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YAMAHA
SNOWMOBILE

BR250F

SERVICE MANUAL

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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**
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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.

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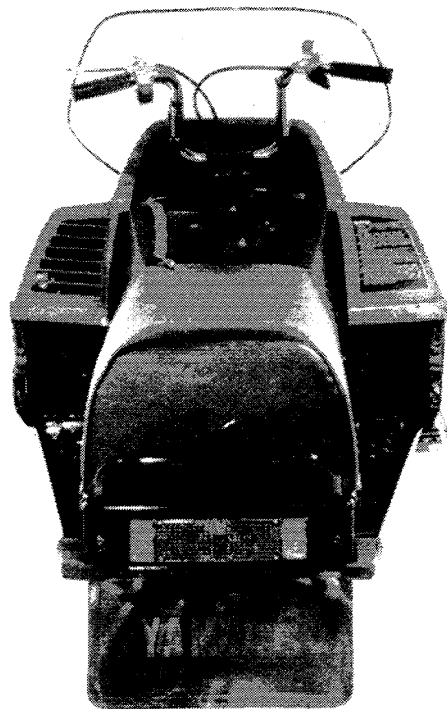
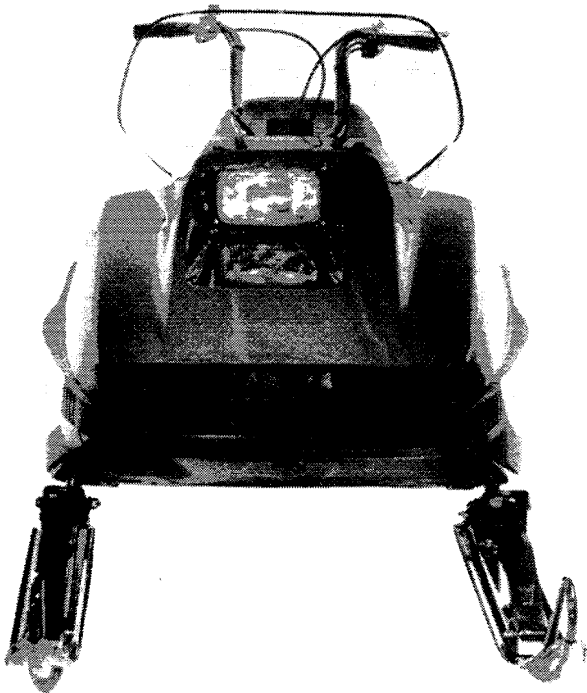
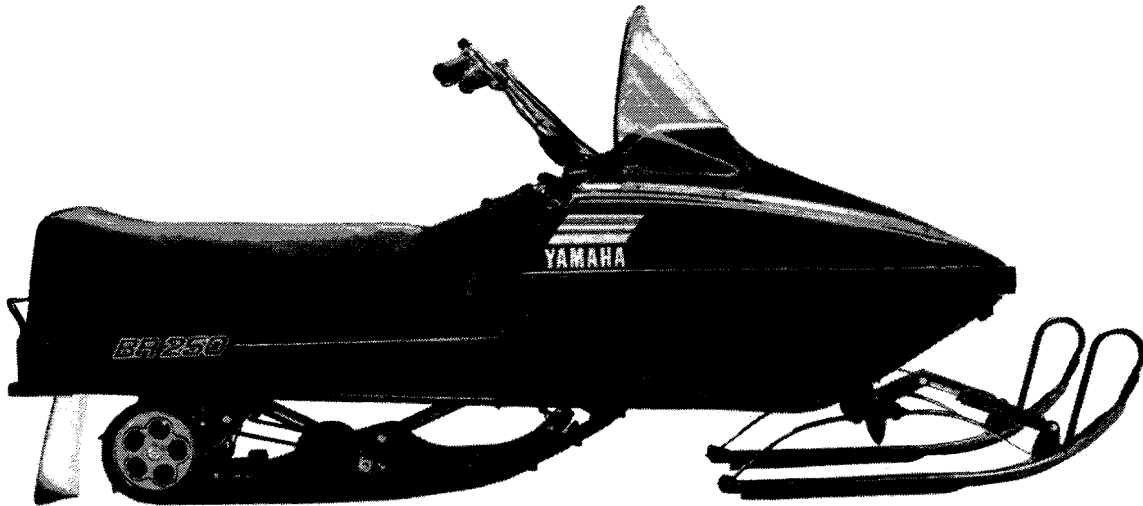
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GENERAL

1-1. EXTERNAL VIEW

GENERAL



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.

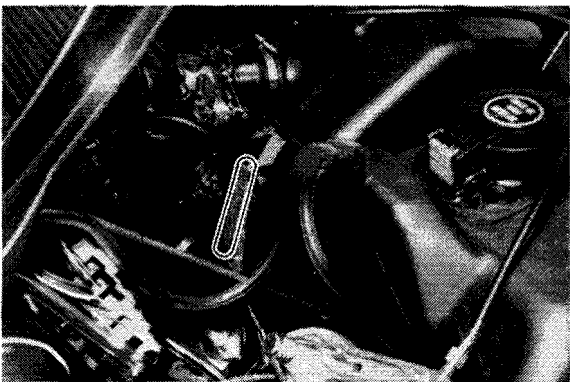


Starting frame serial number

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:					
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		○			
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		○				Molybdenum 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

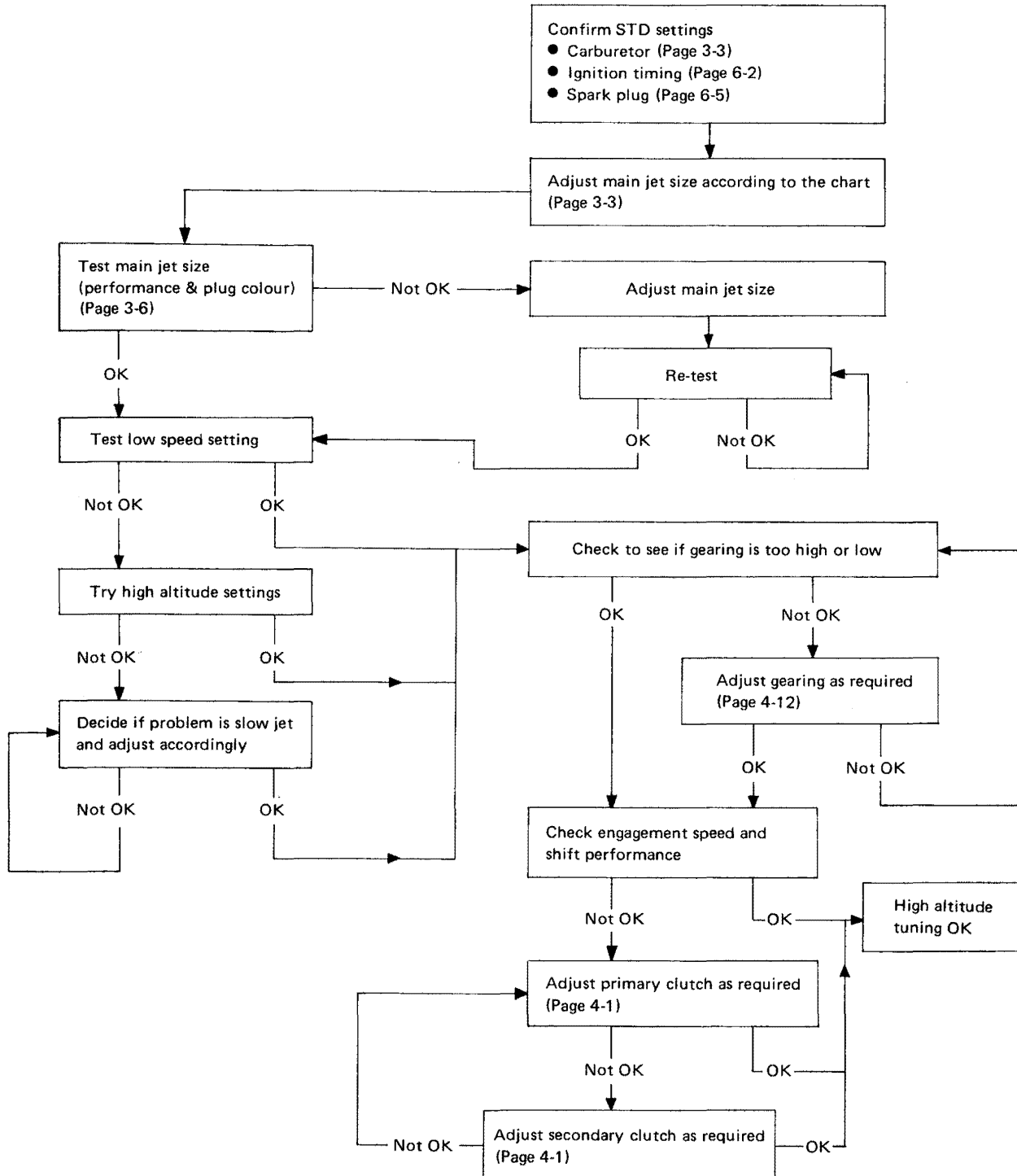
C. Sealing the Carburetor

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

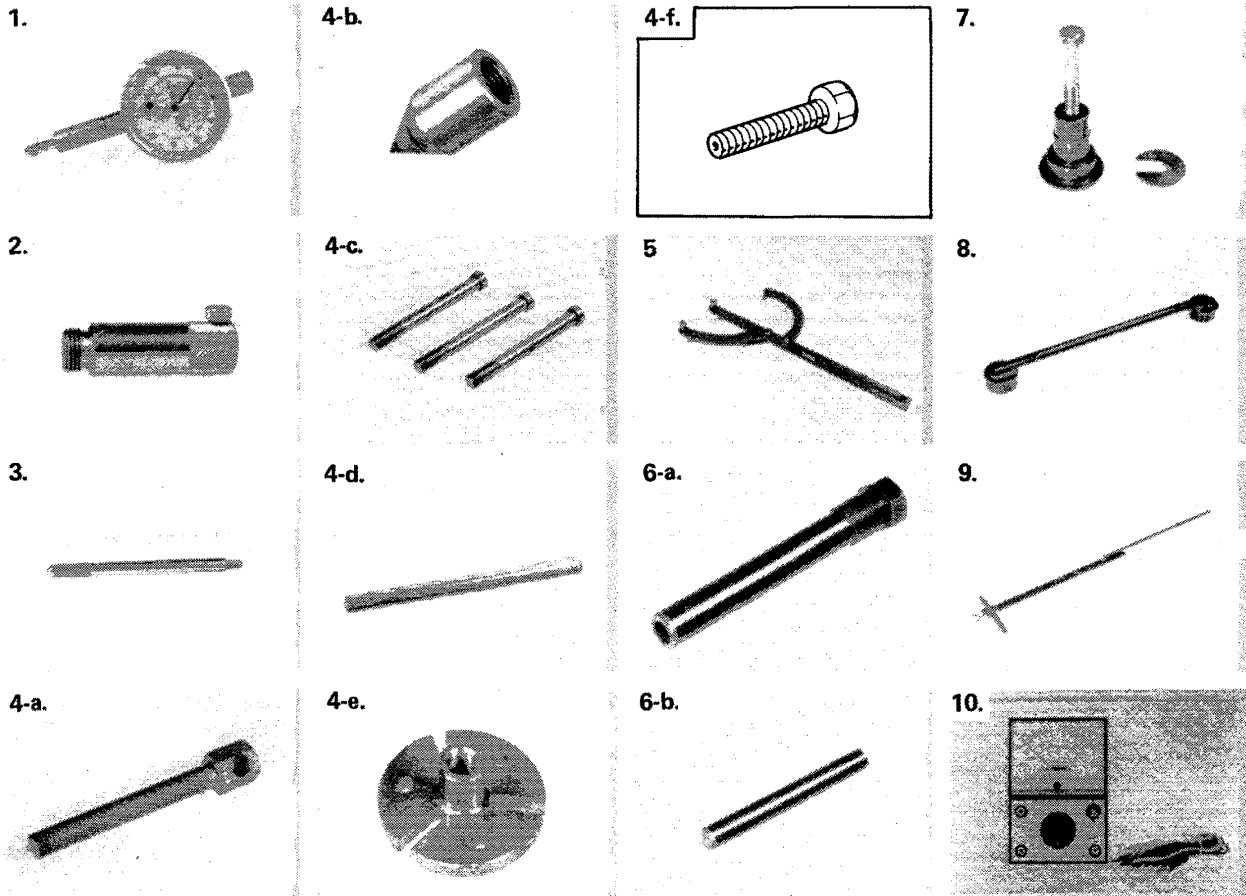
1. Plug the fuel-tank vent pipe.
2. Plug both float-bowl overflow pipes or connect them together.
3. Drain float bowl.

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



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

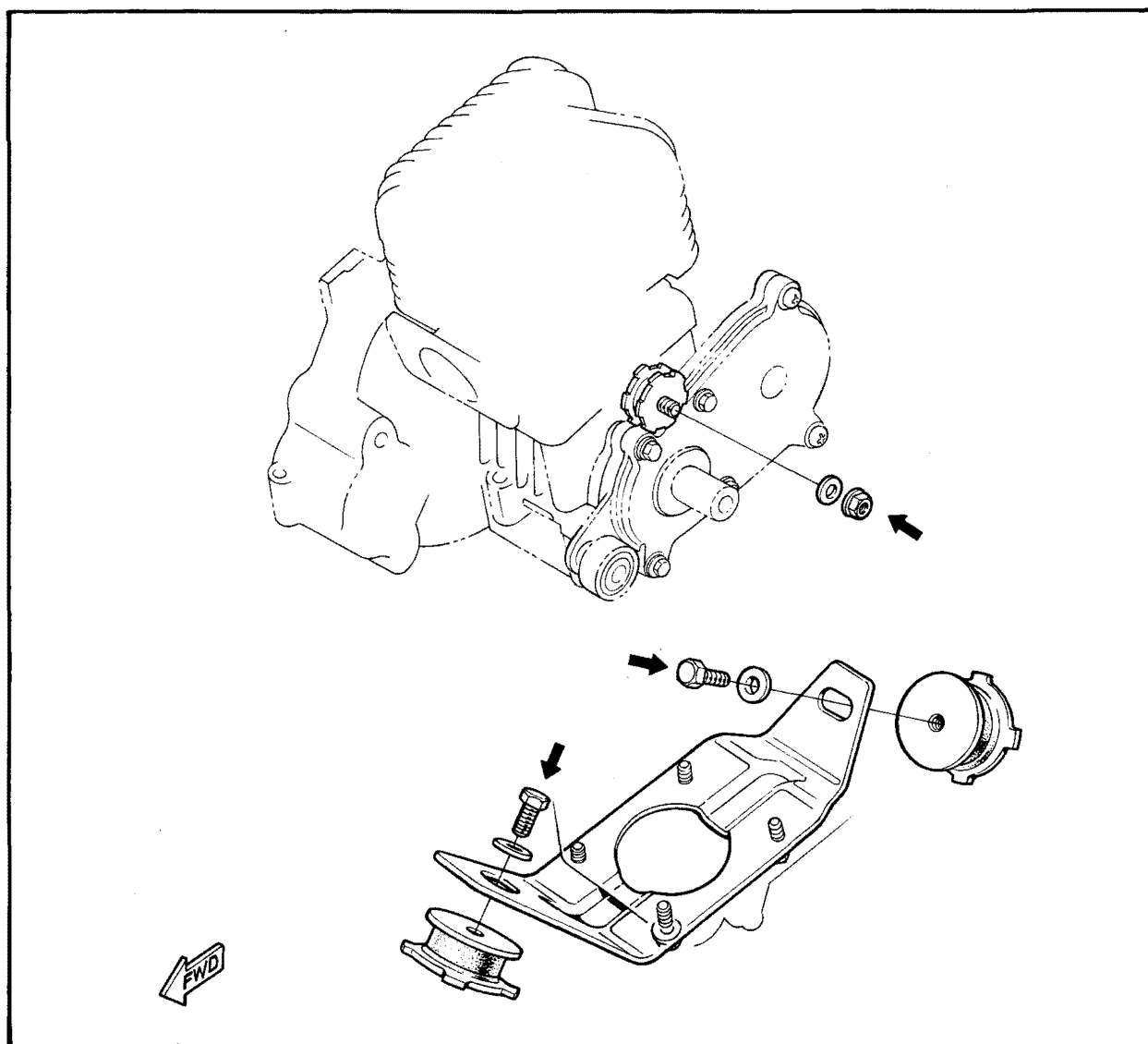
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ENGINE

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

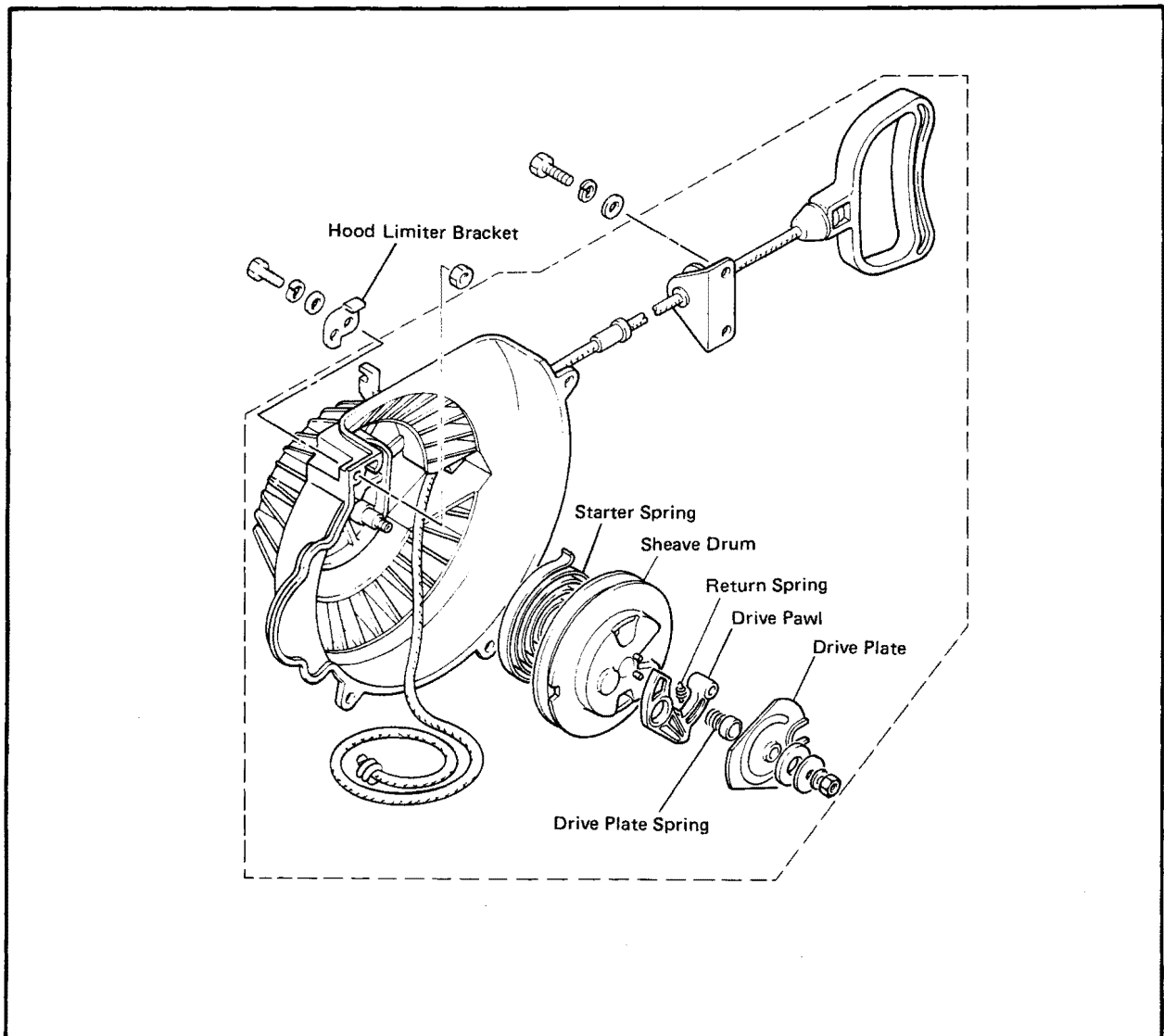
To remove the engine, remove or disconnect the following components in the order given below.

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

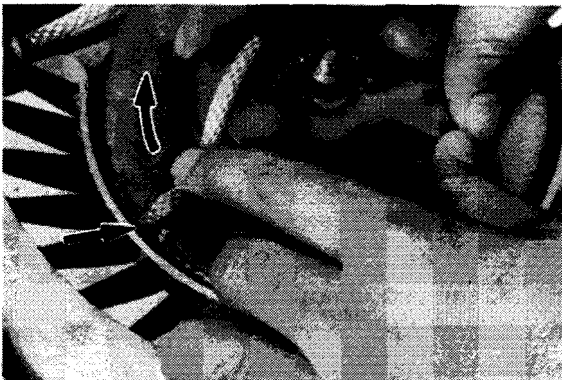


1. Remove the air shroud and the starter from the engine.
2. Pull about four inches of starter rope from the cutout in the sheave drum. Rotate the sheave drum five times clockwise to release the preload on the starter spring.

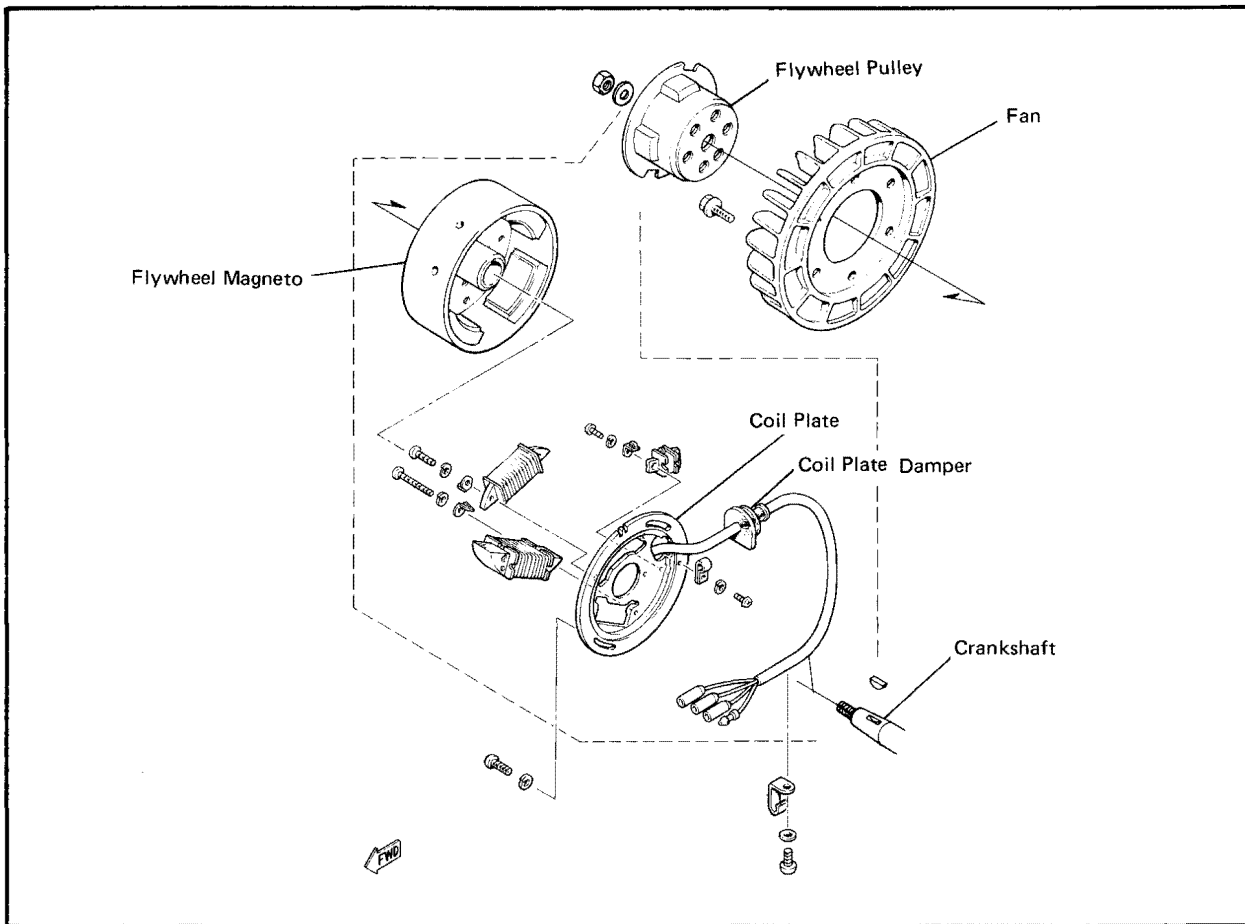
3. Remove the securing nut, and carefully disassemble the starter. Note the relative position of each piece. You will have to reassemble the starter as shown in the illustration above.

CAUTION:

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

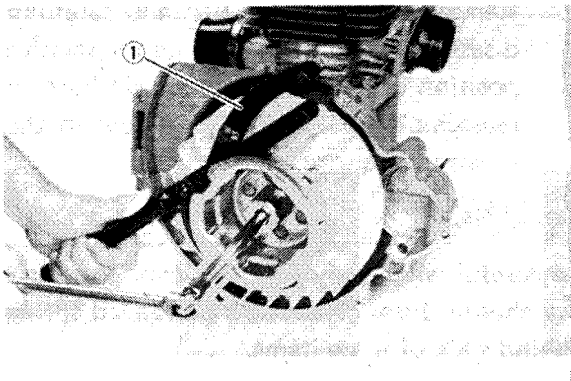


B. Flywheel Magneto



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

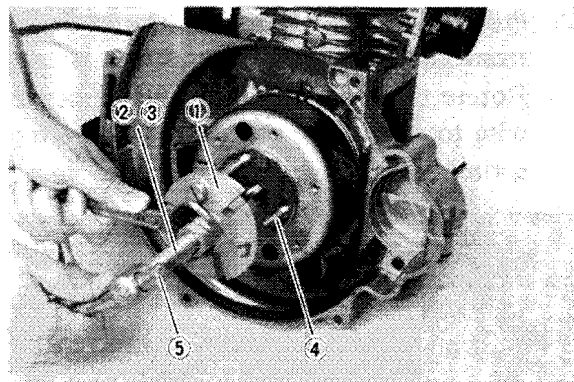
1. Rotor Holding Tool: 90890-01235



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

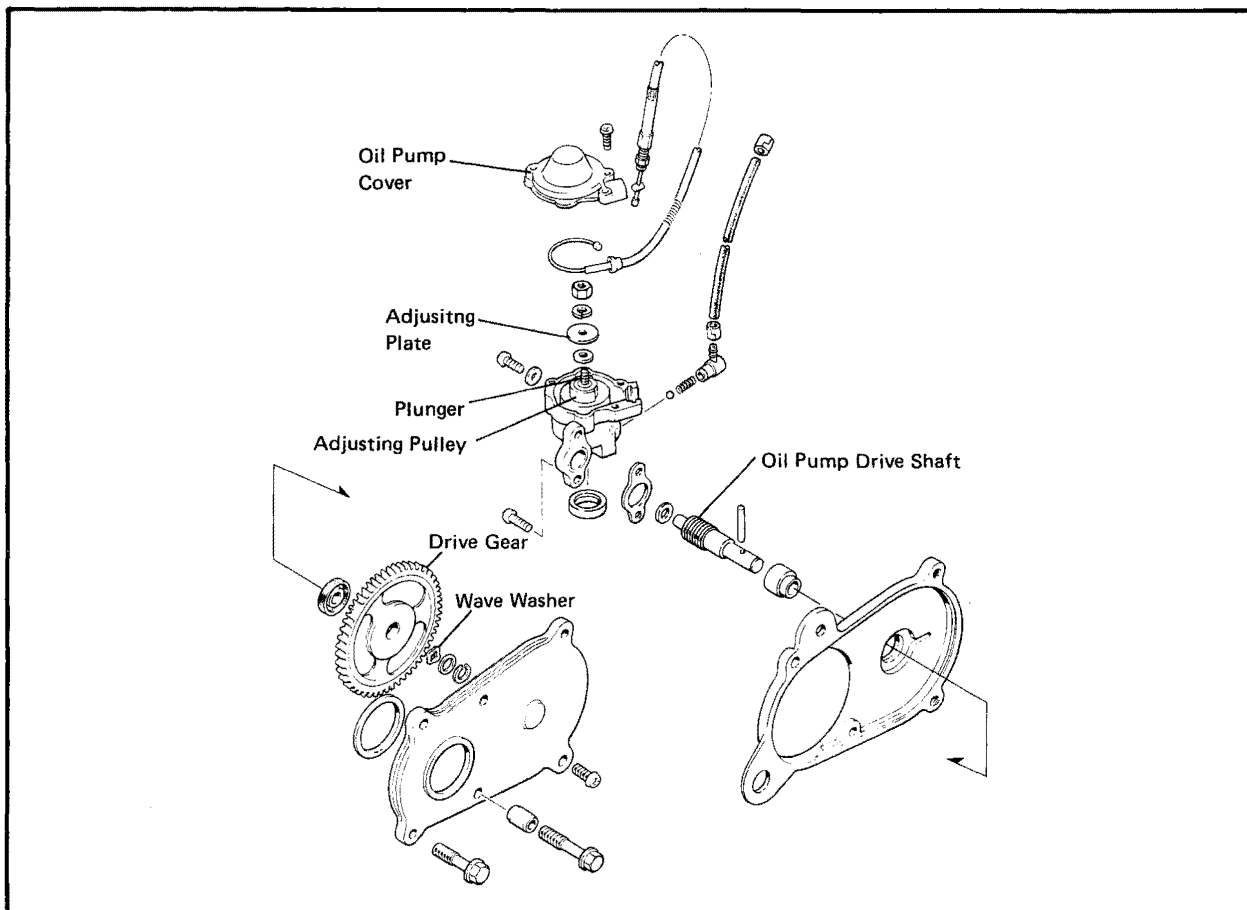
3-Way Puller Ass'y: TLU-90901-05-20 (U.S.A.)

- | | |
|-----------------------------|-------------|
| 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 |

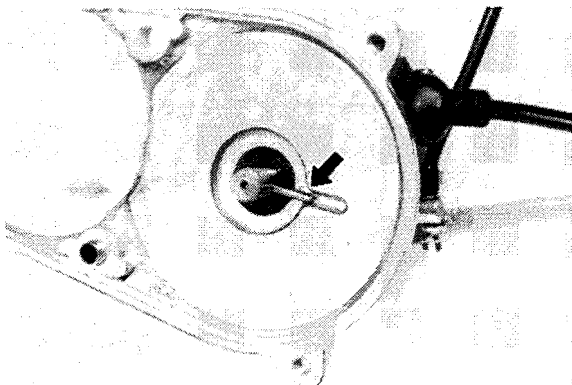


4. Remove the woodruff key from the crankshaft. Remove the two securing screws and remove the coil plate.
5. For inspection, refer to 6-1, G "Pulser and Charge Coil."

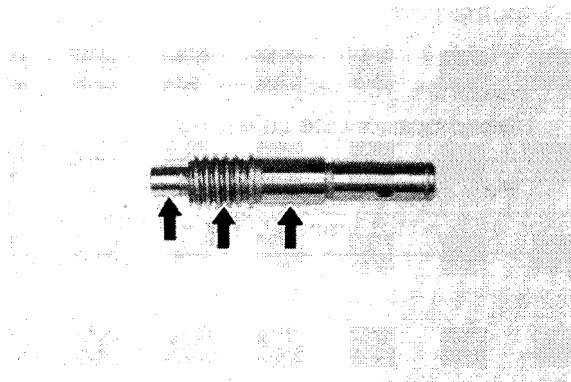
C. Oil Pump



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.

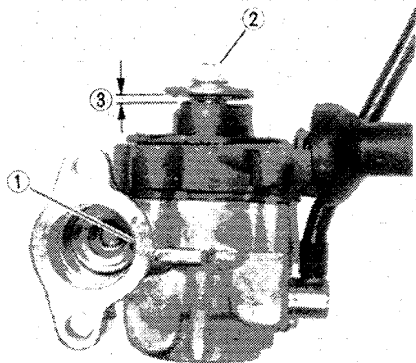


The oil pump should not be disassembled unless the pump stroke must be checked. If a problem with the pump is noted (such as excessive oil consumption) proceed as follows:

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.

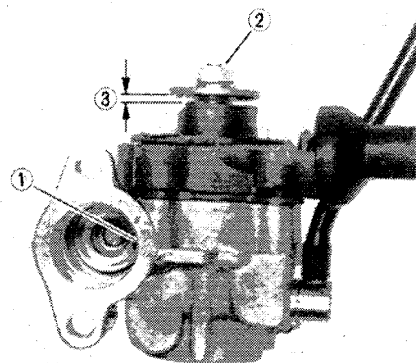
Minimum pump stroke:
0.2 ~ 0.25 mm (0.08 ~ 0.010 in)



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

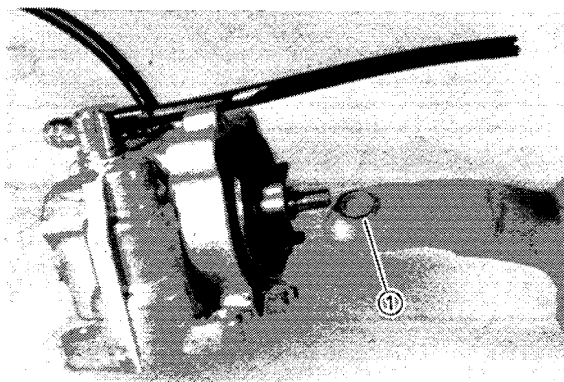
8. Measure the maximum pump stroke.
 - a. Pull the oil pump cable out of its sheath as far as it will go. The cable must be held in this taut position when measuring maximum pump stroke. It may be helpful to securely wrap duct tape around the cable where it enters the sheath.
 - b. Turn the oil pump 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.



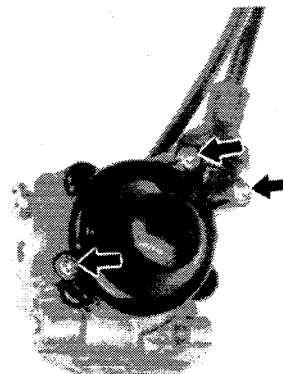
1. Adjusting shim

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)

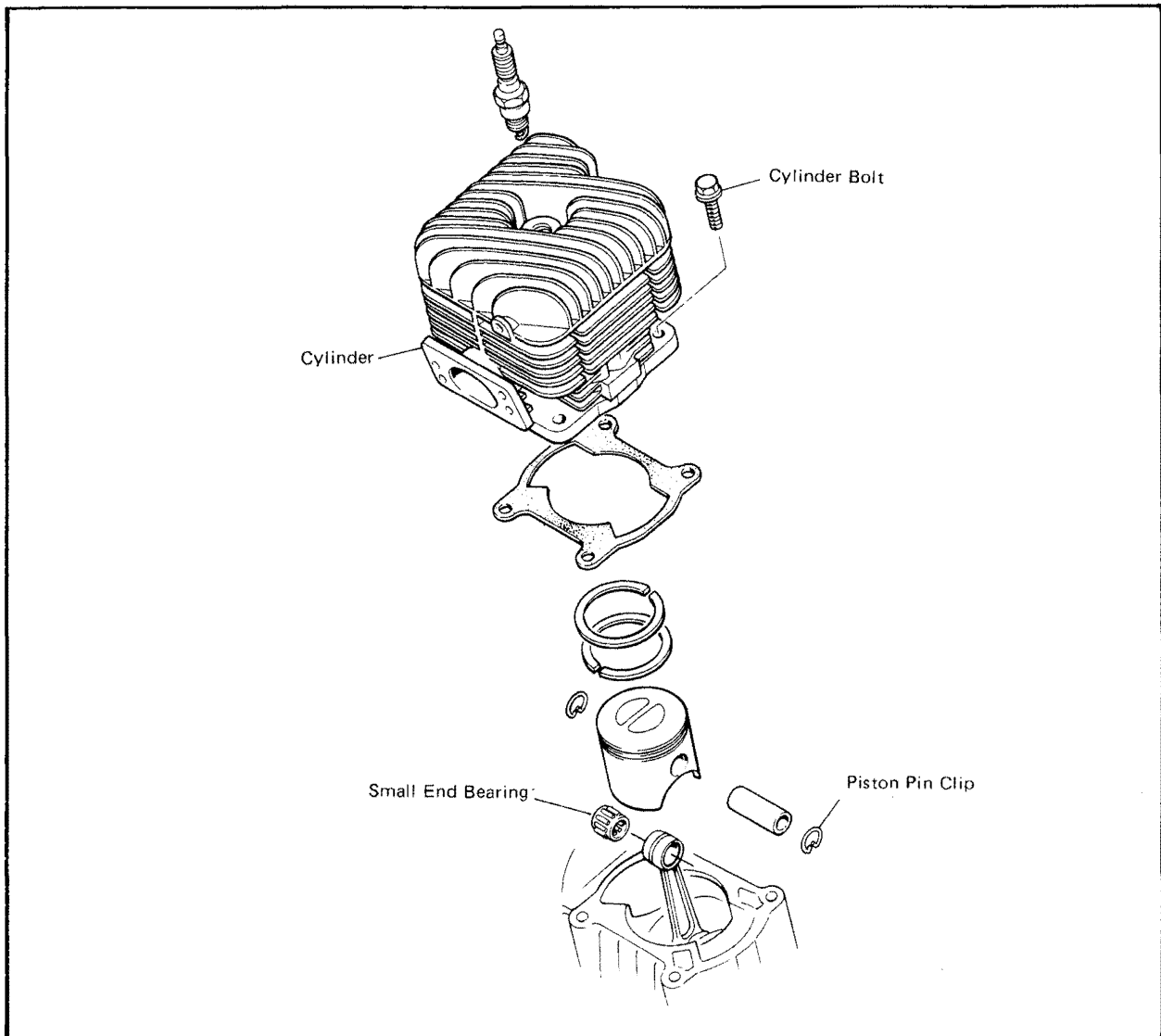
11. Grease the adjusting plate, and reinstall the oil pump cover. Seal the cover with Yamabond 5. Torque the screws to specification.

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



D. Top End

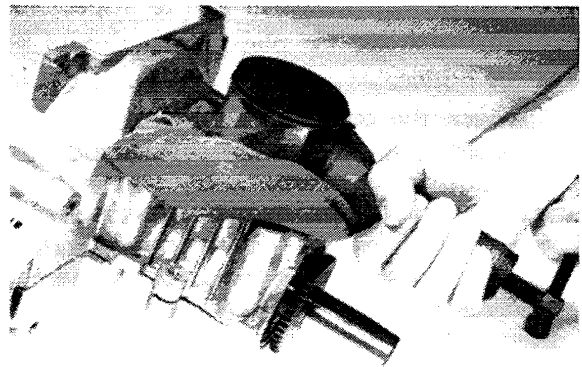
This model has a one-piece cylinder and cylinder-head assembly. There is no cylinder head to remove and service separately from the cylinder.



Disassembly

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

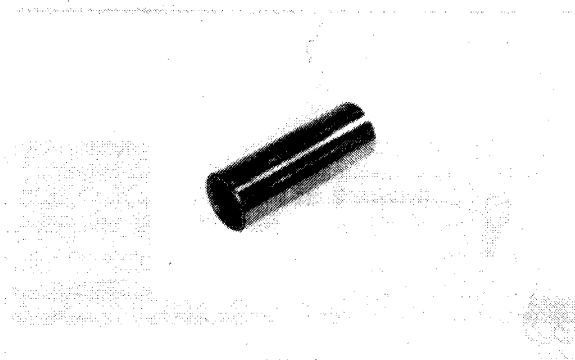
Universal piston-pin puller:
YU-01304



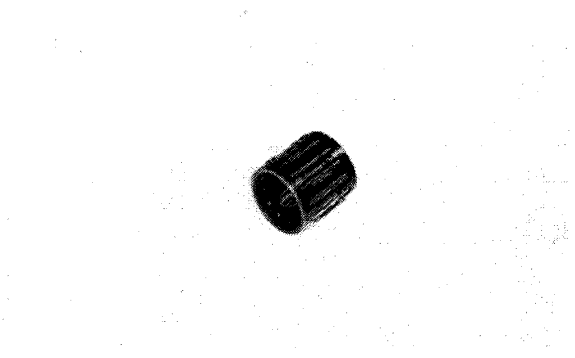
4. Remove the piston and the small-end bearing from the connecting rod.

Inspection

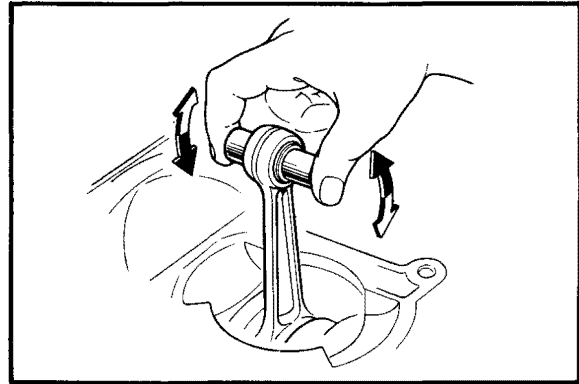
1. Piston pin and bearing inspection.
 - a. Check the piston pin for signs of wear. If any wear is evident, replace the pin and the bearing.



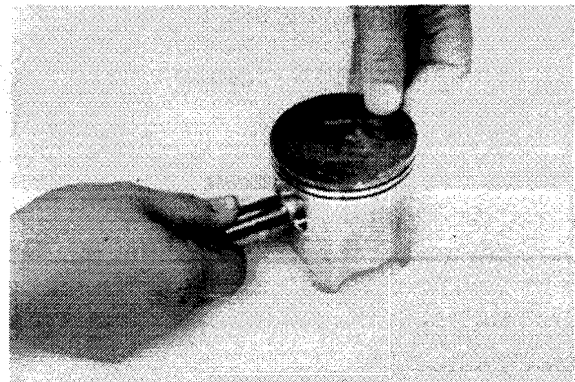
- b. Check the pin and bearing for signs of heat discoloration. If excessive (indentation on pin, etc.), replace the pin and the bearing.
 - c. Check the small-end bearing for excessive wear or damage. Check the rollers for signs of flat spots. If such wear is found, replace the pin and the bearing.



- 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.

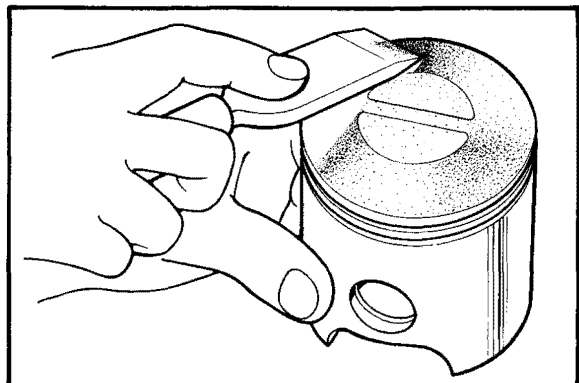


- e. The piston pin should have no noticeable free play in the piston. If the piston pin is loose, replace the pin and/or piston.

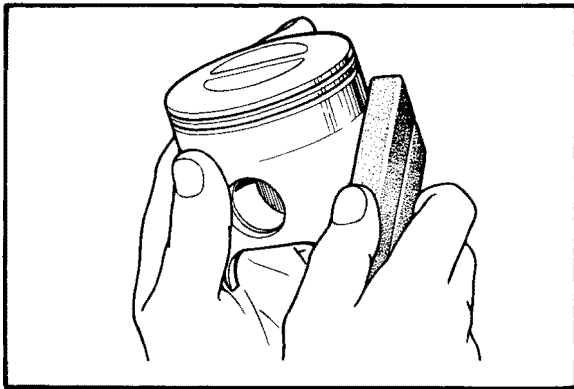


2. Piston

- 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:

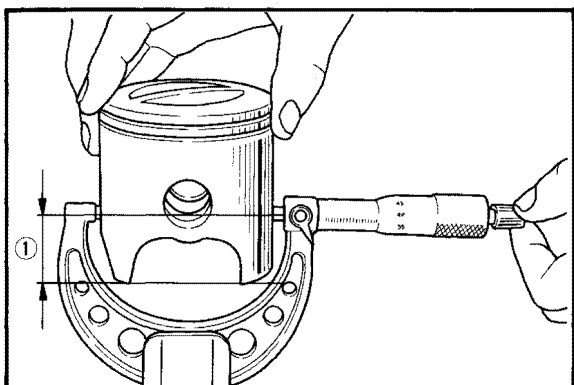
Minimum..... 0.045 mm (0.0018 in)

Maximum.... 0.050 mm (0.0020 in)

Piston oversize:

70.25 mm (2.766 in)

70.50 mm (2.776 in)



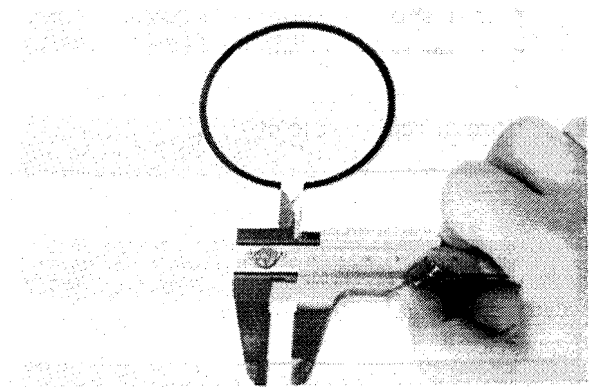
1. 10 mm (0.39 in)

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)

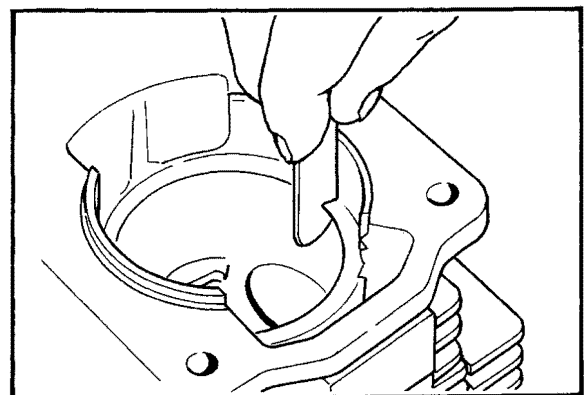


- c. Push the ring into the cylinder, and measure the ring end gap with a feeler gauge. Push the ring into the cylinder with the piston crown so the ring will be at a right angle to the cylinder bore. If the end gap is not within specification, replace the rings as a set.

Ring end gap, installed:

Minimum 0.20 mm (0.0079 in)

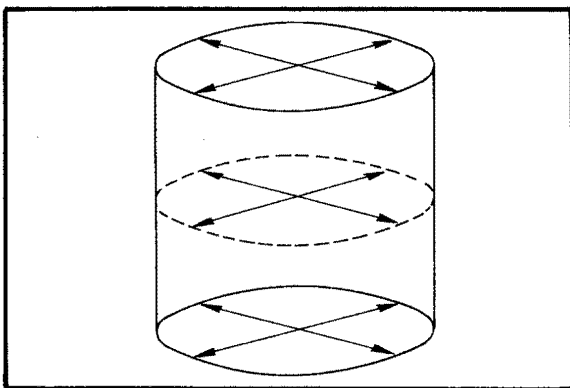
Maximum 0.40 mm (0.0157 in)



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; re-bore 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.

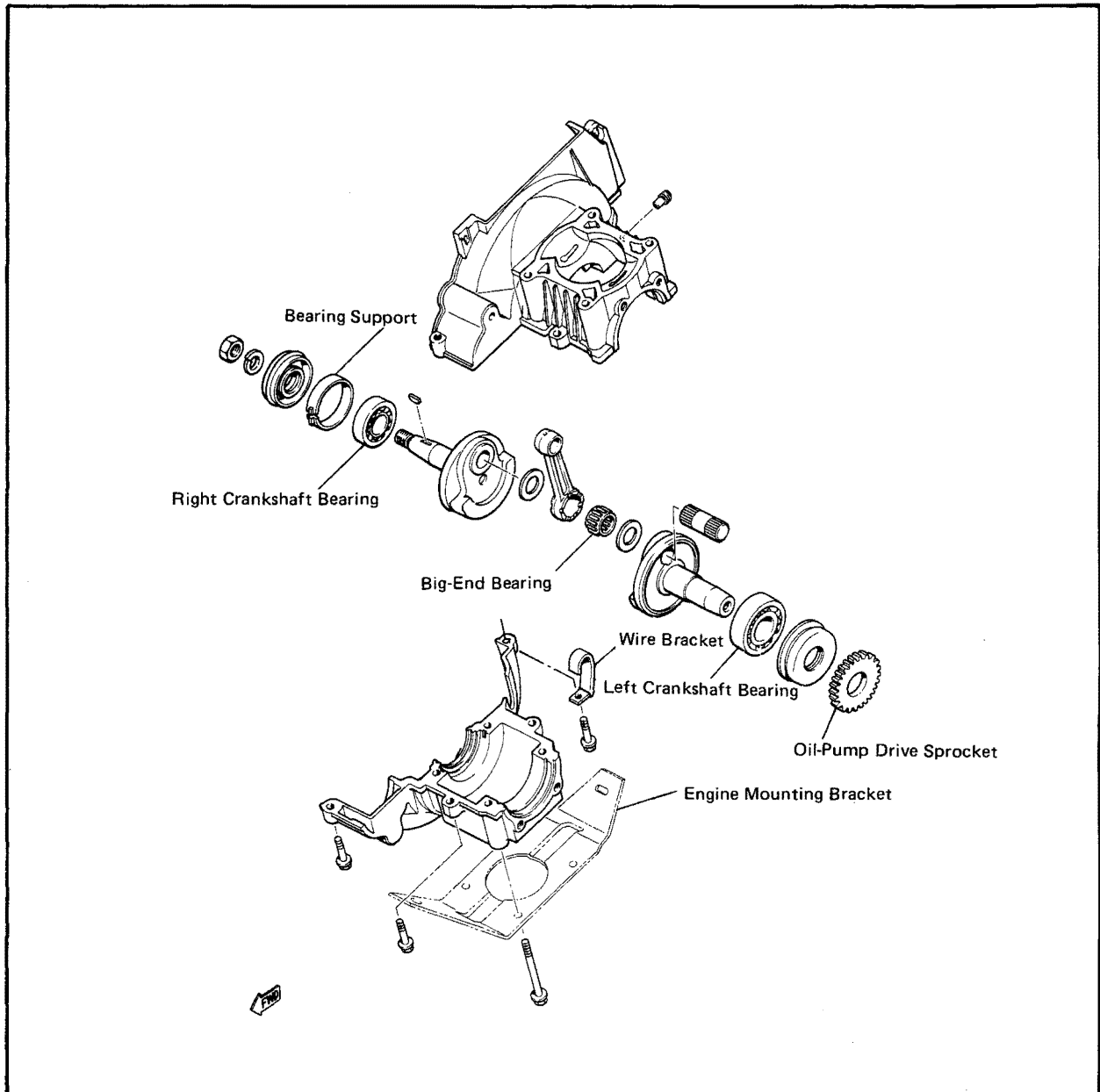


Honing

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.

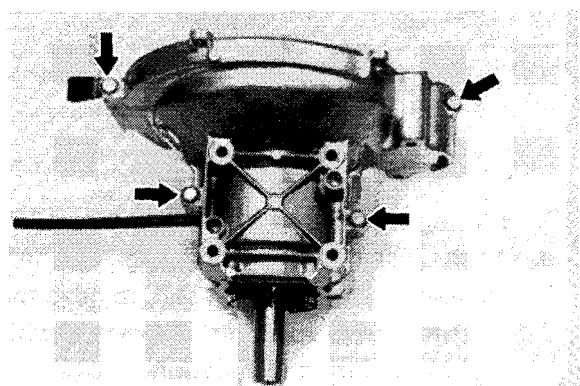
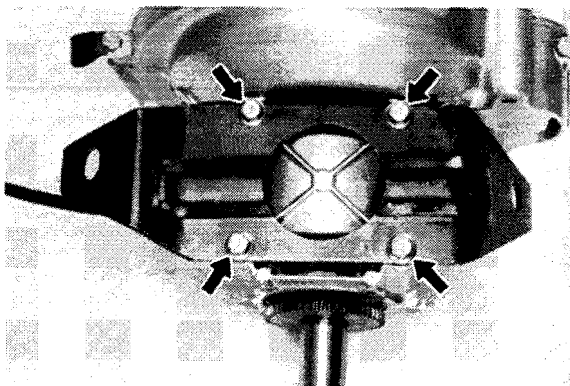
Ammco Hone Kit: TLU-03950-00-00

E. Bottom End

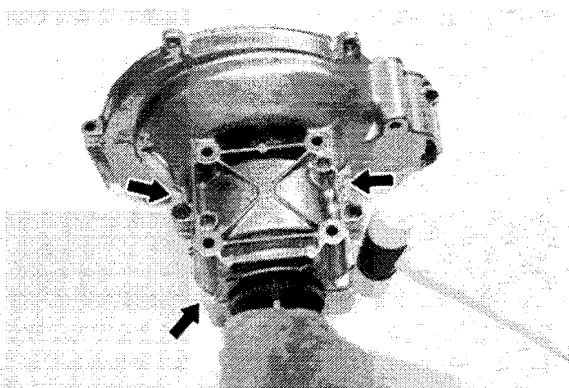


Disassembly

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.



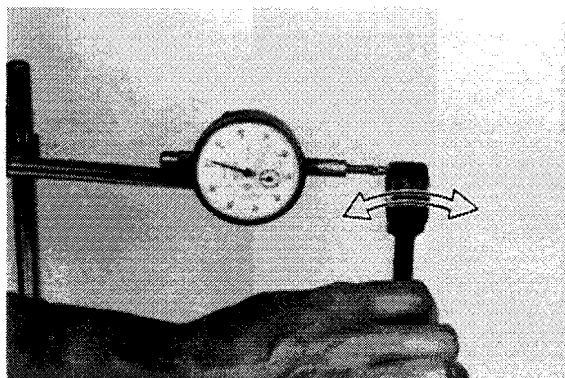
3. Bearing and oil seal installation
 - a. When installing or removing the left crankshaft bearing or oil seal, remove the oil-pump drive sprocket. Replace it with a new one during installation.

- 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

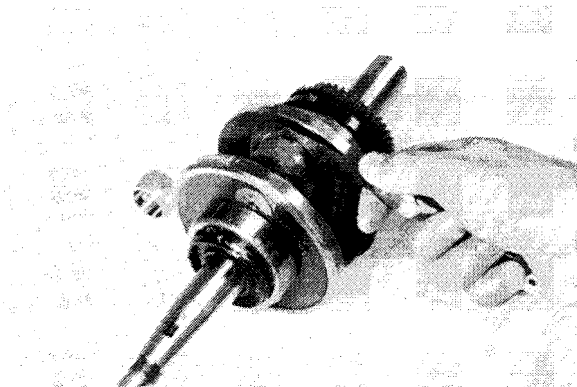
- a. Check the connecting rod axial play at the small end. This will indicate the condition of the big-end bearing and crankpin. If the rod axial play exceeds specification, disassemble the crankshaft and check the connecting rod, crankpin, and big-end bearing. Replace any defective or worn parts. Reassemble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

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



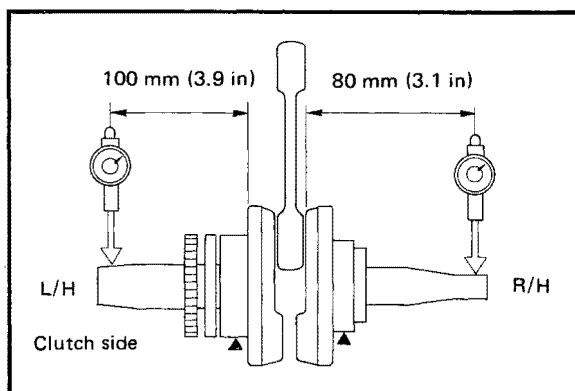
- b. Check the connecting rod side clearance at the big end. If it exceeds specification, disassemble the crankshaft and replace any worn parts.

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.

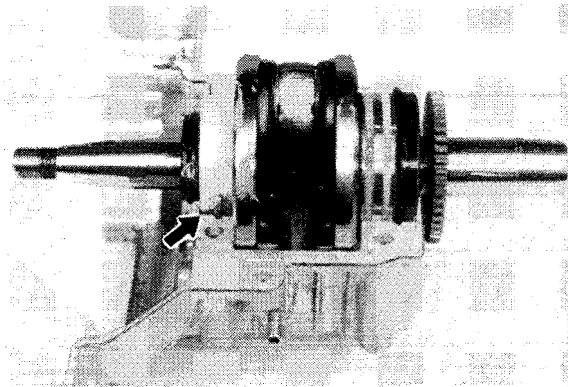
Deflection tolerance	
Left side	Right side
0.02 mm (0.0008 in)	0.02 mm (0.0008 in)



2-3. ASSEMBLY AND ADJUSTMENT

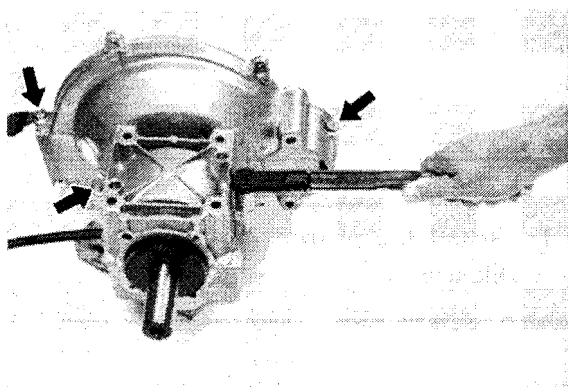
A. Bottom End

- 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.



- Thoroughly oil the bearing and the connecting rod.
- 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.
- Carefully fit the lower crankcase half onto the upper half. The oil 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.

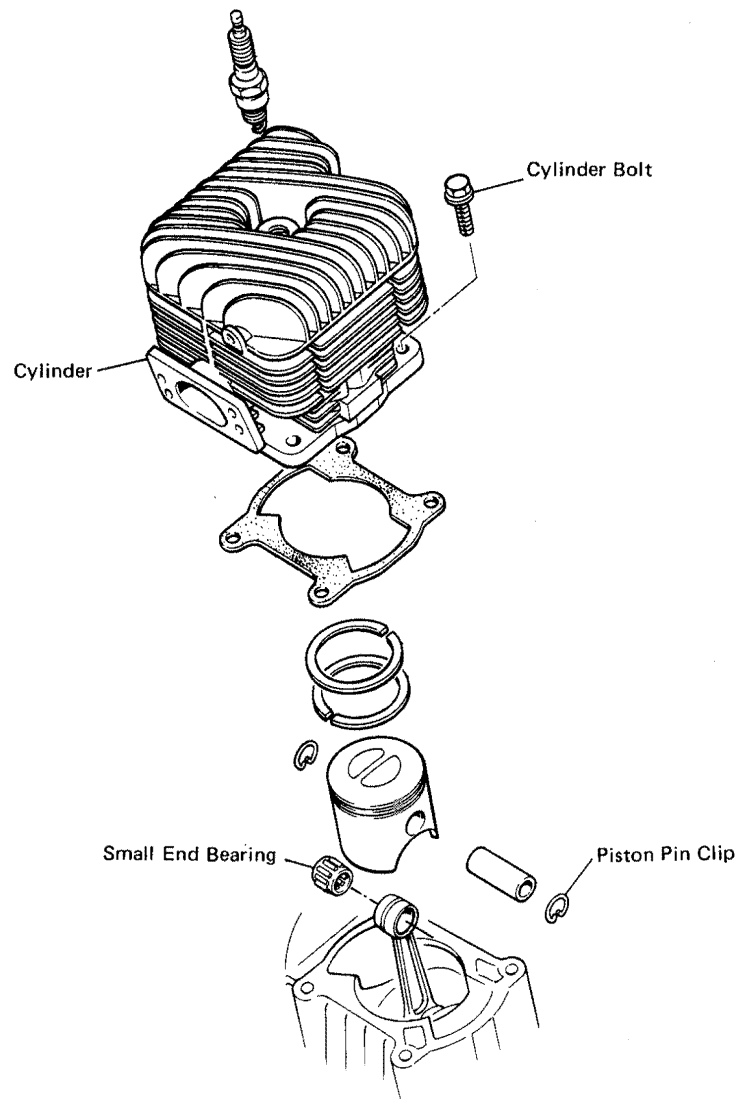
Tightening torque:
1.5 m-kp (10.8 ft-lb)



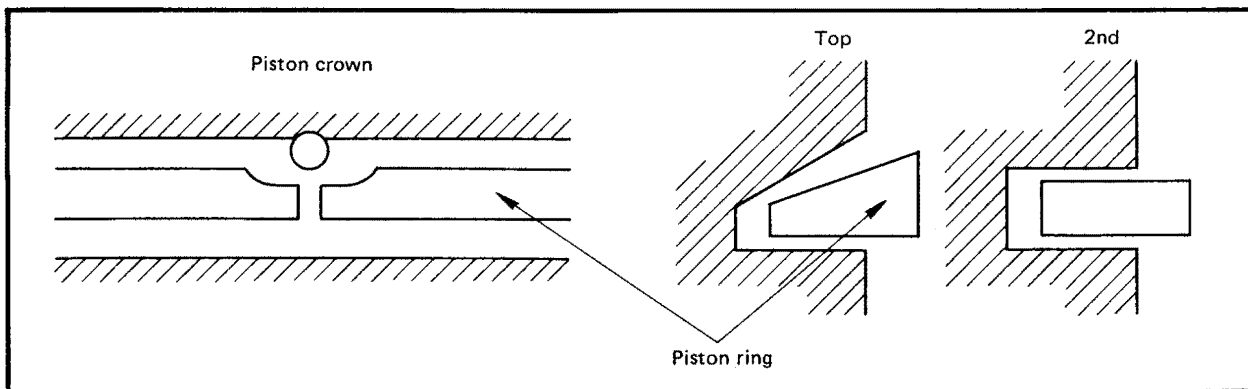
- Install the engine bracket onto the crankcase. Torque the four bolts to specification.

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

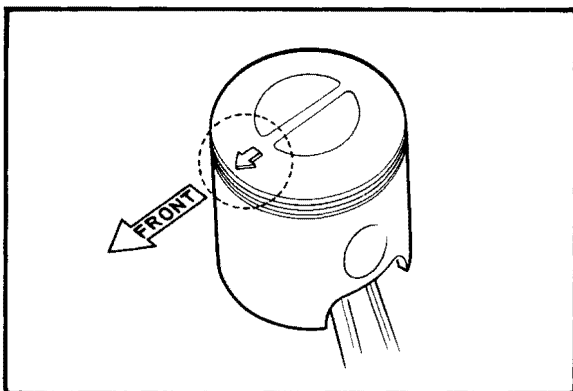
B. Top End



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



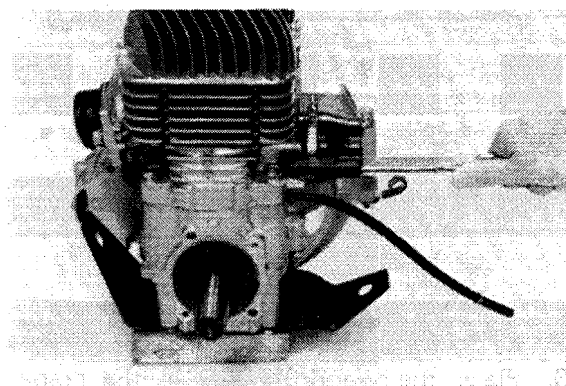
2. Add oil to the crankcase through the oil holes. Oil the connecting rod.
3. Cover the crankcase with a clean cloth so nothing will fall into the crankcase.
4. Oil the small-end bearing and install it in the connecting rod.
5. Oil the connecting rod, and install the piston. The arrow on the piston crown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



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.

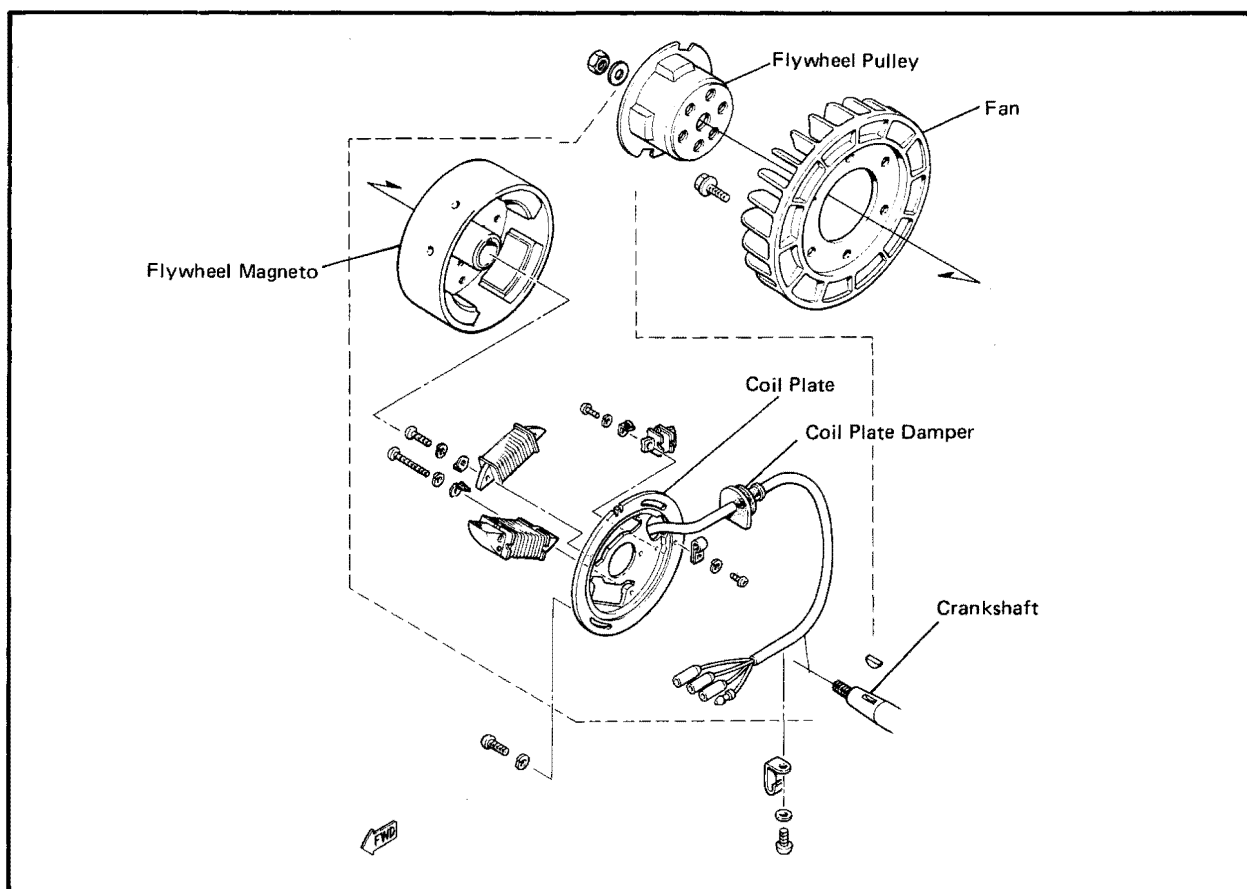
Tightening torque:

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

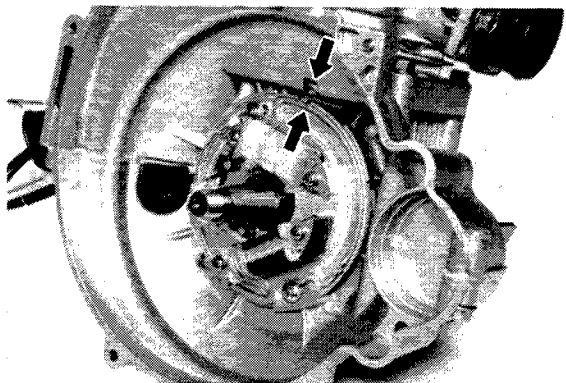


6. Oil the piston pin, and install it in the piston. Be sure the piston pin clip is correctly seated in the groove.

C. Flywheel Magneto

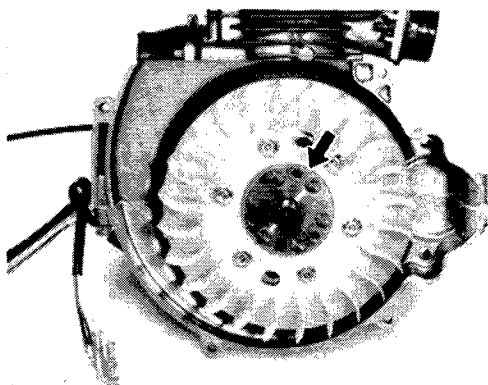


1. Feed the magneto leads through the hole in the crankcase, and secure the damper in the case.
2. Install the coil plate onto the crankcase. Align the pry points on the plate with the cutout in the crankcase. Apply a thread-locking compound to both securing screws.



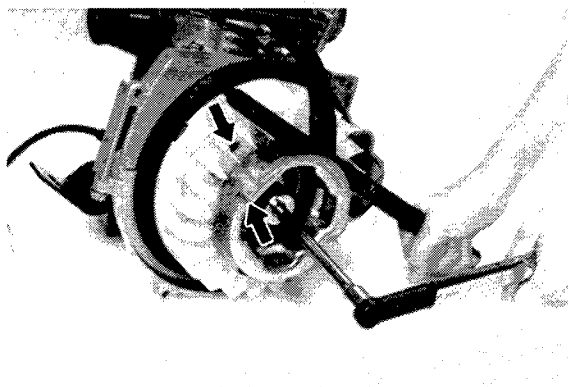
3. Place the woodruff key in the crankshaft, and install the flywheel magneto. The keyway in the magneto must align with the key in the crankshaft. Rap the magneto with a plastic mallet to seat it on the crankshaft.
4. Install the fan on the magneto. The arrow on the fan must point to the keyway in the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

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



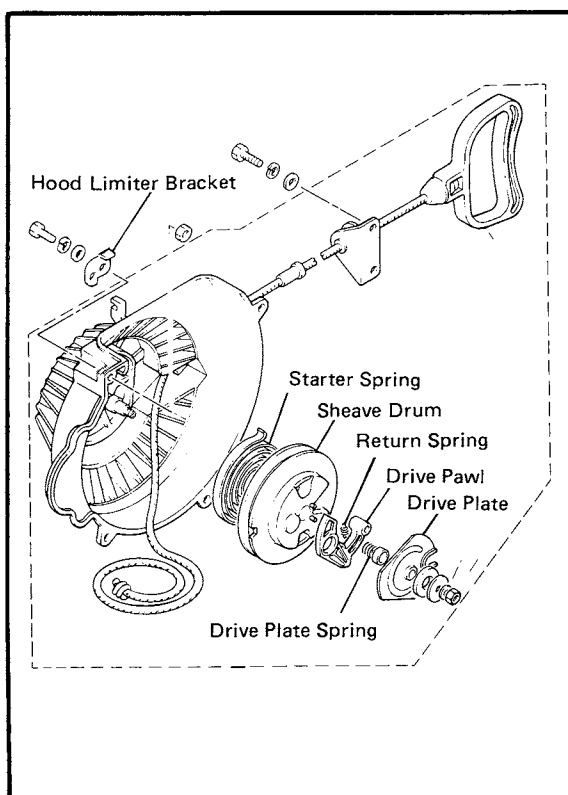
5. Install the flywheel pulley. The two cut-outs on the edge of the pulley must be opposite the holes in the fan. Torque the securing nut to specification.

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

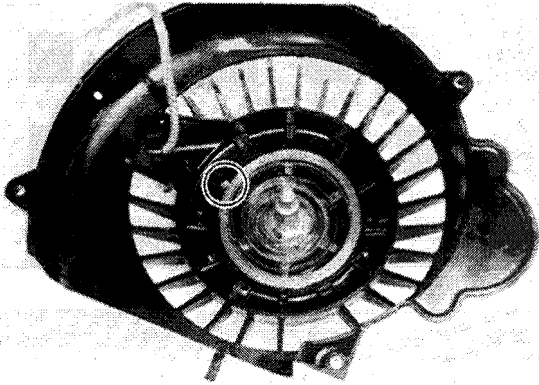


6. For timing adjustment (Refer to 6-1, C "Ignition Timing.")

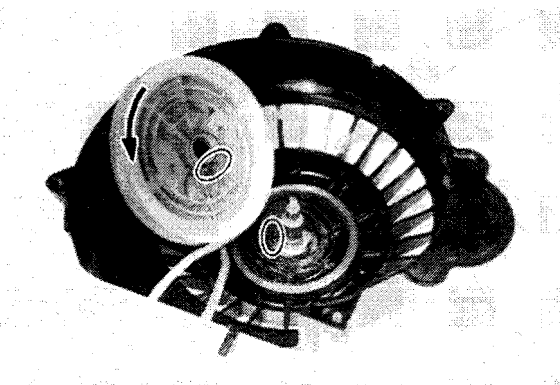
D. Recoil Starter



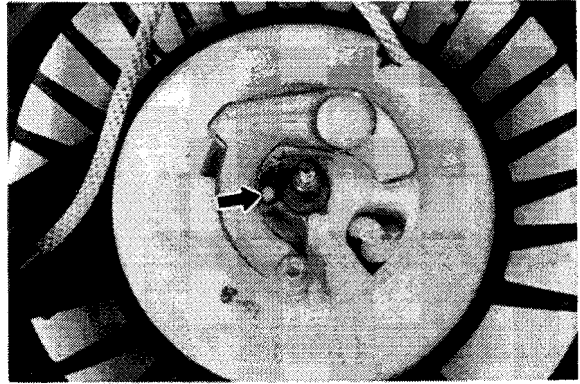
1. Hook the outer book of the starter spring around the post in the starter case. Carefully wind the spring counterclockwise, and fit the spring into the case. Thoroughly grease the spring after installation.



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.

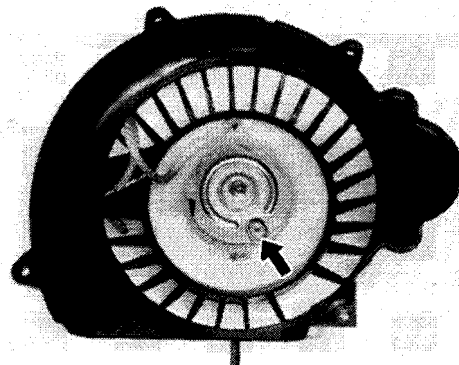


4. Install the drive pawl and the return spring. Hook the spring around the first post on the sheave drum as shown in the photograph.

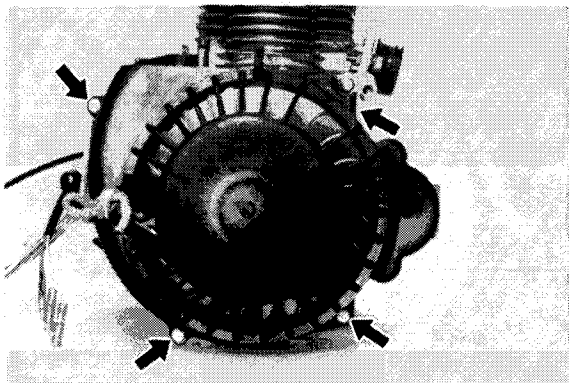


5. Install the drive plate spring, spring collar, and the drive plate. Be sure the cutout in the drive plate fits over the post on the drive pawl. Install the thrust washer and torque the nut. Grease the pivot point of the drive pawl.

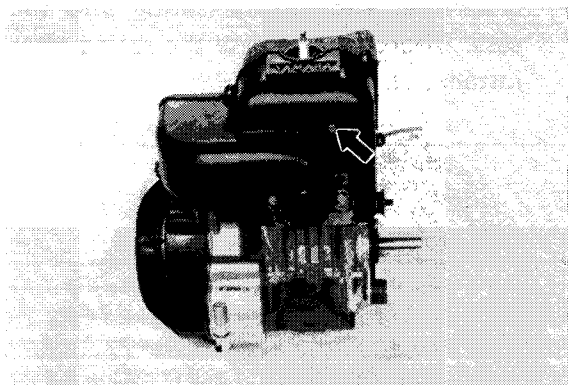
Tightening torque:
1.3 m-kp (9.4 ft-lb)



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 counterclockwise to preload 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.

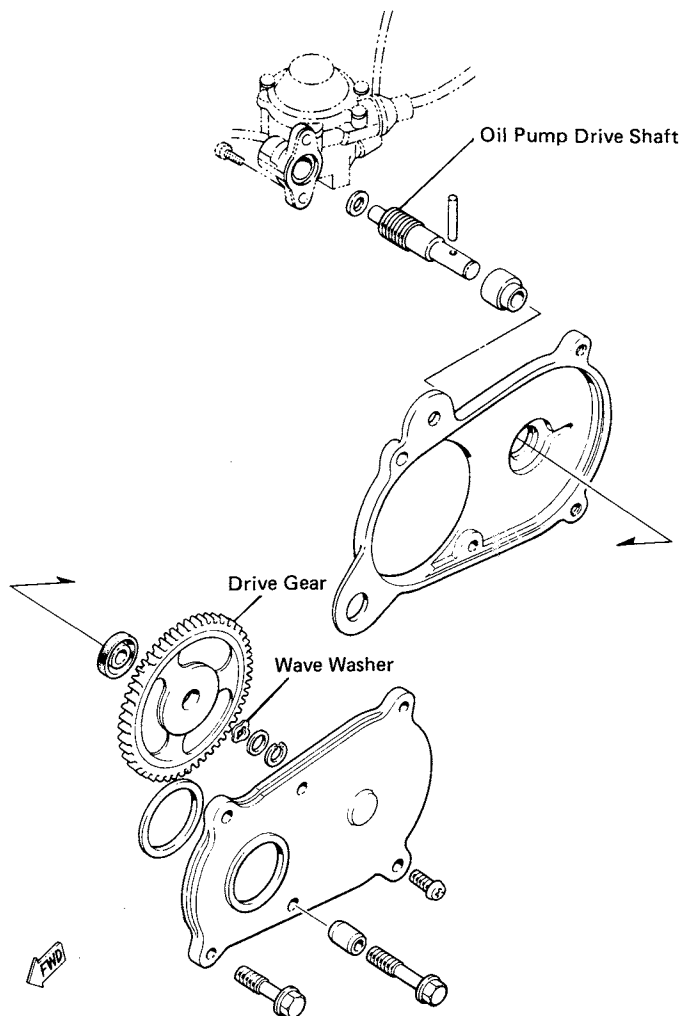


Tightening torque:
0.65 m·kg (4.7 ft·lb)

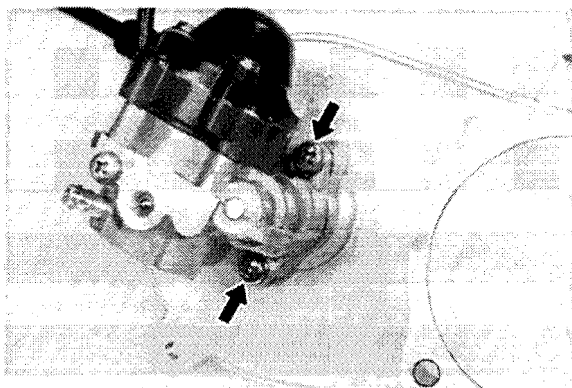


9. Install the air shroud. Use a washer and lock washer with the screw that secures the air shroud to the starter case. Apply a thread-locking compound to the two bolts that thread into the engine. Torque the bolts to specification.

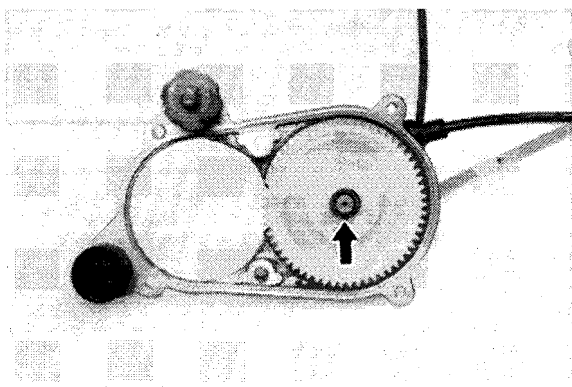
E. Oil Pump Gear Case



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:

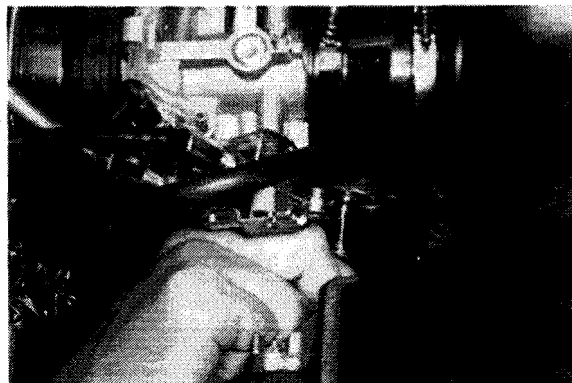
Any portion of the oil system has been disconnected.

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.

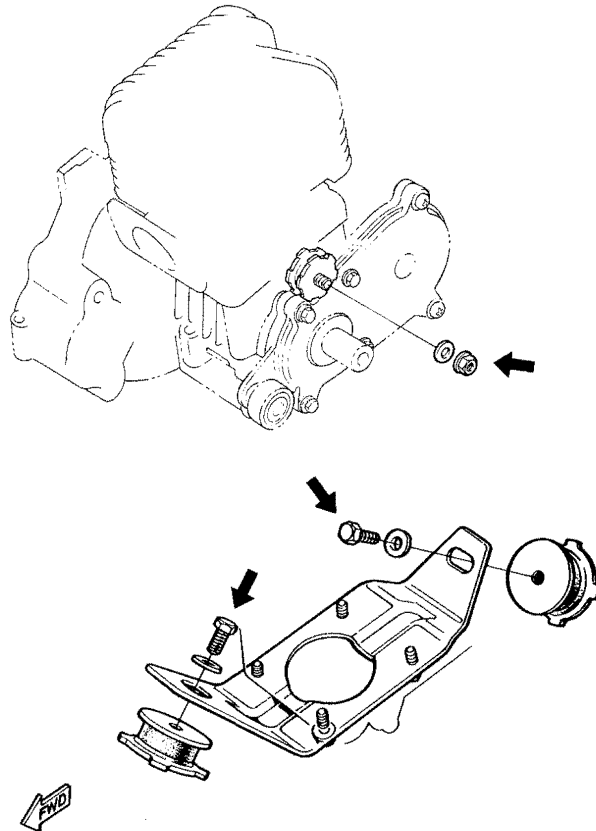
1. Place the engine in the chassis. Torque the three engine mounts to specification.

Tightening torque:

Bolt: 3.0 m-kp (22 ft-lb)

Nut: 1.4 m-kp (10 ft-lb)

ENGINE



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-kp (18 ~ 22 ft-lb)