

FOREWORD

This Service Manual has been written to acquaint the mechanic with the disassembly, reassembly, maintenance, and troubleshooting procedures required to provide optimum performance and longevity of the machine. The information herein should be closely studied to avoid unnecessary repairs and to provide the owner with a sound, safe, dependable machine.

NOTE: _____

The Research and Engineering Departments of Yamaha are continually striving to further perfect all models. Improvements and modifications are therefore inevitable.

In light of this fact, all specifications within this manual are subject to change without notice. Information regarding changes is forwarded to all Authorized Yamaha Dealers as soon as available.

**YAMAHA MOTOR CO., LTD.
SERVICE DEPARTMENT**

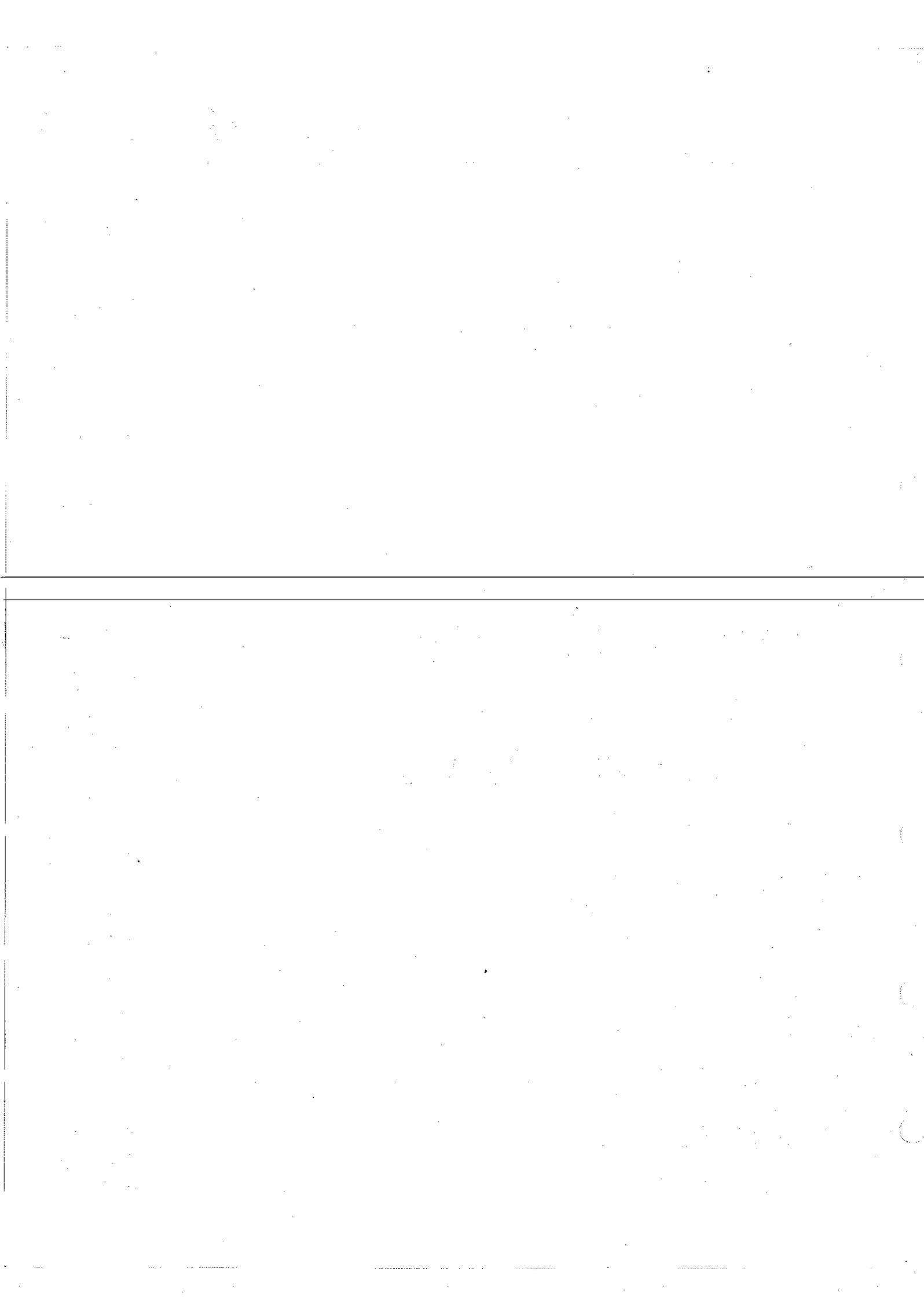
Particularly important information is distinguished in this manual by the following notations:

- NOTE:** A NOTE provides key information to make procedures easier or cleaner.
- CAUTION:** A CAUTION indicates special procedures that must be followed to avoid damage to the machine.
- WARNING:** A WARNING indicates special procedures that must be followed to avoid injury to a machine operator or person inspecting or repairing the machine.



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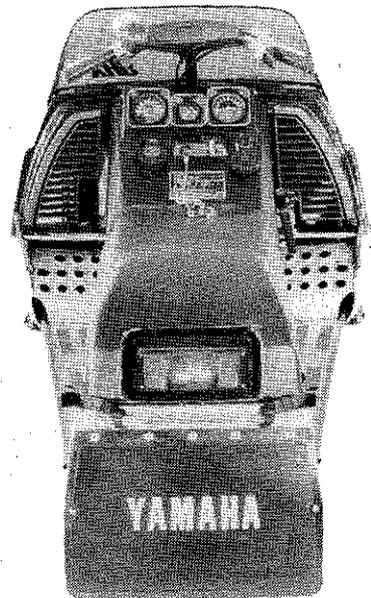
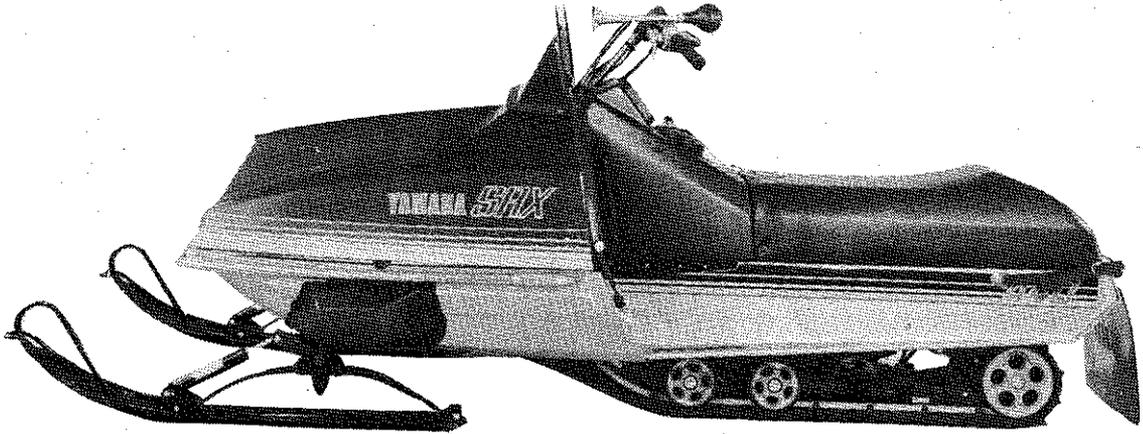
CHAPTER 1. GENERAL

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CHAPTER 1. GENERAL

1-1. EXTERNAL VIEW

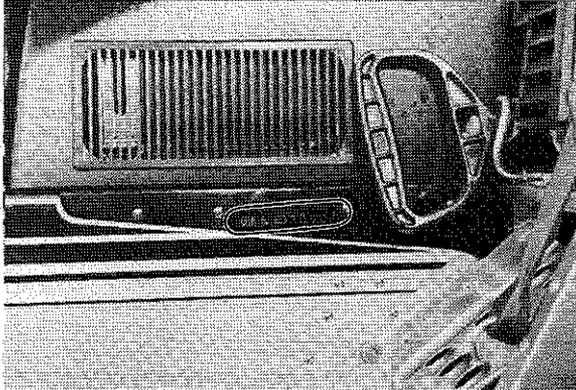
GENERAL



1-2. MACHINE IDENTIFICATION

A. Frame serial number

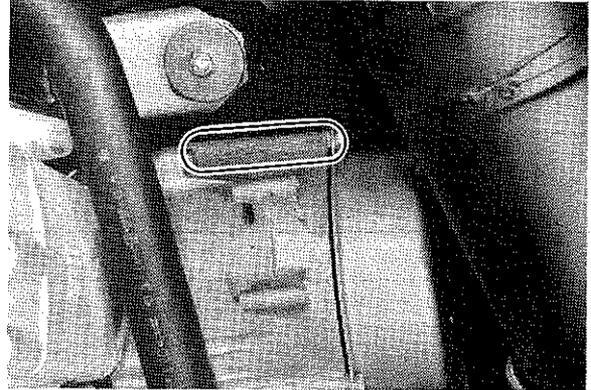
The frame serial number is located on the righthand side of frame (just below the front of seat). The first three digits identify the model. This is followed by a dash. The remaining digits identify the production number of the unit.



Frame starting serial number	8K6-015101
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B. Engine serial number

The engine serial number is located on the right-hand side of crankcase cover. The prefix indicates engine type and displacement. The prefix is followed by a dash and the serial number. Normally both frame and engine serial numbers are identical; however, on occasion they may be two or three numbers off.



Engine starting serial number	RT439-015101
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1-3. MAINTENANCE INTERVALS CHARTS

A. Periodic maintenance

(Use this just as guide only. Certain conditions may require more frequent inspection of components.)

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				○	○
● Throttle valve synchronization		○			○
Operation and adjustment of oil pump		○			○
Ignition timing					○
Engine compressions			○		○
Cylinder head/exhaust pipe decarbonize					○
Spark plug condition, gap and cleaning	○				○
Tightening of the cylinder head**					○

** Retighten every 10 hours from the first use.

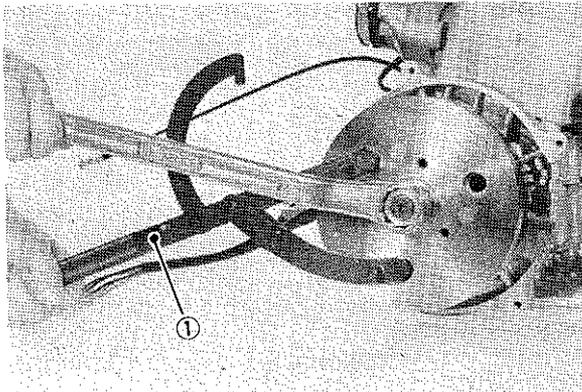
Check point	Every			When necessary	Seasonally
	20 hrs. or 400 km (250 mi)	40 hrs. or 800 km (500 mi)	80 hrs. or 1,600 km (1,000 mi)		
Coolant leakage	<input type="checkbox"/>				<input type="checkbox"/>
Operation of thermostat	<input type="checkbox"/>				<input type="checkbox"/>
Operation of water pump	<input type="checkbox"/>				<input type="checkbox"/>
Water pump belt tension, damage	<input type="checkbox"/>				<input type="checkbox"/>
Coolant level	<input type="checkbox"/>				<input type="checkbox"/>
DRIVE:					
Tightness of bolts and nuts	<input type="checkbox"/>				<input type="checkbox"/>
Wear on slide runners	<input type="checkbox"/>				<input type="checkbox"/>
Primary drive system		<input type="checkbox"/>			<input type="checkbox"/>
V-belt	<input type="checkbox"/>				<input type="checkbox"/>
Secondary drive system		<input type="checkbox"/>			<input type="checkbox"/>
Sheave distance		<input type="checkbox"/>			<input type="checkbox"/>
Sheave offset		<input type="checkbox"/>			<input type="checkbox"/>
Brake pad wear		<input type="checkbox"/>			<input type="checkbox"/>
Brake operation and adjustment		<input type="checkbox"/>			<input type="checkbox"/>
Guide wheel rubber		<input type="checkbox"/>			<input type="checkbox"/>
Wear of drive track wheel sprocket		<input type="checkbox"/>			<input type="checkbox"/>
Drive track adjustment		<input type="checkbox"/>			<input type="checkbox"/>
Breaks in drive track		<input type="checkbox"/>			<input type="checkbox"/>
Bends in front and rear axles		<input type="checkbox"/>			<input type="checkbox"/>
Checking of lock washers		<input type="checkbox"/>			<input type="checkbox"/>
Drive chain adjustment		<input type="checkbox"/>			<input type="checkbox"/>
Drive chain oil level		<input type="checkbox"/>			<input type="checkbox"/>
BODY:					
Tightness of bolts and nuts	<input type="checkbox"/>				<input type="checkbox"/>
Bends and cracks	<input type="checkbox"/>				<input type="checkbox"/>
Welded riveted, joints	<input type="checkbox"/>				<input type="checkbox"/>
Ski adjustment		<input type="checkbox"/>			<input type="checkbox"/>
Ski runner wear	<input type="checkbox"/>				<input type="checkbox"/>
Breaks in fuel tank		<input type="checkbox"/>			<input type="checkbox"/>
Cleaning of fuel tank					<input type="checkbox"/>
Fuel filter					<input type="checkbox"/>
Loose connection and breaks in fuel pipe		<input type="checkbox"/>			<input type="checkbox"/>
Breaks in oil tank		<input type="checkbox"/>			<input type="checkbox"/>
Oil filter					<input type="checkbox"/>
ELECTRICAL:					
Wear, breakage of wire covering		<input type="checkbox"/>			<input type="checkbox"/>
Breaks in high-tension cord	<input type="checkbox"/>				<input type="checkbox"/>
Voltage regulator working voltage					<input type="checkbox"/>
Operation of engine stop switch	<input type="checkbox"/>				<input type="checkbox"/>
Operation of tether switch	<input type="checkbox"/>				<input type="checkbox"/>
Headlight	<input type="checkbox"/>				<input type="checkbox"/>
Taillight	<input type="checkbox"/>				<input type="checkbox"/>
Brake light	<input type="checkbox"/>				<input type="checkbox"/>
Oil caution light	<input type="checkbox"/>				<input type="checkbox"/>

B. Lubrication intervals

Check 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
Speedometer drive housing			○		○	
Water pump bearing and oil seal			○		○	
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		○			○	
Front axle housing		○			○	
Shaft 1 and shaft 2 (Slide rail)			○		○	Light all-purpose grease
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

ENGINE

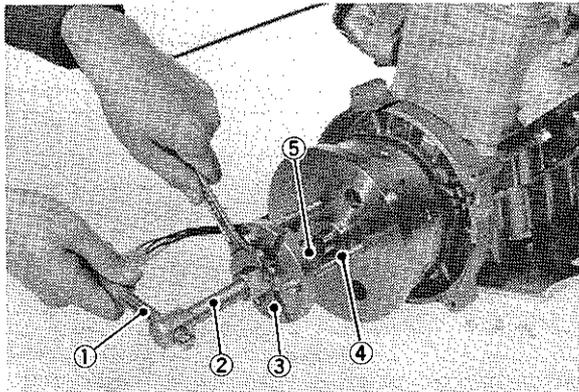
Tool name	Tool No.
Rotor holding tool	90890-01235



1. Rotor holding tool

3. Using the flywheel puller, remove the flywheel assembly.

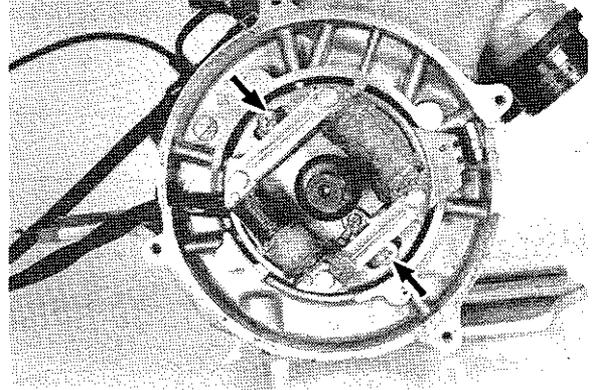
No.	Tool name	Tool No.
1	Drive handle	90890-01817
2	Flywheel puller bolt	90890-01803
3	Flywheel puller body	90890-01848
4	Flywheel puller screw (φ8 × 80 mm)	90890-01806
5	Flywheel puller attachment	90890-01804



NOTE:

When removing the flywheel, the key must be removed from the crankshaft. Take care so that it is not lost.

3. Remove the Phillips-head screw, and remove the coil plate.



E. Primary sheave

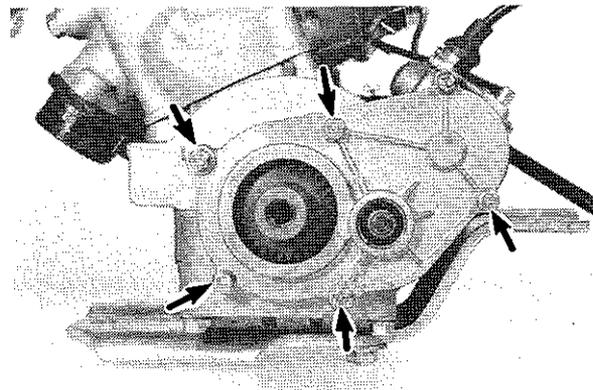
Refer to "5-1-B. Primary sheave"

F. Oil pump

1. Remove the oil delivery pipes.
2. Remove the bolts and pump drive case.

NOTE:

The oil pump can be removed as an assembly together with the pump drive cover. If it is hard to remove the pump drive case, tap it with a soft-faced hammer.



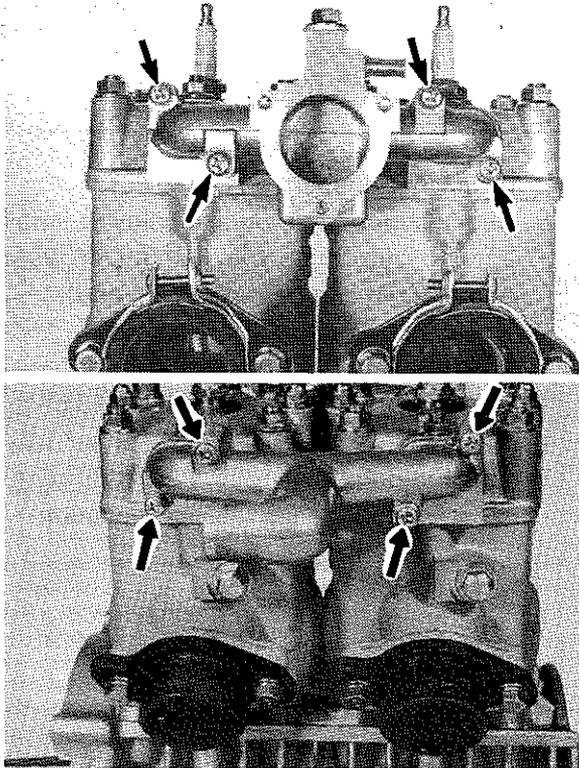
CAUTION:

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

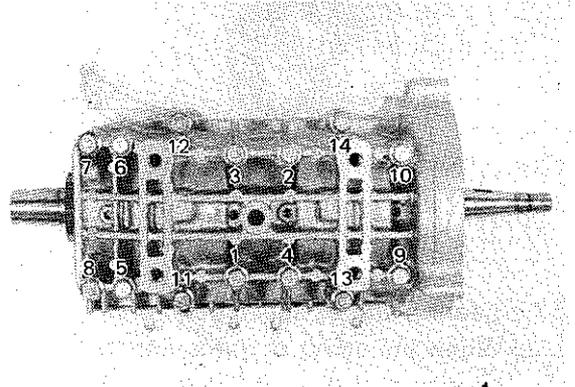
3. Remove the oil pump cap and pump wire.
4. Remove the oil pump assembly.

G. Engine disassembly.

1. Remove the thermostat case and joint.



8. Remove engine bracket.
9. Remove crankcase holding bolts. Each bolt position is numbered. Start with the largest number for disassembly. Loosen each bolt 1/4 turns and proceed to the next.



10. Split crankcase by lightly striking the upper and lower crankcases.
11. Remove crankshaft by tapping the shaft with your hands.

NOTE:

For thermostat inspection, refer to 3-5 thermostat.

2. Remove the intake manifold.
3. Remove the exhaust pipe assembly.
4. Remove the cylinder head holding nuts, cylinder head, gasket and O-ring.

NOTE:

Loosen spark plugs before removing cylinder head.

5. Remove the cylinder and cylinder base gasket.
6. Remove piston pin clip from piston.

NOTE:

Before removing the piston pin clip, cover the crankcase with a clean rag to prevent the clip from accidentally falling into the crankcase.

7. Push piston pin from opposite side, then pull out. Protect pin with rag.

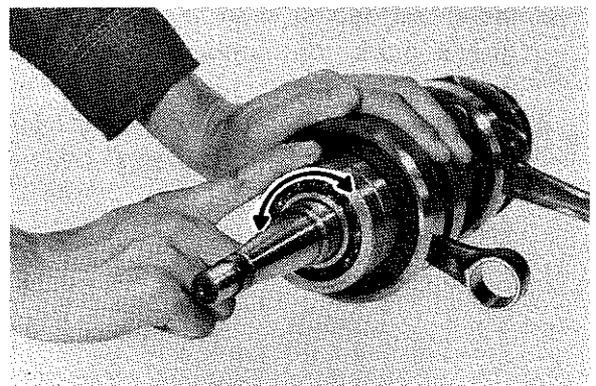
NOTE:

Before moving piston pin, deburr clip groove and pin hole area.

2-2. INSPECTION, REASSEMBLY AND ADJUSTMENT

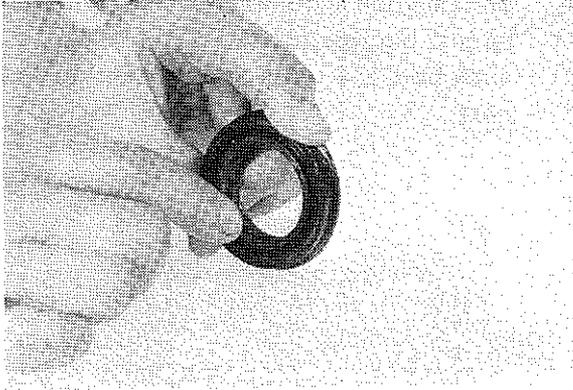
A. Engine components

1. Crankcase
 - a. Thoroughly wash the case halves in mild solvent.
 - b. Clean gasket mating surfaces and crankcase mating surfaces thoroughly.
 - c. Visually inspect case halves for any cracks, road damage, etc.
 - d. Check oil delivery passages in transfer ports for signs of blockage.
2. Bearing and oil seal inspection
 - a. After cleaning and lubricating bearings, rotate outer race with a finger. If rough spots are noticed, replace the bearing.



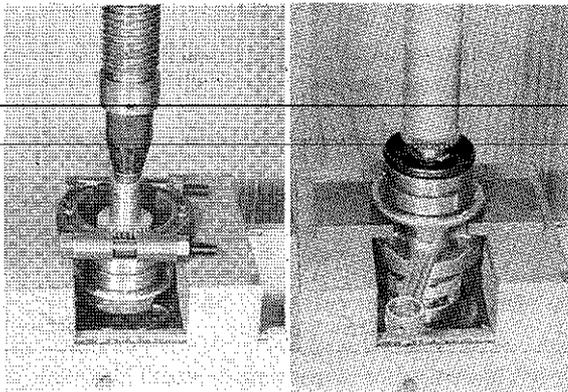
ENGINE

- b. Check oil seal lips for damage and wear. Replace as required.



3. Bearing and oil seal installation

- a. When installing or removing left crank oil seal and bearing, remove the pump drive gear and install new drive gear.



CAUTION:
When removing pump drive gear, replace it with new one.

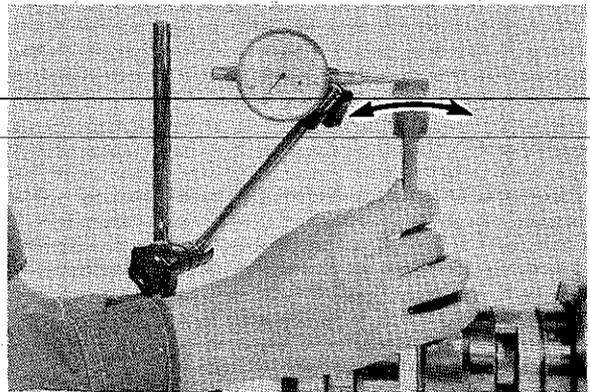
- b. Install bearing(s) with their manufacturer's marks or numbers facing outward. (In other words, the stamped letters must be on the exposed-to-view-side.)
- c. Install oil seal(s) with their manufacturer's marks or numbers facing outward.
- d. When installing bearing(s) or oil seal(s), apply the specified lubrication.

Crank bearing	Yamalube 2-cycle oil
Crankshaft oil seal lip	Low temperature grease (Esso Beacon 325 or Aeroshell grease #7A)

4. Crankshaft inspection

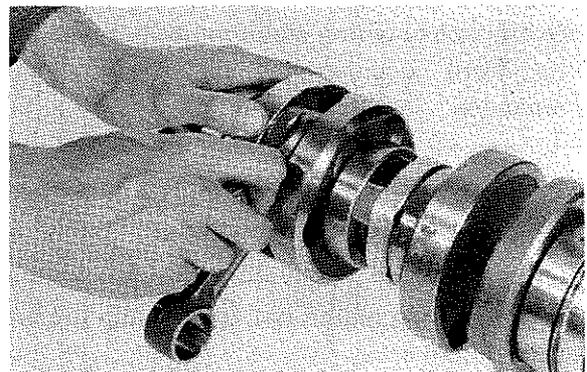
- a. Check connection rod axial play at small end (to determine the amount of wear of crank pin and bearing at big end). If small end play exceeds tolerance, disassemble the crankshaft, check connecting rod, crank pin and big end bearing. Replace defective parts. Play after reassembly should be within specification.

Rod axial play:
Maximum 2.0 mm (0.079 in)



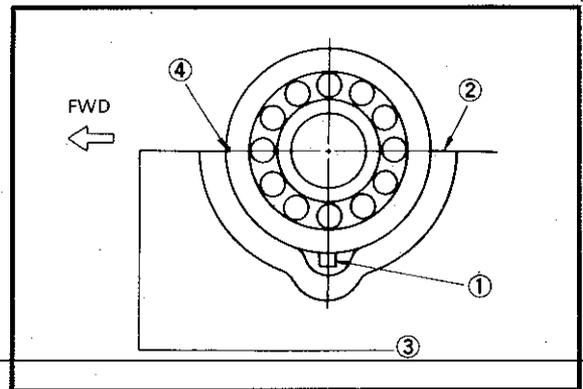
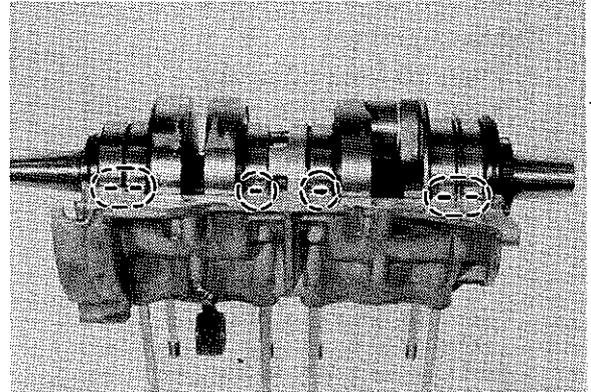
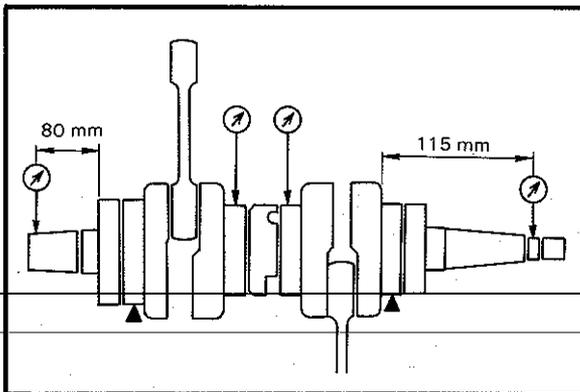
- b. Check the connecting rod side clearance at big end. If axial play exceeds tolerance, disassemble the crankshaft and replace any worn parts. Big end axial play should be within specification.

Rod side clearance	
Minimum	Maximum
0.25 mm (0.010 in)	0.75 mm (0.030 in)



- c. Check crankshaft assembly runout (misalignment of crankshaft parts). Dial gauge readings should be within specification. Correct any misalignment by tapping the flywheel with a brass hammer and/or by using a wedge.

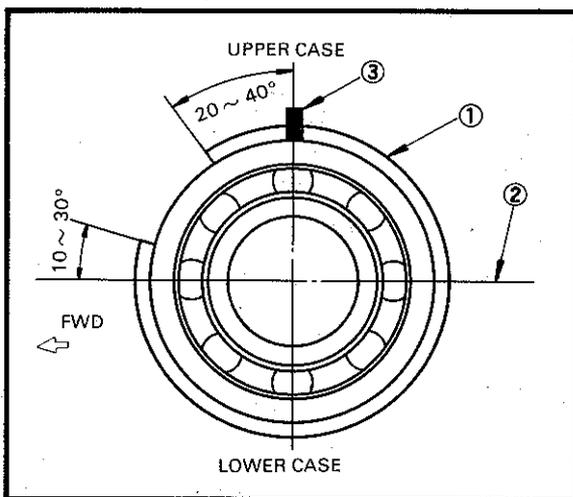
Deflection tolerance			
Left side	Center (left)	Center (right)	Right side
0.03 mm (0.0012 in)	0.04 mm (0.0016 in)	0.04 mm (0.0016 in)	0.05 mm (0.0020 in)



- 1. Knock pin
- 2. Sealing surface
- 3. Upper case
- 4. Aligning mark

5. Crankshaft installation

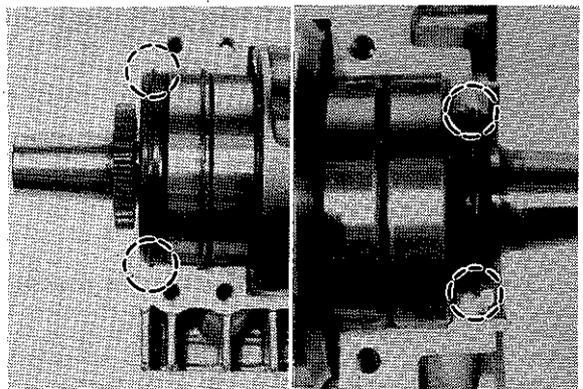
- a. Set the circlip on crank bearing as illustrated. (The primary sheave side.)



- 1. Circlip
- 2. Sealing surface
- 3. Knock-pin

- b. Install the crankshaft assembly with oil seal, align the bearing punch marks with the crankcase lower and upper mating surfaces.
- c. Set the pins of bearing and labyrinth seal in pin holes of crankcase upper by moving the bearings and labyrinth seal.

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



6. Crankcase installation

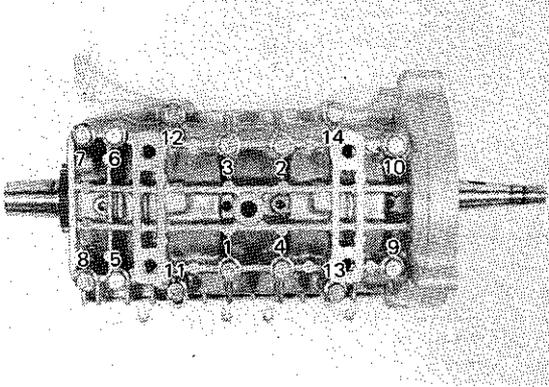
- a. Apply YAMAHA BOND #4 to the mating surfaces of both case halves. Apply thoroughly over all mating surfaces.
- b. Set the crankcase half onto lower case half. Install the crankcase holding bolts. Each bolt position is numbered. Tighten all crankcase holding bolts gradually in the order of the numbers marked on crankcase.

ENGINE

Tightening torque:

First: 10 Nm (1.0 m·kg)

Final: 22 Nm (2.2 m·kg)



Tightening torque:

40 Nm (4.0 m·kg)

8. Piston pin and bearing inspection

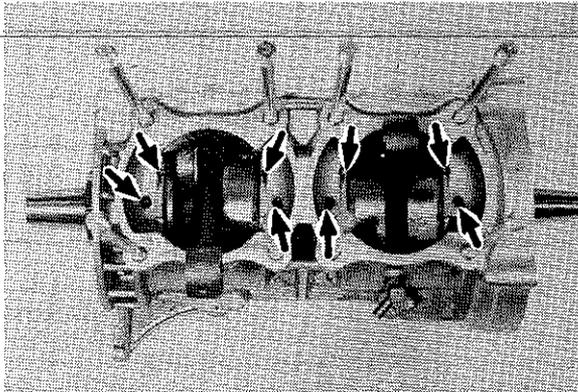
- a. Check the pin for signs of wear. If any wear is evident, replace pin and bearing.



- c. After reassembly, apply a liberal coating of two-stroke oil to the crank pin, bearing and into each crankshaft bearing oil delivery hole.

- b. Check the pin and bearing for signs of heat discoloration. If excessive (indentation on pin, etc.), replace pin and bearing.

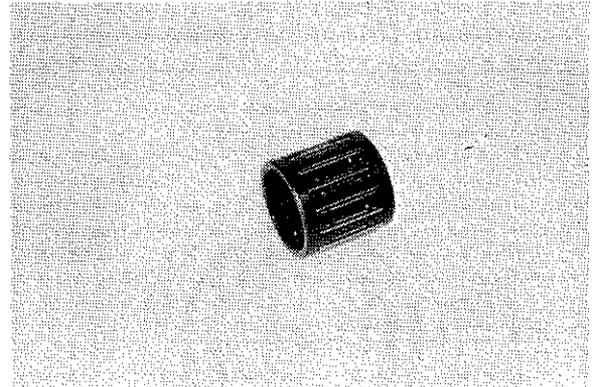
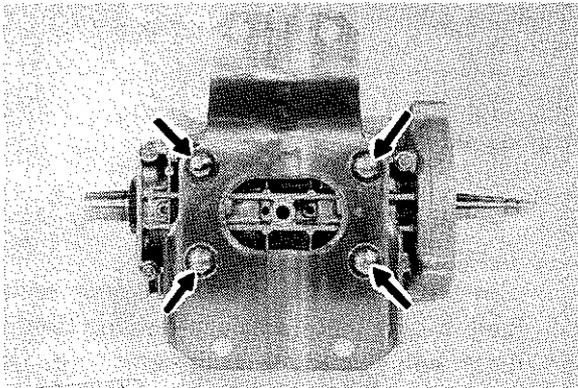
- c. Check the bearing cage for excessive wear or damage. Check the rollers for signs of flat spots. If such wear is found, replace pin and bearing.



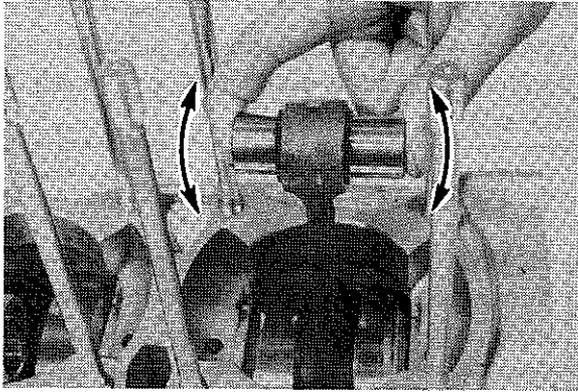
- d. Check crankshaft for freedom of movement.

7. Engine bracket installation

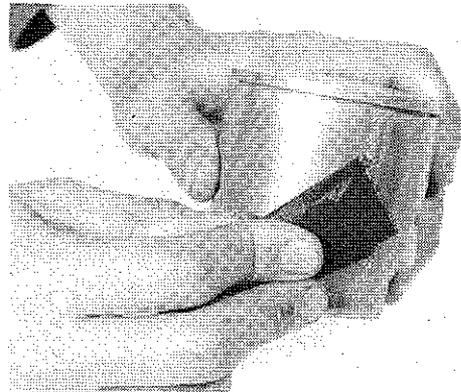
Install the engine brackets in the correct position.



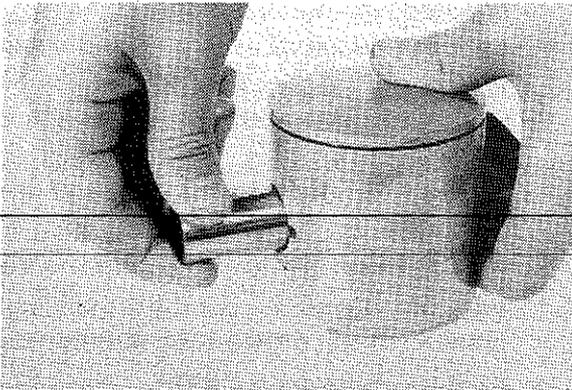
- d. Apply a light film of oil to pin and bearing surfaces. Install them in connecting rod small end to inspect for wear. Check for play. There should be no noticeable vertical play. If play exists, check connecting rod small end for wear. Replace pin, connecting rod and/or bearing, as required.



e. The piston pin should have no noticeable free play in the piston. If the piston pin is loose, replace the pin and/or piston.



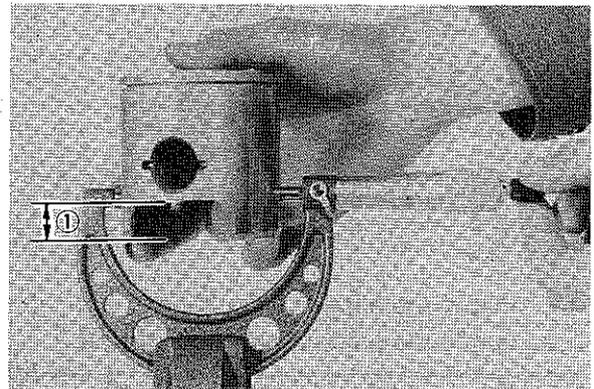
e. Wash piston in solvent and wipe dry.
 f. Measure the outside diameter of the piston at the piston skirt. Measurement should be made at a point 10 mm (0.5 in) above the bottom edge of the piston. Place the micrometer at right angles to the piston pin.
 Piston maximum diameter subtracted from minimum cylinder diameter gives piston clearance. If beyond tolerance, hone cylinder to tolerance or bore to next oversize and fit oversize piston.



9. Piston inspection
- a. Remove piston rings.
 - b. Remove carbon deposits from piston crown.



- c. Carefully remove carbon deposits from ring grooves with filed end of ring.
- d. Remove score marks and lacquer deposits from sides of piston using 600 ~ 800 grit wet sandpaper. Sand in a criss-cross pattern. Do not sand excessively.



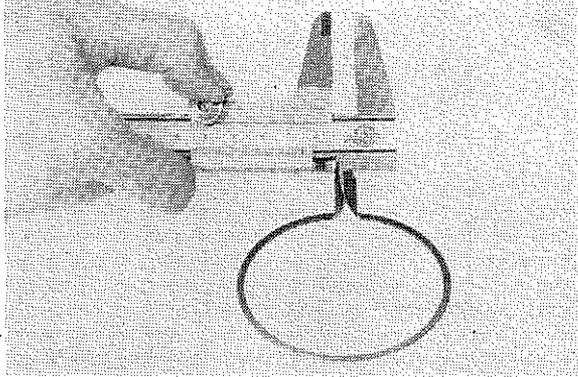
1. 10 mm (0.5 in)

Piston clearance:	
Minimum.....	0.065 mm (0.0026 in)
Maximum.....	0.070 mm (0.0028 in)

10. Piston ring inspection
- a. Check rings for scoring. Any severe scratches are noticed, replace ring set.
 - b. Measure ring end gap in free position. If beyond tolerance, replace ring set.

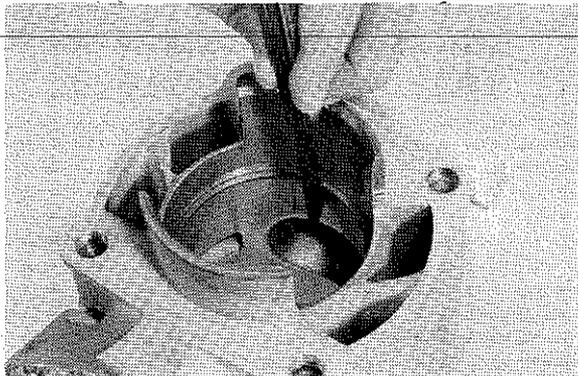
Ring end gap free:	
Approx. 7.0 mm (0.28 in)	

ENGINE



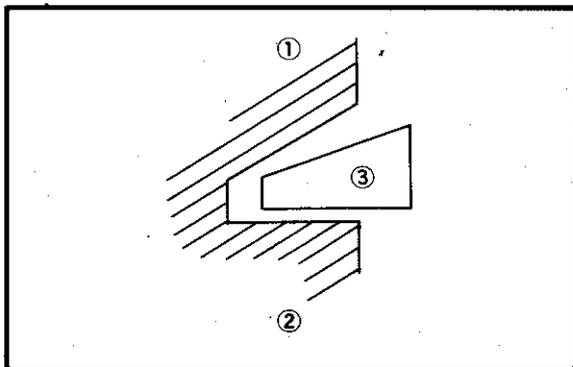
- c. Push the ring into the bore and check end gap clearance with a feeler gauge. If beyond tolerance, replace ring set.

Ring end gap, installed:
 Minimum:
 0.35 mm (0.014 in)
 Maximum:
 0.55 mm (0.022 in)



11. Piston installation

- a. Install the piston ring as illustrated.



1. Piston head 2. Piston bottom 3. Piston ring

- b. During reassembly, coat the piston ring grooves, piston skirt areas, piston pin, and bearing with two-stroke engine oil.
- c. Install new piston pin clips and make sure they are full-seated in their grooves.

NOTE:

Take care during installation to avoid damaging the piston skirts against the crankcase as the cylinder is installed.

12. Cylinder inspection

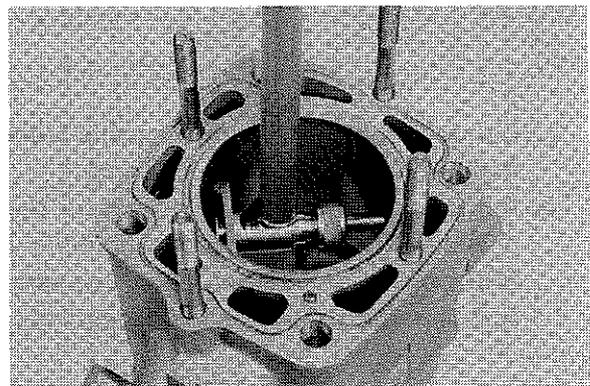
CAUTION:
 This model has a hard chromed cylinder bore, which cannot be honed or bored.

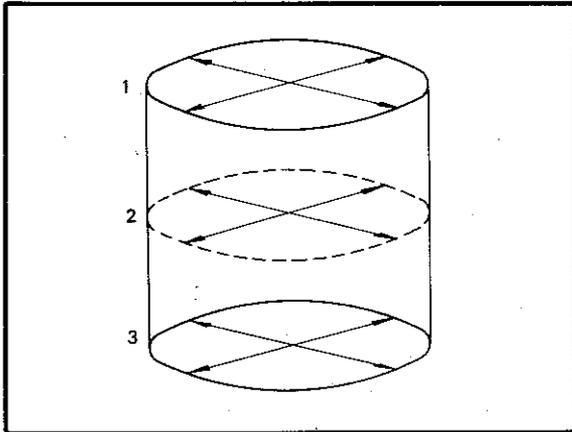
- a. Remove the carbon deposits from exhaust port.
- b. Remove the any obstructions from the coolant passages.
- c. Check cylinder. The cylinder inner wall is plated with hard chrome. Check the edge of each port and upper area of the cylinder bore for peeling-off of chrome. If the chrome peeling is a negligible amount, the cylinder may be used. Smooth out the edge of the chrome with #400 grit sandpaper to prevent the ring edge from catching the edge of the chrome. But if the peeling is present to a considerable degree, the cylinder should be replaced.

NOTE:

If the cylinder wall has a large amount of scuffing, check each piston ring for defects, and replace it if necessary.

- d. Check cylinder bore. Using a cylinder gauge, set to standard bore size, measure the cylinder. Measure at six points; at top, center and bottom. Compare with piston measurements. If over tolerance, replace piston or cylinder as required.

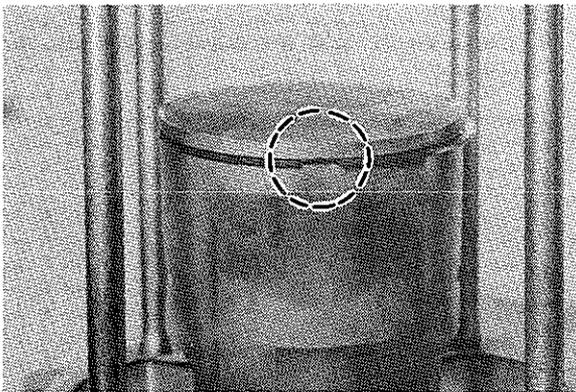




- e. Clean cylinder in solvent, then wash with hot soapy water. Dry. Coat walls with light oil film.
13. Cylinder installation
- Install a new cylinder base gasket.
 - Install cylinder with one hand while compressing piston rings with other hand.

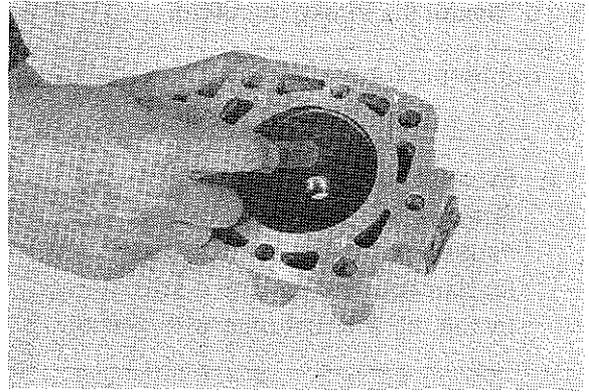
NOTE:

Make sure the rings are properly positioned.



14. Cylinder head inspection

- Remove spark plug.
- Using a rounded scraper, remove carbon deposits from combustion chamber. Take care to avoid damaging spark plug threads. Do not use a sharp instrument. Avoid scratching the aluminum.



- Remove any obstructions from the coolant passages.
15. Cylinder head installation
- Install cylinder head gasket, O-ring and cylinder head. Working in a crisscross pattern, tighten head nuts in two steps.

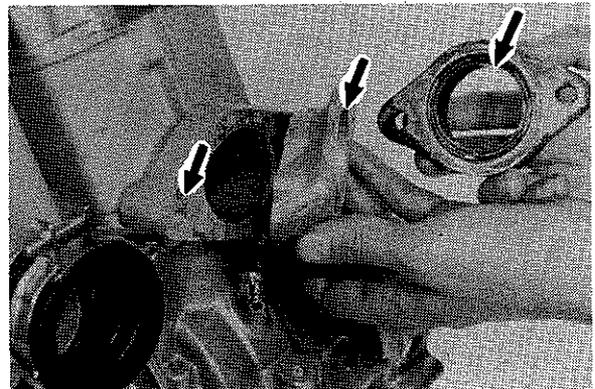
Tightening torque		
10 mm nut	First	20 Nm (2.0 m·kg)
	Final	30 Nm (3.0 m·kg)
8 mm nut	First	20 Nm (2.0 m·kg)
	Final	25 Nm (2.5 m·kg)

NOTE:

When the cylinder head is installed on the cylinder, the O-ring may easily fall off the cylinder. It is advisable, therefore, to coat the O-ring groove sparingly with grease before this procedure.

16. Intake manifold installation

- Clean the mating surfaces of cylinder and intake manifold.
- Coat the mating surfaces of cylinder and intake manifold with YAMAHA BOND #4 and install new intake manifold gaskets.



c. Install the intake manifold.

Tightening torque:
15 Nm (1.5 m-kg)

17. Exhaust pipe installation

Remove the carbon deposits from exhaust pipe. Inspect the exhaust gasket for damage and replace it as required. Install the exhaust pipe with gasket.

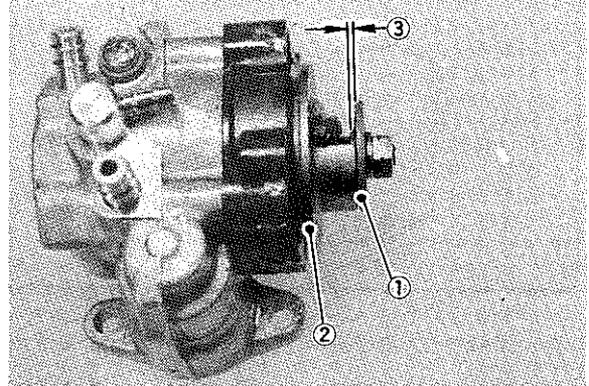
Tightening torque:
23 Nm (2.3 m-kg)

18. Thermostat case and joint installation

Clean the mating surfaces of cylinder head and thermostat case/joint. Install the new gasket and thermostat case/joint.

Tightening torque:
7 Nm (0.7 m-kg)

c. Measure the gap with the thickness gauge between the raised boss on the pump adjust pulley and the adjust plate.



- 1. Adjust plate
- 2. Adjust pulley
- 3. Minimum pump stroke

Minimum pump stroke:
0.20 ~ 0.25 mm
(0.0079 ~ 0.0098 in)

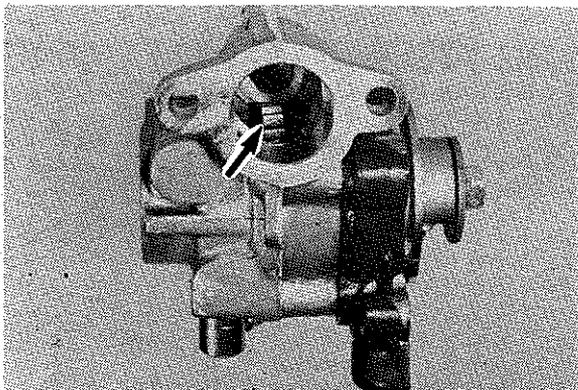
ENGINE

B. Oil pump

1. Minimum pump stroke checking and adjustment.

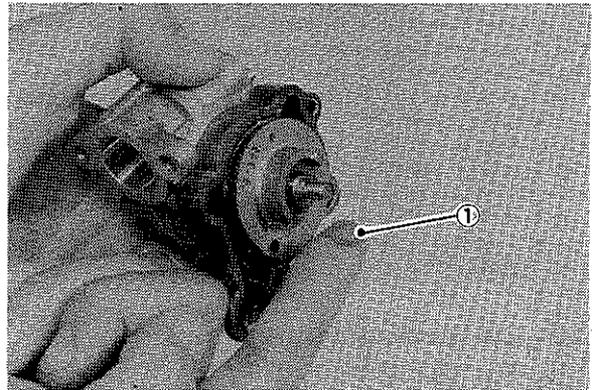
Normally the checking the adjustment of the pump stroke are not required, but if any sign of trouble resulting from an incorrect minimum pump stroke is noticed (e.g., excessive engine oil consumption or engine seizure), proceed as follows:

- a. Remove the oil pump assembly from the engine.
- b. Turn the oil pump worm wheel until the pump plunger moves fully out and away from the pump body to its outermost limit.



d. If clearance is not correct, remove the adjust plate lock nut and the adjust plate.

e. Remove or add an adjust shim as required.



- 1. Adjust shim

f. Reinstall adjust plate and lock nut. Tighten the lock nut. Re-measure gap. Repeat procedure as required.

2. Oil pump drive case installation
Coat the pump drive gear with grease. And install the pump drive case.

Recommended grease:
Low temperature grease
(Esso Beacon 325 or Aeroshell grease #7A)

Pump case tightening torque:
10 Nm (1.0 m-kg)

3. Install pump wire, pump case and oil delivery pipe.

CAUTION:
Before installing pump wire and pump case, apply grease to the pump pulley thoroughly.

Recommended grease:
Low temperature grease
(Esso Beacon 325 or Aeroshell grease #7A)

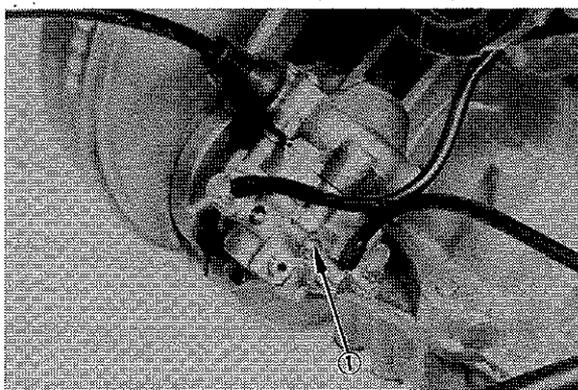
4. Air bleeding (After remounting engine)

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

- Setting up a new machine out of the crate.
- Whenever the oil tank has run dry.
- Whenever any portion of the oil pump system is disconnected.

- a. Bleeding the pump case and/or oil pipe.

- 1) Remove the oil pump bleed screw.



1. Bleed screw

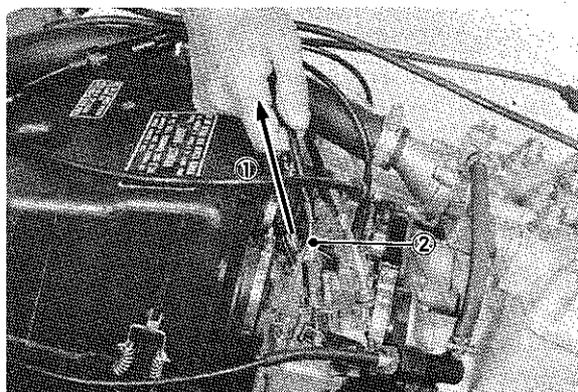
- 2) Keep the oil running out until air bubbles disappear.
- 3) When air bubbles are expelled completely, tighten the bleed screw.

NOTE:

Check the bleed screw gasket, and if damaged, replace with a new one.

- b. Bleeding the pump distributor and/or delivery pipe.

- 1) Start the engine.
- 2) Pull the pump wire all the way out to set the pump stroke to a maximum.



1. Pull
2. Pump wire

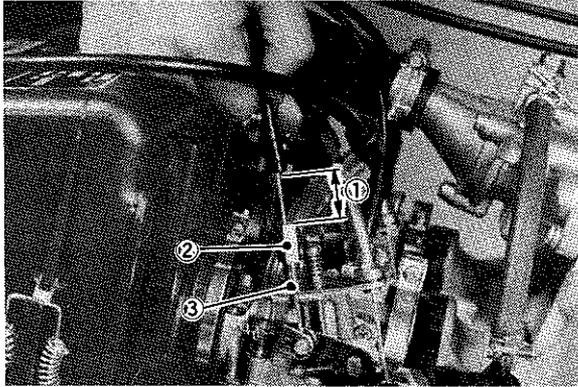
NOTE:

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.

- 3) Keep the engine running at about 2,000 r/min for two minutes or so, and both distributor and delivery pipe can be completely bled.
5. Cable adjustment (After remounting engine)
 - a. Adjust throttle cable free play. (See 4-1-A. Carburetor tuning)
 - b. Pull the oil pump cable outer tube toward the oil pump and adjust the gap between the adjuster and the outer tube to specification.

Play: 23 ± 1 mm (0.91 ± 0.04 in)

- c. After adjusting, don't forget to tighten the lock nut.



- 1. Play
- 2. Adjuster
- 3. Lock nut

C. Primary sheave

Refer to "5-1-B. Primary sheave".

D. Flywheel magento

(For inspection, refer to "7-1-G. Pulser and charge coil test" and "7-2-C. Lighting circuit test".)

- 1. Install woodruff key.
- 2. Install flywheel base.

Flywheel base tightening torque:
6 Nm (0.6 m-kp)

- 3. Install flywheel using rotor holding tool.

Tool name	Tool No.
Rotor holding tool	90890-01235

NOTE:

Make sure woodruff key is properly seated in keyway of crankshaft. Carefully install flywheel while taking care so it aligns with woodruff key.

Flywheel nut torque:
73 Nm (7.3 m-kp)

- 4. Adjust ignition timing.

CAUTION:

Whenever the flywheel magento is removed, ignition timing must be reset. (Refer to 7-1-C. Ignition timing)

- 5. Install the crankcase cover.

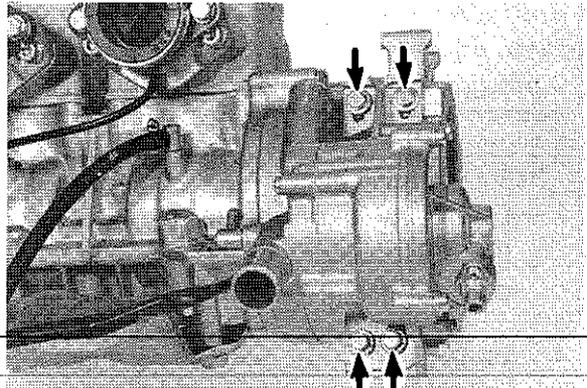
Tightening torque:
10 Nm (1.0 m-kp)

E. Water pump

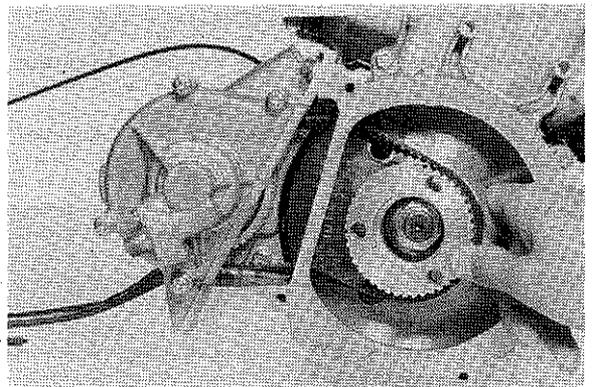
NOTE:

For inspection, refer to "3-4 Water pump".

- 1. Install the water pump assembly temporarily.



- 2. Install the drive water pump pulley with water pump belt.

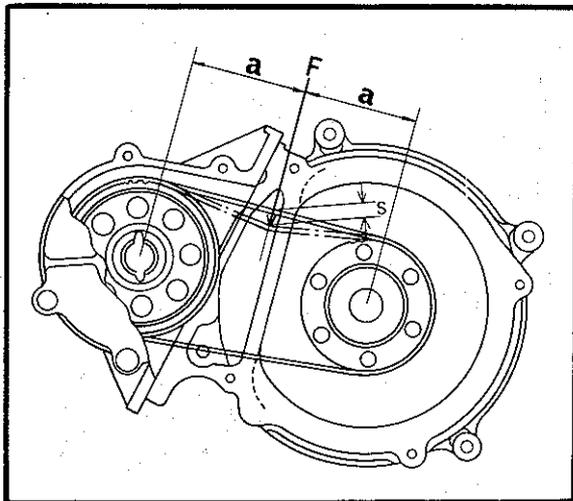


- 3. Install the starter pulley using rotor holding tool.

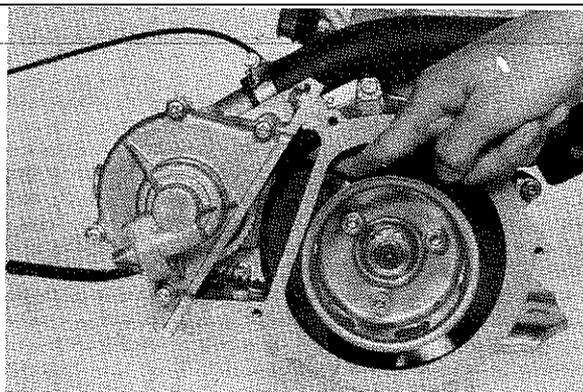
Tool name	Tool No.
Rotor holding tool	90890-01235

Tightening torque:
15 Nm (1.5 m-kp)

4. By moving the water pump housing up and down, adjust the belt tension. Adjust the bolt so that the belt deflects 4 mm (0.16 in) when a force of 4 kg (9 lb) is applied to the center of belt.



F: 4 kg (9 lb)
a: Center of belt
S: 4 mm (0.16 in)

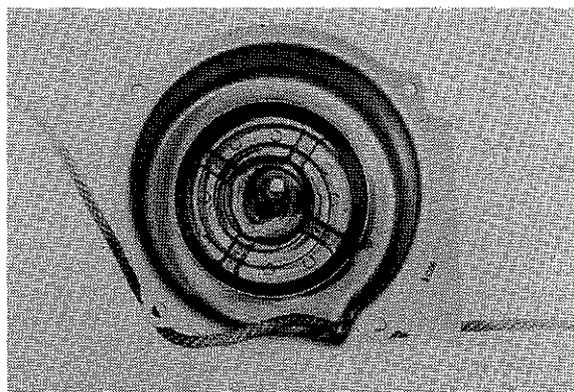


5. After adjusting the belt tension, tighten the water pump housing bolts.

Tightening torque:
9.5 Nm (0.95 m·kg)

F. Starter

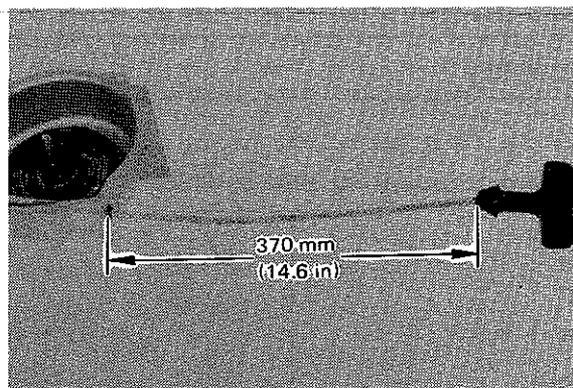
1. Install the starter spring in the starter case.



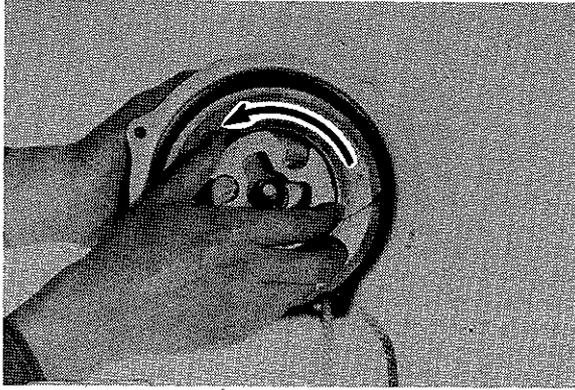
NOTE:

1. It is necessary to wind the spring to a small size before installing it in the starter case.
2. Be careful not to install the spring in a wrong way.
3. Hook the loop on the outer end of the spring onto the spring hook in the starter case. Then thoroughly grease the spring.

2. Wind the starter rope around the sheave drum, and put it into the starter case. Hook the knot on the rope end onto the cut in the sheave drum (as illustrated), and wind the rope around the sheave drum in the direction of the arrow, leaving about 370 mm (14.6 in). The other end of the rope is connected to the starter handle.



3. Bring the rope end out of the cut in the sheave drum, and turn the sheave drum 4 turns counterclockwise to give the starter spring preload. Pull the starter handle and release it, making sure that the starter handle returns to the housing rope eye.



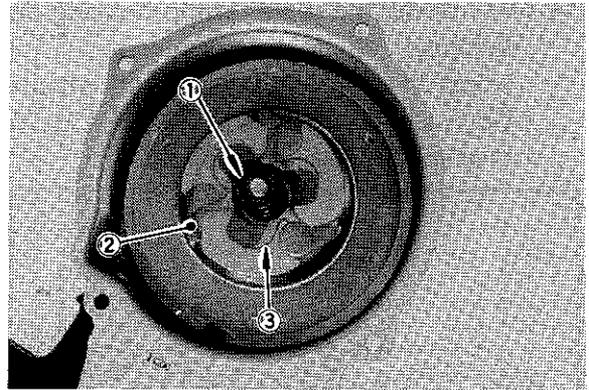
- Place the drive pawl, return spring, drive plate spring, drive plate and tighten the thrust washer and nut.

NOTE:

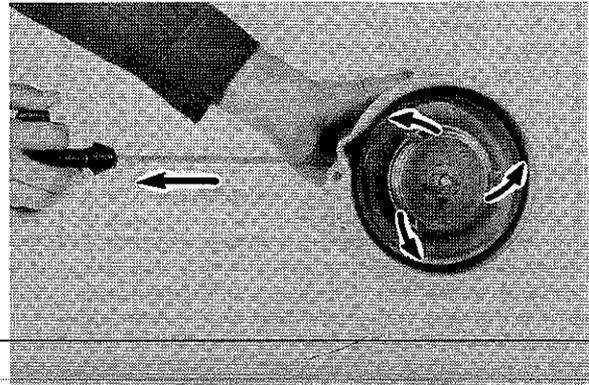
Grease the pivot of the drive pawl.

Tightening torque:
10 Nm (1.0 m-kg)

- After the completion of assembly, check the starter for smooth operation. Pull out the starter rope about 80 ~ 130 mm (3 ~ 5 in), and make sure that the starter pawl moves out of the drive plate.



1. Drive plate spring 2. Drive pawl 3. Return spring

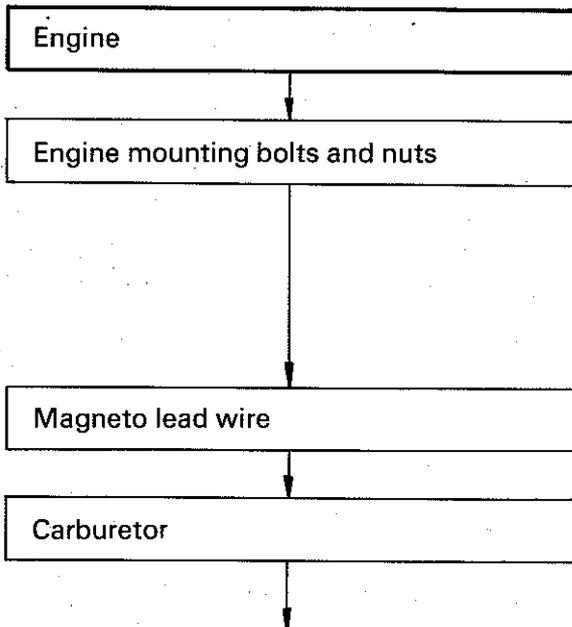


- Install the starter assembly on the crankcase.

Tightening torque:
7 Nm (0.7 m-kg)

G. Engine remounting

Install the engine as follows:



NOTE:

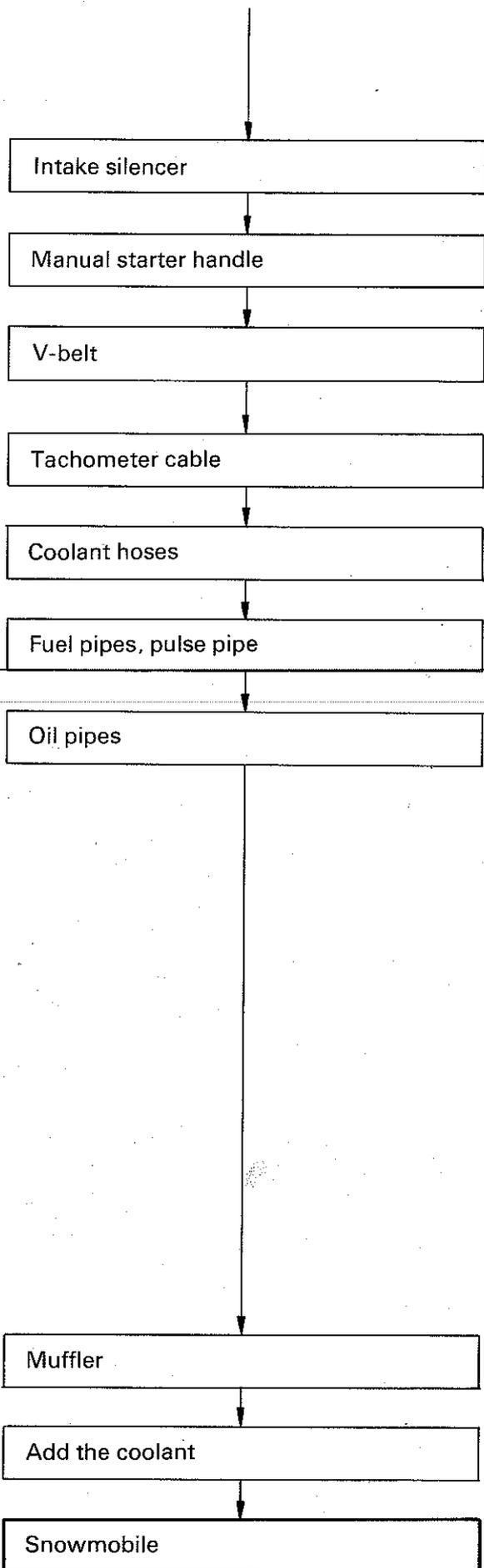
Refer to "5-1-A Sheave adjustment".

CAUTION:

Take care not to pinch the wire and pipes between the engine and frame.

NOTE:

For adjusting, see "4-1 Carburetor".
For routing, see CABLE ROUTING DIAGRAM.

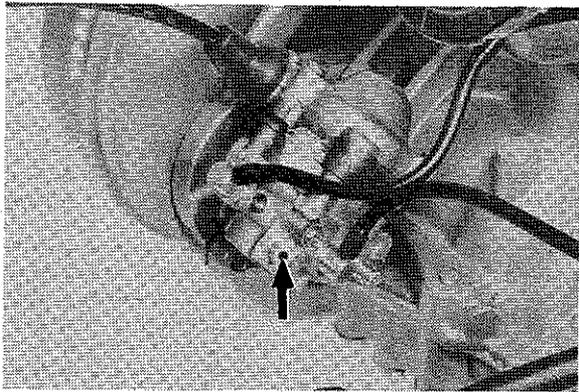


WARNING:
By turning out the throttle lever 2 or 3 turns, make sure it operates correctly.

NOTE:
For inspection, see "5-1-C V-belt".

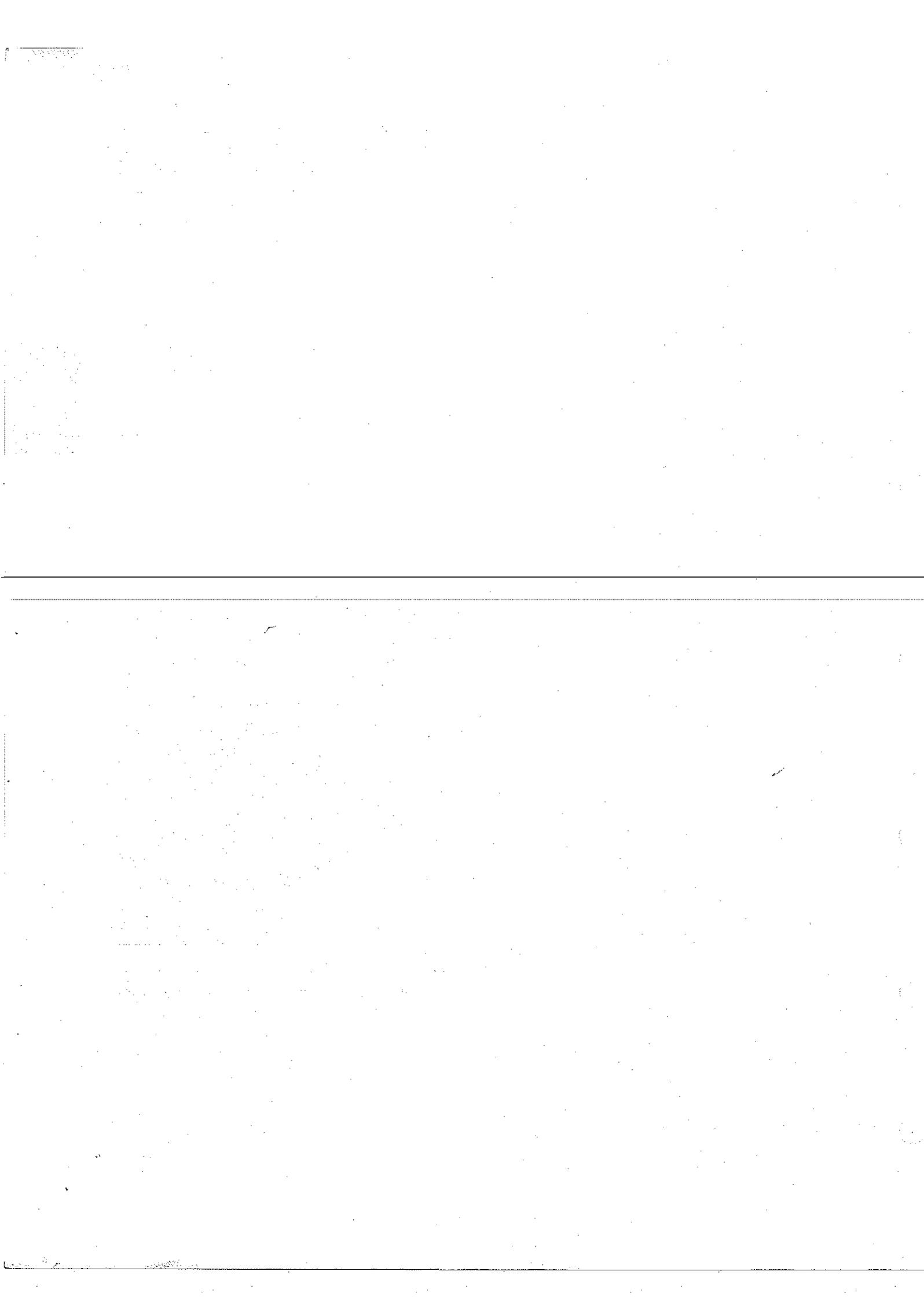
ENGINE

CAUTION:
The oil pipe, in which the oil filter is installed, must be correctly connected to the oil pump.



NOTE:
After installing oil pipe, the autolube system must be bled. (Refer to 2-2-B-4 Air bleeding).

NOTE:
Refer to 3-1-D Replenishing the coolant.



CHAPTER 3. COOLING SYSTEM

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CHAPTER 3. COOLING SYSTEM

3-1. COOLANT

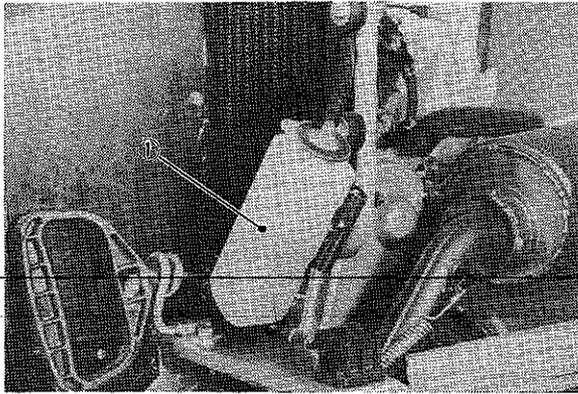
A. Coolant level

—WARNING:

Do not remove the radiator cap when the engine and radiator are hot.

Check the coolant level in the reservoir tank when the engine is cold.

If the reservoir tank level is low, add coolant. (Refer to D. Replenishing coolant).



1. Reservoir tank

B. Coolant type

The coolant is a mixture of tap water and antifreeze. You may use an antifreeze sold in the market, but the coolant should be prepared by taking into account the relation between the mixing ratio and freezing point.

Cooling system capacity:
2500 cm³

When the mixing ratio of tap water to antifreeze is 1 : 1 (50% water 50% antifreeze), the freezing point is -40°C (-40°F).

This mixture can be used in almost all snowmobile conditions.

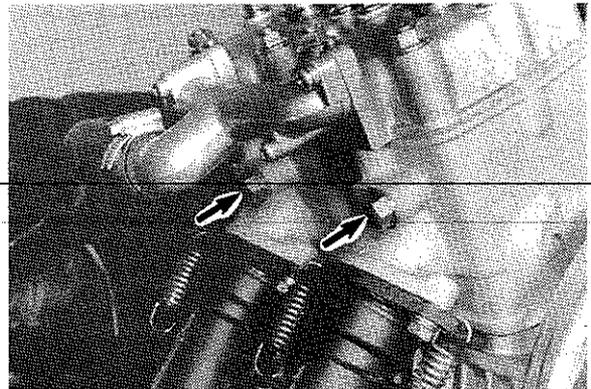
—CAUTION:

- 1) In an area where the temperature is below -40°C (-40°F), the water/antifreeze mixing ratio should be 2 : 3 (40% water 60% antifreeze).
- 2) Do not use water containing impurities or oil.

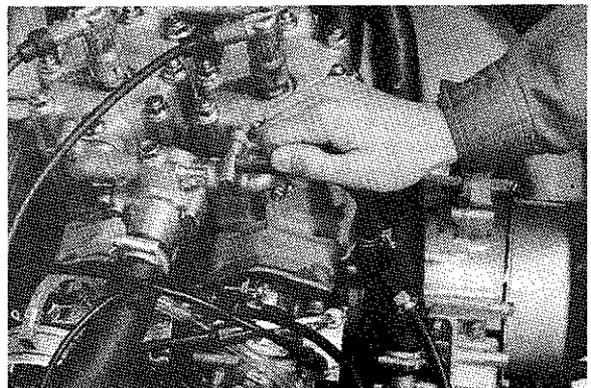
C. Draining coolant

1. When the coolant is still hot, slowly loosen the radiator cap to lower the pressure in the radiator. Take care not to allow the coolant to spout out.
2. Remove the drain bolt on the exhaust side of the cylinder, and let it run into a container so that the cylinder head and cylinder water jackets and radiator are completely drained off.

Drain bolt tightening torque:
30 Nm (3.0 m·kg)



3. The coolant in the heat exchanger and water pump located below the drain bolt should be drained. To drain, remove the by-pass pipe secured to the thermostat housing by the clip, and hold the by-pass pipe end facing downward.

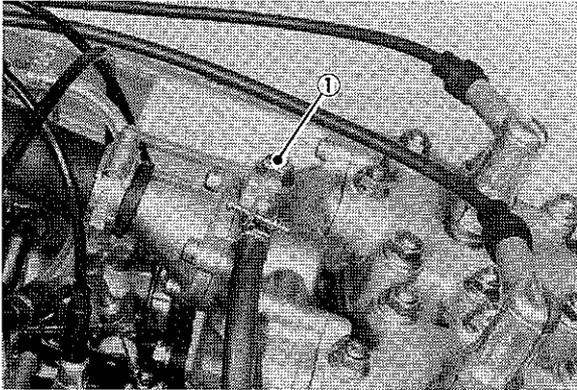


D. Replenishing coolant

NOTE:

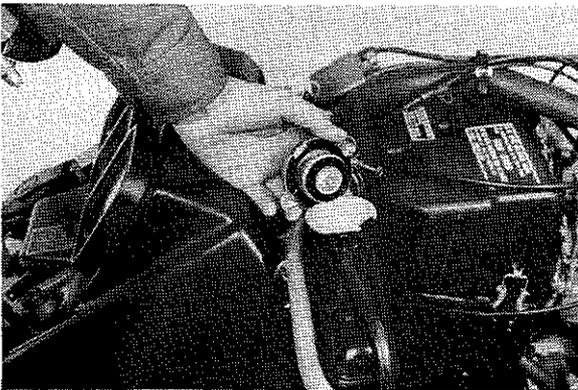
Before pouring the coolant into the radiator, check the cooling system for damage, loose joints or leaks.

1. Loosen the air bleeder bolt.

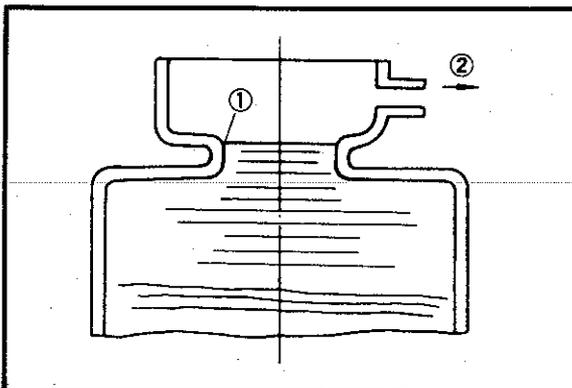


1. Bleeder bolt

2. Remove the radiator cap, and add coolant until the coolant begins to flow out the air bleeder bolt hole (that is, all the remaining air is forced out).



3. Tighten the air bleeder bolt, and add the coolant up to the specified level. Start the engine.



1. Coolant level

2. Breather pipe

4. After starting the engine, the coolant level will go down. Add coolant while keeping the engine running.
5. When the coolant level in the radiator becomes stable, stop the engine. Loosen (do not remove) the bleeder bolt located above the thermostat valve and let the air out. Add coolant to radiator again up to the level line shown in the illustration.
6. Repeat steps 4 and 5 above until the coolant level in the radiator becomes stable. Tighten bleeder bolt.
7. Start the engine and keep it running at 3,000 r/min until thermostat valve opens. The thermostat valve opens at 60 ~ 65°C. If you look into the radiator, you can see when the valve opens, that warm coolant will start flowing into the radiator.
8. Add coolant until the reservoir tank is filled half. The air remaining in the system will be expelled through the radiator cap.

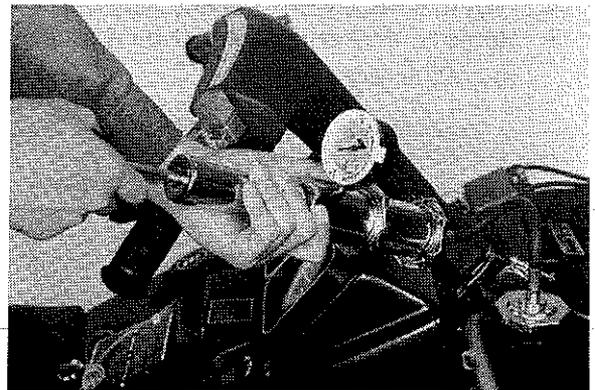
CAUTION:

Always check coolant level, and check for coolant leakage before starting engine.

3-2. COOLING SYSTEM CHECK

A. Cooling system check

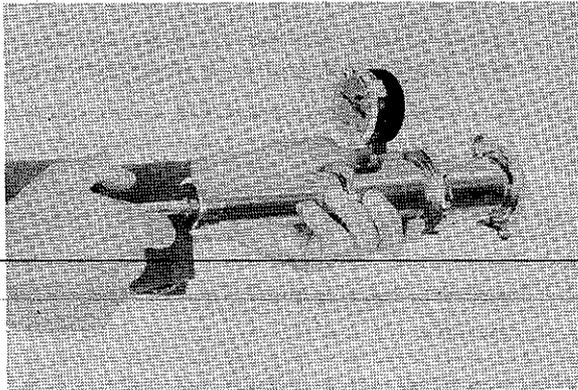
1. Remove the radiator cap, and install a pressure gauge.



- Apply 10 bar (1.0 kg/cm²) pressure, and observe the gauge to check whether pressure drops or not. If the pressure shows a drop, the cooling system is leaky. Repair as required. (Refer to "3-3 Radiator" or below.)

B. Radiator cap check

Using a pressure gauge, inspect the radiator cap pressure and vacuum valve for spring tension and seating condition. If the valve opens at a pressure level below the specified value or otherwise defective, replace the radiator cap.



Valve opening pressure:
8 ~ 10 bar (0.8 ~ 1.0 kg/cm²)

3-3. RADIATOR

A. Removal

- Drain the coolant. (Refer to "3-1-C Draining coolant".)
- Remove the coolant hoses.
- Remove the radiator stay bolts, and remove the radiator.



B. Inspection

- In very dusty conditions, the radiator tube system should be kept clean by blowing through with compressed air from the engine side.
- Check the radiator for leakage and damage. Repair as necessary.
- Check the coolant hoses for cracks and damage. Replace as required.

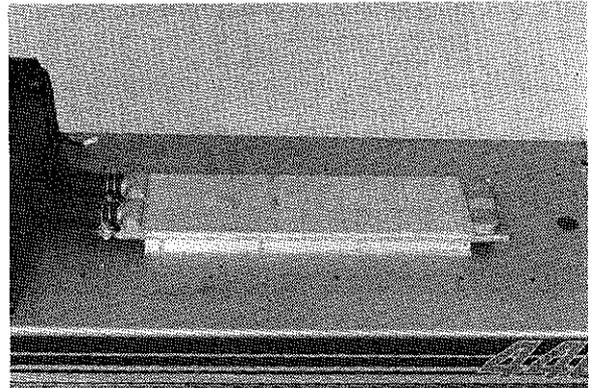
C. Installation

- Install the radiator and coolant hoses.
- Inspect the cooling system. (Refer to "3-2-A Cooling system check".)
- Fill with the coolant. (Refer to "3-2-D Replenishing coolant".)

3-4. HEAT EXCHANGER

A. Removal

- Drain the coolant. (Refer to "3-1-C Draining coolant".)
- Remove the slide rail suspension assembly. (Refer to "5-3 SUSPENSION".)
- Remove the seat assembly.
- Remove the coolant hoses and rivets securing the heat exchanger.



- Remove the heat exchanger.

B. Inspection

Check the heat exchanger for cracks, broken fins or leakage. Replace as required.

C. Installation

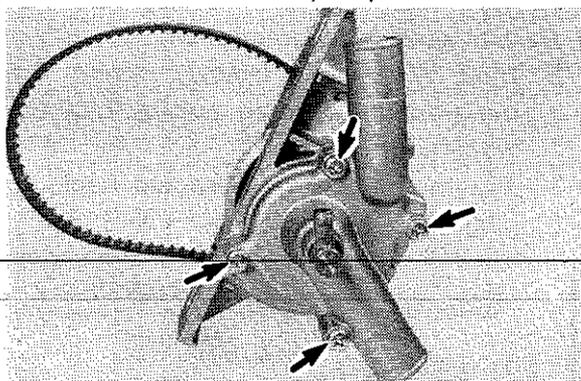
- Secure the heat exchanger to the center of the frame with new rivets.
- Install the coolant hoses.
- Inspect the cooling system. (Refer to "3-2-A Cooling system check".)

4. Install the seat and slide rail suspension assembly. (Refer to "5-3 SUSPENSION".)
5. Fill with the coolant. (Refer to "3-2-D Replenishing coolant".)

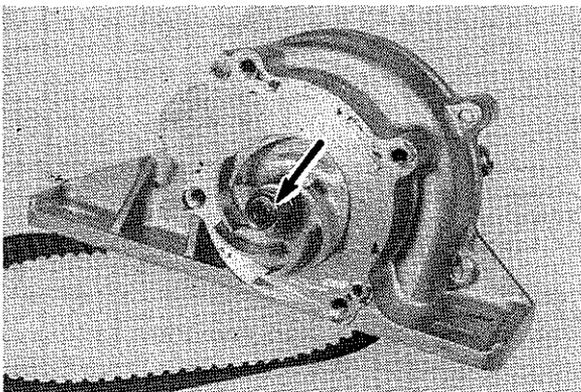
3-5. WATER PUMP

A. Disassembly

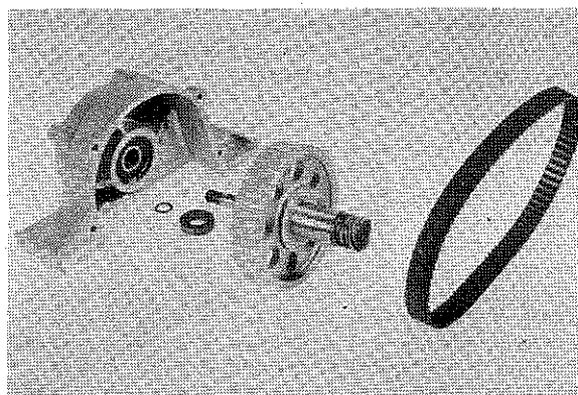
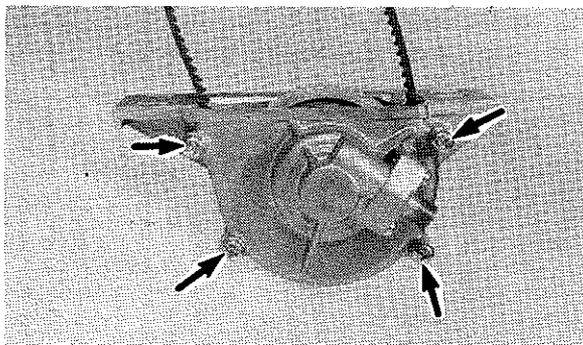
1. Drain the coolant. (Refer to "3-1-C Draining coolant".)
2. Remove the water pump assembly from the engine. (Refer to "2-1-D Water pump".)
3. Remove the water pump cover.



4. Remove the impeller nut, and remove the impeller and collar.



5. Remove the housing, and remove the impeller shaft, driven water pump pulley and belt.

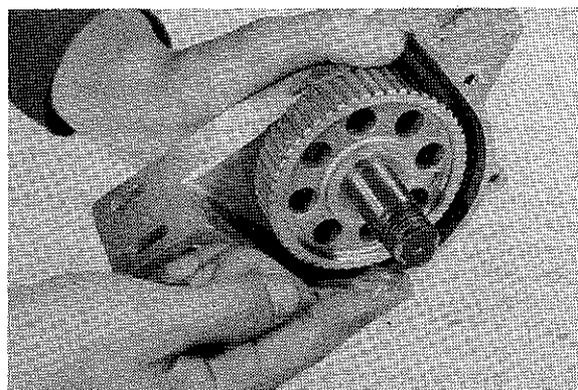


B. Inspection

1. Remove the deposits from the impeller and water pump cover.
2. Check the impeller for cracks and damage. Replace as required.
3. Check the oil seal and bearing for damage and wear. Replace as required.
4. Check the water pump belt for damage and wear. Replace as required.

C. Reassembly

1. Coat the impeller shaft gear with grease.



2. Install the housing together with collar, impeller shaft, driven water pump pulley and belt.

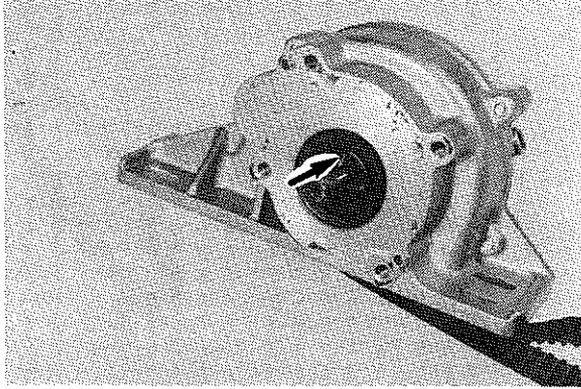
Tightening torque:

7 Nm (0.7 m·kg)

3. Apply a grease to impeller shaft inside the housing, and install the O-ring and collar.

NOTE:

Thoroughly wipe off the grease from the collar.



4. Install the impeller.

Tightening torque:
25 Nm (2.5 m·kg)

5. Coat the mating surfaces of water pump housing and cover with YAMAHA BOND #4, and install a new gasket.
6. Install the water pump cover.

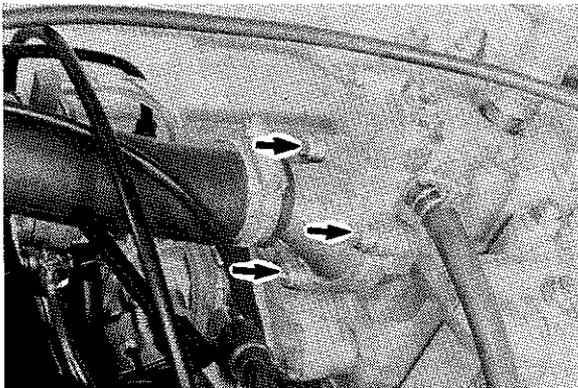
Tightening torque:
7 Nm (0.7 m·kg)

7. Install the water pump assembly on the engine, and adjust the belt tension. (Refer to "2-2-F Water pump".)
8. Inspect the cooling system. (Refer to "3-2-A Cooling system check".)
9. Fill with the coolant. (Refer to "3-2-D Replenishing coolant".)

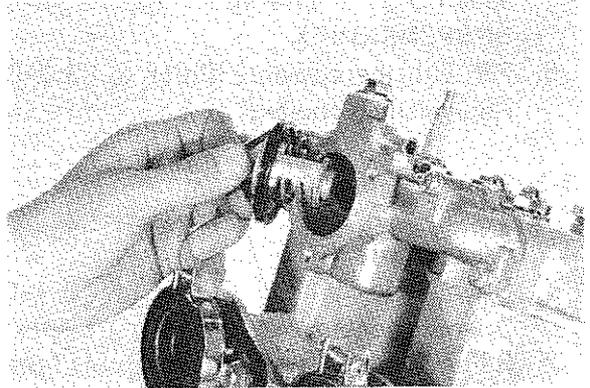
3-6. THERMOSTAT

A. Removal

1. Drain coolant to below thermostat level by loosening cylinder drain bolt.
2. Remove the coolant hose and the thermostat cover.

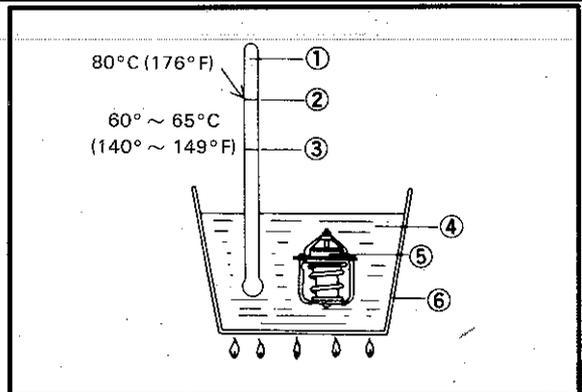


3. Remove the thermostat.



B. Inspection

1. Suspend thermostat in a vessel of water with a reliable thermometer.
2. Heat the water slowly, noting the thermometer reading and stirring the water continually.
3. The thermostat valve should begin to open at 60 ~ 65°C (140 ~ 149°F).



- | | |
|------------------|---------------|
| 1. Thermometer | 4. Water |
| 2. Full open | 5. Thermostat |
| 3. Begin to open | 6. Vessel |

NOTE:

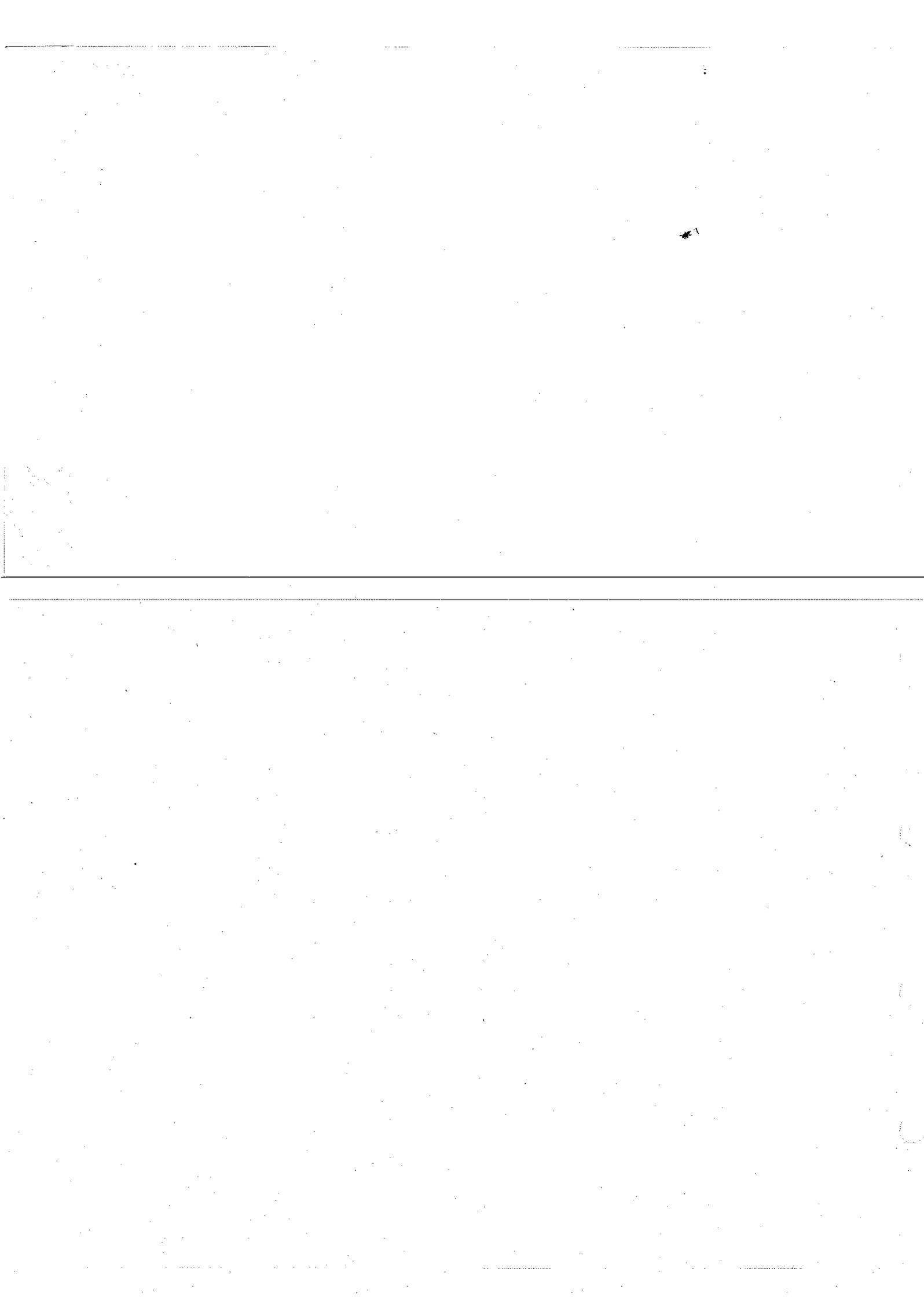
Thermostats are sealed and their setting is specialized work. Always replace if doubt exists. A faulty unit could cause serious overheating.

C. Installation

1. Install the thermostat and cover.

Tightening torque:
7 Nm (0.7 m·kg)

2. Install the coolant hose.
3. Inspect the cooling system. (Refer to "3-2-A Cooling system check".)
4. Fill with the coolant. (Refer to "3-2-D Replenishing coolant".)



CHAPTER 4. CARBURETION

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CHAPTER 4. CARBURETION

4-1. CARBURETOR

A. Carburetor tuning

1. Standard specification

The carburetor is set at the factory to run at temperatures of 0°C to -20°C (32°F to -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 pistons will not be holded or seized.

Main jet	#260
Power jet	#115
Pilot jet	#85
Pilot screw	2.0 turns out
Starter jet	#160
Float height	30 ± 1 mm (1.18 ± 0.04 in)
Idling engine speed	1,500 r/min

CAUTION:

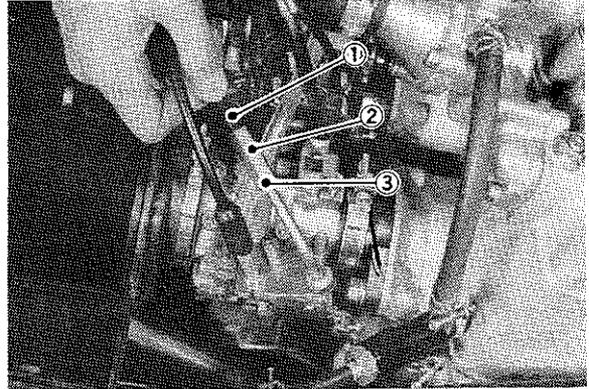
If the air silencer box is removed from the carburetors, the change in intake pressure will create a **LEAN MIXTURE** that may result in severe engine damage. The air silencer box has no effect on performance characteristics and it must be secured to the carburetor during carb tuning and adjustment.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

2. Throttle cable and throttle valve opening

- a. Set the throttle cable adjuster so that the free play between the throttle cable outer tube end and adjuster when the throttle is closed (idling) as specified below:

Free play between outer tube end and adjuster:

0.5 ~ 1.0 mm (0.2 ~ 0.4 in)

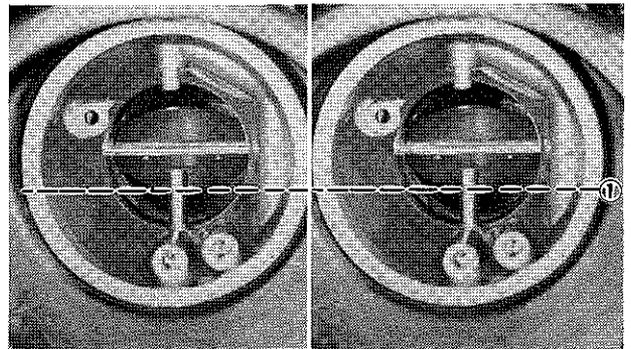


1. Outer wire 2. Adjuster 3. Lock nut

- b. Remove the intake air silencer, and pull the throttle lever while looking into the bores of both the right and left carburetors. Set the throttle cable adjuster so that both throttle valves to open at the same time.

Also make certain that the throttle valves reach full throttle position at the same time.

- c. Repeat the operation specified in a. and b. above. When the adjustment is complete, be sure to install the intake air silencer.



1. Check to see synchronising

WARNING:

Throttle cable must not be lubricated in any way. It must be routed correctly to avoid throttle problems that may lead to an unsafe condition during operation.

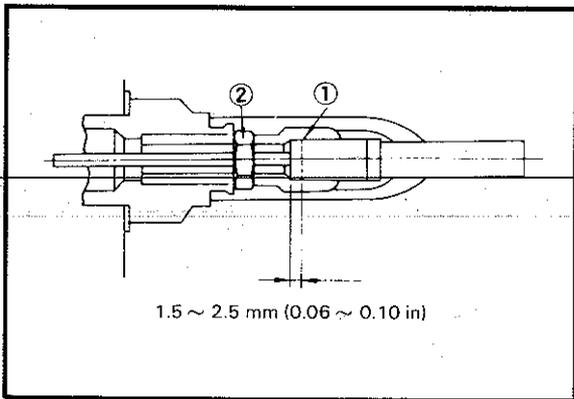
3. Starter cable adjustment

Pull the starter cable outer tube upward, and adjust the free play between the outer tube end and adjuster to specification by turning the adjuster. After the adjustment, tighten the lock nut and replace the rubber cap to keep the lock nut free from dust and water.

NOTE:

Starter cable free play must be adjusted after the cable is correctly routed. (Refer to Cable routing diagram.)

Lock nut tightening torque:
0.08 m·kg (0.6 ft·lb)



- 1. Adjuster
- 2. Lock nut

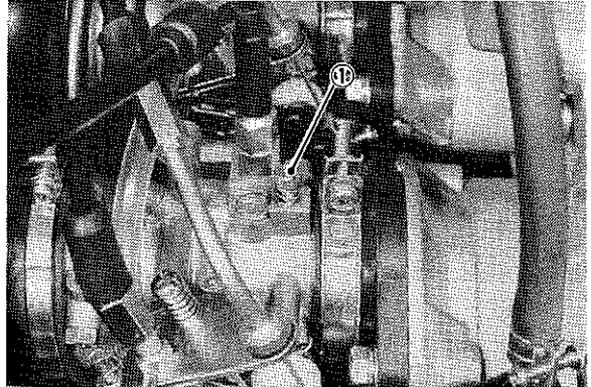
Free play between outer tube end and adjuster:
1.5 ~ 2.5 mm (0.06 ~ 0.10 in)

- 4. Oil pump cable adjustment
Refer to "2-2-B-5. Pump cable adjustment".
- 5. Low speed tuning
The carburetor is built so that low speed tuning can be done by adjusting the throttle stop screw and pilot screw.

CAUTION:
Always install air silencer before making tuning adjustment. High performance tuning cannot be done without the silencer. Engine damage may result from attempting to tune without the silencer installed.

- a. Tighten the pilot screw lightly, and back it out from its lightly seated position.

Standard pilot screw (turns out):
2.0



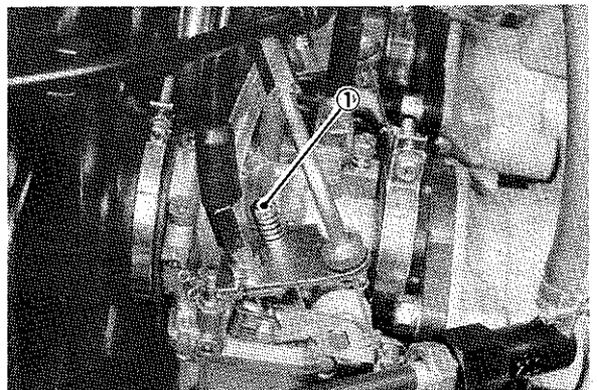
1. Pilot screw

- b. Start the engine by pulling the starter lever, and fully warm up the engine.
- c. Set the throttle stop screw so that the engine idles at the specified speed.

Idling engine speed: 1,500 r/min

NOTE:

Make certain that both throttle valves are adjusted to the same opening.



1. Throttle stop screw

NOTE:

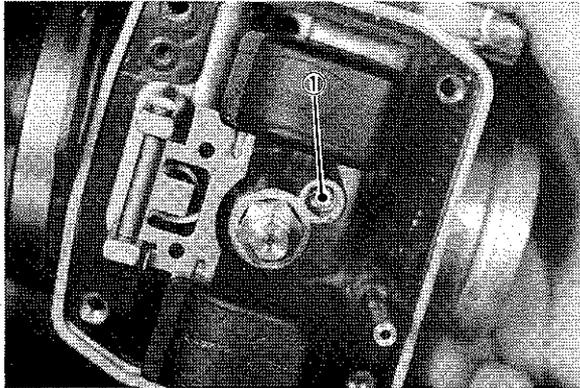
If the engine shows poor performance in elevation or in an extremely cold area or when it is suddenly accelerated or run at low speeds, proceed as follows:

- 1. Replace the pilot jets according to "Jet setting chart" (See next paragraph).

Standard pilot jet: #85

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Spare pilot jet: #90, #80



1. Pilot jet

2. Turn the pilot screw in and out 1/4 turn or less each time, and set it in a position where the engine idles faster.
3. Follow step C in the preceding paragraph.

6. Main circuit tuning
No adjustment is normally required, but adjustment is sometimes necessary depending on temperatures and/or altitude. (Refer to Jet setting chart.)

[Jet setting chart]

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	MJ #260 PJ #85		MJ #250 PJ #85		MJ #240 PJ #85	
Up to 1000 m (3000 ft)	MJ #240 PJ #85		MJ #230 PJ #85		MJ #220 PJ #85	
Up to 2000 m (6000 ft)	MJ #210 PJ #95		MJ #200 PJ #95		MJ #190 PJ #95	
Up to 3000 m (10000 ft)	MJ #180 PJ #105		MJ #170 PJ #105		MJ #160 PJ #105	

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- a. Run the engine at high speeds, and make sure the engine operates smoothly.
- b. Check both spark plugs and, depending on the discoloration of each spark plug, the main jet should be adjusted on the basis of the following table. (Refer to spark plug color samples.)

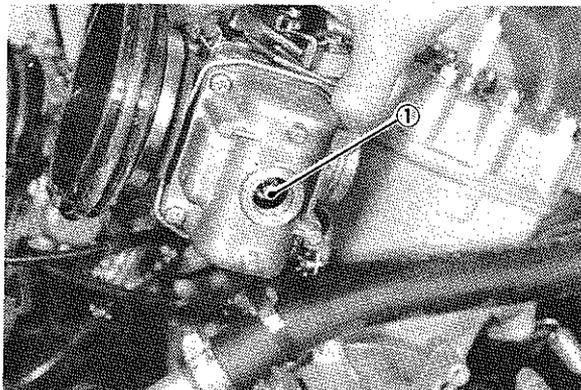
Standard main jet: #260

Spare main jet:
#270, #250, #240, #230

	Spark plug color
No. 1	Good (Carburetor is tuned properly.)
No. 2	Bad (Mixture is too rich.) Replace main jet with one-step smaller one.
No. 3	Bad (Mixture is too lean.) Replace main jet with one-step larger one.
No. 4	Bad (Due to too lean a mixture, piston is holed or seized.) Replace the piston and spark plug. Tune the carburetor again, starting with low-speed tuning.
No. 5	Bad (Due to too lean a mixture, the engine knocks.) Check the piston for holes or seizure. Check the cooling system, gasoline octane rating and ignition timing. After replacing the spark plug, tune the carburetor again, starting with low-speed tuning.

No. 6

Bad (Due to 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.



1. Main jet

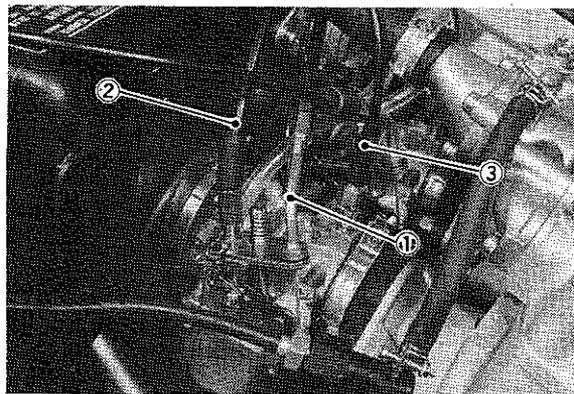
WARNING:

Never remove the main jet cover bolt while the engine is hot. Fuel will flow out of the float chamber which could ignite and cause damage to the snowmobile and possible injury to the mechanic.

Place a rag under the carburetor so fuel does not spread. Place the main jet cover bolt in a clean place. Keep away from fire. After assembling the carburetor, firmly tighten the rubber joint screw. Make sure the throttle outer tube is in place and the throttle cable moves smoothly. Clean the carburetor and allow it to dry.

B. Overhauling

1. Disassembly
 - a. Remove the intake silencer assembly.
 - b. Remove the carburetor from the engine, and disconnect the control cables as follows:
 - 1) Loosen the throttle cable holder screw.
 - 2) Remove the pump cable adjuster from the stay plate, and remove the pump cable from the lever.
 - 3) Remove the cap from the carburetor, together with the starter valve, and disconnect the starter cable.



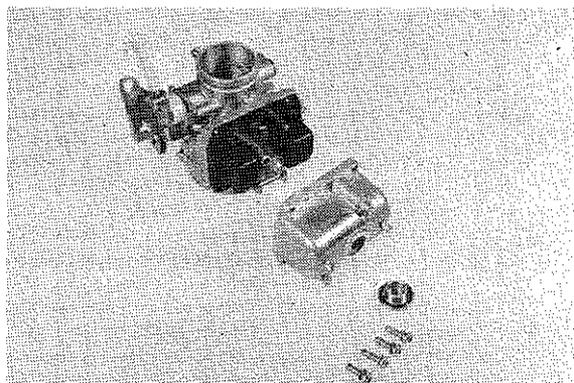
1. Throttle cable 2. Pump cable 3. Starter cable

CAUTION:

When removing the starter cable, take care so that the rubber cap, coil spring and starter cable do not fall off or are not lost. Also use special care not to scratch the rubber seat surface.

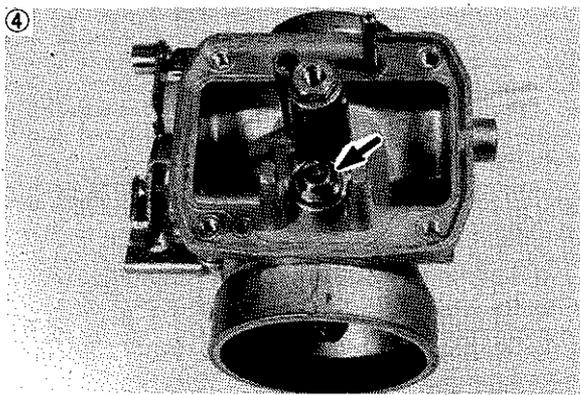
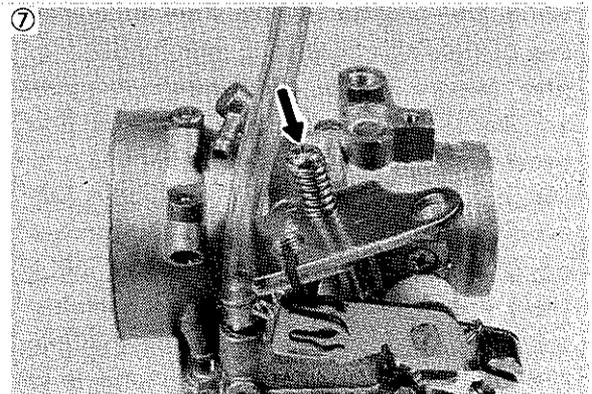
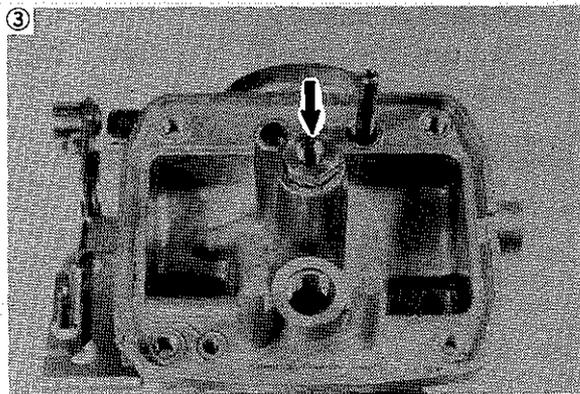
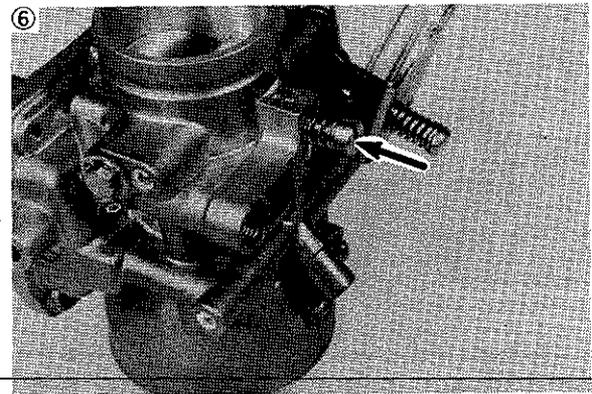
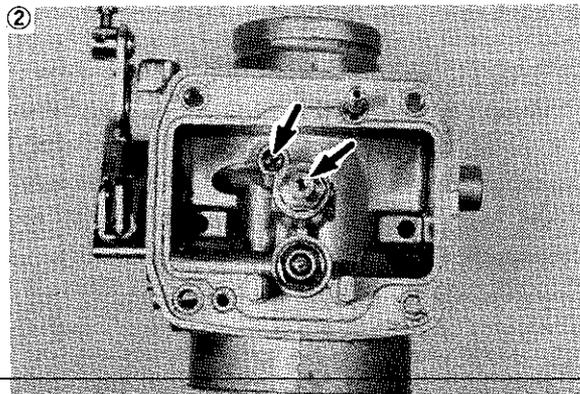
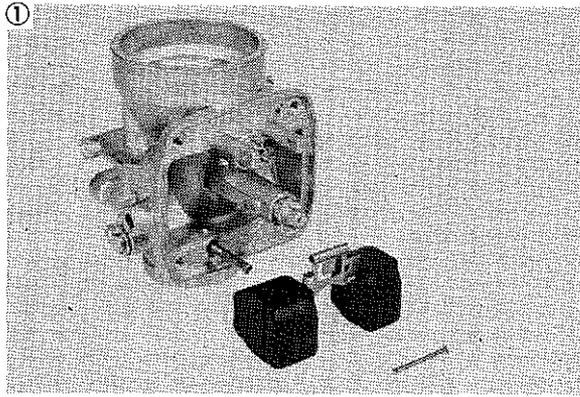
c. Float chamber

- 1) Remove the four screws, together with the float chamber.
- 2) Remove the main jet cover bolt, together with the O-ring.



d. Carburetor body

- 1) Remove the arm pin, together with the float assembly.
- 2) Remove the pilot jet and main jet.
- 3) Remove the main nozzle.
- 4) Remove the valve seat assembly.
- 5) Remove the power jet.
- 6) Remove the pilot screw, together with the coil spring.
- 7) Remove the throttle stop screws, together with the coil spring.



- NOTE:**
1. Hook the clip onto the float arm, and remove the fuel valve while taking care not to drop it.
 2. The fuel valve plays a very important role, so special care should be taken so that the rubber part of the needle is not scratched.
 3. Use care to keep the plastic parts free from shocks, because they could be damaged easily.
 4. Never wash the rubber parts with alcohol or lacquer thinner. Use gasoline.

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CAUTION:

Never attempt to disassemble the following parts.

- 1) Throttle valve
- 2) Throttle shaft

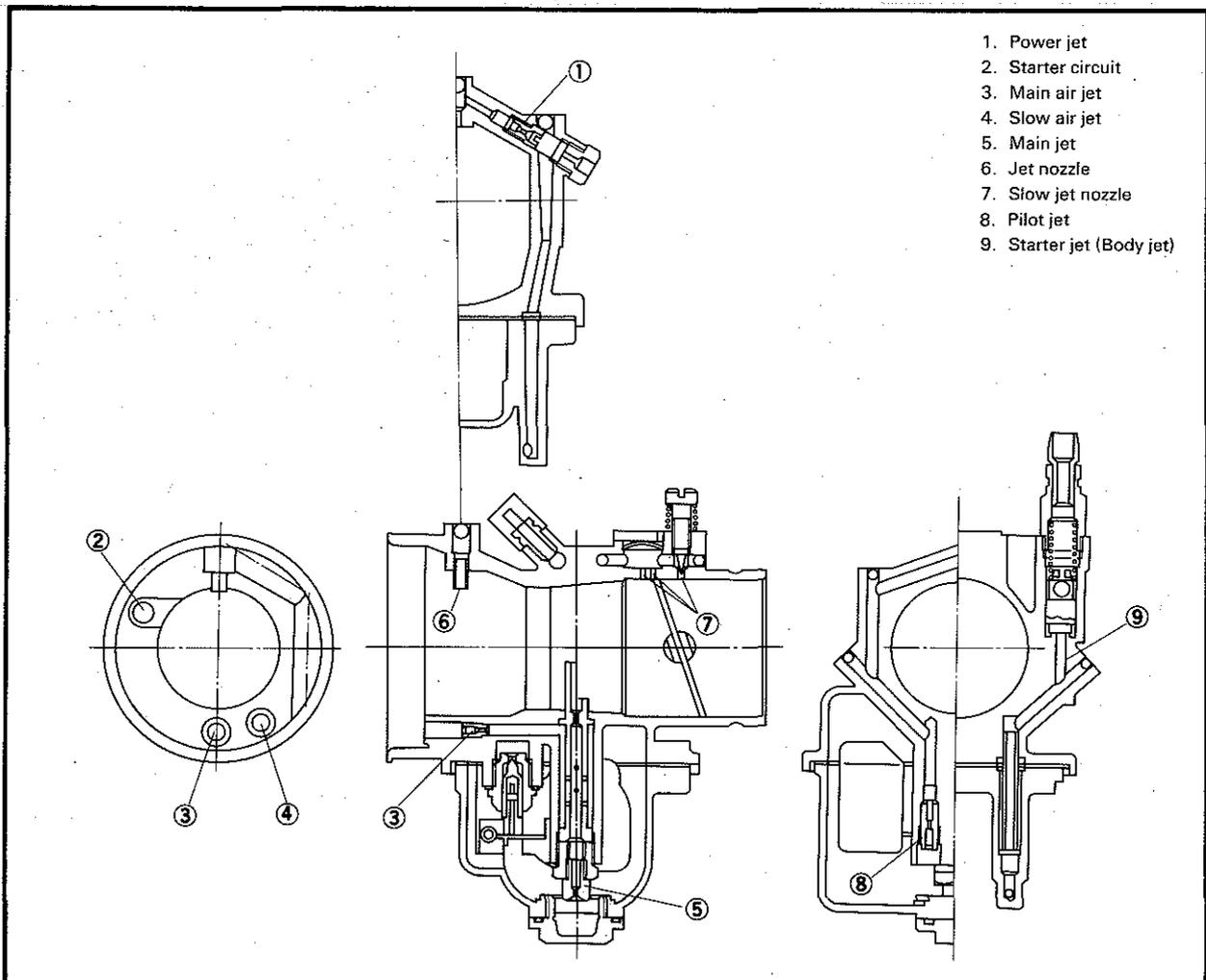
Reason:

- 1) The threaded portion of the screw is clinched after the throttle valve is installed to the throttle shaft so that the screw will not come loose.
- 2) The bypass hole is precision-machined so that the correct distance can be maintained from the end of the throttle valve. Therefore, if the throttle valve is once disassembled, it is difficult to reproduce the original dimensions, and thus engine performance will be adversely affected.

2. Inspection

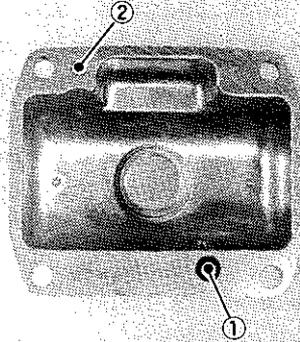
CAUTION:

- 1) Before checking, thoroughly clean all parts in gasoline, and blow the jets, float chamber and fuel passages in the carburetor body with compressed air so the dust and dirt can be removed.
- 2) When washing the carburetor body and float chamber, be sure to use a soft brush.
- 3) When decarbonizing the throttle valve and its adjacent area, take special care not to scratch the throttle valve and throttle bore.
- 4) Never use a hard wire or the like when cleaning jets. It could scratch or deformed jet holes, thus adversely affecting fuel consumption.
- 5) Use care so that all parts are not deformed.



a. Float chamber

- 1) Check the starter jet and power jet circuits for clogging with dust. If clogged, blow them off with compressed air.



1. Starter jet circuit
2. Power jet circuit

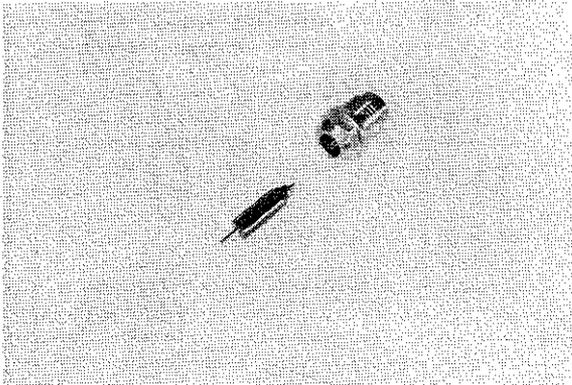
- 2) Blow the float chamber clean of dust and dirt with compressed air.

b. Carburetor body

- 1) Clean the fuel valve seat while taking care not to scratch the seat, and blow it with compressed air.

Check the end of the valve needle and the valve seat for damage.

If damaged, replace the valve needle and valve seat as an assembly.



CAUTION:

A scratched seat could result in the overflow of fuel.

- 2) Check the power jet circuit for clogging. If clogged, blow it with compressed air.

NOTE:

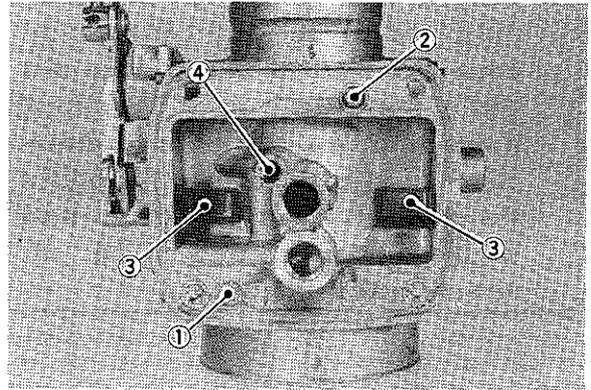
If this circuit is clogged, engine power loss will result at high speed operation.

- 3) Check the starter circuit for clogging with dust. If clogged, blow it off with compressed air.

NOTE:

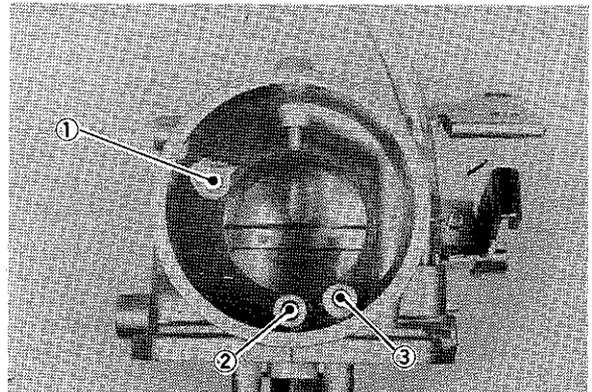
If the starter circuit is clogged, fuel flow will be hindered and hard starting will result.

- 4) Blow the air bent and slow circuits with compressed air.



1. Power jet circuit 3. Air bent circuit
2. Starter jet circuit 4. Slow circuit

- 5) Blow the starter circuit, main air jet and pilot air jet with compressed air.

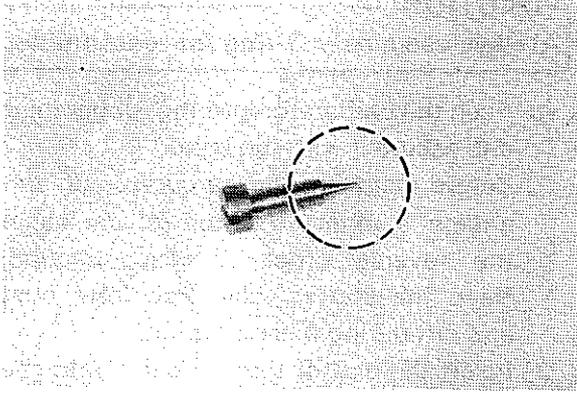


1. Starter circuit 2. Main air jet 3. Pilot air jet

- 6) Blow the main jet, pilot jet, power jet and main nozzle with compressed air.

- 7) Blow the pilot screw clean of dust and dirt with compressed air.

- 8) Check the end of pilot screw for carbon. Check the tapered portion and threaded portion for damage.



3. Reassembly and adjustment

CAUTION:

- 1) Wash all parts in clean gasoline before assembling.
- 2) Always use new O-rings.
- 3) Make sure moving parts rotate or slide smoothly.
- 4) Apply grease to contact surfaces of the throttle shaft.

a. Carburetor body

- 1) Install the main nozzle, main jet, and pilot jet.

Tightening torque:

Main nozzle:	5 Nm (0.5 m-kg)
Main jet:	2 Nm (0.2 m-kg)
Pilot jet:	0.8 Nm (0.08 m-kg)

- 2) Install the power jet and power jet cover bolt.

Tightening torque:

Power jet:	1.8 Nm (0.18 m-kg)
Power jet cover bolt:	4 Nm (0.4 m-kg)

- 3) Install the throttle stop screw and coil spring.

Adjustment: See "Low speed tuning."

- 4) Install the pilot screw and coil spring.

Adjustment: See "Low speed tuning."

NOTE:
The pilot screw must not be tightened excessively.

- 5) Install the valve seat.

Tightening torque:
5 Nm (0.5 m-kg)

- 6) Put the valve needle into the valve seat.

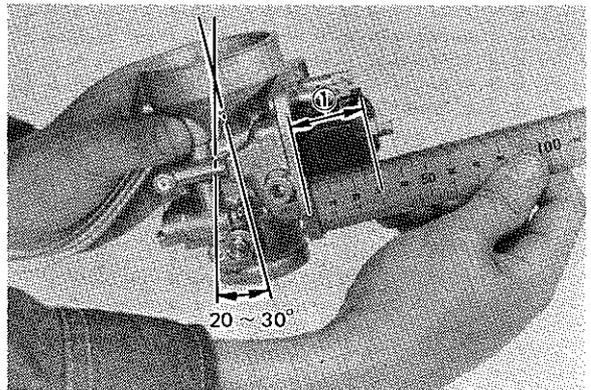
NOTE:
After assembling, take care not to allow dust and dirt to enter.

- 7) Float level

- (1) Reinstall components, except for the float chamber.
- (2) Incline the carburetor at 20 ~ 30° (so that the end of the float valve does not hang down of float weight), and measure the distance from the mating surface of the float chamber and carburetor to the top of the float using a gauge.

Float level:
30 ± 1 mm (1.18 ± 0.04 in)

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

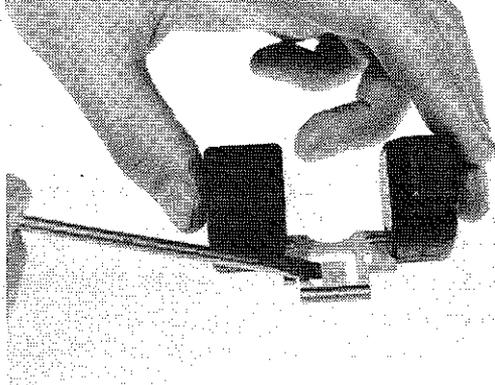


1. Float level

- (3) If the float level is not within the specified range, check the valve seat and needle valve. And replace any damaged part.

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- (4) If any part is in good condition but float level is not within the specified range, correct float level by bending the float arm tang slightly.

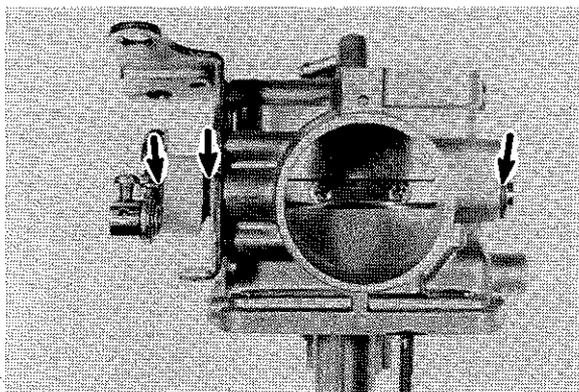


CAUTION:

After installing the carburetor body, be sure to apply grease to the following parts as an anti-freeze measure:

Recommended low temperature grease:
**ESSO Beacon 325 or
 Aero Shell #7**

- 1) Throttle return spring, throttle shaft collar.
- 2) Space between carburetor body and throttle shaft (at 2 places).
- 3) Throttle lock washer, E-clip.
- 4) Wire holder attached to the throttle valve.



b. Float chamber

- 1) Screw the main jet cover bolt (with O-ring) into the float chamber.
- 2) Install the O-ring to the float chamber, and install it to the carburetor body.

CAUTION:
Always use a new O-ring for reassembly.

- c. Push the carburetor into the rubber joint, and secure it with the band.
- 1) Before installing the carburetor on the engine, connect the control cables in the reverse order of disconnection. Keep the starter valve free from dust and dirt during this operation.
- 2) Insert the end of throttle cable into the hole in the throttle lever, adjust the play of cable, and secure it with screw. (See "Throttle cable adjustment.")

NOTE:

By turning the throttle lever to the full-open position two or three times, make sure it operates correctly.

- 3) Make sure the starter lever is fully pushed in, and connect the starter cable and spring to the starter valve, and install the valve in the carburetor. Adjust the starter cable. (See "Starter cable adjustment.")

Tightening torque:
3.5 Nm (0.35 m·kg)

NOTE:

By pulling the starter lever two or three times after installation of the starter cable, check the operation of the starter valve.

- 4) Install the fuel pipe to the carburetor. Next, install the clip firmly.
- d. Install the intake silencer.

C. Troubleshooting

This troubleshooting guide relates only to the carburetor. Making an adjustment of the carburetor, check the engine and electrical system. If no defect is found, consult this troubleshooting guide.

CAUTION:
1) When disassembling the carburetor, use care so that parts don't fall off or are not lost. Also don't strike the

carburetor with a hard tool. Dust should be blown off with compressed air.

- 2) When reinstalling the throttle cable, make sure the throttle valve can be fully opened and closed, and make an adjustment.

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 home position.
	Fuel passage is clogged or frozen	Clean	Parts other than carburetor <ul style="list-style-type: none"> • Clogged fuel tank air vent, clogged fuel filter, or clogged fuel passage Carburetor <ul style="list-style-type: none"> • Clogged or frozen air vent clogged valve • If water collects in float chamber, clean (Also check for ice.)
	Overflow	Correct	See "Overflow"
Poor idling (Relative troubles) <ul style="list-style-type: none"> • Poor performance at low speeds • Poor acceleration • Slow response to throttle • Engine tends to stall 	Improper idling speed adjustment <ul style="list-style-type: none"> • Pilot screw adjustment 	Adjust idling speed	Tighten pilot screw lightly, and check throttle opening. If incorrect, back it out specification. Start the engine and turn pilot 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.
	<ul style="list-style-type: none"> • Throttle stop screw 	Adjust	Tightened to much—Engine speed is higher. Backed out too much—Engine does no idle.
	Damaged pilot screw	Replace pilot screw	
	Clogged bypass hole	Clean	
	Clogged or loose slow jet	Clean and retighten	Remove slow jet, and blow it out with compressed air.
	Air leaking into carburetor joint	Retighten band screw	
	Defective starter valve seat	Clean or replace	
	Overflow	Correct	See "Overflow."
Poor performance at mid-range speeds (Relative troubles) <ul style="list-style-type: none"> • Momentary slow response to throttle • Poor acceleration 	Clogged or loose slow jet	Clean and retighten	Remove slow jet, and blow it out with compressed air.
	Lean mixtures	Overhaul carburetor	See "Overflow."
Poor performance at normal speeds (Relative troubles) <ul style="list-style-type: none"> • Excess fuel consumption • Poor acceleration 	Clogged air vent	Clean	Remove the air vent pipe, and clean.
	Clogged or loose main jet	Clean and retighten	Remove main jet, and blow it out with compressed air.
	Overflow	Check float and float valve and clean	See "Overflow"
Poor performance at high speeds (Relative trouble) <ul style="list-style-type: none"> • Power loss • Poor acceleration 	Starter valve is left open	Fully close valve	Return starter lever to its home position
	Clogged air vent	Remove and clean	
	Clogged or loose main jet	Clean and retighten	Remove main jet, and clean with compressed air, then install.

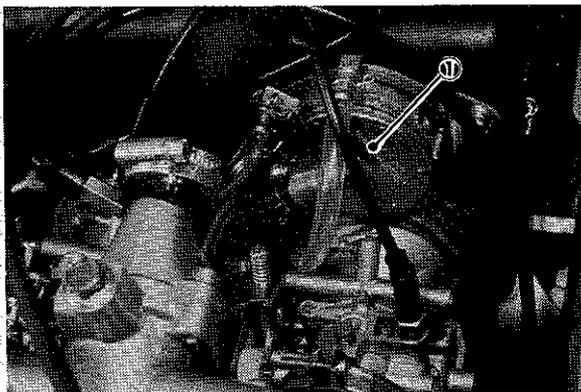
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Trouble	Check point	Remedy	Adjustment
	Clogged power jet	Clean	
	Clogged fuel pipe	Clean or replace	
	Dirty fuel tank	Clean fuel tank	
	Air leaking into fuel line	Check joint and retighten	
	Low fuel pump performance	Repair pump or replace	
	Clogged fuel filter	Replace	
	Clogged silencer outlet	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 • Worn float tang • Worn arm pin • Deformed float arm	If not within the specified range, check the following parts and replace any defective part Replace float Replace arm pin Replace float	Replace float assembly.

4-2. FUEL PUMP

Check to see if fuel moves from tank to carburetor, and if any fuel leaks from pipe joints or fuel pump body.

Replace fuel pump assembly as required.



1. Fuel pump

CHAPTER 5. POWER TRAIN

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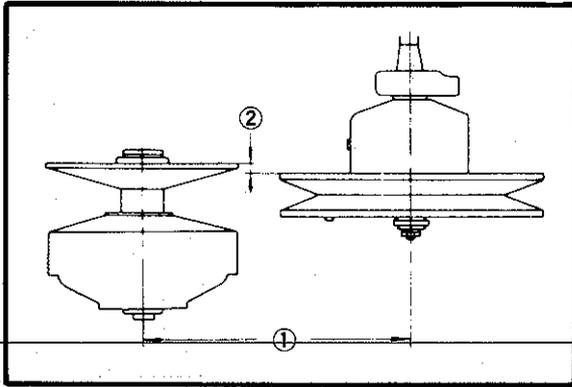
CHAPTER 5. POWER TRAIN

5-1. DRIVE

A. Sheave adjustment

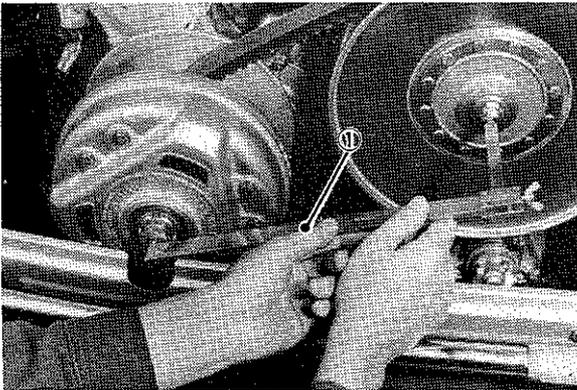
Use the sheave gauge to check the following:

- Center to center distance between the primary and secondary sheaves.
- Off-set between the inside edge of the sheaves.
- Alignment of sheaves.



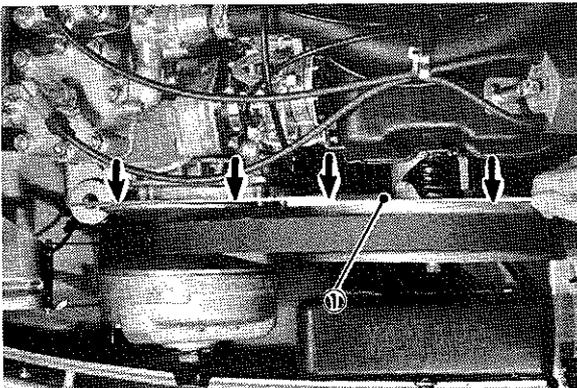
1. Sheave distance
 $270 \begin{smallmatrix} +0 \\ -3 \end{smallmatrix} \text{ mm } (10.63 \begin{smallmatrix} +0 \\ -0.11 \end{smallmatrix} \text{ in})$
2. Sheave off-set
 $5.5 \pm 0.5 \text{ mm } (0.217 \pm 0.020 \text{ in})$

Sheave distance check



1. Sheave gauge

Sheave offset/alignment check



1. Sheave gauge

If any of these is incorrect, proceed as follows:

1. Sheave distance and alignment adjustment
 - a. Loosen the intake silencer securing bolts.
 - b. Loosen the engine mounting nuts.
 - c. Adjust sheave distance and alignment by moving the engine back, forth or sideways.

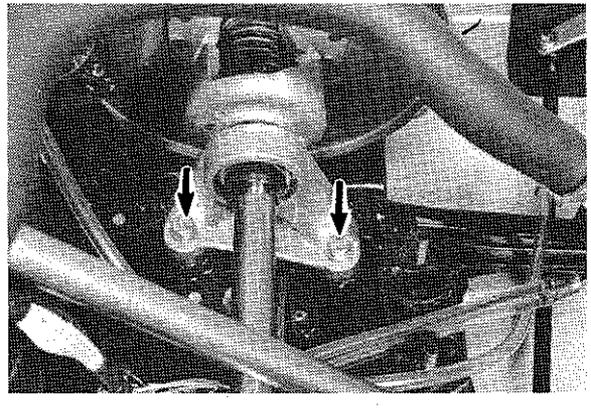
Tool name	Tool No.
Sheave gauge	90890-01875

Sheave distance: $270 \begin{smallmatrix} +0 \\ -3 \end{smallmatrix} \text{ mm } (10.63 \begin{smallmatrix} +0 \\ -0.11 \end{smallmatrix} \text{ in})$

NOTE:

If sheave distance or alignment is not adjusted at above procedure, loosen the two bolts on the bearing housing supporting the secondary shaft and readjust sheave distance and sheave alignment.

Bearing housing-bolt tightening torque: $65 \text{ Nm } (6.5 \text{ m-kp})$
--



- d. Tighten the engine mounting nuts.

Tightening torque: $52 \text{ Nm } (5.2 \text{ m-kp})$

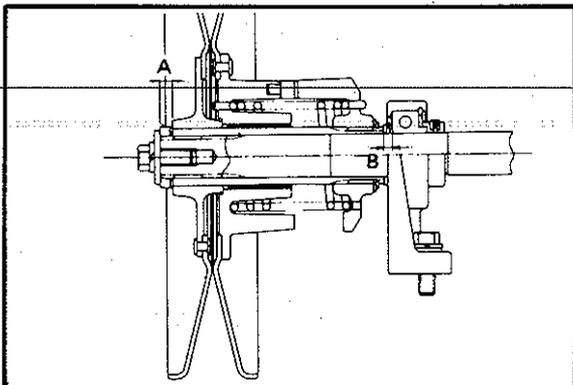
- e. Tighten the intake silencer securing bolts.

Tightening torque:
7 Nm (0.7 m-kG)

2. Sheave off-set adjustment
 - a. Remove the secondary sheave securing bolt and washer.
 - b. Place the sheave gauge over the sheaves, and adjust the sheave off-set and axial play by installing plate washers at points A and B.

Parts name	Thickness
Plate washer (90201-25526)	2 mm (0.08 in)
Plate washer (90201-25527)	1 mm (0.04 in)

Tool name	Tool No.
Sheave gauge	90890-01875



Sheave off-set:
5.5 ± 0.5 mm (0.217 ± 0.020 in)

Axial play:
0 ~ 1.0 mm (0 ~ 0.04 in)

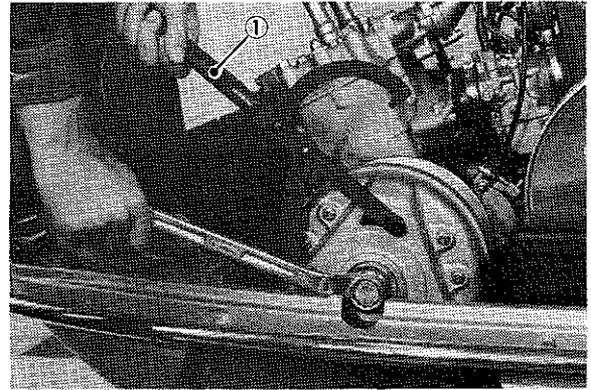
- c. Tighten the secondary sheave securing bolt.

Tightening torque:
50 Nm (5.0 m-kG)

B. Primary sheave

1. Removal
 - a. Remove the V-belt.
 - b. Straighten the lock washer tab, and remove the primary sheave mounting bolt, using the rotor holding tool.

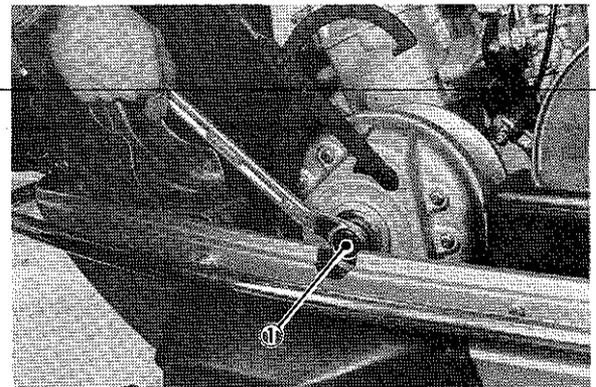
Tool name	Tool No.
Rotor holding tool	90890-01235



1. Rotor holding tool

- c. Remove the primary sheave assembly, using the primary fixed sheave puller and rotor holding tool.

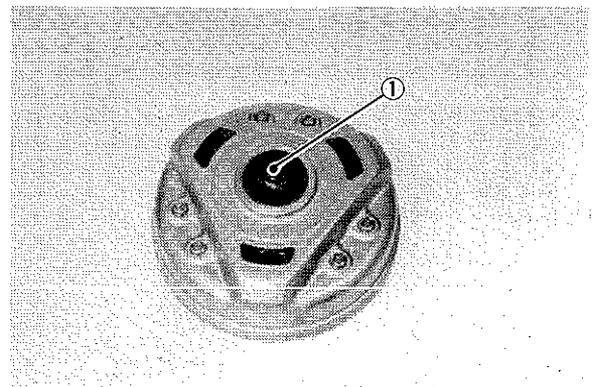
Tool name	Tool No.
Primary fixed sheave puller	90890-01859



1. Primary fixed sheave puller

2. Disassembly
 - a. Install the sheave sub-assembly tool to the primary sheave.

Tool name	Tool No.
Sheave sub-assembly tool	90890-01858



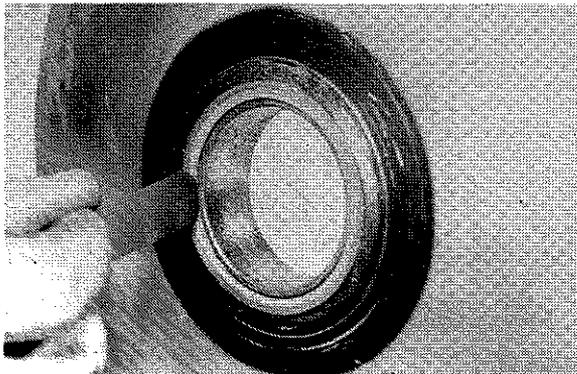
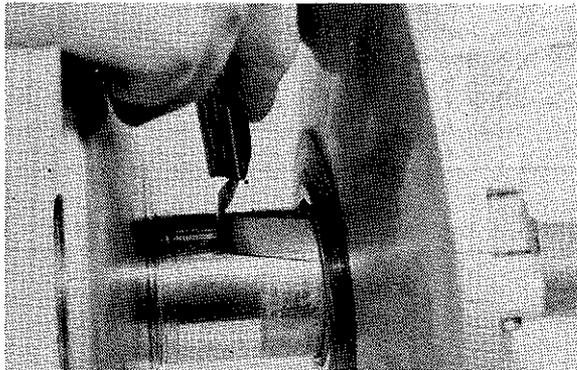
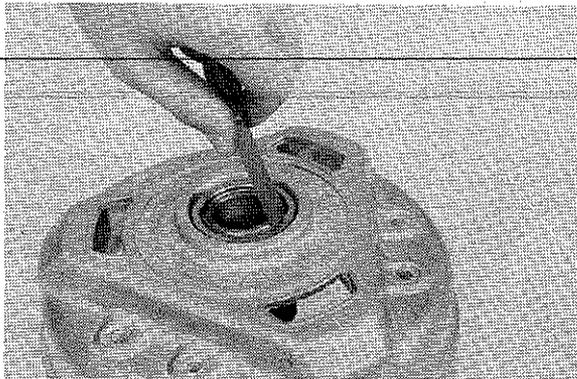
1. Sheave sub-assembly tool

- b. Loosen the six bolts securing the primary sheave cap and sliding sheave.
- c. Remove the sheave subassembly tool. The primary sheave cap and sliding sheave can now be disassembled.

3. Inspection

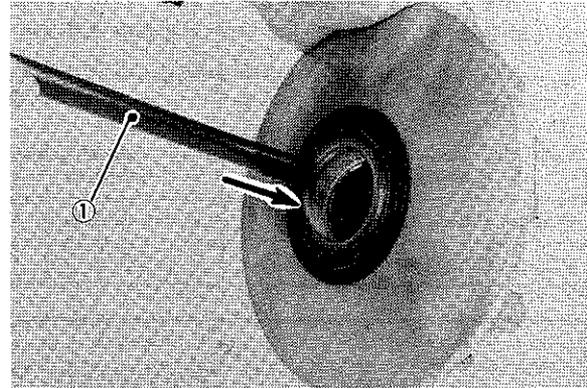
- a. Check the tapered ends of the crankshaft and primary fixed sheave for scratches. If scratched unduly, replace. If scratches are minor, burnish with emery cloth.
- b. Check the primary sheave cap bushing and sliding sheave bushing for wear. If beyond tolerance, replace the bushing.

Bushing clearance, limit		
	Small bushing	Large 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)



NOTE: If bushing is installed tightly, remove the bushing using the bushing tool.

Tool name	Tool No.
Bushing tool	90890-01877

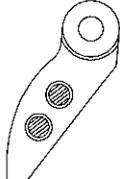
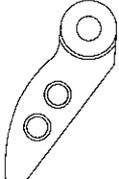


1. Bushing tool

- c. Check the compression spring for fatigue. If excessively fatigued, replace.
- d. Check the spider and roller for smooth movement and wear.
- e. Check both sheaves for warping. If warped, replace.

4. Adjustment

The primary sheave tuning should be set according to the altitude.

Setting parts		Altitude	Sea level (Std.) (Upto 1500 m (5000 ft))	High altitude (About 1500 m (5000 ft) or more)
Spring	Parts No.		90501-60579	90501-55296
	Color code		Red—Brown	Green—Pink
	Set load		39 kg	55 kg
	Spring constant		2.85 kg/mm	1.75 kg/mm
Counter sunk rivet	Parts No.		90261-06015	←
	Set holes			 No rivet

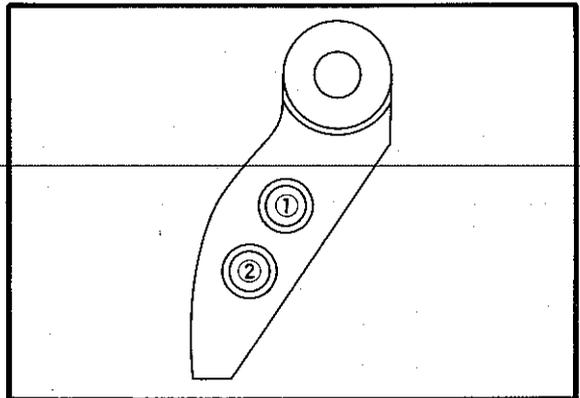
NOTE:

On the sea level (Up to 1500 m), if engine power is poor with snow condition, adjust sheave at the high elevation setting.

a. Compression spring

Clutch engagement rpm must be adjusted to specification using an optional compression spring.

- b. By changing the position and quantity of primary weight rivets, the thrust of weight can be changed, and thus the engine rpm at which the clutch is shifted can also be changed. (As a result, the engine rpm at which the clutch is engaged can be changed.)



5. Reassembly

- a. Adjust the slider button-to-guide clearance by the shims under the each slider button.

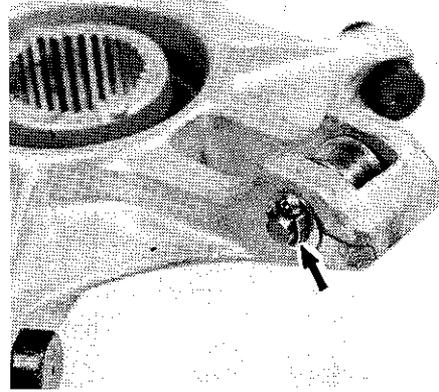
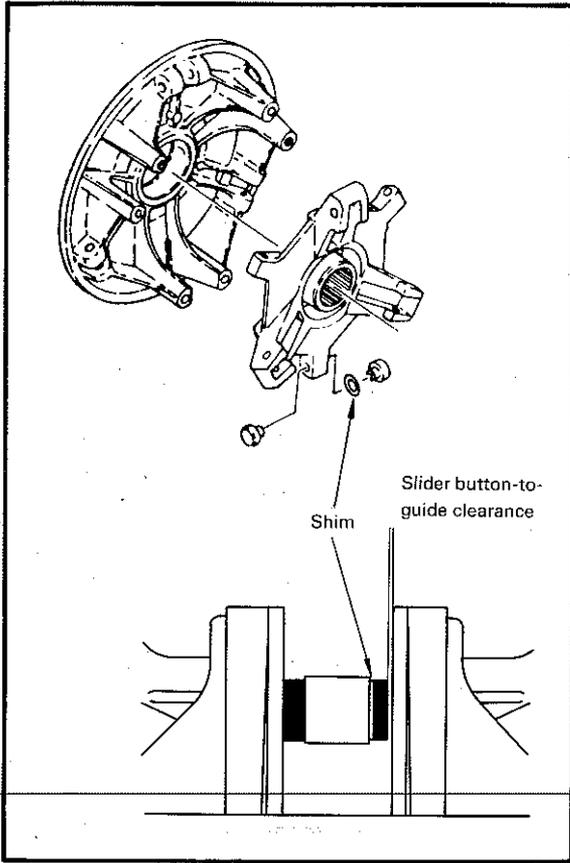
CAUTION:
The rivets for three weights must be in the corresponding positions.

Slider button-to-guide clearance:
0 ~ 0.2 mm (0 ~ 0.008 in)

Shim (90201-090A4)	Thickness 0.3 mm (0.012 in)
--------------------	--------------------------------

Rivet	Shifting rpm
No rivet is in use	rpm increases. ↑
①	
②	
① ②	rpm decreases. ↓

CAUTION:
The shims for three parts must be in the corresponding positions.

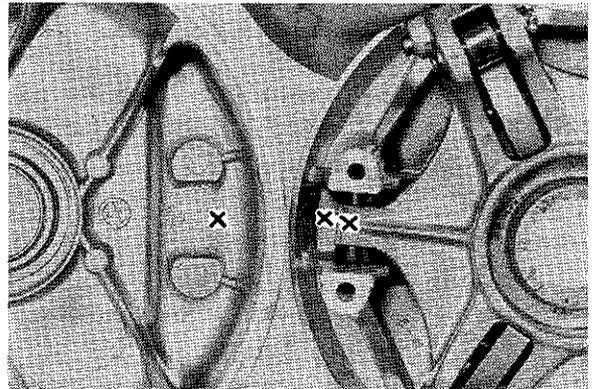


c. Install the component parts to the sliding sheave and the sheave cap.

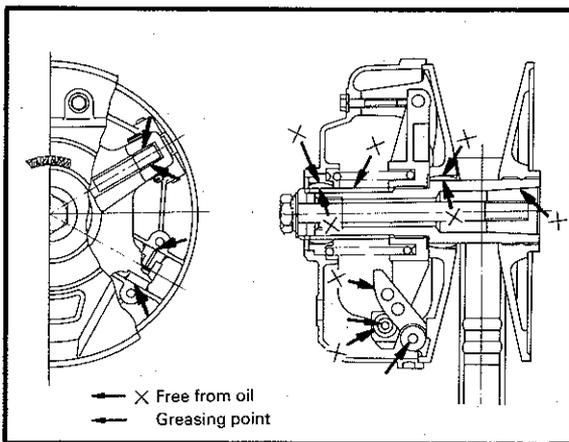
NOTE:

1. When installing the spider and primary sheave cap to the primary sliding sheave, be sure to align the X marks on the spider and sheave cap with that on sliding sheave.

b. Oil the points shown in the illustration. Do not apply the grease on the portion of X mark. For other parts, greasing is unnecessary.



2. when installing the spacer and collar to the spider, the spacer and the spider projections must be fitted to the collar slit.

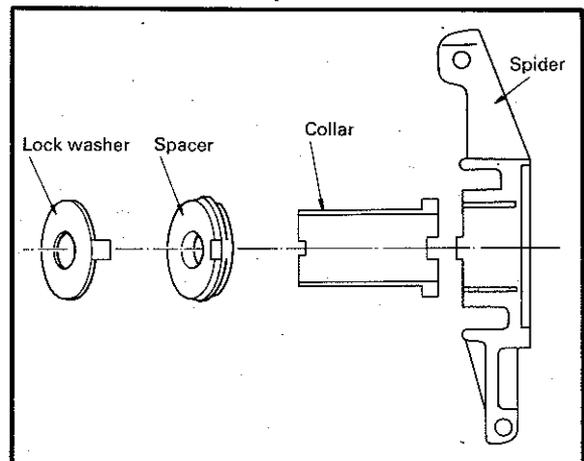


CAUTION:

When the bushing is replaced with new one, apply molybdenum disulfide grease to bushing lightly. Except for this, Don't grease.

CAUTION:

If the cotter pin is removed for the greasing, replace it with new one.

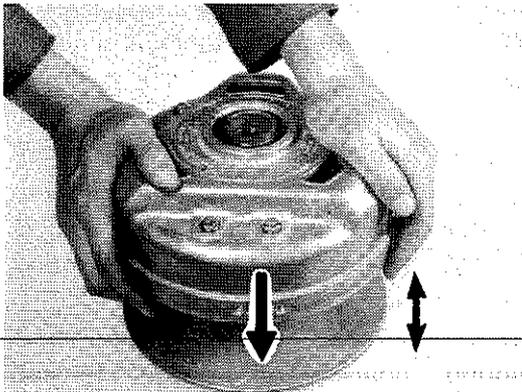


POWER TRAIN

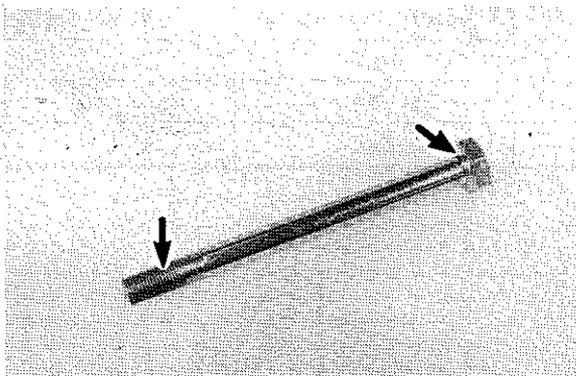
- d. Install the sheave subassembly tool and tighten the cap.
- e. Tighten the six primary sheave cap bolts and remove the subassembly tool.

Tightening torque:
11 Nm (1.1 m-kg)

CAUTION:
Make sure that the primary sheave cap assembly slides in contact with the fixed sheave boss.

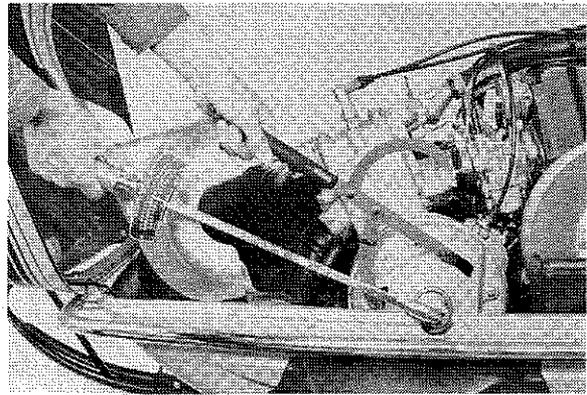


- f. Clean the oil off the tapered portion of crankshaft using a lacquer thinner.
- g. Fit the primary sheave assembly to the tapered portion of crankshaft.
- h. Apply engine oil to the threaded portion of primary sheave bolt and its contact surface with spring washer.



- i. Tighten the primary sheave mounting bolt, using the rotor holding tool. Next, lock the lock washer.

NOTE:
Check the lock washer, and if damaged, replace with a new one.

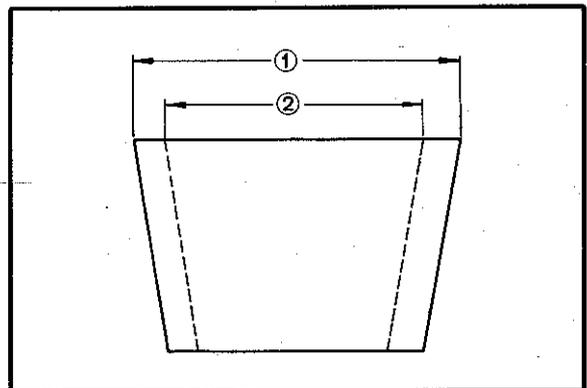


Tightening torque:
First tighten the bolt to a torque of A, then loosen it.
Retighten bolt to a final torque of B.
A: 120 Nm (12 m-kg)
B: 65 Nm (6.5 m-kg)

C. V-belt

Check the drive V-belt for damage and wear. If the width is less than specified value, replace with a new belt.

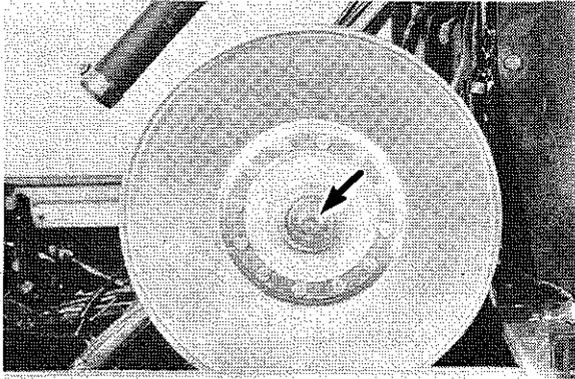
Wear limit: 26 mm (1.02 in)



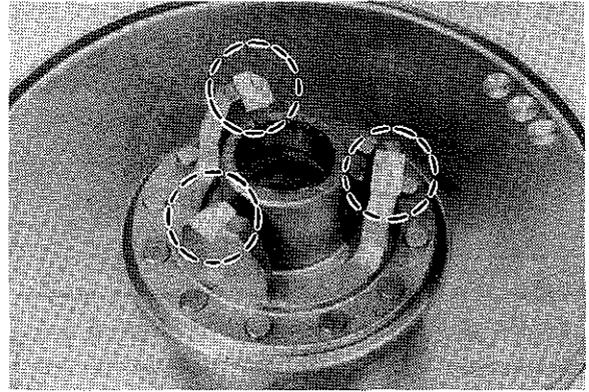
- 1. New: 31.5 mm (1.24 in)
- 2. Wear limit: 26 mm (1.02 in)

D. Secondary sheave

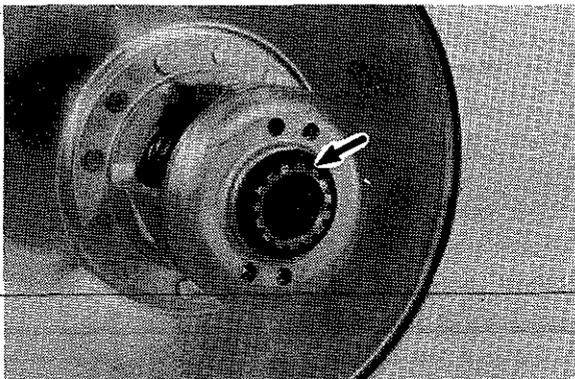
- 1. Disassembly
 - a. Apply the brake and remove the secondary sheave mounting bolt.
 - b. Remove the secondary sheave assembly and plate washers.



c. Remove the circlip and disassemble the secondary sheave component parts.



b. Check torsion spring for fatigue. If excessively fatigued, replace.
 c. Check both sheaves for warpage. If warped replace.



3. Secondary sheave spring adjustment

It is advisable to change the secondary sheave setting to correspond to the course and snow conditions. This is done by changing the secondary spring preload.

The spring seat (see illustration) has 4 spring holes. The spring tension (preload) can be adjusted by selecting a spring in the seat and twisting the seat to engage the sheave ramps. In this way the preload can be adjusted in 30° steps.

2. Inspection

a. Check the ramp shoes on secondary sliding sheave for wear. Replace ramp shoes as required.

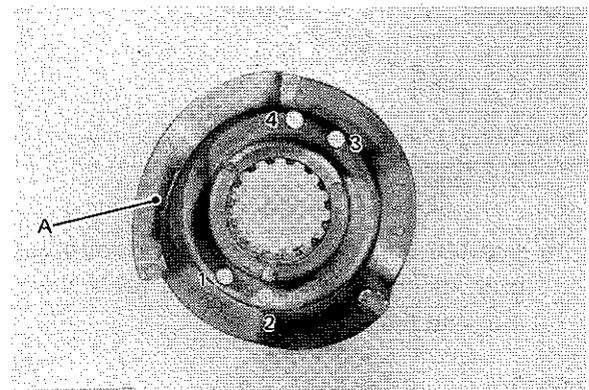
[Secondary spring setting]

Course	Trail and tour		Lake surface	
	Position of spring seat	Twist	Position of spring seat	Twist
Ice snow	Std.	Std.	No. 2	60°
Packed snow	Std.	Std.	Std. or No. 2	Std. or 60°
Wet snow	Std. or No. 4	Std. or 120°	Std.	Std.

Std. secondary spring:
 P/N: 90508-45286
 Color code: Yellow

Std. secondary spring position:
 No. 3

Std. secondary spring twist:
 90°



A. Spring seat

a. Secondary spring position

The spring seat is provided with four holes, Nos. 1 to 4, so that the secondary spring position can be changed as required.

b. Secondary spring tension

The secondary spring tension can be changed by moving the spring position from the free position in order to reset the clutch shifting RPM as required. The four holes are spaced at intervals of 30°.

Secondary spring position	Spring wind
No. 1	30°, 150°, 270°
No. 2	60°, 180°
No. 3	90°, 210°
No. 4	0°, 120°, 240°

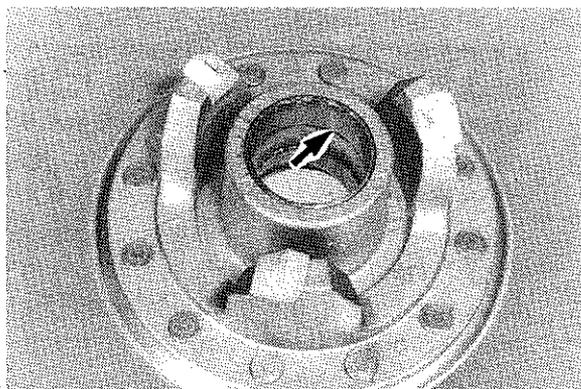
Winding the spring more (e.g., from 30° to 60°) will increase the clutch shifting rpm and vice versa. Snow conditions will also require a change of the spring tension in order to attain the standard shifting rpm. The spring tension must be greater on wet snow than on packed snow, and less tension is needed on icy snow.

4. Reassembly

- a. Grease the sliding sheave boss and secondary shaft, and mount the sliding sheave on the shaft.

Recommended grease:

Molybdenum disulfide snowmobile grease



- b. Install the sliding sheave to the fixed sheave, and set the spring and spring seat as specified. (See "Secondary sheave spring adjustment" of above item)
- c. Install the circlip secondary fixed sheave boss slit.

NOTE:

After installation, thoroughly clean both fixed and sliding sheaves so that they are free of oil.

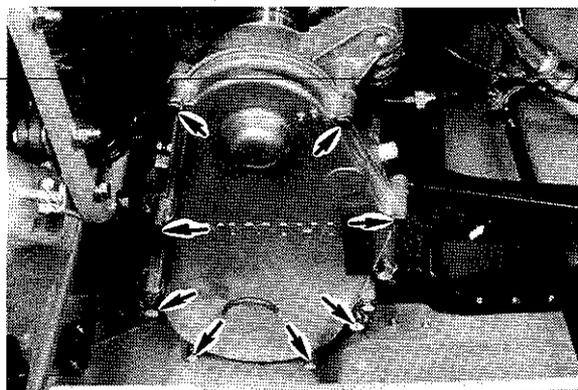
- d. Install the secondary sheave assembly and adjust the axial play and sheave off set.
(Refer to 5-1-A-2. "Sheave off set adjustment")
- e. Tighten the secondary sheave mounting bolt.

Tightening torque:

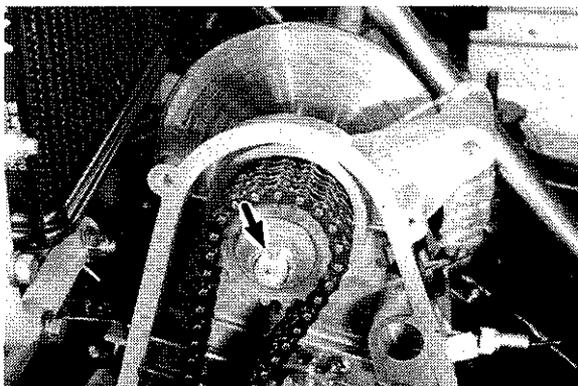
50 Nm (5.0 m·kg)

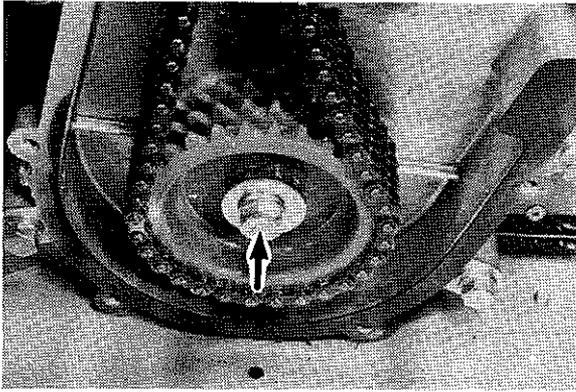
E. Chain housing

1. Disassembly
- a. Remove the chain housing cap and drain the chain housing oil.



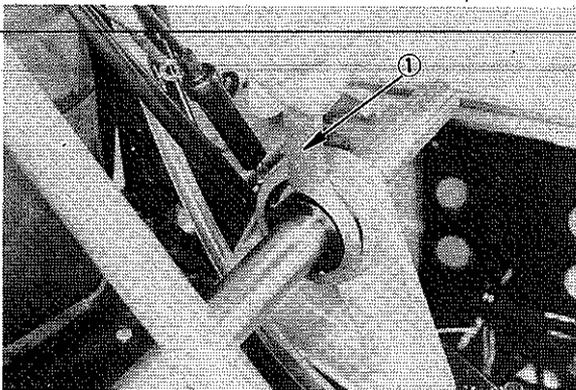
- b. Apply the brake and remove the drive sprocket nut and driven sprocket bolt.





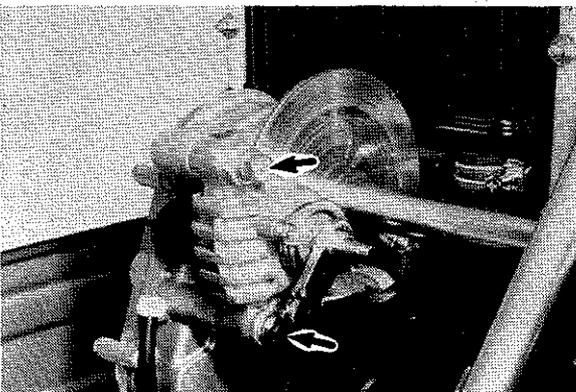
- c. Loosen the chain tensioner and remove the drive, driven sprockets and chain.
- d. Remove the bearing inner race securing screw, and loosen the inner race by using eccentric bearing installer.

Tool name	Tool No.
Eccentric bearing installer	90890-01851

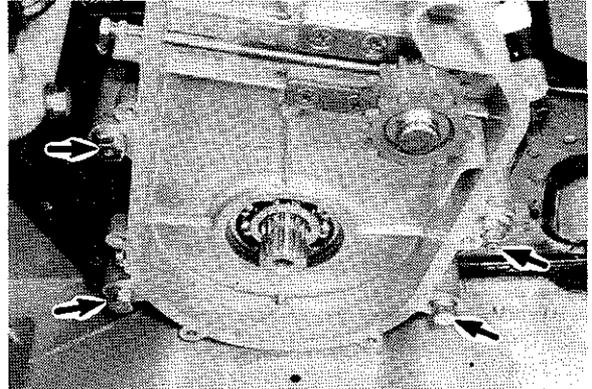


1. Eccentric bearing installer

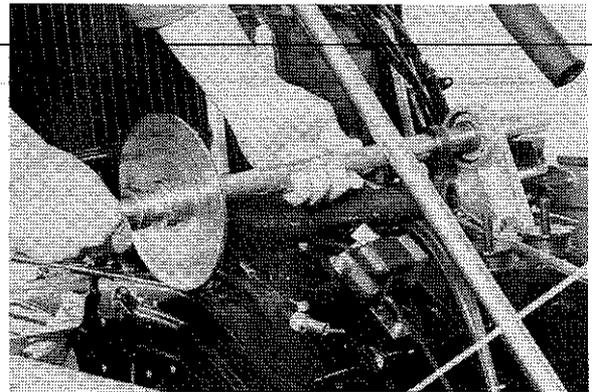
- e. Remove the brake caliper assembly. (Refer to 5-2. "Brake section")



- f. After removing the suspension assembly, remove the four bolts mounting the chain housing. (Refer to 5-3. Suspension)



- g. Remove the chain housing assembly.
- h. Remove the secondary shaft complete.
- i. Remove the bearing race and brake disc and key.



2. Inspection

- a. Drive chain
Except in case of oil starvation, the chain wears very little. If the chain has stretched excessively and it is difficult to keep the proper chain tension, the chain should be replaced.
- b. Drive, driven and chain tension sprockets.
Check sprocket for obvious wear. Replace sprocket as required.
- c. Bearing and oil seals
Check the chain case bearings and oil seals for damage. If damaged, replace.

3. Gearing selection

The reduction ratio of driven sprocket to drive sprocket must be set according to the snow condition.

Many rough surfaces or unfavorable snow conditions; the driven/drive sprocket ratio should be made larger. Few rough surfaces or better snow conditions; the ratio should be made smaller.

a. Std. reduction ratios

Drive chain sprocket	18 (P/N 878-17682-80)
Driven chain sprocket	29 (P/N 878-47548-90)
Chain (Links)	70 (P/N 94850-35070)

b. A guide to reduction ratios

Snow condition	Trail riding			Lake course			High altitude (Up to 1500 m or more)		
	ICY	Packed	Wet	ICY	Packed	Wet	ICY	Packed	Wet
Drive chain sprocket	Std.	Std.	17	Std.	Std.	17 or Std.	16	16	16
Driven chain sprocket	Std.	Std.	Std.	Std.	Std.	Std.	33	33	33
Chain (links)	Std.	Std.	Std.	Std.	Std.	Std.	Std.	Std.	Std.

c. Sprocket ratio and chain link chart

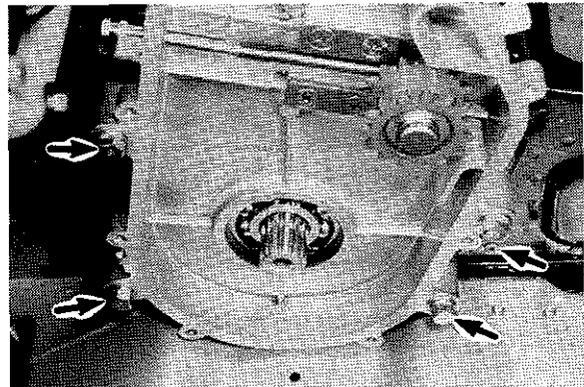
The following sprockets, drive and driven, and chains are available as options. The figures in upper lines repre-

sent the driven/drive sprocket ratios, while those in lower lines represent the number of chain links.

Teeth of drive sprocket \ Teeth of driven sprocket	15 P/N 878-17682-50	16 P/N 878-17682-60	17 P/N 878-17682-70	18 (SRX440 Std.)	19 P/N 878-17682-90	20 P/N 878-17693-00	21 P/N 878-17693-10	22 P/N 878-17693-20
29 (SRX440 Std.)	1.933 68	1.813 68	1.706 68 or 70	1.611 70	1.526 70	1.450 70	1.381 70 or 72	1.318 72
31 P/N 878-47587-00	2.067 68	1.938 70	1.824 70	1.722 70	1.632 70 or 72	1.550 72	1.476 72	1.409 72
33 P/N 888-47587-00	2.200 70	2.063 70	1.941 70 or 72	1.833 72	1.737 72	1.650 72	1.571 72 or 74	1.500 74
35 P/N 878-47587-20	2.333 72	2.188 72	2.059 72	1.944 72 or 74	1.842 72 or 74	1.750 74	1.667 74 or 76	1.591 74 or 76

Chain links	Parts No.
68	94850-35068
72	94850-35072
74	94850-35074

Tightening torque:
23 Nm (2.3 m-kg)



4. Reassembly

- a. Apply a low temperature grease to the chain housing oil seal lip. Install the secondary shaft complete with brake disc.

NOTE:

Make sure woodruff key is properly seated in key way of secondary shaft. Install brake disc so that it is aligned with the woodruff key.

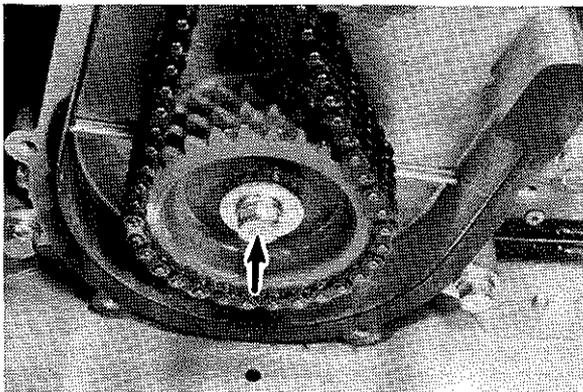
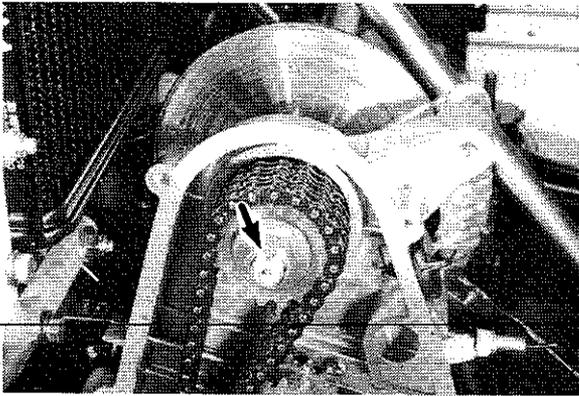
- b. Use the four bolts to mount the chain housing to frame.

- c. Install the brake caliper assembly.

Brake caliper mounting bolt
tightening torque:
50 Nm (5.0 m-kg)

- d. Install the drive and driven sprockets with chain.
Place the collar into the drive sprocket. Tighten the drive sprocket nut and driven sprocket bolt, and install a new cotter pin on the secondary shaft.

Tightening torque:
Drive sprocket nut:
50 Nm (5.0 m-kg)
Driven sprocket bolt:
50 Nm (5.0 m-kg)

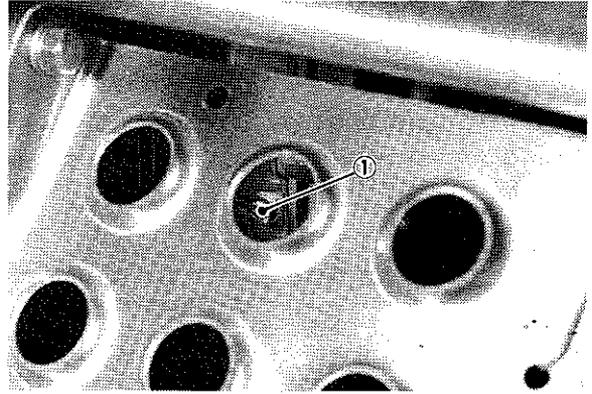


- e. Install the chain housing gasket and chain housing cap.

NOTE:
Check the gasket, and if damaged, replace with a new one.

Tightening torque:
16 Nm (1.6 m-kg)

- f. To add gear oil, the filler cap and oil level screw should be removed.



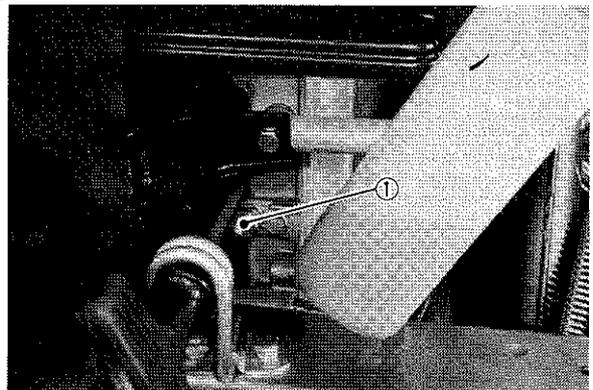
1. Oil level screw

Fill until oil begins to run out the screw hole.

Recommended oil:
Gear oil API "GL-3"
SAE #75 or #80
Quantity: 320 cm³

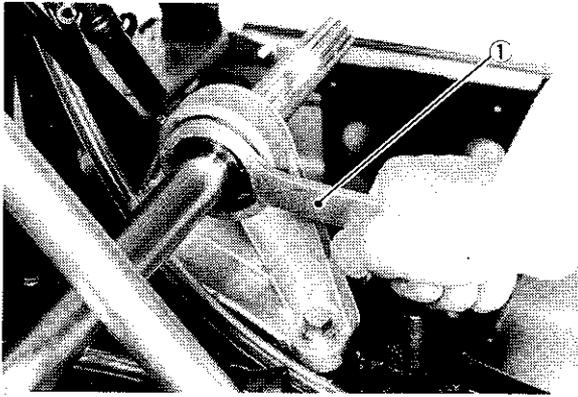
After adding oil, be sure to install and tighten the level screw and filler cap.

- g. Chain tension adjustment
Remove adjuster bolt clip. Tighten adjuster bolt (turn clockwise) by hand until nearly tight. Then tighten or loosen slightly to align clip hole with clip stopper. Install clip.



1. Adjusting bolt

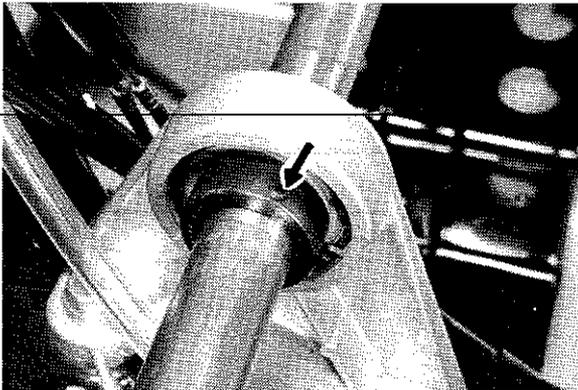
- h. Tighten the bearing inner race by using eccentric bearing installer.



1. Eccentric bearing installer

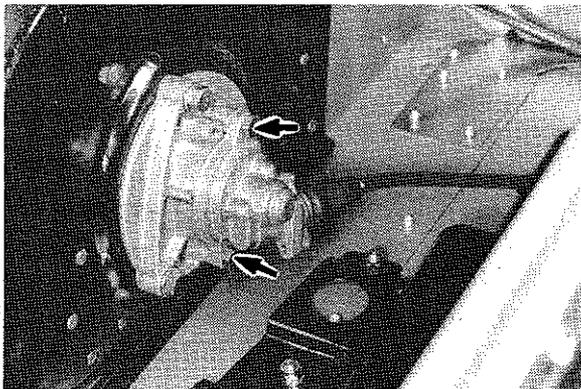
- i. Tighten the bearing inner race securing screw.

Tightening torque:
6 Nm (0.6 m-kg)

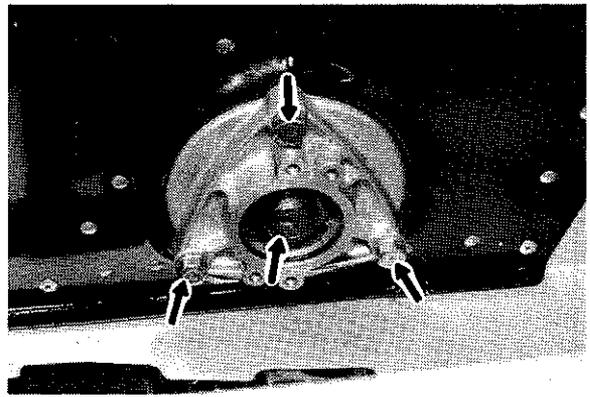


F. Front axle

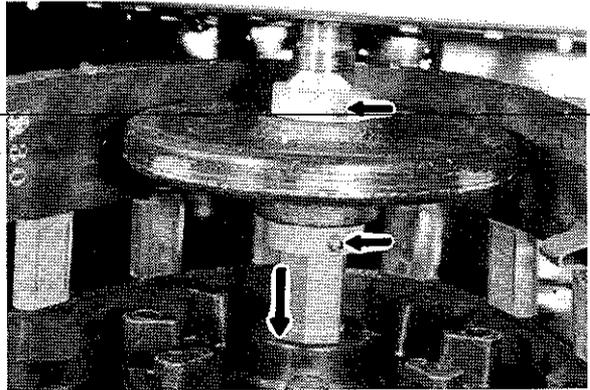
- 1. Removal
 - a. Remove the slide rail suspension assembly. (See 5-3. Suspension)
 - b. Remove the speedometer gear housing.



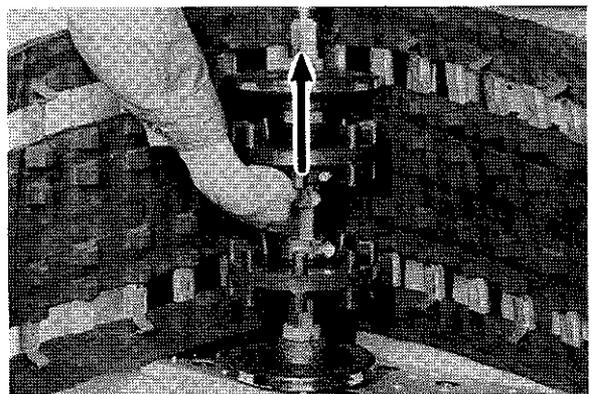
- c. Remove the nut mounting the front axle and front axle housing. (Lock the front axle by applying the brake.)



- d. Remove the chain housing cap. (Refer to "chain housing".) Drain oil and remove the chain driven sprocket.
- e. Loosen the left side guide wheel securing collar and slide the guide wheel to the right side.



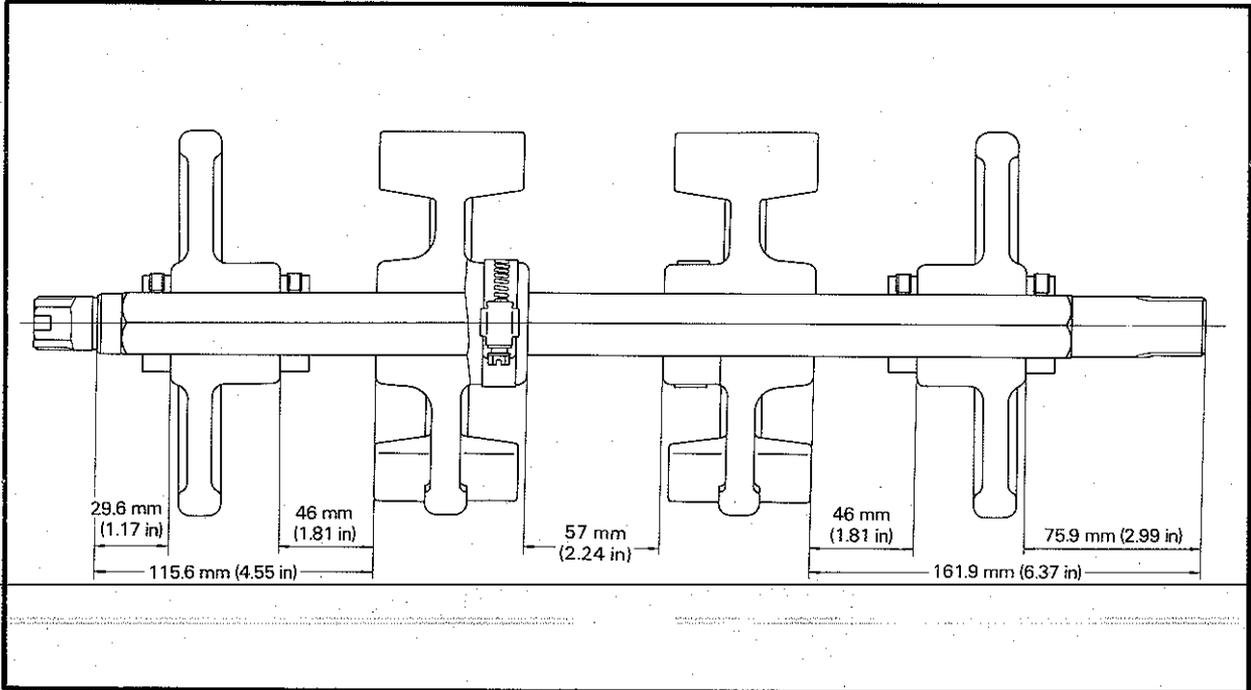
- f. Pull out the front axle.



- g. To remove the wheel sprocket from the axle, loosen the band and push out using a press.
- 2. Inspection
Check wheel sprocket for damage and wear. Replace wheel sprocket as required.

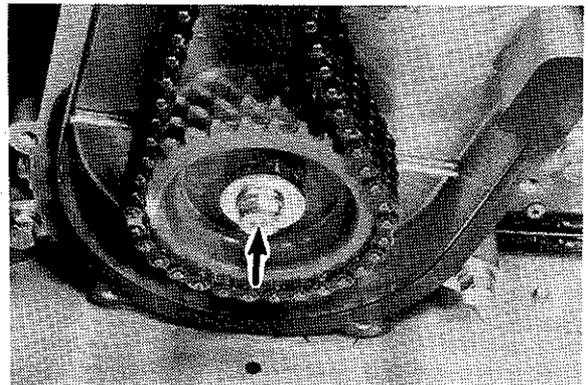
3. Installation

- a. When installing the wheel sprocket to the front axle, position the wheel sprockets on the front axle as shown. Use a press.

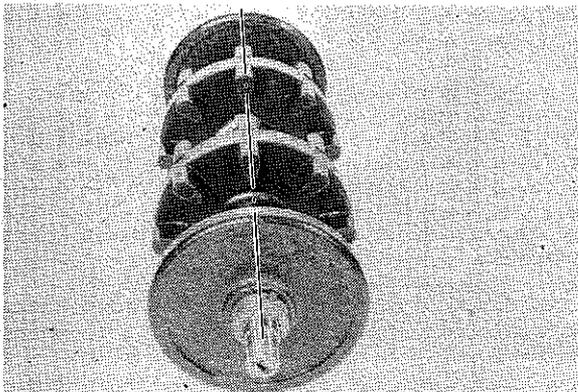


- b. Be sure the sprocket teeth are aligned as shown. After positioning, tighten the band.

Tightening torque:
5 Nm (0.5 m-k_g)



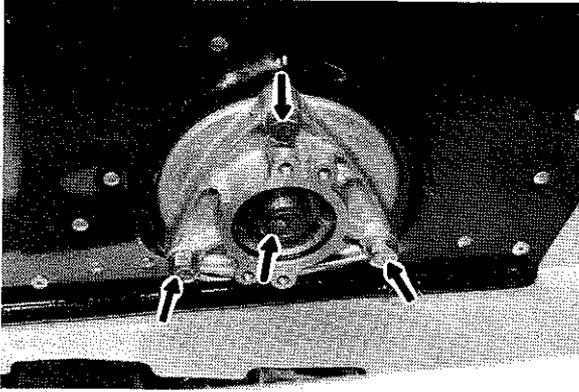
Tightening torque:
50 Nm (5.0 m-k_g)



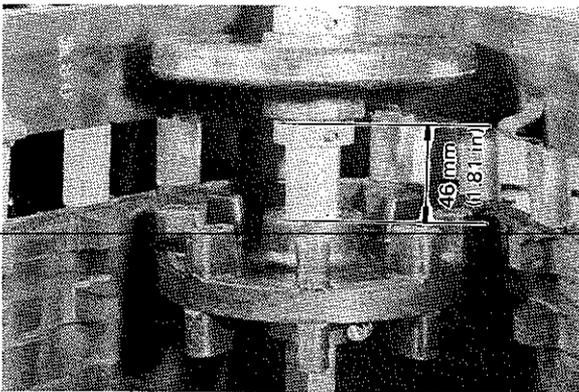
- c. Apply a low temperature grease to the chain case oil seal, and insert the right-hand side of front axle into chain case through drive track. Tighten the front axle with chain driven sprocket.

- d. Install the front axle housing. Next, install belleville washer and front axle nut.

Tightening torque:
Front axle housing:
23 Nm (2.3 m-k_g)
Front axle nut:
85 Nm (8.5 m-k_g)



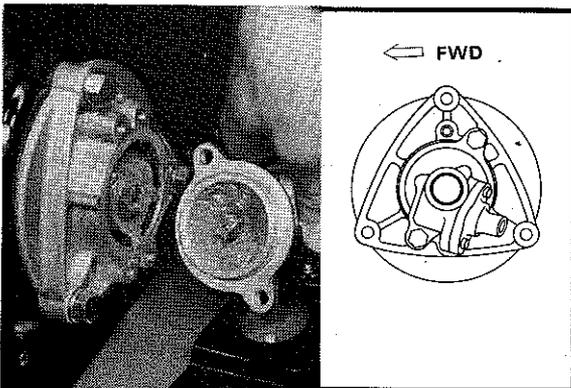
e. Set the left side guide wheel 46 mm (1.81 in) from the left sprocket wheel side.



Guide wheel collar tightening torque:
5.5 Nm (0.55 m·kg)

- f. Install the chain housing cap and add oil. (See "5-1-E-4. Chain housing")
- g. Install the slide rail suspension assembly. (See "5-3-D. Suspension installation")
- h. Fill up the meter housing with a low temperature grease and install it.

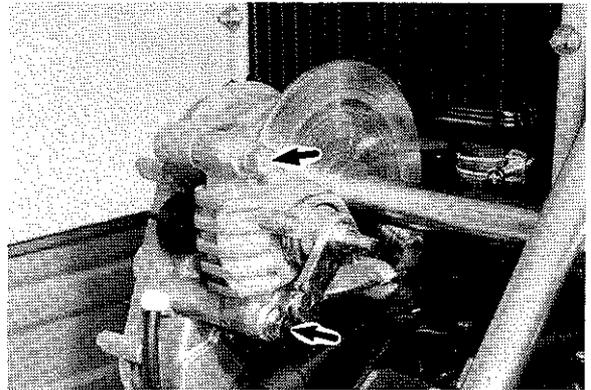
Tightening torque:
6 Nm (0.6 m·kg)



5-2. BRAKE

A. Disassembly

1. Remove the brake cable from the brake caliper.
2. Remove the brake caliper assembly.



3. Remove the brake pads.

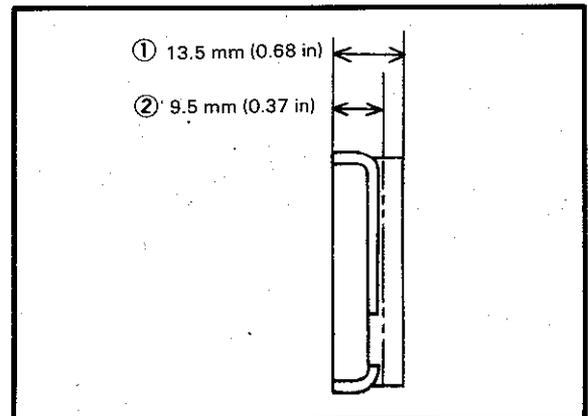
NOTE:

For brake disc removing, refer to "5-1-E-1. Chain housing".

B. Inspection

1. Check the pads for damage and wear. If the thickness is less than specified below, replace pads as a set.

Wear limit: 9.5 mm (0.37 in)

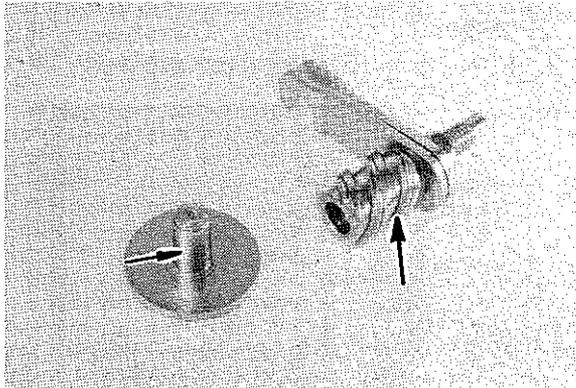


1. New
2. Wear limit

2. Check the brake disc for warpage. If warped, replace.
3. If the brake lever will not return smoothly to the rest position because of a fatigued return spring, replace the return spring.

C. Reassembly

1. Apply a low temperature grease to the back up plate shaft and screw cam.

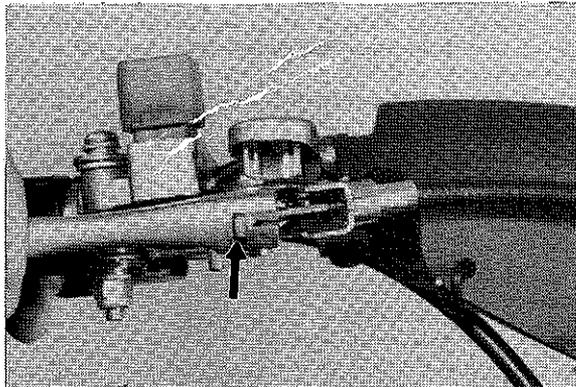


2. Install the brake caliper with brake pads to the chain housing.

Tightening torque:
50 Nm (5.0 m-kg)

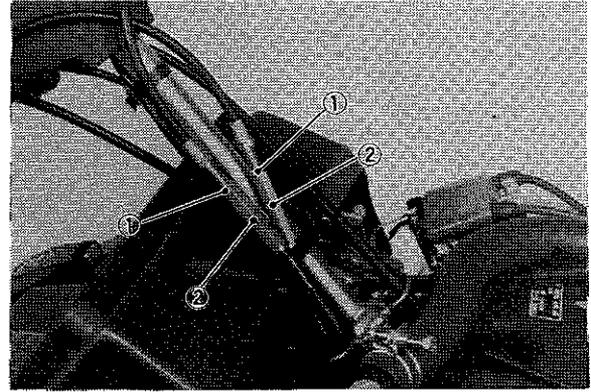
3. Install brake cable to the caliper and brake lever.

CAUTION:
Apply a small amount of antifreeze grease to the contact areas of the brake cable with brake lever stopper surface, but do not apply a grease between the outer cable and inner cable.

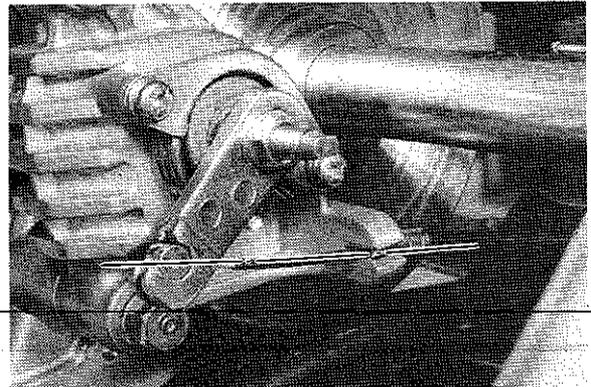


D. Adjustment

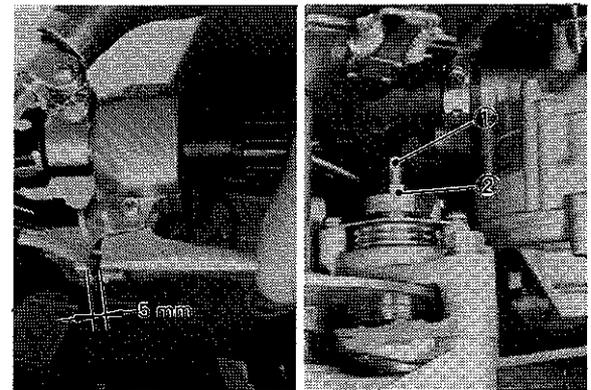
1. Left-hand brake adjustment
 - a. Loosen the brake cable lock nut, and adjust the brake cable adjusting bolt so that the brake inner cable does not touch the brake caliper (the brake caliper and brake inner cable must be in a straight line). Then tighten the lock nut.



1. Lock nut
2. Adjusting bolt

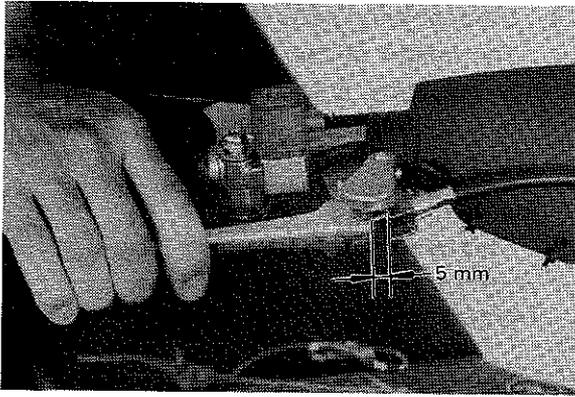


- b. Loosen the lock nut, and turn the adjusting screw so that the brake cable has a play of approx. 5 mm (0.20 in) at the brake lever holder. Then tighten the lock nut.

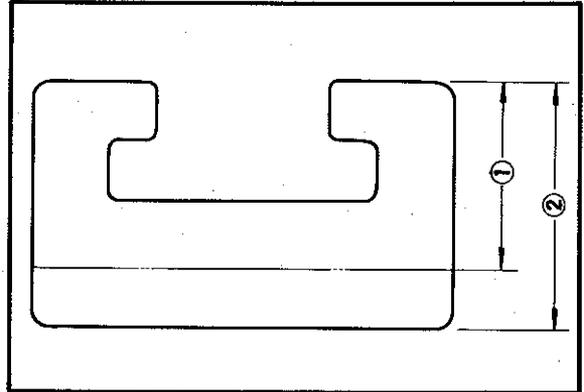


1. Adjusting screw
2. Lock nut

2. right-hand brake adjustment
The right-hand brake is adjustable by turning the adjuster of the right brake cable. To adjust, loosen the adjuster lock nut first and turn the the adjuster in and out so that the brake wire has a play of 5 mm (0.20 in) at the brake lever holder. After adjustment, tighten the lock nut.



Wear limit: 10 mm (0.4 in)
 Slide runner securing screw tightening torque:
 4.5 Nm (0.45 m·kg)

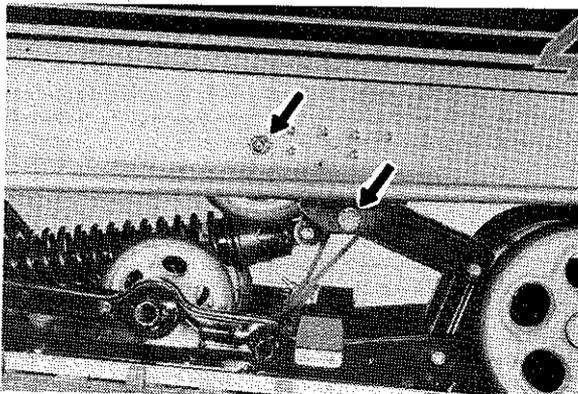
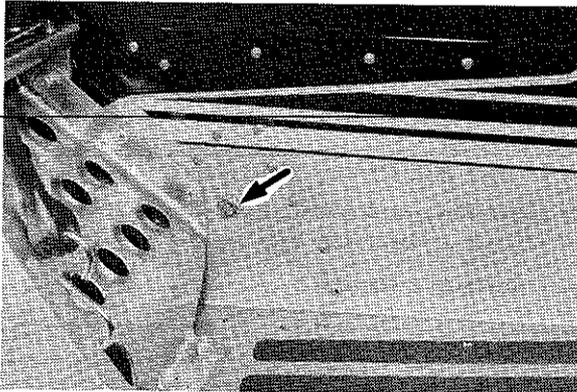


1. Wear limit: 10 mm (0.4 in)
2. New: 15 mm (0.6 in)

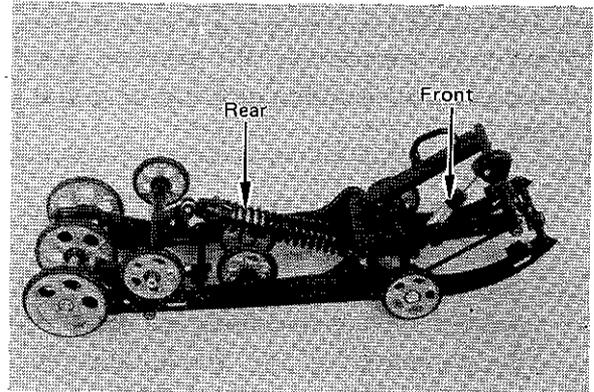
5-3. SUSPENSION

A. Removal

1. Remove the two front pivot shaft mounting bolts and four rear pivot shaft mounting bolts.



2. Check the suspension wheel for damage.
If damaged, replace it.
3. Shock absorber



2. Remove the slide rail suspension assembly.

B. Inspection

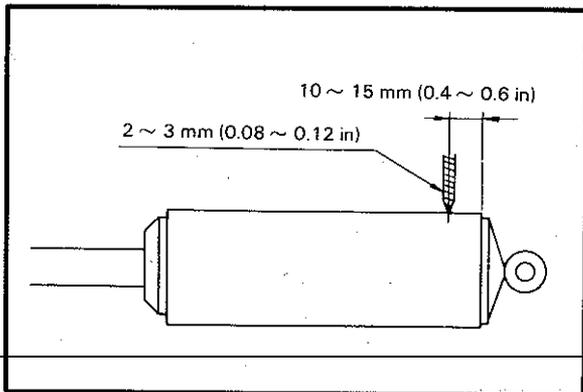
1. Check to see if slide runners are worn excessively. If the slide runner thickness is less than specified value, replace slide runner.

WARNING (Rear shock):
 This shock absorber contains highly pressurized nitrogen gas. Read and understand the following information before handling the shock absorber. The manufacturer cannot be held responsible for property damage or personal injury that may result from improper handling.

- 1) Do not tamper with or attempt to open the cylinder assembly. Injury may result.
- 2) Do not subject shock absorber to an open flame or other high heat. This may cause the unit to explode due to excessive gas pressure.

POWER TRAIN

- 3) Do not deform or damage the cylinder in any way. Cylinder damage will result in poor damping performance.
- 4) Gas pressure must be released before disposing of the shock absorber. To do so, drill a 2 ~ 3 mm (0.08 ~ 0.12 in) hole through the cylinder wall at a point 10 ~ 15 mm (0.4 ~ 0.6 in) above the bottom of the cylinder.



WARNING:
Wear eye protection to prevent eye damage from escaping gas and/or metal chips.

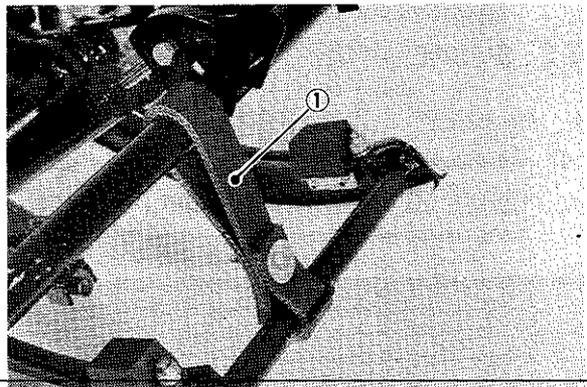
- a. Check the rod, and if it is bent or damaged, replace the shock absorber.
- b. Check for oil leakage. If oil leakage is evident, replace the shock absorber.
- c. By compressing the shock absorber, check to see there is no gas leakage.

C. Slide rail suspension adjustment

The setting of suspension greatly affects the stability and steering of the machine. Therefore, it is necessary to adjust the suspension setting according to course conditions and rider's driving technique.

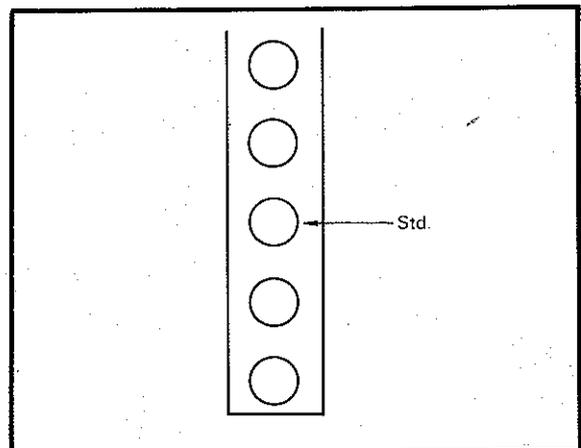
- 1. Stopper band setting
The height of the front suspension can be properly adjusted by changing the length of the stopper band.

Standard setting: 3rd hole from the bottom
Tightening torque: 3.8 Nm (0.38 m·kg)



1. Stopper band

This adjustment will greatly affect the stability and handling of the machine as well as the side slip of the track while turning a corner.



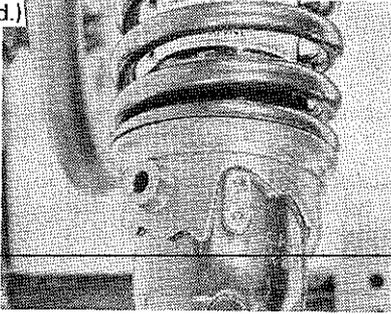
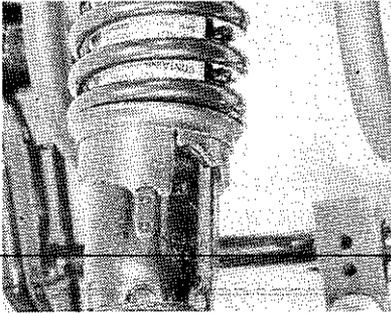
POWER TRAIN

Height	Handling	Track side slip	Performance of straight running	Bumping and pitching	Riding comfort
Lower	Easy	Increase	Poor	More	Poor
Higher	Hard	Decrease	Good	Less	Good

NOTE:
The rear stopper band normally does not require adjustment.

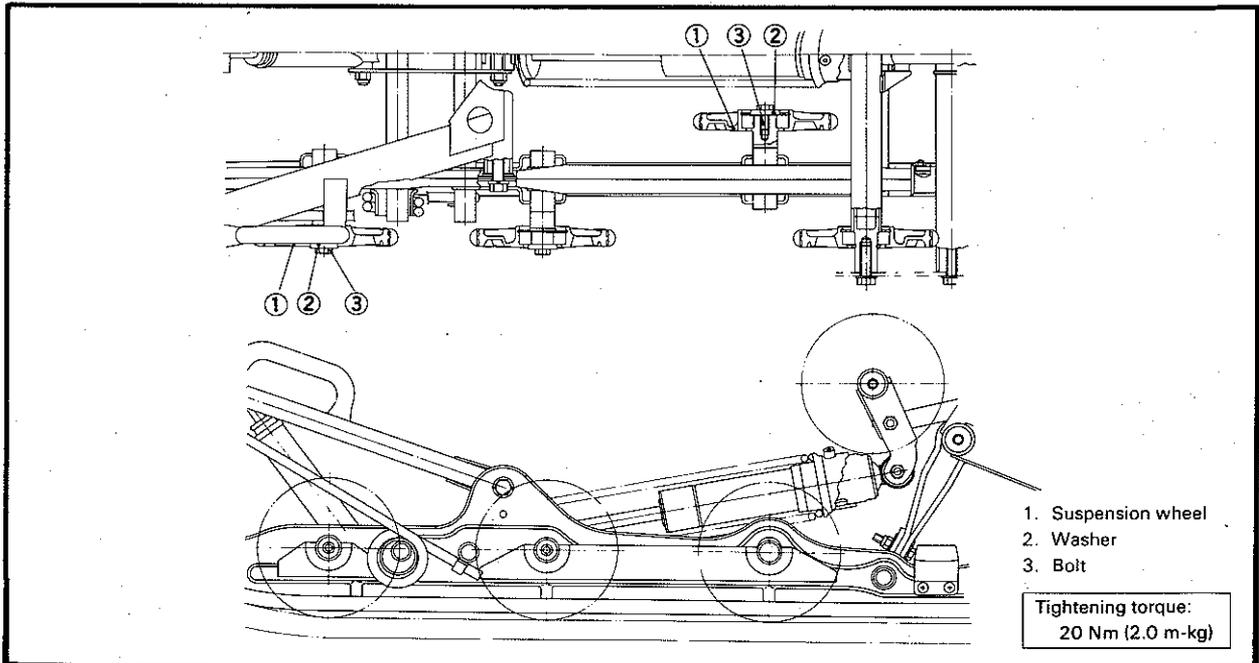
Rear stopper band setting:
3rd hole from bottom

2. Rear spring
The rear spring is a determining factor in machine stability.
Consider the ground surface condition and the rider's weight when setting rear springs. The suspension should be set as soft as possible, unless it impairs the stability of the machine.

Course	Less gap	More gap	Trail riding with passenger
	Softer ←————→ Stiffer		
Rear spring set position	(Std.)		
			



3. Additional wheel installation
When the machine is driven on icy surfaces for a prolonged period of time (for instance, trail riding), additional wheels should be installed to protect the slide runners from fast wear. This is not advisable for a race because the suspension will be adversely affected.

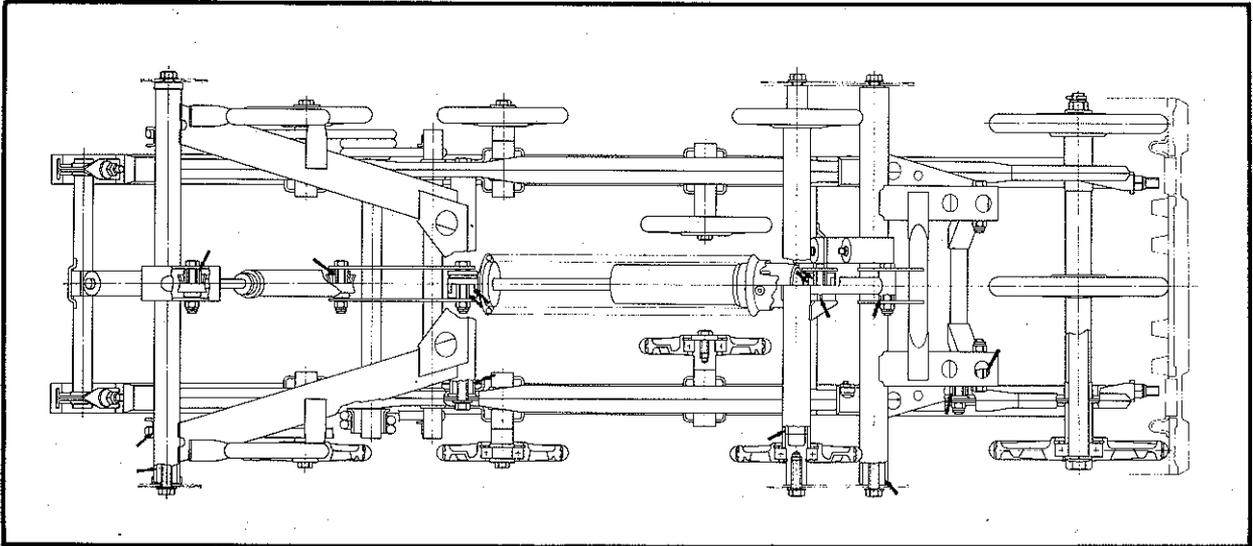


POWER TRAIN

D. Installation

Grease the slide rail suspension as indicated by arrows in the illustration.

For easy installation of the slide rail suspension in the frame, proceed as follows.

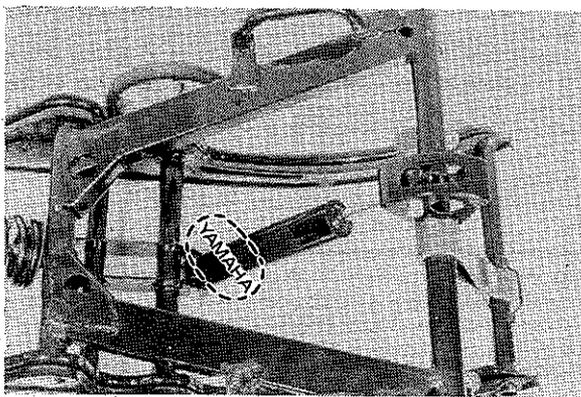


CAUTION:
 Take care that the cushion is installed with the Yamaha mark facing upward for a proper damping effect. If not, damping performance is lost as air enters piston chamber.

To assist in rear shaft installation, keep the shaft forward by using an iron bar.

NOTE:
 When installation of slide rail is complete, tighten front and rear bolts to proper torque.

Tightening torque:
 Front pivot shaft mounting bolts:
 65 Nm (6.5 m-kg)
 Rear pivot shaft mounting bolts:
 65 Nm (6.5 m-kg)



1. Fully loosen the drive track adjusting nuts.
2. Place the slide rail suspension into track and fit the forward pivot shaft using washers and bolts.

NOTE:
 Install bolts finger-tight. Bolts will be tightened to proper torque when slide rail installation is complete.

3. Fit the rear pivot shaft to the frame. The rear pivot shaft is being forced toward the rear by the shock absorber.

4. Adjust the track tension by turning the track adjusting nuts. For adjustment, refer to "5-4-D. Track adjustment".

5-4. DRIVE TRACK

A. Removal

1. Remove the slide rail suspension assembly and front axle. (See 5-1-F. Front axle and 5-3. Suspension section)

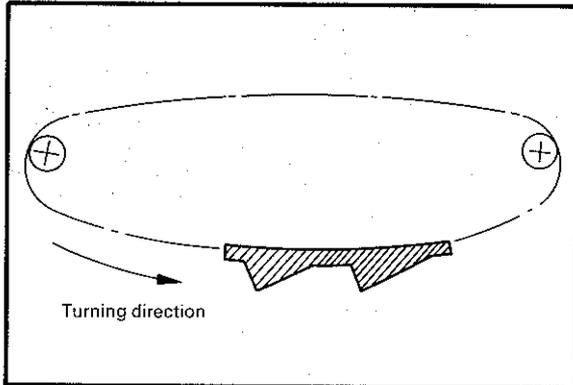
B. Inspection

Check drive track and clips for cracks, damage or wear. Replace drive track or clip as required.

POWER TRAIN

C. Installation

Install drive track assembly as illustrated.
(See 5-1-F. Front axle and 5-3. Suspension section)



D. Adjustment

WARNING:

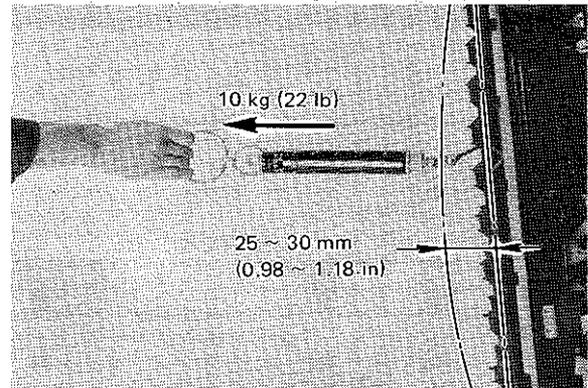
A broken track, track fittings, or debris thrown by the track could be dangerous to an operator or bystanders. Observe the following precautions:

- 1) Do not allow anyone to stand directly behind the snowmobile when starting forward.
- 2) When the engine is running and the track is engaged with the snowmobile placed 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 (top side of the machine).
- 3) Never lift the rear of the snowmobile to allow the track to turn while the engine is running. Stop the engine and prop up the rear with a suitable stand. Never stand behind the machine when the track is spinning.
- 4) Never install studs (cleats) closer than three inches from the edge of the track.
- 5) Replace any track that is damaged to the depth where fabric reinforcement material is visible. Inspect track condition frequently.

The track tension should be so adjusted that when pulled at its window in the track center by a force of 10 kg (22 lb) using a spring scale, the deflection should be as specified below.

Track deflection:

25 ~ 30 mm/10 kg
(0.98 ~ 1.18 in/22 lb)

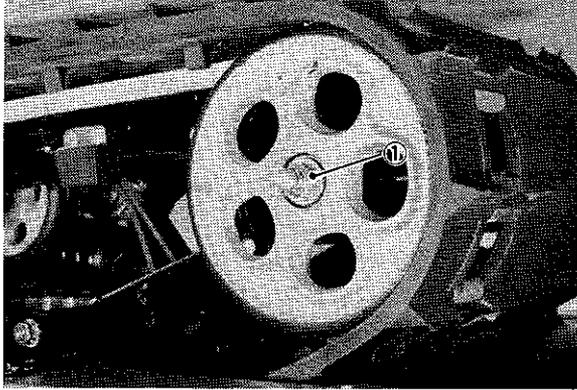


The adjustment should be made in the following sequence:

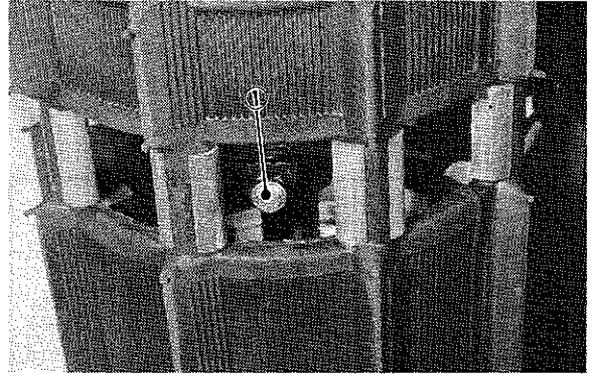
1. Turn the track by running the engine.
2. Loosen the rear axle nut, and set the adjusting nuts both right and left to align the track with the slide rail as illustrated below:
3. After the adjustment specified in 2 above, pull each center track window of the track with a force of 10 kg (22 lb) using a spring scale. The track deflection should be as specified.
4. By repeating the procedures in 1, 2 and 3 above, the track tension should be correctly adjusted.
5. After making sure all adjustments are correct, tighten the rear axle nut.

Tightening torque:

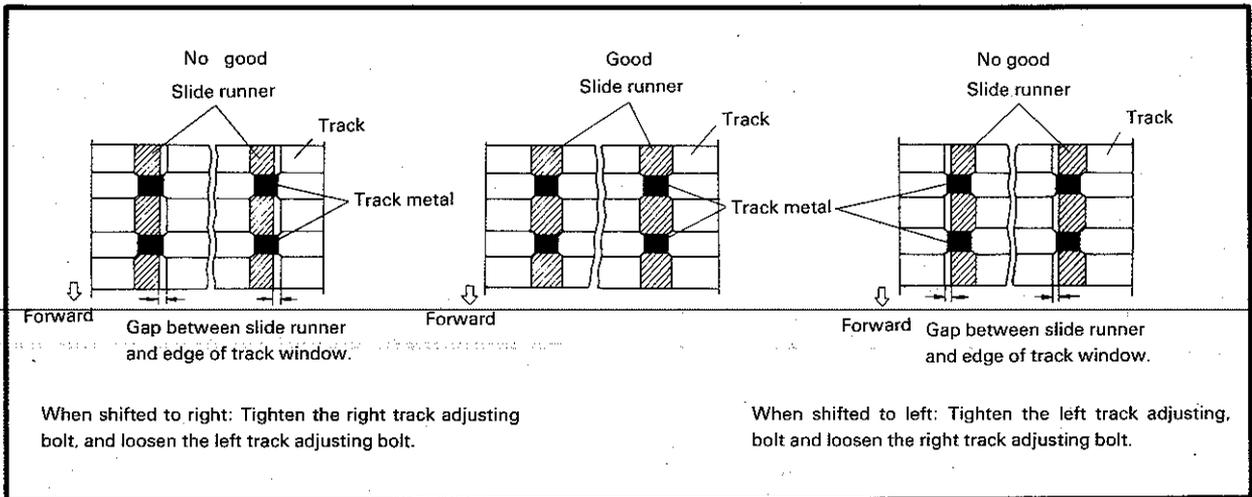
80 Nm (8.0 m·kg)



1. Rear axle nut



1. Adjusting nut



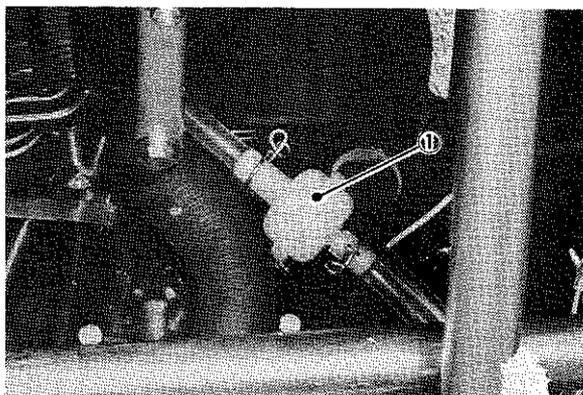
CHAPTER 6. CHASSIS

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6-2. FUEL TANK	6-2
6-3. STEERING	6-2
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6-4. SKIS	6-4
A. Inspection	6-4
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CHAPTER 6. CHASSIS

6-1. OIL TANK

1. Check the hose from the tank to the oil pump for obstructions such as pinching or other damage.
2. It is advisable that the oil filter be replaced with a new one each season.



1. Oil filter

If the filter is faulty (obstructing the fuel flow or having a breakage in the element), it should be replaced as an assembly unit.

6-3. STEERING

A. Installation

1. Grease the ski column on the frame. Position the skis so that they are parallel to each other. Place outside arms on skis (L on left ski, R on right ski). Be sure to install wave washer between outside arm and frame. Tighten the ski column mounting nuts and outside arm pinch bolts. After tightening the nuts, bend the lock washer tab.

6-2. FUEL TANK

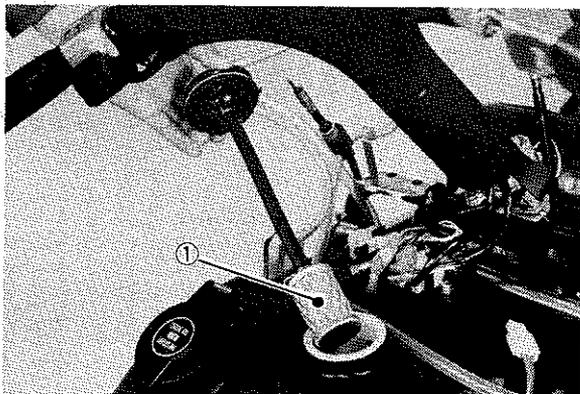
1. Check for missing pipe retaining dips.
2. Check pipes for flattening caused by tank.
3. Check the breather pipe for correct routing.

Check clamps for looseness.

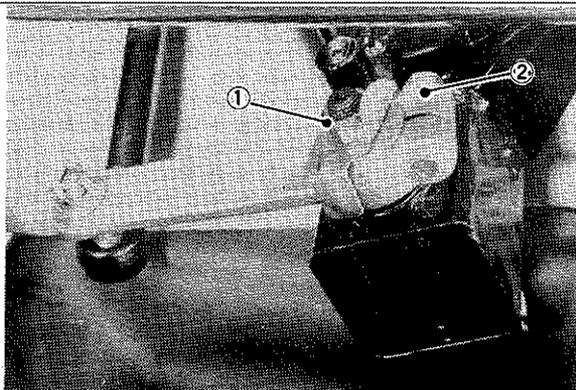
The breather pipe should be routed so that no fuel leakage will result from severe vibration, shock and/or banking of the vehicle.

For routing, refer to piping and wiring diagrams.

4. It is advisable that the fuel filter be replaced with a new one each season.



1. Fuel filter



1. Nut

2. Pinch bolt

Tightening torque:

Nut: 40 Nm (4.0 m-k_g)

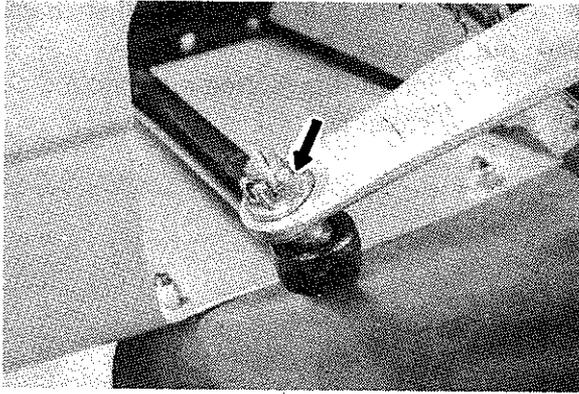
Pinch bolt:

23 Nm (2.3 m-k_g)

2. Secure the steering relay rod (with universal joint attached) to the outside arm with the self-locking nut and cotter pin.

Tightening torque:

30 Nm (3.0 m-k_g)

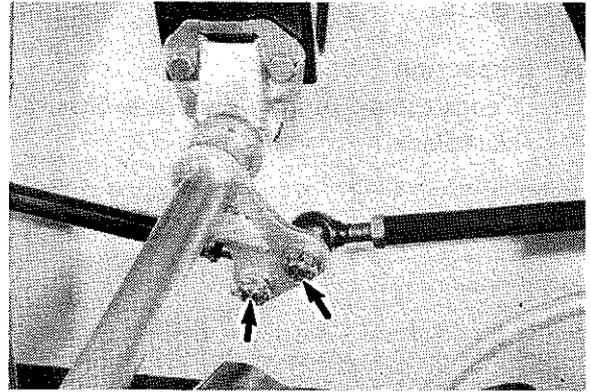


3. Install the steering column on the frame. Before this operation, coat the steering lower and upper bearing with grease. Tighten the nuts, and bend the lock washer tab.

Tightening torque:

UPPER: 7.3 Nm (0.73 m-k_g)

LOWER: 13.7 Nm (1.37 m-k_g)



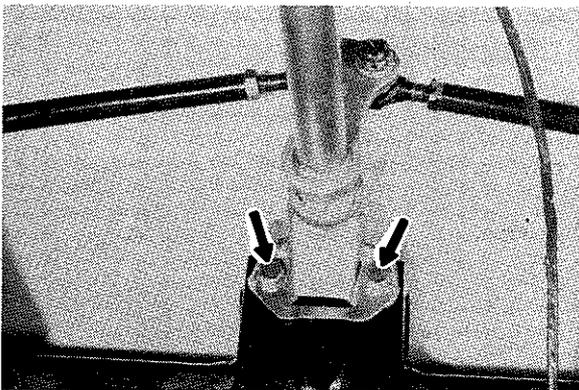
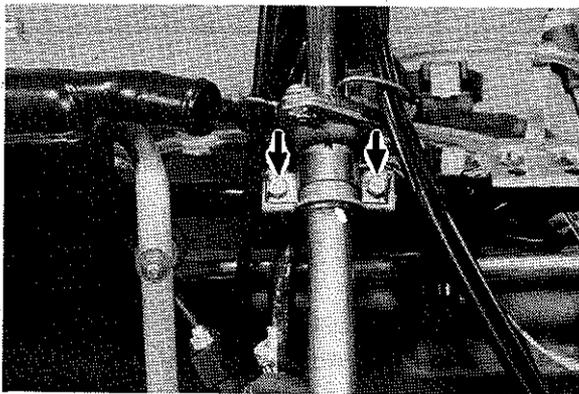
B. Adjustment

Hold the handlebar straight and check to see that the skis are parallel. If not, loosen the steering relay rod lock nut, and by turning the steering relay rod in or out, adjust the ski toe-out to specification (see below).

Ski width: 890 mm (35.0 in)

Ski toe-out: 0 ~ 6 mm (0 ~ 0.23 in)

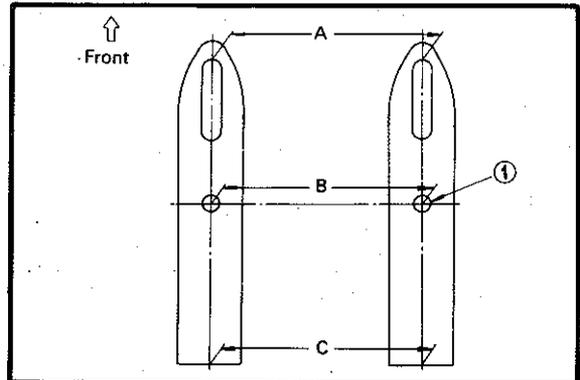
Steering relay rod tightening torque:
25 Nm (2.5 m-k_g)



4. Connect the steering relay rod to the steering column. Install a new cotter pin.

Tightening torque:

30 Nm (3.0 m-k_g)



1. Ski spigle center A - C = 0 ~ 6 mm (0 ~ 0.23 in)
- B. Ski width

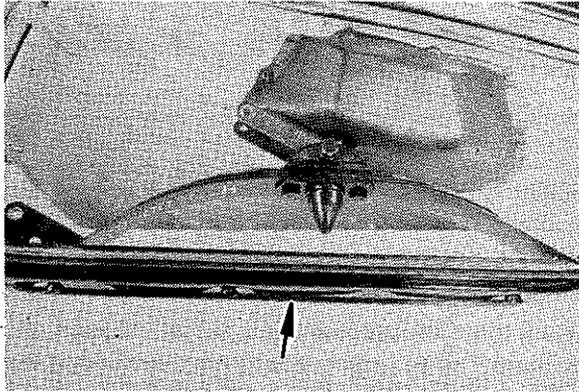


CHASSIS

6-4. SKIS

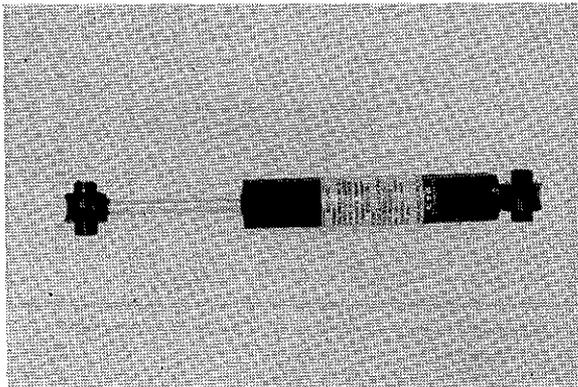
A. Inspection

1. Check the ski runner, if worn excessively, replace.



2. If the leaf spring is fatigued, replace.
3. Check the leaf spring retaining pin for bends and wear. If bent or worn excessively, correct or replace.
4. Check the wear plate, if worn excessively, replace.
5. Shock absorber.

WARNING:
See 5-3-B-3 suspension shock absorber.



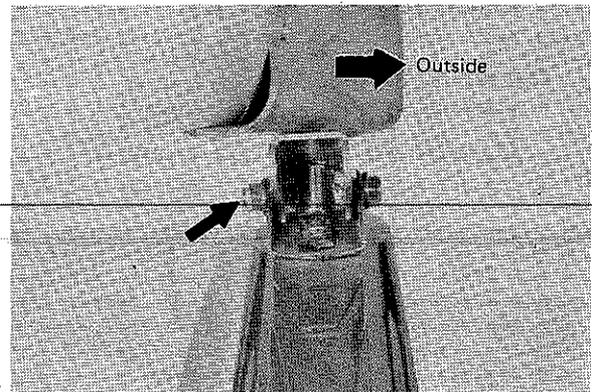
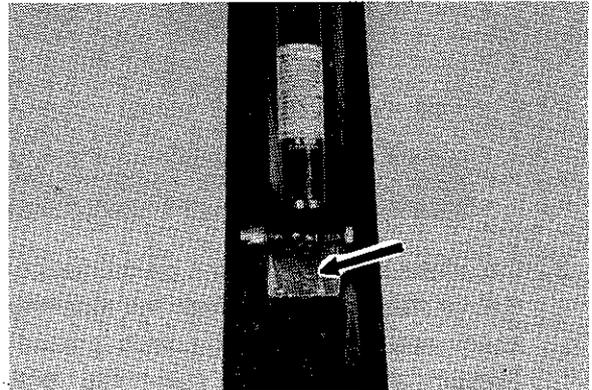
- a. Check the rod, and if it is bent or damaged, replace the shock absorber.
- b. Check for oil leakage. If oil leakage is evident, replace the shock absorber.
- c. By moving the rod, check to see if it has a proper damping effect.

B. Installation

1. After installing the ski assembly, grease the wear plate and retaining pin.
2. Install the ski column to the ski assembly.

Tighten the bolt until tight, then back out 1/4 turn.

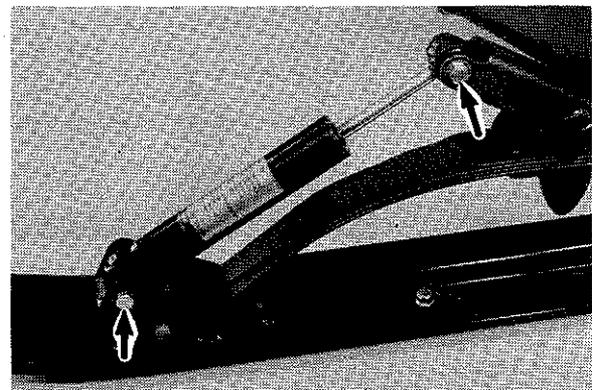
Then tighten the slotted nut, and install a new cotter pin.



3. Install the ski damper at its bottom end to the ski and its top end to the ski column.

Insert the collars into both ends, and secure them with the bolt and nut. The collars should be greased.

Tightening torque:
15 Nm (1.5 m·kg)



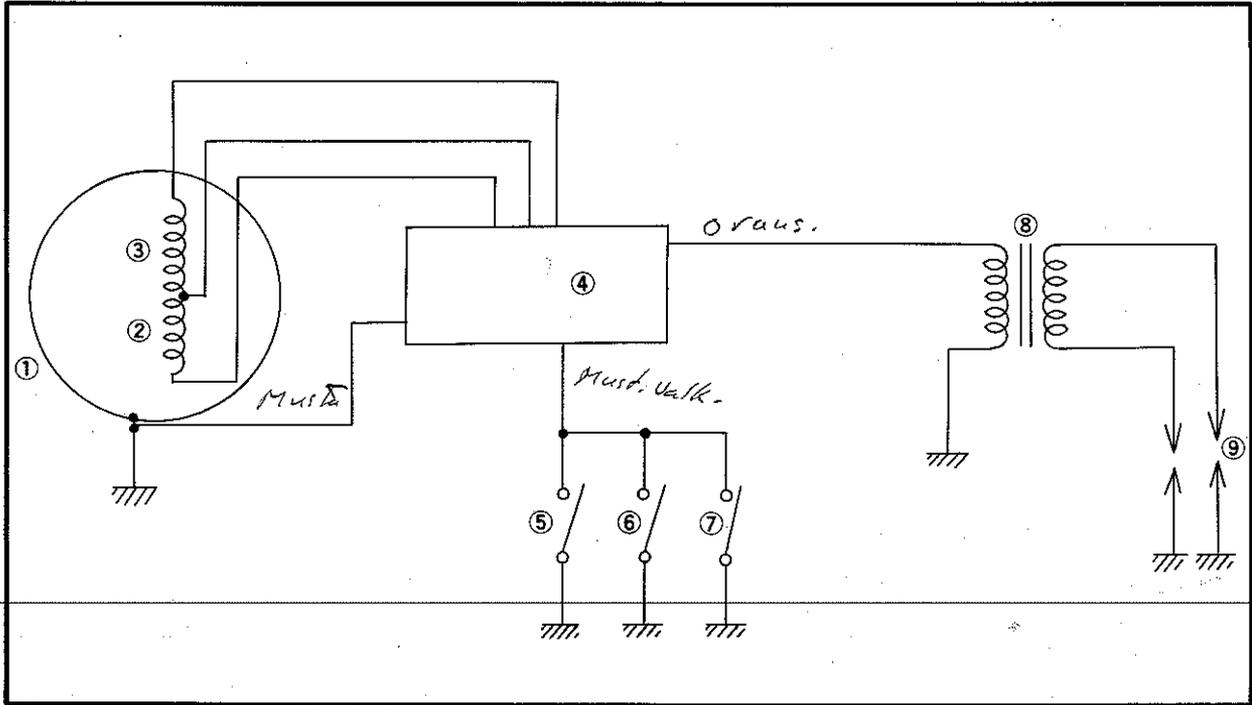
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CHAPTER 7. ELECTRICAL

7-1. IGNITION SYSTEM

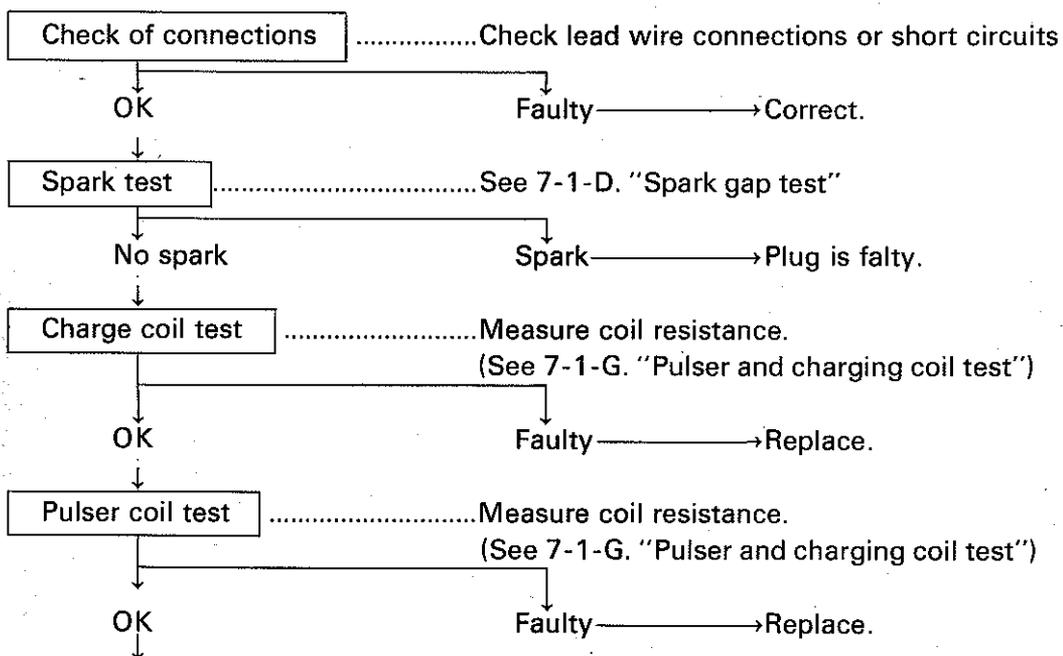
A. Circuit diagram

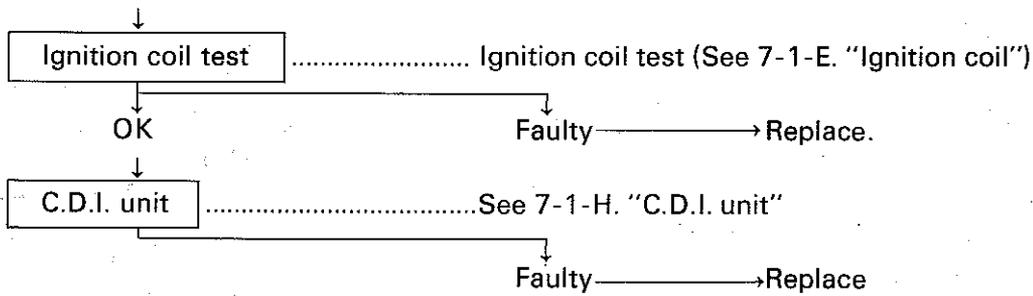


- | | | |
|-------------------|------------------|-----------------------|
| 1. C.D.I. magneto | 4. C.D.I. unit | 7. Engine stop switch |
| 2. Pulser coil | 5. Main switch | 8. Ignition coil |
| 3. Charging coil | 6. Tether switch | 9. Spark plug |

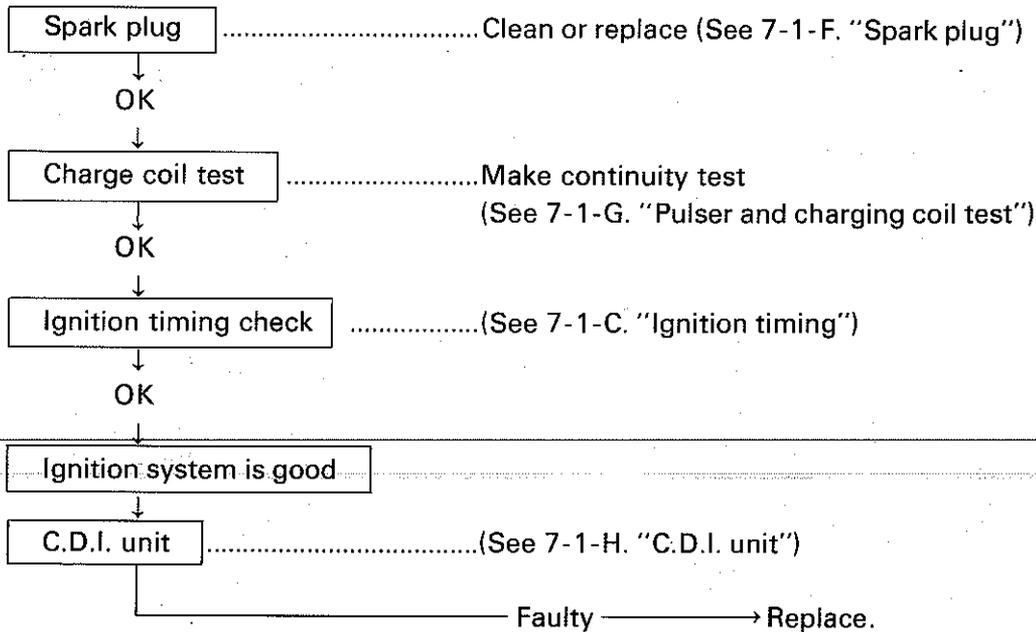
B. Troubleshooting

No spark is produced or weak.





The engine starts but will not pick up speed.



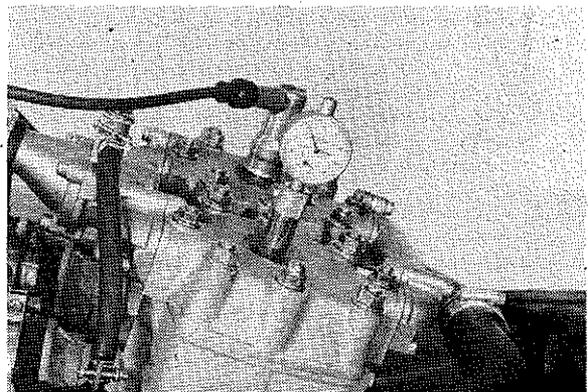
C. Ignition timing

1. Remove the right side spark plug and screw dial gauge stand into spark plug hole.

Tool name	Tool No.
Dial gauge stand	90890-01195

2. Insert dial gauge with needle into stand.

Tool name	Tool No.
Dial gauge	90890-01252
Dial gauge needle	90890-03098

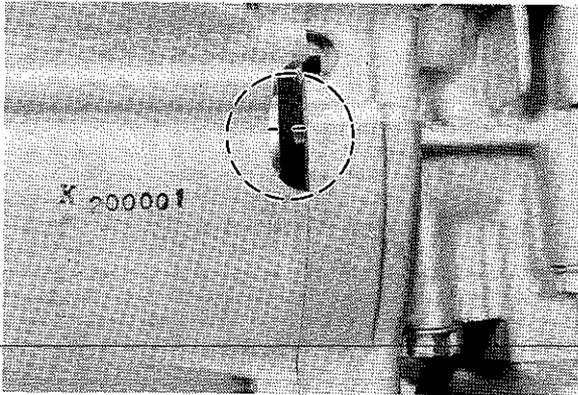


3. Rotate magneto flywheel until piston is at top-dead-center (T.D.C.)
Set the zero on dial gauge face to line up exactly with a dial gauge needle. Tighten set screw on dial gauge stand to secure dial gauge assembly. Rotate flywheel back and forth to be sure that indicator needle does not go past zero.

4. 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.).
5. Slowly turn flywheel clockwise until dial gauge reads specified ignition timing.

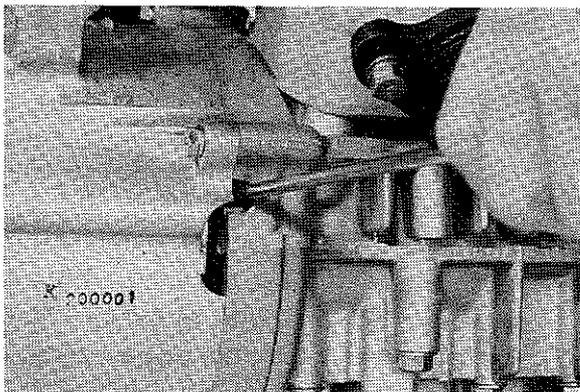
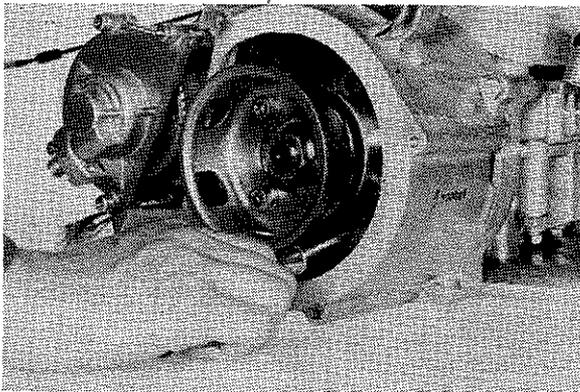
Ignition timing (B.T.D.C.)
 1.4 ± 0.1 mm (0.055 ± 0.004 in)

6. Check the marks on flywheel and base for alignment.



If not aligned, adjust ignition timing as follows.

- a. Remove the manual starter assembly.
- b. Loosen the base set screws and turn the base assembly until mark alignment is achieved.



- c. Tighten base set screw.

Tightening torque:
 7 Nm (0.7 m-kg)

- d. Install the starter assembly. (Refer to "2-2-F Starter")
7. Remove the dial gauge and stand. Replace the spark plug.

Spark plug tightening torque:
 28 Nm (2.8 m-kg)

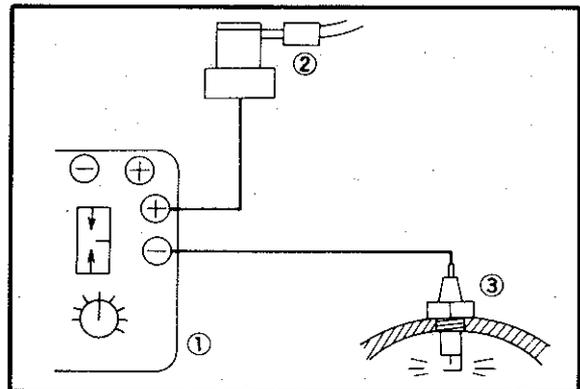
NOTE:

The timing light should be used to check if the marks on the rotor and base are aligned when both are replaced with new ones. The marks should align at any specified timing.

D. Spark gap test

The entire ignition system can be checked for misfire and weak spark using the Electro Tester. If the ignition system will fire across a sufficient gap, the engine ignition system can be considered good. If not, proceed with individual component test until the problem is found.

1. Warm up engine thoroughly so that all electrical components are at operating temperature.
2. Stop engine and connect tester as shown.



1. Electro-Tester
2. Plug wire from coil
3. Spark plug

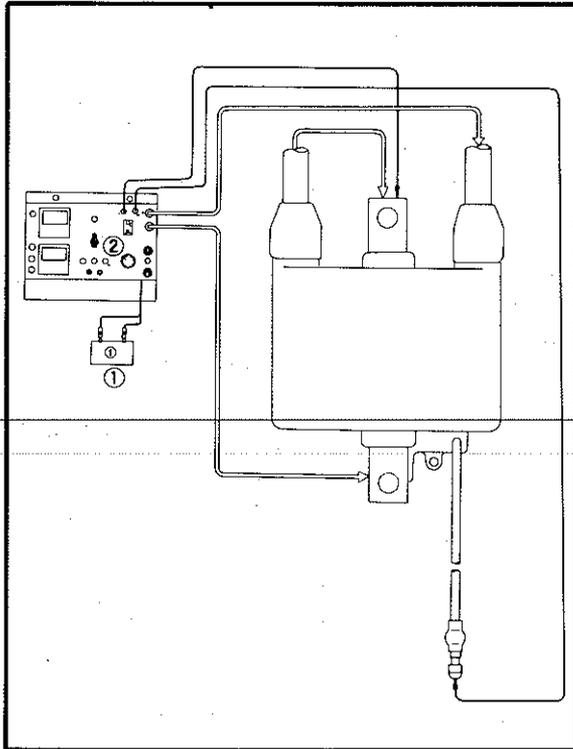
3. Start engine and increase spark gap until misfire occurs.

Minimum spark gap: 6 mm (0.24 in)

E. Ignition coil

1. Coil spark gap test
 - a. Remove the ignition coil from frame.
 - b. Connect Electro Tester as shown.
 - c. Connect fully charged battery to tester.
 - d. Turn on spark gap switch and increase gap until misfire occurs.

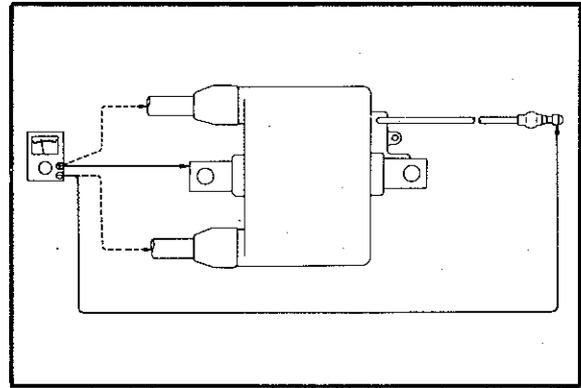
Minimum spark gap: 6 mm (0.24 in)



1. Battery
2. 6 mm

2. Coil winding resistance tests
Use a pocket tester or equivalent ohmmeter to determine resistance and continuity of primary and secondary coil windings.

Primary coil resistance	Secondary coil resistance
0.15Ω ± 10% at 20°C (68°F)	3.6kΩ ± 20% at 20°C (68°F)



- Primary coil resistance
- - - Secondary coil resistance

F. Spark plug

The life of a spark plug and its discoloring vary according to the habits of the rider. At each periodic inspection, replace burned or fouled plug with suitable one. Suitability may be determined by asking the rider how long and how fast he rides. Recommend a hot, standard, or cold plug type accordingly. It is actually economical to install a new plug often since it will tend to keep the engine in good condition and prevent excessive fuel consumption.

1. How to "read" spark plug (condition)
(The spark plug color samples are at the end of this manual)
 - ① Good
The insulator normally has a tan color. This check should be made after driving the machine over a long distance; otherwise, the correct reading of the spark plug will be impossible.
 - ② Bad (Mixture is too rich or spark plus temperature is low).
If mixture are too rich, the metal shell end will be wet as shown in the photo, acceleration or high-speed performance will be poor. If the spark plug temperature is low, the phenomenon specified in above will not take place. As shown in the photo, the insulator is dark and sooty.
 - ③ Bad (Mixture is too lean or spark plug temperature is high.)
The insulator is roughened (lower photo) or burned white (upper photo), and the ground electrode is green due to oxidation. This state of the spark plug

ELECTRICAL

will result in premature ignition or power loss.

④ Bad (Piston holed or seized)

The metal shell end and insulator show signs of overheating. If mixture is too lean, the piston can be holed or the engine may tend to knock. As a result, the spark plug will have occasional aluminum deposits.

⑤ Bad (Knocking)

Generally, the spark plug will not be greatly affected by the strength of mixtures, so long as the distance traveled is not long. But after long hours of driving, the insulator takes a greyish black color due to aluminum deposits. If so, the engine will fail to deliver full power, and the piston could be holed or seized. As a preventive measure, it is recommended to use a higher octane gasoline, adjust the ignition timing, enrich the mixture or remove the carbon in the cylinder.

⑥ Bad (Melting)

If the spark plug overheats, electrodes will melt away or the piston will be holed.

2. Inspection

Instruct the rider to:

- a. Inspect the clean the spark plug every 400 km (250 mi) or 20 hours.

- b. Clean the electrodes of carbon and adjust the electrode gap.

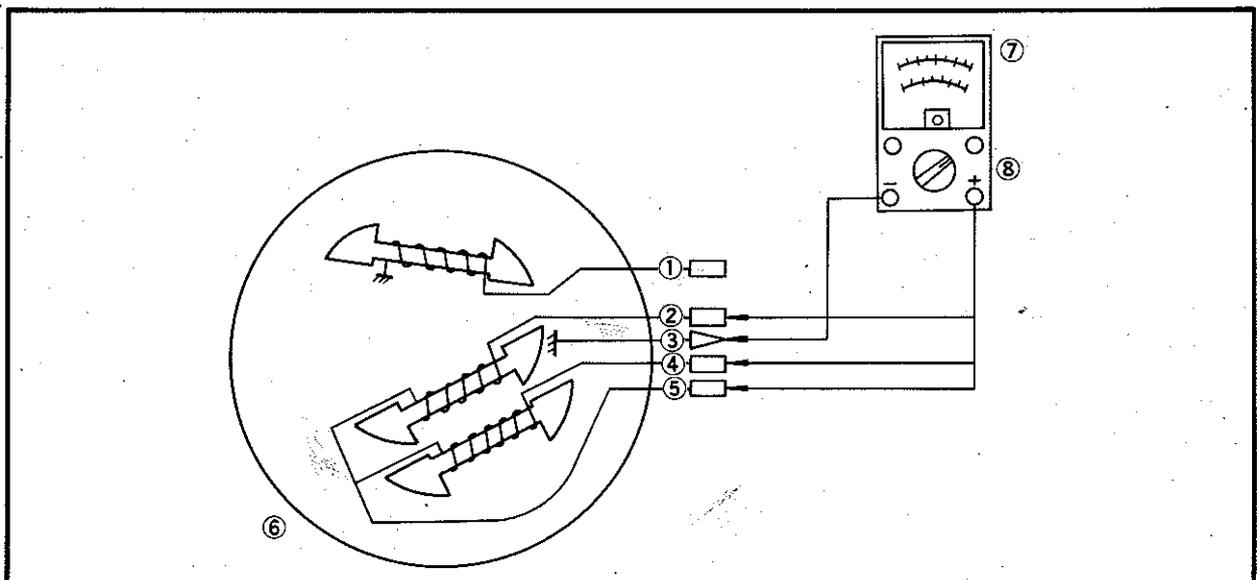
- c. Be sure to use the proper reach plug as a replacement to avoid overheating, fouling or piston damage.

Spark plug type: B-9ES (NGK)
Spark plug gap (use wire gap gauge): 0.7 ~ 0.8 mm (0.028 ~ 0.031 in)
Spark plug torque: 28 Nm (2.8 m-kp)

G. Pulser and charging coil test

Check the resistance between terminals. If resistance is out of specification, coil is broken. Check the coil connections. If the coil connections are good, then the coil is broken inside and it should be replaced.

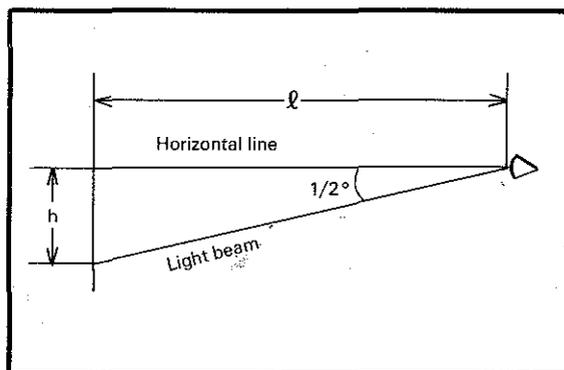
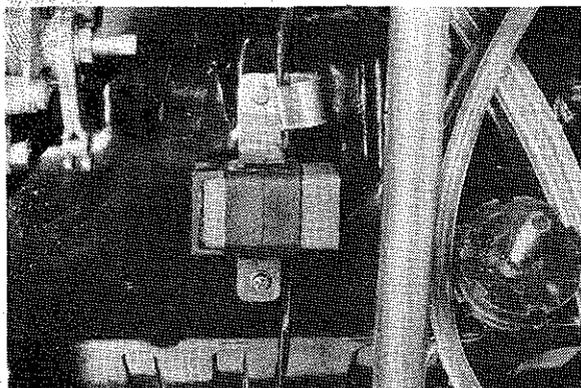
Charging coil resistance: Brown to Red leads: 225Ω ± 10% at 20°C (68°F)
Pulser coil resistance: White to Red leads: 10Ω ± 10% at 20°C (68°F)



- 1. Yellow
- 2. Brown
- 3. Black
- 4. White
- 5. Red
- 6. Flywheel magneto
- 7. Pocket tester
- 8. Set tester at "RX1" position

H. C.D.I. unit

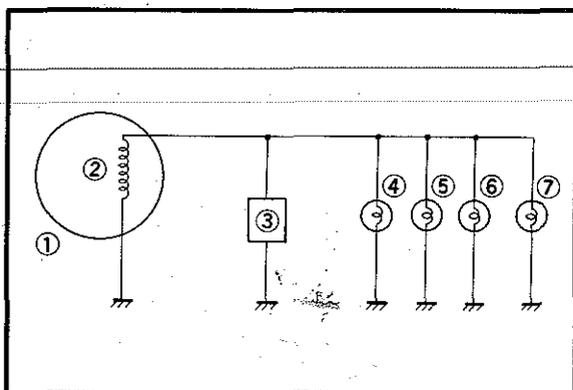
In case of ignition failure with all the above system check-ups proving in good order, replace the C.D.I. unit assembly.



l	3.0 m (10 ft)	7.6 m (25 ft)
h	26 mm (1.0 in)	66 mm (2.6 in)

7-2. LIGHTING SYSTEM

A. Circuit diagram



- 1. Flywheel magneto
- 2. Lighting source coil
- 3. Voltage regulator
- 4. Headlight
- 5. Taillight
- 6. Meter light
- 7. Brake light

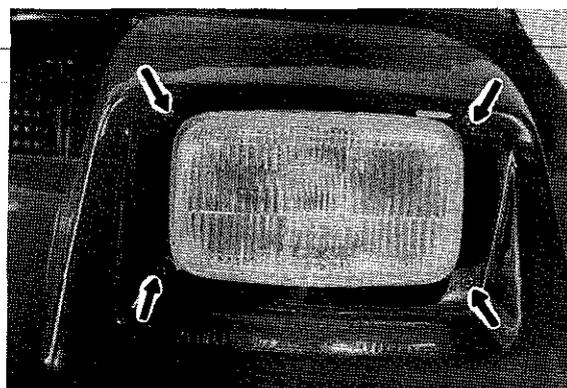
B. Headlight beam adjustment

1. Inspection

Check the headlight beam direction. The high beam must be directed downward at an angle of 1/2° to the horizontal line.

2. Adjustment

When necessary, adjust headlight beam by tightening or loosening the four headlight mounting screws.

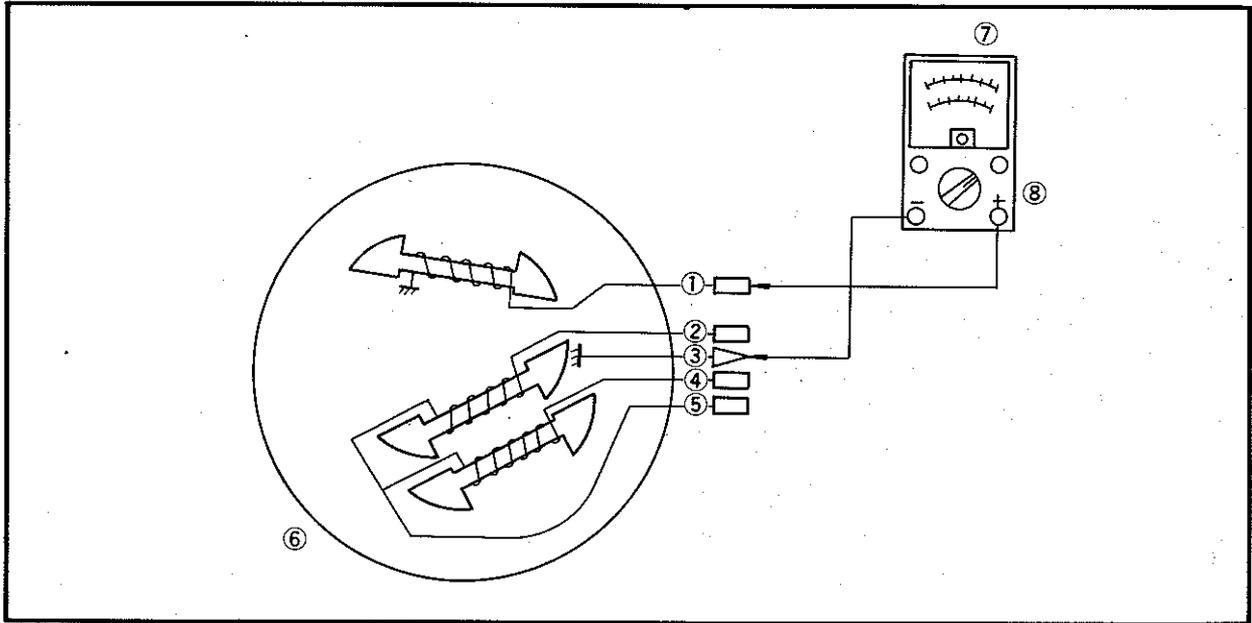


C. Lighting coil resistance check

Check the resistance between yellow lead and ground. If resistance is out of specification, coil is broken. Check the coil connections. If the coil connections are good, then the coil is broken inside and it should be replaced.

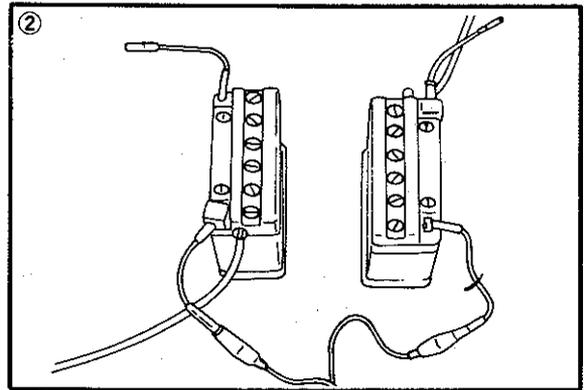
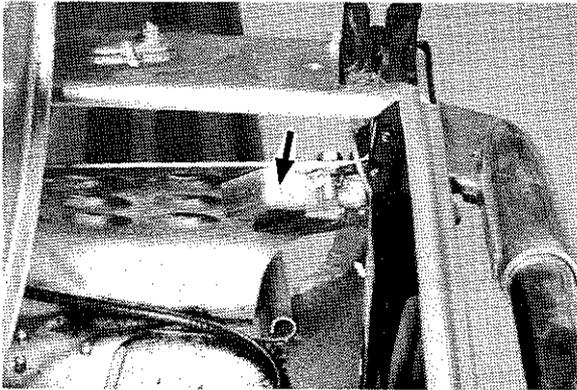
Lighting coil resistance:
 Black to Yellow leads:
 0.22Ω ± 10% / 20°C (68°F)

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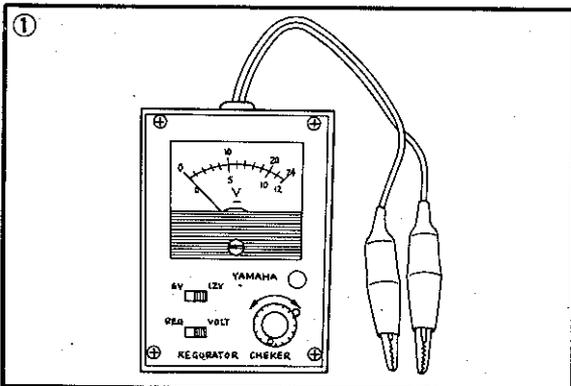
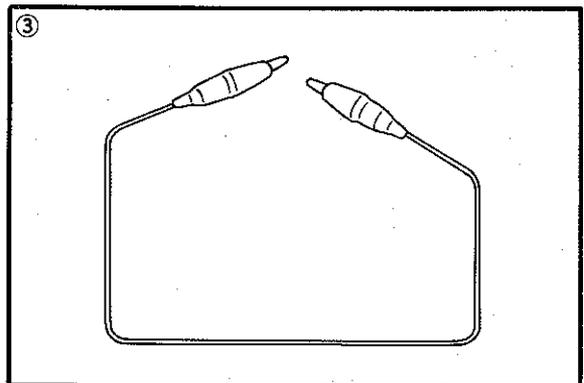


- | | |
|-----------|---------------------------------|
| 1. Yellow | 5. Red |
| 2. Brown | 6. Flywheel magneto |
| 3. Black | 7. Pocket tester |
| 4. White | 8. Set tester at "RX1" position |

D. Voltage regulator



1. Instruments required for inspection
- ① Regulator checker.
 - ② Two 12V batteries.
 - ③ Sub lead wire.



2. Connections
- Connect two 12V batteries in series using the sublead wires. Connect the red lead wire (A) (for power) of the regulator checker to the posi-

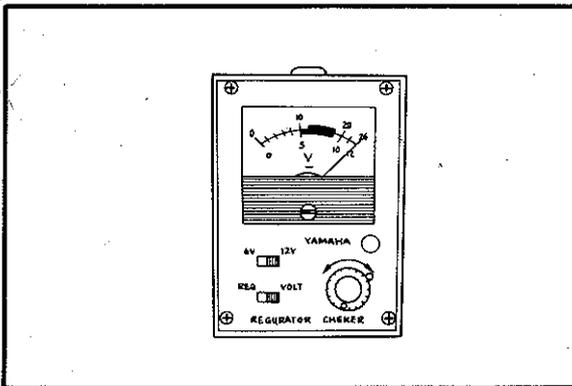
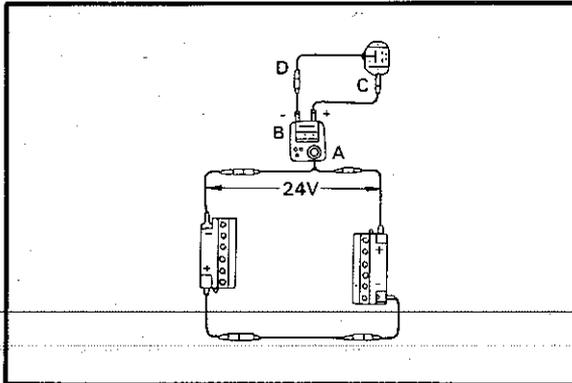
tive side of one of the batteries, and connect the black lead wire (B) to the negative side of the other battery.

Connect the red lead wire (C) (for test) of the regulator to the regulator case, and connect the black lead wire (D) to the lead wire of the regulator.

3. Inspection

Checking the battery voltage

First, set the switches, both right and left, to "12V" "VOLT". If the checker needle points to 20 volts or more, the battery voltage is sufficient.



4. Checking the regulator

a. Set the right switch to "REG". If the lamp lights up, there is continuity in the regulator checker.

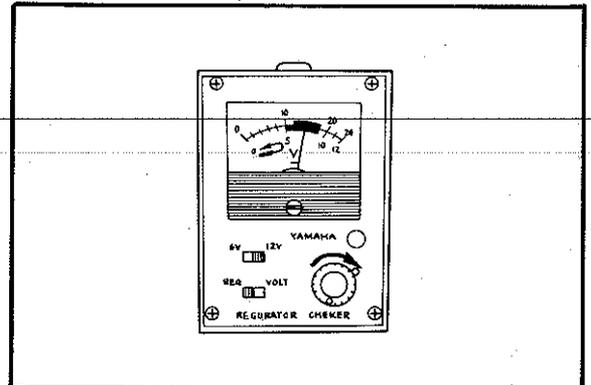
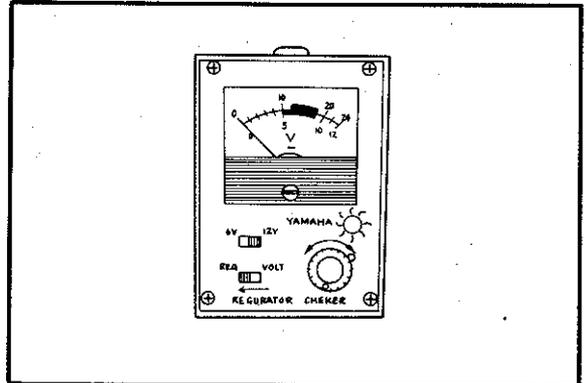
b. Operation test

Slowly slide the switch to the right. If the needle quickly swings back to 0, the moment that it moves into the black zone of the scale, the working voltage of the thyristor in the regulator is in good condition, and the regulator is also in good condition.

Thyristor working voltage:
13.8±0.5 volts at 5,000 r/min

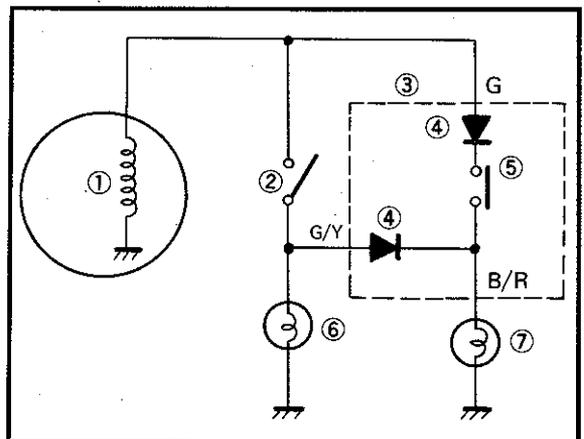
If the regulator is faulty:

The checker needle swings over the black zone, and it will not return to 0 from 20V or more.

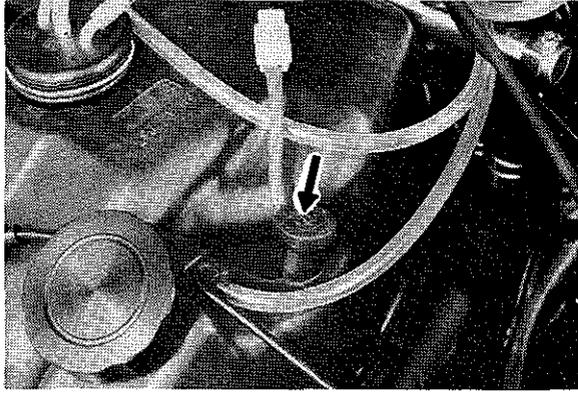


E. Oil caution switch

The oil caution light comes on when there is little oil in the oil tank, thus warning the rider.



- 1. Flywheel magneto
- 2. Brake switch
- 3. Oil caution switch ass'y
- 4. Diode
- 5. Oil level switch
- 6. Brake light
- 7. Oil caution light



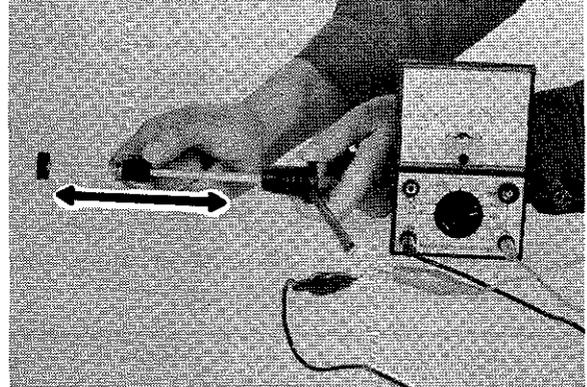
The oil caution circuit can be checked by squeezing the brake lever.

1. Oil level switch check

a. Connect the pocket tester leads to the oil caution switch ass'y lead connecter

(Pocket tester (-) ↔ Green)
 (Pocket tester (+) ↔ Black/Red)

b. Slide the switch float. When the float is moved down to the bottom end of the slider, the tester should read zero. If not, the switch must be replaced.



2. Diode check

Check the diode as specified using the pocket tester.

	Pocket tester connecting point		Good	Replace (element shorted)	Replace (element opened)
	(+) Red	(-) Black			
Lead wire color	Black/Red	Green/Yellow	○	○	×
	Green/Yellow	Black/Red	×	○	×
	Black/Red	Green	○	○	×
	Green	Black/Red	×	○	×

○: Continuity
 ×: Discontinuity

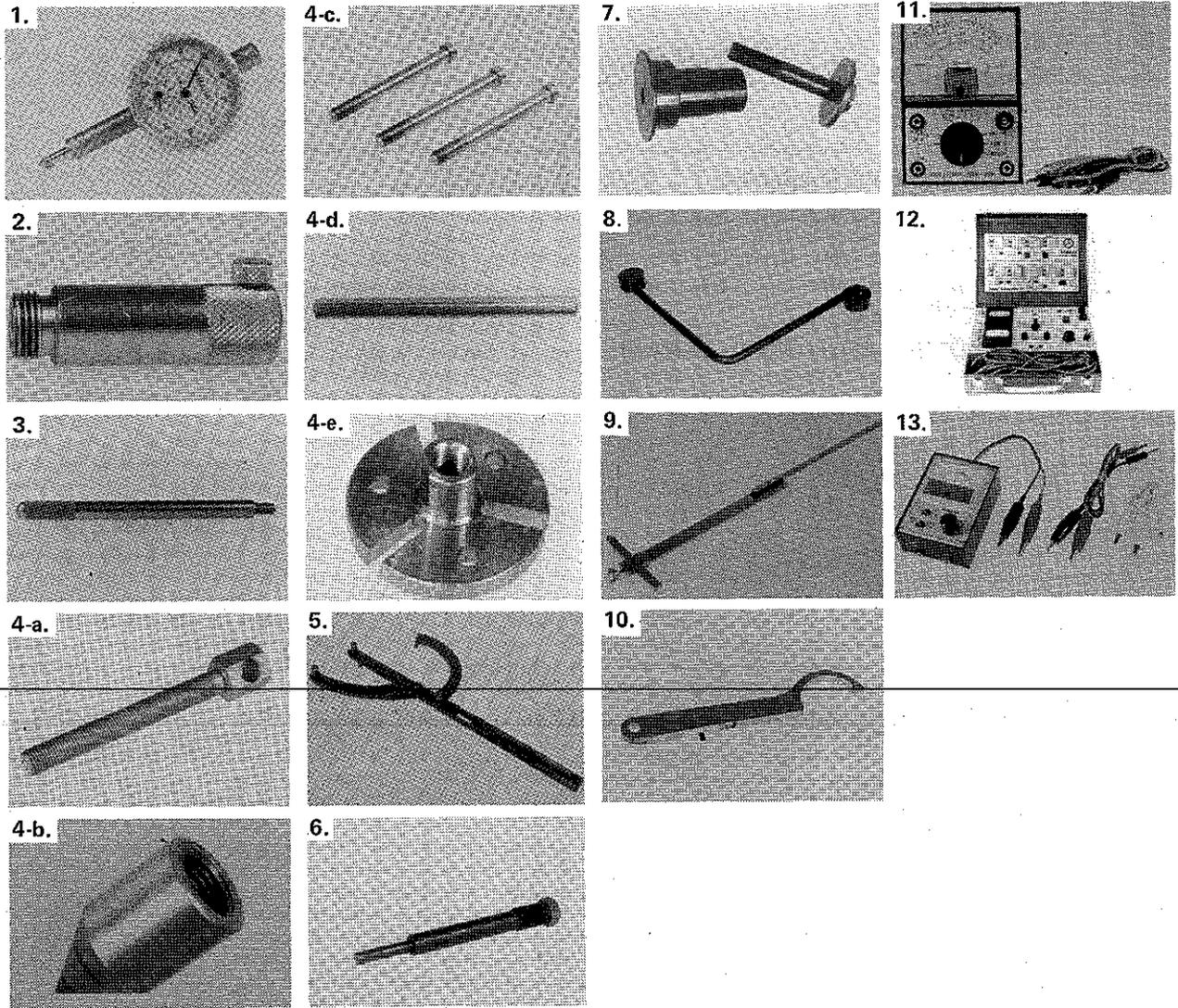
NOTE:

When making this testing, the float switch must be moved down to the bottom end of the slider. (Switch on position)

CHAPTER 8. APPENDIX

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8-4. WIRE AND PIPE ROUTING DIAGRAM	8-9

8-1. SPECIAL TOOLS



No.	Description	Tool No.
1	Dial gauge	90890-03097
2	Dial gauge stand No. 2	90890-01195
3	Dial gauge needle (56 mm)	90890-03098
4-a	Flywheel puller bolt	90890-01803
4-b	Flywheel puller attachment	90890-01804
4-c	Flywheel puller screw	90890-01806
4-d	Drive handle	90890-01817
4-e	Flywheel puller body	90890-01848
5	Rotor holding tool	90890-01235
6	Primary fixed sheave pulley	90890-01859
7	Sheave sub-assembly tool	90890-01858
8	Bushing tool	90890-01877
9	Sheave gauge	90890-01875
10	Eccentric bearing installer	90890-01851
11	Pocket tester	90890-03104
12	Electro tester	90890-03021
13	A.C. Regulator checker	90890-03090

8-2. SPECIFICATIONS

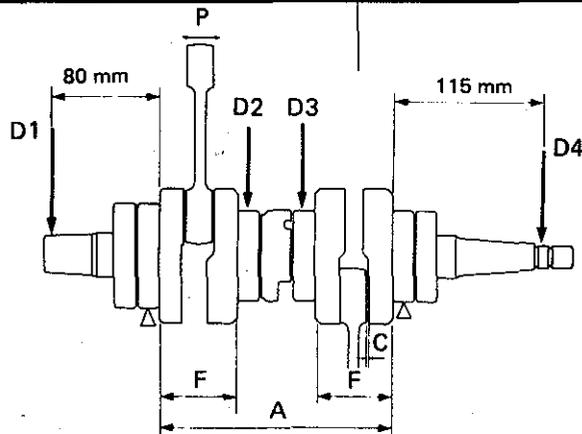
NOTE: * New specification
(Compared with 1979 SRX440)

A. General

Model	SRX440D
Model: Model (I.B.M. No.) Frame I.D. & starting number Engine I.D. & starting number	* SRX440 ('80) (8K6) * 8K6-015101 * RT439-015101
Dimension: Overall length Overall width (std) Overall height (w/windshield)	* 2,570 mm * 990 mm 935 mm

B. Engine

Description: Engine type Engine model Displacement Bore x Stroke Effective compression ratio Starting system Ignition system Lubrication system	Liquid cooled two stroke, twin cylinders RT439 439 cm ³ 68.5 x 59.6 mm 7.0 : 1 Recoil hand starter C.D.I. * "Autotube" oil injection
Cylinder head: Combustion chamber volume (with spark plug) Compression chamber type	21.0 cm ³ Dome + Squish
Cylinder: Material Bore size	Aluminum cylinder with hard chrome bore 68.5 mm
Piston: Piston skirt clearance (measuring point) Piston pin outside diameter x length	0.065 ~ 0.070 mm (10 mm from piston skirt end) φ20 x 56 mm
Piston ring: Piston ring design (Top) Piston ring design (2nd) Ring end gap (installed) (Top) Ring end gap (installed) (2nd)	Keystone 0.35 ~ 0.55 mm
Small end bearing: Type	Needle bearing
Big end bearing: Type	Needle bearing
Crankshaft: Crankshaft assembly width (A) Crankshaft assembly width (F) Crankshaft deflection (D) Connecting rod big end side clearance (C) Connecting rod small end deflection (P)	178 ± 0.1 mm 60 ⁺⁰ _{-0.05} mm 0.03 mm (D-1) 0.04 mm (D-2) 0.04 mm (D-3) 0.05 mm (D-4) 0.25 ~ 0.75 mm 2.0 mm



Crank pin outside diameter x length
 Crank pin type
 Crank bearing type (Left) x q'ty
 Crank bearing type (Center) x q'ty
 Crank bearing type (Right) x q'ty
 Crank oil seal type (Left) x q'ty
 Crank oil seal type (Center) x q'ty
 Crank oil seal type (Right) x q'ty

$\phi 24 \times 59$ mm
 Solid shaft assembly type with serration
 #6306 special x 2 pcs.
 #6206 special x 2 pcs.
 #6206 special x 2 pcs.
 FWJ-3278 9.5 x 1 pc.
 Labyrinth seal x 1 pc.
 FWJ-3248 10 x 1 pc.

Carburetor:

* Type & manufacturer/quantity

B38-36/MIKUNI/2 pcs.

* I.D. Mark

8K200

* Main jet (M.J.)

#260

* Main air jet (M.A.J.)

$\phi 0.6$

* Power jet (Pw.J.)

#115

* Power air jet (Pw.A.J.)

$\phi 1.3$

* Pilot jet (P.J.)

#85

* Pilot air jet (P.A.J.)

$\phi 0.8$

* Pilot screw (P.S.)

2.0 turns out

* Starter jet (St.J.)

$\phi 2.0$

* Float height

30 ± 1 mm

Idling engine speed

1,500 r/min

[Jet setting chart]

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	MJ #260 PJ #85			MJ #250 PJ #85	
Up to 1000 m (3000 ft)	MJ #240 PJ #85			MJ #230 PJ #85		MJ #220 PJ #85
Up to 2000 m (6000 ft)	MJ #210 PJ #95			MJ #200 PJ #95		MJ #190 PJ #95
Up to 3000 m (10000 ft)	MJ #180 PJ #105			MJ #170 PJ #105		MJ #160 PJ #105

Lubrication:

* Autolube pump—Color code
 * Autolube pump—Minimum stroke
 * Autolube pump—Maximum stroke
 * Autolube pump—Reduction ratio
 * Autolube pump—Output Min./200 strokes
 * Autolube pump—Output Max./200 strokes

Yellow
 0.20 ~ 0.25 mm
 1.67 ~ 1.87 mm
 1/25
 0.95 ~ 1.19 cm³
 7.84 ~ 8.89 cm³

* Autolube pump wire free play * Oil tank capacity Oil grade	23±1 mm at idle 2.5 Liter YAMALUBE 2-cycle
Cooling system: Thermostat Open — Close temperature Capacity (Lift) Bearing type Oil seal type Reduction ratio Antifreeze q'ty in system	60 ~ 65°C 2.8 mm/80°C 6201 Z-C ₃ SD20 37 15 51/44 (1.16 : 1) 2.5 Liter automobile all weather antifreeze Antifreeze 50% Water 50%

C. Drive and track suspension

Transmission: Type Drive ratio Engagement rpm Primary spring: Part No. Color code	V-belt automatic centrifugal engagement 3.5 : 1 ~ 1 : 1 * 3,800 ~ 4,200 r/min * 90501-60579 * Red—Brown
Secondary spring: Part No. Color code Secondary spring pre-load (tsist) Sheave distance Sheave off-set V-belt width and outer line length V-belt wear limit	90508-45286 Yellow 90° (No 3 hole) 270 $\begin{smallmatrix} +0 \\ -3 \end{smallmatrix}$ mm 5.5±0.5 mm 31.5 x 1,099 mm 26 mm (1.02 in)
Track suspension: Type Damper type Spring color code (Front) Spring color code (Rear) Slide runner wear limit Track width Track deflection Length on ground Wheel sprocket material and number of teeth Stopper band length	Slide rail suspension Oil and gas damper * Orange No painted 10 mm 380 mm 25 ~ 30 mm/10 kg 850 mm * Polyethylene 12T * 220 mm (8.67 in) (3rd hole from the bottom)
Secondary drive: Type Reduction ratio Chain pitch x Number of links Free play Chain housing oil quantity Chain housing oil grade	Chain (#35K-3) 18/29 (1 : 1.611) 9.525 mm x 70L 10 $\begin{smallmatrix} +5 \\ -2 \end{smallmatrix}$ mm 320 cm ³ Gear oil API "GL-3" (SAE #75 or 80)
Brake: Type Brake pad thickness Brake pad wear limit Brake cable free play	Floating disc type 13.5 mm 9.5 mm 5 mm

D. Chassis

Frame: Material	Aluminum + Steel
Steering system: Caster (ski column) Camber Ski length x width x thickness Ski stance Ski toe-out Steering linkage type Lock to lock angle (Ski) Lock to lock angle (Steering column)	25° 0° 980 x 120 x 2.0 mm * 870 mm 0 ~ 6 mm Tie-rod Right ski, L: 23° R: 30° Left ski, L: 30° R: 23° Right: 51° Left: 51°
Front suspension: Type Damper type	Leaf spring * Oil and gas damper
Fuel tank: Capacity Fuel grade	* 25 Liter Regular-leaded gasoline with octane rating of over 93

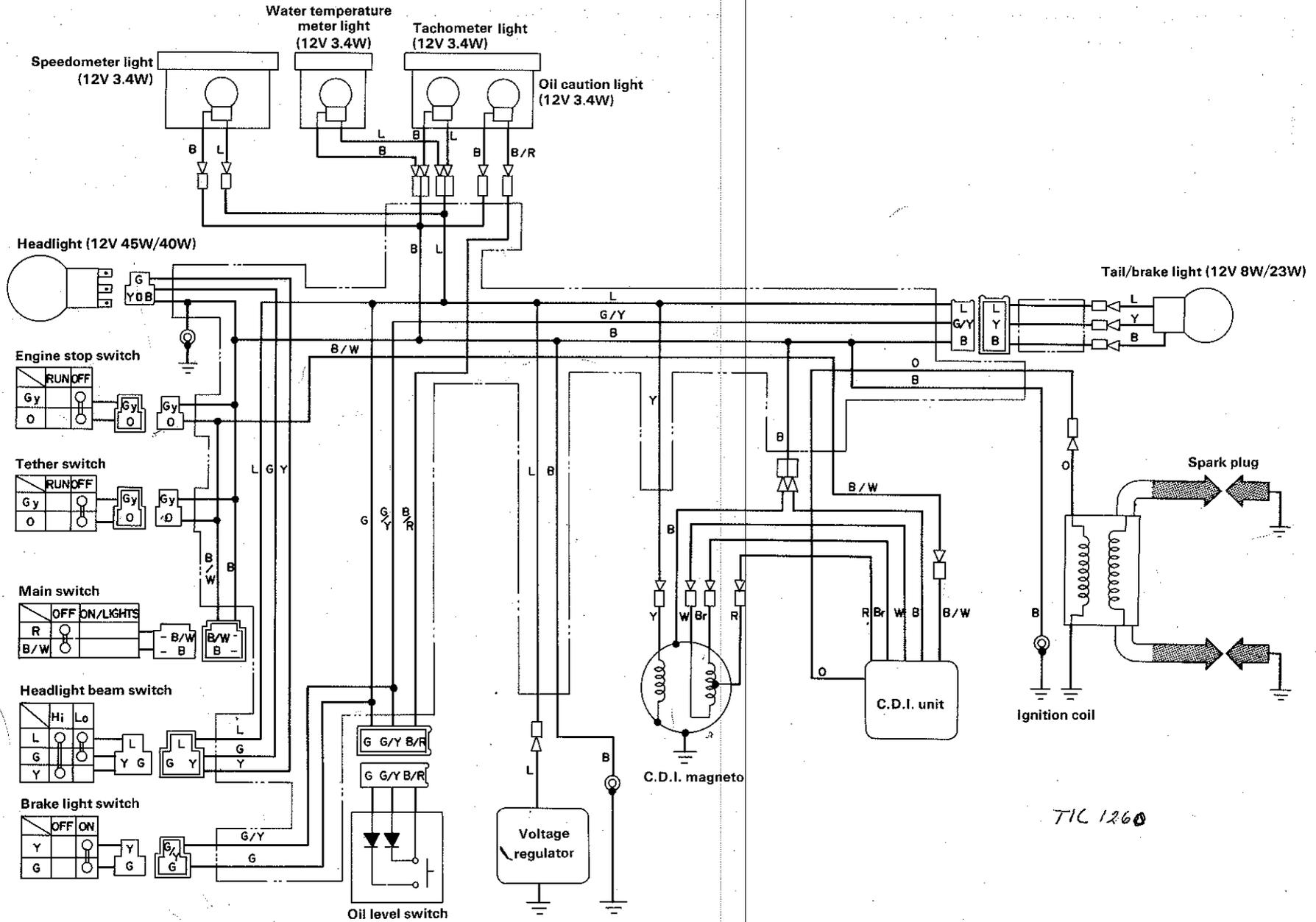
E. Electrical

Ignition system: Type—flywheel magneto (C.D.I. Type) Model/Manufacturer Voltage Pulser coil (charge coil) resistance Charging coil resistance	* F170-54 HITACHI 12V 10Ω at 20°C (Red—White) * 225Ω at 20°C (Brown—Red)
Ignition timing: B.T.D.C.	1.4±0.1 mm
Ignition coil: Model/Manufacturer/Quantity Spark gap Primary winding resistance Secondary winding resistance Diode (Yes or No)	CM60-20/HITACHI/1 pc. 9 mm (300 r/min) 11 mm/3,000 r/min 0.15Ω at 20°C (68°F) 3.6kΩ at 20°C (68°F) No
Spark plug: Type & quality Spark plug gap	* NGK B-9ES x 2 pcs. 0.7 ~ 0.8 mm
Spark plug cap: Type Noise suppressor resistance	Rubber type with noise suppressor 5kΩ at 20°C (68°F)
C.D.I. unit: Model/Manufacturer	* TIA01-32/HITACHI
Lighting system: Lighting output Lighting coil resistance Headlight type Bulb wattage/q'ty Tail/Brake light wattage	12V-100V 0.22Ω at 20°C (68°F) (Yellow—Black) Halogen light * 12V-45/40W x 1 pc. 12V-8W/23W
A.C. regulator: Model/Manufacturer Voltage	TRIZ-24B HITACHI or S8516B TOSHIBA 13.8±0.5V

F. Tightening torque

Part to be tightened	Thread size	Tightening torque	Remarks
[Engine]			
Spark plug	M14 P1.25	28 Nm (2.8 m-k _g)	
Cylinder head	M8 P1.25	25 Nm (2.5 m-k _g)	
Cylinder head	M10 P1.25	30 Nm (3.0 m-k _g)	
Flywheel magneto	M16 P1.0	73 Nm (7.3 m-k _g)	
Crankcase upper and lower	M8 P1.25	First: 10 Nm (1.0 m-k _g) final: 22 Nm (2.2 m-k _g)	
Tightening sequence			
Starter pulley	M8 P1.25	15 Nm (1.5 m-k _g)	
Crankcase and engine bracket	M10 P1.25	40 Nm (4.0 m-k _g)	
[Drive and track suspension]			
Primary sliding sheave and cap Installation of primary sheave	M6 P1.0 UNF 1/2"	11 Nm (1.1 m-k _g) Initial: 120 Nm (12 m-k _g) Loosen once and retighten:	Use motor oil
Installation of secondary sheave	M10 P1.25	65 Nm (6.5 m-k _g)	
Bearing housing	M10 P1.25	50 Nm (5.0 m-k _g)	
Secondary shaft and bearing collar	Socket screw	65 Nm (6.5 m-k _g) 6 Nm (0.6 m-k _g)	
Brake caliper and housing chain	M10 P1.25	50 Nm (5.0 m-k _g)	
Installation of drive chain sprocket	M10 P1.25	50 Nm (5.0 m-k _g)	Nut
Installation of driven chain sprocket	M10 P1.25	50 Nm (5.0 m-k _g)	Bolt
Chain housing and frame	M8 P1.25	23 Nm (2.3 m-k _g)	
Installation of front axle L.H.	M22 P1.0	85 Nm (8.5 m-k _g)	
Front axle housing and frame	M8 P1.25	23 Nm (2.3 m-k _g)	
Wheel sprocket and front axle		5.5 Nm (0.55 m-k _g)	
Front pivot shaft	M10 P1.25	65 Nm (6.5 m-k _g)	
Rear pivot shaft	M10 P1.25	65 Nm (6.5 m-k _g)	
Guide wheel shaft	M12 P1.25	80 Nm (8.0 m-k _g)	
Sliding runner	M8 P1.25	4.5 Nm (0.45 m-k _g)	
[Chassis]			
Engine mounting nut	M10 P1.25	52 Nm (5.2 m-k _g)	
Ski runner	M8 P1.25	14 Nm (1.4 m-k _g)	Use self-locking nut and LOCK-TITE
Steering column and gate	M6 P1.0	7.3 Nm (0.73 m-k _g)	Use lock washer
Steering relay rod adjusting nut	M10 P1.25	25 Nm (2.5 m-k _g)	
Outside arm and ski column	M10 P1.25	40 Nm (4.0 m-k _g)	Use lock washer
Steering lower bracket	M8 P1.25	13.7 Nm (1.37 m-k _g)	Use lock washer
Installation of steering column 1, 2	M6 P1.0	9 Nm (0.9 m-k _g)	Use lock washer
Steering relay ass'y	M10 P1.25	30 Nm (3.0 m-k _g)	Use cotter pin

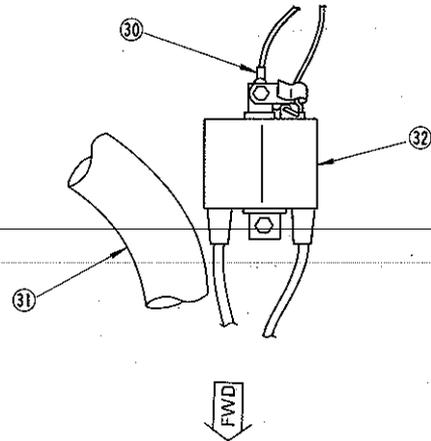
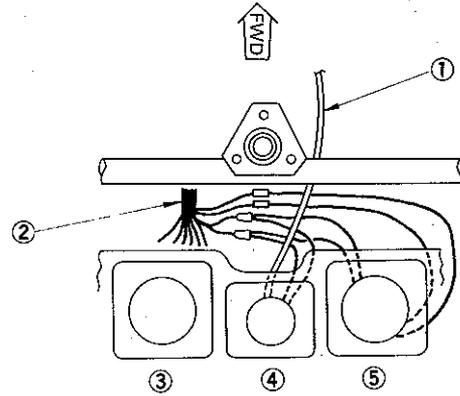
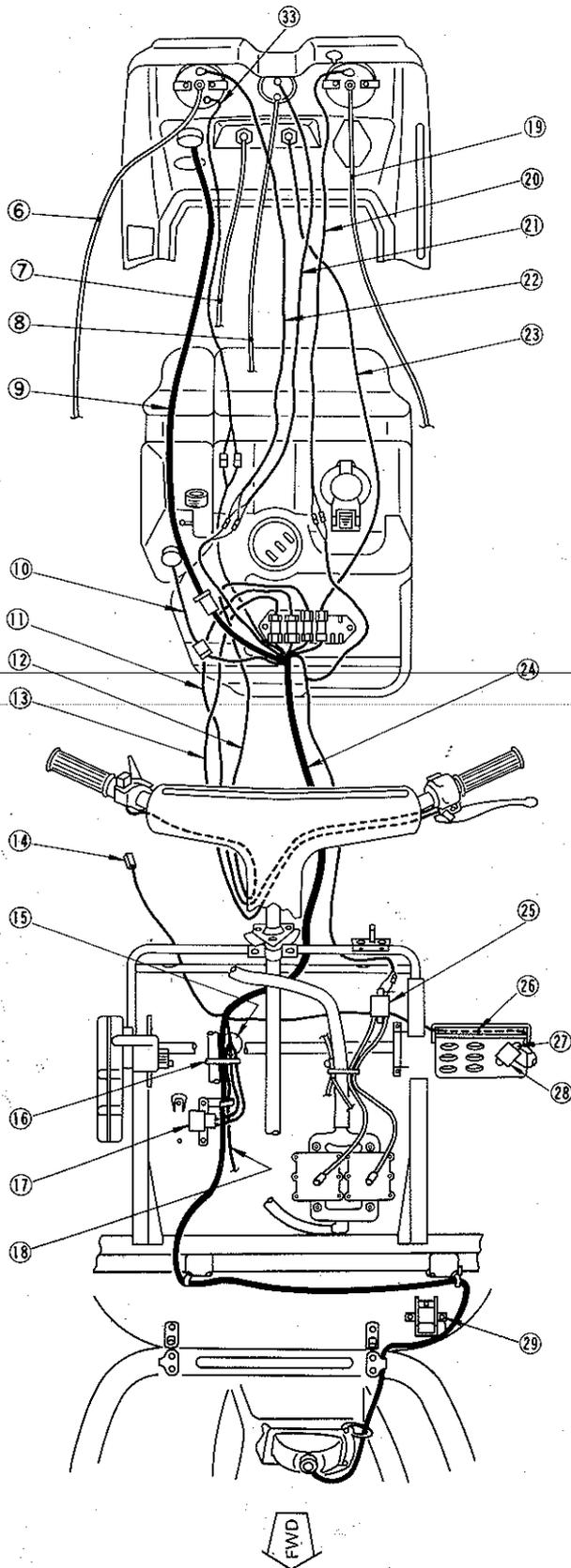
8-3. WIRING DIAGRAM



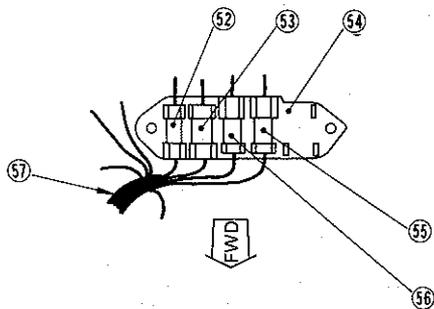
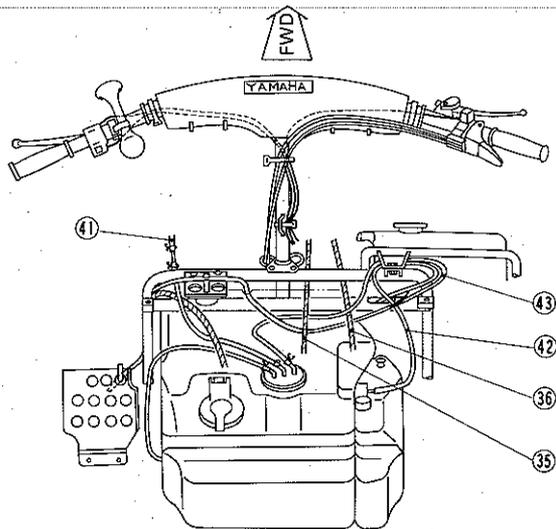
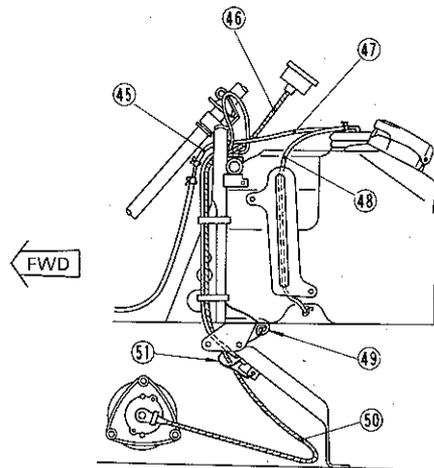
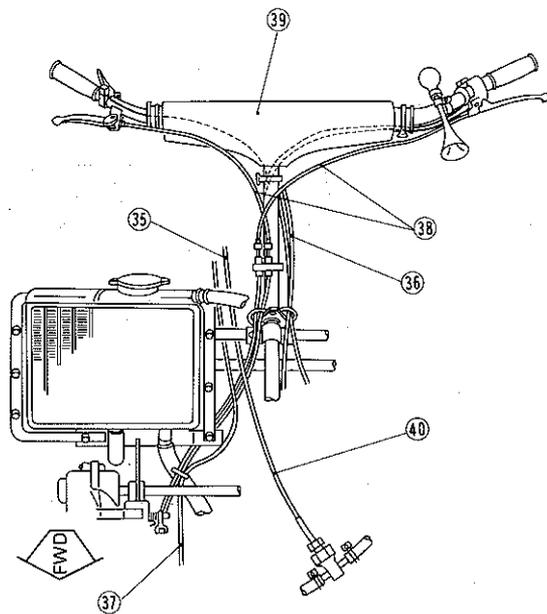
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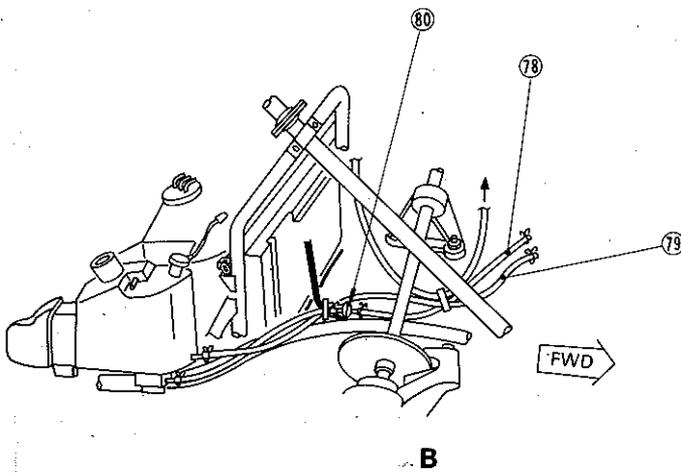
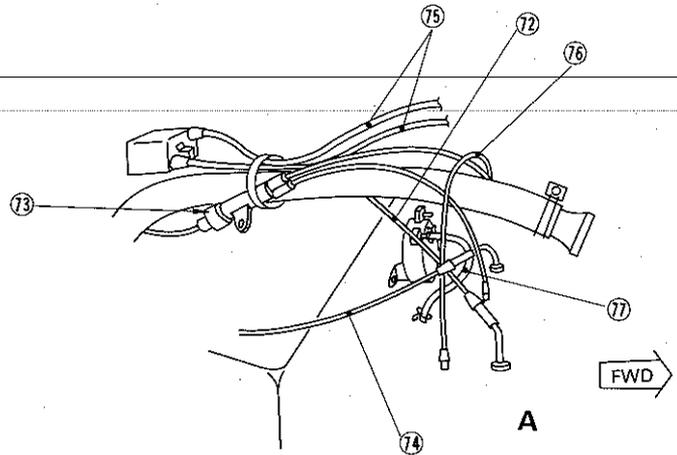
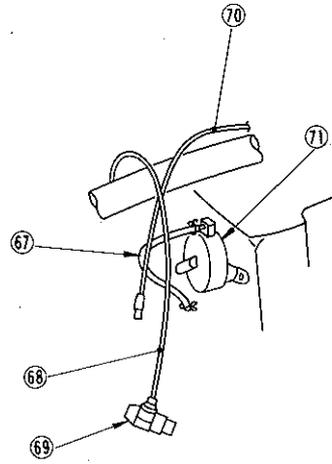
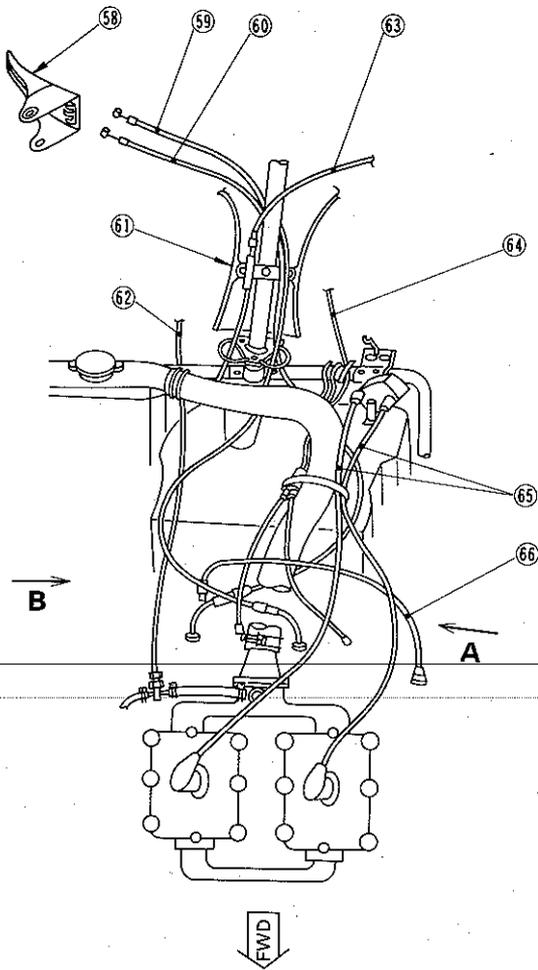
8-4. WIRE AND PIPE ROUTING DIAGRAM



1. Water temperature meter cable
2. Wire harness assembly
3. Speedometer
4. Water temperature meter
5. Tachometer
6. Tachometer cable (To water pump driven gear)
7. Starter cable
8. Water temperature meter cable
9. Main switch lead wire
10. Oil level gauge lead wire
11. Headlight beam switch lead wire
12. Engine stop switch lead wire
13. Brake light switch lead wire
14. Connect the taillight lead wire. (Route the lead wire under the oil tank)
15. Connecting point of C.D.I. unit lead wire, C.D.I. magneto lead wire, wire harness and other lead wire.
16. Band (Clamp the water hose, wire harness, C.D.I. magneto lead wire, and C.D.I. unit lead wires.)
17. C.D.I. unit.
18. C.D.I. magneto lead wire
19. Speedometer cable
20. Speedometer lead wire
21. Water temperature meter lead wire
22. Tachometer lead wire
23. Tether switch lead wire
24. Wire harness assembly
25. Ignition coil
26. Voltage regulator lead wire
27. Ground lead wire (Tighten the lead wire end, together with regulator securing bolt.)
28. Voltage regulator
29. Ground lead wire (Tighten the lead wire end, together with V-belt under side holder.)
30. Ground lead wire
31. Water hose
32. Ignition coil
33. Oil caution light lead wire



- 34. Throttle cable
- 35. Water temperature meter cable
- 36. Tachometer cable
- 37. To water pump driven gear
- 38. Brake cable
- 39. Steering pad
- 40. Route the cable over the intake silencer.
- 41. Fuel pipe
- 42. Oil tank breather pipe
- 43. Fuel tank breather pipe
- 44. To fuel pump
- 45. Fuel pipe
- 46. Speedometer cable
- 47. Fuel pipe
- 48. Fuel level pipe
- 49. Wire harness protector
- 50. Bend cable at large curve
- 51. Voltage regulator lead wire
- 52. Brake light switch coupler
- 53. Headlight beam switch coupler
- 54. Coupler holder
- 55. Tether switch coupler
- 56. Engine stop switch coupler
- 57. Wire harness



- 58. Throttle lever
- 59. Left carburetor throttle cable (Upper side)
- 60. Right carburetor throttle cable (Lower side)
- 61. Steering pad
- 62. Water temperature meter cable
- 63. Brake cable
- 64. Starter cable
- 65. High tension cord
- 66. Oil pump cable
- 67. Fuel pipe (To left carburetor)
- 68. Oil pump cable
- 69. Oil pump
- 70. Starter cable (for left carburetor)
- 71. Fuel pump
- 72. Throttle cable (for right carburetor)
- 73. Starter cable cylinder
- 74. Throttle cable (for left carburetor)
- 75. High-tension cord
- 76. Oil pump cable
- 77. Fuel pipe (To right carburetor)
- 78. Oil pipe (To upper nozzle of oil pump)
- 79. Oil pipe (To lower nozzle of oil pump)
- 80. Oil filter

— MEMO —