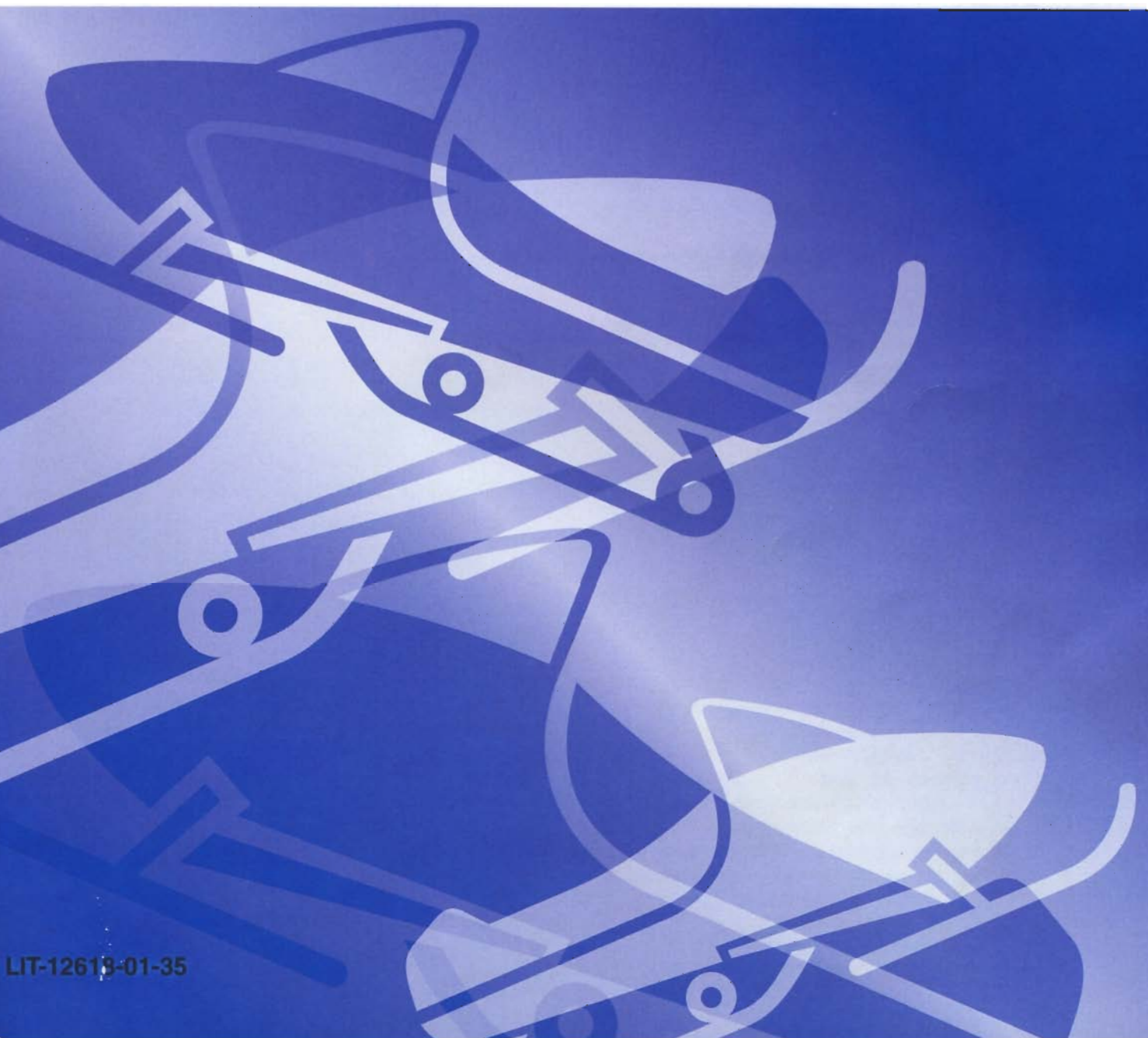
YAMAHA

VX750S

Service Manual



LIT-12613-01-35

CAUTION:

A CAUTION indicates special precautions that must be taken to avoid damage to the snowmobile.

NOTE:

A NOTE provides key information that can make procedures easier or clearer.

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 inspection, repair, assembly, and disassembly operations,

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

- Bearings
  Pitting/Damage → Replace.

EXPLODED DIAGRAM

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

VX750
SERVICE MANUAL

1st Edition, May 1991

Printed in U.S.A.
P/N LIT-12618-01-35

NOTICE

This manual was written by the Yamaha Motor Company primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to put an entire mechanic's education into one manual, so it is assumed that persons using this book to perform maintenance and repairs on Yamaha snowmobiles have a basic understanding of the mechanical concepts and procedures inherent in snowmobile repair technology. Without such knowledge, attempted repairs or service to this model may render it unfit to use and/or unsafe.

Yamaha Motor Company, Ltd. is continually striving to improve all models manufactured by Yamaha. Modifications and significant changes in specifications or procedures will be forwarded to all Authorized Yamaha dealers and will, where applicable, appear in future editions of this manual.

SERVICE DEPT
LEISURE VEHICLES & POWER
PRODUCTS OPERATIONS
YAMAHA MOTOR CO., LTD.

HOW TO USE THIS MANUAL

PARTICULARLY IMPORTANT INFORMATION

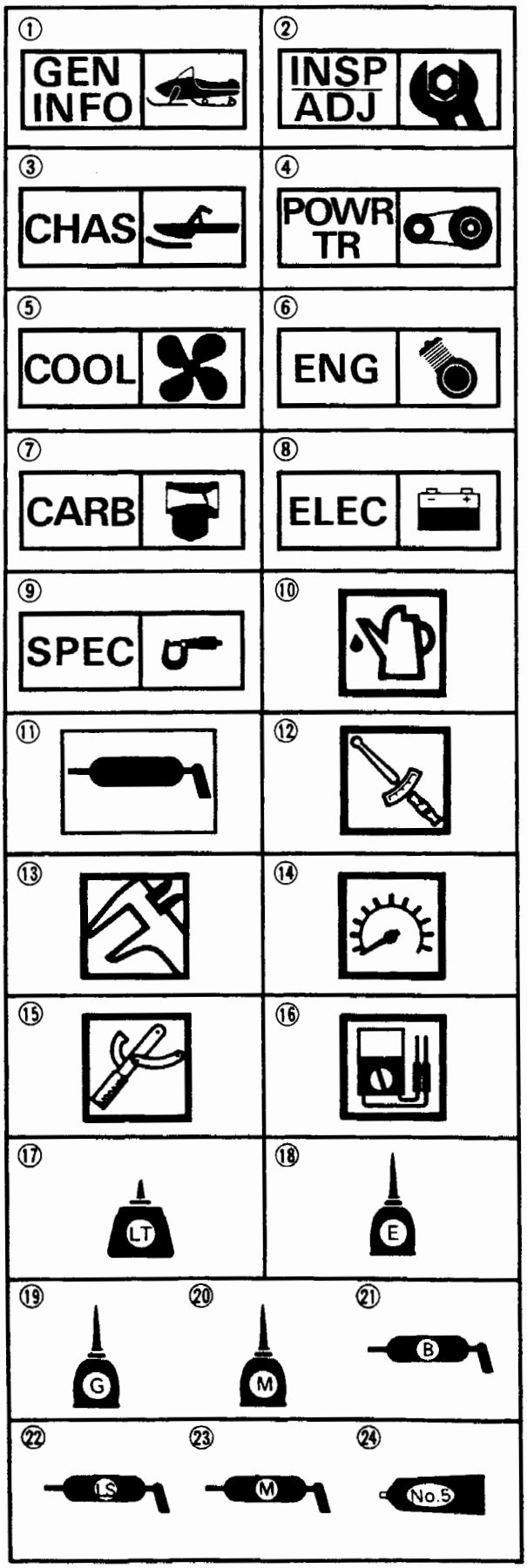
This material is distinguished by the following notations.

⚠

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 the snowmobile operator, a bystander, or a person inspecting or repairing the snowmobile.



ILLUSTRATED SYMBOLS

(Refer to the illustration)

Illustrated symbols ① to ⑨ are designed as thumb tabs to indicate the chapter's number and content.

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

Illustrated symbols ⑩ to ⑯ are used to identify the specifications which appear.

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

Illustrated symbols ⑰ to ㉔ in the exploded diagram indicate grade of lubricant and location of lubrication point.

⑰ Apply locking agent (LOCTITE®)
⑱ Apply engine oil
⑲ Apply gear oil
⑳ Apply molybdenum disulfide oil
㉑ Apply wheel bearing grease
㉒ Apply low-temperature lithium-soap base grease
㉓ Apply molybdenum disulfide grease
㉔ Apply YAMAHA bond No.5

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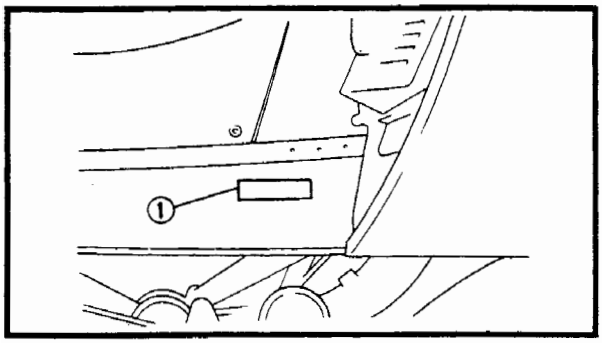
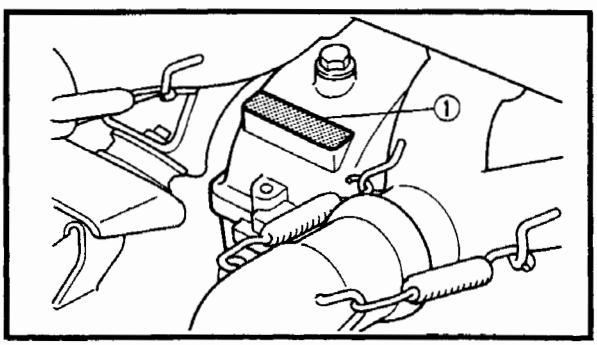
CONTENTS

CHAPTER 1. GENERAL INFORMATION





GENERAL INFORMATION

MACHINE IDENTIFICATION

FRAME SERIAL NUMBER

The frame serial number ① is located on the right-hand side of the frame (just below the front of the seat).

ENGINE SERIAL NUMBER

The engine serial number ① is located on the front side of the crankcase.

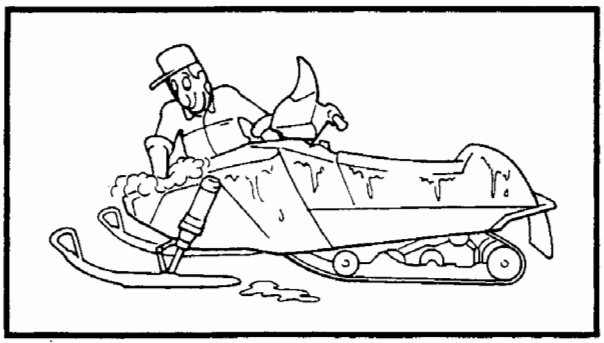
NOTE:

The first three digits of these numbers are for model identification; the remaining digits are the unit production number.

Starting Serial Number
89A-000101

NOTE:

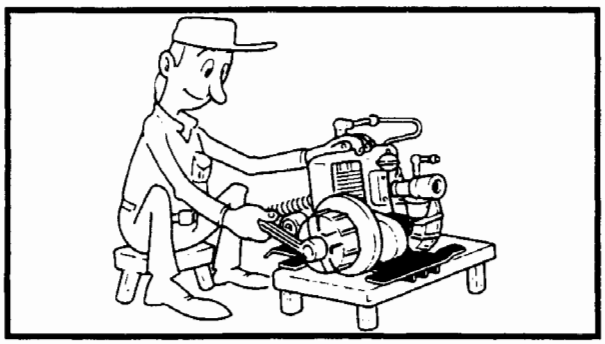
Designs and specifications are subject to change without notice.



IMPORTANT INFORMATION

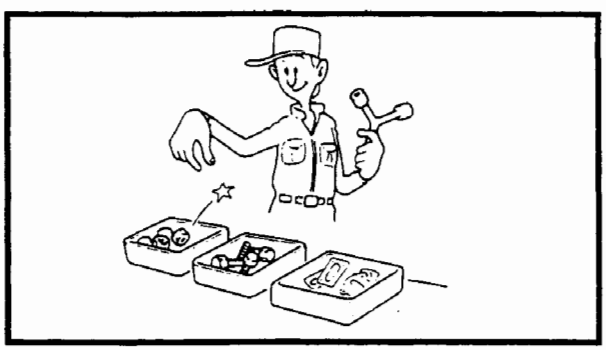
PREPARATION FOR REMOVAL AND DISASSEMBLY

1. Remove all dirt, mud, dust, and foreign material before removal and disassembly. While cleaning, take care to protect the electrical parts, such as relays, switches, motor, resistors, controllers, etc., from high pressure water splashes.

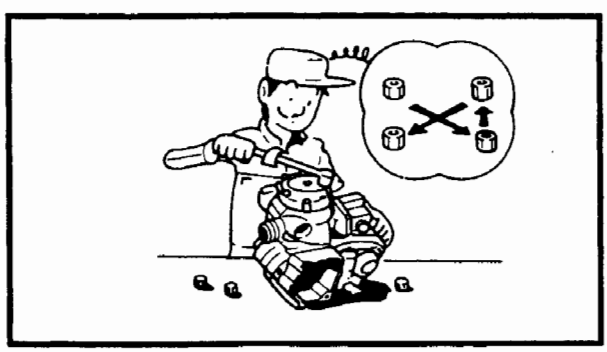


2. Use proper tools and cleaning equipment. Refer to "SPECIAL TOOLS" .

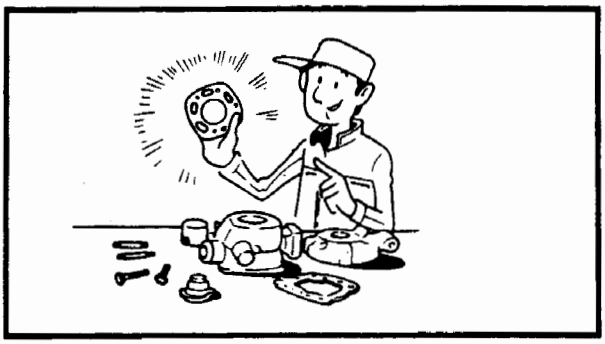
3. When disassembling the machine, keep mated parts together. This includes gears, cylinders, pistons, and other parts that have been "mated" through normal wear. Mated parts must be reused as an assembly or replaced.



4. During disassembly of the machine , 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 reinstalled correctly.
5. Keep away from fire.



6. Be sure to keep to tightening torque specifications. When tightening bolts, nuts, and screws, start with larger-diameter pieces, and proceed from an inner-positioned one to an outer-positioned one in a criss-cross pattern.

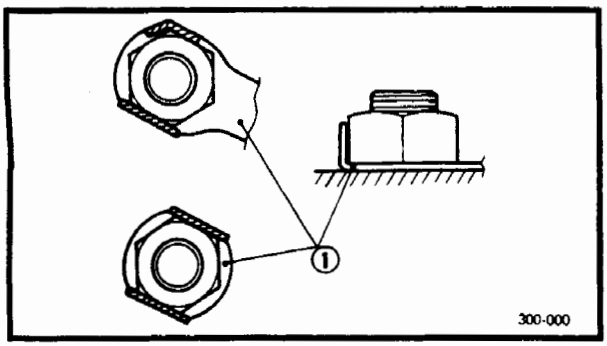


ALL REPLACEMENT PARTS

1. We recommend to use Yamaha genuine parts for all replacements. Use oil and/or grease recommended by Yamaha for assembly and adjustment.

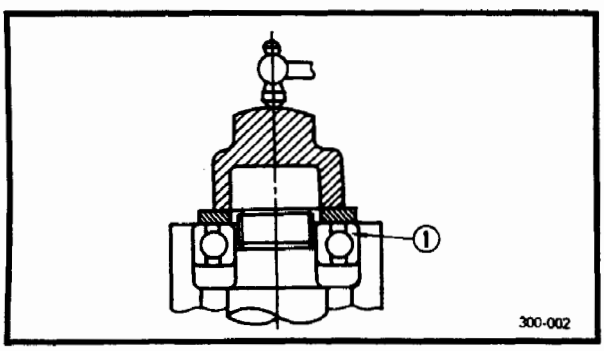
GASKETS, OIL SEALS, AND O-RINGS

1. All gaskets, seals, and O-rings should be replaced when an engine is overhauled. All gasket surfaces, oil seal lips, and O-rings must be cleaned.
2. Properly oil all mating parts and bearings during reassembly. Apply grease to the oil seal lips.



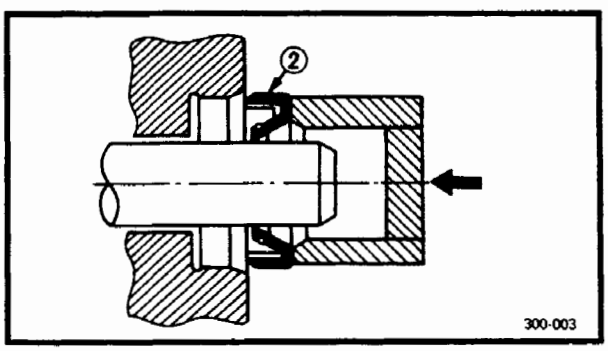
LOCK WASHERS/PLATES AND COTTER PINS

1. All lock washers/plates ① and cotter pins must be replaced when they are removed. Lock tab(s) should be bent along the bolt or nut flat(s) after the bolt or nut has been properly tightened.



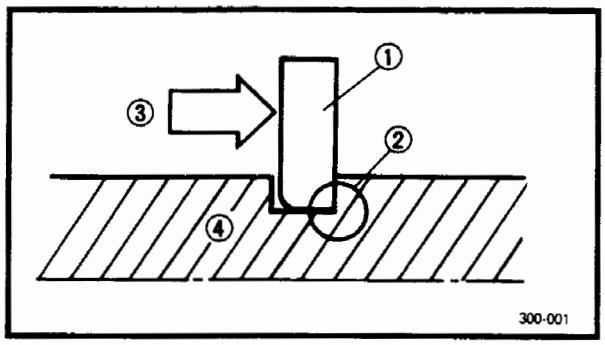
BEARINGS AND OIL SEALS

1. Install the bearing(s) ① and oil seal(s) ② with their manufacturer's marks or numbers facing outward. (In other words, the stamped letters must be on the side exposed to view.) When installing oil seal(s), apply a light coating of light-weight lithium base grease to the seal lip(s). Oil the bearings liberally when installing.



CAUTION:

Do not use compressed air to spin the bearings dry. This causes damage to the surface of the bearings.



CIRCLIPS

1. All circlips should be inspected carefully before reassembly. Always replace piston pin clips after one use. Replace misshapen circlips. When installing a circlip ① , make sure that the sharp edged corner ② is positioned opposite to the thrust ③ it receives. See the sectional view.

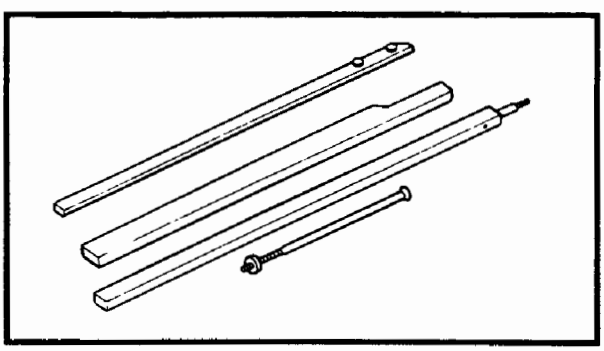
④ Shaft

SPECIAL TOOLS

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

NOTE:

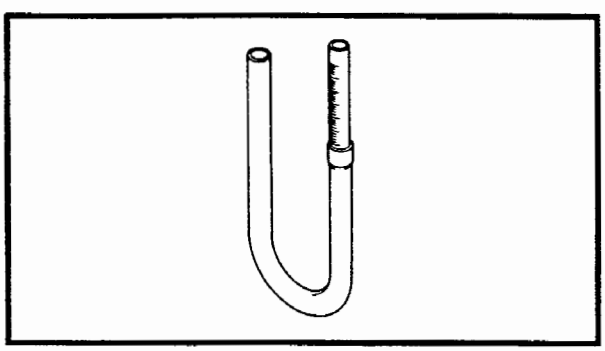
Be sure to use the correct part number when ordering the tool, since the part number differs according to the area as shown below. The first part number is for Europe, and the last part is for the U.S.A. and Canada.
e.g. 90890 - *****, YU- *****



FOR TUNE UP

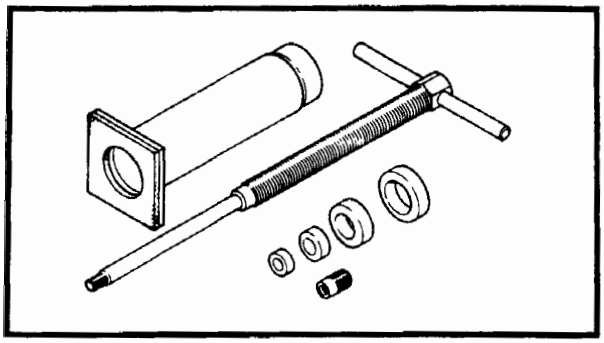
1. Sheave Gauge
   P/N YS-91047-B

This gauge is used to measure sheave distance and for offset adjustment.



2. Fuel Level Gauge
   P/N 90890-01312, YM-01312–A

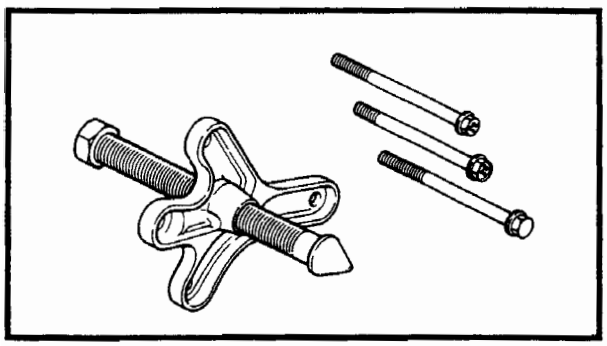
This gauge is used to measure the fuel level in the float chamber.



FOR ENGINE SERVICE

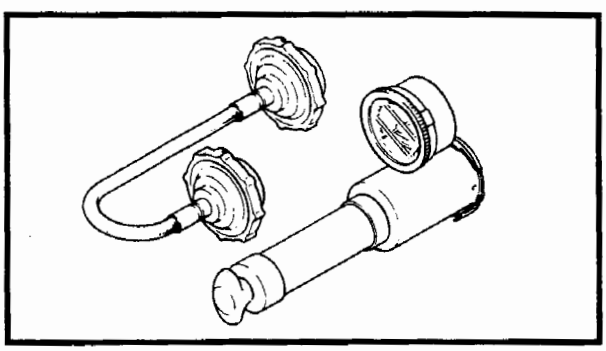
1. Piston Pin Puller
   P/N 90890-01304, YU-01304

This tool is used to remove the piston pin.



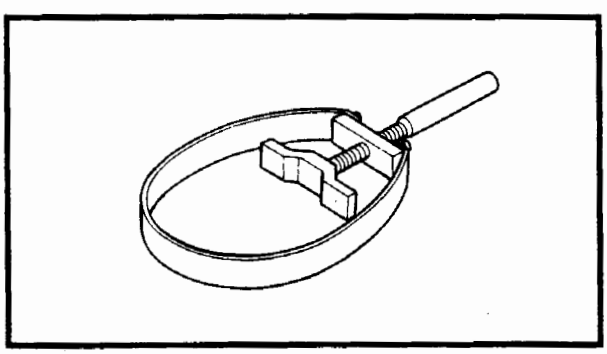
2. Rotor Puller
   P/N 90890-01362, YU-33270

This tool is used to remove the magneto rotor.



3. Cooling System Tester
   P/N 90890-01325, YU-22460-01

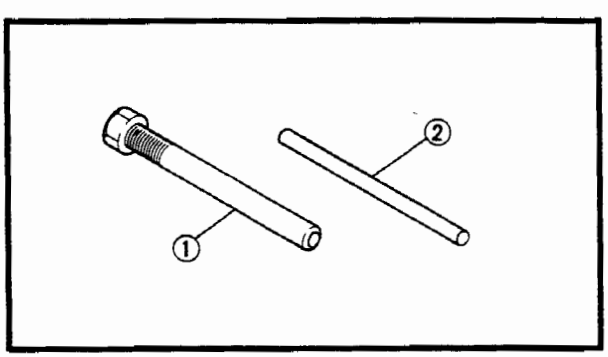
This tester is used for checking cooling system.



FOR POWER TRAIN SERVICE

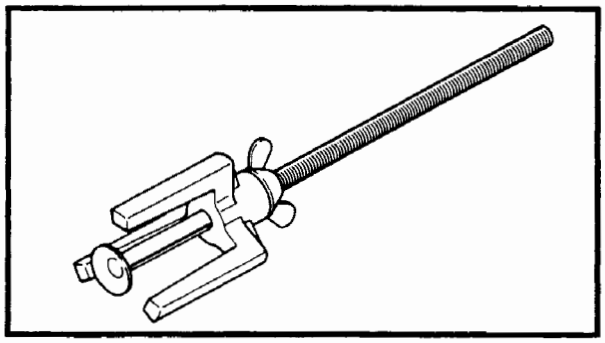
1. Primary Sheave Holder
   P/N 90890-01701, YS-01880

This tool is used to hold the primary sheave.



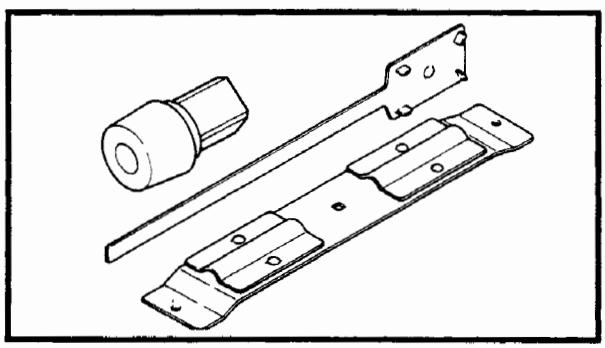
2. Primary Sheave Puller (18 mm)
   P/N YS-01881-1 ① , YS-38517 ②

This tool is used for removing the primary sheave.



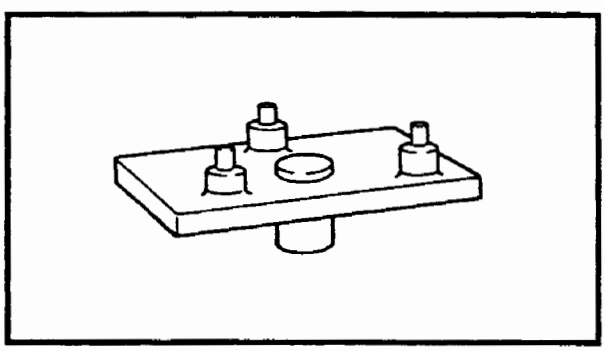
3. Sheave Compressor
   P/N 90890-01712, YS-28891

This tool is used when disassembling and assembling the sheave.



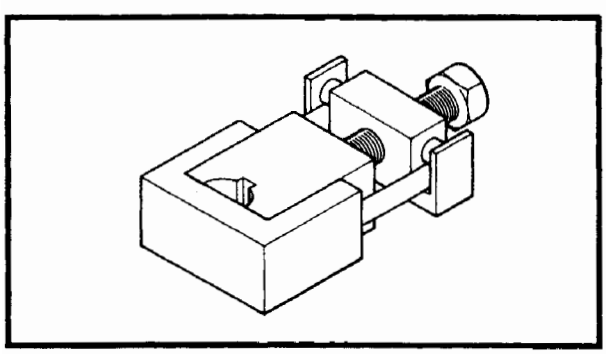
4. Clutch Spider Separator
   P/N 90890-01711, YS-28890-B

This tools are used when disassembling and assembling the primary sheave.



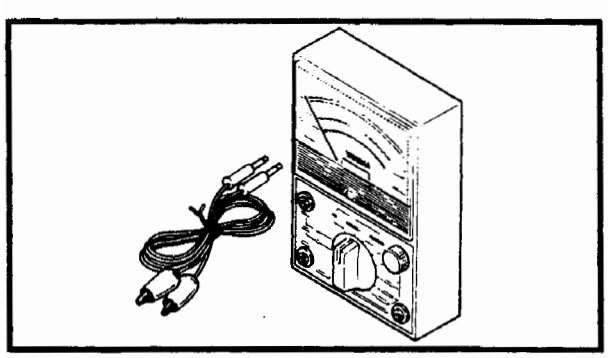
5. Clutch Separator Adapter
   P/N 90890-01740, YS-34480

This tool is used when disassembling and assembling the primary sheave.



6. Track Clip Installer
   P/N 90890-01721, YS-91045-A

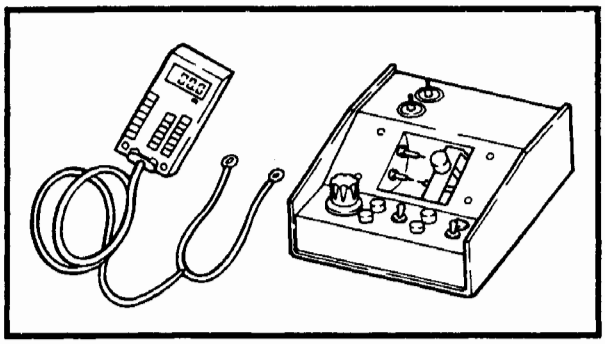
This tool is used for installing the track clip.



FOR ELECTRICAL SERVICE

1. Pocket Tester
   P/N 90890-03112, YU-03112

This instrument is necessary for checking the electrical components.



2. Electro Tester
   P/N 90890-03021, YU-33260-A

This instrument is invaluable for checking the electrical system.

CHAPTER 2. PERIODIC INSPECTIONS AND ADJUSTMETS

PERIODIC INSPECTIONS AND ADJUSTMENTS

INTRODUCTION

This chapter includes all information necessary to perform recommended inspections and adjustments. These preventive maintenance procedures, if followed, will ensure more reliable machine operation and a longer service life. In addition, the need for costly overhaul work will be greatly reduced. This information applies to machines already in service as well as new machines that are being prepared for sale. All service technicians should be familiar with this entire chapter.

PERIODIC MAINTENANCE TABLE

Item	Remarks	Pre-operation check (Daily)	Initial 1 Month or 800 km (500 Mi) (40 hr)	Every Seasonally or 3,200 km (2,000 Mi) (160 hr)
Spark Plug:	Check condition adjust the gap and clean. Replace if necessary.			●
Engine Oil:	Check oil level.	●		
	* Air bleed the oil pump if necessary.			●
*Oil Filter:	Check condition. Replace if necessary.			●
Fuel:	Check fuel level.	●		
*Fuel Filter:	Check condition. Replace if necessary.			●
*Fuel Line:	Check fuel hose for cracks or damage. Replace if necessary.			●
*Oil Line:	Check oil hose for cracks or damage. Replace if necessary.			●
Engine Coolant	Check coolant level.	●		
	* Air bleed the cooling system if necessary.			●
Carburetor	Check throttle lever operation.	●		
	* Adjust the jets.	Whenever operating condition (elevation/temperature) is changed.		
Manual Starter:	Check operation and rope damage. * Replace if necessary.	●		
Engine Stop Switch:	Check operation * Repair if necessary.	●		
Throttle Override System:	Check operation. * Repair if necessary.	●		
Throttle Lever:	Check operation. * Repair if necessary.	●		
*Exhaust System:	Check for leakage. Retighten or replace gasket if necessary.			●
*Decarbonization:	More frequently if necessary.			●
Drive V-belt Guard:	Check cracks, bends or damage. * Replace if necessary.	●		
Drive V-belt:	Check wear and damage. Replace if necessary.	●		
Drive Track/Idler Wheels:	Check deflection, wear and damage. * Adjust/replace if necessary.		●	●
Slide Runner	Check wear and damage.	●		
	* Replace if necessary.			●

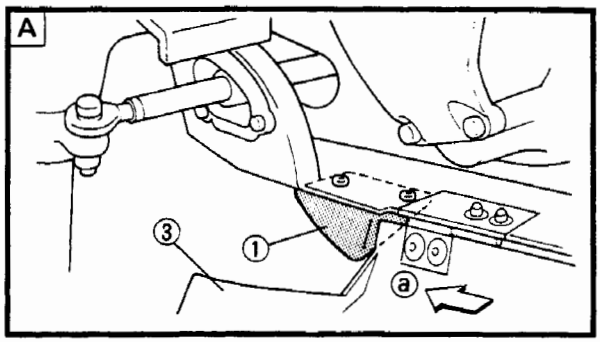
*: It is recommended that these items be serviced by a Yamaha dealer or other qualified mechanic.

PERIODIC MAINTENANCE TABLE

INSP ADJ

Item	Remarks	Pre-operation check (Daily)	Initial 1 Month or 800 km (500 Mi) (40 hr)	Every Seasonally or 3,200 km (2,000 Mi) (160 hr)
Brake/ Parking Brake	Check operation.	●		
	* Adjust free play and/or replace pads if necessary.			●
Drive Chain Oil	Check oil level.		●	
	Replace.			●
Engine Gear Oil	Check oil level.		●	
	* Replace.		●	●
*Drive Chain:	Check deflection. Adjust if necessary.	Apply initial 1 (one) Month or 50 km (31 Mi) and every 1 (one) Month or 400 km (250 Mi).		
Ski/Ski cover/ Ski Runner	Check wear and damage.	●		
	* Replace if necessary.			●
Steering System	Check operation.	●		
	* Adjust toe-out if necessary.			●
Lights:	Check operation. Replace bulbs if necessary.	●		
*Primary Sheave	Check engagement and shift speed.			●
	Adjust if necessary.	Whenever operating elevation is changed.		
	Check wear and damage. Replace if necessary.			●
	Lubricate with specified grease.			●
*Secondary Sheave	Lubricate with specified grease.			●
	Adjust if necessary.	Whenever operating elevation is changed.		
*Steering Column Bearing:	Lubricate with specified grease.			●
*Ski and Front Suspension:	Lubricate with specified grease.			●
*Suspention Component:	Lubricate with specified grease.			●
* Brake Cable End and Lever End/ Throttle Cable End	Lubricate with specified grease.			●
	Check cable damage. Replace if necessary.			●
Shroud Latches:	Make sure the shroud latches are hooked.	●		
Fittings/Fasteners:	Check tightness. * Repair if necessary.	●		
Service Tools/Spare Parts:	Check proper placement.	●		

*: It is recommended that these items be serviced by a Yamaha dealer or other qualified mechanic.

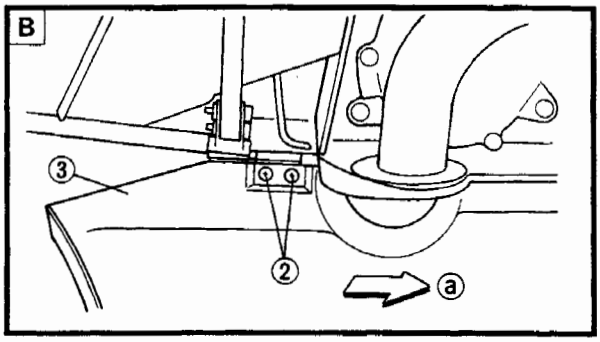


SIDE COWLING

Removal

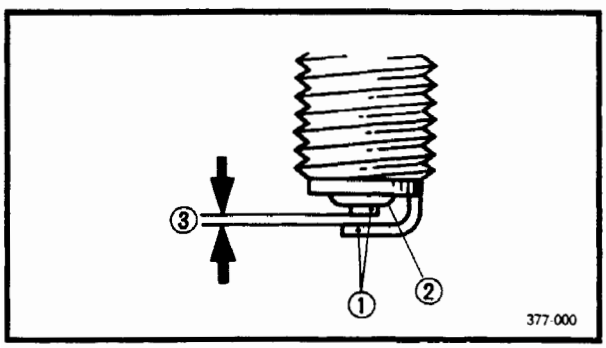
1. Remove:
   - Protector rubber ① (left and right)
   - Screws ② (right)
   - Side cowlings ③ (left and right)
     Pull it forward ⓐ .

Ⓐ Left
Ⓑ Right



Installation

Reverse the "Removal" steps.

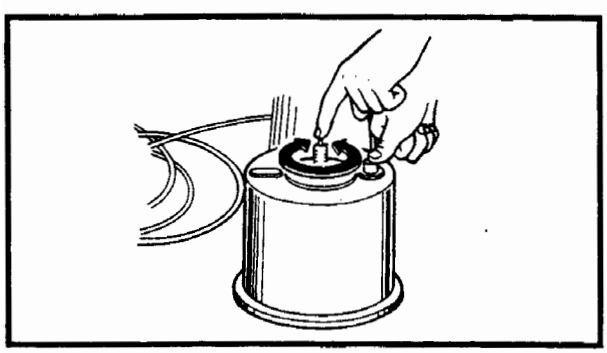


ENGINE

SPARK PLUG

1. Remove:
   - Spark plug
2. Inspect:
   - Electrode ①
     Wear/Damage→Replace.
   - Insulator color ②
3. Measure:
   - Plug gap ③
     Out of specification→Regap.
     Use wire thickness gauge.

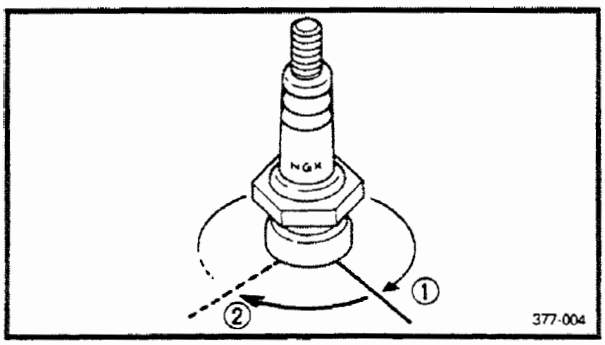
Spark plug gap:
0.7 ~0.8 mm (0.028 ~ 0.031 in)



Clean the plug with a spark plug cleaner if necessary.

Standard spark plug:
BR9ES (NGK)

Before installing a spark plug, clean the gasket surface and plug surface.



4. Tighten:
   - Spark plug

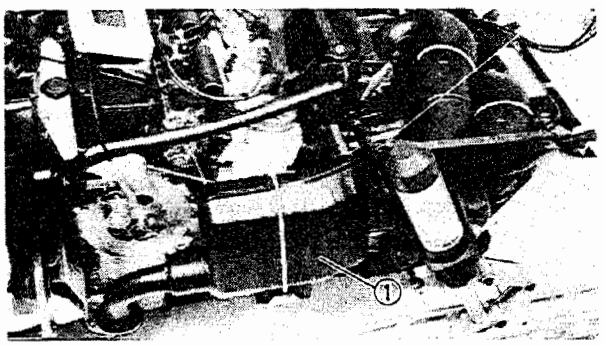
	Spark plug: **28 Nm (2.8 m • kg, 20 ft • lb)**

NOTE:
Finger-tighten ① the spark plug before torquing ② to specification.

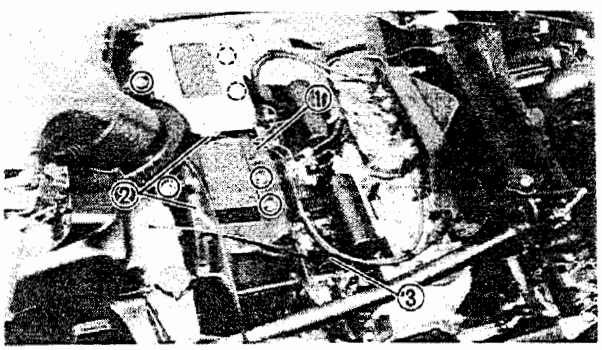
OIL PUMP

Air Bleeding

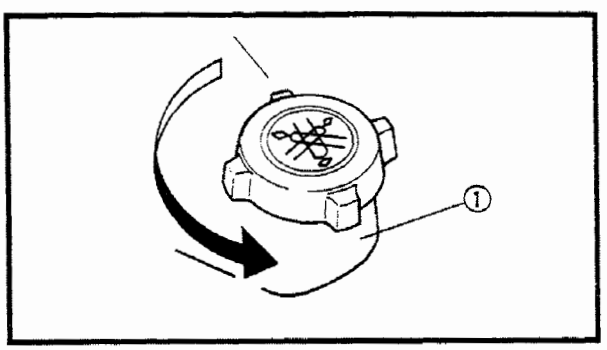
CAUTION:
The oil pump and delivery line must be bled on the following occasions:
- **When any portion of the oil system has been disconnected.**
- **When the machine has been turned on its side.**
- **Whenever the oil tank has been run empty.**
- **During predelivery.**



1. Remove:
   - Side cowling (right) (See page 2-3)
   - Spring
   - Muffler ①

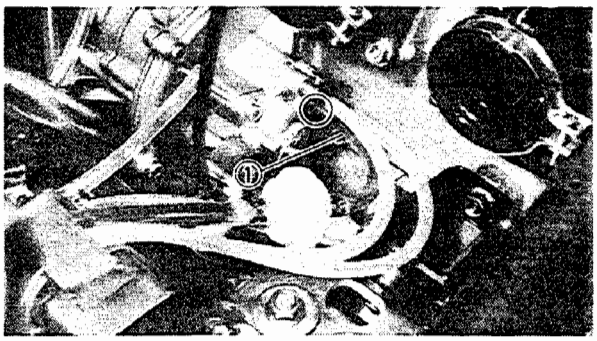


2. Loosen:
   - Clamp screws (carburetor)
3. Remove:
   - Bracket ① (ignition coil)
   - Intake silencers ②
   - Carburetor assembly ③

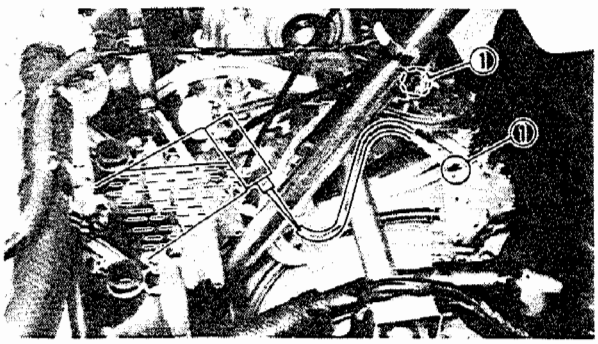


4. Fill:
   - Oil tank ①

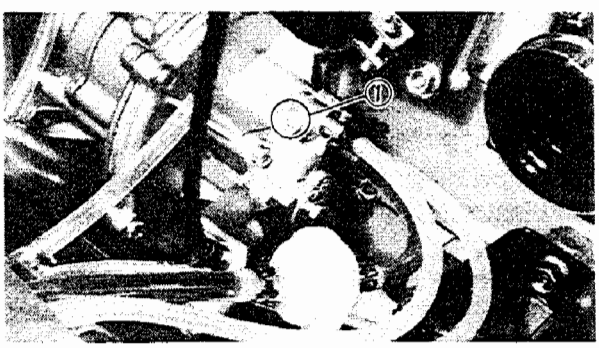
	Oil tank capacity: **2.8 L (2.5 Imp qt, 3.0 US qt)** **Recommended oil:** **Yamalube 2-cycle oil**



5. Disconnect:
   - Oil hose ①
6. Keep the oil running out until air bubbles disappear from the oil hoses ①
7. Connect:
   - Oil hose ①

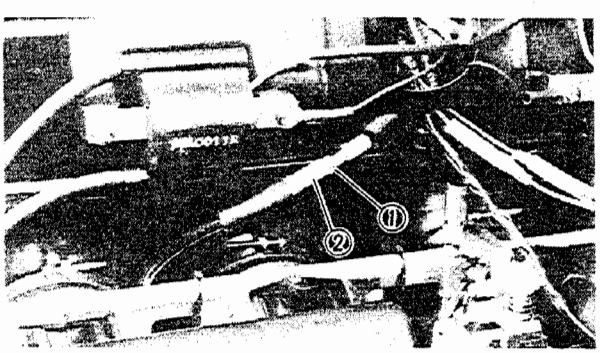


8. Disconnect:
   - Oil delivery hoses ①
     (from fuel pump ② side)
9. Feed the "Yamalube 2-cycle oil" into the oil delivery hoses③using a oil can④for complete air bleeding.
10. Connect:
    - Oil delivery hoses ①



11. Remove:
    - Bleed screw ①
    - Gasket (bleed screw)
12. Keep the oil running out until air bubbles disappear from bleed hole.

13. Inspect:
    - Gasket (bleed screw)
      Wear/Damage → Replace.
14. Install:
    - Gasket (bleed screw)
    - Bleed screw



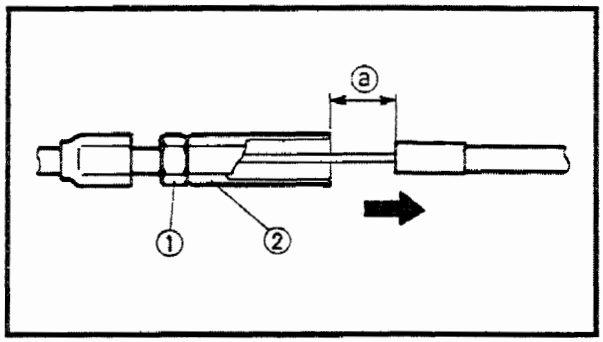
Cable Adjustment

NOTE:

Before adjusting the oil pump cable, the throttle cable free play should be adjusted.

1. Adjust:
   - Oil pump cable

Adjustment steps:
- Loosen the locknut ① .

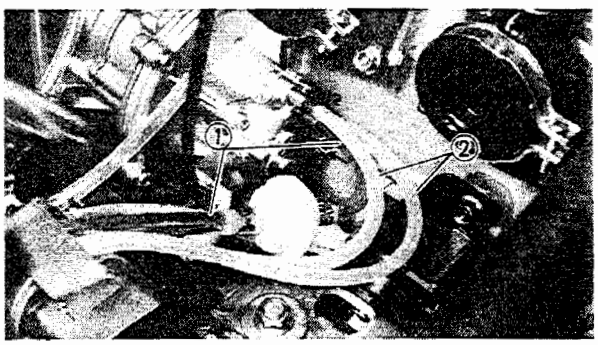


- Turn the adjuster ② in or out until the specified distance length is obtained.

Oil pump cable distance length ⓐ : 27 ~ 29 mm (1.06 ~ 1.14 in)

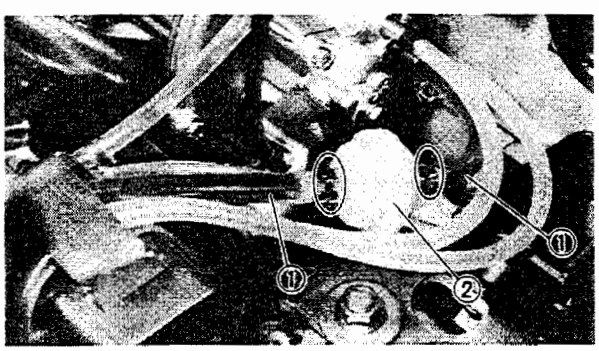
Turning in	**Free play is increased.**
Turning out	**Free play is decreased.**

- Tighten the locknut and push in the adjuster cover.



ENGINE OIL LINE INSPECTION

1. Remove:
   - Intake silencers (See page 2-4)
2. Inspect:
   - Oil hose ①
   - Oil delivery hoses ②
     Crack/Damage → Replace.



OIL FILTER INSPECTION

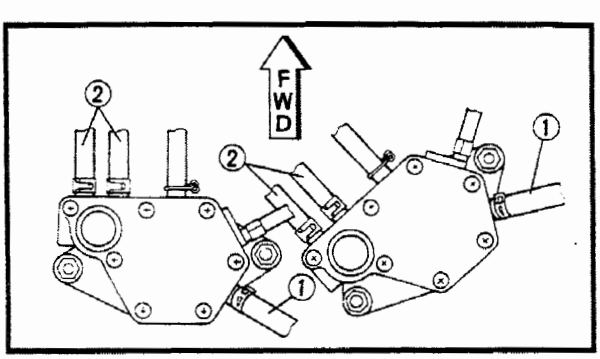
1. Remove:
   - Intake silencer (right)
     (See page 2-4)
2. Disconnect:
   - Oil hose ①

NOTE:
Plug the oil hose so that the oil will not run out of the oil tank and oil pump.

3. Inspect:
   - Oil filter ②
     Contamination→Replace.

Recommended replacement interval:
Every season

4. Reverse the removal procedure.

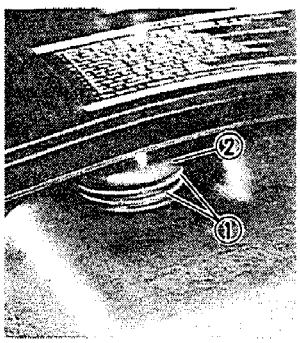


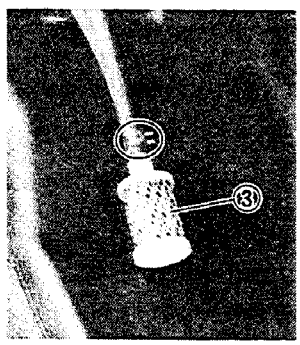
FUEL LINE INSPECTION

1. Remove:
   - Intake silnecers (See page 2-4)
2. Inspect:
   - Fuel hoses ①
   - Fuel delivery hoses ②
     Crack/Damage→Replace.

FUEL FILTER INSPECTION

1. Remove:
   - Seat
2. Disconnect:
   - Tail/brake light coupler
3. Remove:
   - Screws (center cover)





4. Remove:
   - Spring bands ①
   - Cap ②
   - Fuel filter ③
5. Inspect:
   - Fuel filter
     Contamination→Replace.

Recommended replacement interval:
Every season

6. Reverse the removal procedure.

COOLING SYSTEM

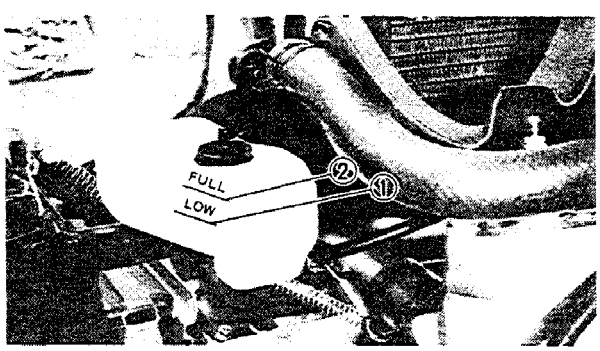
Coolant level inspection

⚠ WARNING

Do not remove the radiator cap when the engine is hot.

CAUTION:

Hard water or salt water is harmful to the engine parts; use boiled or distilled water if you can't get soft water.



1. Place the machine on a level surface.
2. Inspect:
   - Coolant level
     Coolant level is below "LOW" level line ①→ Add soft water, until "FULL" level line ②.

3. Add:
   - Soft water

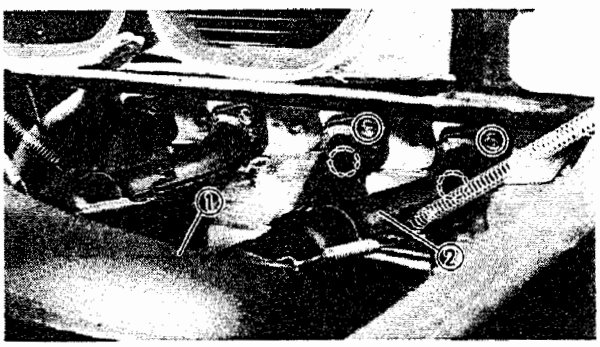
   Until the coolant level reaches "FULL" level line.

Reservoir tank capacity:
Total:
0.25 L (0.22 Imp qt, 0.26 US qt)
From "LOW" to "FULL" level:
0.1 L (0.09 Imp qt, 0.11 US qt)

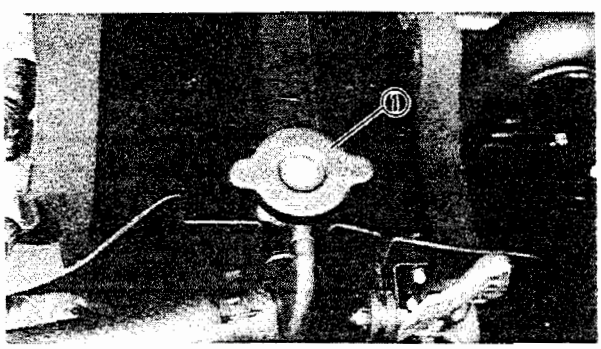
Coolant replacement

NOTE:
The coolant should be changed at least seasonally.

1. Place the machine on a level surface.
2. Remove:
   - Seat



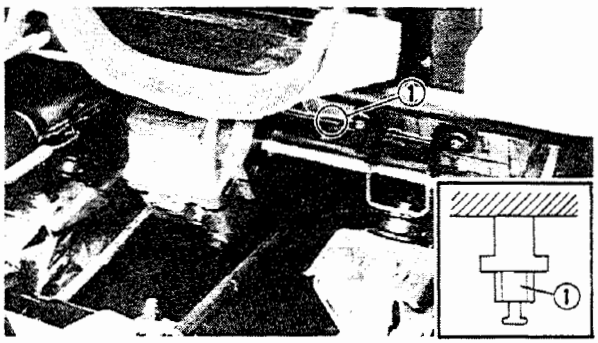
3. Remove:
   - Exhaust pipe ① (left)
   - Exhaust manifold ② (left)



4. Remove:
   - Radiator cap ①

⚠ WARNING

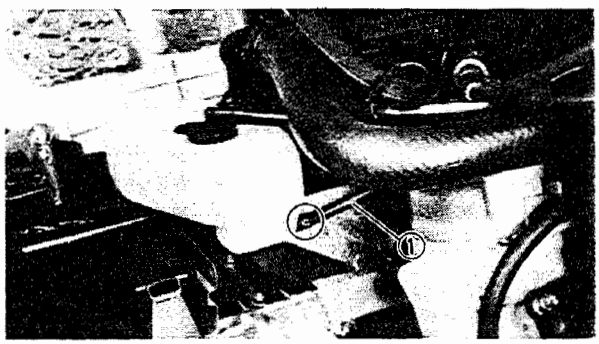
Do not remove the radiator cap① especially when the engine is hot. Scalding hot fluid and steam may be blown out under pressure, which could cause serious injury. When the engine has cooled, place thick rag like a towel over the radiator cap, slowly rotate the cap counterclockwise to the detent. This procedure allows any residual pressure to escape. When the hissing sound has stopped, press down on the cap while turning counterclockwise and remove it.



6. Place an open container under the drain bolt ①.
7. Remove:
   - Drain bolt ①

   Drain the coolant.

NOTE:
Lift up the tail of the machine to drain the coolant.



8. Disconnect:
   - Reservoir tank hose ①

   Drain the coolant.

NOTE:
Place a container under the reservoir tank to catch the draining coolant.

⚠ WARNING

Coolant is poisonous. It is harmful or fatal if swallowed.

- **If coolant is swallowed, induce vomiting immediately. Get immediate medical attention.**
- **If coolant splashes in eyes, flush with water. Call a physician.**
- **If coolant splashes on skin or clothes, wash immediately with soap and water.**

9. Inspect:
   - Gaskets (drain bolt)

   Damage → Replace.
10. Install:
    - Drain bolt (gaskets)
    - Exhaust manifolds (gaskets)

Drain bolt:
25 Nm (2.5 m • kg, 18 ft • lb)
Bolts (exhaust pipe):
9.5 Nm (0.95 m • kg, 6.9 ft • lb)

11. Fill:
- Cooling system

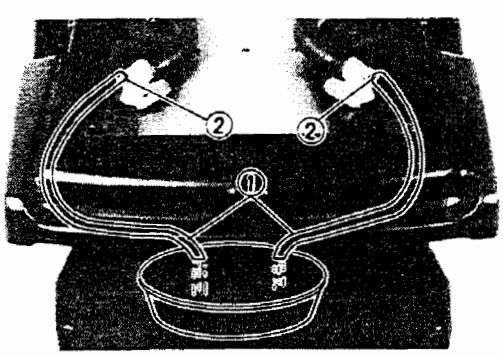
Recommended Coolant:
High quality ethylene glycol anti-freeze containing corrosion inhibitor
Coolant and water mixed ratio:
60% : 40%
Total amount:
4.2 L (3.7 Imp qt, 4.4 US qt)
Reservoir tank capacity:
0.25 L (0.22 Imp qt, 0.26 US qt)

CAUTION:
- **Hard water or salt water is harmful to the engine parts; use boiled or distilled water if you can't get soft water.**
- **Do not use water containing impurities or oil.**

12. Bleed air from the cooling system.

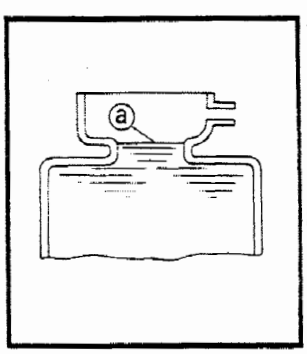
Air bleeding

1. Bleed air from the cooling system.



Air bleeding steps:
- Lift up the tail of the machine.
- Connect plastic tubes ① tightly to the bleed screws ② on the heat exchanger.
- Loosen the bleed screws ② of Heat exchanger.
- Keep the coolant running out until air bubbles disappear, while adding coolant slowly to the radiator.
- Tighten the bleed screws.

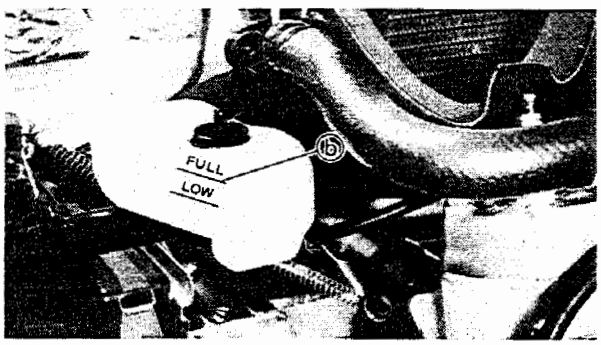
Bleed screw:
6 Nm (0.6 m • kg, 4.3 ft • lb)

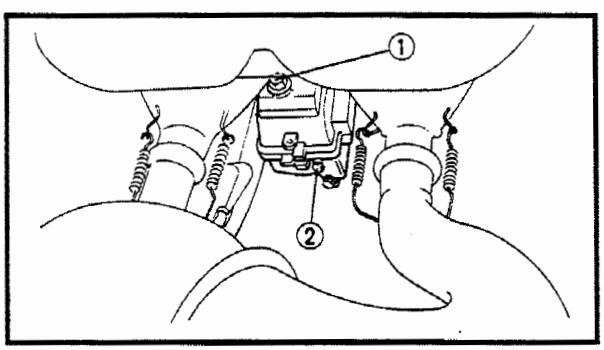


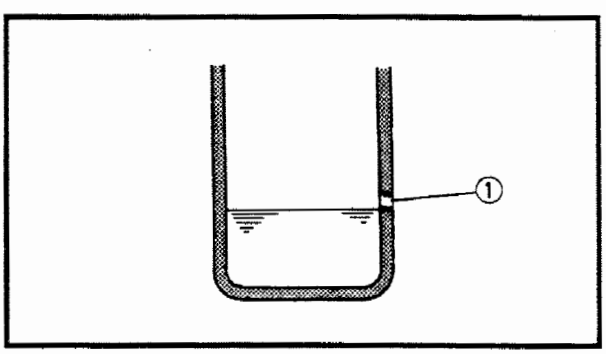
- Add coolant to fill the specified level ⓐ.
- Loosen the bleed bolt ③ on the water pump housing.
- Keep the coolant running out until air bubbles disappear.
- Tighten the bleed bolt.

Bleed bolt:
6 Nm (0.6 m • kg, 4.3 ft • lb)

- Install the radiator cap.
  Start the engine and keep the engine speed 3,000 rpm for one minute, then stop the engine.
- Remove the radiator cap and bleed air on the cooling system again, as shown in the steps above .
  No air bubbles → OK.
- Add coolant up to the specified level.
- Pour coolant into the reservoir tank until the coolant level reaches "FULL" level mark ⓑ .







ENGINE GEAR OIL

Oil level Inspection

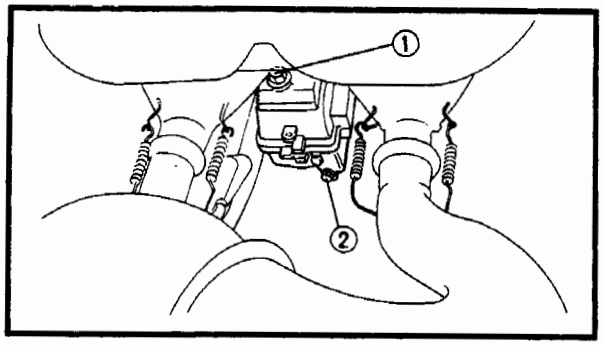
1. Place the machine on a level surface.
2. Place a rag under the checking hole (oil level).
3. Remove:
   - Oil filler cap ①
   - O-ring (oil filler cap)
   - Checking bolt ②
   - Gasket (checking bolt)
4. Inspect:
   - Oil level (drive gear housing)
     Oil flows out → Oil level is correct.
     Oil does not flow out → Oil level is low.
     Add oil until oil flows out.

① Checking bolt hole

Recommended oil:
Gear oil API GL-3 SAE #75 or #80 or SAE #10W-30

5. Inspect:
   - O-ring (oil filler cap)
   - Gasket (checking colt)
     Damage → Replace.
6. Tighten:

Checking bolt:
10 Nm (1.0 m • kg, 7.2 ft • lb)



Oil replacement

1. Place a drain pan under the drain hole.
2. Remove:
   - Oil filler cap ①
   - O-ring (oil filler cap)
   - Drain bolt ②
   - Gasket (drain bolt)

   Drain the oil.
3. Inspect:
   - O-ring (oil filler cap)
   - Gasket (drain bolt)

   Damage → Replace.
4. Install:
   - Drain bolt ② (with gasket)

Drain bolt:
45 Nm (4.5 m • kg, 33 ft • lb)

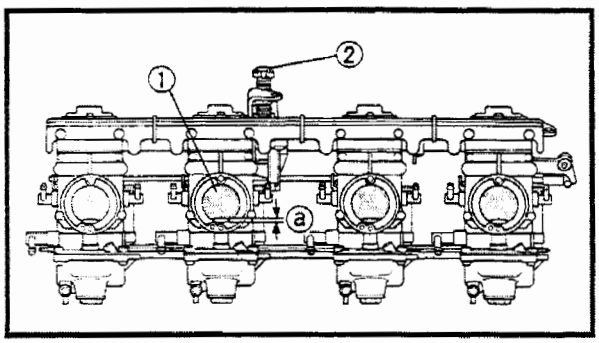
5. Fill:
   - Drive gear housing

CAUTION:

Be sure no foreign material enters the chain housing case.

Recommended oil:
Gear oil API GL-3 SAE #75 or #80 or SAE #10W-30
Oil capacity:
250 cm³ (8.8 Imp oz, 8.5 US oz)

6. Install:
   - Oil filler cap (with O-ring)



CARBURETOR SYNCHRONIZATION

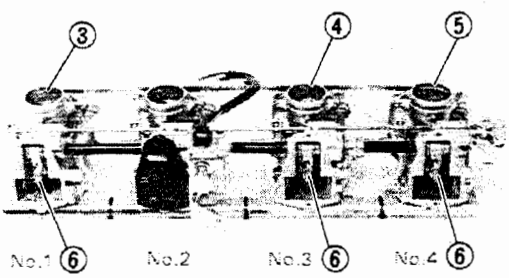
1. Remove:
   - Carburetor assembly
     (see page 7-3)
2. Adjust:
   - Carburetor synchronization

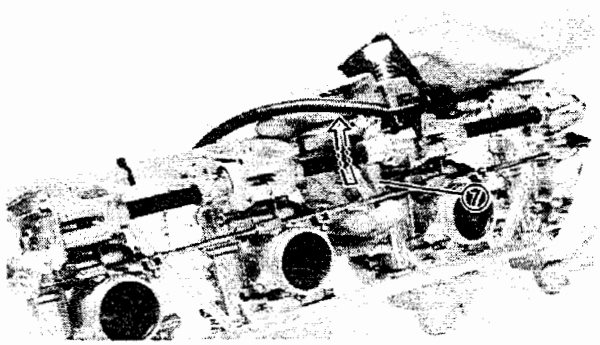
Adjustment steps:

- First, adjust the throttle valve height ⓐ at the No. 2 carburetor ① by turning the throttle stop screw ② until the specified height is obtained.

Throttle valve height:
1.0 ~ 1.2 mm (0.04 ~ 0.047 in)

- Second, adjust the throttle valve height ⓐ on the No. 1 ③, No. 3 ④ and No. 4 ⑤ carburetors with each adjusting screw ⑥.
- Move the throttle lever ⑦ 2 ~ 3 times.
- Make sure all the carburetor throttle valves are on the same height.
  If not, repeat above steps until they all match.

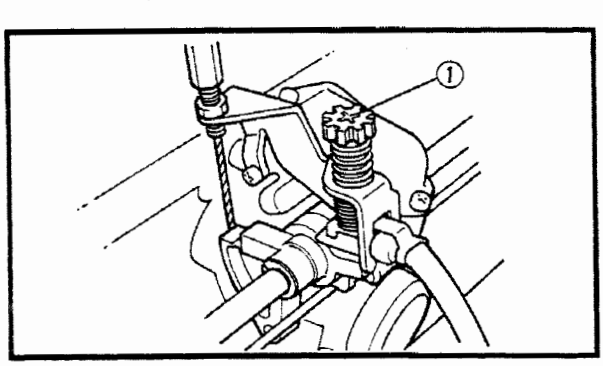




ENGINE IDLE SPEED ADJUSTMENT

NOTE:

Be sure the carburetor synchronization (see page 2-13) has been set before making the idle speed adjustment.



1. Adjust:
   - Engine idle speed

Adjustment steps:

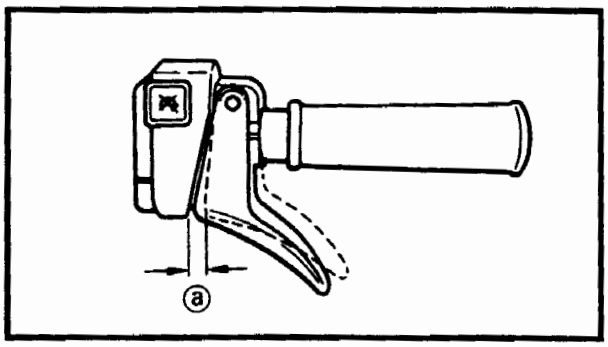
- Start the engine and let it warm up.
- Turn the throttle stop screw ① until the idle speed is in the specified range. Use the inductive tachometer.

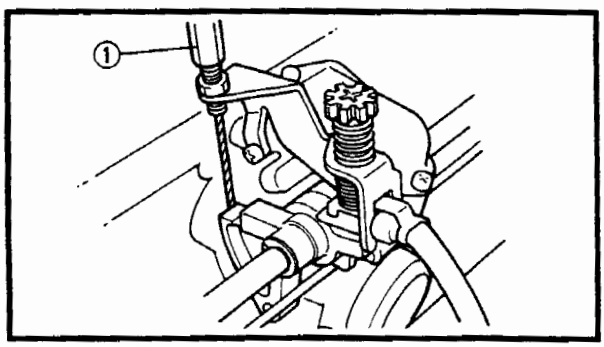
Turning in	Idle speed becomes higher.
Turning out	Idle speed becomes lower.

Inductive tachometer:
90890-08036, YU-08036

Engine idle speed:
1,400 ~ 1,600 r/min

NOTE:
After adjusting the engine idle speed, the throttle cable free play should be adjusted.





THROTTLE CABLE ADJUSTMENT

NOTE:
Before adjusting the throttle cable free play, the engine idle speed should be adjusted.

1. Measure:
   - Throttle cable free play ⓐ
     Out of specification → Adjust.

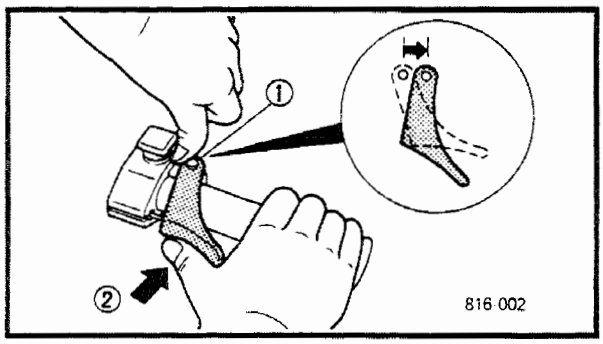
Throttle cable free play:
1.0 ~ 2.0 mm (0.04 ~ 0.08 in)

2. Adjust:
   - Throttle cable adjuster ①

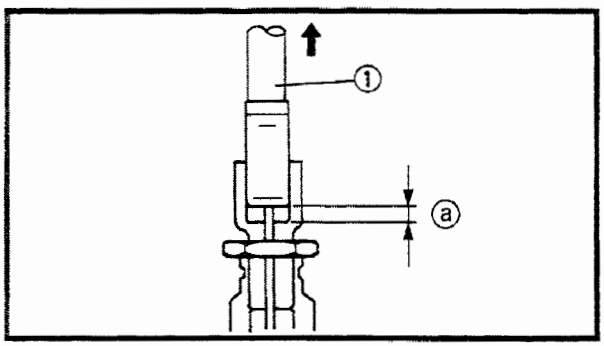
THROTTLE OVERRIDE SYSTEM (T.O.R.S.) CHECK

⚠ WARNING

When checking T.O.R.S.:
- **Be sure the parking brake is applied.**
- **Be sure the throttle lever moves smoothly.**
- **Do not run the engine up to clutch engagement rpm. Otherwise, the machine could start moving forward unexpectedly, which could cause an accident.**



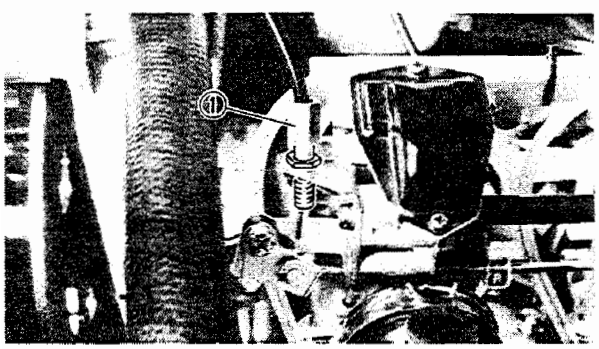
1. Start the engine.
2. Hold the pivot point of the throttle lever away from the throttle switch ① .
3. Press ② the throttle lever gradually. The T.O.R.S. warning light should flash and the engine should not exceed 2,800 to 3,000 r.p.m. If the engine exceeds 2,800 to 3,000 r.p.m.→ Repair the T.O.R.S. (See page 8-8)



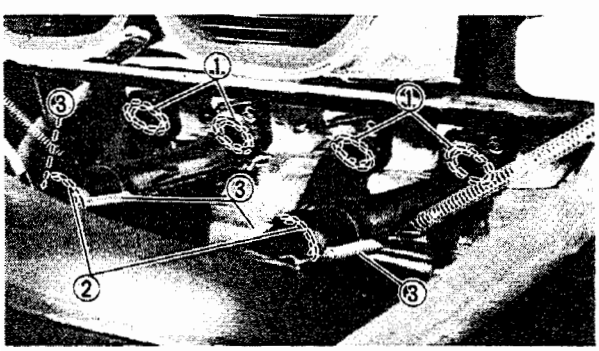
STARTER (CHOKE) CABLE ADJUSTMENT

1. Pull the outer tube of the starter cable ① upward at the carburetor.
2. Measure:
   - Starter cable free play ⓐ
     Out of specification→Adjust.

Free play ⓐ :
0.5 ~ 1.5 mm (0.02 ~ 0.06 in)



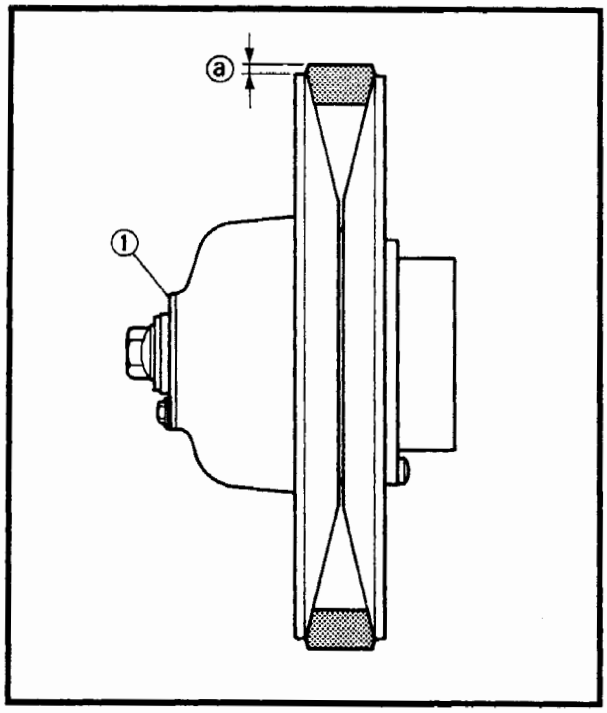
3. Adjust:
   - Starter cable adjuster ①



EXHAUST SYSTEM

1. Inspect:
   - Exhaust pipe gasket (s) ①
     Damage→Replace.
     Exhaust gas leakage→Repair.
     Tighten the bolts.
   - Joint pipe exhaust gas leakage ②
     Tension spring ③ → Replace.

Bolt (exhaust pipe):
25 Nm (2.5 m•kg, 18 ft•lb)

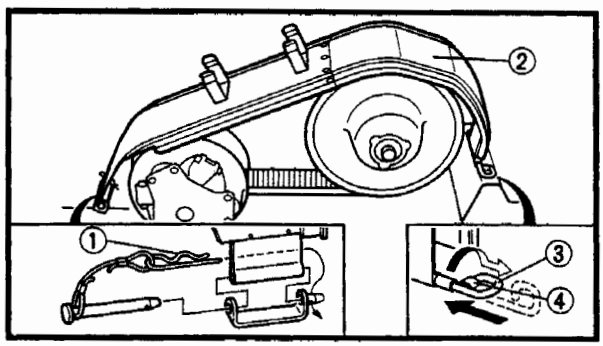


POWER TRAIN

DRIVE V-BELT

⚠ WARNING

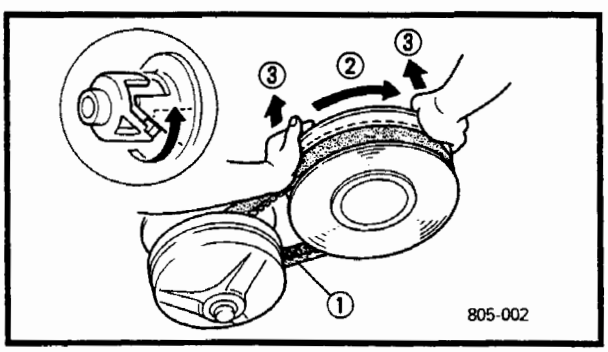
Be sure the V-Belt height ⓐ adjusted to the standard height with a spacer ① when installing a NEW belt.
If the height is incorrect, the clutch engagement speed will be reduced.
The machine may move unexpectedly when the engine is started.



1. Remove:
   - Side cowling (left) (See page 2-3)
   - Lock pin ① (drive V-belt guard)
   - Drive V-belt guard ②

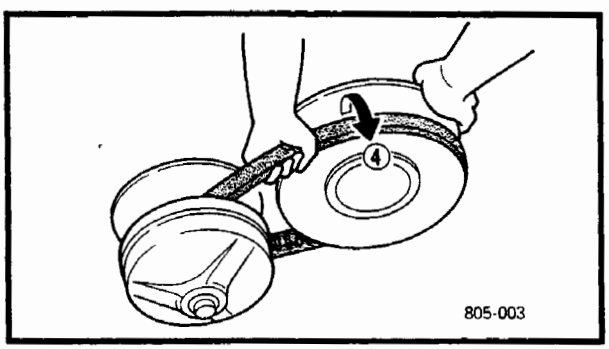
NOTE:

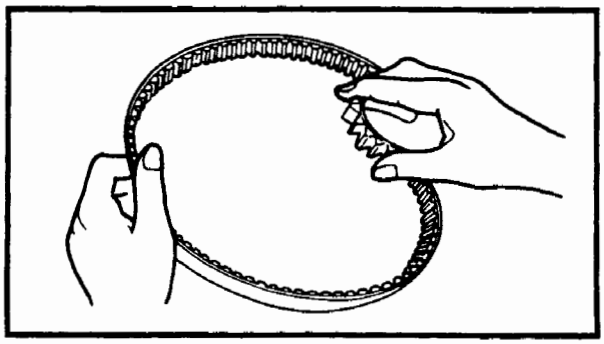
Press the holding pin ③ all the way in until it releases from the hook ④, then rotate it 90° and pull it out.



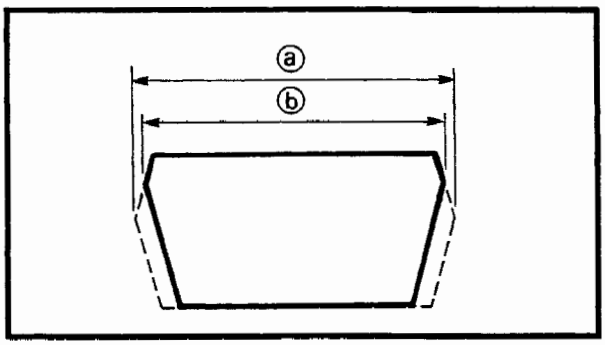
2. Remove:
   - Drive V-belt ①

Removal steps:
- Rotate the secondary sliding sheave clockwise ② and push ③ it so that it separates from the fixed sheave.
- Pull ④ the belt up over the secondary fixed sheave.
- Remove the belt from the secondary sheave and primary sheave.





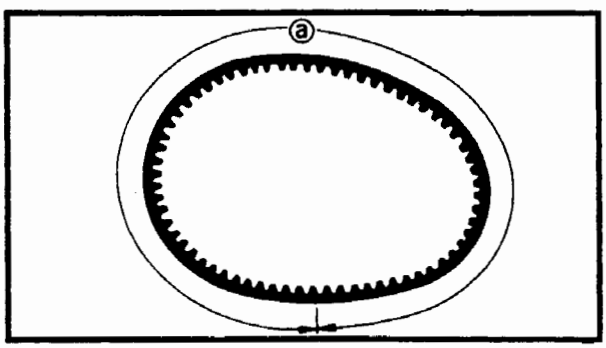
3. Inspect:
   - Drive V-belt
     Crack/Wear/Damage → Replace.
     Oil or grease adhered to the V-belt → Check the primary and secondary sheaves.



4. Measure:
   - Drive V-belt width
     Out of specification → Replace.

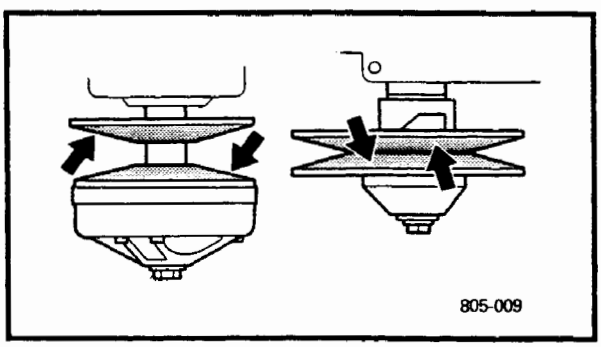
NOTE:
Be sure to measure the sheave offset, when adjusted the V-belt.

New belt width ⓐ:
34.5 mm (1.36 in)
Belt wear limit width ⓑ:
33 mm (1.30 in)

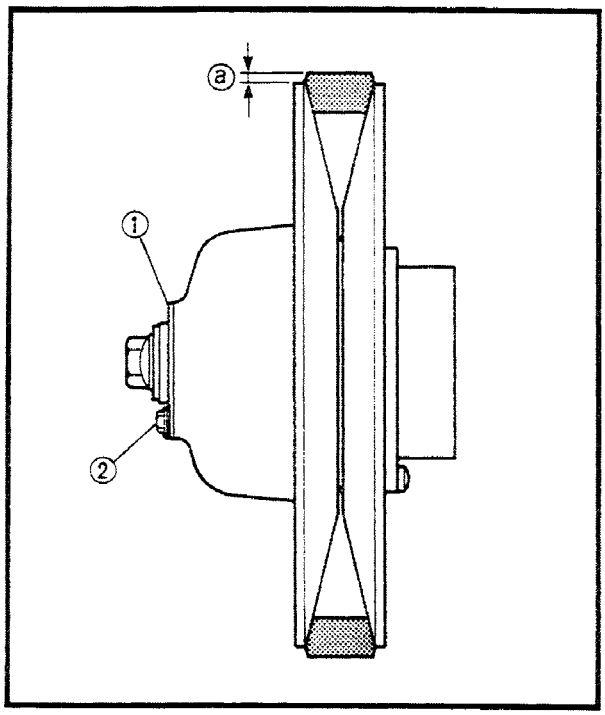


5. Measure:
   - Drive V-belt length ⓐ
     Out of specification → Replace.

Drive V-belt length:
1,336 ~ 1,344 mm (52.6 ~ 52.9 in)



6. Inspect:
   - Primary sheave
   - Secondary sheave
     Oil or grease adhered to the primary and secondary sheaves → Remove the oil or grease using a rag soaked in lacquer thinner or solvent. Check the primary and secondary sheaves.
7. Install:
   - Drive V-belt



8. Adjust:
   - V-belt height ⓐ

Adjustment steps:
- Measure from edge of secondary sheave to V-belt ⓐ.
- If out of specification, adjust the sheave gap by adding or removing a spacer ①.

Adding spacer	**gap is increased**
Removing spacer	**gap is decreased**

V-belt height ⓐ:
2 ~ 3 mm (0.08 ~ 0.12 in)

Spacer size	
1pc	0.5 mm (0.02 in)

Bolt ②:
10 Nm (1.0 m • kg, 0.4 ft • lb)

ENGAGEMENT SPEED CHECK

1. Place the machine on a level area of hard packed snow.
2. Check:
   - Clutch engagement speed

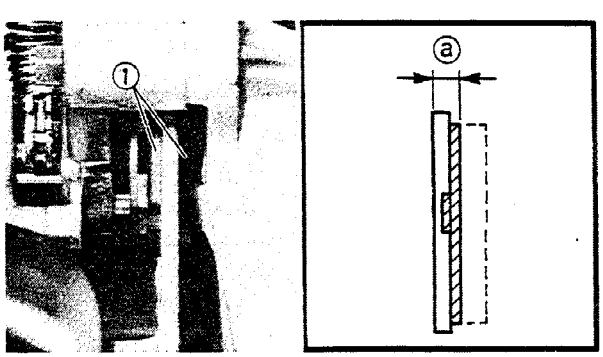
Checking steps:
- Start the engine, and open the throttle lever gradually.
- Check the engine speed when the machine starts moving forward.
  Out of specification→Adjust the primary sheave.(See page 2-37)

Engagement speed:
Approx 3,600 r/min

BRAKE PAD INSPECTION

1. Apply the brake lever.
2. Measure
   - Brake pad thickness ⓐ
     Out of specification → Replace brake pad as a set. (See page 4-24)

Wear limit:
5.2 mm (0.20 in)

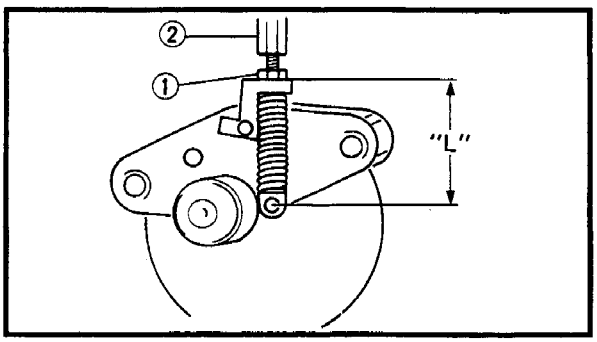


① Brake pad

BRAKE ADJUSTMENT

NOTE:

Adjust brake every 40 hours of operation, or whenever the brake kever becomes loose during operation.



1. Measure:
   - Distance "L"
     Out of specification → Adjust.

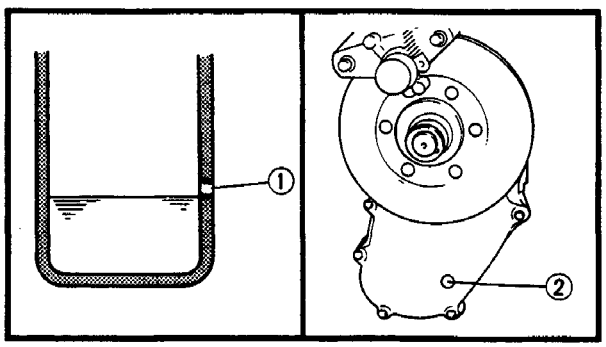
Distance "L"
69.0 ~ 73.0 mm (2.72 ~ 2.87 in)

2. Adjust:
   - Distance "L"

Adjustment steps:
- Loosen the locknut ①.
- Turn the adjuster② in or out until the specified distance is obtained.

Turning out	**Distance "L" is increased.**
Turning in	**Distance "L" is decreased.**

- Tighten the locknut ①.



DRIVE CHAIN

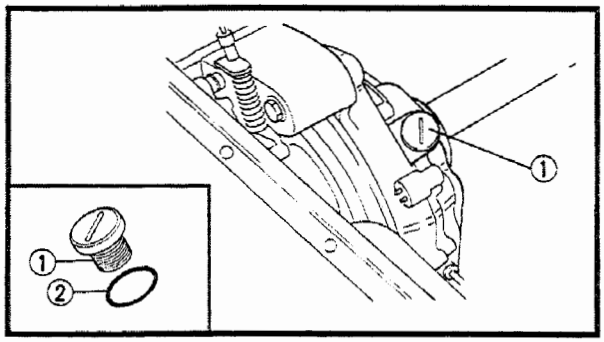
Oil Level Inspection

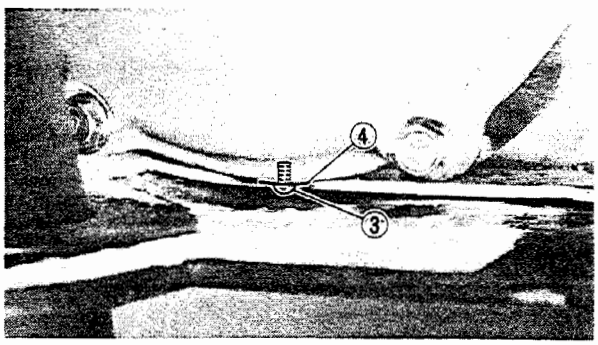
1. Place the machine on a level surface.
2. Remove:
   - Side cowling (right) (See page 2-3)
3. Place a rag under the checking hole ① (oil level).
4. Remove:
   - Checking bolt ②
   - Gasket (checking bolt)
5. Inspect:
   - Oil level (drive chain housing)
     Oil flows out → Oil level is correct.
     Oil does not flow out → Oil level is low.
     Add oil until oil flows out.

Recommended oil:
Gear oil API GL-3 SAE #75
or #80 or SAE #10W-30

6. Inspect:
   - Gasket (checking bolt)
     Damage → Replace.
7. Install:
   - Gasket (checking bolt)
   - Checking bolt ②

Checking bolt:
6 Nm (0.6 m • kg, 4.3 ft • lb)





Oil Replacement

1. Place a drain pan under the drain hole:
2. Remove:
   - Oil filler cap ①
   - O-ring ② (oil filler cap)
   - Drain screw ③
   - Gasket ④ (drain screw)

   Drain the oil.
3. Inspect:
   - O-ring ② (oil filler cap)
   - Gasket ④ (drain screw)

   Damage → Replace.
4. Install:
   - Gasket (drain screw)
   - Drain screw

Drain screw:
6 Nm (0.6 m • kg, 4.3 ft • lb)

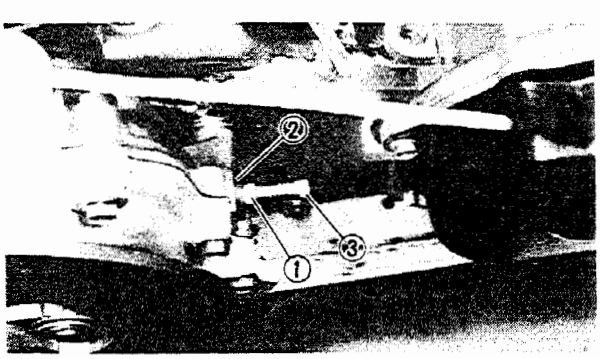
5. Fill:
   - Drive chain housing

CAUTION:

Be sure no foreign material enters the chain housing case.

Recommended oil:
Gear oil API GL-3 SAE #75 or #80 or SAE #10W-30
Oil capacity:
3.5L (3.1 Imp qt, 3.6 US qt)

6. Install:
   - O-ring (oil filler cap)
   - Oil filler cap



Chain Slack Adjustment

1. Adjust:
   - Drive chain slack

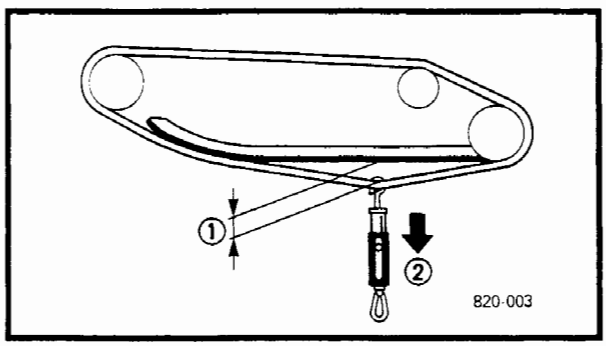
Adjustment steps:
- Loosen the locknut ① and unthread sealing washer ② slightly.
- Turn the adjuster ③ in finger tight.
- Tighten the locknut.

TRACK TENSION ADJUSTMENT

⚠ WARNING

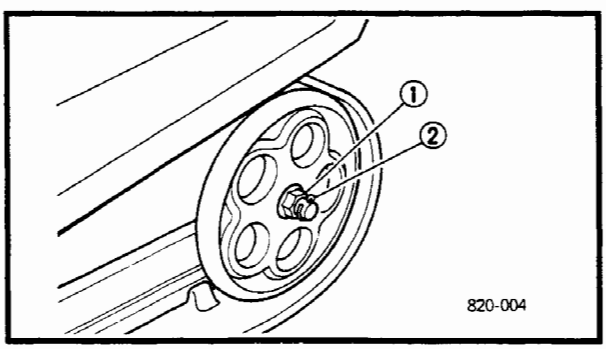
A broken track, track fittings, or debris thrown by the track could be dangerous to an operator or bystanders. Observe the following precautions.

- **Do not allow anyone to stand behind the machine when the engine is running.**
- **When the rear of the machine is raised to allow the track to spin, a suitable stand must be used to support the rear of the machine. Never allow anyone to hold the rear of the machine off the ground to allow the track to spin. Never allow anyone near a rotating track.**
- **Inspect track condition frequently. Replace the track if it is damaged to the depth where fabric reinforcement material is visible.**
- **Never install studs (cleats) closer than three inches from the edge of the track.**



1. Place the machine with the right side facing down.
2. Measure:
   - Track deflection ①
     Pull at the track center window by a force of 10 kg (22 lb) using a spring scale.
     Out of specification → Adjust.

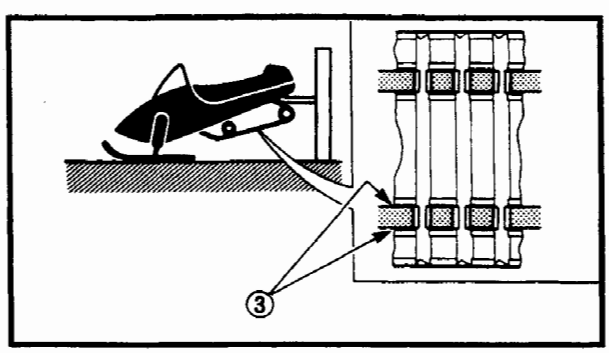
Track deflection:
20 ~ 25 mm/10 kg
(0.79 ~ 0.98 in/22 lb)



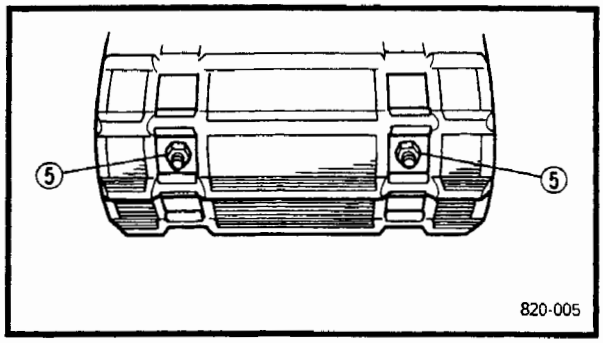
3. Adjust:
   - Track deflection

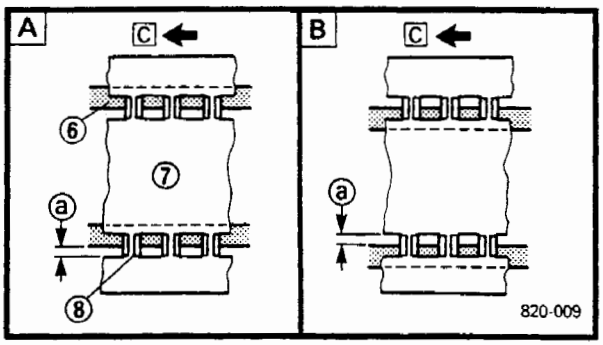
Adjustment steps:
- Lift the rear of the machine onto a suitable stand to raise the track off the ground.
- Loosen the rear axle nut ①.

NOTE:
It is not necessary to remove the cotter pin ②.



a. Start the engine and rotate the track one or two turns. Stop the engine.
b. Check the track alignment with the slide runner ③.
   If the alignment is incorrect, turn the left and right adjusters to adjust.





Track alignment	A Shifted to right	B Shifted to left
④ Left adjuster nut	Turn out	Turn in
⑤ Right adjuster nut	Turn in	Turn out

⑥ Slide runner ⑦ Track
⑧ Track metal ⓐ Gap C Forward

c. Adjust track deflection to the specified amount.

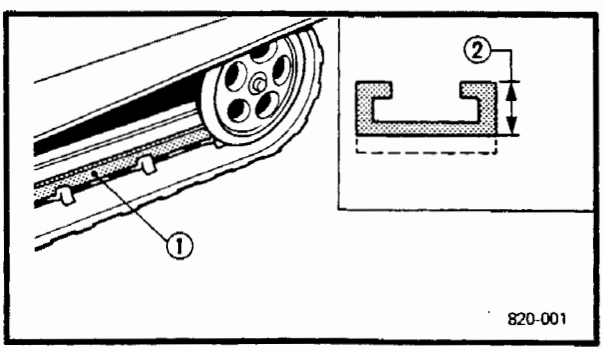
Track deflection	More than Specified	Less than Specified
④ Left adjuster nut	Turn in	Turn out
⑤ Right adjuster nut	Turn in	Turn out

CAUTION:

The adjusters should be turned an equal amount.

- Recheck alignment and deflection. If necessary, repeat steps "a" to "c" until proper adjustment is achieved.
- Tighten the rear axle nut.

Rear axle nut:
75 Nm (7.5 m•kg, 54 ft•lb)

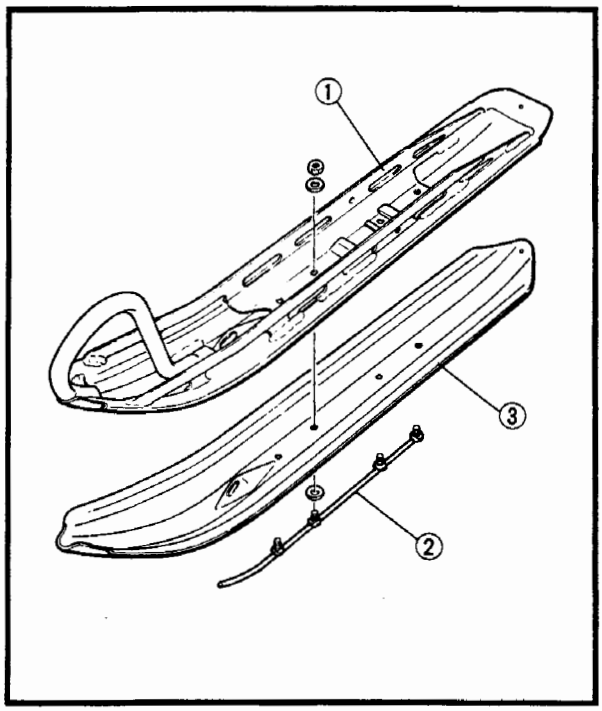


SLIDE RUNNER INSPECTION

1. Inspect:
   - Slide runner ①
     Cracks/Damage/Wear→Replace.

2. Measure:
   - Slide runner thickness ⓐ
     Out of specification → Replace.
     (See page 4-31)

Wear limit:
10 mm (0.39 in)



CHASSIS

SKI/SKI RUNNER

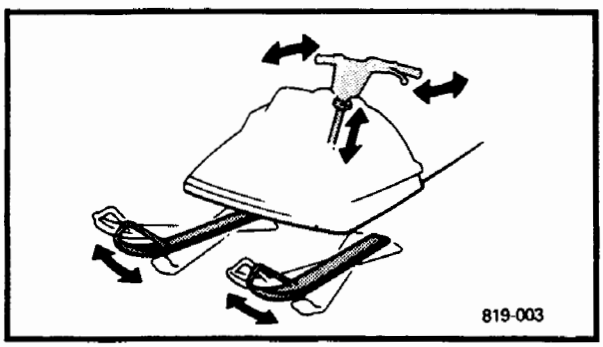
1. Check:
   - Ski ①
   - Ski runner ②
   - Ski cover ③

   Wear/Damage → Replace.

Ski runner wear limit ①:
8 mm (0.31 in)

CAUTION:

Do not operate the machine without the ski cover ③ to prevent the ski wear and damage.



STEERING SYSTEM

Free Play check

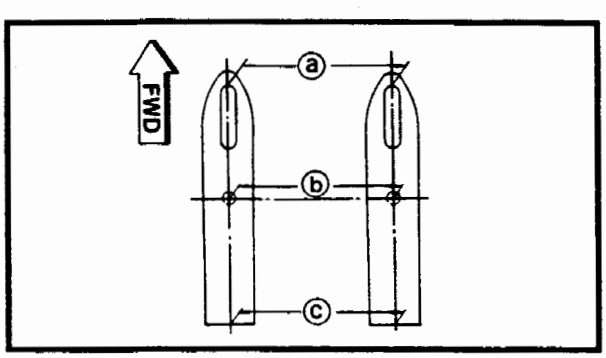
1. Check:
   - Steering system free play

   Push the handlebar up and down and back and forth.

   Turn the handlebar slightly to the right and left.

   Excessive free play→check to be sure the handlebar, tie rod ends and relay rod ends are installed securely in position. If free play still exists, check the steering bearing front suspension links and ski mounting area for wear, and replace if necessary.

   (See page 3-9)



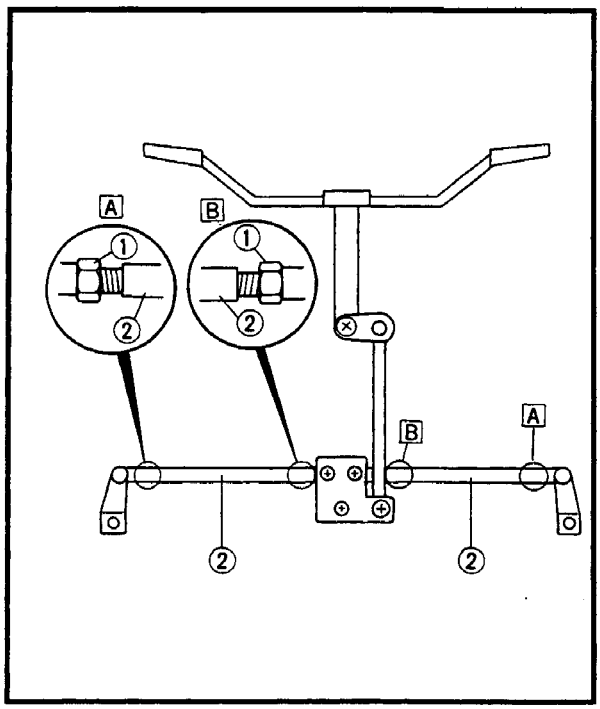
Toe-Out Adjustment

1. Place the machine on a level surface.
2. Check:
   - Ski toe-out

   Direct the skis straight forward.

   Out of specification → Adjust.

Ski toe - out (ⓐ – ⓒ):
0.0 ~ 15.0 mm (0.0 ~ 0.6 in)
Ski stance (center to center) ⓑ:
977 mm (38.5 in)



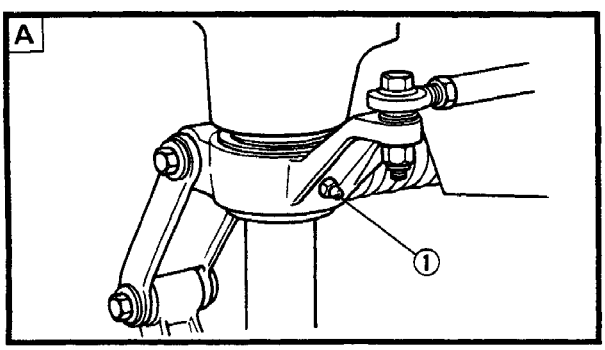
3. Adjust:
   - Ski toe-out

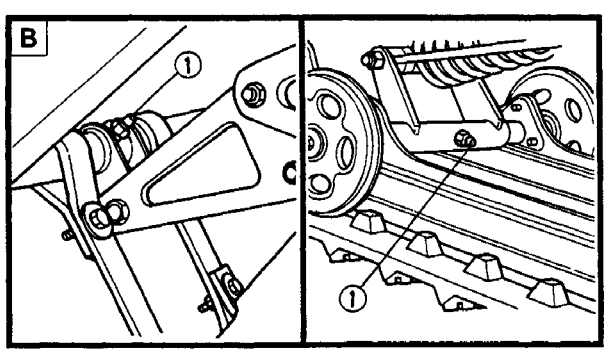
Adjustment steps:
- Mark both tie-rod ends.
  This reference point will be needed during adjustment.
- Loosen the locknuts ① (tie-rod end) of both tie-rods.
- The same number of turns should be given to both tie-rods ② right and left until the specified toe out is obtained, so that the leghts of the rods will be kept the same.
- Tighten the rod end locknuts of both tie-rods.

Locknut (rod end):
25 Nm (2.5 m · kg, 18 ft · lb)

⚠ WARNING

Be sure that both tie-rods are turned the same amount. If not, the machine will drift right or left even though the handlebar is positioned straight. This could lead to mishandling or an accident.





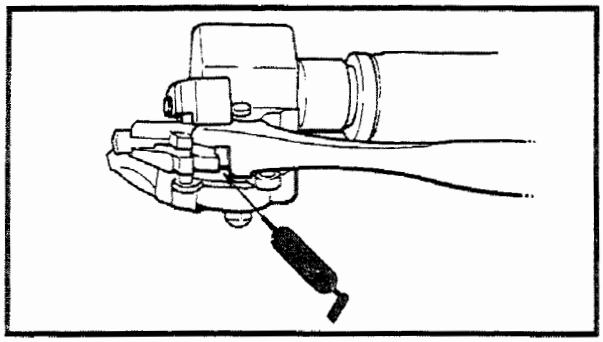
LUBRICATION

Front and Rear Suspension

1. Inject grease through nipples① using a grease gun.

Esso Beacon 325 Grease or Aeroshell Grease #7A.

A Front
B Rear



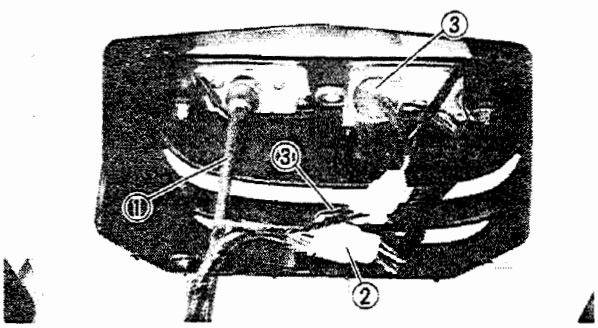
Brake Lever, Brake Cable End and Throttle Lever

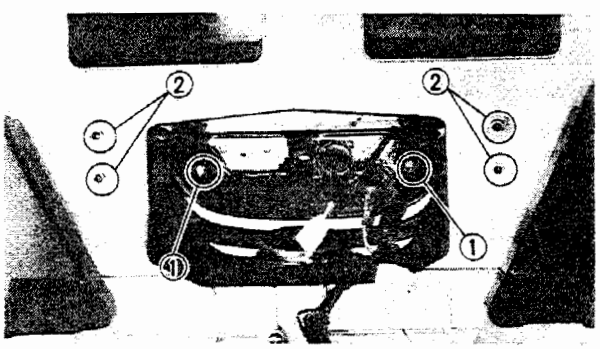
1. Lubricate the brake lever pivot, brake cable end and throttle lever.

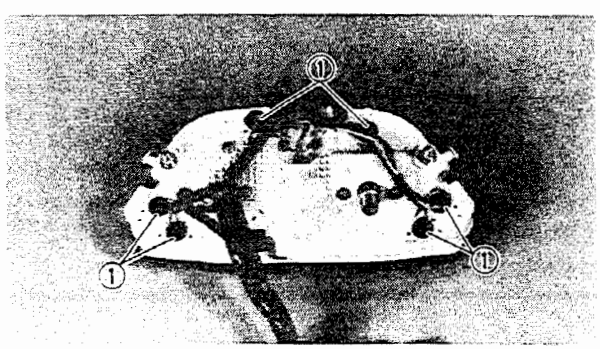
	Esso Beacon 325 Grease.

⚠ WARNING

Apply a dab of grease to the cable end only. Do not grease the brake/throttle cables themselves because they could become frozen, which could cause loss of control.







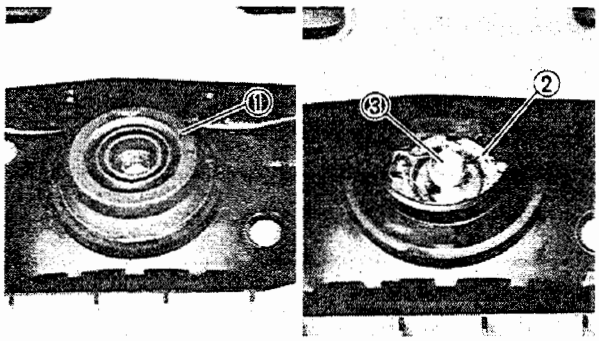
ELECTRICAL

HEADLIGHT AND METER LIGHT BULB REPLACEMENT

1. Disconnect:
   - Speedometer cable ①
   - Meter coupler ②
   - Condenser ③
     (for fuel meter system)
   - Headlight coupler ④

2. Remove:
   - Nuts ① (meter assembly)
   - Nuts ② (meter stay)
     Separate the meter and meter stay.
   - Meter assembly
   - Meter stay

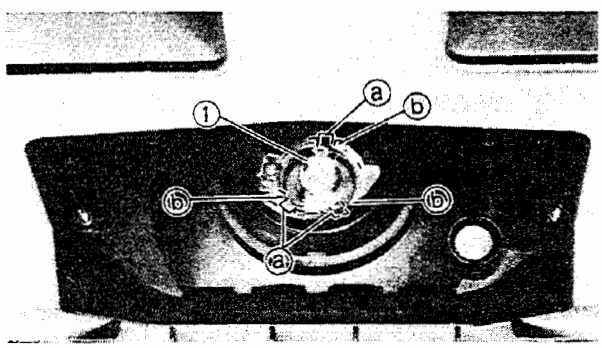
3. Remove:
   - Bulb (defective)
     Pull out the bulb holder ① from the meter case and pull out the bulb from bulb holder.
4. Install:
   - Bulb (new)

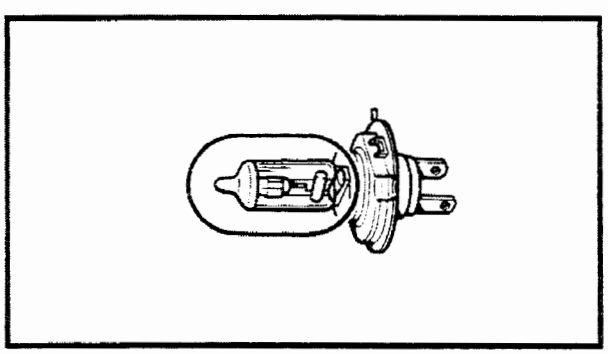


5. Remove:
   - Bulb cover ①
6. Unhook:
   - Bulb holder ②
7. Remove:
   - Bulb (defective) ③

⚠ WARNING

Keep flammable products (and your hands) away from the bulb while it is on; it will be hot. Do not touch the bulb until it cools down.





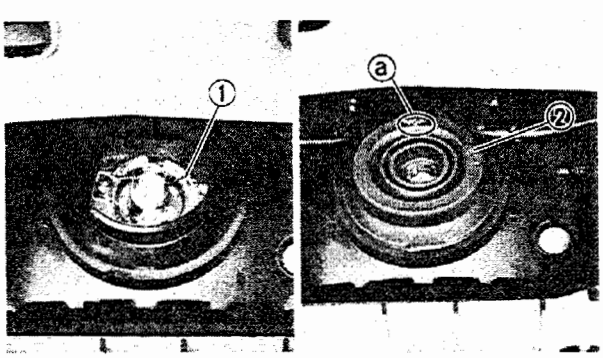
8. Install:
   - Bulb (new) ①

NOTE:

Make sure the projections ⓐ on the bulb are meshed with the slots ⓑ on the light case.

CAUTION:

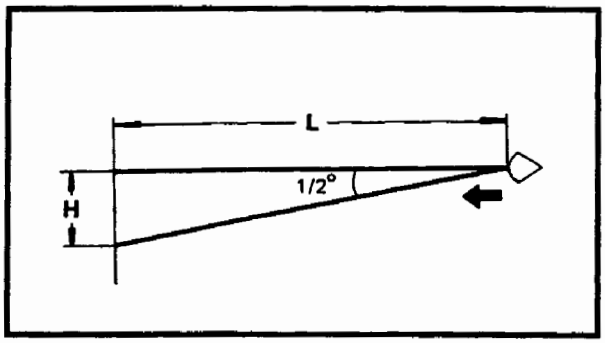
Avoid touching the glass part of the bulb. Keep it free from oil; otherwise, the transparency of the glass, life of the bulb and illuminous flux will be adversely affected. If oil gets on the bulb, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.

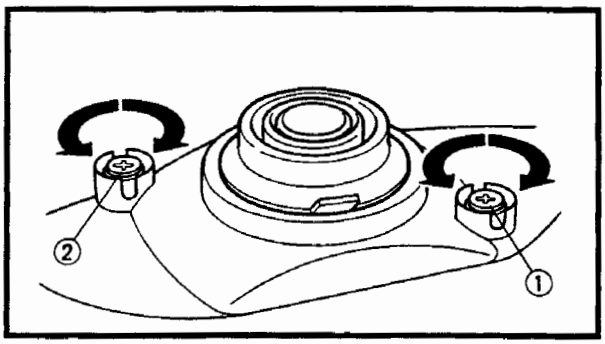


9. Hook:
   - Bulb holder ①
10. Install:
   - Cover (bulb holder) ②

NOTE:

Install the bulb holder cover so that the "TOP" mark ⓐ faces upward.





HEADLIGHT BEAM ADJUSTMENT

1. Place the machine on a level place.
2. Inspect:
   - Headlight beam direction (vertically)
     The high beam should be directed downward at an angle of 1/2° to the horizontal line. If not, adjust the direction (vertically).

L	3.0 m (10 ft)	7.6 m (25 ft)
H	26 mm (1.0 in)	66 mm (2.6 in)

3. Adjust:
   - Headlight beam (vertically)

Vertical adjustment	
Higher	Turn the adjusting screw ① counter clockwise.
Lower	Turn the adjusting screw① clockwise.

4. Adjust:
   - Headlight beam (horizontally)

Horizontal adjustment	
Right	Turn adjusting screw ② counter clockwise.
Left	Turn adjusting screw ② clockwise.

TUNING

CARBURETOR TUNING

The carburetor is set at the factory to run at temperatures of 0°C ~ -20°C (32°F ~ -4°F) at sea level. If the machine has to be operated under conditions other than specified above, the carburetor must be reset as required. Special care should be taken in carburetor setting so that the piston will not be damaged or seized.

CAUTION:

In this model, the engine oil is mixed with the fuel just before the fuel enters the carburetors. During initial fuel flow to the carburetor it is not always possible to supply the optimum fuel/oil mixture depending on the throttle opening.Therefore, after the carburetors have been tuned or maintained, or after the float chamber is removed for cleaning or jet replacement, be sure to idle the engine for about three minutes in order to avoid engine trouble.

CAUTION:

Before performing the carburetor tuning, make sure that the following items are set to specification.

- **Engine Idle speed adjustment**
- **Throttle cable free play adjustment**
- **Carburetor synchronization**
- **Starter cable adjustment**
- **Oil pump cable free play adjustment**

Carburetor Tuning Data

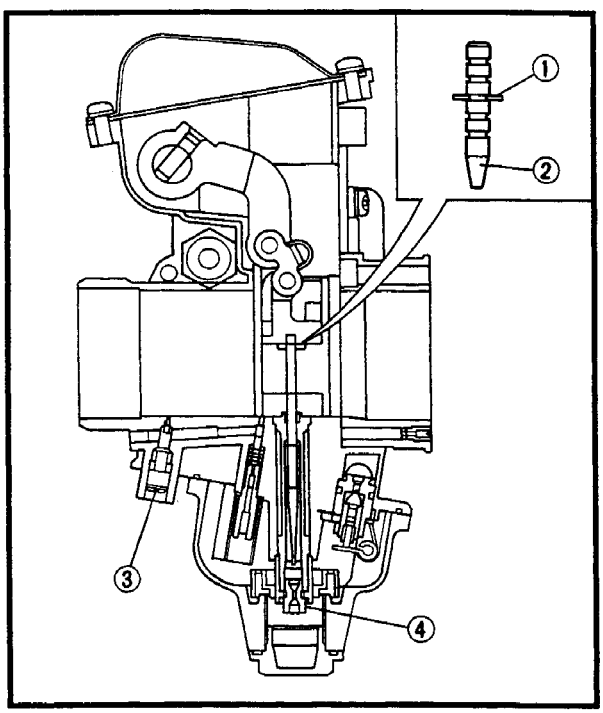
1. Standard specifications

Model	**TM33 x 4**
Manufacturer	**MIKUNI**
I.D. Mark	**89A-00**
Main jet (M.J.)	**#140**
Pilot jet (P.J.)	**#50**
Jet needle (J.N.)	**6GN14-3**
Float height	**11.3 ~ 15.3 mm (0.44 ~ 0.60 in)**
Idle speed	**1,400 ~ 1,600 r/min**

2. High altitude tuning
Use the following guide to select main jets according to variations in elevation and temperature.

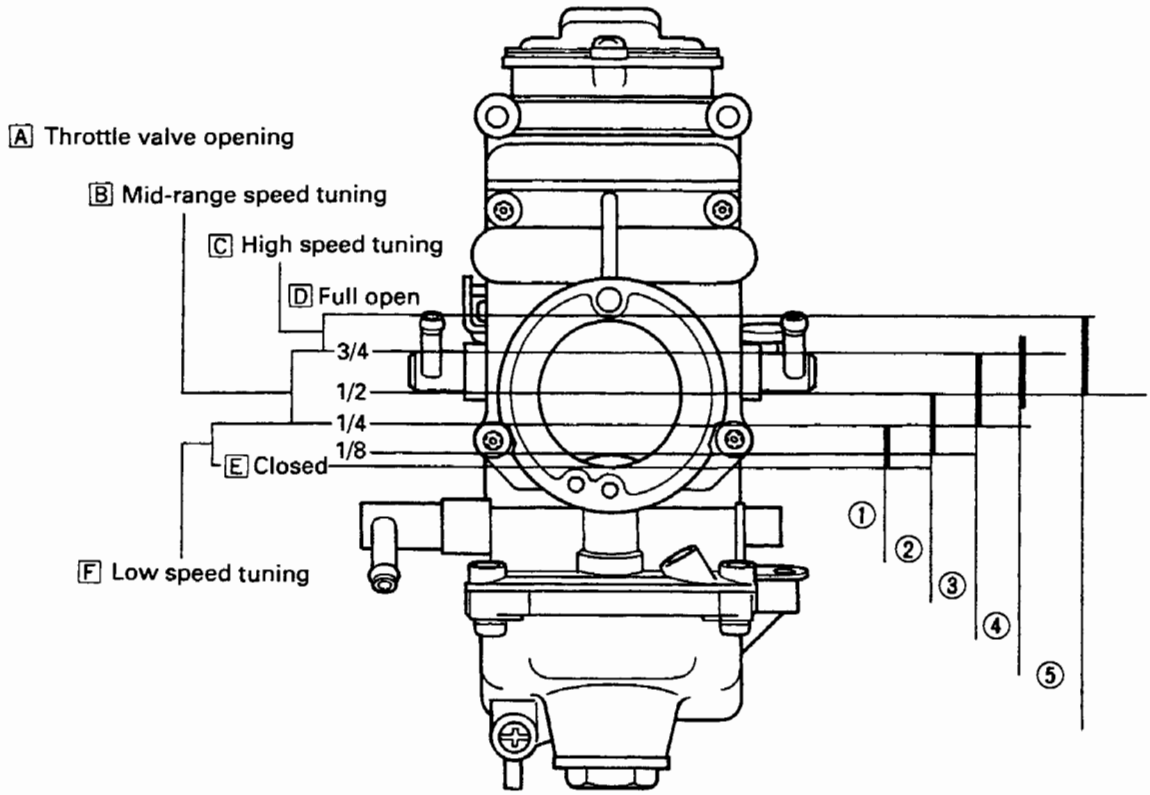
Altitude \ Temperature	-30°C (-22°F)	-20°C (-4°F)	-10°C (14°F)	0°C (32°F)	10°C (50°F)	20°C (68°F)
0 ~ 100 m (300 ft)	#140 (STD) →					
			← #138.8			
100 ~ 600 m (2,000 ft)	#138.8 →					
			← #137.5			
600 ~ 1,200 m (4,000 ft)	#137.5 →			← #135		
		← #136.3 →				
1,200 ~ 1,800 m (6,000 ft)	#136.3 →			← #133.8 JN:2		
		← #135 →				
1,800 ~ 2,400 m (8,000 ft)	#135 →			← #131.3 JN:2		
		← #133.8 JN:2 →				
2,400 mm ~ (8,000 ft ~)	#133.8 JN:2 →			← #130 JN:2		
	← #131.3 JN:2 →				← #128.8 JN:2	

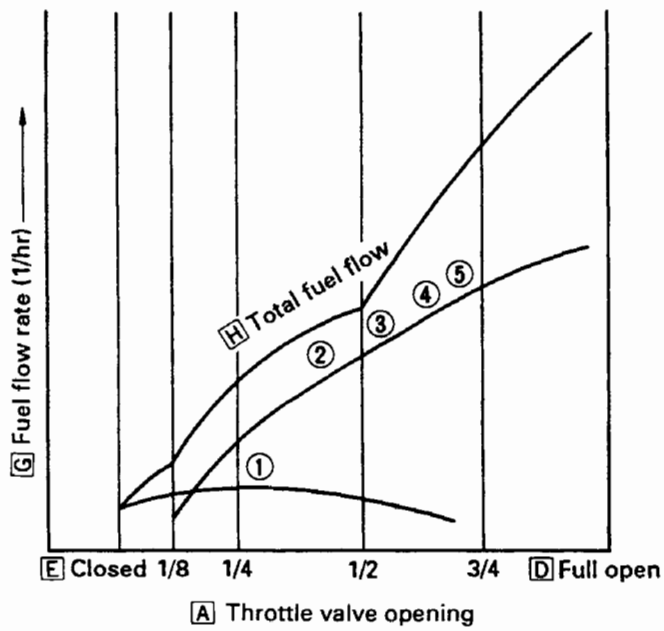
NOTE:
These jetting specifications are subject to change. Consult the latest technical information from Yamaha to be sure you have the most up-to-date jetting specifications.

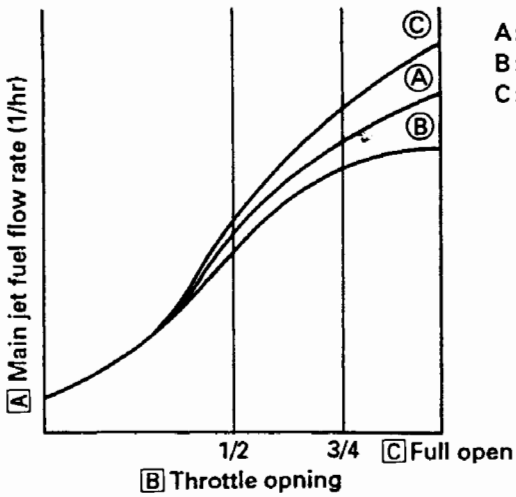


① Clip
② Jet needle
③ Pilot screw
④ Main jet

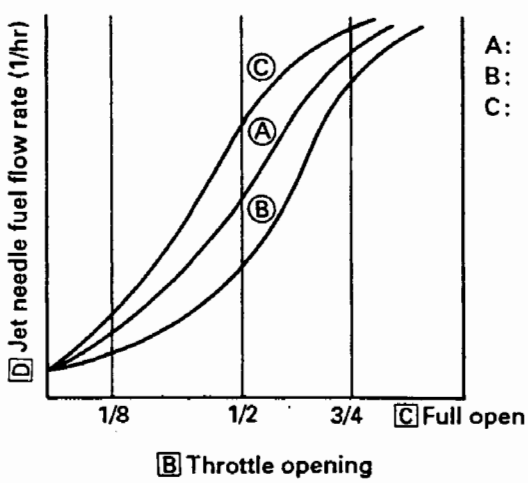
Guide for carburetion



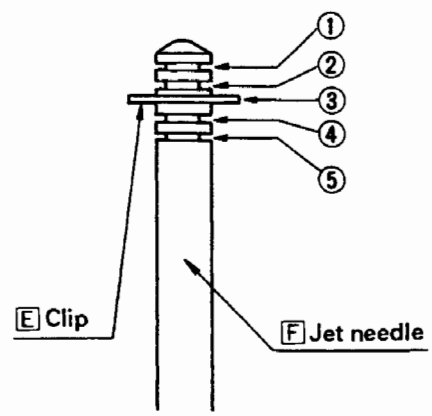




A: Standard main jet
B: Main jet whose diameter is 10% smaller than standard
C: Main jet whose diameter is 10% larger than standard

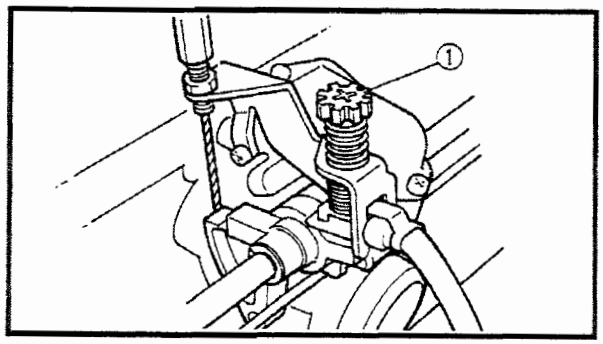


A: No. 3 position
B: No. 2 position
C: No. 4 position



CAUTION:

If the air intake silencer is removed from the carburetors, the change in pressure in the intake will create a LEAN MIXTURE that could likely result in severe engine damage. The air intake air silencer has no effect on performance characteristics and it must be secured to the carburetor during carb tuning and adjustment and it must always be in place when the engine is operated. Examine the air intake silencer regularly for cleanliness and freedom from obstruction.



Low Speed Tuning

The carburetor is built so that low speed tuning can be done by adjusting the throttle stop screw ①.

CAUTION:

The engine should never be run without the air intake silencer and air chamber installed; severe engine damage may result.

1. Start the engine, and allow it to warm up for a few minutes. The warm-up is complete when the engine responds normally to the throttle opening.

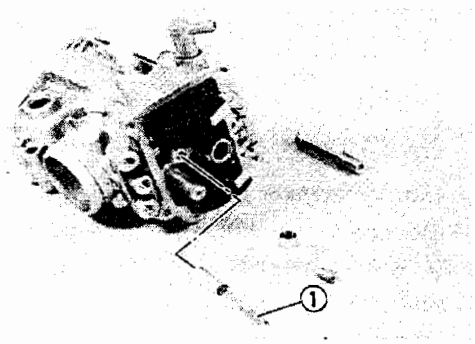
⚠ WARNING

Do not move the throttle enough to reach the following engine speed. The snowmobile could accidentally start to move forward.

Engine revolutions: 3,000 r/min

2. Set the engine idle speed by tuning the throttle stop screws in (to increase engine speed) or out (to decrease engine speed).

Standard idle speed: 1,400 ~ 1,600 r/min



3. If the engine low speed performance is still poor in high elevation under extreme conditions, the standard piliot jets may need to be replaced to obtain proper pilot air/fuel mixture.

NOTE:

In this case, set the carburetor on the richer side; use a larger number pilot jet ①.

Standard pilot jet: #50

4. By repeating steps 1 to 2 above, adjust the idle speed.

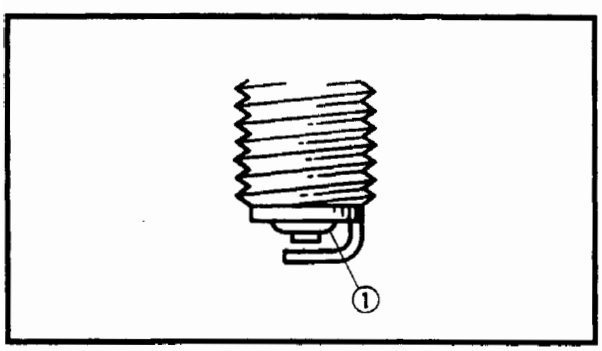
Middle-Range and High Speed Tuning

No adjustment is normally required, but adjustment is sometimes necessary depending on temperatures and/or altitude.

Middle-range speed and high speed tuning (from 1/4 to full-throttle) can be done by adjusting the main jet.

CAUTION:

The engine should never be run without the air intake silencer and air chamber installed; severe engine damage may result.



1. Start the engine and run it at high speed to make sure the engine operates smoothly.
2. Stop the engine, and remove the spark plug. Then, check the spark plug insulator ① color.
3. The main jet should be adjusted on the basis of the following chart.

Standard main jet: #140

⚠ WARNING

Never remove the main jet cover while the engine is hot. Fuel will flow out of the float chamber which could ignite and cause damage to the snowmobile and possible injury to the mechanic. Place a rag under the carburetor so fuel does not spread. Place the main jet cover in a clean place. Keep it away from fire. After assembling the carburetor, firmly tighten the intake silencer joint clamps and intake manifold clamps. Make sure the throttle cable is in place, and the throttle operates smoothly.

Main jet selection chart		
Spark plug color	Check up	Remedy
Light tan or gray.	Carburetor is tuned properly.	
Dry black or fluffy deposits.	Mixture is too rich.	Replace main jet with a one-step smaller one.
White or light gray.	Mixture is too lean.	Replace main jet with a one-step larger one.
White or gray insulator with small black or gray brown spots and with a bluish-burnt appearance of electrodes.	Due to too lean a mixture, piston is damaged or seized.	Replace the piston and spark plug. Tune the carburetor again, starting with low-speed tuning.
Melted electrodes and possibly blistered insulator. Metallic deposits on insulator.	Due to too lean a mixture, the spark plug melts.	Check the piston for holes or seizure. Check the cooling system, gasoline octane rating and ignition timing. After replacing the spark plug with colder type, tune the carburetor again starting with low-speed tuning.

Troubleshooting

Trouble	Check point	Remedy	Adjustment
Hard starting	Insufficient fuel	Add gasoline	
	Excessive use of starter (Excessively opened choke)	Clean spark plug	Return starter level to its seated position.
	Fuel passage is clogged or frozen	Clean	Parts other than carburetor. • Clogged fuel tank air vent, clogged fuel filter, or clogged fuel passage Carburetor • Clogged or frozen air vent clogged valve. • If water collects in float chamber, clean. (Also check for ice)
	Overflow	Correct	
Poor idling (Related symptoms) • Poor performance at low speeds • Poor acceleration • Slow response to throttle • Engine tends to stall	Improper idling speed adjustment • Throttle stop screw	Adjust idling speed	Adjust throttle stop screw so the engine idles at specified speed. Tightened too much – Engine speed is higher. Backed out too much – Engine does not idle.
	Clogged bypass hole	Clean	
	Clogged or loose pilot jet	Clean and retighten	Remove pilot jet, and blow it out with compressed air.
	Air leaking into carburetor joint	Retighten clamp screws	
	Defective starter valve seat	Clean or replace	
	Overflow	Correct	
Poor performance at mid-range speeds (Related symptoms) • Momentary slow response to throttle • Poor acceleration	Clogged or loose pilot jet	Clean and retighten	Remove pilot jet, and blow it out with compressed air.
	Lean mixtures	Overhaul carburetor	
Poor performance at normal speeds (Related symptoms) • Excess fuel consumption • Poor acceleration	Clogged air vent	Clean	Remove the air vent pipe, and clean.
	Clogged or loose main jet	Clean and retighten	Remove main jet, and blow it out with compressed air.
	Overflow	Check float and float valve and clean	

Trouble	Check point	Remedy	Adjustment
Poor performance at high speeds (Related symptoms) • Power loss • Poor acceleration	Starter valve is left open	Fully close valve	Return starter lever to its home position.
	Clogged air vent	Remove and clean	
	Clogged or loose main jet	Clean and retighten	Remove main jet, and clean with compressed air, then install.
	Clogged fuel pipe	Clean or replace	
	Dirty fuel tank	Clean fuel tank	
	Air leaking into fuel line	Check joint and re-tighten	
	Low fuel pump performance	Repair pump or replace	
	Clogged fuel filter	Replace	
	Clogged intake	Check for ice, and remove	
Abnormal combustion (Mainly backfire)	Lean mixtures	Clean carburetor and adjust	
	Dirty carburetor	Clean carburetor	
	Dirty or clogged fuel pipe	Clean or replace fuel pipe	
Overflow (Related symptoms) • Poor idling • Poor performance at low, mid-range, and high speeds • Excessive fuel consumption • Hard starting • Power loss • Poor acceleration	Clogged air vent	Clean	
	Clogged float valve	Disassemble and clean	Clean while taking care not to scratch valve seat.
	Scratched or unevenly worn float valve or valve seat	Clean or replace float valve and valve seat	Replace if seat is damaged.
	Broken float	Replace float	
	Incorrect float level • Worn float tang • Worn pin • Deformed float arm	If not within the specified range, check the following parts and replace any defective part. • Replace float • Replace arm pin • Replace float	Replace float assembly.

CLUTCH TUNING
High Altitude Tuning

Clutch Setting Data

A Item	0 ~ 1,000 m 3,500 ft/1,000 m (STD)	750 ~ 1,700 m 2,500 ft ~ 5,500 ft (MA)	1,500 ~ 2,500 m 5,000 ft ~ 8,000 ft (MA)	2,100 m ~ 7,000 ft ~ (HA)	
B Clutch Engagement RPM:	R Approx 3,600 rpm	←	←	←	
C Shift RPM:	R Approx 8250 rpm	←	←	←	
D Primary Sheave Weight Arm:					
E Part Number	89A-17605-00	←	←	←	
F Weight (Rivet)	S Steel	←	T Aluminum	←	
G Quantity	3 pcs	←	←	←	
H Primary Sheave Spring:					
E Part Number	90501-524G5	90501-553G6	←	90501-556G5	✱ 90501-607G0
I Color Code	Go-Y-Go	W-Y-W	←	W-L-W	G-L-G
J Pre-load/Sheave Spring:	25 kg (55.1 lb)	←	←	20 kg (44.1 lb)	←
K Spring Rate	1.50 kg/mm (15 N/mm, 84 lb/in)	2.25 kg/mm (22 N/mm, 126 lb/in)	←	2.25 kg/mm (22 N/mm, 126 lb/in)	2.75 kg/mm (27 N/mm, 154 lb/in)
L Free Length	82.1 mm (8.23 in)	76.5 mm (3.01 in)	←	74.3 mm (2.93 in)	72.7 mm (2.86 in)
M Secondary Sheave Spring:					
E Part Number	90508-553A1	←	←	←	
I Color Code	R	←	←	←	
N Twist Angle	33°	←	←	53°	
O Hole Position:					
P Sheave Side	A	←	←	C	
Q Spring Seat Side	3	←	←	3	
L Free Length	90.0 mm (3.54 in)	←	←	←	

✱Use heavy load and hill climb conditions

Go ..... Gold
Y ..... Yellow
R ..... Red
L ..... Blue
W ..... White
G ..... Green
P ..... Pink

GEARING SELECTION

The reduction ratio of driven gear to drive gear must be set according to the snow condition. If there are many rough surfaces or unfavorable snow conditions, the drive/driven gear ratio should be made larger. If there are few rough surfaces or better snow condition; the ratio should be made smaller.

Gear Ratio Chart

The following drive and driven gears and chains are available as options. The figures in upper lines represent the driven and drive gear ratios, while those in lower lines represent the number of chain links.

NOTE:

Do not set the gearing to any of the indicated (x) settings.

[B] Driven gear \ [A] Drive gear	20T	21T	22T	23T	24T
33T	*2 1.650 66L	X	X	1.435 68L	1.375 68L
35T	1.750 68L	1.667 68L	1.591 68L	X	1.458 70L
37T	*1 1.850 68L	X	1.682 70L	1.609 70L	1.542 70L
39T	1.950 70L	1.857 70L	1.773 70L	X	X

[C] Drive gear options	
[D] Yamaha Parts No.	[E] Sprocket Teeth
89A-17682-00	*2 20 T
89A-17682-10	21 T
89A-17682-20	22 T
89A-17682-30	23 T
89A-17682-40	24 T

[C] Driven gear options	
[D] Yamaha Parts No.	[E] Sprocket Teeth
89A-47587-30	*2 33 T
89A-47587-50	35 T
89A-47587-70	*1 37 T
89A-47587-90	39 T

*1 : for use in heavy load and hill climb

*2 : standard

[G] Chain options	
[D] Yamaha Parts No.	[F] No. of links
*94860-03066	66
94860-03068	68
94860-03070	70

*Standard

High Altitude Tuning

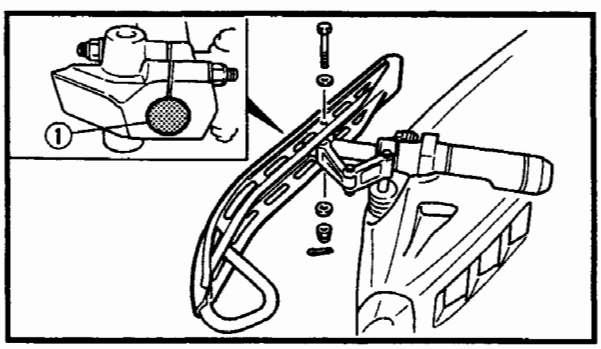
		0 ~ 1,000 m (0 ~ 3,500 ft)(STD)	750 ~ 1,700 m (2,500 ~ 5,500 ft)	1,500 ~2,500 m (5,000 ~ 8,000 ft)	2,100 ~ (HA) 7,000 ft ~ (HA)
[A] Secondary gear ratio		20/33 (0.606)	←	←	←
[B] Drive gear	[E] Part No.	89A-17682-00	←	←	←
	[F] Teeth	20T	←	←	←
[C] Driven gear	[E] Part No.	89A-47587-30	←	←	←
	[F] Teeth	33T	←	←	←
[D] Chain	[E] Part No.	94860-03066	←	←	←
	[G] No. of links	66L	←	←	←

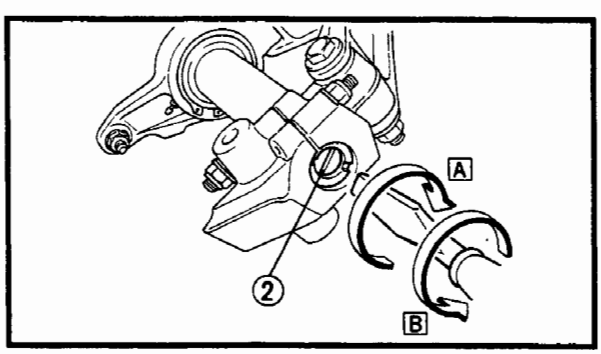
SUSPENSION

The suspension can be adjusted to suit rider preference. A softer setting, for example, may provide greater rider comfort, while a stiffer setting may allow more precise handling and control over certain types of terrain or riding conditions.

Front suspension

1. Adjust:
   - Damping force





Adjustment steps:

- Lay the machine on its side.
- Remove the ski and damper cap ①.
- Turn the adjuster ② in or out to adjust the damping force.

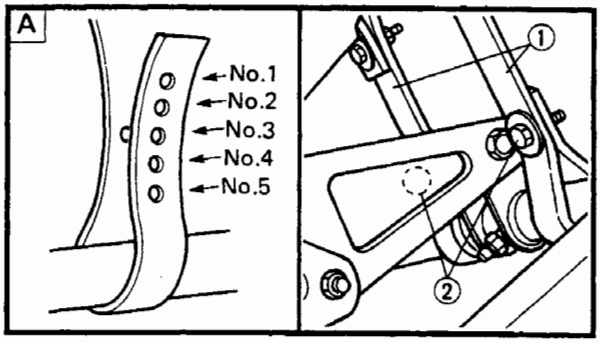
Adjuster Position	36 clicks out — 12 clicks out — 6 clicks out — 0 Min. — Standard — Max. Turns out [B] ← → Turns in [A]	
Damping force	Almost same as 12 clicks out	← Softer — Stiffer →

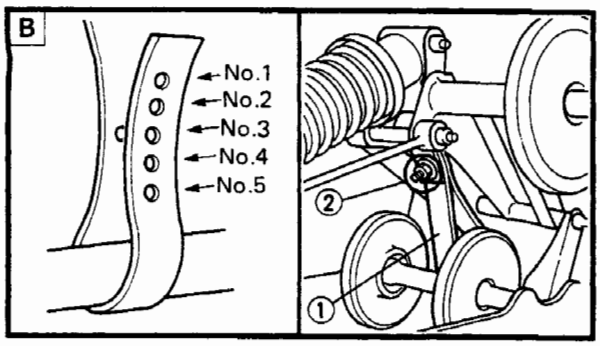
CAUTION:

Be sure the left and right damper adjuster is same position.

- Reinstall the damper cap and ski.

	Nut (ski): **45 Nm (4.5 m • kg , 32.5 ft • lb)**





Rear Suspension

Stopper band setting

1. Adjust:
   - Stopper band length

NOTE:
This adjustment affects the handling characteristics of the machine.

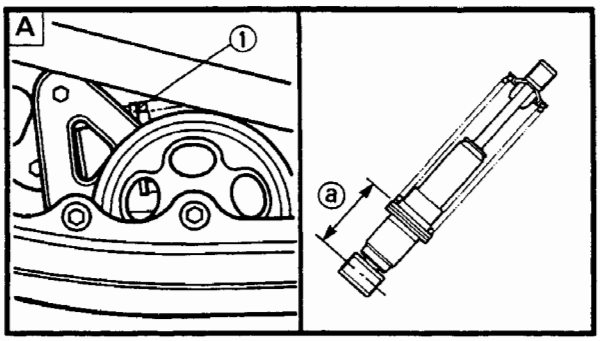
Adjustment Steps • Remove the stopper band securing bolt (2) and washers. • Adjust the length of the stopper band (1).
Standard Setting: **Front [A] : No. 3 hole** **Rear [B] : No 3 hole**
• Tighten the bolt (stopper band)
Nut (stopper band): **4 Nm (0.4m-kg, 2.9 ft-lb)**
Choosing other settings: **NOTE:** The standard settings work well under most general riding conditions. The suspension can be adjusted to work better in one condition, but only at the expense of another. Keep this in mind when you adjust the suspension.

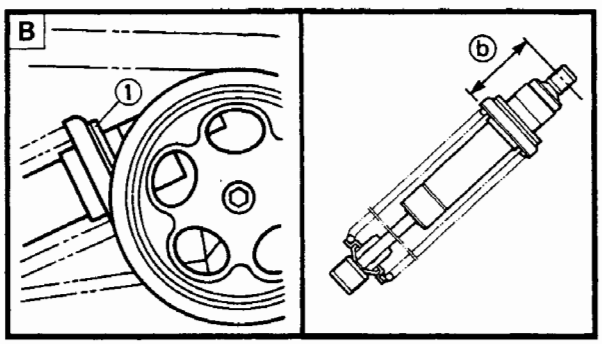
Front [A] ;

No. 5 hole (Shortest)	No. 1 hole (Longest)
More weight on skis: • Heavy steering/ oversteer • More maneuverability Favors: hardpack snow, ice, smooth trails, tight turns	Less weight on skis: • Light steering/ understeer • Better acceleration and speed Favors: deep snow, straight line acceleration, top speed

Rear [B] ;

No. 1 hole (Longest)	No. 5 hole (Shortest)
Less weight on track: • More suspension travel • Greater riding comfort Favors: Rougher trails	More weight on track: • Better acceleration and speed • Firmer handling Favors: deep snow, smooth surfaces





Spring Preload

1. Adjust:
   - Spring preload

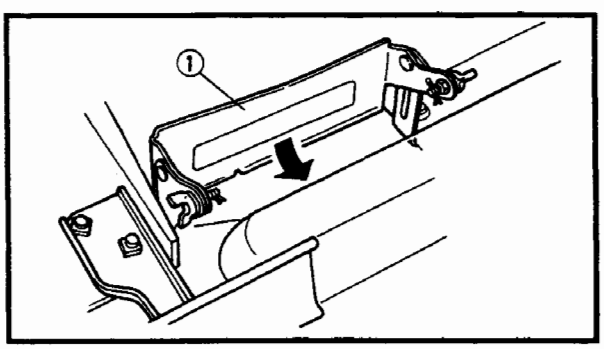
Adjustment steps:
- Turn the spring seat ① in or out.

Spring Seat Distance	Standard Longer ↔ Shorter		
Preload	Harder ↔ Softer		
ⓐ Distance (Front)	Max. 84.5 mm (3.33 in)	72 mm (2.83 in)	Main. 69.5 mm (2.74 in)
ⓑ Distance (Rear)	Max. 85 mm (3.35 in)	77 mm (3.03 in)	Main. 69 mm (2.72 in)

[A] Front
[B] Rear

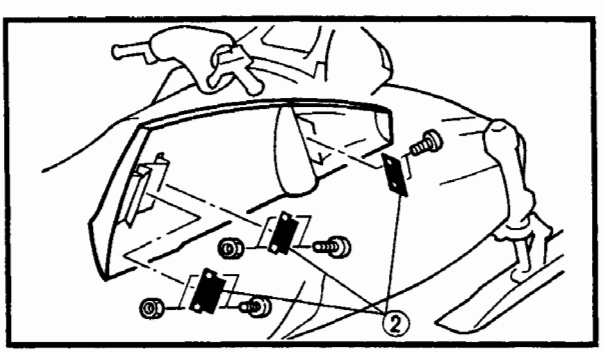
⚠ WARNING

This shock absorber contains highly pressurized nitrogen gas.
Do not tamper with or attempt to open the shock absorber assembly.
Do not subject the shock absorber assembly to open flame or high heat, which could cause it to explode.



ENGINE ROOM PLATES

Open the plates to cool down the engine room.

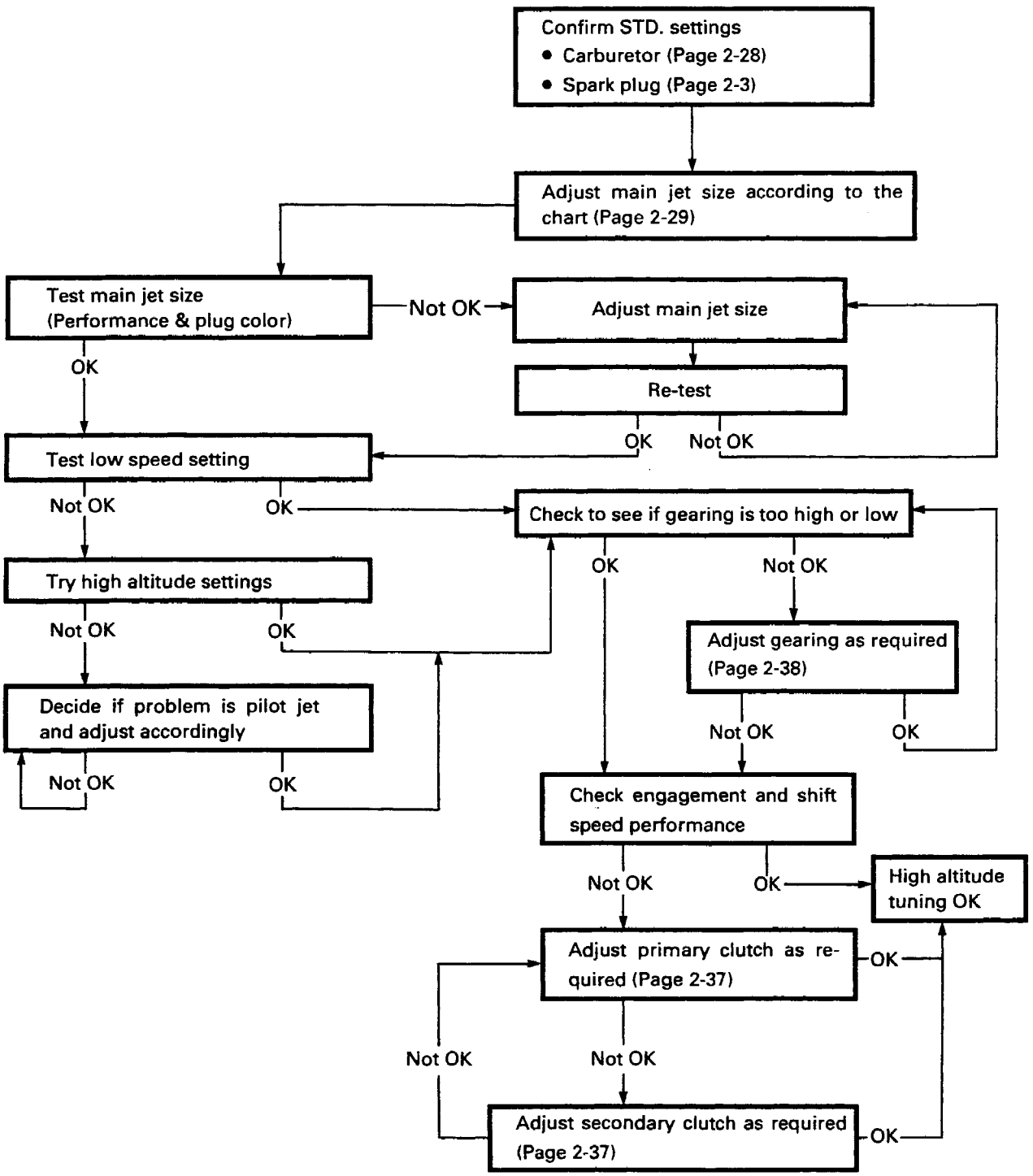


CAUTION:

- **Close the plates ① and attach the louver plates ② when the machine is operated in deep powder snow.**
- **Remove the louver plates ② when the atmospheric temperature is 5°C (41.5°F) or higher.**

HIGH ALTITUDE TUNING

To attain the best performance in high altitude conditions, carefully tune the snowmobile as outlined below.

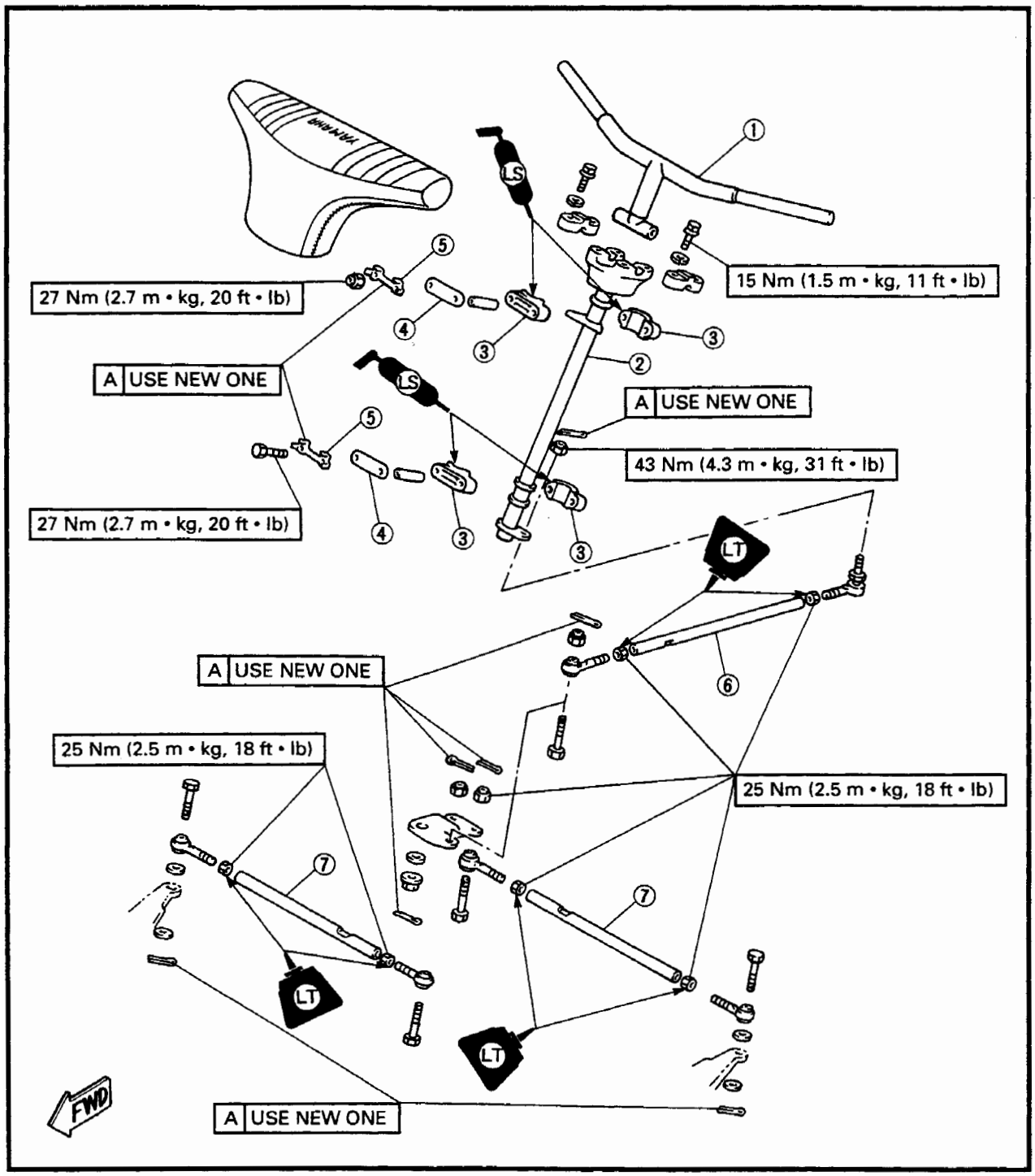


CHAPTER 3.
CHASSIS

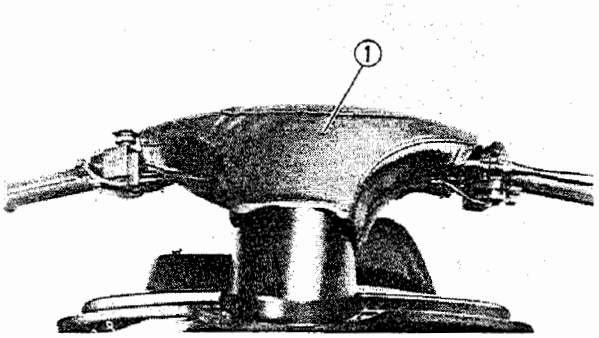
CHASSIS

STEERING

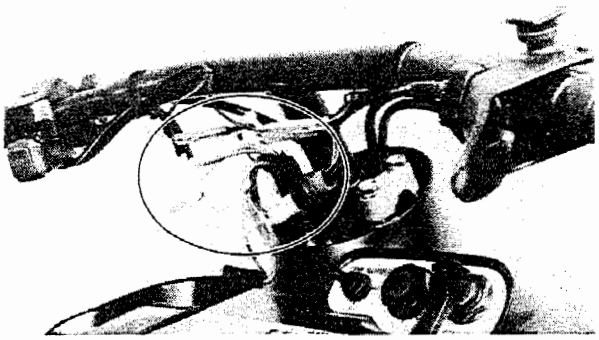
① Handlebar
② Steering column
③ Bearing
④ Bearing holder
⑤ Lock washer
⑥ Relay rod
⑦ Tie-rod



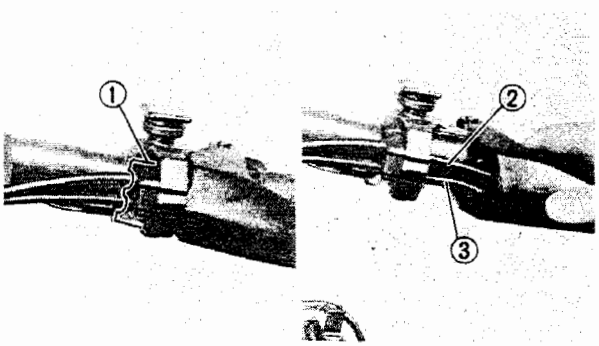
REMOVAL



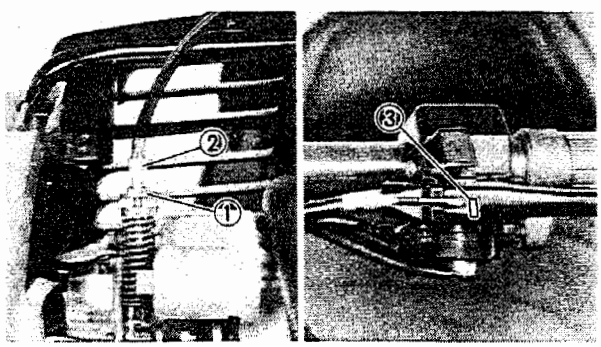
1. Remove:
   - Handlebar cover ①



2. Disconnect:
   - Handlebar switch coupler (right)
   - Brake light switch coupler
   - Headlight beam switch coupler
   - Grip warmer leads

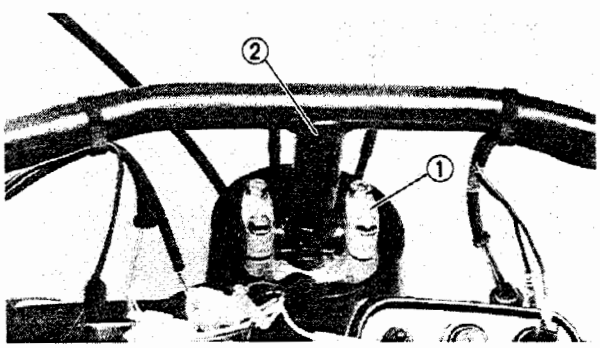


3. Remove:
   - Holder ① (throttle cable)
4. Disconnect:
   - Throttle cable ②
   - Oil pump cable ③
     (from throttle lever)

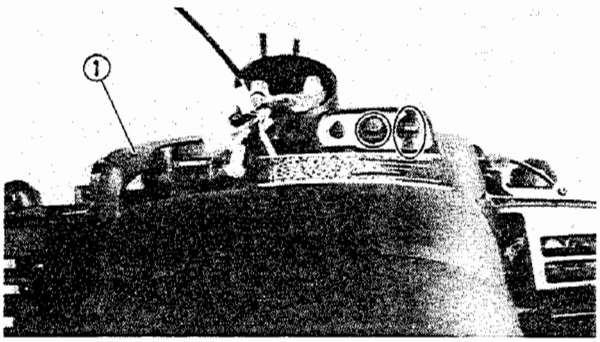


5. Remove:
   - Brake cable

Removal steps:
- Loosen the locknut ① .
- Turn in the adjuster fully ② .
- Disconnect the brake cable end ③ from the brake lever.



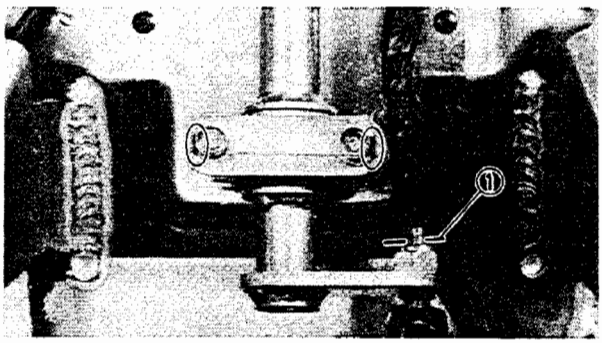
6. Remove:
   - Band
   - Handlebar holders ① (upper)
   - Handlebar ②



7. Remove:
   - Seat
   - Center cover ①

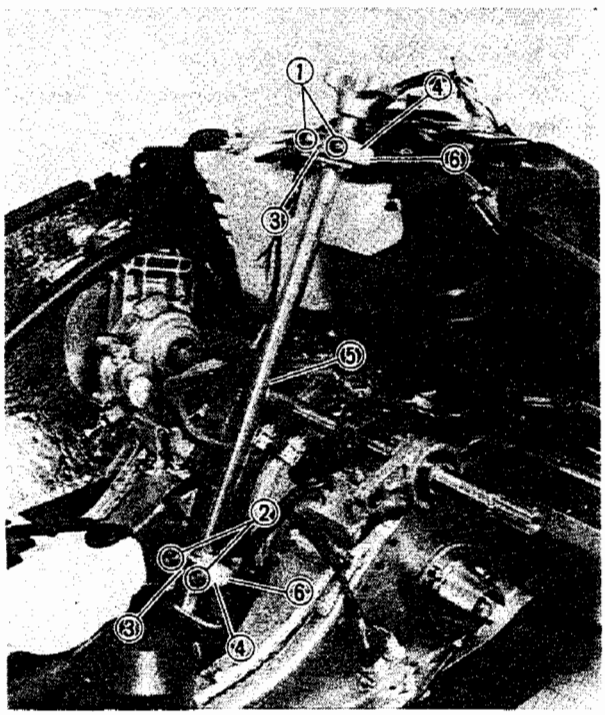
NOTE:
Remove the holding nuts (main switch, "STARTER" lever, and disconnect the grip warmer switch coupler when removing the center cover.

8. Remove:
   - Intake silencer (See page 2-4)
   - Carburetors (See page 7-3)
   - Engine assembly (See page 5-1)

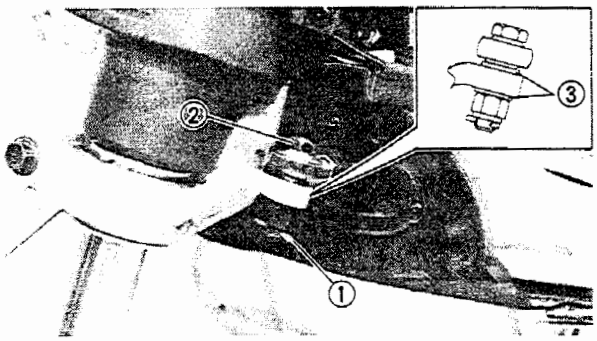


9. Remove:
   - Cotter pin ①
   - Nut (relay rod)

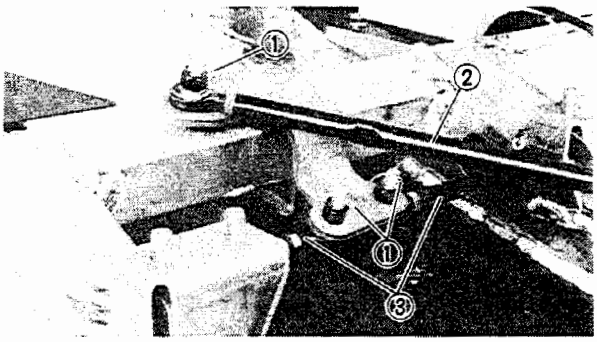
NOTE:
When removing the relay rod from the steering column, the relay rod end needs to be held fixed in order to facilitate the lock nut removal.



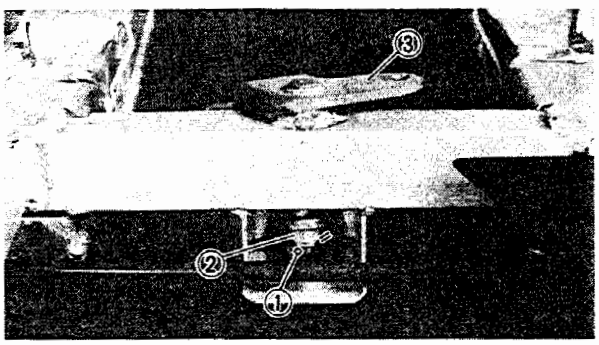
10. Straighten:
    - Lock washer tabs (upper and lower)
11. Remove:
    - Nuts ①
    - Bolts ②
    - Lock washers
    - Bearing holders ③
    - Bearings ④ (upper)
    - Collars
    - Steering column ⑤
    - Bearings ⑥ (lower)



12. Remove:
- Cotter pins ①
- Bolts ②
- Washers ③ (suspension arm side)



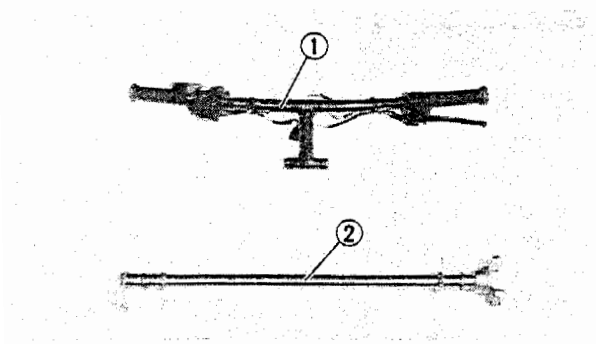
13. Remove:
- Cotter pin ①
- Bolt
- Relay rod ②
- Tie rods ③



14. Remove:
- Cotter pin ①
- Nut ②
- Washer
- Relay arm ③

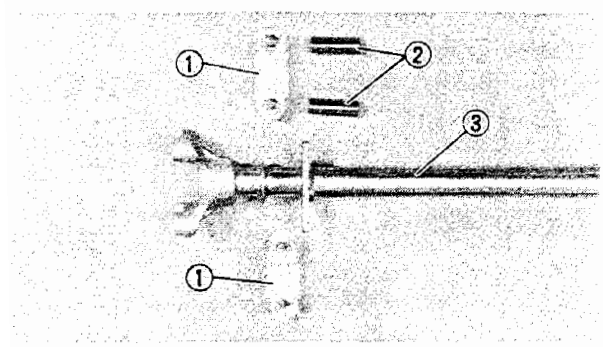
INSPECTION

1. Inspect:
- Handlebar ①
- Steering column ②
  Bends/Cracks/Damage → Replace.

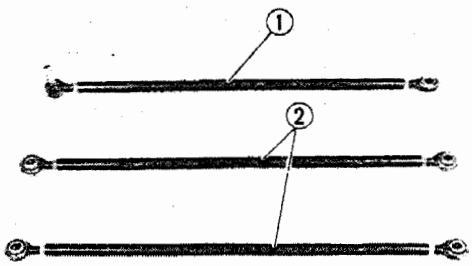


⚠ WARNING

Do not attempt to straighten a bent column. This may dangerously weaken the column.



2. Inspect:
- Bearings ① (steering column)
- Collars ②
  Wear/Damage → Replace.
- Steering column ③ (bearing contact surfaces)
  Scratches/Wear/Damage → Replace.

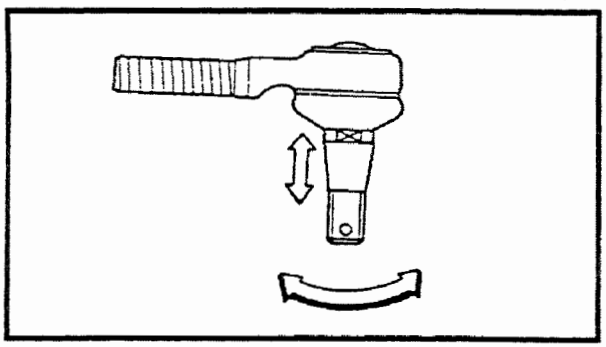


3. Inspect:
   - Relay rod ①
   - Tie-rods ②

   Bends/Cracks/Damage → Replace.

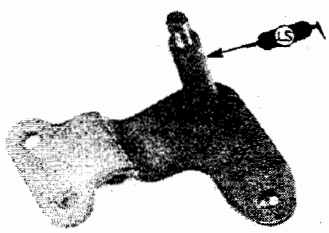
⚠ WARNING

Do not attempt to straighten a bent rod. This may dangerously weaken the rod.



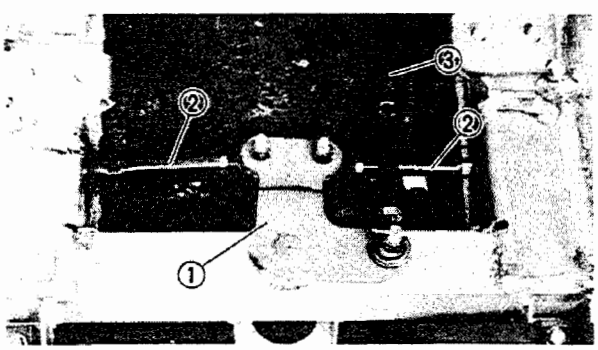
4. Check:
   - Rod end movement

   Rod end free play exists → Replace.
   Rod end turns roughly → Replace.



5. Inspect:
   - Relay arm

   Cracks/Damage → Replace.



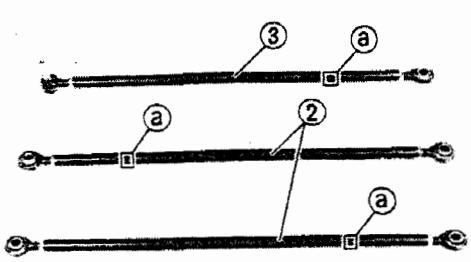
INSTALLATION

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

1. Install:
   - Relay arm ①
   - Tie rod ②
   - Relay rod ③

NOTE:

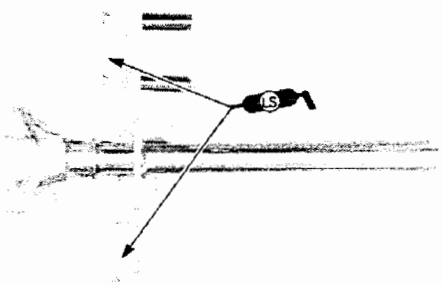
- Be sure that the rod-end of the tie rod and relay rod on the identation ⓐ side is connected to the relay arm.
- The threads on both rod-ends must be the same length.



CAUTION:

Always use a new cotter pin.

Lock nut (rod-end):
25 Nm (2.5 m • kg, 18 ft • lb)
LOCTITE®
Nut (tie rod/relay rod):
25 Nm (2.5 m • kg, 18 ft • lb)

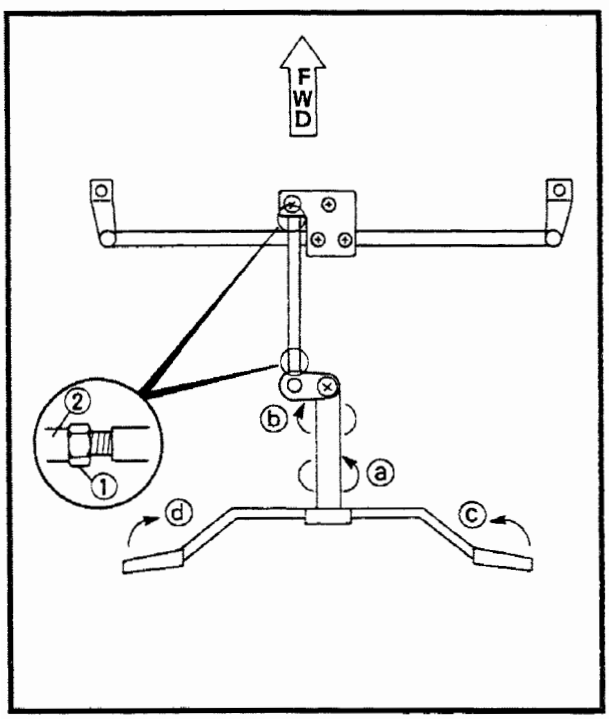


2. Apply
   - Low temperature lithium soap base grease (to bearing inner surface)
3. Tighten:

Nut (bearing holder):
27 Nm (2.7 m • kg, 20 ft • lb)
Bolt (bearing holder):
27 Nm (2.7 m • kg, 20 ft • lb)
Nut (relay rod):
43 Nm (4.3 m • kg, 31 ft • lb)

CAUTION:
Always use a new lock washer and cotter pin.

NOTE:
Bend the lock washer tab along the bolts and nuts flats.



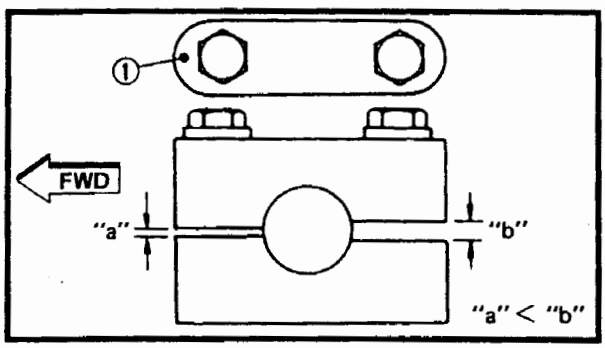
4. Adjust:
   - skis

Adjustment steps:
- Temporarily install the handlebar.
- Hold the handlebar straight, and check to see that the skis are at right angles to the handlebar.
- Loosen the locknuts (relay rod) ①.
- Direct the skis in parallel to the moving direction.
- With the skis thus, turn the relay rod ② either way to adjust the handlebars at right angles with respect to the direction of movement.

Turning the relay rod in direction ⓐ	**The handlebars move in direction ⓒ**
Turning the relay rod in direction ⓑ	**The handlebars move in direction ⓓ**

• Tighten the locknuts (relay rod) ①.

Locknut (relay rod):
25 Nm (2.5 m • kg, 18 ft • lb)
LOCTITE®



5. Tighten:

Handlebar holder bolt:
15 Nm (1.5 m • kg, 11 ft • lb)

NOTE:

- The upper handlebar holder should be installed with the punch mark ① forward.
- Tighten the bolts to specification so that the front clearance "a" is smaller than rear clearance "b".

CAUTION:

First tighten the bolts on the front side of the handlbar holder, and then tighten the bolts on the rear side.

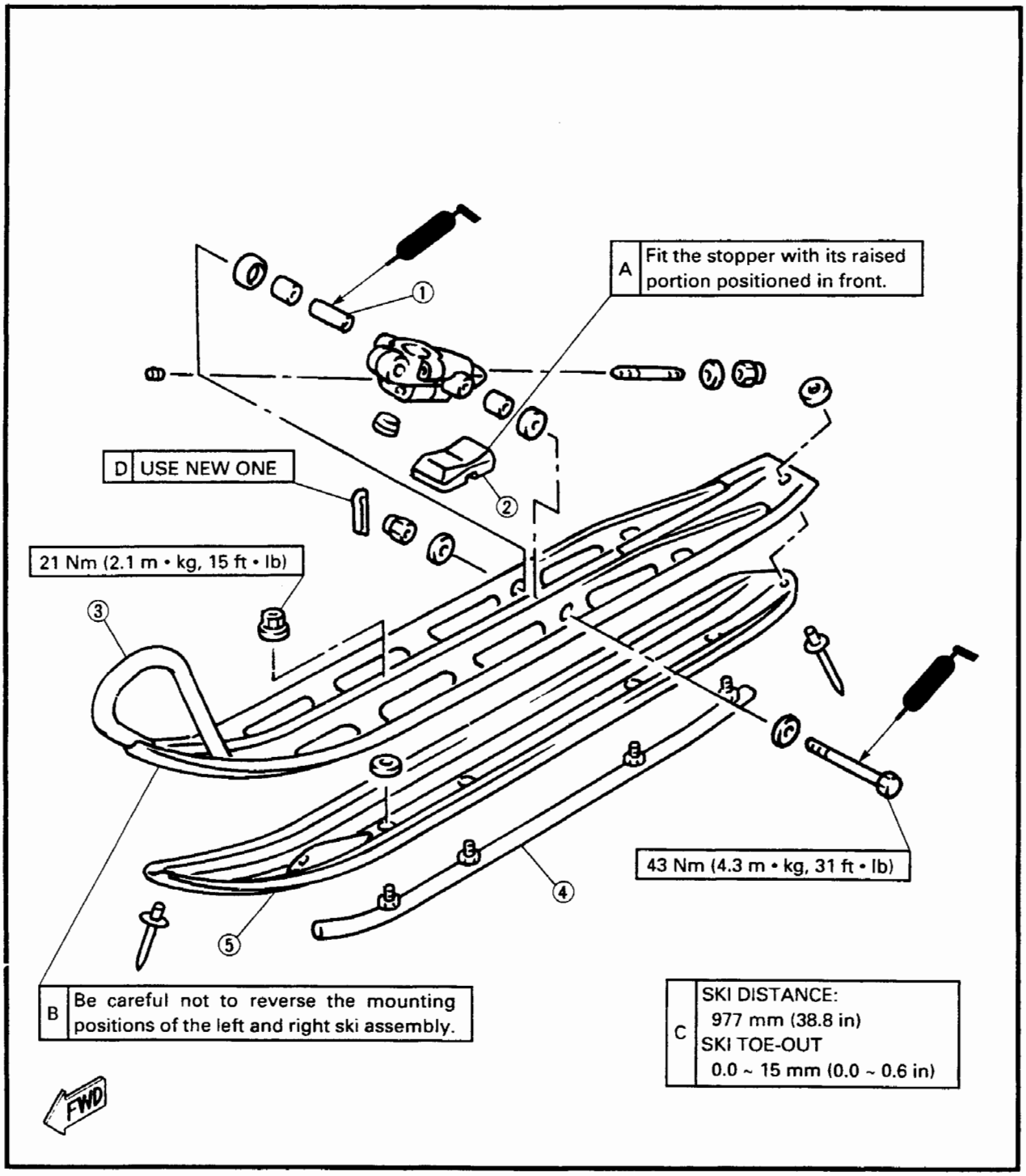
6. Adjust:

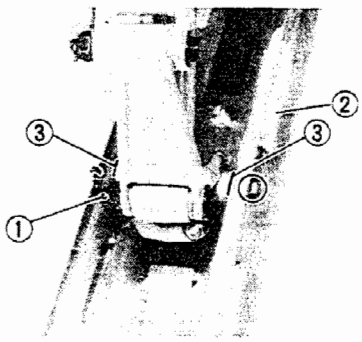
- Brake lever free play (See page 2-18)

SKI

① Collar
② Ski stopper
③ Ski
④ Ski runner
⑤ Ski cover

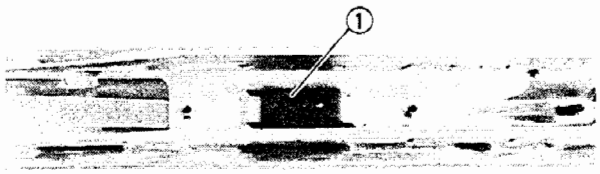
Recommended grease:
ESSO Beacon 325 grease or
Aeroshell grease #7A



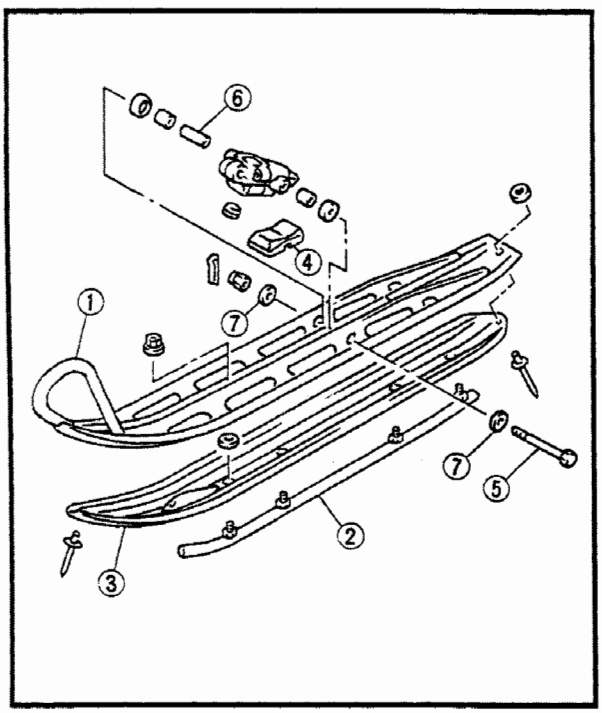


REMOVAL

1. Elevate the ski by placing a suitable stand under the chassis.
2. Remove:
   - Cotter pin ①
   - Ski ②
   - Dust covers ③
   - Collar



3. Remove:
   - Ski stopper ①
   - Ski runner



INSPECTION

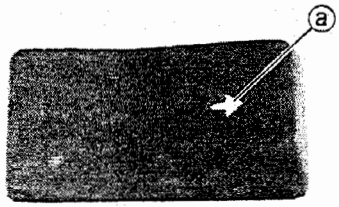
1. Inspect:
   - Ski ①
   - Ski runner ②
   - Ski cover ③ (See page 2-23)
   - Ski stopper ④
     Wear/Cracks/Damage → Replace.
   - Mounting bolt ⑤
   - Collar ⑥
   - Spacer ⑦
     Wear/Damage → Replace.

INSTALLATION

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

1. Tighten:

	Ski runner nut: **21 Nm (2.1 m • kg, 15 ft • lb)**



2. Install:
   - Ski stopper

NOTE:
- Fit the stopper with its arrow mark ⓐ positioned in front.
- Be careful not to reverse the mounting positions of the left and right ski assemblies.

3. Tighten:

Mounting nut:
43 Nm (4.3 m • kg, 31 ft • lb)

NOTE:
Lubricate the collar, dust cover and mounting bolt before installing the ski.

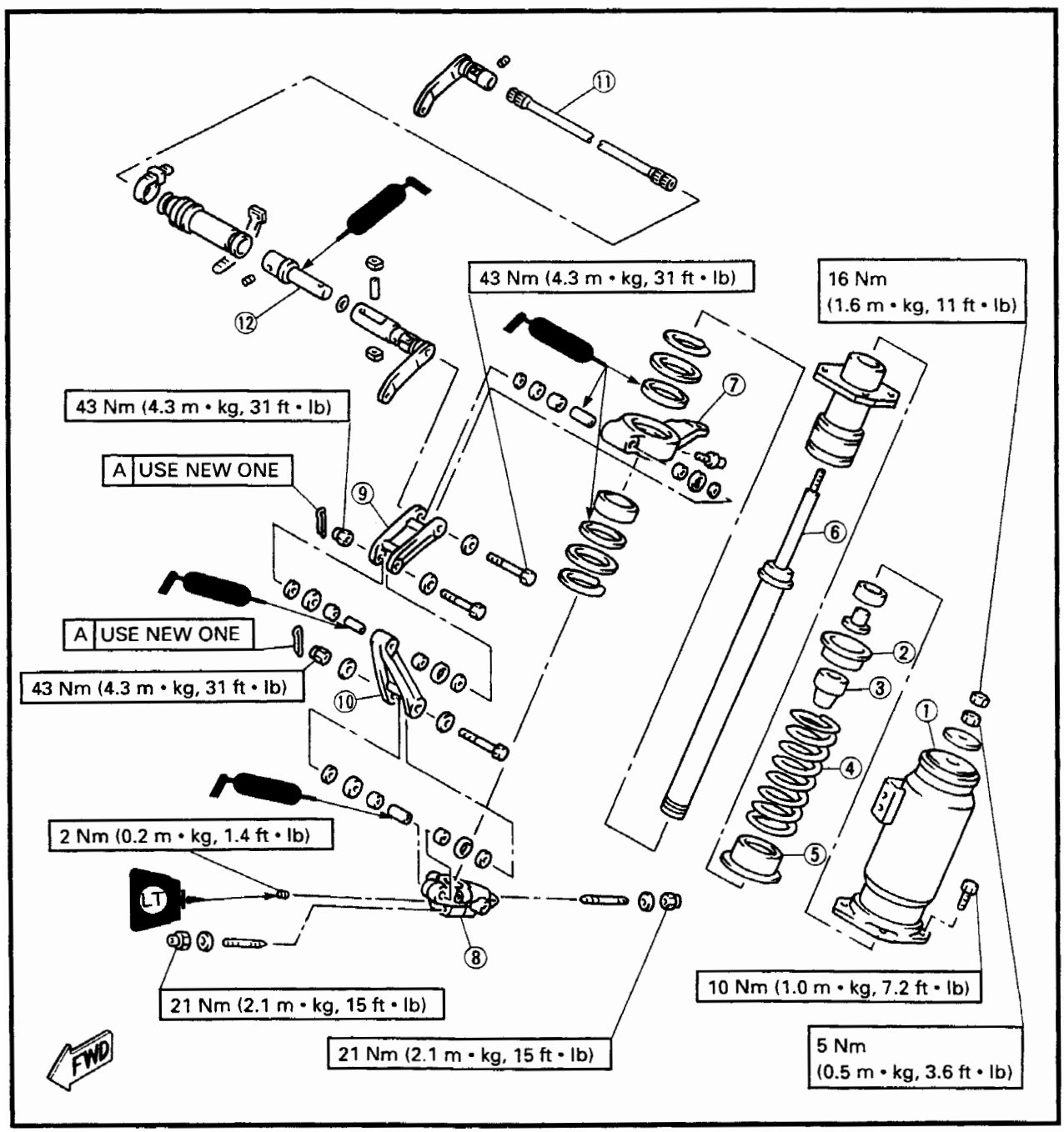
Recommended grease:
ESSO Beacon 325 grease or
Aeroshell grease #7A

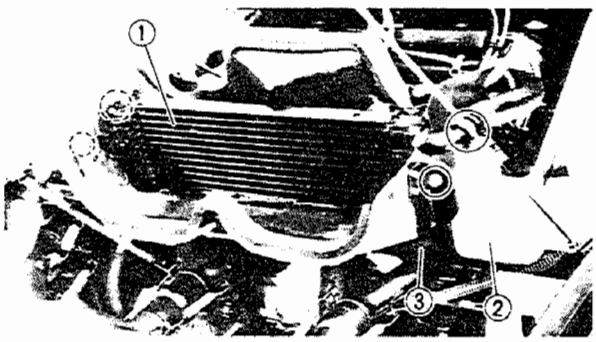
CAUTION:
Always use a new cotter pin.

FRONT SUSPENSION

① Absorber holder
② Spring seat (upper)
③ Dumper
④ Spring
⑤ Spring seat (lower)
⑥ Shock absorber
⑦ Suspension arm
⑧ Suspension bracket
⑨ Front arm (upper)
⑩ Front arm (lower)
⑪ Stabilizer rod
⑫ Stabilizer slider

Recommended grease:
ESSO Beacon 325 grease or
Aeroshell grease #7A



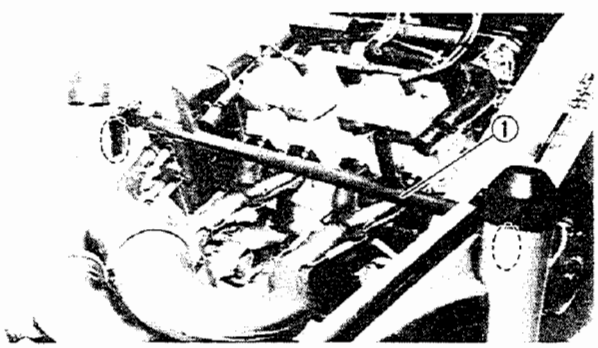


REMOVAL

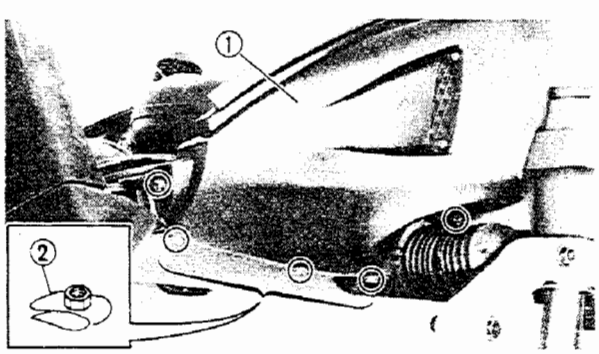
1. Remove:
   - Side cowlings (left and right) (See page 2-3)
   - Radiator assembly ① (See page 6-3)
   - Reservoir tank ②
     (from tie bar③)

NOTE:

Do not disconnect the hoses.



2. Remove:
   - Tie bar ①

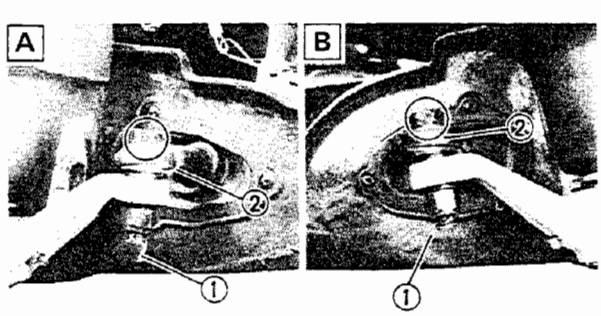


3. Remove:
   - Hoods ①

NOTE:

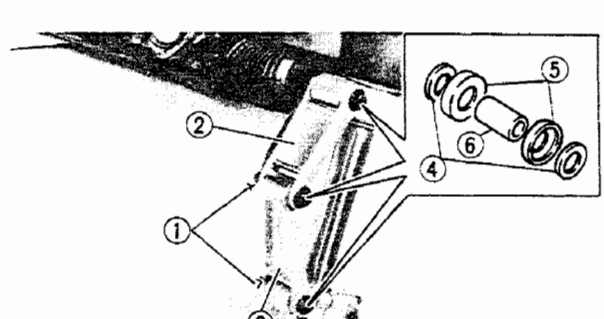
When removing the hood, the nuts② may fall off. Be careful not to lose these parts.

4. Remove:
   - Ski (See page 3-9)

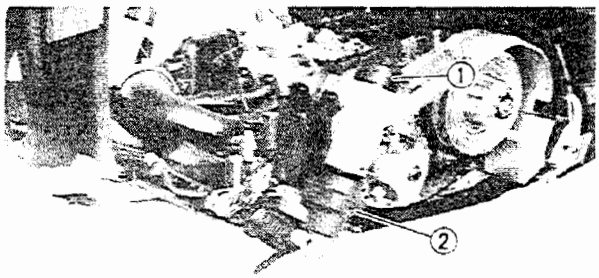


5. Remove:
   - Cotter pin ①
   - Tie-rod ②

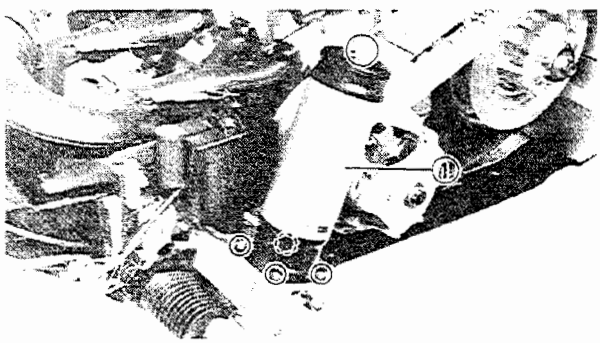
A Left
B Right



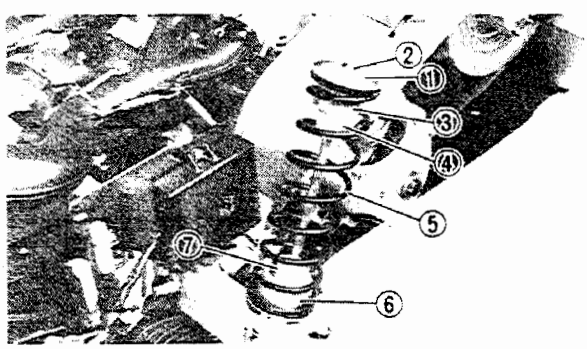
6. Remove:
   - Cotter pins ①
   - Front arm ② (upper)
   - Front arm ③ (lower)
   - Washers ④
   - Thrust washers ⑤
   - Collars ⑥



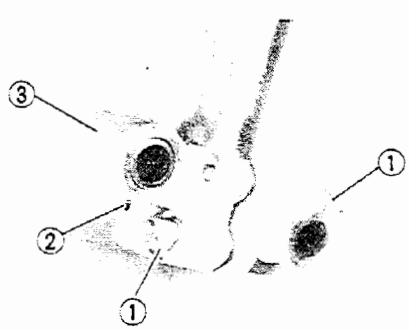
7. Remove:
   - Cap ① (suspension)
   - Protector ②



8. Remove:
   - Absorber holder ①

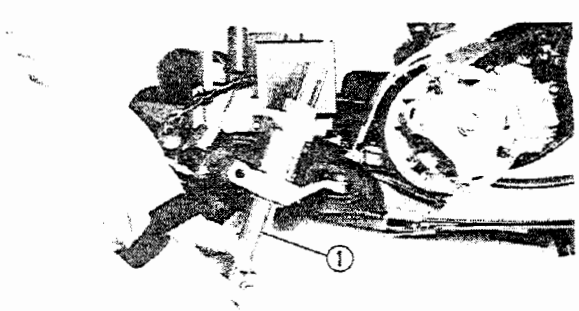


9. Remove:
   - Spacer collar ①
   - Flange plate ②
   - Spring seat ③ (upper)
   - Bump rubber ④
   - Spring ⑤
   - Spring seat ⑥ (lower)
   - Absorber cover ⑦

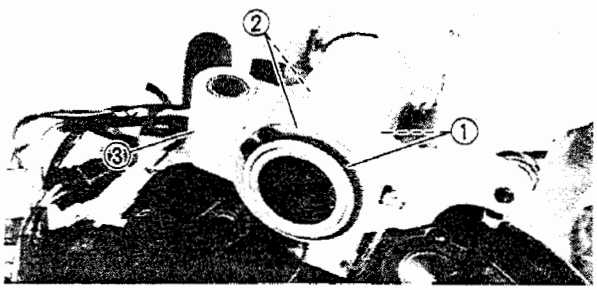


10. Loosen:
    - Nuts ①
    - Set screw ②

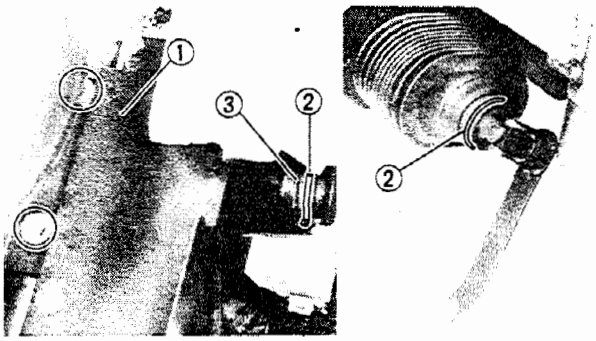
11. Remove:
    - Suspension bracket ③



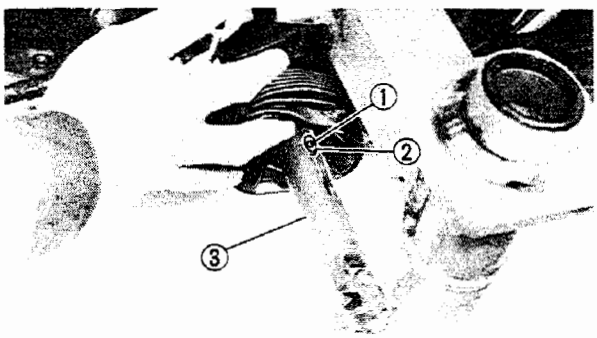
12. Remove:
    - Shock absorber ①



13. Remove:
- Circlips ①
- Washers ②
- Suspension arm ③



14. Remove:
- Exhaust pipe (left)
- Protector ① (exhaust pipe)
- Tie laps ②
- Circlip ③

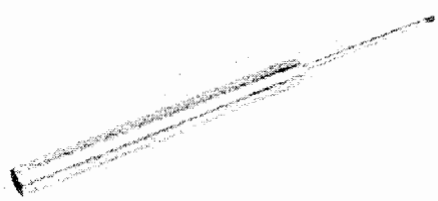


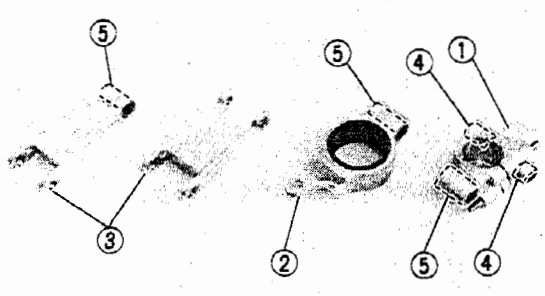
15. Remove:
- Dowel pin ①
- Pin holders ②
- Stabilizer joint ③
- Stabilizer assembly

NOTE:
Slide the stabilizer slider towerd the machine side to remove the dowel pin.

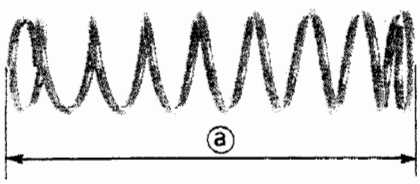
INSPECTION

1. Inspect:
- Shock absorber
  Oil leaks/Bend/Damage → Replace.



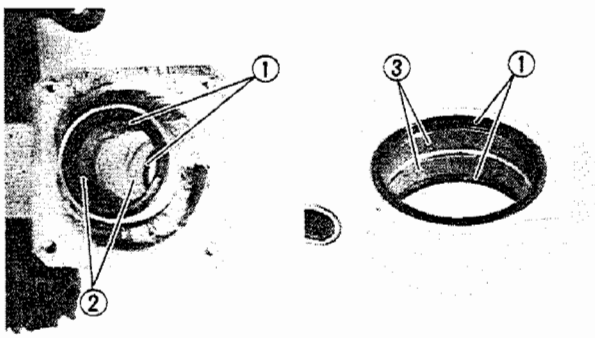


2. Inspect:
- Suspension bracket ①
- Suspension arm ②
- Front arms ③
- Bushings ④
- Bearings ⑤
  Cracks/Wear/Damage → Replace.

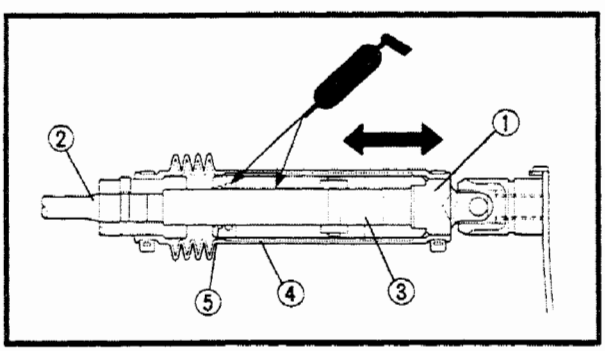


3. Inspect:
   - Spring
     Wear/Cracks/Damage → Replace.
4. Measure:
   - Spring free length ⓐ
     Out of specification → Replace.

Spring free length limit:
235.0 mm (9.25 in)



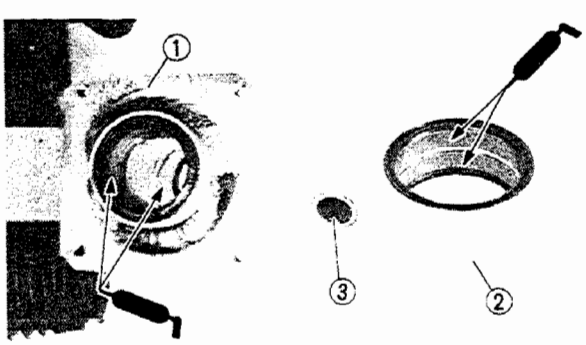
5. Inspect:
   - Oil seals ①
   - Bushings ②
     Damage → Replace.



6. Inspect:
   - Stabilizer joint ①
   - Stabilizer ②
   - Stabilizer link ③
     Cracks/Damage → Replace.
   - Stabilizer slider ④
   - O-ring ⑤
     Wear/Cracks/Damage → Replace.

     Unsmooth movement → Apply a low temperature grease into the stabilizer slider.

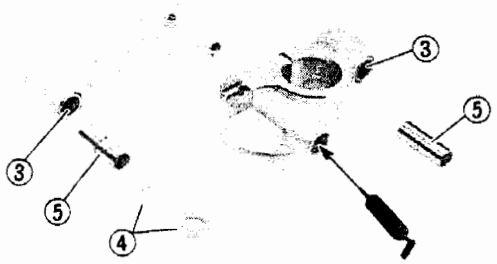
Recommended grease:
ESSO Beacon 325 grease or
Aeroshell grease #7A



INSTALLATION

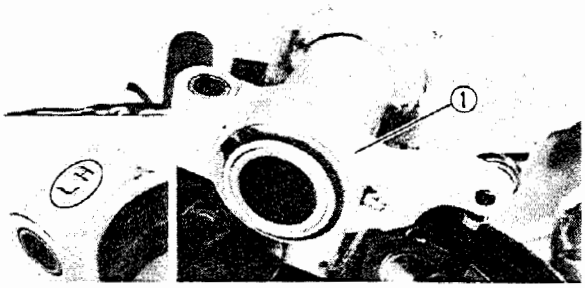
Reverse the "REMOVAL" procedure.
Note the following points.

1. Lubricate:
   - Bushing (suspension support ①)
   - Bushing (suspension arm ②)
   - Oil seal lips
   - Bearings ③
   - Thrust washers ④
   - Collars ⑤



Recommended grease:
ESSO Beacon 325 grease or
Aeroshell grease #7A

2. Install:
   - Suspension arm ①



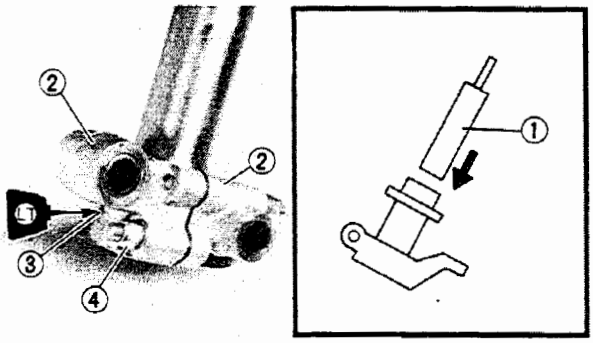
⚠ WARNING

Always use a new circlip.

NOTE:

Install the suspension arm so that the "L" mark should be on the left side and the "R" mark on the right side.

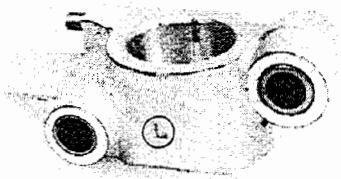
3. Install
   - Shock absorber ①



NOTE:

When attaching the shock absorber, insert it very carefully from above the bracket, to avoid damaging the oil seal.

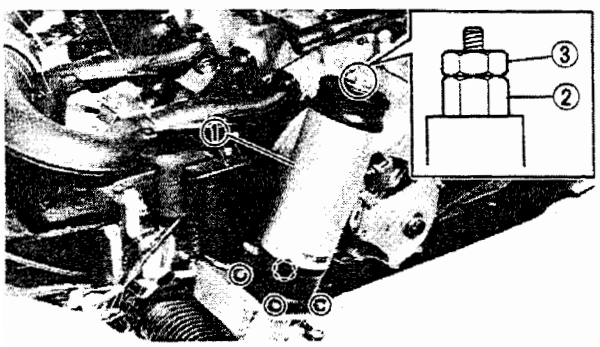
4. Install:
   - Suspension bracket ②



Set screw ③:
2 Nm (0.2 m • kg, 1.4 ft • lb)
LOCTITE®
Nut ④:
21 Nm (2.1 m • kg, 15 ft • lb)

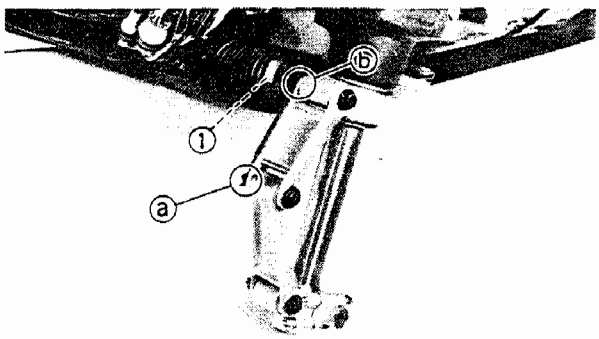
NOTE:

Install the suspension bracket so that the "L" mark should be on the left side and the "R" mark on the right side.



5. Tighten:

Bolt (absorber holder ①):
10 Nm (1.0 m • kg, 7.2 ft • lb)
Nut (shock absorber ②):
5 Nm (0.5 m • kg, 3.6 ft • lb)
Lock nut (shock absorber ③):
16 Nm (1.6 m • kg, 11 ft • lb)



6. Tighten:

	Nut/Bolt (front arm): **43 Nm (4.3 m • kg, 31 ft • lb)**

NOTE:

- Be sure to install the front arms so that the "UPPER -L" mark is positioned to the upper-left and the "LOWER-L" mark is positioned to the lower-left.
- When installing the stabilizer joint ① to the front arm, connect ⓐ.
- Lift up the front of the machine first and then tighten the lock nuts ⓐ. (Left and right)

CAUTION:

Always use a new cotter pin.

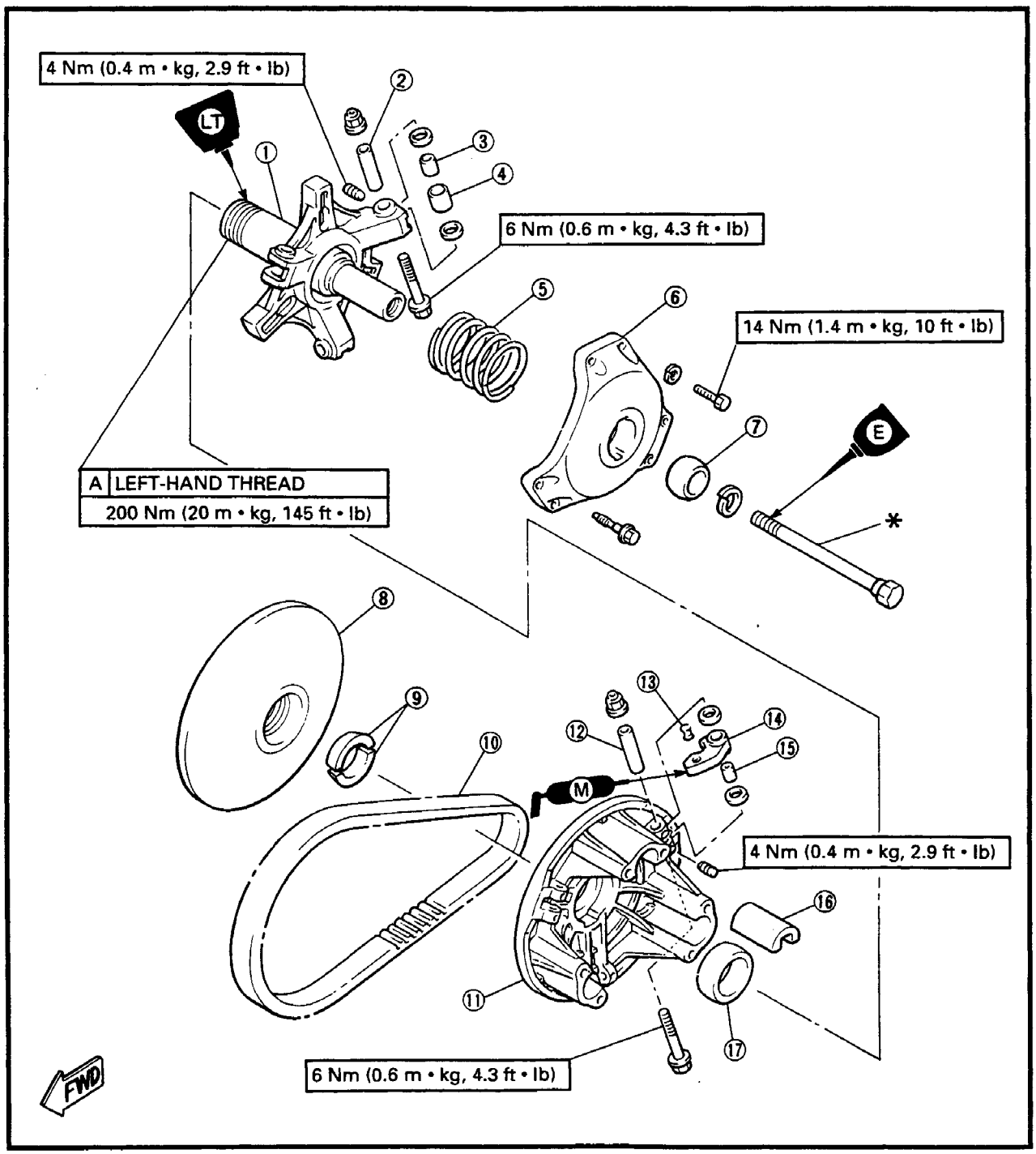
CHAPTER 4.
POWER TRAIN

POWER TRAIN

PRIMARY SHEAVE AND DRIVE V-BELT

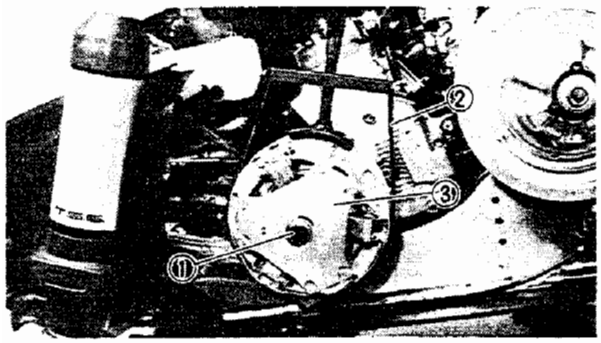
① Spider
② Collar
③ Bushing
④ Roller
⑤ Primary sheave spring
⑥ Primary sheave cap
⑦ Bushing
⑧ Fixed sheave
⑨ Stopper
⑩ V-belt
⑪ Sliding sheave
⑫ Collar
⑬ Rivet
⑭ Weight
⑮ Bushing
⑯ Slider
⑰ Bushing

*
1. Tighten the bolt.
   120 Nm (12 m • kg, 87 ft • lb)
2. Loosen the bolt completely.
3. Retighten the bolt.
   60 Nm (6.0 m • kg, 43 ft • lb)



REMOVAL

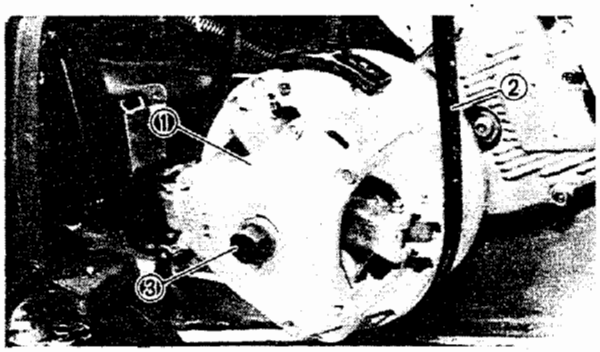
1. Remove:
   - Side cowling (left) (See page 2-3)
   - Drive V-belt guard (See page 2-16)
   - Drive V-belt (See page 2-16)



2. Remove:
   - Bolt ① (primary sheave)

NOTE:
Use the primary sheave holder ② to hold the primary sheave ③.

Primary sheave holder:
90890-01701, YS-01880



3. Remove:
   - Primary sheave assembly ①

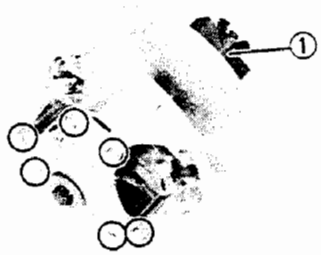
NOTE:
Use the primary sheave holder ② and primary sheave puller ③.

Primary sheave holder:
90890-01701, YS-01880
Primary sheave puller:
90890-01898, YS-01881-1 & YS38517

DISASSEMBLY

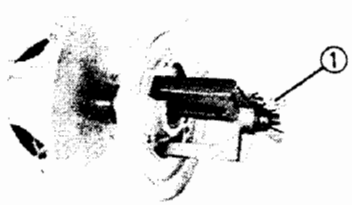
1. Remove:
   - Bolts (primary sheave cap)

NOTE:
Attach the sheave compressor ① to compress the primary sheave spring.

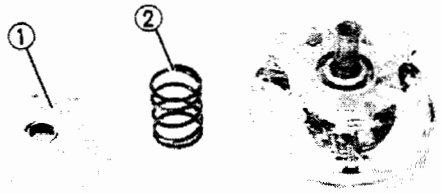


Sheave compressor:
90890-01712, YS-28891

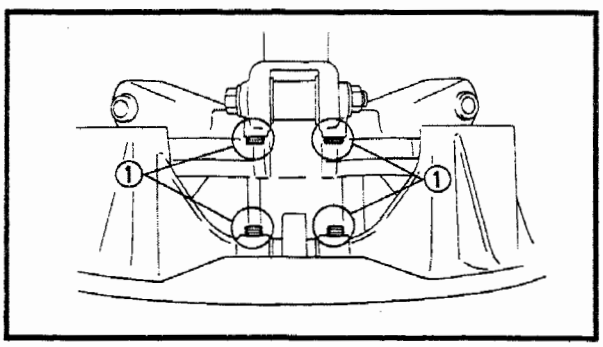
2. Remove:
   - Sheave compressor



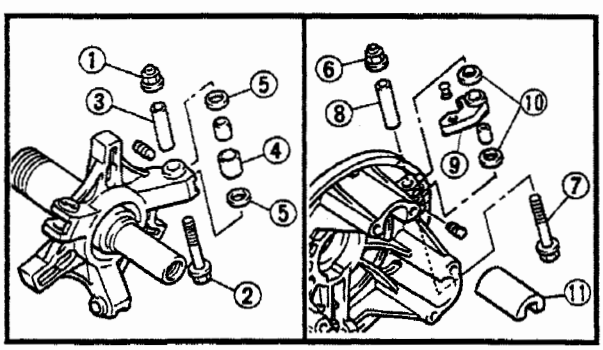
NOTE:
Slowly loosen the wing nut ① of the sheave compressor to release primary sheave spring tension.



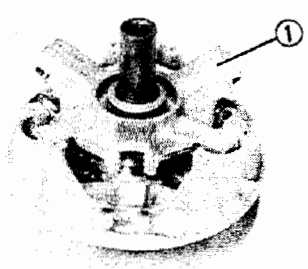
3. Remove:
   - Primary sheave cap ①
   - Primary sheave spring ②



4. Loosen:
   - Set screws ①



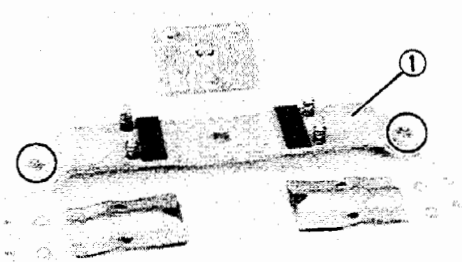
5. Remove:
   - Nut ①
   - Bolt ②
   - Collar ③
   - Roller ④
   - Washers ⑤
   - Nut ⑥
   - Bolt ⑦
   - Collar ⑧
   - Weight ⑨
   - Washers ⑩
   - Slider ⑪



6. Remove:
   - Spider ①

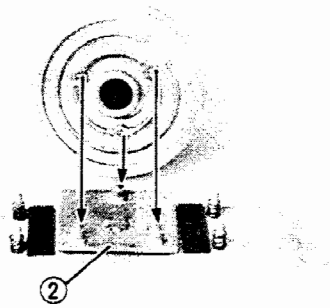
NOTE:

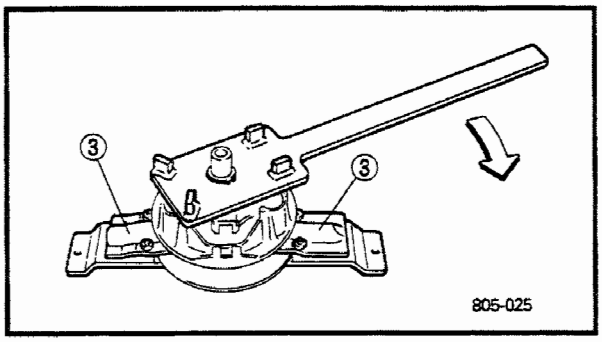
Special tools and LOCTITE® are necessary for assembling the spider and fixed sheave. If these are unavailable, avoid disassembling.

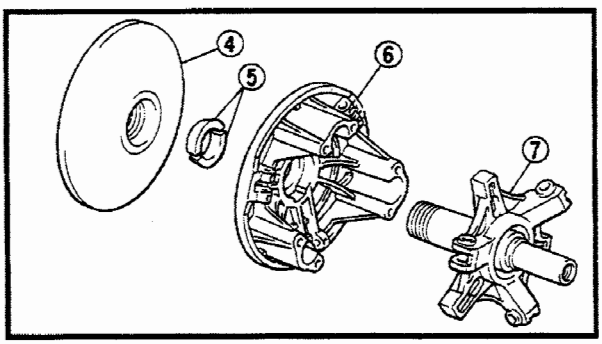


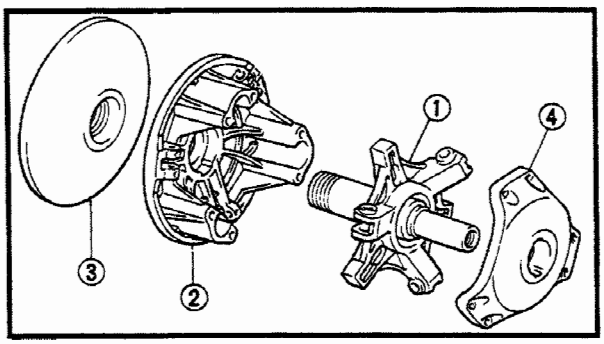
Removal steps:

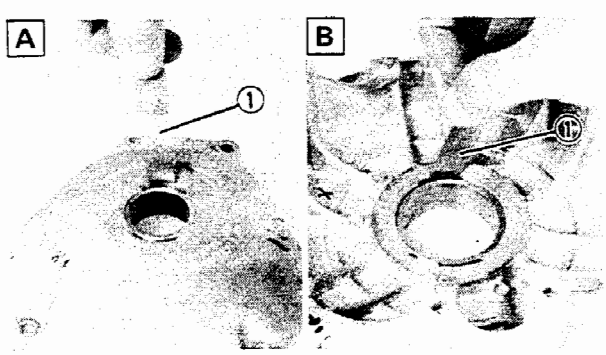
- Immerse the primary sheave assembly in appoximately 80° ~ 100°C (176° ~ 212°F) water for several minutes.
- Hold the lower piece of the clutch spider separator ① on a rigid table using suitable mounting bolts.
  Then, install the clutch separator adapter ② onto the separator.











- Fit the primary sheave assembly onto the adapter, and secure the supporting plates ③.

NOTE:
Securely fit the projections of the adapter into the fixed sheave holes.

Clutch spider separator:
90890-01711, YS-28890-B
Clutch separator adapter:
90890-01740, YS-34480

- Set the bar wrench onto the spider and turn the special tool clockwise to loosen the spider.

CAUTION:
- **The spider has a left-hand thread.**
- **To loosen the spider, high torque is required. Be sure that the spider, fixed sheave and special tool are placed securely. Loosen the spider carefully to prevent cracks and/or damage to the sheaves and spider.**

- Remove the fixed sheave ④, fixed sheave stopper ⑤, and sliding sheave ⑥ from the spider ⑦.

INSPECTION

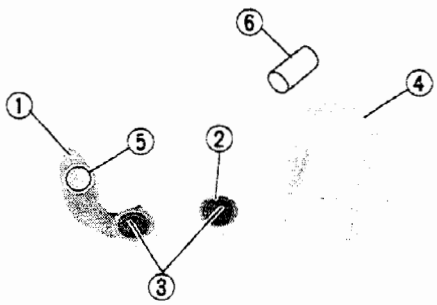
1. Inspect:
   - Spider ① (tapered portion)
   - Sliding sheave ② (belt contact surface)
   - Fixed sheave ③ (belt contact surface)
   - Primary sheave cap ④
     Scratches/Wear/Cracks/Damage → Replace.

2. Measure:
   - Bushing-to-sheave clearance
     Out of specification → Replace bushing.
     Use a feeler gauge ①

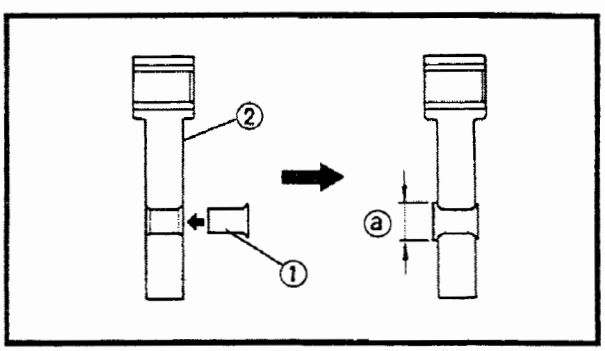
Bush clearance (primary sheave cap) [A] :
0.25 mm (0.01 in)
Bush clearance (sliding sheave) [B] :
0.25 mm (0.01 in)

3. Inspect:
   - Primary sheave spring ①
     Cracks/Wear/Damage → Replace.
4. Measure:
   - Primary sheave spring free length ⓐ
     Out of specification → Replace.

Primary sheave spring free length:
82.1 mm (3.23 in)

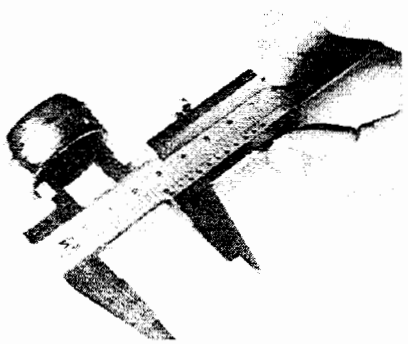


5. Inspect:
   - Weight ①
   - Roller ②
   - Bushing ③
   - Slider ④
   - Rivet ⑤
   - Collar ⑥
     Wear/Scratches/Damage → Replace.



Rivet replacement steps:
- Remove old rivet with the appropriate drill.
- Insert the rivet ① from the ID mark ② side.
- Press or peen the rivet head so that the diameter of rivet head measures to 8.2 mm (0.32 in) or larger ⓐ .

NOTE:
Refer to chart on page 2-37 for rivet application.



6. Measure:
   - Bushing inside diameter (primary sheave cap)
     Out of specification → Replace.

Bushing inside diameter
(primary sheave cap):
new: 28.0 mm (1.10 in)
<wear limit: 28.2 mm (1.11 in)>

7. Measure:
   - Bushing inside diameter (sliding sheave)
     Out of specification → Replace.

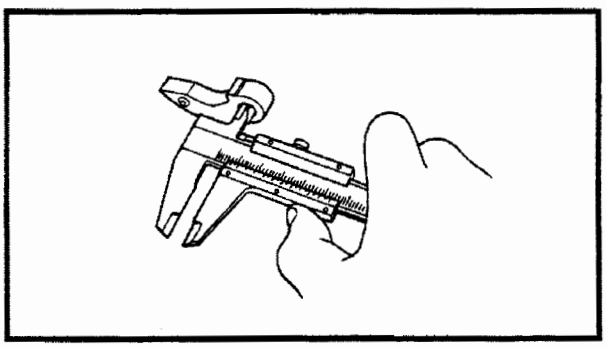
Bushing inside diameter
(sliding sheave):
new: 41.0 mm (1.61 in)
<wear limit: 41.2 mm (1.62 in)>

8. Inspect:
   - Weight pin hole
     Excessive Wear/Damage → Replace.

9. Inspect:
   - Roller collar hole
     Excessive Wear/Damage → Replace.

10. Measure:
    - Roller bushing inside diameter
      Out of specification → Replace as a set.

Roller bushing inside diameter:
new: 8.0 mm (0.31 in)
<wear limit: 8.2 mm (0.32 in)>



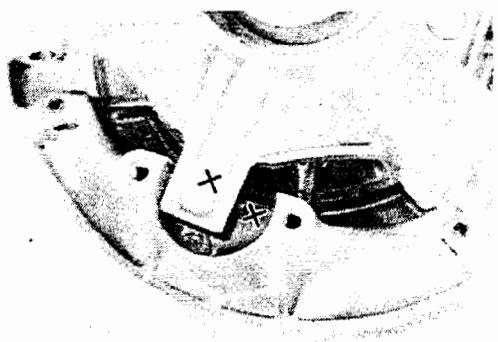
11. Measure:
    - Weight bushing inside diameter
      Out of specification → Replace as a set.

Weight bushing inside diameter:
new: 8.0 mm (0.31 in)
<wear limit: 8.2 mm (0.32 in)>

ASSEMBLY

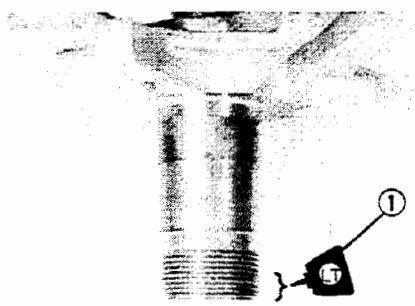
Reverse the "DISASSEMBLY" procedure.
Note the following points.

1. Install:
   - Sliding sheave
     (onto spider)



NOTE:
Be sure the sliding sheave match mark (x) is aligned with the spider match mark (x).

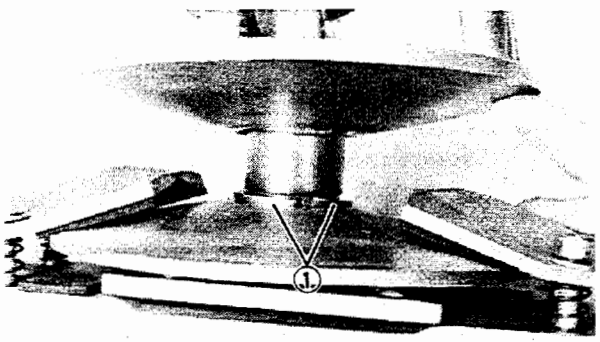
2. Install:
   - Fixed sheave
     (onto spider)



NOTE:
Apply LOCTITE® ① to the first 4 threads of the spider.

CAUTION:

LOCTITE® should be applied only to the area specified. Never apply to the bushings and other areas.

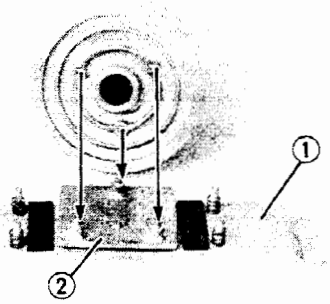


3. Install:
   - Fixed sheave stoppers ①

NOTE:

Stopper tapered portion should face fixed sheave.

4. Tighten:
   - Spider



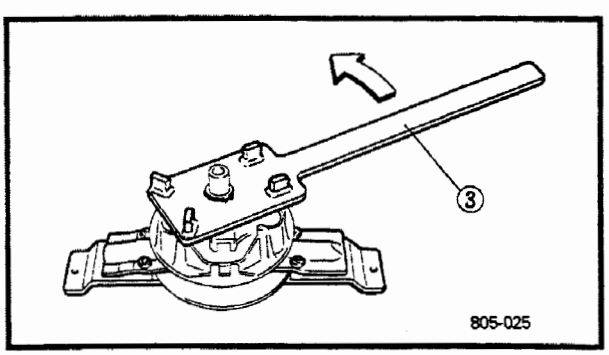
Tightening steps:

- Finger-tighten the spider until it stopped by fixed sheave stopper.
- Hold the fixed sheave with the clutch spider separator ①.

NOTE:

Securely fit the projections of the adapter ② into the fixed sheave holes.

Clutch spider separator:
90890-01711, YS-28890-B
Clutch separator adapter:
90890-01740, YS-34480



- Tighten the spider to specification using the bar wrench ③.

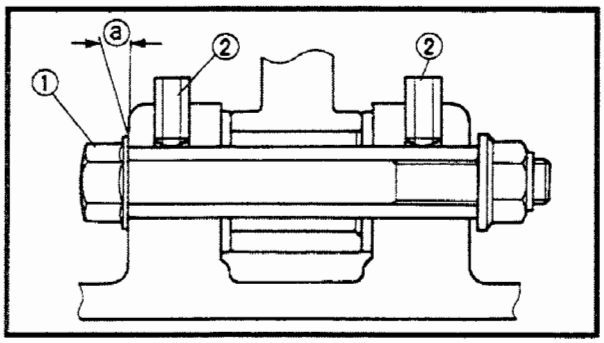
Spider:
200 Nm (20 m • kg, 145 ft • lb)

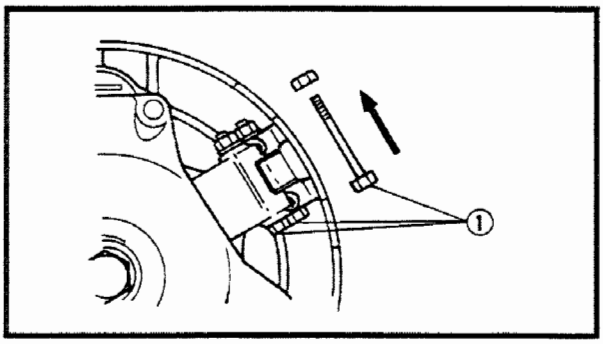
CAUTION:

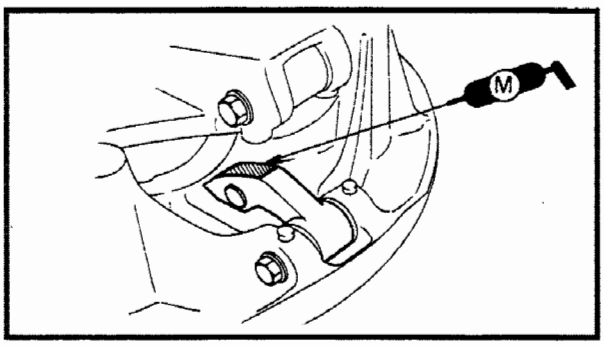
Spider has a left-hand thread.

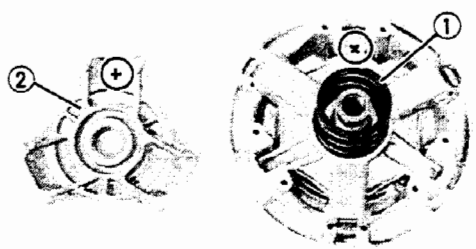
⚠ WARNING

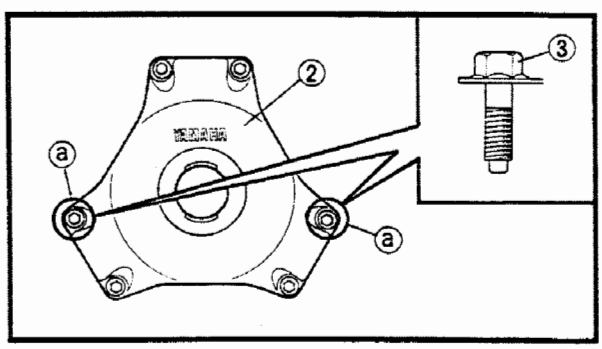
- **Do not operate the primary sheave until the LOCTITE® has dried completely. Wait 24 hours before operating primary sheave.**
- **Since the tightening torque is high, make sure the spider, fixed sheave, and special tool are placed securely. Tighten the spider carefully to prevent cracks and/or damage to the sheaves and spider.**











5. Install:
   - Weight and roller

Installing steps:
- Tighten the bolt ①.

Bolt:
6 Nm (0.6 m • kg, 4.3 ft • lb)

- Tighten the set screws ② so that clearance ⓐ between bolt and sheave surface is 0 mm (0 in).

Set screw:
4 Nm (0.4 m • kg, 2,9 ft • lb)

NOTE:
To maintain the balance of primary sheave, the bolts ① must be installed with their threaded portions pointing in a counter clockwise direction, as illustation.

6. Lubricate:
   - Weight (roller contact surface) (with thin coat)

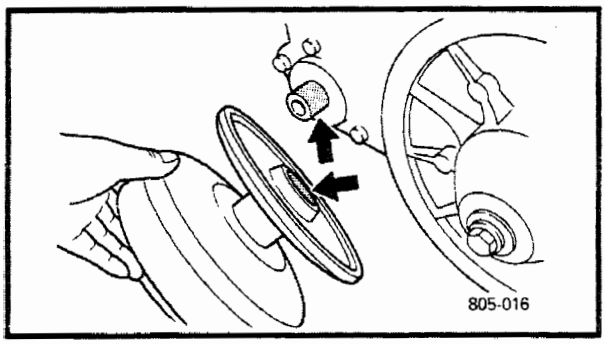
Molybdenum disulfide grease

7. Install:
   - Primary sheave spring ①
   - Primary sheave cap ②

NOTE:
- Be sure the sheave cap match mark "X" is aligned with the spider match mark "X".
- Be sure to use the flange bolts ③ to position ⓐ to maintain the balance of primary sheave.

8. Tighten:

Primary sheave cap bolt:
14 Nm (1.4 m • kg, 10 ft • lb)



INSTALLATION

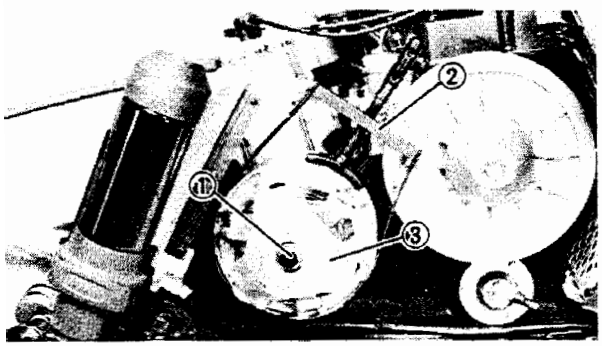
Reverse the "REMOVAL" procedure.
Note the following points.

1. Install:
   - Primary sheave assembly

CAUTION:

Be sure to remove any oil and/or grease from the tapered portion of the crankshaft and spider using a cloth dampened with thinner.

2. Apply:
   - YAMALUBE 2-cycle oil/equivalent grease (to threads of primary sheave bolt)



3. Tighten:
   - Bolt ① (primary sheave)

Tightening steps: • Hold the primary sheave ③ using the primary sheave holder ② and tighten the bolt (primary sheave) to specification.
Primary sheave holder: **90890-01701, YS-01880**
Bolt ① (primary sheave): **(initial tightening)** **120 Nm (12 m • kg, 87 ft • lb)**
• Loosen the bolt (primary sheave) completely. • Retighten the bolt (primary sheave) to specification.
Bolt ① (primary sheave): **60 Nm (6.0 m • kg, 43 ft • lb)**

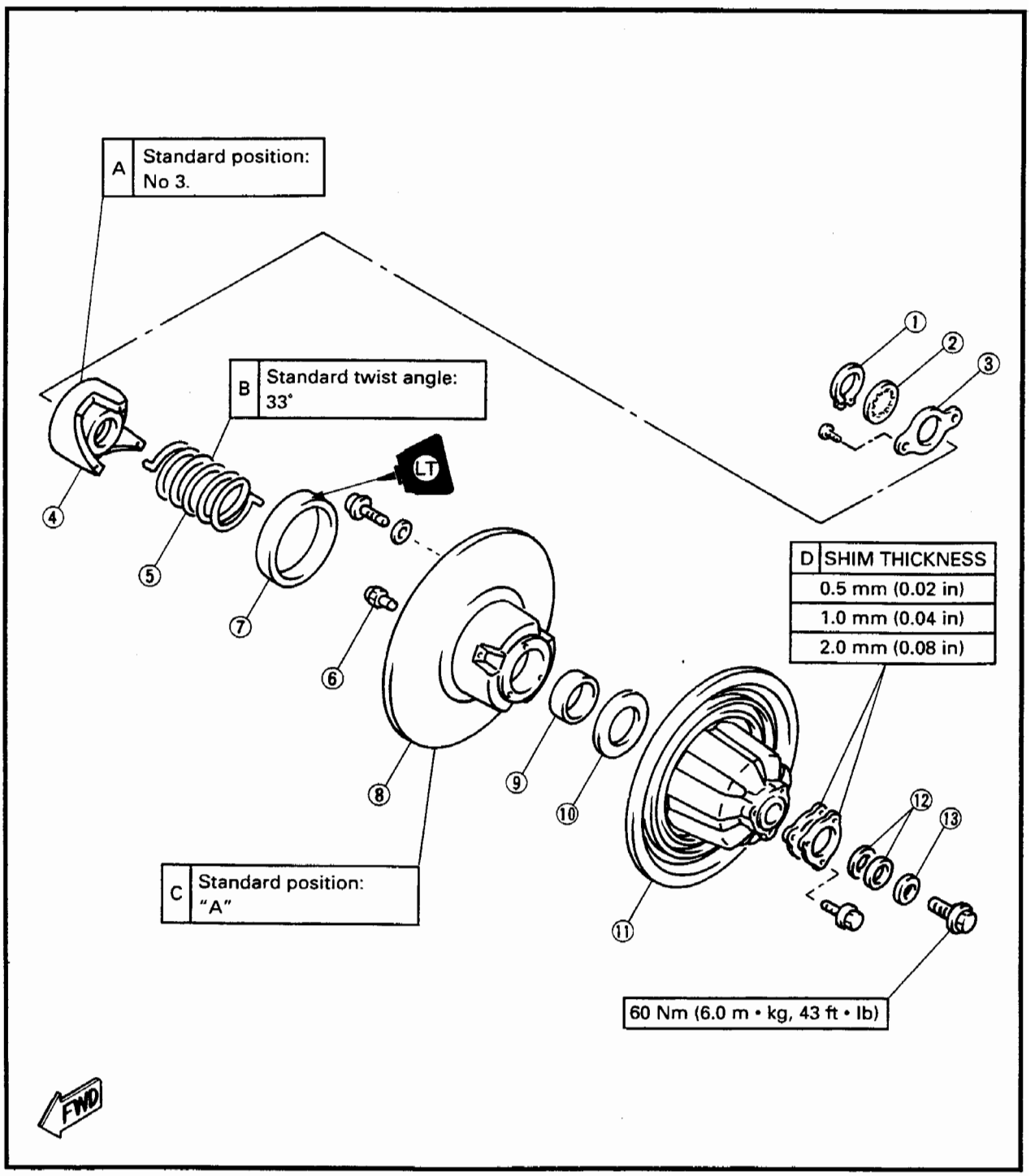
4. Install:
   - Drive V-belt

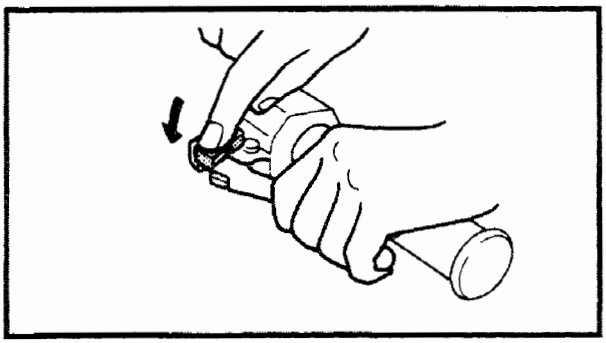
NOTE:

Before installing the V-belt, clean the oil off the fixed sheaves and sliding sheaves using a cloth dampened with thinner.

SECONDARY SHEAVE

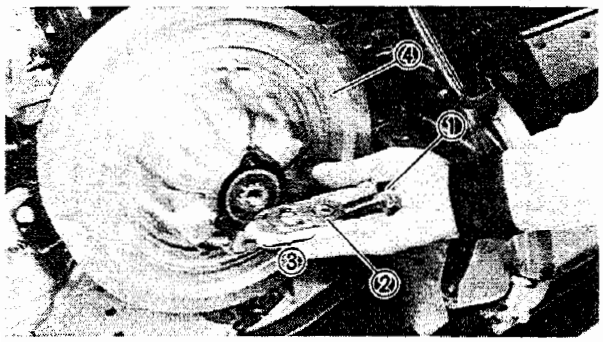
① Circlip
② Washer
③ Plate
④ Spring seat
⑤ Secondary spring
⑥ Ramp shoe
⑦ Sliding bushing
⑧ Sliding sheave
⑨ Bushing
⑩ Base plate
⑪ Fixed sheave
⑫ Shim
⑬ Washer





REMOVAL

1. Remove:
   - Side cowling (left) (see page 2-3)
   - Drive V-belt guard (see page 2-16)
   - Drive V-belt (see page 2-16)
2. Apply the brake to lock the secondary sheave.



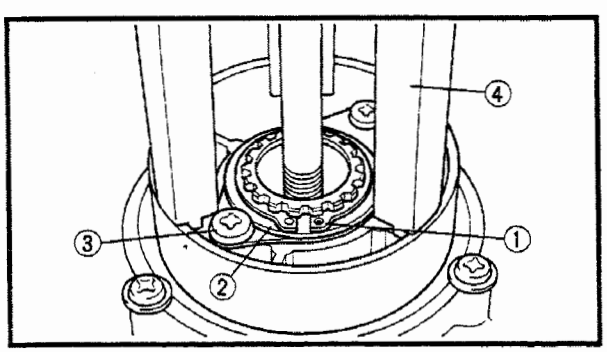
3. Remove:
   - Bolt ① (secondary sheave)
   - Washer ②
   - Shim (s) ③
   - Secondary sheave ④

DISASSEMBLY

⚠ WARNING

- **Use extreme CAUTION when disassembling the secondary sheave as serious injury can occur from the sudden release of spring tension. Use the sheave compressor to contain the spring tension before removing the retaining clip.**
- **Do not attempt the procedure unless you have the proper tools and understand the instructions thoroughly.**

Sheave compressor:
90890-01712, YS-28891

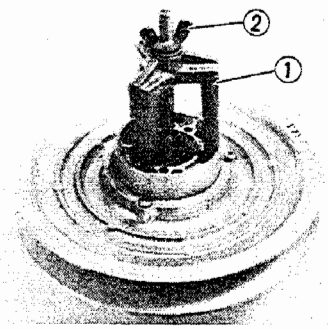


1. Remove:
   - Circlip ①
   - Washer ②
   - Plate ③

NOTE:

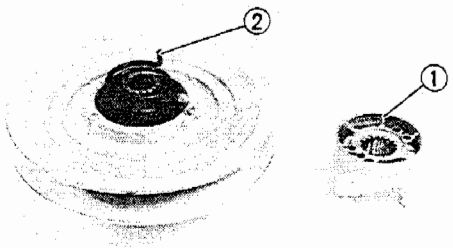
Attach the sheave compressor ④ to compress the secondary sheave spring.

Sheave compressor:
90890-01712, YS-28891

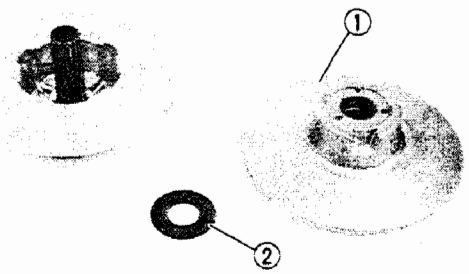


2. Remove:
   - Sheave compressor ①

NOTE:
Slowly loosen the wing nut ② of the sheave compressor to release the secondary sheave spring tension.



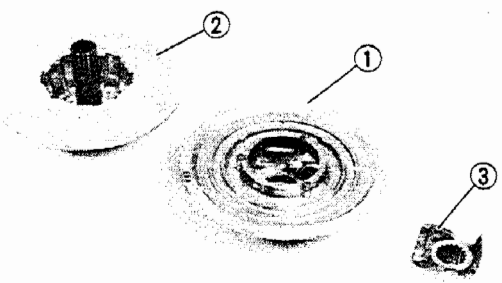
3. Remove:
   - Spring seat ①
   - Secondary sheave spring ②

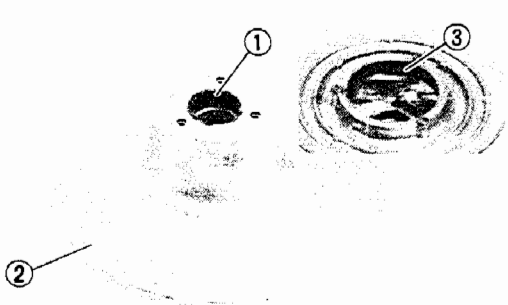


4. Remove:
   - Sliding sheave ①
   - Base plate ②
     (from fixed sheave)

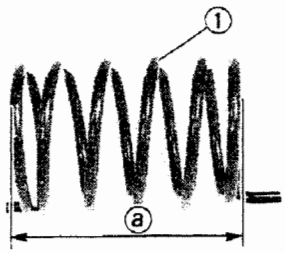
INSPECTION

1. Inspect:
   - Sliding sheave ①
   - Fixed sheave ②
   - Spring seat ③
     Cracks/Damage → Replace.



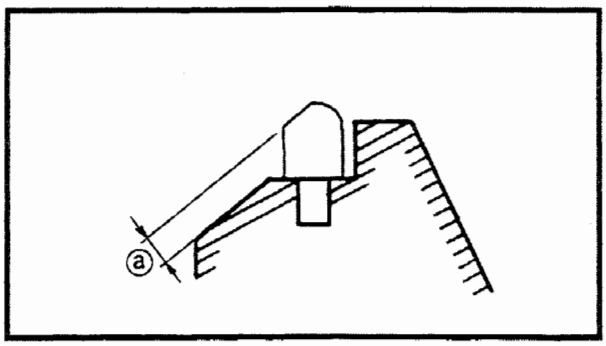


2. Inspect:
   - Bushing ① (sliding sheave)
   - Sliding sheave ② (V-belt contact surface)
     Scratches/Wear/Damage → Replace.
   - Sliding bushing ③
     Unsymmetrical wear/Damage → Replace.



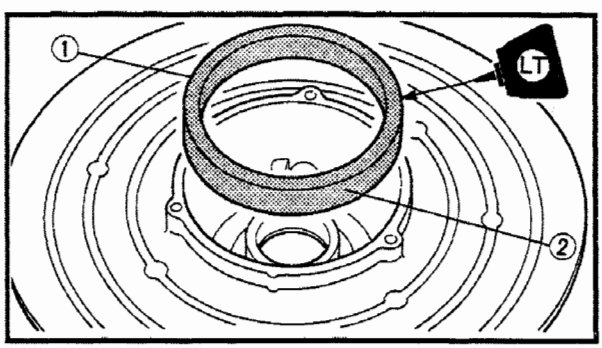
3. Inspect:
   - Secondary sheave spring ①
     Cracks/Damage → Replace.
4. Measure:
   - Torsion spring free length ⓐ
     Less than specification → Replace.

Free length limit :
90 mm (3.5 in)



5. Measure:
   - Ramp shoe thickness ⓐ
     Out of specification→Replace.

Wear limit:
1.0 mm (0.04 in)



ASSEMBLY

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

1. Install:
   - Sliding bushing ①

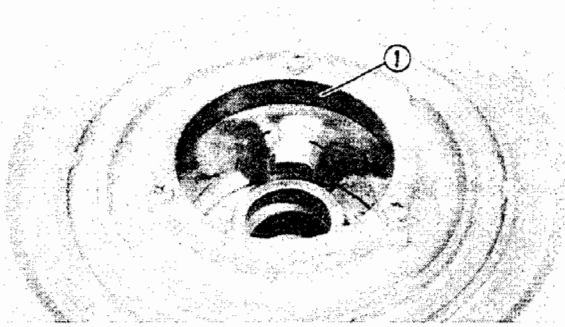
NOTE:

Be sure to appy LOCTITE® on the outside ② to the sliding bushing.

2. Clean:
   - Sliding bushing ① (sliding sheave)

NOTE:

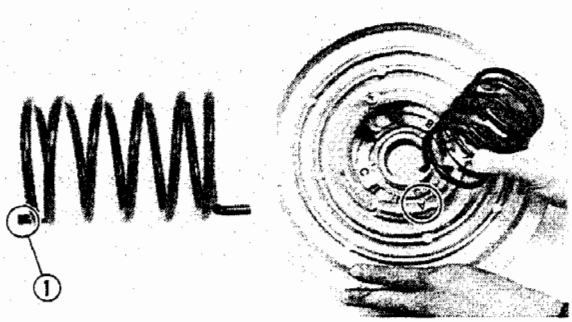
Be sure to remove any dust or grease from the sliding bushing ① of the sliding sheave, using a cloth dampened with thinner.



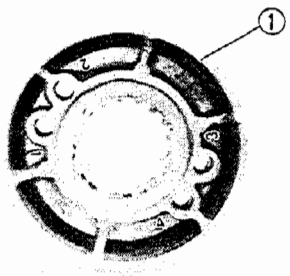
3. Install:
   - Secondary sheave spring

NOTE:

- Hook the end of the secondary sheave spring onto the spring hole Ⓐ in the sliding seat.
- Be sure to install on the short side ① end of spring to the secondary sheave.



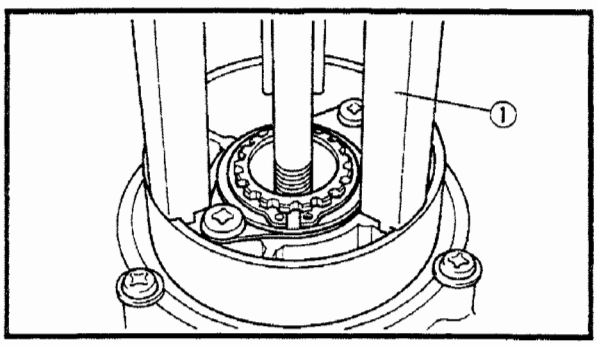
Standard spring position:
Position " Ⓐ "



4. Install:
   - Spring seat ①

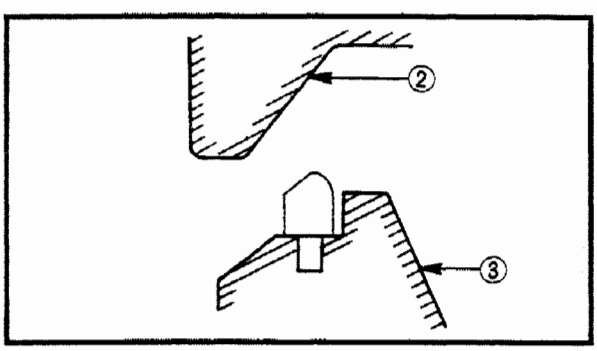
NOTE:
Hook the end of the secondary sheave spring onto the spring hole in the spring seat.

Standard spring position:
Position "3"



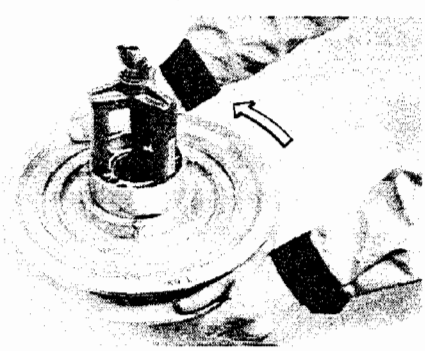
Installation steps:
- Slide the washer and circlip onto the bolt of the sheave compressor ① , and then attach the compressor to the secondary sheave.

Sheave compressor:
90890-01712, YS-28891



CAUTION:
- **Always use a new circlip.**
- **Turn in the screw for the sheave compressor so that the spring seat splines engage with the fixed sheave splines.**

NOTE:
Turn in this screw to a position where the spring seat cam ② does not come in contact with the sliding sheave cam ③.



- Turn the sliding sheave the specified degrees, in the counterclockwise direction.
- Holding the sliding sheave and fixed sheave in this position.

Standard twist angle:
33°

- Turn in the screw for the sheave compressor so that the spring seat engages with the sliding sheave.
- Install the washer and circlip in proper position.

INSTALLATION

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

1. Lubricate:
   - Splines (fixed sheave)

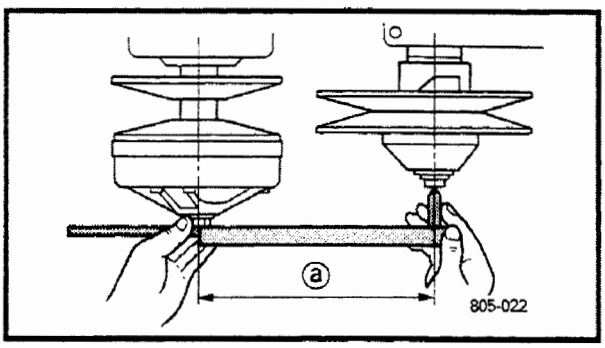
Recommended grease:
Esso beacon 325 grease or
Aero shell grease #7A

2. Tighten:

Secondary sheave bolt:
60 Nm (6.0 m • kg, 43 ft • lb)

3. Adjust:
   - Sheave distance
   - Sheave offset
   - Free play (clearance)

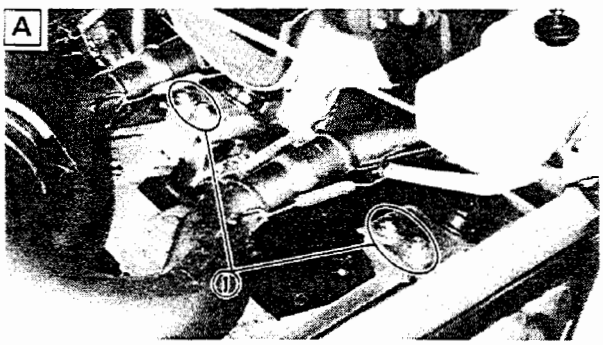
SHEAVE DISTANCE AND OFFSET ADJUSTMENT



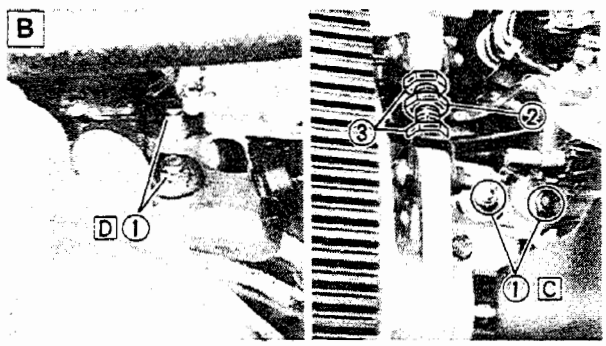
1. Measure:
   - Sheave distance ⓐ
     Use the sheave gauge.
     Out of specification → Adjust.

Sheave gauge:
YS-91047-B

Sheave distance ⓐ:
363.5 ~ 366.5mm (14.3 ~ 14.4 in)



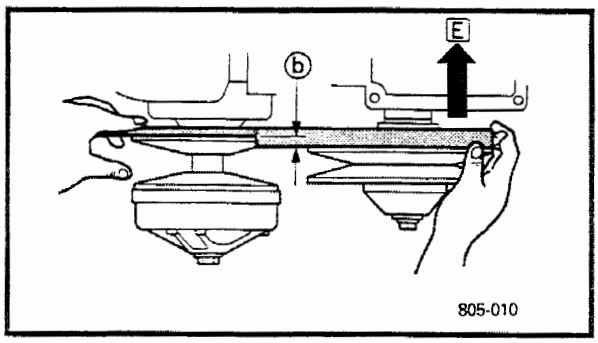
2. Adjust:
   - Sheave distance



Adjustment steps:
- Check the engine mounting bracket, dampers and frame for bends, cracks and corrosion. Repair or replace as required.
- Loosen the engine mounting nuts ①.
- Adjust the position of the engine with the adjuster ②.
  Loosen the lock nuts ③ and turn the adjuster in or out until the specified distance is obtained, the crankshaft and jackshaft being parallel to each other.
- Tighten the lock nuts ③.
- Tighten the engine mounting nuts ①.

A Front B Rear C Left D Right

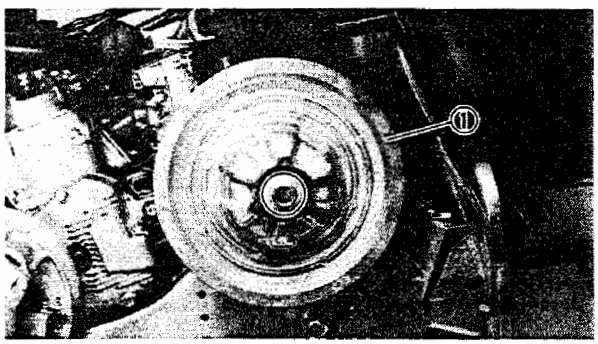
Mounting nut:
40 Nm (4.0 m • kg, 29 ft • lb)
Lock nut (adjuster):
36 Nm (3.6 m • kg, 26 ft • lb)

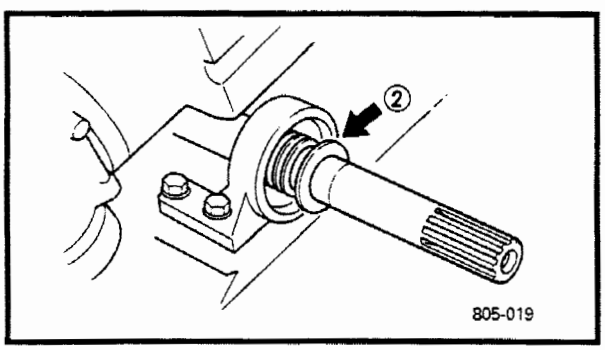


3. Measure:
   - Sheave offset ⓑ
     Use the Sheave Gauge.
     Out of specification → Adjust.

Sheave offset ⓑ :	**14.5 ~ 17.5 mm (0.57 ~ 0.69 in)**
Sheave gauge:	**YS-91047-B**

NOTE:
Be sure to push the secondary sheave to the arrow E and then measure.





4. Adjust:
   - Sheave offset

Adjustment steps:
- Apply the brake to lock the secondary sheave.
- Remove the bolt (secondary sheave) and secondary sheave ① .
- Adjust the sheave offset by adding or removing shim (s) ② .

Adding shim	**Offset is increased.**
Removing shim	**Offset is decreased.**

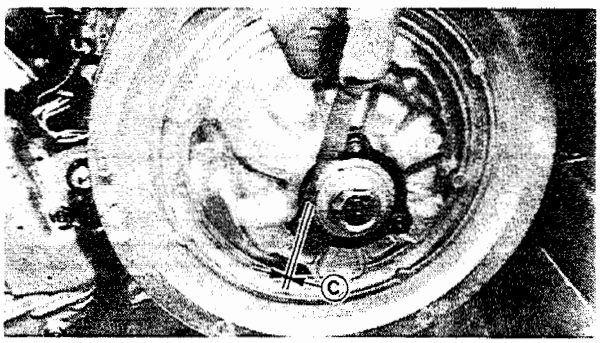
Shim size	
Part Number	**Thickness**
90201-284P9	**0.5 mm (0.02 in)**
90201-284P8	**1.0 mm (0.04 in)**
90201-284P7	**2.0 mm (0.08 in)**

- Install the secondary sheave and bolt (secondary sheave).

Bolt (secondary sheave):
60 Nm (6.0 m • kg, 43 ft • lb)

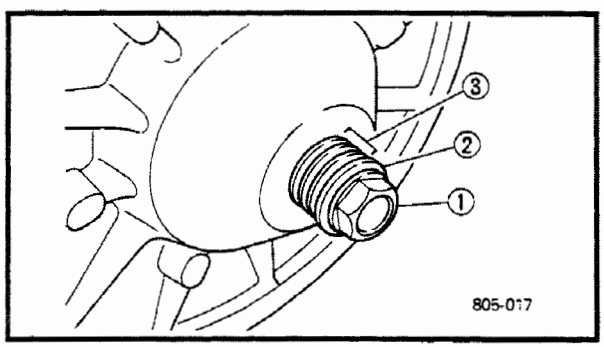
- Recheck the sheave offset. If out of specification, repeat the above steps.

NOTE:
When adjusting the sheave offset, the secondary sheave free play (clearance) should be adjusted.



5. Measure:
   - Secondary sheave free play (clearance) ⓒ
     Use a feeler gauge.
     Out of specification → Adjust.

Secondary sheave free play (clearance):
1.5 mm (0.06 in)



6. Adjust:
   - Secondary sheave free play (clearance)

Adjustment steps:
- Apply the brake to lock the secondary sheave.
- Remove the bolt (secondary sheave) ① and washer ② .
- Adjust the secondary sheave free play (clearance) by adding or removing a shim(s) ③ .

Adding shim	**Free play is decreased.**
Removing shim	**Free play is increased.**

Shim size	
Part Number	**Thickness**
90201-284P9	**0.5 mm (0.02 in)**
90201-284P8	**1.0 mm (0.04 in)**
90201-284P7	**2.0 mm (0.08 in)**

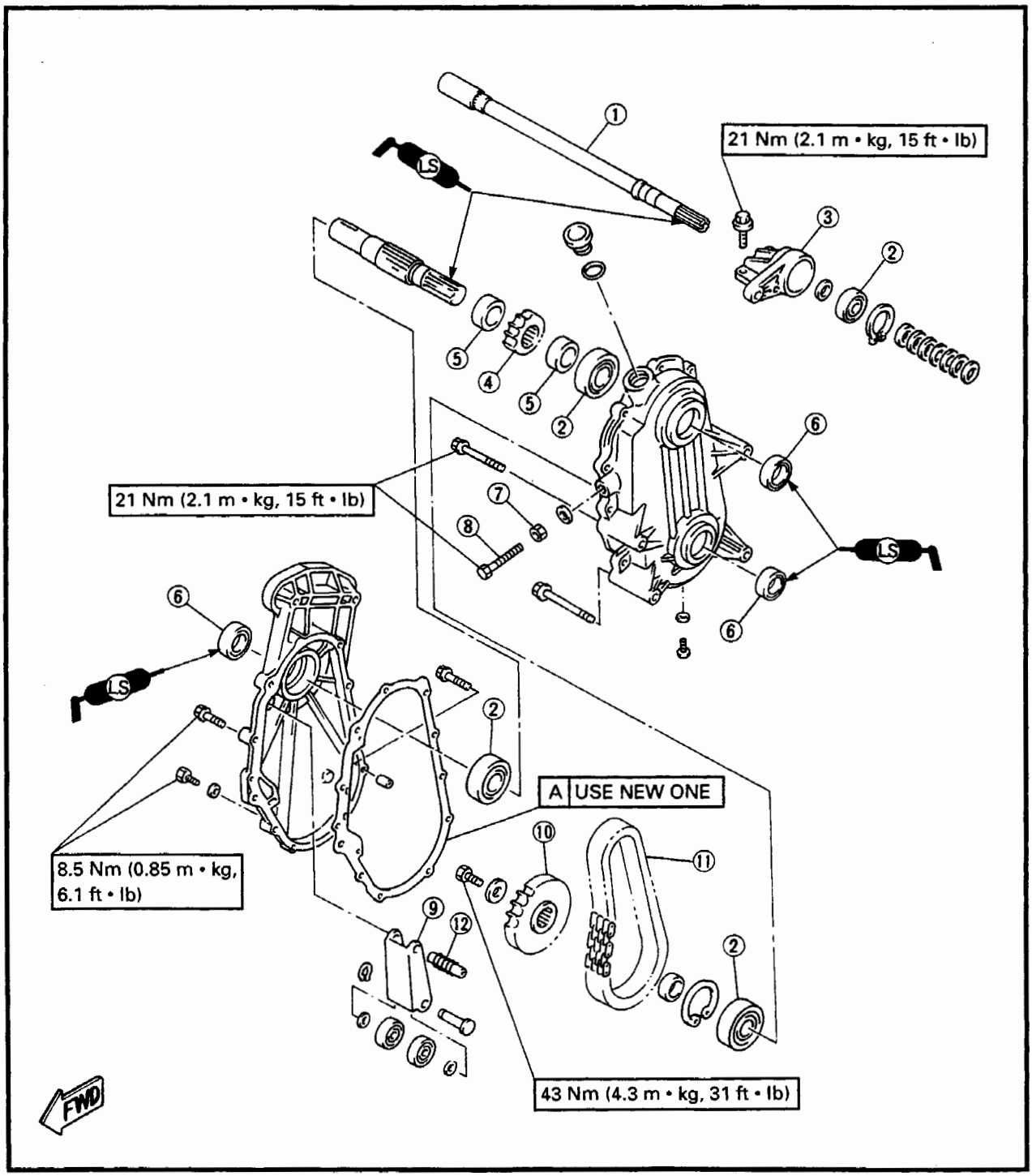
- Install the washer and bolt (secondary sheave), and tighten the bolt.

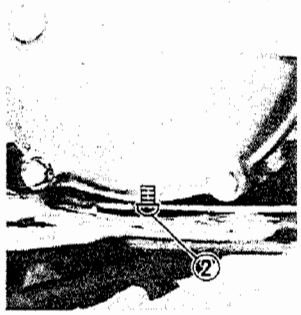
Bolt (secondary sheave):
60 Nm (6.0 m·kg, 43 ft·lb)

- Recheck the secondary sheave free play (clearance). If out of specification, repeat the above steps.

DRIVE CHAIN HOUSING AND JACKSHAFT

① Jackshaft
② Bearing
③ Bearing holder
④ Drive sprocket
⑤ Collar
⑥ Oil seal
⑦ Locknut
⑧ Adjuster
⑨ Drive chain tensioner
⑩ Driven sprocket
⑪ Drive chain
⑫ Torsion spring





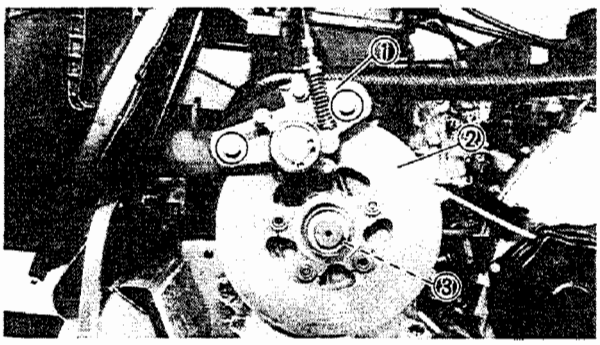
REMOVAL

1. Remove
   - Side cowlings (See page 2-3)
   - Muffler
   - Secondary sheave (See page 4-11)
2. Loosen:
   - Track tension (See page 4-31)
3. Remove:
   - Oil filter cap ① (with O-ring)
   - Drain screw ② (with gasket)

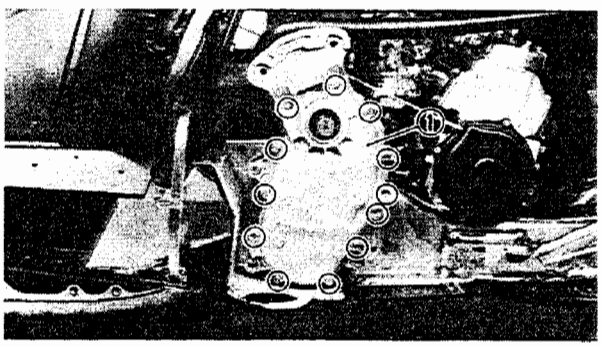
   Drain the oil

NOTE:

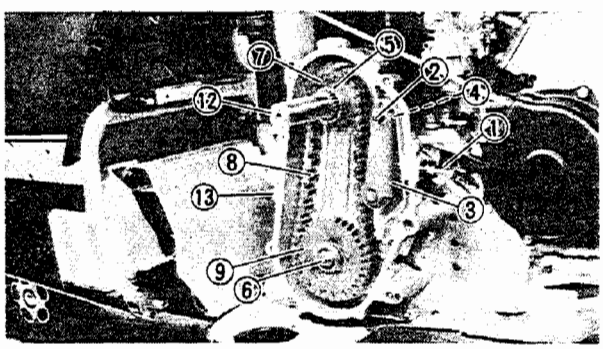
Place a container under the drain hole.

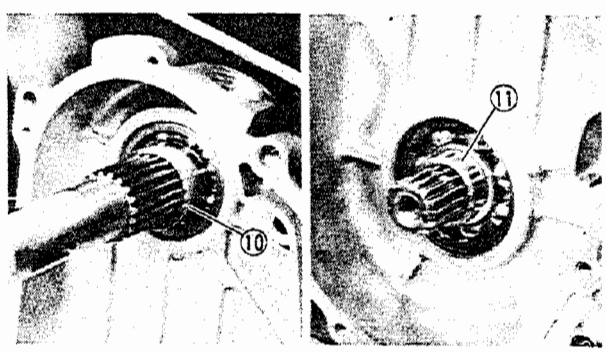


4. Remove:
   - Brake caliper assembly ①
   - Brake disk ②
   - Woodruff key ③
   - Brake pad (inner)



5. Remove:
   - Drive chain housing cover ①
   - Dowel pins
   - Gasket

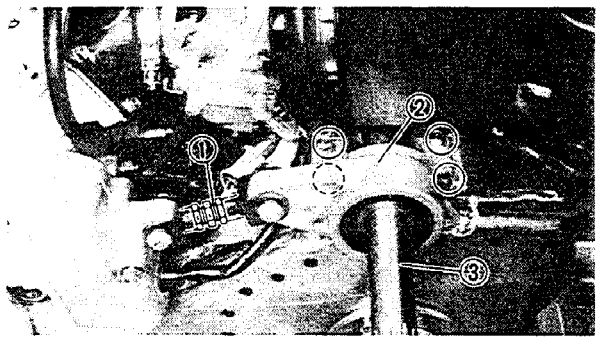




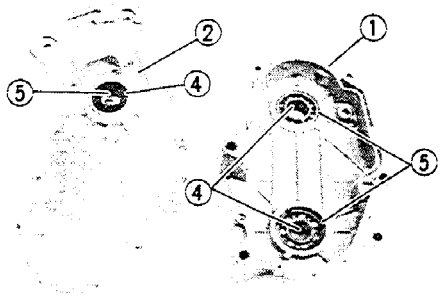
6. Remove:
   - Adjuster ① (chain tensioner)
   - Shaft ② (chain tensioner)
   - Chain tensioner ③
   - Torsion spring ④
   - Spacer collar ⑤
   - Bolt ⑥ (driven sprocket)
   - Drive sprocket ⑦
   - Drive chain ⑧
   - Driven sprocket ⑨
   - Spacer collar ⑩ (drive sprocket)
   - Spacer collar ⑪ (driven sprocket)
   - Drive shaft ⑫
   - Drive chain housing ⑬

NOTE:

Remove the drive sprocket, driven sprocket and drive chain at same time.

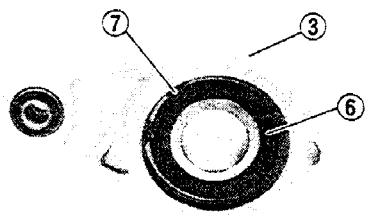


7. Remove:
   - Compression rod ①
   - Bolts (bearing holder ②)
   - Jackshaft assembly ③
   - Bearing holder/washer (from jack shaft)
   - Bolt



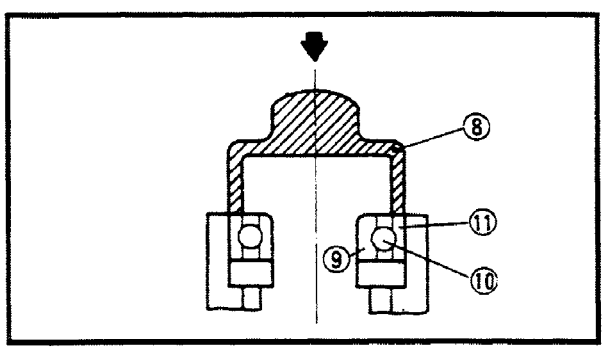
INSPECTION

1. Inspect:
   - Drive chain housing ①
   - Cover ② (drive chain housing)
   - Bearing housing ③
     Cracks/Damage → Replace.
   - Oil seals ④ (drive chain housing)
     Wear/Damage → Replace.
   - Bearings ⑤ (drive chain housing)
     Pitting/Damage → Replace.
   - Bearing ⑥ (bearing housing)
     Pitting/Damage → Replace bearing and inner race holder as a set.



Replacement steps:
- Remove the circlip ⑦ (bearing housing).
- Remove the bearing(s) ⑤ ⑥ using a general bearing puller.
- Install the new bearing(s).

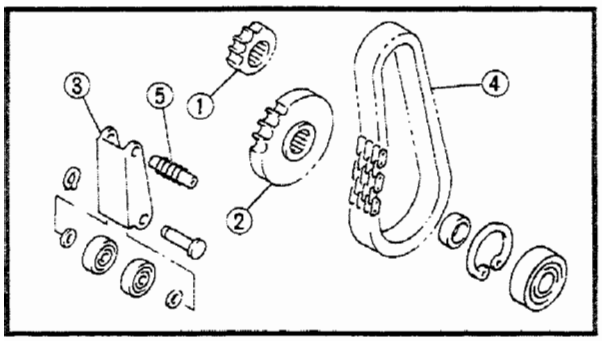
NOTE:
Use a socket ⑧ that matches the outside diameter of the race of the bearing.



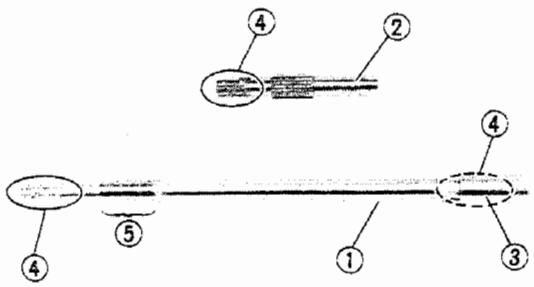
CAUTION:
Do not strike the inner race ⑨ or balls ⑩ of the bearing. Contact should be made only with the outer race ⑪ .

- Install the new circlip (bearing housing).

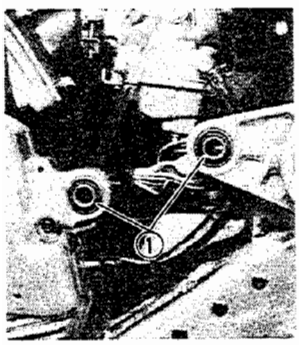
CAUTION:
Always use a new circlip.

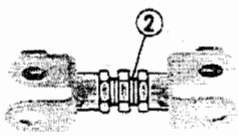


2. Inspect
   - Drive gear teeth ①
   - Driven gear teeth ②
   - Chain tensioner ③
     Pitting/Wear/Damage → Replace.
   - Drive chain ④
   - Torsion spring ⑤
     Wear/Damage → Replace.
     Stiff → Clean or replace.



3. Inspect:
   - Jackshaft ①
   - Drive shaft ②
   - Jackshaft coupler ③
     Scratches (excessive)/Damage → Replace.
   - Splines ④
     Wear/Damage → Replace.
   - Bearing contact surface ⑤
     Scratches/Wear/Damage → Replace.





4. Inspect:
   - Rubber dampers ①
     Wear/Damage → Replace.
   - Compression rod ②
     Cracks/Damage → Replace.

INSTALLATION

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

1. Apply:
   - Low temperature lithium soap base grease (to oil seal lips and splines)
2. Tighten:

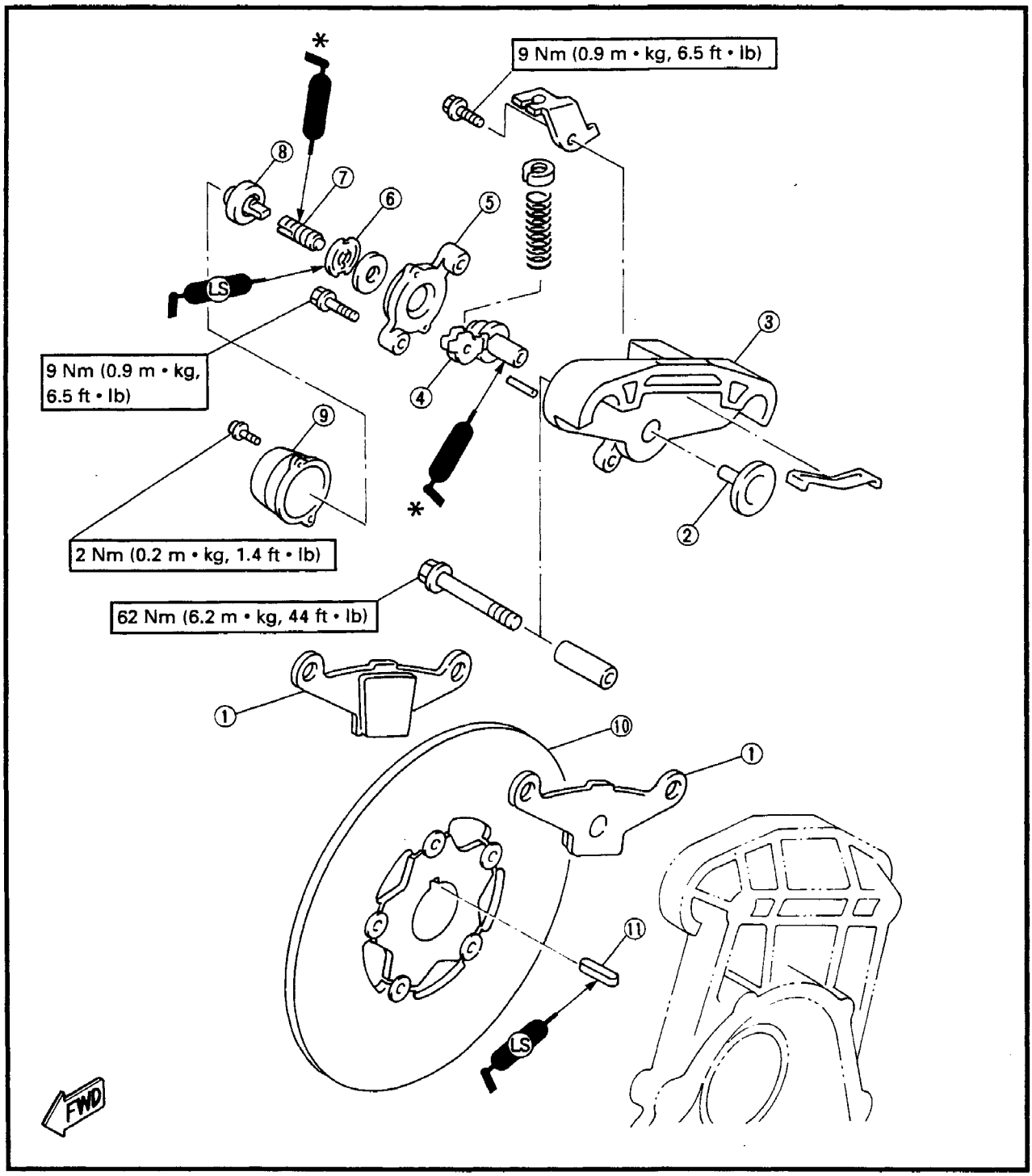
Bolt (bearing housing):
21 Nm (2.1 m • kg, 15 ft • lb)
Bolt (drive chain housing):
21 Nm (2.1 m • kg, 15 ft • lb)
Bolt (drive sprocket):
43 Nm (4.3 m • kg, 31 ft • lb)
Bolt (drive chain housing cover):
8.5 Nm (0.85 m • kg, 6.1 ft • lb)
Bolt (brake caliper body):
65 Nm (6.5 m • kg, 47 ft • lb)
Bolt (compression rod):
40 Nm (4.0 m • kg, 29 ft • lb)
Lock nut (compression rod):
36 Nm (3.6 m • kg, 26 ft • lb)

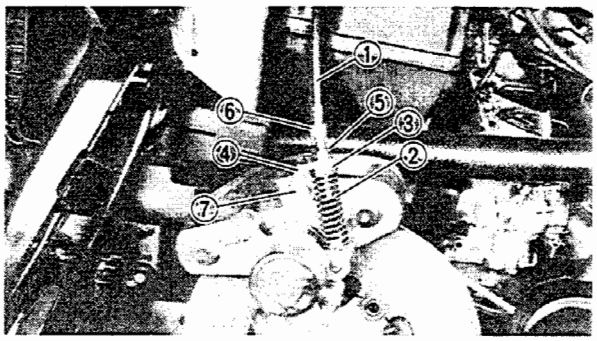
3. Adjust:
   - Drive chain slack (See page 2-20)
   - Sheave distance (See page 4-15)
   - Sheave offset (See page 4-16)
   - Track tension (See page 2-21)
4. Fill:
   - Drive chain housing (See page 2-20)

BRAKE

① Pad
② Back up plate
③ Caliper body
④ Lever
⑤ Stationary cover
⑥ One way lock 2
⑦ Adjusting screw
⑧ Adjusting ratchet
⑨ End cover
⑩ Brake disc
⑪ Woodruff key

* With silicone grease



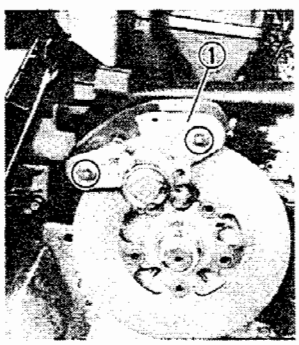


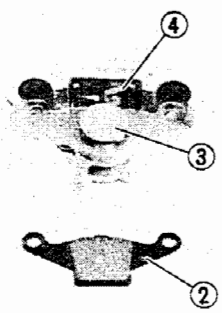
REMOVAL

1. Disconnect:
   - Brake cable ①
2. Remove:
   - Spring ②
   - Spring holder ③
   - Cable holder ④

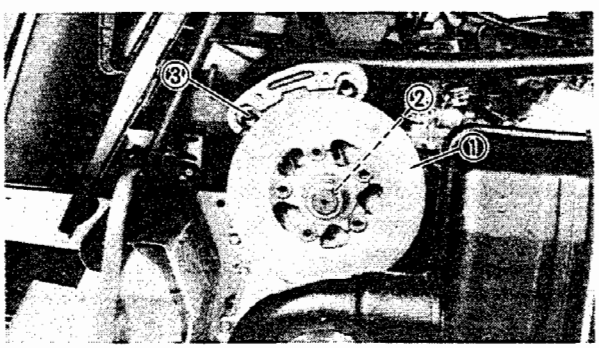
NOTE:

Loosen the locknut ⑤ and turn in the adjuster ⑥ fully to release the tension in the brake cable, then remove the bolt ⑦ (cable holder).

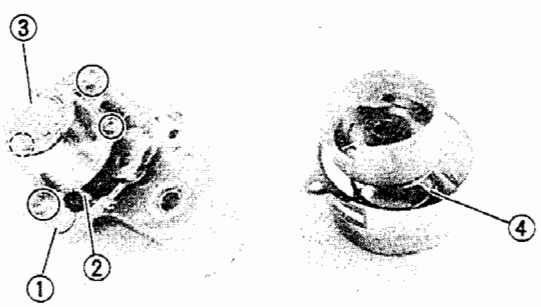




3. Remove:
   - Caliper body ① (outer)
   - Brake pad ② (outer)
   - Brake up plate ③
   - Brake pad spring ④



4. Remove:
   - Brake disk ①
   - Woodruff key ②
   - Brake pad ③ (inner)

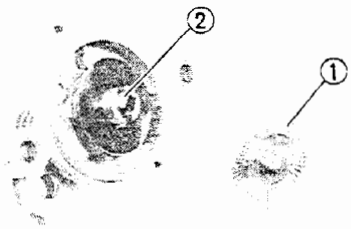


DISASSEMBLY

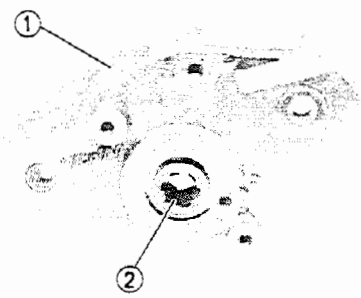
1. Remove:
   - Stationary cover ①
   - Stopper pin ②
   - End cover ③

CAUTION:

Do not disassemble the torsion spring ④ from the end cover and the guide.

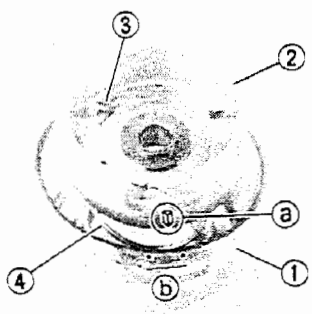


2. Remove:
   - Adjusting ratchet ①
   - Adjusting screw ②



INSPECTION

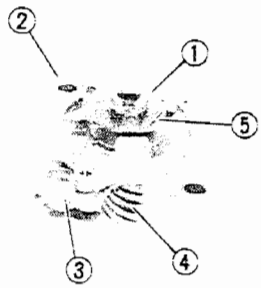
1. Inspect:
   - Caliper body ①
     Cracks/Damage → Replace.
   - Spiral gear ② (caliper body)
     Wear/Damage → Replace.



2. Inspect:
   - End cover ①
   - Guide ②
   - One way lock 1 ③
   - Torsion spring ④
     Cracks/Wear/Damage → Replace the end cover unit.

Inspection steps:

- Check the wear of the torsion spring by the projection mark ⓐ on the guide ② located between the base marks ⓑ on the end cover ①. If projection mark ⓐ is not in the range between the base marks ⓑ, replace the end cover unit.

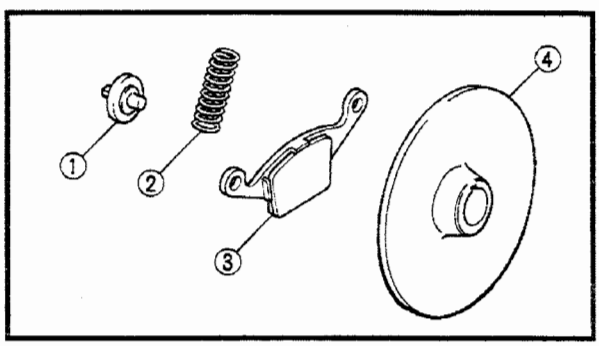


3. Inspect:
- One way lock 2 ①
- Stationary cover ②
- Lever ③
- Spiral gear ④ (lever)
  Cracks/Wear/Damage → Replace.

Replacement steps:
- Remove the one way lock 2 ① using a thin flat-head screw driver.
- Remove the washer ⑤ and stationary cover ②
- Replace a damaged part(s) use a new one.
- Reassemble the removed part(s) and reverse the above steps.

CAUTION:

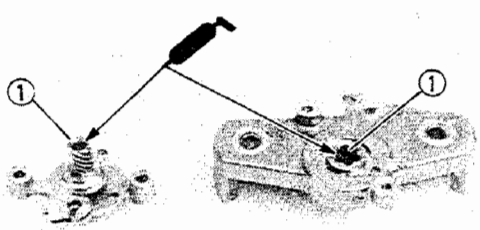
Always use a new one way lock 2.



4. Inspect:
- Adjusting ratchet ①
  Cracks/Wear/Damage → Replace.
- Spring ② (brake cable)
  Wear/Damage → Replace.
- Brake pad ③ thickness
- Brake disk ④
  Bend/Cracks/Damage → Replace.

ASSEMBLY AND INSTALLATION

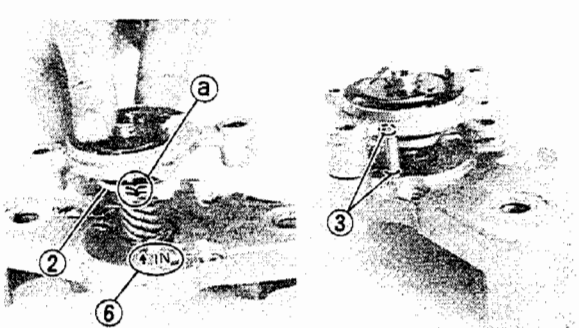
Reverse the "REMOVAL" and "DISASSEMBLY" procedures.
Note the following points.

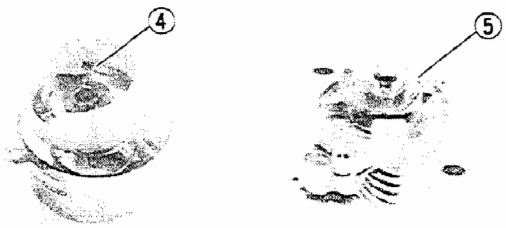


1. Assemble:
- Caliper body

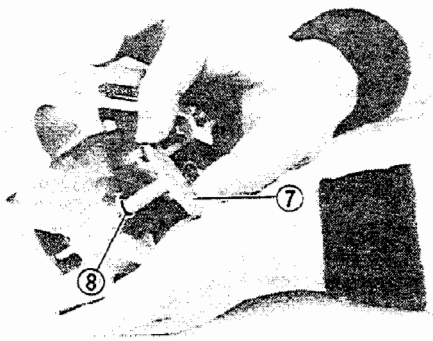
Assembly steps:
- Lubricate the spiral gears ① on the caliper body and lever with silicone grease.
- Align the projection mark ⓐ on the lever with the "IN" mark ⓑ on the caliper body, screw the lever ② counterclockwise to the caliper body.
- Install the stopper pin into the holes ③ on the caliper body and stationary cover, then tighten the bolts (stationary cover).

Bolt (stationary cover):
9 Nm (0.9 m • kg, 6.5 ft • lb)

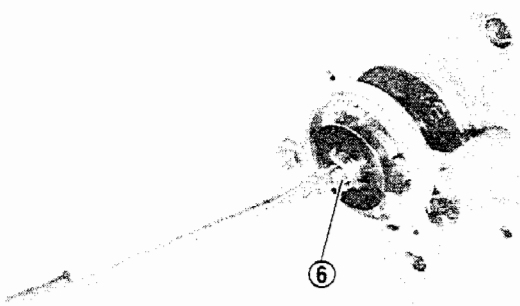




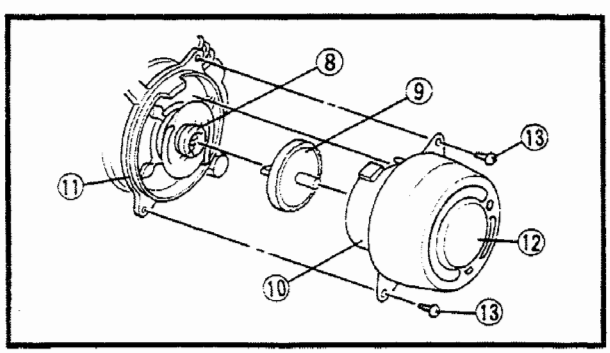
- Lubricate the one way locks 1 ④ and 2 ⑤ with a lithium grease.



- Lubricate the adjusting screw ⑥ and back up plate ⑦ with a silicone grease.
- Insert the back up plate ⑦ into the lever shaft hole ⑧ .



- Screw in the adjusting screw ⑥ , and when it contacts lightly with the end of the back up plate, then back out the adjusting screw ⑥ 1/2 to 1 turn.



- Fit the end of the adjusting rachet ⑨ into the adjusting screw ⑧ , and align the cut in the guide ⑩ with the projection of the stationary cover ⑪ , then install the guide ⑩ , which is fitted to the end cover ⑫ twisting the end cover clockwise approximately 30 degrees and tighten the screws (end cover) ⑬ .

Screw (end cover):
2 Nm (0.2 m • kg, 1.4 ft • lb)

2. Lubricate:
   - Woodruff key
   - Jackshaft

Recommended grease:
ESSO Beacon 325 grease or
Aeroshell grease #7A

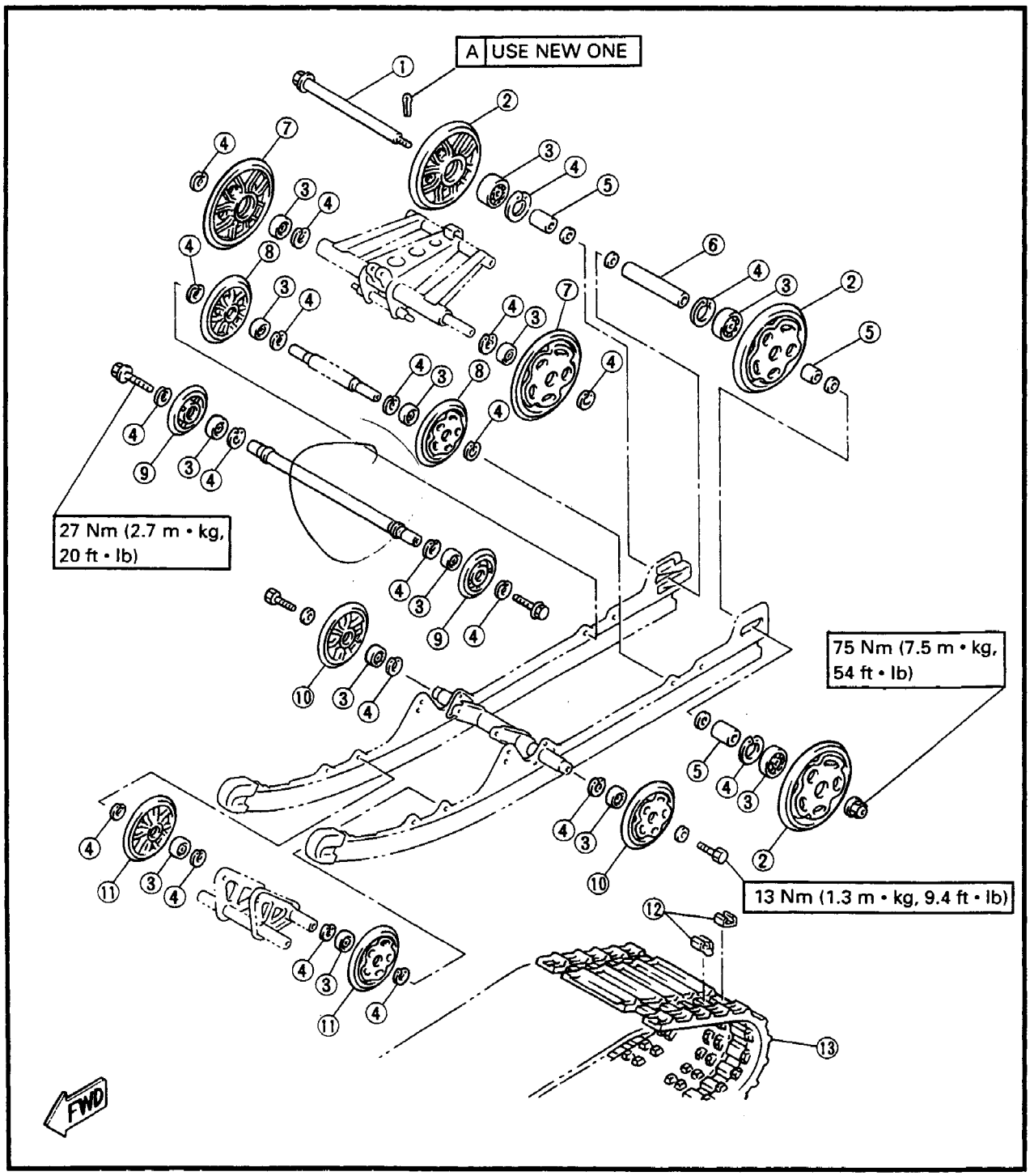
3. Tighten:

Bolt (caliper body):
62 Nm (6.2 m • kg, 44 ft • lb)
Bolt (cable holder):
9 Nm (0.9 m • kg, 6.5 ft • lb)

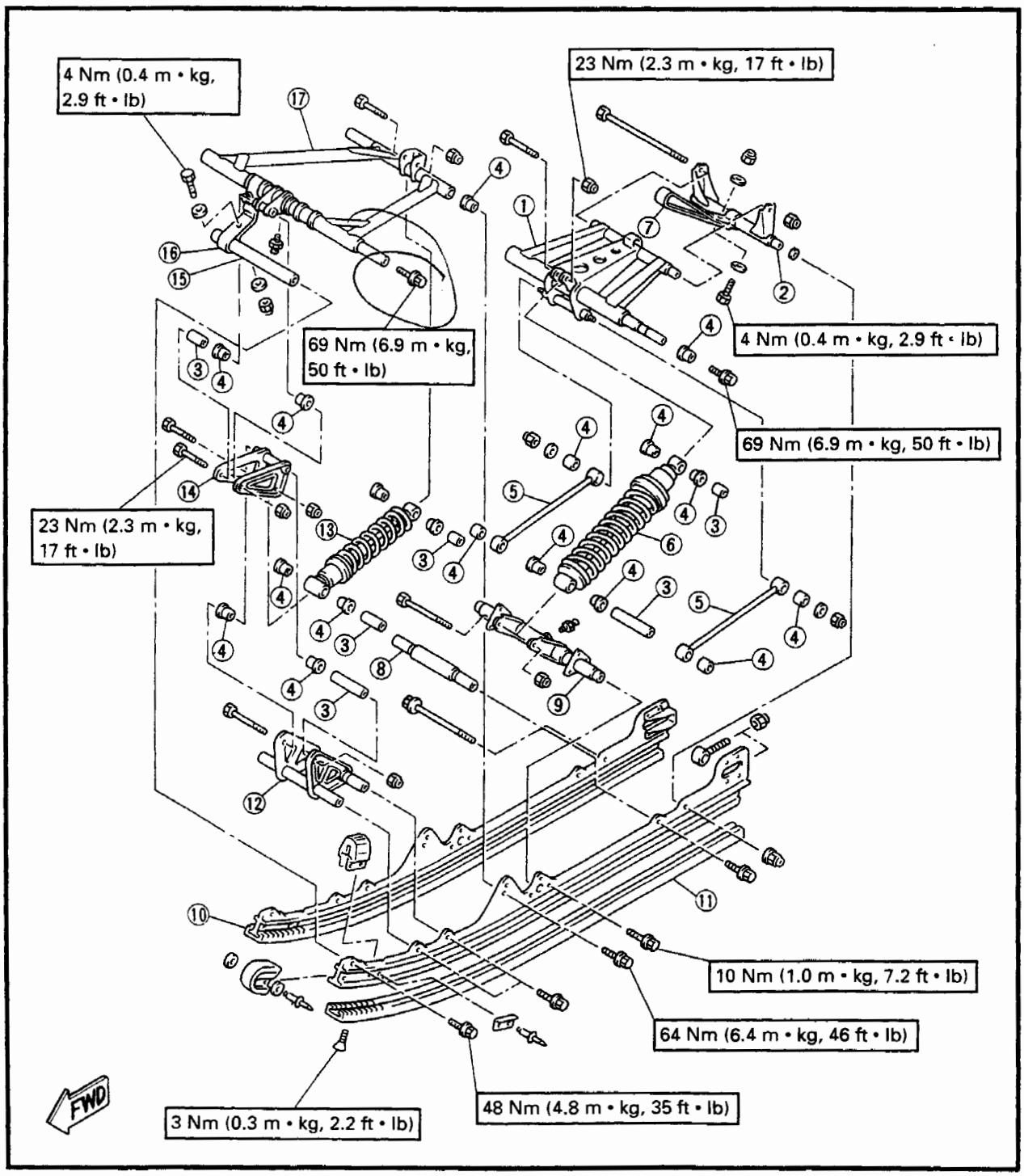
4. Adjust:
- Brake lever distance "L" (See page 2-18)

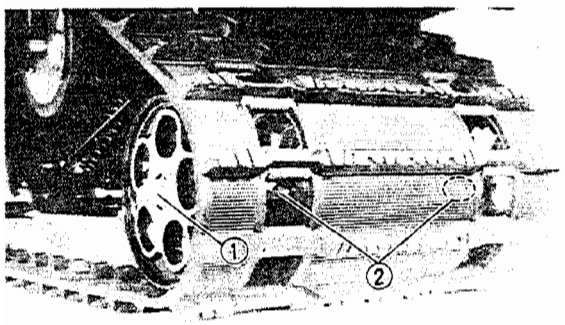
SLIDE RAIL SUSPENSION

① Rear axle
② Guide wheel (rear)
③ Bearing
④ Circlip
⑤ Collar
⑥ Collar (center)
⑦ Suspension wheel
⑧ Suspension wheel (rear)
⑨ Guide wheel (center)
⑩ Suspension wheel (center)
⑪ Suspension wheel (front)
⑫ Slide metal
⑬ Track assembly



① Rear pivot arm
② Pivot arm bracket
③ Collar
④ Bushing
⑤ Pull rod
⑥ Rear suspension
⑦ Rear stopper band
⑧ Bracket
⑨ Rear suspension bracket
⑩ Sliding frame
⑪ Slide runner
⑫ Suspension wheel bracket
⑬ Front suspension
⑭ Relay arm
⑮ Bracket
⑯ Front stopper band
⑰ Front pivot arm



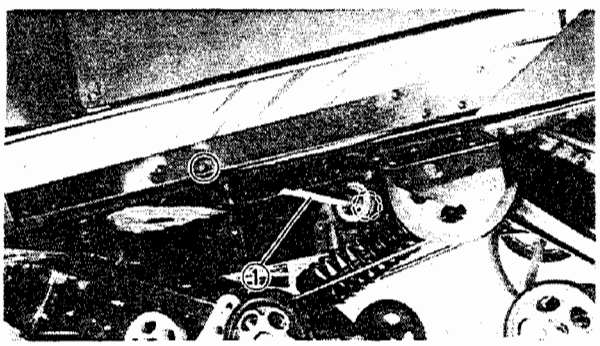


REMOVAL

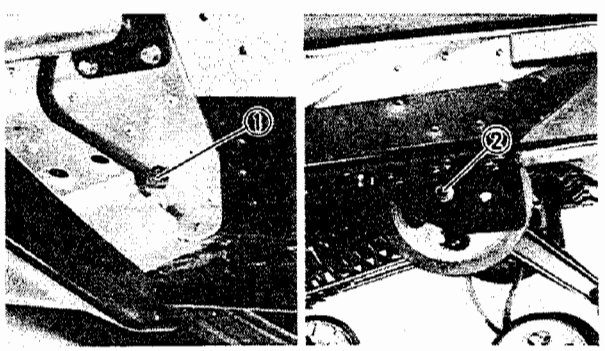
1. Remove:
   - Cotter pin (rear axle)
2. Loosen:
   - Track tension

NOTE:

Loosen the axle nut ① and adjuster nuts (track tension) ②.



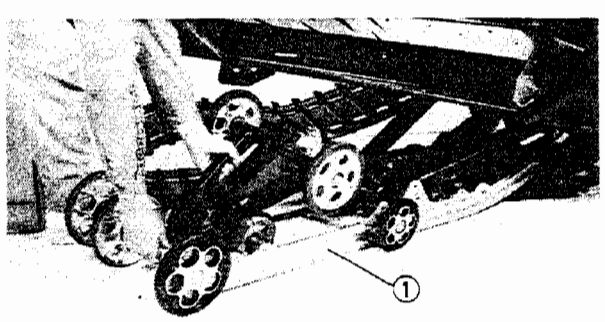
3. Remove:
   - Guide wheel (center) ①



4. Remove:
   - Suspension mounting bolts (front ① and rear ②)

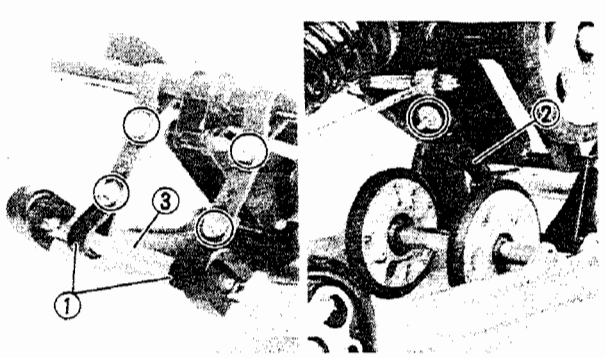
NOTE:

Loosen both right and left bolts (front) ① at the same time.



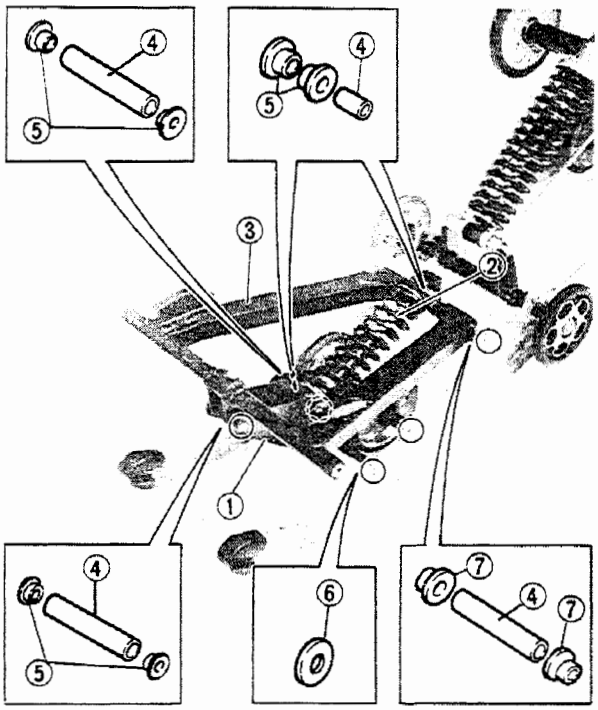
5. Lift the rear of the machine with a suitable stand.

6. Remove:
   - Slide rail suspension ①



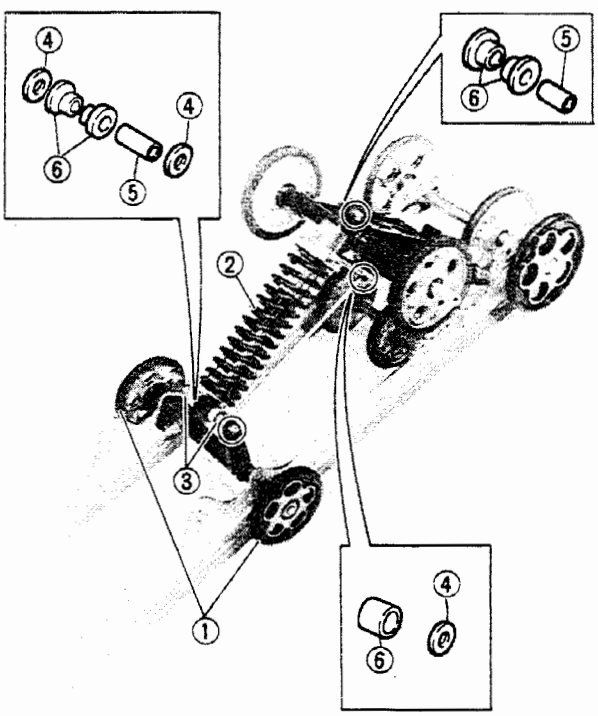
DISASSEMBLY

1. Remove:
   - Stopper bands (front ① and rear ②)
   - Bracket shaft ③



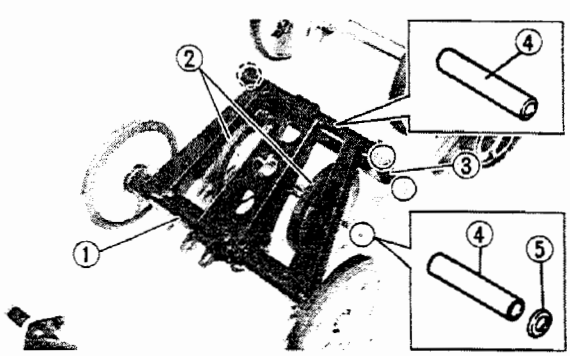
2. Remove:
   - Suspension wheel bracket ①
   - Shock absorber ② (front)
   - Front pivot arm ③

④ Collar
⑤ Bushing
⑥ Washer
⑦ Flange washer



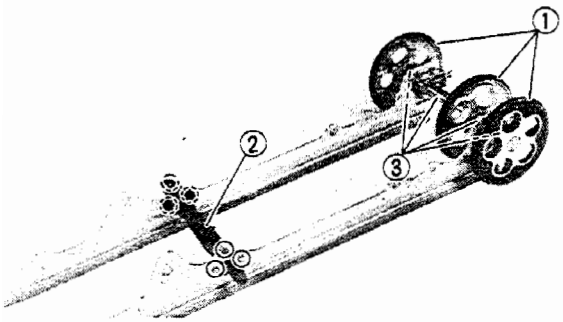
3. Remove:
   - Suspension wheels ① (center)
   - Shock absorber ② (rear)
   - Pull rods ③

④ Washer
⑤ Collar
⑥ Bushing

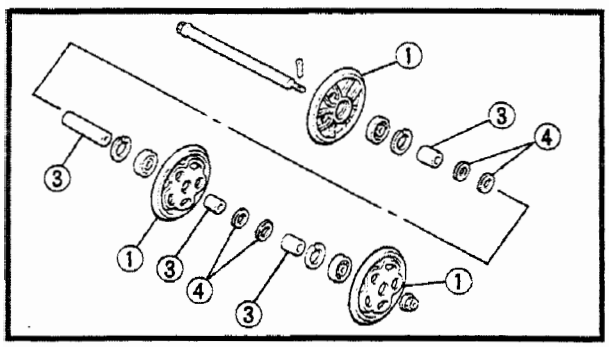


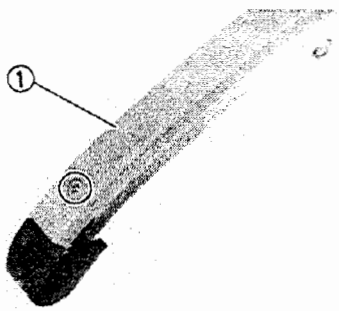
4. Remove:
   - Rear pivot arm ①
   - Suspension wheels ②
   - Pivot arm bracket ③

④ Collar
⑤ Washer

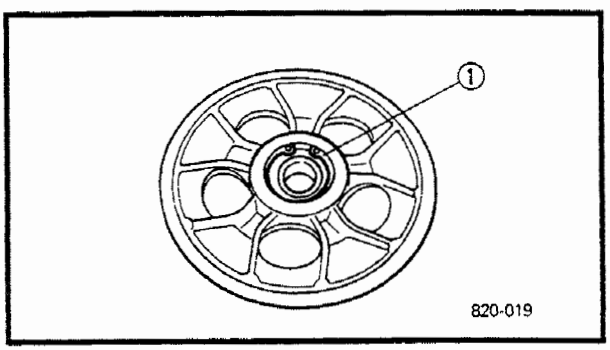


5. Remove:
   - Guide wheels ① (rear)
   - Rear suspension bracket ②
   - Collars ③
   - Washers ④



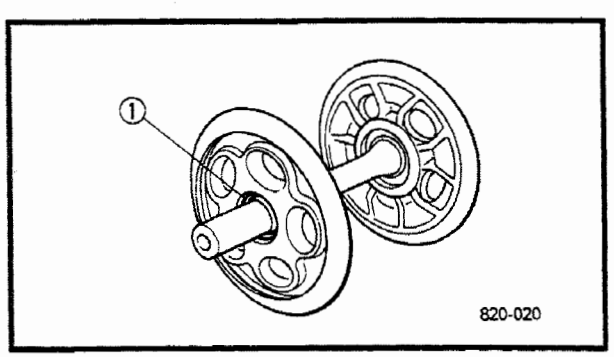


6. Remove:
   - Slide runner ①

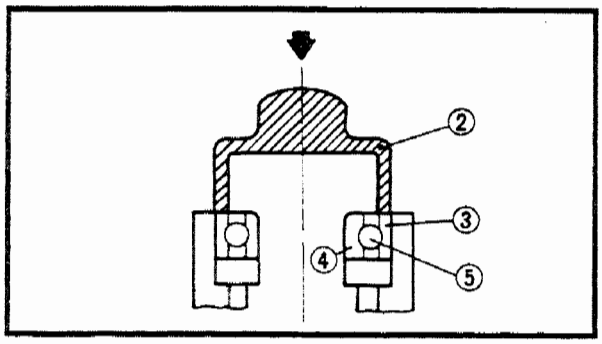


INSPECTION

1. Inspect:
   - Suspension wheel
   - Guide wheel
     Cracks/Damage → Replace.
   - Wheel bearing
     Wheel turns roughly → Replace.



Replacement steps:
- Remove the circlip ①.
- Remove the wheel bearing using a general bearing puller.
- Install the wheel bearing (new) into the wheel.

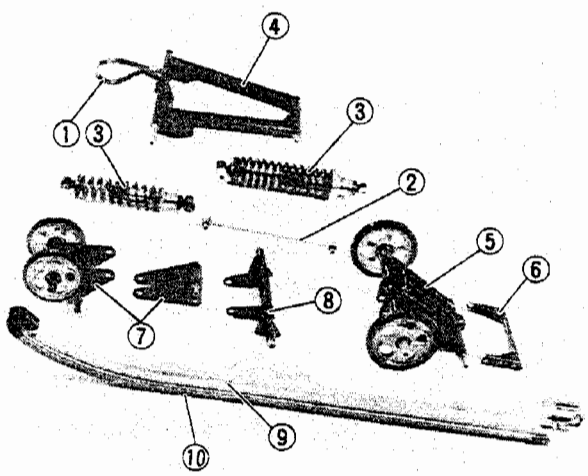


NOTE:
Use a socket ② that matches the outside diameter ③ of the race of the bearing.

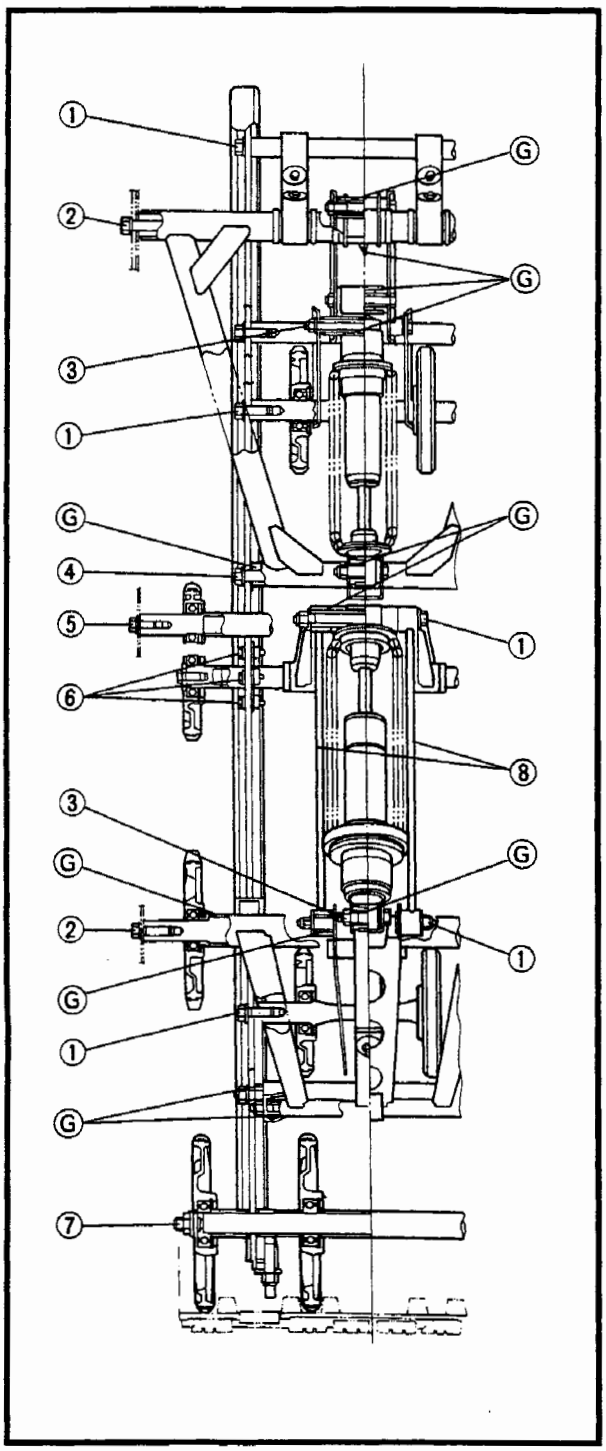
CAUTION:
Do not strike the inner race ④ or balls of the bearing ⑤. Contact should be made only with the outer race.

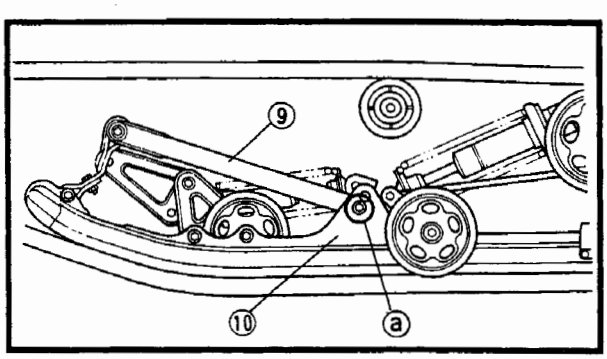
- Install the circlip.
- Install the wheel to the shaft.

CAUTION:
Always use a new circlip.



2. Inspect:
   - Stopper band ①
     Frayed/Damage → Replace.
   - Pull rod ②
     Bends/Damage → Replace.
   - Shock absorber ③
     Oil leaks/Damage → Replace.
   - Bushings
     Wear/Cracks/Damage → Replace.
   - Front pivot arm ④
   - Rear pivot arms ⑤
   - Pivot arm bracket ⑥
   - Suspension wheel bracket ⑦
   - Front pivot arm ⑧
   - Sliding frame ⑨
     Cracks/Damage → Replace.
   - Slide runner ⑩
     Wear/Damage → Replace
     (See page 2-22)





ASSEMBLY

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

1. Apply:
   - Low temperature lithium soap base grease (to "G" mark points in the illustration)
2. Tighten:

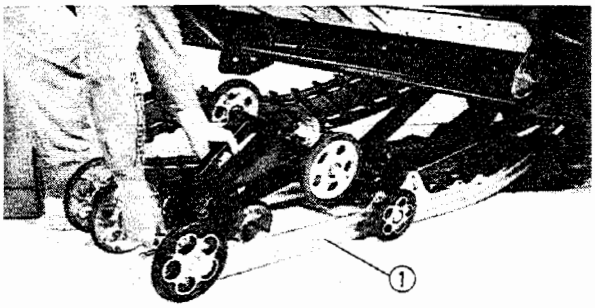
Screw (slide runner):
3 Nm (0.3 m • kg, 2.2 ft• lb)
Bolt ①:
48 Nm (4.8 m • kg, 35 ft • lb)
Bolt ②:
69 Nm (6.9 m • kg, 50 ft • lb)
Nut ③:
23 Nm (2.3 m • kg, 17 ft • lb)
Bolt ④:
64 Nm (6.4 m • kg, 46 ft • lb)
Bolt ⑤:
16 Nm (1.6 m • kg, 11 ft • lb)
Bolt ⑥:
10 Nm (1.0 m • kg, 7.2 ft • lb)
Nut ⑦:
75 Nm (7.5 m • kg, 54 ft • lb)
Nut (stopper band):
4 Nm (0.4 m• kg, 2.9 ft • lb)

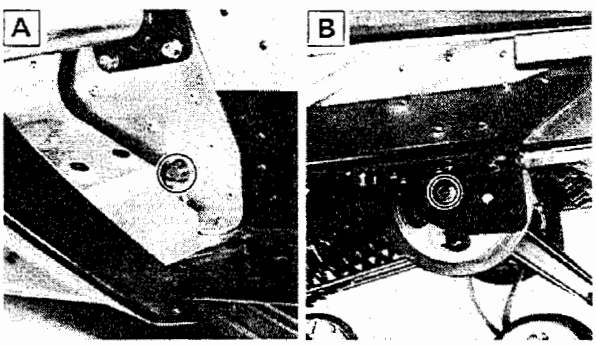
NOTE:

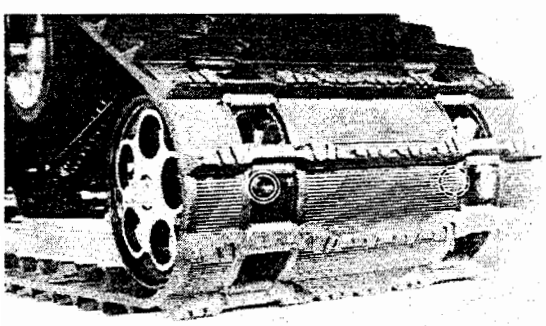
- Install the pull rod ⑧ so that the rod is offset slightly toward the outside.
- When attaching the front pivot arm ⑨ to the sliding frame ⑩ , attach it to the hole ⓐ on the lower side. (for standard setting)

CAUTION:

Always use a new cotter pin.







INSTALLATION

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

1. Place the slide rail suspension ① into the track, and fit the front pivot arm holding bolts. Then fit the rear pivot arm bracket mounting bolts.

NOTE:

Do not tighten the bolts at this point. Finger – tighten the bolts.

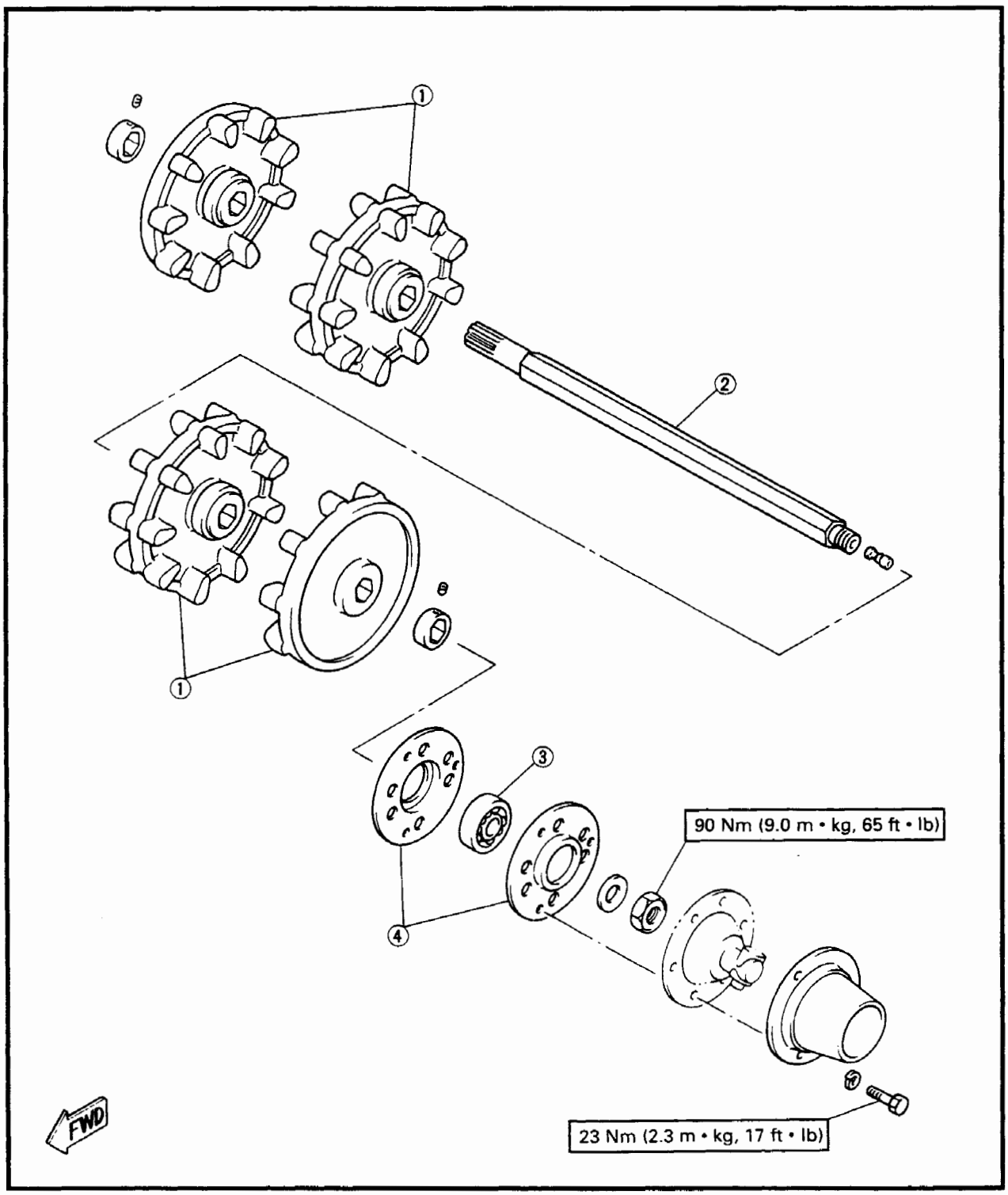
2. Tighten:

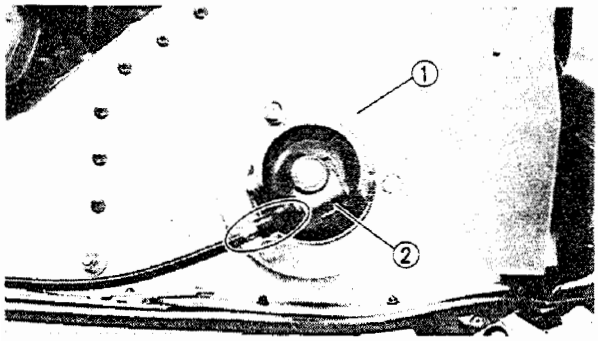
Suspension mounting bolts:
Front A :
68 Nm (6.8 m • kg, 49 ft • lb)
Rear B :
68 Nm (6.8 m • kg, 49 ft • lb)
Guide wheel bolt (center):
27 Nm (2.7 m • kg, 20 ft • lb)

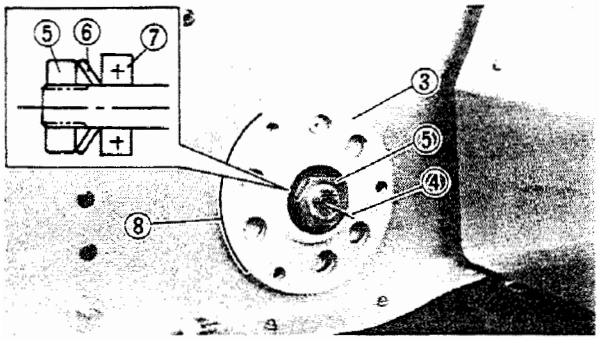
3. Adjust:
   - Track tension (See page 2-21)
   - Spring preload (See page 2-40)

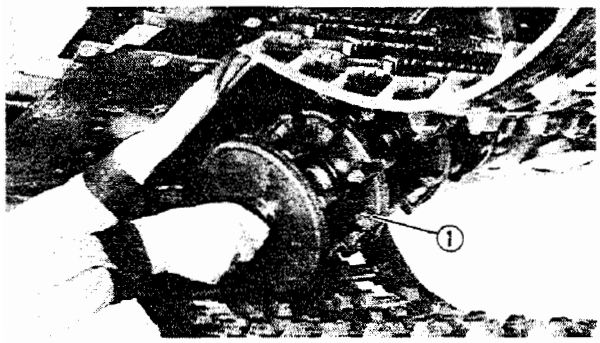
FRONT AXLE AND TRACK

① Sprocket wheel
② Front axle
③ Bearing
④ Bearing holder









REMOVAL

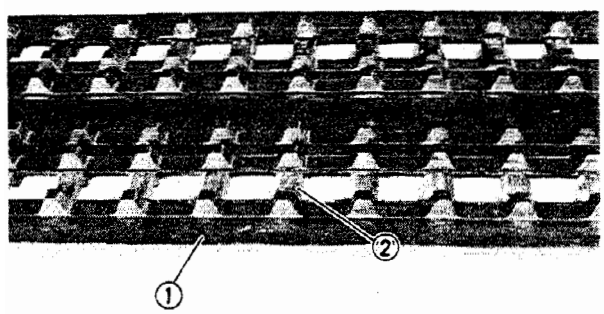
1. Remove:
   - Side cowlings (See page 2-3)
   - Scondaly sheave
   - Speedometer cable
   - Speedometer gear cover ①
   - Speedometer gear assembly ②
   - Bearing holder ③ (outer)
   - Cable joint ④ (speedometer cable)
   - Nut ⑤ (front axle)
   - Plain washer ⑥
   - Bearing ⑦
   - Bearing holder ⑧ (inner)

NOTE:

Apply the parking brake when removing the nut (front axle).

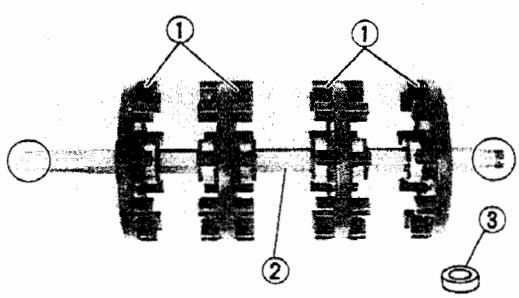
2. Remove:
   - Muffler
   - Driven sprocket (See page 4-19)
   - Slide rail suspension (See page 4-31)

3. Remove:
   - Front axle assembly ①
   - Track assembly

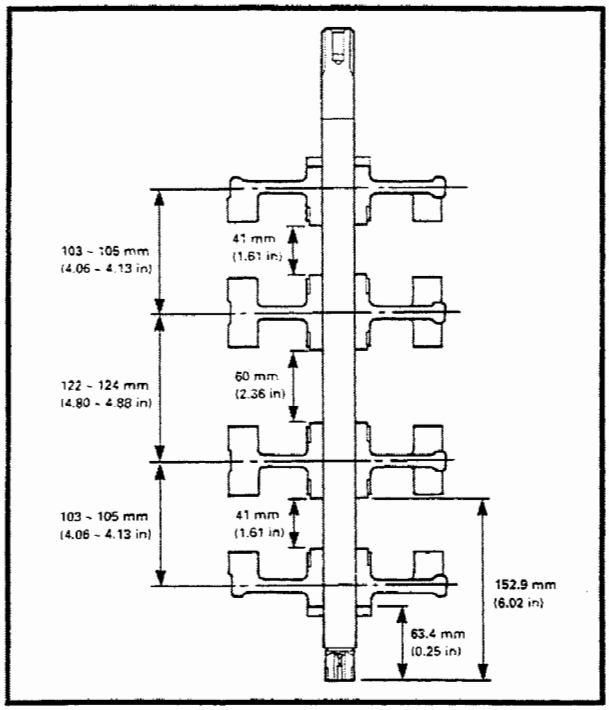


INSPECTION

1. Inspect:
   - Track ①
   - Slide metal ②
     Wear/Cracks/Damage → Replace.



2. Inspect:
   - Sprocket wheels ①
     Wear/Break/Damage → Replace.
   - Front axle ②
     Bent/Scratched (excessively)/Damage → Replace.
   - Splines/Threads (front axle)
     Wear/Damage → Replace.
   - Front axle bearing ③
     Pitting/Damage → Replace.



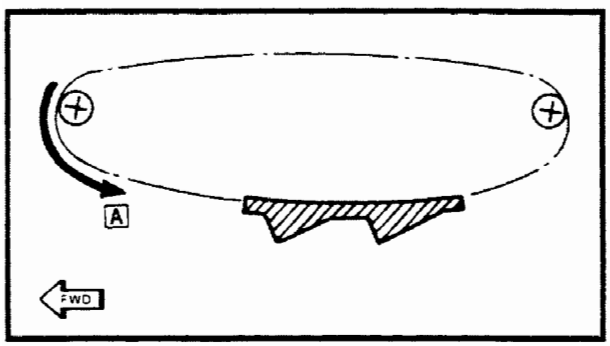
INSTALLATION

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

1. Install:
   - Sprocket wheels ①

NOTE:

- When pressing the sprocket wheels onto the front axle, align the lugs on each sprocket wheel.
- Locate each sprocket wheel on the axle where shown in the illustration.

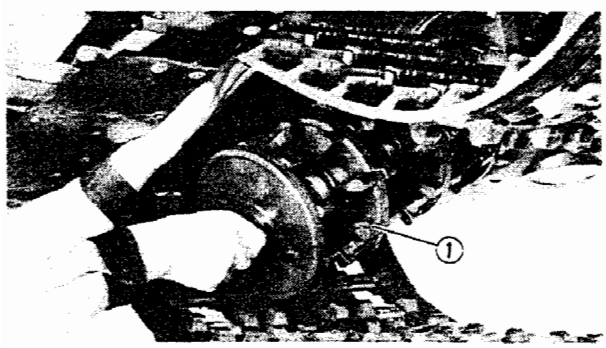


2. Place the track in the chassis.

NOTE:

Be sure it is positioned as shown in the illustration.

A TURNING DIRECTION



3. Install:
   - Front axle ①

NOTE:

- Install the front axle, push in the splined end toward the chain housing, and install the threaded end into the speedometer gear housing side.
- Be sure the lugs correctly engage the track.

4. Tighten:

Front axle nut:
90 Nm (9.0 m • kg, 65 ft • lb)
Speedometer gear assembly bolt:
23 Nm (2.3 m • kg, 17 ft • lb)

CHAPTER 5.
ENGINE OVERHAUL

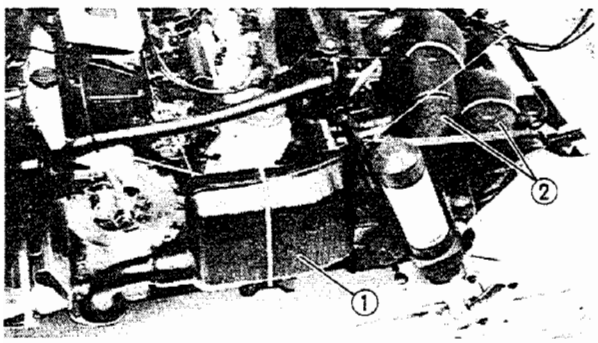
ENGINE OVERHAUL

ENGINE REMOVAL

NOTE:

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

- Cylinder head
- Cylinder
- Piston and piston ring
- Water pump
- Recoil starter
- Oil pump
- Primary sheave

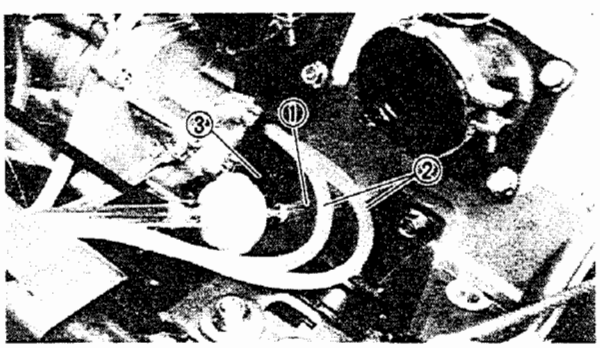


EXHAUST SYSTEM

1. Remove:
   - Side cowling (right) (See page 2-3)
   - Muffler ①
   - Exhaust pipes ②

CARBURETOR AND RADIATOR

1. Remove:
   - Carburetor assembly (See page 7-3)
   - Primary sheave (See page 4-2)
   - Secondary sheave (See page 4-11)
   - Radiator (See page 6-3)

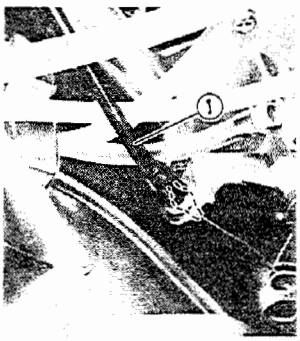


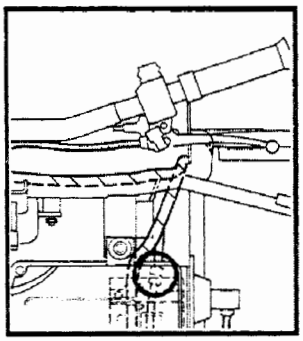
OIL HOSE

1. Disconnect:
   - Oil hose ①
   - Oil delivery hoses ②
   - Pulser hoses ③

NOTE:

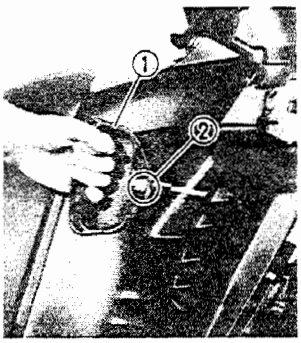
Plug the oil hoses and oil delivery hoses so that oil does not run out.

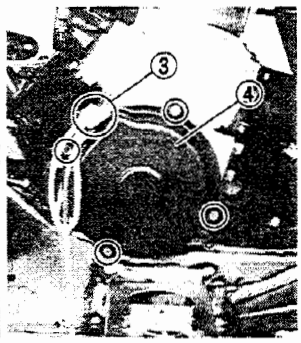




CABLE AND LEADS

1. Disconnect:
   - Oil pump cable ①
   - CDI magneto coupler
   - Pickup coil coupler



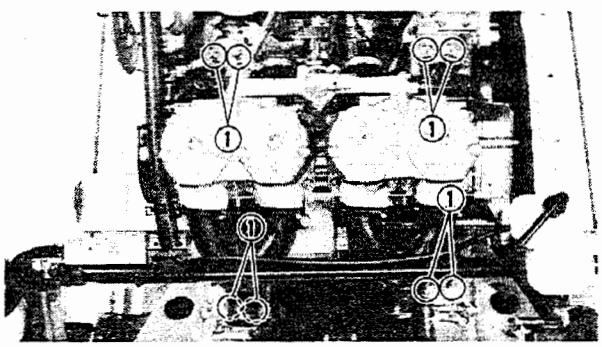


RECOIL STARTER HANDLE

1. Remove:
   - Starter handle ①

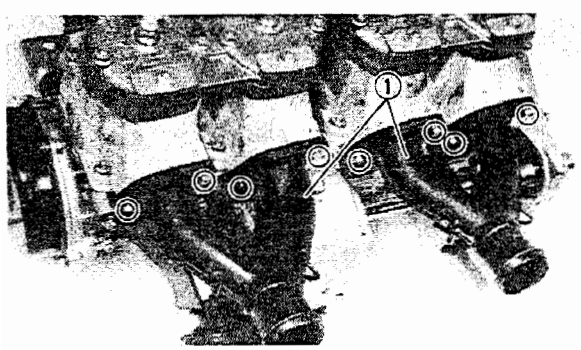
NOTE:

To remove the starter handle, loosen the knot ② of the starter rope and then knot ③ the rope end so it will not be pulled into the recoil starter case ④.



ENGINE REMOVAL

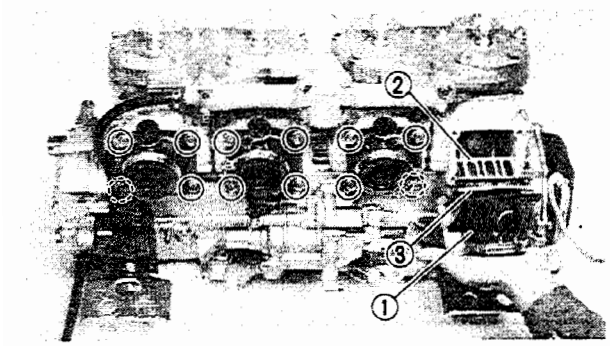
1. Remove:
   - Nuts ① (engine bracket)
   - Engine assembly



DISASSEMBLY

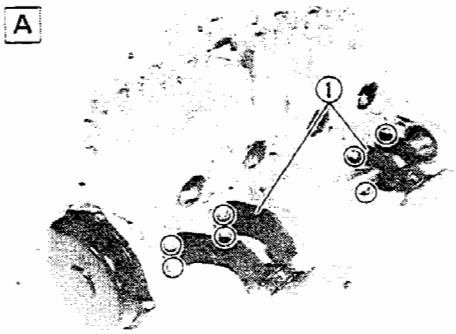
EXHAUST MANIFOLD

1. Remove:
   - Exhaust manifolds ①
   - Gaskets



INTAKE MANIFOLDS AND REED VALVES

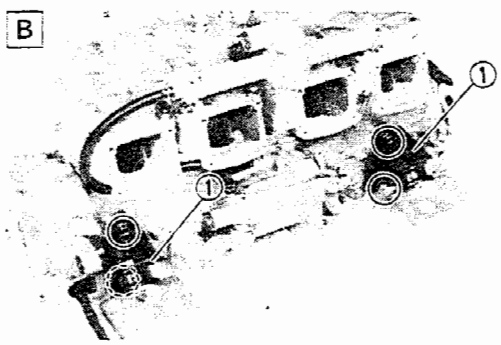
1. Remove:
   - Intake manifolds ①
   - Reed valves ②
   - Gaskets ③



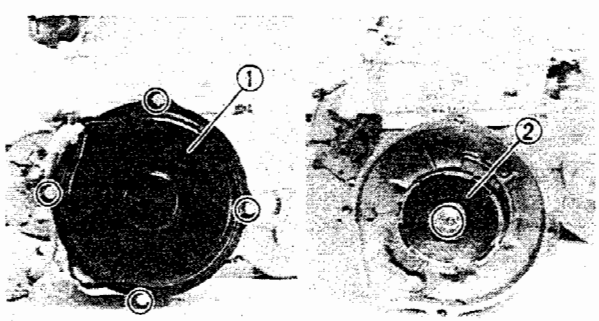
ENGINE BRACKETS

1. Remove:
   - Engine brackets ①

Ⓐ Front

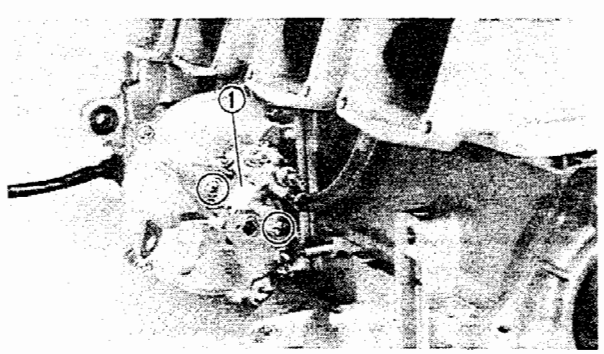


Ⓑ Rear



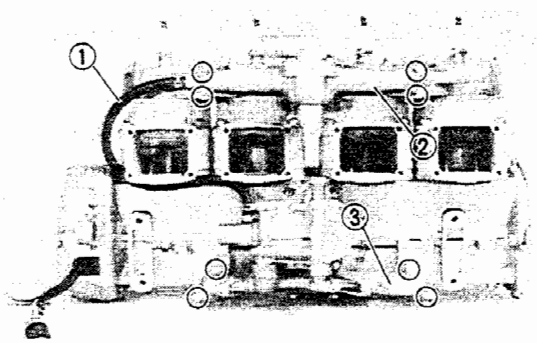
RECOIL STARTER

1. Remove:
   - Recoil starter assembly ①
   - Recoil starter pully ②
   - Woodruff key



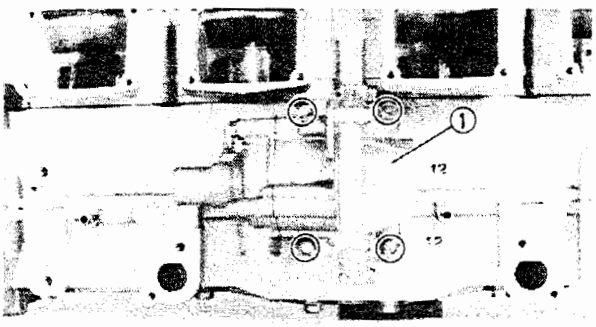
OIL PUMP

1. Remove:
   - Oil pump assembly ①
   - O-ring



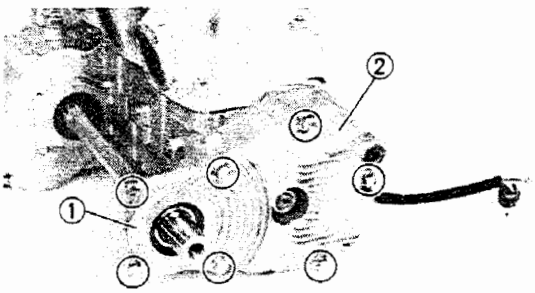
WATER JACKET JOINT

1. Disconnect:
   - Breather hose ①
2. Remove:
   - Water jacket joint ② (upper)
   - Gaskets
   - Water jacket joint ③ (lower)
   - O-rings



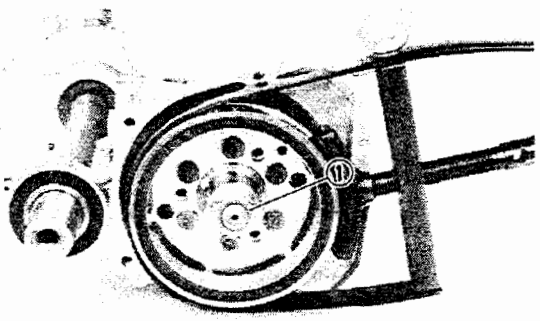
WATER PUMP

1. Remove:
   - Water pump assembly ①
   - Dowel pins
   - Gasket



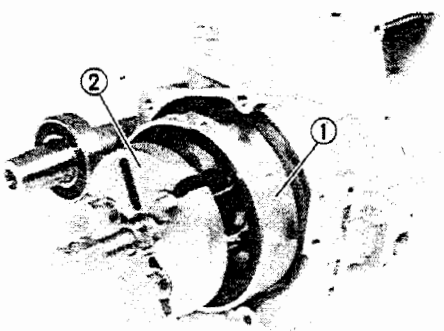
MAGNETO ROTOR

1. Remove:
   - Bearing holder ①
   - CDI magneto cover ②
   - Dowel pin
   - Nut (magneto rotor)
   - Washer



2. Remove:
   - Nut ① (magneto rotor)
   - Washer

	Primary sheave holder: 90890-01701, YS-01880



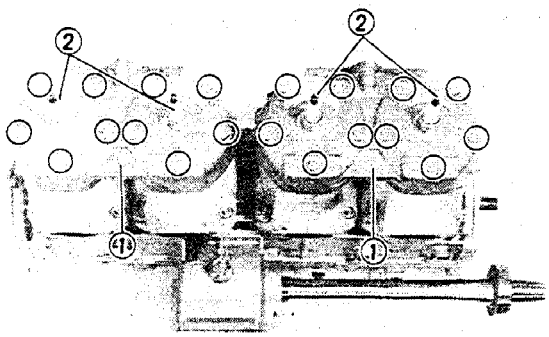
3. Remove:
   - Magneto rotor ①

NOTE:

- Remove the magneto rotor using the rotor puller ②.

	Rotor puller ②: 90890-01362, YU-33270

- Fully tighten the tool holding bolts, but make sure the tool body is parallel with the magneto rotor. If necessary, one screw may be backed out slightly to level tool body.

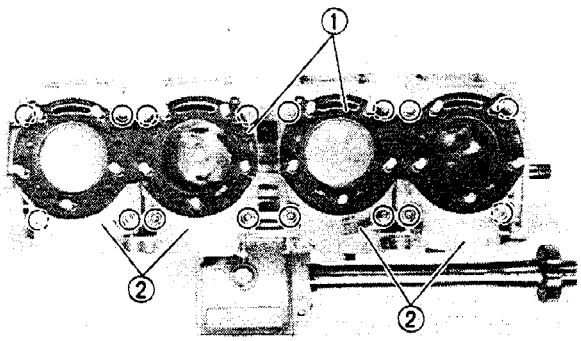


CYLINDER HEAD AND CYLINDER

1. Remove:
   - Cylinder head ①

NOTE:

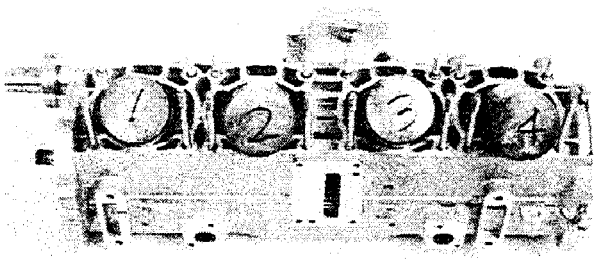
- Before removing the cylinder head, loosen the spark plug ② .
- The cylinder head holding nuts and bolts should be loosened 1/2 turn at a time, and then removed when all are loose.



2. Remove:
   - Gaskets ① (cylinder head)
   - Cylinders ②
     Dowel pins
   - Gasket (cylinder)

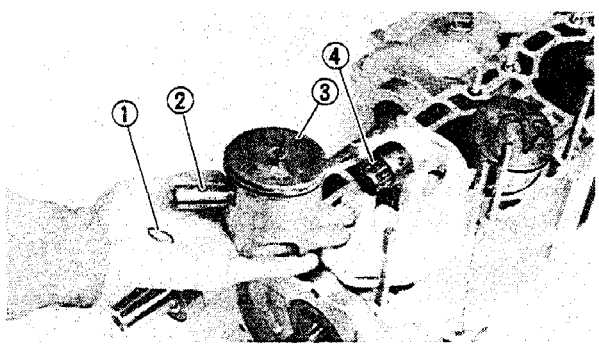
PISTON

1. Remove:
   - Piston pin clip ①
   - Piston pin ②
   - Piston ③
   - Small end bearing ④



NOTE:

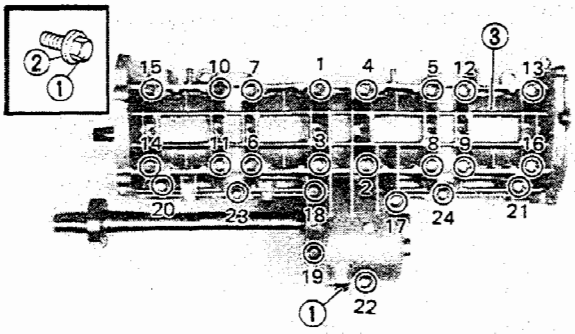
- Before removing the piston pin clip, cover the crankcase with a clean rag so you will not accidentally drop the clip into the crankcase.
- Before removing the piston pin, deburr the clip groove and pin hole area. If the piston pin groove is deburred and the piston pin is still difficult to remove, use piston pin puller.
- Put identification marks on each piston head for reference during reinstallation.

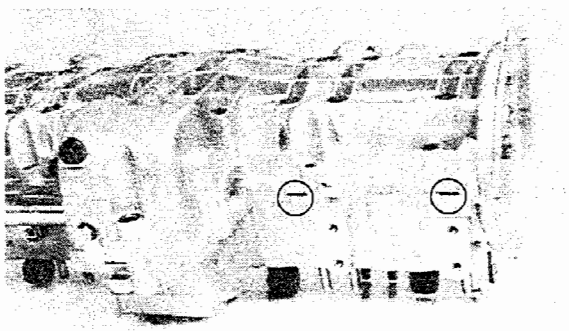


Piston pin puller:
90890-01304, YU-01304

CAUTION:

Do not use a hammer to drive the piston pin out.



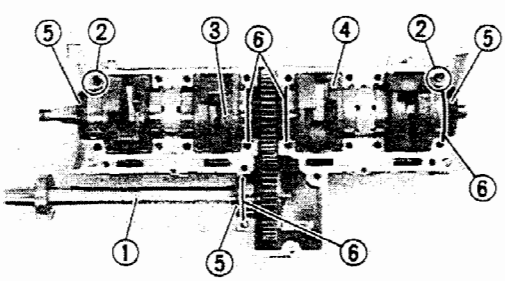


CRANKCASE AND CRANKSHAFT

1. Remove:
   - Drain bolt ①
   - Gasket ②
     Drain the oil.
   - Crankcase ③ (lower)

NOTE:

- Remove the bolts starting with the highest numbered one.
- Loosen each bolt 1/4 turn, and remove them after all bolts are loosened.
- If the case halves are tightly stuck together, tap lightly on the tabs indicated on the crankcase with a soft-head hammer.
- The slits shown in the crankcase can be used to remove it.
- Be sure not to give damages the mating surface.

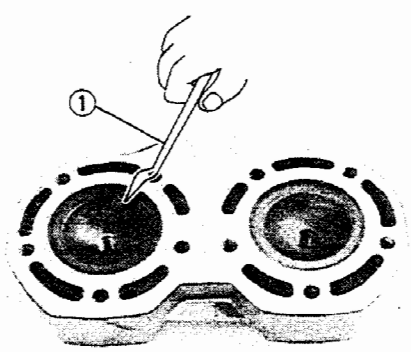


2. Remove:
   - Drive shaft assembly ①
   - Dowel pin ②
   - Crankshaft (left ③ and right ④)
   - Oil seals ⑤
   - Stopper rings ⑥

INSPECTION AND REPAIR

CYLINDER HEAD

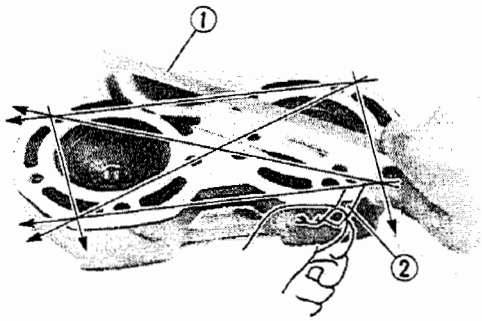
1. Eliminate:
   - Carbon deposit
     (from combustion chamber)
     Use rounded scraper ①.

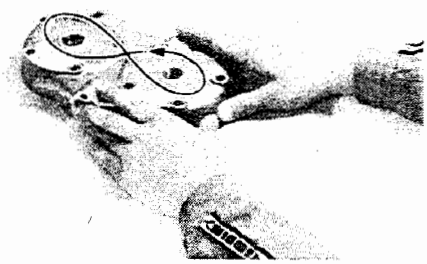


CAUTION:

Do not use a sharp instrument and avoid damaging or scratching.

2. Inspect:
   - Cylinder head water jacket
     Crust of minerals/Rust → Remove.



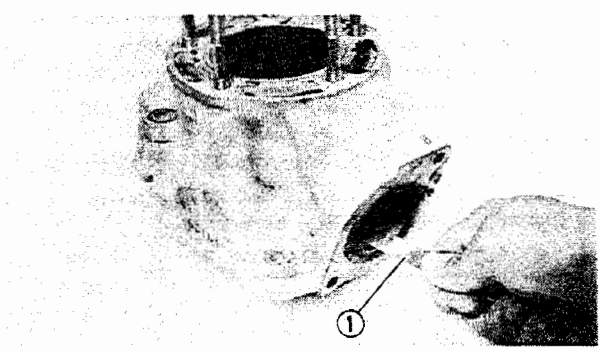


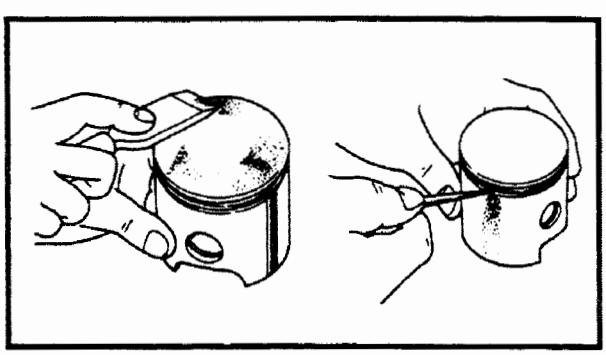
3. Measure:
   - Cylinder head warpage
     Out of specification → Resurface.

Warpage limit:
0.03 mm (0.0012 in)

Measurement and resurfacing steps:
- Attach a straight edge ① on the cylinder head and measure the warpage using a thickness gauge ②.
- If the warpage is out of specification, resurface the cylinder head.
- Place a 400 ~ 600 grit wet sandpaper on the surface plate, and resurface the head using a figure-eight sanding pattern.

NOTE:
Rotate the head several times to avoid removing too much material from one side.





CYLINDER AND PISTON

1. Eliminate: .
   - Carbon deposits
     Use a rounded scraper ①.

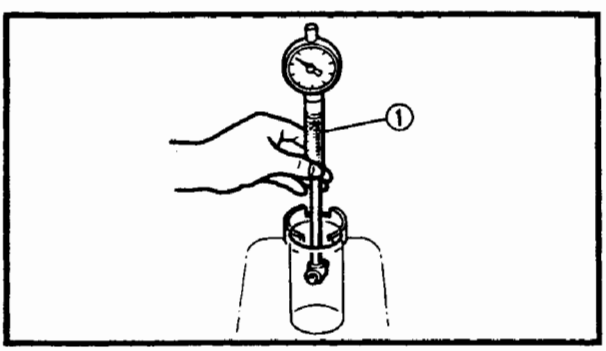
NOTE:
Do not use a sharp instrument and avoid damaging or scratching.

2. Inspect:
   - Cylinder wall
     Wear/Scratches → Hone or replace.
   - Cylinder water jacket
     Crust of minerals/Rust → Remove.
3. Eliminate:
   - Carbon deposits
     (from piston crown and ring grooves)
4. Inspect:
   - Piston crown
     Burrs/Nicks/Damage → Replace.

5. Eliminate:
   - Score marks and lacquer deposits (from piston wall)
     Use 600 ~ 800 grit wet sandpaper.

NOTE:
Sand in a crisscross pattern. Do not sand excessively.

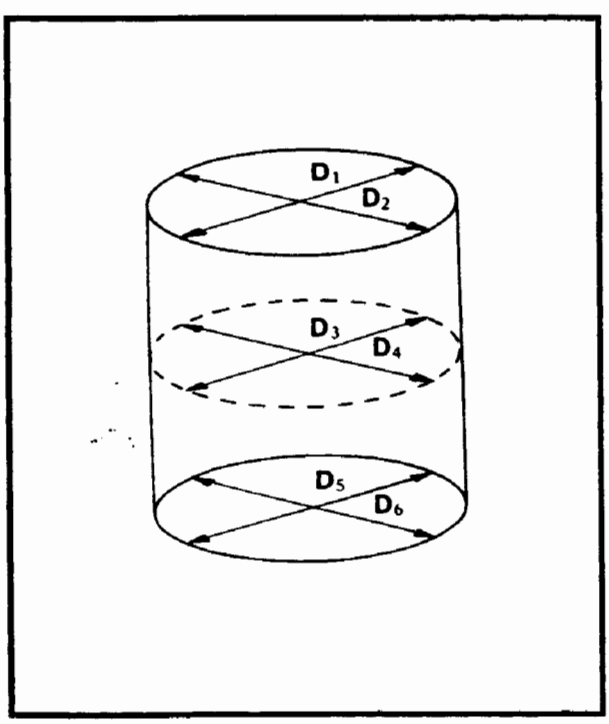
6. Inspect:
   - Piston wall
     Wear/Scratches/Damage → Replace.



7. Measure:
   - Piston-to-cylinder clearance

Measurement steps:
First step:
- Measure the cylinder bore "C" with a cylinder bore gauge ①.

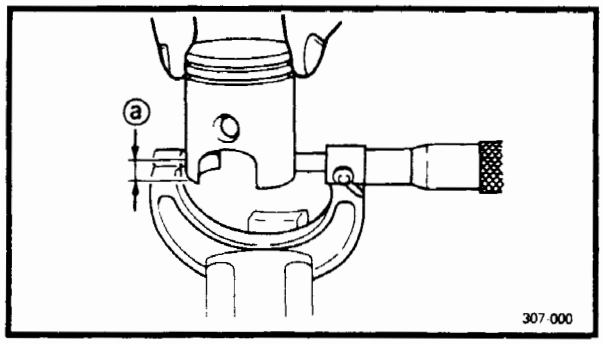
NOTE:
Measure the cylinder bore "C" in parallel to and at right angles to the crankshaft. Then find the average of the measurements.



	Standard	Wear limit
Cylinder bore "C"	63.000 ~ 63.020 mm (2.480 ~ 2.481 in)	63.1 mm (2.484 in)
Taper "T"	—	0.05 mm (0.0019in)
Out of round "R"	—	0.01 mm (0.0004 in)

C = Maximum D
T = (Maximum D^1 or D^2) – (Maximum D^5 or D^6)
R = (Maximum D^1, D^3 or D^5) – (Minimum D^2, D^4 or D^6)

- If out of specification, replace cylinder, and replace piston and piston rings as a set.



2nd step:
- Measure the piston skirt diameter "P" with a micrometer.
  ⓐ 20 mm (0.8 in) from the piston bottom edge.

	Piston size P
Standard	63 mm (2.480 in)

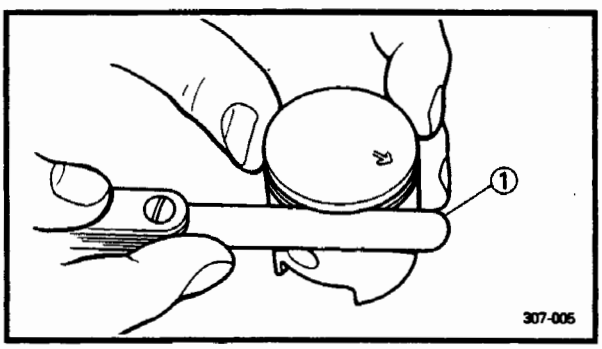
- If out of specification, replace piston and piston rings as a set.

3rd step:
- Calculate the piston-to-cylinder clearance with the following formula:

Piston-to-cylinder clearance = Cylinder bore "C" – Piston skirt diameter "P"

- If out of specification, rebore or replace cylinder, and replace piston and piston rings as a set.

Piston-to-cylinder clearance:
0.065 ~ 0.070 mm
(0.0026 ~ 0.0028 in)
Limit: 0.1 mm (0.004 in)



PISTON RINGS

1. Measure:
   - Side clearance
     Out of specification → Replace piston and/or rings.
     Use a feeler gauge ① .

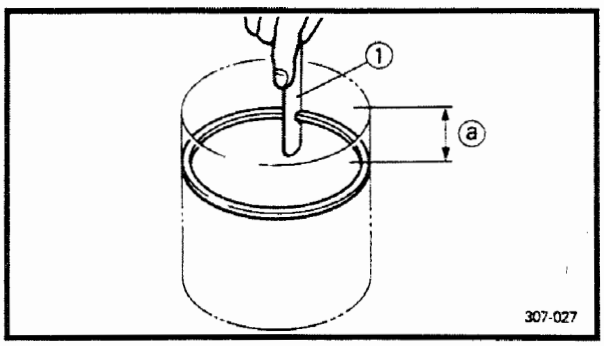
NOTE:
Eliminate the carbon deposits from the piston ring grooves and rings before measuring the side clearance.

Side clearance	Top	0.03 ~ 0.05 mm (0.001 ~ 0.002 in)
	2nd	0.03 ~ 0.05 mm (0.001 ~ 0.002 in)

2. Install:
   - Piston ring
     (into the cylinder)
     Push the ring with piston crown.

NOTE:

Insert the ring into the cylinder, and push it approximately 20 mm (0.8 in) into the cylinder. Push the ring with the piston crown so that the ring will be at a right angle to the cylinder bore.

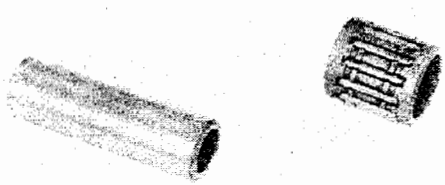


3. Measure:
   - End gap
     Out of specification → Replace rings as a set.
     Use a feeler gauge ①.

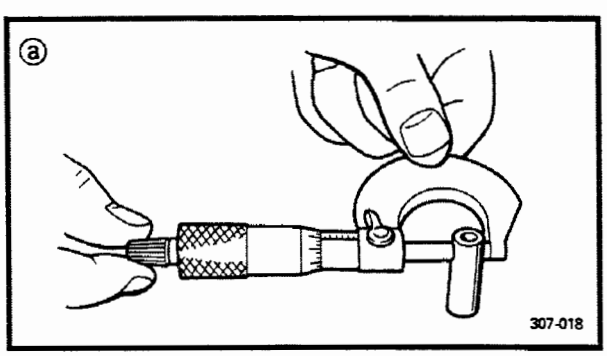
End gap	Top	0.35 ~ 0.55 mm (0.014 ~ 0.020 in)
	2nd	0.35 ~ 0.55 mm (0.014 ~ 0.020 in)

ⓐ 20 mm (0.8 in)

PISTON PIN AND BEARING

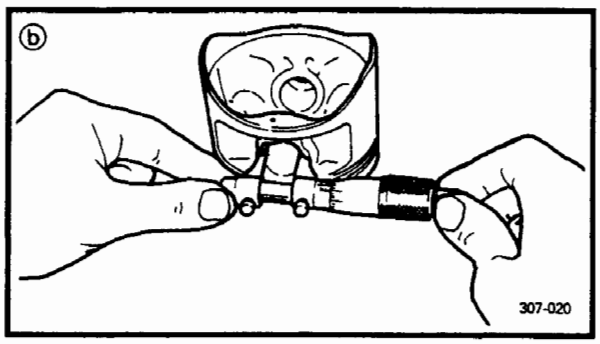


1. Inspect:
   - Piston Pin
     Blue discoloration/Grooves → Replace piston pin and inspect lubrication system.
   - Small end bearing
     Blue discoloration/Bearing turns roughly → Replace bearing and inspect lubrication system.



2. Measure:
   - Outside diameter ⓐ (piston pin)
     Out of specification → Replace.

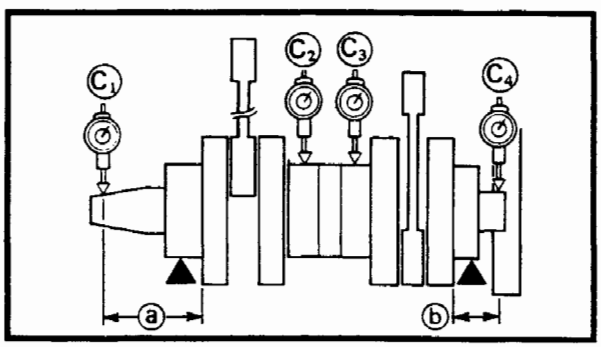
Outside diameter (piston pin): 16.0 ~ 16.005 mm (0.63 ~ 0.6301 in)



3. Measure:
   - Piston pin-to-piston clearance
     Out of specification → Replace piston.

Piston pin-to-piston clearance =
Bore size (piston pin) ⓑ −
Outside diameter (piston pin) ⓐ

Piston pin-to piston clearance =
0.065 ~ 0.070 mm
(0.0026 ~ 0.0028 in)



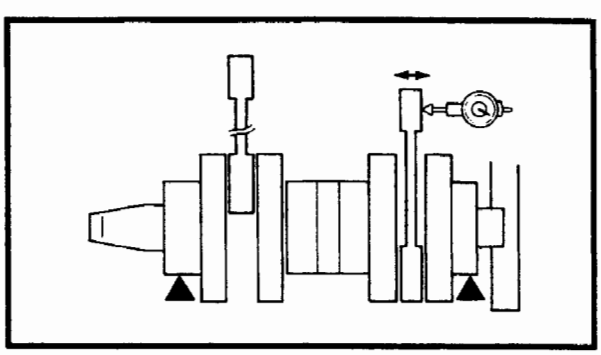
CRANKSHAFT

1. Measure:
   - Runout
     Use V-blocks and a dial gauge
     Out of specification → Replace or repair.

Dial gauge:
90890-03097, YU-03097

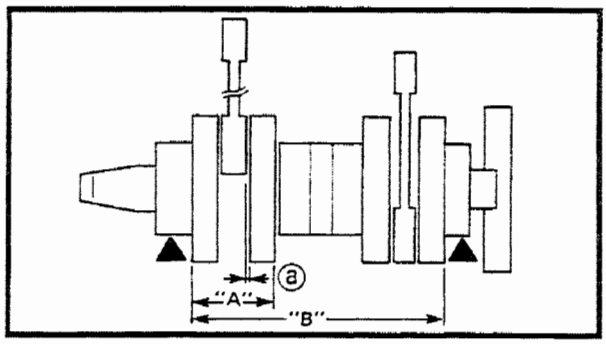
Runout limit:
C^1·C^4 : 0.03 mm (0.0012 in)
C^2, C^3 : 0.04 mm (0.0016 in)

ⓐ 65 mm (2.6 in)
ⓑ 32.5 mm (1.3 in)



2. Measure:
   - Small end free play
     Use a dial gauge.
     Out of specification → Replace the defective parts.

Small end free play:
0.8 ~ 1.0 mm (0.031 ~ 0.039 in)

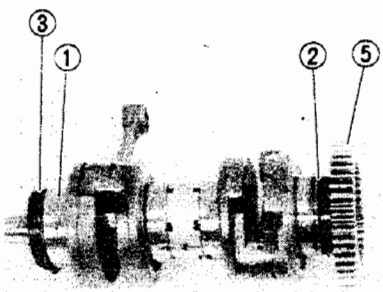


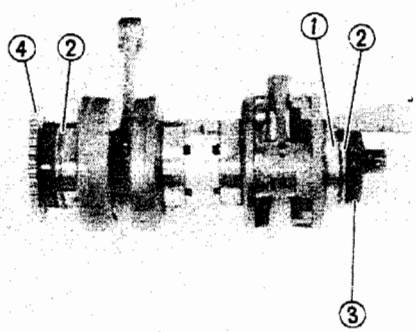
3. Measure:
   - Big end side clearance ⓐ
     Use a feeler gauge.
     Out of specification → Replace the defective parts.

Big end side clearance ⓐ :
0.5 mm (0.02 in)

   - Crank wide "A", "B"
     Out of specification → Replace or repair.

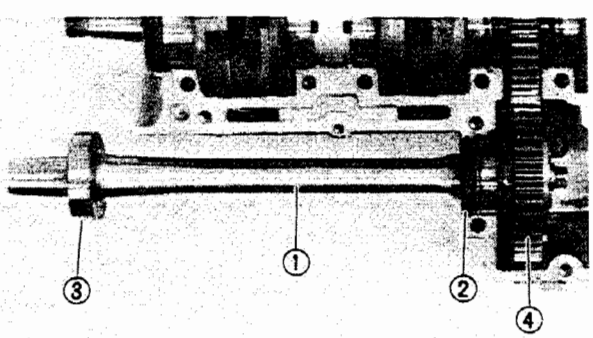
Crank wide:
"A": 55.95 ~ 56.00 mm
(2.202 ~ 2.204 in)
"B": 167.85 ~ 168.15 mm
(6.608 ~ 6.620 in)





4. Inspect:
   - Crankshaft bearing ①
     Pitting/Damage → Replace.
   - Stopper ring ②
     Bend/Damage → Replace.
   - Oil seals ③
     Wear/Damage → Replace.
   - Drive gear (inner ④ and outer ⑤)
     Wear/Damage → Replace.

CAUTION:
Lubricate the bearing immediately after examining them to prevent rust.



DRIVE SHAFT

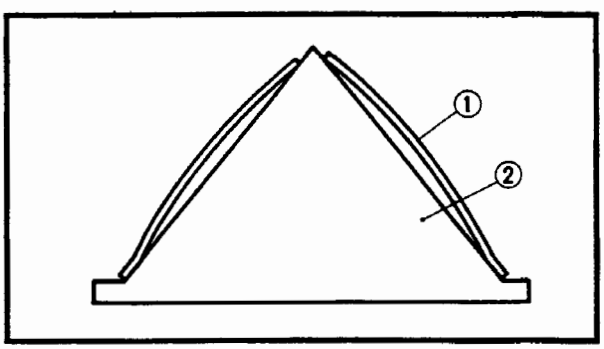
1. Inspect:
   - Drive shaft ①
     Bend/Damage → Replace.
   - Oil seal ②
     Wear/Damage → Replace.
   - Bearings ③
     Pitting/Damage → Replace.

- Driven gear ④
  Cracks/Damage → Replace.

	Bolt (driven gear): **48 Nm (4.8 m • kg, 35 ft • lb)**

REED VALVE AND INTAKE MANIFOLD

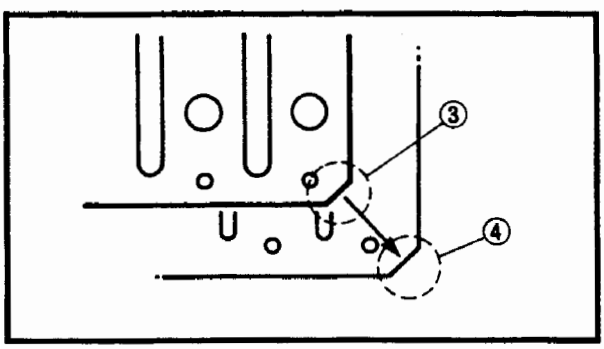
1. Disassemble:
   - Reed valves
2. Inspect:
   - Reed valves
     Bent/Cracks/Damage → Replace.

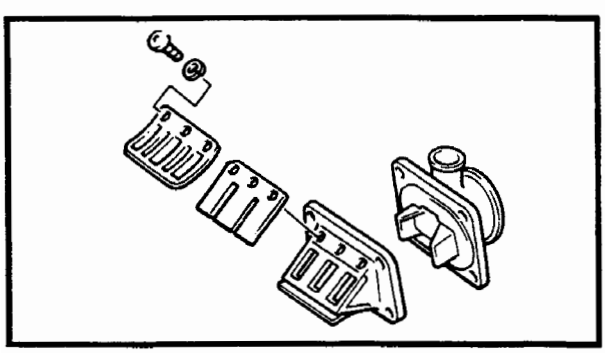


3. Install:
   - Reed valves
   - Reed valves stoppers

NOTE:

- Place the reed valve ① with its concave surface facing the reed valve seat ② .
- Fit the reed valve stopper cut ③ with the corresponding cut ④ on the reed valve.



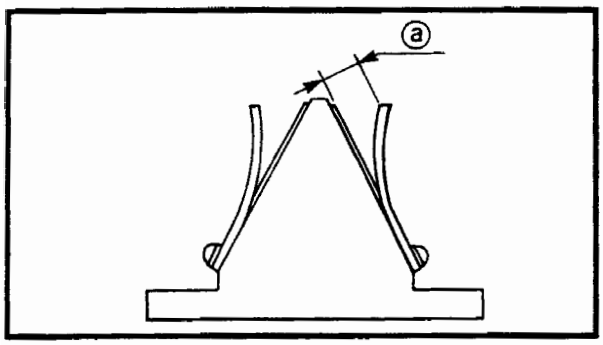


4. Tighten:
   - Screws ① (reed valve)

	Screws (reed valve): **1 Nm (0.1 m • kg, 0.7 ft • lb)** **LOCTITE®**

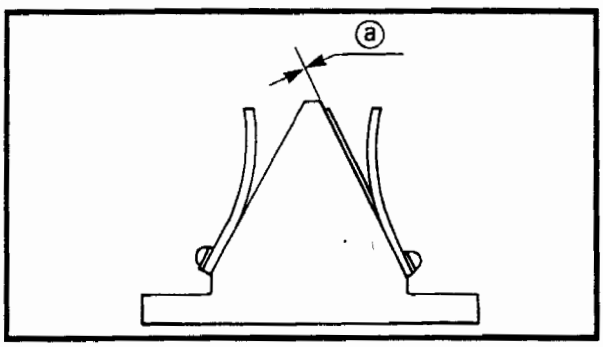
NOTE:

Tighten each screw gradually to avoid warping.



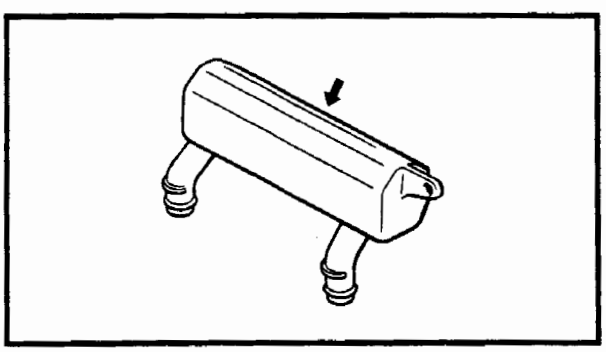
5. Measure:
   - Valve stopper height ⓐ
     Out of specification → Replace.

Valve stopper height:
8.8 ~ 9.2 mm (0.35 ~ 0.36 in)



6. Measure:
   - Reed valve bending limit ⓐ
     Out of specification → Replace.

Reed valve bending limit:
0.6 mm (0.024 in)



7. Inspect:
   - Air chamber
     Cracks/Damage → Replace.

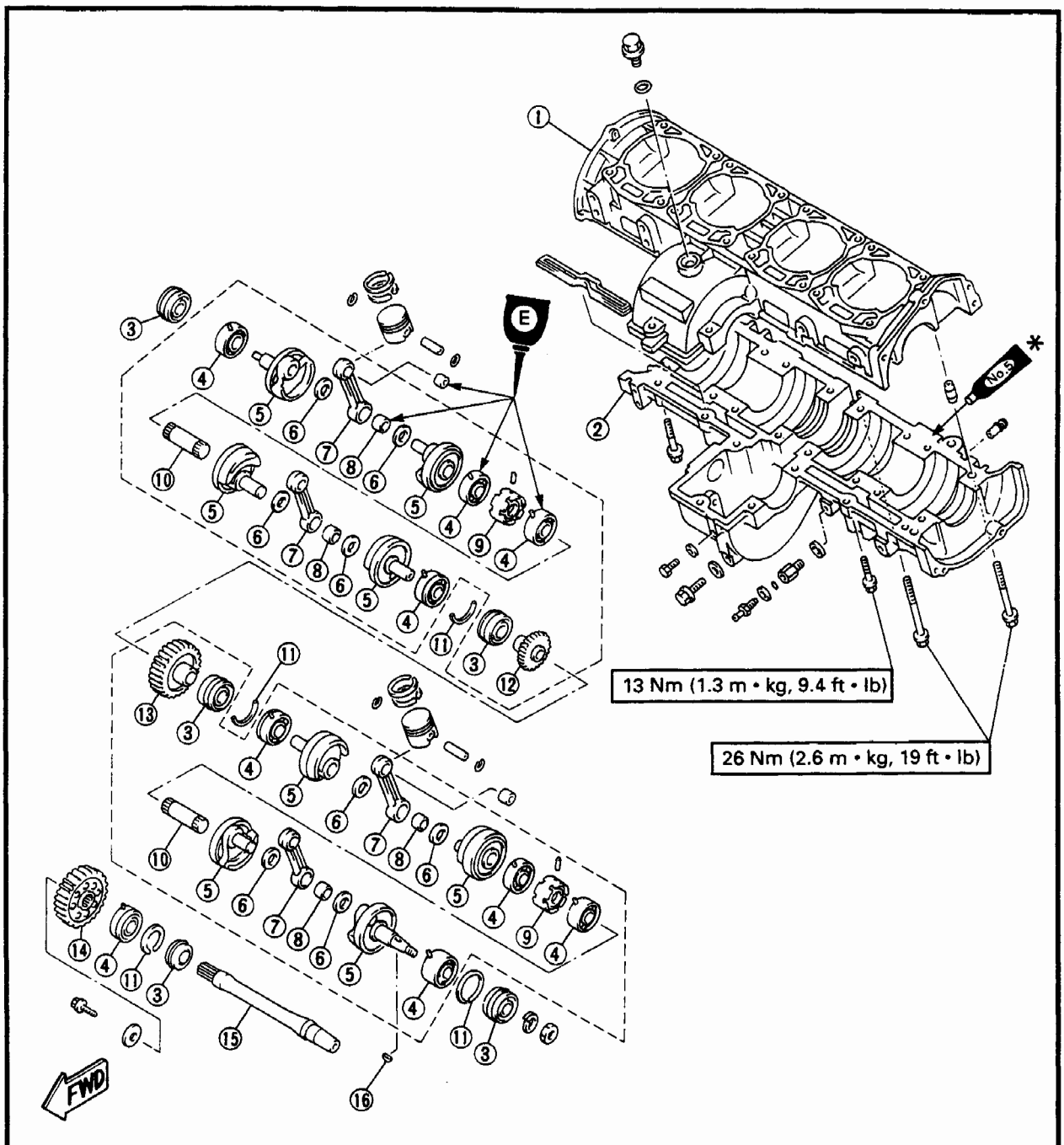
CRANKCASE

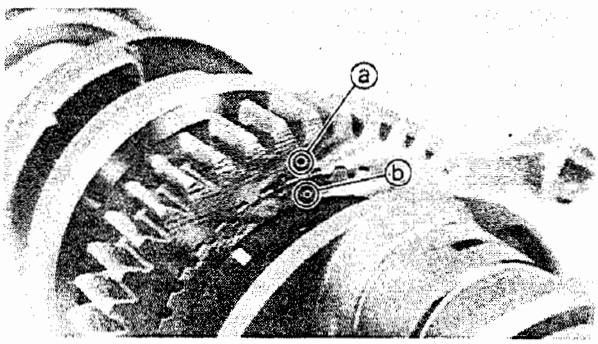
1. Thoroughly wash the case halves in mild solvent.
2. Clean all the gasket mating surfaces and case mating surfaces thoroughly.
3. Inspect:
   - Crankcase
     Cracks/Damage → Replace.

ENGINE ASSEMBLY AND ADJUSTMENT

CRANKCASE AND CRANKSHAFT

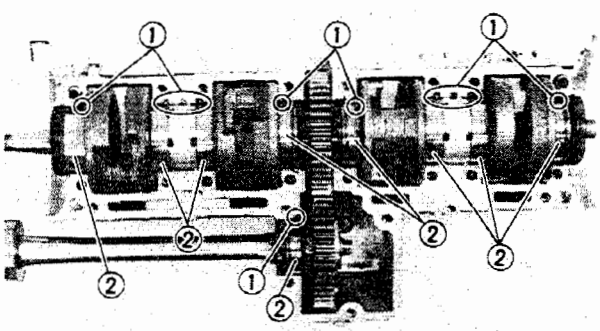
① Upper crankcase
② Lower crankcase
③ Oil seal
④ Bearing
⑤ Crank
⑥ Washer
⑦ Connecting rod
⑧ Big end bearing
⑨ Labyrinth seal
⑩ Crank pin
⑪ Stopper ring
⑫ Drive gear (inner)
⑬ Drive gear (outer)
⑭ Driven gear
⑮ Drive shaft
⑯ Woodruff key
* Yamaha bond No.5





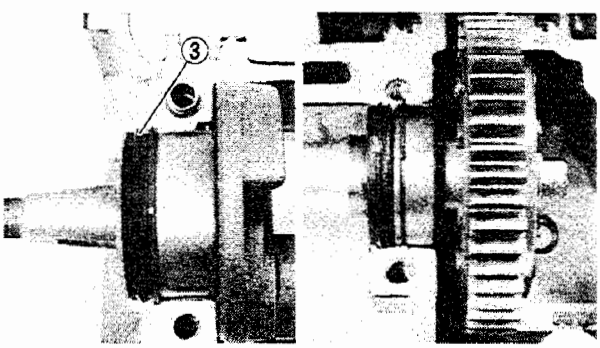
1. Assembly:
   - Crankshaft assembly (left and right)

NOTE:
Align the punch mark ⓐ on the drive gear (outer) with the punch mark ⓑ on the drive gear (inner).

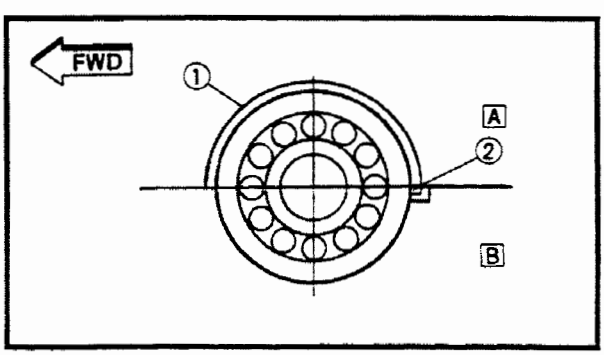


2. Install:
   - Crankshaft assembly
   - Drive shaft
     (to upper crankcase)

NOTE:
Set the knock pins ① on the bearing ② and labyrinth seal into the pin holes on the upper crankcase by turning the bearings and labyrinth seal.

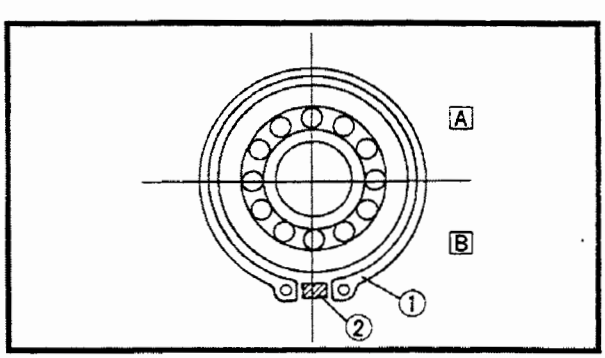


CAUTION:
- **The oil seal lip ③ must fit into the crankcase groove.**
- **The circlip must fit into the crankcase and bearing grooves.**



3. Install:
   - Stopper rings ①
     (onto center bearing)

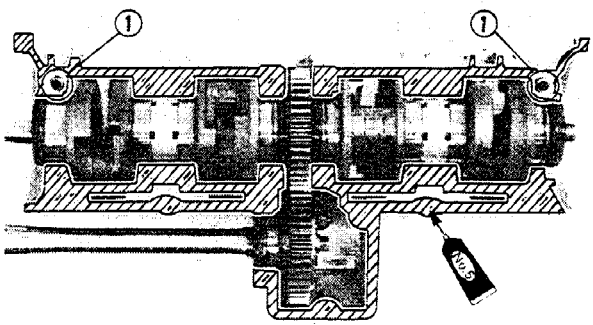
② Knock pin
Ⓐ Lower case
Ⓑ Upper case



4. Install:
   - Circlips ①
     (onto both side bearing)

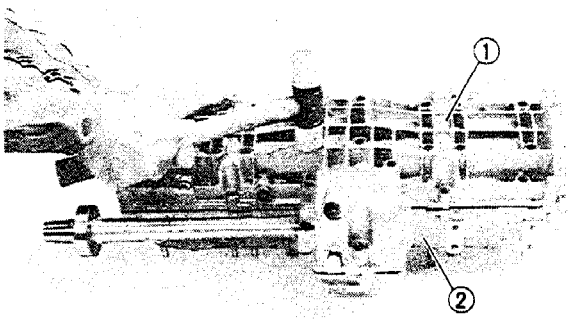
NOTE:
The circlip must fit into the crankcase and oil seal projection ②.

Ⓐ Lower case
Ⓑ Upper case



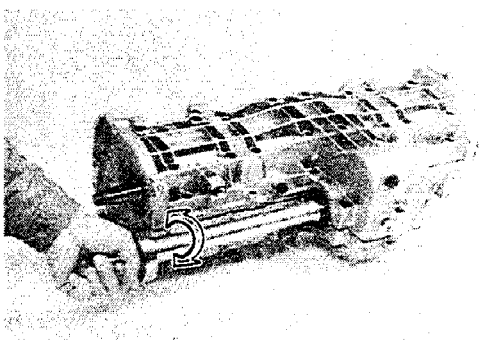
5. Apply:
   - Yamabond No. 5®
     (to mating surfaces of both case halves)

6. Install:
   - Dowel pins ①

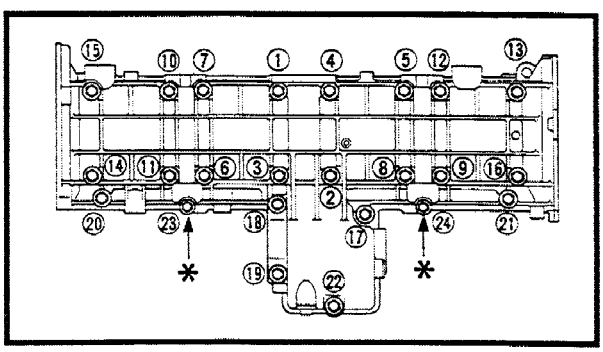


7. Install:
   - Lower crankcase ①
     (onto upper crankcase ②)

NOTE:
Tap lighty on the case with a soft-head hammer.



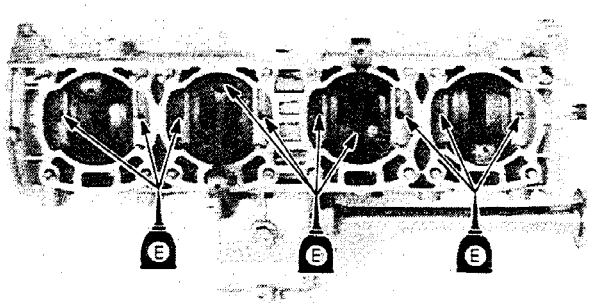
CAUTION:
Before installing and torquing the crankcase bolts, be sure to check whether the crankshaft and drive shaft are turning smoothly.



8. Tighten:
   - Bolts (crankcase)

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

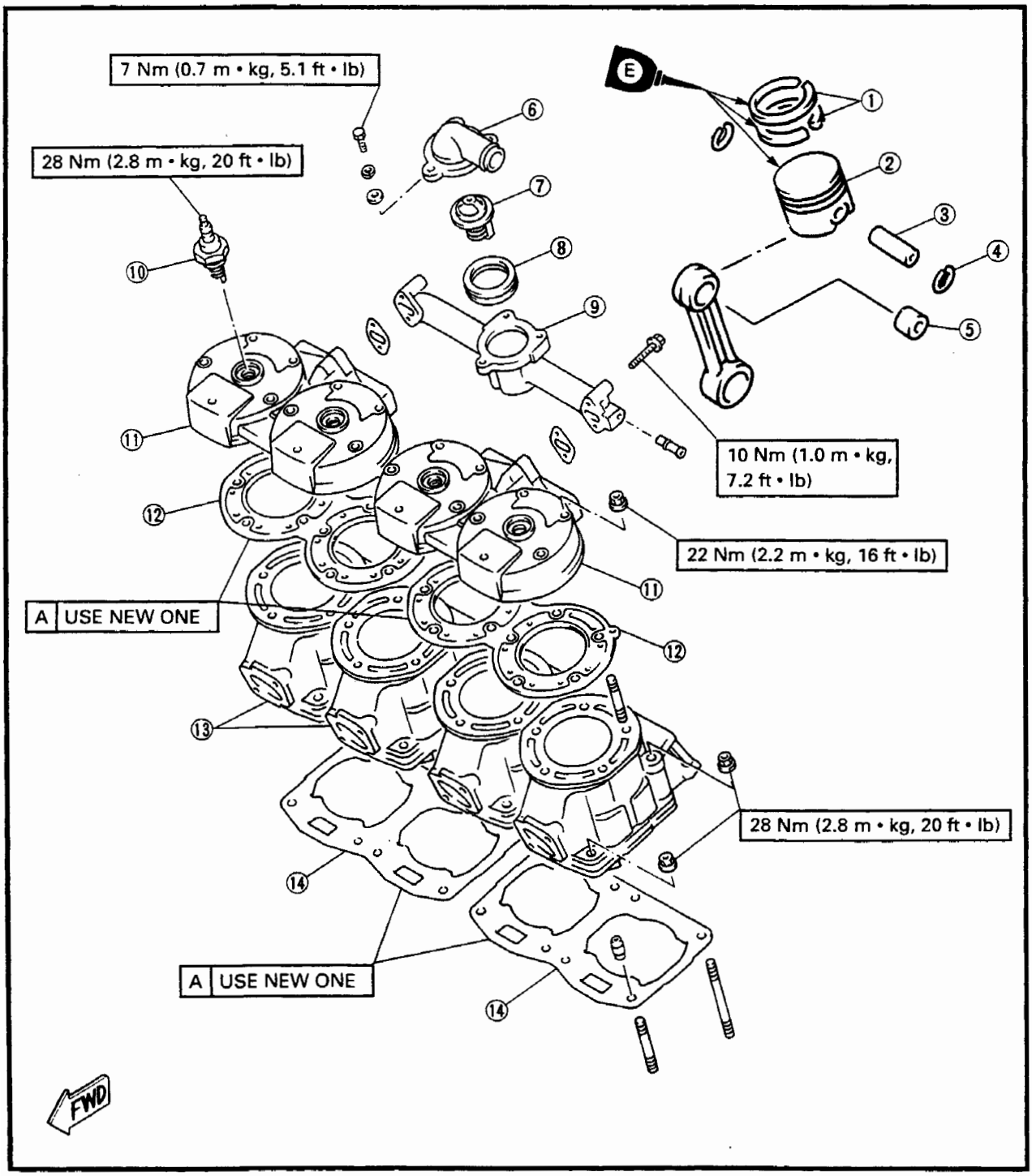
Bolt (crankcase):
26 Nm (2.6 m • kg, 19 ft • lb)
*** marked:**
13 Nm (1.3 m • kg, 9.4 ft • lb)

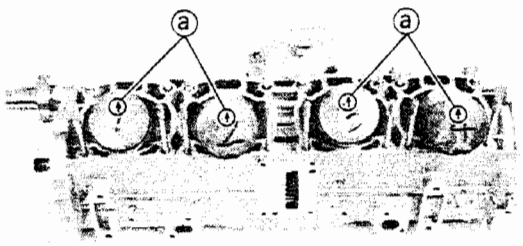


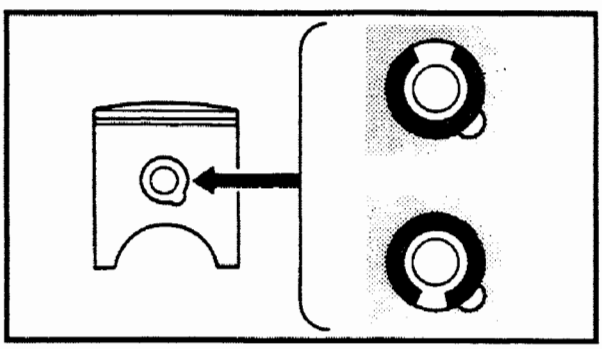
9. Apply:
   - 2-stroke engine oil
     (to crankpin, bearing and oil delivery hole)

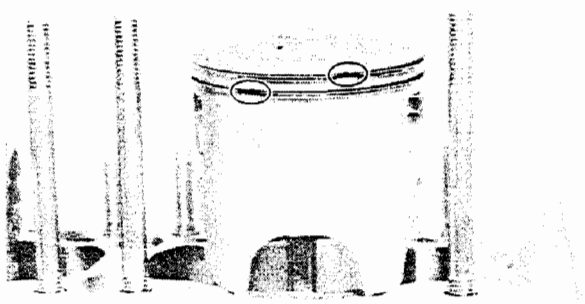
PISTON, CYLINDER AND CYLINDER HEAD

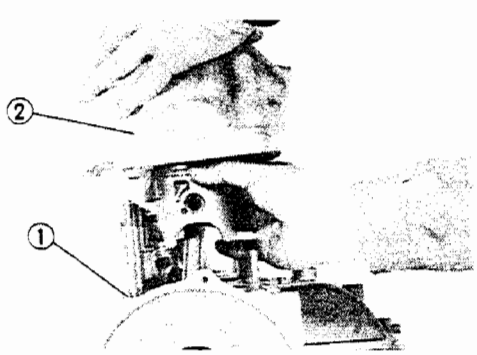
① Piston ring
② Piston
③ Piston pin
④ Piston pin clip
⑤ Small end bearing
⑥ Thermostatic valve cover
⑦ Thermostatic valve
⑧ Gasket
⑨ Water jacket joint
⑩ Spark plug
⑪ Cylinder head
⑫ Head gasket
⑬ Cylinder
⑭ Cylinder gasket











PISTON

1. Apply:
   - 2-stroke engine oil (liberal coating) (to piston pin, bearing, piston ring grooves and piston skirt areas)
2. Install:
   - Small end bearing
   - Piston
   - Piston pin
   - Piston pin clip
   - Piston rings

NOTE:

- The arrow ⓐ on the piston must point to the front of the engine.
- Before installing the piston pin clip, cover the crankcase with a clean rag so you will not accidentally drop the pin clip and material into the crankcase.
- Position each piston very carefully in its original place.

CAUTION:

- **Always use a new piston pin clip.**
- **Do not allow the clip open ends to meet the piston pin slot.**

2. Check:
   - Piston ring position

CAUTION:

- **Make sure ring ends are properly fitted around ring locating pins in piston grooves.**
- **Be sure to check the manufacturer's marks or numbers stamped on the rings are on the top side of the rings.**

CYLINDER AND CYLINDER HEAD

1. Install:
   - Gasket ① (cylinder)
   - Cylinder ②

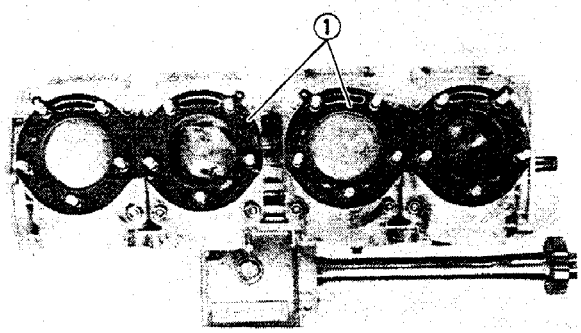
CAUTION:

Always use a new gasket.

NOTE:

Install the cylinder with one hand while compressing the piston rings with the other hand.

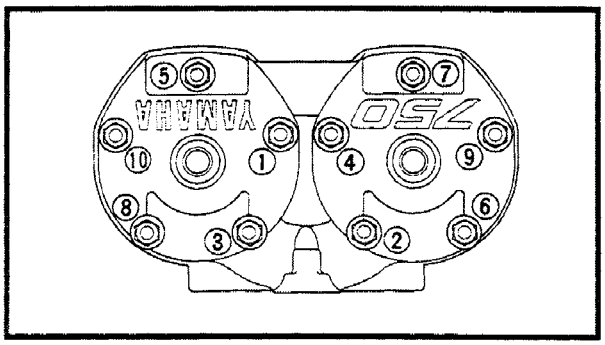
	Nut (cylinder): **28 Nm (2.8 m • kg, 20 ft • lb)**



2. Install:
   - Gaskets ① (cylinder head)
   - Cylinder head

CAUTION:

Always use a new gasket.



3. Tighten:
   - Nuts (cylinder head)

NOTE:

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

Nut (cylinder head):
22 Nm (2.2 m • kg, 16 ft • lb)
Spark plug:
28 Nm (2.8 m • kg, 20 ft • lb)

MAGNETO ROTOR

1. Install:
   - Woodruff key

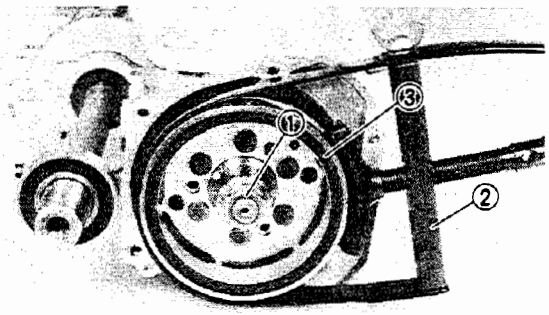
2. Install:
   - Magneto rotor
   - Washer
   - Nut (magneto rotor)

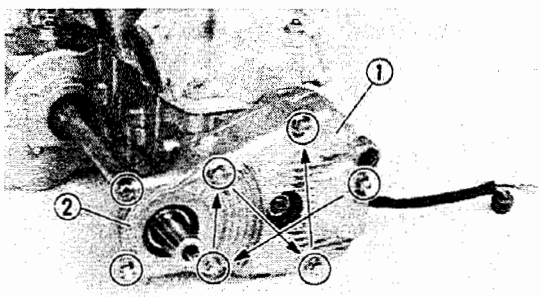
CAUTION:

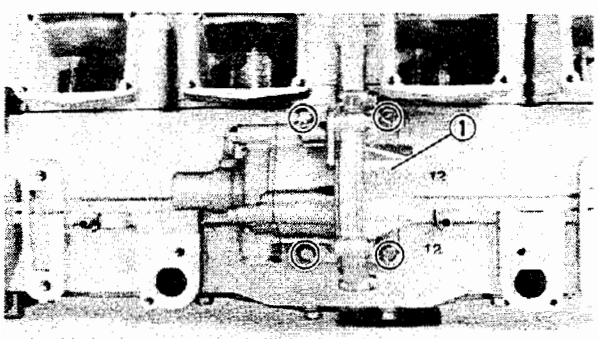
Be sure to remove any oil and/or grease from the tapered portion of the magneto rotor using a dampened cloth with thinner.

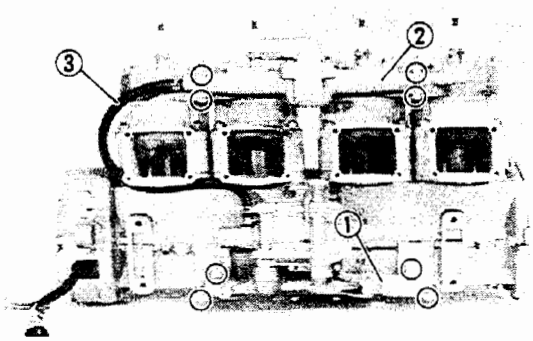
NOTE:

When installing the magneto rotor, make sure the woodruff key is properly seated in the keyway of the crankshaft.









3. Tighten:

	Nut ① (magneto rotor): 85 Nm (8.5 m • kg, 61 ft • lb)

NOTE:

Use the primary sheave holder ② to hold the magneto rotor ③.

	Primary sheave holder: 90890-01701, YS-01880

4. Install:
   - Dowel pin
   - CDI magneto cover ①
   - Bearing holder ②

	Bolt (CDI magneto cover): 23 Nm (2.3 m • kg, 17 ft • lb) **Bolt (bearing holder): 26 Nm (2.6 m • kg, 19 ft • lb)**

WATER PUMP

1. Install:
   - Gasket
   - Dowel pins
   - Water pump assembly ①

	Bolt (water pump housing assembly): 10 Nm (1.0 m • kg, 7.2 ft • lb)

NOTE:

Mesh the water pump gear with the drive gear on the crankshaft.

WATER JACKET JOINT

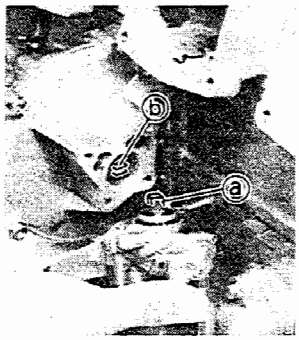
1. Install:
   - O-rings
   - Water jacket joint ① (lower)
   - Gaskets
   - Water jacket joint ② (upper)

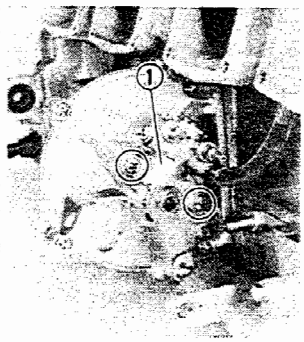
2. Connect:
   - Breather hose ③

	Bolt (water jacket joint): 10 Nm (1.0 m • kg, 7.2ft • lb)

NOTE:

Apply the coolant to the O-ring, when installing the water jacket joint (lower).





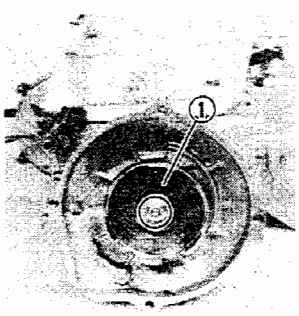
OIL PUMP

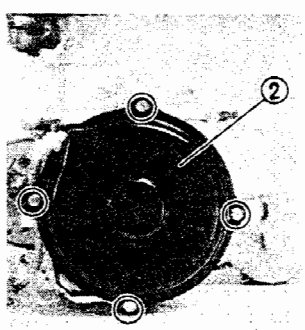
1. Install:
   - O-ring
   - Oil pump assembly ①

	Screw (oil pump assembly): **4 Nm (0.4 m • kg, 2.9 ft • lb)**

NOTE:

- Apply an engine oil to the O-ring.
- Make sure the projection ⓐ fits into the slot ⓑ on the water pump housing correctly.

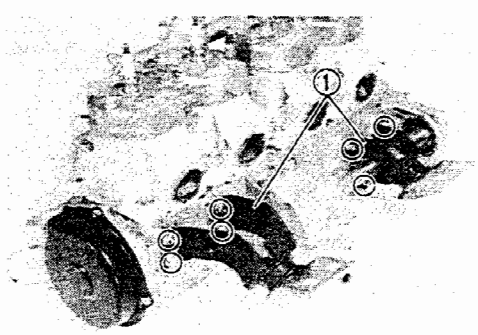




RECOIL STARTER

1. Install:
   - Woodruff key
   - Recoil starter pulley ①
   - Recoil starter assembly ②

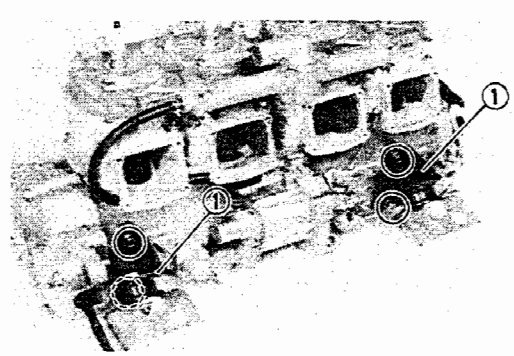
	Bolt (starter pulley): **30 Nm (3.0 m • kg, 22 ft • lb)** **Bolt (recoil starter assembly):** **7 Nm (0.7 m • kg, 5.1 ft • lb)**



ENGINE BRACKETS

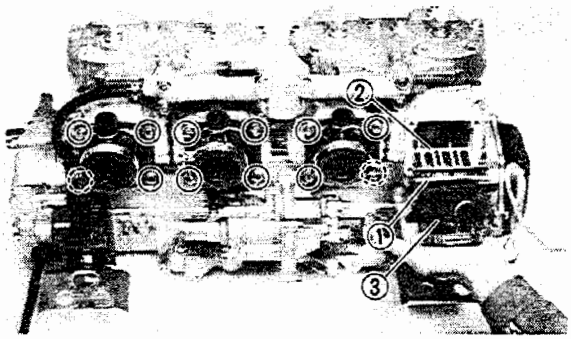
1. Install:
   - Engine brackets ① (front)

	Bolts (engine brackets): **30 Nm (3.0 m • kg, 22 ft • lb)**



2. Install:
   - Engine brackets ① (rear)

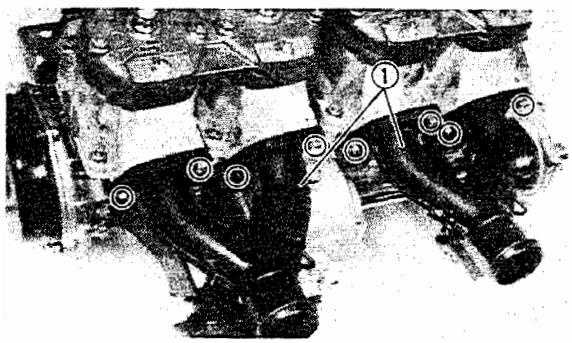
	Bolts (engine brackets): **30 Nm (3.0 m • kg, 22 ft • lb)**



INTAKE MANIFOLDS AND REED VALVES

1. Install:
   - Gaskets ①
   - Reed valves ②
   - Intake manifolds ③

Bolts (intake manifolds):
10 Nm (1.0 m • kg, 7.2 ft • lb)



EXHAUST MANIFOLD

1. Install:
   - Gaskets
   - Exhaust manifolds ①

Bolts (exhaust manifolds):
25 Nm (2.5 m • kg, 18 ft • lb)

REMOUNTING ENGINE

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

1. Install:
   - Engine assembly
   - Nuts ① (engine bracket)

NOTE:

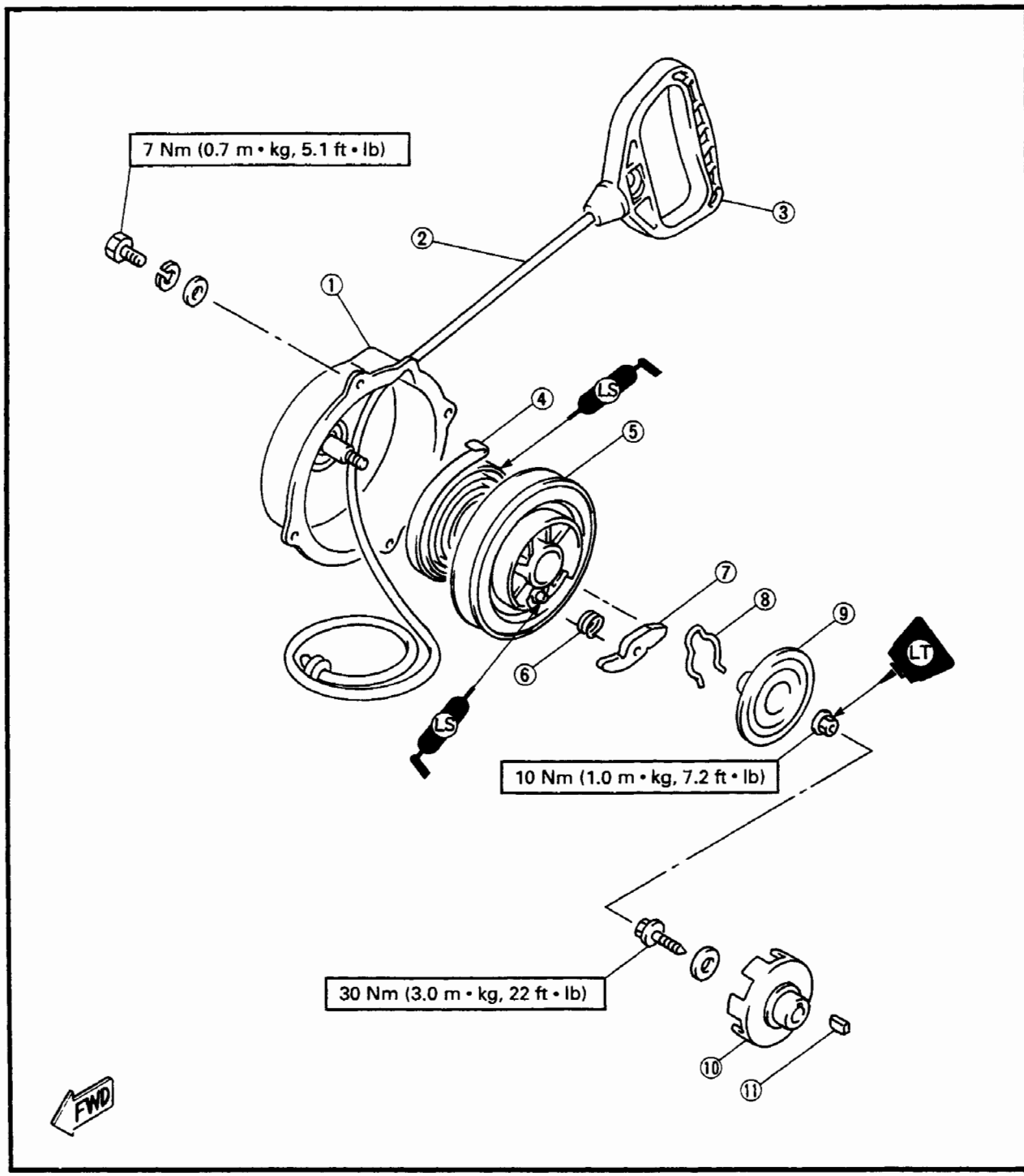
Before tightening the nuts (engine bracket) the sheave distance should be adjusted.

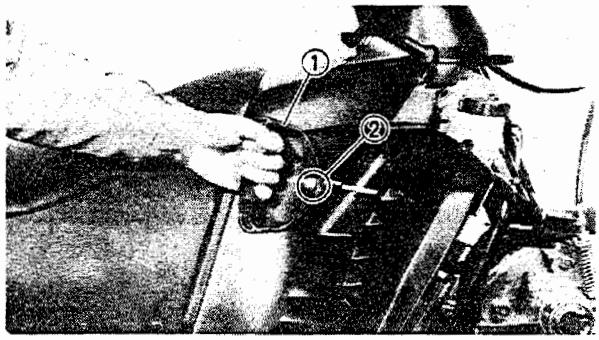
Nuts (engine brackets):
40 Nm (4.0 m • kg, 29 ft • lb)

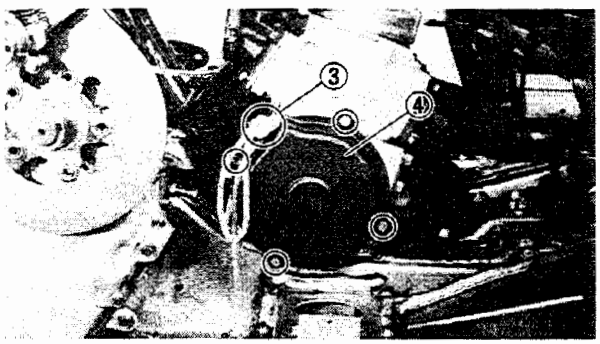
2. Fill:
   - Cooling system (See page 2-12)
   - Drive gear housing (See page 2-11)
3. Air bleed:
   - Oil pump (See page 2-4)
   - Cooling system (See page 2-7)
4. Adjust:
   - Sheave distance (See page 4-15)
   - Sheave offset (See page 4-16)
   - Throttle cable (See page 2-14)
   - Oil pump cable (See page 2-5)
   - Starter cable (See page 2-15)

RECOIL STARTER

① Recoil starter case
② Starter rope
③ Starter handle
④ Starter spring
⑤ Sheave drum
⑥ Return spring
⑦ Drive pawl
⑧ Drive pawl driver
⑨ Drive plate
⑩ Recoil starter pulley
⑪ Woodruff key





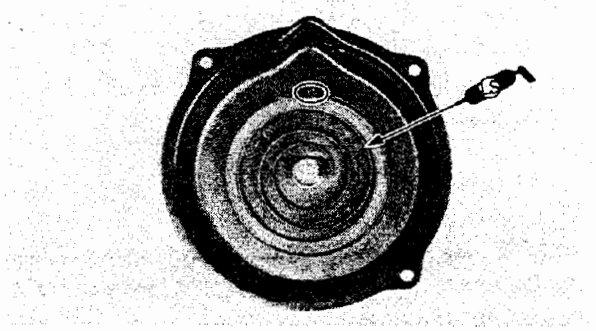


REMOVAL

1. Remove:
   - Muffler
   - Starter handle ①
   - Recoil starter

NOTE:

To remove the starter handle, loosen the knot ② in the starter rope and then re-tie a knot ③ in the rope end so that it will not be pulled into the recoil starter case ④.

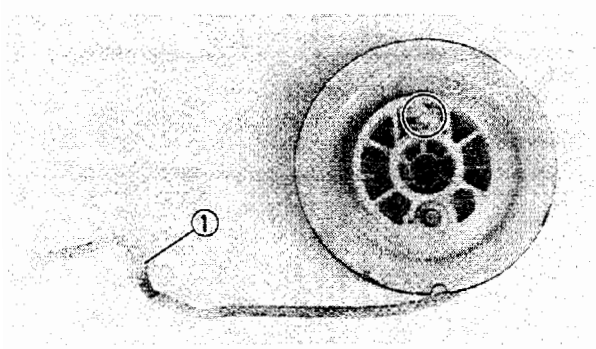


ASSEMBLY AND INSTALLATION

1. Hook the starter spring around the post in the starter case. Carefully wind the spring counterclockwise, and fit the spring into the case.

NOTE:

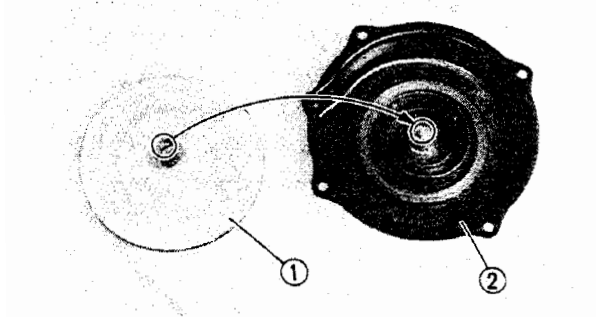
After installing the spring thoroughly apply the low-temperature grease.



2. Pass the starter rope end into the sheave drum, and knot the rope end. Then fit the knot into the cutout in the sheave drum.
3. Wind:
   - Starter rope (2 turns clockwise) (to sheave drum)

NOTE:

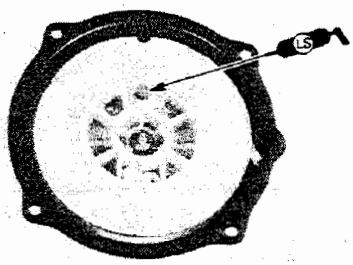
Make sure the rope ① is more than 400m (15.7 in) long.



4. Install:
   - Sheave drum ① (into starter case ②)

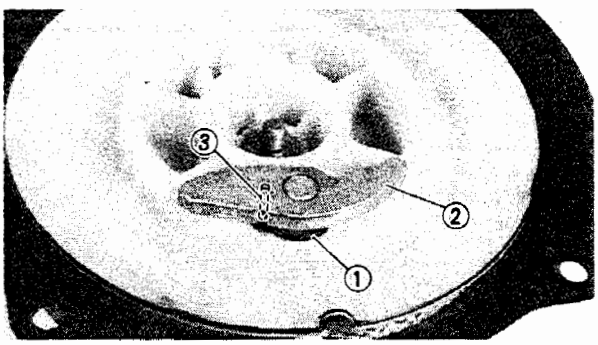
NOTE:

Be sure the inner hook on the starter spring hooks around the post on the sheave drum.



5. Apply:
   - Grease (lightly)
     (to pivot point of the drive pawl)

	Low-temperature grease



6. Install:
   - Return spring ①
   - Drive pawl ②

NOTE:
Hook the return spring end to the drive pawl ②. Then, hook other end of the return spring to the hole ③ on the sheave drum.

7. Install:
   - Drive plate
   - Drive pawl driver
   - Nut

NOTE:
Be sure the tip of the drive pawl driver faces to sheave drum side.

	Nut (drive plate): **10 Nm (1.0 m • kg, 7.2 ft • lb)** **LOCTITE®**

8. Pull about four inches of starter rope from out of the cutout portion in the sheave drum, and rotate the sheave drum five times clockwise to preload the starter spring.
   Then knot the rope end so that it will not be pulled into the recoil starter case.

9. Install:
   - Recoil starter
   - Starter handle

Bolt (recoil starter):
7 Nm (0.7 m • kg, 5.1 ft • lb)

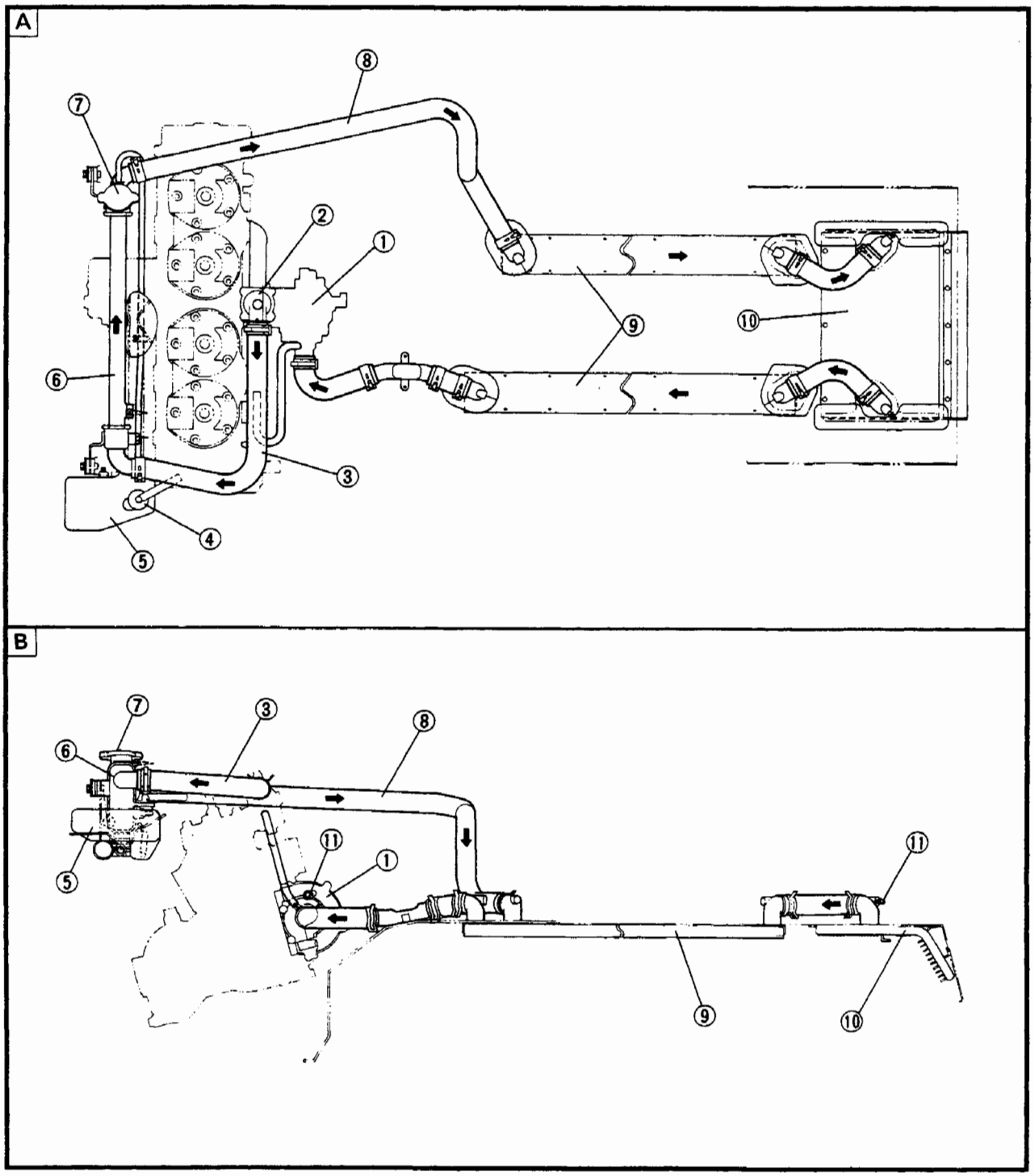
10. Check the starter for smooth operation. If it does not operate smoothly, repair it.

CHAPTER 6.
COOLING SYSTEM

COOLING SYSTEM

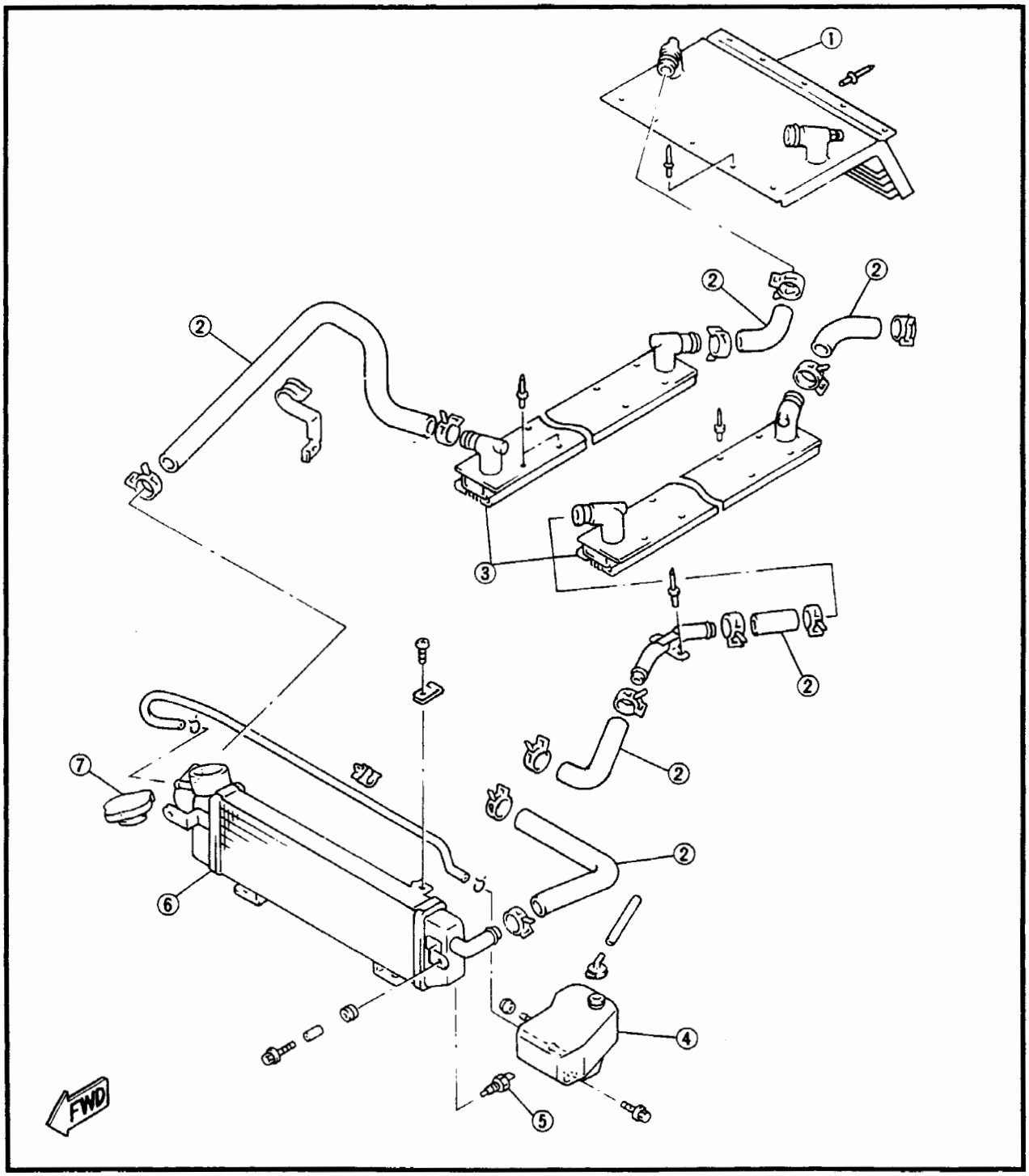
COOLANT FLOW

① Water pump housing
② Thermostatic valve housing
③ Hose (inlet)
④ Coolant filler cap
⑤ Reservoir tank
⑥ Radiator
⑦ Radiator cap
⑧ Hose (outlet)
⑨ Heat exchanger (center)
⑩ Heat exchanger (rear)
⑪ Bleeding bolt
A Top view
B Side view



COOLING LINE

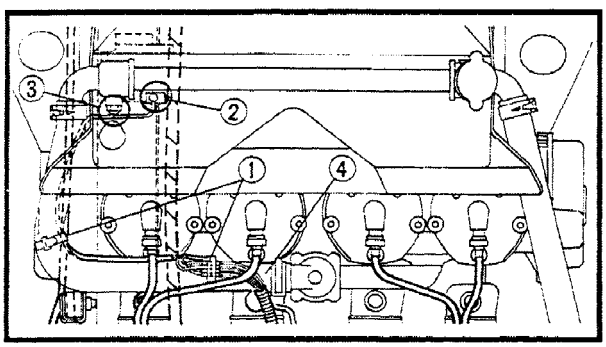
① Heat exchanger (rear)
② Hose
③ Heat exchanger (center)
④ Reservoir tank
⑤ Thermo switch
⑥ Radiator
⑦ Radiator cap



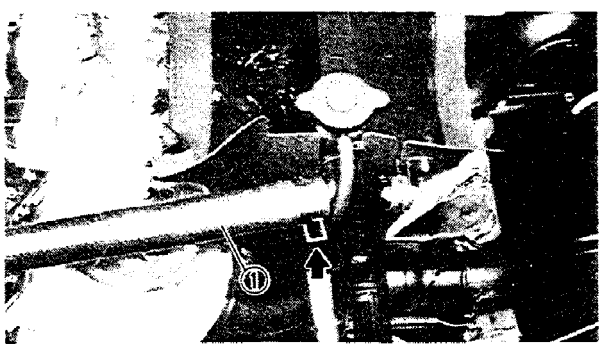
COOLING SYSTEM

REMOVAL

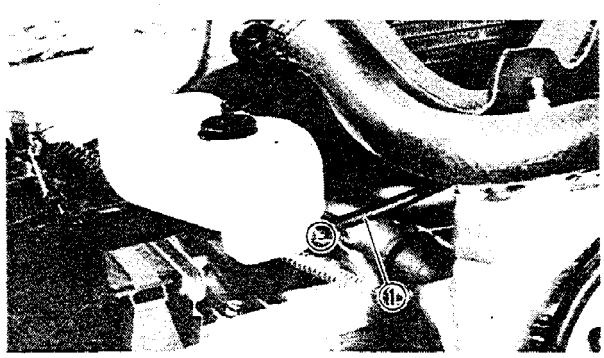
1. Remove:
   - Carburetor assembly
     (See page 7-3)
   - Secondary sheave
     (See page 4-11)



2. Drain the coolant. (See page 2-8)
3. Remove:
   - Bands ①
4. Disconnect:
   - Ground lead ②
   - Thermo switch lead ③
5. Remove:
   - Hose ④ (inlet)



6. Remove:
   - Hose ① (outlet)

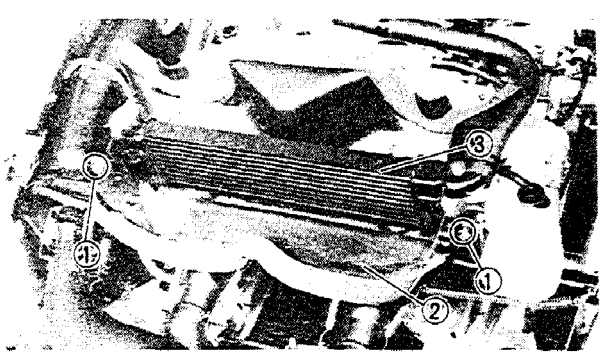


7. Disconnect:
   - Reservoir tank hose ①

   Drain the coolant.

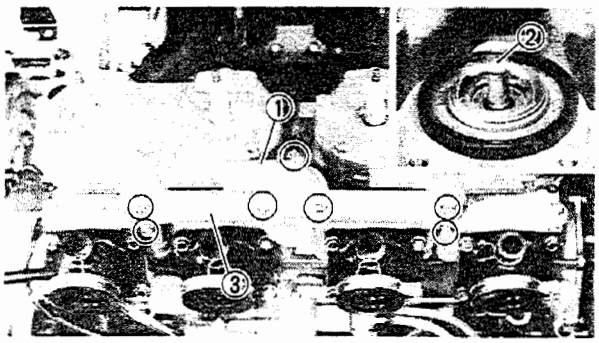
NOTE:

Place a container under the reservoir tank to catch the draining coolant.

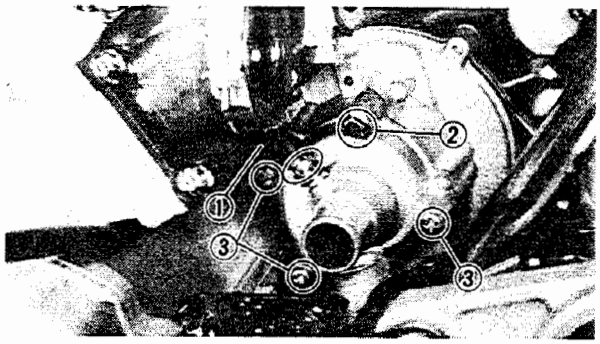


8. Remove:
   - Bolts ① (radiator)
   - Radiator duct ②/radiator ③
   - Radiator ③

     (From radiator duct)



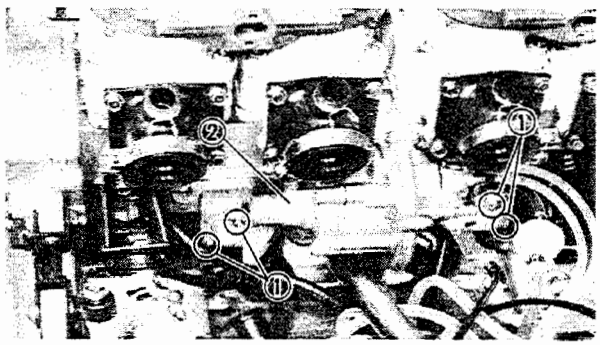
9. Remove:
   - Thermostatic valve cover ①
   - Thermostatic valve ②
   - Water jacket joint ③ (outlet)
   - O-rings



10. Remove:
   - Coolant hose ①

NOTE:
Place a rag under the coolant hose to catch the drainning coolant.

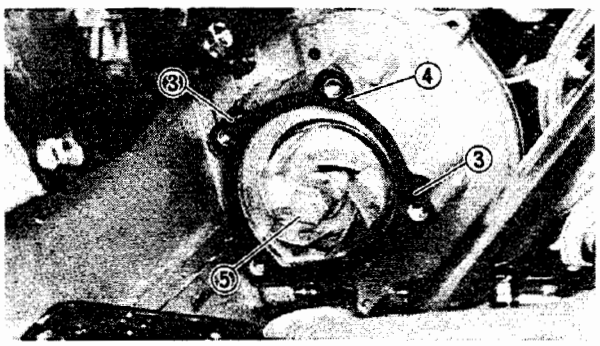
   - Bolt ② (water pump cover)
   - Screws ③ (water pump cover)



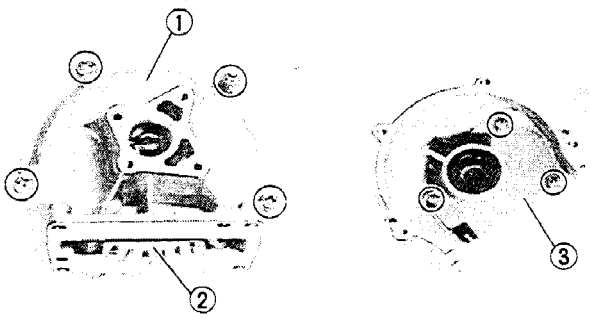
11. Remove:
   - Bolts ① (Water jacket joint-inlet)
   - Water pump cover ②
   - Dowel pins ③
   - Gasket ④ (water pump cover)
   - Impeller ⑤

NOTE:
Attach the primary sheave holder to hold the primary sheave.

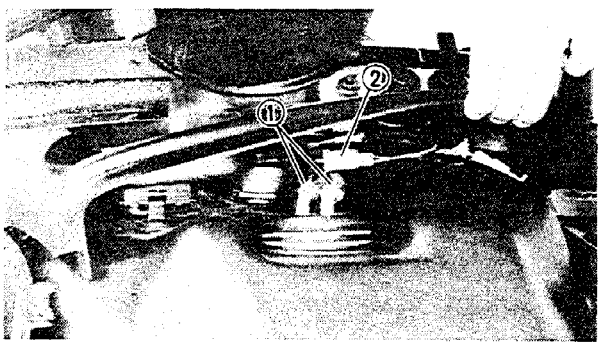
Primary sheave holder:
90890-01701, YS-01880



12. Remove:
   - Water pump assembly ①
   - Dowel pins
   - Washer ②
   - Collar ③
   - Gasket
   - Oil pump assembly ④
   - Water jacket joint ⑤ (inlet)
   - O-rings



13. Remove:
- Water pump housing cap ①
- Dowel pins
- Driven gear ② (water pump)
- Baffle plate ③

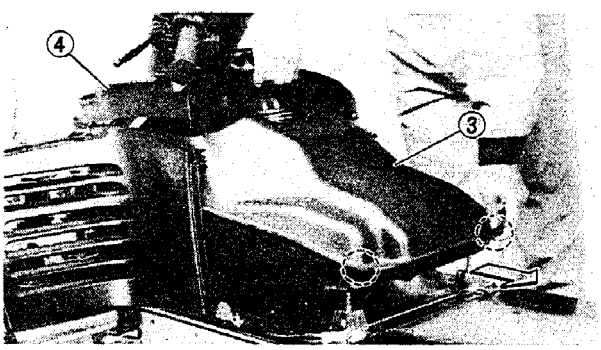


14. Disconnect:
- Fuel hoses ①

⚠ WARNING

Plug the fuel hoses so fuel dose not run out. Spilled fuel can be a fire hazard.

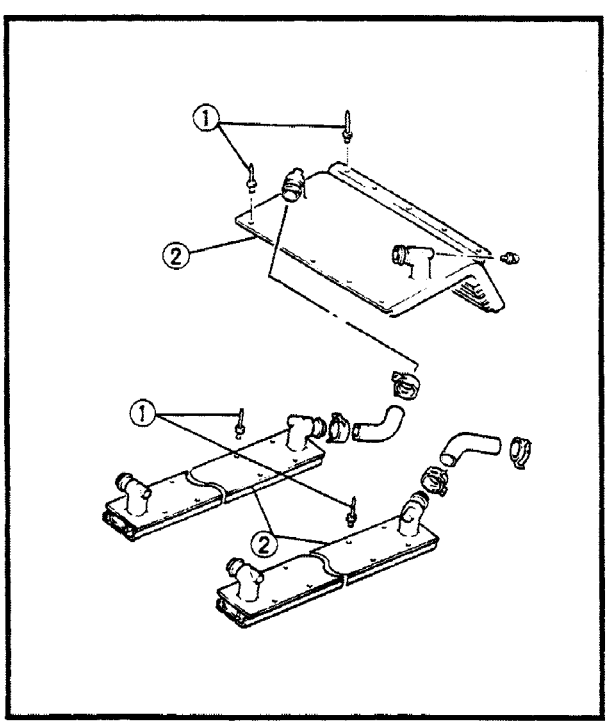
- Fuel sender coupler ②



15. Remove:
- Nuts (fuel tank)
- Fuel tank ③

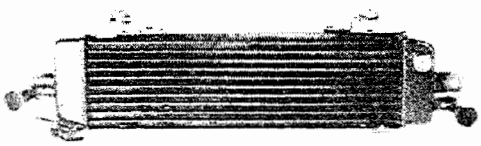
NOTE:

Pull back the fuel tank while lifting up the center cover ④.

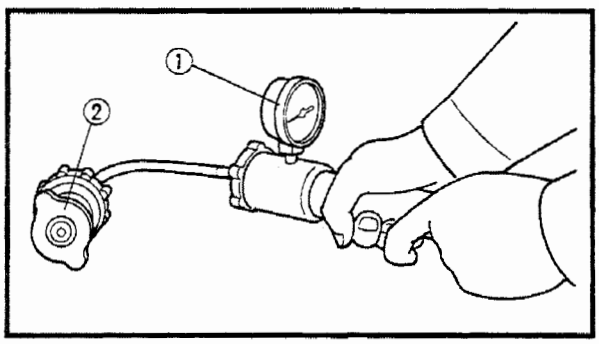


16. Remove:
- Slide rail suspension (See page 4-31)
- Track (See page 4-38)
- Rivets ①
- Heat exchangers ②

INSPECTION



1. Inspect:
   - Radiator core
     Obstruction → Blow out with compressed air through rear of the radiator.
     Flattened fin → Repair/replace.
   - Hose
     Cracks/Damage → Replace.



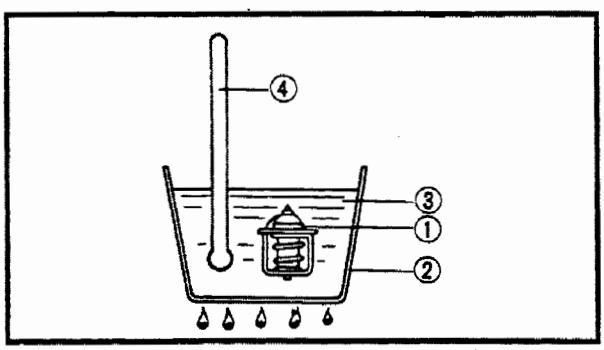
2. Measure:
   - Radiator cap opening pressure
     Cap opens at pressure below the specified pressure → Replace.

Cap opening pressure:
80 ~ 100 kPa
(0.8 ~ 1.0 kg/cm², 11 ~ 14 psi)

Measurement steps:
- Attach the cooling system tester ① to the radiator filler cap ②.

Cooling system tester:
90890-01325, YU-22460-01

- Apply the specified pressure for 10 seconds, and make sure there is no pressure drop.

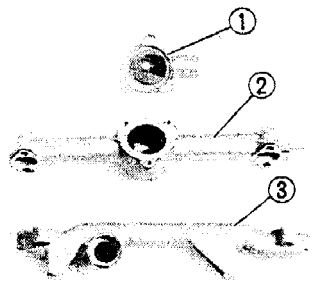


3. Inspect:
   - Thermostatic valve ①
     Valve does not open at 50.0 ~ 55.0°C (122 ~ 131°F) → Replace.

Inspection steps:
- Suspend thermostatic valve ① in a vessel ②.
- Place reliable thermometer in a water ③.
- Heat water slowly.
- Observe thermometer ④, while stirring water continually.

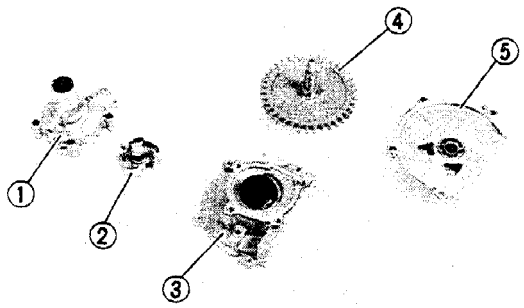
NOTE:

Thermostatic valve is sealed and its setting is preset. If its accuracy is in doubt, always replace it. A faulty unit could cause serious overheating or overcooling.



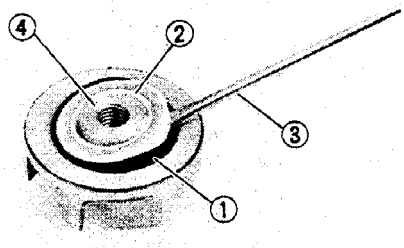
4. Inspect:
   - Thermostatic valve cover ①
   - Water jacket joint ② (inlet)
   - Water jacket joint ③ (outlet)

   Cracks/Damage → Replace.



5. Inspect:
   - Water pump housing cover ①
   - Impeller ②
   - Water pump housing ③
   - Driven gear ④ (water pump)
   - Water pump housing cap ⑤

   Cracks/Damage → Replace.



6. Inspect:
   - Damper rubber ①
   - Thrust collar ②

   Wear/Damage → Replace.

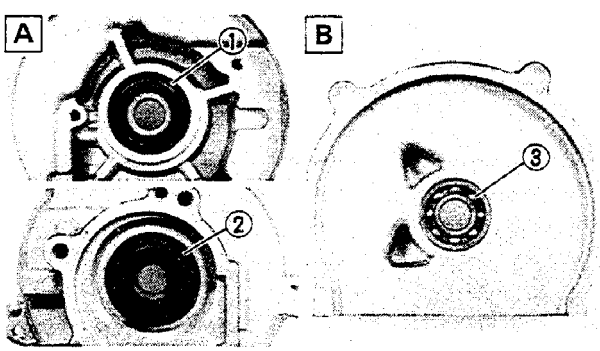
Replacement steps:
- Pry out the thrust collar ② with a thin screwdriver ③ and remove the damper rubber ①.

CAUTION:

Be careful not to scratch the impeller ④.

- Apply tap water or coolant to the damper rubber and install the damper rubber and thrust collar securely to the impeller.

NOTE:
- Be sure the thrust collar ② fits squarely.
- The rubber damper and thrust collar should be replaced as a set.

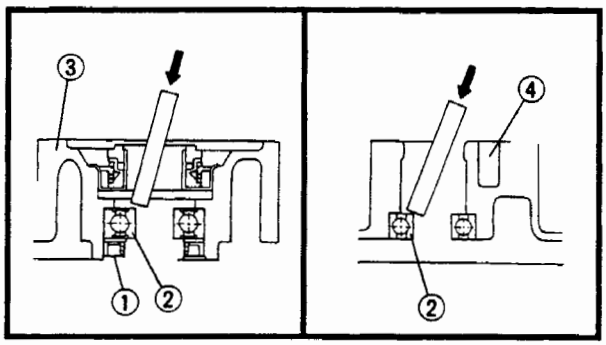


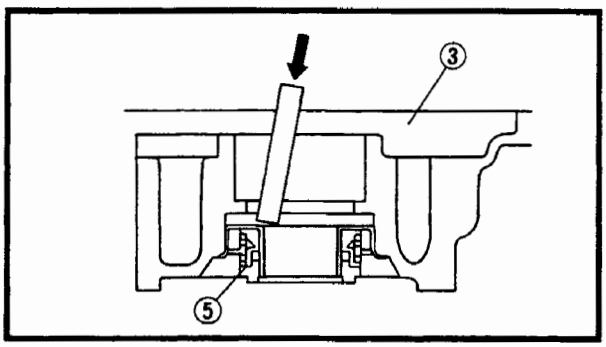
7. Inspect:
   - Oil seal ①
   - Mechanical seal ②

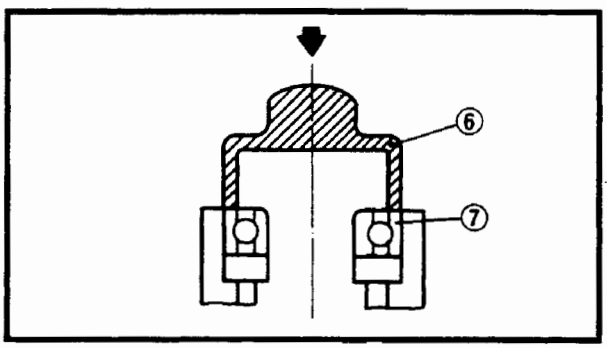
   Wear/Damage → Replace.
   - Bearings ③

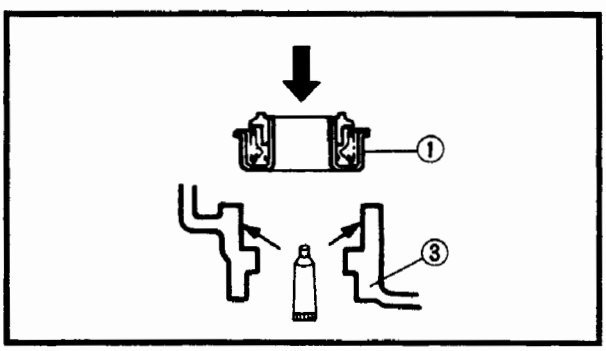
   Roughness → Replace.

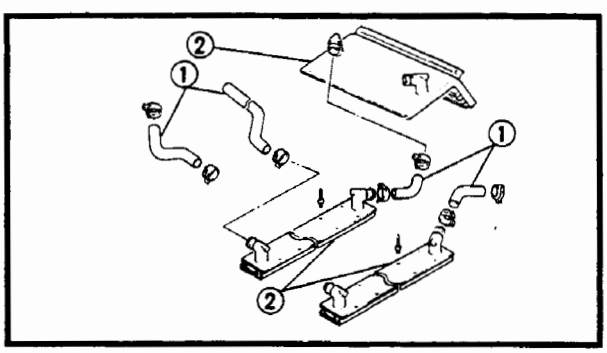
A Water pump housing cover
B Water pump housing cap











Replacement steps:

- Tap off the oil seal ① and bearing(s) ② from the water pump housing ③ and/or water pump housing cap ④.
- Tap off the mechanical seal ⑤ from the water pump housing ③.
- Install the new bearing(s) and oil seal.

NOTE:

Use a socket ⑥ that matches the outside diameter of the race ⑦ of the bearing and oil seal.

CAUTION:

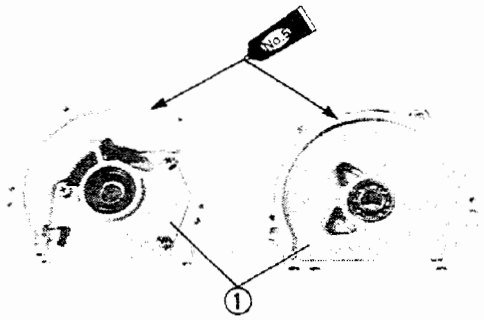
Do not strike the inner race or balls of the bearing.Contact should be made only with the outer race.

- Install the new mechanical seal ① to the water pump housing ③

NOTE:

Apply Yamaha bond No. 4 or Quick gasket® to the water pump housing before installing seal.

8. Inspect:
   - Coolant hoses ①
   - Heat exchangers ②
     Crack/Damage → Replace.



INSTALLATION

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

1. Apply a sealant onto matching surfaces of the pump housing ① and housing cap.

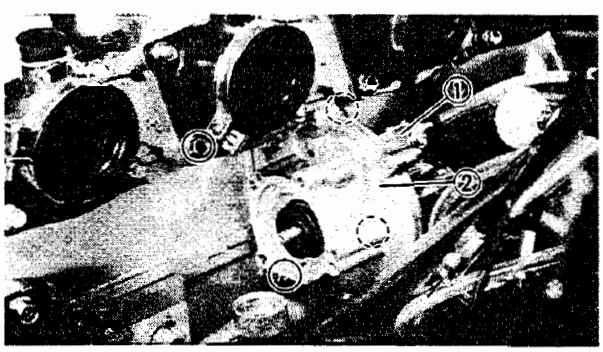
Yamaha bond No. 4:
Quick gasket®:
ACC-11001-03-00

2. Install:
   - Baffle plate
   - Driven gear (water pump)
   - Dowel pins
   - Water pump housing cap

Screw (water pump housing cap)
7 Nm (0.7 m • kg, 5.1 ft • lb)

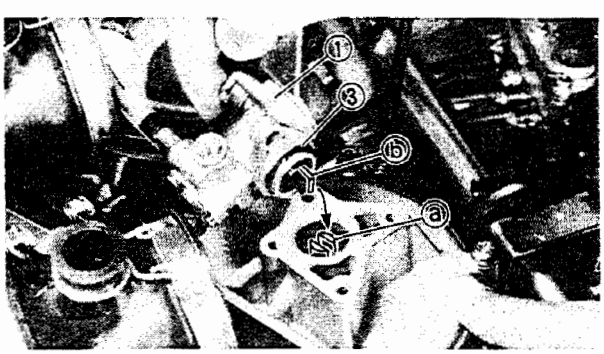
NOTE:

Before installing the driven gear, grease the oil seal lips.



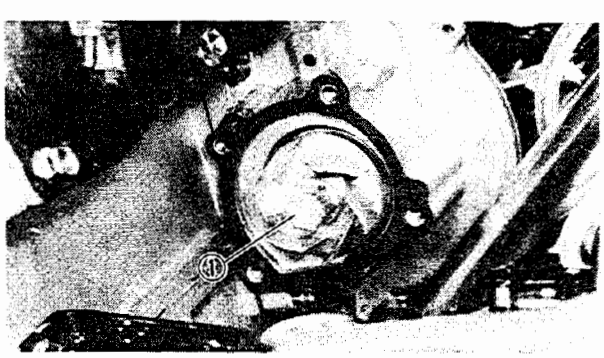
3. Install:
   - Oil pump assembly ①
     (to water pump housing)
   - Water pump assembly ②

Screw (Oil pump assembly):
4 Nm (0.4 m • kg, 2.9 ft • lb)
Bolt Screw (water pump housing assembly):
10 Nm (1.0 m • kg, 7.2 ft • lb)



NOTE:

- Before installing the oil pump assembly, grease the o-ring ③.
- Align the slot ⓐ on the driven gear shaft with the projection ⓑ on the oil pump shaft.



4. Tighten:
   - Impeller ①

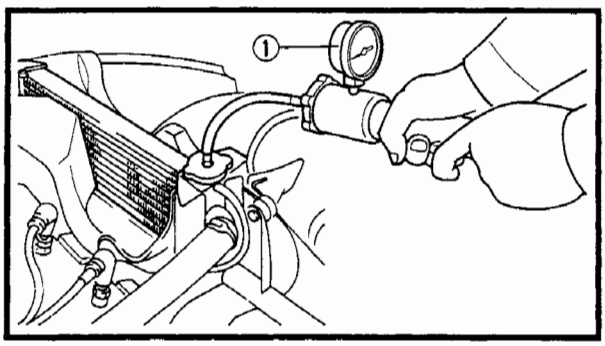
Impeller
14 Nm (1.4 m • kg, 10 ft • lb)

NOTE:

Apply LOCTITE® to the first 4 threads of the driven gear shaft.

5. Tighten:

Bolt (water jacket joints):
10 Nm (1.0 m • kg, 7.2 ft • lb)
Bolt (thermostatic valve cover):
7 Nm (0.7 m • kg, 5.1 ft • lb)
Bolt (radiator duct/radiator):
7 Nm (0.7 m • kg, 5.1 ft • lb)



6. Fill:
- Cooling system (See page 2-7)

7. Inspect:
- Cooling system

Inspection steps:
- Attach the radiator cap tester ① to the radiator.

Radiator cap tester:
90890-01325, YU-24460-01

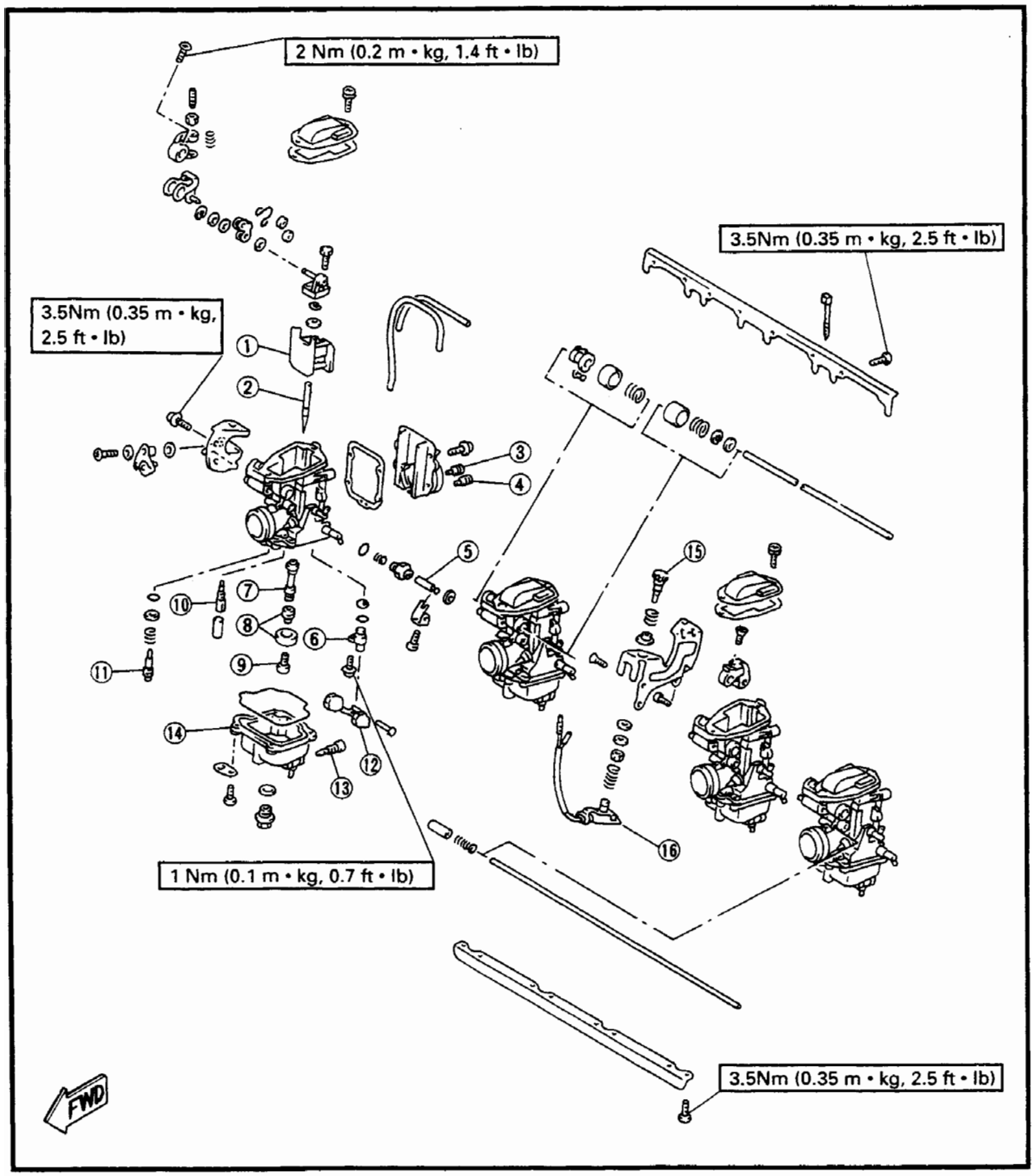
- Apply 90 kPa (0.9 kg/cm², 13 psi) pressure.
- Measure pressure with the gauge.
  Decrease of pressure (leaks) → Repair as required.

CHAPTER 7.
CARBURETION

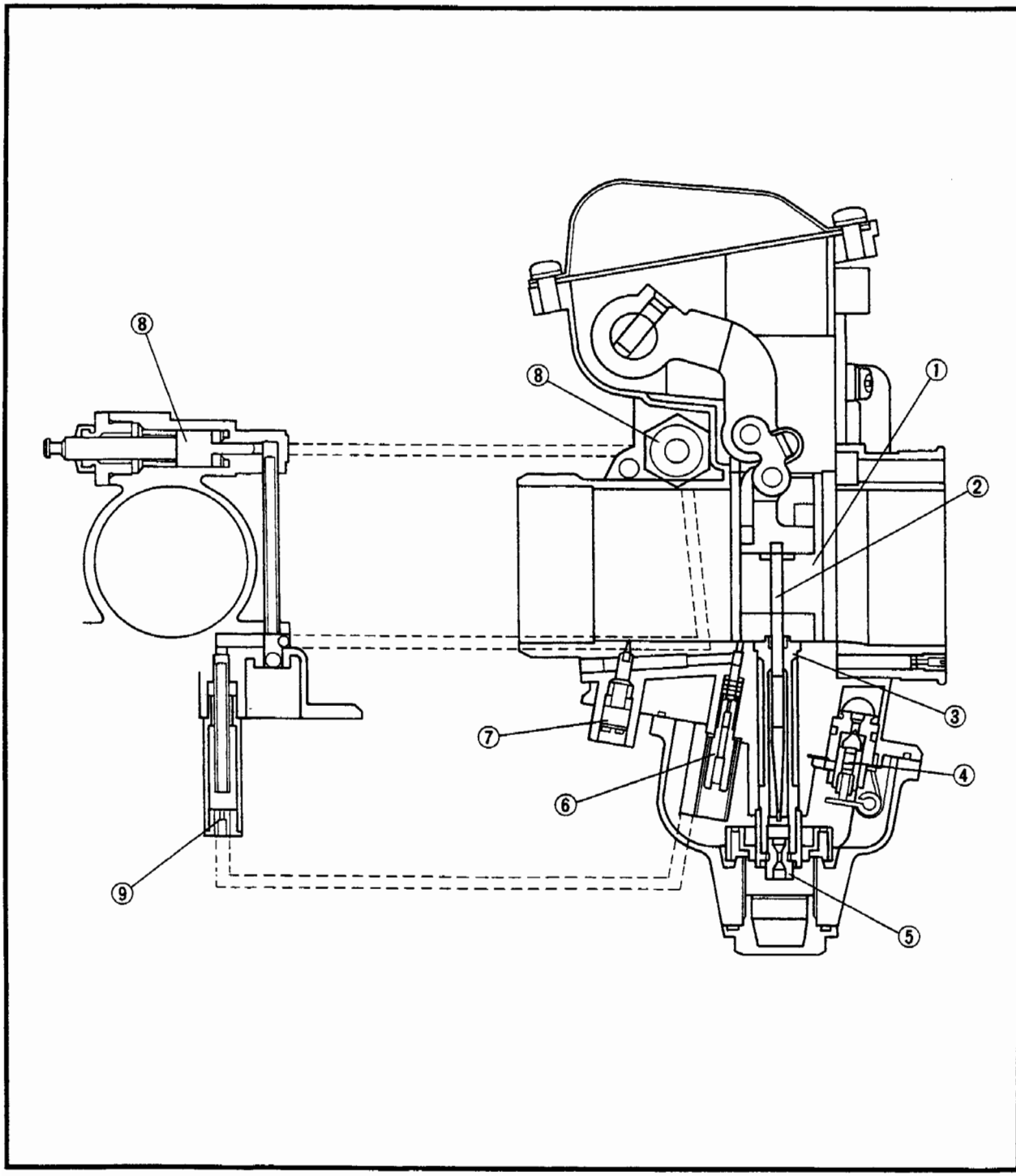
CARBURETION

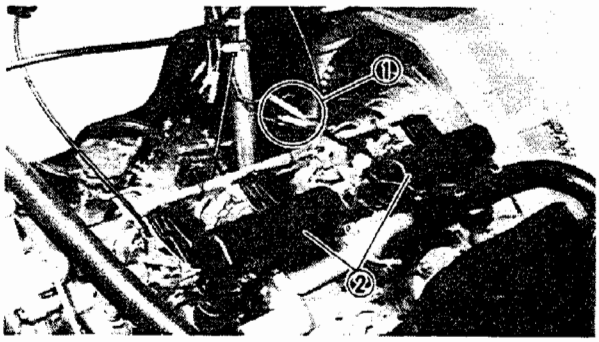
CARBURETOR

① Throttle valve
② Jet needle
③ Pilot air jet
④ Main air jet
⑤ Starter plunger
⑥ Valve seat assembly
⑦ Main nozzle
⑧ Main jet ring
⑨ Main jet
⑩ Pilot jet
⑪ Pilot screw
⑫ Float
⑬ Drain screw
⑭ Float chamber
⑮ Throttle stop screw
⑯ Carburetor switch



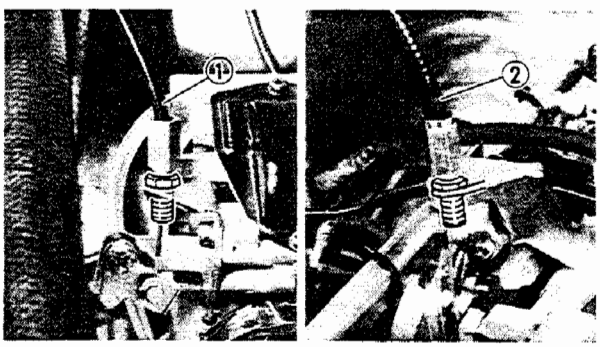
① Throttle valve
② Jet needle
③ Main nozzle
④ Needle valve
⑤ Main jet
⑥ Pilot jet
⑦ Pilot screw
⑧ Starter plunger
⑨ Starter jet



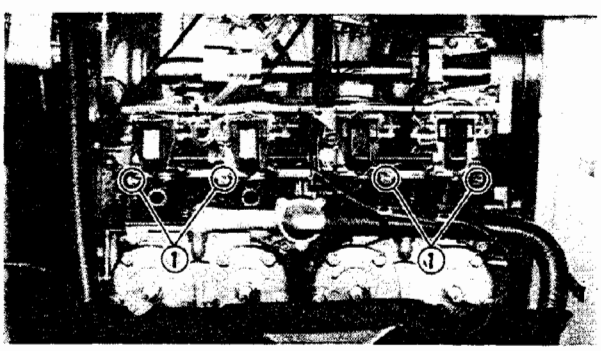


REMOVAL:

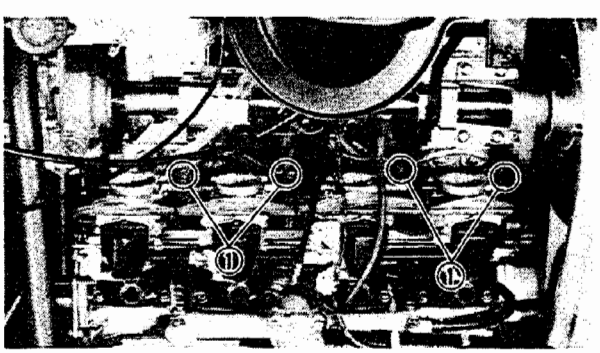
1. Remove:
   - Intake silencers (left and right)
     (see page 2-4)
2. Disconnect:
   - Carburetor switch (T.O.R.S.) leads ①
3. Remove:
   - Air chambers ② (left and right)



4. Disconnect:
   - Starter cable ①
   - Throttle cable ②



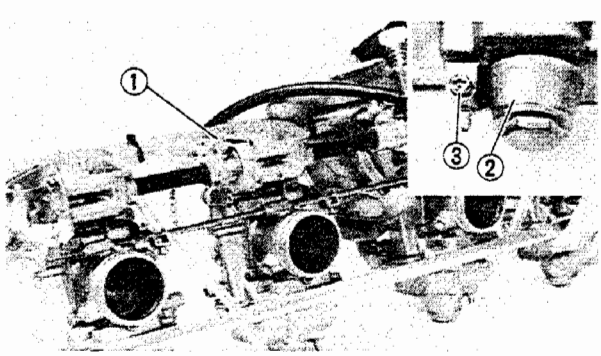
5. Loosen:
   - Clamp screws ① (carburetor joint)



6. Disconnect:
   - Fuel delivery hoses ①

⚠ WARNING

Plug the fuel delivery hoses so that fuel does not run out. Spilled fuel can be a fire hazard.



7. Remove:
   - Carburetor assembly ①
8. Drain:
   - Fuel
     (from float chambers②)

③ Drain screw

DISASSEMBLY

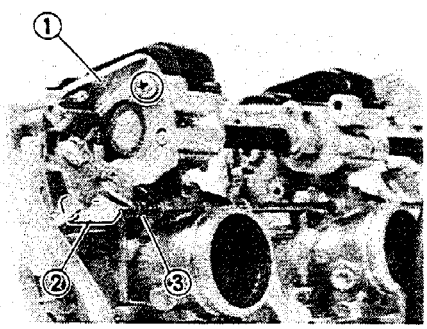
CAUTION:

Because the pilot screw is adjusted and set at the factory before being shipped, it should not be disassembled unless strictly necessary. If the unit must be disassembled, make a note of the position in which it is placed, and make sure it is returned to the same position when assembled.

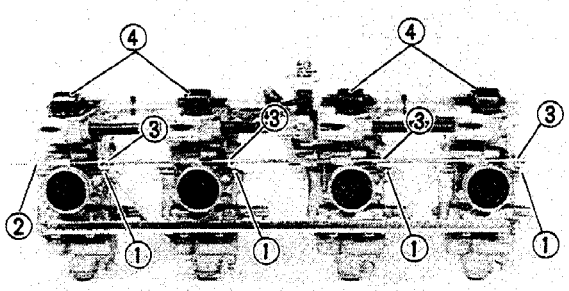
NOTE:

The following parts can be cleaned and inspected without carburetor separation.
(All inner parts except throttle valve can be cleaned and inspected without carburetor separation.)

- Starter plunger
- All jets
- Float
- Needle valve
- Valve seat
- Main nozzle
- Jet needle



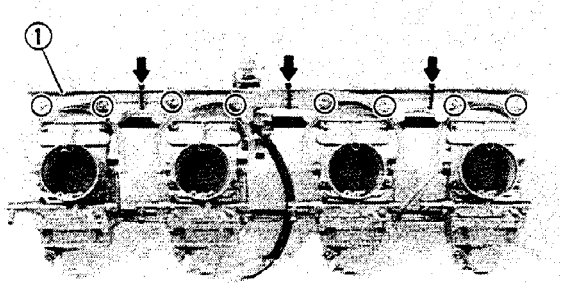
1. Remove:
   - Starter cable holder ①
   - Cap ② (starter shaft)
   - Spring ③ (starter shaft)



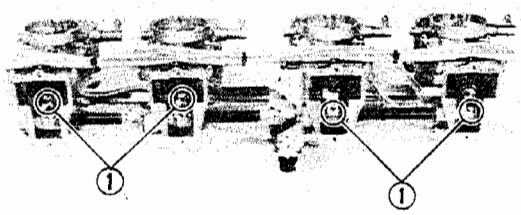
2. Loosen:
   - Screws ① (starter shaft connector)

3. Remove:
   - Starter shaft ②
   - Starter shaft connectors ③

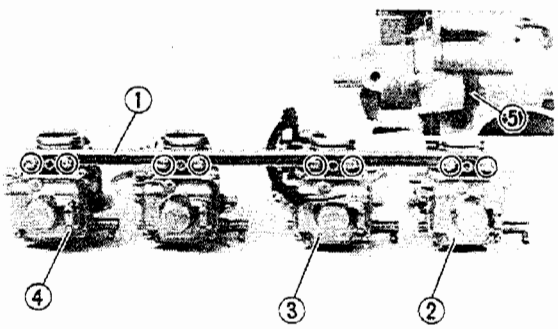
4. Remove:
   - Top covers ④



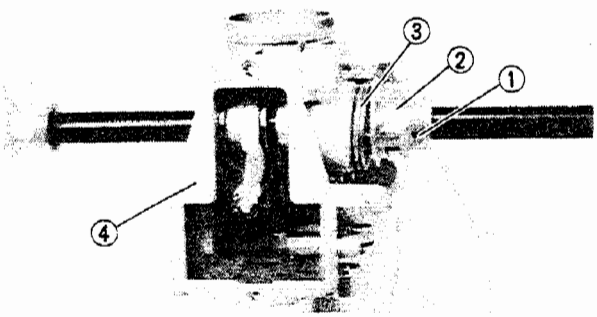
5. Remove:
   - Screws ① (inner throttle lever)



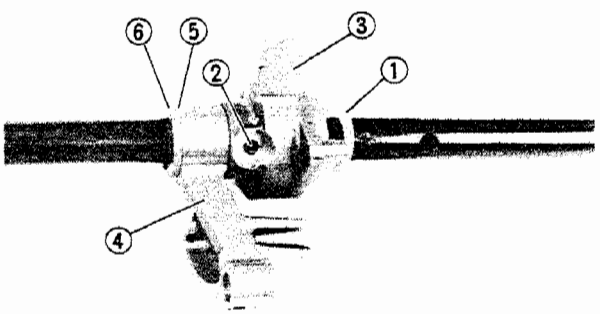
6. Remove:
   - Bands
   - Connecting plate ① (upper)



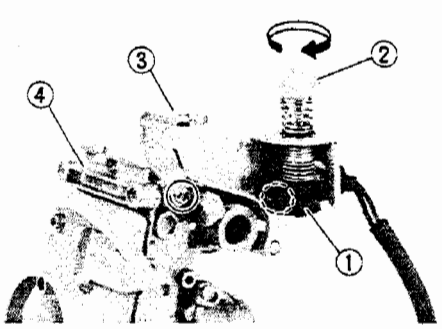
7. Remove:
   - Connecting plate ① (lower)
   - Carburetors (No. 1 ②, No. 2 ③, No. 4 ④)
   - Return spring ⑤



8. Remove:
   - Spring pin ①
   - Connecting lever ②
   - Return spring ③
   - Carburetor ④ (No. 3)

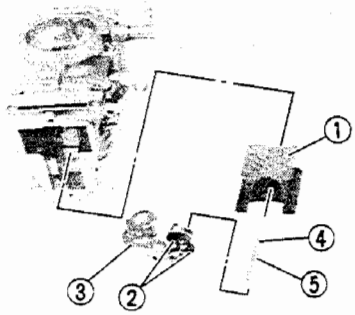


9. Remove:
   - Washer ①
   - Spring pin ②
   - Connecting lever ③
   - Throttle lever ④
   - Washer ⑤
   - Circlip ⑥

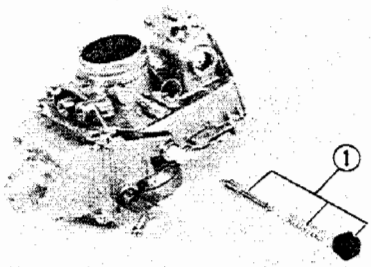


10. Remove:
    - Carburetor switch ① (T.O.R.S.)
      Turn throttle stop screw ② clockwise.
    - Throttle cable holder ③

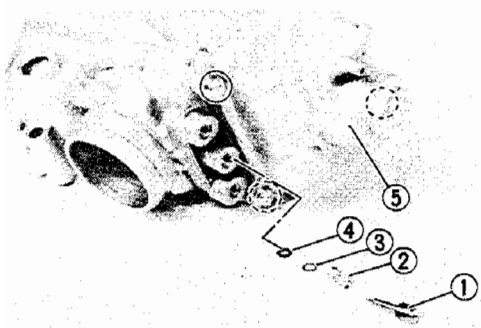
④ No. 3 carburetor



11. Remove:
- Throttle valve assembly ①
- Screws ②
- Inner throttle lever assembly ③
- Jet needle ④
- Washer ⑤

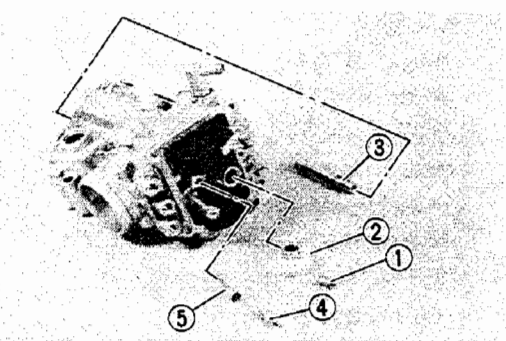


12. Remove:
- Starter plunger assembly ①

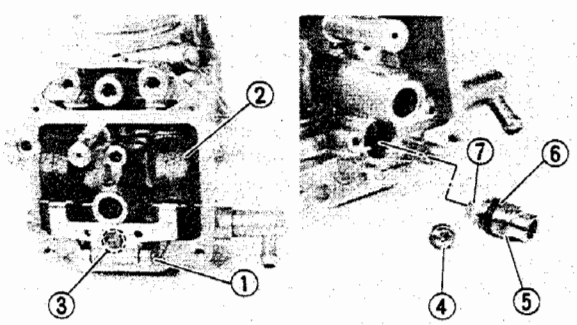


13. Remove:
- Pilot screw ①
- Spring ②
- Washer ③
- O-ring ④
- Float chamber ⑤

NOTE:
Count and write down the numbers of turns the pilot screw was turned in.

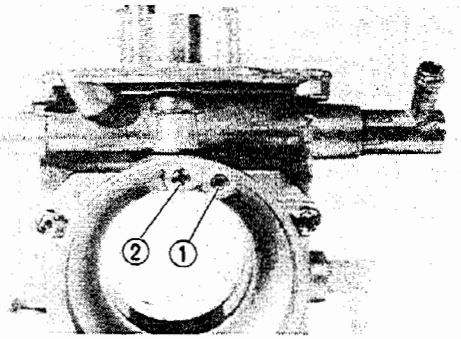


14. Remove:
- Main jet ①
- Main jet ring ②
- Main nozzele ③
- Pilot jet ④
- Pipe ⑤ (pilot jet)



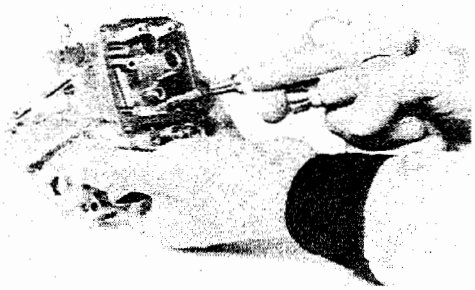
15. Remove:
- Float pin ①
- Floats ②
- Needle valve ③
- Screw ④ (valve seat)
- Valve seat assembly ⑤

⑥ O-rings
⑦ Fuel strainer



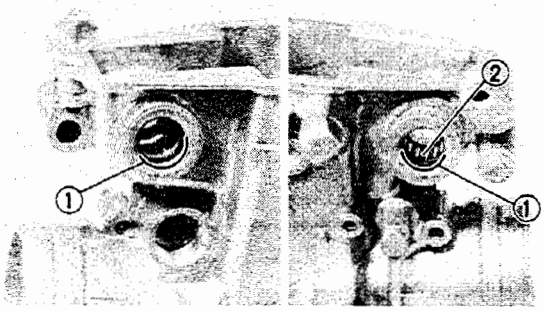
16. Remove:
- Pilot air jet ①
- Main air jet ②

INSPECTION

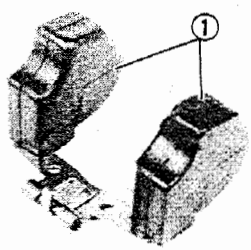


1. Inspect:
- Carburetor body
- Fuel passage
  Contamination → Clean.

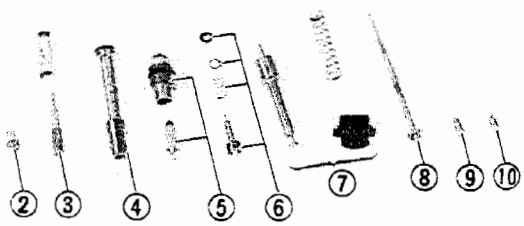
NOTE:
- Use a petroleum based solvent for cleaning.
- Blow out all passages and jets with compressed air.



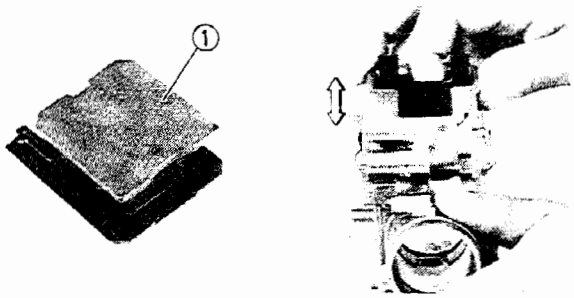
2. Inspect:
- Rubber seals ①
- Bearing ②



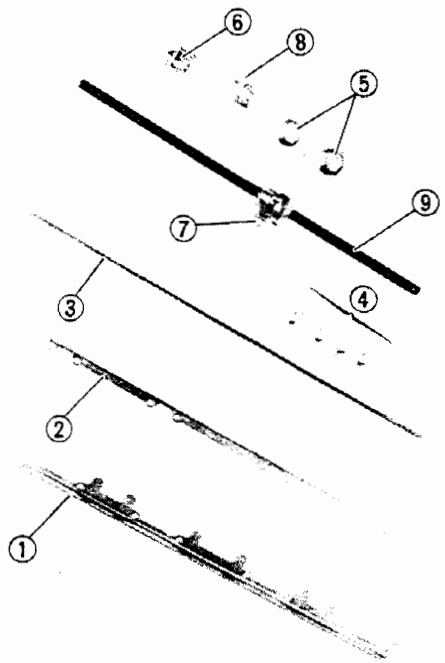
3. Inspect:
- Floats ①
- Main jet ②
- Pilot jet ②
- Main nozzle ④
- Valve seat assembly ⑤
- Pilot screw assembly ⑥
- Startor plunger assembly ⑦
- Jet needle ⑧
- Pilot air jet ⑨
- Main air jet ⑩
  Bends/Wear/Damage → Replace.
  Contamination → Clean.



NOTE:
- Use a petroleum based solvent for cleaning.
- Blow out all passages and jets with compressed air.



3. Inspect:
   - Throttle valve ①
     Wear/Damage → Replace.
4. Check:
   - Throttle valve movement
     Stick → Replace carburetor body assembly.



5. Inspect:
   - Connecting plate ① (upper)
   - Connecting plate ② (lower)
   - Starter shaft ③
   - Starter connector ④
   - Return spring ⑤
   - Connecting lever ⑥
   - Throttle lever ⑦
   - Inner throttle lever assembly ⑧
   - Throttle shaft ⑨
     Bends/Cracks/Wear/Damage → Replace.

ASSEMBLY

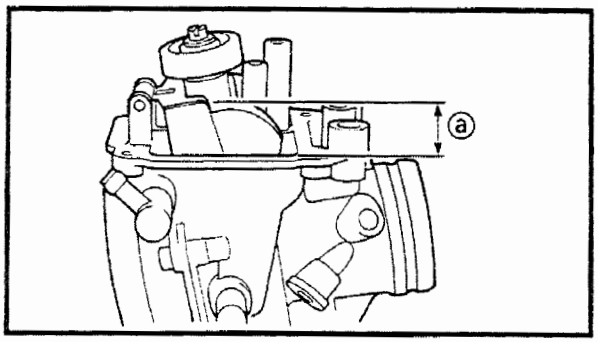
Reverse the "DISASSEMBLY" procedure. Note the following points.

NOTE:

- Before reassembling, wash all parts in clean gasoline.
- Always use a new gasket and O-ring.

1. Tighten:
   - Inner parts

Pilot air jet/Main air jet:
0.7 Nm (0.07 m • kg, 0.51 ft • lb)
Screw (valve seat):
1 Nm (0.1 m • kg, 0.7 ft • lb)
Pilot jet:
0.7 Nm (0.07 m • kg, 0.51 ft • lb)
Main jet:
0.8 Nm (0.08 m • kg, 0.58 ft • lb)
Startor plunger assembly:
2.5 Nm (0.25 m • kg, 1.8 ft • lb)



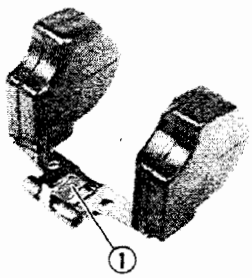
2. Measure:
   - Float height ⓐ
     Out of specification → Adjust.

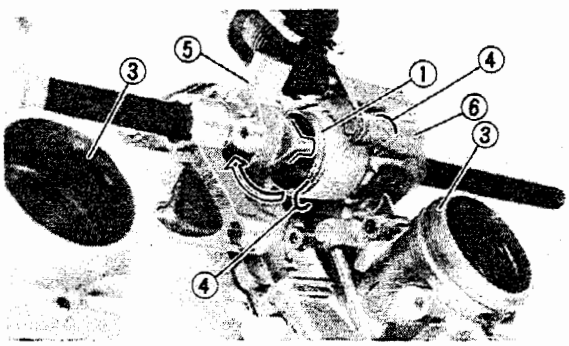
Float height:
11.3 ~ 15.3 mm (0.44 ~ 0.60 in)

Measurement and adjustment steps:
- Hold the carburetor in an upside down position.
- Measure the diatance between the carburetor body and top of the floats.

NOTE:
The float arm should be resting on the valve, but not compressing the needle valve.

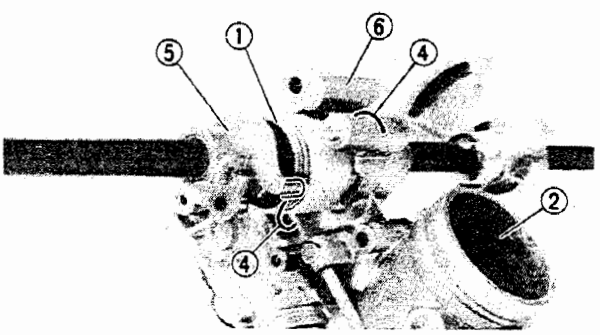
- If the float height is not within specification, inspect the valve seat and needle valve.
- If either is worn, replace them both.
- If both are fine, adjust the float height by bending the float arm tang ① on the float.
- Recheck the float height.





3. Lubricate:
   - Rubber seals
   - Bearings
   - Washer
   - Return spring

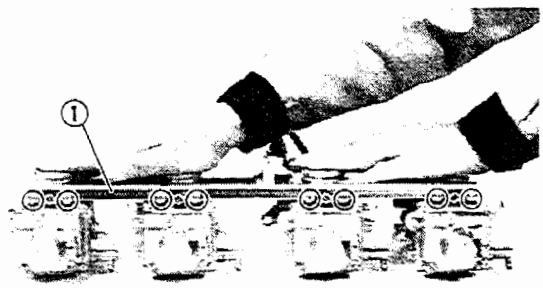
Low-temperature lithium soap base grease



4. Install:
   - Return springs ①
   - Carburetors (No. 3 ②, No. 2 ③)

NOTE:
Hook the spring hooks ④ to the projections on the connecting lever ⑤ and carburetor body ⑥, while twisting the spring clockwise approximately 315 degrees.

- Carburetors (No. 1, No. 4)

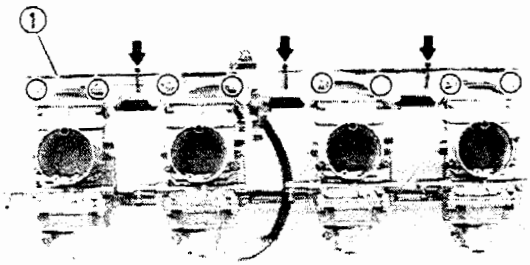


5. Install:
   - Connecting plate ① (lower)
   - Connecting plate ② (upper)

	Screw (connecting plates): **3.5 Nm (0.35 m • kg, 2.5 ft • lb)**

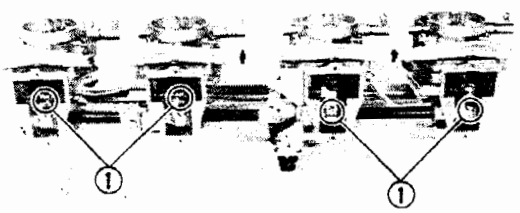
NOTE:

Plate the carburetors on a surface plate with the intake manifold side down, Install the connecting plates while pushing the respective carburetors down with an even force.



6. Tighten:
   - Screws ① (inner throttle lever)

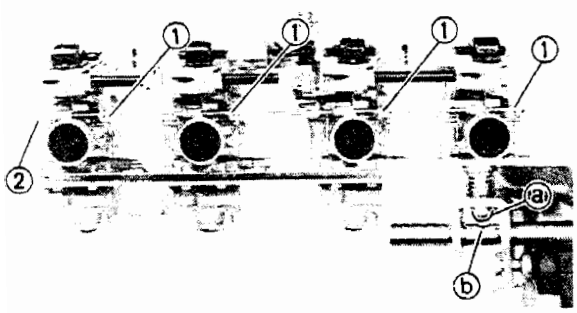
	Screw (inner throttle lever): **2 Nm (0.2 m • kg, 1.4 ft • lb)**



7. Install:
   - Starter shaft connectors ①
   - Starter shaft ②

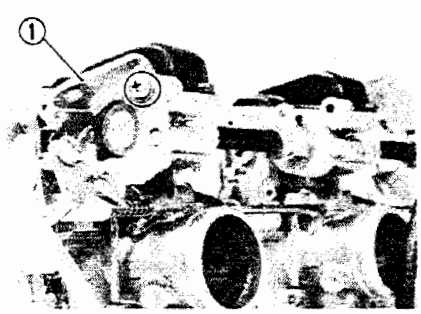
NOTE:

Align the tip ⓐ of the screw with the indentation ⓑ on the starter shaft.



8. Install:
   - Starter cable holder ①

	Screw (starter cable holder): **3.5 Nm (0.35 m • kg, 2.5 ft • lb)**



NOTE:

Make sure the throttle lever and starter lever move smoothly.

INSTALLATION

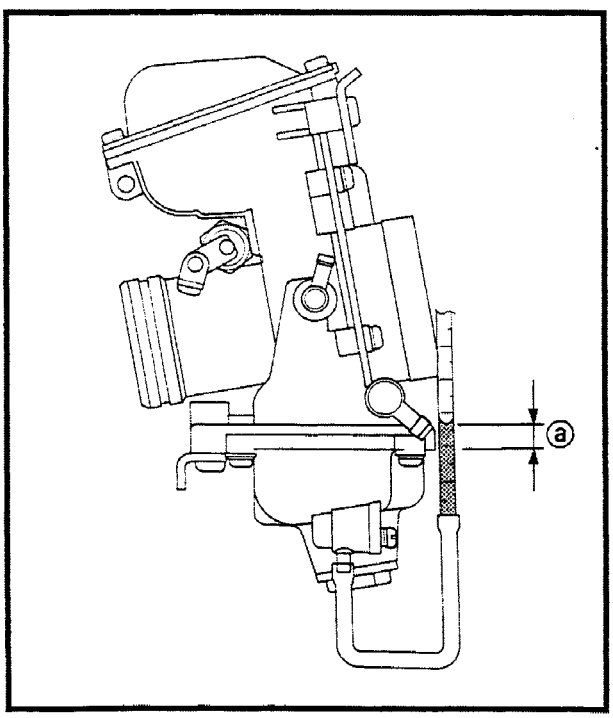
Reverse the "REMOVAL" procedure.
Note the following points.

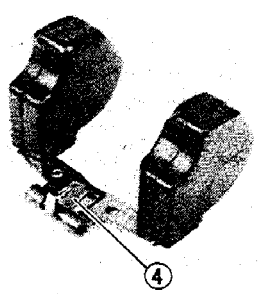
1. Adjust:
   - Carburetor synchronization (See Page 2-13)
   - Engine idle speed (See page 2-13)
   - Throttle cable free play (See page 2-14)
   - Starter cable free play (See page 2-15)

FUEL LEVEL ADJUSTMENT

1. Measure:
   - Fuel level
     Out of specification → Adjust.

Fuel level: ⓐ
5 ~ 7 mm (0.20 ~ 0.28 in)



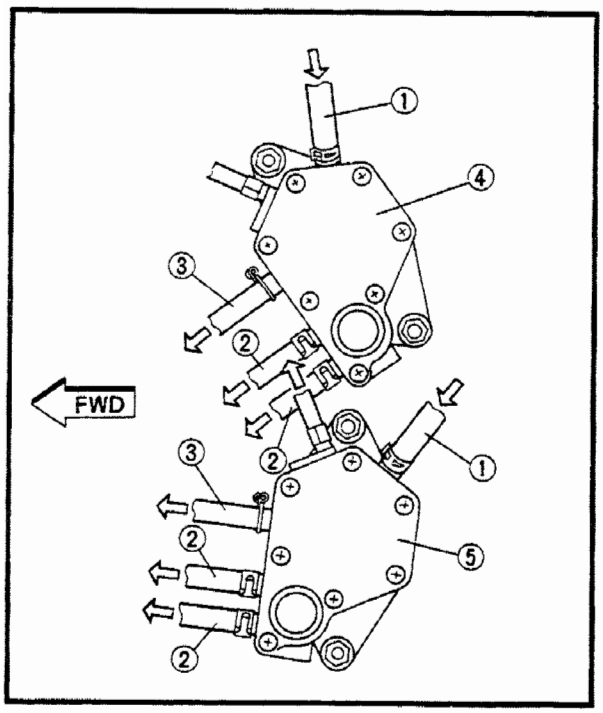


Measurement and adjustment steps:
- Place the machine on a level place.
- Attach the fuel level gauge ① to the float chamber nozzle.

Fuel level gauge:
90890-01312, YM-01312-A

NOTE:
Use the adapter (outside diameter ø6 hose) ② when attaching the fuel level gauge.

- Loosen the drain screw ③ and start the engine.
- Measure the fuel level a with gauge.
- If the fuel level is incorrect, adjust the fuel level.
- Remove the carburetor.
- Inspect the valve seat and needle valve.
- If either is worn, replace them both.
- If both are fine, adjust the float height by bending the float tang ④ on the floats.
- Recheck the fuel level.



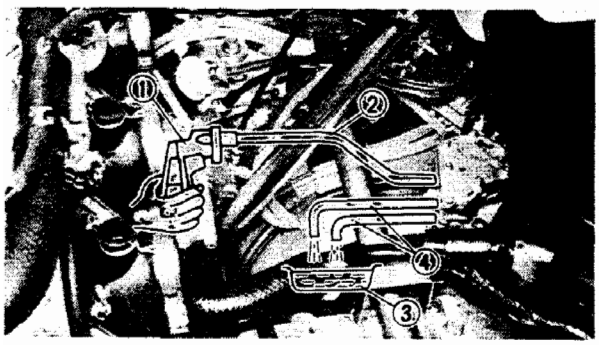
FUEL PUMP

OPERATION CHECK

1. Remove:
   - Intake silencers (left and right) (See page 2-4)
   - Carburetor assembly (See page 7-3)

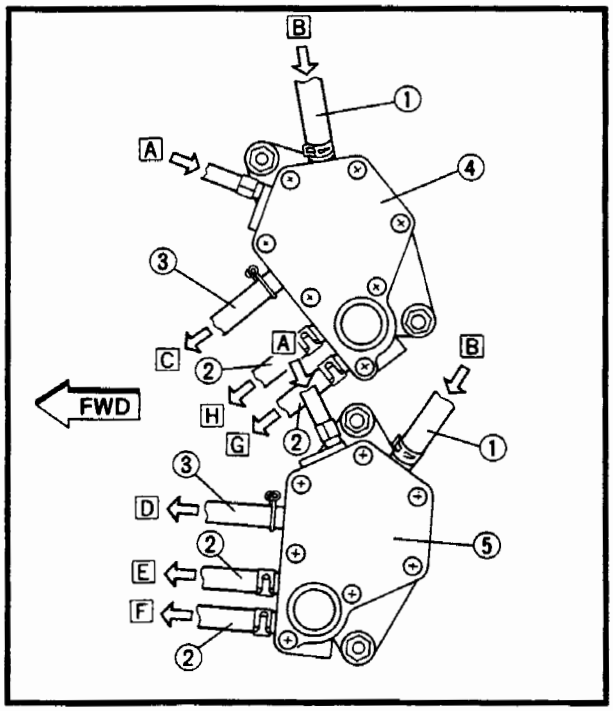
2. Inspect:
   - Fuel hose ①
   - Fuel delivery hoses ②
   - Pulser hose ③
     Clog/Damage → Replace.

④ Fuel pump (right)
⑤ Fuel pump (left)



3. Check:
   - Fuel pump operation

Checking steps:
- Connect a hand-operated vacuum pump ① (Such as Mighty-Vac®) to the pulser hose ②.
- Place a receptacle ③ under the fuel delivery hoses end ④.
- Operate the hand-operated vacuum pump ① (Such as Mighty-Vac®), when checking the fuel flow from the fuel delivery hoses ④.
- If fuel does not flow out, replace the fuel pump assembly.
- To replace the fuel pump assembly, perform the following steps from 4 to 6.



4. Replace:
   - Fuel pump assembly

	Nut (fuel pump assembly): **10 Nm (1.0 m • kg, 7.2 ft • lb)**

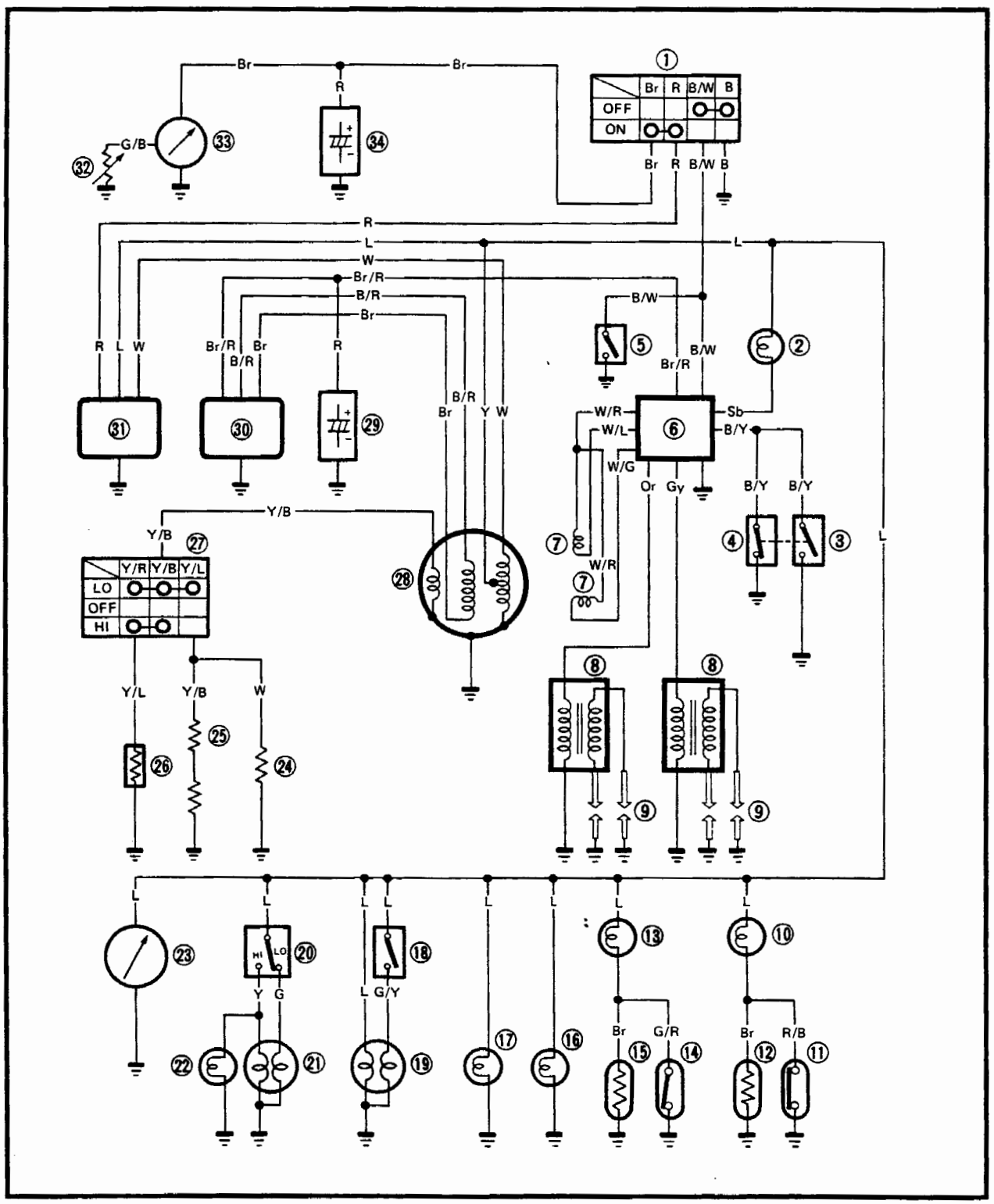
5. Connect:
   - Pulser hose ①
   - Fuel hose ②
   - Fuel delivery hose ③
     (to fuel pump)

④ Fuel pump (right)
⑤ Fuel pump (left)
[A] From oil pump
[B] From fuel tank
[C] To right side crankcase
[D] To left side crankcase
[E] To No. 1 carburetor
[F] To No. 2 carburetor
[G] To No. 3 carburetor
[H] To No. 4 carburetor

CHAPTER 8.
ELECTRICAL

ELECTRICAL

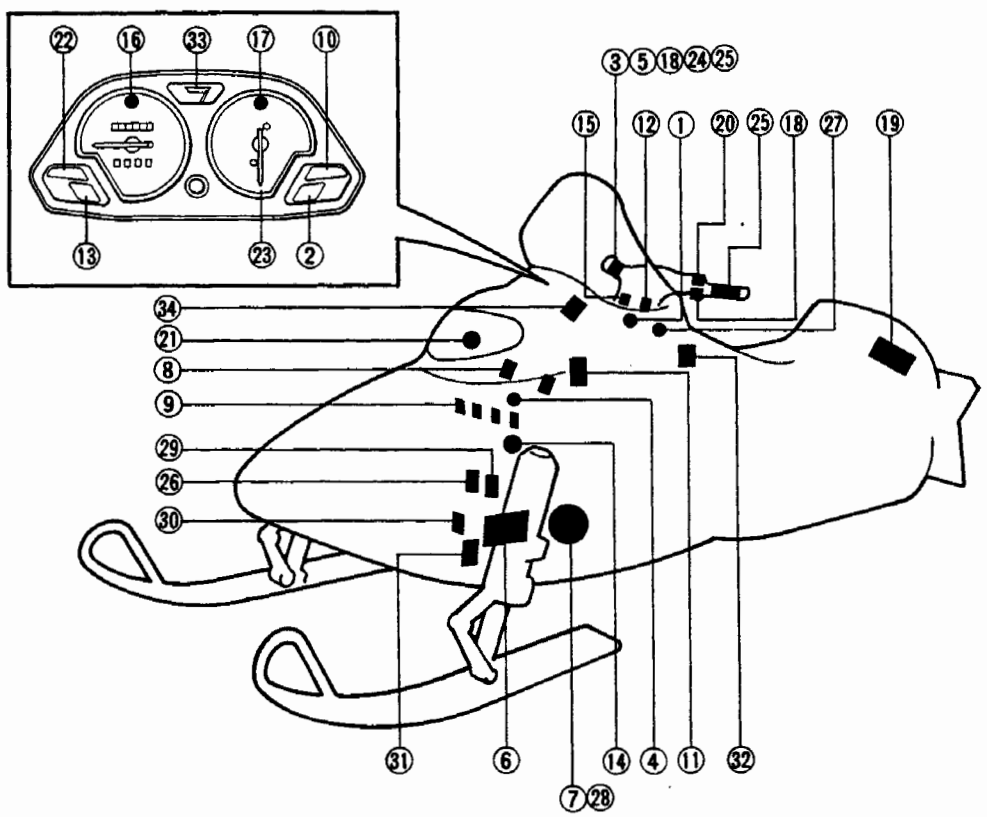
CIRCUIT DIAGRAM



① Main switch
② "T.O.R.S." indicator light
③ Throttle switch
④ Carburetor switch
⑤ "ENGINE STOP"switch
⑥ CDI unit
⑦ Pulser coil
⑧ Ignition coil
⑨ Spark plug
⑩ "OIL LEVEL" warning light
⑪ Oil level gauge
⑫ "OIL LEVEL" warning light checker
⑬ "WATER TEMP" warning light
⑭ Thermo switch
⑮ "WATER TEMP" warning light checker
⑯ Speedometer light
⑰ Tachometer light
⑱ Brake light switch
⑲ Tail/brake light
⑳ Headlight beam switch
㉑ Headlight
㉒ "HIGH BEAM" indicator light
㉓ Tachometer
㉔ Thumb warmer
㉕ Grip warmer
㉖ Resistor
㉗ Grip warmer switch
㉘ CDI magneto
㉙ Condenser (I)
㉚ Rectifier/regulator (I)
㉛ Rectifier/regulator (II)
㉜ Fuel sender
㉝ Fuel meter
㉞ Condenser (II)

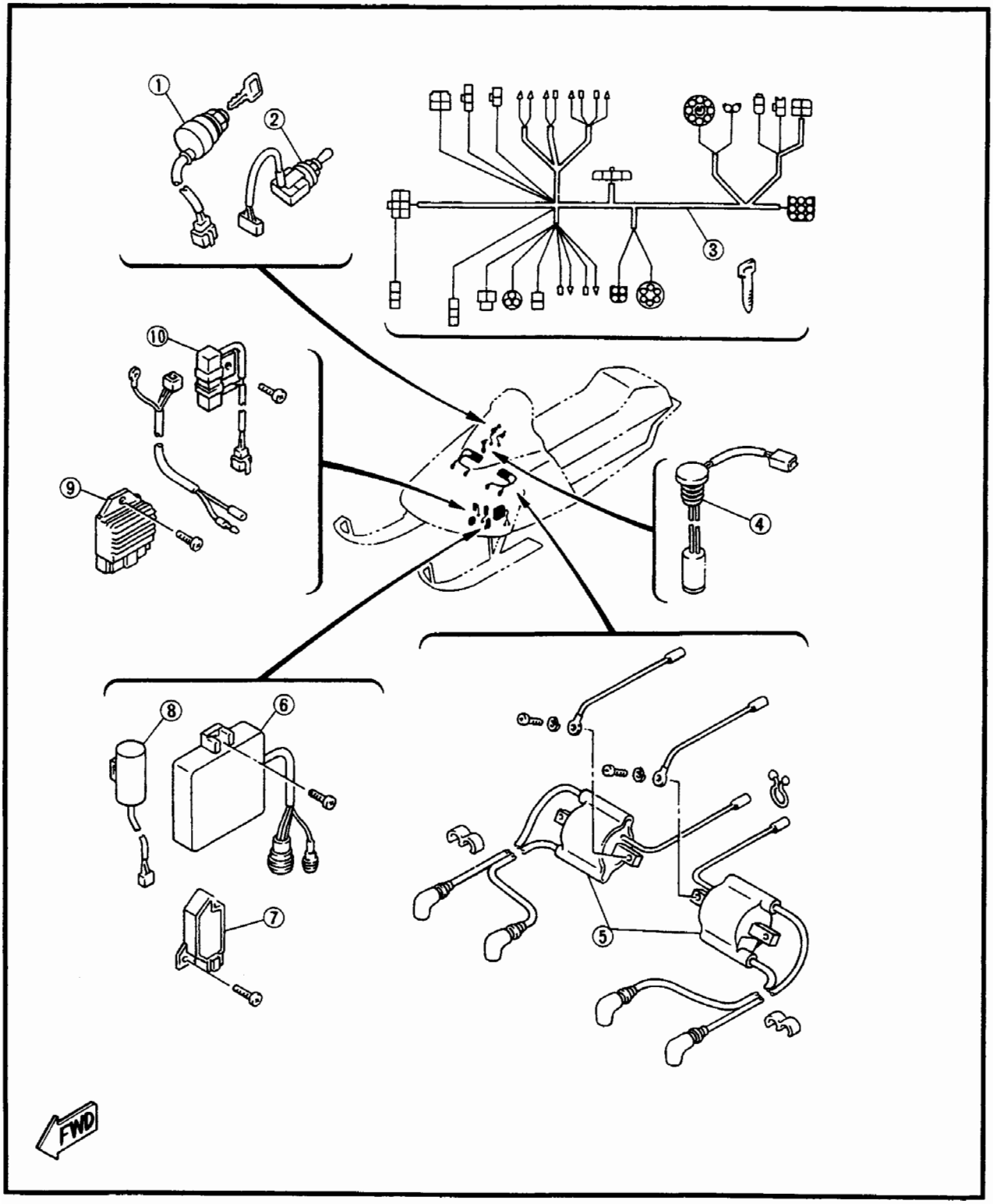
COLOR CODE

B	Black	Gy	Grey	Y/B	Yellow/Black
L	Blue	W	White	Y/L	Yellow/Blue
G	Green	B/Y	Black/Yellow	R/B	Red/Black
Y	Yellow	B/R	Black/Red	W/G	White/Green
R	Red	B/W	Black/White	W/R	White/Red
O	Orange	G/Y	Green/Yellow	W/L	White/Blue
Br	Brown	G/B	Green/Black	Br/R	Brown/Red
Sb	Sky blue	G/R	Green/Red		

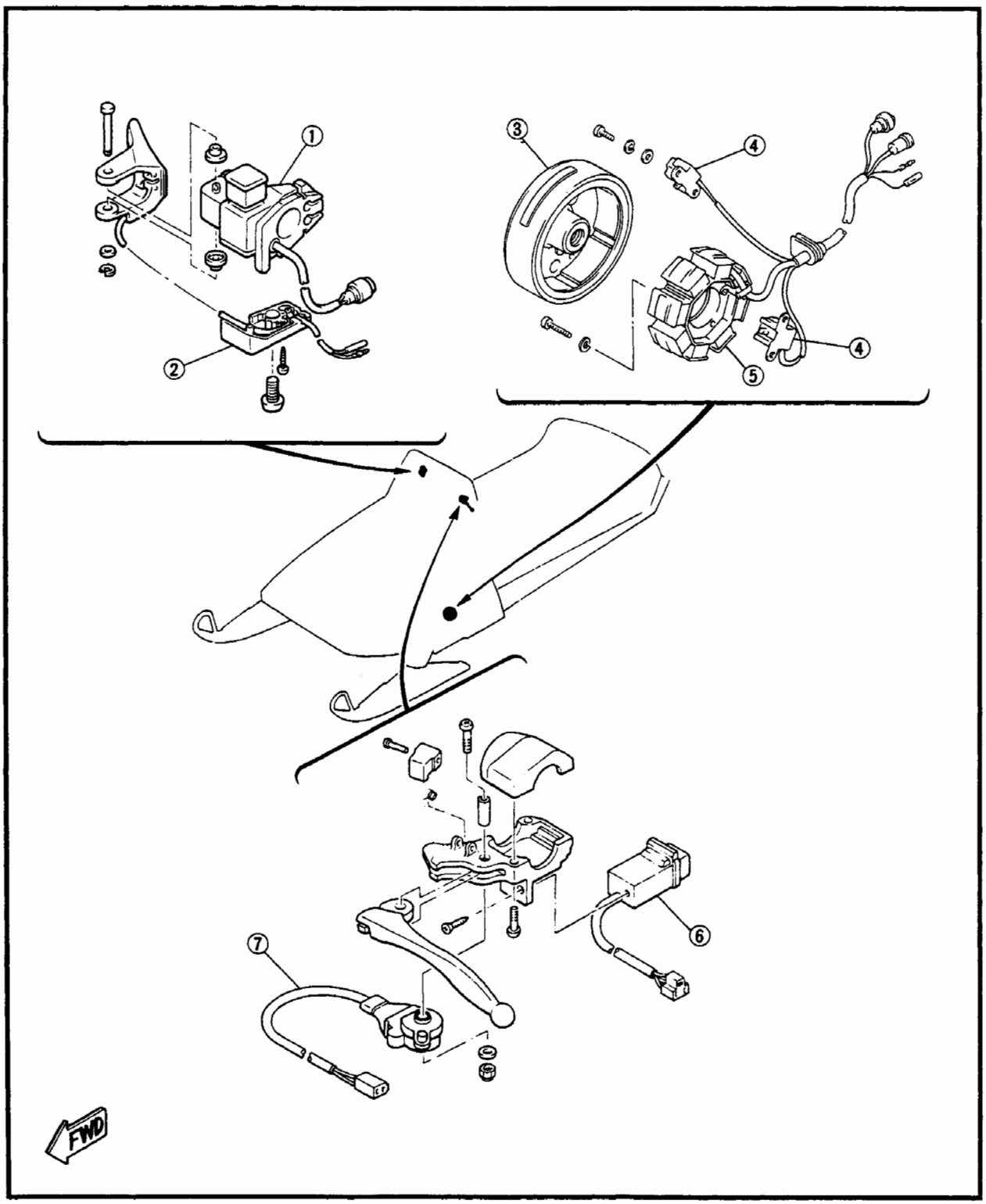


ELECTRICAL COMPONENT

① Main switch
② Grip warmer switch
③ Wireharness
④ Fuel sender
⑤ Ignition coil
⑥ CDI unit
⑦ Rectifier/regulator (II)
⑧ Condenser
⑨ Rectifier/regulator (I)
⑩ Resister



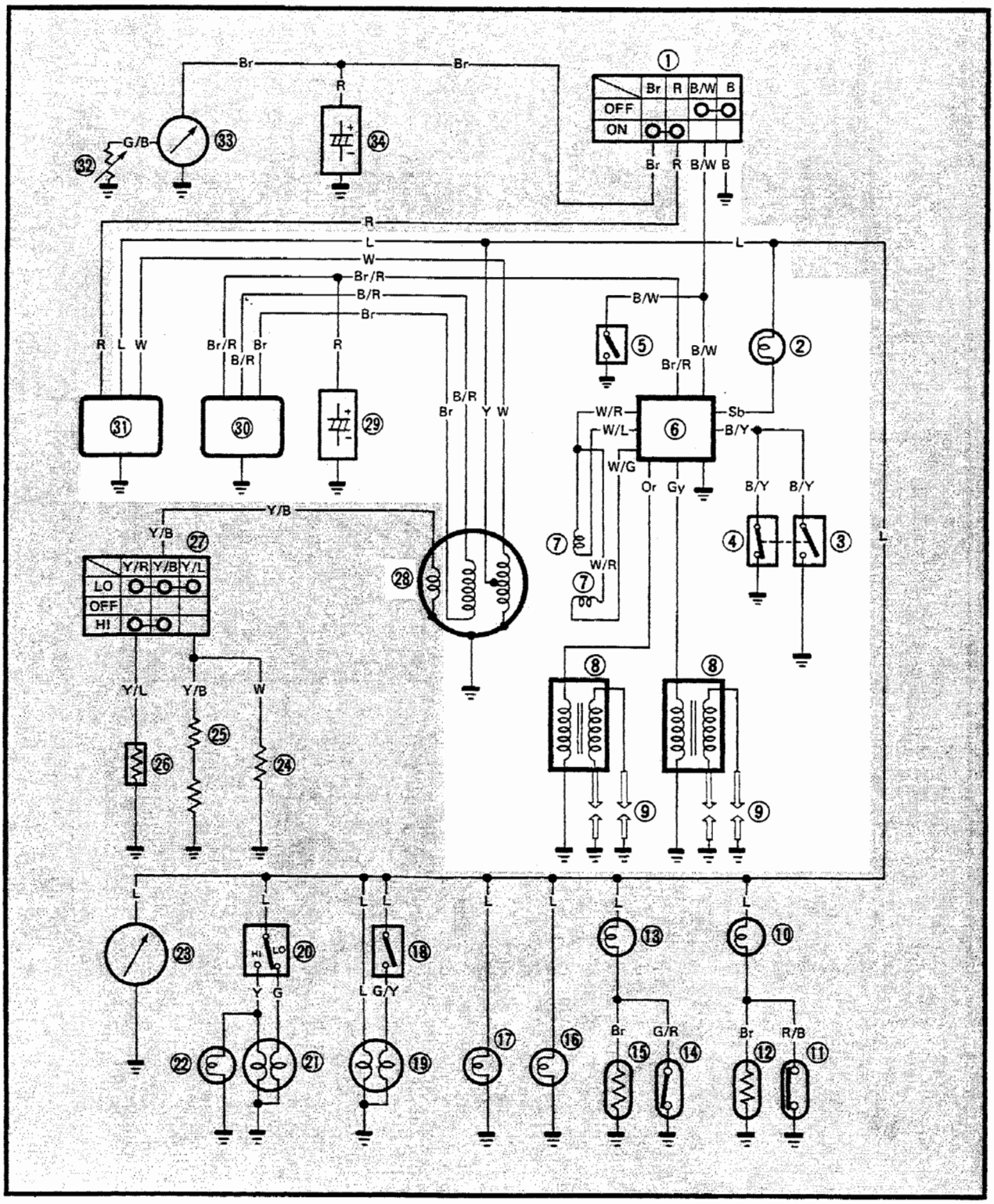
① Handlebar switch assembly (right)
② Throttle switch
③ CDI magneto
④ Pick-up coil
⑤ Stator coil
⑥ High beam switch
⑦ Brake switch

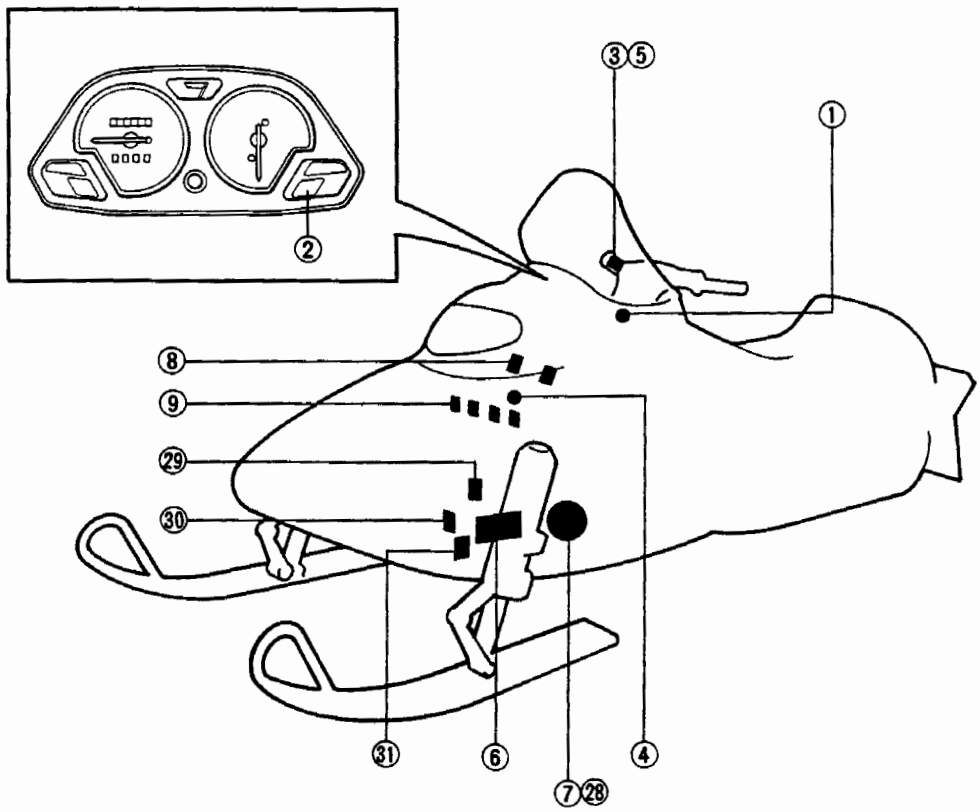


IGNITION SYSTEM

CIRCUIT DIAGRAM

① Main switch
② "TORS" indicator light
③ Throttle switch
④ Carburetor switch
⑤ "ENGINE STOP" switch
⑥ CDI unit
⑦ Pulser coil
⑧ Ignition coil
⑨ Spark plug
㉘ CDI magneto
㉙ Condenser (I)
㉚ Rectifier/regulator (I)
㉛ Rectifier/regulator (II)




③⑤
①
②
⑧
⑨
㉙
㉚
㉛
⑥
④
⑦㉘

TROUBLESHOOTING

NO SPARK OR WEAK SPARK.

Check the spark plug.
- OUT OF SPECIFICATION → Repair or replace the spark plug.
- OK ↓

Check the spark plug cap.
- OUT OF SPECIFICATION → Replace the spark cap.
- OK ↓

Check the ignition coil.
- OUT OF SPECIFICATION → Replace the ignition coils.
- OK ↓

Check the source coil and pickup coil.
- OUT OF SPECIFICATION → Replace the source coil and/or pickup coil.
- OK ↓

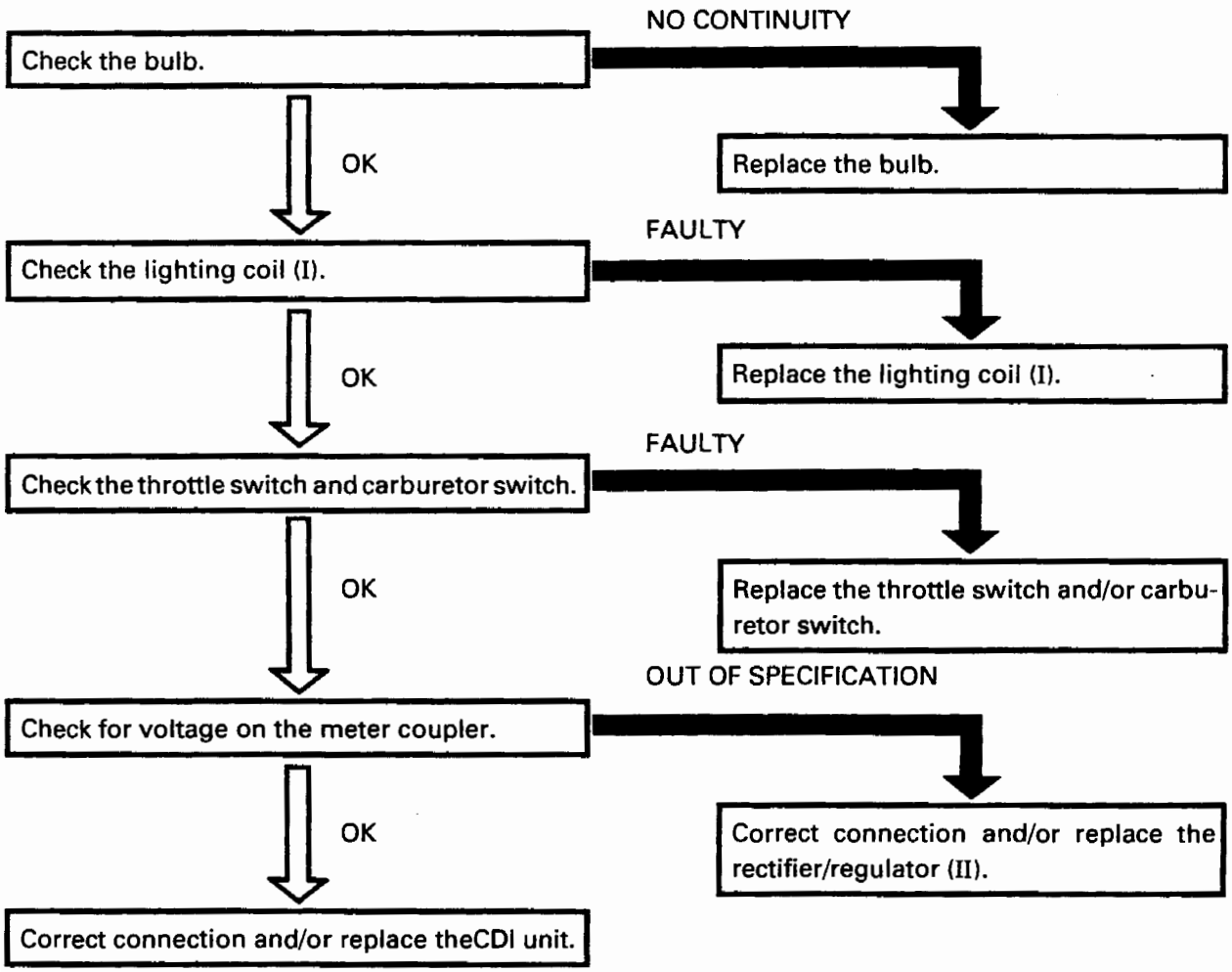
Check the "ENGINE STOP" switch, throttle switch, carburetor switch and main switch.
- FAULTY → Replace the handlebar switch(right), carburetor switch and/or main switch.
- OK ↓

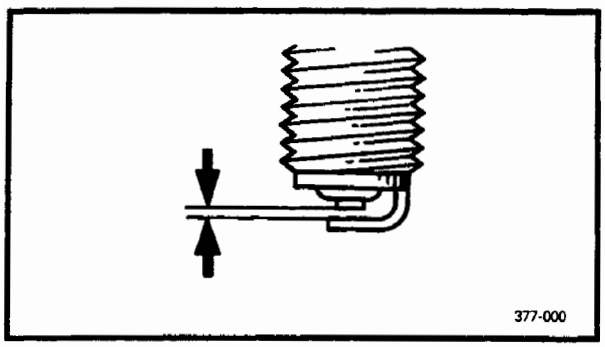
Check for voltage on the condenser coupler.
- OUT OF SPECIFICATION → Correct connection and/or replace the rectifier/regulator(I)
- OK ↓

Check the condenser (I).
- OUT OF SPECIFICATION → Replace the condencer.
- OK ↓

Correct connection and/or replace theCDI unit.

"T.O.R.S." INDICATOR LIGHT DOES NOT COME ON.



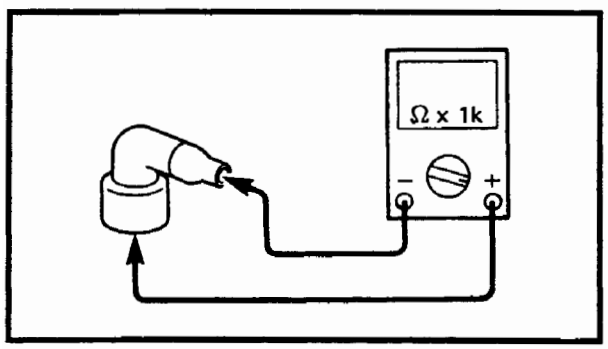


SPARK PLUG

1. Remove:
   - Spark plugs
2. Check:
   - Spark plug

Standard spark plug:
BR9ES (NGK)

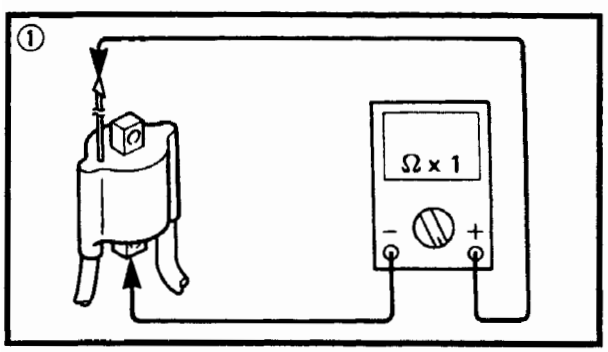
Spark plug gap:
0.7 ~ 0.8 mm (0.028 ~ 0.031 in)



SPARK PLUG CAP

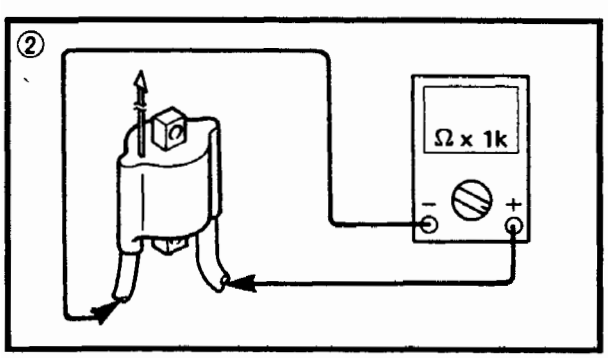
1. Remove:
   - Spark plug cap
2. Connect:
   - Pocket tester
     (to spark plug cap)
3. Measure:
   - Spark plug cap resistance

Spark plug cap resistance:
4.5 ~ 5.5 kΩ at 20°C (68°F)

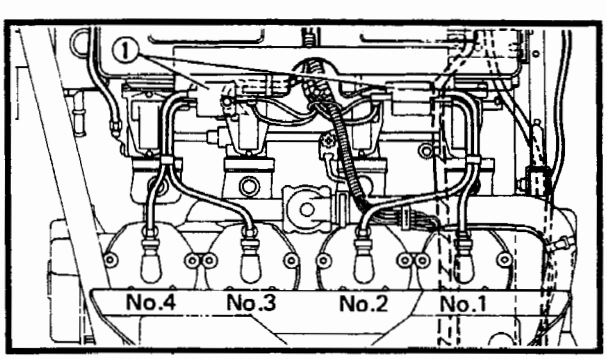


IGNITION COIL

1. Disconnect:
   - Ignition coil lead (Orange)
   - Spark plug lead
2. Connect:
   - Pocket tester
     (to ignition coil and spark plug lead)
3. Measure:
   - Primary coil resistance ①
   - Secondary coil resistance ②

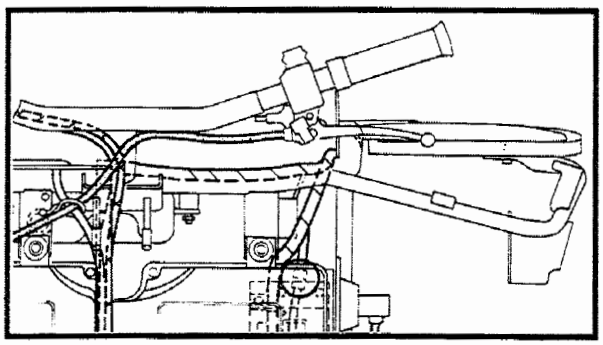


Primary coil resistance:
0.16 ~ 0.24 Ω at 20°C (68°F)
Secondary coil resistance:
3.92 ~ 5.88 kΩ at 20°C (68°F)



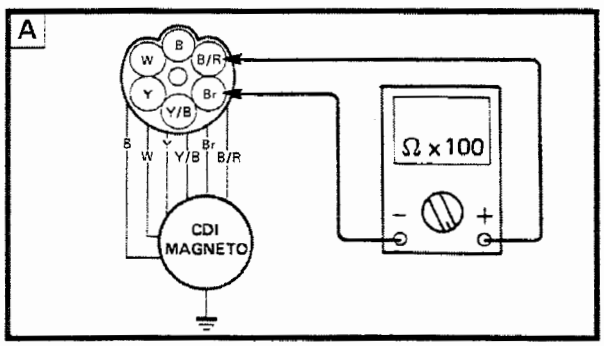
CAUTION:

When the ignition coil ① has been removed, always check the stamped printing on the top of the coil before re-installing it, and make sure it is installed in the correct position.
88R .... For No. 1 and No. 2 cylinders
88A .... For No. 3 and No. 4 cylinders



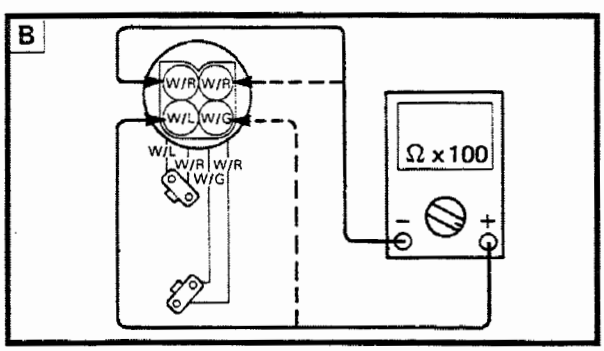
CHARGE COIL AND PULSER COIL

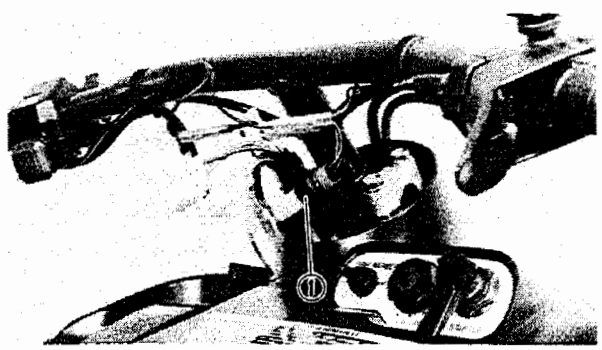
1. Disconnect:
   - CDI magneto coupler
   - Pulser coil coupler
2. Connect:
   - Pocket tester
     (to charge coil leads and pulser coil leads)



3. Measure:
   - Charge coil resistance [A]
   - Pulser coil resistance [B]
     Out of specification → Replace.

Charge coil resistance:
(Brown, Black/Red)
2.295 ~ 2.805 Ω at 20°C (68°F)
Pulser coil resistance:
(White/Red, White/Blue and White/Red, White/Green)
454.5 ~ 555.5 Ω at 20°C (68°F)

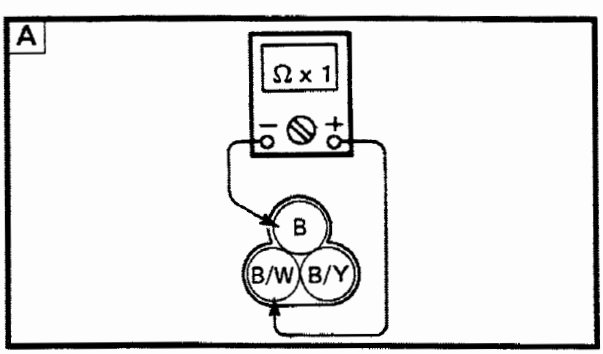




HANDLEBAR SWITCH (RIGHT)

"ENGINE STOP" switch and Throttle Switch

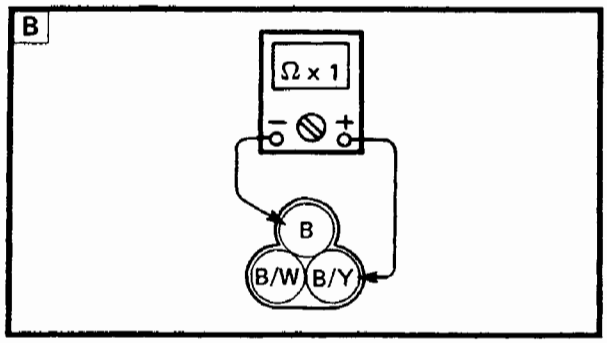
1. Disconnect:
   - Handlebar switch (right) coupler ①
2. Connect:
   - Pocket tester

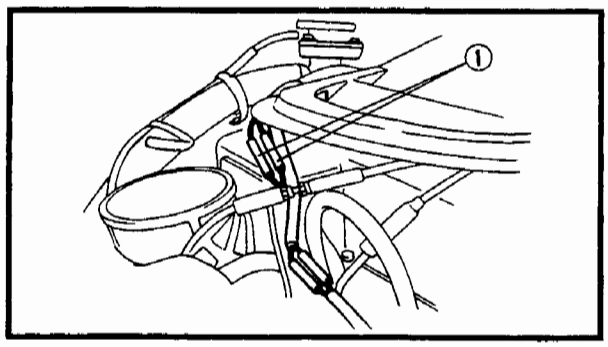


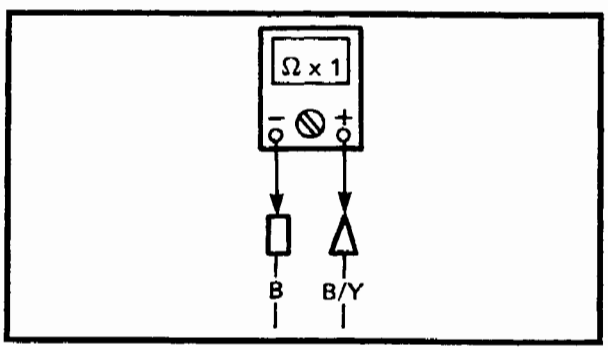
3. Check:
   - "ENGINE STOP" switch continuity [A]
     Faulty → Replace.

Switch position	Good condition
RUN (Pull)	x
OFF (Push)	O

O : Continuity x : No continuity







4. Check:
   - Throttle switch continuity [B]
     Faulty → Replace.

Throttle switch position	Good condition
Throttle lever is operated.	O
Throttle lever is not operated.	x

O: Continuity x: No continuity

CARBURETOR SWITCH

1. Disconnect:
   - Carburetor switch lead ①
2. Connect:
   - Pocket tester

3. Check:
   - Carburetor switch continuity
     Faulty → Replace.

Carburetor switch position	Good condition
Throttle lever is operated.	x
Throttle lever is not operated.	O

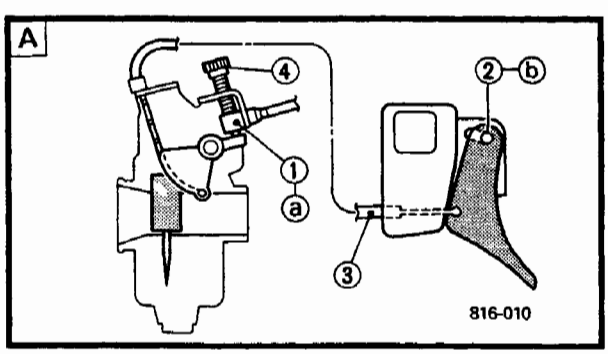
O: Continuity x: No continuity

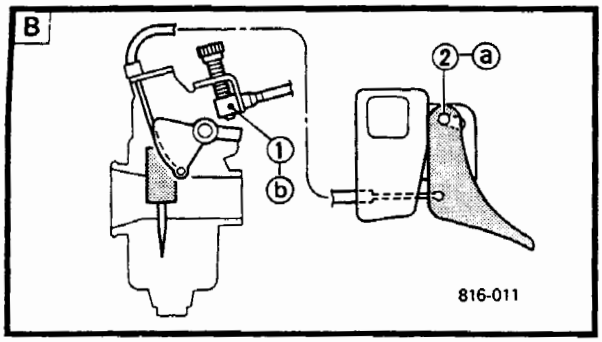
THROTTLE OVERRIDE SYSTEM (T.O.R.S.)

If the carburetor or throttle cable should malfunction during operation, the T.O.R.S. warning light flashes when the throttle lever is released.
The T.O.R.S. is designed to interrupt the ignition and prevent the engine from exceeding 2,800 to 3,000 rpm. if the carburetor fails to return to idle when the lever is released.

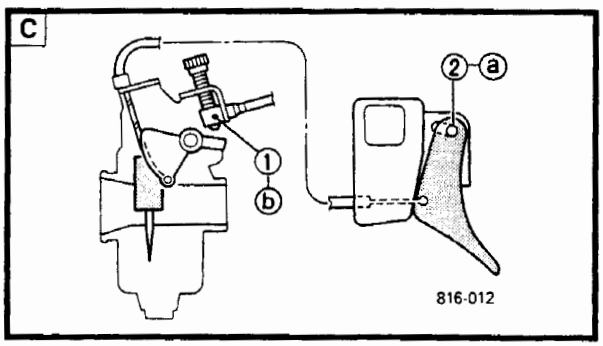
⚠ WARNING

- **If T.O.R.S. warning light flashes, make sure that the cause of the malfunction has been corrected and that the engine can be operated without a problem before restarting the engine.**
- **Be sure to use the standard spark plug and spark plug cap which have resistance. Otherwise T.O.R.S. does not work properly.**

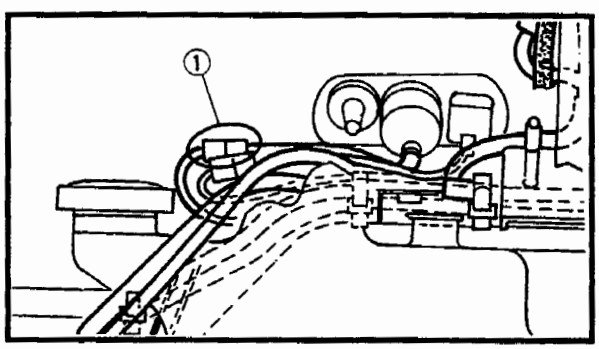




MODE / SWITCH	A Idle or Starting	B Run	C Trouble
Throttle switch	OFF	ON	OFF
Carburetor switch	ON	OFF	OFF
Engine	RUN	RUN	T.O.R.S Warning light turns on and off

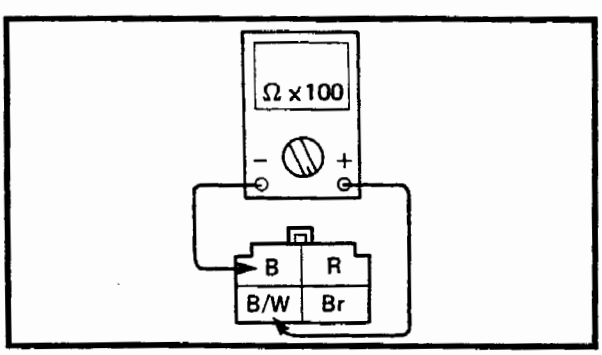


① Carburetor switch
② Throttle switch
③ Throttle cable
④ Throttle stop screw
ⓐ "ON"
ⓑ "OFF"



MAIN SWITCH

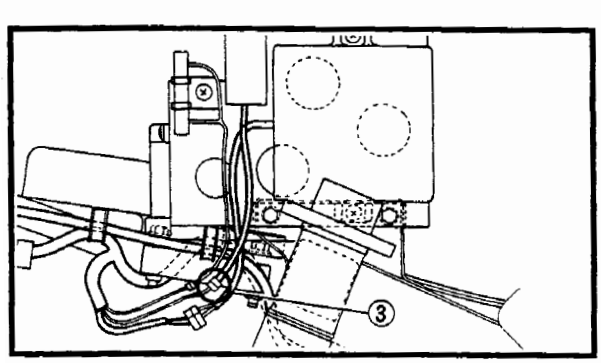
1. Disconnect:
   - Main switch coupler ①
2. Connect:
   - Pocket tester



3. Check:
   - Main switch continuity
     Faulty → Replace.

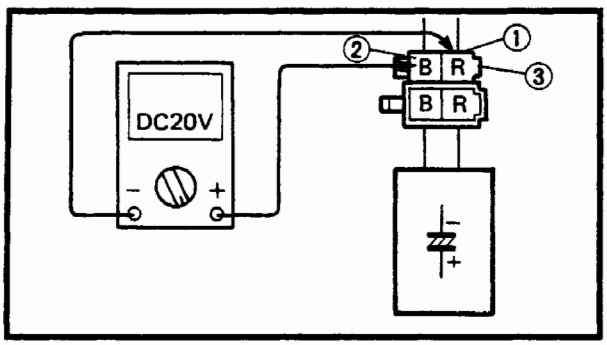
Switch position	Color code			
	B	B/W	Br	R
OFF	O—O			
ON/LIGHT			O—O	

O—O Continuity



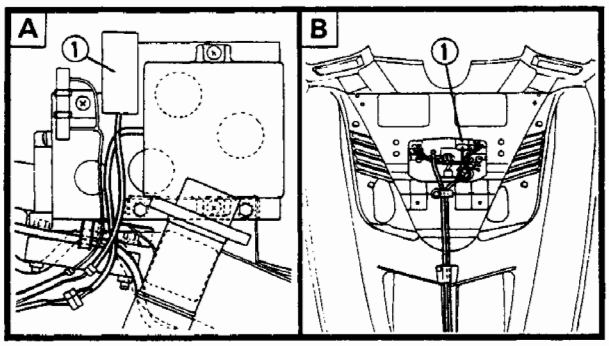
VOLTAGE TEST

1. Connect:
   - Pocket tester
     (to Red ① and Black ② leads on the condenser (I) coupler ③)
2. Start the engine and run the engine at 3,000 r.p.m.



3. Measure:
   - Output voltage

Output voltage:
(Red/Black)
14 ~ 15 V at 20°C (68°F)



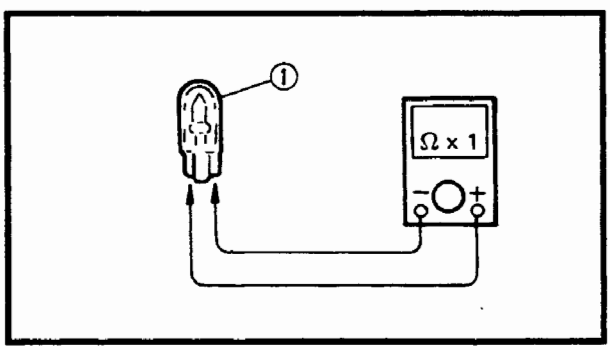
CONDENSER

1. Disconnect:
   - Condenser ①
2. Connect:
   - Condenser
     (to LCR meter as shown)

[A] For ignition [B] For fuel

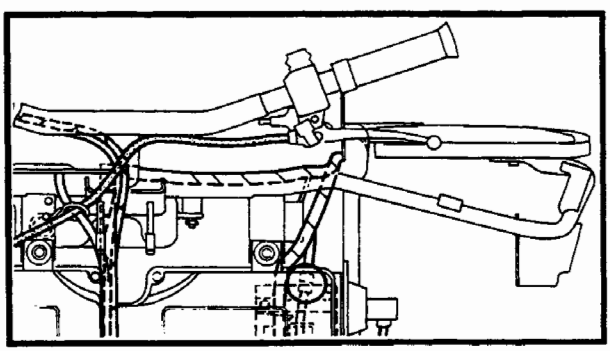
3. Measure:
   - Condenser capacity
     Out of specification → Replace.

Condenser capacity:
3.760 ~ 5.640 µF at 20°C (68°F)



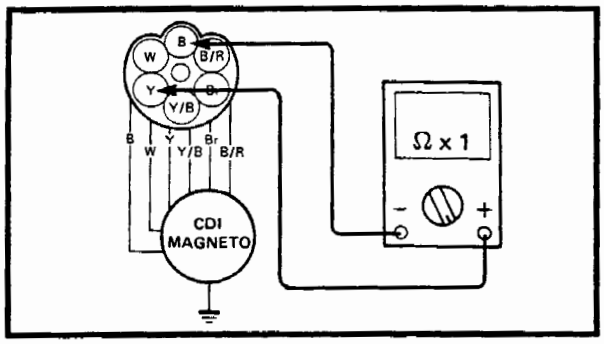
BULB

1. Remove:
   - T.O.R.S. indicator light bulb ①
     (See page 2-25)
2. Connect:
   - Pocket tester ②
     (to bulb terminals)
3. Check:
   - Bulb continuity
     No continuity → Replace.



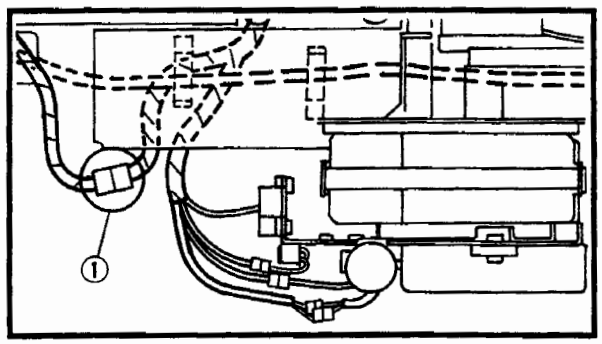
LIGHTING COIL (I)

1. Disconnect:
   - CDI magneto coupler ①
2. Connect:
   - Pocket tester
     (to lighting coil (I) leads)



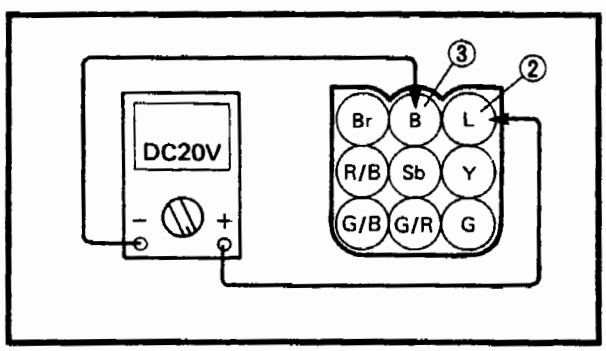
3. Measure:
   - Lighting coil resistance
     Out of specification → Replace.

Lighting coil resistance:
(Yellow, Black)
0.288 ~ 0.352 Ω at 20°C (68°F)



VOLTAGE TEST

1. Disconnect:
   - Wire harness coupler ①
2. Connect:
   - Pocket tester
     (to Blue②and Black③leads on the coupler)
3. Start the engine and run the engine at 3,000 r.p.m.



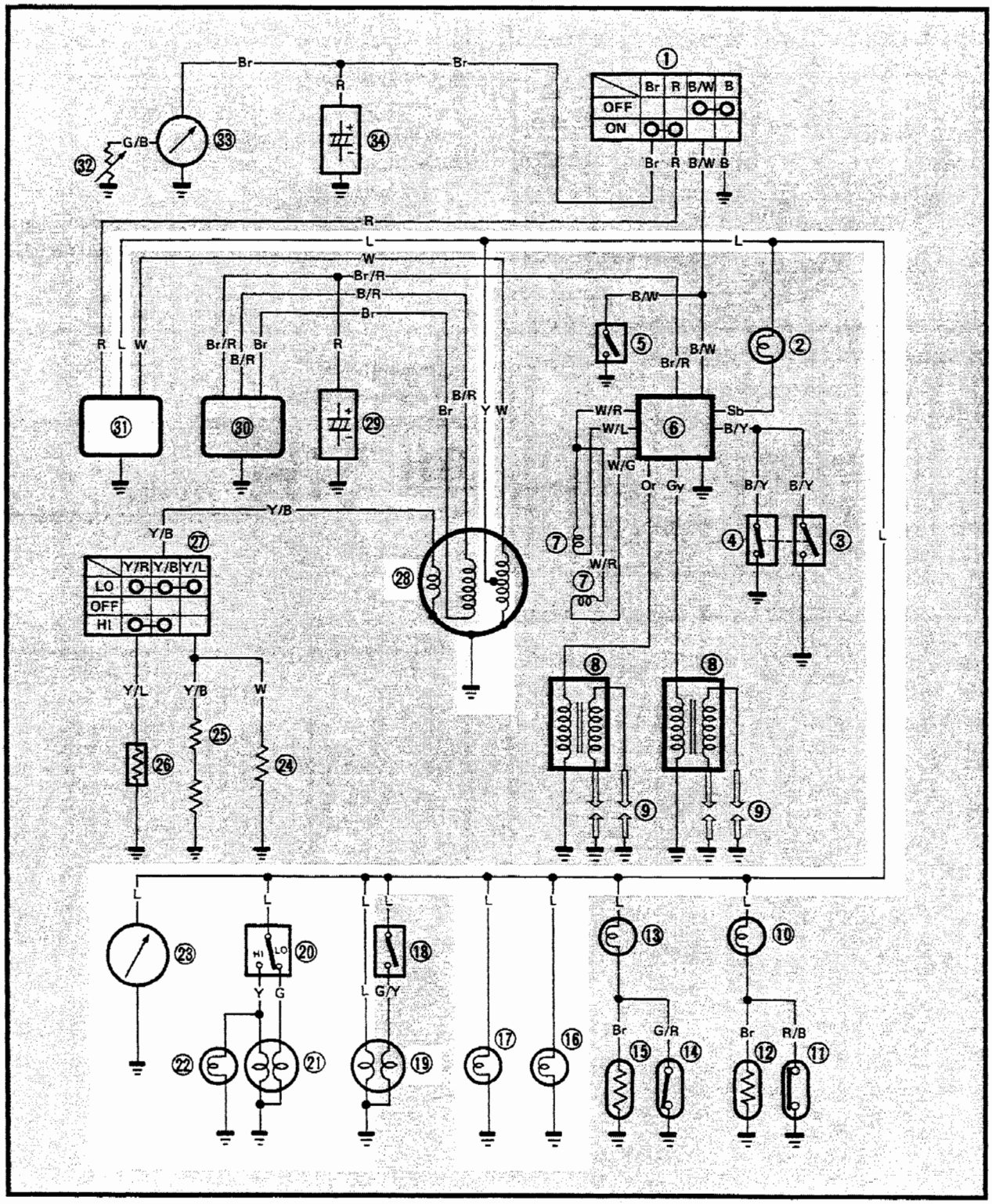
4. Measure:
   - Out put voltage

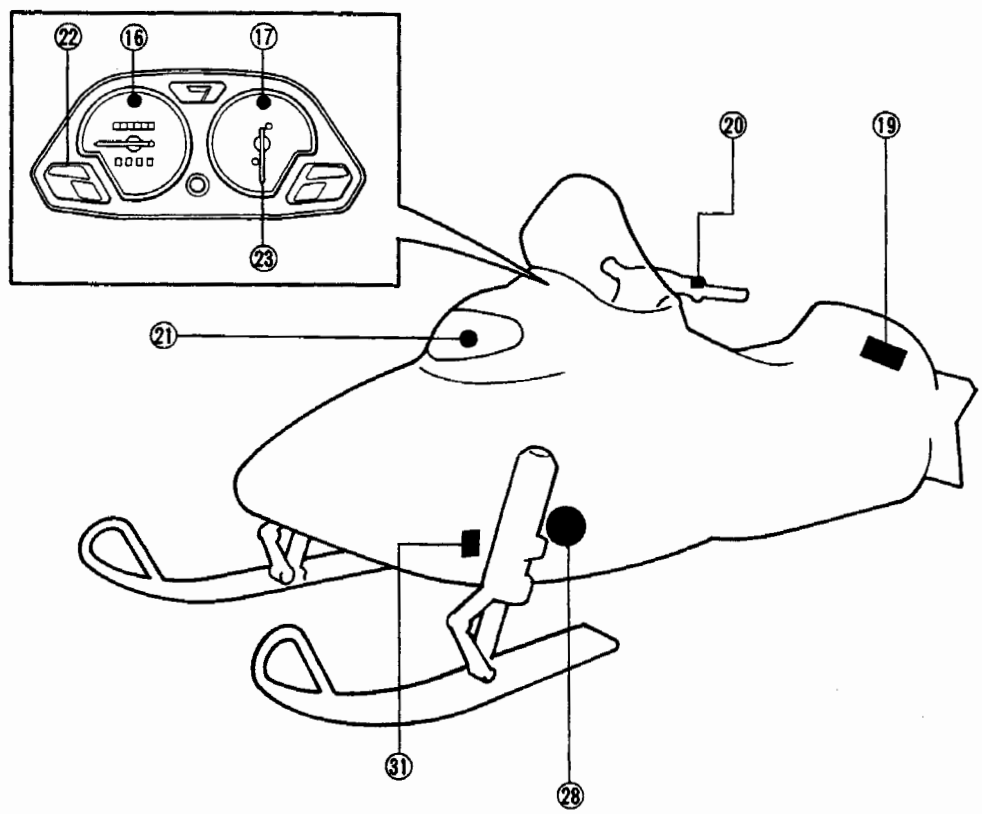
Out put voltage:
(Blue, Black)
12 V or more at 20°C (68°F)

LIGHTING SYSTEM

CIRCUIT DIAGRAM

⑯ Speedometer light
⑰ Tachometer light
⑲ Tail/brake light
⑳ Headlight beam switch
㉑ Headlight
㉒ "HIGH BEAM" indicator light
㉓ Tachometer
㉘ CDI magneto
㉛ Rectifier/regulator




22
16
17
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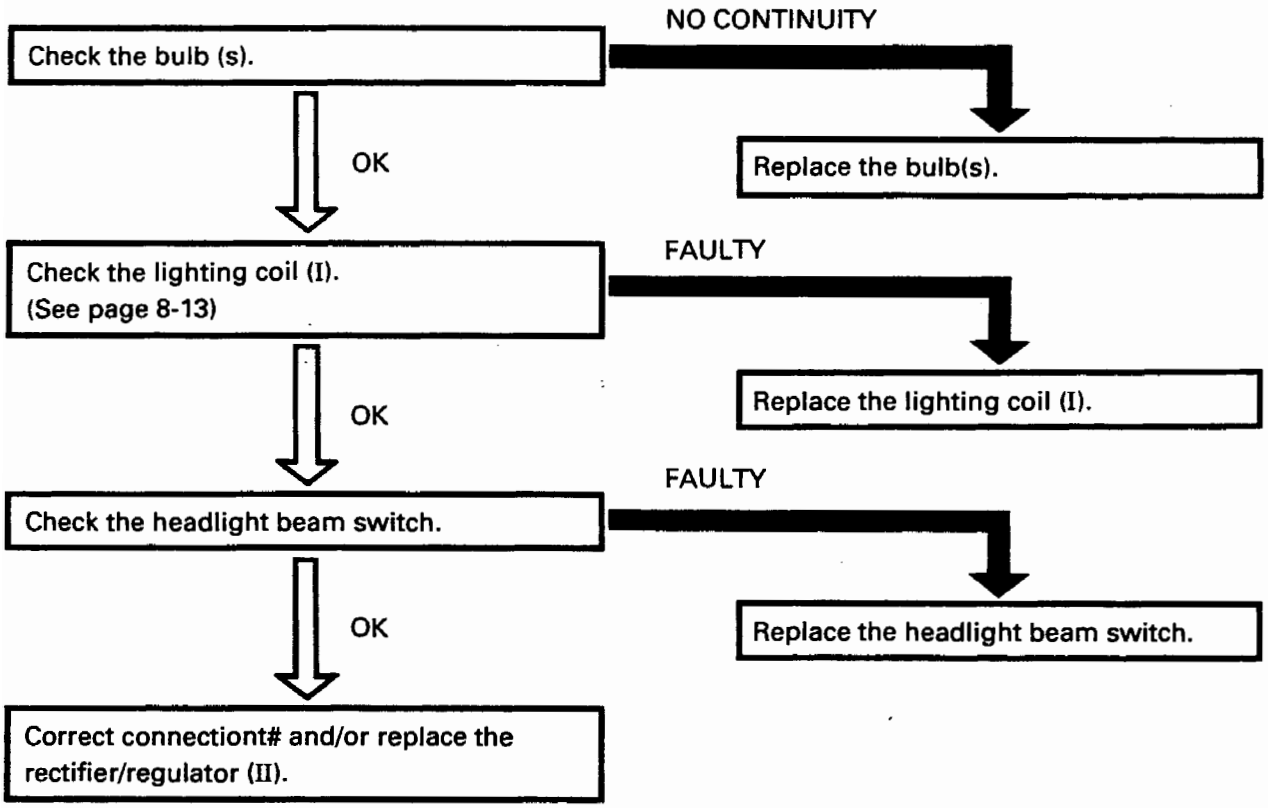
20
19
21
31
28

TROUBLESHOOTING

HEADLIGHT, "HIGH BEAM " INDICATOR LIGHT,TAIL LIGHT, SPEEDOMETER LIGHT AND/OR TACHOMETER LIGHT DO NOT COME ON.



BULB(S)

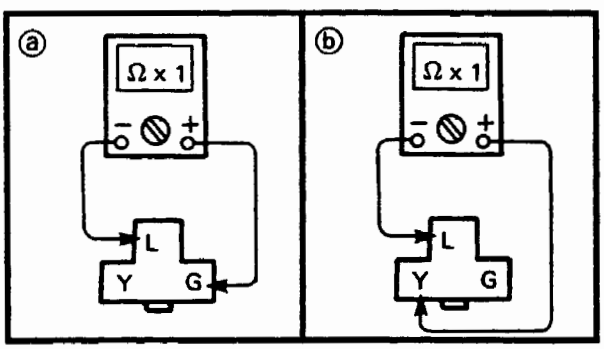
1. Remove:
   - Headlight bulb (See page 2-25)
   - Tail/brake light bulb
   - Speedometer light bulb (See page 2-25)
   - Tachometer light bulb (See page 2-25)
   - "HIGH BEAM" indicator light bulb (See page 2-25)
2. Check:
   - Bulb(s)
     No continuity → Replace.

⚠ WARNING

Keep flammable products or your hands away from bulb while it is on; it will be hot. Do not touch bulb until it cools down.

HEADLIGHT BEAM SWITCH

1. Disconnect:
   - Headlight beam switch coupler
2. Connect:
   - Pocket tester
     (to headlight beam switch coupler)



3. Check:
   - Headlight beam switch continuity
     Faulty → Replace.

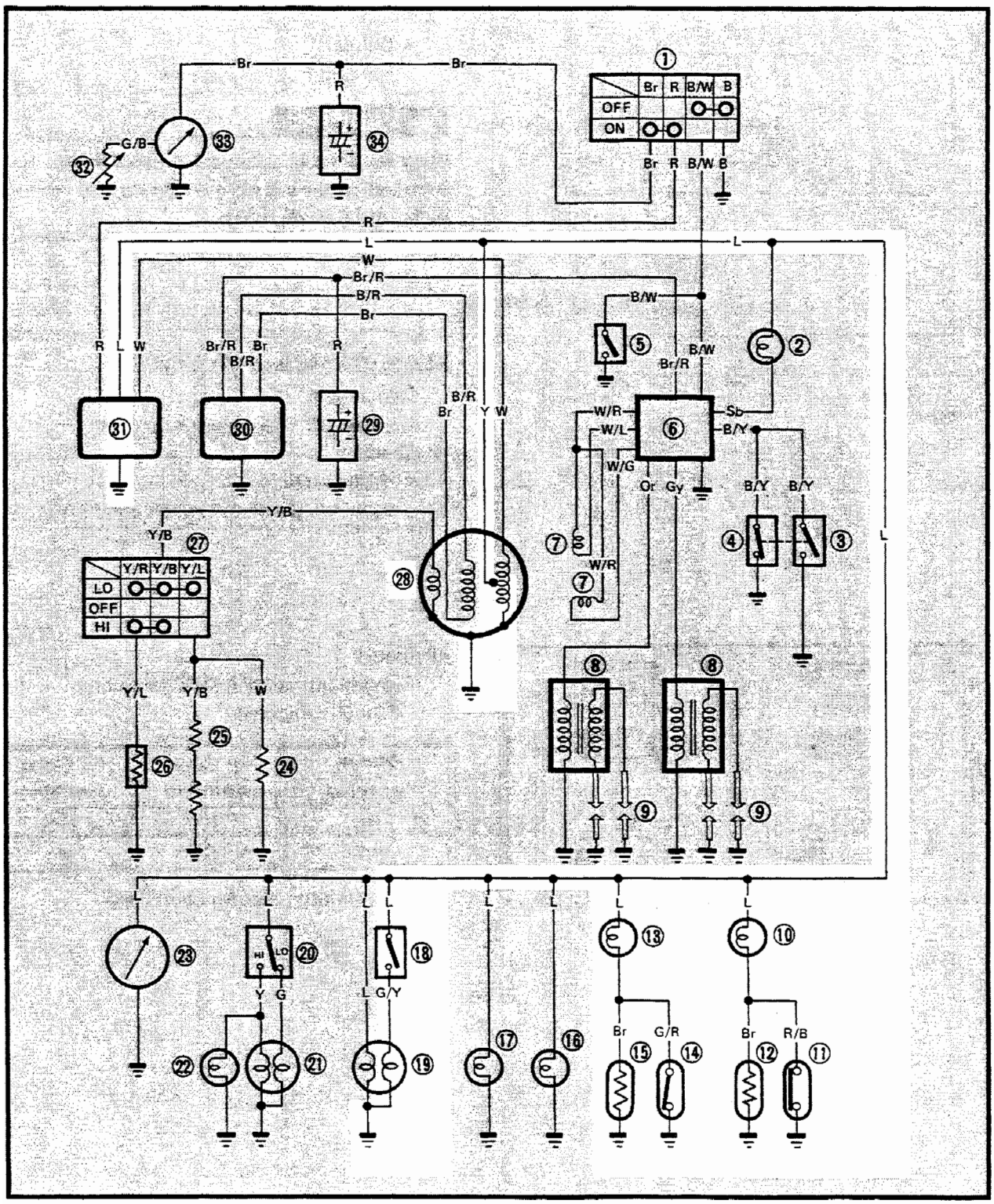
Switch position	ⓐ Good condition	ⓑ Good condition
HI	x	O
LO	O	x

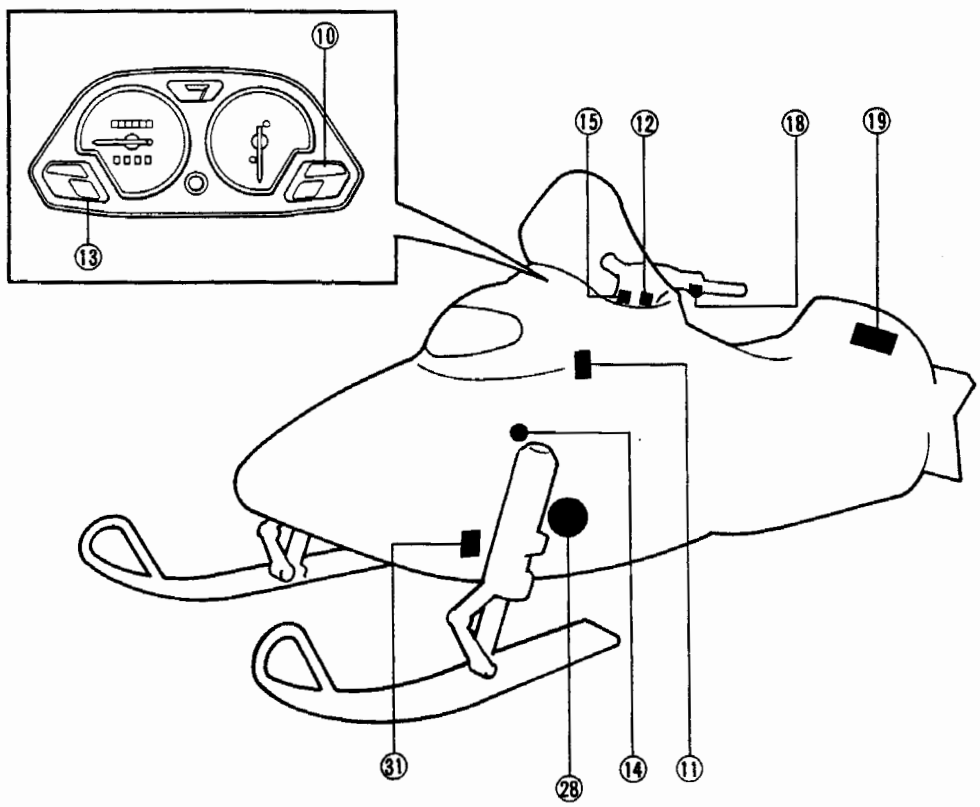
O : Continuity x : No continuity

SIGNAL SYSTEM

CIRCUIT DIAGRAM

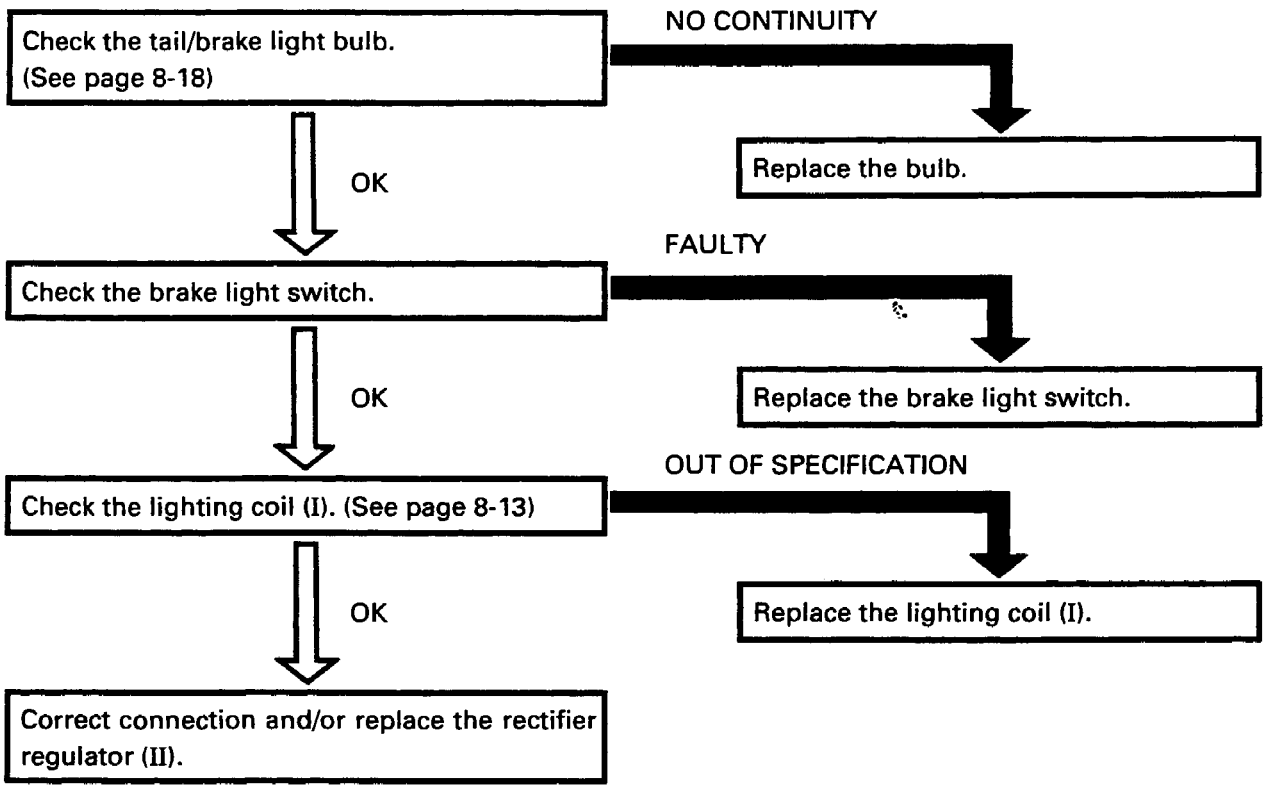
⑩ "OIL LEVEL" warning light
⑪ Oil level gauge
⑫ "OIL LEVEL" warning light checker
⑬ "WATER TEMP" warning light
⑭ Thermo switch
⑮ "WATER TEMP" warning light checker
⑱ Brake light switch
⑲ Tail/brake light
㉘ CDI magneto
㉛ Rectifier/Regulator (II)




⑩
⑬
⑮
⑫
⑱
⑲
㉛
㉘
⑭
⑪

TROUBLESHOOTING

BRAKE LIGHT DOES NOT COME ON.



"WATER TEMP" AND/OR "OIL LEVEL" WARNING LIGHTS DO NOT COME ON.

Check the "WATER TEMP" and/or "OIL LEVEL" warning light bulb(s). (See page 8-18)

NO CONTINUITY → Replace the bulb(s).

OK ↓

Check the lighting coil (I). (See page 8-13)

FAULTY → Replace the lighting coil (I).

OK ↓

Check the thermo switch or oil level gauge.

FAULTY → Replace the thermo switch or oil level gauge.

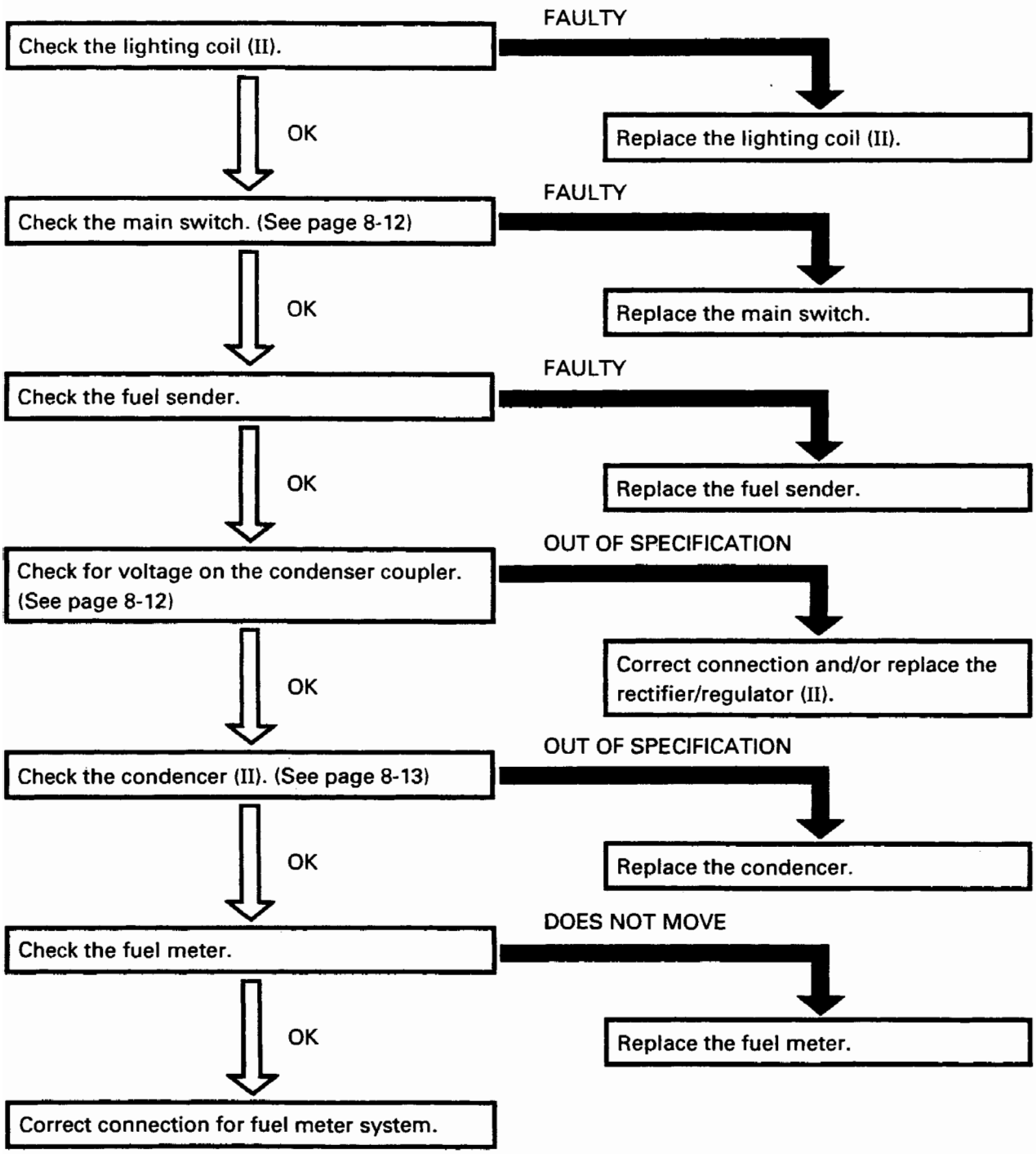
OK ↓

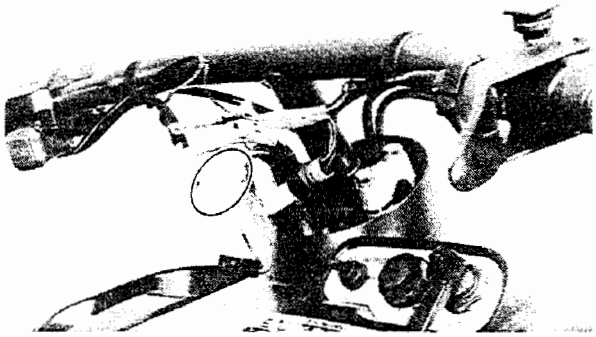
Correct connection and/or replace the rectifier regulator (II).

NOTE:

The warning lights come on for a few seconds after the engine starts. If the lights do not come on, check the warning light circuit and bulb(s). If the lights still do not come on, replace the warning light checker(s). Recheck to be sure the warning lights light.

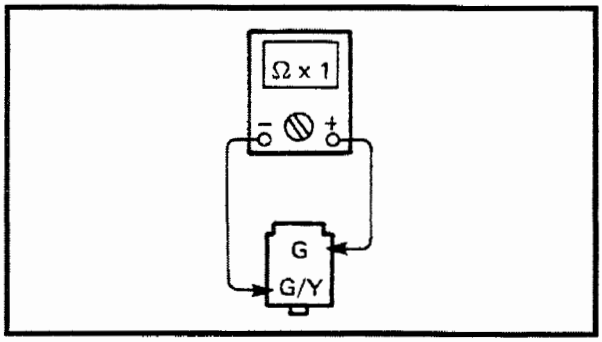
FUEL METER DOES NOT OPERATE





BRAKE LIGHT SWITCH

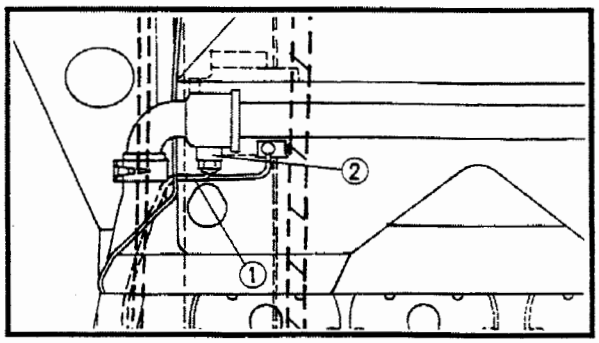
1. Disconnect:
   - Brake light switch coupler
2. Connect:
   - Pocket tester
     (to brake light switch coupler)



3. Check:
   - Brake light switch continuity
     Faulty→Replace.

Switch position	Good condition
Brake lever is opetate	○
Brake lever is not operate	x

○ : Continuity x : No continuity

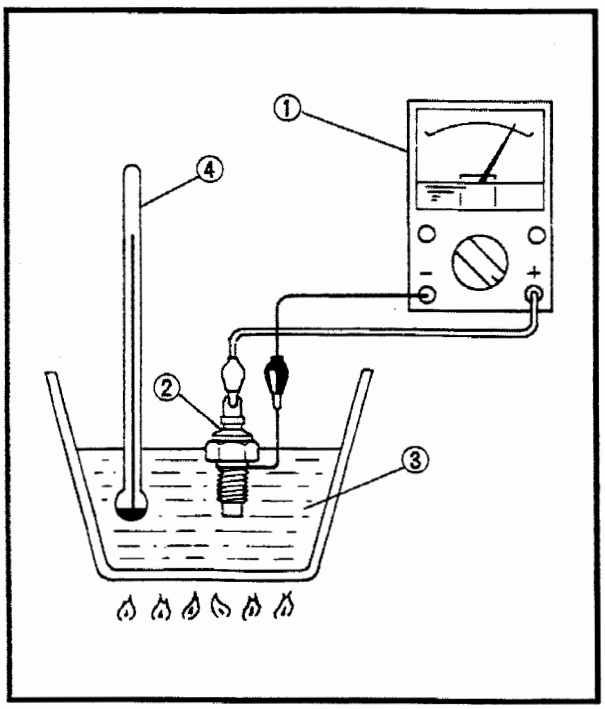


THERMO SWITCH

1. Disconnect
   - Thermo switch lead ① (Green/Red)
2. Remove:
   - Thermo switch ②

CAUTION:

Handle the thermo switch with special care. Never subject it to strong or allow it to be dropped. Should it be dropped, it must be replaced.



3. Connect:
   - Pocket tester
     (to thermo switch as shown)
4. Immerse the thermo switch in coolant ③ and check the thermo switch for operation.

Coolant temperature	Operation
Less than 98°C (209°F)	The switch is open. (∞Ω)
102°C (216°F) or more	The switch is closed.(0Ω)

④ Temperature gauge

CAUTION:

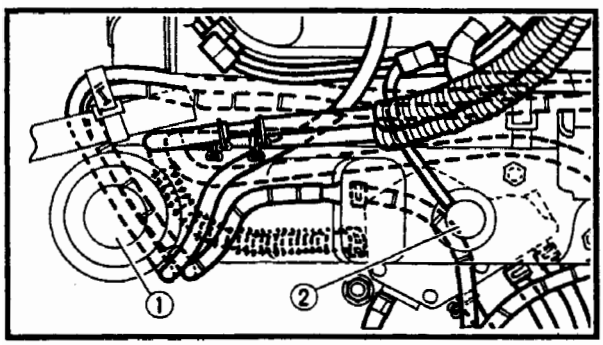
Never heat the coolant to a temperature of 120°C (248.5°F) or more.

5. If the thermo switch operation is incorrect, replace it.
6. Install the thermo switch, and connect thermo switch lead.

Thermo switch:
7.5 Nm (0.75 m • kg, 5.4 ft • lb)

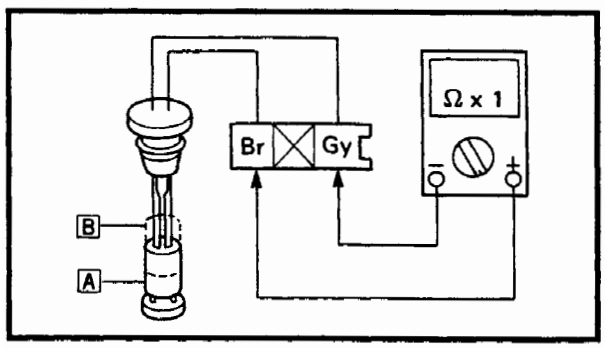
CAUTION:

Avoid overtightening.



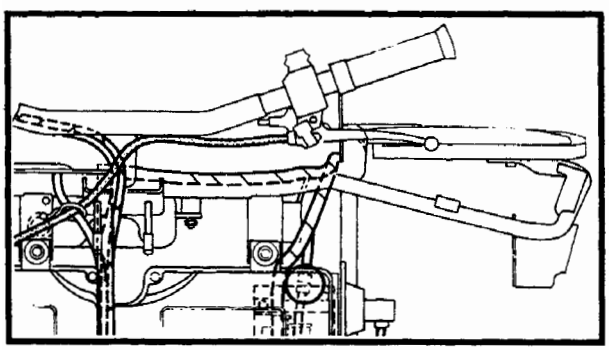
OIL LEVEL SWITCH

1. Remove:
   - Oil tank ①
   - Oil level gauge ②
2. Connect:
   - Pocket tester
     (to oil level switch coupler)
3. Check:
   - Oil level switch continuity
     Fauty → Replace.



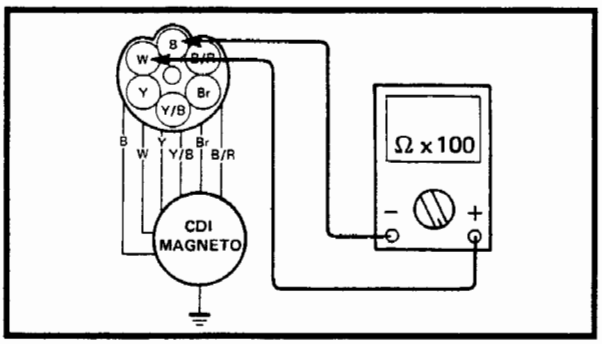
Switch position		Good condition	Bad condition		
A	Upright position	x	O	x	O
B	Upside down position	O	x	x	O

O : Continuity x : No continuity



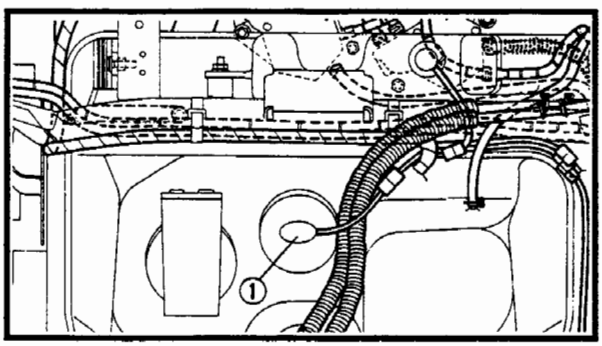
LIGHTING COIL

1. Disconnect:
   - CDI magneto coupler
2. Connect:
   - Pocket tester
     (to lighting coil II leads)



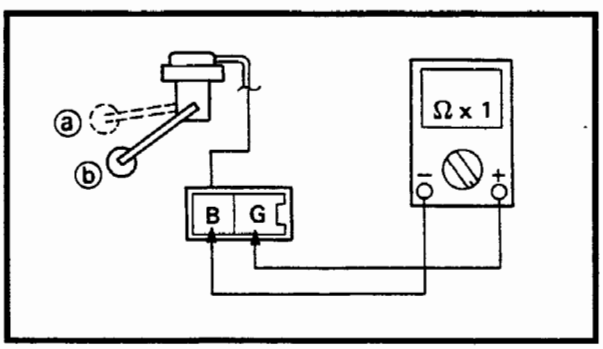
3. Measure:
   - Lighting coil resistance
     Out of specification → Replace.

Lighting coil resistance:
(White, Black)
0.297 ~ 3.63 Ω at 20°C (68°F)



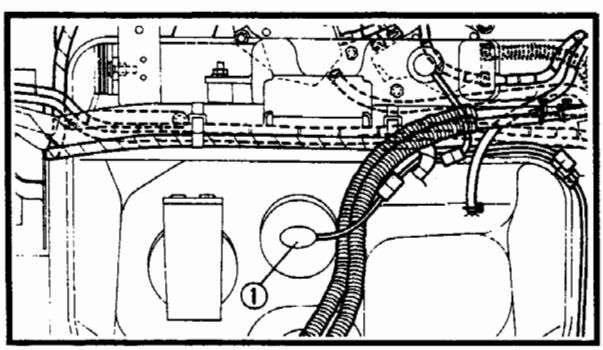
FUEL SENDER

1. Remove:
   - Fuel sender ①
     (from fuel tank)
2. Connect:
   - Pocket tester
     (to fuel sender coupler)



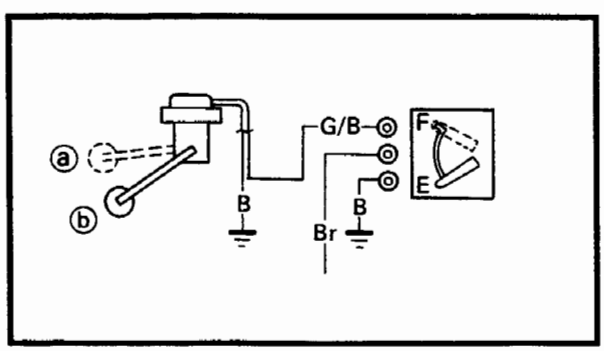
3. Check:
   - Fuel sender resistance
     Out of specification → Replace.

Fuel Sender Resistance (Up ⓐ):
4 ~ 10 Ω at 20°C (68°F)
Fuel Sender Resistance (Down ⓑ):
90 ~ 100 Ω at 20°C (68°F)



FUEL METER

1. Remove:
   - Fuel sender
     (from fuel tank)
2. Start the engine at idling speed.
3. Check if the fuel meter needle moves towards "F" ⓐ or "E" ⓑ, when moving the float "up" ⓐ or "down" ⓑ.
   Faulty → Replace.



Meter Needle position \ Float position	Up ⓐ	Down ⓑ
"F" ⓐ	O	x
"E" ⓑ	x	O

O : Good x : Faulty

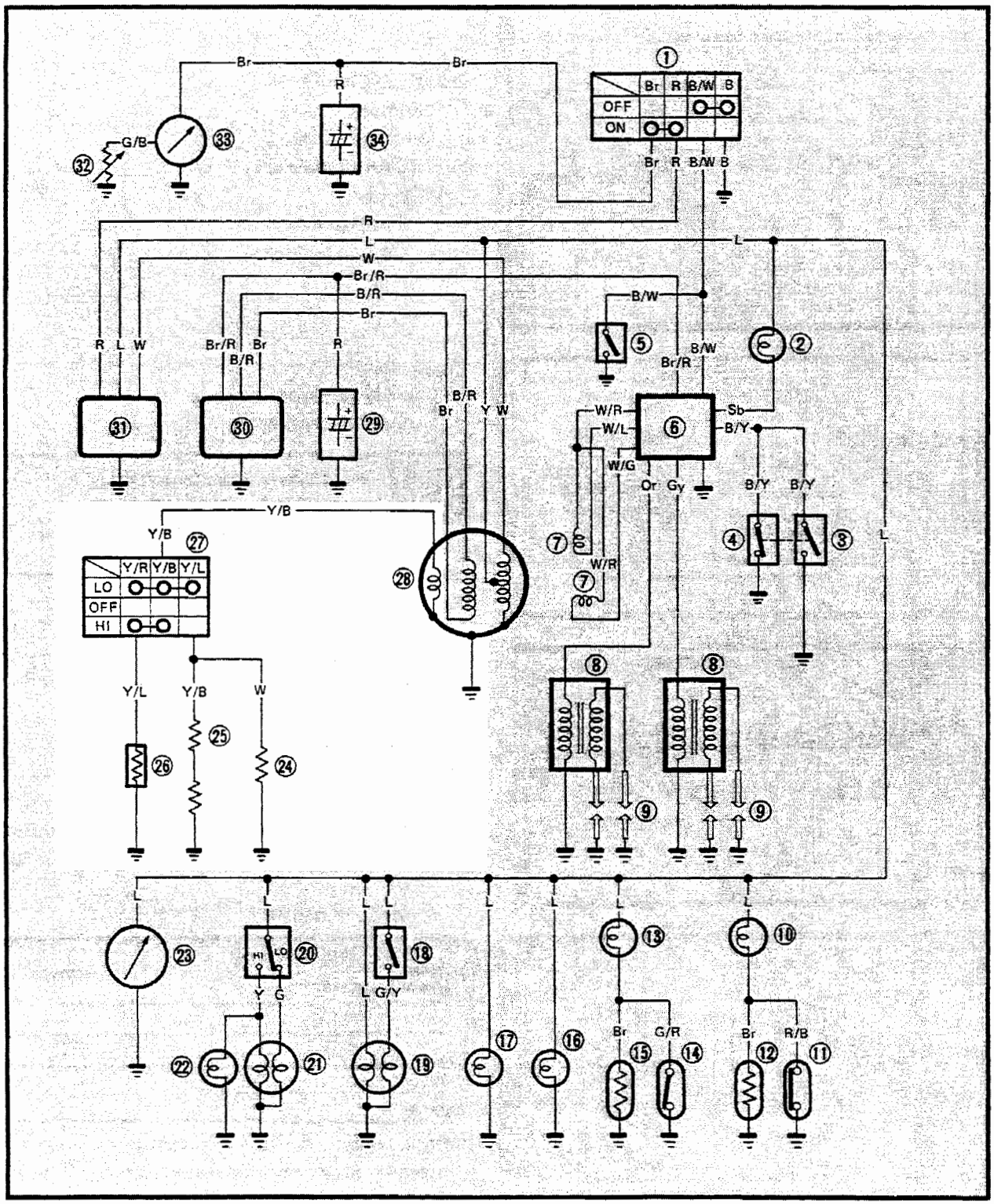
NOTE:

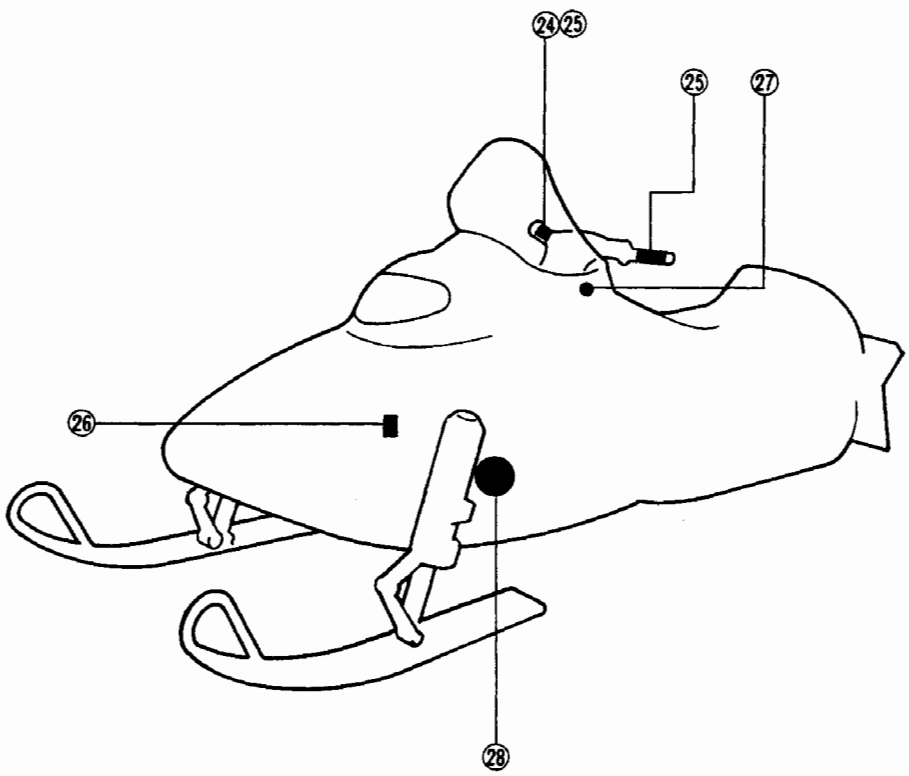
Before reading the meter, stay put the float for more than three minutes respectively at "Up" or "Down".

GRIP WARMER SYSTEM

CIRCUIT DIAGRAM

㉔ Thumb warmer
㉕ Grip warmer
㉖ Resistor
㉗ Grip warmer switch
㉘ CDI magneto




24
25
25
27
26
28

TROUBLESHOOTING

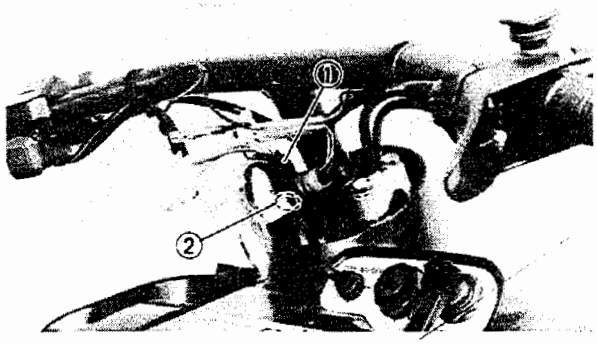
GRIP WARMER DOES NOT OPERATE

Check the resistor.
- NO CONTINUITY → Replace the resistor.
- OK →

Check the grip and thumb warmer.
- NO CONTINUITY → Replace the grip warmer.
- OK →

Check the grip warmer switch.
- INCORRECT → Replace the grip warmer switch.
- CORRECT →

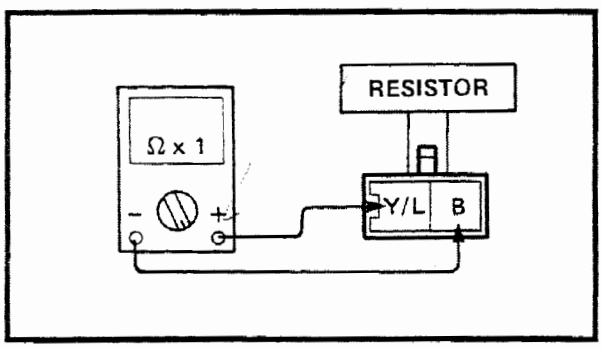
Replace the grip warmer coil and/or correct connection.



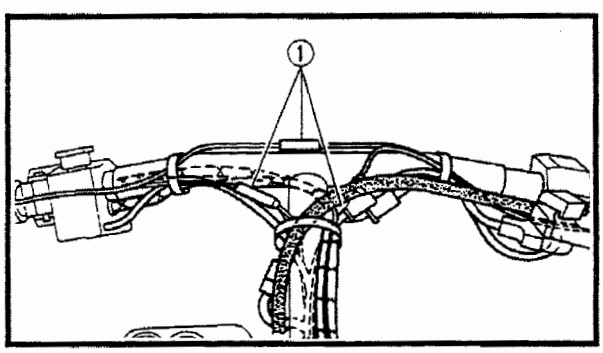
RESISTOR

1. Remove:
   - Resistor ①
   - Resistor coupler ②

2. Connect:
   - Pocket tester
     (to resistor leads)

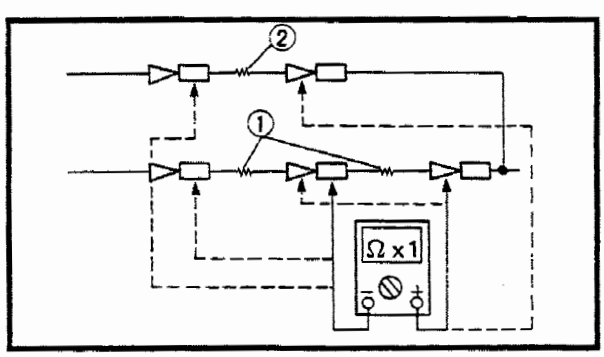


3. Check:
   - Resistor continuity
     No continuity → Replace.

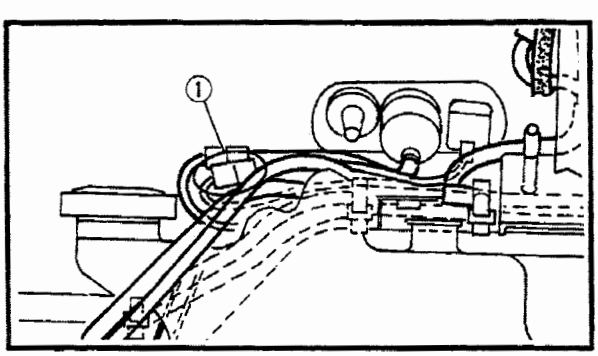


GRIP AND THUMB WARMER COIL

1. Disconnect:
   - Grip warmer leads ①
   - Thumb warmer leads
2. Connect:
   - Pocket tester
     (to grip warmer coil leads and/or thumb warmer coil leads)

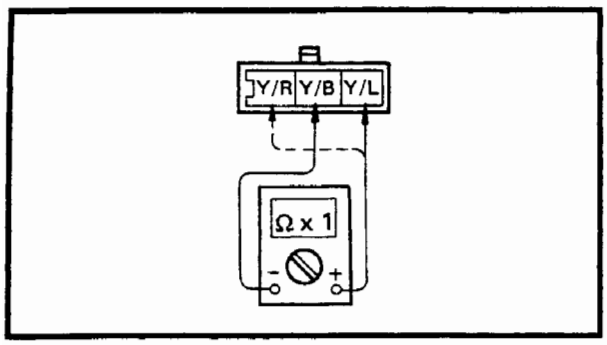


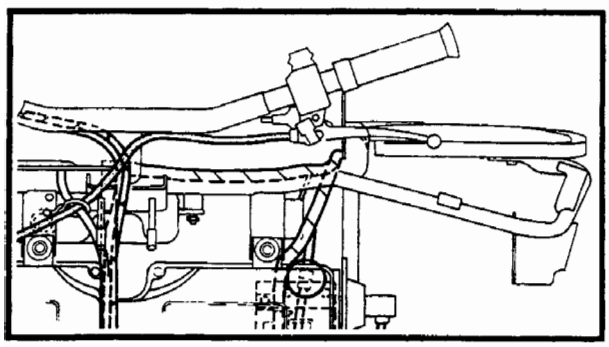
3. Check:
   - Grip warmer ① continuity
   - Thumb warmer ② continuity
     No continuity → Replace.

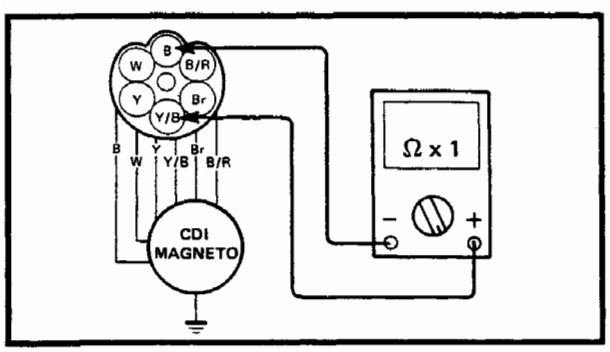


GRIP WARMER SWITCH

1. Disconnect:
   - Grip warmer switch connecters ①
2. Connect:
   - Pocket tester
     (to grip warmer switch leads)







3. Check:
   - Grip warmer switch continuity
     Faulty → Replace.

Switch position	Color code		
	Y/R	Y/B	Y/L
LO	O——	——O	——O
OFF			
HI	O——	——O	

O—O Continuity

GRIP WARMER COIL

1. Disconnect:
   - CDI magneto coupler
2. Connect:
   - Pocket tester
     (to grip warmer coil leads)
3. Measure:
   - Grip warmer coil resistance
     Out of specification → Replace.

Grip warmer coil resistance:
(Yellow/Black – Black)
0.92 ~ 1.12 Ω at 20°C (68°F)

CHAPTER 9.
SPECIFICATIONS

SPECIFICATIONS

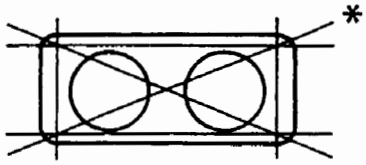
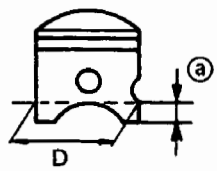
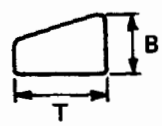
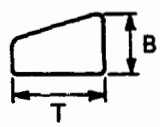
GENERAL SPECIFICATIONS

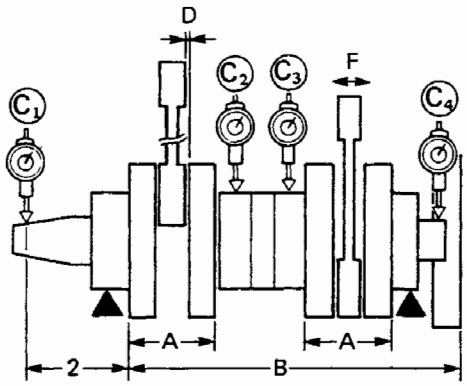
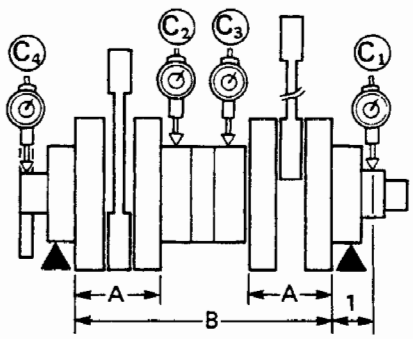
Model	VX750
Model Code Number:	89A
Frame Starting Number:	89A-000101
Engine Starting Number:	89A-000101
Dimensions:	
Overall Length	2,825 mm (111.2 in)
Overall Width	1,125 mm (44.3 in)
Overall Height	1,070 mm (42.1 in)
Weight:	
Dry Weight (Without fuel and oil)	250 kg (551 lb)
Engine:	
Engine Type	Liquid cooled 2-stroke, 7-port
Induction System	Piston reed valve
Cylinder Arrangement	Forward Inclined Parallel 4-cylinder
Displacement	743 cm^3 (45.3 cu. in)
Bore x Stroke	63 x 59.6 mm (2.56 x 2.35 in)
Compression Ratio	6.3:1
Starting System	Electric and Recoil Hand Starter
Lubrication System:	Separate Lubrication (YAMAHA AUTOLUBE)
Engine Oil:	
Type	YAMALUBE 2
Tank Capacity	2.8 L (2.5 Imp qt, 3.0 US qt)
Drive Chain Housing Oil:	
Type	Gear oil API "GL-3" SAE #75 or #85
Capacity	3.5 L (3.1 Imp qt, 3.6 US qt)
Fuel:	
Type	Unleaded gasoline R+M/2
Tank Capacity	38.0 L (8.4 Imp qt, 10 US qt)
Carburetor:	
Type/Quantity	TM/33x4
Manufacturer	MIKUNI
Spark Plug:	
Type	BR9ES
Manufacturer	NGK
Gap	0.7 ~ 0.8 mm (0.028 ~ 0.031 in)
Transmission:	
Primary Reduction System	V-Belt
Primary Reduction Ratio	3.9:1 ~ 0.9:1
Clutch Type	Automatic centrifugal engagement
Secondary Reduction System	Chain
Secondary Reduction Ratio	1.65 (33/20)
Chassis:	
Frame Type	Monocock
Caster	22.5°
Ski Stance	977 mm (38.5 in)

Model	VX750
Suspension:	
Front Suspension Type	Telescopic strut suspension
Rear Suspension Type	Slide rail suspension
Track:	
Track Type	Internal drive type
Track Width	381 mm (15.0 in)
Length on Ground	710 mm (28.0in)
Track Deflection	25 ~ 30 mm (0.98 ~ 1.18 in)/10 kg (22 lb)
Brake:	
Brake Type	Caliper type disc brake
Operation Method	Handle lever, left hand operated
Electrical:	
Ignition System/Manufacturer	CDI/MITSUBISHI
Generator System	Flywheel magneto
Bulb Wattage x Quantity:	
Headlight	60W/55W x 1
Tail/Brake Light	23W/8W x 1
Tachometer Light	3.4W x 1
Speedometer Light	3.4W x 2

MAINTENANCE SPECIFICATIONS

ENGINE

Model	VX750
Cylinder Head:	
Volume (with spark plug)	18.3 cm^3
<Warp Limit> 	<0.03mm (0.0012 in)> *Lines indicate straight edge measurement.
Cylinder:	
Material	Aluminum alloy with dispersion coating
Bore Size	63.00 ~ 63.02 mm (2.48 ~ 2.481 in)
<Taper Limit>	<0.01 mm (0.0004 in)>
<Out-of-Round Limit>	<0.05 mm (0.0019 in)>
Piston:	
Piston Size (D)	63.0 mm (2.48 in)
Measuring Point (a) 	18 mm (0.71 in)
Piston to-Cylinder Clearance	0.065 ~ 0.070 mm (0.0026 ~ 0.0028 in)
<Limit>	<0.1mm (0.004in)>
Oversize 1st	63.25 mm (2.490 in)
2nd	63.50 mm (2.501 in)
Piston Ring:	
Sectional Sketch Top Ring 	Keystone B=1.2 mm (0.047 in) T=2.55 mm (0.1 in)
2nd Ring 	Keystone B=1.2 mm (0.047 in) T= 2.55 mm (0.1 in)
End Gap (Installed) : Top Ring	0.35 ~ 0.55 mm (0.014 ~ 0.022 in)
2nd Ring	0.35 ~ 0.55 mm (0.014 ~ 0.022 in)
Side Clearance Top Ring	0.03 ~ 0.05 mm (0.001 ~ 0.002 in)
2nd Ring	0.03 ~ 0.05 mm (0.001 ~ 0.002 in)
Coating Top Ring	Chrome Plated/Ferox Coating
2nd Ring	Chrome Plated/Ferox Coating
Oversize 1st	63.25 mm (2.490 in)
2nd	63.50 mm (2.501 in)

Model		VX750
Crankshaft:		
Crank Width "A"		55.95 ~ 56.00 mm (2.203 ~ 2.205 in)
Connecting Rod Small End Free Play "F"		0.8 ~ 1.0 mm (0.031 ~ 0.039 in)
Connecting Rod Big End Side Clearance "D"		0.25 ~ 0.75 mm (0.010 ~ 0.030 in)
Crankshaft Deflection "C":	C_1,C_4	Below 0.03 mm (0.0012 in)
	C_2,C_3	Below 0.04 mm (0.0016 in)
Measuring Points:	1	25 mm (0.98 in)
	2	65 mm (3.27 in)
Crank Width "B"		168 mm (6.614 in)
		
Big End Bearing:		
Type		Needle bearing
Small End Bearing:		
Type		Needle bearing
Carburetor:		
Type/Quantity		TM33/4pcs.
Manufacturer		MIKUNI
I.D. Mark		89A-00
Main Jet	(M.J.)	#140
Pilot Jet	(P.J.)	#45
Pilot Air Jet	(P.A.J)	ø1.2
Pilot Outlet	(P.O.)	ø1.0
Pilot Screw	(P.S.)	2 turns out
Throttle Valve	(TH. V.)	#1.0
Valve Seat Size	(V.S.)	ø1.5
Starter Jet	(G.S.)	ø1.2
Float Height	(F.H.)	13.3 mm (0.524 in)
Engine Idle Speed		1,400 ~ 1,600 r/min
Fuel Pump:		
Type		DIAPHRAGM
Manufacturer		TAIYOU GIKEN
Oil Pump:		
Pump Cable Adjustment		27 ~ 29 mm (1.06 ~ 1.14 in)

Model	VX750
Cooling System:	
Filler Cap Opening Pressure	80 ~ 100 kPa (0.8 ~ 1.0 kg/cm², 11 ~ 14 psi)
Thermostat Opening Temperature	50 ~ 55°C (122 ~ 131°F)
Thermostat Valve Lift	8 mm (0.3 in) at 70°C (158.5F)
Water Pump Type	Impeller Type
Coolant Type	Long Life Coolant
Coolant Mixing Ratio (Coolant : Water)	3 : 2
Coolant Capacity	4.68 L (4.11 Imp qt, 4.95 US qt)
Reservoir Tank Capacity	0.25 L (0.22 Imp qt, 0.26 US qt)

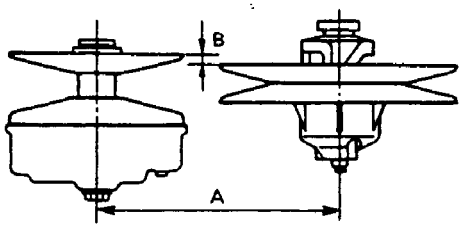
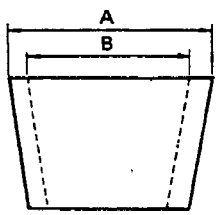
High Altitude Settings

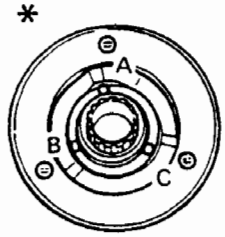
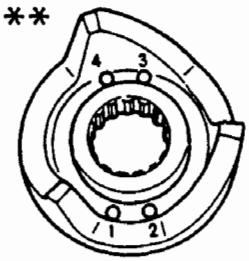
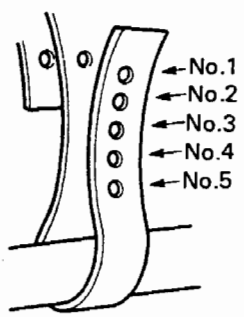
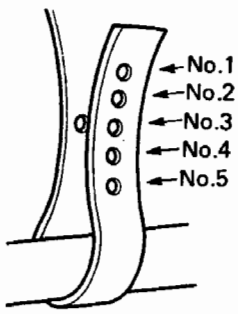
TEMPERATURE / ELEVATION	-30°C (-22°F) ~ -20°C (-4°F)	-20°C (-4°F) ~ -10°C (14°F)	-10°C (14°F) ~ 0°C (32°F)	0°C (32°F) ~ 10°C (50°F)	10°C (50°F) ~ 20°C (68°F)
0 ~ 100 m (300 ft)	#140 (STD)	#140 (STD)	#138.8	#138.8	#138.8
100 ~ 600 m (2,000 ft)	#138.8	#138.8	#137.5	#137.5	#137.5
600 ~ 1,200 m (4,000 ft)	#137.5	#137.5	#136.3	#135	#135
1,200 ~ 1,800 m (6,000 ft)	#136.3	#136.3	#135	#133.8 JN:2	#133.8 JN:2
1,800 ~ 2,400 m (8,000 ft)	#135	#135	#133.8 JN:2	#131.3 JN:2	#131.3 JN:2
2,400 m ~ (8,000 ft ~)	#133.8 JN:2	#133.8 JN:2	#131.3 JN:2	#130 JN:2	#128.8 JN:2

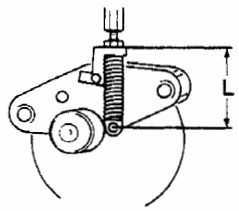
NOTE:

These jetting specifications may be subject to change. Consult your technical literature from Yamaha to be sure you have the most up-to-date jetting specifications.

POWER TRAIN

Model	VX750
Transmission:	
Type	V-belt Automatic
Range of Ratio	3.9:1 ~ 0.9:1
Engagement RPM	Approx 3,600 r/min
Shift RPM	Approx 8,256 r/min
Sheave Center Distance "A"	363.5 ~ 366.5 mm (14.3 ~ 14.4 in)
Sheave Offset "B"	14.5 ~ 17.5 mm (0.57 ~ 0.69 in)
	
V-Belt:	
Outside Circumference	1340 mm (52.8 in)
Width "A"	34.5 mm (1.36 in)
Wear Limit "B"	33 mm (1.30 in)
	
Primary Sheave Spring:	
Color Code	Gold-Yellow-Gold
Outside Diameter	60 mm (2.36 in)
Wire Diameter	5.2 mm (0.20 in)
Pre-load/Set Length	25.0 kg (55.1 lb)
Spring Rate	15 N/mm (1.5 kg/mm, 84 lb/in)
Free Length	82.1 mm (3.23 in)
Primary Sheave Weight:	
Weight	89A-17605-00
Quantity	3 pcs.
Secondary Sheave Spring:	
Color Code	Red
Outside Diameter	60 mm (2.36 in)
Wire Diameter	5.0 mm (0.2 in)
Twist Angle	33°
Free Length	90 mm (3.54 in)

Model	VX750
Hole Position	
Sheave Side*	A
Spring Seat Side**	3
*  ** 	
Spring Rate	9,192 N/mm (938 kg/mm, 52,528 lb/in)
Torque Cam Angle	39°
Drive Chain:	
Type	DID SC-0624 (SILENT CHAIN)
Number of Links	66L
Track:	
Width	381 mm (15.0 in)
Length	3072 mm (121 in)
Pitch	64 mm (2.52 in)
Number of Links	48
Deflection at 10 kg (22 lb)	20 ~ 25 mm (0.98 ~ 11.81 in)
Slide Rail Suspension:	
Front Travel	139 mm (5.47 in)
Rear Travel	137 mm (5.39 in)
Suspension Spring Rate	
Front	7.0 kg • mm/deg (0.6 in • lb/deg)
Rear	2.7 kg • mm/deg (0.23 in • lb/deg)
Suspension Spring Wire Diameter	
Front	9.8 mm (0.39 in)
Rear	9.0 mm (0.35 in)
Suspension Setting Position:	
Stopper Band Hole Position	
Front*	No.3
Rear**	No.3
*  ** 	

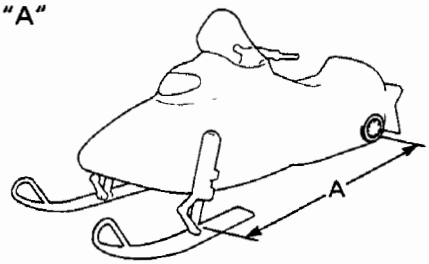
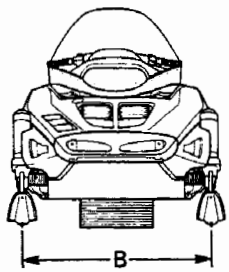
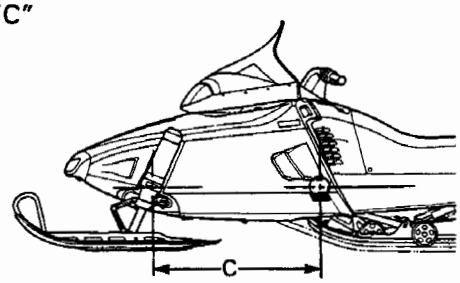
Model	VX750
Shock Absorber:	
Damping Force (Extension)	
Front	130 kg/0.3 m/s
Rear	160 kg/0.3 m/s
Damping Force (Compression)	
Front	55 kg/0.3 m/s
Rear	67 kg/0.3 m/s
Slide Runner:	
Thickness	7 mm (0.28 in)
Wear Limit	2 mm (0.079 in)
Track Sprocket Wheel:	
Material	Polyethylene
Number of Teeth	9T
Rear Guide Wheel:	
Material	Aluminum with rubber
Outside Diameter	178 mm (7 in)
Brake:	
Pad Thickness	8.2 mm (0.32 in)
Pad Wear Limit	4.2 mm (0.17 in)
Pad to Disc Clearance	0.15 ~ 0.30 mm (0.006 ~ 0.012 in)
Disc Outside Diameter	220 mm (8.66 in)
Disc Thickness	60 mm (0.24 in)
Distance "L" 	67.5 ~ 71.5 mm (2.66 ~ 2.81 in)

High Altitude Setting

Item	3500ft/1000m (STD)	2500ft~5500ft (MA)	5000ft~8000ft (MA)	7000ft~ (HA)	
Clutch Engagement RPM:	Approx 3600 rpm	←	←	←	
Shift RPM:	Approx 8250 rpm	←	←	←	
Primary Sheave Weight Arm:					
Part Number	89A-17605-00	←	←	←	
Weight (Rivet)	Steel	←	Aluminum	NONE	
Quantity	3 pcs	←	←	←	
Primary Sheave Spring:					*
Part Number	90501-524G5	90501-553G6	←	90501-556G5	90501-607G0
Color Code	Gold-Yellow-Gold	White-Yellow-White	←	White-Blue-White	Green-Blue-Green
Pre-load/Sheave Spring:	25 kg	←	←	20 kg	←
Spring Rate	1.50 kg/mm	2.25 kg/mm	←	2.25 kg/mm	2.75 kg/mm
Free Length	82.1 mm	76.5 mm	←	74.3 mm	72.7 mm
Secondary Sheave Spring:					
Part Number	90508-553A1	←	←	←	
Color Code	Red	←	←	←	
Twist Angle	33°	←	←	53°	
Hole Position:					
Sheave Side	A	←	←	C	
Spring Seat Side	3	←	←	3	
Free Length	90.0 mm	←	←	←	

* Use in heavy load & hill climb

CHASSIS

Model	VX750
Frame:	
Frame Material	Aluminum and steel
Seat Height	560 mm (22.0 in)
Luggage Box Location	Rear Side of Seat
Steering:	
Steering Angle (Left)	48°
(Right)	48°
Ski Alignment	Toe-out
Toe-out Size	0 ~ 15 mm (0 ~ 0.6 in)
Distance "A" 	2,007 mm (79.0 in)
Distance "B" 	770 mm (30.3 in)
Distance "C" 	660 mm (26.0 in)
Ski:	
Ski Material	Aluminum
Runner Material	High Polymer Polyethylene
Length	1021 mm (40.2 in)
Width	146 mm (5.75 in)
Ski Ground Length	375.6 mm (14.8 in)
Ski Suspension:	
Type	T.S.S.
Travel	175 mm (6.89 in)
Spring Type	Coil Spring
Spring Rate	18 ~ 20 N/mm (1.8 ~ 2.0 kg/mm, 100.8 ~ 112.0 lb/in)
Wire Diameter	8.2 mm (0.32 in)
Shock Absorber:	
Damping Force (Extension)	32 kg, 0.3 m/s
(Compression)	56 kg, 0.3 m/s
Damping Force adjuster	6 turns out