

G16A, G16E GOLF CAR SERVICE MANUAL SUPPLEMENT

FOREWORD

This Supplement Service Manual has been prepared to introduce new service and new data for the G16A/G16E. For complete information on service procedures, it is necessary to use this Supplement Service Manual together with following manual:

**G14A/G14E
SERVICE MANUAL**

NOTE: _____
This Service Manual contains information regarding periodic maintenance to the emission control system. Please read this manual carefully.

**G16A, G16E
SERVICE MANUAL SUPPLEMENT
1999 by Yamaha Motor Manufacturing
Corporation of America
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P/N/ LIT-19616-00-00**

INTRODUCTION

This manual has been written by Yamaha Motor Manufacturing Corporation of America for use by Authorized Yamaha dealers and their qualified mechanics. It is not possible to put an entire mechanic's education into a manual, so it is assumed that persons using this book to perform maintenance and repairs on Yamaha golf cars have a basic understanding of the mechanical concepts and procedures inherent to these products. Without such knowledge, attempted repairs or service to this golf car may render it unfit to use and/or unsafe.

Yamaha Motor Manufacturing Corporation of America is continually striving to further improve all models manufactured by the company. Modifications are therefore inevitable and will, where applicable, appear in future editions of this manual.

**TECHNICAL SERVICE DEPT
GOLF CAR SALES GROUP
YAMAHA MOTOR
MANUFACTURING CORP OF
AMERICA**

HOW TO USE THIS MANUAL

Read This Important Information!

Particularly important information in this manual is distinguished by the following notations:



The Safety Alert Symbol means **ATTENTION! BE ALERT! YOUR SAFETY IS INVOLVED!**

WARNING

Failure to follow WARNING instructions could result in severe injury or death to golf car occupants, a bystander, or a person inspecting or repairing the golf car.

CAUTION

This message describes special precautions that must be taken to avoid damage to the golf car.

NOTE:

This message provides additional key information.

MANUAL FORMAT

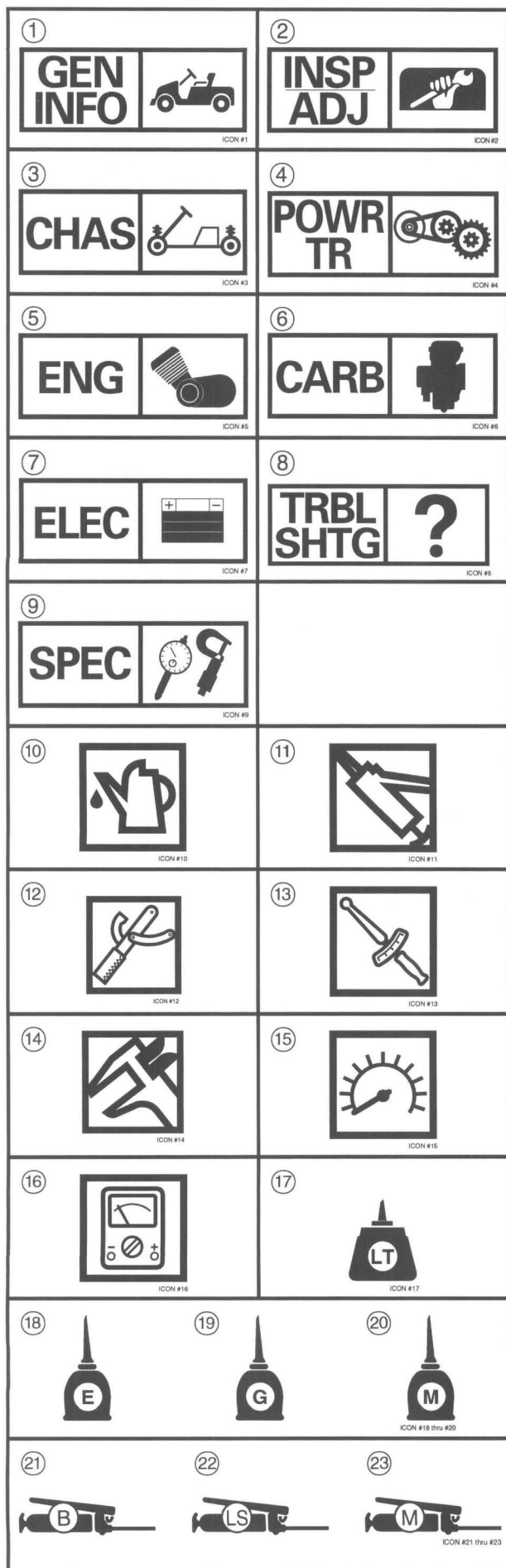
All of the procedures in this manual are organized in a sequential, step-by-step format. The information has been compiled to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all disassembly, repair, assembly, and inspection operations.

In this revised format, the condition of a faulty component will precede an arrow symbol and the course of action required will follow the symbol, e.g.,

- Bearings
Pitting/Damage → Replace.

EXPLODED DIAGRAM

Each chapter provides exploded diagrams before each disassembly section for ease of identifying correct disassembly and assembly procedures.



Symbol Identification

Symbols ① to ⑨ are designed as thumb tabs to indicate the contents within a chapter.

- ① General information
- ② Periodic inspection and adjustment
- ③ Chassis
- ④ Power train
- ⑤ Engine overhaul
- ⑥ Carburetion
- ⑦ Electrical
- ⑧ Troubleshooting
- ⑨ Specifications

Symbols ⑩ to ⑯ are used to identify specifications within the text.

- ⑩ Filling fluid
- ⑪ Lubricant
- ⑫ Special tool
- ⑬ Tightening torque
- ⑭ Wear limit, clearance
- ⑮ Engine speed
- ⑯ Ω , V, A

Symbols ⑰ to ㉓ are used in the exploded diagrams to indicate the grade and location of lubricant.

- ⑰ Apply locking agent
- ⑱ Apply engine oil
- ⑲ Apply gear oil
- ㉑ Apply molybdenum disulfide oil
- ㉒ Apply wheel bearing grease
- ㉓ Apply lightweight lithium soap base grease
- ㉔ Apply molybdenum disulfide grease

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REFER TO G14A, G14E
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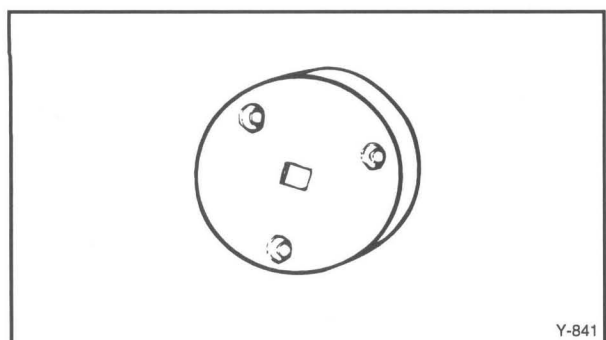
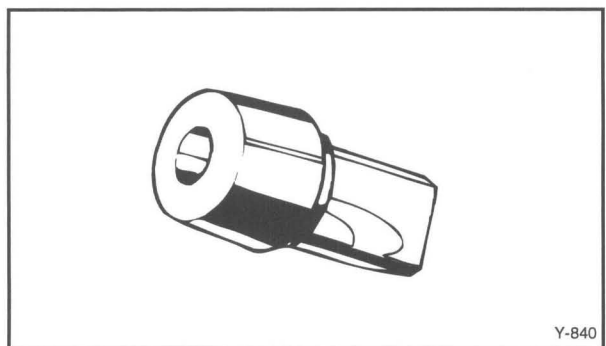
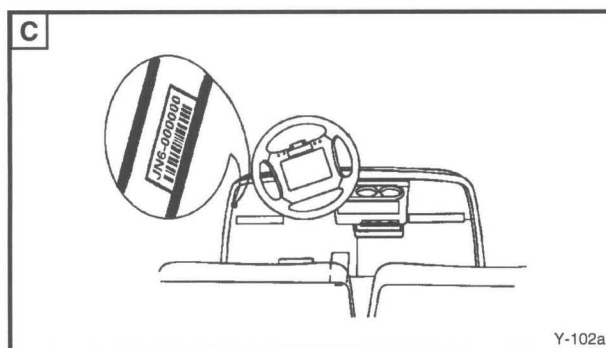
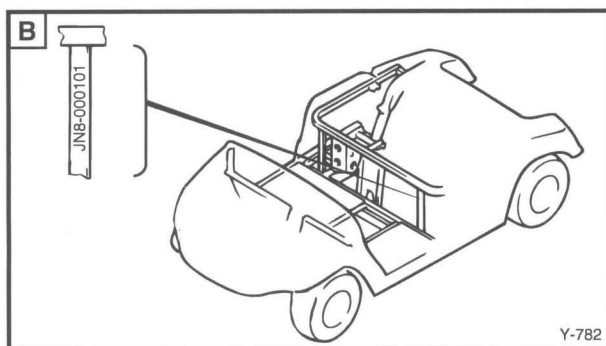
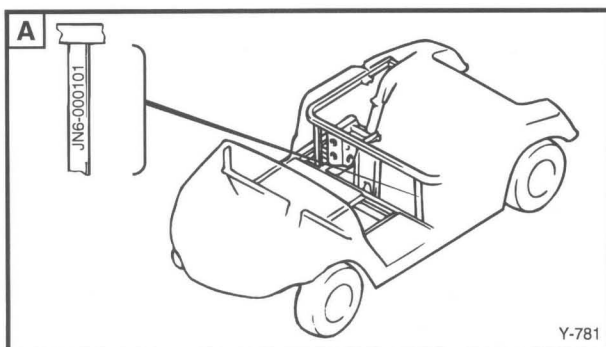
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GENERAL SERVICE INFORMATION

FRAME SERIAL NUMBER

The machine serial number is stamped in the location shown.

Ⓐ **G16A (JN6-000101~299999)**

Ⓑ **G16E (JN8-000101~299999)**

Ⓒ **G16A (JN6-300101~**

G16E (JN8-300101~

SPECIAL TOOLS

The proper special tools are necessary for complete and accurate tune-up and assembly. Using the correct special tool will help prevent damage caused by the use of improper tools or improvised techniques.

FOR PRIMARY CLUTCH SERVICE

1. Tapered clutch holder P/N YS-38518

This tool holds fixed sheave when removing sliding sheave/slider.

2. Clutch spider separator P/N YG 42131

This tool is used to remove sliding sheave/spider assembly from fixed sheave.

1



PERIODIC INSPECTION AND ADJUSTMENT

PERIODIC MAINTENANCE

Regular maintenance is most important for best performance and safe operation.

⚠ WARNING

Be sure to turn off the main switch and apply the parking brake when you perform maintenance unless otherwise specified.

FOR G16E

C - CHECK CA - CHECK AND ADJUST R - REPLACE S - SERVICE CL - CLEAN AND LUBRICATE L - LUBRICATE

	Remarks	Pre-Operation	20 Rounds 20 hours 100 miles 160 kms (Every month)	125 rds 125 hrs 600 mls 1000 kms (Every 6 months)	250 rds 250 hrs 1200 mls 2000 kms (Every year)	500 rds 500 hrs 2500 mls 4000 kms (Every 2 years)	1000 rds 1000 hrs 5000 mls 8000 kms (Every 4 years)
PRE-OPERATION CHECKS	Charge	S	S	S	S	S	S
	Clean battery tops, check for tightness of hold-down screws and terminals	S	S	S	S	S	S
	Check brake pedal freeplay and adjust if necessary	C	CA	CA	CA	CA	CA
	Check steering operation	C	C	C	C	C	
	Check tire pressure, tread depth, tire surface for damage	C	CA	CA	CA	CA	CA
	Check body and chassis for damage	C	C	C	C	C	C
	Check tightness of all bolts, nuts, and screws	C	C	C	C	C	C
	Check reverse buzzer operation	C	C	C	C	C	C
EVERY MONTH	Check electrolyte level		C	C	C	C	C
	Check for loose or broken connections		C	C	C	C	C
	Clean/lube pedal control area		CL				
EVERY 6 MONTHS	Check all wire insulation for cracks and/or worn spots			C	C	C	C
	Check shock absorbers for oil leaks and damaged spring			C	C	C	C
EVERY YEAR	Perform a discharge test				S	S	S
	Apply terminal protectant				S	S	S
	Check shoe lining thickness and rear axle bearing play				C	C	C
	Check kingpin play, seal, and cap / Adjust wheel alignment				CA	CA	CA
	Check wheel nut tightness, front wheel bearing play				C	C	C
	Check gear box oil level and leakage				C	C	C
	Check operation and adjust pedal stop if necessary				CA	CA	CA
EVERY 4 YEARS	Replace gear box oil						R
	Check for grease leakage; adjust gear box if necessary						CA

PERIODIC INSPECTION AND ADJUSTMENT

**INSP
ADJ**



FOR G16A

C - CHECK **CA** - CHECK AND ADJUST **R** - REPLACE **S** - SERVICE **CL** - CLEAN AND LUBRICATE **L** - LUBRICATE

	Remarks	Pre-Operation	20 Rounds 20 hours 100 miles 160 kms (Every month)	125 rds 125 hrs 600 mls 1000 kms (Every 6 months)	250 rds 250 hrs 1200 mls 2000 kms (Every year)	500 rds 500 hrs 2500 mls 4000 kms (Every 2 years)	1000 rds 1000 hrs 5000mls 8000 kms (Every 4 years)
PRE-OPERATION CHECKS	Check engine oil	C	C	C			
	Check air cooling duct	C	C	C	C	C	C
	Check fuel lines for leakage	C	C	C	C	C	C
	Check fuel level	C	C	C	C	C	C
	Check for looseness and corrosion of battery terminals and hold downs	C	C	C	C	C	C
	Check brake pedal freeplay and adjust if necessary	C	CA	CA	CA	CA	CA
	Check steering operation	C	C	C	C	C	
	Check tire pressure, tread depth, tire surface for damage	C	CA	CA	CA	CA	CA
	Check body and chassis for damage	C	C	C	C	C	C
	Check tightness of all bolts, nuts, and screws	C	C	C	C	C	C
	Check reverse buzzer operation	C	C	C	C	C	C
EVERY MONTH	Check fuel filter for clogging		C	C	C	C	C
	Check wear of drive belt		C	C	C	C	C
	Check operation of Forward / Reverse shifting		C	C	C	C	C
	Clean / Lube pedal control area		CL				
EVERY 6 MONTHS	Wash pre-filter, check air cleaner element			S	S	S	S
	Check spark plug and plug cap condition** / Check compression			C	C	C	C
	Check shock absorbers for oil leaks and damaged springs			C	C	C	

**Related to emission control system.

PERIODIC INSPECTION AND ADJUSTMENT

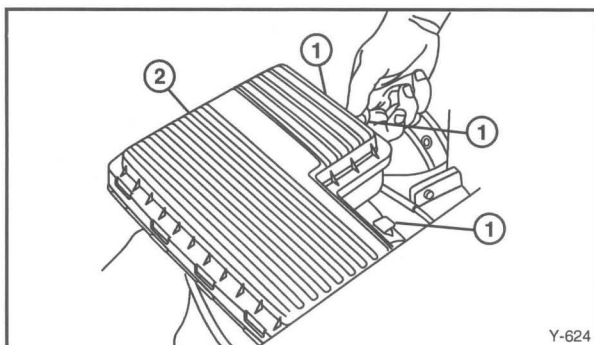
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C - CHECK **CA** - CHECK AND ADJUST **R** - REPLACE **S** - SERVICE **CL** - CLEAN AND LUBRICATE **L** - LUBRICATE

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EVERY YEAR	Replace engine oil				R	R	R
	Adjust throttle cables,** choke cable, check carburetor throttle shaft for wear**				CA	CA	CA
	Check starter V-belt for damage and tension				C	C	C
	Check drive belt for slippage, wear or scratches				C	C	C
	Check sliding sheave and ramp shoes; Grease secondary sheave bearing.				CL	CL	CL
	Grease primary sheave				L	L	L
	Check operation of speed limiter				C	C	C
	Apply battery terminal protectant				S	S	S
	Check wiring connections and insulation				C	C	C
	Check shoe lining thickness and rear axle bearing play				C	C	C
	Check kingpin play, seal, and cap / Adjust wheel alignment				CA	CA	CA
	Check wheel nut tightness, front wheel bearing play				C	C	C
	Check gear box oil level and leakage				C	C	C
	Check operation and adjust pedal stop if necessary				CA	CA	CA
EVERY 2 YEARS	Check brushes for wear and commutator for dirt					C	S
EVERY 4 YEARS	Replace fuel filter and fuel hoses						R
	Check tightness of cylinder head / Adjust valves						CA
	Replace gear box oil						R
	Check for grease leakage; adjust gearbox if necessary						CA

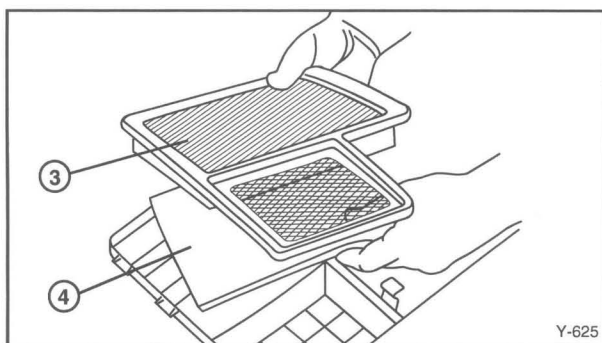
**Related to emission control system.



INSPECTION AND ADJUSTMENT ENGINE (G16A)

AIR FILTER CLEANING

1. Unlatch:
 - Air filter cover clips ①.
2. Remove:
 - Case cap ②.
 - Air filter ③.
 - Pre-filter ④.
3. Clean:
 - Pre-filter ④.
Wash it with soap and water ⑤ and allow it to dry.



CAUTION

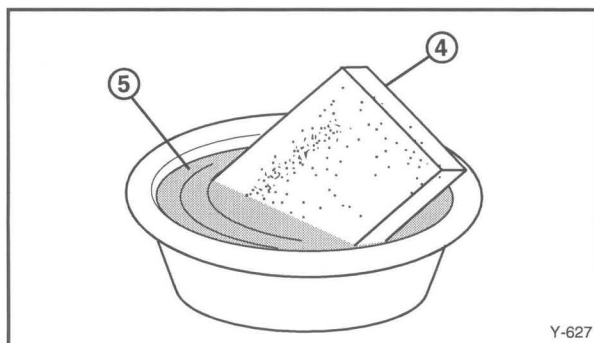
- Do not apply oil to the element pre-filter; resistance to air flow will be increased and adversely affect the performance.
- Do not wash the air filter or use pressurized air which will damage the element.
- Do not use filters made from any other material. Engine life will be reduced.
- Be careful not to drop anything into the air inlet.

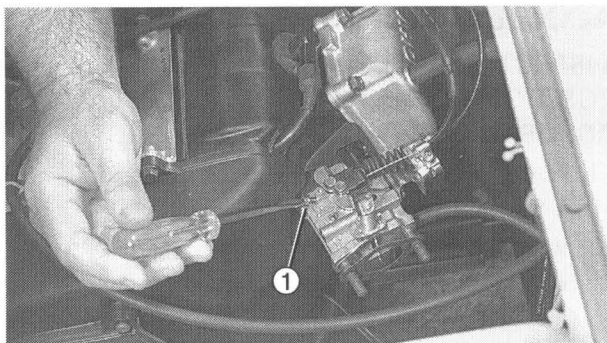
4. Install:
 - All components

NOTE: _____
When assembling the air filter, reverse the removal procedure.

CAUTION

- The pre-filter has a notch on one side. It will only fit in the case one way.





Y-541

CARBURETOR ADJUSTMENT

NOTE:

Remove air cleaner assembly by removing two bolts at the rear of the air cleaner, the two nuts at the intake manifold, and the breather hose. Remove the anti-tamper cap. If the cap is damaged replace it.

1. Adjust:

- Pilot screw ①

Pilot screw adjustment steps:

- Lightly screw in the pilot screw ①.
- Back it out from its seated position.

Standard Turned Out: 1 and 1/2 turns

- Adjust mixture by turning the pilot screw 1/8 ~ 1/4 turn each time.

Too Lean → Turn pilot screw counterclockwise.

Too Rich → Turn pilot screw clockwise.

Replace the anti-tamper cap once the pilot screw is adjusted.

2. Adjust:

- Throttle stop screw ②

Throttle stop screw adjustment steps:

- Screw out the throttle stop screw ② to clear the throttle arm.
- Slowly screw in the throttle stop screw ② until it is lightly touching the throttle arm, then give it another 1/4 turn.

Standard Turned In: 1/4 turn

CAUTION

Do not use any other setting or adverse performance will result.

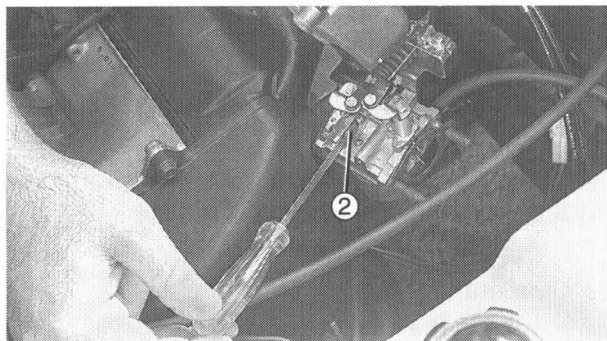
3. Make sure gaskets are clean and not damaged. Replace if necessary.
4. Install air cleaner case.



**Air Cleaner Intake Manifold Nuts and
Air Cleaner Case Bolts:**
6.5 N·m (65 kgf·cm, 5 ft·lb)

CAUTION

Attach the breather hose firmly to the air cleaner case or engine damage may result.

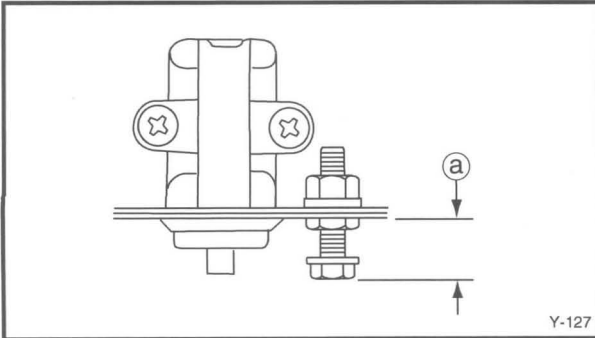


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ACCELERATOR STOP SWITCH INSPECTION/ACCELERATOR PEDAL POSITION ADJUSTING BOLT HEIGHT ADJUSTMENT

1. Remove:
 - Service lid
2. Inspect:
 - Stop switch
 - Dirt deposits → clean.
 - Unsmooth movement → Replace switch.
3. Measure:
 - Adjusting bolt height (a).
 - Out of specification → Adjust.



**Accelerator Pedal Position Adjusting
Bolt Height (a):**
18.00 ~ 18.40 mm (0.708 ~ 0.720 in)

STARTER BELT ADJUSTMENT

Refer to G14 Chapter 2, "STARTER BELT INSPECTION" and note the following points for G16A:

Belt tension adjustment steps:

- Loosen the two large 12 mm flange bolts ① that secure the starter generator to its mount bracket.
- Loosen the lower tensioner lock nut ②.
- Loosen adjuster bolt lock nut ③.
- Turn adjuster bolt ④ in to increase belt tension, out to decrease tension.
- Tighten the two 12 mm flange bolts ①.



Starter Generator Bracket Bolt:
60 N·m (6.0 m·kg, 43 ft·lb)

- Tighten lower tensioner lock nut ②.



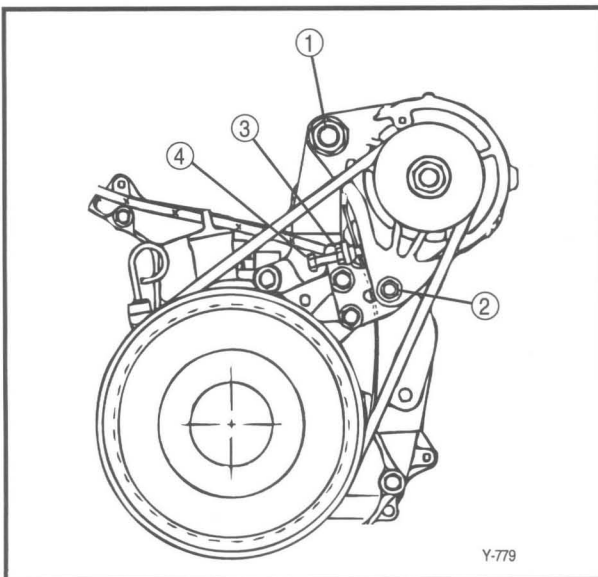
Lower Tensioner Lock Nut:
21 N·m (2.1 m·kg, 15 ft·lb)

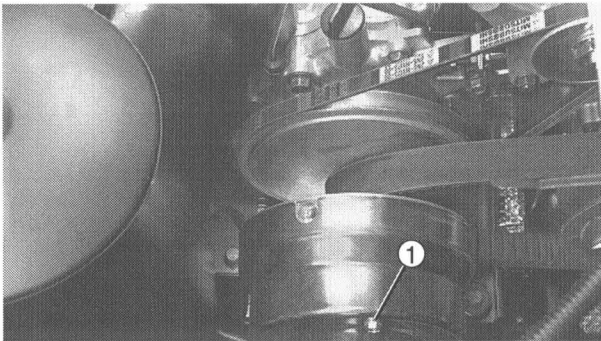
- Tighten adjuster lock nut ③.



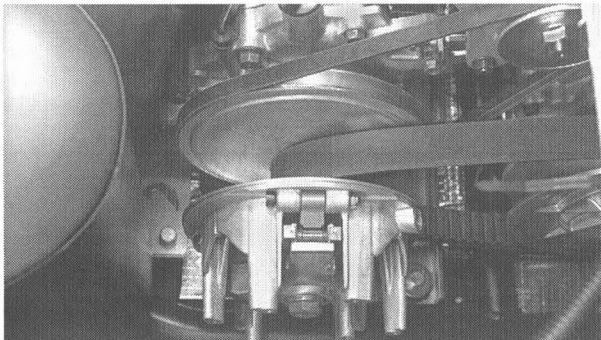
Adjuster Lock Nut:
6.5 N·m (65 kfg·cm, 5 ft·lb)

- Recheck belt tension. Re-adjust if necessary.





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POWER TRAIN

PRIMARY SHEAVE LUBRICATION (FOR G16A)

1. Lubricate:
 - Primary sheave bushings



Recommended Grease:
Molybdenum disulfide grease

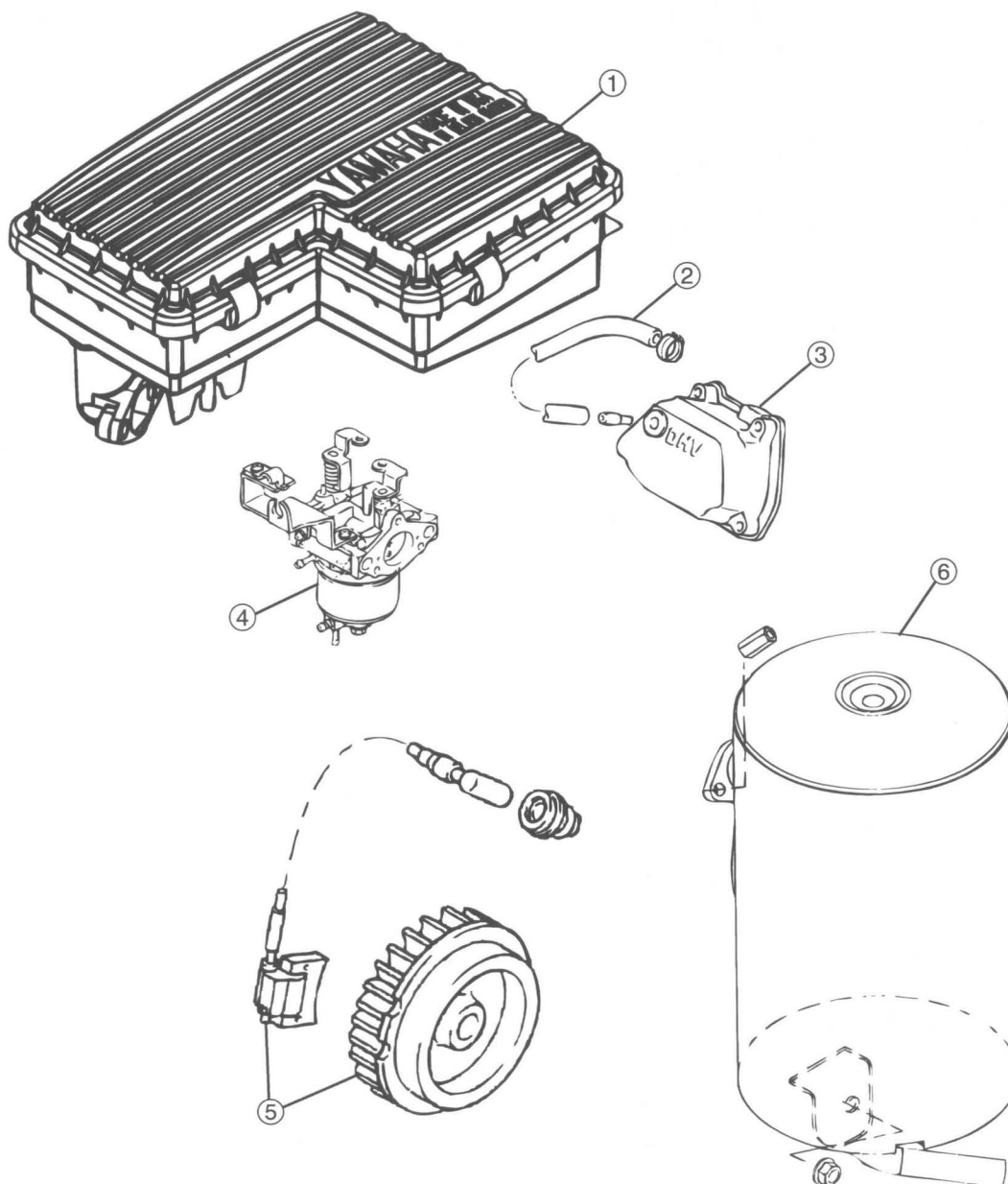
Grease Amount:
Three shots (Manual grease gun)
Three seconds (Automatic grease gun)

2. Inspect:
 - Remove sheave cap bolts ① and inspect weights and rollers.
Worn → Replace.
 - Lubricate with teflon spray



EMISSION CONTROL SYSTEM COMPONENTS

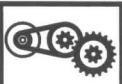
- ① Air cleaner
- ② Crankcase breather hose
- ③ Engine
- ④ Carburetor
- ⑤ TCI Magneto
- ⑥ Exhaust



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NOTES

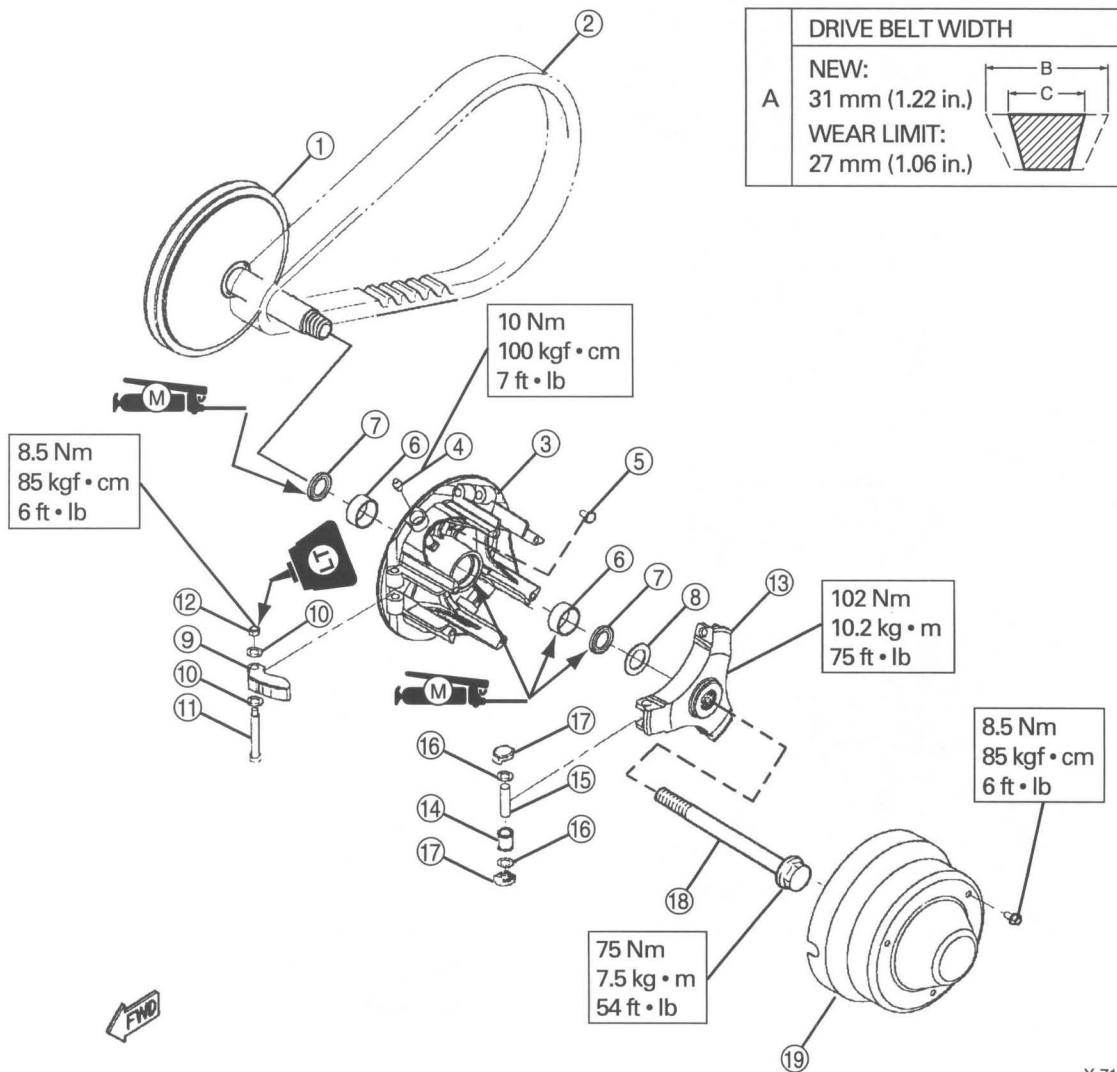
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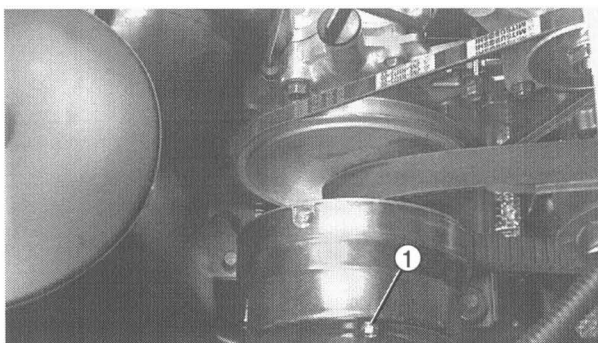


POWER TRAIN

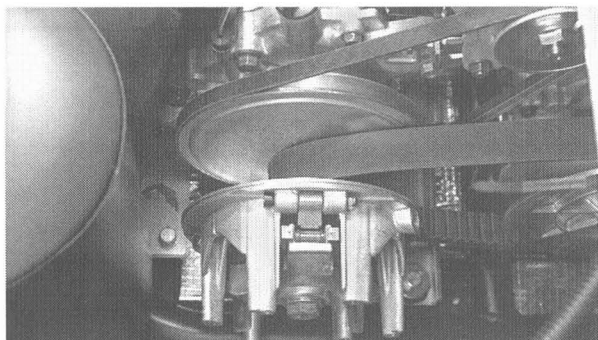
POWER TRAIN FOR G16A PRIMARY SHEAVE

- | | | |
|------------------|---------------------|-----------------|
| ① Fixed sheave | ⑧ Washer, plain | ⑮ Pin, dowel |
| ② Drive belt | ⑨ Weight | ⑯ Washer, plain |
| ③ Sliding sheave | ⑩ Shim, thrust | ⑰ Slider |
| ④ Grease nipple | ⑪ Bolt | ⑱ Bolt |
| ⑤ Plug | ⑫ Nut, self-locking | ⑲ Cap |
| ⑥ Bushing | ⑬ Spider | |
| ⑦ Oil seal | ⑭ Collar, roller | |

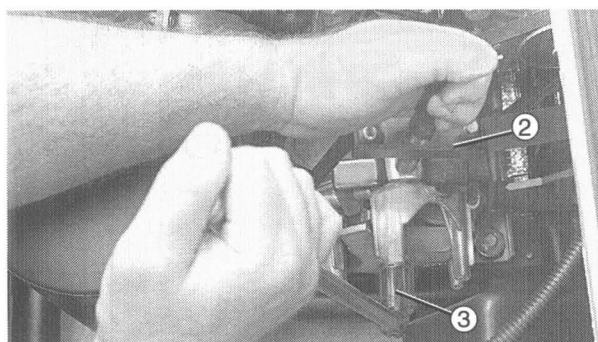




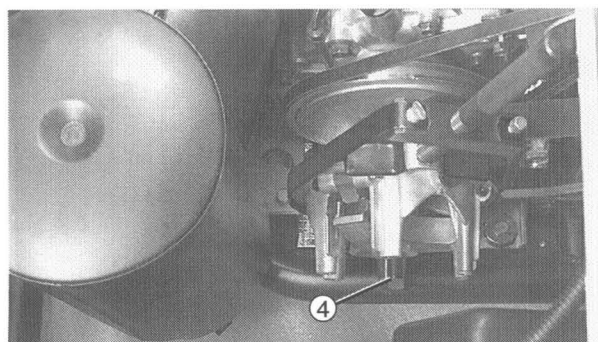
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Y-784



Y-785

REMOVAL

1. Remove:

- Seat
- Primary sheave cap bolts ①

2. Attach

- Primary sheave holder ②

**Primary Sheave Holder:**
YS-1880-A, 90890-01701

3. Remove:

- Bolt (primary sheave) ③

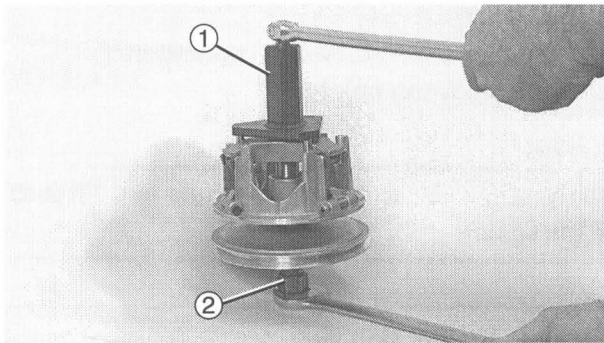
4. Attach:

- Primary sheave puller ④

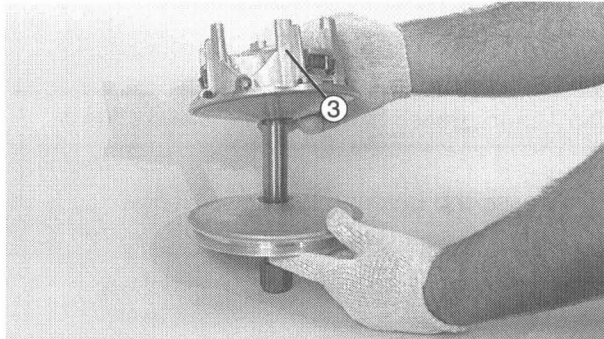
**Primary Sheave Puller:**
YG-1876, 90890-01876

5. Remove:

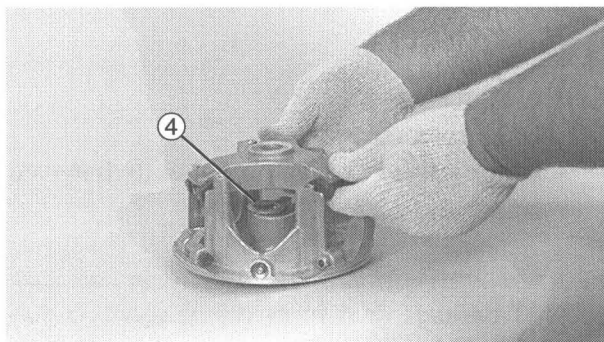
- Primary sheave assembly
When removing the sheave, tighten the sheave puller ④
- Slide drive belt off.
- Starter belt.



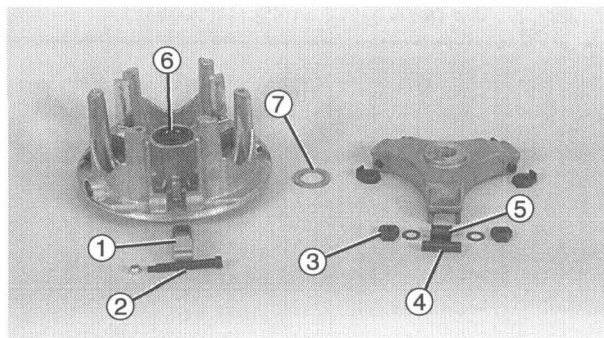
Y-547



Y-786



Y-787



Y-788

DISASSEMBLY

1. Attach:
 - Spider removal tool ①



Spider Removal Tools:

YG-42131 ① Spider Separator

YS-38518 ② Tapered Clutch Holder

2. Remove:
 - Sliding sheave ③ from fixed sheave using the spider removal tools (spider has right hand thread).
 - Lift off sliding sheave ③ with spider still attached

NOTE:

- Use a heat gun to lightly heat spider to free-up the locking agent.
DO NOT overheat, damage to the slider could occur.
- Leave tapered clutch holder tool installed in fixed sheave for assembly.

3. Separate spider from sliding sheave.
 - Note position of plain washer ④ between slider and sheave.

4. Remove:
 - Sliders
 - Plain washers
 - Roller collars
 - Dowel pins
 - Nuts
 - Bolts
 - Thrust shims
 - Weights

INSPECTION

1. Inspect:
 - Weights ①
Unsmooth operation/Damage → Replace.
 - Bolts ②
 - Thrust shims (not shown)
 - Sliders ③
 - Dowel pins ④
 - Roller collars and washers ⑤
Wear/Scratches/Damage → Replace.
 - Oil seals ⑥
Wear/Damage → Replace.
 - Plain washer ⑦

ASSEMBLY

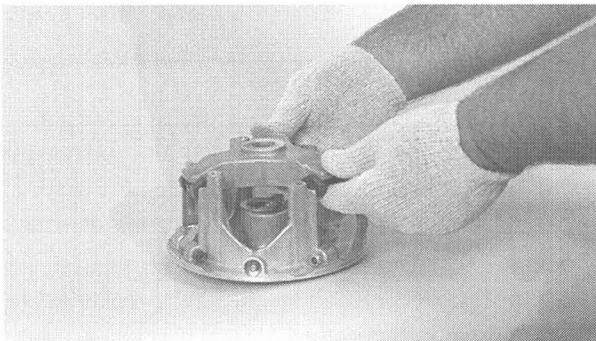
Reverse the "DISASSEMBLY" procedure.
Note the following points.

NOTE: _____
Apply LOCTITE® to the weight nuts and threads of the spider.

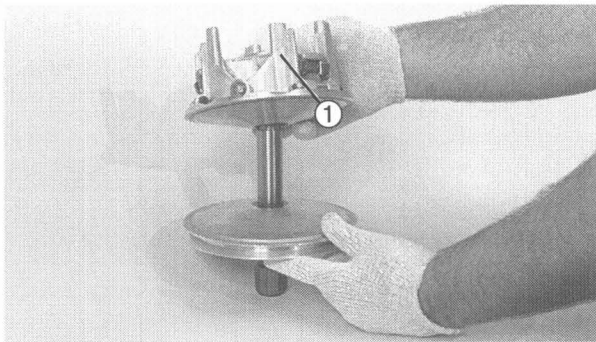


Weight Bolt Nut:
8.5 N·m (85 kgf·cm, 6 ft·lb)

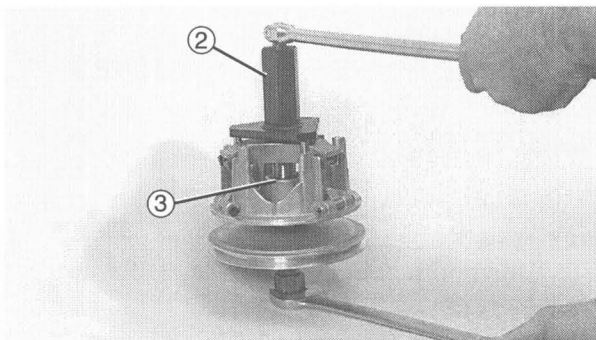
NOTE: _____
Use Teflon grease to install rollers and sliders.



Y-549



Y-548



Y-789

1. Grease the bushing and oil seal lips inside of the sliding sheave.
2. Position:
 - Weights toward inside of sheave.
 - Spider
Into sliding sheave.
 - Plain washer between slider and sheave.
3. Install:
 - Sliding sheave ①
Onto fixed sheave.
 - Check position of plain washer ③ between spider and sliding sheave.

CAUTION

DO NOT damage or deform the oil seal lips during installation.

4. Tighten using spider removal tools ②.



Spider/Sheave Assembly:
102 N·m (10.2 m·kg, 75 ft·lb)

INSTALLATION

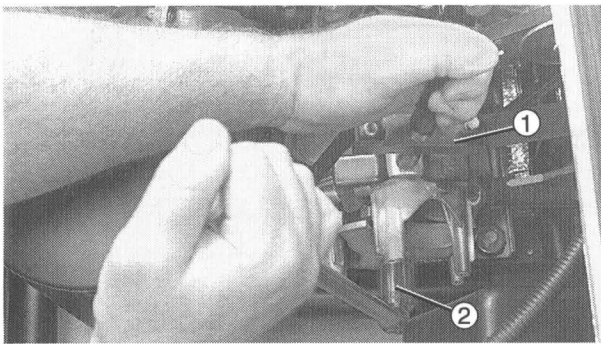
Reverse the "REMOVAL" procedure.

Note the following points:

1. Remove any oil and/or grease from the tapered portion of crankshaft and primary sheave using a non-oily solvent.
2. Install:
 - Primary sheave assembly
 - Sheave securing bolt

Lightly tighten the bolt in this step.
3. Check:
 - Sliding sheave operation

Push and pull the sliding sheave by hand.
Unsmooth operation → Reassemble primary sheave.



Y-545

4. Attach:
 - Primary sheave holder ①

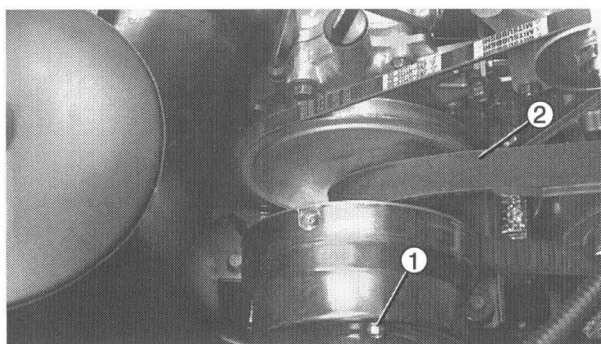


Primary Sheave Holder:
YS-1880-A, 90890-01701

5. Tighten:
 - Bolt (primary sheave) ②



Bolt (Primary Sheave):
75 N·m (7.5 m·kg, 54 ft·lb)



Y-543

6. Install:
 - Primary sheave cap and bolts ①

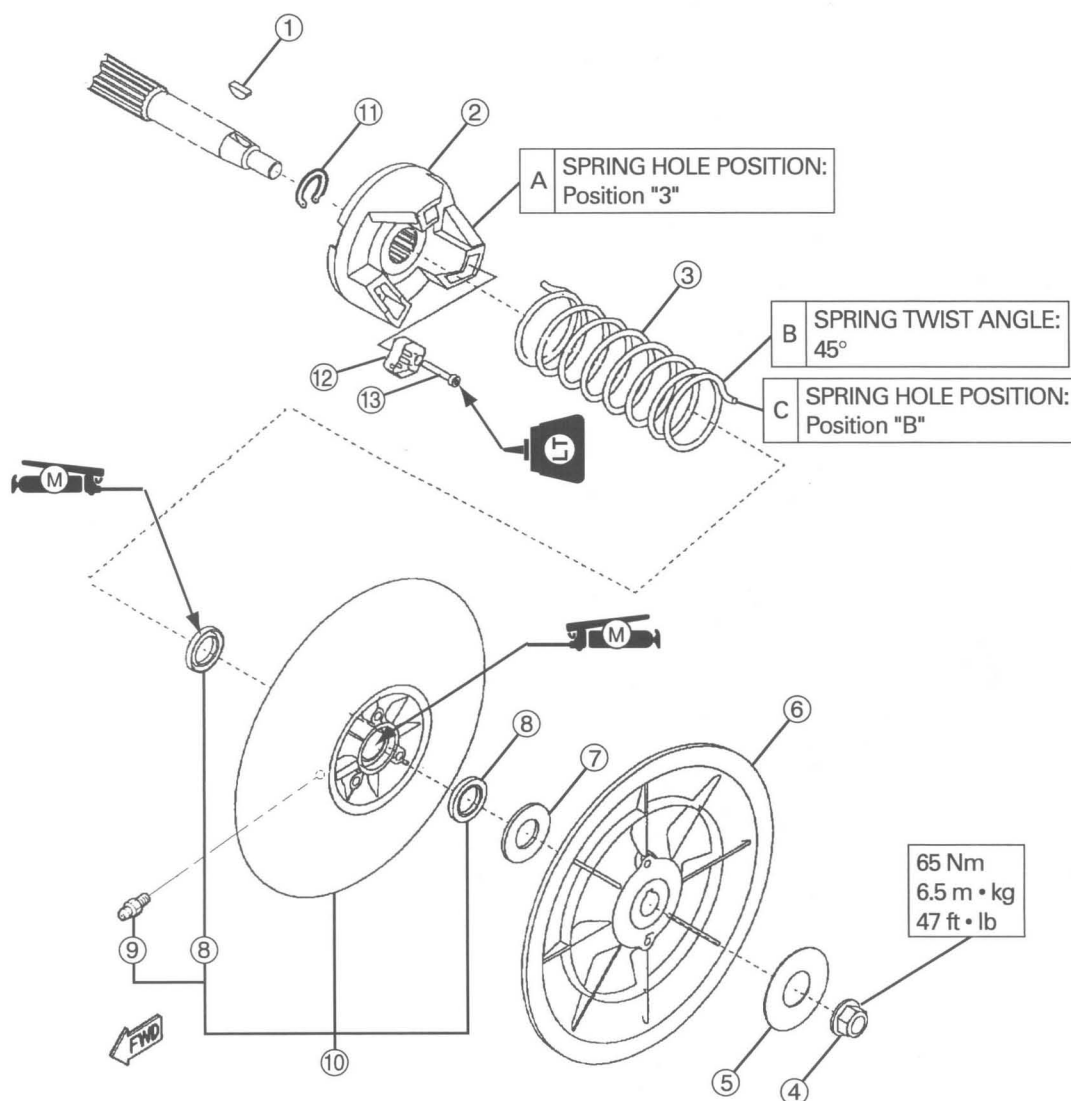


Primary Sheave Cap Bolts:
8.5 N·m (85 kgf cm, 6 ft·lb)

- Drive belt ②
Refer to G14 SERVICE MANUAL, CHAPTER 2 "DRIVE BELT INSPECTION" section.
- Starter belt
Refer to Chapter 2, "STARTER BELT ADJUSTMENT".

SECONDARY SHEAVE

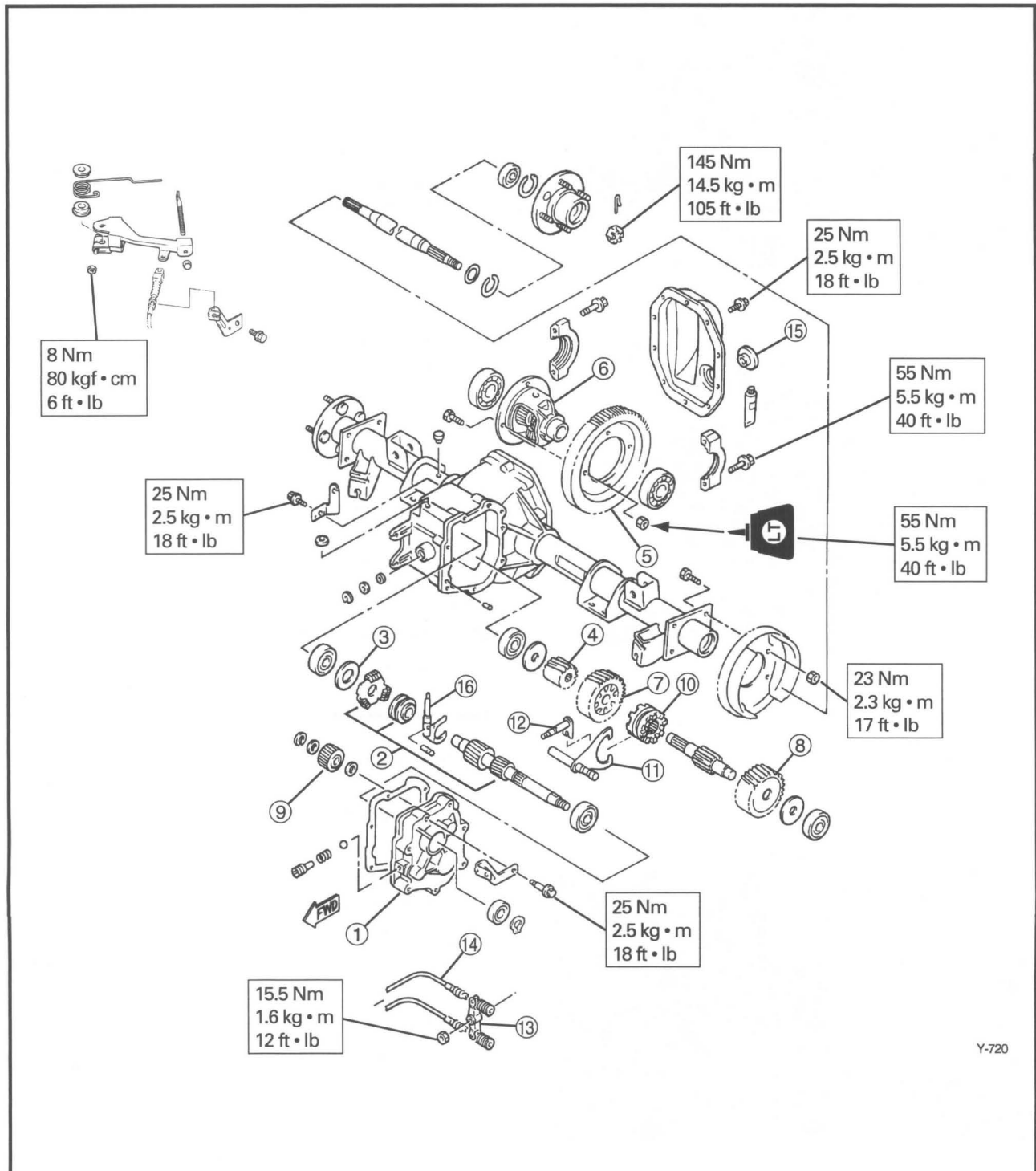
- | | |
|----------------------|------------------|
| ① Woodruff key | ⑧ Oil seal |
| ② Spring seat | ⑨ Grease nipple |
| ③ Compression spring | ⑩ Sliding sheave |
| ④ Securing nut | ⑪ Circlip |
| ⑤ Washer | ⑫ Ramp shoe |
| ⑥ Fixed sheave | ⑬ Bolt |
| ⑦ Plastic washer | |



Y-719

TRANSMISSION

- | | | |
|------------------------|-----------------------------|---------------------------------------|
| ① Transmission cover | ⑦ Wheel gear 1 (Forward) | ⑬ Shift lever 2 |
| ② Input shaft assembly | ⑧ Wheel gear 2 (Reverse) | ⑭ Shift cable |
| ③ Shim | ⑨ Idler gear (Reverse) | ⑮ Stopper (Oil level fill/check plug) |
| ④ Pinion gear | ⑩ Guide collar (Dog clutch) | ⑯ Governor lever (bar, 1) |
| ⑤ Primary gear | ⑪ Shift bar 2 (Shift fork) | |
| ⑥ Differential | ⑫ Shift bar 1 (Shift shaft) | |



Y-720

TRANSMISSION

1. Remove:

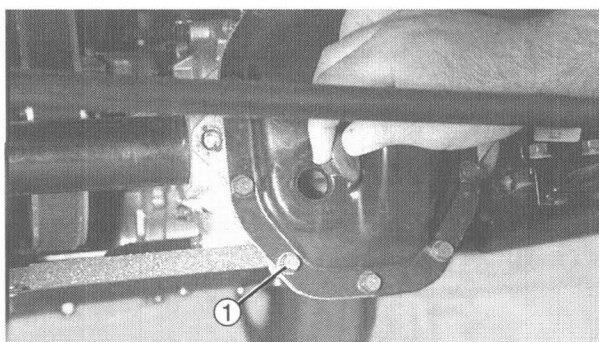
- Drive belt
- Secondary sheave

Refer to G14 SERVICE MANUAL, CHAPTER 4 "SECONDARY SHEAVE" section.

2. Place an oil pan under the transmission case.

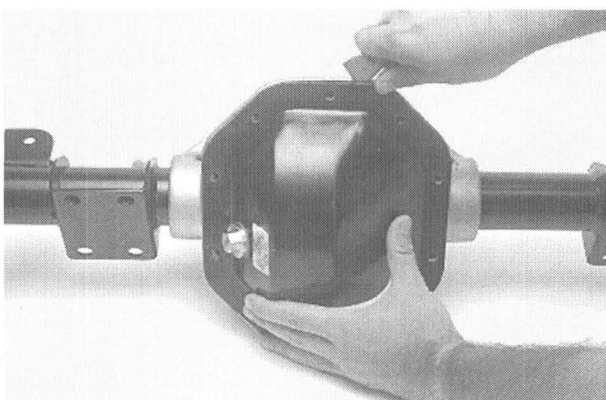
3. Remove:

- Bolts ①



Y-551

NOTE: _____
All transmission case bolts and differential cover bolts are 1/2 inch wrench size.



Y-318

- Transmission case cover using a putty knife.

CAUTION

Use care not to damage the case sealing surface or deform the transmission case cover.

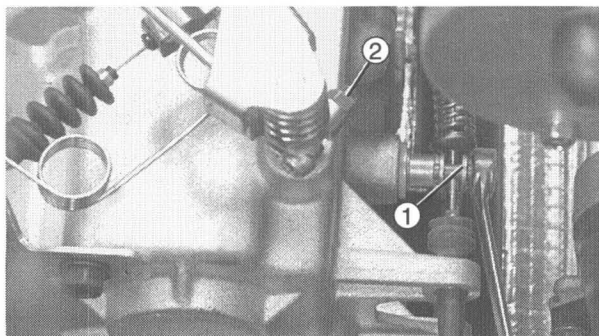
NOTE: _____
It is not necessary to remove the rear axle assembly in order to service the transmission or differential. If in-chassis service is desired, disregard steps 9 ~ 13.

4. Set the brake, jack up the rear of the vehicle and place a stand under the frame. Block the front wheel.

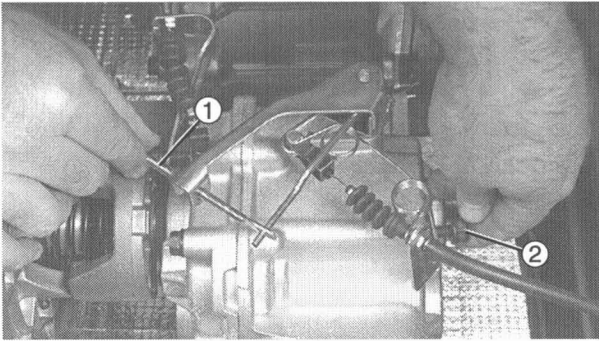
5. Remove rear axle wheel. See G14 SERVICE MANUAL, CHAPTER 3 "REAR AXLE WHEEL FOR G14E" section.

6. Remove:

- Shift lever nut ①
- Governor lever nut ②



Y-790



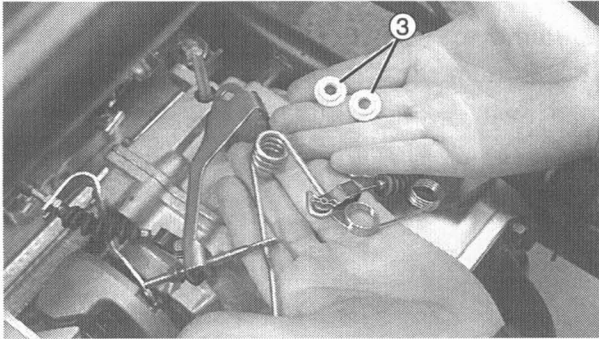
Y-553

7. Remove:

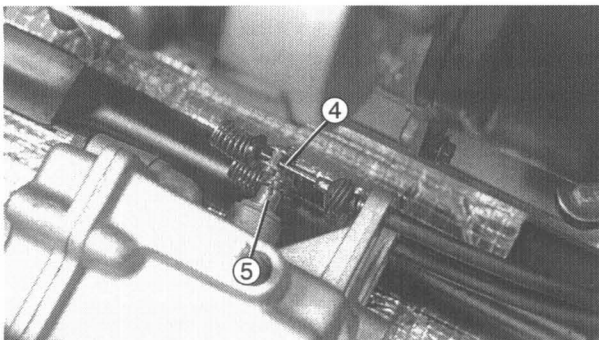
- Speed limiter lever bracket bolts (① and ②)
- Speed limiter lever as a unit
- Spring and 2 plastic washers ③ (keep for installation)

NOTE:

If removing speed limiter lever as a unit, no adjustment of cable is necessary when installing.



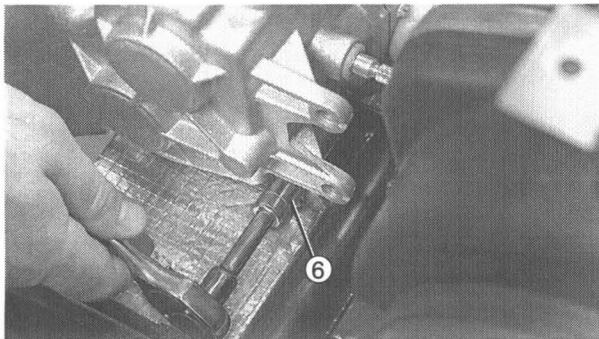
Y-554



Y-791

8. Remove

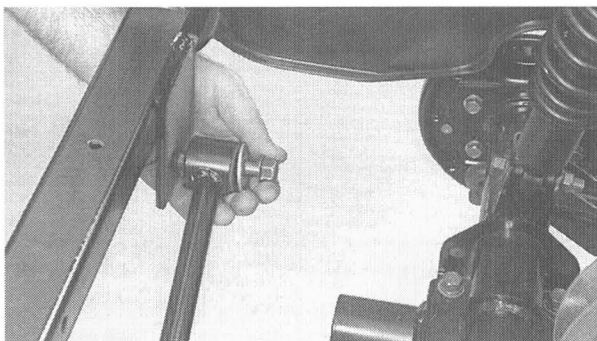
- Shift cables ④
- Mark shift shaft and lever for alignment during installation ⑤



Y-792

9. Remove:

- Remove transmission mounting bolt and nut ⑥

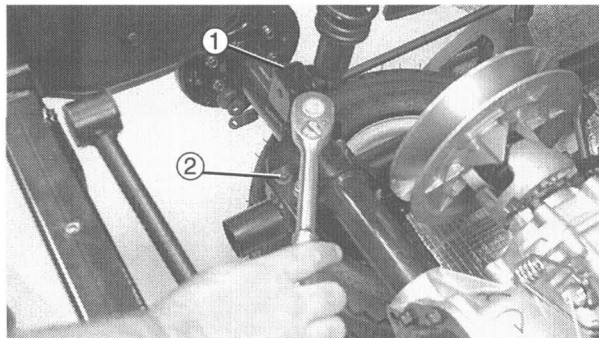


Y-556

10. Remove:

- Rear arm connecting rod.

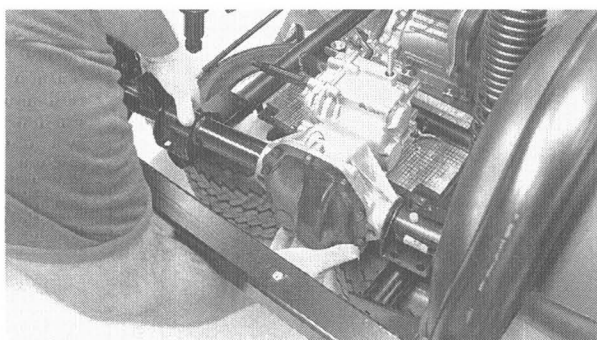
11. Support swing arm so it does not drop to the floor.



Y-828

12. Remove:

- Bottom shock bolts ①
- Bolts ② holding the rear axle to rear arm.



Y-558

13. Lift transmission out through the rear of the car. Place on suitable work surface.

DIFFERENTIAL DISASSEMBLY

1. Remove:

- Rear hubs
- Axles

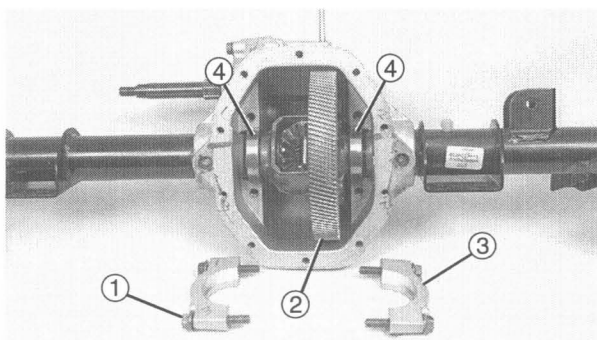
Refer to G14 SERVICE MANUAL, CHAPTER 3 "REAR AXLE WHEEL FOR G14E" section.

2. Remove:

- Bearing holder bolts ①

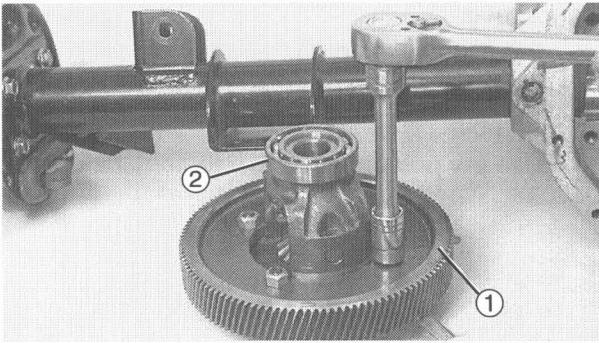
CAUTION

Mark bearing holders before removal so they can be returned to their original position - bearing holders are not interchangeable.



Y-559

- Bearing holders ③
- Differential assembly with ring gear ② and bearings ④



Y-560

3. Separate:

- Ring gear ①
- Differential assembly ②

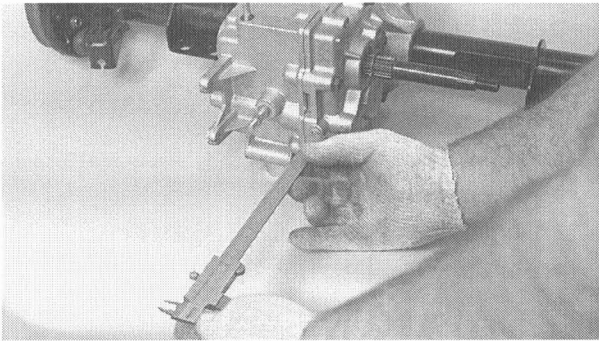
DIFFERENTIAL INSPECTION

1. Inspect:

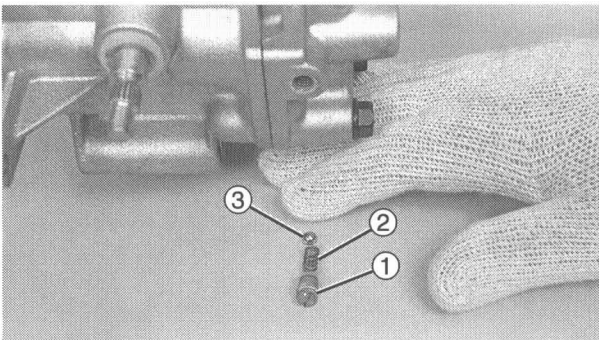
- Ring gear
- Differential gear
Damage/Wear → Replace
- Bearing
Pitting/Damage → Replace
- O-ring
Wear/Damage → Replace

TRANSMISSION DISASSEMBLY

1. Measure height of transmission shift detent screw. Screw has to be installed to the same position.



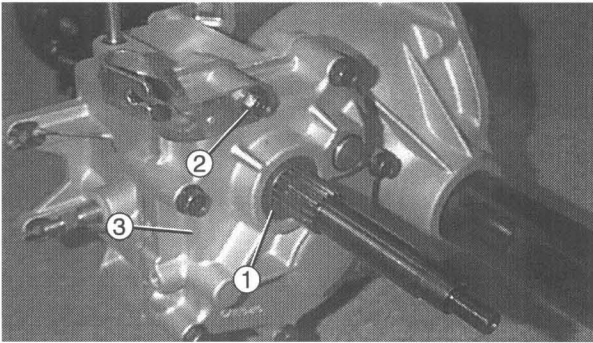
Y-561



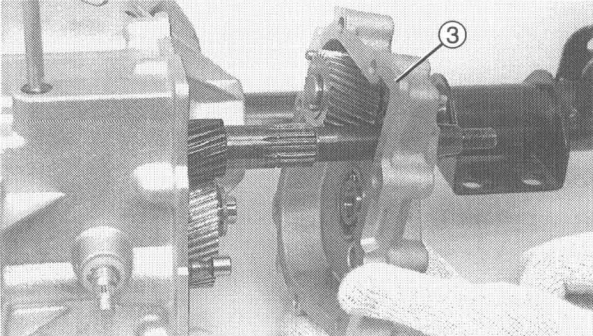
Y-562

2. Remove:

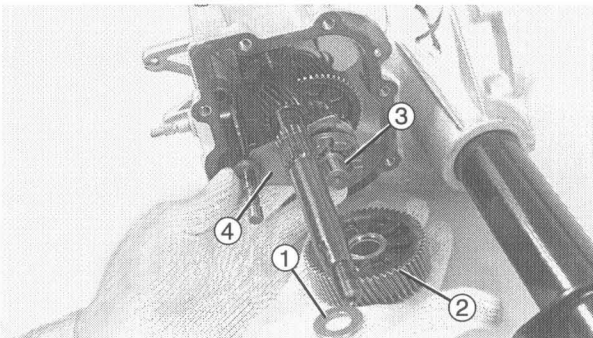
- Screw ①
- Spring ②
- Detent ball ③



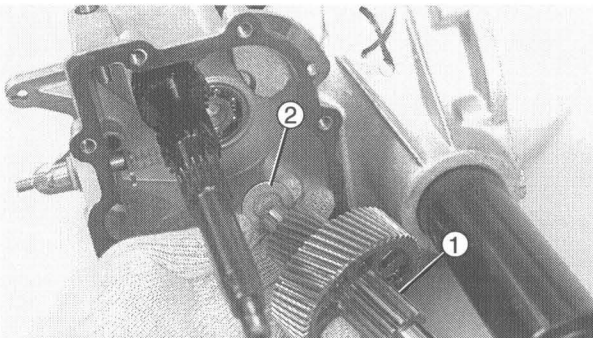
Y-563a



Y-564



Y-565



Y-566

3. Remove:

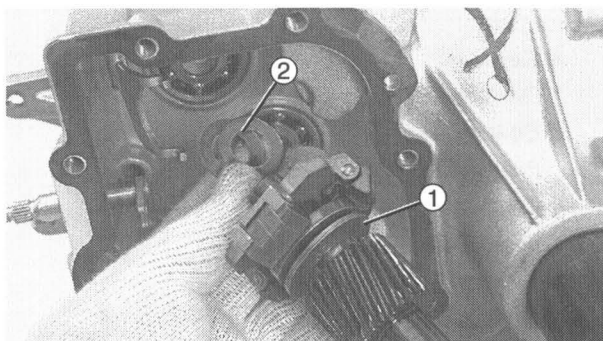
- Input shaft circlip ①
- Transmission case bolts ②
- Remove cover ③
- Use pry points to avoid case damage

4. Remove:

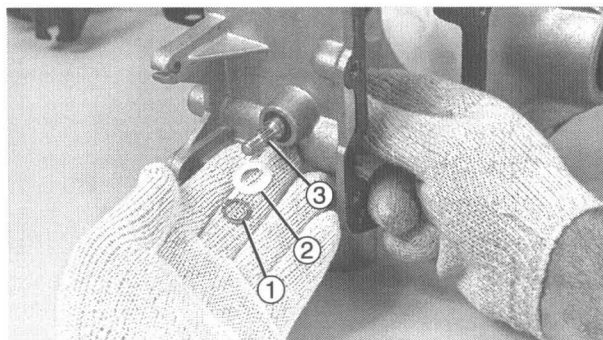
- End washer ①
- Reverse wheel gear ②
- Dog clutch ③
- Shift fork ④

5. Remove:

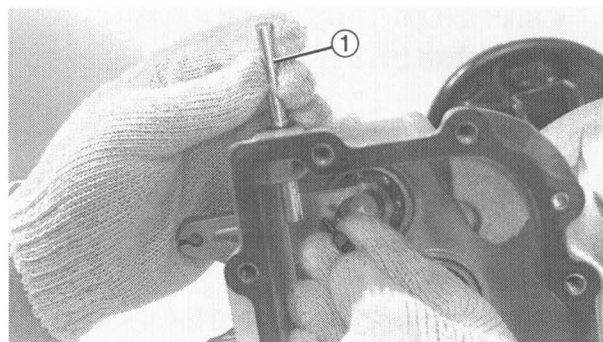
- Counter shaft with forward wheel gear ①
- End washer ②



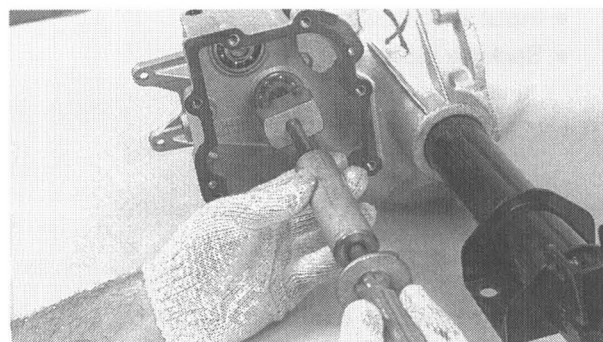
Y-567



Y-568



Y-569



Y-570

6. Remove:

- Input shaft ①
- End washer(s) if used. ② Note thickness and diameter of shims

CAUTION

End washer(s) are used as needed to establish input shaft end play of .002-.005". Use the same end washer(s) during installation. Do not change end washer(s) unless crankcase is replaced.

7. Remove:

- Circlip ①
- Plastic collar ②
- Shift shaft ③

8. Remove:

- Governor shaft and oil seal ①

TRANSMISSION INSPECTION

1. Inspect:

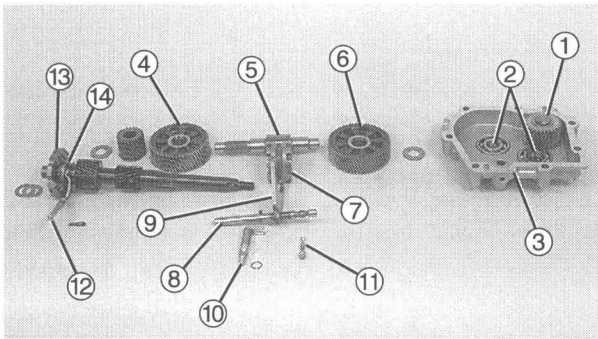
- Bearings
- Rough movement - Replace.

NOTE:

Use a bearing puller to remove bearings. If necessary, use a heat gun to heat the case before removing or installing bearings.

CAUTION

Do not overheat the transmission case. Damage to the case may result.



Y-793

2. Inspect:

- Gears ①
Damage/Wear → Replace
- Bearings ②
Pitting/Damage → Replace
- Oil Seals
Wear/Damage → Replace
- Transmission case ③
Cracks/Damage → Replace

3. Inspect:

- Wheel gear 1 (Forward) ④
- Countershaft ⑤
- Wheel gear 2 (Reverse) ⑥
Wear/Cracks/Damage → Replace
- Dog clutch ⑦
Damage → Replace.

4. Inspect:

- Guide bar ⑧ and pin
- Shift fork ⑨
- Shift shaft ⑩

5. Inspect:

- Detent screw, spring, ball ⑪
Wear/Damage → Replace.

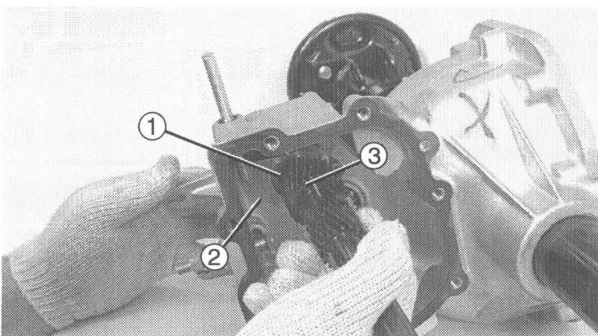
6. Inspect:

- Governor lever and oil seal ⑫
- Governor weights ⑬
- Idler collar ⑭
Wear/Damage → Replace.
- Input shaft gearwear.
- Backing plate secure on shaft.

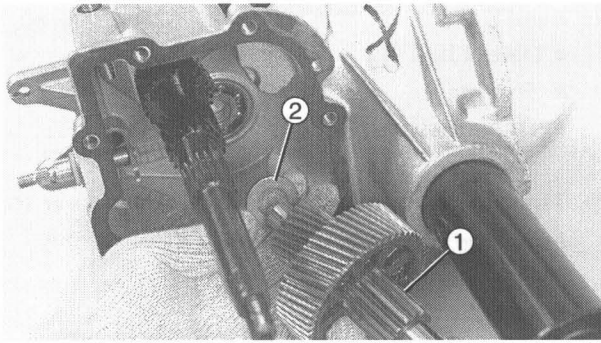
TRANSMISSION ASSEMBLY

Reverse the "DISASSEMBLY" procedure.
Note the following points.

1. When installing the input shaft be sure to install the original shims (if equipped) ①.
2. Install the governor fork ② onto the governor idler collar ③ between the washer and gear.
3. Apply:
 - Gear oil to all oil seals and bearings.

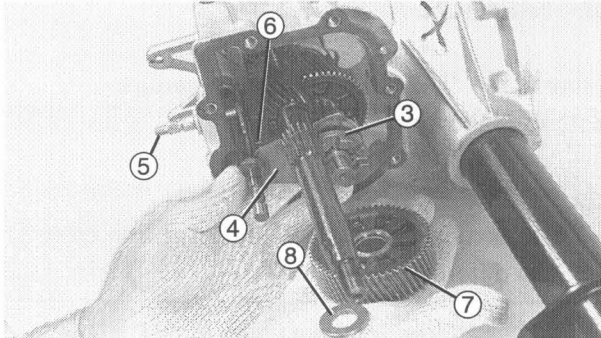


Y-794



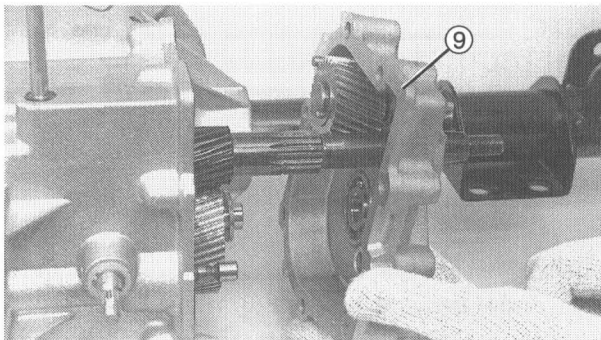
Y-566

4. Install countershaft and forward wheel gear ① with thick, silver color thrust washer ②. The forward gear is smaller in diameter and has a "F" marked between two of the engagement dog slots.



Y-795A

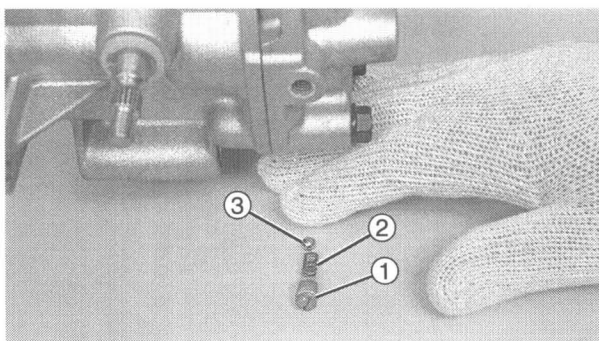
5. Install:
- Dog clutch ③
 - Before installing the clutch, engage the shift fork ④ with groove of the clutch ③. Then turn the shift shaft lever to align the slot of the shift shaft ⑤ with pin ⑥.
 - Drive gear 2 ⑦ (reverse) with end washer ⑧. (The reverse drive gear is larger in diameter and has a "R" marked between two of the engagement dog slots.)



Y-796

6. Install:
- Gasket (New)
 - Transmission cover ⑨.
7. Tighten:
- Bolts (Transmission cover)
- Tighten them in a crisscross pattern.

**Transmission Cover:****First: 20 Nm (2.0 m•kg, 14 ft•lb)****Final: 25 Nm (2.5 m•kg, 18 ft•lb)**



Y-562

8. Install:

- Detent ball ③
- Spring ②
- Transmission shift detent screw ①

9. Tighten transmission shift detent screw to specification measured during disassembly.

DIFFERENTIAL ASSEMBLY

Reverse the "DISASSEMBLY" procedure.
Note the following points.

1. Tighten:

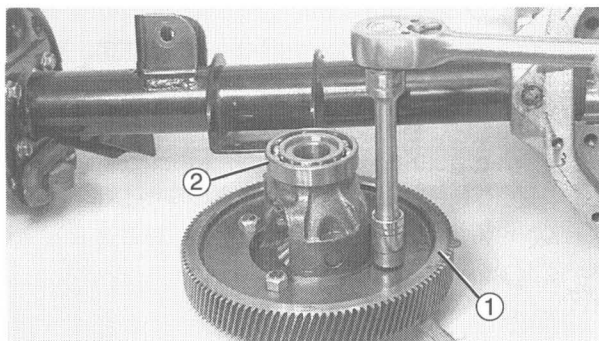
- Differential case nuts attaching ring gear ① to differential assembly ②.



Differential Case Nuts:
55 Nm (5.5 m•kg, 40 ft•lb)

NOTE:

Apply LOCTITE® to the differential case nuts.



Y-560

2. Tighten:

- Differential bearing holder bolts ①

CAUTION

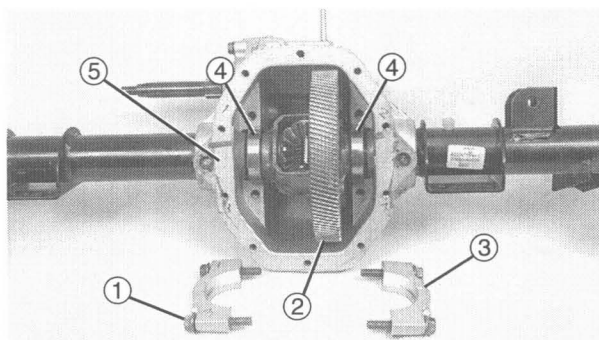
Differential bearing holders ③ must be installed in their original locations. Holders and case are marked with locating letters.



Differential Bearing Holder Bolts:
55 Nm (5.5 m•kg, 40 ft•lb)

NOTE:

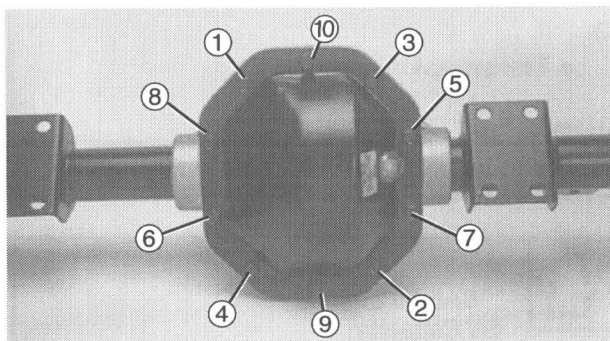
Clean the transmission cover surface ⑤.



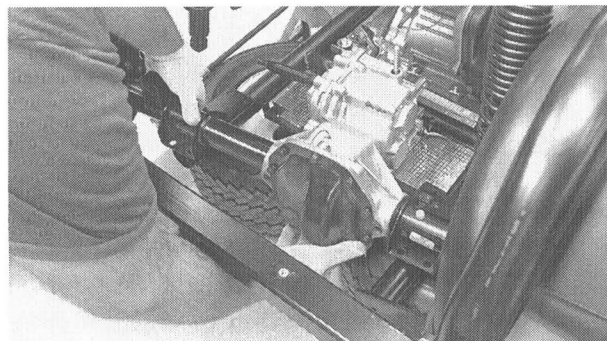
Y-797

3. Apply:

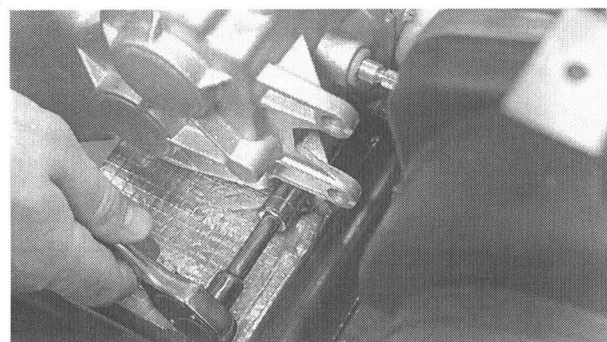
- RTV Quick Gasket sealant (ACC-11001-05-01) or Three bond 1215 (to the cover surface and into the 10 bolt holes)



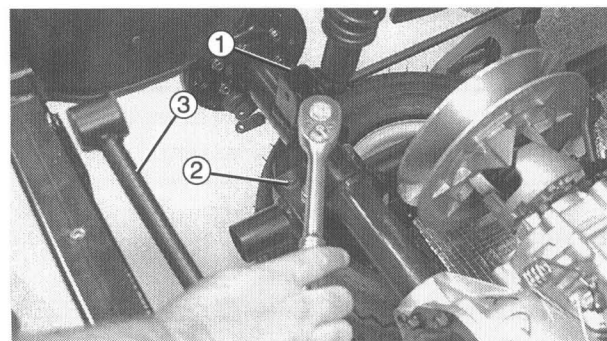
Y-322



Y-558



Y-799



Y-842

4. Tighten:

- Transmission cover bolts ① thru ⑩
- New transmission case holes are not threaded. Bolts are self-tapping.

NOTE:

Tighten the bolts in order starting with the smallest number and torque the bolts in two stages.

**Transmission Cover Bolts:**

First: 20 Nm (2.0 m•kg, 14 ft•lb)

Final: 25 Nm (2.5 m•kg, 18 ft•lb)

INSTALLATION:

Reverse the "REMOVAL" procedure. Note the following points.

1. Install:

- Transmission case assembly
- Transmission mount bolt and nut

**Transmission Mount Nut:**

23 Nm (2.3 m•kg, 17 ft•lb)

- Rear arm bolts ②

**Axle Housing - Rear Arm (2):**

64 Nm (6.4 m•kg, 46 ft•lb)

2. Install:

- Rear shock absorber pivot bolts ①

**Shock Absorber Pivot Bolt ①:**

32 Nm (3.2 m•kg, 23 ft•lb)

- Rear arm connecting rod ③.

**Connecting Rod Nut Torque:**

90 Nm (9.0 m•kg, 65 ft•lb)

- Rear axle shafts
Refer to G14 SERVICE MANUAL, CHAPTER 3 "REAR AXLE WHEEL FOR G14E, REMOVAL" section.
- Rear wheels

**Rear Wheel:**

90 Nm (9.0 m•kg, 65 ft•lb)

3. Fill:

- Transmission case

NOTE:

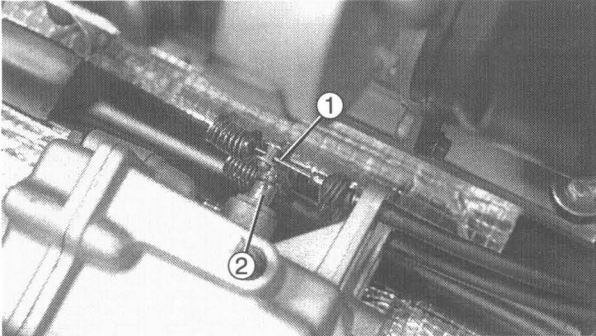
Be sure to install transmission case fill cap.

**Recommended Oil:**

SAE 90 gear oil

Oil Capacity:

415 cc (0.26 Imp qt. 0.42 US qt)



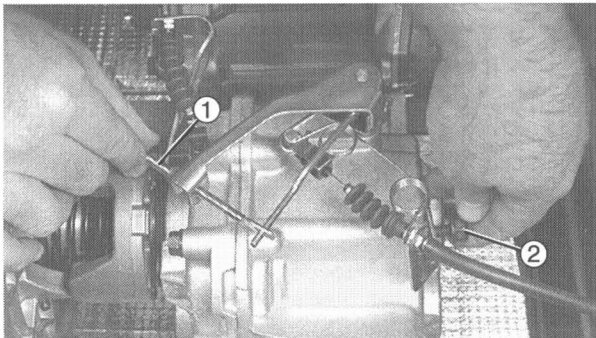
Y-573

4. Connect:

- Shifting cables (1) (with lever (2)) onto shaft
- Align line on shaft with dot on shift lever
- Shift lever nut

NOTE:

Align the match marks on the lever and shaft. Scribe mark on shift shaft end should be in 9 o'clock position (transmission in neutral) with lever straight up and down.



Y-553

5. Install:

- Speed limiter lever onto the governor shaft. Make sure to install the two plastic washers (3).
- Governor lever nut

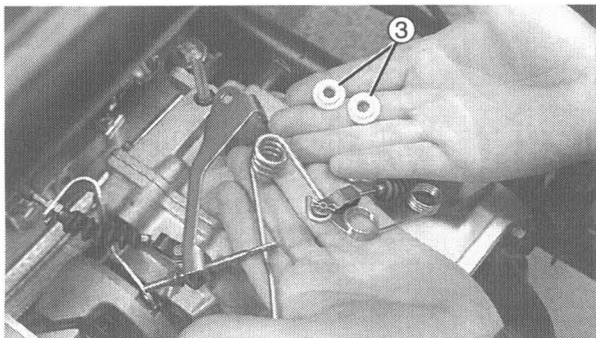
**Governor Lever Nut:**

8 Nm (80 kgf·cm, 6 ft·lb)

- Speed limiter lever bolts (1) and (2)
- Circlip onto the input shaft.

NOTE:

If speed limiter lever was removed as a unit, no throttle cable adjustment is necessary.



Y-554

6. Adjust:

- Throttle cable free play
Refer to G14 SERVICE MANUAL, CHAPTER 2 "THROTTLE CABLE ADJUSTMENT" section.



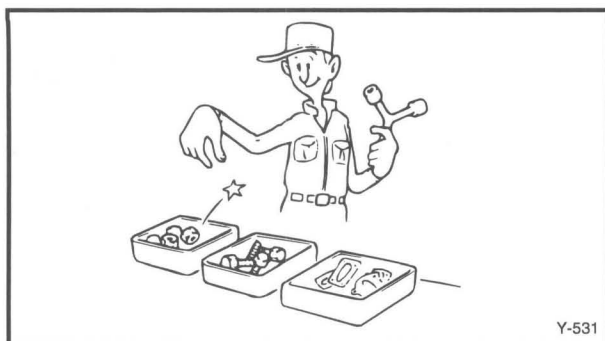
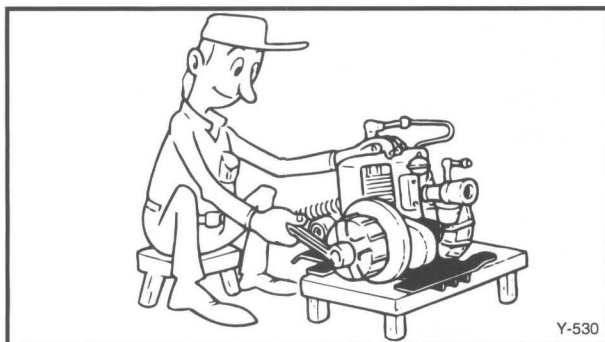
ENGINE OVERHAUL

ENGINE REMOVAL

NOTE:

It is not necessary to remove the engine in order to remove the following components:

- Cylinder head assembly
- Carburetor
- Starter-generator
- Primary sheave
- Air shroud
- Ignition unit
- Flywheel



PREPARATION FOR REMOVAL

1. Remove all dirt, mud, dust, and foreign material before removal and disassembly.
2. Use proper tools and cleaning equipment. Refer to G14 Service Manual CHAPTER 1 "SPECIAL TOOLS"

CAUTION

Make sure all traces of cleaner are removed before engine is reassembled. Engine oil can be adversely affected by even small amounts of cleaner.

NOTE:

When disassembling the engine, keep mated parts together. This includes gears, cylinders, pistons, and other parts that have been "mated" through normal wear. Mated parts must be reused as an assembly or replaced.

3. During the engine disassembly, clean all parts and place them in trays in the order of disassembly. This will speed up assembly time and help assure that all parts are correctly reinstalled in the engine.

4. Disconnect the battery negative lead.



DRIVE BELT

1. Remove:

- Drive belt

Refer to G14 SERVICE MANUAL, CHAPTER 4 "SECONDARY CLUTCH DISASSEMBLY" section.

PRIMARY CLUTCH

1. Remove

- Primary clutch

Refer to CHAPTER 4 "POWER TRAIN PRIMARY SHEAVE" section.

AIR CLEANER CASE

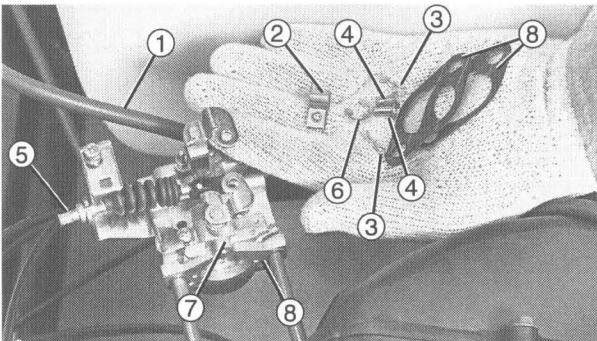
1. Remove

- Air cleaner

Refer to CHAPTER 2 "CARBURETOR ADJUSTMENT" section.

WARNING

Gasoline may be present in the carburetor and fuel system. Use care during engine removal not to spill gasoline. Gasoline is extremely flammable, and its vapors can explode if ignited.



Y-800

CARBURETOR

1. Disconnect:

- Fuel hose ①

2. Remove:

- Choke cable clamp ②

3. Remove:

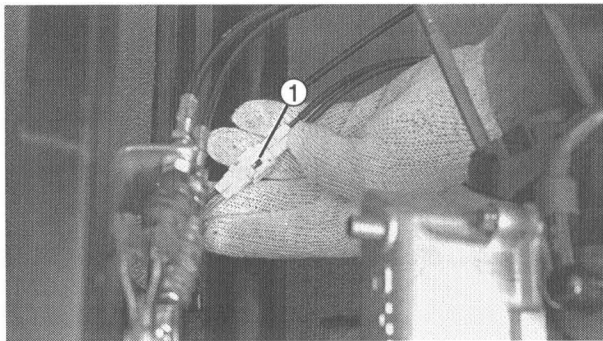
- Cotter pin from clevis pin ③
- Clevis pin ④
- Choke cable

4. Remove:

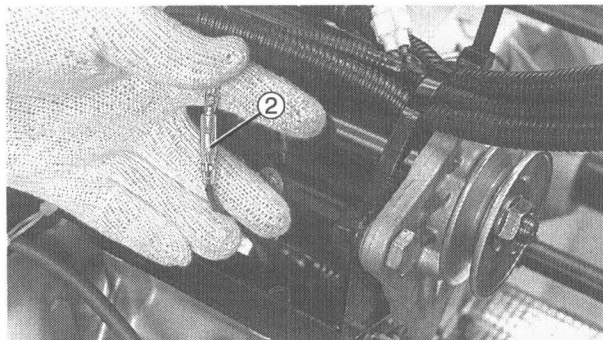
- Circlip ⑥
- Cotter pin from clevis pin ③
- Clevis pin ④
- Throttle cable ⑤

5. Remove

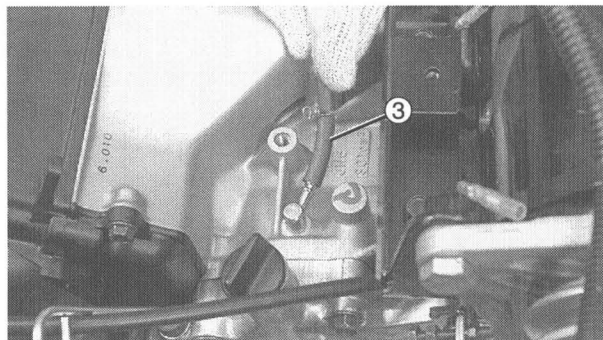
- Carburetor assembly ⑦
- Three gaskets ⑧. (Replace if damaged.)



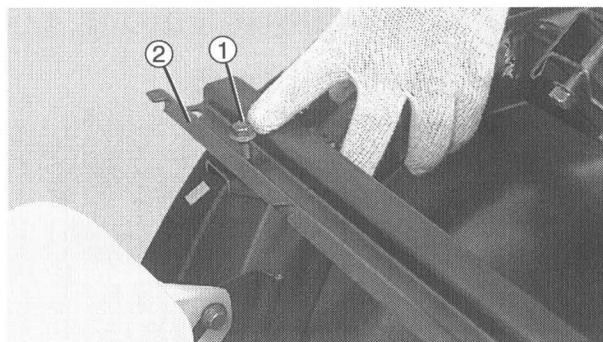
Y-576



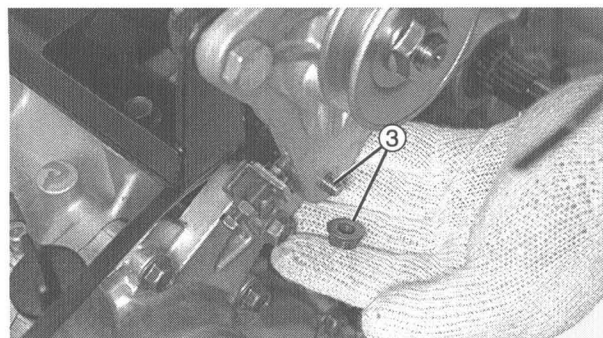
Y-577



Y-580



Y-579



Y-578

WIRING AND HOSE

1. Disconnect:

- Ignition lead ①
- Oil warning level switch lead (blue) ②

2. Disconnect:

- Pulser hose ③ from crankcase.

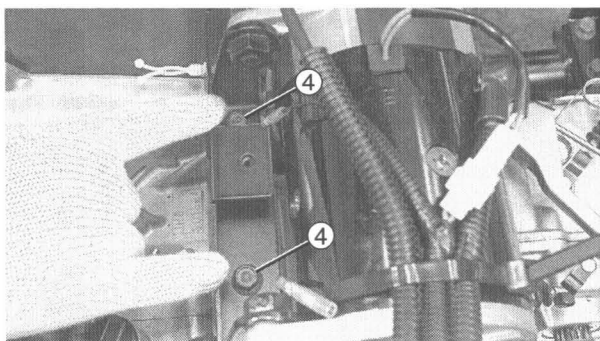
STARTER GENERATOR

1. Remove:

- Seat support bolts ①
- Seat support ②
- Starter generator lead wire clamp

2. Remove:

- Starter generator lower adjuster lock bolt ③



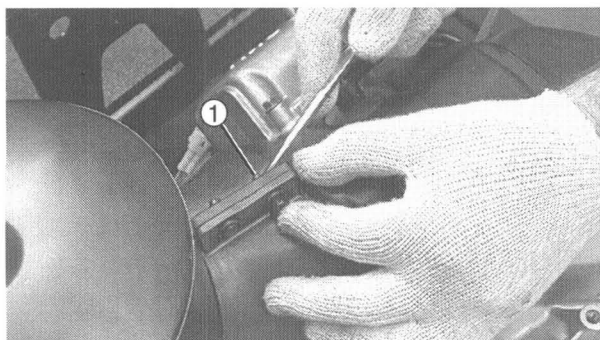
Y-581

3. Remove

- Starter generator bracket mount bolts ④
- Starter generator

NOTE:

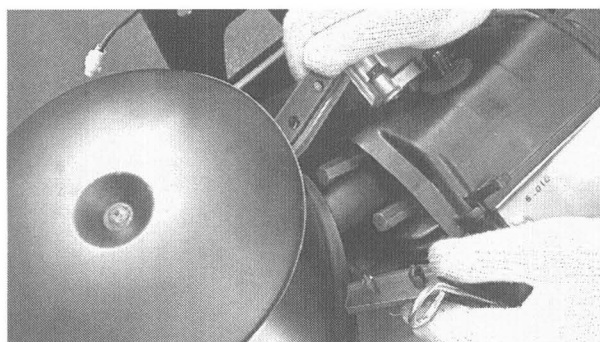
Disconnect starter generator leads if servicing is necessary



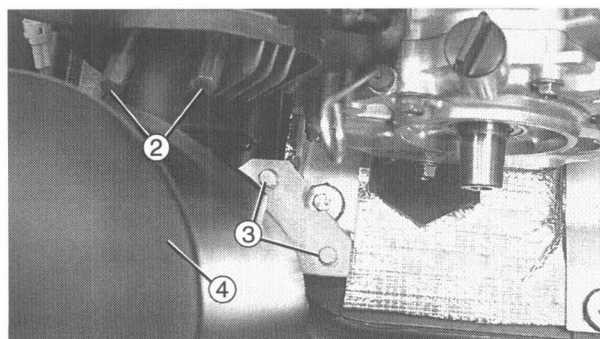
Y-582

MUFFLER**1. Remove:**

- Muffler joint rivets ①



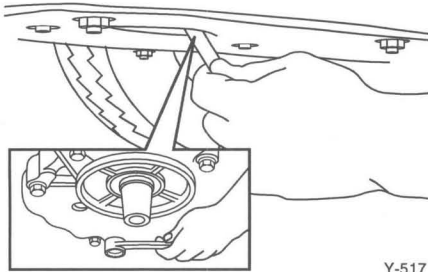
Y-583



Y-584

2. Remove:

- Exhaust pipe holding nuts ②
- Muffler mount bolts ③
- Muffler ④ and gasket



Y-517

ENGINE OIL DRAIN

Refer to G14 SERVICE MANUAL, CHAPTER 2 "ENGINE OIL REPLACEMENT" section for complete instructions.

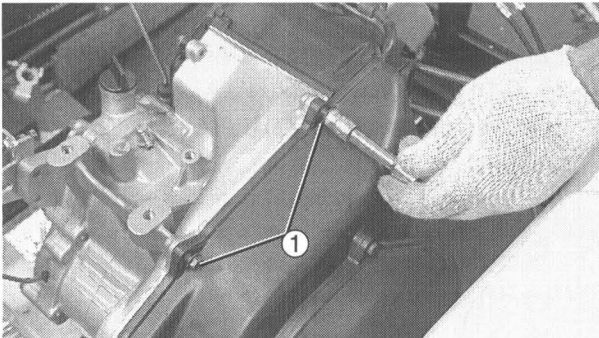
1. Place a proper catch container under the oil drain plug.
2. Remove drain plug.
3. Drain engine oil completely.

AIR SHROUD

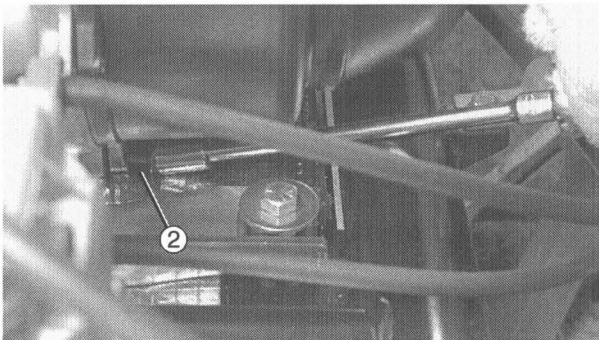
1. Remove:
 - Top bolts ①
 - Bottom bolt ②

NOTE:

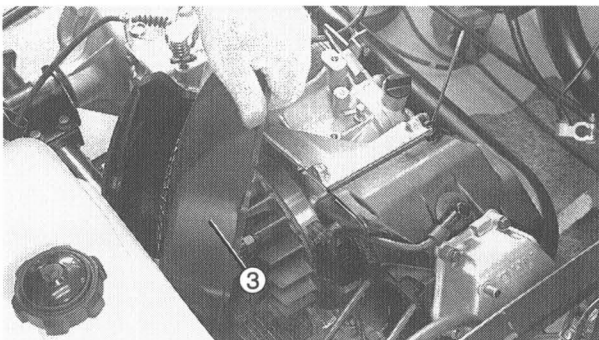
Bottom bolt is accessed from underneath the frame.



Y-586

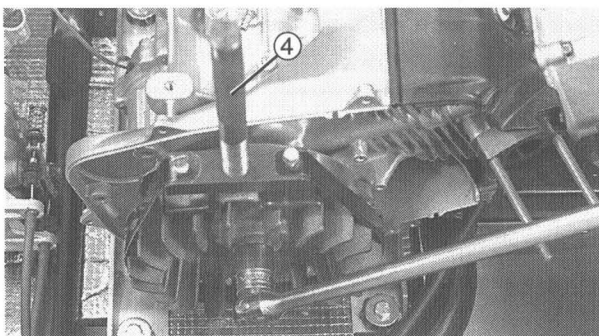


Y-587



Y-588

2. Rotate the air shroud ③ and remove.
3. Remove TCI ignition unit.



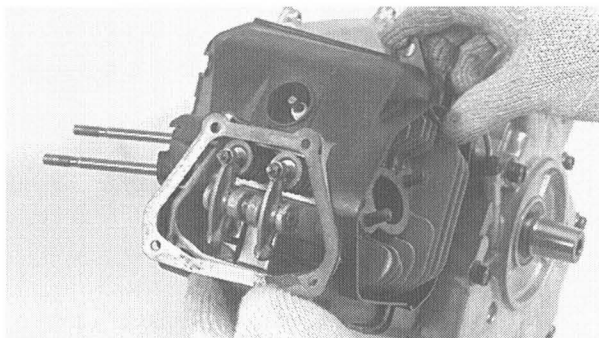
Y-801

FLYWHEEL

1. Remove:
 - Flywheel securing nut and washer
 Use a Sheave Holder ④



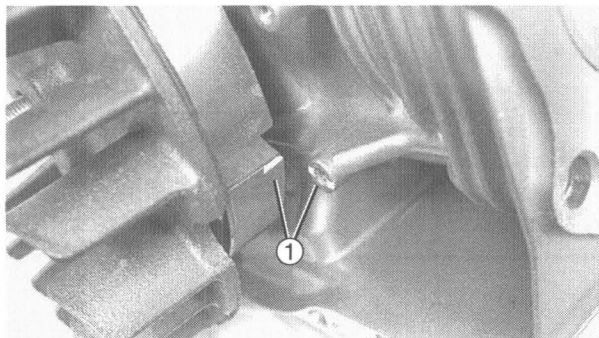
Primary Sheave Holder:
YS-1880-A, 90890-01701



Y-591

2. Remove:

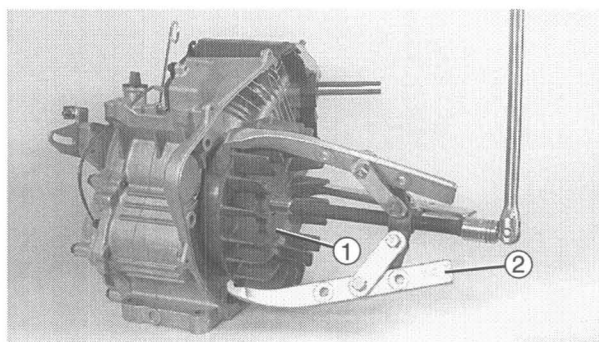
- Remove valve cover
- Air shroud
- Valve cover gasket
- Spark plug



Y-595

3. Place valve at TDC compression stroke. Refer to G14 SERVICE MANUAL CHAPTER 2 "INSPECTION AND ADJUSTMENT ENGINE" section.

Mark flywheel at TDC for installation ①



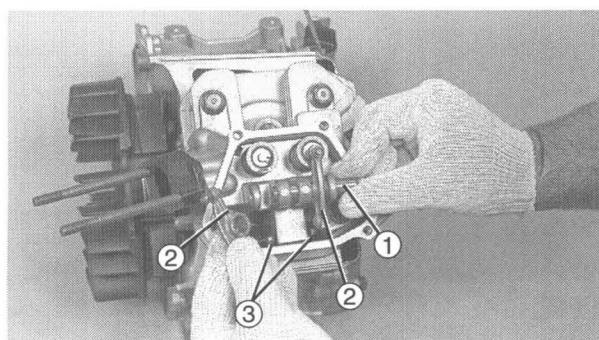
Y-590

4. Remove:

- Flywheel ①
- Use a 2 or 3 jaw puller ②.

NOTE:

Flywheel can be removed in the frame by removing the fuel tank.



Y-593

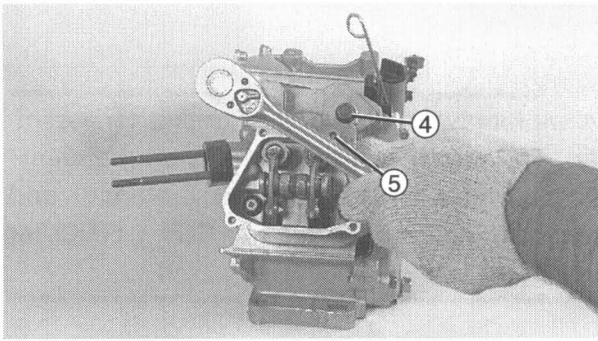
CYLINDER HEAD

1. Remove

- Rocker shaft ① and arms ②
- Push rods (Exhaust/Intake) ③

NOTE:

Mark both push rods so they can be installed in their original positions.



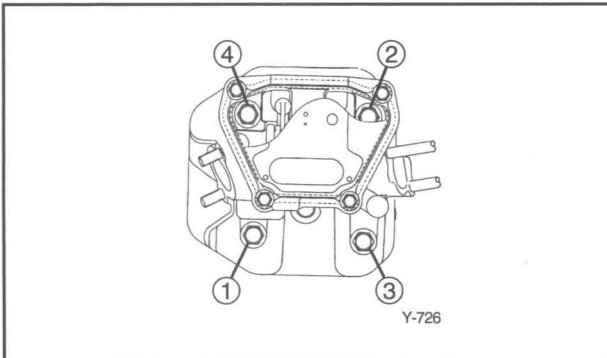
Y-592

2. Remove:

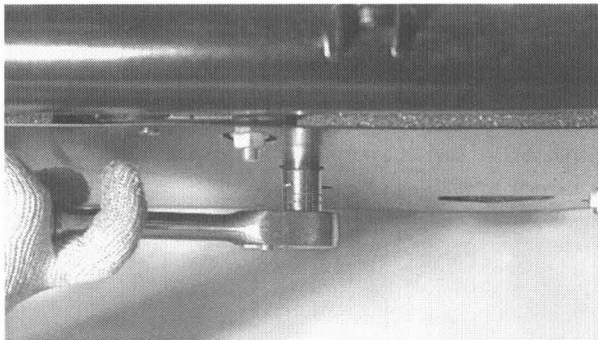
- Cylinder head bolts ④
- Head ⑤ and head gasket

NOTE:

Loosen bolts in numbered sequence as shown. Start by loosening each bolt 1/2 turn until all are loose.



Y-726



Y-594

ENGINE REMOVAL

1. Remove:

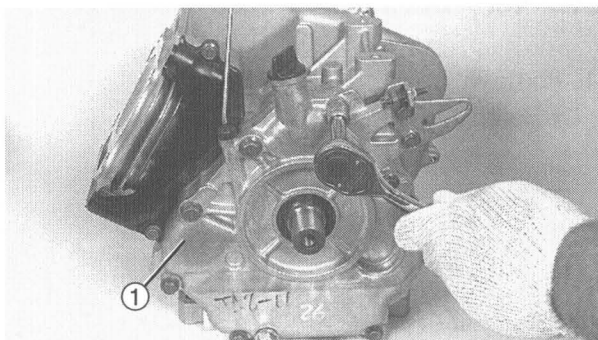
- Engine mount nuts underneath rear arm

2. Remove:

- Engine. Place on a suitable work space

NOTE:

The engine weighs 21.9 kg (48.3 lbs) without the starter.

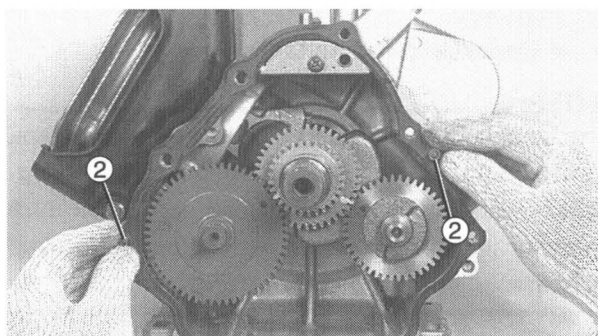


Y-596

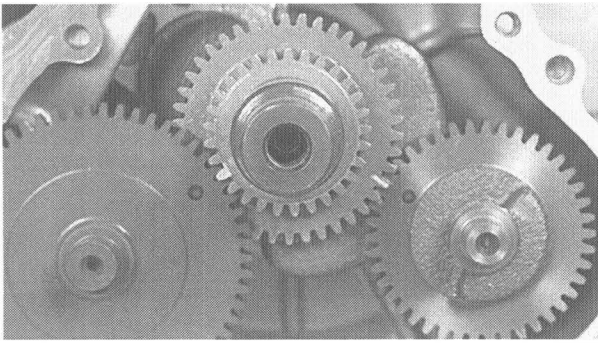
CRANKCASE COVER

1. Remove:

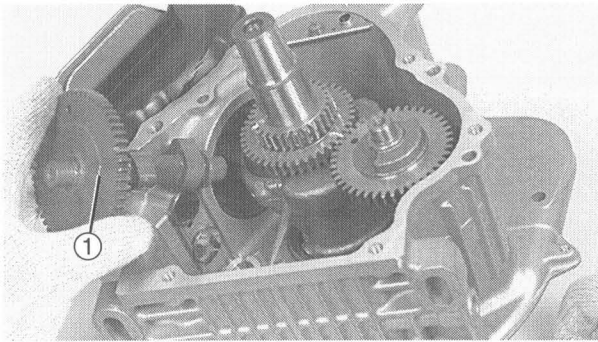
- Bolts
- Crankcase cover ①
- Dowel pins ②
- Gasket



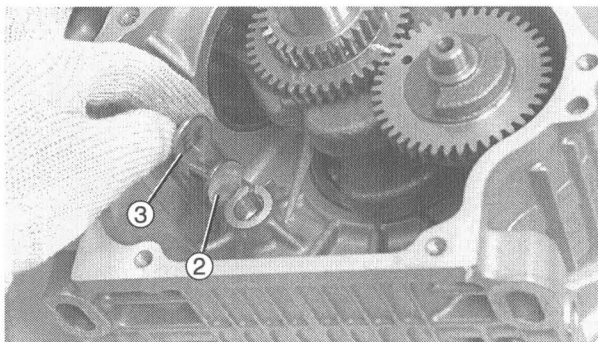
Y-597



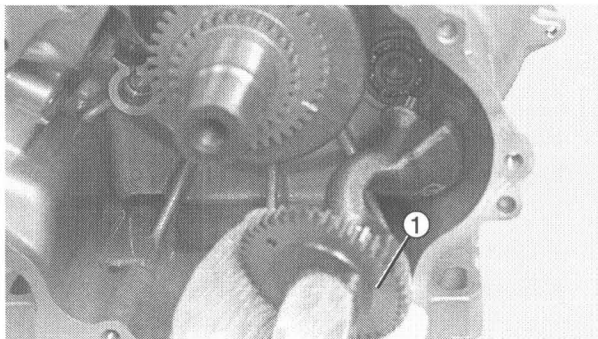
Y-598



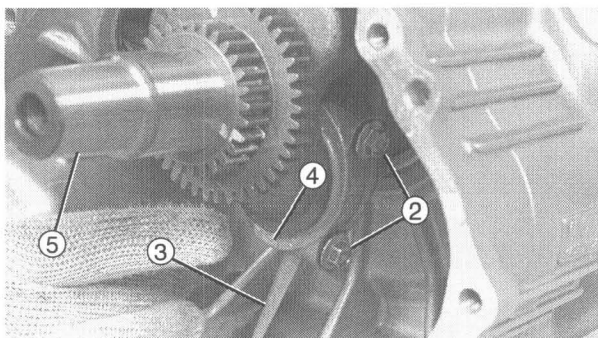
Y-599



Y-600



Y-601



Y-802

CAMSHAFT

NOTE:

Before removal note alignment marks for assembly. The punch and paint marks on the crankshaft align with the holes on balancer and camshaft, indicating Top Dead Center (TDC) for the piston.

1. Remove:

- Cam shaft ①

NOTE:

Before removing the camshaft, place the engine with its left-side up to prevent the tappets from falling out.

2. Remove:

- Intake ② and exhaust tappets ③

NOTE:

Mark both tappets so they can be installed in their original guide hole.

BALANCER SHAFT AND CRANKSHAFT

1. Remove:

- Balancer ①

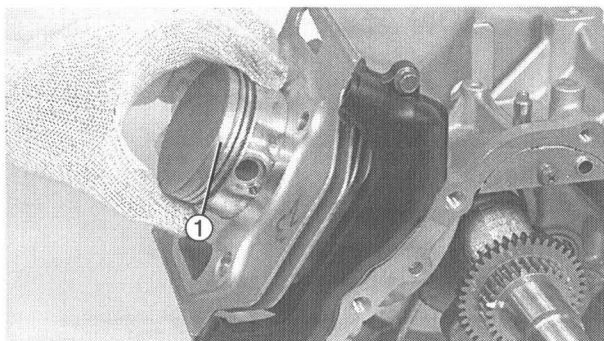
2. Remove:

- Connecting rod bolts ②

NOTE:

The oil splasher ③ is part of connecting rod cap. Remove cap with care; keep bolts with cap. When installing connecting rod cap make sure splasher is pointing down and arrows ④ on cap match.

- Crankshaft ⑤

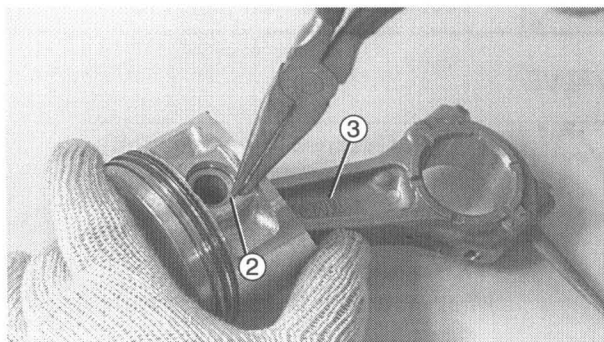


Y-603

PISTON AND CONNECTING ROD

1. Remove:

- Piston / connecting rod from crankcase ①



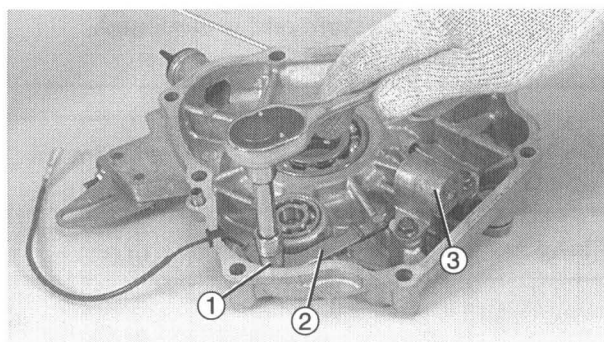
Y-803

2. Remove

- Clip ② (If replacing rod, piston or piston pin)

NOTE:

“YAMAHA” cast on left side of connecting rod ③ always faces primary clutch side of engine.

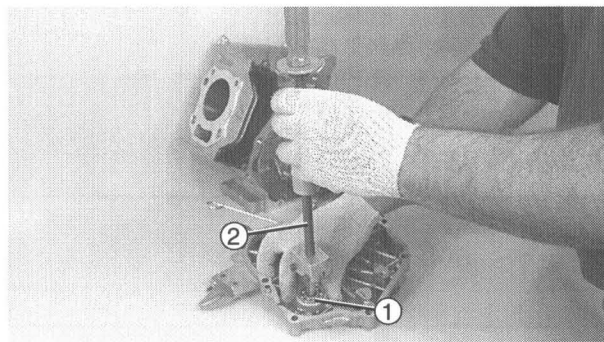


Y-605

OIL SENDER AND WIRE GUIDE PLATE

1. Remove:

- Bolts ①
- Wire guide plate ②
- Oil sender switch ③



Y-606

BEARINGS

1. Remove:

- Bearings ① - heat case evenly with heat gun. Use a bearing puller ② to remove bearings

CAUTION

Do not overheat the engine cases. Damage to the cases may result.



INSPECTION AND REPAIR

For Inspection and Repair refer to the G14 Service Manual CHAPTER 5 "INSPECTION AND REPAIR". Note the following specifications and / or steps that are unique to the G16A engine.

CYLINDER HEAD



Cylinder Head Warp Limit:
Less than 0.03 mm (0.001 in)

VALVE



Margin Thickness (Service limit):
Intake 1.2 mm (0.047 in)
Exhaust 1.0 mm (0.040 in)

Beveled:

No minimum*

Minimum Length (Service limit):

No minimum*

Seat Width (Valve face):

1.0 mm (0.040 in)

*If valve stem end is damaged, replace valve.



Valve Stem/Guide Clearance

Maximum

Intake	0.037 ~ 0.064 mm (0.0015 ~ 0.0025 in)	0.10 mm (0.040 in)
Exhaust	0.030 ~ 0.057 mm (0.0012 ~ 0.0022 in)	0.10 mm (0.040 in)



Maximum Runout:
0.01 mm(0.0004 in)

VALVE SEAT



Valve Seat Width:
Std: 0.7 ~ 0.9 mm
(0.028 ~ 0.035 in)

NOTE:

The G16A only requires a 45° and a 60° cutter. The 10° cut is not required on the G16A.



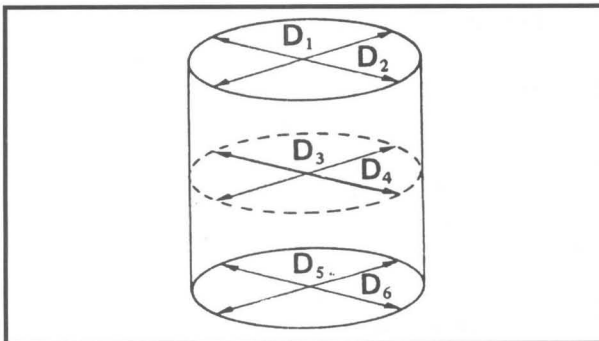
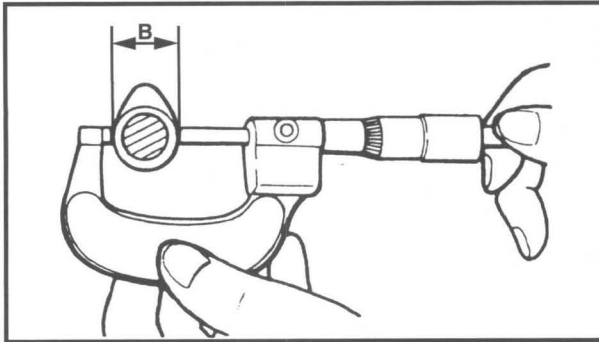
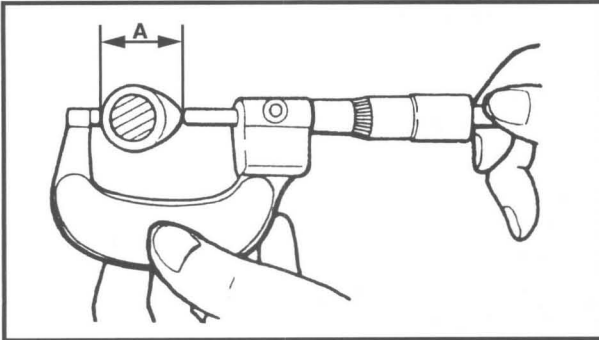
Valve Compressed Force Limit:
Intake: 7.0 kg (15.41 lb)
Exhaust: 9.0 kg (19.81 lb)



ROCKER ARM



Rocker Arm Inside Diameter:
12.00 ~ 12.04 mm
(0.472 ~ 0.474 in)



**Cam Lobe
"A"**

**Cam Lobe
"B"**

In	32.495 ~ 32.595 mm (1.279 ~ 1.283 in)	26.029 ~ 26.129 mm (1.024 ~ 1.028 in)
Ex	32.495 ~ 32.595 mm (1.279 ~ 1.283 in)	26.029 ~ 26.129 mm (1.024 ~ 1.028 in)



Camshaft Bearing Surface Diameter:
15.90 ~ 15.97 mm
(0.625 ~ 0.628 in)

Camshaft Pivot Inside Diameter:
16.00 ~ 16.05 mm
(0.630 ~ 0.632 in)

Clearance Limits:
0.03 ~ 0.15 mm (0.001 ~ 0.005 in)



Cylinder Bore "D":
78.00 ~ 78.02 mm
3.070 ~ 3.071 in
<Limit: 78.05 mm (3.072 in)

Taper Limit "T":
0.15 mm (0.006 in)

Out of Round Limit "R":
0.15 mm (0.006 in)



Piston Outside Diameter "P"

Standard	77.96 ~ 77.98 (3.069 ~ 3.070 in)
Oversize 1	78.25 mm (3.080 in)
Oversize 2	78.50 mm (3.090 in)

PISTON RING AND PIN

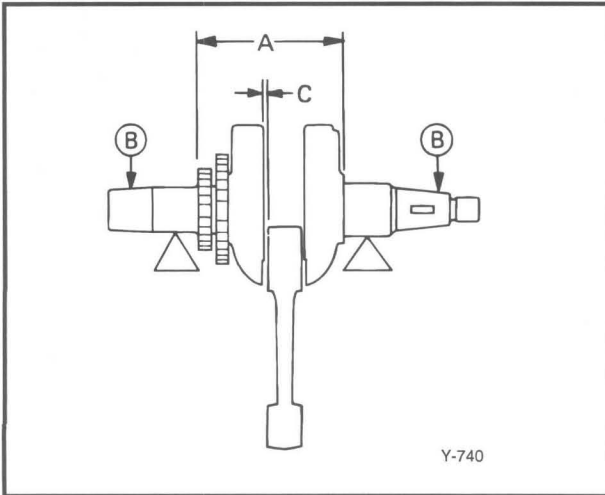


Side Clearance

	Standard	Limit
Top Ring	0.04 ~ 0.08 mm (0.0015 ~ 0.0031 in)	0.10 mm (0.0039 in)
2nd Ring	0.03 ~ 0.07 mm (0.001 ~ 0.003 in)	0.09 mm (0.04 in)



Outside Diameter (Piston Pin):
 19.995 ~ 20.000 mm
 (0.7872 ~ 0.7874 in)



CRANKSHAFT AND CONNECTING ROD

Crankshaft Runout

1. Measure:
 - Crankshaft assembly width (a).
 Out of specification → Replace crankshaft.

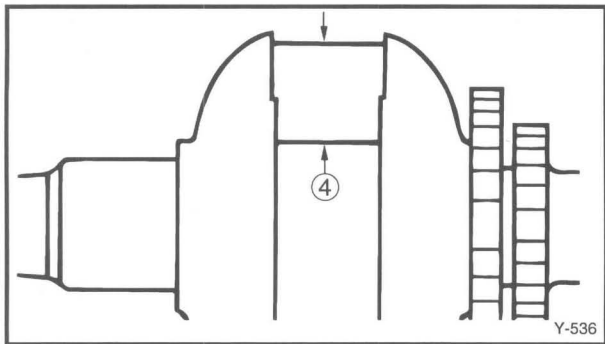


Crankshaft Assembly Width (a):
 104.0 ~ 105.4 mm
 (4.094 ~ 4.149 in)

- Connecting rod big end side clearance (c).
 Out of specification → Replace connecting rod.



Big End Side Clearance (c):
 0.20 ~ 0.65 mm (0.008 ~ 0.025 in)



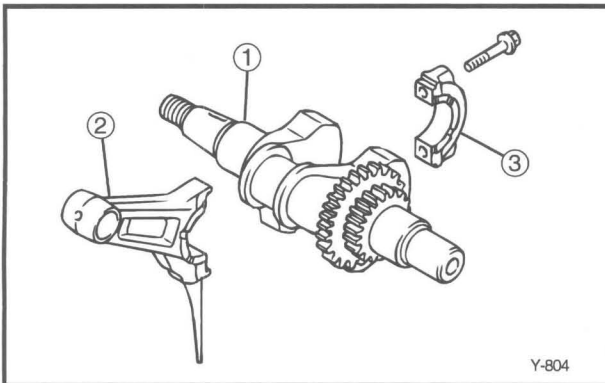
Crank Pin Outside Diameter

1. Measure:
 - Crank pin outside diameter ④
 Use a micrometer.
 Out of specification → Replace.



Crank Pin Outside Diameter ④ :
 35.97 ~ 35.98 mm
 (1.4161 ~ 1.4165 in)

Crank Pin Round or Taper Limit:
 0.03 mm (0.0012 in)



Connecting Rod Oil Clearance

1. Clean:
 - Crankshaft ①
 - Connecting rod ② and cap ③
2. Attach:
 - Plastigage®
 Onto the crank pin.



Plastigage
 YU-33210

3. Install:
 - Connecting rod ②
 Connecting rod cap ③.

**NOTE:**

Be sure the arrows on both components align. Plastigage should be 90° from rod cap to rod seam.

4. Lubricate:

- Connecting rod bolt threads

**Molybdenum Disulfide Grease or Oil**

5. Tighten:

- Connecting rod bolt

NOTE:

Do not turn connecting rod until clearance measurement has been completed.

CAUTION

Tighten to full torque specification without pausing.

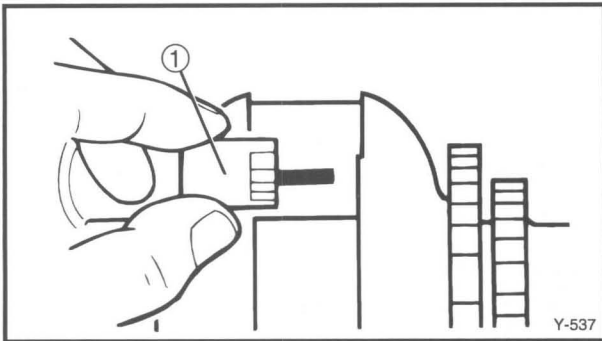
**Connecting Rod Cap Bolt:**
20 Nm (2.0 m·kg, 14 ft·lb)

6. Remove:

- Connecting rod cap
Use care in removing.

7. Measure:

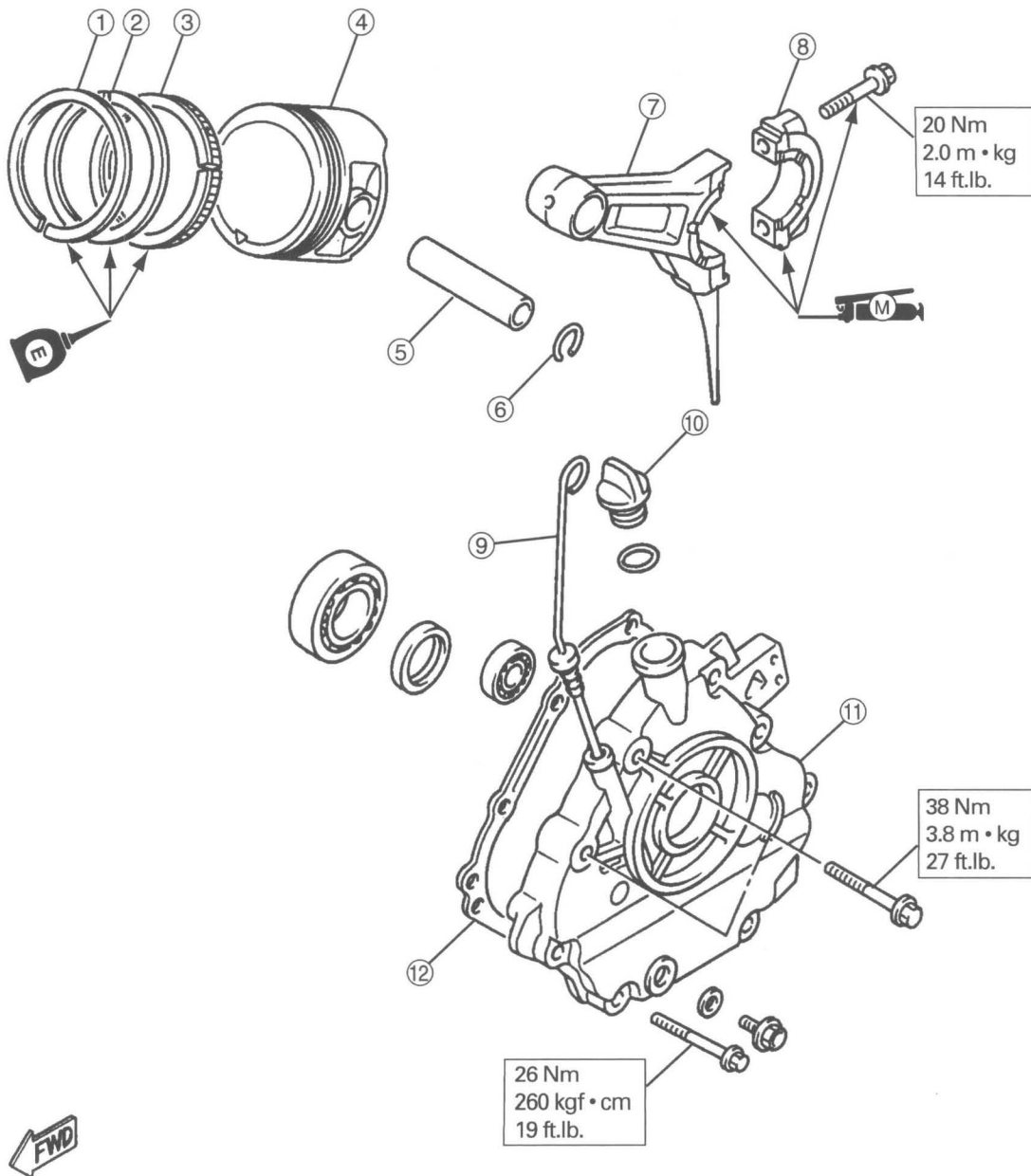
- Width of plastigage® ①
Out of specification → Replace connecting rod and/or replace crankshaft if necessary.

**Connecting Rod Oil Clearance:**
0.016 ~ 0.046 mm
(0.0006 ~ 0.0018 in)
Limit: 0.1 mm (0.004 in)



PISTON, CONNECTING ROD, AND CRANKCASE COVER

- | | |
|--------------------|-------------------|
| ① Top ring | ⑦ Connecting rod |
| ② 2nd ring | ⑧ Rod cap |
| ③ Oil control ring | ⑨ Dip stick |
| ④ Piston | ⑩ Filler cap |
| ⑤ Piston pin | ⑪ Crankcase cover |
| ⑥ Piston pin clip | ⑫ Gasket |



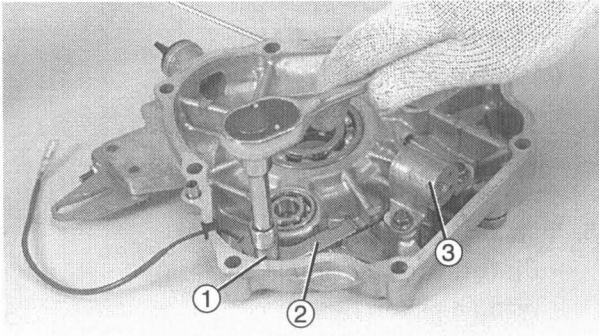
Y-724



INSTALLATION

BEARINGS

1. Install:
 - Bearings using a press. Lubricate races and bearings to ease assembly.



Y-605

OIL SENDER AND WIRE GUIDE PLATE

1. Install:
 - Oil sender ③
 - Wire guide plate ②
 - Bolts ①



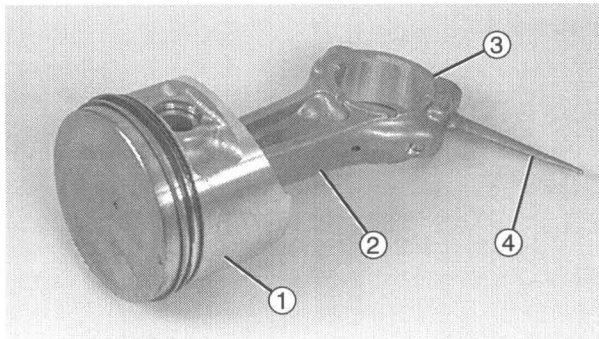
6 mm Bolt:
9 Nm (90 kgf·cm, 6.5 ft·lb)

PISTON AND CONNECTING ROD

1. Install:
 - Piston rings onto the piston using a piston ring expander.

NOTE:

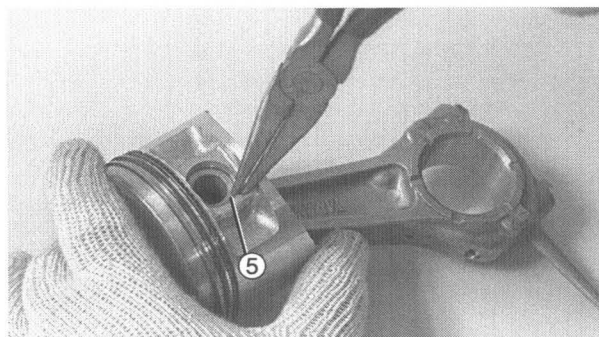
Be sure to install the rings so that manufacturer's marks or numbers are located on the top side of the rings. Oil the pistons and rings liberally.



Y-805

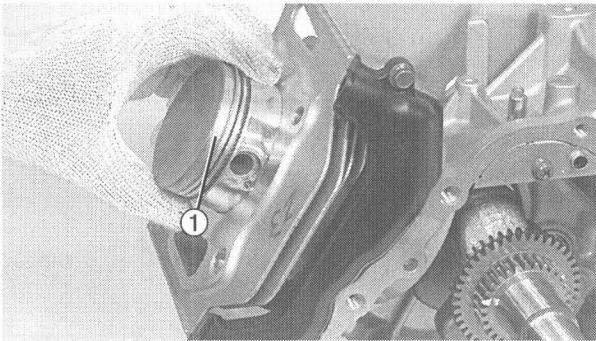
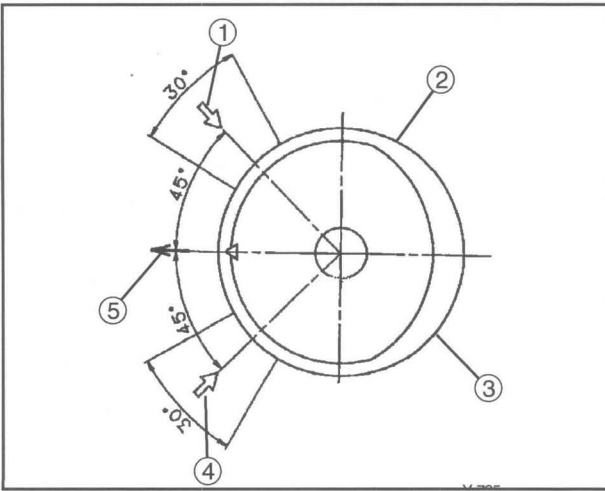
NOTE:

- Arrow on piston top ① faces front of engine
- "YAMAHA" casting ② faces primary clutch side of engine
- Match arrows on rod and rod cap ③
- Splasher ④ points to bottom of engine.
- Always install new piston pin clips ⑤.



Y-806

2. Install:
 - Piston clip ⑤
3. Oil liberally:
 - Piston
 - Rings
 - Cylinder
 - Piston Pin



Y-603

4. Set:

- Piston ring ends

NOTE:

Make sure the ends of the oil ring expander does not overlap.

- (1) TOP RING
- (2) OIL RING (LOWER RAIL)
- (3) OIL RING (UPPER RAIL)
- (4) 2ND RING
- (5) ARROW MARK

5. Install:

- Piston/Connecting rod (1) into cylinder using a piston ring compressor.

NOTE:

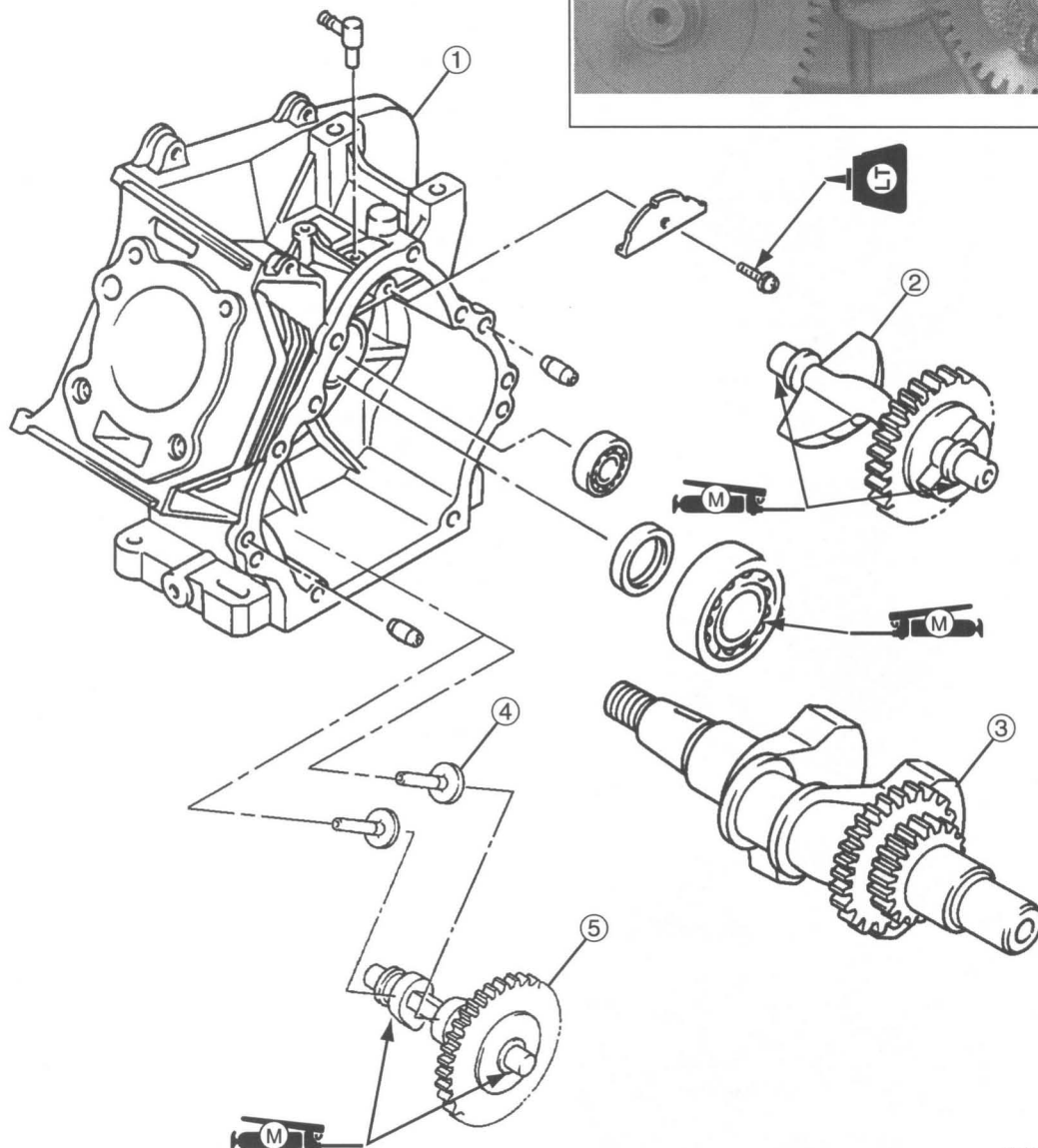
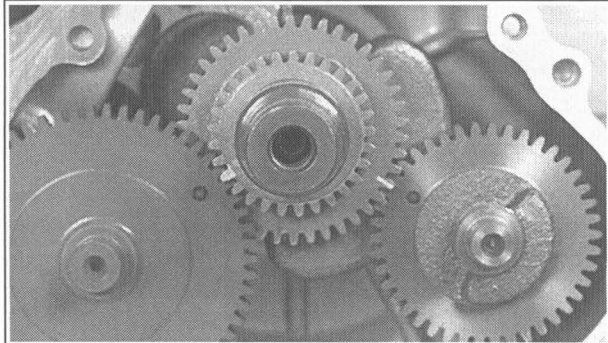
The arrow mark on the piston should face toward the front of the engine (push rod side).

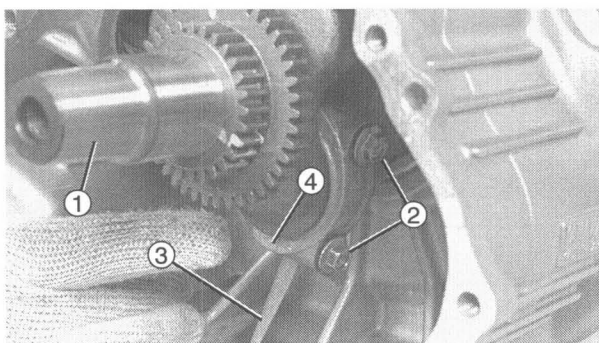


Piston Ring Compressor:
YU-33294

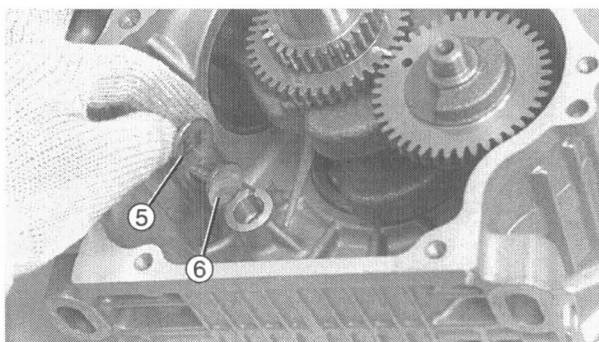
**CRANKSHAFT, BALANCER SHAFT, AND CAMSHAFT**

- ① Crankcase
- ② Balancer shaft
- ③ Crankshaft
- ④ Tappet
- ⑤ Camshaft

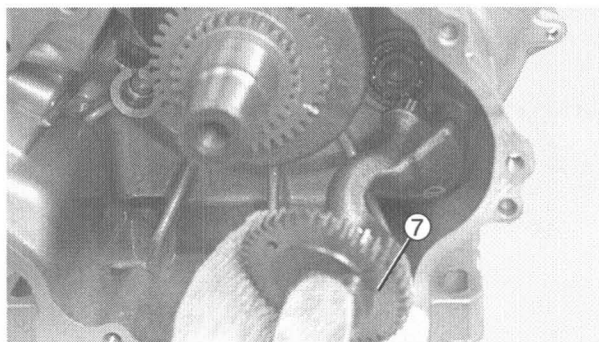
A TIMING GEAR ALIGN MARK:



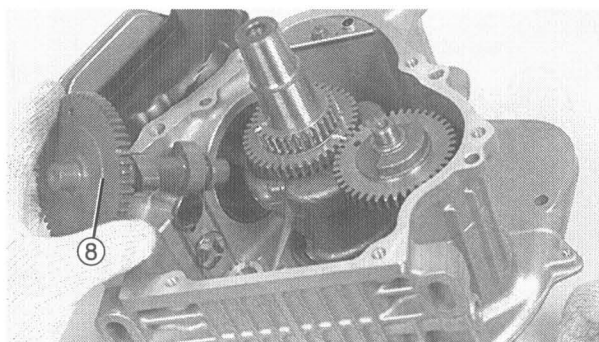
Y-807



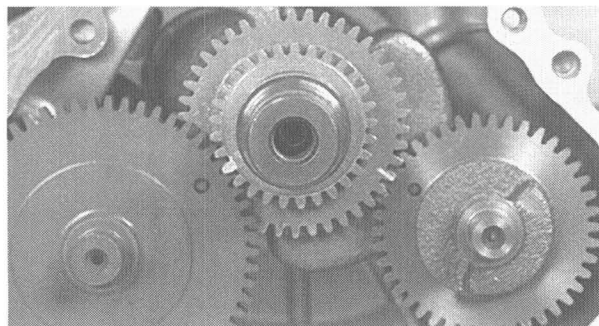
Y-809



Y-808



Y-810



Y-598

CRANKSHAFT, BALANCER SHAFT, AND CAMSHAFT

1. Install:

- Crankshaft ①
- Connecting rod cap ③
- Connecting rod cap bolts ②

NOTE:

Make sure splasher ③ is pointing down and arrows ④ on cap match

2. Lubricate:

- Connecting rod bolt threads



Molybdenum Disulfide Grease



Connecting Rod Bolts:
20 Nm (2.0 m·kg, 14 ft·lb)

- Tappets (Exhaust ⑤/Intake ⑥)

NOTE:

Be sure the tappets are fully installed.

3. Install:

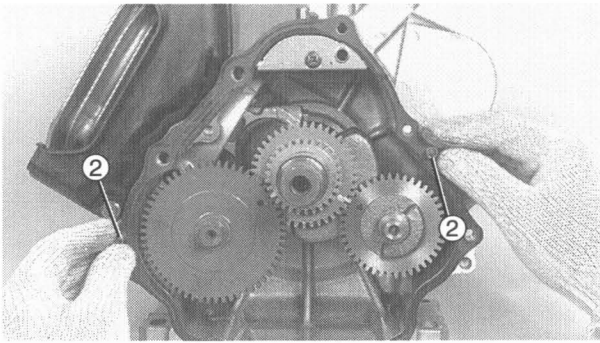
- Balancer shaft ⑦
- Camshaft ⑧

NOTE:

Align the hole in the camshaft gear with the punch mark on the crankshaft cam gear. Align the hole in on the balancer shaft gear with the punch mark on the crankshaft balancer gear.

NOTE:

Do not turn the crankshaft in this position until the rocker arms are installed.



Y-597

CRANKCASE COVER

1. Install:

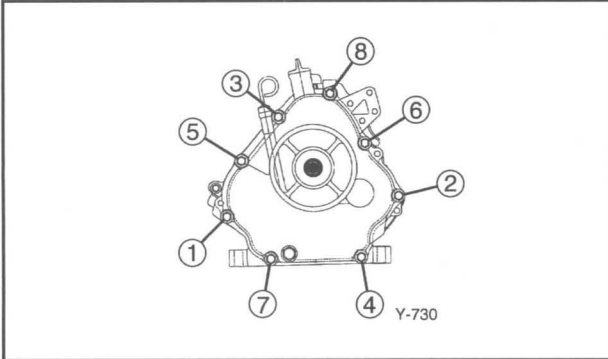
- Dowel pins ②
- Gasket (New)

2. Install:

- Crankcase cover

NOTE:

Follow the numbers for tightening sequence shown in photo. Bolts ③ and ⑤ are 10 mm thread size

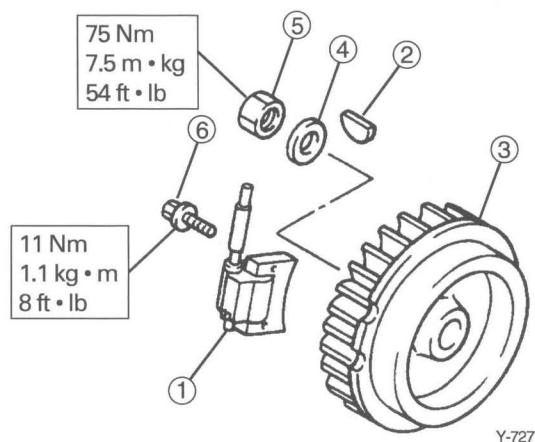
**Crankcase Cover Bolt :**

8 mm: 26 Nm (2.6 m•kg, 19 ft•lb)

10 mm: 38 Nm (3.8 m•kg, 27 ft•lb)

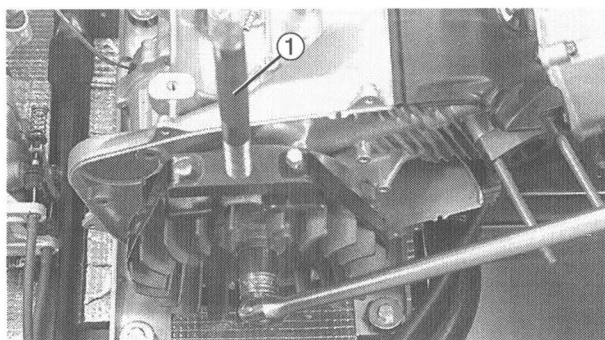
**FLYWHEEL**

- ① T.C.I. unit
- ② Woodruff key
- ③ Flywheel
- ④ Spring washer
- ⑤ Nut
- ⑥ Bolt



**FLYWHEEL**

1. Remove any oil and/or grease from the tapered portion of crankshaft and flywheel with a non-oily solvent.
3. Install:
 - Woodruff key
 - Flywheel
 - Washer
 - Spring Washer
 - Nut
4. Tighten:
 - Flywheel securing nutUse the Primary Sheave Holder ①.



Y-589



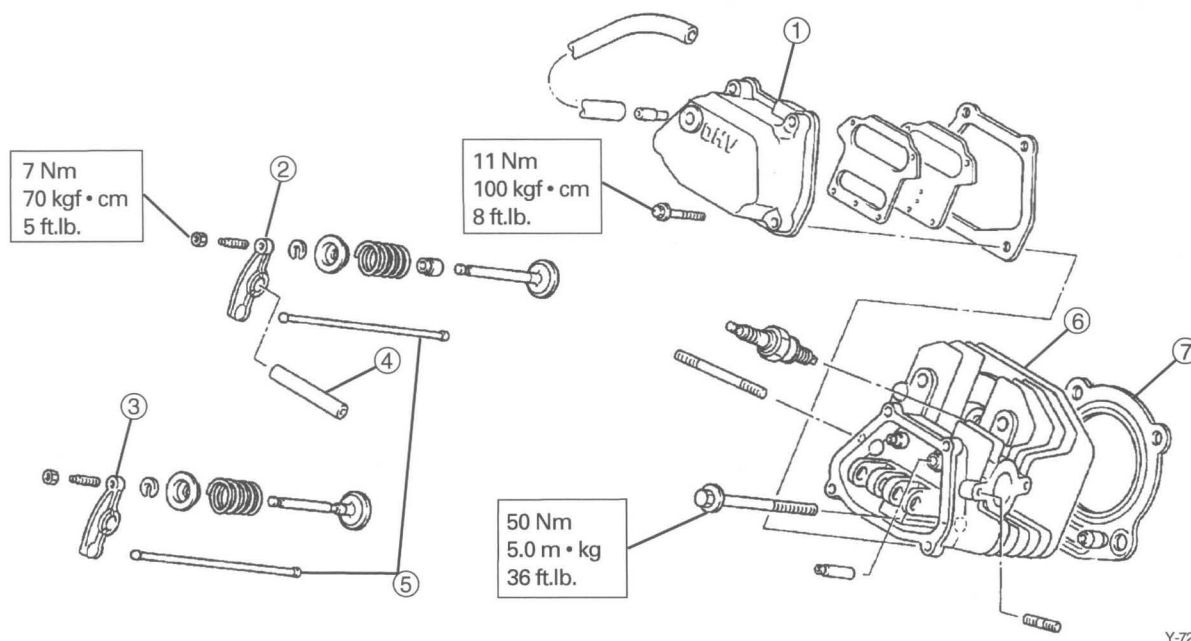
Flywheel Securing Nut:
75 Nm (7.5 m•kg, 54 ft•lb)

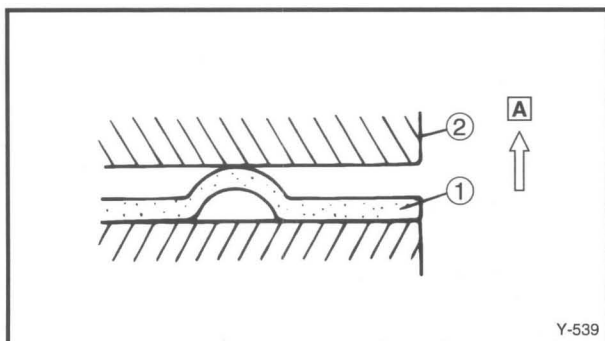


Primary Sheave Holder:
YS-1800-A, 90890-01701

**CYLINDER HEAD AND ROCKER ARM**

- ① Cylinder head cover
- ② Rocker arm (Intake)
- ③ Rocker arm (Exhaust)
- ④ Rocker-arm-shaft
- ⑤ Push rod
- ⑥ Cylinder head
- ⑦ Gasket





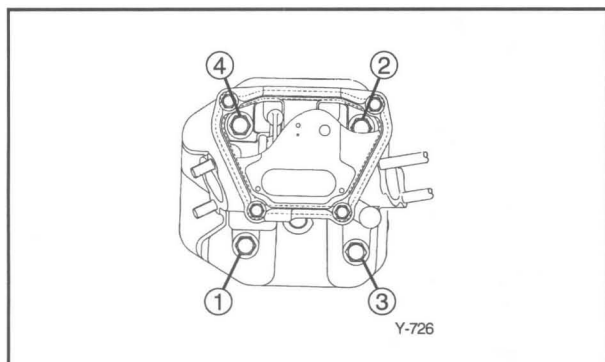
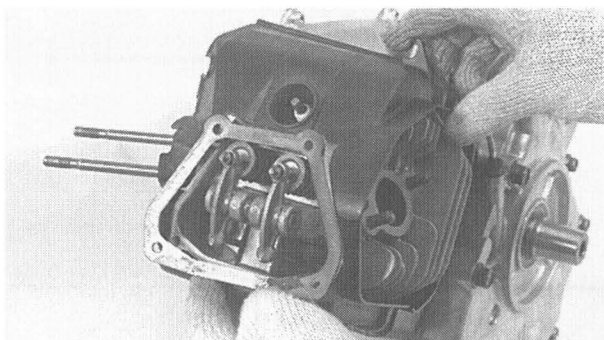
CYLINDER HEAD

1. Install:

- Dowel pins
- Gasket (New) ①
- Cylinder head ②
- Bolts

NOTE:

The swelling side of the new gasket ① should face upward **A**.

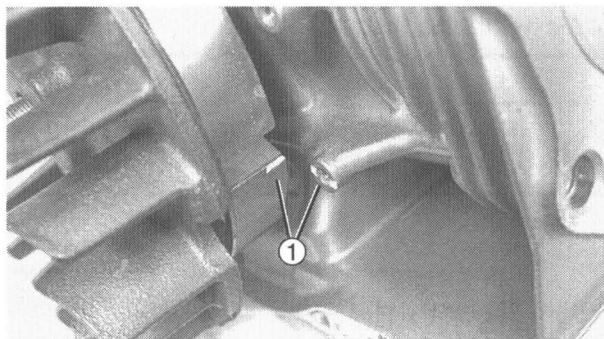


NOTE:

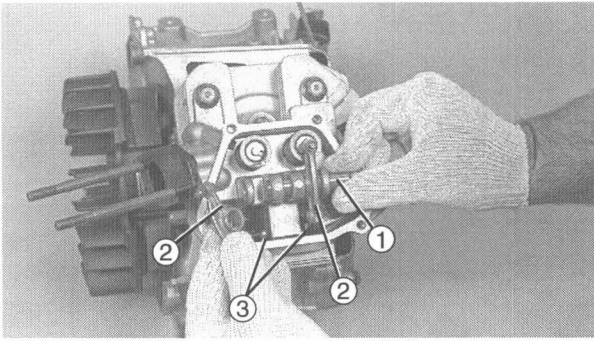
Tighten the bolts in sequence as shown and torque the bolts in two stages.



Bolt (Cylinder Head):
50 Nm (5.0 m·kg, 36 ft·lb)



- Make sure piston is at TDC ①



Y-593

2. Install:

- Pushrods (Exhaust/Intake) ③
- Rocker shaft ① and arms ②

3. Adjust:

- Valve clearance

Refer to G14 SERVICE MANUAL, CHAPTER
2 "VALVE CLEARANCE ADJUSTMENT"

**Valve Clearance (Cold):**

Intake and exhaust:
0.1 mm (0.004 in)

4. Install:

- Cylinder air shroud
- Gasket (New)
- Cylinder head cover
- Spark plug

**Bolt (Cylinder Head Cover):**

11 Nm (1.1 m•kg, 8 ft•lb)

Spark Plug:

20 Nm (2.0 m•kg, 14 ft•lb)

IGNITION UNIT

1. Install:

- Ignition unit

NOTE:

Rotate flywheel 180° to line up the 2 flywheel cut-aways with the ignition unit bolt holes. Install ignition unit. Pull the unit away from the flywheel while tightening the two bolts.

**Ignition Unit Bolt:**

11 N•m (1.1 m•kg, 8 ft•lb.)

NOTE:

Rotate the flywheel magnet past the ignition unit to confirm that there is an air gap between the magnet and ignition unit. If not, loosen the bolts and repeat procedure.

**T.C.I. Air Gap:**

0.3 ~ 0.5 mm (0.012 ~ 0.020 in)

2. Install:

- Spark plug cap



AIR SHROUD

NOTE:

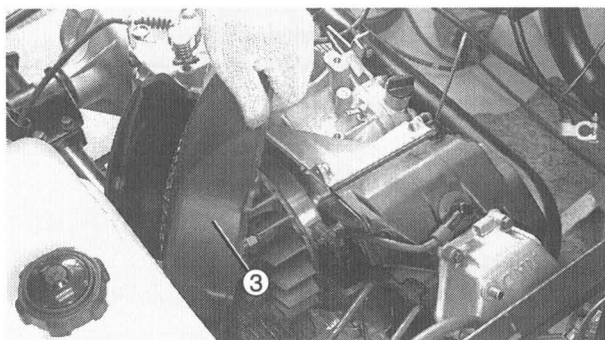
The air shroud may be installed before re-installing the engine in the car.

1. Install:

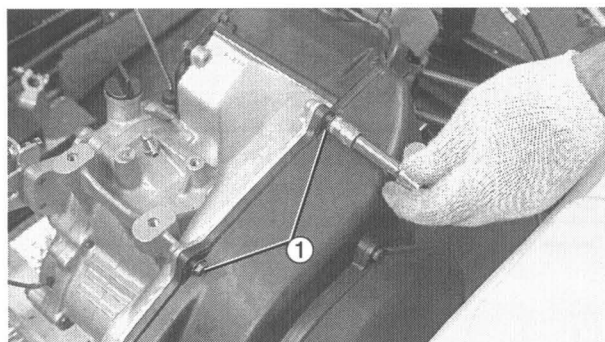
- Flywheel air shroud ③



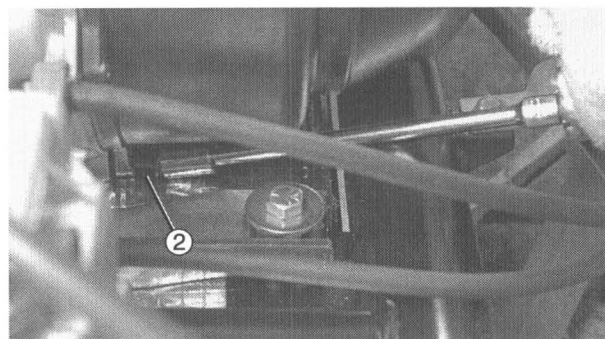
Bolt (Air Shroud – Side):
8 Nm (0.8 m•kg, 5.8 ft•lb)
LOCTITE®



Y-588

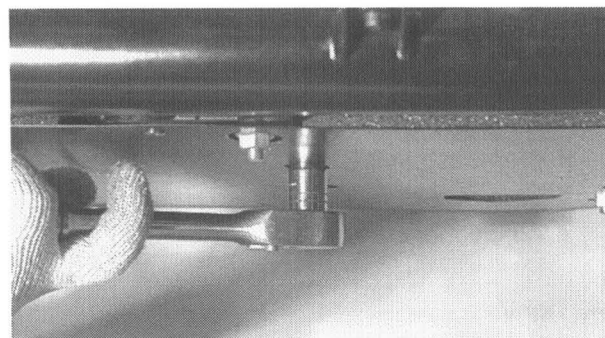


Y-586



Y-587

- Mounting bolts ① and ②



Y-594

REMounting ENGINE

Reverse the “ENGINE REMOVAL” procedure.
Note the following points.

1. Install:

- Engine with bolts and special washers
- Mounting nuts



Engine Mounting Nut:
35 Nm (3.5 m•kg, 25 ft•lb)



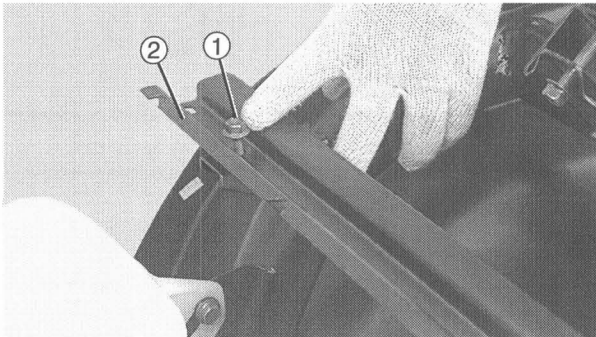
PRIMARY SHEAVE

1. Install:

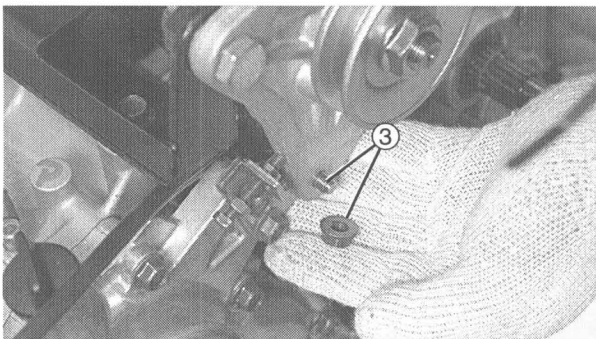
- Primary sheave assembly
Use the Primary Sheave Holder.
Refer to CHAPTER 4 "PRIMARY SHEAVE - INSTALLATION" section.



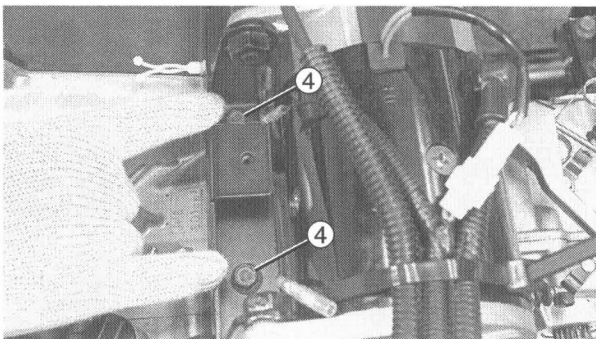
Bolt (Primary Sheave):
85 Nm (8.5 m•kg, 61 ft•lb)



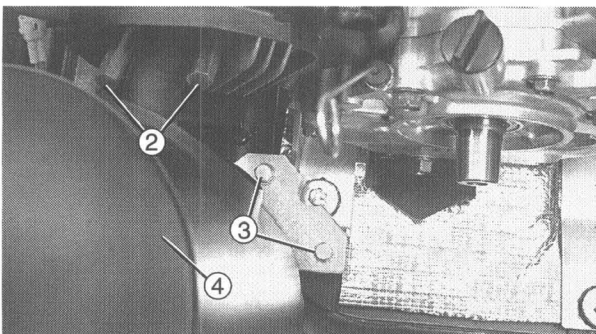
Y-579



Y-578



Y-581



Y-584

STARTER-GENERATOR

1. Install:

- Seat support (2) and bolts (1)
- Starter-generator
- Bolts and nuts (4) (3)
- V-belt

2. Adjust:

- Belt tension
Refer to CHAPTER 2 "STARTER BELT ADJUSTMENT" section.



Starter Belt Tension:
8 ~ 12 mm /10kg
(0.31 ~ 0.47 in/22 lb)

3. Install:

- Muffler assembly (with new gasket (4))
- Muffler mount bolts (3)
- Exhaust pipe holding nuts (2)
- Crankcase pulse hose
- Carburetor
- Air cleaner case.

4. Tighten:

- Bolts/Nuts/Screws



Exhaust Flange Nut (2):
16 Nm (1.6 m•kg, 12 ft•lb)
Muffler Holding Bolts (3):
16 Nm (1.6 m•kg, 12 ft•lb)
Carburetor Holding Nut:
6.5 Nm (65 kgf, 5 ft•lb)
Spark Plug:
20 Nm (2.0 m•kg, 14 ft•lb)

5. Connect:

- Throttle cable
- Choke cable
- Fuel hose

6. Adjust:

- Free play (Throttle cable)
- Free play (Choke cable)

Refer to G14 SERVICE MANUAL, "THROTTLE CABLE ADJUSTMENT" and "CHOKE CABLE ADJUSTMENT" section.



Free Play (Throttle Cable):
0.5 mm (0.02 in)
Free Play (Choke Cable):
1.0 mm (0.04 in)

7. Fill:

- Crankcase

Refer to G14 SERVICE MANUAL, "ENGINE OIL REPLACEMENT" section.



Recommended Oil:
YAMALUBE 4-cycle oil or SAE 10W30
(If temperature does not go below
2°C (35°F): SAE 20W40)
Oil Change Quantity:
0.9 L (1.0 US qt, 0.19 Imp gal)
Oil Capacity:
1.0 L (1.16 US qt, 0.24 Imp gal)

NOTE: _____

Recommended engine oil classification; API Service SE, SF, or SG. Engine oils labeled "Energy Conserving II" are recommended.

CAUTION _____

Do not allow foreign material to enter the engine.



CARBURETION

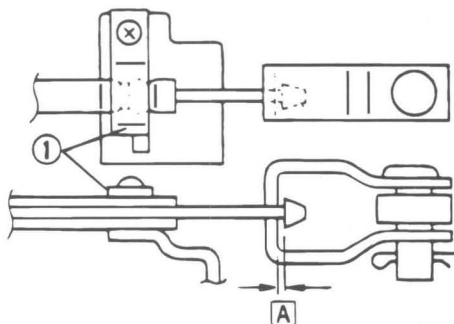
CARBURETOR

- ① Cable housing clamp
- ② Pilot screw (P.S.)
- ③ Throttle stop screw
- ④ Main jet (M.J.)
- ⑤ Main nozzle A
- ⑥ Float
- ⑦ Float chamber cover
- ⑧ Cover holding bolt
- ⑨ Float needle valve
- ⑩ Pilot jet (P.J.)
- ⑪ Pipe, main bleed
- ⑫ Drain screw

SPECIFICATIONS

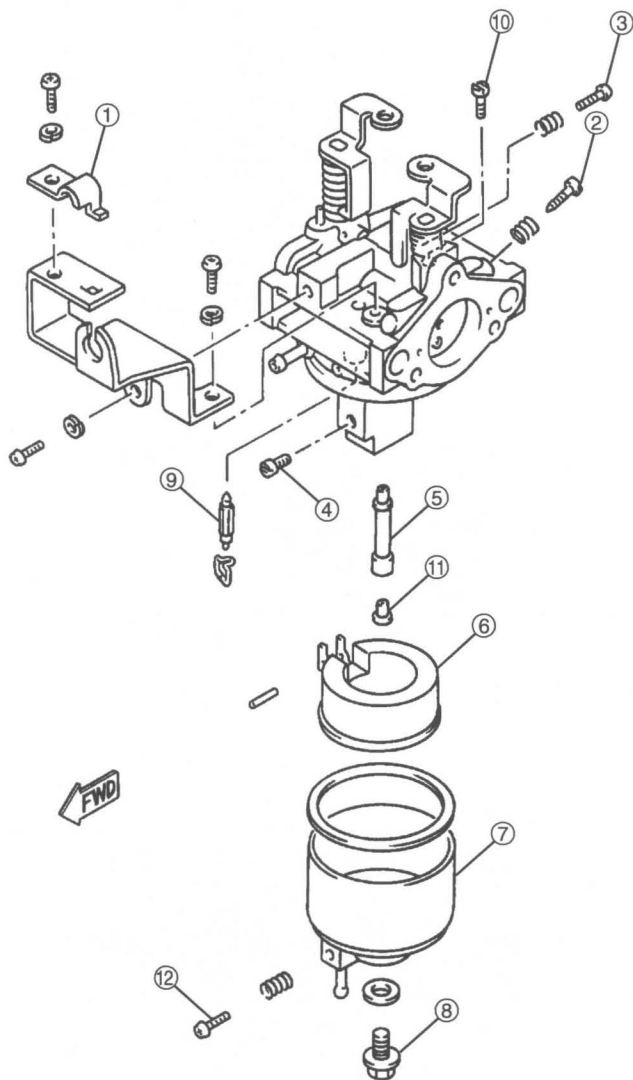
Main jet	(M.J.)	#86.3
Main air jet	(M.A.J.)	Ø1.6
Pilot jet	(P.J.)	#61.3
Pilot air jet	(P.A.J.)	Ø0.9
Throttle valve	(Th.V.)	#150
Valve seat	(V.S.)	Ø1.2
By-pass (1)	(B.P.-1)	Ø0.7
By-pass (2)	(B.P.-2)	Ø0.7
By-pass (3)	(B.P.-3)	Ø1.0
Pilot outlet	(P.O.)	Ø1.0
Pilot screw	(P.S.)	1-1/2 turn out
Float height	(F.H.) FIXED	16.5 ~ 17.5 mm (0.65 ~ 0.69 in)

A CHOKE CABLE FREE PLAY: 1.0 mm (0.04 in)



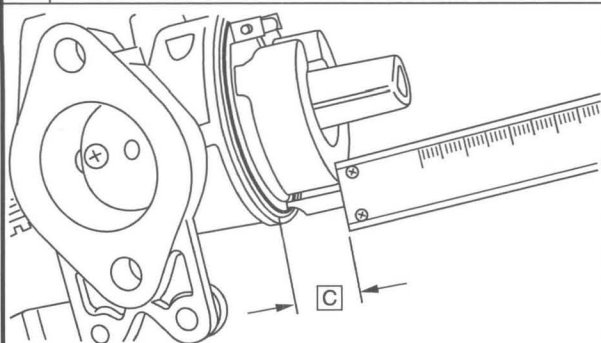
Y-752

B THROTTLE CABLE FREE PLAY: 17.0 mm (0.67 in)



Y-731

C FLOAT HEIGHT (F.H.): 17.0 mm (0.67 in) or 16.5-17.5 mm (0.65-0.69 in)



Y-373A

**NOTE:**

Refer to G14 SERVICE MANUAL, CHAPTER 6 "SECTION VIEW" for "Main Metering System" and "Float System" drawings.

REMOVAL

1. Remove:

- Carburetor assembly
Refer to CHAPTER 5 "ENGINE REMOVAL - CARBURETOR" section.

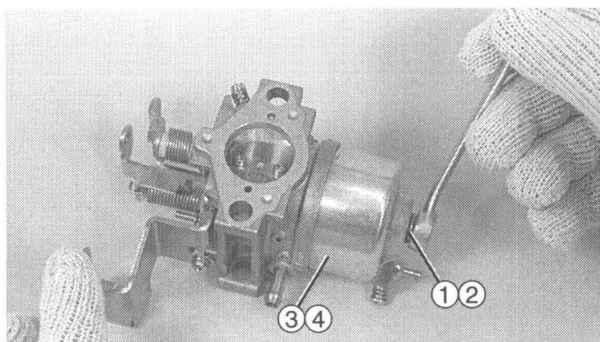
CAUTION

Do not disassemble throttle valve. If throttle valve service is required, replace the carburetor assembly.

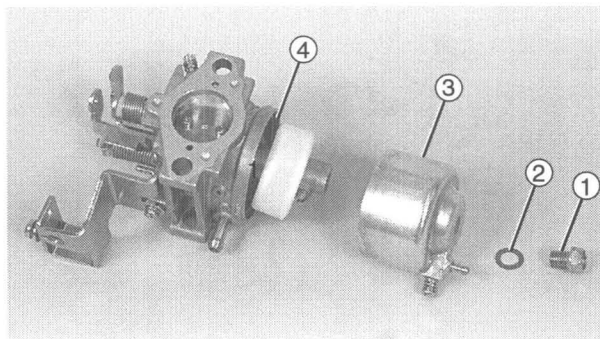
DISASSEMBLY

1. Remove:

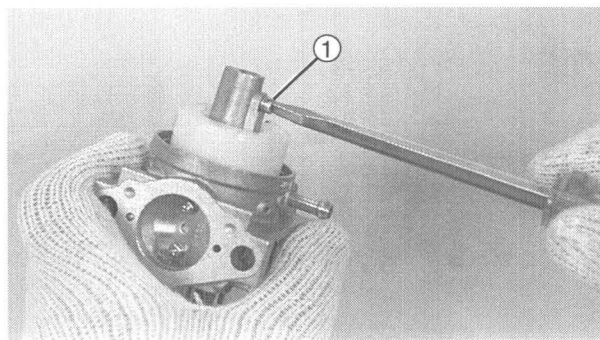
- Cover holding bolt ①
- Gasket ②
- Float chamber cover ③
- Rubber gasket ④



Y-611



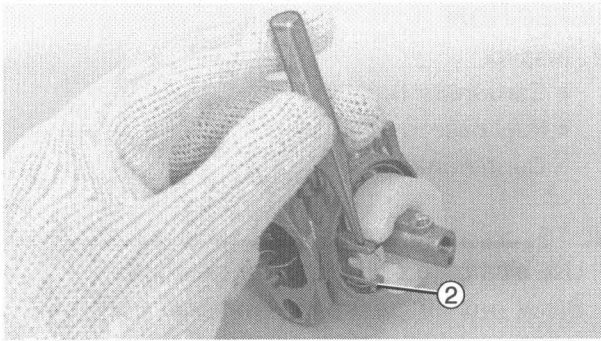
Y-612



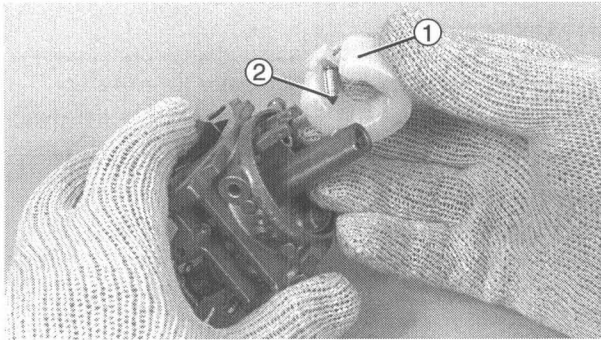
Y-613

2. Remove:

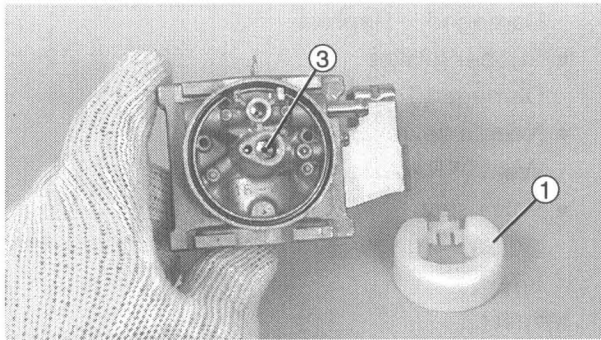
- Main jet ①
- Float pin



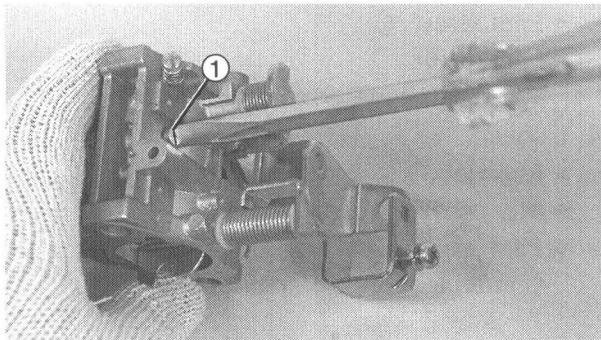
Y-614



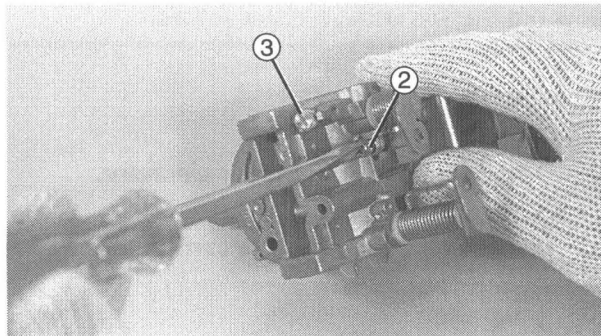
Y-615



Y-619



Y-616



Y-617

- Float pin ②

CAUTION

Float pin ② is staked on one end. When driving out float pin, use a small punch on opposite end of staking. Use care not to break the float stanchions.

3. Remove:

- Float ①
- Float needle valve ②
- Main nozzle A ③

NOTE:

Do not remove the second main nozzle (main nozzle B), which can be seen after nozzle A is removed. Nozzle B is fixed, and may be cleaned in place if required.

4. Remove:

- Pilot jet ①
- Throttle stop screw ② (with spring)
- Pilot screw ③ (with spring)



INSPECTION

1. Inspect
 - Carburetor body
 - Fuel passage
 Contamination → Clean.

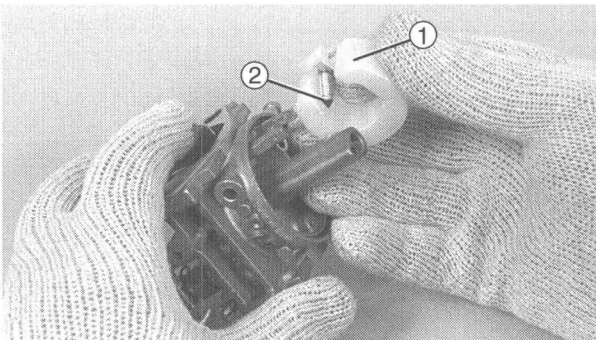
NOTE:

- Use a carburetor cleaner for cleaning.
- Blow out all passages and jets with compressed air.

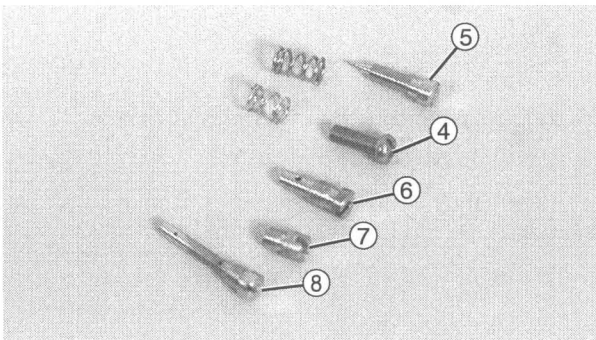
⚠ WARNING

Carburetor cleaners are extremely flammable.

- Keep sparks and flames away from work area.
- Follow all cleaner manufacturer's warnings and instructions.
- NEVER use gasoline as a cleaning agent.



Y-615



Y-620

2. Inspect:
 - Float ①
Damaged → Replace.
 - Rubber gasket
Damaged/Torn → Replace.
 - Needle valve ②
Wear → Replace.
 - Valve seat
Wear/Damage → Replace the carburetor body.
3. Inspect:
 - Throttle stop screw ④
 - Pilot screw ⑤
 - Pilot jet ⑥
Wear/Damage/Corrosion → Replace
4. Inspect:
 - Main jet ⑦
 - Main nozzle A ⑧
 - Pilot jet
Contamination → Clean/Replace.

NOTE:

Blow out the jets with compressed air.

5. Inspect:
 - Throttle valve
Wear/Damage → Replace carburetor.
 - Choke valve
Wear/Damage → Replace carburetor body.



6. Check:

- Choke valve free movement Sticking → Replace parts.

ASSEMBLY

Reverse the "DISASSEMBLY" procedures.

Note the following points.

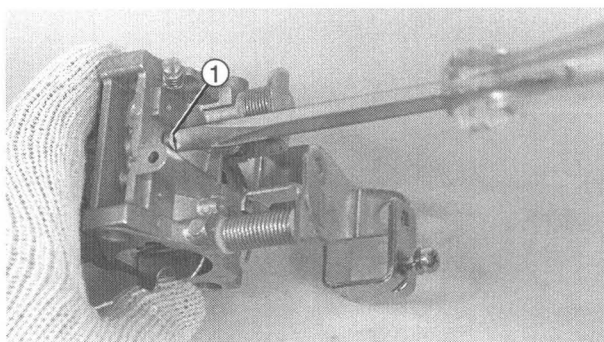
NOTE:

Before reassembling, wash all the parts with a carburetor cleaner.

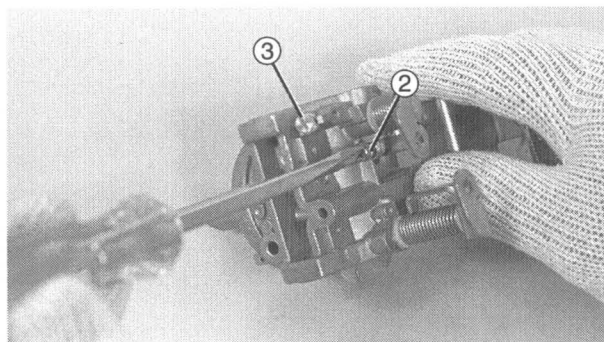
! WARNING

Carburetor cleaners are extremely flammable.

- Keep sparks and flames away from work area.
- Follow all cleaner manufacturer's warnings and instructions.
- NEVER use gasoline as a cleaning agent.



Y-616



Y-617

1. Install:

- Pilot jet ①
- Throttle stop screw ② (with spring)
- Pilot screw ③ (with spring)

NOTE:

See G14 SERVICE MANUAL page 2-13 for pilot screw and throttle stop screw setting procedures.

2. Adjusted:

- Throttle stop screw

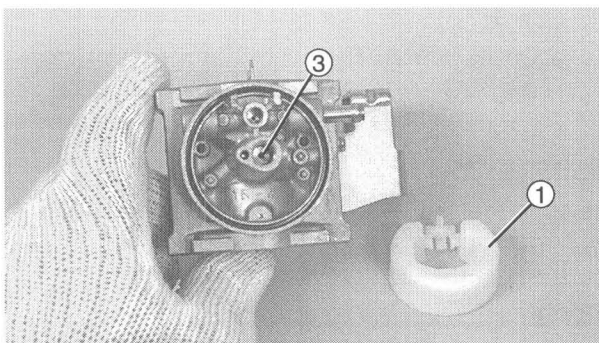


Standard Turned In:
1/4 turn

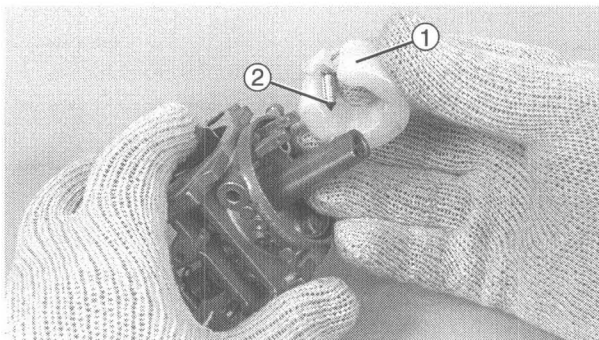
- Pilot screw



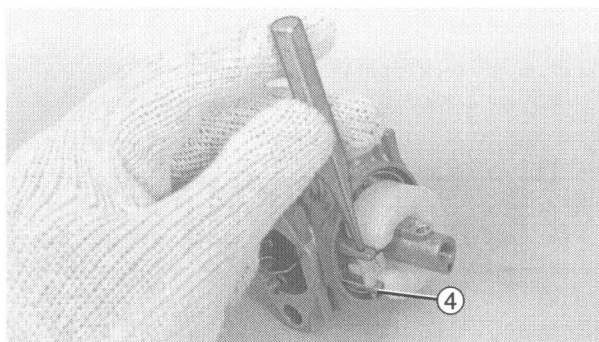
Standard Turned Out:
1-1/2 turns



Y-619



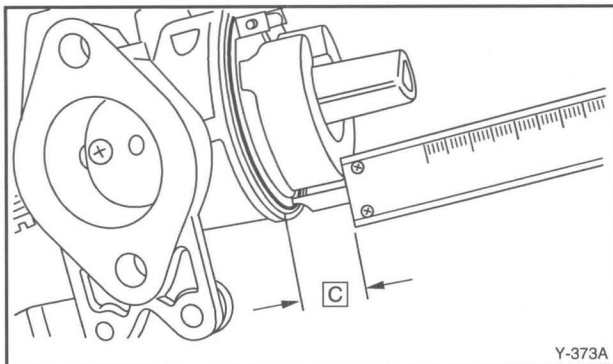
Y-615



Y-756

3. Install:

- Main nozzle A (3)
- Float needle valve (2)
- Float (1)
- Float pin (4)



Y-373A

3. Measure:

- Float height

Float height is preset at the factory. If out of specification replace needle valve, float or carburetor assembly.



Float Height (F.H.) 17.0 mm (0.67 in) or 16.5 ~ 17.5 mm (0.65 ~ 0.69 in)

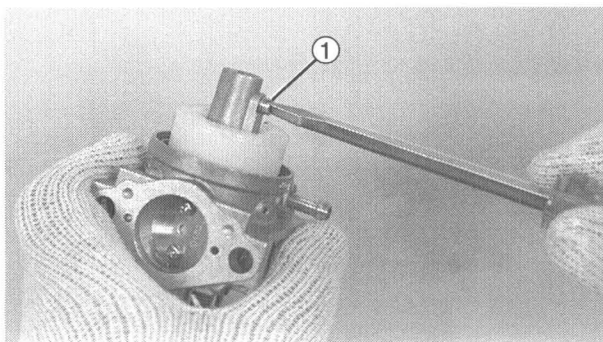
Measurement and adjustment steps:

- Hold the carburetor in an upside down position.
- Incline the carburetor at 60 ~ 70° (so that the float valve does not compress as a result of float weight).
- Measure the distance from the inside of the gasket sealing surface of the carburetor body to the top of the float.

NOTE:

The float should be just resting on, but not depressing, the spring loaded inlet needle.

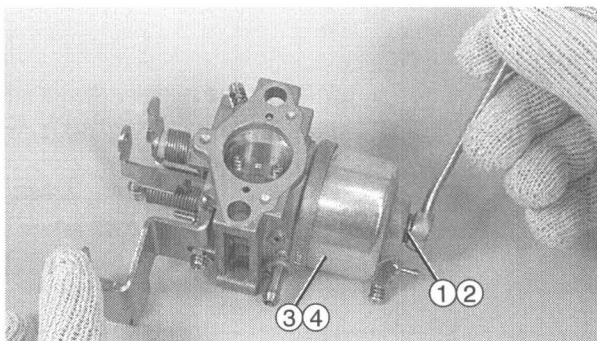
- If the float height is not within specification, inspect the valve seat and needle valve.
- If needle valve rubber seat or body is worn, or if spring is damaged or sticking, replace needle valve.
- If valve seat is worn, replace carburetor.
- If both are fine, replace the float.
- Recheck the float height.



Y-613

4. Install:

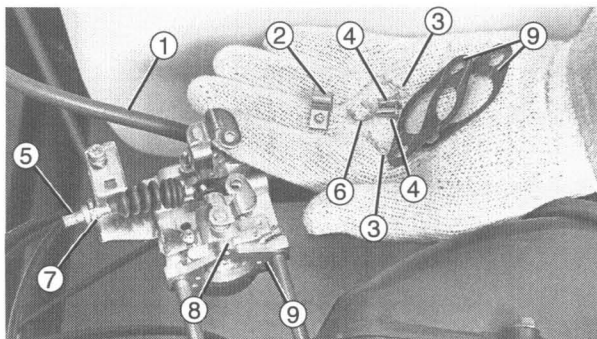
- Main jet ①



Y-611

5. Installation:

- New rubber gasket (4)
- Float chamber cover (3)
- Gasket (2)
- Cover holding bolt (1)



Y-575

INSTALLATION

Reverse the "REMOVAL" procedures.
Note the following points.

1. Install:

- Carburetor
- Air cleaner case

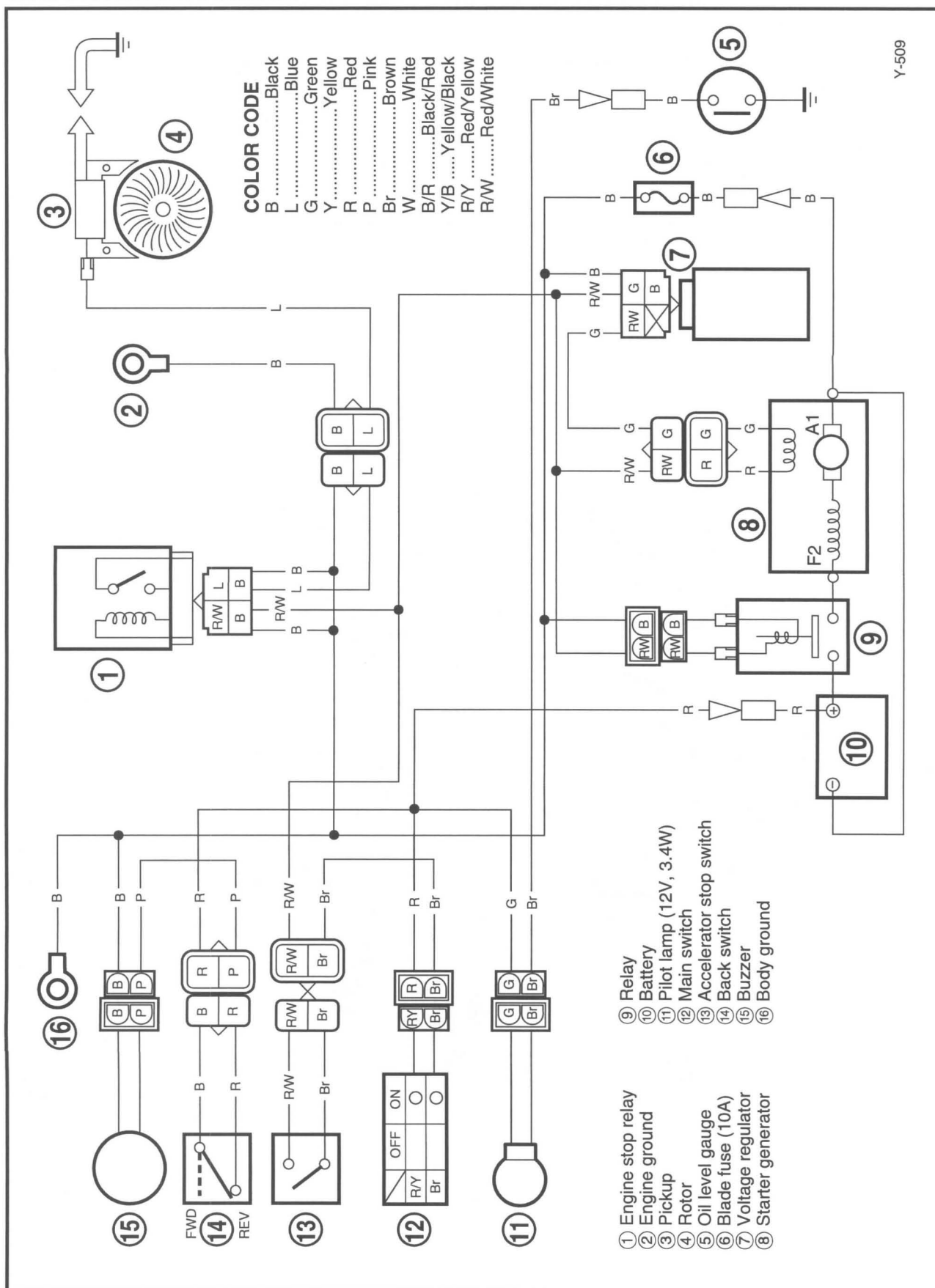


**Carburetor Holding Nut and
Air Cleaner Case:**
6.5 Nm (0.65 kgf·cm, 5 ft·lb)



ELECTRICAL FOR G-16A

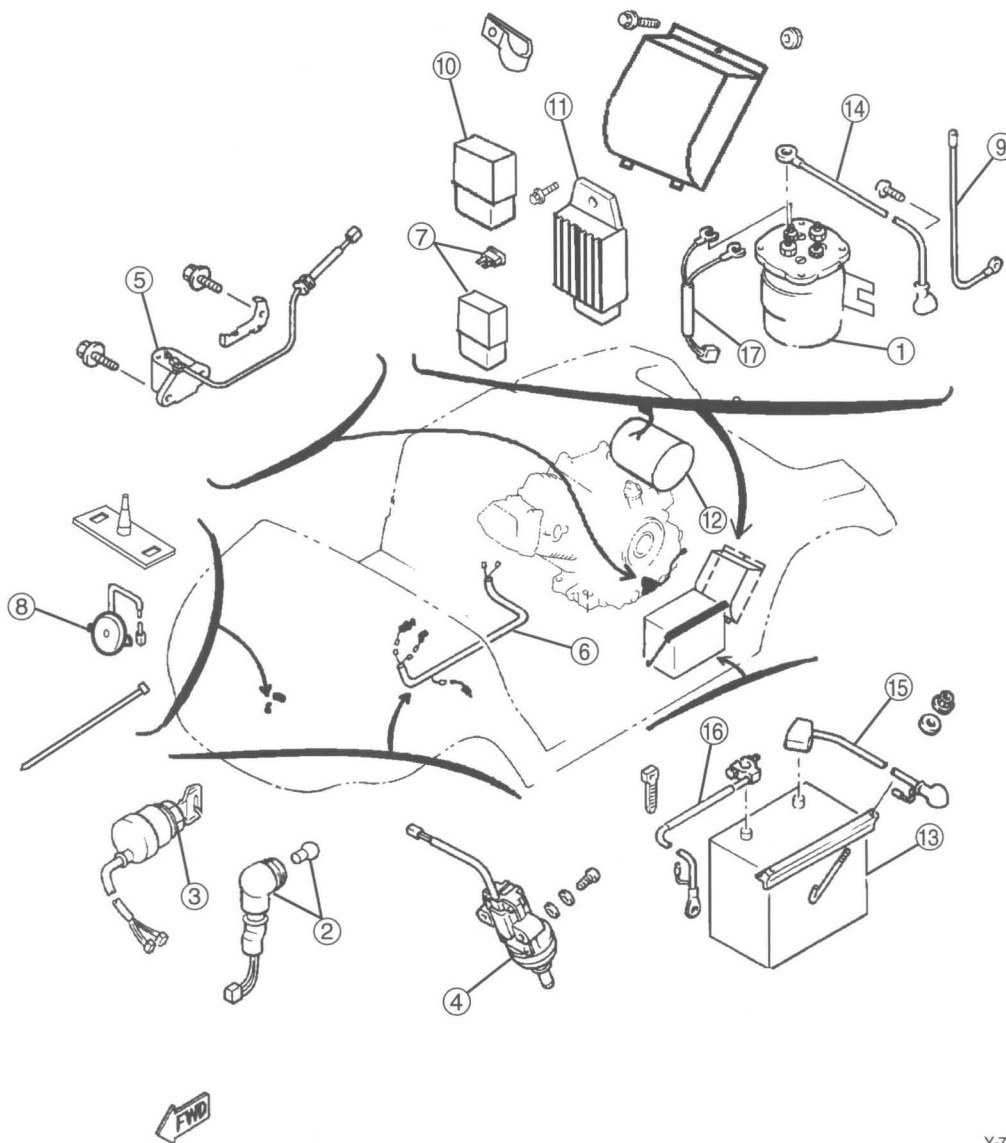
G16A WIRING DIAGRAM





ELECTRICAL COMPONENTS

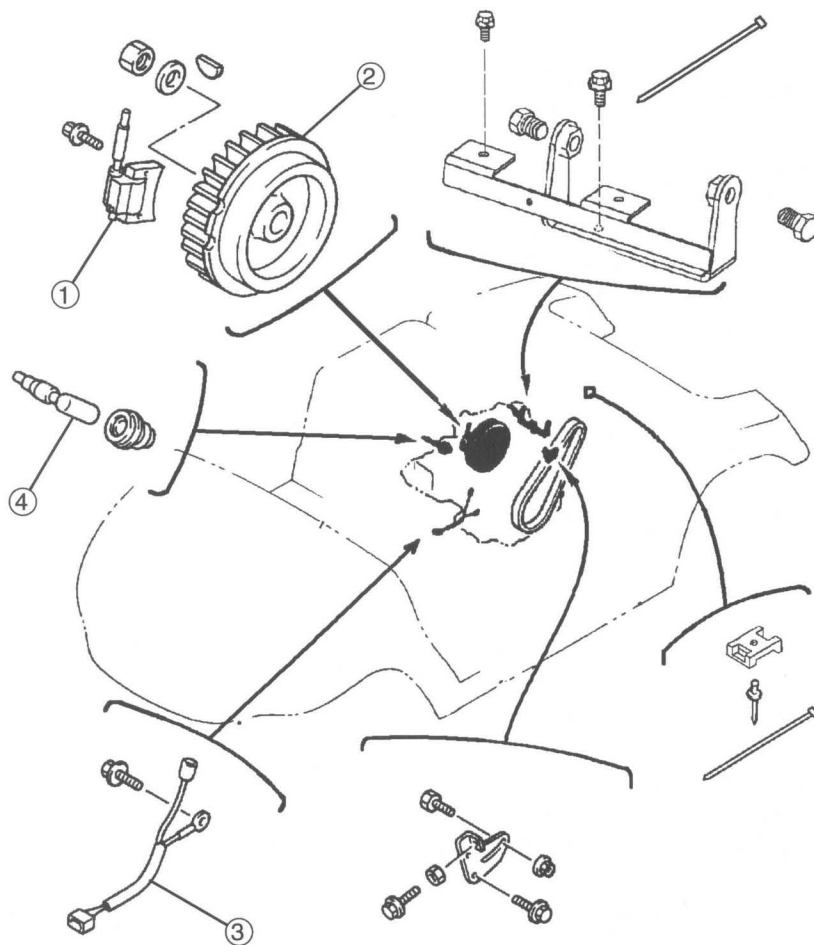
- | | | |
|---------------------------|---------------------|-------------------------|
| ① Solenoid relay | ⑦ Fuse | ⑬ Battery |
| ② Pilot lamp | ⑧ Back-up buzzer | ⑭ Relay plus lead wire |
| ③ Main switch | ⑨ Earth lead wire | ⑮ Battery plus lead |
| ④ Accelerator stop switch | ⑩ Engine stop relay | ⑯ Battery earth lead |
| ⑤ Oil level switch | ⑪ Voltage regulator | ⑰ Wire harness sub lead |
| ⑥ Wire harness | ⑫ Starter generator | |



Y-732

**ELECTRICAL COMPONENTS**

- ① T.C.I. unit
- ② Flywheel
- ③ T.C.I. unit wire sub-lead
- ④ Spark plug cap



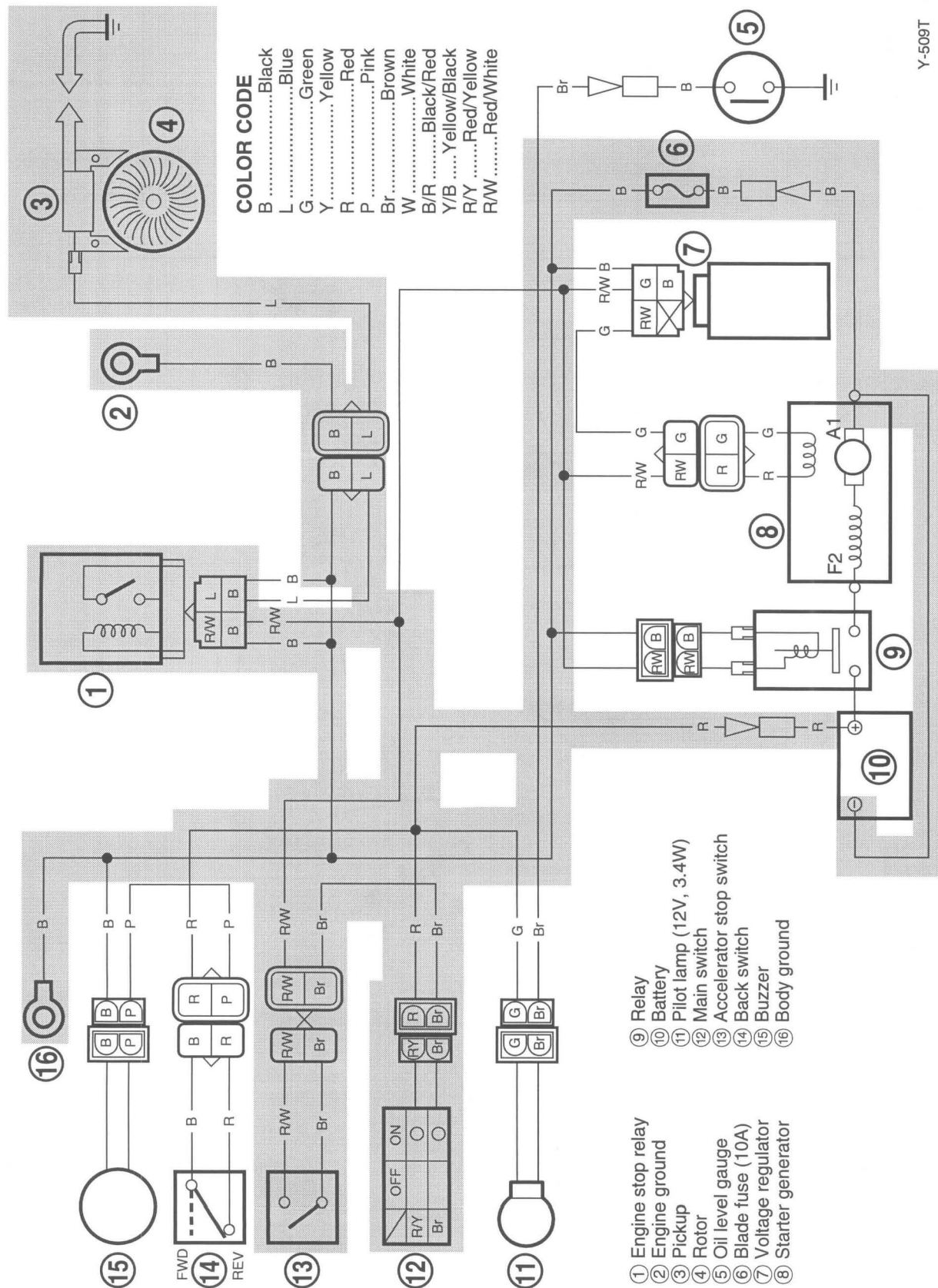
FWD

Y-728



IGNITION SYSTEM

Y-509T





TROUBLESHOOTING

NO SPARK OR WEAK SPARK

Procedure

Check

1. Spark plug cap resistance
2. T.C.I. unit resistance

NOTE:

- Also refer to G14 SERVICE MANUAL, CHAPTER 7, "IGNITION SYSTEM" section.
- Use the following special tools in this troubleshooting



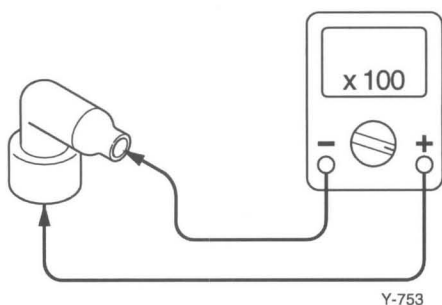
Pocket Tester:
YU-3112-C, 90890-03112



Dynamic Spark Tester:
YM-34487, 90890-03144

1. Spark plug cap resistance

- Remove the spark plug cap.
- Connect the Pocket Tester ($\Omega \times 1k$) to the spark plug cap.



- Check the spark plug cap for specified resistance.



Spark Plug Cap Resistance:
4 ~ 6 k Ω at 20° C (68° F)



MEETS
SPECIFICATION

OUT OF SPECIFICATION

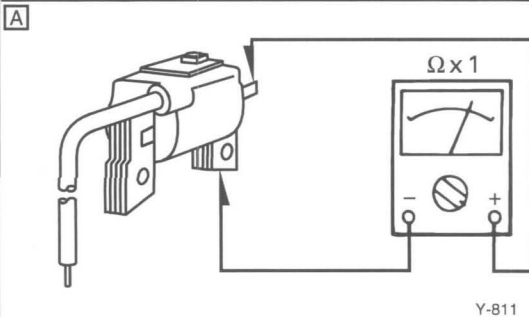
Replace spark plug cap.

- Disconnect the T.C.I. unit coupler from the wire harness.
- Connect the Pocket Tester to the ignition coil.

Primary Coil A:

Tester (+) Lead → Terminal

Tester (-) Lead → Coil base

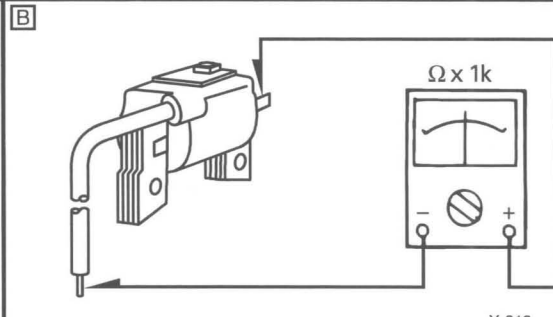


Y-811

Primary Coil **B**:

Tester (+) Lead → Terminal

Tester (-) Lead → High Tension Wire



Y-812

- Measure the primary and secondary coil resistances.



Primary Coil Resistance:

0.9 ~ 1.5Ω at 20° C (68° F)

Secondary Coil Resistance:

10.5 ~ 12.9kΩ ± 20% at 20° C (68° F)

OUT OF SPECIFICATION

Replace T.C.I. Unit

**G16A IGNITION SYSTEM TROUBLESHOOTING****ENGINE WILL NOT RUN, NO SPARK****Procedure**

Check:

1. Ignition unit
2. Engine stop relay

NOTE:

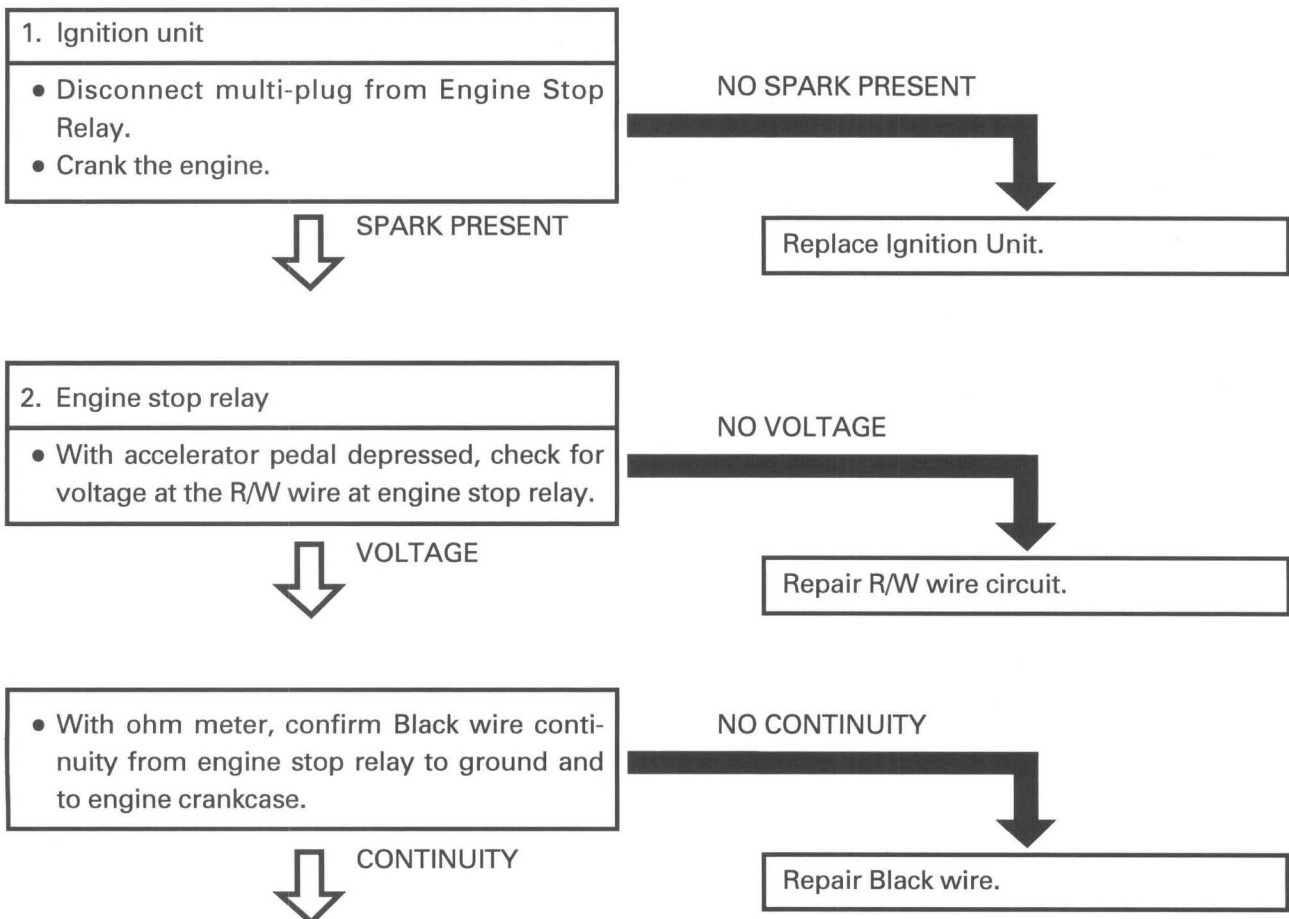
- Use the following special tool in this troubleshooting



Pocket Tester:
YU-3112-C, 90890-03112



Dynamic Spark Tester:
YM-34487, 90890-03144





- With ohm meter, confirm continuity of Blue wire from relay to Ignition unit.

NO CONTINUITY



CONTINUITY

Repair Blue wire.

- R/W, Black and Blue wires correct.



Replace Engine Stop Relay

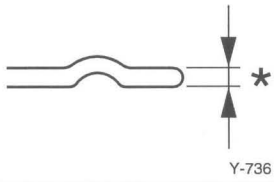
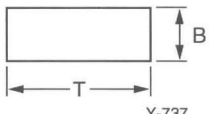
SPECIFICATIONS

GENERAL SPECIFICATIONS

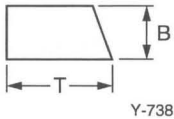
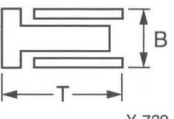
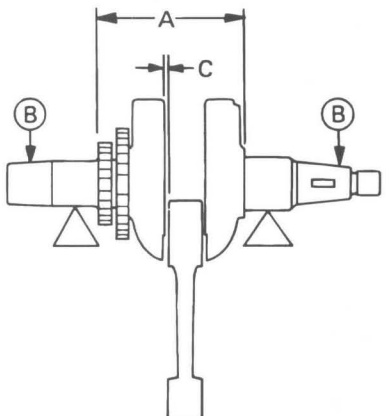
Item \ Model	G16A	G16E
Model Code: Frame Serial Number	JN6 JN6-000101 ~	JN8 JN8-000101 ~
Dimensions: Overall Length Overall Width Overall Height (Steering height) Height of Floor Wheelbase Tread: Front Rear Min. Ground Clearance	2385 mm (93.9 in) 1200 mm (47.2 in) 1190 mm (46.8 in) 300 mm (11.8 in) 1629 mm (64.1 in) 870 mm (34.3 in) 980 mm (38.6 in) 97 mm (3.8 in)	← ← ← ← ← ← ← ←
Weight: Dry Weight (without battery)	296 kg (653 lb)	254 kg (560 lb)
Performance: Maximum Speed Minimum Turning Radius Seating Capacity Hill Climbing Ability	19-24 km/h (12-15 mph) 2.8 m (113 in) 2 persons 27° on pavement	← ← ← 20° on pavement

MAINTENANCE SPECIFICATIONS FOR G16A

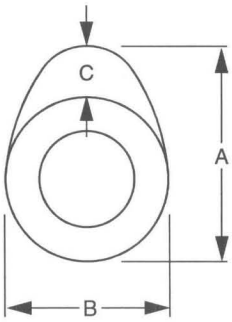
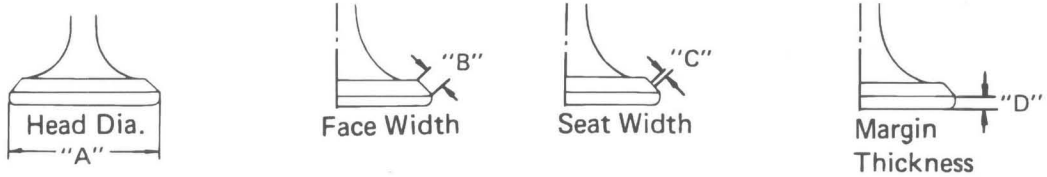
ENGINE

Item	G16A
Description Engine Type Number of Cylinder Displacement Bore x Stroke Compression Ratio Compression Pressure (at sea level) Starting System Ignition System Lubrication System	Forced air cooled 4-stroke OHV gasoline Single 301 cm ³ 78 x 63 mm (3.07 x 2.48 in) 8.1 : 1 Standard: 1,150 kPa (11.5 kg/cm ² , 164 psi) Minimum: 1,000 kPa (10.0 kg/cm ² , 142 psi) Starter TCI Magneto Wet sump
Cylinder Head: Combustion Chamber Volume (With spark plug) Head Gasket Thickness <div style="text-align: center;">  <p>Y-736</p> </div>	32.6 ~ 32.8 *0.20 ~ 0.23 mm (0.0078 ~ 0.009 in)
Cylinder: Material Bore Size Taper/Limit Out of Round/Limit	Cast iron sleeved aluminum (crankcase) 78 mm (3.07 in) 0.02 mm (0.0008 in)/0.15 mm (0.006 in) 0.02 mm (0.0008 in)/0.15 mm (0.006 in)
Piston: Piston-to-Cylinder Clearance < Limit > Oversize: 1 2 Piston Pin Outside Diameter Piston Pin-to-Piston Clearance < Limit >	0.03 ~ 0.05 mm (0.0012 ~ 0.0020 in) < 0.1 mm (0.004 in) > 0.25 mm (0.01 in) 0.50 mm (0.02 in) 19.995 ~ 20.000 mm (0.7872 ~ 0.7874 in) 0.004 ~ 0.020 mm (0.0002 ~ 0.0008 in) < 0.07 mm (0.003 in) >
Piston Ring: Top Ring Type Dimensions (B x T) End Gap (Installed) < Limit > Side Clearance (Installed) < Limit > <div style="text-align: center;">  <p>Y-737</p> </div>	Barrel 1.5 x 3.5 mm (0.059 x 0.137 in) 0.2 ~ 0.4 mm (0.008 ~ 0.016 in) < 1.0 mm (0.04 in) > 0.04 ~ 0.08 mm (0.0015 ~ 0.003 in) < 0.1 mm (0.004 in) >
Engine Oil: Recommended Oil Oil Change Quantity Oil Capacity	YAMALUBE 4 cycle oil or SAE10 W30 type SE, SF, or SG 1.0 U.S. qt (0.9 L, 0.19 Imp gal) 1.16 U.S. qt (1.0 L, 0.24 Imp gal)



Item	G16A
<p>2nd Ring:</p> <p>Type</p> <p>Dimensions (B x T)</p> <p>End Gap (Installed)</p> <p>< Limit ></p> <p>Side Clearance</p> <p>< Limit > (Installed)</p>  <p>Oil Ring:</p> <p>Dimensions (B x T)</p> <p>End Gap (Installed)</p> 	<p>Taper</p> <p>1.5 x 3.5 mm (0.059 x 0.137 in)</p> <p>0.2 ~ 0.4 mm (0.008 ~ 0.016 in)</p> <p>< 1.0 mm (0.04 in) ></p> <p>0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in)</p> <p>< 0.1 mm (0.004 in) ></p> <p>2.5 x 2.80 mm (0.098 x 0.116 in)</p> <p>0.2 ~ 0.7 mm (0.008 ~ 0.028 in)</p>
<p>Small End Bearing:</p> <p>Type</p>	<p>None</p>
<p>Big End Bearing:</p> <p>Type</p>	<p>None</p>
<p>Crankshaft:</p> <p>Crankshaft Assembly Width "A"</p> <p>Crankshaft Deflection "B"</p> <p>Connecting Rod Big End Side Clearance "C"</p>  <p>Crank Pin Outside Diameter</p> <p>Crank Pin Type</p> <p>Crank Oil Seal Type (Both) x Q'ty</p>	<p>104.0 ~ 105.4 mm (4.094 ~ 4.149 in)</p> <p>0.05 mm (0.0020 in)</p> <p>0.2 ~ 0.65 mm (0.008 ~ 0.025 in)</p> <p>35.97 ~ 35.98 mm (1.416 ~ 1.417 in)</p> <p>Solid crankshaft</p> <p>SD 35 50 8 x 2 pc</p>
<p>Camshaft:</p> <p>Drive Method</p> <p>Cam Cap Inside Diameter</p> <p>Camshaft Outside Diameter</p> <p>Shaft-to-Cap Clearance</p> <p>< Limit ></p>	<p>Gear drive</p> <p>16.00 ~ 16.05 mm (0.630 ~ 0.632 in)</p> <p>15.90 ~ 15.97 mm (0.626 ~ 0.628 in)</p> <p>0.03 ~ 0.05 mm (0.0011 ~ 0.0020 in)/</p> <p>< 0.15 mm (0.0059 in) ></p>



Item	G16A
<p>Cam Dimensions:</p> <p>Intake "A" "B" "C"</p> <p>Exhaust "A" "B" "C"</p>  <p>Y-741</p>	<p>32.495 ~ 32.595 mm (1.279 ~ 1.283 in) 26.029 ~ 26.129 mm (1.024 ~ 1.028 in) 6.495 ~ 6.595 mm (0.255 ~ 0.259 in)</p> <p>32.495 ~ 32.595 mm (1.279 ~ 1.283 in) 26.029 ~ 26.129 mm (1.024 ~ 1.028 in) 6.495 ~ 6.595 mm (0.255 ~ 0.259 in)</p>
<p>Rocker Arm/Rocker Arm Shaft:</p> <p>Arm Inside Diameter Shaft Outside Diameter Arm-to-Shaft Clearance</p>	<p>12.00 ~ 12.02 mm (0.472 ~ 0.473 in) 11.90 ~ 11.99 mm (0.469 ~ 0.472 in) 0.01 ~ 0.07 mm (0.0004 ~ 0.0028 in)</p>
<p>Valve, Valve Seat, Valve Guide:</p> <p>Valve Clearance (Cold) IN. EX.</p> <p>Valve Dimensions:</p>  <p>Head Dia. "A"</p> <p>Face Width "B"</p> <p>Seat Width "C"</p> <p>Margin Thickness "D"</p> <p>Y-742</p> <p>"A" Head Diameter IN. EX.</p> <p>"B" Face Width IN. EX.</p> <p>"C" Seat Limit Width IN. EX.</p> <p>"D" Margin Thickness Limit IN. EX.</p>	<p>0.1 mm (0.004 in) 0.1 mm (0.004 in)</p> <p>32 mm (1.259 in) 27 mm (1.062 in) 2.6 mm (0.102 in) 1.6 mm (0.088 in) 1.0 mm (0.0393 in) 1.0 mm (0.0393 in) 1.0 mm (0.0393 in) 1.2 mm (0.047 in) 1.0 mm (0.0393 in)</p>
<p>Valve Spring Free Length < Limit > Spring Tilt Spring Force IN. EX.</p>	<p>36.2 mm < 35.0 mm > 2.5° or 1.6 mm 7.0 kg 9.0 kg</p>
<p>Throttle Cable Freeplay:</p> <p>Cable 1 Cable 2 Choke Cable Freeplay</p>	<p>0.2 ~ 0.5 mm (0.008 ~ 0.020 in) 0.5 mm (0.020 in) 1.0 mm (0.040 in) ></p>



Item	G16A
Carburetor: Model/Maker I.D. Mark Venturi Diameter (Ven. T.) Main Jet (M.J.) Main Air Jet (M.A.J.) Pilot Jet (P.J.) Pilot Air Jet (P.A.J.) Throttle Valve (Th.V.) Valve Seat (V.S.) By-pass (1) (B.P. 1) By-pass (2) (B.P. 2) By-pass (3) (B.P. 3) Pilot Outlet (P.O.) Pilot Screw (P.S.) Float Height (F.H.)	BV26-18-47/MIKUNI JN6-01 ø18 #86.3 ø1.6 #61.3 ø0.9 #150 ø1.2 ø0.7 ø0.7 ø1.0 ø1.0 1-1/2 turn out 16.5 ~ 17.5 mm (0.65 ~ 0.69 in)
Fuel Pump: Manufacturer/Type	MIKUNI/DF-52-205 (Diaphragm)
Fuel Tank: Recommended Fuel Fuel Rating P.O.N (#1) Fuel Tank Capacity Fuel Tank Material/Color	Unleaded regular gasoline MIN. 87 octane 23.0 L (20.2 Imp qt, 6.1 US gal) Polyethylene/Natural

TRANSMISSION

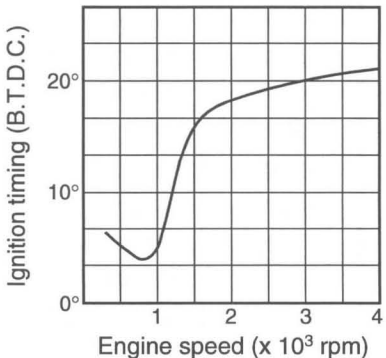
Item	G16A
Transmission: Type Primary Reduction Ratio Primary Spring: Secondary Spring: Outside Diameter x Wire Diameter No. of Turns/Free Length Twist Angle (Preload setting) Torque Cam Angle Sheave Center to Center Distance Sheave Off-Set V-belt Width and Outer Line Length V-belt Wear Limit	V-belt automatic centrifugal engagement 3.1 : 1 ~ 0.8 : 1 None 59 x 4.5 mm (2.32 x 0.18 in) 7.25/100.5±1.5 mm (3.95±0.059 in) 30° (B-3) 37.5° 270.5 mm 24.3 mm 31 x 1,010 mm (1.22 x 39.76 in) 27 mm (1.06 in)



Item	G16A
Differential/Reduction Gear: Secondary Reduction System Secondary Reduction Ratio: Forward Reverse Differential Type Lubricant/Capacity	Helical gear 11.34 : 1 15.25 : 1 Bevel gear SAE 90 gear oil/420 cc (0.09 Imp qt, 0.44 US qt)
Governor: Type Adjustment Factory Speed Setting	Oil bath flyweight Screw with lock nut 19 km/h (12 mph)



ELECTRICAL

Item	G16A
Voltage:	12V Negative ground
Ignition System: Type Model/Manufacturer Dynamic Timing	T.C.I. JN6/YAMAHA 23° B.T.D.C. at 3,000 r/min
Ignition Advance Curve:	 <p style="text-align: center;">Y-780</p>
Ignition: Primary Winding Resistance Secondary Winding Resistance	0.9 ~ 1.5Ω ± 20% at 20°C (68°F) (Coil base to terminal) 10.5 ~ 12.9 kΩ ± 20% at 20°C (68°F) (High tension cord to terminal)

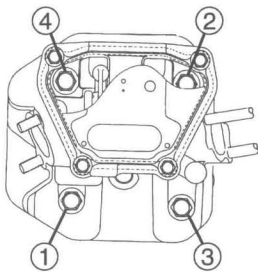


TIGHTENING TORQUE

ENGINE (FOR G16A)

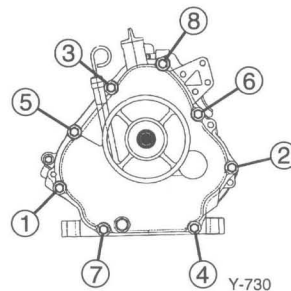
Part to be tightened	Part name	Thread size	Tightening torque			Remarks
			Nm	m·kg	ft·lb	
Spark Plug		M14 x P1.25	20	2.0	14	With oil splasher
Air Shroud	Bolt	M6 x P1.0	8	0.8	5.8	
Cylinder Head	Bolt	M10 x P1.25	50	5.0	36	
Cylinder Head Cover	Bolt	M6 x P1.0	11	1.1	8	
Valve Adjuster Locknut	Nut	M5 x P0.5	7	0.7	5.1	
Connecting Rod Cap	Nut	M8 x P1.25	20	2.0	14	
Cylinder x Exhaust Pipe	Nut	M8 x P1.25	16	1.6	12	
Exhaust Pipe x Bracket	Bolt	M8 x P1.25	16	1.6	12	
Exhaust Bracket x Rear Arm	Bolt	M8 x P1.25	16	1.6	12	
Carburetor x Joint	Nut	M6 x P1.0	6.5	0.65	5	
Flywheel	Nut	M18 x P1.5	120	12.0	87	
Crankcase x Engine Bracket	Bolt	M10 x P1.25	35	3.5	25	
Engine Bracket x Rear Arm	Nut	M8 x P1.25	26	2.6	19	
Crankcase Cover, 8 mm	Bolt	M8 x P1.25	26	2.6	19	
Crankcase Cover, 10 mm	Bolt	M10 x P1.25	38	3.8	27	
Crankcase Drain Plug	Bolt	M12 x P1.5	20	2.0	14	

[Cylinder Head Tightening Sequence]



Y-726

[Crankcase Cover Tightening Sequence]



Y-730



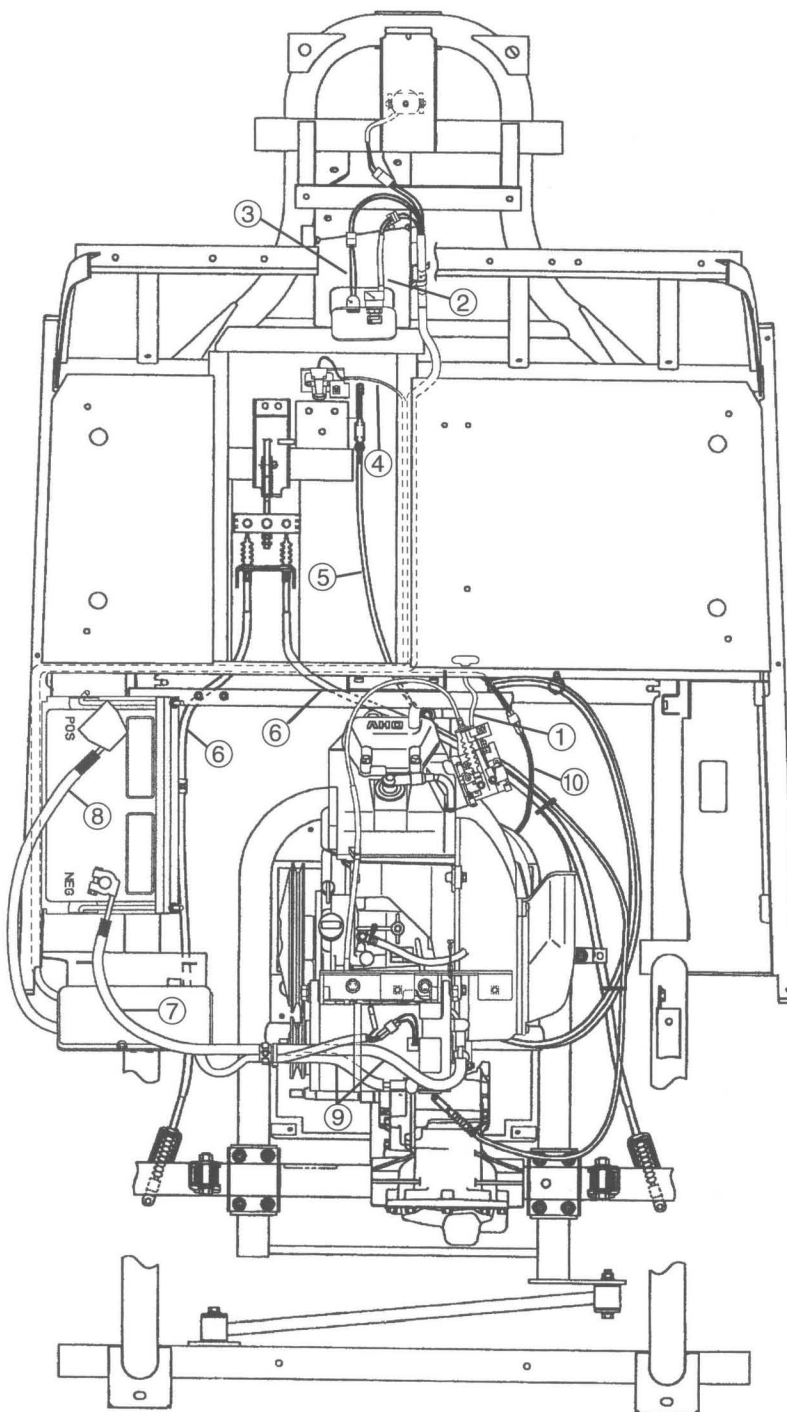
POWER TRAIN

Part to be tightened	Part name	Thread size	Tightening torque			Remarks
			Nm	m·kg	ft·lb	
For G16A						
Primary Sheave x Engine	Bolt	1/2-20UNF-2A	75	7.5	54	
Secondary Sheave x Input Shaft	Castle nut	M12 x P1.25	65	6.5	47	
Transmission Case x Rear Arm	Bolt	M8 x P1.25	23	2.3	17	
Rear Axle Housing x Rear Arm	Bolt	M10 x P1.25	64	6.4	46	
Rear Arm Connecting Rod	Nut	M12 x P1.50	90	9.0	65	
Transmission Cover 1 and	Bolt	5/16-18UNF-2B	20	2.0	14	First
Transmission Cover 2			25	2.5	18	Final
Differential Case x Ring Gear	Bolt	M8 x P1.25	55	5.5	40	
For G16E						
Transmission Case x Traction Motor	Bolt	M6 x P1.0	11.5	1.2	8	
Rear Axle Housing x Rear Arm	Bolt	M10 x P1.25	64	6.4	46	
Transmission Cover 1 and	Bolt	5/16-18UNF-2B	20	2.0	14	First
Transmission Cover 2			25	2.5	18	Final
Differential Case x Ring Gear	Bolt	M8 x P1.25	55	5.5	40	



CABLE/WIRE ROUTING FOR G16A

- | | |
|---------------------|-----------------------------------|
| ① Choke cable | ⑥ Brake cables |
| ② Main switch wire | ⑦ Negative lead |
| ③ Pilot lamp wire | ⑧ Positive lead |
| ④ Stop switch wire | ⑨ Lead wires to starter generator |
| ⑤ Accelerator cable | ⑩ T.C.I. unit wire lead |

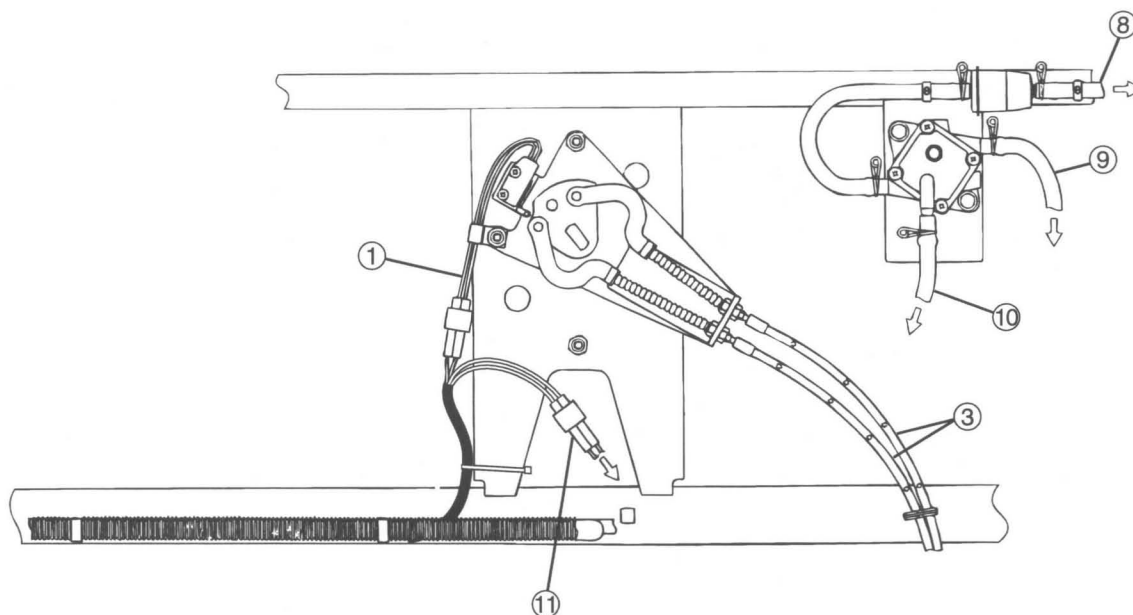


Y-746B

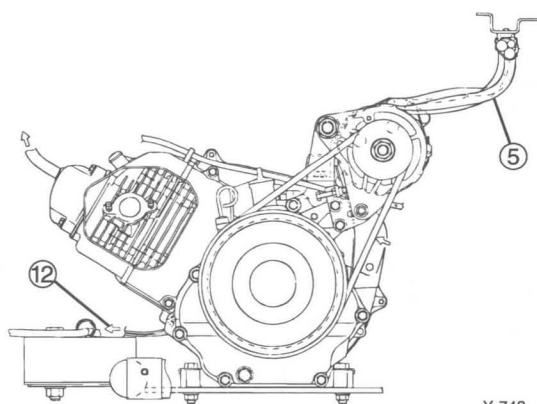


- ① Back-up buzzer switch lead
- ② Solenoid relay
- ③ Shift cables
- ④ Voltage regulator
- ⑤ Starter generator leads
- ⑥ Fuse

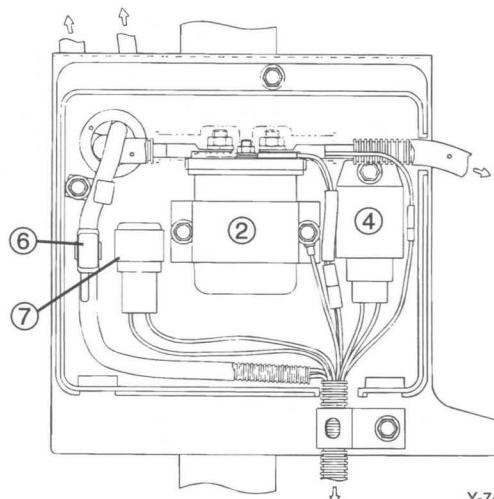
- ⑦ Stop relay
- ⑧ Fuel hose to fuel tank
- ⑨ Fuel hose to carburetor
- ⑩ Pulse hose to crankcase
- ⑪ T.C.I. wire lead
- ⑫ Oil warning switch lead



Y-747



Y-748



Y-749

WIRING DIAGRAM
FOR G16A

