin with water.
2. Apply baking soda or lime to help neutralize the acid.
3. Flush your eyes with water for 15—30 minutes. Get medical attention immediately.

If acid is swallowed:

1. Do not induce vomiting.
2. Drink large amounts of water or milk, but do not exceed 1.9 L (2 quarts).
3. Get medical attention immediately.



TS204—UN—23AUG88



TS203—UN—23AUG88

TX,16,QQ9316 -19-21SEP94-1/2

Check the specific gravity of electrolyte in each battery cell using a battery and coolant tester such as JT05460 Battery/Coolant Tester.

Follow directions included with the tester.

A fully charged battery will have a corrected specific gravity reading of 1.260. If the reading is below 1.200, charge the battery.

NOTE: In tropical areas, use 1.225 for the full charge reading. In cold areas, use 1.280 for the full-charge reading.



T85402—UN—10NOV88

TX,16,QQ9316 -19-21SEP94-2/2

Battery Electrolyte Level and Terminals Check

⚠ CAUTION: Battery gas can explode. Keep sparks and flames away from batteries. Use a flashlight to check battery electrolyte level.

Never check battery charge by placing a metal object across the posts. Use a voltmeter or hydrometer.

Always remove grounded (—) battery clamp first and replace it last.

Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

Avoid the hazard by:

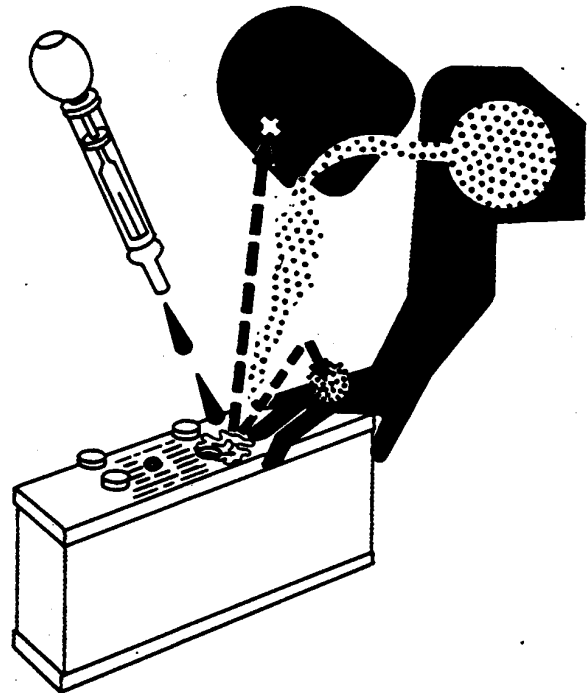
- Filling batteries in a well-ventilated area.
- Wearing eye protection and rubber gloves.
- Avoiding breathing fumes when electrolyte is added.
- Avoiding spilling or dripping electrolyte
- Using proper jump start procedure.

If you spill acid on yourself:

1. Flush your skin with water.
2. Apply baking soda or lime to help neutralize the acid.
3. Flush your eyes with water for 10—15 minutes. Get medical attention immediately.

If acid is swallowed:

1. Drink large amounts of water or milk.
2. Then drink milk of magnesia, beaten eggs, or vegetable oil.



3. Get medical attention immediately.

1. Remove hold-down clamps.
2. Remove battery covers.
3. Clean all excess dirt or debris from top of battery(ies) before removing cell caps.

Continued on next page

TX,9015, RB21 -19-01SEP06-1/2

TS203—UN—23AUG88

IMPORTANT: During freezing weather, batteries must be charged after water is added to prevent battery freezing. Charge battery using a battery charger or by running the engine.

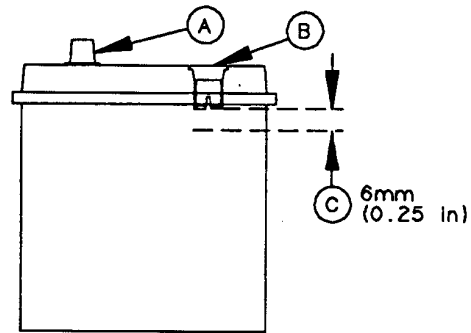
4. Fill each cell to within specified range with distilled water. DO NOT overfill.

CAUTION: Battery gas can explode from sparks of battery causing personal injury. Always remove grounded (—) battery clamp first and replace it last.

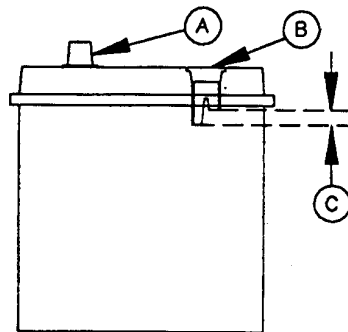
5. Disconnect battery clamps, grounded clamp first.
6. Clean battery terminals (A) and clamps with a stiff brush.
7. Apply lubricating grease around battery terminal base only.
8. Install and tighten clamps, grounded clamp last.
9. Install hold-down clamps.

A—Battery Terminal
B—Fill Tube

C—Electrolyte Level Range



Single Level Fill Tube Application



Dual Level Fill Tube Application

T6996DB—UN—10FEB89

T6996DA—UN—10FEB89

TX,9015,RB21 -19-01SEP06-2/2

Battery Charger—Using

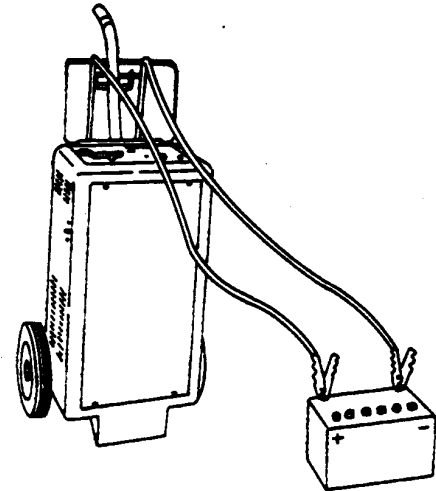
CAUTION: Prevent possible injury from exploding battery. Do not charge a battery if the battery is frozen or it may explode. Warm battery to 16°C (60°F) before charging. Disconnect battery ground (—) clamp before you charge batteries in the machine to prevent damage to electrical components.

IMPORTANT: Do not use battery charger as a booster if a battery has a 1.150 specific gravity reading or lower. Turn off charger before connecting or disconnecting it.

A battery charger may be used as a booster to start engine.

Ventilate the area where batteries are being charged.

Stop or cut back charging rate if battery case feels hot, or is venting electrolyte. Battery temperature must not exceed 52°C (125°F).

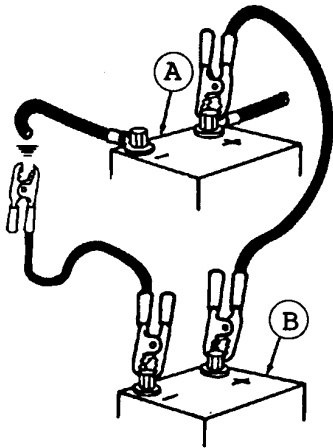


TS204—UN—23AUG88

N36890—UN—07OCT88

T82,EXMA,G -19-01SEP06-1/1

Using Booster Batteries—12 Volt System



T6508AE1 (CV)

Single Battery Application

A—Machine Battery(s) B—Booster Battery(s)

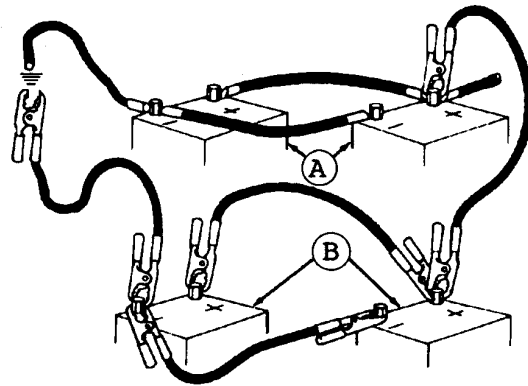
Before boost starting, machine must be properly shut down and secured to prevent unexpected machine movement when engine starts.

CAUTION: An explosive gas is produced while batteries are in use or being charged. Keep flames or sparks away from the battery area. Make sure the batteries are charged in a well ventilated area.

Always remove grounded (—) battery clamp first and replace it last.

IMPORTANT: The machine electrical system is a 12-volt negative (—) ground. Use only 12-volt booster batteries.

1. Connect one end of the positive cable to the positive terminal of the machine batteries and the other end to the positive terminal of the booster batteries.



T6713AI1 (CV)

Two Battery Application

2. Connect one end of the negative cable to the negative terminal of the booster batteries. Then connect other end of the negative cable to the machine frame as far away from the machine batteries as possible.
3. Start engine.
4. Immediately after starting engine, disconnect end of the negative cable from the machine frame and disconnect the other end of the negative cable from the negative terminal of the booster batteries.
5. Disconnect positive cable from booster batteries and machine batteries.

T6508AE1—UN—24OCT91

T6713AI1—UN—24OCT91

TX,25,BD2079 -19-14JAN08-1/1

Charge Battery

⚠ CAUTION: An explosive gas is produced while batteries are in use or being charged. Keep all flames/sparks away from battery. Charge battery in a well-ventilated area.

IMPORTANT: When charging a battery in the machine, disconnect the battery cables.

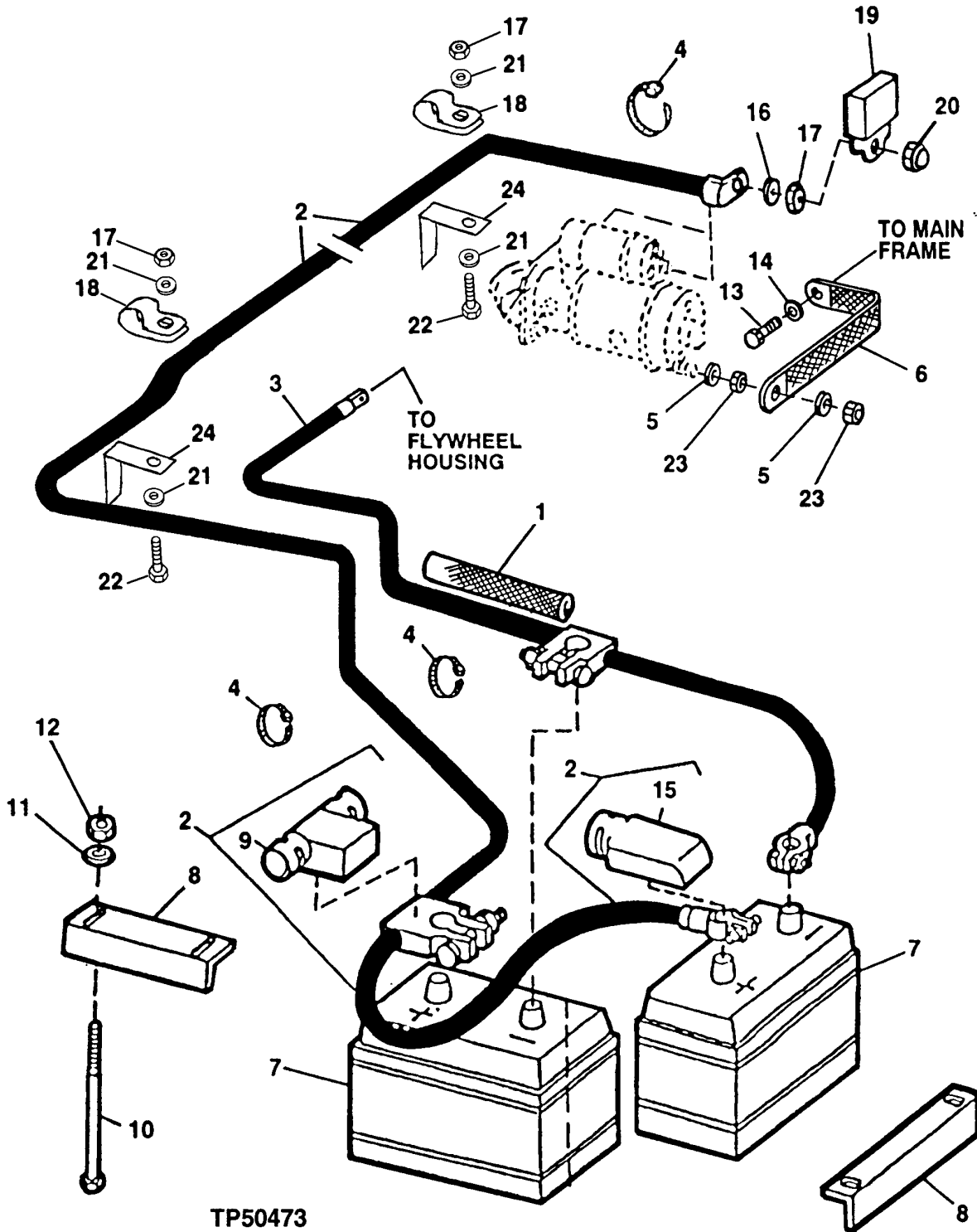
If unit has more than one battery, disconnect all cables and charge each battery separately.



TS204—JN—23AUG88

TX,16,QQ9319 -19-01SEP06-1/1

Remove and Install Batteries



TP50473

TP50473—UN—02NOV96

Batteries, Support, and Cables

- 1— Hose
- 2— Cable
- 3— Cable
- 4 — Tie Band
- 5— Washer (2 used)
- 6— Ground Cable

- 7— Battery (2 used)
- 8— Angle Frame (2 used)
- 9— Cover
- 10— Bolt (4 used)
- 11— Washer (4 used)
- 12— Lock Nut (4 used)

- 13— Cap Screw
- 14— Washer
- 15— Cover
- 16— Washer (3 used)
- 17— Nut (3 used)
- 18— Clamp (2 used)

- 19— Cover
- 20— Nut
- 21— Washer (2 used)
- 22 — Cap Screw (2 used)
- 23— Nut
- 24— Bracket (2 used)

1. Turn battery disconnect switch to "OFF".

⚠ CAUTION: Prevent possible injury from exploding battery. Always remove grounded (—) battery clamp first and replace it last.

- 2. Remove battery cover and disconnect negative (—) battery cables first, then positive (+) cables.
- 3. Remove nuts and angle frames (8). Lift batteries from machine.
- 4. Check cables and clamps for damage and wear. Make certain the batteries are fully charged.

5. Install batteries making sure they are level.

6. Install angle frames. Connect cables, positive then negative. Tighten cable cap screws to specification.

Specification

Battery Cable Cap
Screws—Torque..... 9.2 N·m (82 lb-in.)

7. Turn battery disconnect switch to "ON".

TX,16,QQ9320 -19-23APR96-2/2

Group 1672 Alternator, Regulator and Charging System Wiring

Bosch Alternator Repair—Use CTM77

For complete repair information, the Component Technical Manual (CTM) is also required.

Use the CTM in conjunction with this machine manual.



TX,16,QQ8919 -19-30JUN94-1/1

Specifications

Item	Measurement	Specification
Adjusting Strap-to-Alternator Cap Screw	Torque	25 N·m (18.5 lb-ft)
Nut to B+ Stud on Alternator	Torque	7.75 ± 0.8 N·m (5.7 ± 0.6 lb-ft)
Nut to Alternator Case for Ground Wire	Torque	2.75 ± 0.3 N·m (2 ± 0.22 lb-ft)

CED,OUO1002,689 -19-13JAN99-1/1

Remove and Install Alternator

IMPORTANT: Disconnect battery ground cable to prevent accidental grounding of alternator wiring leads.

1. Raise loader and engage lock bar.
2. Disconnect battery ground (—) cable.
3. Remove right engine side shield.
4. Tag and disconnect wires from alternator.
5. Remove belt from alternator sheave.
6. Remove cap screw (A) and cap screw, bushing, and nut (B) to remove alternator.
7. Replace or repair as necessary. (See CTM77.)

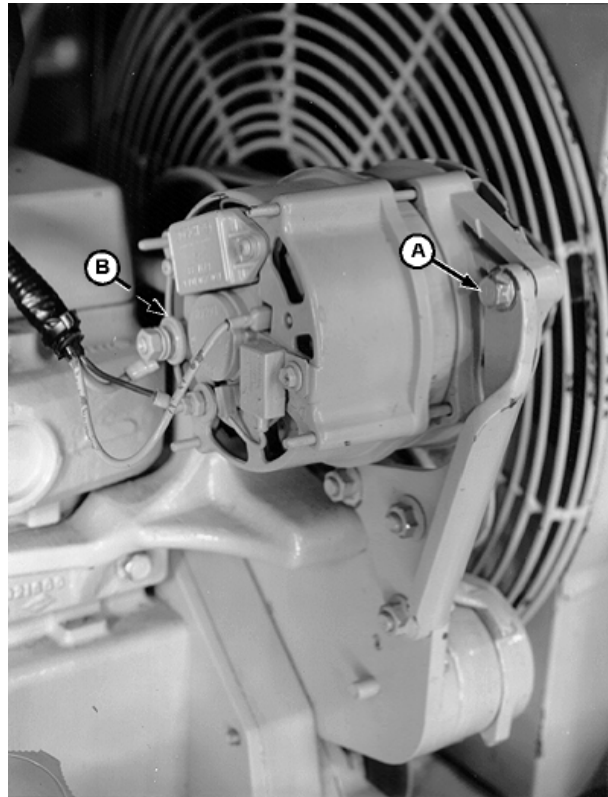
IMPORTANT: Install bushing and nut on side away from radiator.

8. Install alternator, cap screw, bushing, and nut (B).
9. Install support bracket cap screw (A). Tighten cap screw to specification.

Specification

Support Bracket-to-Alternator Cap Screw—Torque..... 25 N·m (18.5 lb-ft)

10. Install belt.



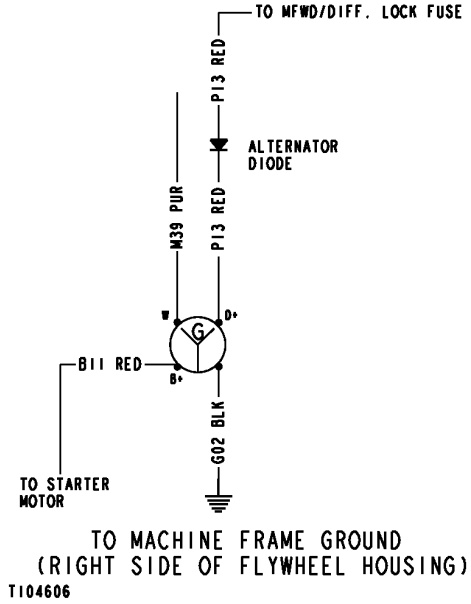
T108356—UN—15MAY97

A—Cap Screw

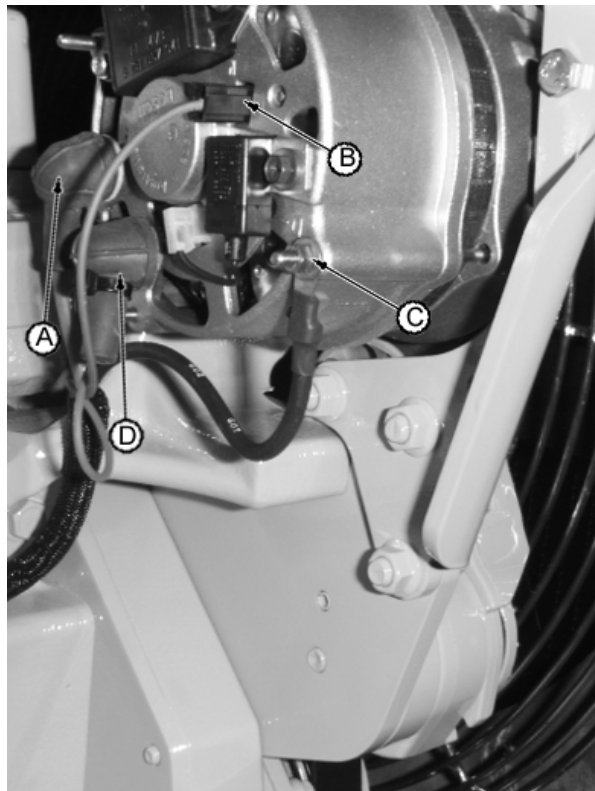
B—Nut, Bushing, and Cap Screw (not visible)

Continued on next page

CED.OU01010,427 -19-04NOV98-1/3



T104606—19—15JAN97



A—B11 Red Wire

B—M39 Purple Wire

C—G02 Black Wire

D—P13 Red Wire

11. Connect wires to alternator.

Continued on next page

T104772B—UN—05DEC96

Alternator, Regulator and Charging System Wiring

12. Tighten nut and B11 red wire (A) to specification.

Specification

Alternator B+ Stud (B11)

Nut—Torque..... 7.75 ± 0.8 N·m (69 ± 7 lb-in.)

13. Tighten nut and black G02 wire (C) to specification.

Specification

Alternator Housing

Ground (G02)

Nut—Torque..... 2.75 ± 0.3 N·m (24 ± 3 lb-in.)

14. Connect battery ground (—) cable.

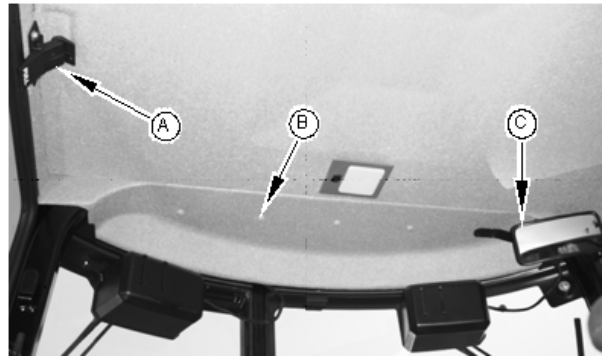
15. Disengage lock bar and lower boom to ground.

CED,OUO1010,427 -19-04NOV98-3/3

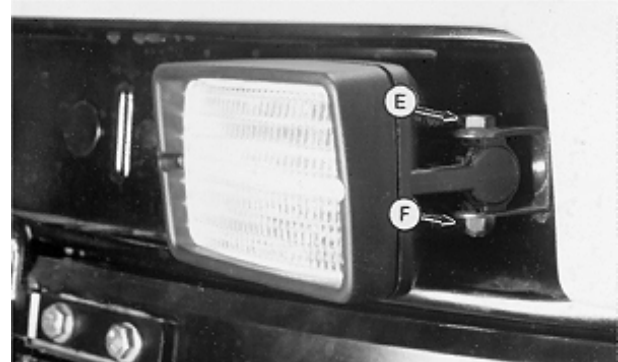
Remove and Install Drive and Work Light

1. Remove bracket and mirror (C).
2. Remove screw covers and screws (B).
3. Remove screws to remove front headliner.
4. Disconnect roof harness connector from work or drive light connector.
5. Remove nut (F) and cap screw (E). Remove light with wiring connector.
6. Install wiring connector of light through hole along side of light bracket. Install light using cap screw (E) and nut (F).
7. Connect roof harness connector to light connector.
8. Install front headliner, screws and screw covers (B).
9. Install bracket and mirror.

A—Window Latches E—Cap Screw
 B—Screw Cover and Screw (4 F—Nut
 used)
 C—Mirror and Bracket



T103629B —UN—07SEP96



T7484AN —UN—12MAR91

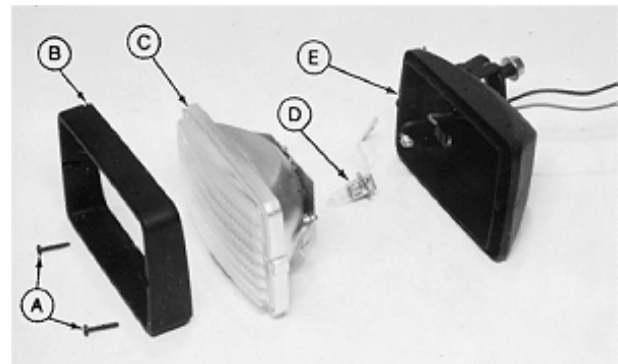
TX.16.QQ8922 -19-23NOV98-1/1

Remove and Install Halogen Bulb

1. Remove screws (A) to remove lamp cover (B), lamp (C), and lamp housing (E).
2. Disconnect wiring lead and release retainer clip to remove bulb (D).

CAUTION: Do not touch the halogen bulb with bare hands. Oil and moisture may cause premature bulb failure. Clean bulb glass if touched, using an oil-free cloth with alcohol.

3. Install new bulb (D).
4. Install lamp into lamp housing.
5. Install lamp cover and screws.
6. Tighten screws (A) alternately. Do not overtighten as screws may strip out plastic.



T7484AC —UN—12MAR91

A—Screw (2 used)
 B—Lamp Cover
 C—Lamp

D—Bulb
 E—Lamp Housing

TX.16.QQ9325 -19-24AUG94-1/1

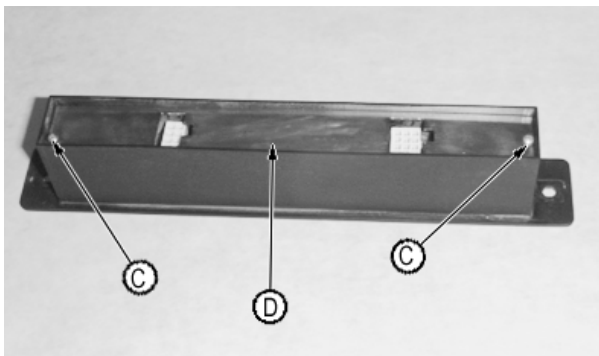
Remove and Install Display Module Bulbs



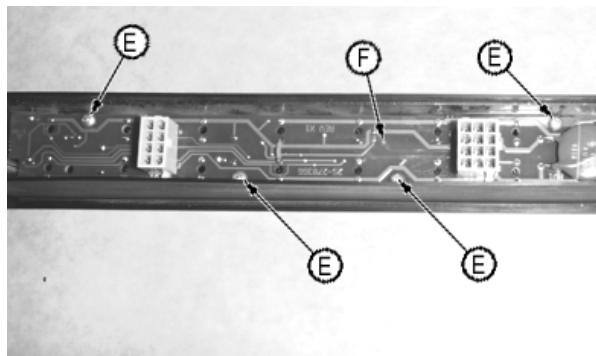
T104762B—UN—25NOV96



T104765B—UN—25NOV96

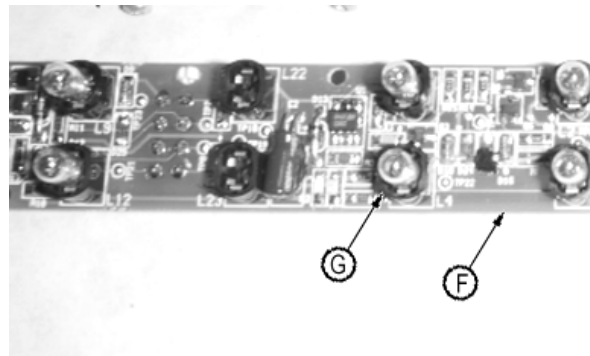


T104766B—UN—25NOV96



T104767B—UN—25NOV96

1. Remove two display module-to-side console panel screws (A). Remove display module.
2. Disconnect wiring harness connectors (B) from display module.
3. Remove screws (C) and cover (D).
4. Remove screws (E) and electrical board (F).
5. Remove and install bulbs (G) as necessary.
6. Install parts (B—F).
7. Install display module to side console panel using screws (A).



T104768C—UN—09JAN97

A—Screw (2 used)
 B—Connector (2 used)
 C—Screw (2 used)
 D—Cover

E—Screw (4 used)
 F—Electrical Board
 G—Bulb

TX,16,QQ8924 -19-23NOV98-1/1

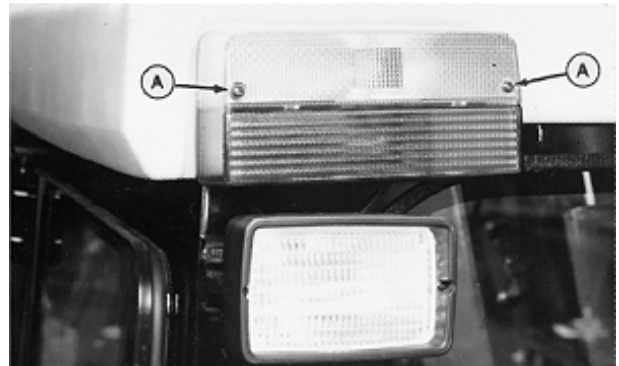
Remove and Install Turn, Brake and Tail Light Bulbs

1. Remove screws (A) to remove lens cover.
2. Remove bulbs (B and C) by pushing in and rotating bulbs counterclockwise (1/4 turn). Replace bulbs if necessary.
3. Install lens cover and fasten with screws (A).

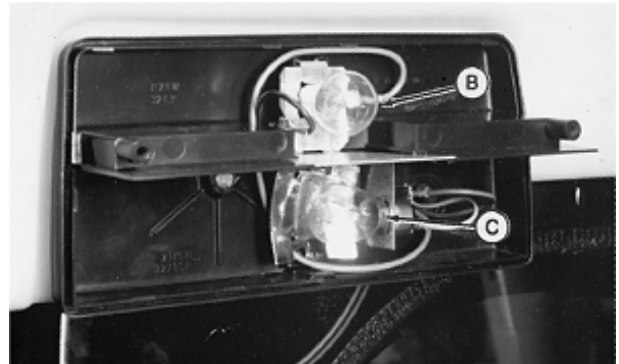
A—Screw (2 used)

B—Turn and Tail Light Bulb

C—Brake Light Bulb



T7484AP —UN—12MAR91



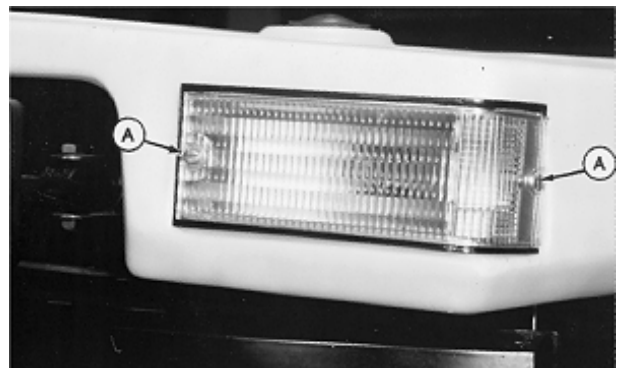
T7484AC —UN—12MAR91

TX,16,QQ9327 -19-30AUG94-1/1

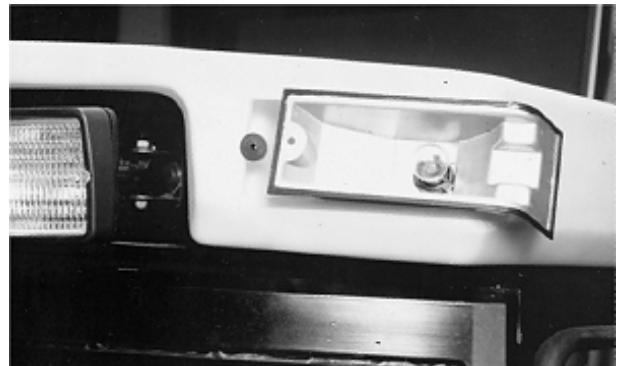
Remove and Install Front Turn Light Bulb

1. Remove screws (A) to remove lens cover.
2. Remove bulb by pushing in and rotating bulb counterclockwise (1/4 turn). Replace bulb if necessary.
3. Install lens cover and fasten with screws (A).

A—Screws



T7484AQ —UN—12MAR91



T7484AR —UN—12MAR91

TX,16,QQ9328 -19-30AUG94-1/1

Lighting System

Group 1674 Wiring Harness and Switches

Essential Tools

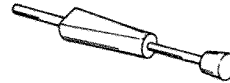
NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or from the European Microfiche Tool Catalog (MTC).

SERVICEGARD is a trademark of Deere & Company

CED,OUO1002,691 -19-13JAN99-1/9

METRIMATE™ Extractor Tool JDG140

Used to remove pin and socket contacts from METRIMATE™, CPC™ and Kostal electrical connector housings.



T104947

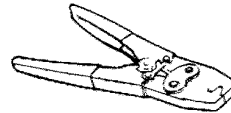
*METRIMATE is a trademark of AMP INC.
CPC is a trademark of AMP INC.*

CED,OUO1002,691 -19-13JAN99-2/9

T104947 —UN—07NOV96

PACKARD™ Crimping Tool JDG707

Used to crimp open barrel contacts and seal retainers for Kostal circular connectors.



T105908

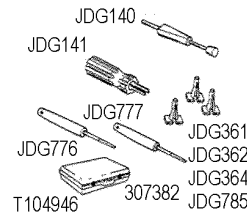
PACKARD is a trademark of Packard Electric

CED,OUO1002,691 -19-13JAN99-3/9

T105908 —UN—19DEC96

¹Extractor Tool JDG361

Remove 12 to 14 gauge wire from connector body.



¹Included in JT07195A Electrical Repair Kit.

CED,OUO1002,691 -19-13JAN99-4/9

T104946 —UN—07NOV96

Extractor Tool JDG362

Remove 16 to 18 gauge wire from connector body.

CED,OUO1002,691 -19-13JAN99-5/9

Extractor Tool JDG363

Remove 20 gauge wire from connector body.

Continued on next page

CED,OUO1002,691 -19-13JAN99-6/9

Wiring Harness and Switches

¹Crimper JDG360 T6606AB —UN—23AUG88

To crimp wire in terminal contact.

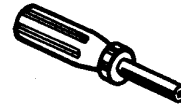


¹Included in JDG359 DEUTSCH™ Electrical Repair Tool Kit.

CED,OUO1002,691 -19-13JAN99-7/9

WEATHER PACK™ Extraction Tool JDG364 T6606AC —UN—23AUG88

Used to remove contacts from WEATHER PACK™ electrical connectors.

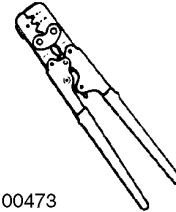


WEATHER PACK is a trademark of Packard Electric.

CED,OUO1002,691 -19-13JAN99-8/9

Terminal Applicator JDG783

To crimp contacts on wire and secure cable seals to contacts.



T100473

T100473 —UN—05MAR96

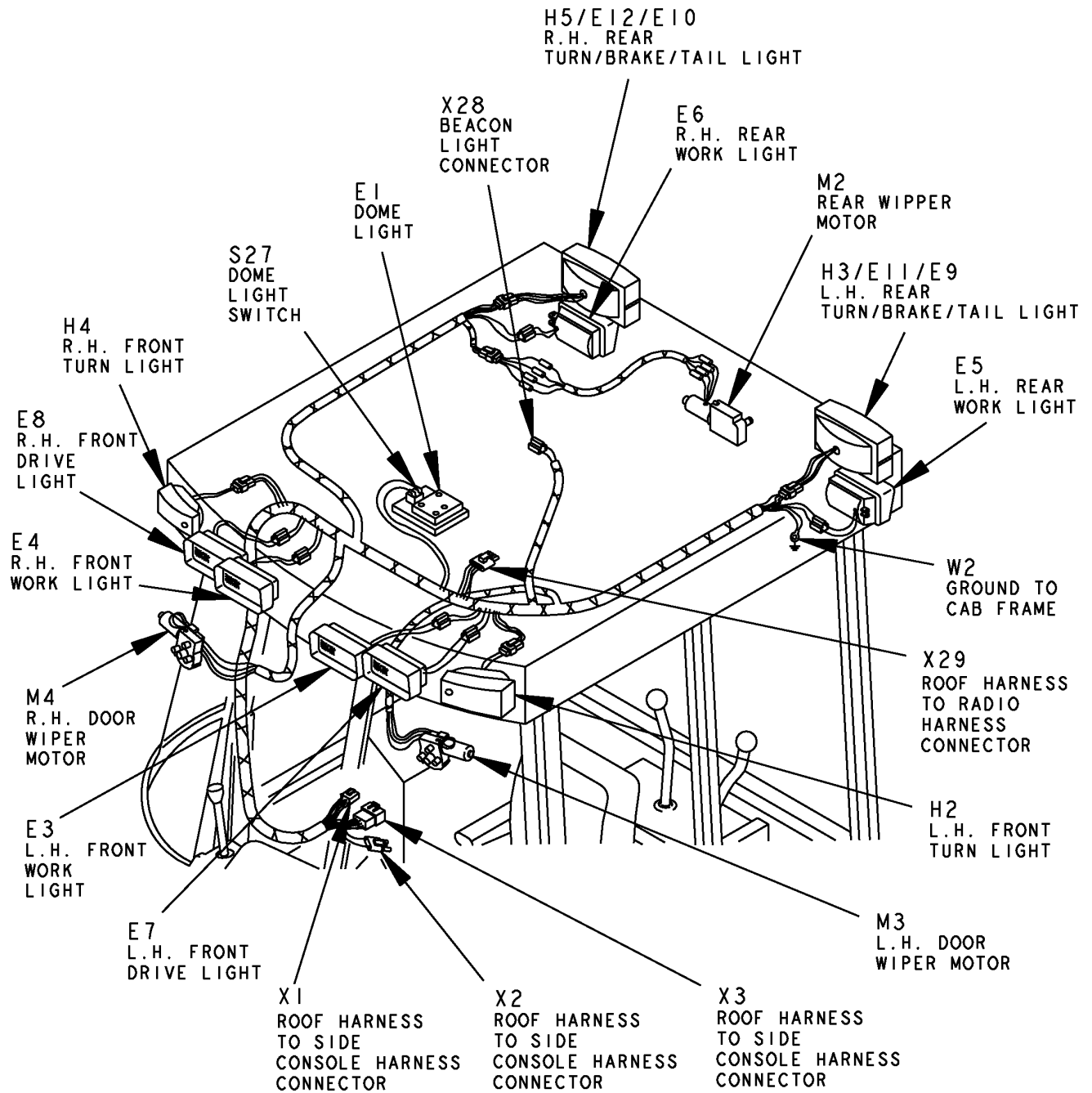
CED,OUO1002,691 -19-13JAN99-9/9

Specifications

Item	Measurement	Specification
Engine Coolant Temperature Switch	Torque	81 N·m (60 lb-ft)

CED, TX03399,5565 -19-15OCT99-1/1

Remove and Install Cab Roof Harness and Components



CAB ROOF HARNESS - COMPONENTS

T104631

T104631-19-15JAN97

Continued on next page

TX.16.QQ9330 -19-19NOV98-1/2

Wiring Harness and Switches

M3—Left Door Wiper Motor
E7—Left Front Drive Light
E3—Left Front Work Light
M4—Right Door Wiper Motor
E4—Right Front Work Light
E8—Right Front Drive Light

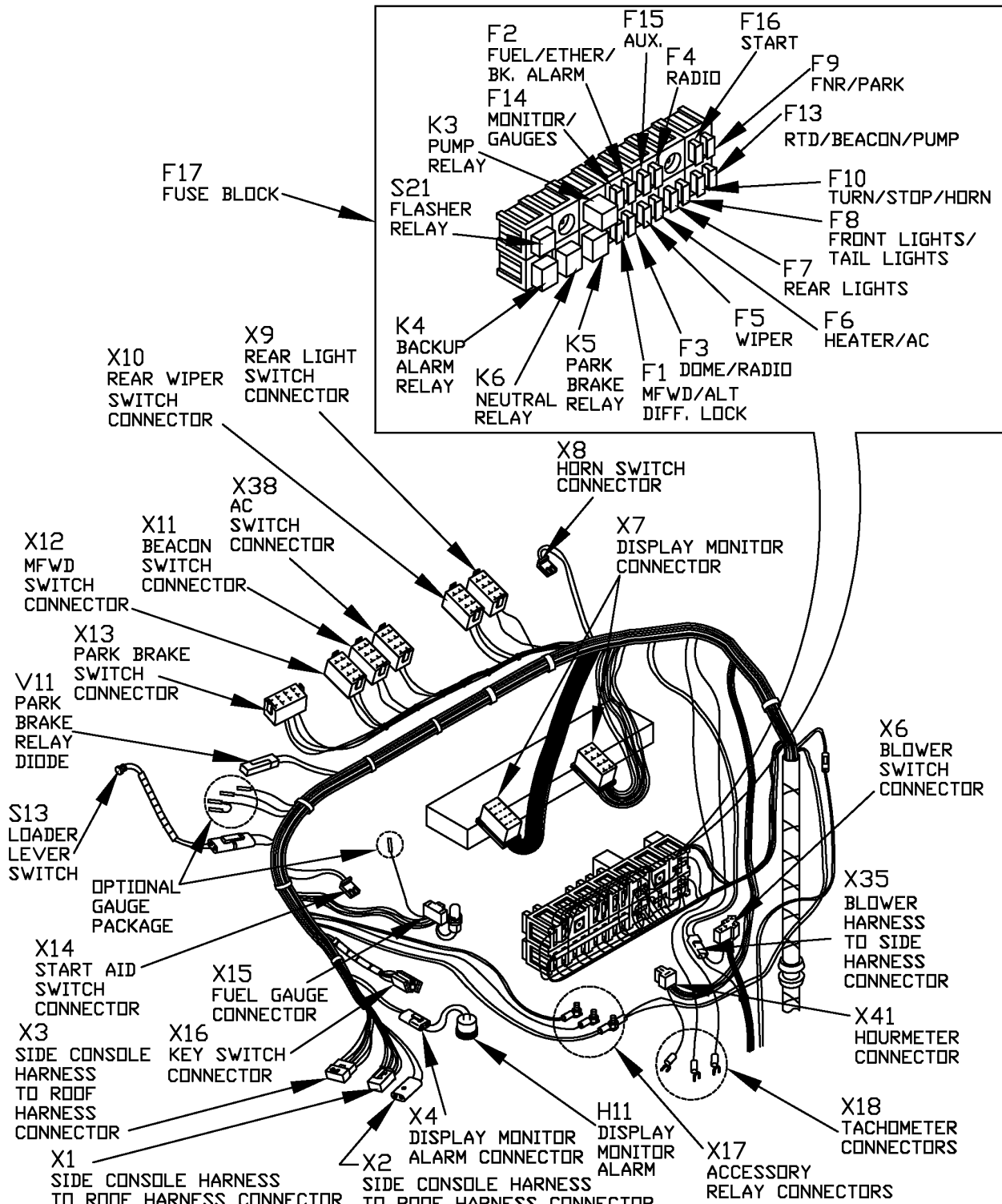
H4—Right Front Turn Light
S27—Dome Light Switch
E1—Dome Light
X28—Beacon Light Connector
X29—Roof Harness To Radio
Harness Connector
M2—Rear Wiper Motor

H5, E12, E10—Right Rear
Turn/Brake/Tail Light
E6—Right Rear Work Light
H3, E11, E9—Left Rear
Turn/Brake/Tail Light
E5—Left Rear Work Light
W2—Ground To Cab Frame
H2—Left Front Turn Light

X1—Roof Harness-to-Side
Console Harness Connector
X3—Roof Harness-to-Side
Console Harness Connector
X2—Roof Harness-to-Side
Console Harness

TX,16,QQ9330 -19-19NOV98-2/2

Remove and Install Cab Side Console Harness and Components



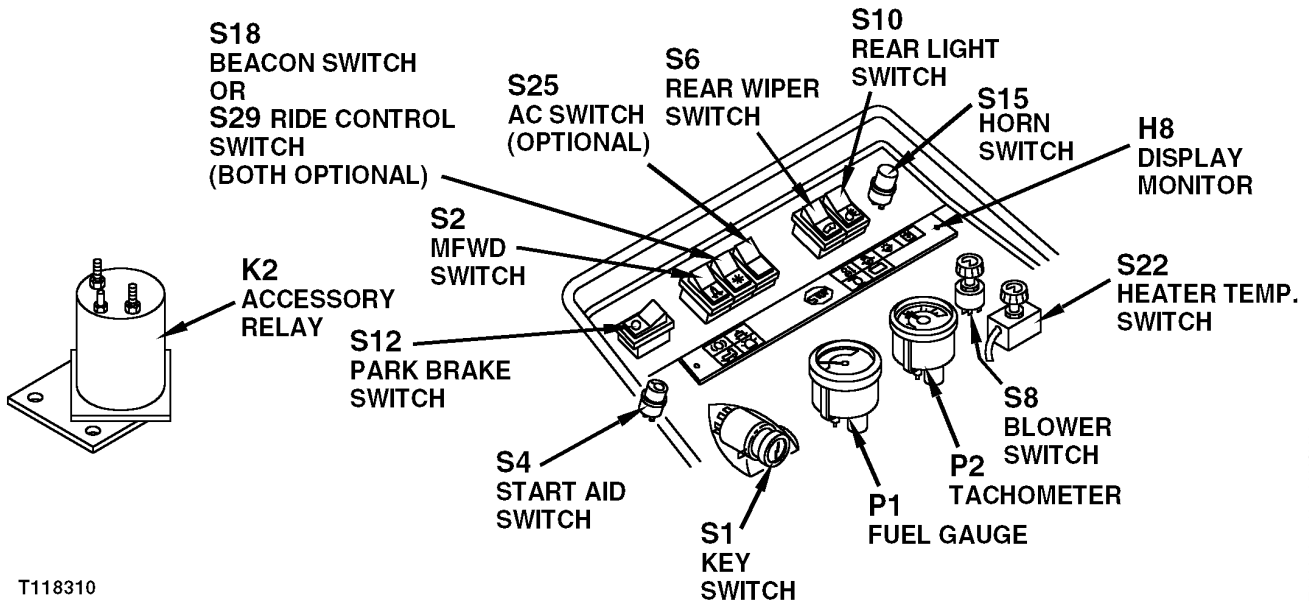
T118309 CAB SIDE CONSOLE HARNESS - COMPONENTS

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TX,16,QQ9331 -19-15FEB00-1/4

T118309-19-17NOV/98

Wiring Harness and Switches



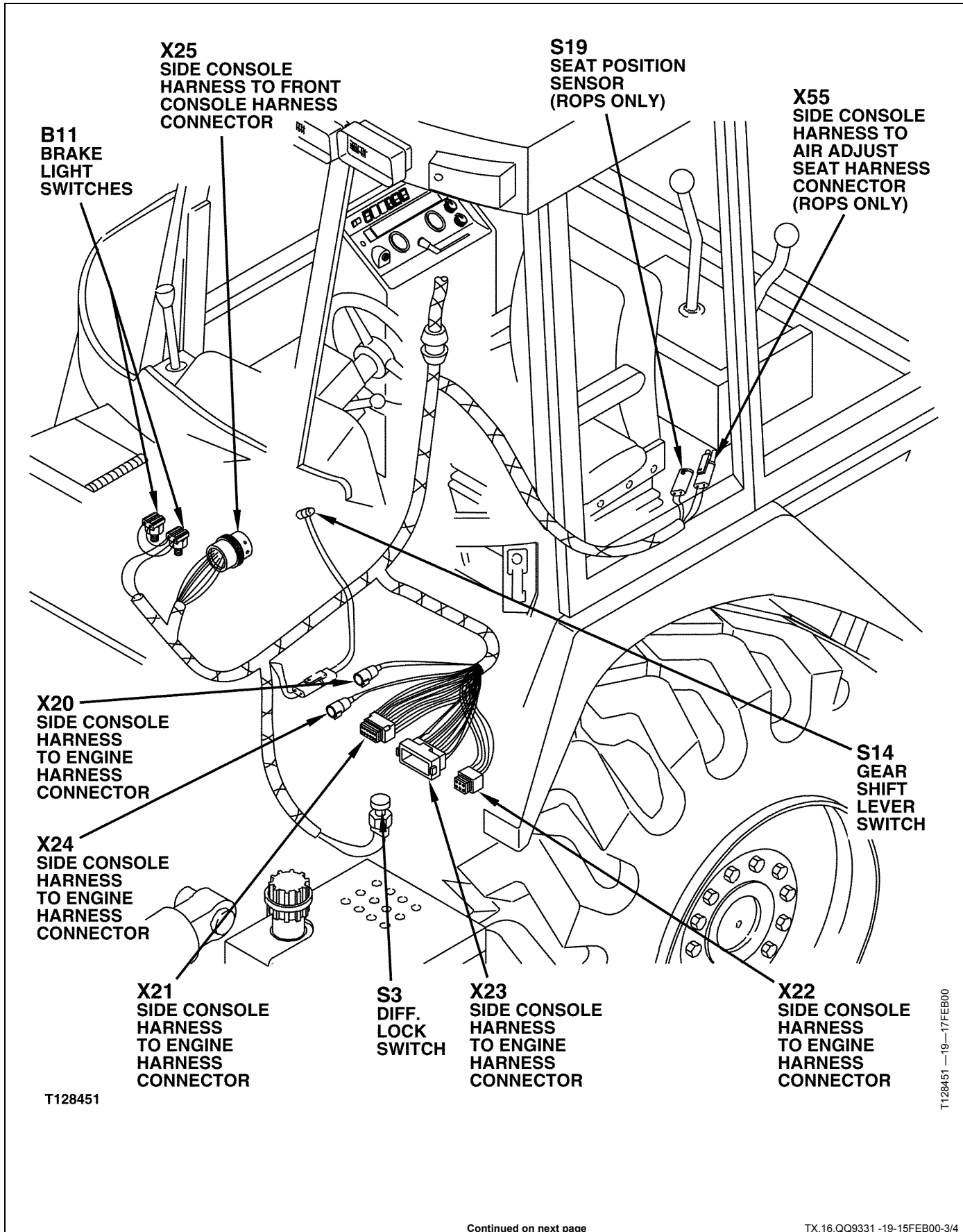
T118310

T118310 -19-20NOV98

- | | | | |
|---|----------------------------|---|---|
| F1— MFWD/Alternator/Diff. Lock Fuse | H8—Display Monitor | S12— Park Brake Switch | X9—Rear Light Switch Connector |
| F2— Fuel Shutoff/Start Aid/Reverse Alarm Fuse | H11— Display Monitor Alarm | S13— Loader Lever Switch | X10— Rear Wiper Switch Connector |
| F3— Dome/Radio Fuse | K2—Accessory Relay | S15— Horn Switch | X11— Beacon Switch Connector |
| F4— Radio Fuse | K3—Pump Relay | S18— Beacon Switch (Optional) | X12— MFWD Switch Connector |
| F5— Wiper Fuse | K4—Backup Alarm Relay | S22— Heater Temperature Control | X13— Park Brake Switch Connector |
| F6— Heater/AC Circuit Breaker | K5—Park Brake Relay | S25— AC Switch (Optional) | X14— Start Aid Switch Connector |
| F7— Rear Work Light Fuse | K6—Neutral Relay | V11— Park Brake Relay Diode | X15— Fuel Gauge Connector |
| F8— Front Lights/Tail Light Fuse | P1—Fuel Gauge | X1—Side Console Harness-to-Roof Harness Connector | X16— Key Switch Connector |
| F9— FNR/Park Brake Fuse | P2— Tachometer | X2—Side Console Harness-to-Roof Harness Connector | X17— Accessory Relay Connectors |
| F10— Turn/Stop/Horn Fuse | S1—Key Switch | X3—Side Console Harness-to-Roof Harness Connector | X18— Tachometer Connectors |
| F13— Return-to-Dig/Beacon Fuse | S2—MFWD Switch | X4—Display Monitor Alarm Connector | S21— Flasher Relay |
| F14— Monitor/Gauge Fuse | S4—Start Aid Switch | X5— Seat Position Sensor Connector | X35— Blower Harness-to-Side Harness Connector |
| F15— Auxiliary Fuse | S6—Rear Wiper Switch | X6—Blower Switch Connector | X38— AC Switch Connector |
| F16— Start Fuse | S8—Blower Switch | X7—Display Monitor Connector | X41— Hour Meter Connector |
| F17— Fuse Block | S10— Rear Light Switch | X8—Horn Switch Connector | |

Continued on next page

TX,16,QQ9331 -19-15FEB00-2/4



B11
BRAKE
LIGHT
SWITCHES

X25
SIDE CONSOLE
HARNESS TO FRONT
CONSOLE HARNESS
CONNECTOR

S19
SEAT POSITION
SENSOR
(ROPS ONLY)

X55
SIDE CONSOLE
HARNESS TO
AIR ADJUST
SEAT HARNESS
CONNECTOR
(ROPS ONLY)

X20
SIDE CONSOLE
HARNESS
TO ENGINE
HARNESS
CONNECTOR

X24
SIDE CONSOLE
HARNESS
TO ENGINE
HARNESS
CONNECTOR

X21
SIDE CONSOLE
HARNESS
TO ENGINE
HARNESS
CONNECTOR

S3
DIFF.
LOCK
SWITCH

X23
SIDE CONSOLE
HARNESS
TO ENGINE
HARNESS
CONNECTOR

X22
SIDE CONSOLE
HARNESS
TO ENGINE
HARNESS
CONNECTOR

S14
GEAR
SHIFT
LEVER
SWITCH

T128451

T128451 -19-17FEB00

Continued on next page

TX.16.QQ9331 -19-15FEB00-3/4

Wiring Harness and Switches

X22— Side Console
Harness-to-Engine
Harness Connector
X23— Side Console
Harness-to-Engine
Harness Connector
X21— Side Console
Harness-to-Engine
Harness Connector

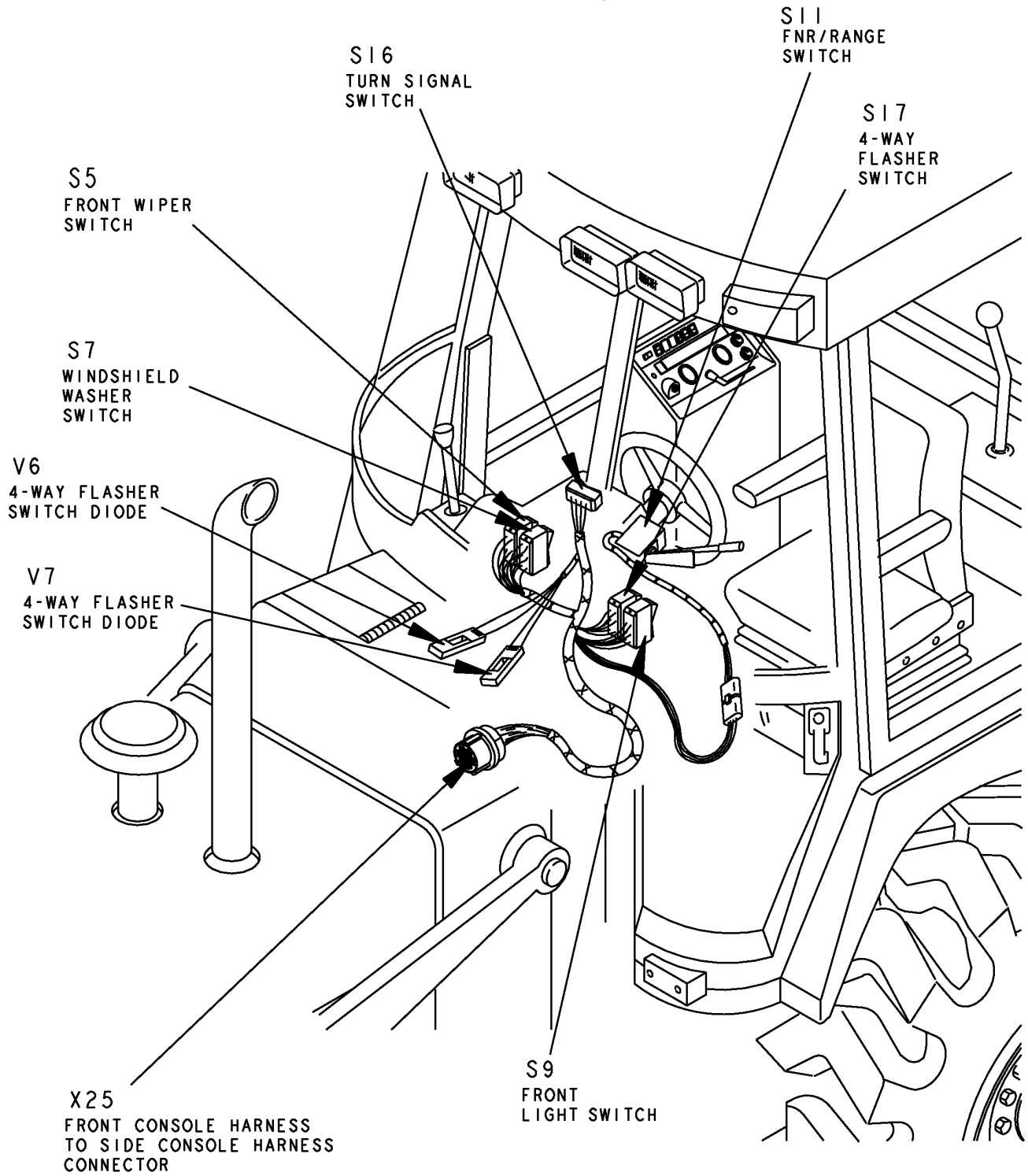
X24— Side Console
Harness-to-Engine
Harness Connector
X20— Side Console
Harness-to-Engine
Harness Connector
X25— Side Console
Harness-to-Front Console
Harness Connector

B11— Brake Light Switches
S19— Seat Position Sensor
(ROPS Only)
S14— Gear Shift Lever Switch

S3— Diff. Lock Switch
X55— Side Console Harness to
Air Adjust Seat Harness
Connector (ROPS Only)

TX,16,QQ9331 -19-15FEB00-4/4

Remove and Install Front Console Harness and Components



FRONT CONSOLE HARNESS - COMPONENTS

T104634

T104634-19-15JAN97

Continued on next page

TX.16.QQ9332 -19-19NOV98-1/2

Wiring Harness and Switches

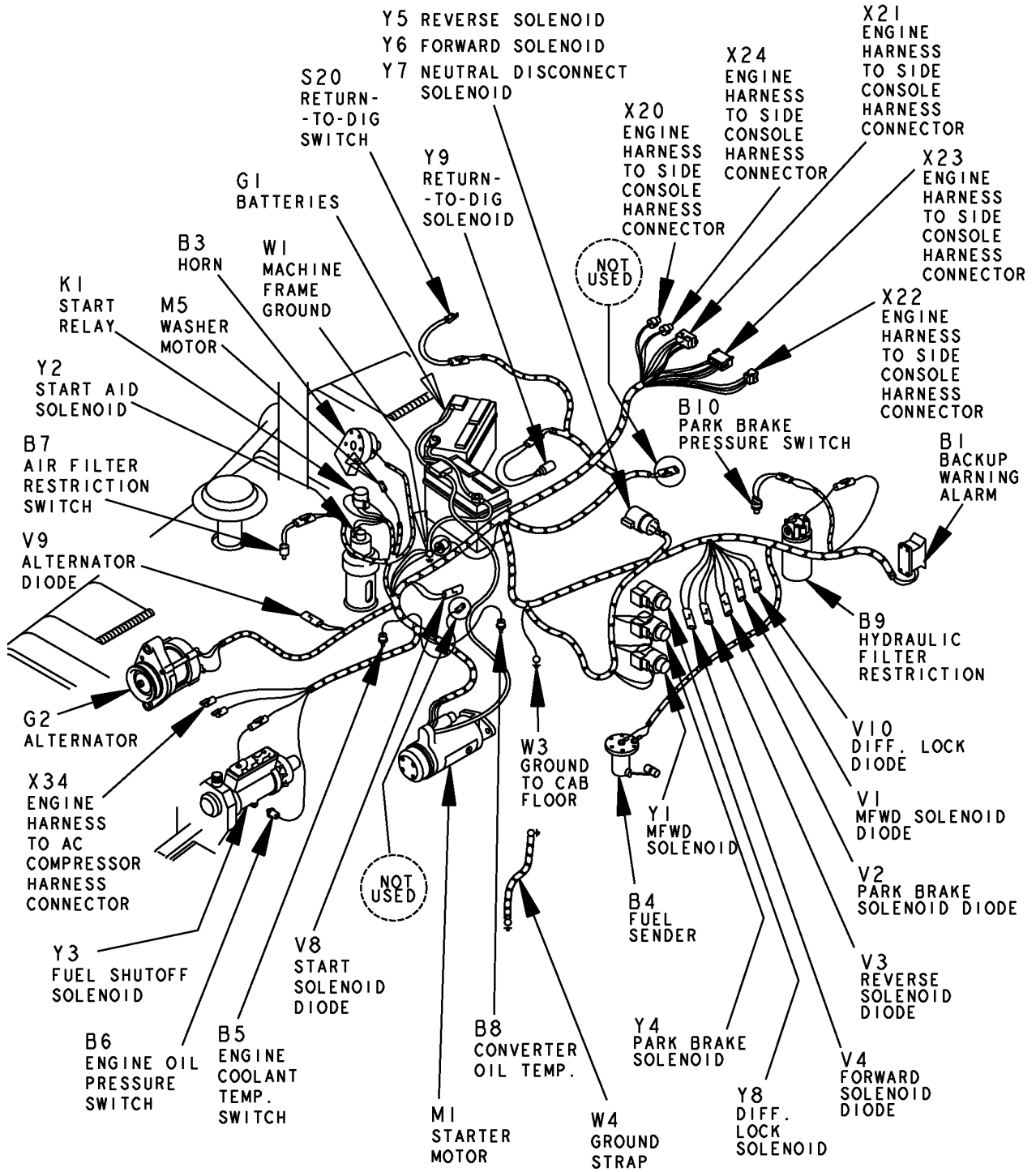
V7—4-Flasher Switch Diode
V6—4-Flasher Switch Diode
S7—Windshield Washer Switch

S5—Front Wiper Switch
S16— Turn Signal Switch
S11— FNR/Range Switch

S17— 4-Way Flasher Switch
S9—Front Light Switch
X25— Front Console
Harness-to-Side Console
Harness Connector

TX,16,QQ9332 -19-19NOV98-2/2

Remove and Install Engine Harness and Components



ENGINE HARNESS - COMPONENTS

T104635

T104635 - 19 - 16 JAN 97

Continued on next page

TX.16.Q09333 -19-20APR00-1/2

Wiring Harness and Switches

V9—Alternator Diode	X20— Engine Harness-to-Side Console Harness Connector	V2—Park Brake Solenoid Diode	W4—Ground Strap
B7—Air Filter Restriction Switch		B9—Hydraulic Filter Restriction Switch	M1—Starter Motor
Y2—Start Aid Solenoid	X24— Engine Harness-to-Side Console Harness Connector	V3—Reverse Solenoid Diode	V8—Start Solenoid Diode
K1—Start Relay		V4—Forward Solenoid Diode	B5—Engine Coolant Temperature Switch
B3—Horn	X21— Engine Harness-to-Side Console Harness Connector	Y8—Diff. Lock Solenoid	B6—Engine Oil Pressure Switch
M5—Washer Motor		Y4—Park Brake Solenoid	Y3—Fuel Shutoff Solenoid
W1—Machine Frame Ground	X23— Engine Harness-to-Side Console Harness Connector	Y1—MFWD Solenoid	X34— Engine Harness-to-AC Compressor Harness Connector
G1—Batteries		B4—Fuel Sender	G2—Alternator
S20— Return-to-Dig Switch	X22— Engine Harness-to-Side Console Harness Connector	W3—Ground to Cab Floor	
Y9—Return-to-Dig Solenoid		B8—Converter Oil Temperature	
	Y5,Y6,Y7—Reverse Solenoid, Forward Solenoid, Neutral Disconnect Solenoid		
	B10— Park Brake Pressure Switch		
	B1—Backup Warning Alarm		
	V10— Diff. Lock Diode		
	V1—MFWD Solenoid Diode		

Tighten engine coolant temperature switch (B5) to specifications.

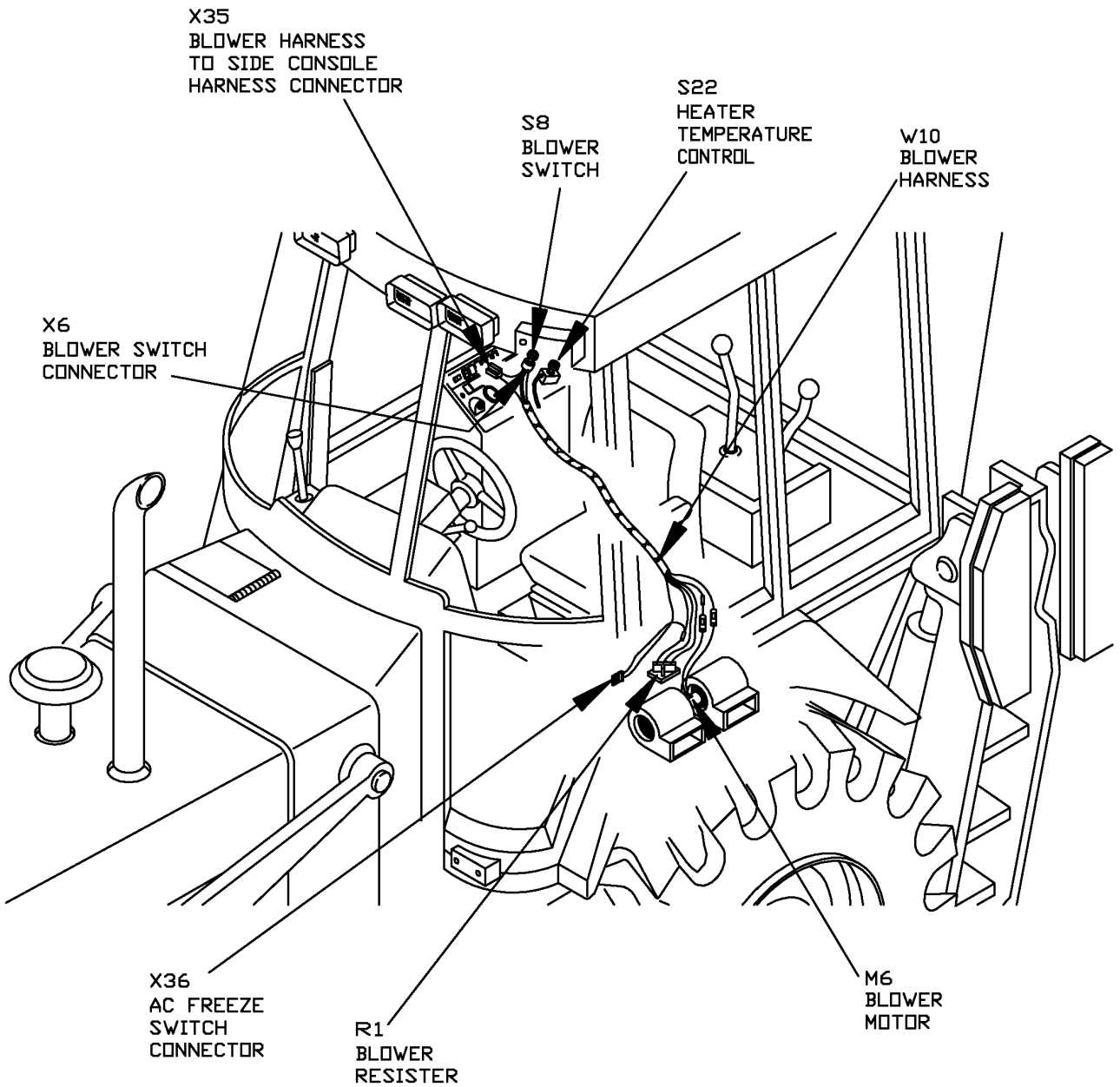
Specification

	Specification
Engine Coolant Temperature	
Switch—Torque.....	81 N·m (60 lb-ft)

Nut on Engine Coolant Temperature Switch—Torque.....	1.35 N·m (12 lb-in.)
--	----------------------

TX,16,QQ9333 -19-20APR00-2/2

Remove and Install Blower Harness and Components



T118424

BLOWER HARNESS - COMPONENTS

T118424 -19-17NOV98

Continued on next page

TX.16.QQ9334 -19-19NOV98-1/2

Wiring Harness and Switches

X6—Blower Switch Connector
**X35— Blower Harness-to-Side
Console Harness
Connector**

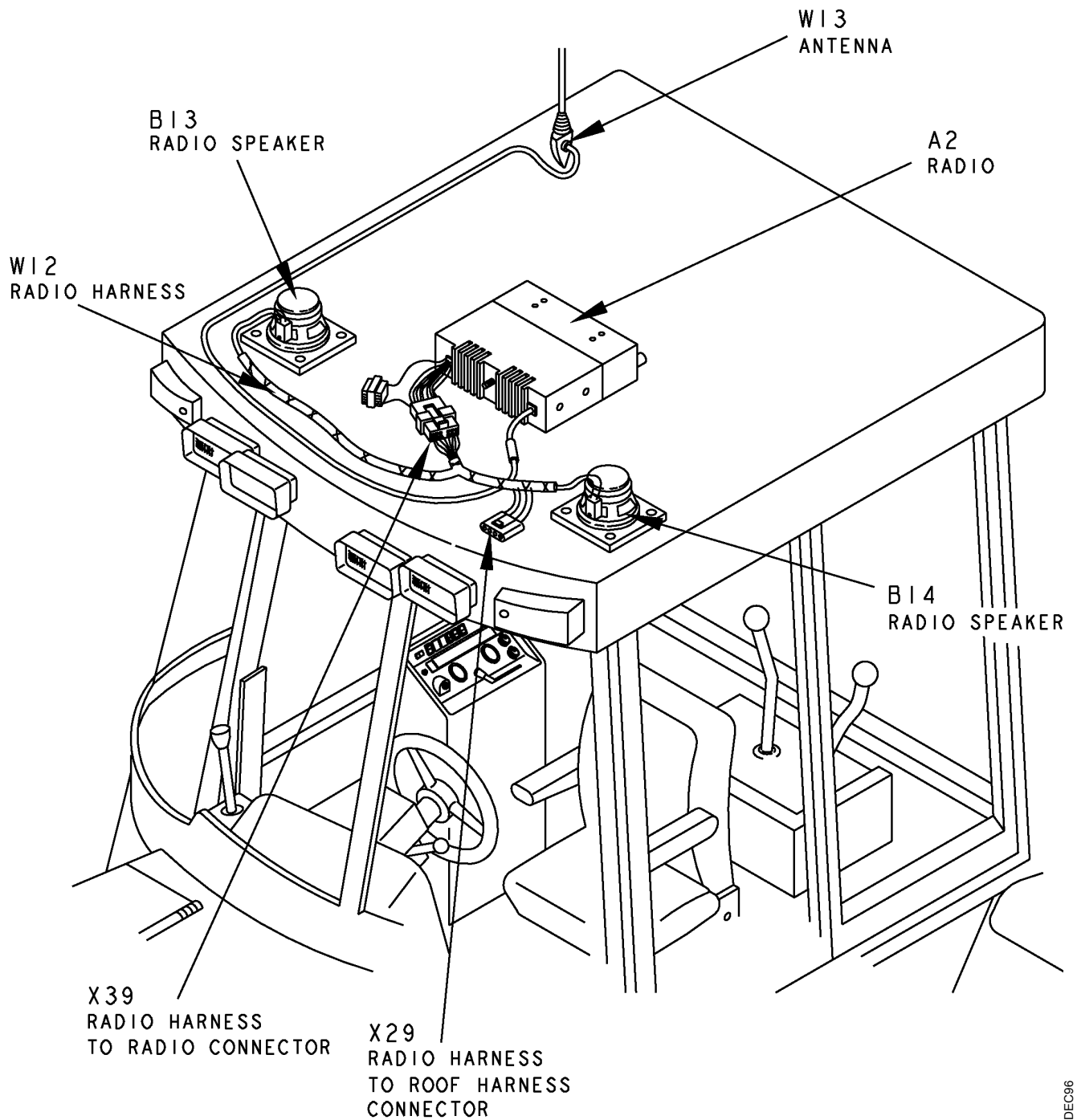
S8—Blower
**S22— Heater Temperature
Control**

W10—Blower Harness
M6—Blower Motor

R1—Blower Resister
**X36— AC Freeze Switch
Connector**

TX,16,QQ9334 -19-19NOV98-2/2

Remove and Install Radio Harness and Components



RADIO HARNESS - COMPONENTS

T104637

T104637-19-09DEC96

Continued on next page

TX.16.QQ9335 -19-19NOV98-1/2

Wiring Harness and Switches

**X29— Radio Harness-to-Roof
Harness Connector**
**X39— Radio Harness-to-Radio
Connector**

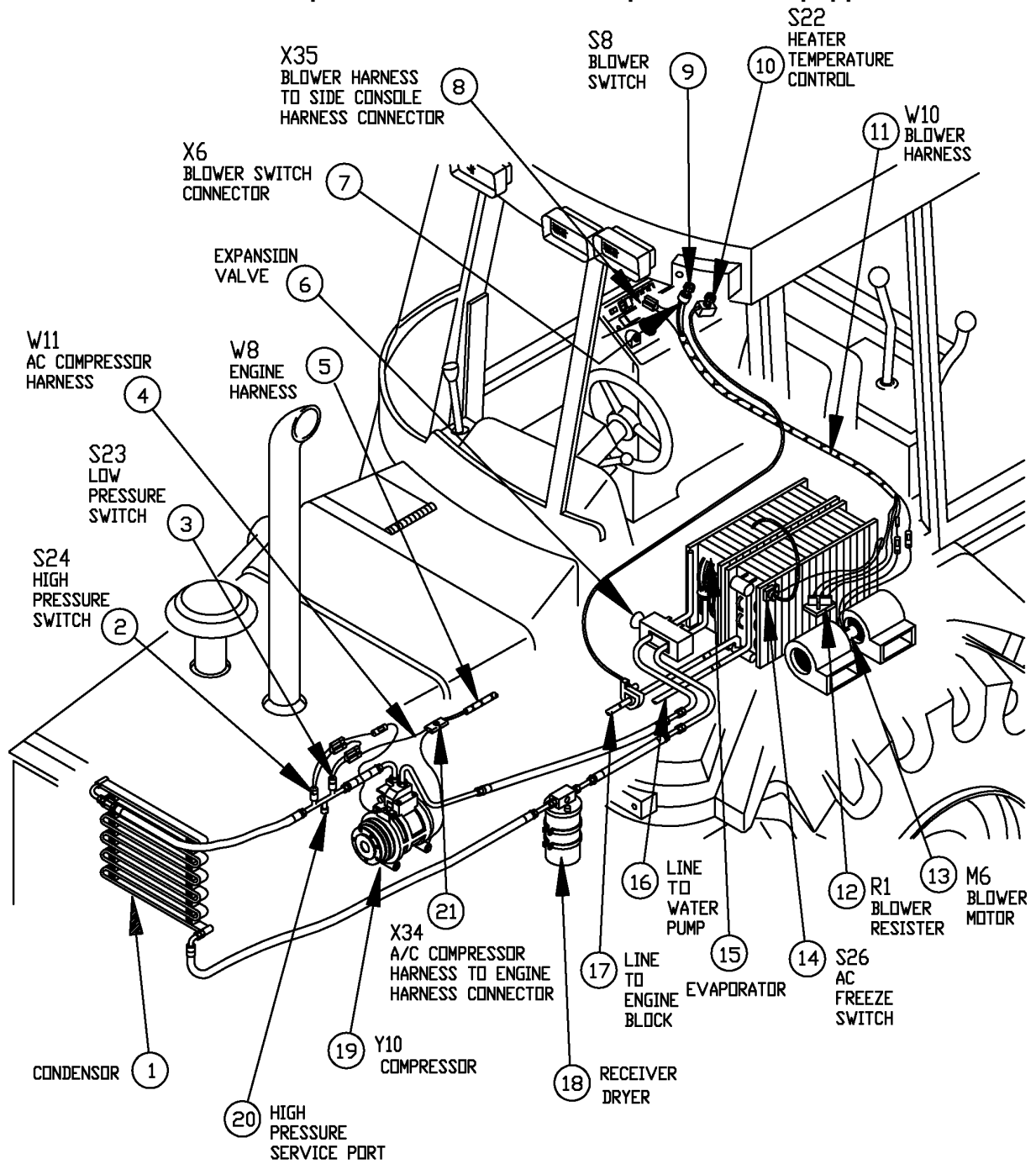
W12—Radio Harness
B13— Radio Speaker

W13—Antenna
A2—Radio

B14— Radio Speaker

TX,16,QQ9335 -19-19NOV98-2/2

Remove and Install A/C Compressor Harness and Components—If Equipped



AIR CONDITIONING COMPRESSOR HARNESS - COMPONENTS
T118426

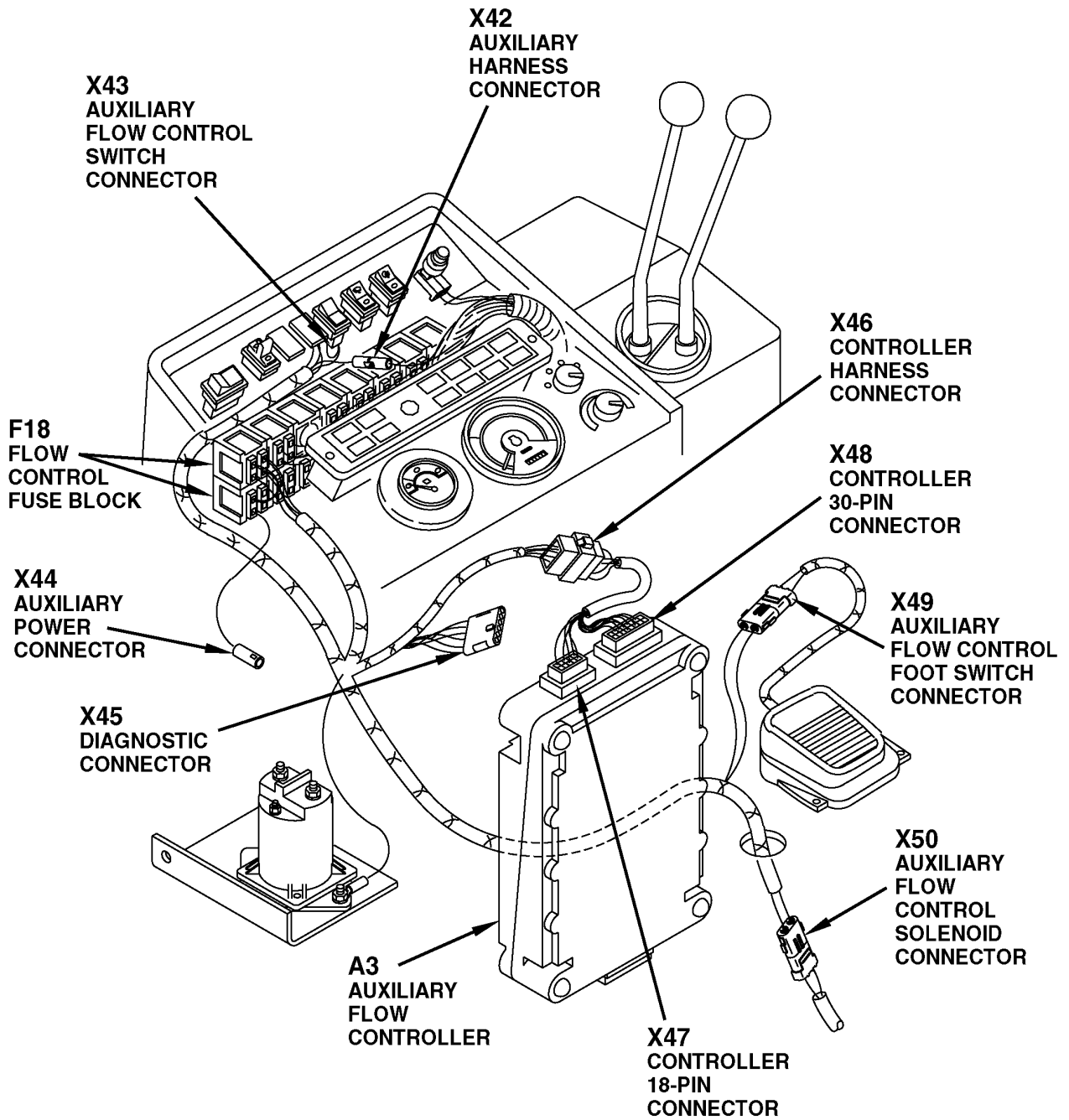
T118426 -19-17NOV98

Wiring Harness and Switches

1— Condenser	7— Blower Switch Connector (X6)	13— Blower Motor (M6)	19— Compressor (Y10)
2— High Pressure Switch (S24)	8— Blower Harness-to-Side Console Harness Connector (X35)	14— AC Freeze Switch (S26)	20— High Pressure Service Port
3— Low Pressure Switch (S23)		15— Evaporator	21— A/C Compressor Harness-to-Engine Harness Connector (X34)
4— AC Compressor Harness (W11)	9— Blower Switch (S8)	16— Line to Water Pump	
5— Engine Harness (W8)	10— Heater Temperature Control (S22)	17— Line to Engine Block	
6— Expansion Valve	11— Blower Harness (W10)	18— Receiver/Dryer	
	12— Blower Resister (R1)		

TX,16,QQ9336 -19-19NOV98-2/2

Remove and Install Auxiliary Flow Control Harness and Components—If Equipped



T111749

T111749 —19—28OCT97

Continued on next page

CED.OU01010,430 -19-15FEB00-1/2

Wiring Harness and Switches

X43— Auxiliary Flow Control Switch Connector
 X42— Auxiliary Harness Connector
 X46— Controller Harness Connector

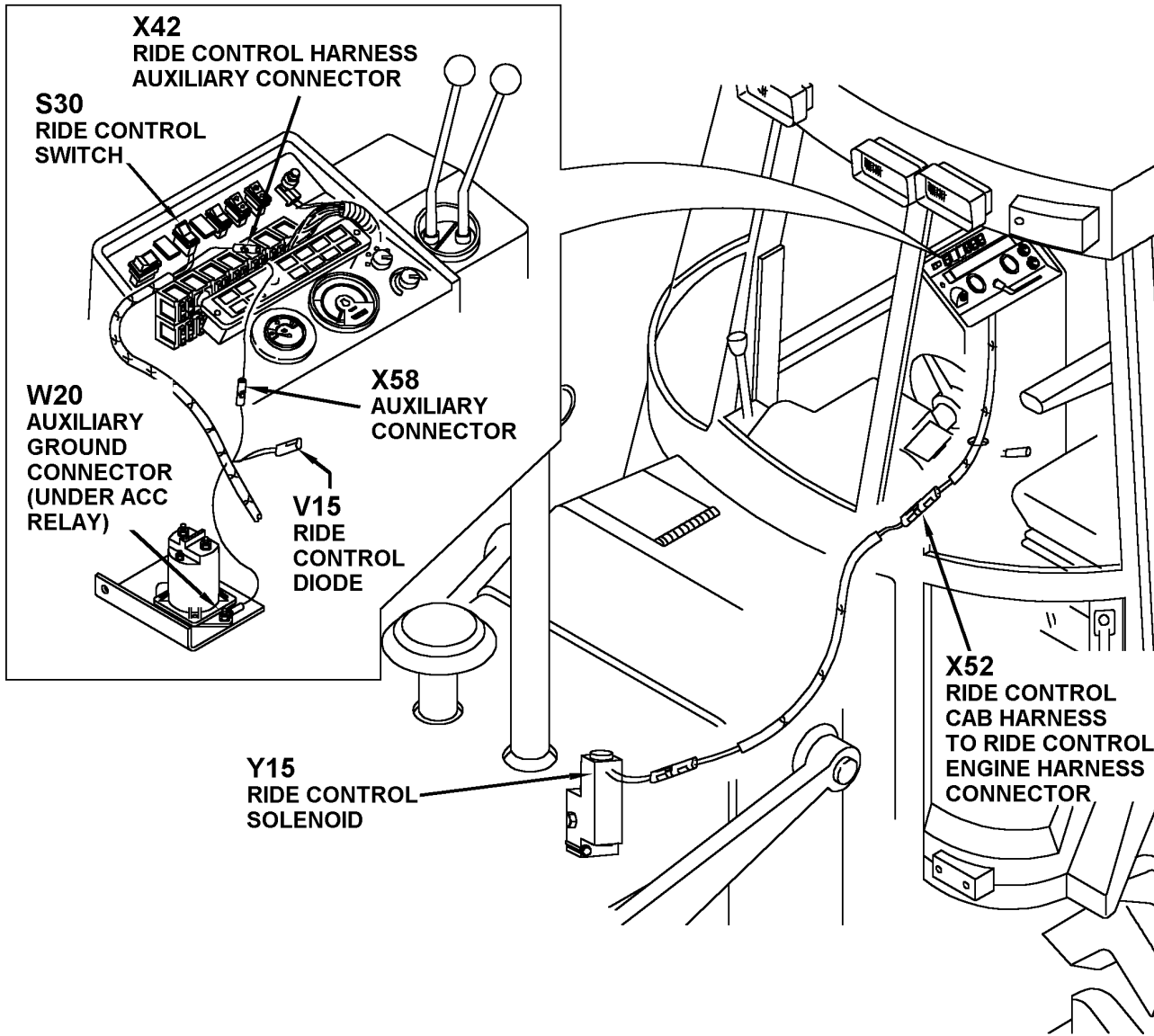
X48— Controller 30-Pin Connector
 X49— Auxiliary Flow Control Foot Switch Connector
 X50— Auxiliary Flow Control Solenoid Connector

X47— Controller 18-Pin Connector
 A3— Auxiliary Flow Controller
 X45— Diagnostic Connector

X44— Auxiliary Power Connector
 F18— Flow Control Fuse Block

CED,OUO1010,430 -19-15FEB00-2/2

Remove and Install Ride Control Harness and Components—If Equipped



T128454

RIDE CONTROL HARNESS — COMPONENT LOCATION

S30— Ride Control Switch
 X42— Ride Control Harness Auxiliary Connector

X58— Auxiliary Connector
 V15— Ride Control Diode

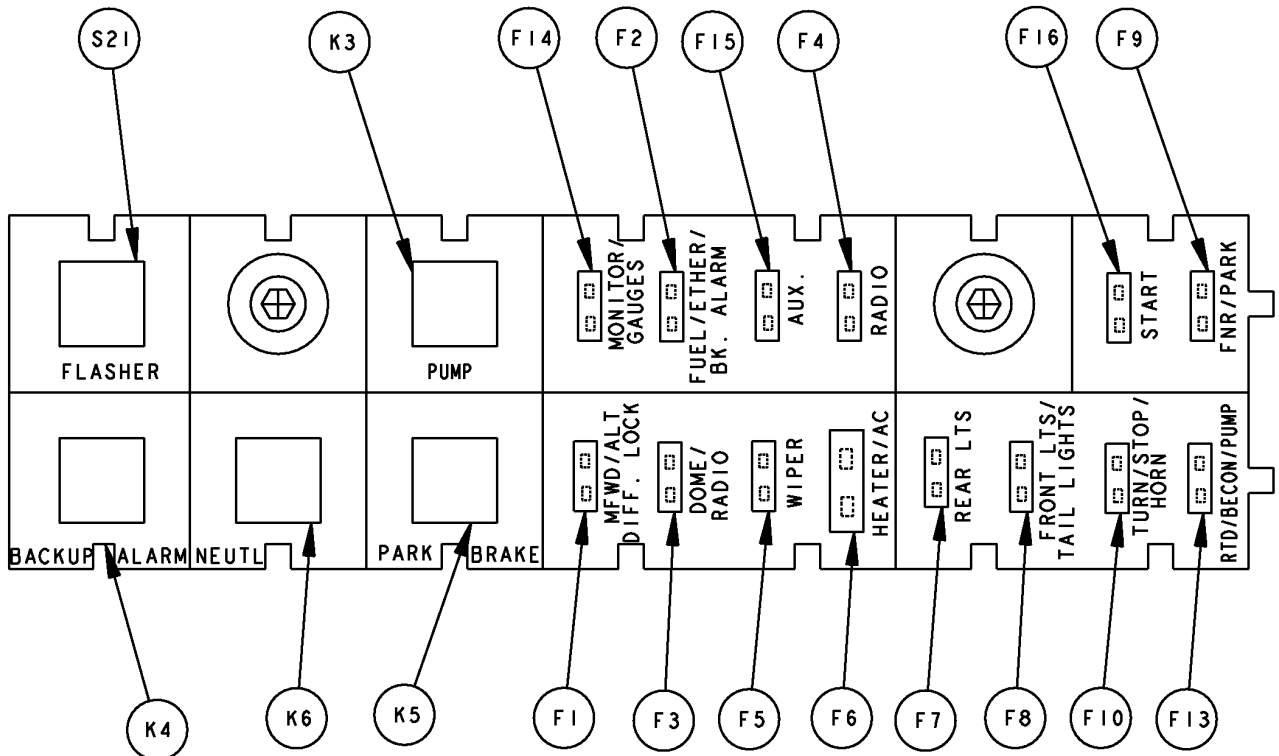
W20— Auxiliary Ground Connector
 Y15— Ride Control Diode

X52— Ride Control Cab Harness-to-Ride Control Engine Harness Connector

CED,OUO1010,431 -19-15FEB00-1/1

T128454 —19—17FEB00

Fuse Specifications



T100712

- | | | | |
|--|---|---|---------------------------------------|
| F1— 7.5 Amp MFWD/ Alternator/Diff. Lock Fuse | F6— 30 Amp Heater/AC Fuse | F13— 10 Amp RTD/Beacon and Pump Cutout Fuse | K4— Reverse Alarm Relay |
| F2— 15 Amp Fuel/Start Aid and Reverse Alarm Fuse | F7— 15 Amp Rear Light Fuse | F14— 10 Amp Monitor/Gauge Fuse | K5— Park Brake Relay |
| F3— 5 Amp Dome Light/ Radio Fuse | F8— 25 Amp Front Light/Tail Light Fuse | F15— 10 Amp Auxiliary Fuse | K6— Neutral Relay |
| F4— 5 Amp Radio Fuse (Unswitched Power) | F9— 10 Amp FNR/Park Brake Fuse | F16— 10 Amp Start Fuse | K7— Timer Relay (Behind side Console) |
| F5— 15 Amp Wiper Fuse | F10— 20 Amp Turn/Stop/Flash and Horn Fuse | K3— Hydraulic Pump Relay | S21— Flasher |

IMPORTANT: Install fuse with correct amperage rating to prevent electrical system damage from overload.

The fuse block is located on the side console inside an access cover.

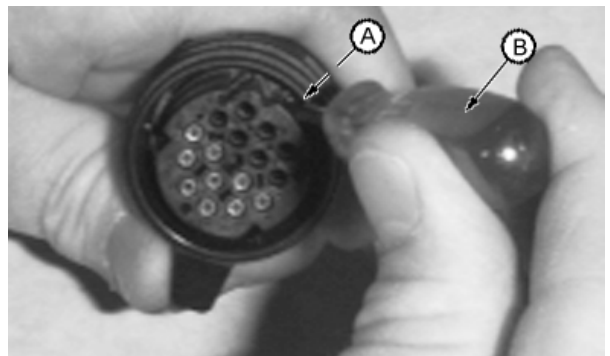
TX,16,QQ9338 -19-31AUG95-1/1

Kostal Connector 16 Way Replace

1. A small locking tab is located inside of the connector. Use a small screwdriver (B) to move tab (A) outward to the first detent position; the tab will "click."

A—Tab

B—Screwdriver



Continued on next page

TX,16,QQ9339 -19-01SEP06-1/3

T100712—19—28MAY96

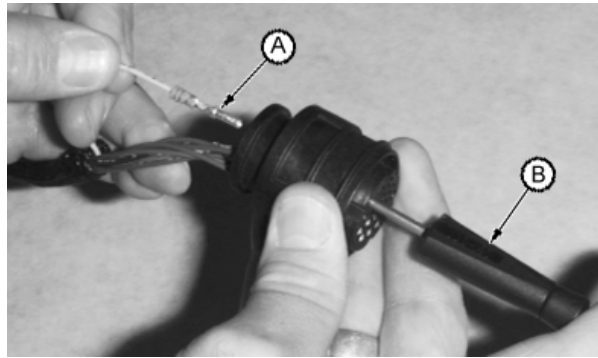
T104764B—UN—01NOV96

- Slide JDG140 METRIMATE™ Extractor Tool (B) into connector body until it is positioned over terminal contact.
- Push on end of extractor tool (B) and gently pull wire (A) out of connector body.

IMPORTANT: Install contact in proper location using correct size grommet.

- Push contact straight into connector body until positive stop is felt.
- Pull on wire slightly to be certain contact is locked in place.
- Transfer remaining wires to correct terminal in new connector.

METRIMATE is a trademark of AMP INC.



A—Wire

B—Extractor Tool

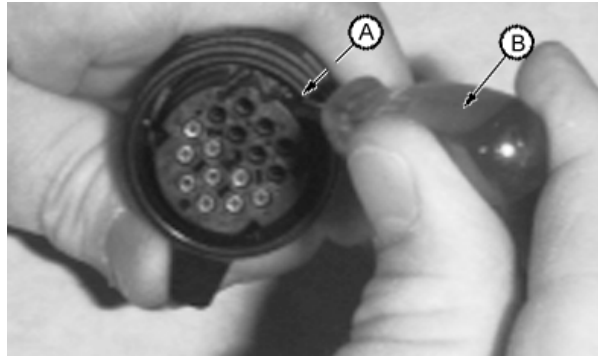
T104763B—UN—01NOV96

TX,16,QQ9339 -19-01SEP06-2/3

- Use a small screwdriver (B) to move tab (A) inward to the first detent position; the tab will “click” and lock the wires in the connector body.

A—Tab

B—Screwdriver



T104764B—UN—01NOV96

TX,16,QQ9339 -19-01SEP06-3/3

Kostal Open-Barrel Contact Install

- Slip correct size cable seal on wire.
- Strip insulation from wire to expose 6 mm (1/4 in.) and align cable seal with edge of insulation.



TS0136—UN—23AUG88

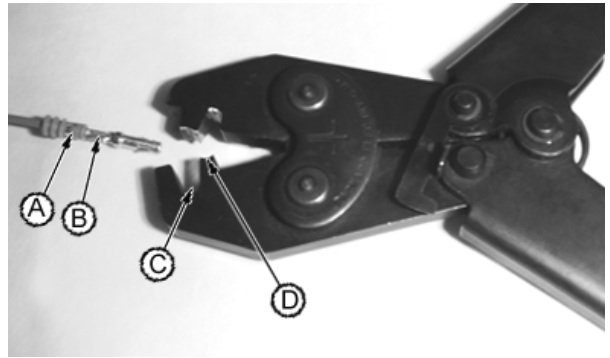
Continued on next page

TX,16,QQ9340 -19-01SEP06-1/2

- Put contact on wire and insert into crimper at location (D) and crimp on contact at location (B) using JDG707 Crimping Tool.
- Secure cable seal to contact by crimping at location (A) on contact and crimp at location (C) on JDG707 Crimping Tool.

A—Contact Location
B—Crimper Location

C—Crimper Location
D—Crimper Location



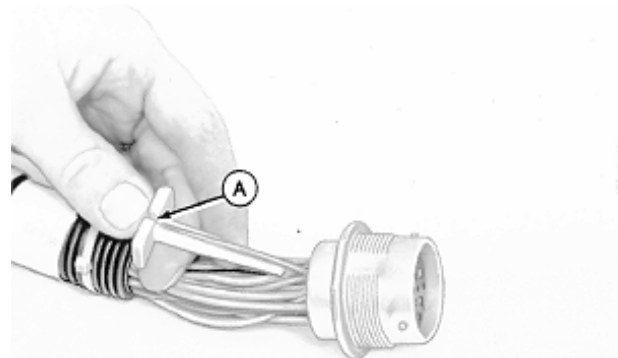
T106879B—UN—06JAN97

TX,16,QQ9340 -19-01SEP06-2/2

Replace DEUTSCH™ Connectors

- Select correct size extractor tool for size of wire to be removed:
 - JDG361 Extractor Tool for 12 to 14 gauge wire.
 - JDG362 Extractor Tool for 16 to 18 gauge wire.
 - JDG363 Extractor Tool for 20 gauge wire.
- Start correct size extractor tool over wire at handle (A).

A—Handle



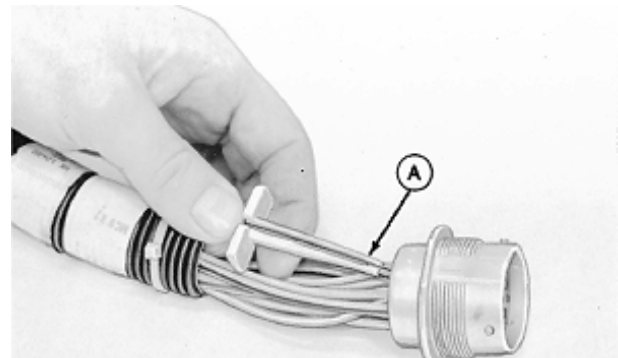
TS0124—UN—23AUG88

DEUTSCH is a trademark of Deutsch Co.

TX,16,QQ9341 -19-29OCT96-1/5

- Slide extractor tool rearward along wire until tool tip (A) snaps onto wire.

A—Extractor Tool Tip



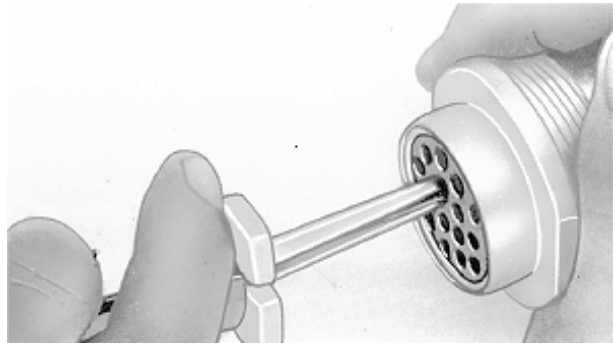
TS0125—UN—23AUG88

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TX,16,QQ9341 -19-29OCT96-2/5

IMPORTANT: Do NOT twist tool when inserting in connector.

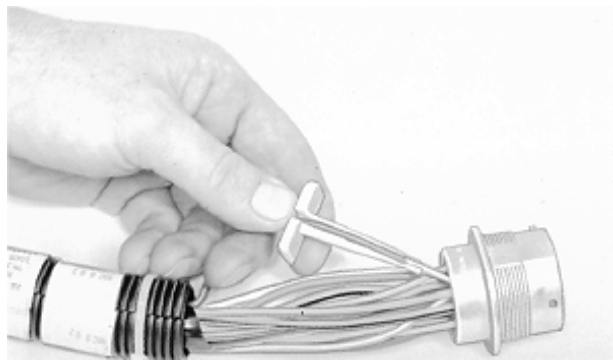
4. Slide extractor tool along wire into connector body until it is positioned over terminal contact.



TS120—UN—23AUG88

TX,16,QQ9341 -19-29OCT96-3/5

5. Pull wire, with extractor tool, out of connector body.

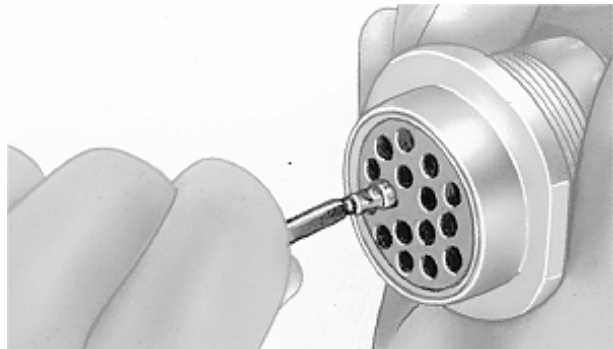


TS0126—UN—23AUG88

TX,16,QQ9341 -19-29OCT96-4/5

IMPORTANT: Install contact in proper location using correct size grommet.

6. Push contact straight into connector body until positive stop is felt.
7. Pull on wire slightly to be certain contact is locked in place.
8. Transfer remaining wires to correct terminal in new connector.



TS122—UN—23AUG88

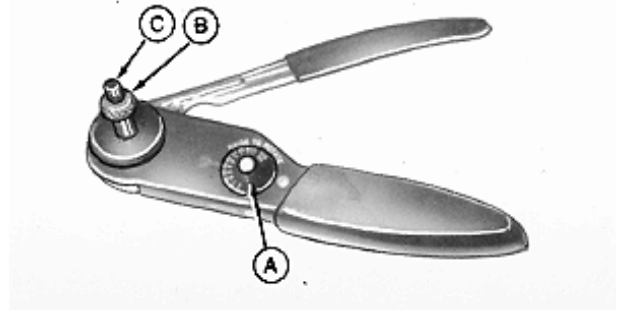
TX,16,QQ9341 -19-29OCT96-5/5

Install DEUTSCH™ Contact

1. Strip 6 mm (1/4 in.) insulation from wire.
2. Adjust selector (A) on JDG360 Crimper for correct wire size.
3. Loosen lock nut (B) and turn adjusting screw (C) in until it stops.

A—Selector
B—Lock Nut

C—Adjusting Screw



TS117 —UN—23AUG88

DEUTSCH is a trademark of Deutsch Co.

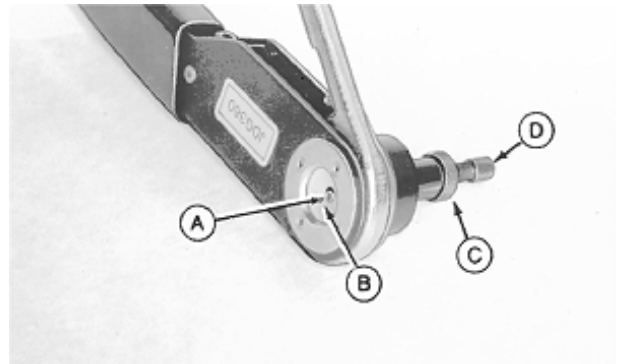
TX,16,QQ9342 -19-01SEP06-1/4

IMPORTANT: Select proper size contact "sleeve" or "pin" to fit connector body.

4. Insert contact (A) and turn adjusting screw (D) until contact is flush with cover (B).
5. Tighten lock nut (C).

A—Contact
B—Cover

C—Lock Nut
D—Adjusting Screw

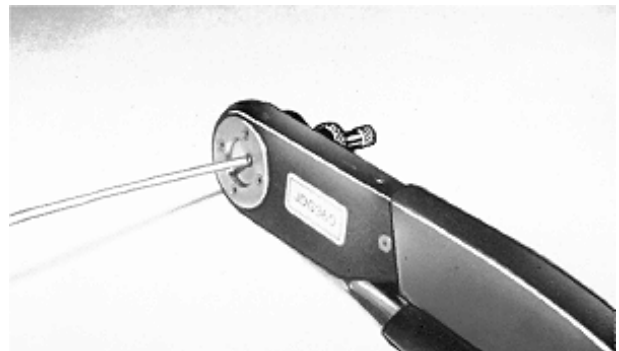


TS0134 —UN—23AUG88

TX,16,QQ9342 -19-01SEP06-2/4

IMPORTANT: Contact must remain centered between indenters while crimping.

6. Insert wire in contact and crimp until handle touches stop.
7. Release handle and remove contact.



TS118 —UN—23AUG88

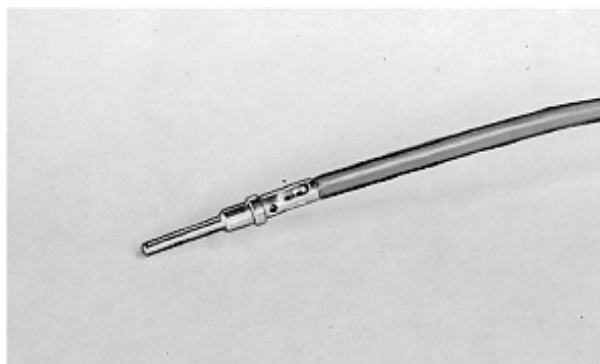
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TX,16,QQ9342 -19-01SEP06-3/4

IMPORTANT: If all wire strands are not crimped into contact, cut off wire at contact and repeat contact installation procedure.

NOTE: Readjust crimping tool for each crimping procedure.

8. Inspect contact to be certain all wires are in crimped barrel.



TS0135 —UN—23AUG88

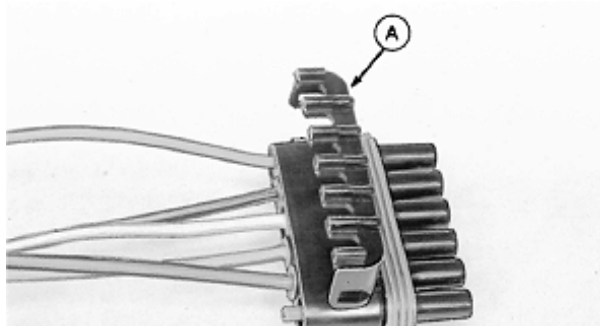
TX,16,QQ9342 -19-01SEP06-4/4

Replace WEATHER PACK™ Connectors

IMPORTANT: Identify wire color locations with connector terminal letters.

1. Open connector body (A).

A—Connector Body

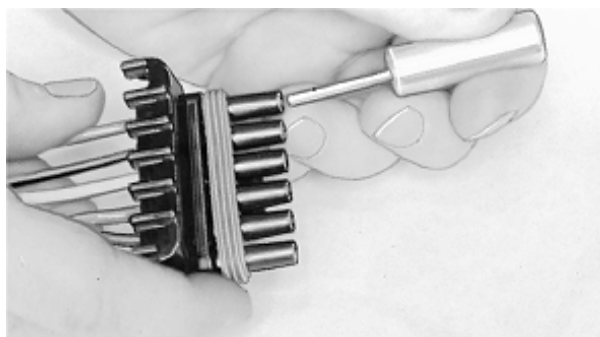


TS0127 —UN—23AUG88

WEATHER PACK is a trademark of Packard Electric.

TX,16,QQ9343 -19-29OCT96-1/4

2. Insert JDG364 Extraction Tool over terminal contact in connector body.



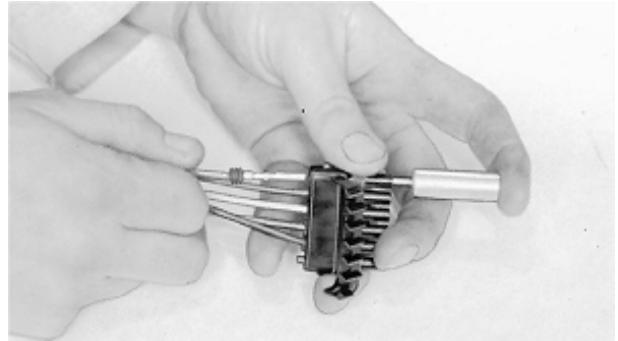
TS0128 —UN—23AUG88

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TX,16,QQ9343 -19-29OCT96-2/4

3. Hold extractor tool fully seated and pull wire from connector body.

NOTE: If terminal cannot be removed, insert wire or nail through extractor tool handle and push terminal contact from connector.



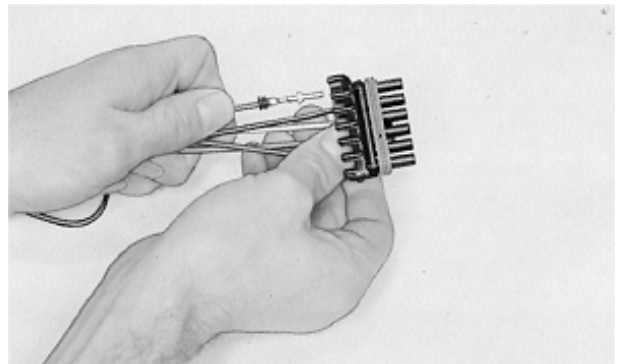
TS0129 —UN—23AUG88

TX,16,QQ9343 -19-29OCT96-3/4

IMPORTANT: Carefully spread contact lances to assure good seating in connector body.

NOTE: Connector bodies are "keyed" for proper contact mating. Be sure contacts are in proper alignment.

4. Push contact into new connector body until fully seated.
5. Pull on wire slightly to be certain contact is locked in place.
6. Transfer remaining wires to correct terminal in new connector.
7. Close connector body.



TS0130 —UN—23AUG88

TX,16,QQ9343 -19-29OCT96-4/4

WEATHER PACK™ Contact Install

NOTE: Cable seals are color coded for three sizes of wire:

- Green — 18 to 20 gauge wire
- Gray — 14 to 16 gauge wire
- Blue — 10 to 12 gauge wire

1. Slip correct size cable seal on wire.
2. Strip insulation from wire to expose 6 mm (1/4 in.) and align cable seal with edge of insulation.



TS0136 —UN—23AUG88

WEATHER PACK is a trademark of Packard Electric.

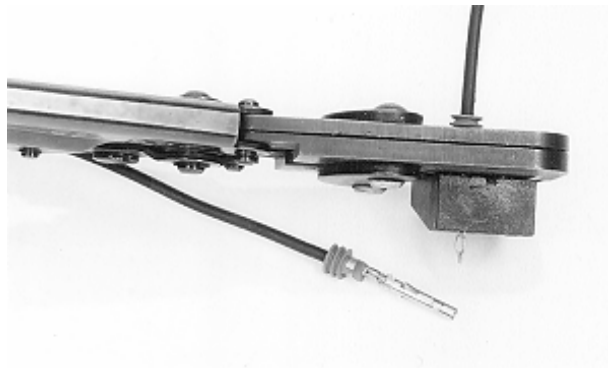
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TX,16,QQ9344 -19-01SEP06-1/3

NOTE: Contacts have numbered identification for two sizes of wire:

- #15 for 14 to 16 gauge wire
- #19 for 18 to 20 gauge wire

3. Put proper size contact on wire and crimp in place with a "W" type crimp, using JDG783 Terminal Applicator.
4. Secure cable seal to contact as shown, using JDG783 Terminal Applicator.



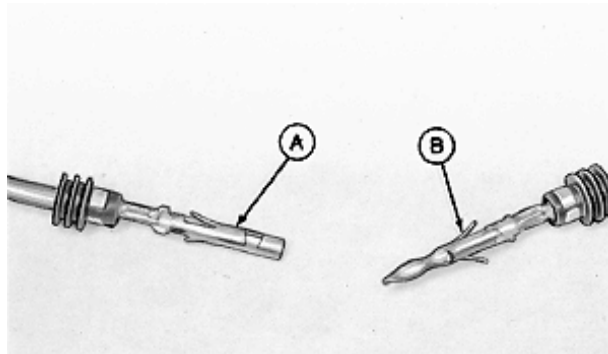
TS1623—UN—02NOV94

TX,16,QQ9344 -19-01SEP06-2/3

IMPORTANT: Proper contact installation for "sleeve" (A) and "pin" (B) is shown.

A—Sleeve

B—Pin



TS0139—UN—02DEC88

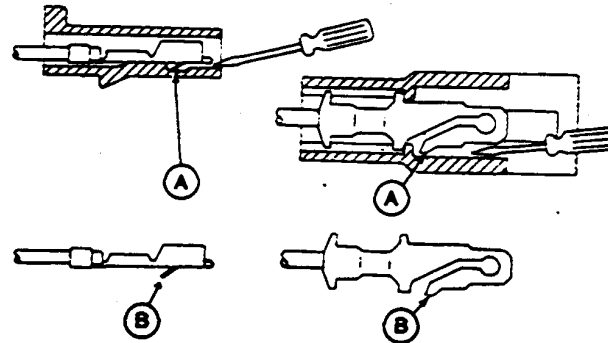
TX,16,QQ9344 -19-01SEP06-3/3

Remove Connector Body from Blade Terminals

1. Depress locking tang (A) on terminal, using a small screwdriver. Slide connector body off.
2. Be sure to bend locking tang back to its original position (B) before installing connector body.

A—Locking Tang

B—Original Tang Position



RW4218—UN—23AUG88

TX,16,QQ9345 -19-02NOV94-1/1

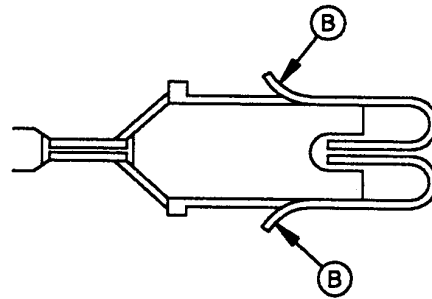
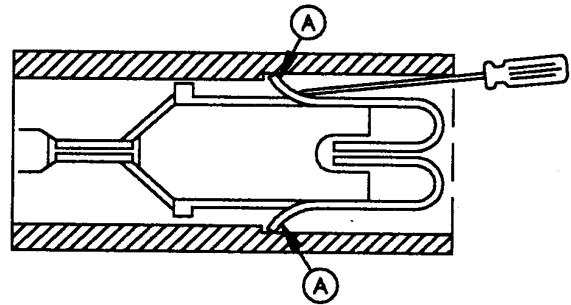
Remove Blade Terminals from Fuse Block

Use small screwdriver to depress each locking tang (A) on terminal. Pull terminal out of fuse block.

Be sure to bend locking tangs back to original position (B) before installing in fuse block.

A—Locking Tang

B—Original Tang Position



T7670AC (CV)

T7670AC —UN—14DEC91

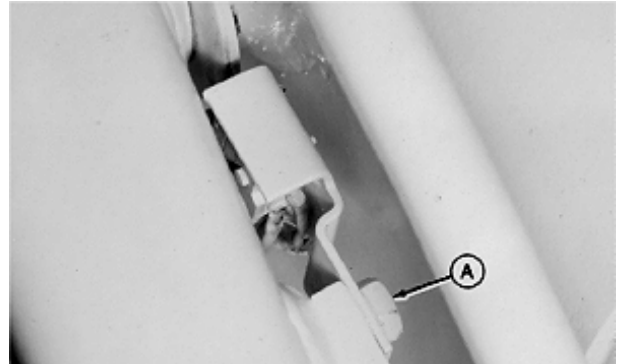
TX,16.QQ9346 -19-01SEP06-1/1

Wiring Harness and Switches

Remove and Install Return-to-Dig Switch

1. Remove cap screw (A) to remove cover and switch.

A—Cap Screw



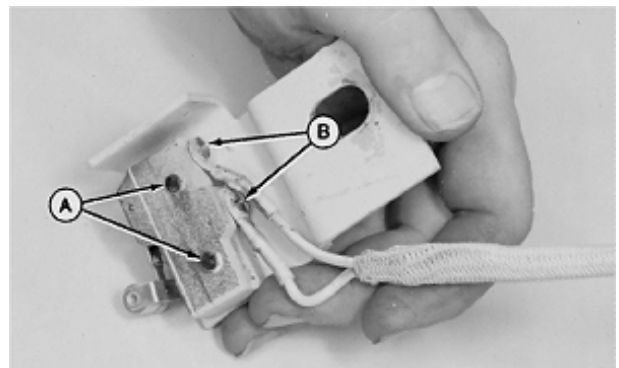
T90714 —UN—17FEB90

TX,16,QQ9347 -19-18NOV98-1/4

2. Remove screws (A) to remove switch from cover.
3. Remove screws (B) and disconnect wire leads to remove switch.
4. Connect wire leads and install screws (B) to switch.
5. Install switch to cover using screws (A).

A—Cover Screws

B—Wire Lead Screws

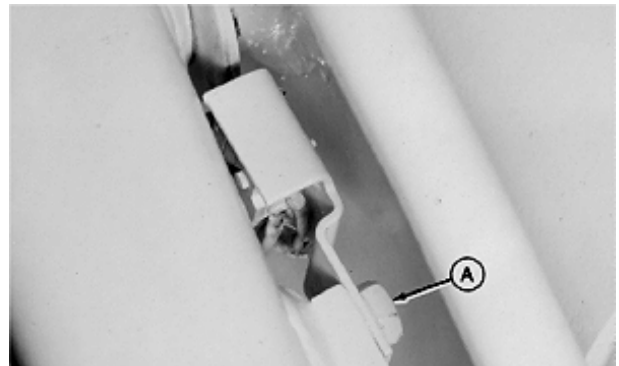


T90715 —UN—17FEB90

TX,16,QQ9347 -19-18NOV98-2/4

6. Install cover and switch using cap screw (A).

A—Cap Screw



T90714 —UN—17FEB90

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TX,16,QQ9347 -19-18NOV98-3/4

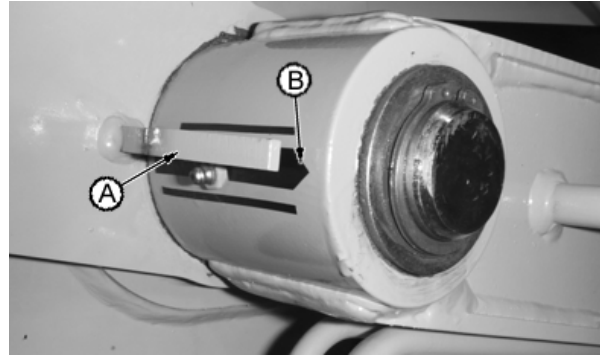
System Controls

7. Bucket must be in the return-to-dig position and level on the ground. Bucket level indicator (A) must align with line (B).

If adjustment is necessary, see Loader Bucket Self-Leveling Linkage Indicator and Return-to-Dig Switch Adjustment in Section 31, Group 3115.

A—Bucket Level Indicator

B—Level Indicator Line



T104776B—JUN—05DEC96

TX,16,QQ9347 -19-18NOV98-4/4

Other Material

Number	Name	Use
TY6304 (U.S.) TY9484 (Canadian) 515 (LOCTITE®)	Flexible Sealant	Apply around the tank surface area where the sending unit gasket contacts fuel tank.

LOCTITE is a registered trademark of Loctite Corp.

CED,OUO1002,690 -19-13JAN99-1/1

Remove and Install Fuel Gauge Sender

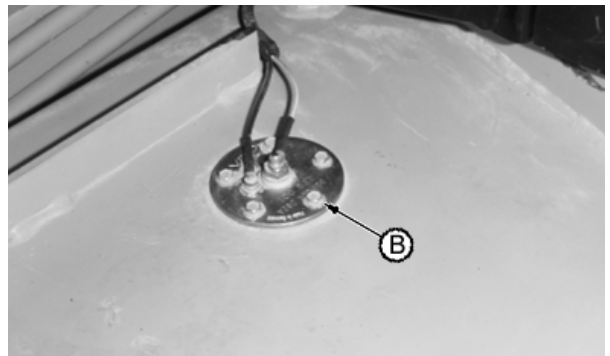
1. Remove fuel tank cover (A).
2. Disconnect wire leads from fuel sender.
3. Remove five cap screws (B) to remove fuel gauge sender.
4. Apply flexible sealant around the tank surface area where the sending unit gasket contacts fuel tank.
5. Install gasket, sender and wiring leads. Wire No. Y33 yellow connects to center of sender.
6. Install fuel tank cover and tighten screws.

A—Fuel Tank Cover

B—Cap Screws (5 used)



T104774B —UN—05DEC96



T104775B —UN—05DEC96

TX,16,QQ9348 -19-21OCT96-1/1

Starter Motor Repair—Use CTM77

For complete repair information the component technical manual (CTM) is also required.

Use the component technical manual in conjunction with this machine manual.



M44215—UN—07SEP88

TX,16,QQ8946 -19-06DEC96-1/1

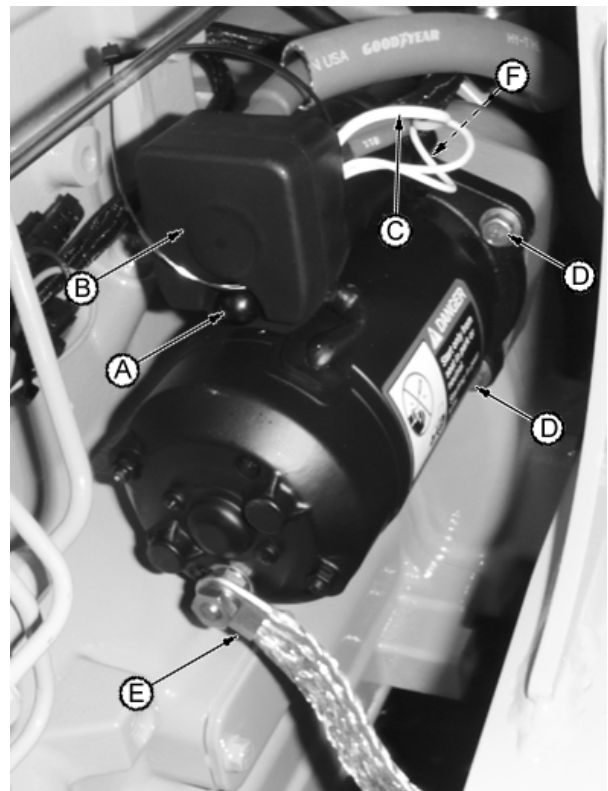
Remove and Install Starting Motor

CAUTION: Before working on unit with loader in raised position, install boom lock bars.

1. Raise loader boom. Install boom lock bars.
2. Disconnect battery ground cable.
3. Remove right engine side shield.
4. Remove cap screw (A) and cover (B).
5. Disconnect wire leads (C).
6. Disconnect ground strap (E).

NOTE: If equipped with air conditioning, remove two cap screws from receiver-dryer clamps and lower receiver-dryer to allow room to remove starting motor.

7. Remove cap screw (D), nut (F) and starting motor.
8. Make necessary repairs. (See CTM77.)
9. Install starting motor and tighten cap screws (D) and nut (F).
10. Connect wire leads (C).
11. Install cover (B) using cap screw (A).
12. Install ground strap (E).
13. Install right engine side shield.
14. Remove lock bars.
15. Connect battery ground cable.



T104771B—UN—06DEC96

A—Cap Screw
B—Cover
C—Wire Leads

D—Cap Screw (2 used)
E—Ground Strap
F—Nut

TX,16,QQ8947 -19-13JAN99-1/1

Remove and Install Starter Relay

⚠ CAUTION: Before working on machine with loader in raised position, install boom lock bars.

1. Raise loader boom. Install boom lock bar.
2. Disconnect battery ground cable.
3. Remove right engine side shield.
4. Remove two screws (A) to move relay (B) away from machine.
5. Open relay cover to disconnect wire leads and remove relay.
6. Connect wire leads and close relay cover.
7. Secure relay using two screws.
8. Install engine side shield and connect battery ground cable.
9. Remove boom safety bar and lower loader to the ground.

A—Screws

B—Relay



T104975C—UN—06DEC06

TX,16,QQ8948 -19-05FEB94-1/1

Section 17
Frames, Chassis or Supporting Structure
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Frame Bumper Remove and Install	17-1749-3

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Group 1740 Frame Installation

Essential Tools

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or from the European Microfiche Tool Catalog (MTC).

SERVICEGARD is a trademark of Deere & Company

CED,TX03399,5665 -19-06DEC99-1/2

RIVNUT® Installation Tool..... JDG894

Used to install RIVNUT® fasteners.

RIVNUT is a registered trademark of The BF Goodrich Co.

CED,TX03399,5665 -19-06DEC99-2/2

Specifications

Item	Measurement	Specification
RIVNUT® Fastener	Torque	68—74 N·m (50—55 lb-ft)

RIVNUT is a registered trademark of The BF Goodrich Co.

CED,TX03399,5666 -19-06DEC99-1/1

Welding Repair of Major Structures

IMPORTANT: Disconnect battery ground strap or turn battery disconnect switch to "OFF" to prevent voltage spikes through alternator or monitor.

Have only a qualified welder do this job. Connect welder ground clamp close to each weld area so electrical current does not pass through any bearings.

Remove or protect all parts that can be damaged by heat or weld splatter.

If machine is equipped with a controller (microprocessor) like Engine Controller (EC) or Pump and Valve Controller (PVC) disconnect harness connector from controller to prevent voltage spikes through microprocessor.

Connect welder ground clamp close to each weld area so electrical current does not arc inside any bearings.

Use one of the following weld processes:

AWS-E-7018 covered electrode with shielded metal arc welding (SMAW) process.

AWS-ER-70S-3 wire electrode with gas metal arc welding (GMAW) process.

AWS-E70T-1 or E71T-1 wire electrode with flux core arc welding (FCAW) process.

Preheat area to be repaired to allow better weld penetration.

To repair weld metal failure, remove failed weld metal using arc or grinding equipment. Thoroughly clean area to be welded. Preheat structural assemblies to a minimum of 38°C (100°F). Preheat ground engaging tools (cutting edges, skid shoes, and teeth shanks) to 177°C (350°F).

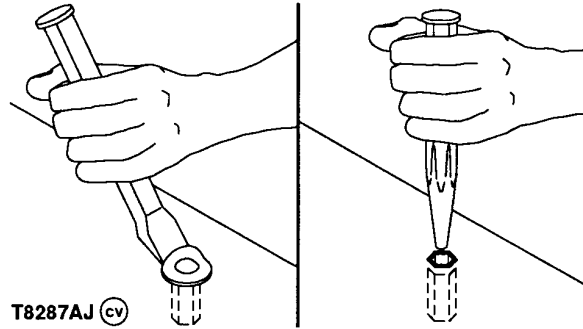
To repair base metal failure remove enough material to allow weld to penetrate to the bottom of crack. Preheat structural assemblies to a minimum of 38°C (100°F). Preheat ground engaging tools (cutting edges, skid shoes, and teeth shanks) to 177°C (350°F).

TX,17,QQ9354 -19-01SEP06-1/1

Remove and Install RIVNUT® (KREMNUТ) Fasteners

1. Remove flange of RIVNUT using a hammer and chisel. Use care not to damage equipment's surface under the flange or the hexagon hole.

Use a punch to remove threaded portion of fastener.



T8287AJ (cv)

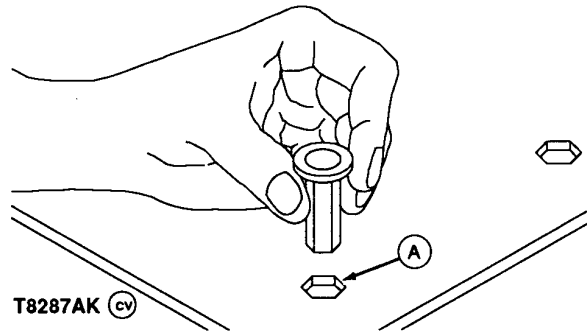
T8287AJ—UN—19JUL94

RIVNUT is a registered trademark of The BF Goodrich Co.

WS68074,00036EA -19-14JUL10-1/4

2. Select the proper length fastener for the thickness of the material where the fastener will be installed. Fasteners are color-coded as well as stamped on the flange surface. (Coding indicates the nominal plate thickness for which the fastener can be used.)

RIVET NUT LENGTH SELECTION		
Material Thickness	Flange Stamp	Color Code
4.25—5.60 mm (0.167—0.220 in.)	4.5	Silver
5.74—7.09 mm (0.226—0.279 in.)	6	Yellow
7.75—9.09 mm (0.305—0.358 in.)	8	Red
9.75—11.10 mm (0.384—0.437 in.)	10	Black
11.73—13.08 mm (0.462—0.515 in.)	12	Olive Drab



T8287AK (cv)

T8287AK—UN—17OCT94

A—Hexagon Hole

IMPORTANT: DO NOT force or drive fastener into hole. Fastener can be damaged and will not hold securely.

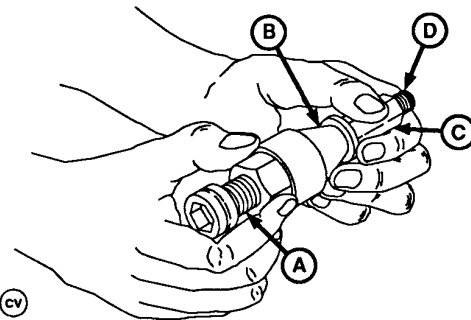
3. Make sure the new fastener fits easily into the existing hexagon hole (A). If necessary, use a small file to clean the edges of the hole.

WS68074,00036EA -19-14JUL10-2/4

4. Lubricate the large threads (A) of the JDG894 Installation Tool.
5. Install RIVNUT fastener (C) on tool:
 - Small threads (D) of installation tool must extend past fastener.
 - Flange of fastener must contact shoulder (B) of tool.

A—Large Threads
B—Tool Shoulder

C—RIVNUT® Fastener
D—Small Threads



T8287AL (cv)

T8287AL—UN—19JUL94

RIVNUT is a registered trademark of The BF Goodrich Co.

Continued on next page

WS68074,00036EA -19-14JUL10-3/4

6. Install fastener with installation tool in hexagon hole. Make sure flange (C) is flat against mounting surface.

IMPORTANT: NEVER turn or tighten JDG894 Tool socket head screw. Damage to threads of fastener can occur.

7. While holding socket head screw (A) stationary, tighten large (1-1/16 in.) nut (B) to specification using a crowsfoot wrench.

Specification

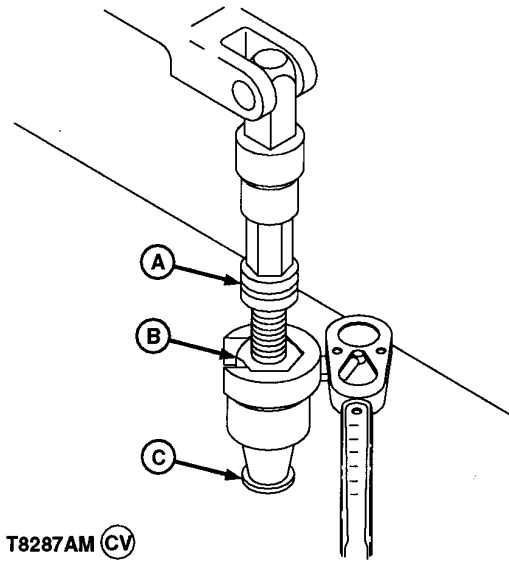
RIVNUT®

Fastener—Torque..... 68—74 N·m (50—55 lb-ft)

8. Loosen large nut to remove tool.

A—Socket Head Screw
B—Nut

C—Flange



T8287AM (CV)

T8287AM—UN—17OCT94

RIVNUT is a registered trademark of The BF Goodrich Co.

WS68074,00036EA -19-14JUL10-4/4

Frame Installation

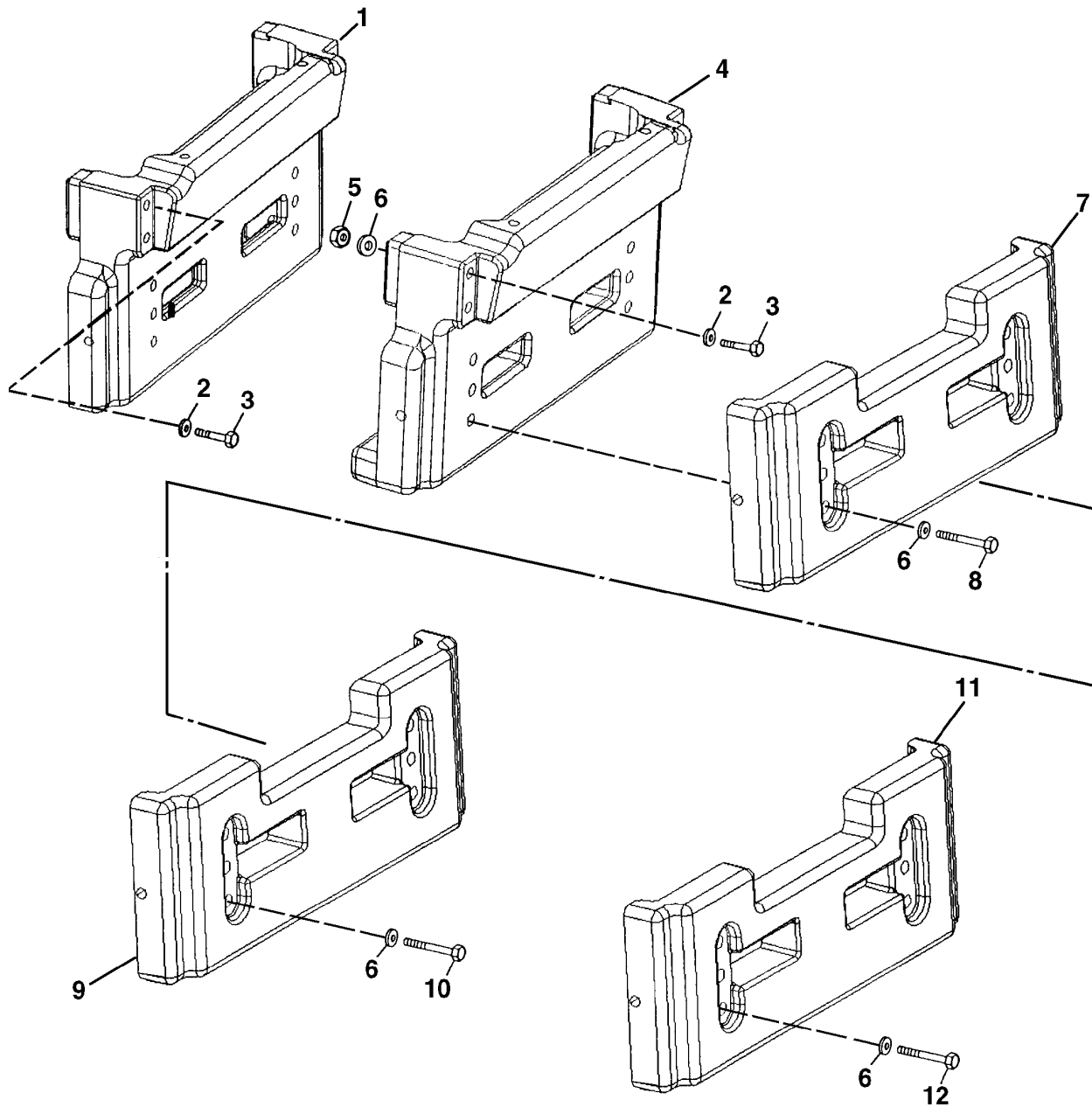
Group 1749 Chassis Weights

Specifications

Item	Measurement	Specification
Front Counterweight (Primary) Used with Additional Counterweights	Weight	295 kg (650 lb)
Front Counterweight (Additional) Three Used	Weight	113 kg (250 lb)
Front Counterweight Cap Screws	Torque	215 ± 43 N·m (159 ± 32 lb-ft)
Front Counterweight Cap Screws (Used with Additional Counterweight)	Torque	620 ± 124 N·m (457 ± 89 lb-ft)

WS68074,00036EB -19-14JUL10-1/1

Remove and Install Counterweight



TP50493

1— Primary Counterweight
(Cannot Use Additional Counterweights)
2— Washer (4 used)
3— Cap Screw (4 used)

4— Primary Counterweight
(Used with Additional Counterweights)
5— Nut (2 used)
6— Washer (4 used)

7— Additional Counterweight
8— Cap Screw (2 used)
Used with One Additional Counterweight
9— Additional Counterweight

10— Cap Screw (2 used)
Used with Two Additional Counterweights
11— Additional Counterweights
12— Cap Screw (2 used) Used with Three Additional Counterweights

TP50493—UN—05OCT96

Continued on next page

Chassis Weights

1. Raise loader boom and install lock bar.

CAUTION: The approximate weight of primary counterweight is 295 kg (650 lb).

Specification

Front Counterweight
(Primary) Used with
Additional Counter-
weights—Weight..... 295 kg (650 lb)

The approximate weight of additional counterweight is 113 kg (250 lb).

Specification

Front Counterweight
(Additional) Three
Used—Weight..... 113 kg (250 lb)

2. Attach hoist to counterweight with straps.
3. Remove cap screws to remove counterweight.
4. Install counterweight. Tighten cap screws (3) to specification.

Specification

Front Counterweight Cap
Screws—Torque..... 353 ± 14 N·m (260 ± 10 lb-ft)

Tighten cap screws (8, 10 and 12) to specification.

Specification

Front Counterweight
Cap Screws (Used
with Additional
Counterweight—Torque..... 620 ± 124 N·m (457 ± 89 lb-ft)

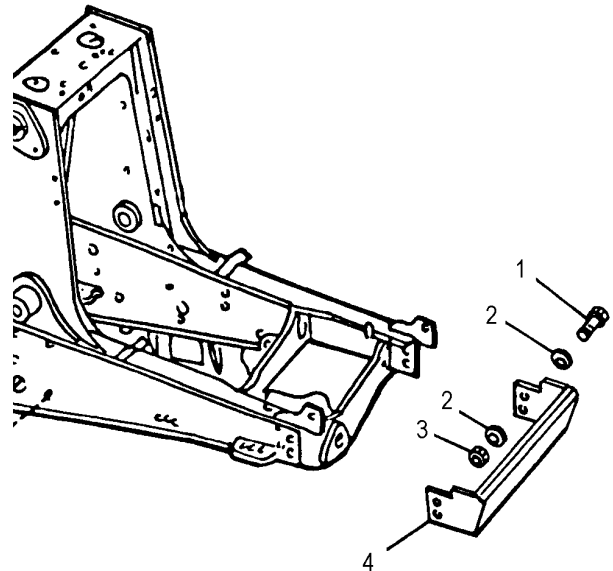
TX,17,QQ8954 -19-02JUN10-2/2

Remove and Install Frame Bumper

1. Raise loader boom and install lock bar.
2. Attach hoist to bumper (4).
3. Remove cap screws (1), washers (2) and nut (3) to remove bumper.
4. Install bumper, using washers, cap screws and nuts.

1— Cap Screw (4 used)
2— Washer (8 used)

3— Nut (4 used)
4— Bumper



T106732

T106732 —UN—17JAN97

TX,17,QQ8955 -19-24OCT94-1/1

Chassis Weights

Section 18 Operator's Station

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Contents

Group 1800 Removal and Installation

Service Equipment and Tools

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or from the

SERVICEGARD is a trademark of Deere & Company

European Microfiche Tool Catalog (MTC). Some tools may be available from a local supplier.

CED, TX03399, 5669 -19-06DEC99-1/2

Lift Bracket.....¹DFT1101 Used to remove and install cab.

¹*Fabricated tool, dealer made. (See Group 1899 for instructions to make tool).*

CED, TX03399, 5669 -19-06DEC99-2/2

Specifications

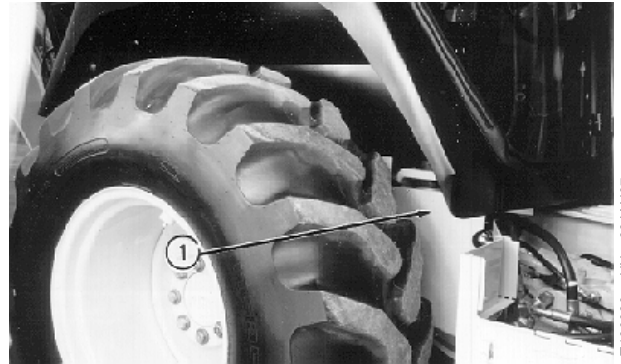
Item	Measurement	Specification
Cab	Weight	817 kg (1800 lb)
Cab and ROPS Isolator Cap Screws	Torque	420 N·m (310 lb-ft)

CED, TX03399, 5670 -19-06DEC99-1/1

Remove and Install Cab/ROPS

NOTE: Cab and ROPS removal and installation are similar. The cab is shown.

1. Raise loader boom and install boom safety lock. Remove engine side shields and cowl.
2. Disconnect backhoe boom lock and raise machine with stabilizers and the backhoe. Support machine with shop stands.
3. Remove rear wheels and right rear panel (1).
4. Disconnect batteries negative (—) ground cable.



T100069—UN—03JAN97

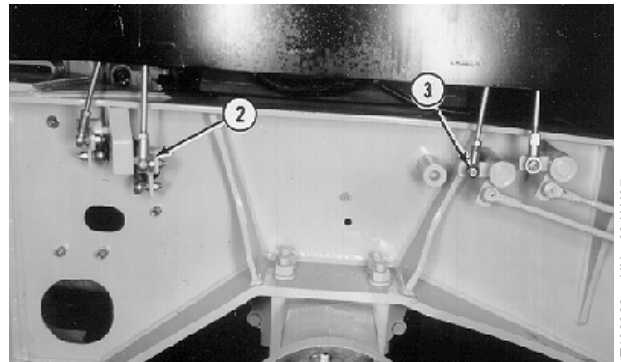
1—Rear Panel

TX, 18, QQ9586 -19-13JAN99-1/12

5. Remove nuts to disconnect ball joints on loader linkage (3) and stabilizer linkage (2).
6. Remove floor mat and floor access panel in cab.
7. Drain radiator. Approximate capacity is 16 L (17 qt).

2—Stabilizer Linkage

3—Loader Linkage



T100382—UN—03JAN97

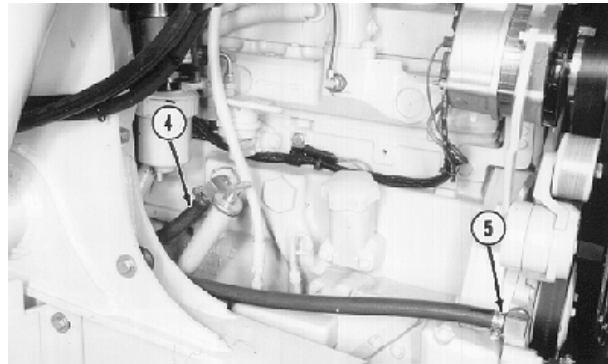
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TX, 18, QQ9586 -19-13JAN99-2/12

8. Disconnect heater hoses (4 and 5).

4— Heater Hose

5— Heater Hose

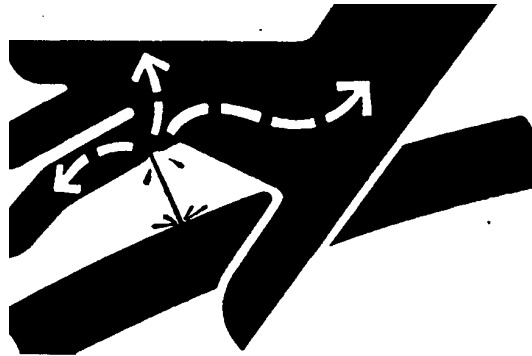


T100383 —UN—03JAN97

TX,18,QQ9586 -19-13JAN99-3/12

⚠ CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.



X9811 —UN—23AUG88

9. Operate all hydraulic control valves to release pressure in the hydraulic system.

Continued on next page

TX,18,QQ9586 -19-13JAN99-4/12

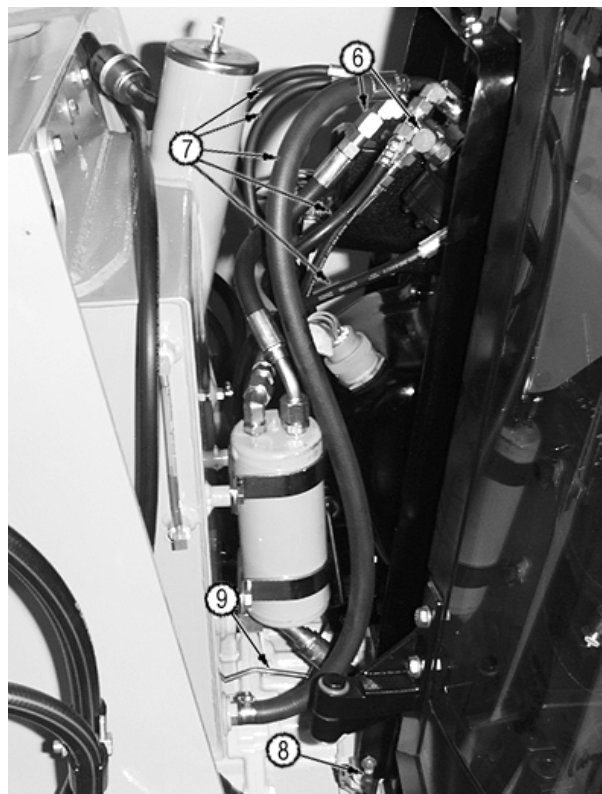
Removal and Installation

10. Disconnect (6—9). Cap and plug lines and hoses.

6— Brake Lines (Pressure In and Return) on Top of Brake Valve

7— Steering Valve Lines (5 used)

8— Ground Wire
9— Throttle Linkage



T1106017B —UN—02JAN97

TX,18,QQ9586 -19-13JAN99-5/12

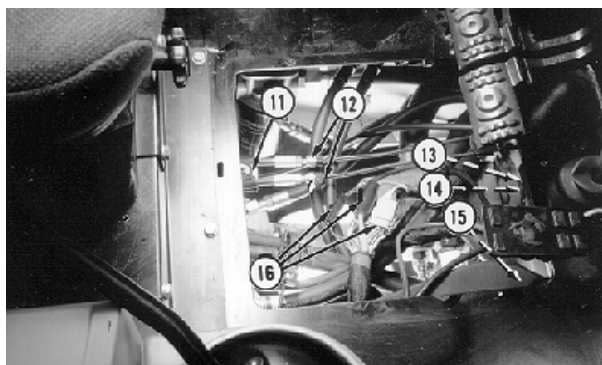
11. Disconnect the following (11—16). Disconnect shift lever.

12. Remove backhoe control lever cover. Disconnect backhoe control valve linkage.

13. Remove two cap screws to disconnect bracket. Pull backhoe linkage through floor.

11— Clamp
12— Brake Line (2 used)
13— Cap Screw (3 used)

14— Transmission Shift Lever Wiring Lead
15— Air Circulating Hose
16— Floor Harness to Engine Harness Connectors



T1100385 —UN—03JAN97

Continued on next page

TX,18,QQ9586 -19-13JAN99-6/12

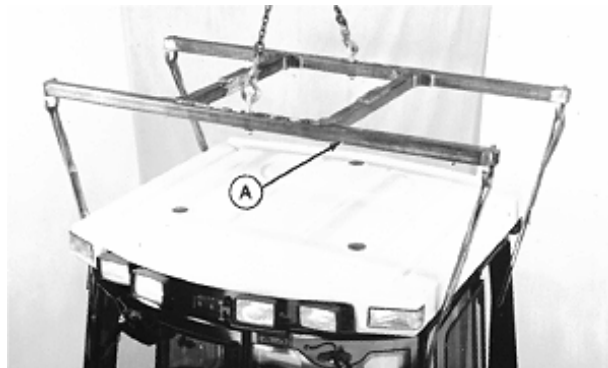
CAUTION: Cab weighs approximately 817 kg (1800 lb).

NOTE: See DFT1101 Cab and ROPS Lift Bracket in Group 1899 Dealer Fabricated Tools.

14. Install DFT1101 Cab and ROPS Lift Bracket (A) using chains and lifting straps. Install lifting straps to the window latch on all four posts of cab.

15. Remove cab mounts.

16. Carefully remove cab and support cab with shop stands.



T7520BV —JUN—02MAY91

Specification

Cab—Weight..... 817 kg (1800 lb)

A—Lift Bracket

17. Install cab and mounts. Tighten four cap screws to specifications.

Specification

Cab and ROPS Isolator

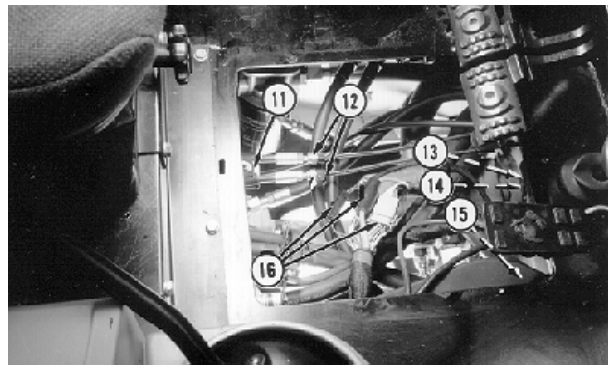
Cap Screws—Torque..... 420 N·m (310 lb-ft)

TX,18,QQ9586 -19-13JAN99-7/12

18. Install bracket and connect backhoe linkage. Install backhoe control lever cover.

19. Connect the following (11—16).

- | | |
|-------------------------|--|
| 11— Clamp | 14— Transmission Shift Lever Wiring Lead |
| 12— Brake Line (2 used) | 15— Air Circulating Hose |
| 13— Cap Screw (3 used) | 16— Floor Harness to Engine Harness Connectors |



T100385 —JUN—03JAN97

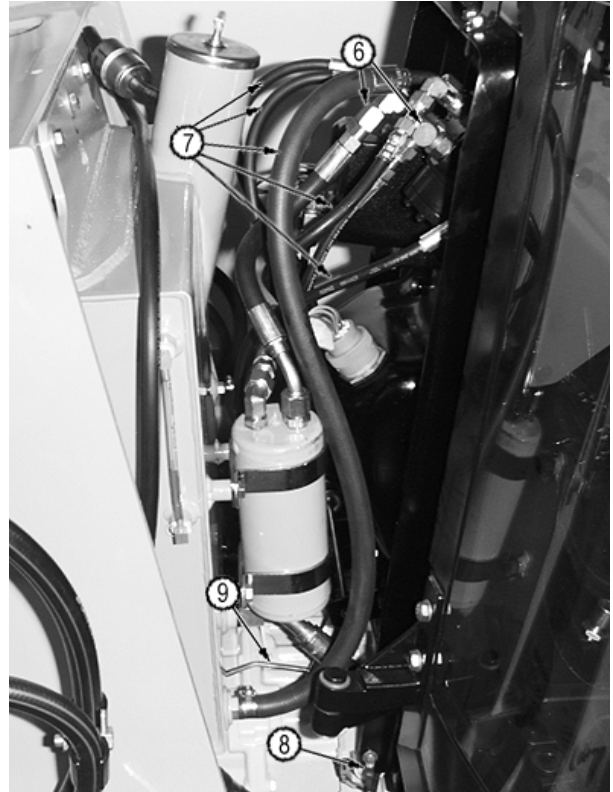
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TX,18,QQ9586 -19-13JAN99-8/12

Removal and Installation

- 20. Connect steering lines (7) and brake lines (6)
- 21. Connect throttle linkage (9) and ground wire (8).

- 6— Brake Lines (Pressure In and Return) on Top of Brake Valve
- 7— Steering Valve Lines (5 used)
- 8— Ground Wire
- 9— Throttle Linkage

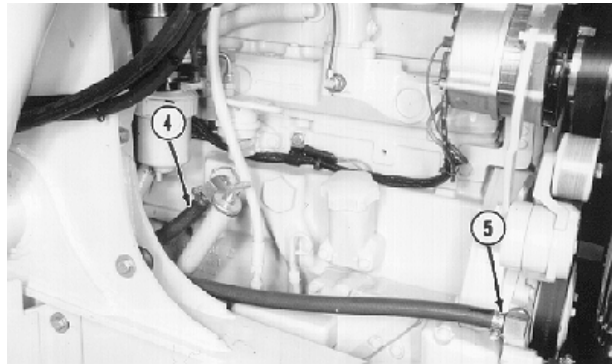


T1106017B —UN—02JAN97

TX,18,QQ9586 -19-13JAN99-9/12

- 22. Connect heater hoses (4 and 5).

- 4— Heater Hose
- 5— Heater Hose



T1100383 —UN—03JAN97

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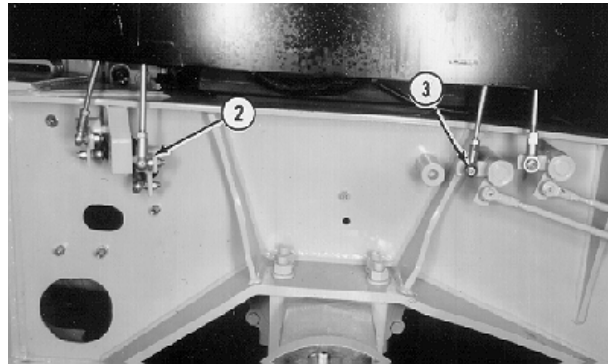
TX,18,QQ9586 -19-13JAN99-10/12

Removal and Installation

23. Connect loader and stabilizer linkage (2 and 3).

2— Stabilizer Linkage

3— Loader Linkage



T100382 —UN—03JAN97

TX,18,QQ9586 -19-13JAN99-11/12

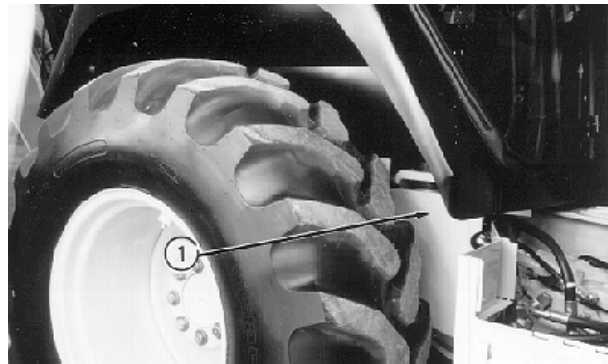
24. Install right rear panel (1) and rear wheels.

25. Install floor access panel and floor mat in cab.

26. Connect batteries negative (—) ground cable.

27. Fill radiator. Approximate capacity is 16 L (17 qt).

1— Rear Panel



T100069 —UN—03JAN97

TX,18,QQ9586 -19-13JAN99-12/12

Group 1810 Operator Enclosure

Other Material

Number	Name	Use
TY16285 (U.S.) CXTY16285 (Canadian) 7649 (LOCTITE®)	Cure Primer	Apply to right fixed window bracket-to-glass cap screws. Apply to threads of cap screws to latch
T43512 (U.S.) TY9473 (Canadian) 242 (LOCTITE®)	Thread Lock and Sealer (Medium Strength)	Apply to right fixed window bracket-to-glass cap screws.
AR31790 (U.S.)	Multipurpose Sealant Adhesive	Apply to corners of door seals.
TY24311 (U.S.) CXTY24311 (Canadian) 222 (LOCTITE®)	Thread Lock and Sealer (Low Strength)	Apply to threads of cap screws to latch.

LOCTITE is a registered trademark of Loctite Corp.

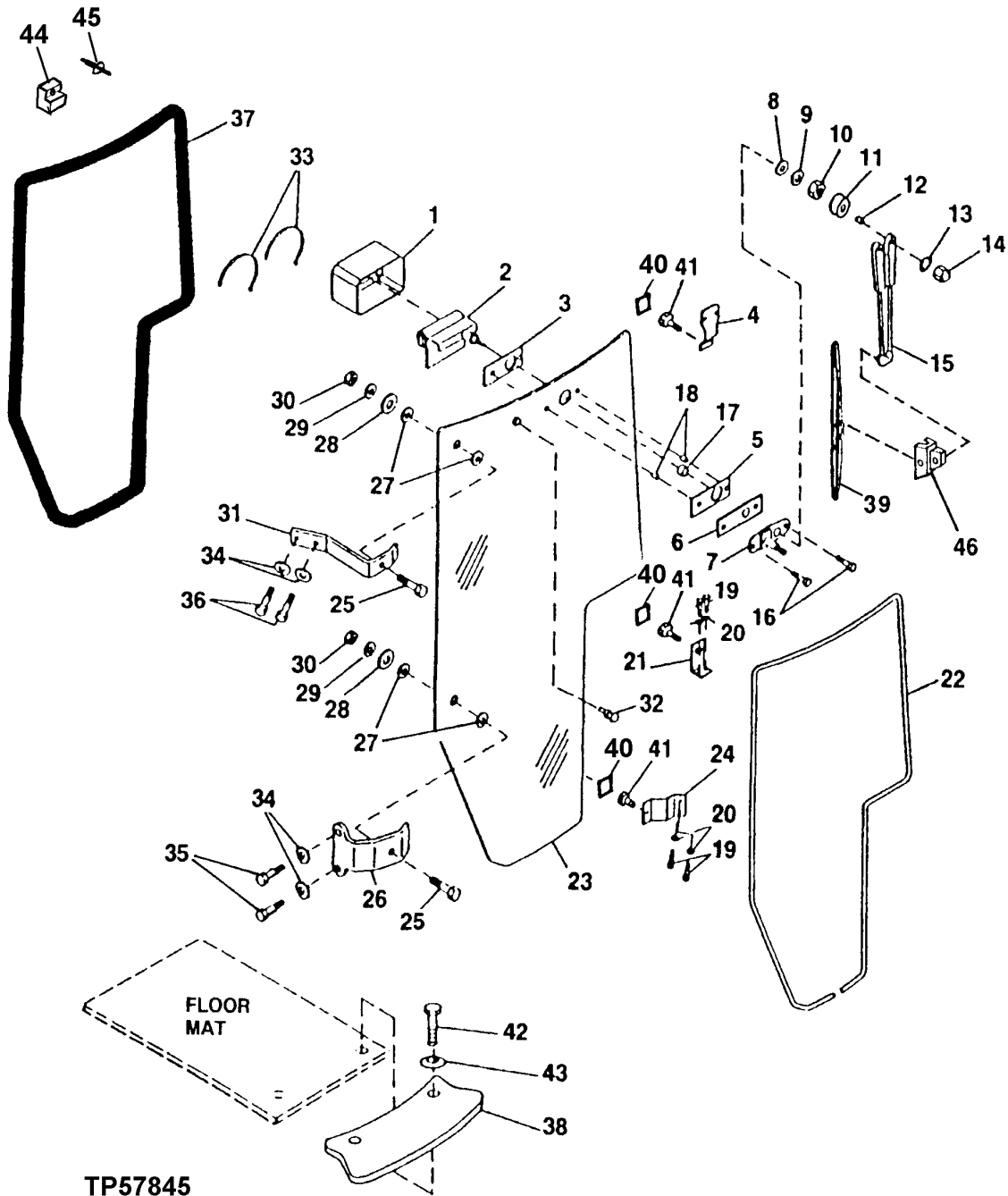
CED,TX03399,5671 -19-06DEC99-1/1

Specifications

Item	Measurement	Specification
Door Latch Striker Nut	Torque	65 ± 13 N·m (48 ± 10 lb-ft)
Door Hinge Cap Screws	Torque	61 ± 12 N·m (45 ± 9 lb-ft)
Cab Frame-to-Door Frame	Clearance	10—12 mm (0.4—0.5 in.)
Lock-to-Top of Left Door Handle Adjusting Screw	Distance	38 mm (1.5 in.)
Lock-to-Top of Right Door Handle Adjusting Screw	Distance	46 mm (1.8 in.)
Door Handle Adjusting Screw Lock Nut	Torque	8.8 N·m (78 lb-in.)
Cap Screw-to-Latch	Torque	3 N·m (26 lb-in.)
Rear Window Latch-to-Cab Frame Screw	Torque	24 ± 2.5 N·m (18 ± 2 lb-ft)
Cab Roof Cap Screw	Torque	6.78 + 0 —1.5 N·m (5 + 0 —1.1 lb-ft)

CED,TX03399,5672 -19-06DEC99-1/1

Disassemble and Assemble Fixed Right Front Cab Window and Wiper Motor



TP57845—UN—17MAR98

Continued on next page

TX, 18, QQ8289 -19-01NOV99-1/2

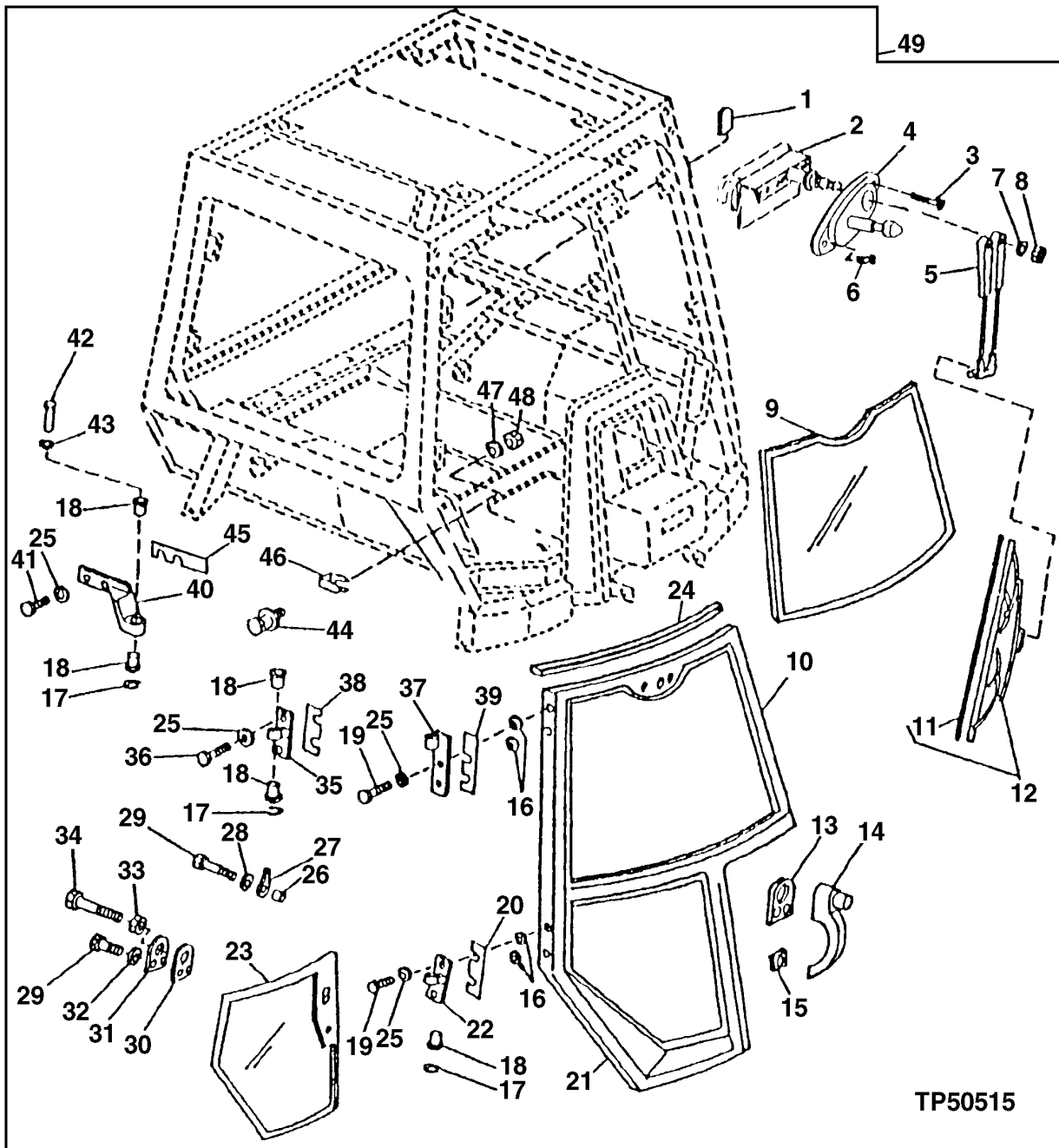
Operator Enclosure

1— Cover	13— Lock Washer	25— Cap Screw (2 used)	37— Window Seal
2— Wiper Motor Assembly	14— Cap Nut	26— Hinge	38— Guard
3— Rear Isolator	15— Wiper Arm	27— Washer (4 used)	39— Windshield Wiper
4— Top Support Bracket	16— Screw	28— Washer (2 used)	40— Pad (3 used)
5— Front Isolator	17— Bushing	29— Washer	41— Button (3 used)
6— Plate	18— Bushing	30— Nut (2 used)	42— Screw (2 used)
7— Plate	19— Screw (4 used)	31— Bracket	43— Washer (2 used)
8— Washer	20— Washer (4 used)	32— Plug	44— Support Backing
9— Steel Washer	21— Plate	33— Tie Band	45— Rivet
10— Nut	22— Isolator	34— Washer	
11— Rubber Cap	23— Windowpane	35— Cap Screw (2 used)	
12— Nut	24— Plate	36— Cap Screw (2 used)	

1. Remove cover (1) and tie bands (33) to disconnect wire leads and remove wiper motor (2). If equipped, remove washer nozzle and tube.
2. Disassemble parts as shown.
3. Inspect for worn or damaged parts. Replace as necessary.
4. To install new isolator (22):
 - a. Clean glass edge with rubbing alcohol and wipe dry with clean rag.
 - b. Start at the bottom center of the glass, remove backing from isolator and apply isolator to edge of glass all the way around.
 - c. Cut end off even with starting point.
 - d. Roll entire edge with roller to ensure seal is tightly secured and all air gaps are removed.
 - e. Let cure 4 hours before installing window.
5. To install new window seal (37):
 - a. Clean old seal and adhesive from cab frame.
 - b. Install support (44) backing on curved surface of cab frame. Put the small backing below and centered between mounting holes of top left door hinge.
 - c. New seal is supplied with adhesive tape along the straight sections of the seal and no adhesive at corners. Do not remove tape until ready to install seal.
 - d. After seal is install on cab frame, lightly sand corners of seal to scuff surface. Apply multipurpose sealant adhesive to seal corners and put in place.
 - e. Roll entire seal with roller to ensure seal is tightly secured and all air gaps are removed.
6. Assemble remaining parts using medium strength thread lock and sealant to right bracket and pivot cap screws.
7. Connect wire leads to wiper motor (2) and connect washer nozzle and tube. Install cover (1) using tie bands (33).

TX,18,QQ8289 -19-01NOV99-2/2

Disassemble and Assemble Right Cab Door and Wiper Motor



- | | | | |
|----------------------|------------------------|------------------------|------------------------|
| 1— Cover | 13— Grommet | 25— Washer (8 used) | 37— Hinge |
| 2— Wiper Motor | 14— Handle | 26— Spacer (3 used) | 38— Shim (As Required) |
| 3— Cap Screw | 15— Grommet | 27— Grommet | 39— Shim (As Required) |
| 4— Plate | 16— Washer | 28— Washer | 40— Hinge |
| 5— Wiper Arm | 17— Snap Ring (2 used) | 29— Cap Screw (3 used) | 41— Cap Screw (2 used) |
| 6— Screw | 18— Bushing (4 used) | 30— Grommet | 42— Pin (2 used) |
| 7— Washer | 19— Cap Screw (4 used) | 31— Plate | 43— Washer (2 used) |
| 8— Nut | 20— Shim (As Required) | 32— Washer (2 used) | 44— Striker |
| 9— Windowpane | 21— Door | 33— Nut | 45— Shim (As Required) |
| 10— Seal | 22— Hinge | 34— Screw | 46— Guard |
| 11— Wiper Blade | 23— Windowpane | 35— Hinge | 47— Washer |
| 12— Windshield Wiper | 24— Seal | 36— Screw | 48— Nut |

TP50515

TP50515—UN—28OCT96

Continued on next page

TX.18.QQ8290-19-13JAN99-1/3

Operator Enclosure

1. Remove parts (1—8). Disconnect wire leads and washer tube, if equipped, when removing wiper motor (2).
2. Disassemble parts as shown.
3. Inspect for worn or damaged parts. Replace as necessary.

NOTE: To replace windowpane (9 or 23), see *Remove and Install Windowpanes*, in this group.

To adjust door frame (10), see *Adjust Door Latches and Hinges*, in this group.

4. Assemble parts noting the following:
 - Tighten nut (48) to specifications.

Specification

Door Latch Striker
Nut—Torque..... 65 ± 13 N·m (48 ± 10 lb-ft)

- Tighten cap screws (41) to specifications.

Specification

Door Hinge Cap
Screws—Torque..... 61 ± 12 N·m (45 ± 9 lb-ft)

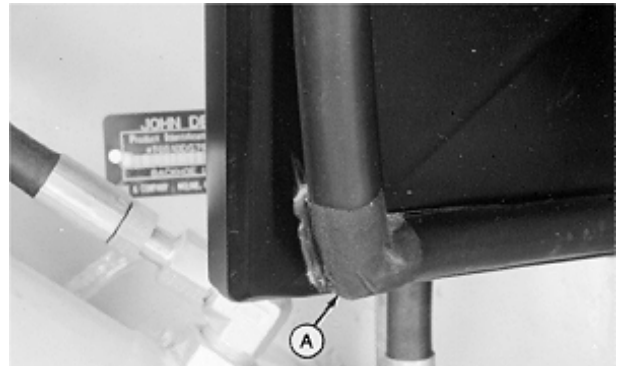
- Depress and hold button on handle (14) while installing cap screws (29).

5. Connect wire leads to wiper motor (2) and connect washer tube, (if equipped). Install parts (1—8).

TX,18,QQ8290 -19-13JAN99-2/3

6. To install new door seal using adhesive, clean old seal and adhesive from edge of door using rubbing alcohol. New seal is supplied with adhesive tape along the straight sections of the seal, no adhesive at corners (A).

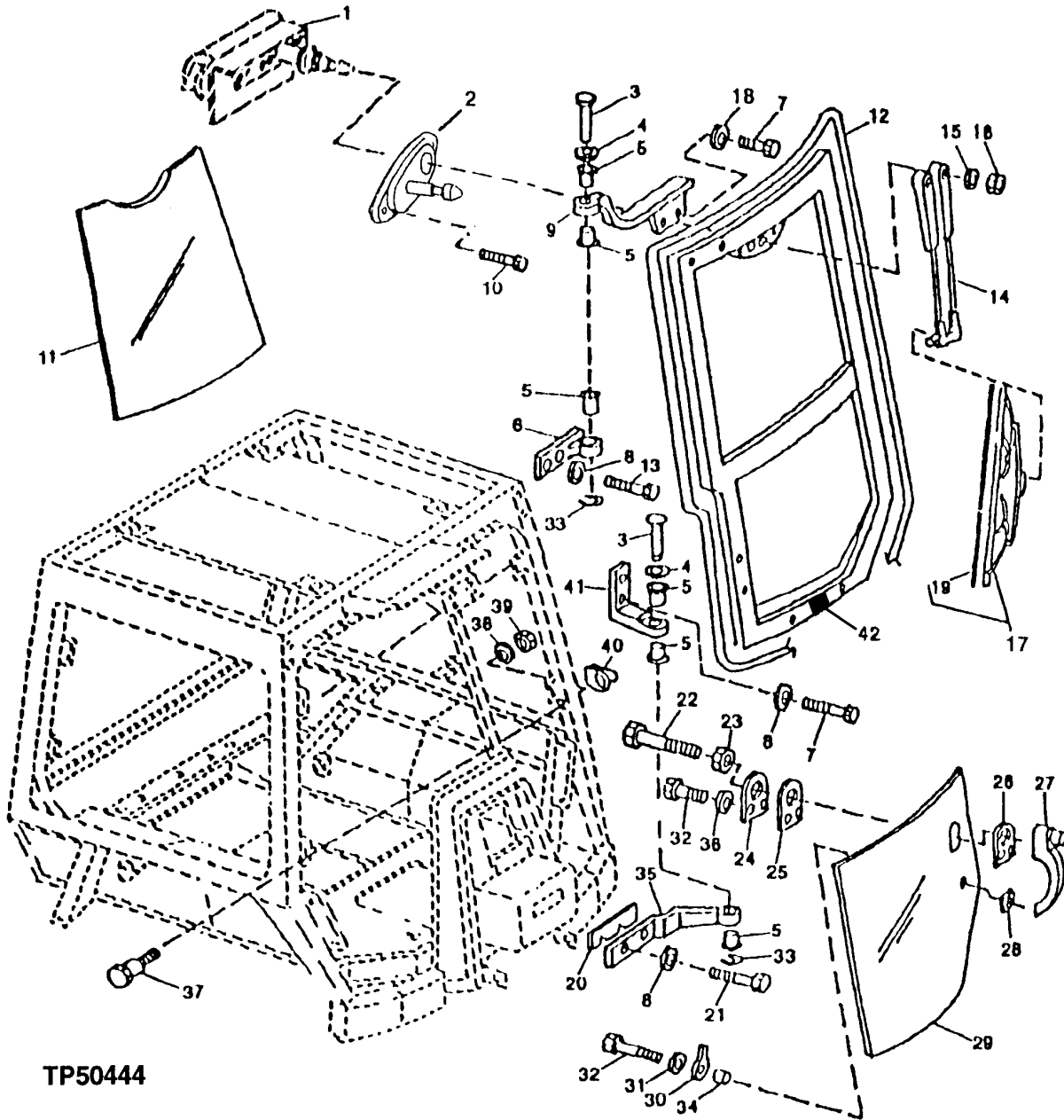
After seal is put on door, lightly sand corners of seal to scuff surface. Apply multipurpose sealant adhesive to seal and put seal in place.



T8147AK—UN—22DEC93

TX,18,QQ8290 -19-13JAN99-3/3

Disassemble and Assemble Left Cab Door and Wiper Motor



TP50444

- | | | | |
|-----------------------|------------------------|------------------------|---------------------|
| 1— Wiper Motor | 12— Seal | 23— Nut | 34— Spacer (3 used) |
| 2— Plate | 13— Cap Screw (2 used) | 24— Plate | 35— Hinge |
| 3— Pin (2 used) | 14— Wiper Arm | 25— Grommet | 36— Washer (2 used) |
| 4— Washer (2 used) | 15— Washer (2 used) | 26— Grommet | 37— Striker |
| 5— Bushing (4 used) | 16— Nut (2 used) | 27— Handle | 38— Washer |
| 6— Hinge | 17— Windshield Wiper | 28— grommet | 39— Nut |
| 7— Cap Screw (4 used) | 18— Washer (2 used) | 29— Windowpane | 40— Guard |
| 8— Washer (6 used) | 19— Wiper Blade | 30— Grommet | 41— Hinge |
| 9— Hinge | 20— Shim (As Required) | 31— Washer | 42— Pad |
| 10— Screw (2 used) | 21— Cap Screw (2 used) | 32— Cap Screw (2 used) | |
| 11— Windowpane | 22— Screw | 33— Snap Ring (2 used) | |

TP50444—UN—08OCT96

Continued on next page

TX,18,QQ8291-19-02APR93-1/3

Operator Enclosure

1. Remove parts (1, 2, 10, and 14—16). Disconnect wire leads and washer tube if equipped when removing wiper motor (1).
2. Disassemble parts as shown.
3. Inspect for worn or damaged parts. Replace as necessary.

NOTE: To replace windowpane (11 or 29), see *Remove and Install Windowpanes, this group*.

To adjust door frame (42), see *Adjust Door Latches and Hinges, this group*.

4. Assemble parts noting the following:
 - Tighten nut (39) to specifications.

Specification

Door Latch Striker

Nut—Torque..... 65 ± 13 N·m (48 ± 10 lb-ft)

- Tighten cap screws (7, 13, and 21) to specifications.

Specification

Door Hinge Cap

Screws—Torque..... 61 ± 12 N·m (45 ± 9 lb-ft)

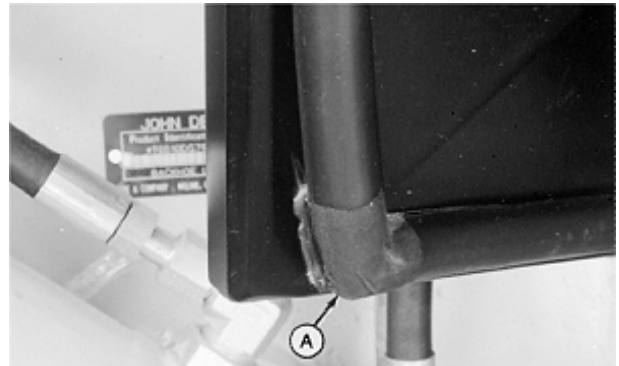
- Depress and hold button on handle (21) while installing cap screws (27).

5. Connect wire leads to wiper motor (1) and connect washer tube. Then, install parts (1, 2, 10, and 14—16).

TX,18,QQ8291 -19-02APR93-2/3

6. To install new door seal using adhesive, clean old seal and adhesive from edge of door using rubbing alcohol. New seal is supplied with adhesive tape along the straight sections of the seal, no adhesive at corners (A).

After seal is put on door, lightly sand corners of seal to scuff surface. Apply multipurpose sealant adhesive to seal and put seal in place.



T8147AK—UN—22DEC93

TX,18,QQ8291 -19-02APR93-3/3

Adjust Cab Right Door Latch and Hinges

NOTE: Cab door is designed with a slight vertical bow. Normally, top and bottom edges will contact cab before center (latch side) edge. Door must be pulled in at center (to flex the door slightly) to latch it. Also, it takes more effort to latch right door than left door.

1. Check door seal for proper compression. Seal (B) should be evenly compressed around door to provide a clearance of 10–12 mm (0.4–0.5 in.) between cab frame (A) and door frame (C).

If excessive clearance exists only at center door area (above console), see procedure in step 3; otherwise, continue with step 2.

Specification

Cab Frame-to-Door
Frame—Clearance..... 10–12 mm (0.4–0.5 in.)

2. If excessive clearance (gap) exists from console to near top of door, but NOT below console, adjust top hinge to cab frame:
 - Loosen two cap screws connecting top hinge to cab frame. Push against top of door and move top hinge toward rear of machine. Tighten cap screws and check clearance. If clearance now is only at center area of door, go to step 3.

NOTE: Hinge mounting holes are slotted to provide for minor adjustments. Hinges attached to cab frame have horizontal slotted holes which provide forward and rearward adjustments. Hinges attached to door frame have vertical slotted holes for upward and downward adjustments.

- After adjusting hinges, tighten cap screws to specification.

Specification

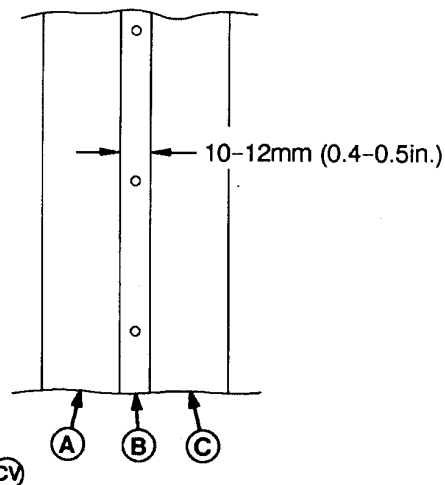
Door Hinge Cap
Screws—Torque..... 61 ± 12 N·m (45 ± 9 lb-ft)

A—Cab Frame
B—Door Seal

C—Door Frame



T7976BI—UN—14APR93



T7959AO (CV)

T7959AO—UN—08APR93

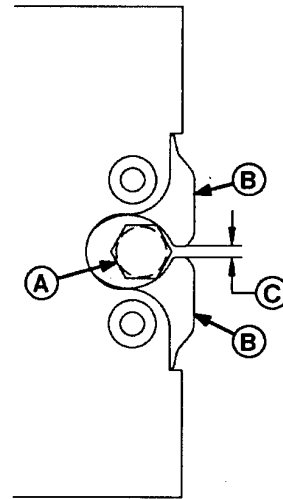
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TX,18,QQ9256 -19-25MAY93-1/2

NOTE: It may be possible to view latch jaw engagement with latch cover in place. If not, remove two screws and washers to remove cover.

3. Adjust latch and striker pin:

- If gap (C) between latch jaw ends (B) is approximately 10 mm (0.4 in.), latch is only in first detent position. Adjust latch to obtain second (primary) detent position. Loosen striker pin (A) and move it forward approximately 0.8 mm (0.03 in.). Tighten striker pin and check gap to make sure jaws are in second detent as described below. If necessary, repeat until second detent engagement is obtained.
- If gap (C) between latch jaw ends (B) is approximately 1—2 mm (0.04—0.08 in.), latch is in second (primary) detent position. To decrease clearance at door center, loosen striker pin (A) and move it rearward about 0.8 mm (0.03 in.). Tighten striker pin and check clearance. If necessary, repeat until clearance of 10—12 mm (0.4—0.5 in.) exists between cab frame and door frame.



T7959AP (CV)

A—Striker Pin
B—Latch Jaw Ends

C—Gap

Specification

Cab Frame-to-Door	
Frame—Clearance.....	10—12 mm (0.4—0.5 in.)

- After making adjustment, tighten striker pin nut to specification.

Specification

Door Latch Striker Pin	
Nut—Torque.....	65 ± 13 N·m (48 ± 10 lb-ft)

TX,18,QQ9256 -19-25MAY93-2/2

T7959AP —UN—08APR93

Adjust Cab Left Door Latch and Hinges

NOTE: Cab door is designed with a slight vertical bow. Normally, top and bottom edges will contact cab before center (latch side) edge. Door must be pulled in at center (to flex the door slightly) to latch it.

1. Check door seal for proper compression. Seal (B) should be evenly compressed around door to provide a clearance of 10—12 mm (0.4—0.5 in.) between cab frame (A) and door frame (C).

If excessive clearance exists only at center door area, see procedures in step 3; otherwise, continue with step 2.

Specification

Cab Frame-to-Door
Frame—Clearance..... 10—12 mm (0.4—0.5 in.)

2. If excessive clearance (gap) exists from latch to near top of door, shim between hinge and cab frame:

- Loosen two cap screws connecting bottom hinge to cab frame. Add 1—3 shims between hinge and cab frame and install cap screws. Close door and check clearance. If necessary, repeat until clearance of 10—12 mm (0.4—0.5 in.) is obtained between cab frame (A) and door frame (C). If clearance now is only at center area of door, go to step 3.

NOTE: Hinge mounting holes are slotted to provide for minor adjustments. Hinges attached to cab frame have horizontal slotted holes for left to right adjustments. Hinge sections attached to door frame have vertical slotted holes for upward and downward adjustments.

- After adjusting hinges, tighten cap screws to specification.

Specification

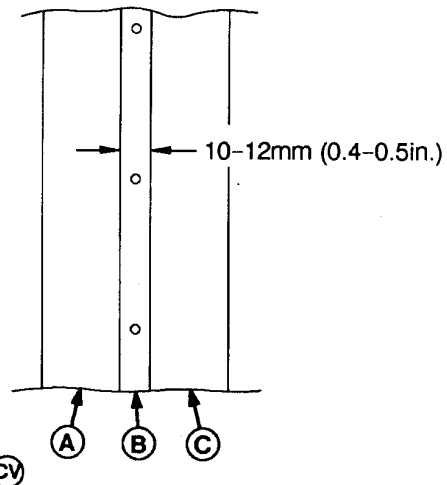
Door Hinge Cap
Screws—Torque..... 61 ± 12 N·m (45 ± 9 lb-ft)

A—Cab Frame
B—Seal

C—Door Frame



T7976BI—UN—14APR93



T7959AO—UN—08APR93

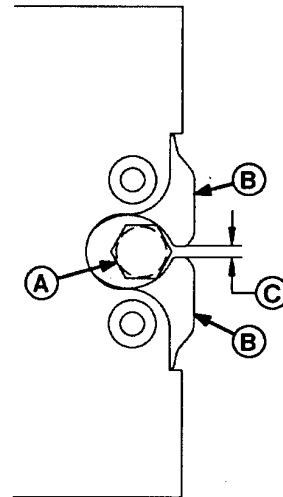
Continued on next page

TX,18,QQ9257 -19-25MAY93-1/2

NOTE: It may be possible to view latch jaw engagement with latch cover in place. If not, remove two screws and washers and move cover aside.

3. Adjust latch and striker pin:

- If gap (C) between latch jaw ends (B) is about 10 mm (0.4 in.), latch is only in first detent position. Adjust latch to obtain second (primary) detent position. Loosen striker pin (A) and move it forward approximately 0.8 mm (0.03 in.). Then, tighten striker pin and check gap to make sure jaws are in second detent as described below. If necessary, repeat until second detent engagement is obtained.
- If gap (C) between latch jaw ends (B) is about 1—2 mm (0.04—0.08 in.), latch is in second (primary) detent position. To decrease clearance at door center, loosen striker pin (A) and move it rearward about 0.8 mm (0.03 in.). Then, tighten striker pin and recheck clearance. If necessary, repeat until clearance of 10—12 mm (0.4—0.5 in.) is obtained between cab frame and door frame.



T7959AP (CV)

A—Striker Pin
B—Latch Jaw Ends

C—Gap

Specification	
Cab Frame-to-Door	
Frame—Clearance.....	10—12 mm (0.4—0.5 in.)

- After making adjustment, tighten striker pin nut to specification.

Specification

Door Latch Striker Pin	
Nut—Torque.....	65 ± 13 N·m (48 ± 10 lb-ft)

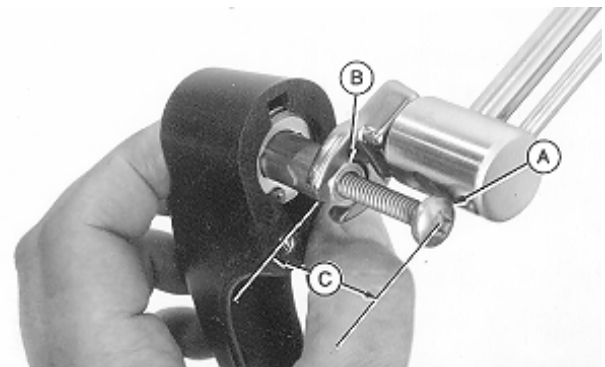
TX,18,QQ9257 -19-25MAY93-2/2

T7959AP —UN—08APR93

Adjust Cab Door Handle Screw

NOTE: If door handle is replaced, the door handle screw will require adjustment.

1. Install adjusting screw (A) and lock nut (B). Install screw until the distance (C) from the lock to the top of the screw is to dimension indicated.



A—Adjusting Screw
B—Lock Nut

C—Distance Between A and B

Specification	
Lock-to-Top of Left	
Door Handle Adjusting	
Screw—Distance.....	38 mm (1.5 in.)
Lock-to-Top of Right	
Door Handle Adjusting	
Screw—Distance.....	46 mm (1.8 in.)

IMPORTANT: The lock may be permanently damaged if correct procedure is not followed when lock nut is tightened.

2. With the lock mechanism unlocked, push button fully. Tighten lock nut to specification. Check dimension again after lock nut is tightened.

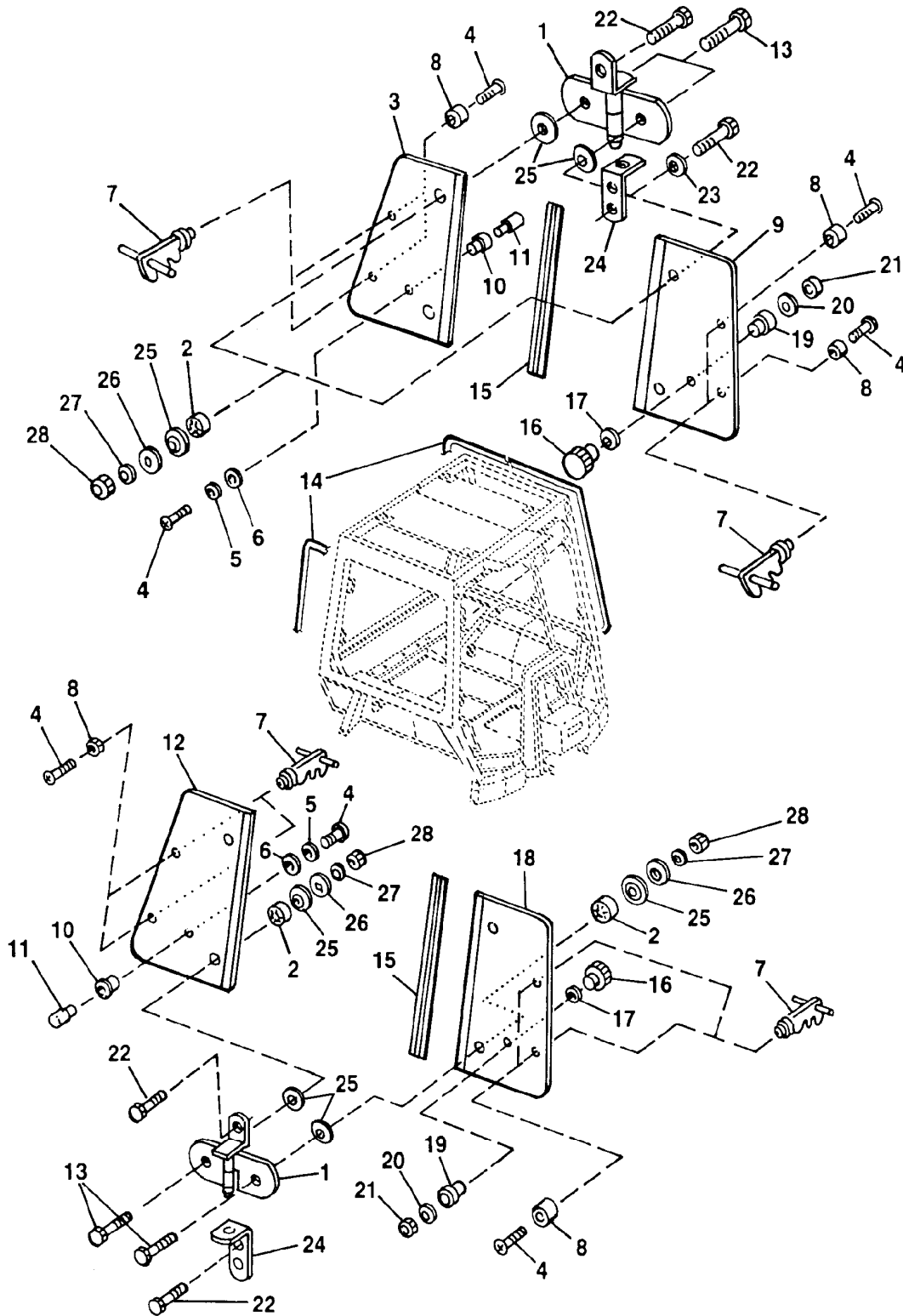
3. Install handle and check operation of lock. If further adjustment is required, push button fully before loosening lock nut.

Specification	
Door Handle	
Adjusting Screw Lock	
Nut—Torque.....	8.8 N·m (78 lb-in.)

TX,18,QQ9258 -19-28JUL94-1/1

T8288BH —UN—15JUL94

Disassemble and Assemble Cab Side Windows



T107252

Legend for Cab Side Windows

T107252—UN—14FEB97

Continued on next page

Operator Enclosure

- | | | | |
|---------------------------------|------------------------|-----------------------|-----------------------|
| 1— Hinge (4 used) | 8— Bumper (8 used) | 15— Isolator (2 used) | 22— Screw (12 used) |
| 2— Bushing (8 used) | 9— Window | 16— Knob (2 used) | 23— Washer (12 used) |
| 3— Window | 10— Washer (2 used) | 17— Washer (2 used) | 24— Angle (4 used) |
| 4— Self-Locking Screw (10 used) | 11— Bushing (2 used) | 18— Window | 25— Washer (16 used) |
| 5— Washer (2 used) | 12— Window | 19— Guard (2 used) | 26— Washer (8 used) |
| 6— Washer (2 used) | 13— Cap Screw (8 used) | 20— Washer (2 used) | 27— Washer (8 used) |
| 7— Latch (8 used) | 14— Isolator (2 used) | 21— Lock Nut (2 used) | 28— Lock Nut (8 used) |

1. Disassemble parts as shown.
2. Inspect for worn or damaged parts. Replace if necessary.
3. Apply cure primer, then thread lock and sealer (low strength) to threads of cap screw (4).
4. Tighten cap screw (4).

Specification

Cap Screw-to-
Latch—Torque..... 3 N·m (26 lb-in.)

5. Assemble parts.

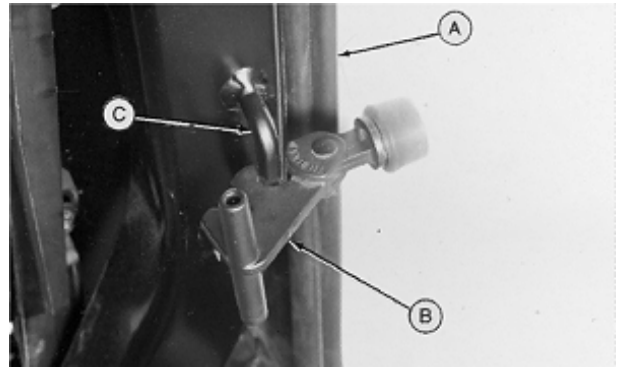
TX,18,QQ9595 -19-01NOV99-2/2

Adjust Cab Side Windows

1. Close window and lock using latch (B).
2. Check for even compression of seal (A).
3. Open window. Bend striker (C) to obtain correct compression of seal.

A—Seal
B—Latch

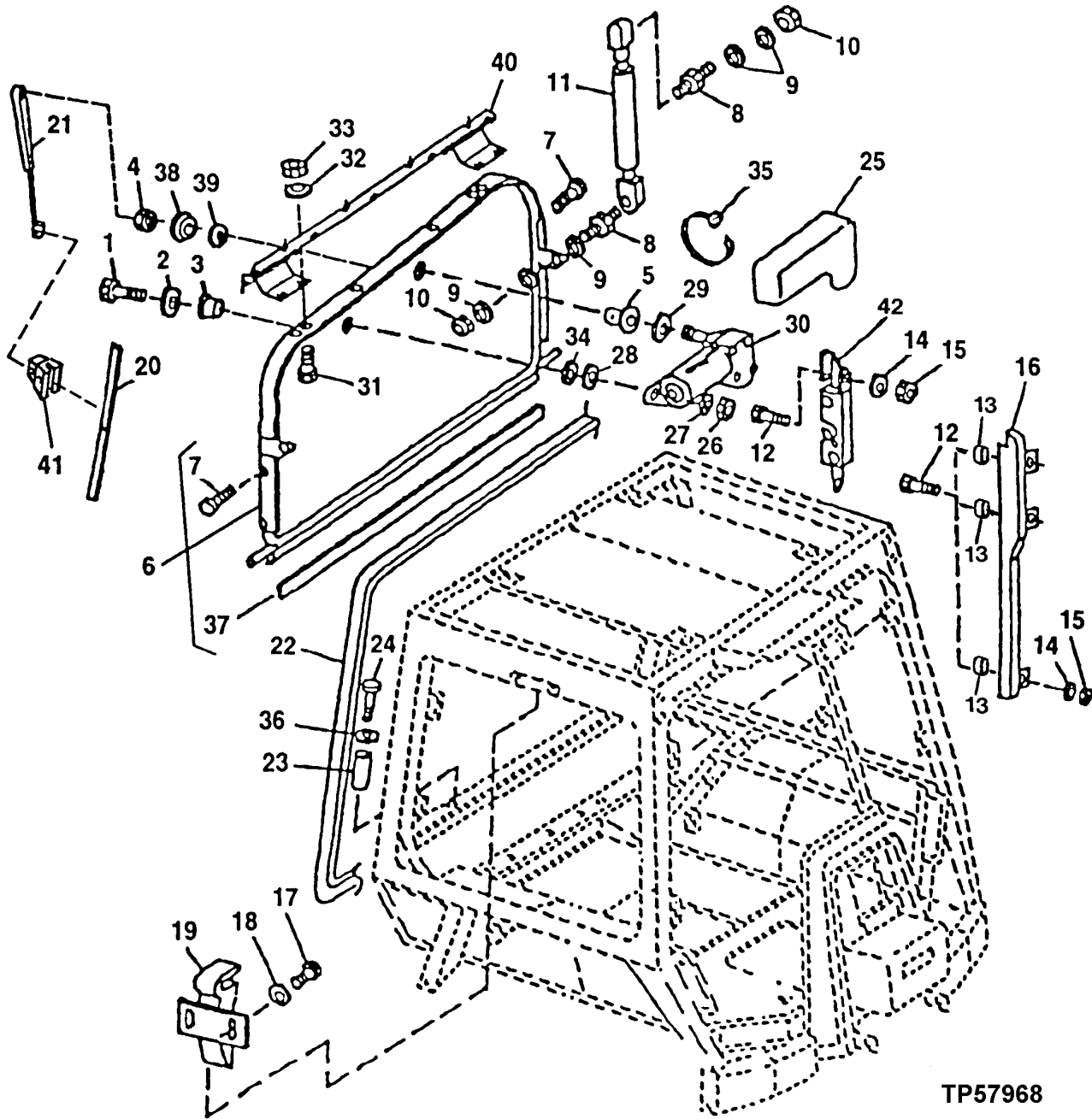
C—Striker



T7976BD —UN—19APR93

TX,18,QQ9260 -19-13APR93-1/1

Disassemble and Assemble Upper Rear Window and Wiper Motor



TP57968

- | | | | |
|----------------------|---|-----------------------|--------------------|
| 1—Screw | 12—Cap Screw (10 used) | 23—Bumper (2 used) | 34—Washer |
| 2—Washer | 13—Bushing (3 used) (S.N. 853621—) | 24—Cap Screw (2 used) | 35—Tie Band |
| 3—Washer | 14—Washer (10 used) | 25—Cover | 36—Washer (2 used) |
| 4—Nut | 15—Lock Nut (10 used) | 26—Nut | 37—Seal |
| 5—Washer | 16—Old Guide (S.N. —853674), New Guide (S.N. 853675—) | 27—Washer | 38—Spacer |
| 6—Window | 17—Cap Screw (4 used) | 28—Washer | 39—Gasket |
| 7—Screw (13 used) | 18—Washer (4 used) | 29—Washer | 40—Hinge |
| 8—Ball Stud (4 used) | 19—Latch (2 used) | 30—Wiper Motor | 41—Wiper Blade Kit |
| 9—Washer (4 used) | 20—Windshield Wiper | 31—Cap Screw (4 used) | 42—Latch |
| 10—Nut (4 used) | 21—Wiper Arm | 32—Washer (4 used) | |
| 11—Cylinder (2 used) | 22—Isolator | 33—Nut (4 used) | |

Continued on next page

TX,18,QQ9261 -19-01NOV99-1/2

Operator Enclosure

1. Disassemble parts as shown.
2. Inspect for worn or damaged parts. Replace if necessary.
3. With New Guides (16) above (S.N. 853675—) adjust the guides so the top of the guide is 6 mm (1/4 in.) below the lock/latch mechanism of the upper window. Adjust them side-to-side to provide just enough clearance with the window to allow it to slide freely.
4. Assemble parts. Tighten rear window latch to cab frame screw (17) to specification.

Specification

Rear Window	
Latch-to-Cab Frame	
Screw—Torque.....	24 ± 2.5 N·m (18 ± 2 lb-ft)

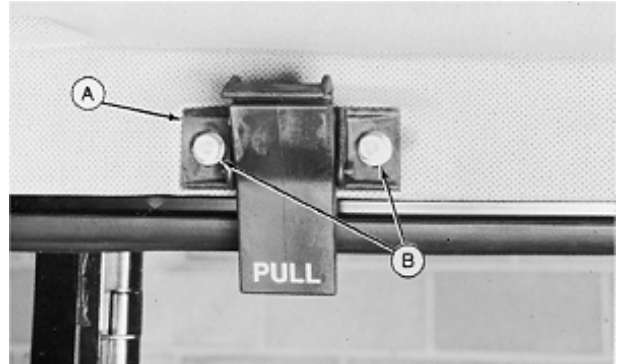
TX,18,QQ9261 -19-01NOV99-2/2

Adjust Upper Rear Window

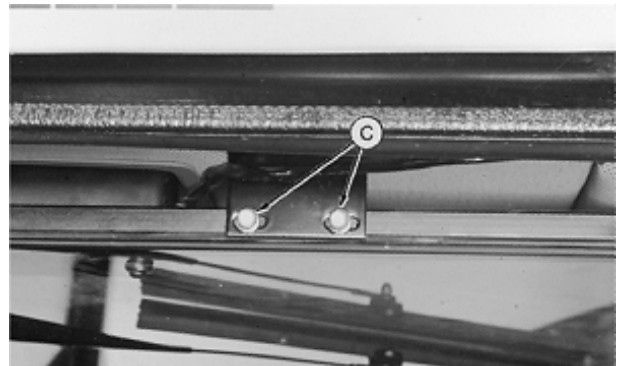
1. Adjust latches (A) to hold window up by loosening cap screws (B) and moving latch up or down. Tighten cap screws after proper latch engagement is obtained.
2. Open upper window and lock open using latches (A).
3. Align window to window opening by loosening screws (C) and moving window left or right. Tighten screws after checking alignment.

A—Latch
B—Cap Screws

C—Cap Screws



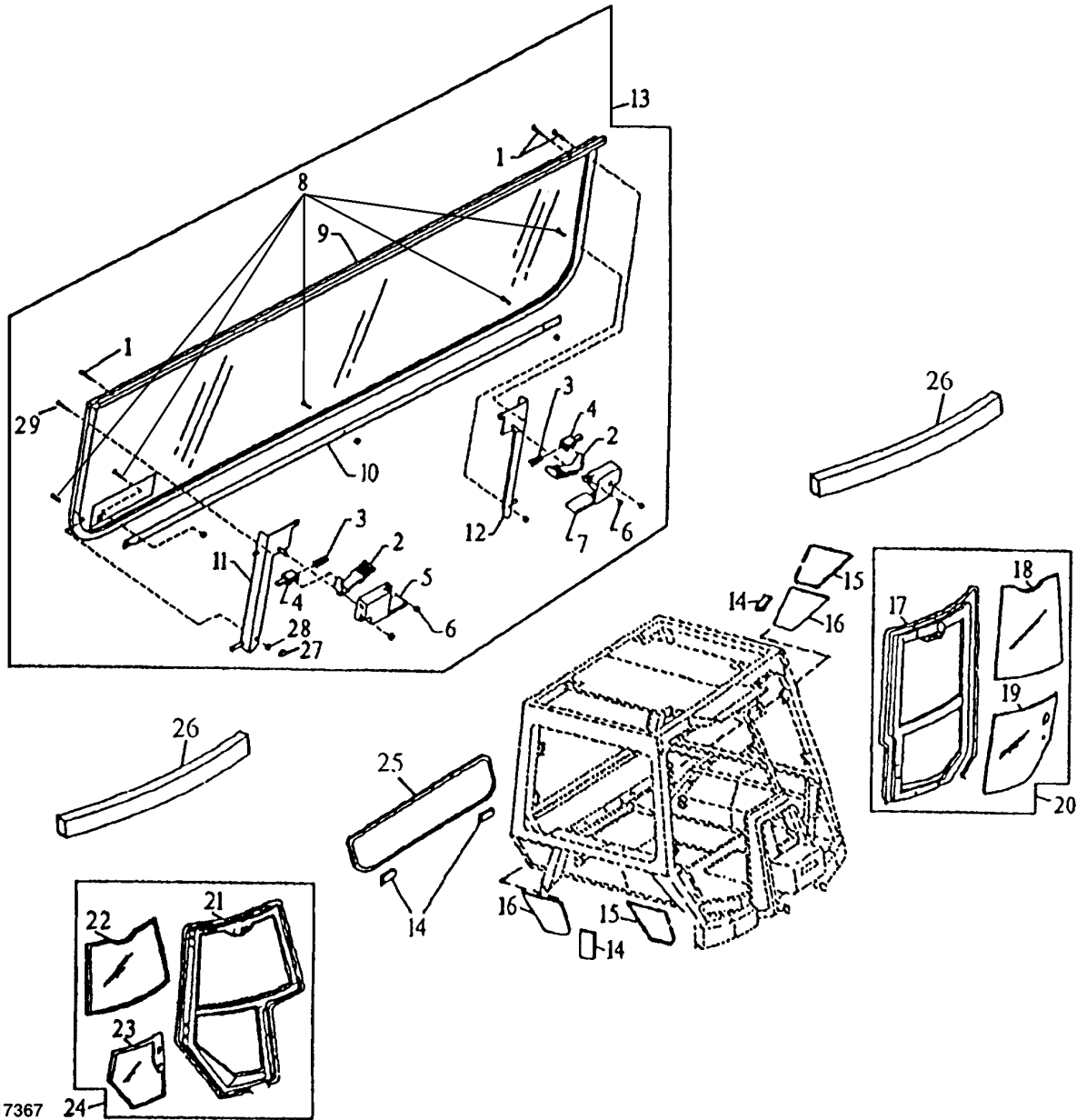
T7976BE—UN—19APR93



T7976BF—UN—19APR93

TX,18,QQ9262 -19-13APR93-1/1

Disassemble and Assemble Lower Rear Windows



- 1— Cap Screw (4 used)
- 2— Lever (2 used)
- 3— Spring (2 used)
- 4— Pin (2 used)
- 5— Latch
- 6— Lock Nut (9 used)
- 7— Latch
- 8— Cap Screw (5 used)

- 9— Rear Window
- 10— Support
- 11— Guide
- 12— Guide
- 13— Rear Lower Window
- 14— Stand-Off (12 used)
- 15— Sealant (as required)
- 16— Windowpane

- 17— Seal
- 18— Windowpane
- 19— Windowpane
- 20— Door
- 21— Seal
- 22— Windowpane
- 23— Windowpane
- 24— Door

- 25— Windowpane
- 26— Seal (2 used)
- 27— Washer (6 used)
- 28— Lock Nut (6 used)
- 29— Cap Screw (6 used)

1. Disassemble parts as shown.
2. Inspect for worn or damaged parts. Replace if necessary.

NOTE: To replace windowpanes, see Remove and Install Windowpanes in this group.

3. Assemble parts.

T117367 —UN—23SEP98

TX,18,QQ9263 -19-24MAY91-1/1

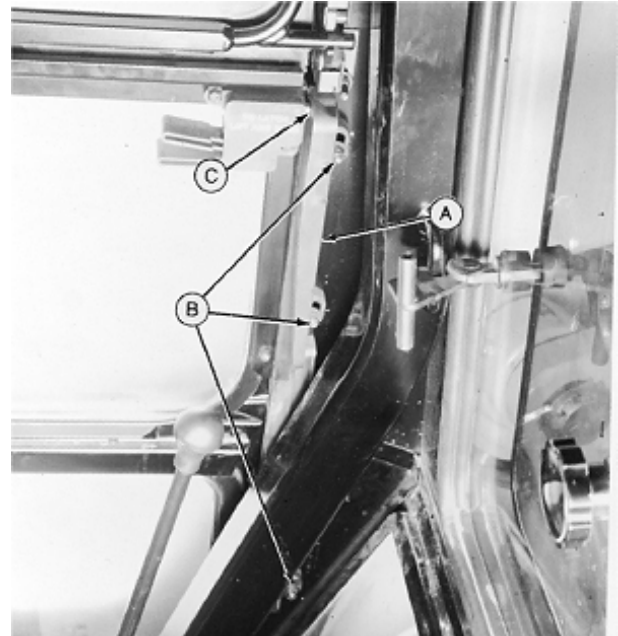
Adjust Lower Rear Window

NOTE: Slotted holes in guides (A) provide for vertical and slight horizontal adjustments.

Adjust lower window guide (A) by loosening three nuts (B). Move guide until latch pin engages in guide hole (C) and window evenly compresses seal. Repeat for other side. Tighten all nuts after correct alignment is obtained.

A—Window Guide
B—Nuts

C—Guide Hole



T7976BG—UN—19APR93

TX,18,QQ9264 -19-13APR93-1/1

Remove and Install Windowpanes

NOTE: Use this procedure to replace all door windowpanes and lower rear cab windowpane.

Use Quick Cure Primerless Autoglass Windshield Sealant or equivalent to hold windowpanes in place. DO NOT use any other type of adhesive other than a urethane. It is also recommended that an auto glass dealer install the windowpanes.

IMPORTANT: Windowpanes must have an ultra-violet barrier around the edge of the glass since ultra-violet rays will deteriorate the adhesive. Windowpanes ordered through John Deere Parts have the ultra-violet barrier. If the windowpane is purchased through a glass dealer, the dealer must put an ultra-violet barrier on the glass. DO NOT apply paint to the border of the glass.

If an auto glass dealer is not installing the windowpanes, use the following procedure:

1. Purchase urethane adhesive from your local auto glass dealer.

2. If window frame is removable, remove frame from cab.
3. Scrape broken glass off existing adhesive. DO NOT remove adhesive from window frame or cab.
4. Trim existing adhesive so it has a smooth surface.
5. Apply a 12.5 mm (1/2 in.) bead of adhesive on top of the existing adhesive.
6. Put a new windowpane into position. Use light hand pressure to force windowpane down around the edges until even with metal frame. DO NOT over press adhesive.
7. If windowpane is installed directly on cab, use tape to hold it in place while adhesive cures.
8. Allow adhesive to cure for 24 hours before operating machine.

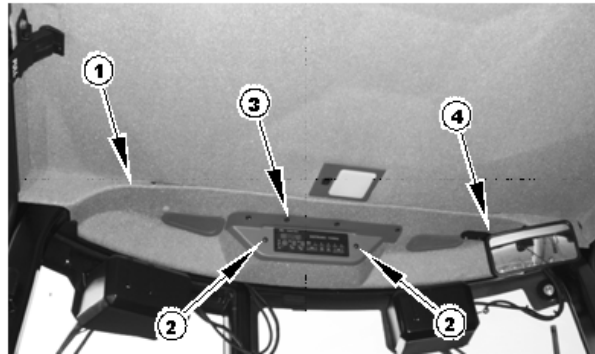
TX,18,QQ9601 -19-13JAN99-1/1

Remove and Install Headliner

NOTE: If machine does NOT have a radio, go to step 4.

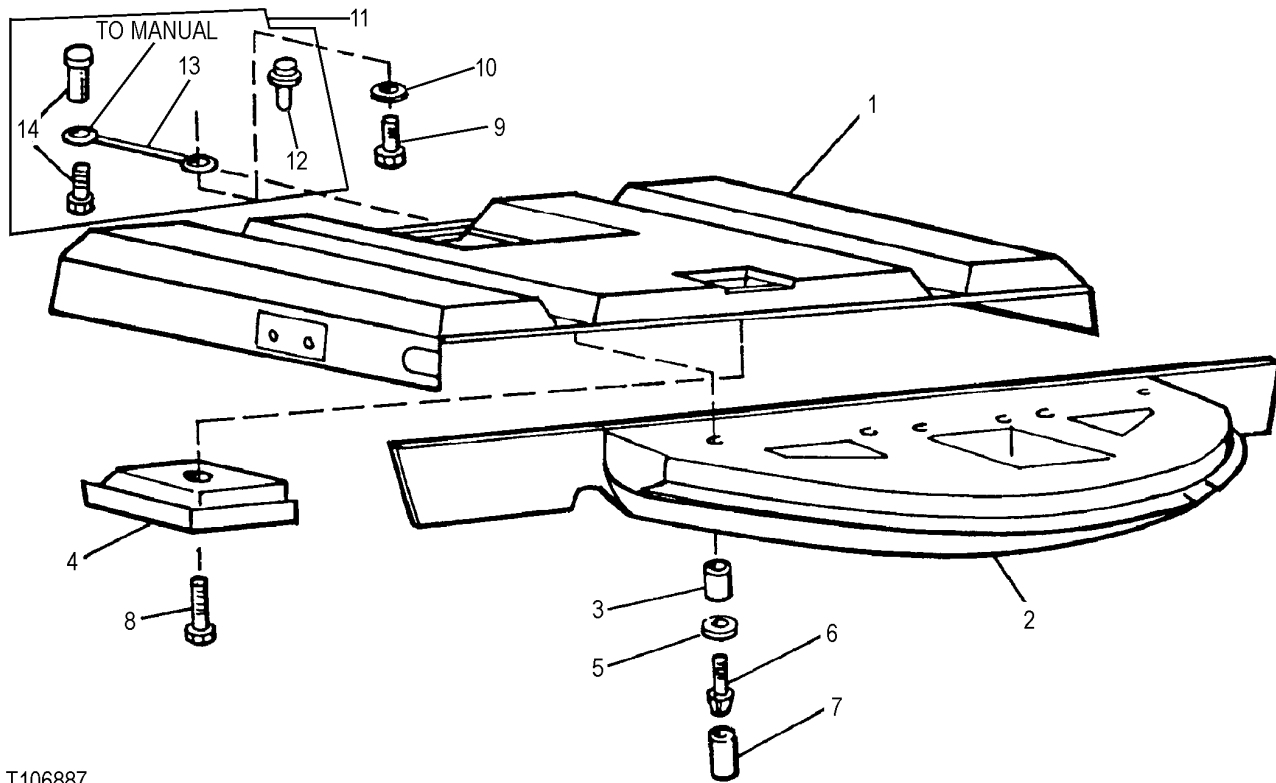
1. Remove screws (2 and 3) from radio and trim panel.
2. Remove radio with trim panel and disconnect antenna cable and wire harness.
3. Remove mirror assembly (4).

- | | |
|-------------------|--------------------|
| 1— Headliner | 3— Screw (7 used) |
| 2— Screw (2 used) | 4— Mirror Assembly |



T106633B—UN—10SEP96

TX,18,QQ9602 -19-05FEB94-1/2



T106887

T106887—19—27JAN97

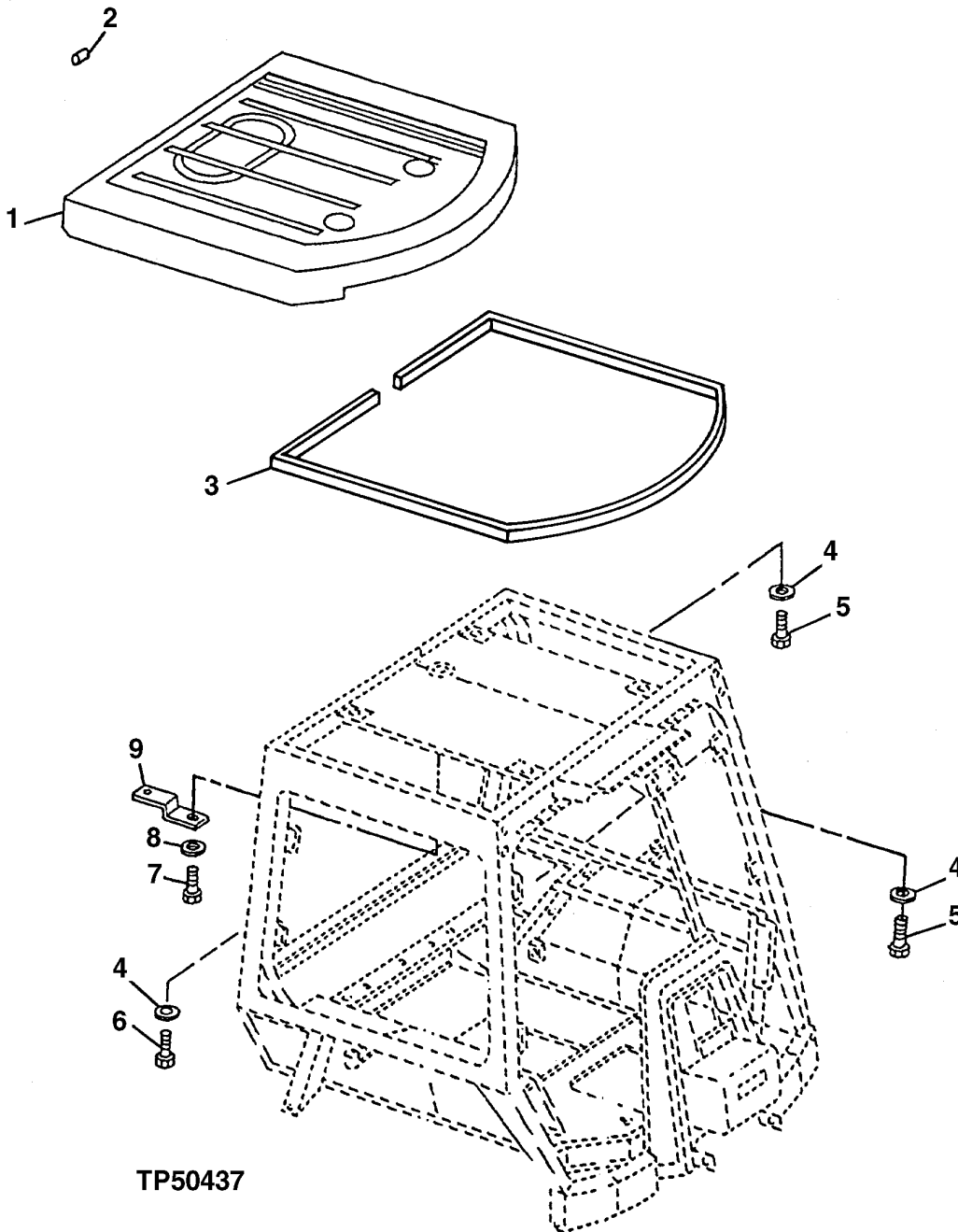
Legend for Headliner

- | | | | |
|--------------------|--------------------------------|-----------------------|-----------|
| 1— Rear Headliner | 5— Retainer (4 used) | 9— Self-Locking Screw | 13— Cable |
| 2— Front Headliner | 6— Self-Locking Screw (6 used) | 10— Washer | 14— Bolt |
| 3— Washer | 7— Cap (7 used) | 11— Kit | |
| 4— Dome Light | 8— Screw (2 used) | 12— Rivet | |

4. Remove side brackets, and disconnect wire harness from dome light.
5. Remove front headliner (2).
6. Remove screw at rear side of rear headliner (1) to remove headliner.
7. Install rear headliner (1).
8. Install front headliner (2).
9. Install rear view mirror.
10. Install radio with trim panel if equipped.

TX,18,QQ9602 -19-05FEB94-2/2

Remove and Install Cab Roof



TP50437

1—Roof
2—Plug
3—Isolator

4—Washer (10 used)
5—Cap Screw (10 used)
6—Cap screw

7—Cap Screw
8—Washer
9—Bracket

Continued on next page

TP50437 —UN—02JUL96

Operator Enclosure

1. Remove cab roof (1) as shown.
2. Inspect for worn or damaged parts. Replace if necessary.
3. Install cab roof. Tighten cap screw (5) to specification.

Specification

Cab Roof Cap
Screw—Torque.....6.78 + 0 —1.5 N·m (5 + 0 —1.1 lb-ft)

TX,18,QQ9267 -19-28JAN97-2/2

Group 1821 Seat and Seat Belt

Specifications

Item	Measurement	Specification
Seat Assembly	Weight	54 kg (118 lb) Approximate
Tether Belt-to-Heater/Blower Cover Cap Screw	Torque	50 N·m (37 lb-ft)
Seat Base Cap Screw	Torque	50 N·m (37 lb-ft)

CED, TX03399, 5673 -19-06DEC99-1/1

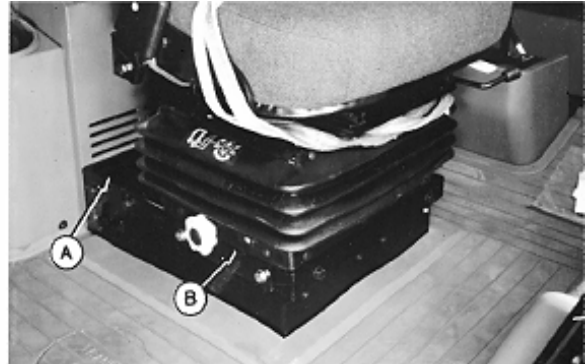
Remove and Install Seat Assembly

1. Remove four cap screws from seat base (B).
2. Remove two cap screws from heater/blower cover (A) to remove tether belts.

⚠ CAUTION: Seat assembly weighs approximately 54 kg (118 lb).

	Specification
—Weight.....	54 kg (118 lb)

3. Use a lifting device and remove seat assembly with seat belts through rear of cab.
4. Inspect parts. Replace as necessary.
5. Install seat assembly using lifting device through rear of cab.
6. Install four cap screws to seat base (B).
7. Install two cap screws through tether belt to heater/blower cover (A). Tighten to specification.



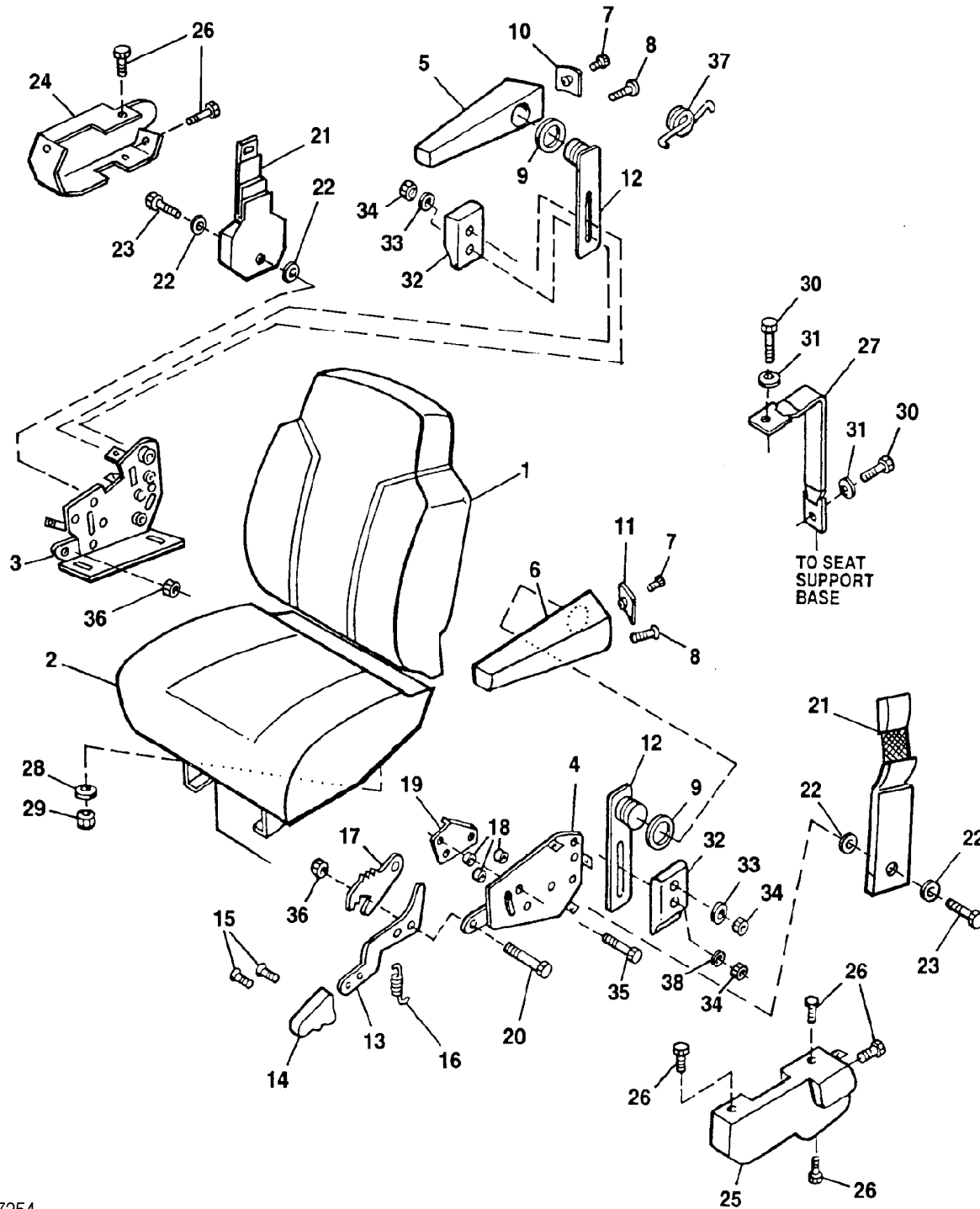
T7630AG—UN—14MAY91

A—Heater/Blower Cover B—Seat Base

	Specification
Tether Belt-to-Heater/Blower Cover Cap Screw—Torque.....	50 N·m (37 lb-ft)

TX, 18, QQ9269 -19-31JAN97-1/1

Seat and Seat Belt and Arm Rest—Disassemble and Assemble



T107254

T107254-19-14FEB97

Continued on next page

TX,18,QQ9270-19-01SEP06-1/2

Seat and Seat Belt

- | | | | |
|--------------------|---------------------|------------------------|------------------|
| 1— Cushion | 11— Plate | 21— Seat Belt | 31— Lock Nut |
| 2— Cushion | 12— Bracket | 22— Washer (4 used) | 32— Plate |
| 3— Plate | 13— Lever | 23— Cap Screw (2 used) | 33— Washer |
| 4— Plate | 14— Knob | 24— Cover | 34— Nut (3 used) |
| 5— Arm Rest | 15— Screw | 25— Cover | 35— Cap Screw |
| 6— Arm Rest | 16— Spring | 26— Cap Screw (6 used) | 36— Nut |
| 7— Screw (2 used) | 17— Latch | 27— Spacer (2 used) | 37— Spring |
| 8— Screw (2 used) | 18— Spacer (3 used) | 28— Washer (4 used) | 38— Washer |
| 9— Washer (2 used) | 19— Plate | 29— Nut (4 used) | |
| 10— Plate | 20— Bolt (2 used) | 30— Cap Screw | |

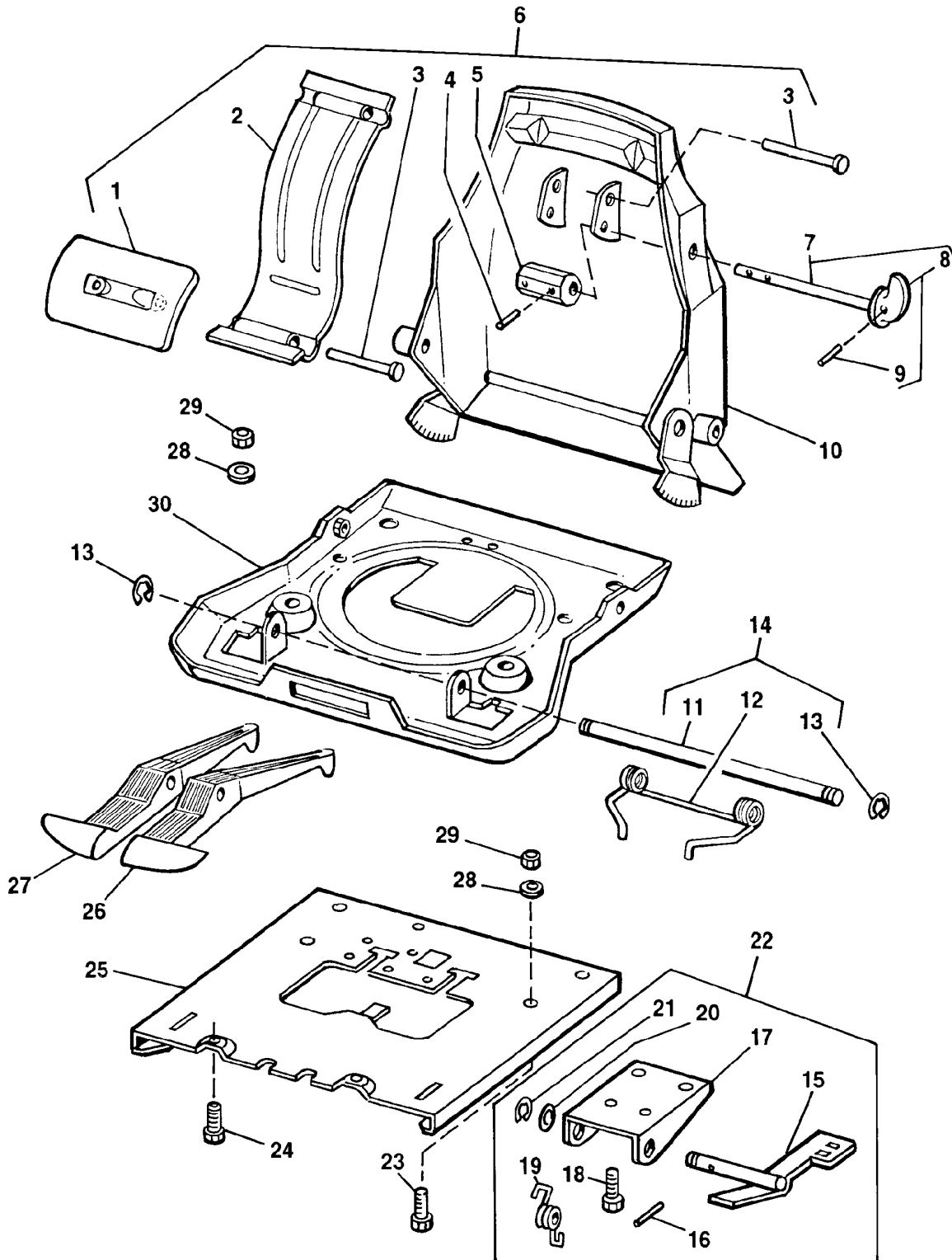
1. Disassemble parts as shown.
2. Inspect for worn or damaged parts.
3. Assemble parts. Tighten cap screw (26) to specification.

Specification

Tether Belt-to-
Heater/Blower Cover
Cap Screw—Torque..... 50 N·m (37 lb-ft)

TX,18,QQ9270 -19-01SEP06-2/2

Seat Slide and Swivel and Lumbar Control Levers—Disassemble and Assemble



T107255

T107255—UN—14FEB97

Continued on next page

TX,18,QQ9271 -19-01SEP06-1/2

Seat and Seat Belt

1— Paddle	9— Spring Pin	17— Bracket	25— Plate
2— Spring	10— Seat Back	18— Cap Screw	26— Control Lever
3— Nail (2 used)	11— Shaft	19— Spring	27— Control Lever
4— Spring Pin	12— Spring	20— Washer (2 used)	28— Washer (2 used)
5— Cam	13— Snap Ring	21— Snap Ring	29— Nut (2 used)
6— Lumbar Adjuster Kit	14— Slide Latch Spring Assembly	22— Slide Control Kit	30— Pan
7— Knob	15— Latch	23— Bolt (3 used)	
8— Knob	16— Spring Pin	24— Cap Screw (2 used)	

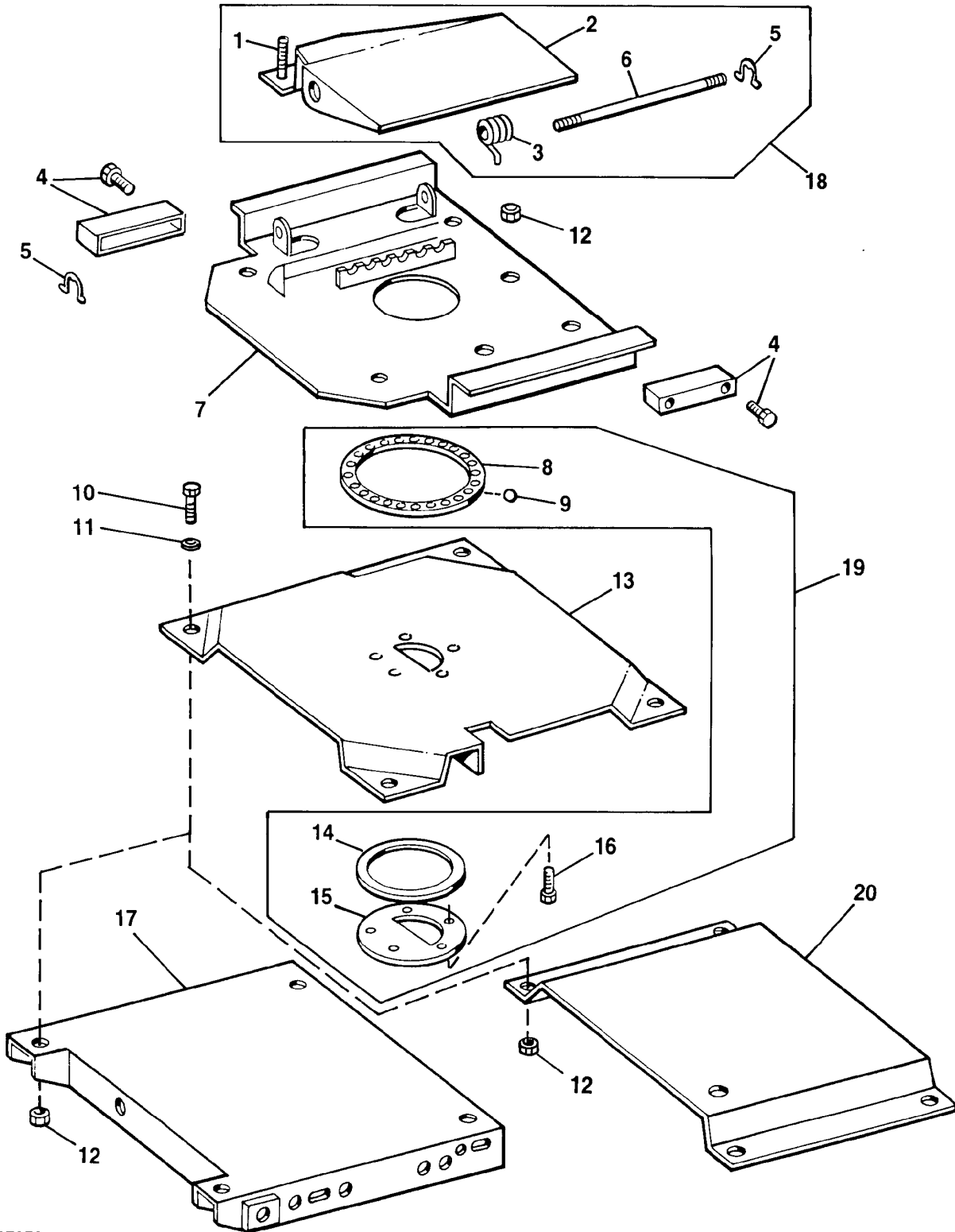
1. Disassemble parts as shown.

2. Inspect for worn or damaged parts.

3. Assemble parts.

TX,18,QQ9271 -19-01SEP06-2/2

Seat Swivel and Latch Disassemble and Assemble



T107256

T107256-UN-14FEB97

Continued on next page

TX,18,QQ9608-19-01SEP06-1/2

Seat and Seat Belt

1— Clip	6— Shaft	11— Washer (4 used)	16— Bolt (5 used)
2— Lock Plate	7— Top Swivel Plate	12— Lock Nut (4 used)	17— Tray
3— Spring	8— Retainer	13— Plate	18— Swivel Latch Assembly
4— Slide Puck and Cap Screw	9— Ball Bearing (24 used)	14— Plate	19— Swivel Assembly
5— Snap Ring (2 used)	10— Cap Screw (4 used)	15— Plate	20— Platform

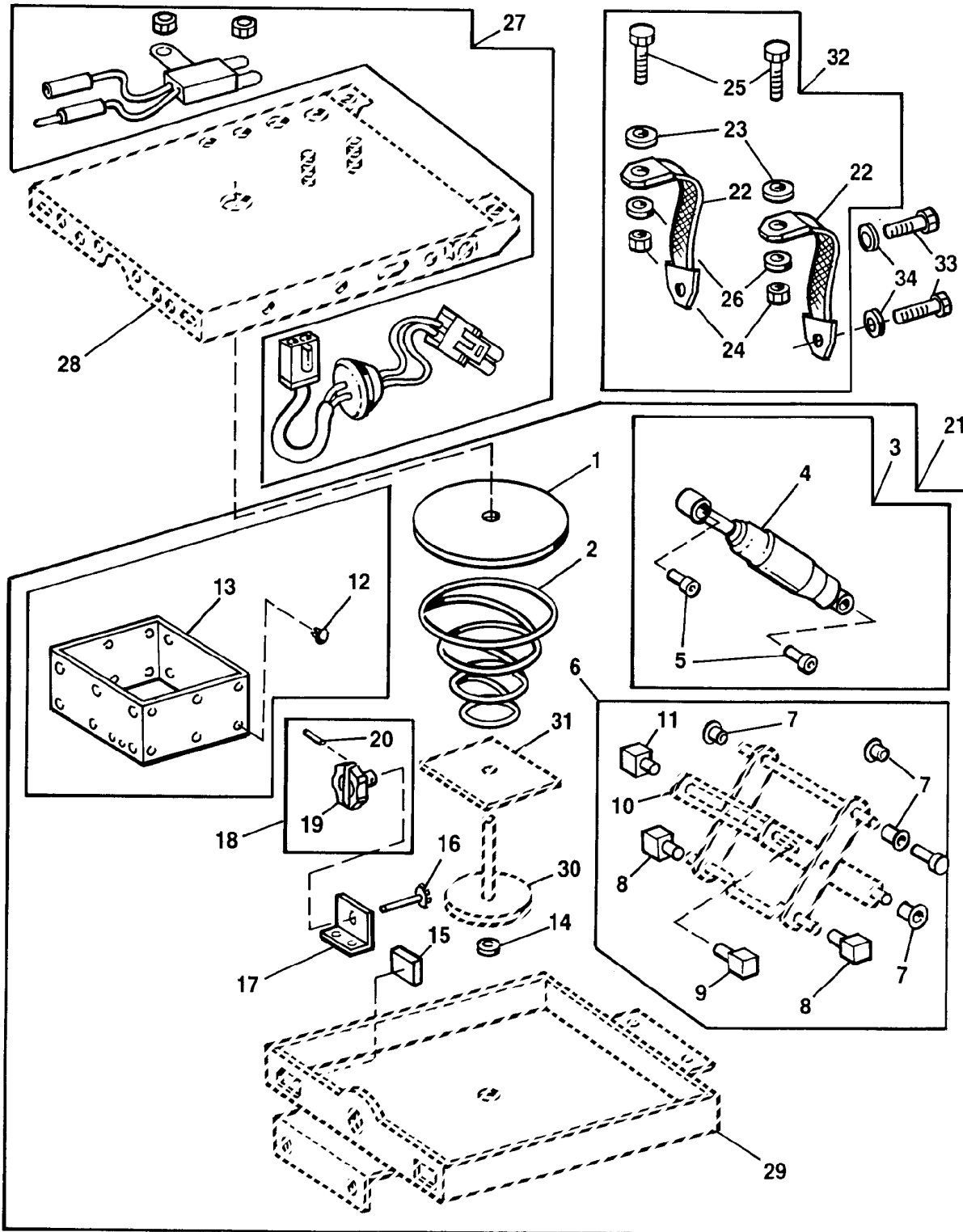
1. Disassemble parts as shown.

3. Assemble parts.

2. Inspect for worn or damaged parts.

TX,18,QQ9608 -19-01SEP06-2/2

Disassemble and Assemble Seat Suspension and Shock Absorber



T107257

T107257 —UN—14FEB97

Continued on next page

TX,18,QQ9609 -19-30JAN97-1/2

Seat and Seat Belt

1— Pad	10— Scissor Frame	19— Adjusting Knob	28— Upper Tray
2— Spring	11— Bar	20— Spring Pin	29— Lower Tray
3— Shock Absorber Assembly	12— Plug (25 used)	21— Suspension Assembly	30— Gear
4— Shock Absorber	13— Boot	22— Tether Belt (2 used)	31— Plate
5— Bushing (2 used)	14— Washer	23— Washer (2 used)	32— Tether Belt Assembly
6— Bearing/Bushing Assembly	15— Isolator (2 used)	24— Lock Nut (2 used)	33— Cap Screw (2 used)
7— Bushing (4 used)	16— Gear	25— Cap Screw (2 used)	34— Washer (2 used)
8— Bar	17— Angle	26— Washer (2 used)	
9— End	18— Adjusting Knob Assembly	27— Seat Position Sensor Assembly	

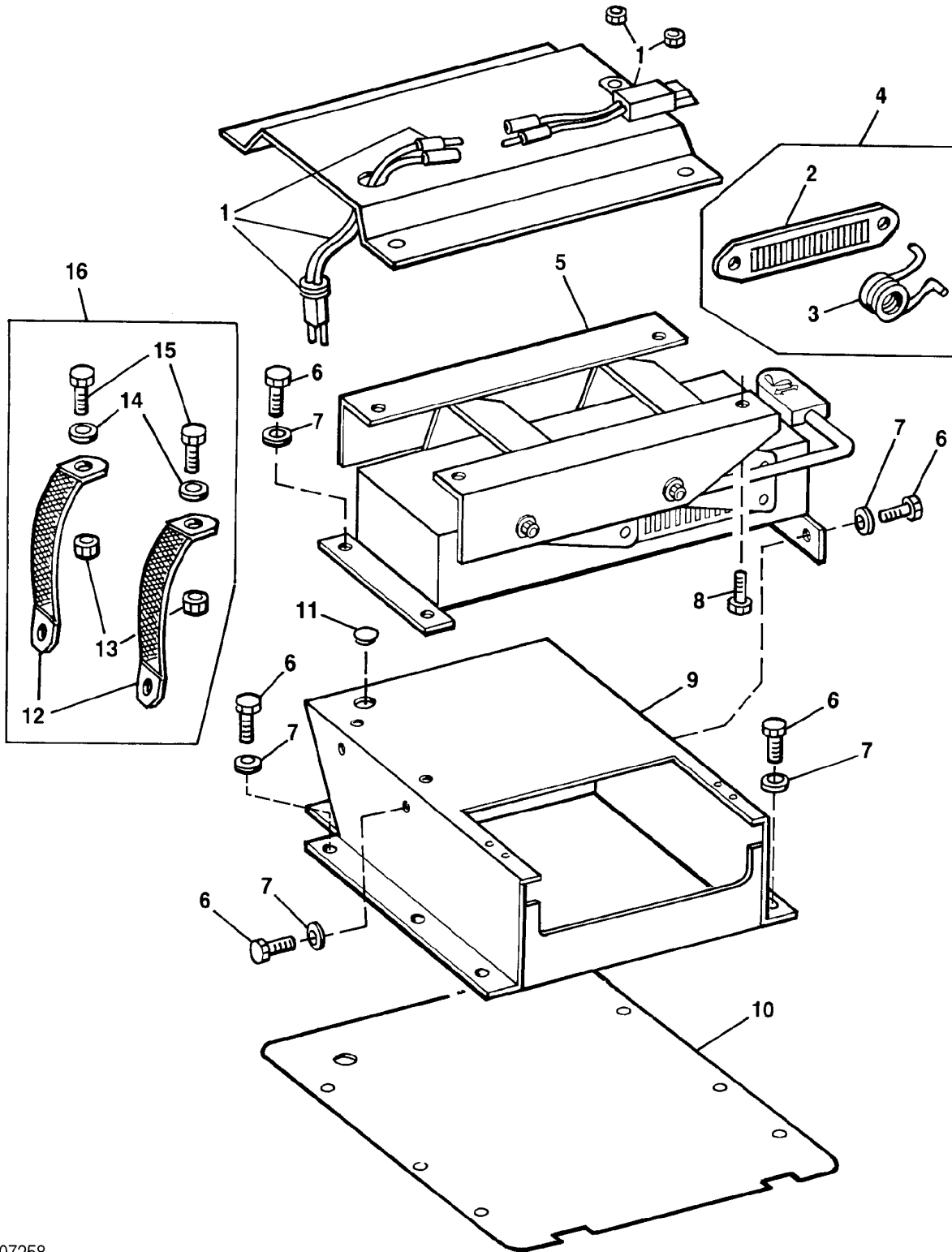
1. Disassemble parts as shown.

2. Inspect for worn or damaged parts.

3. Assemble parts.

TX,18,QQ9609 -19-30JAN97-2/2

Disassemble and Assemble Seat Base and Support



T107258

T107258 —UN—14FEB97

Continued on next page

TX,18,QQ9274 -19-30JAN97-1/2

Seat and Seat Belt

- | | | | |
|---|---|---|--|
| 1— Seat Position Sensor Assembly
2— Link
3— Spring
4— Height Adjuster Assembly | 5— Adjuster
6— Cap Screw (11 used)
7— Washer (11 used)
8— Cap Screw (4 used) | 9— Base
10— Plate
11— Grommet
12— Tether Belt (2 used) | 13— Lock Nut (2 used)
14— Washer (2 used)
15— Cap Screw (2 used)
16— Tether Belt Assembly |
|---|---|---|--|

1. Disassemble parts as shown.
2. Inspect for worn or damaged parts.
3. Assemble parts. Tighten cap screw (6) to specification.

Specification

Seat Base Cap
Screw—Torque..... 50 N·m (37 lb-ft)

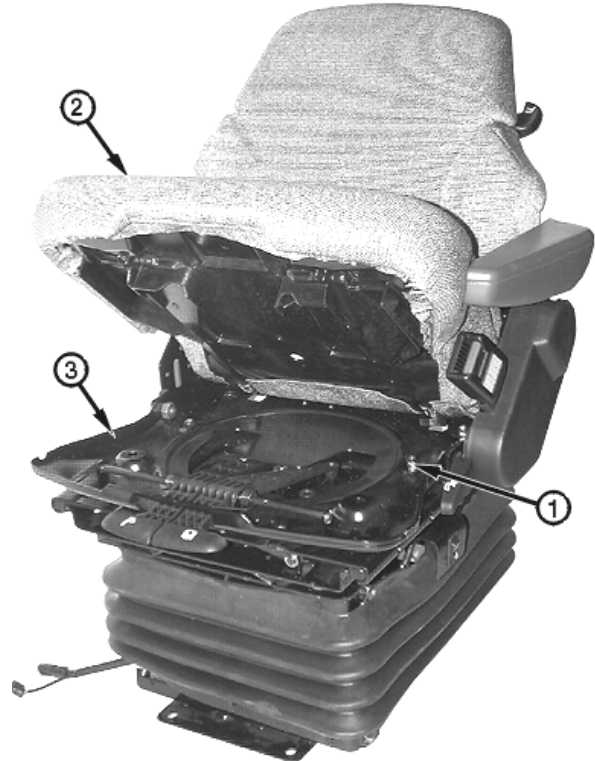
TX,18,QQ9274 -19-30JAN97-2/2

Disassemble and Assemble Air Seat Suspension (If Equipped)

NOTE: For seat cushion, seat support, and swivel/slider plate repair, see procedures in Standard Suspension Seat in this group.

1. Lift front of seat cushion (2) to access seat base mounting hardware.
2. Remove nuts and washers (1) to remove seat base assembly (3).

- | | |
|------------------------------|-----------------------|
| 1— Nuts and Washers (6 used) | 3— Seat Base Assembly |
| 2— Seat Cushion | |



T120001B —UN—11FEB99

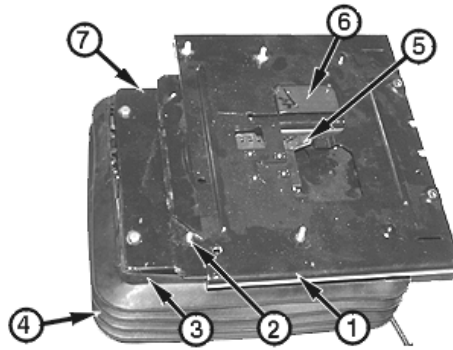
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TX, -19-02NOV99-1/11

Seat and Seat Belt

3. While holding latch (5) down, move plate (1) to rearmost position.
4. Remove the two front nuts and washers (2). Push latch (6) and rotate plate (1) to access and remove the two rear nuts and washers (2).
5. Remove the swivel/slide assembly.
6. While holding latch (5) down, move plate (1) forward and remove from swivel/slide assembly.
7. Remove 32 plastic fasteners (3) to remove boot (4).

- | | |
|--|---------------------|
| 1—Slide Plate | 5—Slide Latch |
| 2—Nuts and Washers (4 used) | 6—Swivel Latch |
| 3—Plastic Fasteners (Plugs)
(32 used) | 7—Swivel-Stop Plate |
| 4—Boot | |

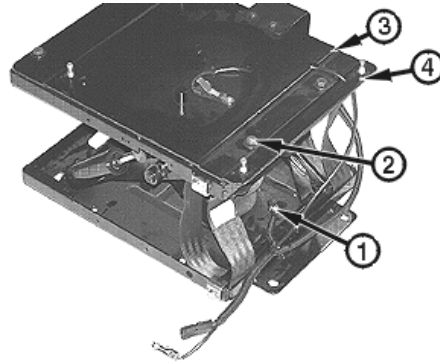


T120002B —UN—14FEB99

TX, -19-02NOV99-2/11

8. Remove wiring connector (1).
9. Remove cap screws (2) and swivel stop plate (3).

- | | |
|--------------------------------------|-------------------------|
| 1—Air Compressor Wiring
Connector | 3—Swivel-Stop Plate |
| 2—Cap Screws (4 used) | 4—Upper Suspension Tray |



T120004B —UN—14FEB99

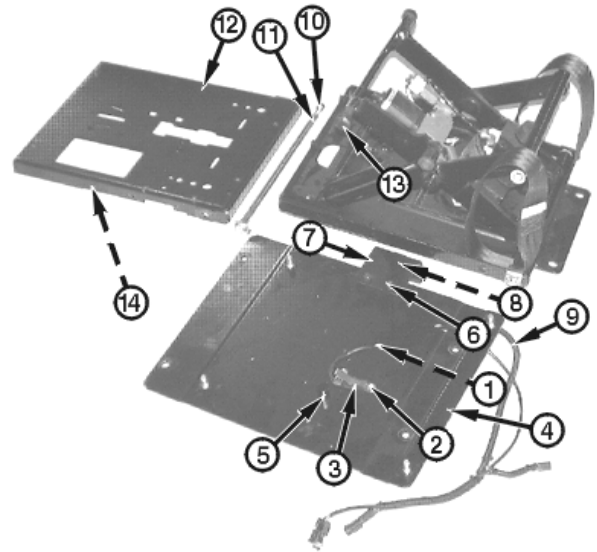
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TX, -19-02NOV99-3/11

Seat and Seat Belt

10. Disconnect wiring connectors (1).
11. Remove cap screws (2) and switch (3).
12. Disconnect wire harness (9) and remove switch (8).
13. Remove cap screws (6) and switch bracket (7).
14. Remove lock nut (10) and upper pivot shaft (11).
15. Remove upper tray (12) by lifting and moving the tray forward until rollers (13) clear roller channel (14).

- | | |
|------------------------------|---------------------------|
| 1— Wiring Connector (2 used) | 8— Air Control Switch |
| 2— Cap Screws (2 used) | 9— Wire Harness |
| 3— Seat Position Switch | 10— Lock Nut |
| 4— Swivel-Stop Plate | 11— Upper Pivot Shaft |
| 5— Swivel Stop | 12— Upper Suspension Tray |
| 6— Cap Screws (2 used) | 13— Roller (4 used) |
| 7— Switch Bracket | 14— Roller Channel |

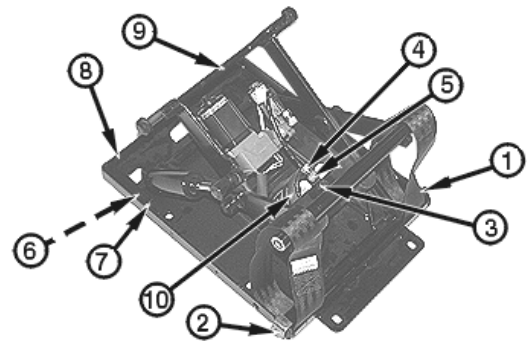


T120006B —UN—14FEB99

TX, -19-02NOV99-4/11

16. Remove fitting (4) and elbow (5).
17. Remove upper and lower cap screws (3) and air bag (10).
18. Remove lock nut (1) and lower pivot shaft (2).
19. Remove scissor frame assembly (9) by turning and lifting assembly until rollers (6) clear the roller channel (7).

- | | |
|-------------------------------------|---------------------------|
| 1— Lock Nut | 6— Roller |
| 2— Lower Pivot Shaft | 7— Roller Channel |
| 3— Air Bag Mount Cap Screw (2 used) | 8— Lower Suspension Tray |
| 4— Fitting | 9— Scissor Frame Assembly |
| 5— Elbow Fitting | 10— Air Bag |



T120006B —UN—14FEB99

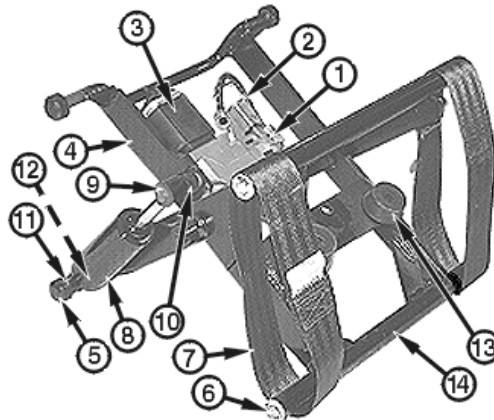
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TX, -19-02NOV99-5/11

Seat and Seat Belt

20. Inspect parts (1—14). Replace if necessary.
21. Clean all bushings, rollers, and pivots. Lubricate with multi-purpose grease.
22. Assemble parts as shown.

- | | |
|------------------------|----------------------------------|
| 1—Line Fitting | 8—Shock Absorber |
| 2—Air Line | 9—Retainer Clip |
| 3—Air Compressor | 10—Spacer/Bushing |
| 4—Cap Screw (2 used) | 11—Spacer |
| 5—Roller (4 used) | 12—Bushing |
| 6—Bushing (4 used) | 13—Bumper and Cap Screw (2 used) |
| 7—Tether Belt (2 used) | 14—Scissor Frame Assembly |

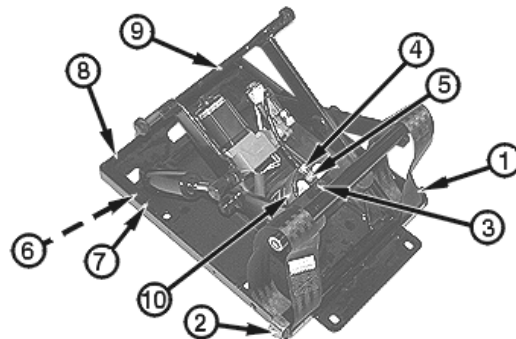


T120007B —UN—14FEB99

TX, -19-02NOV99-6/11

23. Install scissor frame assembly (9) onto lower tray (8) by inserting rollers (6) into roller channel (7).
24. Install lower pivot shaft (2) and lock nut (1).
25. Put a wood block between scissor frame arm and lower tray to hold scissor frame in the raised position.
26. Install air bag (10) and cap screws (3). Be careful not to over tighten cap screws.
27. Install elbow fitting (5) and line fitting (4).

- | | |
|------------------------------------|--------------------------|
| 1—Lock Nut | 6—Roller |
| 2—Lower Pivot Shaft | 7—Roller Channel |
| 3—Air Bag Mount Cap Screw (2 used) | 8—Lower Suspension Tray |
| 4—Fitting | 9—Scissor Frame Assembly |
| 5—Elbow Fitting | 10—Air Bag |



T120006B —UN—14FEB99

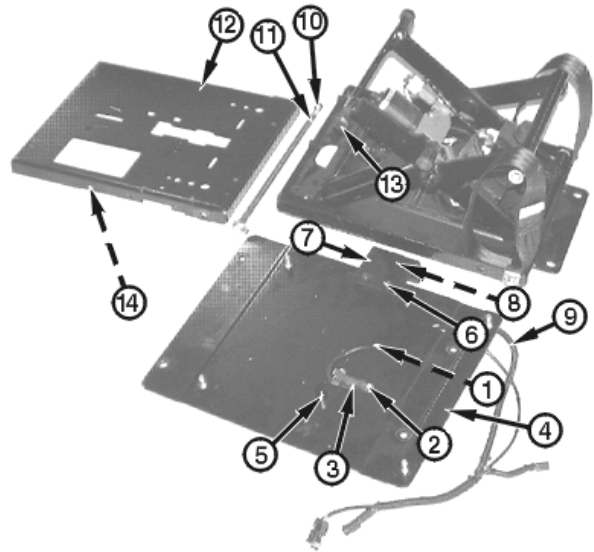
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TX, -19-02NOV99-7/11

Seat and Seat Belt

28. Install upper tray (12) on the scissor frame by inserting rollers (13) into roller channel (14). Install pivot shaft (11) and lock nut (10).
29. Install switch bracket (7) and cap screws (6).
30. Install air control switch (8) and connect wire harness (9).
31. Install seat position switch (3) and cap screws (2).
32. Connect wiring connectors (1).

- | | |
|------------------------------|---------------------------|
| 1— Wiring Connector (2 used) | 8— Air Control Switch |
| 2— Cap Screws (2 used) | 9— Wire Harness |
| 3— Seat Position Switch | 10— Lock Nut |
| 4— Swivel-Stop Plate | 11— Upper Pivot Shaft |
| 5— Swivel Stop | 12— Upper Suspension Tray |
| 6— Cap Screws (2 used) | 13— Roller (4 used) |
| 7— Switch Bracket | 14— Roller Channel |

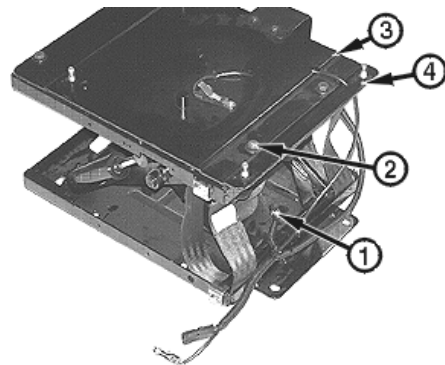


T120005B —UN—14FEB99

TX, -19-02NOV99-8/11

33. Install swivel-stop plate (3) and cap screws (2). Be careful not to crush wires or connectors.
34. Connect air compressor wire connector (1).

- | | |
|------------------------------------|--------------------------|
| 1— Air Compressor Wiring Connector | 3— Swivel-Stop Plate |
| 2— Cap Screws (4 used) | 4— Upper Suspension Tray |

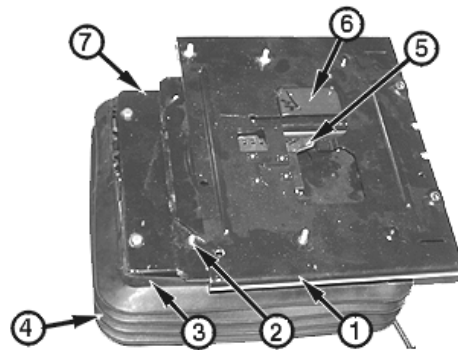


T120004B —UN—14FEB99

TX, -19-02NOV99-9/11

35. Fasten boot (4) to upper tray using 32 plastic fasteners (3).
36. While holding latch (5) down, install slide plate (1) onto swivel plate assembly.
37. Install swivel/slide assembly to swivel-stop plate (7). Fasten with four nuts and washers (2).

- | | |
|--|----------------------|
| 1— Slide Plate | 5— Slide Latch |
| 2— Nuts and Washers (4 used) | 6— Swivel Latch |
| 3— Plastic Fasteners (Plugs) (32 used) | 7— Swivel-Stop Plate |
| 4— Boot | |



T120002B —UN—14FEB99

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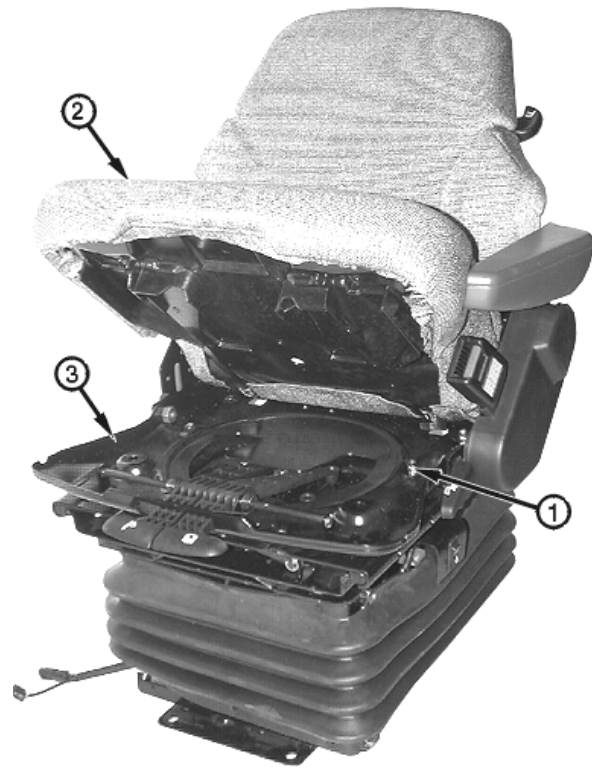
TX, -19-02NOV99-10/11

Seat and Seat Belt

38. Install cushion base assembly (3) to slide plate using nuts and washers (1).

39. Install seat cushion (2).

1— Nuts and Washers (6 used) 3— Cushion Base Assembly
2— Seat Cushion



T120001B—UN—11FEB99

TX, -19-02NOV99-11/11

Group 1830 Heating and Air Conditioning

Essential Tools

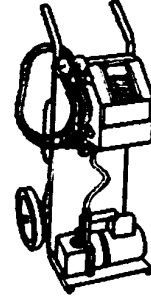
NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or from the European Microfiche Tool Catalog (MTC).

SERVICEGARD is a trademark of Deere & Company

CED,TX03399,5676 -19-06DEC99-1/8

Charging Station¹JT02046

Used for servicing air conditioning systems using R134a refrigerant.



RW21595 —UN—17AUG92

¹Used with JT02050 Recovery/Recycling Station. JT02047 Recovery/Recycling and Charging Station can be substituted for JT02046 and JT02050.

CED,TX03399,5676 -19-06DEC99-2/8

Compressor Clutch Spanner JDG747

RW19932 —UN—19MAY92

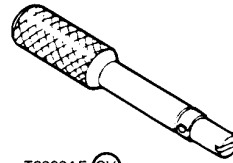
Used to hold clutch hub while removing shaft bolt.



CED,TX03399,5676 -19-06DEC99-3/8

Schrader Valve ToolJT02130

Used to replace Schrader valve in compressor manifold



T8389AF (CV)

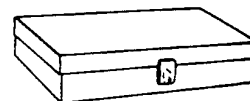
T8389AF —UN—03JAN95

CED,TX03399,5676 -19-06DEC99-4/8

Compressor Seal and Clutch Repair Kit JDG215

R40105 —UN—23AUG88

Used to remove and install air conditioning seal and clutch components on A/C compressor.



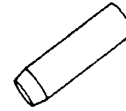
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CED,TX03399,5676 -19-06DEC99-5/8

Heating and Air Conditioning

Lip Seal Protector JDG746 RW19943 —UN—19MAY92

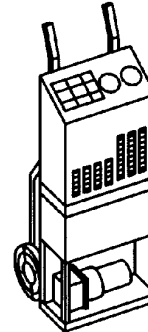
Protect gasket during installation of shaft.



CED, TX03399, 5676 -19-06DEC99-6/8

R134a Refrigerant Recovery/Recycling and Charging Station ¹JT02045

Removes and recharges refrigerant from the system.



T103573

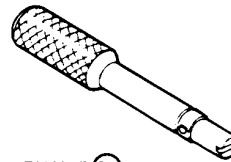
T103573 —UN—04NOV96

¹JT02050 Recovery/Recycling Station and JT02046 Charging Station can be substituted for the JT02045 station.

CED, TX03399, 5676 -19-06DEC99-7/8

Schrader Valve Tool JT02130

Use to replace Schrader valve in A/C high and low pressure switches



T8389AF (CV)

T8389AF —UN—03JAN95

CED, TX03399, 5676 -19-06DEC99-8/8

Service Equipment and Tools

European Microfiche Tool Catalog (MTC). Some tools may be available from a local supplier.

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or from the

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CED, TX03399, 5675 -19-06DEC99-1/8

Bench Mounted Holding Fixture D01006AA Mount removed air compressor.

CED, TX03399, 5675 -19-06DEC99-2/8

Compressor Holding Fixture¹ DFRW20 Mount removed air compressor.

¹See Dealer Fabricated Tools in Section 18-1899 for instructions to make tool.

Continued on next page

CED, TX03399, 5675 -19-06DEC99-3/8

Heating and Air Conditioning

Puller JDG220 Remove compressor pulley.

CED,TX03399,5675 -19-06DEC99-4/8

Jaws JDG748 Remove compressor pulley.

CED,TX03399,5675 -19-06DEC99-5/8

Forcing Screw..... JDG771 Remove compressor pulley.

CED,TX03399,5675 -19-06DEC99-6/8

A/C Service Fitting Kit.....JT05419 Use to connect test equipment.

CED,TX03399,5675 -19-06DEC99-7/8

Electronic A/C Leak DetectorJT02081 Use to detect A/C refrigerant leaks.

CED,TX03399,5675 -19-06DEC99-8/8

Other Material

Number	Name	Use
NA (U.S.)	Refrigerant R134a	Used to charge air conditioning system.
TY22025 (U.S.)	R134a Compressor Oil (8.5 oz.)	Used to lubricate R134a air conditioning system.

CED,TX03399,5674 -19-06DEC99-1/1

Specifications

Item	Measurement	Specification
Compressor Hub Retaining Nut	Torque	14 N·m (120 lb-in.)
Pulley-to-Clutch Hub	Clearance	0.35—0.65 mm (0.014—0.026 in.)
Clutch Shaft Bolt	Torque	14 N·m (120 lb-in.)
Manifold Cap Screw	Torque	26 N·m (19 lb-ft)
Compressor Through Bolts (S.N. 558325—) or (S.N. 559115—)	Torque	26 N·m (19 lb-ft)
New A/C Compressor (System Completely Flushed)	Volume	230 ± 20 mL (7.8 ± 0.7 fl oz)
A/C System w/o Compressor (System Completely Flushed)	Volume	80 mL (2.7 fl oz)
Used A/C Compressor (System Completely Flushed)	Volume	310 ± 20 mL (10.5 ± 0.7 fl oz)
New A/C Compressor (System Not Flushed)	Volume	Drain and return 45 mL (1.5 fl oz).
Used A/C Compressor; Drained Only (System Not Flushed)	Volume	Drain and return 45 mL (1.5 fl oz)
Used A/C Compressor; Drained and Flushed (System Not Flushed)	Volume	60 mL (2.0 fl oz)
Evaporator	Volume	130 mL (4.4 fl oz)
Condenser	Volume	65 mL (2.2 fl oz)
Receiver/Dryer	Volume	30 mL (1.0 fl oz)
Hoses	Volume	60 mL (2.0 fl oz)
A/C Freeze Switch Probe	Depth	228 ± 1 mm (9 ± 1 in.)

CED,TX03399,5677 -19-06DEC99-1/1

Proper Refrigerant Handling

The U.S. Environmental Protection Agency prohibits discharge of any refrigerant into the atmosphere, and requires that refrigerant be recovered using the approved recovery equipment.

IMPORTANT: Use correct refrigerant recovery, recycling, and charging stations. DO NOT use refrigerant, hoses, fittings, components, or refrigerant oils intended for use with R12 refrigerant.

Recovery, recycling, and charging stations for R12 and R134a refrigerants **MUST NOT** be interchanged. Systems containing R12 refrigerant use a different oil than systems using R134a. Certain seals are not compatible with both types of refrigerants.

TX,9031,QQ2009 -19-19AUG94-1/1

R134a Refrigerant Cautions

⚠ CAUTION: DO NOT allow liquid refrigerant to contact eyes or skin. Liquid refrigerant will freeze eyes or skin on contact. Wear goggles, gloves and protective clothing.

If liquid refrigerant contacts eyes or skin, **DO NOT** rub the area. Splash large amounts of **COOL** water on affected area. Go to a physician or hospital immediately for treatment.

DO NOT allow refrigerant to contact open flames or very hot surfaces such as electric welding arc, electric heating element and lighted smoking materials.

DO NOT heat refrigerant over 52°C (125°F) in a closed container. Heated refrigerant will develop high pressure which can burst the container. Keep refrigerant containers away from heat sources. Store refrigerant in a cool place.

DO NOT handle damp refrigerant container with your bare hands. Skin may freeze to container. Wear gloves.

If skin freezes to container, pour **COOL** water over container to free the skin. Go to a physician or hospital immediately for treatment.

TX,9031,HH1465 -19-19AUG94-1/1

Refrigerant Hoses and Tubing Inspection

When a component is disconnected from the system, special care should be given to inspecting hoses and tubing for moisture, grease, dirt, rust, or other foreign material. If such contamination is present in hoses, tubing or fittings and cannot be removed by cleaning, replace parts.

Fittings that have grease or dirt on them should be wiped clean with a cloth dampened with alcohol. Chlorinated solvents (such as trichloroethylene) are contaminants, and must not be used for cleaning.

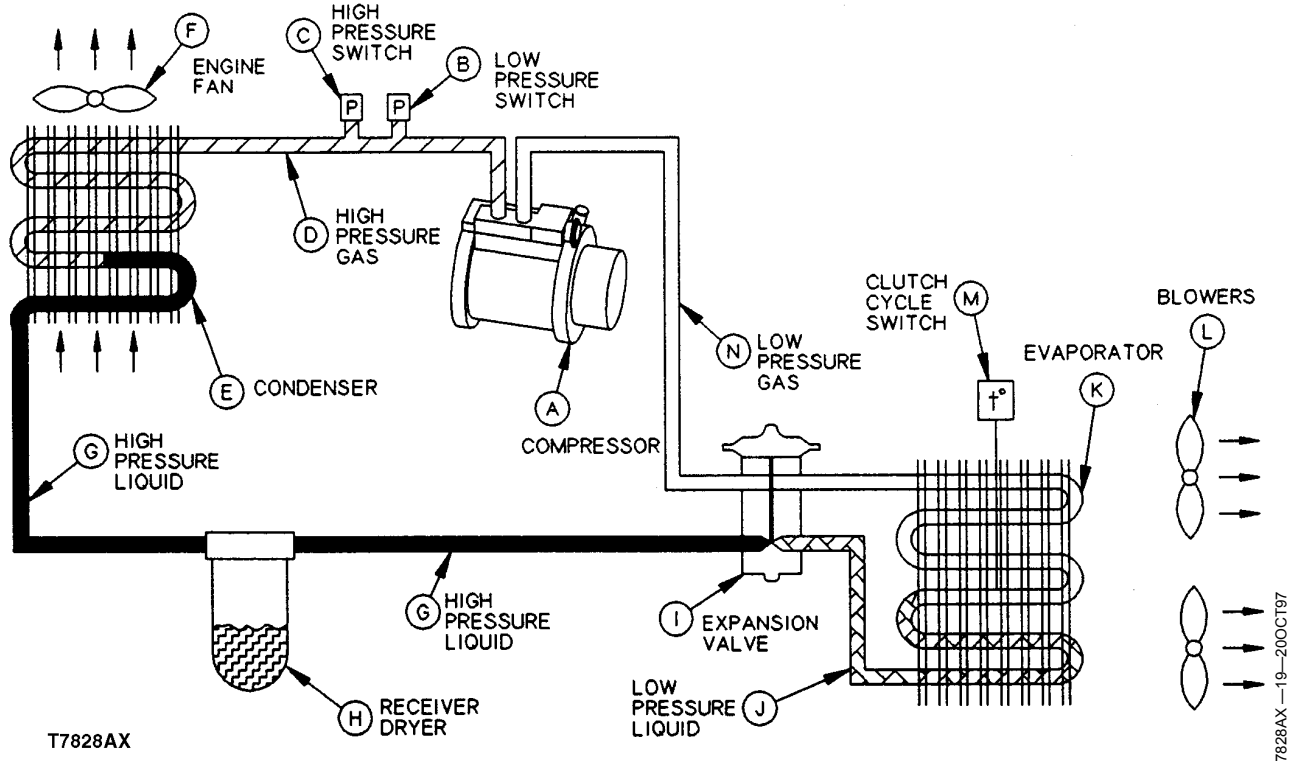
To assist in making leak-proof joints, use a small amount of clean, correct viscosity refrigerant oil on all hose and tube connections. Dip O-rings in correct viscosity oil before assembling.

IMPORTANT: Hose used for air conditioning systems contains special barriers in its walls to prevent migration of refrigerant gas.

DO NOT use hydraulic hoses as replacement hoses in the air conditioning system. Use **ONLY** certified hose meeting SAE J51B requirements.

TX,18,RB745 -19-01SEP06-1/1

Refrigerant Theory of Operation



- | | | | |
|------------------------|------------------------|-----------------------|-----------------------|
| A—Compressor | E—Condenser | I—Expansion Valve | M—Clutch Cycle Switch |
| B—Low Pressure Switch | F—Engine Fan | J—Low Pressure Liquid | N—Low Pressure Gas |
| C—High Pressure Switch | G—High Pressure Liquid | K—Evaporator | |
| D—High Pressure Gas | H—Receiver/Dryer | L—Blowers | |

The compressor (A) draws low pressure gas (N) from the evaporator (K) and compresses it into high pressure gas (D). Increasing the pressure of the refrigerant causes its boiling point to rise to a temperature higher than the outside air temperature.

High pressure gas (D) leaves the compressor (A) and passes through two switches (B and C). These switches monitor refrigerant pressure. Should the pressure become too great or too small, either the high or low pressure switch will open and stop the compressor, interrupting the cycle.

As the high pressure gas flows through the condenser (E), the engine fan (F) draws air through the condenser core which cools the refrigerant. Cooling the refrigerant causes it to condense and it leaves the condenser (E) as a high pressure liquid (G). The high pressure liquid flows into the receiver/dryer (H) where moisture and contaminants are removed.

The refrigerant flows from the receiver/dryer (H) to the expansion valve (I). The expansion valve (I) is a variable orifice used to cause a pressure and temperature drop in the refrigerant, causing refrigerant to vaporize. The expansion valve (I) is one of the dividing lines between

the high side and low side of the air conditioning system. At this point in the system, the high pressure/high temperature liquid is sprayed into the evaporator (K) where it changes and becomes a gas.

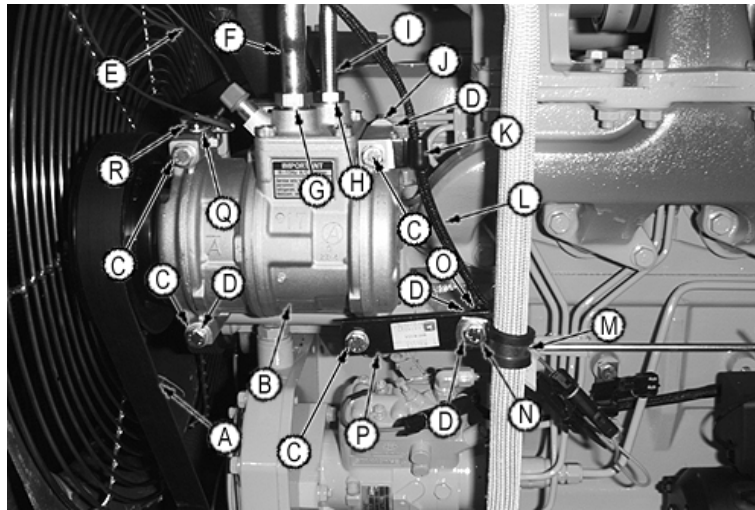
The expansion valve diaphragm is activated by sensing temperature and pressure within the valve body. The internal bulb senses the evaporator outlet or discharge temperature and pressure of refrigerant as it passes through the valve back to the low pressure or suction side of the compressor.

If too much refrigerant is flowing into evaporator, the liquid refrigerant will still be evaporating as it leaves the evaporator, causing a low temperature at the evaporator outlet. The low temperature causes the expansion valve variable orifice to decrease in size, restricting refrigerant flow. If the evaporator outlet temperature is too warm, the orifice will increase in size, allowing more refrigerant into evaporator.

If evaporator (K) temperature becomes too low, the clutch cycle switch (M) will interrupt current flow to the compressor clutch coil, stopping system operation until the temperature becomes normal, between -0.6°C (31°F) and 4.5°C (40°F).

TX.18,QQ8317 -19-04NOV98-1/1

Remove and Install Air Conditioning Compressor



A—Belt	F—Hose (Compressor to Suction Line at Expansion Valve)	K—Clamp	P—Strap
B—Compressor	G—O-Ring	L—Compressor Harness	Q—Cap Screw
C—Cap Screw (4 used)	H—O-Ring	M—Clamp	R—Lock Washer
D—Washer (9 used)	I—Hose (Compressor to Condenser)	N—Cap Screw	
E—Ground Wire	J—Nut (3 used)	O—Nut	

1. Recover refrigerant from the system. (See procedure in this group.)
2. Disconnect ground wire (E), lines (F and I).
3. Remove belt (A).
4. Remove cap screws (C).
5. Repair or replace compressor.
6. Install compressor using cap screws (C).
7. Install belt (A).
8. Install a new receiver/dryer.
9. Evacuate and charge the system. (See procedures in this group.)

TX,18,QQ8318 -19-13JAN99-1/1

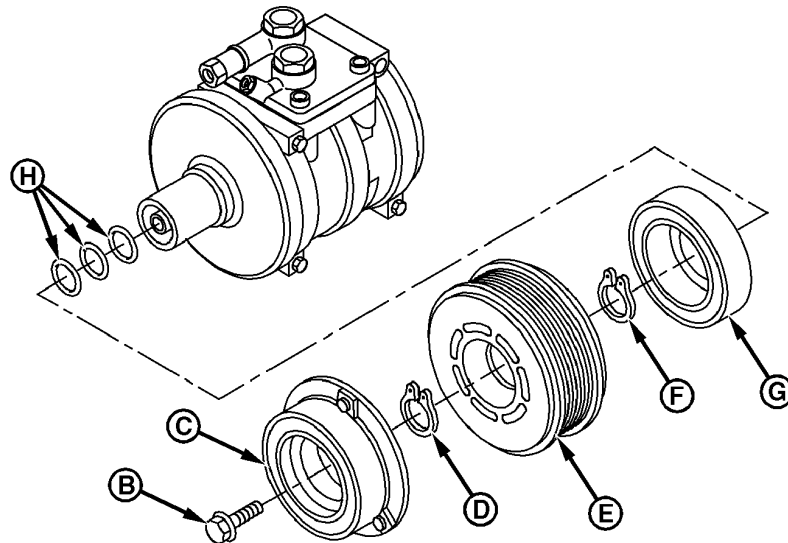
R134a Compressor Oil Removal

1. Remove air conditioning compressor from machine. (See Remove and Install Air Conditioning Compressor in this group.)
2. Remove inlet/outlet manifold from compressor, and clutch dust cover.
3. Drain oil into graduated container while rotating compressor shaft.
4. Record measured oil and discard oil properly.
5. Fill with new oil. See R134a Component Oil Charge in this group.
6. Install air conditioning compressor. (See Remove and Install Air Conditioning Compressor in this group.)

TX,1830,DT424 -19-05NOV98-1/1

T106008C —UN—07JAN97

Disassemble and Assemble Compressor Clutch

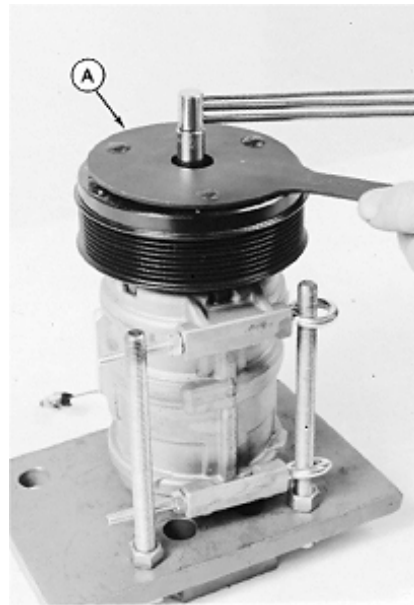


T114965

1. Mount compressor on D01006AA Bench Mounted Holding Fixture or DFRW20 Compressor Holding Fixture using two 6 in. x 1/4 in. eye bolts with nuts as illustrated. (See Dealer Fabricated Tools in Group 1899.)
2. Remove dust cover.
3. Hold the clutch hub using JDG747 Compressor Clutch Spanner (A) and remove the clutch shaft bolt (B).
4. Remove the clutch hub (C). Remove the shims (H) from the clutch hub and save for installation.
5. Remove and discard snap ring (D). Remove the pulley (E) using a plastic hammer or JDG220 Puller, JDG748 Jaws and JDG771 Forcing Screw.
6. Disconnect the clutch coil lead wire. Remove and discard the snap ring (F) and remove the clutch coil (G).

NOTE: The bearing in the pulley is NOT serviceable.

7. Check pulley bearing operation. Replace pulley and bearing as required.
8. Install the clutch coil and new snap ring with flat side of the snap ring down. Connect the clutch coil lead wire.
9. Install the pulley and new snap ring with the flat side of the snap ring down. Apply grease to the shims (H) and install to the clutch hub.
10. Install clutch hub and shaft bolt and tighten to specification.



- | | |
|------------------------------------|-------------------------|
| A—JDG747 Compressor Clutch Spanner | E—Pulley |
| B—Clutch Shaft Bolt | F—Clutch Coil Snap Ring |
| C—Clutch Hub | G—Clutch Coil |
| D—Pulley Snap Ring | H—Shims |

Specification

Compressor Hub
Retaining Nut—Torque..... 14 N·m (120 lb-in.)

WS68074.0003706 -19-14JUL10-1/1

T114965—UN—29APR98

RW21157—UN—24JUN02

Clutch Hub Clearance Check

NOTE: The clutch coil is **NOT** polarity sensitive.

1. Check pulley-to-clutch hub clearance using a dial indicator. Mount the gauge to the pulley as illustrated and connect a set of jumper wires from the compressor to a 12V battery.
2. Rotate the pulley and check clearance in three equally spaced locations around the clutch hub. Correct clearance is per specification. Add or remove shims as required.

Specification

Pulley-to-Clutch
Hub—Clearance..... 0.35—0.65 mm (0.014—0.026 in.)

3. Tighten clutch shaft bolt to specification after correct clearance is obtained.

Specification

Clutch Shaft
Bolt—Torque..... 14 N·m (120 lb-in.)



RW21159 —UN—24JUN92

CED.OUO1017,61 -19-01SEP06-1/1

Compressor Manifold Inspect

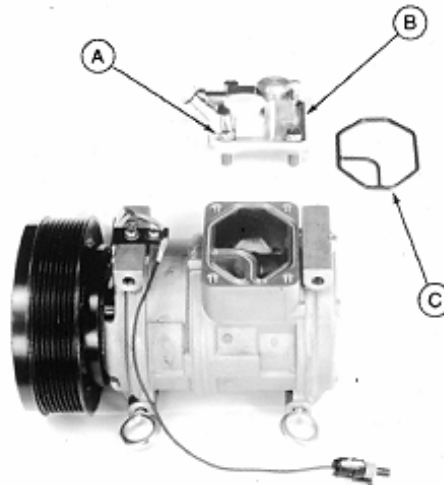
1. Remove cap screws (A) and the manifold (B).
2. Remove and discard seal (C). Inspect porting surfaces.
3. Lubricate and install a new seal (C).
4. Install manifold and tighten cap screws to specifications.

Specification

Manifold Cap
Screw—Torque..... 26 N·m (19 lb-ft)

A—Manifold Cap Screw
B—Manifold

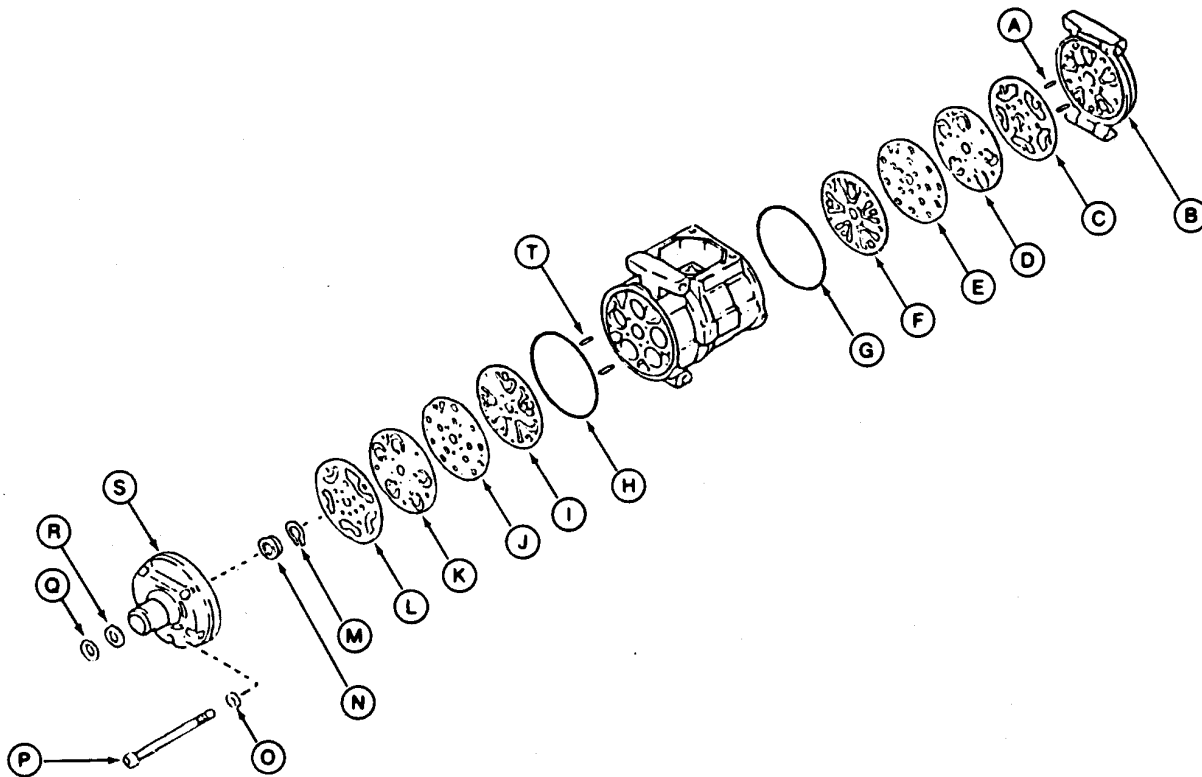
C—Manifold Seal



RW21160 —UN—24JUN92

CED.OUO1017,62 -19-01SEP06-1/1

Disassemble, Inspect, and Assemble Compressor



- | | | | |
|-----------------------------|----------------------------|------------------------------|-----------------|
| A—Rear Pins | F—Rear Suction Reed Valve | K—Front Discharge Reed Valve | P—Through Bolt |
| B—Rear Housing | G—Rear O-Ring | L—Front Gasket | Q—Felt Holder |
| C—Rear Gasket | H—Front O-Ring | M—Snap Ring | R—Felt |
| D—Rear Discharge Reed Valve | I—Front Suction Reed Valve | N—Lip Seal | S—Front Housing |
| E—Rear Valve Plate | J—Front Valve Plate | O—Washer | T—Front Pins |

1. Clean the compressor using solvent before disassembly. Mount compressor on holding fixture and remove clutch. (See procedure in this group.)

IMPORTANT: When removing front and rear housing, be careful NOT to damage the sealing surfaces.

2. Disassemble the compressor as illustrated and discard the O-rings, gaskets, lip seal, snap ring, and through bolt washers. Replace parts from service kits.

NOTE: The valve plates, reed valves, cylinders, and cylinder housings are NOT serviceable. Some cylinder scuffing (light scratches) is normal.

3. Inspect the valves for an even wear pattern and the cylinders for scoring or excessive wear. Replace compressor as required.

4. Remove the shaft seal snap ring (M). Turn the housing over and remove the felt holder (Q) and felt (R) from the front housing (S).

Continued on next page

CED,OUO1017.63 -19-16NOV98-1/2

RW21161—UN—24-JUN92

5. Remove the shaft lip seal (N) from the front housing (S) using a small tool with 5/8 in. OD.

6. Wash all parts in clean solvent and dry before assembly.

IMPORTANT: Lubricate O-rings, gaskets, and lip seal using only R134a refrigerant oil during assembly. Other oils could damage the compressor.

7. Apply R134a oil to the bore of the front housing and install new lip seal (N) to the bottom of the bore using a socket. Install new snap ring (M) flat side down.

IMPORTANT: Bushing spacer (U) must be in position before assembling the compressor.

8. Install pins (A) and new O-ring (G) in the rear cylinder.

NOTE: The rear valve plate is marked with an "R" and is installed face up.

9. Install parts (F—D) over the pins on the rear cylinder.

10. Install a new gasket (C) flat side down and the rear housing (B) on the rear cylinder. Mount the compressor onto the holding fixture.

11. Install pins (T) and new O-ring (H) in the front cylinder.

NOTE: The front valve plate is marked with an "F" and is installed face up.

12. Install parts (I—K) over the pins on the front cylinder.

13. Install a new gasket (L) flat side down. Put JDG746 Lip Seal Protector on the shaft and lubricate with R134a oil.

14. Install the front housing (S) on the front cylinder and remove the lip seal protectors. Install through bolts (P) and new washers (O).

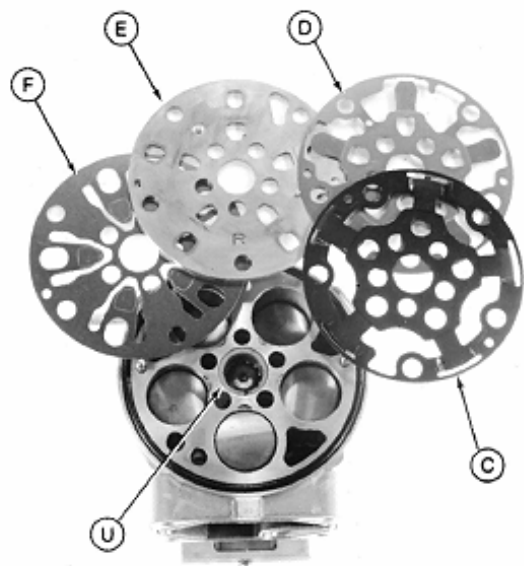
15. Partially tighten the through bolts and then tighten to specification.

Specification

Compressor Through Bolts (S.N. 558325—) or (S.N. 559115—)—Torque..... 26 N·m (19 lb·ft)

16. Install the felt (R) and felt holder (Q) using the clutch hub.

17. Install the pulley clutch hub and check clearance. (See procedure in this group.)



C—Rear Gasket
 D—Rear Discharge Reed Valve
 E—Rear Valve Plate
 F—Rear Suction Reed Valve
 U—Bushing Spacer

RW21162 —UN—24JUN92

RW21163 —UN—24JUN92

CED,OUO1017,63 -19-16NOV98-2/2

R134a Component Oil Charge

CAUTION: All new compressors are charged with a mixture of nitrogen, R134a refrigerant and TY22025 (R134a) compressor oil. Wear safety goggles and discharge the compressor slowly to avoid possible injury.

Compressors can be divided into three categories when determining the correct oil charge for the system.

- New compressor from parts depot
- Used compressor removed from operation
- Used compressor internally washed with flushing solvent

Determine the amount of system oil charge prior to installation of compressor on a machine.

1. When the complete system, lines, and components were flushed, add the correct amount of oil as described:

- New compressor from parts depot contains 230 ± 20 mL (7.8 ± 0.7 fl oz) of new oil. System requires an additional 80 mL (2.7 fl oz) of new oil added to it.

Specification

New A/C Compressor
(System Completely
Flushed)—Volume..... 230 ± 20 mL (7.8 ± 0.7 fl oz)
A/C System
w/o Compressor
(System Completely
Flushed)—Volume..... 80 mL (2.7 fl oz)

- Used compressor removed from operation, oil drained and flushed, requires 310 ± 20 mL (10.5 ± 0.7 fl oz) of new oil.

Specification

Used A/C Compressor
(System Completely
Flushed)—Volume..... 310 ± 20 mL (10.5 ± 0.7 fl oz)

2. If the complete system was not flushed, add the correct amount of oil for the compressor plus amount of oil for each component that was serviced:

- New compressor from parts depot: drain and return 45 mL (1.5 fl oz) of oil to the compressor. (See R134a Compressor Oil Removal procedure in this group)

Specification

New A/C Compressor
(System Not
Flushed)—Volume..... Drain and return 45 mL (1.5 fl oz).

- Used compressor removed from operation: drain and add 45 mL (1.5 fl oz) of new oil. (See R134a Compressor Oil Removal procedure in this group.)

Specification

Used A/C Compressor;
Drained Only (System
Not Flushed)—Volume..... Drain and return 45 mL (1.5 fl oz)

- Used compressor removed from operation: oil drained and flushed, add 60 mL (2.0 fl oz) of new oil.

Specification

Used A/C Compressor;
Drained and Flushed
(System Not
Flushed)—Volume..... 60 mL (2.0 fl oz)

NOTE: Components listed below which have been removed, drained, or flushed, require the removal of the compressor to determine the correct oil charge. Use the following specifications as a guide for adding oil to components:

Specification

Evaporator—Volume..... 130 mL (4.4 fl oz)
Condenser—Volume..... 65 mL (2.2 fl oz)
Receiver/Dryer—Volume..... 30 mL (1.0 fl oz)
Hoses—Volume..... 60 mL (2.0 fl oz)

NOTE: Hoses = 3 mL per 30 cm (0.1 fl oz per ft).
Approximate total length equals 600 cm (20 ft).

If any section of hose is removed and flushed or replaced, measure the length of hose and use the formula to determine the correct amount of oil to be added.

CAUTION: DO NOT leave the system or R134a compressor oil containers open. This oil easily absorbs moisture.

DO NOT spill R134a compressor oil on acrylic or ABS plastic. This oil will deteriorate these materials rapidly.

Identify R134a oil containers and measures to eliminate accidental mixing of different oils.

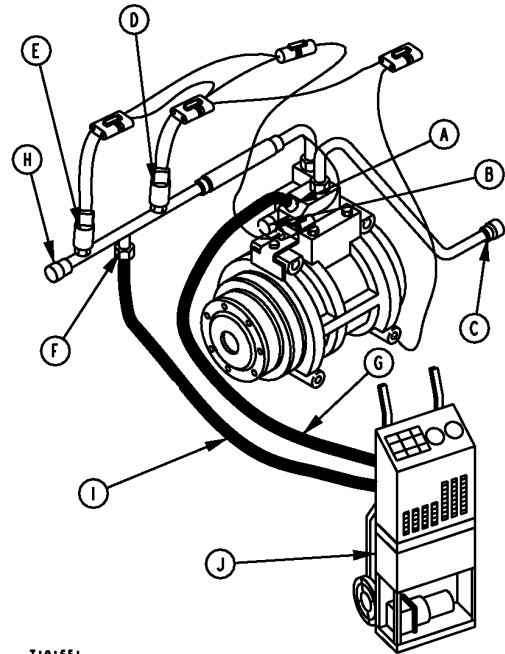
R134a Refrigerant Recovery/Recycling and Charging Station Installation Procedure

CAUTION: Do not remove high pressure relief valve (B). Air conditioning system will discharge rapidly causing possible injury.

IMPORTANT: Use correct refrigerant recovery/recycling and charging stations. **DO NOT** mix refrigerant, hoses, fittings, components or refrigerant oils.

NOTE: JT02050 Recovery/Recycling Station and JT02046 Charging station can be substituted for the JT02045 station.

1. Close both high and low pressure valves on JT02045 R134a Refrigerant Recovery/Recycling and Charging Station (J).
2. Remove cap from low pressure test port (A).
3. Connect low pressure blue hose (G) from refrigerant recovery/recycling and charging station (J) to low pressure test port (A) on compressor.
4. Connect high pressure red hose (I) to high pressure quick-disconnect (F).
5. Follow the manufacture's instructions when using the refrigerant recovery/recycling and charging station.



T101551

- | | |
|------------------------------|---|
| A—Low Pressure Test Port | F—High Pressure Quick-Disconnect |
| B—High Pressure Relief Valve | G—Blue Hose |
| C—Low Pressure Hose | H—High Pressure Hose |
| D—Low Pressure Switch | I—Red Hose |
| E—High Pressure Switch | J—Refrigerant Recovery/Recycling and Charging Station |

T101551—UN—10SEP96

CED,OUO1017,83 -19-24NOV98-1/1

Recover R134a System

CAUTION: Do not remove high pressure relief valve (B). Air conditioning system will discharge rapidly causing possible injury.

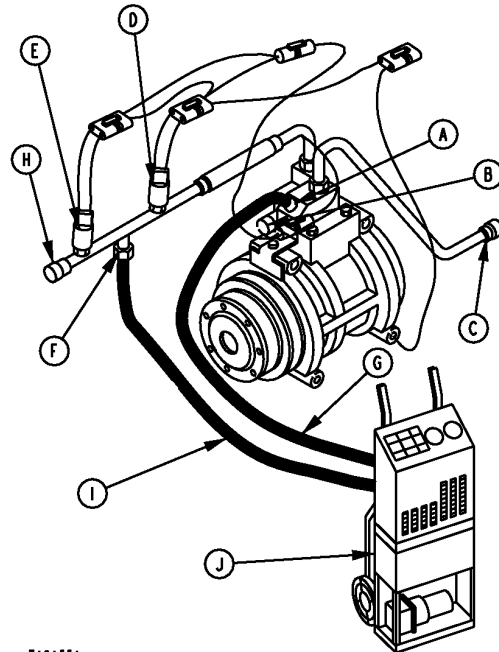
IMPORTANT: Use correct refrigerant recovery/recycling and charging stations. **DO NOT** mix refrigerant, hoses, fittings, components or refrigerant oils.

NOTE: Run the air conditioning system for three minutes to help in the recovery process. Turn air conditioning system off before proceeding with recovery steps.

NOTE: JT02050 Recovery/Recycling Station and JT02046 Charging station can be substituted for the JT02045 station.

1. Connect JT02045 R134a Refrigerant Recovery/Recycling and Charging Station. (See installation procedure in this group.)
2. Follow the manufacture's instructions when using the refrigerant recovery/recycling and charging station.

- | | |
|------------------------------|---|
| A—Low Pressure Test Port | F—High Pressure Quick-Disconnect |
| B—High Pressure Relief Valve | G—Blue Hose |
| C—Low Pressure Hose | H—High Pressure Hose |
| D—Low Pressure Switch | I—Red Hose |
| E—High Pressure Switch | J—Refrigerant Recovery/Recycling and Charging Station |



T101551

T101551—UN—10SEP96

CED,OUO1017,86 -19-25NOV98-1/1

Evacuate R134a System

CAUTION: Do not remove high pressure relief valve (B). Air conditioning system will discharge rapidly causing possible injury.

IMPORTANT: Use correct refrigerant recovery/recycling and charging stations. **DO NOT** mix refrigerant, hoses, fittings, components or refrigerant oils.

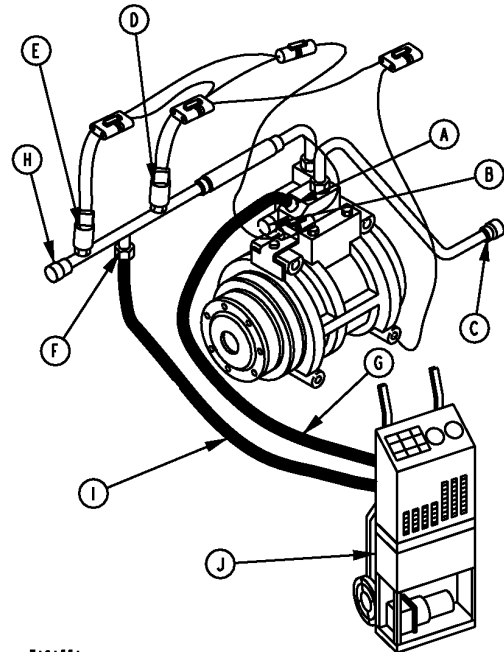
Do not run compressor while evacuating.

NOTE: JT02050 Recovery/Recycling Station and JT02046 Charging station can be substituted for the JT02045 station.

1. Connect JT02045 R134a Refrigerant Recovery/Recycling and Charging Station. (See installation procedure in this group.)
2. Open low and high pressure valves on refrigerant recovery/recycling and charging station.
3. Follow the manufacturer's instructions and evacuate the system.

NOTE: The vacuum specifications listed are for sea level conditions. Subtract 3.4 kPa (34 mbar) (1 in. Hg) from 98 kPa (980 mbar) (29 in. Hg) for each 300 m (1000 ft) elevation above sea level.

4. Evacuate system until low pressure gauge registers 98 kPa (980 mbar) (29 in. Hg) vacuum.
If 98 kPa (980 mbar) (29 in. Hg) vacuum cannot be obtained in 15 minutes, test the system for leaks. (See Leak Testing in Operation and Test Manual Group 9031-25). Correct any leaks.
5. When vacuum is 98 kPa (980 mbar) (29 in. Hg), close low-side and high-side valves. Turn vacuum pump off.
6. If the vacuum decreases more than 3.4 kPa (34 mbar) (1 in. Hg) in 5 minutes, there is a leak in the system.
7. Repair leak.
8. Start to evacuate.



T101551

A—Low Pressure Test Port
B—High Pressure Relief Valve
C—Low Pressure Hose
D—Low Pressure Switch
E—High Pressure Switch

F—High Pressure Quick-Disconnect
G—Blue Hose
H—High Pressure Hose
I—Red Hose
J—Refrigerant Recovery/Recycling and Charging Station

9. Open low-side and high-side valves.
10. Evacuate system for 30 minutes after 98 kPa (980 mbar) (29 in. Hg) vacuum is reached.
11. Close low-side and high-side valves. Stop evacuation.
12. Charge the system. (See procedure in this group.)

CED,OUO1017,87 -19-13JAN99-1/1

T101551—UN—10SEP96

Charge R134a System

CAUTION: Do not remove high pressure relief valve (B). Air conditioning system will discharge rapidly causing possible injury.

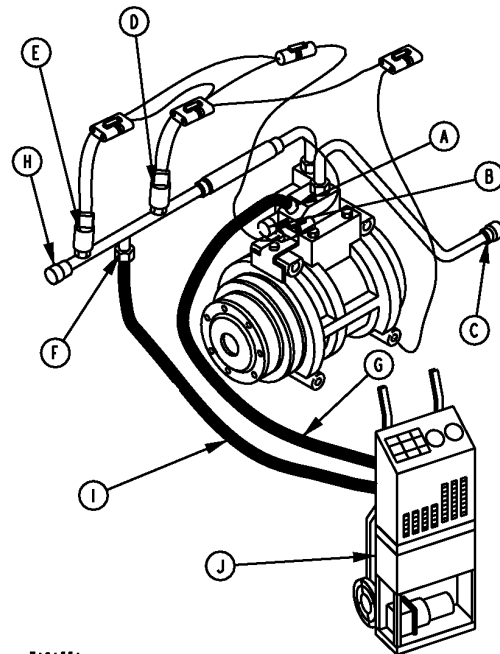
IMPORTANT: Use correct refrigerant recovery/recycling and charging stations. **DO NOT** mix refrigerant, hoses, fittings, components or refrigerant oils.

NOTE: JT02050 Recovery/Recycling Station and JT02046 Charging station can be substituted for the JT02045 station.

1. Connect JT02045 R134a Refrigerant Recovery/Recycling and Charging Station. (See installation procedure in this group.)
2. Evacuate the system. (See Evacuate R134a System in this group.)

NOTE: Before beginning to charge air conditioning system, the following conditions must exist: Engine STOPPED, the pump must be capable of pulling at least 96.8 kPa (968 mbar) (28.6 in. Hg) vacuum (sea level). Subtract 3.4 kPa (34 mbar) (1 in. Hg) from 98 kPa (980 mbar) (29 in. Hg) for each 300 m (1000 ft) elevation above sea level.

3. Follow the manufacturer's instructions and charge the system.
4. Add refrigerant until system is charged with 2.04 kg (4.50 lbs).
5. Do air conditioner checks and tests in Operation and Test Manual, Groups 9031-10 and 9031-25.



T101551

T101551—UN—10SEP96

A—Low Pressure Test Port
B—High Pressure Relief Valve
C—Low Pressure Hose
D—Low Pressure Switch
E—High Pressure Switch

F—High Pressure Quick-Disconnect
G—Blue Hose
H—High Pressure Hose
I—Red Hose
J—Refrigerant Recovery/Recycling and Charging Station

CED,OUO1010,379 -19-08OCT98-1/1

R134a System Leak Testing

1. Inspect all lines, fittings, and components for oily or dusty spots. When refrigerant leaks from the system, a small amount of oil is carried out with it.
2. A soap and water solution can be sprayed on the components in the system to form bubbles at the source of the leak.
3. If a leak detector is used, move the leak detector probe under the hoses and around the connections at a rate of 25 mm (1 in.) per second.
4. Some refrigerant manufacturers add dye to refrigerant to aid in leak detection.

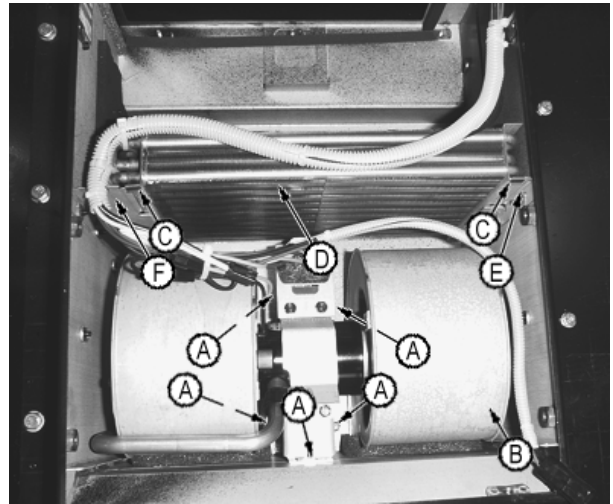
TX,9031,QQ1881 -19-01SEP06-1/1

Remove and Install Heater Core

1. Remove seat, seat base, and seat belts. (See procedures in Group 1821.)
2. Drain radiator. The approximate capacity of cooling system is 16 L (17 qt).
3. Disconnect the heater hoses at the heater core (below the cab floor).
4. Remove heater/blower cover and air filter housing from heater/blower housing.
5. Remove cap screws (A) and lift blower assembly (B) out of heater housing.
6. Remove clips (C) from heater core (D) and heater core retainers (E and F).

⚠ CAUTION: Wear gloves when removing and installing heater core to prevent cuts from fins on heater core.

7. Carefully remove the heater core (D) by swinging it toward the area where the blower assembly was located.
8. Repair or replace heater core.
9. Install heater core (D) using heater core retainers (E and F) and clips (C).
10. Lift blower assembly (B) into heater housing and install cap screws (A).
11. Install heater/blower cover and air filter housing.



T106027B—UN—02JAN97

- | | |
|--------------------------|------------------------------|
| A—Cab Cap Screw (5 used) | D—Heater Core |
| B—Blower Assembly | E—Rear Heater Core Retainer |
| C—Clip (2 used) | F—Front Heater Core Retainer |

12. Connect heater hoses at the heater core (below the cab floor).
13. Fill radiator and check for leaks.
14. Install seat assembly. (See procedures in Group 1821.)

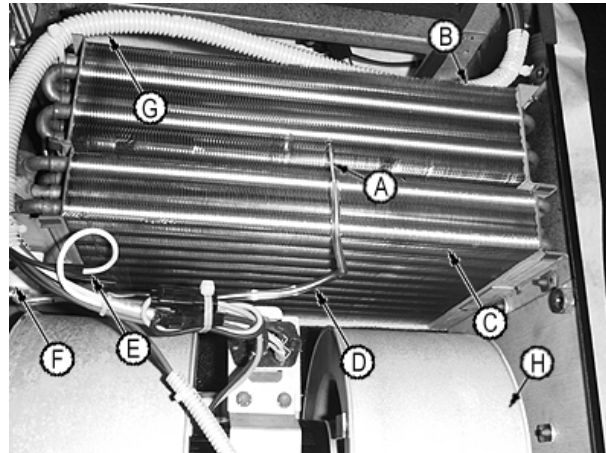
TX,18,QQ9289 -19-02NOV99-1/1

Remove and Install Evaporator

1. Remove seat, seat base, and seat belts. (See procedures in Group 1821.)
2. Drain radiator. The approximate capacity of cooling system is 16 L (17qt).
3. Recover refrigerant from the system. (See procedure in this group.)
4. Disconnect the heater hoses at the heater core (below the cab floor).
5. Disconnect evaporator suction line and liquid line located below the cab floor.
6. Remove heater/blower cover and air filter housing from heater/blower housing.
7. Remove cap screws and lift blower assembly (H) out of heater/blower housing.
8. Remove clips from heater core (C) and evaporator (B) and remove heater core front and rear retainers.

CAUTION: Wear gloves when removing and installing heater core to prevent cuts from fins on heater core.

9. Carefully remove the heater core (C) by swinging it toward the area where the blower assembly was located.
10. Carefully remove the evaporator (B) by swinging it toward the area where the blower assembly was located.
11. Repair or replace evaporator.
12. Install evaporator (B) and heater core (C).
13. Install heater core front and rear retainers and clips.
14. Install blower assembly into heater/blower housing.



A—A/C Freeze Switch Probe
 B—Evaporator
 C—Heater Core
 D—Freeze Switch Tube
 E—Wire Harness Leads
 F—A/C Freeze Switch
 G—Wiring Harness
 H—Blower Mount Assembly

15. Install heater/blower cover and air filter housing into heater/blower housing.
16. Connect the heater hoses at the heater core (below the cab floor).
17. Connect evaporator suction line and liquid line located below the cab floor.
18. Fill radiator and check for leaks.
19. Install seat assembly. (See procedures in Group 1821.)
20. Evacuate and charge the system. (See procedures in this group.)

TX,18,QQ9290 -19-02NOV99-1/1

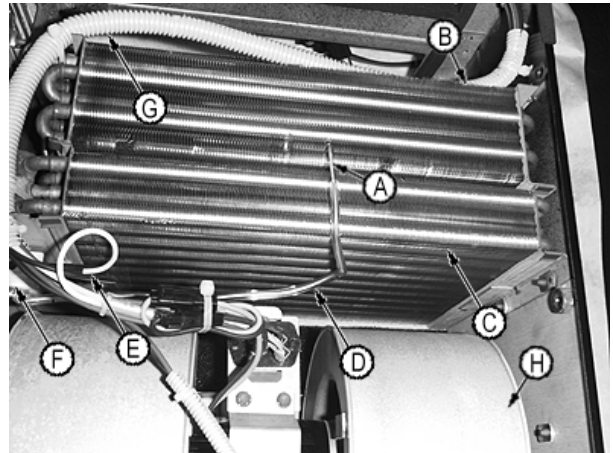
Remove and Install A/C Freeze Switch

1. Remove seat assembly. (See procedures in Group 1821.)
2. Remove heater/blower cover and air filter housing from heater/blower housing.
3. Disconnect wire harness leads (E) from A/C freeze switch (F).
4. Remove A/C freeze switch (F) and A/C freeze switch probe (A).
5. Repair or replace A/C freeze switch.
6. Install A/C freeze switch (F) on the top header support plate.
7. Install the A/C freeze switch probe (A) 228 ± 1 mm (9 ± 1 in.) into the evaporator between the last two rows of tubes closest to the heater core and centered between the headers.

Specification

A/C Freeze Switch
 Probe—Depth..... 228 ± 1 mm (9 ± 1 in.)

8. Connect wire harness leads (E) with white wire and black wire to the A/C freeze switch.
9. Install heater/blower cover and air filter housing into heater/blower housing.



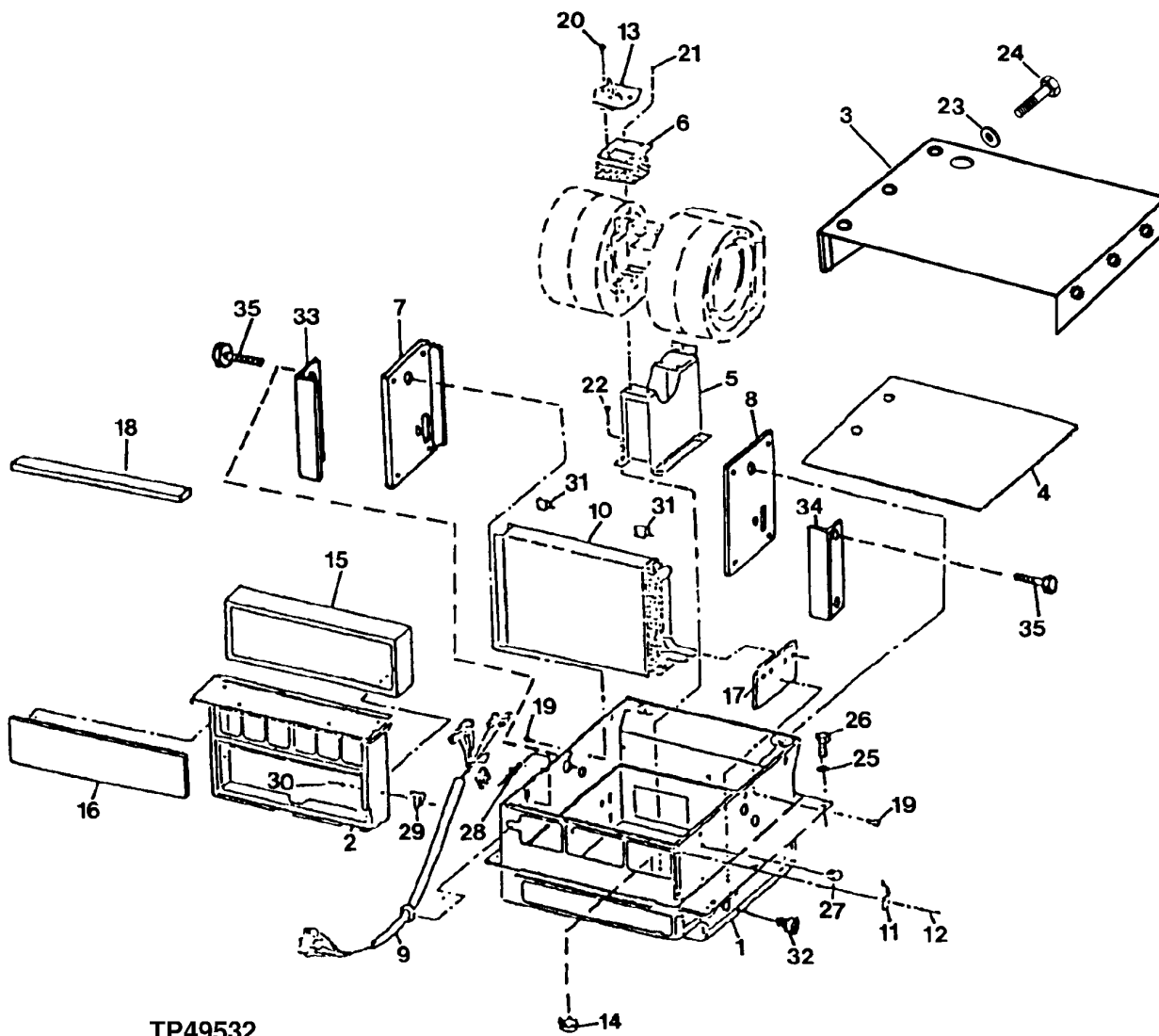
T106041C—UN—08JAN97

- | | |
|---------------------------|-------------------------|
| A—A/C Freeze Switch Probe | E—Wire Harness Leads |
| B—Evaporator | F—A/C Freeze Switch |
| C—Heater Core | G—Wiring Harness |
| D—Freeze Switch Tube | H—Blower Mount Assembly |

10. Install seat assembly. (See procedures in Group 1821.)

TX,18,QQ9291 -19-28JUL94-1/1

Disassemble and Assemble Heater/Blower Assembly



TP49532

TP49532 —UN—07 JAN97

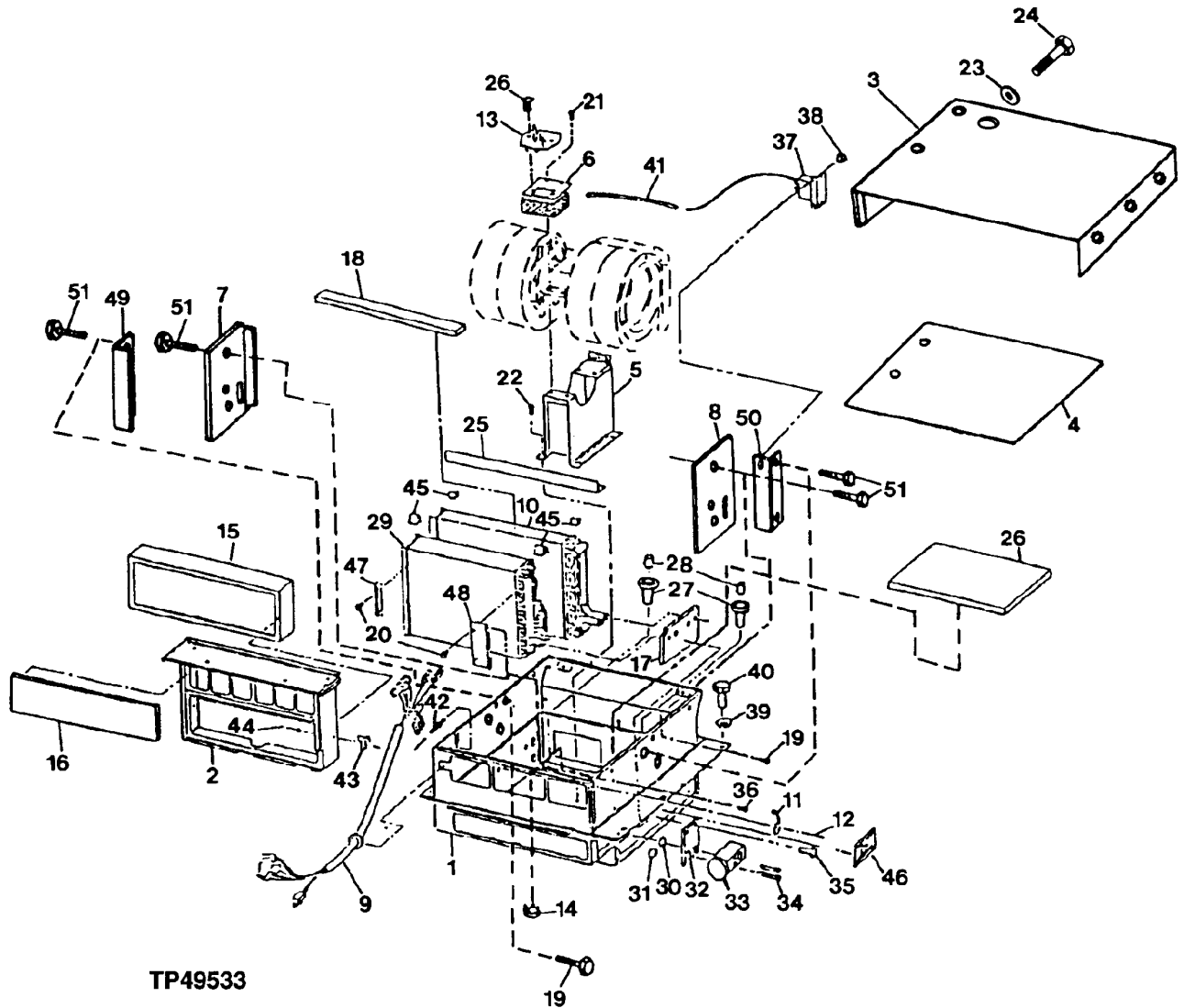
- | | | | |
|-------------------|--------------------|------------------------|-----------------------|
| 1— Case | 10— Heater Core | 19— Screw (6 used) | 28— Tie Band (2 used) |
| 2— Housing | 11— Latch (2 used) | 20— Cap Screw (2 used) | 29— Bolt (2 used) |
| 3— Cover | 12— Rivet (2 used) | 21— Screw (4 used) | 30— Rivet (2 used) |
| 4— Gasket | 13— Resistor | 22— Screw (6 used) | 31— Clip (2 used) |
| 5— Support | 14— Plug (2 used) | 23— Washer (4 used) | 32— Screw (3 used) |
| 6— Bracket | 15— Air Filter | 24— Cap Screw | 33— Rear Retainer |
| 7— Plate | 16— Filter | 25— Washer (7 used) | 34— Front Retainer |
| 8— Plate | 17— Seal | 26— Cap Screw (7 used) | 35— Screw (4 used) |
| 9— Wiring Harness | 18— Seal | 27— Plug (4 used) | |

1. Disassemble parts (1—35).

2. Inspect and replace parts as necessary.

TX,18,QQ9292 -19-24OCT94-1/1

Disassemble and Assemble Heater/Blower Assembly with Air Conditioning



TP49533

TP49533 — UN — 07JAN97

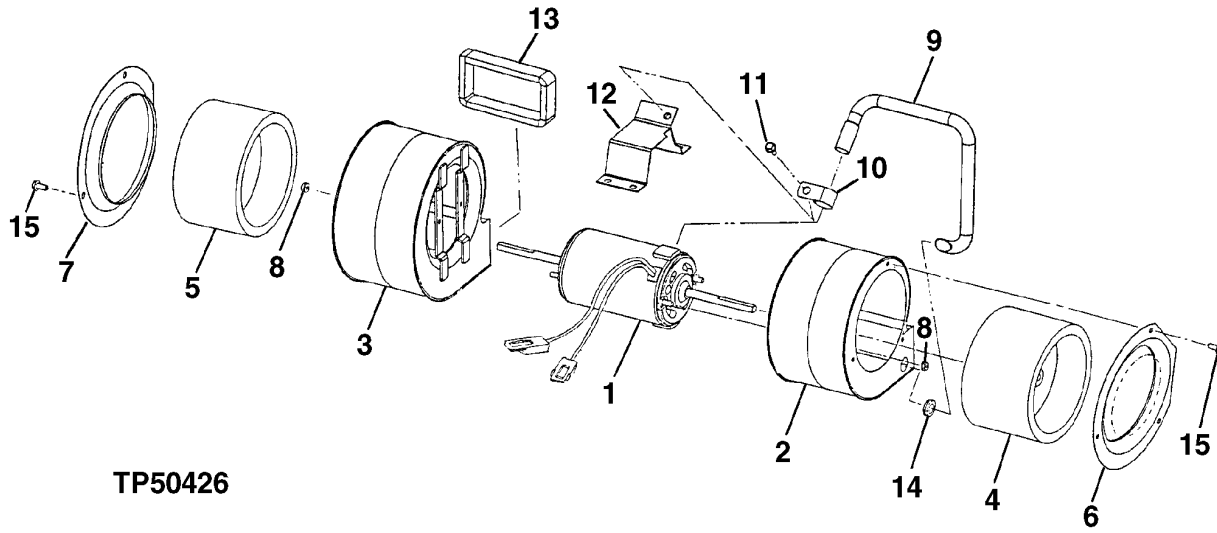
- | | | | |
|--------------------|------------------------|---------------------|--------------------------------|
| 1— Case | 14— Plug (2 used) | 27— Boot (2 used) | 40— Cap Screw (7 used) |
| 2— Housing | 15— Air Filter | 28— Valve | 41— Tube |
| 3— Cover | 16— Filter | 29— Evaporator | 42— Tie Band (2 used) |
| 4— Gasket | 17— Seal | 30— Ring | 43— Bolt (2 used) |
| 5— Support | 18— Seal | 31— O-Ring | 44— Rivet (2 used) |
| 6— Bracket | 19— Screw (6 used) | 32— Plate | 45— Clip (4 used) |
| 7— Plate | 20— Cap Screw (2 used) | 33— Valve | 46— Label |
| 8— Plate | 21— Screw (4 used) | 34— Screw (2 used) | 47— Rear Evaporator Retainer |
| 9— Wiring Harness | 22— Screw (5 used) | 35— Screw (3 used) | 48— Front Evaporator Retainer |
| 10— Heater Core | 23— Washer (4 used) | 36— Screw (4 used) | 49— Rear Heater Core Retainer |
| 11— Latch (2 used) | 24— Cap Screw | 37— Thermostat | 50— Front Heater Core Retainer |
| 12— Rivet (2 used) | 25— Angle | 38— Screw | 51— Screw (4 used) |
| 13— Resistor | 26— Gasket | 39— Washer (7 used) | |

1. Disassemble parts (1—51).

2. Inspect and replace parts as necessary.

TX,18,QQ9293 -19-24OCT94-1/1

Disassemble and Assemble Blower Assembly



TP50426

TP50426—UN—31OCT96

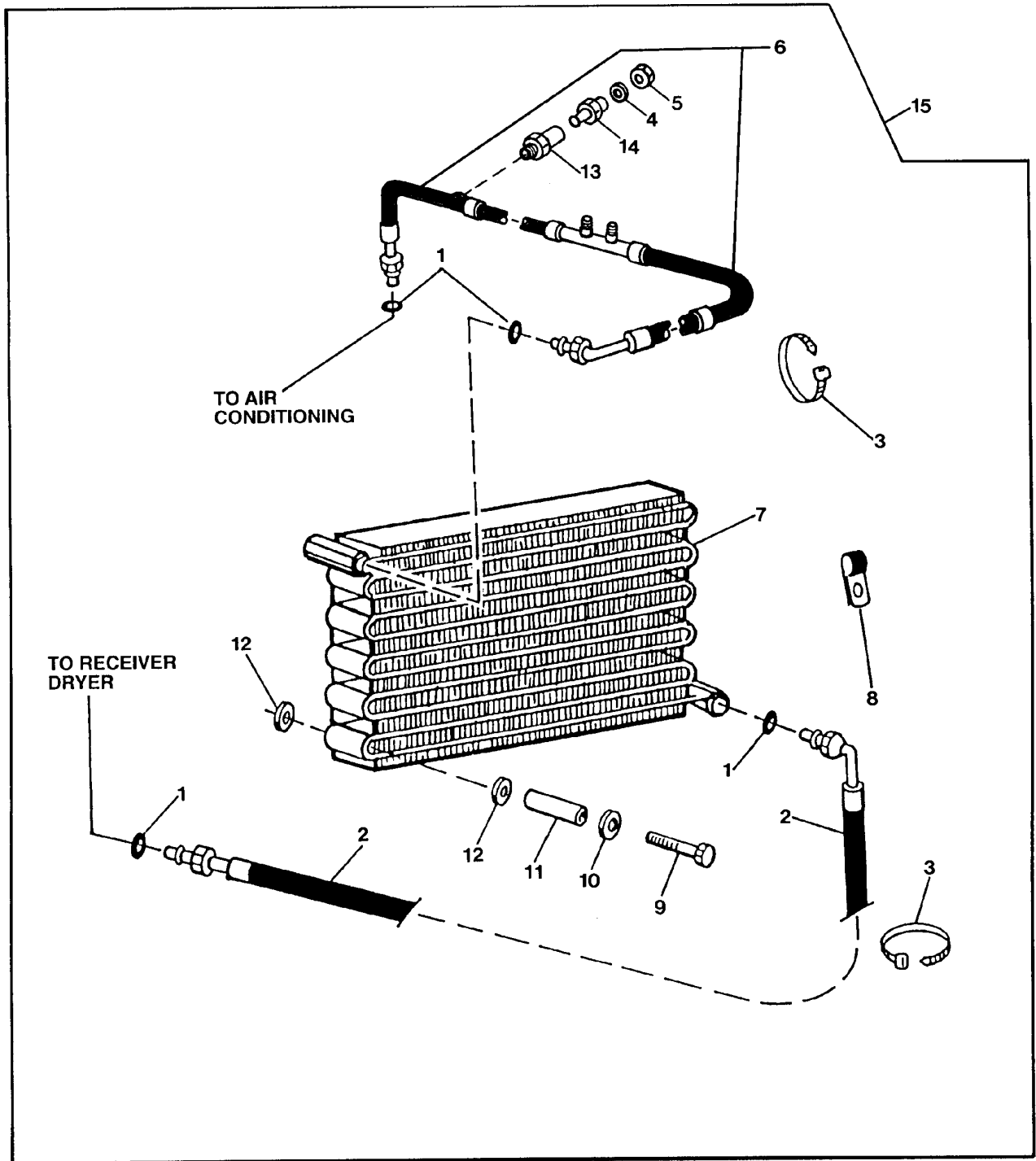
- | | | | |
|-----------------------|----------------------|--------------|------------------------|
| 1— Motor | 5— Rear Blower Wheel | 9— Tube | 13— Gasket (2 used) |
| 2— Front Housing | 6— Front Ring | 10— Clamp | 14— Grommet |
| 3— Rear Housing | 7— Rear Ring | 11— Screw | 15— Cap Screw (6 used) |
| 4— Front Blower Wheel | 8— Lock Nut (4 used) | 12— Retainer | |

1. Disassemble parts (1—15).

2. Inspect and replace parts as necessary.

TX,18,QQ9294 -19-04FEB97-1/1

Disassemble and Assemble Condenser



T107096

T107096-19-08FEB97

Continued on next page

TX.18.QQ9295 -19-04FEB97-1/2

Heating and Air Conditioning

1— O-Ring (4 used)
2— Hose
3— Tie Band
4— O-Ring

5— Cap
6— Hose
7— Condenser
8— Clamp

9— Cap Screw (4 used)
10— Washer (4 used)
11— Spacer (4 used)
12— Washer (8 used)

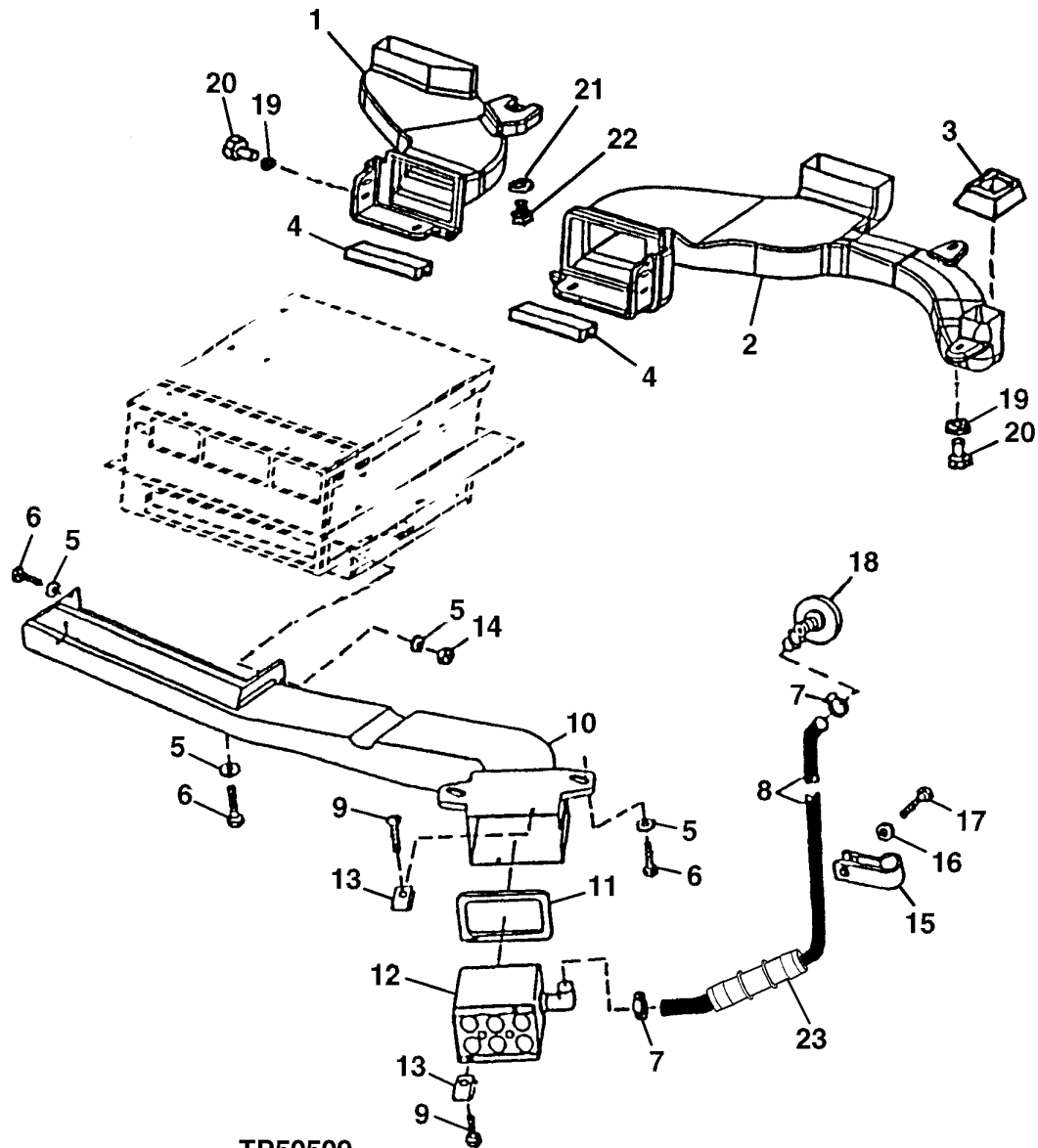
13— Port
14— Valve
15— Condenser Assembly

1. Disassemble parts (1—15).

2. Inspect and replace parts as necessary.

TX,18,QQ9295 -19-04FEB97-2/2

Disassemble and Assemble Air Ducts



TP50509

- | | | | |
|--------------------------------|-------------------|-----------------------|------------------------|
| 1— Left Rear Air Duct | 7— Clamp (2 used) | 13— Lock Nut (2 used) | 19— Washer (6 used) |
| 2— Left Front/Defrost Air Duct | 8— Hose | 14— Nut | 20— Cap Screw (6 used) |
| 3— Seal | 9— Screw (2 used) | 15— Clip | 21— Washer |
| 4— Seal (2 used) | 10— Air Duct | 16— Washer | 22— Screw |
| 5— Washer (4 used) | 11— Gasket | 17— Cap Screw | 23— Coupling |
| 6— Cap Screw (6 used) | 12— Air Freshener | | |

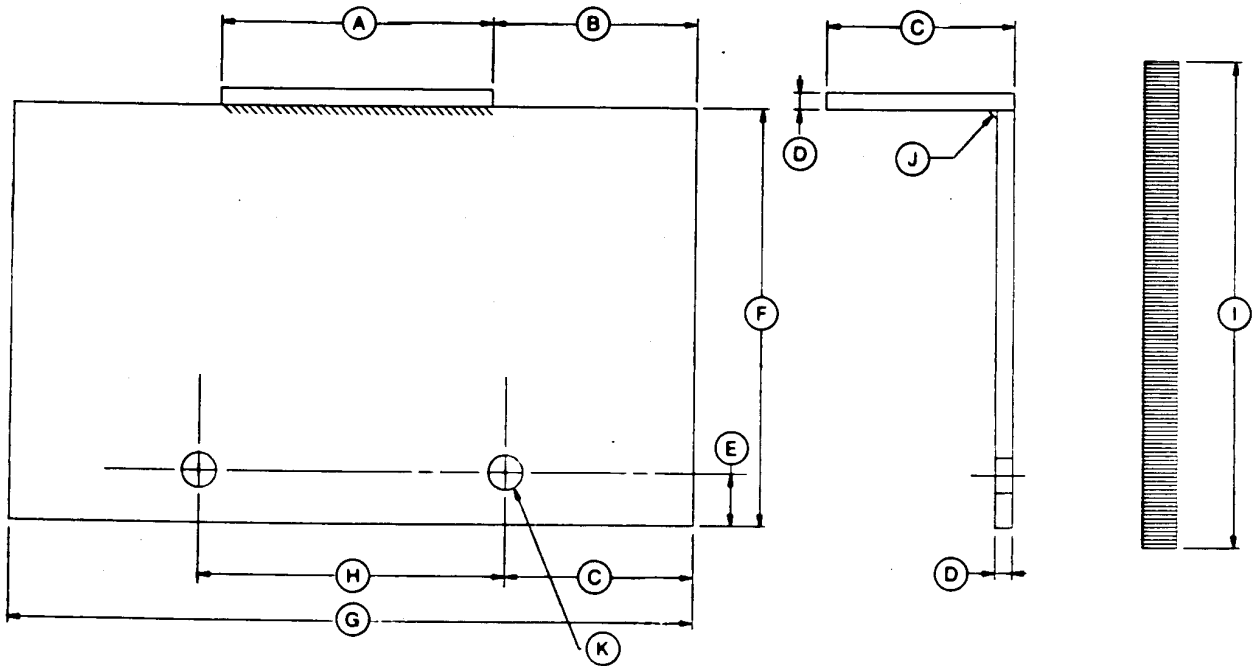
1. Disassemble parts (1—23).

2. Inspect and replace parts as necessary.

TX,18,QQ9296 -19-04FEB97-1/1

TP50509—UN—25OCT96

DFRW20 Compressor Holding Fixture



A—102 mm (4 in.)
B—76 mm (3 in.)
C—70 mm (2.75 in.)

D—6.4 mm (0.25 in.)
E—19 mm (0.75 in.)
F—152 mm (6 in.)

G—254 mm (10 in.)
H—114 mm (4.5 in.)
I—178 mm (7 in.)

J— Fillet Weld
K—Two Holes

This tool is used to hold the air conditioning compressor during disassembly and assembly.

MATERIALS:

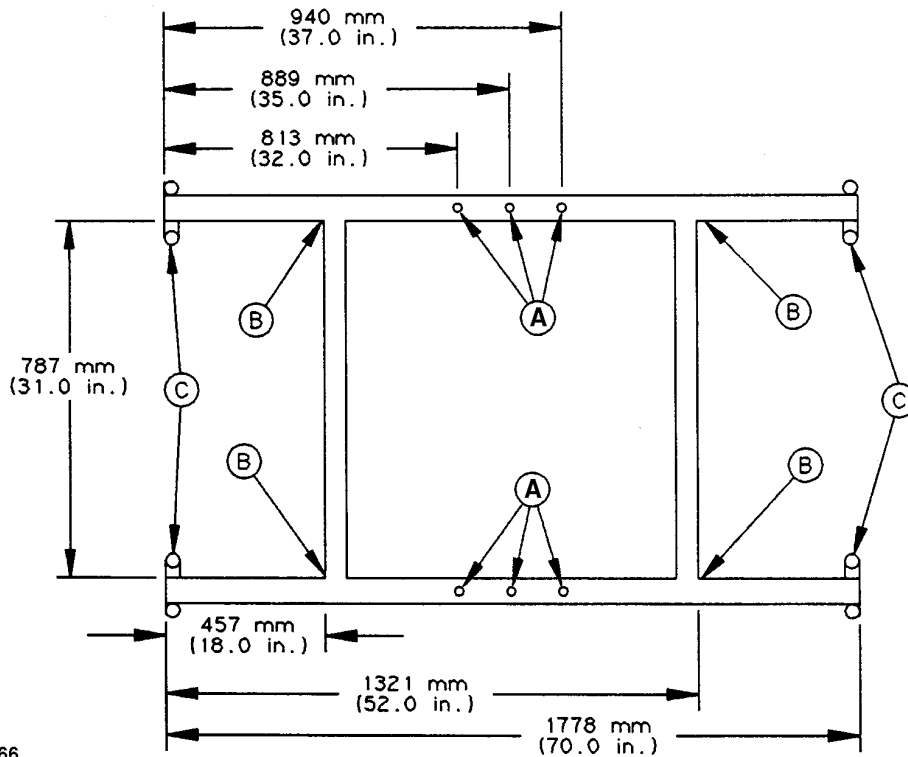
- Two pieces of steel plate, approximately 70 x 120 mm (2-3/4 x 4 in.) and 152 x 254 mm (6 x 10 in.)

- Two pieces of threaded rod, 13 mm (1/2 in.) threads x 178 mm (7 in.) long
- Four lock washers and nuts

RW13619—UN—20SEP89

TX,18,QQ9297 -19-25MAY90-1/1

DFT1101 Cab and ROPS Lift Bracket



T117366

T117366—UN—23SEP98

A—Drill Six Holes (0.625 in.)

B—Weld

C—U46161 Lift Eyes Welded to Tube with 0.25 in. Fillet Weld

Used to remove and install cab or ROPS.

Material:

- 2.0 in. x 2.0 in. x 0.250 in. Square Tube

- U46161 U-Bolts (4 used)
- JT01748 Lift Brackets (2 used)
- 0.625 in. x 3.00 in. "F" Grade Cap Screws (2 used)

TX,18,QQ9298 -19-01SEP06-1/1

Section 19
Sheet Metal and Styling

Contents

Page

Group 1910—Hood and Engine Enclosure
Hood and Engine Enclosure
Disassemble and Assemble 19-1910-1

Group 1913—Miscellaneous Shields
Battery Box
Disassemble and Assemble 19-1913-1

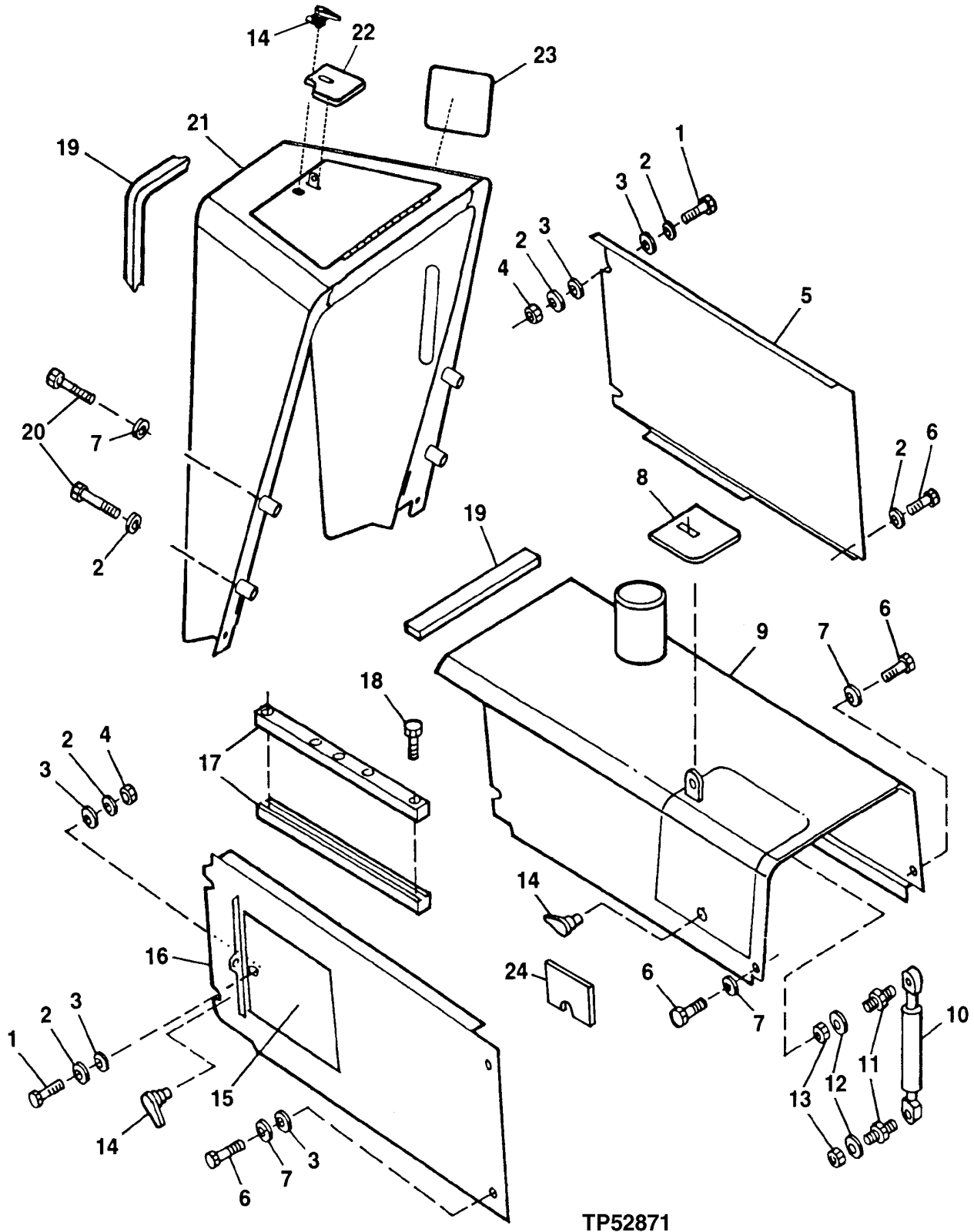
Group 1921—Grille and Grille Housing
Grille and Grille Housing
Disassemble and Assemble 19-1921-1

Group 1927—Fenders
Fenders
Disassemble and Assemble 19-1927-1
Fender Extension
Disassemble and Assemble 19-1927-2

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Group 1910 Hood and Engine Enclosure

Disassemble and Assemble Hood and Engine Enclosure



TP52871

TP52871 —UN—02JAN97

Continued on next page

TX,19,QQ9635 -19-24OCT94-1/2

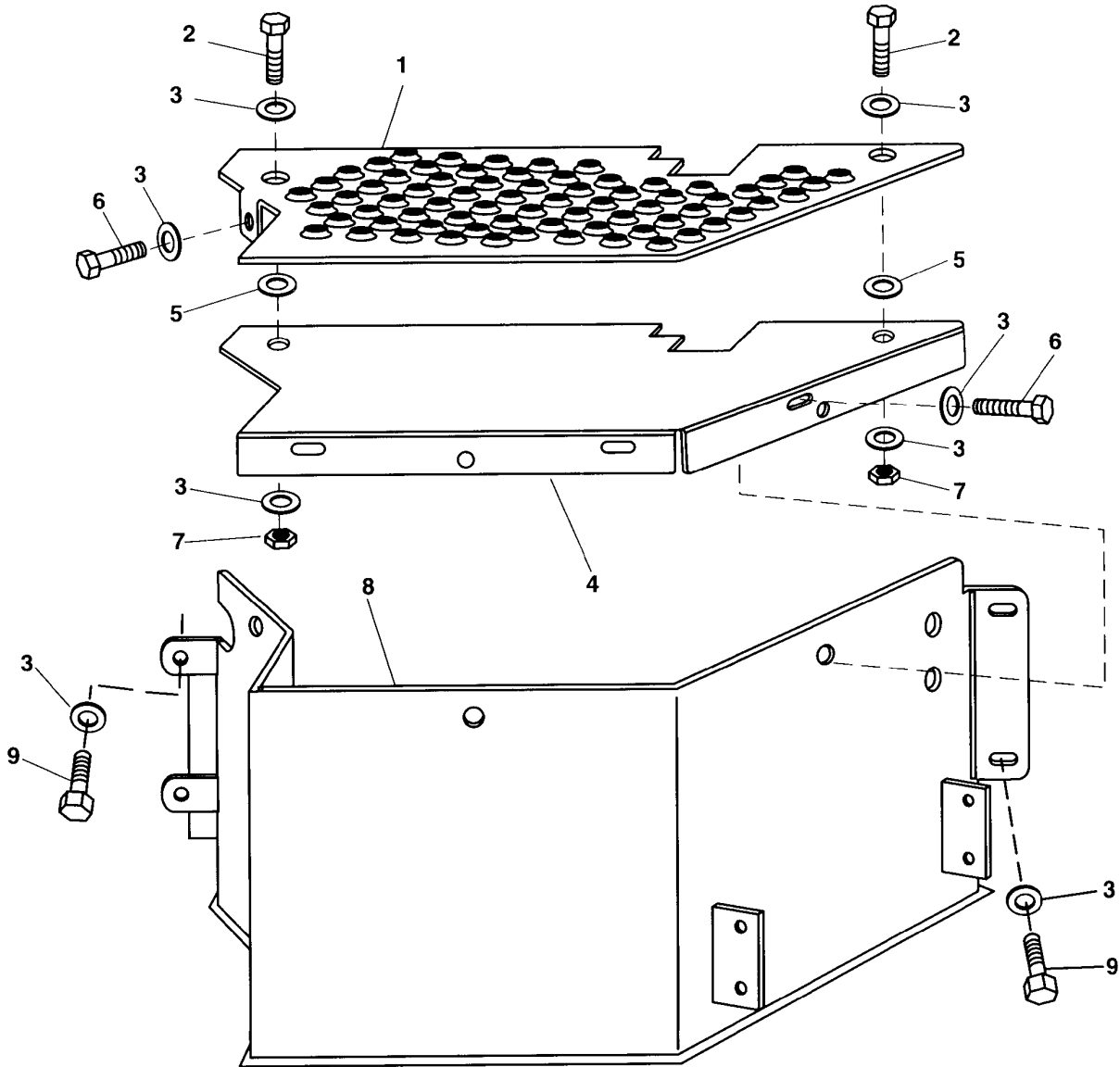
Hood and Engine Enclosure

1— Cap Screw (4 used)	7— Washer (5 used)	13— Nut (2 used)	19— Isolator
2— Washer (15 used)	8— Label	14— Latch (3 used)	20— Cap Screw (4 used)
3— Guide (8 used)	9— Hood	15— Door	21— Cowl
4— Lock Nut (4 used)	10— Cylinder	16— Right Hand Shield	22— Label
5— Left Hand Shield	11— Ball Stud (2 used)	17— Door Guide	23— Label
6— Cap Screw (8 used)	12— Washer (2 used)	18— Screw (10 used)	24— Label

1. Raise loader and install boom lock bar.
2. Remove precleaner and muffler extension.
3. Disassemble parts as shown.
4. Inspect parts and replace if necessary.
5. Assemble parts.
6. Install precleaner and muffler extension.

TX,19,QQ9635 -19-24OCT94-2/2

Disassemble and Assemble Battery Box



TP50453

- 1— Plate
- 2— Cap Screw (2 used)
- 3— Washer (11 used)

- 4— Plate
- 5— Washer (2 used)
- 6— Cap Screw (3 used)

- 7— Nut (2 used)
- 8— Battery Box
- 9— Cap Screw

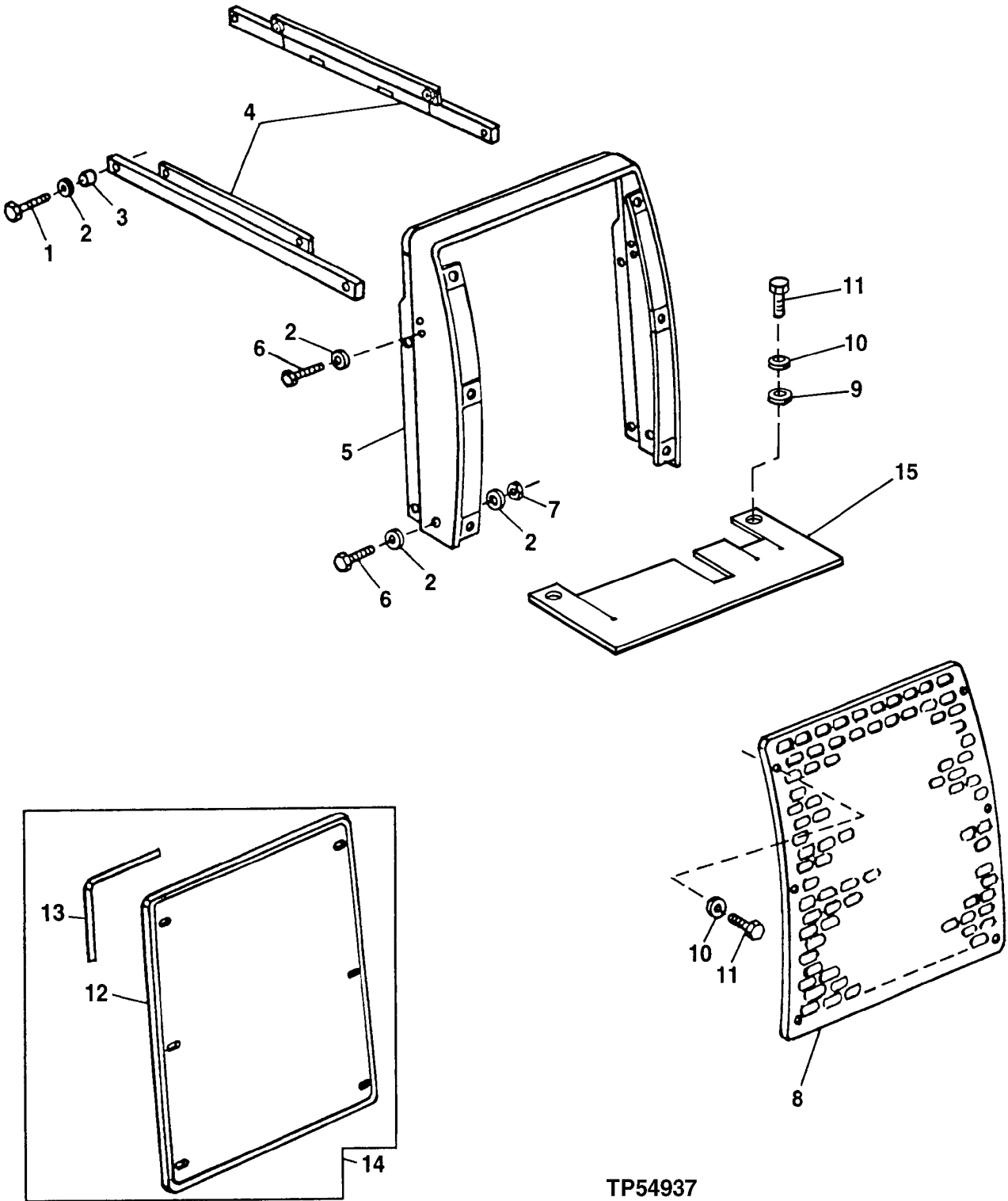
Inspect for worn or damaged parts and replace if necessary.

TX,19,QQ9636 -19-24OCT94-1/1

TP50453 —UN—22AUG96

Miscellaneous Shields

Disassemble and Assemble Grille and Grille Housing



TP54937 —UN—02JAN97

Continued on next page

Grille and Grille Housing

1— Cap Screw (2 used)
2— Washer (8 used)
3— Spacer (2 used)
4— Bar (2 used)

5— Grille Housing
6— Cap Screw (4 used)
7— Nut (2 used)
8— Grille

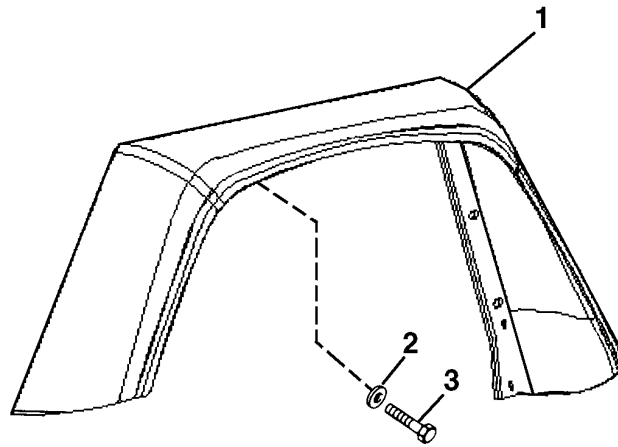
9— Washer (2 used)
10— Washer (8 used)
11— Cap Screw (8 used)
12— Trash Screen

13— Isolator
14— Trash Screen Assembly
15— Deflector

1. Raise loader and install boom lock bar.
2. Disassemble parts as shown.
3. Inspect parts and replace if necessary.
4. Assemble parts.
5. Remove boom lock bar.

TX,19,QQ9637 -19-17OCT94-2/2

Disassemble and Assemble Fenders



TP50487

1—Fender

2—Washer (24 used)

3—Cap Screw (24 used)

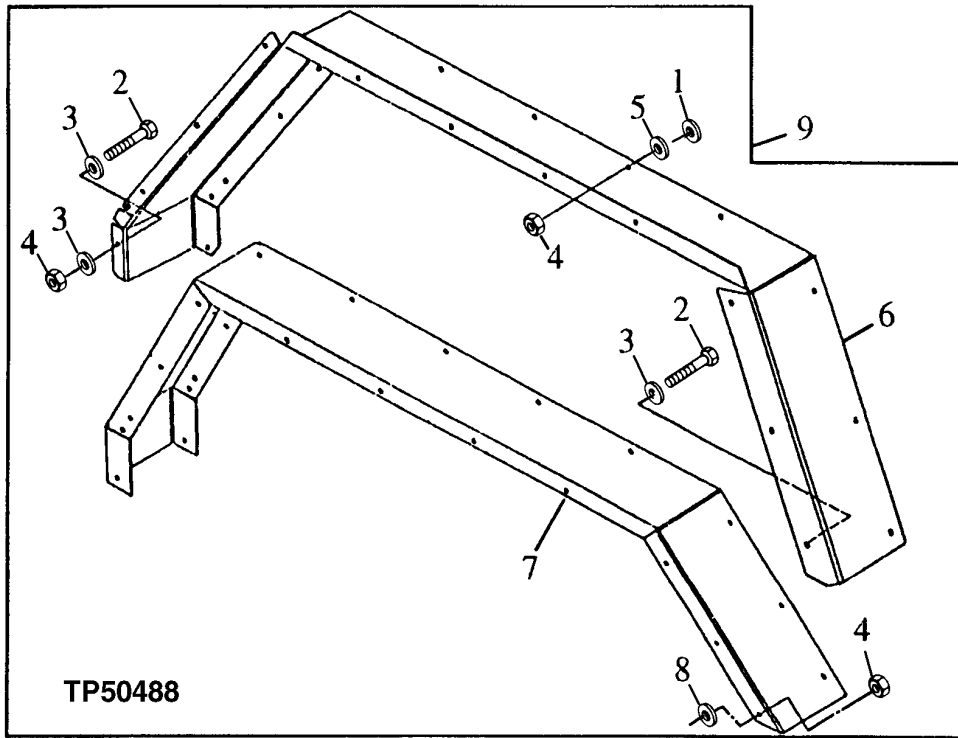
1. Disassemble parts as shown.

2. Inspect parts and replace as necessary.

TX,19,QQ9638 -19-24MAY93-1/1

TP50487—UN—21SEP96

Disassemble and Assemble Fender Extensions



TP50488—UN—21SEP96

- | | | |
|------------------------|-----------------------|---------------------|
| 1— Washer (8 used) | 4— Lock Nut (25 used) | 7— Extension |
| 2— Cap Screw (24 used) | 5— Washer (8 used) | 8— Washer (16 used) |
| 3— Washer (25 used) | 6— Extension | 9— Fender |

1. Disassemble parts as shown.
2. Inspect parts and replace as necessary.

TX,19,QQ9639 -19-13JAN99-1/1

Section 20
Safety, Convenience and Miscellaneous
Contents

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Group 2001—Radio

Remove and Install Radio and Speakers ..	20-2001-1
Remove and Install Antenna	20-2001-1
Disassemble and Assemble Radio, Speakers and Antenna	20-2001-2

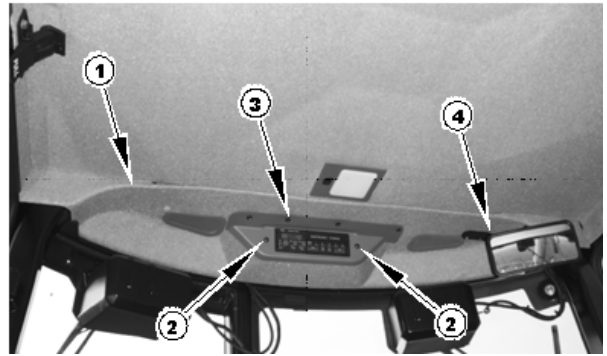
Group 2004—Horn and Warning Devices

Remove and Install Horn	20-2004-1
Remove and Install Back-Up Alarm.....	20-2004-2
Adjust Back-Up Alarm Volume	20-2004-2

Contents

Remove and Install Radio and Speakers

1. Remove screws (2 and 3).
2. Disconnect antenna coaxial cable and radio wiring harness.
3. Remove rear view mirror.
4. Remove cover and front headliner.
5. Install cover and front headliner.
6. Install rear view mirror.
7. Connect antenna coaxial cable and radio wiring harness.
8. Install screws (2 and 3).



T103633B—UN—10SEP96

1— Headliner
2— Screw (2 used)

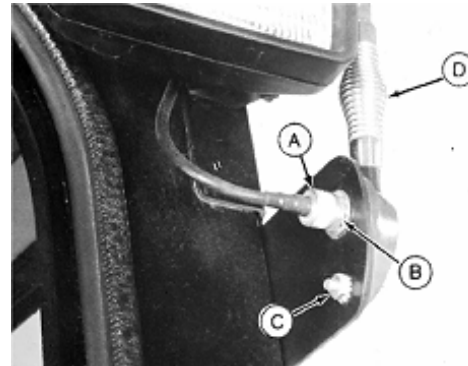
3— Screw (7 used)
4— Mirror Assembly

TX,20,QQ9640 -19-13JAN99-1/1

Remove and Install Antenna

1. Remove knurled nut (A) to disconnect cable.
2. Remove nuts and lock washers (B and C) to remove antenna (D).
3. Install antenna, lock washers and nuts.
4. Connect cable using knurled nut.

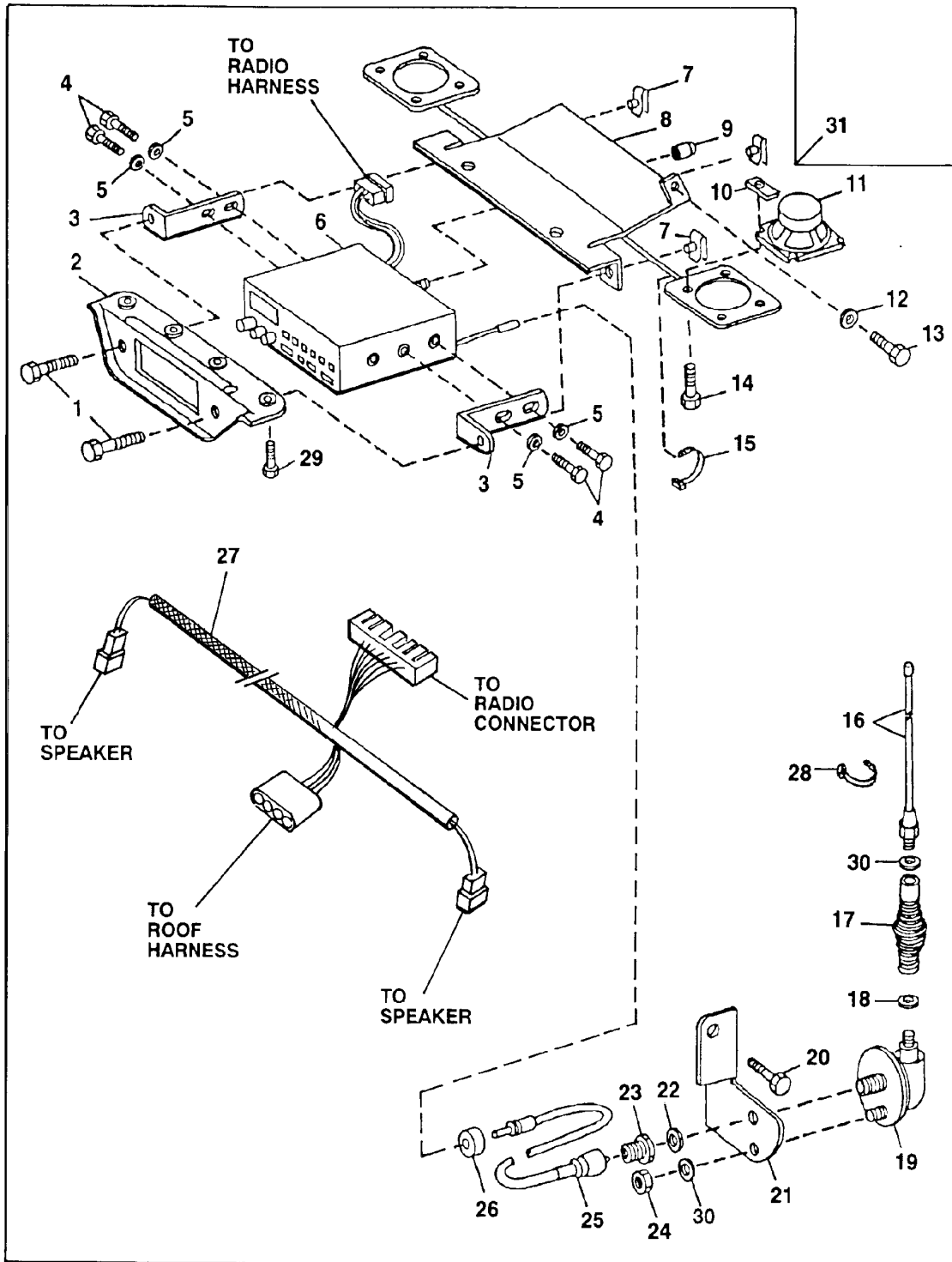
A—Knurled Nut C—Small Nut and Lock Washer
B—Large Nut and Lock Washer D—Antenna



T7883BN—UN—09JAN93

TX,20,QQ9641 -19-13JAN99-1/1

Disassemble and Assemble Radio, Speakers and Antenna



T107259

T107259-19-14FEB97

Continued on next page

TX,20,QQ9642-19-24MAY93-1/2

Radio

- | | | | |
|--------------------------------|------------------------|--------------------------|---------------------------------|
| 1— Self-Locking Screw (2 used) | 9— Bushing | 17— Spring | 25— Antenna Cable |
| 2— Panel | 10— Nut (8 used) | 18— Lock Washer (2 used) | 26— Grommet |
| 3— Angle (2 used) | 11— Speaker (2 used) | 19— Base | 27— Wiring Harness |
| 4— Screw (4 used) | 12— Washer | 20— Cap Screw | 28— Tie Band |
| 5— Washer (4 used) | 13— Cap Screw | 21— Bracket | 29— Self-Locking Screw (7 used) |
| 6— Radio | 14— Cap Screw (8 used) | 22— Lock Washer | 30— Lock Washer (2 used) |
| 7— Nut (10 used) | 15— Tie Band (4 used) | 23— Nut | 31— Radio |
| 8— Plate | 16— Antenna | 24— Nut | |

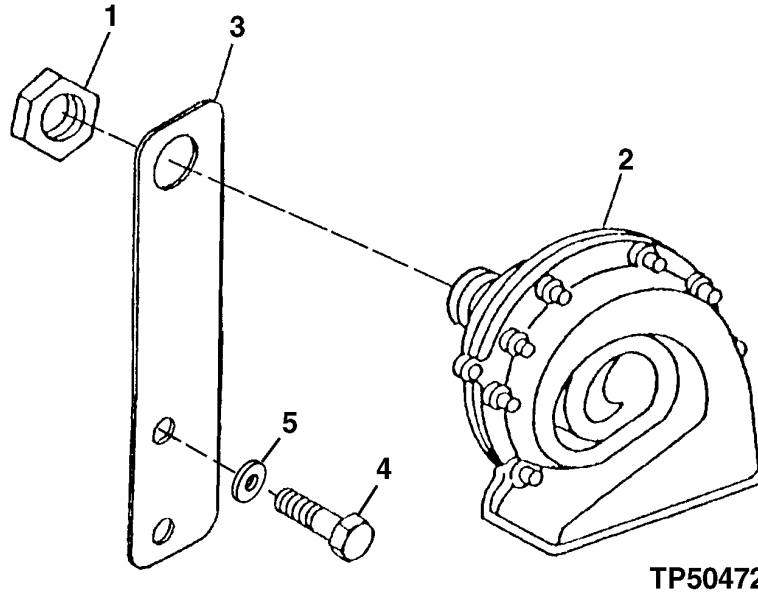
1. Disassemble parts as shown.

2. Inspect parts and replace as necessary.

TX.20.QQ9642 -19-24MAY93-2/2

Radio

Remove and Install Horn



1— Nut
2— Horn

3— Support
4— Cap Screw (2 used)

5— Washer (2 used)

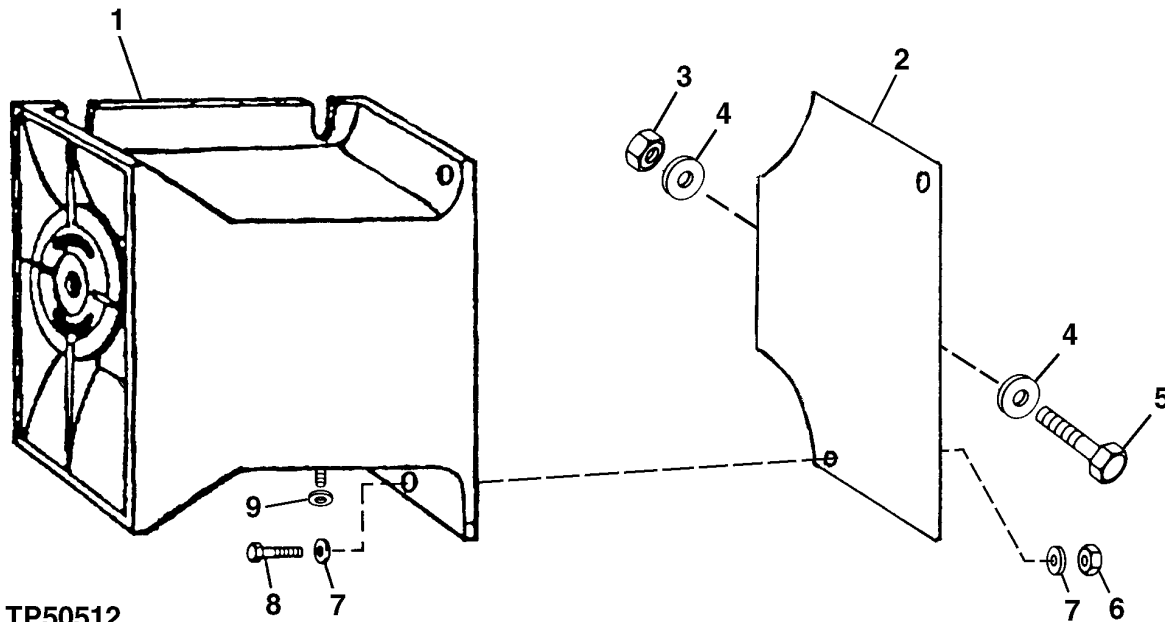
NOTE: Horn is located in upper right rear of engine compartment.

1. Open engine's left side access door.
2. Disconnect wire lead.
3. Remove nut (1) and horn (2).
4. Install horn and tighten nut.
5. Connect wire lead.

TX,20,QQ9643 -19-13JAN99-1/1

TP50472 —UN—30AUG96

Remove and Install Back-Up Alarm



TP50512

- | | | |
|------------------|----------------------|-----------------------|
| 1— Back-Up Alarm | 4— Washer (2 used) | 7— Washer (4 used) |
| 2— Bracket | 5— Cap Screw | 8— Cap Screw (2 used) |
| 3— Lock Nut | 6— Lock Nut (2 used) | 9— Washer (2 used) |

NOTE: Back-up alarm is located on inside of left rear of main frame.

1. Disconnect wire leads.
2. Remove two cap screws (8) to remove back-up alarm (1).

3. Install back-up alarm using cap screws.
4. Connect wire leads.

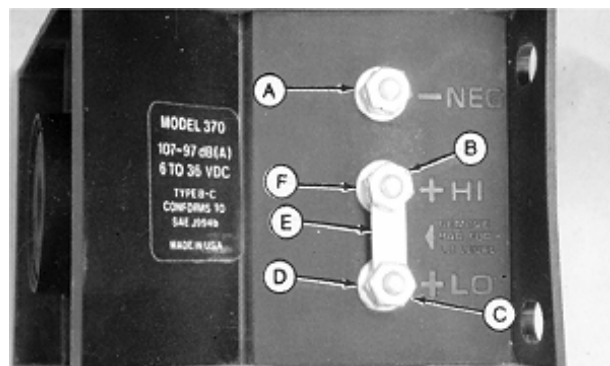
TP50512—UN—01NOV98

TX,20,QQ9644 -19-24OCT94-1/1

Adjust Back-Up Alarm Volume

IMPORTANT: The back-up alarm is set on high volume at the factory. It may be necessary to adjust the volume to meet local regulations.

1. To change alarm to low volume, leave ground wire attached to ground terminal (—NEG) (A). Remove nut (B) and disconnect wire from high terminal (+HI) (F).
2. Remove nut (C) and shorting bar (E).
3. Attach wire to low terminal (+LO) (D). Install nut (C) and tighten securely. Save shorting bar (E) for future use.



- | | |
|--------------------------|-----------------------|
| A—Ground Terminal (—NEG) | D—Low Terminal (+LO) |
| B—Nut | E—Shorting Bar |
| C—Nut | F—High Terminal (+HI) |

T7530AV—UN—20MAY91

TX,20,QQ9645 -19-01SEP06-1/1

Section 21 Main Hydraulic System

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Contents

Group 2160 Hydraulic System

Other Material

Number	Name	Use
TY9375 (U.S.)	Pipe Sealant	Apply to threads of sight tube fittings.
TY9480 (Canadian)	LOCTITE ® Products	
592 (LOCTITE)		

LOCTITE is a registered trademark of Loctite Corp.

CED,TX03399,5678 -19-06DEC99-1/1

Hydraulic System

Specifications

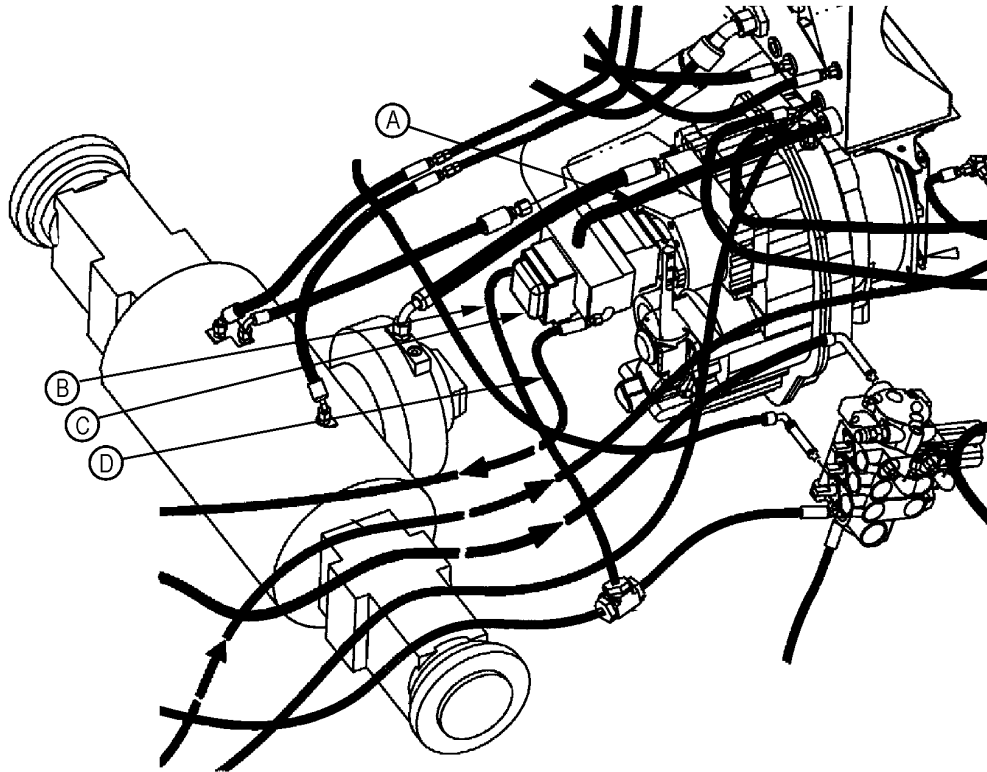
Item	Measurement	Specification
Hydraulic Pump	Weight	37 kg (82 lb) Approximate
Load Sense-to-Pump 90° Elbow on Bottom of Pump	Torque	34 N·m (25 lb-ft)
Plug in Control Piston Cap End Housing	Torque	20 N·m (15 lb—ft)
Load Sense Seat Hex Nut	Torque	7.9 N·m (70 lb-in.)
Load Sense Bonnet	Torque	197 N·m (145 ft-lb)
Plug Load Sense Housing	Torque	5 N·m (45 lb-in.)
Plug Load Sense Housing	Torque	13.5 N·m (120 lb-in.)
Load Sense Module Cap Screws	Torque	6 N·m (57 lb-in.)
End Cap Screw-to-Control Piston Housing	Torque	20 N·m (15 lb-ft)
Control Housing-to-Pump Cap Screw	Torque	60 N·m (44 lb-ft)
Control Piston Housing End Plug	Torque	115 N·m (85 lb-ft)
Control Piston End Cap Plug	Torque	108 N·m (80 lb-ft)
Control Piston End Cap Plug Four Way Valve Plug	Torque	68 N·m (50 lb-ft)
Control Piston End Cap Plug	Torque	95 N·m (70 lb-ft)
Control Piston End Cap Internal Plug	Torque	23 N·m (200 lb-in.)
Control Valve Cap Screws	Torque	60 N·m (44 lb-ft)
Flow Limiter Module Cap Screws	Torque	6 N·m (53 lb-in.)
Valve Plate-to-Pump Housing Cap Screw	Torque	95 N·m (70 lb-ft)
Flow Limiter-to-Control Piston Housing Cap Screws	Torque	6.44 N·m (57 in-lb)
Flow Limiter End Plug	Torque	108 N·m (80 lb-ft)
Flow Limiter Bonnet	Torque	108 N·m (80 lb-ft)
Flow Limiter Plug	Torque	108 N·m (80 lb-ft)
Valve Plate Cap Screws	Torque	95 N·m (70 lb-ft)
Valve-to-Outlet Port Fitting, Check Valve-to-Inlet Port Fitting, and Tee Fitting	Torque	700 N·m (516 lb-ft)
Filter Assembly-to-Frame Cap Screws	Torque	33 ± 4 N·m (24 ± 3 lb-ft)
Hydraulic Reservoir	Weight	27 kg (60 lb)
Reservoir-to-Mainframe Cap Screws	Torque	59 N·m (43 lb-ft)

CED, TX03399, 5679 -19-06DEC99-1/1

Remove and Install Hydraulic Pump

IMPORTANT: Do Pump Flow Test in Group 9025-25, Operation and Test Manual before

removing hydraulic pump for repair. If pump does not meet test specification, replace it. Do not rebuild pump.



T108560

A—Pump-to-Reservoir Hose

B—Load Sense Hose-to-Pump

C—Pump

D—Pump Outlet Hose-to-Backhoe Valve

1. Stop engine.
2. Lower all equipment to the ground.
3. Operate all hydraulic control valves to relieve hydraulic pressure.

Continued on next page

TX,21,RR7823 -19-02DEC99-1/2

T108560 —UN—03APR97

⚠ CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids. If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A. Turn battery disconnect switch off (if equipped) or disconnect battery ground strap.

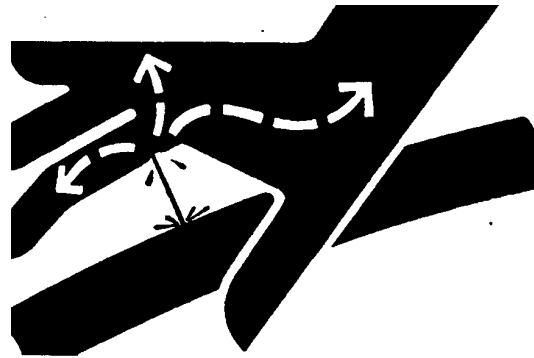
4. Drain hydraulic reservoir. Approximate capacity is 37 L (39 qt).
5. Disconnect and cap lines (A, B and D). Also disconnect suction hose and cap.

⚠ CAUTION: Approximate weight of hydraulic pump is 37 kg (82 lb)

Specification

Hydraulic Pump—Weight..... 37 kg (82 lb) Approximate

6. Remove hydraulic pump mounting cap screws and remove pump (C).
7. Remove hydraulic pump with hoist and strap.
8. Repair and replace parts as necessary.



X9611 —UN—23AUG88

9. Replace O-ring on pump mounting surface.
10. If load sense-to-pump 90° elbow was removed on the bottom of pump, tighten elbow to specifications.

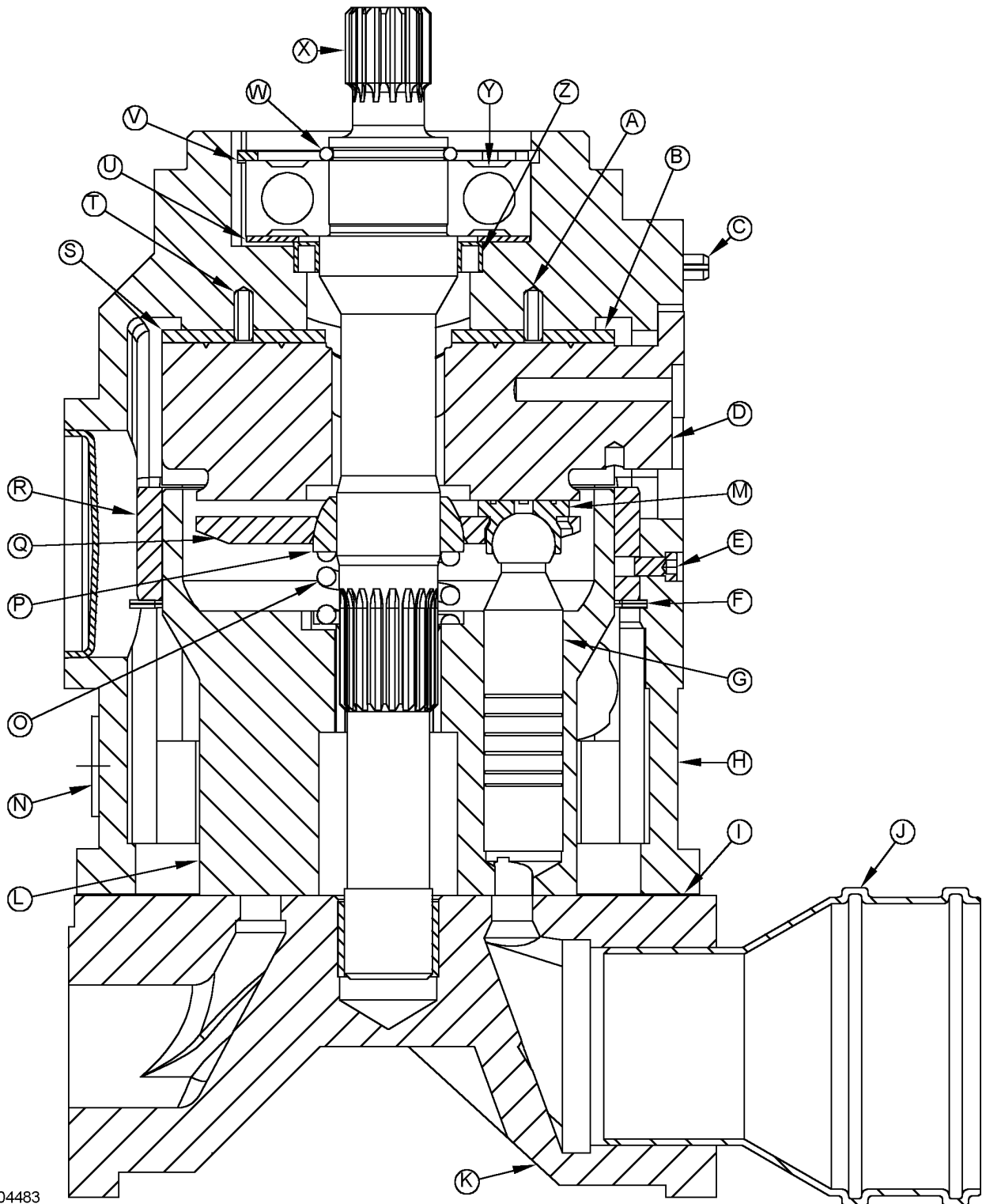
Specification

Load Sense-to-Pump 90° Elbow on Bottom of Pump—Torque..... 34 N·m (25 lb-ft)

11. Install pump with cap screws.
12. Fill pump body with hydraulic oil to assure lubrication for start-up.
13. Connect hoses and fittings.
14. Fill hydraulic reservoir.
15. Switch battery disconnect on (if equipped) or install battery ground cable.

TX,21,RR7823 -19-02DEC99-2/2

Hydraulic Pump Cross Section



T104483

T104483 —UN—18OCT96

Continued on next page

TX.21.RR7828 -19-21MAR97-1/2

Hydraulic System

A—Roll Pin (2 used)
B—Bearing
C—Roll Pin (4 used)
D—Swashplate
E—Screw
F—Retaining Ring
G—Piston (9 used)

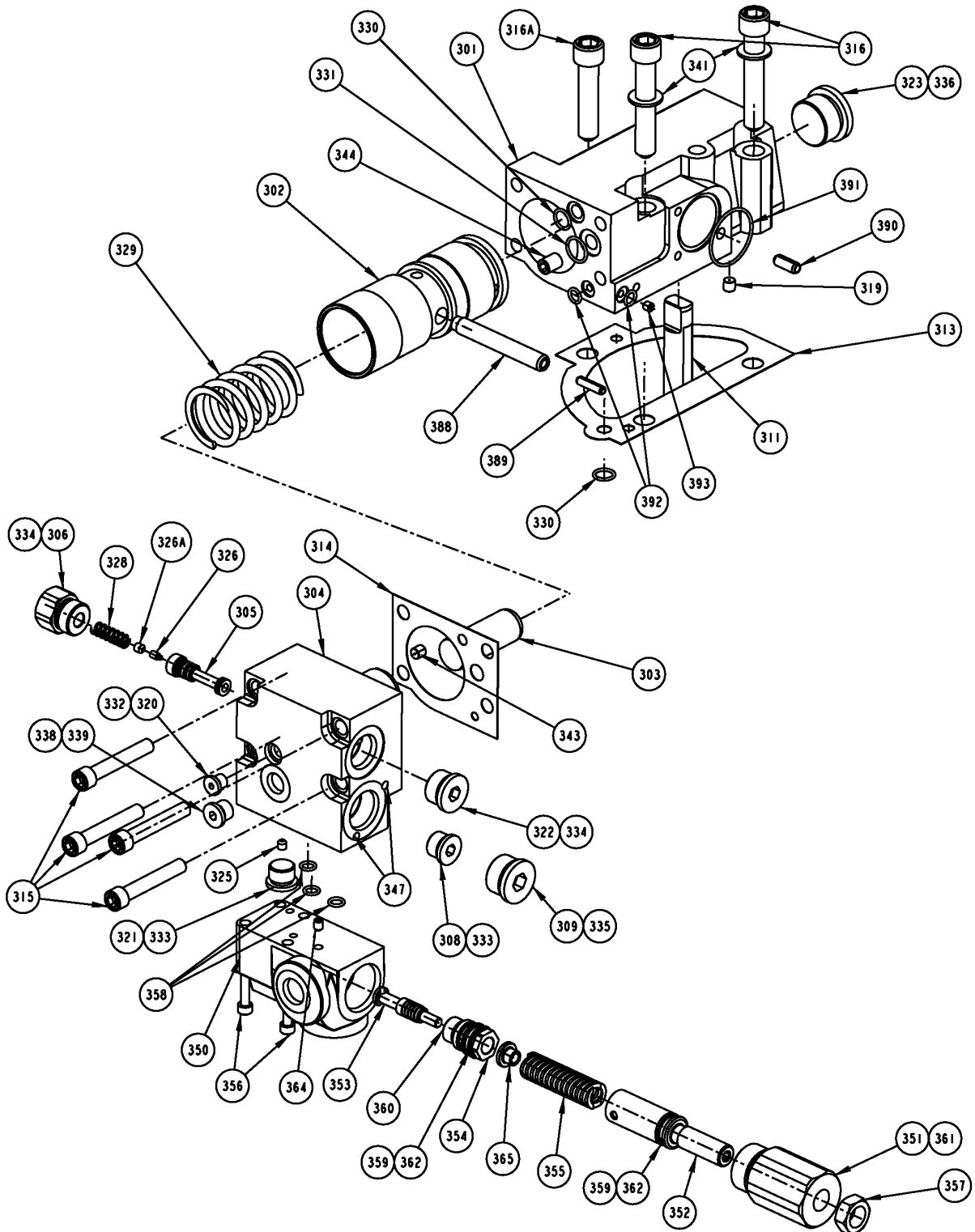
H—Housing
I— Gasket
J— Inlet Tube
K—Plate
L— Cylinder Barrel
M—Slipper (9 used)
N—Plug

O—Spring
P—Ball
Q—Retainer Shoe
R—Bearing
S—Bearing
T—Roll Pin (2 used)
U—Retainer Seal

V—Retaining Ring
W—Retaining Ring
X—Shaft
Y—Bearing
Z—Seal

TX,21,RR7828 -19-21MAR97-2/2

Hydraulic Pump Control Piston and Load Sense Module



T109028

Pump Control Piston and Load Sense Module

T109028—UN—14APR97

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TX.21,RR7868 -19-11APR97-1/2

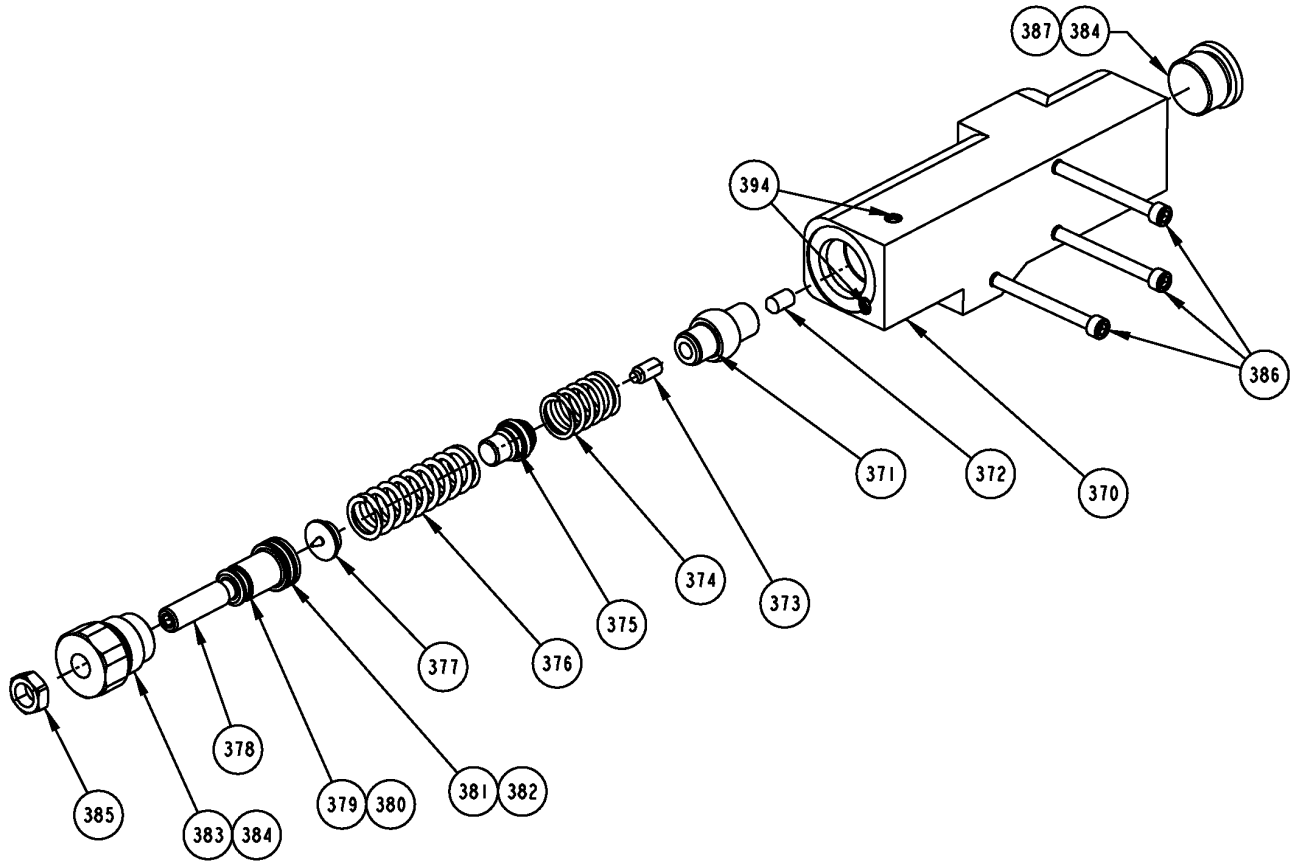
Hydraulic System

- | | | | |
|--|--|---|---|
| 301— Control Housing
302— Control Piston
303— Dowel Pin
304— End Cap Assembly
305— Spool
306— Plug
308— Plug
309— Plug
311— Control Pin
313— Gasket
314— Gasket
315— Socket Head Screw (4 used)
316— Socket Head Screw (2 used)
316A— Socket Head Screw
319— Orifice | 320— O-Ring
321— Plug
322— Plug
323— Plug
325— Orifice
326— Orifice
326A— Orifice
328— Spring
329— Spring
330— O-Ring (2 used)
331— O-Ring
332— Plug
333— O-Ring (2 used)
334— O-Ring (2 used)
335— O-Ring | 336— O-Ring
338— O-Ring
339— Plug
341— Washer (2 used)
343— Orifice
344— Orifice
347— Plug (2 used)
350— Load Sense Module
351— Load Sense Bonnet
352— Load Sense Adjusting Screw
353— Load Sense Spool
354— Load Sense Seat
355— Spring
356— Socket Head Screw (4 used)
357— Nut | 358— O-Ring (3 used)
359— O-Ring (2 used)
360— O-Ring
361— O-Ring
362— Backup Ring (2 used)
364— Cap Screw
365— Spring Guide
388— Pin
389— Roll Pin
390— Roll Pin
391— O-Ring
392— O-Ring (2 used)
393— Orifice |
|--|--|---|---|

ORIFICE SIZES		
Thread Size	Hole Size	Item Number
.125 NPTF	.100	344
#10-24UNC	.032	326
#10-24UNC	.040	325
.062 NPTF	.062	319
#10-24UNC	Closed	364
#10-24UNC	.040	393
.062 NPTF	.081	343

TX,21,RR7868 -19-11APR97-2/2

Hydraulic Pump Flow Limiter



T109029

Pump Flow Limiter

- | | | | |
|----------------------|----------------------|----------------------|---------------------------------|
| 370— Control Housing | 375— Spring Guide | 380— Backup Ring | 385— Jam Nut |
| 371— Piston | 376— Spring | 381— O-Ring | 386— Socket Head Screw (3 used) |
| 372— Set Screw | 377— Poppet | 382— Backup Ring | 387— Plug |
| 373— Set Screw | 378— Adjusting Screw | 383— Bonnet | |
| 374— Spring | 379— O-Ring | 384— O-Ring (2 used) | |

TX,21,RR7870 -19-11APR97-1/1

T109029—UN—14APR97

Disassemble, Inspect and Assemble Hydraulic Pump

CAUTION: Reduce compressed air to less than 210 kPa (2.1 bar) (30 psi) when using for cleaning purposes. Clear area of bystanders, guard against flying chips, and wear personal protection equipment including eye protection.

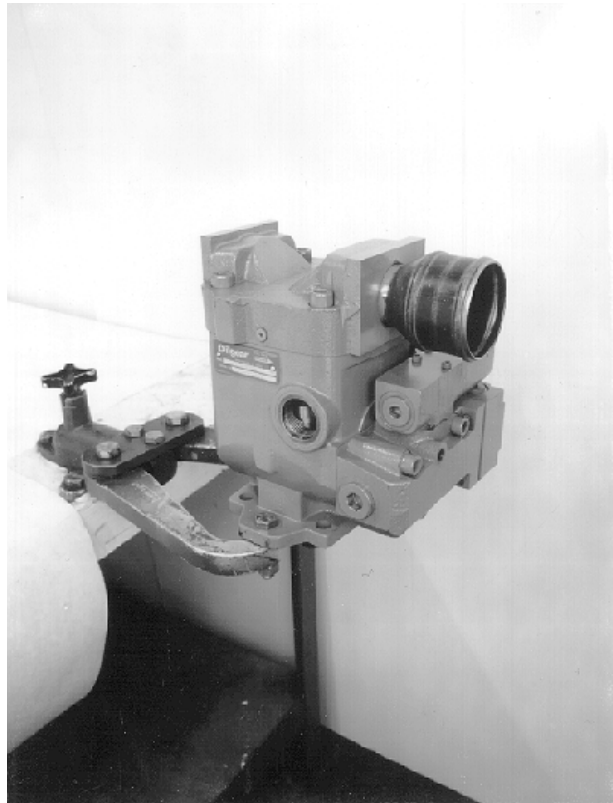
CAUTION: Prevent possible injury from falling heavy object. Approximate weight of pump is 37 kg (82 lb). Support pump with a lifting device.

Specification

Hydraulic Pump—Weight..... 37 kg (82 lb) Approximate

IMPORTANT: Perform Pump Leakage Test in Group 9025-25, Operation and Test Manual before removing hydraulic pump for repairs. If pump does not pass the test, replace it, DO NOT rebuild it. Use only diesel fuel to clean pump parts. Solvents can damage internal components.

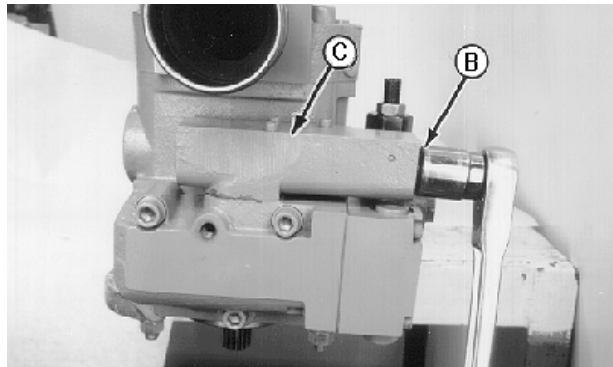
1. Mount pump on D01006AA Bench Mounted Holding Fixture.
2. As pump parts are removed wash in diesel fuel and dry using compressed air.



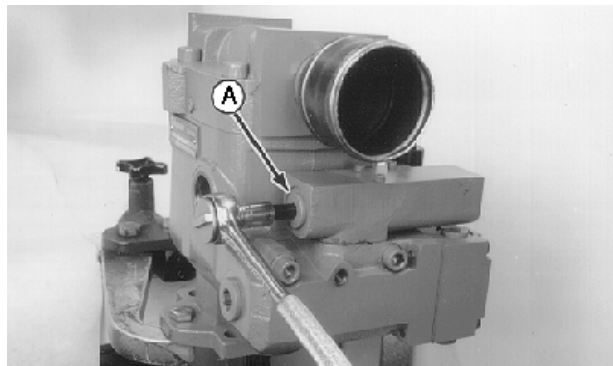
T108614—UN—01APR97

TX,21,RR7827 -19-21MAR97-1/50

3. Remove plug (A) and flow limiter adjustment screw assembly (B) from flow limiter assembly (C).



T108615—UN—01APR97



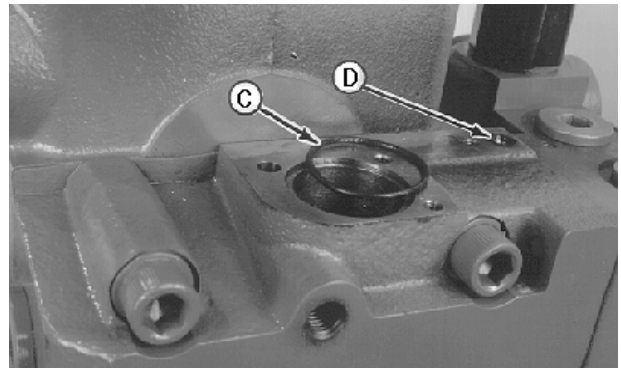
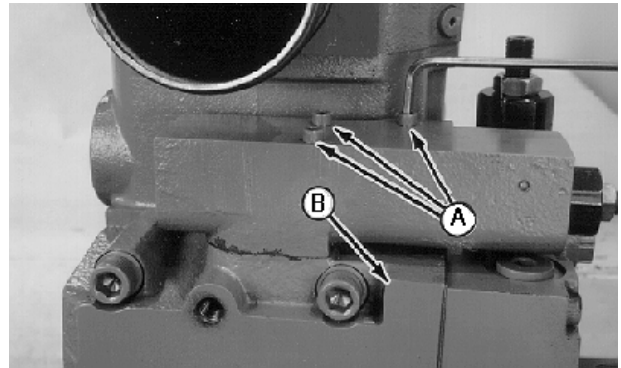
T108616—UN—01APR97

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TX,21,RR7827 -19-21MAR97-2/50

4. Remove three hex screws (A) from flow limiter assembly and remove flow limiter assembly from control piston housing (B). Inspect O-rings (C and D) for wear.

A—Hex Screws (3 used) C—O-Ring
 B—Piston Housing D—O-Ring



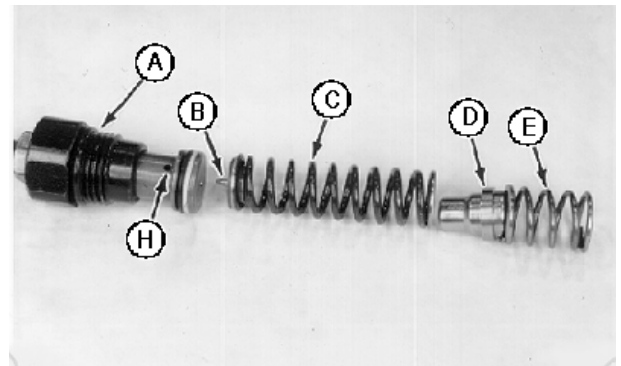
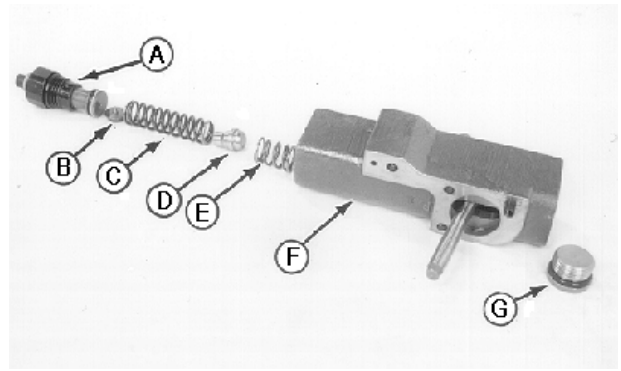
T108617 —UN—01APR97

T108621 —UN—07APR97

TX.21,RR7827 -19-21MAR97-3/50

5. Disassemble flow limiter and inspect parts (A—H) for wear or contamination.

A—Flow Limiter Adjustment Screw E—Small Spring
 B—Poppet F—Flow Limiter Housing
 C—Large Spring G—Plug and O-Ring
 D—Spring Follower H—Orifice



T108624 —UN—01APR97

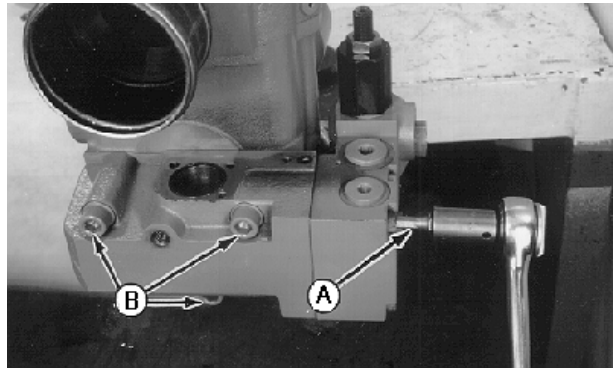
T108623 —UN—01APR97

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TX.21,RR7827 -19-21MAR97-4/50

Hydraulic System

6. Remove control piston end cap socket head cap screws (A) and remove the end cap. Remove cap screws (B) and remove the control piston housing from the pump.

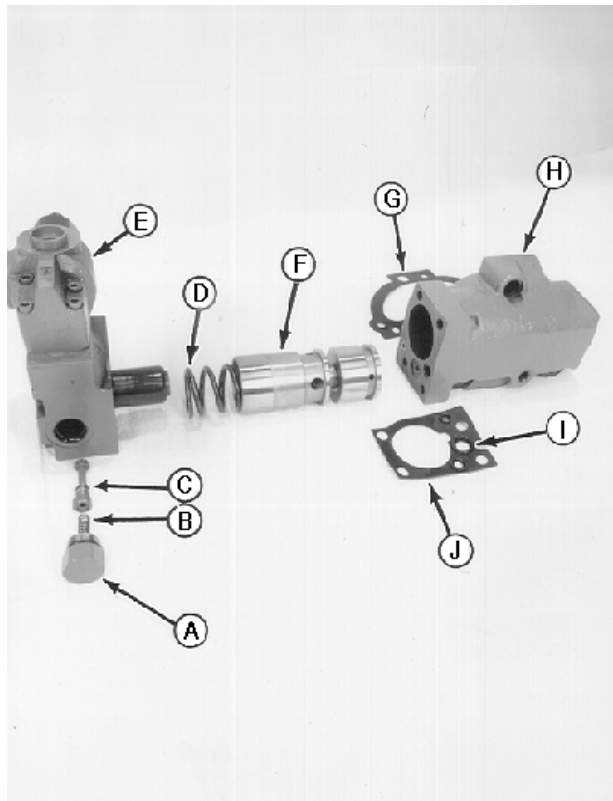


T108622—UN—01APR97

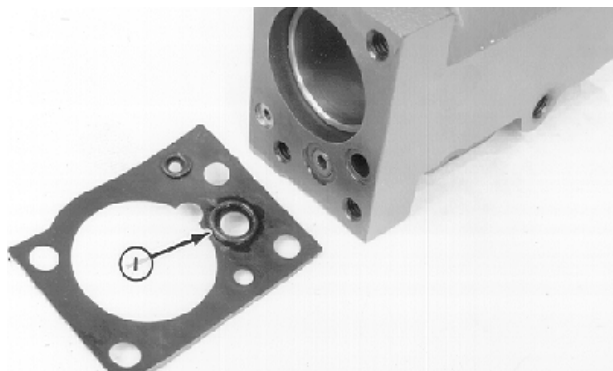
TX,21,RR7827 -19-21MAR97-5/50

7. Remove and inspect parts for wear.

- | | |
|--------------------|------------------|
| A—Plug with O-Ring | F—Piston |
| B—Spring | G—Gasket |
| C—Four-Way Spool | H—Piston Housing |
| D—Spring | I—O-Ring |
| E—End Cap Assembly | J—Gasket |



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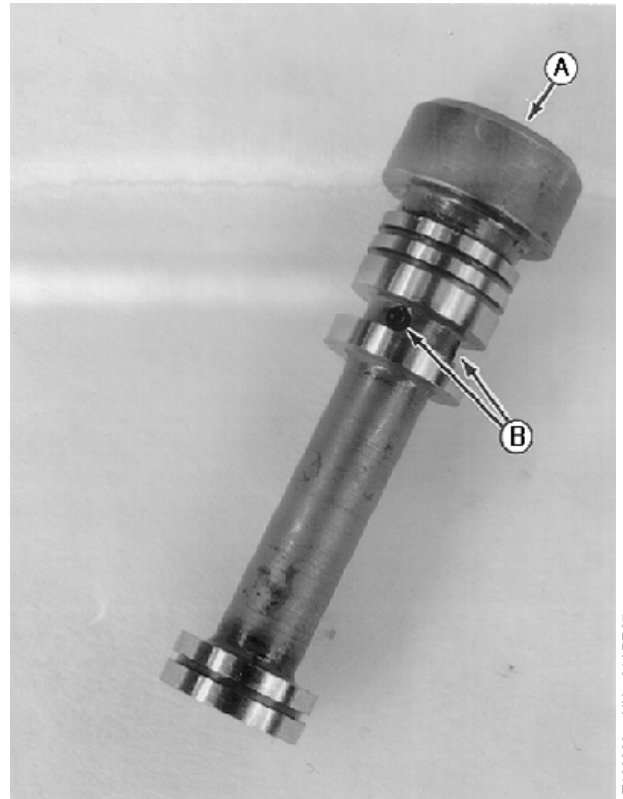


T108618—UN—01APR97

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TX,21,RR7827 -19-21MAR97-6/50

8. Clean orifices (A and B) in the four-way spool.



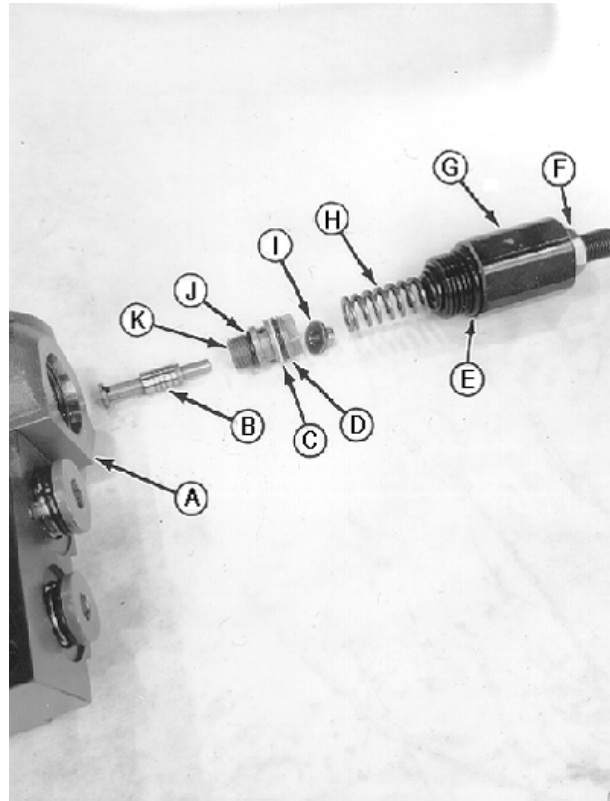
T108620 —UN—01/APR97

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TX,21,RR7827 -19-21MAR97-7/50

9. Remove pump load sense module and inspect parts (A—K) for contamination.

- | | |
|----------------------|-------------------------------|
| A—Load Sense Housing | G—Load Sense Adjustment Screw |
| B—Spool | H—Spring |
| C—Backup Ring | I—Spring Guide |
| D—O-Ring | J—O-Ring |
| E—O-Ring | K—Seat |
| F—Jam Nut | |

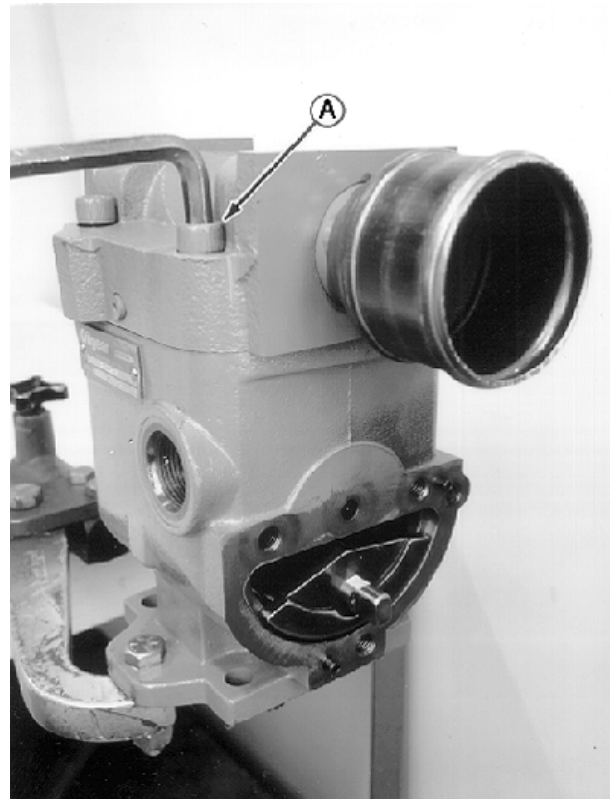


Pump Load Sense Module

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TX,21,RR7827 -19-21MAR97-8/50

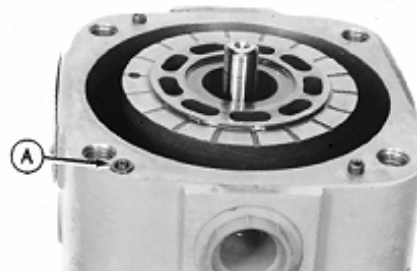
10. Remove valve plate by removing four cap screws (A) and lifting it away from main pump assembly.



T108643 —UN—01APR97

TX,21,RR7827 -19-21MAR97-9/50

11. Remove O-ring (A).

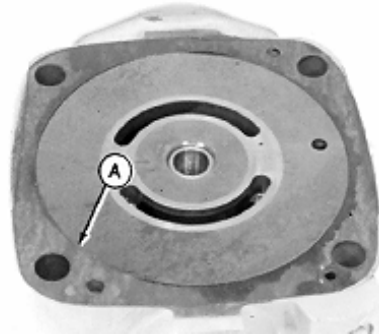


T7653BG —UN—24JUN91

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TX,21,RR7827 -19-21MAR97-10/50

12. Remove gasket (A).

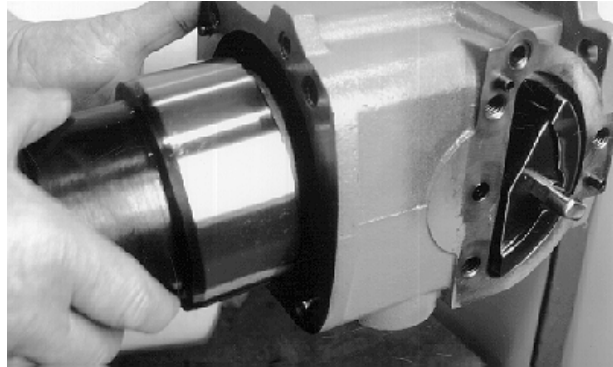


T7553BA — UN—24JUN91

TX,21,RR7827 -19-21MAR97-11/50

13.

Make sure pump is in a horizontal position. Make a mark on cylinder barrel to one of the pistons to aid in reassembly. Remove rotating group by turning input shaft slowly while pulling the cylinder barrel from the pump's housing.

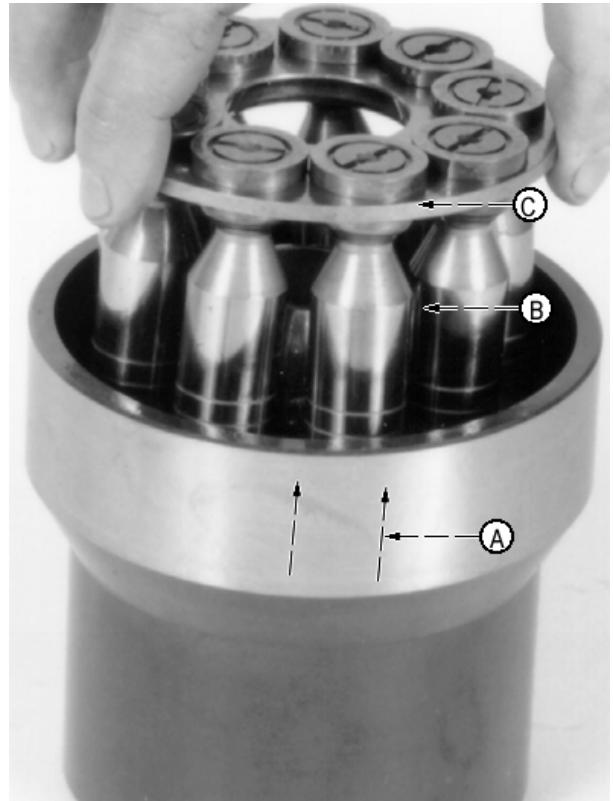


T108642 — UN—01APR97

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TX,21,RR7827 -19-21MAR97-12/50

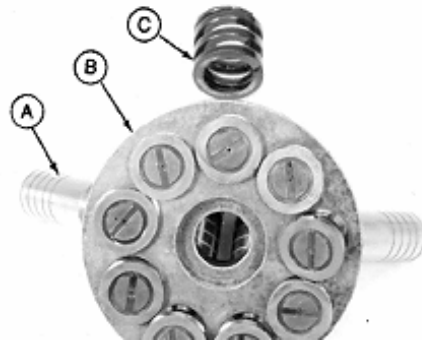
14. Number each pump piston shoe assembly (B) and its respective bore in cylinder barrel (A) and shoe retainer (C) while disassembling. This will assure the same parts are installed to the respective bore in the retainer and barrel.



T104036 —UN—04NOV96

TX,21,RR7827 -19-21MAR97-13/50

15. Remove shoe retainer (B) with pistons (A) and shoe retainer spring (C).

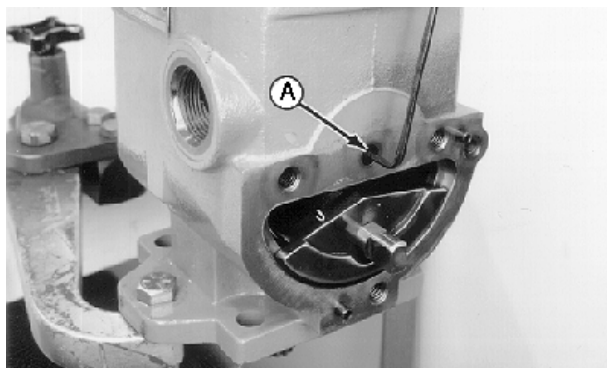


T7653BB —UN—24JUN91

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TX,21,RR7827 -19-21MAR97-14/50

16. Remove hydrodynamic bearing locking screw (A).

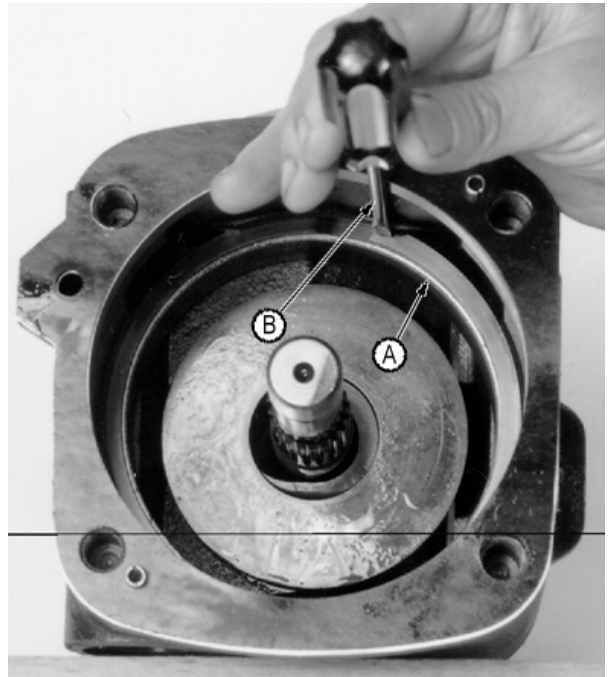


T108645 -JUN-01APR97

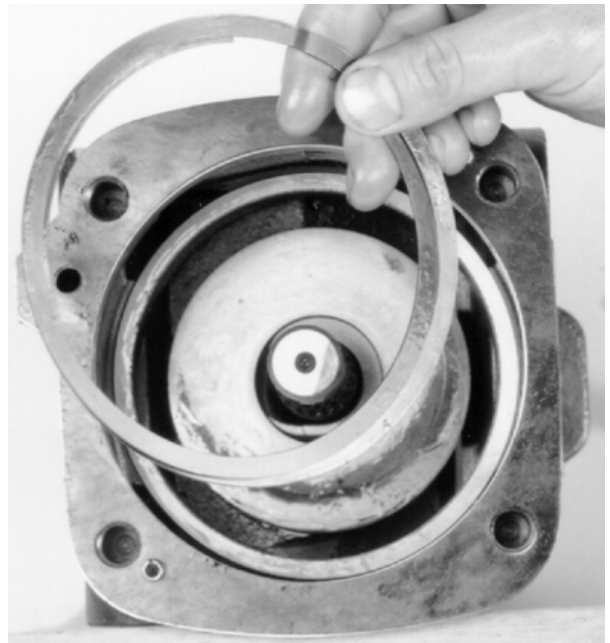
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TX,21,RR7827 -19-21MAR97-15/50

17. Remove retaining ring (A) with flat head screwdriver (B).



T104037 —UN—04NOV96

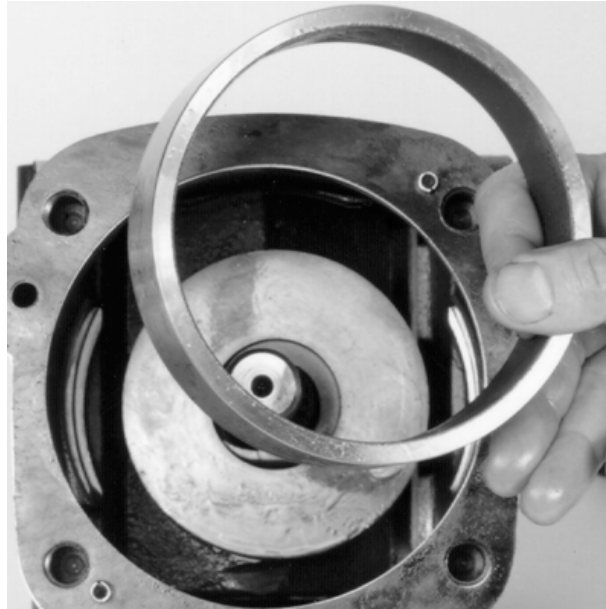


T104041 —UN—04NOV96

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TX,21,RR7827 -19-21MAR97-16/50

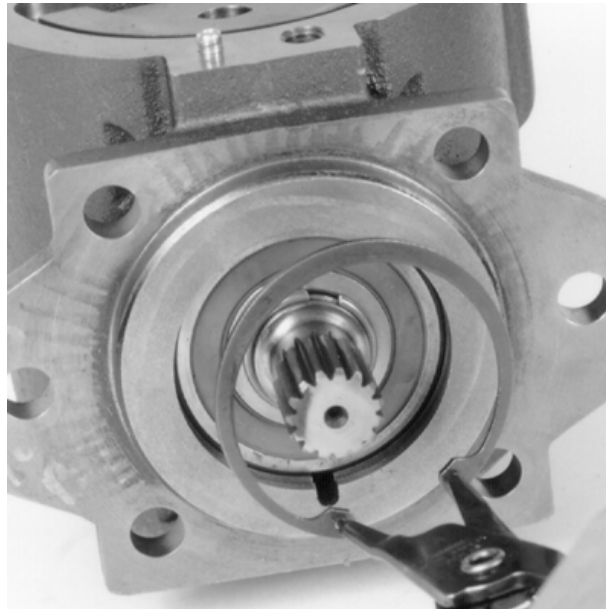
18. Remove hydrodynamic bearing by pulling it out of the pump's housing evenly.



T104028 —UN—04NOV96

TX,21,RR7827 -19-21MAR97-17/50

19. Remove drive shaft bearing retainer ring with snap ring pliers.



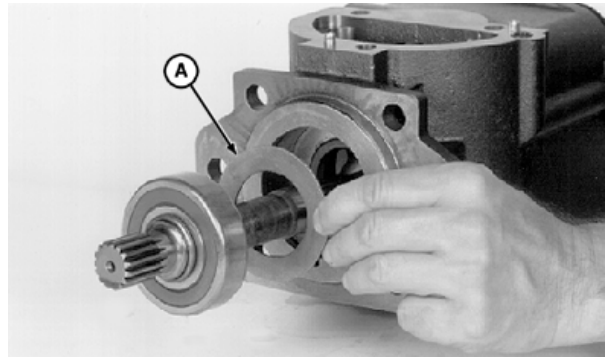
T103483 —UN—04NOV96

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TX,21,RR7827 -19-21MAR97-18/50

Hydraulic System

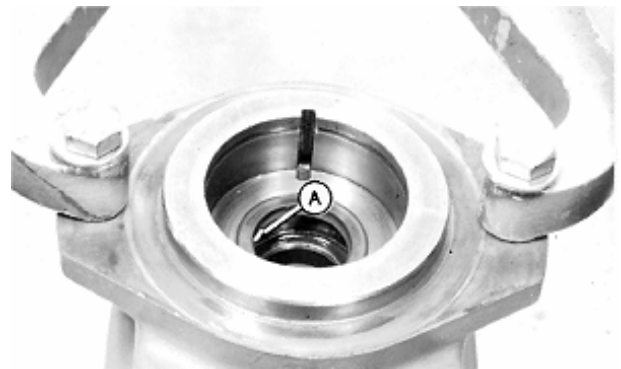
20. Remove outboard end of drive shaft and pull out from pump housing. Remove shaft seal retainer.



T104805 —UN—12AUG97

TX,21,RR7827 -19-21MAR97-19/50

21. Remove shaft seal (A) from housing only if necessary. This is not reusable.



T7553AL —UN—24JUN91

TX,21,RR7827 -19-21MAR97-20/50

22. Remove the swashblock from pump housing.

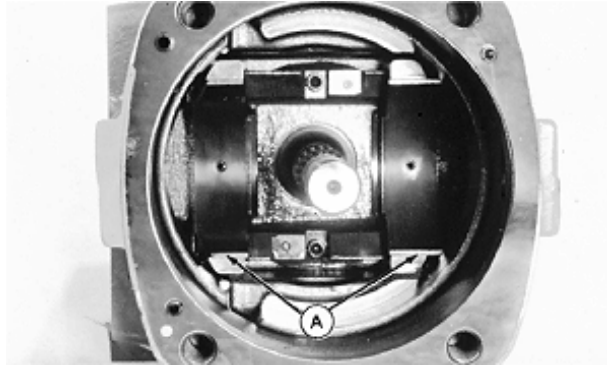


T103485 —UN—04NOV96

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TX,21,RR7827 -19-21MAR97-21/50

23. Remove the saddle bearings (A) from pump housing.



T8170AE — JUN — 31JAN94

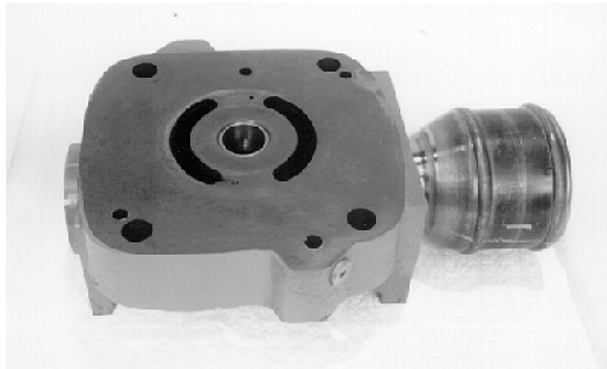
TX,21,RR7827 -19-21MAR97-22/50

24. Clean all parts thoroughly. Inspect all seals and O-rings for hardening, cracking or deterioration and replace if necessary.

Inspect valve plate group.

Inspect the valve plate surface that mates with the pump's cylinder barrel for excessive wear or scoring. Remove minor defects by lightly stoning the surface with a hard stone that is flat to within 0.001". Be sure to stone lightly. Any excessive stoning will remove the hardened surface. If wear or damage is extensive, replace the valve plate.

Check drive shaft bushing for abnormal wear.



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Continued on next page

TX,21,RR7827 -19-21MAR97-23/50

25. Inspect suction inlet tube for cracks and damage from handling. If any cracks or damage, valve plate must be replaced.



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TX,21,RR7827 -19-21MAR97-24/50

26. Inspect cylinder barrel piston bores and the face that mates with valve plate for wear and scoring. Remove minor defects on the face by lightly stoning the surface. If defects cannot be removed by this method, cylinder barrel is unusable.

27. Inspect all piston and shoe assemblies to be sure they ride properly on the swashblock.



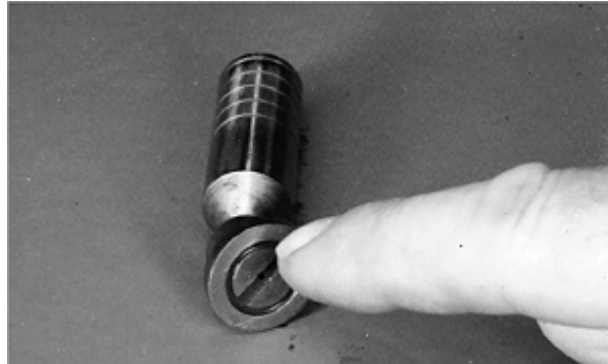
T7653AT —UN—24JUN91

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TX,21,RR7827 -19-21MAR97-25/50

Hydraulic System

28. Check each piston shoe for smooth pivot action on the piston. Contaminants or burrs can cause them to stick.

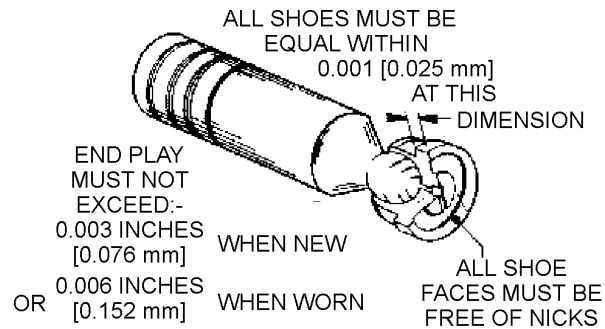


T7553AO —UN—24JUN91

TX,21,RR7827 -19-21MAR97-26/50

29. Check piston shoe wear. All shoes must be equal within 0.025 mm (.001 in) at outer dimension.

Check piston shoe end play. End play must not exceed 0.152 mm (0.006 in).



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TX,21,RR7827 -19-21MAR97-27/50

30.

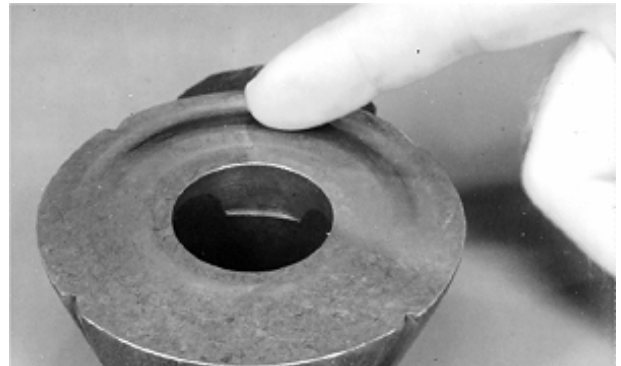
Inspect bearing for contaminant damage or extreme wear.



T108625 —UN—01APR97

TX,21,RR7827 -19-21MAR97-28/50

31. Inspect the swashblock for wear and scoring. If defects are minor, stone the swashblock lightly. If damage is extensive, swashblock should be rejected. Check that the very small holes in the face of the swashblock are open. These holes provide "porting" for the hydrostatic balance fluid (of the piston/shoe assembly) to be channeled through the swashblock to the face of the saddle bearing (providing pressure lubrication).

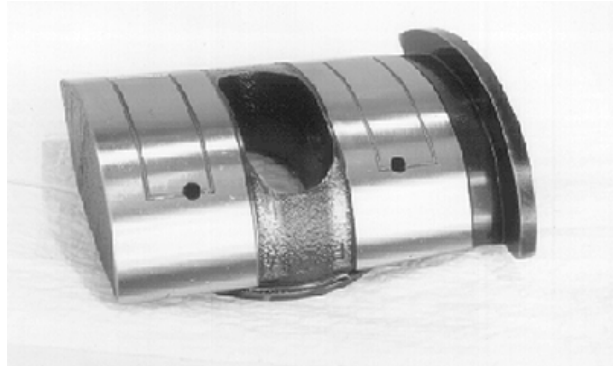


T7553AQ —UN—24JUN91

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TX,21,RR7827 -19-21MAR97-29/50

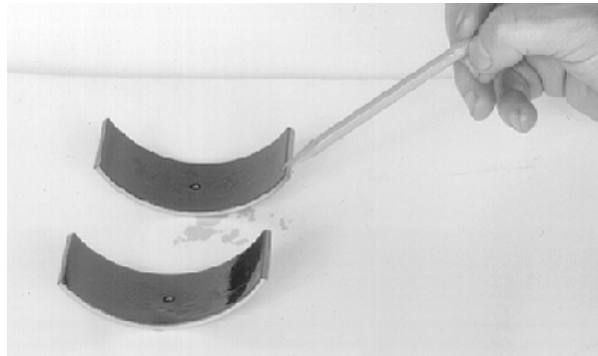
32. Check bearing mating surface of swashblock for cracks or excessive wear. Swashblock movement in saddle bearings must be smooth. Replace if necessary.



T108628 —UN—01APR97

TX,21,RR7827 -19-21MAR97-30/50

33. Compare saddle bearing thickness in worn area to thickness in an unworn area. Replace saddle bearings if difference is greater than 0.4 mm (0.016 inches).



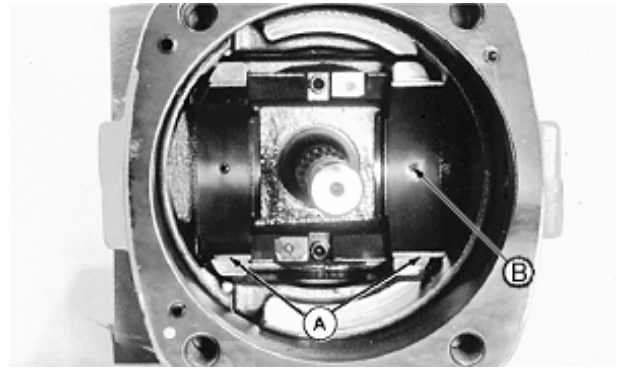
T104803 —UN—04NOV96

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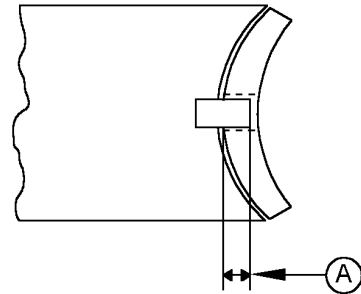
TX,21,RR7827 -19-21MAR97-31/50

IMPORTANT: Bearing locator pins (B) must not protrude through swashplate bearing. See sketch below for proper installation of pins.

34. Inspect bearing locator pins in housing. Pins (B) must be able to hold bearing in place without protruding through bearing. Pins should extend 1.3 mm to 1.6 mm (0.050 to 0.065 in) (distance A) into the bearing locating hole.



T104810 —UN—08NOV96



T103488

T103488 —UN—04NOV96

TX,21,RR7827 -19-21MAR97-32/50

35. Check shaft bearing for galling, pitting, binding, roughness.

Check seal of bearing for grease containment. If seal is worn or broken. Replace shaft and bearing.

Check shaft and its splines for wear. If worn, replace shaft and bearing.



T108626 —UN—01APR97

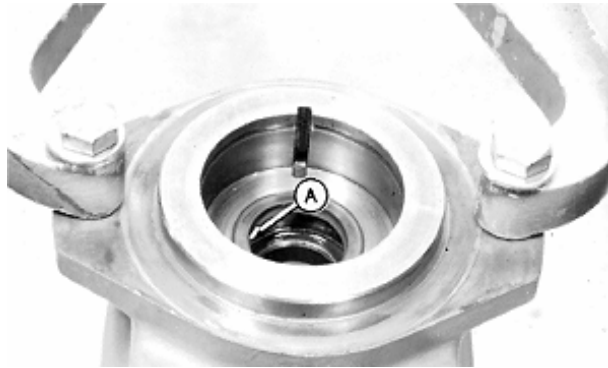
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TX,21,RR7827 -19-21MAR97-33/50

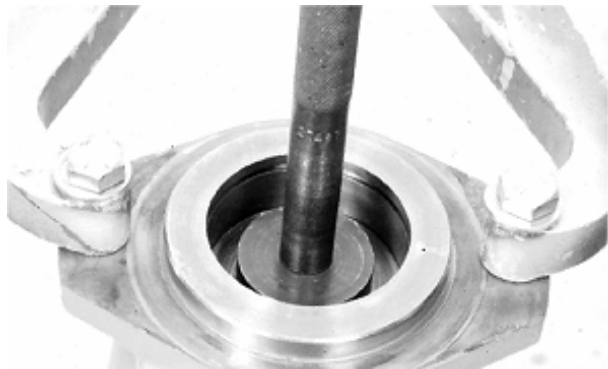
36. Check shaft seal (A) for deterioration or cracks. Replace (press out) if necessary.

NOTE: Install new gaskets, seals and O-rings. Apply a thin film of CLEAN grease or hydraulic fluid to sealing components to ease assembly. Apply fluid generously to all wear surfaces.

37. If removed, press shaft seal into front of pump housing with a 50 mm disk and seal driver.



T7553AL—UN—24JUN91

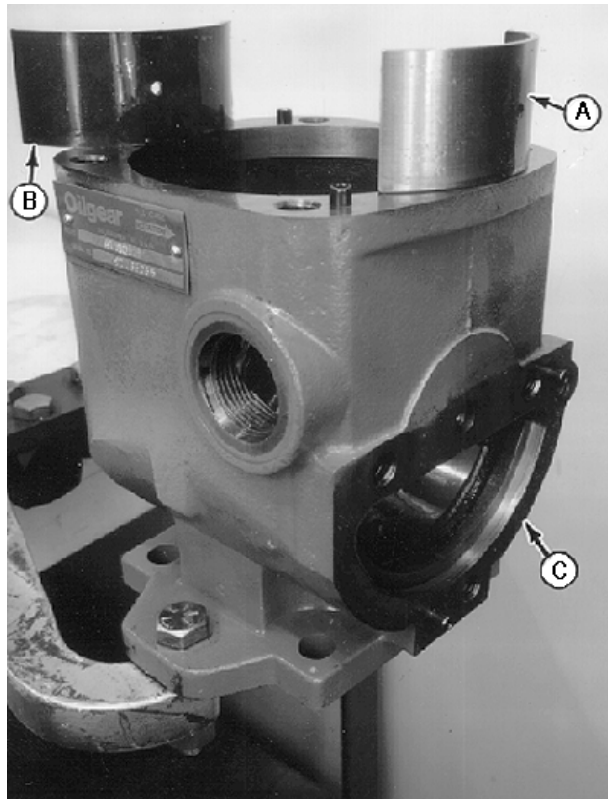


T7553AU—UN—24JUN91

TX,21,RR7827 -19-21MAR97-34/50

38. Place pump with drive shaft facing down. Grease back side of saddle bearings and place on the locator pins to locate the bearings in pump case. Pins must not protrude through the bearing's locator hole. Plastic bearing (B) position should be installed on opposite of control pin side of washblock. Steel bearing (A) must be positioned in pump on same side as the control piston housing (C).

39. Insert swashblock into rear of pump housing . Make sure swashblock swivels in the saddle bearings smoothly.



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TX,21,RR7827 -19-21MAR97-35/50

40.

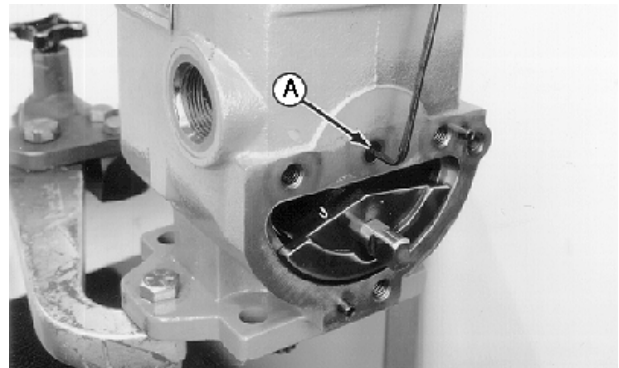
Place bearing in pump with the hydrodynamic lock screw hole (A) up. Align the lock screw hole to receive the hydrodynamic lock screws in the next procedural step. Tap bearing into place, if necessary, using extreme care not to damage the bearing.



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TX,21,RR7827 -19-21MAR97-36/50

41. Insert hydrodynamic lock screw (A) and hand tighten.

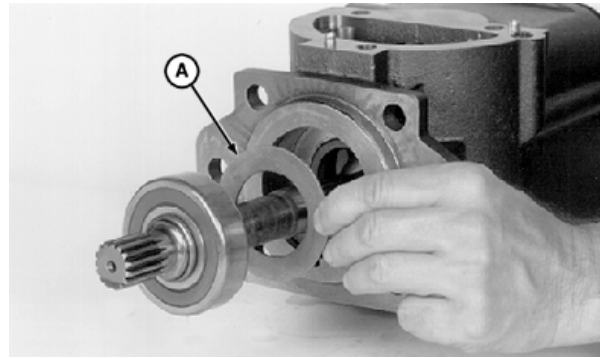


T108645 —UN—01APR97

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TX,21,RR7827 -19-21MAR97-37/50

42. Place pump in a horizontal position and install shaft seal retainer (A).



T104805 —UN—12AUG97

TX,21,RR7827 -19-21MAR97-38/50

43. Insert drive shaft and bearing assembly into pump housing and lock in place with drive shaft bearing retainer ring.

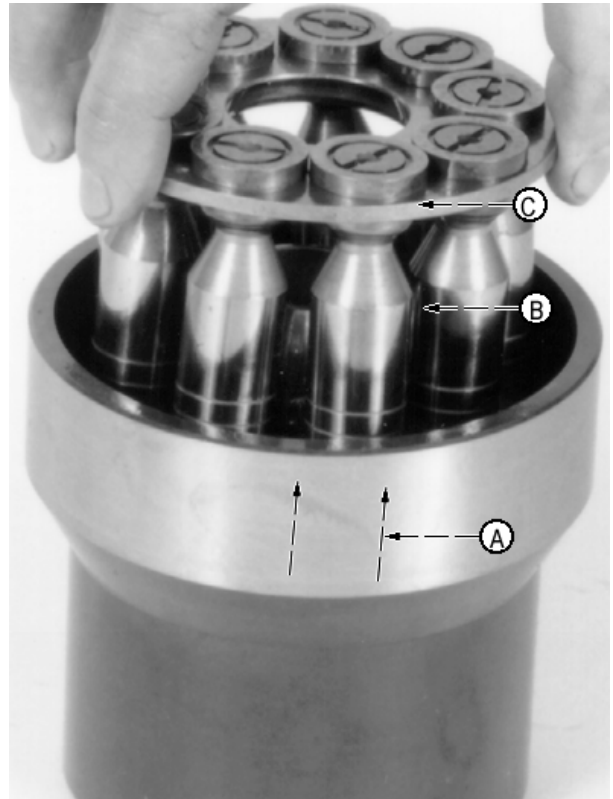


T103483 —UN—04NOV96

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TX,21,RR7827 -19-21MAR97-39/50

44. Place the cylinder barrel, wear surface down, on a clean cloth. Place the shoe retainer spring in the center of the barrel with the fulcrum ball on top of it. Insert pistons into their corresponding (numbered) holes of the shoe retainer. As a unit, fit the pistons into their corresponding (numbered) bores in the cylinder barrel. DO NOT FORCE.

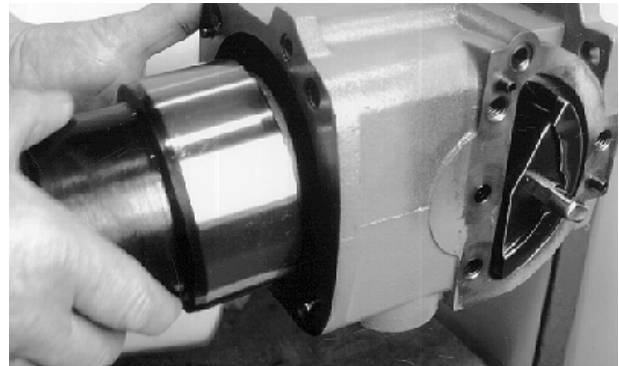


T104036 —UN—04NOV96

TX,21,RR7827 -19-21MAR97-40/50

NOTE: Make sure the rotate group has spring action. This assures correct assembly in relation to the spline.

45. Support the weight of the cylinder barrel as cylinder spline is passed over the tail shaft, to avoid scratching or damage. Push cylinder forward until the cylinder spline reaches the drive shaft spline and rotate the cylinder slightly to engage shaft splines. Continue to slide cylinder forward until it encounters the cylinder bearing. Lifting the tail shaft slightly helps cylinder and cylinder bearing engagement. Continue pushing cylinder forward until the piston shoes contact the swashblock.



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At this point, the back of the cylinder should be located approximately 10.2 mm (0.4 in) outside the back of the pump housing.

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TX,21,RR7827 -19-21MAR97-41/50

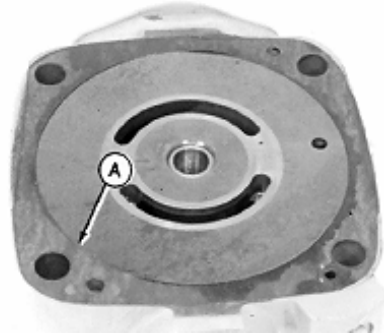
46. With the drive shaft facing down, install O-ring (A) in pump housing.



T7553BG —UN—24JUN91

TX,21,RR7827 -19-21MAR97-42/50

47. With the drive shaft facing down, install gasket (A) on pump housing.

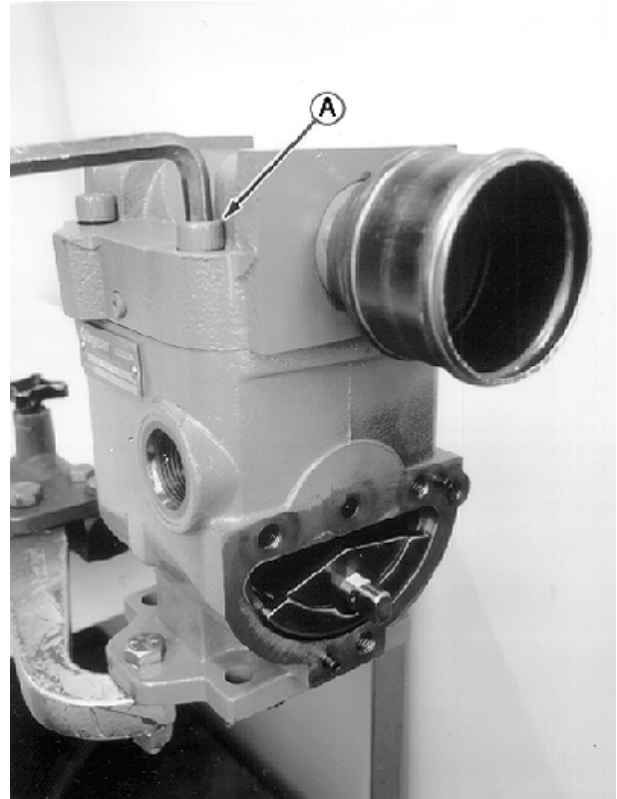


T7553BA —UN—24JUN91

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48. Position valve plate on housing pins, making sure tail end of shaft engages shaft bushing in valve plate. Finger tighten hex head cap screw (A) closest to O-ring first. Alternately hand tighten the other cap screws.



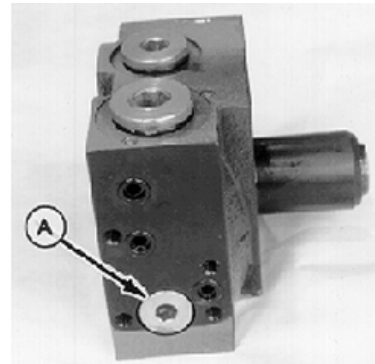
T108643 —UN—01APR97

TX,21,RR7827 -19-21MAR97-44/50

49. Install plug (A) into control piston cap end housing and tighten to specification.

Specification

Plug in Control
Piston Cap End
Housing—Torque.....20 N·m (15 lb—ft)



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TX,21,RR7827 -19-21MAR97-45/50

50. Assemble and install load sense module into housing (A). Tighten load sense seat hex nut (K) to specification.

Specification

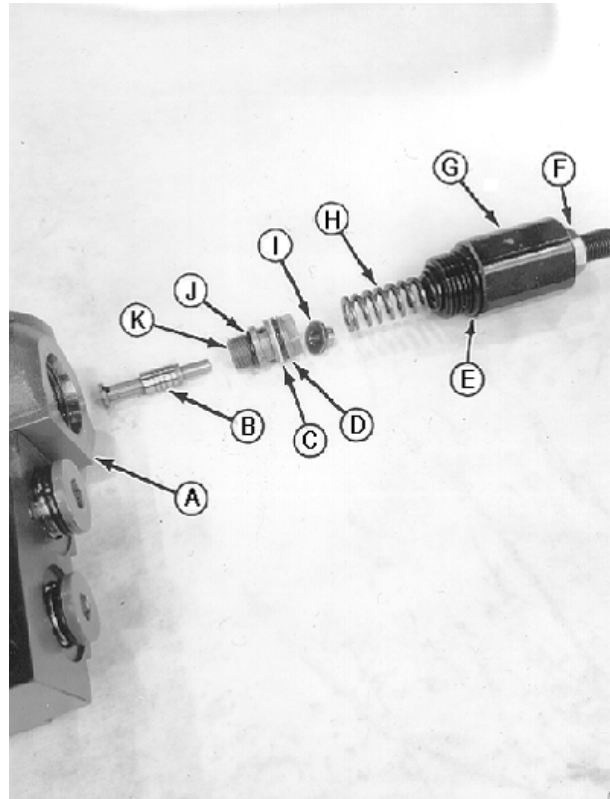
Load Sense Seat Hex Nut—Torque..... 7.9 N·m (70 lb-in.)

Loosen jam nut (F) and tighten load sense bonnet (G) to specification. Tighten jam nut.

Specification

Load Sense Bonnet—Torque..... 197 N·m (145 ft-lb)

- | | |
|----------------------|---------------------|
| A—Load Sense Housing | G—Load Sense Bonnet |
| B—Spool | H—Spring |
| C—Backup Ring | I— Spring Guide |
| D—O-Ring | J— O-Ring |
| E—O-Ring | K—Load Sense Seat |
| F—Jam Nut | |



T108883 —UN—07APR97

Pump Load Sense Module

TX,21,RR7827 -19-21MAR97-46/50

51. Install plug (A) and tighten to specification.

Specification

Plug Load Sense Housing—Torque..... 5 N·m (45 lb-in.)

52. Install plug (B) and tighten to specification.

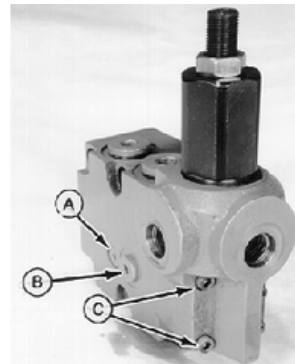
Specification

Plug Load Sense Housing—Torque..... 13.5 N·m (120 lb-in.)

53. Install four cap screws (C) and tighten to specification.

Specification

Load Sense Module Cap Screws—Torque..... 6 N·m (57 lb-in.)



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Continued on next page

TX,21,RR7827 -19-21MAR97-47/50

54. Assemble control piston assembly and install new control gasket and O-ring. Place control pin (B) in piston and insert control assembly (A) into swashblock. Install cap screws and tighten control piston housing to pump.



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TX,21,RR7827 -19-21MAR97-48/50

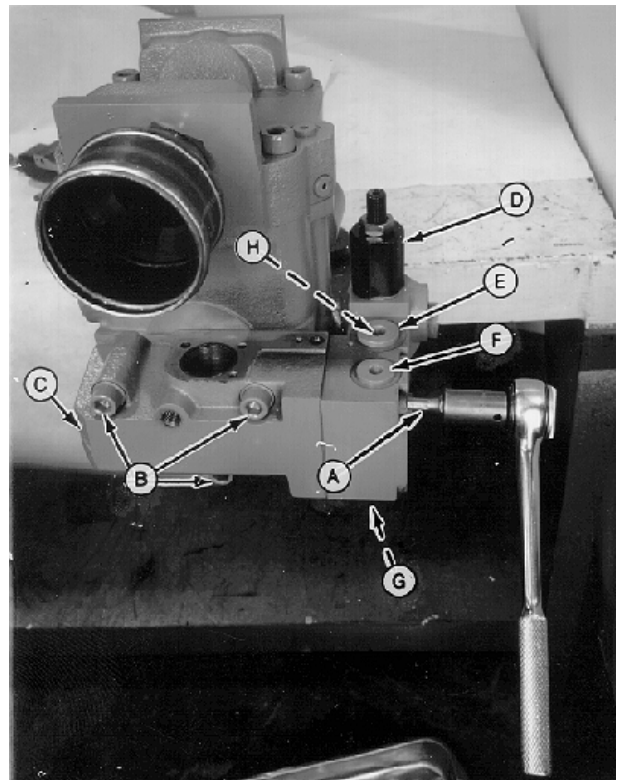
55. Tighten to specifications.

	Specification
End Cap Screw-to-Control Piston Housing—Torque.....	20 N·m (15 lb-ft)
Control Housing-to-Pump Cap Screw—Torque.....	60 N·m (44 lb-ft)
Control Piston Housing End Plug—Torque.....	115 N·m (85 lb-ft)
Control Piston End Cap Plug—Torque.....	108 N·m (80 lb-ft)
Control Piston End Cap Plug Four Way Valve Plug—Torque.....	68 N·m (50 lb-ft)
Control Piston End Cap Plug—Torque.....	95 N·m (70 lb-ft)
Control Piston End Cap Internal Plug—Torque.....	23 N·m (200 lb-in.)

Install control valve cap screws (B) and tighten to specification. Make final tightening to specification.

	Specification
Control Valve Cap Screws—Torque.....	60 N·m (44 lb-ft)

- | | |
|---|--|
| A —End Cap Screws to Control Piston Housing (4 used) | E —Control Piston End Cap Plug |
| B —Control Piston Housing to Pump Cap Screw (3 used) | F —Control Piston End Cap Four Way Valve Plug |
| C —Control Piston Housing End Plug | G —Control Piston End Cap Plug |
| D —Load Sense Module Adjustment Screw | H —Control Piston End Cap Internal Plug |



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56. Assemble and install flow limiter with cap screws (A) to the control piston housing. Tighten cap screws (A) to specifications.

Specification

Flow Limiter Module Cap	
Screws—Torque.....	6 N·m (53 lb-in.)
Valve Plate-to-Pump	
Housing Cap	
Screw—Torque.....	95 N·m (70 lb-ft)
Flow Limiter-to-Control	
Piston Housing Cap	
Screws—Torque.....	6.44 N·m (57 in-lb)
Flow Limiter End	
Plug—Torque.....	108 N·m (80 lb-ft)
Flow Limiter	
Bonnet—Torque.....	108 N·m (80 lb-ft)

57. Install flow limiter plug (C) and tighten to specification.

Specification

Flow Limiter	
Plug—Torque.....	108 N·m (80 lb-ft)

58. Tighten flow limiter bonnet (B) to specification.

Specification

Flow Limiter	
Bonnet—Torque.....	108 N·m (80 lb-ft)

59. Final tighten valve plate cap screws to specification.

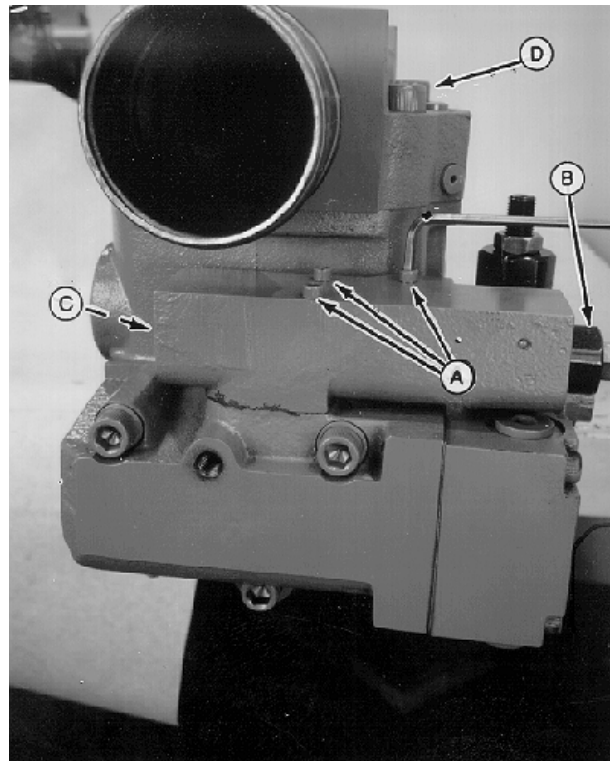
Specification

Valve Plate Cap	
Screws—Torque.....	95 N·m (70 lb-ft)

60. Install pump in machine. (See Remove and Install Hydraulic Pump in this group.)

61. Do Pump Load Sense Differential Pressure Test in Group 9025 of Technical Manual.

62. Do Backhoe Load Sense and Loader Load Sense Relief Stall Pressure Test in Group 9025 of Technical Manual.



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A—Flow Limiter-to-Control
Piston Housing Cap Screws
(3 used)
B—Flow Limiter Bonnet

C—Flow Limiter End Plug
D—Valve Plate-to-Pump
Housing Cap Screws

63. Do Flow Limiter Test in Group 9025 of Technical Manual.

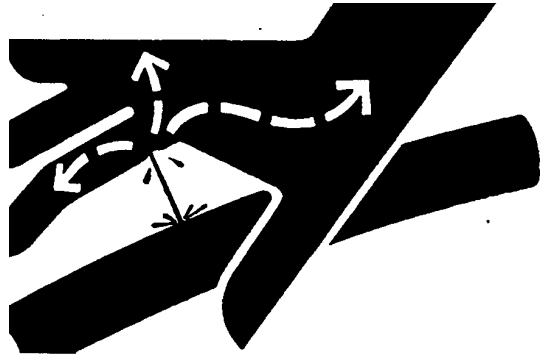
64. Do cycle times to check pump performance. (See Cycle Time Specifications in Group 9025 of Technical Manual. If cycle times are not to specifications, do Pump Flow Test in Group 9025 of Technical Manual.)

TX,21,RR7827 -19-21MAR97-50/50

Remove and Install Hydraulic Filter Assembly

CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.



X8811 —UN—23AUG88

TX,21,RR7830 -19-09APR97-1/2

1. Lower all equipment to the ground and shut the engine off.
2. Operate controls to relieve pressure in hydraulic system.
3. Disconnect lines (A, B, E and F).
4. Tag all lines. Cap and plug all openings.
5. Disconnect wire lead (C) from pressure switch.
6. Remove cap screws (D) to remove filter assembly.
7. Remove pressure switch. (See procedure in Section 16 Group 1674.)
8. Inspect and replace parts as necessary.
9. Install pressure switch. If removed, tighten check valve to outlet port fitting, check valve to inlet port fitting, and tee fitting to specification.

Specification

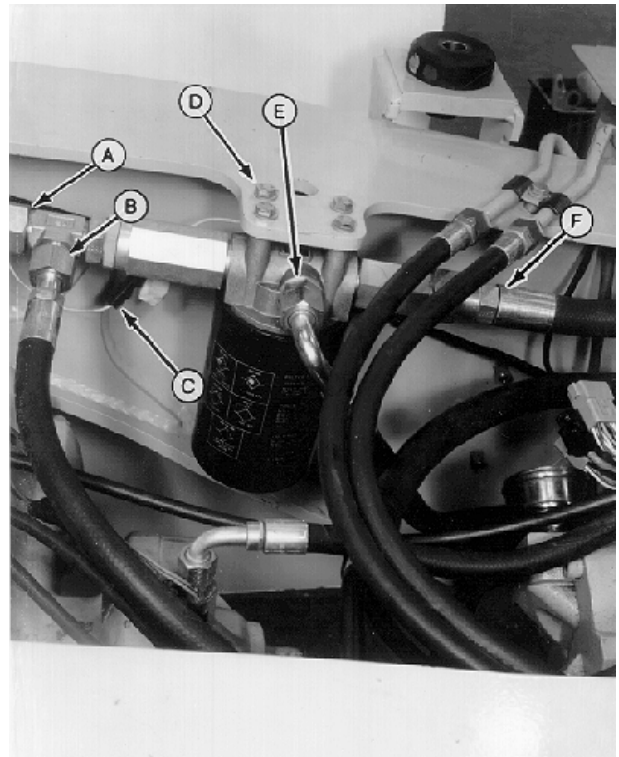
Valve-to-Outlet
Port Fitting, Check
Valve-to-Inlet Port Fitting,
and Tee Fitting—Torque..... 700 N·m (516 lb-ft)

10. Replace all O-rings.
11. Install filter assembly to frame with cap screws.
Tighten cap screws to specification.

Specification

Filter Assembly-to-Frame
Cap Screws—Torque..... 33 ± 4 N·m (24 ± 3 lb-ft)

12. Connect wire lead.
13. Connect hoses.
14. Add oil to proper level. (See Fuels and Lubricants in Group 0004.)



- A—Return Hose from Backhoe Control Valve
- B—Return Hose from Load Sense Shuttle Check Valve
- C—Wire Lead from Pressure Switch
- D—Cap Screw (4 used)
- E—Hose to Cooler
- F—Hose to Reservoir

T1108886 —UN—11APR97

TX,21,RR7830 -19-09APR97-2/2

Remove and Install Reservoir

1. Lower all equipment to the ground and shut the engine off. Release hydraulic pressure in the machine by moving control levers.
2. Remove left engine side shield, cowl, pre-cleaner, exhaust stack, and hood.
3. Using an oil caddie, pump oil from reservoir.

CAUTION: To avoid injury from escaping fluid under pressure, relieve the pressure in the system before disconnecting or connecting hydraulic or other lines. Tighten all connections before applying pressure.

4. Remove two brake valve lines (4). Tag and cap all lines and hoses when removing the reservoir.
5. Remove four brake valve mounting cap screws from brake valve in cab or ROPS and move brake valve toward the operator's station.
6. Disconnect or remove windshield washer (14) (if equipped).
7. Remove (15 and 16) and disconnect (1—3, and 5—13).
8. Remove three cap screws at top of tank holding reservoir.
9. Install JT01748 Lifting Bracket and a hoist.

CAUTION: The approximate weight of reservoir is 27 kg (60 lb).

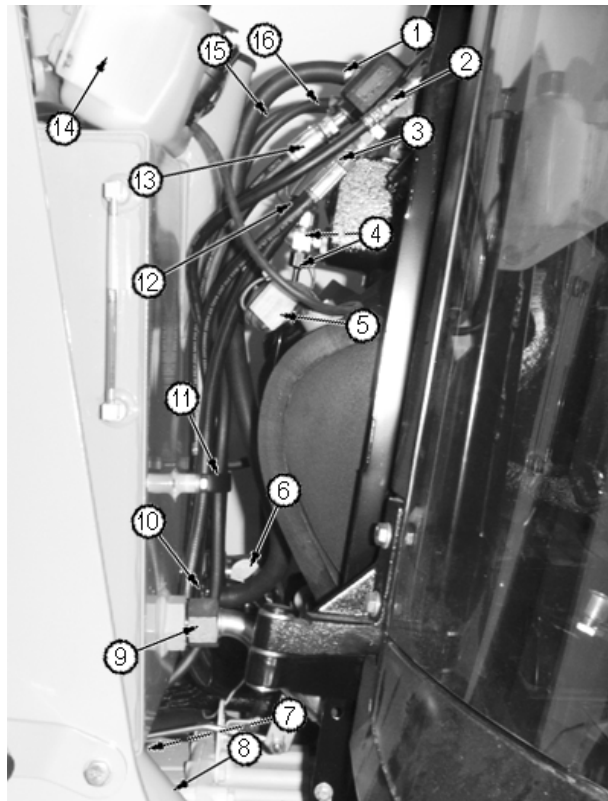
Specification

Hydraulic Reservoir—Weight..... 27 kg (60 lb)

10. Tilt top of reservoir out towards cab to clear main frame. Push in on bottom of reservoir towards engine and lift out to left side of machine.

Specification

Reservoir-to-Mainframe Cap Screws—Torque..... 59 N·m (43 lb-ft)



T108848B—UN—04APR97

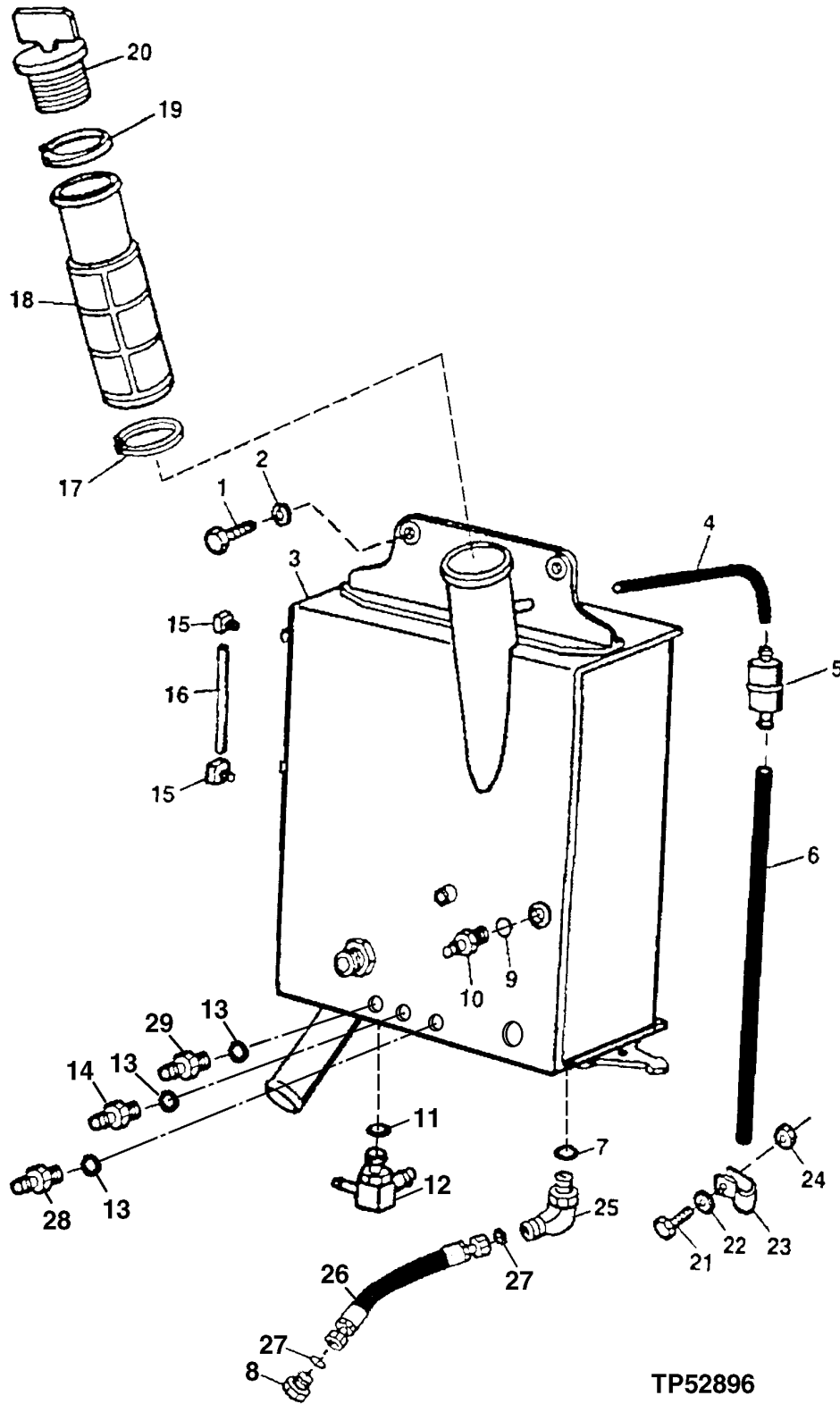
- | | |
|--|--|
| 1—Steering Valve “T” Port-to-Reservoir Line | 9—Steering Valve-to-Reservoir Return Line |
| 2—Steering Valve “L” Port-to-Steering Cylinder Head End Line | 10—Temperature Sending Unit Lead |
| 3—Steering Valve “R” Port-to-Cylinder Rod End Line | 11—Clamp |
| 4—Brake Lines (2 used) | 12—Steering Valve LS Port from Loader Control Valve LS Circuit |
| 5—Harness Connector | 13—Steering Valve Pressure Port Line from Backhoe Valve |
| 6—Reservoir-to-Pump Line | 14—Windshield Washer |
| 7—Cooler Line- to-Reservoir | 15—Brake Return Line |
| 8—Reservoir Suction Line-to-Pump | 16—Brake Pressure In Line |

12. Connect all parts.

13. Fill reservoir. See Group 0004.

TX,21,SS3952 -19-02APR97-1/1

Disassemble and Assemble Reservoir



Continued on next page

TX,2160,SS3555 -19-16JAN97-1/2

Hydraulic System

1— Cap Screw (3 used)	9— O-Ring	17— Snap Ring	25— Elbow
2— Washer (3 used)	10— Fitting	18— Strainer	26— Hose
3— Reservoir	11— O-Ring	19— Snap Ring	27— O-Ring
4— Hose	12— Tee Fitting	20— Filler Cap	28— Fitting
5— Air Filter	13— O-Ring	21— Cap Screw	29— Switch
6— Hose	14— Fitting	22— Washer	
7— O-Ring	15— Union Fitting (2 used)	23— Clamp	
8— Fitting Plug	16— Oil Tube	24— Nut	

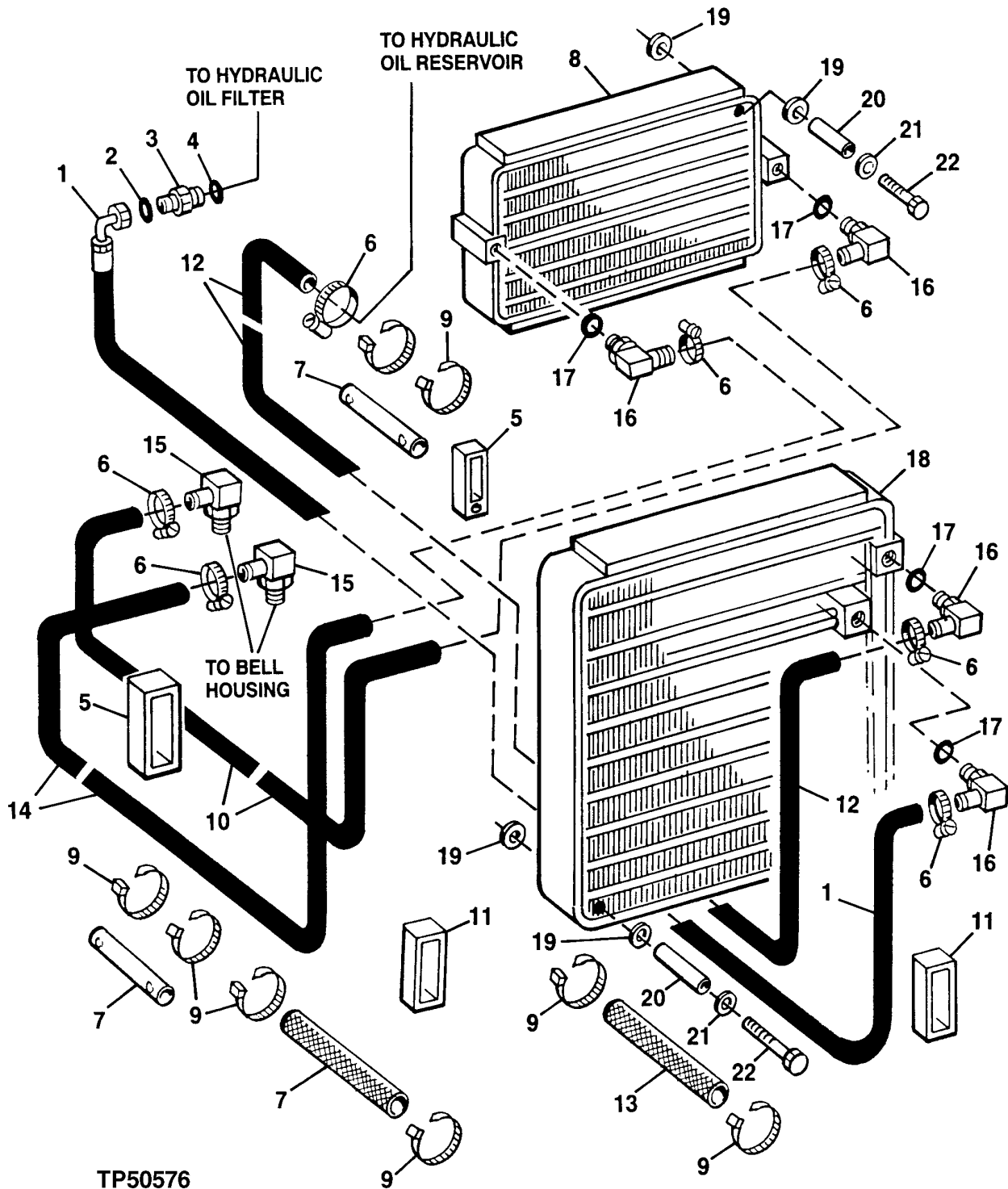
1. Remove parts. Replace as necessary.
2. Apply pipe sealant to threads of sight tube fittings (15).
Install fittings.
3. Install cap screws (1) and tighten to specification.

Specification

Reservoir-to-Mainframe	
Cap Screws—Torque.....	59 N·m (43 lb-ft)

TX,2160,SS3555 -19-16JAN97-2/2

Remove and Install Hydraulic Oil Cooler (Standard without Air Conditioning)



TP50576

- 1—Hose
- 2—O-Ring
- 3—Adapter
- 4—O-Ring
- 5—Grommet
- 6—Clamp (7 used)

- 7—Sleeve (2 used)
- 8—Transmission Oil Cooler
- 9—Tie Band (6 used)
- 10—Hose
- 11—Grommet (2 used)
- 12—Hose

- 13—Sleeve (2 used)
- 14—Hose
- 15—Elbow Fitting (2 used)
- 16—Fitting (4 used)
- 17—O-Ring (4 used)
- 18—Hydraulic Oil Cooler

- 19—Washer (16 used)
- 20—Spacer (8 used)
- 21—Washer (8 used)
- 22—Cap Screw (8 used)

Continued on next page

TX, 21,RR7729 -19-24FEB97-1/2

Hydraulic System

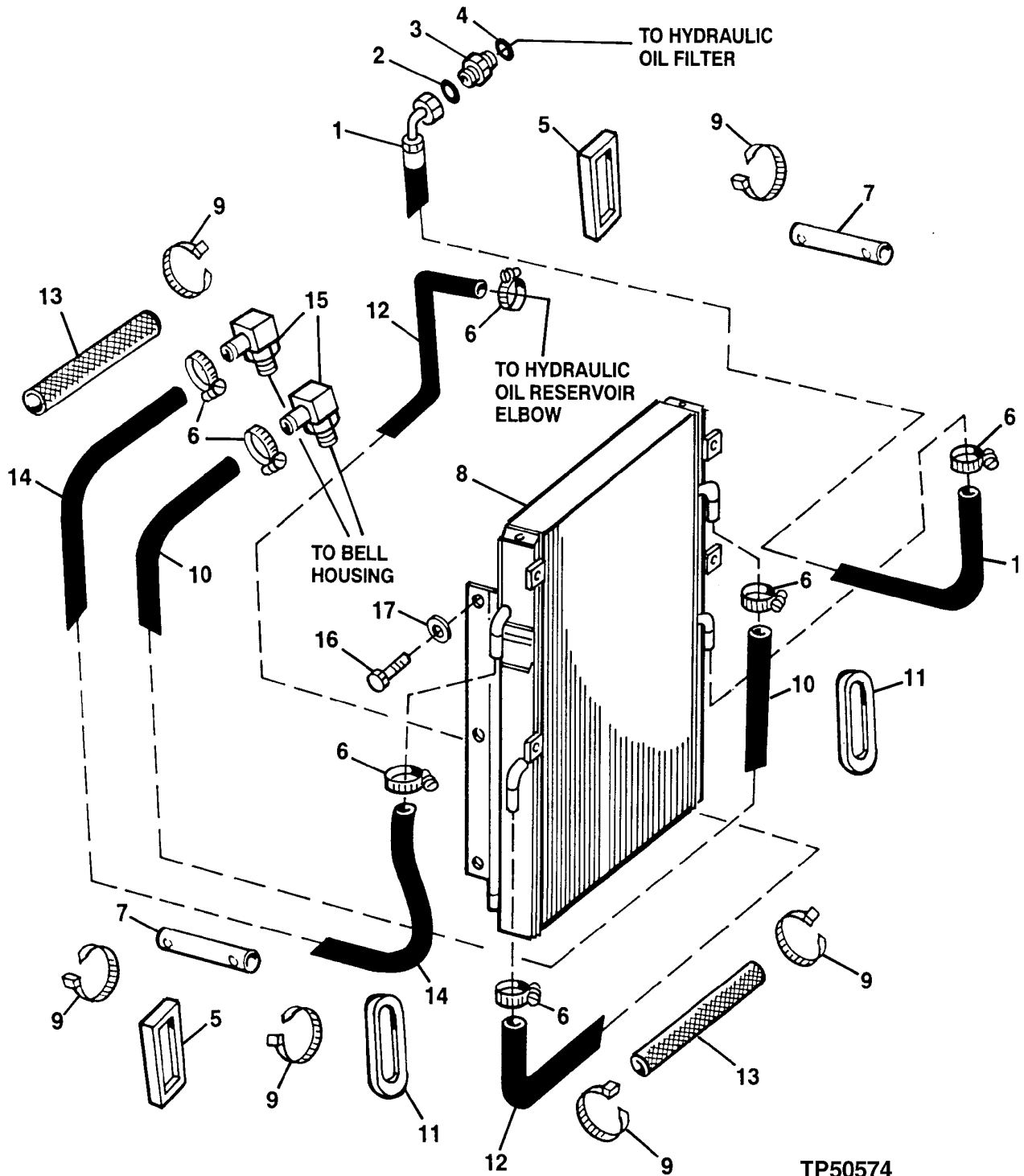
NOTE: Illustration shows transmission oil cooler along with the hydraulic oil cooler.

⚠ CAUTION: Prevent possible injury from unexpected loader boom movement. When working on machine with loader in raised position, use a support or loader boom lock bar to prevent accidental lowering of loader.

1. Raise loader boom and install loader boom lock bar.
2. Drain cooler.
3. Remove engine front grille.
4. Tag and disconnect lines. Close all openings using caps and plugs.
5. Remove cap screws (22), washers (21), spacers (20), and rubber washers (19) to remove cooler.
6. Clean and inspect cooler fins for wear. Repair if necessary.
7. Install oil cooler.
8. Connect hoses.
9. Install grille.

TX, 21,RR7729 -19-24FEB97-2/2

Remove and Install Hydraulic Oil Cooler and Hoses with Air Conditioning



- 1— Hose
- 2— O-Ring
- 3— Adapter
- 4— O-Ring
- 5— Grommet (2 used)

- 6— Clamp (7 used)
- 7— Sleeve (2 used)
- 9— Tie Band (6 used)
- 10— Hose

- 11— Grommet (2 used)
- 12— Hose
- 13— Sleeve (2 used)
- 14— Hose
- 15— Elbow Fitting

- 16— Cap Screw (6 used)
- 17— Washer (6 used)

TP50574

TP50574—UN—16JAN97

Continued on next page

TX.21,SS3966-19-15APR97-1/2

Hydraulic System

⚠ CAUTION: Prevent possible injury from unexpected loader boom movement. When working on machine with loader in raised position, use a support or loader boom lock bar to prevent accidental lowering of loader.

1. Raise loader boom and install loader boom lock bar.
2. Drain cooler.
3. Remove engine front grille.
4. Leave air conditioning condenser lines connected. Remove cap screws and let condenser hang.
5. Tag and disconnect lines. Close all openings using caps and plugs.
6. Remove cap screws (16) and washers (17) to remove cooler.
7. Clean and inspect cooler fins for wear. Repair if necessary.
8. Install oil cooler.
9. Connect hoses.
10. Install condenser.
11. Install grille.

TX,21,SS3966 -19-15APR97-2/2

Section 31 Loader

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Contents

Specifications

Item	Measurement	Specification
Boom Cylinder	Weight	37 kg (81 lb) Approximate
Loader Boom	Weight	317 kg (700 lb) Approximate

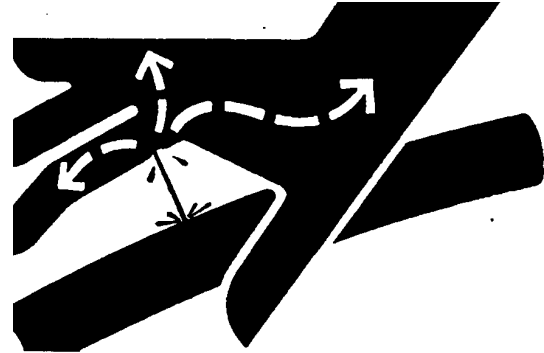
CE, TX03399, 5685 -19-06DEC99-1/1

Remove Loader

⚠ CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

1. Lower all equipment to ground. Stop engine.



2. Operate all hydraulic control valves to release pressure in hydraulic system.
3. Remove pre-cleaner and exhaust stack (if necessary) to remove hood.

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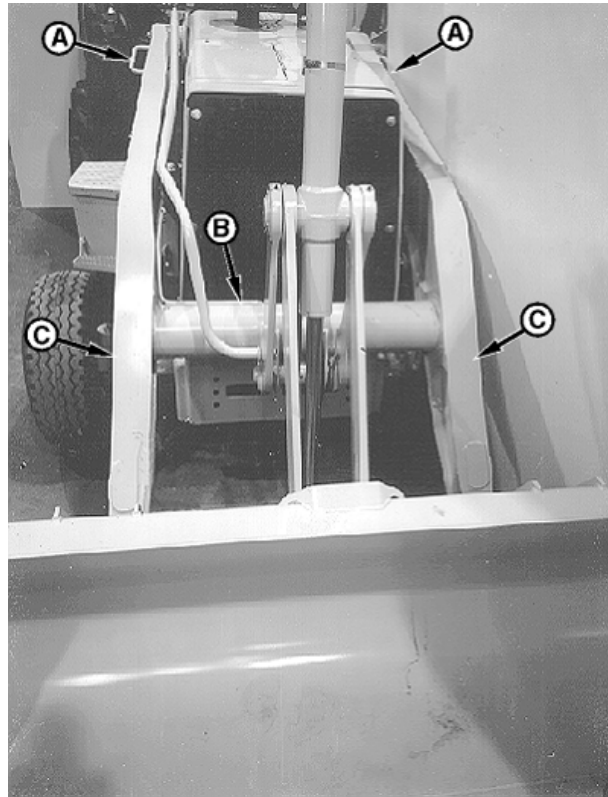
WS68074.00036EE -19-14JUL10-1/4

X9811 —UN—23AUG88

CAUTION: Prevent possible injury from falling bucket linkage when pins are removed. Support or block linkage from falling when removing pins.

4. Remove loader linkage, bucket cylinder, and bucket. (See Remove and Install Loader Bucket Cylinder in Group 3160 and Remove and Install Loader Bucket in Group 3102.)
5. Install lifting straps at locations (A and C). Make sure lifting straps are installed as follows:
 - Location (A)—Around the boom arms and through the handholds.
 - Location (C)—Around the boom arms just in front of cross tube (B).

A—Location (rear lifting point) C—Location (front lifting point)
 B—Cross Tube



T118413—UN—24NOV98

WS68074,00036EE -19-14JUL10-2/4

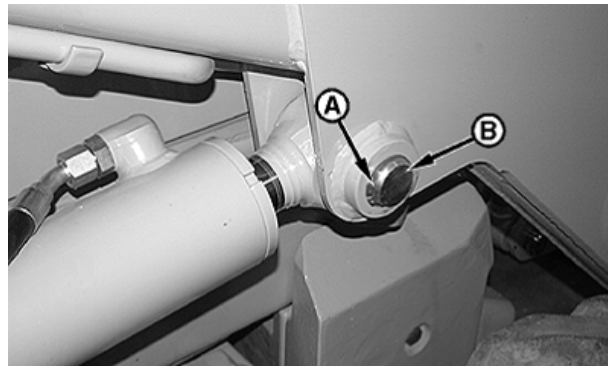
CAUTION: The approximate weight of boom cylinder is 37 kg (81 lb).

Specification

Boom Cylinder—Weight..... 37 kg (81 lb) Approximate

NOTE: If removal of boom cylinder is necessary, see Remove and Install Loader Boom Cylinder in Group 3160.

6. Position a 102 x 102 mm (4 x 4 in.) (minimum) wide block on the front axle directly under boom cylinder.
7. Remove boom cylinder rod end snap ring (A) and pin (B). Lower rod end of boom cylinder and allow it to rest on the block.



T118632A—UN—24NOV98

Continued on next page

WS68074,00036EE -19-14JUL10-3/4

8. Disconnect return-to-dig switch connector (D).
9. Tag and disconnect bucket hydraulic lines (C) (left side) and auxiliary hydraulic lines (right side). Close all openings using caps and plugs.
10. Remove cotter pin and yoke pin to disconnect bucket self leveling linkage (A). Fasten linkage rod to loader arm using a tie band.
11. Support weight of loader using a hoist attached to lifting straps. Remove snap rings (B), washers, and shims. Remove pivot pin and actuator (E).

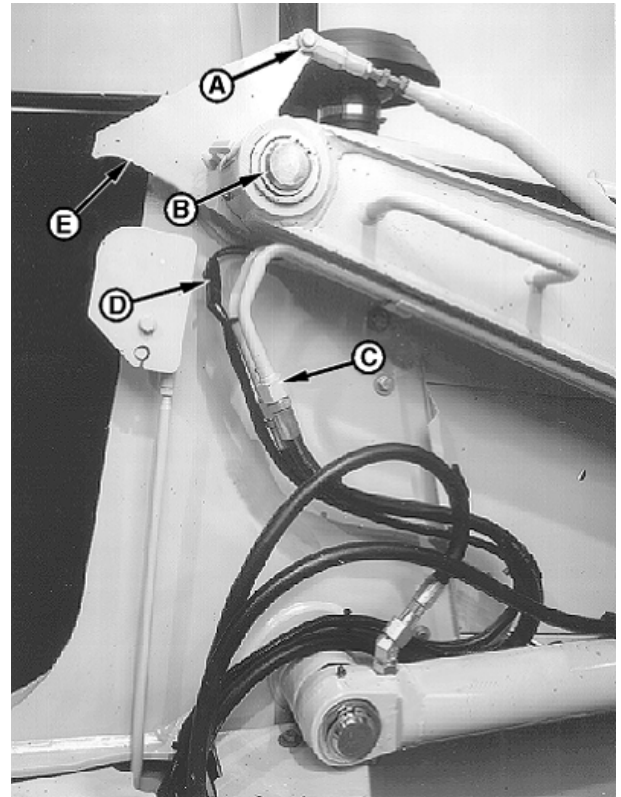
CAUTION: The approximate weight of the loader boom is 317 kg (700 lb).

Specification

Loader Boom—Weight..... 317 kg (700 lb) Approximate

12. Lift loader boom and remove.
13. Repair or replace loader boom as necessary.

- | | |
|--|----------------------------------|
| A—Bucket Leveling Linkage | D—Return-to-Dig Switch Connector |
| B—Loader Pin and Snap Ring | E—Actuator |
| C—Bucket ¹ Hydraulic Lines (2 used) | |

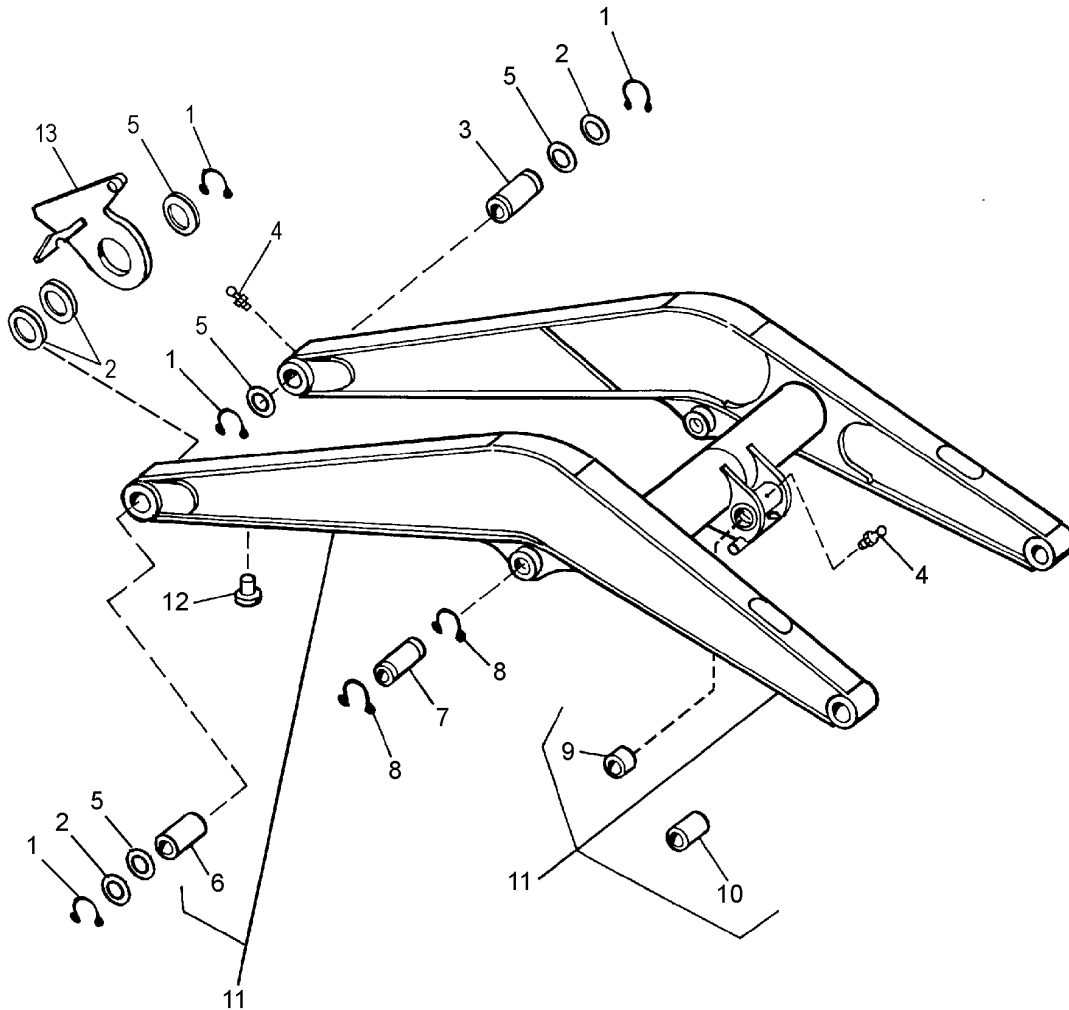


Boom and Bucket Linkage and Lines (right side shown)

T118631—JUN—24NOV98

¹Similar lines are located on the left side. These lines are for auxiliary hydraulics.

Install Loader



T107573

T107573—UN—26FEB97

- | | | | |
|---------------------------------|-----------------------|----------------------|--------------|
| 1— Snap Ring (4 used) | 5— Shim (as required) | 9— Bushing (2 used) | 13— Actuator |
| 2— Washer (4 used) | 6— Bushing (2 used) | 10— Bushing (2 used) | |
| 3— Pivot Pin (2 used) | 7— Pin (2 used) | 11— Loader | |
| 4— Lubrication Fitting (3 used) | 8— Snap Ring (4 used) | 12— Nut | |

1. Put actuator (13) on bushing (6) on inside of right loader arm.

2. Lower loader boom into position and align boom with pin boss holes.

3. Install hardware (1—3 and 5).

4. Connect bucket self leveling linkage to actuator (13).

5. Connect return-to-dig switch connector.

CAUTION: The approximate weight of the loader boom is 317 kg (700 lb).

Specification

Loader Boom—Weight..... 317 kg (700 lb) Approximate

Continued on next page

TX,31,RR7733 -19-11NOV98-1/2

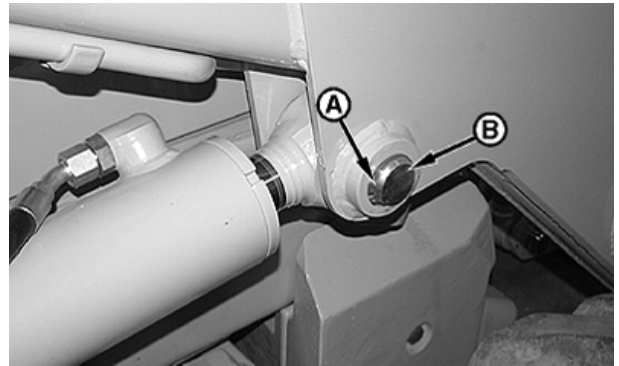
CAUTION: The approximate weight of boom cylinder is 37 kg (81 lb).

Specification

Boom Cylinder—Weight..... 37 kg (81 lb) Approximate

NOTE: If boom cylinder was completely removed from machine, see Remove and Install Loader Boom Cylinder in Group 3160 for installation procedure.

6. Raise boom cylinder into position and install pin (B) and snap ring (A).
7. Install loader bucket, bucket linkage, and bucket cylinder. (See Remove and Install Loader Bucket in Group 3102 and Remove and Install Loader Bucket Cylinder in Group 3160.)
8. Connect all hydraulic hoses and lines.



T118632A—UN—24NOV98

9. Adjust bucket self leveling linkage. (See procedure in Group 3115.)

TX,31,RR7733 -19-11NOV98-2/2

Loader

Specifications

Item	Measurement	Specification
RIVNUT ® Installation Tool	Torque	68—74 N·m (50—55 lb-ft)

RIVNUT is a registered trademark of The BF Goodrich Co.

CED,TX03399,5686 -19-06DEC99-1/1

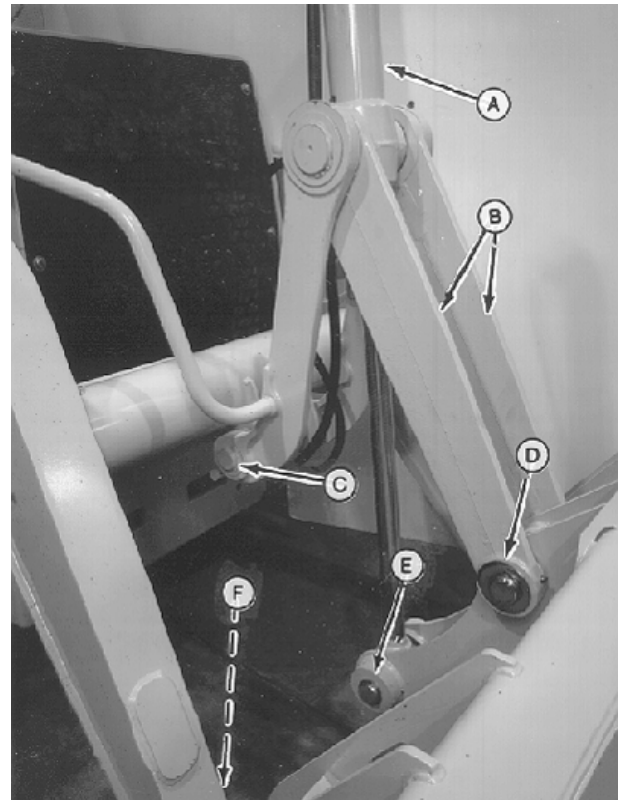
Remove and Install Loader Bucket

⚠ CAUTION: Prevent possible injury from falling linkage. Bucket cylinder and links will fall forward when pins are removed. Support or block linkage before removing pins.

1. Put bucket on floor.
2. Remove pin (D). Lift and rotate bucket links (B) until links rest against the machine.

NOTE: Stops (C) at the end of cylinder-to-loader cross tube links prevent cylinder and links from dropping. The stops keep the link assembly approximately at the full dump position.

3. Attach a hoist and lifting strap to bucket cylinder. Remove pin (E). Allow cylinder (A) to rest against the machine while being careful not to damage hose fitting at top of cylinder.
4. Remove pins (F). Remove bucket.
5. Repair or replace bucket as needed.
6. Move bucket into position. Align loader arms with bucket pin bosses and install pins.
7. Align bucket cylinder rod with bucket. Install pin.
8. Align links with bucket and install pin.



T107569 —UN—27FEB97

A—Cylinder
B—Bucket Link (2 used)
C—Link Stops Cylinder-to-Bucket Pin

D—Bucket Link-to-Bucket Pin
E—Cylinder-to-Bucket Pin
F—Boom-to-Bucket Pin (2 used)

TX, 21,RR7721 -19-11NOV98-1/1

Replace Welded Bucket Cutting Edges

1. Perform welding in an environment with a minimum ambient temperature of 10°C (50°F).
2. Clean all joints to be welded of all foreign matter such as dirt, rust, mill scale, oil, etc. with grinders and/or solvents.
3. Use dry AWS-E7018 low hydrogen electrodes or either of the following equivalent low hydrogen wire feed electrodes: gas metal arc welding (CO₂ or argon CO₂) AWS-E70S6 or flux cored arc welding AWS-E70T1.
4. Preheat parts to be welded (both tack and final welds) to minimum of 204°C (400°F). PREHEAT TEMPERATURE MUST BE THROUGHOUT THE ENTIRE THICKNESS OF THE PARTS JOINED AND AT LEAST 51 mm (2 in.) BACK FROM THE JOINT. Maintain preheat throughout the entire welding operation. Tempilstiks should be used if possible.
5. Tack weld preheated plates starting at center of bucket and working toward the outside ends.
6. Final weld preheated plates starting at the center of the front edge of the bucket backing plate and working toward the outside ends.

Repeat this operation at back edge of loader blade.

Tack welds may be incorporated into the final weld, providing they have been made with electrodes that meet the requirements of the final welds and no cracking has occurred in the weld metal. Tack welds not meeting these requirements must be completely removed by grinding or air arc gouging just prior to making the final weld in that area.
7. Do not remove bucket from welding environment until weld metal temperature has dropped to the ambient temperature. Do not force cooling rate of weld metal.

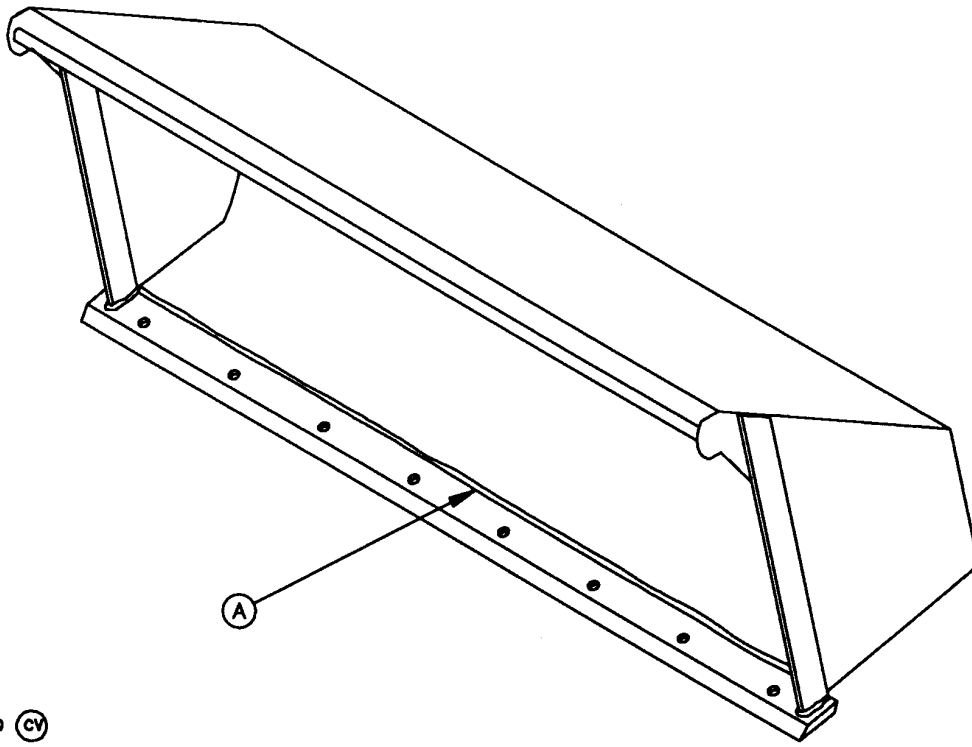
TX,31,ME120 -19-01SEP06-1/1

Bucket Cutting Edge Cracked Repair

1. If cutting edge has any cracks, clean the area to find end of crack.
2. Drill a small hole at end of crack to prevent spreading.
3. Grind V-grooves along crack on top and bottom of cutting edge.
4. Fill the V-grooves with weld. Use E7018 electrodes. Extend the weld approximately 13 mm (0.5 in.) beyond end of crack.

TX,31,ME122 -19-01SEP06-1/1

Remove and Install Cutting Edge



T7513AQ (CY)

A—Weld

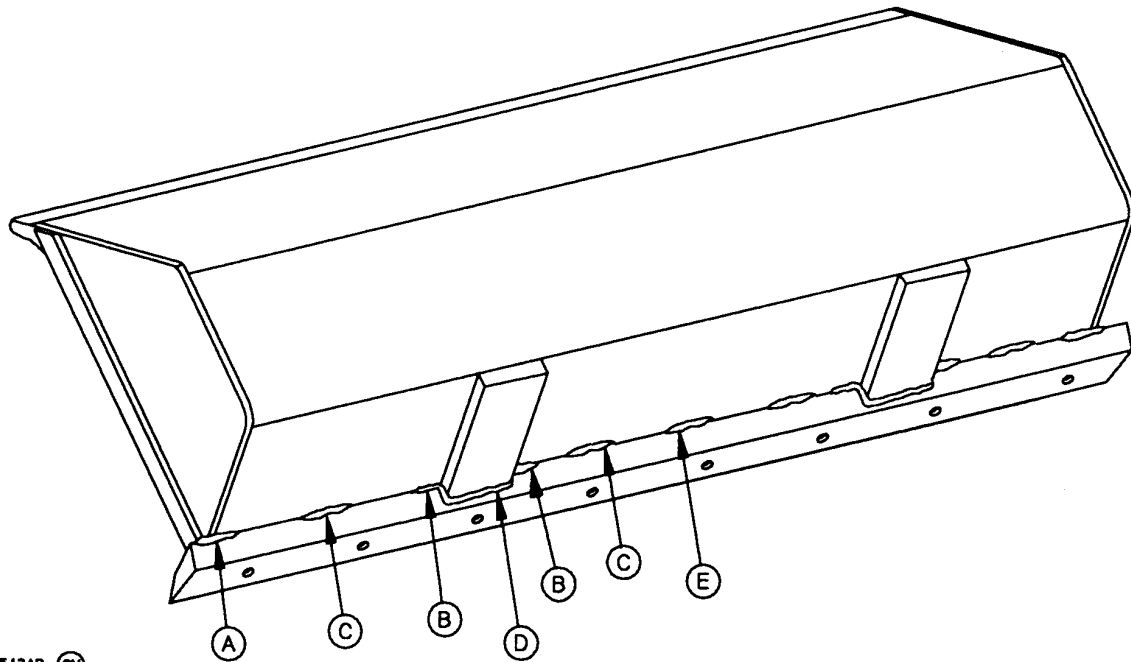
1. Lower bucket onto shop stands.
2. Tack weld a straight edge along weld (A) joining bucket to cutting edge to use as a guide.
3. Remove top weld using cutting torch or air arc equipment. Remove weld on side stiffener to cutting edge joint.

Continued on next page

TX3102BR269 -19-05JUN91-1/6

T7513AQ—UN—15MAY91

Bucket



T7513AR (CV)

T7513AR—UN—15MAY91

- | | | |
|--|--|---|
| <p>A—51 mm (2.0 in.) long x 12 mm
(0.5 in.) fillet weld</p> <p>B—51 mm (2.0 in.) long x 8 mm
(0.3 in.) fillet weld</p> | <p>C—40 mm (1.6 in.) long x 8 mm
(0.3 in.) fillet weld</p> <p>D—140 mm (5.5 in.) long x 8 mm
(0.3 in.) fillet weld (also wrap
corners)</p> | <p>E—76 mm (3.0 in.) long x 8 mm
(0.3 in.) fillet weld</p> |
|--|--|---|

IMPORTANT: Cutting edge overlaps bucket at bottom welds. Be careful not to cut into bucket when removing weld.

4. Put bucket into dump position. Remove all bottom welds (A—E) with cutting torch or air arc equipment.

NOTE: Weld sequence on cutting edge is symmetrical. Use left side notations to guide you to cut welds on the right side.

Continued on next page

TX3102BR269 -19-05JUN91-2/6

Bucket

5. Smooth rough surfaces with grinder.
6. Position new cutting edge and hold in place with clamps.

IMPORTANT: Disconnect battery ground strap or turn battery disconnect switch to "OFF".

Have only a certified or qualified welder do this work. Connect welder ground clamp close to each weld area so electrical current does not pass through any bearings.

Remove or protect all parts that can be damaged by heat or weld splatter.

High carbon cutting edges must be preheated to 176°C (350°F), then welded with low hydrogen E-7018 dry rods or A.W.S. E-70T-4 flux core process.

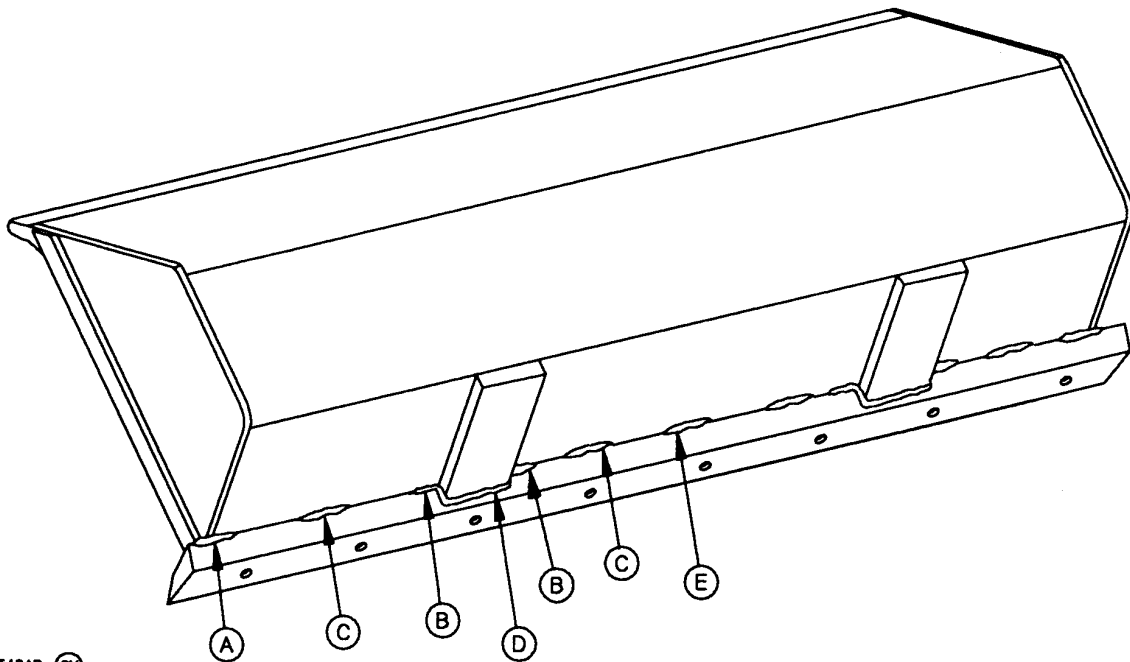


T92453 —UN—07FEB90

NOTE: Weld sequence on cutting edge is symmetrical. Use left side notations to weld right side.

7. Tack weld cutting edge to bucket. Remove clamps.

TX3102BR269 -19-05JUN91-3/6



T7513AR (CV)

- | | | |
|--|--|---|
| A—51 mm (2.0 in.) long x 12 mm (0.5 in.) fillet weld | C—40 mm (1.6 in.) long x 8 mm (0.3 in.) fillet weld | E—76 mm (3.0 in.) long x 8 mm (0.3 in.) fillet weld |
| B—51 mm (2.0 in.) long x 8 mm (0.3 in.) fillet weld | D—140 mm (5.5 in.) long x 8 mm (0.3 in.) fillet weld (also wrap corners) | |

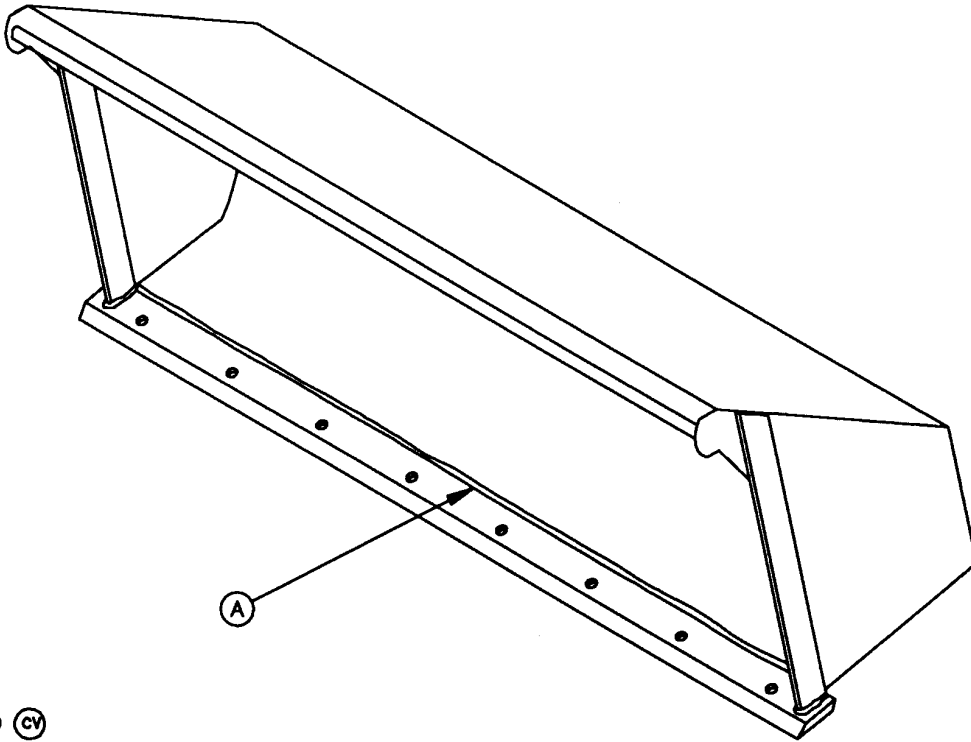
8. Weld bottom of cutting edge at A, B, C, D and E. Use weld instructions on drawing.

Continued on next page

TX3102BR269 -19-05JUN91-4/6

T7513AR —UN—15MAY91

Bucket



T7513AQ —UN—15MAY91

T7513AQ (CV)

A—Weld

9. Put bucket flat on shop stands. Weld floor of bucket to cutting edge (A) with a 5 mm (0.2 in.) high by 9 mm (0.36 in.) wide fillet weld. Start weld in center

and weld continuous to end. Weld both halves before welding side stiffener to cutting edge.

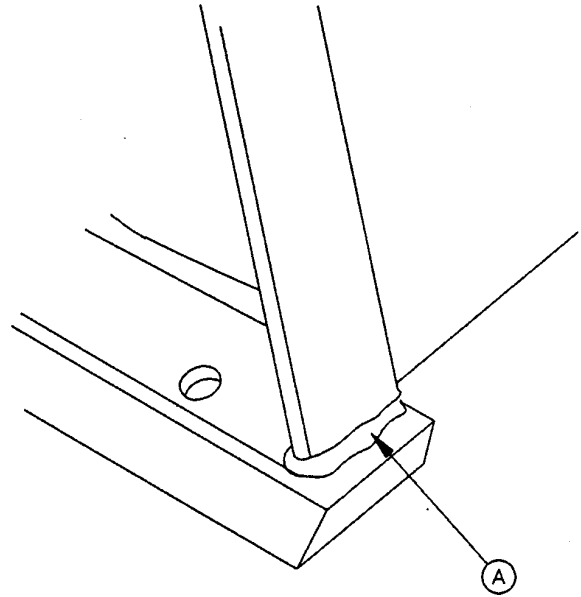
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TX3102BR269 -19-05JUN91-5/6

Bucket

10. Weld both sides and front of each side stiffener to cutting edge using a 12 mm (0.5 in.) fillet weld (A). Wrap weld around corners.

A—Fillet Weld

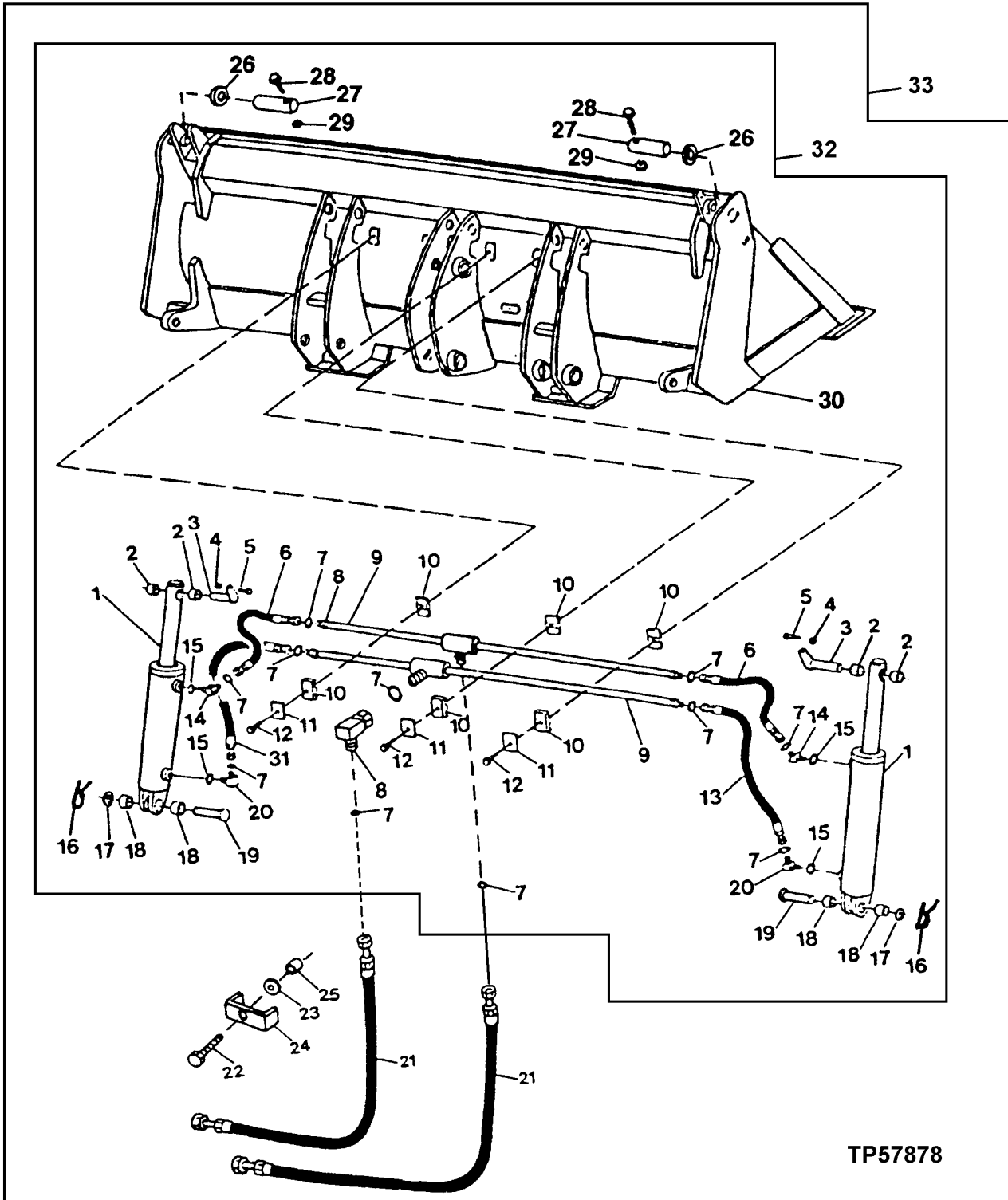


T7513AS (CV)

T7513AS —UN—05JUN91

TX3102BR269 -19-05JUN91-6/6

Disassemble and Assemble Multi-Purpose Bucket and Lines



TP57878

TP57878—UN—19JUN98

Continued on next page

CED.TX03399,5610 -19-02DEC99-1/2

Bucket

1— Cylinder (2 used)	10— Clamp (6 used)	19— Pin (2 used)	28— Cap Screw (2 used)
2— Bushing (4 used)	11— Plate (3 used)	20— Elbow (2 used)	29— Lock Nut (2 used)
3— U-Joint Lock Pin (2 used)	12— Cap Screw (3 used)	21— Hydraulic Hose Loader Lift	30— Moldboard
4— Lock Nut (2 used)	13— Hydraulic Hose-to-Head End	Arms-to-Bucket (2 used)	31— Hydraulic Hose-to-Head End
5— Cap Screw (2 used)	(Right Side)	22— Cap Screw	(Left Side)
6— Hydraulic Hose-to-Rod End (2	14— Elbow	23— Washer	32— Multi-Purpose Bucket
used)	15— O-Ring (4 used)	24— Clamp	Assembly
7— O-Ring (11 used)	16— Cotter Pin (2 used)	25— Bushing	33— Complete Multi-Purpose
8— Elbow (2 used)	17— Washer (2 used)	26— Washer (2 used)	Bucket Assembly
9— Tube (2 used)	18— Bushing (4 used)	27— Pin (2 used)	

Inspect all part for wear. Replace if necessary.

CED,TX03399,5610 -19-02DEC99-2/2

Bucket

Group 3115 Control Linkages

Other Material

Number	Name	Use
TY16285 (U.S.) CXTY16285 (Canadian) 7649 (LOCTITE®)	Cure Primer	Apply to threads of cap screw.
T43512 (U.S.) TY9473 (Canadian) 242 (LOCTITE®)	Thread Lock and Sealer (Medium Strength)	Apply to threads of cap screw.
TY21517 (U.S.) NA (Canadian) 454 (LOCTITE®)	Instant Gel Adhesive	Apply to threads on loader control knob.

LOCTITE is a trademark of Loctite Corp.

CED,TX03399,5690 -19-06DEC99-1/1

Specifications

Item	Measurement	Specification
Return-to-Dig Adjustment (Guard/Stop-to-Bell Crank)	Gap	1 mm (0.04 in.)
Return-to-Dig Adjustment (Top of Bell Crank Pin-to-Actuator Tang)	Gap	152 mm (6 in.)
Control Valve Linkage Support Bracket Cap Screws	Torque	37 N·m (27 lb-ft)
Control Valve Lever Ball Joint Nuts	Torque	25 N·m (18 lb-ft)
Control Valve Lever Ball Joint Jam Nuts	Torque	115 N·m (85 lb-ft)
Bucket	Weight	45 kg (100 lb) Approximate

CED,TX03399,5691 -19-06DEC99-1/1

Loader Bucket Self-Leveling Linkage Indicator and Return-to-Dig Switch Adjustment

1. Position bucket flat on ground. Stop engine.
2. Remove cover that covers linkage and reinstall cap screw.
3. Hold bucket lever in rollback position.
4. Measure gap (A) between guard/stop (B) and bell crank (C). Gap should be as specified.

Specification

Return-to-Dig Adjustment
 (Guard/Stop-to-Bell Crank)—Gap..... 1 mm (0.04 in.)

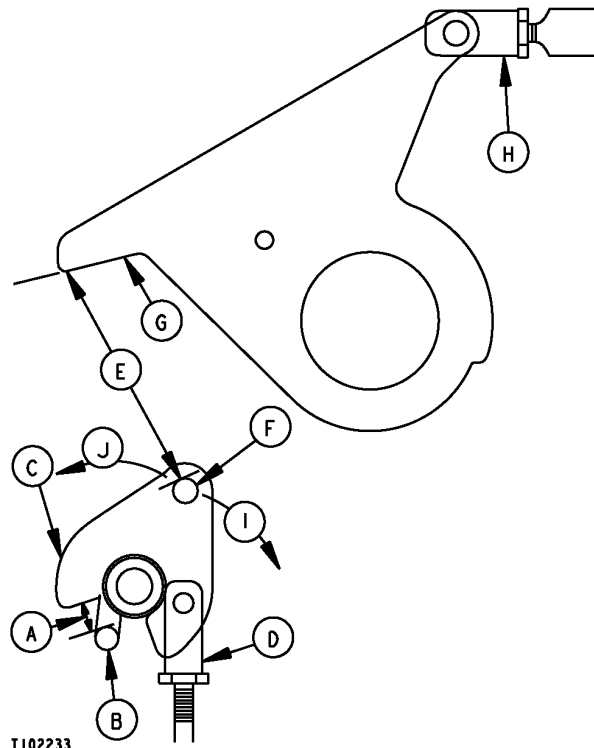
5. If gap is not to specification, adjust rod jam nut and yoke (D) to obtain correct gap. Allow bucket lever to return to neutral position.
6. Measure gap (E) between top of bell crank pin (F) and bottom of actuator tang (G). Gap should be as specified.

Specification

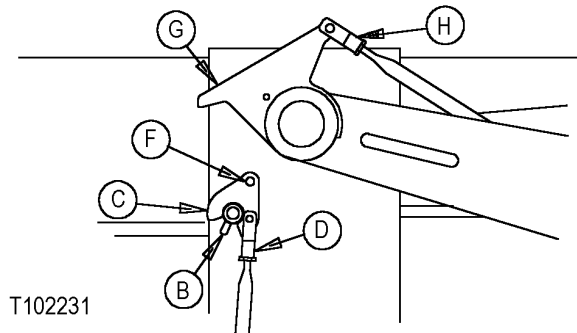
Return-to-Dig Adjustment
 (Top of Bell Crank Pin-to-Actuator Tang)—Gap..... 152 mm (6 in.)

7. If gap (E) is not to specification, adjust sensor tube jam nut and yoke (H) until correct specification is obtained.

- | | |
|-------------------------------|--------------------------------|
| A—1 mm (0.04 in.) Gap | F—Bell Crank Pin |
| B—Guard/Stop | G—Actuator Tang |
| C—Bell Crank—Neutral Position | H—Sensor Tube Jam Nut and Yoke |
| D—Rod Jam Nut and Yoke | I—Bucket Dump |
| E—152 mm (6 in.) Gap | J—Bucket Rollback |



T102233 —UN—26JUL96



T102231 —UN—05SEP96

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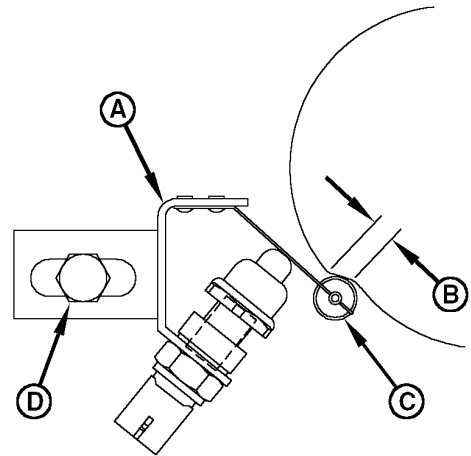
CED,OUO1010,482 -19-20NOV98-1/3

Control Linkages

8. Loosen cap screw (D) and move return-to-dig switch so roller (C) is touching area (B) on the cam.
9. Connect an ohmmeter test leads across the return-to-dig switch terminals.
10. Move switch toward cam until continuity is indicated.
11. Move switch away from cam until no continuity is indicated.
12. Tighten cap screw (D) without moving switch assembly (A).
13. Remove pin from sensor tube yoke.
14. While watching clearance between cam and switch, turn bucket level pointer back and forth to make sure cam does not hit switch bracket.

NOTE: Be sure that switch arm and roller do not bottom on switch housing.

15. If cam contacts switch bracket or arm, repeat steps 8—14.
16. Connect return-to-dig switch connector.
17. Install cover.
18. Connect sensor tube.



T118401

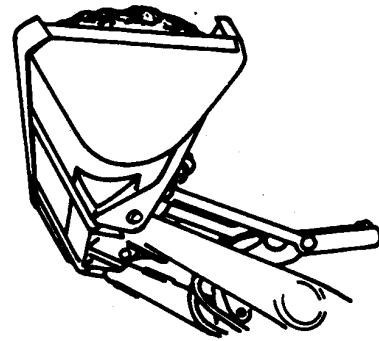
A—Switch Assembly
B—Cam Area

C—Roller
D—Cap Screw

T118401—UN—13NOV98

CED,OUO1010,482 -19-20NOV98-2/3

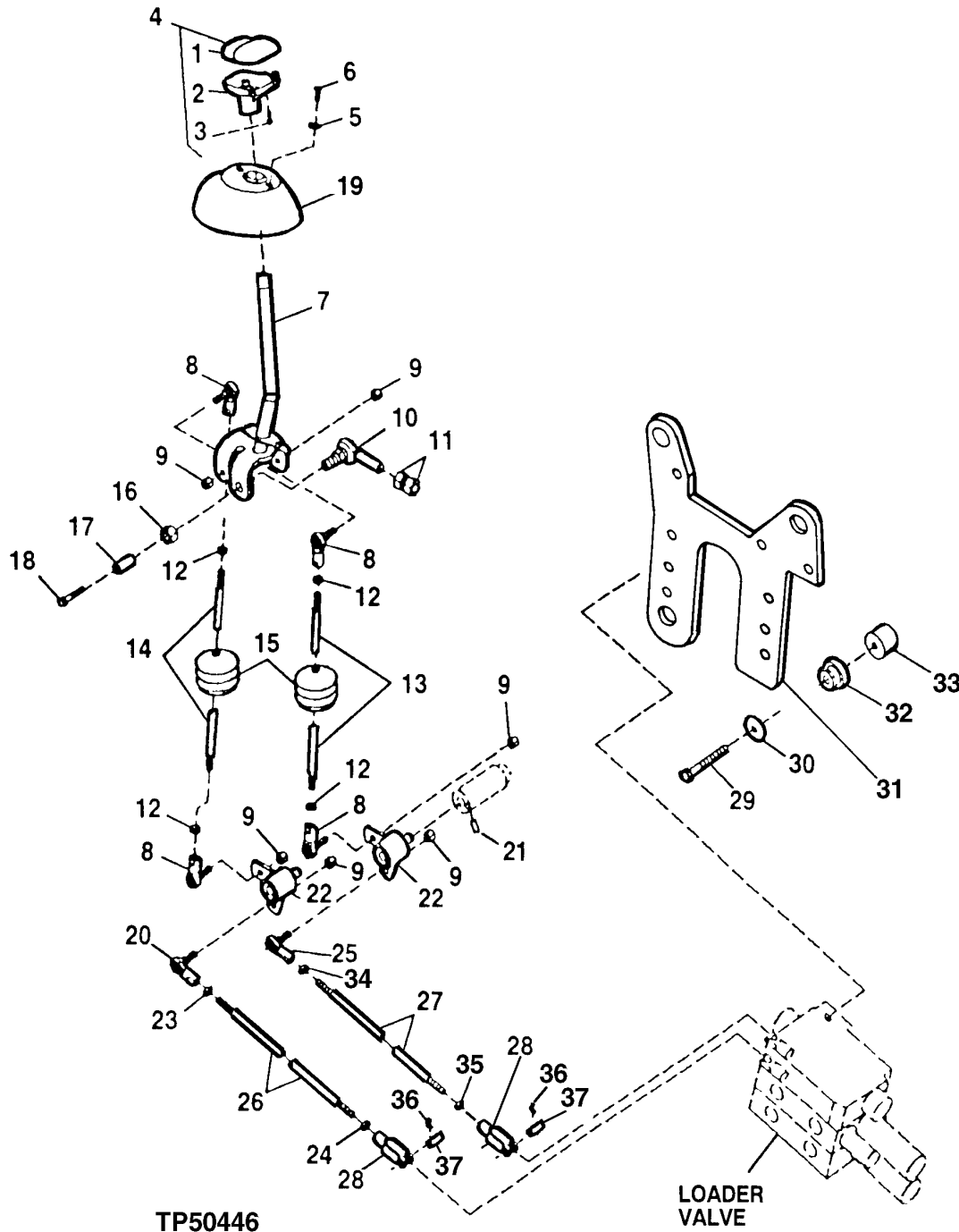
19. When self-leveling mechanism is adjusted correctly, bucket position will be approximately level or slightly forward with the ground.
20. Check position of bucket level indicator-to-leveling decal. For operator's preference, the decal may be moved to align with the bucket pointer.



T6161AA—UN—18OCT88

CED,OUO1010,482 -19-20NOV98-3/3

Remove and Install Loader Control Valve Linkage



- | | | | |
|------------------------|-------------------|------------------------|-----------------------|
| 1— Handle | 11— Nut (2 used) | 21— Set Screw (2 used) | 31— Support |
| 2— Handle | 12— Nut (4 used) | 22— Bellcrank (2 used) | 32— Isolator (3 used) |
| 3— Screw (2 used) | 13— Stud | 23— Nut | 33— Spacer (3 used) |
| 4— Knob | 14— Rod | 24— Nut | 34— Nut |
| 5— Washer (2 used) | 15— Boot (2 used) | 25— Ball Joint | 35— Nut |
| 6— Screw (2 used) | 16— Nut | 26— Rod | 36— Cotter Pin |
| 7— Lever | 17— Bushing | 27— Rod | 37— Pin |
| 8— Ball Joint (4 used) | 18— Cap Screw | 28— Yoke (2 used) | |
| 9— Lock Nut (6 used) | 19— Base | 29— Cap Screw (3 used) | |
| 10— Ball Joint | 20— Ball Joint | 30— Washer (3 used) | |

Continued on next page

TP50446—UN—22AUG96

Control Linkages

1. Tighten cap screws (29) to 37 N·m (27 lb-ft).

Specification

Control Valve Linkage
Support Bracket Cap
Screws—Torque..... 37 N·m (27 lb-ft)

2. Tighten nuts (9) to 25 N·m (18 lb-ft).

Specification

Control Valve Lever Ball
Joint Nuts—Torque..... 25 N·m (18 lb-ft)

3. Tighten nuts (11) to 115 N·m (85 lb-ft).

Specification

Control Valve Lever Ball
Joint Jam Nuts—Torque..... 115 N·m (85 lb-ft)

4. Apply cure primer, then thread lock and sealer to threads of cap screw (18) which retains bushing to large ball joint.
5. Apply gel instant adhesive to threads on loader control knob (4).

CED,OUO1002,766 -19-18JAN99-2/2

Loader Control Valve Linkage Adjustment

NOTE: Levers must be positioned correctly to allow full travel and proper operation of loader valves.

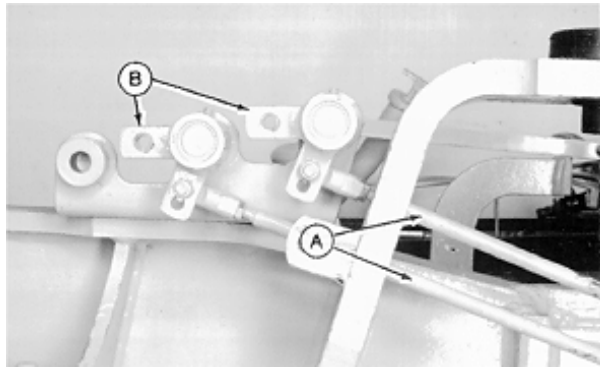
Cab and other components have been removed in some photos for illustration purposes only.

1. Put loader control valve spools in neutral position.
2. Adjust rods (A) so tabs (B) on bell crank are horizontal.
3. Put a piece of masking tape from right front to right rear ROPS posts on inside surface at loader knob height.
4. Distance (C) from right side of knob to tape should be 250 mm (10 in.).
5. Put a piece of masking tape from left front to right front ROPS posts on inside surface at loader knob height.
6. Distance (D) from front of loader knob to tape should be 130 mm (5.25 in.).

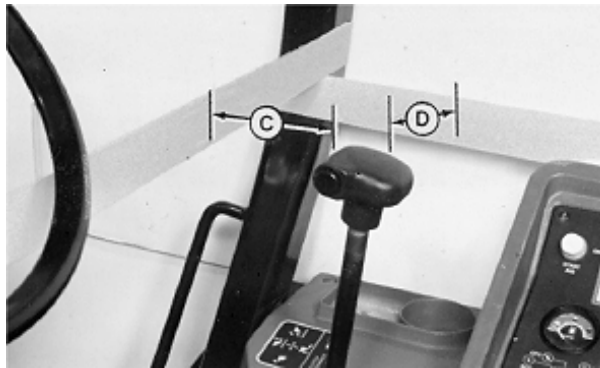
NOTE: Pivot (F) must remain in slot when holding the loader lever in the rollback position.

7. The distances in steps 4 and 6 can be obtained by adjusting control rods (E).

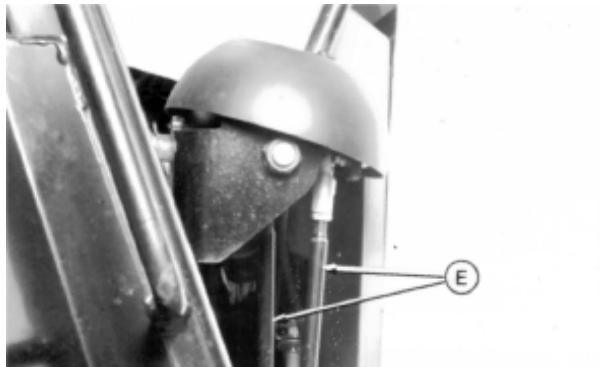
- | | |
|------------------------------|--------------------------------|
| A—Linkage Rods | D—Distance [130 mm (5.25 in.)] |
| B—Tabs | E—Control Rods |
| C—Distance [250 mm (10 in.)] | F—Pivot |



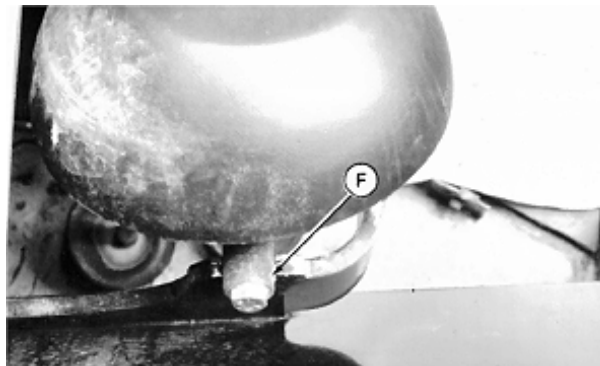
T7407AN —UN—30OCT90



T7407AO —UN—14NOV90



T7407AP —UN—30OCT90



T7407AQ —UN—30OCT90

TX.9025,RR7491 -19-20NOV98-1/1

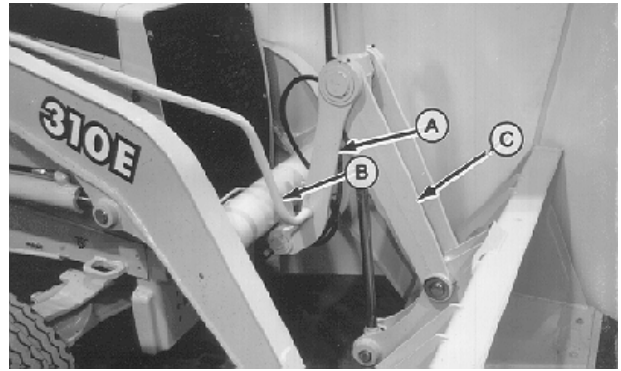
Remove and Install Bucket Cylinder Linkage

CAUTION: Prevent possible injury from falling linkage. Bucket cylinder and links will fall forward when pins are removed. Support or block linkage before removing pins. The approximate weight of the bucket cylinder is 45 kg (100 lb).

Specification

Bucket—Weight..... 45 kg (100 lb) Approximate

1. Support or block linkage from falling when disconnecting the linkage.
2. Remove bucket level indicator rod (B) by removing snap ring.
3. Remove two bucket links (C) by removing snap rings at both ends of links.
4. Slowly remove bucket links (A) by removing snap rings. Position cylinder against machine.
5. Inspect and repair links as needed. Remove and install bushings using 45, 55, 65, 75 and 85 mm disks.
6. Apply multipurpose grease to inside of all bushings before assembly.
7. Install bucket links and snap rings. Shim as required to reduce looseness on bucket links and bucket links to cylinder.
8. Attach indicator rod using snap ring.



T 107570 —UN—27FEB97

TX, 21,RR7722 -19-24FEB97-1/1

Control Linkages

Group 3160 Hydraulic System

Essential Tools

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or from the European Microfiche Tool Catalog (MTC).

SERVICEGARD is a trademark of Deere & Company

CED, TX03399, 5885 -19-05JAN00-1/5

Relief Valve Seal Installer JDG1290 To install special seal on relief valve.

CED, TX03399, 5885 -19-05JAN00-2/5

Shut-Off Plug Seal Installer JDG1328 To install special seal on shut-off plug.

CED, TX03399, 5885 -19-05JAN00-3/5

Seal Installation Tool..... JDG734 Install seals and wiper rings in spool valves.

CED, TX03399, 5885 -19-05JAN00-4/5

Gas Cock.....JT01735 Charge Accumulator

CED, TX03399, 5885 -19-05JAN00-5/5

Service Equipment and Tools

European Microfiche Tool Catalog (MTC). Some tools may be available from a local supplier.

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or from the

SERVICEGARD is a trademark of Deere & Company

CED, TX03399, 5693 -19-06DEC99-1/2

Gauge (600 psi) Used to determine accumulator charge pressure.

CED, TX03399, 5693 -19-06DEC99-2/2

Hydraulic System

Other Material

Number	Name	Use
TY16285 (U.S.) CXTY16285 (Canadian) 7649 (LOCTITE®)	Cure Primer	Apply to threads on spool and spool end screw. Apply to spanner nut and rod guide threads
T43513 (U.S.) TY9474 (Canadian) 271 (LOCTITE®)	Thread Lock and Sealer (High Strength)	Apply to threads of spool end screw.
T43512 (U.S.) TY9473 (Canadian) 242 (LOCTITE®)	Thread Lock and Sealer (Medium Strength)	Apply to rod guide and spanner nut threads.

LOCTITE is a registered trademark of Loctite Corp.

CED,TX03399,5694 -19-06DEC99-1/1

Specifications

Item	Measurement	Specification
Loader Control Valve		
Bucket Curl and Boom Raise Circuit Relief Valve Body	Torque	34 ± 3 N·m (25 ± 2 lb-ft)
Bucket Curl and Boom Raise Circuit Relief Valve (Installation)	Torque	45 ± 4.7 N·m (33 ± 3.5 lb-ft)
Loader Bucket Dump Relief Valve with Anti-Cavitation Nut	Torque	45 ± 4.7 N·m (33 ± 3.5 lb-ft)
Loader Bucket Dump Relief Valve with Anti-Cavitation Body	Torque	65 ± 7 N·m (48 ± 5 lb-ft)
Loader Bucket Dump Relief Valve with Anti-Cavitation (Installation)	Torque	65 ± 7 N·m (48 ± 5 lb-ft)
Anti-Cavitation Valve (Installation)	Torque	65 ± 7 N·m (48 ± 5 lb-ft)
Auxiliary Circuit Relief Valve (Installation)	Torque	65 ± 7 N·m (48 ± 5 lb-ft)
Shut-Off Plug (Installation)	Torque	65 ± 7 N·m (48 ± 5 lb-ft)
Control Valve and Mounting Plate	Weight	45 kg (100 lbs) Approximate
Loader Control Valve Mounting Plate Isolator Cap Screws	Torque	37 N·m (27 lb-ft)
Loader Control Valve Mounting Cap Screws	Torque	130 N·m (95 lb-ft)
Loader Control Valve	Weight	45 kg (100 lb) Approximate
Loader Control Tie Rod Nuts, 7/16 in.-20 Threads	Torque	65 N·m (48 lb-ft)
Loader Control Tie Rod Nuts, 1/2 in.-20 Threads	Torque	100 N·m (74 lb-ft)
Spool Cap, Cap Screws	Torque	9.5 N·m (84 lb-in.)
Spool Retainer Plate Screws	Torque	5.5 N·m (48 lb-in.)
Relief Valve 27 mm (1-1/2 in.) Threads	Torque	65 ± 7 N·m (48 ± 5 lb-ft)
Relief Valve w/out Locking Ring, 22.2 mm (7/8 in.) Threads	Torque	45 ± 4 N·m (33 ± 3 lb-ft)
Relief Valve w/Locking Ring, 22.2 mm (7/8 in.) Threads	Torque	34 ± 3 N·m (25 ± 2 lb-ft)
Relief Valve Locking Ring Nut	Torque	14 ± 1.4 N·m (10 ± 1 lb-ft)
Steering Load Sense Relief Nut and Cap	Torque	9.5 ± 1.5 N·m (84 ± 12 lb-in.)
Plug	Torque	22—27 N·m (16—20 lb-ft)
Spool End Screw	Torque	8—11 N·m (6—8 lb-ft)
Socket Head Screws	Torque	8—11 N·m (6—8 lb-ft).
Spool End Screw	Torque	9.5 N·m (84 lb-in.)
Spool Cap, Cap Screws	Torque	9.5 N·m (84 lb-in.)

Continued on next page

CED, TX03399, 5901 -19-10JAN00-1/2

Hydraulic System

Item	Measurement	Specification
Spool Retainer Plate Screws	Torque	5.5 N·m (48 lb-in.)
Loader Cylinder		
Boom Cylinder	Weight	38 kg (84 lb)
Bucket Cylinder Piston Nut with 855.5 ± 2 mm (33.7 ± 0.08 in.) Rod Stroke	Torque Turn	170 N·m (125 lb-ft) + 1/8 (45°) turn
Bucket Cylinder Piston Nut with 744 ± 2 mm (29.3 ± 0.08 in.) Rod Stroke	Torque Turn	190 N·m (140 lb-ft) + 1/8 turn (45°)
Boom Cylinder Piston Nut	Torque Turn	250 N·m (185 lb-ft) + 1/8 (45°) turn
Ride Control		
Control Valve Cap Screws	Torque	37 N·m (27 lb-ft)
Control Valve Hydraulic Hoses	Torque	50 N·m (37 lb-ft)
Control Valve Manifold SAE #4 Plug	Torque	8—14 N·m (6—10 lb-ft)
Control Valve Manifold SAE #6 Plug	Torque	20—27 N·m (15—20 lb-ft)
Solenoid Valve Block-to-Control Valve Manifold Socket-Head Screws	Torque	5—7 N·m (44—62 lb-in.)
Accumulator Clamp Cap Screws	Torque	73 N·m (54 lb-ft)
Accumulator Hydraulic Line	Torque	37 N·m (27 lb-ft)
Accumulator Charge for Optimal Performance	Pressure	— 345 kPa (— 3.5 bar) (— 50 psi)
Ride Control Accumulator Pre-Charge—17 in. accumulator canister length	Pressure (310E, 310SE, 315SE Machines)	2482 ± 138 kPa (25 ± 1bar) (360 ± 20 psi)
Ride Control Accumulator Pre-Charge—17 in. accumulator canister length	Pressure (410E Machine)	3447 kPa (35 bar) (500 psi)
Ride Control Accumulator Pre-Charge—14 in. accumulator canister length	Pressure (310E, 310SE, 315SE and 410E Machines)	2930 kPa (29 bar) (425 psi)

CED, TX03399, 5901 -19-10JAN00-2/2

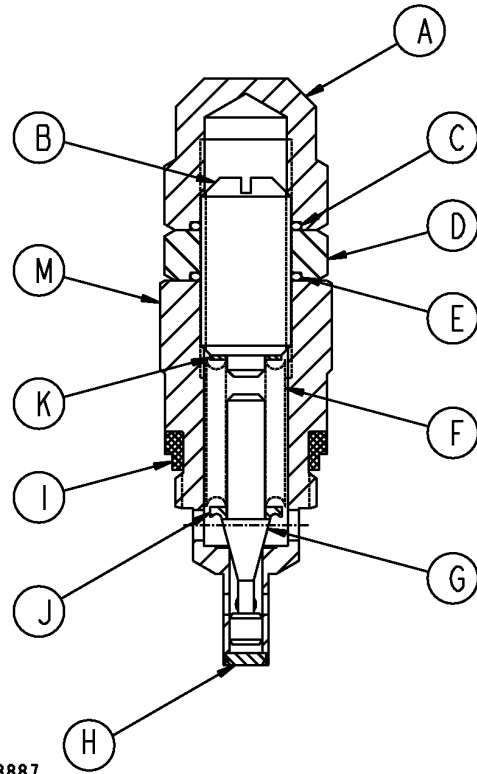
Disassemble and Assemble Loader Bucket Curl, Load Sense, Boom Raise Circuit Relief Valves with Anti-Cavitation and Loader System Relief Valve without Anti-Cavitation

1. Disassemble and inspect parts for wear and damage. Replace as necessary.
2. Put clean hydraulic oil on all parts before assembly.
3. Install special seal (I) using JDG1290 Seal Installer.
4. Tighten cap (A) and nut (D) to specification. Reference circuit relief valve installation torque.

Loader Control Valve—Specification

Bucket Curl and Boom	
Raise Circuit Relief Valve	
Body —Torque.....	34 ± 3 N·m (25 ± 2 lb-ft)
Bucket Curl and Boom	
Raise Circuit Relief Valve	
(Installation)—Torque.....	45 ± 4.7 N·m (33 ± 3.5 lb-ft)

- | | |
|--------------------------|-------------------------|
| A—Cap | G—Poppet |
| B—Adjusting Screw | H—Orifice |
| C—O-Ring | I— Special Seal |
| D—Nut | J— Collar |
| E—O-Ring | K—Retaining Ring |
| F— Spring | M—Valve Body |



T108887

T108887 —UN—09APR97

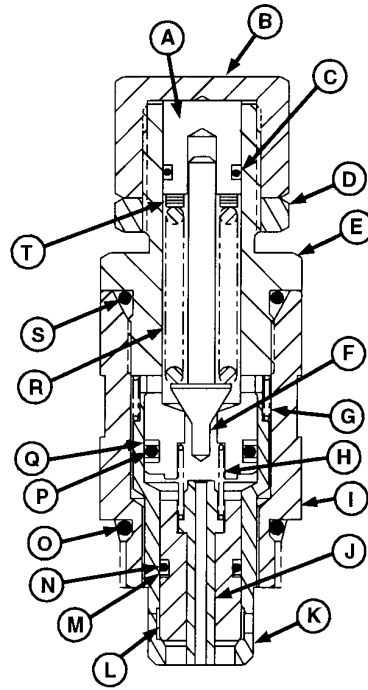
TX,3160,SS3095 -19-20OCT99-1/1

Disassemble and Assemble Loader Bucket Dump Relief Valve with Anti-Cavitation

1. Disassemble and inspect parts for wear and damage. Replace as necessary.
2. Put clean hydraulic oil on all parts before assembly.
3. Tighten nut (D) and valve body (E) to specifications. Reference relief valve installation torque.

Specification

Loader Bucket	
Dump Relief Valve	
with Anti-Cavitation	
Nut—Torque.....	45 ± 4.7 N·m (33 ± 3.5 lb-ft)
Loader Bucket	
Dump Relief Valve	
with Anti-Cavitation	
body—Torque.....	65 ± 7 N·m (48 ± 5 lb-ft)
Loader Bucket	
Dump Relief Valve	
with Anti-Cavitation	
(Installation)—Torque.....	65 ± 7 N·m (48 ± 5 lb-ft)



- | | |
|--------------|------------------------|
| A—End Stop | K—Poppet |
| B—Cap | L—Poppet |
| C—O-Ring | M—Backup Ring |
| D—Nut | N—O-Ring |
| E—Valve Body | O—O-Ring |
| F—Poppet | P—O-Ring |
| G—Spring | Q—Backup Ring (2 used) |
| H—Spring | R—Spring |
| I—Valve Body | S—O-Ring |
| J—Piston | T—Shim (as required) |

T8259AJ (CV)

T8259AJ—UN—05JUL94

TX,31,RR7855 -19-20OCT99-1/1

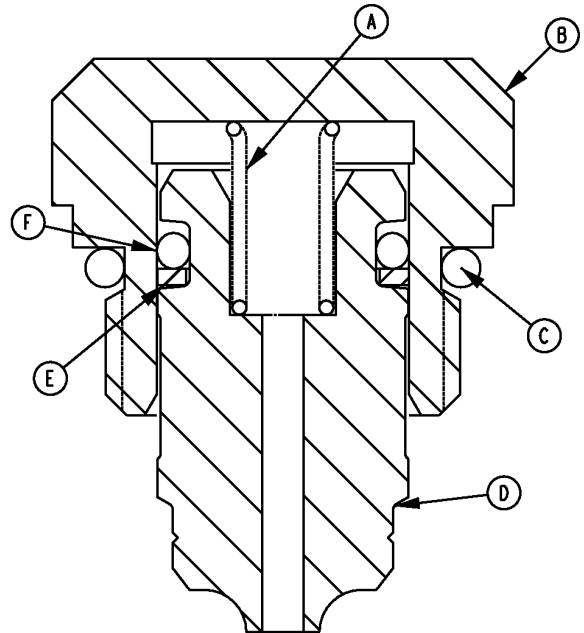
Disassemble and Assemble Anti-Cavitation Valve

1. Disassemble and inspect parts for wear and damage. Replace as necessary.
2. Put clean hydraulic oil on all parts before assembly.
3. Anti-cavitation valve installation torque.

Specification

Anti-Cavitation Valve
(Installation)—Torque..... $65 \pm 7 \text{ N}\cdot\text{m}$ ($48 \pm 5 \text{ lb}\cdot\text{ft}$)

- | | |
|--------------|---------------|
| A—Spring | D—Poppet |
| B—Valve Body | E—Backup Ring |
| C—O-Ring | F—O-Ring |



T100609

T100609 —JUN—27 JANS97

TX,31,RR7690 -19-20OCT99-1/1

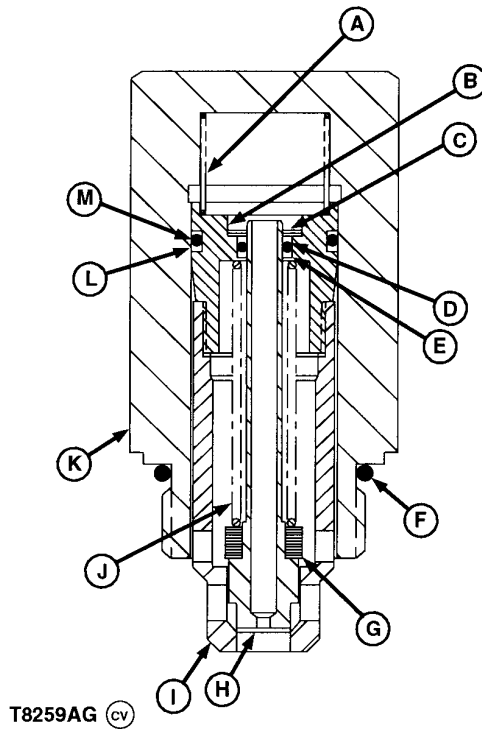
Disassemble and Assemble Auxiliary Circuit Relief Valve

1. Disassemble and inspect parts for wear or damage. Replace as necessary.
2. Put clean hydraulic oil on all parts before assembly.
3. Circuit relief valve installation torque specification.

Specification

Auxiliary Circuit Relief Valve
 (Installation)—Torque..... 65 ± 7 N·m (48 ± 5 lb-ft)

- | | |
|------------------------|------------------------|
| A—Spring | H—Poppet |
| B—Sleeve | I— Sleeve |
| C—Retaining Ring | J— Spring |
| D—O-Ring | K—Valve Body |
| E—Backup Ring (2 used) | L—Backup Ring (2 used) |
| F—O-Ring | M—O-Ring |
| G—Shim (as required) | |



T8259AG (CV)

T8259AG—UN—05JUL94

TX,31,RR7857 -19-20OCT99-1/1

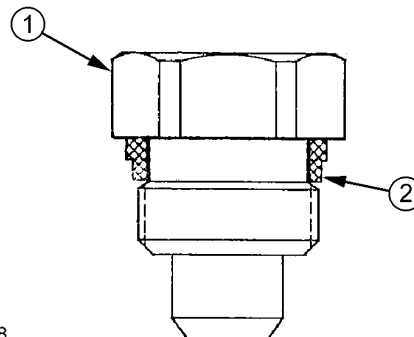
Disassemble and Assemble Auxiliary Shut-off Plug

1. Remove seal, if necessary.
2. Put clean hydraulic oil on seal before assembly.
3. Install special seal using JDG1328 Seal Installer.
4. Plug (1) installation torque.

Specification

Shut-Off Plug
 (Installation)—Torque..... 65 ± 7 N·m (48 ± 5 lb-ft)

- | | |
|------------------|-----------------|
| 1— Shut-Off Plug | 2— Special Seal |
|------------------|-----------------|



T127068

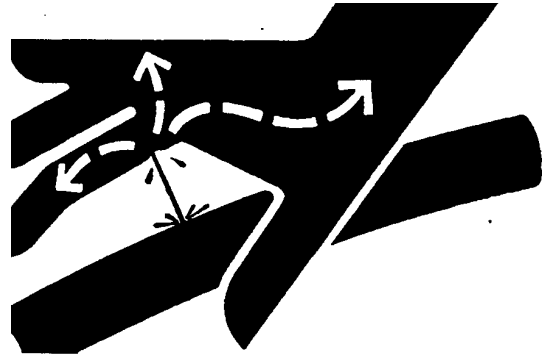
T127068—UN—05JAN00

WS68074,00036F5 -19-14JUL10-1/1

Remove and Install Loader Control Valve

CAUTION: To avoid injury from escaping fluid under pressure, stop engine and relieve the pressure in the system before disconnecting or connecting hydraulic or other lines. Tighten all connections before applying pressure.

1. Operate hydraulic controls to release hydraulic pressure.
2. Remove battery box cover. (See Remove and Install Battery in Group 1671).
3. Disconnect battery cables.
4. Disconnect loader control valve linkage. (See Remove and Install Loader Control Valve Linkage in Group 3115.)



X8811 —UN—23AUG88

TX,31,RR7780 -19-12MAR97-1/2

5. Tag and disconnect lines (A) located inside of frame. Tag and disconnect all hoses and lines from control valve. Close all openings using caps and plugs.

CAUTION: Control valve and mounting plate weighs approximately 45 kg (100 lbs).

Specification

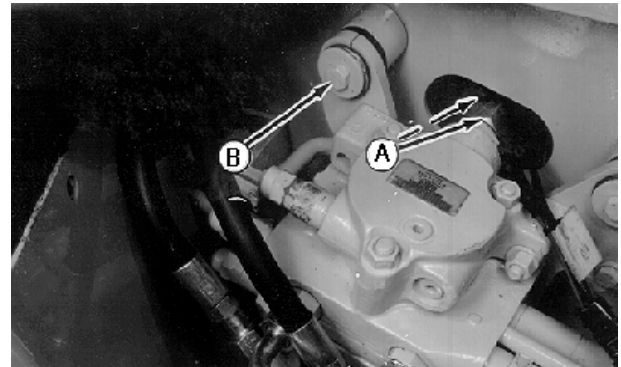
Control Valve and
Mounting Plate—Weight..... 45 kg (100 lbs) Approximate

6. Remove cap screws (B) to remove valve mounting plate with loader valve. Remove valve.
7. Install valve mounting plate with isolators. Tighten three isolator cap screws to specification.

Specification

Loader Control
Valve Mounting Cap
Screws—Torque..... 37 N·m (27 lb-ft)

8. Install loader valve and cap screws. Tighten cap screws to specification.



T104873 —UN—15FEB97

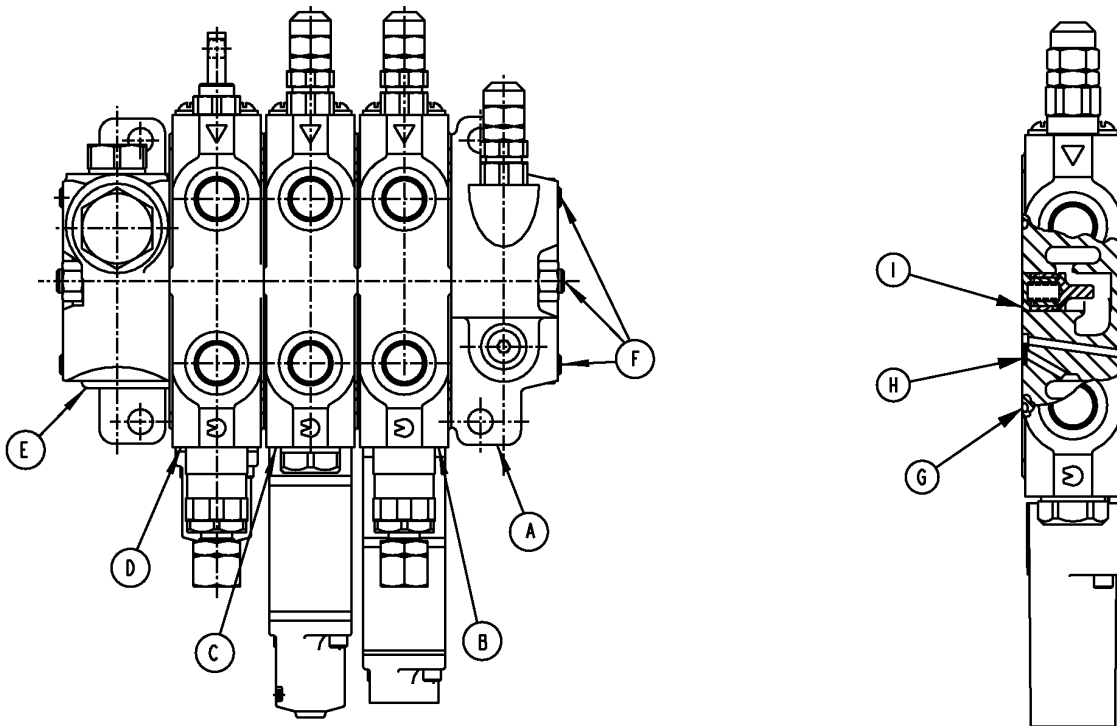
Specification

Loader Control
Valve Mounting Cap
Screws—Torque..... 130 N·m (95 lb-ft)

9. Connect hoses and lines.
10. Install battery box and batteries. Connect battery cable.

TX,31,RR7780 -19-12MAR97-2/2

Disassemble and Assemble Loader Control Valve



T100645

T100645—UN—10APR97

A—Inlet Valve Section
B—Boom Valve Section
C—Bucket Valve Section

D—Auxiliary Valve Section
E—Outlet Valve Section
F—Tie Rods

G—O-Ring
H—Load Sense Logic Check
I—Compensator

J—O-Ring

IMPORTANT: Keep all components for each valve section together as a set.

CAUTION: Prevent possible injury from falling heavy control valve. The control valve weighs approximately 45 kg (100 lb). Use a hoist to lift the valve assembly from the machine to the bench. Support the valve assembly in a holding fixture.

Specification

Loader Control
Valve—Weight..... 45 kg (100 lb) Approximate

1. Set control valve assembly vertically on a work bench with the inlet section on the bottom.

2. To aid in assembly, identify each section with a mark.
3. Remove nuts and tie rods (F).
4. Carefully remove sections (A—E) so as not to lose or damage O-rings (G), load sense logic check (H) and compensator (I). Keep compensator parts and valve section together as a set.

Use care not to damage or score mating surfaces of valve sections.

Continued on next page

TX,3160,SS3089 -19-15MAR96-1/2

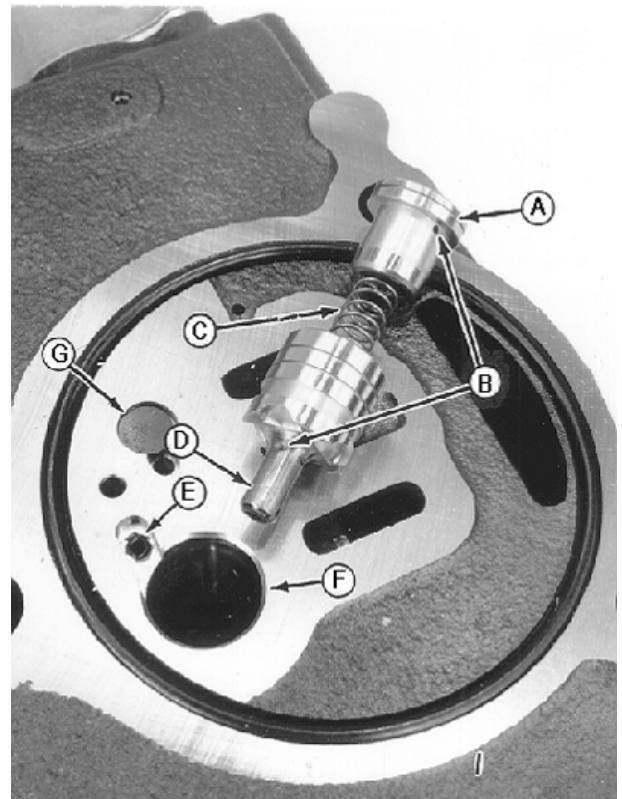
5. Inspect compensator parts (A and D), springs (C), orifices (B), and load sense logic checks (G) for scoring, wear, or damage. Replace as necessary.
6. Inspect O-rings between each section for wear or damage. Replace as necessary.
7. Apply clean hydraulic oil to all internal parts.
Install load sense logic check valve, compensator, spring and O-ring into each spool section.
8. Assemble sections making sure load sense logic check, compensator valve, spring and O-ring remain in position. Install the tie rods so the shorter threaded length end is on the bottom. First, fully screw on the nuts on the bottom shorter threaded end.
9. Then, install nuts on the other end of tie rods and snug tight; do not make final torque.

IMPORTANT: Tighten tie rod evenly and at several intervals to prevent valve spool binding or leakage between sections.

10. Lay valve assembly horizontally on bench supported by blocks under the mounting feet. Tighten 1/2 in. nuts and 7/16 nuts to specification.

Specification

Loader Control Tie	
Rod Nuts, 7/16 in.-20	
Threads—Torque.....	65 N·m (48 lb-ft)
Loader Control Tie	
Rod Nuts, 1/2 in.-20	
Threads—Torque.....	100 N·m (74 lb-ft)



T108649 —JUN—07APR97

A—Compensator
B—Orifices
C—Spring
D—Compensator

E—Orifice (used on backhoe control valve sections only)
F—Compensator Bore
G—Load Sense Logic Check

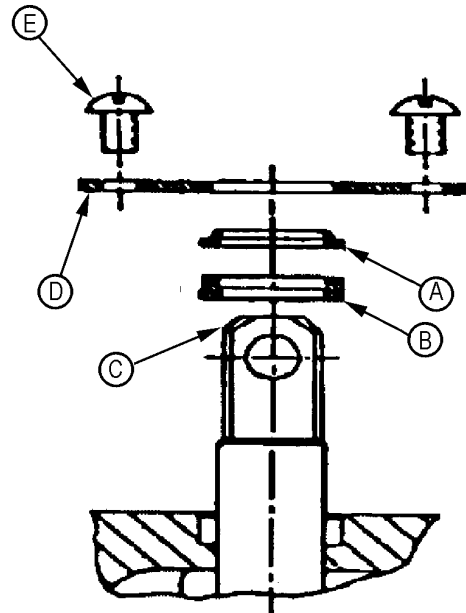
TX.3160.SS3089 -19-15MAR96-2/2

Replace Wiper Rings and Seals of Loader Control Valve Sections

1. Remove screws (E) to remove plate (D) from valve section.

A—Wiper Ring
B—Seal
C—Spool

D—Plate
E—Screw (2 used)



T7698AB

T7698AB—UN—27 JAN 97

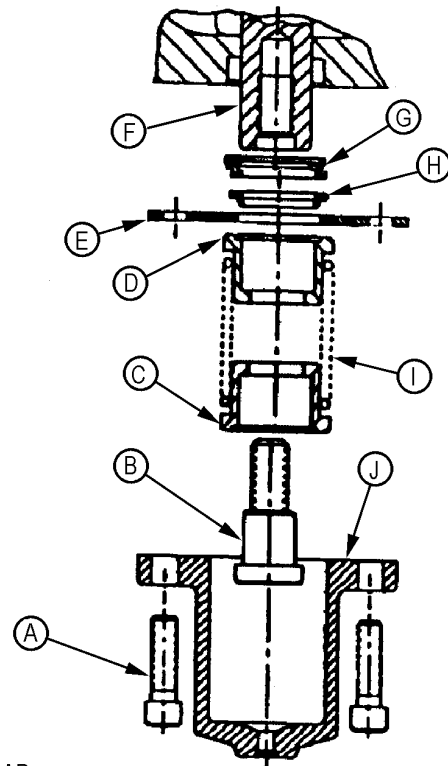
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WS68074,00036EF -19-14JUL10-1/5

2. Use an O-ring pick to remove wiper ring (A) and seal (B).
3. Remove two screws (A) to remove cap (J) from bottom of valve section.
4. Remove screw (B) to remove retainers (C and D), spring (I) and plate (E).

A—Screw (2 used)
 B—Spool End Screw
 C—Spring Retainer
 D—Spring Retainer
 E—Plate

F—Spool
 G—Seal
 H—Wiper Ring
 I—Spring
 J—Cap



T7698AD

T7698AD —UN—27JAN97

Continued on next page

WS68074.00036EF -19-14JUL10-2/5

5. Use an O-ring pick to remove wiper ring (H) and seal (G).

IMPORTANT: DO NOT damage OD or ID of new seal during installation. Installation tool MUST be used to install seal and wiper ring.

6. Use JDG734 Seal Installation Tool to install new seal and wiper ring at each end of spool:
 - a. Install wiper ring (C) on end of tool driver (D) with smaller OD of ring into driver.
 - b. Put seal (B) on wiper ring with open side of seal away from wiper ring.
 - c. Carefully slide sleeve (A) over seal, wiper ring, and driver with raised lip of sleeve away from driver. Do not push seal through sleeve.
 - d. Put tool assembly over end of spool with raised lip into counterbore of valve section.
 - e. Push driver to install seal and wiper ring into valve housing.

NOTE: Lip end of sleeve ID is cone-shaped to compress seal and wiper ring for installation.

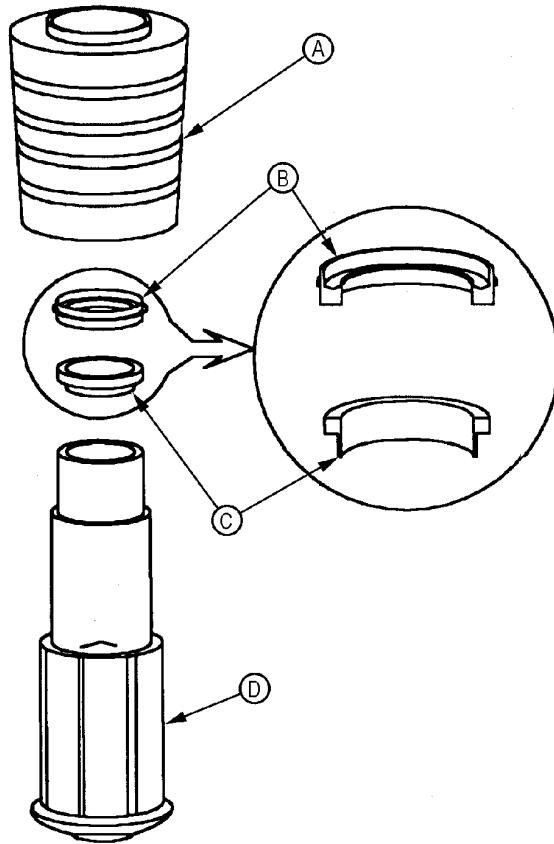
7. Install plate (E), retainers (C and D) and spring (I).
8. Apply cure primer to threads of spool and spool end screw (B). Apply thread lock and sealer (high strength) to threads of screw (B). Tighten screw.

A—Tool Sleeve
B—Seal

C—Wiper Ring
D—Tool Driver

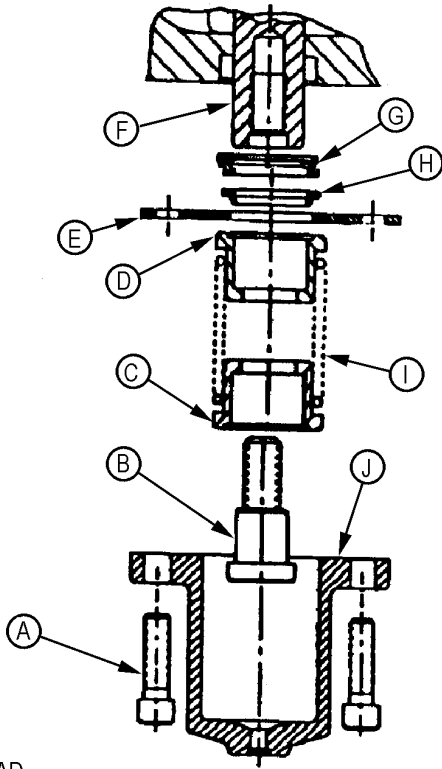
A—Screw (2 used)
B—Spool End Screw
C—Spring Retainer
D—Spring Retainer
E—Plate

F—Spool
G—Seal
H—Wiper Ring
I—Spring
J—Cap



T7677AA

T7677AA—UN—27 JAN 97



T7698AD

T7698AD —UN—27JAN97

Continued on next page

WS68074.00036EF -19-14JUL10-4/5

9. Install cap (J) and screws (A). Tighten screws to specification.

Loader Control Valve—Specification

Spool Cap, Cap
Screws—Torque..... 9.5 N·m (84 lb-in.)

10. Install plate (D) and two screws (E). Tighten screws to specification.

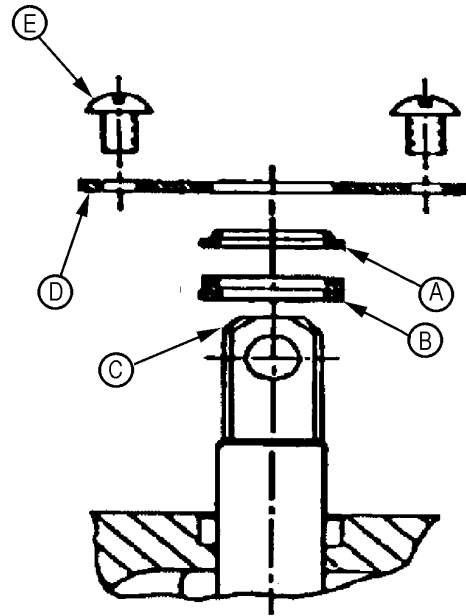
Loader Control Valve—Specification

Spool Retainer Plate
Screws—Torque..... 5.5 N·m (48 lb-in.)

11. Check for correct installation of seals by pushing down of spool (C). Spool must return to neutral position.

A—Wiper Ring
B—Seal
C—Spool

D—Plate
E—Screw (2 used)



T7698AB

T7698AB —UN—27 JAN97

WS68074,00036EF -19-14JUL10-5/5

Remove and Install Loader Control Valve Relief Valves

IMPORTANT: Relief valves MUST be installed in the correct ports.

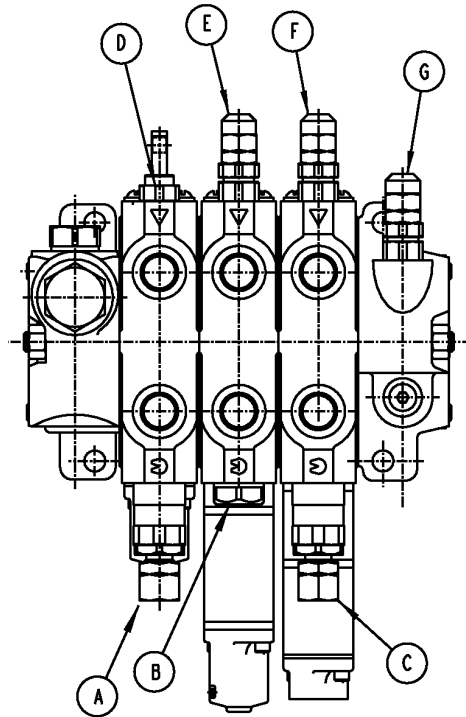
1. To aid in assembly, put identification marks on the relief valve and the control valve.
2. Remove relief valves.
3. Remove and inspect O-rings and backup rings for damage. If damaged, check housing for cause.
4. Install new O-rings and backup rings.
5. Install circuit relief valves in control valves and tighten to specification.

Specification

Relief Valve 27 mm (1-1/2 in.) Threads—Torque.....	65 ± 7 N·m (48 ± 5 lb-ft)
Relief Valve w/out Locking Ring, 22.2 mm (7/8 in.) Threads—Torque.....	45 ± 4 N·m (33 ± 3 lb-ft)
Relief Valve w/Locking Ring, 22.2 mm (7/8 in.) Threads—Torque.....	34 ± 3 N·m (25 ± 2 lb-ft)
Relief Valve Locking Ring Nut—Torque.....	14 ± 1.4 N·m (10 ± 1 lb-ft)
Steering Load Sense Relief Nut and Cap—Torque.....	9.5 ± 1.5 N·m (84 ± 12 lb-in.)

IMPORTANT: Relief valves MUST be adjusted anytime they are disassembled or replaced. Failure to do so could cause damage to hydraulic system.

6. For pressures and adjustment of relief valves, see Operation and Test Manual Group 9025-25 for procedures.



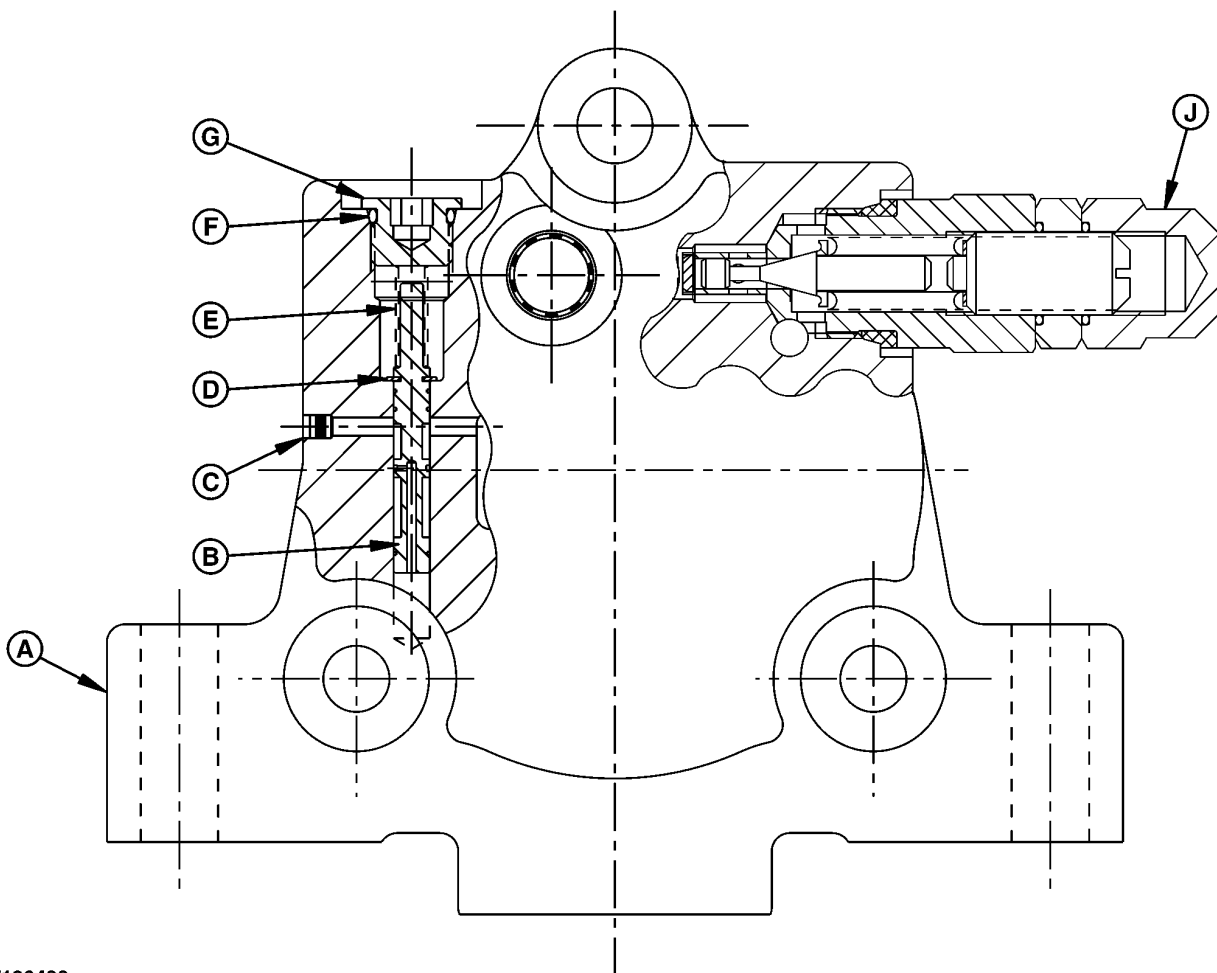
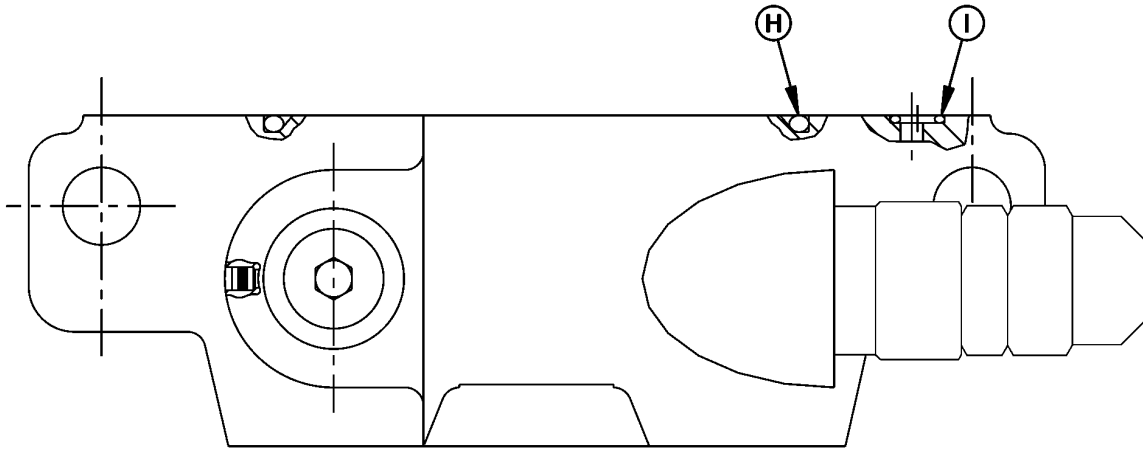
T100644

- | | |
|------------------------------|------------------------------|
| A—Auxiliary Circuit Relief | E—Boom Raise Circuit Relief |
| B—Anti-Cavitation Valve | F—Bucket Curl Circuit Relief |
| C—Bucket Dump Circuit Relief | G—Load Sense Relief |
| D—Auxiliary Plug | |

T100644 —UN—26MAR97

TX,3160,SS3092 -19-05JAN00-1/1

Disassemble and Assemble Loader Inlet Section



T126426

T126426—UN—07DEC99

A—Valve Body
B—Isolator Spool
C—Expander Plug

D—Retaining Ring
E—Spring
F—O-Ring

G—Plug
H—O-Ring
I—O-Ring (Optional Aux. Pilot)

J—Load Sense Relief Valve

Continued on next page

TX,31,RR7835 -19-03DEC99-1/2

Hydraulic System

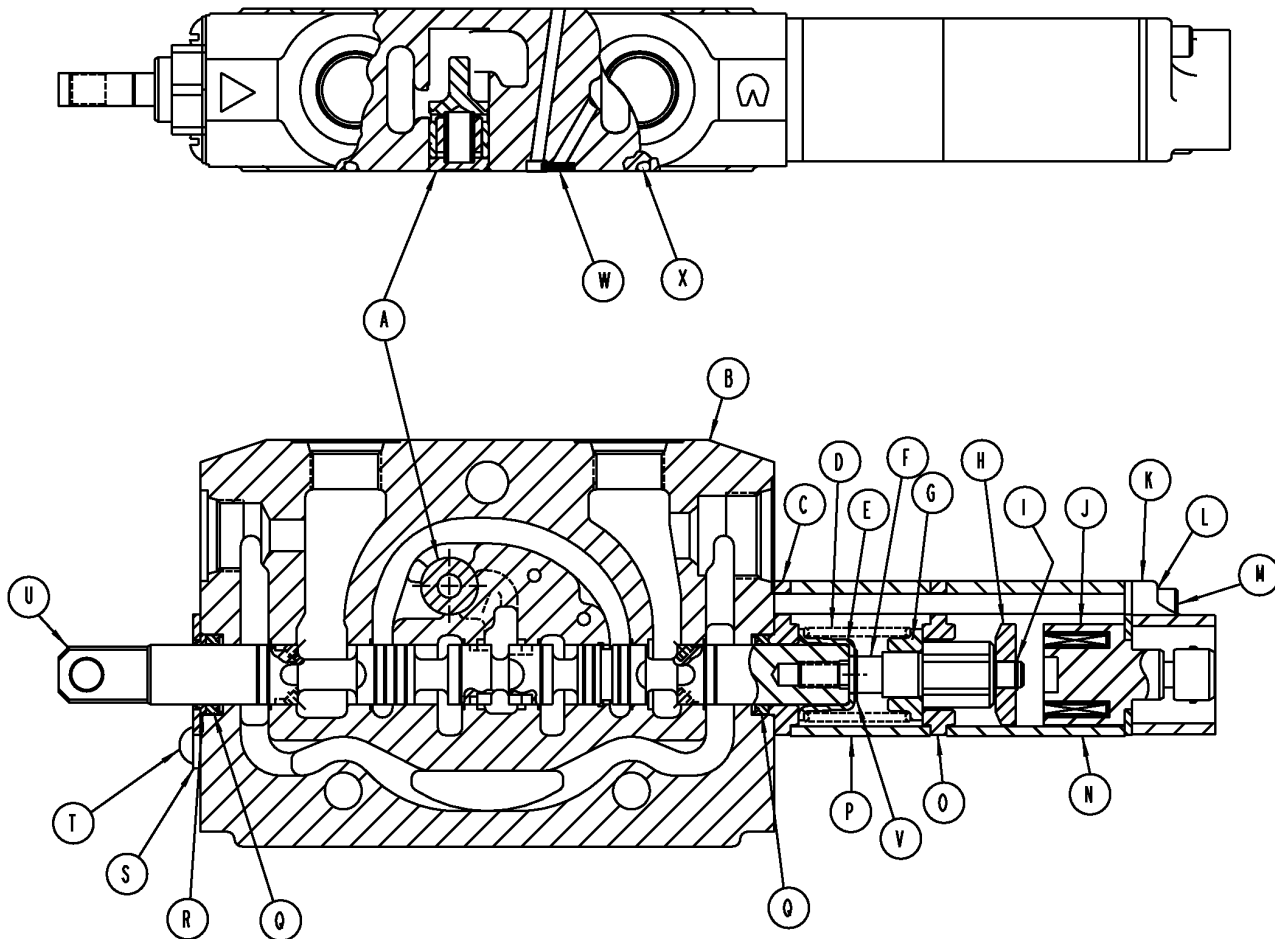
1. Remove plug with O-ring (F and G) to remove spring (E) and spool assembly (D and B) from valve body (A).
2. Inspect all parts for wear or damage. Replace O-rings.
3. Inspect orifice in spool (B). Orifice must be clear of any debris.
4. Put clean hydraulic oil on isolator spool. Install spool assembly in housing.
5. Install spring and plug assembly (E and G). Tighten plug to 22—27 N·m (16—20 lb-ft).

Specification

Plug—Torque..... 22—27 N·m (16—20 lb-ft)

TX,31,RR7835 -19-03DEC99-2/2

Disassemble and Assemble Loader Bucket Section



T100647

T100647—UN—09APR97

- | | | | |
|----------------------|-------------------------|------------------------------|--------------------------|
| A—Compensator | G—Spring Seat | M—Socket Head Screw (2 used) | S—Retaining Plate |
| B—Valve Section Body | H—Clapper | N—Spacer | T—Cap Screw (2 used) |
| C—Retaining Plate | I—Retaining Ring | O—Guide | U—Spool |
| D—Centering Spring | J—Electromagnet Housing | P—Spacer | W—Load Sense Logic Check |
| E—Spring Seat | K—End Cap | Q—Lip Seal (2 used) | X—O-Ring |
| F—Spool End Screw | L—Washer (2 used) | R—Wiper Seal | |

IMPORTANT: Spool MUST be installed in the same valve section as was removed for proper operation of the hydraulic function.

1. Remove parts (L, M, J, K, and N) to remove spool (U).
2. Using a protective cover or wooden blocks, put spool in vise. Remove parts (D—I and V).
3. Inspect parts for wear or damage. Remove lip seals and wiper.
4. Install parts (D—I and V).

5. Clean threads of spool and spool end screw (F) with cure primer. Put thread lock and sealer (high strength) on threads and tighten to specification.

Specification

Spool End
Screw—Torque..... 8—11 N·m (6—8 lb·ft)

6. Put clean hydraulic oil on spool and install spool in valve housing.
7. Install seals (Q) and wiper seal (R) using JDG734 Seal Installation tool (see procedure in this group).

Continued on next page

TX,31,RR7665 -19-02NOV99-1/2

Hydraulic System

8. Put clean hydraulic oil on all remaining parts before assembly.

9. Install and tighten screws (M) to specification.

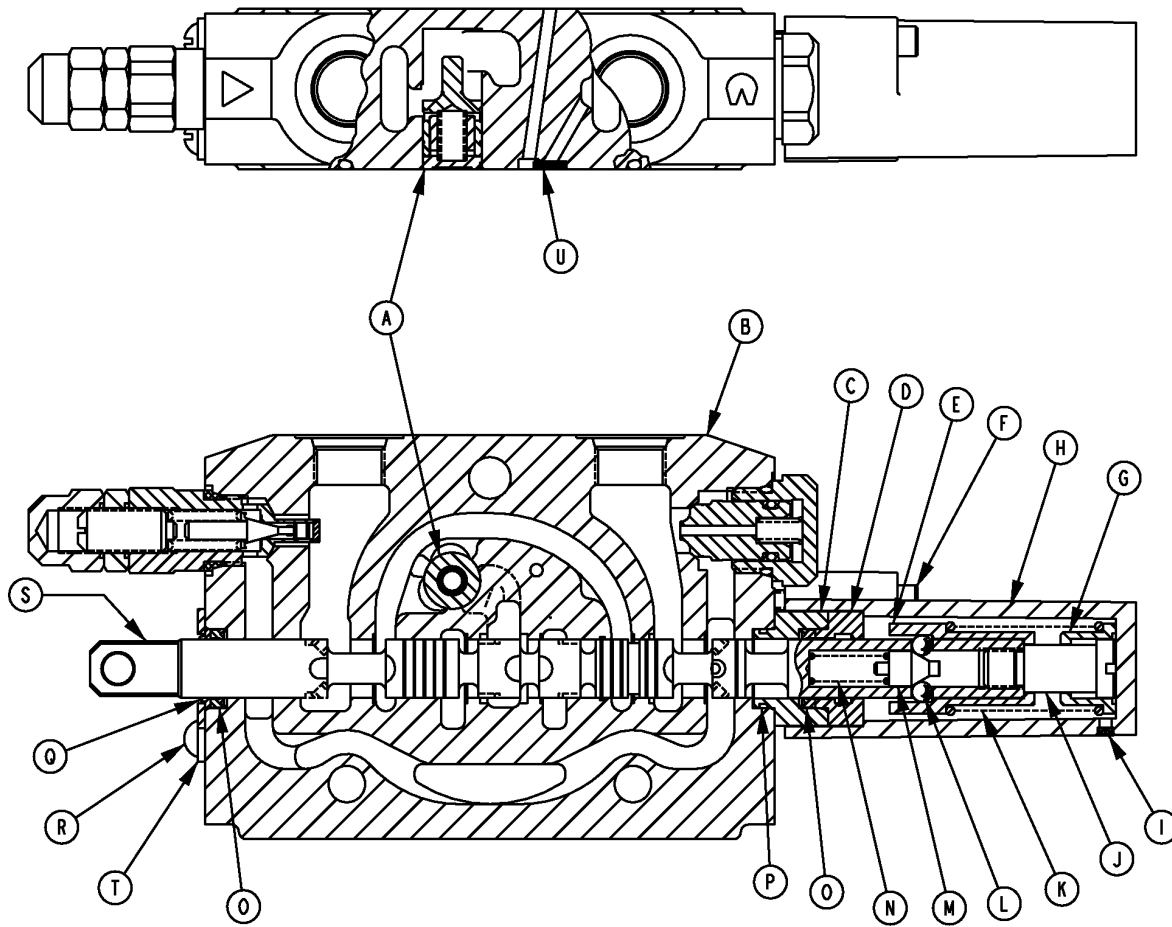
Specification

Socket Head

Screws—Torque..... 8—11 N·m (6—8 lb-ft).

TX,31,RR7665 -19-02NOV99-2/2

Disassemble and Assemble Loader Boom Section



T108845

T108845—UN—09APR97

- | | | | |
|----------------------|------------------------|----------------------|--------------------------|
| A—Compensator | G—Spring Guide | M—Detent Cam | S—Spool |
| B—Valve Section Body | H—Spool Cap | N—Lip Seal (2 used) | T—Retaining Plate |
| C—Detent Sleeve | I—Vent Screen | O—Seal (2 used) | U—Load Sense Logic Check |
| D—Detent | J—Spool End Screw | P—O-Ring | |
| E—Spring Seat | K—Centering Spring | Q—Wiper Seal | |
| F—Cap Screw (2 used) | L—Detent Ball (4 used) | R—Cap Screw (2 used) | |

IMPORTANT: Spool MUST be installed in the same valve section as was removed for proper operation of the hydraulic function.

1. Remove parts (F and H) to remove spool (S) from housing (B).
2. Using a protective cover or wooden blocks, put spool in vise. Remove parts (E, G, and J—N).
3. Inspect parts for wear or damage. Replace all O-rings and backup rings.
4. Install parts (E, G, and K—N) on spool.

5. Clean threads on spool and spool end screw (J) with cure primer. Put thread lock and sealer (high strength) on screw and tighten to specification.

Specification

Spool End
Screw—Torque..... 9.5 N·m (84 lb·in.)

6. Apply clean hydraulic oil on spool and install spool into valve housing.
7. Install seals (O) and wiper seal (Q) using JDG734 Seal Installation tool.

Continued on next page

WS68074.0003708 -19-16JUL10-1/2

Hydraulic System

8. Put clean hydraulic oil on all remaining parts before assembly.

9. Install spool cap (H) and tighten cap screws (F) to specification.

Loader Control Valve—Specification

Spool Cap, Cap
Screws—Torque..... 9.5 N·m (84 lb-in.)

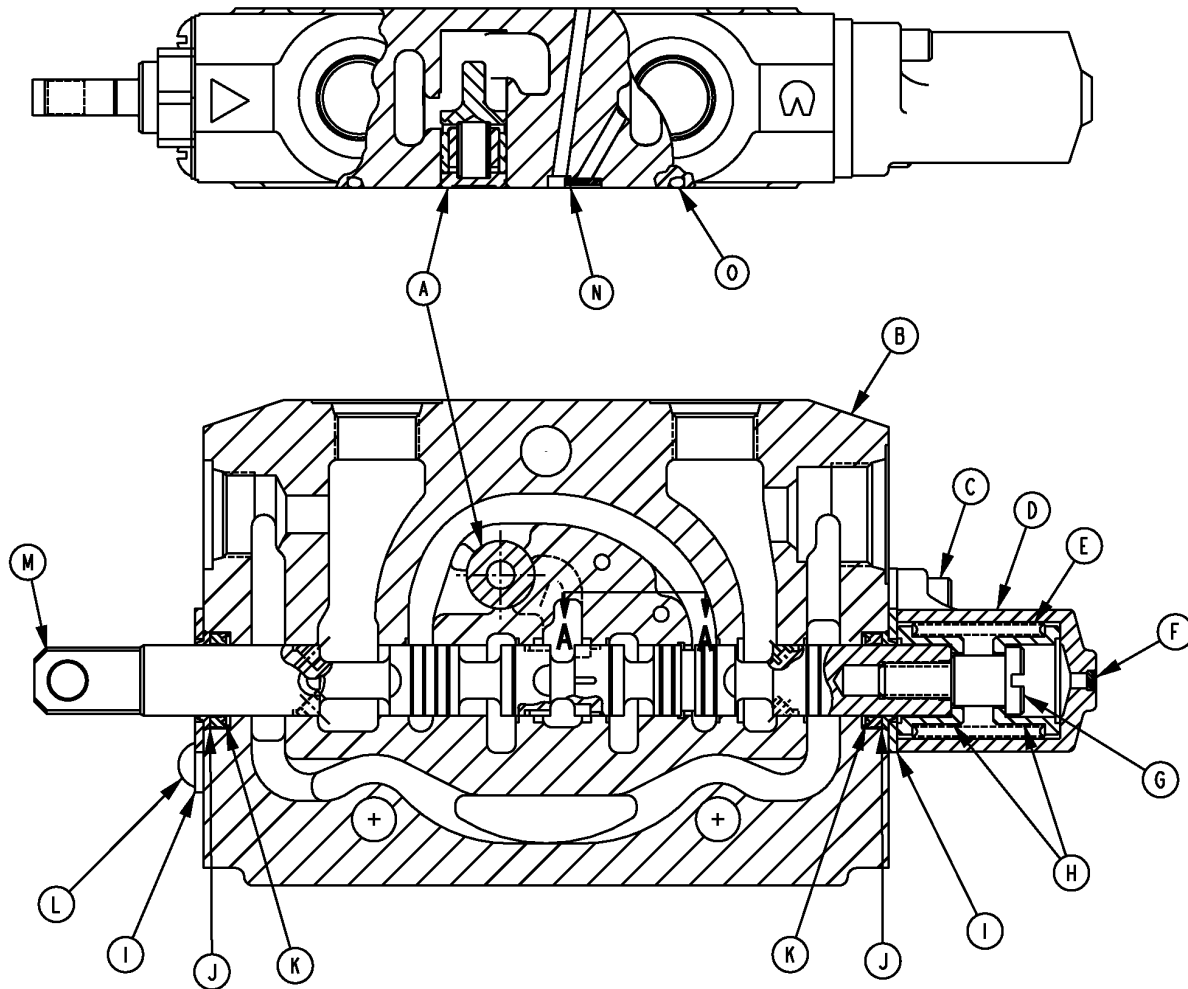
10. Install and tighten screws (R) to specification.

Loader Control Valve—Specification

Spool Retainer Plate
Screws—Torque..... 5.5 N·m (48 lb-in.)

WS68074.0003708 -19-16JUL10-2/2

Disassemble and Assemble Loader Auxiliary Section



T108979

T108979—UN—10APR97

- | | | | |
|----------------------------------|-------------------------|------------------------|--------------------------|
| A—Compensator Spool and Spring | E—Spring | I— Seal Plate | M—Spool |
| B—Valve Body | F—Vent | J— Wiper Seal (2 used) | N—Load Sense Logic Check |
| C—Socket Hex Cap Screws (2 used) | G—Spool End Screw | K—Lip Seal (2 used) | O—O-Ring |
| D—End Cap | H—Spring Guide (2 used) | L—Screw (2 used) | |

IMPORTANT: Spool MUST be installed in the same valve section as was removed for proper operation of the hydraulic function.

1. Remove parts (C and D) to remove spool from valve housing (B).
2. Using a protective cover or wooden blocks, put spool in vise. Remove parts (E and G—K).
3. Inspect parts for wear or damage. Replace lip seals and wiper seals.
4. Put clean hydraulic oil on spool and install spool into valve housing.

5. Install seals (K) and wiper seals (J) using JDG734 seal installation tool.
6. Clean threads of spool and spool end screw (G) with cure primer. Install parts (E, H and I) on spool. Put thread lock and sealer (high strength) on spool end screw (G). Tighten to specification.

Loader Control Valve—Specification

Spool End
Screw—Torque..... 9.5 N·m (84 lb·in.)

Continued on next page

WS68074.0003707 -19-16JUL10-1/2

Hydraulic System

7. Install end cap (D) and tighten screws (C) to specification.

Loader Control Valve—Specification

Spool Cap, Cap	
Screws—Torque.....	9.5 N·m (84 lb-in.)

8. Install and tighten cap screws (L) to specification.

Loader Control Valve—Specification

Spool Retainer Plate	
Screws—Torque.....	5.5 N·m (48 lb-in.)

WS68074.0003707 -19-16JUL10-2/2

Remove and Install Loader Boom Cylinder—120 Series

CAUTION: To avoid injury from escaping fluid under pressure, relieve the pressure in the system before disconnecting or connecting hydraulic or other lines. Tighten all connections before applying pressure. (See tractor operator's manual for specific procedures to relieve pressure.)

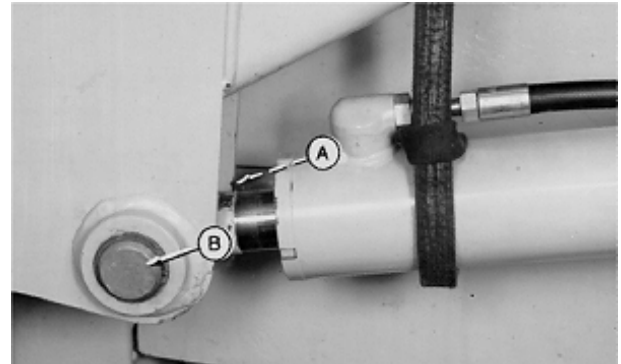
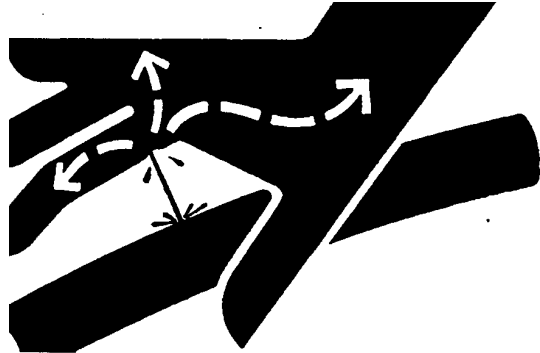
1. Lower all equipment to the ground.
2. Operate all hydraulic control valves to release pressure in the hydraulic system.
3. Tag and disconnect boom cylinder hydraulic lines. Close all openings using caps and plugs.

CAUTION: The approximate weight of boom cylinder is 38 kg (84 lb).

Loader Cylinder—Specification

Boom Cylinder—Weight.....	38 kg (84 lb)
---------------------------	---------------

4. Attach boom cylinder to hoist using a lifting strap.
5. Remove snap rings (A) at both ends of cylinder. Remove pin (B) and cylinder.
6. Install boom cylinder, pin (B) and snap rings.



X9811 —UN—23AUG88

T7511A1 —UN—09APR91

7. Replace O-rings. Connect hydraulic lines to cylinder.

TX,31,SS3955 -19-08APR97-1/1

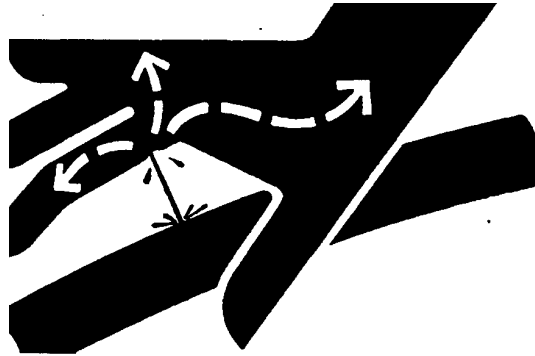
Remove and Install Loader Bucket Cylinder—120 Series

⚠ CAUTION: Bucket cylinder and links will fall forward when bucket is flat on floor and pins are removed. Remove pins only when bucket is on floor in full dump position.

1. Place bucket in full dump position on floor.

⚠ CAUTION: To avoid injury from escaping fluid under pressure, relieve the pressure in the system before disconnecting or connecting hydraulic or other lines. Tighten all connections before applying pressure. (See tractor operator's manual for specific procedures to relieve pressure.)

2. Operate all hydraulic control valves to release pressure in the hydraulic system.



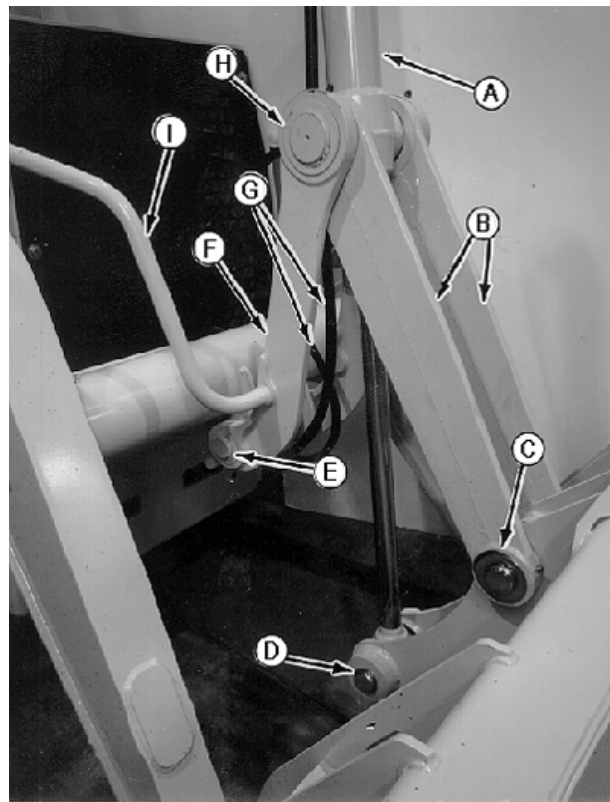
X9811 —UN—23AUG88

TX,31,SS3956 -19-08APR97-1/2

3. Disconnect hydraulic lines (G) from cylinder. Close all openings with caps or plugs.

⚠ CAUTION: The approximate weight of bucket cylinder is 50 kg (110 lb).

4. Attach lift strap to cylinder using a hoist.
5. Remove snap rings (C, D, E, and H) from both sides.
6. Remove cylinder rod to bucket pin.
7. Remove links (B and F) and remove bucket cylinder.
8. Inspect and make necessary repairs.
9. Align cylinder rod and bucket bores. Install pin and snap rings (D).
10. Apply multipurpose grease to inside of all link bushings before assembly.
11. Install links (B and F) and snap rings (C, E, and H).
12. Connect hydraulic lines (G) to cylinder.



T108568 —UN—08APR97

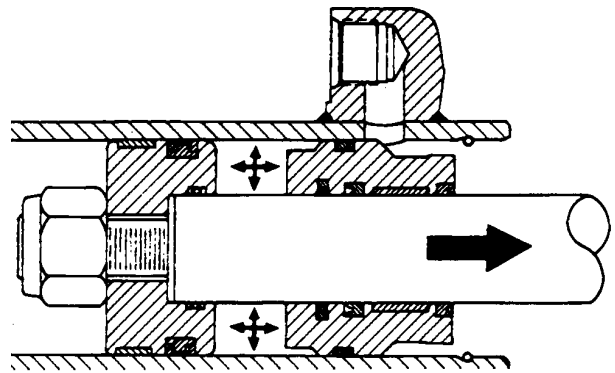
TX,31,SS3956 -19-08APR97-2/2

- | | |
|------------------------------------|----------------------------------|
| A—Bucket Cylinder | F—Boom-to-Cylinder Link (2 used) |
| B—Cylinder-to-Bucket Link (2 used) | G—Cylinder Lines |
| C—Snap Ring (2 used) | H—Snap Ring (2 used) |
| D—Snap Ring (2 used) | I—Return-to-Dig Rod |
| E—Snap Ring (2 used) | |

Disassemble Loader Bucket and Boom Cylinders—120 Series

IMPORTANT: Extend rod to remove oil or air between the rod piston and rod guide. Excessive amount of trapped oil or air will force seals to expand making disassembly more difficult.

1. Extend rod so rod piston is approximately 25.4 mm (1 in.) from rod guide.



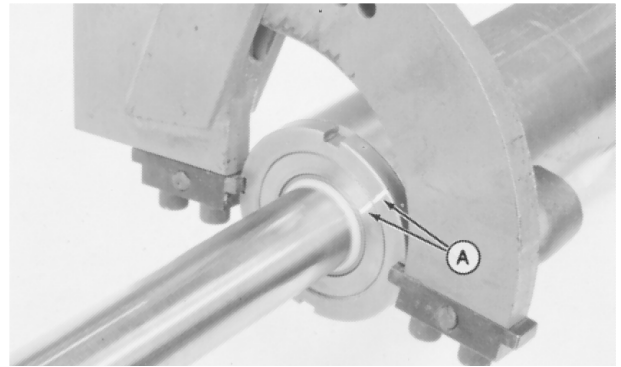
T6190AS—UN—19OCT88

TX,31,RR7784 -19-12MAR97-1/7

2. Make a mark on rod guide and spanner nut (A) to aid in assembly.

NOTE: If nut and rod guide turn as an assembly, put cylinder in a vise. Vise jaws must contact cylinder barrel behind nut and over rod guide area. Tighten vise just enough to hold rod guide.

3. Remove nut using adjustable spanner wrench or blunt chisel and a hammer.

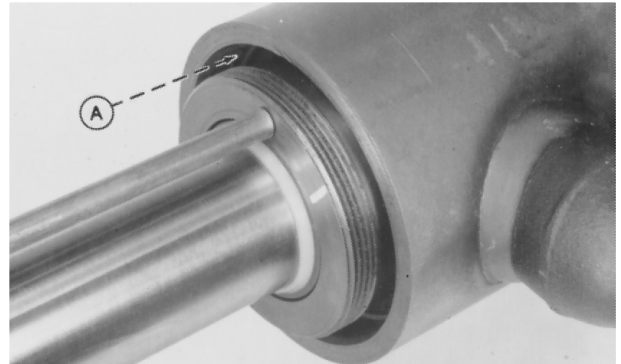


T6119AL—UN—19OCT88

TX,31,RR7784 -19-12MAR97-2/7

NOTE: Filler rings (used for disassembly only) are installed between spanner nut and rod guide to aid in disassembly. Filler rings are provided in the cylinder bore seal kit.

4. Move rod guide rearward, using a wooden dowel or brass drift, just enough to remove snap ring (A). Remove snap ring. Do not damage rod guide threads or seal.



T6119AM—UN—12APR91

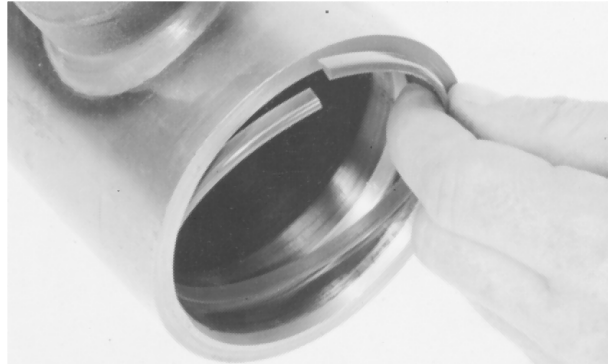
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TX,31,RR7784 -19-12MAR97-3/7

Hydraulic System

NOTE: Rod piston assembly removed for clarity of photograph.

5. Install filler ring in snap ring groove.
6. Remove rod and piston assembly.



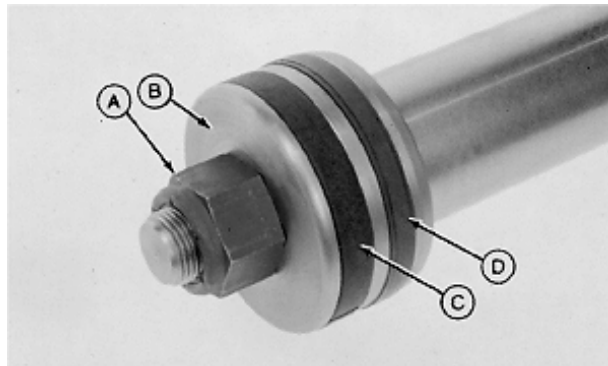
T6119AN—JUN—19OCT88

TX,31,RR7784 -19-12MAR97-4/7

7. Remove nut (A) to remove piston (B).
8. Remove wear ring (C) and cap seals (D).

A—Nut
B—Piston

C—Wear Ring
D—Cap Seals



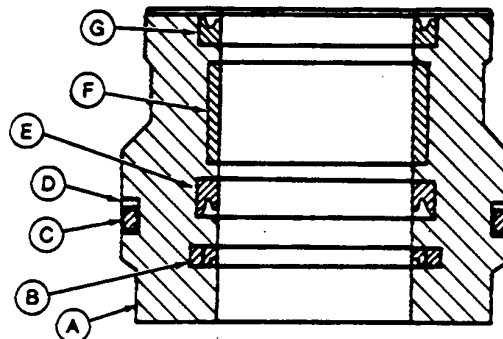
T6172BQ—JUN—19OCT88

TX,31,RR7784 -19-12MAR97-5/7

9. Remove rod guide (A).
10. Remove O-ring (C), backup ring (D), seals (B, E and G) and wear ring (F).

A—Rod Guide
B—Seal
C—O-Ring
D—Backup Ring

E—Seal
F—Wear Ring
G—Seal



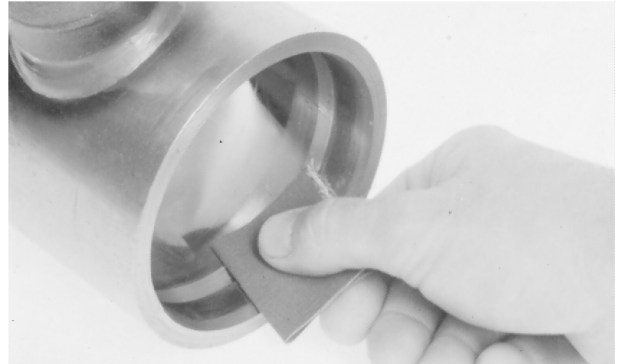
T6119AK—JUN—19OCT88

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TX,31,RR7784 -19-12MAR97-6/7

Hydraulic System

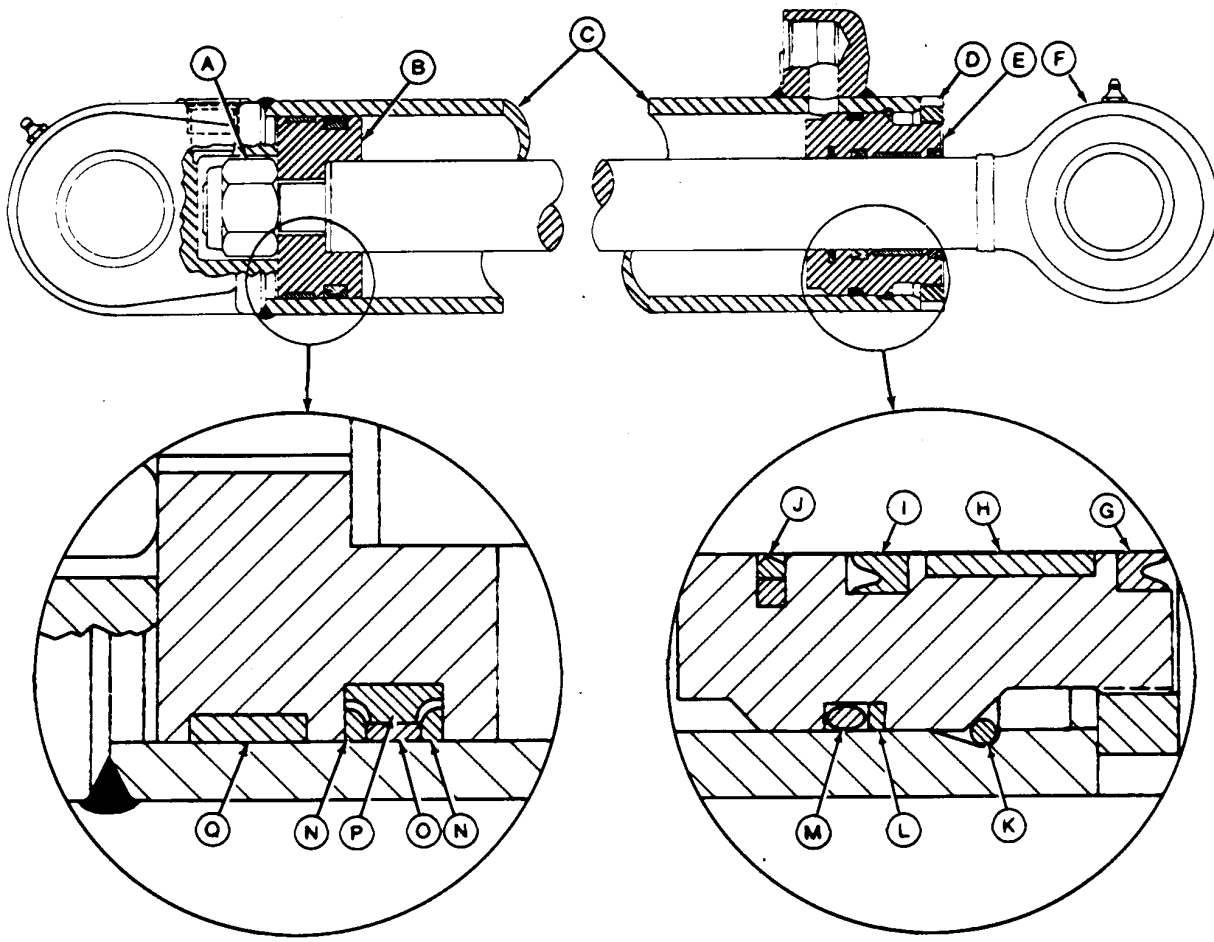
11. Inspect snap ring groove. If necessary, clean groove of nicks or burrs.



T6 119AO —UN—19OCT88

TX,31,RR7784 -19-12MAR97-7/7

Cross Section of Loader Bucket and Boom Cylinder—120 Series



Boom Cylinder Shown

- | | | | |
|-------------|---------------|------------------------|-----------------|
| A—Nut | F—Rod | K—Snap Ring | P—Seal Expander |
| B—Piston | G—Wiper Seal | L—Backup Ring | Q—Wear Ring |
| C—Barrel | H—Wear Ring | M—O-Ring | |
| D—Nut | I—Rod Seal | N—Backup Ring (2 used) | |
| E—Rod Guide | J—Buffer Seal | O—Cap Seal | |

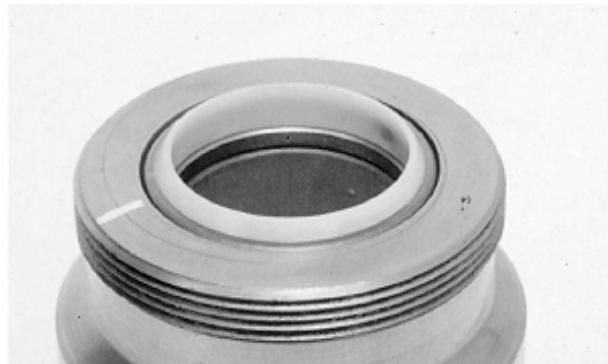
T6223AZ —UN—26MAY 89

TX,31,RR7783 -19-12MAR97-1/1

Assemble Loader Bucket and Boom Cylinder—120 Series

NOTE: Use a cylinder repair kit when assembling cylinder. Put clean hydraulic oil on all internal parts before assembling.

1. Install wiper seal. Push seal to bottom of bore.



T6122AA —UN—19OCT88

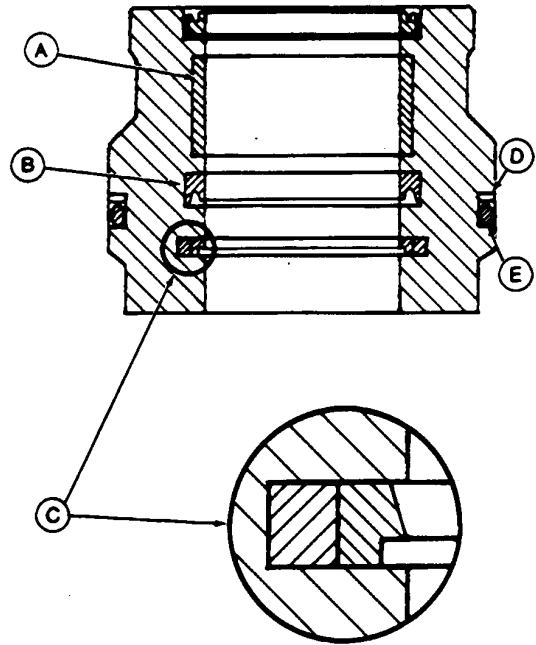
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TX,31,RR7782 -19-02NOV99-1/12

2. Install seals (B and C).
3. Install wear ring (A).
4. Install backup ring (D) and O-ring (E).

A—Wear Ring
B—Seal
C—Seal

D—Backup Ring
E—O-Ring

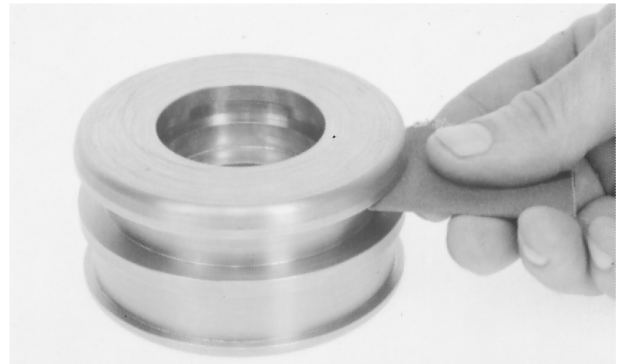


T6126AN —UN—27OCT88

TX,31,RR7782 -19-02NOV99-2/12

IMPORTANT: To prevent damage of cap seal during assembly, the lands on piston must be clean and free of nicks or burrs.

5. Inspect the piston lands. If necessary, clean lands of any nicks or burrs that can cut cap seal.



T6122AB —UN—19OCT88

Continued on next page

TX,31,RR7782 -19-02NOV99-3/12

Hydraulic System

6. Install seal expander by pushing seal expander onto end of piston.



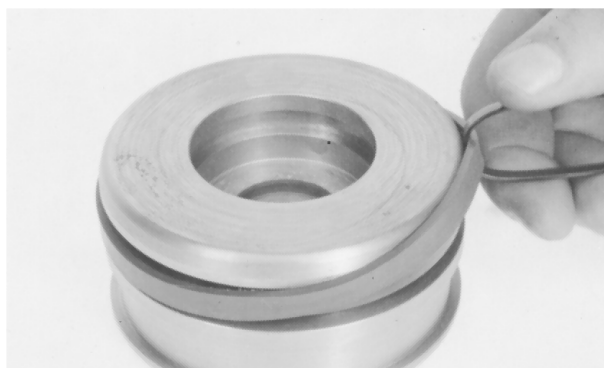
T612ZAC —UN—06AUG90

TX,31,RR7782 -19-02NOV99-4/12

NOTE: The cap seal can be made more pliable by warming it with your hands or by putting seal in hot water for approximately 5 minutes.

Once started, install cap seal as quickly as possible to keep the amount of time that seal is stretched to a minimum.

7. Install a plastic tie band around cap seal with the smooth side against the cap seal.
8. Using the plastic tie band, pull cap seal across the piston land and into position over seal expander.



T612ZAE —UN—19OCT88

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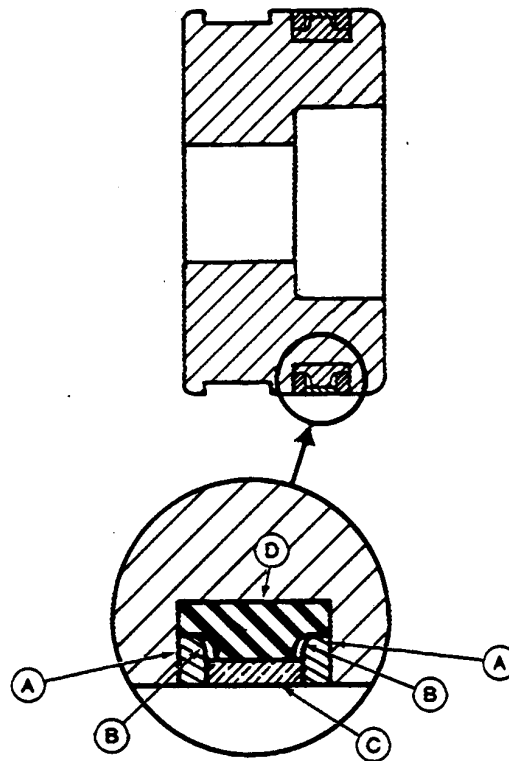
TX,31,RR7782 -19-02NOV99-5/12

IMPORTANT: For proper fit, the backup rings must be installed with the radius toward seal expander.

9. Install backup rings (A) with radius (B) toward seal expander (D).
10. Check if cap seal is loose; seal must fit tight against seal expander and not turn. If seal can be turned, it has been stretched too much and can be damaged during assembly into barrel.

A—Backup Ring (2 used)
B—Radius

C—Cap Seal
D—Seal Expander



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TX,31,RR7782 -19-02NOV99-6/12

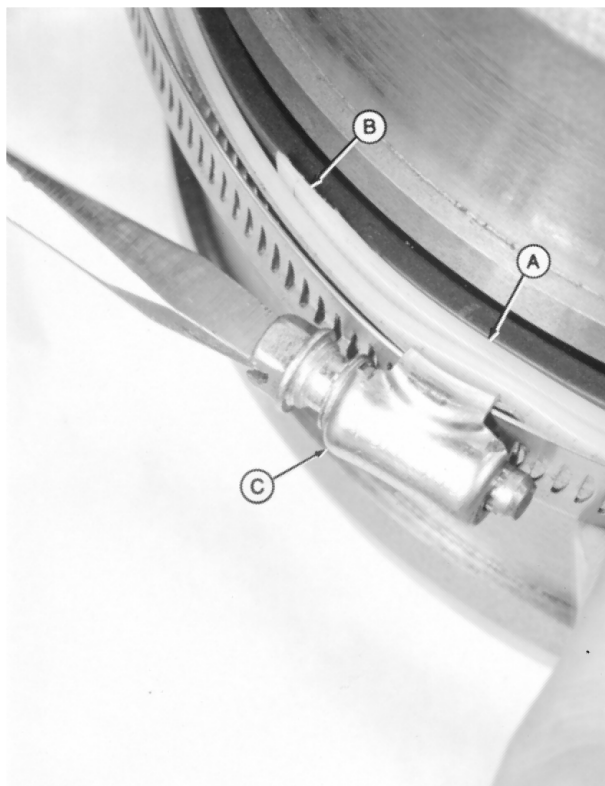
T6126AO —UN—19OCT88

Hydraulic System

11. If necessary, shrink cap seal to its original size using a ring compressor or a plastic tie band (A) and hose clamp (C).

When using a ring compressor, put a piece of shim stock between cap seal and compressor at the joint so it does not damage seal.

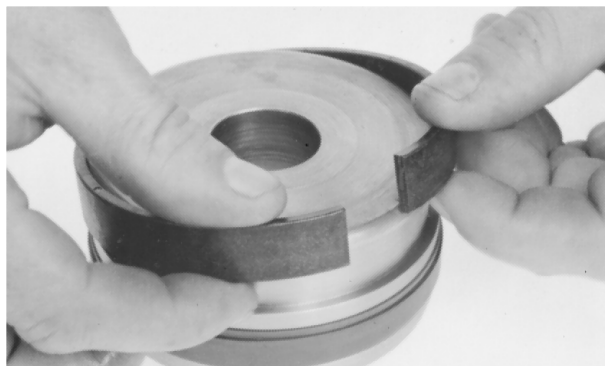
When using a plastic tie band and hose clamp, grind a taper (B) on one end of tie band. Install tie band with the taper against cap seal. Before tightening the hose clamp, tie band must be under hose clamp all around piston.



T86565 —JUN—09NOV88

TX,31,RR7782 -19-02NOV99-7/12

12. Install wear ring.



T6122AF —JUN—19OCT88

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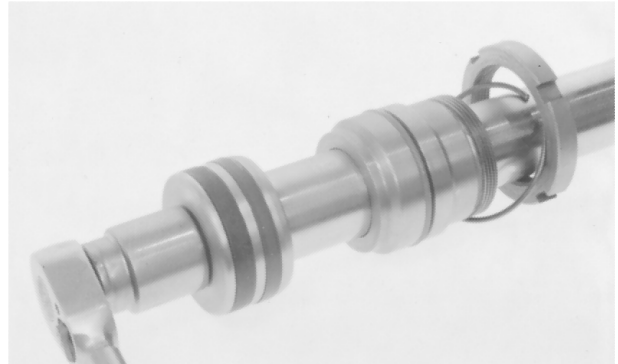
TX,31,RR7782 -19-02NOV99-8/12

13. Install spanner nut, retaining ring, rod guide, and piston assembly on rod.

14. Install and tighten piston nut:

Loader Cylinder—Specification

Bucket Cylinder Piston	
Nut with 855.5 ± 2 mm	
(33.7 ± 0.08 in.) Rod	
Stroke—Torque Turn.....	170 N·m (125 lb-ft) + 1/8 (45°) turn
Bucket Cylinder Piston	
Nut with 744 ± 2 mm	
(29.3 ± 0.08 in.) Rod	
Stroke—Torque Turn.....	190 N·m (140 lb-ft) + 1/8 turn (45°)
Boom Cylinder Piston	
Nut—Torque Turn.....	250 N·m (185 lb-ft) + 1/8 (45°) turn



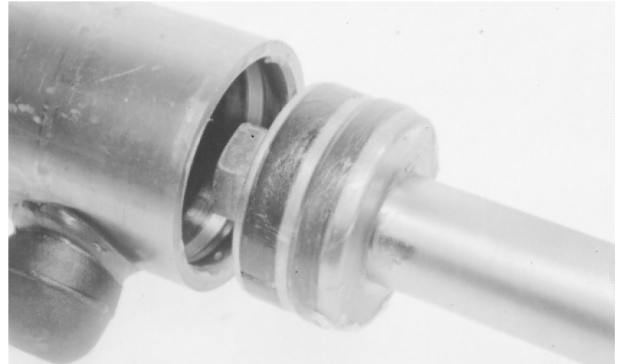
T6172BP —UN—19OCT88

TX,31,RR7782 -19-02NOV99-9/12

IMPORTANT: To prevent seal damage, the barrel, piston, and rod must be in alignment during installation.

15. Apply clean hydraulic oil to seals and chamfer of barrel.

16. Carefully push piston and rod guide into barrel. Keep piston and rod guide together.



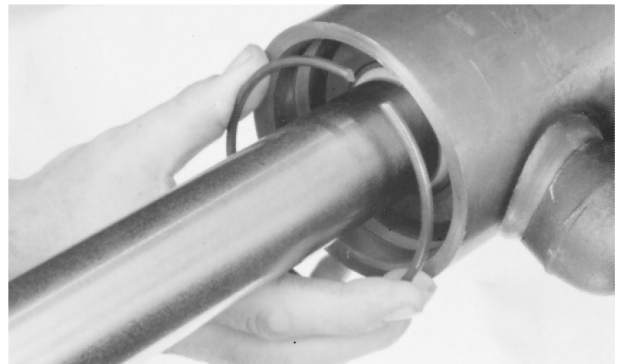
T6122AH —UN—19OCT88

TX,31,RR7782 -19-02NOV99-10/12

17. Push rod guide into barrel just enough to install retaining ring. Install retaining ring.

18. Pull rod guide against retaining ring.

19. Apply a light film of oil to ID of barrel at void between rod guide and spanner nut to help minimize rust.



T6133AE —UN—27OCT88

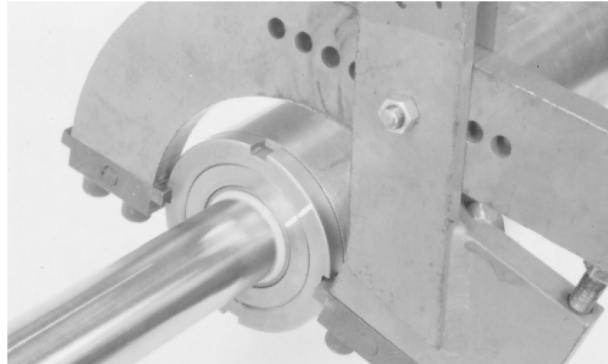
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TX,31,RR7782 -19-02NOV99-11/12

20. Apply cure primer, then thread lock and sealer (medium strength) to spanner nut and rod guide threads.

IMPORTANT: The filler ring is used for disassembly purposes only and must not be installed between rod guide and spanner nut during assembly.

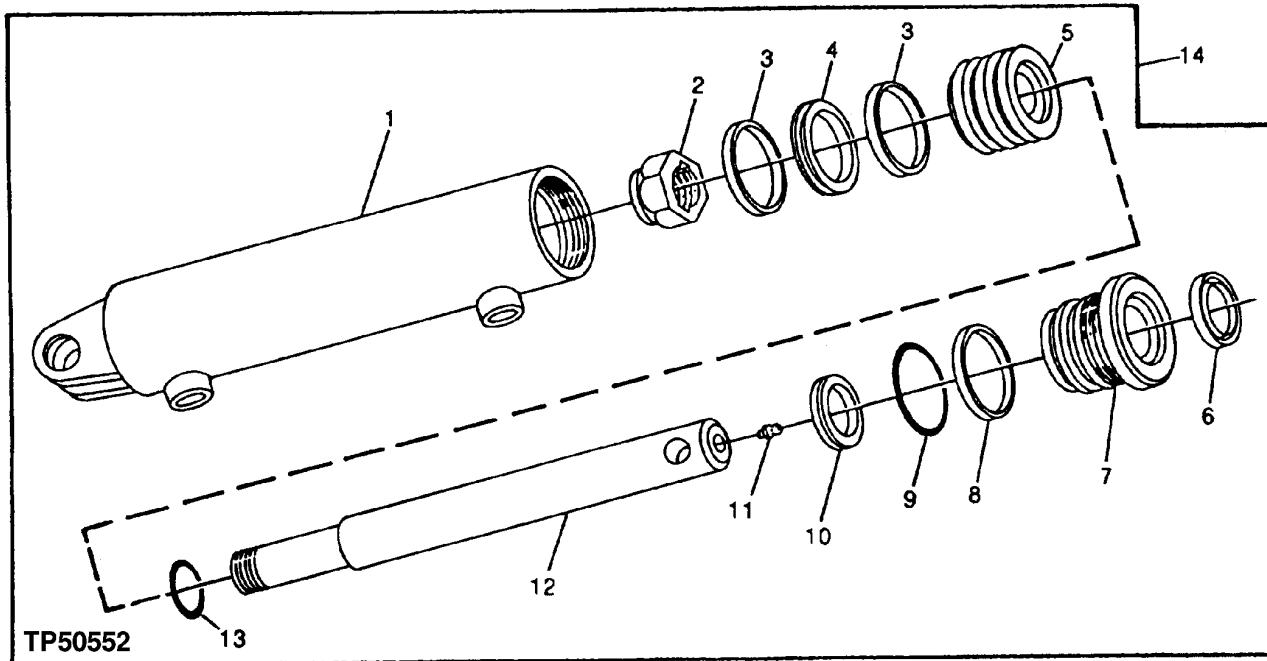
21. Install spanner nut. Tighten nut until rod guide and nut marks (made before disassembly) align. Make sure spanner nut is tight.



T619AR —UN—27OCT88

TX,31,RR7782 -19-02NOV99-12/12

Disassemble and Assemble Multi-Purpose Bucket Cylinder—120 Series



TP50552 —UN—18DEC96

- | | | | |
|-----------------------|-----------------|-------------------------|------------|
| 1— Barrel | 5— Piston | 9— O-Ring | 13— O-Ring |
| 2— Nut | 6— Seal | 10— Seal | |
| 3— Wear Ring (2 used) | 7— Rod Guide | 11— Lubrication Fitting | |
| 4— Seal | 8— Back-Up Ring | 12— Rod | |

TX,31,RR7731 -19-24FEB97-1/1

Remove and Install Ride Control Valve— If Equipped

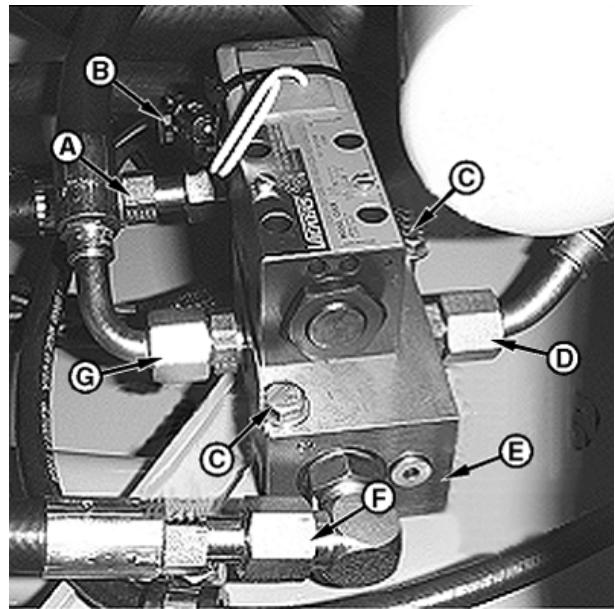
CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

Prevent possible injury from unexpected boom or bucket movement when equipped with ride control. Ride control accumulator energy must be discharged when working on hydraulic components. Turn key switch to ON position and move the loader control lever into the float position.

NOTE: Ride control valve is located inside left frame rail near the transmission filter.

1. Position loader bucket approximately 30 cm (1 ft) off the ground.
2. Make sure area around bucket is clear and move ride control switch to OFF position.
3. Turn key switch to ON position, but do not start engine. Move ride control switch to ON position.
4. Move loader control lever to float position. Bucket should lower to ground.
5. Disconnect wire connector (B).
6. Disconnect hydraulic hoses (A, D, F, and G).
7. Remove cap screws and washers (C) and lift out valve.



T115979C—UN—09NOV98

- | | |
|--|---|
| A—Hydraulic Hose to Loader Lift Cylinder Rod End | E—Ride Control Valve |
| B—Solenoid Wire Connector | F—Hydraulic Hose to Loader Lift Cylinder Head End |
| C—Cap Screw and Washer (2 used) | G—Hydraulic Hose to Reservoir |
| D—Hydraulic Hose to Accumulator | |

8. Position valve on frame and install cap screws and washers (C). Tighten to specification.

Ride Control—Specification

Control Valve Cap
Screws—Torque..... 37 N·m (27 lb-ft)

9. Connect hydraulic hoses (A, D, F, and G) at valve. Tighten hoses to specification.

Ride Control—Specification

Control Valve Hydraulic
Hoses—Torque..... 50 N·m (37 lb-ft)

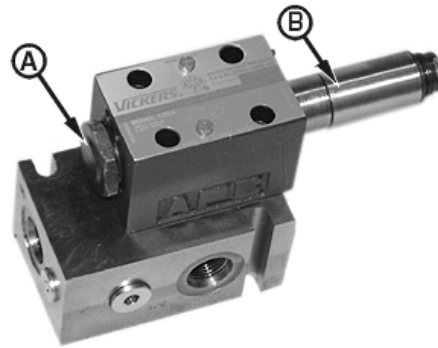
10. Connect wire connector (B).

WS68074,00036F0 -19-14JUL10-1/1

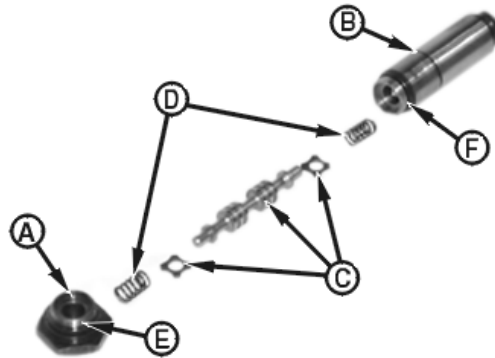
Disassemble and Assemble Ride Control Valve— If Equipped

1. Remove solenoid from valve. (See procedure in this group.)
2. Remove cap (A) and solenoid spool housing (B).
3. Remove solenoid valve block spool (C) and springs (D).
4. Remove four socket-head cap screws (G) and lift off solenoid valve block (I).
5. Inspect O-rings (H).

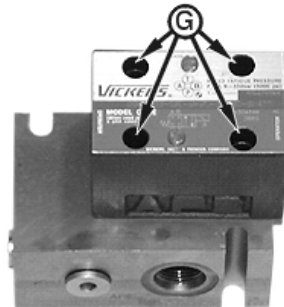
- | | |
|------------------------------|-------------------------------|
| A—Cap | F—O-Ring |
| B—Solenoid Spool Housing | G—Socket-Head Screw (4 used) |
| C—Solenoid Valve Block Spool | H—O-Ring (4 used) |
| D—Spring (2 used) | I—Solenoid Valve Block |
| E—O-Ring | J—Ride Control Valve Manifold |



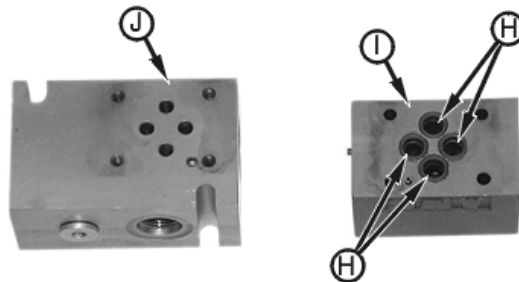
T118053B—UN—02NOV/98



T118054B—UN—02NOV/98



T118055B—UN—02NOV/98



T118056B—UN—02NOV/98

Continued on next page

CED,OUO1017,7 -19-22OCT98-1/3

6. Remove plugs (A and B).
7. Replace O-Rings (C and D).
8. Install plug (A) and tighten to specifications

Ride Control—Specification

Control Valve Manifold
SAE #4 Plug—Torque..... 8—14 N·m (6—10 lb-ft)

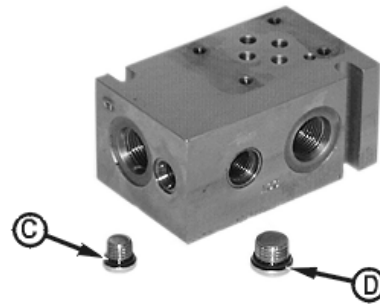
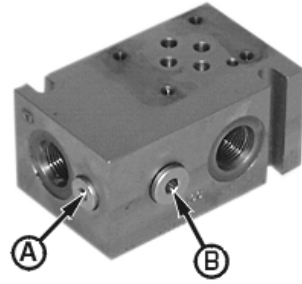
9. Install plug (B) and tighten to specification.

Ride Control—Specification

Control Valve Manifold
SAE #6 Plug—Torque..... 20—27 N·m (15—20 lb-ft)

A—Plug
B—Plug

C—O-Ring
D—O-Ring



T118057B—UN—02NOV98

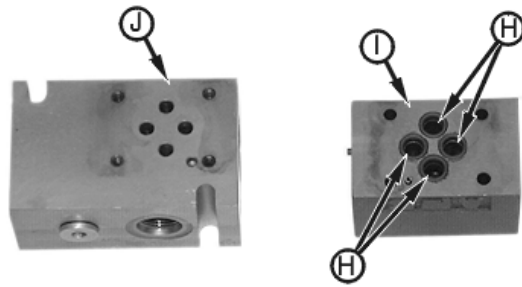
T118058B—UN—02NOV98

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CED,OUO1017,7 -19-22OCT98-2/3

10. Install new O-rings (H) and assemble solenoid valve block (I) onto ride control valve manifold (J).

11. Install socket-head screws (G) and tighten to specification.



Ride Control—Specification

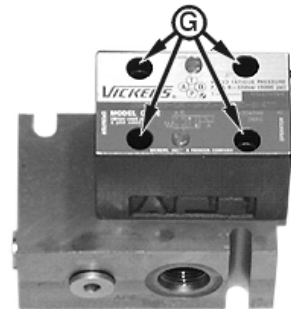
Solenoid Valve
 Block-to-Control Valve
 Manifold Socket-Head
 Screws—Torque..... 5—7 N·m (44—62 lb-in.)

12. Assemble valve block spool (C) and springs (D) and install in valve block.

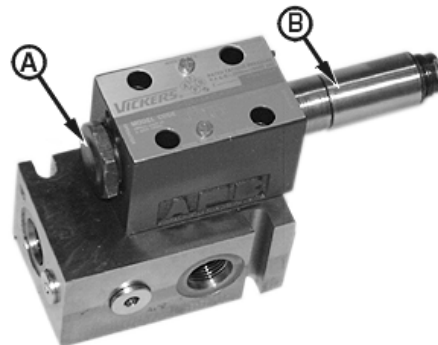
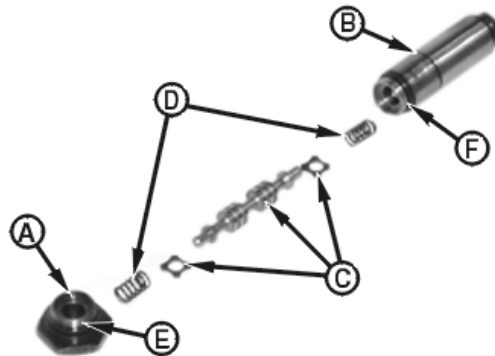
13. Install new O-rings (E and F).

14. Install solenoid spool housing (B).

15. Install cap (A).



- | | |
|------------------------------|-------------------------------|
| A—Cap | F—O-Ring |
| B—Solenoid Spool Housing | G—Socket-Head Screw (4 used) |
| C—Solenoid Valve Block Spool | H—O-Ring (4 used) |
| D—Spring (2 used) | I—Solenoid Valve Block |
| E—O-Ring | J—Ride Control Valve Manifold |



T118056B—UN—02NOV98

T118055B—UN—02NOV98

T118054B—UN—02NOV98

T118053B—UN—02NOV98

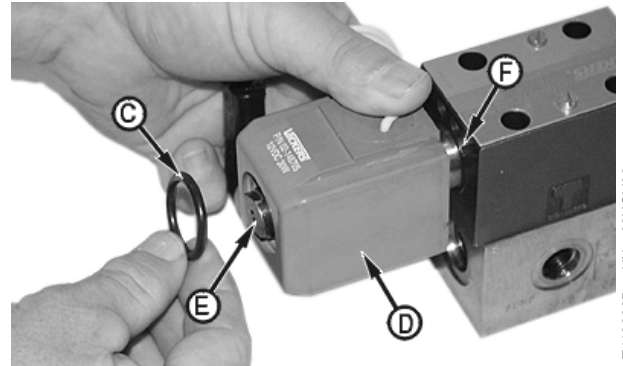
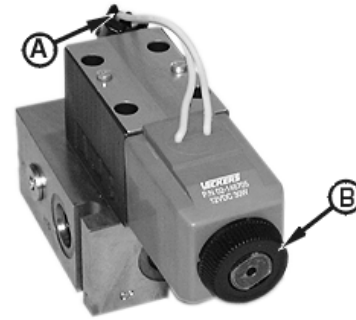
CED,OUO1017,7 -19-22OCT98-3/3

Remove and Install Ride Control Valve Solenoid—If Equipped

NOTE: Ride control valve removed for illustration purposes only. Solenoid valve can be serviced when ride control valve is installed on machine.

1. Disconnect wire connector (A).
2. Remove nut (B).
3. Remove O-ring (C).
4. Slide solenoid (D) off of spool housing (E).
5. Slide solenoid (D) onto spool housing (E). Line up hole in solenoid with locating pin (F).
6. Install new O-ring (C).
7. Install nut (B) finger tight only.
8. Connect wire connector (A).

A—Wire Connector	D—Solenoid
B—Nut	E—Spool Housing
C—O-Ring	F—Locating Pin



T118059B —UN—02NOV98

T118060B —UN—02NOV98

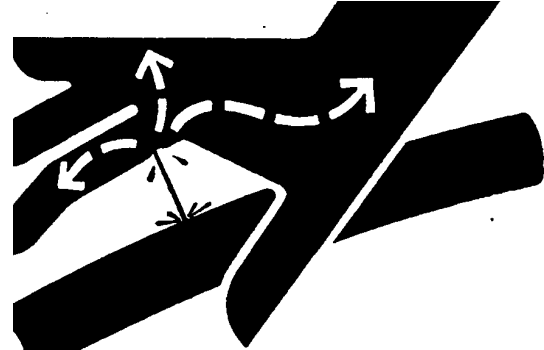
CED,OUO1017,8 -19-22OCT98-1/1

Remove and Install Ride Control Accumulator—If Equipped

CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

Prevent possible injury from unexpected boom or bucket movement when equipped with ride control. Ride control accumulator energy must be discharged when working on hydraulic components. Turn key switch to ON position and move the loader control lever into the float position.



1. Position loader bucket approximately 30 cm (1 ft) off the ground.
2. Make sure area around bucket is clear and move ride control switch to OFF position.
3. Turn key switch to ON position, but do not start engine. Move ride control switch to ON position.
4. Move loader control lever to float position. Bucket should lower to ground.

X9811 —UN—23AUG88

Continued on next page

CED,OUO1017,9 -19-22OCT98-1/2

Hydraulic System

5. Remove cowl cover from machine.
6. Disconnect hydraulic line (A).
7. Remove two clamps (B) and remove accumulator (C).
8. Install accumulator (C) using clamps (B). Tighten clamp cap screws to specification.

Ride Control—Specification

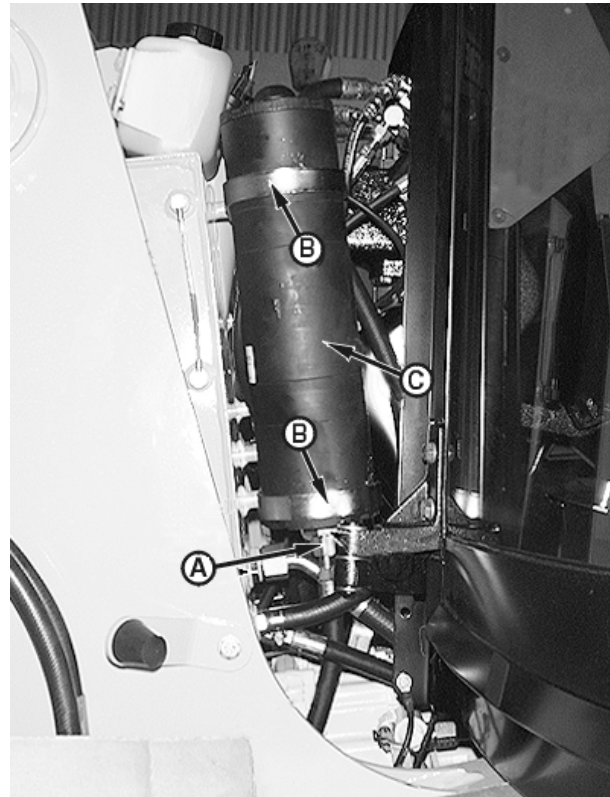
Accumulator Clamp Cap
Screws—Torque..... 73 N·m (54 lb-ft)

9. Connect hydraulic hose (A) and tighten to specification.

Ride Control—Specification

Accumulator Hydraulic
Line—Torque..... 37 N·m (27 lb-ft)

10. Charge accumulator. (See procedure in this group.)

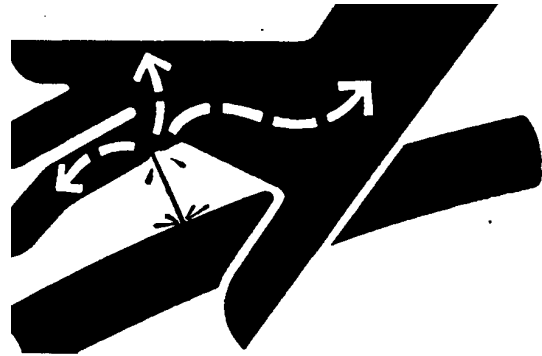


T115976C—UN—02NOV98

CED,OUO1017,9 -19-22OCT98-2/2

Charging the Ride Control Accumulator

CAUTION: Hydraulic oil may escape at pressure high enough to penetrate skin from components in the Ride Control solenoid circuit if components are removed without discharging this accumulator. Hydraulic oil in accumulator can be stored at pressures equal to or above system relief pressures. Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.



If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

Ride Control Accumulator Charge—17.2 in accumulator canister length—Pre-charge Pressure (410E Machine).....	3447 ± 241 kPa (35 ± 2.4 bar) (500 ± 35 psi)
Ride Control Accumulator Charge—14.2 in. accumulator canister length—Pre-charge Pressure (310E, 310SE, 315SE and 410E Machines).....	2930 ± 241 kPa (29 ± 2.4 bar) (425 ± 35 psi)

Specification

Oil—Temperature.....	40°C (104°F)
Ride Control Accumulator Charge—17.2 in. accumulator canister length—Pre-charge Pressure (310E, 310SE, 315SE Machines).....	2482 ± 241 kPa (25 ± 2.4 bar) (360 ± 35 psi)

X9811 —UN—23AUG88

CED,TX03768,8501 -19-08MAR00-1/3

Gas Cock.....JT01735

Charge Accumulator

CED,TX03768,8501 -19-08MAR00-2/3

Two different length accumulators have been used in production and field installed ride control kits. The nitrogen charge pressure is different for the two accumulators;

measure the length of the accumulator to determine the proper charge. If the accumulator length is 14.2 in., use procedure "A". If the length is 17.2 in., use procedure "B".

CED,TX03768,8501 -19-08MAR00-3/3

Charging the Ride Control Accumulator—Procedure “A” (14.2 in. accumulator)

1.

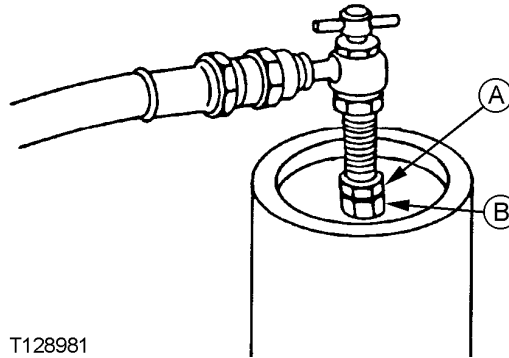
IMPORTANT: Charge accumulator using only dry nitrogen. Dry nitrogen does not mix with oil and is non-combustible. It will not cause oxidation or condensation inside accumulator and is not harmful to piston seal. DO NOT use air or any combustible gas as these can cause oxidation and condensation. Oxidation and condensation are harmful to piston seal and accumulator.

If accumulator is to be charged on machine and has some nitrogen pressure left, turn key to ON position. Move ride control switch to OFF then back to ON. Move control lever to float position to drain oil from accumulator.

2. Loosen hose fitting on bottom of ride control accumulator to release any trapped oil pressure. Leave fitting loose until after charge pressure process is complete.
3. Remove cover and cap from top of accumulator.
4. Turn handle on gas cock fully counterclockwise. Attach gas cock, hose, and regulator to accumulator.

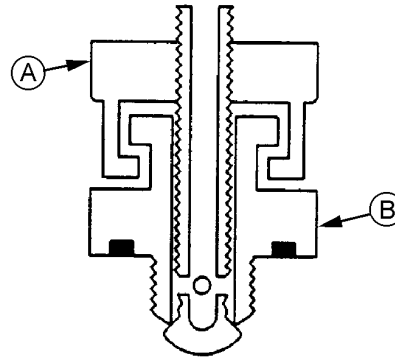
CAUTION: Loosen only the top nut (A). The bottom nut (B) is actually the accumulator gas valve fitting. Do Not loosen bottom fitting. Loose fitting under pressure can cause injury.

5. Loosen top nut (A) (counterclockwise) 2 1/2 turns to open gas valve in accumulator. (Resistance may be felt at approximately 1 1/2 turns.)
6. Slowly open regulator valve to pressurize accumulator to specification 2930 kPa (29 bar)(425 psi).
7. Tighten nut (A) clockwise until snug to close gas valve.



T128981

T128981—UN—03MAR00



T128982

T128982—UN—03MAR00

A—Top Nut

B—Bottom Nut

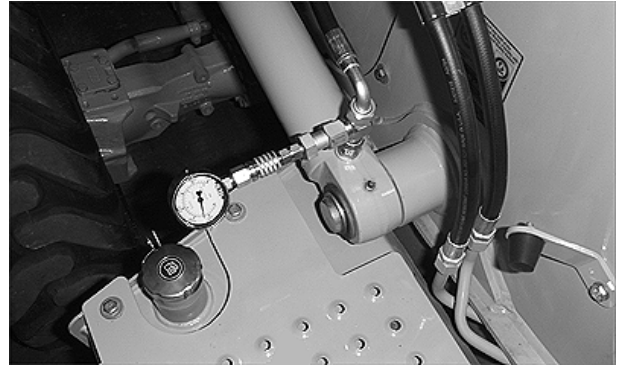
8. Shut-off the gas pressure from the nitrogen tank.
9. Slowly loosen the connector at the pressure regulator valve to release pressure from the hose.
10. Remove the gas cock from the accumulator and install cap.
11. Tighten hydraulic hose fitting on bottom of accumulator.

WS68074,00036F7 -19-14JUL10-1/1

Charging the Ride Control Accumulator—Procedure “B” (17.2 in. accumulator)

The following procedure should be used for charging accumulator that is already installed on the machine. See specifications above to charge accumulator that needs a precharge before it is installed on the machine.

1. To determine proper nitrogen charge pressure for the machine, install a gage into the head end of the loader cylinder.
2. Raise the loader 3 to 4 ft. off the ground. Note the head end pressure required to support the loader. (The accumulator charge pressure should be 50 psi below this pressure.)
3. If accumulator is to be charged on machine and has some nitrogen pressure left, turn key to ON position. Move ride control switch to OFF then back to ON. Move control lever to float position to drain oil from accumulator.
4. Loosen hose fitting on bottom of ride control accumulator to release any trapped oil pressure.



T115658B —JUN—29MAY98

Leave fitting loose until after charge pressure process is complete.

5. Remove cover and cap from the top of accumulator.
6. Turn handle on gas cock fully counterclockwise. Attach gas cock, hose, and regulator to accumulator.

CED, TX03768,2709 -19-19SEP06-1/2

7.

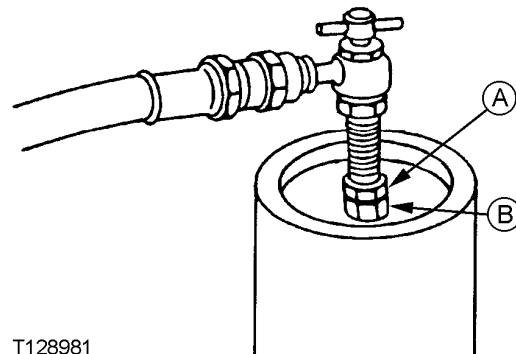
CAUTION: Loosen only the top nut (A). The bottom nut (B) is actually the accumulator gas valve fitting. Do Not loosen bottom fitting. Loose fitting under pressure can cause injury.

Loosen top nut (A) counterclockwise 2 1/2 turns to open gas valve in accumulator. (Resistance may be felt in approximately 1 1/2 turns.)

8. Slowly open the regulator valve to pressurize accumulator to 345 kPa (3.5 bar)(50 psi) below head end psi measured earlier.
9. Tighten nut (A) clockwise until snug to close gas valve.
10. Shut-off the gas pressure from the nitrogen tank.
11. Slowly loosen the connector at the pressure regulator valve to release pressure from the hose.
12. Remove the gas cock from the accumulator and install cap.
13. Tighten hydraulic hose fitting on bottom of accumulator.

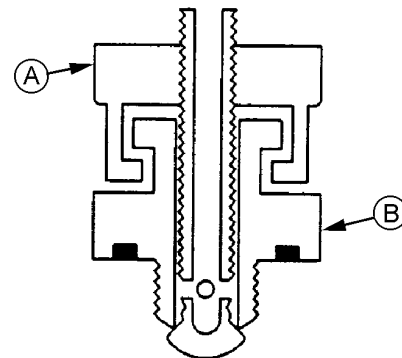
A—Top Nut

B—Bottom Nut



T128981

T128981 —JUN—03MAR00



T128982

T128982 —JUN—03MAR00

CED, TX03768,2709 -19-19SEP06-2/2

Ride Control Accumulator—Discharge Procedure

⚠ CAUTION: Prevent possible injury from unexpected boom or bucket movement when equipped with ride control. Ride control accumulator energy must be discharged when working on hydraulic components. Turn key switch to ON position and move the loader control lever into the float position.

1. Position loader bucket approximately 30 cm (1 ft) off the ground.

2. Make sure area around bucket is clear and move ride control switch to OFF position.
3. Turn key switch to ON position, but do not start engine. Move ride control switch to ON position.
4. Move loader control lever to float position. Bucket should lower to ground.

WS68074,00036F8 -19-14JUL10-1/1

Section 33 Backhoe

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Service Equipment and Tools

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or from the

SERVICEGARD is a trademark of Deere & Company

European Microfiche Tool Catalog (MTC). Some tools may be available from a local supplier.

CED,OUO1002,739 -19-15JAN99-1/2

Bushing, Bearing and Seal Driver Set..... D01044AA

Install Bushings in Bucket Links

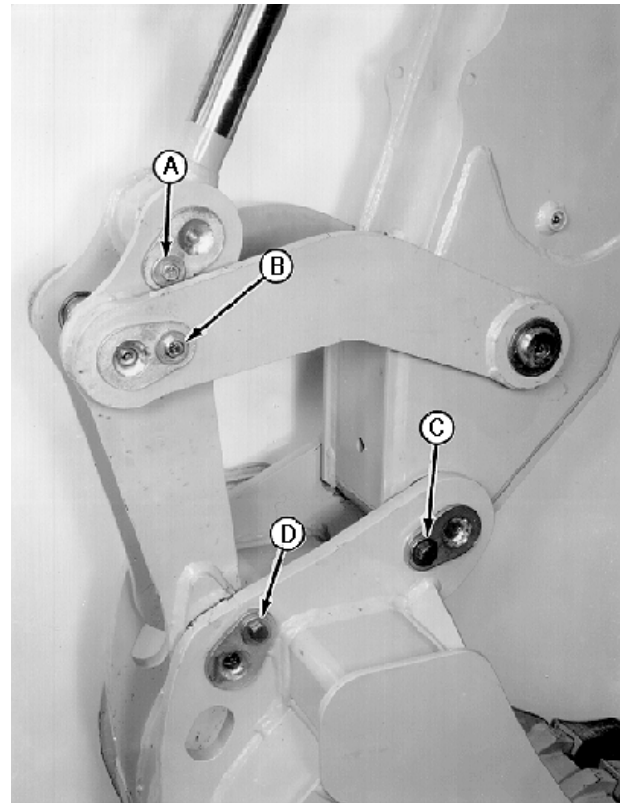
CED,OUO1002,739 -19-15JAN99-2/2

Remove and Install Bucket and Bucket Links

1. Lower bucket to ground.
2. Remove bucket cap screws and special washers (A—D) and remove bucket links and linkage pins.
3. Inspect bushings and replace as necessary. For ease of removing bushings weld three straight beads the inside length of the bushing. Allow bushing to cool before removing with a punch. Install new bushings even with outside surface of bucket using D01044AA Bushing, Bearing and Seal Driver Set.
4. Install links and linkage pins.
5. Install bucket cap screws and special washers (A—D)
6. Align bucket with pin boss holes. Install bucket pins.

A—Rod End Cap Screw and Special Washer
B—Link Cap Screw and Special Washer

C—Dipperstick-to-Bucket Cap Screw and Special Washer
D—Link-to-Bucket Cap Screw and Special Washer



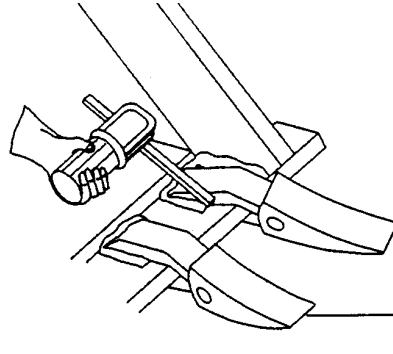
T108120—UN—12MAR97

TX,33,RR7776 -19-12MAR97-1/1

Remove and Install Bucket Tooth Shank

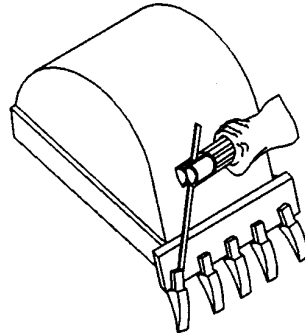
1. Remove top and bottom welds using air arc equipment or cutting torch.

T7535AG (CV)



T7535AG —UN—07JUN91

T7535AF (CV)



T7535AF —UN—07JUN91

TX,33,RR7781 -19-25NOV98-1/5

2. Grind smooth all surfaces.



T92511 —UN—31OCT88

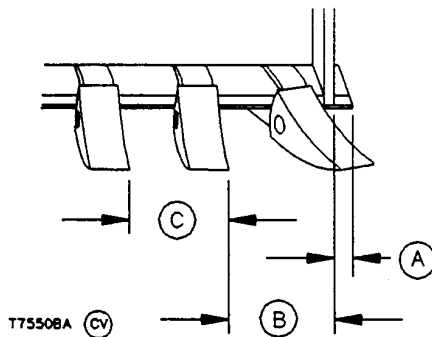
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TX,33,RR7781 -19-25NOV98-2/5

Bucket

IMPORTANT: Shanks and cutting edge must be preheated to 177°C (350°F) to prevent under bead cracking in shank and brittleness in cutting edge. Preheat each shank and cutting edge area just before welding. Use low hydrogen E-7018 dry rods or E-70T-4 flux core process.

3. Position shanks on cutting edge. Preheat area to be welded just before welding to 177°C (350°F).



T75508A—UN—10JUN91

Width	Teeth	^a DIM. A	^b DIM. B	^b DIM. C
12 in. STD	3	12.5 mm (0.49 in.)	120.5 mm (4.74 in.)	
18 in. STD	3	11.5 mm (0.45 in.)	211.4 mm (8.32 in.)	
18 in. HD	4	11.0 mm (0.43 in.)	137.0 mm (5.40 in.)	147.0 mm (5.78 in.)
18 in. XHD	4	9.0 mm (0.35 in.)	137.0 mm (5.40 in.)	147.0 mm (5.78 in.)
24 in. STD	4	11.0 mm (0.43 in.)	195.6 mm (7.70 in.)	180.8 mm (7.12 in.)
24 in. HD	5	11.0 mm (0.43 in.)	140.5 mm (5.53 in.)	144.5 mm (5.69 in.)
24 in. XHD	5	9.0 mm (0.35 in.)	140.5 mm (5.53 in.)	144.5 mm (5.69 in.)
30 in. STD	5	11.5 mm (0.45 in.)	187.2 mm (7.37 in.)	175.0 mm (6.89 in.)
30 in. HD	5	11.0 mm (0.43 in.)	187.2 mm (7.37 in.)	175.0 mm (6.89 in.)
30 in. XHD	5	9.0 mm (0.35 in.)	187.0 mm (7.36 in.)	175.0 mm (6.89 in.)

^a+ 3.0 — 1.5 mm (+ 0.12 — 0.06 in.) Tolerance

^b± 1.5 mm (0.06 in.) Tolerance

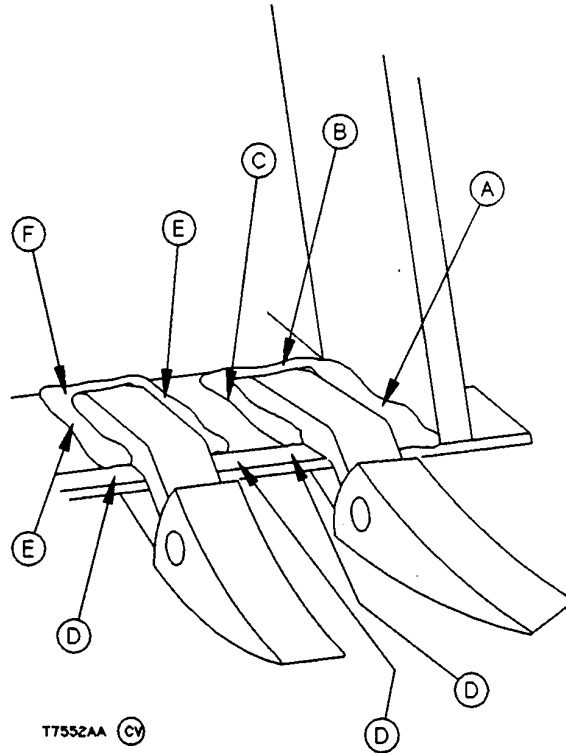
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TX,33,RR7781 -19-25NOV98-3/5

Bucket

4. Start welds on top of shank, the long part. On corner shanks, weld area (A) with a bevel weld. Penetrate 3 mm (0.12 in.) and leave a 5 mm (0.20 in.) face. Fill entire area between shank and side cutter level with top of shank. Cap this area with a 9 mm (0.35 in.) fillet weld. Weld all the way to edge of cutting edge.
5. Weld area (B) of corner shank with an angle weld 6 mm (0.24 in.) deep and 11 mm (0.43 in.) across face.
6. Weld area (C) of corner shank with a bevel weld. Penetrate 3 mm (0.12 in.) and leave a 5 mm (0.20 in.) face. Cap that weld with a 11 mm (0.43 in.) fillet weld. Leave area (D) free of weld for 19 mm (0.75 in.).
7. On center shanks, weld areas (E) with a bevel weld. Penetrate 3 mm (0.12 in.) and leave a 5 mm (0.20 in.) face. Cover with a 9 mm (0.35 in.) fillet weld.
8. Weld area (F) with an angle weld 6 mm (0.24 in.) deep and 11 mm (0.43 in.) across face.

A—Bevel Weld and Fillet Weld	D—Weld Free Area
B—Angle Weld	E—Bevel Weld and Fillet Weld
C—Bevel Weld	F—Angle Weld

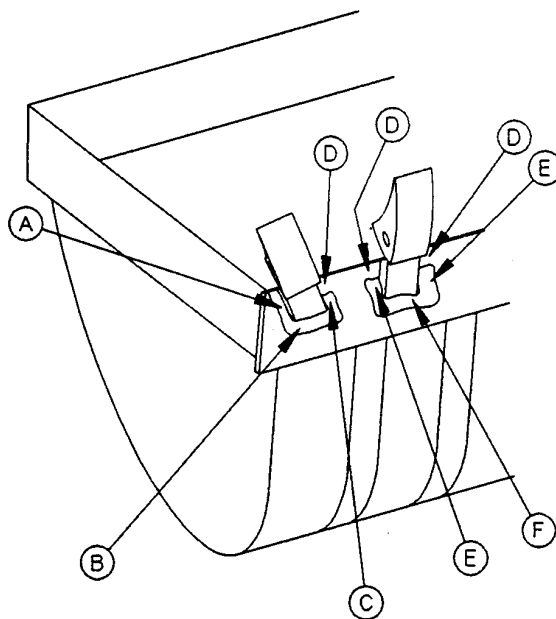


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TX.33,RR7781 -19-25NOV98-4/5

9. Turn bucket over and weld bottom of shank to cutting edge. On corner shank, weld area (A) with bevel weld. Penetrate 3 mm (0.12 in.) and leave a 5 mm (0.20 in.) face. Cover with 11 mm (0.43 in.) fillet weld. Weld all the way to edge of cutting edge.
10. Weld area (B) with bevel weld. Penetrate 3 mm (0.12 in.) and leave a 5 mm (0.20 in.) face. Cover with 9 mm (0.35 in.) fillet weld.
11. Weld area (C) of corner shank with bevel weld. Penetrate 3 mm (0.12 in.) and leave a 5 mm (0.20 in.) face. Cover with 11 mm (0.43 in.) fillet weld. Leave area (D) free of weld for 19 mm (0.75 in.).
12. On center shanks, weld areas (E) with bevel weld. Penetrate 3 mm (0.12 in.) and leave a 5 mm (0.20 in.) face. Cover with a 9 mm (0.35 in.) fillet weld. Leave area (D) free of weld for 19 mm (0.75 in.).
13. Weld area (F) with angle weld. Penetrate 6 mm (0.24 in.) and leave a 11 mm (0.43 in.) face.

A —Bevel Weld and Fillet Weld	D —Weld Free Area
B —Bevel Weld and Fillet Weld	E —Bevel Weld and Fillet
C —Bevel Weld and Fillet Weld	F —Angle Weld



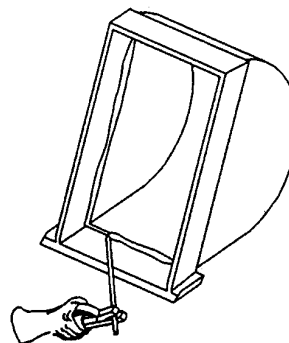
T7552AB (CV)

T7552AB —UN—07 JUN91

TX,33,RR7781 -19-25NOV98-5/5

Remove and Install Bucket Cutting Edge

1. Remove tooth shanks in corners. Remove all shanks if they are to be reused. (See procedure in this group.)
2. Use air arc equipment or cutting torch to remove welds. Remove all welds from cutting edge to side cutters.
3. Remove weld from cutting edge to bottom joint.



T7535AL (CV)

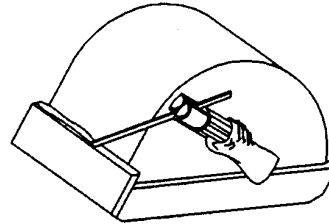
T7535AL —UN—07 JUN91

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TX3302BR400 -19-25NOV98-1/4

Bucket

- Turn bucket over and remove weld from cutting edge to bottom. Do not blow through bottom.
- Cut new cutting edge to proper length for bucket, approximately 11 mm (0.43 in.) protruding beyond side cutter on each side.



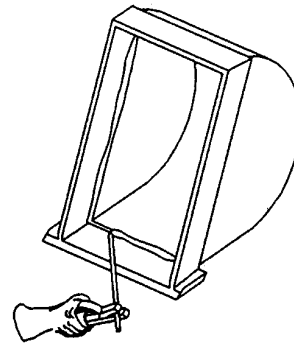
T7535AK (CV)

T7535AK—JUN—07JUN91

TX3302BR400 -19-25NOV98-2/4

IMPORTANT: Cutting edge must be preheated to 177°C (350°F) to prevent brittleness in cutting edge. Preheat area just before welding. Use low hydrogen E-7018 dry rods or E-70T-4 flux core process.

- Set bucket on bottom and weld top first. Position cutting edge and clamp. Preheat cutting edge to 177°C (350°F). Start at center of cutting edge and weld toward side cutters. Use a 6 mm (0.24 in.) fillet weld.
- Make 11 mm (0.43 in.) fillet weld outside bucket at cutting edge to side cutter joint. Continue weld down back edge.

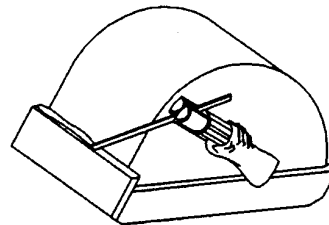


T7535AL (CV)

T7535AL—JUN—07JUN91

TX3302BR400 -19-25NOV98-3/4

- Turn bucket over and weld cutting edge to bottom with 6 mm (0.24 in.) fillet weld.
- Install shanks. (See procedure in this group).



T7535AK (CV)

T7535AK—JUN—07JUN91

TX3302BR400 -19-25NOV98-4/4

Group 3315 Control Linkage

Other Material

Number	Name	Use
TY24445 (U.S.)	454	Apply to threads of backhoe control lever knobs.
380 (LOCTITE®)	Instant Adhesive	Apply to threads of spacer before installing on lever base pivot balljoint.
T43512 (U.S.) TY9473 (Canadian) 242 (LOCTITE®)	Thread Lock and Sealer (Medium Strength)	Apply to threads of lever assembly to lever base screws.

LOCTITE is a trademark of Loctite Corp.

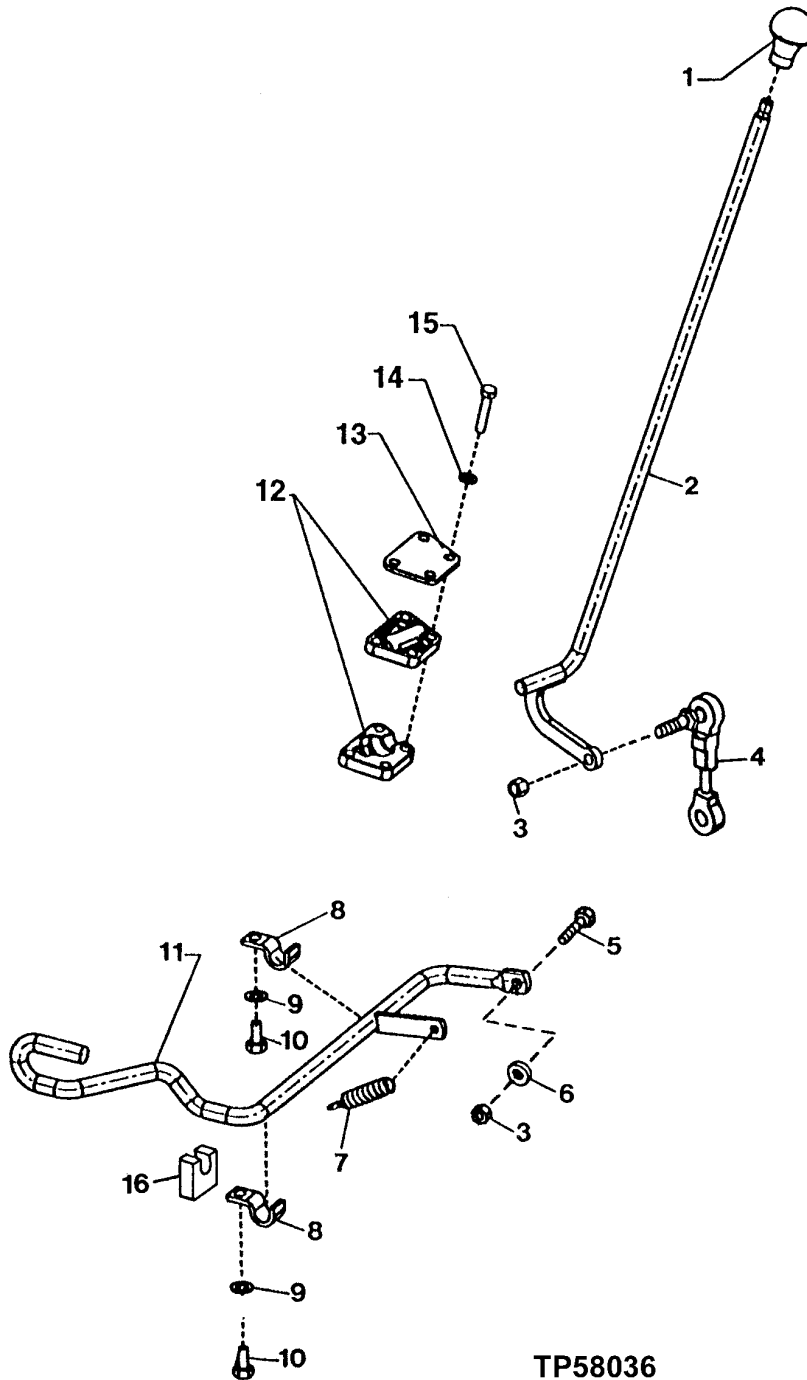
CED,TX03399,5696 -19-06DEC99-1/1

Specifications

Item	Measurement	Specification
Boom Lock Lever Pivot and Plate-to-Cab or ROPS Rear Ramp Cap Screws	Torque	25 N·m (18 lb-ft)
Boom Lock Clamps-to-Boom Lock Control Rod-to-Tapped Block Cap Screws	Torque	73 N·m (54 lb-ft)
Backhoe Two Lever Linkage Cap Screws	Torque	60 N·m (44 lb-ft)
Backhoe Two Lever Linkage Ball Joint Lock Nuts	Torque	25 N·m (18 lb-ft)
Backhoe Two Lever Linkage Ball Joint Nuts	Torque	60 N·m (44 lb-ft)
Backhoe Valve Mounting Plate cap screws	Torque	46 N·m (34 lb-ft)
Two Lever Linkage Nuts and Lock Nut and Stabilizer Nuts	Torque	25 N·m (18 lb-ft)
Stabilizer Bellcrank Yoke Nuts	Torque	25N·m (18 lb-ft)

CED,TX03399,5697 -19-06DEC99-1/1

Remove and Install Backhoe Boom Swing Lock Control Lever and Linkage



TP58036

- | | | | |
|----------------------|-------------------|------------------------|------------------------|
| 1— Knob | 5— Cap Screw | 9— Washer (2 used) | 13— Plate |
| 2— Lever | 6— Washer | 10— Cap Screw (2 used) | 14— Washer (4 used) |
| 3— Lock Nut (2 used) | 7— Spring | 11— Rod | 15— Cap Screw (4 used) |
| 4— Link | 8— Clamp (2 used) | 12— Pivot (2 used) | 16— Stop |

TP58036 —UN—19MAY99

Continued on next page

Control Linkage

1. Attach boom lock lever pivot (12) and plate (13) to cab or ROPS rear ramp. Tighten cap screws (15) to specification.

Specification

Boom Lock Lever Pivot
and Plate-to-Cab or
ROPS Rear Ramp Cap
Screws—Torque..... 25 N·m (18 lb-ft)

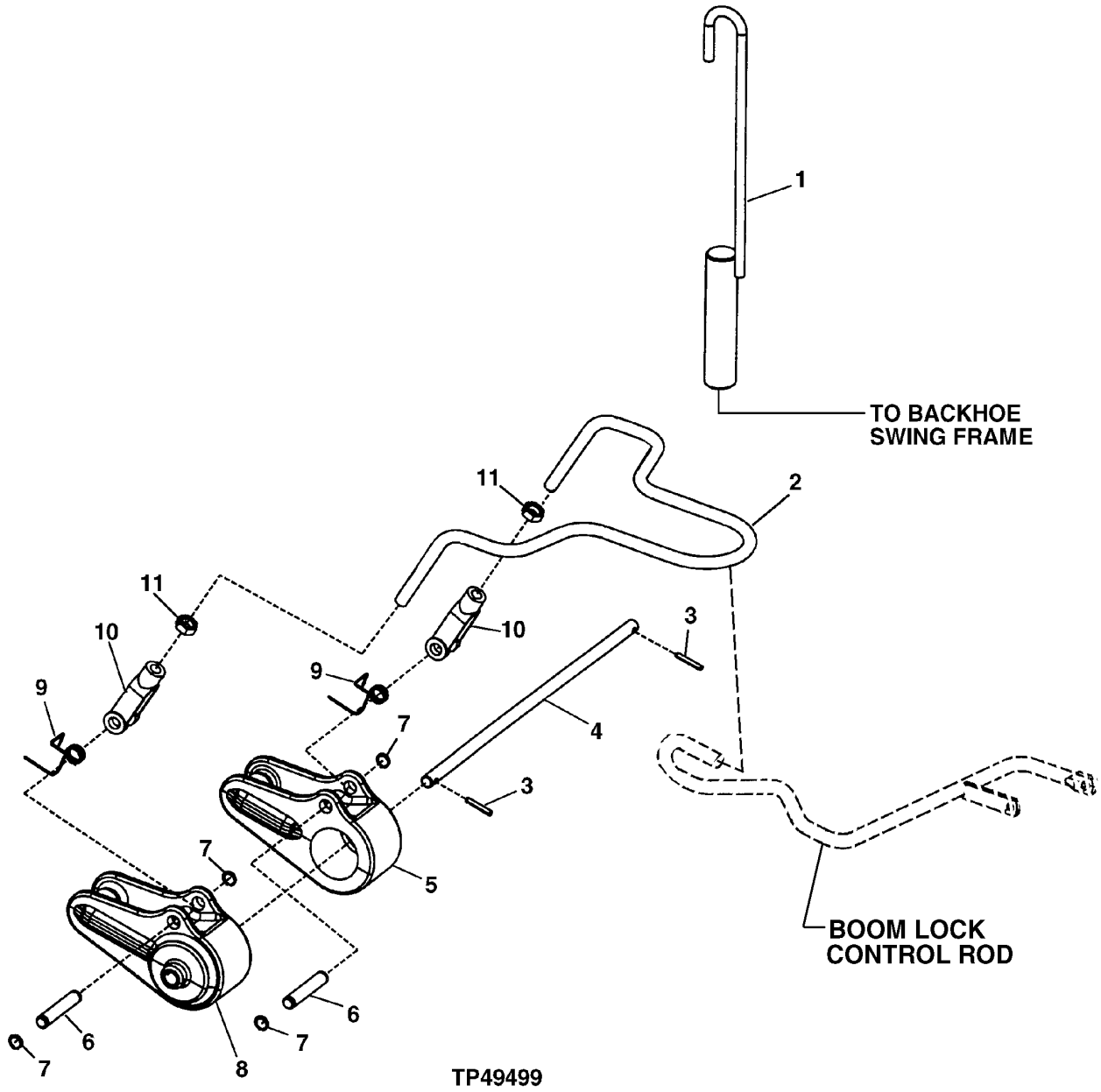
2. Attach boom lock clamps to boom lock control rod to tapped blocks in bottom rear of cab or ROPS. Tighten cap screw (10) to specification.

Specification

Boom Lock Clamps-
to-Boom Lock Control
Rod-to-Tapped Block
Cap Screws—Torque..... 73 N·m (54 lb-ft)

TX,33,SS3959 -19-08OCT99-2/2

Remove and Install Backhoe Boom Swing Lock Arms and Locking Pin



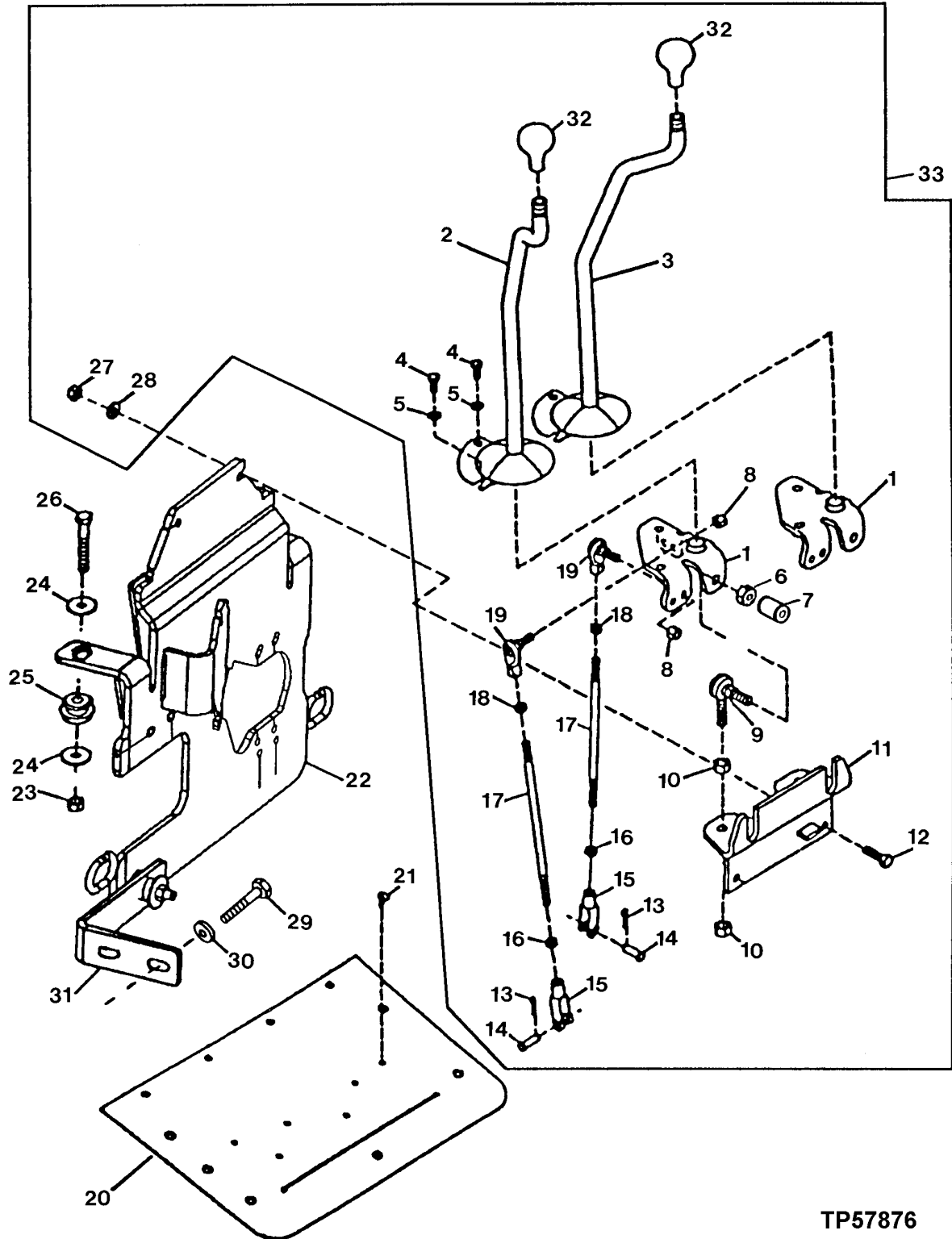
- | | | | |
|------------------------|-----------------|-----------------------|-------------------|
| 1— Pin | 4— Rod | 7— Snap Ring (4 used) | 10— Yoke (2 used) |
| 2— Rod | 5— Lock | 8— Lock | 11— Nut (2 used) |
| 3— Spring Pin (2 used) | 6— Pin (2 used) | 9— Spring (2 used) | |

Adjust yokes (10) evenly each side until a 4—6 mm (35—53 in.) gap is obtained between boom lock rod and boom lock control rod. Tighten nuts.

TP49499—UN—24OCT96

TX,33,SS3960 -19-08APR97-1/1

Remove and Install Backhoe Valve Linkage—Two Lever



TP57876

TP57876—UN—03JUN98

Continued on next page

TX.33,RR7808 -19-08OCT99-1/2

Control Linkage

- | | | | |
|--|--|--|---|
| <ul style="list-style-type: none"> 1— Base (2 used) 2— Lever 3— Lever 4— Screw (4 used) 5— Washer (4 used) 6— Nut (2 used) 7— Spacer (2 used) 8— Lock Nut (4 used) 9— Ball Joint (2 used) | <ul style="list-style-type: none"> 10— Nut (4 used) 11— Linkage Support 12— Cap Screw (2 used) 13— Spring Locking Pin (4 used) 14— Pin (4 used) 15— Yoke 16— Nut 17— Rod (4 used) 18— Nut | <ul style="list-style-type: none"> 19— Ball Joint 20— Gasket 21— Plug (6 used) 22— Plate 23— Nut (3 used) 24— Washer (6 used) 25— Isolator (3 used) 26— Cap Screw (3 used) 27— Nut (2 used) | <ul style="list-style-type: none"> 28— Washer 29— Cap Screw (2 used) 30— Washer (2 used) 31— Bracket 32— Knob (2 used) 33— Linkage Assembly |
|--|--|--|---|

1. Fasten lever base (1) to shouldered end of large ball joint (19) to fit in vertical slot of linkage support (11).
2. Apply instant gel adhesive to threads of backhoe control knobs (32).
3. Apply instant gel adhesive to threads of spacers (7). Apply thread lock and sealer (medium strength) to threads of cap screws (4) and balljoints (9).
4. Tighten cap screws (4) to specification.

Specification

Backhoe Two
Lever Linkage Cap
Screws—Torque..... 60 N·m (44 lb-ft)

5. Tighten lock nuts (8) to specification.

Specification

Backhoe Two Lever
Linkage Ball Joint Lock
Nuts—Torque..... 25 N·m (18 lb-ft)

6. Tighten nuts (10) to specification.

Specification

Backhoe Two Lever
Linkage Ball Joint
Nuts—Torque..... 60 N·m (44 lb-ft)

7. Tighten cap screws (26) to specifications.

Specification

Backhoe Valve
Mounting Plate cap
screws—Torque..... 46 N·m (34 lb-ft)

8. After attaching yokes (15) to spools, adjust length of link rods (17) so lever bases (2 and 3) are parallel to ground.
9. See Backhoe Valve Linkage Adjustment in this group to adjust valve linkage.

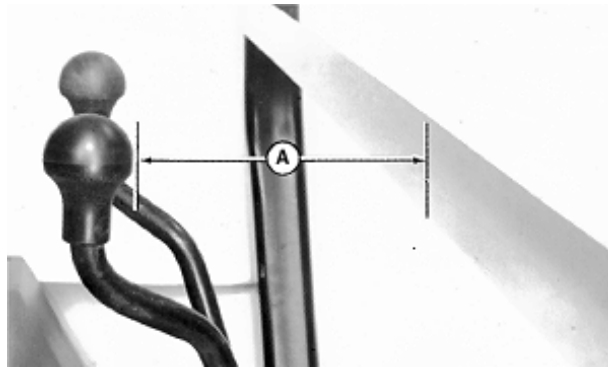
TX,33,RR7808 -19-08OCT99-2/2

Backhoe Valve Linkage Adjustment

NOTE: Levers must be positioned correctly to allow full travel and proper operation of backhoe valves.

Cab and other components have been removed in some photos for illustration purposes only.

1. Put backhoe valve spools in neutral position.
2. Put a piece of masking tape across the rear ROPS posts on inside surface at backhoe lever knob height.
3. Measure from edge of knobs to tape. Distance (A) should be 140 mm (5.5 in.). Knobs should be 250 mm (10.25 in.) apart.

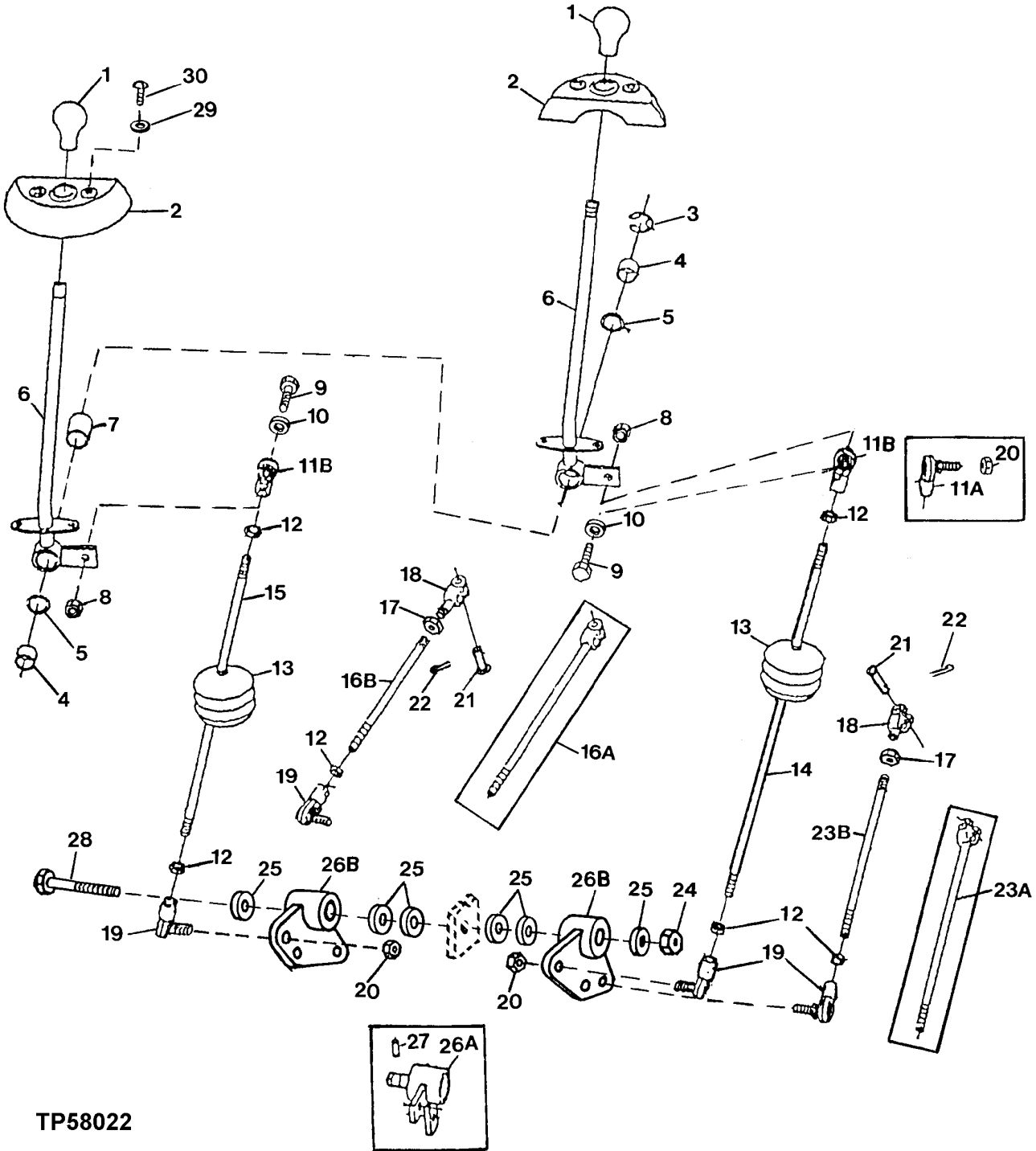


A—Distance [140 mm (5.5 in.)]

T117168 —UN—24SEP98

TX,9025,RR7492 -19-10JUN96-1/1

Remove and Install Stabilizer Valve Linkage (S.N. —874256)



TP58022

- 1— Knob (2 used)
- 2— Base (2 used)
- 3— Snap Ring
- 4— Bushing (2 used)
- 5— Washer (2 used)

- 6— Lever (2 used)
- 7— Bushing
- 8— Ball Joint (6 used)
- 9— Nut (6 used)
- 10— Rod

- 11— Boot (2 used)
- 12— Pin (2 used)
- 13— Cotter Pin (2 used)
- 14— Yoke
- 15— Set Screw (2 used)

- 16— Bellcrank (2 used)
- 17— Lock Nut (2 used)
- 18— Yoke
- 19— Rod

Continued on next page

TX.33.SS3961 -19-08OCT99-1/2

TP58022—JUN—21APR99

Control Linkage

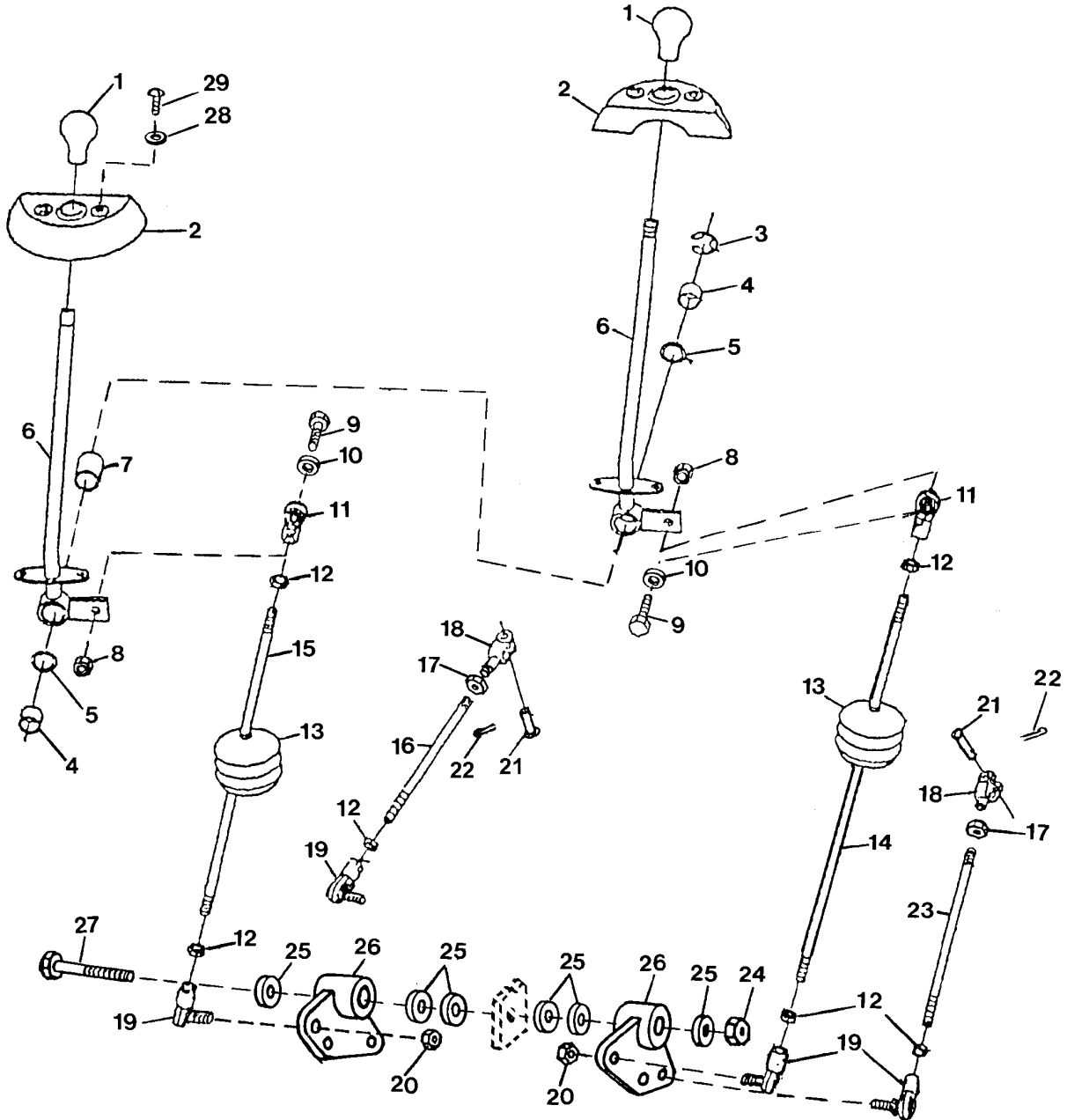
Apply gel instant adhesive to threads of stabilizer control lever knobs. Tighten nuts (17) to 25 N·m (18 lb-ft).

Specification

Two Lever Linkage
Nuts and Lock Nut and
Stabilizer Nuts—Torque..... 25 N·m (18 lb-ft)

TX,33,SS3961 -19-08OCT99-2/2

Remove and Install Stabilizer Valve Linkage (S.N. 874257—)



T125032

- | | | | |
|----------------------|--------------------------|----------------------------|------------------------|
| 1— Knob (2 used) | 9— Cap Screw (2 used) | 17— Nut (2 used) | 25— Washer (6 used) |
| 2— Cover (2 used) | 10— Washer (2 used) | 18— Yoke L.H. (2 used) | 26— Bellcrank (2 used) |
| 3— Snap Ring | 11— Tie Rod End (2 used) | 19— Ball Joint (4 used) | 27— Cap Screw |
| 4— Bushing (2 used) | 12— Nut (6 used) | 20— Lock Nut (As Required) | 28— Washer (4 used) |
| 5— Washer (2 used) | 13— Boot (2 used) | 21— Pin (2 used) | 29— Screw (4 used) |
| 6— Lever (2 used) | 14— Rod | 22— Cotter Pin (2 used) | |
| 7— Bushing | 15— Rod | 23— Rod | |
| 8— Lock Nut (2 used) | 16— Rod | 24— Lock Nut | |

1. Apply gel instant adhesive to threads of stabilizer control lever knobs. Tighten nuts (17) to specification.

Specification

Two Lever Linkage
 Nuts and Lock Nut and
 Stabilizer Nuts—Torque..... 25 N·m (18 lb-ft)

Continued on next page

CEDEX03399,5548 -19-08OCT99-1/2

Control Linkage

2. Tighten nuts (20) to specifications

Specification

Stabilizer Bellcrank Yoke

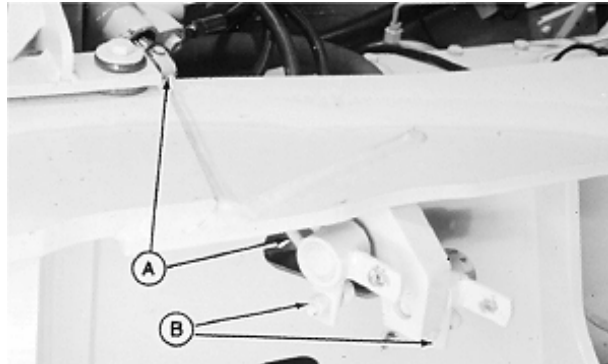
Nuts—Torque..... 25 N·m (18 lb-ft)

CED, TX03399, 5548 -19-08OCT99-2/2

Stabilizer Valve Linkage Adjustment

NOTE: Levers must be positioned correctly to allow full travel and proper operation of stabilizer valves. Cab and other components have been removed in some photographs for clarity.

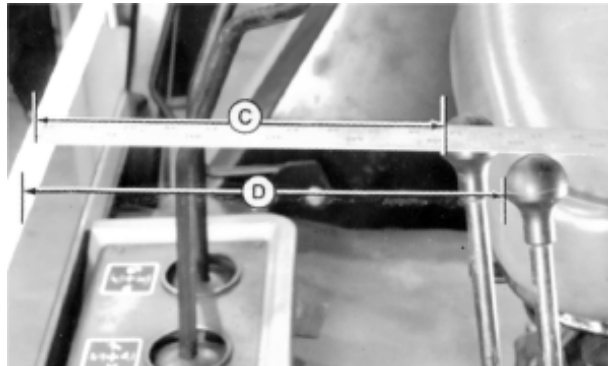
1. Put stabilizer valve spools in neutral position.
2. Adjust linkage rods (A) so that tabs (B) are vertical.
3. Put masking tape across left and right rear ROPS posts on inside surface at stabilizer knob height.



T8187AL —UN—20FEB94

TX,9025,RR7493 -19-10JUN96-1/2

4. Measure the distance (C) from edge of right stabilizer knob to tape. It should be 260 mm (10.25 in.). Measure the distance (D) from edge of left stabilizer knob to tape. It should be 295 mm (11.6 in.). Adjust rods (E) as necessary.



T7407AL —UN—30OCT90



T7407AM —UN—30OCT90

TX,9025,RR7493 -19-10JUN96-2/2

Other Material

Number	Name	Use
TY16285 (U.S.) CXTY16285 (Canadian) 7649 (LOCTITE®)	Cure Primer	Apply to inner surface of bushing bores in dipperstick. Apply to inner surface of bushing bores in backhoe boom. Apply to backhoe boom lock collar set screws. Apply to threads of extendible dipperstick hex socket cap screws for outer pads.
TY15969 (U.S.) TY9479 (Canadian) 680 (LOCTITE®)	Retaining Compound (Maximum Strength)	Apply to inner surface of bushing bores in dipperstick. Apply to inner surface of bushing bores in backhoe boom.
T43512 (U.S.) TY9473 (Canadian) 242 (LOCTITE®)	Thread Lock and Sealer (Medium Strength)	Apply to backhoe boom lock collar set screws. Apply to threads of extendible dipperstick hex socket cap screws for outer pads.

LOCTITE is a registered trademark of Loctite Corp.

CED, TX03399, 5698 -19-06DEC99-1/1

Specifications

Item	Measurement	Specification
Dipperstick (with Bucket Cylinder and Links)	Weight	204 kg (450 lb) Approximate
Dipperstick-to-Boom Connecting Pin	Torque	620 N·m (460 lb-ft)
Boom (with Boom and Crowd Cylinders)	Weight	341 kg (750 lb) Approximate
Boom (with cylinders)	Weight	385 kg (850 lb) Approximate
Boom Collar Set Screws	Torque	49 N·m (36 lb-ft)
Swing Frame	Weight	123 kg (272 lb) Approximate
Dipperstick Extension	Weight	385 kg (850 lb) (Approximate)
Extendible Dipperstick Hex Socket Cap Screws for Internal Pads	Torque	22—27 N·m (16—20 lb-ft)
Extendible Dipperstick Hex Socket Cap Screws for Outer Pads	Torque	47—54 N·m (35—40 lb-ft)

CED, TX03399, 5699 -19-06DEC99-1/1

Remove and Install Dipperstick

1. Remove bucket. (See Remove and Install Bucket and Bucket Links in Group 3302.)
2. Extend boom and dipperstick straight out. Put a floor stand under outer end of boom. Support dipperstick with a hoist.

CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

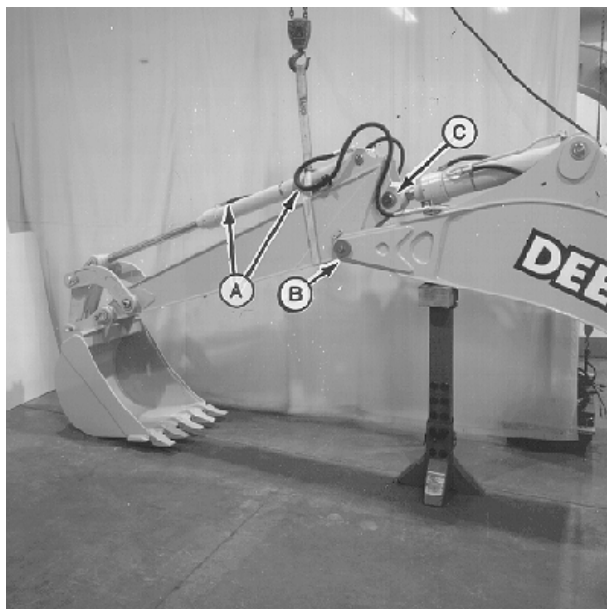
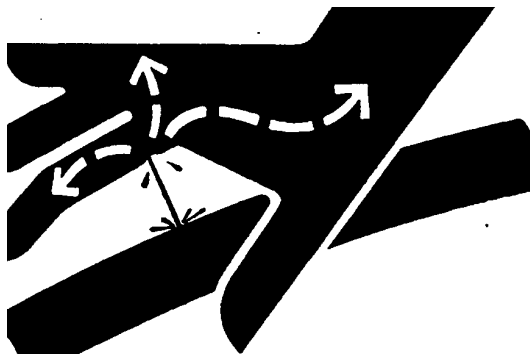
3. Operate all control valves to release pressure in hydraulic system. Tag and remove bucket cylinder lines (A).
4. Remove pin (C) from crowd cylinder and dipperstick.

CAUTION: Dipperstick with bucket cylinder and links weighs approximately 204 kg (450 lb).

Specification

Dipperstick (with Bucket Cylinder and Links)—Weight.....204 kg (450 lb) Approximate

NOTE: If bucket links are removed, fasten rod end of bucket cylinder to dipperstick.



5. Remove pin (B) from boom to dipperstick joint. Remove dipperstick using a hoist.

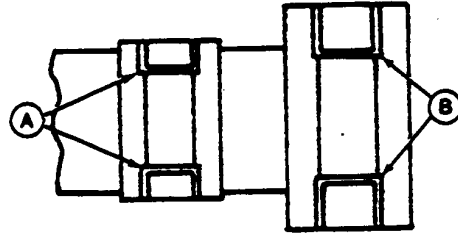
X9811 —UN—23AUG88

T107574 —UN—27FEB97

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TX,31,RR7726 -19-02NOV99-1/2

6. Inspect bushings (A and B).
7. Remove bushings (A and B), if replacement is necessary, using E7018 electrodes. Weld three straight beads on the inside length of the bushing.
8. Allow sufficient time for bushing to cool before removing with a punch.
9. Make sure ID of bores for bushings are clean and free of any grease or oil. Apply retaining compound to inner surface of bore before installing bushings.
10. Install bushings (A) flush.
11. Install new bushings (B) flush.
12. Install dipperstick to boom. Tighten arm pin bolt to specification.



13. Align crowd cylinder and install pin.
14. Connect bucket cylinder lines.

Specification

Dipperstick-to-Boom
 Connecting
 Pin—Torque..... 620 N·m (460 lb-ft)

T92545 —UN—18APR89

TX,31,RR7726 -19-02NOV99-2/2

Remove and Install Boom

CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

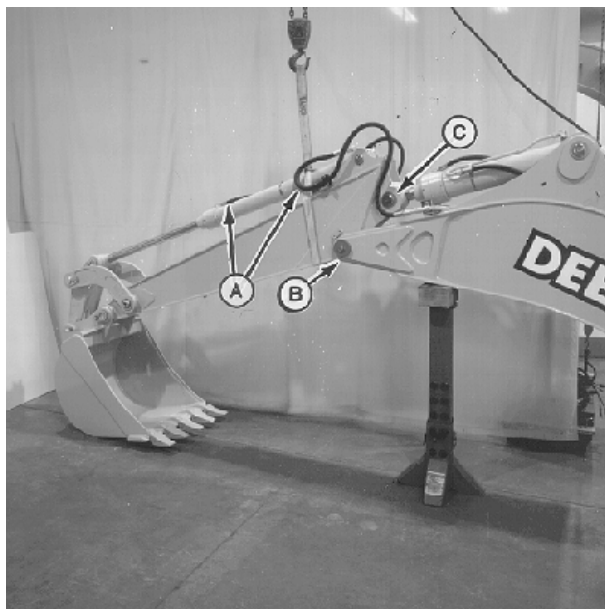
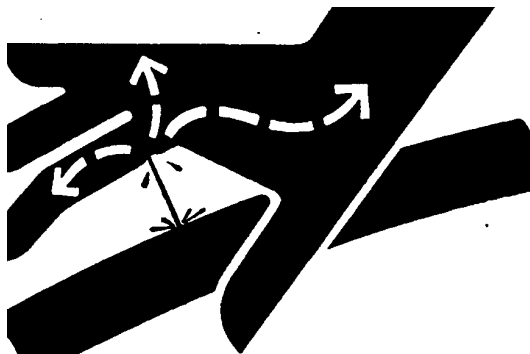
1. Extend boom and dipperstick straight out. Put a floor stand under outer end of boom. Support dipperstick with a hoist.
2. Stop engine and operate all hydraulic controls to release pressure in system. Tag and disconnect bucket hoses (A). Close all openings with caps and plugs.

CAUTION: Boom with boom and crowd cylinders weighs approximately 341 kg (750 lb).

Specification

Boom (with
Boom and Crowd
Cylinders)—Weight..... 341 kg (750 lb) Approximate

3. Remove pins (C and B) and remove dipperstick to the ground using hoist.



X9811 —UN—23AUG88

T107674 —UN—27FEB97

Continued on next page

TX,31,RR7727 -19-02NOV99-1/4

- Support boom with a hoist. Tag and disconnect hoses (A). Close all openings with caps and plugs.
- Put wooden block over oil lines before removing the cylinder rod end. Remove pin (C), snap ring and pin (D), pivot (E), and collar (B). Remove pin from cylinder rod end and lay cylinder on wooden block.

⚠ CAUTION: Prevent possible injury from moving heavy object. The boom and cylinders weigh approximately 385 kg (850 lb).

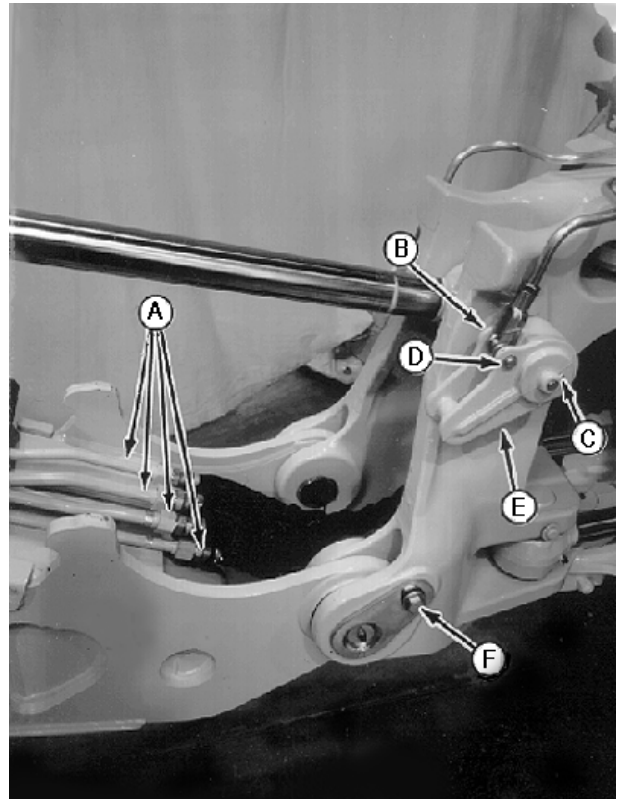
Specification

Boom (with cylinders)
—Weight..... 385 kg (850 lb) Approximate

- Remove cap screws (F) and remove boom pivot pins to remove boom.

A—Hoses
B—Collar
C—Pin

D—Snap Ring
E—Pivot
F—Cap Screw (2 used)



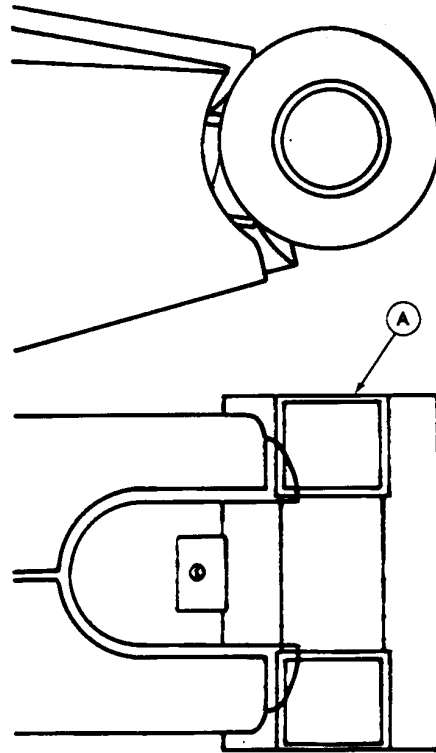
T107582 —UN—06MAR97

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TX.31,RR7727 -19-02NOV99-2/4

7. Inspect bushings (A). Remove if replacement is necessary using E7018 electrodes. Weld three straight beads the inside length of the bushings.
8. Allow sufficient time for bushings to cool before removing using a punch.
9. Make sure ID of bores for bushings are clean and free of any grease or oil. Apply retaining compound to inner surface of bore before installing bushings.

Install new bushings for dipperstick to boom joint bushings and for boom to swing frame joint bushings.



T6130AG—UN—25MAY89

Continued on next page

TX,31,RR7727 -19-02NOV99-3/4

10. Install collar (B). Apply cure primer, then thread lock and sealer (medium strength) to three set screws.

11. Tighten collar set screws to 49 N·m (36 lb-ft).

Specification

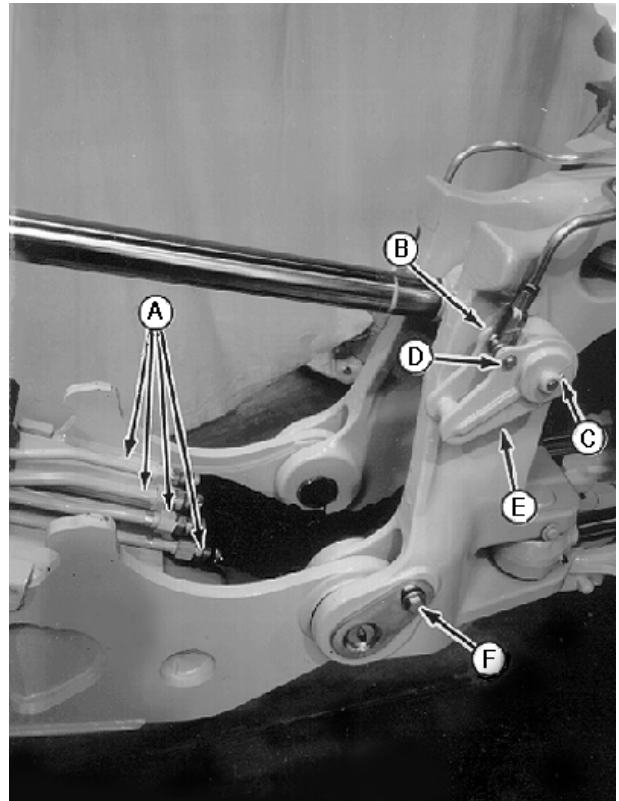
Boom Collar Set
Screws—Torque..... 49 N·m (36 lb-ft)

12. Install pivot (E), pin (C), snap ring, and pin (D).

13. Connect lines (A) to backhoe valve.

14. Install dipperstick to boom. (See Remove and Install Dipperstick in this group.)

- | | |
|-----------------|-----------------------------|
| A—Hoses | D—Snap Ring |
| B—Collar | E—Pivot |
| C—Pin | F—Cap Screw (2 used) |



T107582 —UN—06MAR97

TX,31,RR7727 -19-02NOV99-4/4

Remove and Install Swing Frame

1. Remove dipperstick and boom. (See procedures in this group.)
2. Position swing frame straight rearward.

CAUTION: Swing frame weighs approximately 123 kg (272 lb).

3. Connect swing frame to hoist using a lift strap (A).
4. Remove swing cylinder snap ring (F) and remove rod. Remove swing cylinder pins (D).
5. Remove cap screws (C and E) to remove swing pivot pins (B and H).
6. Remove swing frame and thrust washer (G) for repair or replacement.

Specification

Swing Frame—Weight..... 123 kg (272 lb) Approximate

NOTE: Weight of backhoe is supported at the lower pivot. There must be clearance between upper main frame pivot boss and the ears of the swing frame.

7. Install thrust washer on top of lower pivot boss.

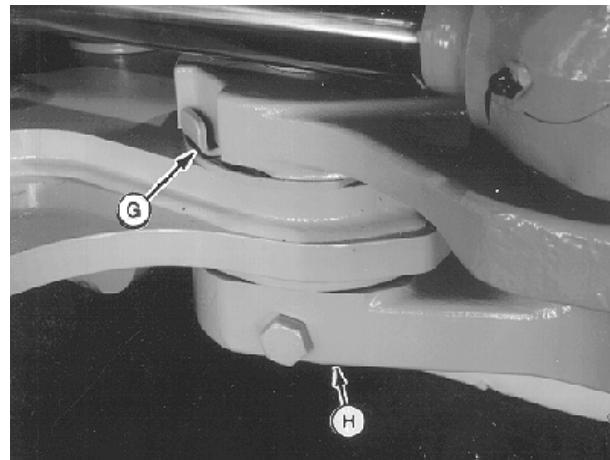
NOTE: Install swing frame pins so that cross-drilled holes align with holes in swing frame to ease hardware installation.

8. Position swing frame and install pin (B) even with top surface. Secure in position with cap screw (C) and nut.
9. Install pin (H) even with top surface of swing frame. Make sure pin is through thrust washer. Secure in position with cap screw (E) and nut.
10. Align swing cylinders and install pins (D) from the bottom. Top of pins should be even with casting. Secure in position with rod and snap ring.
11. Install boom and dipperstick. (See procedures in this group.)

- | | |
|-------------------------------------|--|
| A—Lift Strap | E—Lower Pivot Locking Cap Screw |
| B—Upper Pivot Pin | F—Swing Cylinder Locking Snap Ring and Rod |
| C—Upper Pivot Locking Cap Screw | G—Thrust Washer |
| D—Swing Cylinder Pivot Pin (2 used) | H—Lower Pivot Pin |



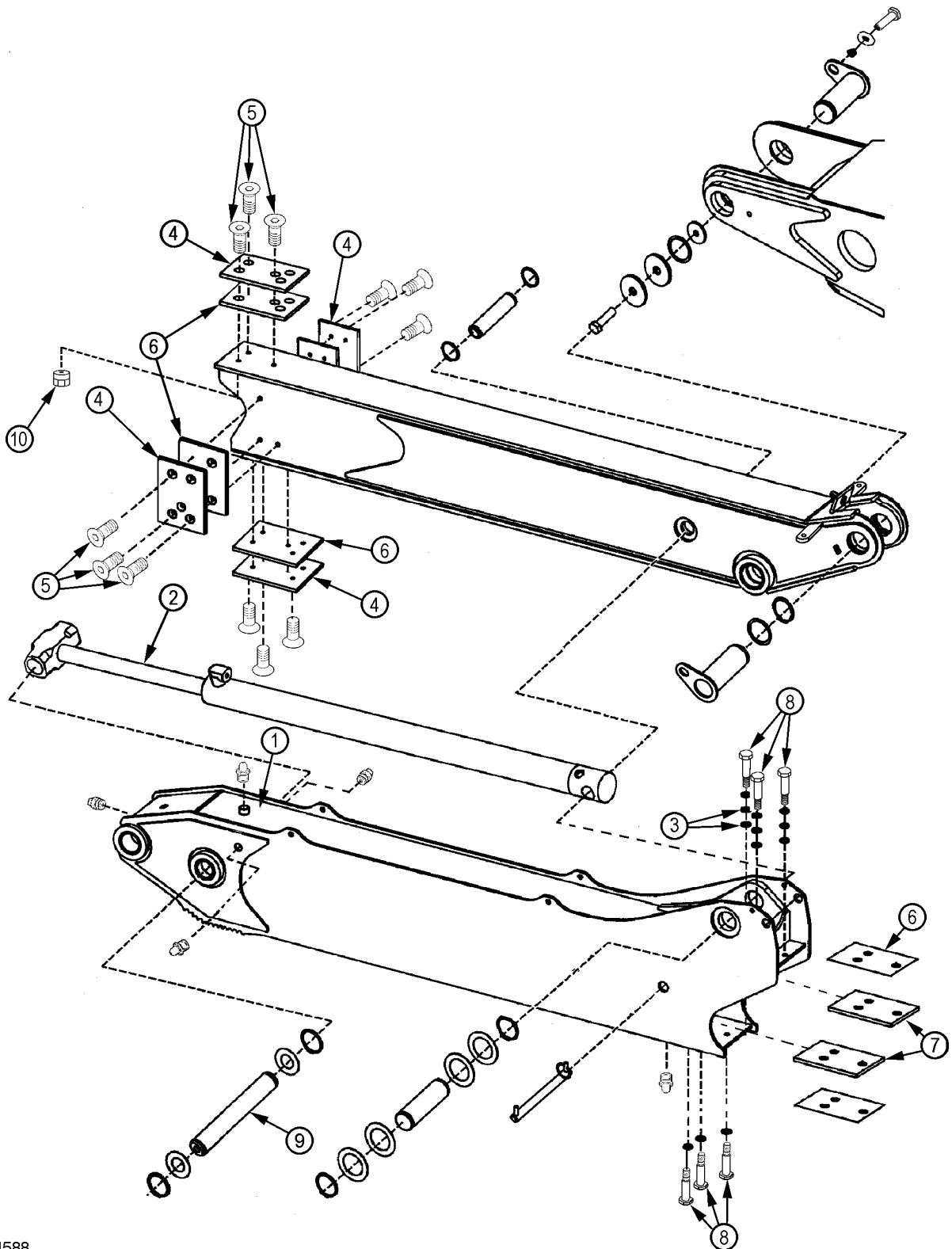
T107577 —UN—27FEB97



T107578 —UN—27FEB97

TX,31,RR7728 -19-24FEB97-1/1

Remove Extendible Dipperstick Extension



T134588

T134588 —UN—20OCT00

Continued on next page

CED,OOU01010,489 -19-26FEB02-1/4

Frames

- | | | | |
|--|---|--|------------------------|
| 1— Outer Box
2— Extendible Dipperstick
Cylinder
3— Washer (12 used) | 4— Internal Wear Pad (4 used)
5— Cap Screws (12 used)
6— Shim (as required) | 7— Upper Outer Wear Pad and
Lower Outer Wear Pad
8— Cap Screw (6 used)
9— Pin | 10— Lock Nut (12 used) |
|--|---|--|------------------------|

CED,OUO1010,489 -19-26FEB02-2/4

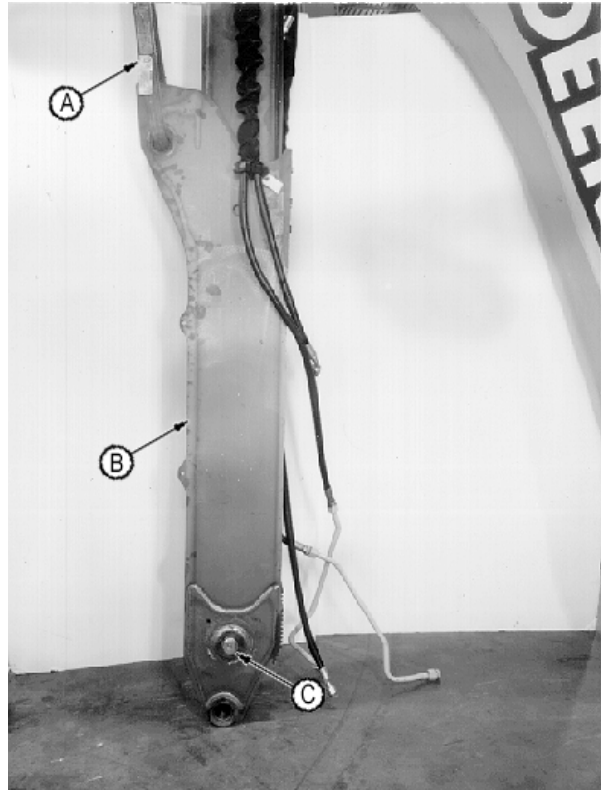
1. Park machine on level surface. Extend boom and extendible dipperstick to maximum reach with bucket dumped and lowered to the ground.
2. Stop engine and set park brake.
3. Remove bucket and bucket links. (See Remove and Install Bucket and Bucket Links in Group 3302.)
4. Remove quick coupler (if equipped).
5. Remove bucket cylinder. (See Remove and Install Backhoe Bucket Cylinder in Group 3360.) Let hoses and lines hang to the side.
6. Remove outer upper (8) and outer lower (10) wear pads. Remove shims (7) (if equipped).

⚠ CAUTION: Prevent possible injury from falling dipperstick extension. Make sure hoist is attached to dipperstick extension. When extendible cylinder rod end pin is removed, dipperstick extension can drop suddenly. Dipperstick extension weighs approximately 386 kg (850 lb).

Specification

Dipperstick
 Extension—Weight.....385 kg (850 lb) (Approximate)

7. Install a hoist and chain to dipperstick extension (A)
8. Remove snap ring and remove extendible dipperstick cylinder rod end pin (C).
9. Raise boom and put dipperstick extension in vertical position (B). While raising boom and moving dipperstick toward machine with extension supported on the ground, raise boom until extension can be removed.



T104732 —UN—25OCT96

A—Dipperstick Extension **C—Cylinder Rod End Pin**
B—Dipperstick Extension in
Vertical Position

10. Inspect internal dipperstick wear pads (4). Replace if necessary.

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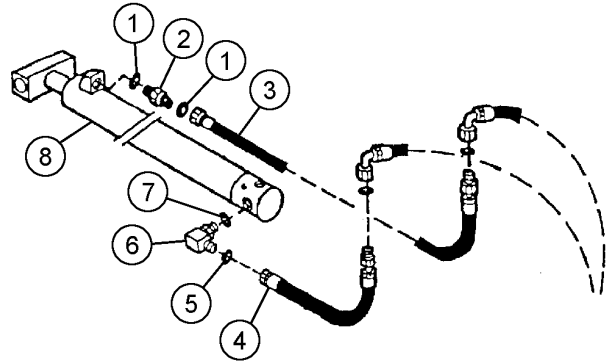
CED,OUO1010,489 -19-26FEB02-3/4

11. Inspect extendible dipperstick cylinder hoses and fittings for wear. Replace parts as needed. Attach extendible cylinder hoses and fittings and tighten.

Specification

Rod End (1)	
Hose-to-fitting—Torque.....	73 N·m (54 lb-ft.)
Head End (4)	
Hose-to-Elbow	
Fitting—Torque.....	73 N·m (54 lb-ft.)
Elbow Fitting (6) to	
Extendible Cylinder Head	
End—Torque.....	73 N·m (54 lb-ft.)

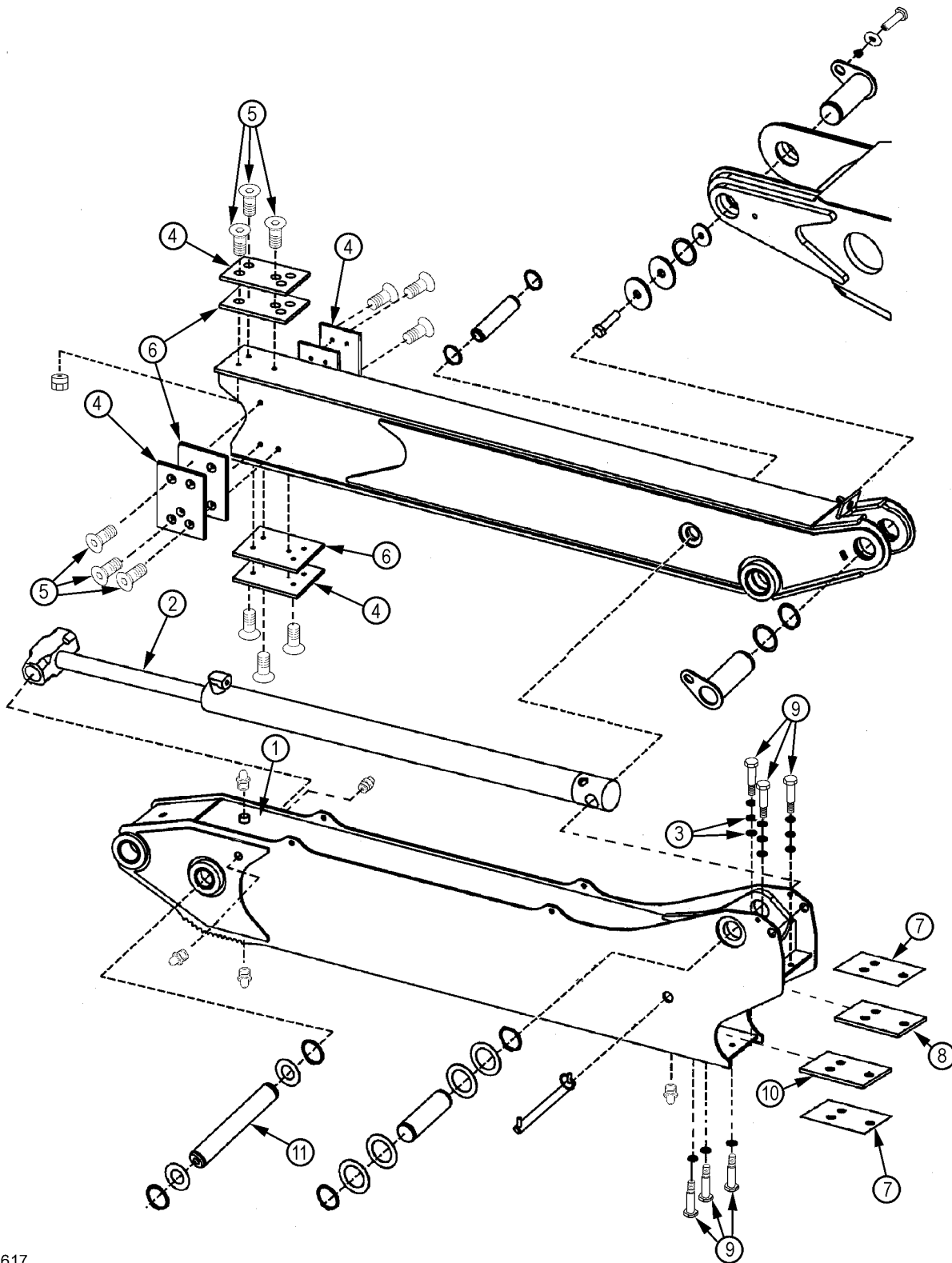
- | | |
|--------------------|------------------------|
| 1— O-Ring (2 Used) | 5— O-Ring |
| 2— Fitting | 6— Elbow Fitting |
| 3— Hose, Rod End | 7— O-Ring |
| 4— Hose, Head End | 8— Extendible Cylinder |



T151963—UN—27FEB02

CED,OUO1010,489 -19-26FEB02-4/4

Install Extendible Dipperstick Extension



T125617

T125617 —UN—08NOV99

Continued on next page

CED.OU01010,490 -19-04NOV99-1/2

Frames

- 1— Outer Box
- 2— Extendible Dipperstick Cylinder
- 3— Washer (12 used)

- 4— Internal Wear Pad (4 used)
- 5— Cap Screws (12 used)
- 6— Shim (as required)

- 7— Shim (as required)
- 8— Upper Outer Wear Pad
- 9— Cap Screw (6 used)

- 10— Lower Outer Wear Pad
- 11— Pin
- 12— Lock Nut

IMPORTANT: It is important to maintain running clearance between pad and inner member of extension.

Do not damage shims. Only put in enough shims to fill clearance and then remove one shim.

Locking nuts should be replaced if removed to prevent loosening.

1. Install shims (6), as required, to fill clearance and then remove one shim. If wear pads are replaced, install new lock nuts (12) with flat face of nut mating to dipperstick.

NOTE: Do not over tighten cap screws or pad deformation may result.

2. Tighten hex socket cap screws (5) to 22—27 N·m (16—20 lb-ft).

Specification

Extendible Dipperstick
Hex Socket Cap
Screws for Internal
Pads—Torque..... 22—27 N·m (16—20 lb-ft)

3. Apply a light film of grease on wear pads.

4. With the extension in the vertical position, install dipperstick into the extension using the hoist.
5. Install extendible dipperstick cylinder rod end pin (11) through dipperstick and cylinder rod end.
6. Install outer upper (8) and outer lower (10) wear pads. Install shims (7) as required. For every three shims added, remove a washer (3) from under the head of cap screws (9) to allow adequate thread engagement.
7. Apply cure primer, then thread lock and sealer (medium strength) to threads of cap screws (9). Tighten cap screws (9).

Specification

Extendible Dipperstick
Hex Socket Cap Screws
for Outer Pads—Torque..... 47—54 N·m (35—40 lb-ft)

8. Install bucket cylinder. (See procedure in Group 3360.)
9. Install bucket, links, and quick couplers (if equipped). (See procedure in Group 3302.)
10. Cycle extension in and out to ensure proper operation.

CED,OUO1010,490 -19-04NOV99-2/2

Frames

Group 3360 Hydraulic System

Essential Tools

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or from the European Microfiche Tool Catalog (MTC).

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CED,TX03399,5887 -19-05JAN00-1/4

Relief Valve Seal Installer JDG1290 To install special seal on relief valve.

CED,TX03399,5887 -19-05JAN00-2/4

Shut-Off Plug Seal Installer JDG1328 To install special seal on shut-off plug.

CED,TX03399,5887 -19-05JAN00-3/4

Seal Installation Tool..... JDG734 Install seals and wiper rings in spool valves.

CED,TX03399,5887 -19-05JAN00-4/4

Service Equipment and Tools

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or from the

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European Microfiche Tool Catalog (MTC). Some tools may be available from a local supplier.

CED,TX03399,5702 -19-06DEC99-1/2

Spanner Wrench..... PH95—473—6A Used to loosen and tighten boom, bucket, and crowd cylinder jam (spanner) nut.

CED,TX03399,5702 -19-06DEC99-2/2

Hydraulic System

Other Material

Number	Name	Use
TY16285 (U.S.) CXTY16285 (Canadian) 7649 (LOCTITE®)	Cure Primer	Apply to threads of spool, spool end screw, and spool tang. Apply to threads of spool and spool end screw. Apply to boom, bucket, and crowd cylinder rod threads. Apply to boom, bucket, and crowd cylinder barrel threads. Apply to threads of swing and stabilizer cylinder spanner nut. Apply extendible dipperstick cylinder rod threads. Apply to threads of spanner nut.
T43513 (U.S.) TY9474 (Canadian) 271 (LOCTITE®)	Thread Lock and Sealer (High Strength)	Apply to spool end screw and spool tang. Apply to threads of spool end screw. Apply to boom, bucket, and crowd cylinder rod threads. Apply to extendible dipperstick cylinder rod threads. Apply to spanner nut threads.
TY24311 (U.S.) CXTY24311 (Canadian) 222 (LOCTITE®)	Thread Lock and Sealer (Low Strength)	Apply to boom, bucket, and crowd cylinder barrel threads.
T43512 (U.S.) TY9473 (Canadian) 242 (LOCTITE®)	Thread Lock and Sealer (Medium Strength)	Apply to threads of swing and stabilizer cylinder spanner nut.

LOCTITE is a registered trademark of Loctite Corp.

CED, TX03399, 5705 -19-06DEC99-1/1

Specifications

Item	Measurement	Specification
Backhoe Control Valve		
Five Stack Backhoe Control Valve	Weight	61 kg (135 lb) Approximate
Backhoe Control Valve	Weight	64 kg (140 lb) Approximate
Backhoe Control Valve Tie Rod Nuts (1/2-20 Threads)	Torque	100 N·m (74 lb-ft)
Backhoe Control Valve Tie Rod Nuts (7/16-20 Threads)	Torque	65 N·m (48 lb-ft)
Circuit Relief Valve, 27 mm (1-1/16 in.) Thread	Torque	65 N·m (48 lb-ft)
Circuit Relief Valve with Locking Ring, 22 mm (7/8 in.) Thread	Torque	34 N·m (25 lb-ft)
Circuit Relief Locking Ring	Torque	14 N·m (10 lb-ft)
Anti-Cavitation Valve (Installation)	Torque	65 ± 7 N·m (48 ± 5 lb-ft)
Backhoe Boom Raise, Bucket Dump, Crowd Out Circuit Relief Valves with Anti-Cavitation and Load Sense Relief Valve without Anti-Cavitation Cap and Nut	Torque	24 ± 3 N·m (18 ± 2 lb-ft)
Backhoe Boom Raise, Bucket Dump, Crowd Out Circuit Relief Valves with Anti-Cavitation and Load Sense Relief Valve without Anti-Cavitation (Installation)	Torque	45 ± 4.7 N·m (33 ± 3.5 lb-ft)
Backhoe Bucket Curl Circuit Relief Valve with Anti-Cavitation Nut	Torque	45 ± 4.7 N·m (33 ± 3.5 lb-ft)
Backhoe Bucket Curl Circuit Relief Valve with Anti-Cavitation Valve Body	Torque	65 ± 7 N·m (48 ± 5 lb-ft)
Backhoe Bucket Curl Circuit Relief Valve with Anti-Cavitation (Installation)	Torque	65 ± 7 N·m (48 ± 5 lb-ft)
Backhoe Swing, Boom Lower, Crowd In Circuit Relief Valves and System Relief Valve (Installation)	Torque	65 ± 7 N·m (48 ± 5 lb-ft)
Backhoe Electro-Hydraulic Auxiliary Circuit Relief Valve Nut	Torque	5 ± 0.68 N·m (44 ± 6 lb-in.)
Backhoe Electro-Hydraulic Auxiliary Circuit Relief Valve Body Plug	Torque	45 ± 4.7 N·m (33 ± 3.5 lb-ft)
Backhoe Electro-Hydraulic Auxiliary Circuit Relief Valve (Installation)	Torque	45 ± 4.7 N·m (33 ± 3.5 lb-ft)
Shut-Off Plug (Installation)	Torque	65 ± 7 N·m (48 ± 5 lb-ft)
Backhoe Inlet Section Plug	Torque	22—27 N·m (16—20 lb-ft)
Backhoe Auxiliary Flow Section End Cap Screws	Torque	9.5 N·m (84 lb-in.)

Continued on next page

CED, TX03399, 5902 -19-10JAN00-1/2

Hydraulic System

Item	Measurement	Specification
Backhoe Auxiliary Flow Section Electro-Hydraulic Pilot valve Block Screws	Torque	9.5 N·m (84 lb-in.)
Backhoe Auxiliary Flow Section Electro-Hydraulic Pilot Solenoid Screws	Torque	2 N·m (18 lb-in.)
Backhoe Auxiliary Flow Section Plug	Torque	65 N·m (48 lb-ft)
Backhoe Swing, Boom, Bucket, Crowd and Extendible Section Spool End Screw	Torque	9.5 N·m (84 lb-in.)
Backhoe Swing, Boom, Bucket, Crowd and Extendible Section Seal Plate Screws	Torque	5.5 N·m (48 lb-in.)
Backhoe Boom Crowd and Extendible Section Plug	Torque	65 N·m (48 lb-ft)
Backhoe Boom, Crowd and Extendible Section Plug	Torque	65 N·m (48 lb-ft)
Spool Cap, Cap Screws	Torque	9.5 N·m (84 lb-in.)
Spool Retainer Plate Screws	Torque	5.5 N·m (48 lb-in.)
Stabilizer Valve Spool Caps	Torque	50 ± 3 N·m (37 ± 2 lb-ft)
Stabilizer Valve Hex Drive Retaining Plug	Torque	50 N·m (37 lb-ft)
Backhoe Cylinder		
Backhoe Bucket Cylinder	Weight	34 kg (75 lb) Approximate
Backhoe Crowd Cylinder	Weight	59 kg (130 lb) Approximate
Backhoe Boom Cylinder	Weight	82 kg (180 lb) Approximate
Backhoe Bucket Cylinder Piston Nut	Torque Turn	340 N·m (250 lb-ft) + 1/8 (45°) turn
Backhoe Boom Cylinder Piston Nut	Torque Turn	375 N·m (276 lb-ft) + 1/8 (45°) turn
Backhoe Crowd Cylinder Piston Nut (S.N. —837228)	Torque Turn	375 N·m (276 lb-ft) + 1/4 (90°) turn
Backhoe Crowd Cylinder Piston Cap Screw (S.N. 837229—873597)	Torque Turn	1000 N·m (738 lb-ft) + 1/6 (60°) turn
Backhoe Crowd Cylinder Piston Nut (S.N. —873598)	Torque Turn	200 N·m (148 lb-ft) + 1/6 (60°) turn
Boom, Bucket, and Crowd Cylinder Rod Guide Jam (Spanner) Nut	Torque	1350 N·m (1000 lb-ft)
Swing Cylinder	Weight	48 kg (106 lb) Approximate
Swing Cylinder Hydraulic Fittings	Torque	34 N·m (25 lb-ft)
Stabilizer Cylinder	Weight	39 kg (86 lb) Approximate
Backhoe Swing Cylinder Piston	Torque Turn	225 N·m (165 lb-ft) + 1/6 (60°) turn
Backhoe Stabilizer Cylinder Piston	Torque Turn	600 N·m (442 lb-ft) + 1/12 (30°) turn
Extendible Dipperstick Cylinder Piston Nut	Torque Turn	170 N·m (125 lb-ft) plus 45° turn

CED.TX03399.5902 -19-10JAN00-2/2

Hydraulic System

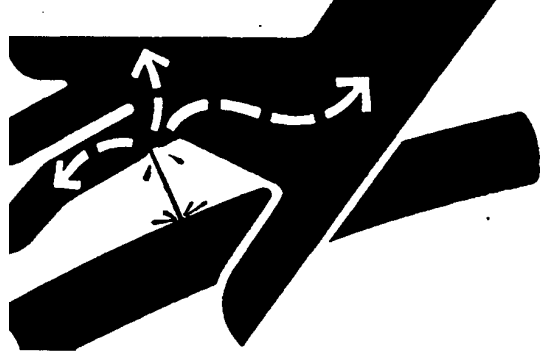
Item	Measurement	Specification
Spanner Nut	Torque	520—600 N·m (384—443 lb-ft)

CED, TX03399, 5902 -19-10JAN00-3/2

Remove and Install Backhoe Control Valve

⚠ CAUTION: To avoid injury from escaping fluid under pressure, stop engine and relieve the pressure in the system before disconnecting or connecting hydraulic or other lines. Tighten all connections before applying pressure.

1. Lower backhoe bucket on the floor with dipperstick straight out.
2. Stop engine and operate all hydraulic control levers to relieve pressure in the hydraulic system.
3. Disconnect linkage from backhoe valve spools.

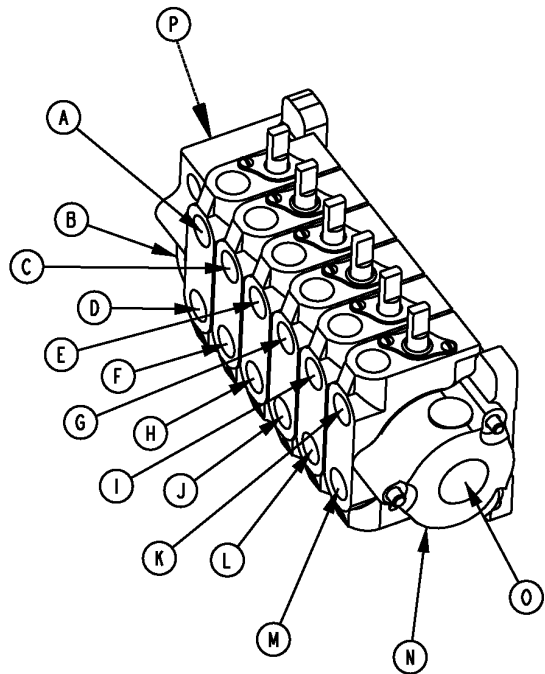


X9811 —UN—23AUG88

TX,33,RR7798 -19-23NOV98-1/6

4. Disconnect all lines (A—P) from valve. Close all openings with caps and plugs.

- | | |
|--|--|
| <p>A—Auxiliary Function
 B—Return from Stabilizer
 C—To Extendible Cylinder Head End
 D—Auxiliary Function
 E—To Crowd Cylinder Head End
 F—To Extendible Cylinder Rod End
 G—To Bucket Cylinder Head End
 H—To Crowd Cylinder Rod End</p> | <p>I— To Boom Cylinder Head End
 J— To Bucket Cylinder Rod End
 K—To Swing Cylinder Right Head End Tee to Left Cylinder Rod End
 L— To Boom Cylinder Rod End
 M—To Swing Cylinder Left Head End Tee to Right Cylinder Rod End
 N—From Hydraulic Pump Discharge
 O—Stabilizer Pressure Line-to-Backhoe Valve
 P—To Hydraulic Filter</p> |
|--|--|



T100806

T100806 —UN—27JAN97

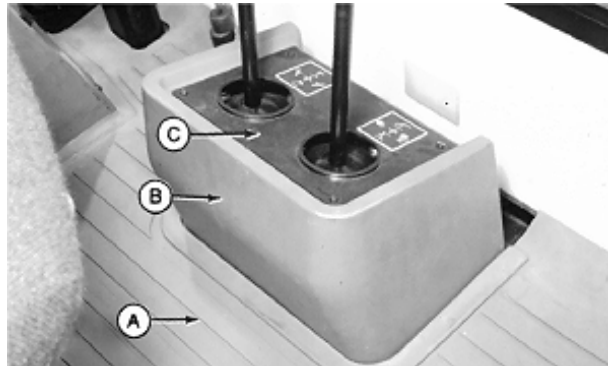
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TX,33,RR7798 -19-23NOV98-2/6

Hydraulic System

- Remove floor mat (A), cover (B) and backhoe lever console (C).
- Remove foot pedal or pedals, if equipped.

A—Floor Mat C—Console
B—Console Cover



T7520BG—UN—02MAY91

TX,33,RR7798 -19-23NOV98-3/6

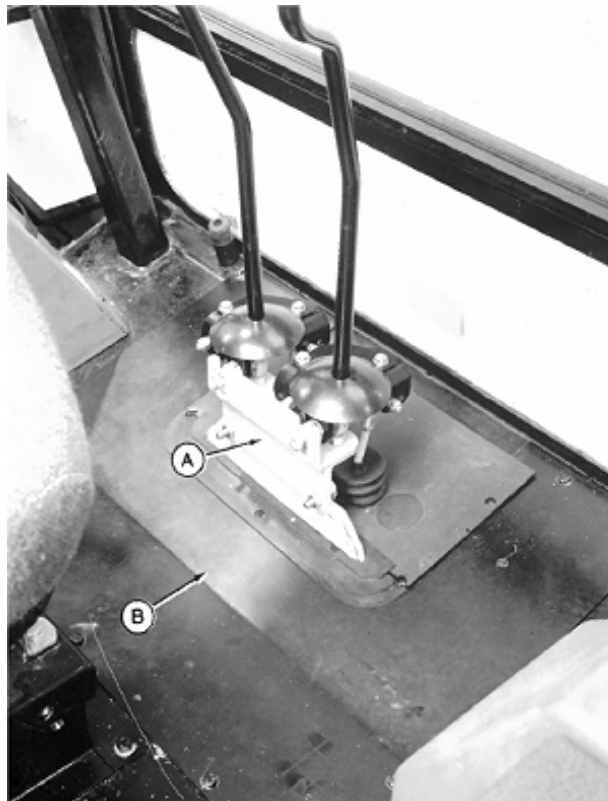
- Remove floor plate (B) and lever assembly bracket (A) with levers.
- Install lifting strap around backhoe control valve and a hoist.

CAUTION: Approximate weight of five stack backhoe control valve is 61 kg (135 lb).

Specification

Five Stack Backhoe
Control Valve—Weight..... 61 kg (135 lb) Approximate

A—Lever Assembly Bracket B—Floor Plate



T7525AC—UN—06MAY91

Continued on next page

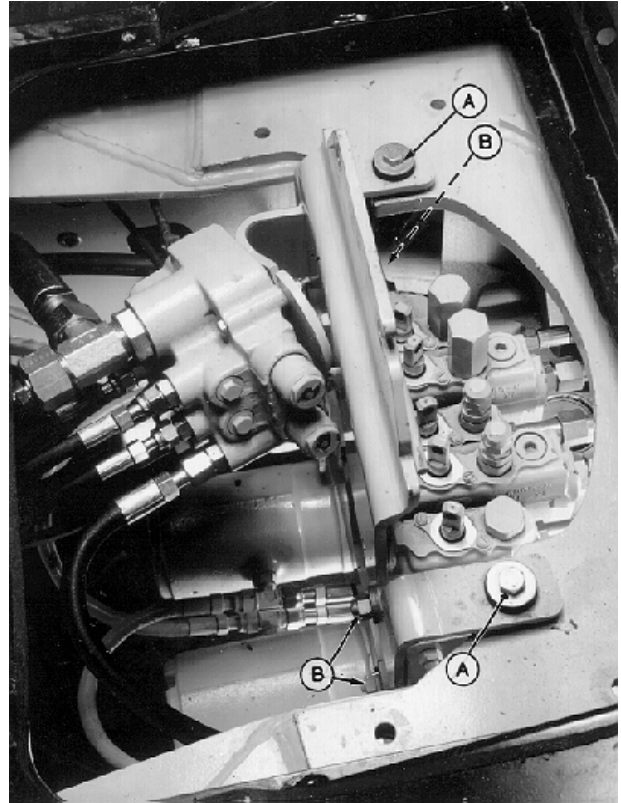
TX,33,RR7798 -19-23NOV98-4/6

Hydraulic System

9. Remove cap screws (A and B). Remove valve "L" shaped bracket. Move backhoe valve bracket back and slowly remove valve.
10. Install valve and cap screws (A and B). Tighten cap screws.
11. Install lever assembly and bracket with levers, floor plate, and foot pedal or pedals, if equipped.
12. Install backhoe lever console, cover and floor mat.
13. Connect backhoe valve linkage.

A—Cap Screw (2 used)

B—Cap Screw (2 used)



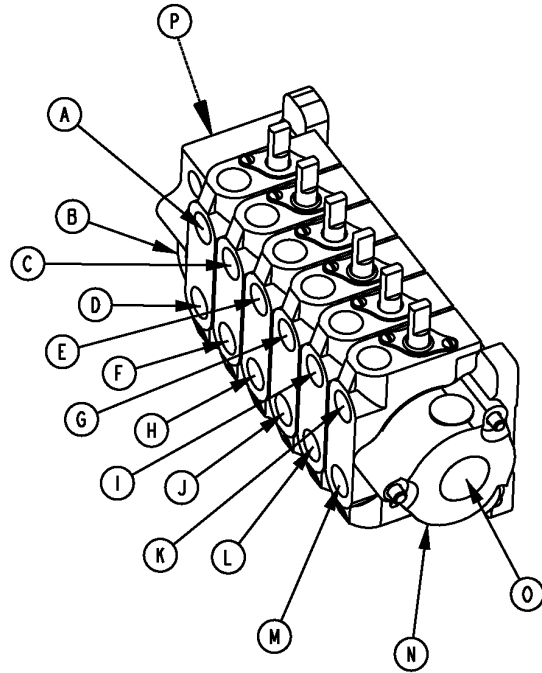
T100808 —UN—15APR97

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TX,33,RR7798 -19-23NOV98-5/6

14. Connect hydraulic lines (A—P).

- | | |
|-----------------------------------|---|
| A—Auxiliary Function | I— To Boom Cylinder Head End |
| B—Return from Stabilizer | End |
| C—To Extendible Cylinder Head End | J— To Bucket Cylinder Rod End |
| D—Auxiliary Function | K—To Swing Cylinder Right Head End Tee to Left Cylinder Rod End |
| E—To Crowd Cylinder Head End | L—To Boom Cylinder Rod End |
| F—To Extendible Cylinder Rod End | M—To Swing Cylinder Left Head End Tee to Right Cylinder Rod End |
| G—To Bucket Cylinder Head End | N—From Hydraulic Pump Discharge |
| H—To Crowd Cylinder Rod End | O—Stabilizer Pressure Line-to-Backhoe Valve |
| | P—To Hydraulic Filter |

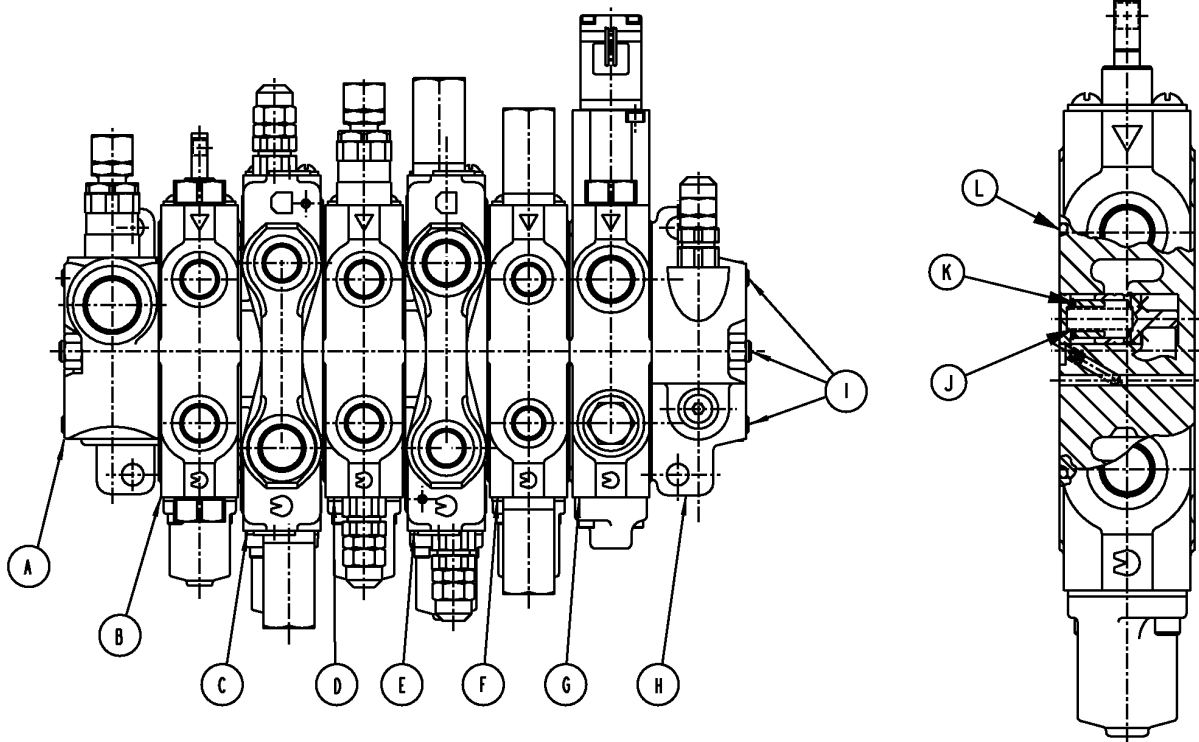


T100806

T100806—UN—27JAN97

TX,33,RR7798 -19-23NOV98-6/6

Disassemble and Assemble Backhoe Control Valve



T100651

A—Outlet Section
B—Auxiliary Flow Section
C—Crowd Section

D—Bucket Section
E—Boom Section
F—Swing Section

G—Electro-Hydraulic Auxiliary Section
H—Inlet Section
I— Nut and Tie Rod Assembly (3 used)

J— Orifice (one in each section except the auxiliary flow section)
K—Compensator Valve (one in each section)
L— O-Ring (one between each section)

IMPORTANT: Keep all components for each valve section together as a set.

CAUTION: Prevent possible injury from falling heavy control valve. The control valve weighs approximately 64 kg (140 lb). Use a hoist to lift the valve assembly from the machine to the bench. Support the valve assembly in a holding fixture.

Specification

Backhoe Control Valve—Weight..... 64 kg (140 lb) Approximate

1. Set control valve assembly vertically on a work bench with the inlet section on the bottom.

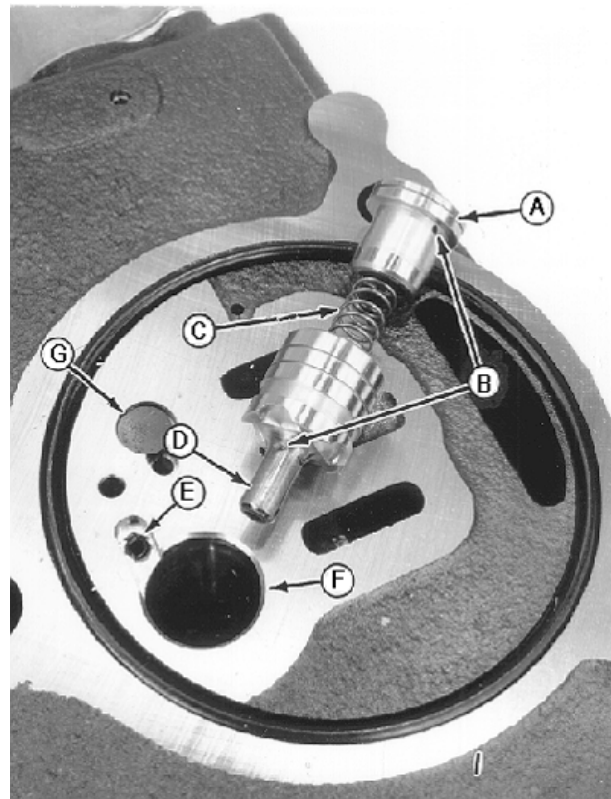
2. To aid in assembly, identify each section with a mark.
3. Remove nuts and tie rods (I).
4. Carefully remove sections (A—H) so as not to lose or damage O-rings (L), orifices (J), compensators (K) and load sense logic check. Keep compensators and valve sections together as a set.
5. Inspect O-rings between each section for wear or damage. Replace as necessary.

Continued on next page

TX,31,RR7669 -19-31OCT07-1/3

T100651—UN—08APR97

6. Inspect compensator parts (A and D), springs (C), orifices (B and E), and load sense logic checks (G) for scoring, wear, or damage. Replace as necessary.
7. Apply clean hydraulic oil to all internal parts.



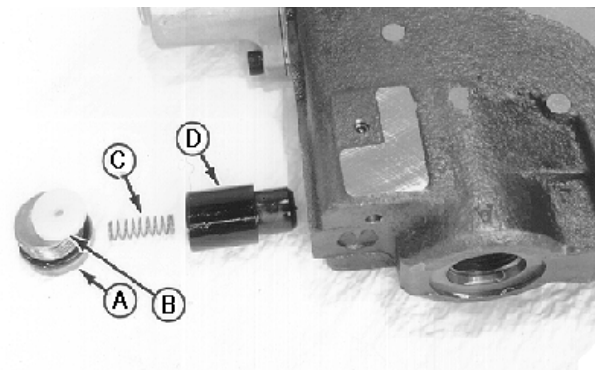
T108649 —UN—07APR97

TX,31,RR7669 -19-31OCT07-2/3

8. Remove and inspect the anti-drift poppet parts (A—D) used on the boom, crowd, and extendible dipperstick sections only.
9. Assemble sections making sure load sense logic checks, compensators, spring and O-ring remain in position. Install the tie rods in so the shorter threaded length end is on the bottom. Fully screw on the nuts on the shorter threaded end.
10. Install nuts on other end of tie rods and snug tight; do not make final torque.

IMPORTANT: Tighten tie rod evenly and at several intervals to prevent valve spool binding or leakage between sections.

11. Lay valve assembly horizontally on bench supported by blocks under the mounting feet. Tighten tie rod nuts to specification.



T108647 —UN—07APR97

A—Plug with O-Ring
B—Spring Guide

C—Spring
D—Anti-Drift Poppet

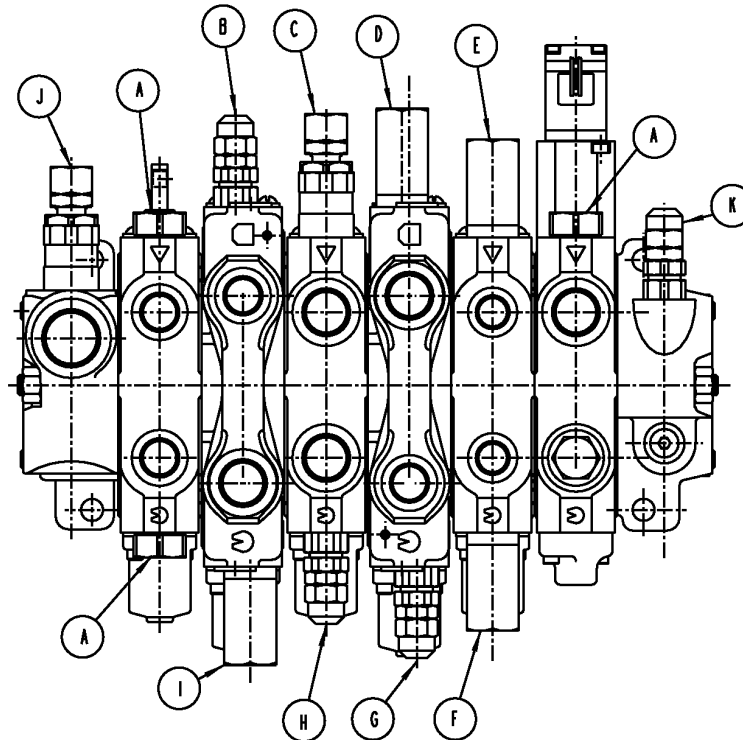
Specification

Specification	
Backhoe Control Valve	
Tie Rod Nuts (1/2-20	
Threads)—Torque.....	100 N·m (74 lb-ft)

Specification	
Backhoe Control Valve	
Tie Rod Nuts (7/16-20	
Threads)—Torque.....	65 N·m (48 lb-ft)

TX,31,RR7669 -19-31OCT07-3/3

Remove and Install Backhoe Circuit Relief and System Relief Valves



T100650

- | | | | |
|--|----------------------------|----------------------------|---------------------------|
| A—Extendible Dipperstick Plugs
(2 used) | D—Boom Down Relief Valve | G—Boom Raise Relief Valve | J—System Relief Valve |
| B—Crowd Out Relief Valve | E—Swing Left Relief Valve | H—Bucket Dump Relief Valve | K—Load Sense Relief Valve |
| C—Bucket Curl Relief Valve | F—Swing Right Relief Valve | I—Crowd In Relief Valve | |

IMPORTANT: Relief valves MUST be installed in the correct ports for proper valve function.

- To aid in assembly, put identification marks on the relief valves and the valve section.
- Remove relief valves.
- Remove and inspect O-rings and backup rings for damage. If damaged, check housing for cause.
- Install new O-rings and backup rings.
- Install circuit relief valves in control valve. Tighten relief valves to specification.

Specification

Circuit Relief Valve,
27 mm (1-1/16 in.)
Thread—Torque..... 65 N·m (48 lb-ft)

Circuit Relief Valve with
Locking Ring, 22 mm (7/8
in.) Thread—Torque..... 34 N·m (25 lb-ft)
Circuit Relief Locking
Ring—Torque..... 14 N·m (10 lb-ft)

IMPORTANT: Relief valves MUST be adjusted when valves are disassembled or replaced. Failure to do so could cause damage to hydraulic system.

- For pressures and adjustments of relief valves, see Operation and Test Manual Group 9025-25 for procedures.

T100650—JUN—28MAR97

CED,TX03399,5570 -19-19OCT99-1/1

Disassemble and Assemble Anti-Cavitation Valve

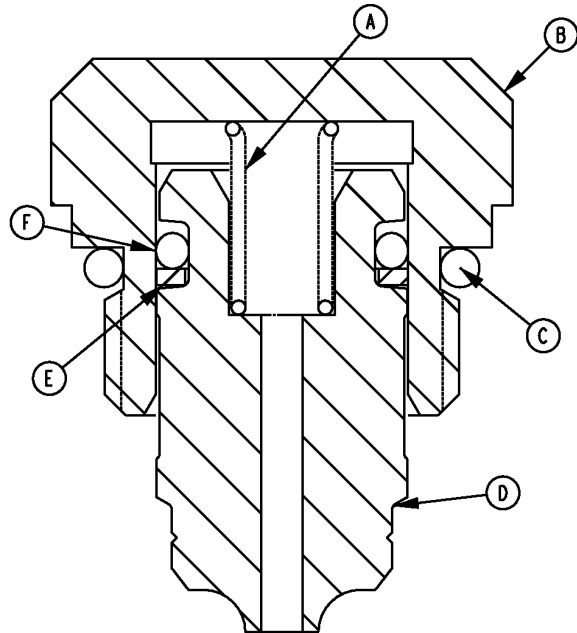
1. Disassemble and inspect parts for wear and damage. Replace as necessary.
2. Put clean hydraulic oil on all parts before assembly.
3. Anti-cavitation valve installation torque.

Specification

Anti-Cavitation Valve
(Installation)—Torque..... 65 ± 7 N·m (48 ± 5 lb-ft)

A—Spring
B—Valve Body
C—O-Ring

D—Poppet
E—Backup Ring
F—O-Ring



T100609

T100609—UN—27JAN97

TX,33,RR7867 -19-10JAN00-1/1

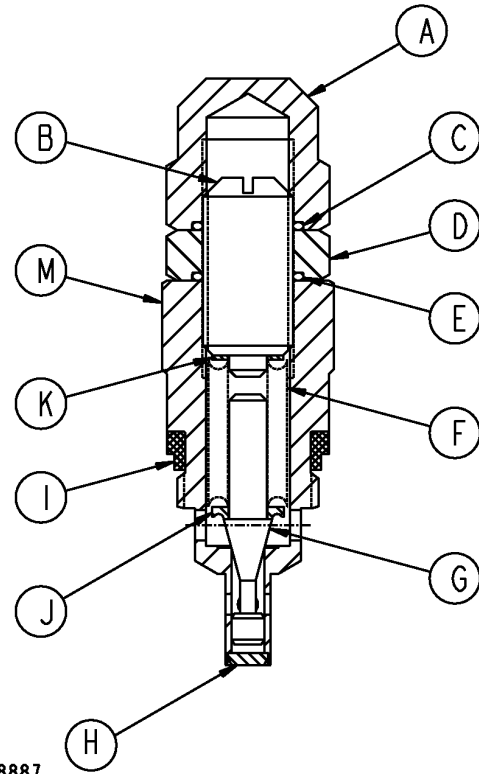
Disassemble and Assemble Backhoe Boom Raise, Bucket Dump, Crowd Out Circuit Relief Valves with Anti-Cavitation and Load Sense Relief Valve without Anti-Cavitation

1. Disassemble and inspect parts for wear and damage. Replace as necessary.
2. Put clean hydraulic oil on all parts before assembly.
3. Install special seal (I) using JDG1290 Seal Installer.
4. Tighten valve cap (A), nut (D) to specification. Reference circuit relief valve installation torque.

Backhoe Control Valve—Specification

Backhoe Boom Raise,
 Bucket Dump, Crowd
 Out Circuit Relief Valves
 with Anti-Cavitation and
 Load Sense Relief Valve
 without Anti-Cavitation
 Cap and Nut—Torque..... 24 ± 3 N·m (18 ± 2 lb-ft)
 Backhoe Boom Raise,
 Bucket Dump, Crowd
 Out Circuit Relief Valves
 with Anti-Cavitation and
 Load Sense Relief Valve
 without Anti-Cavitation
 (Installation)—Torque..... 45 ± 4.7 N·m (33 ± 3.5 lb-ft)

- | | |
|--------------------------|-------------------------|
| A—Cap | G—Poppet |
| B—Adjusting Screw | H—Orifice |
| C—O-Ring | I— Special Seal |
| D—Nut | J— Collar |
| E—O-Ring | K—Retaining Ring |
| F—Spring | M—Valve Body |



T108887

T108887 —UN—09APR97

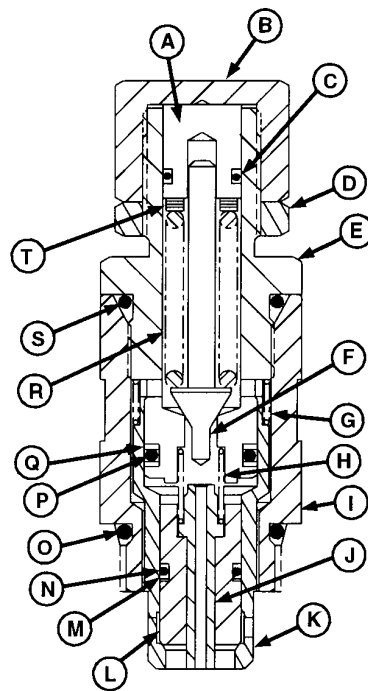
TX,33,RR7862 -19-19OCT99-1/1

Disassemble and Assemble Backhoe Bucket Curl Circuit Relief Valve with Anti-Cavitation

1. Disassemble and inspect parts for wear and damage. Replace as necessary.
2. Put clean hydraulic oil on all parts before assembly.
3. Tighten nut (D) and valve body (E) to specifications. Reference relief valve installation torque.

Specification

Backhoe Bucket Curl Circuit Relief Valve with Anti-Cavitation Nut—Torque.....	45 ± 4.7 N·m (33 ± 3.5 lb-ft)
Backhoe Bucket Curl Circuit Relief Valve with Anti-Cavitation Valve Body—Torque.....	65 ± 7 N·m (48 ± 5 lb-ft)
Backhoe Bucket Curl Circuit Relief Valve with Anti-Cavitation (Installation)—Torque.....	65 ± 7 N·m (48 ± 5 lb-ft)



- | | |
|--------------|------------------------|
| A—End Stop | K—Poppet |
| B—Cap | L—Poppet |
| C—O-Ring | M—Backup Ring |
| D—Nut | N—O-Ring |
| E—Valve Body | O—O-Ring |
| F—Poppet | P—O-Ring |
| G—Spring | Q—Backup Ring (2 used) |
| H—Spring | R—Spring |
| I—Valve Body | S—O-Ring |
| J—Piston | T—Shim (as required) |

T8259AJ (CV)

T8259AJ —UN—05JUL94

TX,33,RR7863 -19-10APR97-1/1

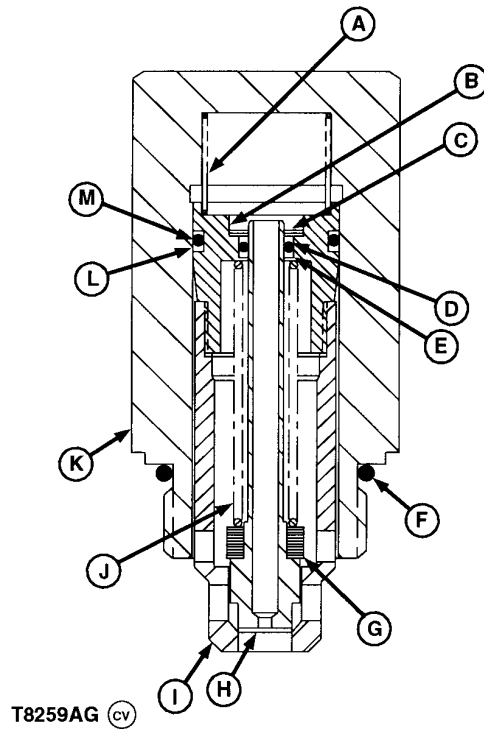
Disassemble and Assemble Backhoe Swing, Boom Lower, Crowd In Circuit Relief Valves and System Relief Valve

1. Disassemble and inspect parts for wear and damage. Replace as necessary.
2. Put clean hydraulic oil on all parts before assembly.
3. Circuit relief valve installation torque specification.

Specification

Backhoe Swing, Boom Lower, Crowd In Circuit Relief Valves and System Relief Valve
 (Installation)—Torque..... 65 ± 7 N·m (48 ± 5 lb-ft)

- | | |
|------------------------|-------------------------|
| A—Spring | H—Poppet |
| B—Sleeve | I— Sleeve |
| C—Retaining Ring | J— Spring |
| D—O-Ring | K—Valve Body |
| E—Backup Ring (2 used) | L— Backup Ring (2 used) |
| F—O-Ring | M—O-Ring |
| G—Shim (as required) | |



T8259AG —UN—05JUL94

WS68074.00036F6 -19-14JUL10-1/1

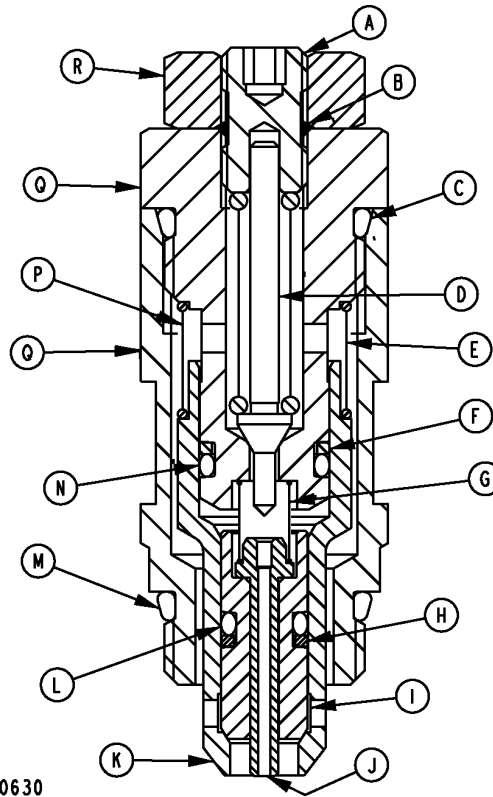
Disassemble and Assemble Backhoe Electro-Hydraulic Auxiliary Circuit Relief Valve

1. Disassemble and inspect parts for wear and damage. Replace as necessary.
2. Put clean hydraulic oil on all parts before assembly.
3. Tighten nut (R), valve body plug (Q). Reference circuit relief valve installation torque.

Specification

Backhoe Electro-Hydraulic Auxiliary Circuit Relief Valve
 Nut—Torque..... 5 ± 0.68 N·m (44 ± 6 lb-in.)
 Backhoe Electro-Hydraulic Auxiliary Circuit Relief Valve Body
 Plug—Torque..... 45 ± 4.7 N·m (33 ± 3.5 lb-ft)
 Backhoe Electro-Hydraulic Auxiliary Circuit Relief Valve (Installation)—Torque..... 45 ± 4.7 N·m (33 ± 3.5 lb-ft)

- | | |
|-------------------|-------------------|
| A—Adjusting Screw | J—Piston |
| B—O-Ring (2 used) | K—Poppet |
| C—O-Ring | L—O-Ring |
| D—Pilot Poppet | M—O-Ring |
| E—Spring | N—O-Ring |
| F—Backup Ring | O—Valve Body |
| G—Spring | P—Spring |
| H—Backup Ring | Q—Valve Body Plug |
| I—Poppet | R—Nut |



T100630—UN—05MAR97

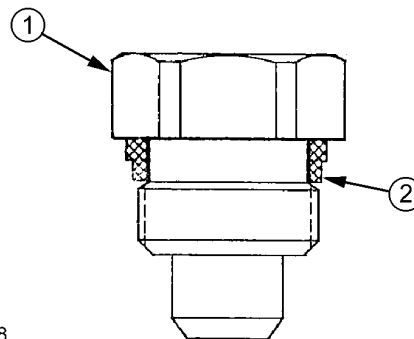
TX,33,RR7866 -19-10APR97-1/1

Disassemble and Assemble Auxiliary Shut-off Plug

1. Remove seal, if necessary.
2. Put clean hydraulic oil on seal before assembly.
3. Install special seal using JDG1328 Seal Installer.
4. Plug (1) installation torque.

Specification

Shut-Off Plug (Installation)—Torque..... 65 ± 7 N·m (48 ± 5 lb-ft)



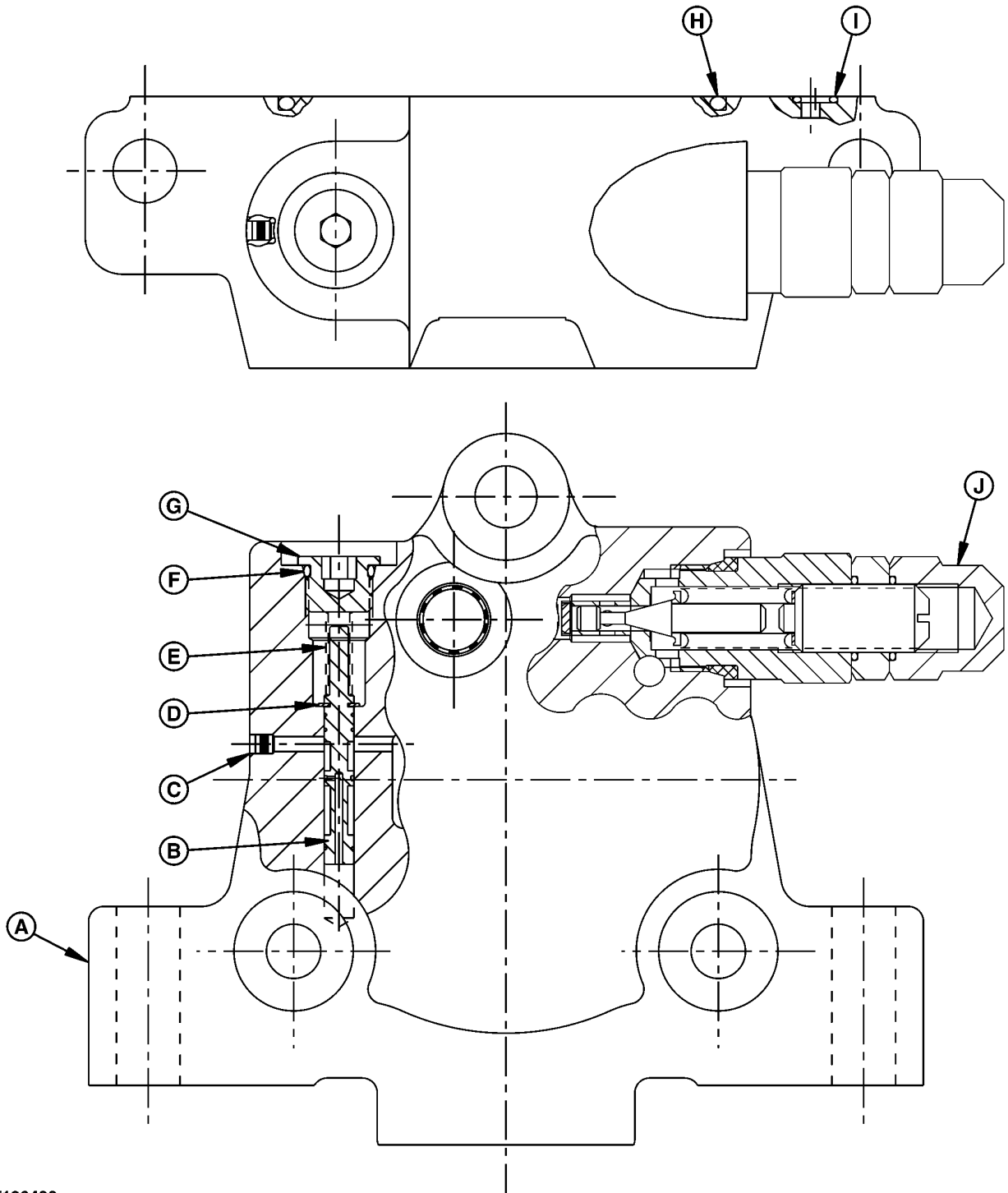
T127068—UN—05JAN00

T127068

- 1—Shut-Off Plug 2—Special Seal

WS68074,00036F4 -19-14JUL10-1/1

Disassemble and Assemble Backhoe Inlet Section



T126426

A—Valve Section Body
B—Isolator Spool
C—Expander Plug

D—Retaining Ring
E—Spring
F—O-Ring

G—Plug
H—O-Ring
I— O-Ring (Optional)

J— Load Sense Relief Valve

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T126426 — UN — 07DEC99

Hydraulic System

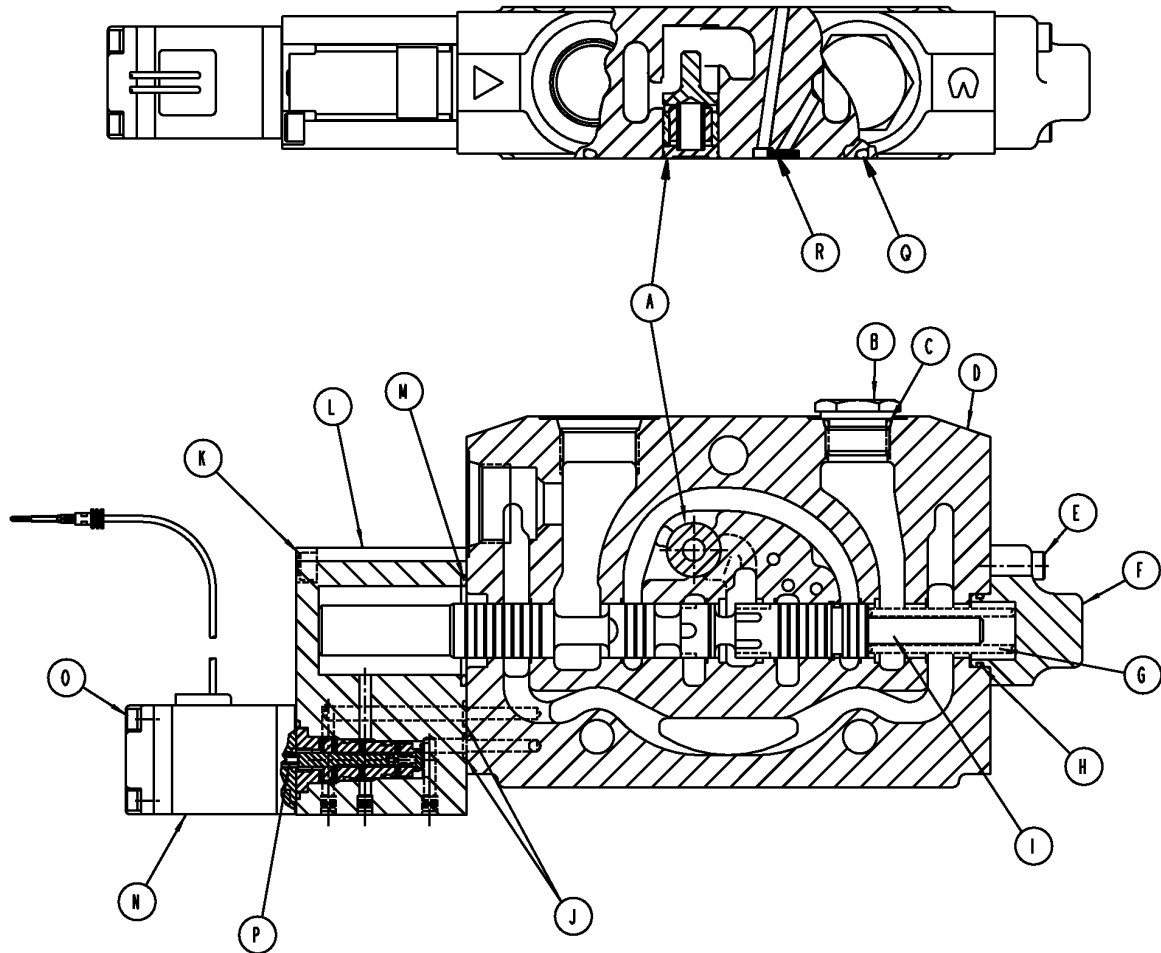
1. Remove plug with O-ring (F and G) to remove spring (E) and spool assembly (D and B) from housing (A).
2. Inspect all parts for wear or damage. Replace O-rings.
3. Inspect orifice in spool (B). Orifice must be clear of any debris.
4. Put clean hydraulic oil on isolator spool. Install spool assembly in housing.
5. Install spring and plug assembly (F and G). Tighten plug to specification.

Specification

Backhoe Inlet Section
Plug—Torque..... 22—27 N·m (16—20 lb-ft)

TX,33,RR7858 -19-03DEC99-2/2

Disassemble and Assemble Backhoe Auxiliary Flow Section (If Equipped)



T100654

- | | | | |
|----------------------------------|-------------------|---------------------------------------|--|
| A—Compensator | F—End Cap | K—Socket Hex Head Screw (2 used) | P—Electro-Hydraulic Pilot Solenoid Pin |
| B—Plug | G—Spring | L—Electro-Hydraulic Pilot Valve Block | Q—O-Ring |
| C—O-Ring | H—O-Ring | M—O-Ring | R—Load Sense Logic Check |
| D—Valve Housing | I—Spool | N—Electro-Hydraulic Pilot Solenoid | |
| E—Socket Hex Head Screw (2 used) | J—O-Ring (2 used) | O—Socket Hex Head Screw (4 used) | |

IMPORTANT: Spool MUST be installed in the valve housing the same way spool was removed for proper operation of the hydraulic function.

1. Remove parts (E and F) to remove spool from valve housing (D).
2. Remove parts (B and C).
3. Remove screws (O) to remove electro-hydraulic pilot solenoid (N). Be careful not to lose push pin (P).
4. Remove screws (K) to disassemble electro-hydraulic pilot valve block (L) from housing. (See cross section in this group to disassemble the actuator.)
5. Inspect all parts for wear or damage. Replace all seals.
6. Put clean hydraulic oil on spool. Install spool in housing.

Continued on next page

TX.31.RR7671 -19-16NOV99-1/3

T100654—UN—16APR97

Hydraulic System

7. Install spring as shown. Install end cap (F) and tighten screws (E) to specification.

Specification

Backhoe Auxiliary Flow Section End Cap
Screws—Torque..... 9.5 N·m (84 lb-in.)

8. Apply thread lock and sealer (medium strength) to threads of screws (K). Install electro-hydraulic valve block assembly (J—M) and tighten screws (K) to specification.

Specification

Backhoe Auxiliary Flow Section Electro-Hydraulic Pilot valve Block
Screws—Torque..... 9.5 N·m (84 lb-in.)

9. Install electro-hydraulic pilot solenoid (N) and push-pin (P). Tighten screws (O) to specification.

Specification

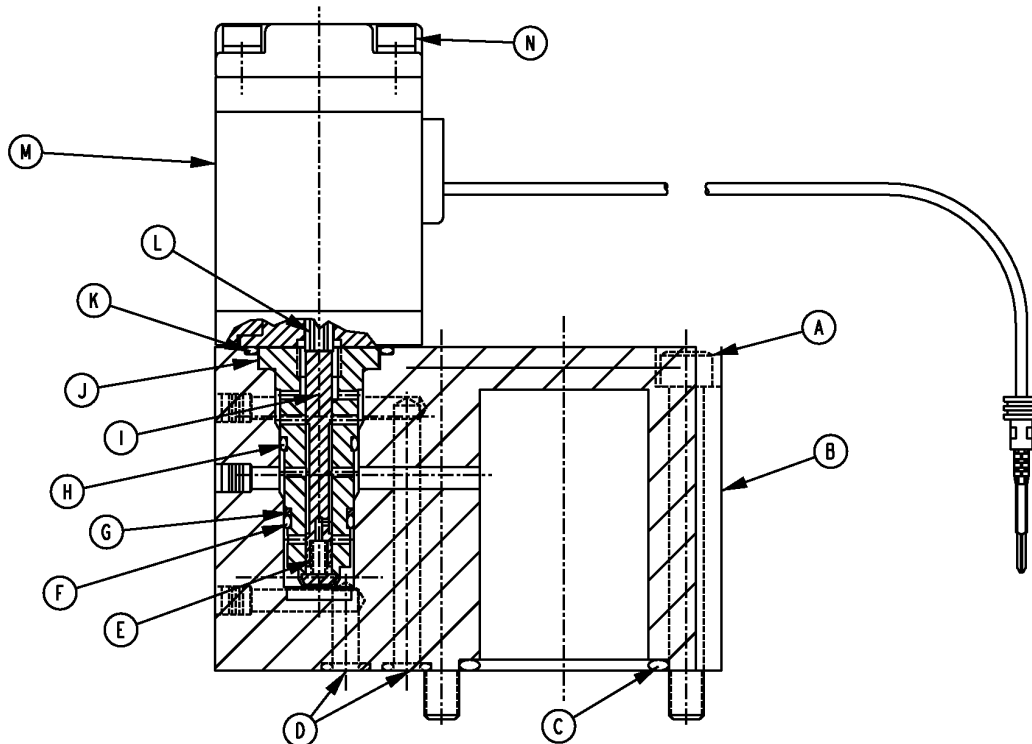
Backhoe Auxiliary Flow Section Electro-Hydraulic Pilot Solenoid
Screws—Torque..... 2 N·m (18 lb-in.)

10. Install parts (B and C) and tighten plug (B) to specification.

Specification

Backhoe Auxiliary Flow Section Plug—Torque..... 65 N·m (48 lb-ft)

TX,31,RR7671 -19-16NOV99-2/3



T100655

T100655—UN—09APR97

A—Socket Hex Head Screw (2 used)
B—Electro-Hydraulic Pilot Valve Block
C—O-Ring
D—O-Ring

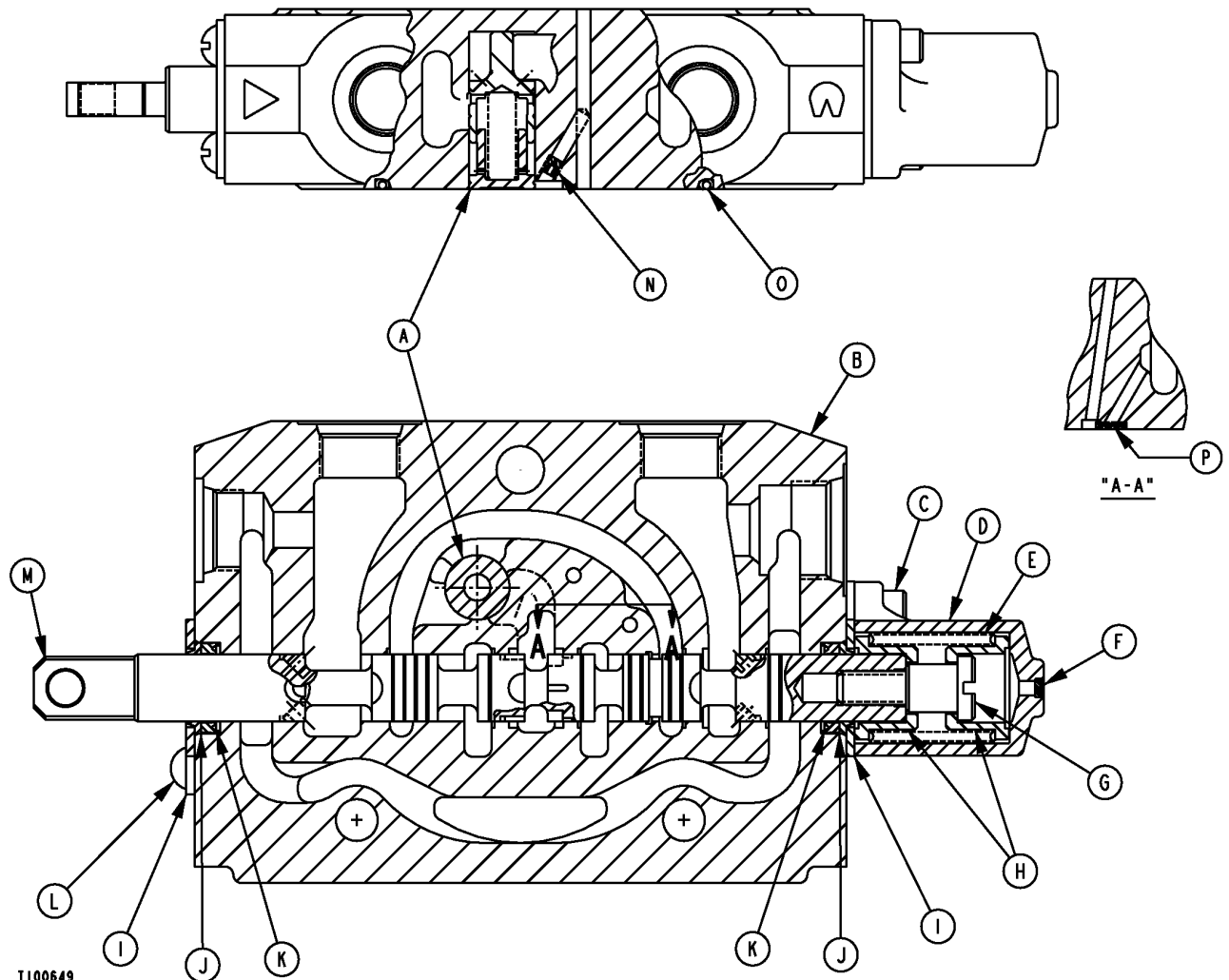
E—Spring
F—O-Ring
G—Backup Ring
H—O-Ring

I— Spool
J— Pilot Sleeve
K—O-Ring
L— Push Pin

M—Electro-Hydraulic Solenoid Assembly
N—Socket Hex Head Screw (4 used)

TX,31,RR7671 -19-16NOV99-3/3

Disassemble and Assemble Backhoe Swing Section



- | | | | |
|----------------------------------|-------------------------|------------------------|--------------------------|
| A—Compensator Spool and Spring | E—Spring | I— Seal Plate (2 used) | M—Spool |
| B—Valve Section Body | F—Vent | J—Wiper Seal (2 used) | N—Orifice |
| C—Socket Hex Head Screw (2 used) | G—Spool End Screw | K—Lip Seal (2 used) | O—O-Ring |
| D—End Cap | H—Spring Guide (2 used) | L—Screw (2 used) | P—Load Sense Logic Check |

IMPORTANT: Spool MUST be installed in the valve housing the same way spool was removed for proper operation of the hydraulic function.

1. Remove parts (C and D) to remove spool assembly from valve housing (B).
2. Using a protective cover or wooden blocks, put spool (M) in vise. Remove parts (E and G—K).
3. Inspect parts for wear or damage. Replace lip and wiper seals.
4. Apply clean hydraulic oil on spool and install spool into valve housing.

5. Install lip seals (K) and wiper seals (J) using JDG734 Seal Installation Tool. (See procedure in this group).
6. Clean threads of spool and spool end screw (G) with cure primer. Install parts (E, H and I) on spool. Apply thread lock and sealer (high strength) on spool end screw (G) and spool tang. Tighten to specification.

Specification

Backhoe Swing, Boom,
 Bucket, Crowd and
 Extendible Section Spool
 End Screw—Torque..... 9.5 N·m (84 lb-in.)

Continued on next page

TX.3360,SS3108 -19-02NOV99-1/2

Hydraulic System

7. Install end cap (D) and tighten screws (C) to specification.

Specification

Backhoe Swing, Boom,
Bucket, Crowd and
Extendible Section End
Cap Screws—Torque..... 9.5 N·m (84 lb-in.)

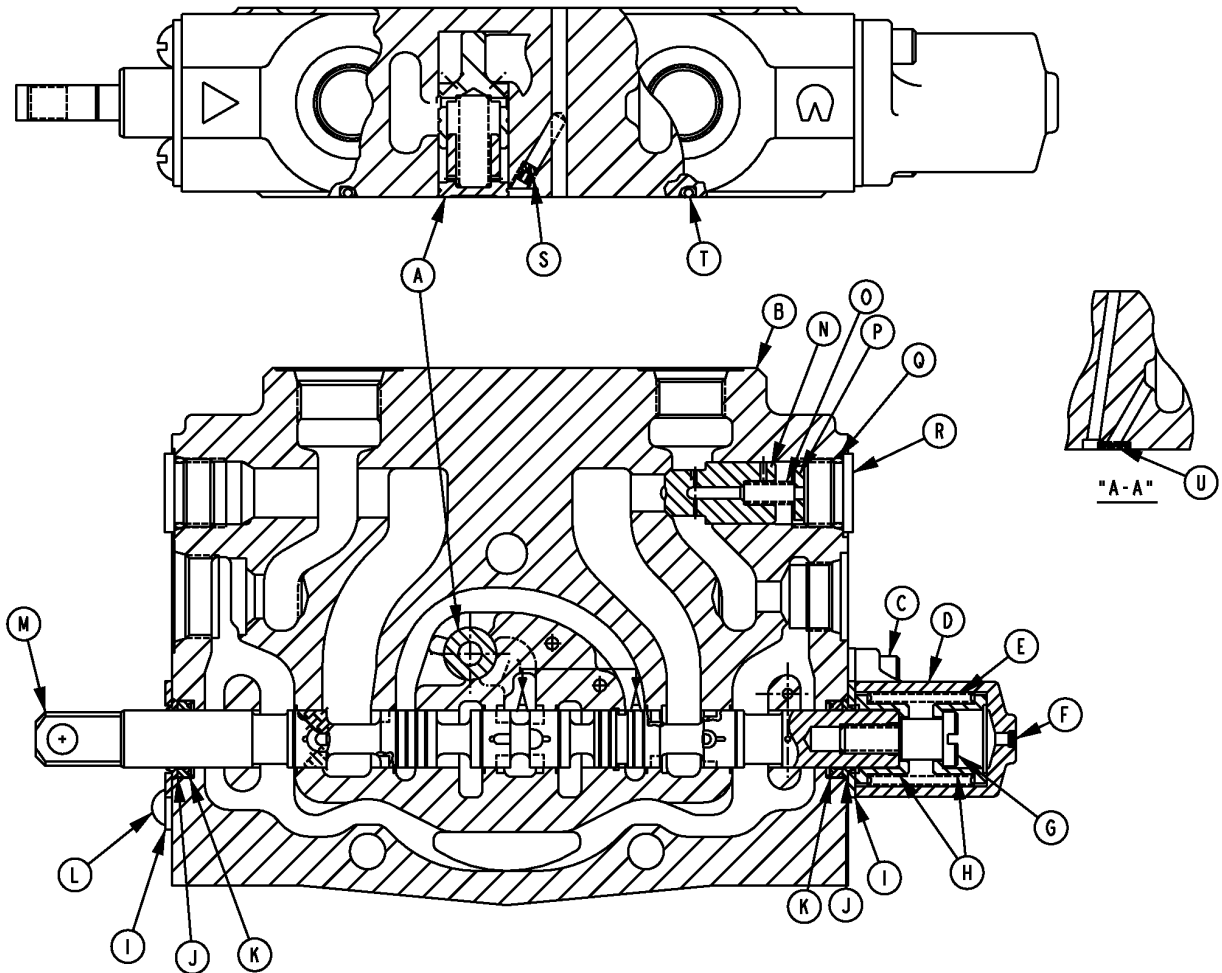
8. Install and tighten screws (L) to specification.

Specification

Backhoe Swing, Boom,
Bucket, Crowd and
Extendible Section Seal
Plate Screws—Torque..... 5.5 N·m (48 lb-in.)

TX,3360,SS3108 -19-02NOV99-2/2

Disassemble and Assemble Backhoe Boom Section



T100653

- | | | | |
|----------------------------------|-------------------------|---------------------|--------------------------|
| A—Compensator Spool and Spring | G—Spool End Screw | M—Spool | S—Orifice |
| B—Valve Section Body | H—Spring Guide (2 used) | N—Anti-Drift Poppet | T—O-Ring |
| C—Socket Hex Head Screw (2 used) | I— Seal Plate (2 used) | O—Spring | U—Load Sense Logic Check |
| D—End Cap | J— Wiper Seal (2 used) | P—Spring Guide | |
| E—Spring | K—Lip Seal (2 used) | Q—O-Ring (2 used) | |
| F—Vent | L— Screw (2 used) | R—Plug (2 used) | |

IMPORTANT: Spool MUST be installed in the same valve section as was removed for proper operation of the hydraulic function.

- Remove parts (C and D) to remove spool assembly from valve housing (B).
- Using a protective cover or wooden blocks, put spool (M) in vise. Remove parts (E and G—K).
- Remove parts (N—R) from housing.
- Inspect parts for wear or damage. Replace lip and wiper seals.
- Apply clean hydraulic oil on spool and install spool into valve housing.
- Install lip seals (K) and wiper seals (J) using JDG734 Seal Installation Tool. (See procedure in this group).

Continued on next page

TX.3360.RR7683 -19-02NOV99-1/2

T100653—UN—16APR97

Hydraulic System

7. Clean threads of spool and spool end screw (G) with cure primer. Install parts (E, H and I) on spool. Apply thread lock and sealer (high strength) on spool end screw (G) and spool tang. Tighten to specification.

Specification

Backhoe Swing, Boom,
Bucket, Crowd and
Extendible Section Spool
End Screw—Torque..... 9.5 N·m (84 lb-in.)

8. Install end cap (D) and tighten screws (C) to specification.

Specification

Backhoe Swing, Boom,
Bucket, Crowd and
Extendible Section End
Cap Screws—Torque..... 9.5 N·m (84 lb-in.)

9. Install and tighten screws (L) to specification.

Specification

Backhoe Swing, Boom,
Bucket, Crowd and
Extendible Section Seal
Plate Screws—Torque..... 5.5 N·m (48 lb-in.)

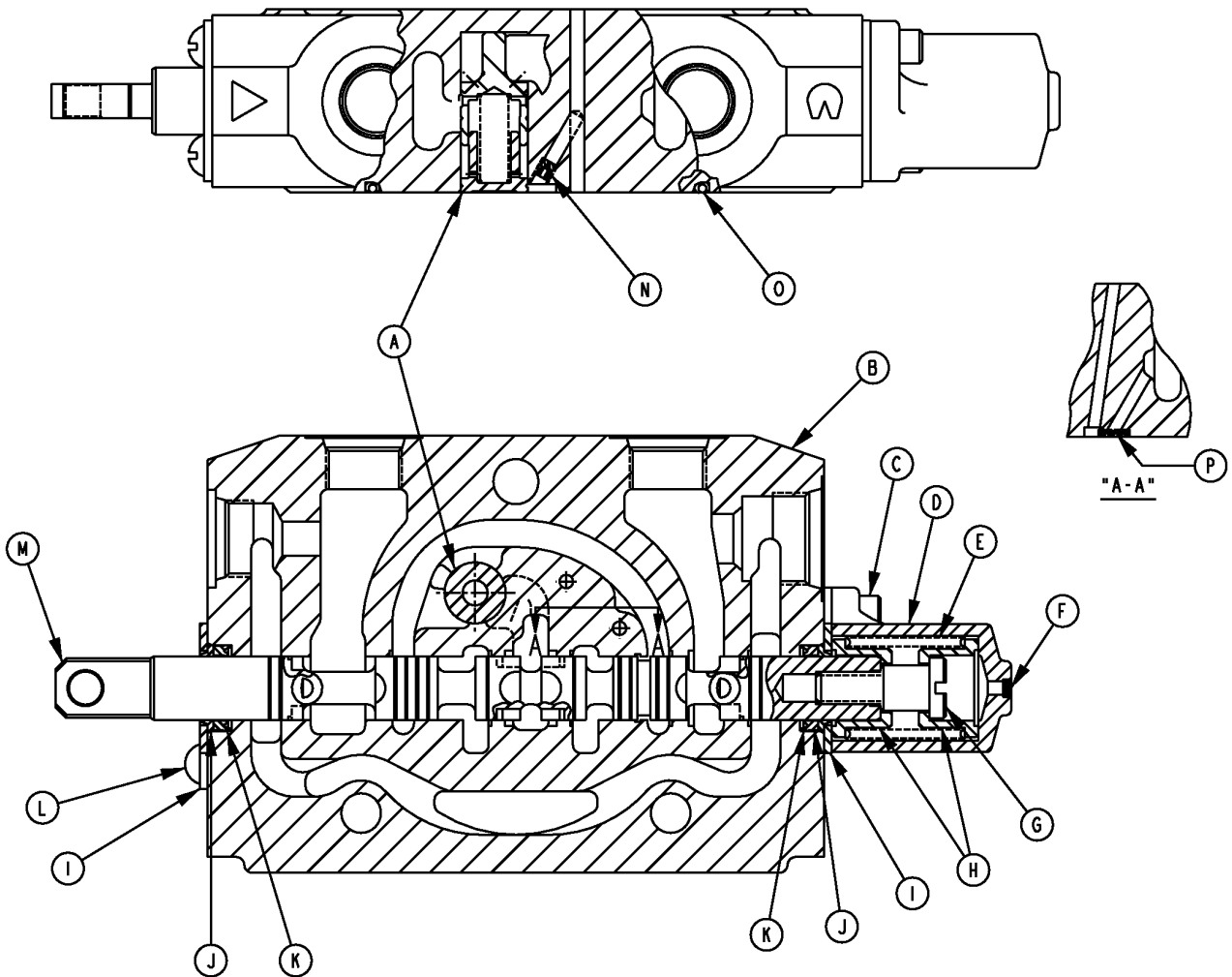
10. Install parts (N—R) and tighten plug (R) to specification.

Specification

Backhoe Boom Crowd
and Extendible Section
Plug—Torque..... 65 N·m (48 lb-ft)

TX,3360,RR7683 -19-02NOV99-2/2

Disassemble and Assemble Backhoe Bucket Section



T100652

- | | | | |
|-------------------------|-------------------------|------------------------|--------------------------|
| A—Compensator Spool | E—Spring | I— Seal Plate (2 used) | M—Spool |
| B—Valve Section Body | F—Vent | J— Wiper Seal (2 used) | N—Orifice |
| C—Socket Hex Head Screw | G—Spool End Screw | K—Lip Seal (2 used) | O—O-Ring |
| D—End Cap | H—Spring Guide (2 used) | L— Screw (2 used) | P—Load Sense Logic Check |

IMPORTANT: Spool MUST be installed in the valve housing the same way spool was removed for proper operation of the hydraulic function.

1. Remove parts (C and D) to remove spool from valve housing (B).
2. Using a protective cover or wooden blocks, put spool (M) in vise. Remove parts (E and G—K).
3. Inspect parts for wear or damage. Replace lip and wiper seals.
4. Apply clean hydraulic oil on spool and install spool into valve housing.

5. Install seals (K) and wiper seals (J) using JDG734 Seal Installation Tool.
6. Clean threads of spool and spool end screw (G) with cure primer. Install parts (E, H and I) on spool. Apply thread lock and sealer (high strength) on spool end screw (G) and spool tang. Tighten to specification.

Specification

Backhoe Swing, Boom,
 Bucket, Crowd and
 Extendible Section Spool
 End Screw—Torque..... 9.5 N·m (84 lb-in.)

Continued on next page

TX.3360.RR7684 -19-02NOV99-1/2

Hydraulic System

7. Install end cap (D) and tighten screws (C) to specification.

Specification

Backhoe Swing, Boom,
Bucket, Crowd and
Extendible Section End
Cap Screws—Torque..... 9.5 N·m (84 lb-in.)

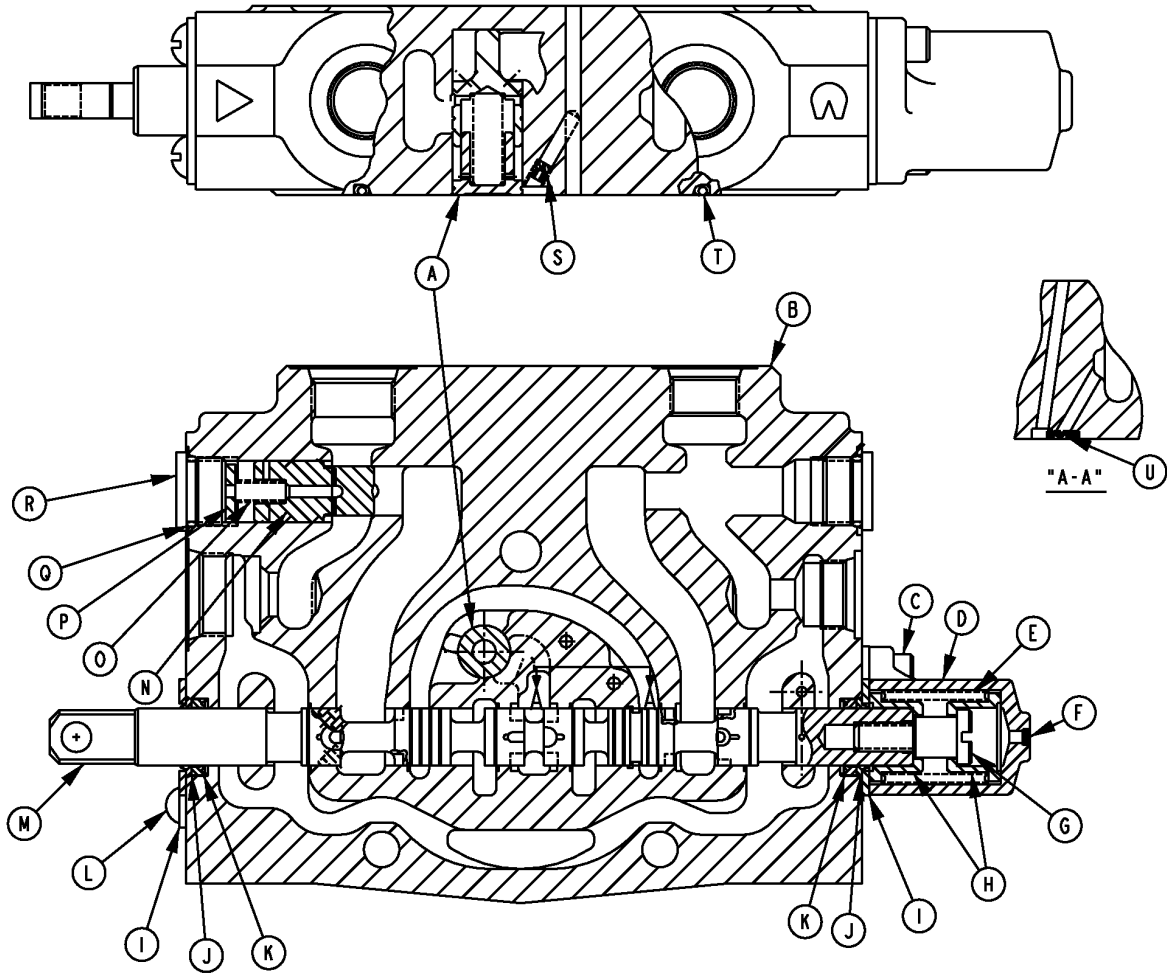
Specification

Backhoe Swing, Boom,
Bucket, Crowd and
Extendible Section Seal
Plate Screws—Torque..... 5.5 N·m (48 lb-in.)

8. Install and tighten screws (L) to specification.

TX,3360,RR7684 -19-02NOV99-2/2

Disassemble and Assemble Backhoe Crowd Section



T108939

- | | | | |
|----------------------------------|-------------------------|---------------------|--------------------------|
| A—Compensator Spool and Spring | G—Spool End Screw | M—Spool | S—Orifice |
| B—Valve Section Body | H—Spring Guide (2 used) | N—Anti-Drift Poppet | T—O-Ring |
| C—Socket Hex Head Screw (2 used) | I— Seal Plate (2 used) | O—Spring | U—Load Sense Logic Check |
| D—End Cap | J— Wiper Seal (2 used) | P—Spring Guide | |
| E—Spring | K—Lip Seal (2 used) | Q—O-Ring (2 used) | |
| F—Vent | L—Screw (2 used) | R—Plug (2 used) | |

IMPORTANT: Spool MUST be installed in the same valve section as was removed for proper operation of the hydraulic function.

- Remove parts (C and D) to remove spool assembly from valve housing (B).
- Using a protective cover or wooden blocks, put spool in vise. Remove parts (E and G—K).
- Remove parts (N—R) from housing.
- Inspect parts for wear or damage. Replace lip and wiper seals.
- Apply clean hydraulic oil on spool and install spool into valve housing.
- Install seals (K) and wiper seals (J) using JDG734 Seal Installation Tool.

Continued on next page

TX.3360,RR7685 -19-02NOV99-1/2

Hydraulic System

7. Clean threads of spool and spool end screw (G) with cure primer. Install parts (E, H and I) on spool. Apply thread lock and sealer (high strength) on spool end screw (G) and spool tang. Tighten to specification.

Specification

Backhoe Swing, Boom,
Bucket, Crowd and
Extendible Section Spool
End Screw—Torque..... 9.5 N·m (84 lb-in.)

8. Install end cap (D) and tighten screws (C) to specification.

Specification

Backhoe Swing, Boom,
Bucket, Crowd and
Extendible Section End
Cap Screws—Torque..... 9.5 N·m (84 lb-in.)

9. Install and tighten screws (L) to specification.

Specification

Backhoe Swing, Boom,
Bucket, Crowd and
Extendible Section Seal
Plate Screws—Torque..... 5.5 N·m (48 lb-in.)

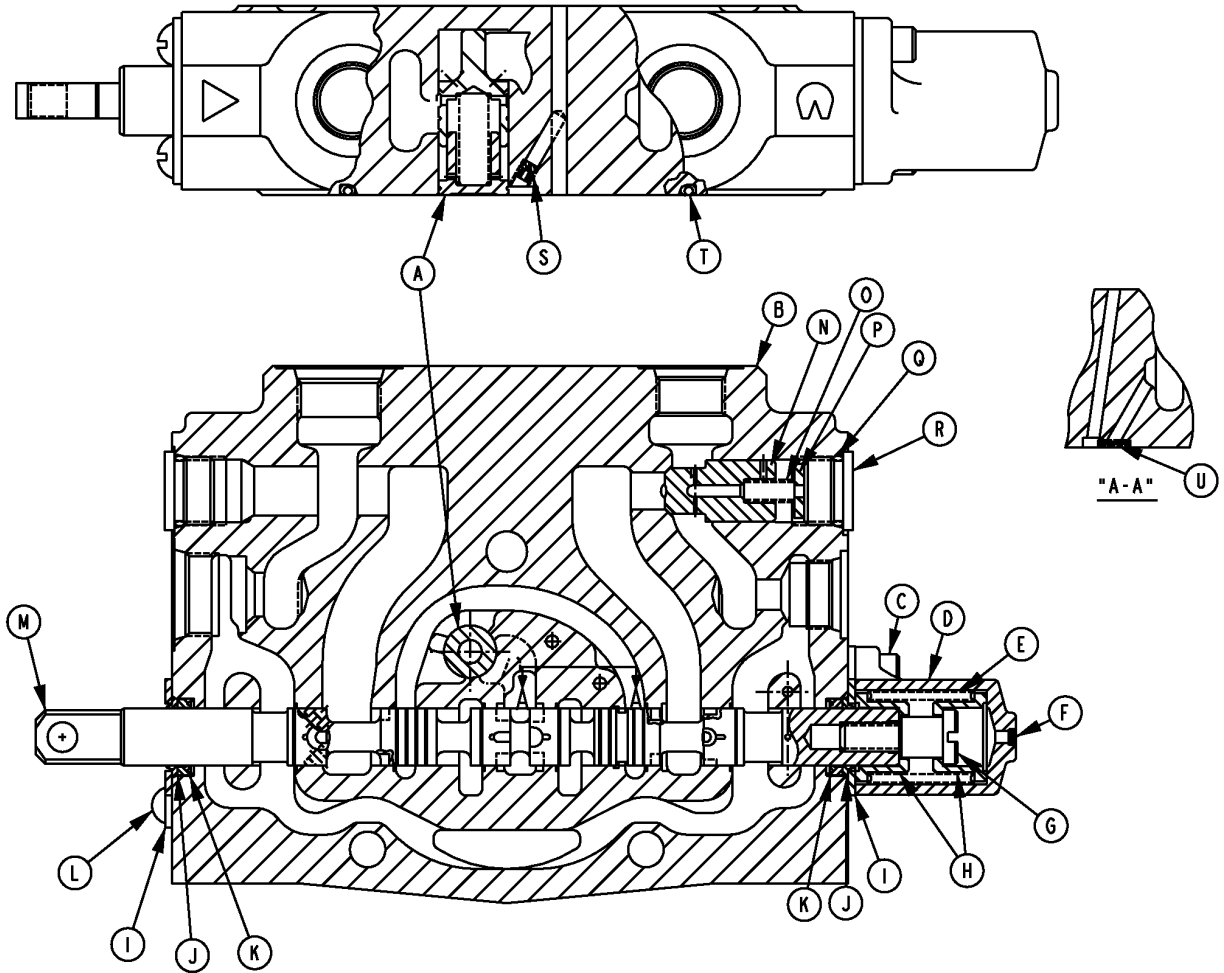
10. Install parts (N—R) and tighten plug (R) to specification.

Specification

Backhoe Boom, Crowd
and Extendible Section
Plug—Torque..... 65 N·m (48 lb-ft)

TX,3360,RR7685 -19-02NOV99-2/2

Disassemble and Assemble Backhoe Extendible Section



T100653

- | | | | |
|----------------------------------|-------------------------|---------------------|--------------------------|
| A—Compensator Spool | G—Spool End Screw | M—Spool | S—Orifice |
| B—Valve Section Body | H—Spring Guide (2 used) | N—Anti-Drift Poppet | T—O-Ring |
| C—Socket Hex Head Screw (2 used) | I— Seal Plate (2 used) | O—Spring | U—Load Sense Logic Check |
| D—End Cap | J— Wiper Seal (2 used) | P—Spring Guide | |
| E—Spring | K—Lip Seal (2 used) | Q—O-Ring (2 used) | |
| F—Vent | L— Screw (2 used) | R—Plug (2 used) | |

IMPORTANT: Spool MUST be installed in the same valve section as was removed for proper operation of the hydraulic function.

1. Remove parts (C and D) to remove spool assembly from valve housing (B).
2. Using a protective cover or wooden blocks, put spool (M) in vise. Remove parts (E and G—K).
3. Remove parts (N—R) from housing.
4. Inspect parts for wear or damage. Replace lip and wiper seals.
5. Apply clean hydraulic oil on spool and install spool into valve housing.
6. Install lip seals (K) and wiper seals (J) using JDG734 Seal Installation Tool.

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TX.3360.RR7686 -19-02NOV99-1/2

Hydraulic System

7. Clean threads of spool and spool end screw (G) with cure primer. Install parts (E, H and I) on spool. Apply thread lock and sealer (high strength) on spool end screw (G) and spool tang. Tighten to specification.

Specification

Backhoe Swing, Boom,
Bucket, Crowd and
Extendible Section Spool
End Screw—Torque..... 9.5 N·m (84 lb-in.)

8. Install end cap (D) and tighten screws (C) to specification.

Specification

Backhoe Swing, Boom,
Bucket, Crowd and
Extendible Section End
Cap Screws—Torque..... 9.5 N·m (84 lb-in.)

9. Install and tighten screws (L) to specification.

Specification

Backhoe Swing, Boom,
Bucket, Crowd and
Extendible Section Seal
Plate Screws—Torque..... 5.5 N·m (48 lb-in.)

10. Install parts (N—R) and tighten plug (R) to specification.

Specification

Backhoe Boom, Crowd
and Extendible Section
Plug—Torque..... 65 N·m (48 lb-ft)

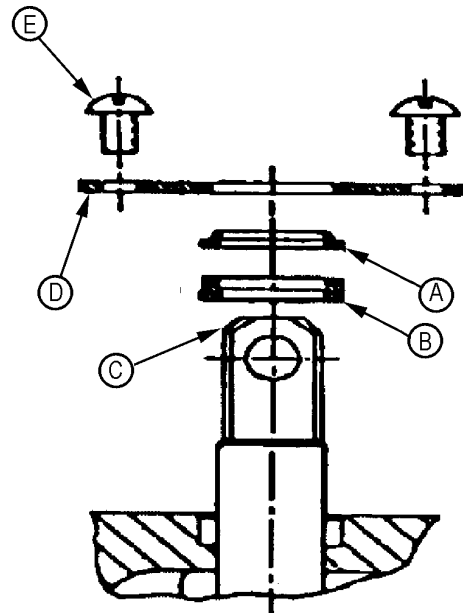
TX,3360,RR7686 -19-02NOV99-2/2

Replace Wiper Rings and Seals of Backhoe Control Valve Sections

1. Remove screws (E) to remove plate (D) from valve section.

A—Wiper Ring
B—Seal
C—Spool

D—Plate
E—Screw (2 used)



T7698AB

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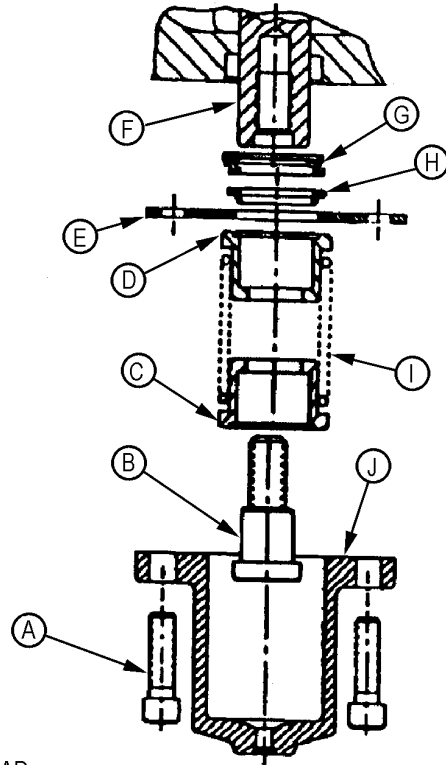
TX,33,RR7812 -19-02NOV99-1/5

T7698AB—JUN—27JAN97

2. Use an O-ring pick to remove wiper ring (A) and seal (B).
3. Remove two screws (A) to remove cap (J) from bottom of valve section.
4. Remove screw (B) to remove retainers (C and D), spring (I) and plate (E).

A—Screw (2 used)
B—Spool End Screw
C—Spring Retainer
D—Spring Retainer
E—Plate

F—Spool
G—Seal
H—Wiper Ring
I—Spring
J—Cap



T7698AD

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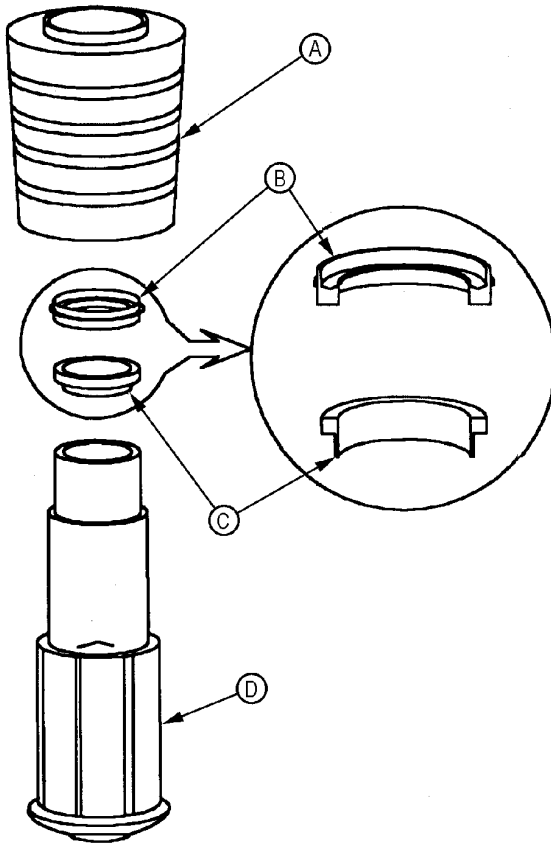
TX,33,RR7812 -19-02NOV99-2/5

T7698AD —UN—27JAN97

5. Use an O-ring pick to remove wiper ring (H) and seal (G).

IMPORTANT: DO NOT damage OD or ID of new seal during installation. Installation tool MUST be used to install seal and wiper ring.

6. Use JDG734 Seal Installation Tool to install new seal and wiper ring at each end of spool:
- Install wiper ring (C) on end of tool driver (D) with smaller OD of ring into driver.
 - Put seal (B) on wiper ring with open side of seal away from wiper ring.
 - Carefully slide sleeve (A) over seal, wiper ring, and driver with raised lip of sleeve away from driver. Do not push seal through sleeve.
 - Put tool assembly over end of spool with raised lip into counterbore of valve section.
 - Push driver to install seal and wiper ring into valve housing.



T7677AA

T7677AA —UN—27JAN97

NOTE: Lip end of sleeve ID is cone-shaped to compress seal and wiper ring for installation.

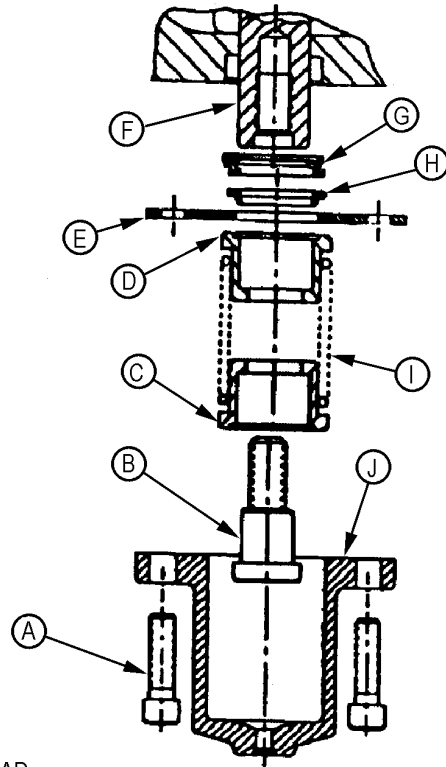
7. Install plate (E), retainers (C and D) and spring (I).
8. Apply cure primer to threads of spool and spool end screw (B). Apply thread lock and sealer (high strength) to threads of screw (B). Tighten screw.

A—Tool Sleeve
B—Seal

C—Wiper Ring
D—Tool Driver

A—Screw (2 used)
B—Spool End Screw
C—Spring Retainer
D—Spring Retainer
E—Plate

F—Spool
G—Seal
H—Wiper Ring
I—Spring
J—Cap



T7698AD

Continued on next page

TX,33,RR7812 -19-02NOV99-4/5

T7698AD —JUN—27.JAN97

9. Install cap (J) and screws (A). Tighten screws to specification.

Specification

Spool Cap, Cap
Screws—Torque..... 9.5 N·m (84 lb-in.)

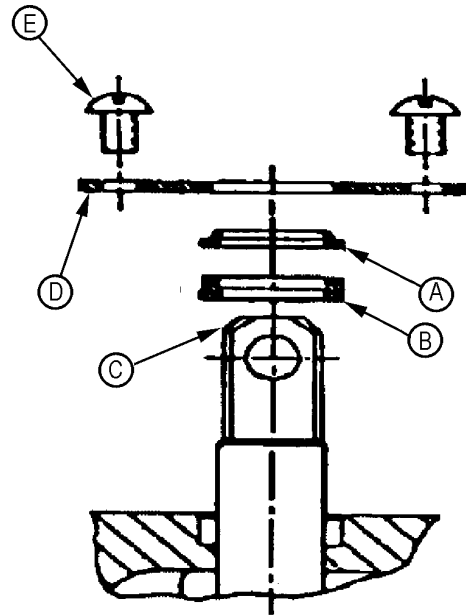
10. Install plate (D) and two screws (E). Tighten screws to specification.

Specification

Spool Retainer Plate
Screws—Torque..... 5.5 N·m (48 lb-in.)

11. Check for correct installation of seals by pushing down of spool (C). Spool must return to neutral position.

A—Wiper Ring
B—Seal
C—Spool
D—Plate
E—Screw (2 used)



T7698AB

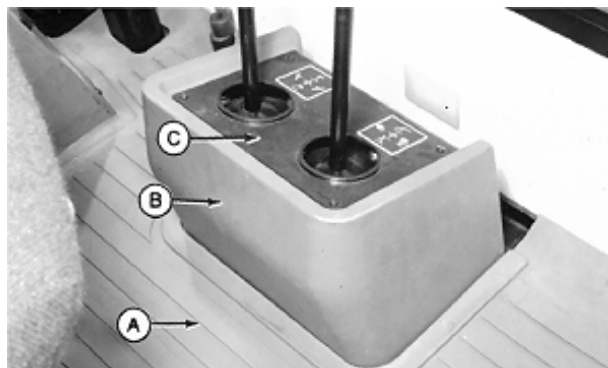
T7698AB —UN—27 JAN97

TX,33,RR7812 -19-02NOV99-5/5

Remove and Install Stabilizer Valve

1. Park machine on level surface. Lower attachments and stabilizers to ground.
2. Remove floor mat (A), backhoe valve console cover (C) and backhoe valve console (B).
3. Remove floor plate.

A—Floor Mat
B—Console Cover
C—Console

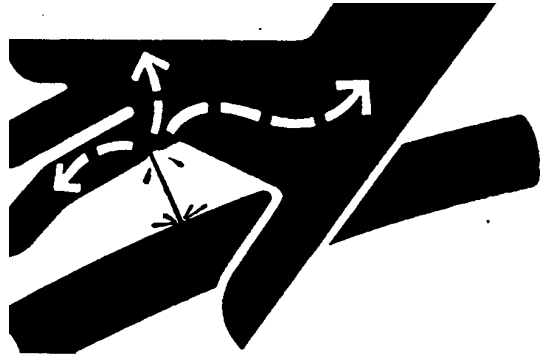


T7520BG —UN—02 MAY91

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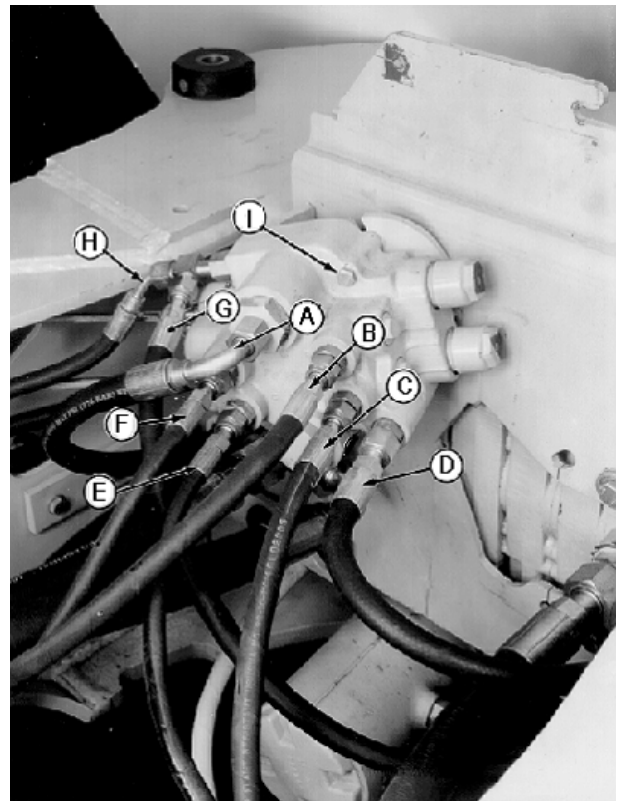
TX,31,RR7700 -19-16NOV99-1/3

⚠ CAUTION: To avoid injury from escaping fluid under pressure, relieve the pressure in the system before disconnecting or connecting hydraulic or other lines. Tighten all connections before applying pressure. (See tractor operator's manual for specific procedures to relieve pressure.)



4. Operate controls to release pressure in hydraulic system. Tag and disconnect lines (A—H) from stabilizer valve. Close all openings with caps or plugs.
5. Disconnect stabilizer linkage at valve spools.
6. Remove valve mounting cap screws (I) and stabilizer valve.
7. Install stabilizer valve on mounting plate with cap screws.
8. Connect stabilizer linkage to valve spools.
9. Connect hydraulic lines (A—H).
10. Install floor plate.

- | | |
|---|--|
| A—Stabilizer Valve-to-Backhoe Valve Inlet | F—Stabilizer Valve-to-Right Cylinder Rod End |
| B—Stabilizer Valve-to-Right Cylinder Head End | G—Stabilizer Valve-to-Backhoe Valve Load Sense |
| C—Stabilizer Valve-to-Left Cylinder Head End | H—Stabilizer Valve-to-Hydraulic Oil Reservoir |
| D—Stabilizer Valve-to-Backhoe Valve Return | I—Cap Screw (2 used) |
| E—Stabilizer Valve-to-Left Cylinder Rod End | |



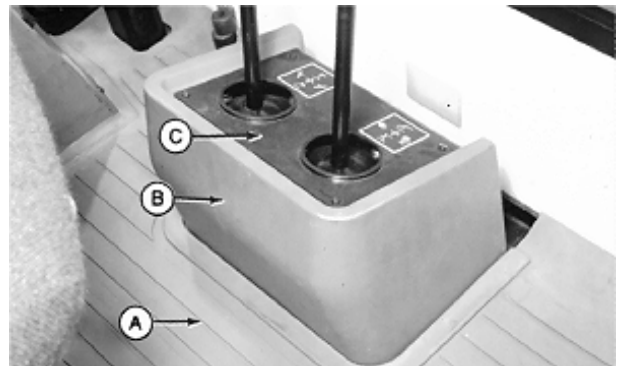
X9811 —UN—23AUG88

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TX,31,RR7700 -19-16NOV99-2/3

11. Install backhoe valve console (B), console cover (C) and floor mat (A).

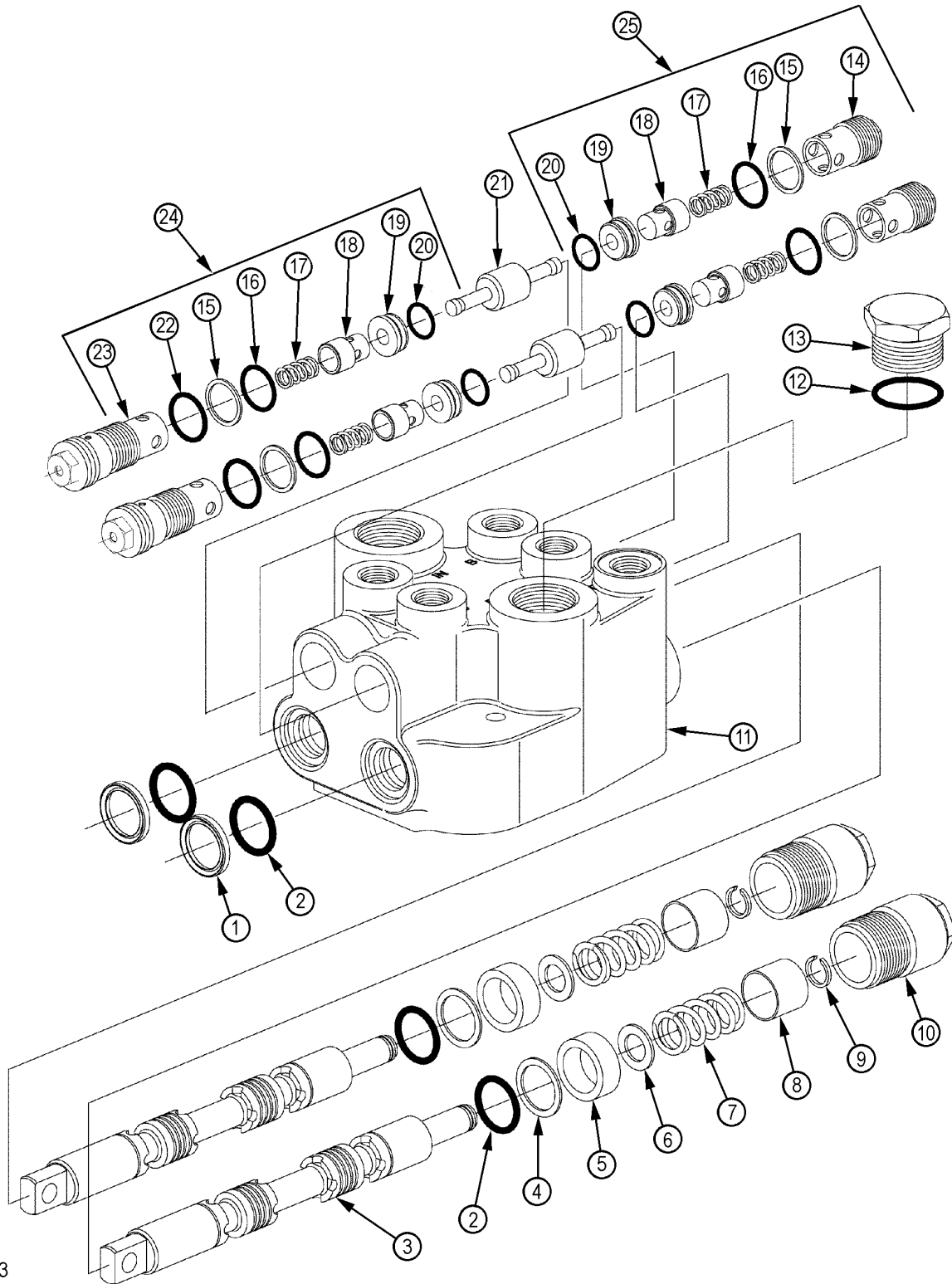
- | | |
|-----------------|-----------|
| A—Floor Mat | C—Console |
| B—Console Cover | |



T7520BG —UN—02MAY91

TX,31,RR7700 -19-16NOV99-3/3

Disassemble and Assemble Stabilizer Valve



T108943

T108943—UN—09APR97

Continued on next page

Hydraulic System

- | | | | |
|-------------------------|-----------------------|----------------------|-----------------------|
| 1— Seal (2 used) | 8— Retainer (2 used) | 15— Washer (4 used) | 22— O-Ring (2 used) |
| 2— O-Ring (4 used) | 9— Snap Ring (2 used) | 16— O-Ring (4 used) | 23— Retainer (2 used) |
| 3— Spool (2 used) | 10— Cap (2 used) | 17— Spring (4 used) | 24— Kit |
| 4— Backup Ring (2 used) | 11— Valve Housing | 18— Poppet (4 used) | 25— Kit |
| 5— Spacer (2 used) | 12— O-Ring | 19— Seat (4 used) | |
| 6— Washer (2 used) | 13— Plug | 20— O-Ring (4 used) | |
| 7— Spring (2 used) | 14— Retainer (2 used) | 21— Plunger (2 used) | |

1. Plug all ports and clean the outside of the valve housing (11) thoroughly.
2. Mark the spools (3) and their specific bores. The spools are matched to the bores and must not be switched.
3. Remove the spool caps (10) and slide the spool assemblies from their bores.
4. Remove the O-ring and bushings from the spools.
5. Remove the wiper seals and O-rings from the valve body.
6. Disassemble the spool assemblies only if the retaining ring, spacer, spool spring, or washers need to be replaced.
7. Remove the hex drive retainers, springs, poppets, seat assemblies and plungers from the valve body work ports.
8. Inspect all parts for wear and replace as necessary.

IMPORTANT: Do not wipe parts dry with paper towels or cloth. Lint in hydraulic system will cause damage.

9. Wash all metal parts in clean solvent and blow dry them with compressed air.
10. Install new O-rings, backup rings, and wiper seals.
11. Slide the bushing and new O-ring over each of the spools.
12. Liberally lubricate the spools with clean hydraulic fluid and install spools in their proper bores.
13. Install the spool caps and tighten them to specification.

Specification

Stabilizer Valve Spool

Caps—Torque..... 50 ± 3 N·m (37 ± 2 lb-ft)

14. Lubricate and install plunger in each work port.
15. Install the seat with new O-ring in each work port.
16. Install the poppets and springs.
17. Install the hex drive retaining plug in each work port. Tighten to specification.

Specification

Stabilizer Valve Hex Drive

Retaining Plug—Torque..... 50 N·m (37 lb-ft)

TX,31,RR7699 -19-03DEC98-2/2

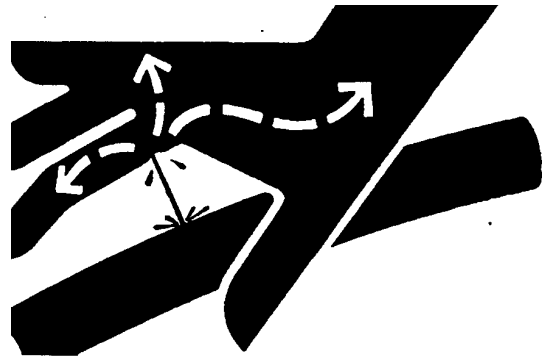
Remove and Install Backhoe Bucket Cylinder—125 Series

CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

1. Operate all hydraulic control valves to release pressure in system.

CAUTION: The approximate weight of cylinder is 34 kg (75 lb).



Backhoe Cylinder—Specification

Backhoe Bucket

Cylinder—Weight..... 34 kg (75 lb) Approximate

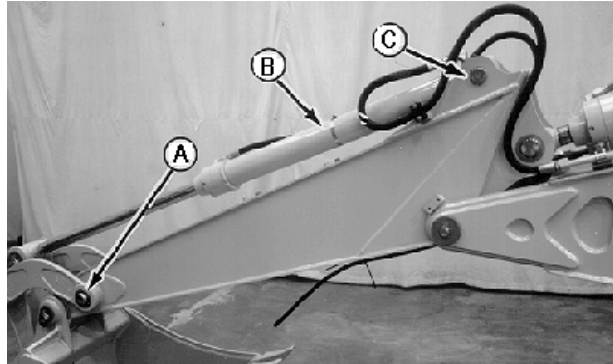
2. Attach cylinder to a hoist using a lifting strap.

X9811—UN—23AUG88

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TX,31,RR7701 -19-19NOV98-1/2

3. Tag and disconnect lines to cylinder (B). Close all openings with caps and plugs. Remove hose clamps on cylinder.
4. Remove pin (A) from bucket linkage.
5. Remove pin (C) from head end of cylinder and remove cylinder.
6. Install pin (C) at head end of cylinder.
7. Install pin (A) through bucket linkage and cylinder rod.
8. Connect lines and install hose clamps.



T107239—UN—15FEB97

TX,31,RR7701 -19-19NOV98-2/2

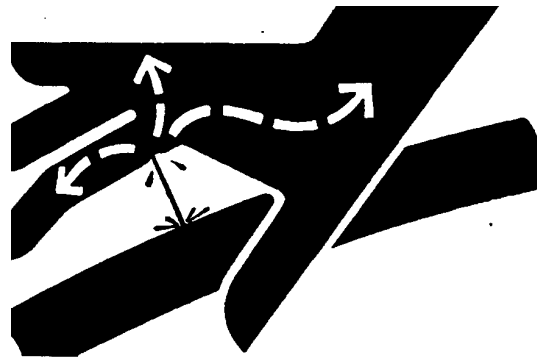
Remove and Install Backhoe Crowd Cylinder—125 Series

⚠ CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

1. Operate all hydraulic control valves to release pressure in system.

⚠ CAUTION: The approximate weight of crowd cylinder is 59 kg (130 lb).



X9811—UN—23AUG88

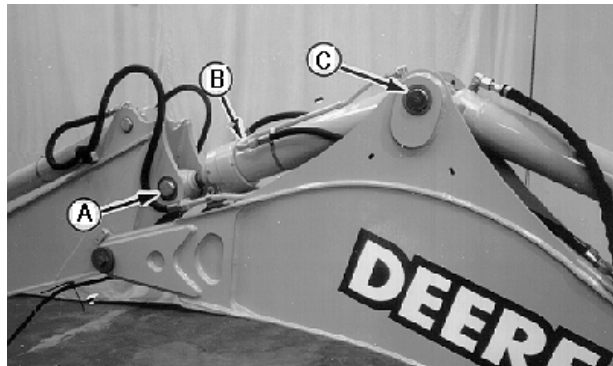
Specification

Backhoe Crowd
Cylinder—Weight..... 59 kg (130 lb) Approximate

2. Attach cylinder to a hoist using a lifting strap.

TX,31,RR7706 -19-19NOV98-1/2

3. Tag and disconnect lines to cylinder (B). Close all openings with caps and plugs.
4. Remove pin (A) from dipperstick and cylinder rod.
5. Remove pin (C) from head end of cylinder and remove cylinder.
6. Install pin (A) at head end of cylinder.
7. Install pin (A) through dipperstick and cylinder rod.
8. Connect lines.



T107236—UN—15FEB97

TX,31,RR7706 -19-19NOV98-2/2

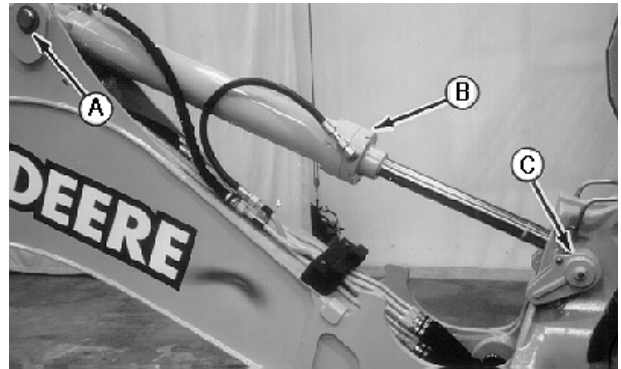
Remove and Install Backhoe Boom Cylinder—125 Series

CAUTION: The approximate weight of boom cylinder is 82 kg (180 lb).

Specification

Backhoe Boom
Cylinder—Weight..... 82 kg (180 lb) Approximate

1. Lower boom to the ground.
2. Attach cylinder (B) to hoist using a lifting strap.
3. Remove pin (A) from cylinder head end and boom.



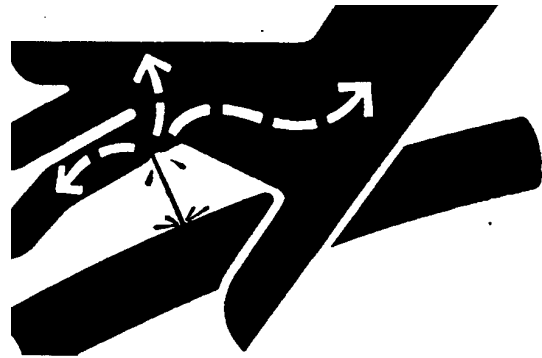
T107234 —UN—15FEB97

TX,31,RR7702 -19-19NOV98-1/3

CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

4. Operate all hydraulic control valves to release pressure in system.



X9811 —UN—23AUG88

5. Tag and disconnect lines from cylinder. Close all openings with caps and plugs.

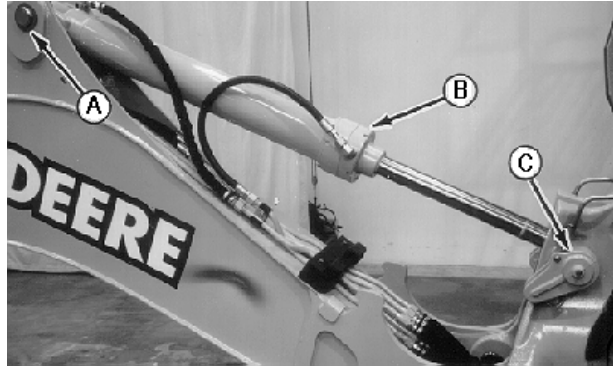
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TX,31,RR7702 -19-19NOV98-2/3

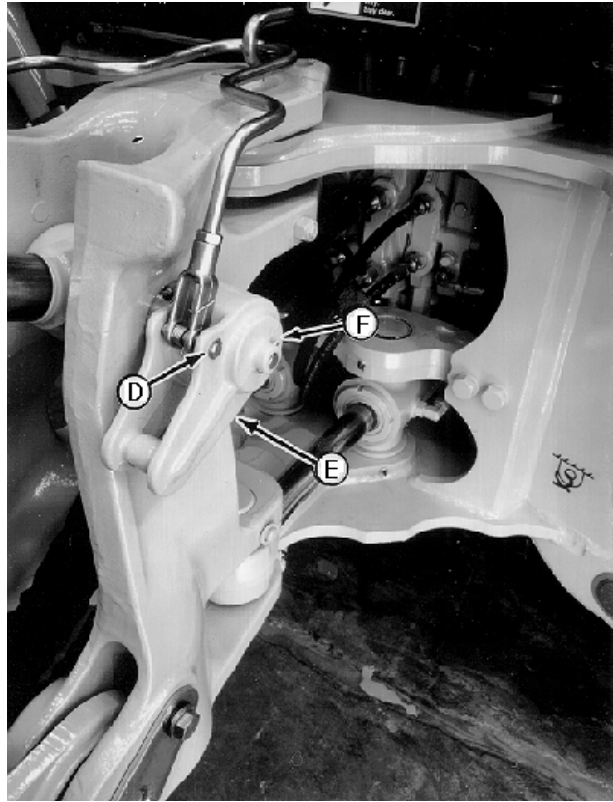
Hydraulic System

6. Remove pins (D and F) to remove boom lock pivot (E).
7. Remove rod end pin (C) to remove cylinder.
8. Install pins (A and C).
9. Install pins (D and F) and boom lock pivot (E).

A—Head End Pin	D—Pin
B—Boom Cylinder	E—Boom Lock Pivot
C—Rod End Pin	F—Pin



T107234 —UN—15FEB97



T107235 —UN—15FEB97

TX,31,RR7702 -19-19NOV98-3/3

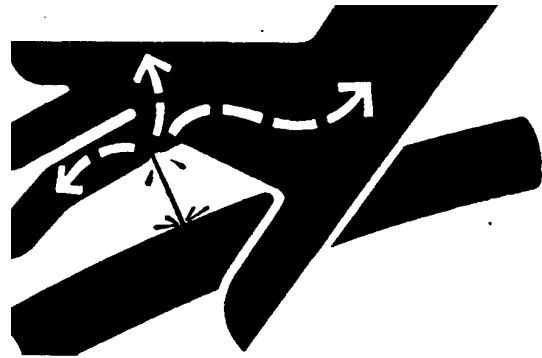
Remove and Install Extendible Dipperstick Cylinder

CAUTION: To avoid injury from escaping fluid under pressure, stop engine and relieve the pressure in the system before disconnecting or connecting hydraulic or other lines. Tighten all connections before applying pressure.

1. 1. Remove extendible dipperstick extension. (See Remove Extendible Dipperstick Extension in Group 3340.)
2. Extend arm out.
3. 2. Disconnect extendible dipperstick cylinder lines.

CAUTION: The approximate weight of extendible dipperstick cylinder is 43 kg (95 lb).

4. Remove head end extendible dipperstick cylinder pin and slowly remove cylinder.



5. Install cylinder and connect lines.
6. Install extendible dipperstick extension. (See Install Extendible Dipperstick Extension in Group 3340.)

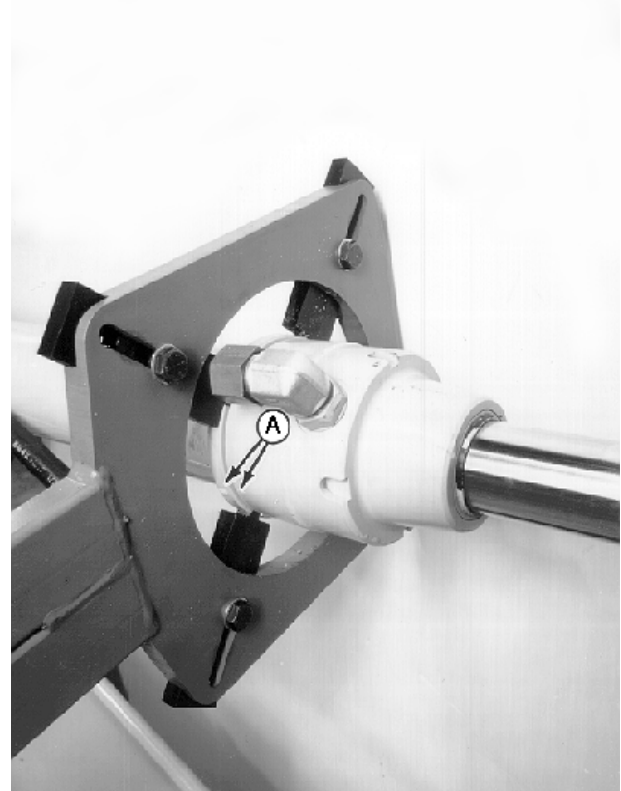
X8811 —UN—23AUG88

CED,TX03399,5613 -19-03DEC99-1/1

Disassemble Boom, Bucket, and Crowd Cylinders—125 Series

NOTE: The PH95—473—6A Spanner Wrench must be attached parallel to the JT02004 torque wrench (or equivalent) to provide a 2:1 multiplier. Torque reading will be half of actual torque.)

1. Put a mark (A) across rod guide and barrel to aid in assembly.
2. Loosen the jam nut using PH95—473—6A spanner wrench.
3. Remove rod guide from barrel by rotating counterclockwise (viewed from rod end of cylinder).



PH95—473—6A Spanner Wrench

T107241 —UN—19FEB97

Continued on next page

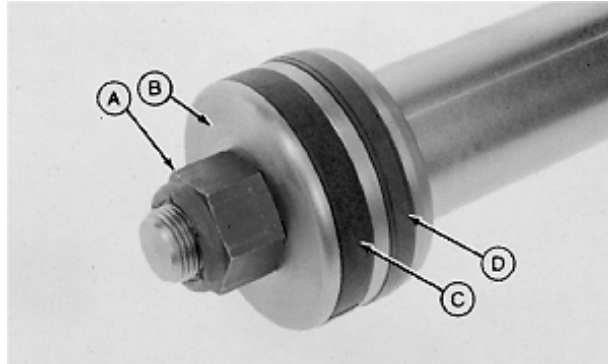
CED,OOU1010,462 -19-05FEB02-1/3

Hydraulic System

4. Remove nut (A) or cap screw with washer.
5. Remove piston (B), piston wear ring (C), and seals (D).
6. Remove rod guide.
7. Remove O-ring, backup ring, rod seals, and rod wear ring.

A—Nut
B—Piston

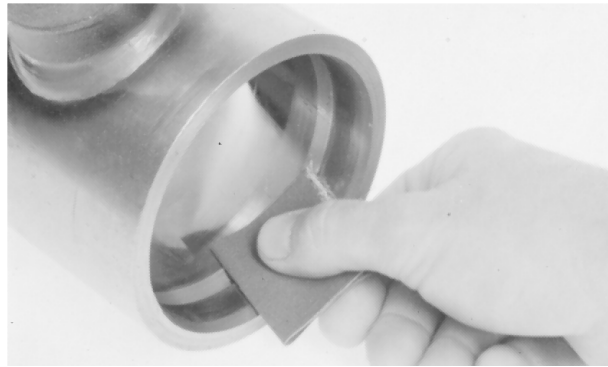
C—Wear Ring
D—Cap Seal



T6172BQ —UN—19OCT88

CED,OUO1010,462 -19-05FEB02-2/3

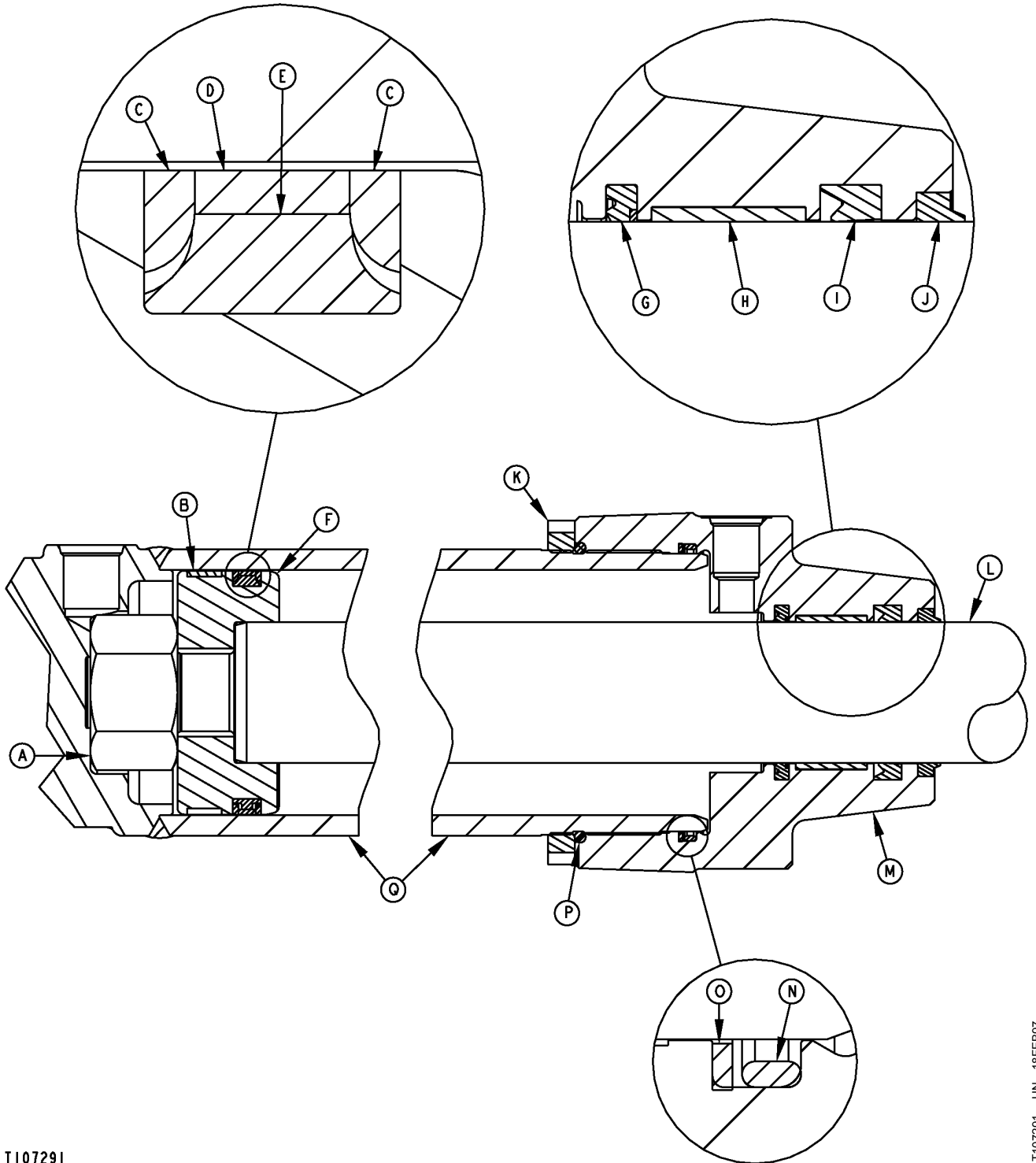
8. Inspect end of barrel. If necessary, remove nicks and burrs from the end of the barrel.
9. Thoroughly clean all components.



T6119AO —UN—19OCT88

CED,OUO1010,462 -19-05FEB02-3/3

Cross Section of Backhoe Crowd (S.N. —837228) and Bucket Cylinders—125 Series



T107291

T107291 —UN—18FEB97

Continued on next page

TX.31,RR7716 -19-18OCT99-1/2

Hydraulic System

A—Nut
B—Wear Ring
C—Ring (2 used)
D—Cap Seal
E—Seal Expander

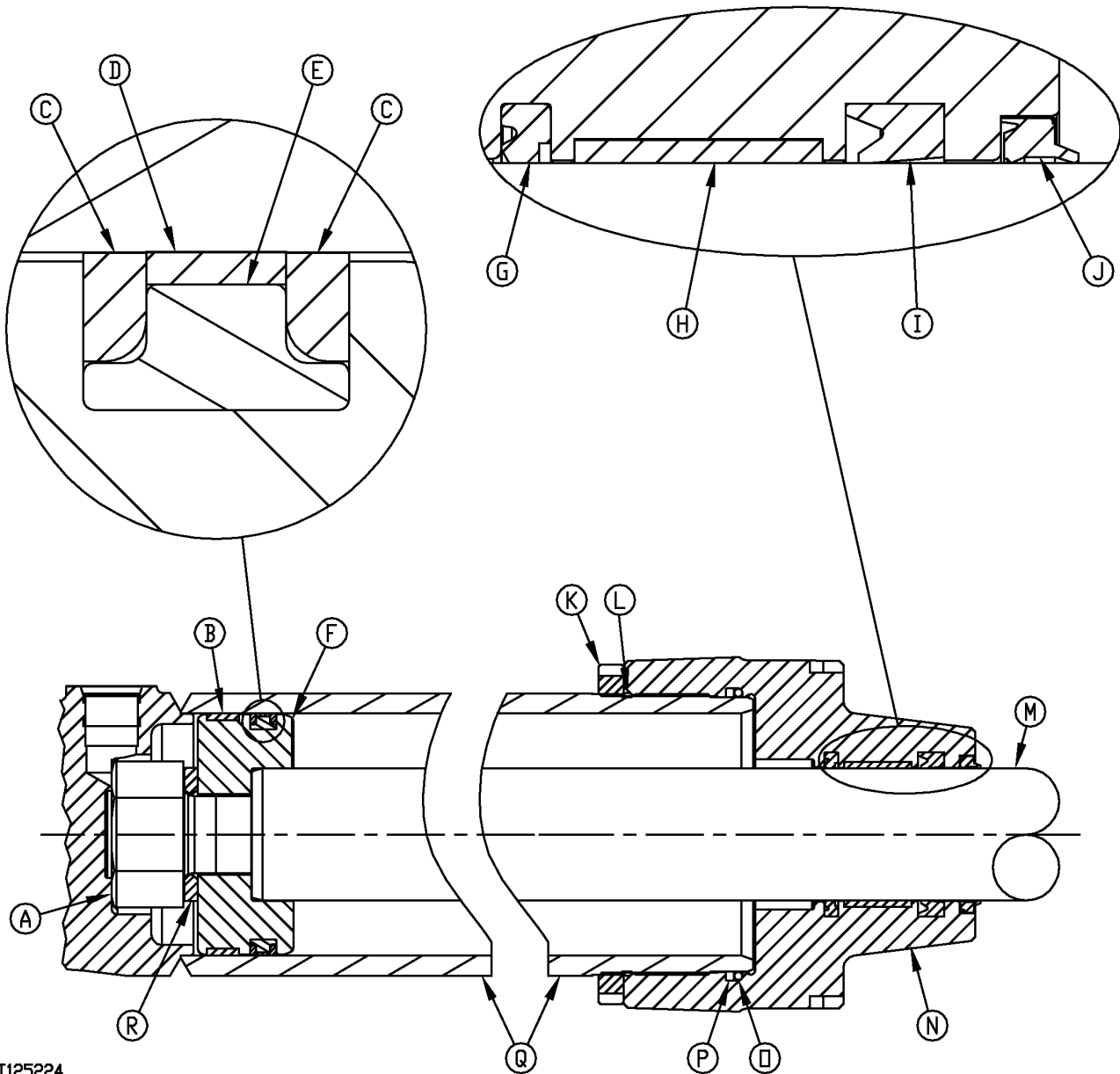
F—Piston
G—Rod Seal
H—Wear Ring
I—Rod Seal
J—Wiper Seal

K—Nut
L—Rod
M—Rod Guide
N—O-Ring
O—Backup Ring

P—O-Ring
Q—Barrel

TX,31,RR7716 -19-18OCT99-2/2

Cross Section of Crowd Cylinder (S.N. 837229—873597) 125 Series



T125224

A—Cap Screw
B—Piston Wear Ring
C—Back-up Ring (2 used)
D—Cap Seal
E—Piston Seal Expander

F—Piston
G—Buffer Seal
H—Rod Bearing
I—U-Cup Seal
J—Rod Wiper Seal

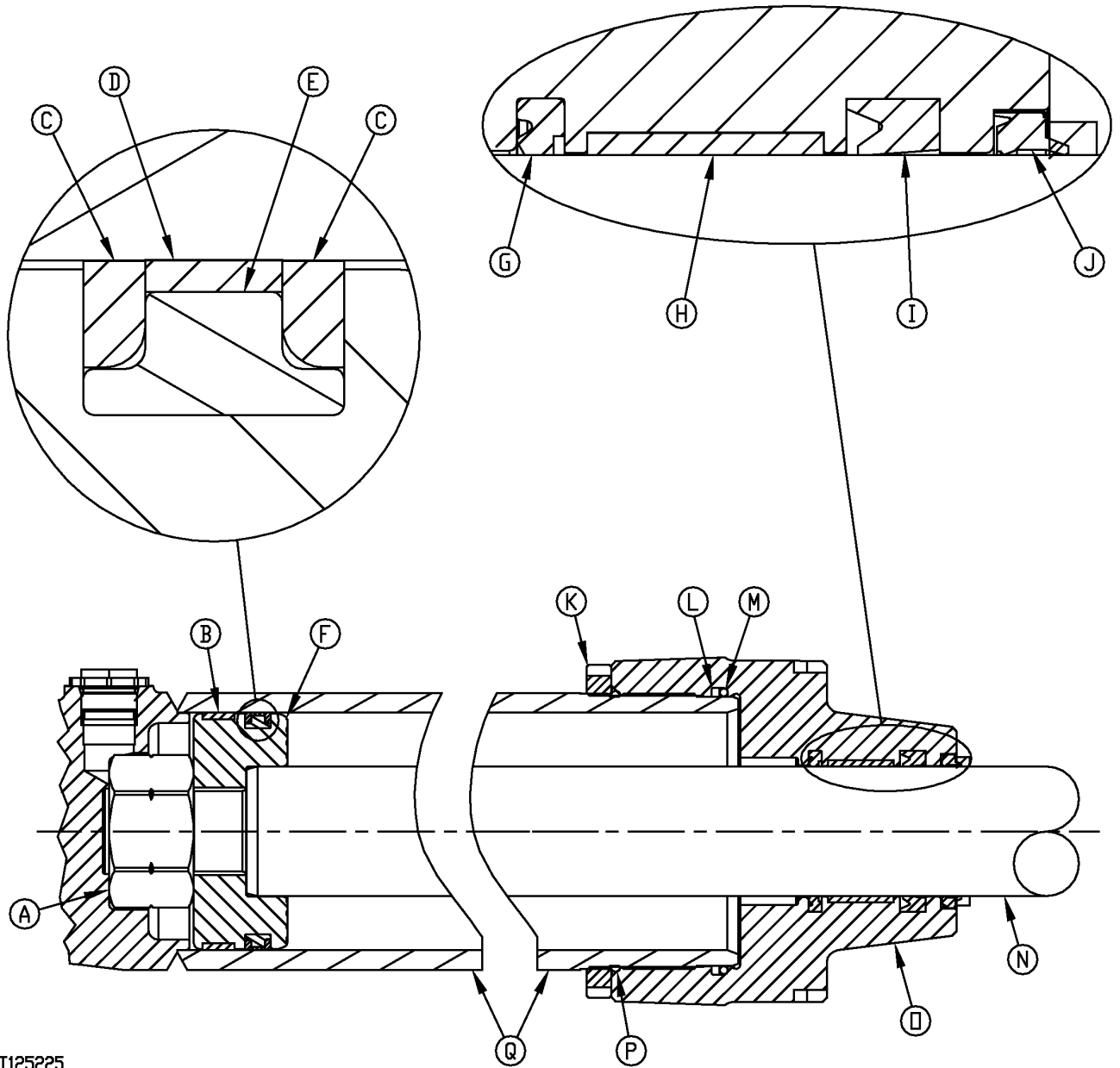
K—Nut
L—O-Ring
M—Rod
N—Rod Guide
O—O-Ring Seal

P—Back-up Ring
Q—Barrel
R—Washer

T125224—UN—25OCT99

CED, TX03399, 5568 -19-18OCT99-1/1

Cross Section of Crowd Cylinder (S.N. 873598—) 125 Series



T125225

A—Nut
 B—Piston Wear Ring
 C—Back-up Ring
 D—Cap Seal
 E—Piston Seal Expander

F—Piston
 G—Buffer Seal
 H—Rod Bearing
 I—U-Cup Seal
 J—Rod Wiper Seal

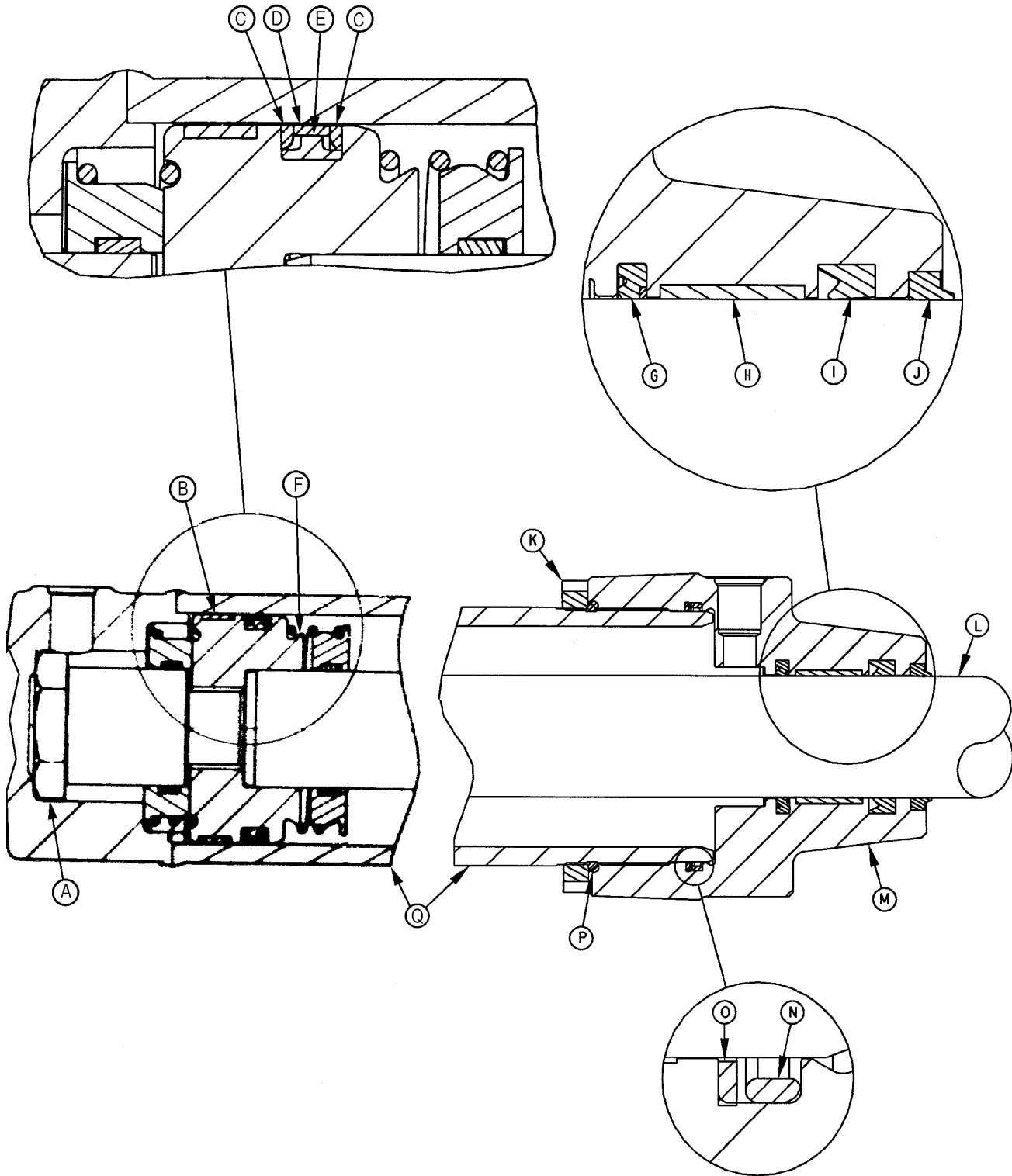
K—Nut
 L—Back-up Ring
 M—O-Ring Seal
 N—Rod
 O—Rod Guide

P—O-Ring
 Q—Barrel

T125225—UN—25OCT99

CEDEX, TX03399, 5569 -19-18OCT99-1/1

Cross Section of Backhoe Boom Cylinder—125 Series



T108111

T108111 —UN—12MAR97

Continued on next page

TX,33,RR7795 -19-19NOV98-1/2

A—Nut
B—Wear Ring
C—Ring (2 used)
D—Cap Seal

E—Seal Expander
F—Piston
G—Rod Seal
H—Wear Ring

J—Rod Seal
K—Wiper Seal
L—Rod
M—Rod Guide

N—O-Ring
O—Backup Ring
P—O-Ring
Q—Barrel

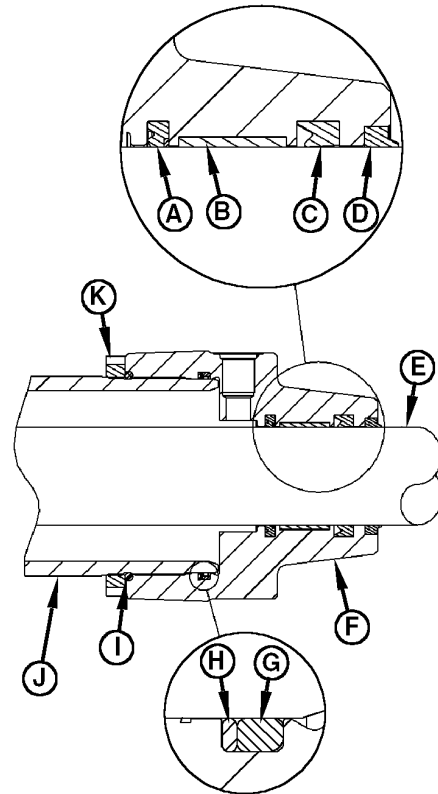
TX,33,RR7795 -19-19NOV98-2/2

Assemble Boom, Bucket, and Crowd Cylinders—125 Series

1. Install seals and backup ring into rod guide (F):
 - a. Install rod wear ring (B).
 - b. Install inner rod seal (A) with lip of seal toward inside (oil side) of cylinder.
 - c. Install inner rod seal backup ring in notch provided.
 - d. Install outer rod seal (C) with sealing lip toward inside (oil side) of cylinder.
 - e. Install wiper seal (D) with extended lip toward outside (air side) of cylinder. Install until metal ring is flush with the outer end of guide using care not to damage the extended sealing lip.
 - f. Install O-ring (G) and backup ring (H) in orientation shown.

A—Inner Rod Seal
B—Wear Ring
C—Outer Rod Seal
D—Wiper Seal
E—Rod

F—Rod Guide
G—O-Ring
H—Back-Up Ring
I—O-Ring
J—Barrel



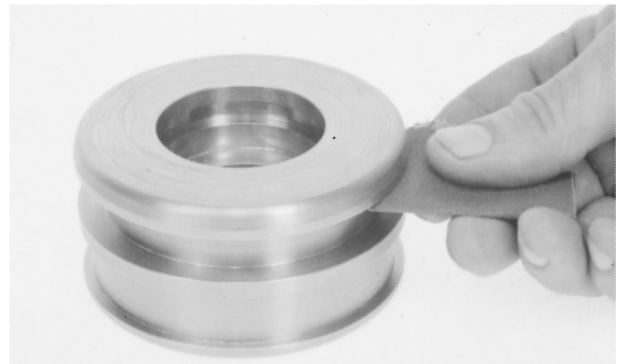
T118575

T118575 —UN—19NOV98

WS68074,00036ED -19-14JUL10-1/10

IMPORTANT: To prevent damage of seal during assembly, the lands on the piston must be clean and free of nicks and burrs.

2. Inspect the piston lands. If necessary, clean the lands of any nicks or burrs that can cut the piston seal.



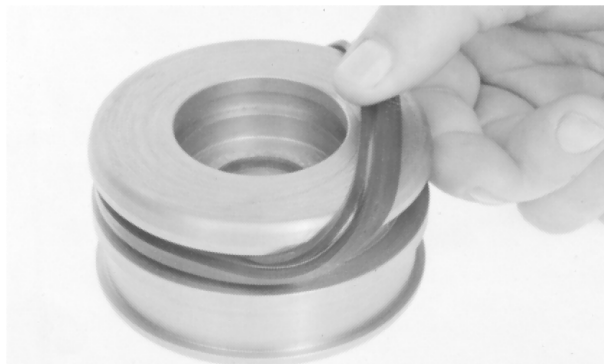
T6122AB —UN—19OCT88

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WS68074,00036ED -19-14JUL10-2/10

Hydraulic System

3. Install seal expander by pushing seal expander onto end of piston.



T612ZAC —UN—06AUG90

WS68074,00036ED -19-14JUL10-3/10

NOTE: The cap seal can be made more pliable by warming it with your hands or putting seal in hot water for approximately 5 minutes.

Once started, install cap seal as quickly as possible to keep the amount of time that the seal is stretched to a minimum.

4. Install a plastic tie band around cap seal with the smooth side against the cap seal.
5. Using the plastic tie band, pull cap seal across piston land and into position over seal expander.



T612ZAE —UN—19OCT88

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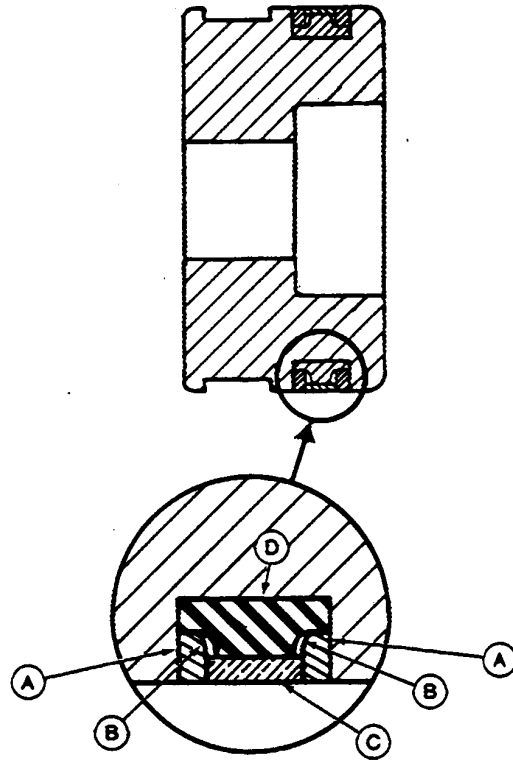
WS68074,00036ED -19-14JUL10-4/10

IMPORTANT: For proper fit and operation, the backup rings must be installed with the radius toward seal expander.

6. Install backup rings with radius toward seal expander.
7. Check the cap seal for looseness. Seal must fit tight against seal expander and not turn. If seal can be turned, it has been stretched too much and can be damaged during assembly into barrel.

A—Backup Ring (2 used)
B—Radius

C—Cap Seal
D—Seal Expander



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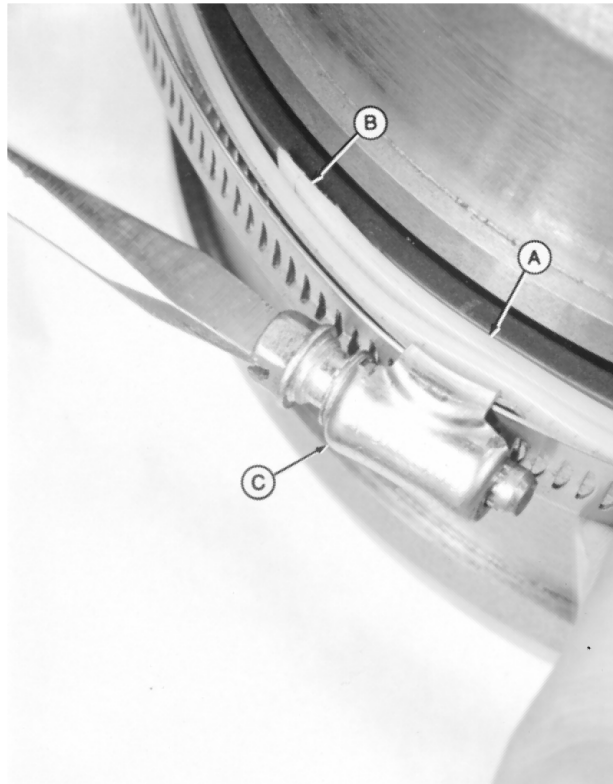
WS68074,00036ED -19-14JUL10-5/10

T6126AO —UN—19OCT88

NOTE: When using a ring compressor, put a piece of shim stock between cap seal and compressor at the joint so it does not damage seal.

When using a plastic tie band (A) and hose clamp, grind a taper (B) on one end of the tie band. Install tie band with the taper against cap seal. Before tightening the hose clamp (C), the tie band must be under hose clamp all around the piston. Seal will also shrink to its original size if left for a minimum of 8 hours before installing assembly into barrel.

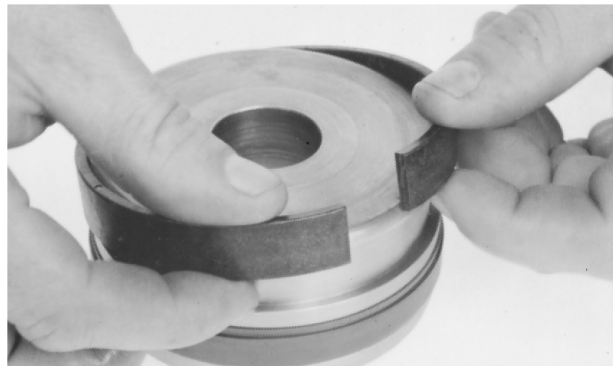
8. If necessary, shrink cap seal to its original size using a ring compressor or plastic tie band and a hose clamp.



T86565 —JUN—09NOV88

WS68074,00036ED -19-14JUL10-6/10

9. Install wear ring.

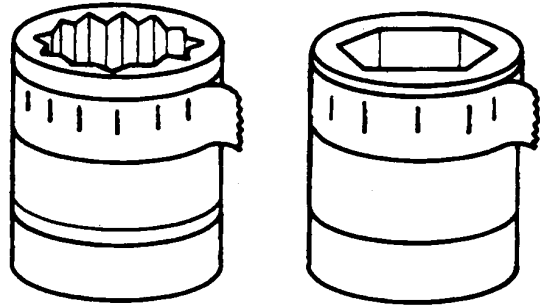


T6122AF —JUN—19OCT88

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WS68074,00036ED -19-14JUL10-7/10

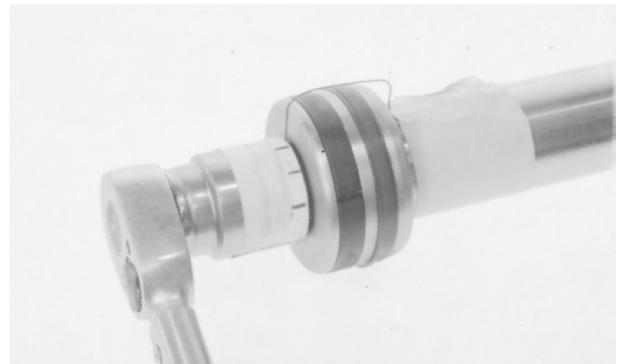
10. Wrap light colored tape around socket being used to tighten piston nut. Make several marks on socket to the appropriate additional torque turn specification.



T6149AG—UN—19OCT88

WS68074,00036ED -19-14JUL10-8/10

11. Install assembled rod guide onto rod.
 12. Apply cure primer, then thread lock and sealer (high strength) to rod threads.
 13. Install piston nut or cap screw with washer and tighten to specification using the following directions.
 14. Fasten a piece of wire to the piston rod using tape. Bend the wire over the piston so it points to one of the marks on the taped socket. (*The wire is used as a stationary pointer.*)
 15. For bucket and boom cylinders, tighten nut an additional 1/8 (45°) turn until the wire aligns with the next mark.



T6172BR—UN—19OCT88

Specification

Backhoe Bucket Cylinder	
Piston Nut—Torque	
Turn.....	340 N·m (250 lb-ft) + 1/8 (45°) turn
Backhoe Boom Cylinder	
Piston Nut—Torque	
Turn.....	375 N·m (276 lb-ft) + 1/8 (45°) turn

For crowd cylinder, tighten nut an additional 1/12 (30°) or 1/6 (60°) turn (depending on serial number) or cap screw an additional 1/6 (60°) turn until the wire aligns with next mark.

Specification

Backhoe Crowd Cylinder	
Piston Nut (S.N. —837228)—Torque	
Turn.....	375 N·m (276 lb-ft) + 1/4 (90°) turn

Backhoe Crowd Cylinder	
Piston Cap Screw (S.N. 837229—873597)—Torque	
Turn.....	1000 N·m (738 lb-ft) + 1/6 (60°) turn
Backhoe Crowd Cylinder	
Piston Nut (S.N. 873598—)—Torque	
Turn.....	200 N·m (148 lb-ft) + 1/6 (60°) turn

16. Apply cure primer, then thread lock and sealer (low strength) to barrel threads that will be under (spanner) nut.
 17. Install jam (spanner) nut all the way onto barrel.
 18. Install O-ring into gap in the barrel threads.

Continued on next page

WS68074,00036ED -19-14JUL10-9/10

IMPORTANT: To prevent seal damage, the barrel, piston, and rod must be in alignment during installation.

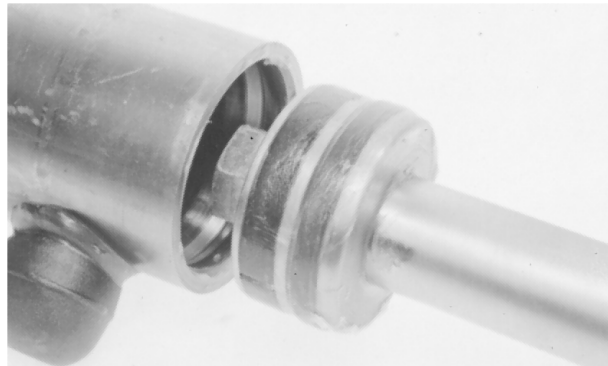
19. Apply clean hydraulic oil to piston seals and barrel chamfer. Use care not to get oil on barrel threads.
20. Carefully push piston into barrel.

IMPORTANT: Use care not to get thread lock and sealer on the end of the barrel that contacts the inner O-ring and backup ring.

21. Apply cure primer, then thread lock and sealer (low strength) to the remaining barrel threads.
22. Carefully push and rotate rod guide to engage threads.
23. Turn guide onto barrel until it bottoms (internally) against the end of the barrel.

IMPORTANT: Do not turn the guide in place with a spanner wrench.

24. Rotate the guide counterclockwise (viewed from rod end of cylinder) until the marks made before disassembly are aligned, or the rod guide port is



T6122AH—UN—19OCT88

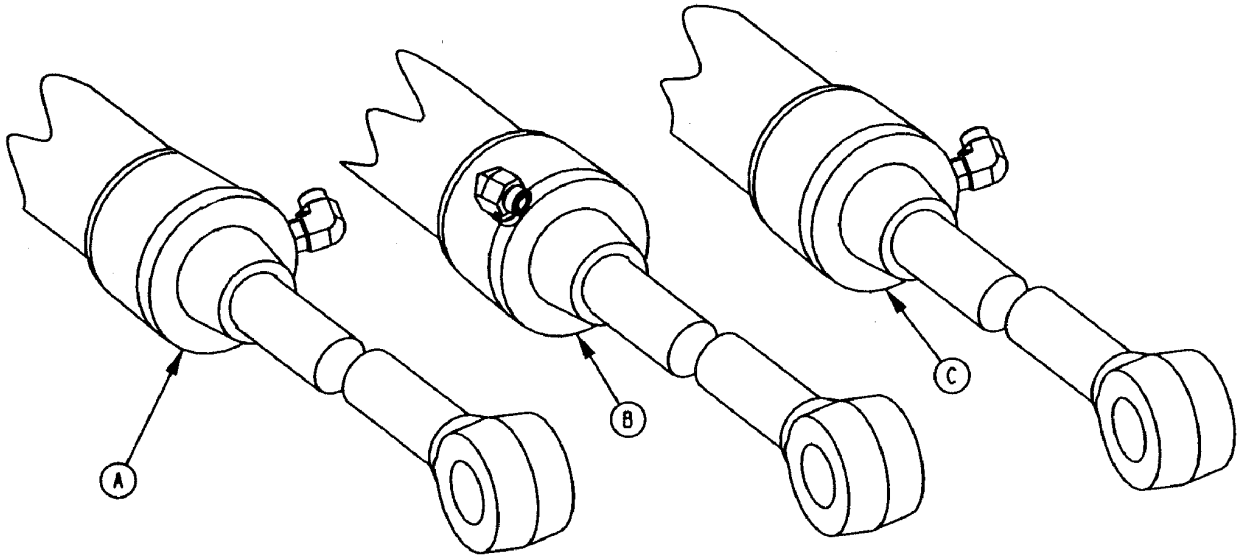
- properly positioned. (See Indexing 125 Series Cylinders in this group.)
25. Tighten jam (spanner) nut against the rod guide to specification.

Specification

Boom, Bucket, and Crowd Cylinder Rod Guide Jam (Spanner)	
Nut—Torque.....	1350 N·m (1000 lb-ft)

WS68074,00036ED -19-14JUL10-10/10

Indexing Series 125 Cylinders



T100326

A—Bucket Cylinder

B—Boom Cylinder

C—Crowd Cylinder

When assembling the 125 Series cylinders, position the rod guide so the rod end port will receive the hydraulic hose at the correct angle. Tighten jam (spanner) nut against the rod guide when desired position is obtained.

Use the illustration to determine proper position of the rod guide for cylinder being assembled.

TX,31,RR7737 -19-19NOV98-1/1

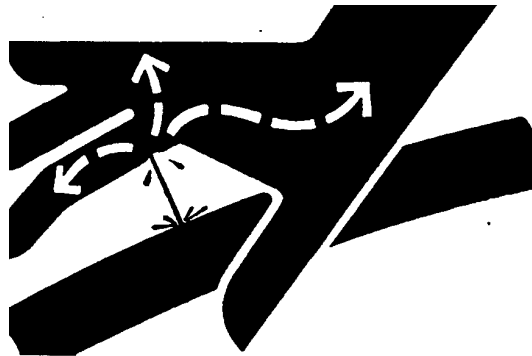
T100326—UN—03MAR97

Remove and Install Swing Cylinder—120 Series

CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

1. Swing backhoe to one side and lower backhoe bucket to ground.



X9811 —UN—23AUG88

2. Operate all hydraulic controls to release pressure in system.
3. Tag and disconnect lines from cylinder. Close all openings with caps and plugs.

TX,31,RR7703 -19-19NOV98-1/4

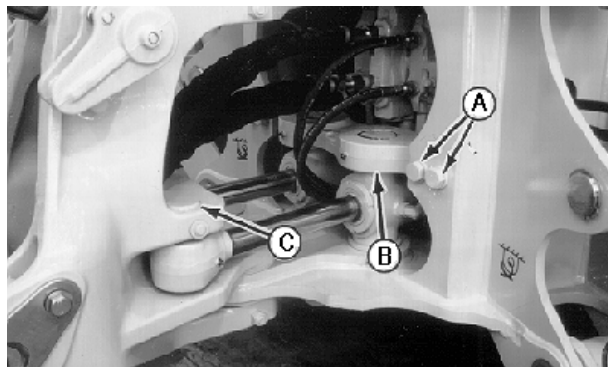
4. Remove trunnion cap screws (A) and trunnion (B).

CAUTION: The approximate weight of swing cylinder is 48 kg (106 lb).

Specification

Swing Cylinder—Weight..... 48 kg (106 lb) Approximate

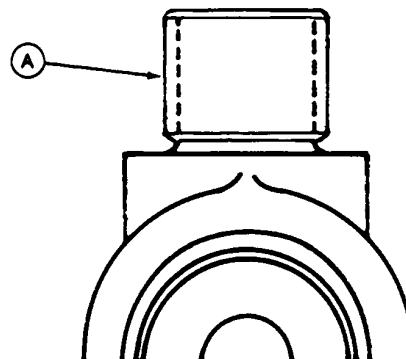
5. Attach cylinder to a hoist using a lifting strap.
6. Remove pin (C) through swing frame and cylinder rod end.
7. Remove cylinder.



T107238 —UN—15FEB97

TX,31,RR7703 -19-19NOV98-2/4

8. Inspect swing cylinder bushings (A). Remove if replacement is necessary.
9. Install new bushings even with trunnion using 49 mm and 59 mm disks.



T6131AK —UN—25MAY89

Continued on next page

TX,31,RR7703 -19-19NOV98-3/4

10. Inspect upper and lower trunnion block bushings. Remove if replacement is necessary using 60 mm and 69 mm disks.
11. Install new bushings with 60 mm and 69 mm disks. Align grease passages in trunnion block and frame with passage in bushing. Be sure lower trunnion bushing is pushed into seat flange.
Press upper bushing even with top of trunnion block.

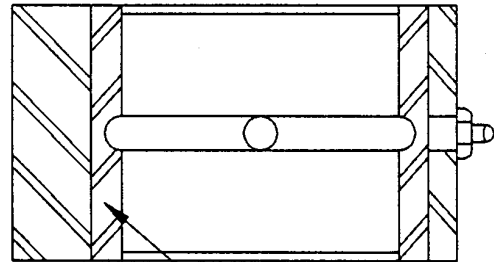
IMPORTANT: Be sure hydraulic fittings in swing cylinder are tightened to specification. Cylinder movement and hydraulic pressure can loosen fittings and cause a leak.

12. If hydraulic fittings were removed from cylinder, install and tighten fittings to specification.

Specification

Swing Cylinder Hydraulic
Fittings—Torque..... 34 N·m (25 lb-ft)

13. Install lower trunnion spacer washer.
14. Install cylinder into lower trunnion.



T7531CA (CY)

15. Install pin through swing frame and cylinder rod end.
16. Install trunnion over upper cylinder bushings.
17. Install trunnion cap screws and tighten.
18. Connect hydraulic lines to cylinder.

T7531CA—UN—15MAY91

TX,31,RR7703 -19-19NOV98-4/4

Remove and Install Stabilizer Cylinder—120 Series

CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

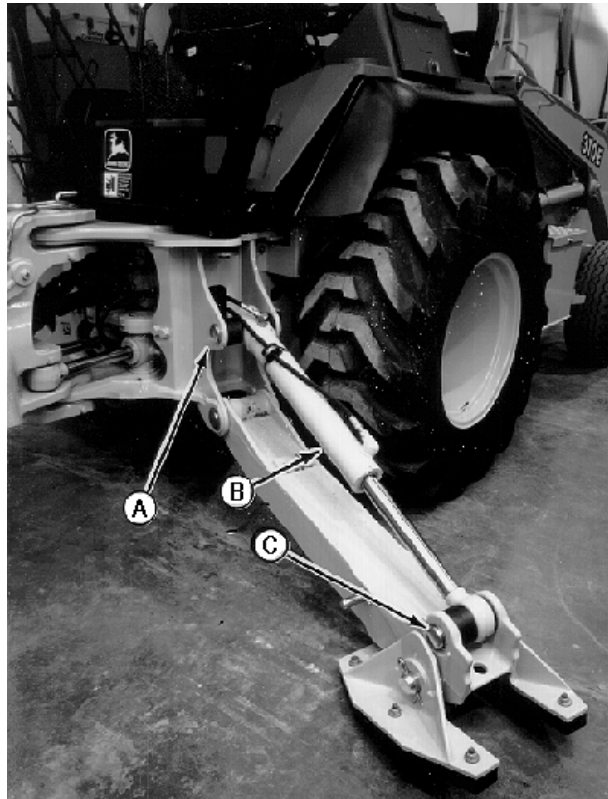
1. Lower stabilizer to ground. On machines equipped with reversible feet, remove the foot before lowering stabilizer arm to ground.

CAUTION: The approximate weight of stabilizer cylinder is 39 kg (86 lb).

Specification

Stabilizer
Cylinder—Weight..... 39 kg (86 lb) Approximate

2. Attach cylinder (B) to a hoist with a lifting strap.
3. Tag and disconnect hydraulic lines. Close all openings with caps and plugs. Remove hose clamp.
4. Remove pin (C) from cylinder rod end.
5. Remove pin (A) from cylinder head end and remove cylinder.
6. Install cylinder and pins (A and C).
7. Connect hydraulic lines.
8. Install hose clamp around cylinder and hose.



T107237 —UN—15FEB97

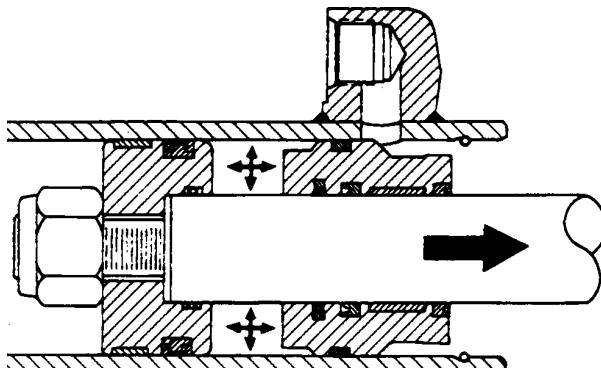
TX,31,RR7704 -19-19NOV98-1/1

Disassemble Swing and Stabilizer Cylinders—120 Series

NOTE: Repair procedures for cylinders are similar except as shown.

IMPORTANT: Extend rod to remove oil or air between the rod piston and rod guide. Excessive amount of trapped oil or air will force seals to expand making disassembly more difficult.

1. Extend rod so rod piston is approximately 25.4 mm (1 in.) from rod guide.



T6190AS —UN—19OCT88

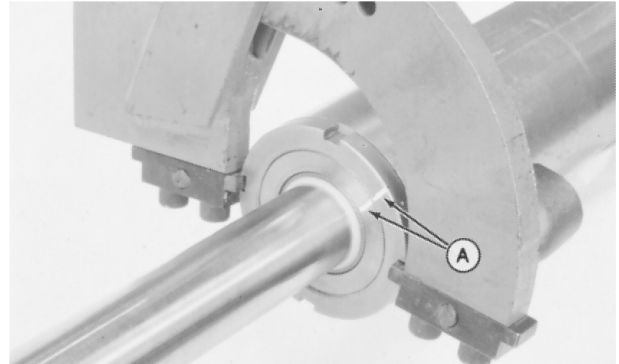
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TX,31,RR7709 -19-19NOV98-1/8

Hydraulic System

2. Make a mark on rod guide and spanner nut (A) to aid in assembly.
3. Remove nut using adjustable spanner wrench or blunt chisel and a hammer.

NOTE: If nut and rod guide turn as an assembly, put cylinder in a vise. Vise jaws must contact cylinder barrel behind nut and over rod guide area. Tighten vise just enough to hold rod guide.

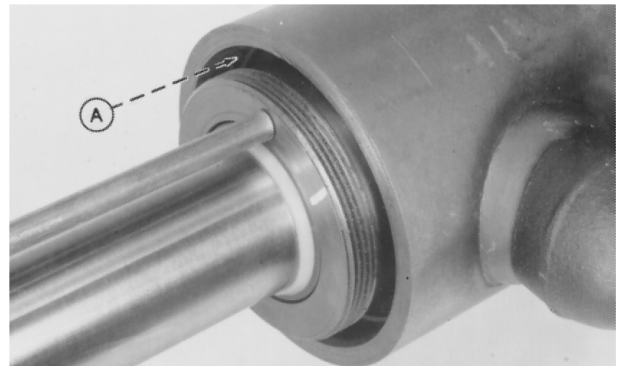


T6119AL —UN—19OCT88

TX,31,RR7709 -19-19NOV98-2/8

NOTE: Filler rings (used for disassembly only) are installed between spanner nut and rod guide to aid in disassembly.

4. Move rod guide rearward, using a wooden dowel or brass drift, just enough to remove retaining ring (A). Remove retaining ring by tipping retaining ring inward, always push the side opposite the gap in ring. Use care not to damage rod guide threads or seal.

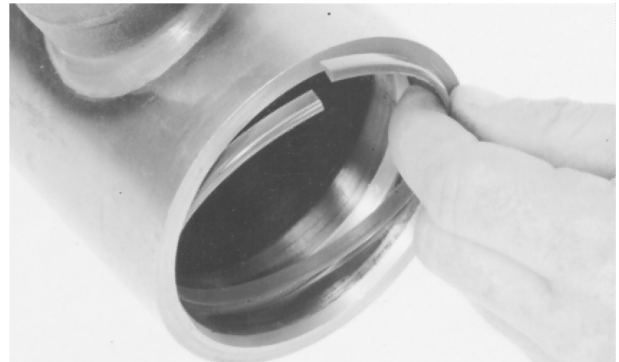


T6119AM —UN—12APR01

TX,31,RR7709 -19-19NOV98-3/8

NOTE: Rod piston assembly removed for illustration purposes only.

5. Install filler ring in snap ring groove.
6. Remove rod and piston assembly.



T6119AN —UN—19OCT88

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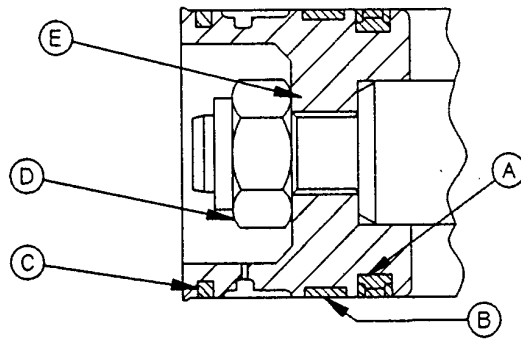
TX,31,RR7709 -19-19NOV98-4/8

Hydraulic System

7. For swing cylinder, remove brake seal ring (C), wear ring (B), and cap seal assembly (A).
8. If necessary, remove nut (D) and piston (B) from rod.

A—Cap Seal Assembly
 B—Wear Ring
 C—Brake Seal Ring

D—Nut
 E—Piston



Swing Cylinder

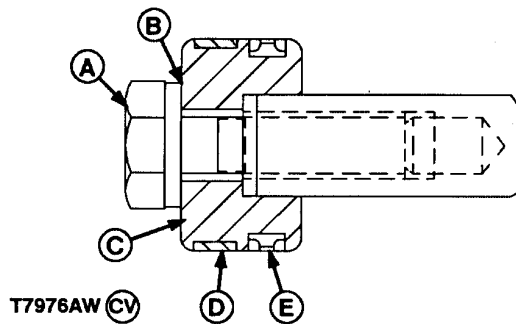
T7535AB —UN—16MAY91

TX,31,RR7709 -19-19NOV98-5/8

9. For stabilizer cylinder, remove wear ring (D) and cap seal assembly (E).
10. If necessary, remove cap screw (A), washer (B), and piston (C).

A—Cap Screw
 B—Washer
 C—Piston

D—Wear Ring
 E—Cap Seal Assembly



Stabilizer Cylinder

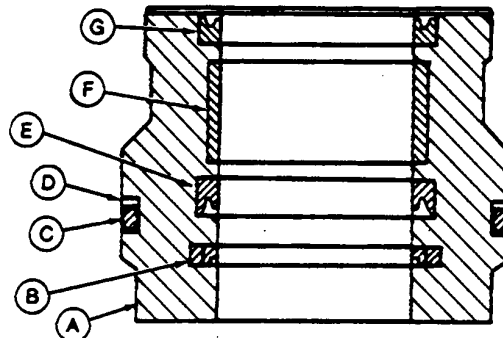
T7976AW —UN—14APR93

TX,31,RR7709 -19-19NOV98-6/8

11. Remove rod guide (A).
12. Remove O-ring (C), backup ring (D), seals (B, E and G) and wear ring (F).

A—Rod Guide
 B—Buffer Seal
 C—O-Ring
 D—Backup Ring

E—Rod Seal
 F—Wear Ring
 G—Wiper Seal

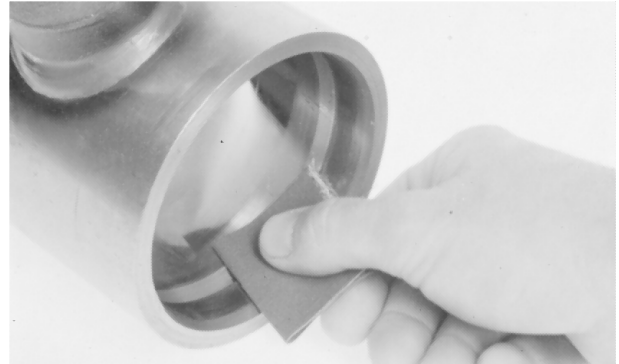


T6119AK —UN—19OCT88

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TX,31,RR7709 -19-19NOV98-7/8

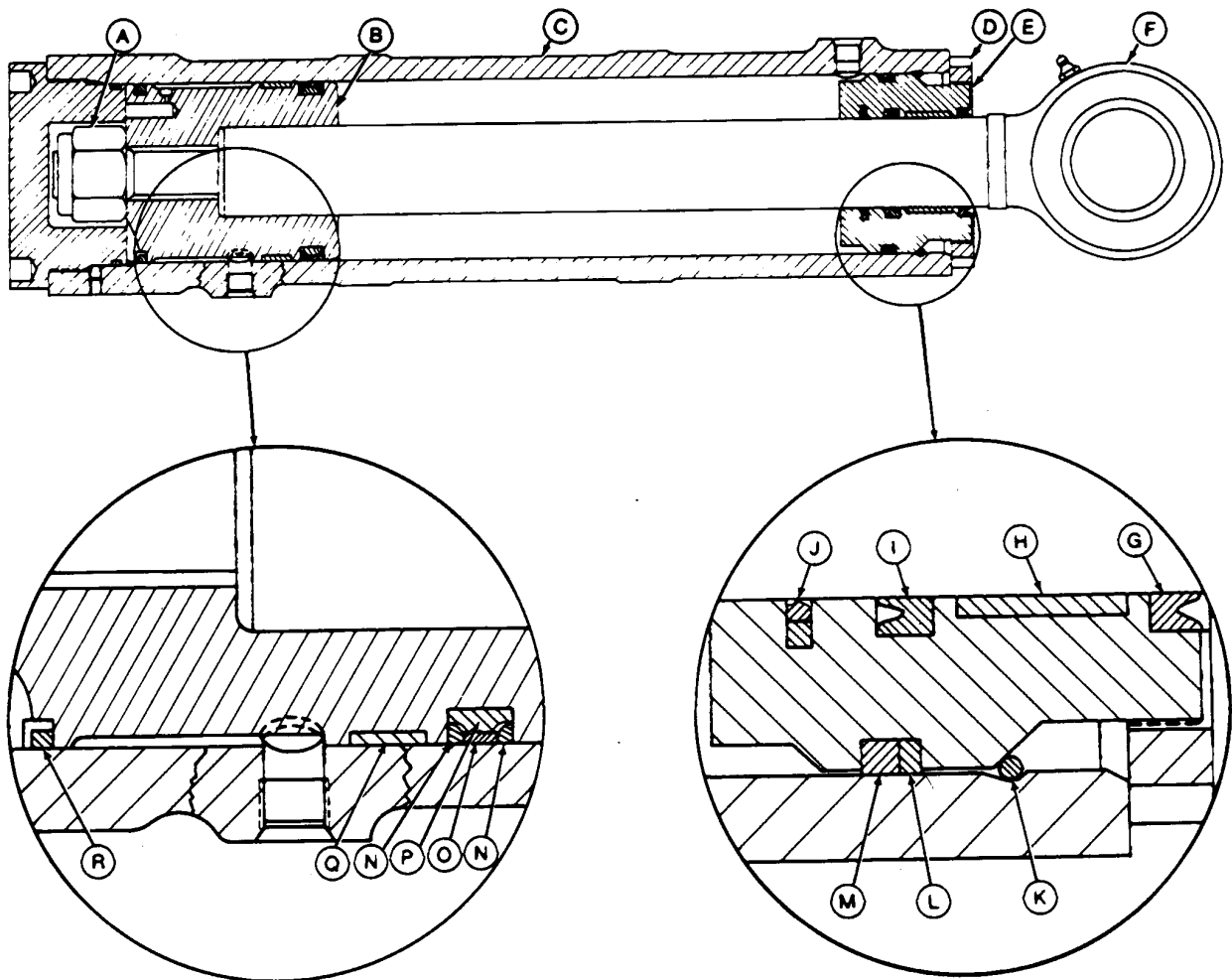
13. Inspect snap ring groove. If necessary, clean groove of nicks or burrs.



T6119AO —UN—19OCT88

TX.31.RR7709 -19-19NOV98-8/8

Cross Section of Swing Cylinder—120 Series



A—Nut
B—Piston
C—Barrel
D—Spanner Nut
E—Rod Guide

F—Rod
G—Wiper Seal
H—Wear Ring
I—Rod Seal
J—Buffer Seal

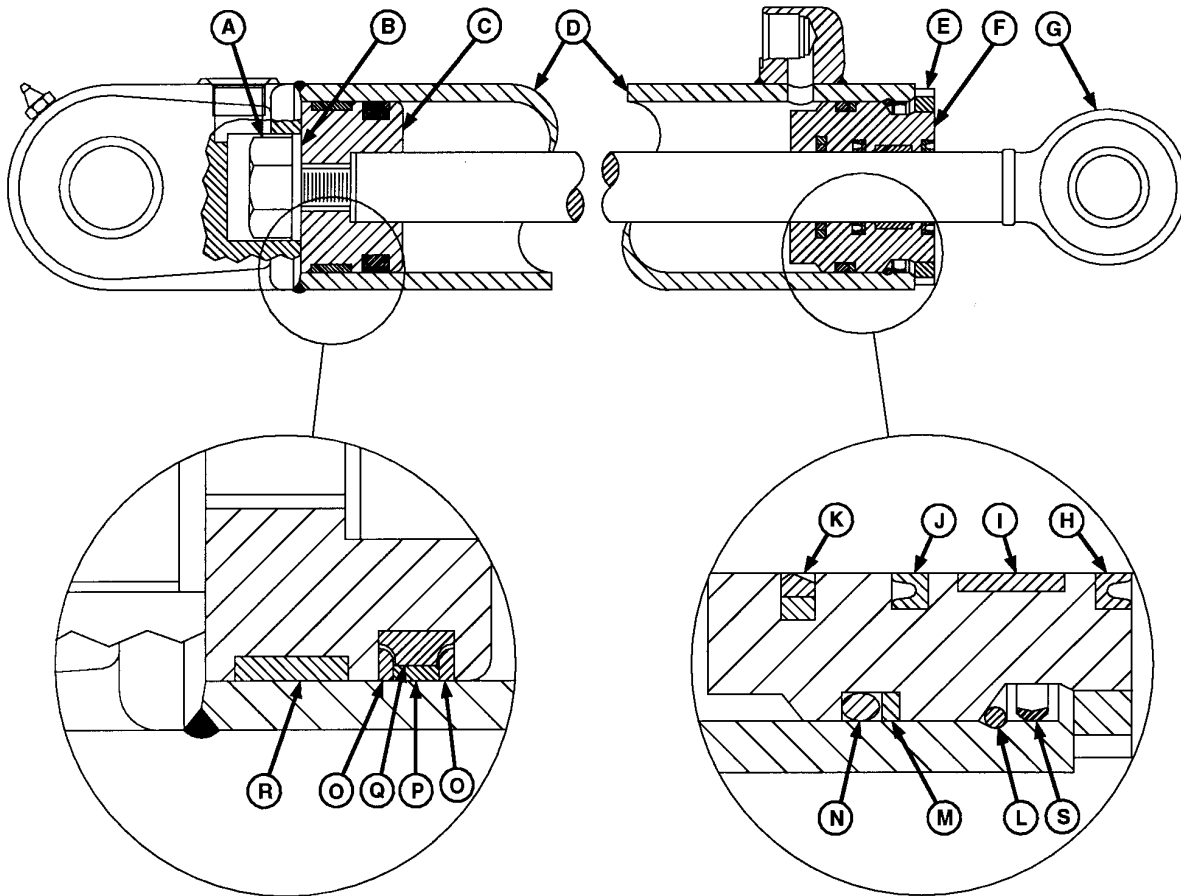
K—Retaining Ring
L—Backup Ring
M—O-Ring
N—Backup Ring (2 used)
O—Cap Seal

P—Expander Seal
Q—Wear Ring
R—Brake Seal Ring

T623BC —UN—26MAY99

TX.33.RR7786 -19-19NOV98-1/1

Cross Section of Stabilizer Cylinder—120 Series



T8339AA (CV)

T8339AA —UN—17OCT94

A—Nut
B—Washer
C—Piston
D—Barrel
E—Nut

F—Rod Guide
G—Rod
H—Wiper Seal
I—Wear Ring
J—Rod Seal

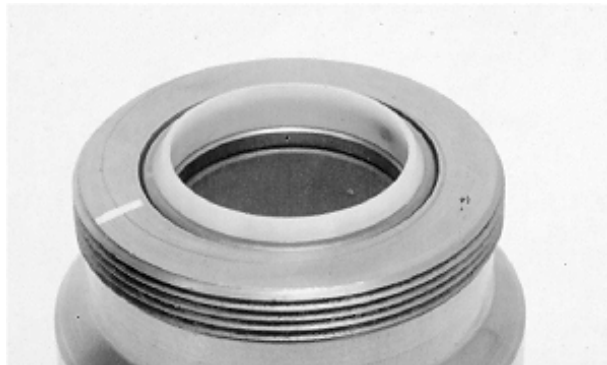
K—Buffer Seal
L—Retaining Ring
M—Backup Ring
N—O-Ring
O—Backup Ring (2 used)

P—Cap Seal
Q—Expander Seal
R—Wear Ring
S—Filler Ring

TX,33,RR7785 -19-19NOV98-1/1

Assemble Swing and Stabilizer Cylinder—120 Series

1. Put clean hydraulic oil on all internal parts before assembly. Install wiper seal. Push seal to bottom of bore.



T6122AA —UN—19OCT88

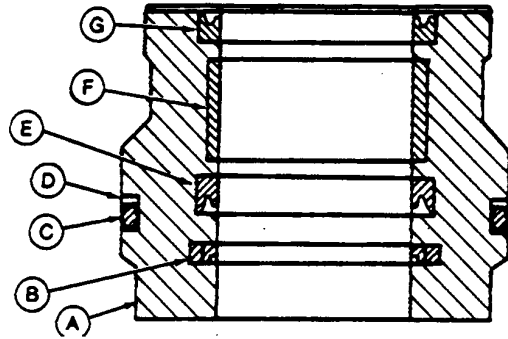
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TX,31,RR7708 -19-02NOV99-1/15

Hydraulic System

2. Install seals (B, E and G).
3. Install wear ring (F).
4. Install backup ring (D) and O-ring (C).

A—Rod Guide
B—Buffer Seal
C—O-Ring
D—Backup Ring
E—Seal
F—Wear Ring
G—Wiper Seal

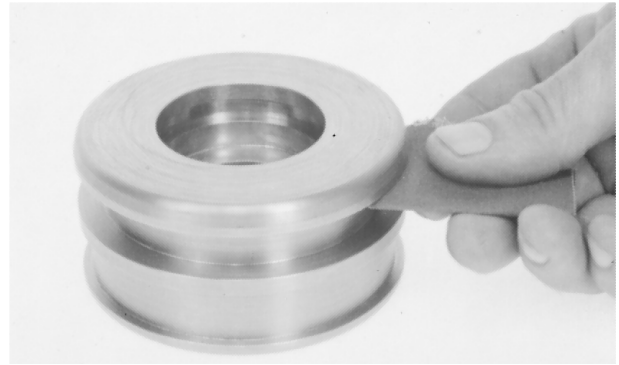


T6119AK—UN—19OCT88

TX,31,RR7708 -19-02NOV99-2/15

IMPORTANT: To prevent damage of cap seal during assembly the lands on piston must be clean and free of nicks or burrs.

5. Inspect the piston lands. If necessary, clean the lands of any nicks or burrs that can cut cap seal.



T6122AB—UN—19OCT88

TX,31,RR7708 -19-02NOV99-3/15

6. Install seal expander by pushing seal expander onto end of piston.



T6122AC—UN—06AUG90

Continued on next page

TX,31,RR7708 -19-02NOV99-4/15

NOTE: The cap seal can be made more pliable by warming it with your hands or by putting seal in hot water for approximately five minutes.

Once started, install cap seal as quickly as possible to keep the amount of time that seal is stretched to a minimum.

7. Install a plastic tie band around cap seal with the smooth side against the cap seal.
8. Using the plastic tie band, pull cap seal across the piston land and into position over seal expander.



T6122AE—JUN—19OCT88

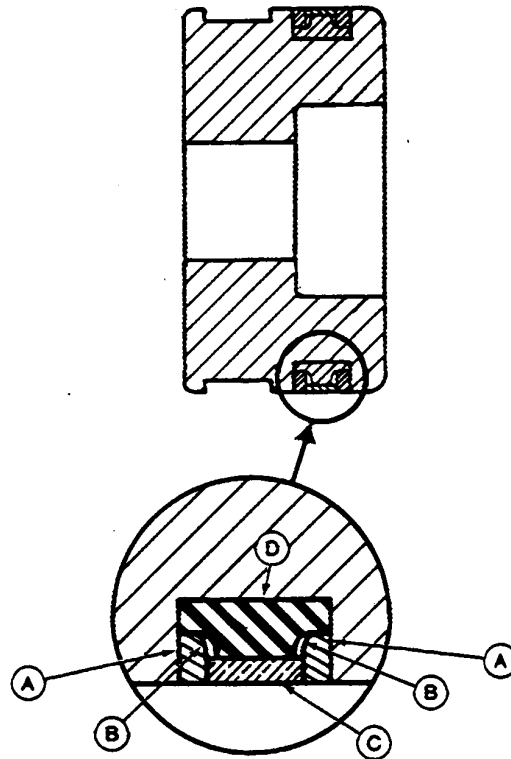
TX,31,RR7708 -19-02NOV99-5/15

IMPORTANT: For proper fit, the backup rings must be installed with the radius toward seal expander.

9. Install backup rings (A) with radius (B) toward seal expander (D).
10. Check if cap seal is loose. Seal must fit tight against seal expander and not turn. If seal can be turned, it has been stretched too much and can be damaged during assembly into barrel.

A—Backup Ring (2 used)
B—Radius

C—Cap Seal
D—Seal Expander



T6126AO—JUN—19OCT88

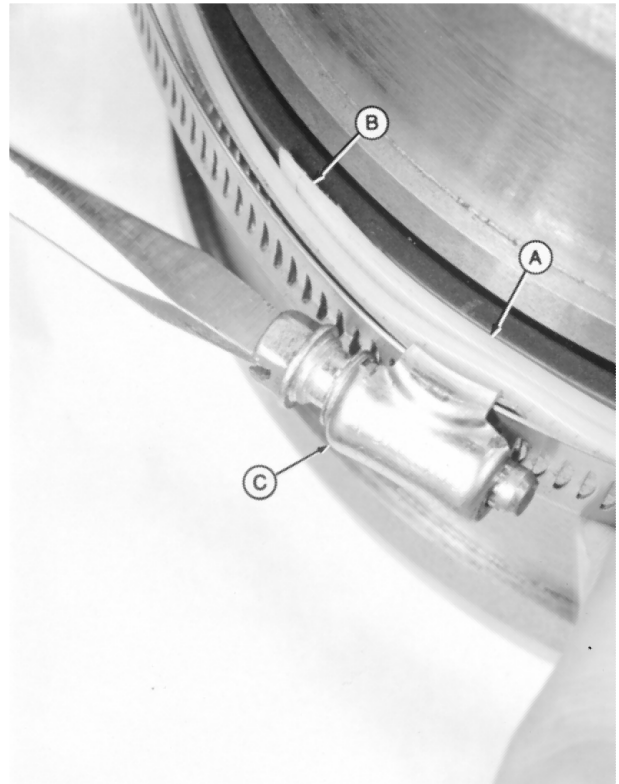
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TX,31,RR7708 -19-02NOV99-6/15

11. If necessary, shrink cap seal to its original size using a ring compressor or a plastic tie band (A) and hose clamp (C).

When using a ring compressor, put a piece of shim stock between cap seal and compressor at the joint so it does not damage seal.

When using a plastic tie band and hose clamp, grind a taper (B) on one end of tie band. Install tie band with the taper against cap seal. Before tightening the hose clamp, tie band must be under hose clamp all around piston.



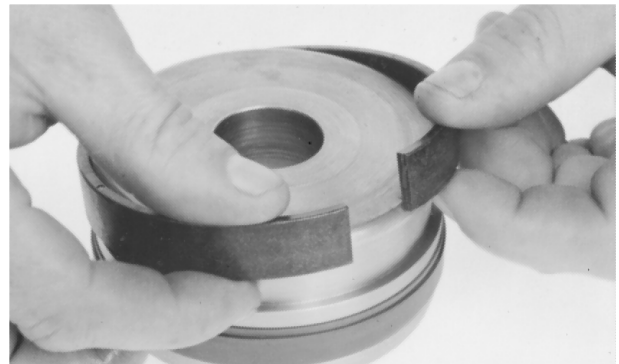
T86565 —UN—09NOV88

TX,31,RR7708 -19-02NOV99-7/15

12. Install wear ring.

NOTE: Brake seal ring (swing cylinder only) is marked on one side with "UP". Be sure the seal is installed with the "UP" side toward the head end of cylinder.

13. For swing cylinder, install brake seal ring with the "UP" mark toward the head end of cylinder.



T6122AF —UN—19OCT88

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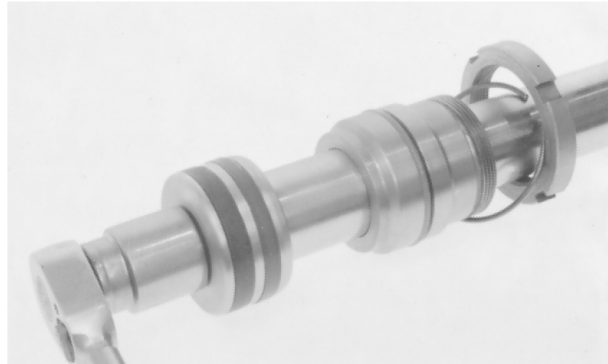
TX,31,RR7708 -19-02NOV99-8/15

Hydraulic System

14. Install nut, retaining ring, rod guide, and piston assembly on rod.

15. Install piston nut.

- For swing cylinder, tighten piston to 225 N·m (165 lb-ft).
- For stabilizer cylinder, tighten piston to 600 N·m (442 lb-ft).

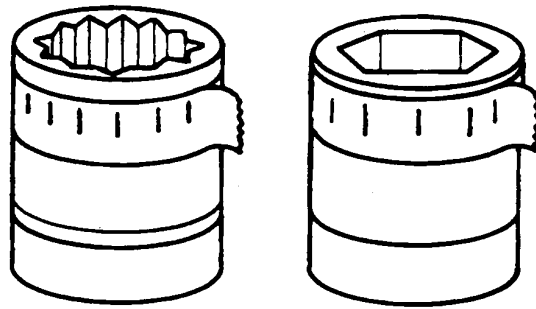


T6172BP —JUN—19OCT88

TX,31,RR7708 -19-02NOV99-9/15

16. Wrap light colored tape around socket being used to tighten piston nut.

- For swing cylinder, make several marks 60° apart (1/6 divisions) around circumference of the taped socket.
- For stabilizer cylinder, make several marks 30° apart (1/12 divisions) around circumference of the taped socket.



T6149AG —JUN—19OCT88

TX,31,RR7708 -19-02NOV99-10/15

17. Fasten a piece of wire to the piston rod using tape. Bend the wire over the piston so it points to one of the marks on the taped socket. (*The wire is used as a stationary pointer.*)

18. For swing cylinder, tighten nut an additional 1/6 (60°) turn until the wire aligns with the next mark.

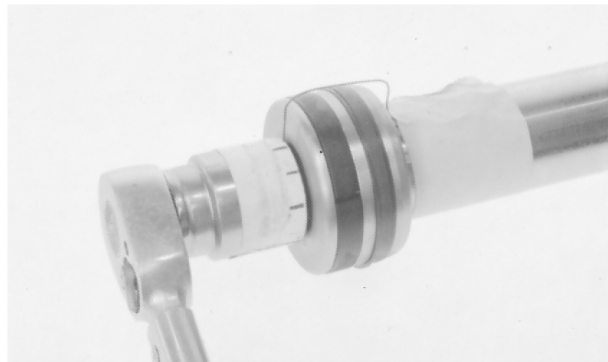
Specification

Backhoe Swing Cylinder
Piston—Torque Turn..... 225 N·m (165 lb-ft) + 1/6 (60°) turn

For stabilizer cylinder, tighten nut an additional 1/12 (30°) turn until the wire aligns with next mark.

Specification

Backhoe Stabilizer
Cylinder Piston—Torque
Turn..... 600 N·m (442 lb-ft) + 1/12 (30°) turn



Boom Cylinder Shown

T6172BR —JUN—19OCT88

Continued on next page

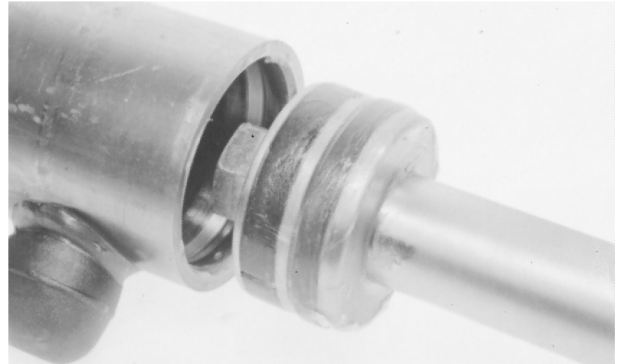
TX,31,RR7708 -19-02NOV99-11/15

Hydraulic System

19. Apply clean hydraulic oil to seals and chamfer of barrel.

IMPORTANT: To prevent seal damage, the barrel, piston, and rod must be in alignment during installation.

20. Carefully push piston and rod guide into barrel. Keep piston and rod guide together.

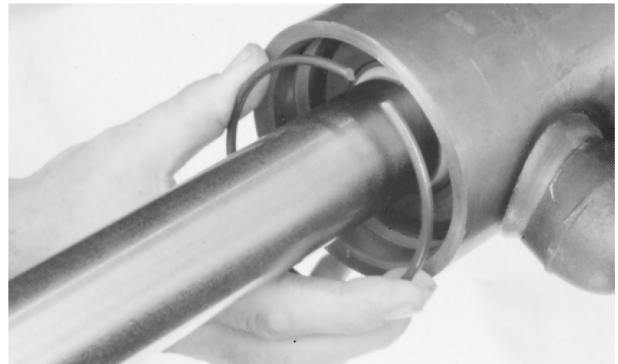


Boom Cylinder Shown

T6122AH—UN—19OCT88

TX,31,RR7708 -19-02NOV99-12/15

21. Push rod guide into barrel just enough to install retaining ring. Install retaining ring.

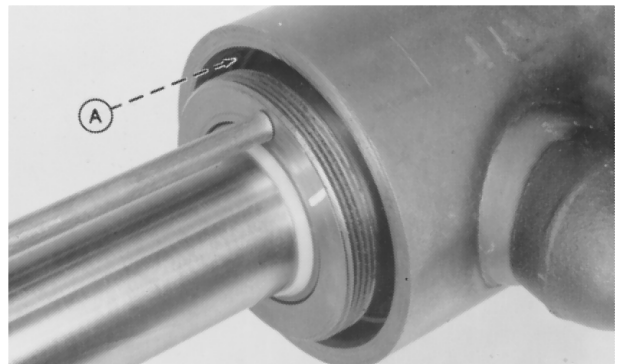


Boom Cylinder Shown

T6133AE—UN—27OCT88

TX,31,RR7708 -19-02NOV99-13/15

22. Pull rod guide against retaining ring (A).
23. Apply cure primer to threads of spanner nut. Put thread lock and sealer (medium strength) on spanner nut threads.
24. Put filler ring between rod guide and spanner nut.

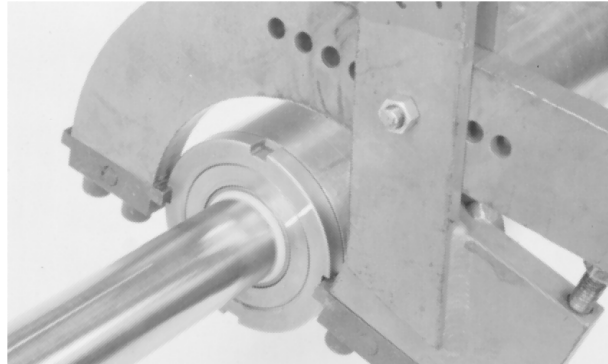


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TX,31,RR7708 -19-02NOV99-14/15

T6119AM—UN—12APR91

25. Install and tighten spanner nut until marks made before disassembly align. Make sure nut is tight.



T619AR—UN—27OCT88

TX,31,RR7708 -19-02NOV99-15/15

Disassemble Extendible Dipperstick Cylinder

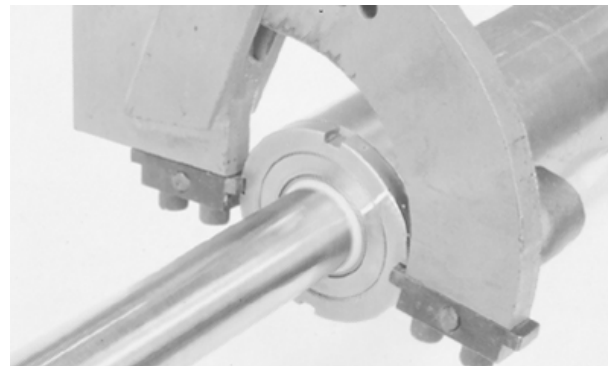
IMPORTANT: Extend rod to remove oil or air between the rod piston and rod guide. Excessive amount of trapped oil or air will force seals to expand making disassembly more difficult.

1. Open ports and drain all oil from the cylinder.
2. Extend rod fully.
- 3.

Make a mark on rod guide and spanner nut to aid in assembly.

4. Remove nut using adjustable spanner wrench or blunt chisel and a hammer.

NOTE: If nut and rod guide turn as an assembly, put cylinder in a vise. Vise jaws must contact cylinder



HCD1000—UN—14AUG98

barrel behind nut and over rod guide area. Tighten vise just enough to hold rod guide.

Continued on next page

CED,TX03399,5604 -19-18NOV99-1/5

NOTE: Filler rings (used for disassembly only) are installed between spanner nut and rod guide to aid in disassembly. Filler rings are provided in the cylinder bore seal kit.

5. Using a wooden dowel or bass drift, move rod guide rearward just enough to remove snap ring (A). Use care not to damage rod guide threads or seals.

6. Remove snap ring.

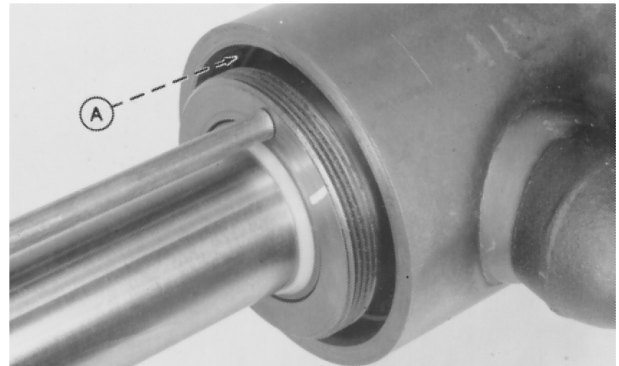
NOTE: Filler ring is provided in the cylinder bore seal kit.

7. Move groove filler ring (B) in snap ring groove.

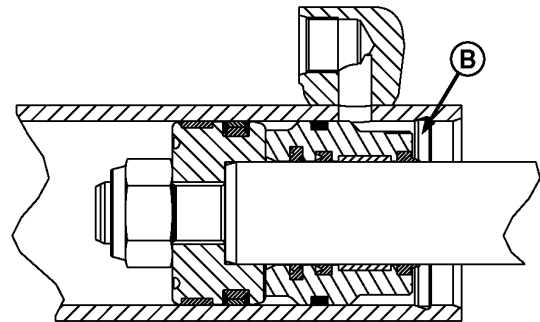
8. Remove rod assembly from barrel.

A—Snap Ring

B—Filler Ring



T6119AM —UN—12APR91



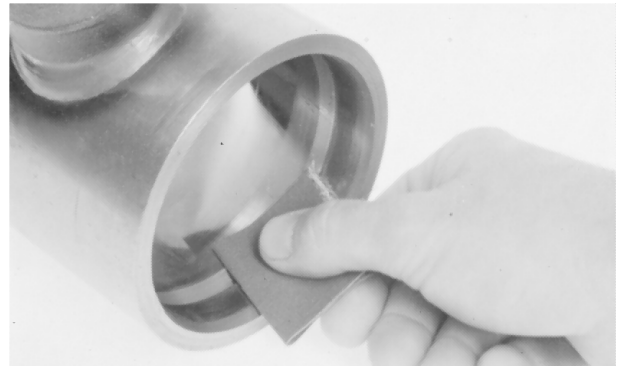
HCD1002 —UN—14AUG98

CED,TX03399,5604 -19-18NOV99-2/5

9.

Remove groove filler ring from snap ring groove. It is not necessary for reassembly.

10. Inspect snap ring groove. If necessary, clean groove and inside of barrel of nicks, burrs, or rust.



T6119AO —UN—19OCT88

Continued on next page

CED,TX03399,5604 -19-18NOV99-3/5

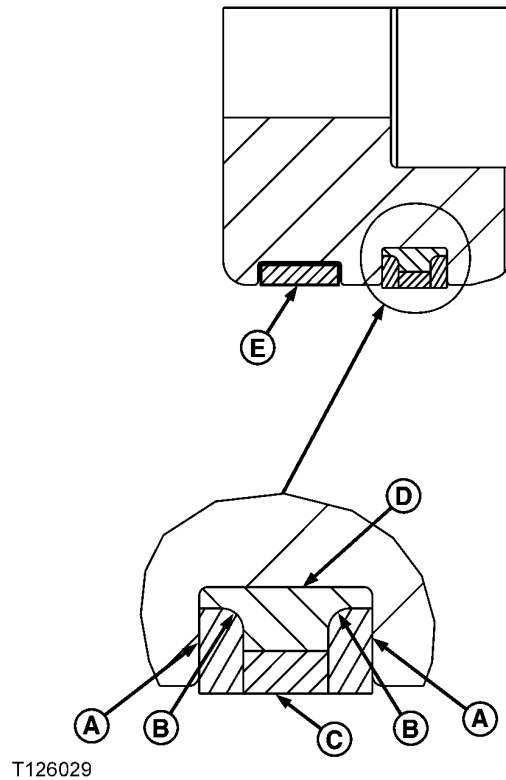
11. Remove nut to remove piston.

NOTE: Backup ring radius position (B) indicate the radius of the backup rings toward the seal expander.

12. Remove backup rings (A), cap seal (C), seal expander (D), and piston wear ring (E)

13. Inspect the piston lands. If necessary, clean the lands.

- | | |
|-------------------------------|------------------|
| A—Backup Ring (2 used) | D—Seal Expander |
| B—Backup ring Radius Position | E—Piston Bearing |
| C—Cap Seal | |



T126029

T126029—UN—18NOV99

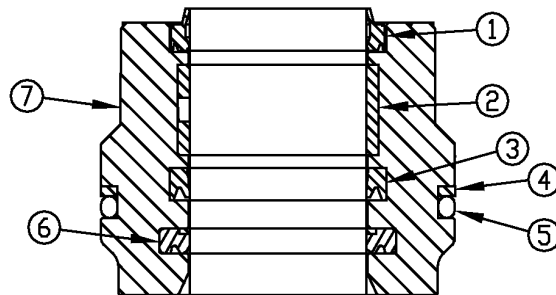
CED, TX03399, 5604 -19-18NOV99-4/5

NOTE: When removing seals from rod guide, do not damage, mark or score any surfaces that contact the seals.

14.

Remove parts (1—6).

- | | |
|---------------|---------------|
| 1—Wiper Seal | 5—O-Ring |
| 2—Wear Ring | 6—Buffer Seal |
| 3—U-Cup Seal | 7—Rod Guide |
| 4—Backup Ring | |



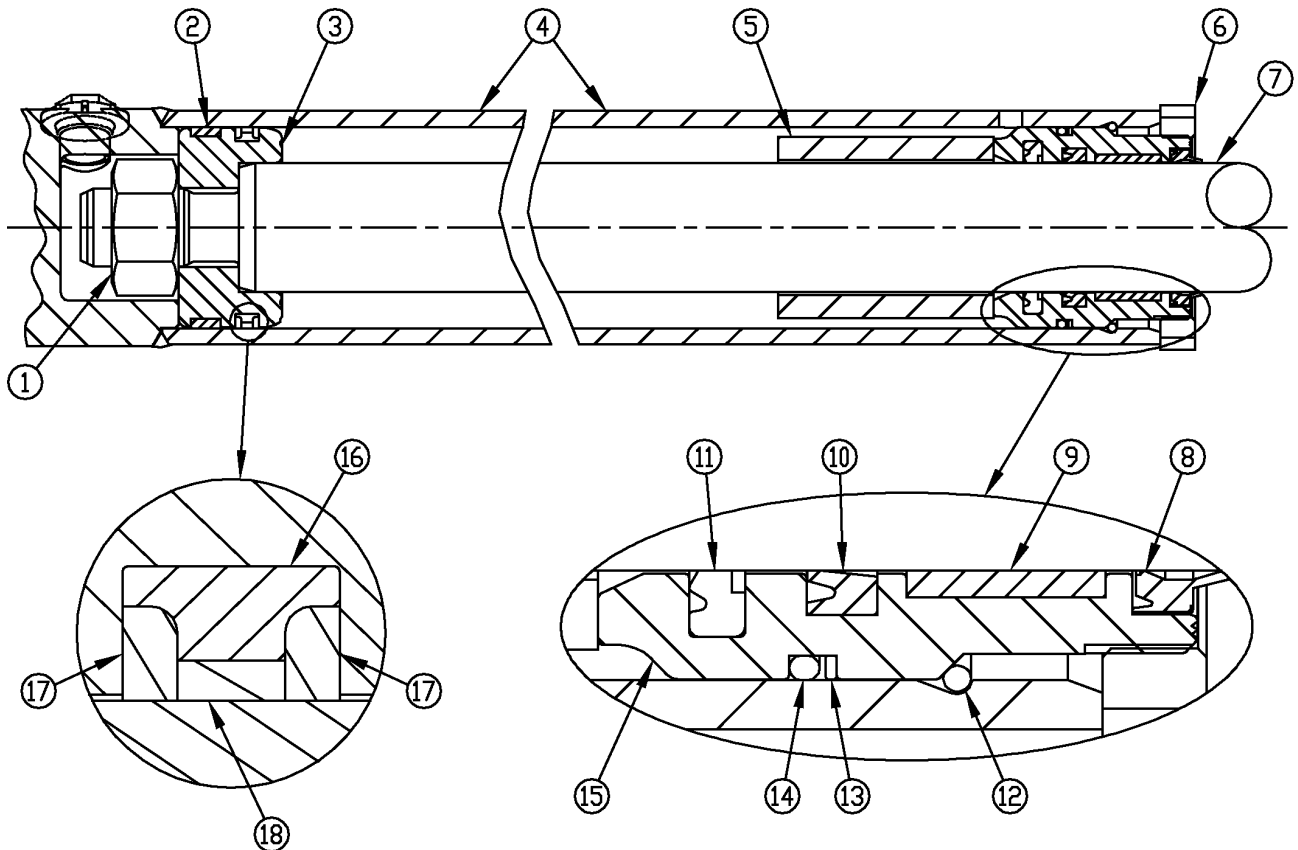
T119553

Cylinder Rod Guide

T119553—UN—14JAN99

CED, TX03399, 5604 -19-18NOV99-5/5

Cross Section of Extendible Dipperstick Cylinder



T126019

- 1— Nut
- 2— Wear Ring
- 3— Piston
- 4— Barrel
- 5— Bushing

- 6— Spanner Nut
- 7— Rod
- 8— Wiper Seal
- 9— Wear Ring
- 10— U-Cup Seal

- 11— Buffer Seal
- 12— Snap Ring
- 13— Backup Ring
- 14— O-Ring
- 15— Rod Guide

- 16— Expander Seal
- 17— Backup Rings (2 used)
- 18— Cap Seal

CED,TX03399,5605 -19-01SEP06-1/1

T126019—UN—23NOV99

Assemble Extendible Dipperstick Cylinder

IMPORTANT: All parts must be thoroughly cleaned and dried prior to reuse.

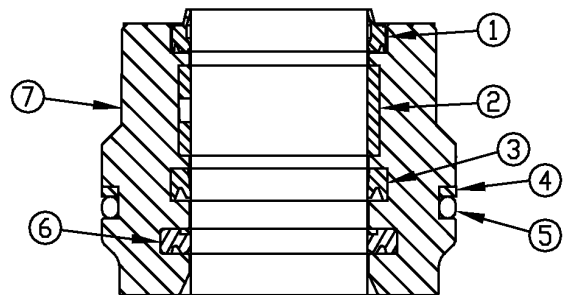
NOTE: Use a cylinder repair kit(s) when assembling cylinder. Before assembly, apply a light film of clean hydraulic oil to all sealing parts.

1. Install parts (1—6). Wiper Seal (1) with extended lip toward outside (air side) of cylinder.

- 1— Wiper Seal
- 2— Wear Ring
- 3— U-Cup Seal
- 4— Backup Ring

- 5— O-Ring
- 6— Buffer Seal
- 7— Rod Guide

T119553



Cylinder Rod Guide

T119553—UN—14JAN99

Continued on next page

CED,TX03399,5606 -19-18NOV99-1/10

2. Install seal expander (D).

NOTE: The cap seal (C) can be made more pliable by warming it with your hands or by putting the seal in hot water for approximately 5 minutes.

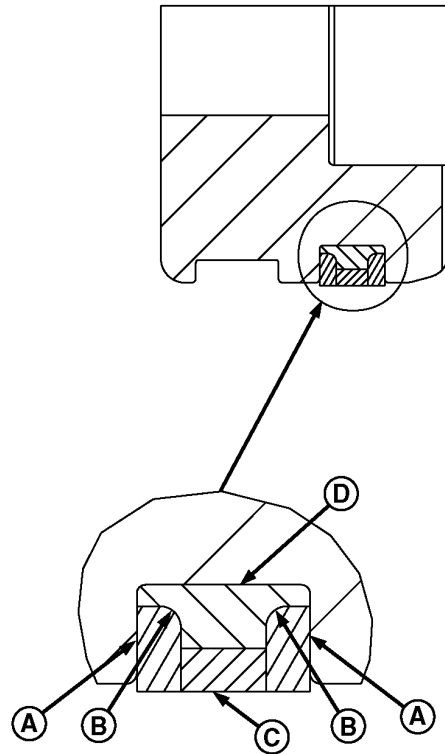
Once started, install cap seal as quickly as possible to keep the amount of time that seal is stretched to a minimum.

3. Push seal on end of piston.
4. Install a plastic tie band around cap seal with the smooth side against seal.
5. Pull cap seal across land into position over seal expander using the plastic tie band.

IMPORTANT: For proper fit, the backup rings must be installed with the radius toward the seal expander.

6. Install backup rings (A) with radius (B) toward seal expander (D).

A—Backup Rings (2 used)	C—Cap Seal
B—Backup Ring Radius Position	D—Seal Expander



HCD1003—UN—14AUG98

T6122AE—UN—19OCT88

T6122AC—UN—06AUG90

Continued on next page

CED, TX03399,5606 -19-18NOV99-2/10

7. Piston seal must be compressed before piston is attached to the rod, use the following procedure:

Check if cap seal is loose; seal must fit tight against seal expander and not turn. If seal can be turned, it has been stretched too much and can be damaged during assembly into barrel.

If necessary, shrink cap seal to its original size using a ring compressor or a plastic tie band (A) and hose clamp (C).

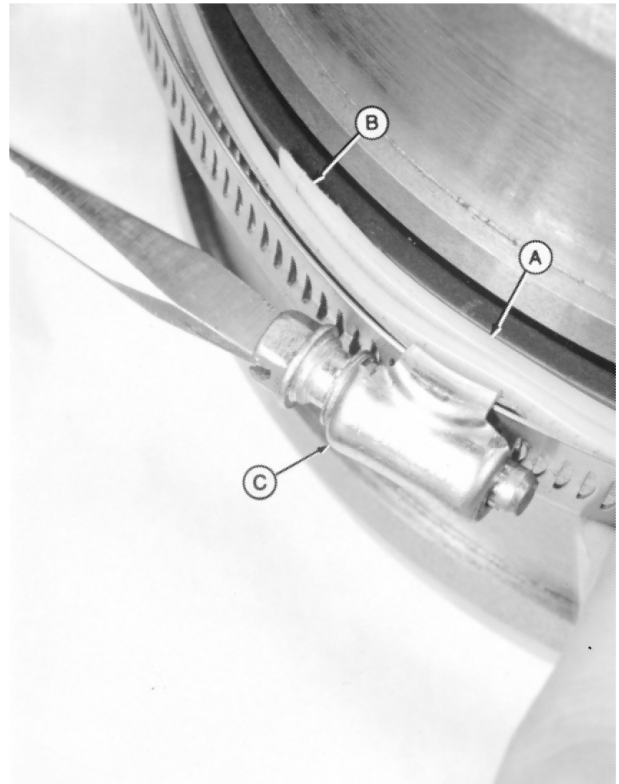
When using a ring compressor, put a piece of shim stock between cap seal and compressor at the joint so it does not damage seal.

When using a plastic tie band and hose clamp, grind a taper (B) on one end of tie band. Install tie band with the taper against cap seal. Before tightening the hose clamp, tie band must be under hose clamp all around piston.

Seal will also shrink to its original size if left for a minimum of 8 hours before installing assembly into barrel.

A—Plastic Tie Band
B—Taper

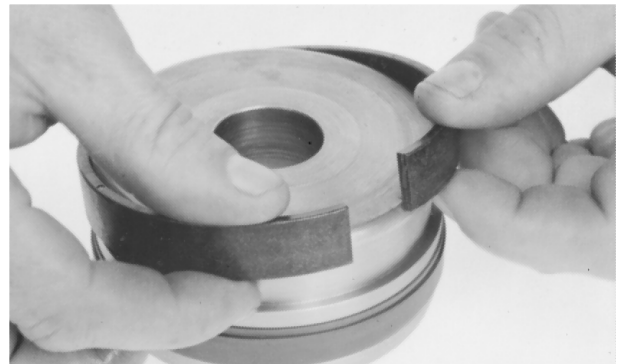
C—Hose Clamp



T86565 —UN—09NOV88

CED, TX03399, 5606 -19-18NOV99-3/10

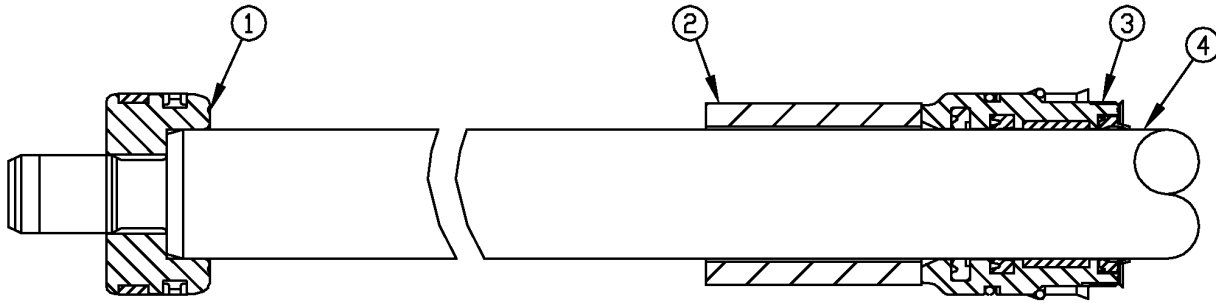
8. Install piston wear ring.



T6122AF —UN—19OCT88

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CED, TX03399, 5606 -19-18NOV99-4/10



T126167

1—Piston Assembly

2—Bushing

3—Rod Guide Assembly

4—Rod

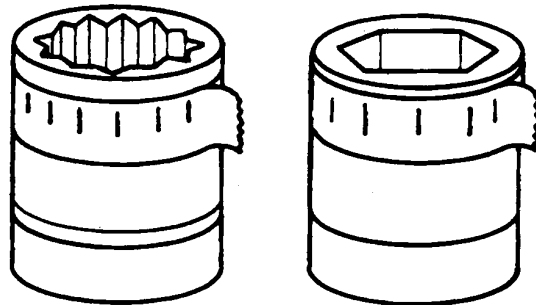
NOTE: Lubricate rod with clean hydraulic oil before assembly.

9. Install spanner nut, snap ring, rod guide assembly (3), bushing (2), and piston assembly (1) onto rod.

CED,TX03399,5606 -19-18NOV99-5/10

T126167—UN—15DEC99

- 10. Apply cure primer, then thread lock and sealer (high strength) to rod threads.
- 11. Install piston nut. Tighten to torque specification using the following directions.
- 12. Put tape around a socket. Make marks on the tape to divide the socket into 1/8's. The marks will be 45° apart. These will serve as a handy visual reference for determining "Degrees Beyond Torque".



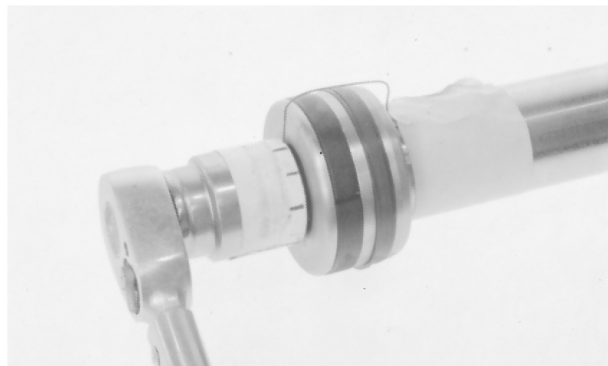
CED,TX03399,5606 -19-18NOV99-6/10

T6149AG—UN—19OCT88

- 13. Tape a piece of wire on the rod, over the piston, pointing to one of the marks on the socket.
- 14. Turn the piston nut beyond snug torque as specified.

Specification

Extendible Dipperstick
 Cylinder Piston
 Nut—Torque Turn..... 170 N·m (125 lb-ft) plus 45° turn



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CED,TX03399,5606 -19-18NOV99-7/10

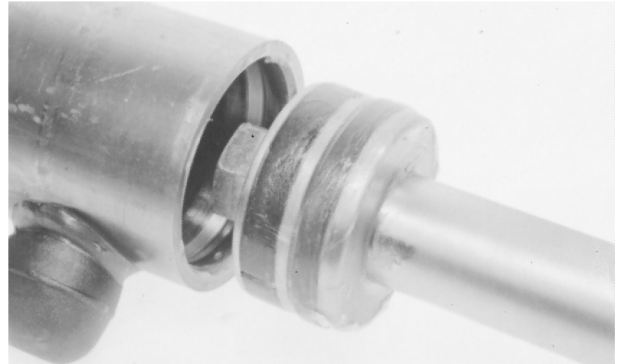
T6172BR—UN—19OCT88

Hydraulic System

15. Apply light film of clean hydraulic oil on seals and chamfer of barrel.

IMPORTANT: To prevent seal damage, the barrel, piston and rod must be in alignment during installation.

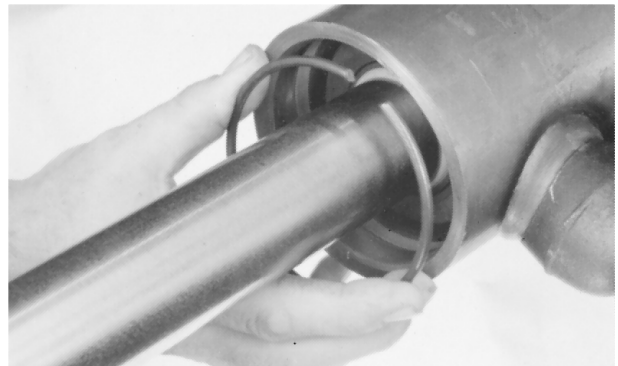
16. Carefully push piston and rod guide into barrel. Keep piston and rod guide together.



T6122AH—UN—19OCT88

CED, TX03399, 5606 -19-18NOV99-8/10

17. Push rod guide into barrel just enough to install snap ring.
18. Install snap ring. Snap ring must be seated in barrel groove.
19. Pull rod guide against snap ring.



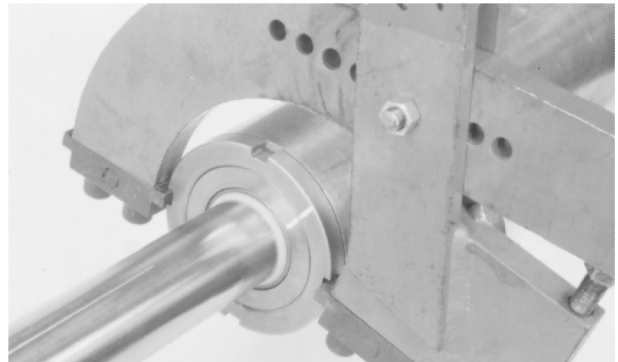
T6133AE—UN—27OCT88

CED, TX03399, 5606 -19-18NOV99-9/10

20. Clean spanner nut. Apply cure primer and a light coat of thread lock and sealer (high strength) on threads of spanner nut.
21. Install and tighten spanner nut until marks made before disassembly align or tighten nut to specification.

Specification

Spanner Nut—Torque..... 520—600 N·m (384—443 lb-ft)



T6119AR—UN—27OCT88

CED, TX03399, 5606 -19-18NOV99-10/10

Hydraulic System

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