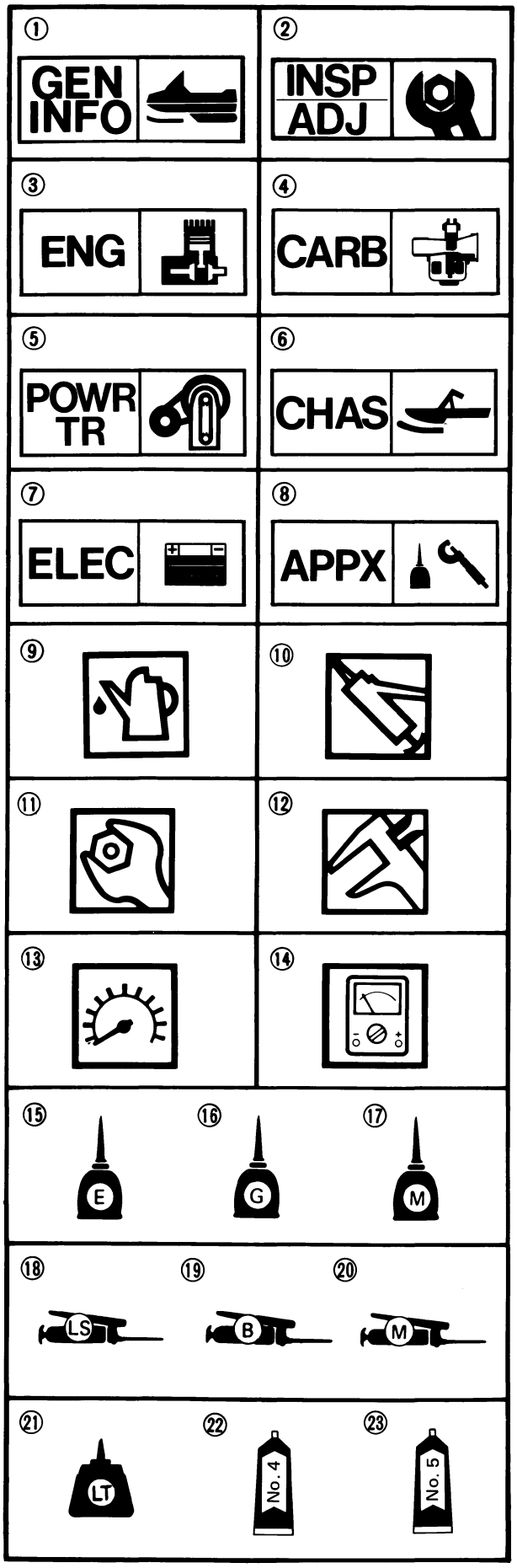


ILLUSTRATED SYMBOLS (Refer to the illustration)

Illustrated symbols ① to ⑧ are designed as thumb tabs to indicate the chapter's number and content.

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

Illustrated symbols ⑨ to ⑭ are used to identify the specifications appearing.

⑨ Filling fluid
⑩ Lubricant
⑪ Tightening
⑫ Wear limit, clearance
⑬ Engine speed
⑭ Ω, V, A

Illustrated symbols ⑮ to ⑳ in the exploded diagram indicate grade of lubricant and location of lubrication point.

⑮ Apply engine oil
⑯ Apply gear oil
⑰ Apply molybdenum disulfide oil
⑱ Apply low-temperature lithium soap base grease
⑲ Apply bearing grease
(Esso-Beacon 325 grease or Aero Shell grease #7)
⑳ Apply molybdenum disulfide grease

Illustrated symbols ㉑ or ㉓ in the exploded diagram indicate grade of sealing or locking agent and location of application point.

㉑ Apply locking agent (LOCTITE®)
㉒ Apply Yamabond No. 4®
㉓ Apply Yamabond No. 5®

INDEX

GENERAL INFORMATION	GEN INFO 1
PERIODIC INSPECTIONS AND ADJUSTMENTS	INSP ADJ 2
ENGINE OVERHAUL	ENG 3
CARBURETION	CARB 4
POWER TRAIN	POWR TR 5
CHASSIS	CHAS 6
ELECTRICAL	ELEC 7
APPENDICES	APPX 8

CHAPTER 1.
GENERAL INFORMATION

MACHINE IDENTIFICATION 1-1
FRAME SERIAL NUMBER 1-1
ENGINE SERIAL NUMBER 1-1

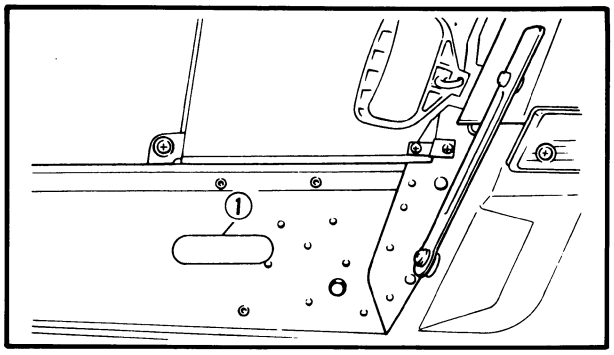
STORAGE 1-2

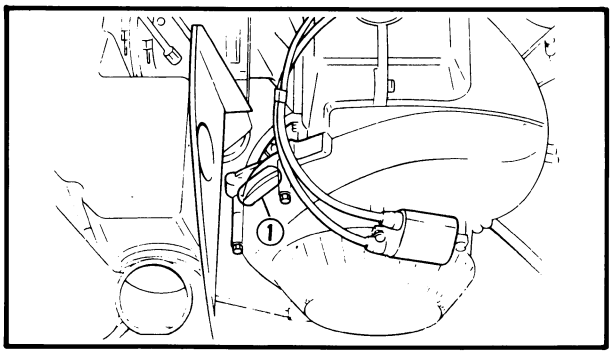
PRE-SEASON PREPARATION 1-2

IMPORTANT INFORMATION 1-3
NO FLAME SOURCES 1-3
WASHING AND CLEANING 1-3
RIGHT TOOLS 1-3
MAKING IT NEAT 1-3
TIGHTENING TORQUE 1-3
ALL REPLACEMENT PARTS 1-4
GASKETS, OIL SEALS, AND O-RINGS 1-4
LOCK WASHERS/PLATES AND COTTER PINS 1-4
BEARINGS AND OIL SEALS 1-4
CIRCLIPS 1-5
NOTES ON DISASSEMBLY AND ASSEMBLY 1-5

SPECIAL TOOLS 1-6
FOR TUNE UP 1-6
FOR ENGINE SERVICE 1-6
FOR POWER TRAIN SERVICE 1-7
FOR ELECTRICAL SERVICE 1-8

FEATURE 1-9
GEAR TRAIN SYSTEM 1-9





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 right-hand side of the crankcase.

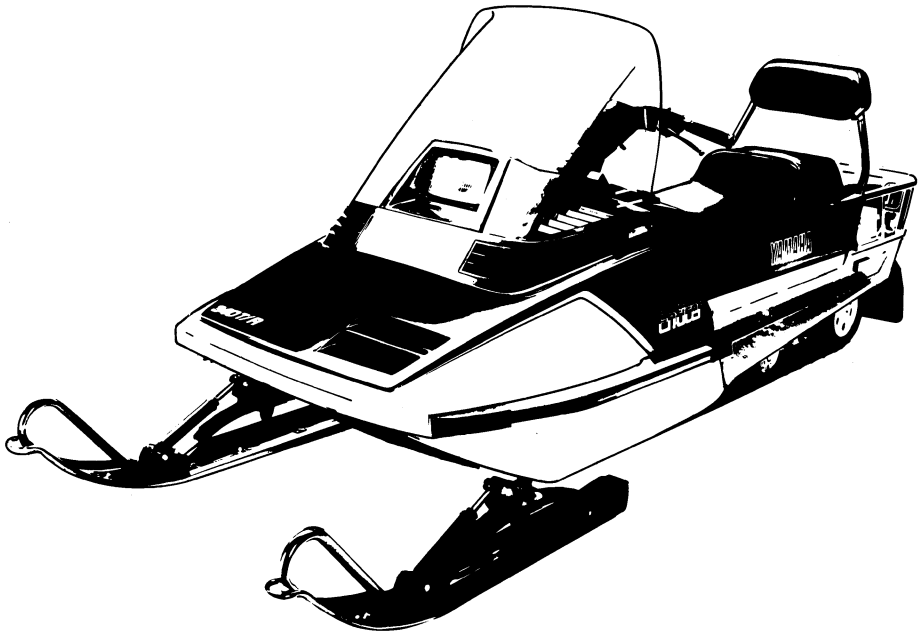
NOTE:

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

Starting Serial Number
84G-000101

NOTE:

Designs and specifications are subject to change without notice.



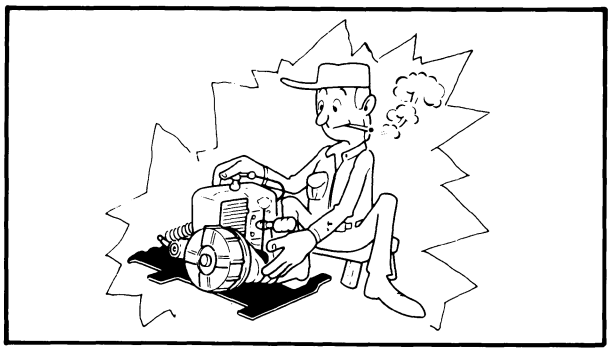
STORAGE

If a snowmobile will not be used for several months, it should be stored in a proper place so that both the engine and the track are not damaged.

- Completely drain the fuel tank, and disconnect the fuel line from the carburetor.
- With the engine running at idle, squirt oil into the carburetor until the engine dies. This will distribute oil evenly throughout the engine, and protect it against rust.
- Disassemble the suspension, clean and grease all parts, and reassemble the suspension.
- Lightly coat all shafts and axles with grease.
- Oil all fittings and cable controls with a lightly oiled cloth.
- Loosen the track.
- Block the chassis so that the track is off the floor.
- Protect the snowmobile with a covering.

PRE-SEASON PREPARATION

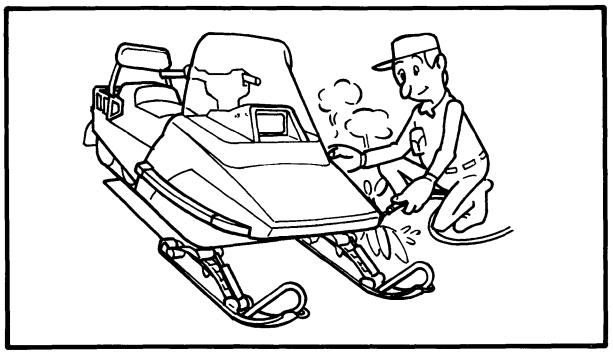
Perform the predelivery service as described in the predelivery check list before operating any snowmobile that has been stored for several months. (Refer to CHAPTER 2. "PERIODIC MAINTENANCE TABLE", page 2-1.)



IMPORTANT INFORMATION

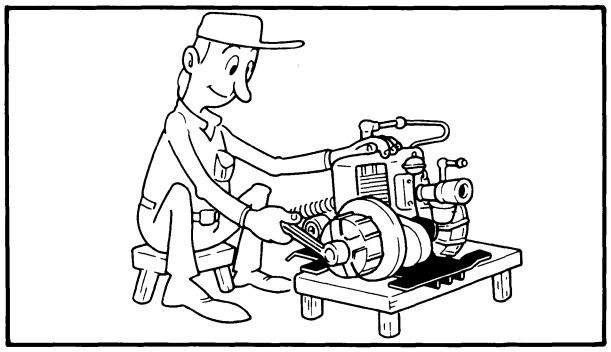
NO FLAME SOURCES

1. Avoid any flame sources in the service shop.



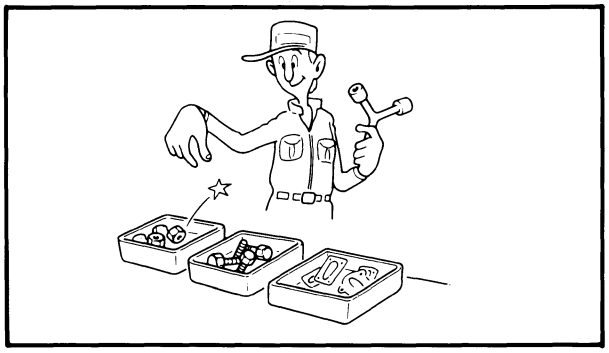
WASHING AND CLEANING

1. Thoroughly clean the exterior of the body and engine. While cleaning, take care to protect the electrical parts, such as relay switches, motor, resistors, controllers, etc., from high pressure water splashes.



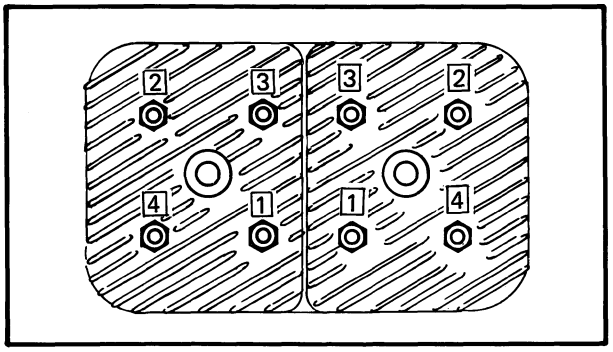
RIGHT TOOLS

1. Be sure to use the right special tool for the right part in order to protect the part from damage. Always use the right tool and the right instrument.



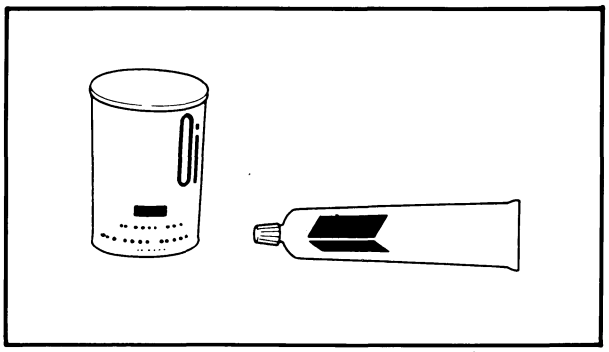
MAKING IT NEAT

1. Keep the removed parts separately in groups so that they will not be misplaced or confused.



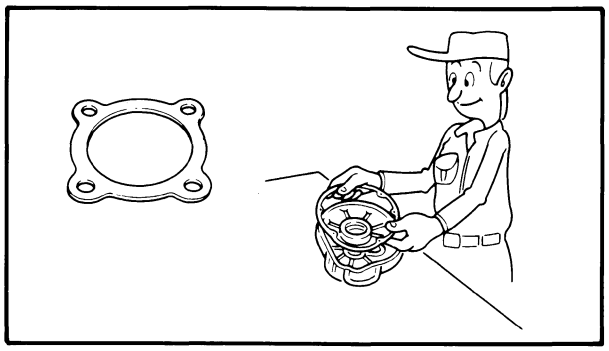
TIGHTENING TORQUE

1. Be sure to keep to tightening torque specifications. When tightening bolts, nuts, and screws, start with a larger-diameter one and from an inner-positioned one to an outer-positioned one in a criss-cross pattern. Refer to CHAPTER 8. "TIGHTENING TORQUE".



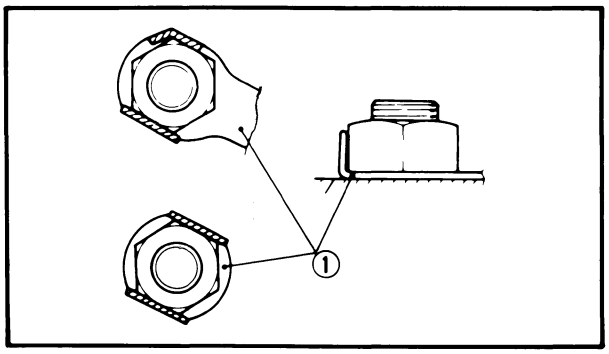
ALL REPLACEMENT PARTS

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



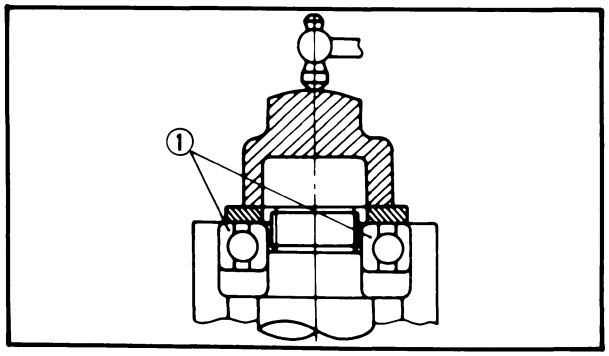
GASKETS, OIL SEALS, AND O-RINGS

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.



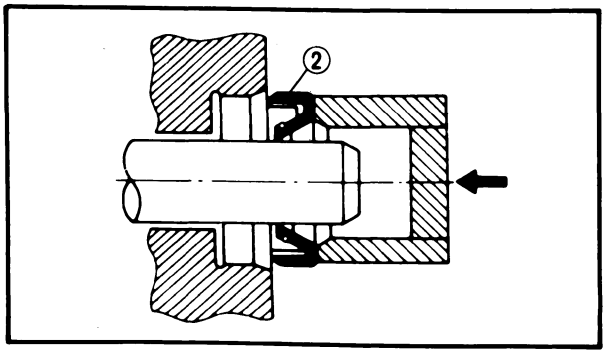
LOCK WASHERS/PLATES AND COTTER PINS

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.



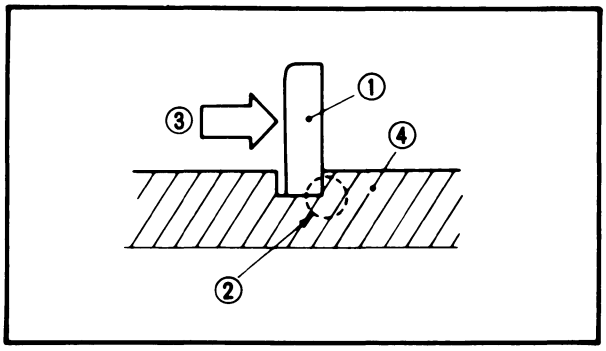
BEARINGS AND OIL SEALS

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:

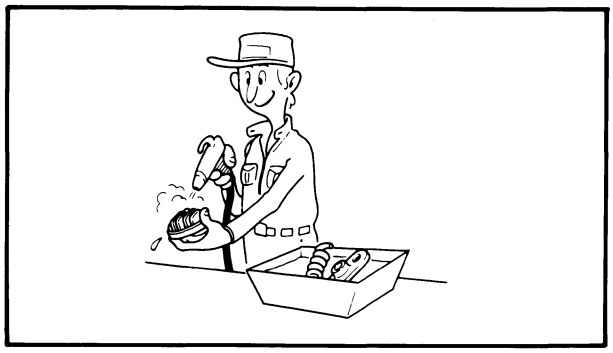
Do not use compressed air to spin the bearings dry. This causes damage to the bearing surfaces.



CIRCLIPS

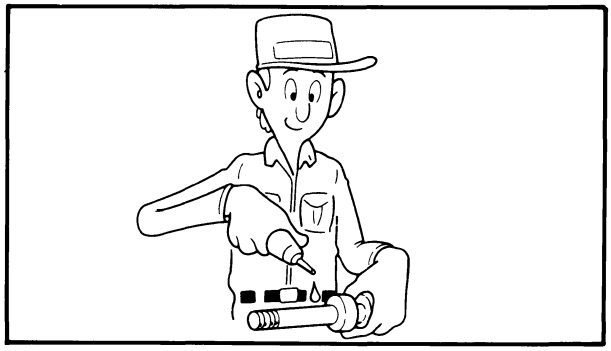
1. All circlips should be inspected carefully before reassembly. Always replace piston pin clips after one use. Replace distorted circlips. When installing a circlip ① , make sure that the sharp-edged corner ② is positioned opposite to the thrust ③ it receives. See the sectional view.

④ Shaft

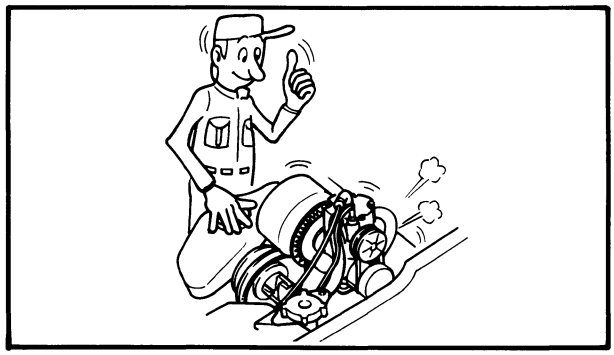


NOTES ON DISASSEMBLY AND ASSEMBLY

1. Parts should be blown off with compressed air whenever they are disassembled.



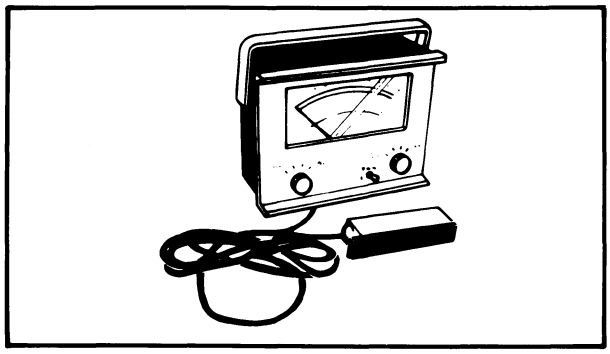
2. Contact surfaces of moving parts should be oiled when they are assembled. Apply grease to the oil seal lips.



3. After assembling, make sure each of the moving parts operate normally.

SPECIAL TOOLS

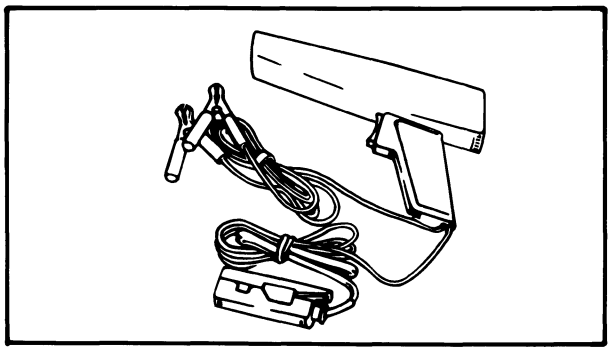
The proper special tools are necessary for complete and accurate tune-up and assembly. Using the correct special tool will help prevent damage caused by the use of improper tools or improvised techniques.



FOR TUNE UP

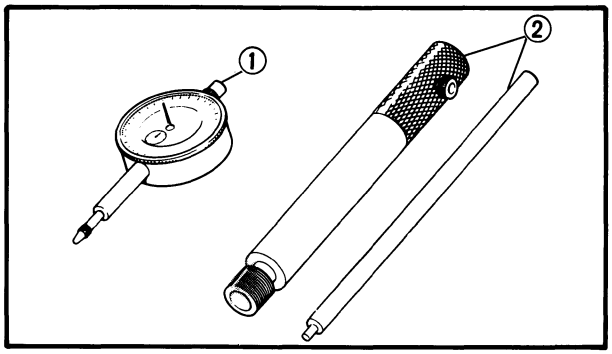
1. Inductive Tachometer
   P/N YU-08036

This tool is needed for detecting engine rpm.



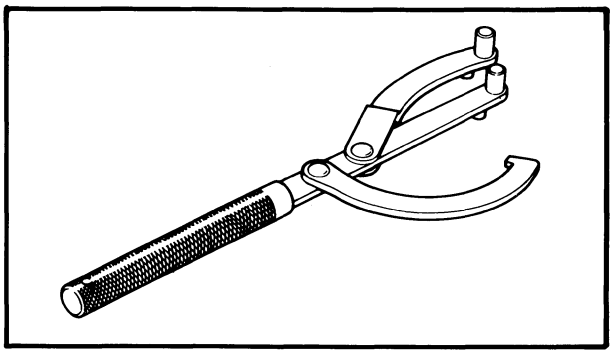
2. Inductive Timing Light
   P/N YU-08037

This tool is necessary for checking ignition timing.



3. Dial Gauge – ①
   P/N YU-03097
   Dial Stand – ②
   P/N YU-01256-1, -2

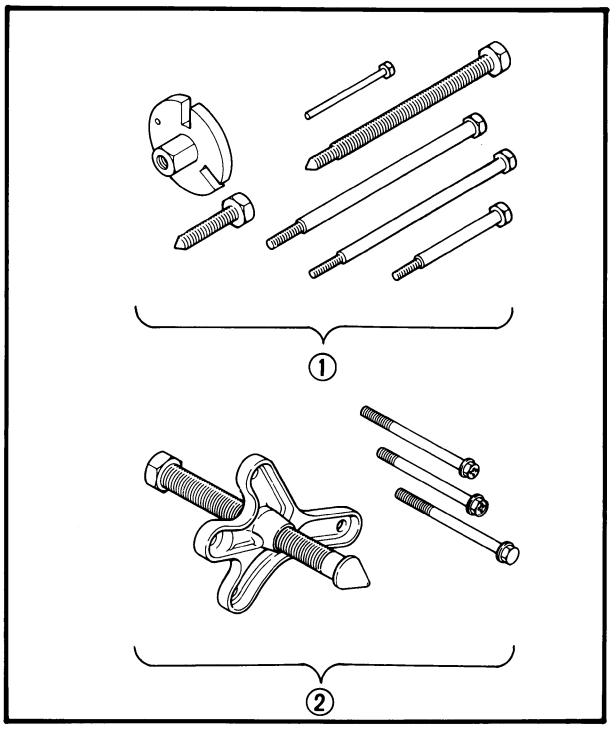
These tools are necessary for ignition timing adjustment.



FOR ENGINE SERVICE

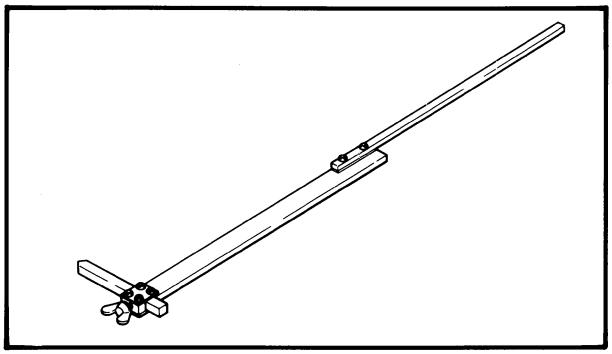
1. Rotor Holding Tool
   P/N YU-01235

This tool is used to hold the water pump pulley when removing or installing the pulley securing nuts.



2. 3-Way Puller
   P/N YU-90105 – ①
   P/N YU-33270 – ②

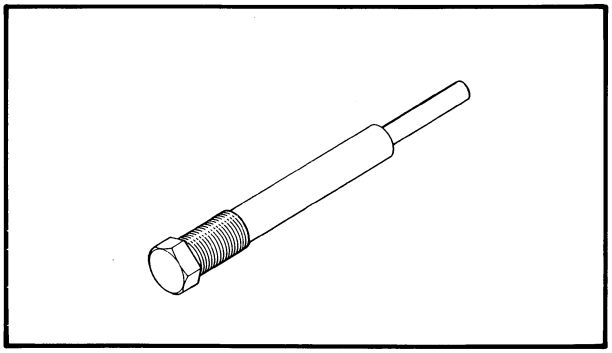
These tools are used to remove the flywheel magneto.



FOR POWER TRAIN SERVICE

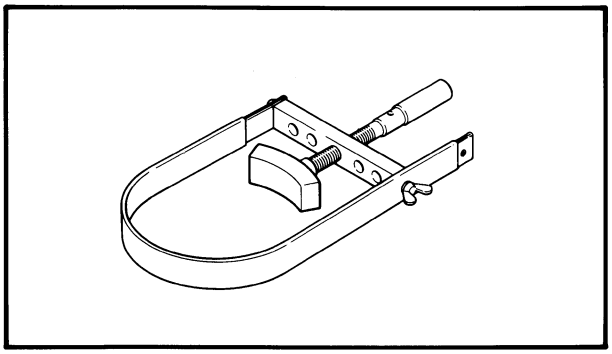
1. Sheave Gauge
   P/N YS-33274

This gauge is needed for sheave alignment.



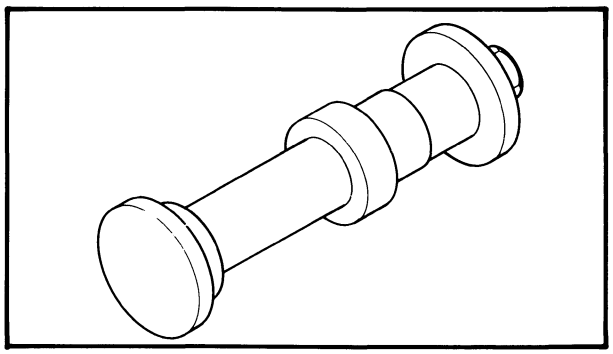
2. Primary Sheave Puller (M20)
   P/N YS-01859-1

These tools are used to remove the primary sheave.



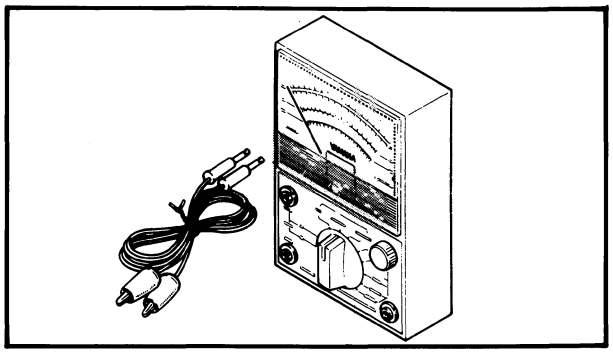
3. Primary Sheave Holder
   P/N YS-01880

This tool is used to hold the primary sheave when removing or installing the primary sheave mounting bolt.



4. Primary Sheave Subassembly Tool
   P/N YS-91060-A

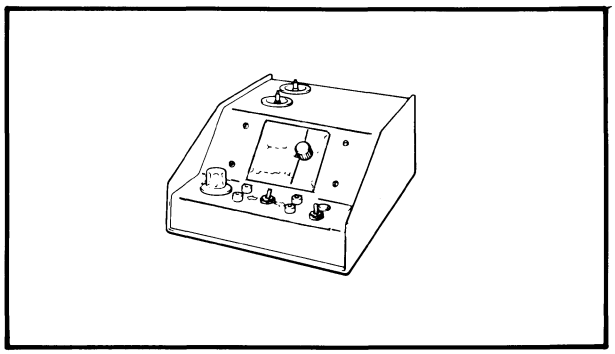
These tools are used to remove or install the primary sheave cap.



FOR ELECTRICAL SERVICE

1. Pocket Tester
   P/N YU-03112

This instrument is necessary for checking the ignition system components.



2. Coil Tester
   P/N YU-33261

This instrument is necessary for checking the ignition system.

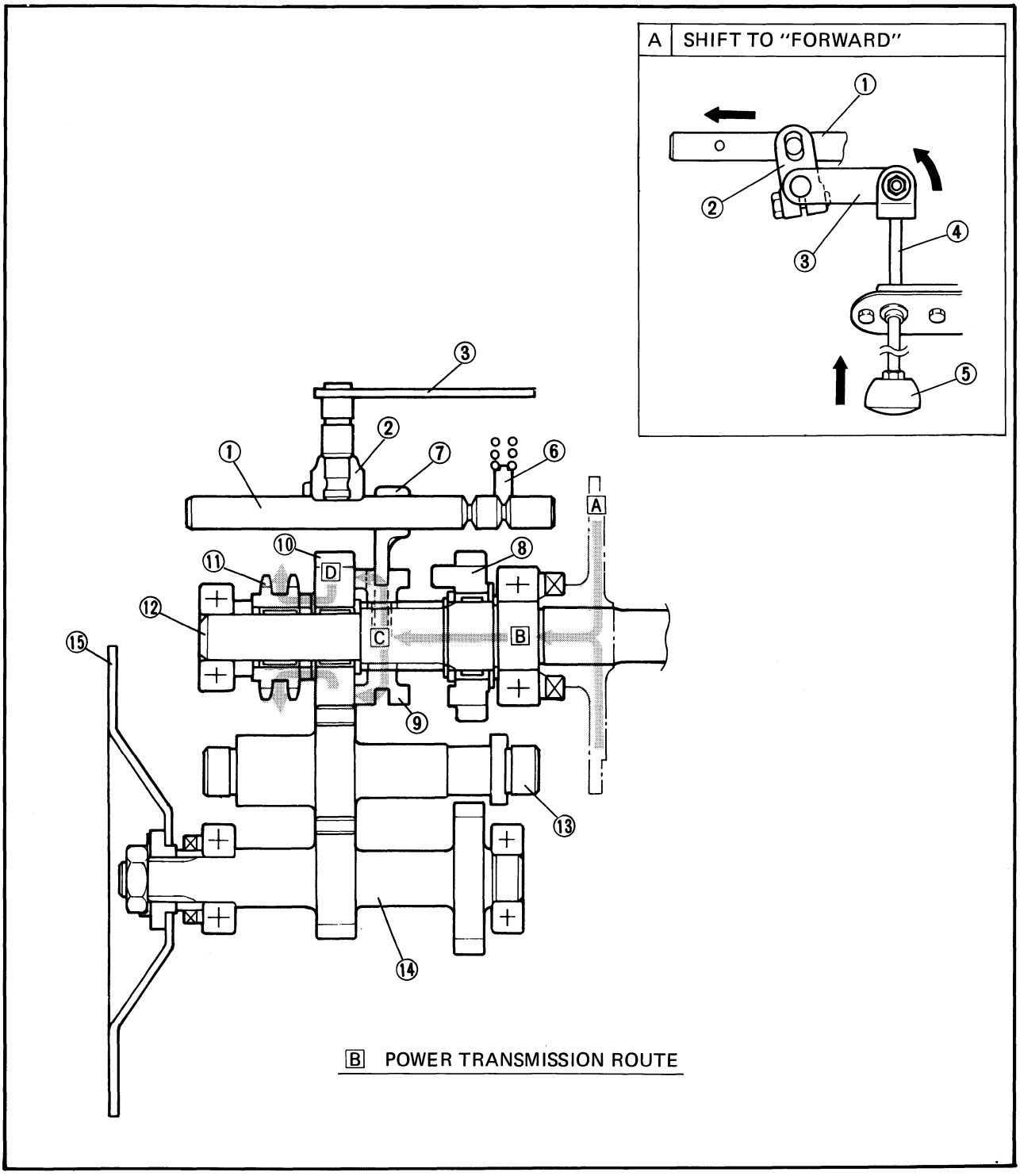
FEATURE

GEAR TRAIN SYSTEM

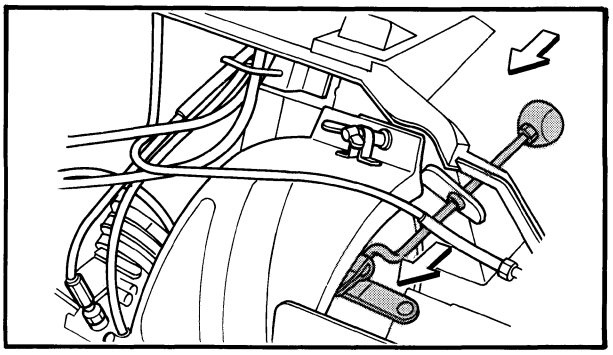
This model is equipped with a revers gear train system.

Forward Gear System

① Shift fork guide bar
② Shift lever
③ Shift linkage lever
④ Shift rod
⑤ Shift knob
⑥ Stopper pin
⑦ Shift fork
⑧ Reverse gear
⑨ Dog
⑩ Forward gear
⑪ Drive sprocket
⑫ Secondary shaft
⑬ Idle axle
⑭ Counter axle
⑮ Brake disc



B POWER TRANSMISSION ROUTE



Operation

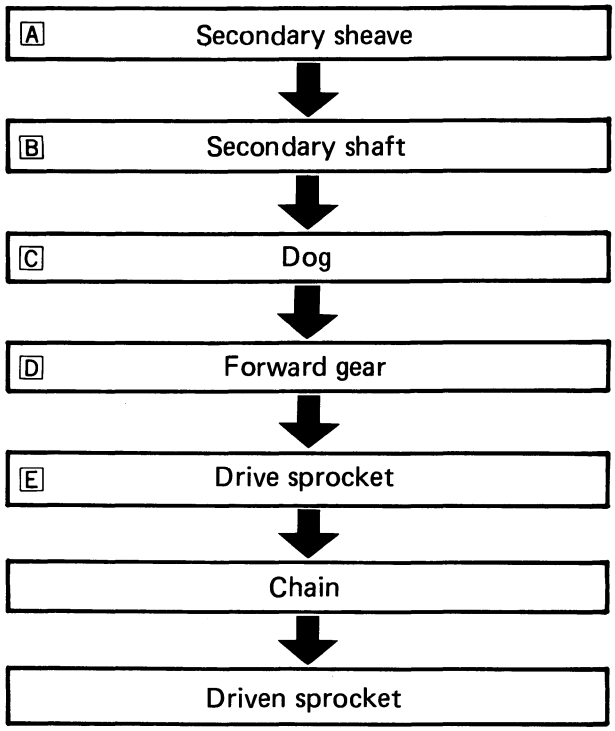
WARNING:

- **Never operate the shift rod when the snowmobiles is moving.**
- **Operate the shift rod when the engine is running at idle speed.**

- Shift to "Forward".

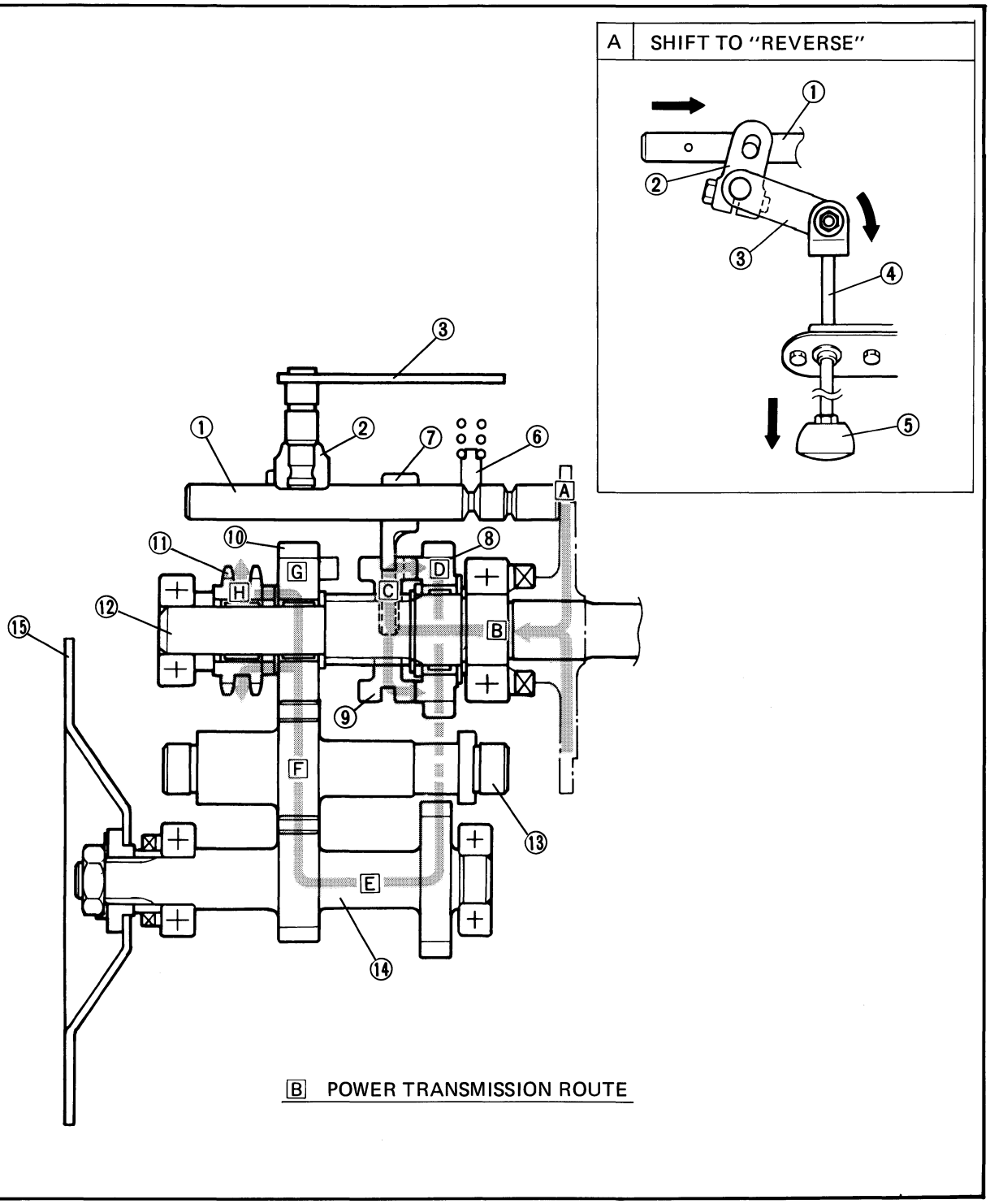
1) Push the shift knob to select the forward position.
2) The dog meshes with the pinion gear that is connected to the drive sprocket.

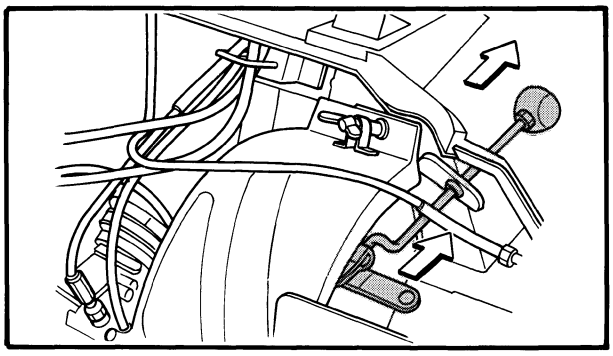
Power transmission route



Reverse Gear System

① Shift fork guide bar
② Shift lever
③ Shift linkage lever
④ Shift rod
⑤ Shift knob
⑥ Stopper pin
⑦ Shift fork
⑧ Reverse gear
⑨ Dog
⑩ Forward gear
⑪ Drive sprocket
⑫ Secondary shaft
⑬ Idle axle
⑭ Counter axle
⑮ Brake disc





Operation

WARNING:

- **Never operate the shift rod when the snowmobiles is moving.**
- **Operate the shift rod when the engine is running at idle speed.**

- Shift to "Reverse"

1) Pull the shift knob to select the reverse position.
2) The dog meshes with gear ① connected to the counter axle gear.
3) The counter axle gear is connected to the idle axle gear, pinion gear and drive sprocket.

Power transmission route

Ⓐ Secondary sheave
↓
Ⓑ Secondary shaft ⑫
↓
Ⓒ Dog ⑨
↓
Ⓓ Reverse gear ⑧
↓
Ⓔ Counter axle ⑭
↓
Ⓕ Idle axle (Idle gear) ⑬
↓
Ⓖ Forward gear ⑩
↓
Ⓗ Drive sprocket ⑪
↓
Chain
↓
Driven sprocket

CHAPTER 2.
PERIODIC INSPECTIONS AND ADJUSTMENTS

INTRODUCTION 2-1

PERIODIC MAINTENANCE TABLE 2-1

LUBRICATION INTERVALS 2-2

REAR BUMPER AND SEAT REMOVAL 2-3
- REAR BUMPER 2-3
- SEAT 2-3

HANDLEBAR COVERS AND TANK COVER REMOVAL 2-3
- HANDLEBAR COVERS 2-3
- TANK COVER 2-3

ENGINE 2-4
- OIL PUMP INSPECTION 2-4

CARBURETOR 2-9
- IDLE MIXTURE SETTING 2-9
- IDLE SPEED ADJUSTMENT 2-9
- THROTTLE CABLE ADJUSTMENT 2-9
- STARTER CABLE ADJUSTMENT 2-10

ELECTRICAL 2-11
- IGNITION TIMING 2-11

POWER TRAIN 2-14
- DRIVE V-BELT 2-14
- SHEAVE ADJUSTMENT 2-15
- DRIVE CHAIN HOUSING OIL LEVEL INSPECTION 2-17
- DRIVE CHAIN HOUSING OIL REPLACEMENT 2-18
- DRIVE CHAIN SLACK ADJUSTMENT 2-19
- BRAKE ADJUSTMENT 2-19
- TRACK TENSION ADJUSTMENT 2-21

CHASSIS 2-22
- SKI ADJUSTMENT (TO THE HANDLEBAR) 2-22
- SKI TOE-OUT ADJUSTMENT 2-23
- SLIDE RAIL SUSPENSION SETTING 2-23
- HANDLEBAR ADJUSTMENT 2-26
- ENGINE OIL LEVEL INSPECTION 2-26
- SLIDE RUNNER INSPECTION 2-27
- OIL FILTER INSPECTION 2-27
- FUEL PUMP INSPECTION 2-28
- FUEL FILTER INSPECTION 2-29

ELECTRICAL 2-30
SPARK PLUG INSPECTION 2-30
HEADLIGHT 2-31
METER LIGHTS 2-32
TAIL/BRAKE LIGHT 2-32

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 vehicle operation and a longer service life. The need for costly overhaul work will be greatly reduced. This information applies to vehicles already in service as well as new vehicles that are being prepared for sale. All service technicians should be familiar with this entire chapter.

PERIODIC MAINTENANCE TABLE

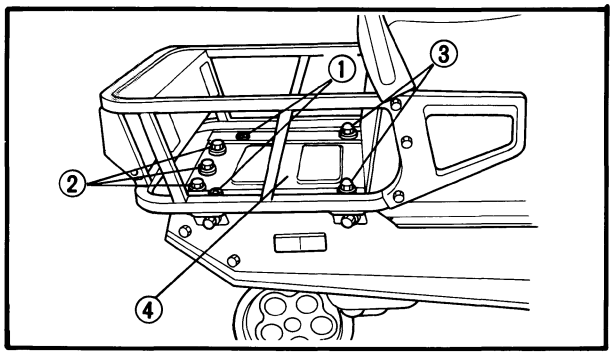
Check point	Every			When necessary	Seasonally
	20 hrs. or 400 km (250 mi)	40 hrs. or 800 km (500 mi)	80 hrs. or 1,600 km (1,000 mi)		
ENGINE:					
Tightness of bolts and nuts	○				○
Bends, cracks and wear	○				○
Abnormal noise	○				○
Loose connection and breaks of fuel and pulse pipes	○				○
Loose connection and breaks of oil pipes	○				○
Loose connection and breaks of oil delivery pipe	○				○
Manual rope starter system		○			○
Carburetor					
● Operation of starter jet		○			○
● Mixing adjuster (pilot screw)				○	○
● Idling speed adjustment				○	○
Operation and adjustment of oil pump		○			○
Engine compression			○		○
Cylinder head/exhaust pipe decarbonization					○
Spark plug condition, gap and cleaning	○				○
Tightening of the cylinder head**					○
Coolant leakage	○				○
Operation of water pump	○				○
Water pump drive belt tension/damage	○				○
Coolant level	○				○
DRIVE:					
Tightness of bolts and nuts	○				○
Wear on slide runners	○				○
Primary drive system		○			○
V-belt	○				○
Secondary drive system		○			○
Sheave distance		○			○
Sheave offset		○			○
Brake pad wear		○			○
Brake operation and adjustment		○			○
Guide wheel rubber		○			○
Wear of drive track wheel sprocket		○			○
Drive track adjustment	Initial 100 km (60 mi) & 300 km (200 mi)	○			○
Breaks in drive track		○			○
Checking of lock washers		○			○
Drive chain adjustment		○			○
Drive chain oil level		○			○

** Retighten every 10 hours from the first use.

Check point	Every			When necessary	Seasonally
	20 hrs. or 400 km (250 mi)	40 hrs. or 800 km (500 mi)	80 hrs. or 1,600 km (1,000 mi)		
BODY:					
Tightness of bolts and nuts	○				○
Bends and cracks	○				○
Welded/riveted, joints	○				○
Ski adjustment		○			○
Ski runner wear	○				○
Breaks in fuel tank		○			○
Cleaning of fuel tank					○
Fuel filter					○
Loose connection and breaks in fuel pipe		○			○
Breaks in oil tank		○			○
Oil filter					○
ELECTRICAL:					
Wear, breakage of wire covering		○			○
Breaks in high-tension cord	○				○
Voltage regulator working voltage					○
Operation of engine stop switch		○			○
Operation of throttle override system		○			○
Headlight		○			○
Taillight		○			○
Brake light		○			○

LUBRICATION INTERVALS

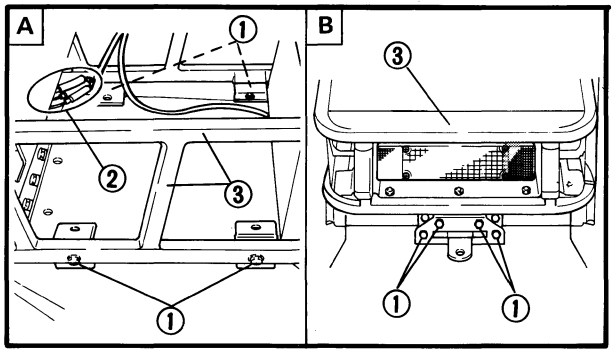
Lubrication point	Every			When necessary	Seasonally	Oil/Grease brand name
	20 hrs. or 400 km (250 mi)	40 hrs. or 800 km (500 mi)	80 hrs. or 1,600 km (1,000 mi)			
ENGINE:						
Starter case					○	Aeroshell grease #7A or Esso Beacon 325 grease
Oil pump control box			○		○	
Pump drive cover			○		○	
Oil in the oil tank				○		YAMALUBE 2-cycle oil
DRIVE:						
Primary sheave weight and roller pins		○			○	Molybdenum disulfide snowmobile grease
Secondary shaft and sliding sheave		○			○	Molybdenum disulfide snowmobile grease
Front axle housing		○			○	Light all-purpose grease
Shaft 1 and shaft 2 (Slide rail)			○		○	
Drive chain oil replacement		○			○	Gear oil API "GL-3" SAE #75 or #80
BODY:						
Steering column lower bearing		○			○	Light all-purpose grease
Steering column upper bearing		○			○	Motor oil
Steering links		○			○	Light all-purpose grease
Ski column		○			○	
Ski wear plate		○			○	Light all-purpose grease
Ski retaining pin		○			○	
Brake wire end stopper and brake lever		○			○	Esso Beacon 325 grease



REAR BUMPER AND SEAT REMOVAL

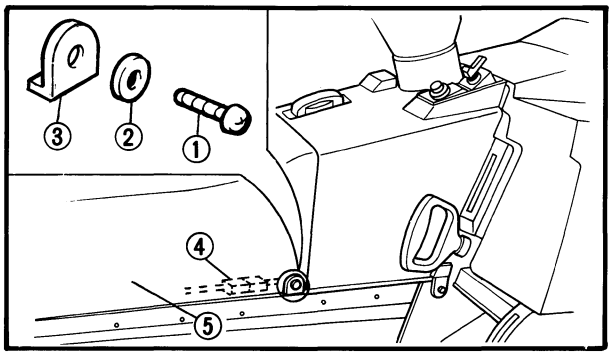
REAR BUMPER

1. Remove:
   - Bumper plate securing screws ①
   - Bumper plate securing bolts ②
   - Bumper plate securing nuts ③
   - Bumper plate ④



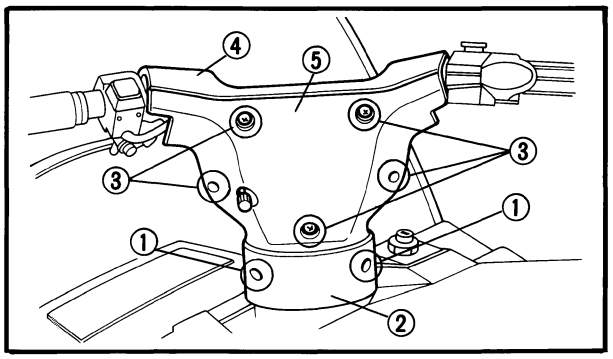
2. Remove:
   - Bumper securing bolts ①
3. Disconnect:
   - Tail/Brake light couplers ②
4. Remove:
   - Rear bumper ③

Ⓐ SIDE
Ⓑ REAR



SEAT

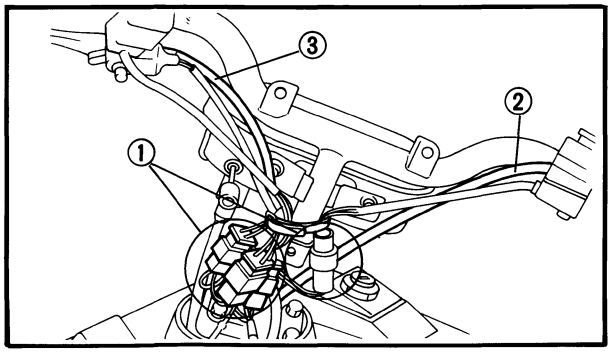
1. Remove:
   - Seat securing screws ①
   - Plate washer ②
   - Lock washer ③
2. Disconnect:
   - Tail/Brake light connector ④
3. Remove:
   - Seat ⑤



HANDLEBAR COVERS AND TANK COVER REMOVAL

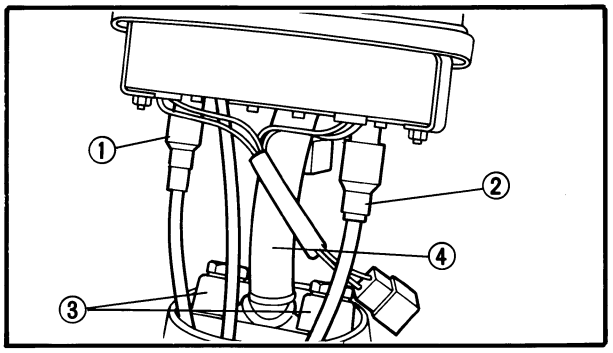
HANDLEBAR COVERS

1. Remove:
   - Lower handlebar cover screws ①
   - Lower handlebar cover ②
   - Handlebar cover screws ③
   - Handlebar cover (Front) ④
   - Handlebar cover (Rear) ⑤

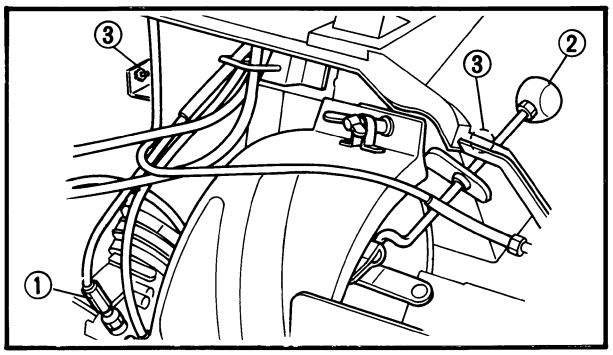


TANK COVER

1. Remove:
   - Handlebar covers
2. Disconnect:
   - Couplers ①
   - Throttle cable ②
     From carburetor side.
   - Brake cable ③
     From brake caliper side.

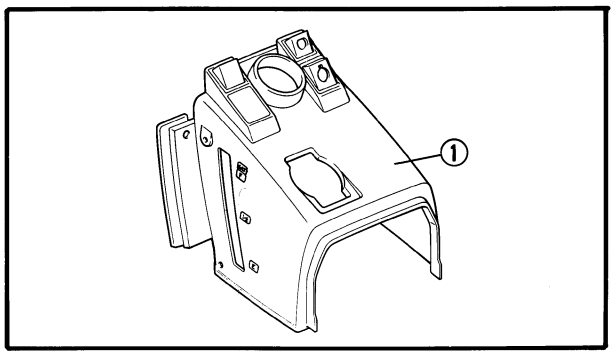


3. Disconnect:
   - Tachometer cable ①
   - Speedometer cable ②
4. Remove:
   - Handle holders ③
   - Handlebar ④

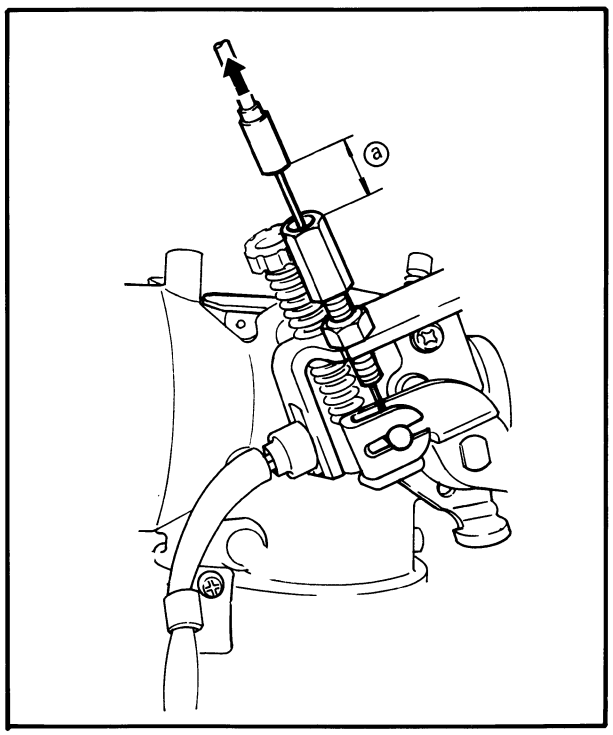


5. Disconnect:
   - Starter cable ①

   From carburetor side.
6. Remove:
   - Drive select knob ②
   - Tank cover securing screws ③



7. Disconnect the oil level hose and fuel level hose from the hose joint and pull out the hose from the tank cover.
8. Disconnect:
   - Main switch connector
9. Remove:
   - Tank cover ①



ENGINE

OIL PUMP INSPECTION

Oil Pump Cable Adjustment

NOTE:

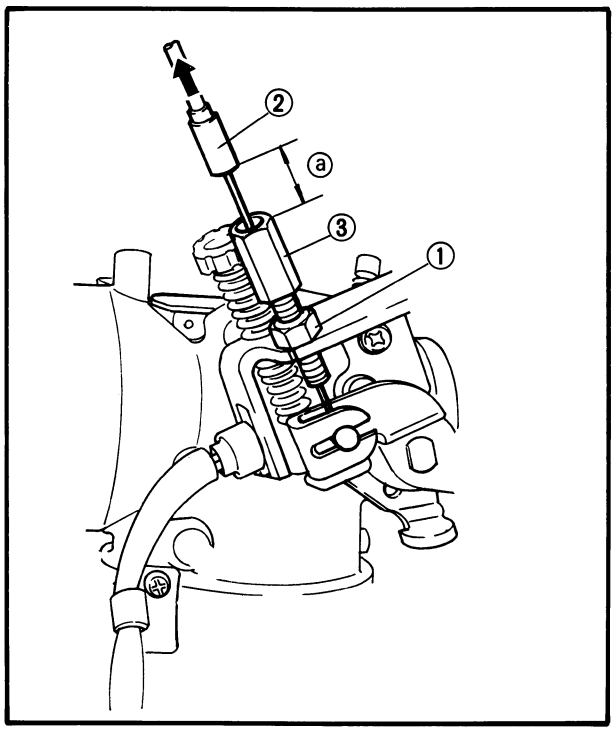
Before adjusting the oil pump cable free play, the throttle cable should be adjusted.

1. Check:
   - Oil pump cable free play ⓐ

   Out of specification → Adjust; perform step 2.

	Oil Pump Cable Free Play ⓐ: **25 ± 1 mm (1.0 ± 0.04 in)**

OIL PUMP INSPECTION

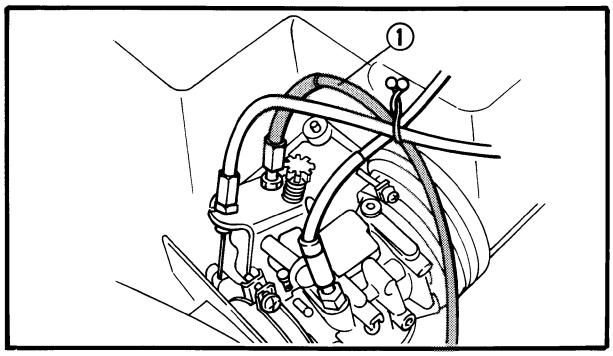


1. Adjust:
   - Oil pump cable free play ⓐ

Oil pump cable free play adjustment steps:
- Loosen the locknut ① .
- Pull up the cable outer tube ② to its limit, and turn the adjuster ③ until the cable free play ⓐ is within the specified limits.

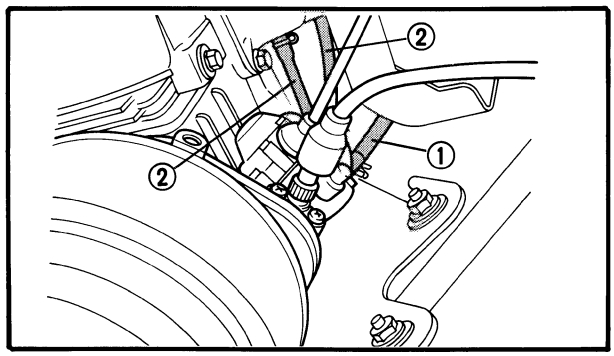
Oil Pump Cable Free Play ⓐ :
25 ± 1 mm (1.0 ± 0.04 in)

- Tighten the locknut ① .



Oil Pump Stroke Inspection

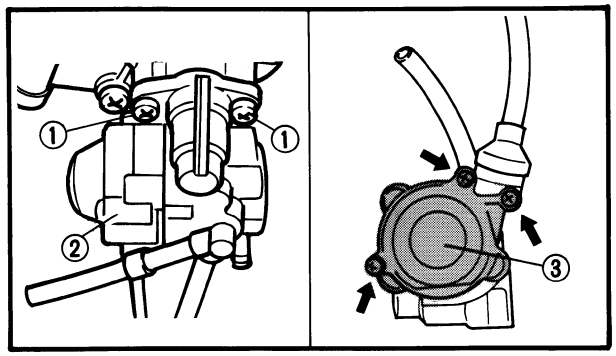
1. Remove:
   - Oil pump cable ①
     From carburetor side



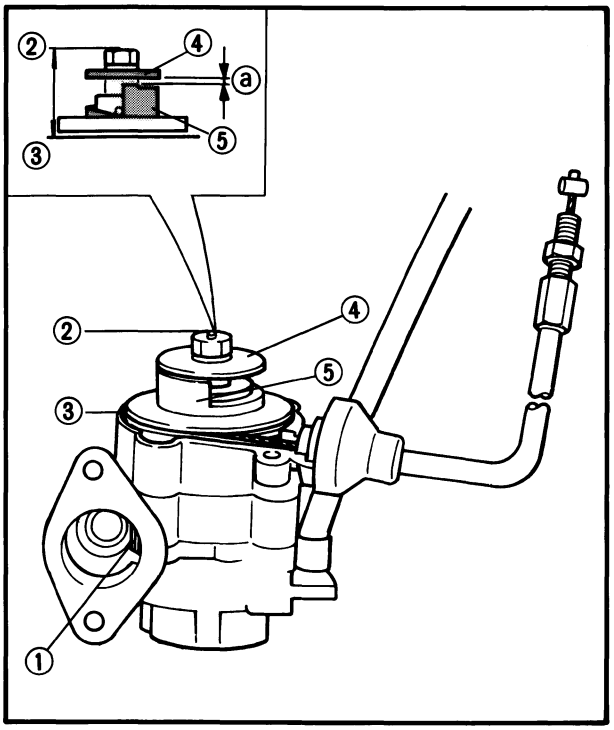
2. Disconnect:
   - Oil hose ①
     From oil pump side.

NOTE:
Plug the oil hose so that the oil does not run out of the oil tank.

   - Oil delivery hoses ②
     From intake manifold.



3. Remove:
   - Oil pump assembly holding screws ①
     Use a long nose screwdriver.
   - Oil pump assembly ②
   - Oil pump cover ③

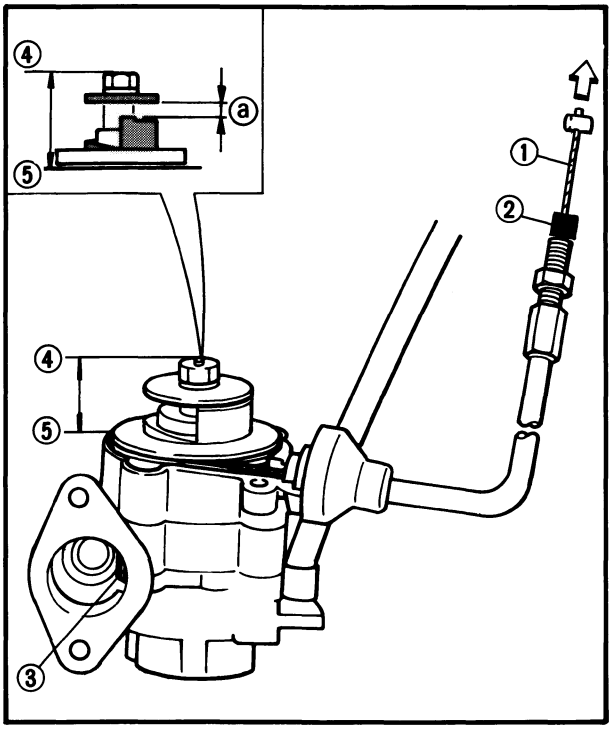


4. Measure:
   - Minimum pump stroke ⓐ

Minimum pump stroke measurement steps:
- Turn the pump worm gear ① with your fingers, until the plunger top ② is at its maximum distance from the pump body mating surface ③ of the pump cover.
- Using a Feeler Gauge, measure the minimum pump stroke a between the adjusting plate ④ and the raised boss ⑤ on the adjusting pulley.

Minimum Pump Stroke ⓐ :
0.20 ~ 0.25 mm
(0.008 ~ 0.010 in)

- If minimum pump stroke is not within the specified limits, perform the adjustment steps.



5. Measure:
   - Maximum pump stroke ⓐ

Maximum pump stroke measurement steps:
- Pull the oil pump cable ① out of its sheather as far as it will go. The cable must be held in this taut position when measuring the maximum pump stroke.

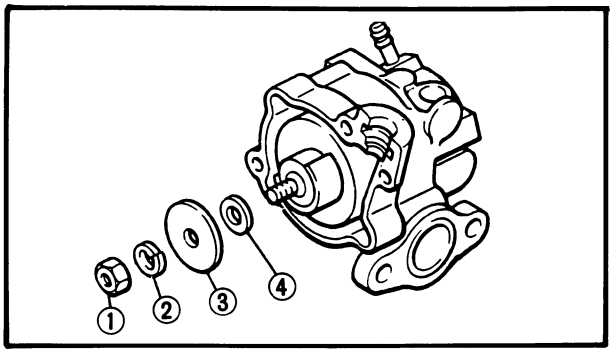
NOTE:
It may be helpful to securely warp duct tape ② around the cable where it enters the sheath.

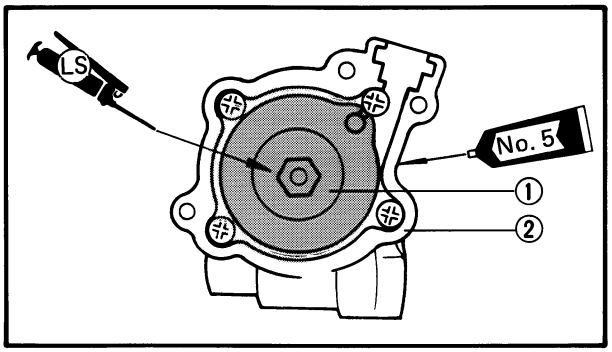
- Turn the pump worm gear ③ with your fingers, until the plunger top ④ is at its maximum distance from the pump body ⑤.
- Using a Feeler Gauge, measure the maximum pump stroke ⓐ .

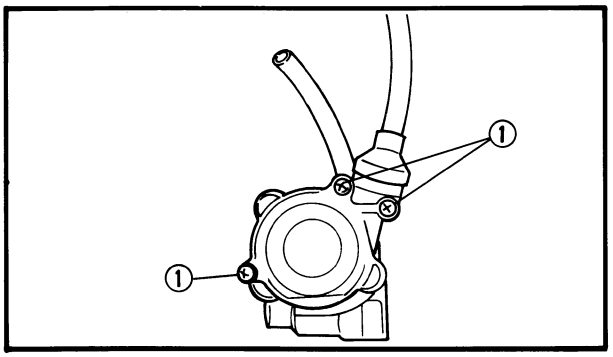
Maximum Pump Stroke ⓐ :
1.65 ~ 1.87 mm
(0.065 ~ 0.074 in)

- If maximum pump stroke is not within the specified limits, perform the adjustment steps.

OIL PUMP INSPECTION







Oil Pump Stroke Adjustment

1. Adjust:
   - Oil pump stroke

Oil pump stroke adjustment steps:

- Remove the locknut ① , spring washer ② and adjusting plate ③ .
- Adjust the pump stroke with the proper sized shim ④ .

Increase Stroke	Increase the shim size.
Decrease Stroke	Decrease the shim size.

- Reinstall the adjusting plate ③ , spring washer ② and locknut ① .

Adjusting Plate Locknut ① :
7 Nm (0.7 m·kg, 4.8 ft·lb)

- Recheck the oil pump stroke. If out of specification limits, perform the above steps again.
- If within specification limits, perform the next steps.
- Apply grease to the adjusting plate around ① , then apply Yamabondo No. 5® to the mating surface ② of pump case cover.
  pump case cover.
- Assemble in reverse order of disassembly. Note the following points.

Pump Case Cover Securing Screw ① :
2 Nm (0.2 m·kg, 1.45 ft·lb)
Pump Body Holding Screw:
4 Nm (0.4 m·kg, 2.9 ft·lb)

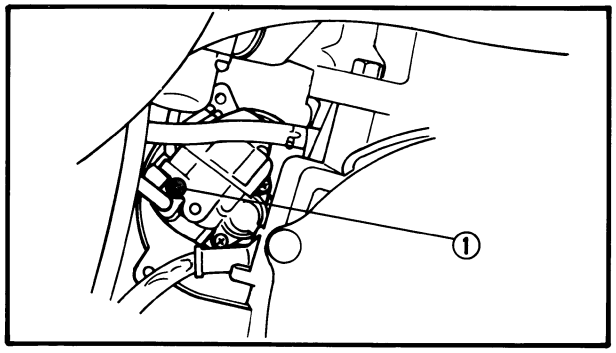
NOTE:

- After connecting the oil hose and oil delivery hose, perform the oil pump air bleeding.
  Refer to **"Oil Pump Air Bleeding"**, page 2-8.
- After connecting the oil pump cable, adjust the pump cable free play.
  Refer to **"Oil Pump Cable Adjustment"**, page 2-4.

Oil Pump Air Bleeding

The oil pump and delivery line must be bled on the following occasions:

- Any portion of the oil system has been disconnected.
- The machine has been turned on its side.
- Whenever the oil tank has been run empty.
- During predelivery.



Pump case and/or oil hose

Air bleeding steps:

NOTE:

- Place a rag under the oil pump.
- Add the YAMALUBE 2-cycle oil to the oil tank before bleeding.

- Remove the bleed screw ①.
- Inspect the bleed screw gasket.
  Damage → Replace.
- Keep the oil running out until air bubbles disappear.
- Install the bleed screw ① with gasket.

NOTE:

- Thoroughly clean the engine exterior of oil.

Pump distributor and/or delivery hose

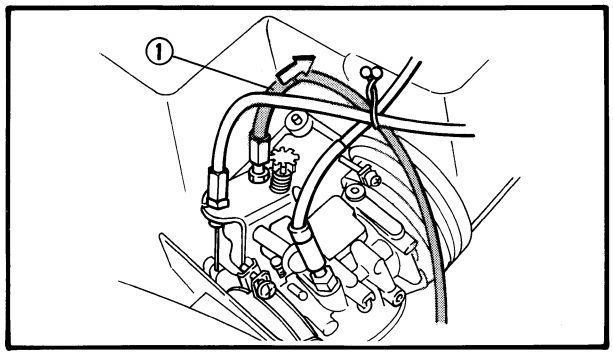
Air bleeding steps:

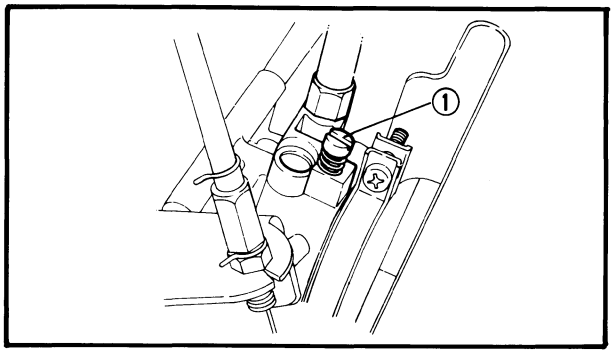
- Start the engine, and keep it running at idle.
- Pull the pump cable ① all the way out to set pump stroke to a maximum.

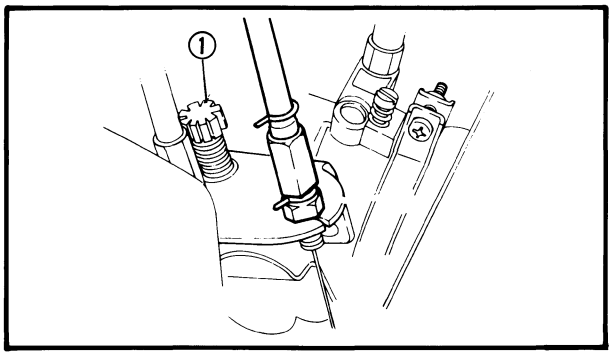
NOTE:

It is difficult to bleed the distributor completely with the pump stroke at a minimum, and therefore the pump stroke should be set to a maximum.

- Keep the engine running at about 2,000 r/min for two minutes or so, and distributor and delivery hose can be completely bled.







CARBURETOR

IDLE MIXTURE SETTING

1. Tighten:
   - Idle mixture screw ① (lightly)
2. Loosen:
   - Idle mixture screw ①
     Back it out from its lightly seated position.

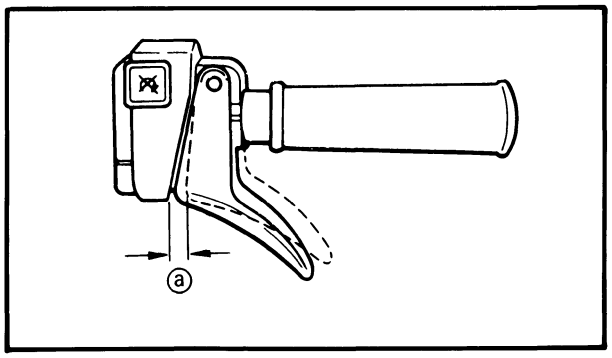
Idle Mixture Screw:
(Standard turn out) 1

IDLE SPEED ADJUSTMENT

NOTE:
Before adjusting the idle speed, the idle mixture should be setting.

1. Adjust:
   - Idle speed:
     Warm up the engine and turn the throttle stop screw ① to adjust.

Engine Idle Speed:
1,600 ± 100 r/min



THROTTLE CABLE ADJUSTMENT

Throttle Cable Free Play

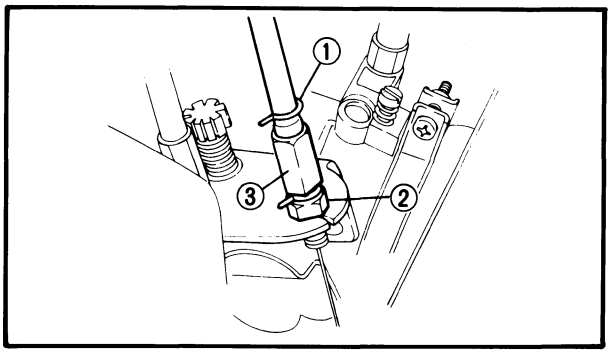
1. Check:
   - Throttle cable free play ⓐ
     Out of specification → Adjust; perform step 2.

Throttle Cable Free Play ⓐ :
1 ~ 2 mm (0.04 ~ 0.08 in)

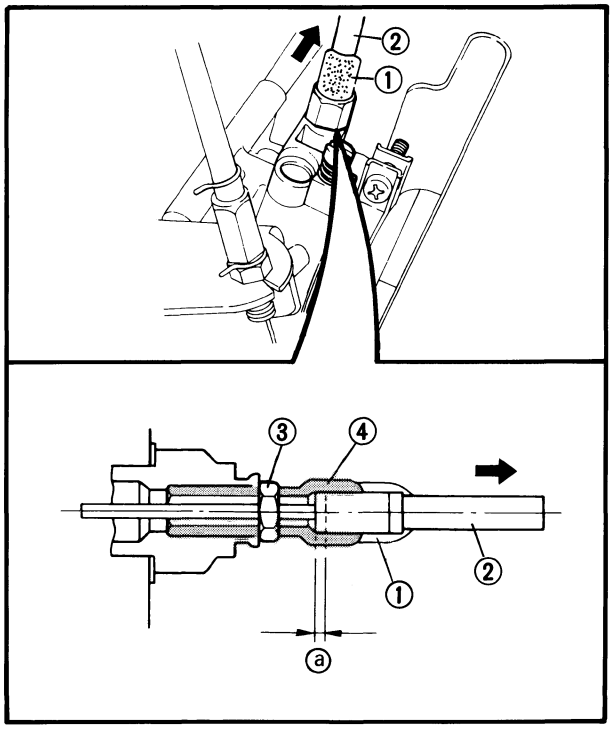
2. Adjust:
   - Throttle cable free play ⓐ

Throttle cable free play adjustment steps:

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



- Remove the clip ①
- Loosen the locknut ②
- Turn the adjuster ③ until the free play is within the specified limits.
- Tighten the locknut ② and install the clip ① .



STARTER CABLE ADJUSTMENT

1. Measure/Adjust:
   - Starter cable free play ⓐ

Starter cable measurement/adjustment steps:

NOTE:
Before adjusting the starter cable, make sure the starter cable is correctly routed.
Refer to "CABLE ROUTING" page 8-13.

- Remove the starter cable rubber cap ① .
- Pull the starter cable outer tube ② upward, and measure the free play ⓐ .

Starter Cable Free Play ⓐ :
0.5 ~ 1.5 mm (0.02 ~ 0.06 in)

- If free play ⓐ is out of the specified limits, loosen the locknut ③ .
- Turn the adjuster ④ until the free play ⓐ is within the specified limits.
- Tighten the locknut ③ .
- Install the starter cable rubber cap ① .

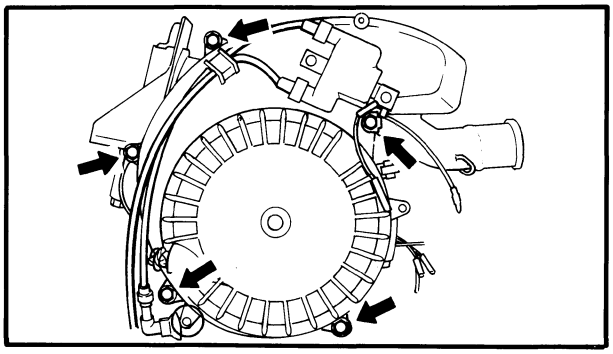
NOTE:
After adjusting the choke cable, make sure that the choke moves smoothly.

ELECTRICAL

IGNITION TIMING

WARNING:

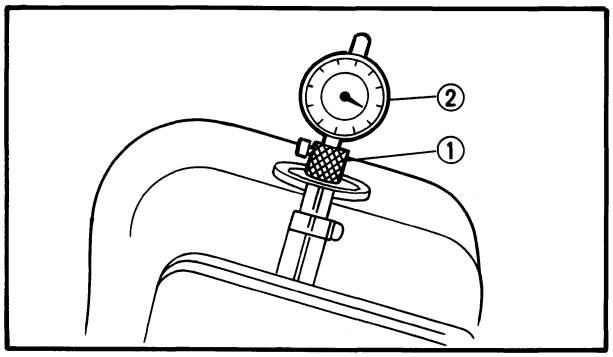
The snowmobile must be elevated and firmly supported by using a suitable device so that the drive track is off the ground and rotates freely as the engine runs.



Ignition Timing Check (Using dial gauge).

1. Open the shroud
2. Remove:
   - Recoil starter assembly

   Refer to "RECOIL STARTER – REMOVAL", page 3-33.

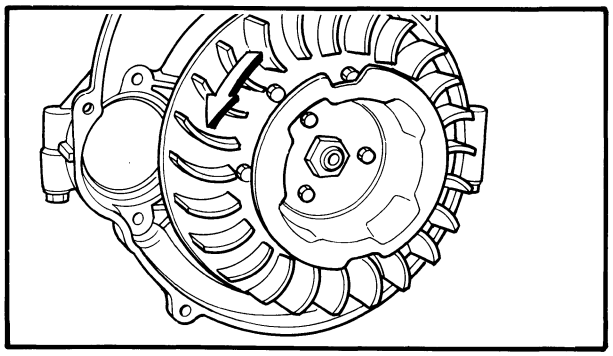


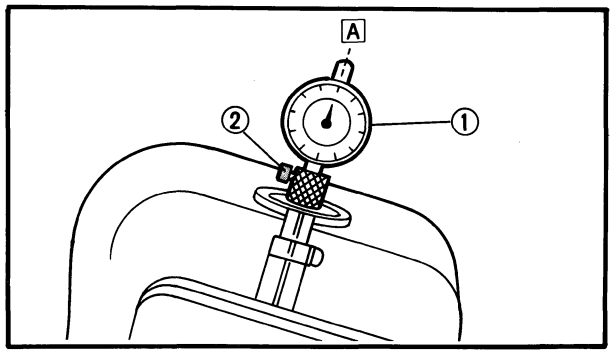
3. Remove:
   - Spark plugs
4. Attach:
   - Dial Gauge Stand (YU-01256) ①

   Into the right side spark plug hole.
5. Insert:
   - Dial Gauge (YU-03097) ② with Dial Gauge Needle (YU-01256-2)

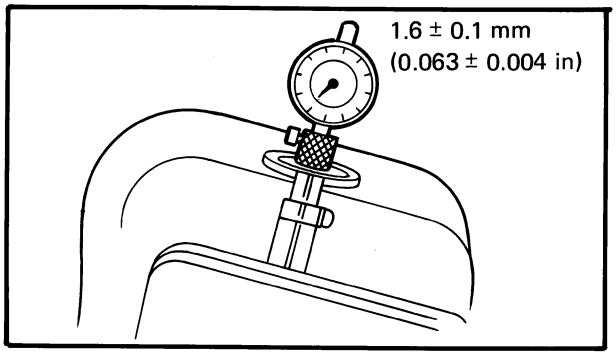
   To the dial gauge stand.
6. Rotate:
   - Flywheel magneto rotor

   Until the piston is at top-dead-center (T.D.C.).



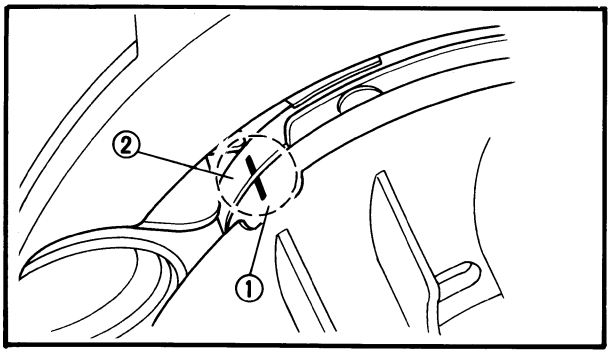


7. Set the dial gauge ① at zero A with the dial gauge needle, and tighten set screw ② on the dial gauge stand to secure dial gauge assembly.
8. Rotate flywheel back and forth to be sure that indicator needle does not go past zero A .

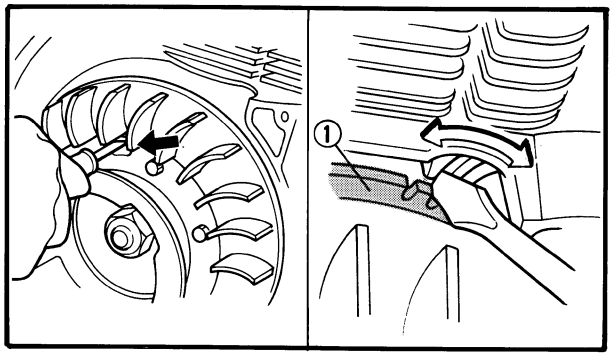


9. Starting at T.D.C. rotate flywheel counterclockwise until dial gauge reads approximately 3-1/2 needle revolutions before-top-dead-center (B.T.D.C.).
10. Slowly turn flywheel clockwise until dial gauge reads specified ignition timing.

Ignition timing (B.T.D.C.):
1.6 ± 0.1 mm (0.063 ± 0.004 in)



11. Check the marks on the flywheel magneto rotor ① and coil base plate ② for alignment.
    If not aligned, adjust ignition timing as following ignition timing adjustment steps.



Ignition timing adjustment steps.
1. Loosen:
   - Coil base plate securing screws
     Move the coil base plate ① until the mark aligns with the mark on the flywheel magneto rotor.
2. Tighten:
   - Coil base plate securing screws

Coil Base Plate Securing Screw:
LOCTITE®
7 Nm (0.7 m·kg, 5.1 ft·lb)

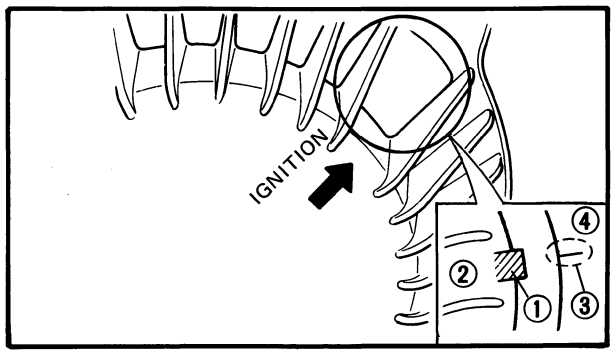
3. Remove:
   - Dial Gauge (YU-03097)
   - Dial Gauge Stand (YU-01256)
4. Install:
   - Spark plugs
   - Recoil starter assembly

Spark Plug:
28 Nm (2.8 m·kg, 20 ft·lb)
Starter Case Holding Bolt:
7 Nm (0.7 m·kg, 5.1 ft·lb)

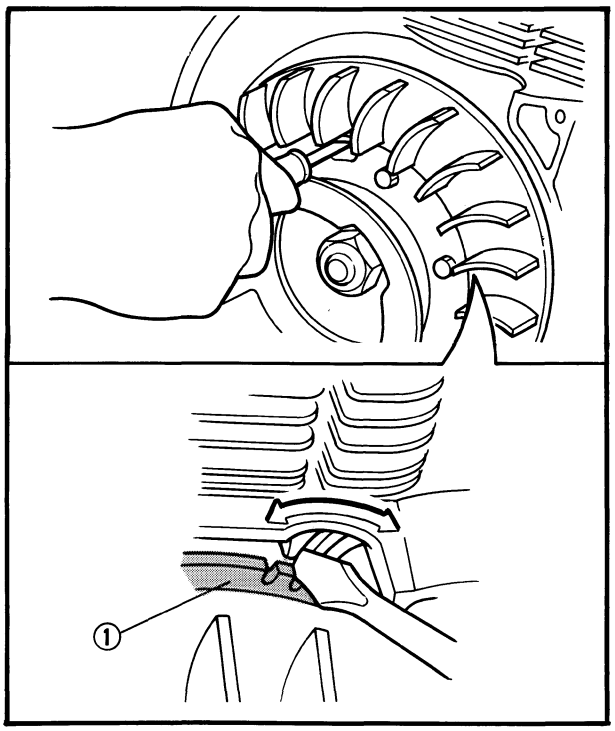
Ignition Timing Check (Using timing light)

1. Attach:
   - Inductive Timing Light (YU-08037)
     To the right side high tension cord.
2. Lift up the rear frame to allow the track to turn fleely.
3. Start the engine and keep the engine speed as specified.

Engine Speed:
5,000 r/min.



4. Using the timing light (YU-08037), check the projection ① on the fan ② and the mark ③ on the crankcase ④ for alignment. If not aligned, adjust ignition timing as following ignition timing adjustment steps.

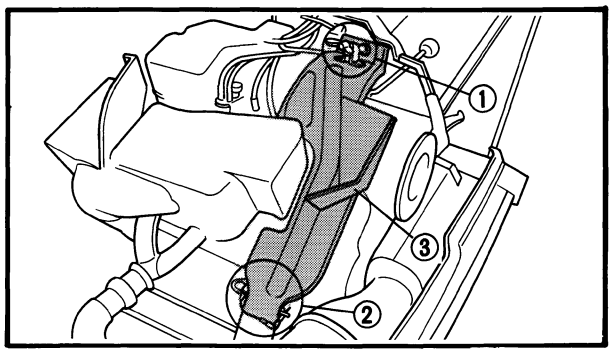


Ignition timing adjustment steps:

1. Remove:
   - Recoil starter
     Refer to "RECOIL STARTER – REMOVAL", page 3-33.
2. Loosen:
   - Coil base plate securing screws
     Move the coil base plate ① to the proper position.
3. Tighten:
   - Coil base plate securing screws

Coil Base Plate Securing Screws:
7 Nm (0.7 m·kg, 5.1 ft·lb)

4. Recheck the ignition timing.
   If not aligned, readjust ignition timing as above steps again.

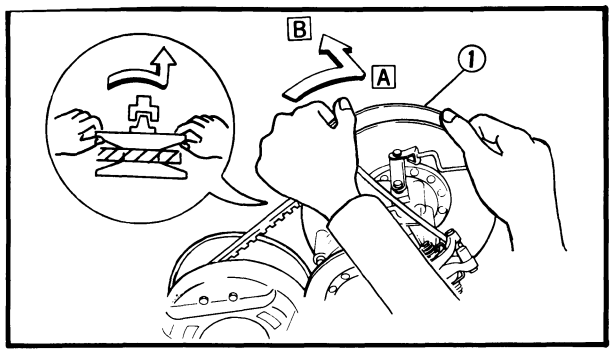


POWAR TRAIN

DRIVE V-BELT

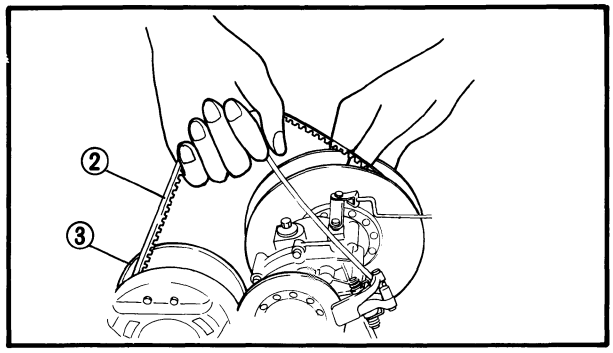
Drive V-belt Removal

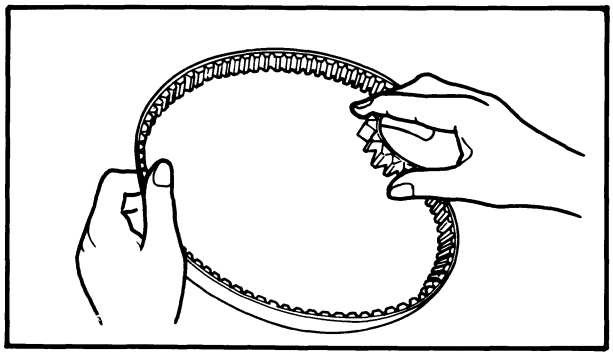
1. Open the shroud.
2. Remove:
   - Wing bolt ①
   - Pin ②
   - Drive V-belt guard ③



3. Remove:
   - Drive V-belt

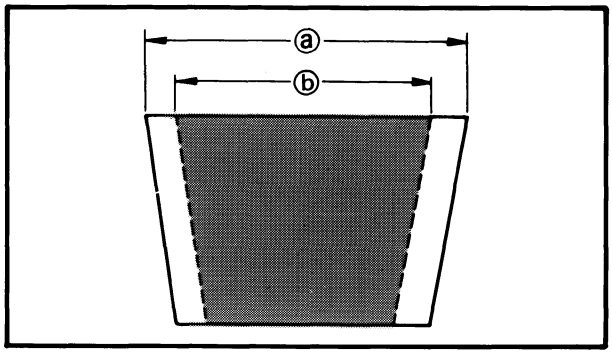
Drive V-belt removal steps:
- Turn the secondary sliding sheave ① clockwise [A] and push it towards the engine [B] .
- While holding the sliding sheave in this compressed position, remove the drive V-belt ② from the secondary sheave, and then from the primary sheave ③ .





Drive V-belt Inspection

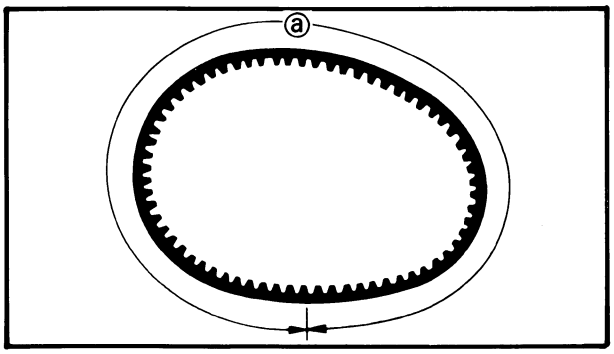
1. Inspect:
   - Drive V-belt
     Crack/Wear/Scaling/Chipping → Replace.
     Oil/grease on primary/secondary sheave → Clean the oil/grease off using a lacquer thinner.



2. Measure:
   - Drive V-belt width ⓐ
     Out of specification limit → Replace.

New Belt Width ⓐ :
31.6 mm (1.24 in)
Wear Limit ⓑ :
28.0 mm (1.10 in)

SHEAVE ADJUSTMENT

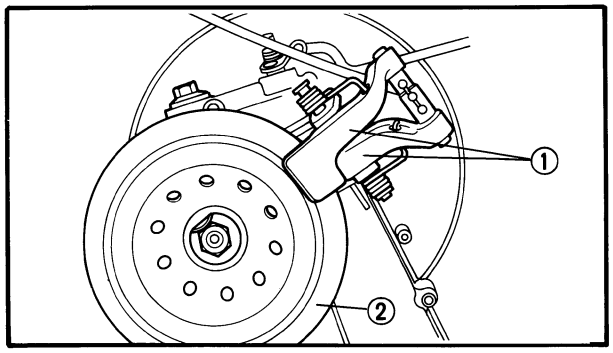


3. Measure:
   - Drive V-belt length ⓐ
     Out of specification → Replace.

Belt Length ⓐ :
1,099 mm (43.27 in)

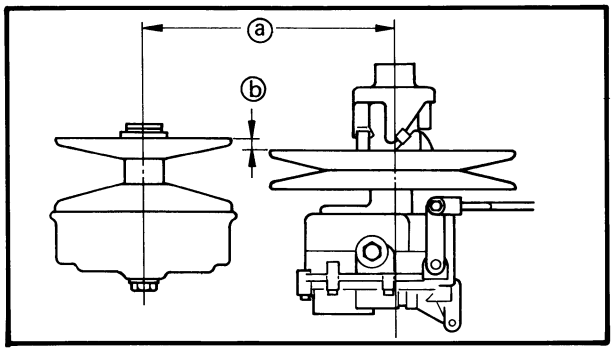
Drive V-belt Installation

When reassembling the drive V-belt, reverse the removal procedure.



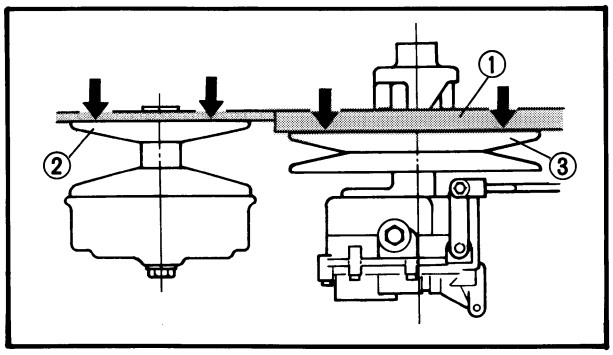
SHEAVE ADJUSTMENT

1. Remove:
   - Drive V-belt
   - Drive V-belt guard
     Refer to "DRIVE V-BELT – Drive V-belt Removal", page 2-14.
   - Brake calipers ①
   - Brake disc ②
     Refer to "BRAKE – DISASSEMBLY", page 5-9.



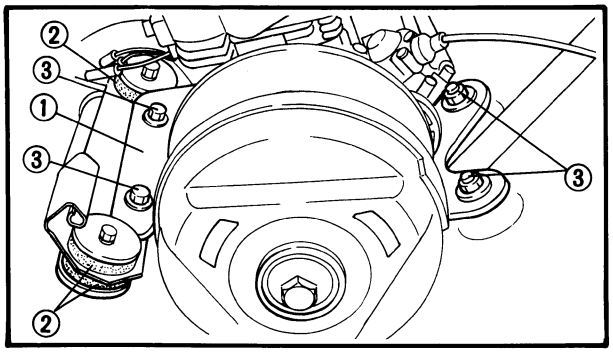
2. Measure:
   - Sheave distance ⓐ
   - Sheave offset ⓑ
     Use the Sheave Gauge (YS-33274)
     Out of specification → Adjust.

Sheave Distance ⓐ :
Approx. 266 mm (10.47 in)
Sheave Offset ⓑ :
Approx. 11 mm (0.43 in)



NOTE:

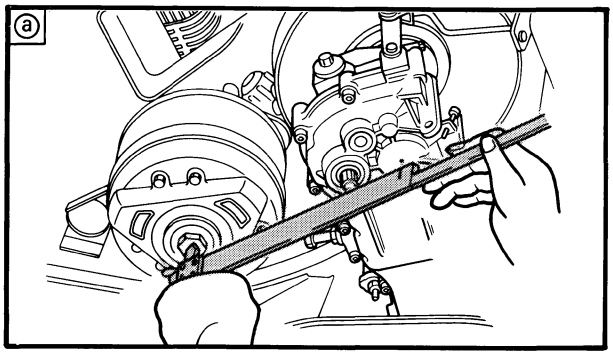
Sheave Gauge ① should contact the primary ② and secondary ③ sheaves at the four indicated points.

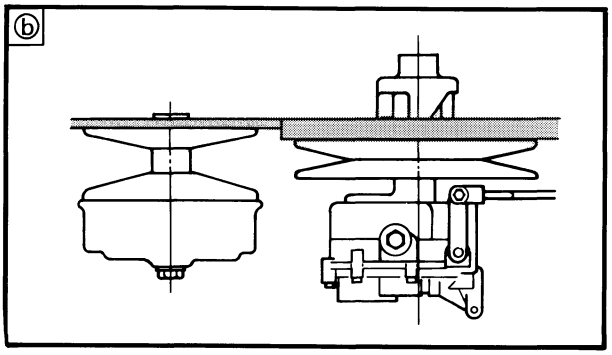


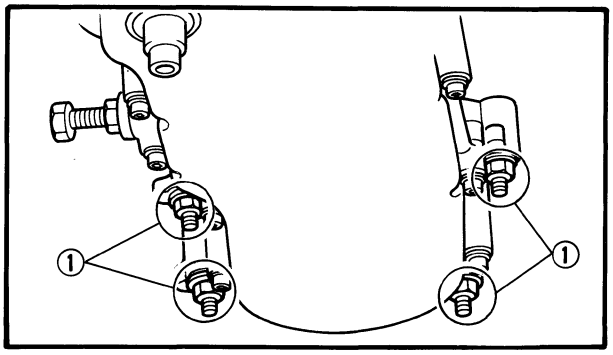
3. Adjust:
   - Sheave distance ⓐ /offset ⓑ

Sheave distance/offset adjustment steps:

- Check the engine mounting bracket ① , dampers ② and frame for bend, crack and weathering. Replace as required.







- Loosen four engine mount bolts and nuts ③ and adjust the position of the engine so that the sheave distance ⓐ and sheave offset ⓑ are within the specified limits.

Sheave Distance ⓐ :
Approx. 266 mm (10.47 in)
Sheave Offset ⓑ :
Approx. 11 mm (0.43 in)

- Tighten the engine mount lightly, then measure the sheave distance ⓐ and offset ⓑ again. Tighten the bolts to the specified torque if they are within the specification.

Engine Mount Bolt and Nut:
30 Nm (3.0 m·kg, 22 ft·lb)

- If the specified sheave distance ⓐ can not be achieved by above procedures, loosen the chain housing holding bolts ① to obtain the correct distance by adjusting the setting position.
- Tighten the chain housing holding bolts ①.

Chain Housing Holding Bolt ① :
15 Nm (1.5 m·kg, 11 ft·lb)

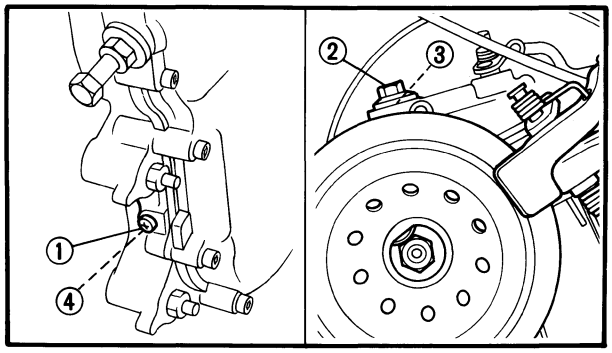
- Reassembly the brake calipers and brake disc.

Brake Disc Securing Nut:
50 Nm (5.0 m·kg, 36 ft·lb)

NOTE:
After installing the brake cable, perform the brake pad clearance and brake lever free play. Refer to "BRAKE ADJUSTMENT", page 2-19.

Brake Pad Clearance:
Inner/Outer:
0.2 ~ 1.0 mm (0.008 ~ 0.04 in)
Brake Lever Free Play:
6 ~ 7 mm (0.24 ~ 0.28 in)

DRIVE CHAIN HOUSING OIL LEVEL INSPECTION



DRIVE CHAIN HOUSING OIL LEVEL INSPECTION

1. Open the shroud
2. Inspect:
   - Drive chain housing oil level
     Oil level low → Add sufficient oil.

Drive chain housing oil level inspection steps:

- Place the machine on a level place.
- Warm up the engine for several minutes, then stop the engine. Leave the engine for few minutes.
- Remove the oil level checking screw ① and oil filler cap ② .

NOTE:

Place a waste under the oil level checking hole.

- Add sufficient oil little by little into the oil filler hole ③ until oil flows out from the level checking hole ④ .
- Allow excess oil to flow out until it stops.

Recommended Oil:
Gear oil API GL-3
or SAE #75 ~ #80.

- Install the oil level checking screw ① and oil filler bolt ② .

Oil Level Checking Screw ① :
7 Nm (0.7 m·kg, 5.1 ft·lb)
Oil Filler Bolt ② :
25 Nm (2.5 m·kg, 18 ft·lb)

CAUTION:

Do not allow foreign material to enter the chain housing.

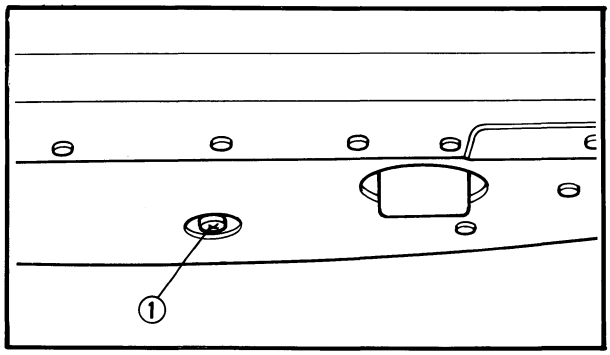
DRIVE CHAIN HOUSING OIL REPLACEMENT

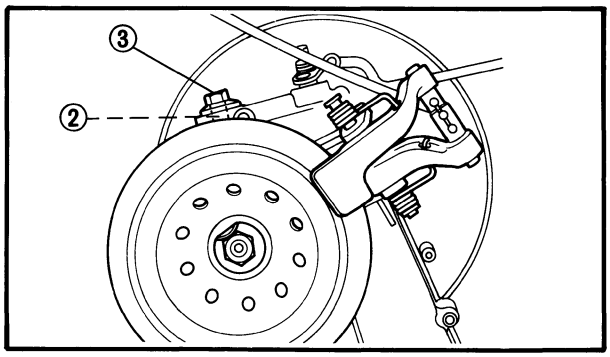
Recommended Oil:
Gear oil API GL-3 or
SAE #75 ~ #80.

Oil Capacity:
Fill until oil begins to runout the level checking hole.
0.3 L (0.26 Imp qt, 0.32 US qt)

Recommended Oil Replacement:
Every 40 hrs. or 800 km (500 miles)

1. Replace:
   - Drive chain housing oil





Drive chain housing oil replacement steps:
- Place the machine on a level place.
- Warm up the engine for several minutes, then stop the engine. Leave the engine for few minutes.
- Place an oil pan under the oil drain hole.
- Remove the oil drain screw ① , and drain the oil completely.
- Tighten the oil drain screw ①.

Oil Drain Screw ① :
7 Nm (0.7 m·kg, 5.1 ft·lb)

- Add oil through the oil filler hole ② .
  Refer to "DRIVE CHAIN HOUSING OIL LEVEL INSPECTION" page 2-17.

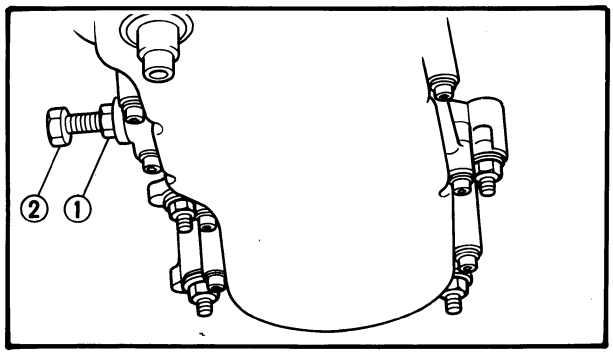
CAUTION:
Do not allow foreign material to enter the chain housing.

- Tighten the oil filler bolt ③ .

Oil Filler Bolt ③ :
25 Nm (2.5 m·kg, 18 ft·lb)

NOTE:
Thoroughly clean the chain housing exterior of oil.

DRIVE CHAIN SLACK ADJUSTMENT/ BRAKE ADJUSTMENT



DRIVE CHAIN SLACK ADJUSTMENT

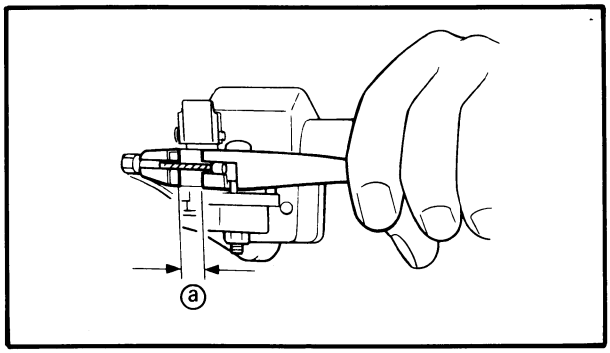
1. Adjust:
   - Drive chain slack

Drive chain slack adjustment steps:
- Loosen the adjusting bolt lock nut ①
- Loosen the adjusting bolt ②
- Retighten the adjusting bolt ② , until stop with a finger.

NOTE:
While tightening the adjusting bolt ② , rotate the secondary sheave.

- Tighten the adjusting bolt lock nut ① .

Adjusting Bolt Locknut ① :
30 Nm (3.0 m·kg, 22 ft·lb)



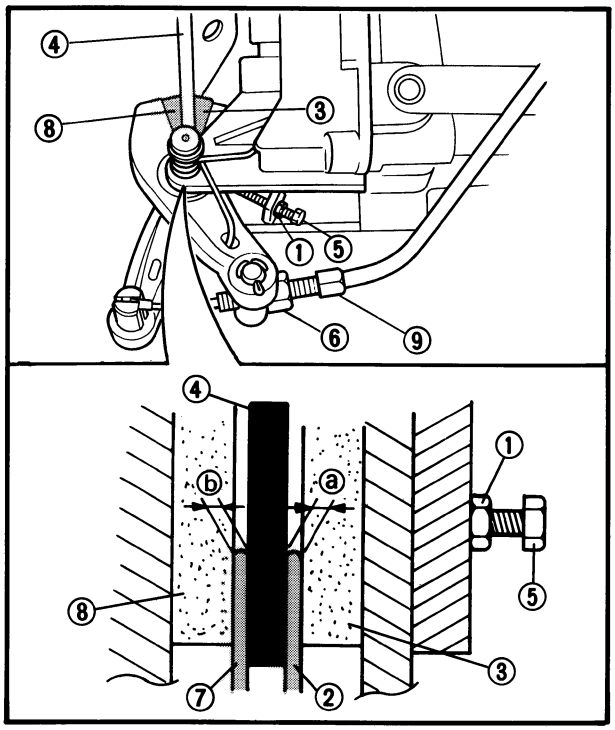
BRAKE ADJUSTMENT

Brake Lever Free Play

1. Measure:
   - Brake lever free play ⓐ
     Out of specification → Adjust; perform step 2.

Brake Lever Free Play ⓐ :
6 ~ 7 mm (0.24 ~ 0.28 in)

NOTE:
Proper adjustment of the outer and inner pad gaps will result in specified free play between the brake lever and holder.



2. Adjust:
   - Inner and outer pads clearance.

Inner and outer pads clearance adjustment steps:

- Loosen the inner pad adjusting screw locknut ①.
- Insert the feeler gauge ② between the inner pad ③ and disk rotor ④.
- Turn the adjusting screw ⑤ clockwise or counterclockwise until proper clearance ⓐ is attained.

Inner Pad Clearance ⓐ :
0.2 ~ 1.0 mm (0.008 ~ 0.04 in)

- Hold the adjusting screw ⑤ to prevent it from moving and thoroughly tighten the locknut ①.

Adjusting Screw Locknut ① :
10 Nm (1.0 m·kg, 7.2 ft·lb)

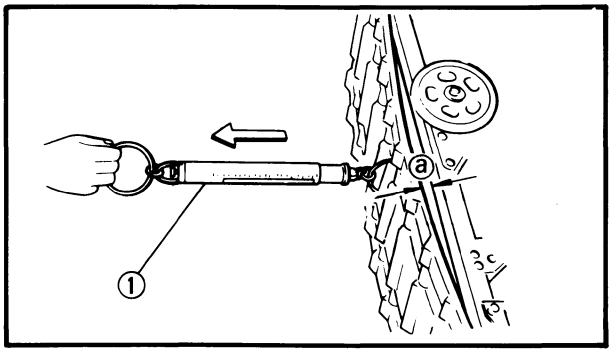
- Loosen the outer pad adjusting screw locknut ⑥.
- Insert the feeler gauge ⑦ between the outer pad ⑧ and disk rotor ④.
- Turn the adjusting screw ⑨ clockwise or counterclockwise until proper clearance ⓑ is attained.

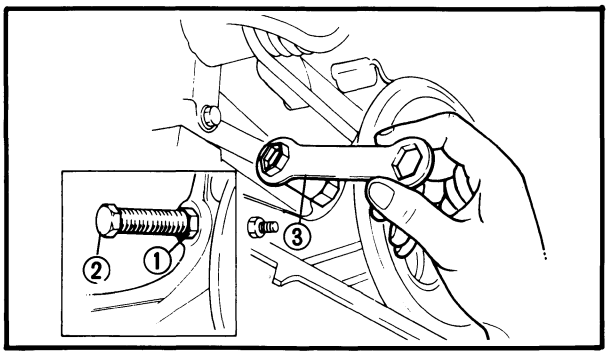
Outer Pad Clearance ⓑ :
0.2 ~ 1.0 mm (0.008 ~ 0.04 in)

- Hold the adjusting screw ⑨ to prevent it from moving and thoroughly tighten the locknut ⑥.

Adjusting Screw Locknut ⑥ :
3 Nm (0.3 m·kg, 2.2 ft·lb)

- Make sure the inner ⓐ and outer ⓑ pad clearance is within the specification.
- Check the brake lever free play. It should be within the specified free play. If not, perform the above steps again.





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 directly behind the snowmobile when starting forward.**
- **When the engine is running and the track is engaged with the snowmobile on its side, do not allow anyone to stand behind or on the track side of the snowmobile. The operator must stay on the seat side (near the machine front).**
- **A suitable stand must be applied under the rear bumper in order to rotate the track by running the engine.**
- **Replace any track that is damaged to the depth where fabric reinforcement material is visible. Inspect track condition frequently.**

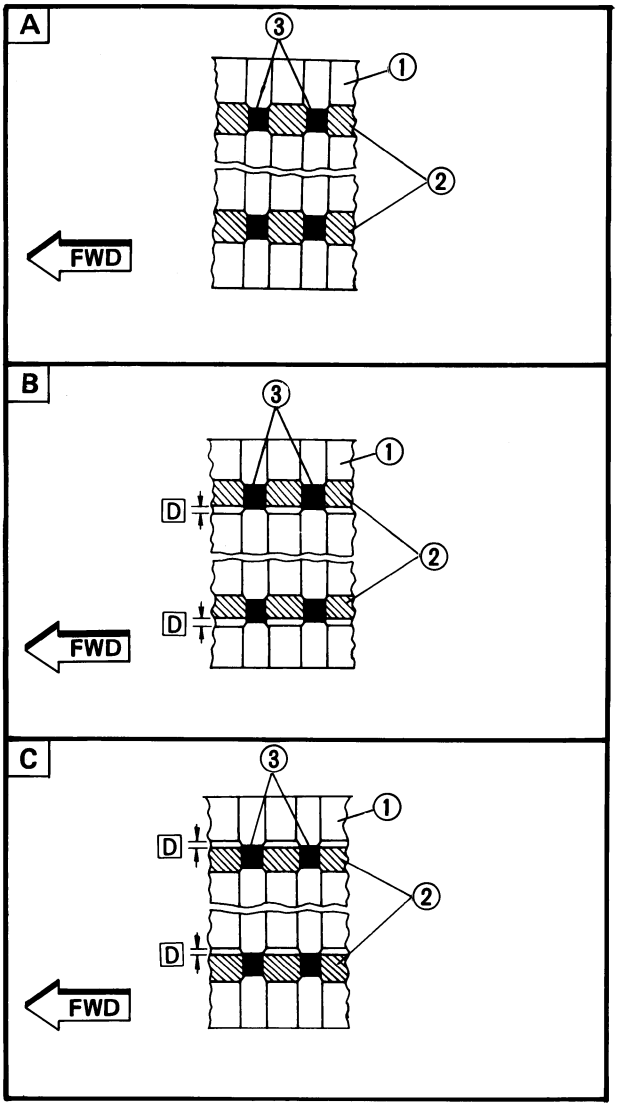
1. Check:
   - Track tension
     Pull at its track center window by a force of 10 kg (22 lb) using a spring scale ①
     Out of specification → Adjust; perform the step 2.

Track Tension ⓐ :
40 ~ 50 mm/10 kg
(1.6 ~ 2.0 in/22 lb)

2. Adjust:
   - Track tension

Track tension adjustment steps.

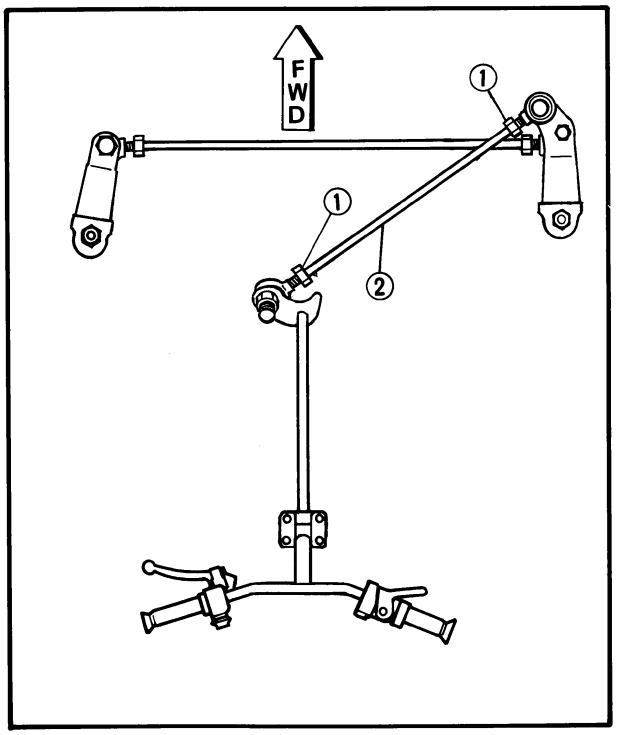
- Turn the track by running the engine, then stop the engine.
- Loosen the track tension adjusting bolt locknuts ① .
- Turn the both right and left track tension adjusting bolts ② using a box wrench ③ until the track tension is within the specification.



- Be sure that the track ① and slide rail ② are correctly aligned as shown in figure A . If they are misaligned as indicated in the figure B and C , correct as follows.
  1) B (when shifted to the right)
     Tighten the right track adjusting bolt, and loosen the left track adjusting bolt.
  2) C (when shifted to the left)
     Tighten the left track adjusting bolt and loosen the right track adjusting bolt.
- By repeating the above procedures the track should be brought in alignment with correct tension.
- After making sure all adjustments are correct, tighten the adjusting bolt lock nuts.

Adjusting Bolt Locknut:
30 Nm (3.0 m·kg, 22 ft·lb)

③ Track metal
D GAP BETWEEN SLIDE RUNNER AND EDGE OF TRACK WINDOW.



CHASSIS

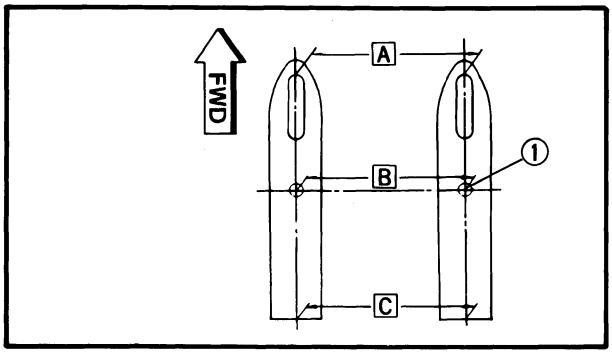
SKI ADJUSTMENT (TO THE HANDLE BAR)

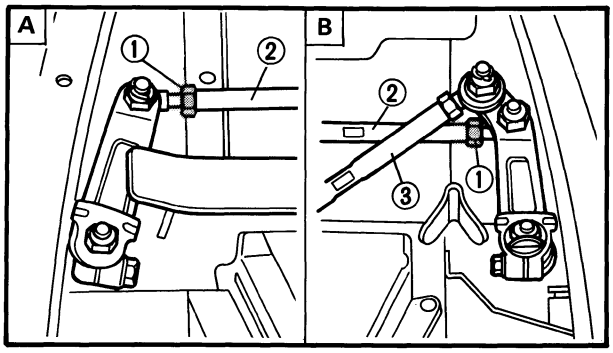
1. Place the machine on a level place.
2. Bring the handlebar in the straight forward position, then check to see that the skis are facing forward straightly.
   If not, adjust it by taking the following steps.

Ski adjustment steps:
- Open the shroud.
- Loosen the steering relay rod locknuts ① .
- Turn the steering relay rod ② in or out until adjustment is suitable.
- Tighten the steering relay rod locknuts ① .

Steering Relay Rod Locknuts ① :
LOCTITE®
25 Nm (2.5 m·kg, 18 ft·lb)

SKI TOE-OUT ADJUSTMENT/ SLIDE RAIL SUSPENSION SETTING





SKI TOE-OUT ADJUSTMENT

1. Place the machine on a level place.
2. Measure:
   - Toe-out

   Position the ski straight ahead.

   Out of specification → Adjust; perform step 3.

Toe-Out (A – C):
0 ~ 15 mm (0 ~ 0.59 in)
Ski Width B :
880 mm (34.6 in)

3. Adjust:
   - Toe-out

Ski toe-out adjustment steps:
- Loosen the tie rod locknuts ① .
- Turn the tie rod ② in or out until the toe-out is within the specification.

To Reduce	Turn the tie rod ② to make its length longer.
To Increase	Turn the tie rod ② to make its length shorter.

- Tighten the tie rod lock nuts ① .

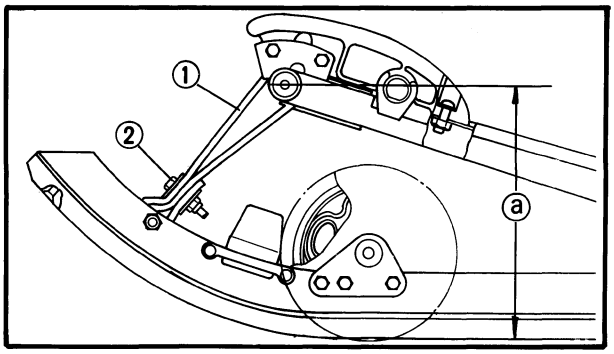
Tie Rod Lock Nut ① :
LOCTITE®
25 Nm (2.5 m·kg, 18 ft·lb)

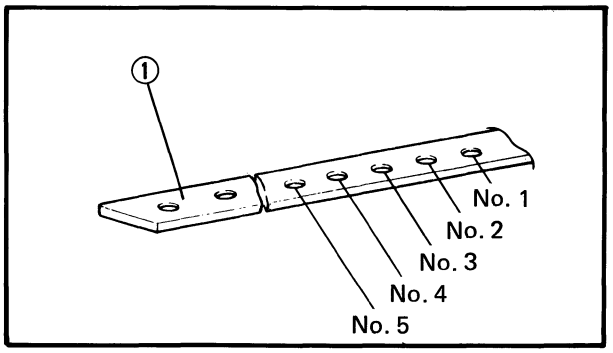
- Compress the front suspension by standing on the front bumper.
- Check the toe-out. If out of specification, perform the above steps again.

A LEFT SIDE
B RIGHT SIDE
③ Steering relay rod

SLIDE RAIL SUSPENSION SETTING

NOTE:
- The slide rail suspension springs are determining factor in machine stability.
- Consider the course condition and rider's weight when setting the suspension springs.
- The slide rail suspension should be set as soft as possible without impairing the stability of the machine.





Front Spring Setting

The performance of the suspension can be adjusted by changing the height ⓐ of the suspension.
(That is, by adjusting the length of stopper band ①)

② Stopper band securing bolt

1. Adjust:
   - Front spring preload
     By adjusting the length of stopper band.

Front spring preload adjustment steps:
- Remove the stopper band securing bolt ② .
- Adjust the length of stopper band ① .
  Refer to "Front spring preload setting table".

Length of stopper band	Spring preload
Lower (No. 1)	Decrease
Std. (No. 2)	Normal
Higher (No. 5)	Increase

- Tighten the stopper band securing bolt ② .

Stopper Band Securing Bolt:
4 Nm (0.4 m·kg, 2.9 ft·lb)

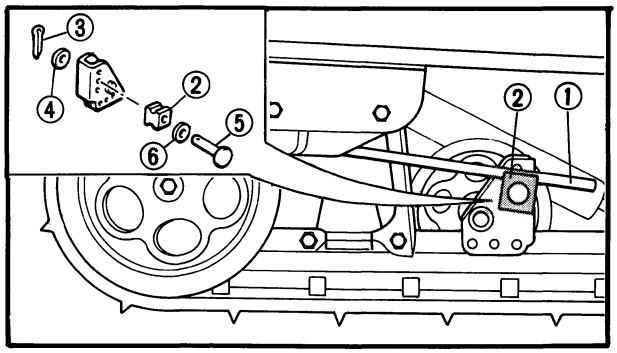
Front spring preload setting table

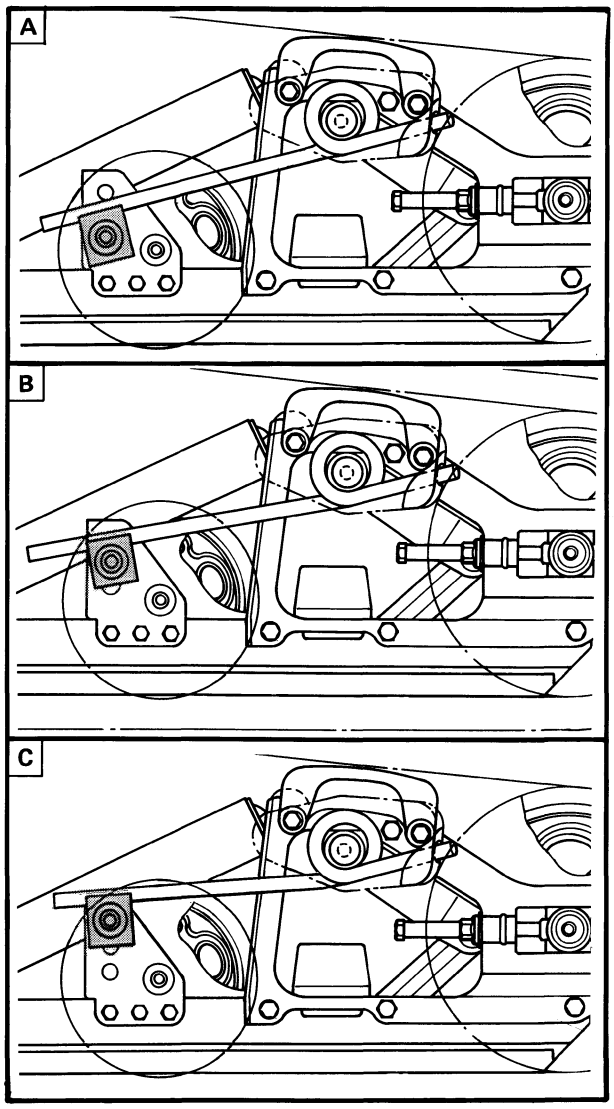
Snow condition	Length of stopper band	Track side slip	Performance of straight running	Bumping and pitching	Riding comfort
Hard packed	Lower	Increase	Poor	Less	Poor
	Std.	Normal	Normal	Normal	Normal
	Higher	Decrease	Good	More	Good
Soft deep snow	Lower	Increase	Good	—	Poor
	Std.	Normal	Normal	—	Normal
	Higher	Decrease	Poor	—	Good

Rear Spring Setting

The performance of the suspension can be adjusted by changing the hook setting position of the rear suspension.

1. Adjust:
   - Rear spring preload





Rear spring preload adjustment steps:

- Remove the rear springs ① from the hooks ② .
- Remove the cotter pin ③ washer ④ , hook holding pin ⑤ , washer ⑥ and hook ② .
- Adjust the spring preload with the spring hook. Refer to "Rear spring preload setting table".

A	LOWER	Spring preload is decrease.
B	MIDDLE	Normal setting position.
C	UPPER	Spring preload is increase.

- Assemble in reverse order of disassembly.

WARNING:

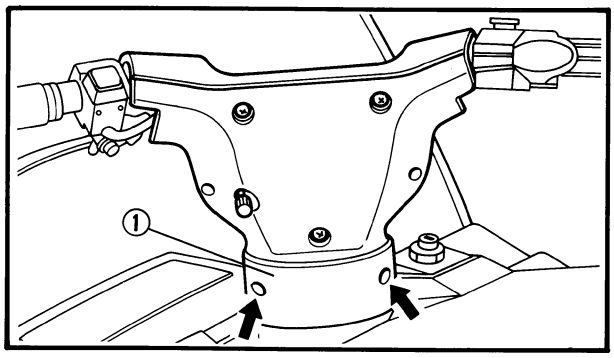
Must be set both the right and left springs to the same position.

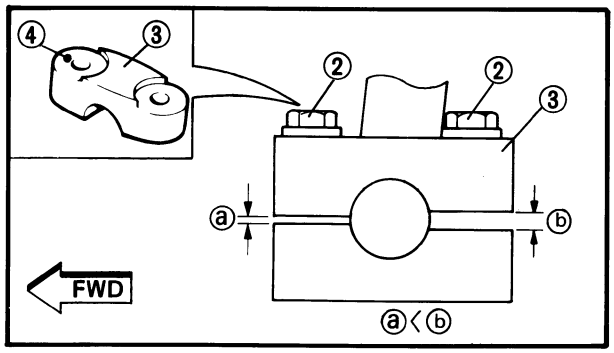
Rear spring preload setting table

Rear spring hook setting position	Handling	Track side slip	Perform-ance of straight running	Bumping and pitching	Riding comfort
LOWER	Easy	Increase	Poor	Less	Good
MIDDLE	Normal	Normal	Normal	Normal	Normal
UPPER	Hard	Decrease	Good	More	Poor

HANDLEBAR ADJUSTMENT

The height of the handlebars can be adjusted to suit the rider's preference.





1. Adjust:
   - Handlebar height

Handlebar height adjustment steps:
- Remove the handlebar lower cover ①.
- Loosen the handlebar holder securing bolts ②.
- Adjust the handlebar height by moving the handlebars up or down.
- Tighten the handlebar holder securing bolts ②.

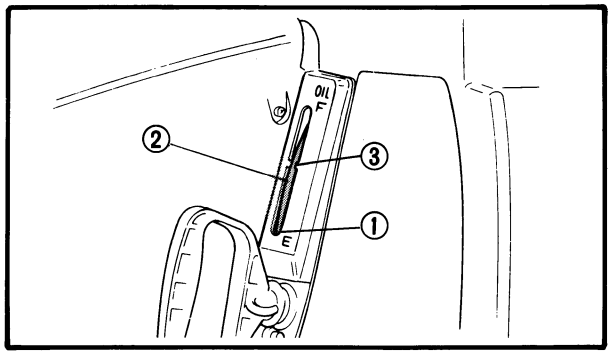
Handlebar Holder Securing Bolts ② : 15 Nm (1.5 m·kg, 11 ft·lb)

NOTE:

The upper handlebar holder ③ should be installed with the punched mark ④ forward.

CAUTION:

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

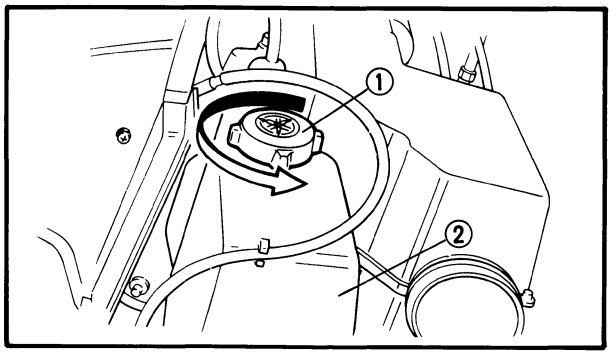


ENGINE OIL LEVEL INSPECTION

1. Place the machine on a level place.
2. Inspect:
   - Engine oil level
     Oil level "E" line ① → Add suffice.

① Empty line
② Oil level gauge
③ 1/2 line

SLIDE RUNNER INSPECTION/OIL FILTER INSPECTION

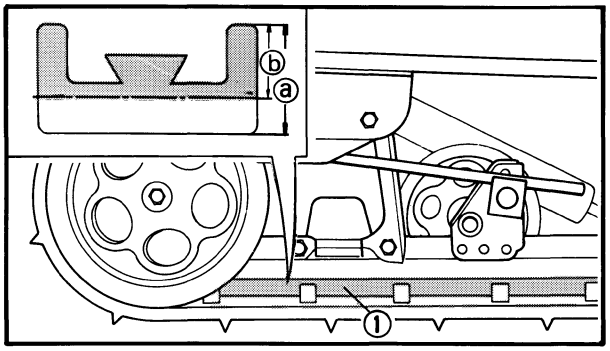


3. Open the shroud
4. Remove:
   - Oil filler cap ①
5. Fill:
   - Engine oil tank ②

Recommended Oil:
YAMALUBE 2-cycle oil
Oil Capacity:
2.4 L (2.1 Imp qt, 2.5 US qt)

CAUTION:

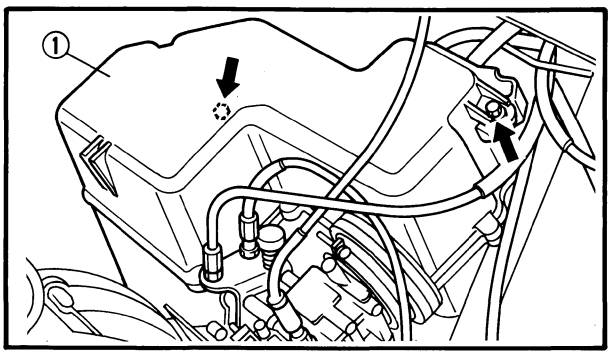
Always use the same type of engine oil; mixing oils may result in a harmful chemical reaction and lead to poor performance.



SLIDE RUNNER INSPECTION

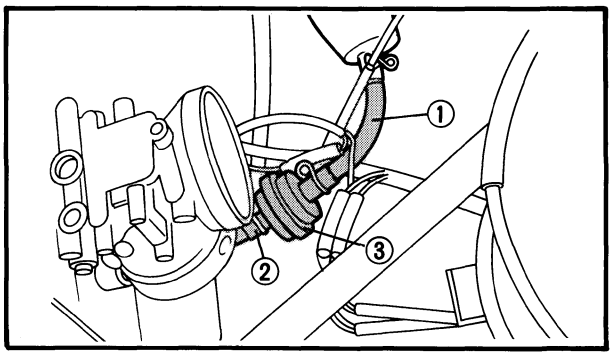
1. Inspect:
   - Slide runners ①
   Cracks/Damage/Wear → Replace.
2. Measure:
   - Slide runners ①
   Out of specification → Replace.
   Refer to "CHAPTER 5. POWER TRAIN – SLIDE RAIL SUSPENSION", page 5-27.

Slide Runner Thickness:
New ⓐ : 15 mm (0.6 in)
Wear Limit ⓑ : 10 mm (0.4 in)



OIL FILTER INSPECTION

1. Open the shroud.
2. Remove:
   - Intake silencer assembly ①

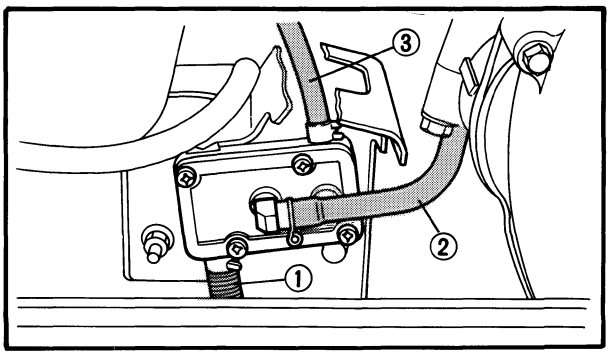


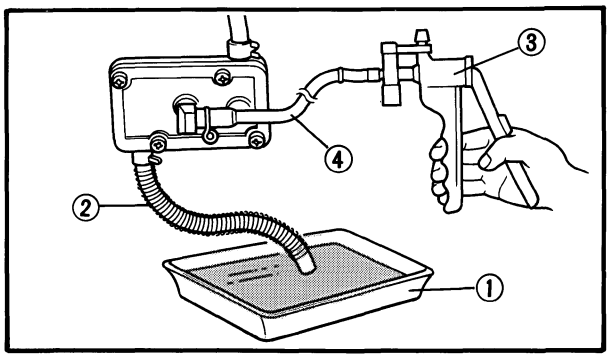
3. Disconnect/Remove:
   - Oil hose 1 (from oil tank) ①
   - Oil hose 2 (to oil pump) ②
   - Oil filter ③

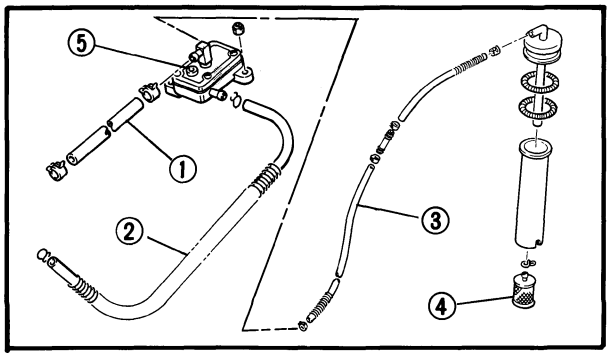
NOTE:
Plug the oil hoses so that the oil will not run out of the oil tank and oil pump.

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

Recommended Replacement Interval:
Every Season







FUEL PUMP INSPECTION

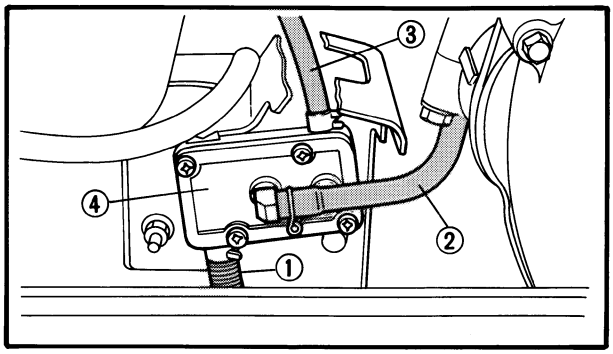
Pump Operation Checking

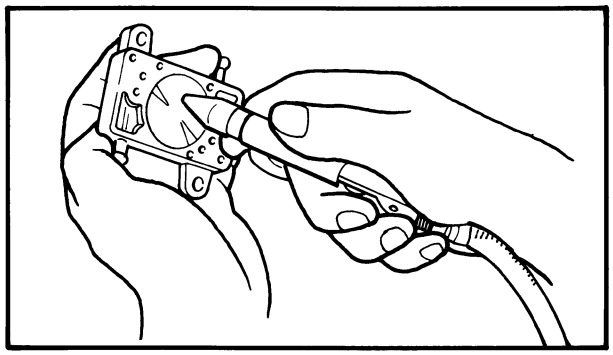
1. Open the shroud.
2. Disconnect:
   - Fuel feed hose ①
     From carburetor.
   - Pulser hose ②
     From crankcase.

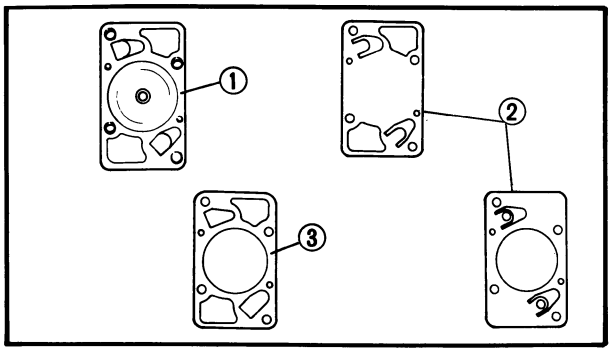
③ Fuel hose

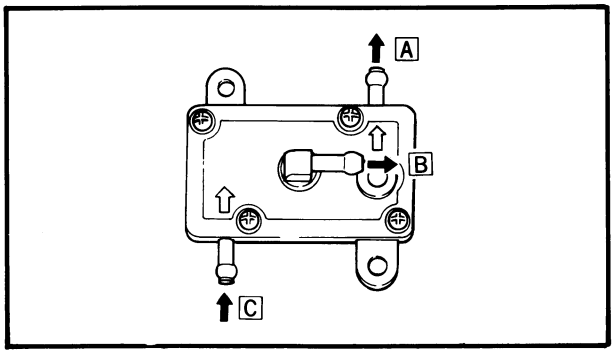
3. Place a receptacle ① under the fuel feed hose ② end.
4. Connect:
   - Mighty-vac ③
     To the pulser hose ④ of the fuel pump.
5. Operate the Mighty-vac, when check that the fuel flows out from the fuel feed hose ② end.
   If fuel does not flow out, inspect the following points.
   - Disconnection or damage of the pulser hose ① .
   - Bending, clogging, or damage of the fuel feed hose ② and fuel hose ③ .
   - Clogging of the fuel filter ④ .
   - Damage of internal parts of the fuel pump ⑤ .

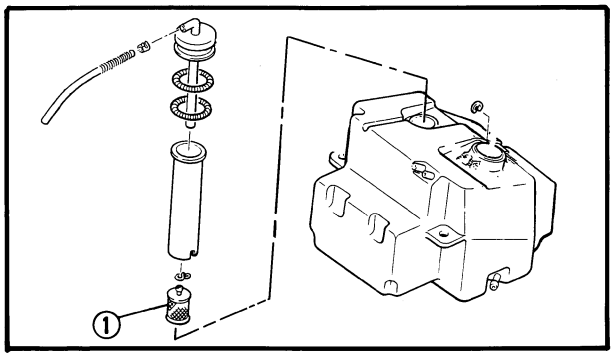
FUEL FILTER INSPECTION











Component Parts Inspection

1. Disconnect:
   - Fuel feed hose ①
     From carburetor
   - Pulser hose ②
     From crankcase
   - Fuel hose ③
     From fuel tank
2. Remove:
   - Fuel pump assembly ④
3. Disassemble the fuel pump
4. Inspect:
   - Fuel pump body
     Contamination → Clean.
     Cracks/Damage → Replace.

NOTE:

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

5. Inspect:
   - Diaphragm ① /Valve petals ②
     Torn/Fatigue/Cracks → Replace.
   - Gasket ③
     Torn/Damage → Replace.
6. Assemble and install the fuel pump.

Fuel Pump Holding Bolt:
7 Nm (0.7 m·kg, 5.1 ft·lb)

7. Reconnect the hoses as shown.

NOTE:

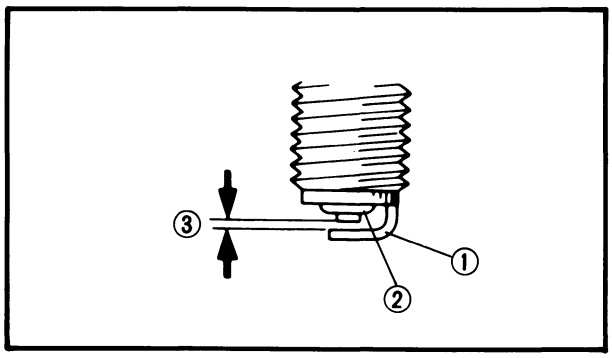
Be sure to connect the hoses correctly, when connecting.

[A] TO CARBURETOR
[B] TO CRANKCASE
[C] FROM FUEL TANK

FUEL FILTER INSPECTION

1. Inspect:
   - Fuel filter ①
     Contamination → Replace.

Recommended Replacement Interval:
Every Season



ELECTRICAL

SPARK PLUG INSPECTION

1. Inspect:
   - Electrode ①
     Wear/Damage → Replace.
   - Insulator color ②
     Normal condition is a medium to light tan color.
     Distinctly different color → Check the engine condition.

③ Spark plug gap

2. Clean:
   - Spark plug
     Clean the spark plug with a spark plug cleaner or wire brush.
3. Inspect:
   - Spark plug type
     Incorrect → Replace.

Standard Spark Plug:
BR9ES (NGK)

4. Measure:
   - Spark plug gap
     Out of specification → Regap.
     Use a wire gauge.

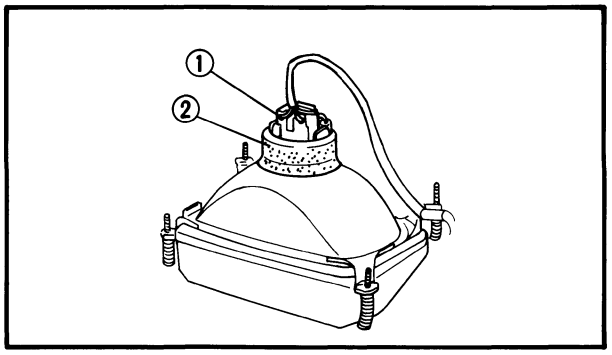
Spark Plug Gap:
0.7 ~ 0.8 mm (0.028 ~ 0.031 in)

5. Tighten:
   - Spark plug

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

Spark Plug:
28 Nm (2.8 m·kg, 20 ft·lb)

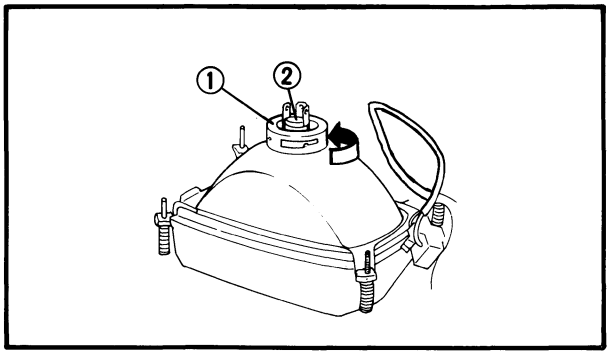
NOTE:
If a torque wrench is not available when you are installing a spark plug, a good estimate of the correct torque is 1/4 to 1/2 turns part finger tight. Have the spark plug torqued to the correct value as soon as possible with a torque wrench.



HEADLIGHT

Headlight Bulb Replacement

1. Open the shroud
2. Disconnect:
   - Headlight connector ①
3. Remove:
   - Bulb holder cover ②



4. Remove:
   - Bulb holder ①
     Turn it counterclockwise.
   - Bulb (Defective) ②

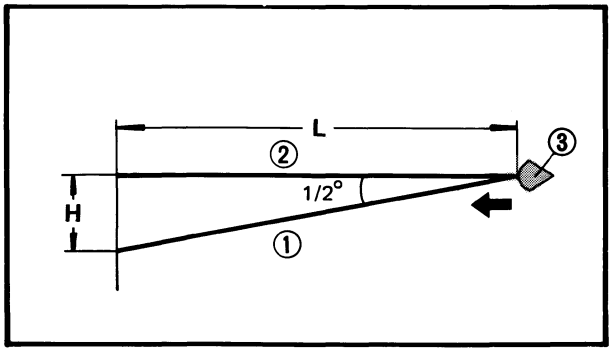
WARNING:

Keep flammable products or your hands away from the bulb while it is on, it will be hot. Do not touch the bulb until it cools down.

5. Install:
   - Bulb (new)
     Be sure the bulb is properly positioned.

Headlight Bulb: 12V, 60W/60W

6. Assemble in reverse order of disassembly.

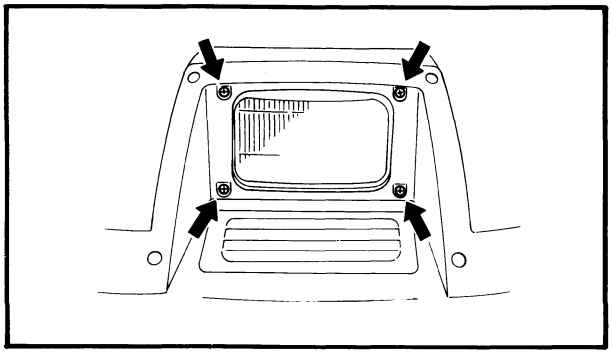


Headlight Beam Adjustment

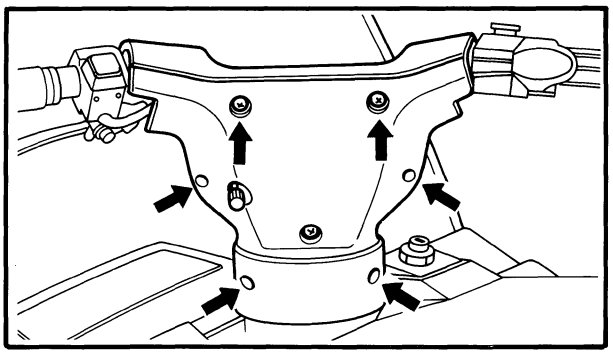
1. Inspect:
   - Headlight beam direction
     The high beam ① must be directed downward at an angle of 1/2 to the horizontal line ② .

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

③ Headlight



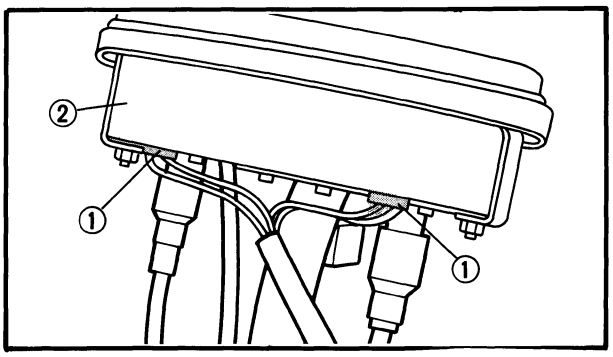
2. If necessary, adjust headlight beam by turning clockwise or counterclockwise.



METER LIGHTS

Meter Lights Replacement

1. Open the shroud
2. Remove:
   - Handlebar covers

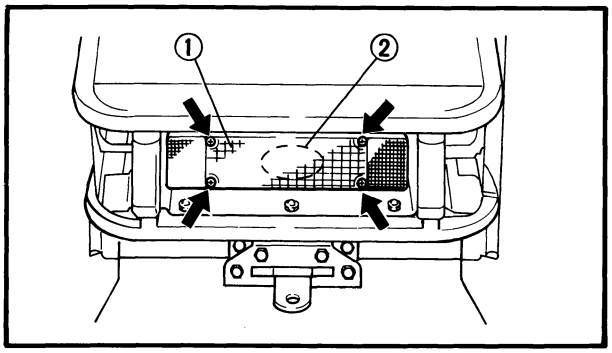


3. Remove:
   - Bulbs

   Pull out the bulb holders ① from the meter case ② then pull out the bulbs from the holders.
4. Install:
   - Bulbs (new)

Meter Light Bulb:
12V, 3.4W x 2

5. Assemble in reverse order of disassembly.



TAIL/BRAKE LIGHT

Tail/Brake Light Replacement

1. Remove:
   - Taillight lense ①
   - Bulb (defective) ②

   Turn it counterclockwise.
2. Install:
   - Bulb (new)

Tail/Brake Light Bulb:
12V, 8W/23W

3. Assemble in reverse order of disassembly.

CHAPTER 3.
ENGINE

ENGINE REMOVAL 3-1
PREPARATION FOR REMOVAL 3-1
DRIVE V-BELT 3-2
CARBURETOR AND CABLES 3-2
MUFFLER 3-3
LEAD AND HOSE 3-3
RECOIL STARTER HANDLE 3-3
ENGINE REMOVAL 3-4

ENGINE DISASSEMBLY 3-4
AIR SHROUD AND RECOIL STARTER 3-4
FLYWHEEL MAGNETO 3-5
PRIMARY SHEAVE 3-6
PUMP DRIVE GEAR UNIT AND OIL PUMP 3-7
CYLINDER HEAD AND CYLINDER 3-8
PISTON AND PISTON PIN 3-8
CRANKCASE AND CRANKSHAFT 3-9

INSPECTION AND REPAIR 3-9
CYLINDER HEAD 3-9
CYLINDER 3-10
PISTON 3-11
PISTON RING 3-12
PISTON PIN AND BEARING 3-13
CRANKSHAFT 3-13
OIL PUMP GEARS 3-14
DRIVE GEAR UNIT CASE 3-15
CRANKCASE 3-15

ENGINE ASSEMBLY AND ADJUSTMENT 3-16
CRANKCASE AND CRANKSHAFT 3-16
PISTON, CYLINDER AND CYLINDER HEAD 3-19
OIL PUMP AND DRIVE GEAR UNIT 3-22
PRIMARY SHEAVE ASSEMBLY AND CDI MAGNETO 3-26
AIR SHROUD 3-28
REMOUNTING ENGINE 3-30

RECOIL STARTER 3-32
REMOVAL 3-33
DISASSEMBLY 3-33
INSPECTION 3-34
ASSEMBLY 3-34
INSTALLATION 3-36

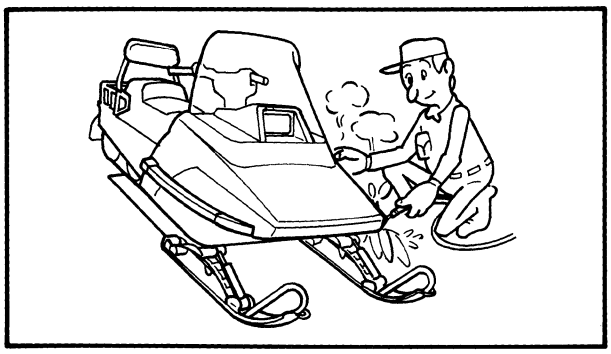
ENGINE

ENGINE REMOVAL

NOTE:

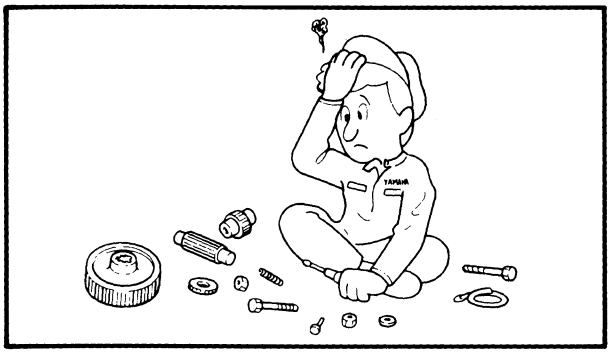
It is not necessary to remove the engine in order to remove the following parts:

- Cylinder head
- Cylinder
- Piston
- Recoil starter
- Oil pump
- C.D.I. magneto
- Carburetor
- Primary sheave
- Starter motor

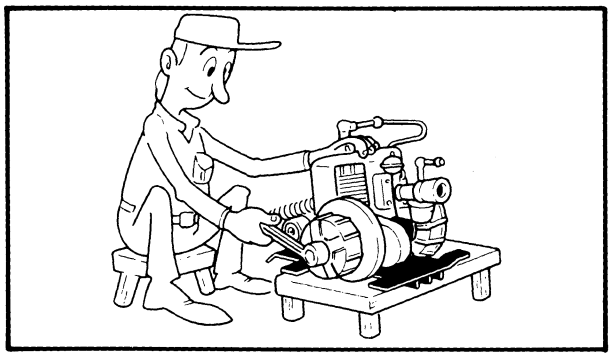


PREPARATION FOR REMOVAL

1. Remove all dirt, mud, dust, and foreign material before removal and disassembly.

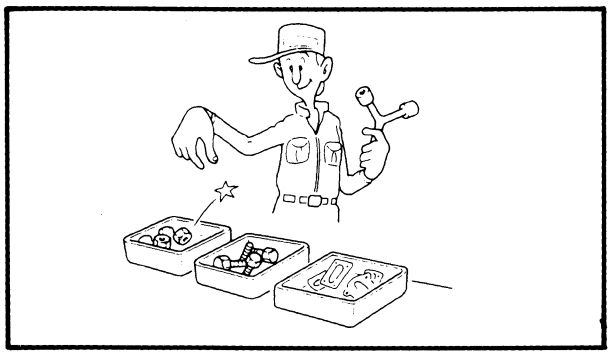


2. Use proper tools and cleaning equipment. Refer to CHAPTER 1 "SPECIAL TOOL".

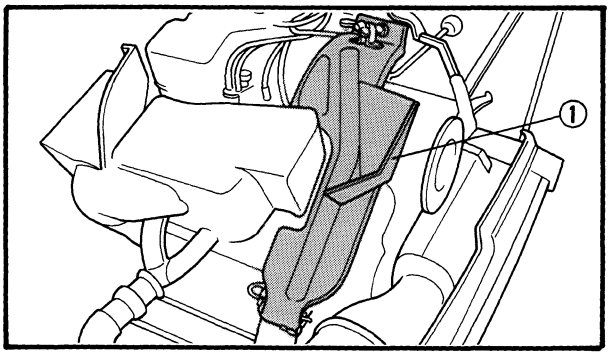


NOTE:

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

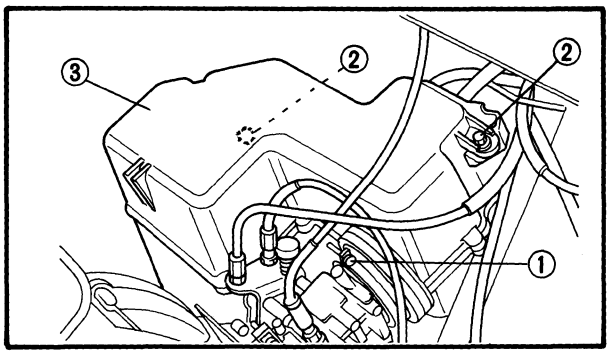


3. During the engine disassembly, clean all parts and place them in trays in the order of disassembly. This will speed up assembly time and help assure that all parts are correctly reinstalled in the engine.
4. Disconnect the battery negative lead.



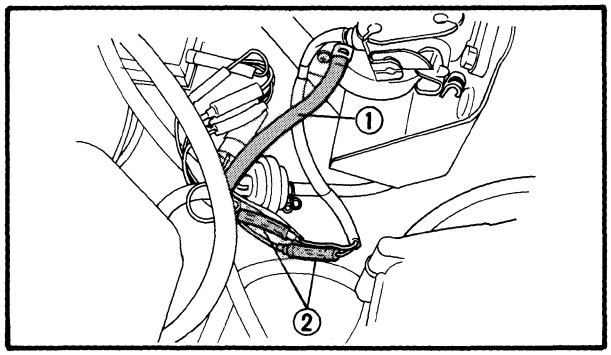
DRIVE V-BELT

1. Open the shroud.
2. Remove:
   - Drive V-belt guard ①
   - Drive V-belt
     Refer to "DRIVE V-BELT – Drive V-belt Removal", page 2-14.

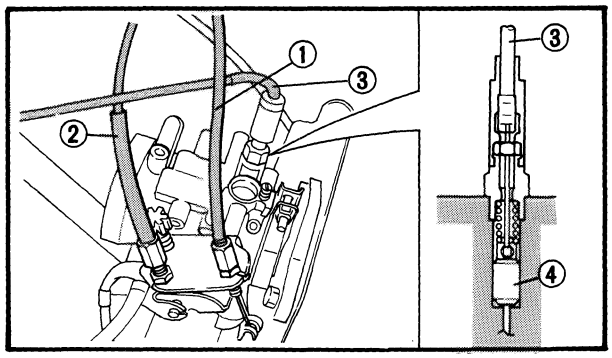


CARBURETOR AND CABLES

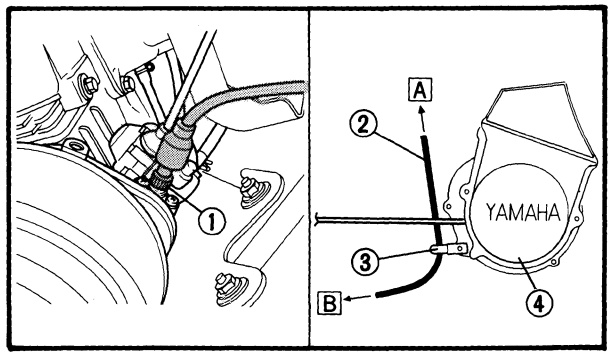
1. Loosen:
   - Clamp screw (Joint hose) ①
2. Remove:
   - Intake silencer holding bolts ②
   - Intake silencer ③



3. Disconnect:
   - Fuel hose ①
   - Carburetor switch couplers ②

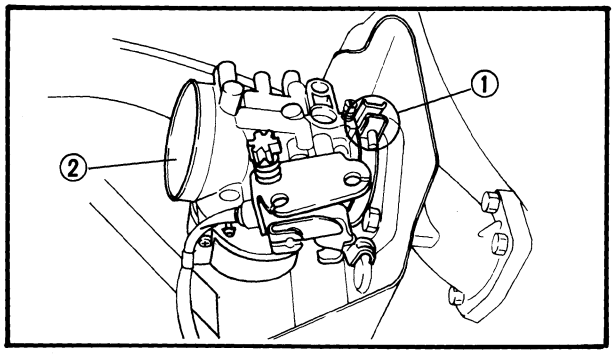


4. Disconnect:
   - Throttle cable ①
   - Oil pump cable ②
   - Starter cable ③ with plunger ④

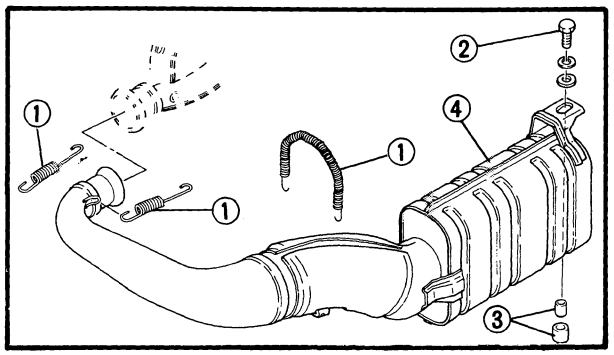


5. Disconnect:
   - Tachometer cable ①
6. Remove:
   - Speedometer cable ②
     From the clamp ③ of the engine.

④ Starter case air shroud
[A] To speedometer
[B] To speedometer gear unit

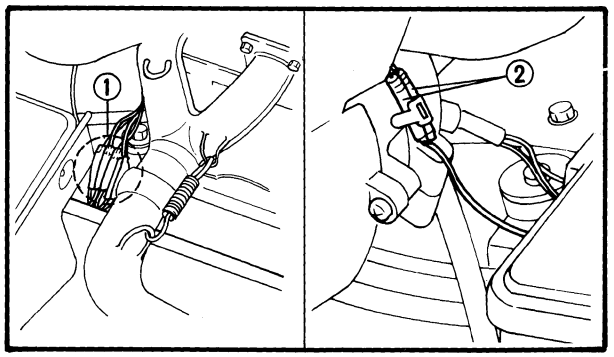


7. Loosen:
   - Carburetor clamp screw ①
8. Remove:
   - Carburetor assembly ②



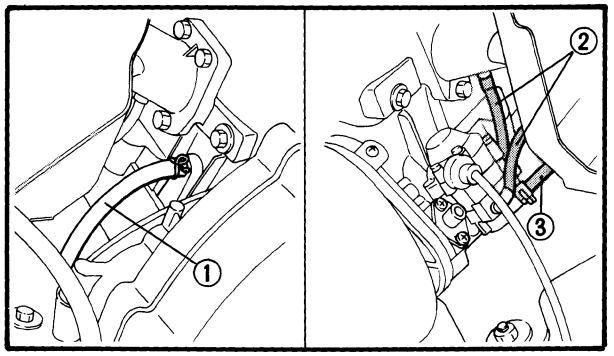
MUFFLER

1. Remove:
   - Muffler holding springs ①
   - Muffler securing bolt ②
   - Damper rubber with collar ③
   - Muffler assembly ④

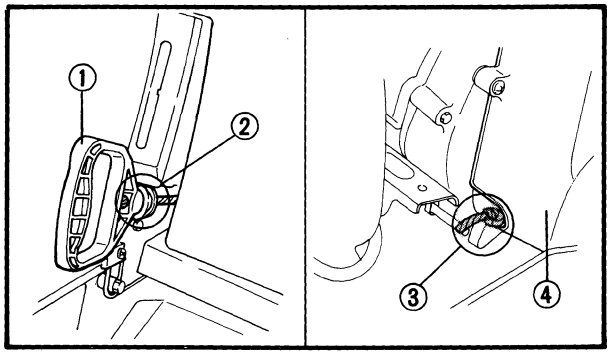


LEAD AND HOSE

1. Disconnect:
   - CDI magneto couplers ①
   - Ignition coil couplers ②



2. Disconnect:
   - Fuel pump pulser hose ①
     From crankcase.
   - Oil hose ②
     From oil pump.
   - Oil delivery hoses ③
     From intake manifold.

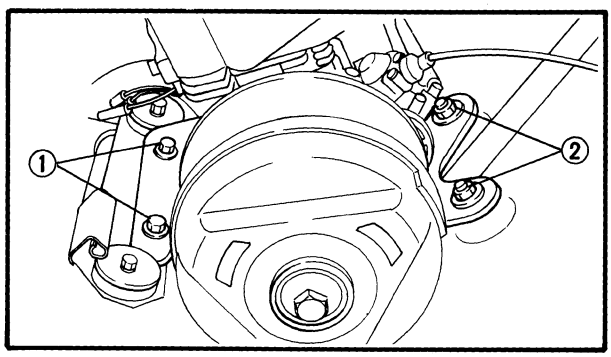


RECOIL STARTER HANDLE

1. Remove:
   - Starter handle ①
     Loosen the knot ② of the starter rope.

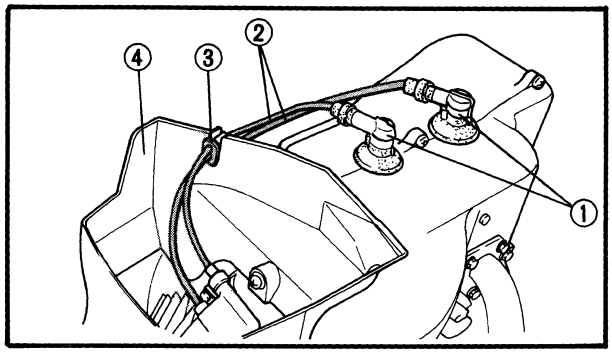
NOTE:

After removing the starter handle, knot ③ the rope so it will not be pulled into the recoil starter case ④.



ENGINE REMOVAL

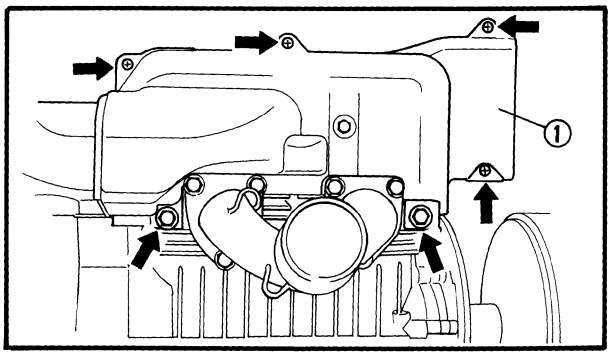
1. Remove:
   - Engine mounting bolts ① (Front)
   - Engine mounting nuts ② (Rear)
   - Engine assembly



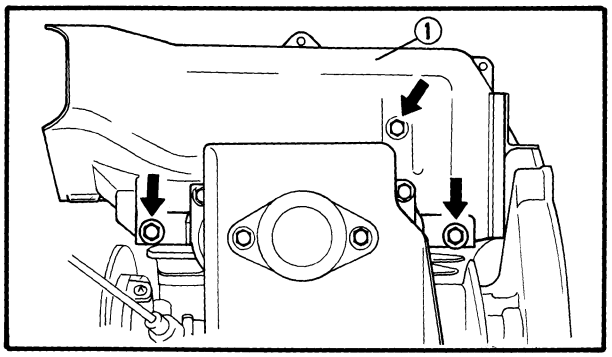
ENGINE DISASSEMBLY

AIR SHROUD AND RECOIL STARTER

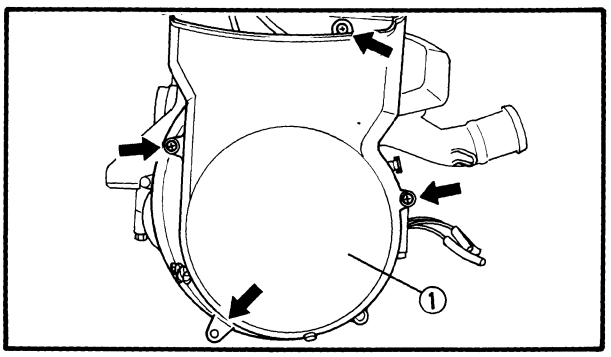
1. Remove:
   - Plug caps ①
   - Spark plug leads ② with grommet ③ From the cooling fan air shroud ④ .



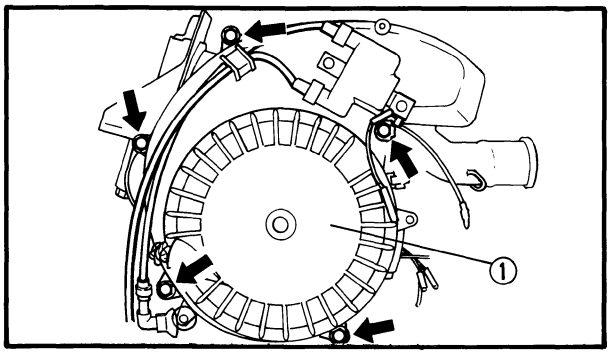
2. Remove:
   - Cylinder air shroud ① (Exhaust side)



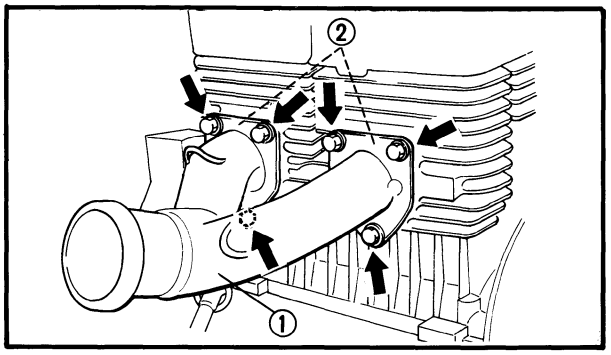
3. Remove:
   - Cylinder air shroud ① (Intake side)



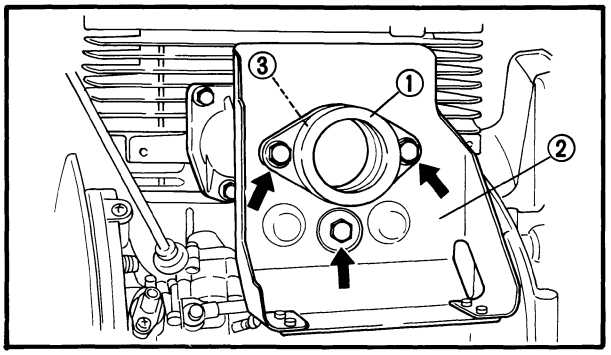
4. Remove:
   - Starter case air shroud ①



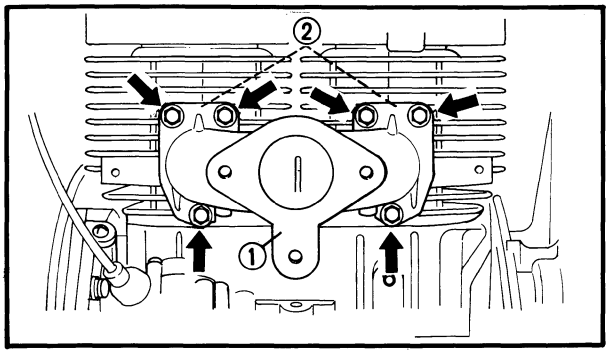
5. Remove:
   - Recoil starter assembly ①



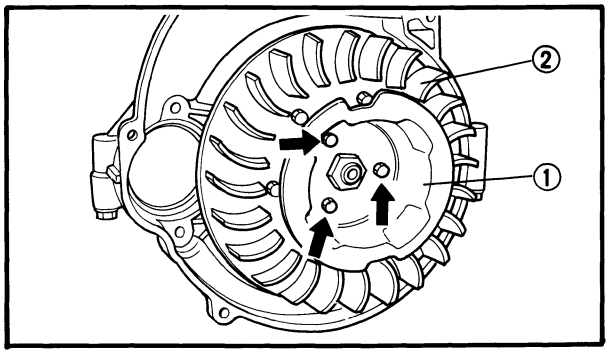
6. Remove:
   - Exhaust manifold ①
   - Exhaust gaskets ②



7. Remove:
   - Carburetor joint ①
   - Heat baffle plate ②
   - Gasket ③ (Heat baffle plate)



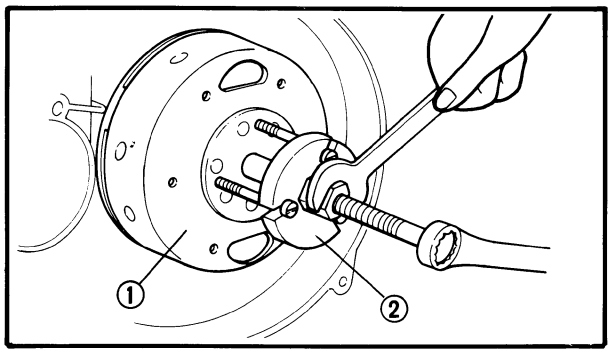
8. Disconnect:
   - Intake manifold ①
   - Gaskets ② (Intake manifold)



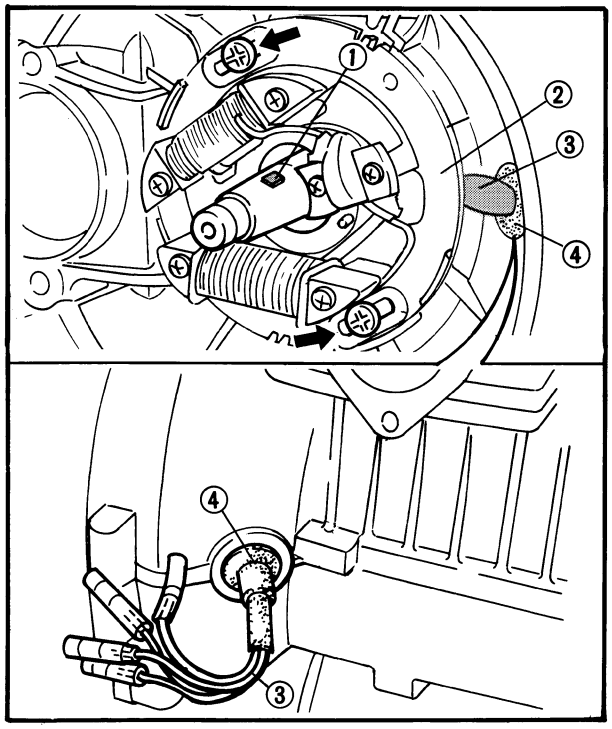
FLYWHEEL MAGNETO

1. Remove:
   - Starter pulley ①
   - Cooling fan ②

   Use a Rotor Holding Tool (YU-01235) ③ to hold the primary sheave.



2. Remove:
   - Flywheel magneto ①
     Use a 3-way Puller (YU-90105 or YU-33270) ② .

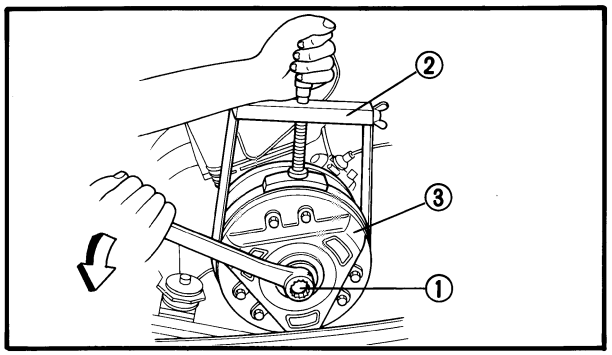


3. Remove:
   - Woodruff key ①

NOTE:
Care should be taken so that it will not be lost.

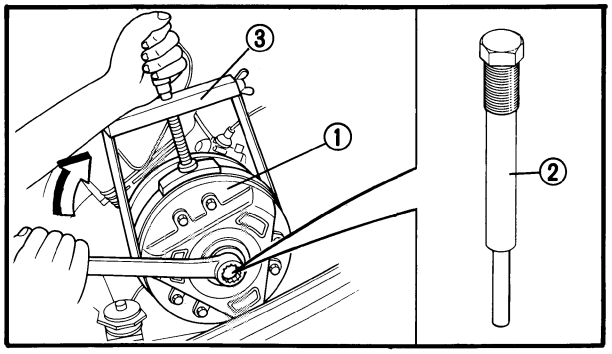
   - Coil plate ②

4. Remove:
   - Magneto leads ③ (with grommet ④)
     From the crankcase.

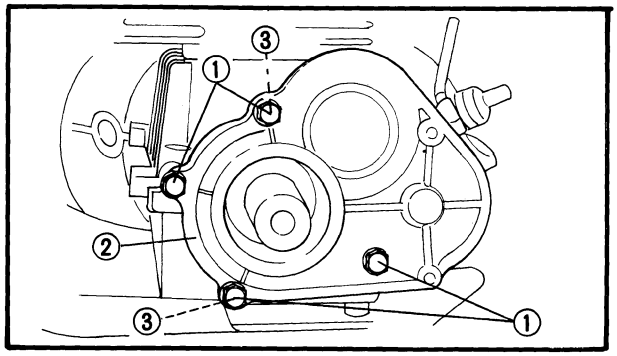


PRIMARY SHEAVE

1. Straighten:
   - Lock washer tab
2. Remove:
   - Primary sheave holding bolt ①
     Use a Primary Sheave Holder (YS-01880) ② to hold the primary sheave ③ .

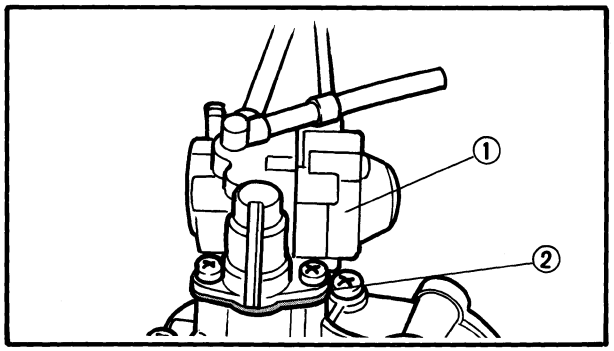


3. Remove:
   - Primary sheave assembly ①
     Use a Primary Sheave Puller (M20) (YS-01859-A) ② and Primary Sheave Holder (YS-01880) ③ .



PUMP DRIVE GEAR UNIT AND OIL PUMP

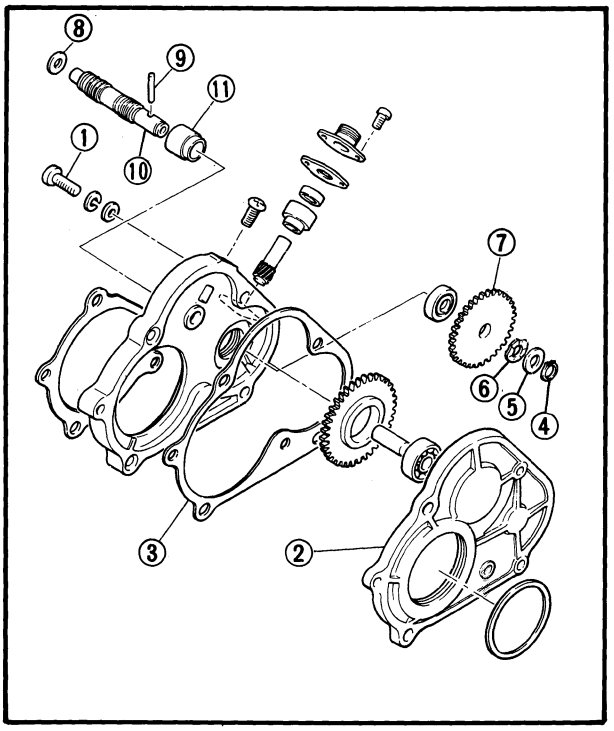
1. Remove:
   - Drive gear unit case holding bolts ①
   - Drive gear unit case ②
   - Dowel pins ③
   - Gasket



2. Remove:
   - Oil pump assembly ①
   - Gasket ②

CAUTION:

The oil pump must not be disassembled, because the oil pump is a precision part.

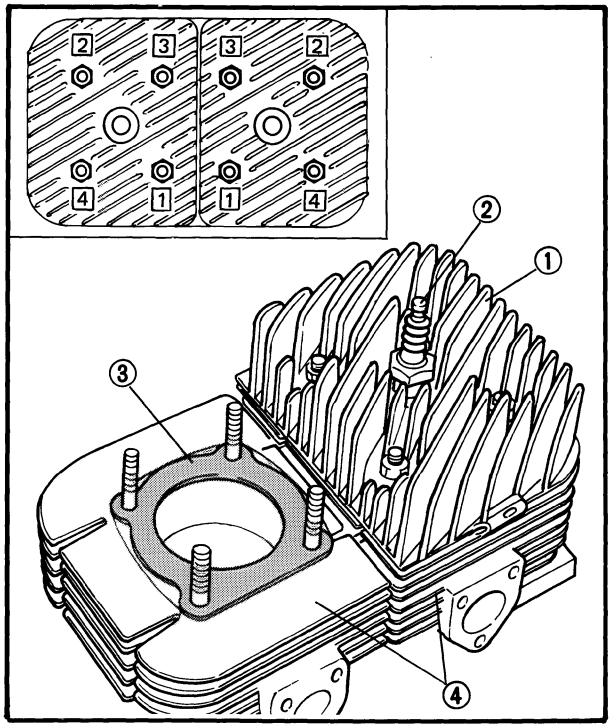


3. Remove:
   - Drive gear case cover securing screws ①
   - Drive gear case cover ②
   - Gasket ③
   - Circlip ④
   - Plain washer ⑤
   - Wave washer ⑥
   - Driven gear ⑦

NOTE:

Note the relative positions of the washers. The wave washer is against the driven gear.

   - Thrust washer ⑧
   - Securing pin ⑨
   - Worm shaft ⑩
   - Collar ⑪



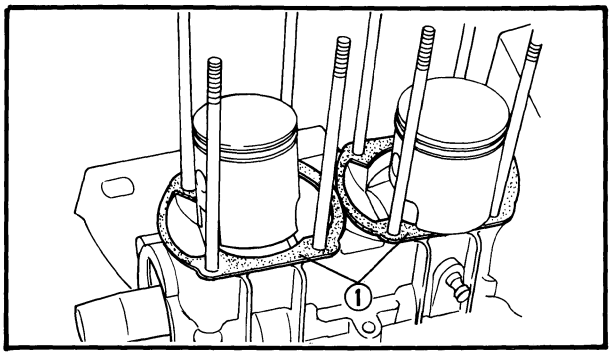
CYLINDER HEAD AND CYLINDER

1. Remove:
   - Cylinder heads ①

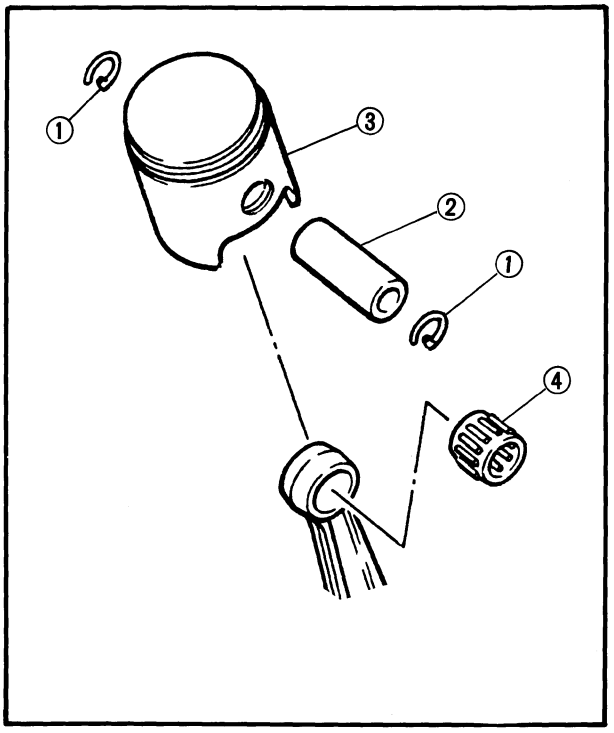
NOTE:

- Before loosening the cylinder head, loosen the spark plug ② .
- Follow numerical order shown in illustration. Start by loosening each nut 1/2 turn until all are loose.

   - Cylinder head gaskets ③
   - Cylinders ④



2. Remove:
   - Cylinder base gaskets ①



PISTON AND PISTON PIN

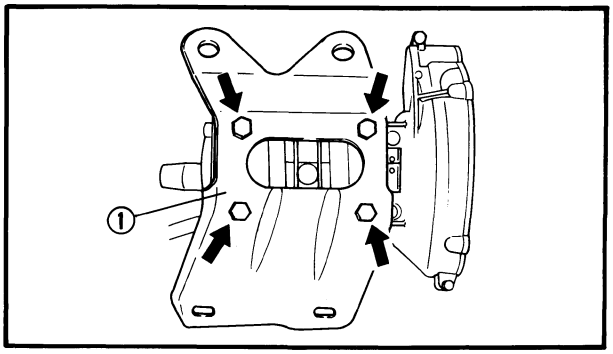
1. Remove:
   - Piston pin clip ①
   - Piston pin ②
   - Piston ③
   - Small end bearing ④

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.
- If the piston pin groove is deburred and piston pin is still difficult to remove, use a Piston Pin Puller (YU-01304).

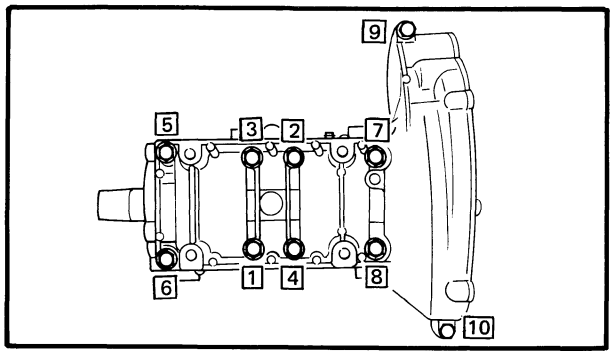
CAUTION:

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



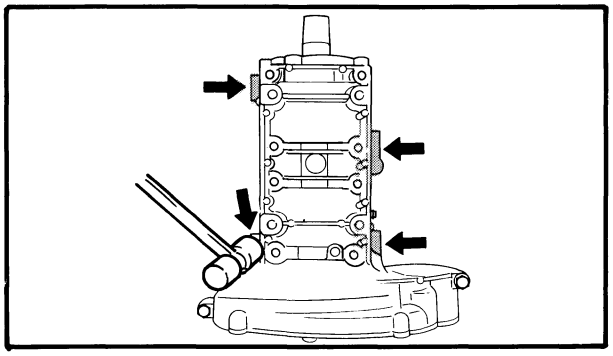
CRANKCASE AND CRANKSHAFT

1. Remove:
   - Engine mount bracket ①



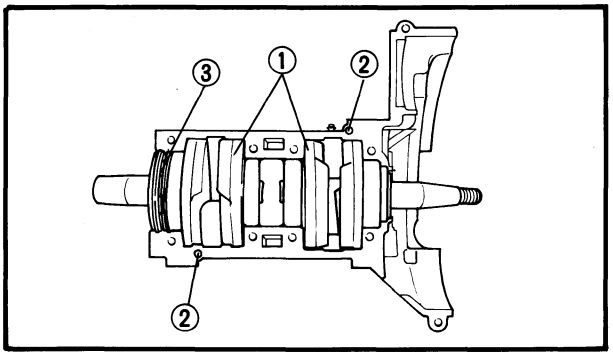
2. Remove:
   - Crankcase securing bolts.

NOTE:
Follow numerical order shown in illustration. Start by loosening each nut 1/2 turn until all are loose.



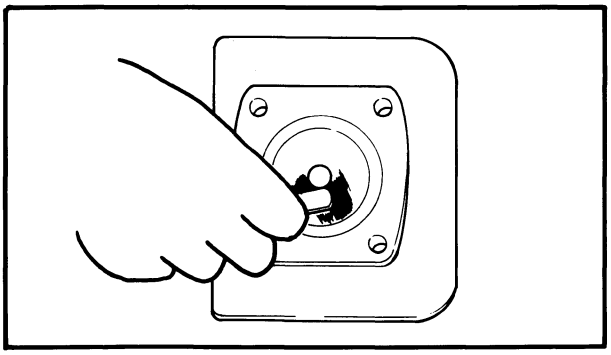
3. Remove:
   - Upper crankcase

   Tap lightly the crankcase indicated points with a soft-head hammer.



4. Remove:
   - Crankshaft assembly ①
   - Dowel pins ②
   - Stopper ring ③

   From lower crankcase.



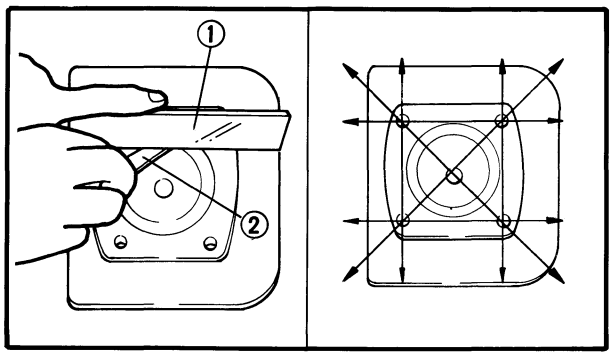
INSPECTION AND REPAIR

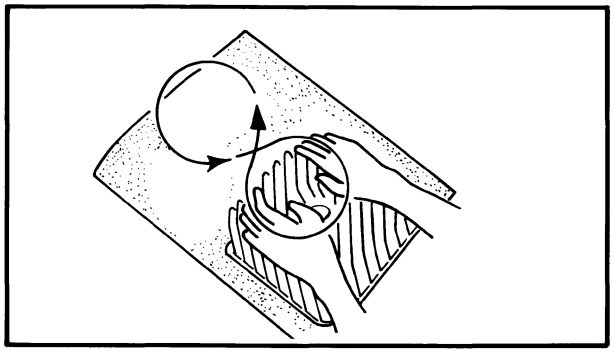
CYLINDRE HEAD

1. Eliminate:
   - Carbon deposit

   Use rounded scraper

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





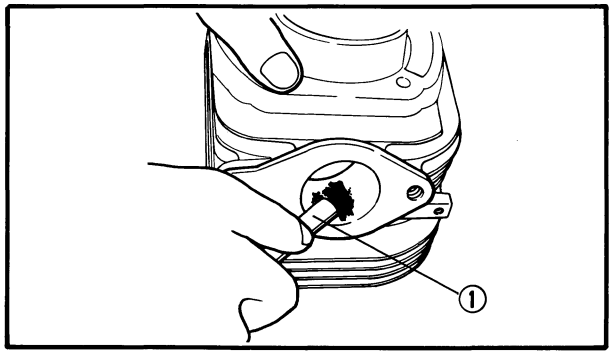
2. Inspect:
   - Cylinder head warpage
     Out of specification → Resurface or replace.

Warpage measurement and resurfacement steps:
- Attach a straight edge ① and a thickness gauge ② on the cylinder head.
- Measure the warpage limit.

Warpage Limit:
0.03 mm (0.0012 in)

- 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.

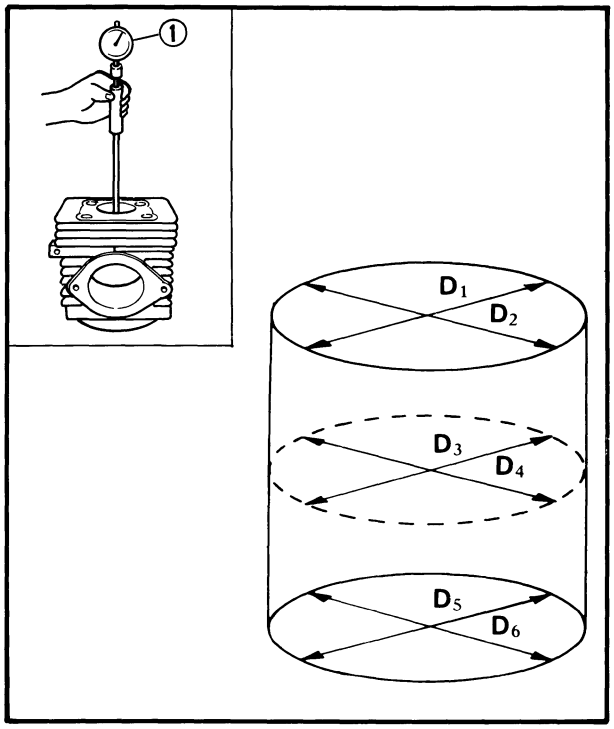


CYLINDER

1. Eliminate:
   - Carbon deposit
     Use a rounded scraper ① and a steel wire.

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

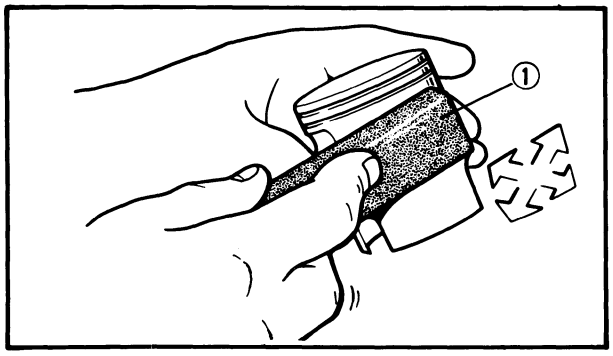
2. Inspect:
   - Cylinder wall
     Wear/Scratches → Replace.



3. Measure:
   - Cylinder bore "C"
     Use a Cylinder Bore Gauge ① .
     Out of specification → Replace.

	Standard	Wear Limit
Cylinder Bore "C"	60.00 mm (2.362 in)	60.10 mm (2.366 in)
Cylinder Taper "T"	—	0.05 mm (0.0020 in)
Out of Round "R"	—	0.01 mm (0.0004 in)

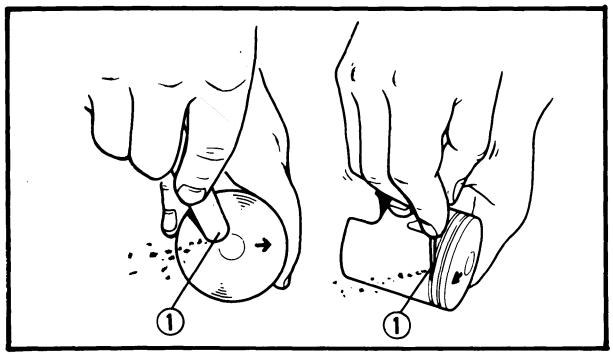
C = Maximum D
T = (Maximum D_1 or D_2) − (Minimum D_5 or D_6)
R = (Maximum D_1, D_3 or D_5) − (Minimum D_2, D_4 or D_6)



PISTON

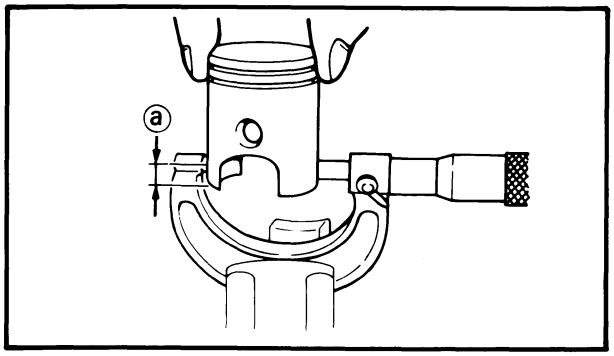
1. Inspect:
   - Piston wall
     Wear/Scratches/Damage → Replace.
2. Eliminate:
   - Score marks and lacquer deposits
     From the piston wall.
     Use a 600 ~ 800 grit wet sandpaper ① .

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



3. Eliminate:
   - Carbon deposit
     From the piston crown and ring grooves.
     Use a rounded scraper ①

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



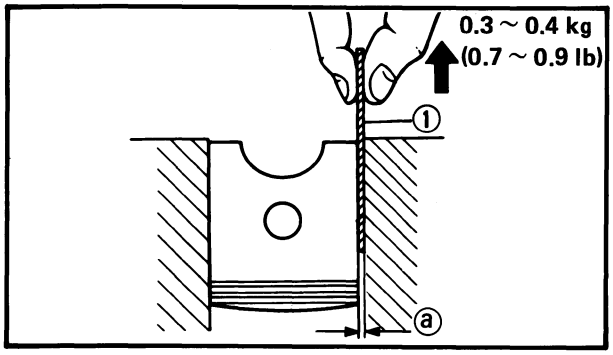
4. Measure:
   - Piston outside diameter "P"

   Out of specification → Replace.

NOTE:

Measurement should be made at a point 10 mm (0.4 in) ⓐ above the bottom edge of the piston skirt.

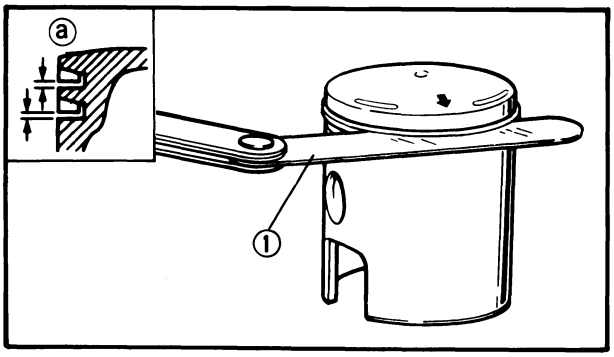
Piston Outside Diameter:
59.940 ~ 60.000 mm
(2.360 ~ 2.362 in)



5. Measure:
   - Piston clearance ⓐ

   Calculate or use feeler gauge ①.
   Out of specification → Rebore cylinder or replace piston.

Piston Clearance ⓐ = C — P:
0.040 ~ 0.045 mm
(0.0016 ~ 0.0018 in)
C = Maximum cylinder bore
P = Piston outside diameter

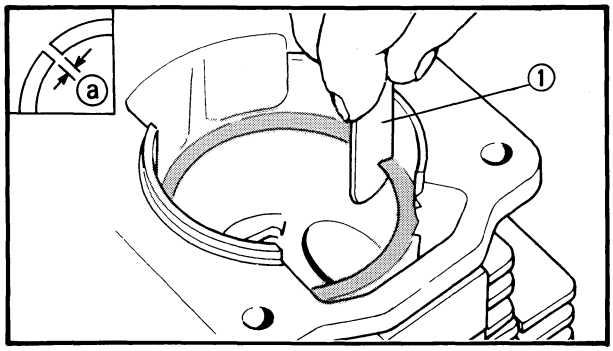


PISTON RING

1. Measure:
   - Side clearance ⓐ

   Out of specification → Replace piston and/or rings.
   Use a Feeler Gauge ①.

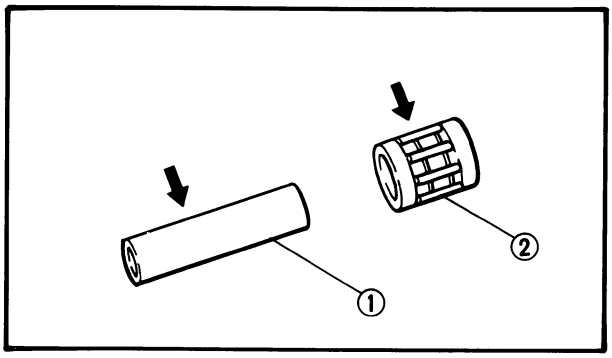
Side Clearance ⓐ : (Top/2nd Rings)
0.02 ~ 0.06 mm
(0.0008 ~ 0.0024 in)



3. Measure:
   - End gap ⓐ

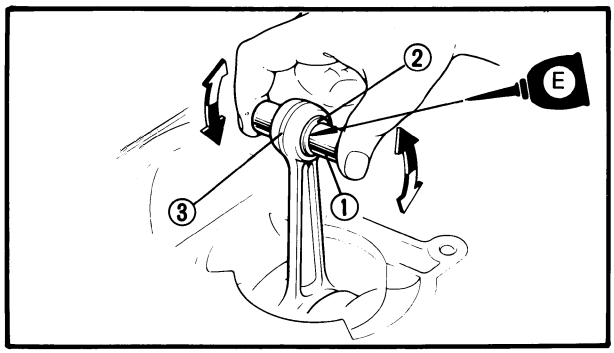
   Use a feeler gauge ①.
   Out of specification → Replace rings as a set.

End Gap ⓐ : (Top/2nd Rings)
0.35 ~ 0.55 mm
(0.014 ~ 0.022 in)



PISTON PIN AND BEARING

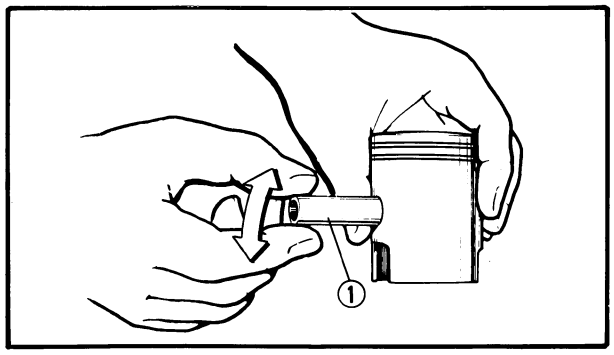
1. Inspect:
   - Piston pin ①.
   - Small end bearing ②.
     Wear/Scratches/Heat discoloration → Replace the piston pin and bearing as a set.



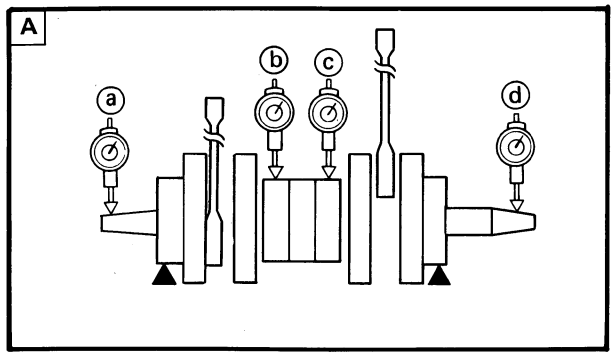
2. Lubricate:
   - Piston pin ①
   - Small end bearing ②

	2-Stroke Engine Oil (Lightly)

3. Install:
   - Piston pin ①
   - Small end bearing ②
     Into small end ③ of the connecting rod.
4. Check:
   - Free play
     There should be no noticeable for the play.
     Free play exists → Inspect the connecting rod for wear/Replace the pin, small end bearing and/or connecting rod as required.



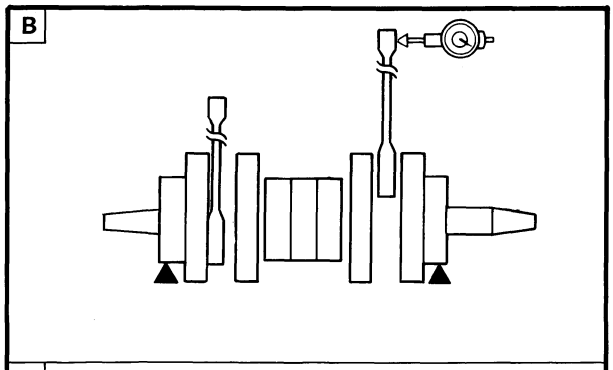
5. Install:
   - Piston pin ①
     Into piston pin hole.
6. Check:
   - Free play
     There should be no noticeable for the play.
     Free play exists → Replace piston pin and/or piston.



CRANKSHAFT

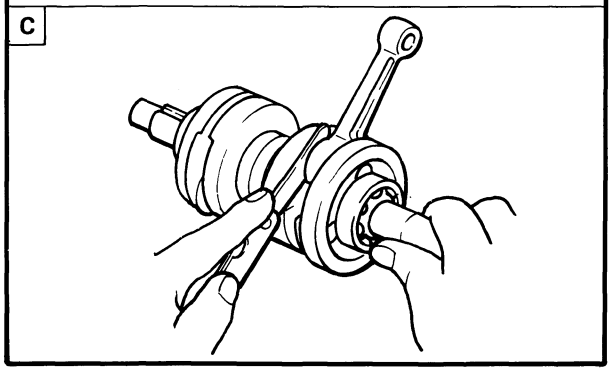
1. Measure:
   - Runout A
     Use a V-Blocks and Dial Gauge (YU-03097).
     Out of specification → Replace or repair.

	Runout Limit: **ⓐ, ⓓ : 0.03 mm (0.0012)** **ⓑ, ⓒ : 0.04 mm (0.0016)**



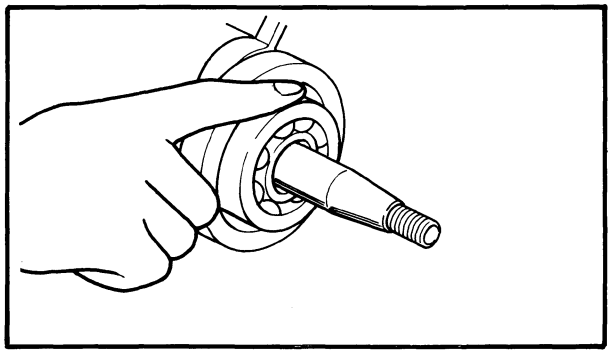
2. Measure:
   - Small end free play [B]
     Use a Dial Gauge (YU-03097)
     Out of specification → Replace the defective parts.

Small End Free Play Limit:
2.0 mm (0.080 in)



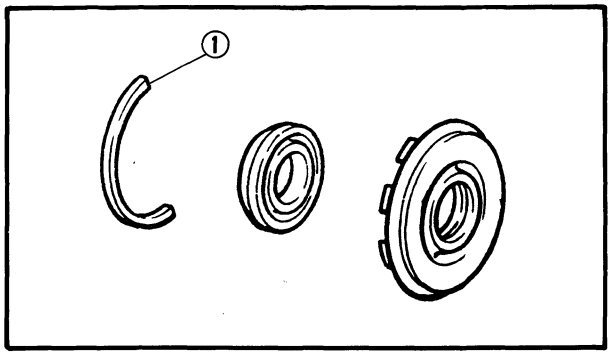
3. Measure:
   - Big end side clearance [C]
     Use a feeler gauge.
     Out of specification → Replace the defective parts.

Big End Side Clearance:
0.25 ~ 0.75 (0.010 ~ 0.030 in)

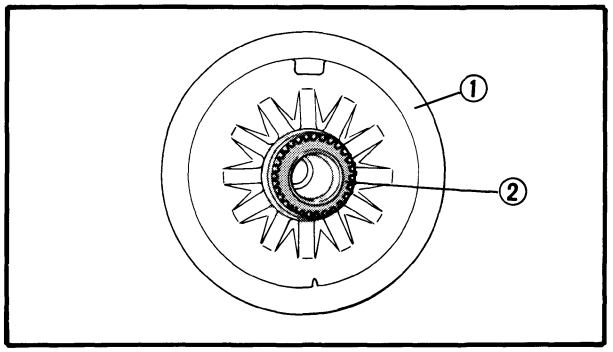


4. Inspect:
   - Crankshaft bearing ①
     Pitting/Damage → Replace.

NOTE:
Lubricate the bearing immediately after examing them to prevent rust.



5. Inspect:
   - Stopper ring ①
     Bend/Damage → Replace.
   - Crankshaft oil seals
     Wear/Damage → Replace.

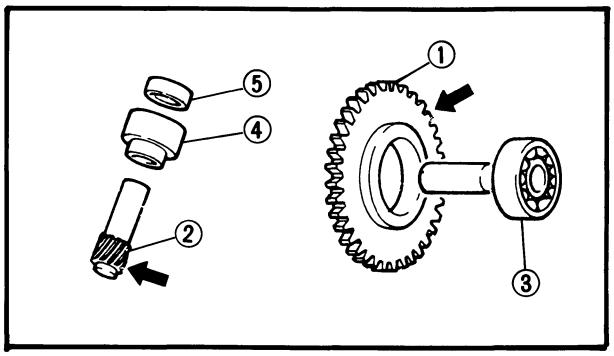


OIL PUMP GEARS

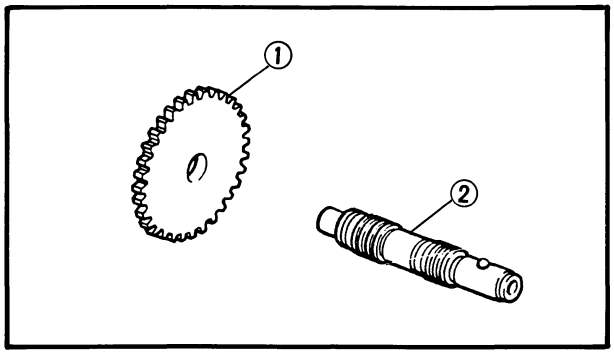
Pump Drive Gear and Idle Gear

1. Inspect:
   - Drive gear teeth
     Pitting/Cracks/Wear/Damage → Replace.

① Fixed sheave
② Drive gear

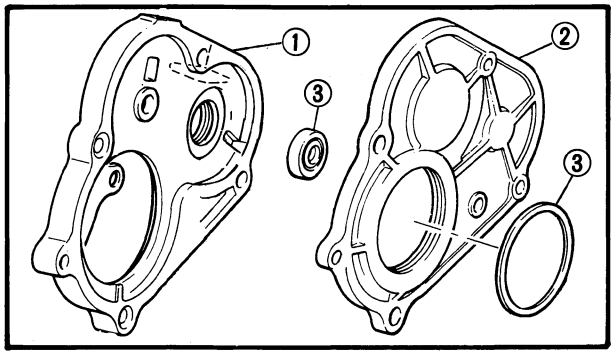


2. Inspect:
   - Idle gear teeth ①
   - Tachometer gear teeth ②
     Pitting/Cracks/Damage → Replace.
   - Idle gear bearing ③
   - Bushing ④
     Pitting/Damage → Replace.
   - Oil seal ⑤
     Wear/Damage → Replace.



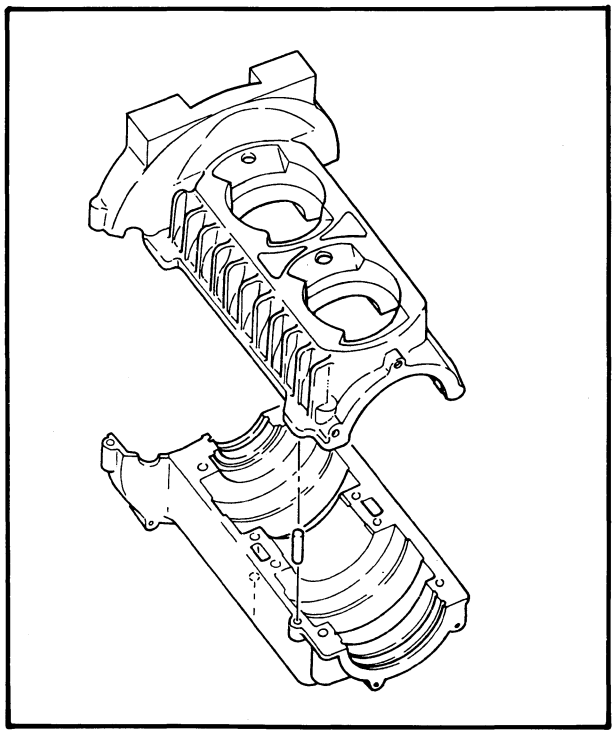
Driven Gear and Worm Shaft

1. Inspect:
   - Driven gear ①
     Pitting/Galling/Wear → Replace.
   - Worm shaft ②
     Bend/Pitting/Wear → Replace.



DRIVE GEAR UNIT CASE

1. Inspect:
   - Drive gear unit case ①
   - Drive gear unit case cover ②
     Cracks/Damage → Replace.
   - Drive gear unit case oil seals ③
     Wear/Damage → Replace.



CRANKCASE

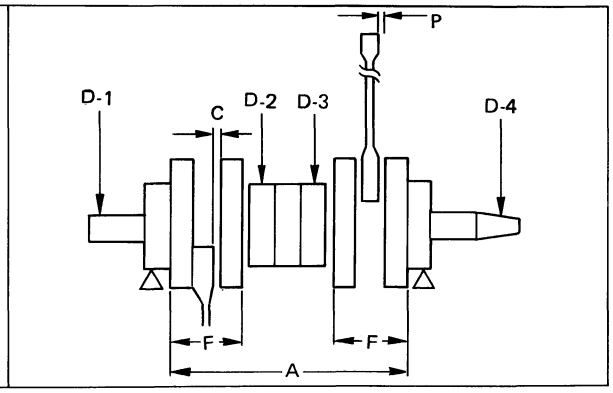
1. Thoroughly wash the case halves in mild solvent.
2. Clean all the gasket mating surfaces and crankcase mating surfaces thoroughly.
3. Inspect:
   - Crankcase
     Cracks/Damage → Replace.
   - Oil delivery passages
     Clog → Blow out with compressed air.

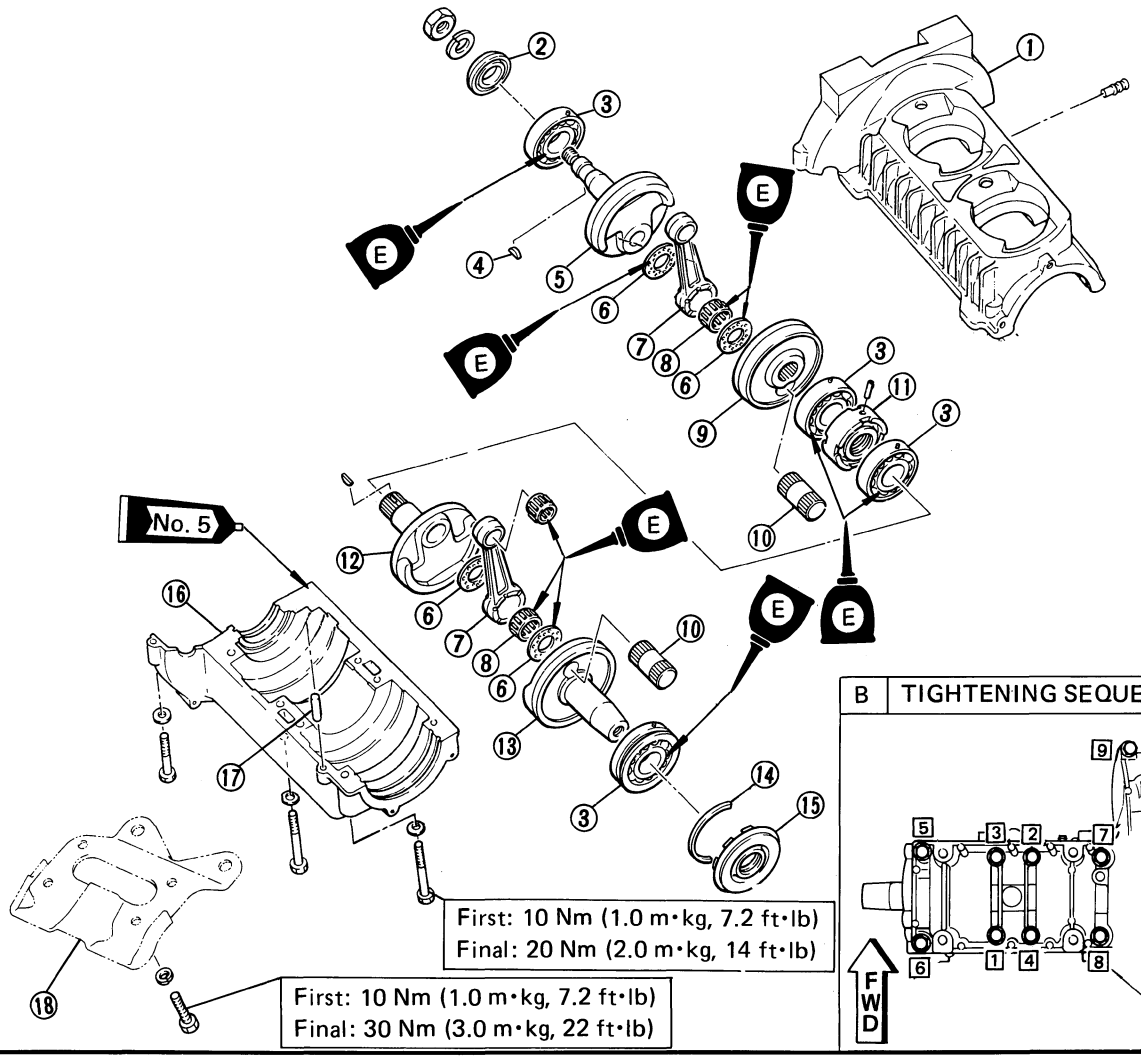
ENGINE ASSEMBLY AND ADJUSTMENT

CRANKCASE AND CRANKSHAFT

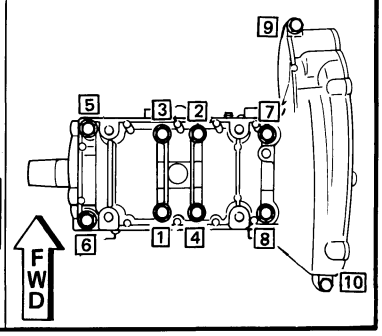
① Upper crankcase
② Oil seal
③ Bearing
④ Woodruff key
⑤ Crank 4
⑥ Thrust washer
⑦ Connecting rod
⑧ Big end bearing
⑨ Crank 3
⑩ Crank pin
⑪ Labyrinth seal
⑫ Crank 2
⑬ Crank 1
⑭ Stopper ring
⑮ Oil seal
⑯ Lower crankcase
⑰ Dowel pin
⑱ Engine mount bracket

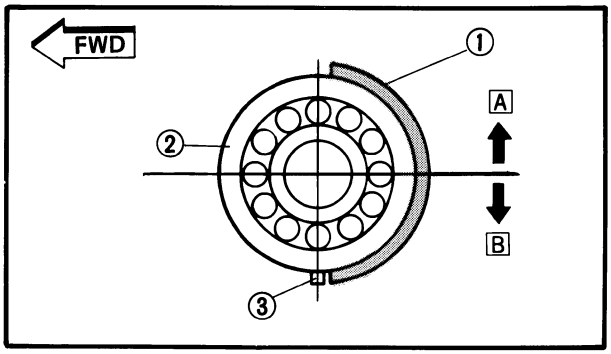
A	CRANKSHAFT
F:	51.95 ~ 52.00 mm (2.045 ~ 2.047 in)
A:	159.9 ~ 160.1 mm (6.295 ~ 6.303 in)
P:	2.0 mm (0.080 in)
C:	0.25 ~ 0.75 mm (0.010 ~ 0.030 in)
D-1:	0.03 mm (0.0012 in)
D-2:	0.04 mm (0.0016 in)
D-3:	0.04 mm (0.0016 in)
D-4:	0.05 mm (0.0020 in)





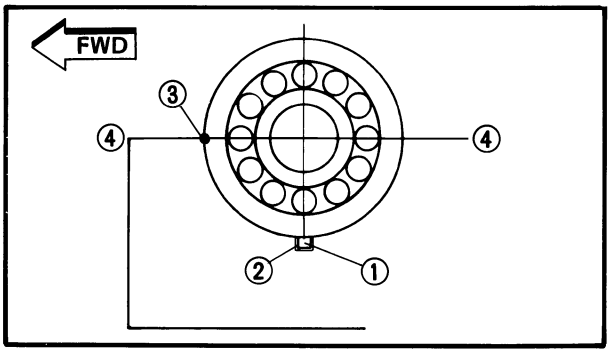
B TIGHTENING SEQUENCE





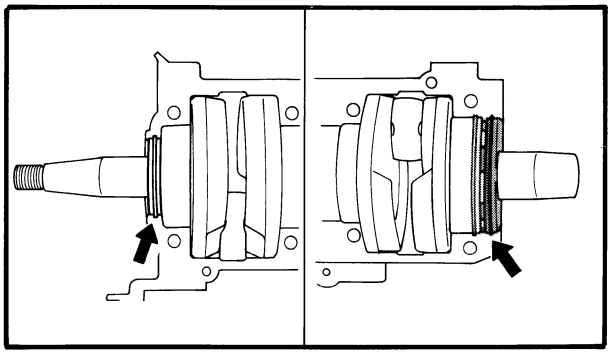
1. Install:
   - Stopper ring ①
     Onto the crankshaft bearing ② (Primary sheave side) as shown.

③ Knock pin
A Lower case side
B Upper case side

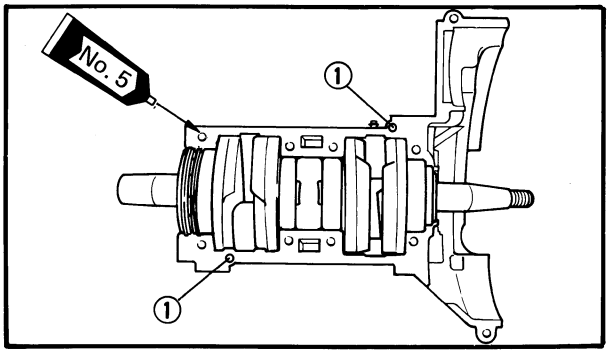


2. Install:
   - Crankshaft assembly
     To the upper crankcase.

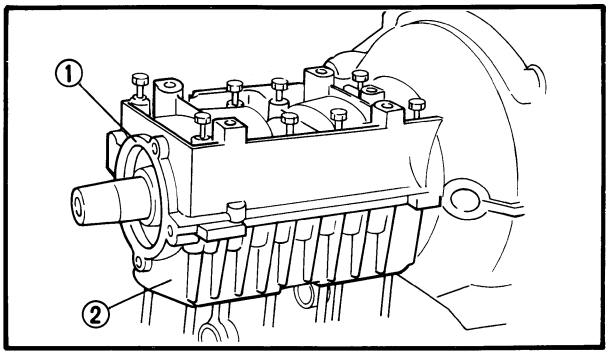
NOTE:
Set the knock pins ① on the bearings and labyrinth seal into the pin holes ② of the upper crankcase by turning the bearings and labyrinth seal. At the same time, align the bearing and seal punch marks ③ with the crankcase mating surface ④.



CAUTION:
The oil seal lip must fit into the crankcase groove.

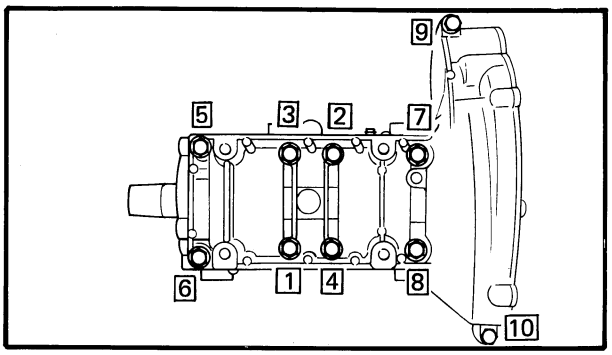


3. Apply:
   - Yamaha Bond No. 5®
     To the mating surfaces of both case halves.
4. Install:
   - Dowel pins ①



5. Install:
   - Lower crankcase ①
     Onto the upper crankcase ②, then tap lightly on the case with a soft-head hammer.

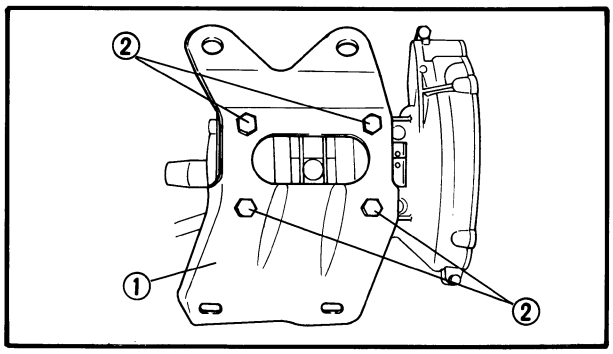
CAUTION:
Before installing and torquing the crankcase bolts, be sure to check whether the crankshaft is turning smoothly.



6. Tighten:
   - Crankcase securing bolts

NOTE:
In sequence as shown, and torque the bolts in two stages.

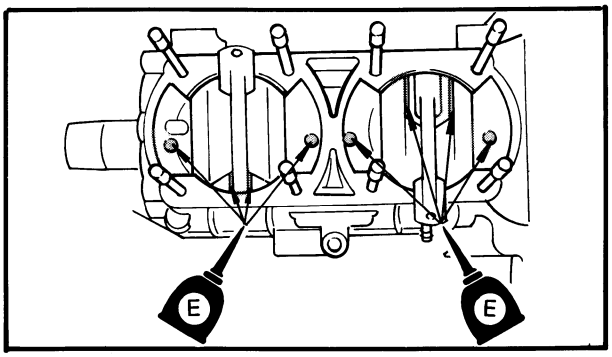
Crankcase Securing Bolt:
First: 10 Nm (1.0 m·kg, 7.2 ft·lb)
Final: 20 Nm (2.0 m·kg, 14 ft·lb)



7. Install:
   - Engine mount bracket ①
8. Tighten:
   - Engine mount bracket securing bolts ②

NOTE:
Tighten the securing bolts in two stages, using a crisscross pattern.

Mount Bracket Securing Bolt:
First: 10 Nm (1.0 m·kg, 7.2 ft·lb)
Final: 30 Nm (3.0 m·kg, 22 ft·lb)

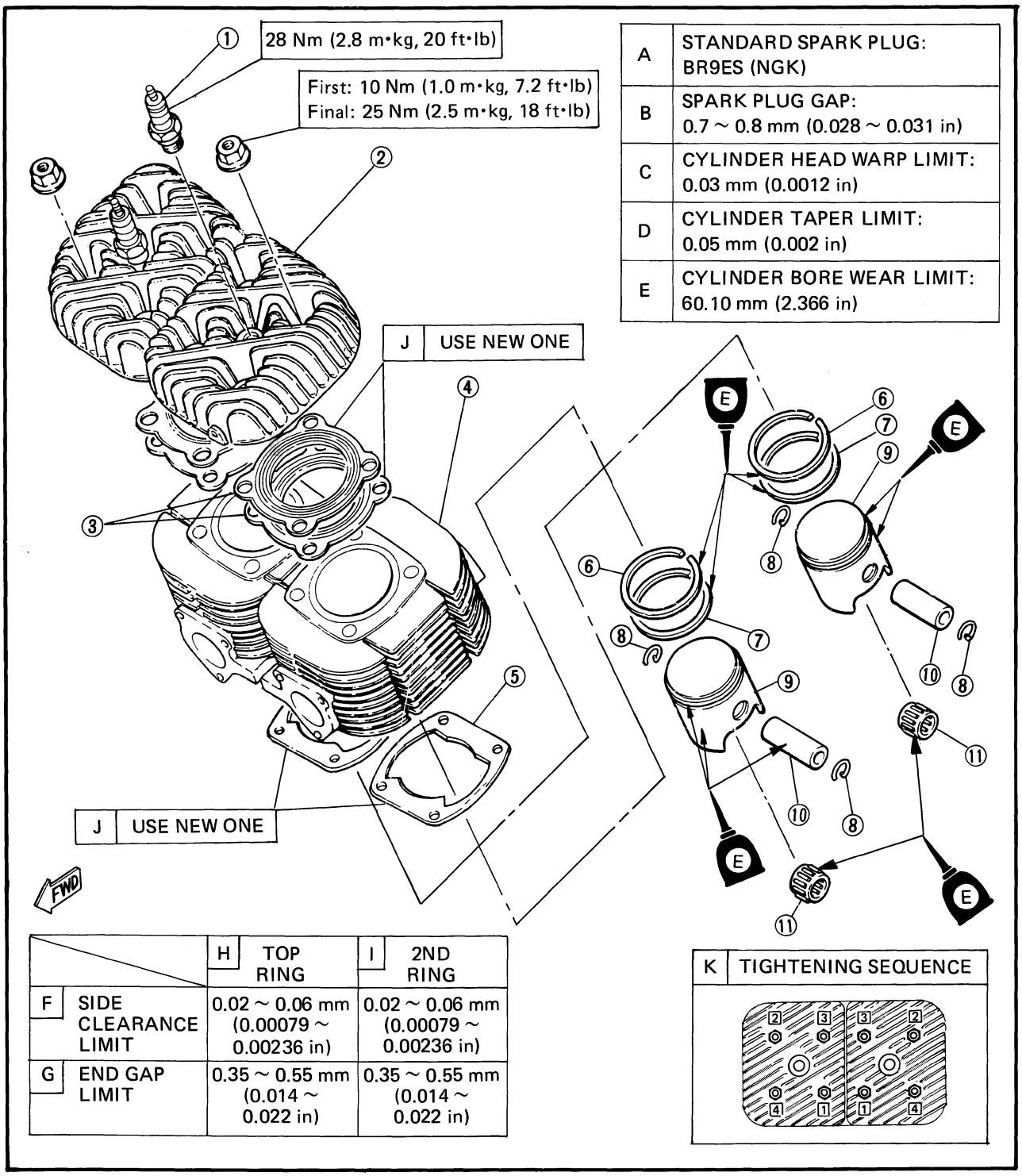


9. Apply:
   - 2-stroke engine oil

   To the crankpin, bearing and each crankshaft bearing oil delivery hole.

PISTON, CYLINDER AND CYLINDER HEAD

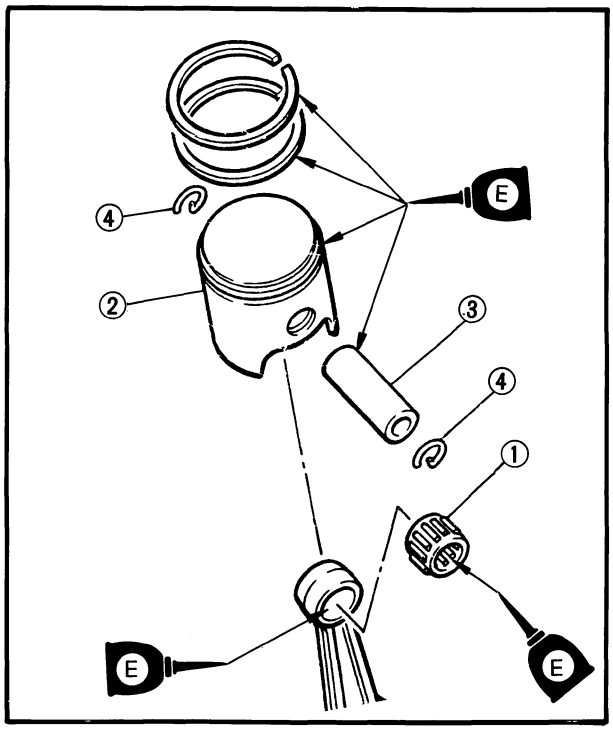
① Spark plug
② Cylinder head
③ Cylinder head gasket
④ Cylinder
⑤ Cylinder base gasket
⑥ Top ring
⑦ 2nd ring
⑧ Circlip
⑨ Piston
⑩ Piston pin
⑪ Small end bearing



A	STANDARD SPARK PLUG: BR9ES (NGK)
B	SPARK PLUG GAP: 0.7 ~ 0.8 mm (0.028 ~ 0.031 in)
C	CYLINDER HEAD WARP LIMIT: 0.03 mm (0.0012 in)
D	CYLINDER TAPER LIMIT: 0.05 mm (0.002 in)
E	CYLINDER BORE WEAR LIMIT: 60.10 mm (2.366 in)

	H TOP RING	I 2ND RING
F SIDE CLEARANCE LIMIT	0.02 ~ 0.06 mm (0.00079 ~ 0.00236 in)	0.02 ~ 0.06 mm (0.00079 ~ 0.00236 in)
G END GAP LIMIT	0.35 ~ 0.55 mm (0.014 ~ 0.022 in)	0.35 ~ 0.55 mm (0.014 ~ 0.022 in)

K TIGHTENING SEQUENCE

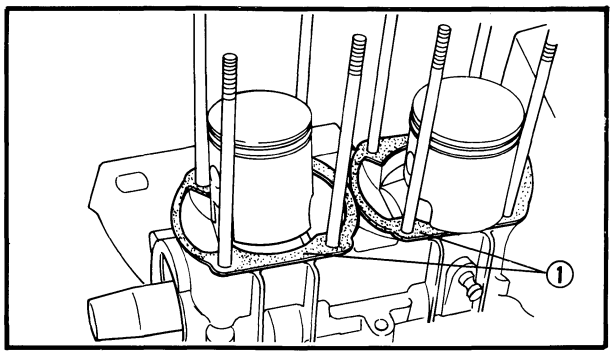


Piston Pin and Piston

1. Apply:
   - 2-stroke engine oil
     To the piston pin, bearing, piston ring grooves and piston skirt areas.
2. Install:
   - Small end bearing ①
   - Piston ②
   - Piston pin ③
   - Piston pin clip ④ (New)

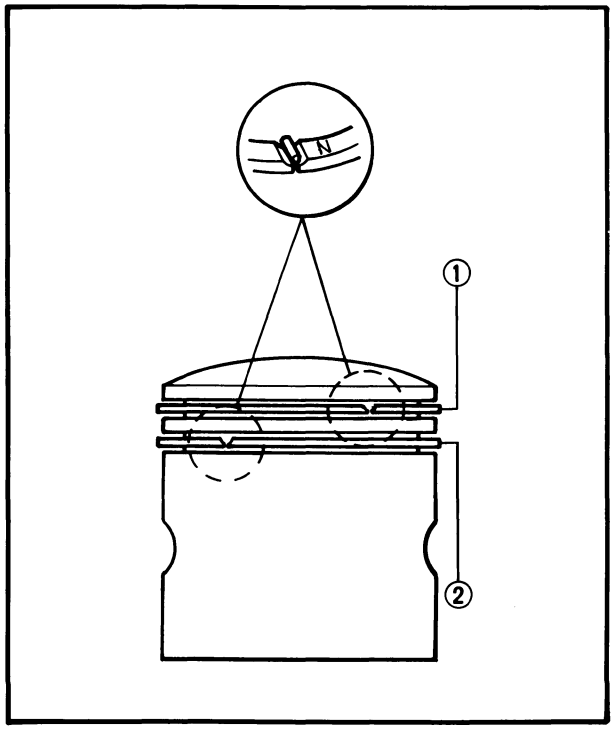
NOTE:

- 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.



Cylinder and Cylinder Head

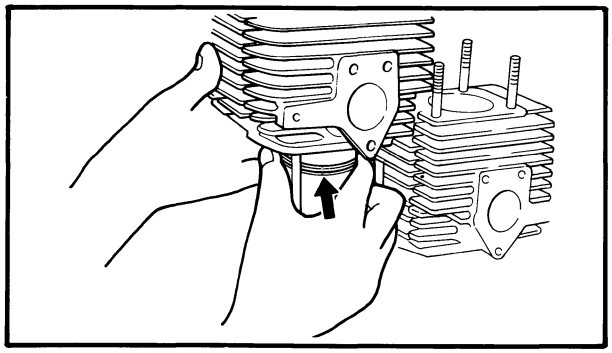
1. Install:
   - Cylinder base gaskets ① (New)



NOTE:

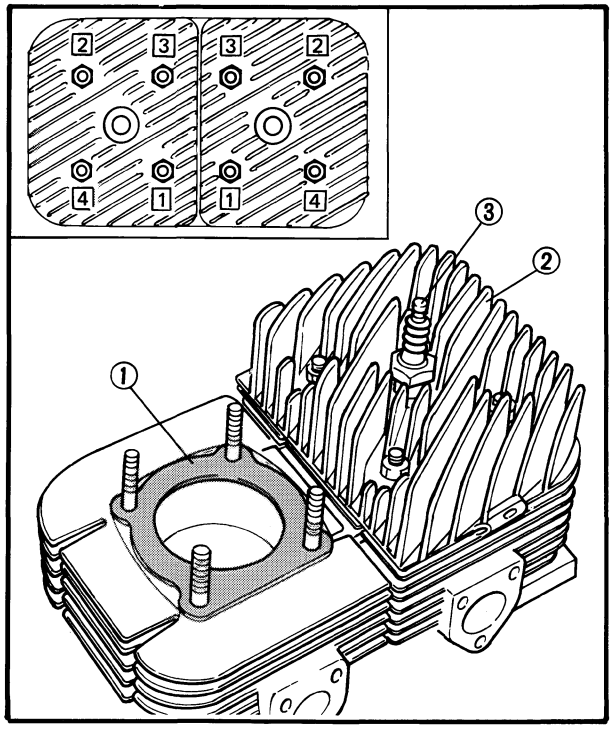
- Make sure ring ends are properly fitted around ring locating pins in piston grooves.
- Be sure to check the manufacture's marks or numbers stamped on the rings are on the top side of the rings.
- Before installing the cylinder, apply a liberal coating of 2-stroke engine oil to the piston rings.

① 1st ring
② 2nd ring



2. Install:
   - Cylinder

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



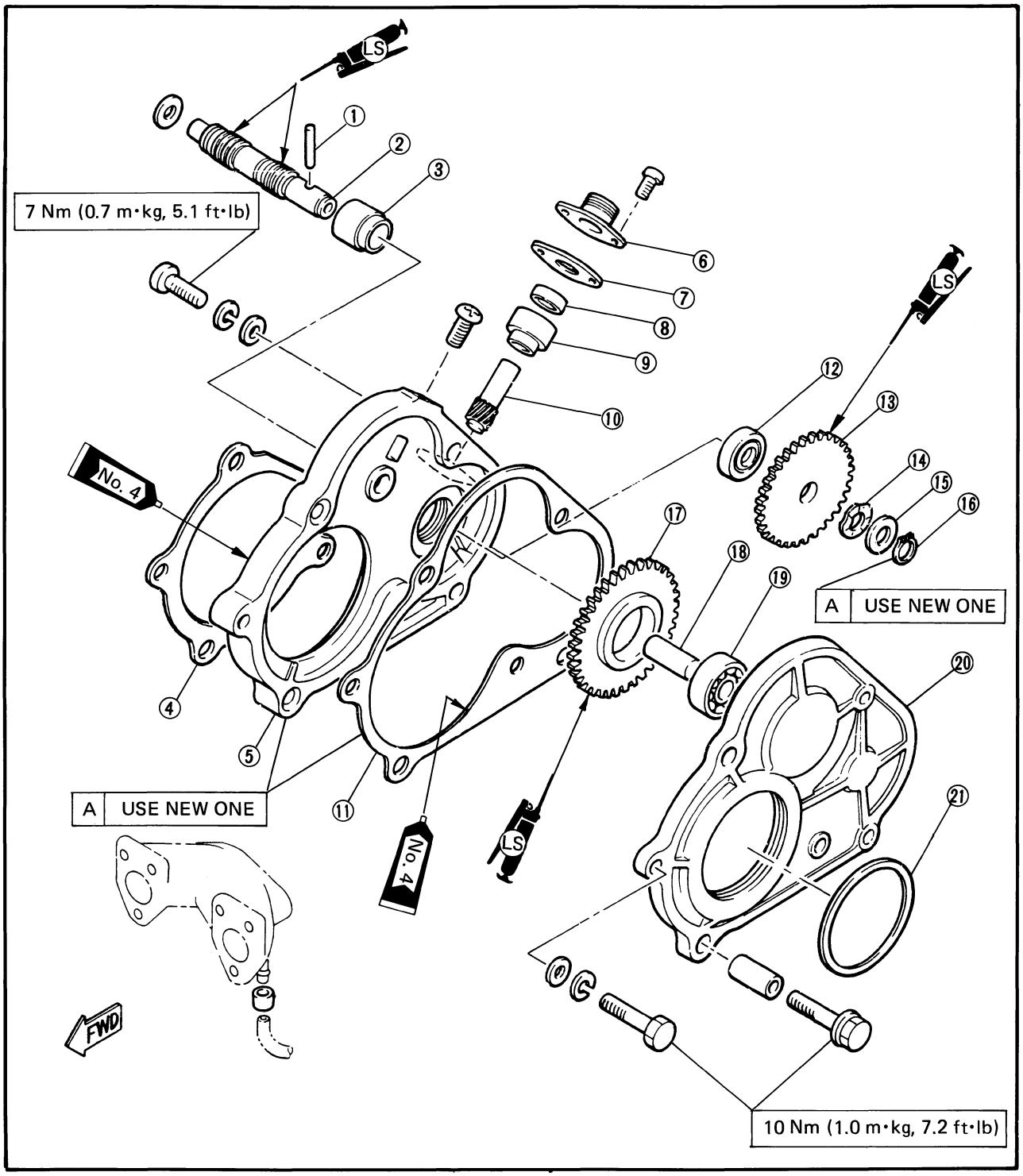
3. Install:
   - Cylinder head gaskets (New) ①
   - Cylinder heads ②
   - Spark plugs ③

Cylinder Head Securing Bolt:
First: 10 Nm (1.0 m·kg, 7.2 ft·lb)
Final: 25 Nm (2.5 m·kg, 18 ft·lb)
Spark Plug:
28 Nm (2.8 m·kg, 20 ft·lb)

NOTE:
- In sequence as shown, and torque cylinder head bolts in two stages.
- Finger-tighten the spark plug before tightening to specification.

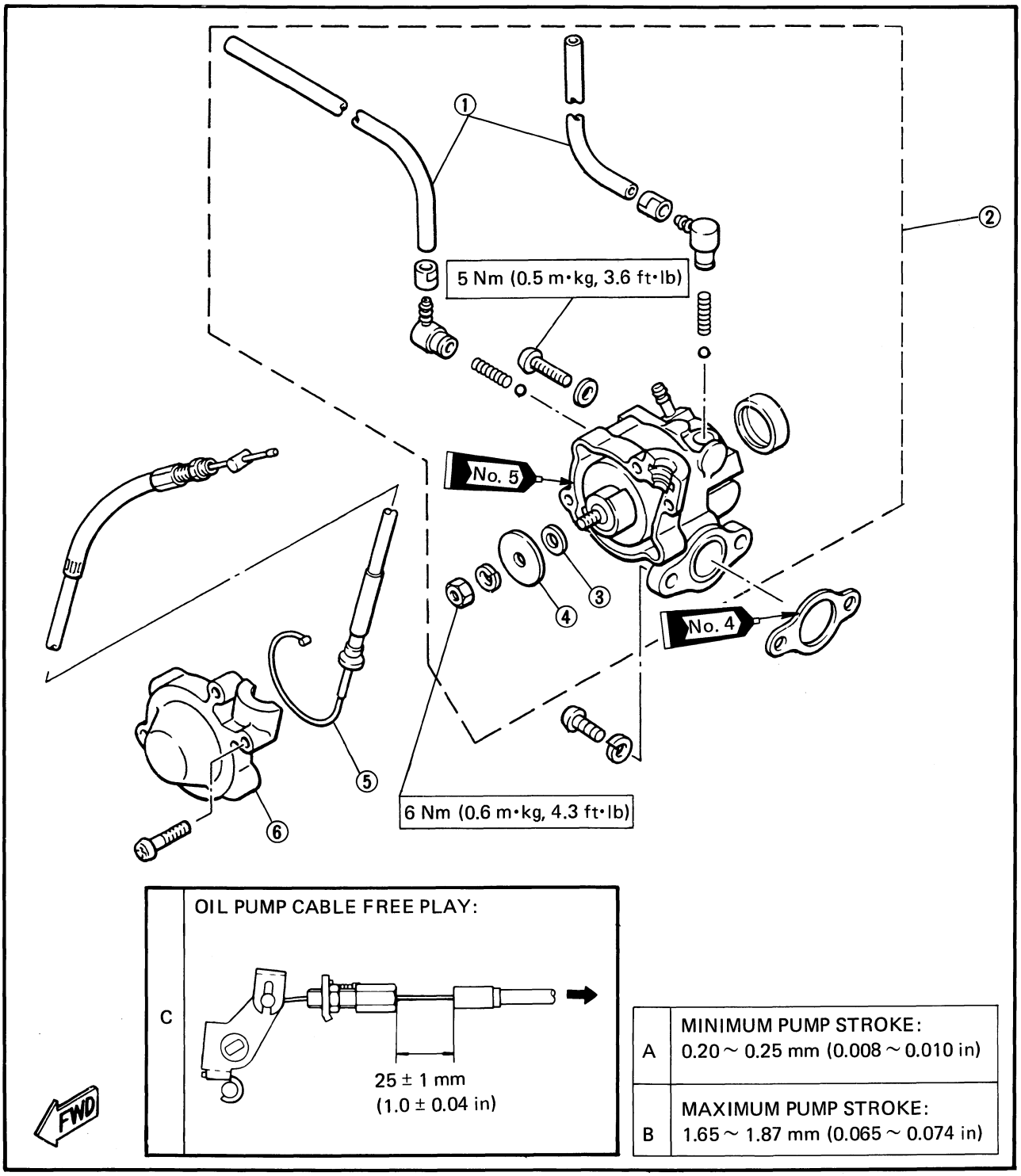
OIL PUMP AND DRIVE GEAR UNIT (1)

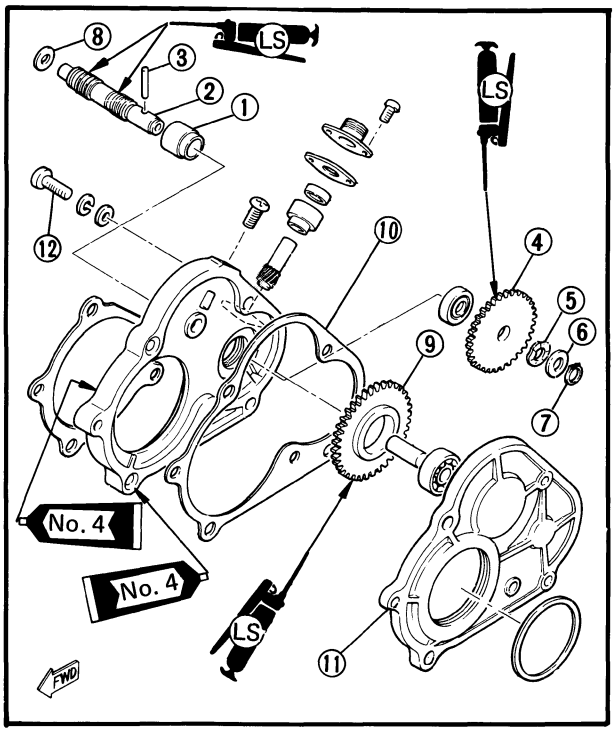
① Securing pin
② Worm shaft
③ Collar
④ Gasket
⑤ Drive gear unit case
⑥ Housing cap
⑦ Gasket
⑧ Oil seal
⑨ Bushing
⑩ Tachometer gear
⑪ Gasket
⑫ Oil seal
⑬ Pump driven gear
⑭ Wave washer
⑮ Plain washer
⑯ Circlip
⑰ Idle gear
⑱ Idle gear shaft
⑲ Bearing
⑳ Drive gear unit case cover
㉑ Oil seal



OIL PUMP AND DRIVE GEAR UNIT (2)

① Oil delivery hose
② Oil pump assembly
③ Shim
④ Adjusting plate
⑤ Oil pump cable
⑥ Oil pump cover





1. Install:
   - Collar ①
   - Worm shaft ②
   - Securing pin ③

NOTE:
Before installing the pin, align the hole in the worm shaft with the slot in the gear case. Then install the securing pin to the worm shaft hole from the gear case slot side.

   - Driven gear ④
   - Wave washer ⑤
   - Plain washer ⑥
   - Circlip ⑦
   - Thrust washer ⑧

NOTE:
- Before installing the driven gear, align the securing pin into the worm shaft with the slot in the driven gear.
- Be sure the wave washer is against the driven gear.

2. Apply:
   - Driven gear ④ (tooth)
   - Idle gear ⑨ (tooth)

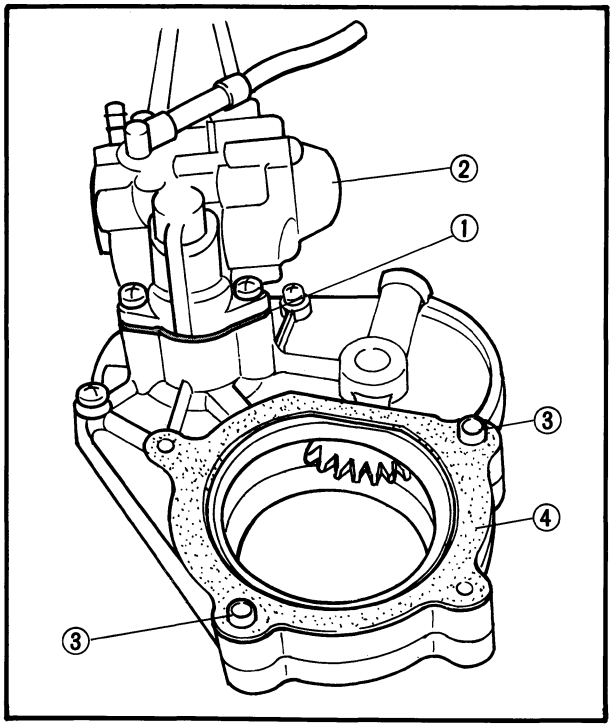
Lithium Soap Base Grease (Sufficient)

3. Install:
   - Gasket ⑩ (new)
   - Drive gear unit case cover ⑪

NOTE:
Apply Yamaha Bond No. 4® (ACC-11001-30-00) to the gear case unit side of the gasket only.

4. Tighten:
   - Drive gear unit case cover securing screws ⑫

Case Cover Securing Screws: 7 Nm (0.7 m·kg, 5.1 ft·lb)



5. Install:
   - Oil pump gasket ① (new)

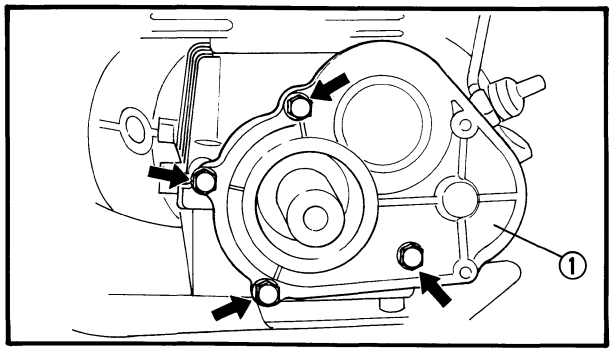
NOTE:
Apply Yamaha Bond No. 4® (ACC-11001-30-00) to the gear case side of the gasket only.

6. Install:
   - Oil pump assembly ②

Oil Pump Securing Screws:
5 Nm (0.5 m·kg, 3.6 ft·lb)

NOTE:
Be sure the worm shaft correctly engages the oil pump worm gear.

   - Dowel pins ③
   - Gasket ④ (new)

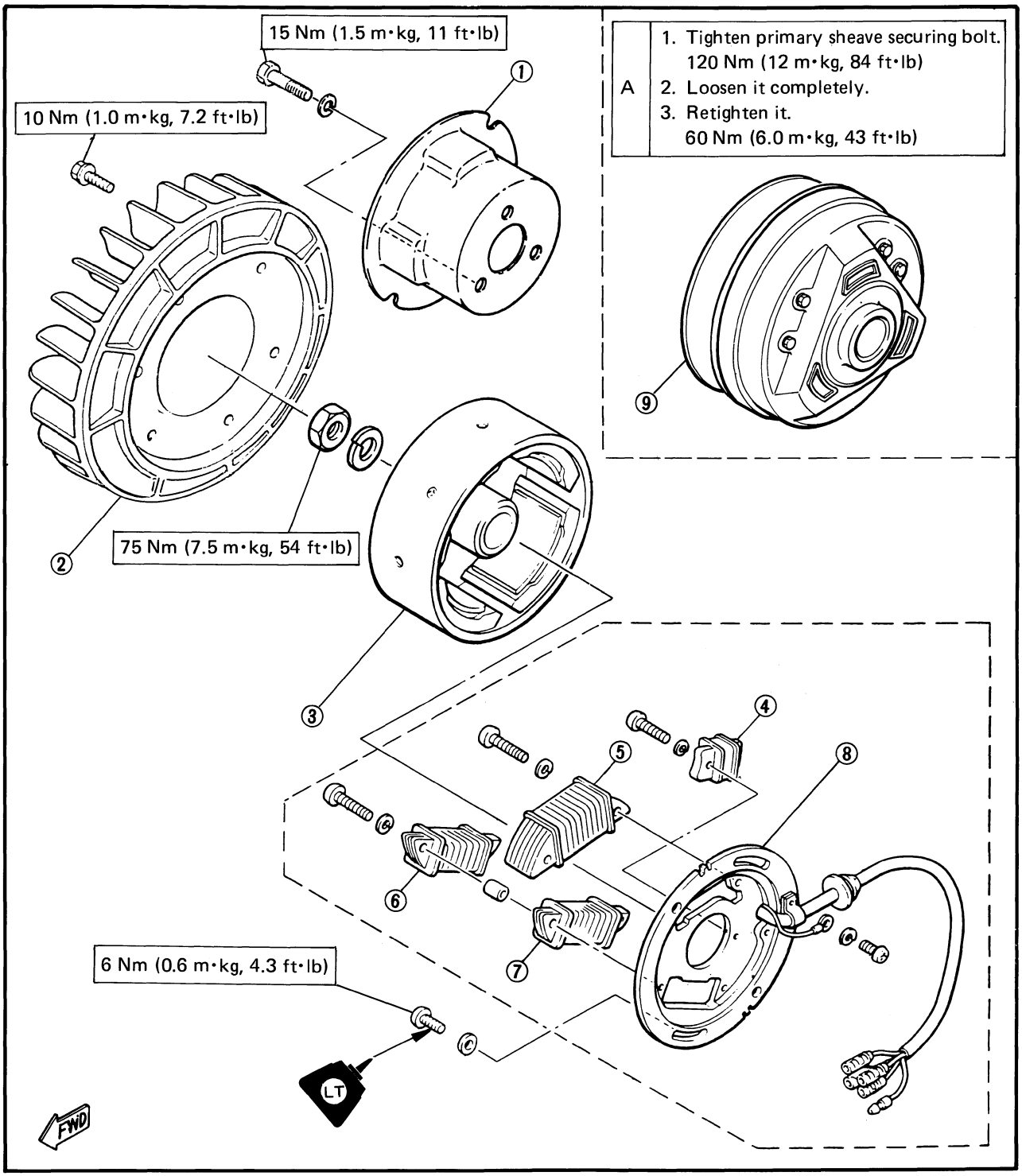


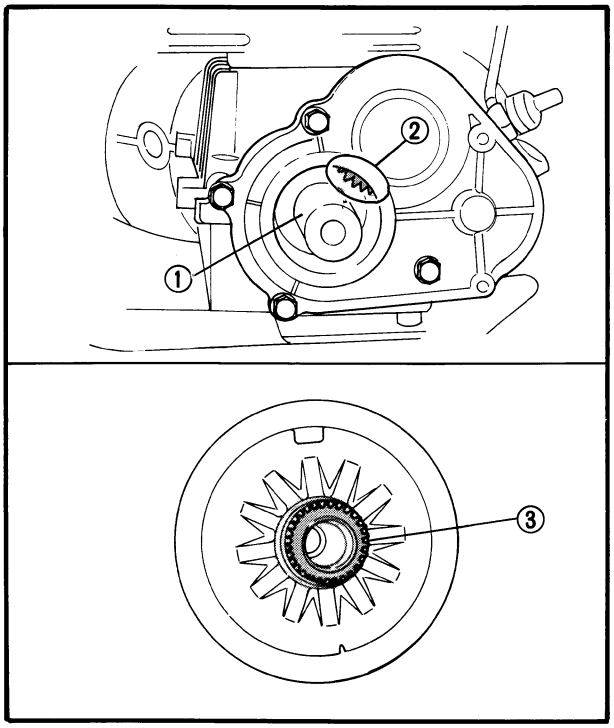
7. Install:
   - Drive gear unit case ①

Unit Case Holding Bolt:
10 Nm (1.0 m·kg, 7.2 ft·lb)

PRIMARY SHEAVE ASSEMBLY AND CDI MAGNETO

① Flywheel pully
② Fan
③ Flywheel magneto
④ Pick up coil
⑤ Lighting coil
⑥ Grip warmer coil
⑦ Source coil
⑧ Coil plate
⑨ Primary sheave assembly



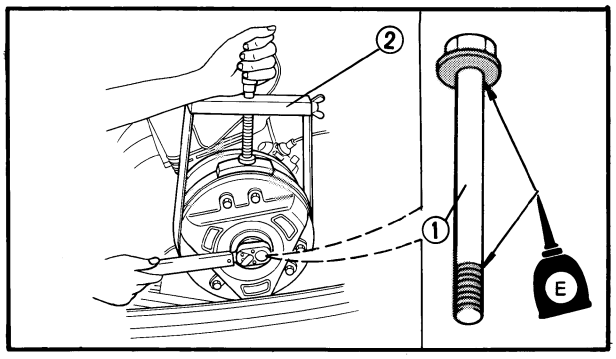


Primary Sheave

1. Install:
   - Primary sheave assembly.

NOTE:

- Before installing the primary sheave assembly, clean the oil off the tapered portion ① of the crankshaft with a lacquer thinner.
- When installing the primary sheave assembly, be sure the oil pump idle gear ② correctly engages the oil pump drive gear ③ on the fixed sheave.



2. Install:
   - Primary sheave assembly

NOTE:

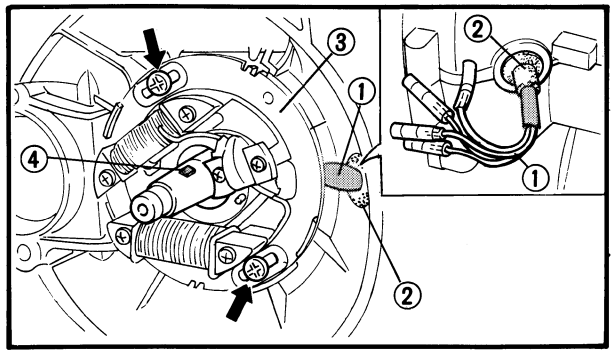
Clean the oil off the tapered portions of the crankshaft with a lacquer thinner.

3. Tighten:
   - Primary sheave securing bolt ①
     Use the Primary Sheave Holding (YS-01880) ②.

NOTE:

Apply engine oil to the bolt head inside surface and thread portion of the securing bolt.

Primary Sheave Securing Bolt:
1. Tighten primary sheave securing bolt.
100 Nm (10 m·kg, 72 ft·lb)
2. Loosen it completely.
3. Retighten it.
60 Nm (6.0 m·kg, 43 ft·lb)

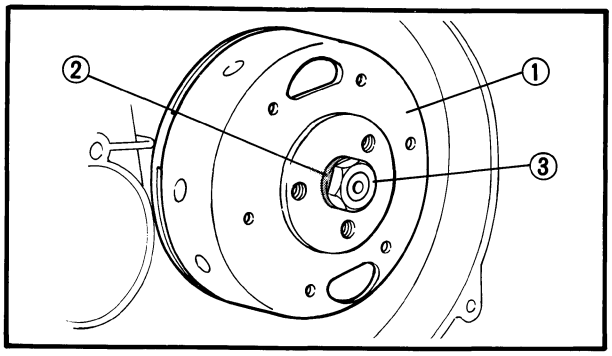


Flywheel Magneto

1. Pass the magneto leads ① through the hole, and install the grommet ② into the crankcase.
2. Install:
   - Coil plate ③

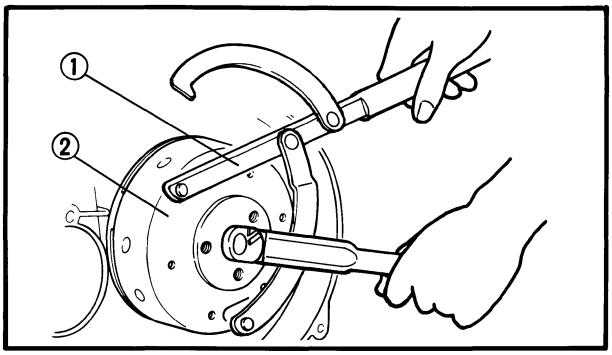
Coil Plate Securing Screw:
LOCTITE®
6 Nm (0.6 m·kg, 4.3 ft·lb)

- Woodruff key ④



3. Install:
   - Flywheel magneto ①
   - Spring washer ②
   - Flywheel magneto securing nut ③

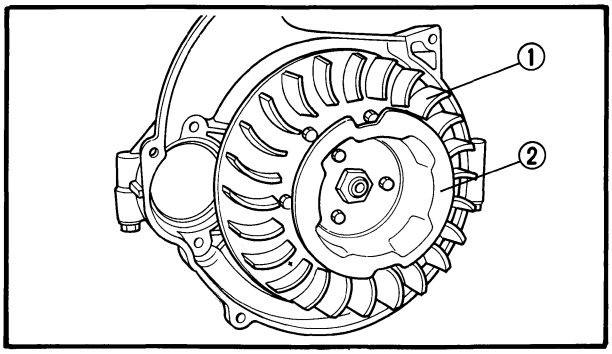
NOTE:
- When installing the Flywheel magneto, align the keyway in the magneto with the woodruff key in the crankshaft.
- Apply a light coating of grease to the tapered portion of the crankshaft end.



4. Tighten:
   - Flywheel magneto securing nut

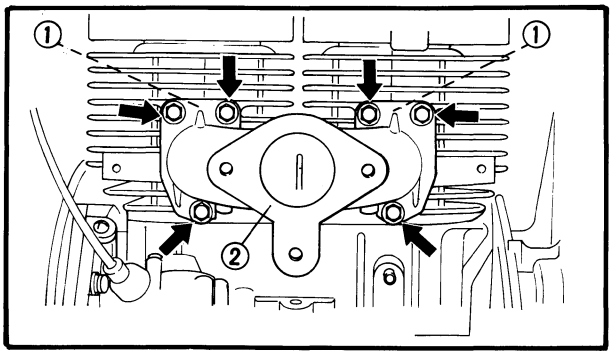
   Use a Primary Sheave Holder (YS-01880) ① to hold the flywheel magneto ②.

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



5. Install:
   - Cooling fan ①
   - Starter pulley ②

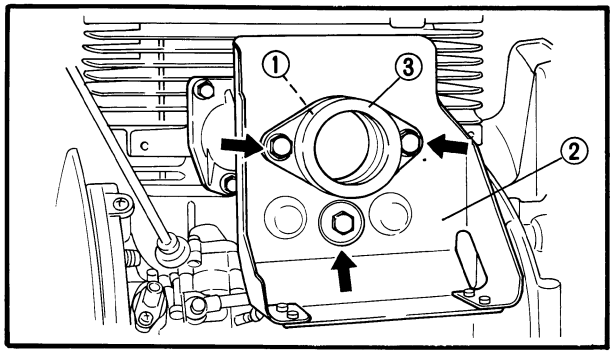
Cooling Fan Securing Bolt:
10 Nm (1.0 m·kg, 7.2 ft·lb)
Starter Pulley Securing Bolt:
15 Nm (1.5 m·kg, 11 ft·lb)



AIR SHROUD

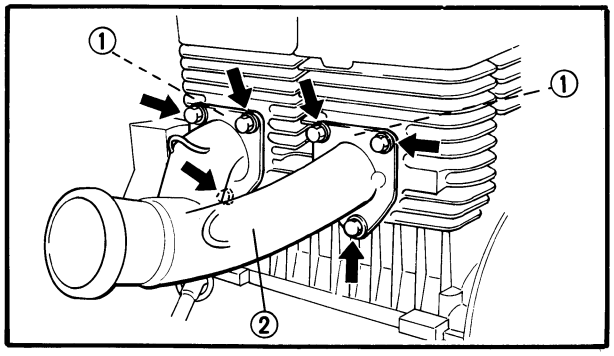
1. Install:
   - Gaskets ① (new)
   - Intake manifold ②

Intake Manifold Securing Bolt:
10 Nm (1.0 m·kg, 7.2 ft·lb)



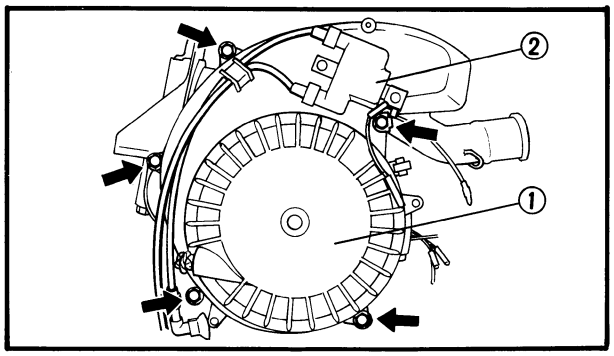
2. Install:
   - Gasket ① (new)
   - Heat baffle plate ②
   - Carburetor joint ③

Carburetor Joint Securing Bolt:
15 Nm (1.5 m·kg, 11 ft·lb)



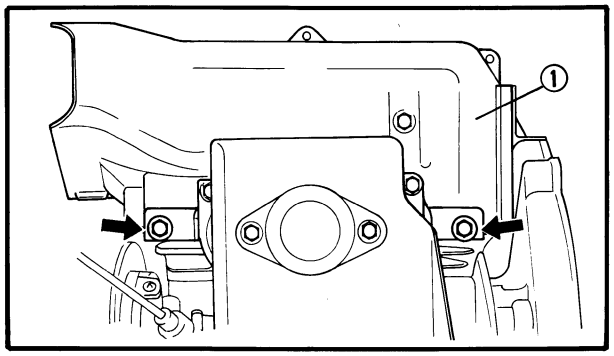
3. Install:
   - Exhaust gaskets ① (new)
   - Exhaust manifold ②

Exhaust Manifold Securing Bolt:
10 Nm (1.0 m·kg, 7.2 ft·lb)

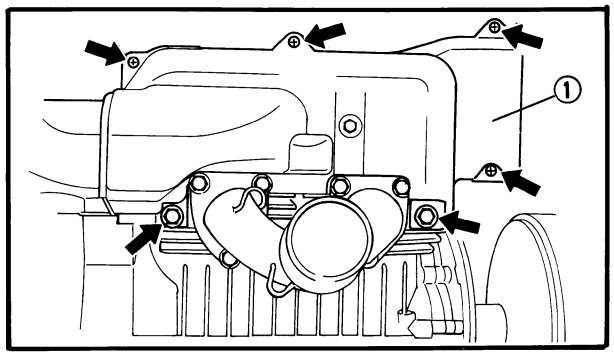


4. Install:
   - Starter case ① with ignition coil ②

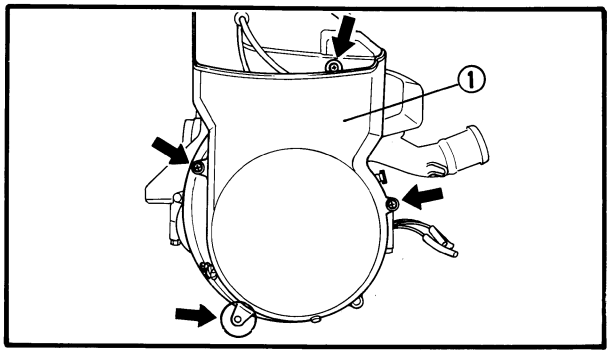
Starter Case Securing Bolt:
10 Nm (1.0 m·kg, 7.2 ft·lb)



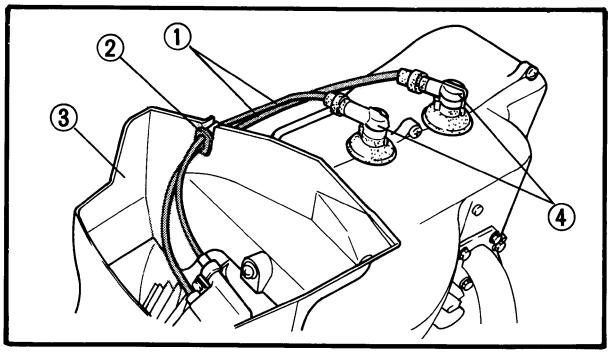
5. Install:
   - Cylinder air shroud ① (Intake side)



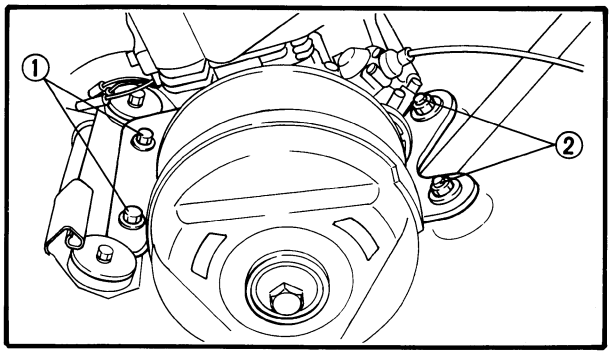
6. Install:
   - Cylinder air shroud ① (Exhaust side)



7. Install:
   - Starter case air shroud ①



8. Install:
   - Spark plug leads ① with grommet ②
     To the cooling fan air shroud ③
   - Plug caps ④

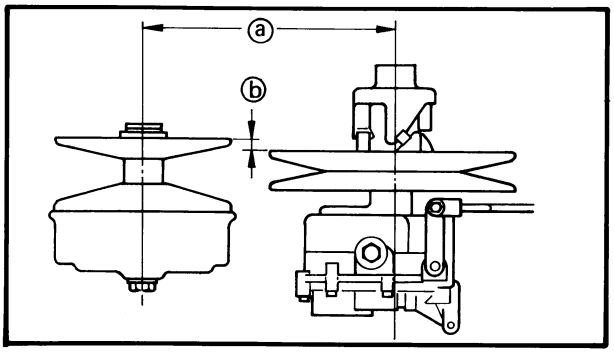


REMOUNTING ENGINE

When remounting the engine, reverse the removal procedure.
Note the following points.

1. Tighten:
   - Engine mount bolts/nuts

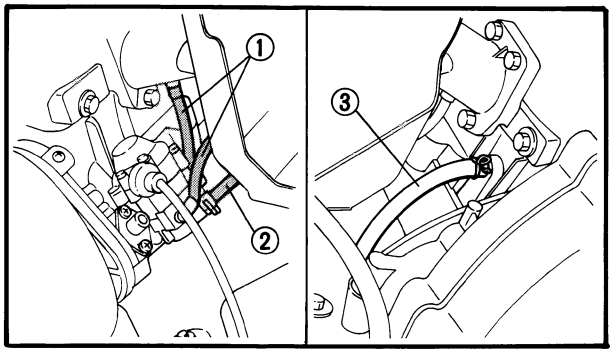
Engine Mounting Bolt ① (Front):
30 Nm (3.0 m·kg, 22 ft·lb)
Engine Mounting Nut ② (Rear):
30 Nm (3.0 m·kg, 22 ft·lb)



NOTE:

Before tightening the engine mount bolts and nuts, the sheave distance ⓐ and sheave offset ⓑ should be adjusted.
Refer to "SHEAVE ADJUSTMENT", page 2-15.

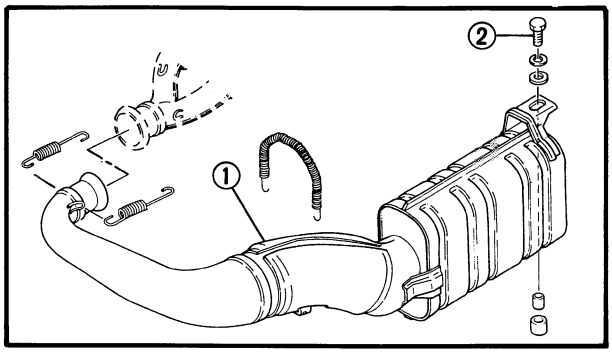
Sheave Distance ⓐ :
Approx. 266 mm (10.47 in)
Sheave Offset ⓑ :
Approx. 11 mm (0.43 in)



2. Connect:
   - Oil delivery hose ①
     To intake manifold.
   - Oil hose ②
     To oil pump.

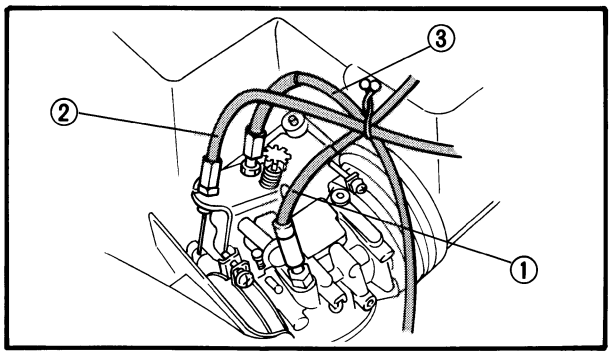
NOTE:
After connecting the hoses, bleed the air in the oil pump assembly.

   - Fuel pump pulser hose ③



3. Install:
   - Muffler assembly ①

Muffler Holding Bolt ② :
15 Nm (1.5 m·kg, 11 ft·lb)



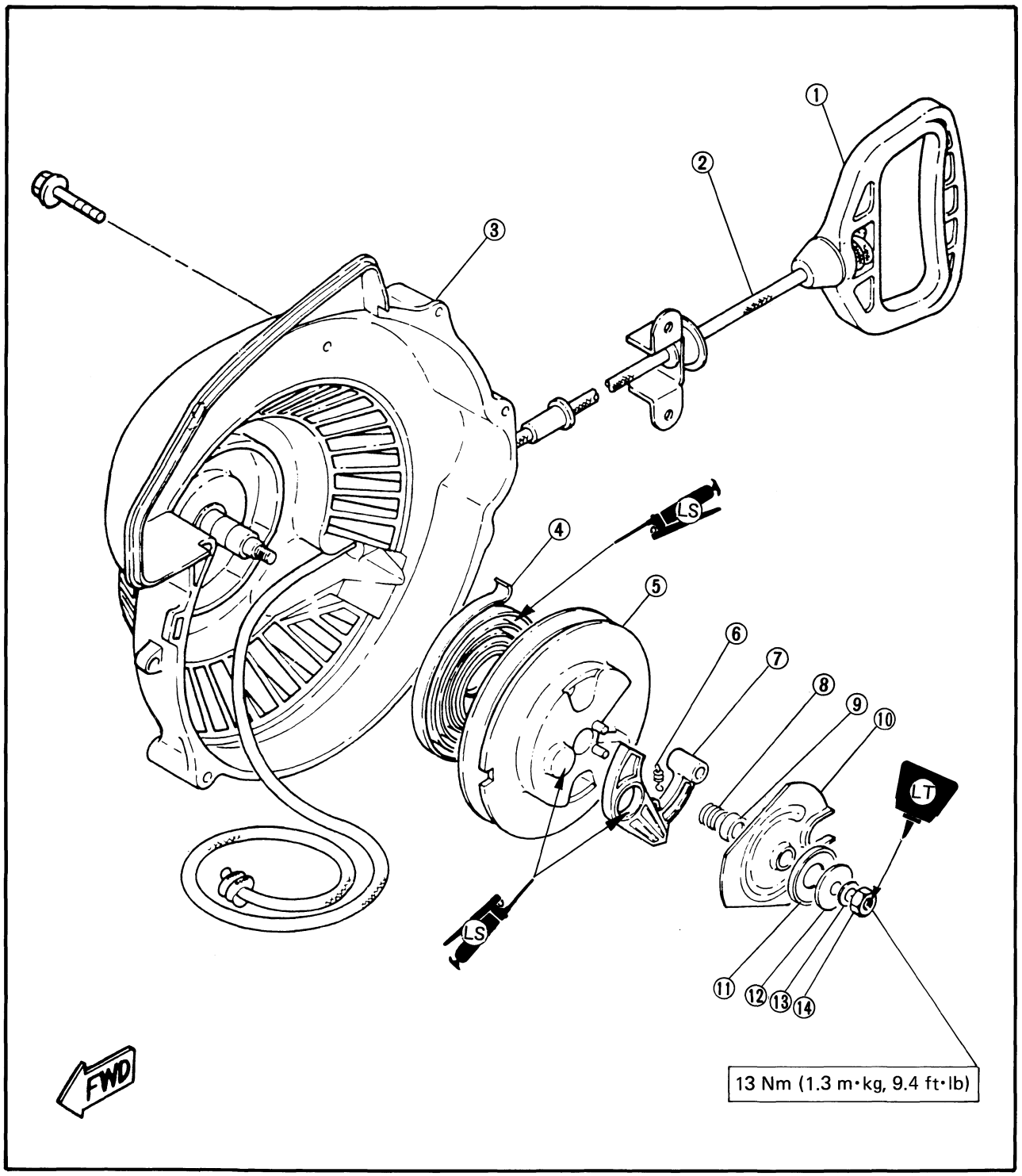
4. Adjust:
   - Starter cable ① free play
     Refer to "STARTER CABLE ADJUSTMENT", page 2-10.
   - Throttle cable ② free play
     Refer to "THROTTLE CABLE ADJUSTMENT", page 2-9.
   - Oil pump cable ③ free play
     Refer to "Oil Pump Cable Adjustment", page 2-4.

Starter Cable Free Play:
0.5 ~ 1.5 mm (0.02 ~ 0.06 in)
Throttle Cable Free Play:
1 ~ 2 mm (0.04 ~ 0.08 in)
Oil Pump Cable Free Play:
25 ± 1 mm (1.0 ± 0.04 in)

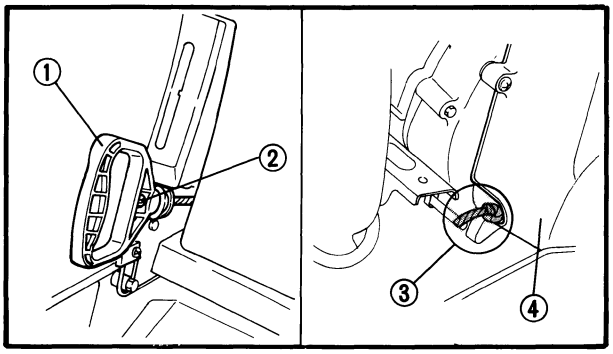
5. Adjust:
   - Ignition timing
     Refer to "IGNITION TIMING", page 2-11.
   - Idle speed adjustment
     Refer to "IDLE SPEED ADJUSTMENT", page 2-9.

RECOIL STARTER

① Starter handle
② Starter rope
③ Recoil starter case
④ Starter spring
⑤ Sheave drum
⑥ Return spring
⑦ Drive pawl
⑧ Drive plate spring
⑨ Spring seat
⑩ Drive plate
⑪ Special washer
⑫ Plain washer



RECOIL STARTER



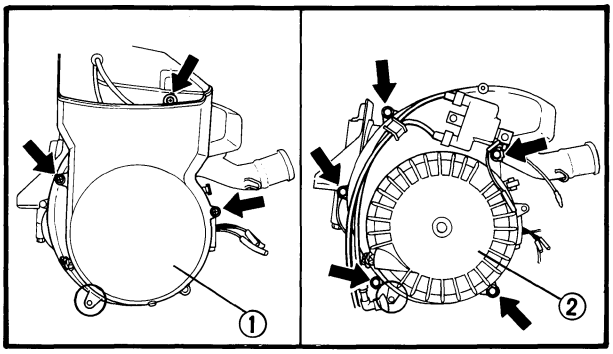
REMOVAL

1. Remove:
   - Starter handle ①

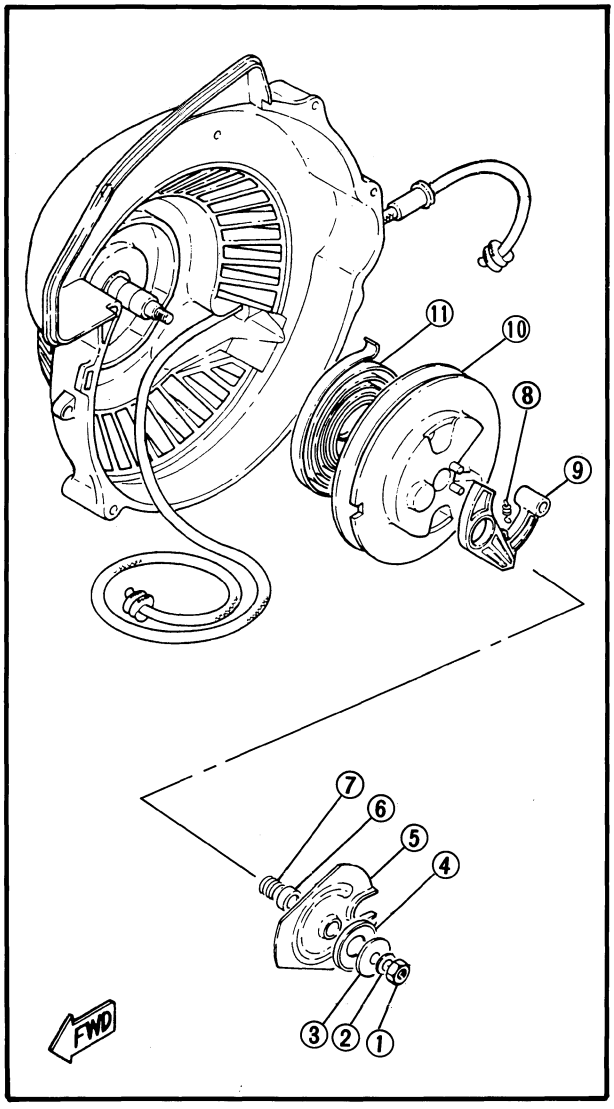
     Loosen the knot ② of the starter rope.

NOTE:

After removing the starter handle, knot ③ the rope so it will not be pulled into the recoil starter case ④.



2. Remove:
   - Starter case air shroud ①
   - Recoil starter assembly ②



DISASSEMBLY

1. Remove:
   - Drive plate securing nut ①
   - Spring washer ②
   - Plain washer ③
   - Special washer ④
   - Drive plate ⑤
   - Spring seat ⑥
   - Drive plate spring ⑦
   - Return spring ⑧
   - Drive pawl ⑨

NOTE:

Care should be taken so that the return spring ⑧ will not be lost.

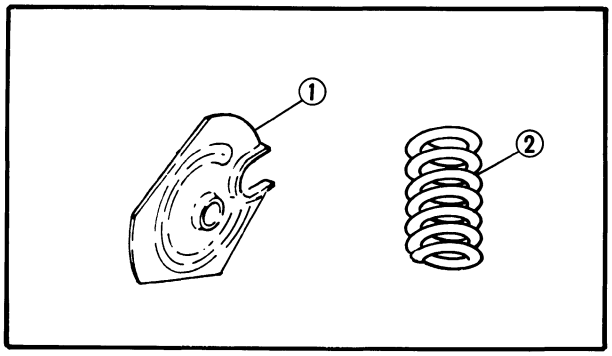
   - Sheave drum ⑩

CAUTION:

Starter spring ⑪ is under the sheave drum. Care should be taken so that it will not spring out.

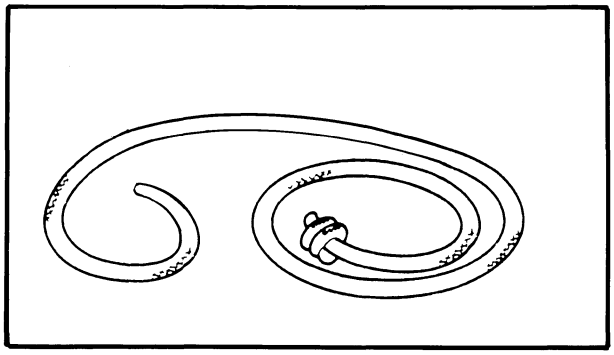
2. Undo the knot on one end of the starter rope. Then, pull it out from the starter case.

3. Remove:
   - Starter spring ⑪



INSPECTION

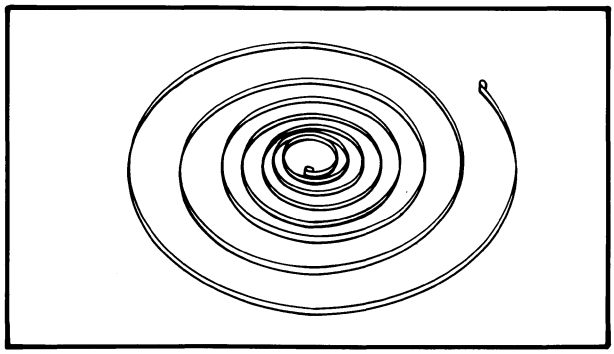
1. Inspect:
   - Drive plate ①
     Cracks/Bends/Damage → Replace.
   - Drive plate spring ②
     Fatigue/Damage → Replace.



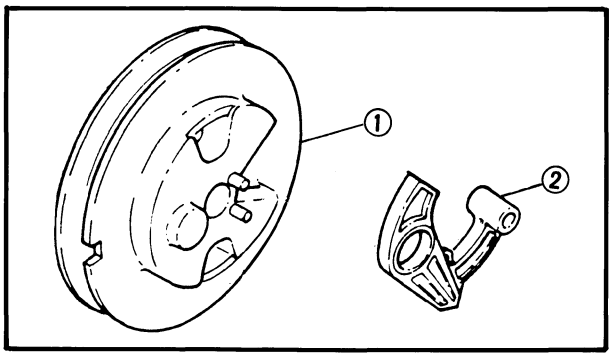
2. Inspect:
   - Starter rope
     Wear/Breaks/Damage → Replace.

NOTE:

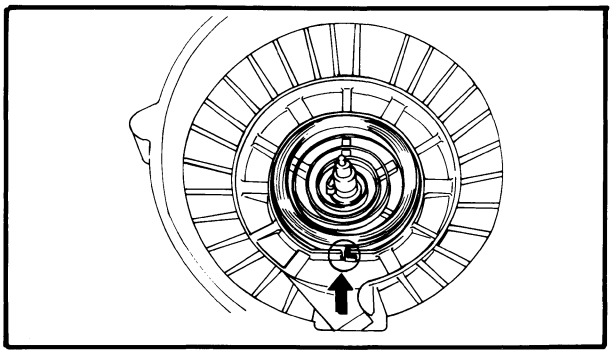
When replacing the starter rope, cut it to the specified length (1,900 mm or 75 in) and burn the rope end so that it will not ravel.



3. Inspect:
   - Starter spring
     Cracks/Bends/Damage → Replace.



4. Inspect:
   - Sheave drum ①
     Cracks/Damage → Replace.
   - Drive pawl ②
     Wear/Cracks/Damage → Replace.

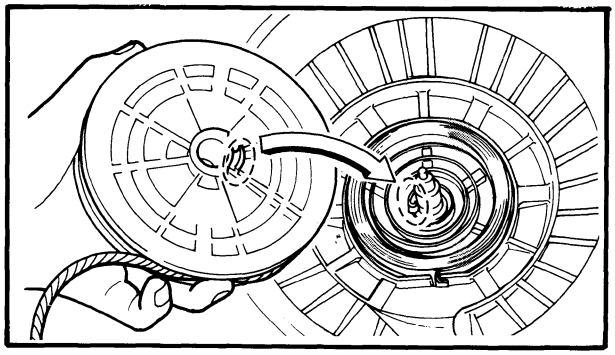


ASSEMBLY

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

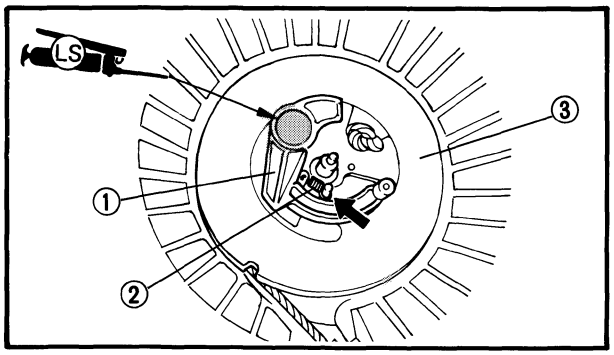
NOTE:

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



2. Feed the starter rope into the sheave drum, and knot the rope end. Then fit the knot into the cutout in the sheave drum.
3. Wind:
   - Starter rope (2-1/4 turns counterclockwise)
     To the sheave drum.
4. Install:
   - Sheave drum
     In the starter case

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

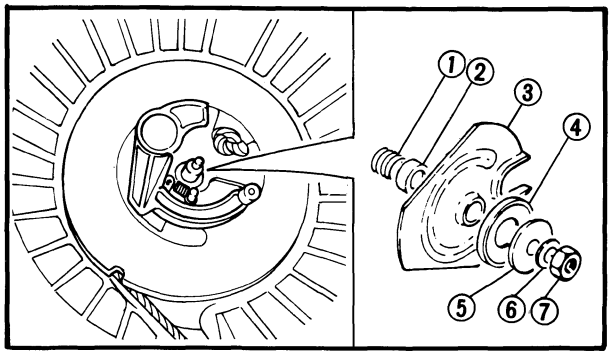


5. Lubricate:
   - Grease (lightly)

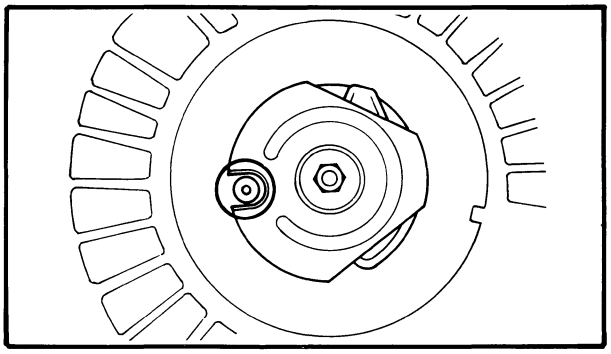
Low-Temperature Lithium Soap Base Grease

To the pivot point of the drive pawl ①.

6. Install:
   - Drive pawl ①
   - Return spring ②
     Hook the return spring end to the drive pawl ① . Then, hook other end of the return spring to the post on the sheave drum ③.

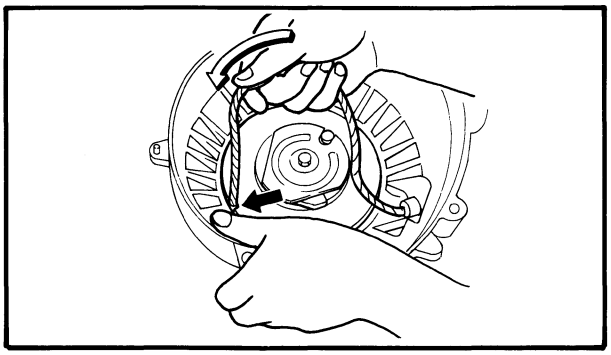


7. Install:
   - Drive plate spring ①
   - Spring seat ②
   - Drive plate ③
   - Special washer ④
   - Plain washer ⑤
   - Spring washer ⑥
   - Drive plate securing nut ⑦

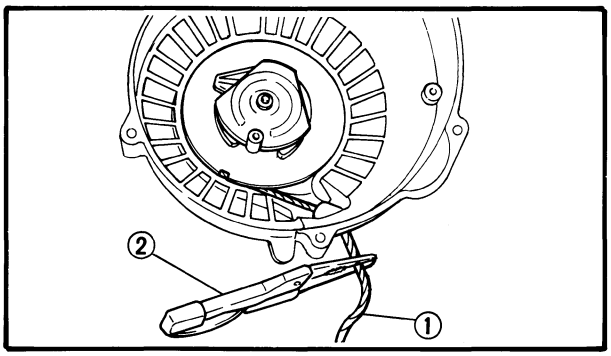


Drive Plate Securing Nut:
LOCTITE®
13 Nm (1.3 m·kg, 9.4 ft·lb)

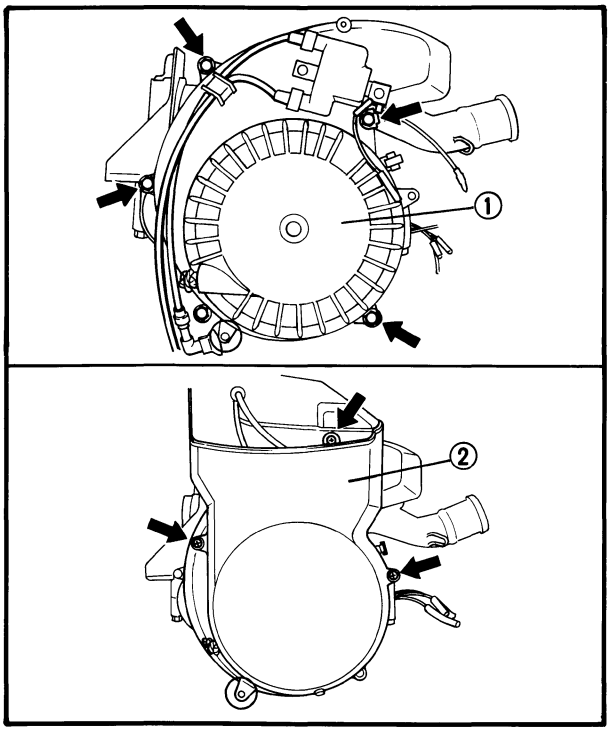
NOTE:
Be sure the cutout in the drive plate fits over the post on the drive pawl.



8. Pull about four inches of starter rope from out of the cutout in the sheave drum, and rotate the sheave drum five times counterclockwise to preload the starter spring.



9. Hold the starter rope ① wise a vise-grip plier ② at the starter case hole side.
10. Install:
    - Starter handle holder
    - Starter handle
11. Remove:
    - Vise-grip plier ②
12. Check the starter for smooth operation. If it does not operate smoothly, disassembly it. Then, reassemble it correctly.



INSTALLATION

When installing the recoil starter assembly, reverse the removal procedure.
Note the following point.

1. Tighten:
    - Recoil starter case ① securing bolts.
    - Starter case air shroud ② securing screws:

Starter Case Securing Bolt:
10 Nm (1.0 m·kg, 7.2 ft·lb)
Starter Case Air Shroud Securing Screw:
6 Nm (0.6 m·kg, 4.3 ft·lb)

CHAPTER 4.
CARBURETION

CARBURETOR 4-1
FUEL FLOW CHART 4-2
REMOVAL 4-3
DISASSEMBLY 4-3
INSPECTION 4-4
ASSEMBLY 4-5
FLOAT HEIGHT ADJUSTMENT 4-5
INSTALLATION 4-6

CARBURETOR TUNING 4-7
FUEL FLOW CHART 4-7
HIGH ALTITUDE TUNING 4-9
LOW SPEED TUNING 4-10
MIDDLE-RANGE AND HIGH SPEED TUNING 4-11
TROUBLESHOOTING 4-13

CARBURETION

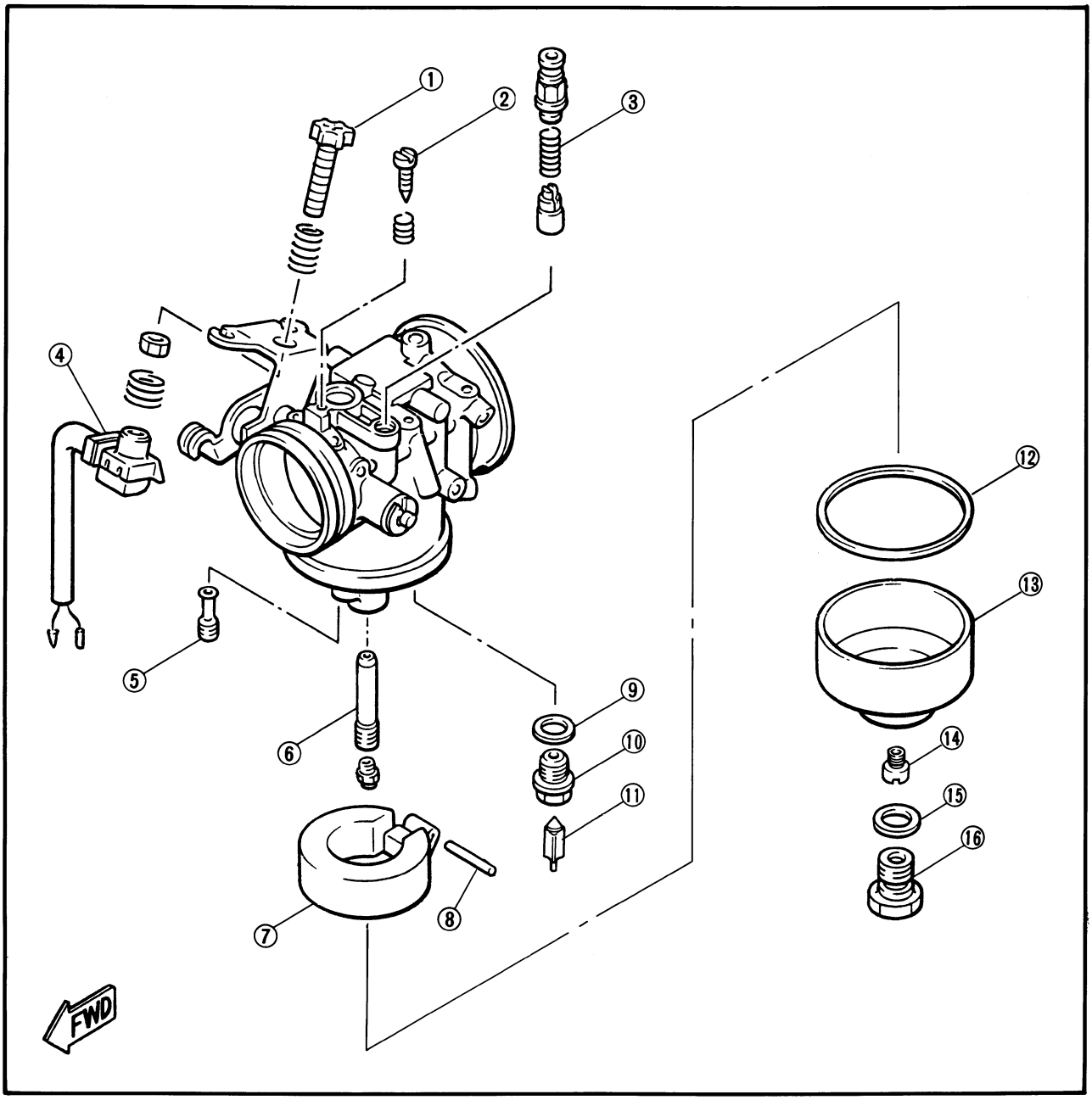
CARBURETOR

① Idle adjusting screw
② Idle mixture screw
③ Starter plunger
④ Carburetor switch
⑤ Pilot jet
⑥ Main nozzle
⑦ Float
⑧ Float pin
⑨ Gasket
⑩ Valve seat
⑪ Needle valve
⑫ Rubber gasket
⑬ Float chamber cover
⑭ Main jet
⑮ Gasket
⑯ Main jet holder

SPECIFICATIONS	
Main Jet	#132.5
Pilot Jet	#95
Idle Mixture Screw	1.0 (turns out)
Float Height	15 ± 1.0 mm (0.59 ± 0.04 in)
Engine Idle Speed	1,600 r/min

CAUTION:

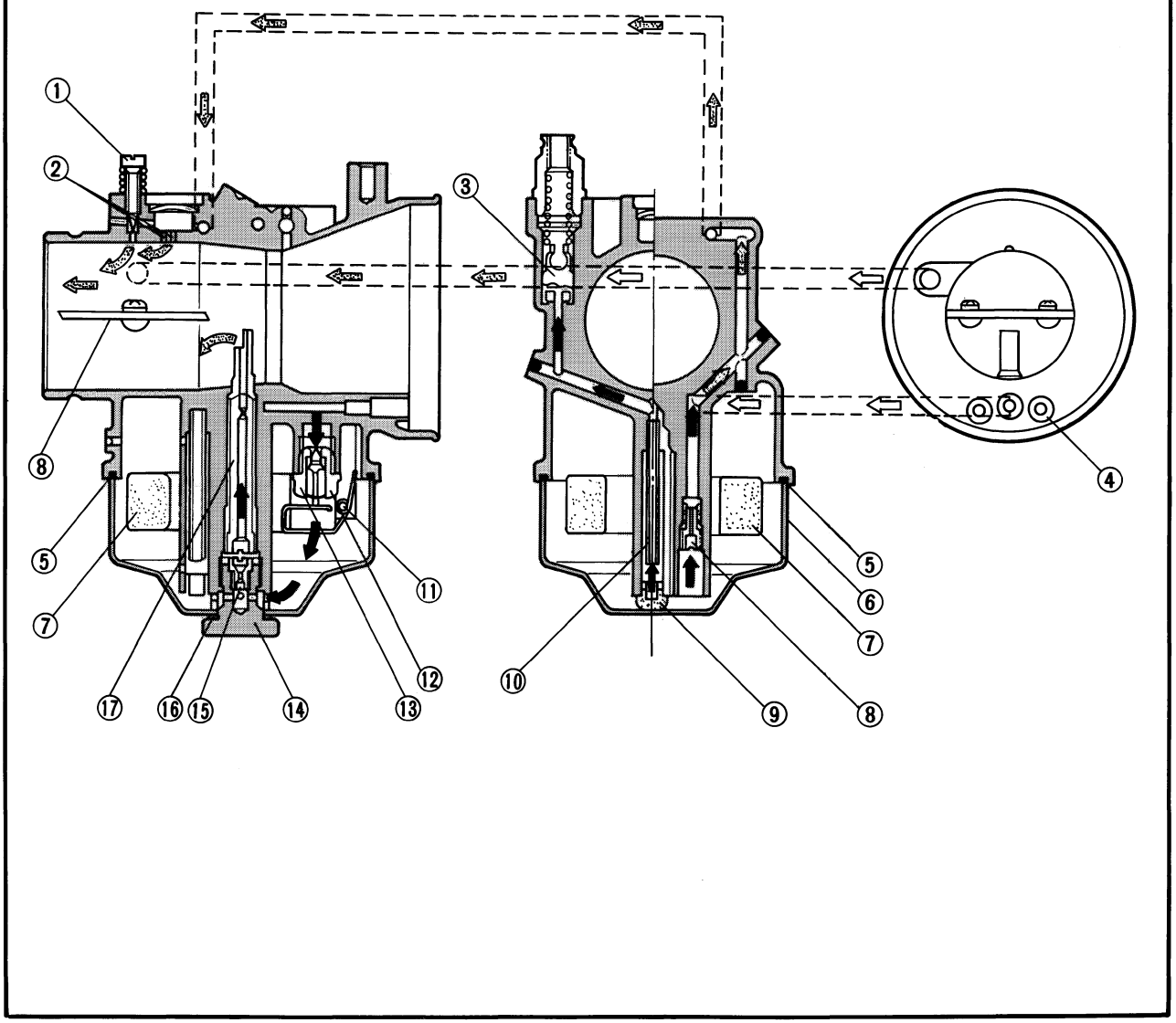
Never attempt to disassemble the following parts.
- **Throttle valve**
- **Throttle shaft**



FUEL FLOW CHART

① Idle mixture screw
② Bypass port
③ Starter plunger
④ Pilot air jet
⑤ Rubber gasket
⑥ Float chamber cover
⑦ Float
⑧ Pilot jet
⑨ Rubber plug
⑩ Starter jet
⑪ Float pin
⑫ Needle valve
⑬ Valve seat
⑭ Main jet holder
⑮ Main jet
⑯ Gasket
⑰ Main nozzle
⑱ Throttle valve

A	FUEL	⬅
B	AIR	⇦
C	MIXTURE	⇦



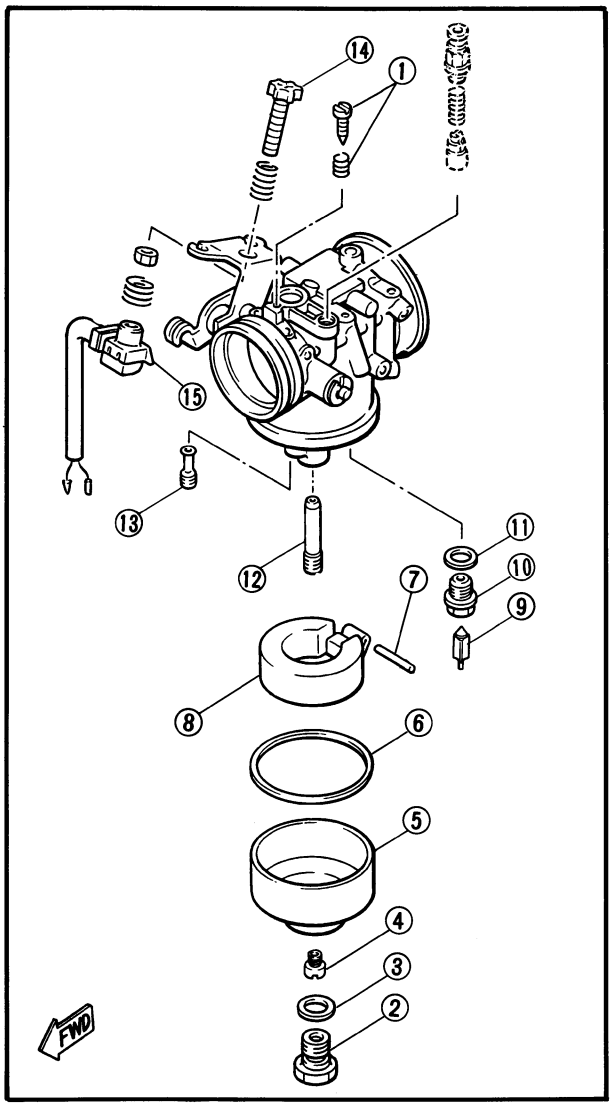
REMOVAL

1. Remove:
   - Carburetor assembly
     Refer to "ENGINE REMOVAL – CARBURETOR", page 3-2.

NOTE:

The following parts can be cleaned and inspected without disassembly.

- Idle mixture screw
- Main jet
- Starter plunger
- Carburetor switch



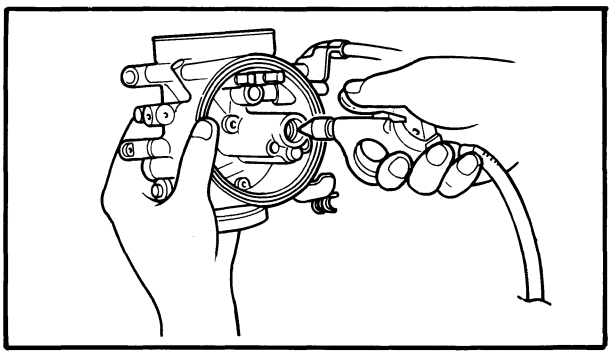
DISASSEMBLY

1. Remove:
   - Idle mixture screw set ①
   - Main jet holder ②
   - Gasket ③
   - Main jet ④
   - Float chamber ⑤
   - Rubber gasket ⑥
   - Float pin ⑦
   - Float ⑧
   - Needle valve ⑨
   - Valve seat ⑩
   - Gasket ⑪
   - Main nozzle ⑫
   - Pilot jet ⑬
   - Idle adjusting screw ⑭
   - Carburetor switch ⑮

CAUTION:

Never attempt to disassemble the following parts.

- **Throttle valve**
- **Throttle shaft**

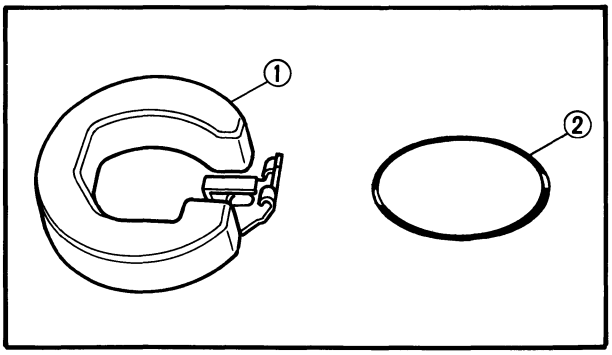


INSPECTION

1. Inspect:
   - Carburetor body
   - Fuel passage

   Contamination → Clean.

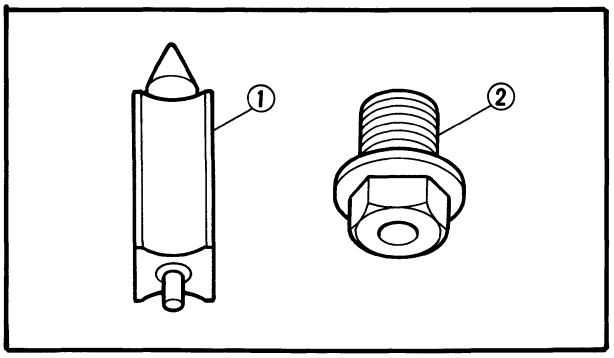
NOTE:
- Use a petroleum based solvent for cleaning.
- Blow out all passages and jets with compressed air.



2. Inspect:
   - Float ①

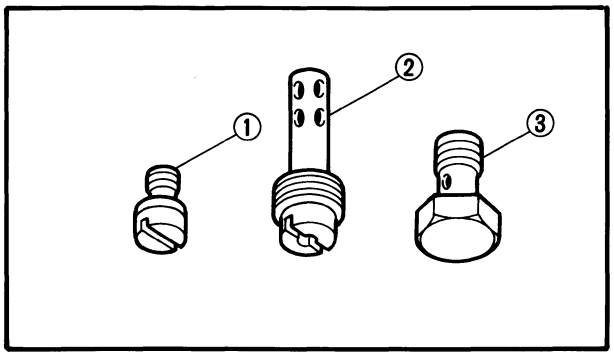
   Damage/Torn → Replace.
   - Rubber gasket ②

   Damage → Replace.



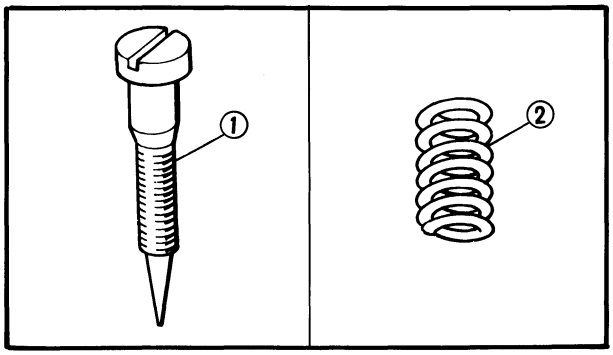
3. Inspect:
   - Needle valve ①
   - Valve seat ②

   Wear/Scratches/Damage → Replace as a set.



4. Inspect:
   - Main jet ①
   - Pilot jet ②
   - Main jet holder ③

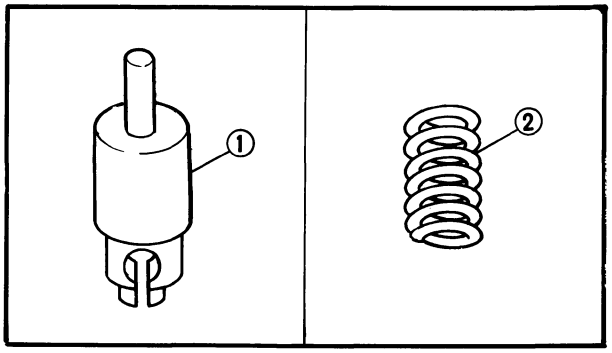
   Wear/Damage → Replace.
   Contamination → Clean.



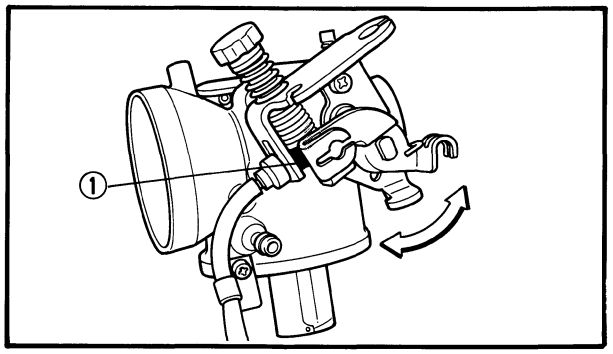
5. Inspect:
   - Idle mixture screw ①

   Wear/Damage → Replace.
   - Idle mixture screw spring ②

   Fatigue → Replace.



6. Inspect:
   - Starter plunger ①
     Scratches/Wear → Replace.
   - Starter plunger spring ②
     Fatigue → Replace.



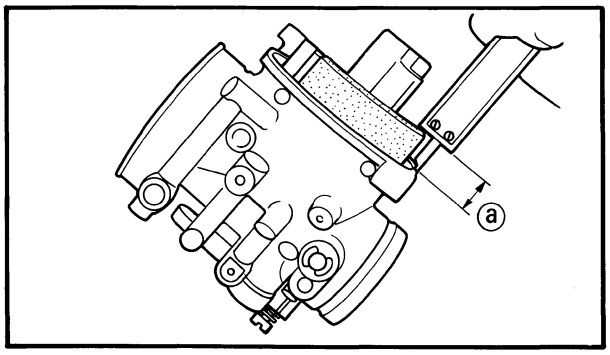
7. Inspect:
   - Throttle valve
     Wear/Damage → Replace.
8. Check:
   - Valve free movement
     Stick → Replace carburetor assembly.
9. Check:
   - Carburetor switch ①
     Refer to "SWITCH TEST – CARBURETOR SWITCH", page 7-19.

ASSEMBLY

1. Assemble:
   - Carburetor
     Reverse the disassembly procedure steps.

CAUTION:

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



FLOAT HEIGHT ADJUSTMENT

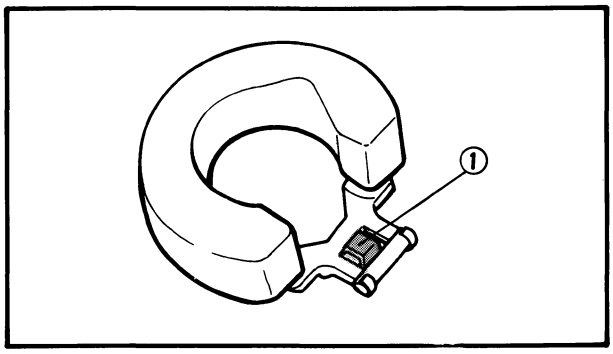
1. Measure:
   - Float height ⓐ

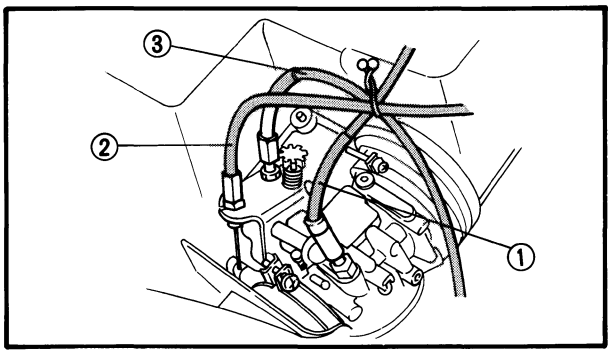
Float Height (F.H.) ⓐ:
15.0 ± 1.0 mm (0.60 ± 0.04 in)

Out of specification → Adjust.

Float height measurement and adjustment steps:

- Remove the carburetor, and remove the float chamber cover.
- Hold the carburetor in an upside down position.
- Incline the carburetor at 60 ~ 70° (so that the end of the float valve does not hang down as a result of float weight).





- Measure the distance between the mating surface of the float chamber and top of the float using a gauge.

NOTE:
The float arm should be resting on the needle 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 tang ① on the float.
- Recheck the float height.

2. Install:
   - Rubber gasket (new)
   - Float chamber cover
   - Chamber cover holding screws
3. Tightening the main jet holder.

INSTALLATION

To install the carburetor assembly, reverse the removal procedures.
Note the following points.

1. Adjust:
   - Starter cable ① free play
     Refer to "STARTER CABLE ADJUSTMENT", page 2-10.
   - Throttle cable ② free play
     Refer to "THROTTLE CABLE ADJUSTMENT", page 2-9.
   - Oil pump cable ③ free play
     Refer to "Oil Pump Cable Adjustment", page 2-4.

Starter Cable Free Play:
0.5 ~ 1.5 mm (0.02 ~ 0.06 in)
Throttle cable Free Play:
1 ~ 2 mm (0.04 ~ 0.08 in)
Oil Pump Cable Free Play:
25 ± 1 mm (1.0 ± 0.04 in)

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 fuel pump, so it is not always possible to supply the optimum mixture depending on the throttle opening.**
  Therefore, after the carburetor is tuned up 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.
- **Before performing the carburetor tuning, make sure that the following items are in correct condition.**
  1) Starter cable adjustment
  2) Throttle cable adjustment
  3) Oil pump cable adjustment
  4) Idle mixture setting
  5) Idle speed adjustment

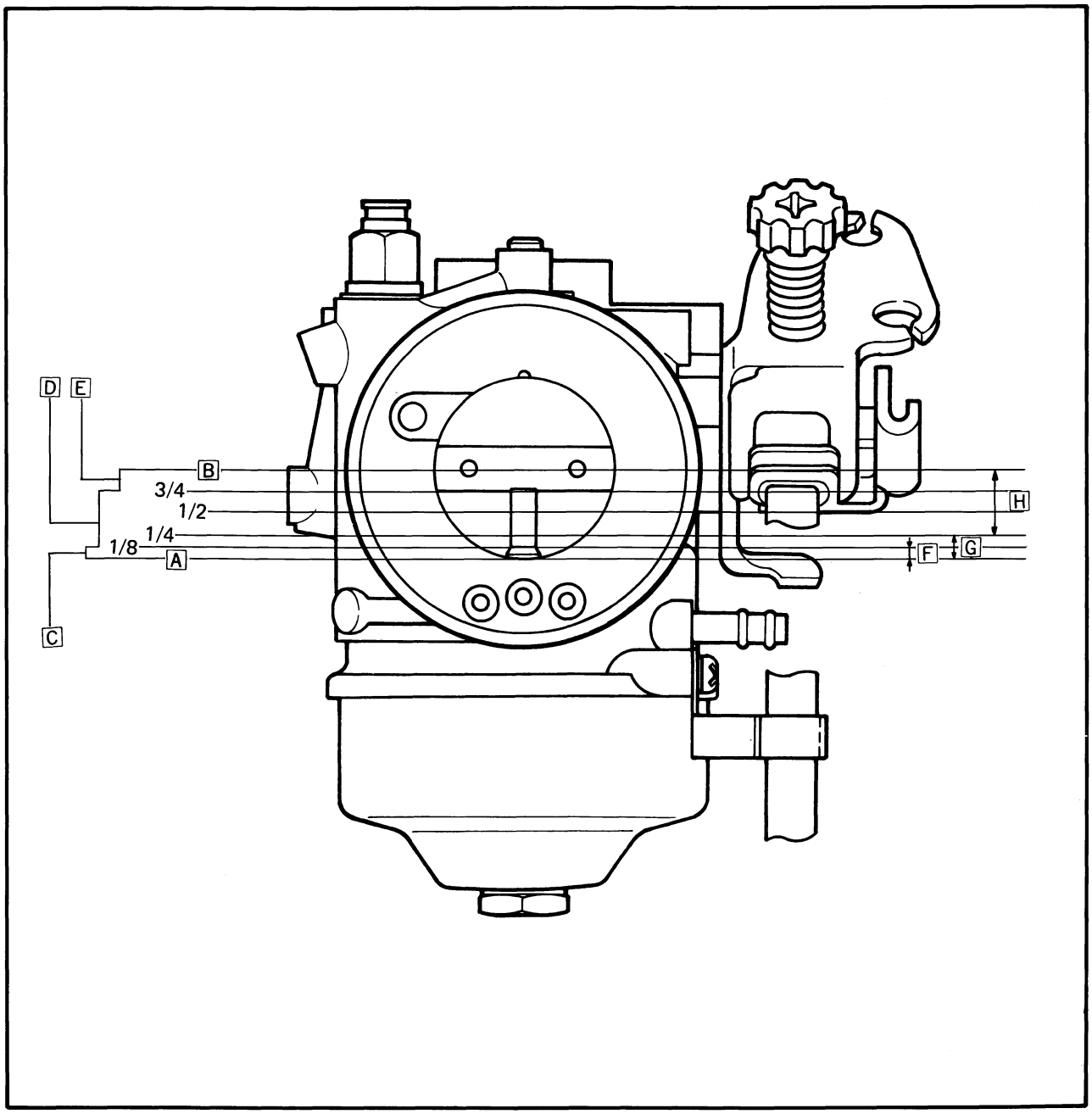
FUEL FLOW CHART

A guide to fuel flow rate according to throttle opening.

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.**
- **Removal of the air intake silencer have no increasing effect on performance characteristics.**
- **They must be secured to the carburetor during tuning and adjustment, and must always be in place when the engine is operated.**
- **Examine the intake silencer regularly for cleanliness and freedom from obstruction.**

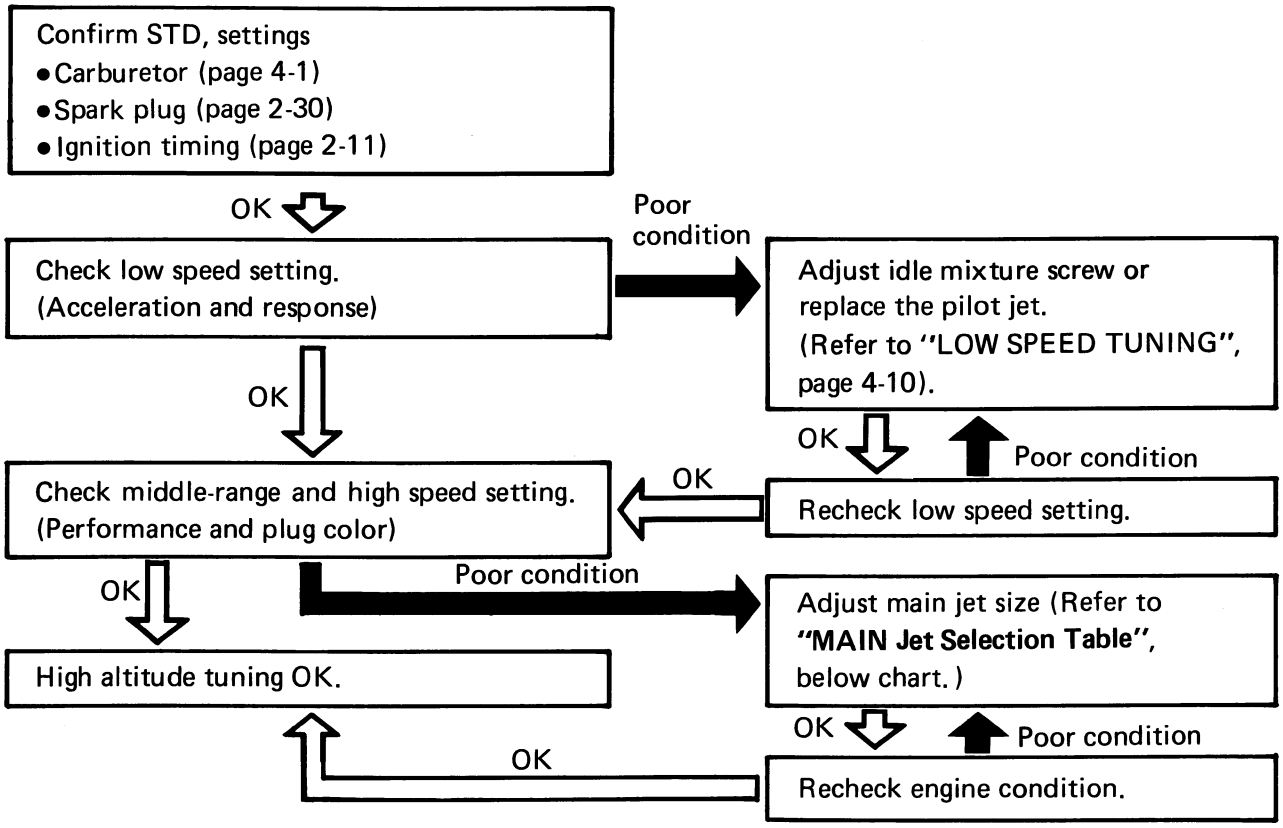
[A] CLOSED POSITION
[B] FULL OPEN POSITION
[C] LOW SPEED TUNING
[D] MID-RANGE SPEED TUNING
[E] HIGH SPEED TUNING
[F] EFFECTIVE RANGE OF PILOT JET, PILOT AIR JET AND IDLE MIXTURE SCREW
[G] EFFECTIVE RANGE CONTROLLED BY BYPASS PORT AND MAIN JET.
[H] EFFECTIVE RANGE CONTROLLED BY MAIN JET AND FUEL LEVEL



HIGH ALTITUDE TUNING

High Altitude Tuning Flow Chart

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



Main Jet Selection Table

A guide to main jet according to variations in elevation and temperature.

Elevation \ 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)
Sea level	#135					
0 ~ 600 m (0 ~ 2,000 ft)	#132.5 (STD)					
600 ~ 1,200 m (2,000 ~ 4,000 ft)						
1,200 ~ 1,800 m (4,000 ~ 6,000 ft)		#128.8				
1,800 ~ 2,400 m (6,000 ~ 8,000 ft)			#125			
2,400 ~ 3,000 m (8,000 ~ 10,000 ft)				#121.3		

LOW SPEED TUNING

The carburetor is built so that low speed tuning can be done by adjusting the idle mixture screw and pilot jet.

CAUTION:

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

Idle Mixture Setting and Idle Speed Adjustment

1. Refer to CARBURETOR – IDLE MIXTURE SETTING, IDLE SPEED ADJUSTMENT, page 2-9.
2. If the engine shows poor performance at high altitudes or in an extremely cold area or when it is suddenly accelerated or run at low speed, replace the pilot jet.

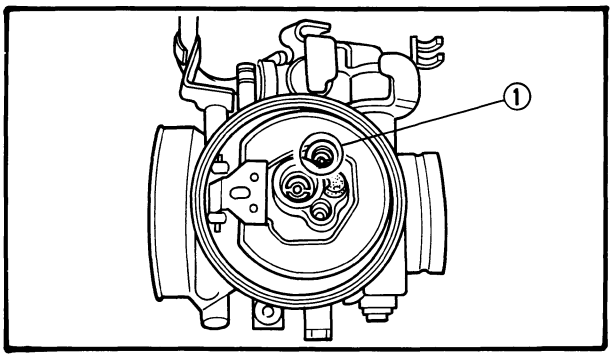
NOTE:

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

3. Replace:
   - Pilot jet

Standard Pilot Jet:
#95

By the following replacement steps.



Pilot jet replacement steps:

- Remove the carburetor assembly. Refer to "ENGINE REMOVAL – CARBURETOR", page 3-2.
- Drain the fuel from the float chamber.
- Remove the float chamber.
- Replace the pilot jet ① by the proper sized jet.
- When reassembling, reverse the above steps.
- Recheck the idle mixture, idle speed and engine performance. If the engine shows poor performance, perform the above steps again.

MIDDLE-RANGE AND HIGH SPEED TUNING

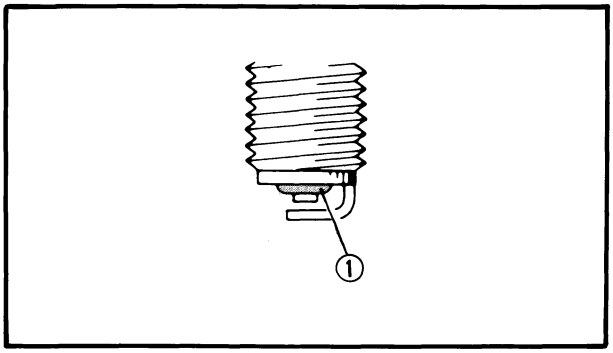
No adjustment is normally required, but adjustment is sometimes necessary depending on temperatures and/or altitude.

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; severe engine damage may result.

1. Start the engine, and run the engine at high speed. Make sure the engine operates smoothly.
2. Stop the engine.
3. Remove:
   - Spark plug



4. Check:
   - Spark plug insulator color ①

   Normal condition is a medium to light tan color.

   Distinctly different color → Replace the main jet; perform the step 5.

Standard Main Jet:
#132.5

NOTE:

- Refer to "CARBURETOR – Main Jet Selection Table", page 4-13.
- During warm weather or at high altitudes, a smaller main jet should be used.
- During periods of excessively cold weather, a larger one should be used.
- Too rich mixture can cause poor performance and excessive carbon formation with accompanying shorter spark plug life.
- Too lean mixture can cause overheating and possible engine failure.

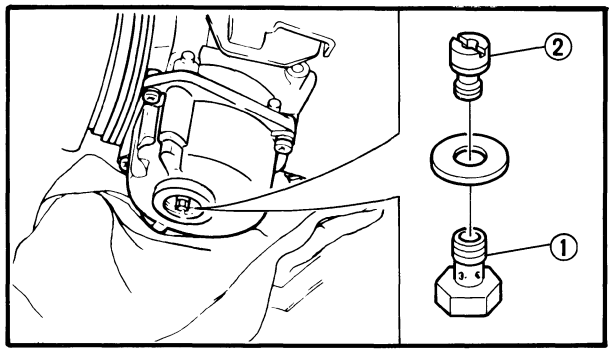
5. Replace:
   - Main jet

Main jet replacement steps:

WARNING:

- **Never remove the main jet holder 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.**
- **After having assembled the carburetor, make sure the throttle outer tube is in place and the throttle moves smoothly.**

- Place a rag under the carburetor so fuel does not spread.
- Drain the fuel from the float chamber by removing the main jet holder ① .
- Remove the main jet ② from the main jet holder ① .
- Replace the main jet ② by the proper sized jet.
- When reassembling, reverse the above steps.
- Recheck the engine (spark plug insulator color) condition.
  If the engine shows poor performance and spark plug color is bad, perform the above steps again.



Main Jet Selection Table

A guide to main jet according to plug color

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 to lean.	Replace main jet with a one-step larger one.
White or gray insulator with small black or gray brown spots and with 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 lever 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 (Relative troubles) • Poor performance at low speeds • Poor acceleration • Slow response to throttle • Engine tends to stall	Improper idling speed adjustment • Idle mixture screw	Adjust idling speed	Tighten idle mixture screw lightly, and check throttle opening. If incorrect, back it out according to the specification. Start the engine and turn idle mixture screw in and out 1/4 turn each time. When the engine runs faster, back out throttle stop screw so the engine idles at specified speed. Tightened too much — Engine speed is too high. Backed out too much — Engine does not idle.
	Damaged idle mixture screw	Replace idle mixture screw	
	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 band screw	
	Overflow	Check float and float valve and clean	

Trouble	Check point	Remedy	Adjustment
Poor performance at mid-range speeds (Relative troubles) • 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 (Relative troubles) • Excess fuel consumption • Poor acceleration	Clogged air vent	Clean	Remove the air vent, 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	
Poor performance at high speeds (Relative troubles) • Power loss • Poor acceleration	Starter plunger on the right side	Fully close plunger	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 retighten	
	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 (Relative troubles) • Power 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	Valve seat is press-fitted to body. So body must be replaced if seat is damaged.
	Broken float	Replace float	
	Incorrect float level	If not within the specified range, check the following parts and replace any defective part.	
	• Worn float tang	Replace float	Replace float assembly.
	• Worn pin	Replace arm pin	
	• Deformed float arm	Replace float	

CHAPTER 5.
POWER TRAIN

PRIMARY SHEAVE 5-1
REMOVAL 5-2
DISASSEMBLY 5-2
INSPECTION 5-3
ASSEMBLY 5-6
INSTALLATION 5-7

BRAKE 5-8
DISASSEMBLY 5-9
INSPECTION 5-9
ASSEMBLY 5-10

CHAIN HOUSING 5-11
DISASSEMBLY 5-12
INSPECTION 5-15
ASSEMBLY 5-16

SECONDARY SHEAVE 5-20
REMOVAL 5-21
DISASSEMBLY 5-21
INSPECTION 5-21
ASSEMBLY 5-22
INSTALLATION 5-23

SLIDE RAIL SUSPENSION 5-23
REMOVAL 5-23
DISASSEMBLY 5-26
INSPECTION 5-27
ASSEMBLY 5-28
INSTALLATION 5-29

DRIVE 5-30
REMOVAL 5-30
INSPECTION 5-32
INSTALLATION 5-33

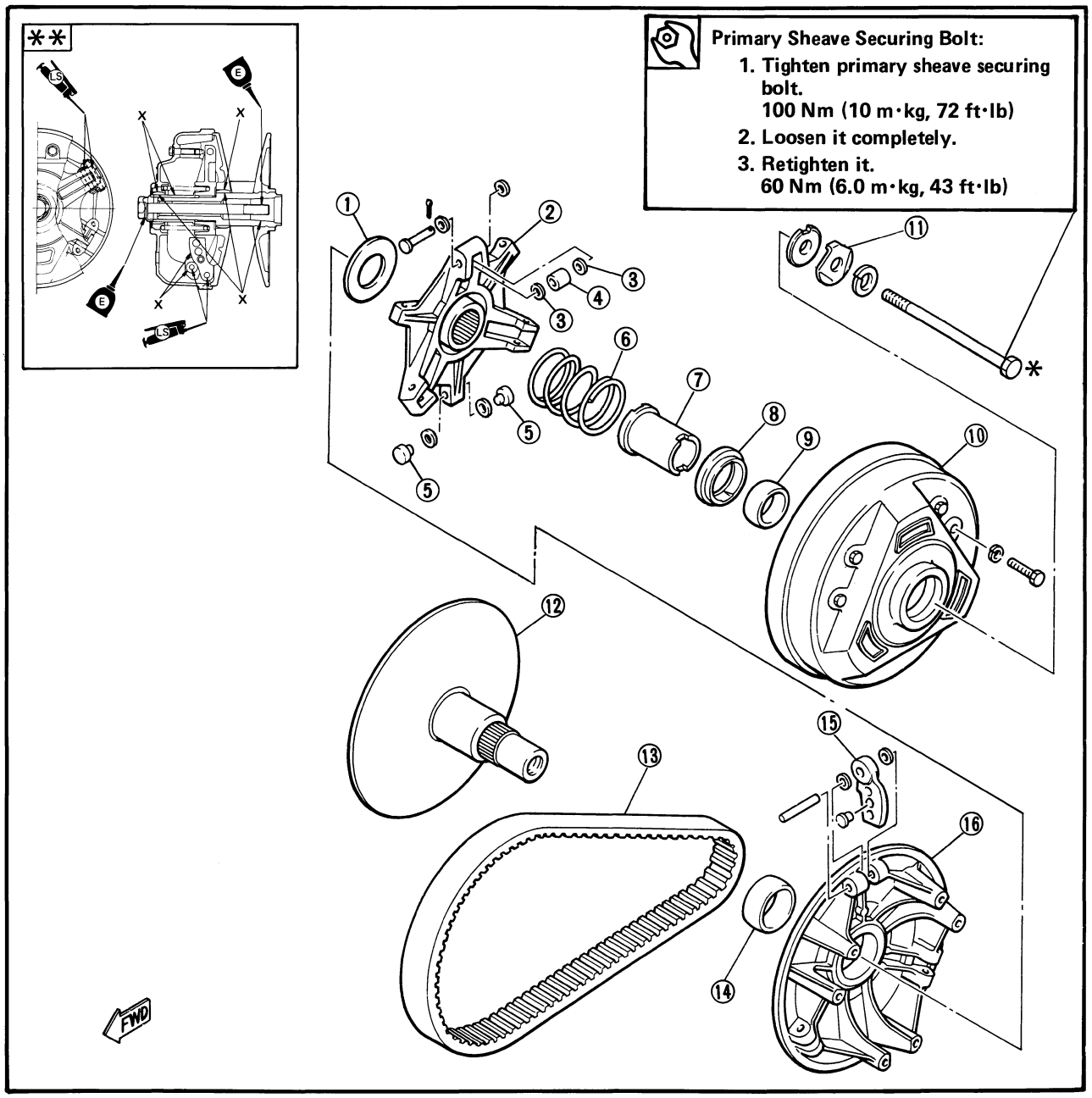
POWER TRAIN

PRIMARY SHEAVE

① Special washer
② Spider
③ Washer
④ Roller
⑤ Slider button
⑥ Compression spring
⑦ Collar
⑧ Bushing outer race
⑨ Bushing
⑩ Sheave cap
⑪ Lock washer
⑫ Fixed sheave
⑬ Drive V-belt
⑭ Bushing
⑮ Weight
⑯ Sliding sheave

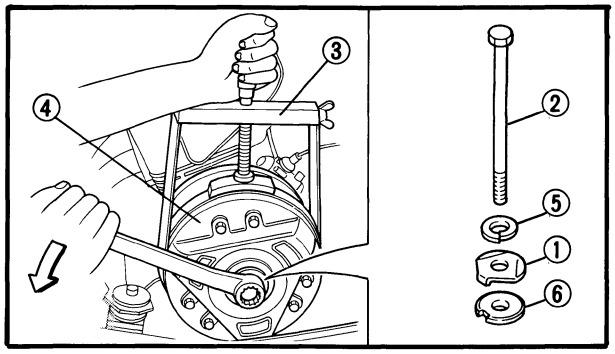
*
NOTE:
Before installing the primary sheave securing bolt, apply engine oil to the threaded portion of securing bolt and its contact surface with spring washer.

**
CAUTION:
Do not apply grease to the area marked X.

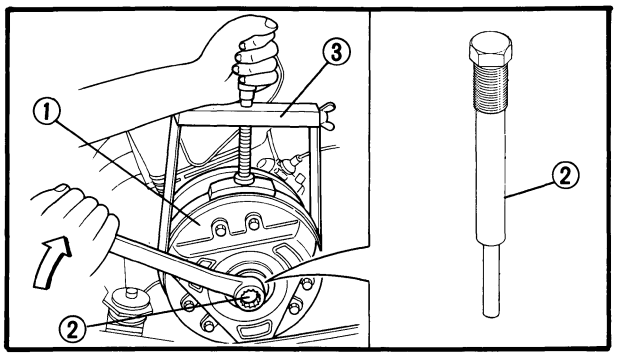


REMOVAL

1. Open the shroud.
2. Remove:
   - Drive V-belt guard
   - Drive V-belt
   - Muffler assembly



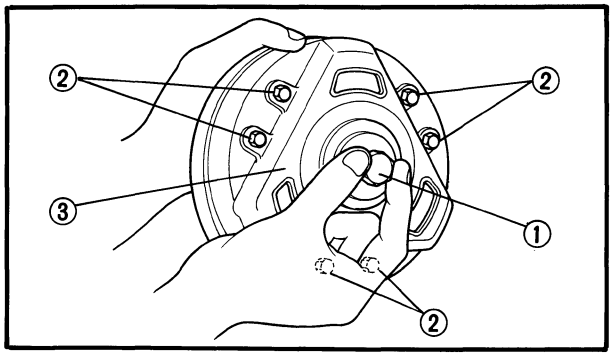
3. Straighten:
   - Lock washer ① tabs
4. Remove:
   - Primary sheave securing bolt ②
     Use the Primary Sheave Holder (YS-01880) ③ to hold the primary sheave ④ .
   - Spring washer ⑤
   - Lock washer ①
   - Plate washer ⑥

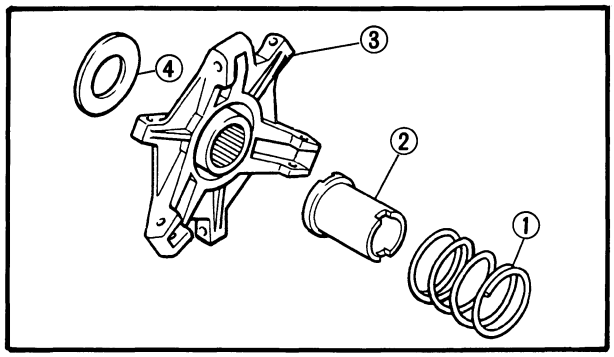


5. Remove:
   - Primary sheave assembly ①
     Use the Primary Sheave Puller (YS-01859) ② and Primary Sheave Holder (YS-01880) ③ .

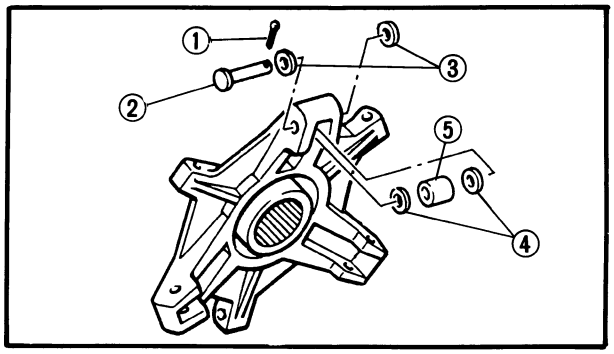
DISASSEMBLY

1. Attach:
   - Primary Sheave Sub-assembly Tool (YS-91060) ①
2. Remove:
   - Sheave cap securing bolts ②
   - Primary sheave sub-assembly tool ①
   - Sheave cap ③

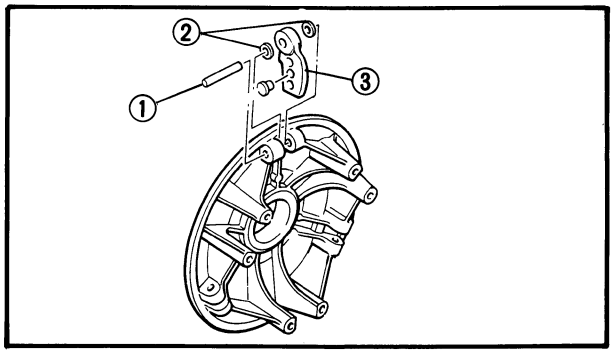




3. Remove:
   - Compression spring ①
   - Collar ②
   - Spider ③
   - Special washer ④

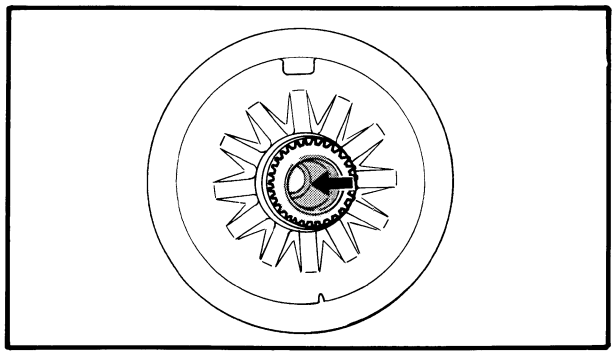


4. Remove:
   - Cotter pin ①
   - Roller holding pin ②
   - Washer ③
   - Nylon washer ④
   - Roller ⑤

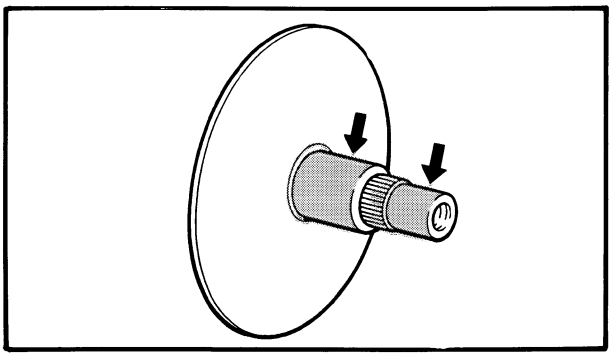


5. Remove:
   - Weight holding pin ①
   - Washer ②
   - Weight ③

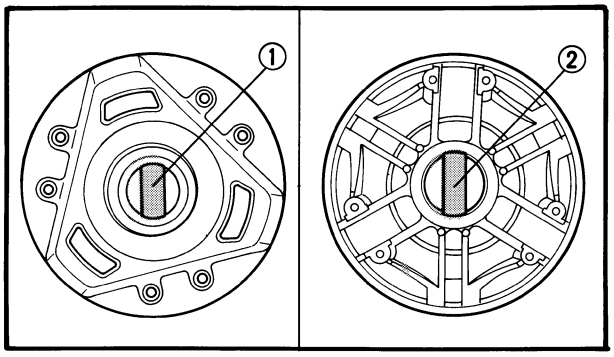
INSPECTION



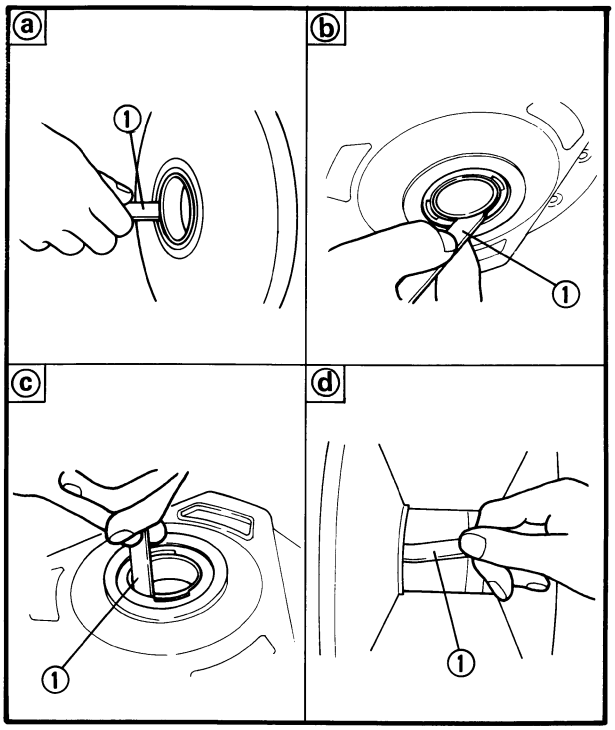
1. Inspect:
   - Crankshaft taper ends
   - Primary fixed sheave tapered portions
     Scratches/Pitting/Damage → Replace.



2. Inspect:
   - Sliding Shaft (Primary fixed sheave)
     Scratches/Pitting/Damage → Replace.



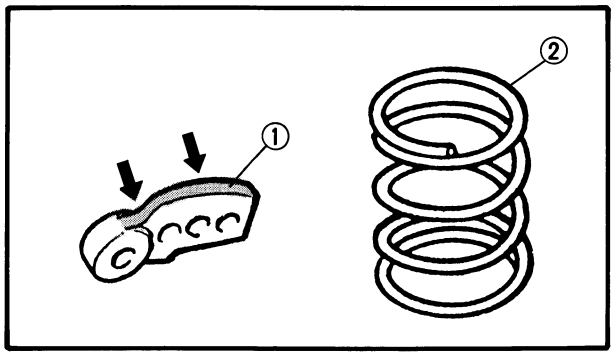
3. Inspect:
   - Primary sheave cap bushing ①
   - Primary fixed sheave bushing ②
     Scratches/Cracks/Damage → Replace.



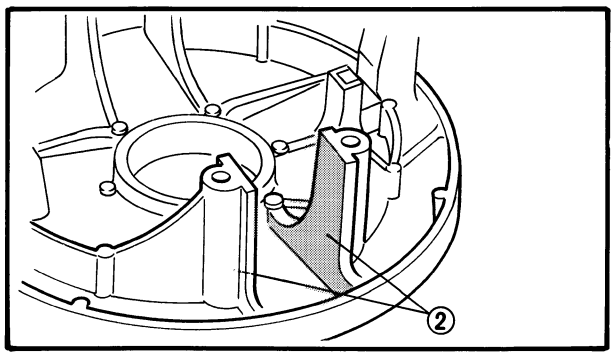
4. Measure:
   - Sheave cap bushing clearance
   - Sliding sheave bushing clearance

   Use a Feeler Gauge ① .
   Out of specification → Replace the bushing.

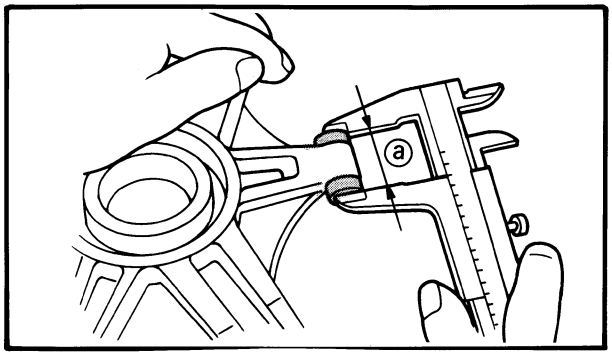
	Bushing Limit Clearance	
	Sheave Cap Bushing	Sliding Sheave Bushing
Inside	0.25 mm (0.01 in) ⓐ	0.25 mm (0.01 in) ⓒ
Outside	0.25 mm (0.01 in) ⓑ	0.25 mm (0.01 in) ⓓ



5. Inspect:
   - Weight ①
     Wear/Scratches/Damage → Replace.
   - Compression spring ②
     Fatigued/Damage → Replace.

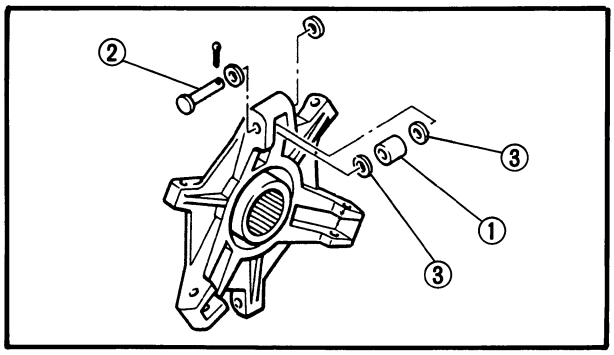


6. Inspect:
   - Slide rail surfaces ②
     Cracks/Scratches/Damage → Replace.



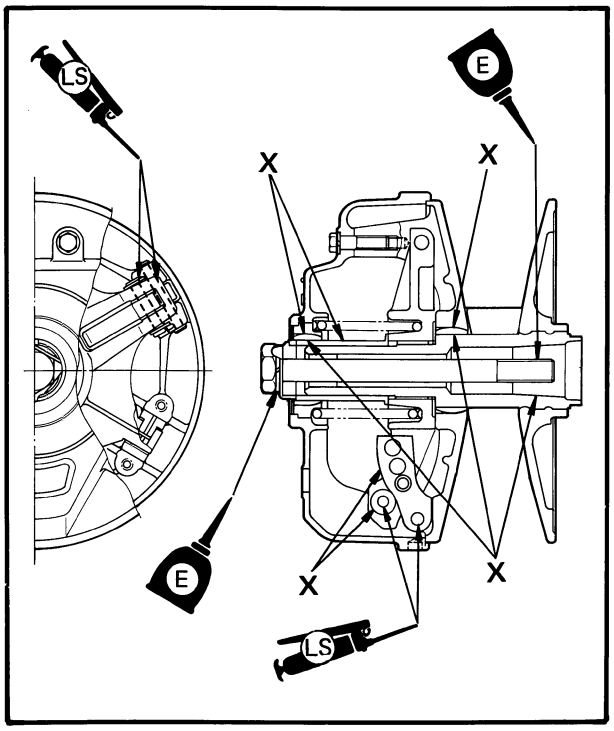
7. Measure:
   - Slider button distance ⓐ
     Out of specification → Replace.

Distance Wear Limit ⓐ :
27.0 mm (1.06 in)



8. Inspect:
   - Spider roller ①
   - Roller holding pin ②
   - Nylon washer ③

   Wear/Scratches/Damage → Replace.



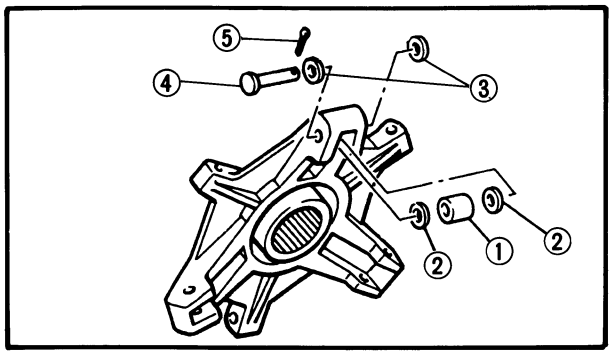
ASSEMBLY

When assembling the primary sheave, reverse the disassembly procedure. Note the following points:

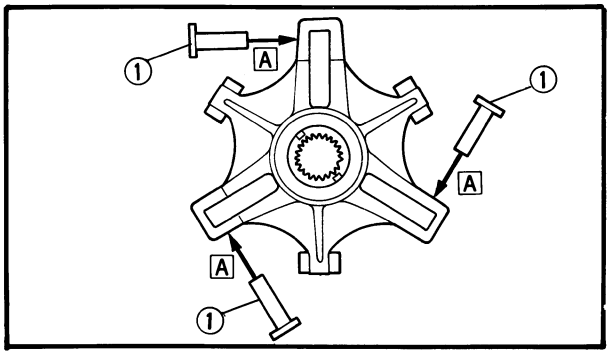
1. Before assembling the primary sheave, the sheaves should be lubricated with low-temperature lithium soap base grease and 2-stroke engine oil as indicated in the illustration.

CAUTION:

Do not apply grease to the area marked X.

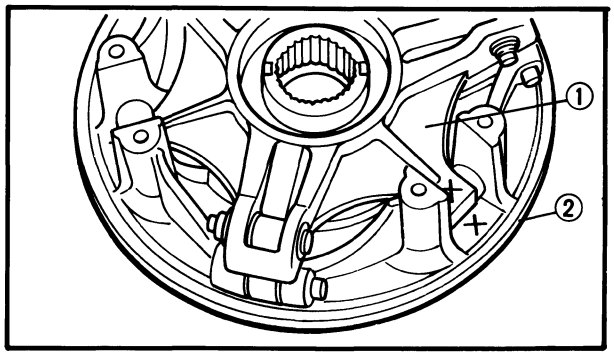


2. Install:
   - Roller ①
   - Nylon washer ②
   - Washer ③
   - Roller holding pin ④
   - Cotter pin (New) ⑤



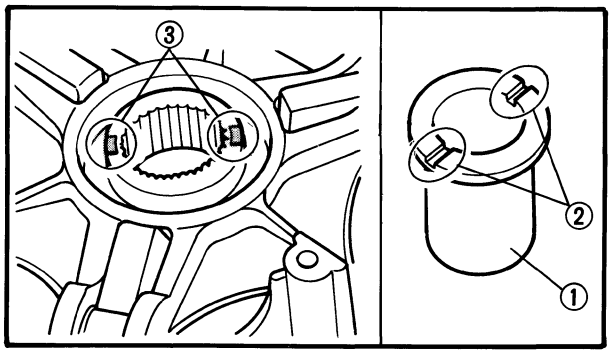
WARNING:

To maintain the balance of the clutch, all the roller holding pins ① must be installed in a clockwise direction A .



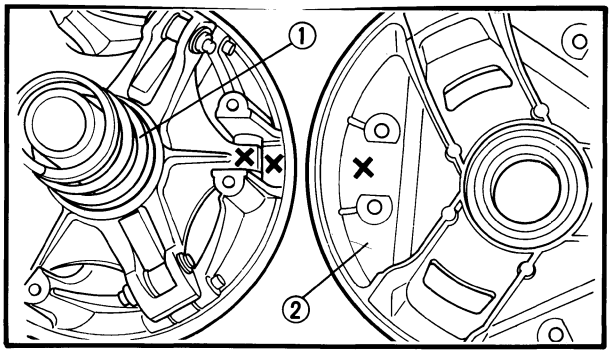
3. Thread the spider onto the fixed sheave correctly seated in the sliding sheave.

NOTE:
Be sure the "X" on the spider ① aligns with the "X" on the sliding sheave ② .



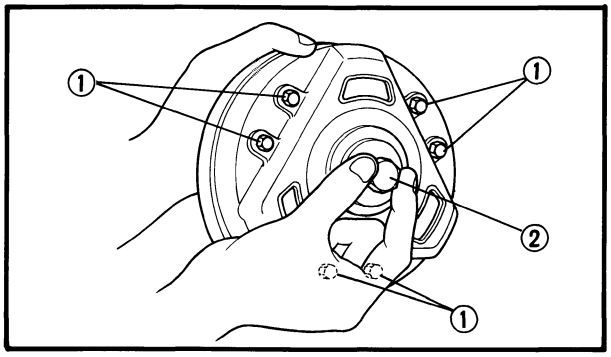
4. Install:
   • Coller ①

NOTE:
• The slot ② in the coller ① must engage the spider projection ③ .



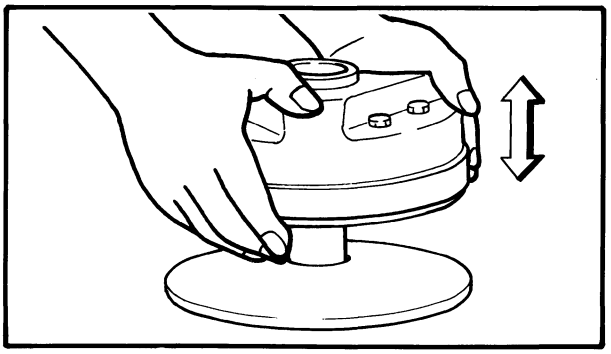
5. Install:
   • Spring ①
   • Sheave cap ②

NOTE:
Be sure the "X" on the sheave cap aligns with the "X" on the sliding sheave.



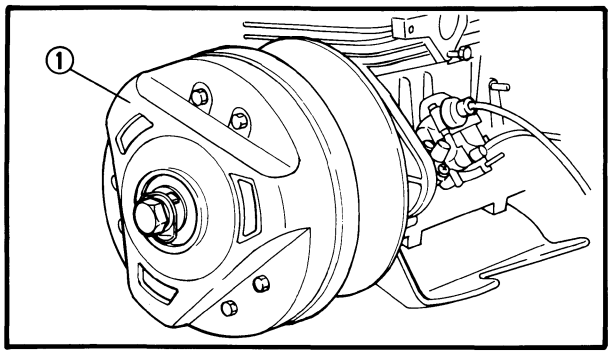
6. Tighten:
   • Primary sheave cap securing bolts ①
   Use the Primary Sheave Sub-assembly Tool (YS-91060) ② to hold the primary sheave cap.

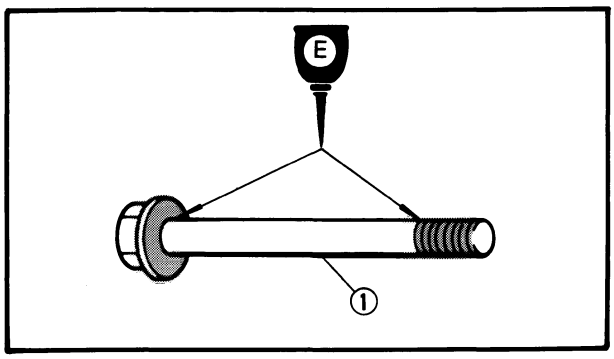
Primary Sheave Cap Securing Bolt: 10 Nm (1.0 m·kg, 7 ft·lb)



NOTE:
Check the movement of the sliding sheave. If it is not smooth, disassemble the primary sheave. Then, reassemble it correctly.

PRIMARY SHEAVE





INSTALLATION

When installing the primary sheave assembly, reverse the removal procedure.
Note the following points;

1. Install:
   - Primary sheave assembly ①

NOTE:

Before installing the primary sheave assembly. Clean the tapered porsions of crankshaft and fixed sheave with a lacquer thinner.

2. Tighten:
   - Primary sheave securing bolt ①
     Use the Primary Sheave Holder (YS-01880) to hold the primary fixed sheave.

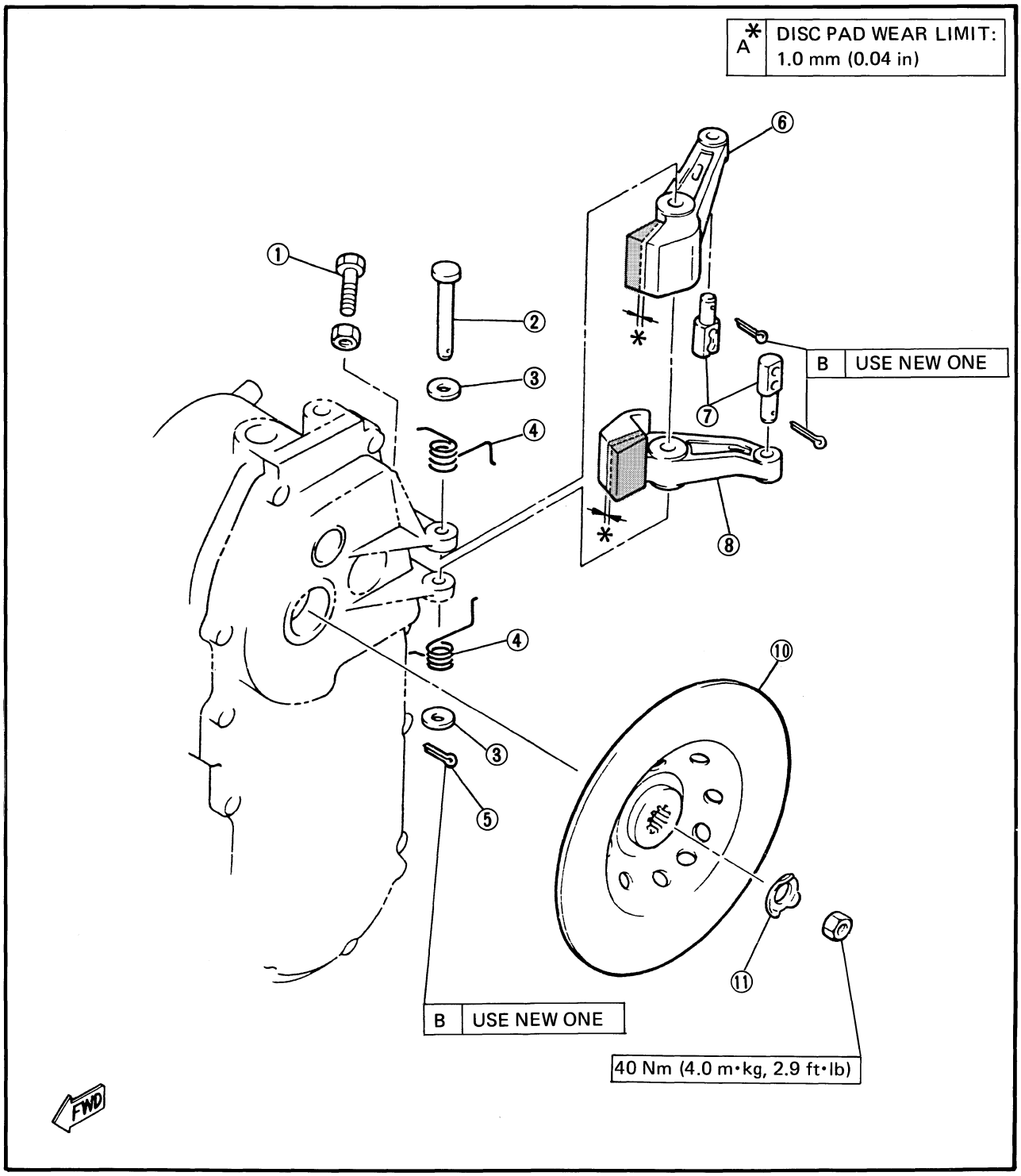
NOTE:

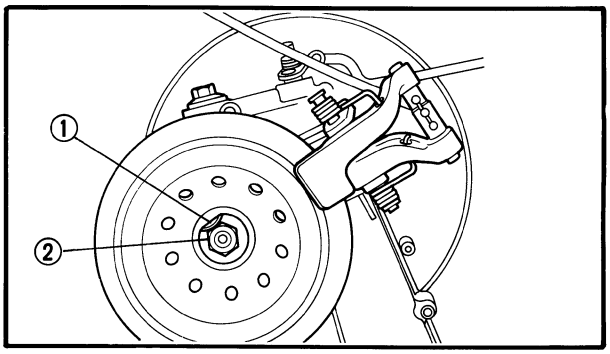
Before installing the primary sheave securing bolt ① , apply engine oil to the threaded portion of securing bolt and its contact surface with spring washer.

Primary Sheave Securing Bolt:
1. **Tighten primary sheave securing bolt.**
   100 Nm (10 m·kg, 72 ft·lb)
2. **Loosen it completely.**
3. **Retighten it.**
   60 Nm (6.0 m·kg, 43 ft·lb)

BRAKE

① Inner caliper adjusting screw
② Pivot pin
③ Plain washer
④ Return spring
⑤ Cotter pin
⑥ Outer caliper
⑦ Cable pivot pin
⑧ Inner caliper
⑨ Plain washer
⑩ Brake disc
⑪ Lock washer

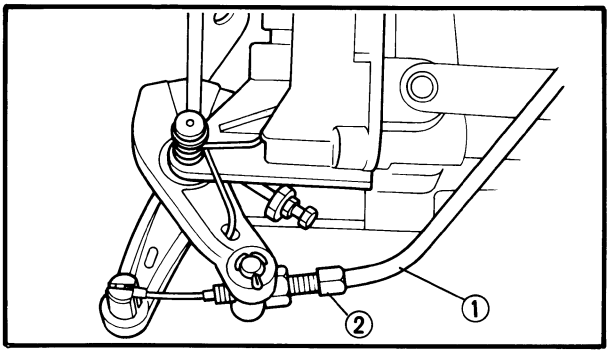




DISASSEMBLY

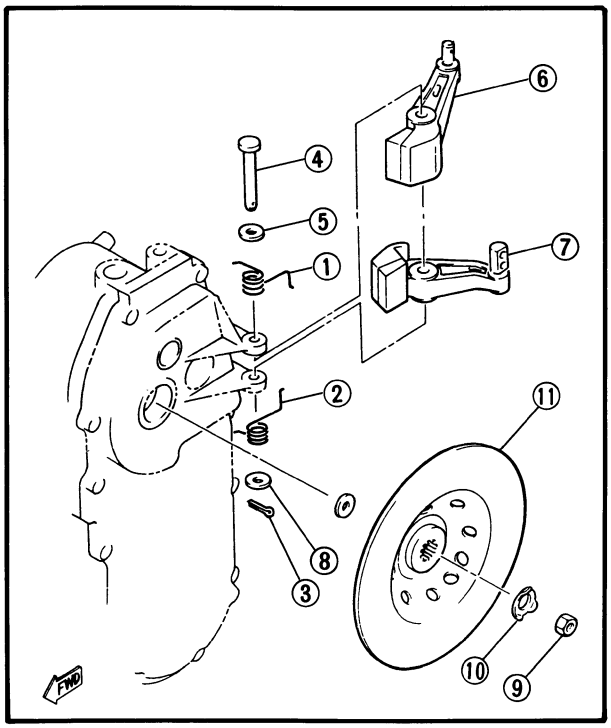
1. Flatten the lock washer ① , and loosen the brake disc securing nut ② .

NOTE:
When loosening the brake disc securing nut, set the parking brake.



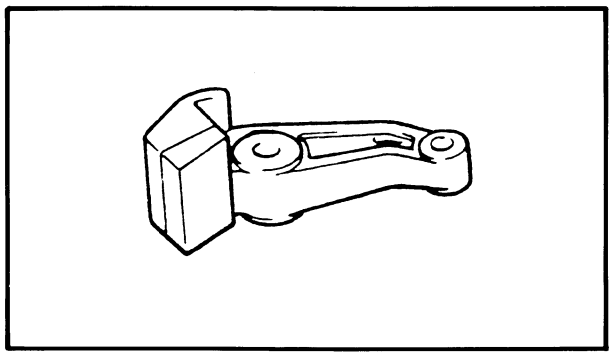
2. Disconnect:
   - Brake cable ①

   It is necessary to loosen the adjusting screw ② attached to the caliper so that the brake cable is slack.



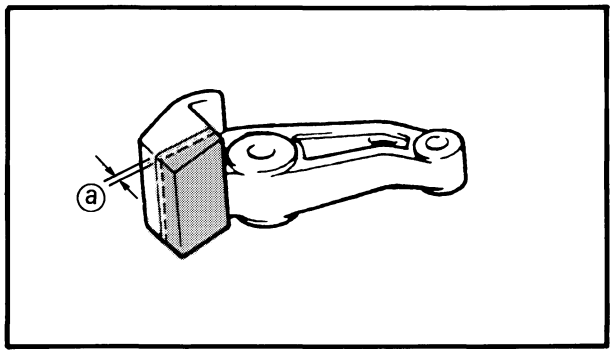
3. Release:
   - Caliper return springs (outer ① and inner ②)

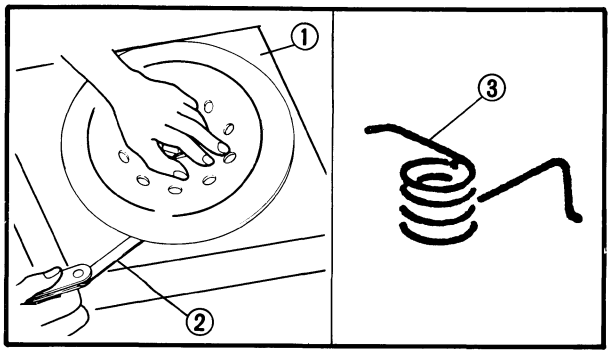
4. Remove:
   - Cotter pin ③
   - Pivot pin ④
   - Plain washer ⑤
   - Caliper return spring (outer) ①
   - Outer caliper ⑥
   - Inner caliper ⑦
   - Caliper return spring (inner) ②
   - Plate washer ⑧
   - Brake disc securing nut ⑨
   - Lock washer ⑩
   - Brake disc ⑪



INSPECTION

1. Inspect:
   - Brake calipers (outer and inner)
     Cracks/Bend/Damage → Replace.





2. Measure:
   - Disc pads
     Out of specification → Replace.

NOTE:
Replace the pads as a set if either is found to be worn to the wear limit.

Disc Pad Wear Limit ⓐ :
1.0 mm (0.04 in)

3. Inspect:
   - Brake disc
     Bend/Wear/Damage → Replace.
     Place it on a surface plato ① , and check around the edges with a feeler gauge ② .

4. Inspect:
   - Return springs ③ (outer and inner)
     Fatigue/Damage → Replace.

ASSEMBLY

To assembly the brake caliper, reverse the disassembly procedures.
Note the following points:

CAUTION:

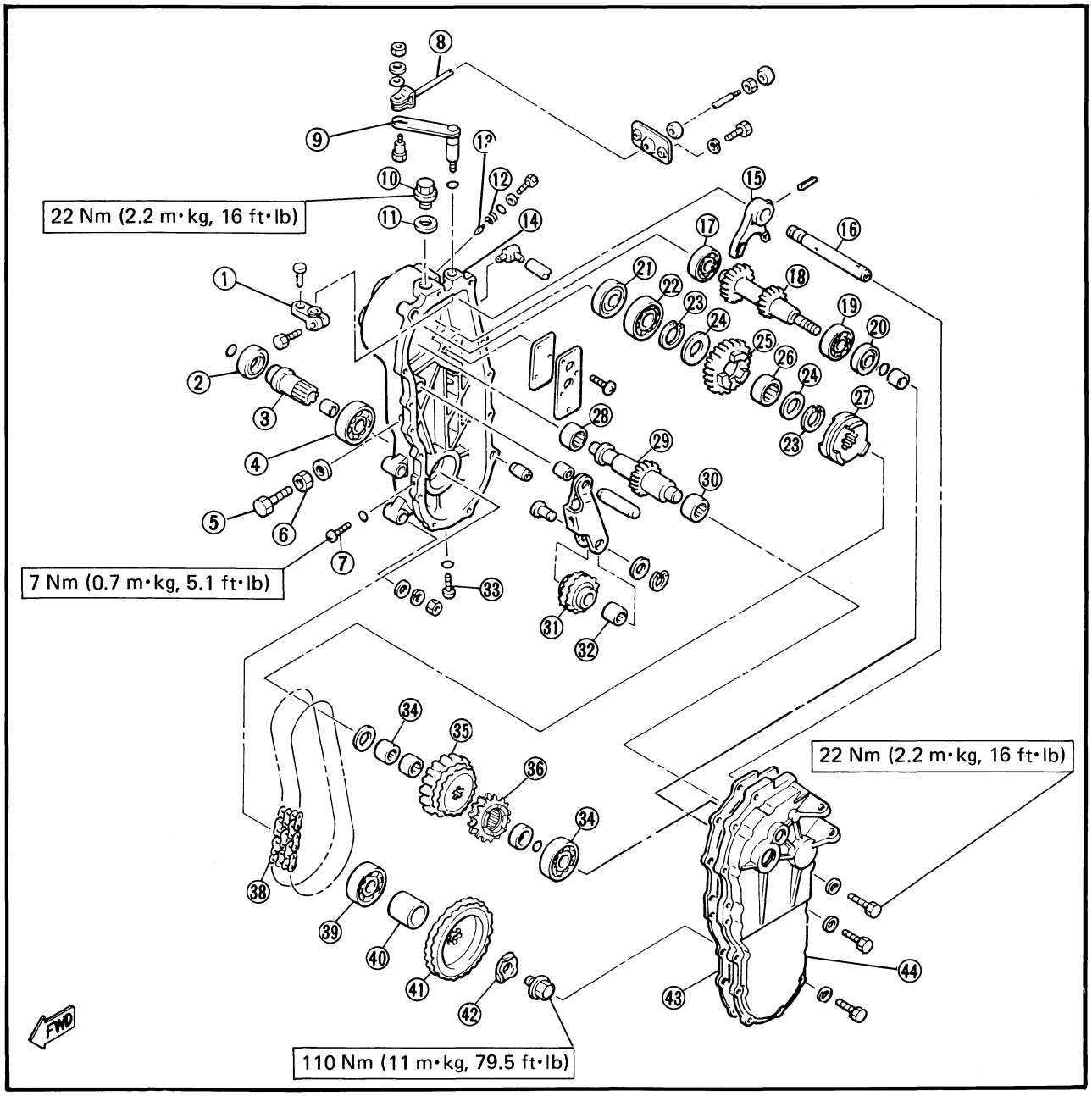
- **Apply a small amount of Anti-freeze grease to the following points.**
  1) **Brake caliper contact surface of the inner and outer brake caliper.**
  2) **Pivot pin outer surface.**
  3) **Brake cable contact areas.**
- **Always use a new cotter pin.**
- **After installing the brake cable, perform the brake pad clearance adjustment.**
  Refer to "BRAKE ADJUSTMENT", page 2-19.

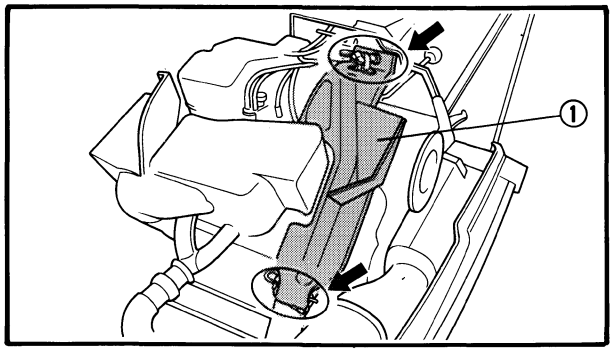
Brake Pad Clearance:
Inner/Outer
0.2 ~ 1.0 mm (0.008 ~ 0.04 in)
Brake Lever Free Play:
6 ~ 7 mm (0.24 ~ 0.26 in)

Brake Disc Securing Nut:
40 Nm (4.0 m·kg, 2.9 ft·lb)

CHAIN HOUSING

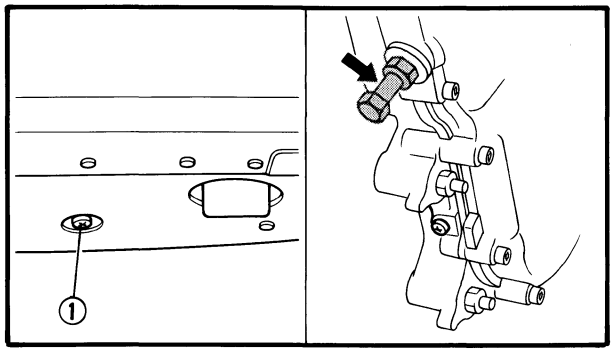
① Shift lever
② Oil seal
③ Journal
④ Bearing
⑤ Adjusting screw
⑥ Locknut
⑦ Oil level screw
⑧ Shift rod
⑨ Shift linkage lever
⑩ Oil filler cap
⑪ Gasket washer
⑫ Compression spring
⑬ Stopper pin
⑭ Chain housing
⑮ Shift fork
⑯ Shift fork guide bar
⑰ Bearing
⑱ Counter axle
⑲ Bearing
⑳ Oil seal
㉑ Oil seal
㉒ Bearing
㉓ Circlip
㉔ Thrust washer
㉕ Reverse gear
㉖ Bearing
㉗ Dog
㉘ Bearing
㉙ Idle axle
㉚ Bearing
㉛ Tensioner sprocket
㉜ Bearing
㉝ Drain screw
㉞ Bearing
㉟ Forward gear
㊱ Drive sprocket
㊲ Bearing
㊳ Chain
㊴ Bearing
㊵ Spacer collar
㊶ Driven sprocket
㊷ Lock washer
㊸ Chain housing cover gasket
㊹ Chain housing





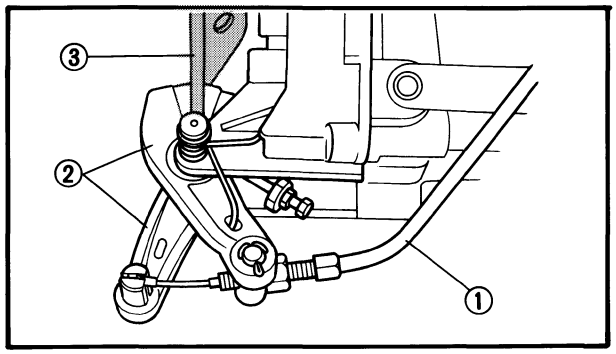
DISASSEMBLY

1. Open the shroud.
2. Remove:
   - Drive V-belt guard ①
   - Drive V-belt
   - Muffler assembly



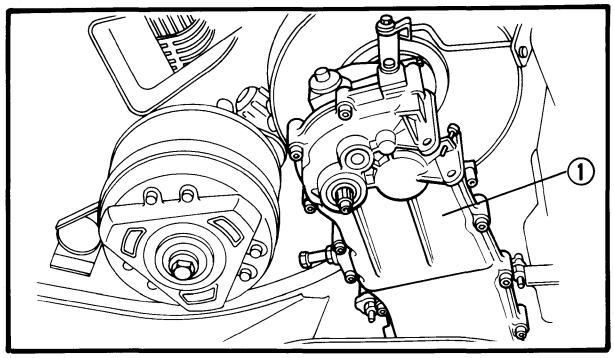
3. Place an oil pan under the drain hole.
4. Remove:
   - Drain screw ①

   Drain the chain housing oil completely.
5. Loosen the chain tension.

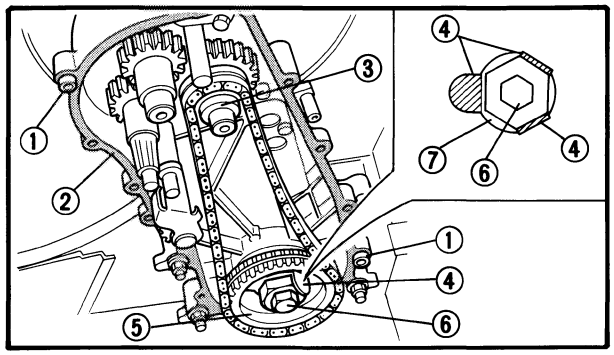


6. Remove:
   - Brake cable ①
   - Brake calipers ②
   - Brake disc ③

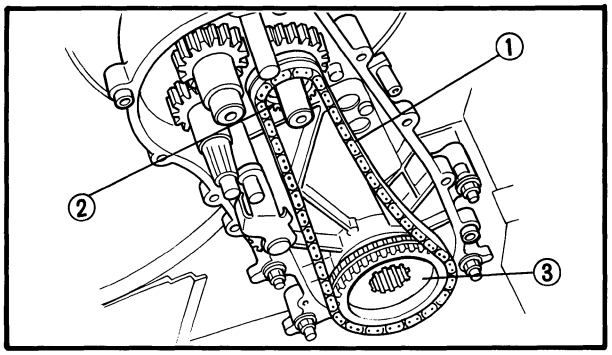
   Refer to "BRAKE – DISASSEMBLY", page 5-9.



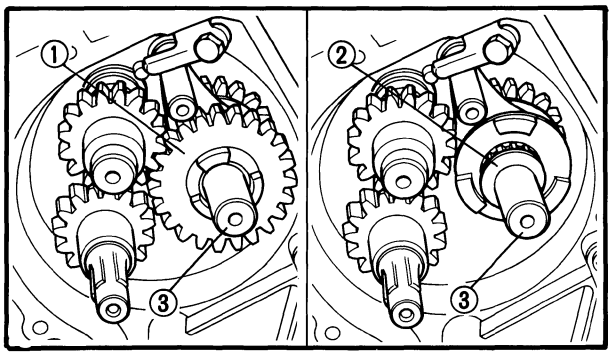
7. Remove:
   - Chain case cover ①



8. Remove:
   - Dowell pins ①
   - Gasket ②
   - Spacer collar ③
9. Flatten:
   - Lock washer tab ④ (driven sprocket ⑤)
10. Remove:
    - Driven sprocket securing bolt ⑥
    - Lock washer ⑦

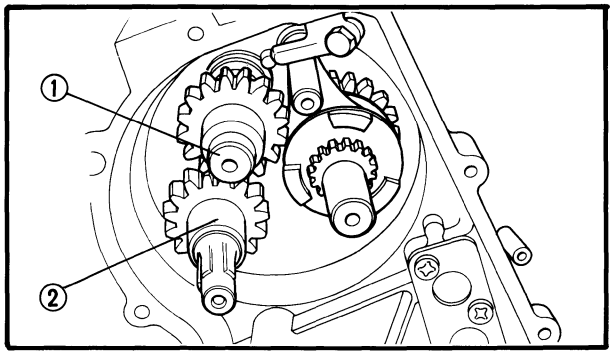


11. Remove the drive chain ① with both drive ② and driven ③ sprockets.

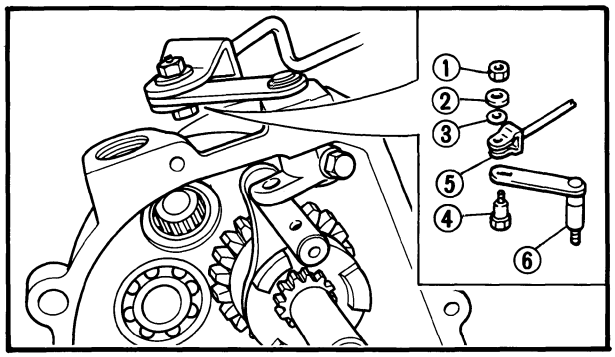


12. Remove:
- Forward gear ①
- Thrust washer ②

③ Secondary shaft

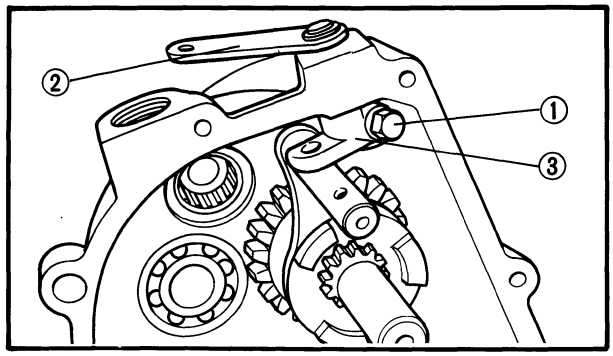


13. Remove:
- Counter axle ①
- Idle axle ②

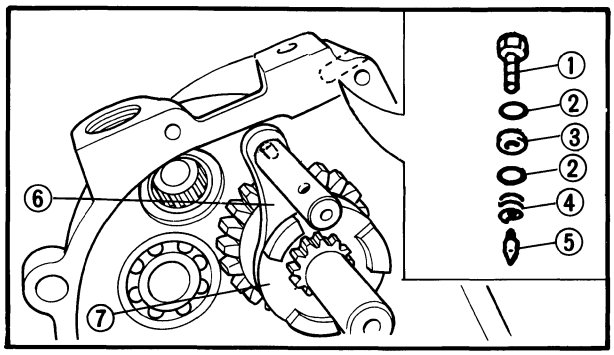


14. Remove:
- Self locking nut ①
- Plate washer ②
- Spongy rubber washer ③
- Bolt ④
- Shift rod ⑤

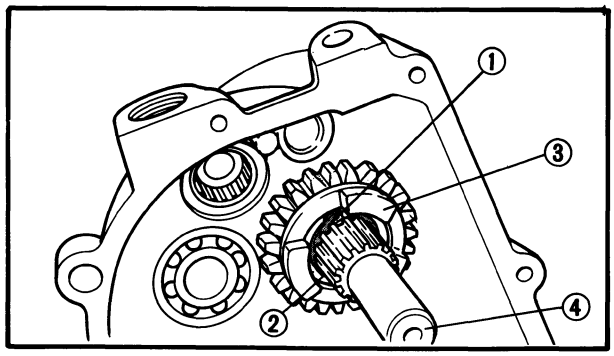
From shift linkage lever ⑥



15. Remove:
- Shift lever securing bolt ①
- Shift linkage lever ② (pull out)
- Shift lever ③

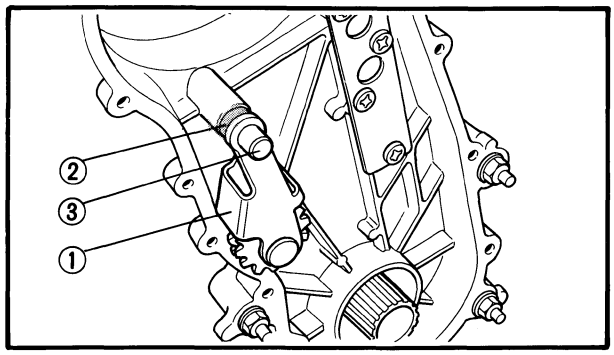


16. Remove:
    - Bolt ①
    - Gaskets ②
    - Washer ③
    - Compression spring ④
    - Stopper pin ⑤
17. Remove the shift fork guide bar ⑥ with dog ⑦ .

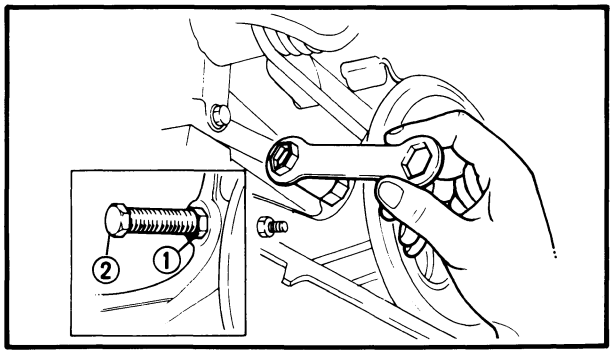


18. Remove:
    - Circlip ①
    - Thrust washer ②
    - Reverse gear ③
    - Thrust washer

④ Secondary shaft

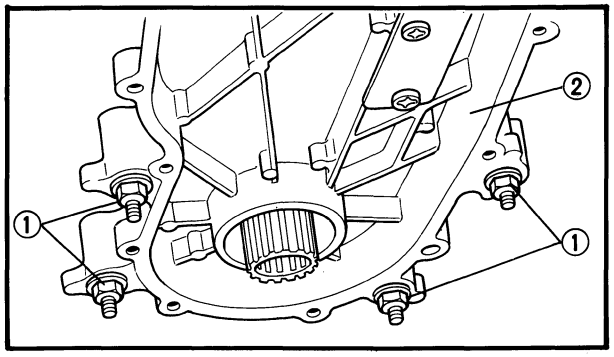


19. Remove:
    - Chain tensioner ①
    - Spacer collar ②
    - Tensioner rod ③

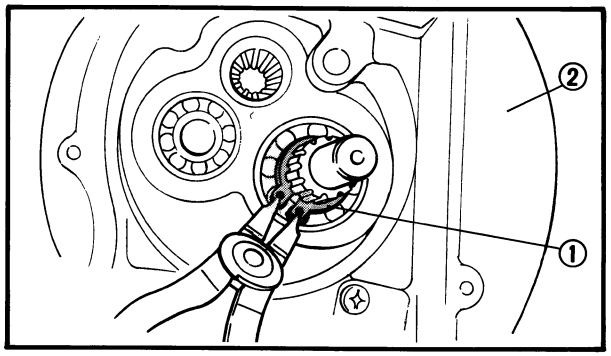


20. Loosen the track tension with an adjusting bolt ① .

② Locknut

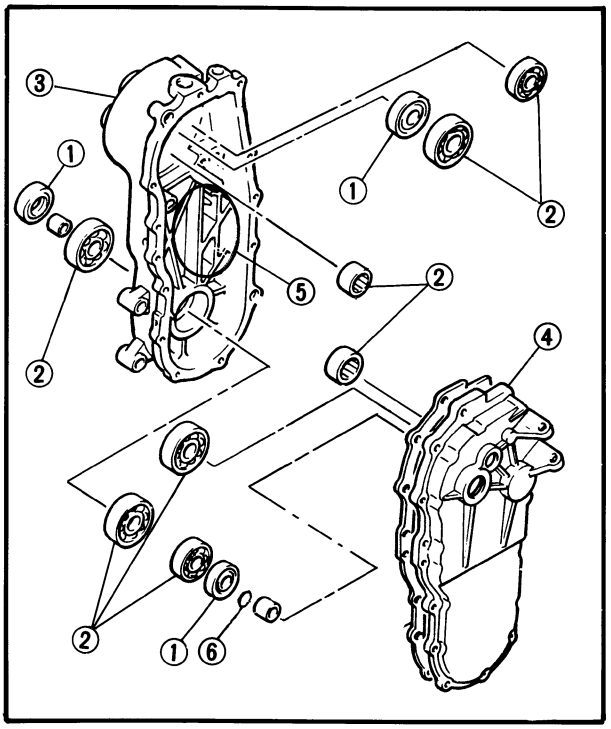


21. Remove:
    - Chain housing mounting nut ①
22. Remove the chain housing ② with secondary sheave assembly.



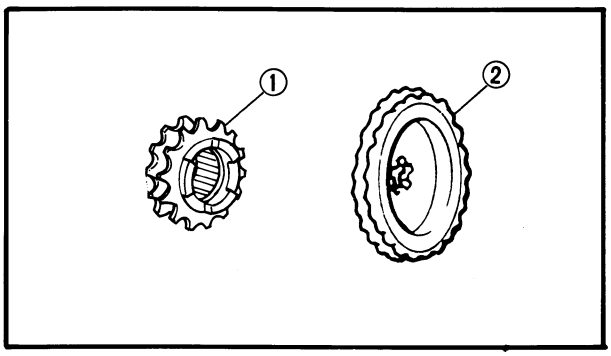
23. Remove:
- Circlip ①
- Secondary sheave assembly ②

Tap lightly secondary shaft with a soft hammer, and pull out the secondary sheave assembly.



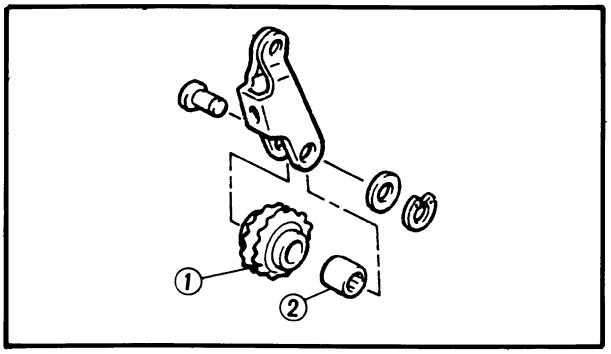
INSPECTION

1. Inspect:
- Oil seals ①
  Damage → Replace.
- Bearings ②
  Pitting/Damage → Replace.
- Chain housing ③
- Chain housing cover ④
  Cracks/Damage → Replace.
- Breather passage (chain housing) ⑤
  Contamination → Blow out all passage with compressed air.
- O-ring ⑥
  Damage → Replace.

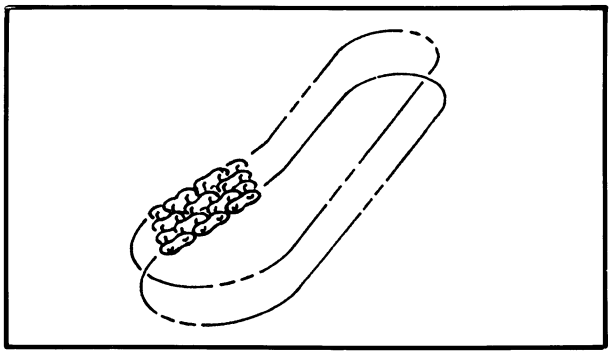


2. Inspect:
- Drive sprocket teeth ①
- Driven sprocket teeth ②

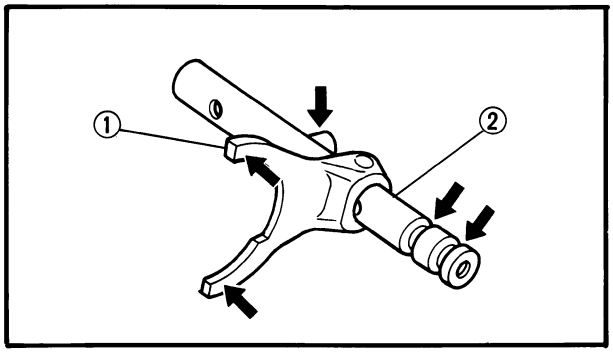
Cracks/Wear/Damage → Replace.



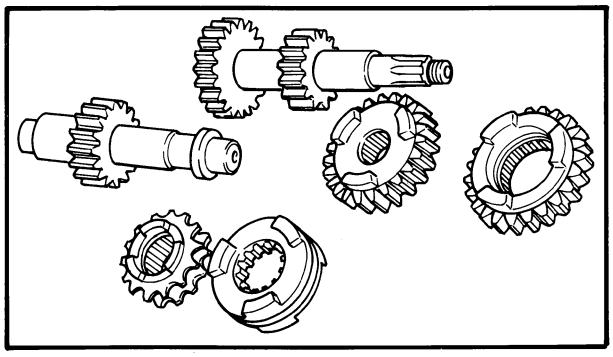
3. Inspect:
- Chain tensioner sprocket ①
  Wear/Damage → Replace.
- Tensioner sprocket bearing ②
  Pitting/Damage → Replace.



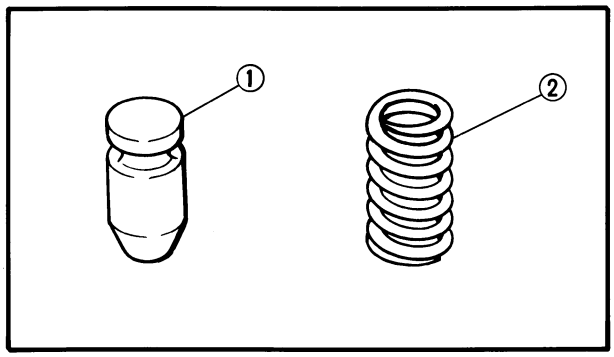
4. Inspect:
   - Drive chain
     Damage → Replace.



5. Inspect:
   - Shift fork ①
     On the dog contact surfaces.
     Wear/Chafing/Bends/Damage → Replace.
   - Shift fork guide bar ②
     On the stopper pin and shift lever contact surfaces.
     Wear/Chafing/Damage → Replace.



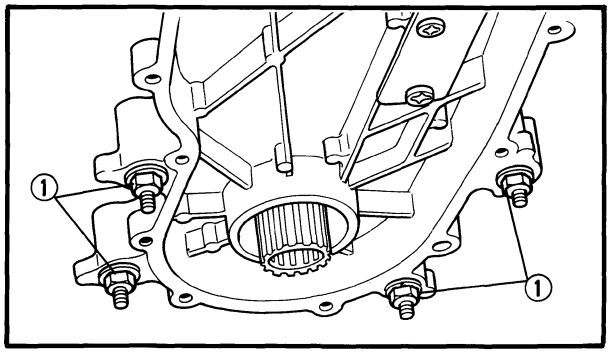
6. Inspect:
   - Gears
   - Mating dogs
     Cracks/Damage/Wear → Replace.
7. Check:
   - Gear movement
     Unsmooth operation → Replace.



8. Inspect:
   - Stopper pin ①
     Wear/Damage → Replace.
   - Compression spring ②
     Fatigued/Damage → Replace.

ASSEMBLY

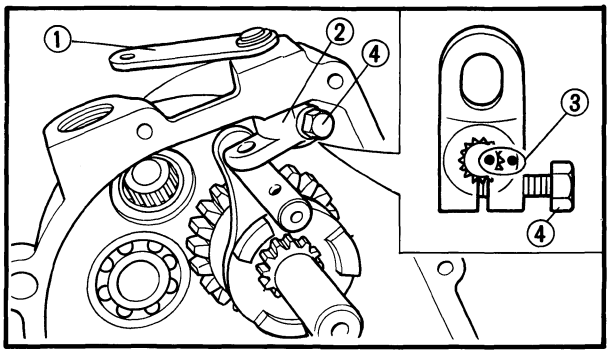
When assembling the chain housing component, reverse the disassembly procedure.
Note the following points.



1. Tighten:
   - Chain housing holding nuts ①

Chain Housing Holding Nut:
22 Nm (2.2 m·kg, 16 ft·lb)

NOTE:
Before tightening the housing holding nuts, the sheave distance should be adjusted.



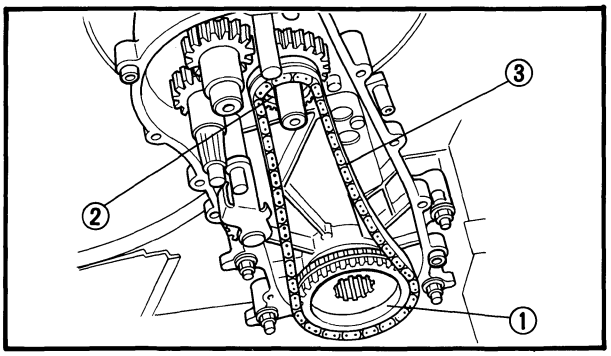
2. Install:
   - Shift linkage lever ①
     To the shift lever ② .

NOTE:
Align the punch marks ③ on the shift linkage lever and shift lever.

3. Tighten:
   - Shift lever securing screw ④

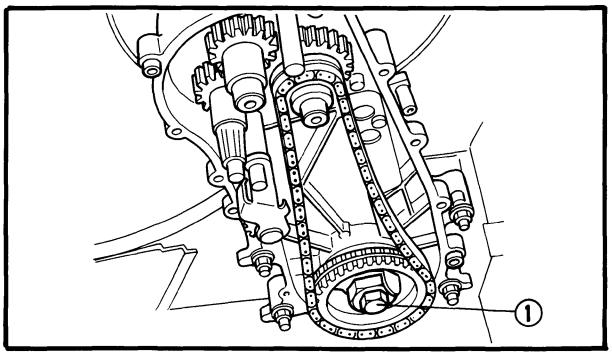
Shift Lever Securing Screw:
10 Nm (1.0 m·kg, 7.2 ft·lb)

NOTE:
Set the shifting lever to the reverse position before proceeding with next procedure.



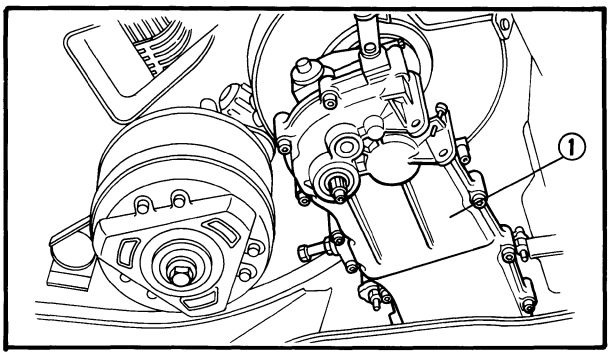
4. Place both the drive ① and driven ② sprockets in the drive chain ③ , and install them in the chain housing.

NOTE:
- Mesh the dog of drive sprocket with the dog of pinion gear.



5. Tighten:
   - Driven sprocket securing bolt ①

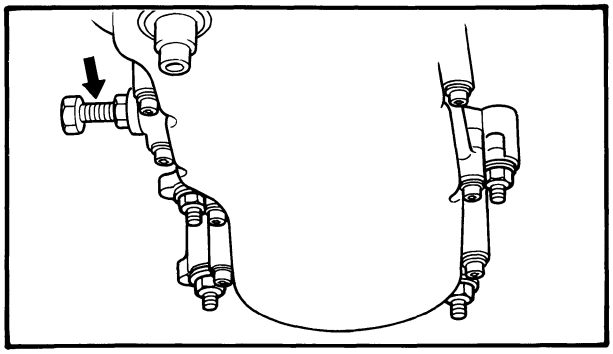
Driven Sprocket Securing Bolt ① :
110 Nm (11 m·kg, 79.5 ft·lb)



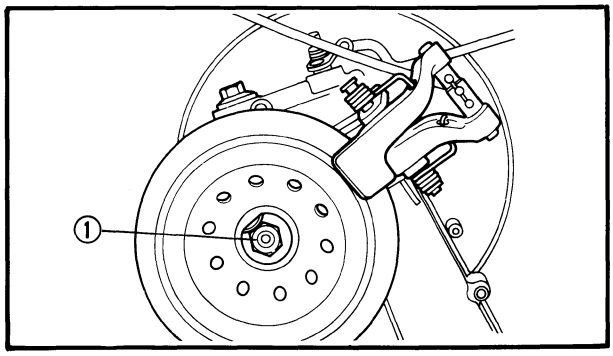
6. Tighten:
   - Chain housing cover ① securing bolt

Cover Securing Bolt:
10 Nm (1.0 m·kg, 7.2 ft·lb)

NOTE:
- Be careful so that the oil seal lip is not damaged when installing the chain housing cover.
- Before installing the chain housing cover, apply a light coating of low temperature grease to the oil seal and Yamaha Bond #4® (ACC-11001-30-00) to the mating surface of case cover gasket.

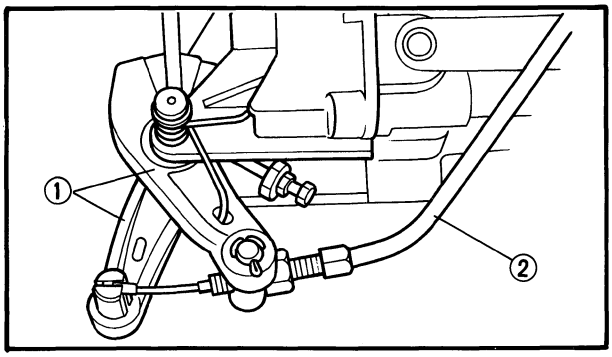


7. Adjust:
   - Chain slack
     Refer to "POWER TRAIN – DRIVE CHAIN SLACK ADJUSTMENT", page 2-19.



8. Tighten:
   - Brake disc securing nut ①

Brake Disc Securing Nut ① :
40 Nm (4.0 m·kg, 29 ft·lb)

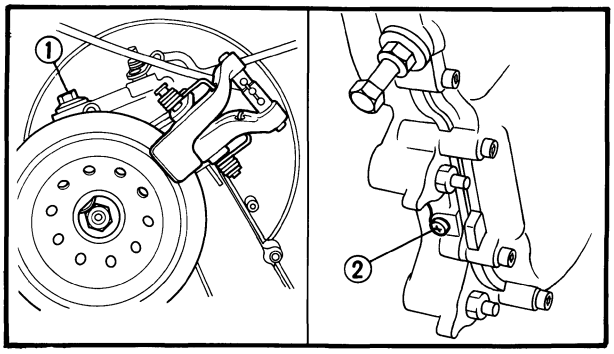


9. Install:
   - Brake calipers ①
   - Brake cable ②
10. Adjust:
   - Brake cable free play
     Refer to "POWER TRAIN – BRAKE ADJUSTMENT", page 2-19.

11. Fill:
    - Chain housing

    Refer to "DRIVE CHAIN HOUSING OIL REPLACEMENT", page 2-18.

Recommended Oil:
Gear oil API GL-3 SAE #75 or #80
Oil Capacity:
Fill until oil begins to run out of the level checking hole.
0.3 L (10.6 Imp oz, 10.1 US oz)
Recommended Oil Replacement:
Every 40 hrs or 800 km (500 mile)

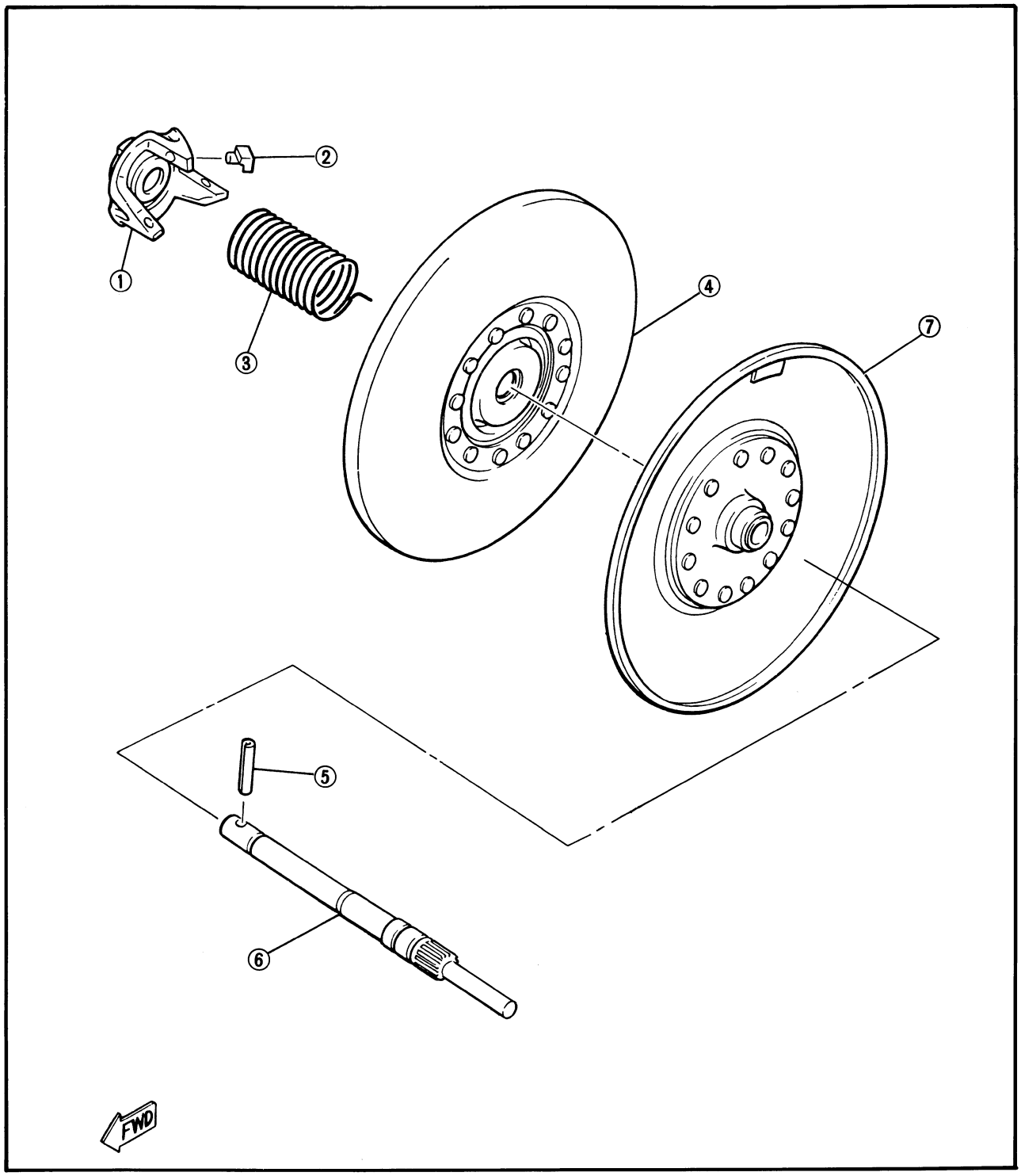


12. Tighten:
    - Filler cap ①
    - Oil level screw ②

Filler Cap ① :
22 Nm (2.2 m·kg, 16 ft·lb)
Oil Level Screw ② :
7 Nm (0.7 m·kg, 5.1 ft·lb)

SECONDARY SHEAVE

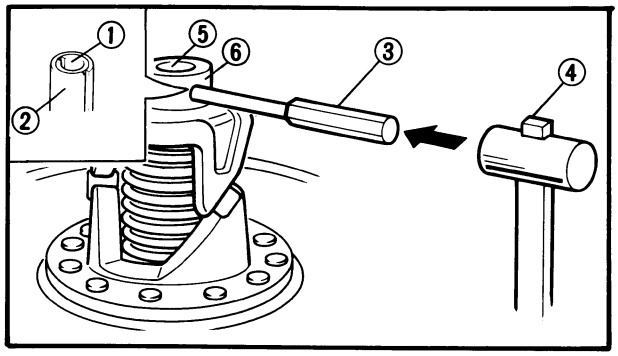
① Spring seat
② Ramp shoe
③ Secondary spring
④ Sliding sheave
⑤ Spring pin (inner and outer)
⑥ Secondary shaft
⑦ Fixed sheave



SECONDARY SHEAVE

REMOVAL

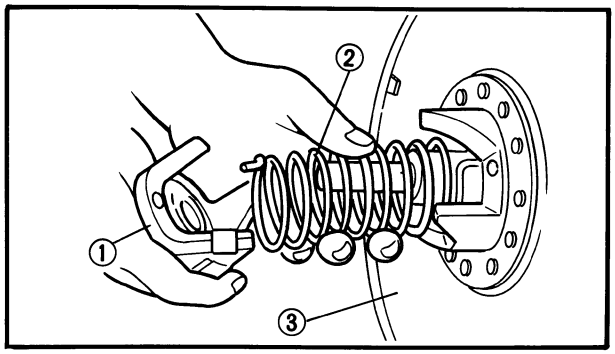
1. Remove:
   - Secondary sheave
     Refer to "CHAIN HOUSING – DISASSEMBLY", page 5-12.



DISASSEMBLY

1. Remove:
   - Spring pins (inner ① and outer ②)
     Pound the spring pins with a pin punch ③ and hammer ④, and remove the spring pins.

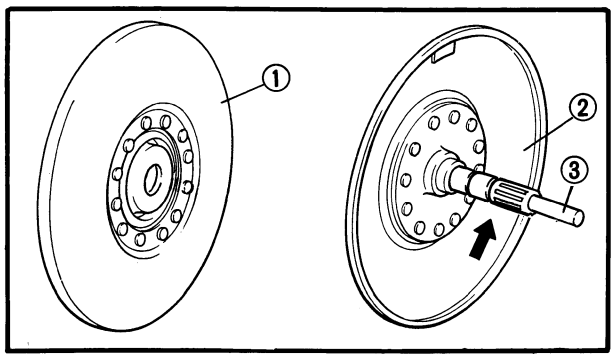
NOTE:
While removing the spring pins from the secondary shaft ⑤ hold the spring seat ⑥ by hand.



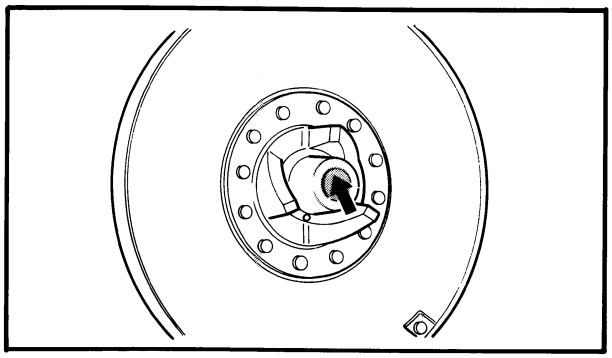
2. Remove:
   - Spring seat ①
   - Torsion spring ②
   - Sliding sheave ③
     From secondary shaft together with fixed sheave.

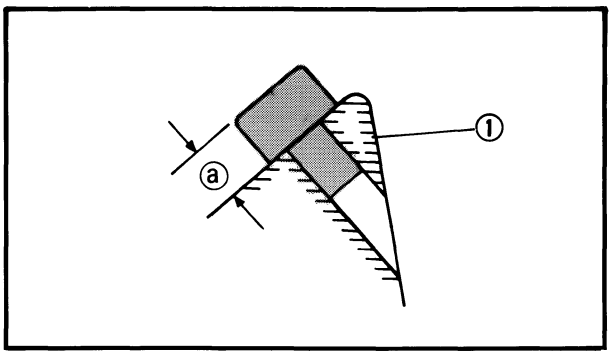
INSPECTION

1. Inspect:
   - Sliding sheave ①
   - Fixed sheave ②
     Warpage/Scratches/Damage → Replace.
   - Secondary shaft ③
     Scratches/Bend/Damage → Replace.



2. Inspect:
   - Sliding sheave bushing inner surface
     Wear/Scratches/Damage → Replace the sliding sheave as a set.

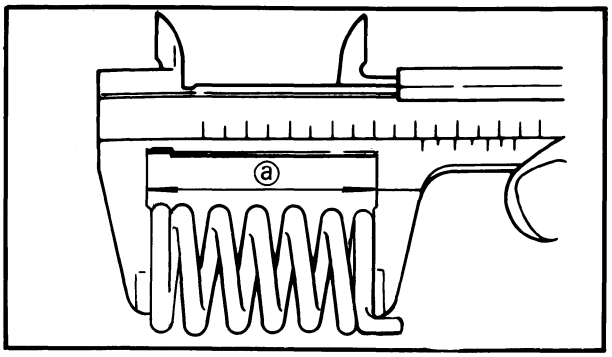




3. Measure:
   - Ramp shoe thickness ⓐ
     Out of specification → Replace.

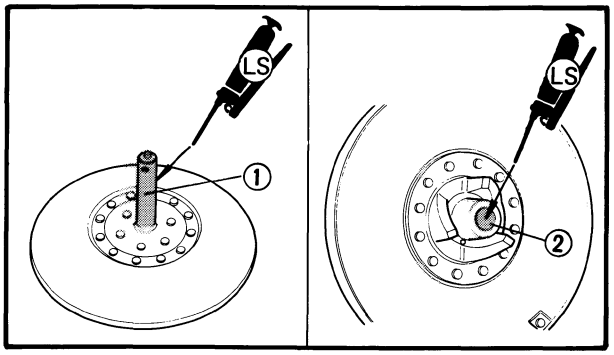
Wear Limit ⓐ :
1.0 mm (0.04 in)

① Spring seat cam



4. Measure:
   - Torsion spring free length ⓐ
     Less than specification → Replace.

Free Length Limit ⓐ :
105 mm (4.13 in)

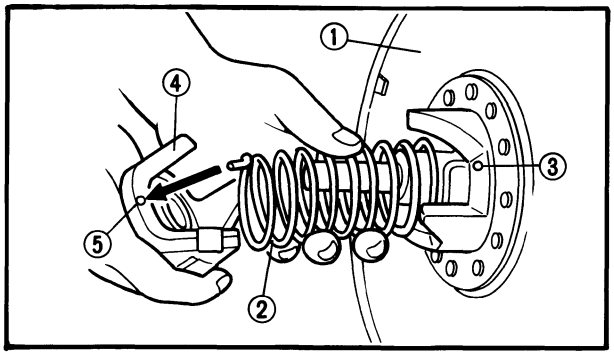


ASSEMBLY

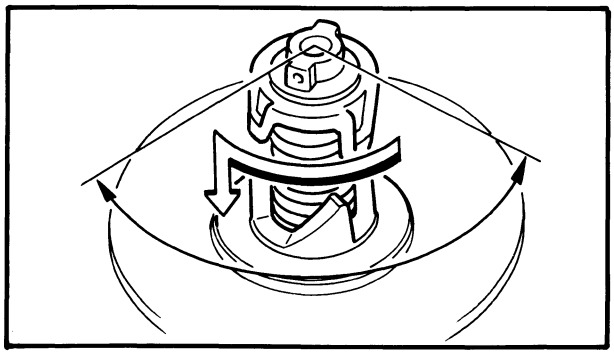
1. Apply:
   - Grease

Low-Temperature Lithium Soap Base Grease

To the contact surface of the secondary shaft ① and sliding sheave bushing ② .



2. Install:
   - Sliding sheave ①
     To the sliding shaft
   - Torsion spring ②
     Hook the spring end into the spring hole ③ on the sliding sheave.
   - Spring seat ④
     Hook the other end of the spring into the hole 5 on the spring seat.



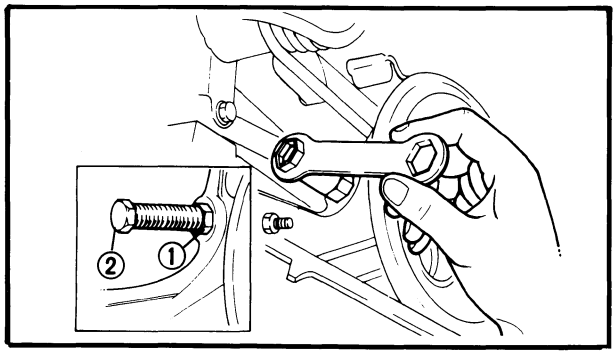
3. Turn the spring seat 192 degrees clockwise from the free position of the spring, and drive the spring pins into the spring seat to lock it to the secondary shaft.

CAUTION:

The spring pins must be replaced with a new one.

INSTALLATION

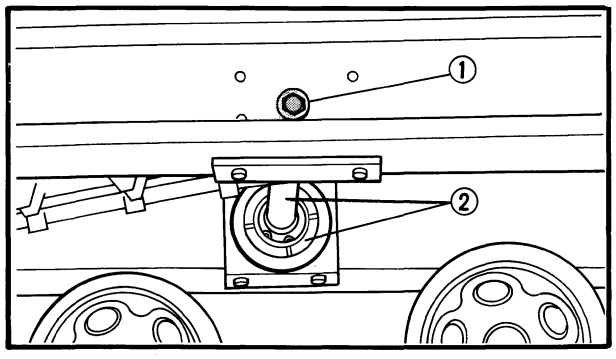
1. Install:
   - Secondary sheave
     Refer to "CHAIN HOUSING – ASSEMBLY", page 5-16.



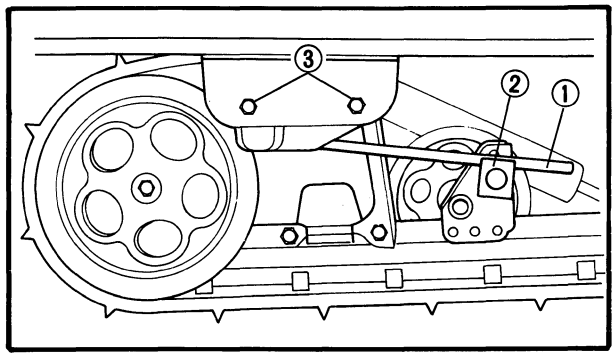
SLIDE RAIL SUSPENSION

REMOVAL

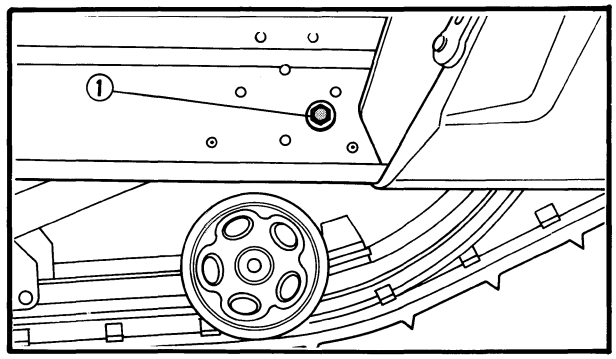
1. Place the snowmobile on the suitable stand under the rear bumper, and raise the track off the ground.
2. Loosen the track tension.



3. Remove:
   - Center guide wheel mounting bolts ①
   - Center guide wheel assembly ②



4. Unhook:
   - Rear torsion spring ①
     From the spring hook ② .
5. Remove:
   - Rear pivot arm bracket mounting bolts ③

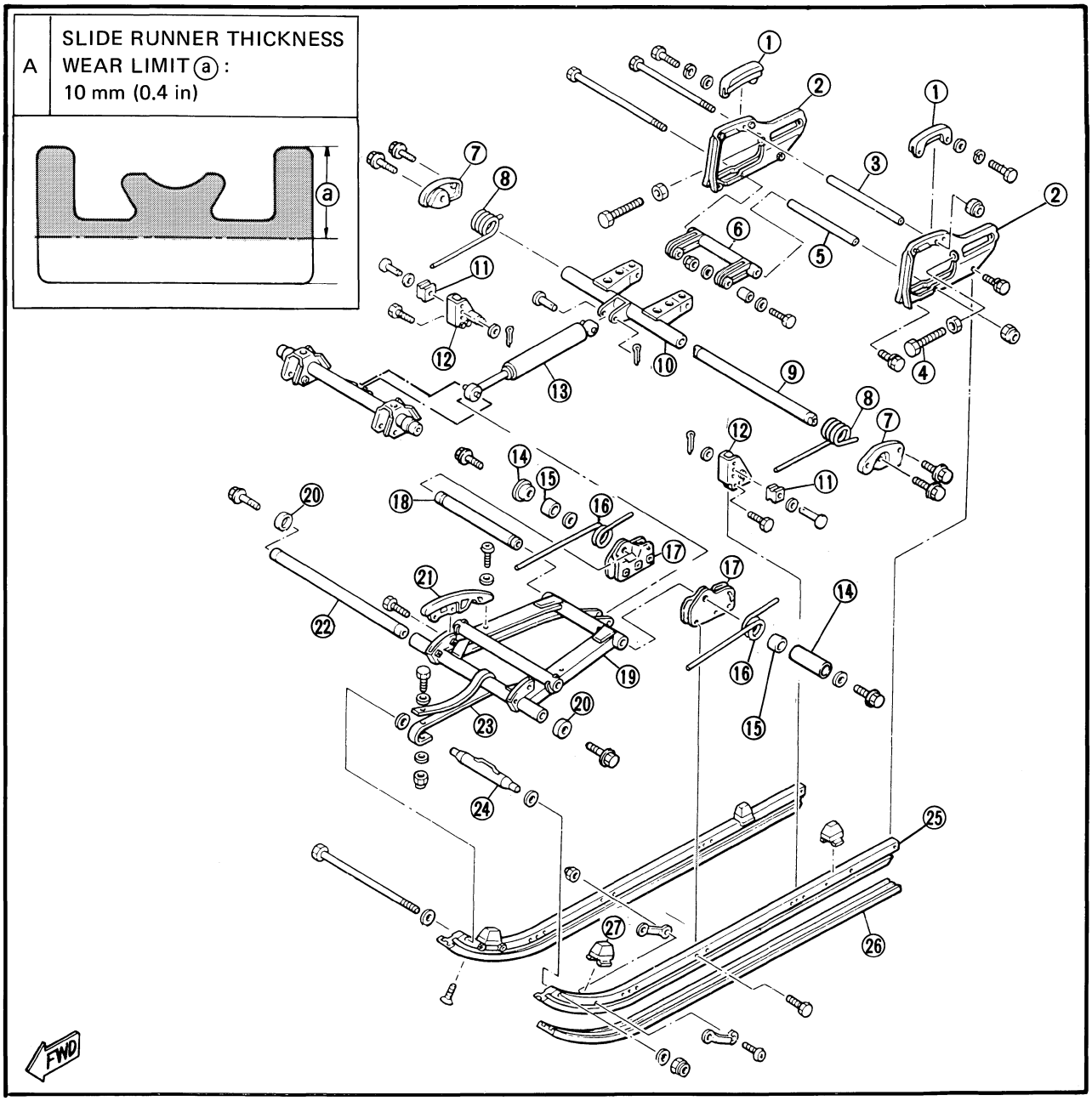


6. Remove:
   - Front pivot arm mounting bolts ①

SLIDE RAIL SUSPENSION (1)

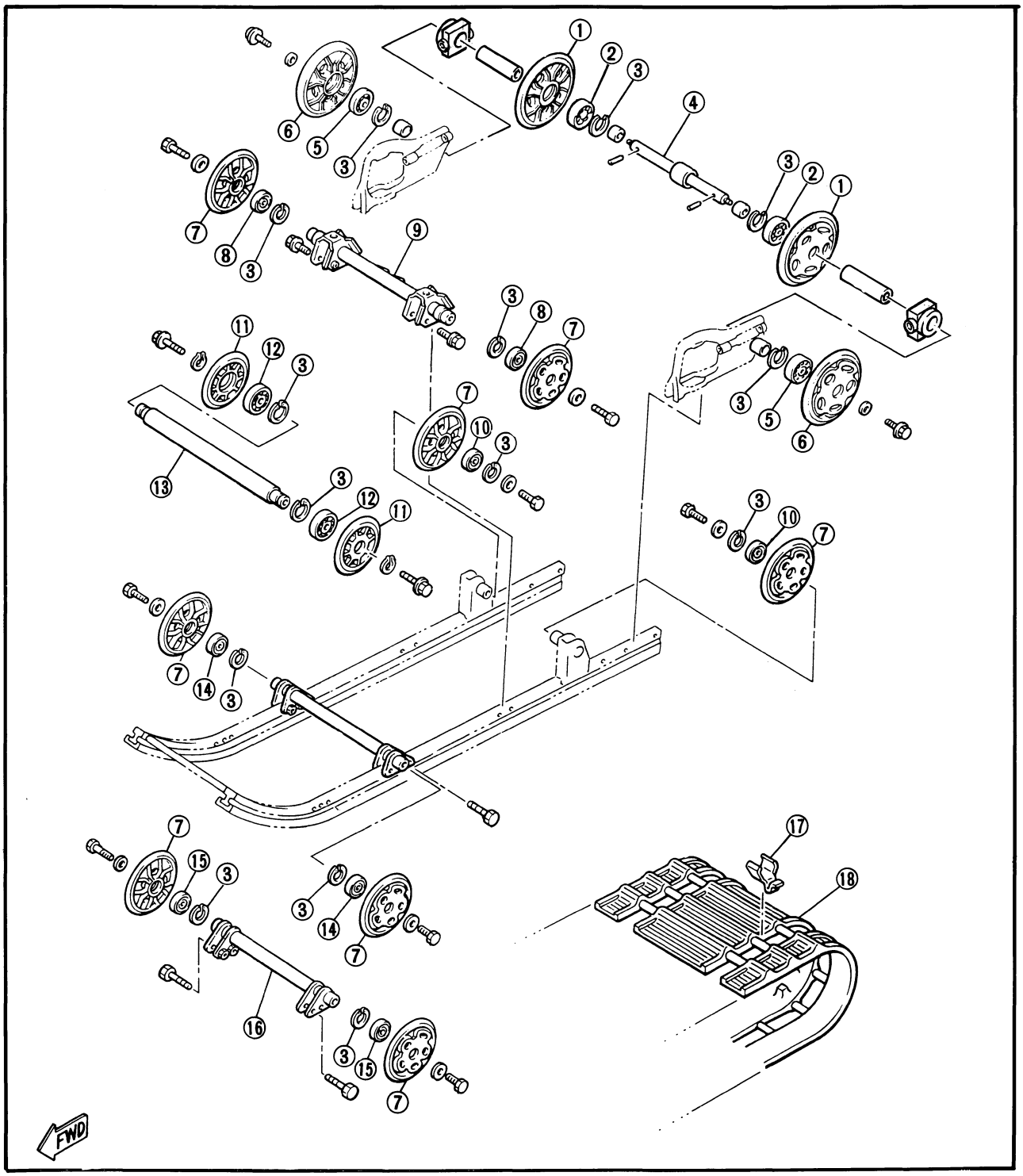
① Slide runner 1
② Rear guide wheel mounting bracket
③ Center collar
④ Track tension adjusting bolt
⑤ Relay arm inner shaft
⑥ Relay arm
⑦ Rear pivot arm bracket
⑧ Torsion spring
⑨ Rear pivot arm inner shaft
⑩ Rear pivot arm
⑪ Hook
⑫ Suspension wheel mounting bracket
⑬ Shock absorber
⑭ Collar
⑮ Bushing
⑯ Torsion spring
⑰ Front pivot arm bracket
⑱ Front pivot arm inner shaft 2
⑲ Front pivot arm
⑳ Thrust cover
㉑ Slide runner 2
㉒ Front pivot arm inner shaft 1
㉓ Stopper band
㉔ Slide rail bracket
㉕ Slide rail
㉖ Slide runner 3
㉗ Damper

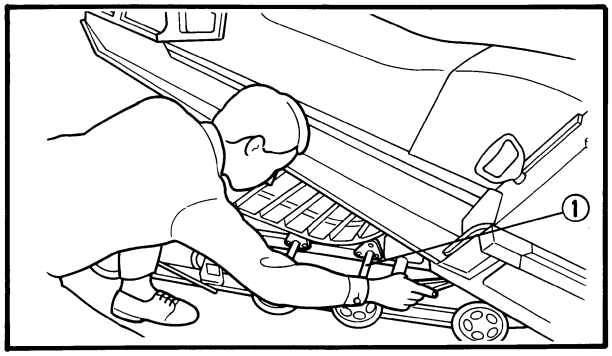
NOTE:
Replace the right and left slide runners as a set.



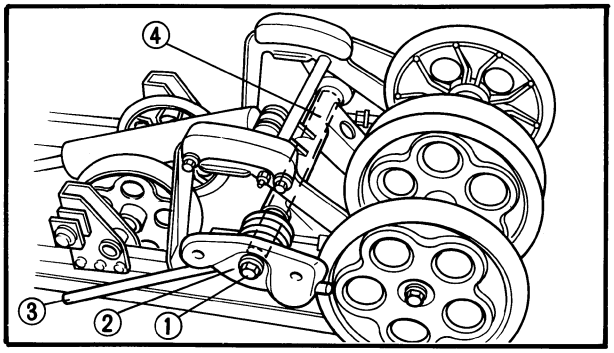
SLIDE RAIL SUSPENSION (2)

① Rear guide wheel (Center)
② Bearing
③ Circlip
④ Rear axle shaft
⑤ Bearing
⑥ Rear guide wheel
⑦ Suspension wheel
⑧ Bearing
⑨ Suspension wheel mounting bracket
⑩ Bearing
⑪ Center guide wheel
⑫ Bearing
⑬ Center guide wheel shaft
⑭ Bearing
⑮ Bearing
⑯ Suspension wheel mounting bracket
⑰ Slide metal
⑱ Track



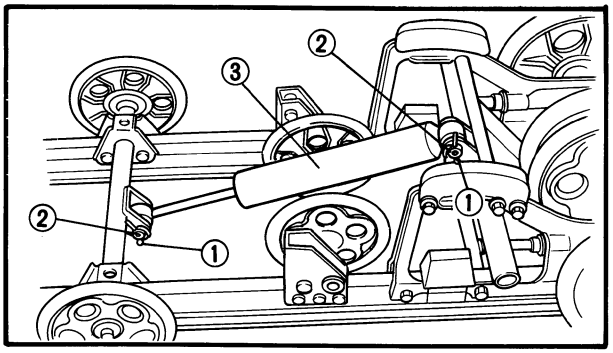


7. Remove:
   - Slide rail suspension assembly ①
   - Thrust cover (front pivot arm)
   - Inner shaft 1 (front pivot arm)

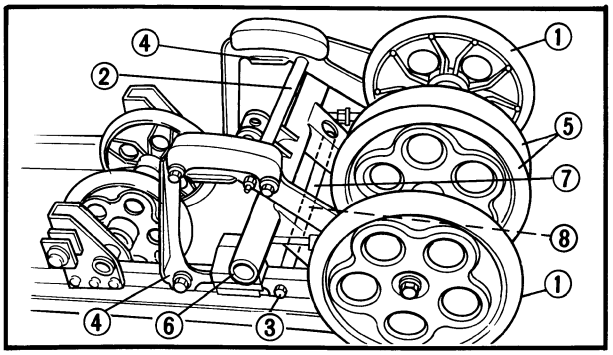


DISASSEMBLY

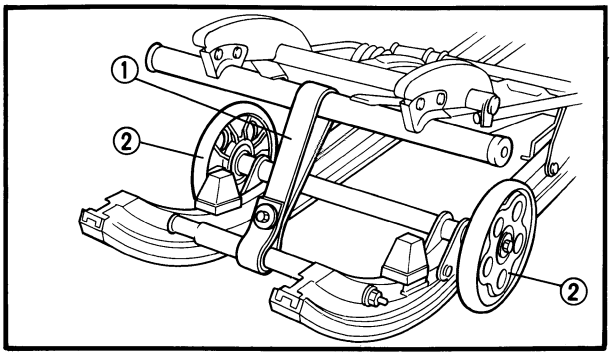
1. Remove:
   - Bracket securing bolts (rear pivot shaft) ①
   - Brackets ②
   - Springs ③
   - Inner shaft (rear pivot arm) ④



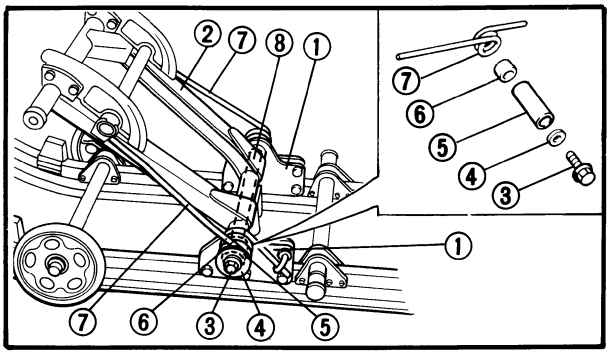
2. Remove:
   - Cotter pins (upper and lower) ①
   - Pivot shaft pins (upper and lower) ②
   - Rear shock absorber ③



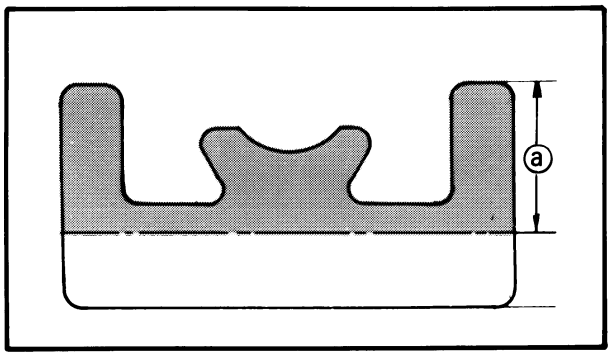
3. Remove:
   - Rear guide wheel ①
   - Center collar (mounting bracket) ②
   - Relay arm securing bolt (rear pivot arm) ③
   - Mounting bracket (rear guide wheel) ④
   - Center guide wheel assembly ⑤
   - Rear pivot arm ⑥
     With relay arm ⑦.
   - Inner shaft (rear pivot arm) ⑧



4. Remove:
   - Front stopper band ①
   - Suspension wheels ②



5. Remove:
   - Front pivot arm bracket ①
     With front pivot arm assembly ②
   - Front pivot arm securing bolt ③
   - Special plain washer ④
   - Bushing ⑤
   - Inner collar ⑥
   - Front torsion spring ⑦
   - Inner shaft 2 ⑧ .

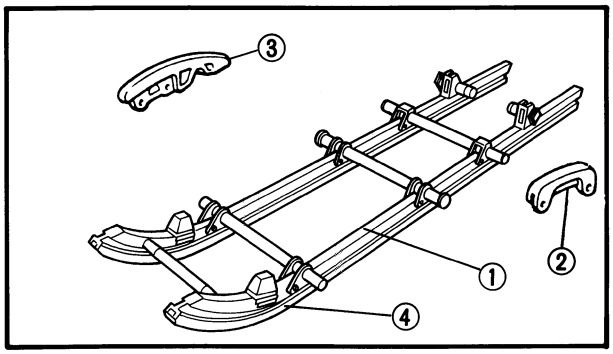


INSPECTION

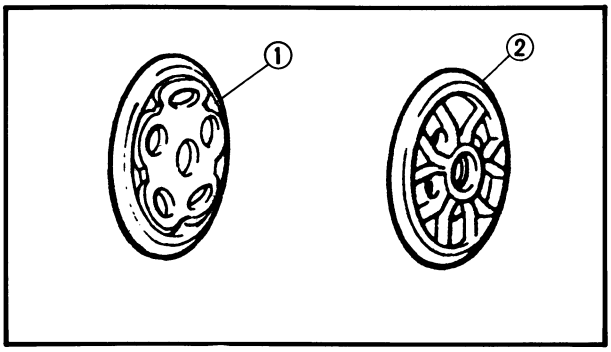
1. Measure:
   - Slide runner thickness
     Less than specification → Replace.

Slide Runner Thickness:
Wear Limit ⓐ:
10 mm (0.4 in)

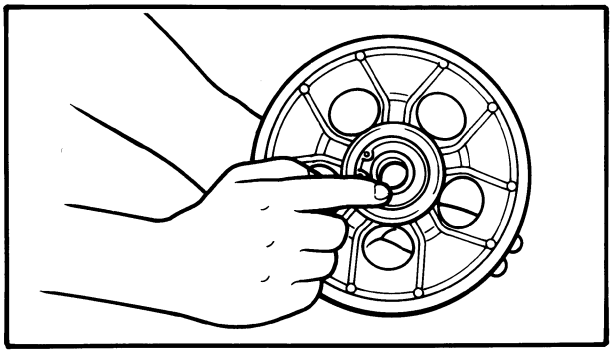
NOTE:
Replace the right and left slide runners as a set.



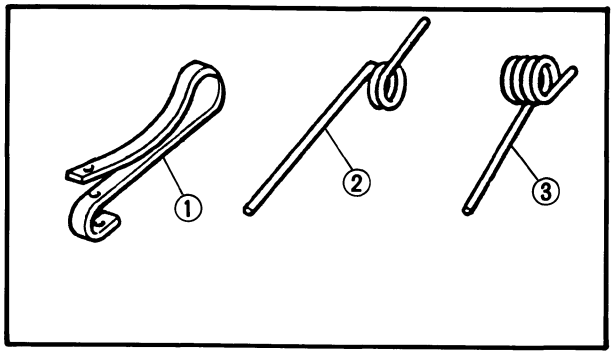
2. Inspect:
   - Slide rail ①
   - Slide runner 1 ② , 2 ③ , 3 ④
     Cracks/Bends/Damage → Replace.
   - Inner shaft (rear/front pivot arm)
   - Rear axle
   - Slide rail bracket
   - Center collar (mounting bracket)
     Bends/Damage → Replace.



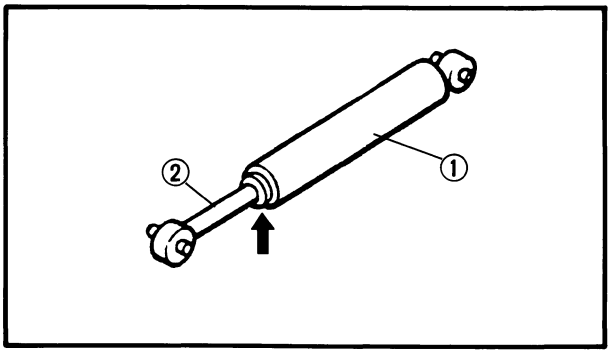
3. Inspect:
   - Suspension wheel ①
   - Guide wheel ②
     Wear/Cracks/Damage → Replace.



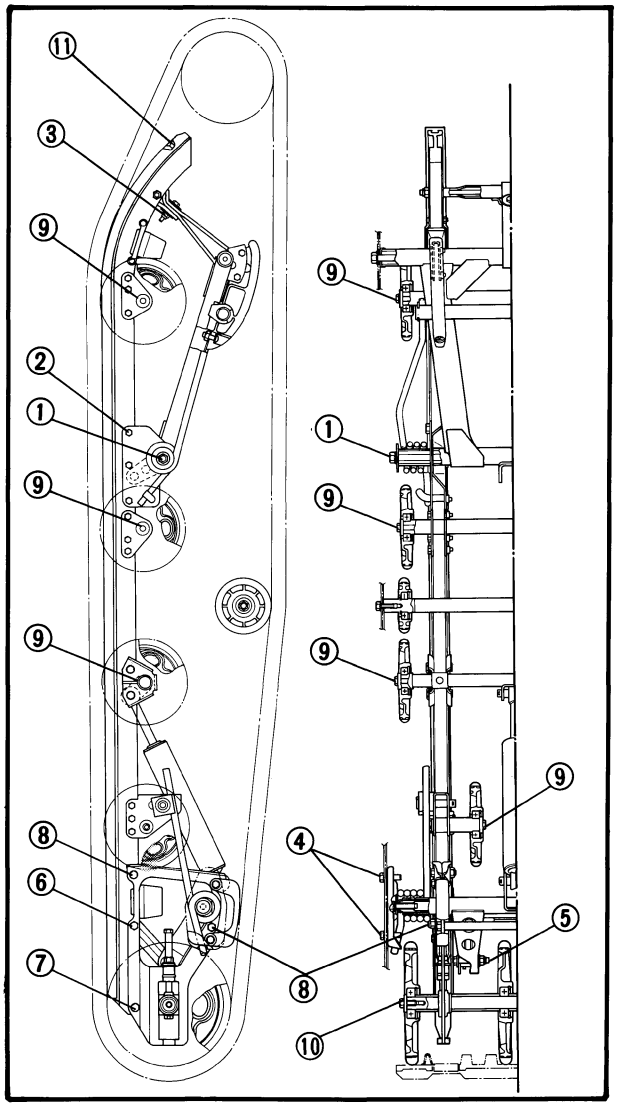
4. Inspect:
   - Wheel bearing
     Wheel turns roughly/Damage → Replace.



5. Inspect:
   - Stopper band ①
     Frayed/Damage → Replace.
   - Torsion spring (front ② and rear ③)
     Fatigue/Cracks/Damage → Replace.



6. Inspect:
   - Shock absorber ①
     Oil leaks/Damage → Replace.
   - Shock absorber rod ②
     Bends/Damage → Replace.



ASSEMBLY

When assembling the slide rail suspension, reverse the disassembly procedure.
Note the following points.

1. Before assembling the slide rail suspension, the suspension should be lubricated with low-temperature lithium soap base grease as indicated in the illustration.
2. Tighten:
   - All bolts and nuts

Front Pivot Arm — Bracket Securing Bolt ①:
LOCTITE®
65 Nm (6.5 m·kg, 47 ft·lb)

Front Pivot Arm Bracket Securing Bolt ②:
15 Nm (1.5 m·kg, 11 ft·lb)

Front Stopper Band Securing Nut ③:
4 Nm (0.4 m·kg, 2.9 ft·lb)

Slide Rail Bracket Securing Bolt ④:
30 Nm (3.0 m·kg, 22 ft·lb)

Rear Pivot Arm — Relay Arm Securing Nut ⑤:
30 Nm (3.0 m·kg, 22 ft·lb)

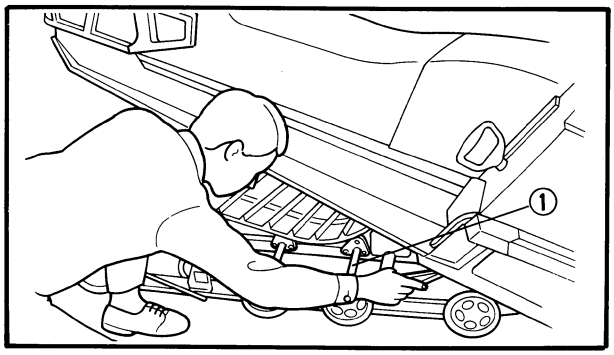
Relay Arm — Mounting Bracket Securing Bolt ⑥:
30 Nm (3.0 m·kg, 22 ft·lb)

Mounting Bracket — Slide Rail Securing Nut ⑦:
30 Nm (3.0 m·kg, 22 ft·lb)

Mounting Bracket Center Collar Securing Nut ⑧ :
30 Nm (3.0 m·kg, 22 ft·lb)
Suspension Wheel Securing Bolt ⑨ :
30 Nm (3.0 m·kg, 22 ft·lb)
Rear Guide Wheel Securing Bolt ⑩ :
55 Nm (5.5 m·kg, 40 ft·lb)
Slide Runner Securing Screw ⑪ :
3 Nm (0.3 m·kg, 2.2 ft·lb)

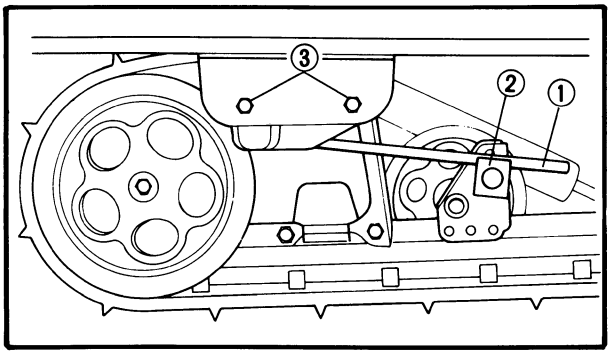
INSTALLATION

When installing the slide rail suspension assembly, reverse the removal procedure. Note the following points:



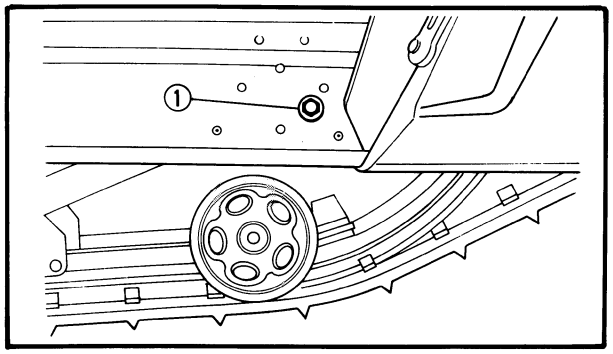
1. Place the slide rail suspension ① into the track, and fit the front pivot arm holding bolts. Then fit the rear pivot arm bracket mounting bolts.

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



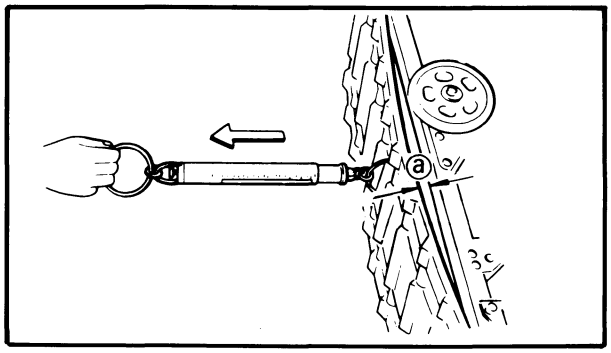
2. Hook:
   - Rear torsion spring ①
     To the spring hook ② .
3. Tighten:
   - Rear pivot arm bracket mounting bolts ③

Arm Bracket Mounting Bolt:
30 Nm (3.0 m·kg, 22 ft·lb)



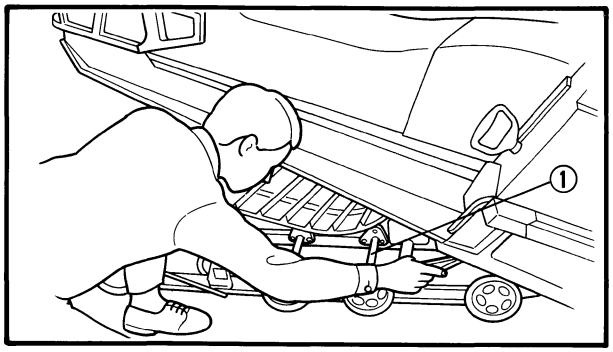
4. Tighten:
   - Front pivot arm mounting bolts ①
   - Center guide wheel mounting bolts

Front Pivot Arm Mounting Bolt ① :
69 Nm (6.9 m·kg, 50 ft·lb)
Center Guide Wheel Mounting Bolt:
30 Nm (3.0 m·kg, 22 ft·lb)



5. Adjust:
   - Track tension ⓐ
     Refer to "TRACK TENSION ADJUSTMENT", page 2-21.

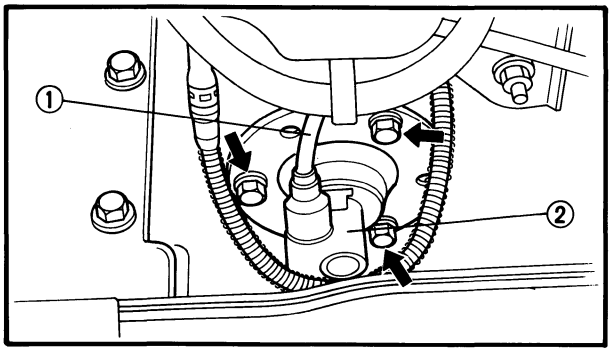
Track Tension ⓐ:
40 ~ 50 mm/10 kg
(1.57 ~ 1.97 in/22 lb)



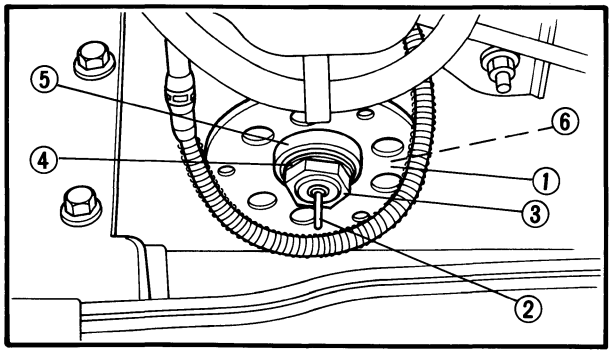
DRIVE

REMOVAL

1. Remove:
   - Slide rail suspension assembly ①
     Refer to "SLIDE RAIL SUSPENSION – REMOVAL", page 5-23.



2. Remove:
   - Speedometer cable ①
   - Speedometer gear housing ②

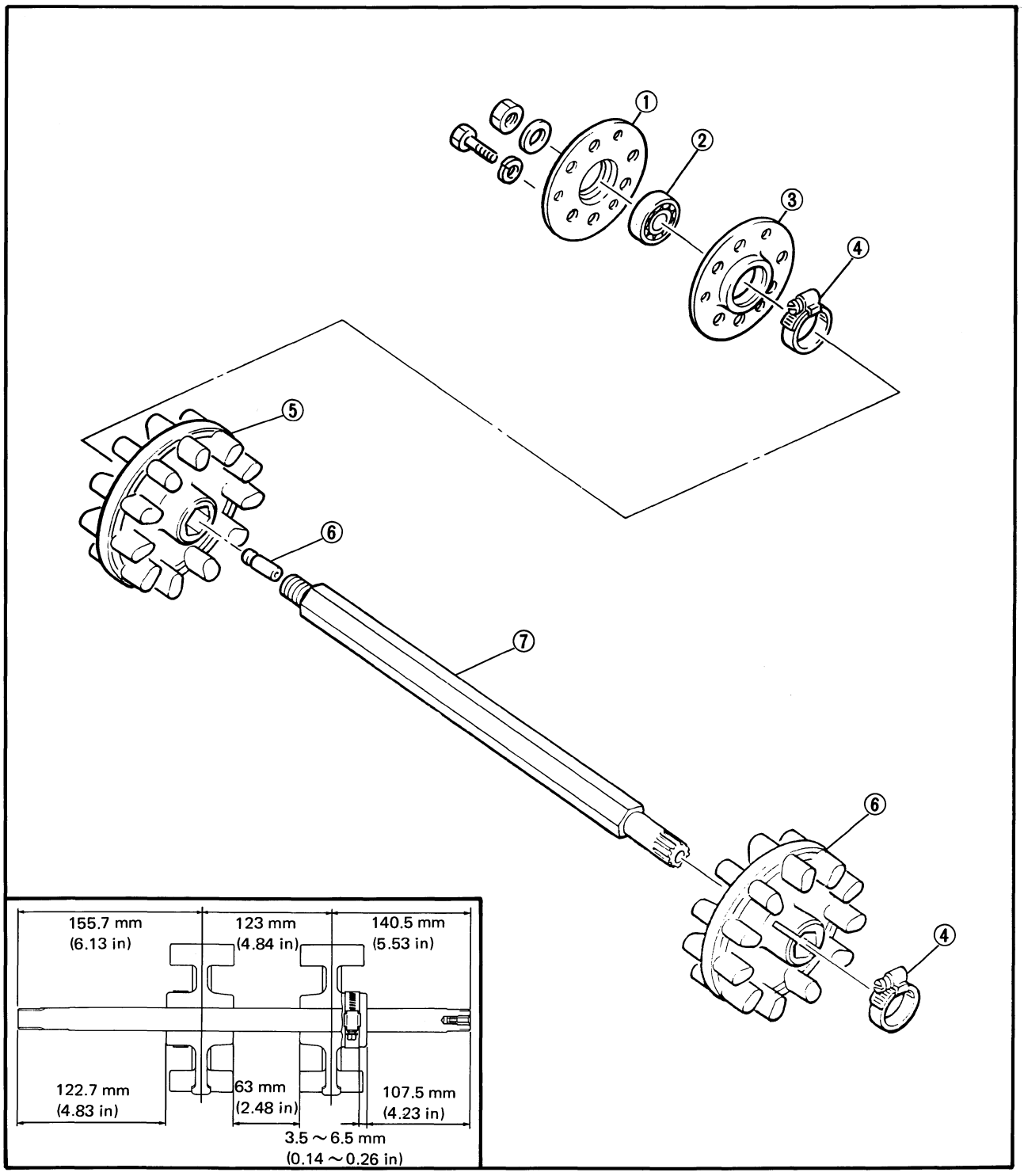


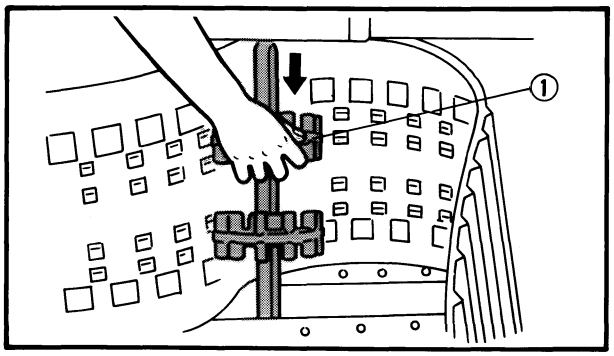
3. Remove:
   - Bearing cover ①
   - Speedometer cable joint ②
   - Front axle nut ③
   - Conical washer ④
   - Bearing ⑤
   - Bearing housing ⑥

NOTE:
When removing the front axle nut, set the parking brake.

DRIVE

① Bearing cover
② Bearing
③ Bearing housing
④ Sprocket wheel band
⑤ Sprocket wheel
⑥ Speedometer cable joint
⑦ Front axle

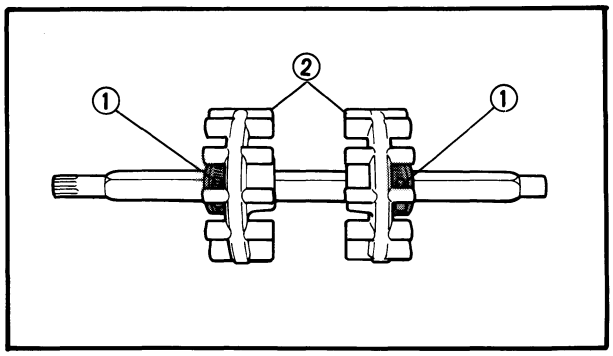




4. Place the machine on its right side.
5. Remove:
   - Front axle

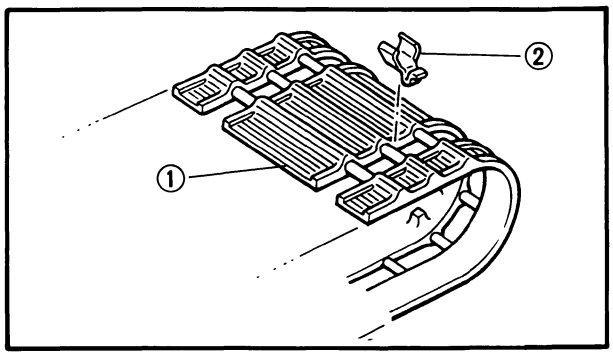
   Pull out the front axle from the chain housing, and remove the front axle.

NOTE:
Before turning the machine on it's side, seal the carburetor so that fuel does not spill out.



6. Remove:
   - Track
7. Loosen:
   - Sprocket wheel band ①
8. Remove:
   - Sprocket wheel ②

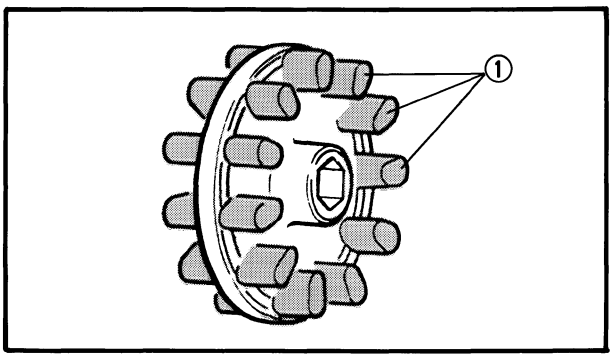
   Use a press.



INSPECTION

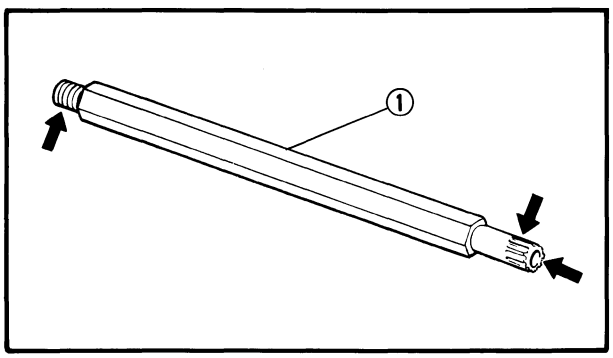
1. Inspect:
   - Track ①
   - Slide metal ②

   Wear/Cracks/Damage → Replace.



2. Inspect:
   - Wheel sprocket (lugs ①)

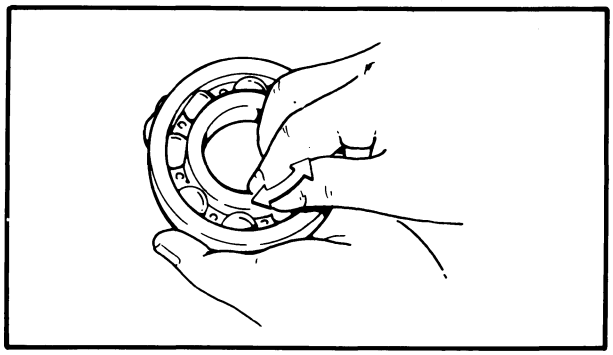
   Wear/Break/Damage → Replace.



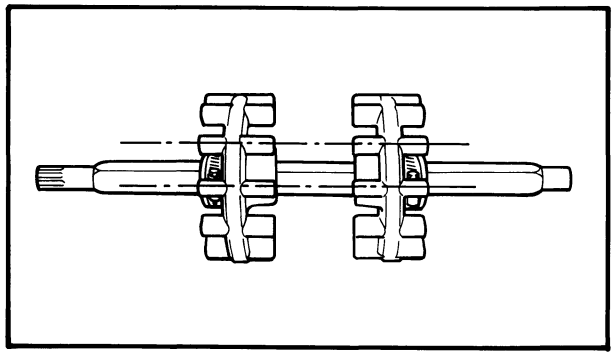
3. Inspect:
   - Front axle ①

   Bent/Scratched (excessively)/Damage → Replace.
   - Splines/Threads

   Damage → Replace.



4. Inspect:
   - Front axle bearing
     Pitting/Damage → Replace.

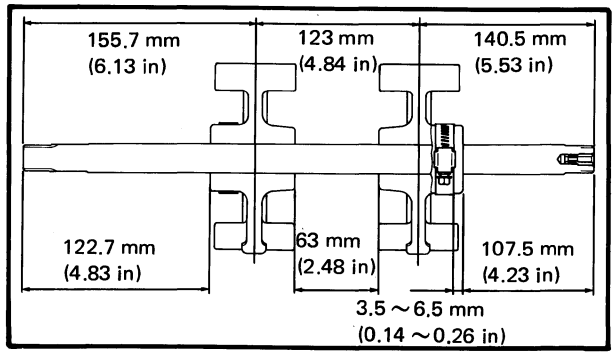


INSTALLATION

When installing the front axle, reverse the removal procedure.
Note the following points.

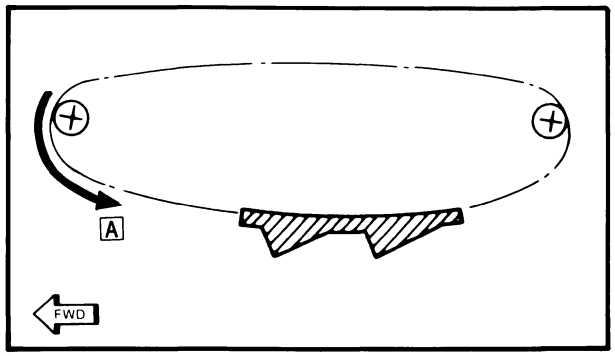
1. Install:
   - Sprocket wheels (onto front axle)
     Use a press.

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



2. Tighten:
   - Sprocket wheel band screw

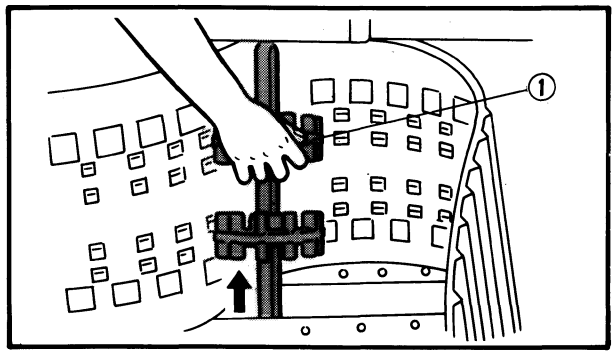
Sprocket Wheel Band Screw:
5 Nm (0.5 m·kg, 3.6 ft·lb)



3. Place the track in the chassis.

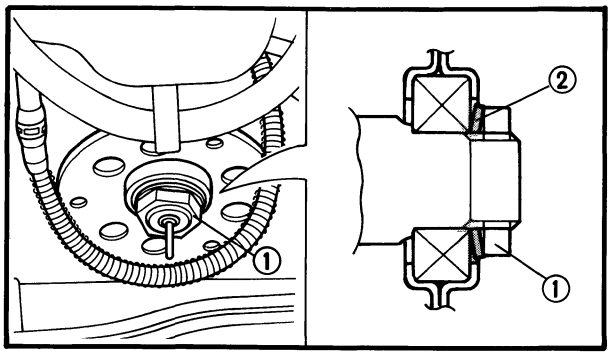
NOTE:
Be sure it is positioned as shown in the illustration.

A TURNING DIRECTION



4. Install the front axle ① , push up the splined end toward the chain housing, and install the threaded end into the speedometer gear housing side.

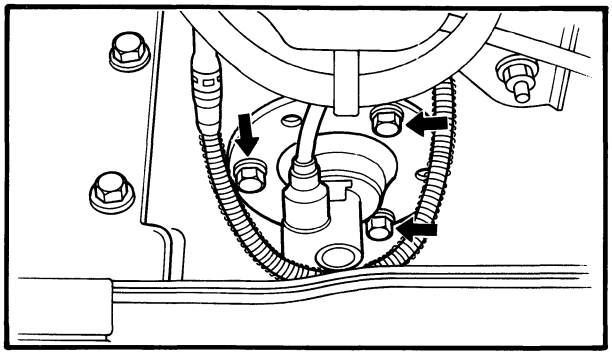
NOTE:
Be sure the lugs correctly engage the track.



5. Tighten:
   - Front axle securing nut ①

Front Axle Securing Nut ①:
110 Nm (11 m·kg, 80 ft·lb)

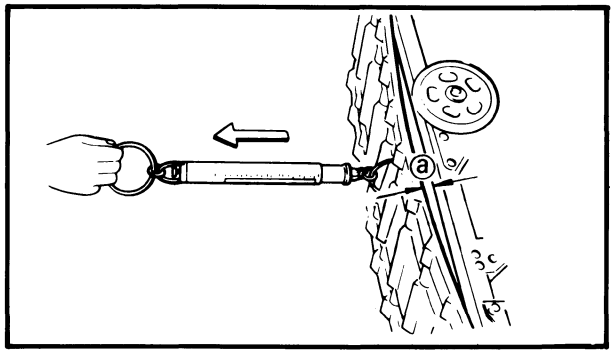
NOTE:
Be careful to install the conical spring washer ② in proper position as shown.



6. Tighten:
   - Speedometer gear housing securing bolts.

Gear Housing Securing Bolt:
23 Nm (2.3 m·kg, 17 ft·lb)

NOTE:
Before installing the gear housing, install the cable joint into the axle shaft.



7. Adjust:
   - Track tension ⓐ
     Refer to "TRACK TENSION ADJUSTMENT", page 2-21

Track Tension ⓐ:
40 ~ 50 mm/10 kg
(1.6 ~ 2.0 in/22 lb)

CHAPTER 6.
CHASSIS

SKI AND FRONT SUSPENSION 6-1
REMOVAL 6-2
DISASSEMBLY 6-2
INSPECTION 6-2
ASSEMBLY 6-3
INSTALLATION 6-5

STEERING 6-6
DISASSEMBLY 6-7
INSPECTION 6-8
ASSEMBLY 6-9
ADJUSTMENT 6-11

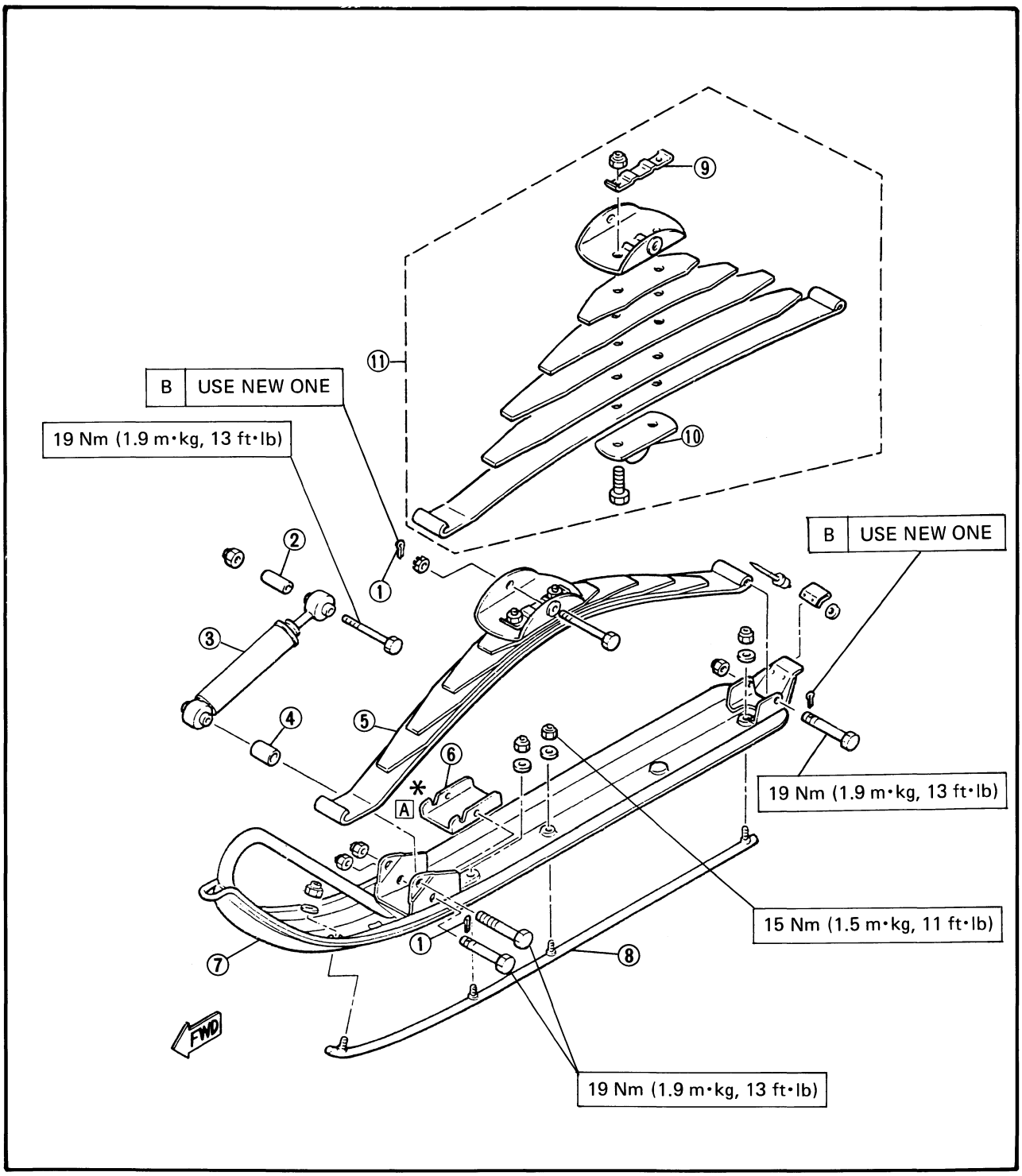
OIL TANK 6-11
INSPECTION 6-11

FUEL TANK 6-12
INSPECTION 6-12

SKI AND FRONT SUSPENSION

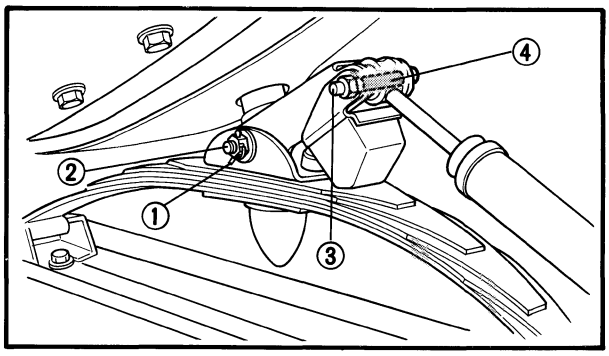
① Cotter pin
② Inner collar (Upper)
③ Shock absorber
④ Inner collar (Lower)
⑤ Leaf spring
⑥ Wear plate
⑦ Ski
⑧ Ski runner
⑨ Lock washer
⑩ Spring seat
⑪ Leaf spring assembly

*
NOTE:
Fit the wear plate ① with its cut out portion [A] positioned in front.

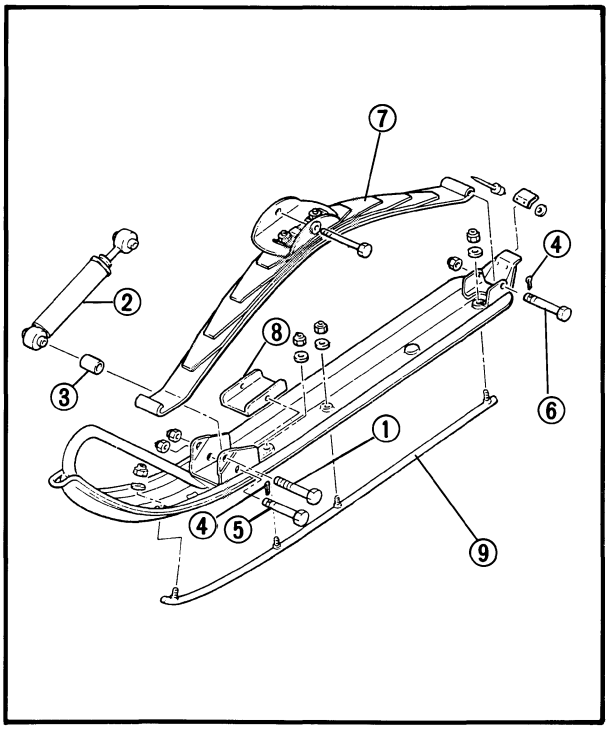


REMOVAL

1. Elevate the skis by placing a suitable stand under the chassis.

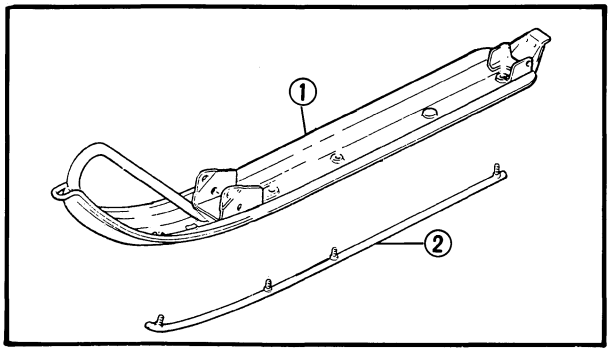


2. Remove:
   - Cotter pin ①
   - Ski holding bolt ②
   - Shock absorber holding bolt (upper) ③
   - Inner collar (upper) ④
   - Ski assembly



DISASSEMBLY

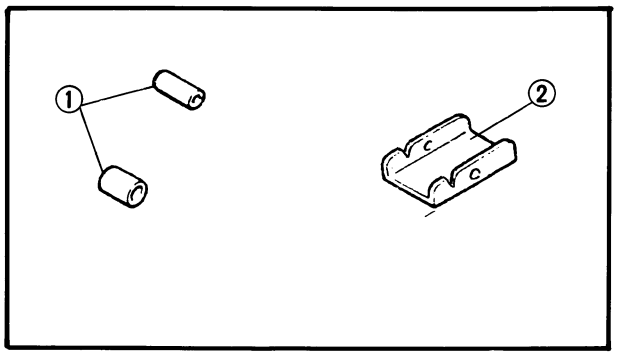
1. Remove:
   - Shock absorber holding bolt (lower) ①
   - Shock absorber ②
   - Inner collar (lower) ③
   - Cotter pin ④
   - Leaf spring holding bolt (front) ⑤
   - Leaf spring securing bolt (rear) ⑥
   - Leaf spring assembly ⑦
   - Wear plate ⑧
   - Ski runner ⑨



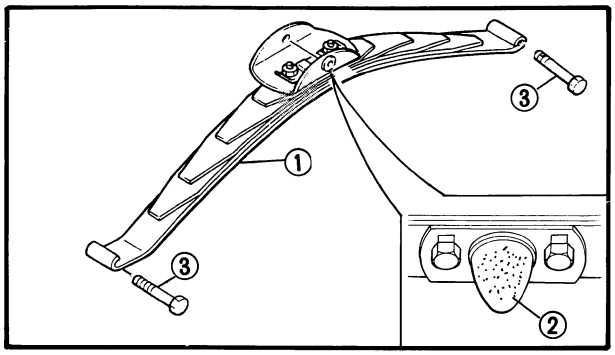
INSPECTION

1. Inspect:
   - Ski ①
   - Ski runner ②

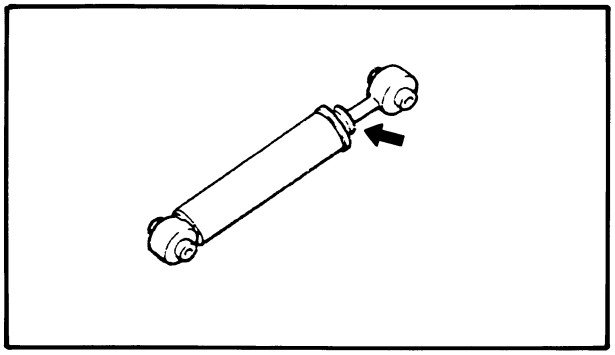
   Wear/Cracks/Damage → Replace.



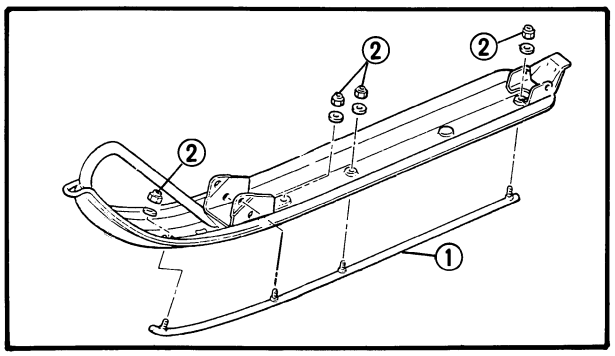
2. Inspect:
   - Inner collars (shock absorber) ①
     Scratches/Wear/Damage → Replace.
   - Wear plate ②
     Wear/Cracks/Damage → Replace.



3. Inspect:
   - Leaf spring ①
     Fatigue/Damage → Replace.
   - Spring seat (rubber) ②
     Damage → Replace.
   - Bolts (leaf spring) ③
     Wear/Damage → Replace.



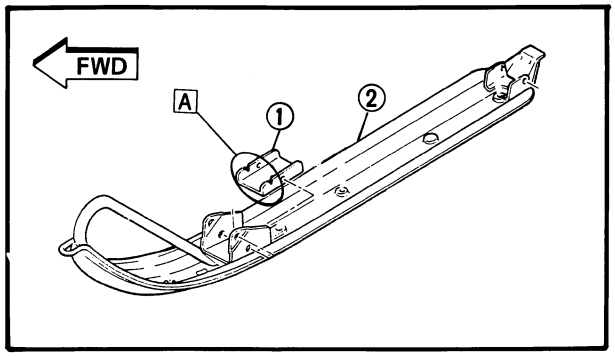
4. Inspect:
   - Shock absorber
     Oil leaks/Bend/Damage → Replace.



ASSEMBLY

1. Install:
   - Ski runner ①
2. Tighten:
   - Ski runner securing nuts ②

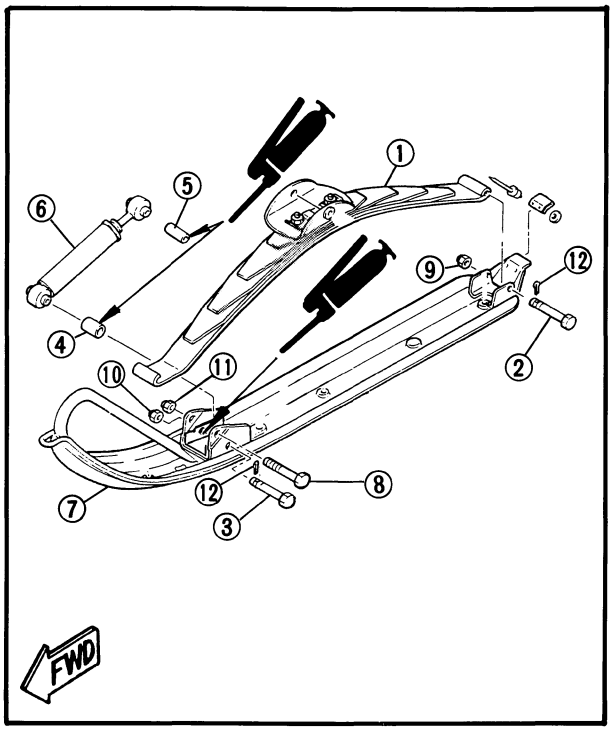
Ski Runner Securing Nut:
15 Nm (1.5 m·kg, 11 ft·lb)



3. Fit:
   - Wear plate ①
     Onto the ski ② .

NOTE:

Fit the wear plate ① with its cut out portion [A] positioned in front.



4. Apply:
   - Low-temperature grease

Esso-Beacon 325 Grease or Aero Shell Grease #7

To the inner collars (shock absorber) and wear plate sliding surface with a leaf spring.

5. Install:
   - Leaf spring assembly ①
   - Leaf spring securing bolt (rear) ②
   - Leaf spring holding bolt (front) ③
   - Inner collar (lower ④ and upper ⑤)
     To the shock absorber ⑥ .
   - Shock absorber ⑥
     To the ski ⑦ .
   - Shock absorber holding bolt (lower) ⑧

CAUTION:

Be sure to install the shock absorber with the word "YAMAHA" facing upward.

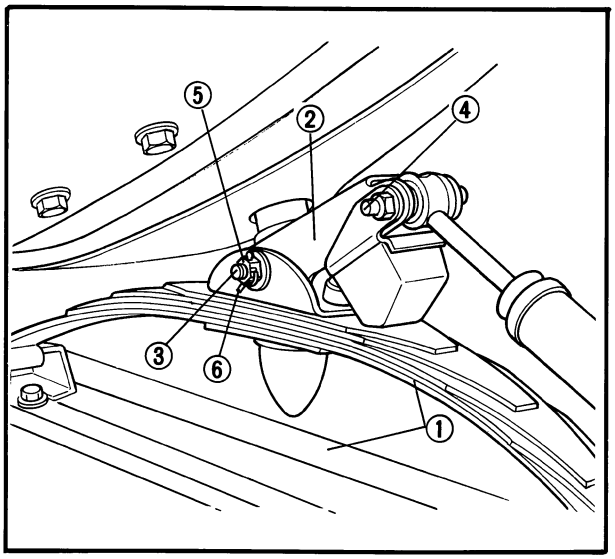
6. Tighten:
   - Nuts

Leaf Spring Securing Nut (rear) ⑨ : 19 Nm (1.9 m·kg, 13 ft·lb)
Leaf Spring Holding Nut (front) ⑩ : 19 Nm (1.9 m·kg, 13 ft·lb)
Shock Absorber Holding Nut ⑪ : 19 Nm (1.9 m·kg, 13 ft·lb)

7. Install:
   - Cotter pins ⑫

WARNING:

Always use a new cotter pin.



INSTALLATION

1. Fit:
   - Ski assembly ①
     To the ski column ② .
2. Install:
   - Ski holding bolt ③
   - Shock absorber holding bolt (upper) ④
3. Tighten:
   - Ski holding nut ⑤
     Tighten the holding nut ⑤ until it is tight, then back it out 1/4 turn.
4. Install:
   - Cotter pin ⑥

NOTE:

Before installing the cotter pin, make sure the ski can be turned smoothly.

WARNING:

Always use a new cotter pin.

5. Tighten:
   - Shock absorber holding bolt (upper) ④

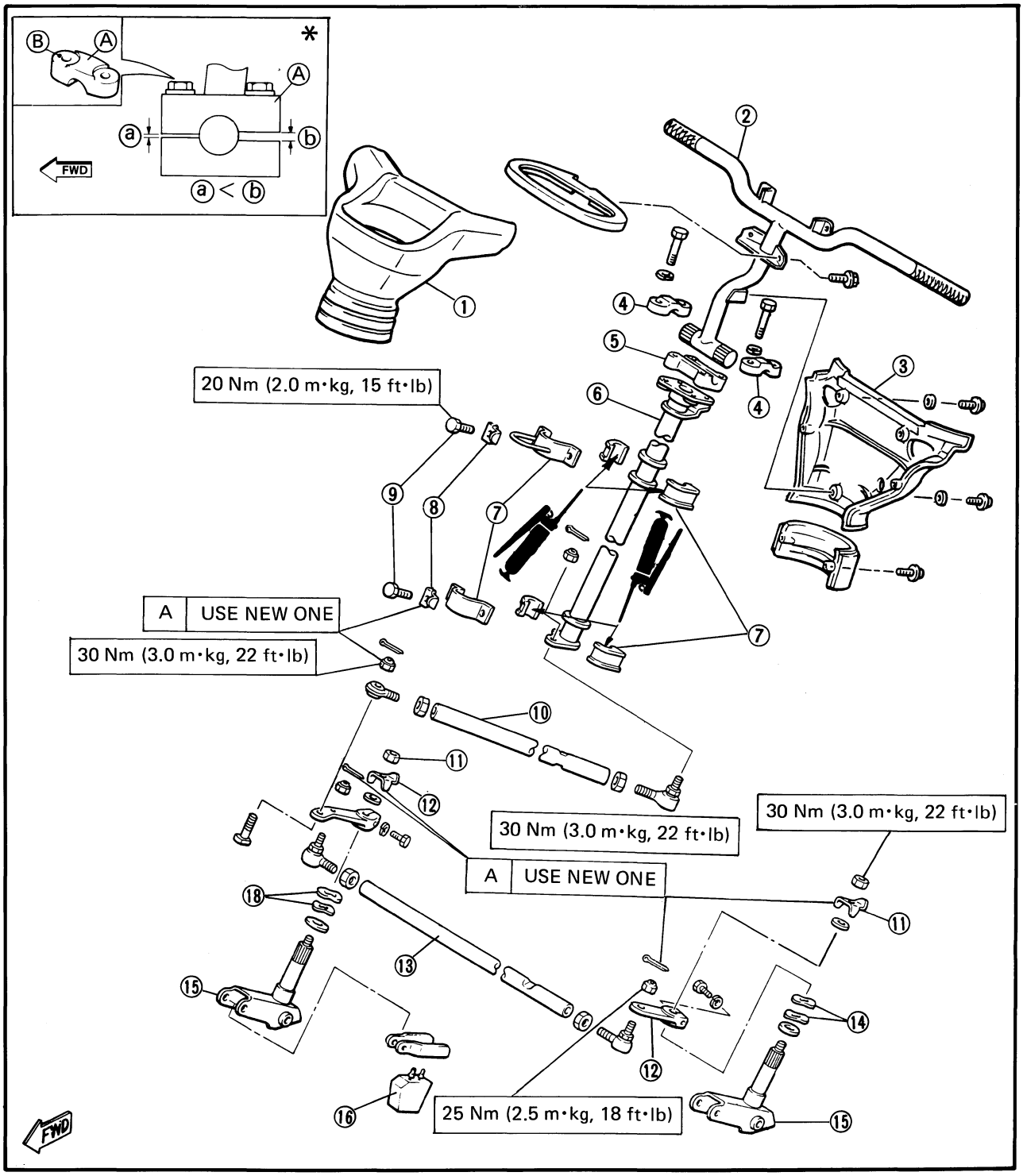
	Absorber Holding Bolt (upper): 19 Nm (1.9 m·kg, 13 ft·lb)

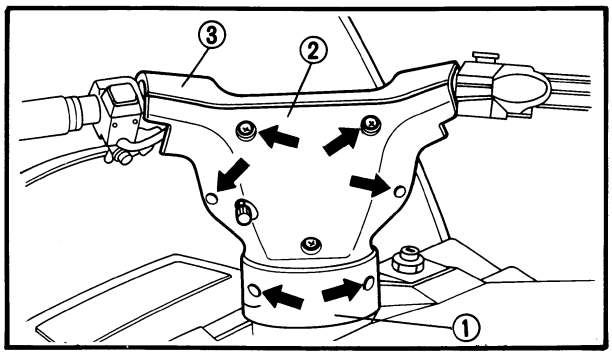
STEERING

① Handlebar cover (Front)
② Handlebar
③ Handle cover (Rear)
④ Handle holder (Upper)
⑤ Handle holder (Lower)
⑥ Steering shaft
⑦ Bearing
⑧ Bearing holder
⑨ Lock washer
⑩ Relay-rod
⑪ Lock washer
⑫ Knuckle arm
⑬ Tie-rod
⑭ Wave washer
⑮ Ski column
⑯ Damper rubber

* **NOTE:**
The upper handlebar holder Ⓐ should be installed with the punched mark Ⓑ forward.

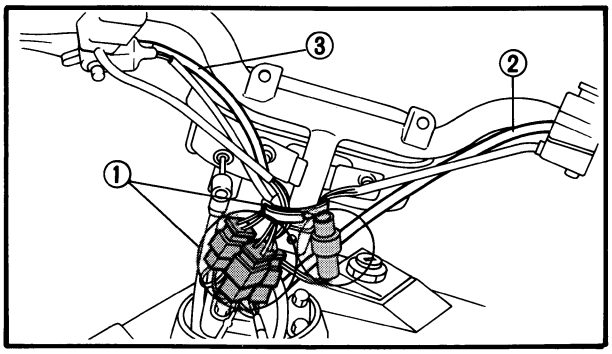
* **CAUTION:**
First tighten the bolts on the front side of the handlebar holder, and then tighten on the rear side.



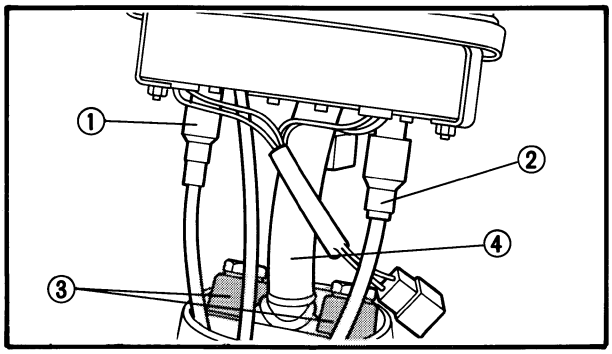


DISASSEMBLY

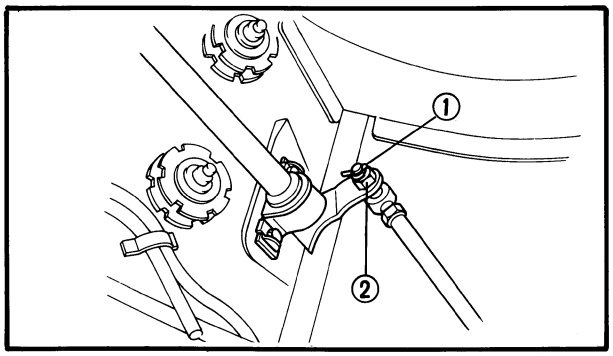
1. Remove:
   - Handlebar cover (lower) ①
   - Handlebar cover (rear) ②
   - Handlebar cover (front) ③



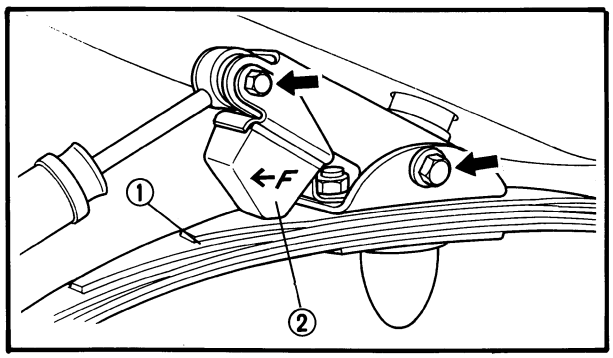
2. Disconnect:
   - Couplers ①
   - Throttle cable ②
     From carburetor side.
   - Brake cable ③
     From brake caliper side.



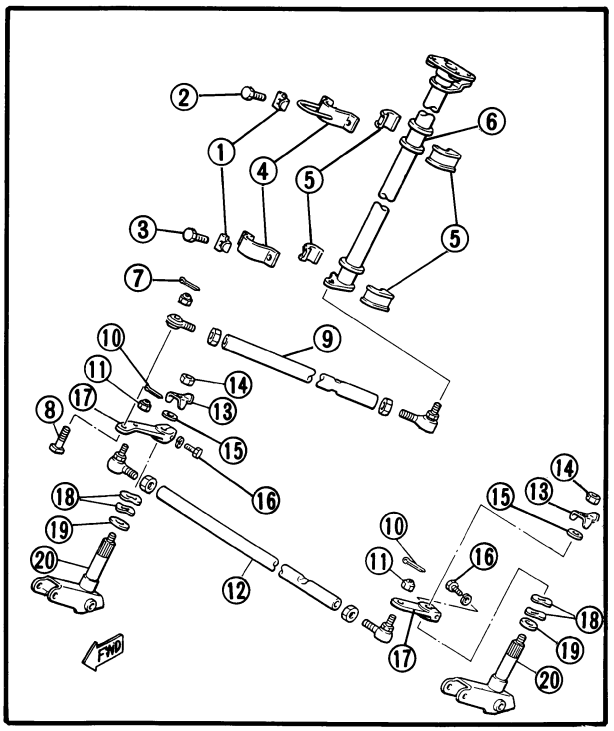
3. Disconnect:
   - Tachometer cable ①
   - Speedometer cable ②
4. Remove:
   - Handle holders ③
     Handlebar ④ .



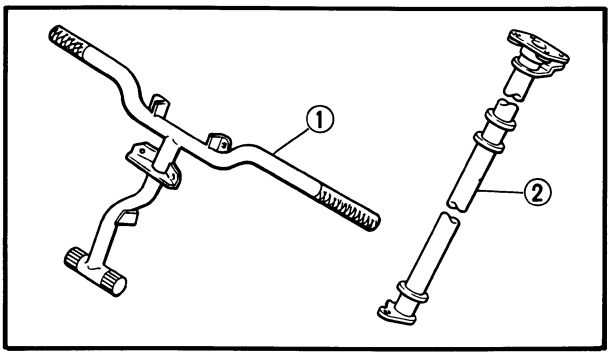
5. Remove:
   - Cotter pin (relay rod) ①
   - Relay rod securing locknut ②

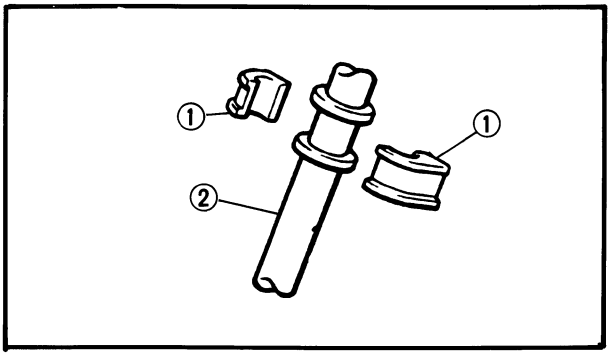


6. Remove:
   - Ski assembly ①
     Refer to "SKI AND FRONT SUSPENSION – REMOVAL", page 6-2.
   - Damper rubber ②



7. Straighten:
   - Lock washer tab (bearing holder) ①
8. Remove:
   - Bearing holder securing bolts (upper ② and lower ③)
   - Lock washer ①
   - Bearing holders ④
   - Bearings ⑤
   - Steering shaft ⑥
   - Cotter pin (relay-rod) ⑦
   - Relay-rod securing bolt ⑧
   - Relay-rod ⑨
   - Cotter pins (tie-rod) ⑩
   - Tie-rod securing nuts ⑪
   - Tie-rod ⑫
9. Straighten:
   - Lock washer tab (ski column) ⑬
10. Remove:
    - Ski column securing nut ⑭
    - Plain washer ⑮
11. Loosen:
    - Knuckle arm pinch bolt ⑯
12. Remove:
    - Knuckle arm ⑰
    - Wave washer ⑱
    - Plate washer ⑲
    - Ski column ⑳





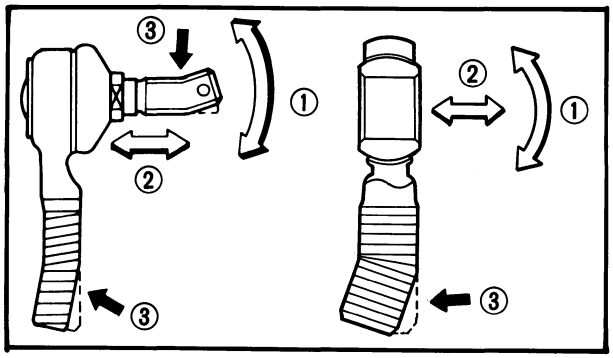
INSPECTION

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

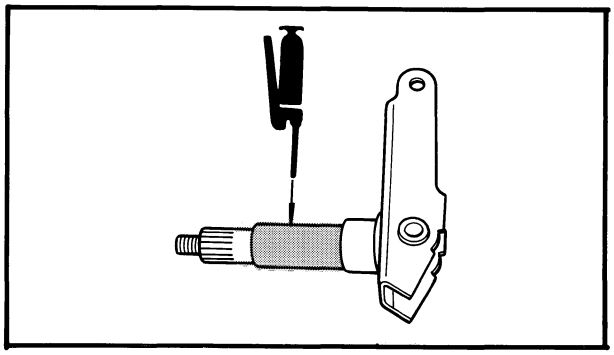
WARNING:

Do not attempt to straighten a bent shaft, this may dangerously weaken the shaft.

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



3. Check:
   - Rod end
     Unsmooth movement ① → Replace.
     Noticeable free play ② → Replace.
     Bolt bends ③ → Replace.

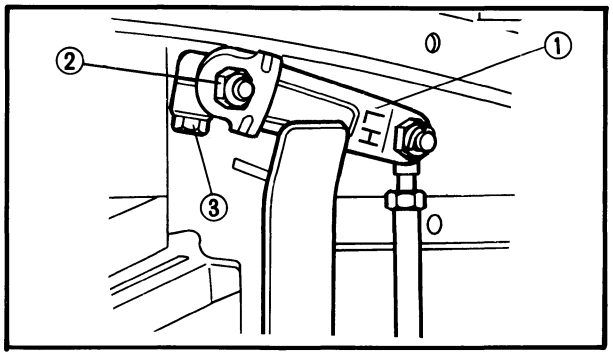


ASSEMBLY

When installing the steering system, reverse the removal procedure.
Note the following points.

1. Lubricate:
   - Grease
     To the ski column shaft.

Light All-Purpose Grease:



2. Install:
   - Knuckle arm ①
     Marked "LH" on the left ski column and "RH" on the right ski column.

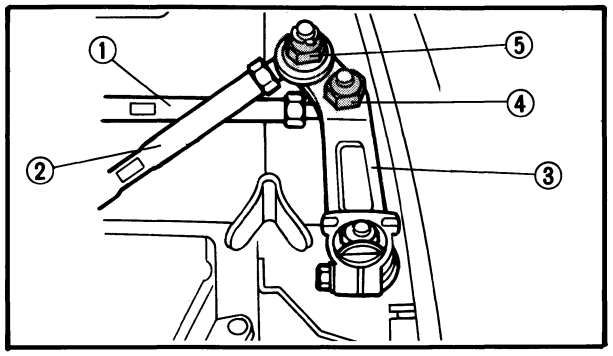
NOTE:

Be sure to install the wave washers between knuckle arm and frame.

3. Tighten:
   - Ski column securing nut ②
   - Knuckle arm pinch bolt ③

Ski Column Securing Nut:
30 Nm (3.0 m·kg, 22 ft·lb)
Knuckle Arm Pinch Bolt:
20 Nm (2.0 m·kg, 15 ft·lb)

4. Bend:
   - Lock washer tab (new) ④



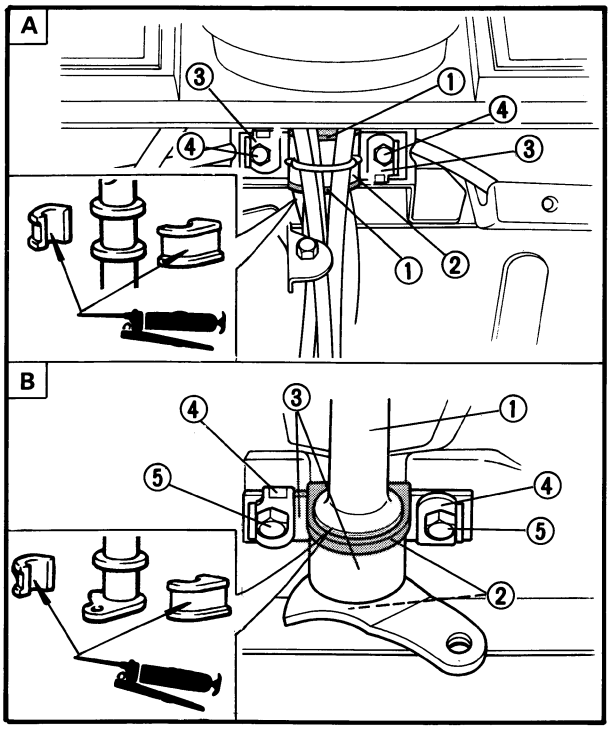
5. Install:
   - Tie rod ①
   - Relay rod ②
     To the knuckle arm ③

Tie Rod Securing Nut ④ :
25 Nm (2.5 m·kg, 18 ft·lb)
Relay Rod Securing Nut ⑤ :
30 Nm (3.0 m·kg, 22 ft·lb)

6. Install:
   - Cotter pins (new)

WARNING:

Always use a new cotter pin.



7. Lubricate:
   - Grease (lightly)
     To the bearing inner surface.

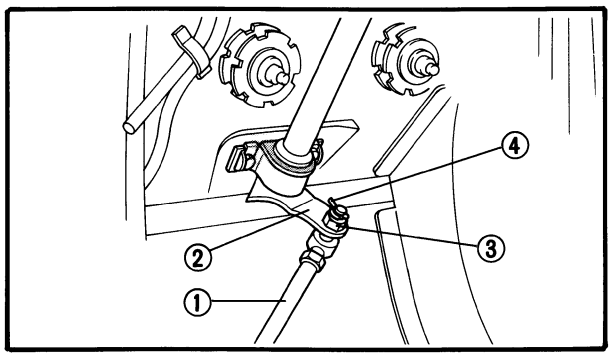
Light All-Purpose Grease:

8. Install:
   - Steering shaft ①
   - Bearings ②
   - Bearing holders ③
   - Lock washers (new) ④
   - Bearing holder securing bolts ⑤

Holder Securing Bolt:
20 Nm (2.0 m·kg, 15 ft·lb)

9. Bend:
   - Lock washer tab

Ⓐ UPPER
Ⓑ LOWER



10. Install:
    - Relay rod ①
      To the steering shaft arm ②.

Relay Rod Securing Nut ③ :
30 Nm (3.0 m·kg, 22 ft·lb)

- Cotter pin ④

WARNING:

Always use a new cotter pin.

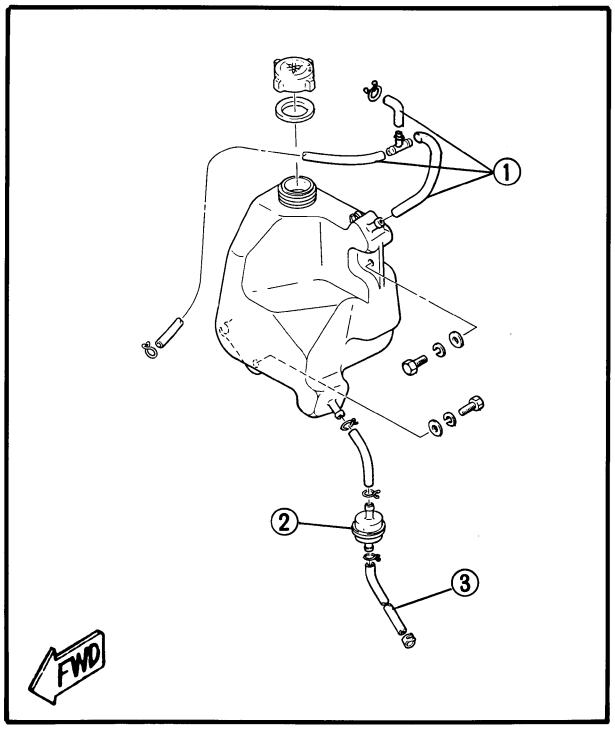
11. Install:
    - Components
      When reassembly, reverse the "REMOVAL" steps.

ADJUSTMENT

Ski Adjustment (To the handlebar)
Refer to "CHASSIS – SKI ADJUSTMENT (TO THE HANDLEBAR)", page 2-22.

Ski Toe-out Adjustment
Refer to "CHASSIS – SKI TOE-OUT ADJUSTMENT", page 2-23.

Handlebar Adjustment
Refer to "CHASSIS – HANDLEBAR ADJUSTMENT", page 2-26.



OIL TANK

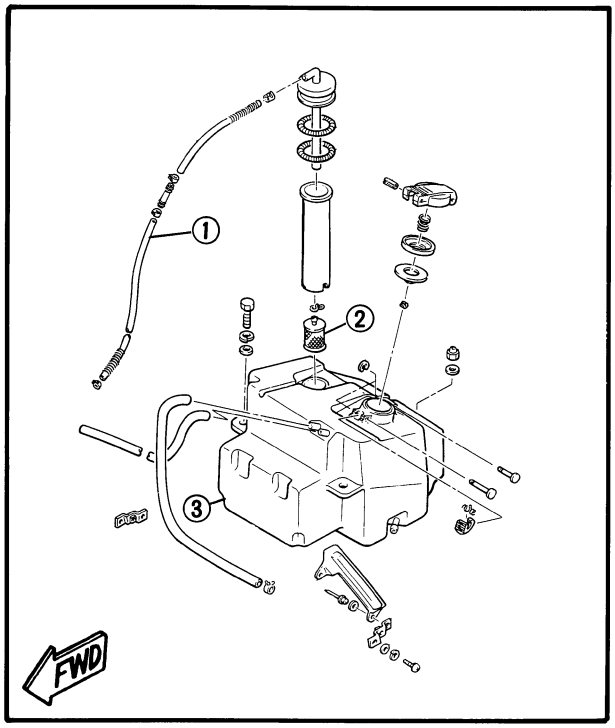
INSPECTION

Check the oil line from the tank to the pump. It should be free from all obstructions and should not be pinched or damaged in any way. Replace as necessary.

WARNING:

Proper cable, hose and lead routing is essential to assure safe vehicle operation. Refer to "CABLE ROUTING".

① Breather hose
② Oil filter
③ To oil pump



FUEL TANK

INSPECTION

WARNING:

- **FUEL IS HIGHLY FLAMMABLE:**
  1) **Always turn off the engine when inspecting.**
  2) **Take care not to spill any fuel on the engine or exhaust pipe(s)/muffler(s) when cleaning.**
  3) **Never clean the fuel filter while smoking or in the vicinity of an open flame.**
- **Proper cable and lead routing is essential to assure safe vehicle operation.**
  "CABLE ROUTING", page 8-14.

1. Inspect:
   - Fuel hoses ①
     Breaks/Damage → Replace.
     Poor connection → Reconnect.
2. Inspect:
   - Fuel filter ②
     Dirty → Clean or replace.
3. Inspect:
   - Fuel tank ③
     Cracks/Damage → Replace.

CHAPTER 7.
ELECTRICAL

ET340TRM CIRCUIT DIAGRAM 7-1

ELECTRICAL COMPONENTS 7-3

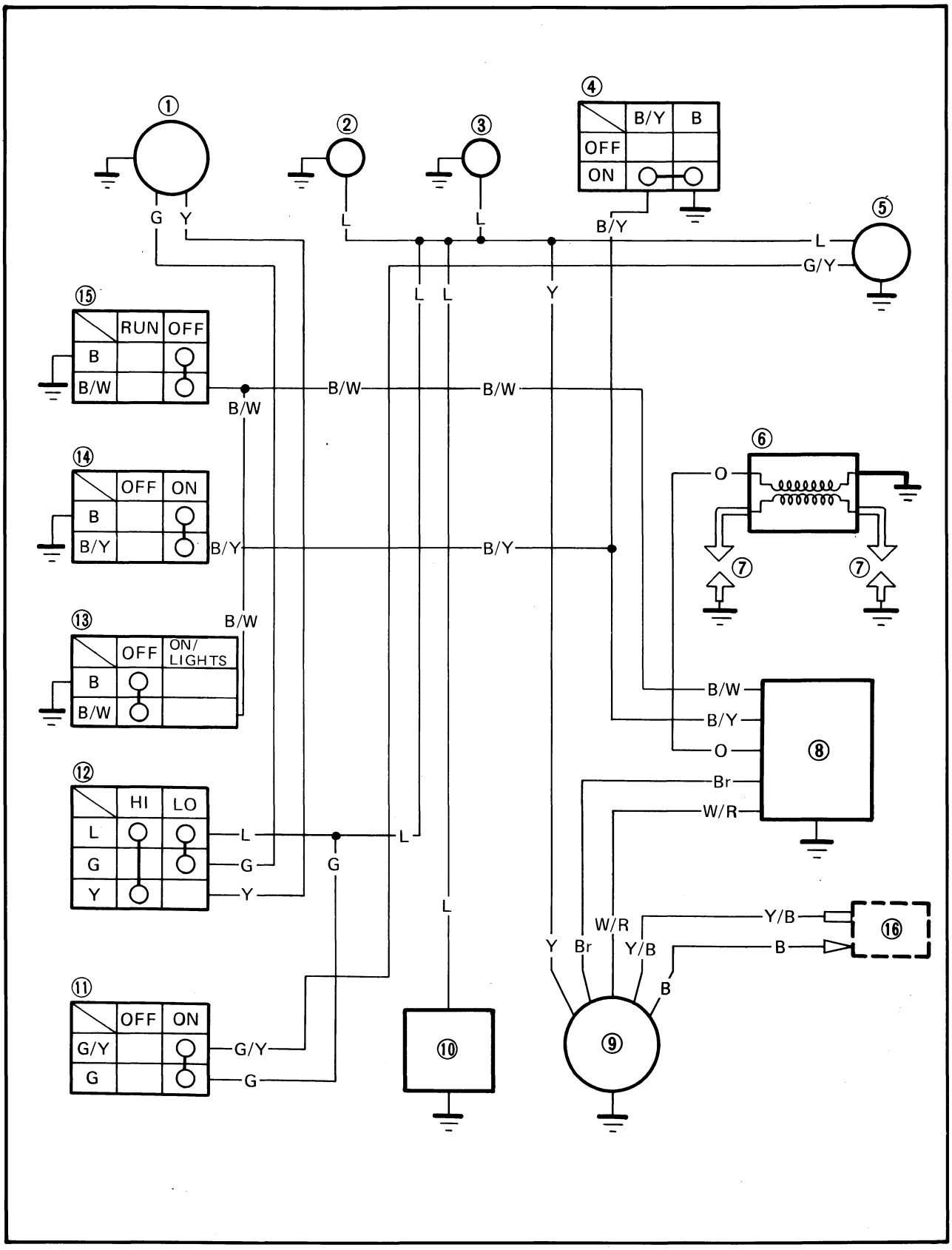
IGNITION SYSTEM 7-5
- CIRCUIT DIAGRAM 7-5
- TROUBLESHOOTING 7-7
- SPARK PLUG INSPECTION 7-9
- IGNITION TIMING CHECK 7-9
- IGNITION SPARK GAP TEST 7-9
- IGNITION COIL RESISTANCE TEST 7-9
- PICK-UP COIL RESISTANCE TEST 7-10
- SOURCE COIL RESISTANCE TESTS 7-11

LIGHTING SYSTEM 7-13
- CIRCUIT DIAGRAM 7-13
- TROUBLESHOOTING 7-15
- LIGHTING OUTPUT TEST 7-17
- LIGHTING COIL RESISTANCE TEST 7-17
- GRIP WARMER COIL RESISTANCE TEST 7-18

SWITCHES TEST 7-19
- MAIN SWITCH 7-19
- CARBURETOR SWITCH 7-19
- THROTTLE SWITCH 7-19
- HEADLIGHT BEAM SWITCH 7-20
- ENGINE STOP SWITCH 7-20
- BRAKE LIGHT SWITCH 7-20

ELECTRICAL

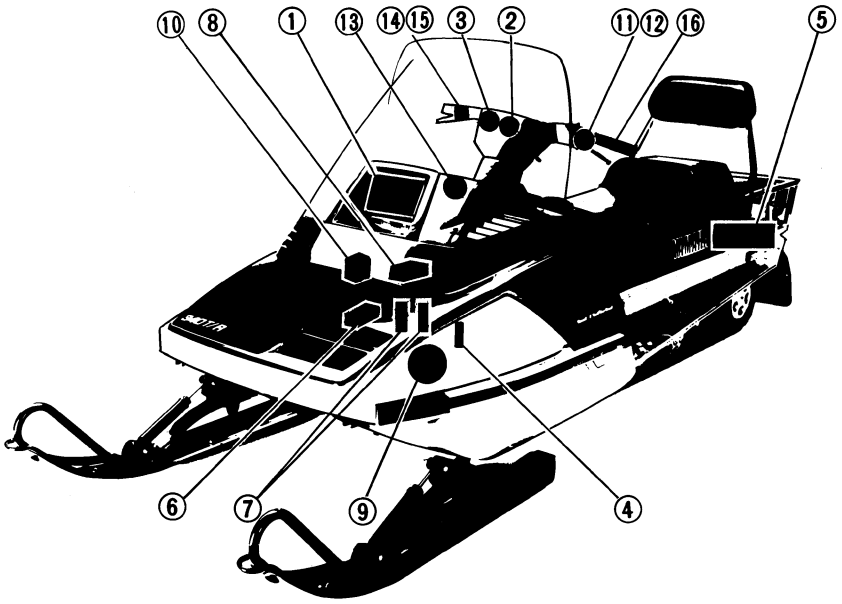
ET340TRM CIRCUIT DIAGRAM



① Headlight
② Speedometer light
③ Tachometer light
④ Carburetor switch
⑤ Tail/Brake light
⑥ Ignition coil
⑦ Spark plug
⑧ CDI unit
⑨ CDI magneto
⑩ Voltage regulator
⑪ Brake light switch
⑫ Headlight beam switch
⑬ Main switch
⑭ Throttle switch
⑮ Engine stop switch
⑯ Grip warmer (Opt)

COLOR CODE

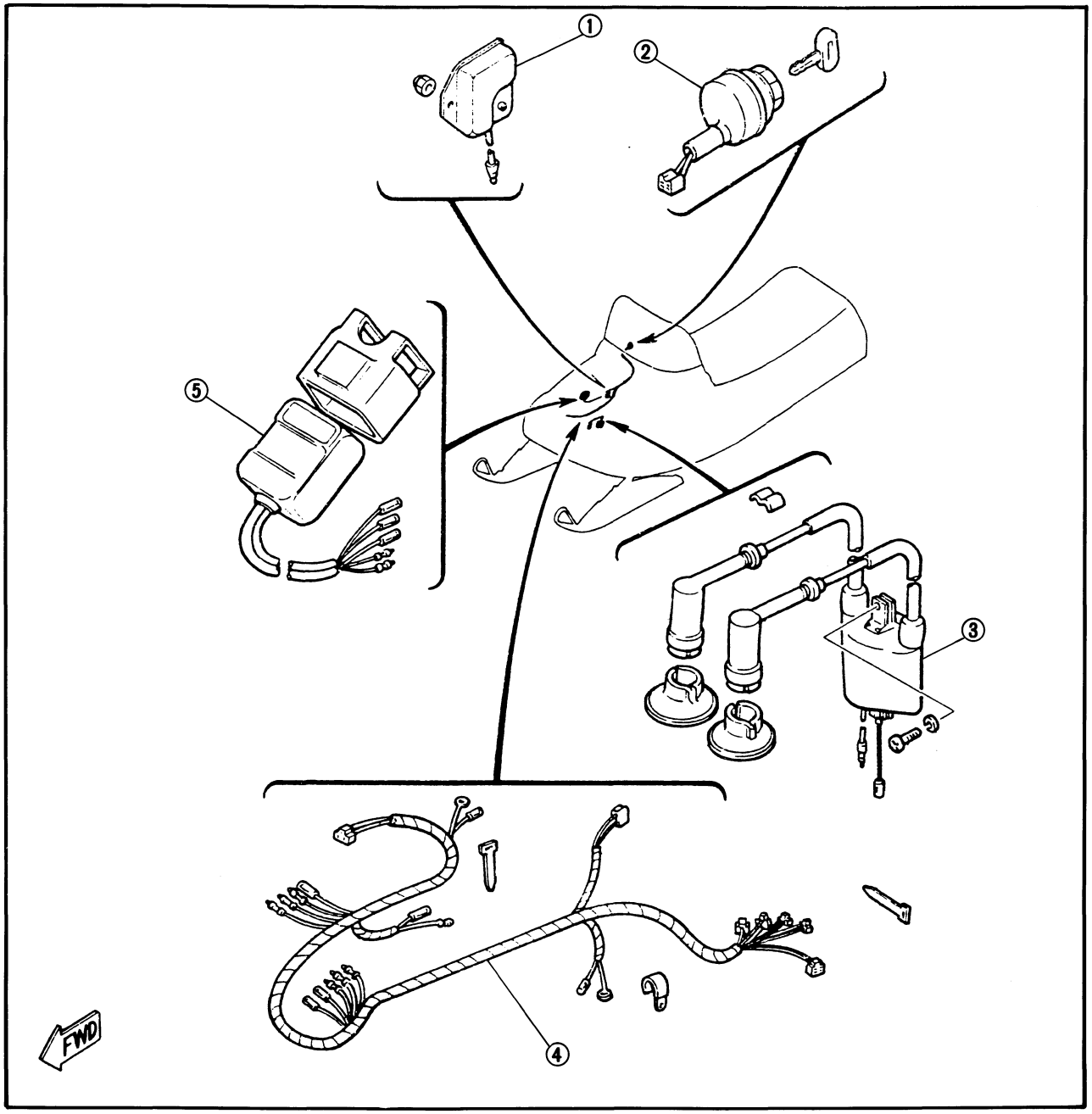
B . . . . . .Black	W/R . . . . .White/Red
G . . . . . .Green	Y/B . . . . .Yellow/Black
Y . . . . . .Yellow	B/W . . . . .Black/White
O . . . . . .Orange	B/Y . . . . .Black/Yellow
L . . . . . .Blue	G/Y . . . . .Green/Yellow
Br. . . . . .Brown	B/Y . . . . .Black/Yellow



ELECTRICAL COMPONENTS (1)

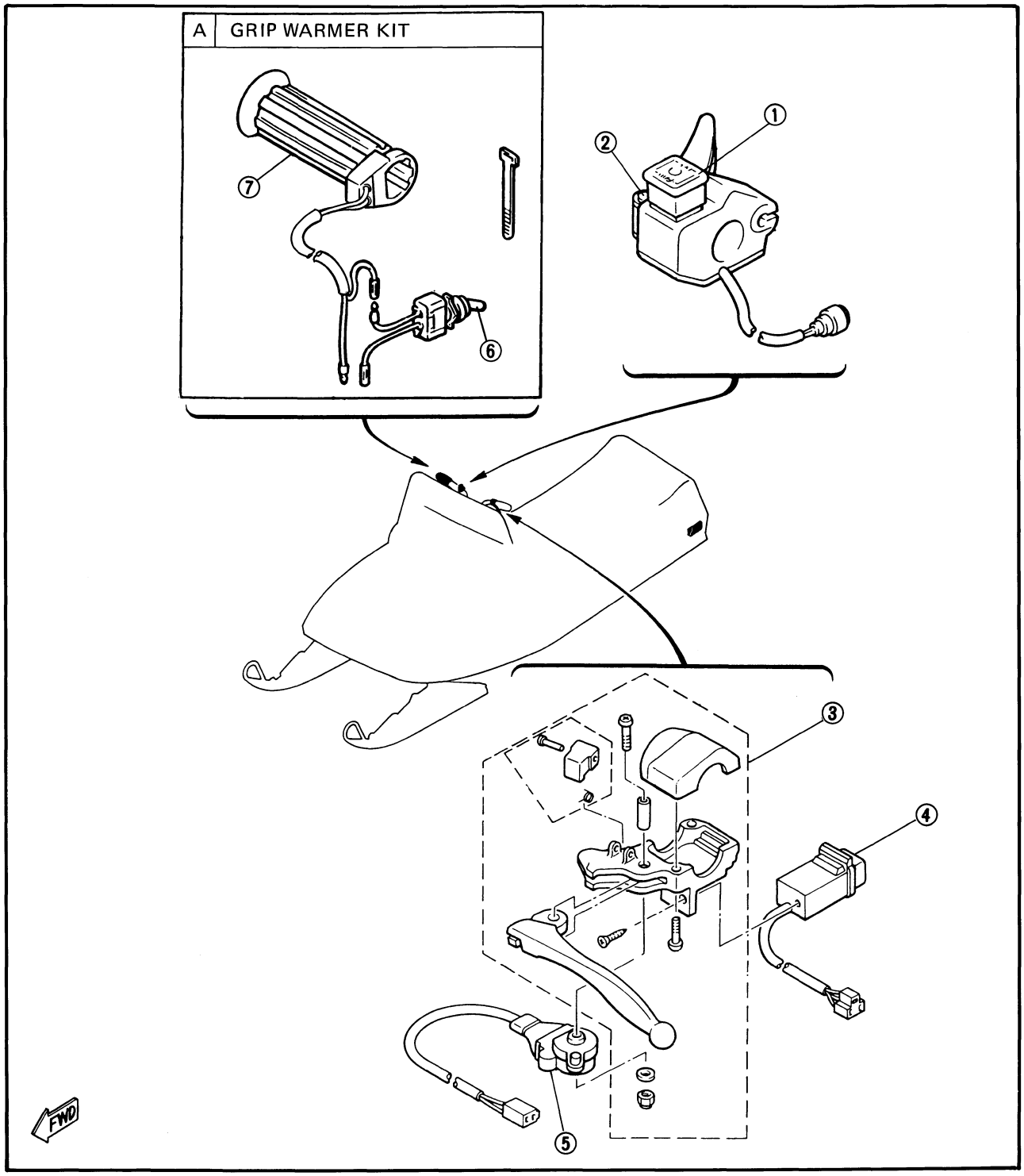
① Voltage regulator
② Main switch
③ Ignition coil
④ Wireharness
⑤ CDI unit

SPECIFICATIONS	RESISTANCE
IGNITION COIL:	
PRIMARY:	
(TOYO DENSO)	0.12Ω ± 10%
(HITACHI)	0.15Ω ± 10%
SECONDARY:	
(TOYO DENSO)	4.0 kΩ ± 20%
(HITACHI)	3.5 kΩ ± 20%
PICK-UP COIL	17Ω ± 10% (W/R – B)
SOURCE COIL	1,290Ω ± 10% (Br – B)
LIGHTING COIL	0.19Ω ± 10% (Y – B)
GRIP WARMER COIL	0.66Ω ± 10% (Y/B – B)



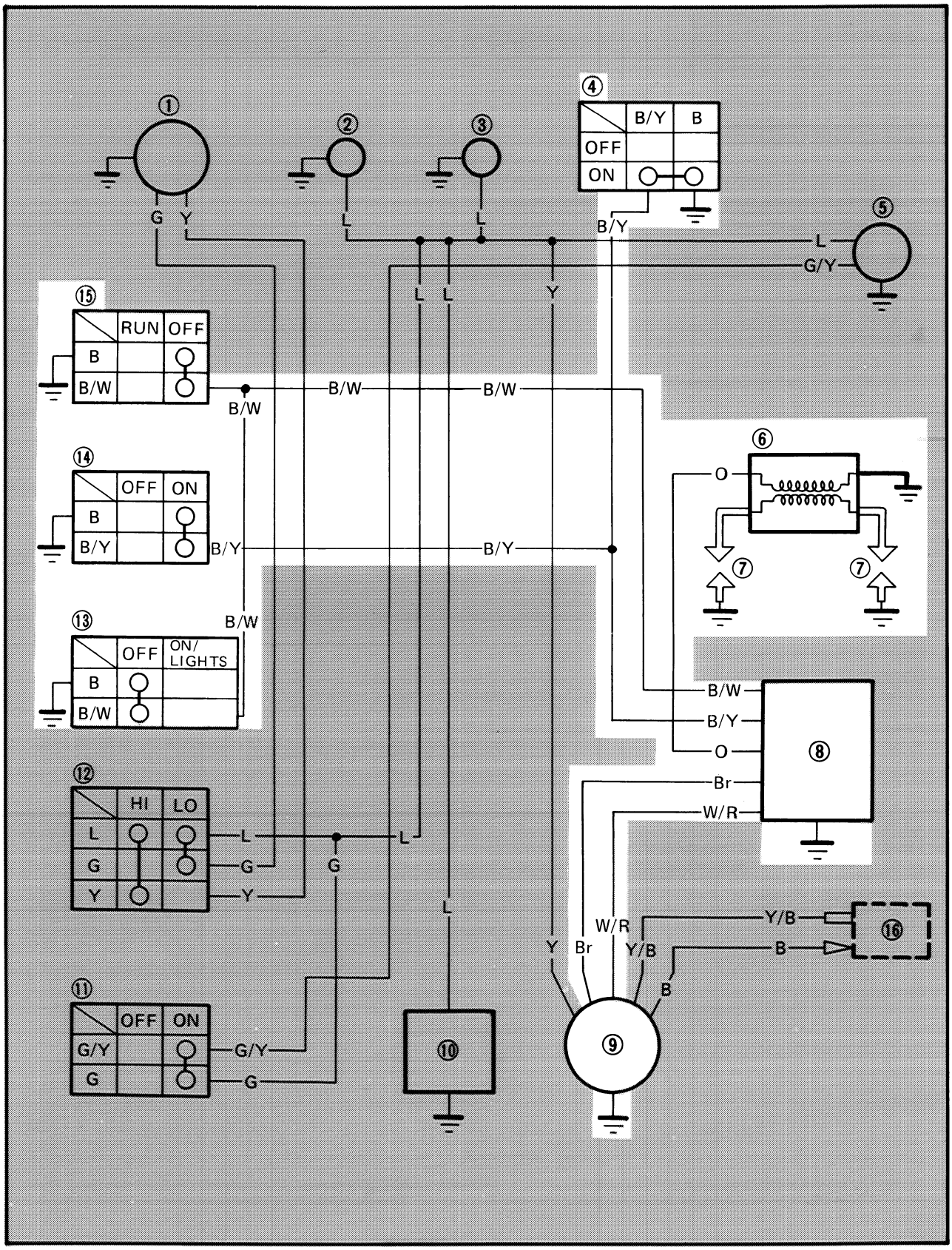
ELECTRICAL COMPONENTS (2)

① Engine stop switch
② Throttle switch
③ Handlebar switch (Left)
④ Headlight beam switch
⑤ Brake light switch
⑥ Grip warmer switch (Option)
⑦ Grip warmer (Option)



IGNITION SYSTEM

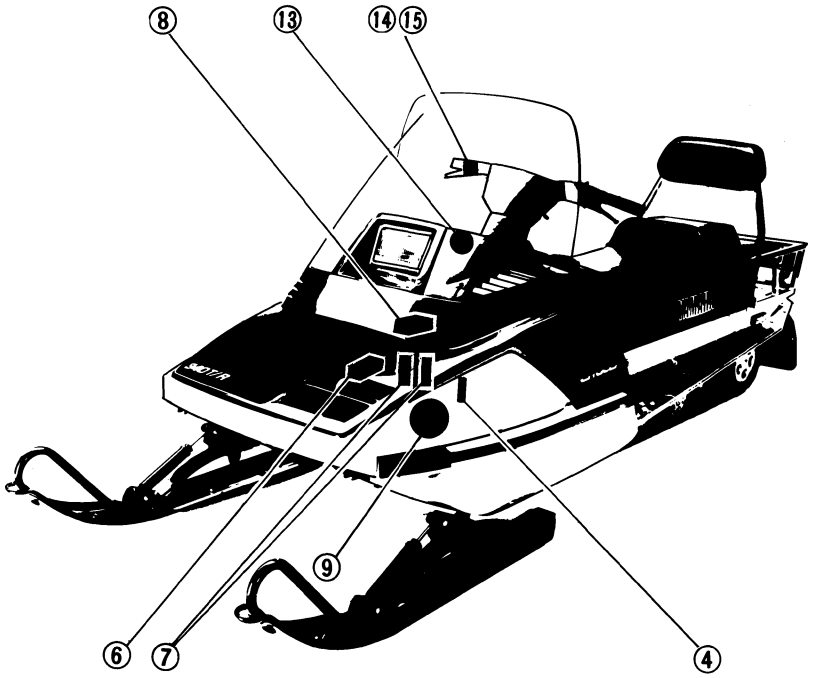
CIRCUIT DIAGRAM



④ Carburetor switch
⑥ Ignition coil
⑦ Spark plug
⑧ CDI unit
⑨ CDI magneto
⑬ Main switch
⑭ Throttle switch
⑮ Engine stop switch

COLOR CODE

B . . . . . .Black	W/R . . . . .White/Red
G . . . . . .Green	Y/B . . . . .Yellow/Black
Y . . . . . .Yellow	B/W . . . . .Black/White
O . . . . . .Orange	B/Y . . . . .Black/Yellow
L . . . . . .Blue	G/Y . . . . .Green/Yellow
Br. . . . . .Brown	B/Y . . . . .Black/Yellow



TROUBLESHOOTING

NO SPARK OR INTERMITTENT SPARK.

↓

Check entire ignition system for connections.
(Refer to "CIRCUIT DIAGRAM", page 7-5.)

Faulty → Correct.

↓ OK

Check condition of each switch for ignition system.
(Refer to "SWITCHES TEST", page 7-19.)

Fautly → Replace switch(es).

↓ OK

Check spark gap condition.
(Refer to "IGNITION SPARK GAP TEST", page 7-9.)

Faulty →
- Replace spark plug and/or spark plug cap.
- Clean spark plug.

↓ OK

Check ignition coil resistance (primary and secondary).
(Refer to "IGNITION COIL RESISTANCE TEST", page 7-9.)

If other than specified → Replace ignition coil.

Primary Coil Resistance:
[TOYO DENSO]
0.12Ω ± 10% at 20°C (68°F)
[HITACHI]
0.15Ω ± 10% at 20°C (68°F)

Secondary Coil Resistance:
[TOYO DENSO]
4.0 kΩ ± 20% at 20°C (68°F)
[HITACHI]
3.5 kΩ ± 20% at 20°C (68°F)

↓ OK

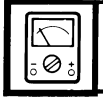
Check pick-up coil resistance of CDI magneto.
(Refer to "PICK-UP COIL RESISTANCE TEST", page 7-10.)

Pick-up Coil Resistance:
17Ω ± 10% at 20°C (68°F)

If other than specified → Replace pick-up coil.

OK ↓

Check source coil resistance of CDI magneto.
(Refer to "SOURCE COIL RESISTANCE TEST", page 7-11.)



Source Coil Resistance:
1,290Ω ± 10% at 20°C (68°F)

If other than specified → Replace source coil.

OK ↓

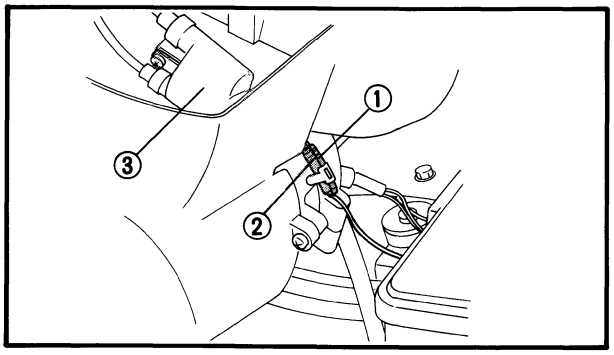
CDI unit is faulty, replace it.

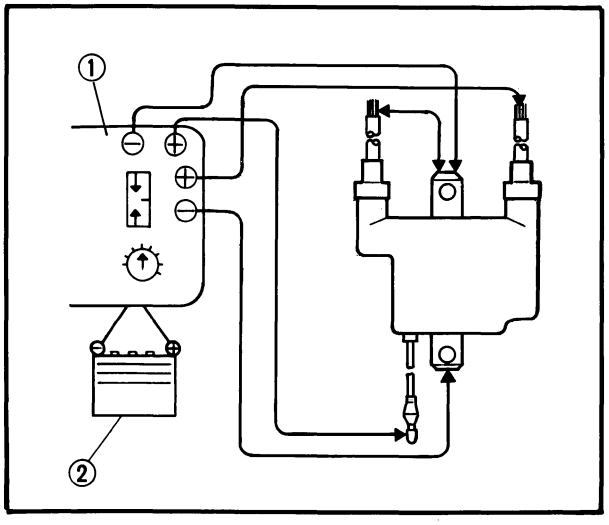
SPARK PLUG INSPECTION

Refer to "CHAPTER 2. SPARK PLUG INSPECTION", page 2-30.

IGNITION TIMING CHECK

Refer to "CHAPTER 2. IGNITION TIMING", page 2-11.





IGNITION SPARK GAP TEST

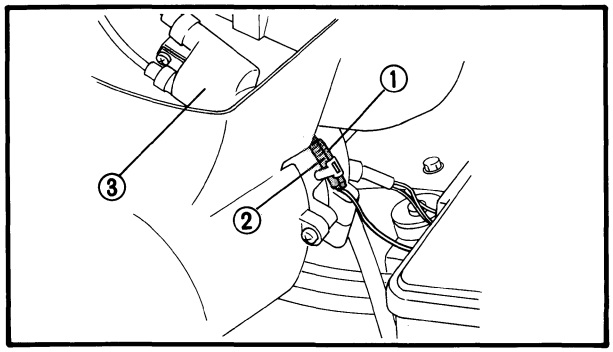
1. Open the shroud
2. Disconnect:
   - Ignition coil lead (Orange) ①
   - Ignition coil lead (Black) ②
   - Spark plug lead
3. Remove:
   - Ignition coil ③
4. Connect:
   - Coil Tester (YU-33261) ①

NOTE:

Be sure to use a fully charged (12V) battery ② .

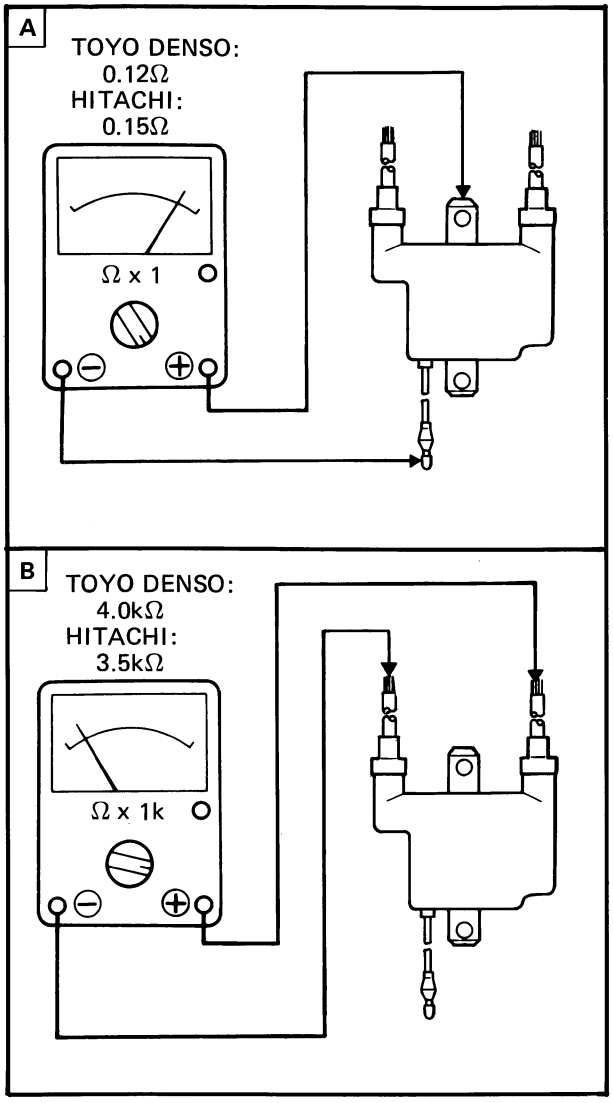
5. Turn the spark plug gap adjuster, and increase the gap to the maximum limit unless misfire occurs first.

Minimum Spark Gap:
11 mm (0.43 in)



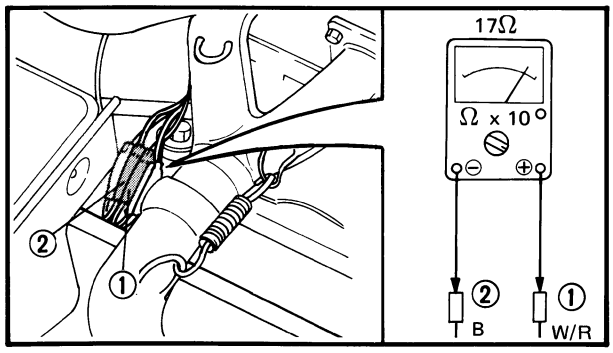
IGNITION COIL RESISTANCE TEST

1. Open the shroud
2. Disconnect:
   - Ignition coil lead (Orange) ①
   - Ignition coil lead (Black) ②
   - Spark plug lead
3. Remove:
   - Ignition coil ③



4. Connect:
   - Pocket Tester (YU-03112)
     Set the tester selector to "Ohm x 1" (For primary winding resistance [A] check) or "Ohm x 1K" (For secondary winding resistance [B] check) position.
5. Measure:
   - Primary coil resistance [A]
   - Secondary coil resistance [B]
     Out of specification → Replace.

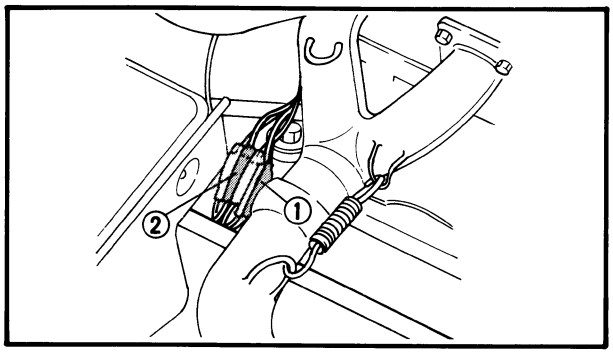
Primary Coil Resistance [A] :
[TOYO DENSO]
0.12Ω ± 10% at 20°C (68°F)
[HITACHI]
0.15Ω ± 10% at 20°C (68°F)
Secondary Coil Resistance [B] :
[TOYO DENSO]
4.0 kΩ ± 20% at 20°C (68°F)
[HITACHI]
3.5 kΩ ± 20% at 20°C (68°F)



PICK-UP COIL RESISTANCE TEST

1. Open the shroud
2. Disconnect:
   - White/Red lead coupler ①
   - Black lead coupler ②
     From CDI magneto.
3. Connect:
   - Pocket Tester (YU-03112)
     Set the tester selector to "Ohm x 10" position.
     To the White/Red ① and Black ② lead couplers.
4. Measure:
   - Pick-up coil resistance
     Out of specification → Replace.

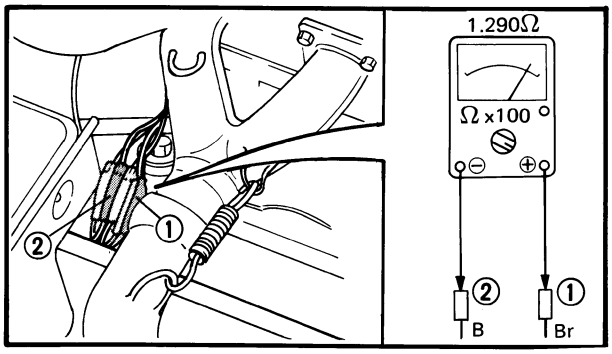
Pick-up Coil Resistance:
17Ω ± 10% at 20°C (68°F)



SOURCE COIL RESISTANCE TESTS

1. Open the shroud
2. Disconnect:
   - Brown lead coupler ①
   - Black lead coupler ②

   From CDI magneto



Source Coil Resistance Test

1. Connect:
   - Pocket Tester (YU-03112)

   Set the tester selector to "Ohm x 100" position.

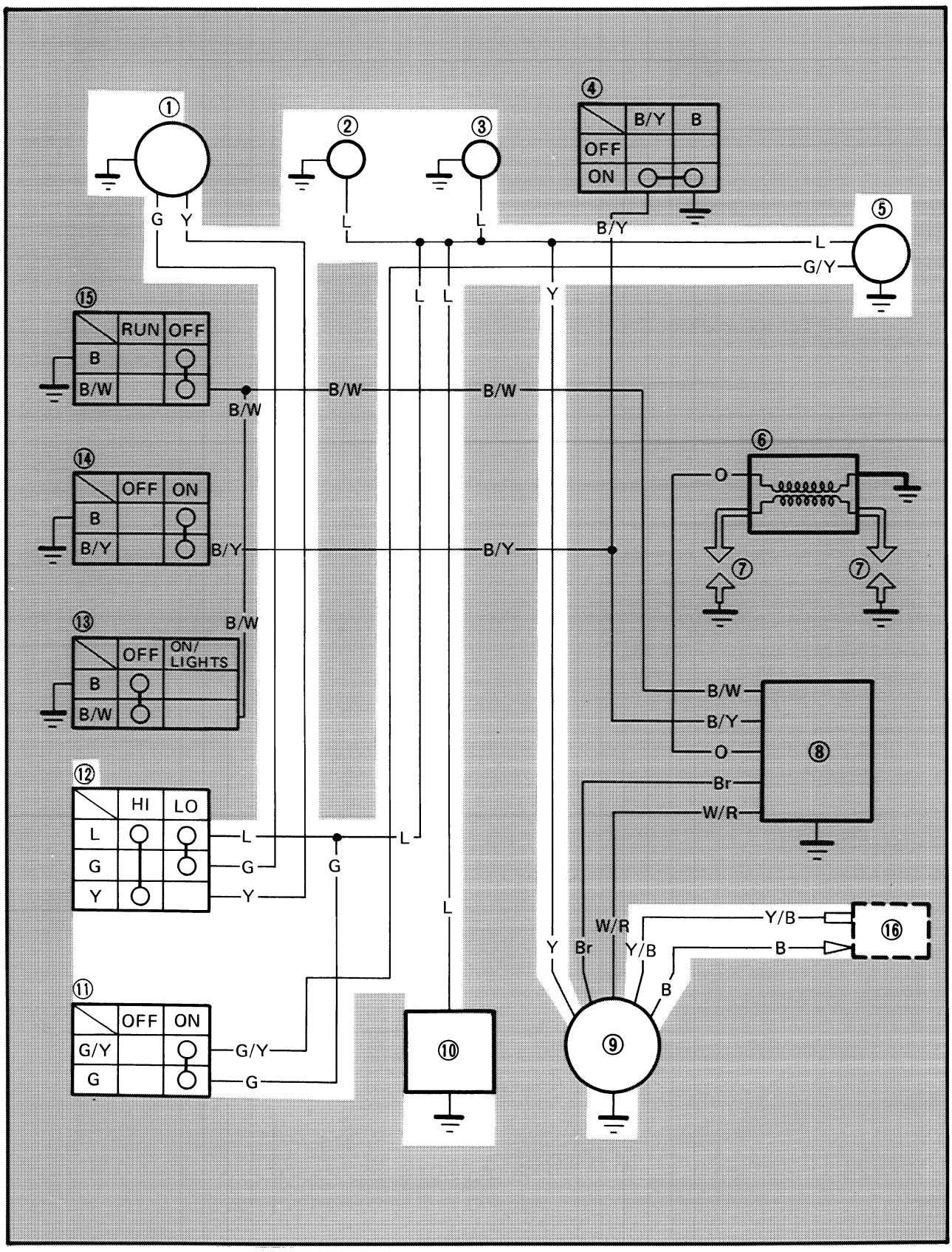
   To the Brown ① and Black ② lead couplers.
2. Measure:
   - Source coil resistance

   Out of specification → Replace.

Source Coil Resistance:
1,290Ω ± 10% at 20°C (68°F)

LIGHTING SYSTEM

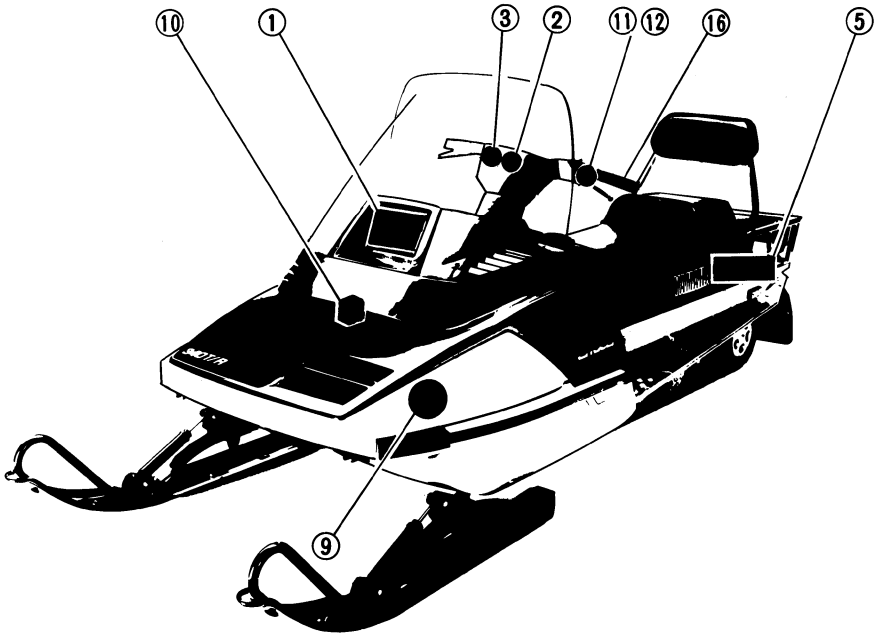
CIRCUIT DIAGRAM



① Headlight
② Speedometer light
③ Tachometer light
⑤ Tail/Brake light
⑨ CDI magneto
⑩ Voltage regulator
⑪ Brake light switch
⑫ Headlight beam switch
⑯ Grip warmer (Opt)

COLOR CODE

B . . . . . .Black	W/R . . . . .White/Red
G . . . . . .Green	Y/B . . . . .Yellow/Black
Y . . . . . .Yellow	B/W . . . . .Black/White
O . . . . . .Orange	B/Y . . . . .Black/Yellow
L . . . . . .Blue	G/Y . . . . .Green/Yellow
Br. . . . . .Brown	B/Y . . . . .Black/Yellow



TROUBLESHOOTING

Headlight

LIGHTS DO NOT COME ON.

↓

Check bulb conditions of headlight, meter lights and tail/brake light.
→ Faulty → Replace.

↓ OK

Check entire lighting system for connections.
(Refer to "CIRCUIT DIAGRAM", page 7-13.)
→ Faulty → Correct.

↓ OK

Check condition of each switch for lighting system.
(Refer to "SWITCHES TEST", page 7-19.)
→ Faulty → Replace.

↓ OK

Check voltage of lighting circuit.
(Refer to "LIGHTING OUTPUT TEST", page 7-17.)
→ OK → Lighting system is good.

Lighting Voltage:
11.8V at 3,000 r/min
at 80°C (176°F)

↓ If other than specified

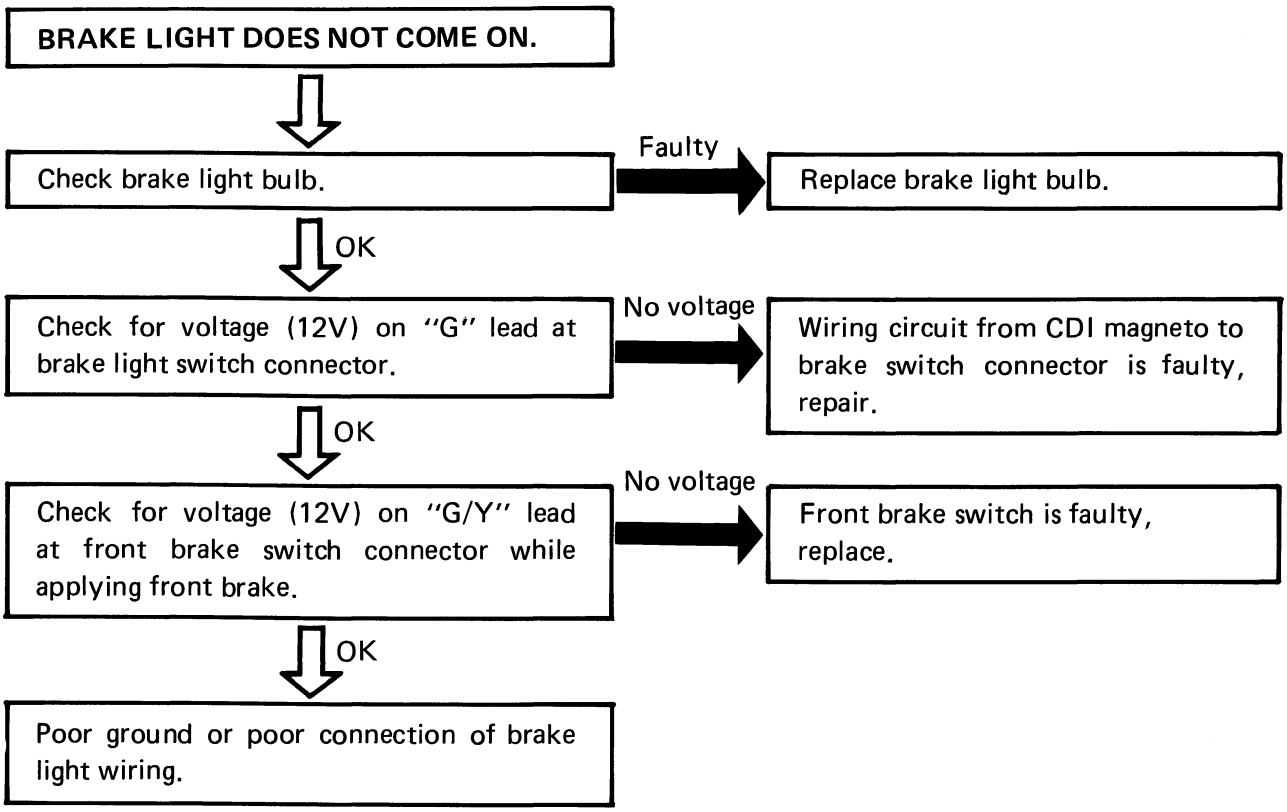
Check lighting coil resistance.
(Refer to "LIGHTING COIL RESISTANCE TEST", page 7-17.)
→ If other than specified → Replace lighting coil.

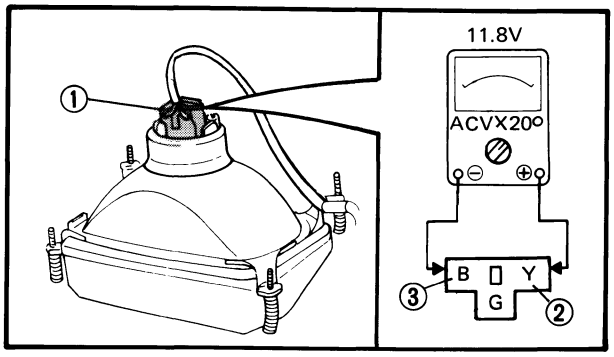
Lighting Coil Resistance:
0.19Ω ± 10% at 20°C (68°F)

↓ OK

Voltage regulator is faulty, replace it.

Brake Light


BRAKE LIGHT DOES NOT COME ON.
Check brake light bulb.
Faulty
Replace brake light bulb.
OK
Check for voltage (12V) on "G" lead at brake light switch connector.
No voltage
Wiring circuit from CDI magneto to brake switch connector is faulty, repair.
OK
Check for voltage (12V) on "G/Y" lead at front brake switch connector while applying front brake.
No voltage
Front brake switch is faulty, replace.
OK
Poor ground or poor connection of brake light wiring.



LIGHTING OUTPUT TEST

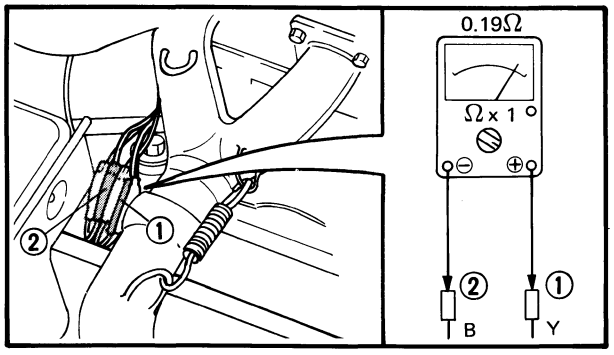
1. Open the shroud
2. Disconnect:
   - Headlight connector ①
3. Connect:
   - Pocket Tester (YU-03112)
     Set the tester selection to "ACV x 20" position.
     To the Yellow ② and Black ③ lead.
4. Start the engine, and warm it up for a few minutes.

WARNING:

- **Always set parking brake before attempting to start the engine.**
- **Never run the snowmobile with the parking brake applied. This may overheat the brake disc.**

5. Accelerate the engine to specification, and check the lighting output voltage.
6. Measure:
   - Lighting voltage
     Out of specification → Perform the "LIGHTING COIL RESISTANCE TEST".

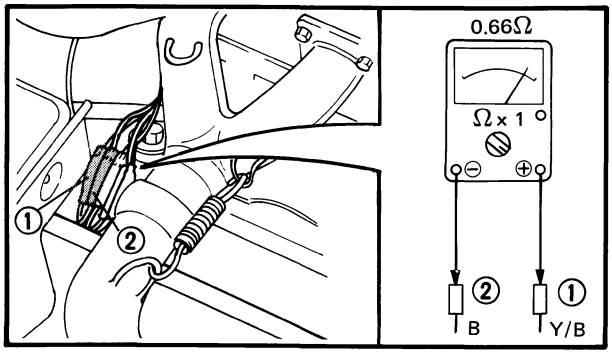
Lighting Voltage:
11.8V at 3,000 r/min
at 80°C (176°F)



LIGHTING COIL RESISTANCE TEST

1. Open the shroud
2. Disconnect:
   - Yellow lead coupler ①
   - Black lead coupler ②
     From CDI magneto
3. Connect:
   - Pocket Tester (YU-03112)
     Set the tester selector to "Ohm x 1" position.
     To the Yellow ① and Black ② leads.
4. Measure:
   - Lighting coil resistance
     Out of specification → Replace.

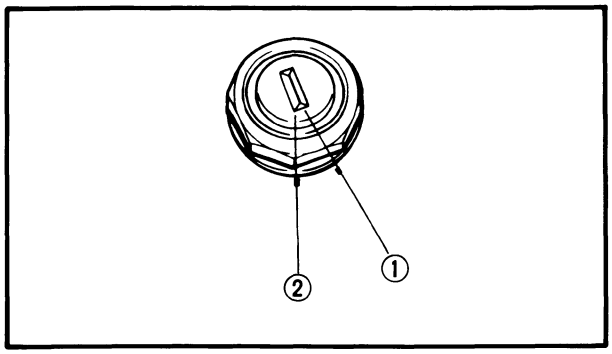
Lighting Coil Resistance:
0.19Ω ± 10% at 20°C (68°F)



GRIP WARMER COIL RESISTANCE TEST

1. Connect:
   - Pocket Tester (YU-03112)
     Set the tester selector to "Ohm x 1" position.
     To the Yellow/Black ① and Black ② lead couplers.
2. Measure:
   - Grip warmer coil resistance
     Out of specification → Replace.

Grip Warmer Coil Resistance:
0.66Ω ± 10% at 20°C (68°F)

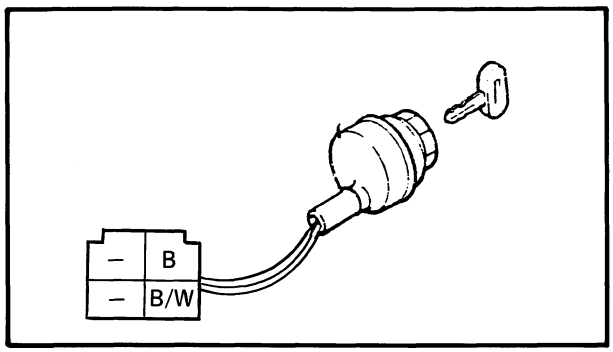


SWITCHES TEST

Switches may be checked for continuity with a Pocket Tester (YU-03112) on the "Ohm x 1" position.

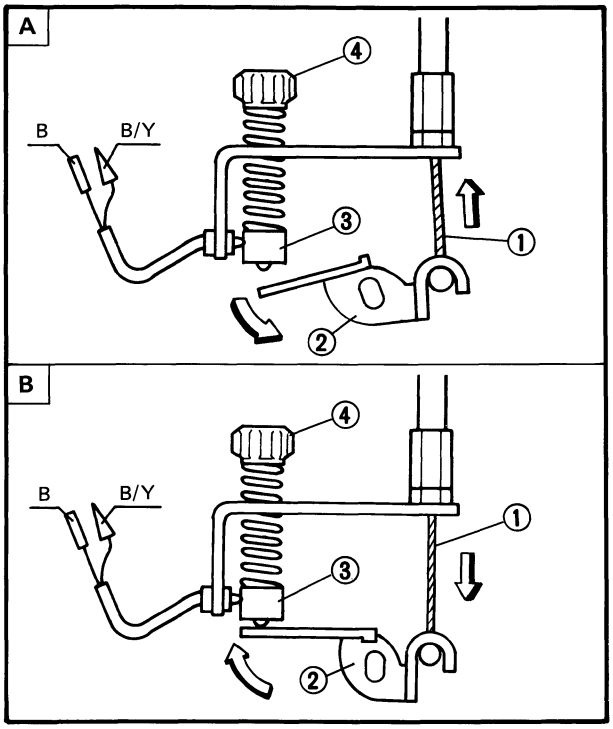
MAIN SWITCH

① "OFF" position
② "ON/LIGHT" position



Main switch position	Lead color	
	B	B/W
OFF	○———	———○
ON/LIGHT		

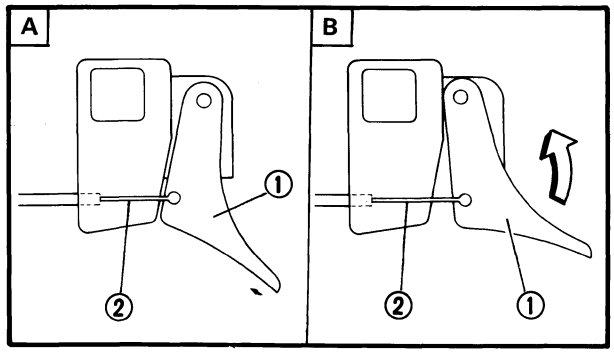
CARBURETOR SWITCH



Carburetor switch position	Lead color	
	B	B/Y
Free (OFF) A		
Depress (ON) B	○———	———○

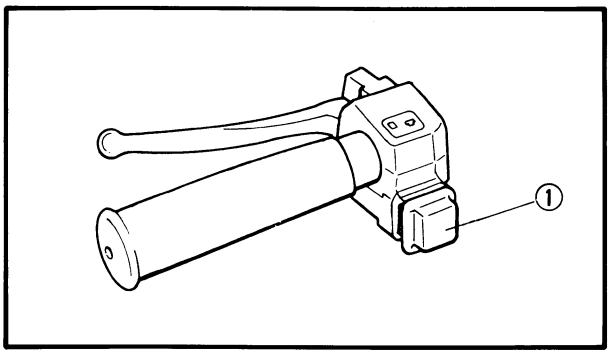
① Throttle cable
② Throttle lever (Carburetor side)
③ Carburetor switch
④ Idle adjusting screw

THROTTLE SWITCH



Throttle switch position	Lead color	
	B	B/Y
Free (OFF) A		
Pull (ON) B	○———	———○

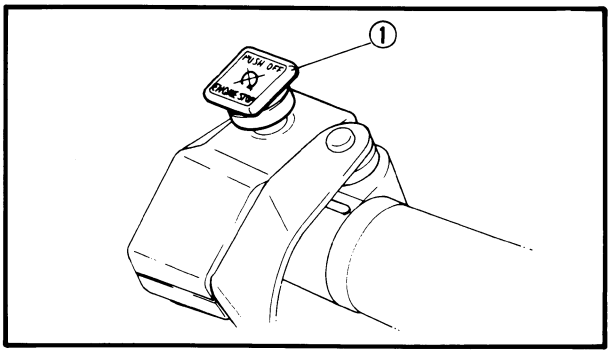
① Throttle lever
② Throttle cable



HEADLIGHT BEAM SWITCH

Beam switch position	Lead color		
	L	G	Y
Lo	○	○	
Hi	○		○

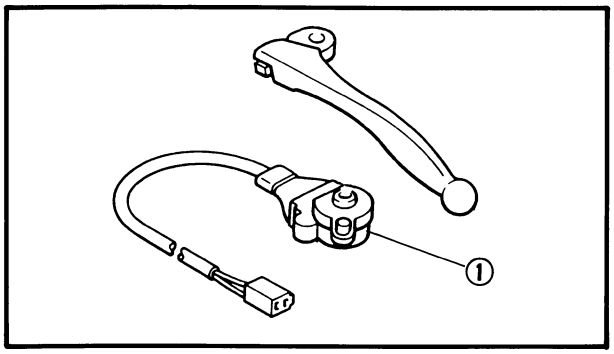
① Headlight beam switch



ENGINE STOP SWITCH

Engine stop switch position	Lead color	
	B	B/W
RUN (Free)		
OFF (Push)	○	○

① Engine stop switch



BRAKE LIGHT SWITCH

Brake lever position	Lead color	
	G	G/Y
Free (OFF)		
Pull (ON)	○	○

① Brake light switch

CHAPTER 8.
APPENDICES

SPECIFICATION 8-1
GENERAL SPECIFICATION 8-1
MAINTENANCE SPECIFICATION 8-2
TIGHTENING TORQUE 8-11

GENERAL TORQUE SPECIFICATIONS 8-12

CONVERSION TABLES 8-12

CABLE ROUTING 8-13

ET340TRM WIRING DIAGRAM

APPENDICES

SPECIFICATION

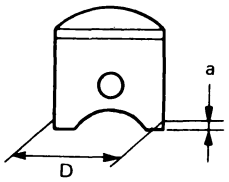
GENERAL SPECIFICATIONS

Model	ET340TRM
Model Code Number:	84G
Frame Starting Number:	84G-000101
Engine Starting Number:	84G-000101
Dimensions:	
Overall Length	2,930 mm (115.4 in)
Overall Width	990 mm (39.0 in)
Overall Height	1,080 mm (42.5 in)
Weight:	
With Oil and Full Fuel Tank	224 kg (494 lb)
Engine:	
Engine Type	Two-stroke, 5-port
Cooling System	Axial fan air cooled
Cylinder Arrangement	Forward-incline, twin cylinder
Displacement	337 cm^3 (20.6 cu.in)
Bore x Stroke	60 x 59.6 mm (2.36 x 2.35 in)
Compression Ratio	6.1 : 1
Starting System	Recoil hand starter
Lubrication System:	YAMAHA Autolube system
Engine Oil:	
Type	YAMALUBE 2-cycle oil
Tank Capacity	2.4 L (2.1 Imp qt, 2.5 US qt)
Transmission Oil:	
Type	Gear oil API "GL-3" (SAE #75 ~ #80)
Capacity	0.3 L (0.26 Imp qt, 0.32 US qt)
Fuel:	
Type	Regular gasoline
Tank Capacity	25 L (5.5 Imp gal, 6.6 US gal)
Carburetor:	
Type	B38-32
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	3.5 : 1 ~ 1 : 1
Clutch Type	Automatic centrifugal engagement
Secondary Reduction System	Chain (RF35V-2)
Secondary Reduction Ratio	14/33 (0.42)
Reverse System	Equipped
Chassis:	
Frame Type	Monocock (Steel & Aluminum)
Caster	25°
Ski Stance	800 mm (31.5 in)

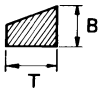
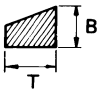
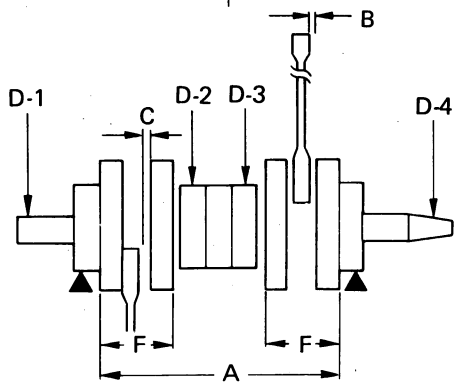
Model	ET340TRM
Suspension:	
Front Suspension Type	Leaf spring, oil damper
Rear Suspension Type	Slide rail
Track:	
Track Type	Internal drive type
Track Width	381 mm (15 in)
Length on Ground	1,330 mm (52.4 in)
Track Deflection at 10 kg (22 lb)	40 ~ 50 mm (1.57 ~ 1.97 in)
Brake:	
Brake Type	Disc brake (Caliper swing type)
Operation	Left hand
Electrical:	
Ignition System	C.D.I.
Generator System	Flywheel magneto
Battery Type	—
Battery Capacity	—
Headlight:	
Type	Bulb
Bulb Wattage x Pcs:	
Headlight	12V, 60W/60W high-Low beam
Tail/Brake Light	12V, 8W/23W
Meter Light	12V, 3.4W x 2

MAINTENANCE SPECIFICATIONS

Engine

Model	ET340TRM
Cylinder Head:	
Volume (with spark plug)	21.3 cm^3 (1.30 cu.in)
Warp Limit	0.03 mm (0.0012 in)
Cylinder.	
Material	Aluminum alloy with special cast iron sleeve
Bore Size	60.0 ~ 60.1 mm (2.362 ~ 2.366 in)
Taper Limit	< 0.05 mm (0.0020 in) >
Out-of-Round Limit	< 0.01 mm (0.0004 in) >
Piston:	
Piston Size (D)/Measuring Point (a)	59.940 ~ 60.000 mm (2.3598 ~ 2.3622 in)/ 10 mm (0.4 in)
	
Clearance between Piston & Cylinder	0.040 ~ 0.045 mm (0.0016 ~ 0.0018 in)
Over Size 1st	60.25 mm (2.372 in)
2nd	60.50 mm (2.382 in)
3rd	—
4th	—
Piston Pin Hole Off-Set	1.0 mm (0.04 in) Ex. side

SPECIFICATION

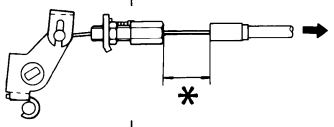
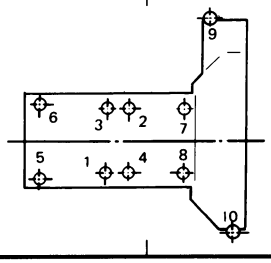
Model			ET340TRM
Piston Pin:			
Outside Diameter x Length			ϕ16 x 47 mm (0.63 x 1.85 in)
Piston Ring:			
Sectional Sketch	Top Ring		Keystone B = 1.2 mm (0.047 in) T = 2.6 mm (0.102 in)
	2nd Ring		Keystone B = 1.2 mm (0.047 in) T = 2.6 mm (0.102 in)
End Gap (Installed)	Top Ring		0.35 ~ 0.55 mm (0.014 ~ 0.022 in)
	2nd Ring		0.35 ~ 0.55 mm (0.014 ~ 0.022 in)
Side Clearance	Top Ring		0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)
	2nd Ring		0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)
Coating	Top Ring		Hard chrome
	2nd Ring		Hard chrome
Crankshaft:			
Crank Width "F"			51.95 ~ 52.00 mm (2.045 ~ 2.047 in)
Assembly Width "A"			159.9 ~ 160.1 mm (6.295 ~ 6.303 in)
Connecting Rod Small End Free Play "B"			2.0 mm (0.08 in)
Connecting Rod Big End Clearance "C"			0.25 ~ 0.75 mm (0.010 ~ 0.030 in)
Crankshaft Deflection "D":			
Measuring Point – 1			0.03 mm (0.0012 in)
– 2			0.04 mm (0.0016 in)
– 3			0.04 mm (0.0016 in)
– 4			0.03 mm (0.0012 in)
			
Big End Bearing:			
Type			Needle bearing
Small End Bearing:			
Type			Needle bearing
Crank Pin:			
Outside Dia. x Length			ϕ22 x 51 mm (0.87 x 2.01 in)
Crank Bearing:			
Type x Quantity:			
Crankshaft Left			#6306 special x 1
Crankshaft Center			#6206 special x 2
Crankshaft Right			#6305 special x 1

Model		ET340TRM
Crank Oil Seal:		
Type/Size x Quantity:		
Crankshaft Left		FPJ-30-72-8-2TS x 1 pc.
Crankshaft Center		Labyrinth sheel x 1 pc.
Crankshaft Right		FPJ-25-48-8TS x 1 pc.
Connecting Rod:		
Parallel Limit		< 0.05 mm (0.0020 in) >
Intake:		
Type		Piston valve
Carburetor:		
Type/Manufacture x Quantity		B38-32/MIKUNI x 1 pc.
I.D. Mark		50E
Main Jet	(M.J.)	#132.5
Main Nozzle	(M.N.)	4A
Pilot Jet	(P.J.)	#95
Pilot Air Jet	(P.A.J.)	ϕ0.7
Air Screw	(A.S.)	1 turn out
Power Jet	(Pw.J.)	–
Power Air Jet	(Pw.A.J.)	–
Starter Jet	(G.S.)	ϕ1.4
Valve Seat Size	(V.S.)	ϕ1.5
Idling Engine Speed		1,600 ± 100 r/min
Float Arm Height	(F.H.)	15 ± 1 mm (0.59 ± 0.04 in)
High Altitude Tuning		

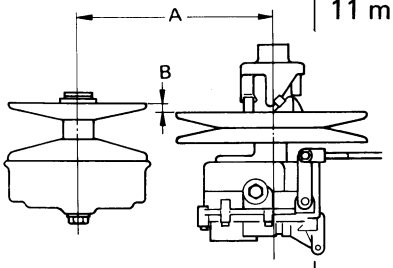
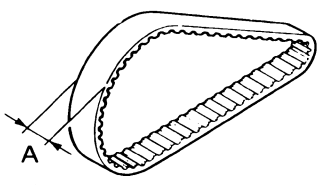
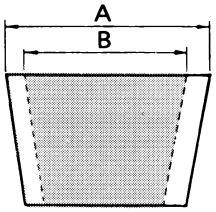
Temperature / Altitude	–30°C (–22°F)	–20°C (–4°F)	–10°C (14°F)	0°C (32°F)	10°C (50°F)	20°C (68°F)
Sea level	#135					
0 ~ 600 m (0 ~ 2,000 ft)	#132.5 (STD)					
600 ~ 1,200 m (2,000 ~ 4,000 ft)						
1,200 ~ 1,800 m (4,000 ~ 6,000 ft)		#128.8				
1,800 ~ 2,400 m (6,000 ~ 8,000 ft)			#125			
2,400 ~ 3,000 m (8,000 ~ 10,000 ft)				#121.3		

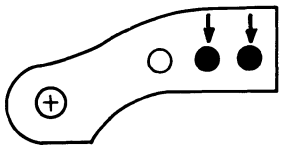
Fuel Pump:	
Type/Manufacturer Quantity	Diaphragm type/KEIHIN/1

SPECIFICATION

Model	ET340TRM
Oil Pump:	
Color Code	White
Plunger Diameter	4.0 mm (0.157 in)
Minimum Stroke	0.20 ~ 0.25 mm (0.0079 ~ 0.0098 in)
Maximum Stroke	1.65 ~ 1.87 mm (0.0650 ~ 0.0736 in)
Reduction Ratio	1/32
Minimum Output (at 200 strokes)	0.50 ~ 0.63 cm^3 (0.0176 ~ 0.0222 Imp oz, 0.0169 ~ 0.0213 US oz)
Maximum Output (at 200 strokes)	4.15 ~ 4.70 cm^3 (0.146 ~ 0.166 Imp oz, 0.140 ~ 0.159 US oz)
Pump Cable Adjustment	 * 24 ~ 26 mm (0.94 ~ 1.02 in)
Cooling System:	
Cooling Fan Belt Tension	—
Crankcase Tightening Sequence:	

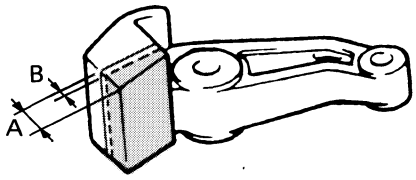
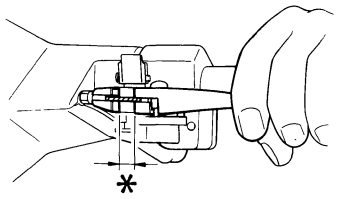
Drive and suspension

Model	ET340TRM
Transmission:	
Type	V-belt Automatic
Range of Ratio	3.5 : 1 ~ 1 : 1
Engagement RPM	Approx. 3,100 r/min
Shift RPM	Approx. 6,500 r/min
Sheave Center Distance "A"	266 mm (10.47 in)
Sheave Offset "B"	11 mm (0.43 in)
	
V-belt:	
Part No.	8F2-17641-01
Outside Circumference	1,099 mm (43.27 in)
Width "A"	31.6 mm (1.24 in)
Wear Limit "B"	< 28.0 mm (1.10 in) >
	 

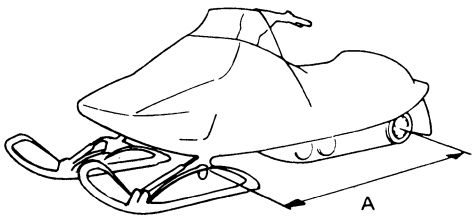
Model	ET340TRM
Primary Sheave Spring:	
Part No.	90501-520A9
Color Code	Gold
Outside Dia. x Wire Dia.	55.0 x 5.2 mm (2.165 x 0.205 in)
Pre-load/Set Length	25 kg/61.5 mm (2.42 in)
Spring Rate	2.1 kg/mm
No. of Coils	4.82
Free Length	73.4 mm (2.89 in)
Primary Sheave Weight Arm:	
Part No.	8G8-17632-00
Weight x Quantity	62.4 g x 3 pcs = 187.2 g
Additional Weight Type	Rivet
Hole Position	
Secondary Sheave Spring:	
Part No.	90508-40666
Color Code	Gold
Outside Dia. x Wire Dia.	50 x 4.0 mm (1.968 x 0.157 in)
Twist Angle	192°
Spring Rate	187 kg·mm/rad (16.2 lb·in/rad.)
No. of Coils	9.8
Free Length	127 mm (5.0 in)
Color Code	—
Torque Cam Angle	55°, 48.5°
Secondary Drive:	
Type	Gear train and Chain drive
Reduction Ratio (Total)	Forward: 0.424 Reverse: 0.318
Reduction Ratio (Gear train)	Forward: (Direct) Reverse: 0.75
Reduction Ratio (Chain drive)	(14/33) 0.424
Gear train:	
Shifting Type	Constant mesh, Forward or Reverse
Shifting Operation	Left hand operation
Chain drive:	
Chain pitch x Number of links	9.825 mm (0.387 in) x 80L
Chain type	35V x 2
Free play	Hand operation
Chain case oil quantity	300 cm^3 (10.6 Imp oz, 10.1 US oz)
Chain case oil grade	Gear oil APL GL-3 (SAE #75 ~ 80)

SPECIFICATION

Model	ET340TRM
Track: Part No. Width x Length Pitch x No. of Links Thickness "A" Height "B"	 381 x 3,427.6 mm (15.0 x 135.0 in) 83.6 mm (3.3 in) x 41 5.5 mm (0.22 in) 16.0 mm (0.63 in)
Deflection at 10 kg (22 lb)	40 ~ 50 mm (1.57 ~ 1.97 in)
Track Suspension: Front Travel Rear Travel	 120 mm (4.7 in) 80 mm (3.15 in)
Front Suspension Spring: Spring Rate Wire Dia.	 305 kg·mm (17.080 lb·in)/deg. 9.5 mm (0.37 in)
Rear Suspension Spring: Spring Rate Wire Dia.	 318 kg·mm (17.810 lb·in)/deg. 10 mm (0.4 in)
Suspension Setting Position: Stopper Band Hole Position	 No. 2
Shock Absorber: Damping Force (Extension) Damping Force (Compression)	 48 kg/0.3 m/s 45 kg/0.3 m/s
Slide Runner: Thickness "A" Wear Limit "B"	 15 mm (0.16 in) < 10 mm (0.4 in) >

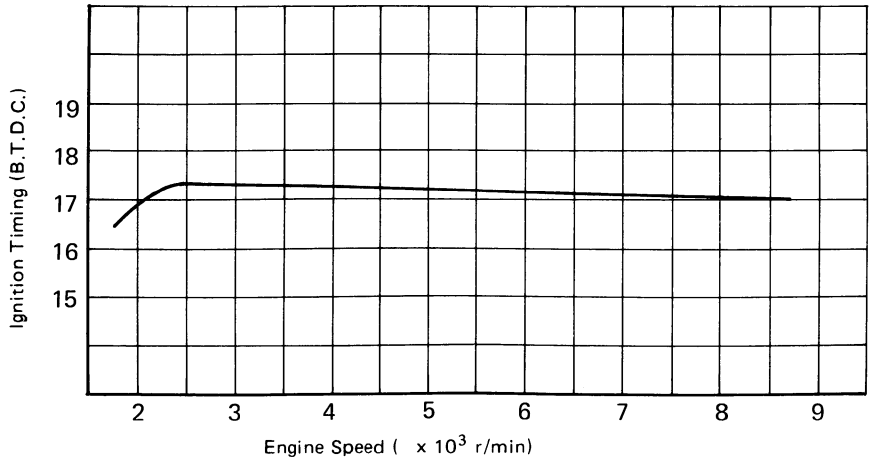
Model	ET340TRM
Track Drive Sprocket Wheel: Material No. on Teeth	 Polyethylene 11
Rear Guide Wheel: Material Outside Dia.	 Alminium + Rubber 178.0 mm (7.01 in)
Brake: Pad Thickness "A" Wear Limit "B" 	 7.3 mm (0.287 in) < 1.0 mm (0.039 in) >
Pad to Disc Clearance Disc Outside Dia. Disc Thickness Brake Lever Free Play* 	0.2 ~ 1.0 mm (0.008 ~ 0.039 in) 179.0 mm (7.05 in) 2.9 mm (0.114 in) 6 ~ 7 mm (0.24 ~ 0.28 in)

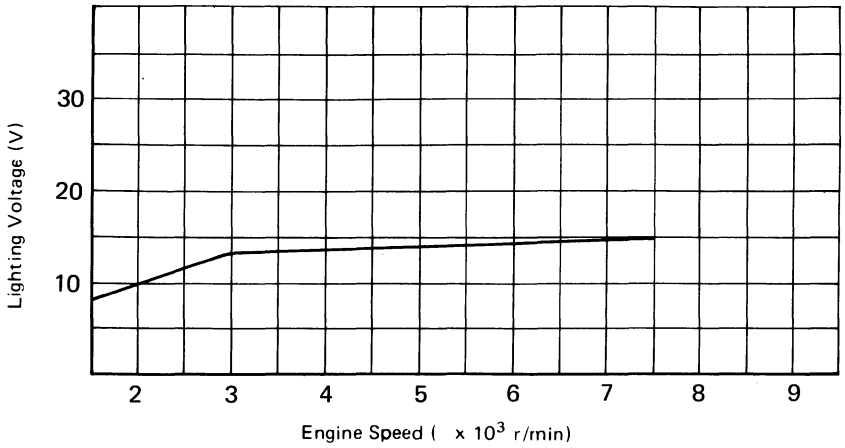
Chassis

Model	ET340TRM
Frame: Frame Material Seat Height Luggage Box Location	 Aluminum + Steel 555 mm (21.85 in) In the engine room & Front of steering shaft
Steering Steering Angle (Right) Steering Angle (Left)	 54.3° 56.3°
Ski Alignment: Ski Toe-out Size Distance "A" 	Toe-out 0 ~ 15 mm (0 ~ 0.59 in) 1,951 mm (76.8 in)

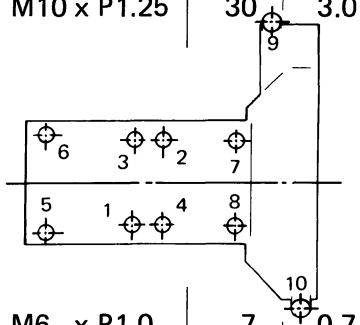
Electrical

Model	ET340TRM
Voltage:	12V
Ignition System:	
Ignition Timing (B.T.D.C.)	1.6 mm (0.063 in)
Advanced Timing (B.T.D.C.)	17° at 7,000 r/min
Advancer Type	Electrical
CDI:	
Model/Manufacturer	F3T352/MITSUBISHI
Pickup Coil Resistance	17Ω ± 10% at 20°C (68°F)
Color Code	(W/R – B)
Charge Coil Resistance	1,290Ω ± 10% at 20°C (68°F)
Color Code	(Br – B)
CDI Unit Model/Manufacturer	8V0/MITSUBISHI
Ignition Coil:	
Model/Manufacturer	CM62-21/HITACHI
Minimum Spark Gap	11 mm (0.43 in) at 3,000 r/min
Primary Winding Resistance	0.15Ω ± 10% at 20°C (68°F)
Secondary Winding Resistance	3.5 kΩ ± 20% at 20°C (68°F)
Ignition Coil:	
Model/Manufacturer	YW51/TOYO DENSO
Minimum Spark Gap	11 mm (0.43 in) at 3,000 r/min
Primary Winding Resistance	0.12Ω ± 10% at 20°C (68°F)
Secondary Winding Resistance	4.0 kΩ ± 20% at 20°C (68°F)
Spark Plug Cap:	
Type	Noise-Suppressor Type
Model/Manufacturer	ASSC21/NIPPONDENSO
Resistance	5.5 kΩ ± 25%
Flywheel Magneto:	
Model/Manufacturer	F3T352/MITSUBISHI
Charging Current-Day (Min.)	–
(Max.)	–
Charging Current-Night (Min.)	–
(Max.)	–



Model	ET340TRM
Lighting Voltage (Min.) (Max.)	11.8V/3,000 r/min –
Lighting Coil Resistance Color Code	0.19Ω ± 10% at 20°C (68°F) (Y – B)
	
Coil Resistance for Grip Warmer Color Code	0.66Ω ± 10% at 20°C (68°F) (Y/B – B)
Voltage Regulator: Type Model/Manufacturer No Load Regulated Voltage	 A.C. Type TR1Z-50/HITACHI, S8516B/TOSHIBA 13.3 ~ 14.3V

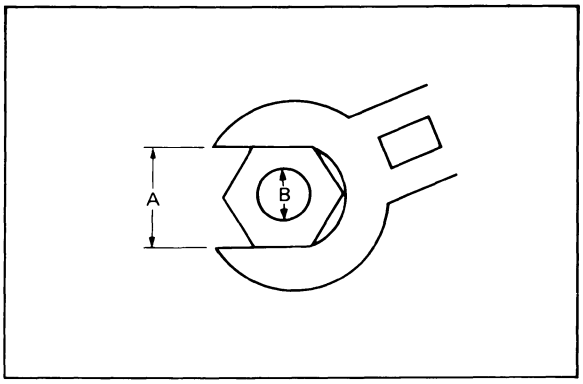
TIGHTENING TORQUE

Part to be tightened	Thread size	Tightening torque			Remarks
		Nm	m·kg	ft·lb	
Engine:					
Spark Plug	M14 x P1.25	28	2.8	20	
Cylinder Head – First	M8 x P1.25	20	2.0	14	
– Final	M8 x P1.25	25	2.5	18	
Flywheel Magneto	M16 x P1.0	73	7.3	53	
Crankcase Upper and Lower – First	M8 x P1.25	10	1.0	7	
– Final	M8 x P1.25	25	2.5	14	
Engine Bracket					
Tightening Sequence – First	M10 x P1.25	20	2.0	14	
– Final	M10 x P1.25	30	3.0	22	
					
Fan	M6 x P1.0	7	0.7	5.1	Use Loctite®
Oil Pump Gear Case	M6 x P1.0	7	0.7	5.1	
Drive and Track Suspension:					
Primary Sliding Sheave and Cap	M6 x P1.0	11	1.1	8	
Installation of Primary Sheave:					
Initial	UNF 1/2"	120	12	85	Use motor oil
Loosen Once and Retighten	UNF 1/2"	60	6.0	43	
Installation of Secondary Sheave	M12 x P1.25	40	4.0	29	
Installation of Drive Chain Sprocket	M12 x P1.25	40	4.0	29	Use cotter pin
Installation of Driven Chain Sprocket	M10 x P1.25	35	3.5	25	
Chain Housing and Frame	M8 x P1.25	22	2.2	16	
Chain Housing Cap	M8 x P1.25	16	1.6	11	
Chain Tensioner Lock Nut	M10 x P1.25	33	3.3	24	
Installation of Front Axle R.H.	M20 x P1.0	80	8.0	58	
Front Axle Housing and Frame	M8 x P1.25	23	2.3	17	
Shaft 1 and Frame	M10 x P1.25	55	5.5	40	
Pivot Arm 1 and Sliding Frame 1	M10 x P1.25	47	4.7	34	Use Loctite®
Suspension Wheel	M8 x P1.25	16	1.6	11	
Spring Hook	M8 x P1.0	23	2.3	17	
Sliding Frame 1	M8 x P1.25	23	2.3	17	
Rear Guide Wheel	M8 x P1.25	23	2.3	17	
Sliding Runner 1	M6 x P1.0	2.5	0.25	2	Use Loctite®
Sliding Runner 2	M6 x P1.0	6.5	0.65	5	
Stopper 1	M6 x P1.0	4	0.4	3	
Chassis:					
Engine Mounting Bolt	M10 x P1.25	30	3.0	22	
Ski Runner	M8 x P1.25	14	1.4	10	
Steering Column and Gate	M8 x P1.25	20	2.0	14	Use lock washer
Steering Relay Rod Adjusting Nut	M10 x P1.25	25	2.5	18	Use Loctite®
Outside Arm and Ski Column	M10 x P1.25	30	3.0	22	Use lock washer
Steering Lower Bracket	M8 x P1.25	20	2.0	15	Use lock washer
Installation of Steering Column 1, 2	M8 x P1.25	15	1.5	11	
Steering Relay Ass'y	M10 x P1.25	30	3.0	22	
Universal Joint and Outside Arm	M10 x P1.25	25	2.5	18	

GENERAL TORQUE SPECIFICATIONS

This chart specifies torque for standard fasteners with standard I.S.O. pitch threads. Torque specifications for special components or assemblies are included in the applicable sections of this book. To avoid warpage, tighten multi-fastener assemblies in a criss-cross fashion, in progressive stages, until full torque is reached. Unless otherwise specified, torque specifications call for clean, dry threads. Components should be at room temperature.

A (Nut)	B (Bolt)	General torque specifications		
		Nm	m·kg	ft·lb
10 mm	6 mm	6	0.6	4.3
12 mm	8 mm	15	1.5	11
14 mm	10 mm	30	3.0	22
17 mm	12 mm	55	5.5	40
19 mm	14 mm	85	8.5	61
22 mm	16 mm	130	13.0	94

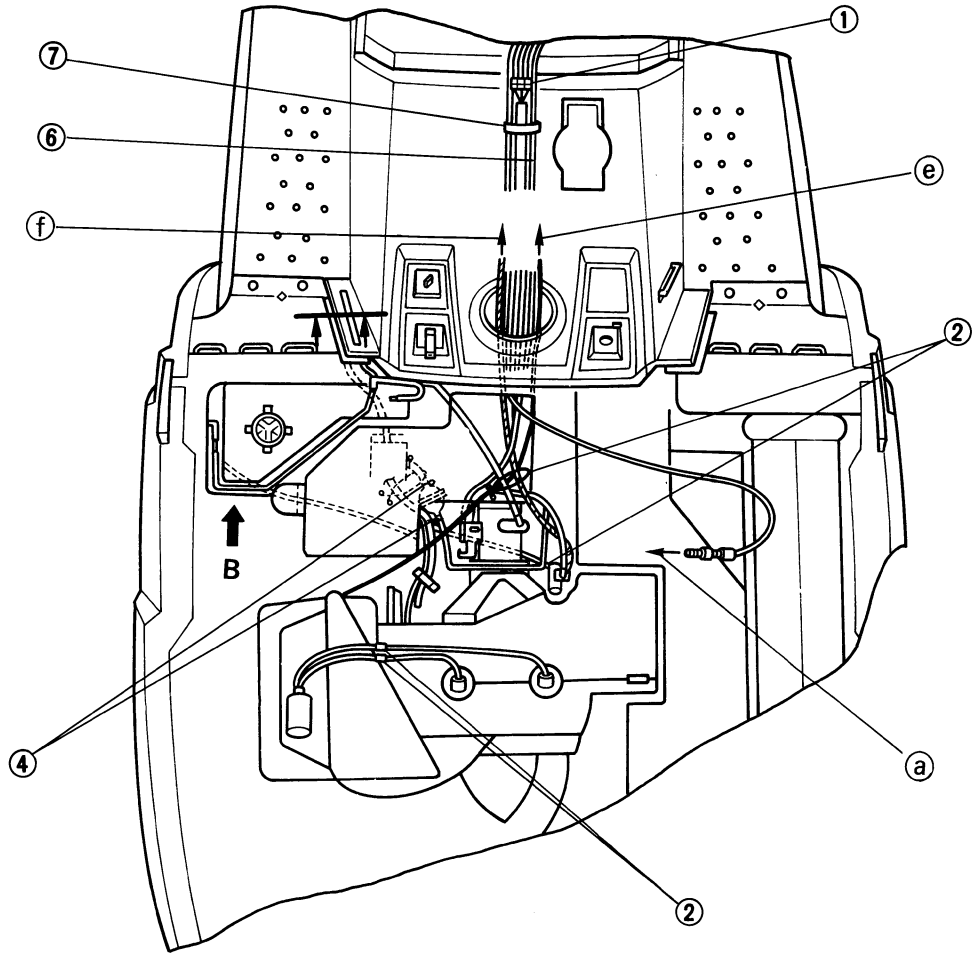


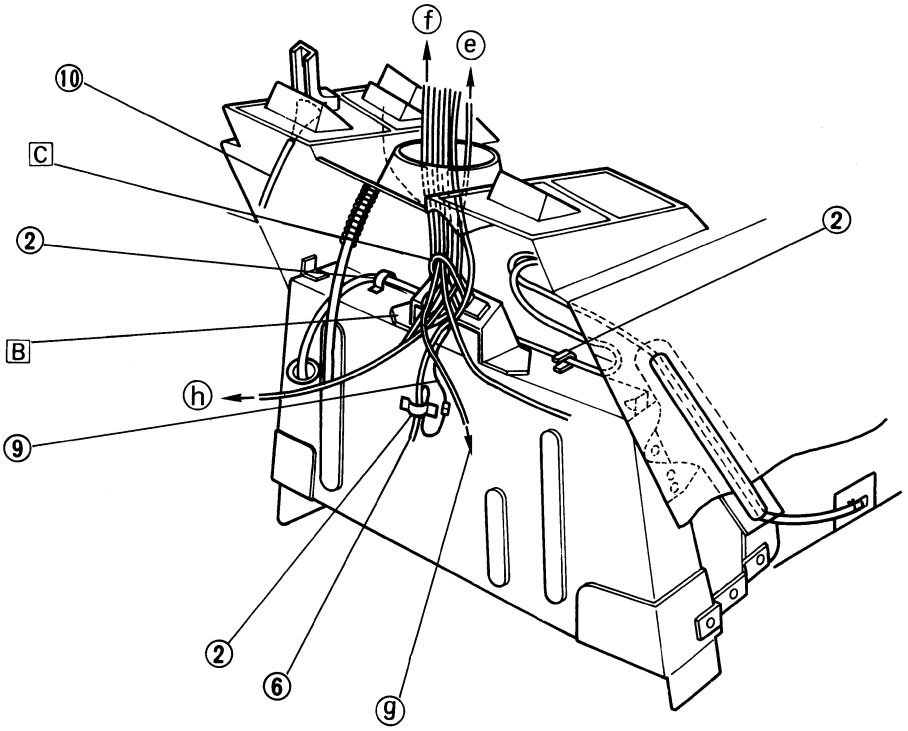
CONVERSION TABLES

METRIC TO INCH SYSTEM		
Known	Multiplier	Result
m·kg	7.233	ft·lb
m·kg	86.80	in·lb
cm·kg	0.0723	ft·lb
cm·kg	0.8680	in·lb
kg	2.205	lb
g	0.03527	oz
km/lit	2.352	mpg
km/hr	0.6214	mph
km	0.6214	mi
m	3.281	ft
m	1.094	yd
cm	0.3937	in
mm	0.03937	in
cc (cm^3)	0.03382	oz (U.S. liq)
cc (cm^3)	0.06102	cu.in
lit (liter)	2.1134	pt (U.S. liq)
lit (liter)	1.057	qt (U.S. liq)
lit (liter)	0.2642	gal (U.S. liq)
kg/mm	56.007	lb/in
kg/cm^2	14.2234	psi (lb/in^2)
Centigrade (°C)	9/5 (°C) + 32	Fahrenheit (°F)

INCH TO METRIC SYSTEM		
Known	Multiplier	Result
ft·lb	0.13826	m·kg
in·lb	0.01152	m·kg
ft·lb	13.831	cm·kg
in·lb	1.1521	cm·kg
lb	0.4535	kg
oz	28.352	g
mpg	0.4252	km/lit
mph	1.609	km/hr
mi	1.609	km
ft	0.3048	m
yd	0.9141	m
in	2.54	cm
in	25.4	mm
oz (U.S. liq)	29.57	cc (cm^3)
cu.in	16.387	cc (cm^3)
pt (U.S. liq)	0.4732	lit (liter)
qt (U.S. liq)	0.9461	lit (liter)
gal (U.S. liq)	3.785	lit (liter)
lb/in	0.017855	kg/mm
psi (lb/in^2)	0.07031	kg/cm^2
Fahrenheit (°F)	5/9 (°F) − 32	Centigrade (°C)

CABLE ROUTING (1)

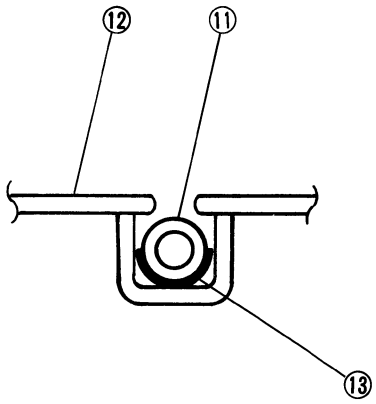




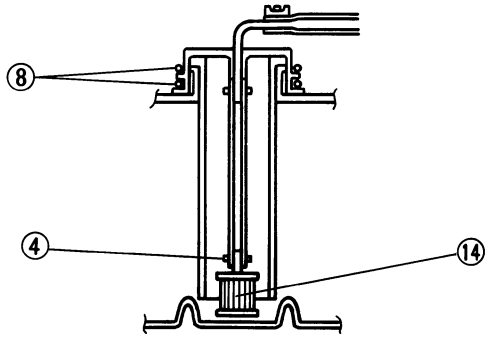
① Coupler
② Clamp
③ Wireharness
④ Clip
⑤ Tachometer
⑥ Wireharness
⑦ Band
⑧ Tension spring
⑨ Main switch lead
⑩ Starter (Choke) cable
⑪ Hose
⑫ Instrument panel
⑬ White tape
⑭ Fuel filter
⑮ Pipe joint

ⓐ To brake caliper
ⓑ To oil level gauge
ⓒ From oil level gauge
ⓓ To oil filter
ⓔ To speedometer
ⓕ To tachometer
ⓖ To engine gear unit
ⓗ To front axle housing
[A] BRAKE LIGHT, BEAM, AND ENGINE STOP SWITCHES
[B] PASS THE MAIN SWITCH, TETHER SWITCH LEADS, AND WIRE-HARNESS THROUGH UNDER THE BRACKET.
[C] PASS THE TACHOMETER, SPEEDOMETER, BRAKE, AND THROTTLE CABLES THROUGH UNDER THE BEARING HOLDER.
[D] Z-Z SECTION.
[E] FUEL FILTER IN FUEL TANK.
[F] B-VIEW.

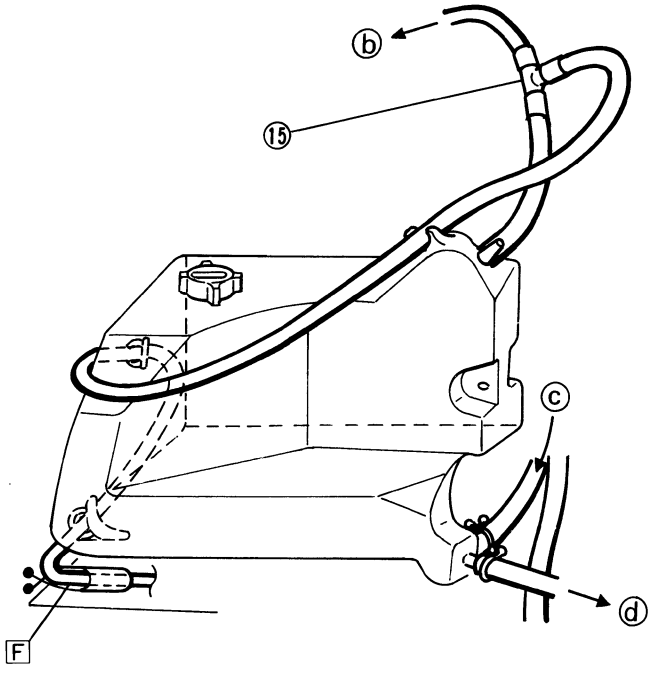
D



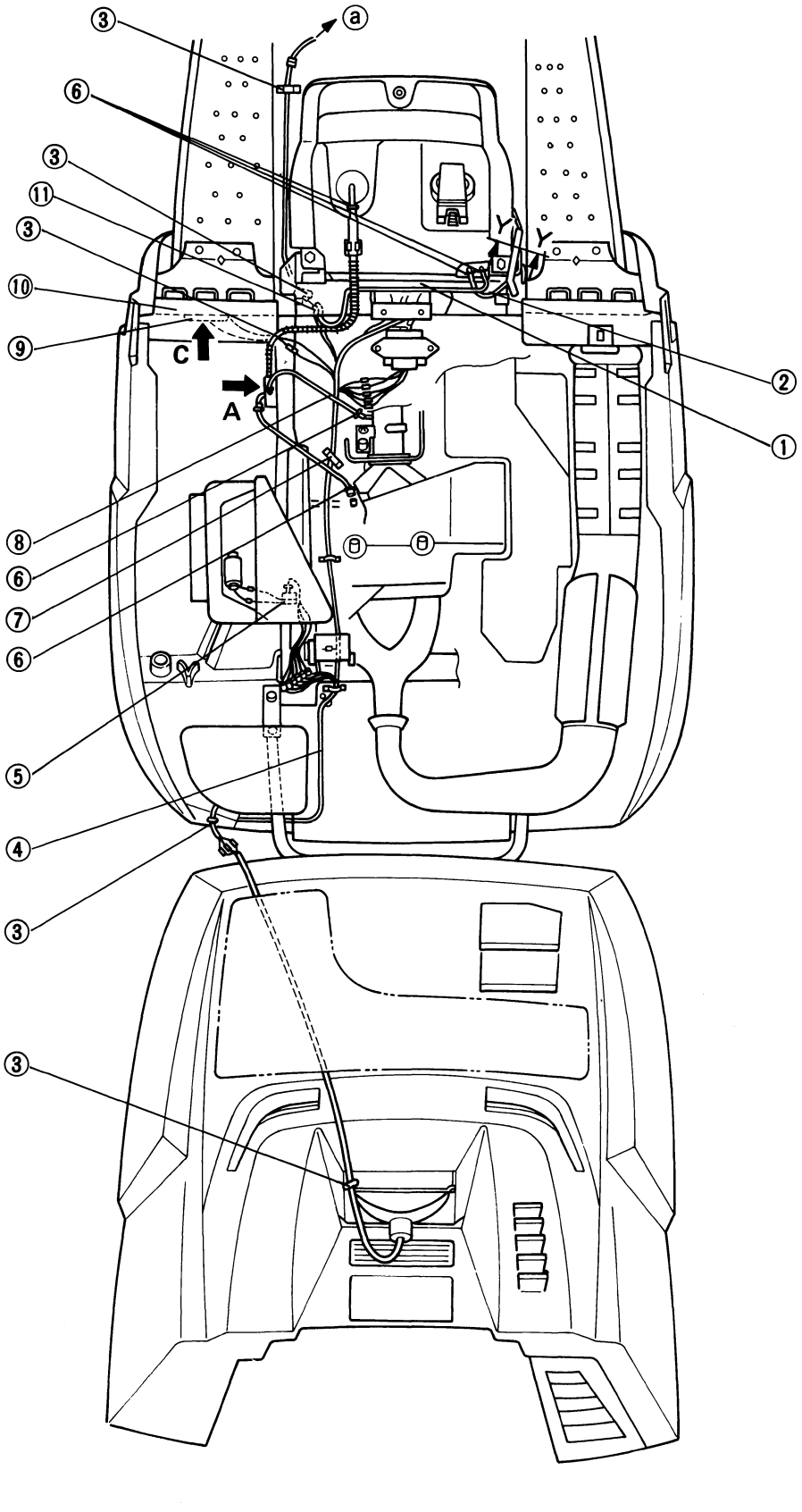
E



F

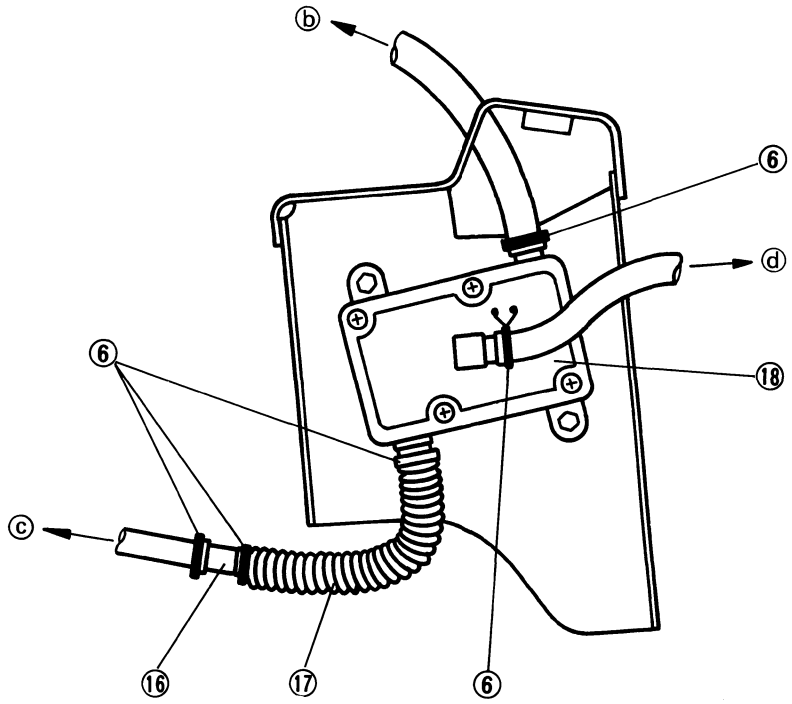


CABLE ROUTING (2)

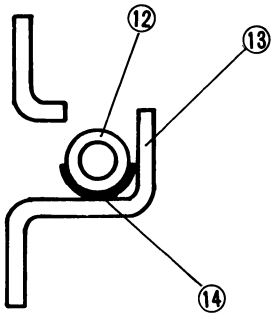


① Fuel hose 1
② Fuel hose 2
③ Clamp
④ Wireharness
⑤ Band
⑥ Clip
⑦ Pulser hose
⑧ Fuel feed hose
⑨ Voltage regulator
⑩ Ground
⑪ Grommet
⑫ Hose
⑬ Fuel gauge
⑭ White tape
⑮ Voltage regulator
⑯ Pipe joint
⑰ Hose protector
⑱ Fuel pump
ⓐ To taillight
ⓑ To carburetor
ⓒ To fuel tank
ⓓ To crankcase pulse pipe
[A] A-VIEW (Fuel pump installation)
[B] Y-Y SECTION
[C] C-VIEW (Voltage regulator installation)

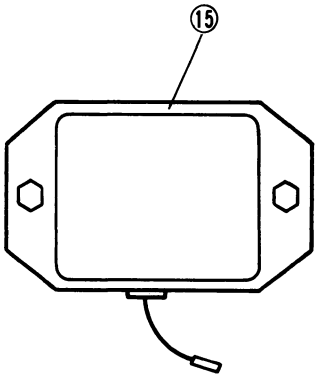
A



B



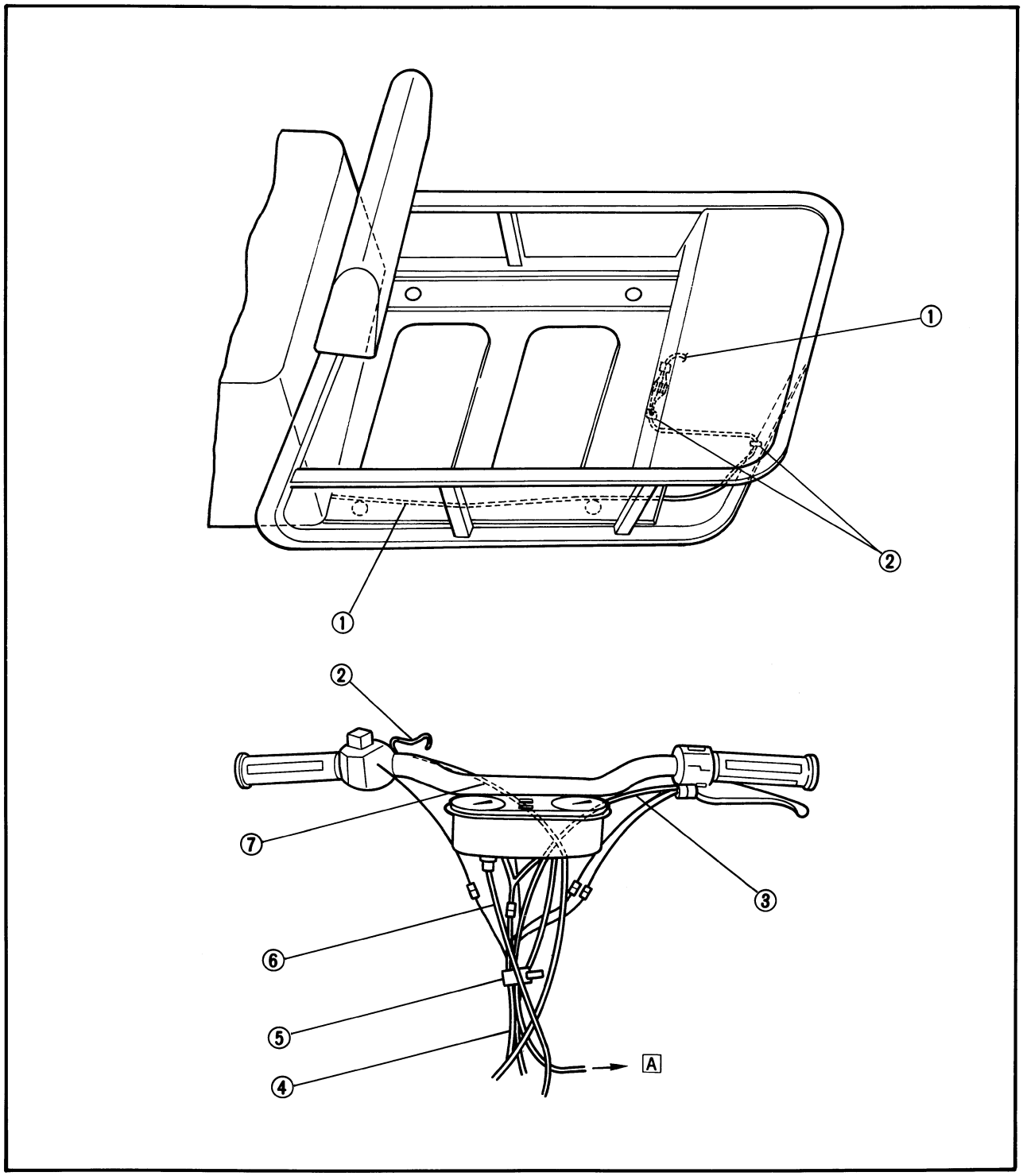
C



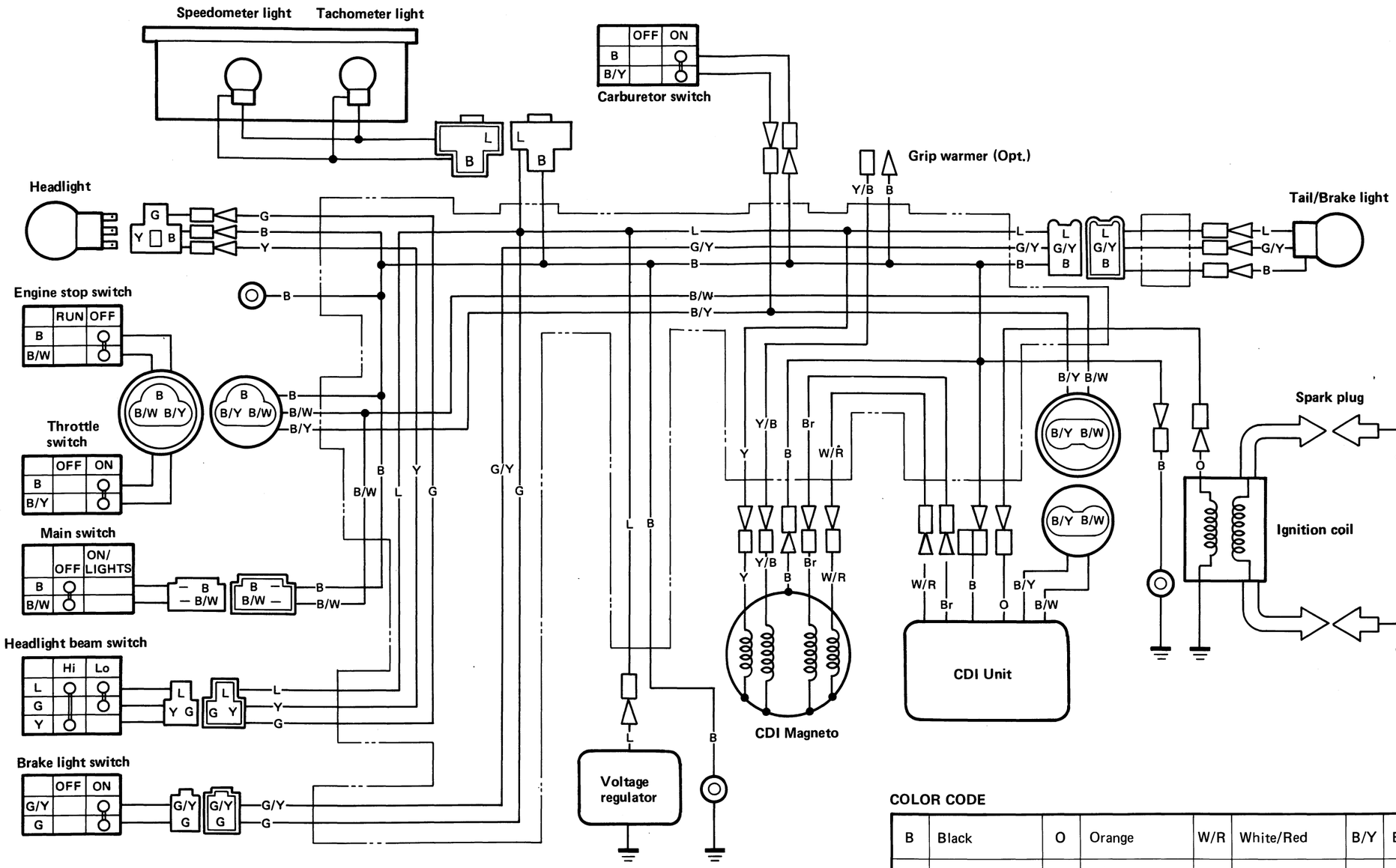
CABLE ROUTING (3)

① Taillight lead
② Clamp
③ Brake cable
④ Wireharness
⑤ Band
⑥ Tachometer cable
⑦ Throttle cable

Ⓐ TO BRAKE CALIPER



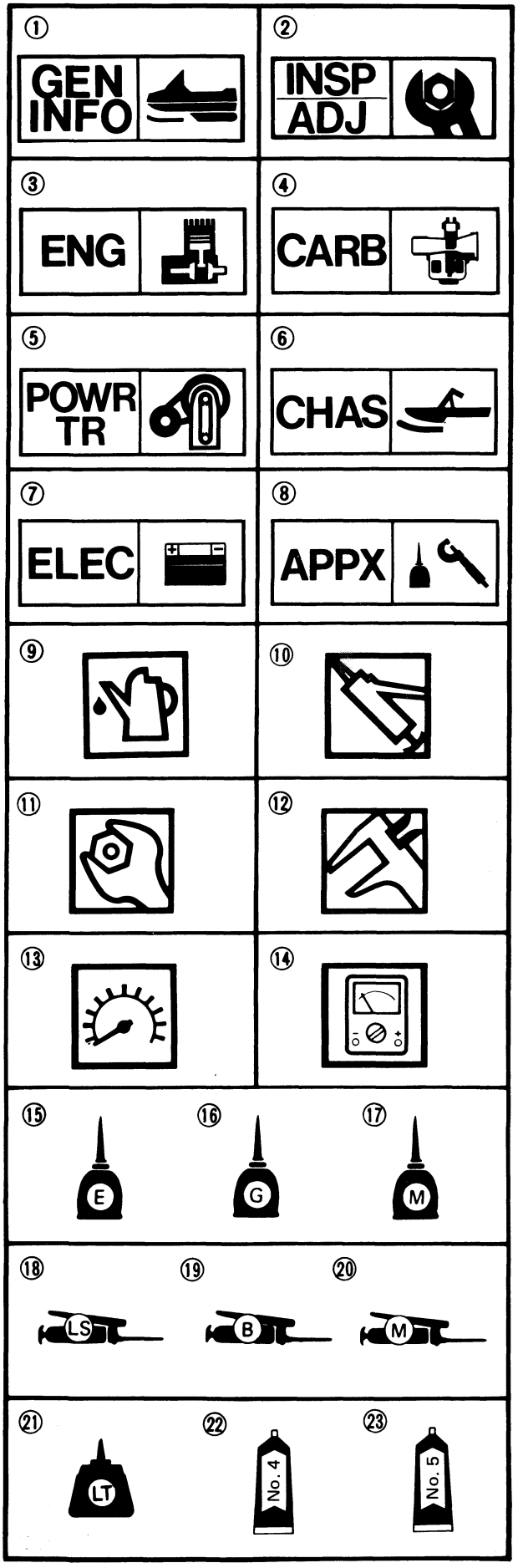
ET340TRM WIRING DIAGRAM



COLOR CODE

B	Black	O	Orange	W/R	White/Red	B/Y	Black/Yellow
G	Green	L	Blue	Y/B	Yellow/Black	G/Y	Green/Yellow
Y	Yellow	Br	Brown	B/W	Black/White		

Lit126180103 1-1



ILLUSTRATED SYMBOLS
(Refer to the illustration)

Illustrated symbols ① to ⑧ are designed as thumb tabs to indicate the chapter's number and content.

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

Illustrated symbols ⑨ to ⑭ are used to identify the specifications appearing.

⑨ Filling fluid
⑩ Lubricant
⑪ Tightening
⑫ Wear limit, clearance
⑬ Engine speed
⑭ Ω, V, A

Illustrated symbols ⑮ to ⑳ in the exploded diagram indicate grade of lubricant and location of lubrication point.

⑮ Apply engine oil
⑯ Apply gear oil
⑰ Apply molybdenum disulfide oil
⑱ Apply low-temperature lithium soap base grease
⑲ Apply bearing grease
(Esso-Beacon 325 grease or Aero Shell grease #7)
⑳ Apply molybdenum disulfide grease

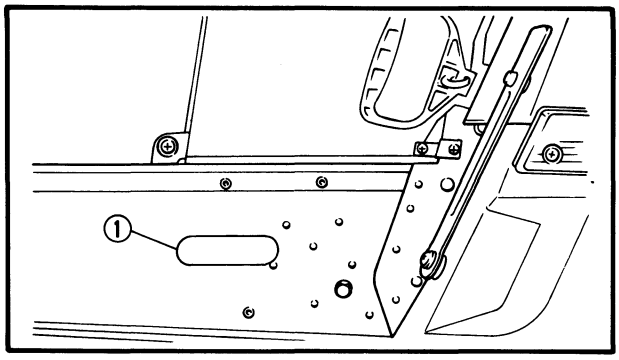
Illustrated symbols ㉑ or ㉓ in the exploded diagram indicate grade of sealing or locking agent and location of application point.

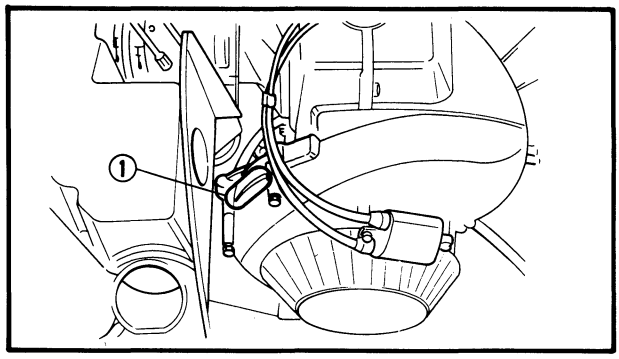
㉑ Apply locking agent (LOCTITE®)
㉒ Apply Yamabond No. 4®
㉓ Apply Yamabond No. 5®

CONTENTS

GENERAL INFORMATION 1
MACHINE IDENTIFICATION 1
FRAME SERIAL NUMBER 1
ENGINE SERIAL NUMBER 1

APPENDICES 2
SPECIFICATION 2
GENERAL SPECIFICATIONS 2
MAINTENANCE SPECIFICATIONS 2





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 right-hand side of the crankcase.

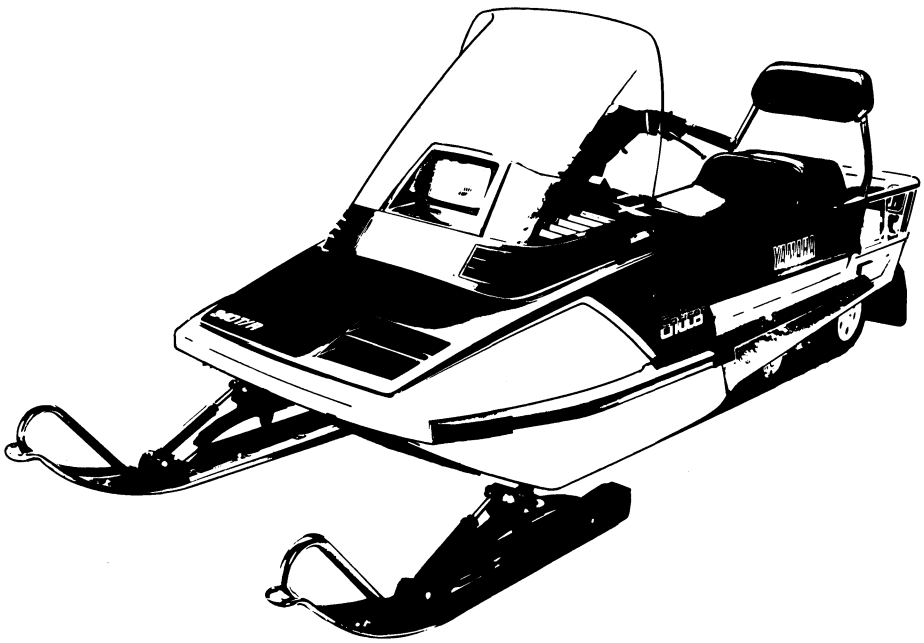
NOTE:

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

Starting Serial Number
85V-000101

NOTE:

Designs and specifications are subject to change without notice.



APPENDICES

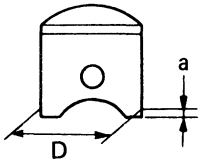
SPECIFICATION

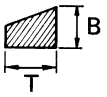
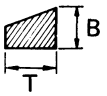
GENERAL SPECIFICATIONS

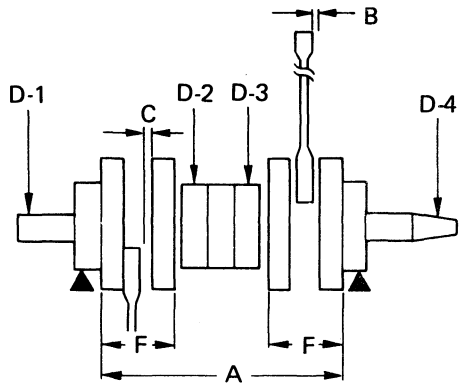
Model	ET400TRN
Model Code Number:	85V
Frame Starting Number:	85V-000101
Engine Starting Number:	85V-000101
Engine:	
Engine Type	Two-stroke, 5-port
Cooling System	Axial fan air cooled
Cylinder Arrangement	Forward-incline, twin cylinder
Displacement	408 cm^3 (20.6 cu.in)
Bore x Stroke	66 x 59.6 mm (2.60 x 2.35 in)
Compression Ratio	6.4 : 1
Starting System	Recoil hand starter
Spark Plug:	
Type	BR8ES
Manufacturer	NGK
Gap	0.7 ~ 0.8 mm (0.028 ~ 0.031 in)
Transmission:	
Primary Reduction System	V-Belt
Primary Reduction Ratio	3.5 : 1 ~ 1 : 1
Clutch Type	Automatic centrifugal engagement
Secondary Reduction System	Chain (RF35V-2)
Secondary Reduction Ratio	14/31 (0.45)
Reverse System	Equipped

MAINTENANCE SPECIFICATIONS

Engine

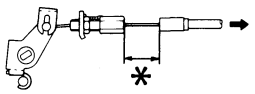
Model	ET400TRN
Cylinder Head:	
Volume (with spark plug)	27.9 cm^3 (1.70 cu.in) ~ 28.5 cm^3 (1.74 cu.in)
Warp Limit	0.03 mm (0.0012 in)
Cylinder:	
Material	Aluminum alloy with special cast iron sleeve
Bore Size	66.00 ~ 66.02 mm (2.598 ~ 2.599 in)
Taper Limit	< 0.05 mm (0.0020 in) >
Out-of-Round Limit	< 0.01 mm (0.0004 in) >
Piston:	
Piston Size (D)/Measuring Point (a)	65.940 ~ 66.000 mm (2.596 ~ 2.598 in)/ 10 mm (0.4 in)
	
Clearance between Piston & Cylinder	0.050 ~ 0.056 mm (0.0020 ~ 0.0022 in)
Over Size 1st	66.25 mm (2.608 in)
2nd	66.50 mm (2.618 in)
3rd	—
4th	—
Piston Pin Hole Off-Set	1.5 mm (0.06 in) Ex. side

Model			ET400TRN
Piston Pin:			
Outside Diameter x Length			ϕ15.950 x 53.970 mm (0.63 x 2.12 in) ~ ϕ16 x 54 mm (0.63 x 2.13 in)
Piston Ring:			
Sectional Sketch	Top Ring		Keystone B = 1.2 mm (0.047 in) T = 2.6 mm (0.102 in)
	2nd Rind		Keystone B = 1.2 mm (0.047 in) T = 2.6 mm (0.102 in)
End Gap (Installed)	Top Ring		0.30 ~ 0.50 mm (0.012 ~ 0.020 in)
	2nd Ring		0.30 ~ 0.50 mm (0.012 ~ 0.020 in)
Side Clearance	Top Ring		0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)
	2nd Ring		0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)
Coating	Top Ring		Hard chrome
	2nd Rind		Hard chrome
Crankshaft:			
Crank Width "F"			51.95 ~ 52.00 mm (2.045 ~ 2.047 in)
Assembly Width "A"			159.9 ~ 160.2 mm (6.295 ~ 6.307 in)
Connecting Rod Small End Free Play "B"			2.0 mm (0.08 in)
Connecting Rod Big End Clearance "C"			0.25 ~ 0.75 mm (0.010 ~ 0.030 in)
Crankshaft Deflection "D":			
Measuring Point – 1			0.03 mm (0.0012 in)
– 2			0.04 mm (0.0016 in)
– 3			0.04 mm (0.0016 in)
– 4			0.05 mm (0.0020 in)
Carburator:			
Type/Manufacture x Quantity			B38-32/MIKUNI x 1 pc.
I.D. Mark			85T00
Main Jet	(M.J.)		#140
Main Nozzle	(M.N.)		4A
Pilot Jet	(P.J.)		#80
Pilot Air Jet	(P.A.J.)		ϕ0.7
Air Screw	(A.S.)		1 turn out
Power Jet	(Pw.J.)		–
Power Air Jet	(Pw.A.J.)		–
Starter Jet	(G.S.)		ϕ2.2
Valve Seat Size	(V.S.)		ϕ1.5
Idling Engine Speed			1,600 ± 100 r/min
Float Arm Height	(F.H.)		15 ± 1 mm (0.59 ± 0.04 in)
High Altitude Tuning			

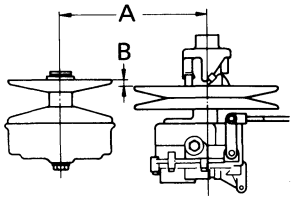


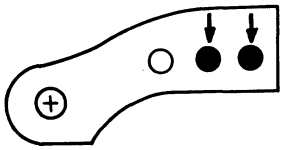
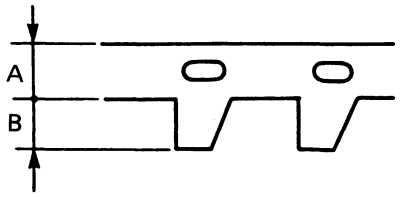
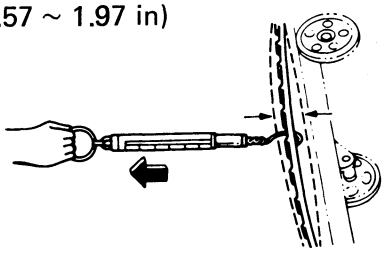
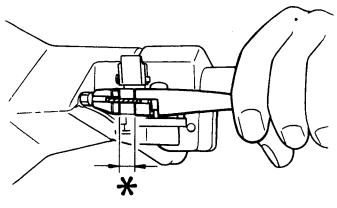
Model	ET400TRN

Temperature / Altitude	−30°C (−22°F)	−20°C (−4°F)	−10°C (14°F)	0°C (32°F)	10°C (50°F)	20°C (68°F)	Pilot screw
Sea level	# 142.5 →				# 140 (STD) ←		1 and 1/2 turns out
0 ~ 600 m (0 ~ 2,000 ft)	# 140 (STD) →					# 135 ←	
600 ~ 1,200 m (2,000 ~ 4,000 ft)	# 140 (STD) →				# 135 ←		
1,200 ~ 1,800 m (4,000 ~ 6,000 ft)	# 140 (STD) →		# 135 ↔			# 132.5 ←	
1,800 ~ 2,400 m (6,000 ~ 8,000 ft)	# 135 →		# 132.5 ↔			# 131.3 ←	1 and 1/8 turns out
2,400 ~ 3,000 m (8,000 ~ 10,000 ft)	# 132.5 →		# 131.3 ↔			# 130 ←	

Fuel Pump: Type/Manufacture Quantity	 DF52/MIKUNI/1
Oil Pump: Color Code Plunger Diameter Minimum Stroke Maximum Stroke Reduction Ratio Minimum Output (at 200 strokes) Maximum Output (at 200 strokes) Pump Cable Adjustment 	 Orange 4.0 mm (0.157 in) 0.10 ~ 0.15 mm (0.0039 ~ 0.0059 in) 1.55 ~ 1.77 mm (0.061 ~ 0.0697 in) 1/25 0.503 ~ 0.754 cm³ (0.0177 ~ 0.0265 Imp oz, 0.0170 ~ 0.0255 US oz) 7.791 ~ 8.897 cm³ (0.274 ~ 0.313 Imp oz, 0.263 ~ 0.301 US oz) * 21 ~ 23 mm (0.83 ~ 0.91 in)

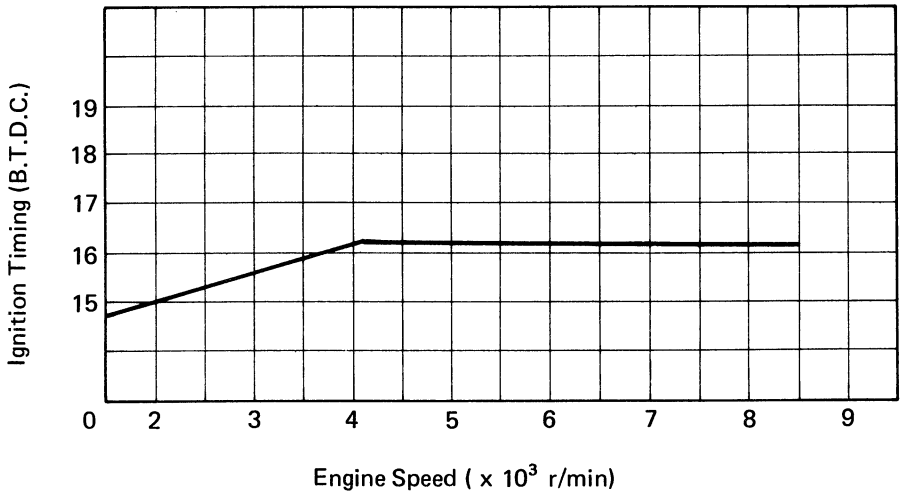
Drive and suspension

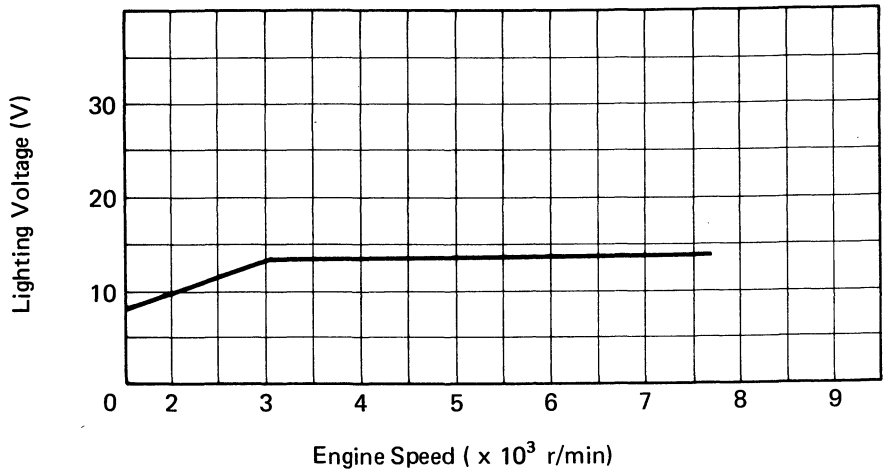
Model	ET400TRN
Transmission: Type Range of Ratio Engagement RPM Shift RPM Sheave Center Distance "A" Sheave Offset "B" 	 V-belt Automatic 3.5 : 1 ~ 1 : 1 Approx. 3,200 r/min Approx. 6,500 r/min 266 mm (10.47 in) 11 mm (0.43 in)

Model	ET400TRN
Primary Sheave Spring:	
Part No.	90501-504A3
Color Code	White-Vider
Outside Dia. x Wire Dia.	55.0 x 5.0 mm (2.165 x 0.197 in)
Pre-load/Set Length	25 kg/61.5 mm (2.42 in)
Spring Rate	1.59 kg/mm
No. of Coils	5.14
Free Length	77.2 mm (3.04 in)
Primary Sheave Weight Arm:	
Part No.	8V0-17632-00
Weight x Quantity	45.6 g x 3 pcs = 136.8
Additional Weight Type	Rivet
Hole Position	
Track:	
Part No.	8X0-47110-00
Width x Length	381 x 3,427.6 mm (15.0 x 135.0 in)
Pitch x No. of Links	60.0 mm (2.4 in)
Thickness "A"	5.5 mm (0.22 in)
Height "B"	15.5 mm (0.61 in)
	
Deflection at 10 kg (22 lb)	40 ~ 50 mm (1.57 ~ 1.97 in) 
Pad to Disc Clearance	0.2 ~ 1.0 mm (0.008 ~ 0.039 in)
Disc Outside Dia.	179.0 mm (7.05 in)
Disc Thickness	4.0 mm (0.157 in)
Brake Lever Free Play *	6 ~ 7 mm (0.24 ~ 0.28 in)
	

Electrical

Model	ET400TRN
Voltage:	12V
Ignition System:	
Ignition Timing (B.T.D.C.)	1.6 mm (0.063 in)
Advanced Timing (B.T.D.C.)	17° at 7,000 r/min
Advancer Type	Electrical



CDI:	
Model/Manufacturer	F85T/YAMAHA
Pickup Coil Resistance	20Ω ± 20% at 20°C (68°F)
Color Code	(W/R – B)
Charge Coil Resistance	275Ω ± 20% at 20°C (68°F)
Color Code	(Br – B)
CDI Unit Model/Manufacturer	81E-M0/YAMAHA
Ignition Coil:	
Model/Manufacturer	85T-00/YAMAHA
Minimum Spark Gap	11 mm (0.43 in) at 3,000 r/min
Primary Winding Resistance	0.2Ω ± 20% at 20°C (68°F)
Secondary Winding Resistance	4.9 kΩ ± 20% at 20°C (68°F)
Flywheel Magneto:	
Model/Manufacturer	F85T/YAMAHA
Charging Current-Day (Min.)	0.6A/3,000 r/min
(Max.)	2.0A/8,000 r/min
Charging Current-Night (Min.)	–
(Max.)	–

Model	ET400TRN
Lighting Voltage (Min.) (Max.)	6.2V/1,200 r/min 15.0V/8,000 r/min
Lighting Coil Resistance	0.3Ω ± 20% at 20°C (68°F)
Color Code	(Y – B)
Coil Resistance for Grip Warmer	0.8Ω ± 20% at 20°C (68°F)
Color Code	(R – B)
Voltage Regulator:	
Type	Short Circuit Type
Model/Manufacturer	82M-A0/SHINDENGEN
No Load Regulated Voltage	13.3 ~ 14.3V