YAMAHA

SNOWMOBILE

BR250F

SERVICE MANUAL

LIT-12618-00-41

8R4-28197-10

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 Department of Yamaha is 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

BR250F
SERVICE MANUAL

1st edition, June 1981

Printed in U.S.A.
LIT-12618-00-41

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

NOTE: A NOTE provides key information to make procedures easier or clearer.

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.

TABLE OF CONTENTS

GENERAL 1 GENERAL

ENGINE 2 ENGINE

CARBURETION 3 CARBURETION

POWER TRAIN 4 POWER TRAIN

CHASSIS 5 CHASSIS

ELECTRICAL 6 ELECTRICAL

APPENDIX 7 APPENDIX

CHAPTER 1. GENERAL

1-1. EXTERNAL VIEW 1-1

1-2. MACHINE IDENTIFICATION 1-2

1-3. TERMS 1-2

1-4. STORAGE 1-2

1-5. PRE-SEASON PREPARATION 1-2

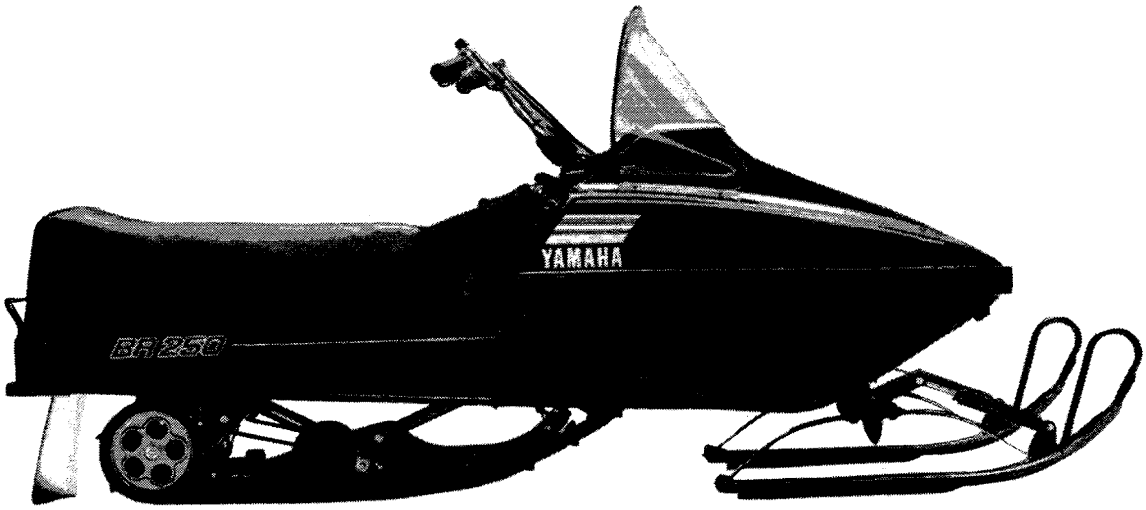
1-6. MAINTENANCE 1-3
- A. Periodic Maintenance 1-3
- B. Lubrication Intervals 1-4
- C. Sealing the Carburetor 1-5

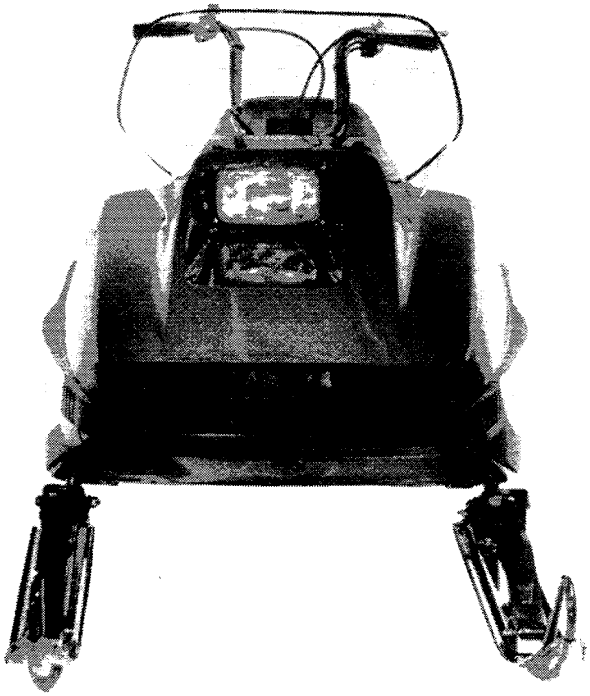
1-7. HIGH ALTITUDE TUNING 1-5

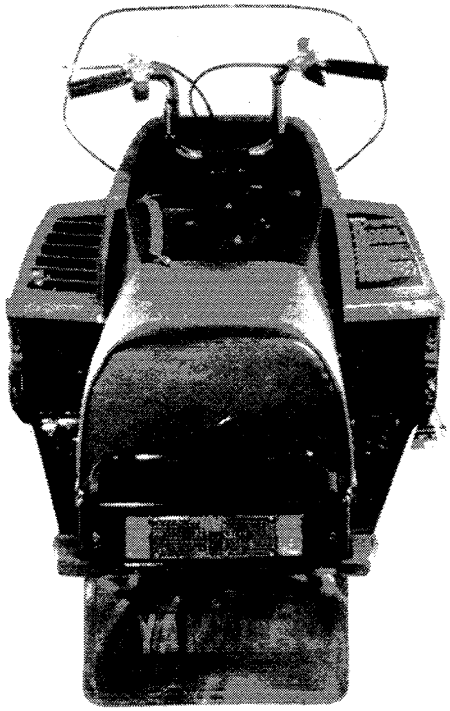
1-8. SPECIAL TOOLS 1-6

GENERAL

1-1. EXTERNAL VIEW







1-2. MACHINE IDENTIFICATION

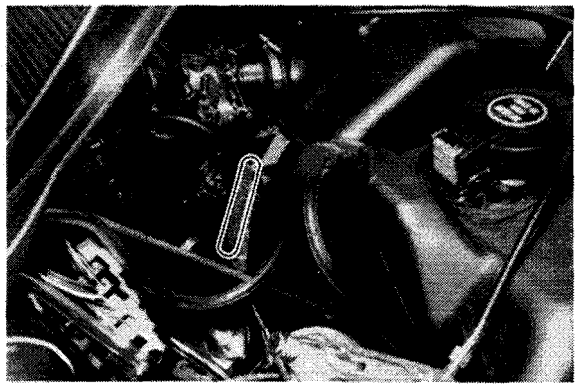
A. Frame Serial Number

The frame serial number is located on the right-hand 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.

Starting frame serial number	8R4-000101

B. Engine Serial Number

The engine serial number is located on the fan case. The prefix indicates the engine type and displacement. The prefix is followed by a dash and the serial number. Normally both the frame and engine serial numbers are identical.



Starting engine serial number	R246-000101

1-3. TERMS

Grease:

Unless other specified, use a low-temperature lithium base grease when instructed to grease a part or component.

Thread-locking compound:

Use Loctite® Lock N' Seal (blue), unless other wise specified, when applying a thread-locking compound to securing hardware.

Oil:

Use Yamalube 2 to oil components unless another oil is specified.

1-4. STORAGE

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

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

1-5. PRE-SEASON PREPARATION

Perform the predelivery service as described in the predelivery check list before operating any snowmobile that has been stored for several months.

1-6. MAINTENANCE

A. Periodic Maintenance

Perform the various inspections and services at the indicated intervals; however use this schedule as a guide only. Depending upon the operating conditions, certain components may require more frequent servicing.

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:					
Tighteness of bolts and nuts	○				
Bends, cracks, and wear	○				
Abnormal noise	○				
Loose connection and breaks in the fuel and pulse pipes	○				
Loose connection and breaks in the oil pipes	○				
Loose connection and breaks in the oil delivery pipe	○				
Recoil starter		○			
Carburetor					
● Operation of starter jet		○			
● Mixing adjuster (pilot screw)				○	
● Idle speed adjustment				○	
Operation and adjustment of oil pump		○			
Ignition timing					○
Cylinder compression			○		
Cylinder/exhaust pipe decarbonize					○
Spark plug condition, gap, and cleaning	○				
Tighten the cylinder**	○				
DRIVE:					
Tightness of bolts and nuts	○				
Wear on slide runners	○				
Primary drive system		○			
V-belt	○				
Secondary drive system		○			
Sheave distance		○			
Sheave offset		○			
Brake pad wear		○			
Brake operation and adjustment		○			
Guide wheel rubber		○			
Wear of track drive sprockets		○			
Drive track adjustment	Initial 100 km (60 mi) & 300 km (200 mi)	○			
Breaks in drive track		○			
Bends in front and rear axles		○			
Check lock washers		○			
Drive chain adjustment		○			
Chain case oil level		○			

** Retighten every 10 hours from the first use.

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

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
Oil pump control box			○			
Pump drive cover			○			
Oil in the oil tank				○		YAMALUBE 2-cycle oil
DRIVE:						
Primary sheave weights and roller pins		○				Molybedenum disulfide snowmobile grease
Secondary shaft and sliding sheave		○				
Front axle housing		○				Light all-purpose grease
Shaft 1 and shaft 2 (Slide rail)			○			
Replace chain case oil		○				Gear oil API "GL-3" SAE #75 or #80
CHASSIS:						
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		○				
Ski retaining pin		○				
Brake cable end stopper and brake lever		○				Esso Beacon 325 gear

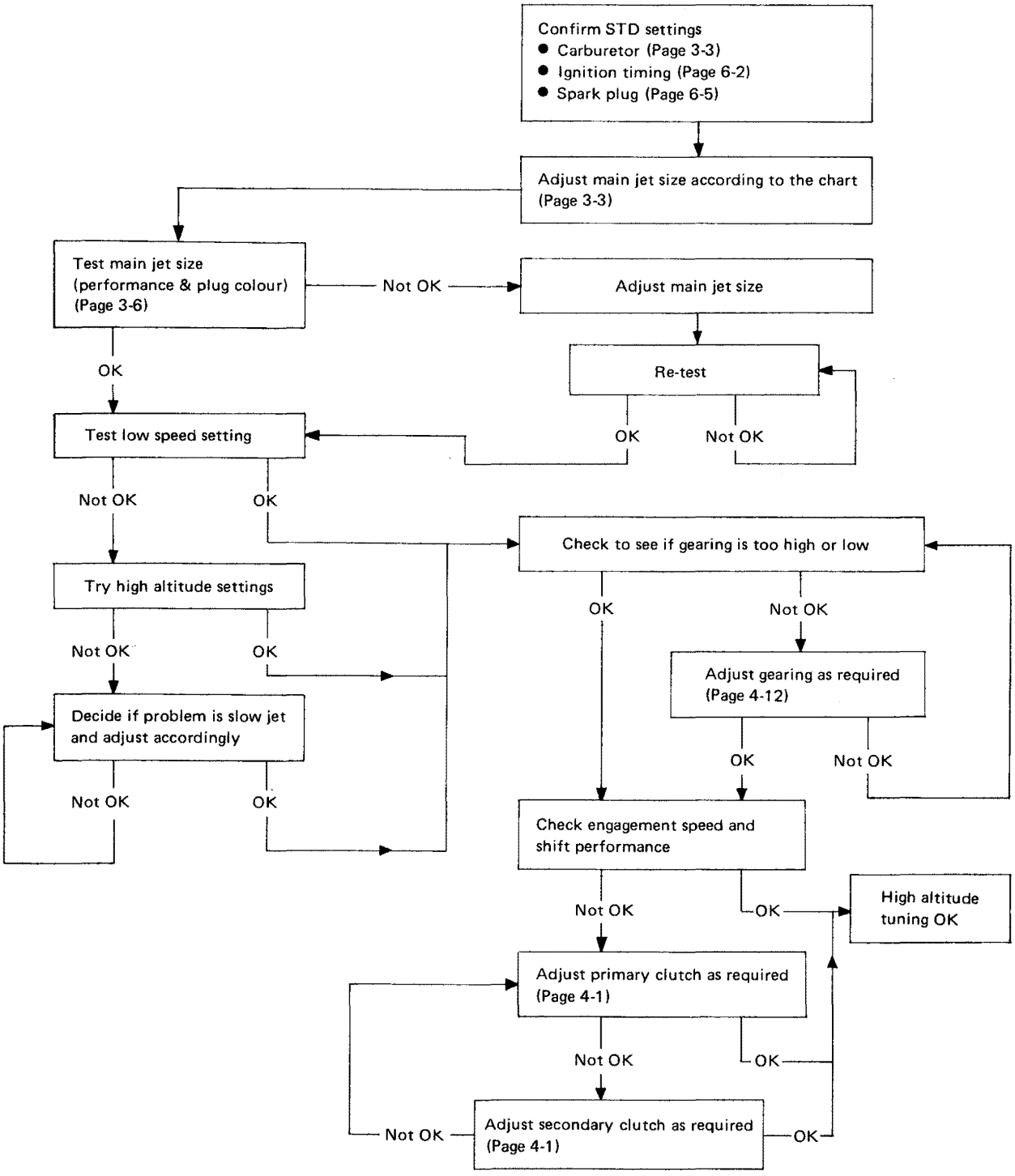
C. Sealing the Carburetor

ALWAYS seal the carburetor before turning a snowmobile on its side for service. This will prevent fuel from spilling and creating a hazard.

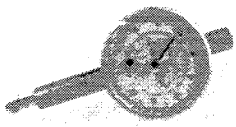
1. Plug the fuel-tank vent pipe.
2. Plug both float-bowl overflow pipes or connect them together.
3. Drain float bowl.

1-7. HIGH ALTITUDE TUNING

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

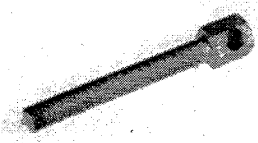


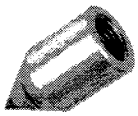
1-8. SPECIAL TOOLS

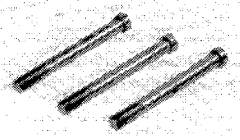
1.


2.

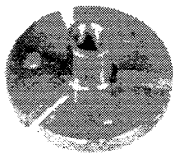

3.

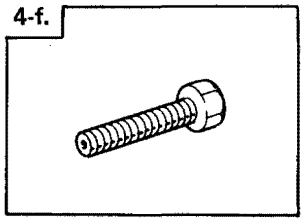

4-a.


4-b.


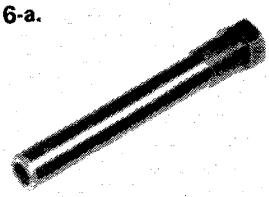
4-c.


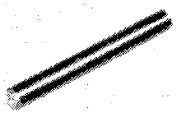
4-d.

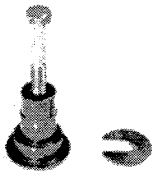

4-e.


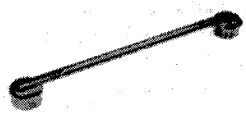
4-f.


5

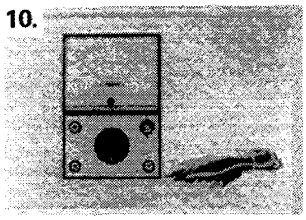

6-a.


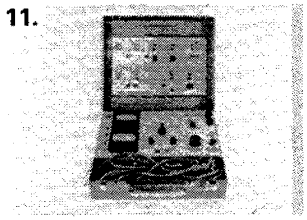
6-b.


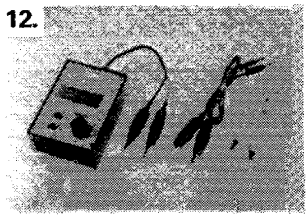
7.


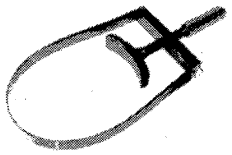
8.


9.


10.


11.


12.


13.


14.


No.	Description	Tool No.
1	Dial Gauge	90890-03097-00
2	Dial Gauge Stand	90890-01195-00
3	Dial Gauge Needle (56 mm)	90890-03098-00
4	3-Way Puller A'ssy	TLU-90901-05-20 (U.S.A.)
4-a	3-Way Puller Attachment	90890-01803-00
4-b	3-Way Puller Attachment	90890-01804-00
4-c	3-Way Puller Screw	90890-01906-00
4-d	Drive Handle	90890--1906-00
4-e	3-Way Puller Body	90890-01848-00
4-f	3-Way Puller Attachment	90890-01873-00
5	Rotor Holding Tool	90890-01235-00
6-a	Primary Sheave Puller (M18)	TLS-90018-59-02 (U.S.A.) 90890-01898-00
6-b	Primary Sheave Puller Attachment	90890-01899-00
7	Primary Sheave Subassembly Tool	TLS-90910-60-00 90890-01858-00
8	Bushing Tool	90890-01883-00
9	Sheave Gauge	TLS-90910-47-02 (U.S.A.) 90890-01702-00
10	Pocket Tester	90890-03112-00
11	Electro Tester	90890-03021-00
12	AC Regulator Checker	90890-03090-00
13	Primary Sheave Holder	TLS-90018-80-00 (U.S.A.) 90890-01701-00
14	Secondary Sheave Holder	90890-01872-00

CHAPTER 2. ENGINE

2-1. ENGINE REMOVAL 2-1

2-2. DISASSEMBLY AND INSPECTION 2-2
- A. Recoil Starter 2-2
- B. Flywheel Magneto 2-3
- C. Oil Pump 2-4
- D. Top End 2-6
- E. Bottom End 2-10

2-3. ASSEMBLY AND ADJUSTMENT 2-12
- A. Bottom End 2-12
- B. Top End 2-13
- C. Flywheel Magneto 2-14
- D. Recoil Starter 2-15
- E. Oil Pump Gear Case 2-17

2-4. ENGINE INSTALLATION 2-19

ENGINE

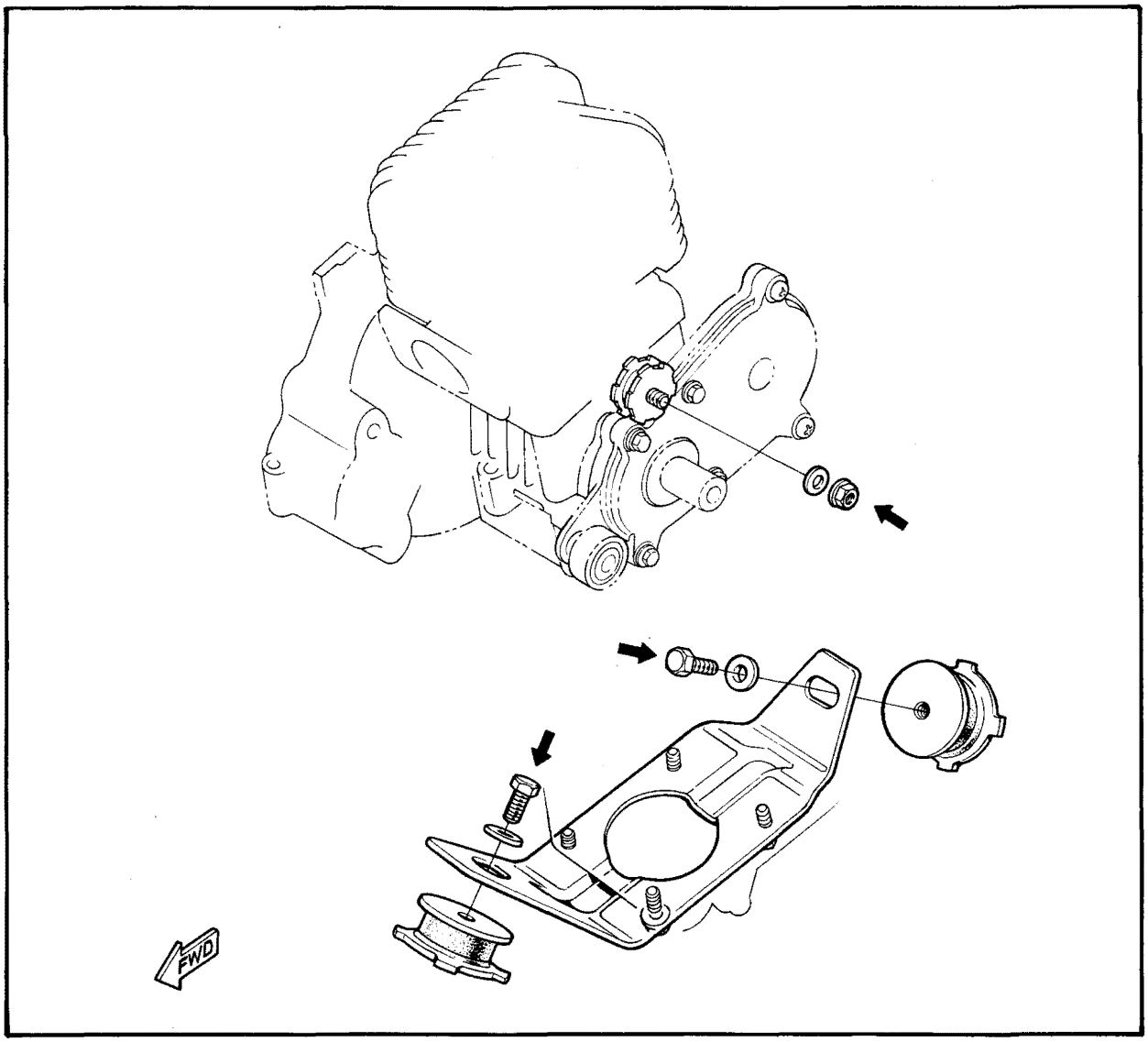
2-1. ENGINE REMOVAL

You do not have to remove the engine in order to service the following components:

Cylinder,
Piston,
Recoil Starter,
Flywheel Magneto, and
Carburetor

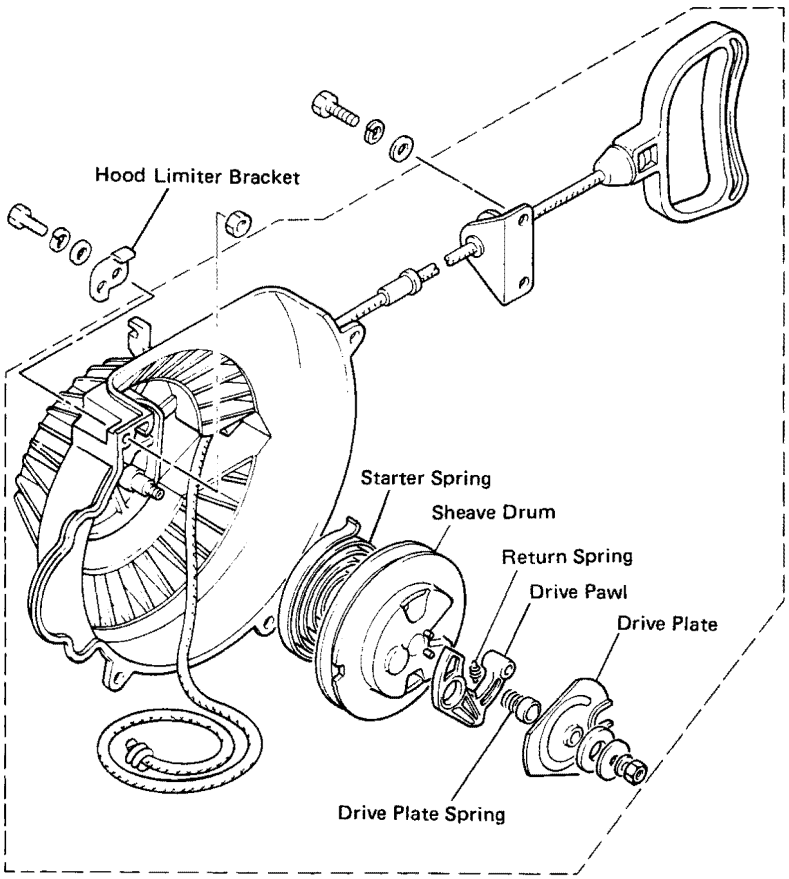
To remove the engine, remove or disconnect the following components in the order given below.

1. Muffler.
2. Drive guard, V-belt, and primary sheave (Refer 4-3, A "Removal.")
3. Carburetor (Refer to 3-1, A "Removal.")
4. D-handle from the starter rope. Knot the rope so it will not be pulled into the starter case.
5. Spark plug wire.
6. Pulse pipe from the fuel pump.
7. Oil line that feeds the autolube pump. Disconnect the joint in the middle of the line. Do not let air enter the line.
8. Four flywheel magneto leads.
9. Hood limiter cable.
10. Three engine mounts; remove the engine.

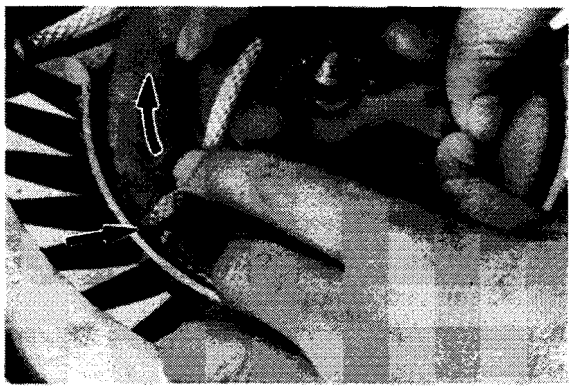


2-2. DISASSEMBLY AND INSPECTION

A. Recoil Starter



1. Remove the air shroud and the starter from the engine.
2. Pull about four inches of starter rope from the cutout in the sheave drum. Rotate the sheave drum five times clockwise to release the preload on the starter spring.

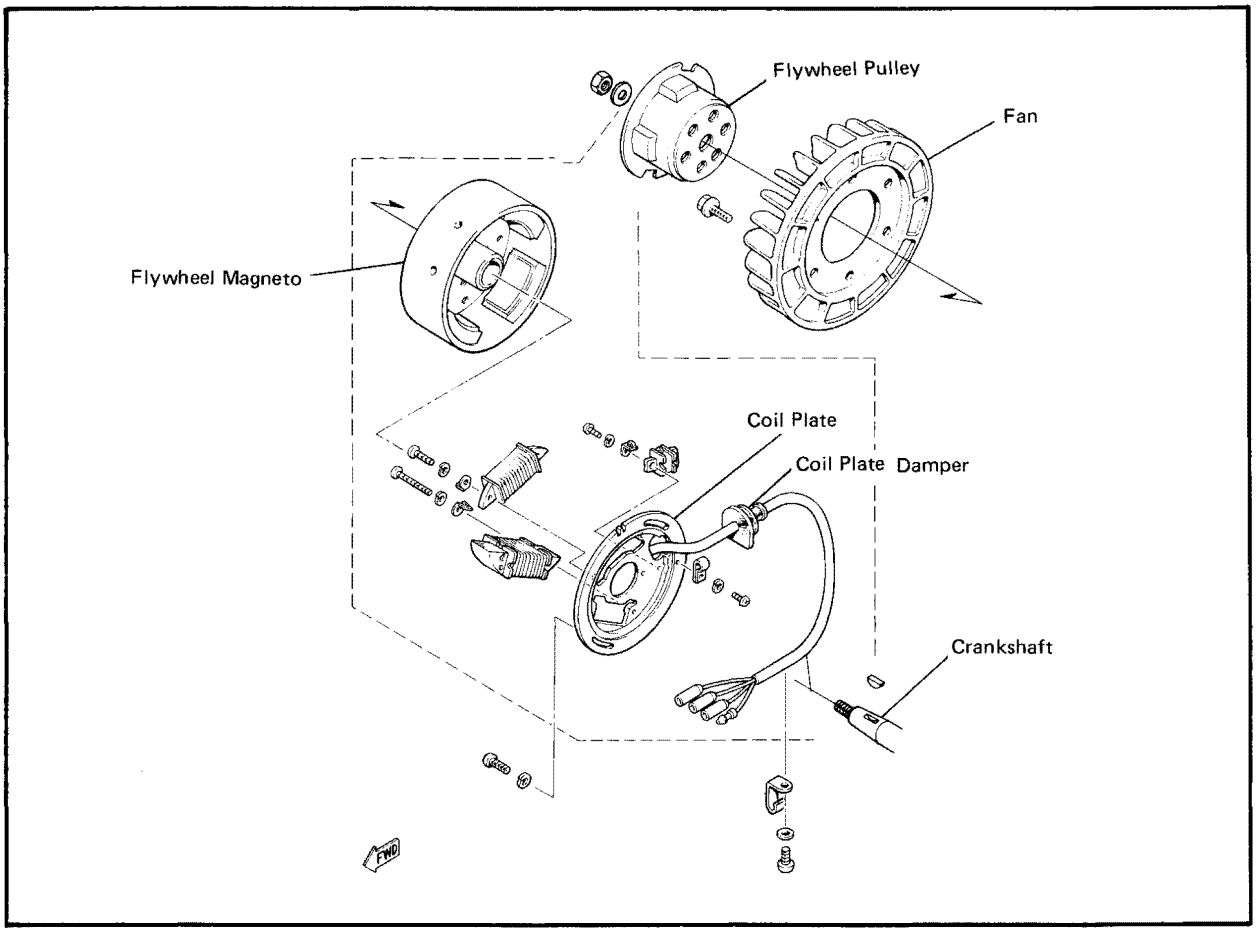


3. Remove the securing nut, and carefully disassemble the starter. Note the relative position of each piece. You will have to reassemble the starter as shown in the illustration above.

CAUTION:

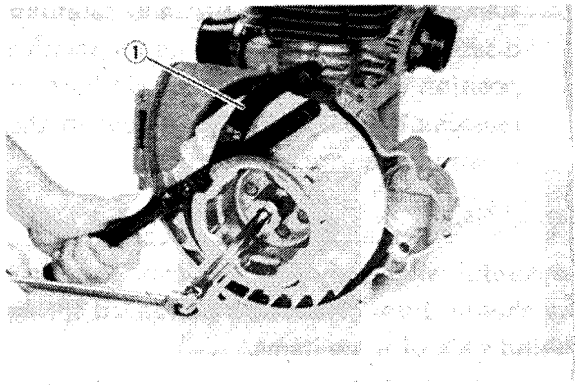
Be careful when removing the drive plate and the sheave drum. There is a preloaded spring behind each of these items.

B. Flywheel Magneto



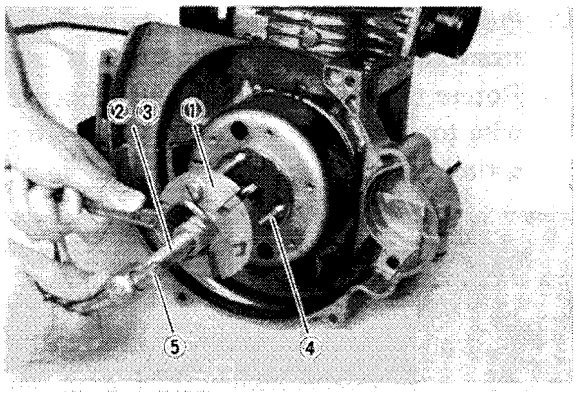
1. Using the rotor holding tool, loosen the securing nut, and remove the flywheel pulley from the magneto.

1. Rotor Holding Tool: 90890-01235



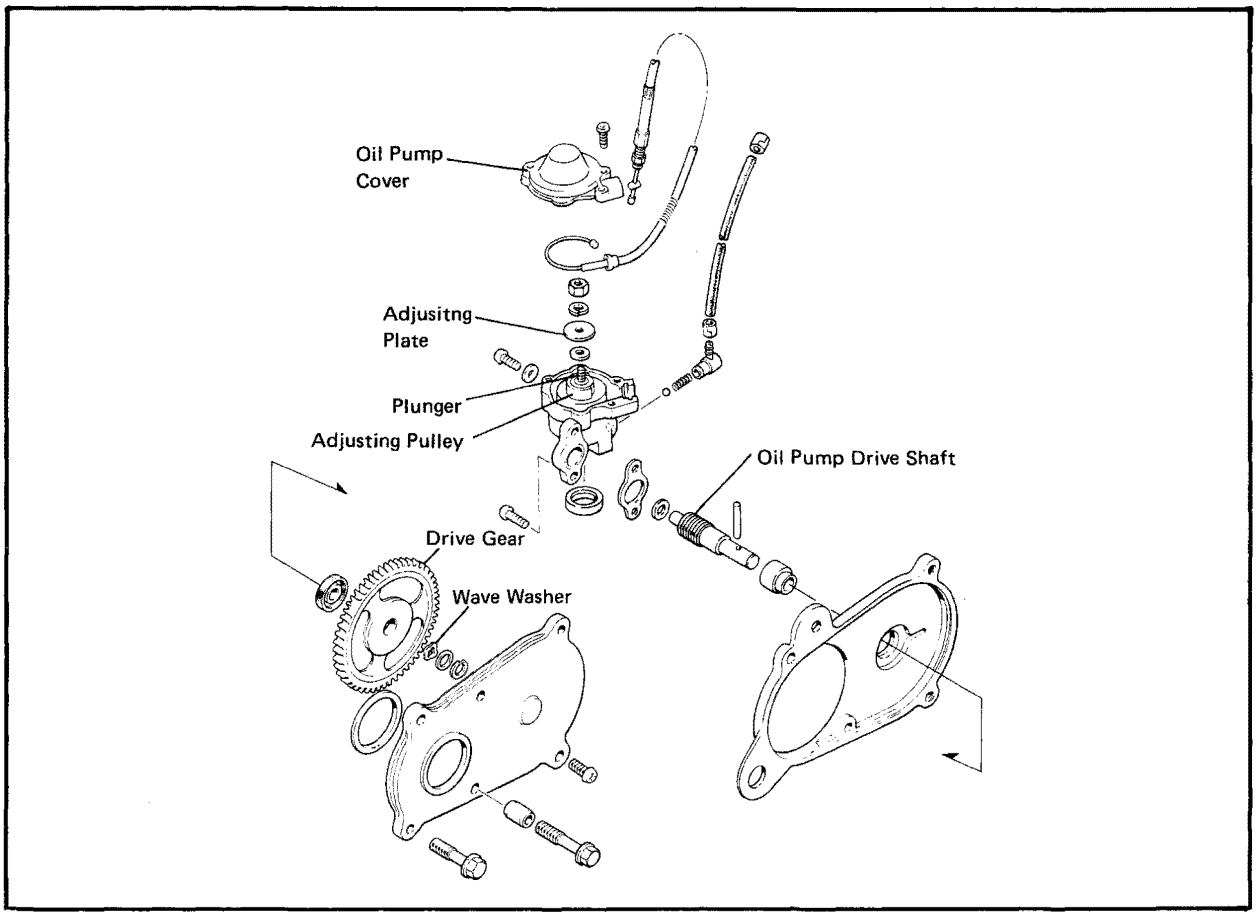
2. Remove the six securing bolts and remove the fan.
3. Using the 3-way puller, remove the magneto.

3-Way Puller Ass'y: TLU-90901-05-20 (U.S.A.)	
1. 3-Way Puller:	90890-01848
2. 3-Way Puller Attachment:	90890-01803
3. 3-Way Puller Attachment:	90890-01804
4. 3-Way Puller Screw:	90890-01906
5. Drive handle:	90890-01817

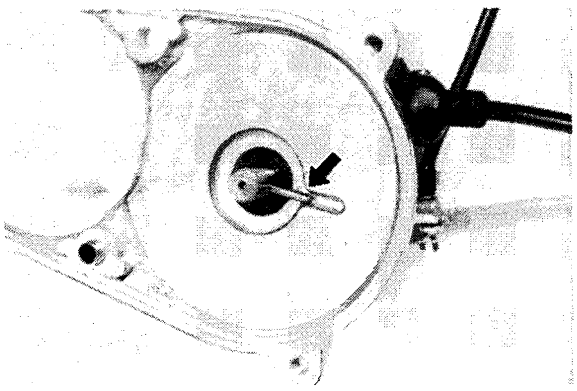


4. Remove the woodruff key from the crankshaft. Remove the two securing screws and remove the coil plate.
5. For inspection, refer to 6-1, G "Pulser and Charge Coil.".

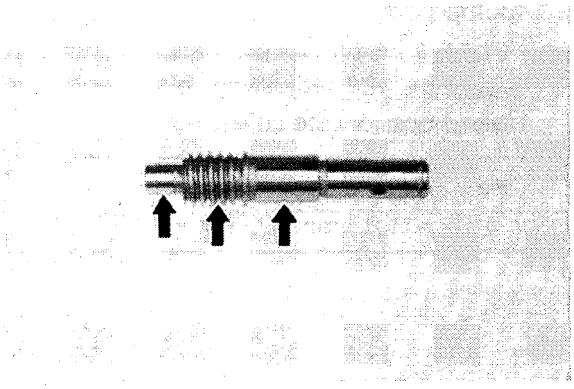
C. Oil Pump



1. Loosen the four gear-case bolts, and remove the gear case/oil pump assembly from the engine.
2. Remove the two gear case screws and open the gear case.
3. Remove the snap ring and the two washers, and remove the drive gear. Note the relative positions of the washer. The wave washer is against the drive gear.
4. Rotate the oil-pump drive shaft until the securing pin is opposite the slot in the gear case. Remove the pin and remove the pump from the gear case.



5. Remove the drive shaft from the oil pump. Inspect the bearing surfaces of the shaft and the gear teeth. If any part of the shaft is worn or pitted, the shaft must be replaced.

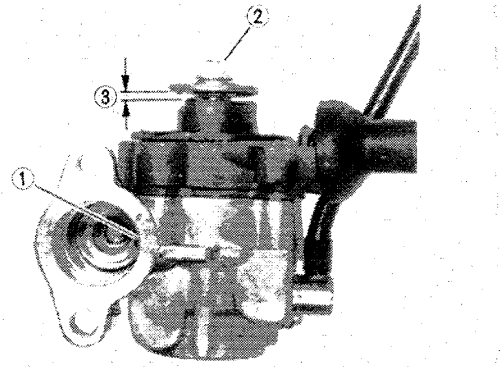


The oil pump should not be disassembled unless the pump stroke must be checked. If a problem with the pump is noted (such as excessive oil consumption) proceed as follows:

6. Remove the oil pump cover.

7. Check the minimum pump stroke.
   a. Turn the oil pump gear until the plunger is at its maximum distance from the pump body.
   b. Using a feeler gauge, measure the gap between the adjusting plate and the raised boss on the adjusting pulley.

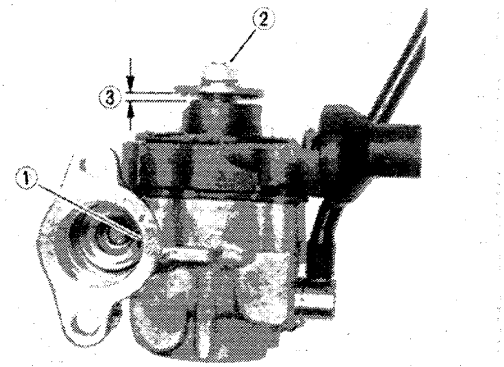
Minimum pump stroke:
0.2 ~ 0.25 mm (0.08 ~ 0.010 in)



1. Oil pump gear 2. Plunger 3. Minimum pump stroke

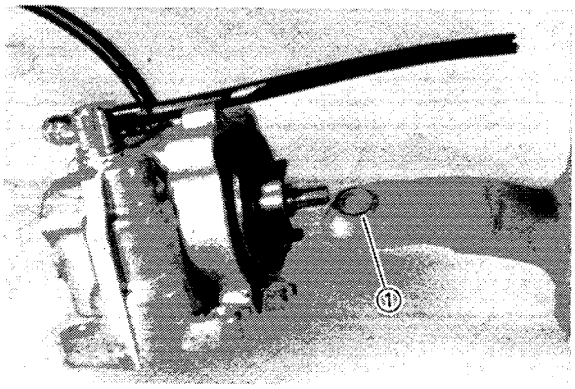
8. Measure the maximum pump stroke.
   a. Pull the oil pump cable out of its sheath as far as it will go. The cable must be held in this taut position when measuring maximum pump stroke. It may be helpful to securely wrap duct tape around the cable where it enters the sheath.
   b. Turn the oil pump gear until the plunger is at its maximum distance from the pump body.
   c. Using a feeler gauge, measure the gap between the adjusting plate and the raised boss on the adjusting pulley.

Maximum pump stroke:
1.65 ~ 1.87 mm (0.065 ~ 0.074 in)



1. Oil pump gear 2. Plunger 3. Maximum pump stroke

9. If either the maximum pump stroke or the minimum pump stroke does not equal specification, remove the adjusting plate and add or remove adjusting shims as required. Adding shims increases the stroke, removing shims decreases the stroke.



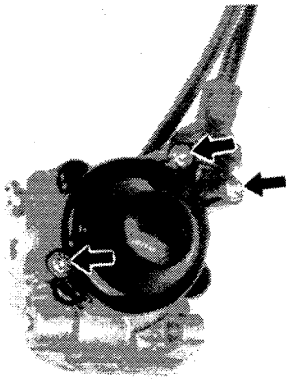
1. Adjusting shim

10. Reinstall the adjusting plate and lock nut. Torque the nut to specification. Recheck maximum and minimum pump stroke.

Tightening torque:
0.67 m-kg (4.8 ft-lb)

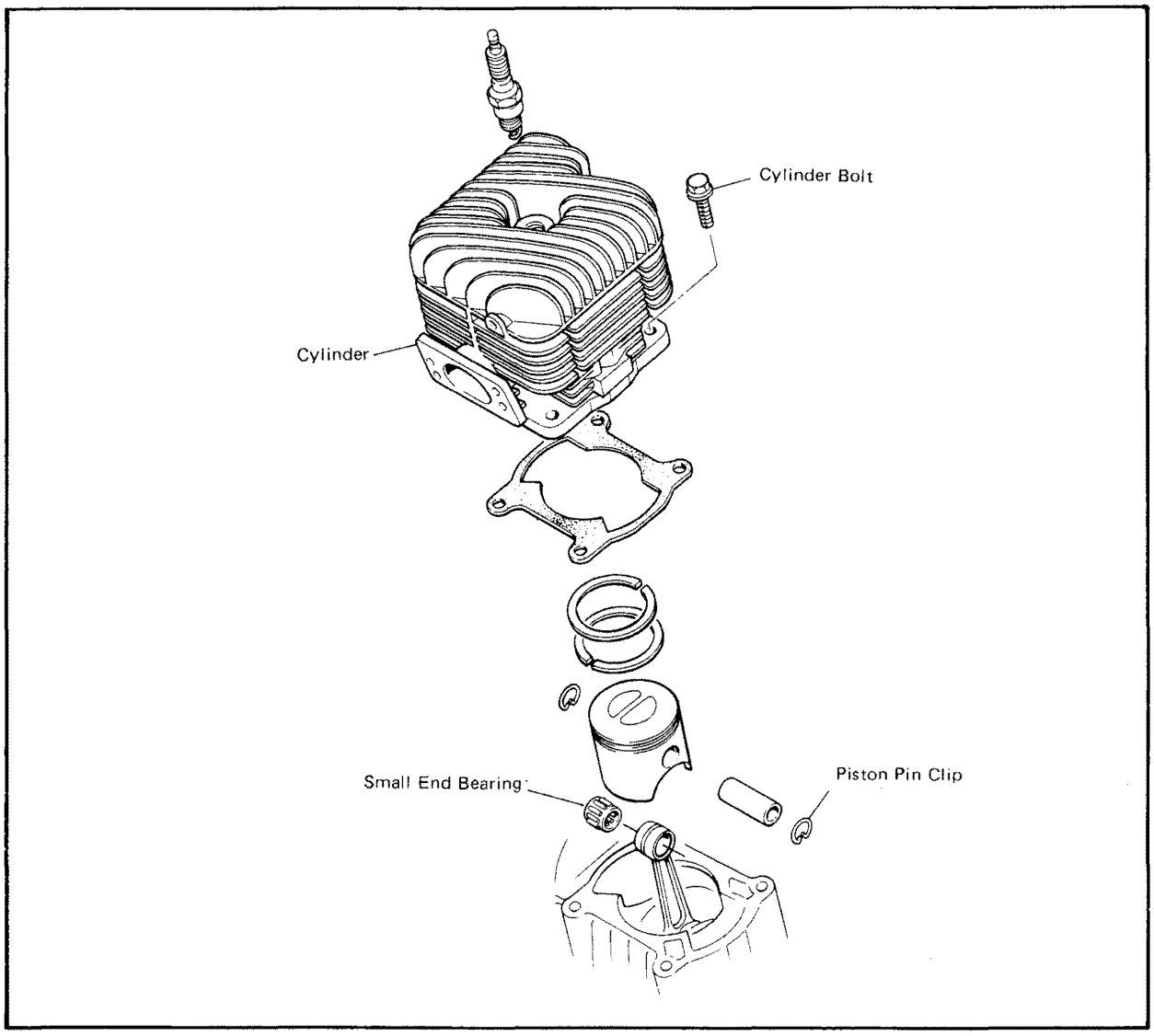
11. Grease the adjusting plate, and reinstall the oil pump cover. Seal the cover with Yamabond 5. Torque the screws to specification.

Tightening torque:
0.2 m-kg (1.45 ft-lb)



D. Top End

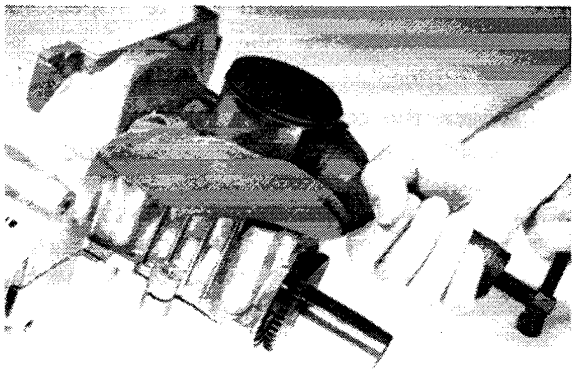
This model has a one-piece cylinder and cylinder-head assembly. There is no cylinder head to remove and service separately from the cylinder.



Disassembly

1. Loosen the spark plug, and remove the cylinder from the crankcase.
2. Cover the crankcase with a clean rag so nothing will accidently drop into the crankcase.
3. ▲ Remove a piston pin clip from the piston, and remove the pin with the universal piston-pin puller.

Universal piston-pin puller:
YU-01304

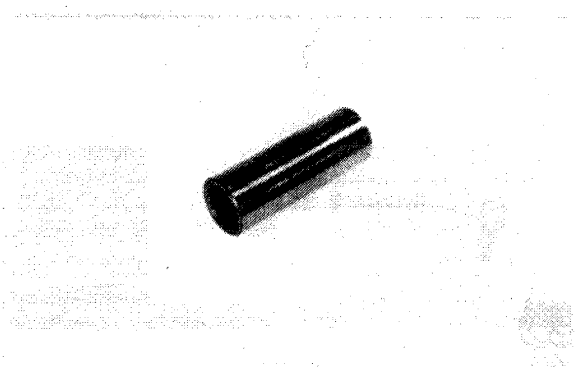


4. Remove the piston and the small-end bearing from the connecting rod. ▲

Inspection

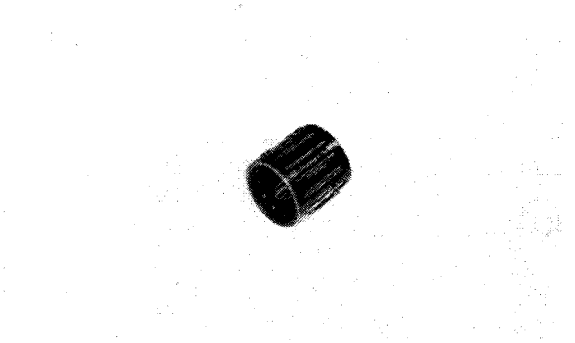
1. Piston pin and bearing inspection.

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

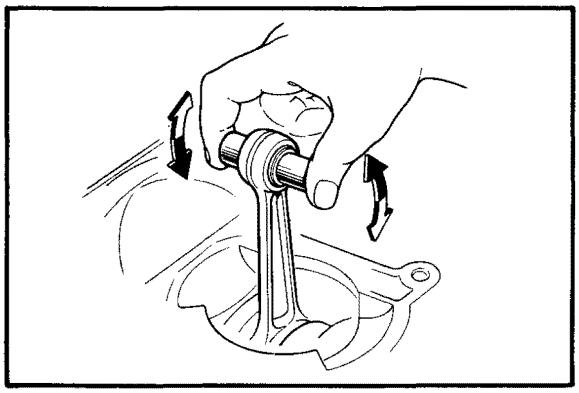


b. Check the pin and bearing for signs of heat discoloration. If excessive (indentation on pin, etc.), replace the pin and the bearing.

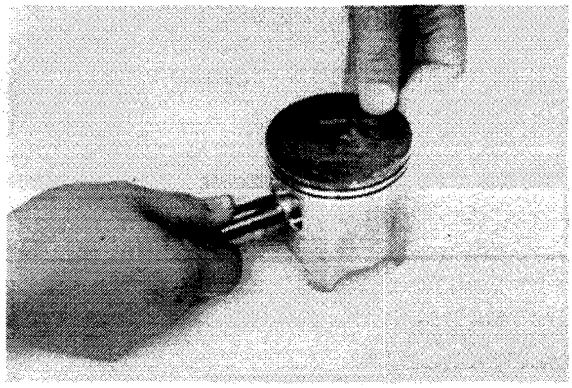
c. Check the small-end bearing for excessive wear or damage. Check the rollers for signs of flat spots. If such wear is found, replace the pin and the bearing.



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



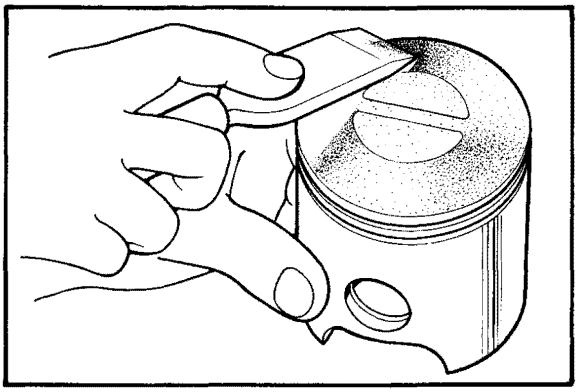
e. The piston pin should have no noticeable free play in the piston. If the piston pin is loose, replace the pin and/or piston.



2. Piston

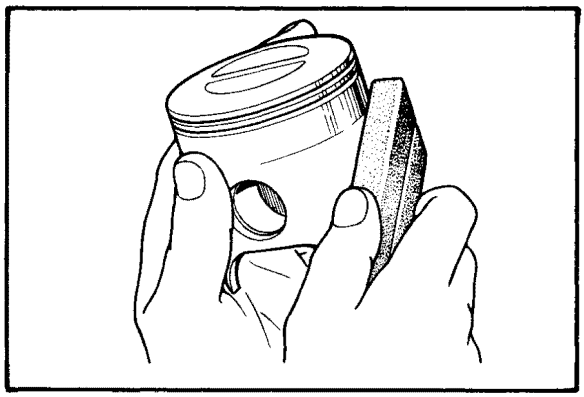
a. Remove the piston rings.

b. Remove any carbon deposits from piston crown.



c. Carefully remove any carbon deposits from the ring grooves.

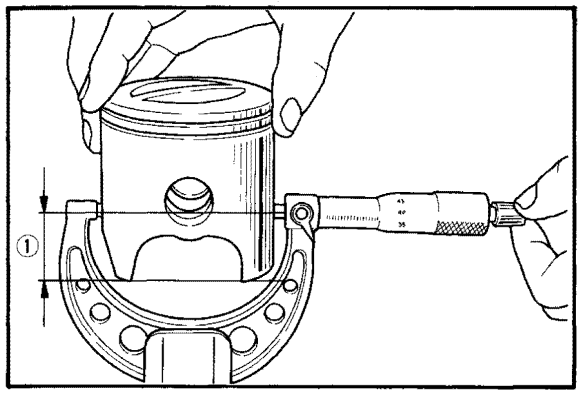
d. Remove score marks and lacquer deposits from the sides of the piston using 600 ~ 800 grit wet sandpaper. Sand in a crisscross pattern. Do not sand excessively.



e. Wash the piston in solvent, and dry it with compressed air.
f. Measure the outside diameter of the piston at the piston skirt.
The measurement should be made at a point 10 mm (0.39 in) above the bottom edge of the piston. Place the micrometer at a right angle to the piston pin.
The maximum piston diameter subtracted from the minimum cylinder diameter gives the piston clearance. If the clearance is beyond tolerance, hone the cylinder to tolerance or bore it to the next oversize and install an oversized piston.

Piston clearance:
Minimum..... 0.045 mm (0.0018 in)
Maximum.... 0.050 mm (0.0020 in)

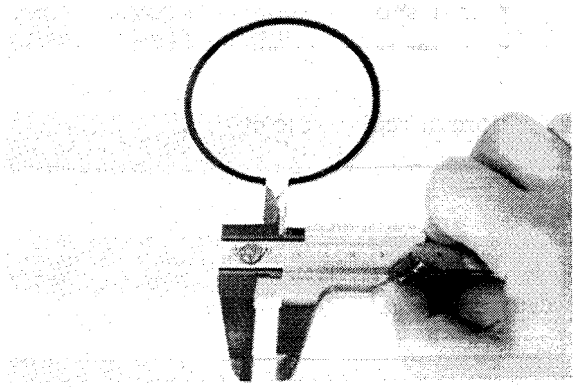
Piston oversize:
70.25 mm (2.766 in)
70.50 mm (2.776 in)



1. 10 mm (0.39 in)

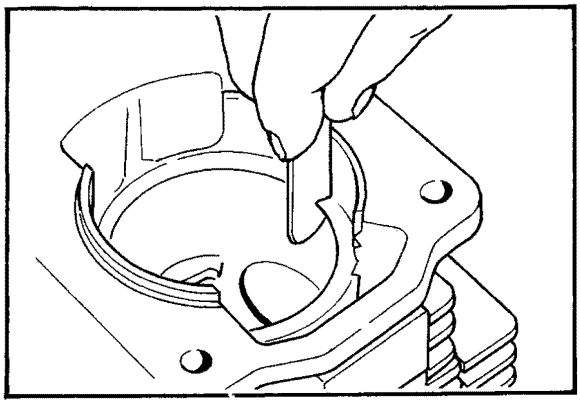
3. Piston rings
a. Check the rings for scoring. If any severe scratches are noticed, replace the rings as a set.
b. Measure the ring end gap in the uninstalled rings. If it is beyond tolerance, replace the rings as a set.

Ring end gap, free:
Approx. 6.5 mm (0.26 in)



c. Push the ring into the cylinder, and measure the ring end gap with a feeler gauge. Push the ring into the cylinder with the piston crown so the ring will be at a right angle to the cylinder bore. If the end gap is not within specification, replace the rings as a set.

Ring end gap, installed:
Minimum ..... 0.20 mm (0.0079 in)
Maximum ..... 0.40 mm (0.0157 in)



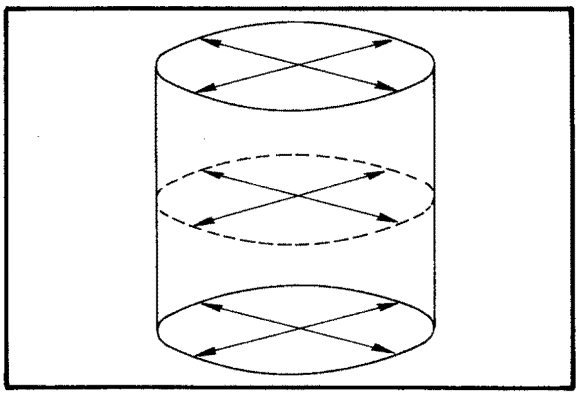
4. Cylinder

a. Remove all carbon deposits from the cylinder and from the ports. Carburetor cleaner will help lift carbon from the cylinder head. Thoroughly wash the cylinder in solvent, and blow it dry with compressed air.

b. Inspect the cylinder walls for scratches. If vertical scratches are evident, the cylinder should be rebored or replaced.

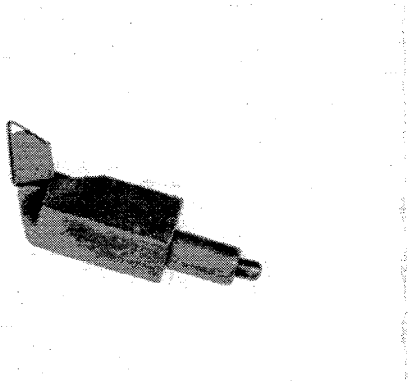
c. Measure the cylinder wall wear at the places shown in the illustration; use a cylinder bore gauge. If wear is excessive, compression pressure will decrease; rebore or replace the cylinder.

	Standard	Wear limit
Cylinder bore	70.00 ~ 70.02 mm (2.756 ~ 2.757 in)	70.05 mm (2.776 in)
Cylinder taper	—	0.05 mm (0.002 in)
Cylinder out-of-round	—	0.01 mm (0.004 in)



Boring

If the cylinder requires boring, follow the standard boring procedures but use an offset bit as shown below. This bit is standard equipment with some boring bars. Be sure that the depth adjustment is precisely set so the combustion chamber is not damaged.

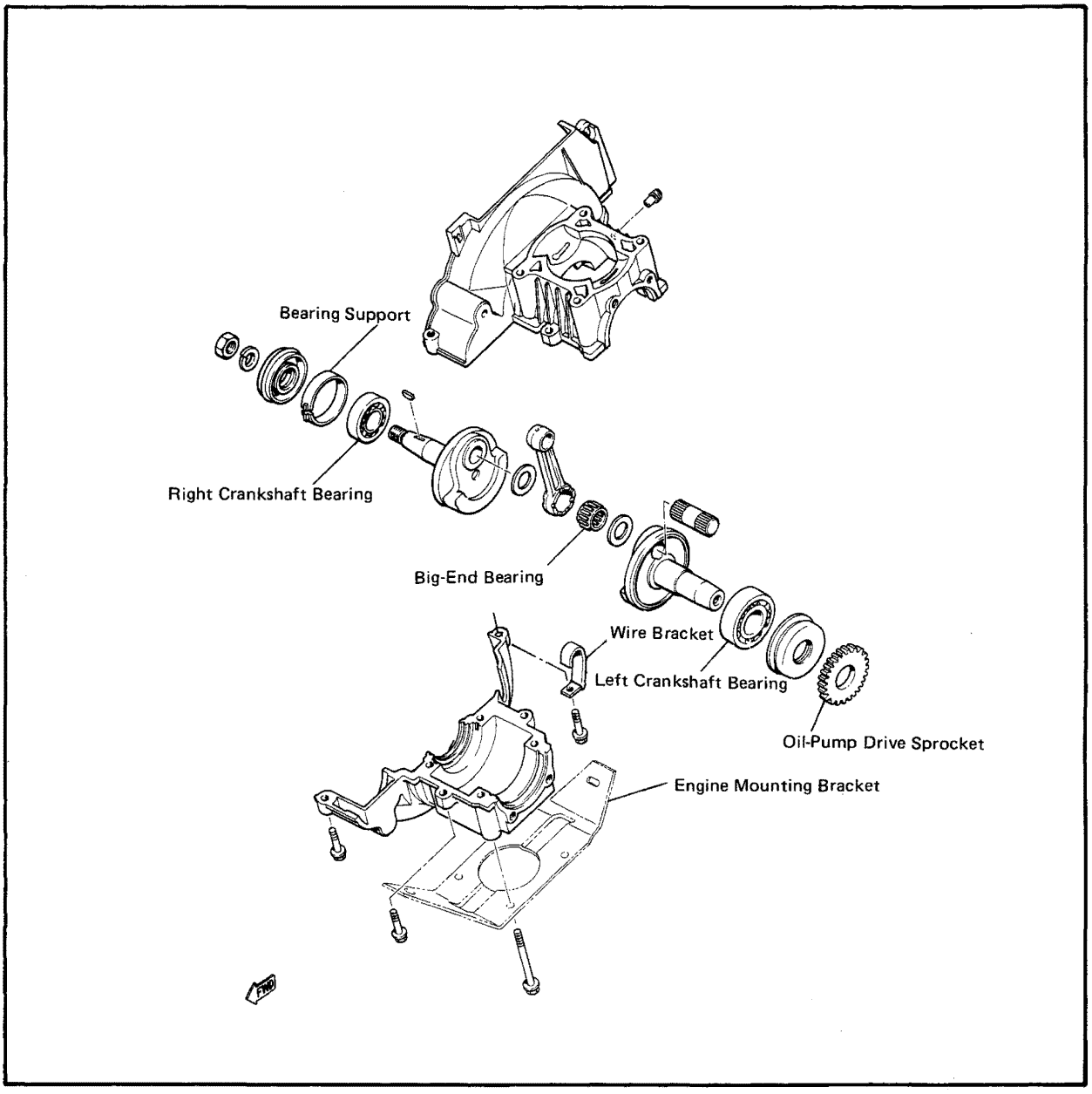


Honing

Whenever honing the cylinder on the BR250, use a hone with a bumper device so the combustion chamber will not be carelessly damaged. Otherwise follow standard honing procedures. Yamaha recommends the use of an Ammco Hone. This kit includes all the necessary pieces to properly hone the cylinder on the BR250.

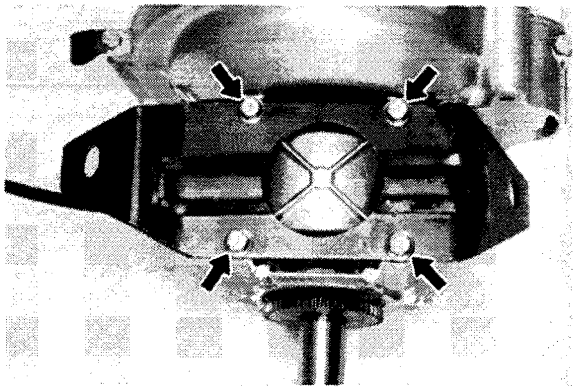
Ammco Hone Kit: TLU-03950-00-00

E. Bottom End

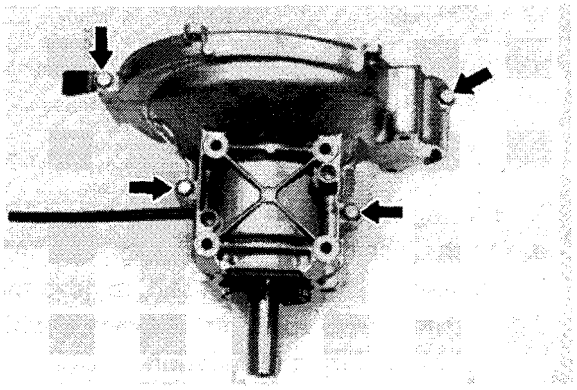


Disassembly

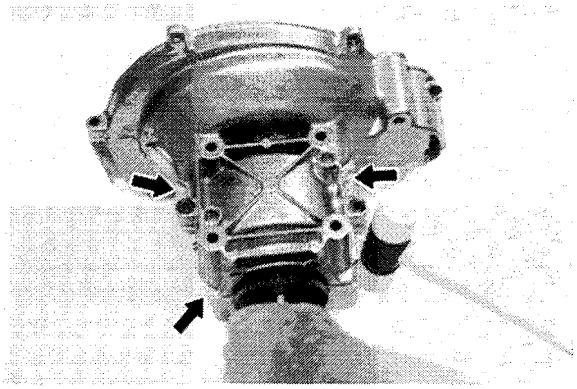
1. Remove the engine mounting bracket from the crankcase.



2. Remove the four crankcase bolts. Note the position of the wire bracket. You will have to reinstall it on the same bolt.



3. Separate the crankcase halves by rapping the indicated points with a rubber mallet.



4. Remove the crankshaft.

Inspection

1. Crankcase

a. Thoroughly wash the case halves in a mild solvent. Blow them dry with compressed air.

b. Thoroughly clean the crankcase mating surfaces.

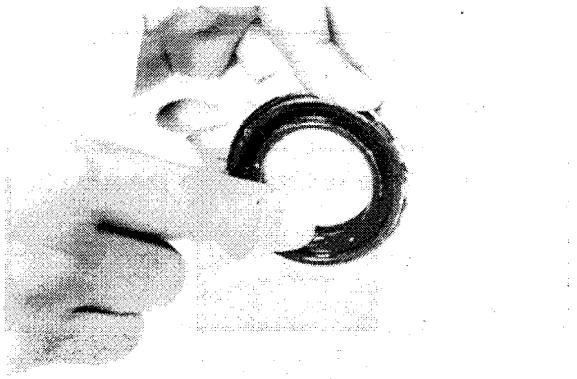
c. Visually inspect the case halves for cracks or damage.

d. Inspect the oil delivery passages in the transfer ports for signs of blockage.

2. Bearings and oil seals

a. After cleaning and lubricating the bearings, rotate the outer race with your finger. If rough spots are noticed, replace the bearings.

b. Check the oil seal lips for damage or wear. Replace the seals as required.



3. Bearing and oil seal installation

a. When installing or removing the left crankshaft bearing or oil seal, remove the oil-pump drive sprocket. Replace it with a new one during installation.

b. Install bearings with their manufacturer's marks or numbers facing outward. They should be visible when intalled.

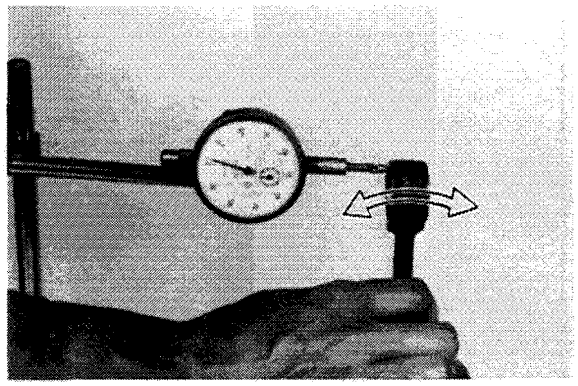
c. Install oil seals with their manufacturer's marks also facing outward.

d. Always **thoroughly** lubricate bearings and oil seals with the specified lubricant before installing them on the crankshaft.

4. Crankshaft

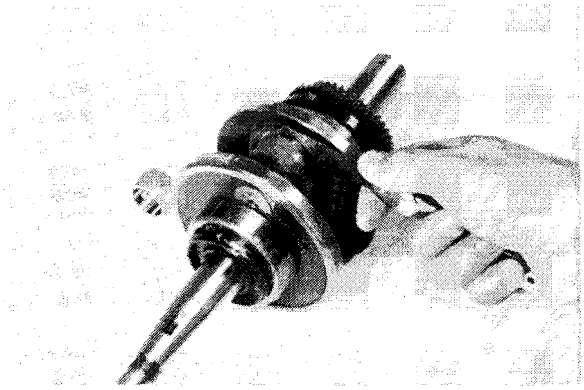
a. Check the connecting rod axial play at the small end. This will indicate the condition of the big-end bearing and crankpin. If the rod axial play exceeds specification, disassemble the crankshaft and check the connecting rod, crankpin, and big-end bearing. Replace any defective or worn parts. Reassemble the crankshaft, and recheck the rod axial play.

Rod axial play: Maximum: 2.0 mm (0.079 in)



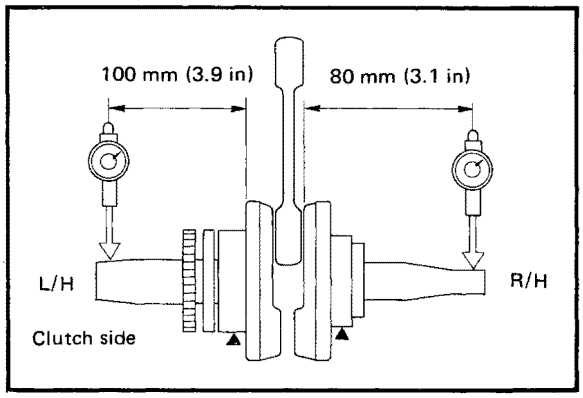
b. Check the connecting rod side clearance at the big end. If it exceeds specification, disassemble the crankshaft and replace any worn parts.

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



c. Check the crankshaft assembly runout with a dial gauge. If the runout is not within specification, the crankshaft parts are not properly aligned. To correct this misalignment, tap the flywheel with a brass hammer. Use a wedge if necessary.

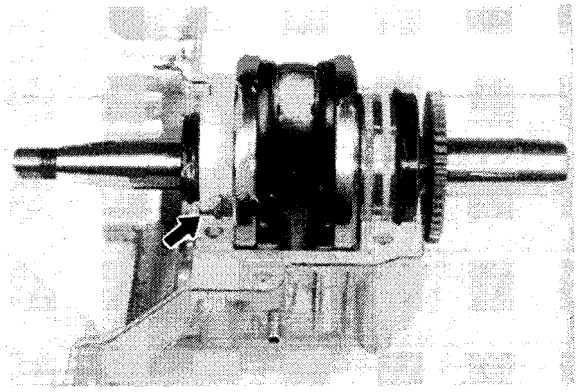
Deflection tolerance	
Left side	Right side
0.02 mm (0.0008 in)	0.02 mm (0.0008 in)



2-3. ASSEMBLY AND ADJUSTMENT

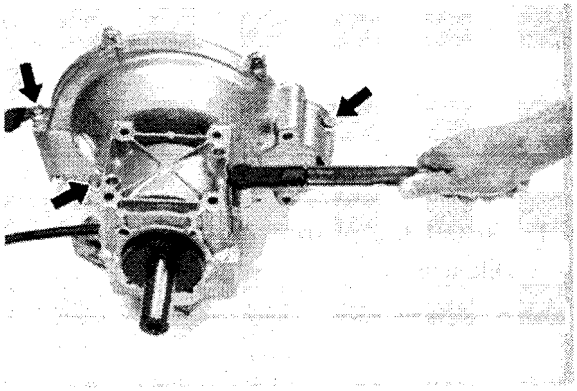
A. Botton End

1. Place the crankshaft in the upper crankcase half. Be sure the lip of each oil seal and the nylon bearing support for the right crankshaft bearing are properly seated in the crankcase. The open side of the bearing support **must** face the front of the engine.



2. Thoroughly oil the bearing and the connecting rod.
3. Apply Yamabond 4 to the mating surfaces of the crankcase halves. Use enough Yamabond to completely seal the crankcase. An air leak can lead to severe engine damage.
4. Carefully fit the lower crankcase half onto the upper half. The oils seals and the bearings must be properly seated in both crankcase halves. Place the wire bracket on the rear crankcase bolt as shown in the photograph. Torque the four crankcase bolts to specification.

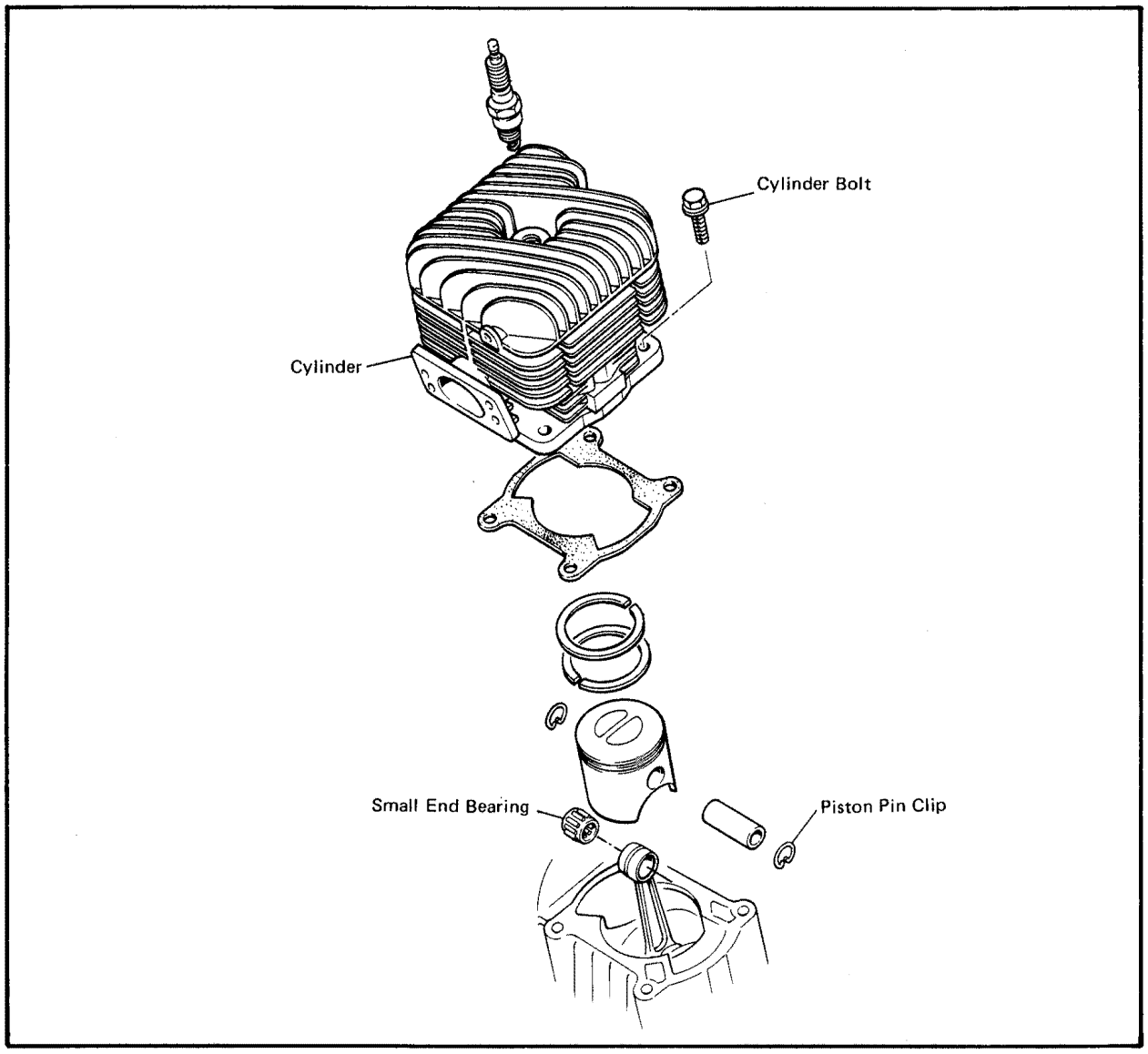
Tightening torque:
1.5 m-kg (10.8 ft-lb)



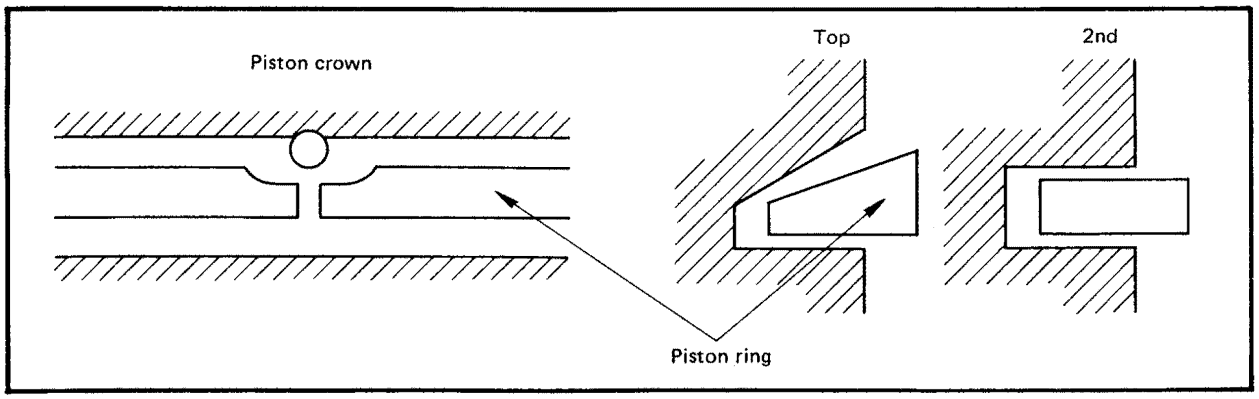
5. Install the engine bracket onto the crankcase. Torque the four bolts to specification.

Tightening torque:
First 1.0 m-kg (7.2 ft-lb)
Final 2.5 m-kg (18 ft-lb)

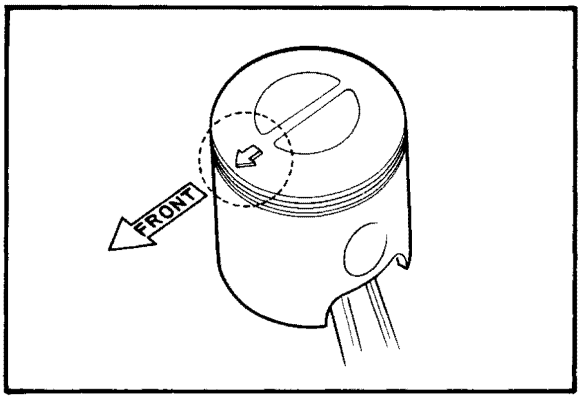
B. Top End



1. Install the piston rings as shown in the illustration.



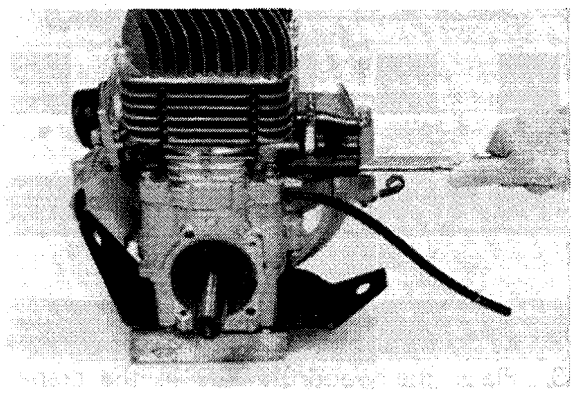
2. Add oil to the crankcase through the oil holes. Oil the connecting rod.
3. Cover the crankcase with a clean cloth so nothing will fall into the crankcase.
4. Oil the small-end bearing and install it in the connecting rod.
5. Oil the connecting rod, and install the piston. The arrow on the piston crown must point to the front of the engine.



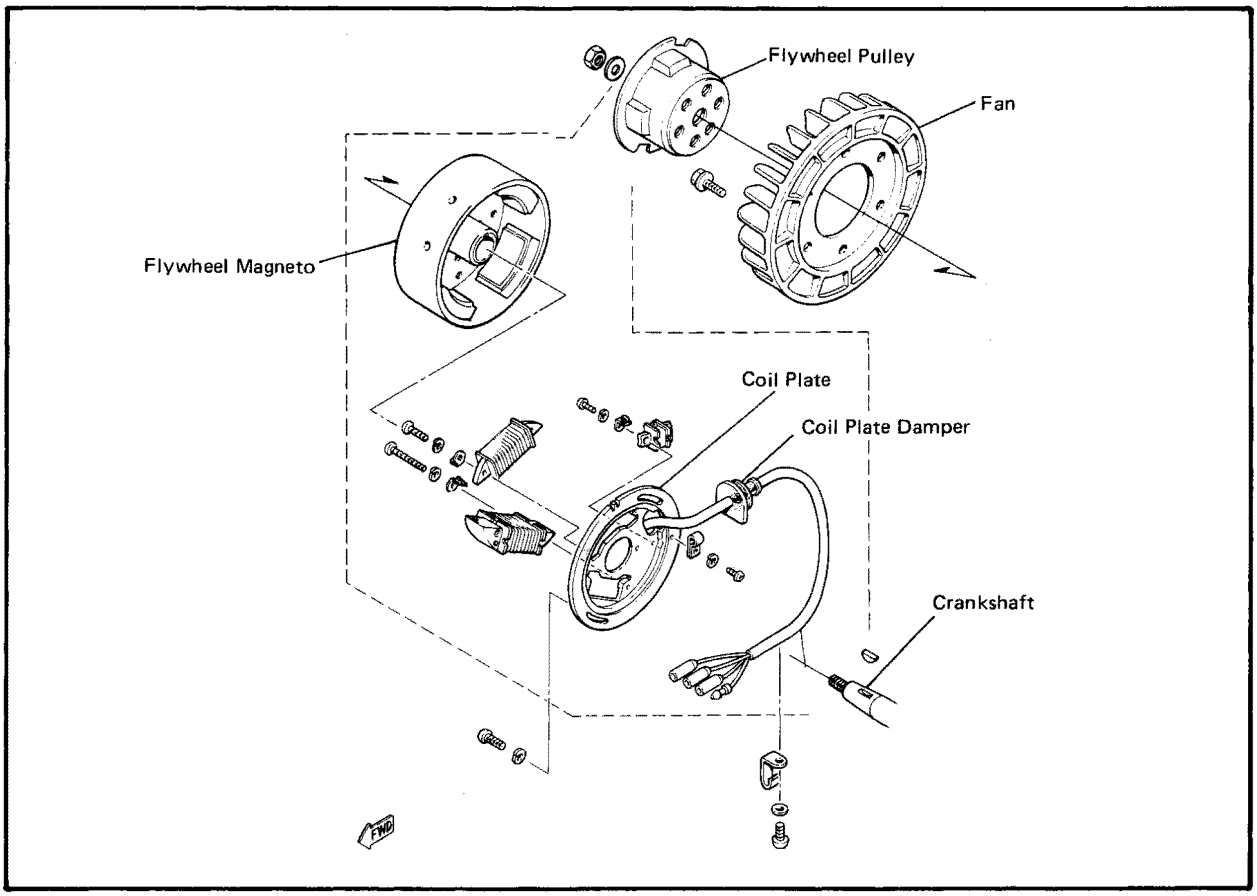
6. Oil the piston pin, and install it in the piston. Be sure the piston pin clip is correctly seated in the groove.

7. Oil the piston, and install the cylinder onto the crankcase. Use a new cylinder gasket. Torque the four cylinder bolts to specification. You will need a 12 mm crowfoot wrench.

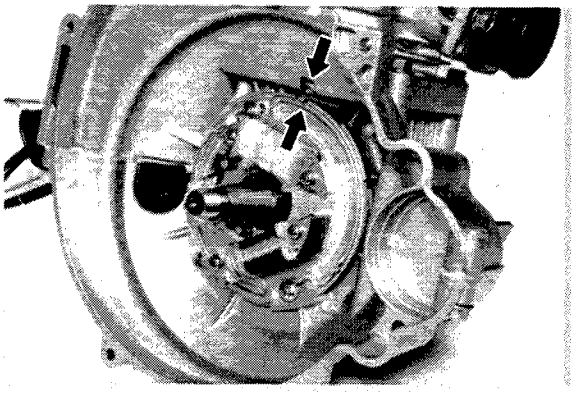
Tightening torque:	
First:	2.0 m-kg (14.5 ft-lb)
Final:	2.5 m-kg (18 ft-lb)



C. Flywheel Magneto

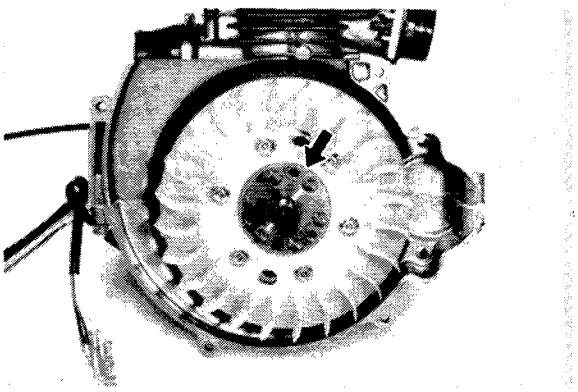


1. Feed the magneto leads through the hole in the crankcase, and secure the damper in the case.
2. Install the coil plate onto the crankcase. Align the pry points on the plate with the cutout in the crankcase. Apply a thread-locking compound to both securing screws.



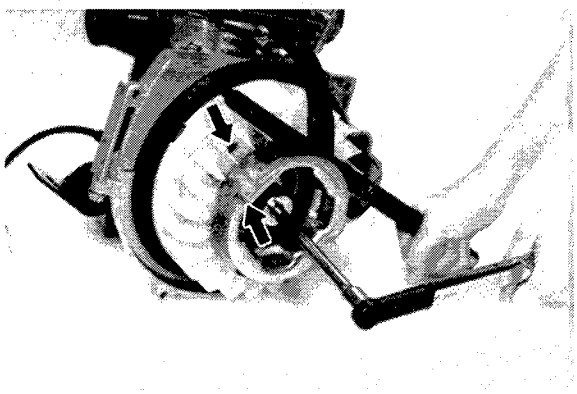
3. Place the woodruff key in the crankshaft, and install the flywheel magneto. The keyway in the magneto must align with the key in the crankshaft. Rap the magneto with a plastic mallet to seat it on the crankshaft.
4. Install the fan on the magneto. The arrow on the fan must point to the keyway in the magneto. Torque the six bolts to specification.

Tightening torque:
0.7 m-kg (5 ft-lb)



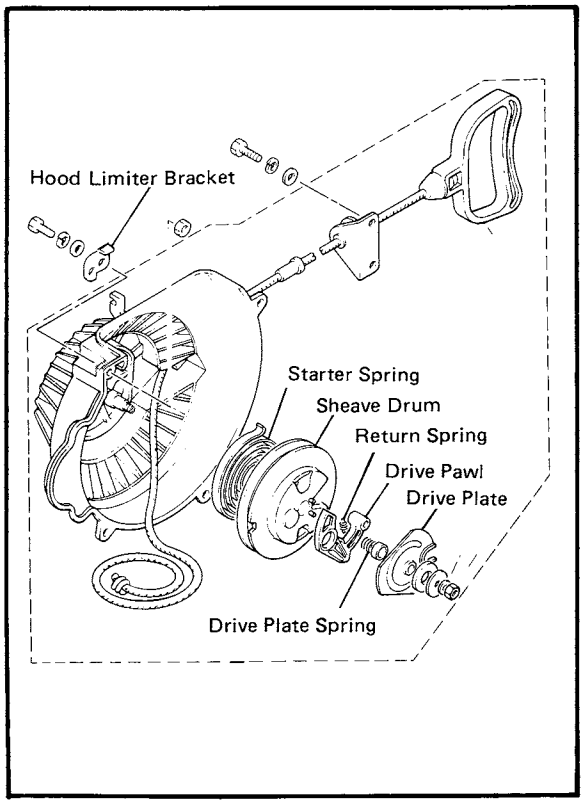
5. Install the flywheel pulley. The two cutouts on the edge of the pulley must be opposite the holes in the fan. Torque the securing nut to specification.

Tightening torque:
7.0 ~ 7.5 m-kg (51 ~ 54 ft-lb)

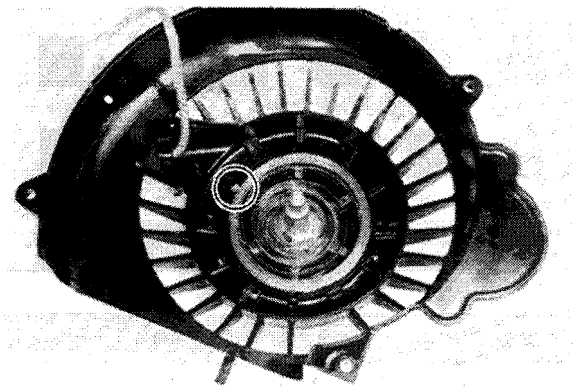


6. For timing adjustment (Refer to 6-1, C "Ignition Timing.")

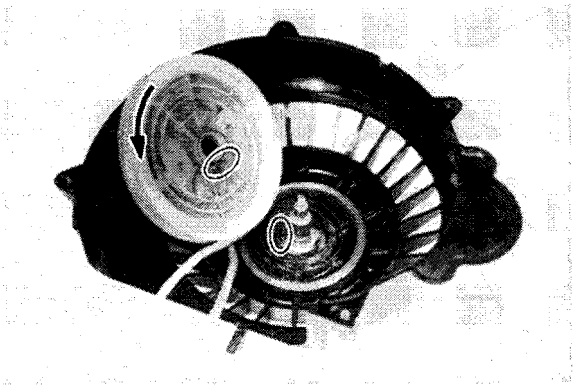
D. Recoil Starter



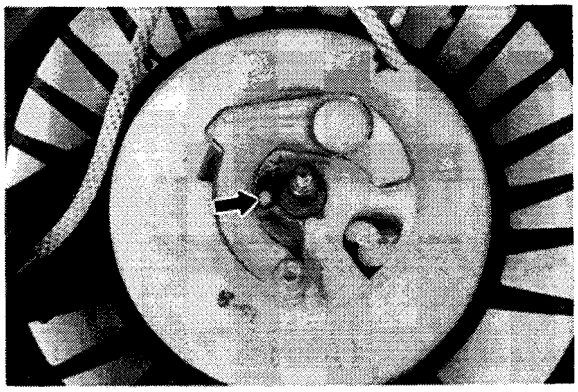
1. Hook the outer book of the starter spring around the post in the starter case. Carefully wind the spring counter-clockwise, and fit the spring into the case. Thoroughly grease the spring after installation.



2. Feed the starter rope into the sheave drum, knot the end, and fit the knot into the cutout in the sheave drum.
3. Wind the starter rope 2-1/4 times counterclockwise around the sheave drum. Insert the drum in the starter case. Be sure the inner hook on the starter spring hooks around the post on the sheave drum.

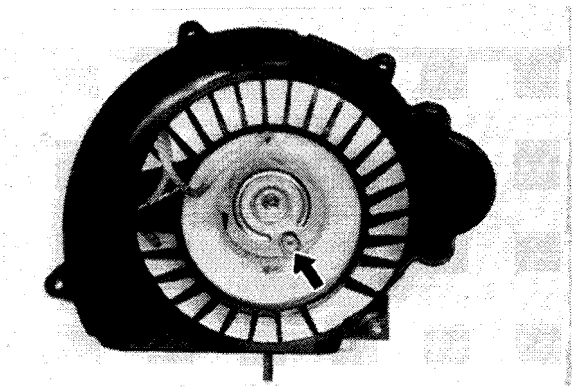


4. Install the drive pawl and the return spring. Hook the spring around the first post on the sheave drum as shown in the photograph.

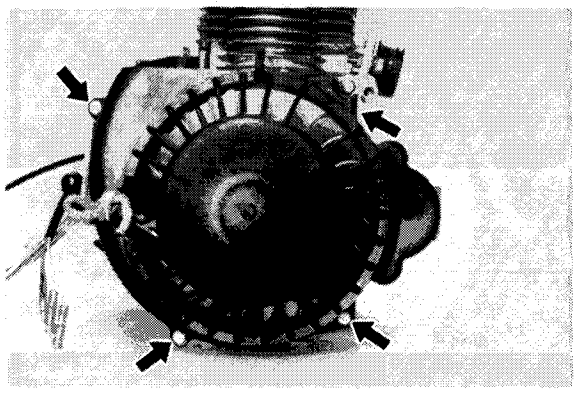


5. Install the drive plate spring, spring collar, and the drive plate. Be sure the cutout in the drive plate fits over the post on the drive pawl. Install the thrust washer and torque the nut. Grease the pivot point of the drive pawl.

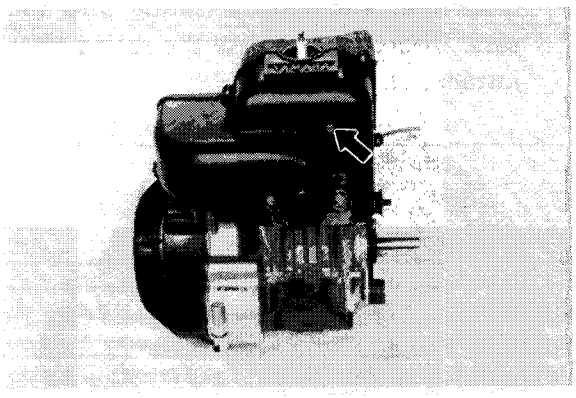
Tightening torque:
1.3 m-kg (9.4 ft-lb)



6. Pull about four inches of starter rope from out of the cutout in the sheave drum and form a loop. Rotate the sheave drum five times couterclockwise to pre-load the starter spring.
7. Check the starter. If it does not operate smoothly, disassemble it, and reassemble it correctly.
8. Install the recoil starter onto the engine. Be sure the hood limiter bracket is on the forward, upper bolt as shown in the photograph.

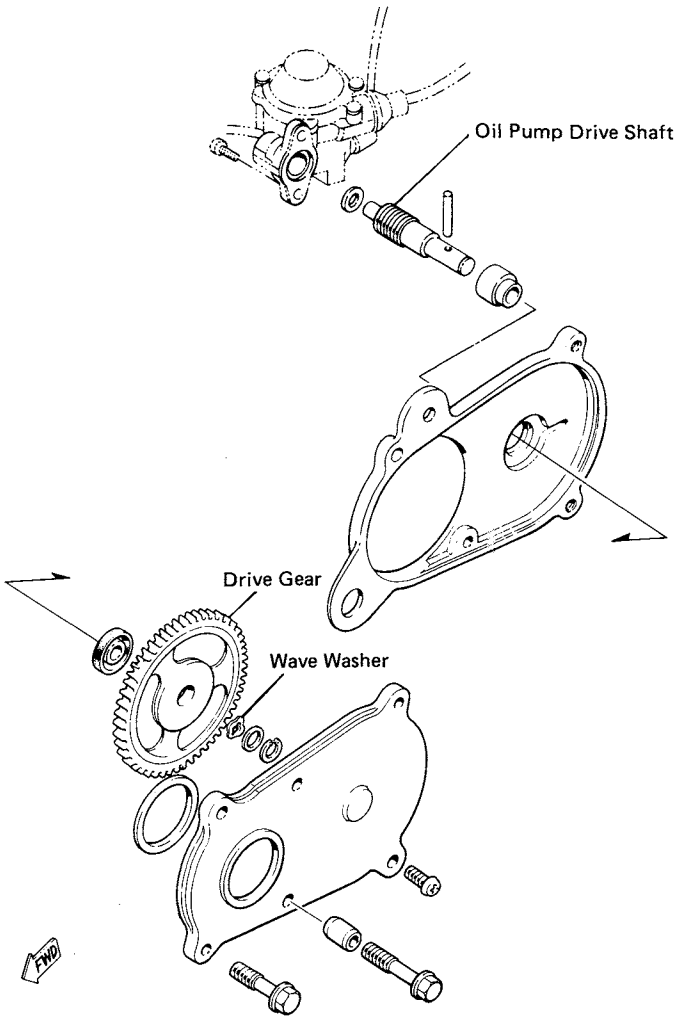


Tightening torque:
0.65 m-kg (4.7 ft-lb)

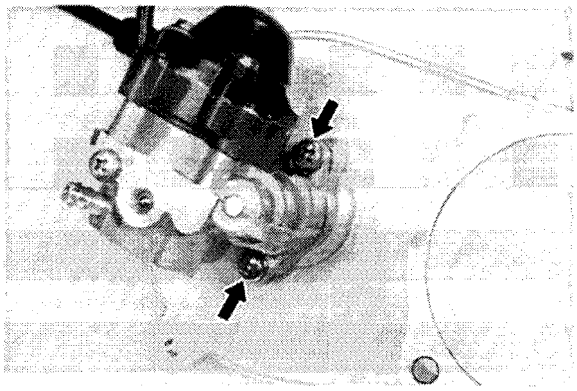


9. Install the air shroud. Use a washer and lock washer with the screw that secures the air shroud to the starter case. Apply a thread-locking compound to the two bolts that thread into the engine. Torque the bolts to specification.

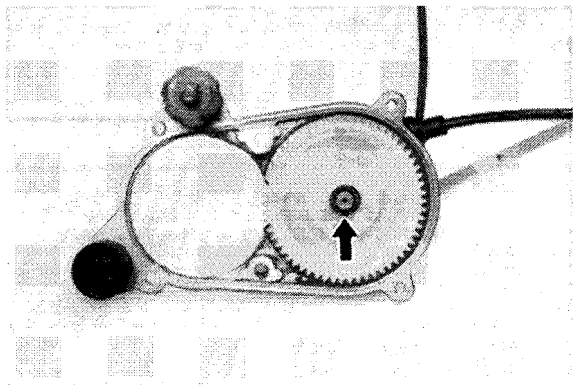
E. Oil Pump Gear Case



1. Place the washer on the oil pump drive shaft, and insert the drive shaft into the oil pump. Be sure the worm gear correctly engages the oil pump gear in the pump.
2. Secure the pump to the gear case. Use a new gasket. Apply Yamabond 4 to the gear case side of the gasket only.



3. Align the hole in the drive shaft with the slot in the gear case and install the securing pin.
4. Thoroughly grease the outer edges of the drive gear onto the oil pump drive shaft. Be sure the gear correctly engages the securing pin.
5. Secure the drive gear in place with the two washers and the snap ring. Be sure the wave washer is against the drive gear.



6. Grease the edges of the drive gear, and install the gear case cover.
7. Install the oil pump gear box onto the engine. Be sure the drive gear correctly engages the oil pump drive gear on the crankshaft. Torque the four securing bolts to specification.

Tightening torque:
0.68 m-kg (4.9 ft-lb)

Bleeding the Oil Pump

The oil pump must be bled whenever:

Any portion of the oil system has been disconnected.

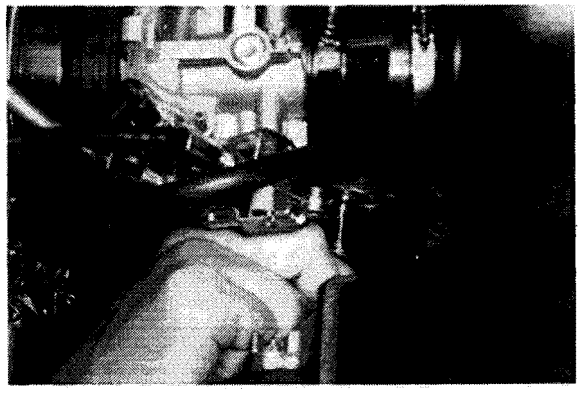
The machine has been turned on its side.

Whenever the oil tank has been run empty.

During predelivery.

There are two methods for bleeding the pump on this model. Either will work very well.

1. Loosen the bleed screw at the pump. Oil should begin to flow through the line. Keep the bleed screw open until all air has left the fuel line. Tighten the bleed screw.

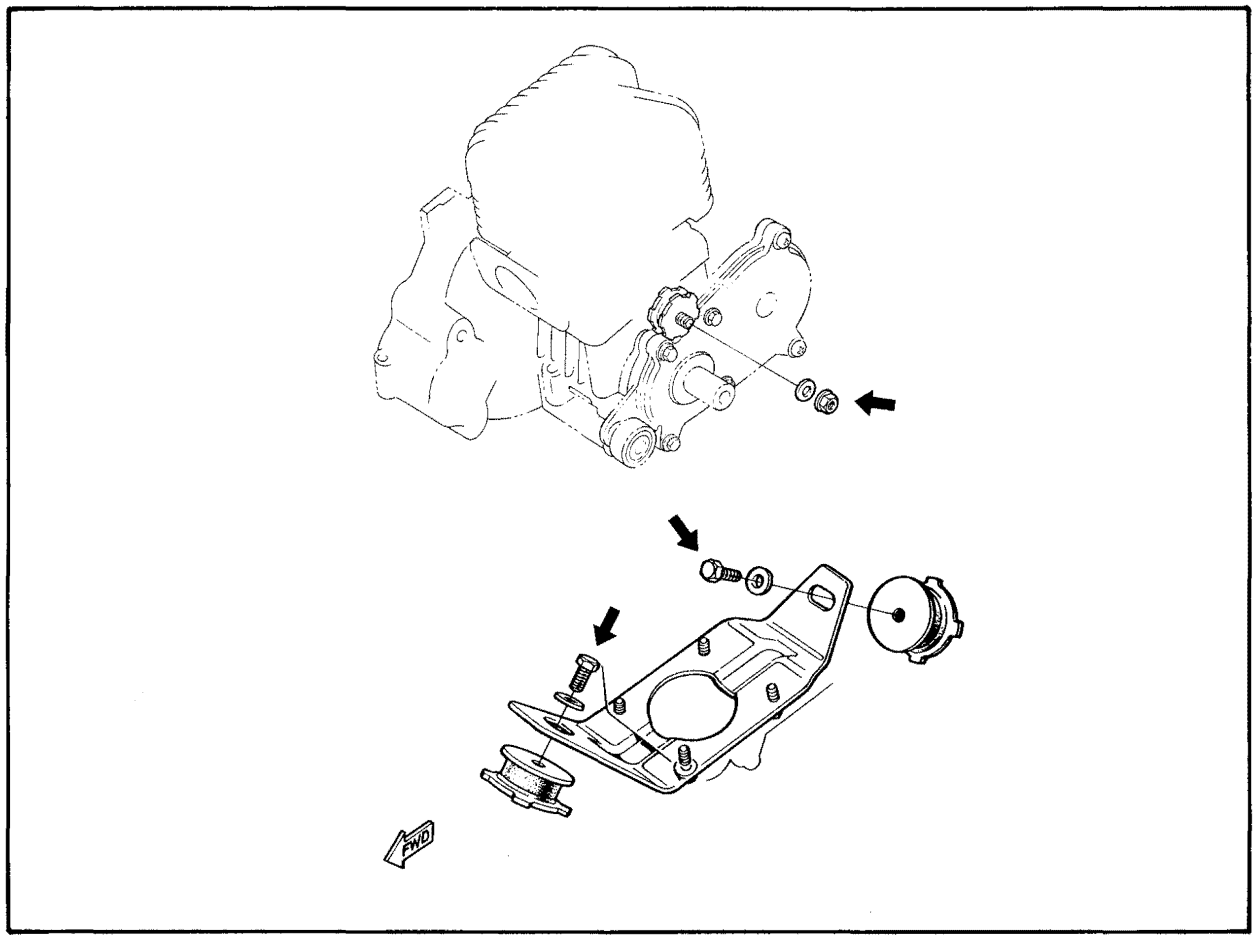


2. Start the engine and keep it running at idle. Pull the pump stroke wire all the way out to set the pump at maximum stroke. Keep the pump operating at full stroke for about two minutes. This will bleed the air from the oil system.

2-4. ENGINE INSTALLATION

1. Place the engine in the chassis. Torque the three engine mounts to specification.

Tightening torque:	
Bolt:	3.0 m-kg (22 ft-lb)
Nut:	1.4 m-kg (10 ft-lb)



2. Install or connect the following components in the order given below.
   - Primary Sheave, V-belt, and drive guard (Refer to 4-4, D "Assembly")
   - Carburetor (Refer to 3-1, A "Installation")
   - Pulse Pipe
     Oil line that feeds the oil pump
   - Four magneto leads
   - D-handle to the starter rope
   - Spark plug and spark plug wire

Spark Plug Tightening Torque:
2.5 ~ 3.0 m-kg (18 ~ 22 ft-lb)

   - Muffler and hood limiter bracket.

CHAPTER 3. CARBURETION

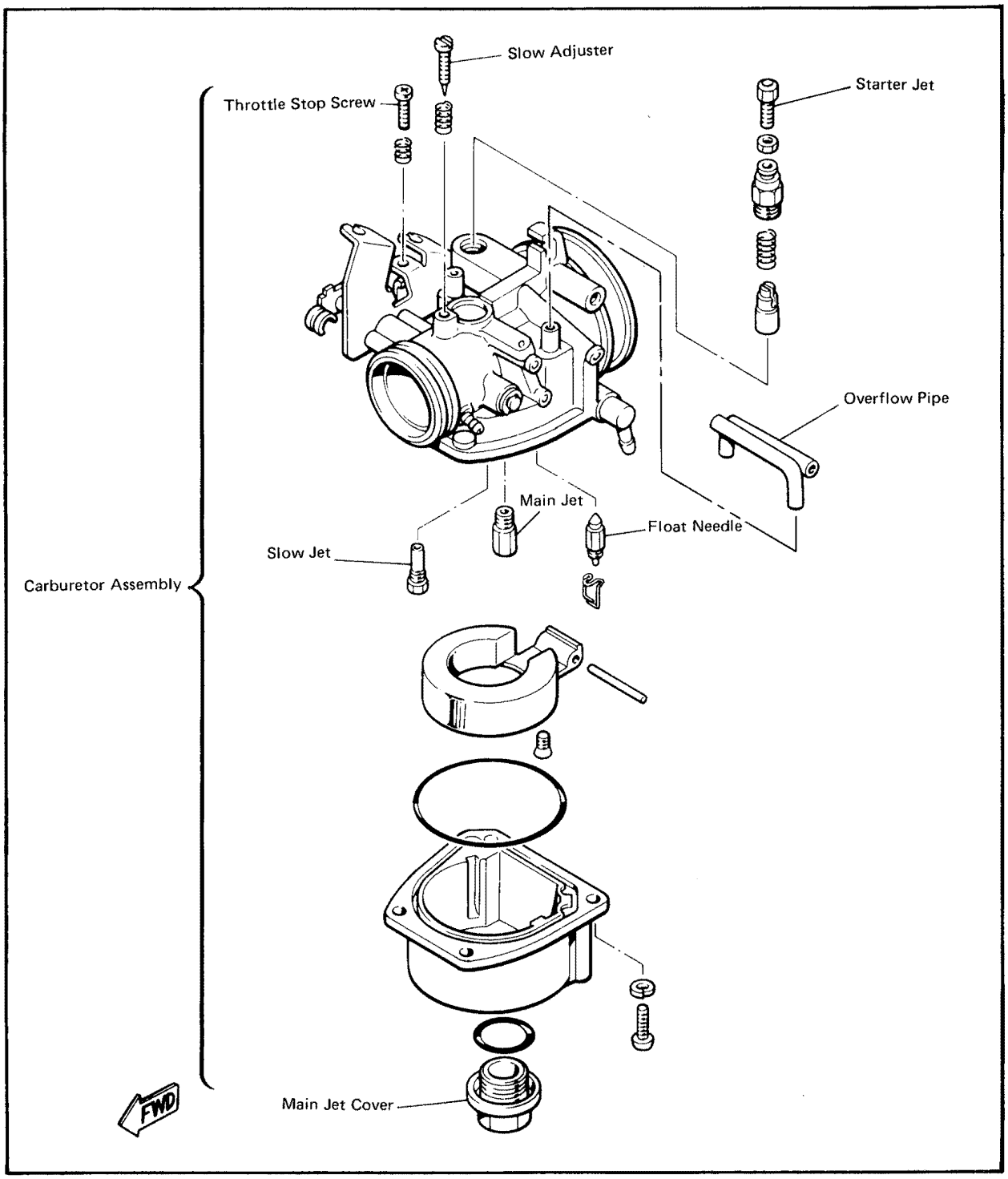
3-1. CARBURETOR 3-1
A. Removal 3-1
B. Disassembly 3-2
C. Inspection 3-2
D. Assembly 3-2
E. Installation 3-3

3-2. TUNING AND ADJUSTMENT 3-3
A. Carburetor Tuning Data 3-3
B. Starter Cable Adjustment 3-4
C. Throttle Cable Adjustment 3-5
D. Oil Pump Cable Adjustment 3-5
E. Low Speed Tuning 3-5
F. Mid-range and High Speed Tuning 3-6
G. Troubleshooting 3-7

3-3. INTAKE 3-9

CARBURETION

3-1. CARBURETOR



A. Removal

1. Disconnect the pulse pipe, oil pump cable, oil delivery pipe, throttle cable, and the starter cable. Be careful not to lose the rubber cap or coil spring from the starter cable.
2. Loosen the clamp on the carburetor boot and remove the carburetor. Do not lose a spring from the air box boot.

B. Disassembly

1. Carefully remove the jets, float, etc. Never, however, disassemble the throttle valve or the throttle shaft. The threads of the throttle shaft have been crimped so the screw will not come lose. Once the throttle valve is disassembled, it will be very difficult to reassemble it correctly. The original characteristics of this carburetor will be difficult to reproduce, thus performance will be adversely affected.
2. Carefully clean all parts. Blow the jets and passages clear with compressed air. Use a soft brush to clean the outside surfaces so nothing will be scratched or damaged. Do not use a wire or any such object to clear a jet. This will deform the jet and reduce performance.
3. Remove the carbon from the throttle valve and adjacent area. Take care not to scratch the throttle valve or bore.

C. Inspection

1. Inspect all jets and passages. They must be clear.
2. Check the mating surfaces for wear. Replace jets as required.
3. Check the float valve for damage. If either the float seat or float needle are damaged, replace both parts.
4. Check the pilot screw for carbon deposits; check the threads for wear. Clean and replace the jet as required.

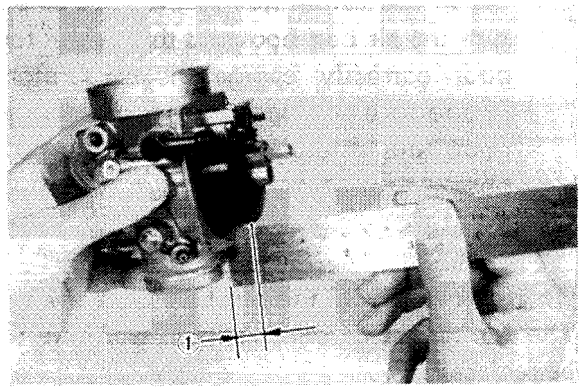
D. Assembly

Use new O-rings when assembling the carburetor. Thoroughly grease the contact surfaces of the throttle shaft. Be sure all moving parts in the carburetor operate smoothly.

1. Install the throttle stop screw with its spring. For adjustment (Refer to 3-2, E "Low Speed Tuning".)
2. Install the main jet and the slow jet.
3. Install the slow adjuster with its spring. For adjustment (Refer to 3-2, E "Low Speed Tuning".)
4. Install the clip onto the float needle.
5. Hook the float needle clip onto the float tang. Install the float, and insert the float needle into the float valve.
6. Measure the float level.

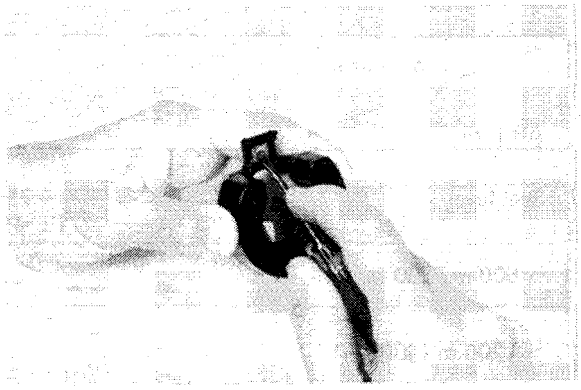
a. Incline the carburetor approximately 20 or 30 degrees until the float valve just barely closes. The float should be resting on the float needle, but not compressing the spring.
b. Measure the distance from the carburetor body to the top of the float.

Float height:
15 ± 2 mm (0.59 ± 0.08 in)



1. Float height

c. If the float height is not within specification, examine the valve seat and the float needle. If either is worn, replace them both. If both are fine, adjust the float height by bending the tang on the float.



d. Reinstall the float and recheck the float height.
8. Reassemble the float.

9. Apply grease to the following areas so they will not freeze:
   Throttle return spring,
   Throttle shaft,
   Both spaces between the throttle shaft and carburetor body,
   Throttle lock washer,
   E-clip, and
   The wire holder attached to the throttle valve.

E. Installation

1. Install the carburetor in the engine. Be sure the air box boot and the carburetor boot correctly engage the carburetor. Secure the clamp on the carburetor boot, and carefully secure the air box boot spring.

CAUTION:

Do not overstrech the air box boot spring. The spring can be damaged and will have to be replaced.

2. Attach the throttle cable, starter cable, oil pump cable, oil delivery line, and the pulse pipe. Refer to the Cable Routing Diagram in the appendix.

3-2. Tuning and Adjustment

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

A. Carburetor Tuning Data

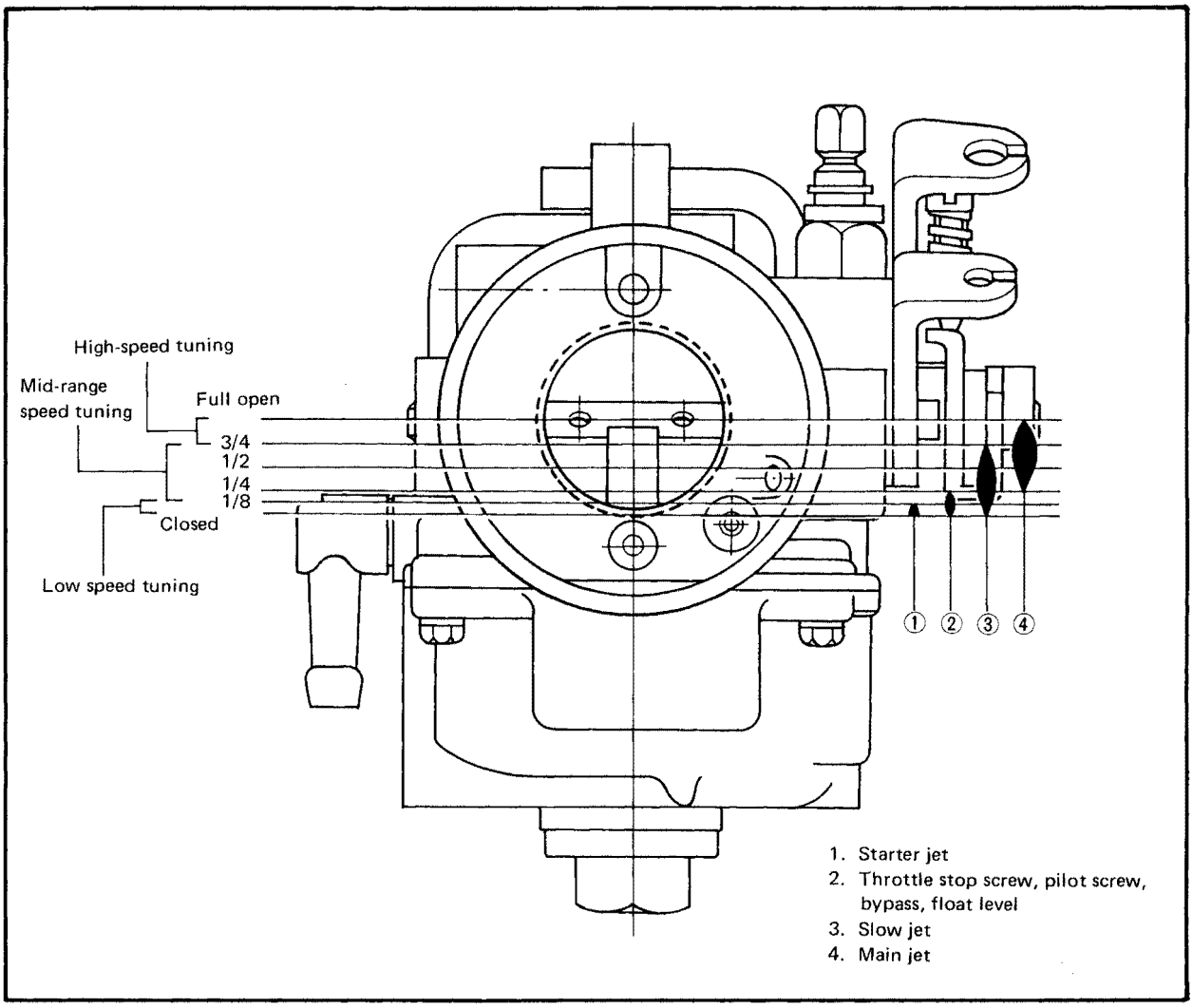
1. Standard specification

Carburetor	BD32-28/KEIHIN
I.D. Mark	8R401
Main jet	#108
Slow adjuster (turn out)	1-1/4
Starter jet.	#120
Slow jet	#78
Float height	15 ± 2.0 mm (0.59 ± 0.08 in)

2. High altitude tuning

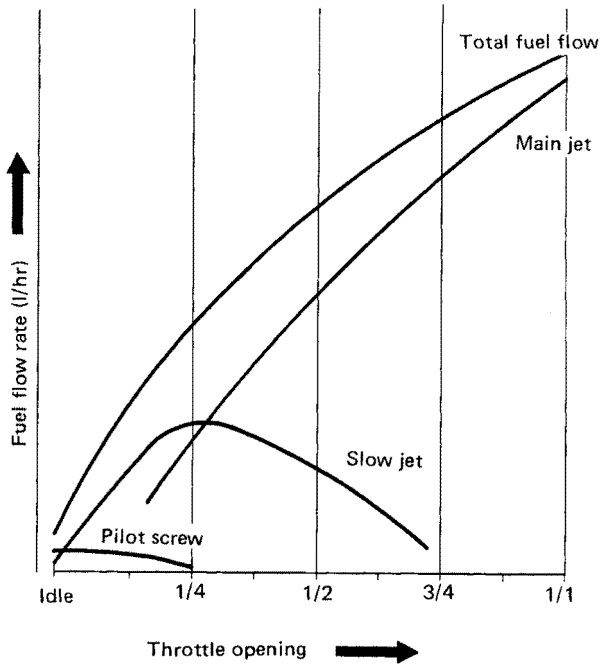
Altitude \ Temperature	–30°C (–22°F)	–20°C (–4°F)	–10°C (14°F)	0°C (32°F)	10°C (50°F)	20°C (68°F)
Seal level	#112	#108	#108	#105	#105	#105
~ 600 m (200 ft)	#108	#108	#108	#105	#105	#105
~ 1200 m (4000 ft)	#108	#108	#105	#105	#102	#102
~ 1800 m (6000 ft)	#108	#108	#105	#105	#102	#102
~ 2400 m (8000 ft)	#105	#105	#102	#102	#100	#100
~ 3000 m or more (10000 ft)	#102	#102	#100	#100	#100	#100

3. Fuel flow



BR250 CARBURETOR (KEIHIN BD32-28)

Fuel Flow Chart



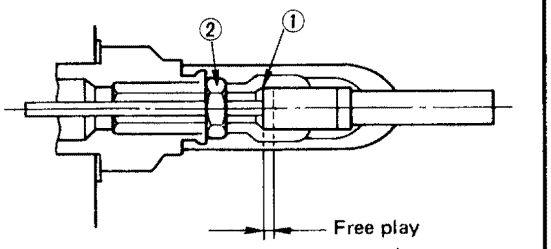
B. Starter Cable Adjustment

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)



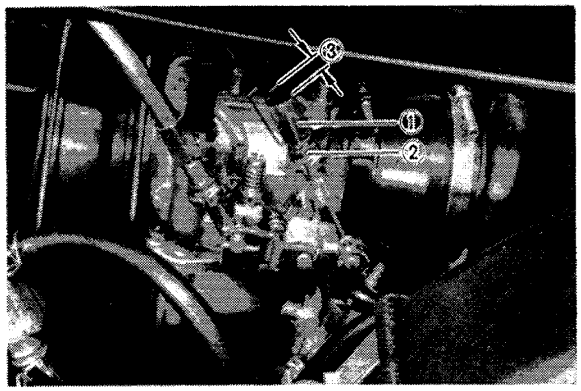
1. Adjuster 2. Lock nut

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

C. Throttle Cable Adjustment

Set the throttle cable adjuster so that the free play between the throttle cable outer tube end and adjuster equals specification when the throttle valve is closed (at idle).

Free play between outer tube end and adjuster:
0.5 ~ 1.0 mm (0.2 ~ 0.4 in)



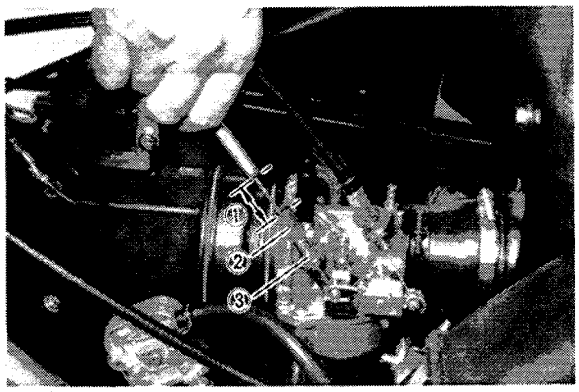
1. Adjuster 2. Lock nut 3. Play

D. Oil Pump Cable Adjustment

NOTE:
Always adjust the throttle cable **BEFORE** adjusting the oil pump cable.

1. Loosen the lock nut on the oil pump cable adjusting screw.
2. Pull up the cable to its limit, and turn the adjusting screw until the free play of the outer cable is as specified below:

Play: 25 ± 1 mm (1.00 ± 0.04 in)



1. Play 2. Adjusting screw 3. Lock nut

3. Lock the adjusting screw by tightening the nut.

E. Low Speed Tuning

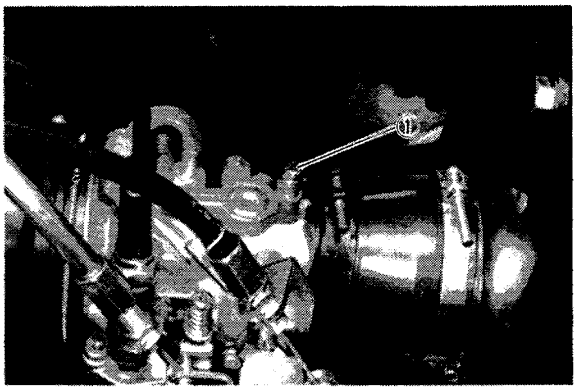
The carburetor is built so that low speed tuning can be done by adjusting the slow adjuster and the throttle stop screw.

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.

1. Tighten the slow adjuster lightly, and back it out from its lightly seated position.

Stardard pilot screw (turns out):
1-1/4

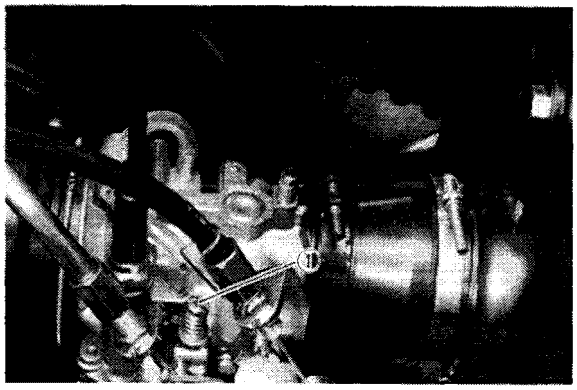


1. Slow adjuster

2. Start the engine, and fully warm up the engine.
3. Adjust the throttle stop screw until the engine runs at 2,000 ~ 2,500 rpm.

4. Slowly loosen slow adjuster. As the slow adjuster is loosened, the mixture will become leaner and engine rpm will increase. Adjust the slow adjuster to attain the highest possible engine speed.
5. Finally, turn the throttle stop screw counterclockwise so that the engine runs at 1,100 rpm.

Idle speed: 1,100 ± 100 rpm



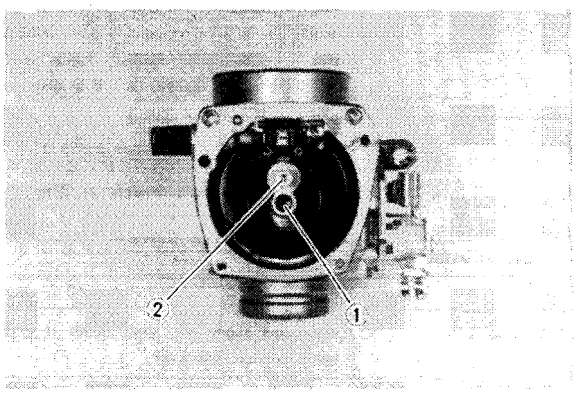
1. Throttle stop screw

NOTE:

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

a. Replace the slow jet according to operating conditions.

Standard slow jet: #78



1. Slow jet 2. Main jet

b. By repeating steps 1 to 5 above, adjust the idle speed.

Idle speed: 1,100 ± 100 rpm

F. Mid-range and High Speed Tuning

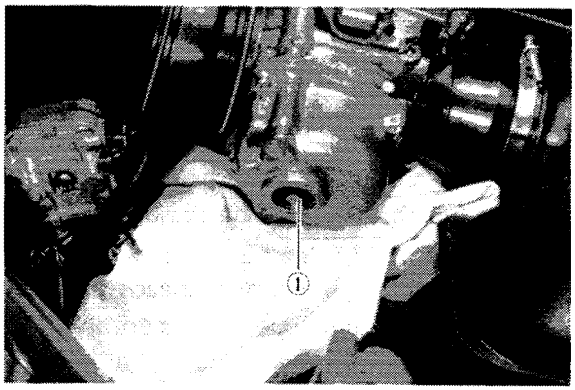
No adjustment is normally required, but adjustment is sometimes necessary depending on temperatures and/or altitude.

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

1. Run the engine at high speeds, and make sure the engine operates smoothly.
2. Check the spark plug. The main jet should be adjusted on the basis of the following table. (Refer to spark plug color samples.)

Standard main jet: #108

	Spark plug color
No. 1	Good (Carburetor is turned properly.)
No. 2	Bad (Mixture is too rich.) Replace main jet with one-step small 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 damaged 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.

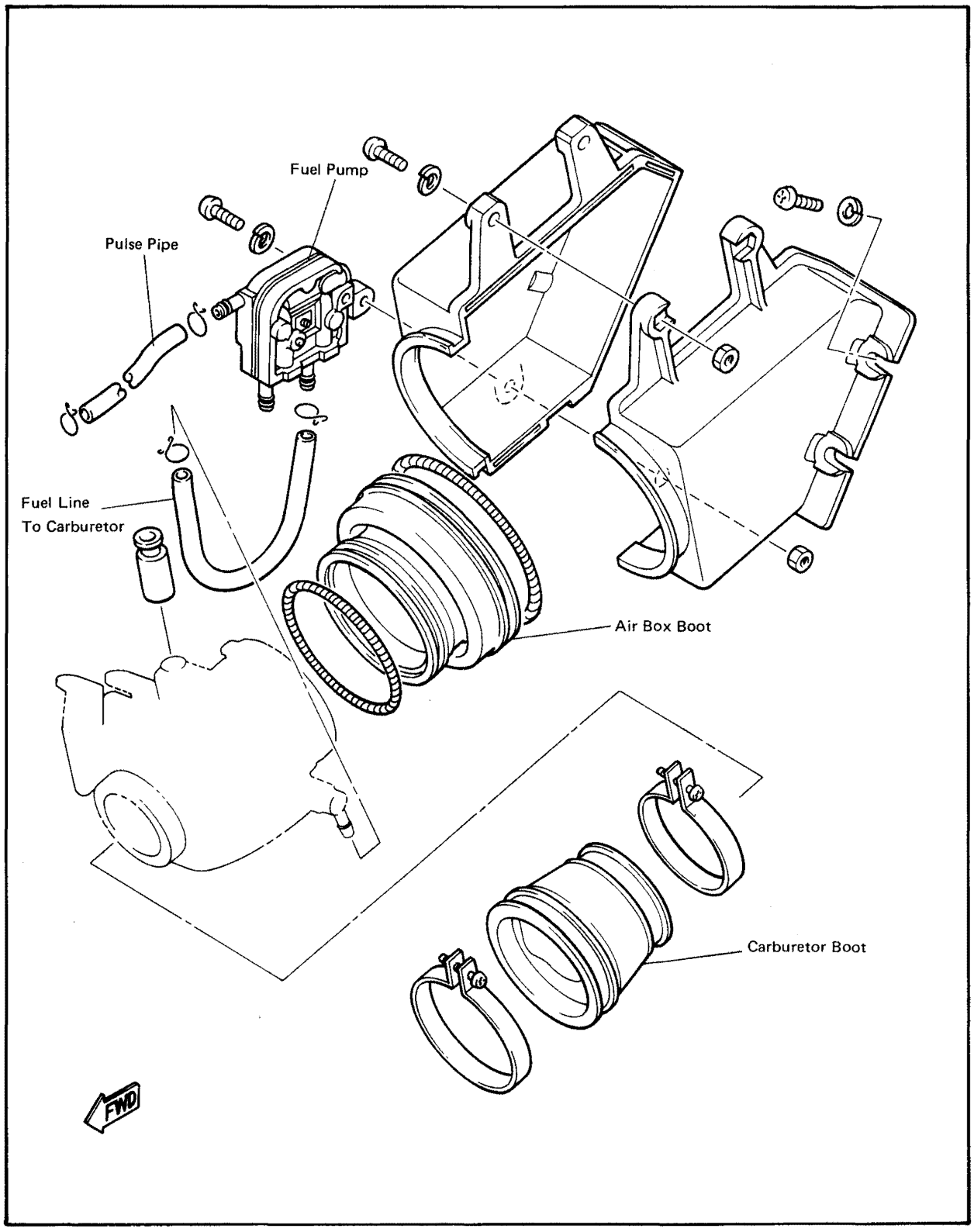
Place a rag under the carburetor so fuel does not spread. Place the main jet cover bolt in a clean place. Keep it away from fire. After assembling the carburetor, firmly tighten the rubber joint screw. Make sure the throttle outer tube is in place and the throttle cable moves smoothly. Clean the carburetor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

G. Troubleshooting

Trouble	Check point	Remedy	Adjustment
Hard starting	Insufficient fuel	Add gasoline	
	Excessive use of starter (Excessively opened choke)	Clean spark plug	Return starter lever to its seated position.
	Fuel passage is clogged or frozen	Clean	Parts other than carburetor • Clogged fuel tank air vent, clogged fuel filter, or clogged fuel passage Carburetor • Clogged or frozen air vent clogged valve. • If water collects in float chamber, clean. (Also check for ice.)
	Overflow	Correct	
Poor idling (Relative troubles) • Poor performance at low speeds • Poor acceleration • Slow response to throttle • Engine tends to stall	Improper idling speed adjustment • Slow adjuster	Adjust idling speed	Tighten slow adjuster lightly, and check throttle opening. If incorrect, back it out specification. Start the engine and turn slow adjuster 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.
	• Throttle stop screw	Adjust	Tightened to much — Engine speed is higher. Backed out too much — Engine does not idle.
	Damaged slow adjuster	Replace slow adjuster	
	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	
Poor performance at mid-range speeds (Relative troubles) • 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	

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

3-3. INTAKE



1. Check to see that fuel moves from the fuel tank, to the fuel pump, then to the carburetor. If fuel leaks, replace the components as required.
2. Inspect the air box boot and the carburetor boot. Replace as necessary. Replace the air box boot springs if either is fatigued.

CHAPTER 4. POWER TRAIN

4-1. SHEAVE ALIGNMENT 4-1

4-2. CLUTCH TUNING 4-1
A. Clutch Setting Data 4-2
B. Changing Clutch Engagement and Shift RPM 4-3

4-3. V-BELT 4-3
A. Removal 4-3
B. Inspection 4-3

4-4. PRIMARY SHEAVE 4-4
A. Removal 4-4
B. Disassembly 4-5
C. Inspection 4-5
D. Assembly 4-6

4-5. SECONDARY SHEAVE 4-8
A. Removal 4-8
B. Inspection 4-9
C. Assembly 4-9

4-6. CHAIN CASE 4-10
A. Disassembly 4-11
B. Inspection 4-11
C. Gearing 4-12
D. Assembly 4-12

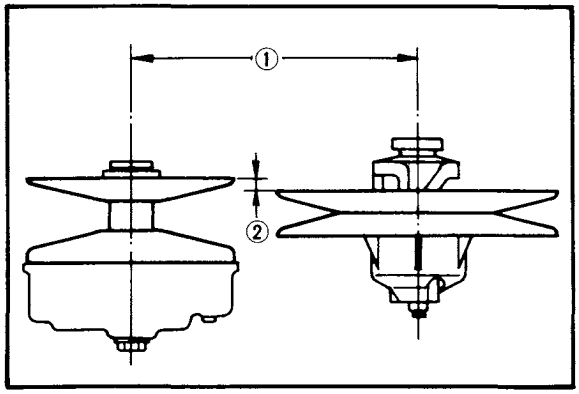
4-7. BRAKE 4-14
A. Disassembly 4-14
B. Inspection 4-15
C. Assembly 4-15
D. Brake Adjustment 4-15

4-8. SLIDE RAIL SUSPENSION 4-16
A. Removal 4-16
B. Inspection 4-17
C. Installation 4-18

4-9. DRIVE 4-19
A. Removal 4-19
B. Inspection 4-20
C. Assembly 4-20
D. Track Adjustment 4-20

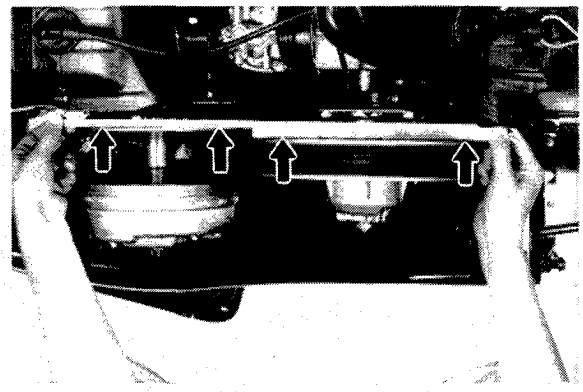
POWER TRAIN

4-1. SHEAVE ALIGNMENT

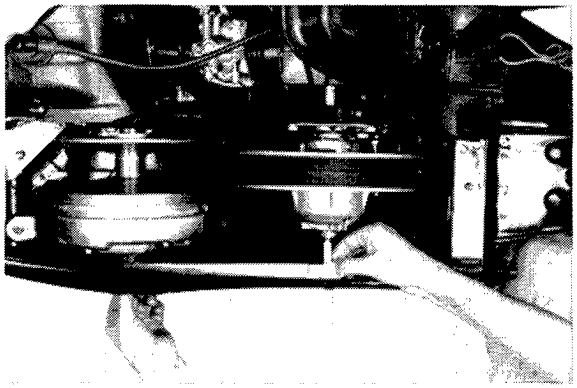


1. Sheave distance: 266 ± 2 mm (10.47 ± 0.08 in)
2. Sheave offset: 11 ± 3 mm (0.43 ± 0.12 in)

1. Using the sheave gauge, check the sheave offset. If the gauge does not contact the primary and secondary sheaves at the four indicated points, the sheave offset is incorrect.



2. Check the sheave center-to-center distance.



3. If either the center-to-center distance or the offset is not within specification, check the engine mounts. If the engine has been mounted correctly, the engine mounting bracket, the frame, or both are bent. Replace as required.

Sheave gauge: TLS-90910-47-02 (U.S.A.)
90890-01702

Center-to-center:
266 ± 2 mm (10.47 ± 0.08 in)
Sheave offset:
11 ± 3 mm (0.43 ± 0.12 in)

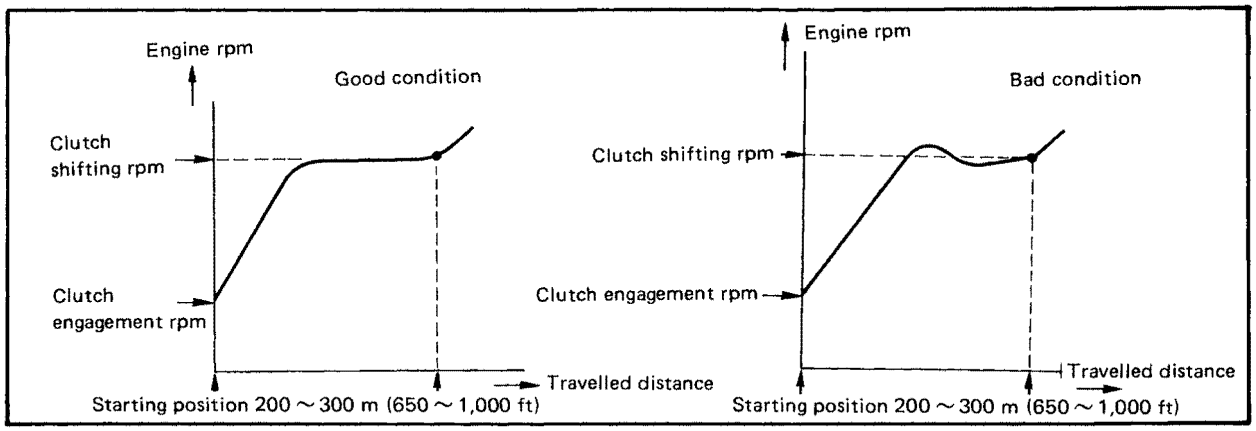
4-2. CLUTCH TUNING

The clutch may require tuning depending upon the area of operation and the desired handling characteristics. The clutch can be tuned by changing engagement & shifting rpm.

Clutch engagement rpm is defined as the engine speed where the machine first begins to move from a complete stop.

Shifting rpm is the engine speed when the machine passes a point 200 ~ 300 m (650 ~ 1000 ft) from the starting position after the machine has been started at full-throttle from a dead stop.

Normally, when a machine reaches shift rpm, the vehicle speed increases but the engine speed remains nearly constant. Under unfavorable conditions, however (wet snow, icy snow, hills, or rough terrain), engine speed can decrease after the engine has reached shifting rpm.



A. Clutch Setting Data

		S.T.D. spec.	High altitude spec.
Engagement	r.p.m.	3100 ± 200	←
Shifting	r.p.m.	5750 ± 50	←
Primary spring	Parts No.	90501-50654	←
	Set weight	15 kg (33 lb)	←
	Spring constant	2.4 kg/mm (134 lb/in)	←
	Color	None	←
Roller shim	Q'ty	8 p.c.s./unit	←
	Parts No.	90201-06727	←
Secondary spring	Twist angle	160°	←
	Color	None	←

NOTE:
High altitude specifications apply to operation at an altitude of more than 1506 meters (4500 ft).

Since the clutch weights are secured in place by the sheave cap bolts, the centrifugal force that can alter clutch characteristics comes from the weight of the lever on the spider. To adjust clutch engagement and clutch shifting rpm, add or remove roller shims from the spider as indicated by the chart.
Clutch shifting rpm can also be adjusted by changing the preload on the secondary sheave spring: 160° and 280°. 160° is standard.

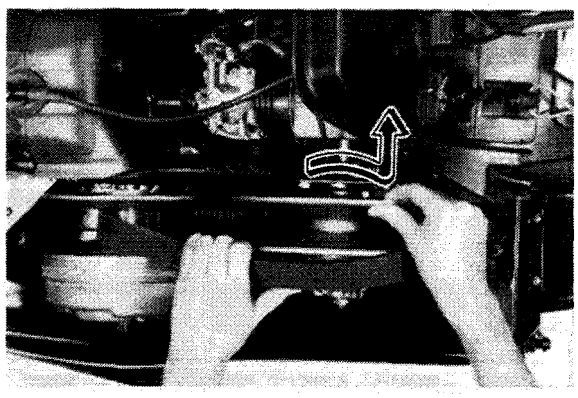
B. Changing Clutch Engagement and Shift RPM

Setting factor		Clutch engagement r.p.m.		Clutch shifting r.p.m.	
		Decrease	Increase	Decrease	Increase
Centrifugal force of rollers		Add shims	Remove shims	Add shims	Remove shims
Secondary spring	Torsion spring constant	–	–	Decrease	Increase
	Twist angle	–	–	Smaller wind	Greater wind

4-3. V-BELT

A. Removal

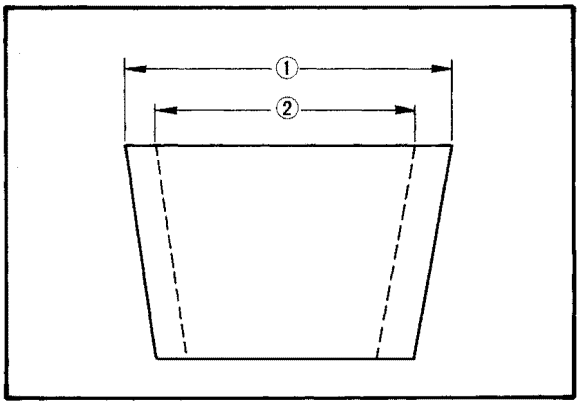
1. Turn the secondary sliding sheave clockwise and push it towards the chain case.
2. While holding the sliding sheave in this compressed position, remove the V-belt from the secondary sheave then from the primary.



B. Inspection

1. Visually inspect the V-belt for signs of damage. Replace the belt if it is damaged.
2. Measure the width of the V-belt. If the belt is worn beyond the wear limit, replace it.

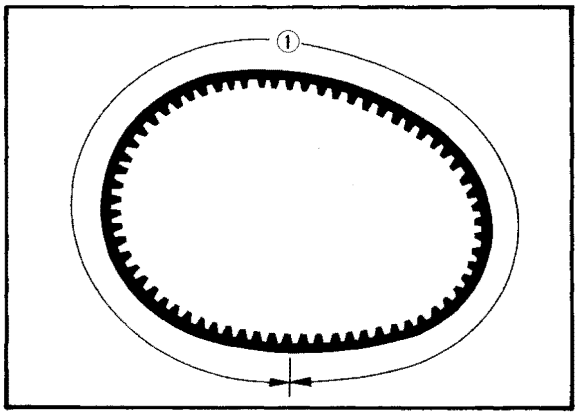
Wear limit: 26 mm (1.02 in)



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

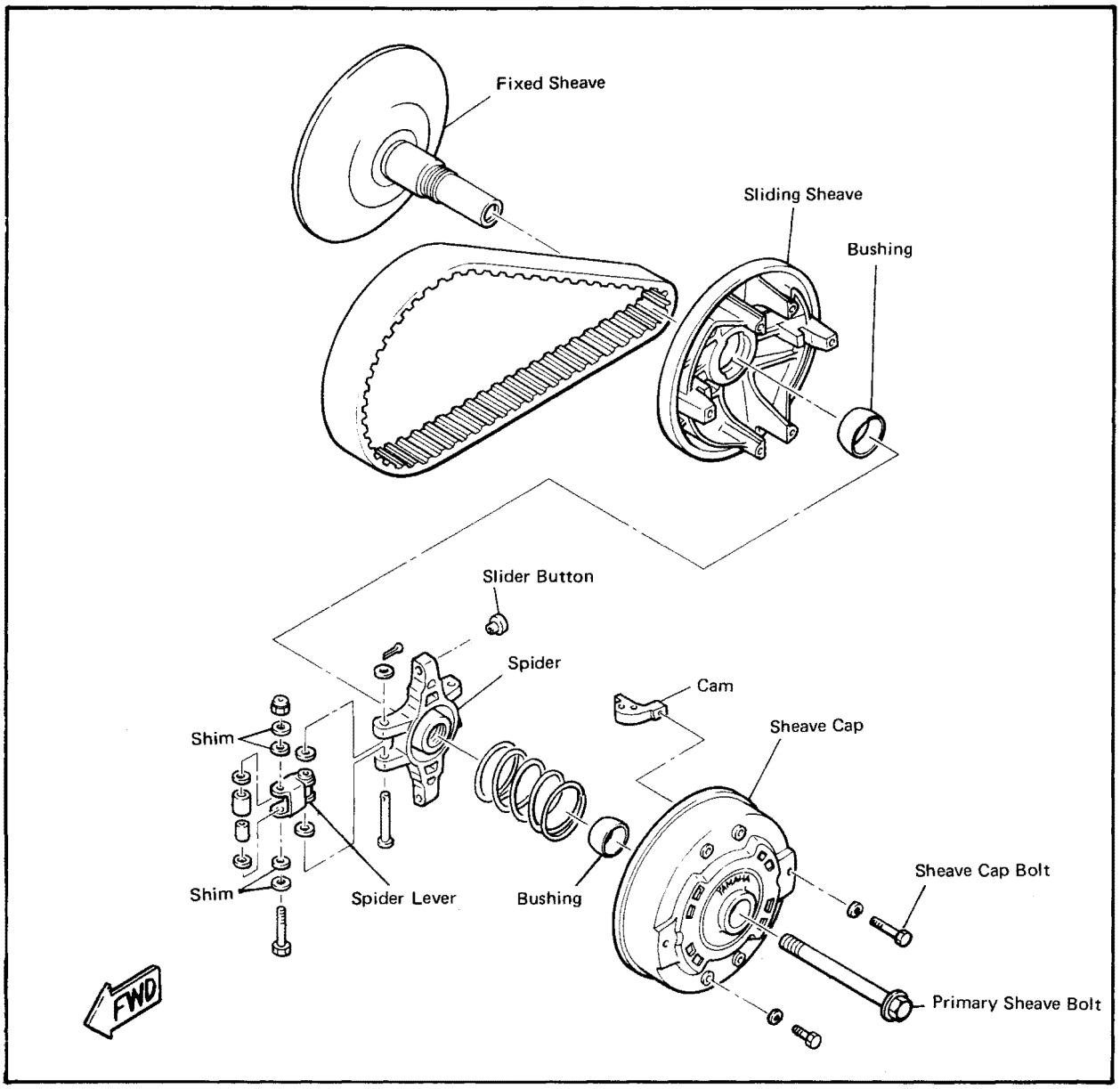
3. Measure the length of the V-belt. It should be within specification; if not, replace the belt.

Part No.	Length of V-Belt
820-17641-00	1,099 mm (42.8 in)



1. V-belt length

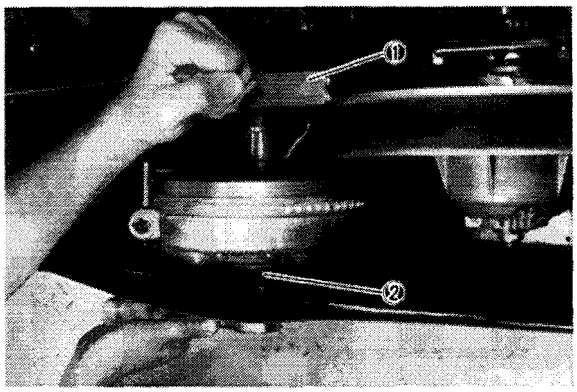
4-4. PRIMARY SHEAVE



A. Removal

1. Remove the drive guard, and remove the V-belt.
2. Hold the fixed sheave with the primary sheave holder and remove the clutch bolt. Drive the primary sheave off the crankshaft with the primary sheave puller.

Primary sheave holder:
TLS-90018-80-00 (U.S.A.)
90890-01701
Primary sheave puller:
90890-01898

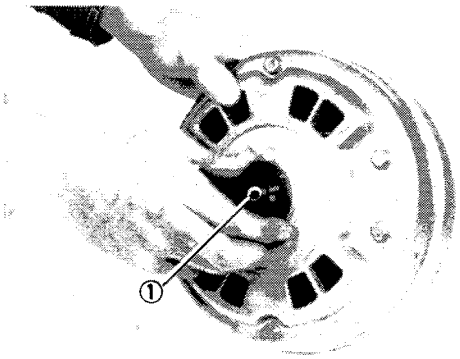


1. Sheave holder
2. Sheave puller

B. Disassembly

1. Install the sheave subassembly tool in the primary sheave.

Primary sheave subassembly tool: 90890-01858



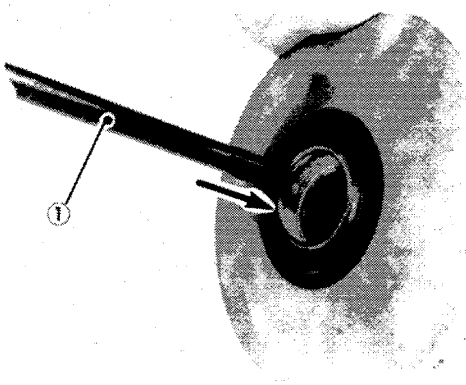
1. Sheave sub-assembly tool

2. Loosen the six sheave-cap bolts.
3. Remove the sheave subassembly tool, and remove the sheave cap.

C. Inspection

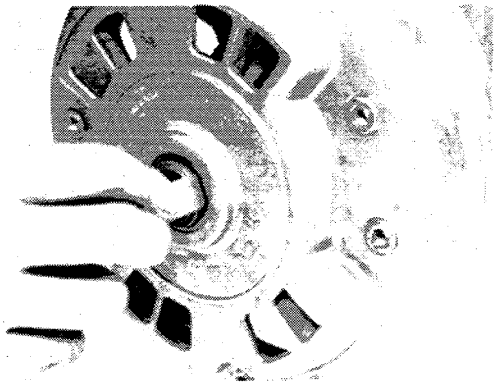
1. Inspect the tapered ends of the crankshaft and the primary fixed sheave for scartches. If either is severely scratched, replace it. If scratches are minor, burnish the component with emery cloth.
2. Check the primary sheave cap bushing and the sliding sheave bushing for wear. If worn beyond tolerance, replace the bushing.
   Use the bushing tool if a bushing is difficult to remove.

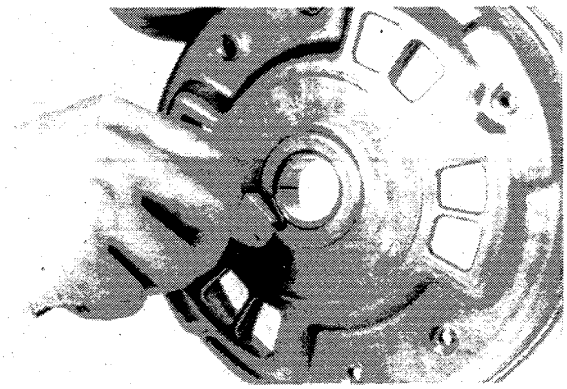
Bushing tool: 90890-01883

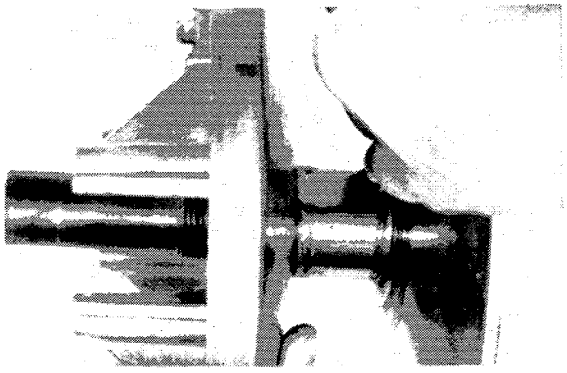


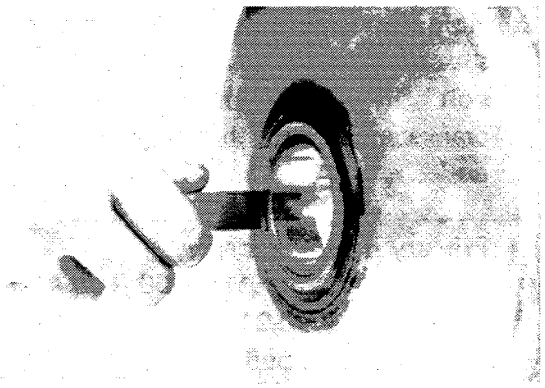
1. Bushing tool

	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)



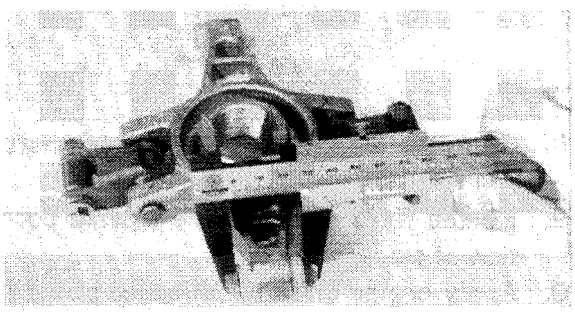




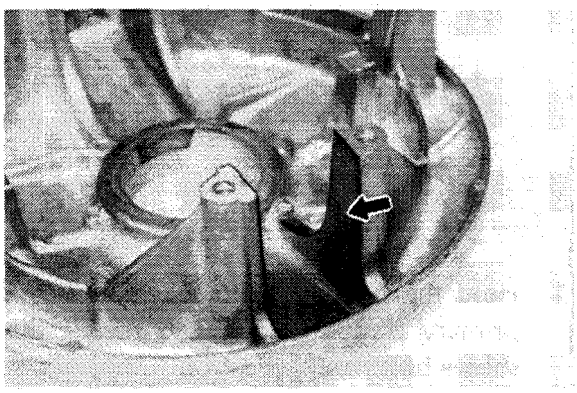


3. Remove the sliding sheave from the fixed sheave, and remove the spider.
4. Measure the wear on the slider buttons. If worn beyond specification, replace the buttons.

Wear limit: 27.0 mm (1.06 in)

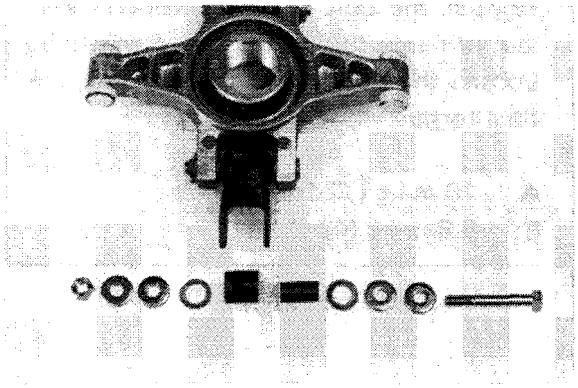


5. Inspect the slides in the sliding sheave for scratches or other damage; replace the sliding sheave as required.

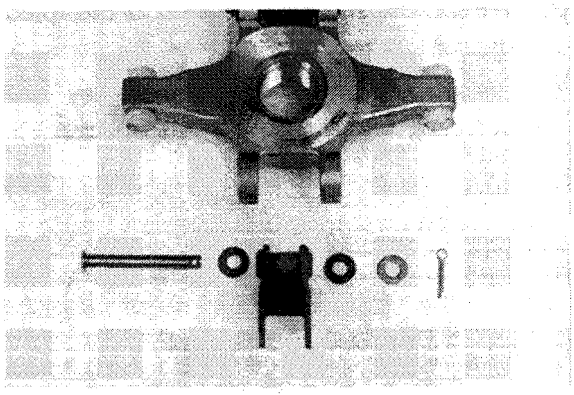


6. Disassemble and inspect the rollers; replace worn parts as necessary. Torque the nut to specification during reassembly.

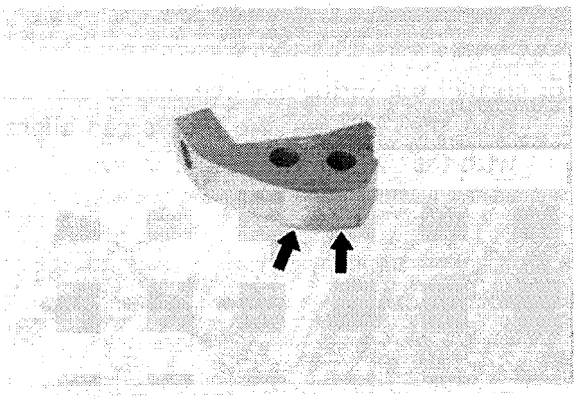
Tightening torque: 1.0 m-kg (7 ft-lb)



7. Disassemble and inspect the spider levers; replace any worn parts. Reassemble the levers with new cotter pins.



8. Inspect the cams for wear; replace as necessary.

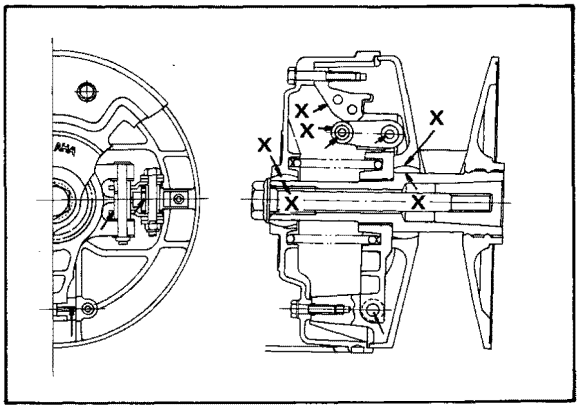


9. Check the spring. Replace it if it is fatigued or damaged.

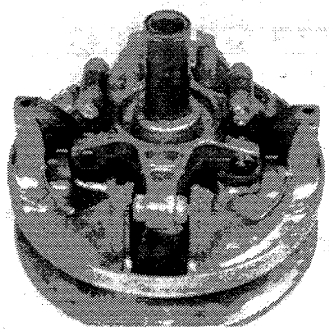
D. Assembly

1. During assembly, grease the indicated points, but take care to keep the other indicated areas from grease.

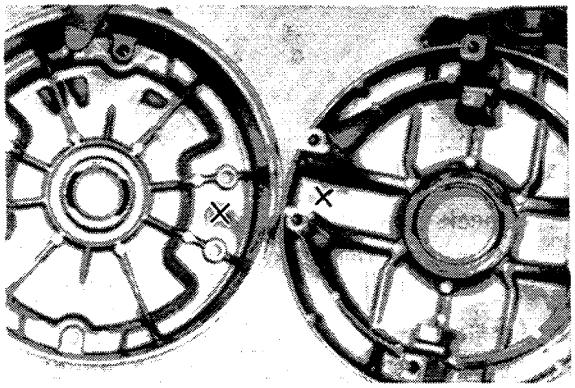
← X Free from grease
← Grease point



2. Install the bushing and the spider into the sliding sheave. Be sure the bottons correctly engage the slider.
3. Thread the sliding sheave onto the fixed sheave.
4. Install the cams. Be sure they are correctly seated in the sliding sheave.



5. Install the spring and the sheave cap. Be sure the "X" on the sheave cap aligns with the "X" on the sliding sheave.

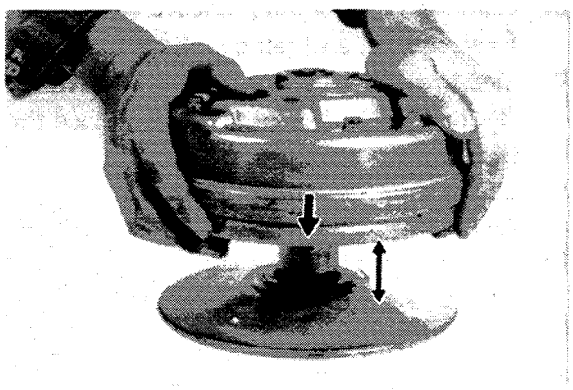


6. Install the primary sheave subassembly tool and secure the sheave cap to the fixed sheave. The two long bolts must also secure the clutch cams in place. Torque all six bolts to specification.

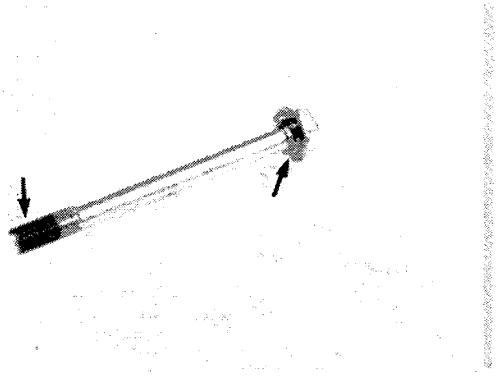
Primary sheave subassembly tool:
90890-01858

Tightening torque:
1.0 m-kg (7 ft-lb)

7. Check the movement of the sliding sheave. If it is not smooth, disassemble the primary sheave and reassemble it correctly.



8. Clean the tapered portions of crankshaft and fixed sheave.
9. Fit the fixed sheave to the tapered portion of crankshaft.
10. Apply engine oil to the threaded portion of primary sheave bolt and its contact surface with spring washer.

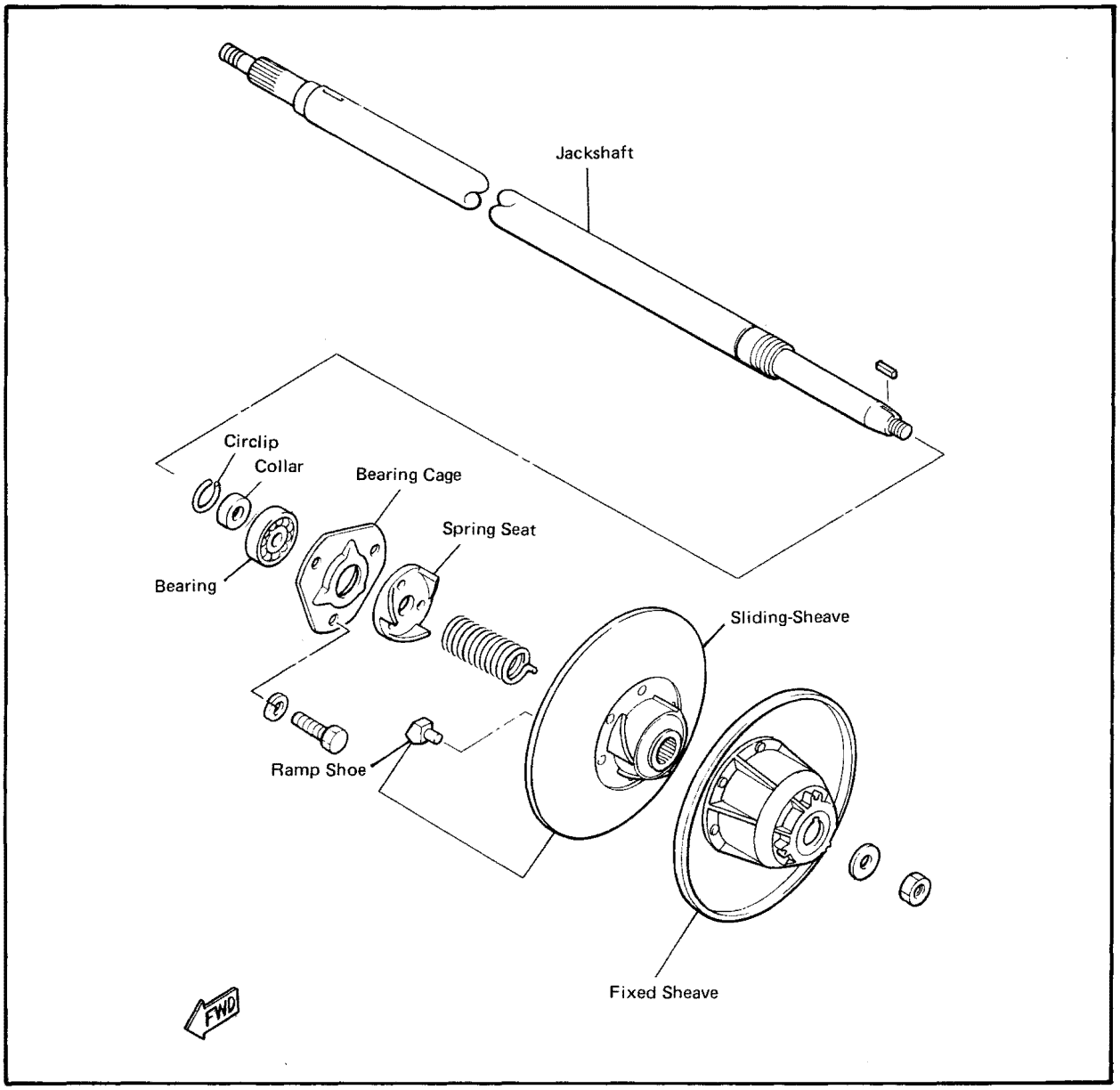


11. Hold the primary fixed sheave with the primary sheave holder, and torque the sheave bolt to specification.

Primary sheave holder:
TLS-90018-80-00 (U.S.A.)
90890-01701

Tightening torque:
Tighten the bolt to A to properly seat the primary sheave on the crankshaft. Loosen the bolt, then torque it to B, the final torque.
A: 10 m-kg (72 ft-lb)
B: 5.8 m-kg (42 ft-lb)

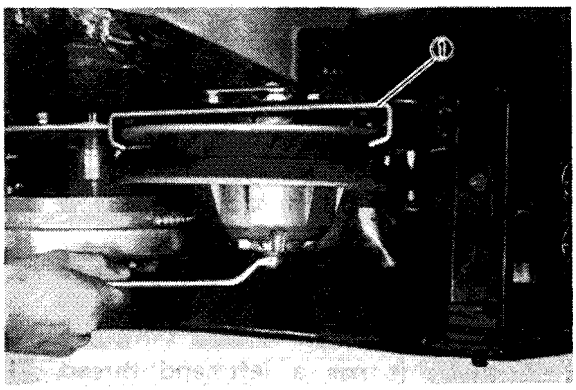
4-5. SECONDARY SHEAVE



A. Removal

1. Lock the brake, and install the secondary sheave holder. Fit the tool behind the spring seat so it will hold the sliding sheave in place when the fixed sheave is removed. Remove the securing nut.

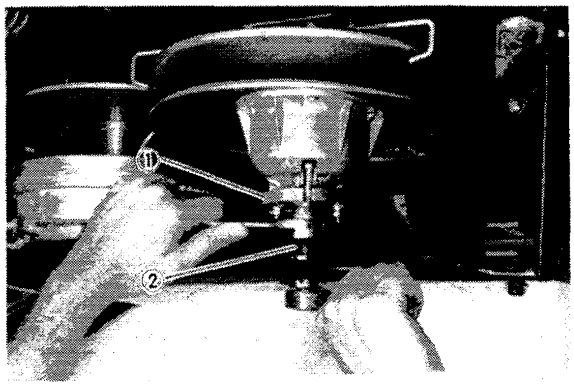
Secondary sheave holder: 90890-01872



1. Secondary sheave holder

2. Using the 3-way puller, remove the fixed sheave.

3-Way Puller Ass'y: TLU-90901-05-20 (U.S.A.)	
1. 3-Way Puller Body:	90890-01848
2. 3-Way Puller Attachment:	90890-01873



3. Remove the key from the jackshaft.
4. Very carefully remove the secondary sheave holder. The spring will force the sheave out.
5. Remove the sliding sheave, the spring, and the spring seat. The spring seat has a left-hand thread. If it is difficult to remove the spring seat, rap it with a plastic mallet.
6. Remove the collar and the circlip from the jackshaft bearing cage.

B. Inspection

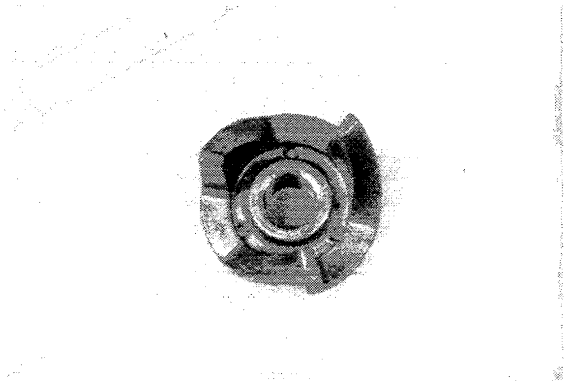
1. Inspect both sheaves. If either is warped, replace it.
2. Inspect the ramp shoes on the sliding sheave; replace as necessary.
3. Check the sheave bushings for wear; replace the sheave as required.
4. Check the spring. If it is fatigued or damaged, replace it.

C. Assembly

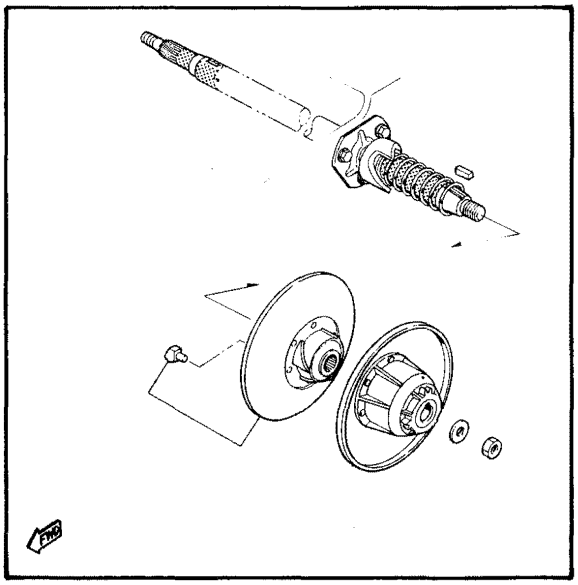
1. Install the circlip and collar into the jackshaft bearing cage.
2. Thread the spring seat onto the jackshaft; it has a left-hand thread. The spring seat **must** be tight or it will come loose when you preload the secondary sheave spring.
3. Install the spring into the spring seat. Be sure the spring is in one of the holes.

NOTE:

The three holes in the spring seat are for convenience only. Seating the spring in a different hole will not change the spring preload.



4. Install the sliding sheave onto the jackshaft. Be sure the spring engages the hole in the sheave.



5. Starting from the free position, rotate the sliding sheave clockwise to preload the spring, and push the sheave towards the chain case. Lock the sliding sheave in place with the secondary sheave holder.

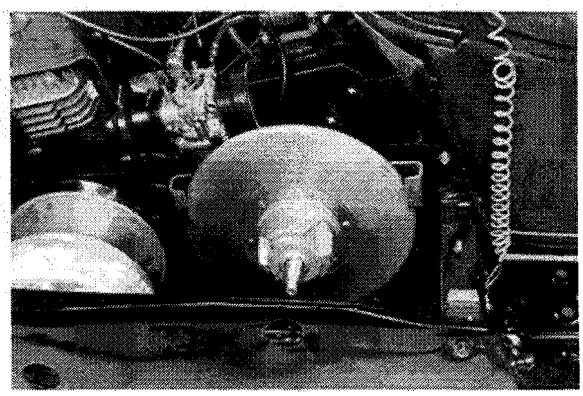
Secondary sheave holder:
90890-01872

Preload:

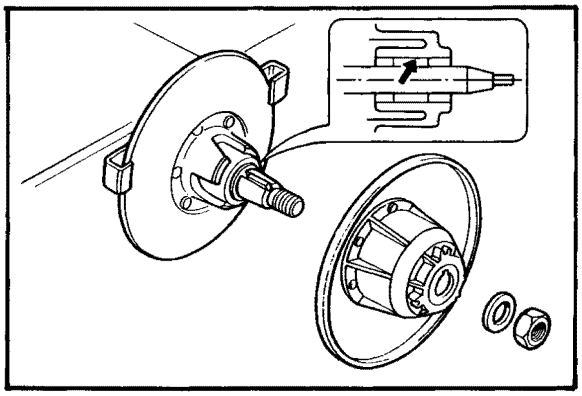
Turning the sliding sheave 1/3 of a turn from the free position (past one ramp shoe) sets the spring at 160°.

Turning the sliding sheave 2/3 of a turn from the free position (past two ramp shoes) sets the spring at 280°.

Std. secondary spring preload :
160° (Twist augle)



6. Install the key in the jackshaft, and install the fixed sheave. Grease the indicated point.

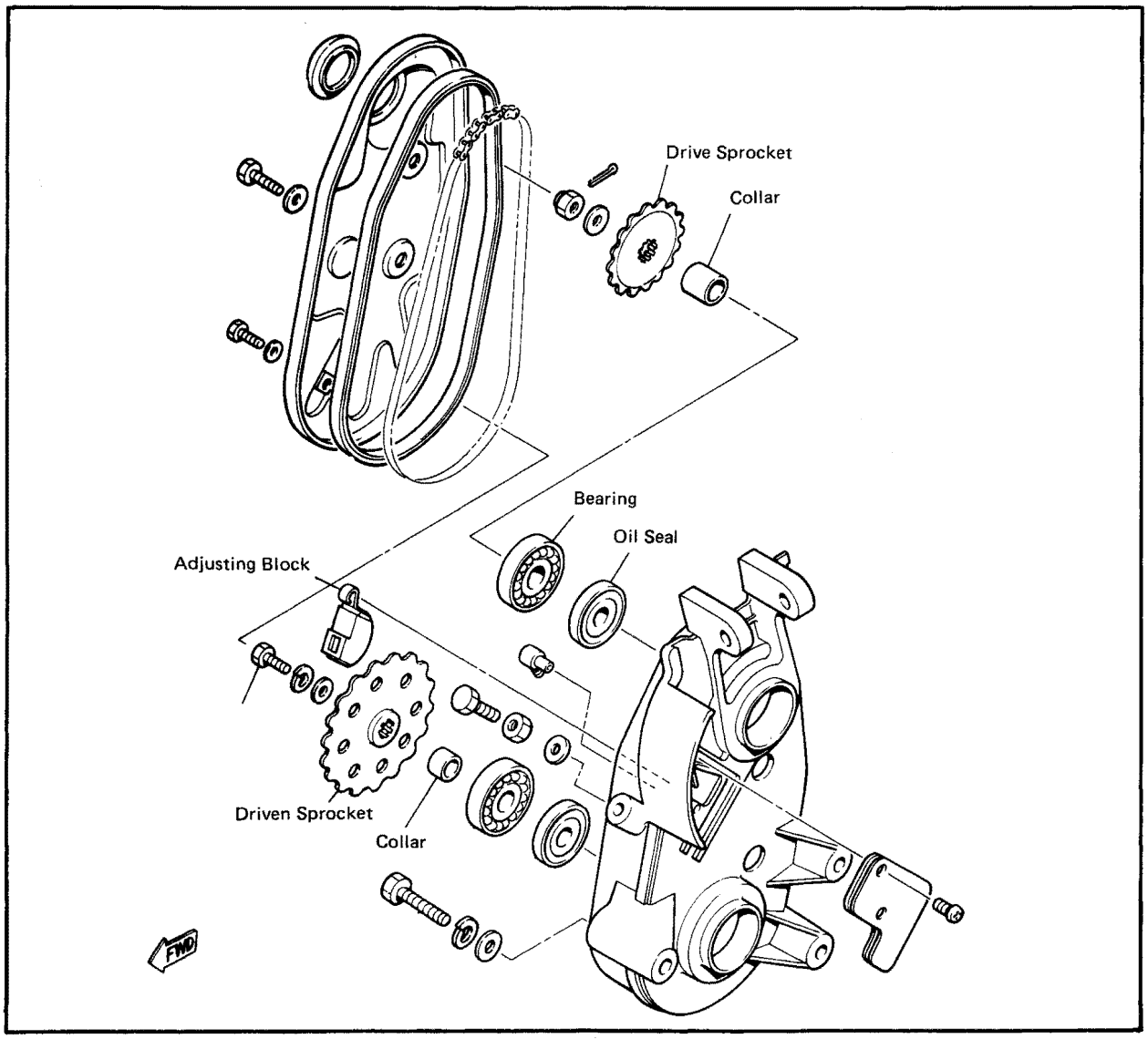


7. Install the washer and securing nut. Torque the nut to specification.

Tightening torque:
4.0 m-kg (29 ft-lb)

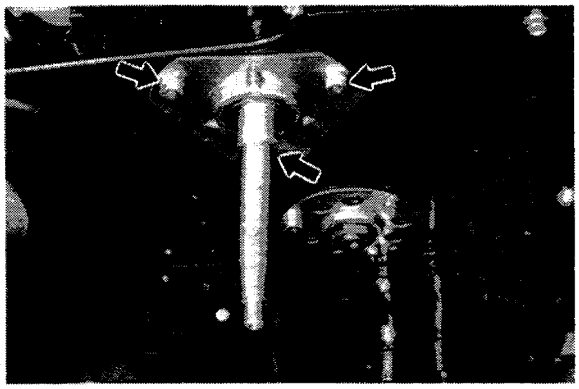
8. Wipe both sheaves. They should be free from oil and grease.

4-6. CHAIN CASE

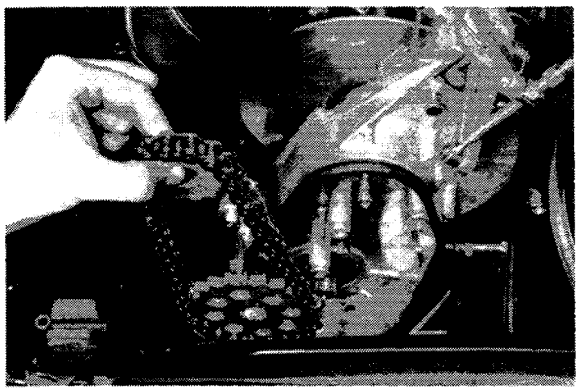


A. Disassembly

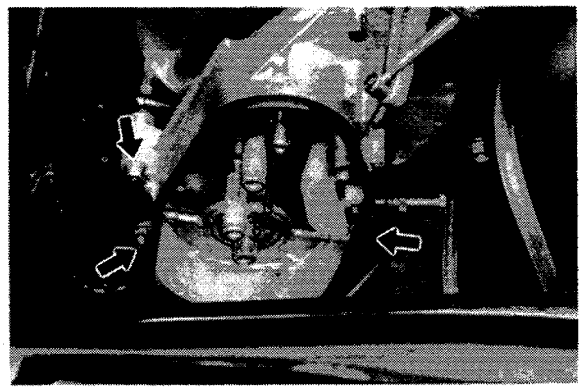
1. Remove the secondary sheave from the jackshaft (Refer to 4-5, A "Removal.")
2. Remove the bearing cage from behind the jackshaft bearing.



3. Disconnect the brake cable from the handlebar. It will be helpful to loosen the cable at the caliper. The caliper need not be disassembled.
4. Place an oil pan beneath the drain hole under the chain case.
5. Remove the chain case cover, and let the oil drain into the oil pan.
6. Loosen the chain tension.
7. Remove the securing hardware and washers from both the drive and driven sprockets.
8. Remove the drive chain and both sprockets.



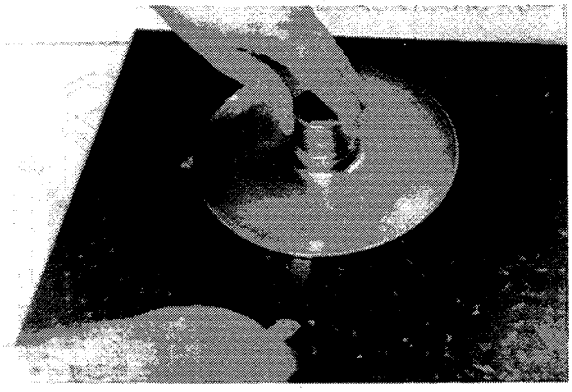
9. Remove the collar from behind each sprocket.
10. Remove the three securing bolts and remove the chain case.



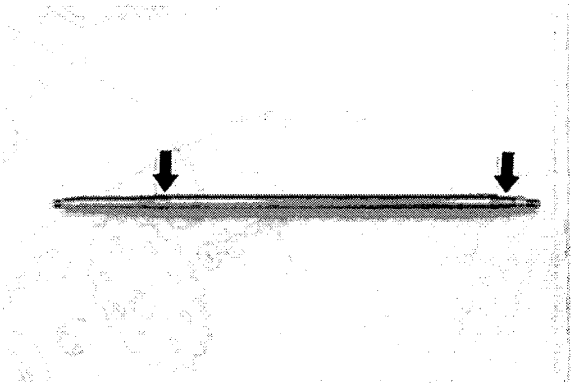
11. Remove the jackshaft from the left side of the snowmobile.

B. Inspection

1. Inspect the brake disc. Place it on a surface plate and check around the edges with a feeler gauge. If the gap is uneven, the disc is bent and must be replaced.

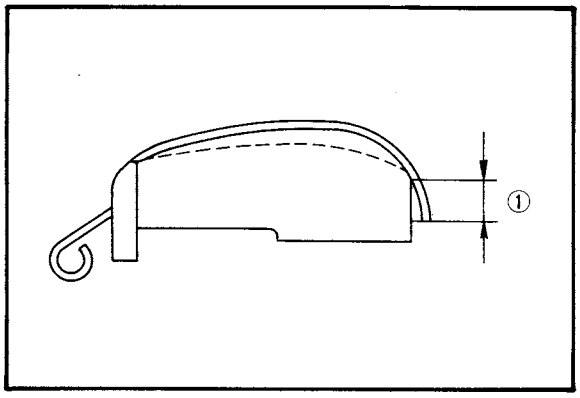


2. Inspect the bearing surfaces of the jackshaft. If worn or bent, replace the jackshaft.



3. Inspect the bearings in the chain case. If the movement is rough or uneven, replace the bearings.
4. Inspect the drive and driven sprockets; replace if worn.

5. Inspect the drive chain; replace as necessary.
6. Inspect the adjusting block. If the raised boss is worn to the base of the block, replace the block.



1 Wear limit 6 mm (0.24 in)

C. Gearing

Use the chart below to change the chain case gearing to suit the local conditions and the rider's driving style.

Higher gearing will increase the machine's top speed.

Lower gearing will increase the machine's acceleration and climbing ability.

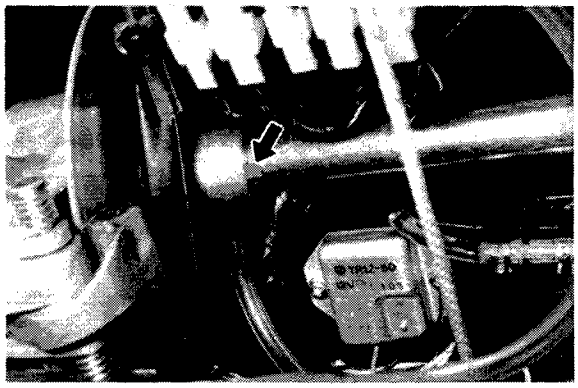
Do not set the gearing to any of the indicated (X) settings.

Drive gear / Driven gear	11T	12T	13T	14T
21T	X	X	X	○ 44
22T	X	X	S.T.D. ○ 44	X
23T	X	○ 44	X	X
24T	○ *44	X	X	X

* No. of chain links

D. Assembly

1. Grease the inner surfaces of the bearings and oil seals in the chain case.
2. Place the brake disc between the brake pads. Be sure the raised side of the disc faces away from the chain case.
3. Loosely bolt the chain case in place in the chassis. It may be helpful to block up the chassis to relieve the tension on the drive axle.
4. Grease the bearing surfaces of the jackshaft. Place the key in the jackshaft, and install the jackshaft from the left-side of the machine. The splined end must go through the brake disc and into the chain case. Align the keyway in the disc with the key on the jackshaft.



5. Tighten the chain case bolts and torque them to specification.

Tightening torque: 2.3 m-kg (17 ft-lb)

6. Install the jackshaft bearing on the left side of the machine. Install the bearing cage over the jackshaft bearing. Torque the three bolts to specification.

Tightening torque: 2.3 m-kg (17 ft-lb)

7. Install the collar and the circlip into the bearing cage.
8. Install both collars in the chain case. The larger goes on the jackshaft, the smaller on the drive axle.
9. Place both the drive and driven sprockets in the drive chain, and install them in the chain case. Be sure the stepped side of the driven sprocket faces in towards the engine.
10. Install the adjusting block.

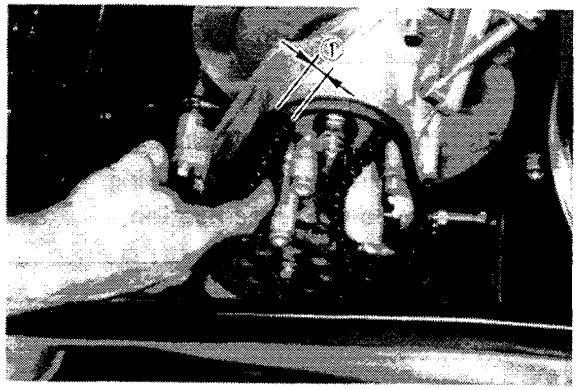
11. Secure the drive and driven sprockets onto their respective shafts. Torque the securing hardward to specification. Use a new cotter pin with the drive sprocket.

Tightening torque:	
Drive sprocket nut:	4.0 m-kg (29 ft-lb)
Driven sprocket bolt:	2.3 m-kg (17 ft-lb)

12. Adjust the chain tension. Turn the adjusting bolt until the chain deflection equals specification. Torque the lock nut to specification.

Chain deflection
8 ~ 15 mm (0.3 ~ 0.6 in)

Tightening torque:
3.5 m-kg (25 ft-lb)



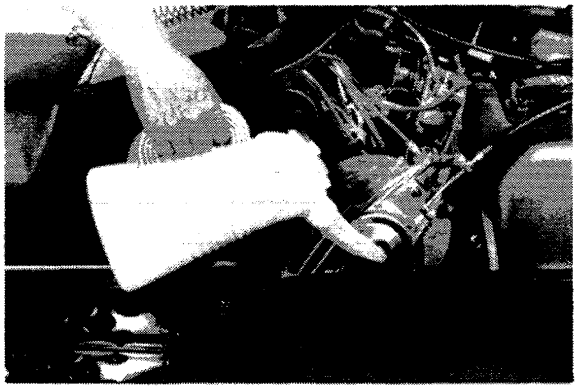
1. Chain deflection

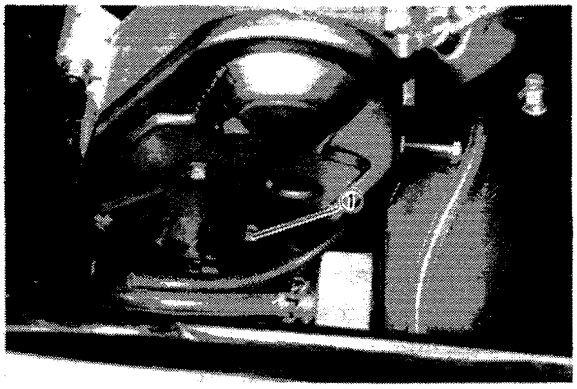
13. Install the chain case cover. Torque the two bolts to specification. Be sure the rubber gasket is properly seated on the chain case.

Tightening torque:
1.6 m-kg (12 ft-lb)

14. Add oil to the chain case until oil begins to flow from the oil drain bolt.

Recommended oil:
SAE 75W80 API-GL3 Gear Oil



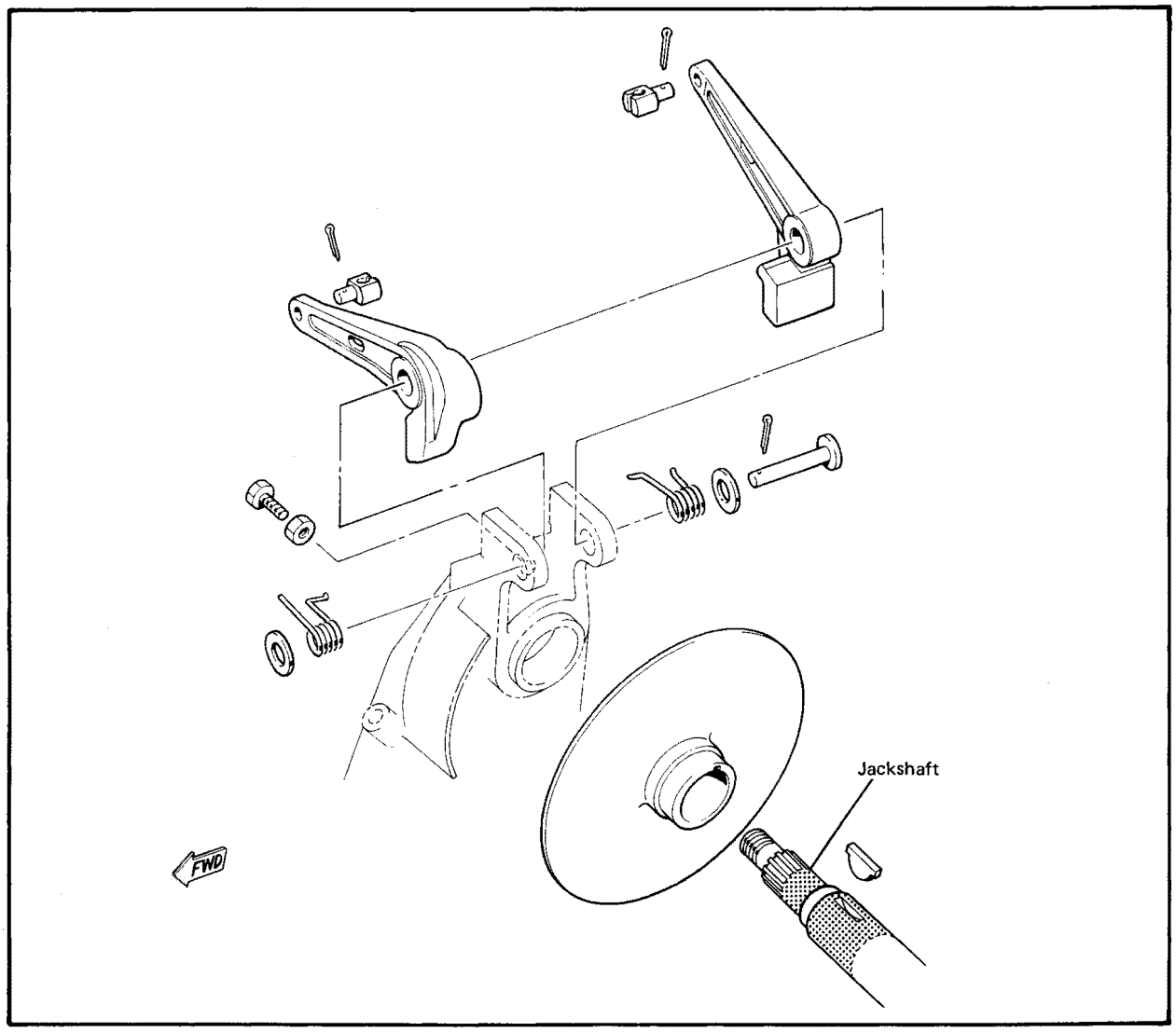


1. Oil drain bolt

15. Install the secondary sheave onto the jackshaft. (Refer to 4-5, C "Assembly.")
16. Reconnect and adjust the brake cable. (Refer to 4-7, D "Brake Adjustment.")

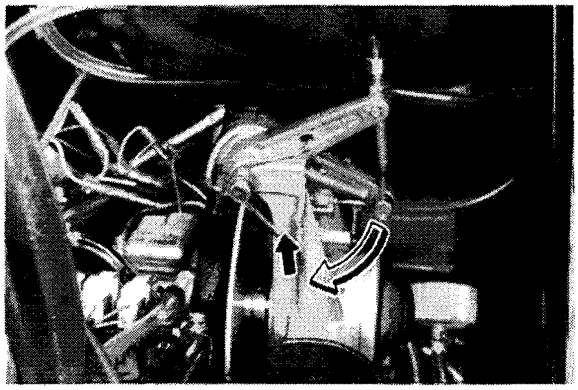
POWER TRAIN

4-7. BRAKE



A. Disassembly

1. Remove the brake cable from the handlebar. Loosen the adjuster at the caliper, then remove the cable.
2. With a pair of pliers, left the arm of each of the return springs off the chain case to release the preload.

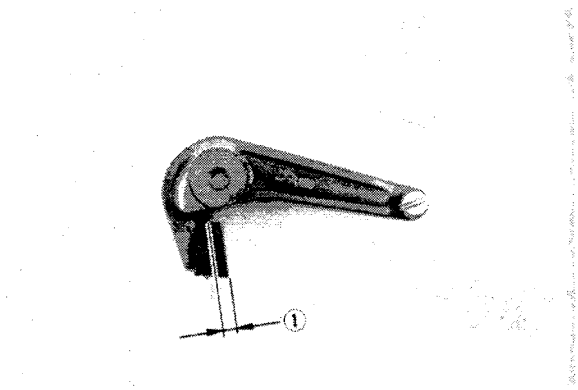


3. Remove the clevis pin and disassemble the brake.

B. Inspection

1. Check the brake pads. If either is worn beyond the wear limit, replace the pads as a set.

Wear limit: 1.0 mm (0.04 in)

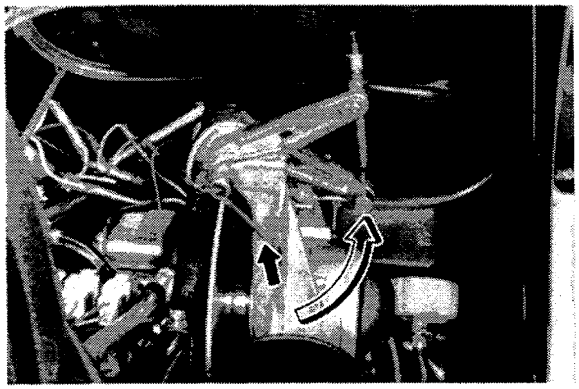


1. Wear limit

2. Replace any fatigued return spring.

C. Assembly

1. When assembling the brake caliper, be sure that hooked end of each return spring is seated in the brake arm before installing the clevis pin. Assemble the brake as shown in the exploded illustration. Always use a new cotter pin.
2. Preload the lower spring first, then the upper spring. Using a pair of pliers, lift the spring up and over the chain case.

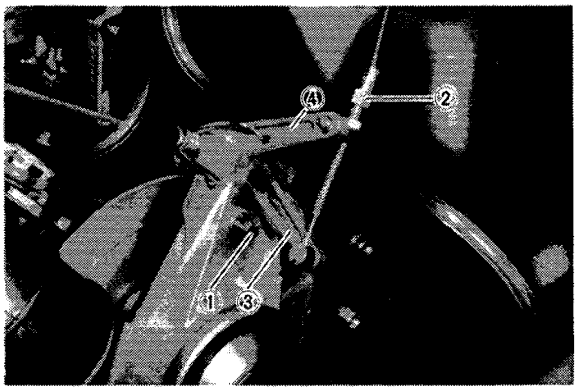


3. Connect the brake cable to the handlebar.

D. Brake Adjustment

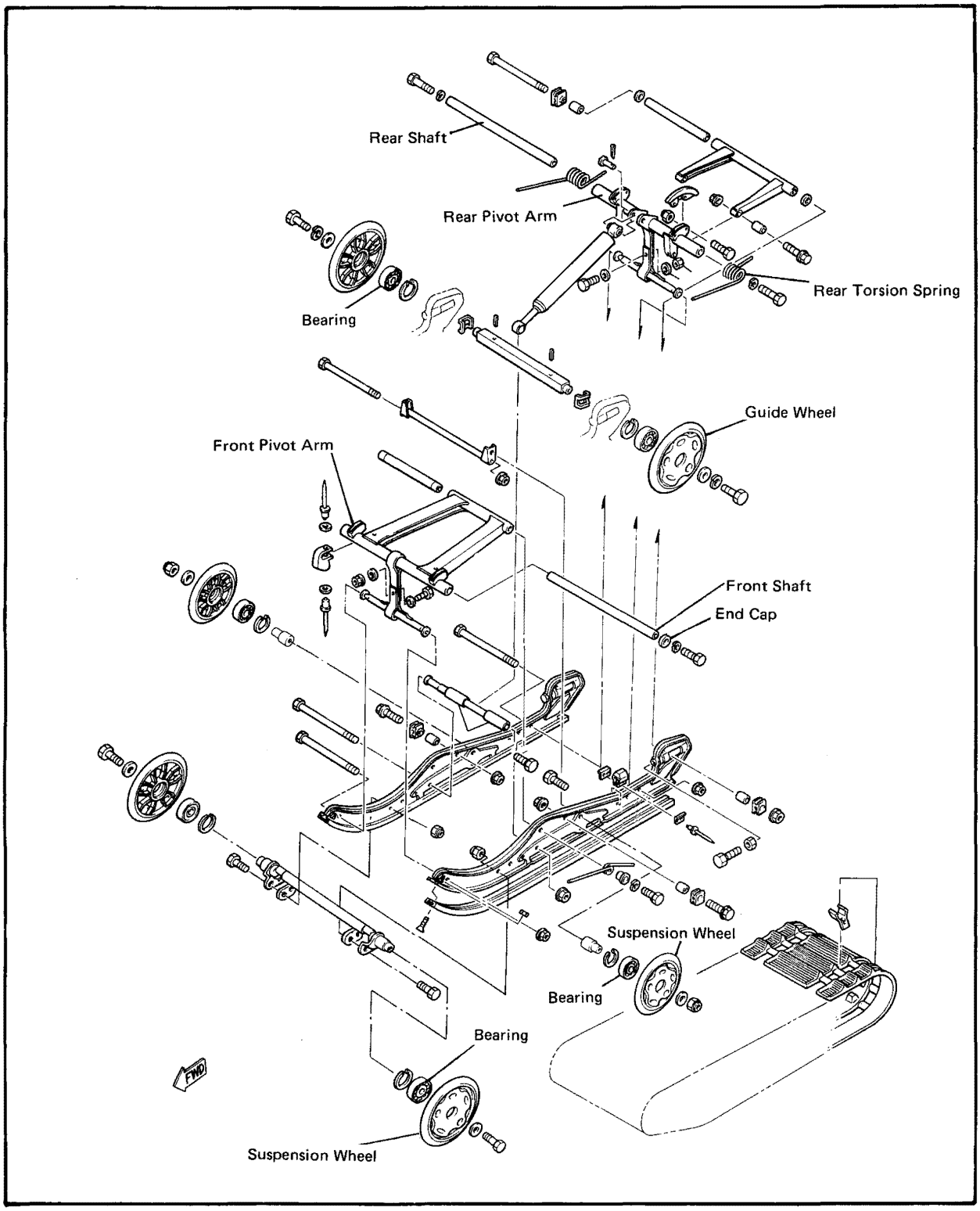
The brake is adjusted at two points so that the gaps between the disc and pads are equal and within tolerance. Proper adjustment will result in 6 ~ 7 mm (0.24 ~ 0.28 in) free play between the brake lever and the brake lever holder.

1. Loosen the lock nut on the screw (inner pad adjusting screw) until the inner brake pad is 0.2 ~ 1.0 mm (0.008 ~ 0.04 in) from the brake disc.
2. Loosen the lock nut on the cable adjust screw (outer pad adjusting screw) and adjust until the outer pad is 0.2 ~ 1.0 mm (0.008 ~ 0.04 in) from the brake disc.
3. Make sure both lock nuts are tight after completing this procedure.



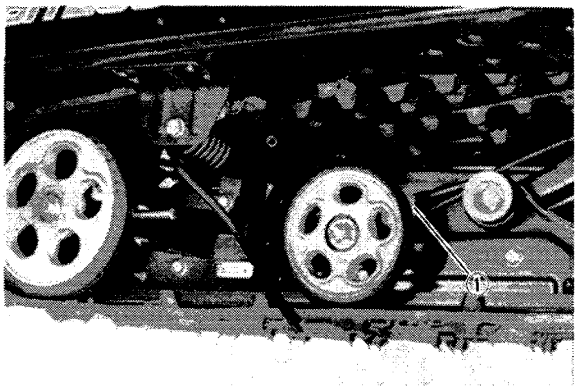
1. Inner pad adjusting screw
2. Outer pad adjusting screw
3. Outer pad arm
4. Inner pad arm

4-8. SLIDE RAIL SUSPENSION



A. Removal

1. Loosen the track.
2. Seal the carburetor so fuel will not spill when you turn the machine on its side. (Refer to 1-6, C "Sealing the Carburetor.")
3. Turn the machine on its side, and lift the rear torsion spring off its seat to release the preload. Repeat this procedure on the opposite side.



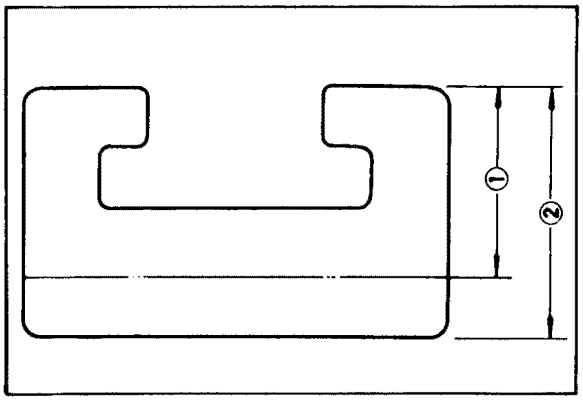
1. Spring seat

4. Remove the two suspension bolts from one side of the machine, turn the machine over, remove the remaining two bolts, and remove the suspension from the track.

B. Inspection

1. Inspect the hyfax. Replace them if they are worn beyond the wear limit. Torque the screws to specification.

Wear limit:	8.5 mm (0.3 in)
Slide runner securing screw tightening torque:	0.25 m-kg (2 ft-lb)



1. Wear limit: 8.5 mm (0.3 in)
2. New: 13.5 mm (0.5 in)

2. Inspect the suspension wheels; replace as necessary. Apply a thread-locking compound to the securing bolts, and torque the bolts to specification.

Tightening torque: 7.0 m-kg (51 ft-lb)

3. Inspect the guide wheels; replace as necessary. Apply a thread-locking compound and torque the bolt to specification.

Tightening torque: 2.3 m-kg (17 ft-lb)

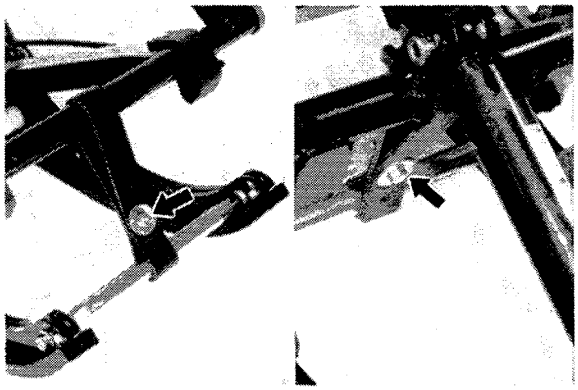
4. Replace any fatigued springs.
5. Inspect both the front and rear stopper bands. Replace if either is frayed or damaged.

CAUTION:

When installing the stopper bands, always use the standard setting. Another setting will damage the rear shock. Torque the nut to specification.

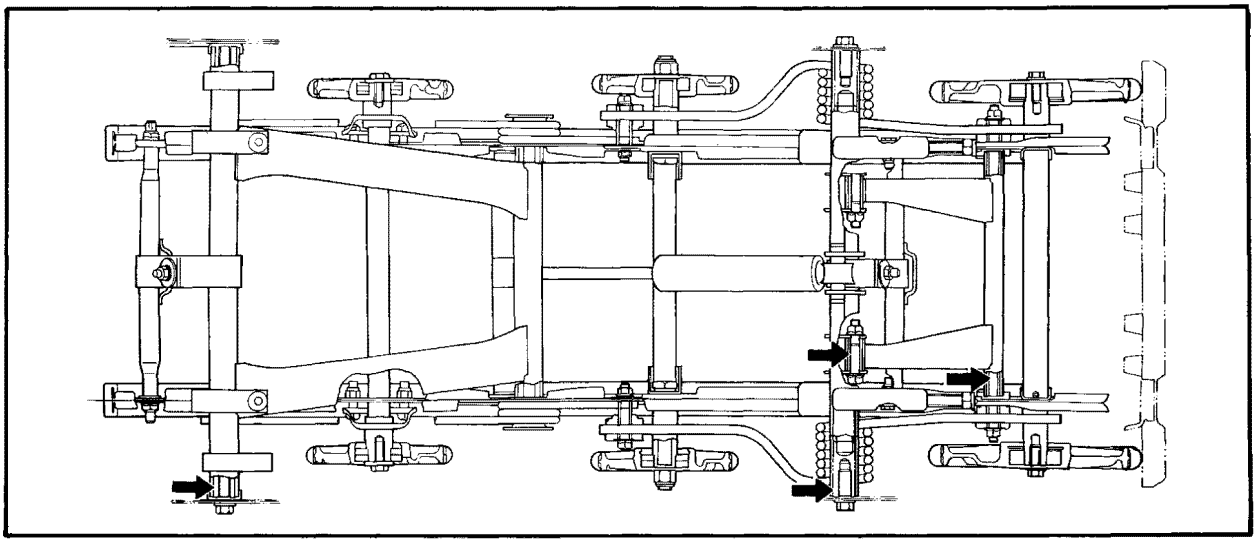
Tightening torque: 0.4 m-kg (3 ft-lb)

Standard setting: Front band: Lower hole (#1 hole) Rear band: Upper hole (#2 hole)

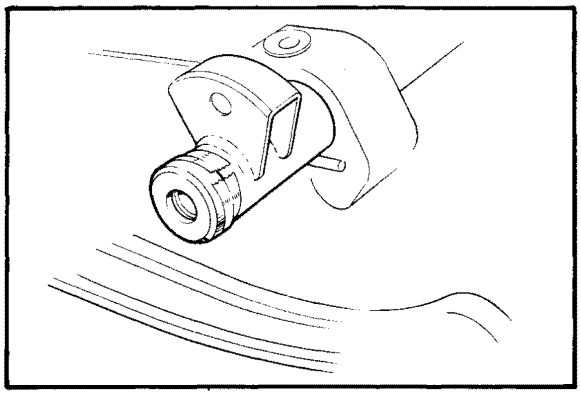


C. Installation

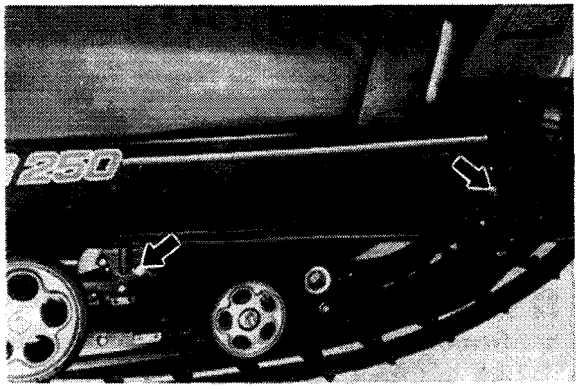
1. Grease the suspension where indicated in the illustration.



2. Thoroughly grease the axle in the front pivot arm. Tape the end caps in place. This will hold the axle within the pivot arm during installation of the suspension.

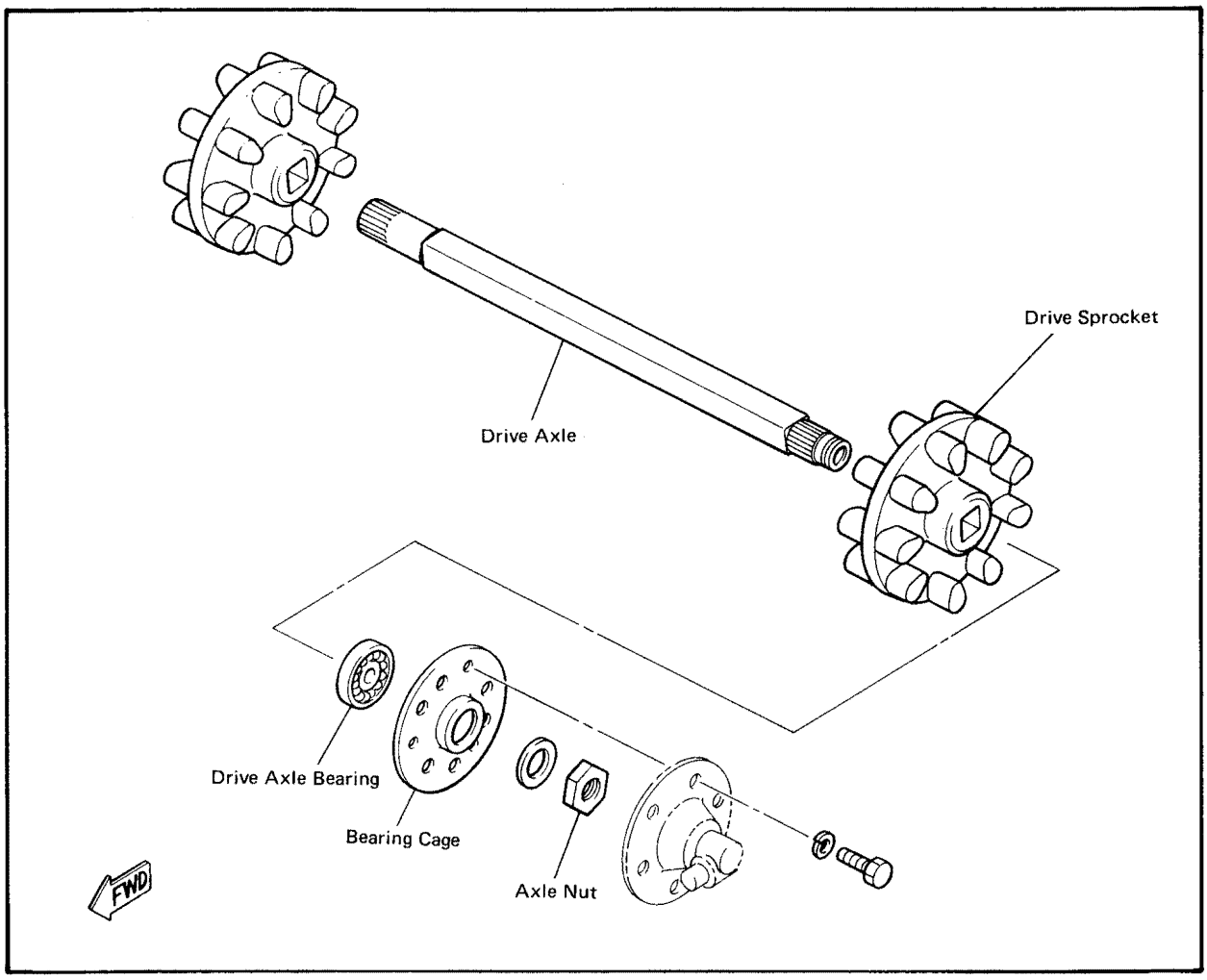


3. Place the suspension in the track, and swing it into place in the chassis. Install both front suspension-mounting bolts. Do not tighten them at this point.
4. Grease the rear axle, and install it in the rear pivot arm.
5. Install both rear suspension-mounting bolts.
6. Tighten all four suspension-mounting bolts, and torque them to specification.



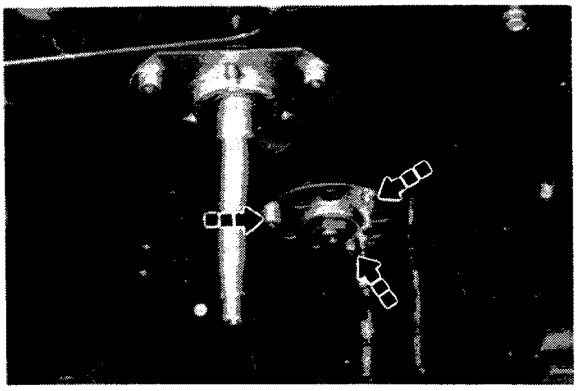
Tightening torque:
4.5 m-kg (33 ft-lb)

7. Place the torsion springs on their seats.
8. Adjust the track tension. (Refer to 4-9, D "Track Adjustment.")

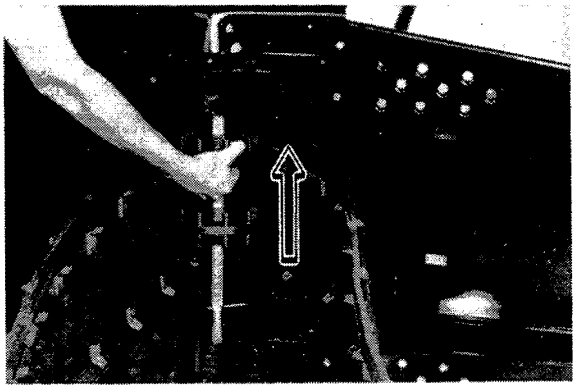


A. Removal

1. Place an oil pan beneath the chain case, and remove the chain case cover. Let the oil drain into the oil pan.
2. Remove the driven sprocket.
3. Remove the secondary sheave. (Refer to 4-5, A "Removal.")
4. Remove the axle nut and washer; remove the bearing cage.



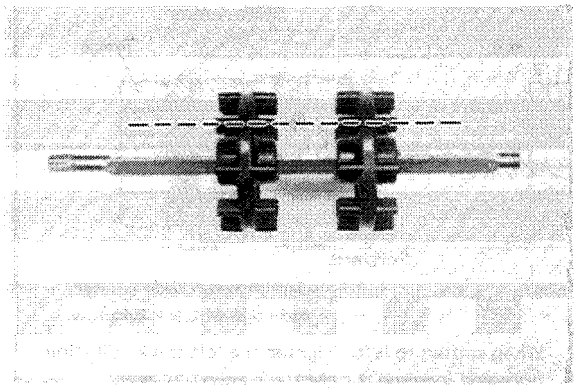
5. Remove the suspension. (Refer to 4-8, A "Removal.")
6. Place the machine on its right side. Remove the axle by lifting it up and out of the chain case, then out of the track.

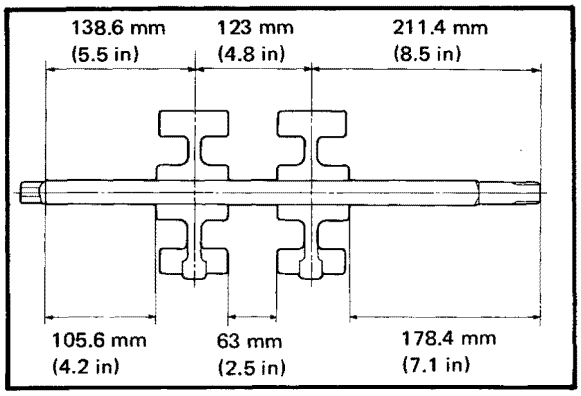


7. Remove the track.

B. Inspection

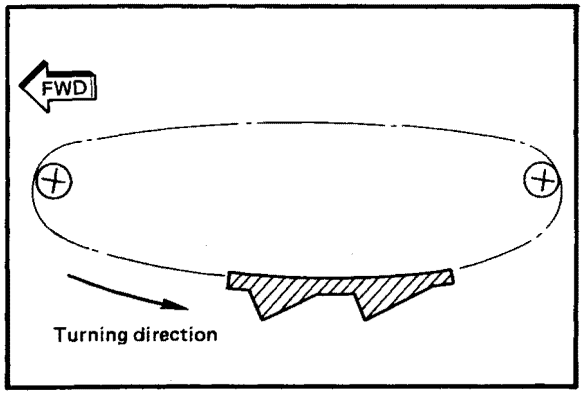
1. Check the track and clips for cracks, damage, or wear. Replace the track or clips as required.
2. Inspect the sprockets. If the lugs are excessively worn, replace the sprockets.
3. Inspect the axle. If it is bent, excessively scratched, or if the splines or threads are damaged, replace the axle.
4. When pressing the sprockets onto the axle, be sure the lugs on each sprocket are opposite one another as shown in the photograph. Locate each sprocket on the axle where shown in the illustration.





C. Assembly

1. Place the track in the chassis. Be sure it is positioned as shown in the illustration.



2. Install the axle. Push the threaded end up towards the secondary sheave, then install the splined end into the chain case. Be sure the lugs correctly engage the track.
3. Install the bearing and the bearing cage onto the drive axle. Torque the three bolts to specification.

Tightening torque: 2.3 m-kg (17 ft-lb)

4. Install the washer and the axle nut. Torque the nut to specification.

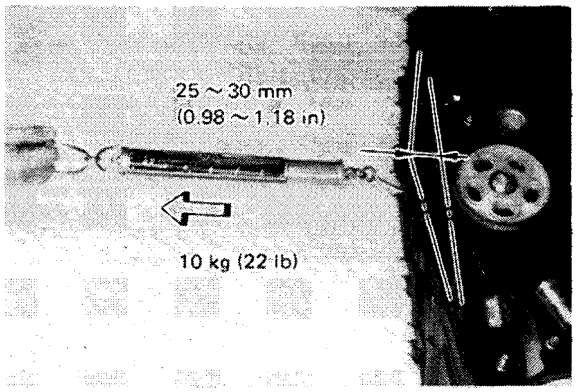
Tightening torque: 8.0 m-kg (58 ft-lb)

5. Install the slide rail suspension. (Refer to 4-8, C "Installation.")
6. Reassemble the chain case, and add oil. (Refer to 4-6, D "Assembly.")

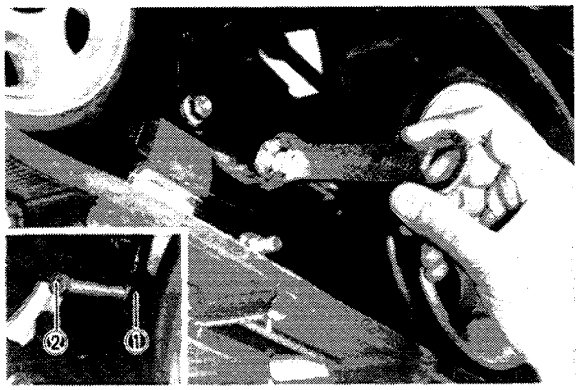
D. Track Adjustment

The track tension should be adjusted so that track deflection will equal specification when the track is pulled at the middle by a force of 10 kg (22 lb).

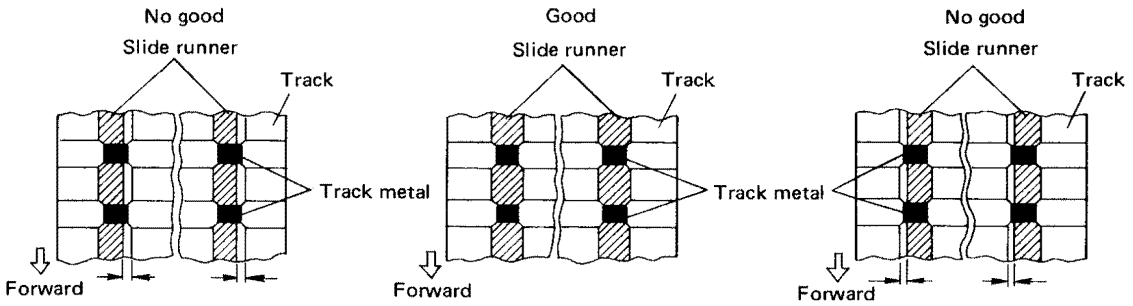
Track deflection: 25 ~ 30 mm/10 kg 1.0 ~ 1.2 in/22 lb)



1. Turn the track by running the engine.
2. Loosen the lock nuts, and turn both the right and left track adjusting bolts until the track is aligned with the slide rail as illustrated.



1. Lock nut 2. Adjusting bolt



When shifted to right: Tighten the right track adjusting bolt, and loosen the left track adjusting bolt.

When shifted to left: Tighten the left track adjusting bolt, and loosen the right track adjusting bolt.

3. Check the track deflection. It should equal the specified value.
4. If it does not, repeat the above procedures until deflection equals specification.
5. Tighten the track adjusting lock nuts. Torque to specification.

Tightening torque:
3.5 m-kg (25 ft-lb)

POWER TRAIN

CHAPTER 5. CHASSIS

5-1. STEERING 5-1
A. Assembly 5-1
B. Adjustment 5-2

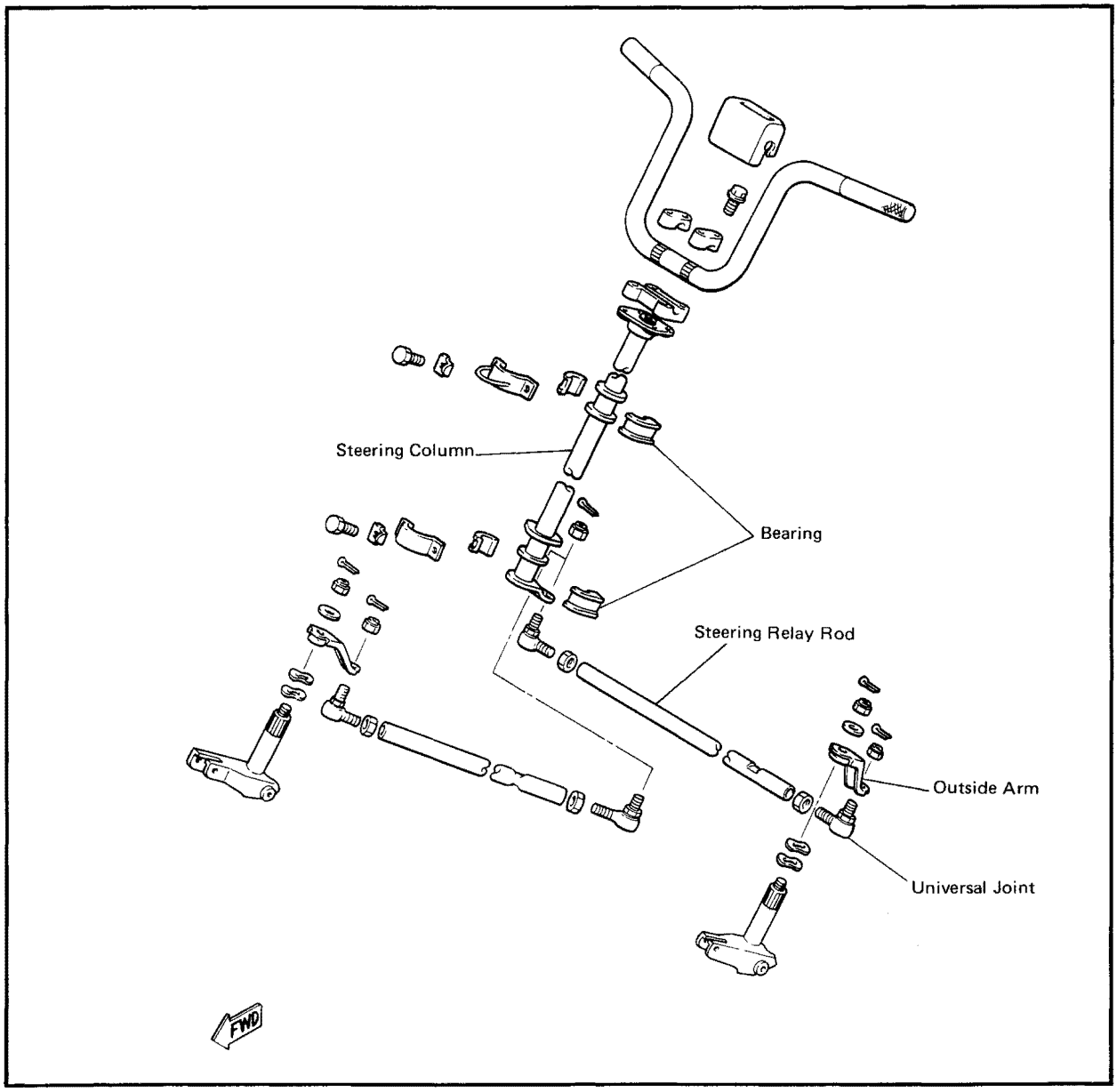
5-2. SKIS 5-3
A. Inspection 5-3
B. Assembly 5-4

5-3. OIL TANK 5-4

5-4. FUEL TANK 5-5

CHASSIS

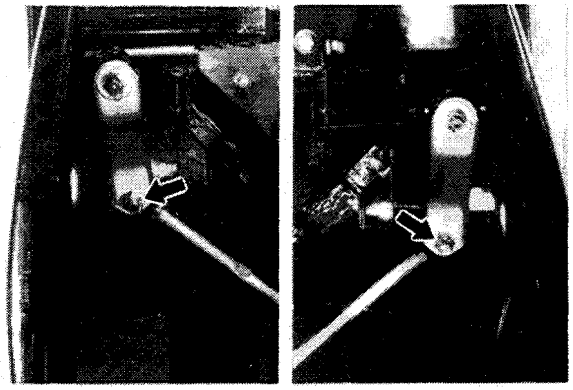
5-1. STEERING



A. Assembly

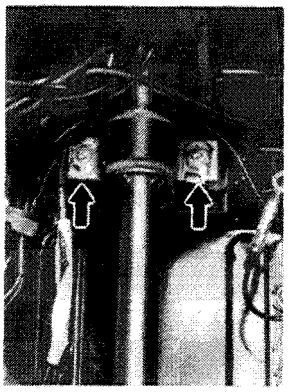
1. Secure the steering relay rods (with the universal joint attached) to the outside arm. Torque the flange nut to specification and install a new cotter pin.

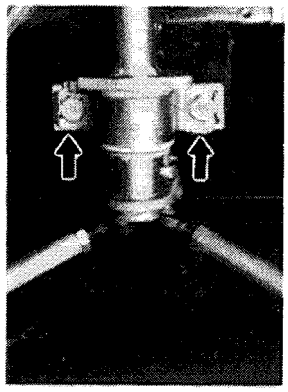
Tightening torque:
3.0 m-kg (22 ft-lb)



2. Install the steering column onto the frame. Grease the upper and lower bearings. Torque the bolts to specification and bend the lock tab.

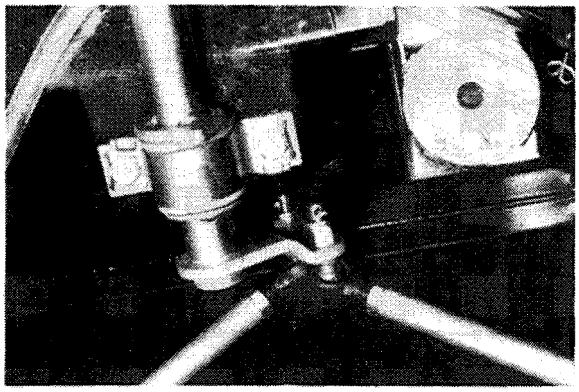
Tightening torque: 2.0 m-kg (15 ft-lb)





3. Connect the steering relay rods to the steering column. Torque the flange nut to specification and install a new cotter pin.

Tightening torque: 2.5 m-kg (18 ft-lb)

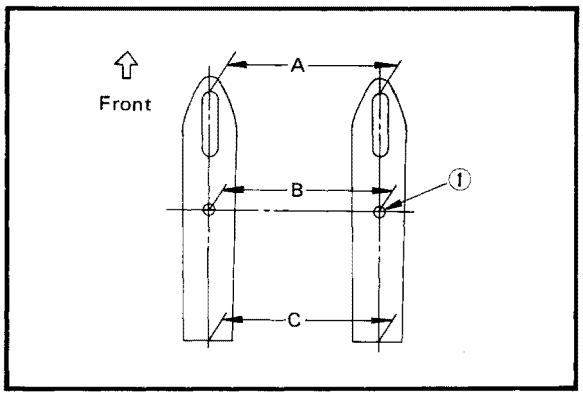


B. Adjustment

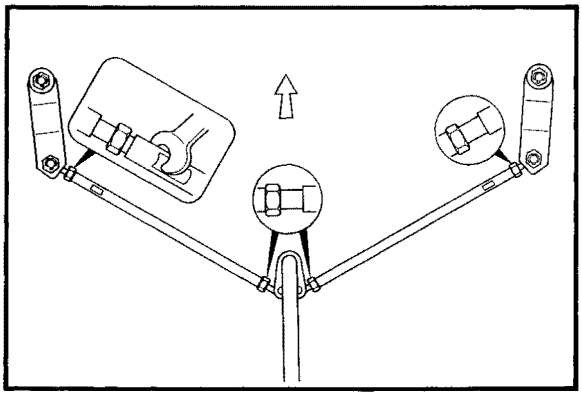
1. Straighten the handlebars and check to see that the skis are parallel. If not, loosen the steering relay-rod lock nut. By turning the steering relay rod, adjust the ski toe-out to specification. Torque the lock nut to specification.

Ski stance: 750 mm (29.53 in) Ski toe-out: 0 ~ 6 mm (0 ~ 0.23 in)

Tightening torque: 2.5 m-kg (18 ft-lb)

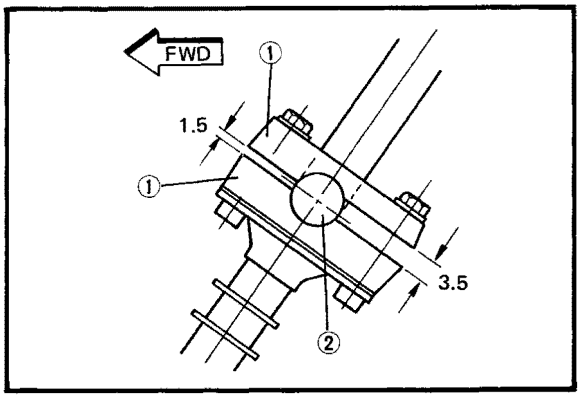


1. Ski spindle center
   A – C = 0 ~ 6 mm (0 ~ 0.23 in) B. Ski width



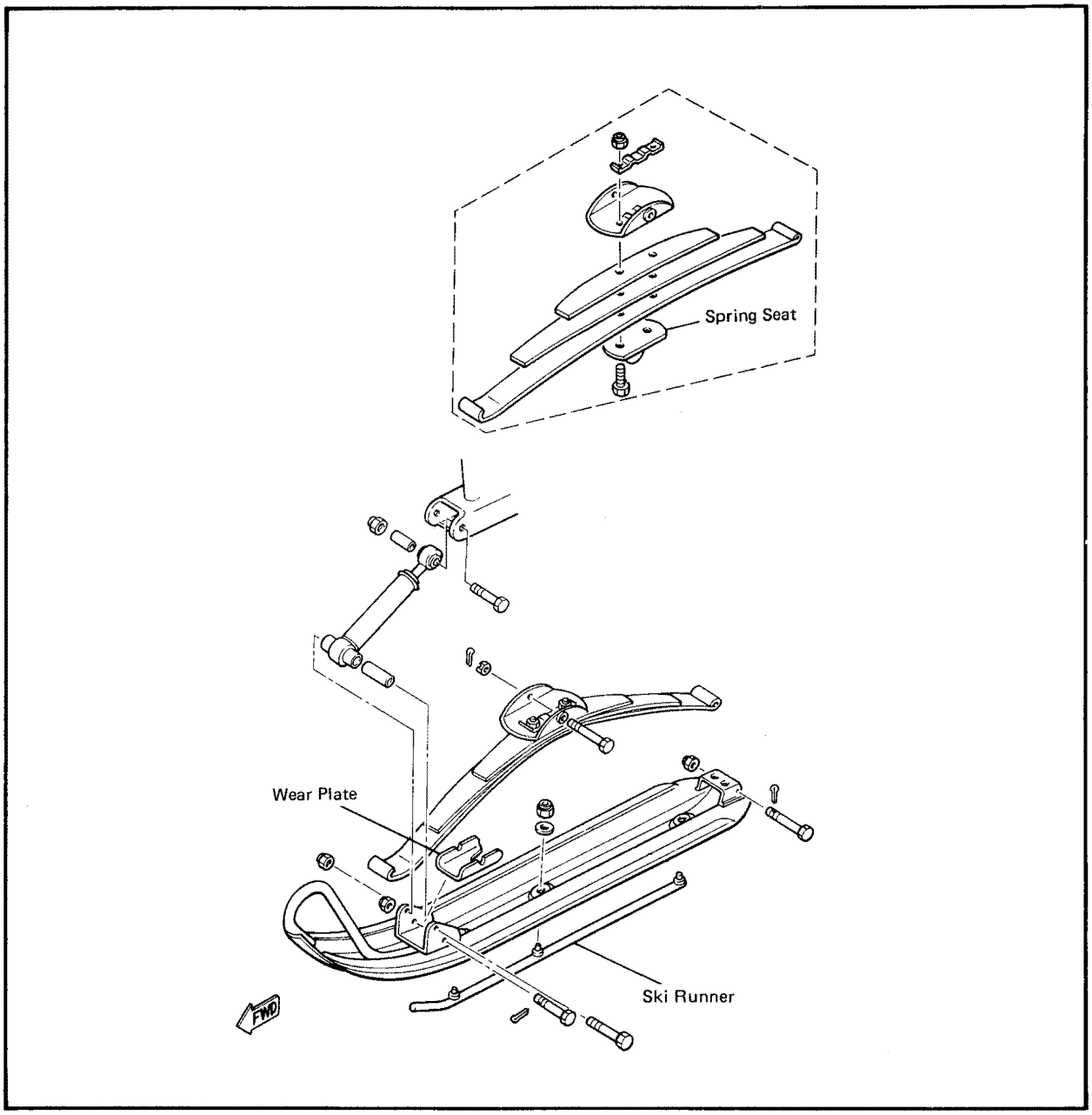
2. The height of the handlebars can be adjusted to suit the rider's preference. After adjusting the handlebars, alternately tighten the four securing bolts. Maintain the specified gap in the steering clamps. Torque the bolts to specification.

Tightening torque: 1.4 m-kg (10 ft-lb)



1. Clamp
2. Handlebar

5-2. SKIS



A. Inspection

1. Check the ski runner. Replace it if it is excessively worn. Torque the nuts to specification.

Tightening torque:
1.4 m-kg (10 ft-lb)

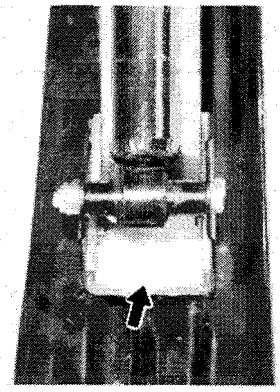
2. Inspect the leaf spring and the spring retaining pins. If the spring is fatigued or if a pin is worn, replace them as necessary. Torque the securing nut to specification and install a new cotter pin.

Tightening torque:
Spring nut: 1.4 m-kg (10 ft-lb)

3. Check the wear plate. Replace it if it is worn.

B. Assembly

1. After assembling the ski, thoroughly grease the wear plate and all retaining pins.

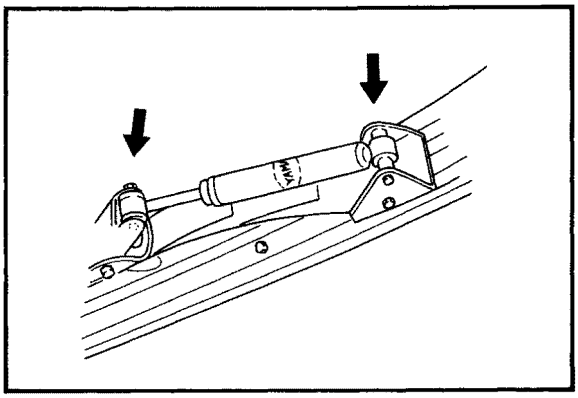


2. Carefully install the ski onto the ski column. Tighten the securing bolt until it is tight, then back it out 1/4 turn. Tighten the slotted nut, and install a new cotter pin.
3. When installing the ski shock, secure the bottom end to the ski then secure the top end to the ski column. All collars should be greased, and securing nuts should be torqued.

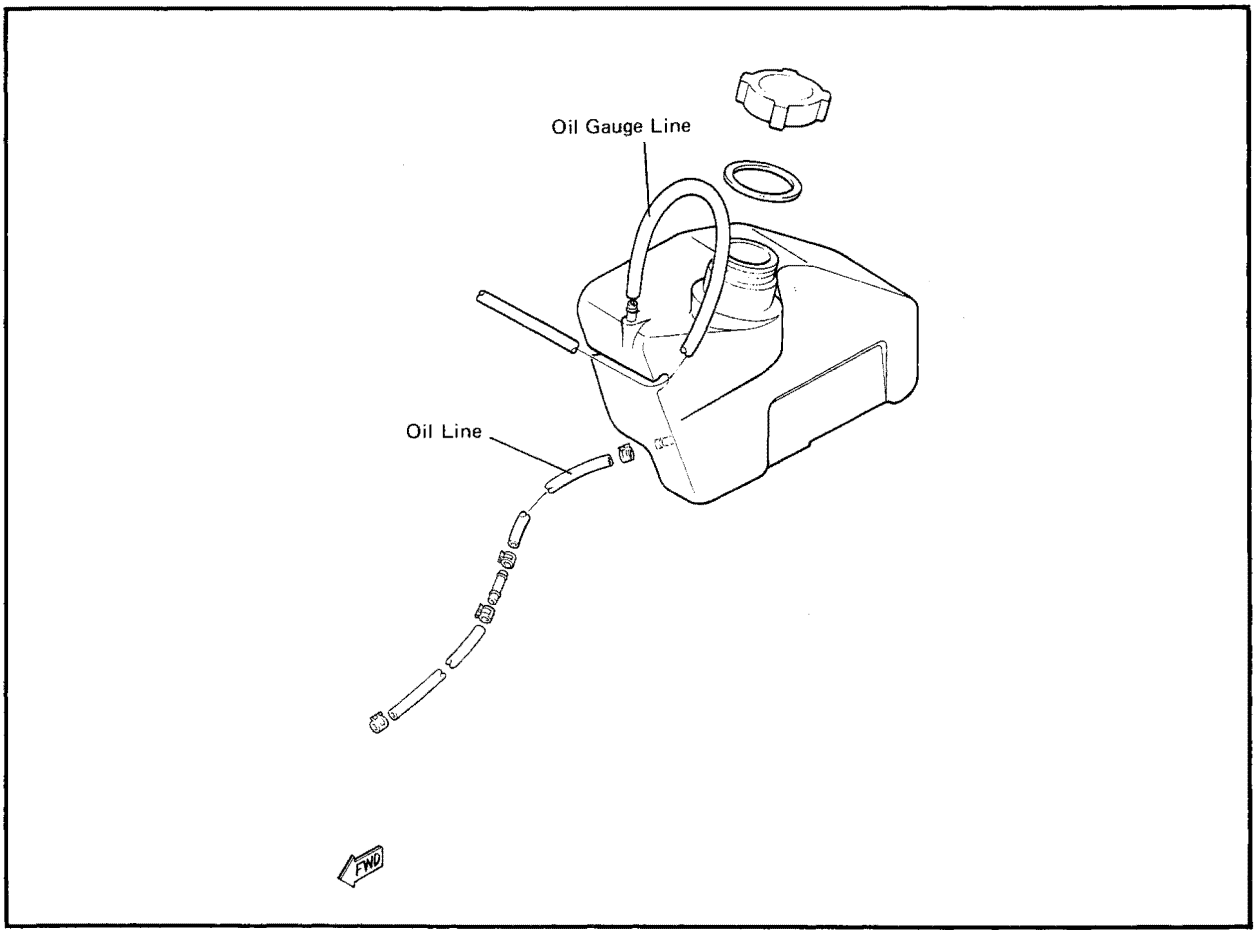
CAUTION:

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

Tightening torque:
1.45 m-kg (10.5 ft-lb)

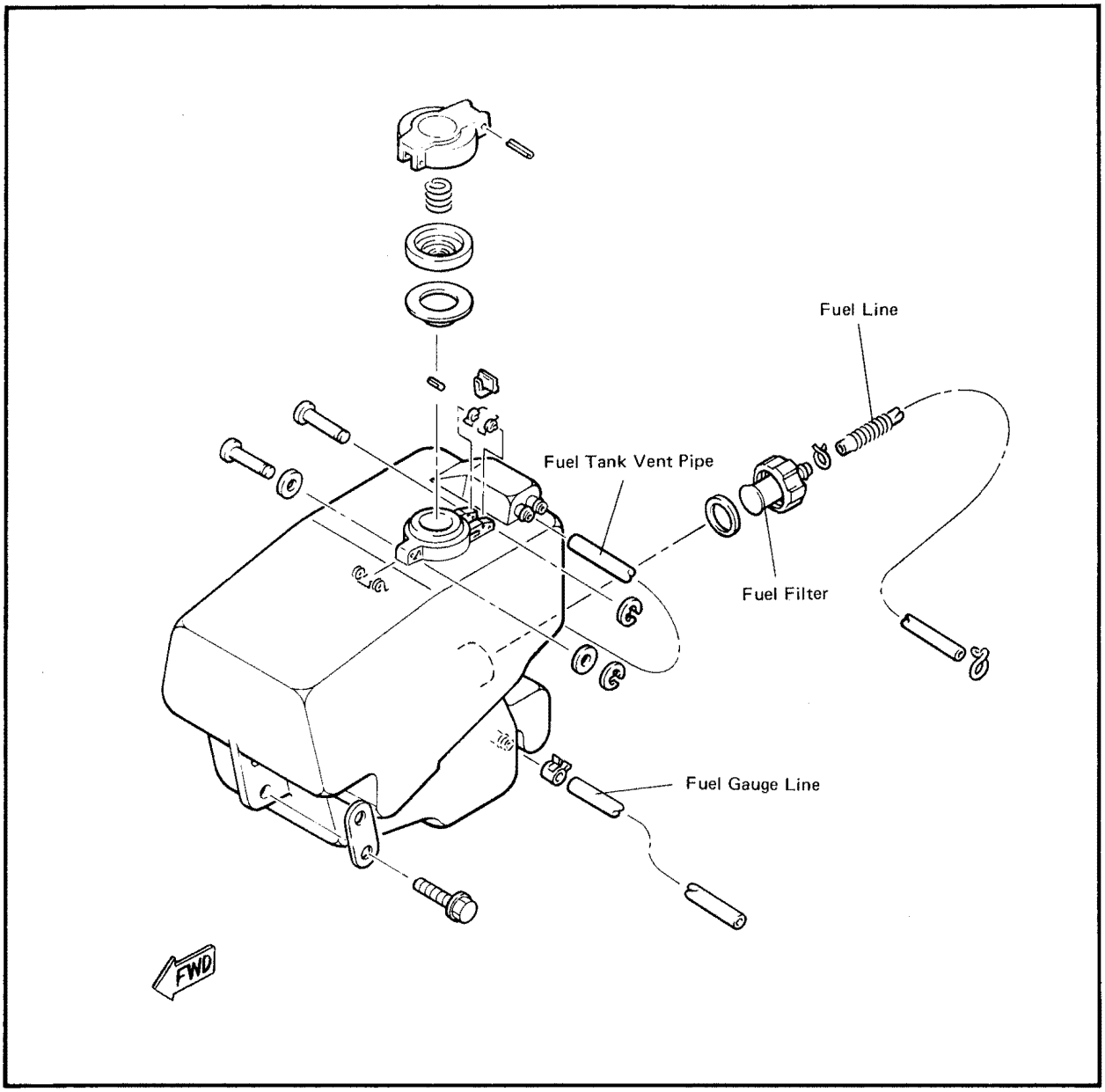


5-3. OIL TANK



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

5-4. FUEL TANK



1. Check all lines. If any are cracked, crimped, or damaged in any way, replace them.
2. Be sure all lines are secured in place by a retaining clip.
3. Be sure that all lines are routed as shown in the Cable Routing Diagram in the appendix. The breather pipe must be routed so that no fuel will leak during operation.
4. Replace the fuel filter each season.
5. When reinstalling the fuel tank, torque the four securing bolts to specification.

Tightening torque:
1.0 m-kg (7 ft-lb)

CHASSIS

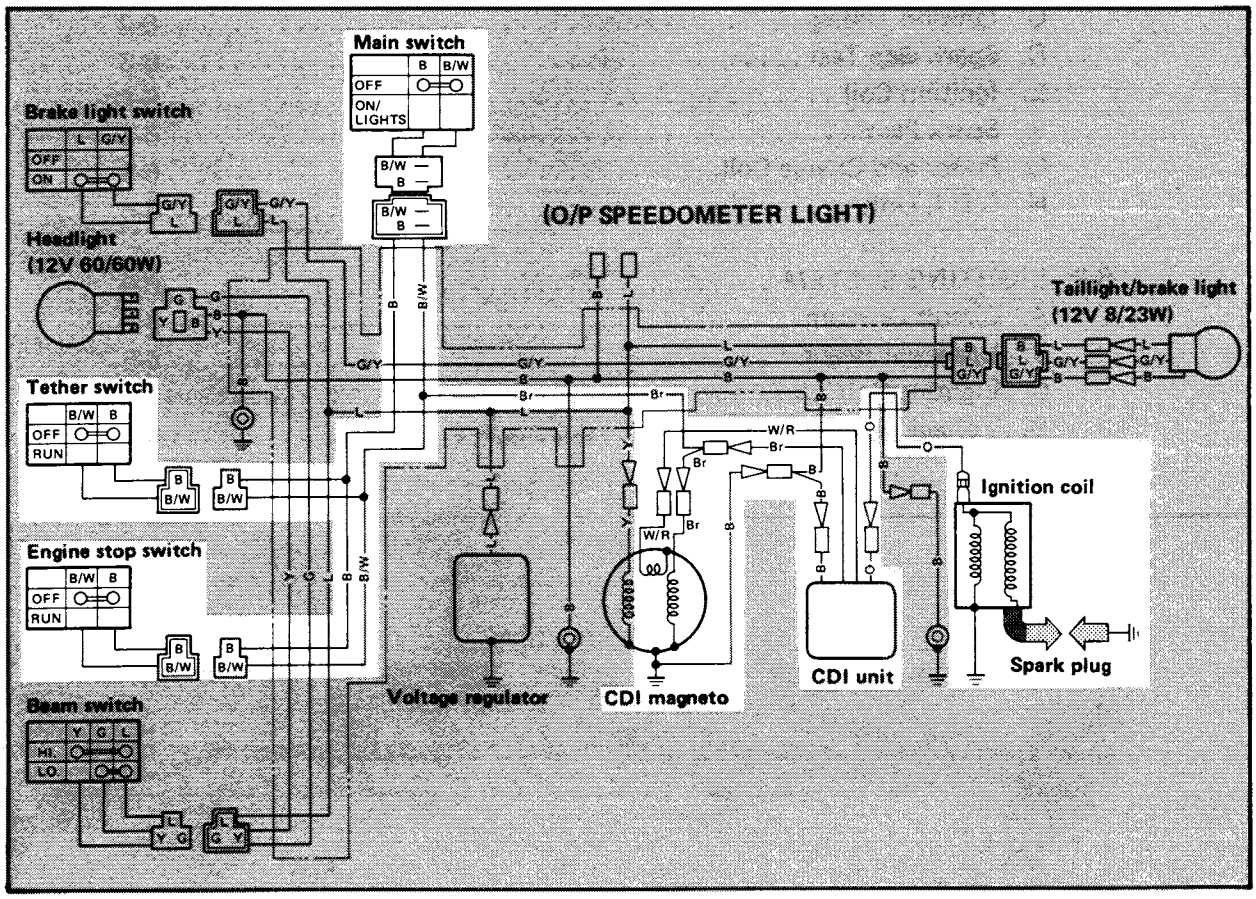
CHAPTER 6. ELECTRICAL

6-1. IGNITION SYSTEM 6-1
- A. Circuit Diagram 6-1
- B. Troubleshooting 6-1
- C. Ignition Timing 6-2
- D. Spark Gap Test 6-3
- E. Ignition Coil 6-4
- F. Spark Plug 6-4
- G. Pulser and Charge Coil 6-5
- H. C.D.I. Unit 6-5

6-2. LIGHTING SYSTEM 6-6
- A. Circuit Diagram 6-6
- B. Headlight Beam 6-6
- C. Lighting Coil 6-7
- D. Voltage Regulator 6-7

6-1. IGNITION SYSTEM

A. Circuit Diagram



B. Troubleshooting

No spark is produced or weak.

Check of connections ..... Check lead wire connections for short circuits.

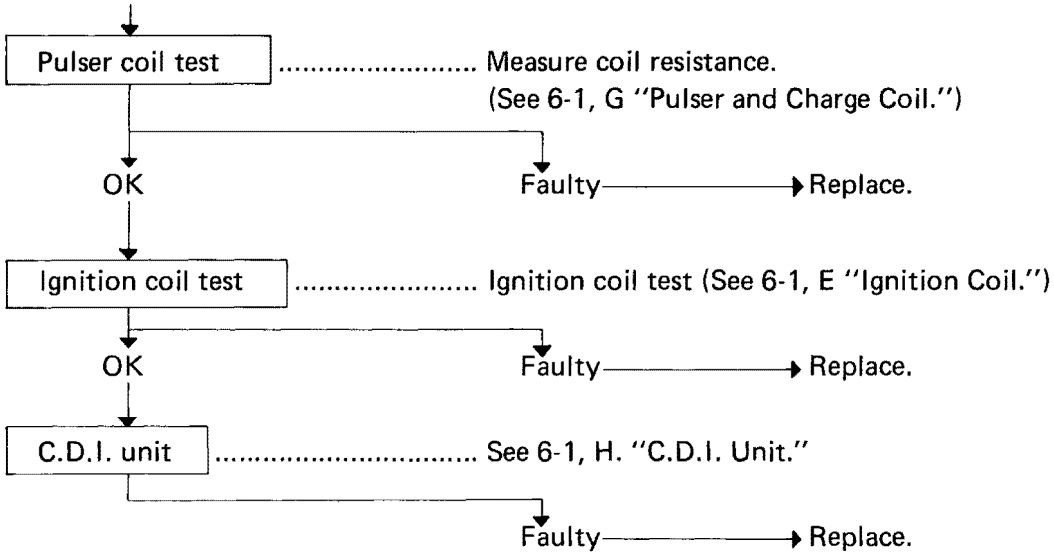
OK → Faulty ——→ Correct.

Spark test ..... See 6-1, D "Spark Gap Test."

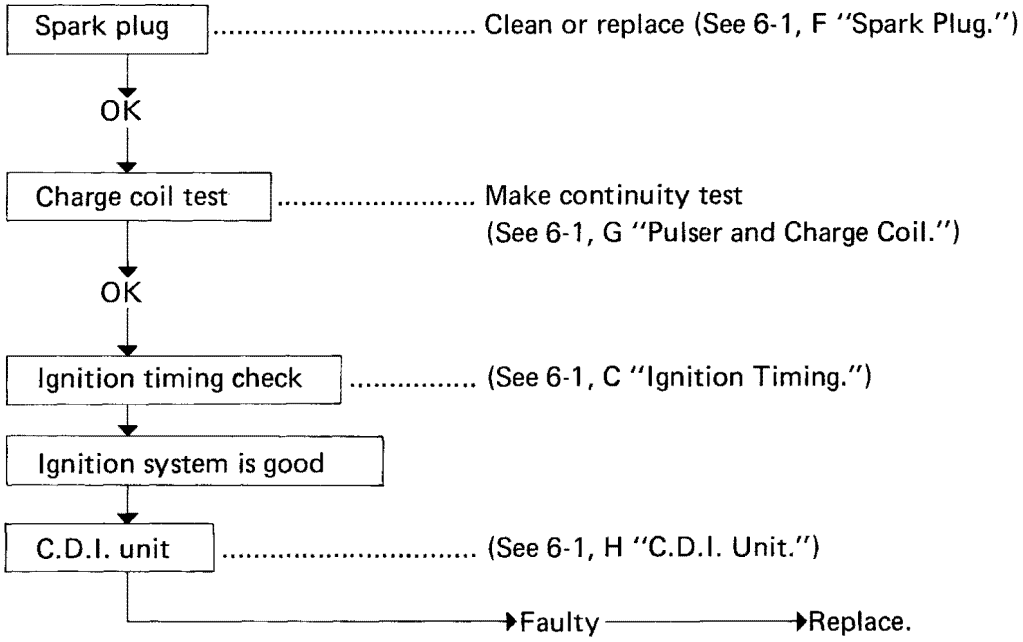
No spark → Spark ——→ Plug is faulty.

Charge coil test ..... Measure coil resistance. (See 6-1, G "Pulser and Charge Coil.")

OK → Faulty ——→ Replace.



The engine starts but will not pick up speed.



C. Ignition Timing

1. Remove the starter from the engine.
2. Remove the spark plug, and screw the dial gauge stand into the spark plug hole.

Dial gauge stand:	90890-01195

3. Insert the dial gauge with the needle into the stand.

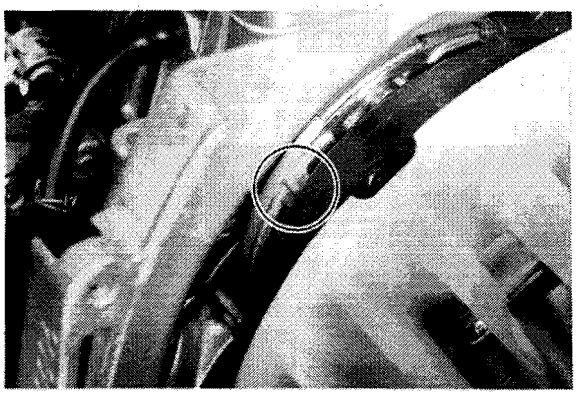
Dial gauge:	90890-03097
Dial gauge needle:	90890-03098

4. Rotate the flywheel magneto until the piston is at top-dead-center (T.D.C.). Set the dial gauge at zero. Tighten the set screw on the dial gauge stand to secure the dial gauge assembly. Rotate the flywheel back and forth to be sure that the indicator needle does not go past zero.
5. Starting from T.D.C., rotate the flywheel counterclockwise until the dial gauge reads 3-1/2 needle revolutions before top-dead-center.

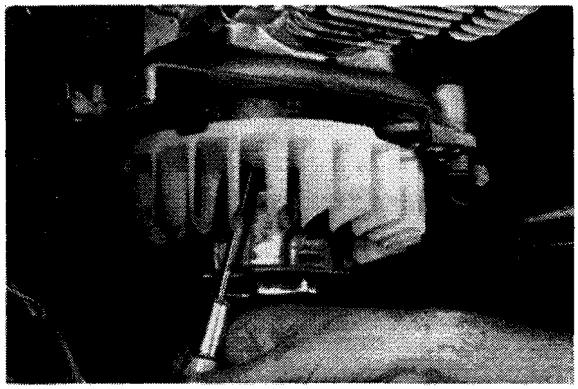
6. Slowly turn the flywheel clockwise until the dial gauge indicates the specified ignition timing.

Ignition timing (B.T.D.C.): 1.6 mm (0.062 in)

7. The marks on the coil plate should align with the timing mark on the magneto. If not, adjust the timing.

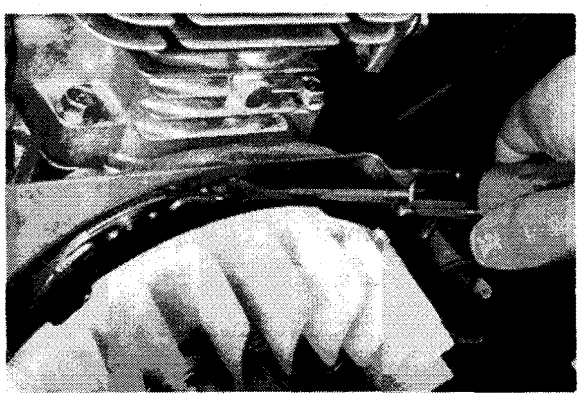


8. Loosen both coil plate screws.



9. Rotate the coil plate by using a screwdriver at the pry points. Align the marks on the coil plate with the mark on the flywheel. Tighten the screws and torque them to spec.

Tightening torque: 0.65 m-kg (5 ft-lb)



10. Remove the dial gauge stands. Reinstall the starter and the spark plug. Torque the plug to specification.

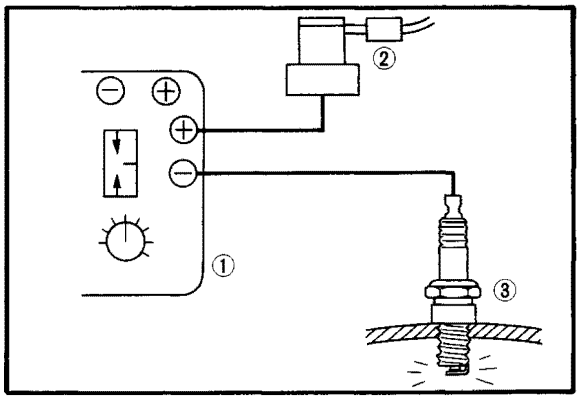
Tightening torque: 2.8 m-kg (20 ft-lb)

D. Spark Gap Test

The entire ignition system can be checked for misfire and weak spark by using the Electro Tester. If the ignition system will fire across a specified gap, the entire ignition system is good. If it will not fire across the gap, proceed with the individual component tests until the problem is located.

Electro tester: 90890-03021

1. Thoroughly warm up the engine so that all electrical components are at operating temperature.
2. Stop the engine, and connect the tester as shown.



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

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

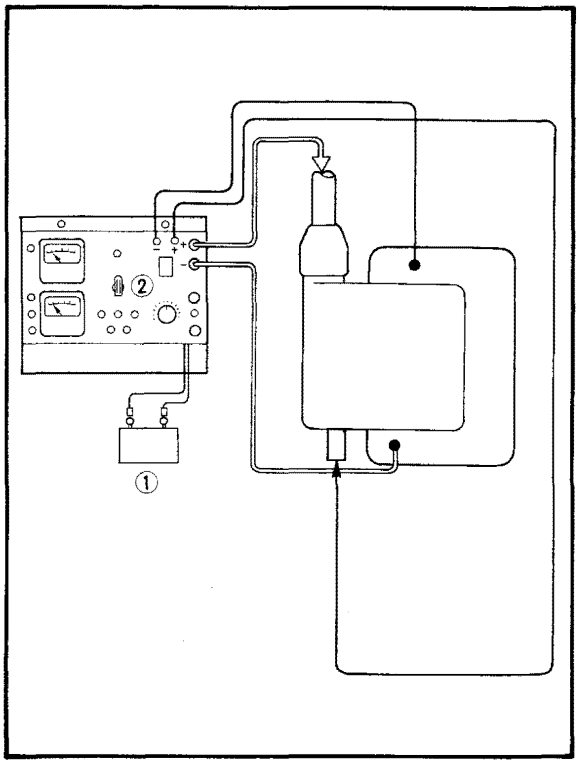
Minimum spark gap: 9 mm (0.35 in)

ELECTRICAL

E. Ignition Coil

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

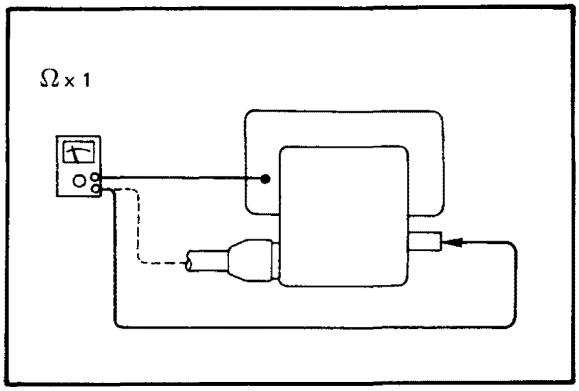
Minimum spark gap: 9 mm (0.35 in)



1. Battery 2. 6 mm (0.24 in)

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

Manufacturer	Primary coil resistance	Secondary coil resistance
MITSUBISHI F6T411	1.0Ω ± 10% at 20°C (68°F)	5.9 kΩ ± 20% at 20°C (68°F)



——→ Primary coil resistance
- - -→ Secondary coil resistance

F. Spark Plug

The life of a spark plug and its condition vary according to the habits of the rider. You can learn a great deal about the operating condition of an engine by studying the spark plug. Examine the spark plug at each periodic inspection, and replace it with a suitable plug. Ask the customer how long and how fast he rides his snowmobile, and recommend a hot, standard, or cold plug accordingly. Encourage your customers to change the spark plug regularily. Their snowmobiles will run better, and fuel consumption will remain low.

Spark plug color	
No. 1	Good (Carburetor is tuned properly.)
No. 2	Bad (Mixture is too rich.) Replace main jet with one-step small one.
No. 3	Bad (Mixture is too lean.) Replace main jet with one-step larger one. Bad (Due to too lean a mixture, piston is damaged or seized.)
No. 4	Replace the piston and spark plug. Tune the carburetor again, starting with low-speed tuning. Bad (Due to too lean a mixture, the engine knocks.) Check the piston for holes or seizure.
No. 5	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.

Inspection

Instruct the rider to:

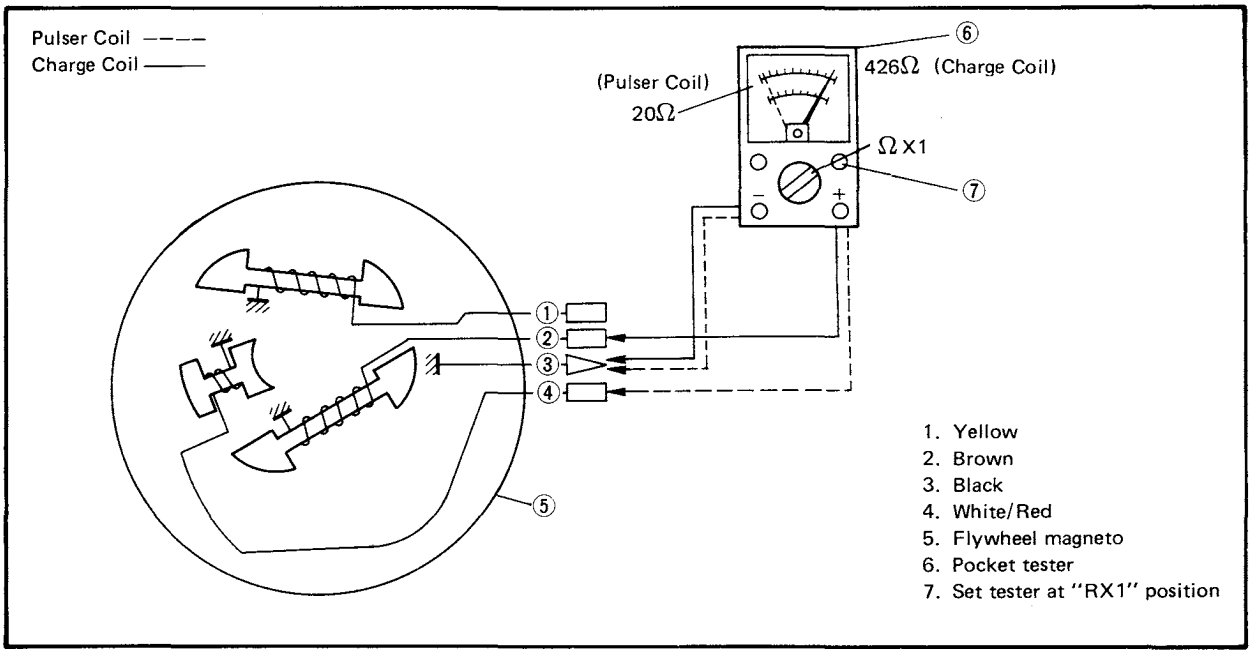
1. Inspect the clean the spark plug every 400 km (250 mi) or 20 hours.
2. Clean the electrodes of carbon and adjust the electrode gap.
3. Be sure to use the proper reach plug to avoid overheating, fouling, or piston damage.

Spark plug type: NGK BR8HS
Spark plug gap (use wire gap gauge): 0.6 ~ 0.7 mm (0.023 ~ 0.028 in)
Spark plug torque: 2.8 m-kg (20 ft-lb)

G. Pulser and Charge Coil

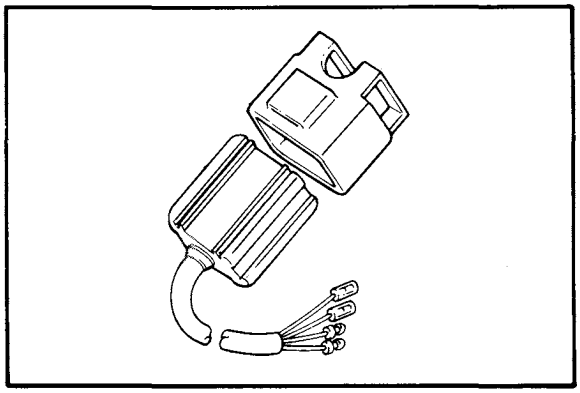
Check the resistance of each coil as shown in the illustartion. If the resistance is not within specification, the coil is not working. Check the connections. If the connections are good, the coil is damaged internally; it should be replaced.

Pocket tester: 90890-03112
Charging coil resistance: Black to Brown leads: 426Ω ± 10% at 20°C (68°F)
Pulser coil resistance: Black to White/Red leads: 20Ω ± 10% at 20°C (68°F)



H. C.D.I. Unit

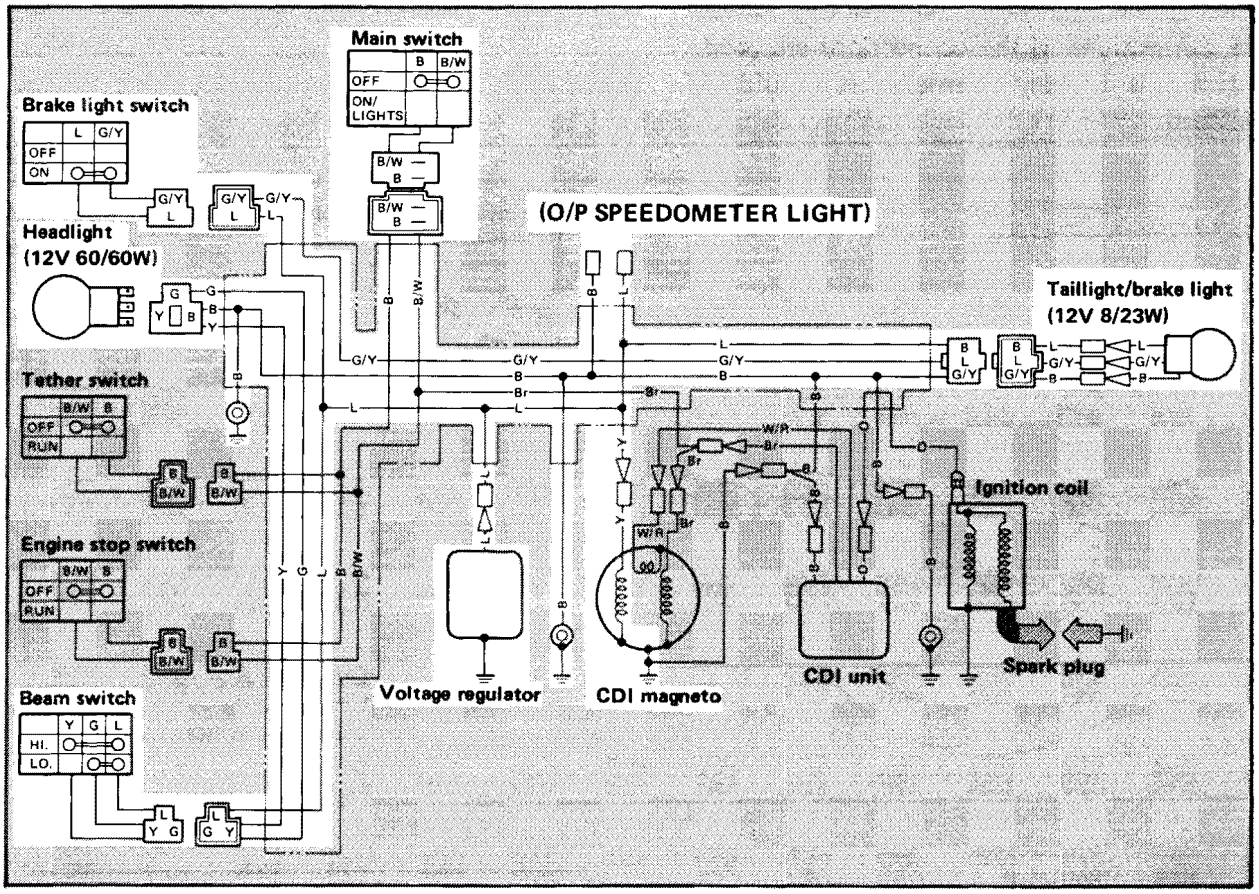
If the ignition system malfunctions and all of the above components are working properly, then the C.D.I. unit is faulty; replace it.



ELECTRICAL

6-2. LIGHTING SYSTEM

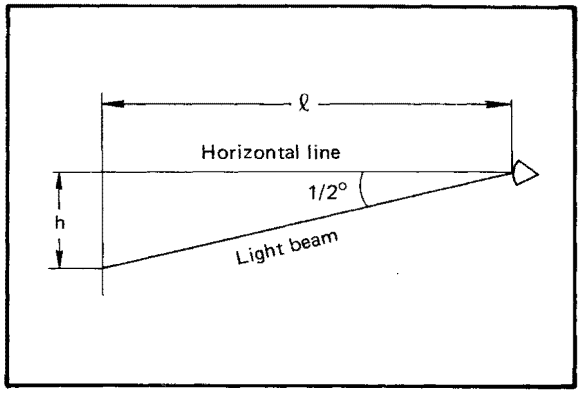
A. Circuit Diagram



B. Headlight Beam

1. Inspection

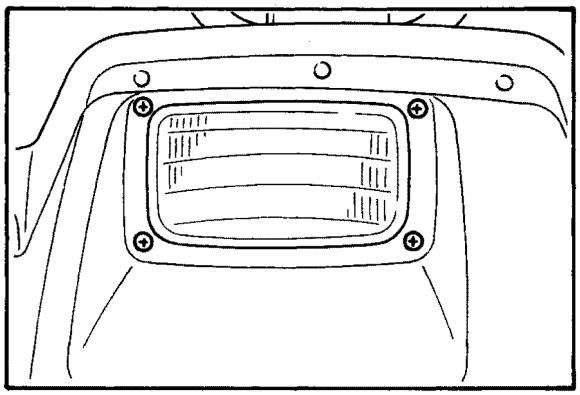
   Check the headlight beam direction. The high beam must be directed downward at an angle of 1/2° to the horizontal line.



ℓ	3.0 m (0 ft)	7.6 m (25 ft)
h	26 mm (1.0 in)	66 mm (2.6 in)

2. Adjustment

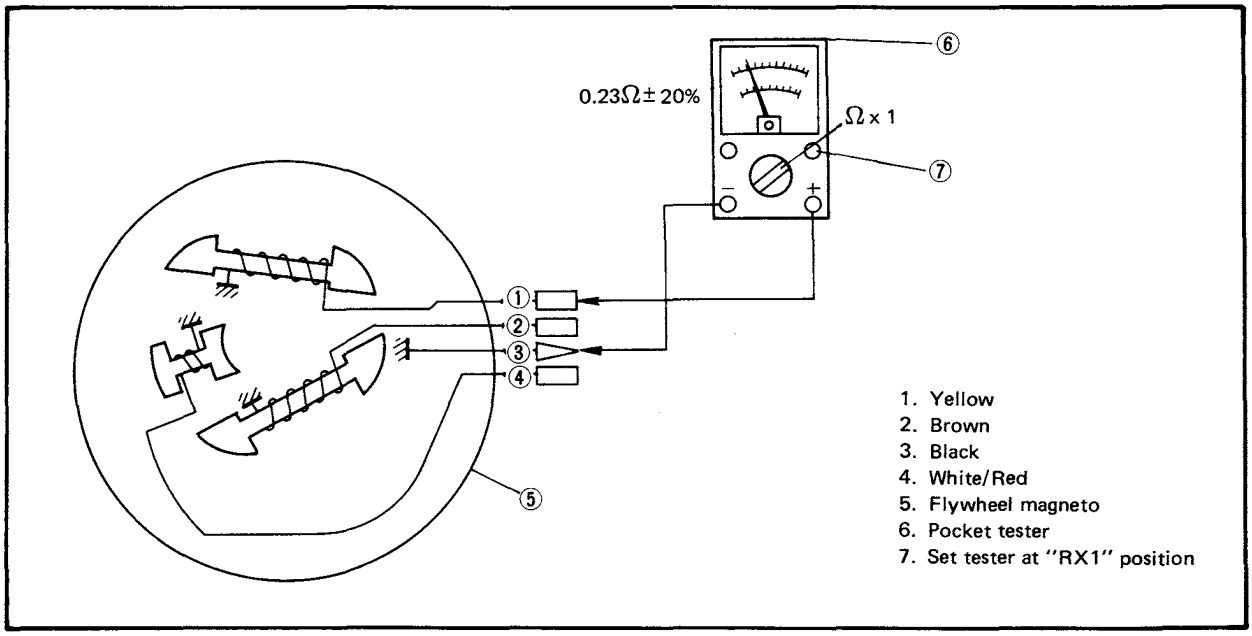
   When necessary, adjust the headlight beam by tightening or loosing the four headlight mounting screws.



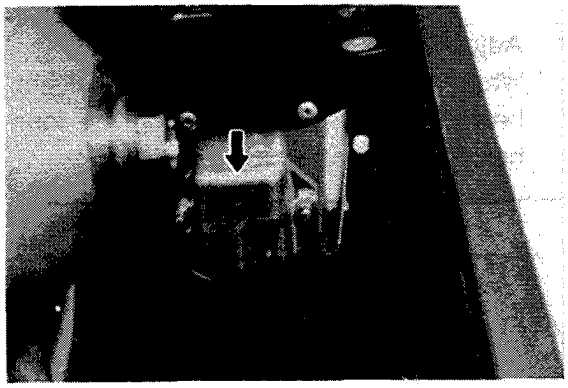
C. Lighting Coil

Check the resistance between the yellow lead and ground. If the resistance is not within specification, the coil is not working. Check the connections. If the connections are good, the coil is broken internally; it should be replaced.

Lighting coil resistance:
Black & Yellow:
0.23Ω ± 20% at 20°C (68°F)



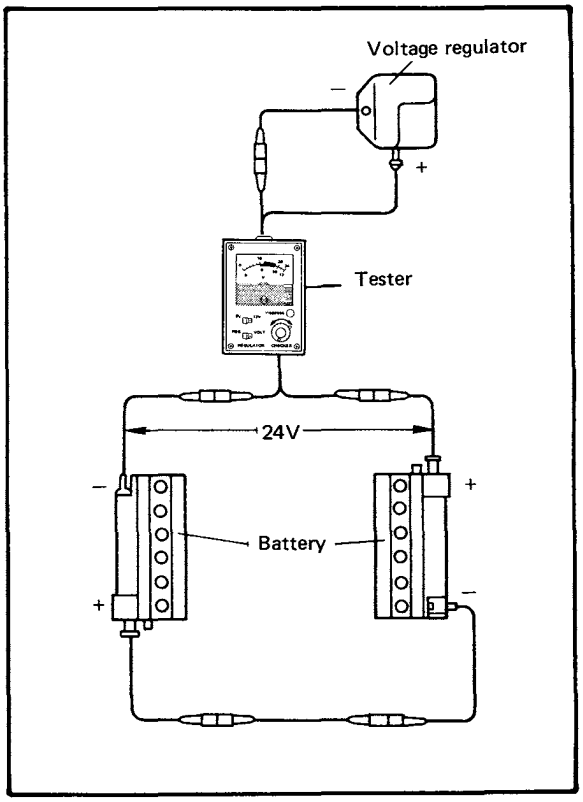
D. Voltage Regulator



Instruments required for inspection:

- Voltage Regulator Tester:
  90890-03090
- Two 12V batteries
- One jumper

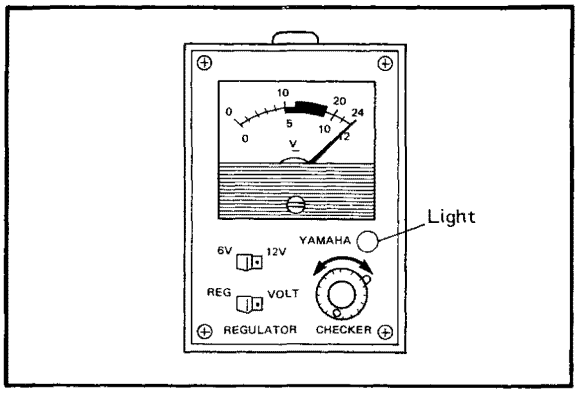
Connect the tester, batteries, and the voltage regulator as shown in the illustration.



ELECTRICAL

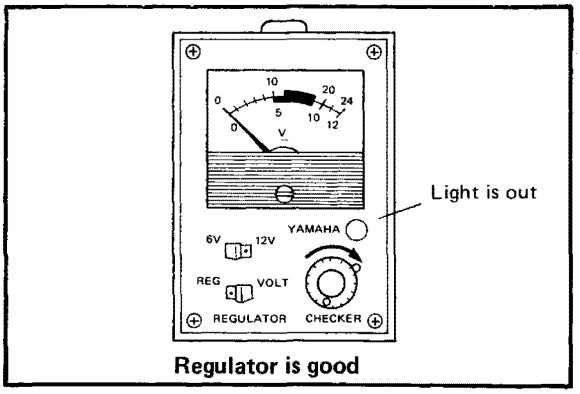
Inspection

1. Check the battery voltage.
   Set the left and right switches to "VOLT" and "12V". If the checker needle reads 20 volts or more, battery voltage is sufficient.

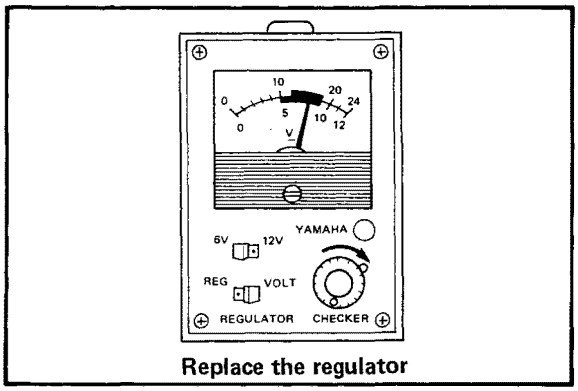


2. Check the tester.
   Set the right switch to "REG." If the lamp lights up, there is continuity in the tester. Proceed with the tester.
3. Test the regulator
   Slowly turn the tester knob clockwise; the needle will move with the knob. If the needle quickly returns to zero the moment it enters the black area on the scale, then the working voltage of the thyristor is good; the voltage regulator is working properly.
   If the needle swings into the black area of the scale but will not return to zero, the regulator is faulty and should be replaced.

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



Regulator is good



Replace the regulator

CHAPTER 7. APPENDIX

7-1. SPECIFICATIONS 7-1

7-2. TIGHTENING TORQUE 7-4

7-3. CONVERSION TABLES. 7-6

7-4. EXPLODED DIAGRAMS 7-7
- Recoil Starter 7-7
- Flywheel Magneto 7-8
- Oil Pump 7-9
- Oil Pump Drive Gear 7-10
- Top End 7-11
- Bottom End 7-12
- Carburetor. 7-13
- Intake 7-14
- Primary Sheave 7-15
- Secondary Sheave 7-16
- Chain Case. 7-17
- Brake. 7-18
- Slide Rail. 7-19
- Suspension Wheels. 7-20
- Drive Axle. 7-21
- Steering. 7-22
- Ski. 7-23
- Ski Shock 7-24
- Oil Tank 7-25
- Fuel Tank 7-26
- Electrical Components (1). 7-27
- Electrical Components (2). 7-28
- Control Cables. 7-29

7-5. WIRING DIAGRAM 7-30

7-6. WIRE AND CABLE ROUTING 7-32

APPENDIX

7-1. SPECIFICATIONS

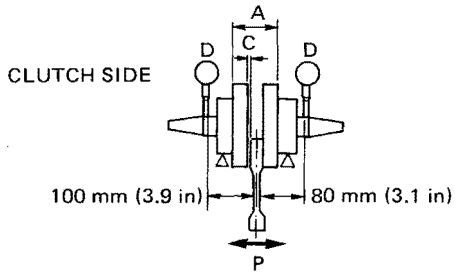
A. General

Model	BR250F
Model:	
Model (I.B.M. No.)	BR250F (8R4)
Frame I.D. & starting number	8R4-000101
Engine I.D. & staritng number	R246-000101
Dimension:	
Overall length	2,360 mm (92.9 in)
Overall width (std)	870 mm (34.3 in)
Overall height (w/windshield)	940 mm (37.0 in)
Weight:	
Net weight	130 kg (286.6 lb)

B. Engine

Description:	
Engine type	Fan cooled two-stroke 5-port
Engine model	R246
Displacement	246 cm^3 (15.01 cu. in)
Bore x Stroke	70 x 64 mm (2.76 x 2.52 in)
Effective compression ratio	6.1 : 1
Starting system	Recoil hand starter
Ignition system	C.D.I.
Lubrication system	"Autolube" oil injection
Cylinder:	
Material	Cast iron sleeves aluminum
Bore size	70 mm (2.76 in)
Taper limit	0.05 mm (0.0020 in)
Out of round limit	0.01 mm (0.0004 in)
Combustion chamber volume	24.8 cm^3 (1.51 cu. in) with spark plug
Compression chamber type	Dome + Squish
Piston:	
Piston skirt clearance (Measuring point)	0.045 ~ 0.050 mm (0.0018 ~ 0.0020 in) (10 mm from piston skirt end)
Piston oversize	1st 70.25 mm (2.766 in) 2nd 70.50 mm (2.776 in)
Piston pin outside diameter x length	ϕ18 x 55 mm (ϕ0.709 x 2.165 in)
Piston ring:	
Piston ring design (Top)	Keystone
Piston ring design (2nd)	Plain
Ring end gap (installed) (Top)	0.20 ~ 0.40 mm (0.0078 ~ 0.016 in)
Ring end gap (installed) (2nd)	0.20 ~ 0.40 mm (0.0078 ~ 0.016 in)
Small end bearing:	
Type	Needle bearing
Big end bearing:	
Type	Needle bearing

Crankshaft:	
Crankshaft assembly width (A)	$56^{+0}_{-0.05}$ mm ($2.20^{+0.039}_{-0.00197}$ in)
Crankshaft deflection (D)	0.02 mm (0.0008 in)
Connecting rod big end side clearance (C)	0.25 ~ 0.75 mm (0.010 ~ 0.030 in)
Connecting rod small end deflection (P)	2.0 mm (0.079 in)



Crank pin outside diameter x length	ϕ24 x 55 mm (ϕ0.945 x 2.165 in)
Crank pin type	Solid shaft
Crank bearing type (Left) x q'ty	#6306 special x 1 pc.
Crank bearing type (Right) x q'ty	#6305 special x 1 pc.
Crank oil seal type (Left) x q'ty	SD3-30 x 1 pc.
Crank oil seal type (Right) x q'ty	SD5-25 x 1 pc.
Carburetor:	
Type & manufacturer/quantity	BD32-28 KEIHIN x 1 pc.
I.D. Mark	8R401
Main jet (M.J.)	#108
Pilot screw (P.S.)	1-1/4 turns out
Throttle valve (Th.V.)	t = 1.0
Valve seat (V.S.)	ϕ1.4 mm (ϕ0.055 in)
Float height	15 ± 2 mm (0.59 ± 0.08 in)
Idling engine speed	1100 ± 100 r/min
Lubrication:	
Autolube pump – Color code	Pink
Autolube pump – Minimum stroke	0.20 ~ 0.25 mm (0.0079 ~ 0.0098 in)
Autolube pump – Maximum stroke	1.65 ~ 1.87 mm (0.0650 ~ 0.0736 in)
Autolube pump – Reduction ratio	1/40
Autolube pump – Output Min./200 strokes	0.95 ~ 1.19 cm^3 (0.0321 ~ 0.0402 oz)
Autolube pump – Output Max./200 strokes	7.84 ~ 8.89 cm^3 (0.2508 ~ 0.3006 oz)
Autolube pump wire free play	25 ± 1 mm (0.98 ± 0.04 in) at idle
Oil tank capacity	1.75
Oil grade	YAMALUBE 2-cycle

C. Drive and track suspencion

Transmission:	
Type	V-belt automatic centrifugal engagement
Drive ratio	3.5 : 1 ~ 1 : 1
Engagement rpm	3100 ± 200 r/min
Shift rpm	5,700 ~ 5,800 r/min
Primary spring:	
Part No.	90501-50654
Color code	No painted

Secondary spring:	
Part No.	90508-40506
Color code	No painted
Secondary spring pre-load (twist)	160°
Sheave distance	266 ± 2 mm (10.47 ± 0.08 in)
Sheave off-set	11 ± 3 mm (0.43 ± 0.12 in)
V-belt width and outer line length	31.6 x 1,099 mm (1.24 x 43.3 in)
V-belt wear limit	26 mm (1.02 in)
Track suspenison	
Type	Slide rail suspension
Damper type	Oil and gas damper
Spring color code (Front)	Green — Green
Spring color code (Rear)	No painted
Slide runner wear limit	8.5 mm (0.335 in)
Stopper band length/Hole No. (Front)	218.5 mm (8.60 in) No.1
Stopper band length/Hole No. (Rear)	152 mm (5.98 in) No.2
Track width	381 mm (15 in)
Track deflection	25 ~ 30 mm/10 kg (0.984 ~ 1.18 in/22 lb)
Length on ground	600 mm (23.6 in)
Wheel sprocket material and number of teeth	Polyethylene 9T
Chain:	
Type	Chain (#40K-1)
Reduction ratio	22/13 (1.692)
Chain pitch x Number of links	12.7 mm (0.5 in) x 44L
Free play	$10\ ^{+5}_{-2}$ mm ($0.4\ ^{+0.2}_{-0.08}$ in)
Chain housing oil quantity	200 cm^3 (6.8 oz)
Chain housing oil grade	Gear oil API "GL3" (SAE #75 or 85)
Brake:	
Type	Disc brake
Brake pad thickness	7.3 mm (0.287 in)
Brake pad wear limit	1.0 mm (0.04 in)
Gap between pad and disc	0.2 ~ 1.0 mm (0.008 ~ 0.039 in)

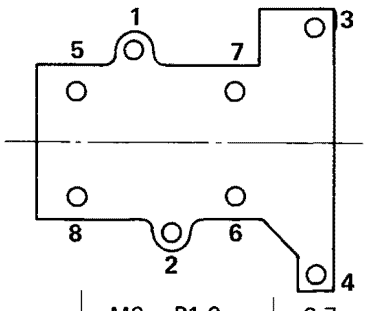
D. Chassis

Frame:	
Material	Steel
Steering system:	
Caster (ski column)	25°
Camber	0°
Ski length x width x thickness	980 x 120 x 1.6 mm (38.6 x 4.7 x 0.06 in)
Ski stance	750 mm (29.5 in)
Ski toe-out	0 ~ 6 mm (0 ~ 0.23 in)
Steering linkage type	Tie-rod
Lock to lock angle (ski)	Right ski, L: 26.8° R: 30.5° Left ski, L: 30.5° R: 26.8°
Lock to lock angle (steering column)	Right: 55° Left: 55°
Front suspension:	
Type	Leaf spring
Damper type	Oil damper
Fuel tank:	
Capacity	15 liter (4 US.gal)
Fuel grade	Regular gasoline

E. Electrical

Ignition system:	
Type – flywheel magneto (C.D.I. type)	
Model/manufacturer	F8R4/YAMAHA
Voltage	12V
Pluser coil resistance	20Ω ± 10% at 20°C (68°F) (White/Red – Black)
Charging coil resistance	426Ω ± 10% at 20°C (68°F) (Brown – Black)
Ignition timing:	
B.T.D.C.	1.6 ± 0.1 mm (0.063 ± 0.004 in)
Ignition coil:	
Model: Manufacturer	F6T411/MITSUBISHI
Spark gap	9 mm (0.4 in)/300 r/min
	11 mm (0.6 in)/3,000 r/min
Primary winding resistance	1.0Ω ± 10% at 20°C (68°F)
Secondary winding resistance	5.9kΩ ± 20% at 20°C (68°F)
Diode (Yes or No)	No
Spark plug:	
Type & quantity	NGK BR8HS x 1 pcs.
Spark plug gap	0.6 ~ 0.7 mm (0.024 ~ 0.028 in)
Spark plug cap:	
Type	Resign type
Resistance	5kΩ ± 25% at 20°C (68°F)
C.D.I. unit:	
Model/Manufacturer	8R4/YAMAHA
Lighting system:	
Lighting output	12V-100W
Lighting coil resistance	0.23Ω ± 20% at 20°C (68°F) (Yellow – Black)
Headlight type	Semi shield
Bulb wattage/q'ty	12V-60/60W x 1 pc.
Tail/stop light wattage	12V-8W/23W
A.C. regulator:	
Model/manufacturer	TRIZ-50 HITACHI/S8516B TOSHIBA
Voltage	13.8 ± 0.5V

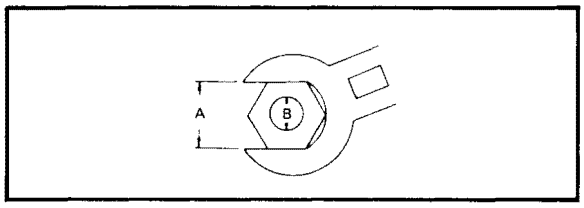
7-2 Tightening torque

Part to be tightened	Thread size	Tightening torque	Remarks
[Engine]			
Spark plug	M14 P1.25	2.8 m-kg (20 ft-lb)	
Cylinder	M8 P1.25	First: 2.0 m-kg (14.5 ft-lb)	
		Final: 2.5 m-kg (18 ft-lb)	
Flywheel magneto	M16 P1.9	7.3 m-kg (53 ft-lb)	
Crankcase upper and lower	M8 P1.25	First: 1.0 m-kg (7 ft-lb)	
with engine bracket		Final: 2.5 m-kg (18 ft-lb)	
Tightening sequence			
Fan	M6 P1.0	0.7 m-kg (5.1 ft-lb)	Use Loctite®

Part to be tightened	Thread size	Tightening torque	Remarks
Oil pump gear case	M6 P1.0	0.7 m-kg (5.1 ft-lb)	
[Drive and track suspension]			
Primary sliding sheave and cap	M6 P1.0	1.1 m-kg (8 ft-lb)	
Installation of primary sheave	UNF 1/2"	Initial: 10 m-kg (72.5 ft-lb) Loosen once and retighten: 6.0 m-kg (43.5 ft-lb)	Use motor oil
Installation of secondary sheave	M12 P1.25	4.0 m-kg (29 ft-lb)	
Installation of drive chain sprocket	M12 P1.25	6.0 m-kg (43.5 ft-lb)	Use cotter pin
Installation of driven chain sprocket	M8 P1.25	2.3 m-kg (16.5 ft-lb)	
Chain housing and frame	M8 P1.25	2.3 m-kg (16.5 ft-lb)	
Chain hosing cap	M6 P1.0	0.65 m-kg (5 ft-lb)	
Chain tensioner lock nut	M10 P1.25	3.3 m-kg (24 ft-lb)	
Installation of front axle L.H.	M20 P1.0	8.0 m-kg (58 ft-lb)	
Front axle housing and frame	M8 P1.25	2.3 m-kg (16.5 ft-lb)	
Shaft 1 and frame	M10 P1.25	5.5 m-kg (40 ft-lb)	
Pivot arm 1 and sliding frame 1	M10 P1.25	5.0 m-kg (36 ft-lb)	Use Loctite®
Suspension wheel	M12 P1.25	7.3 m-kg (53 ft-lb)	
Spring hook	M8 P1.0	2.3 m-kg (16.5 ft-lb)	
Sliding frame 1	M8 P1.25	2.3 m-kg (16.5 ft-lb)	
Rear guide wheel	M8 P1.25	2.3 m-kg (16.5 ft-lb)	
Sliding runner 1	M6 P1.0	0.25 m-kg (2 ft-lb)	Use Loctite®
Sliding runner 2	M6 P1.0	0.65 m-kg (5 ft-lb)	
Stopper 1	M6 P1.0	0.4 m-kg (3 ft-lb)	
[Chassis]			
Engine mounting bolt	M10 P1.25	3.0 m-kg (22 ft-lb)	
Ski runner	M8 P1.25	1.4 m-kg (10 ft-lb)	
Steering column and gate	M8 P1.25	2.0 m-kg (14.5 ft-lb)	Use lock washer
Steering relay rod adjusting nut	M10 P1.25	2.5 m-kg (18 ft-lb)	Use Loctite®
Outside arm and ski colume	M10 P1.25	3.0 m-kg (22 ft-lb)	Use lock washer
Steering lower bracket	M8 P1.25	2.0 m-kg (15 ft-lb)	Use lock washer
Installation of steering column 1, 2	M8 P1.25	1.45 m-kg (10.5 ft-lb)	
Steering relay ass'y	M10 P1.25	3.0 m-kg (22 ft-lb)	
Universal joint and outside arm	M10 P1.25	2.5 m-kg (18 ft-lb)	

GENERAL TORQUE SPECIFICATIONS

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



A (Nut)	B (Bolt)	General torque specifications	
		m-kg	ft-lb
10 mm	6 mm	0.6	4.5
12 mm	8 mm	1.5	11
14 mm	10 mm	3.0	22
17 mm	12 mm	5.5	40
19 mm	14 mm	8.5	51
22 mm	16 mm	13.0	94

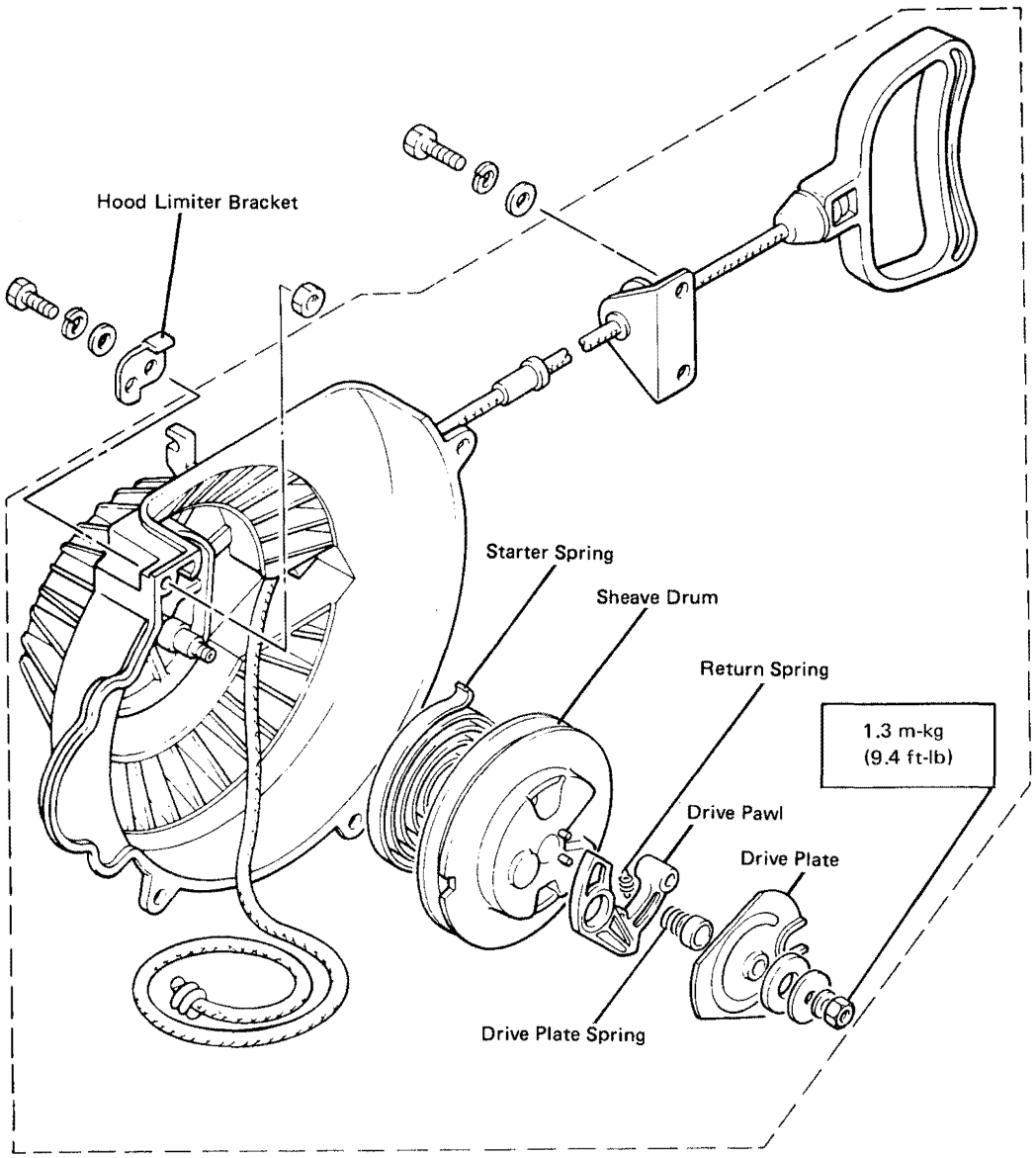
CONVERSION TABLES

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

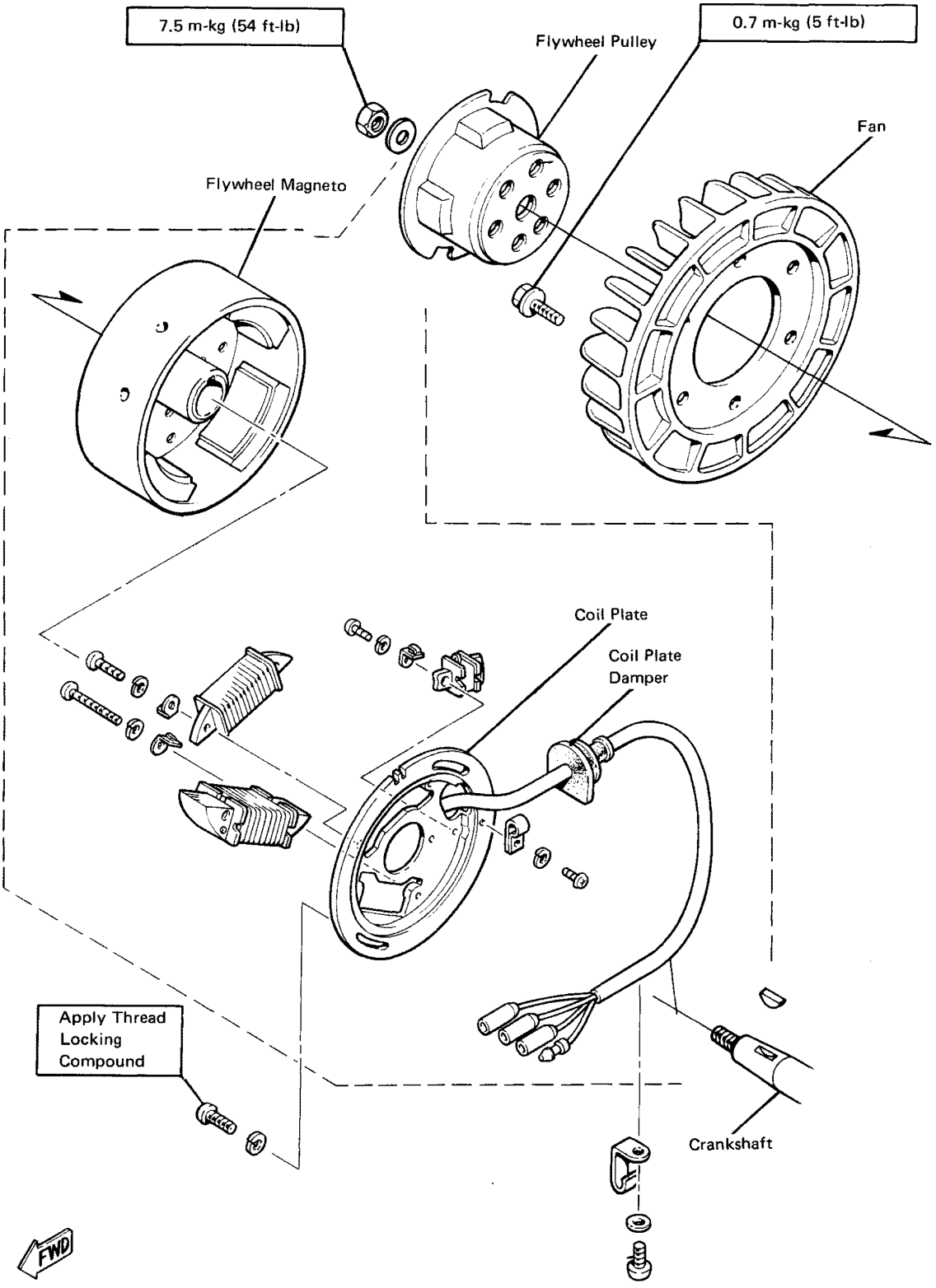
INCH TO METRIC SYSTEM		
Known	Multiplier	Result
ft-lb	0.13826	m-kg
in-lb	0.01152	m-kg
ft-lb	13.831	cm-kg
in-lb	1.1521	cm-kg
lb	0.4535	kg
oz	28.352	g
mpg	0.4252	km/lit
mph	1.609	km/hr
mi	1.609	km
ft	0.3048	m
yd	0.9141	m
in	2.54	cm
in	25.4	mm
oz (U.S. liq)	29.57	cc (cm^3)
cu.in	16.387	cc (cm^3)
pt (U.S.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

7.4 EXPLODED DIAGRAM

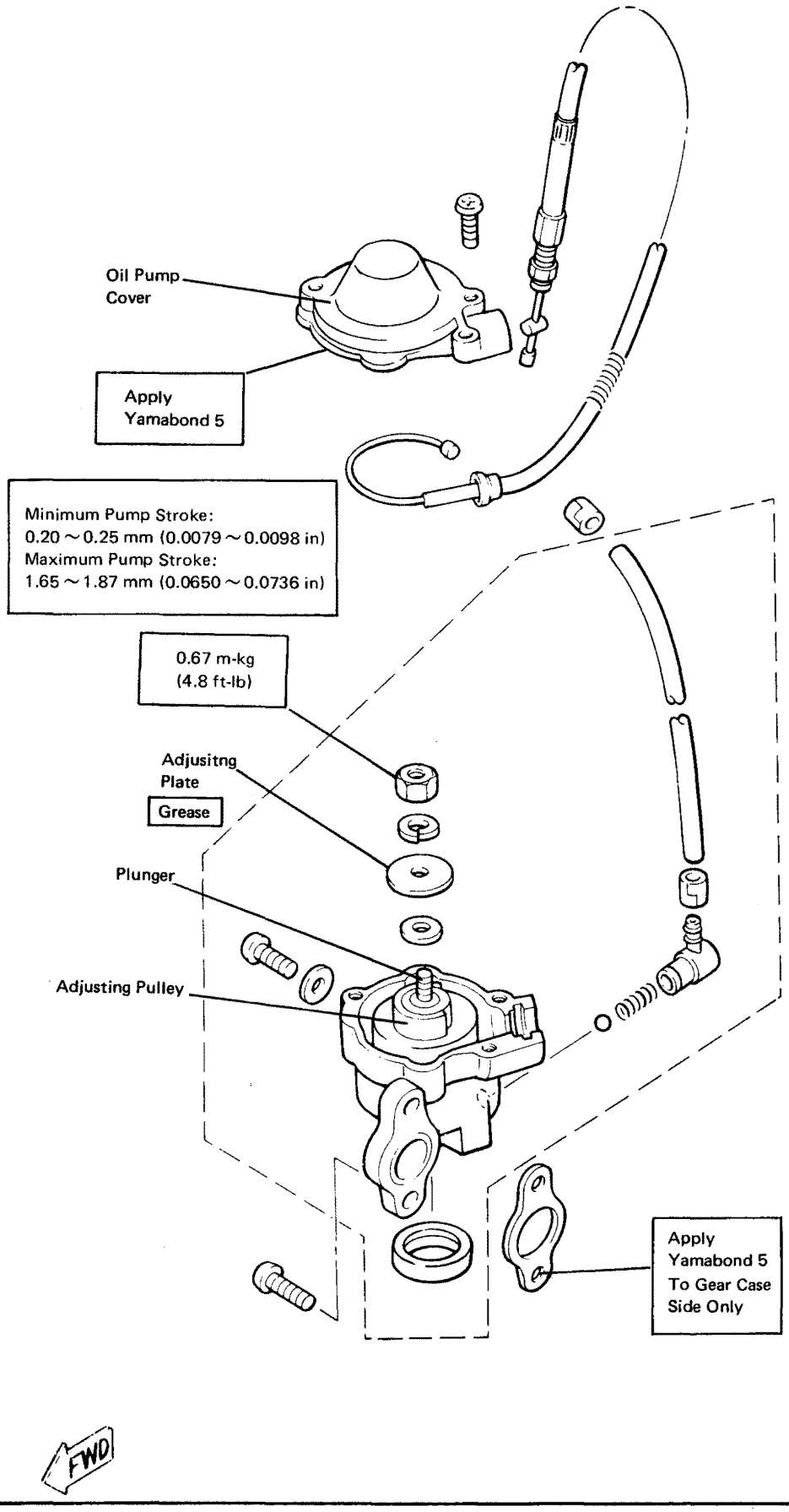
RECOIL STARTER



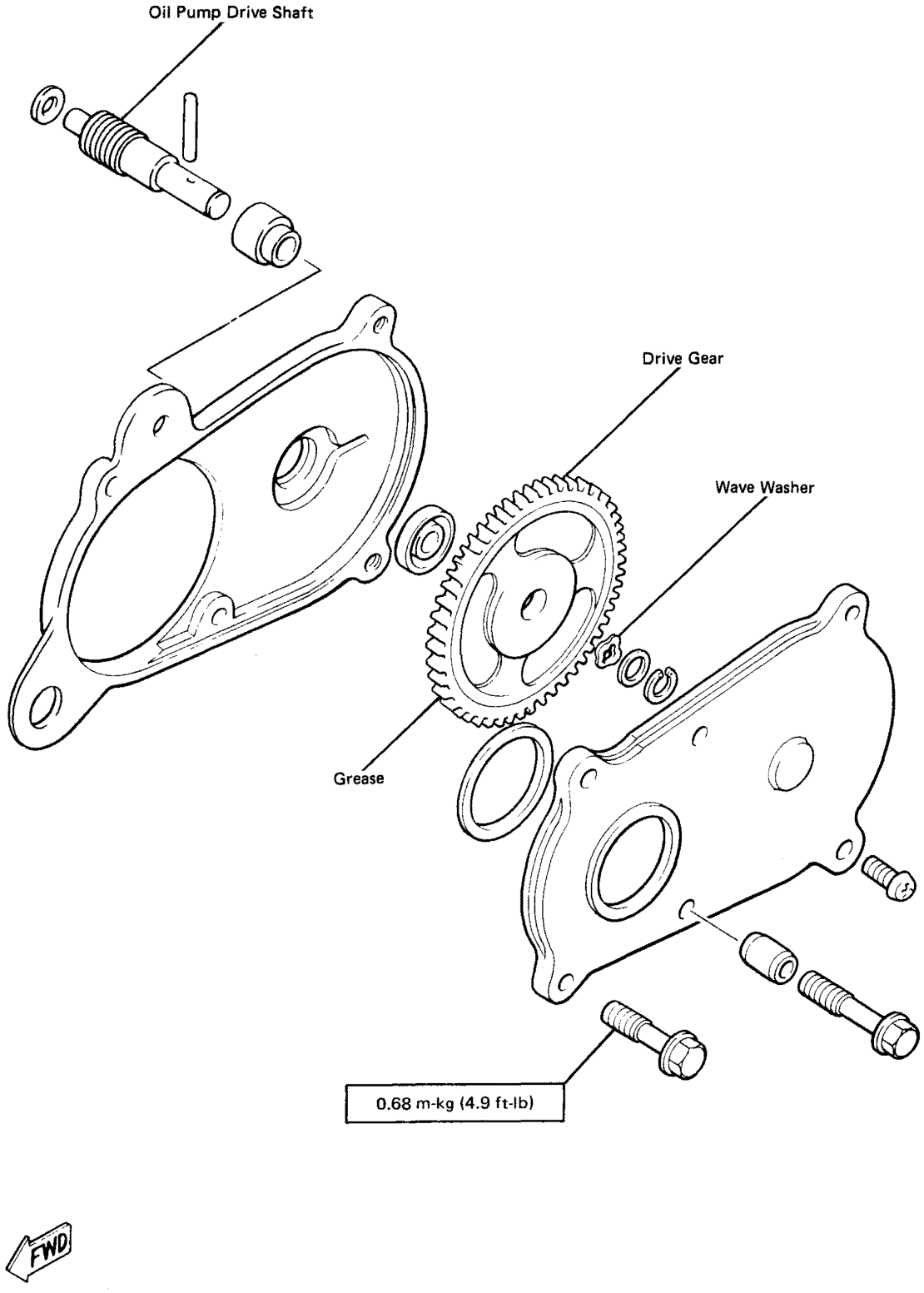
FLYWHEEL MAGNETO



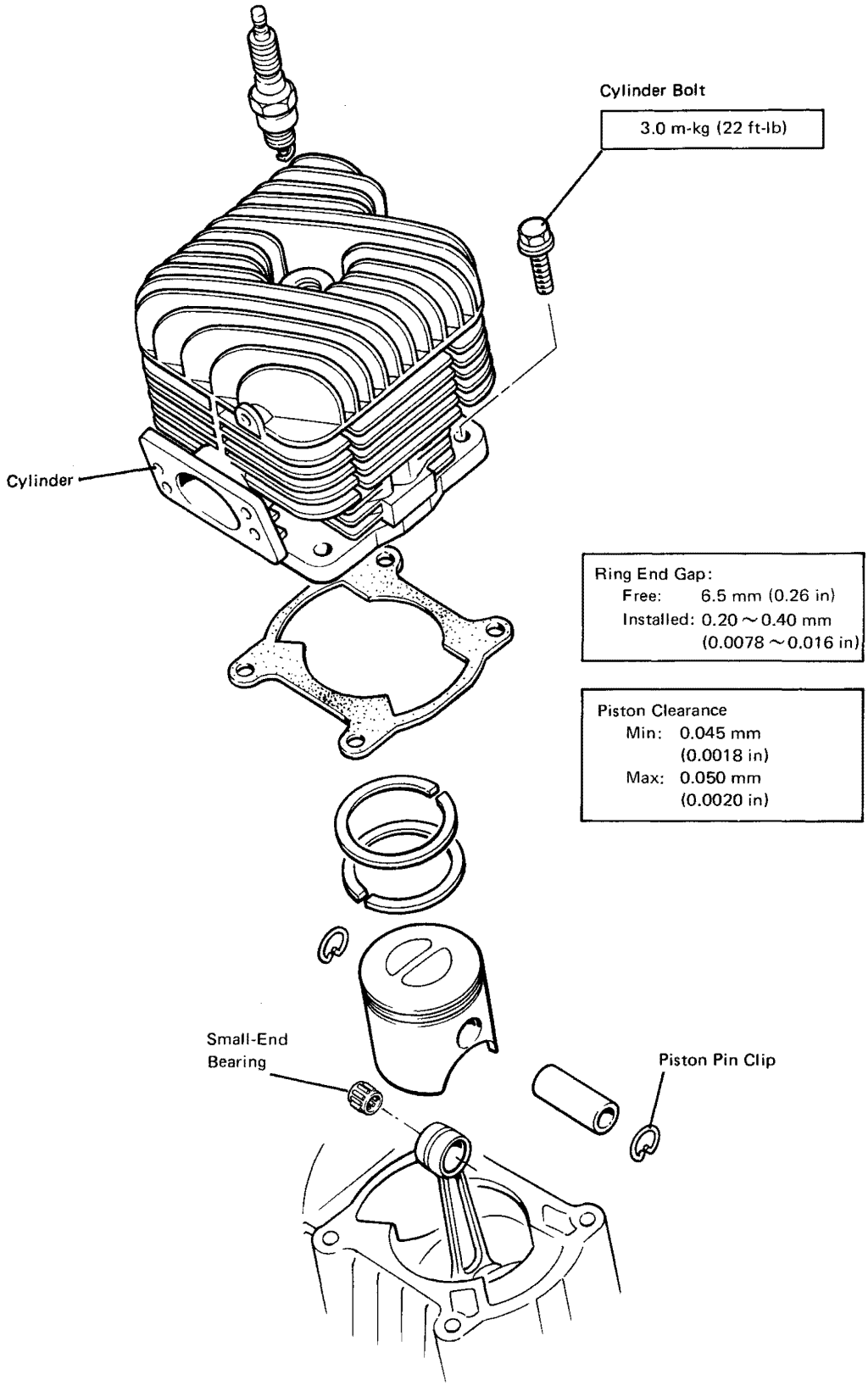
OIL PUMP



OIL PUMP DRIVE GEAR

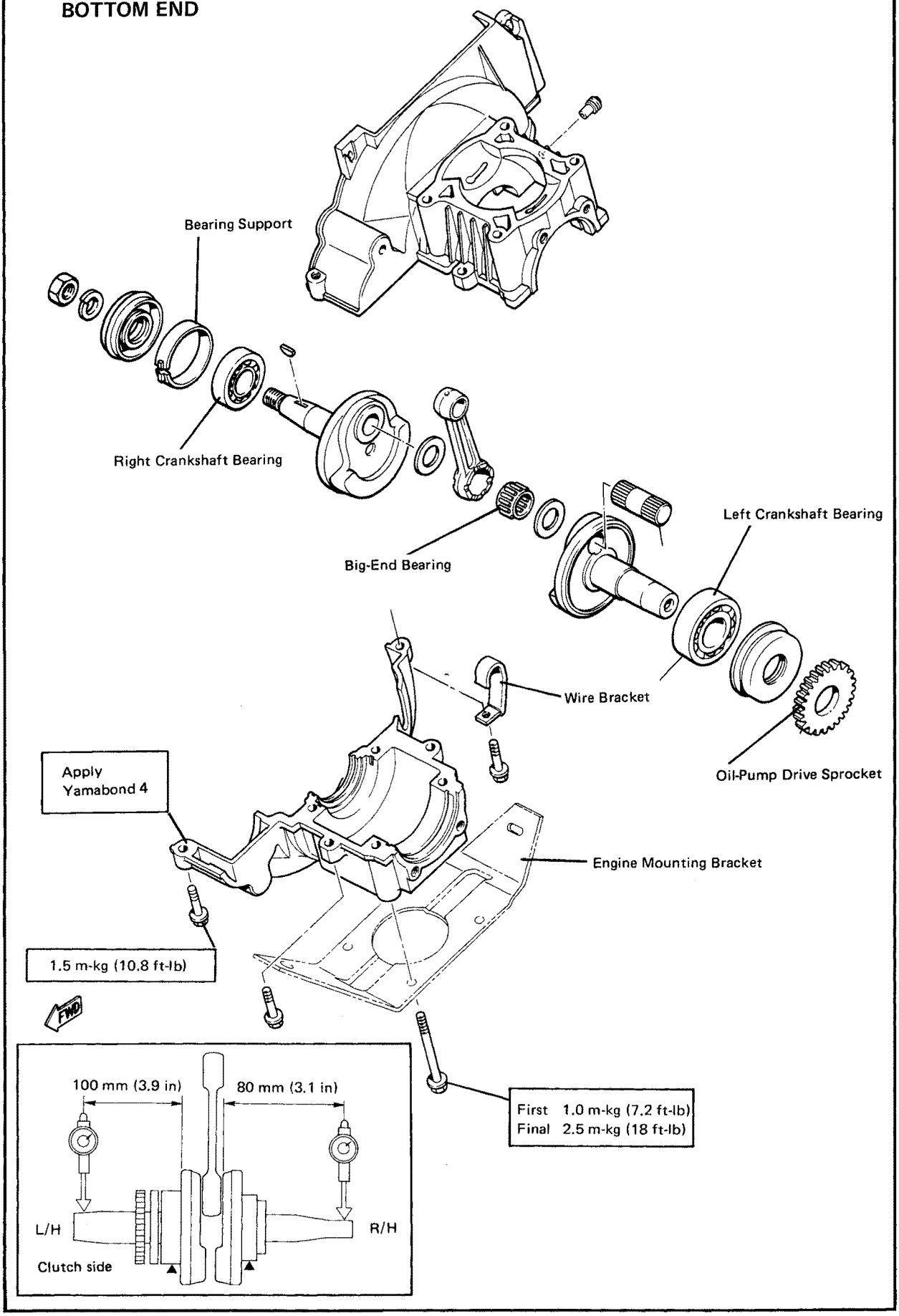


TOP END

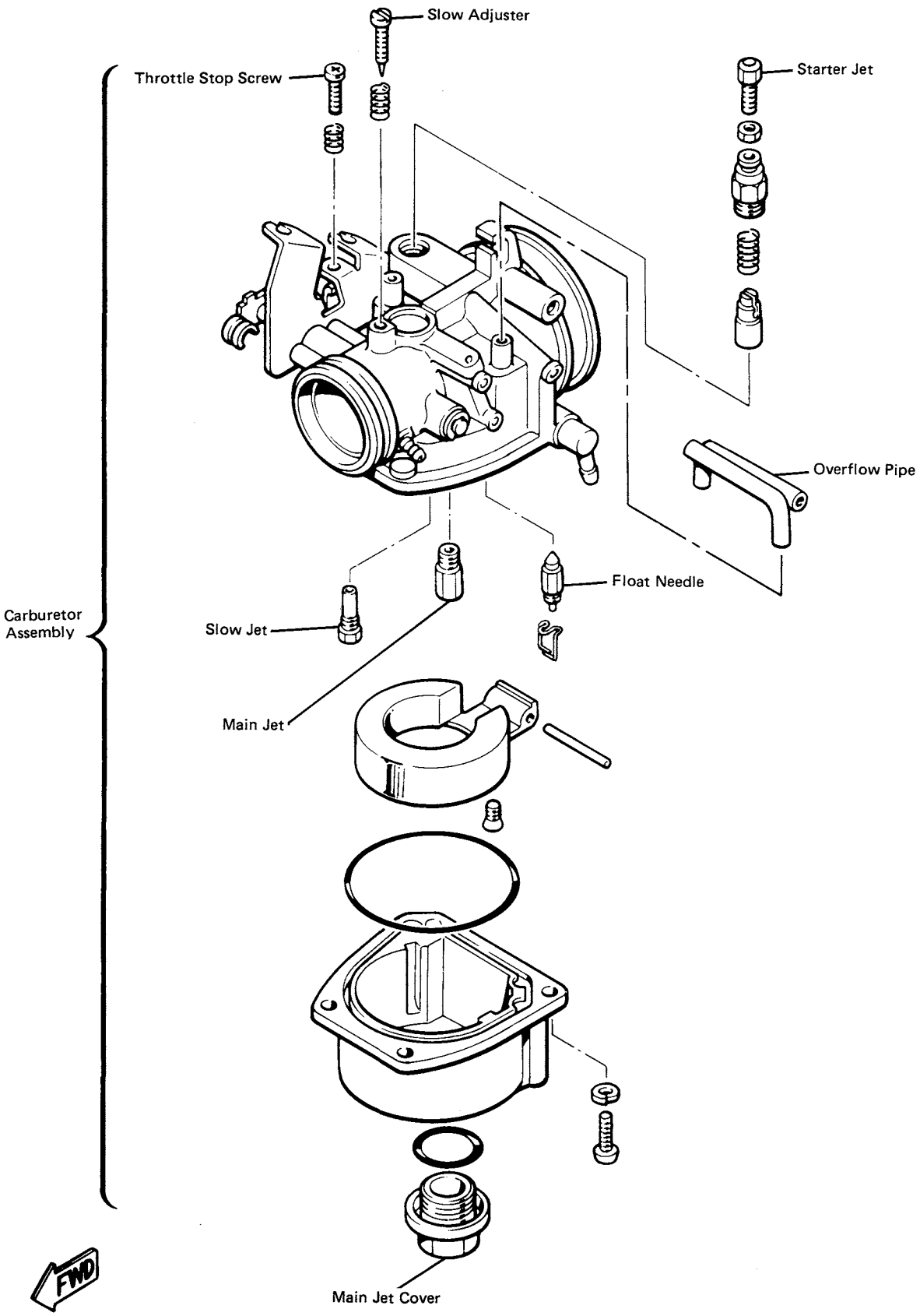


APPENDIX

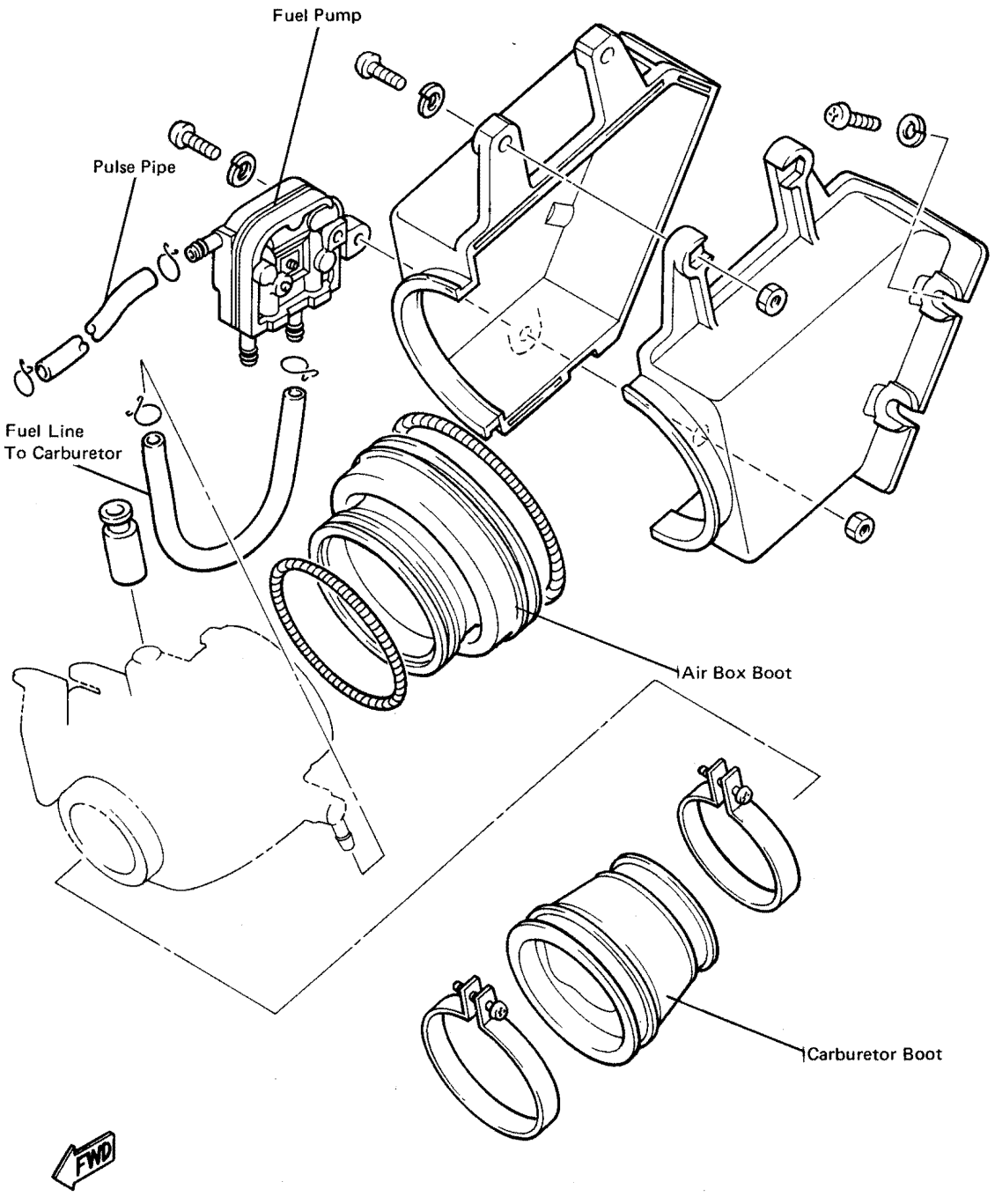
BOTTOM END



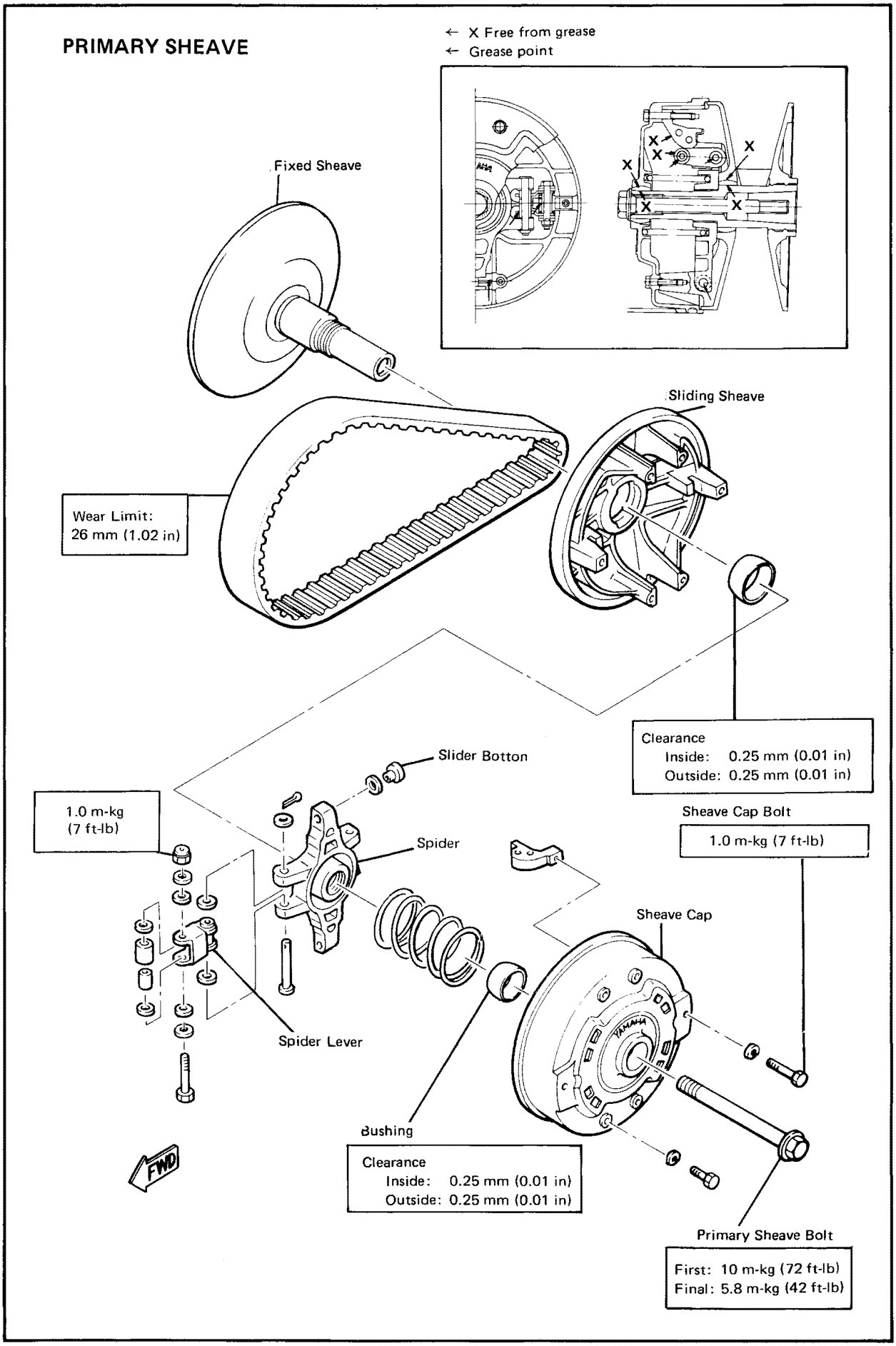
CARBURETOR



INTAKE

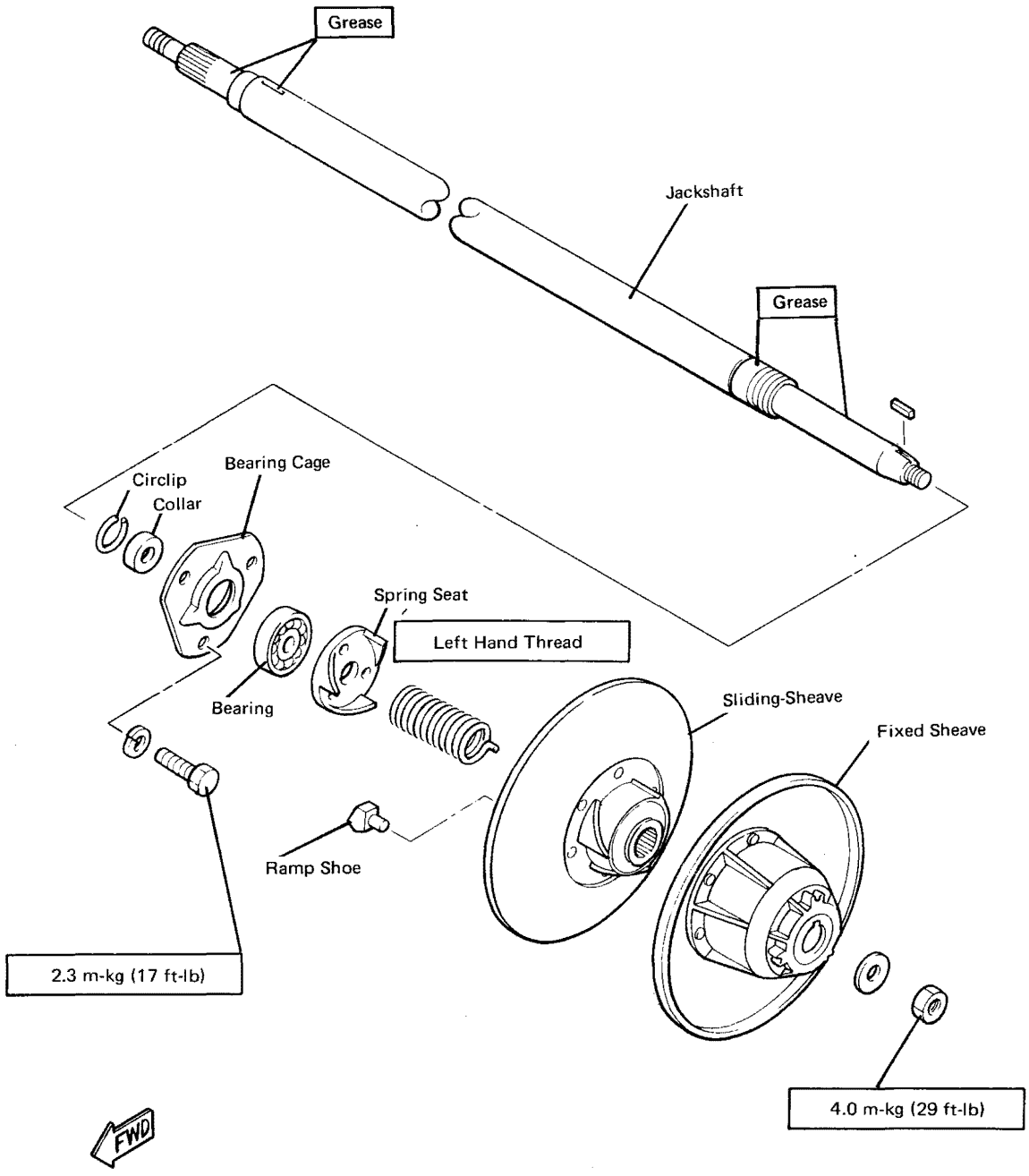


PRIMARY SHEAVE

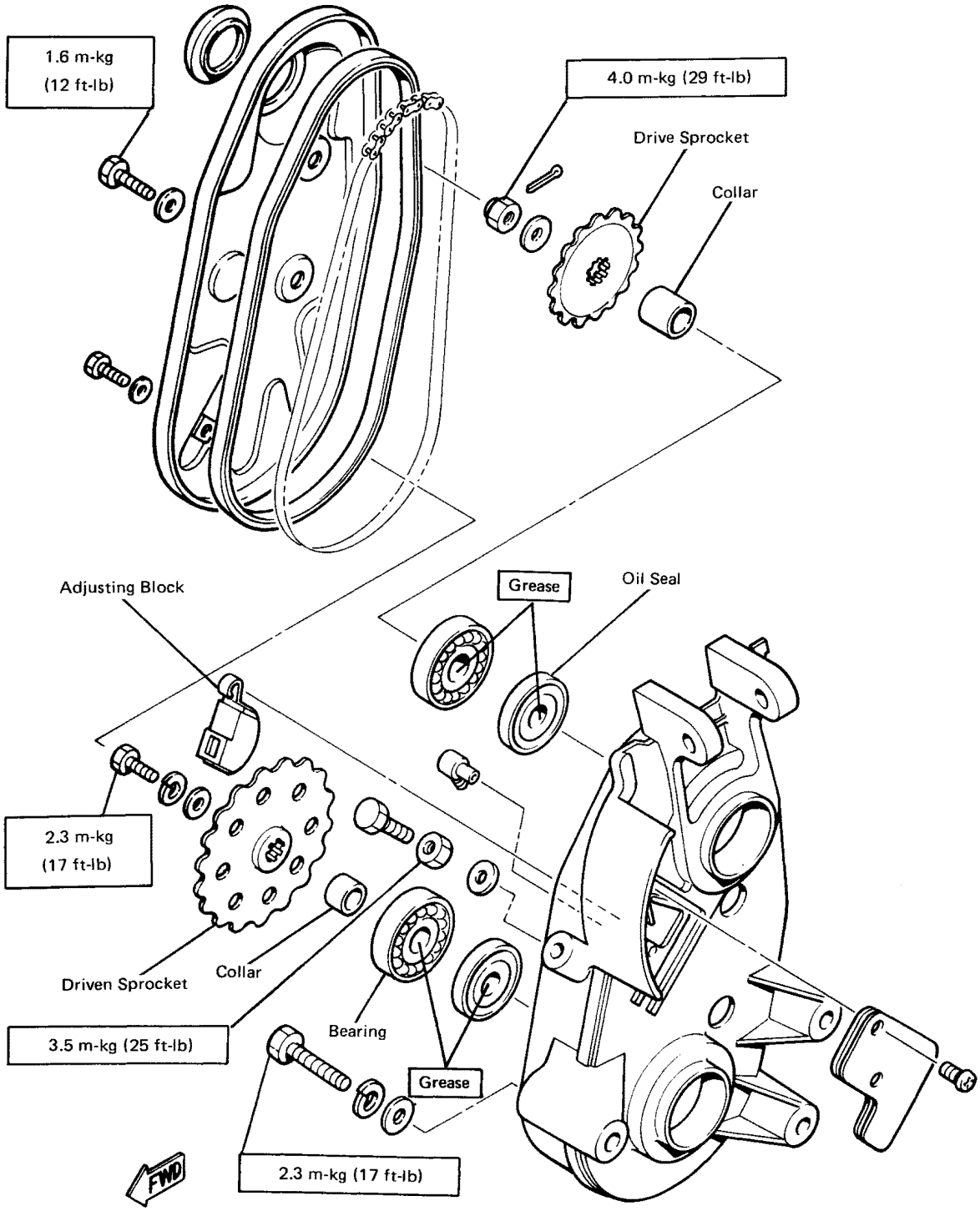


APPENDIX

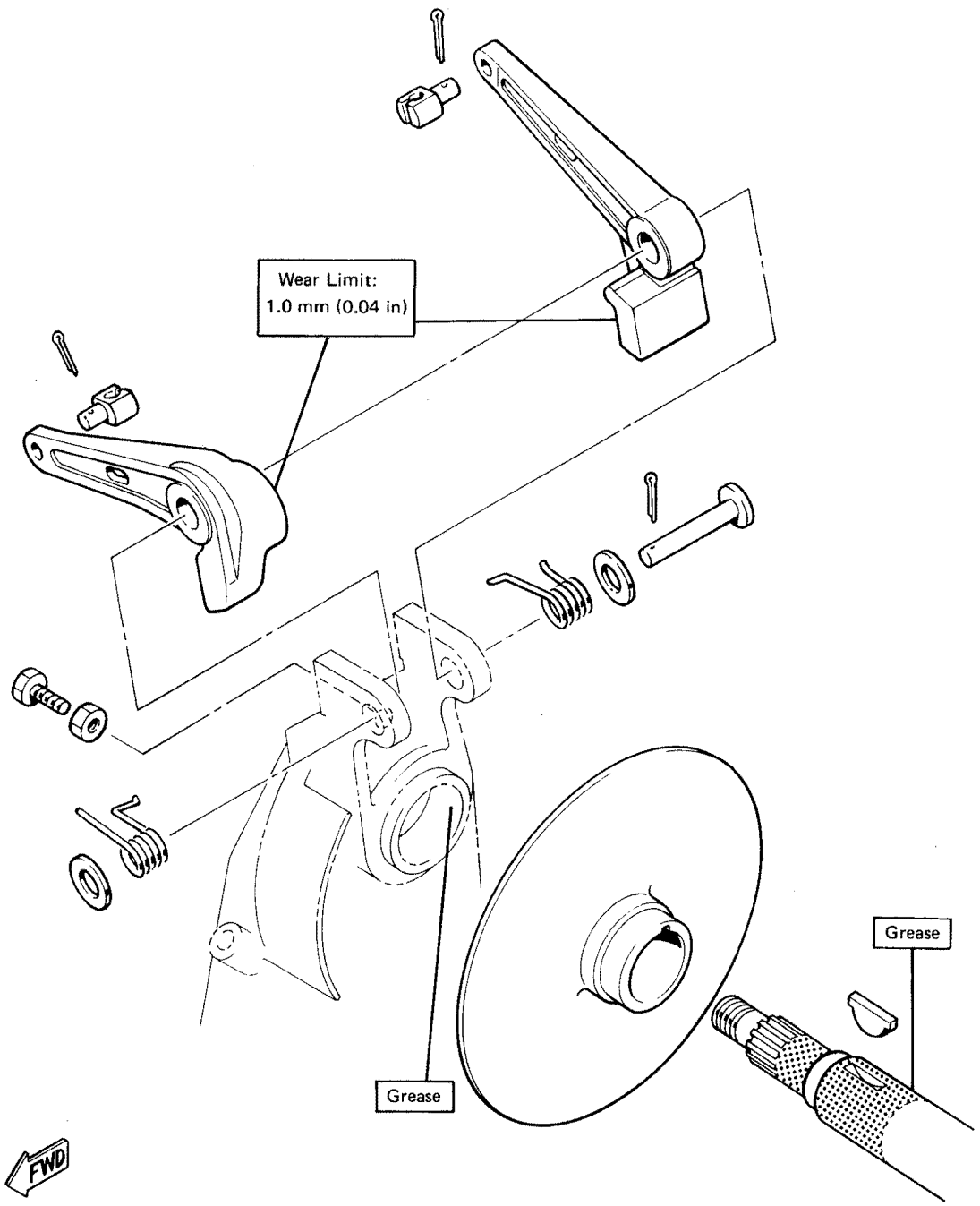
SECONDARY SHEAVE



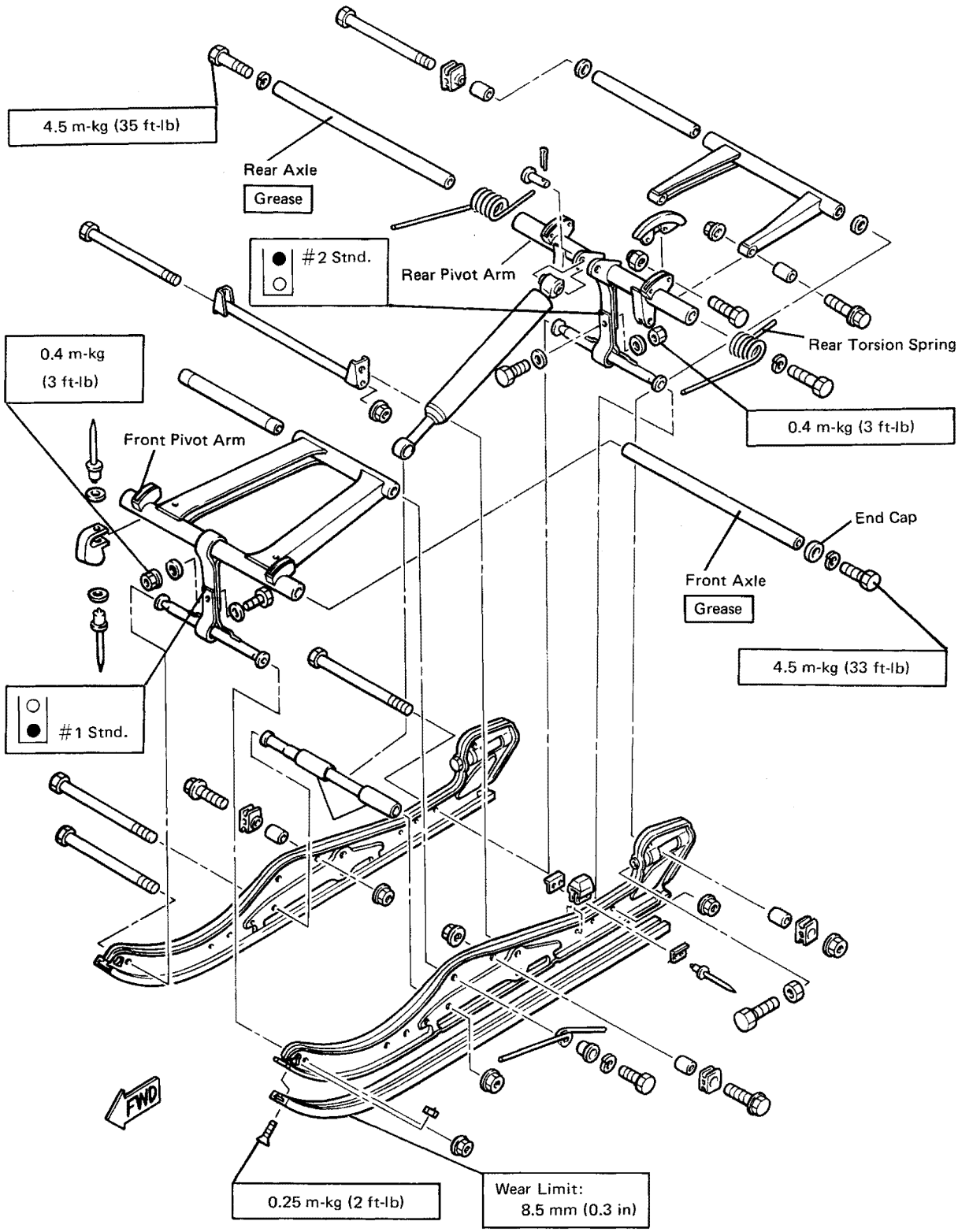
CHAIN CASE



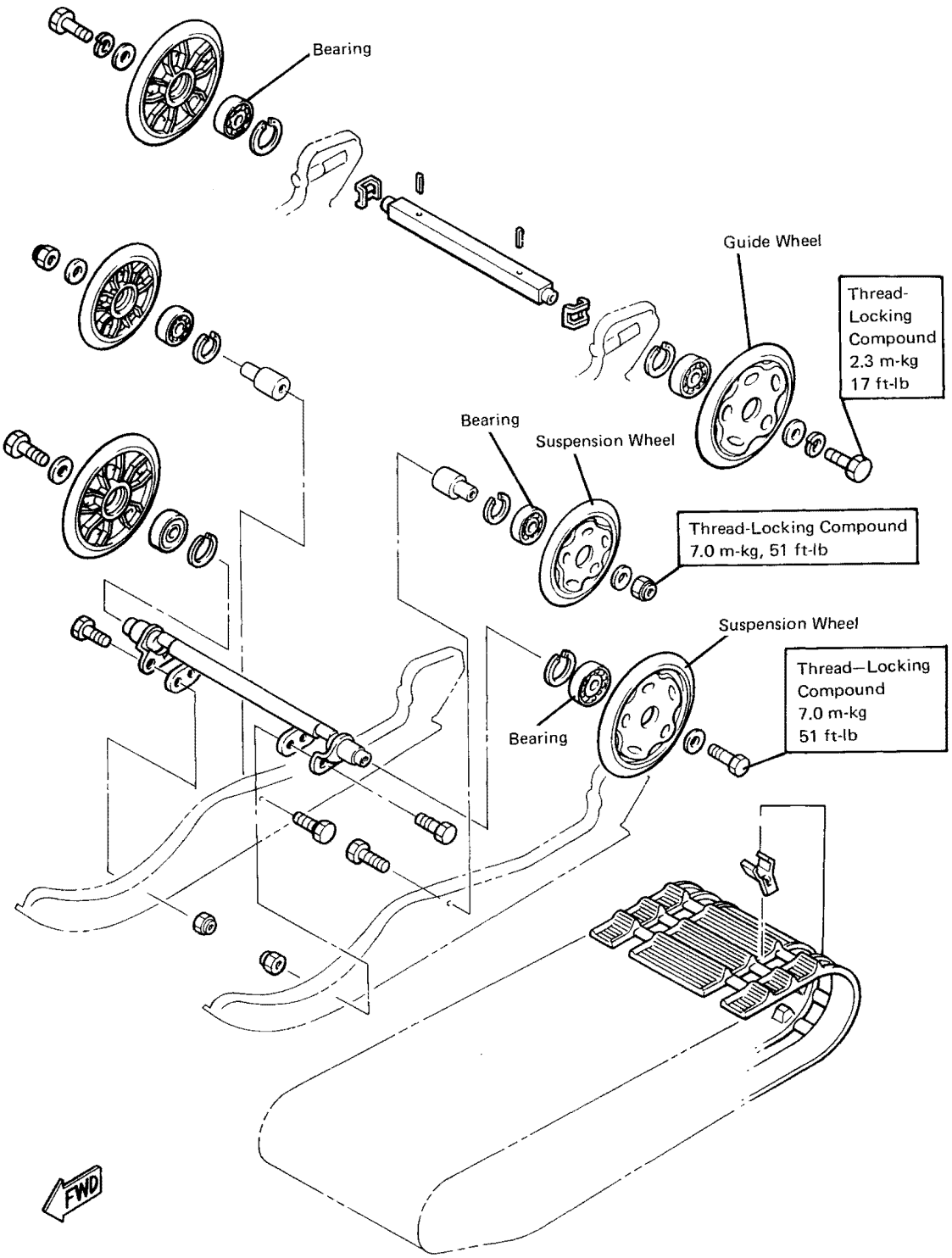
BRAKE



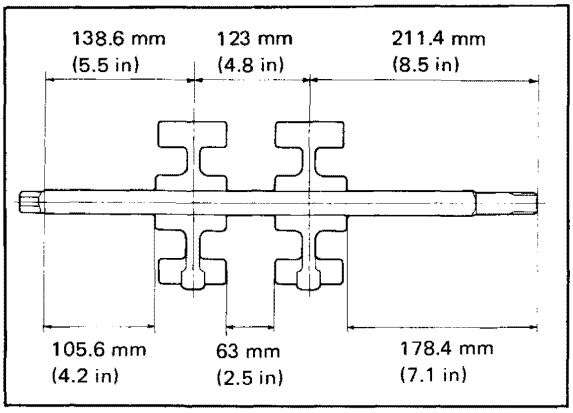
SLIDE RAIL

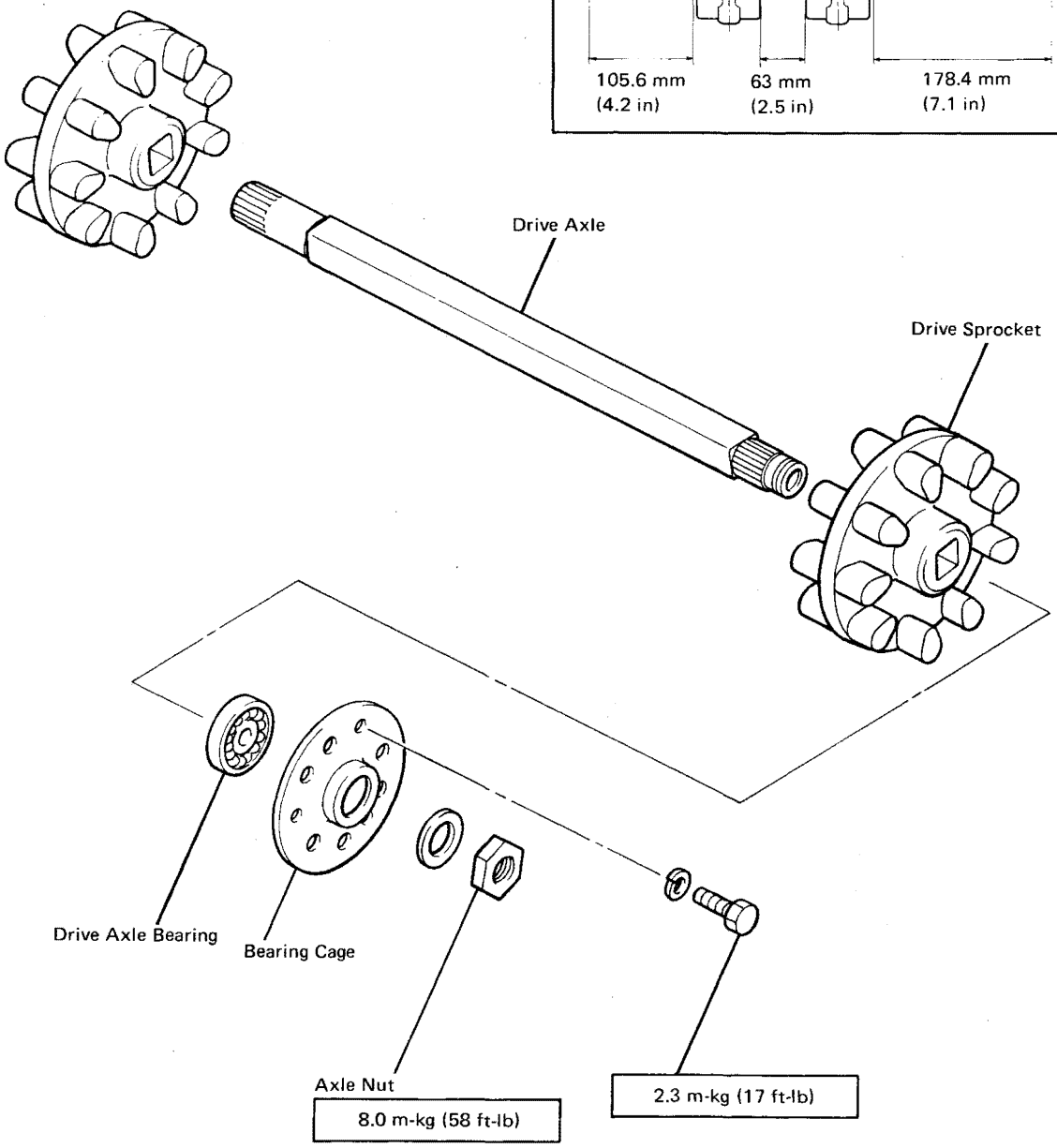


SUSPENSION WHEELS

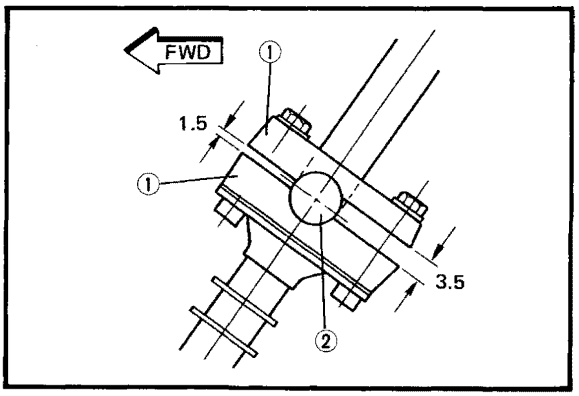


DRIVE AXLE



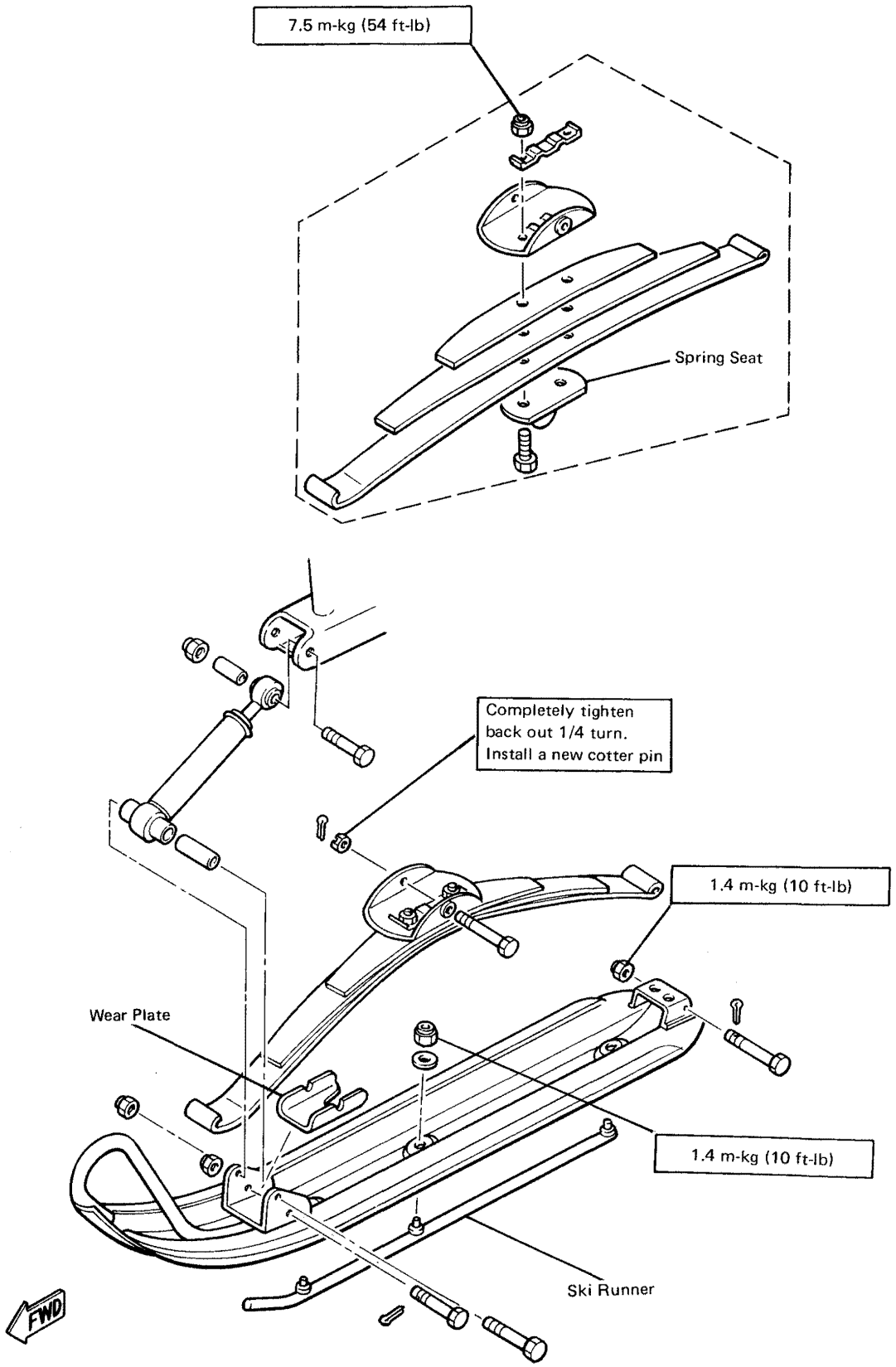


STEERING

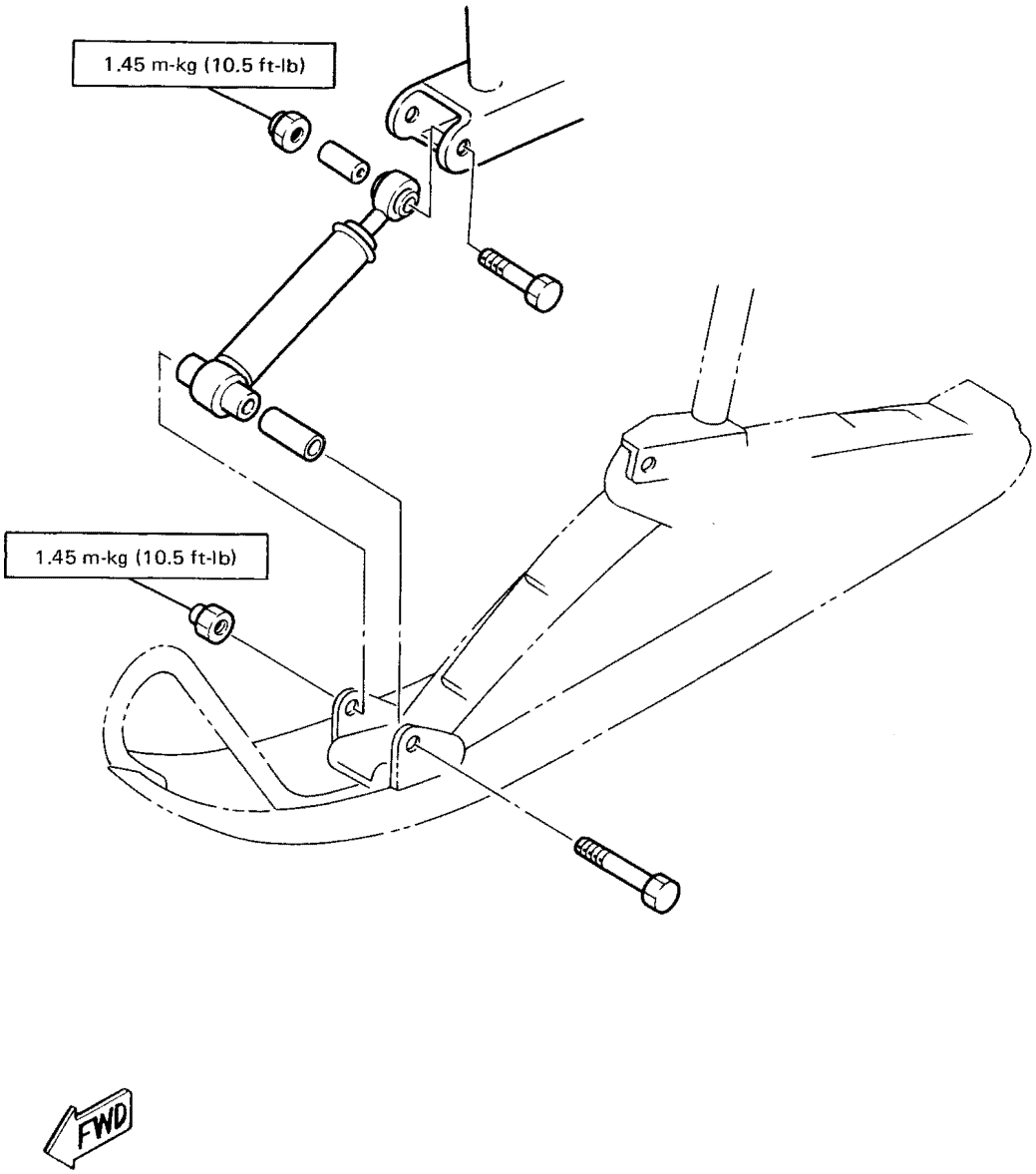


1. Clamp
2. Handlebar

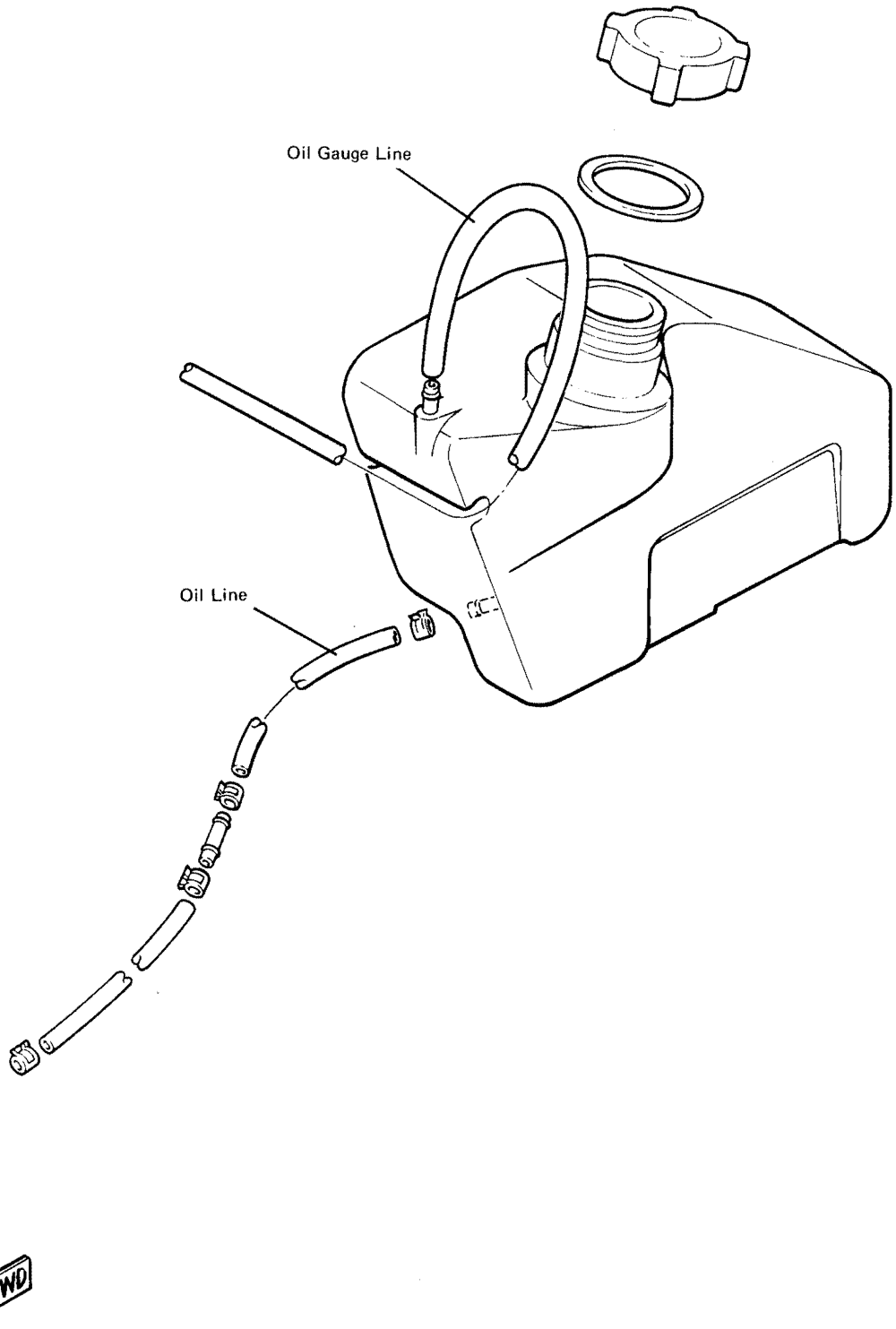
SKI



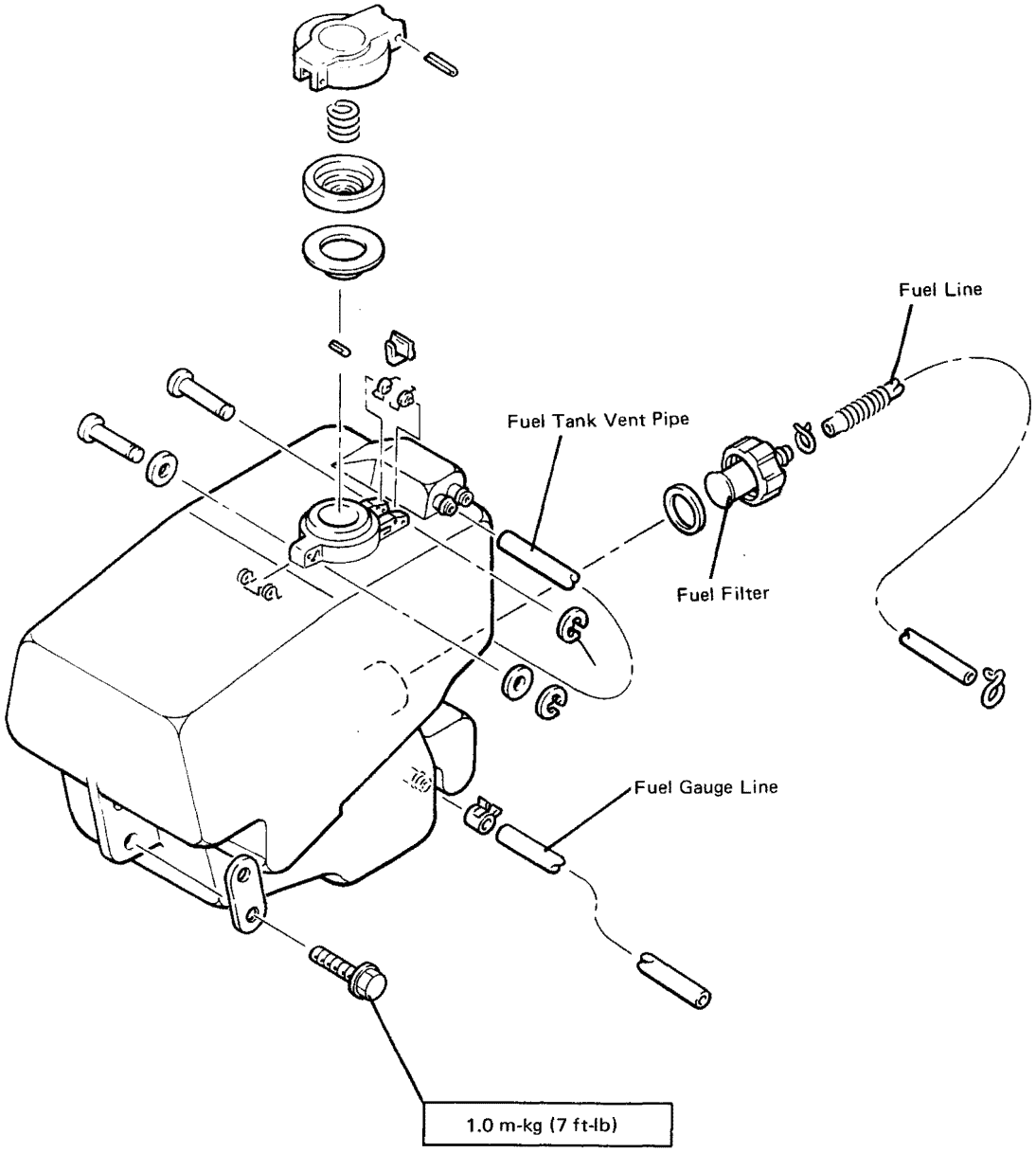
SKI SHOCK



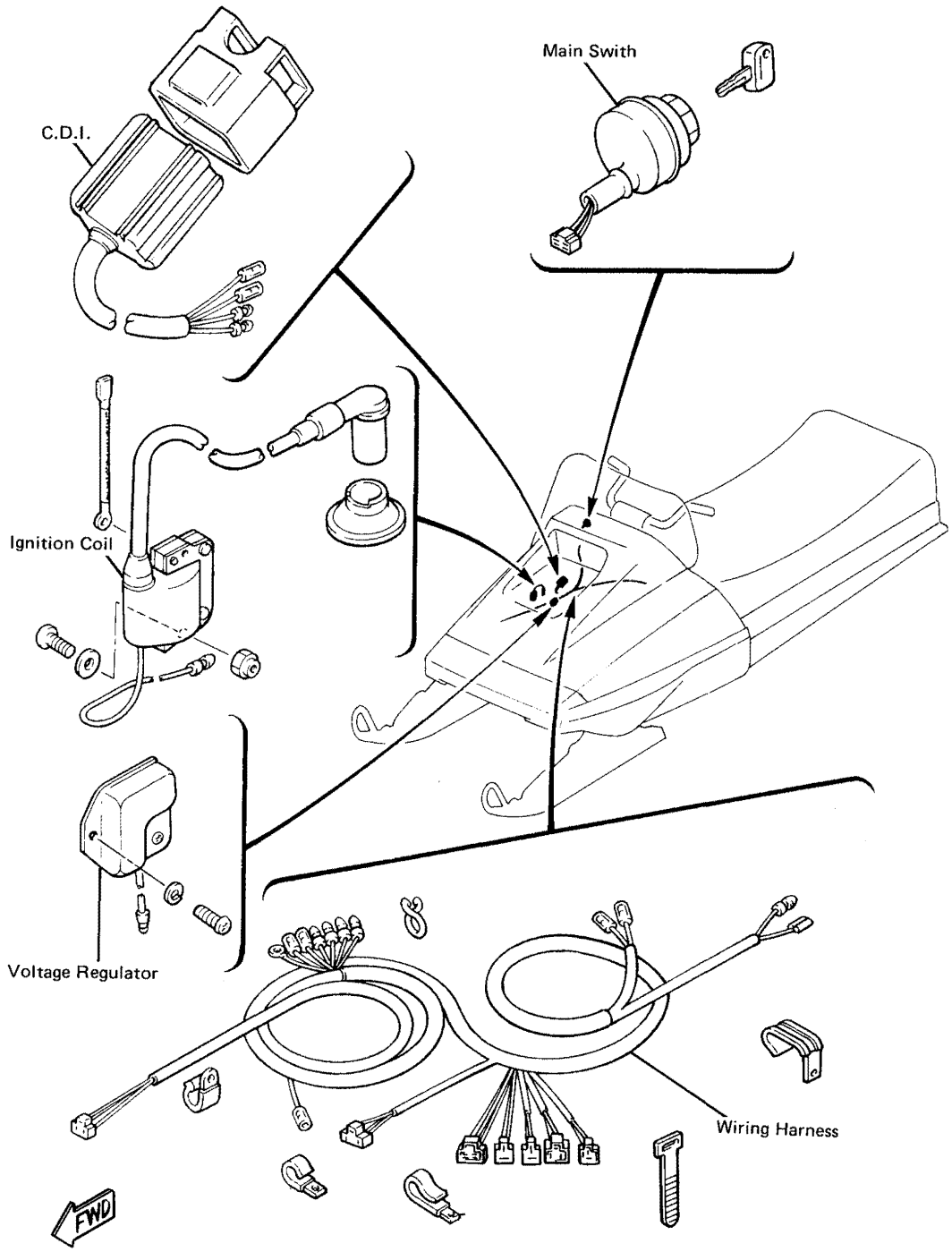
OIL TANK



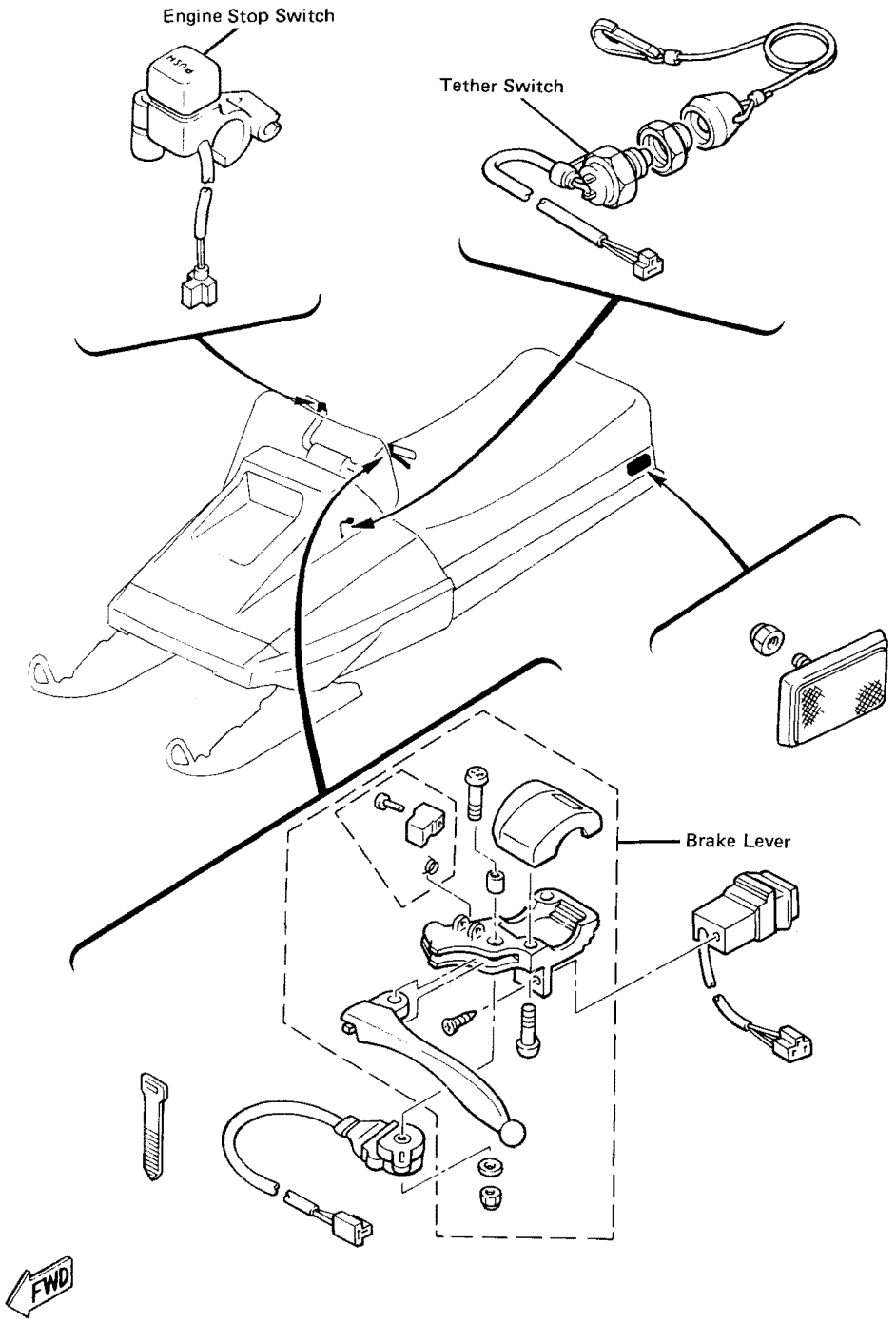
FUEL TANK



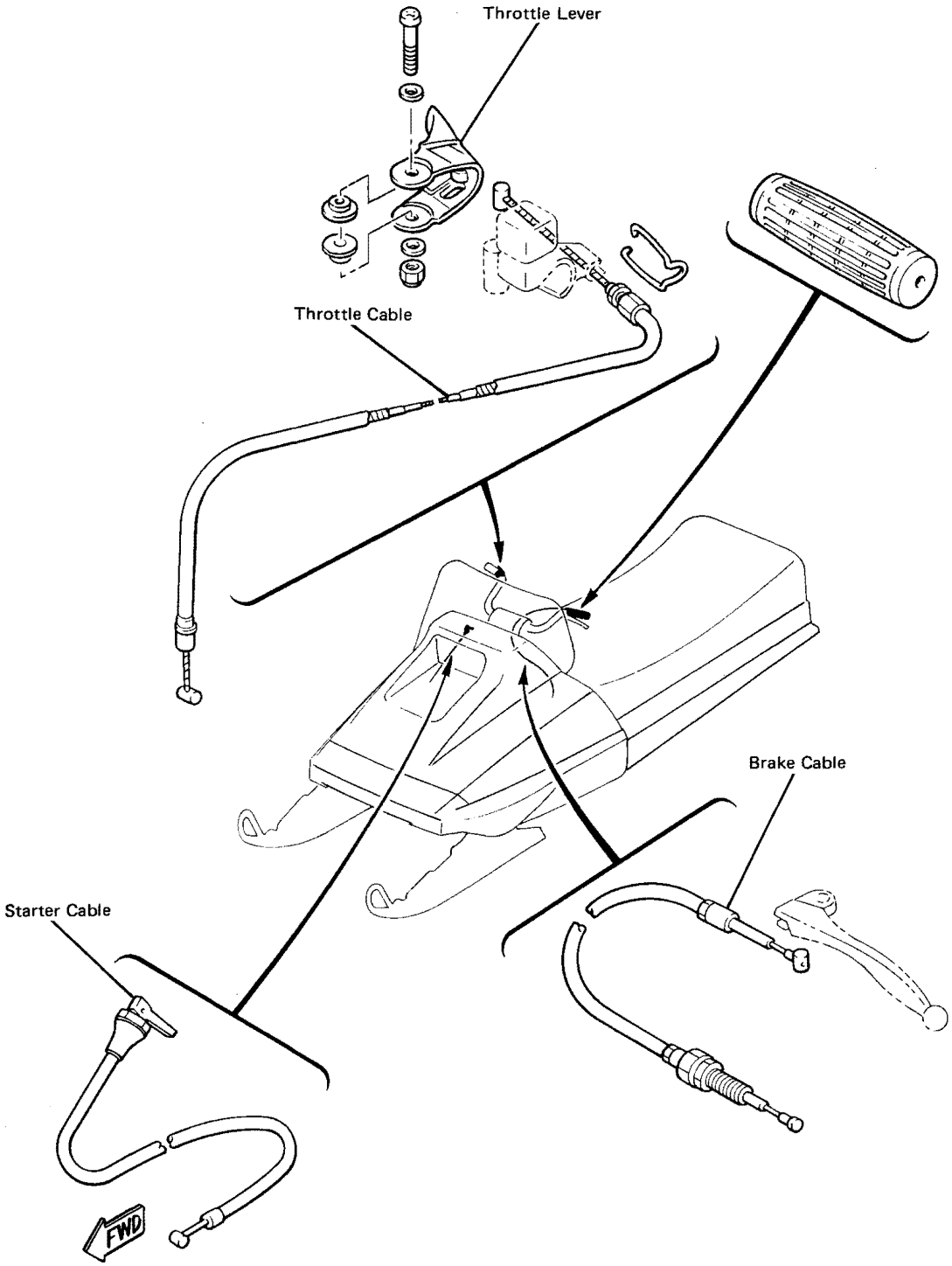
ELECTRICAL COMPONENTS (1)



ELECTRICAL COMPONENTS (2)

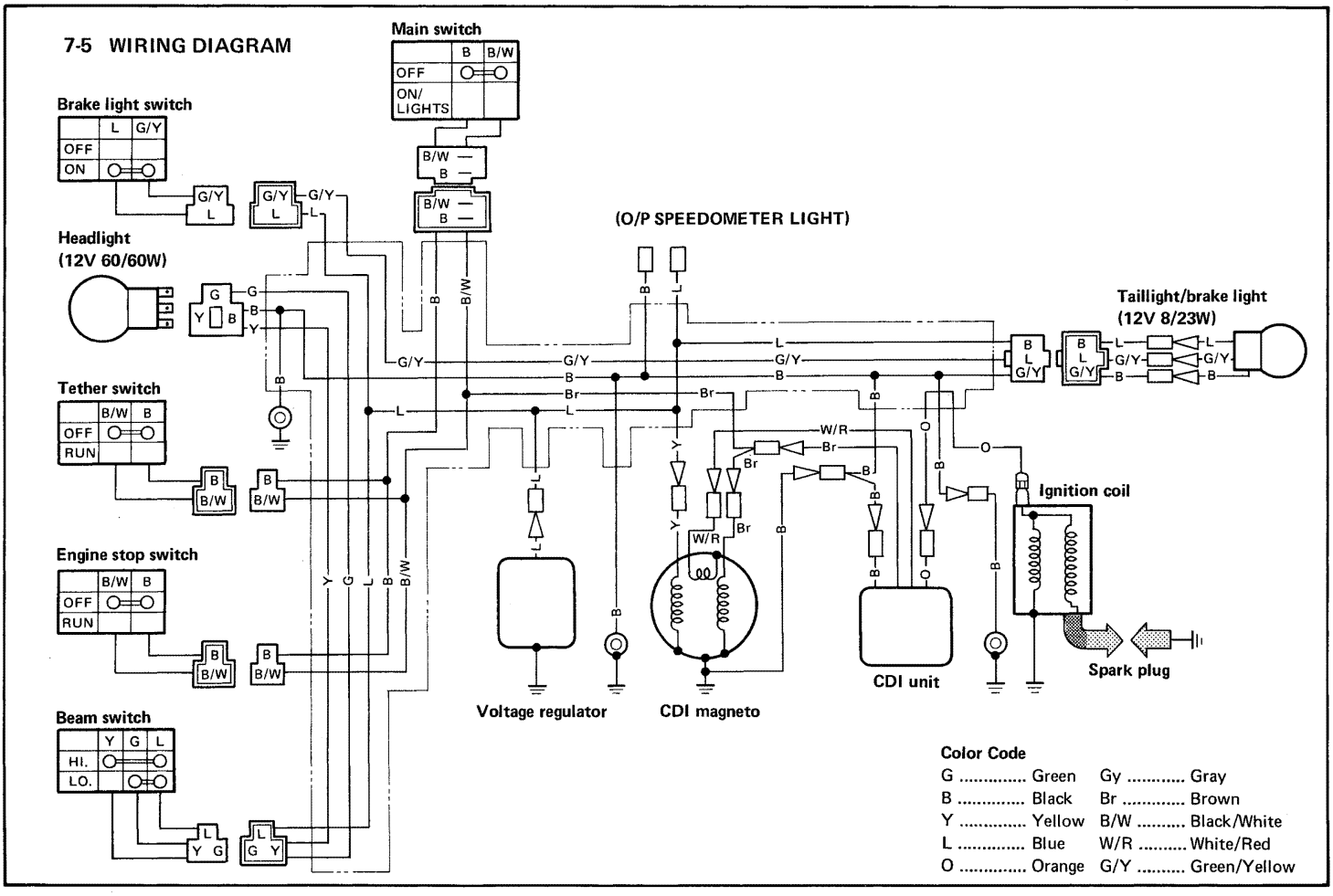


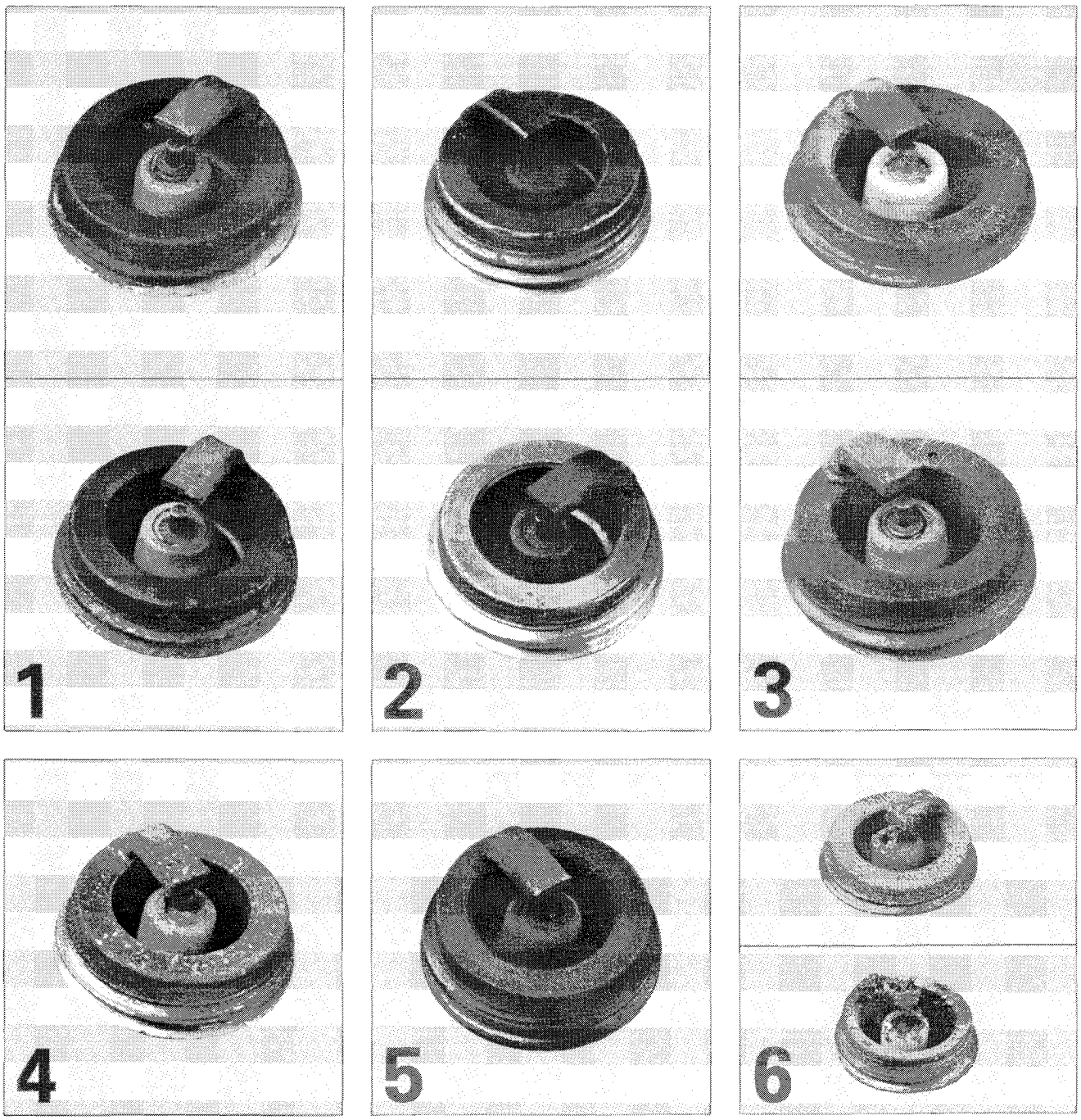
CONTROL CABLE



APPENDIX

7-5 WIRING DIAGRAM





1 Good
Bon

2 Bad
Mauvais

3 Bad
Mauvais

4 Bad
Mauvais

5 Bad
Mauvais

6 Bad
Mauvais

YAMAHA MOTOR CO.,LTD.

IWATA, JAPAN

PRINTED IN U.S.A.

YAMAHA

SNOWMOBILE

BR250TJ

SUPPLEMENTARY SERVICE MANUAL

LIT-12618-00-70

8Y1-28197-10

FOREWORD

This supplementary service manual for the BR250TJ has been published to supplement the BR250F service manual (LIT-12618-00-41). For complete information on service procedures, it is necessary to use this Supplementary Service Manual together with the following manual.

BR250F Service Manual (LIT-12618-00-41)

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 possible.

OVERSEAS SERVICE
OVERSEAS OPERATIONS
YAMAHA MOTOR CO., LTD.

BR250TJ SUPPLEMENTARY SERVICE MANUAL
1984 by Yamaha Motor Corporation, U.S.A.
1st Edition, June 1984

Printed in U.S.A.
P/N LIT-12618-00-70

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

NOTE: A NOTE provides key information to make procedures easier or clearer.

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.

CONTENTS

EXTERNAL VIEW 1

MAINTENANCE 2
- Periodic Maintenance 2
- Lubrication Intervals 3

THROTTLE OVERRIDE SYSTEM 4
- Description 4
- T.O.R.S. cancellation 5
- Block diagram 5

POWER TRAIN 6

PRIMARY SHEAVE 6
- Removal 7
- Disassembly 7
- Inspection 8
- Reassembly 10
- Installation 12

V-BELT 12
- Removal 12
- Inspection 12
- Reassembly 12

EXPLODED DIAGRAM 13
- CARBURETOR 13
- INTAKE 14
- PRIMARY SHEAVE 15
- DRIVE AXLE 16
- SKI 17
- SLIDE RAIL 18
- SUSPENSION WHEELS 19
- BUMPER 20
- ELECTRICAL COMPONENTS 21

SPECIFICATIONS 22

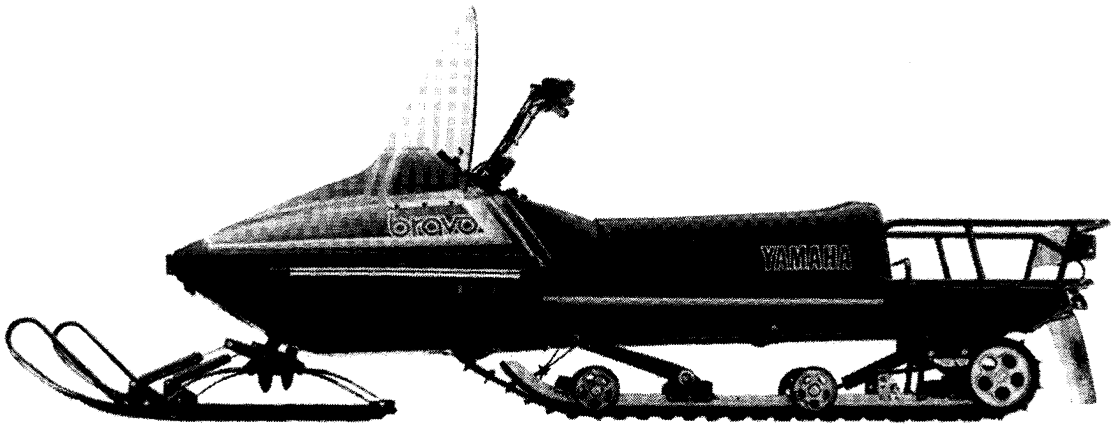
GENERAL SPECIFICATIONS 22

MAINTENANCE SPECIFICATIONS 24

CABLE ROUTING 35

WIRING DIAGRAM 40

EXTERNAL VIEW



Periodic Maintenance

Perform the various inspections and services at the indicated intervals; however use this schedule as a guide only. Depending upon the operating conditions, certain components may require more frequent servicing.

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 in the fuel and pulse pipes	○				
Loose connection and breaks in the oil pipes	○				
Loose connection and breaks in the oil delivery pipe	○				
Recoil starter		○			
Carburetor					
● Operation of starter jet		○			
● Mixing adjuster (pilot screw)				○	
● Idle speed adjustment				○	
Operation and adjustment of oil pump		○			
Cylinder compression			○		
Cylinder/exhaust pipe decarbonize					○
Spark plug condition, gap, and cleaning	○				
Tightening of the cylinder**	○				
DRIVE:					
Tightness of bolts and nuts	○				
Wear on slide runners	○				
Primary drive system		○			
V-belt	○				
Secondary drive system		○			
Sheave distance		○			
Sheave offset		○			
Brake pad wear		○			
Brake operation and adjustment		○			
Guide wheel rubber		○			
Wear of track drive sprockets		○			
Drive track adjustment	Initial 100 km (60 mi) & 300 km (200 mi)	○			
Breaks in drive track		○			
Bends in front and rear axles		○			
Check lock washers		○			
Drive chain adjustment		○			
Drive chain oil level		○			

** Retighten every 10 hours from the first use.

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

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
Oil pump control box			○			
Pump drive cover			○			
Oil in the oil tank				○		YAMALUBE 2-cycle oil
DRIVE:						
Spider lever and pin, Spider roller and collar		○				Molybedenum disulfide snowmobile grease
Secondary shaft and sliding sheave		○				
Front axle housing		○				Light all-purpose grease
Shaft 1 and shaft 2 (Slide rail)			○			
Replace chain case oil		○				Gear oil API "GL-3" SAE #75 ~ #80
CHASSIS:						
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		○				
Ski retaining pin		○				
Brake cable end stopper and brake lever		○				Esso Beacon 325 grease

THROTTLE OVERRIDE SYSTEM

Description

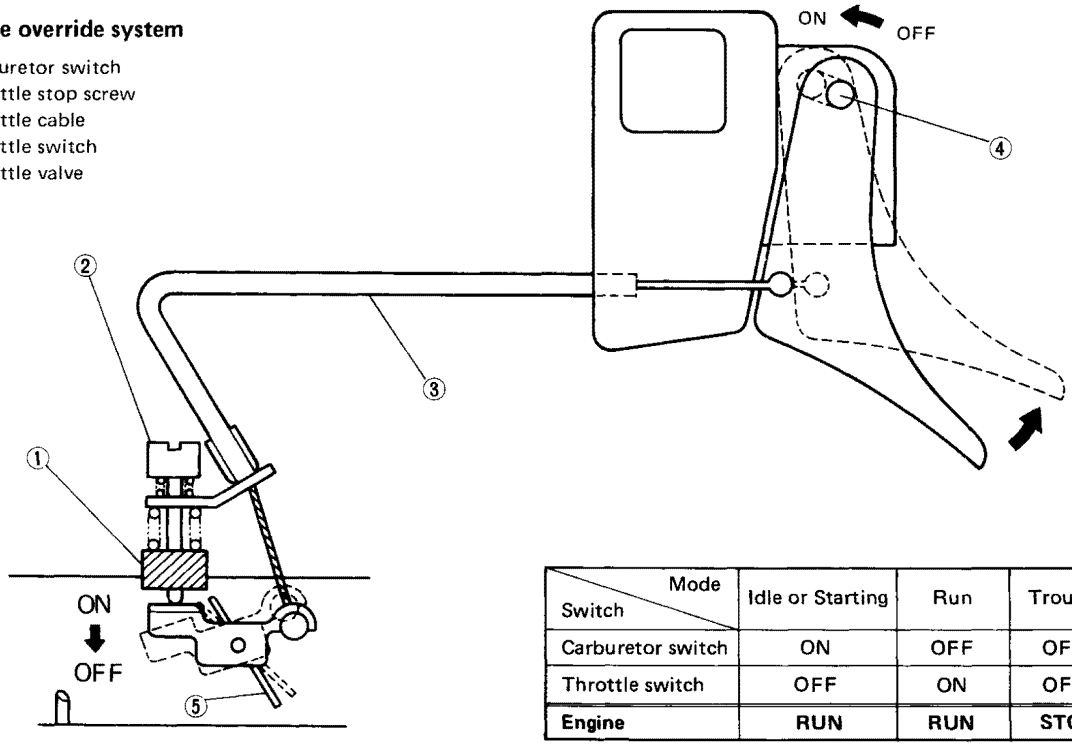
If during operation the throttle cable or carb should malfunction in anyway, remove your hand from the throttle lever. The throttle switch will be deactivated, the ignition circuit will be interrupted and the engine will stop.

WARNING:

Before restarting the engine, make sure that the cause of the malfunction has been corrected and that the engine can be operated without a problem.

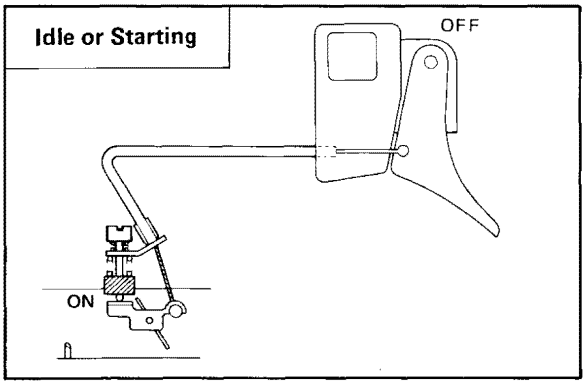
Throttle override system

1. Carburetor switch
2. Throttle stop screw
3. Throttle cable
4. Throttle switch
5. Throttle valve

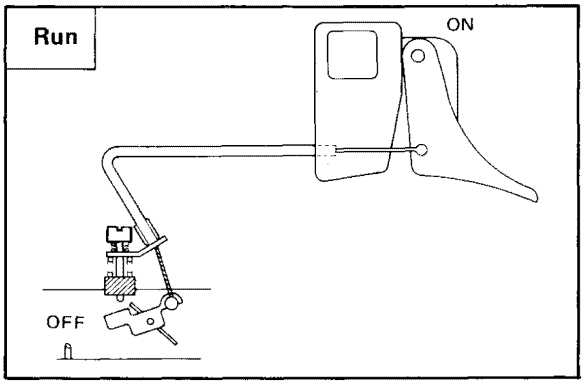


Switch \ Mode	Idle or Starting	Run	Trouble
Carburetor switch	ON	OFF	OFF
Throttle switch	OFF	ON	OFF
Engine	**RUN**	**RUN**	**STOP**

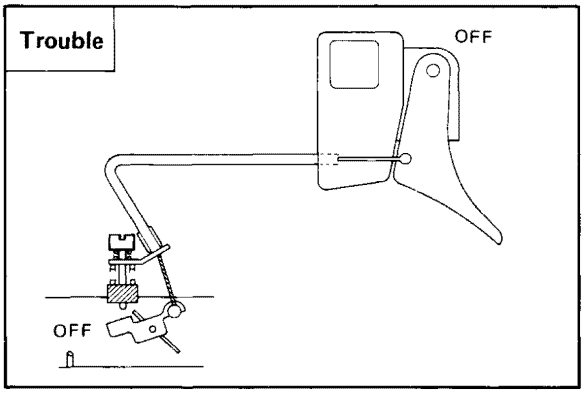
Idle or Starting



Run

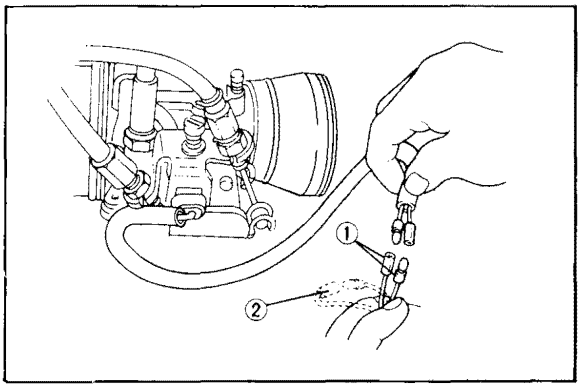


Trouble



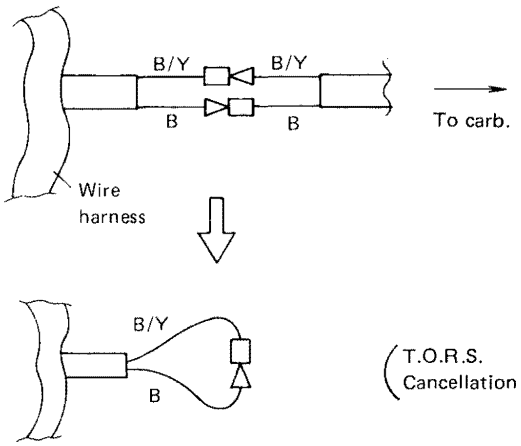
T.O.R.S. cancellation

If the engine cannot started due to carburetor switch or throttle switch failure, first separate the connections; then, short the circuit on the wire harness side. This will turn on the ignition circuit and the engine can be restarted. In this case, the throttle override system will not work. Go to your Yamaha dealer for immediate service.

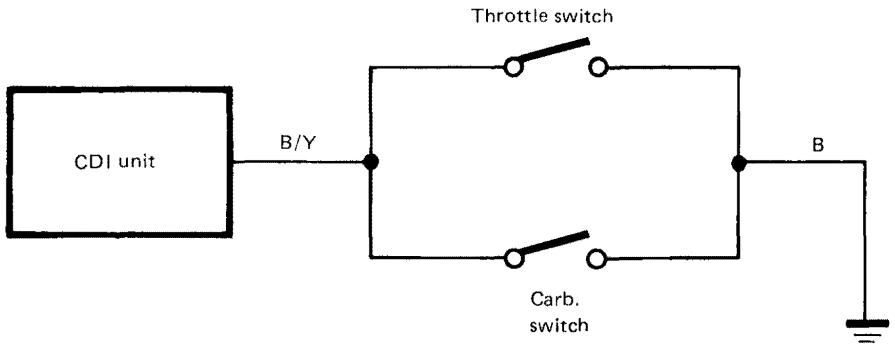


1. Lead from wire harness 2. Short

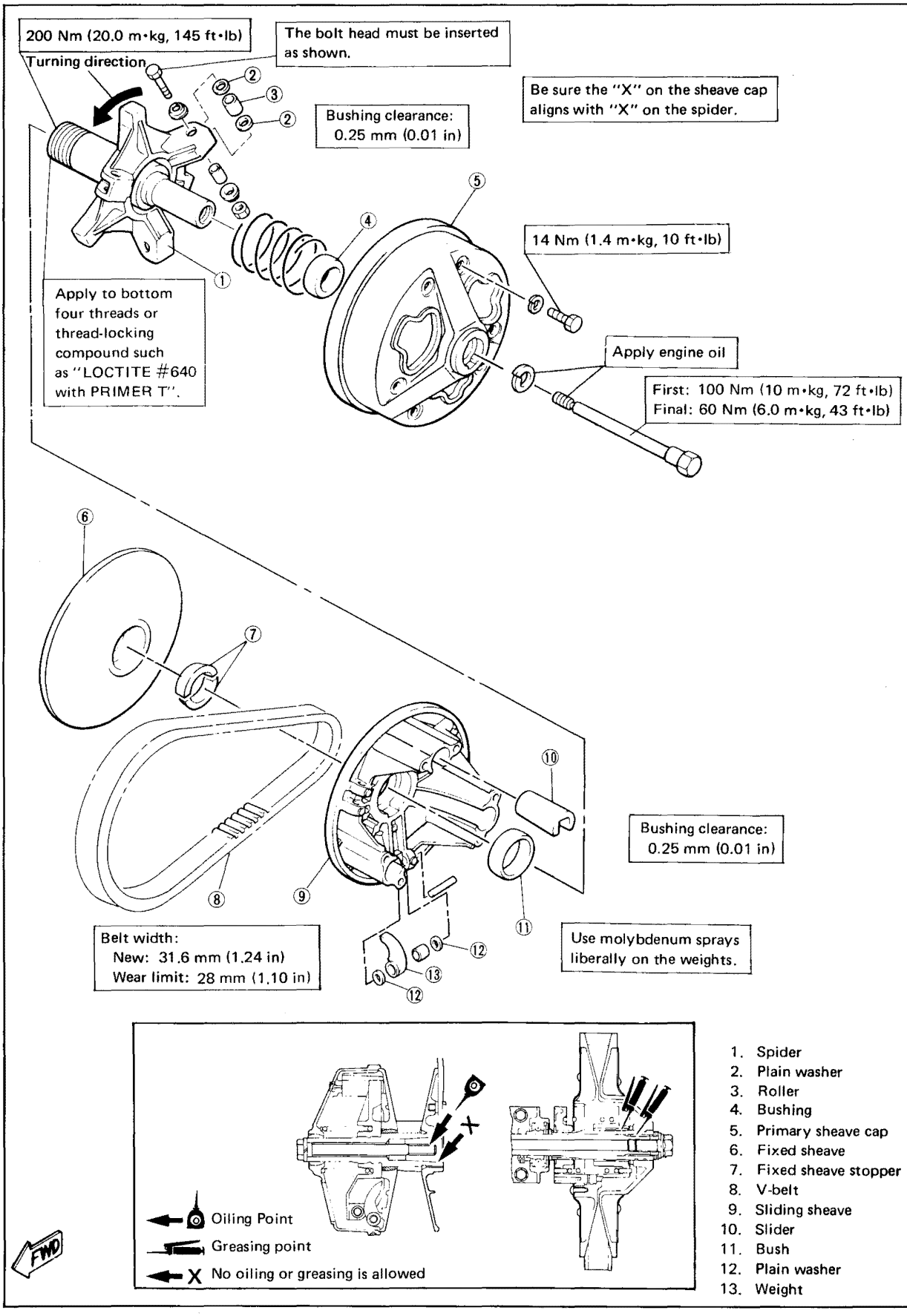
Leads connection



Block diagram



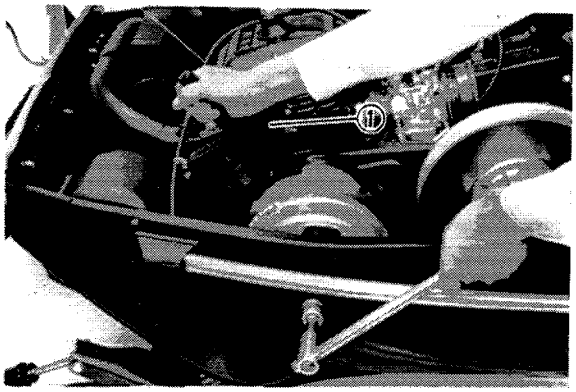
PRIMARY SHEAVE



1. Spider
2. Plain washer
3. Roller
4. Bushing
5. Primary sheave cap
6. Fixed sheave
7. Fixed sheave stopper
8. V-belt
9. Sliding sheave
10. Slider
11. Bush
12. Plain washer
13. Weight

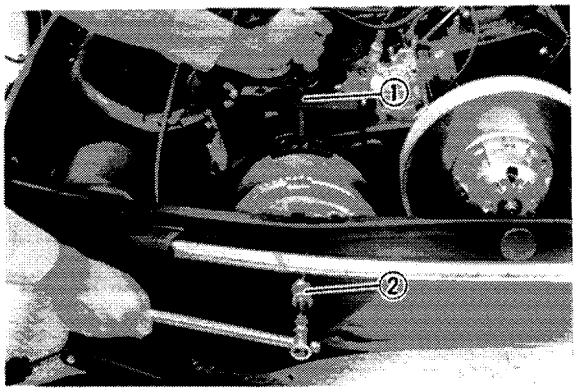
Removal

1. Remove the drive guard, and remove the V-belt.
2. Remove the blind cap, and remove the primary sheave mounting bolt with the Sheave Holder (special tool) as shown.



1. Sheave Holder (P/NO. YS-01880)

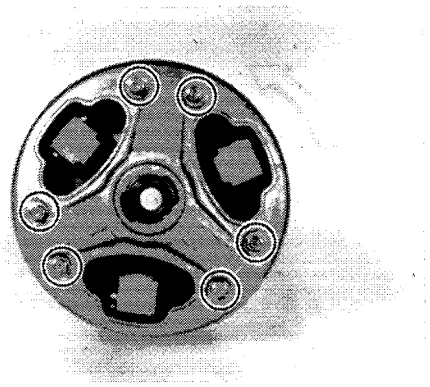
3. Remove the primary sheave assembly with the Sheave Holder (special tool) and Sheave Puller (special tool) as shown.



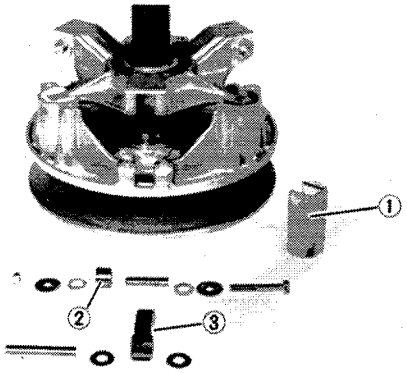
1. Sheave Holder (P/NO. YS-01880)
2. Sheave Puller (P/NO. YS-01882)

Disassembly

1. Loosen the six sheave cap securing bolts, and remove the sheave cap and spring.



2. Remove the sliders, rollers and weights.



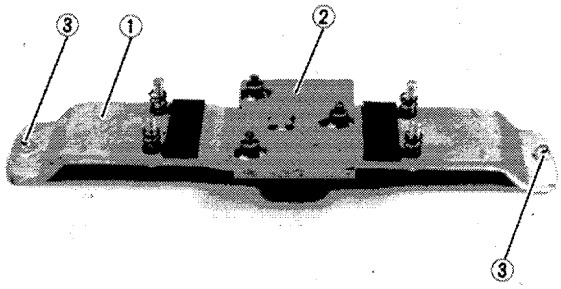
1. Slider 2. Roller 3. Weight

3. Remove the sliding sheave bush as follows.

NOTE:

For this operation, the special tools and LOCTITE #640 with PRIMER "T" (required for fixed sheave) are necessary. If these are unavailable, avoid disassembling.

a. Immerse the primary sheave assembly in appoximately 80°C (176°F) water for several minutes.
b. Hold the lower piece of the Clutch Spider Separator (special tool) on a rigid table using a suitable mounting bolts. Then, install the Clutch Separator Adapter onto the Separator.

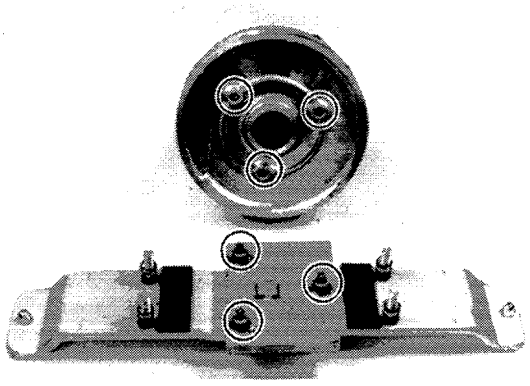


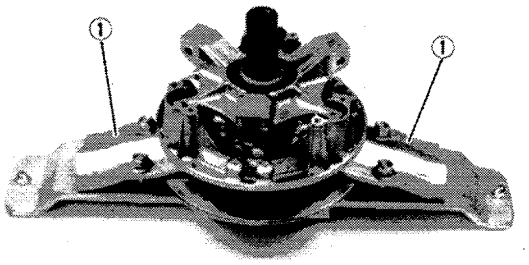
1. Lower piece of the Clutch Spider Separator (P/NO. YS-28890-A)
2. Clutch Separator Adapter (P/NO. YS-34480)
3. Mounting bolt

c. Fit the primary sheave assembly onto the Adapter, and secure the supporting plates.

NOTE:

Securely fit the projections of the Adapter into the fixed sheave holes.



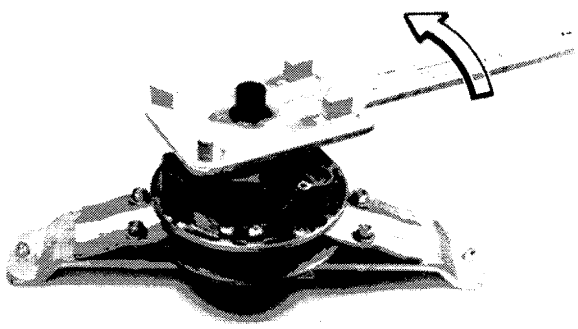


1. Supporting plate

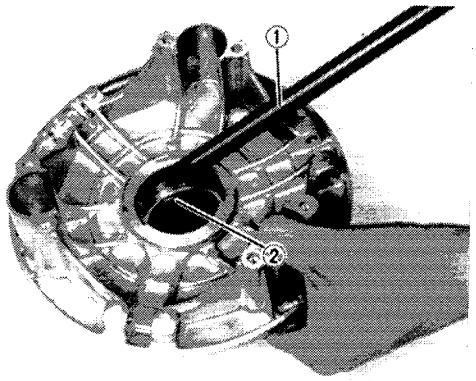
d. Set the upper piece of the Clutch Spider Separator onto the spider as shown.
e. Remove the fixed sheave and fixed sheave stopper by turning the Clutch Separator counterclockwise.

CAUTION:

To loosen the fixed sheave, high torque is required. Therefore, make sure the primary sheave and special tools are placed securely also take care not to crack the fixed sheave.



f. Remove the spider, sliding sheave and fixed sheave from the Clutch Spider Separator.
g. Remove the sliding sheave bush from the sliding sheave with Bushing Tool (special tool) as shown.

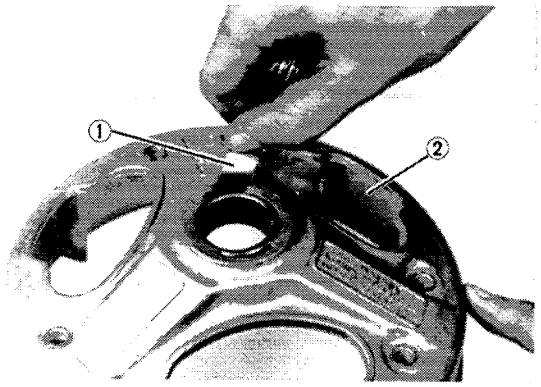


1. Bushing Tool (special tool) 2. Bush

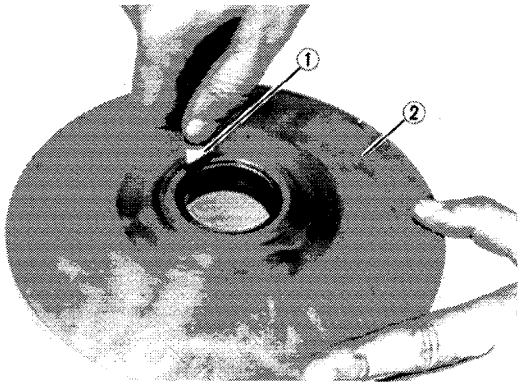
Inspection

1. Inspect the tapered ends of the crankshaft and fixed sheave for scratches. If either is severely scratched, replace it. If scratches are minor, burnish the component with emery cloth.
2. Check the primary sheave cap bush and sliding sheave bush for wear. If worn beyond tolerance, replace the bush.

	Primary sheave cap	Sliding sheave
Bush clearance <Limit>	0.25 mm (0.01 in)	0.25 mm (0.01 in)

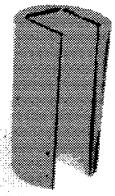


1. Feeler gauge 2. Primary sheave cap

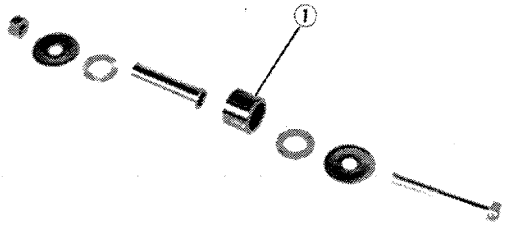


1. Feeler gauge 2. Sliding sheave

3. Inspect the sliders for scratches or other damage. If any, replace them.

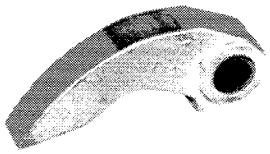


4. Inspect the rollers for wear. If any, replace them.

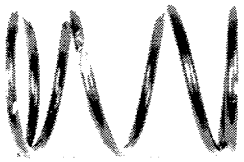


1. Roller

5. Inspect the weights for wear. If any, replace them.



6. Check the spring. Replace it, if it is fatigued or damaged.



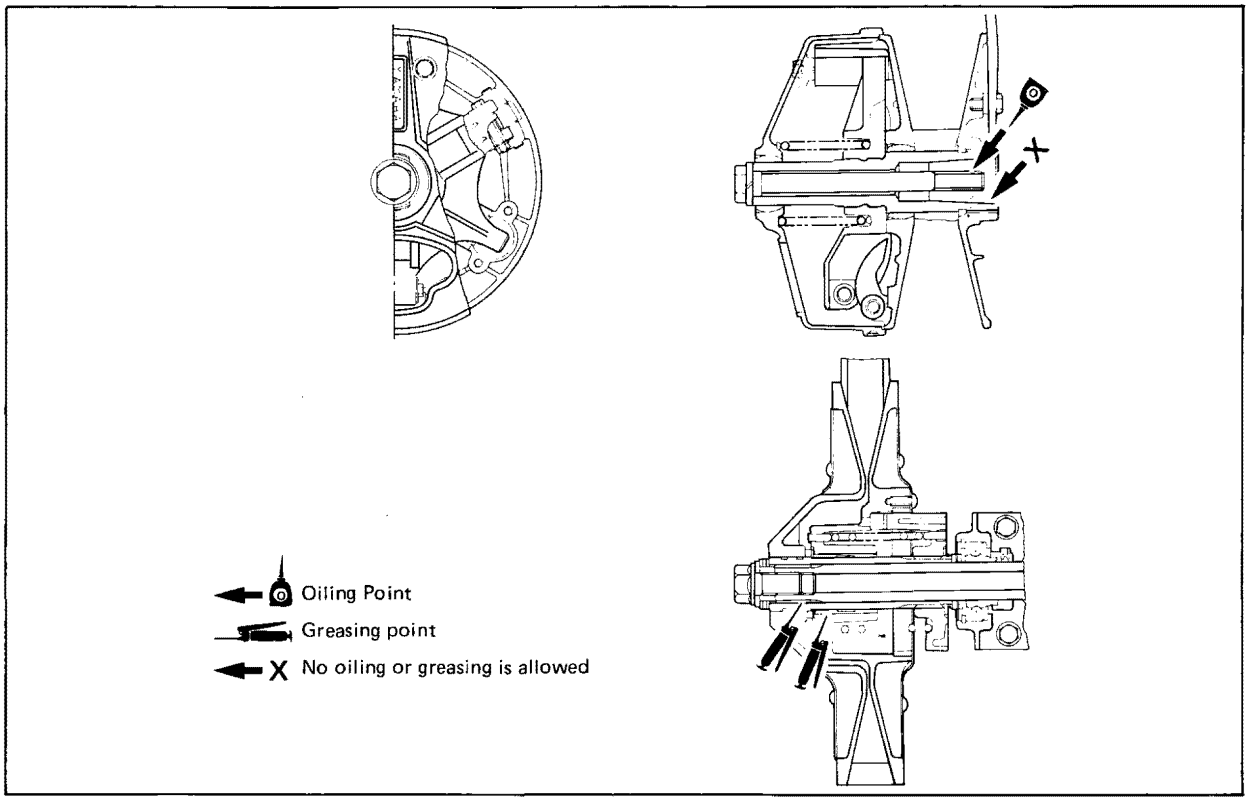
Reassembly

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

1. Before reassembling the primary sheave, the sheaves should be lubricated with the low-temperature grease and motor oil as illustrated.

CAUTION:

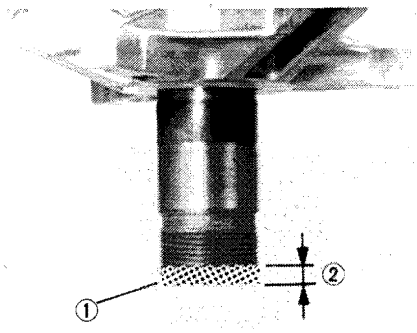
Do not apply grease to the area marked X. For other parts, oiling is unnecessary.



2. Before tightening the fixed sheave, apply thread-locking compound as LOCTITE #640 with PRIMER "T" to the thread portion (bottom four threads) of the spider.

CAUTION:

1. **LOCTITE should be applied only to the specified area. Never apply to the other areas.**
2. **Do not use the clutch until LOCTITE has completely cured.**



1. Apply LOCTITE #640 with PRIMER "T"
2. 4 threads

3. Tighten the fixed sheave with the special tools to specification.

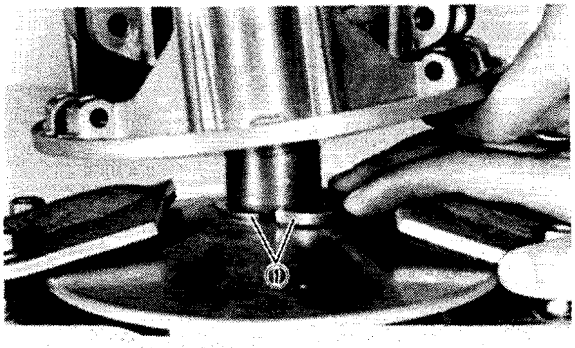
NOTE:

Before securing the fixed sheave, fit the fixed sheave stoppers onto the spider shaft.

CAUTION:

To tighten the fixed sheave, high torque is required. Therefore, make sure the primary sheave, vise and special tools are placed securely also take care not to crack the fixed sheave.

Tightening torque:
200 Nm (20.0 m·kg, 145 ft·lb)

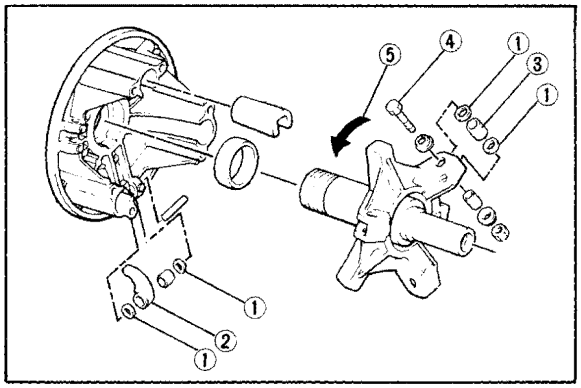


1. Fixed sheave stopper

4. Install the rollers and weights into the sliding sheave and spider.
   Torque the roller securing bolts to specification.

NOTE:
1. Be sure there is a washer on each side of the roller and weight.
2. The bolt head must be to the right of the roller as show in the illustration.

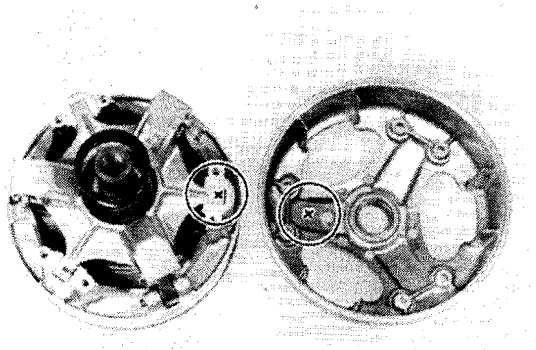
Tightening torque:
5 Nm (0.5 m·kg, 3.6 ft·lb)



1. Washer
2. Weight
3. Roller
4. Bolt
5. Turning direction

5. Install the primary sheave cap onto the spider as shown.

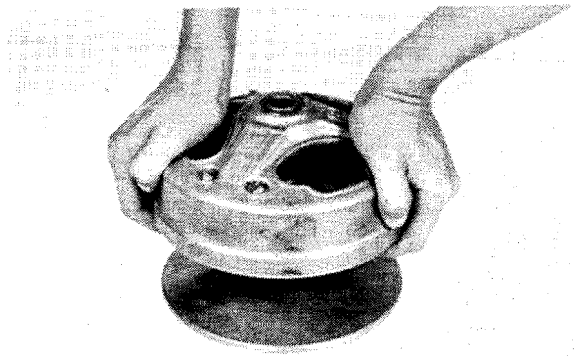
NOTE:
1. Before installing the primary sheave cap, use molybdenum sprays liberally on the weights.
2. Be sure the "X" on the sheave cap aligns with the "X" on the spider.



6. Secure the primary sheave cap with the securing bolts. Torque the bolts to specification.

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

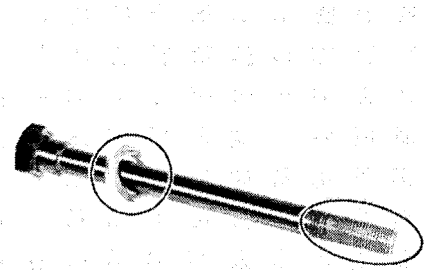
Tightening torque:
14 Nm (1.4 m·kg, 10 ft·lb)



Installation

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

1. Before installing the primary sheave, clean the oil off the tapered portion of the crankshaft using a lacquer thinner.
2. Before tightening the primary sheave mounting bolt, apply engine oil to the thread portion of the mounting bolt and its contact surface with the spring washer.



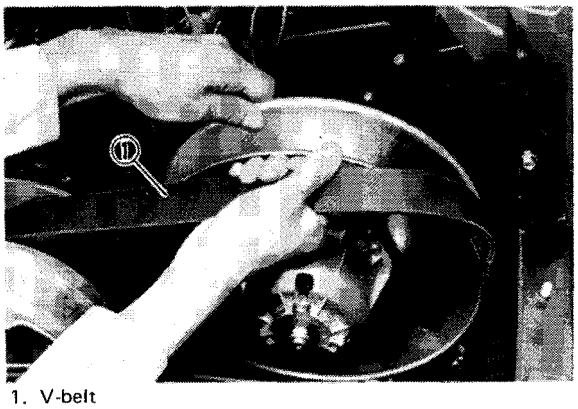
3. Tighten the mounting bolts with the special tools to specification.

Tightening torque:
A: 100 Nm (10 m·kg, 72 ft·lb)
B: 60 Nm (6.0 m·kg, 43 ft·lb)
Tighten the bolt to A to properly seat the primary sheave on the crankshaft. Loosen the bolt, then torque it to B, the final torque.

V-BELT

Removal

1. Turn the secondary sliding sheave clockwise, and push it towards the chain case.
2. While holding the sliding sheave in this compressed position, remove the V-belt from the secondary sheave. Then, remove it from the primary sheave.

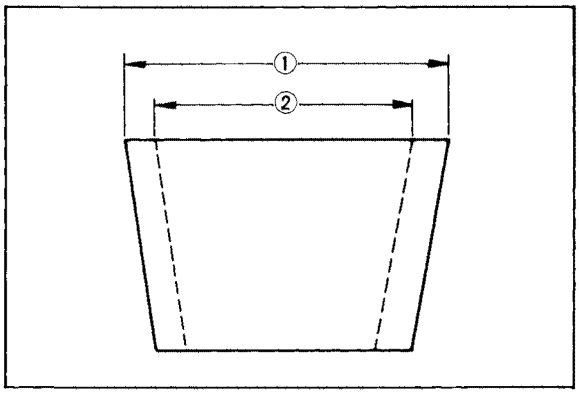


1. V-belt

Inspection

1. Visually inspect the V-belt for signs of damage. Replace the belt, if it is damaged.
2. Measure the width of the V-belt. If the belt is worn beyond the wear limit, replace it.

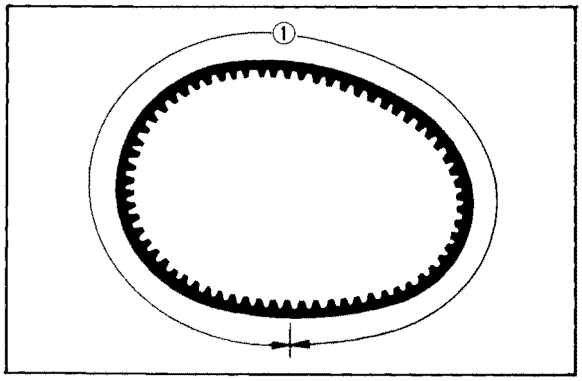
Belt width:
New: 31.6 mm (1.24 in)
Wear limit: 28.0 mm (1.10 in)



1. New 2. Wear limit

3. Measure the length of the V-belt. It should be within specification; if not, replace the belt.

Belt length:
1,099 mm (43.26 in)



1. V-belt length

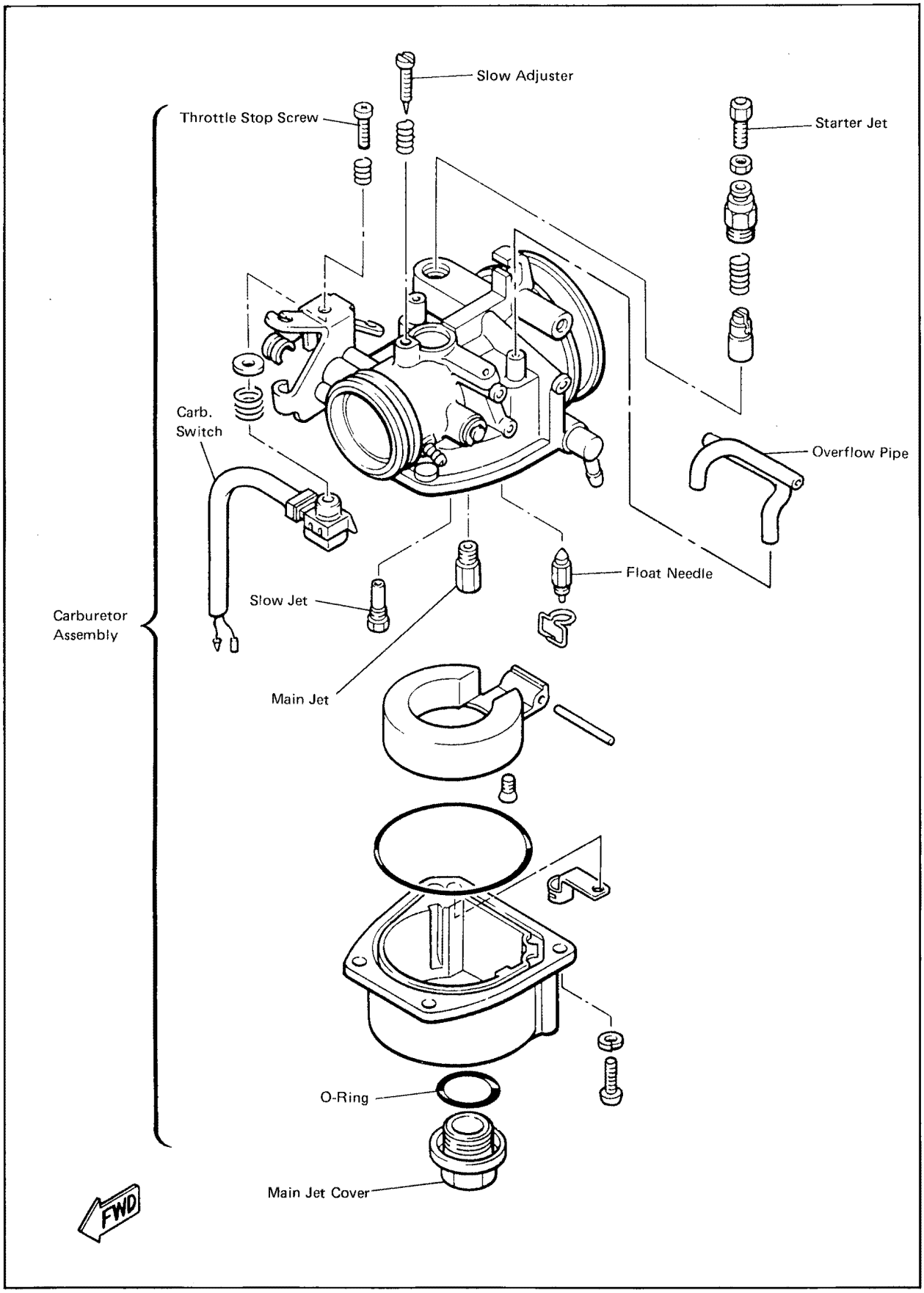
Reassembly

When reassembly the V-belt, reverse the removal procedure. Note the following points:

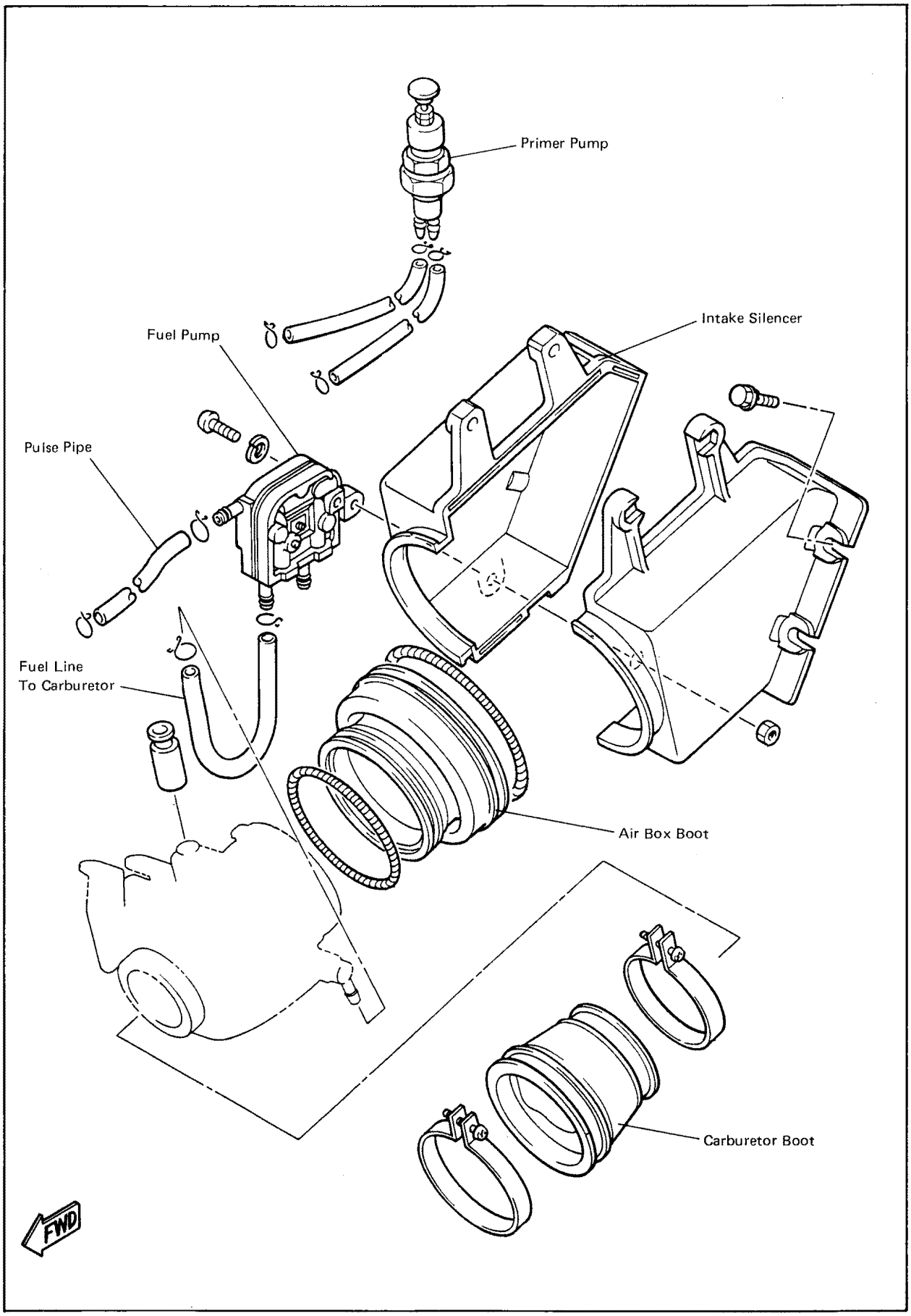
1. Before installing the V-belt, clean the oil off the fixed sheaves and sliding sheaves using a lacquer thinner.

EXPLODED DIAGRAM

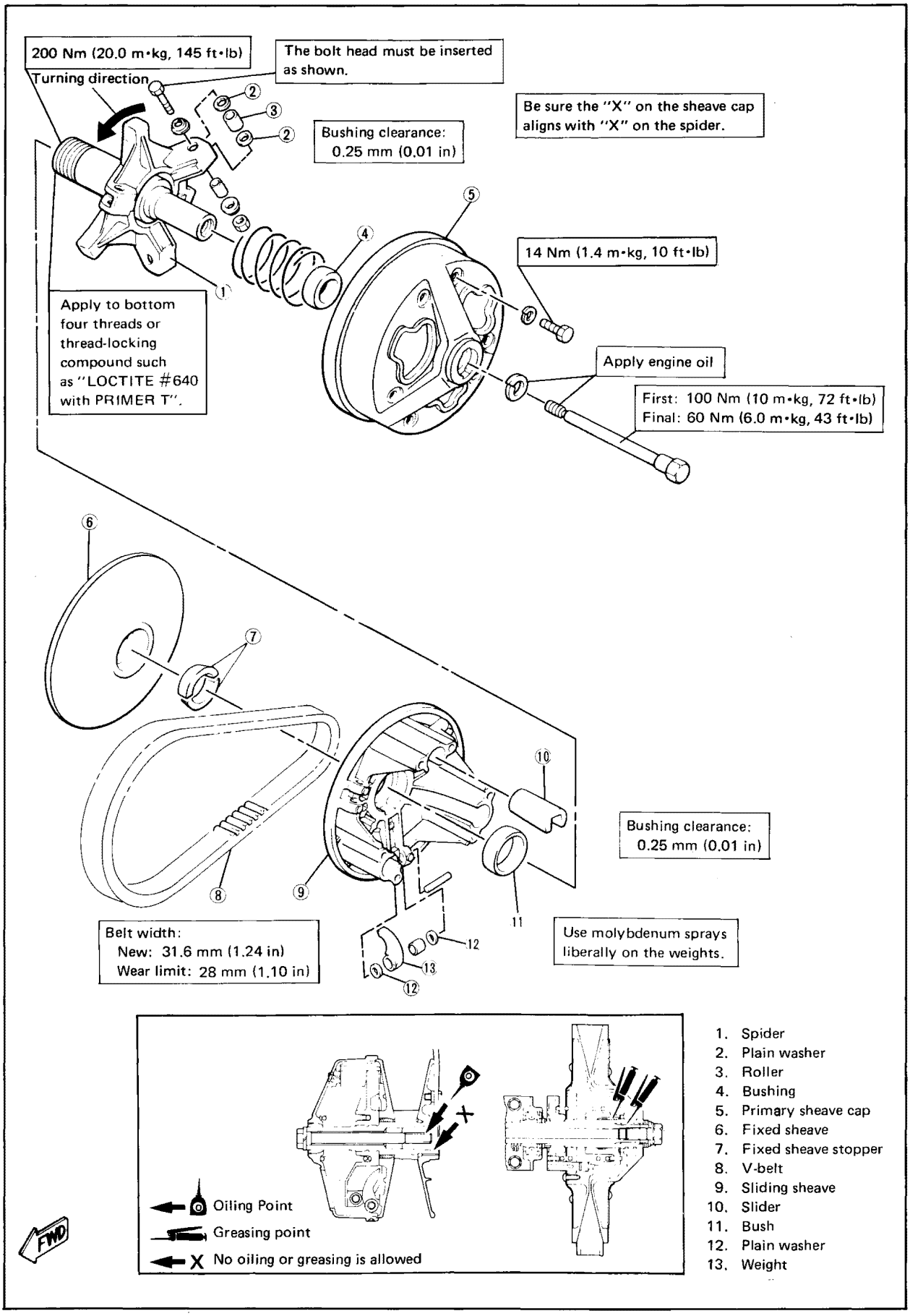
CARBURETOR



INTAKE

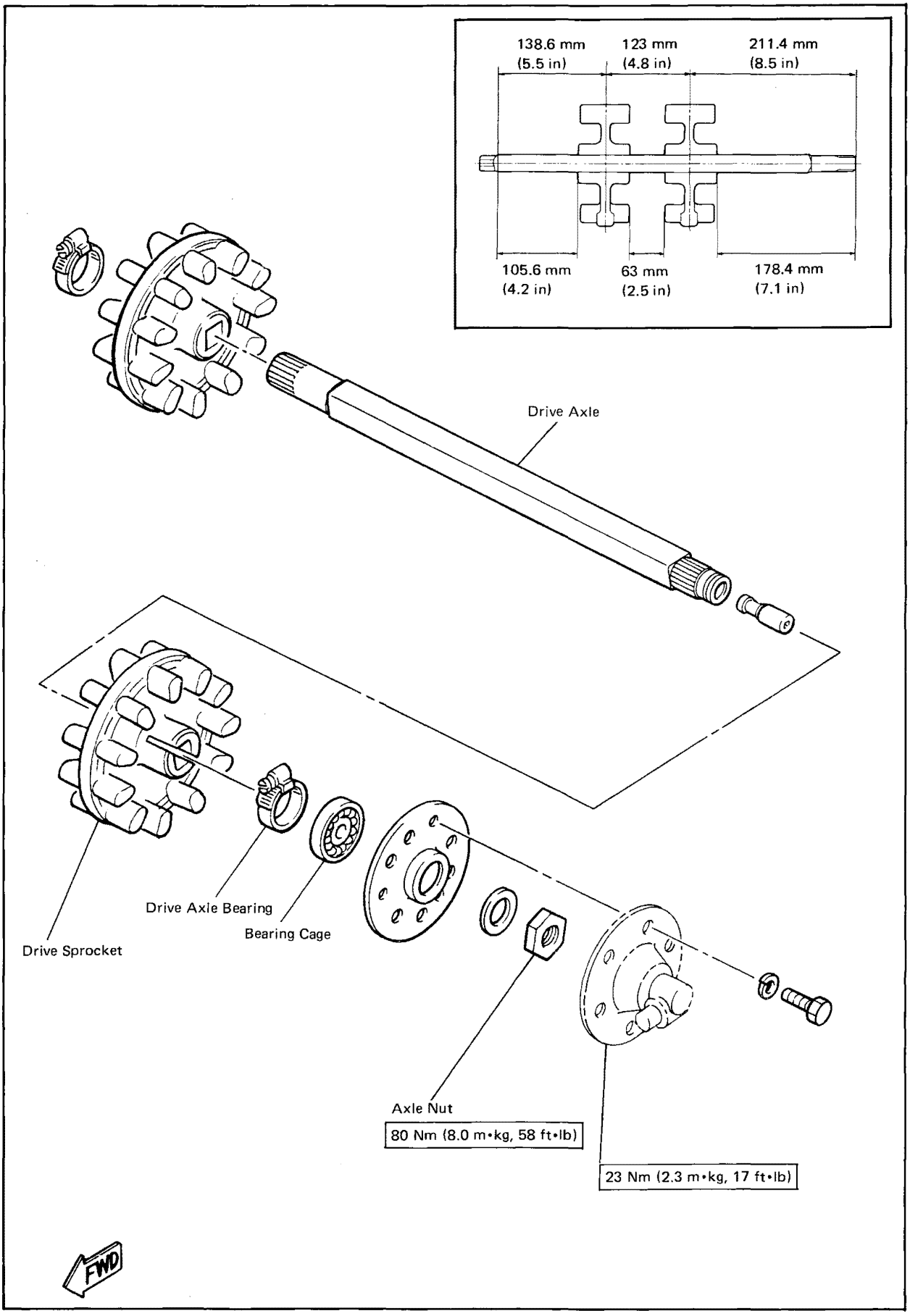


PRIMARY SHEAVE

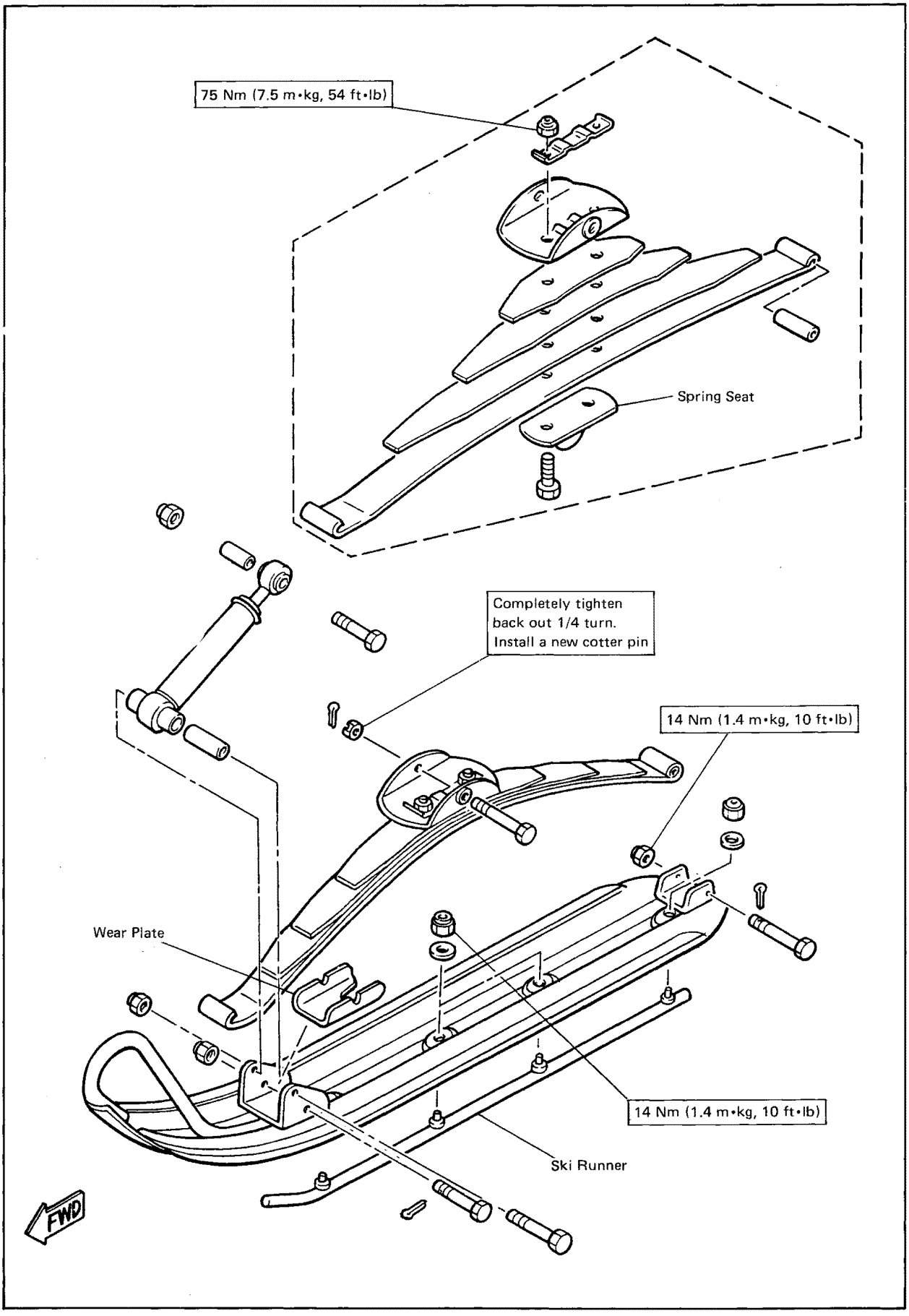


1. Spider
2. Plain washer
3. Roller
4. Bushing
5. Primary sheave cap
6. Fixed sheave
7. Fixed sheave stopper
8. V-belt
9. Sliding sheave
10. Slider
11. Bush
12. Plain washer
13. Weight

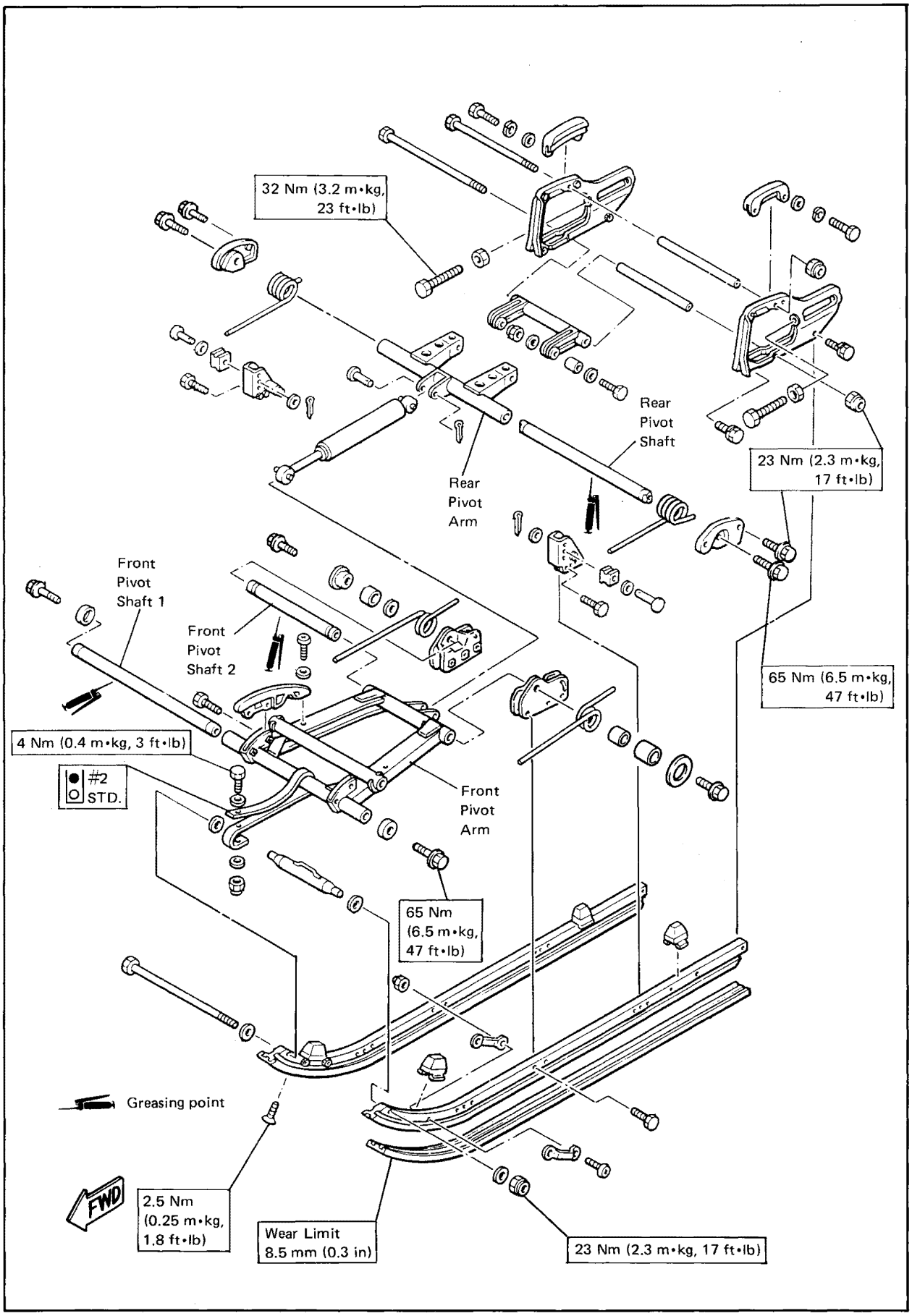
DRIVE AXLE



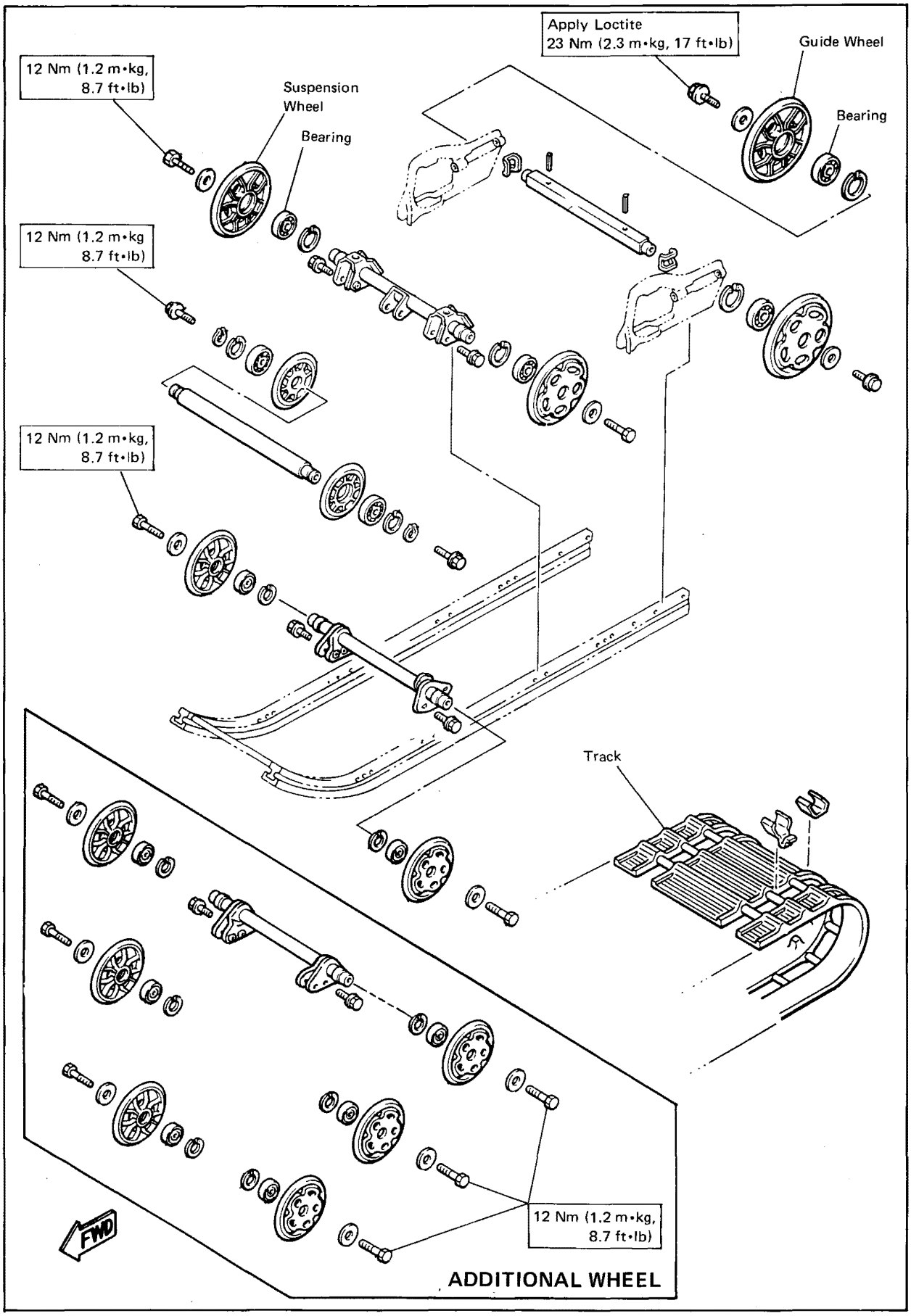
SKI



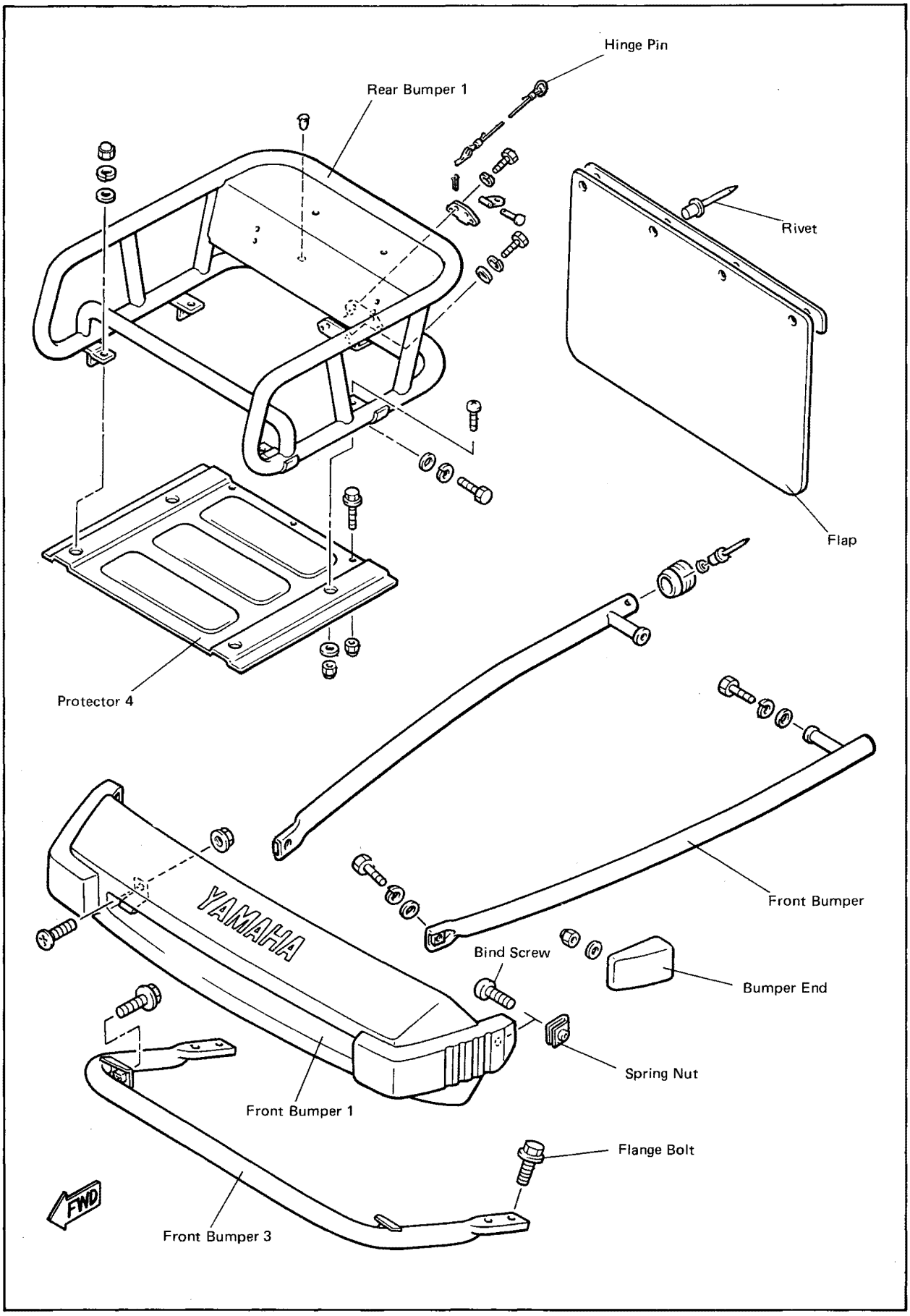
SLIDE RAIL



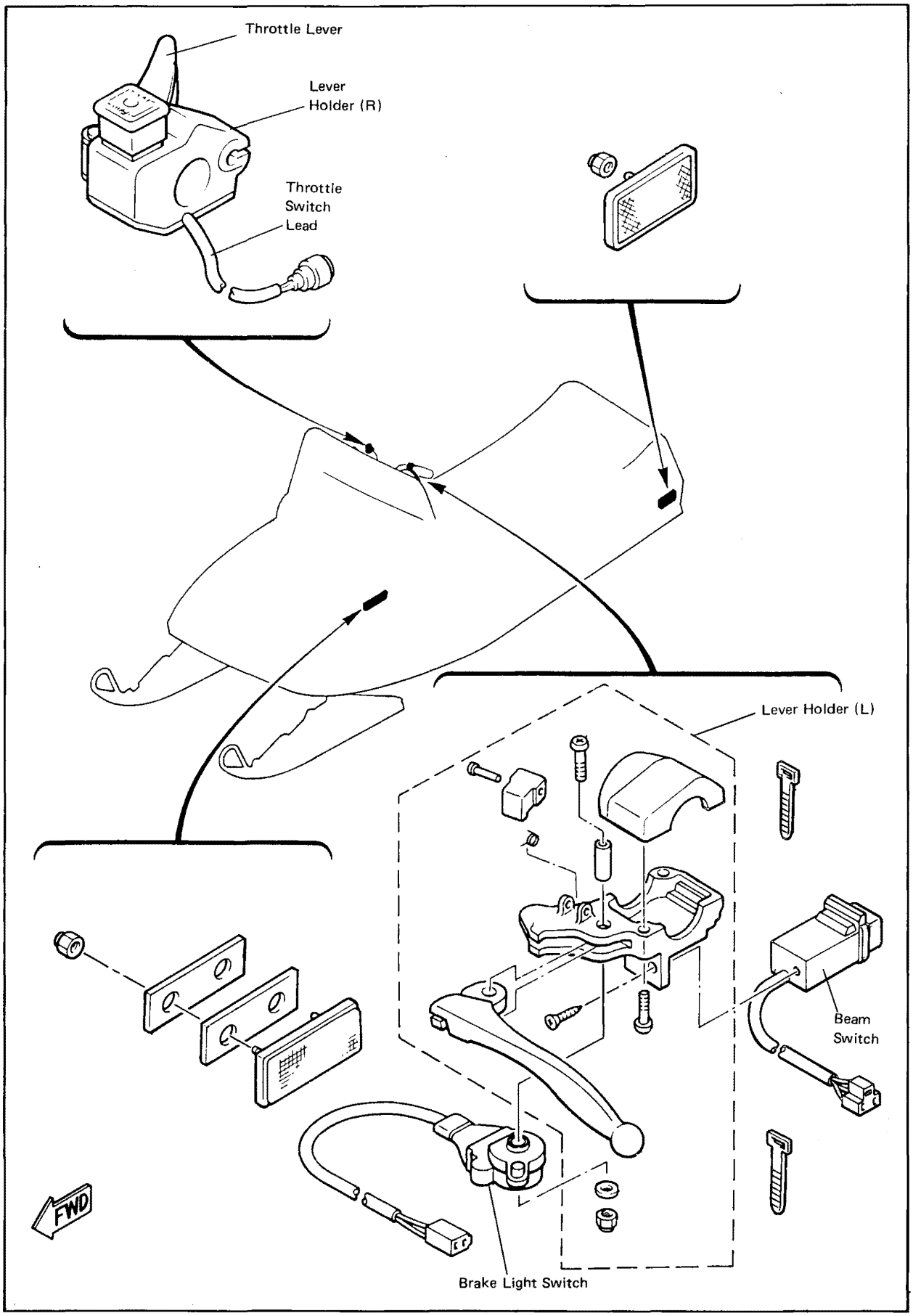
SUSPENSION WHEELS



BUMPER



ELECTRICAL COMPONENTS



SPECIFICATIONS

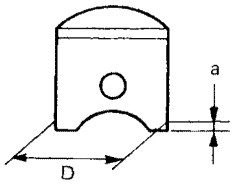
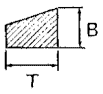
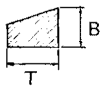
GENERAL SPECIFICATIONS

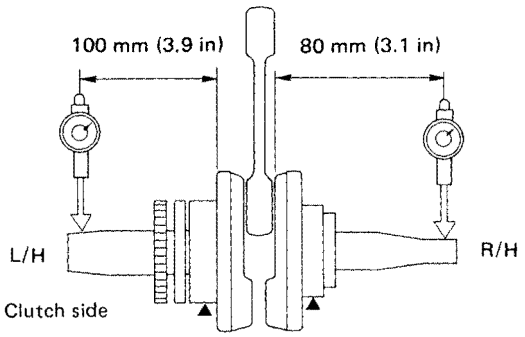
Model	BR250TJ
Model Code Number:	8Y1
Frame Starting Number:	8Y1-000101
Engine Starting Number:	8Y1-000101
Dimensions:	
Overall Length	2,925 mm (115.2 in)
Overall Width	950 mm (37.4 in)
Overall Height	1,115 mm (43.9 in)
Weight:	
With Oil and Full Fuel Tank	184 kg (406 lb)
Engine:	
Engine Type	Two-stroke
Cooling System	Axial fan air cooled
Cylinder Arrangement	Forward-incline, single cylinder
Displacement	246 cm^3 (15.0 cu.in)
Bore x Stroke	70 x 64 mm (2.76 x 2.52 in)
Compression Ratio	6.1 : 1
Starting System	Recoil hand starter
Lubrication System:	YAMAHA Autolube system
Engine Oil:	
Type	YAMALUBE 2-cycle oil
Tank Capacity	1.75 L (1.54 Imp qt, 1.85 US qt)
Transmission Oil:	
Type	Gear oil API "GL-3" (SAE # 75 ~ # 80)
Capacity	0.20 L (0.18 Imp qt, 0.21 US qt)
Fuel:	
Type	Regular gasoline
Tank Capacity	15.0 L (3.3 Imp gal, 4.0 US gal)
Carburetor:	
Type	BD32-28
Manufacturer	KEIHIN
Spark Plug:	
Type	BR8HS
Manufacturer	NGK
Gap	0.6 ~ 0.7 mm (0.024 ~ 0.028 in)
Transmission:	
Primary Reduction System	V-Belt
Primary Reduction Ratio	3.5 : 1 ~ 1 : 1
Clutch type	Automatic centrifugal engagement
Secondary Reduction System	Chain (# 40K-1)
Secondary Reduction Ratio	24/11 (2.18)
Reverse System	No
Chassis:	
Frame Type	Monocock (Steel)
Caster	25°
Ski Stance	750 mm (29.5 in)

Model	BR250TJ
Suspension:	
Front Suspension Type	Leaf spring, oil damper
Rear Suspension Type	Slide rail
Track:	
Track Type	Internal drive type
Track Width	381 mm (15.0 in)
Length on Ground	1,110 mm (43.7 in)
Track Deflection	40 ~ 50 mm (1.57 ~ 1.97 in)/10 kg (22 lb)
Brake:	
Brake Type	Disc brake (Caliper swing type)
Operation	Left hand
Electrical:	
Ignition System	C.D.I. ignition
Generator System	Flywheel magneto
Battery Type	—
Battery Capacity	—
Headlight:	
Type	Halogen light
Bulb Wattage x Pcs:	
Headlight	60/55W x 1
Tail/Brake Light	8W/23W x 1
Meter Light	3.4W x 1

MAINTENANCE SPECIFICATIONS

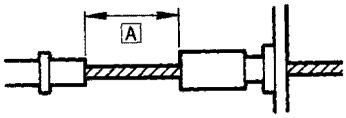
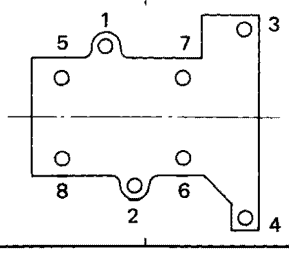
Engine

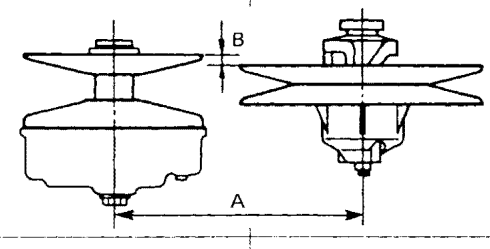
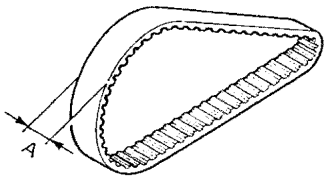
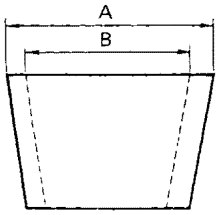
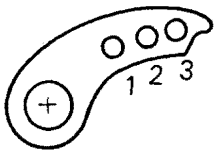
Model		BR250TJ
Cylinder head:		
Volume (With spark plug)		33.1 ~ 33.7 cm^3 (2.02 ~ 2.06 cu.in)
Warp Limit		—
Cylinder:		
Material		Aluminum alloy with special cast iron sleeve
Bore Size		70.000 ~ 70.020 mm (2.756 ~ 2.757 in)
Taper Limit		< 0.05 mm (0.0020 in) >
Out-of-Round Limit		< 0.01 mm (0.0004 in) >
Piston:		
Piston Size (D)/Measuring Point (a)		69.950 ~ 69.980 mm (2.754 ~ 2.755 in)/ 10 mm (0.394 in)
		
Clearance between Piston & Cylinder		0.045 ~ 0.050 mm (0.0018 ~ 0.0020 in)
Oversize	1st	72.25 mm (2.845 in)
	2nd	72.50 mm (2.854 in)
	3rd	—
	4th	—
Piston Pin Hole Off-Set		1.0 mm (0.04 in) Exhaust side
Piston Pin:		
Outside Diameter x Length		18 x 55 mm (0.71 x 2.71 in)
Piston Ring:		
Sectional Sketch	Top Ring	 Keystone B = 1.2 mm (0.047 in) T = 2.8 mm (0.110 in)
	2nd Ring	 Plain B = 1.2 mm (0.047 in) T = 2.8 mm (0.110 in)
End Gap (Installed)	Top Ring	0.20 ~ 0.40 mm (0.0079 ~ 0.00157 in)
	2nd Ring	0.20 ~ 0.40 mm (0.0079 ~ 0.00157 in)
Side Clearance	Top Ring	0.03 ~ 0.07 mm (0.0008 ~ 0.0024 in)
	2nd Ring	0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)
Coating	Top Ring	Parkerizing
	2nd Ring	Parkerizing

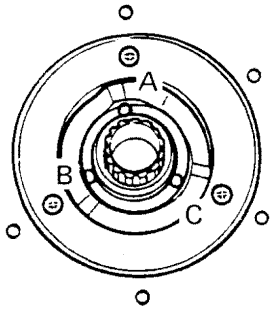
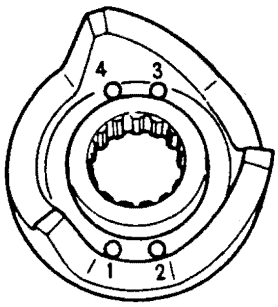
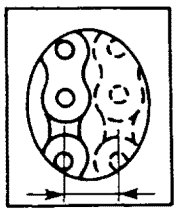
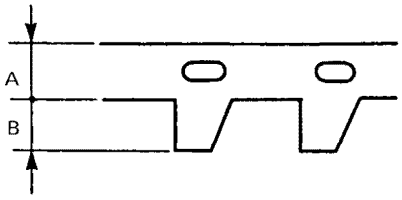
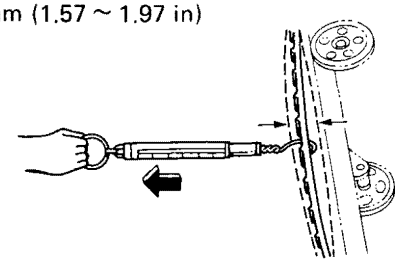
Model	BR250TJ
Crankshaft:	
Crank Width "F"	–
Assembly Width "A"	55.95 ~ 56.00 mm (2.202 ~ 2.362 in)
Connecting Rod Small End Free Play "B"	2.0 mm (0.080 in)
Connecting Rod Big End Clearance "C"	0.25 ~ 0.75 mm (0.010 ~ 0.030 in)
Crankshaft Deflection "D":	
Measuring Point – 1	0.02 mm (0.0008 in)
– 2	0.02 mm (0.0008 in)
– 3	–
– 4	–
Inside Diameter for Crank Pin	23.900 ~ 23.915 mm (0.941 ~ 0.942 in)
	
Big End Bearing:	
Type	Needle bearing
Small End Bearing:	
Type	Needle bearing
Crank Pin:	
Outside Dia.	23.987 ~ 24.000 mm (0.9444 ~ 0.9449 in)
Crank Bearing:	
Type Quantity:	
Crankshaft Left	# 6306
Crankshaft Center	–
Crankshaft Right	# 6305
Crank Oil Seal:	
Type/Size Quantity:	
Crankshaft Left	SD3-30, 72, 71, GS
Crankshaft Center	–
Crankshaft Right	SD5-25, 48, 8, GS
Connecting Rod:	
Parallel Limit	< 0.05 mm (0.0020 in) >
Intake:	
Type	Piston valve
Carburetor:	
Type/Manufacturer Quantity	BD32-28/KEIHIN
I.D. Mark	80J00
Main Jet (M.J.)	# 105
Main Air Jet (M.A.J.)	–
Jet Needle	–
Needle Jet	–
Pilot Jet (P.J.)	# 78
Pilot Air Jet (P.A.J.)	# 100
Air Screw (A.S.)	1 and 1/4 turns out
Power Jet (Pw.J.)	–

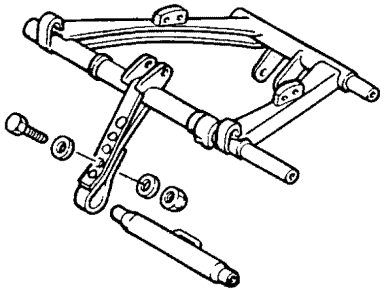
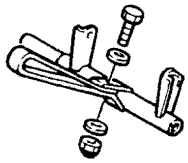
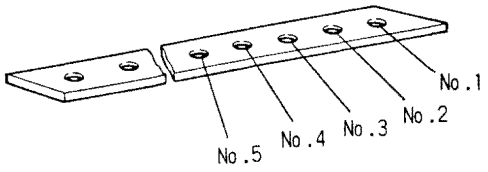
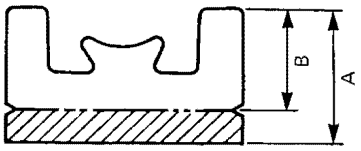
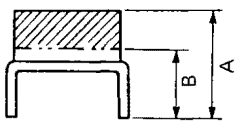
Model		BR250TJ
Power Air Jet	(Pw.A.J.)	–
Starter Jet	(G.S.)	# 120
Valve Seat Size	(V.S.)	ϕ 1.4
Idling Engine Speed		1,100 ± 100 r/min
Float Arm Height	(F.H.)	15 ± 2.0 mm (0.59 ± 0.08 in)
High Altitude Tuning		

Altitude \ Temperature	−30°C (−22°F)	−20°C (−4°F)	−10°C (14°F)	0°C (32°F)	10°C (50°F)	20°C (68°F)
Sea level	#105					#102
~600 m (2,000 ft)	#105				#102	
~1,200 m (4,000 ft)	#105			#102		
~1,800 m (6,000 ft)	#102				#100	
~2,400 m (8,000 ft)	#102			#100		
~3,000 m (10,000 ft)	#100				#98	

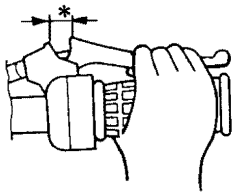
Fuel Pump:	
Type/Manufacturer Quantity	Diaphragm type/KEIHIN/1
Oil Pump:	
Color Code	Pink
Plunger Diameter	5.5 mm (0.16 in)
Minimum Stroke	0.20 ~ 0.25 mm (0.0079 ~ 0.0098 in)
Maximum Stroke	1.65 ~ 1.87 mm (0.0650 ~ 0.0736 in)
Reduction Ratio	1/45
Minimum Output (at 200 stroke)	0.95 ~ 1.19 cm^3 (0.033 ~ 0.042 Imp oz, 0.032 ~ 0.040 US oz)
Maximum Output (at 200 stroke)	7.84 ~ 8.89 cm^3 (0.276 ~ 0.313 Imp oz, 0.265 ~ 0.301 US oz)
Pump Cable Adjustment	24 ~ 26 mm (0.94 ~ 1.02 in) 
Cooling System:	
Cooling Fan Belt Tension	–
Crankcase Tightening Sequence:	

Model	BR250TJ
Transmission:	
Type	V-belt Automatic
Range of Ratio	3.5 : 1 ~ 1 : 1
Engagement RPM	Approx. 2,800 r/min
Shift RPM	Approx. 5,700 r/min
Sheave Center Distance "A"	266 mm (10.47 in)
Sheave Offset "B"	11 mm (0.433 in)
	
V-belt:	
Part No.	8F2-17641-00
Outside Circumference	1,099 mm (43.26 in)
Width "A"	31.6 mm (1.24 in)
Wear Limit "B"	28.0 mm (1.10 in)
	
Primary Sheave Spring:	
Part No.	90501-553A5
Color Code	Gold-Red
Outside Dia. x Wire Dia.	55.0 x 5.5 mm (2.165 x 0.217 in)
Pre-load/Set Length	14 kg/61.5 mm (2.42 in)
Spring Rate	2.64 kg/mm
No. of Coils	4.9
Free Length	66.8 mm (2.63 in)
Primary Sheave Weight Arm:	
Part No.	8V0-17632-00
Weight x Quantity	46.1 g x 3 pcs
Additional Weight type	None
Hole Position	None
	

Model	BR250TJ
Secondary Sheave Spring:	
Part No.	90580-40080
Color Code	None
Outside Dia. x Wire Dia.	50 x 4.0 mm (1.968 x 0.157 in)
Twist Angle	160°
Hole Position (Sheave Side)*	–
(Spring Seat Side)**	–
* 	** 
Spring Rate	183 kg·mm/deg (15.9 lb·in/deg)
No. of Coils	9.9
Free Length	105 mm (4.13 in)
Color Code	–
Torque Cam Angle	48.5°
Drive Chain:	
Type	#40-1
No. of Links	44
Free Play 	8 ~ 15 mm (0.32 ~ 0.59 in)
Optional Sprocket:	
Drive Sprocket	11, 12, 13, 14
Driven Sprocket	21, 22, 23, 24
Track:	
Part No.	8X0-47110-00
Width x Length	381 x 3,456 mm (15.0 x 136.1 in)
Pitch x No. of Links	64 mm (2.52 in) x 54
Thickness "A"	5.5 mm (0.22 in)
Height "B" 	15.5 mm (0.61 in)
Deflection at 10 kg (22 lb)	40 ~ 50 mm (1.57 ~ 1.97 in) 

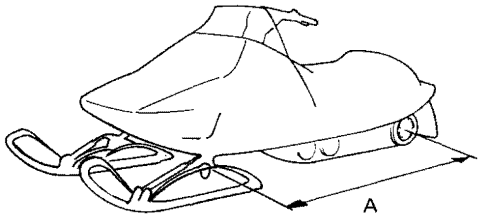
Model		BR250TJ
Track Suspension:		
Front Travel		102 mm (4.02 in)
Rear Travel		76 mm (2.99 in)
Front Suspension Spring:		
Spring Rate		305 kg/mm (17,080 lb/in)/deg
Wire Dia.		9.5 mm (0.37 in)
Rear Suspension Spring:		
Spring Rate		318.3 kg/mm (17,825 lb/in)/deg
Wire Dia.		10 mm (0.39 in)
Suspension Setting Position:		
Stopper Band Hole Position	Front	No. 2
	Rear	—
  		
Shock Absorber:		
Damping Force (Extension)	Front	48 kg (106 lb)/0.3 m/s
	Rear	48 kg (106 lb)/0.4 m/s
Damping Force (Compression)	Front	45 kg (99 lb)/0.3 m/s
	Rear	45 kg (99 lb)/0.3 m/s
Slide Runner:		
Thickness "A"		15 mm (0.59 in)
Wear Limit "B"		10 mm (0.39 in)
		
Track Drive Sprocket Wheel:		
Material		Polyethylene
No. on Teeth		7
Rear Guide Wheel:		
Material		Alminium
Outside Dia.		191 mm (7.52 in)
Brake:		
Pad Thickness "A"		7.3 mm (0.287 in)
Wear Limit "B"		1.0 mm (0.039 in)
		

Model	BR250TJ
Pad to Disc Clearance	0.2 ~ 1.0 mm (0.008 ~ 0.039 in)
Disc Outside Dia.	182 mm (7.16 in)
Disc Thickness	3.2 mm (0.13 in)
Brake Lever Free Play*	3.0 ~ 8.0 mm (0.12 ~ 0.32 in)



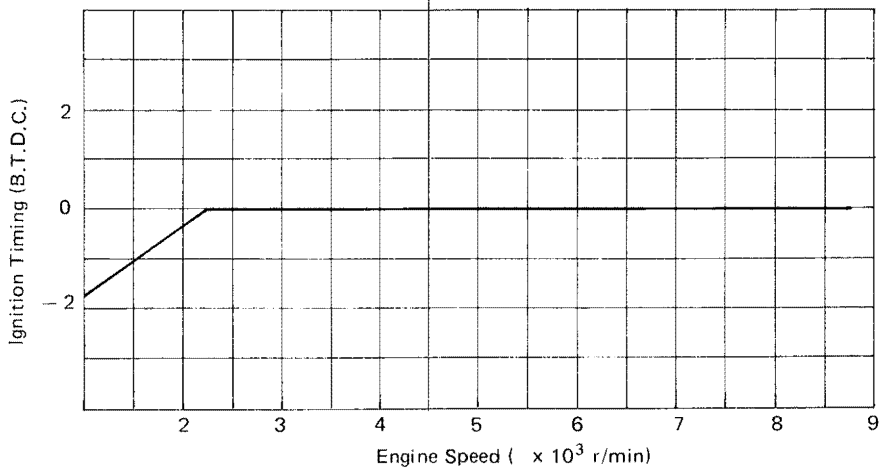
Chassis

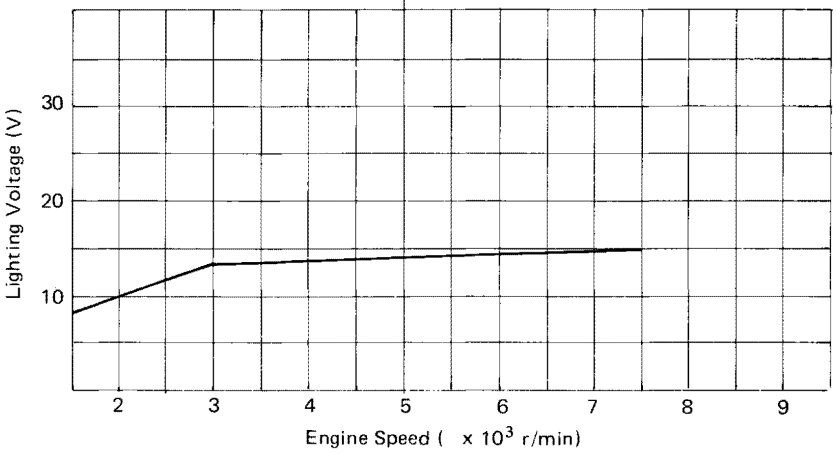
Model	BR250TJ
Frame:	
Frame Material	Steel
Seat Height	
Luggage Box Location	Between seat and shroud
Steering	
Steering Angle (Right)	55.0 mm (2.17 in)
Steering Angle (Left)	55.0 mm (2.17 in)
Ski Alignment	Toe-out
Ski Toe-out Size	0 ~ 15 mm (0 ~ 0.59 in)
Distance "A"	1,960 mm (77.0 in)



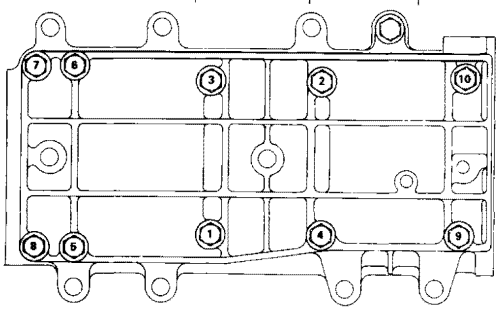
Electrical

Model		BR250TJ
Voltage:		12V
Ignition System:		
Ignition Timing	(B.T.D.C.)	1.6 mm (0.063 in) 16° at 5,500 r/min
Advanced Timing	(B.T.D.C.)	
Advancer Type		
CDI:		
Model/Manufacturer		F8R4/YAMAHA
Pickup Coil Resistance		20Ω ± 10% at 20°C (68°F)
Color Code		(W/R – B)
Charge Coil Resistance		426Ω ± 10% at 20°C (68°F)
Color Code		(Br – B)
CDI Unit Model/Manufacturer		80F/YAMAHA
Ignition Coil:		
Model/Manufacturer		F6T411/MITSUBISHI
Minimum Spark Gap		11 mm (0.43 in) at 3,000 r/min
Primary Winding Resistance		1.0Ω ± 15% at 20°C (68°F)
Secondary Winding Resistance		5.9 kΩ ± 15% at 20°C (68°F)
Ignition Coil:		
Model/Manufacturer		–
Minimum Spark Gap		–
Primary Winding Resistance		–
Secondary Winding Resistance		–
Spark Plug Cap:		
Type		Resin
Model/Manufacturer		L05E/NGK
Resistance		5.0 kΩ ± 25%
Flywheel Magneto:		
Model/Manufacturer		F8R4/YAMAHA
Charging Current-Day	(Min.)	–
	(Max.)	–
Charging Current-Night	(Min.)	–
	(Max.)	–



Model		BR250TJ
Charging Coil Resistance		–
Color Code		–
Lighting Voltage	(Min.)	11.8 V/3,000 r/min
	(Max.)	–
Lighting Coil Resistance		0.23Ω ± 20% at 20°C (68°F)
Color Code		Y – B
		
Coil Resistance for Grip Warmer		–
Color Code		–
Voltage Regulator:		
Type		A.C. Type
Model/Manufacturer		TR1Z-50/HITACHI, S8516B/TOSHIBA
No Load Regulated Voltage		13.3 ~ 14.3 V

Tightening torque

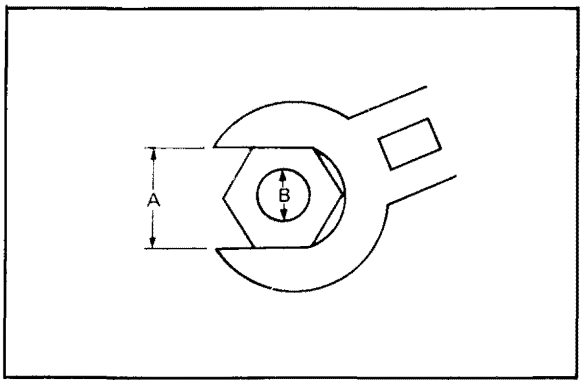
Part to be tightened	Tread size	Tightening torque			Remarks
		Nm	m·kg	ft·lb	
[Engine]					
Spark plug	M14 x P1.25	28	2.8	20	
Cylinder head (bolt)	M8 x P1.25	20	2.0	14	
Cylinder head (nut)	M10 x P1.25	25	2.5	18	
Flywheel magneto	M16 x P1.9	73	7.3	53	
Crankcase upper and lower					
First:	M8 x P1.25	10	1.0	7.2	
Final:		25	2.5	18	
Tightening sequence					
Crankcase and gear unit	M8 x P1.25	25	2.5	18	
Oil pump and gear unit	M5 x P0.8	8	0.8	5.8	with screw lock
Starter pulley	M8 x P1.25	15	1.5	11	
Crankcase and engine bracket	M8 x P1.25	25	2.5	18	
[Drive and track suspension]					
Primary sliding sheave and cap	M6 x P1.0	11	1.1	8.0	
Installation of primary sheave					
Initial:	UNF 1/2"	100	10	72	Use motor oil
		60	6.0	43	Loosen once and retighten.
Installation of secondary sheave	M12 x P1.25	40	4.0	29	
Bearing housing	M8 x P1.25	23	2.3	17	
Secondary shaft and bearing collar	Socket screw	6	0.6	4.3	
Brake cliper and housing chain	M10 x P1.25	50	5.0	36	
Installation of drive chain sprocket	M20 x P1.25	60	6.0	43	Bolt
Installation of driven chain sprocket	M6 x P1.0	5.8	0.58	4.2	Bolt
Chain housing and frame	M8 x P1.25	23	2.3	17	
Installation of front axle L.H. and bearing	M22 x P1.0	85	8.5	61	
Front axle housing and frame	M8 x P1.25	23	2.3	17	
Front pivot shaft	M10 x P1.25	65	6.5	47	
Rear pivot shaft	M10 x P1.25	65	6.5	47	
Guide wheel shaft	M12 x P1.25	80	8.0	58	
Sliding runner	M6 x P1.0	2.5	0.25	1.7	
Lower end bracket	M8 x P1.25	20	2.0	14	
Lower end bracket and absorber	M6 x P1.0	2	0.2	1.4	Loctite®
Front arm 1 and 2	M10 x P1.25	45	4.5	32	
Installation of ski	M10 x P1.25	45	4.5	32	
[Chassis]					
Engine mounting bolt	M10 x P1.25	52	5.2	37	
Ski runner	M8 x P1.25	14	1.4	10	Use self-locking nut and Loctite®

Part to be tightened	Thread size	Tightening torque			Remarks
		Nm	m·kg	ft·lb	
Steering column and gate	M8 x P1.25	13.7	1.37	10	Use lock washer
Steering tie rod adjusting nut	M10 x P1.25	25	2.5	18	Loctite®
Steering lower bracket	M8 x P1.25	13.7	1.37	10	Use lock washer
Installation of steering column 1, 2	M8 x P1.25	13.7	1.37	10	
Steering relay adjusting nut	M10 x P1.25	25	2.5	18	Loctite®

GENERAL TORQUE SPECIFICATIONS

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

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

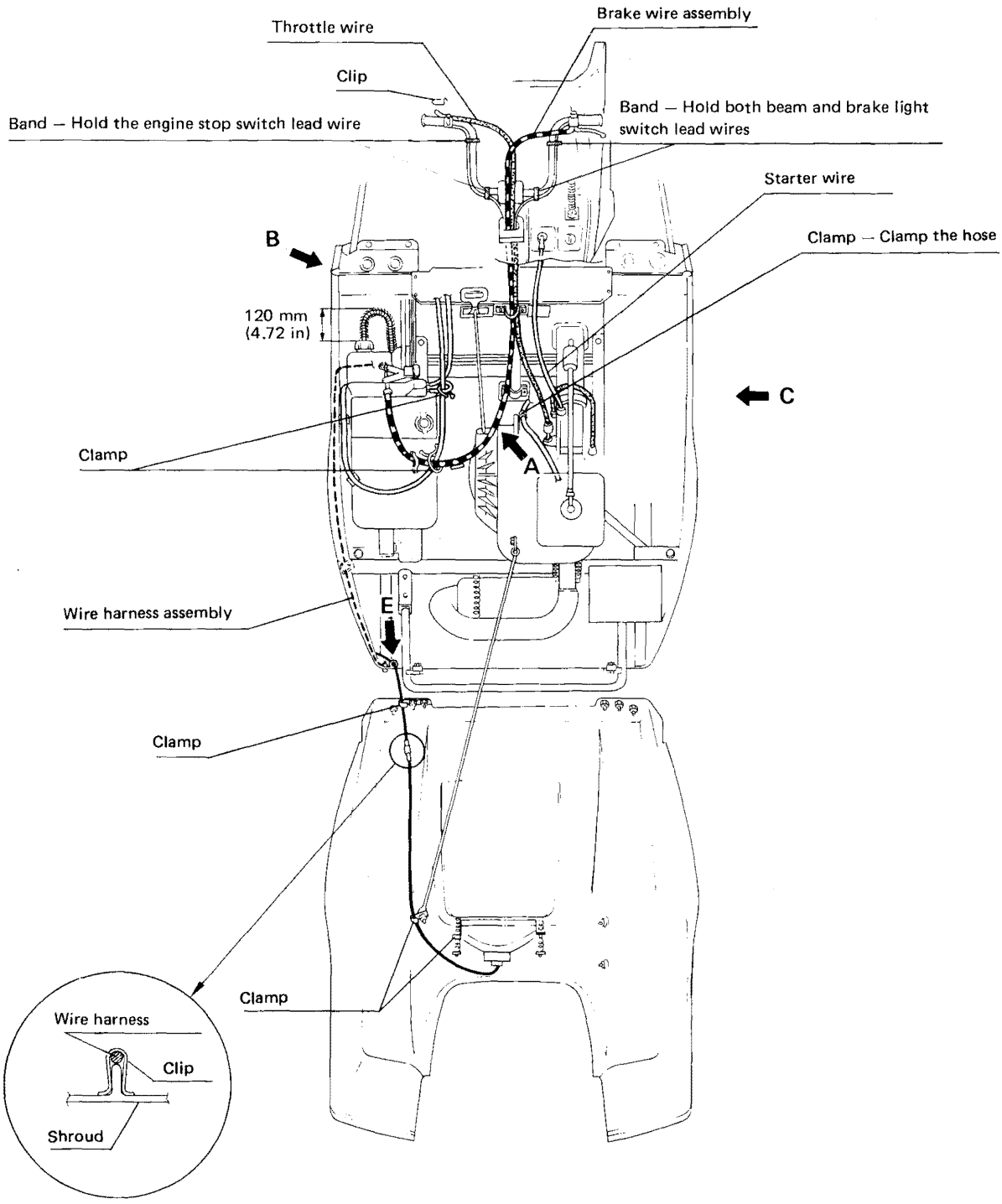


CONVERSION TABLES

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

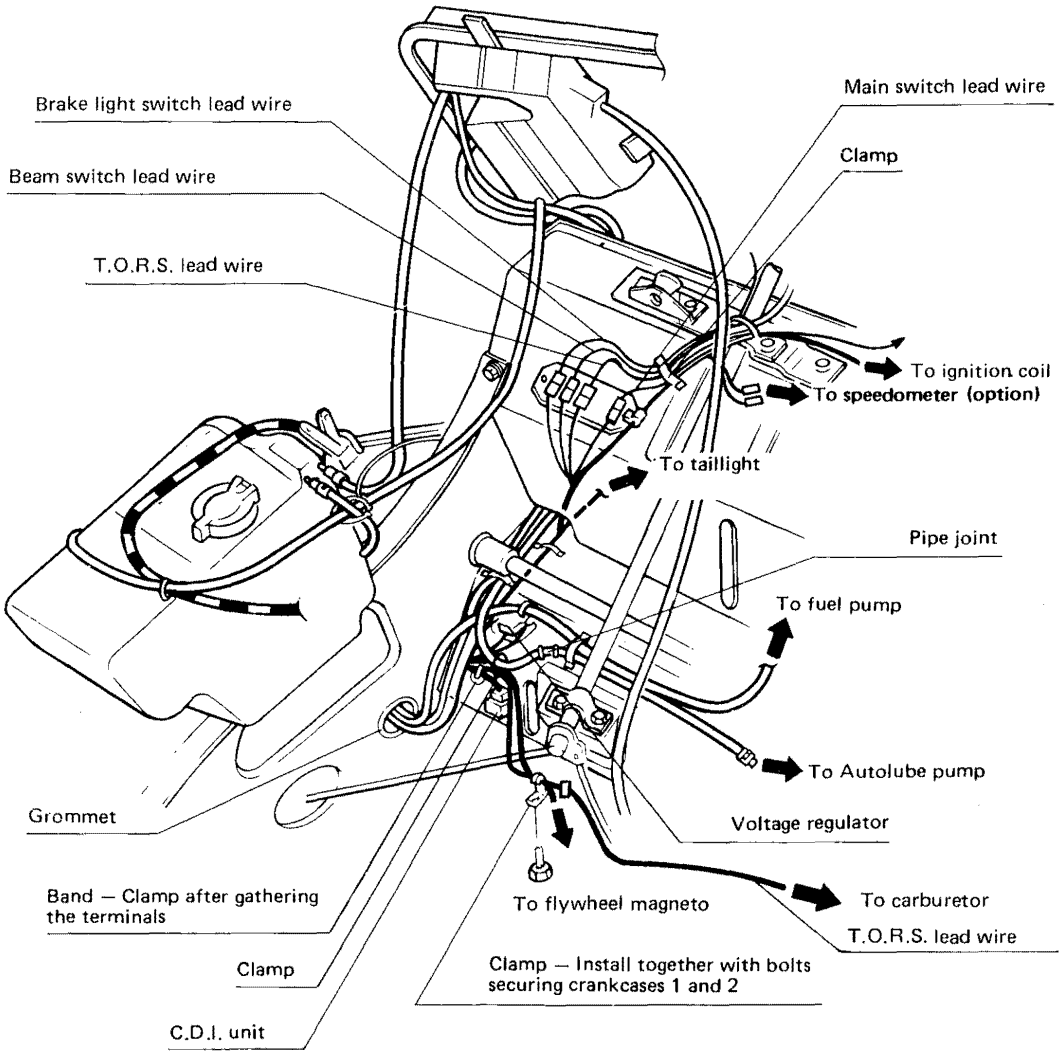
INCH TO METRIC SYSTEM		
Known	Multiplier	Result
ft·lb	0.13826	m·kg
in·lb	0.01152	m·kg
ft·lb	13.831	cm·kg
in·lb	1.1521	cm·kg
lb	0.4535	kg
oz	28.352	g
mpg	0.4252	km/lit
mph	1.609	km/hr
mi	1.609	km
ft	0.3048	m
yd	0.9141	m
in	2.54	cm
in	25.4	mm
oz (U.S. liq)	29.57	cc (cm^3)
cu.in	16.387	cc (cm^3)
pt (U.S.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

CABLE ROUTING (1)

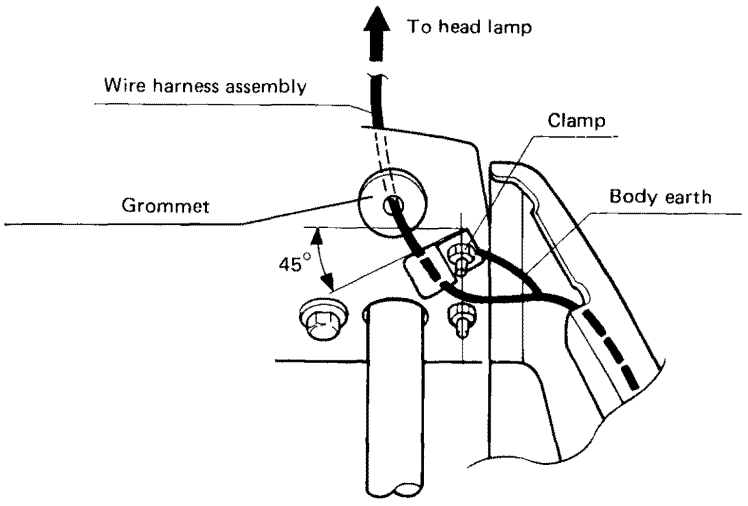


CABLE ROUTING (2)

A-View

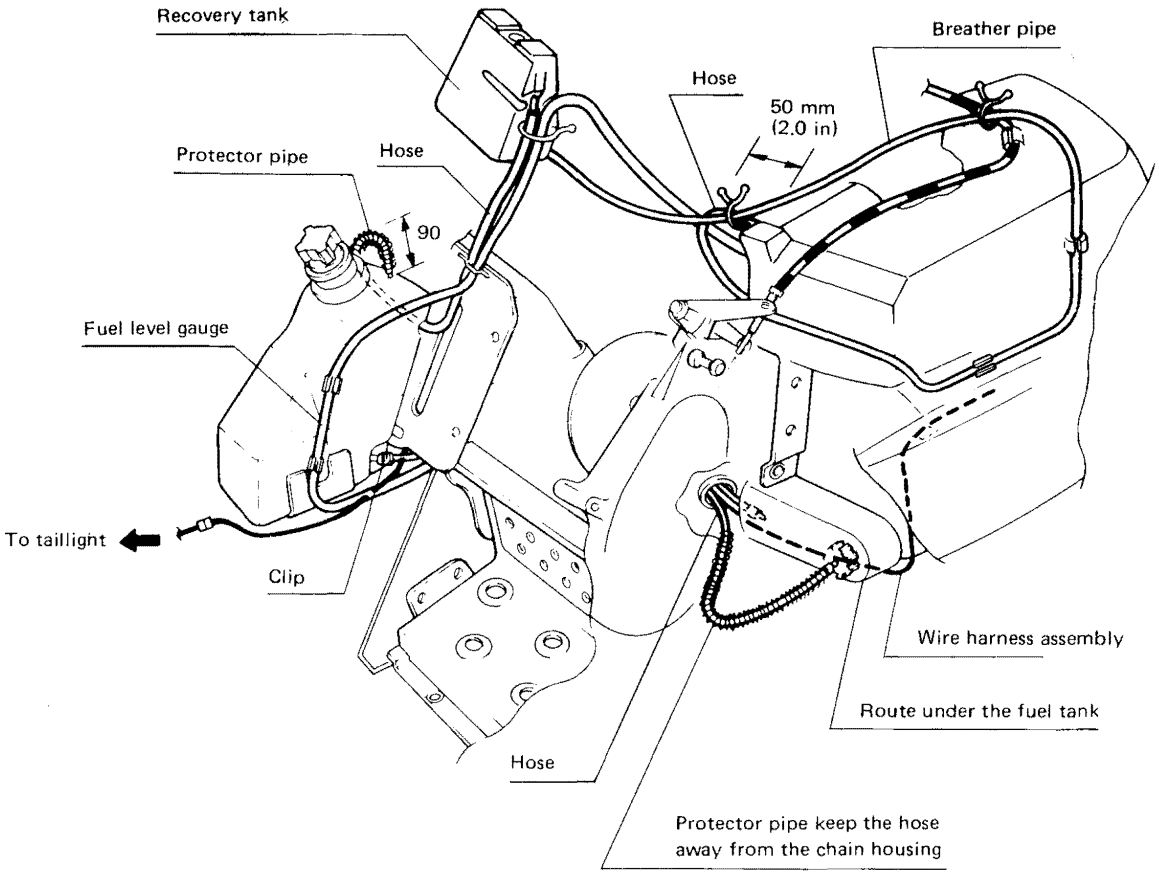


E-View

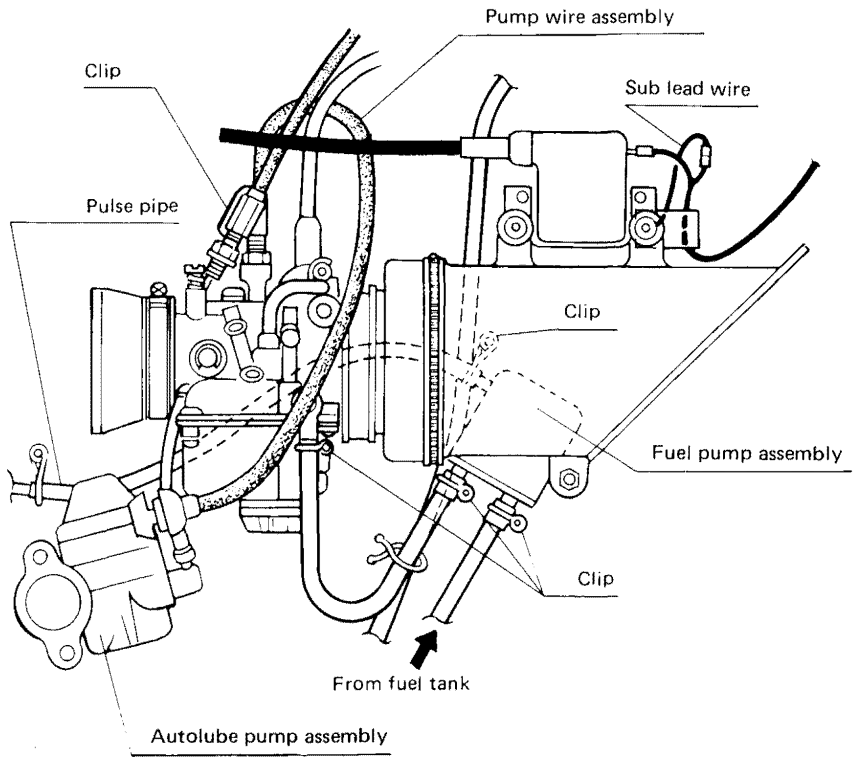


CABLE ROUTING (3)

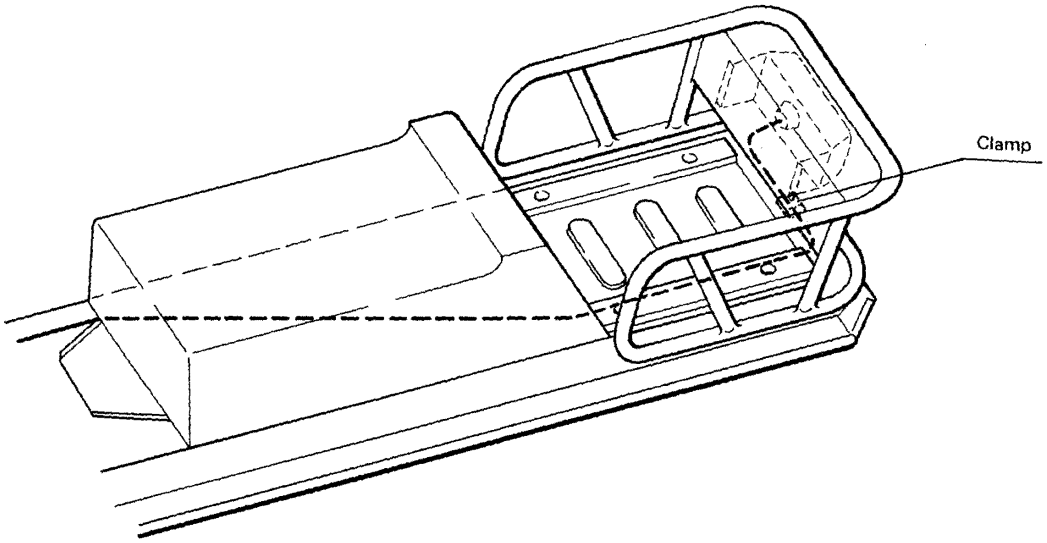
B-View



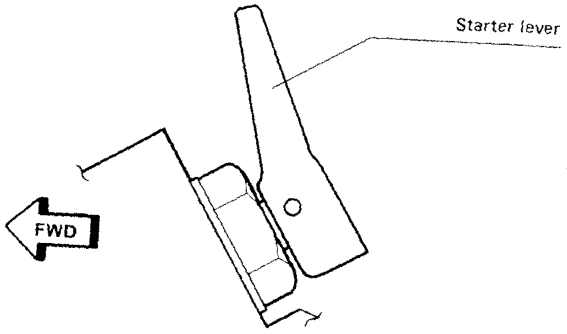
C-View



CABLE ROUTING (4)

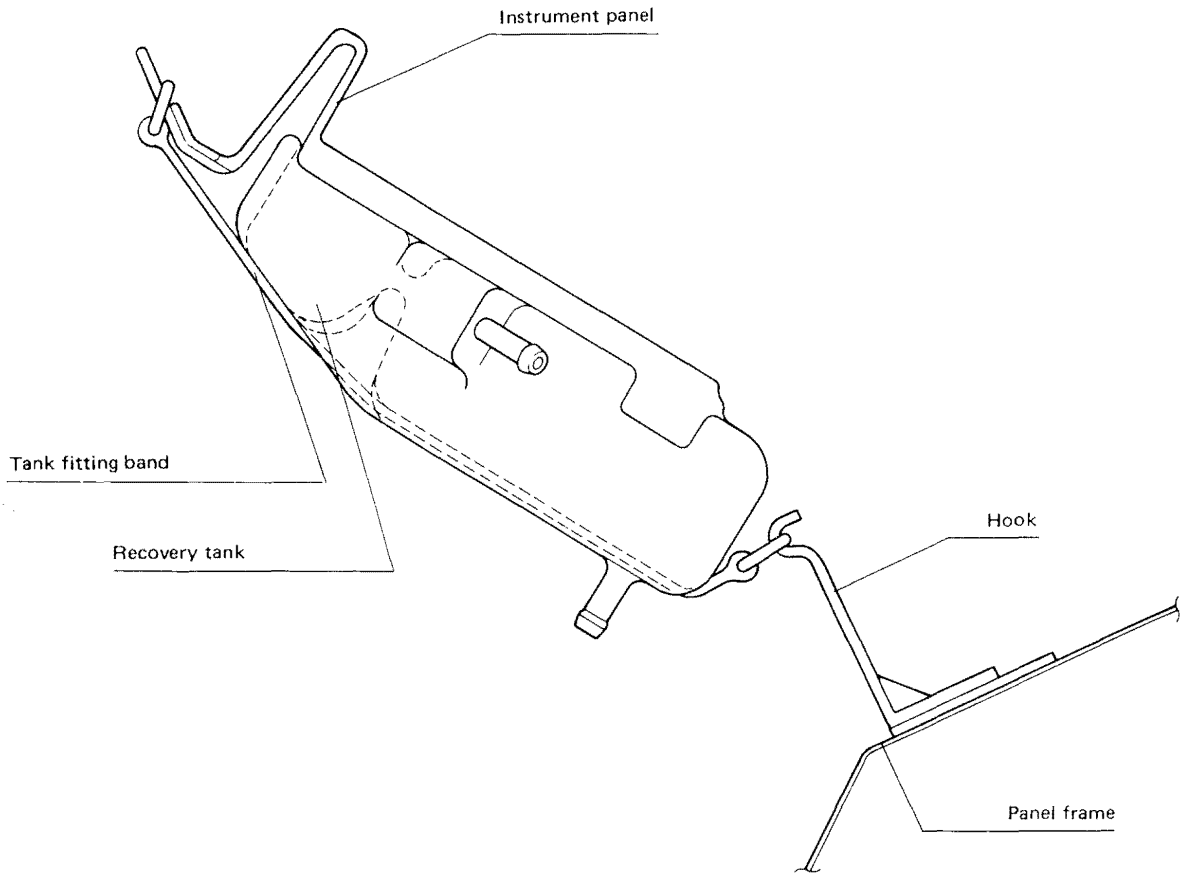


Starter lever installation

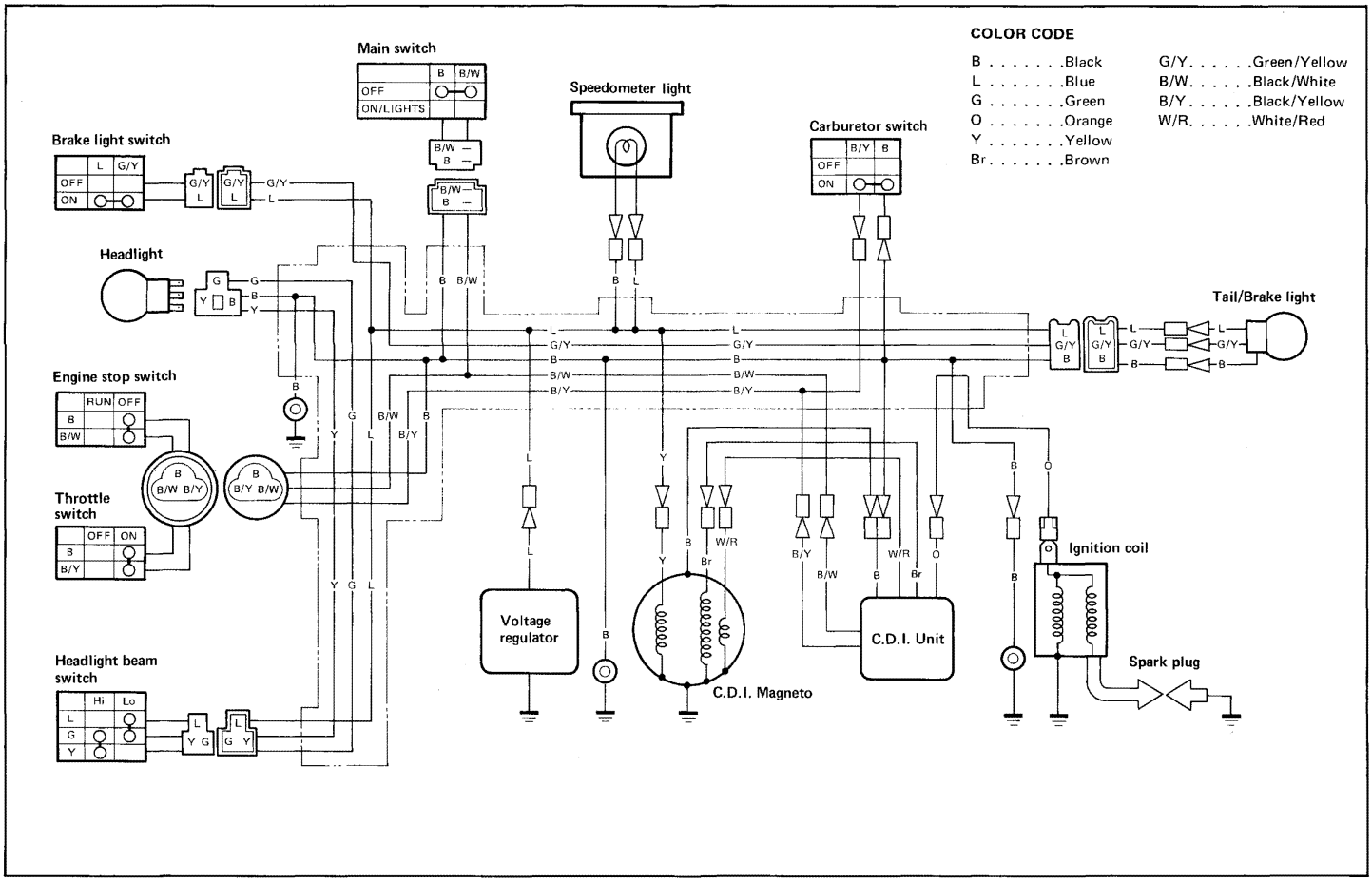


CABLE ROUTING (5)

Recovery tank installation



WIRING DIAGRAM

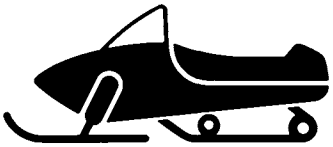


YAMAHA MOTOR CO.,LTD.

IWATA, JAPAN

PRINTED IN U.S.A.

YAMAHA



SUPPLEMENTARY SERVICE MANUAL

BR250TV

8BD-28197-10

BR250TV
SUPPLEMENTARY SERVICE MANUAL

1st Edition, May 1994

Printed in U.S.A.
P/N LIT-21618-01-61

FOREWORD

This Supplementary Service Manual has been prepared to introduce new service and new data for the BR250TV. For complete information on service procedures, it is necessary to use this Supplementary Service Manual together with following manual:

BR250F SERVICE MANUAL:
8R4-28197-10
BR250G SERVICE MANUAL:
8V6-28197-20
BR250H
SUPPLEMENTARY SERVICE MANUAL:
8X4-28197-20
BR250T(J)
SUPPLEMENTARY SERVICE MANUAL:
8Y1-28197-70
BR250T
SUPPLEMENTARY SERVICE MANUAL:
81X-28197-25

HOW TO USE THIS MANUAL

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

⚠
The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

⚠ WARNING

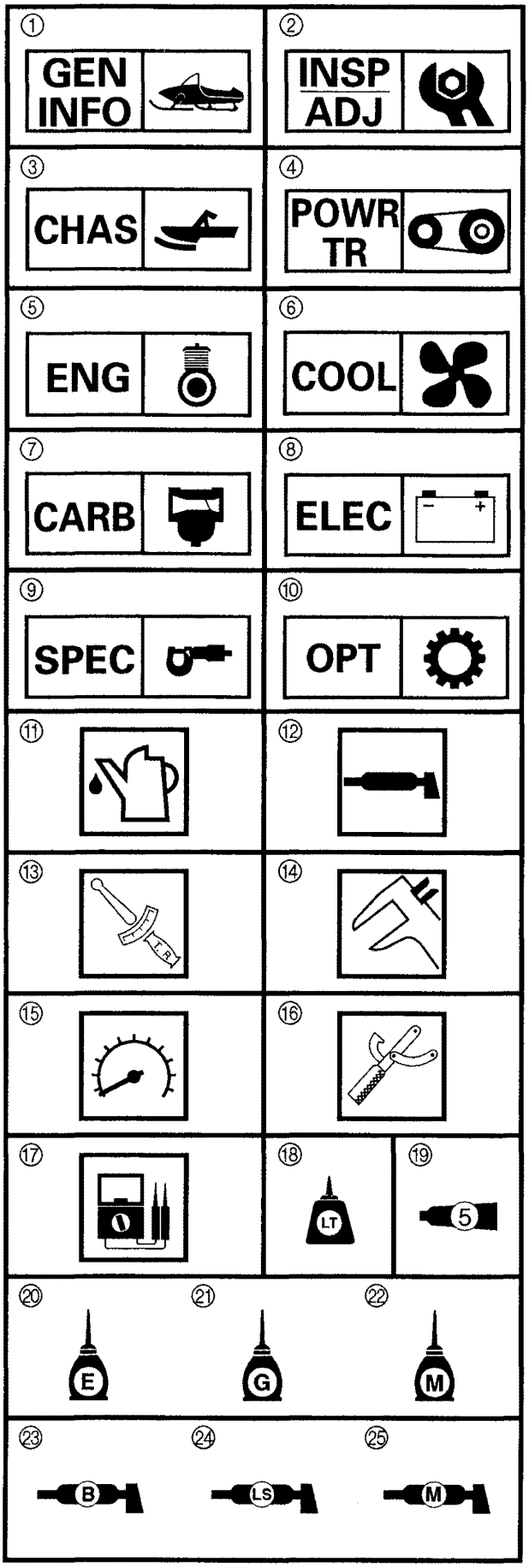
Failure to follow WARNING instructions could result in severe injury or death to the machine operator, a bystander, or a person inspecting or repairing the machine.

CAUTION:

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

NOTE:

A NOTE provides key information to make procedures easier or clearer.



0E031

ILLUSTRATED SYMBOLS

(Refer to the illustration)

Illustrated symbols ① to ⑩ are designed as thumb tabs to indicate the chapter's number and content.

① General information
② Periodic inspection and adjustment
③ Chassis
④ Power train
⑤ Engine overhaul
⑥ Cooling system
⑦ Carburetion
⑧ Electrical
⑨ Specifications
⑩ Optional kit

Illustrated symbols ⑪ to ⑰ are used to identify the specifications which appear.

⑪ Filling fluid
⑫ Lubricant
⑬ Tightening
⑭ Wear limit, clearance
⑮ Engine speed
⑯ Special tool
⑰ Ω, V, A

Illustrated symbols ⑱ to ㉕ in the exploded diagram indicate grade of lubricant and location of lubrication point.

⑱ Apply locking agent (LOCTITE®)
⑲ Apply Yamabond No.5®
⑳ Apply engine oil
㉑ Apply gear oil
㉒ Apply molybdenum disulfide oil
㉓ Apply wheel bearing grease
㉔ Apply low-temperature lithium-soap base grease
㉕ Apply molybdenum disulfide grease

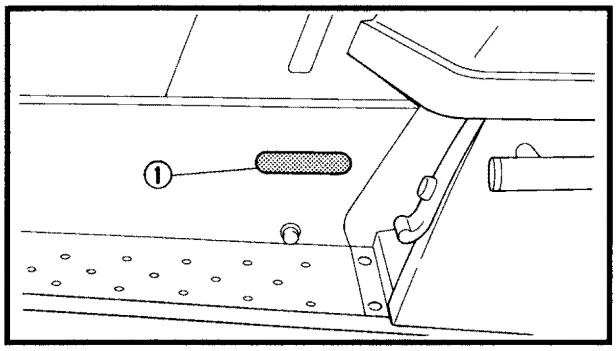
CONTENTS

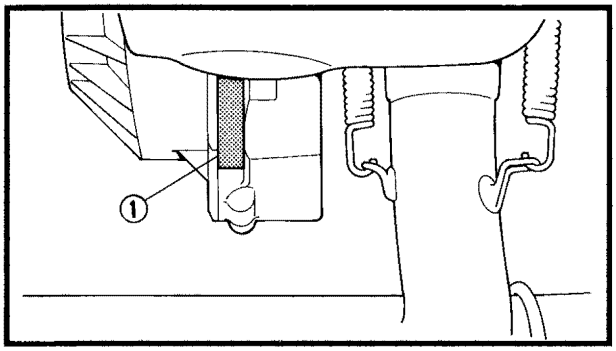
GENERAL INFORMATION 1
- MACHINE IDENTIFICATION 1
  - FRAME SERIAL NUMBER 1
  - ENGINE SERIAL NUMBER 1

CHASSIS 2
- FUEL SUB TANK 2
- JOB INSTRUCTION CHART 3

ELECTRICAL 4
- CIRCUIT DIAGRAM 4
- ELECTRICAL COMPONENT 6
- IGNITION SYSTEM 7
  - CIRCUIT DIAGRAM 7
  - TROUBLESHOOTING 8
  - SPARK PLUG CAP 9
  - IGNITION COIL 9
  - SOURCE COIL 9
  - SPARK PLUG 10
  - THROTTLE OVERRIDE SYSTEM (T.O.R.S.) 10
  - HANDLEBAR SWITCH (RIGHT) 11
  - CARBURETOR SWITCH 11
  - MAIN SWITCH 12
- LIGHTING SYSTEM 13
  - CIRCUIT DIAGRAM 13
  - TROUBLESHOOTING 14
  - BULB (S) 15
  - HEADLIGHT BEAM SWITCH 15

SPECIFICATIONS 16
- GENERAL SPECIFICATIONS 16
- MAINTENANCE SPECIFICATIONS 18
  - ENGINE 18
  - POWER TRAIN 22
  - CHASSIS 26
  - ELECTRICAL 27
- GENERAL TORQUE SPECIFICATIONS 28
- CABLE ROUTING 29





1E001

GENERAL INFORMATION

MACHINE IDENTIFICATION

FRAME SERIAL NUMBER

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

ENGINE SERIAL NUMBER

The engine serial number ① is located on the right-hand side of the crankcase.

NOTE:

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

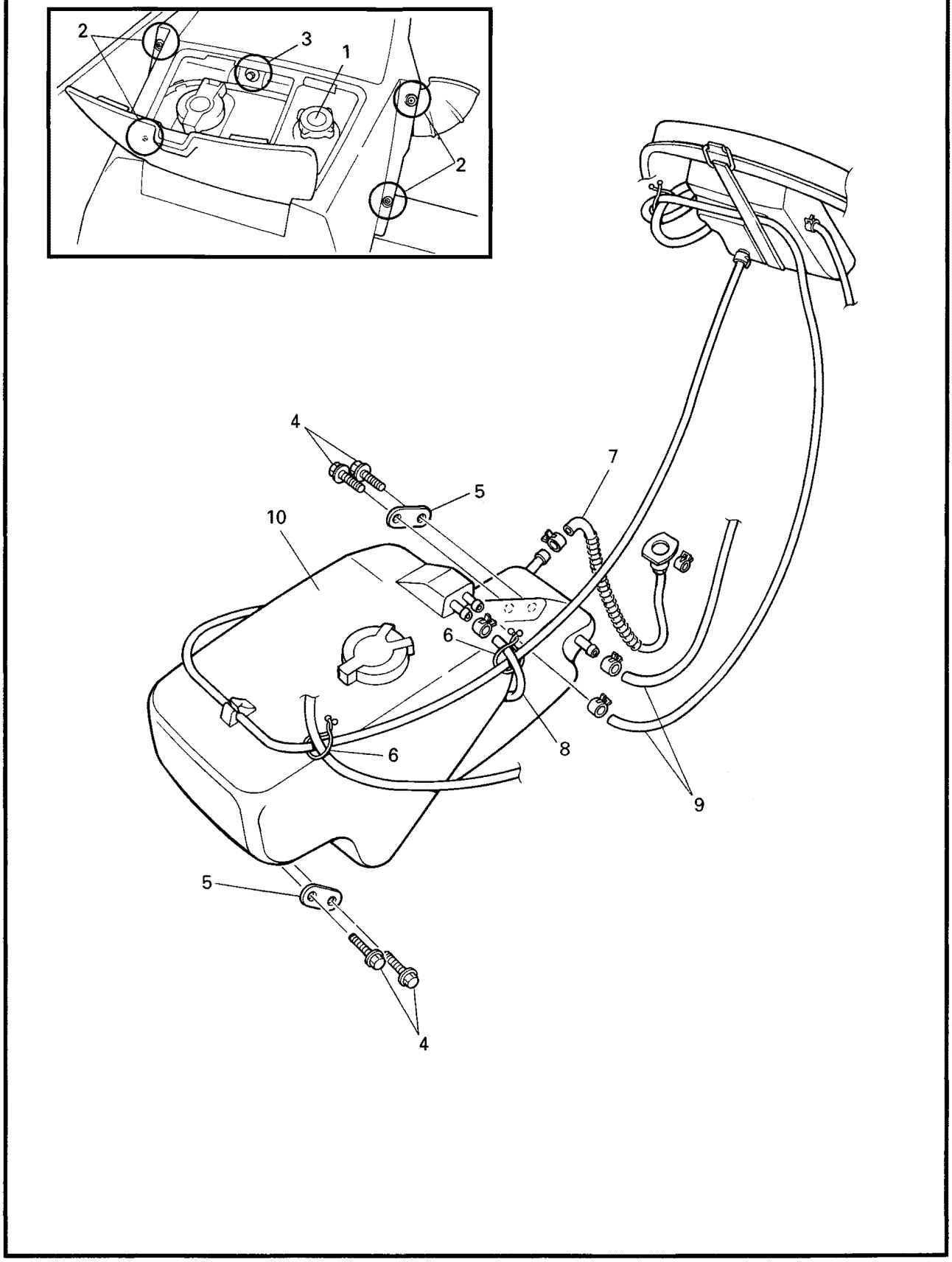
Starting Serial Number:
BR250TV 8BD-008101

NOTE:

Designs and specifications are subject to change without notice.

CHASSIS

FUEL SUB TANK

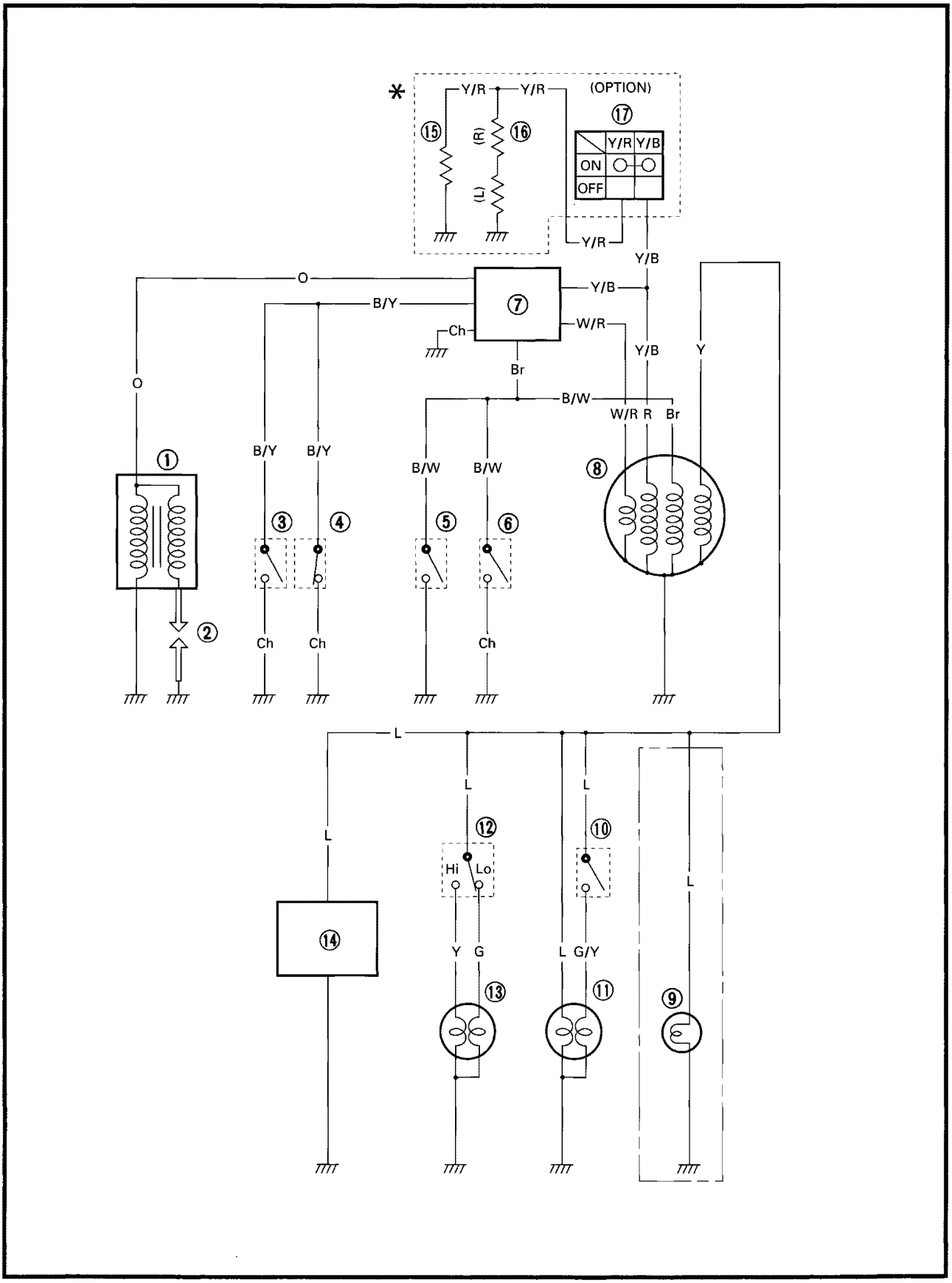


JOB INSTRUCTION CHART

Order	Job name/Part name	Q'ty	Remarks
	Removal of fuel sub tank		Remove the parts in the order in which they are listed.
	Fuel		
	Brake cable		Extract the fuel from the fuel sub tank using a pump.
1	Oil tank cap	1	
2	Screw	4	
3	Nut	1	
4	Bolt	4	
5	Plate	2	
6	Clamp	2	Refer to the "CABLE ROUTING" section.
7	Fuel suction hose	1	
8	Breather hose	1	**NOTE:** Unclamp and remove the breather hose from the fuel sub tank.
9	Fuel level hose	1	**NOTE:** Disconnect the fuel level hose connected to the upper part of the fuel sub tank, then raise the tank so that the other fuel level hose, the one connected to the lower part of the tank can be disconnected.
10	Fuel sub tank	1	Reverse the removal procedure for installation.

ELECTRICAL

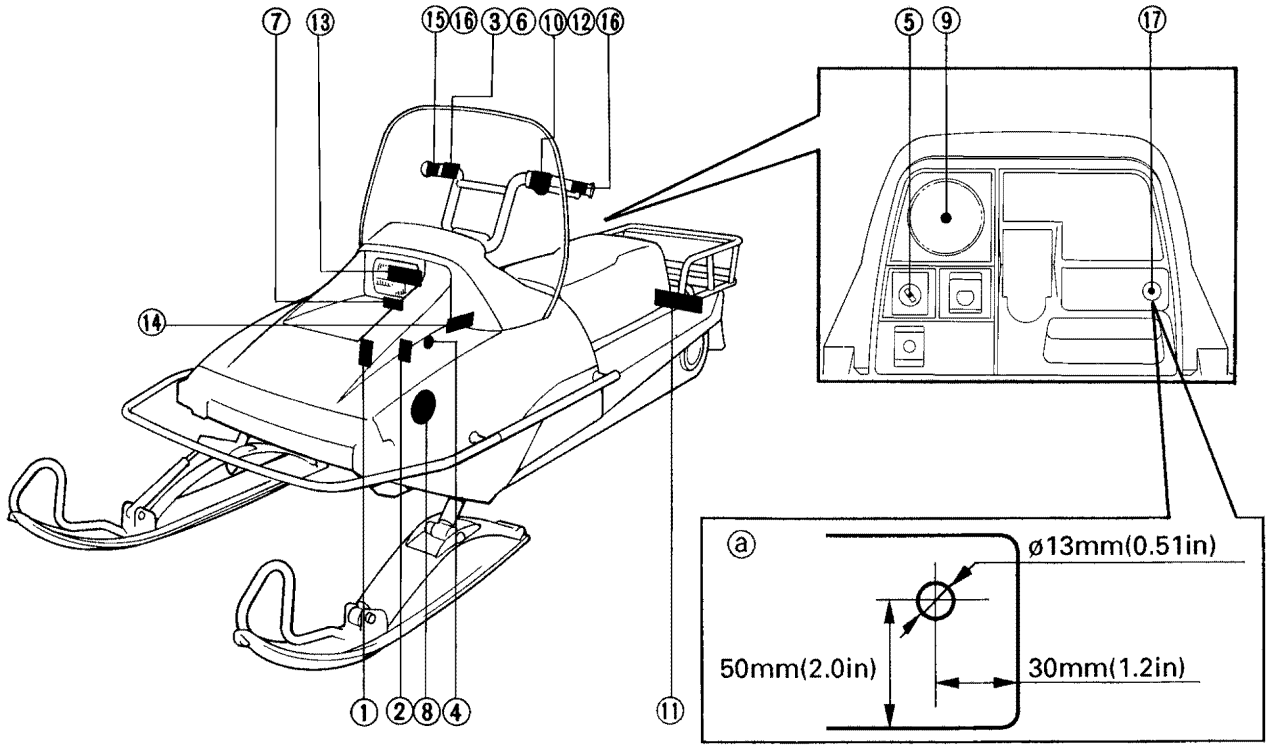
CIRCUIT DIAGRAM



① Ignition coil
② Spark plug
③ Throttle switch
④ Carburetor switch
⑤ Main switch
⑥ "ENGINE STOP" switch
⑦ C.D.I. unit
⑧ C.D.I. magneto
⑨ Speedometer light**
⑩ Brake light switch
⑪ Tail/Brake light
⑫ Headlight beam switch
⑬ Headlight
⑭ Voltage regulator
⑮ Thumb warmer*
⑯ Grip warmer*
⑰ Grip warmer switch*
* Option
** BR250T: Standard equipment
BR250TS: Option

COLOR CODE

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

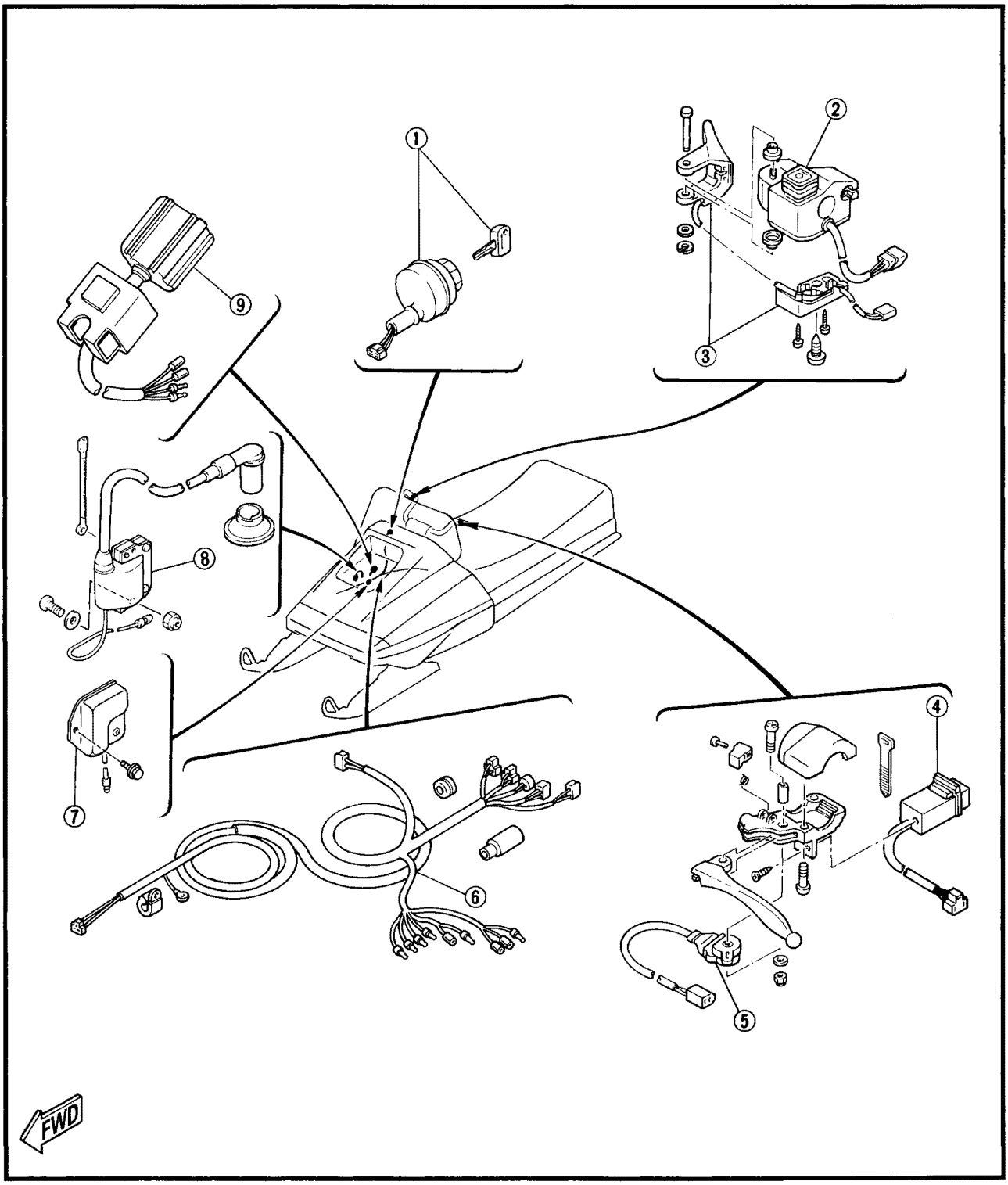


NOTE:

- Specified hole should be drilled for the "Grip warmer switch" installation.
- Refer to the illustration ⓐ for location and size.

ELECTRICAL COMPONENT

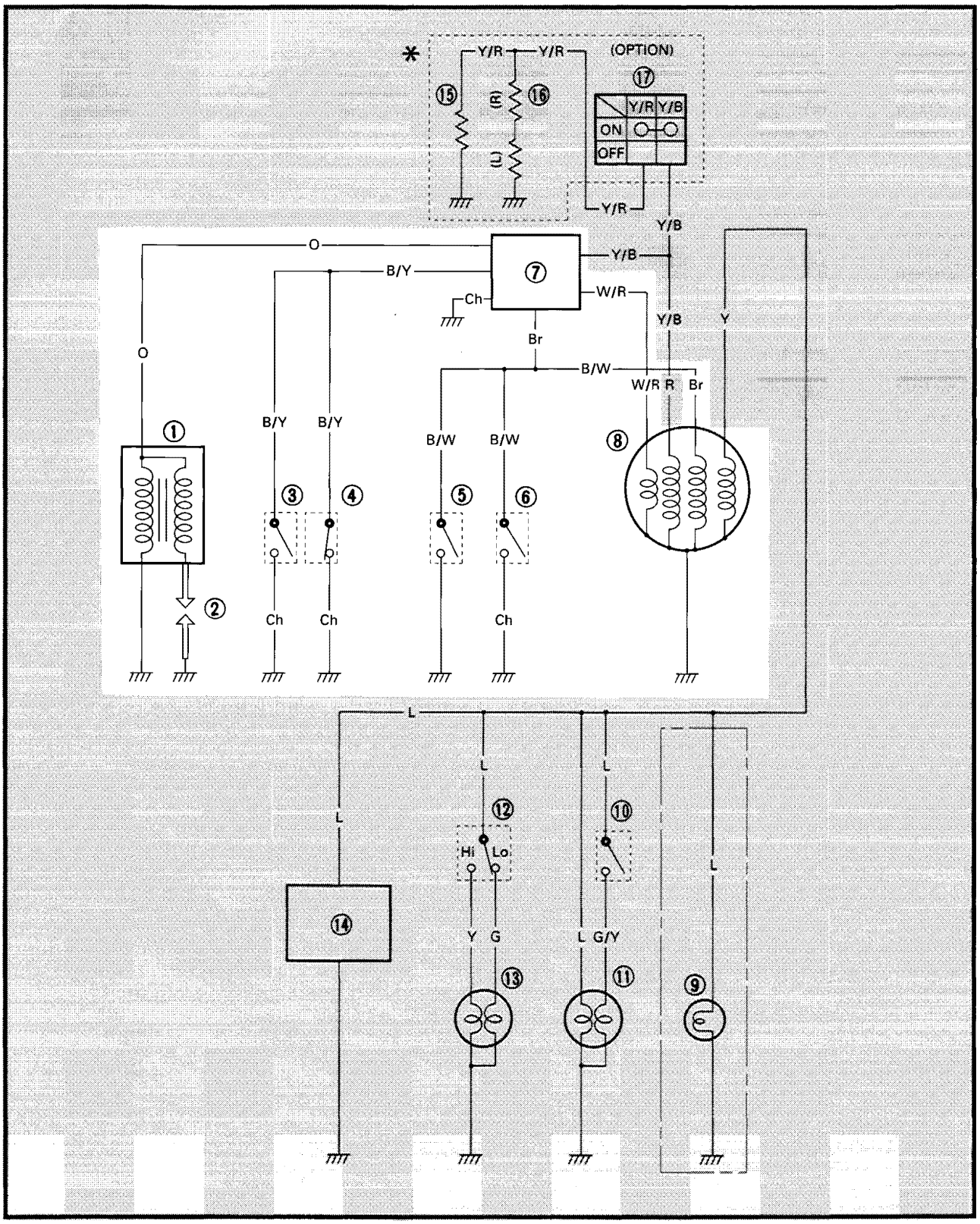
① Main switch
② "ENGINE STOP" switch
③ Throttle switch
④ Headlight beam switch
⑤ Brake light switch
⑥ Wire harness
⑦ Voltage regulator
⑧ Ignition coil
⑨ C.D.I. unit



IGNITION SYSTEM

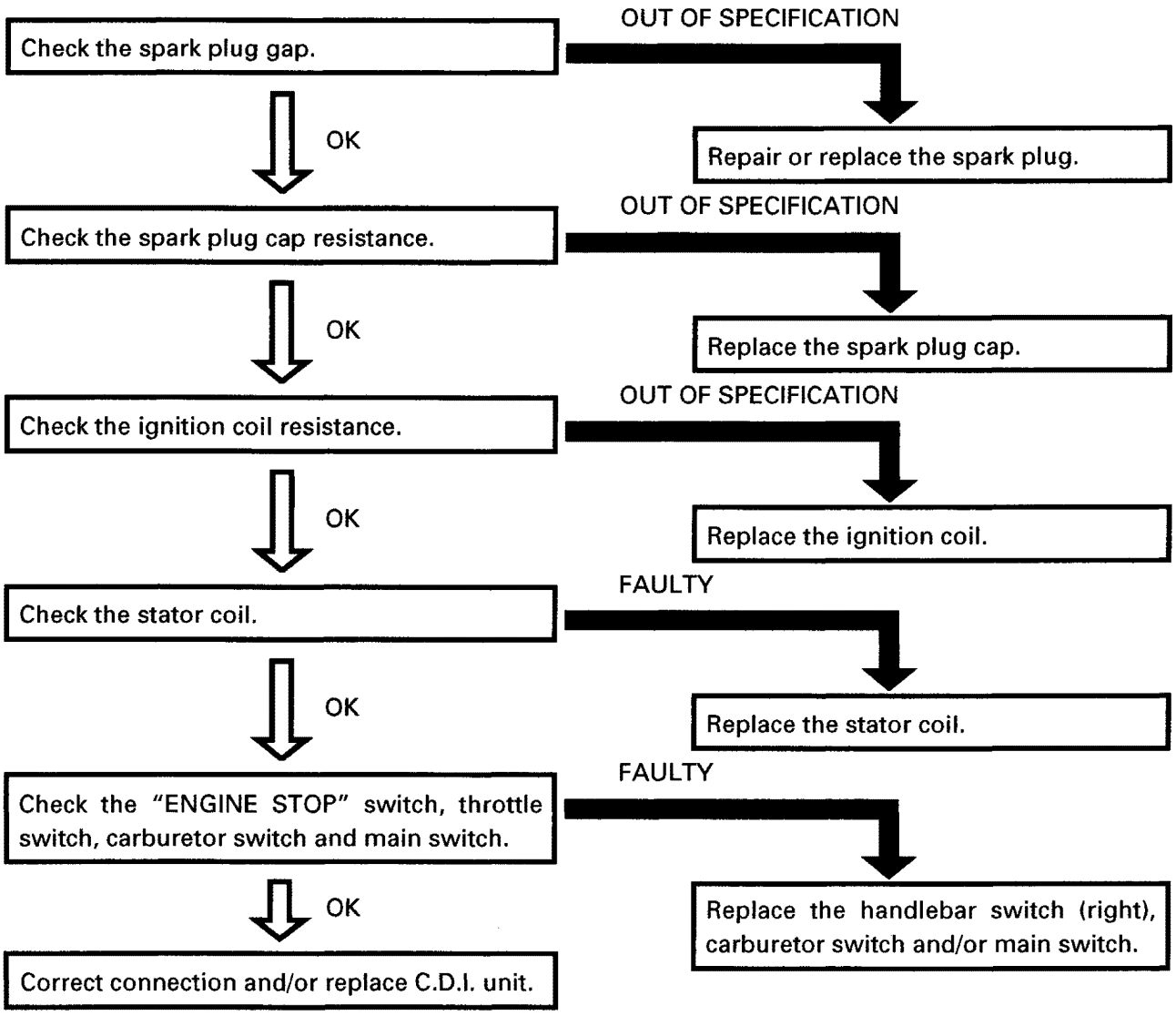
CIRCUIT DIAGRAM

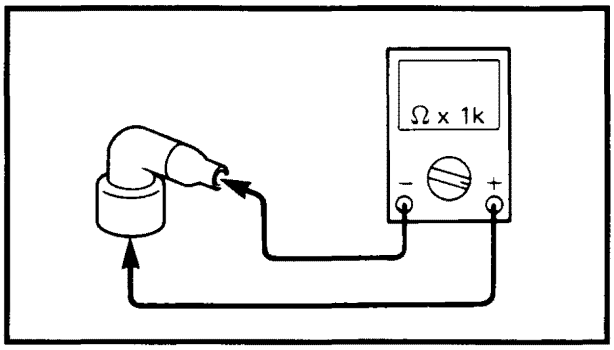
① Ignition coil
② Spark plug
③ Throttle switch
④ Carburetor switch
⑤ Main switch
⑥ "ENGINE STOP" switch
⑦ C.D.I. unit
⑧ C.D.I. magneto



8E021
TROUBLESHOOTING

NO SPARK OR WEAK SPARK.

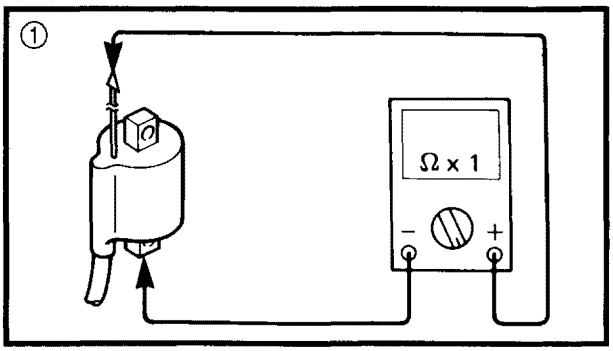




8E041
SPARK PLUG CAP

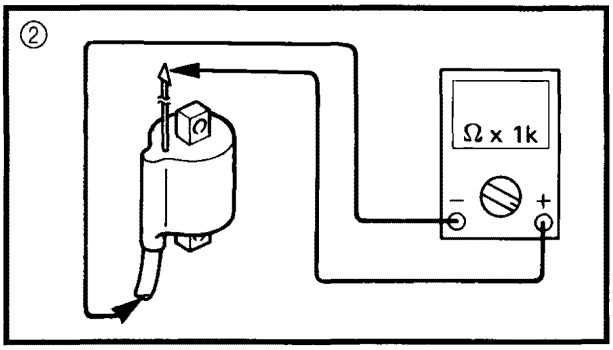
1. Remove:
   - Spark plug cap
2. Connect:
   - Pocket tester
     (to spark plug cap)
3. Measure:
   - Spark plug cap resistance

Spark plug cap resistance:
5 kΩ at 20°C (68°F)

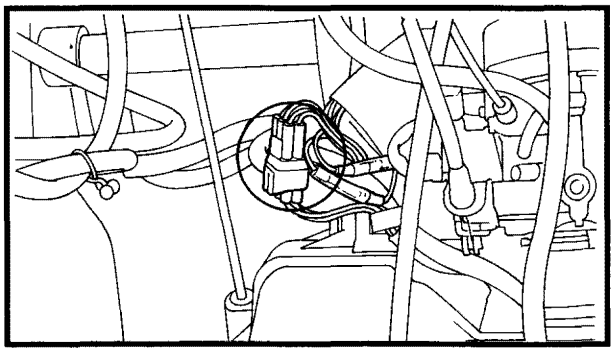


8E051
IGNITION COIL

1. Disconnect:
   - Ignition coil lead (Orange)
   - Spark plug lead
2. Connect:
   - Pocket tester
     (to ignition coil and spark plug lead)
3. Measure:
   - Primary coil resistance ①
   - Secondary coil resistance ②

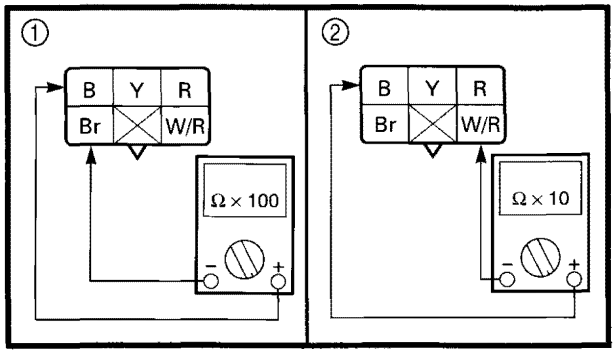


Primary coil resistance:
0.4 Ω ± 20% at 20°C (68°F)
Secondary coil resistance:
7.1 kΩ ± 20% at 20°C (68°F)



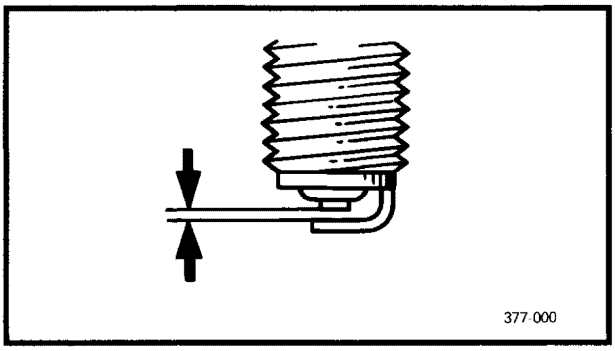
8E061
SOURCE COIL

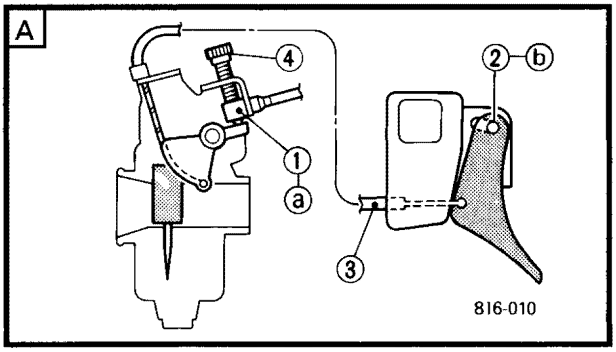
1. Disconnect:
   - C.D.I. magneto lead and coupler (Brown, Black)
2. Connect:
   - Pocket tester
     (to C.D.I. magneto lead and coupler)

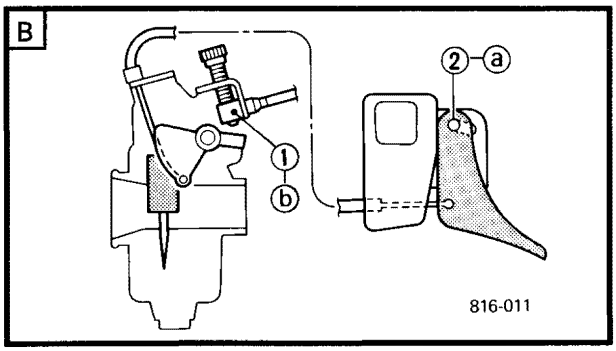


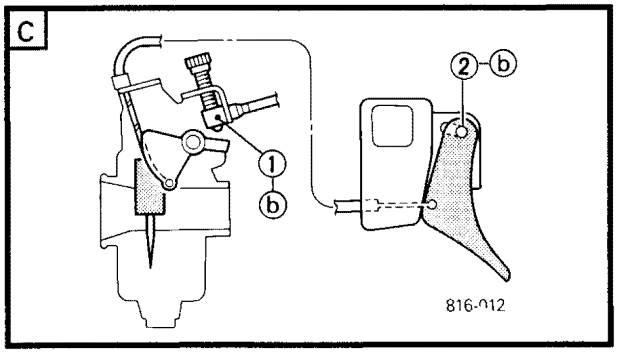
3. Measure:
   - Source coil/pulser coil resistance
     Out of specification→Replace.

Source coil resistance: ①
(Brown – Black)
275 Ω ± 20% at 20°C (68°F)
Pulser coil resistance: ②
(White/Red – Black)
20 Ω ± 20% at 20°C (68°F)









8E031
SPARK PLUG

1. Remove:
   - Spark plugs
2. Check:
   - Spark plug

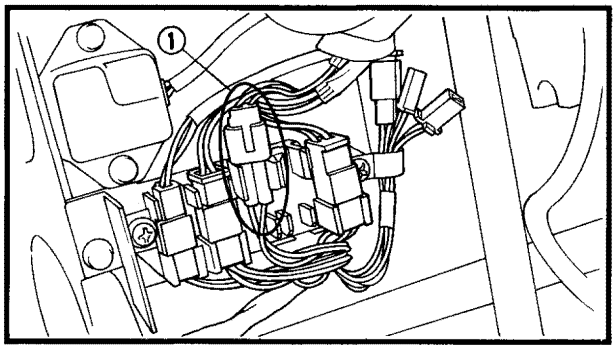
Standard spark plug: BR9ES (NGK)
Spark plug gap: 0.6 ~ 0.7 mm (0.024 ~ 0.028 in)

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

The ignition is turned off by the following switching functions when the throttle system fails.

Mode / Switch	A Idle or starting	B Run	C Trouble
Throttle switch	OFF	ON	OFF
Carburetor switch	ON	OFF	OFF
Engine	RUN	RUN	STOP

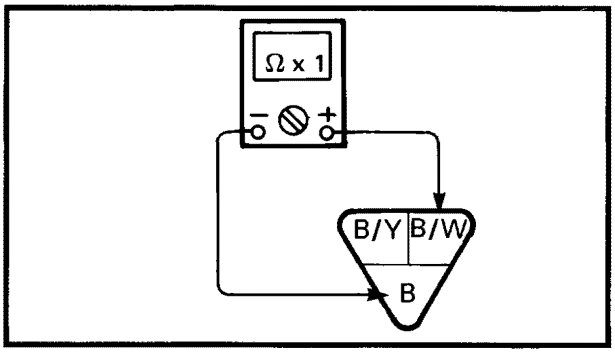
① Carburetor switch
② Throttle switch
③ Throttlle cable
④ Throttle stop screw
ⓐ "ON"
ⓑ "OFF"



8E071
HANDLEBAR SWITCH (RIGHT)

"ENGINE STOP" switch and throttle switch

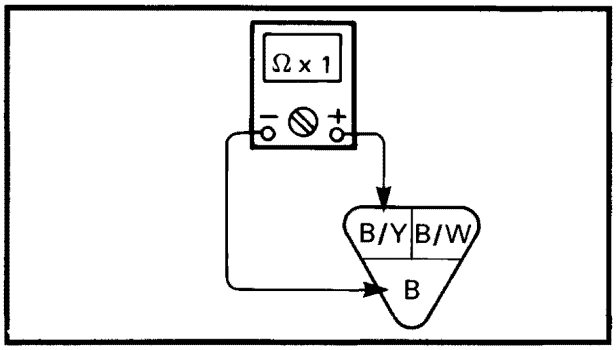
1. Disconnect:
   - Handlebar switch (right) coupler ①
2. Connect:
   - Pocket tester (90890-03112, YU-03112)



3. Check:
   - "ENGINE STOP" switch continuity
     Faulty→Replace.

Switch position	Good condition
RUN (pull)	×
OFF (push)	○

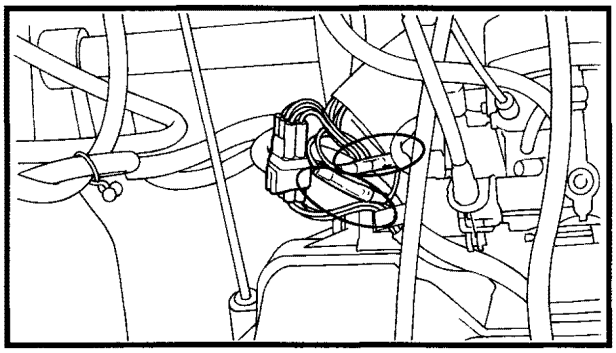
○ : Continuity × : No continuity



4. Check:
   - Throttle switch continuity
     Faulty→Replace.

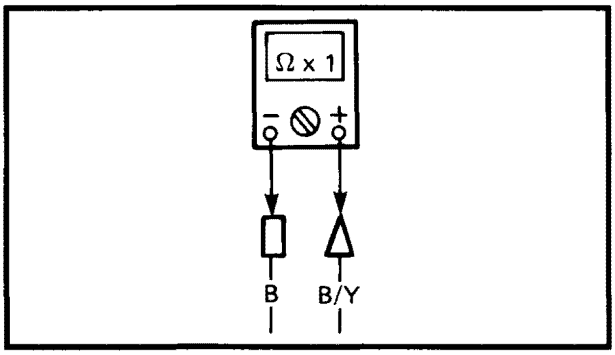
Throttle switch position	Good condition
Throttle lever is operated.	○
Throttle lever is not operated.	×

○ : Continuity × : No continuity



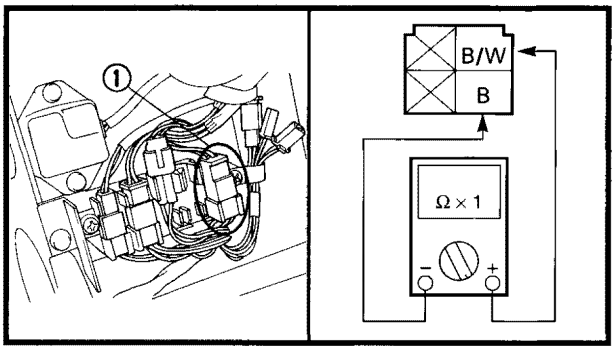
8E081
CARBURETOR SWITCH

1. Disconnect:
   - Carburetor switch lead
2. Connect:
   - Pocket tester
3. Check:
   - Carburetor switch continuity
     Faulty→ Replace.



Carburetor switch position	Good condition
Throttle lever is operated.	×
Throttle lever is not operated.	○

○ : Continuity × : No continuity



8E101

MAIN SWITCH

1. Disconnect:
   - Main switch coupler ①
2. Connect:
   - Pocket tester
3. Check:
   - Main switch continuity
     Faulty → Replace.

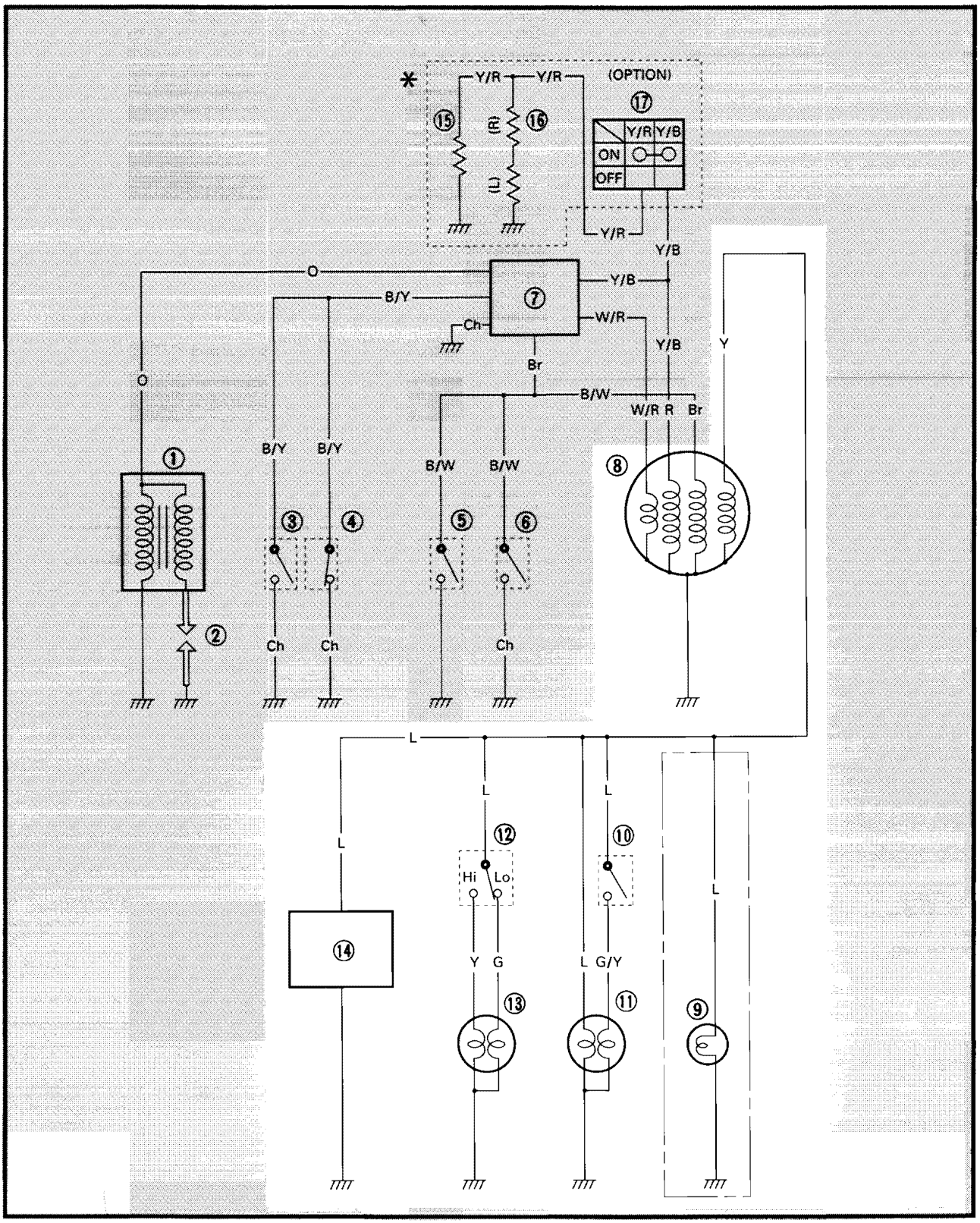
Switch position	Good condition
OFF	×
ON	○

○: Continuity ×: No continuity

LIGHTING SYSTEM

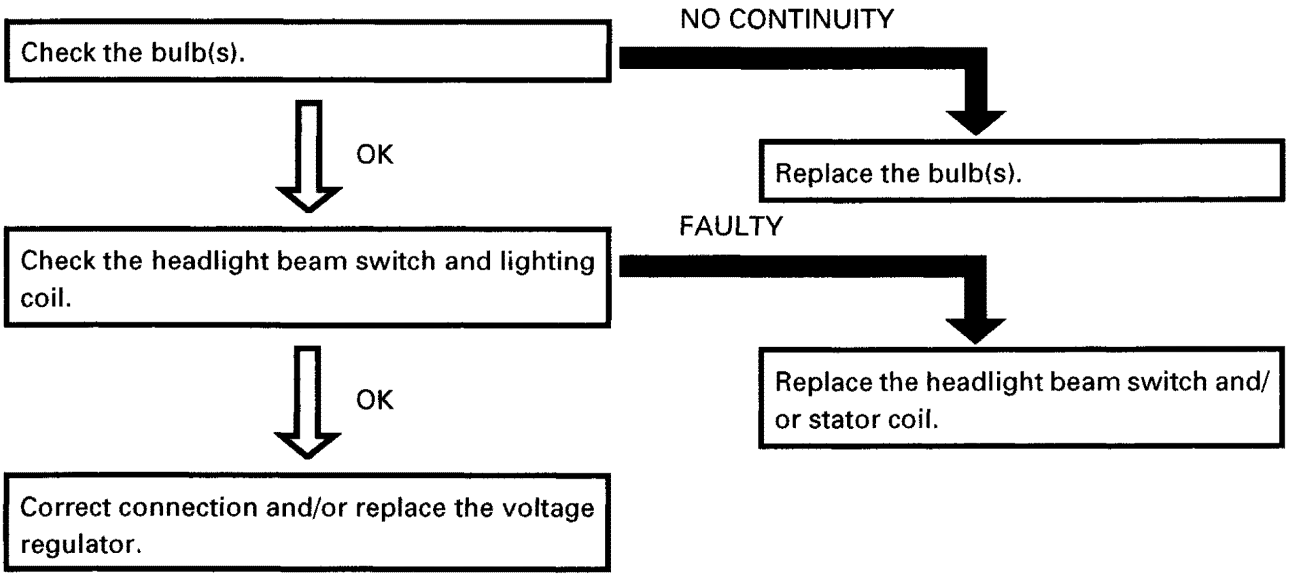
CIRCUIT DIAGRAM

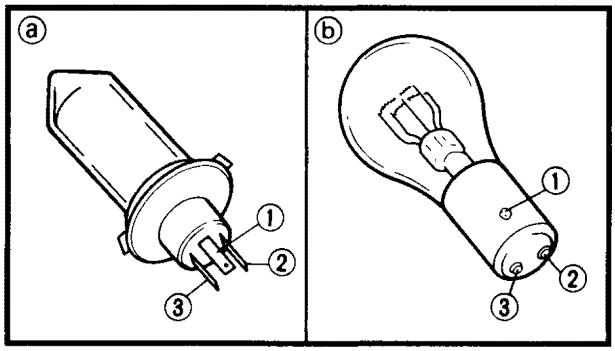
⑧ C.D.I. magneto
⑨ Speedometer light
⑩ Brake light switch
⑪ Tail/brake light
⑫ Headlight beam switch
⑬ Headlight
⑭ Voltage regulator

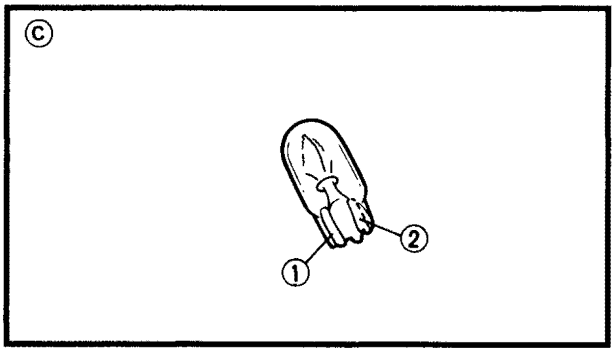


8E141
TROUBLESHOOTING

HEADLIGHT, TAIL LIGHT AND/OR METER LIGHT DO NOT COME ON.







BULB (S)

1. Remove:
   - Headlight bulb
   - Tail/brake light bulb
   - Meter light bulb
2. Connect:
   - Pocket tester
     (to bulb terminals)

⚠ WARNING

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

ⓐ Headlight ⓑ Tail/brake light
ⓒ Meter light

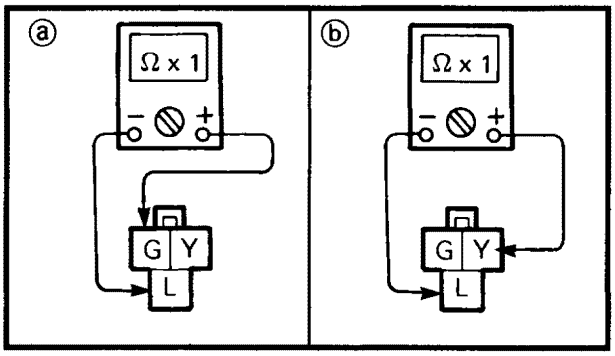
3. Check:
   - Bulb(s)

Terminal	Good condition
① – ②	○
① – ③	○

○ : Continuity

HEADLIGHT BEAM SWITCH

1. Disconnect:
   - Headlight beam switch coupler
2. Connect:
   - Pocket tester
     (to headlight beam switch coupler)



3. Check:
   - Headlight beam switch continuity
     Faulty→Replace.

Switch position	ⓐ Good condition	ⓑ Good condition
HI	×	○
LO	○	×

○ : Continuity × : No continuity

SPECIFICATIONS

GENERAL SPECIFICATIONS

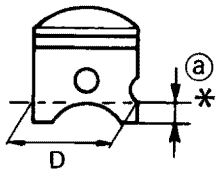
Model	BR250T	BR250TS
Model code number:	8BD2	8BC2
Frame & Engine starting number:	8BD-008101	8BC-001101
Dimensions:		
Overall length	2,945 mm (115.9 in)	2,425 mm (95.5 in)
Overall width	950 mm (37.4 in)	←
Overall height	1,120 mm (44.1 in)	1,100 mm (43.3 in)
Weight:	175 kg (386 lb)	153 kg (337 lb)

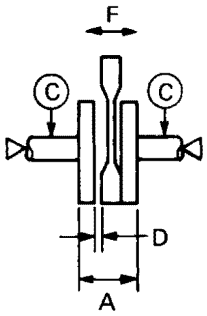
Model	BR250T/TS
Minimum turning radius:	
Clockwise	3.7 m (12.1 ft)
Counterclockwise	3.7 m (12.1 ft)
Engine:	
Engine type	Air cooled 2-stroke
Induction system	Piston valve
Cylinder arrangement	Forward inclined single cylinder
Displacement	246 cm^3
Bore × Stroke	70 × 64 mm (2.76 × 2.52 in)
Compression ratio	6.1:1
Starting system	Recoil starter
Lubrication system:	Separate Lubrication
Engine oil:	
Type	YAMALUBE 2
Tank capacity	1.8 L (1.6 Imp qt, 1.9 US qt)
Drive chain housing oil:	
Type	Gear oil API "GL-3" SAE #75 or #80
Capacity	0.2 L (0.18 Imp qt, 0.21 US qt)
Fuel:	
Type	Unleaded gasoline
Tank capacity (main tank)	15 L (3.3 Imp gal, 3.96 US gal)
(sub tank)	9.3 L (2.05 Imp gal, 2.46 US gal)
Carburetor:	
Type/Quantity	BD32-28
Manufacturer	KEIHIN
Spark plug:	
Type	BR8HS
Manufacturer	NGK
Gap	0.6 ~ 0.7 mm (0.02 ~ 0.03 in)
Transmission:	
Primary reduction system	V-belt
Primary reduction ratio	3.5 ~ 1.0:1
Clutch type	Automatic centrifugal engagement
Secondary reduction system	Chain
Secondary reduction ratio	24/10 (2.40) (BR250T)
	23/12 (1.92) (BR250TS)

Model	BR250T/TS
Chassis:	
Frame type	Monocoque
Caster	25°
Ski stance (center to center)	750 mm (29.5 in)
Suspension:	
Front suspension type	Leaf spring
Rear suspension type	Slide rail suspension
Track:	
Track type	Internal drive type
Track width	381 mm (15.0 in)
Length on ground	1126 mm (44.3 in)
Track deflection mm/10 kg (22 lb)	40 ~ 50 mm (1.6 ~ 2.0 in)
Brake:	
Brake type	Caliper type disc brake
Operation method	Handle lever, left handle operated
Electrical:	
Ignition system/Manufacturer	C.D.I./YAMAHA
Generator system	Flywheel magneto
Bulb wattage × Quantity:	
Headlight	12V 60W/55W × 1 (BR250T) 12V 60W/60W × 1 (BR250TS)
Tail/Brake light	12V 8W/23W × 1
Speedometer light	12V 3.4W × 1

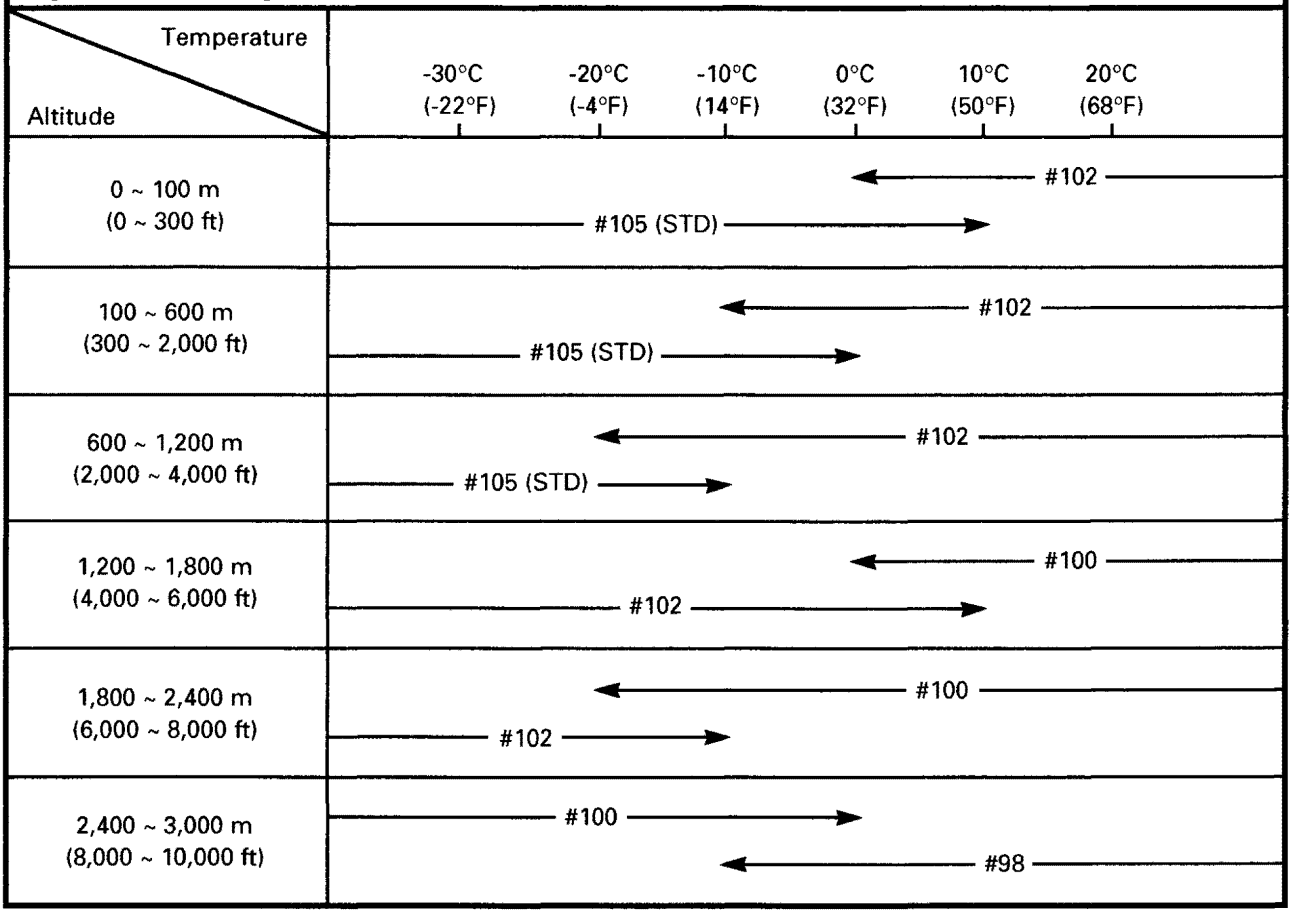
MAINTENANCE SPECIFICATIONS

ENGINE

Model		BR250T/TS
Cylinder:		
Material		Aluminum alloy with cast iron sleeve
Bore size		70.00 ~ 70.02 mm (2.756 ~ 2.757 in)
<Taper limit>		0.05 mm (0.0020 in)
<Out-of-Round limit>		0.01 mm (0.0004 in)
Piston:		
Piston size (D)		69.955 ~ 69.960 mm (2.7541 ~ 2.7543 in)
Measuring point ⓐ		10 mm (0.4 in)
Piston to-Cylinder clearance		0.045 ~ 0.050 mm (0.0018 ~ 0.0020 in)
Piston ring:		
Sectional sketch	Top ring	Keystone B= 1.2 mm (0.05 in) T= 2.8 mm (0.11 in)
	2nd ring	Plain B= 1.2 mm (0.05 in) T= 2.8 mm (0.11 in)
End gap (installed):	Top ring	0.2 ~ 0.4 mm (0.008 ~ 0.016 in)
	2nd ring	0.2 ~ 0.4 mm (0.008 ~ 0.016 in)
Side clearance	Top ring	0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)
	2nd ring	0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)
Coating	Top ring	Chrome plated/Parkerrizing
	2nd ring	Chrome plated/Parkerrizing

Model		BR250T/TS
Crankshaft:		
Crank width "A"		55.95 ~ 56.00 mm (2.203 ~ 2.205 in)
Connecting rod small end free play "F"		2 mm (0.08 in)
Connecting rod big end side clearance "D"		0.25 ~ 0.75 mm (0.01 ~ 0.03 in)
Crankshaft deflection "C": C		0.03 mm (0.0012 in)
		
Big end bearing:		
Type		Needle bearing
Small end bearing:		
Type		Needle bearing
Carburetor:		
Type/Quantity		BD32-28/1
Manufacturer		KEIHIN
I.D. mark		80J 01
Main jet	(M.J.)	#105
Pilot jet	(P.J.)	# 78
Pilot screw	(P.S.)	1-1/4
Throttle valve	(Th.V.)	T= 1.0/15°
Valve seat size	(V.S.)	1.4
Fuel level	(F.L.)	13 ~ 17 mm (0.51 ~ 0.67 in)
Engine idle speed		1,000 ~ 1,200 r/min
Fuel pump:		
Type		Diaphragm
Manufacturer		KEIHIN
Oil pump:		
Pump cable free play		24 ~ 26 mm (0.94 ~ 1.02 in)

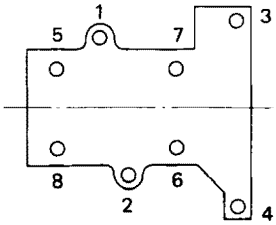
Model	BR250T/TS
High altitude settings	



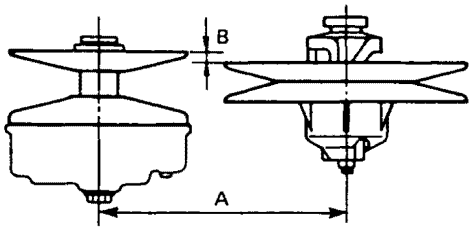
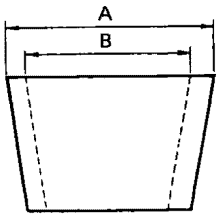
: Main jet number

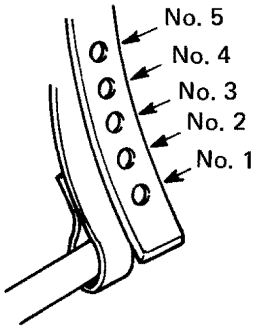
Tightening torque:

Part to be tightened	Tightening torque			Remarks
	Nm	m·kg	ft·lb	
Spark plug	28	2.8	20	
Cylinder head (bolt)	20	2.0	14	
Cylinder head (nut)	25	2.5	18	
Flywheel magneto	85	8.5	61	
Crankcase upper and lower				
First:	20	2.0	14	Tighten the bolts in
Final:	25	2.5	18	two stages.
Tightening sequence				
Crankcase and gear unit	25	2.5	18	
Oil pump and gear unit	8	0.8	5.8	With screw lock
Starter pulley	15	1.5	11	
Crankcase and engine bracket	25	2.5	18	



POWER TRAIN

Model	BR250T/TS
Transmission:	
Type	V-belt automatic
Range of ratio	3.5 ~ 1.0:1
Engagement RPM	2,900 ~ 3,500 r/min (BR250T) 2,600 ~ 3,200 r/min (BR250TS)
Shift RPM	5,600 ~ 7,200 r/min (BR250T) 5,400 ~ 6,000 r/min (BR250TS)
Sheave center distance "A"	264 ~ 268 mm (10.4 ~ 10.6 in)
Sheave offset "B"	8 ~ 14 mm (0.31 ~ 0.55 in)
	
V-Belt:	
Part number	89X-17641-00
Outside circumference	1.095 ~ 1.103 mm (43.1 ~ 43.4 in)
Width "A"	31.6 mm (1.24 in)
Wear limit "B"	28.0 mm (1.10 in)
	
Primary sheave spring:	
Part number	90501-50654
Color code	NO PAINTED
Outside diameter	55 mm (2.2 in)
Wire diameter	5 mm (0.2 in)
Pre-load/Set length	15 kg (33 lb)/61.5 m (2.42 in)
Spring rate	24 N/mm (2.4 kg/mm, 134 lb/in)
Number of coils	4.08
Free length	67.8 mm (2.67 in)
Primary sheave weight arm:	
Part number (with bushing)	8V8-W176A-00
Weight	45.7 ± 1 g (1.61 ± 0.04 oz)
Secondary sheave spring:	
Part number	90508-40080
Color code	NO PAINTED
Outside diameter	50 mm (1.97 in)
Wire diameter	4 mm (0.16 in)

Model	BR250T/TS
Hole position Sheave side-spring seat side (twist angle) Spring rate Number of coils Free length	 "X" – "X" (160°) 183 kg/mm 9.9 105 mm (4.13 in)
Drive chain: Type Number of links	 DID 40K-1 44
Track: Part number Width Length Pitch Number of links	 89X-47110-00 381 mm (15.0 in) 3,456 mm (136 in) 64 mm (2.52 in) 54
Suspension setting position: Stopper band hole position Front 	 No.2

Model	BR250T/TS
Shock absorber: Damping force	
Front	
Extension	80 kg/0.3 m/s
Compression	50 kg/0.3 m/s
Rear	
Extension	48 kg/0.3 m/s
Compression	45 kg/0.3 m/s
Slide runner:	
Thickness	13.5 mm (0.53 in)
Wear limit	8.5 mm (0.33 in)
Track sprocket wheel:	
Material	Polyethylene
Number of teeth	9
Rear guide wheel:	
Material	Aluminum with rubber
Outside diameter	ø191 mm (7.5 in)
Brake:	
Pad thickness	7.3 mm (0.29 in)
Pad wear limit	1 mm (0.04 in)
Pad to disc clearance	0.2 ~ 1.0 mm (0.008 ~ 0.040 in)
Disc thickness	3.2 mm (0.13 in)
Brake lever free play	6 ~ 7 mm (0.24 ~ 0.28 in)

Tightening torque:

Parts to be tightened	Tightening torque			Remarks
	Nm	m·kg	ft·lb	
Primary sliding sheave and cap	11	1.1	8.0	
Installation of primary sheave				
First:	100	10	72	Tighten the bolts in
Final:	60	6.0	43	two stages. See NOTE.
Installation of secondary sheave	40	4.0	29	
Bearing housing	23	2.3	17	
Secondary shaft and bearing collar	6	0.6	4.3	
Brake caliper and housing chain	50	5.0	36	
Installation of drive chain sprocket	60	6.0	43	Bolt
Installation of driven chain sprocket	5.8	0.58	4.2	Bolt
Chain housing and frame	23	2.3	17	
Installation of front axle L.H. and bearing	85	8.5	61	
Front axle housing and frame	23	2.3	17	
Front pivot shaft	65	6.5	47	
Rear pivot shaft	65	6.5	47	
Guide wheel shaft	80	8.0	58	
Sliding runner	2.5	0.25	1.7	
Lower end bracket	20	2.0	14	
Lower end bracket and absorber	2	0.2	1.4	Apply LOCTITE®
Front arm 1 and 2	45	4.5	32	
Installation of ski	45	4.5	32	

NOTE:

Tightening steps:

1. Tighten the bolt. 120Nm (12 m • kg, 85 ft • lb).
2. Loosen it completely.
3. Retighten it. 60Nm (6.0 m • kg, 43 ft • lb).

CHASSIS

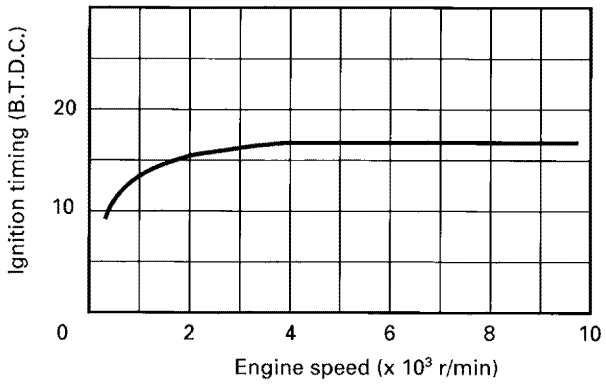
Model	BR250T/TS
Frame:	
Frame material	Steel
Steering:	
Lock to lock angle (left)	24.6° (R Ski), 28.1° (L Ski)
(right)	28.1° (R Ski), 24.6° (L Ski)
Ski alignment	Toe-out
Toe-out size	0 ~ 6 mm (0 ~ 0.24 in)
Ski:	
Ski material	Steel
Length	980 mm (38.6 in)
Width	120 mm (4.72 in)
Thickness	1.6 mm (0.06 in)
Ski suspension:	
Spring type	Leaf spring

Tightening torque:

Parts to be tightened	Tightening torque			Remarks
	Nm	m·kg	ft·lb	
Engine mounting bolt	30	3.0	22	
Ski runner	14	1.4	10	
Steering column and gate	13.7	1.37	10	Use lock washer
Steering tie rod adjusting nut	25	2.5	18	Apply LOCTITE®
Steering lower bracket	13.7	1.37	10	Use lock washer
Installation of steering column 1, 2	13.7	1.37	10	
Steering relay adjusting nut	25	2.5	18	Apply LOCTITE®

9E041
ELECTRICAL

Model	BR250T/TS
Voltage:	12V
Ignition system: Ignition timing (B.T.D.C.)	16.5°/3,000 r/min



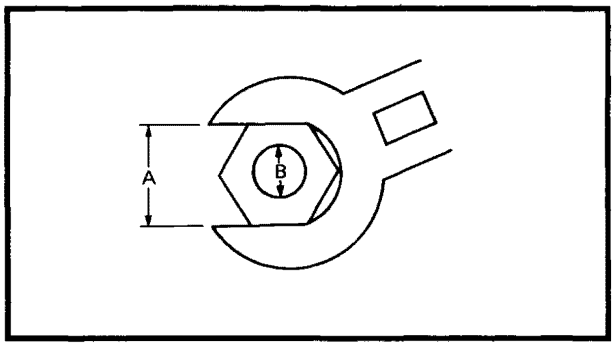
C.D.I.:	
Magneto model/Manufacturer	F85L/YAMAHA
Pickup coil resistance	20 Ω ± 20% at 20°C (68°F)
(color code)	(White/Red – Black)
Source coil resistance	275 Ω ± 20% at 20°C (68°F)
(color code)	(Brown – Black)
Lighting voltage-(minimum)	11 V/3,000 r/min
Lighting voltage-(maximum)	15 V/6,000 r/min
Lighting coil resistance	0.3 Ω ± 20% at 20°C (68°F)
(color code)	(Yellow – Black)
Coil resistance for grip warmer	0.8 Ω ± 20% at 20°C (68°F)
(color code)	(Red – Black)
C.D.I. unit manufacturer	8AU-00/YAMAHA
Ignition coil:	
Model/Manufacturer	86B-00/YAMAHA
Minimum spark gap	3 mm (0.12 in)
Primary coil resistance	0.4 Ω ± 20% at 20°C (68°F)
Secondary coil resistance	7.1 kΩ ± 20% at 20°C (68°F)
Spark plug cap:	
Type	Resin type
Resistance	5 kΩ at 20°C (68°F)
Charging system:	
Type	Flywheel magneto

9E051

GENERAL TORQUE SPECIFICATIONS

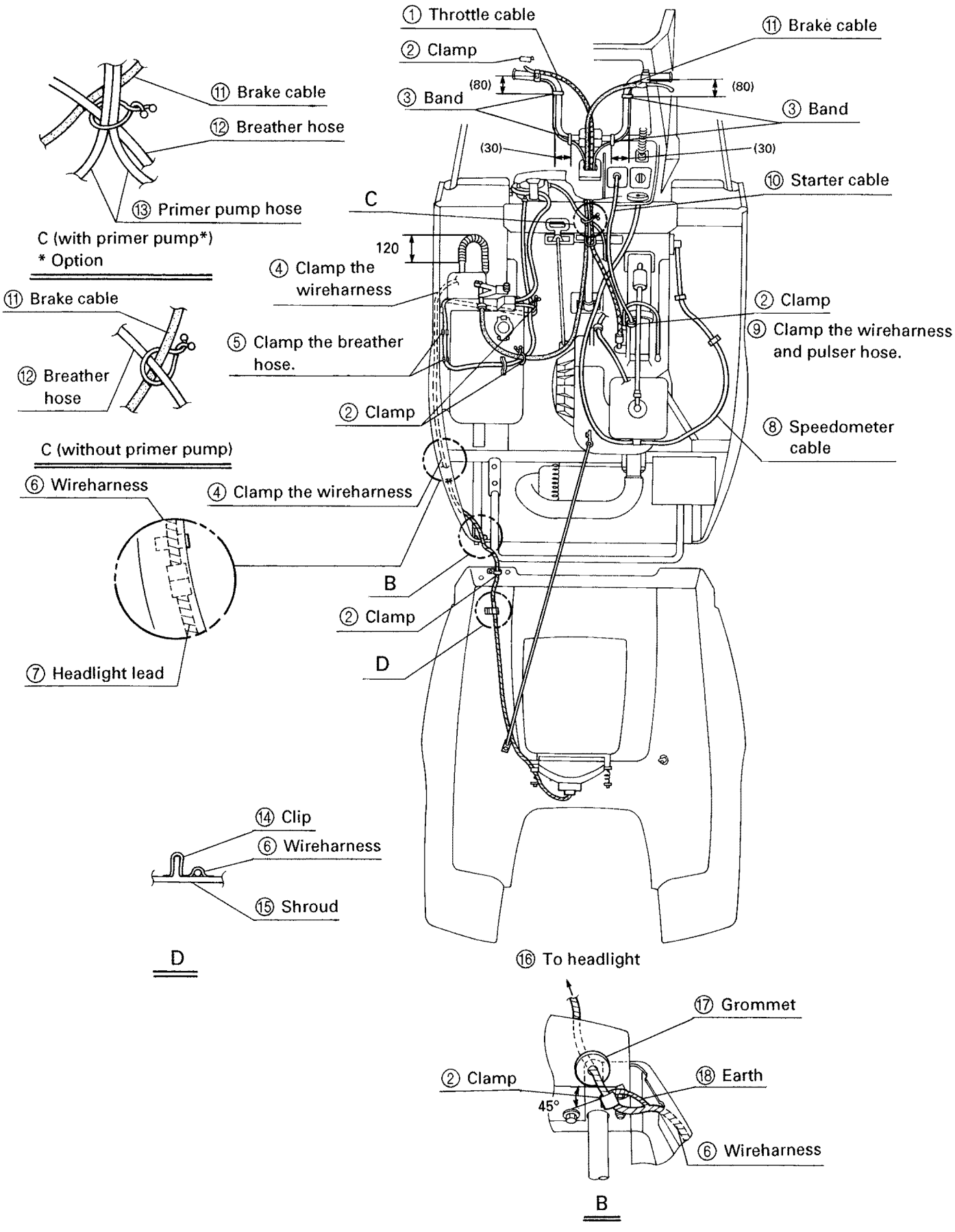
This chart specifies torque for standard fasteners with standard I.S.O. pitch threads. Torque specifications for special components or assemblies are included in the applicable sections of this book. To avoid warpage, tighten multi-fastener assemblies in a crisscross fashion, in progressive stages, until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

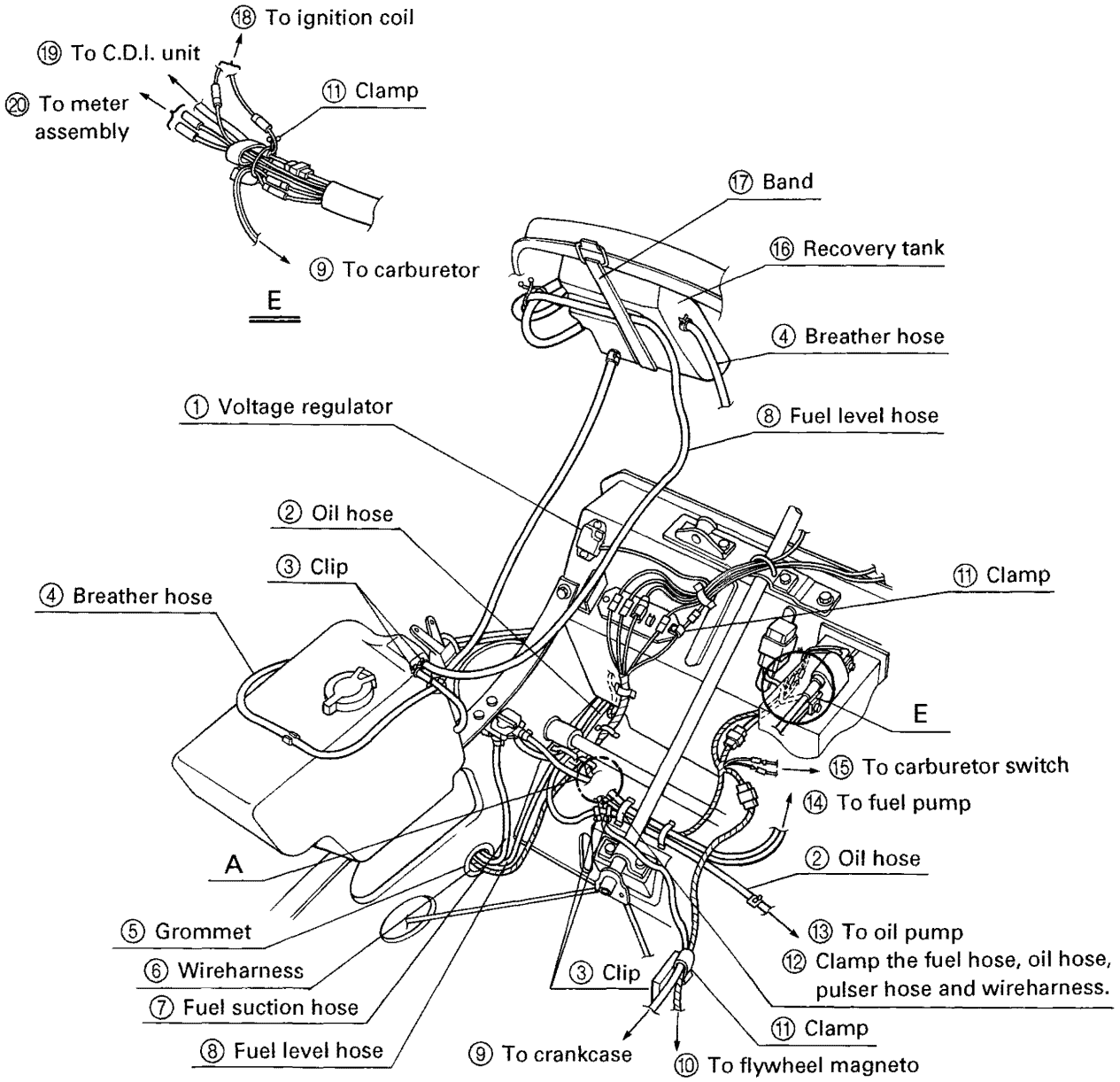
A (nut)	B (bolt)	General Torque Specifications		
		Nm	m·kg	ft·lb
10 mm	6 mm	6	0.6	4.3
12 mm	8 mm	15	1.5	11
14 mm	10 mm	30	3.0	22
17 mm	12 mm	55	5.5	40
19 mm	14 mm	85	8.5	61
22 mm	16 mm	130	13.0	94

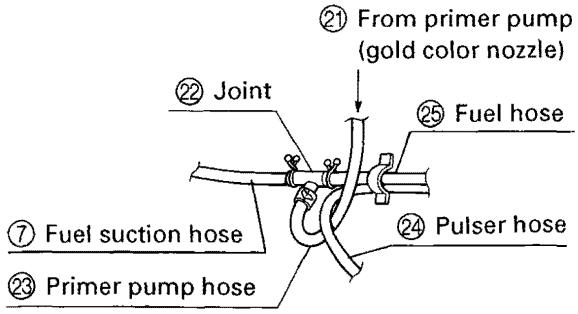


A: Distance across flats
B: Outside thread diameter

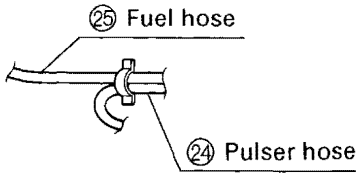
CABLE ROUTING



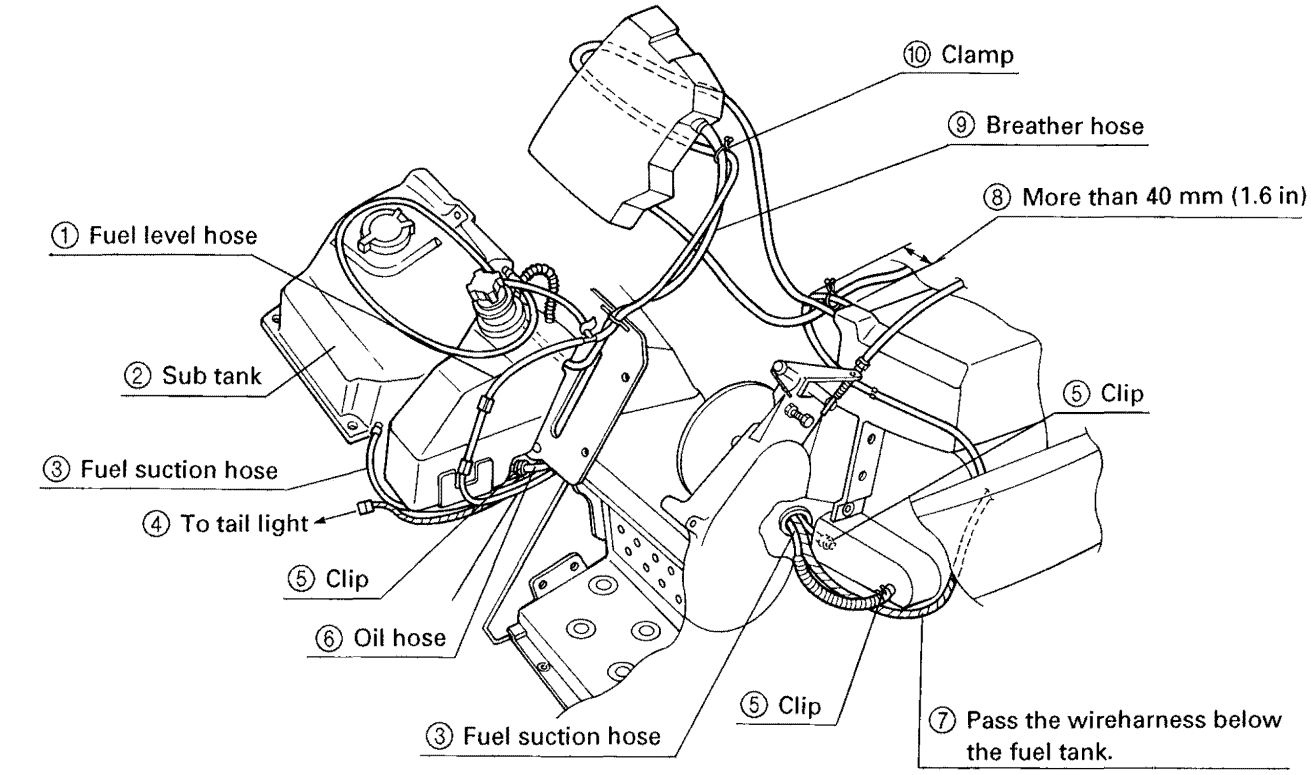


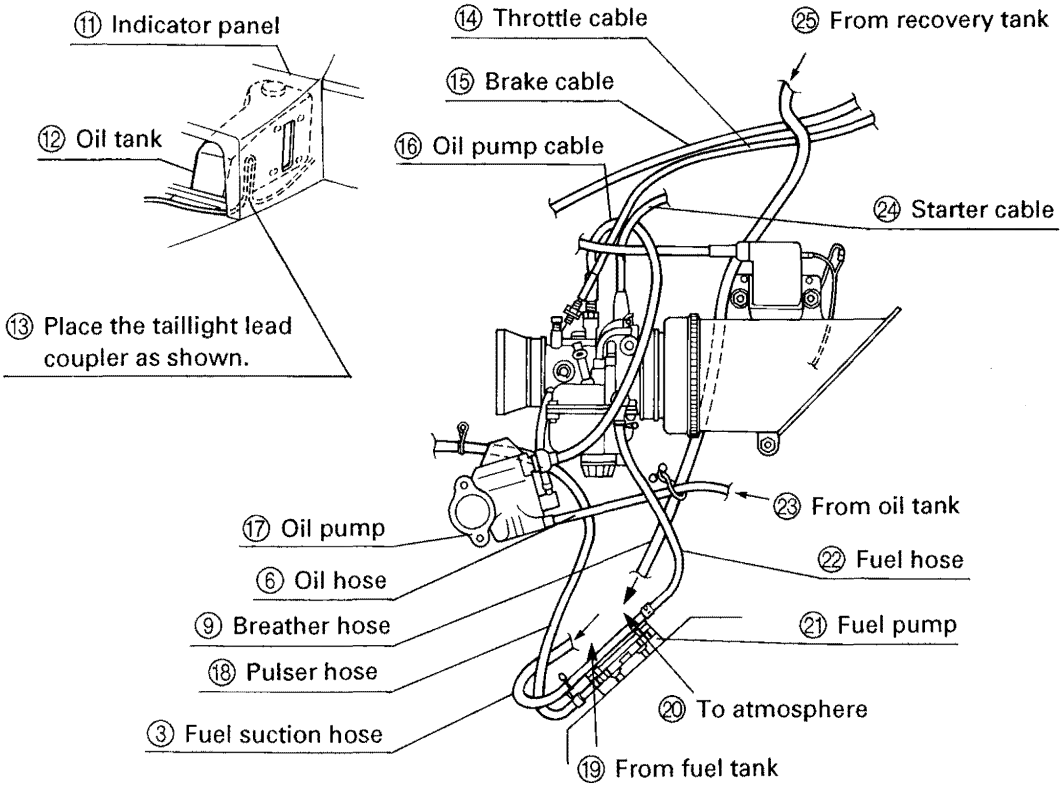


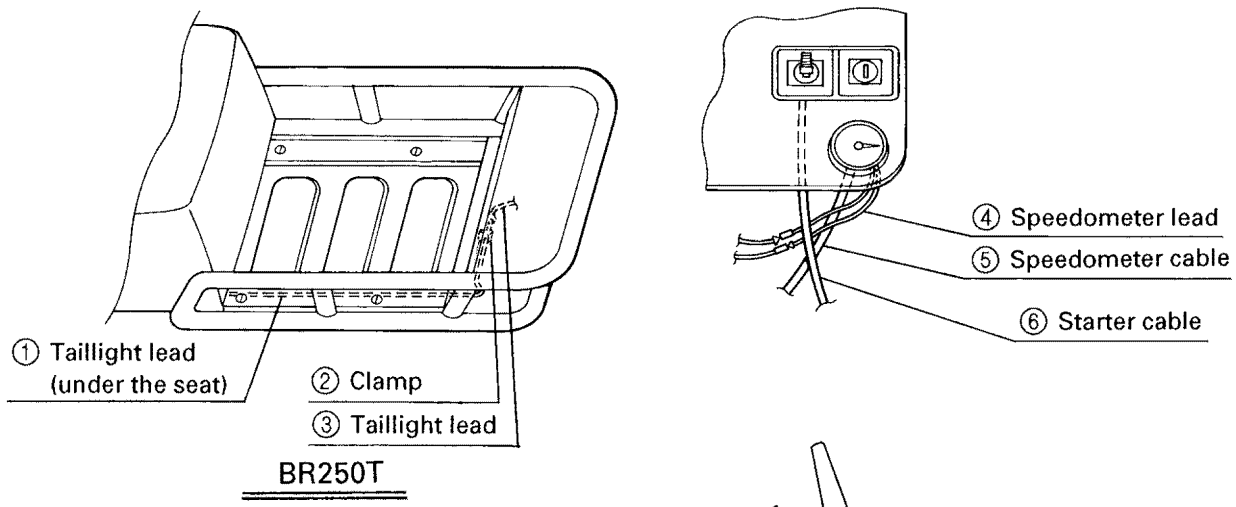
A (with primer pump*)
* Option



A (without primer pump)







BR250T