

SERVICE MANUAL

McCULLOCH 300 SERIES, Eager Beaver® 2.1 and WILDCAT™ Chain Saws

ABOUT THIS MANUAL

This service manual was prepared to assist the experienced Two-Cycle outdoor power equipment technician. It provides service information and procedures to facilitate trouble-shooting and repair of the PM 300 Series, Eager Beaver 2.1 and Wildcat chain saws.

It is organized in a teardown sequence that continues until the unit is completely disassembled. Special reassembly notes are listed where deemed appropriate to ensure proper and safe operation. It should be noted that the disassembly sequence used in the manual was selected for demonstration purposes. It is not intended to represent the most efficient approach to a particular repair action.

NOTES AND CAUTIONS

NOTE:

is used to list helpful service information or techniques.

CAUTION

is used to draw attention to procedures which, if not accomplished properly, could cause personal injury or damage to the unit.

APPLICATION

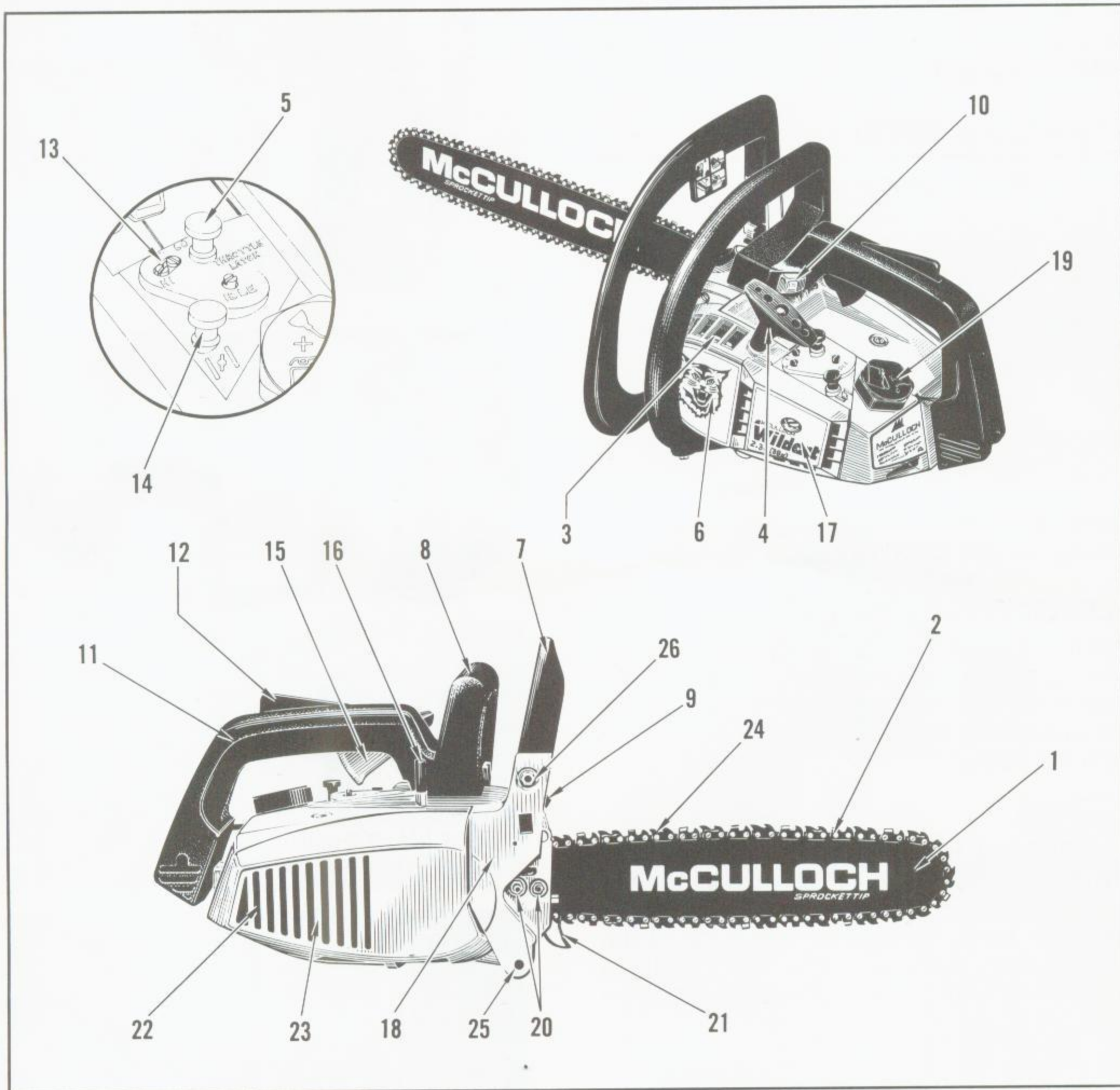
Service information and procedures in this manual apply to:

| Model | Build Level |
|----------------------------|-------------------------|
| Power Mac 310, 320, 330 | 11-, 12-, 14-, 15-, 16- |
| Power Mac 340 | 11-, 12-, 14-, 15- |
| Eager Beaver 2.1, 2.1 A.V. | 11- |
| Wildcat | 11- |
| Pro Mac 355, 365, 375 | 11- |

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I. GENERAL IDENTIFICATION



- | | |
|----------------------------------|-------------------------------------|
| 1. Guide Bar | 14. Choke Knob |
| 2. Saw Chain | 15. Throttle Trigger |
| 3. Fan Housing | 16. Manual Oiler Button |
| 4. Starter Handle | 17. Air Cleaner Cover |
| 5. Throttle Latch Knob | 18. Chain Brake |
| 6. Starter Cover | 19. Fuel Tank Cap |
| 7. Chain Brake Lever/Hand Guard | 20. Bar Bolt Retaining Nuts |
| 8. Front Handle | 21. Spike (Optional Equipment) |
| 9. Oil Tank Cap | 22. Spark Plug |
| 10. Ignition/Stop Switch | 23. Muffler Shield |
| 11. Rear Handle | 24. Saw Chain Adjustment Screw |
| 12. Safety Trigger | 25. Chain Catcher |
| 13. Carburetor Adjustment Screws | 26. Chain Brake Lever Retaining Nut |

II. UNIT DISASSEMBLY PROCEDURE

NOTE:

Drain the unit of all fuel and oil before servicing those respective systems.

STARTER ASSEMBLY

Remove the air cleaner cover.

Remove the 2 starter housing fasteners and the 5/16" nut and washer that fasten the front handle link to the starter housing. The bottom starter housing screw threads into a nut which is glued in a nut pocket in the fan housing.

Remove the starter assembly from the rear, pulling out and back (Figure 2).

SERVICING THE STARTER HOUSING

Pull 6 to 8 inches of rope off the starter pulley. Now locate the rope in the notch of the pulley. Hold tension on the rope in the notch and allow the pulley to rotate, relieving spring tension from the pulley.

CAUTION

Exercise care when removing the starter pulley, as there is tension on the rewind spring.

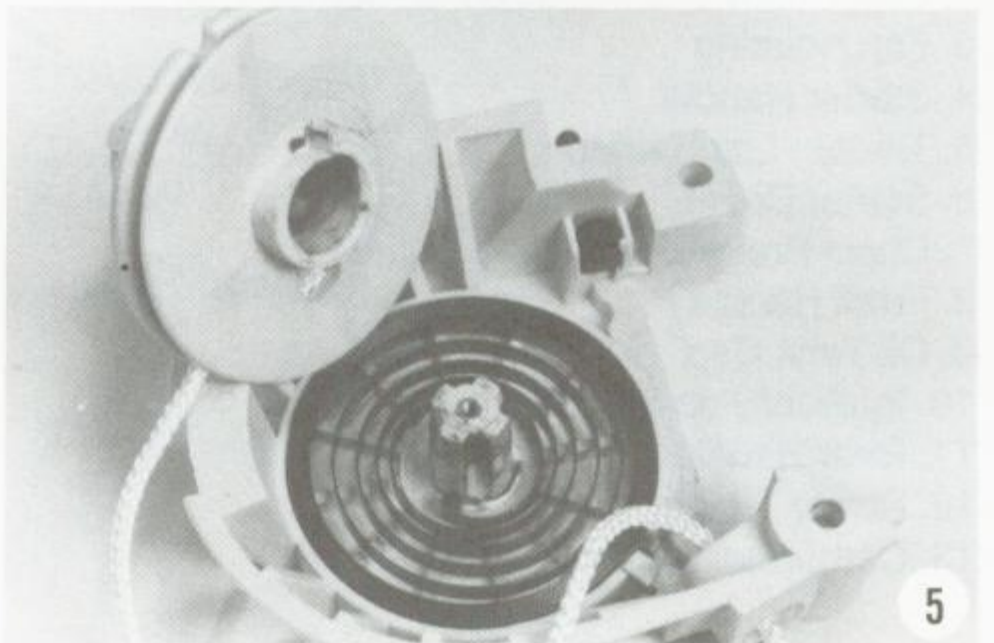
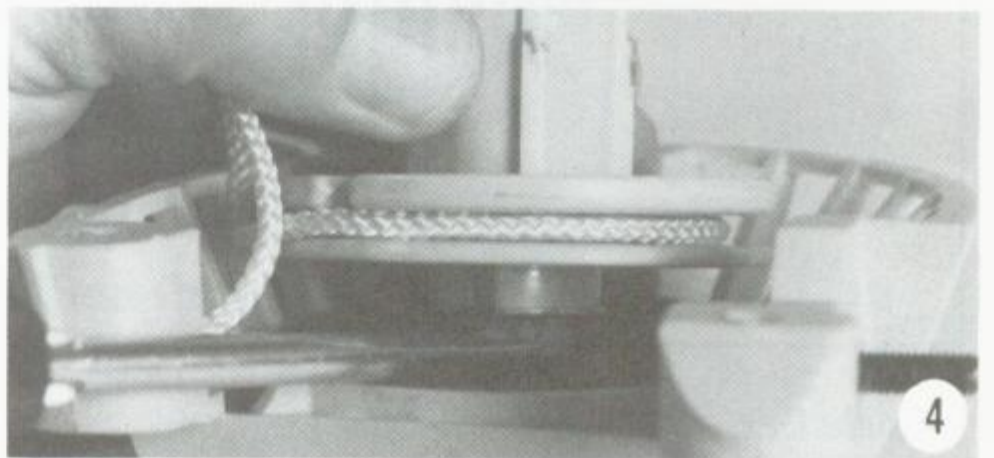
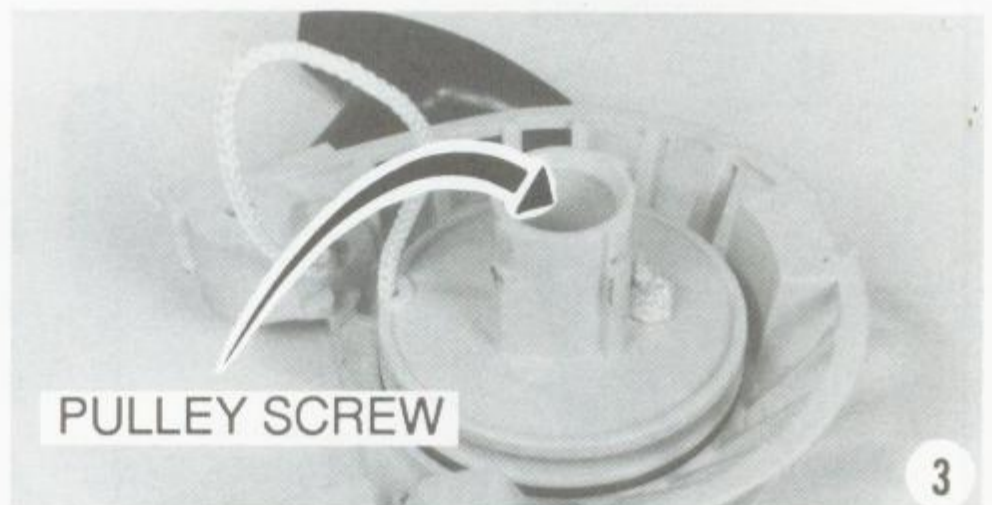
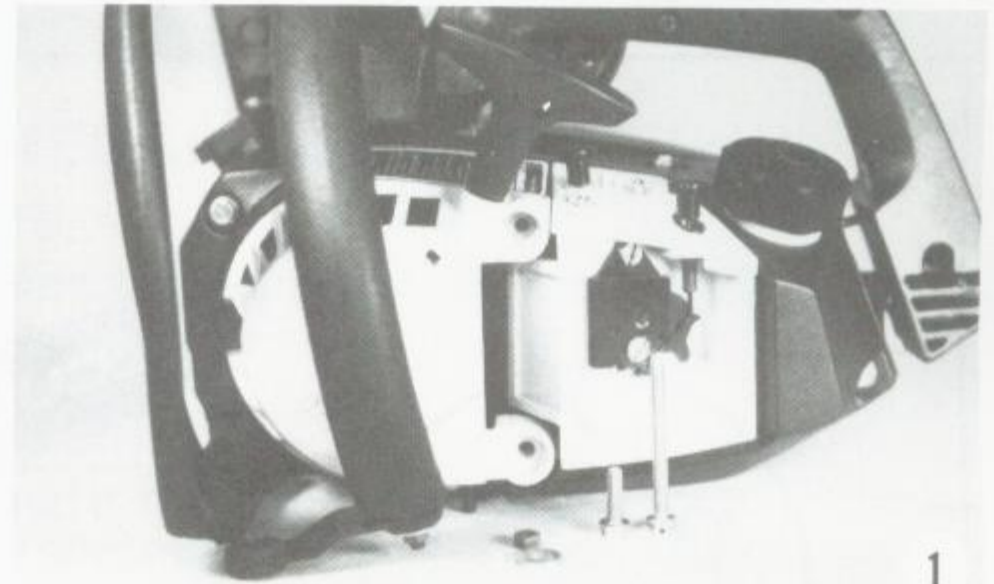
Remove the pulley screw. Carefully lift the pulley while containing the spring with a screwdriver until the spring disengages. See Figure 4.

REASSEMBLY NOTE:

Replacement starter rope length is 31.75" min. - 33.75" max. x .120" in diameter.

Rewind the starter rope clockwise on the pulley. Position the pulley so the ramp aligns with the inside loop of the spring. Push down and rotate back and forth until the pulley engages.

Pull off enough rope to engage the notch and rotate the pulley one full turn, applying tension to the spring.



IMPORTANT SERVICE NOTE:

To prevent premature recoil spring failure, the recoil spring must never bottom out when the starter rope is pulled out to its full length.

Hold the starter rope fully extended with one hand, and turn the pulley with the other hand. The starter rope must have at least one-quarter turn of play remaining for correct recoil tension.

If there is not at least one-quarter turn of play, remove one loop of rope from the starter pulley to ensure correct spring tension.

CARBURETOR

11- AND 12- LEVEL 300 SERIES UNITS

Pull choke knob up and squeeze the throttle trigger.

Lift the edge of the airbox cover to clear the adjustment screws. Pull the cover out and disconnect the choke rod. See Figure 7.

Disconnect the pulse hose and fuel hose at the carburetor. Hold the throttle open with your finger, then pull throttle cable out of slot with needle nose pliers.

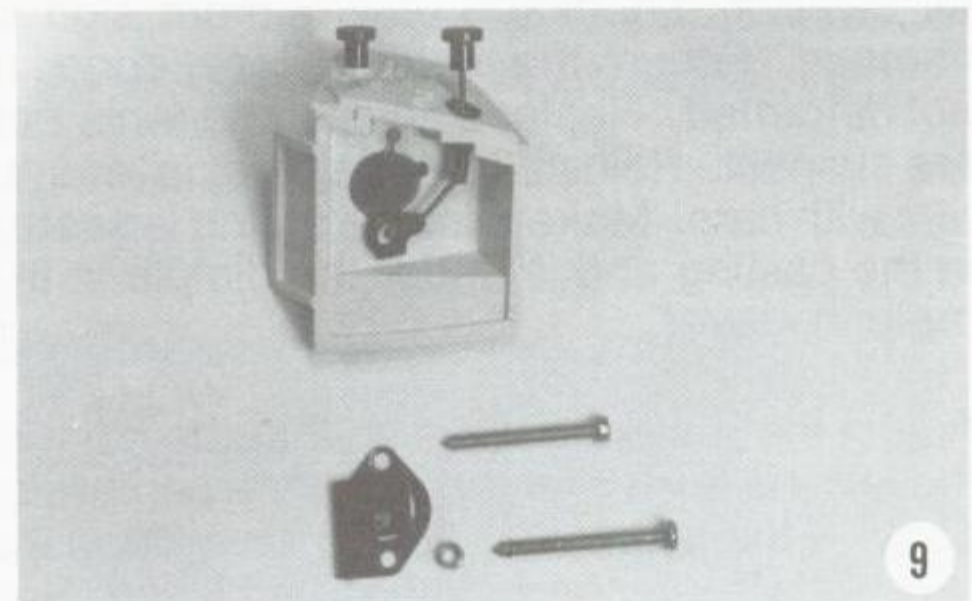
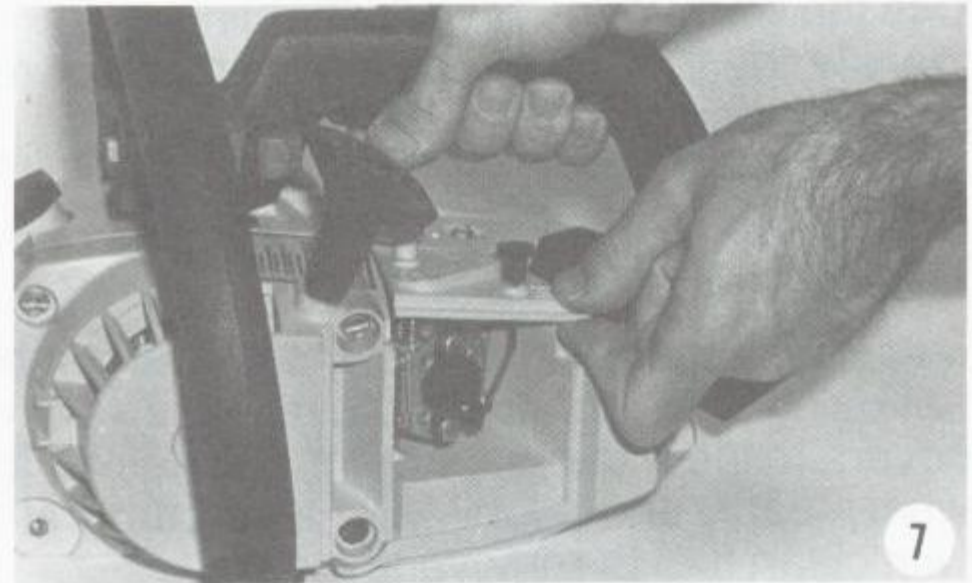
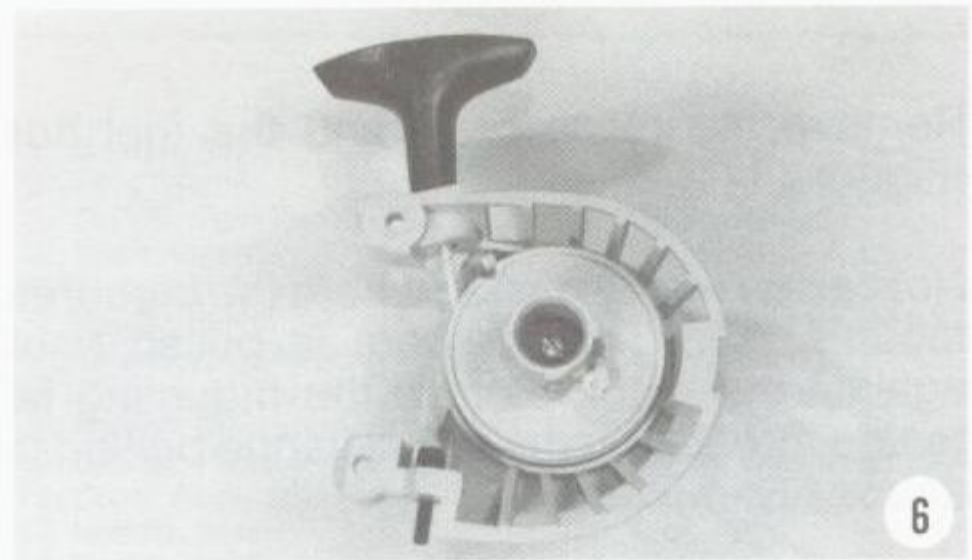
Remove the 2 carburetor screws, the carburetor, the air cleaner cover bracket and the choke.

Later 300 Series Models, Eager Beaver 2.1 and Wildcat

Remove the 2 carburetor fasteners. Remove the air cleaner cover bracket and choke plate. Note the location of the spacer/bushing on which the choke plate pivots (Figure 9).

Depress the throttle trigger to release the throttle latch. Remove the airbox assembly.

Hold the throttle lever at full open and remove the throttle cable from the slot with needle-nose pliers. See Figure 10.



Remove the pulse hose and the fuel hose (Figure 11).

Notice there is no gasket where the carburetor mounts. The rubber boot is pulled tightly against the carburetor as the mounting fasteners thread into the metal flange behind the airbox. See Figure 12.

Use the Carburetor Troubleshooting Guide to identify the probable cause of carburetor related problems.

SERVICING THE CARBURETOR METERING SYSTEM

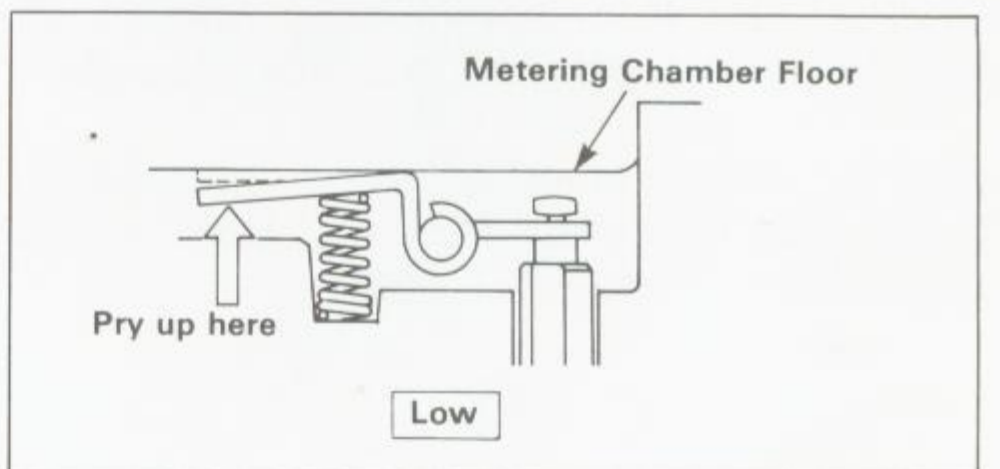
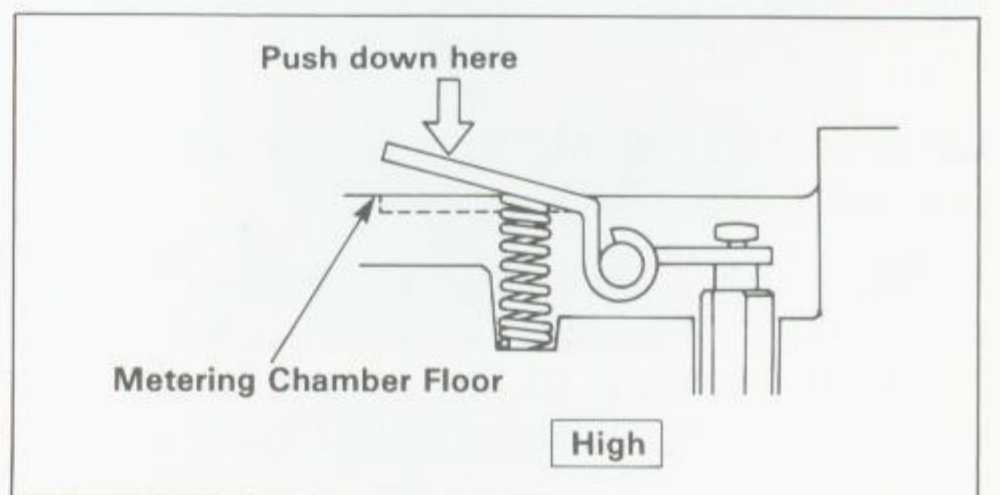
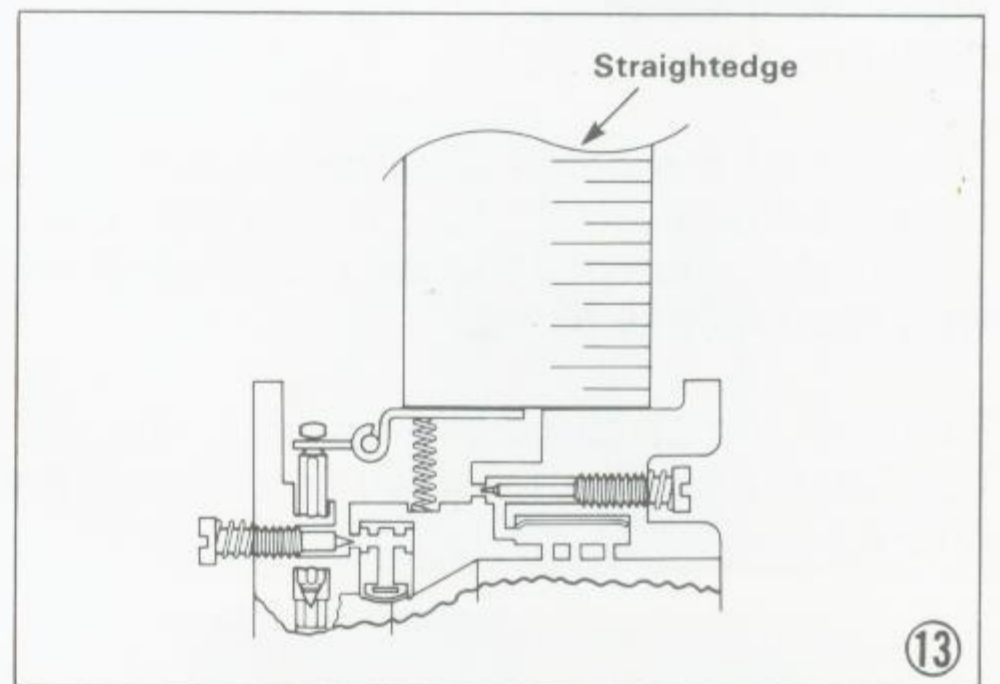
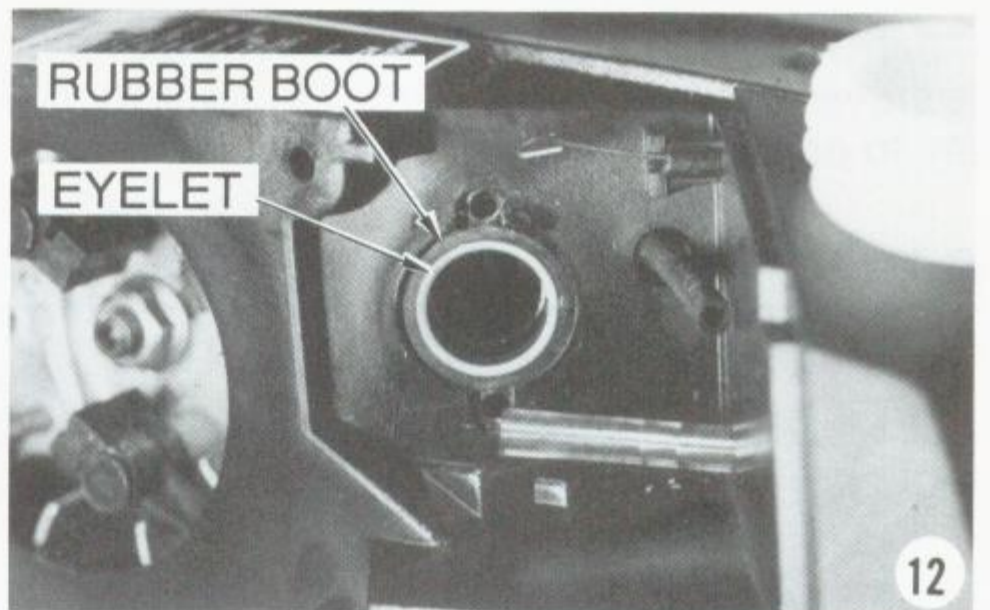
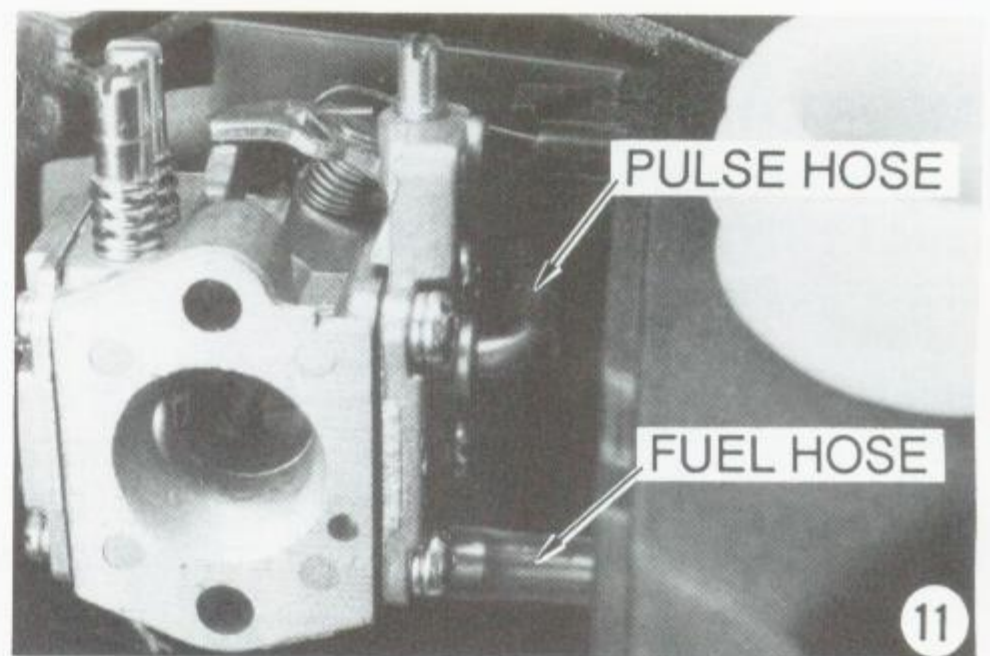
Inspect the metering side of the carburetor by removing the 4 metering cover screws and cover. Inspect the diaphragm and gasket for wear, tears, and pliability. Flush carburetor with clean fuel to remove any debris.

Remove the metering lever pin retaining screw to release the metering components.

Replace the welch plug if a leak is suspected. Gently punch the welch plug, being careful not to damage the casting below. Press in the new welch plug with any device that is of the same dimension. After installation, seal the plug with "Seal All," or clear nail polish.

Inspect the rubber tip of the inlet needle valve for swelling, shrinkage or any other sign of damage. Ensure the metering lever spring is not deformed. Replace any components that are suspect. Reinstall the metering lever system with care. Make sure the spring is seated in the casting and is under the dimple in the metering lever.

Adjust the metering lever so that the back of the lever is flush with the top of the carburetor body. If the lever is not flush, gently bend the lever until the desired setting is achieved. See Figure 13.



SERVICING THE CARBURETOR FUEL PUMP

Remove the fuel pump cover screw and cover. Inspect the gasket and diaphragm. Replace if worn, torn, punctured or out of shape. Ensure fuel filter screen in the carburetor body is clean.

Remove both the high and low speed needles and examine each tip and replace if damaged. Replace or reinstall each needle valve carefully. To prevent any damage to the tips or seats, turn screw in until you feel resistance, then open each needle one (1) full turn.

CARBURETOR PRESSURE TEST

See Page 19 for carburetor pressure test.

CARBURETOR ADJUSTMENTS

Locate the 3 adjustment controls on your unit (Figure 15):

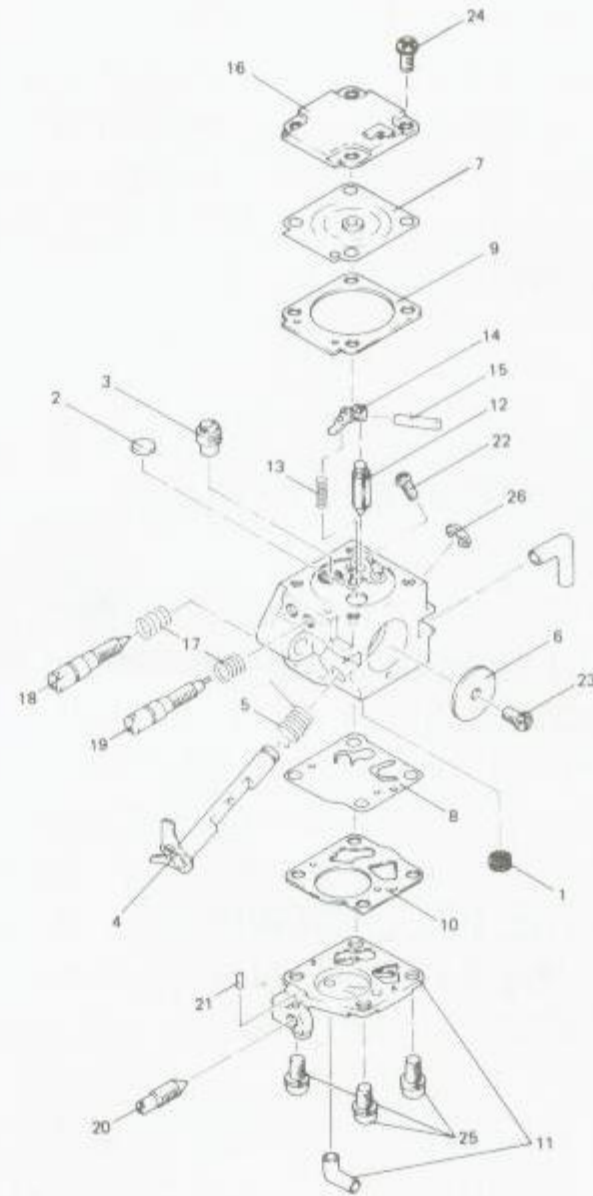
- (1) **HIGH (H)** Speed Mixture Needle.
Function: Governs the high speed fuel flow (throttle fully open).
- (2) **LOW (L)** Speed Mixture Needle.
Function: Governs the fuel flow at idle speed and the acceleration from idle to high speed.
- (3) **IDLE (I)** Speed Screw.
Function: Controls the throttle opening at idle speed.

NOTE:

Engine revolutions per minute (r.p.m.) adjustment, with bar and chain installed, is as follows:

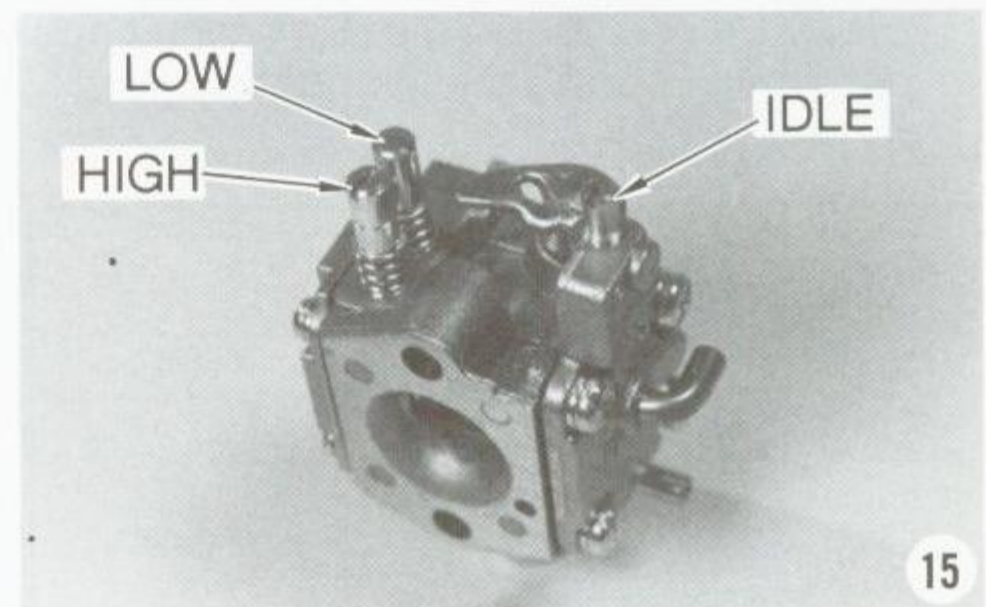
Idle speed 2700 - 2900 r.p.m.
Maximum 10,500 - to 11,000 r.p.m.

- | | |
|-------------------------------|----------------------------|
| 1. Screen, Filter | 15. Pin, Lever |
| 2. Plug, Welch | 16. Cover, Diaphragm |
| 3. Orifice, Main Fuel | 17. Spring, Needle |
| 4. Shaft Assembly, Throttle | 18. Screw, Main Adjust |
| 5. Spring, Throttle Return | 19. Screw, Idle Adjust |
| 6. Throttle Plate | 20. Screw, Idle Speed |
| 7. Diaphragm, Metering | 21. Insert, Friction |
| 8. Diaphragm, Pump | 22. Screw, Lever Pin |
| 9. Gasket, Metering Diaphragm | 23. Screw, Plate |
| 10. Gasket, Pump Diaphragm | 24. Screw, Diaphragm Cover |
| 11. Cover Assembly, Pump | 25. Screw, Pump Cover |
| 12. Needle, Inlet | 26. Ring, "E" |
| 13. Spring, Lever | |
| 14. Lever, Inlet Needle | |



14

CARBURETOR ASSEMBLY



15

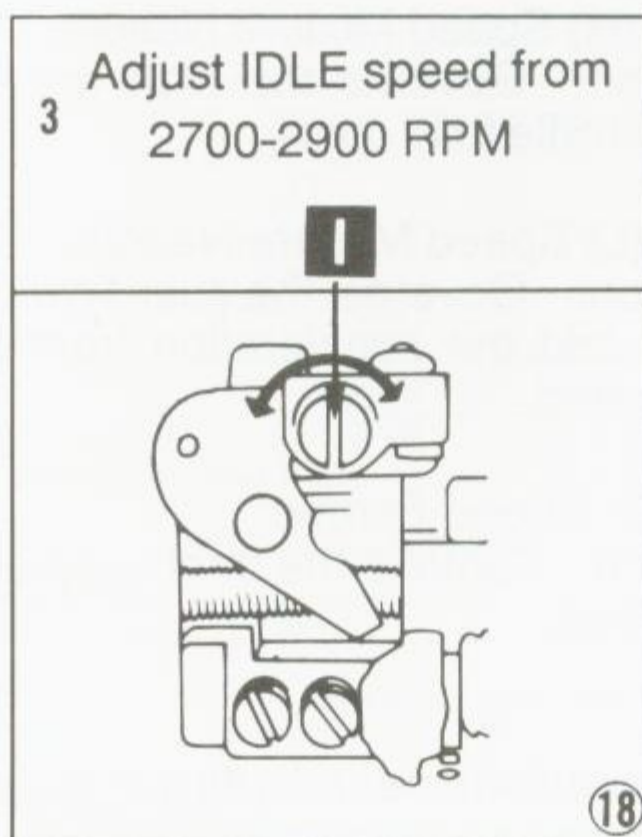
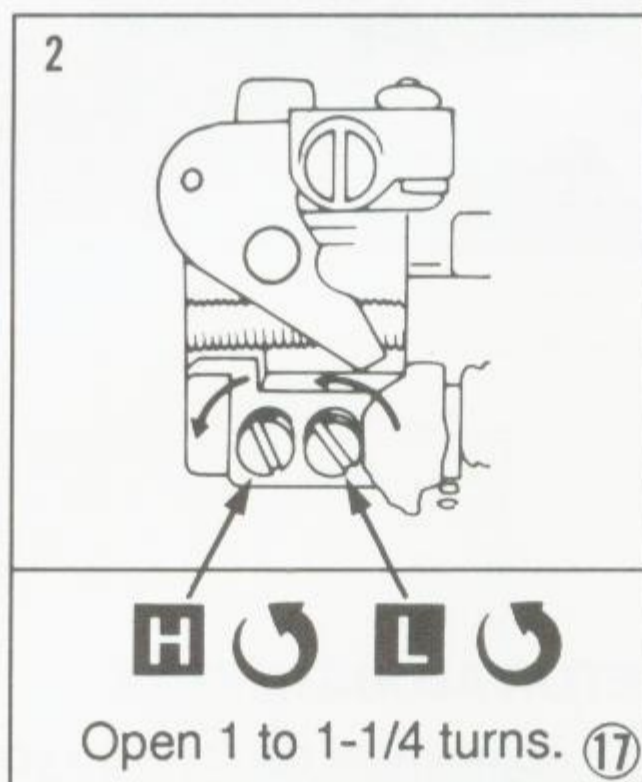
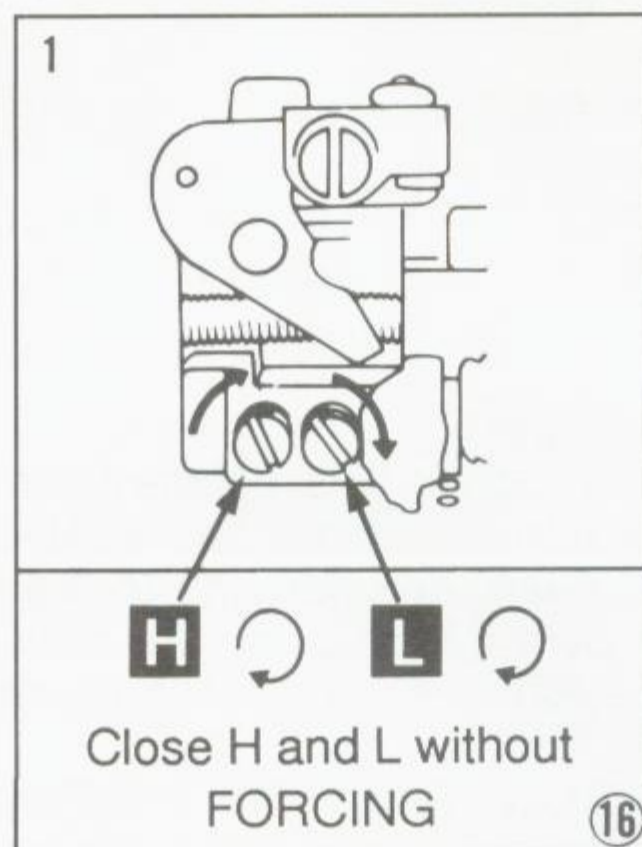
To Adjust Carburetor:

1. Carefully turn LOW (L) and HIGH (H) speed mixture needles **CLOCKWISE** until resistance is felt. Then **OPEN** (turn **COUNTERCLOCKWISE** to open) each needle one (1) full turn. **DO NOT TURN** needles in too tight or you can damage both needle tips and their seats.
2. Start engine and let it warm up at low speed. If engine will not idle without stopping, turn **IDLE** speed screw **CLOCKWISE** until engine idles properly. If saw chain turns on guide bar while engine is idling, turn **IDLE** speed screw **COUNTERCLOCKWISE** slowly until chain stops.

NOTE:

Remember that an adjustment to one needle affects the adjustment of the other.

3. Accelerate engine several times, adjusting **LOW** (L) speed needle to obtain a smooth, rapid acceleration without hesitation or falter. Final position of **LOW** (L) speed needle will usually be about one (1) to one and one-quarter (1-1/4) turns open (**COUNTERCLOCKWISE**). If **LOW** (L) speed needle is out of adjustment, engine will hesitate or falter when accelerated.
4. Adjust **HIGH** (H) speed needle for best power under load. Final position of **HIGH** (H) speed needle will usually be about one (1) to one and one-quarter (1-1/4) turns open (**COUNTERCLOCKWISE**).
5. Check idle speed again. It may be necessary to readjust slightly for smooth idle and acceleration. (See Step 2.) Chain should not move at correct idle speed.



FAN HOUSING/FUEL TANK

Removing the fan housing provides access to the flywheel, ignition module, intake duct and fuel tank (Figure 20).

If the starter housing isn't already removed, it may remain attached to the fan housing. Remove the top starter housing fastener and leave the lower fastener intact.

Locate and remove the remaining three (3) fan shroud fasteners. The chain brake handle may also be removed by taking out one additional fastener.

When removing the fan housing, guide the throttle cable through the hole in the airbox with needle nose pliers. Then gently pull it through and away.

The intake boot components are shown in Figure 21.

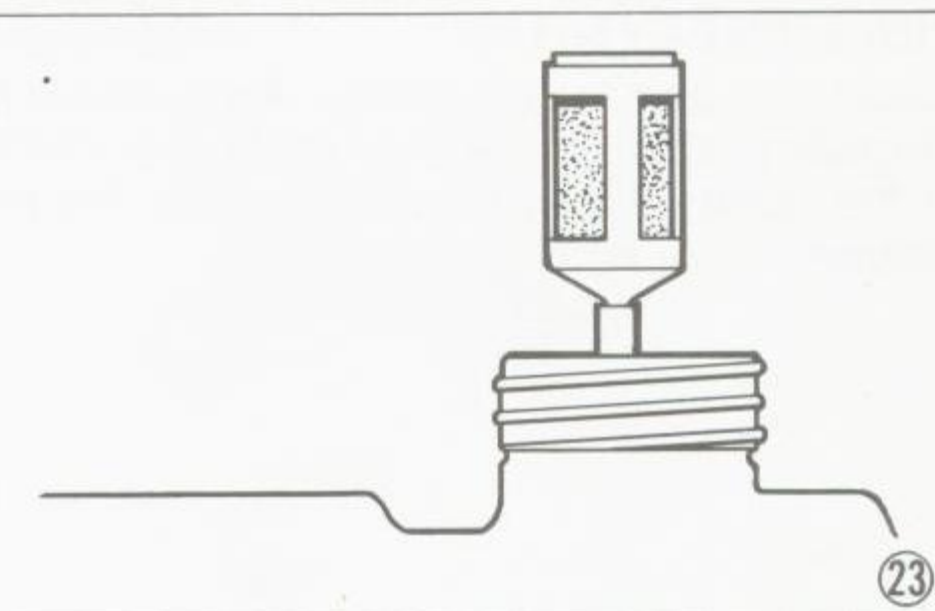
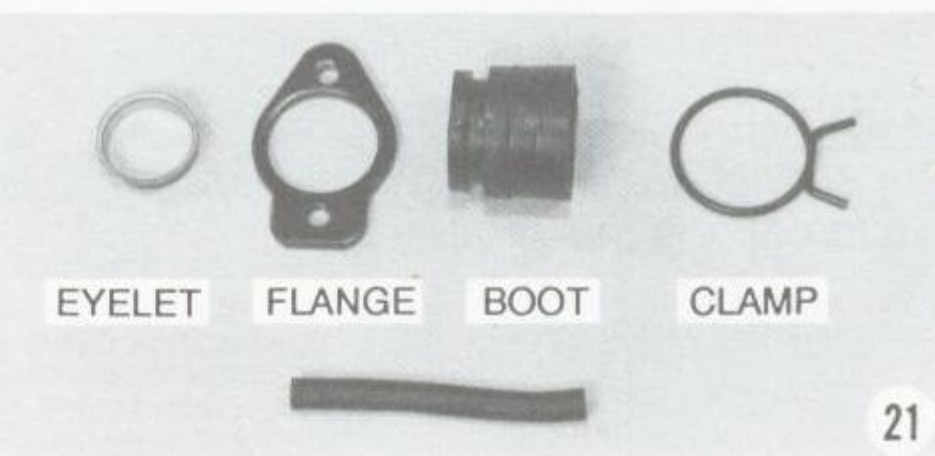
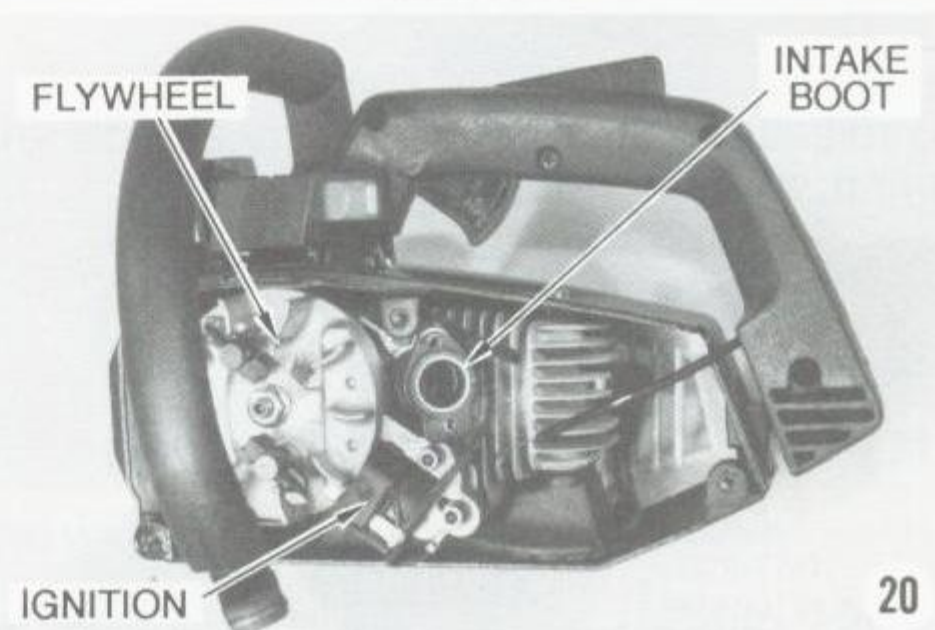
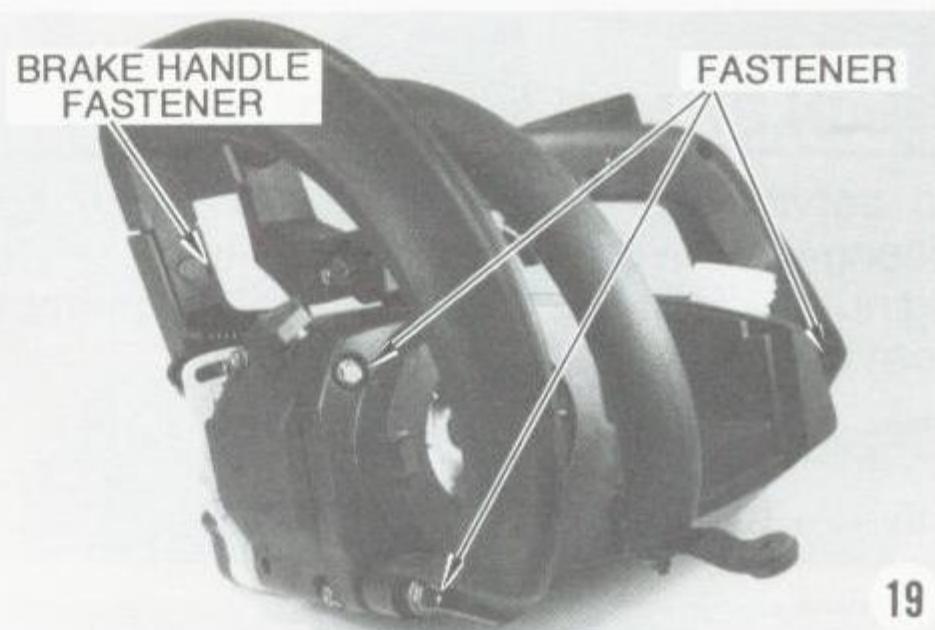
REASSEMBLY NOTE:

When reassembling the intake boot, the flange is positioned in the groove, pointed end up. The eyelet is inserted inside the boot at the same end to prevent the boot from collapsing. For ease of installation, the eyelet should be inserted after the fan housing is installed. The clamp should be positioned approximately 1/4" from the end of the boot where it mounts to the manifold.

Once the fan shroud is removed, the fuel tank can be replaced by removing one remaining fastener.

If the fuel hose is replaced, ensure the fuel pickup strainer is positioned to the far end of the tank.

To replace the fuel strainer, use a hooked piece of mechanic's wire to pull the strainer through the opening (Figure 23).



CHAIN BRAKE ASSEMBLY

To service the chain brake assembly, first disengage the brake. Remove the bar retaining nut(s). Remove the chain brake assembly from the power unit.

To release tension from the brake band and spring, actuate the brake lever.

Pry the spring out with a screwdriver (Figure 26).

CAUTION

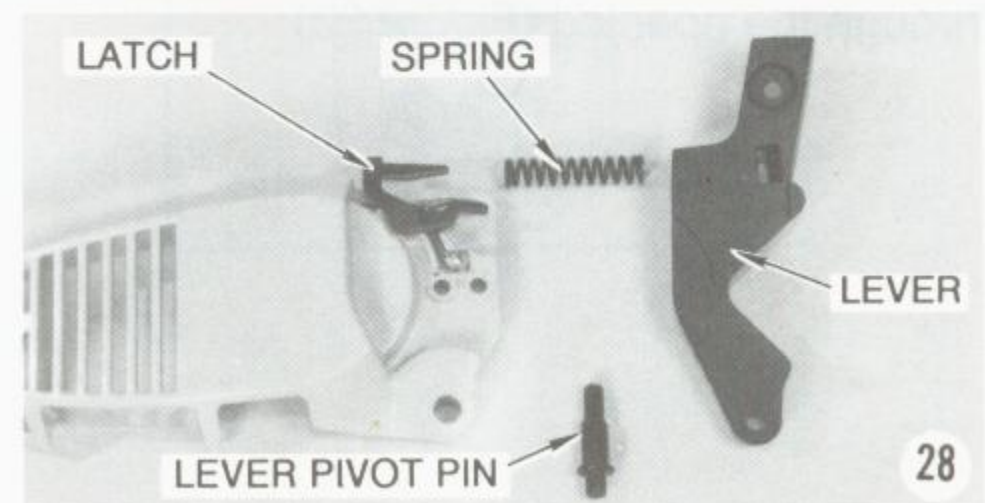
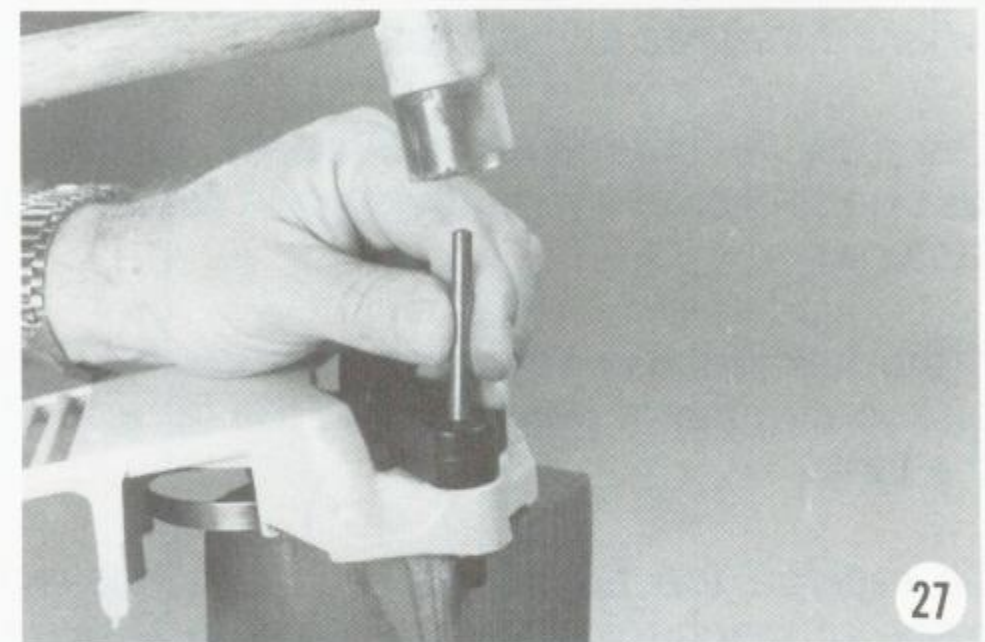
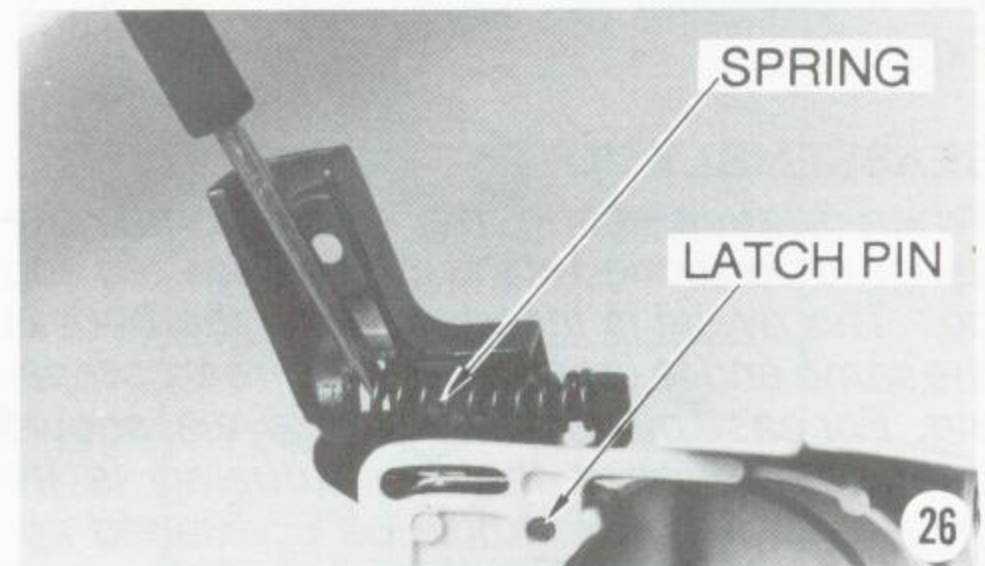
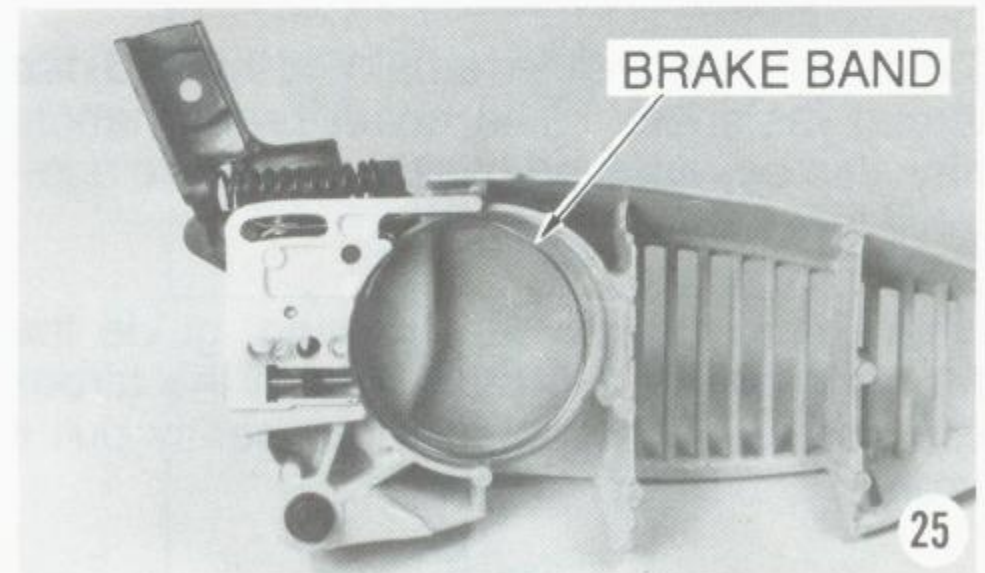
The spring is still under some tension. Use caution during this procedure.

Support the casting as shown in Figure 27. Drive the lever pivot pin out with a punch.

Inspect the brake band for excessive wear. If any portion is worn to less than .021 inches thickness, replace it by removing the latch pin and brake band retaining screw.

REASSEMBLY NOTE:

Clean pins and the pin holes. Apply loctite to the pivot pin hole in the lever casting, but NOT in the main casting pin hole where the pin rotates.



FRONT/REAR HANDLES

Removing the handle assembly provides access to the anti-vibration mounts, ignition switch, throttle trigger and cable.

The front handle is secured by the 2 pan head screws located on either side of the anti-vibration (AV) mount (Figure 29).

Continue by removing the front mount bolt, rubber mount and springs. The rear mount consists of the similar components.

SERVICE NOTE:

The AV mounts should be replaced without separating the rear handle.

THROTTLE AND IGNITION CONTROLS

CAUTION

The trigger spring is under tension. Use care when separating handle.

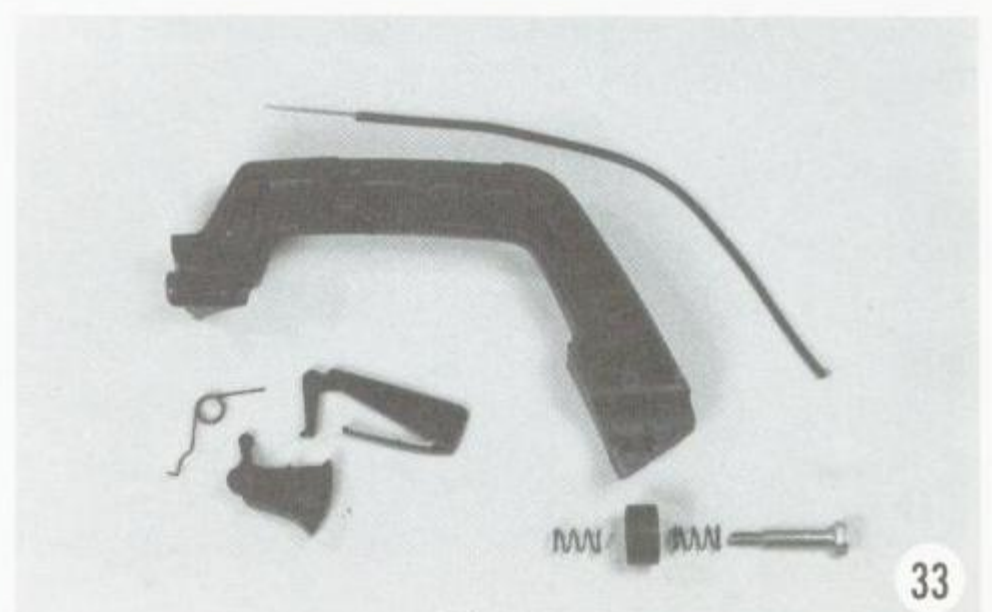
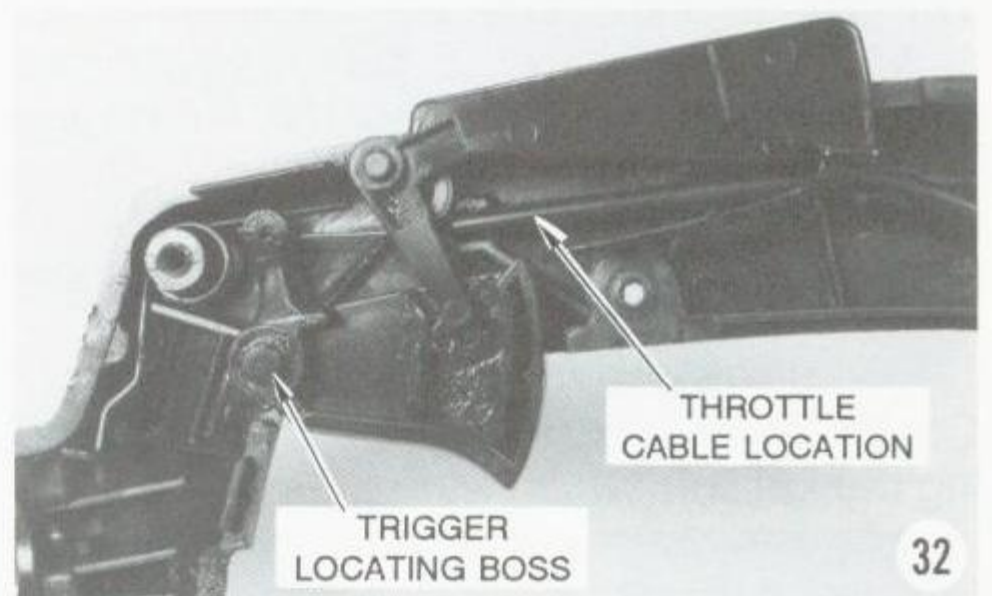
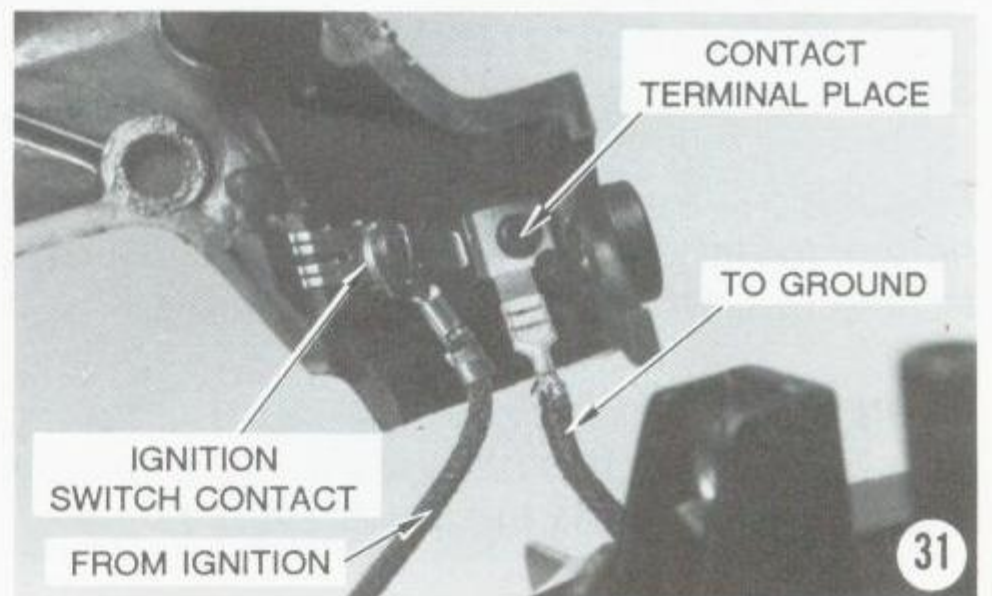
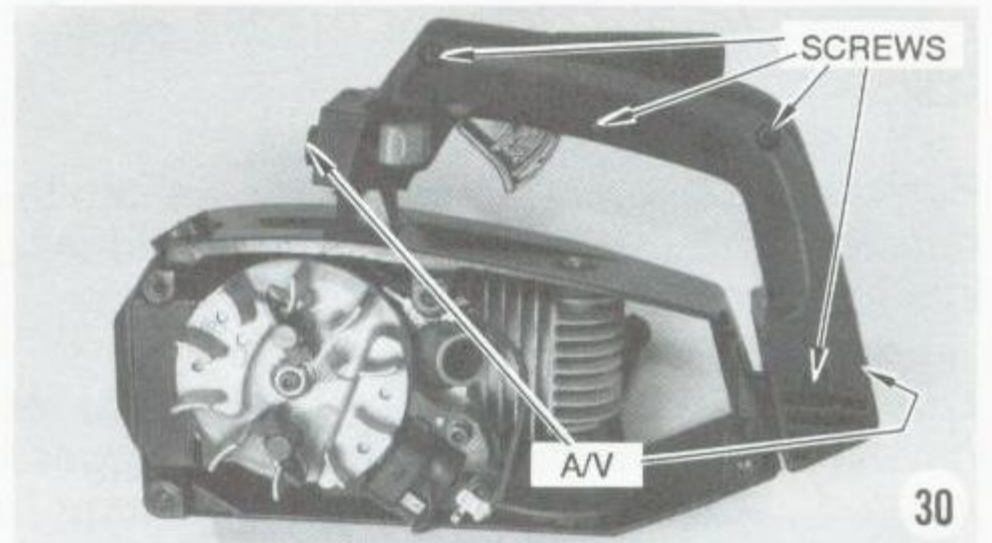
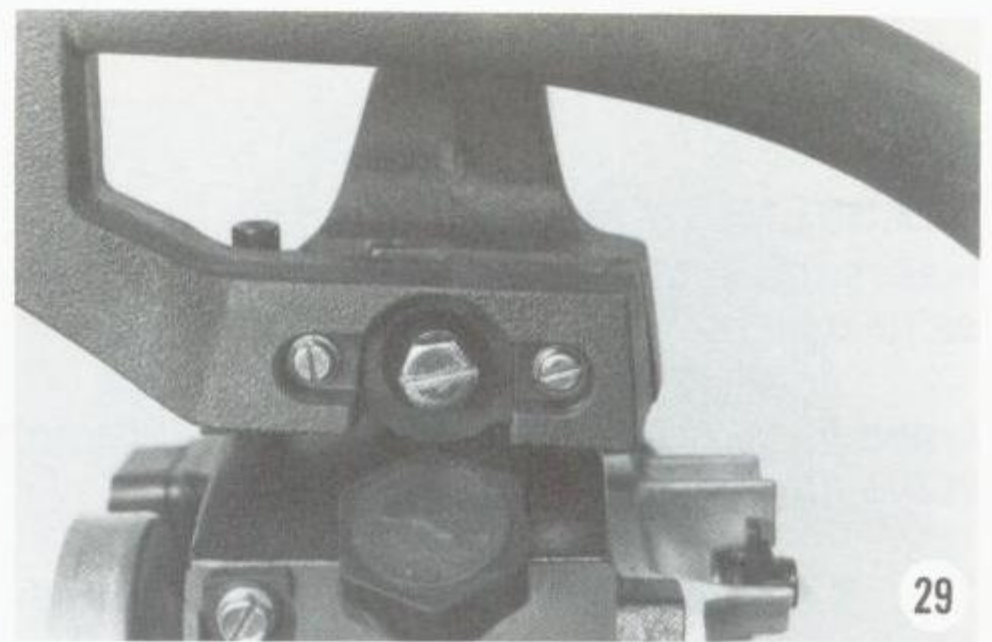
Remove the fasteners that hold the 2 halves together (Figure 30). Separate the 2 halves.

The left half contains the ignition switch (Figure 31). Replace the switch by removing the 2 screws. Disconnect the 2 wires.

REASSEMBLY NOTE:

When replacing the ignition switch, ensure the arrows on the button point forward.

The right half of the handle contains the throttle trigger, spring, safety latch and cable. These components may be serviced at this time (Figures 32 and 33).



REASSEMBLY NOTE:

Reassemble trigger, spring and throttle cable as follows.

Insert the "L" shaped end of the throttle cable in the throttle trigger hole (Figure 34).

The "L" shaped cable end replaced the hooked end design and requires installing a matching trigger. Kit P/N 215293 contains both parts.

Position the spring, trigger and cable into the handle. Press the end of the cable housing into the cavity provided.

Late model 300 Series and Wildcat models have a hole in the handle where the trigger is located. A small self-tapping screw may be inserted to thread into the trigger pivot boss to hold it in place during reassembly. See Figure 35.

Position the safety trigger and place the two halves together. Masking tape may be used to hold the cable in place if necessary.

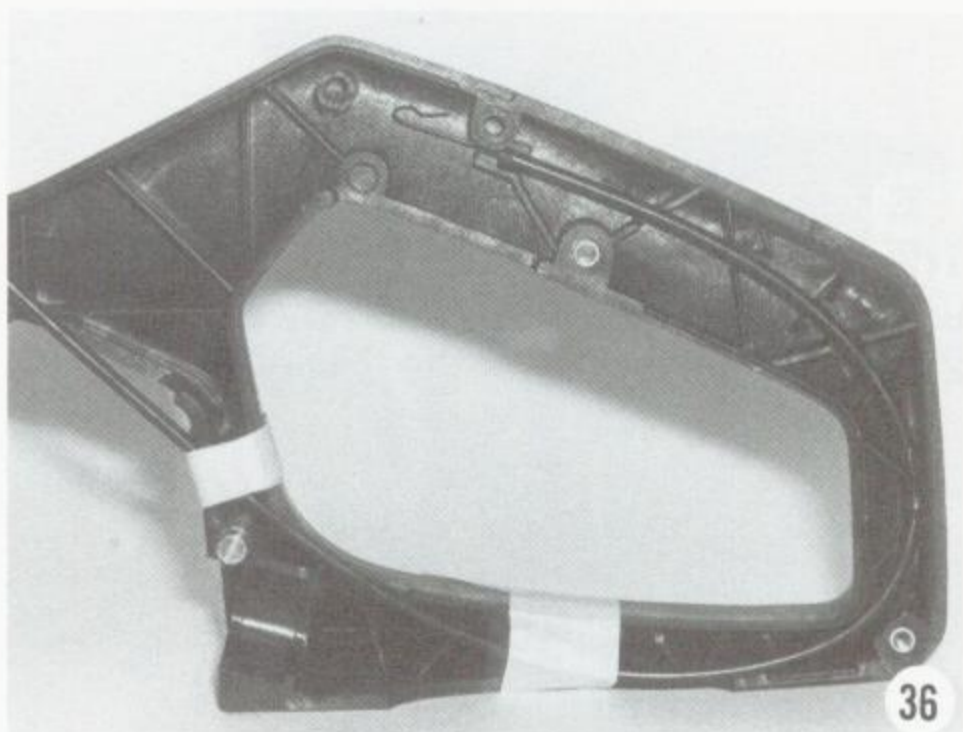
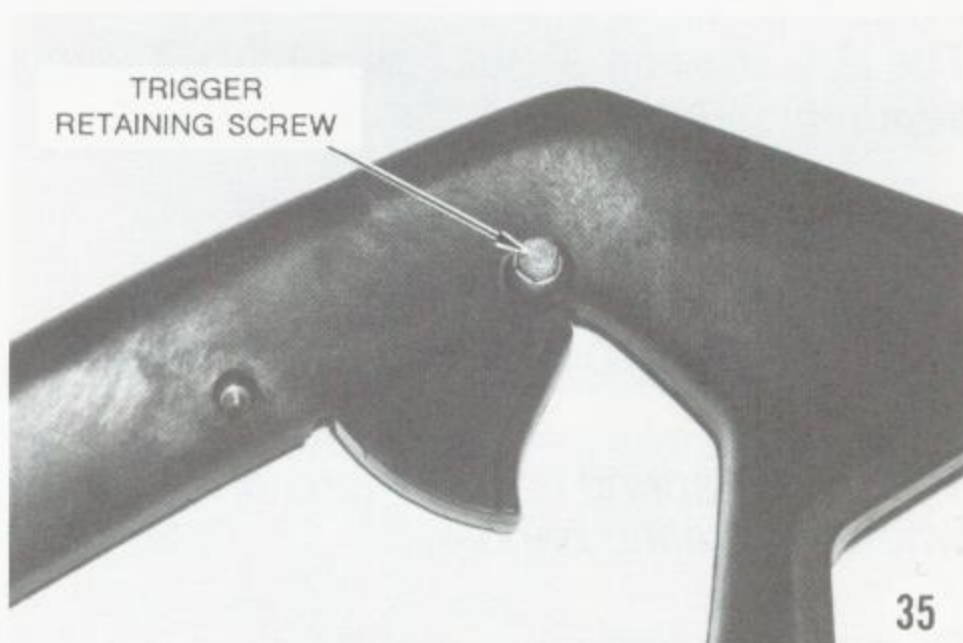
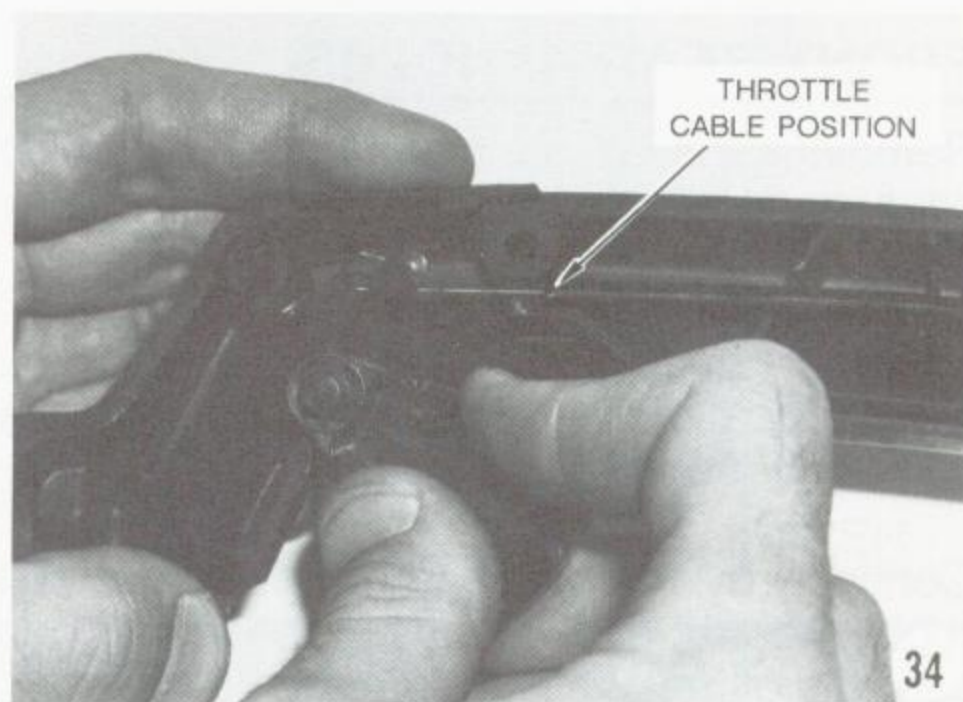
Insert the fastener closest to the throttle trigger. Spread the two halves slightly to remove any tape and install the lower mount.

The long handle models are assembled in the same manner. However, masking tape must be used to hold the cable in place. See Figure 36.

DO NOT use Loctite on handle fasteners. Torque to 15-20 inch pounds.

Continue removing the handle by disconnecting the ignition switch wiring.

Locate the fasteners to remove the top engine shroud and pull the wiring through the grommet. Lay the shroud aside.



CHAIN OILER SYSTEM

The oil pickup strainer is accessible through the oil tank fill point as shown in Figure 38. Replace as necessary.

Remove the remaining fastener from the oil tank and pull the tank away from the powerhead. See Figure 39.

Disconnect the oil pump suction hose at the pump.

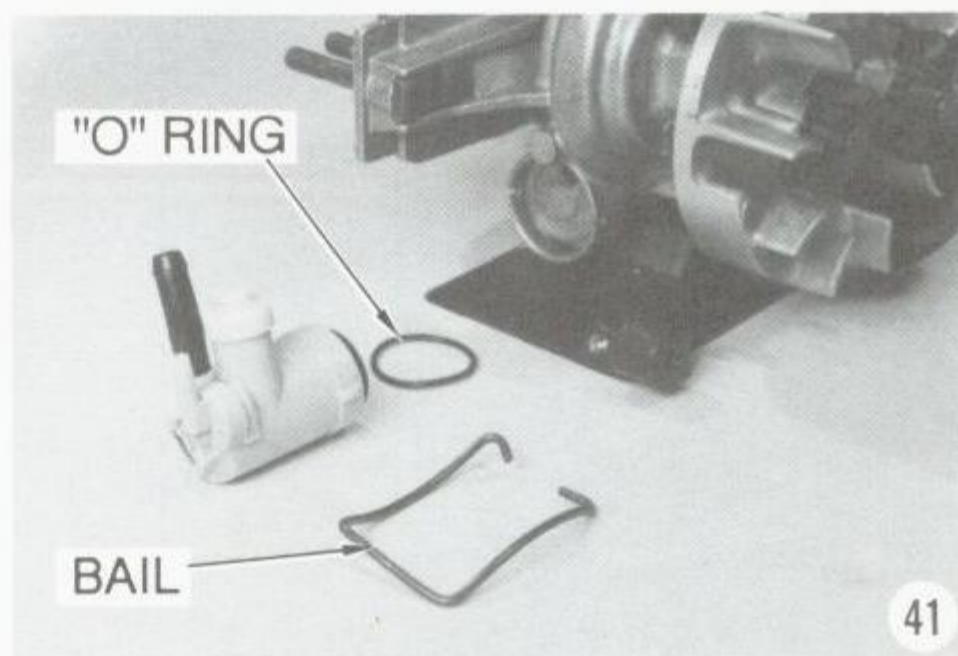
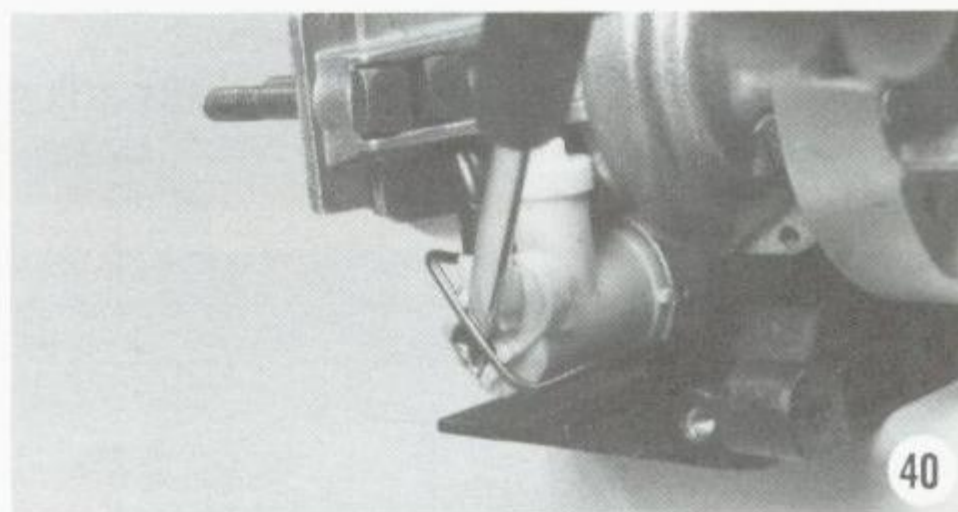
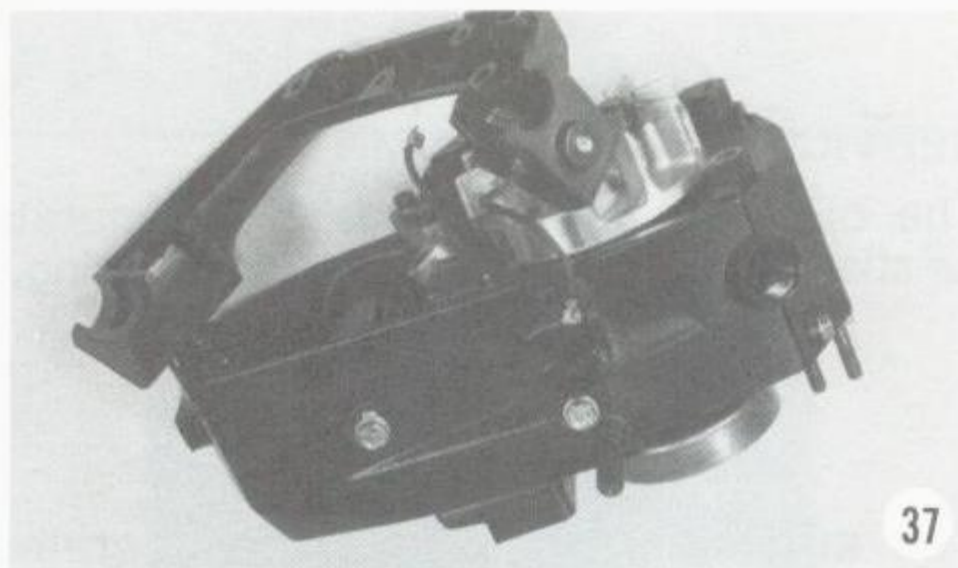
REASSEMBLY NOTE:

The oil suction line contains a small spring to prevent the hose from collapsing and blocking oil flow to the pump. Ensure the spring is positioned in the hose so that 1-1/2 to 2 inches is inside the tank.

REMOVING THE OIL PUMP

Remove the oil discharge hose.

Carefully pry the bail off the pump body. Remove the pump from the crankcase along with the "O" ring seal (Figures 40 and 41).



SERVICING THE OIL PUMP

The oil pump incorporates two separate functioning pumps within the same housing.

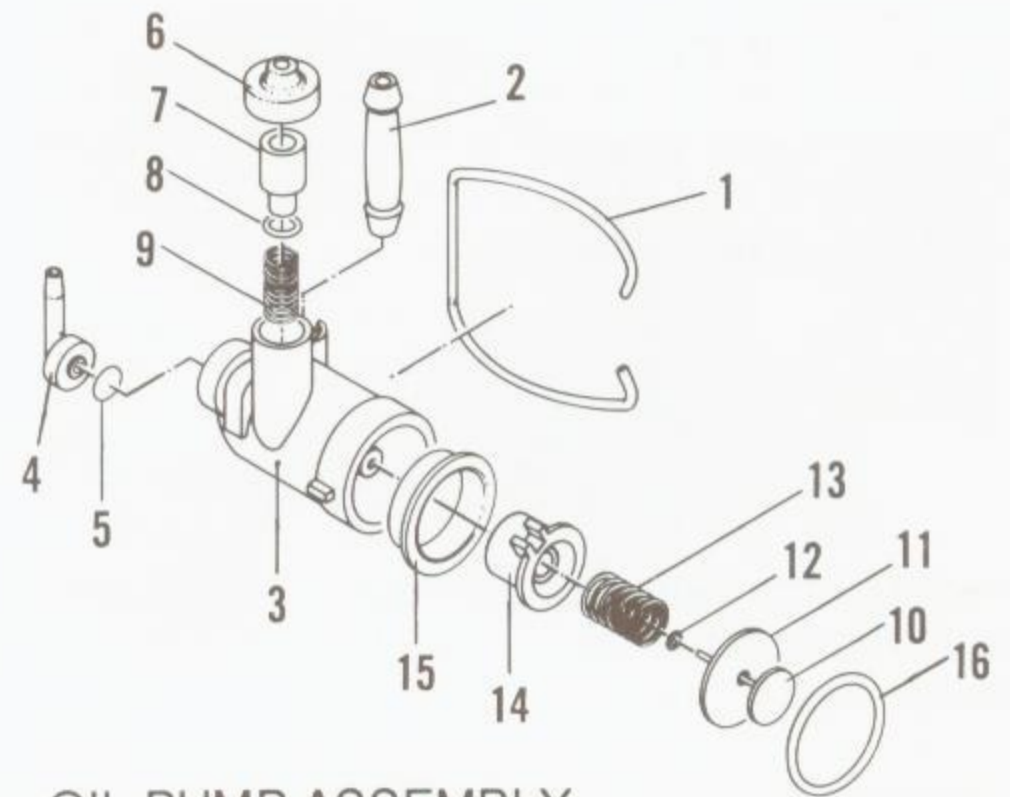
The automatic pump is pulse operated through a port in the crankcase where the pump housing mounts.

The manual pump, located at the top right of the pump housing, is operated by depressing the manual oiler button.

Both pumps use a common inlet and discharge port. The most common cause of problems in the oiler system is dirt or debris in the oil.

The pump body houses a spring-ball check valve which is not replaceable. Another check valve (floating disk) is serviceable and located behind the oil inlet port. Both check valves must be functional for either pump system to work.

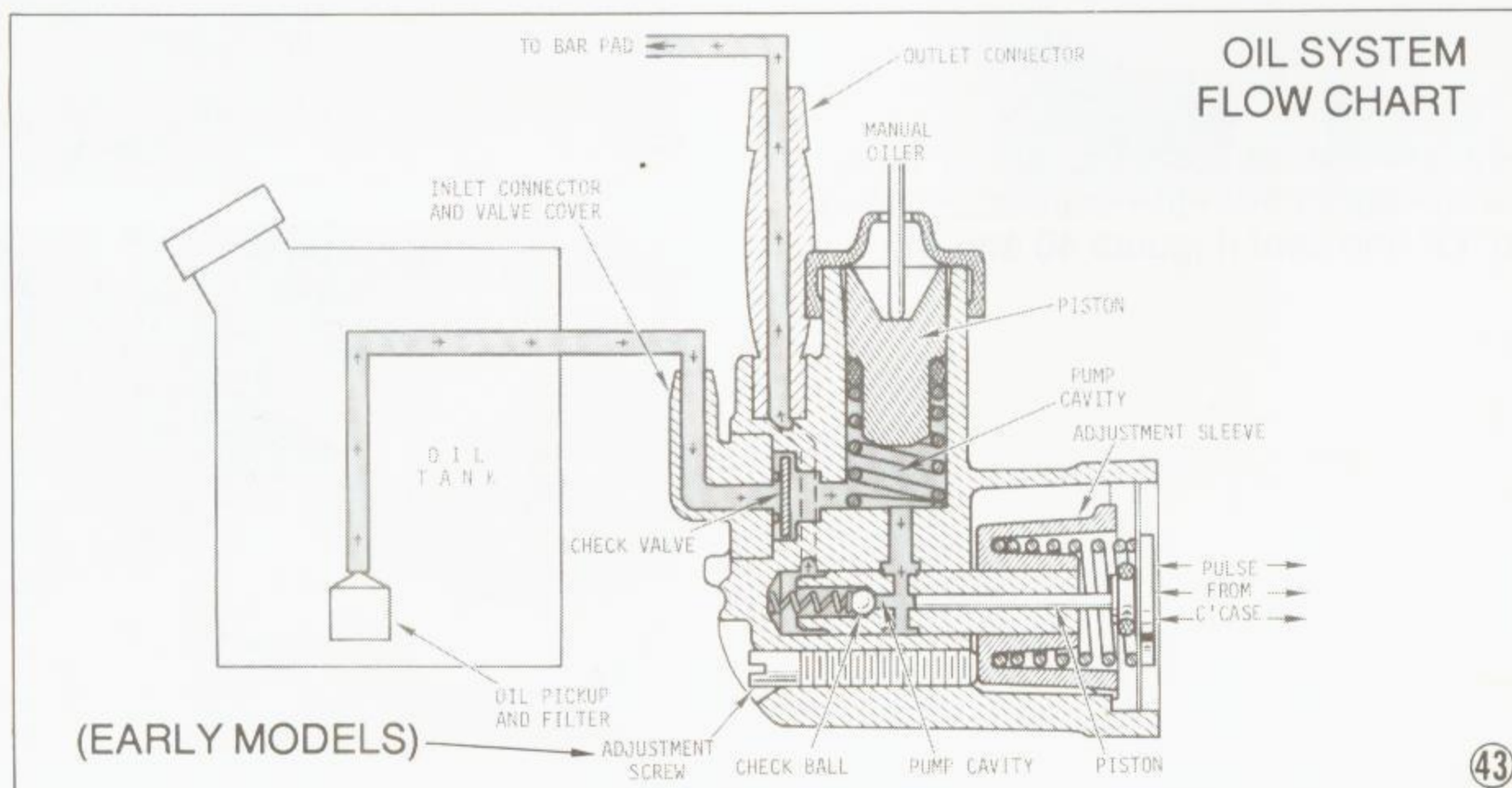
Early model 300 Series saws had an adjustable pump which has since been discontinued.



OIL PUMP ASSEMBLY

(42)

| ITEM NO. | DESCRIPTION |
|----------|-------------------------|
| 1 | Bail |
| 2 | Connector - Outlet |
| 3 | Pump Assembly - Oiler |
| 4 | Connector - Hose |
| 5 | Valve - Oiler |
| 6 | Cap - Oil Pump |
| 7 | Plunger - Oil Pump |
| 8 | Ring - "O" |
| 9 | Spring |
| 10 | Piston Assembly - Oiler |
| 11 | Ring - Oil Pump Piston |
| 12 | Ring - "O" |
| 13 | Spring |
| 14 | Sleeve - Oil Pump |
| 15 | Eyelet |
| 16 | Ring - "O" |



(43)

III. POWERHEAD ASSEMBLY

Locate and remove the 2 bolts to remove the bottom engine shroud.

REASSEMBLY NOTE:

Loctite should be used on both top and bottom shroud bolts.

MUFFLER ASSEMBLY

Remove the two deflector shield fasteners to gain access to the muffler mounting fasteners.

Remove the muffler bolts and the muffler from the cylinder.

Remove the spark arrestor screen and clean or replace it.

REASSEMBLY NOTE:

Turn the flywheel until the piston completely covers the exhaust port. Thoroughly clean the mounting surfaces of the cylinder and muffler before replacing the muffler. Take care not to scratch the mating surfaces. Use Loctite on muffler bolts and torque from 40-45 in. lbs.

ELECTRONIC IGNITION

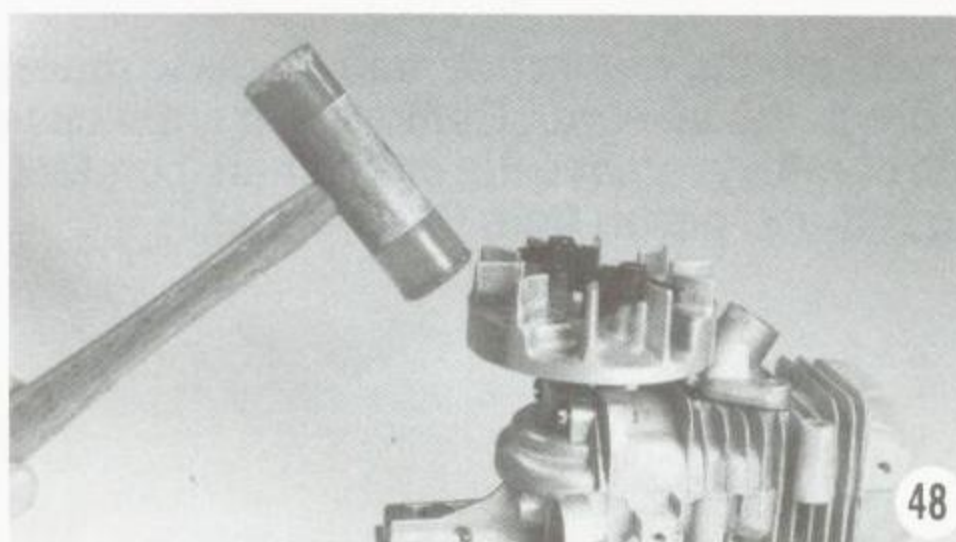
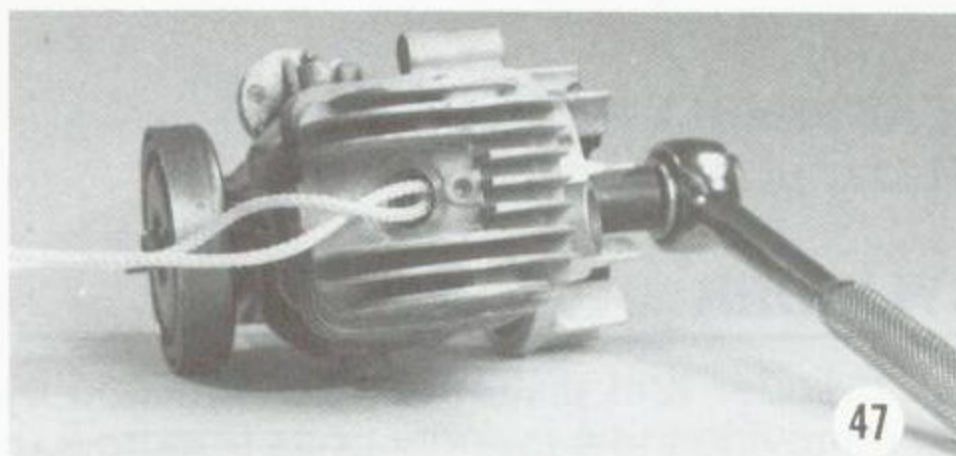
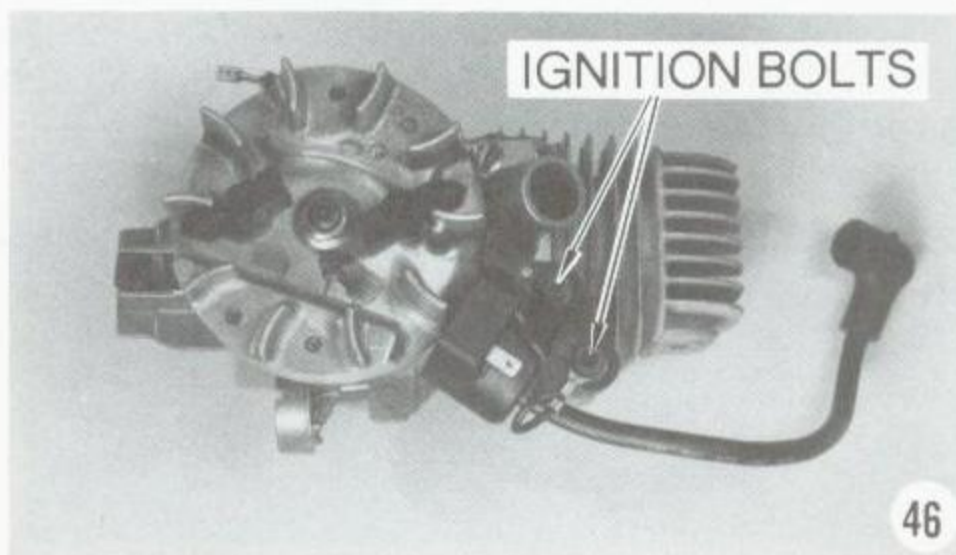
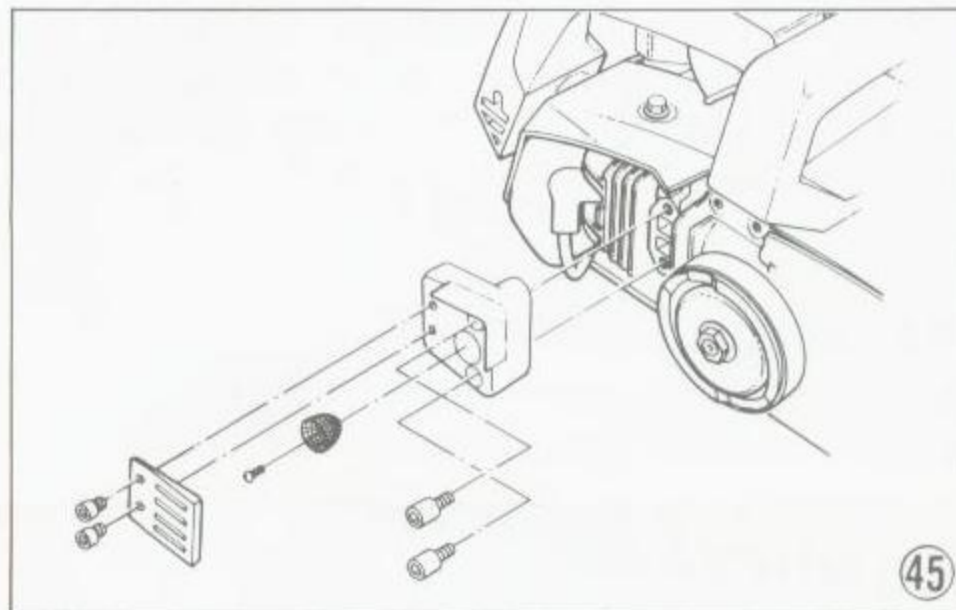
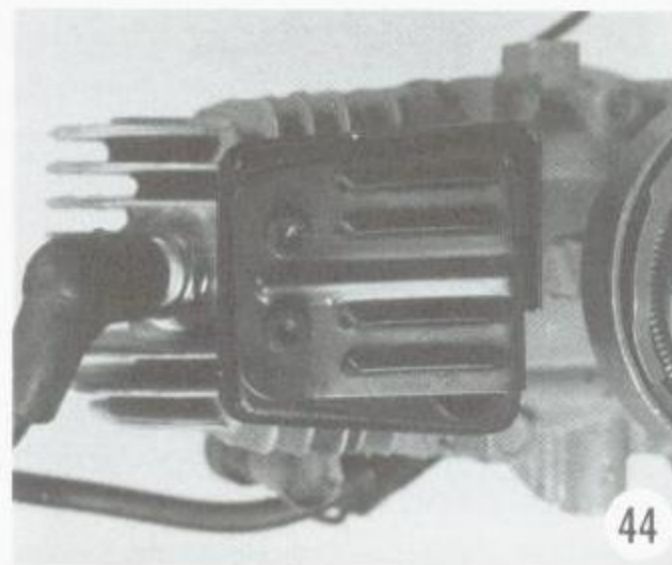
Disconnect the ignition lead from the spark plug. Remove the spark plug. Locate and remove the two ignition assembly bolts. Remove the ignition and intake insulator.

FLYWHEEL

Insert a knotted starter rope into the spark plug hole as a piston stop (Figure 47).

Turn the flywheel until the piston stops against the rope. Remove the flywheel nut.

Set the powerhead up on the clutch side and hold it firmly. Tap the flywheel counter balance with a plastic mallet to unseat the taper. Remove the flywheel (Figure 48).



REASSEMBLY NOTE:

Torque the flywheel nut to 190-200 inch pounds. **DO NOT** use impact tools, and **DO NOT** over-torque. This flywheel does not have a steel insert or hub so impact tools and/or over-torquing can distort or crack the tapered hole, resulting in a failure.

When reinstalling the electronic ignition, rotate the flywheel until the magnets line up with the lamination of the electronic ignition assembly.

Insert a .012 feeler gauge between the lamination and the flywheel. Push the ignition assembly towards the flywheel as hard as possible, hold in place and tighten the hold-down screws.

REASSEMBLY NOTE:

Use Loctite on ignition bolts. Torque to 60-70 in. lbs.

CLUTCH ASSEMBLY

Using the knotted starter rope as a piston stop, loosen the clutch nut and remove the clutch assembly (left hand thread). See Figure 49.

Remove the remaining intake manifold fastener. Remove the manifold and gasket.

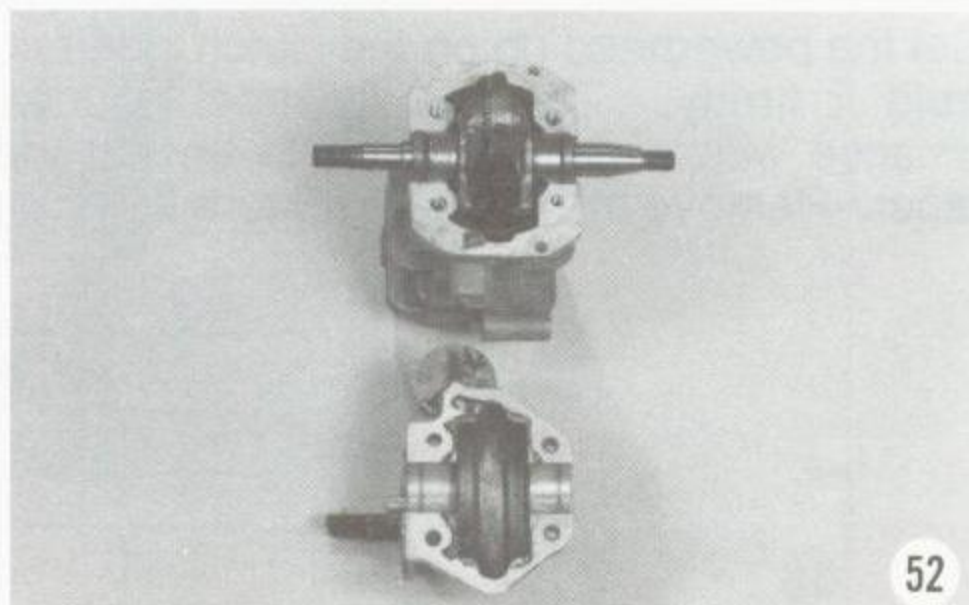
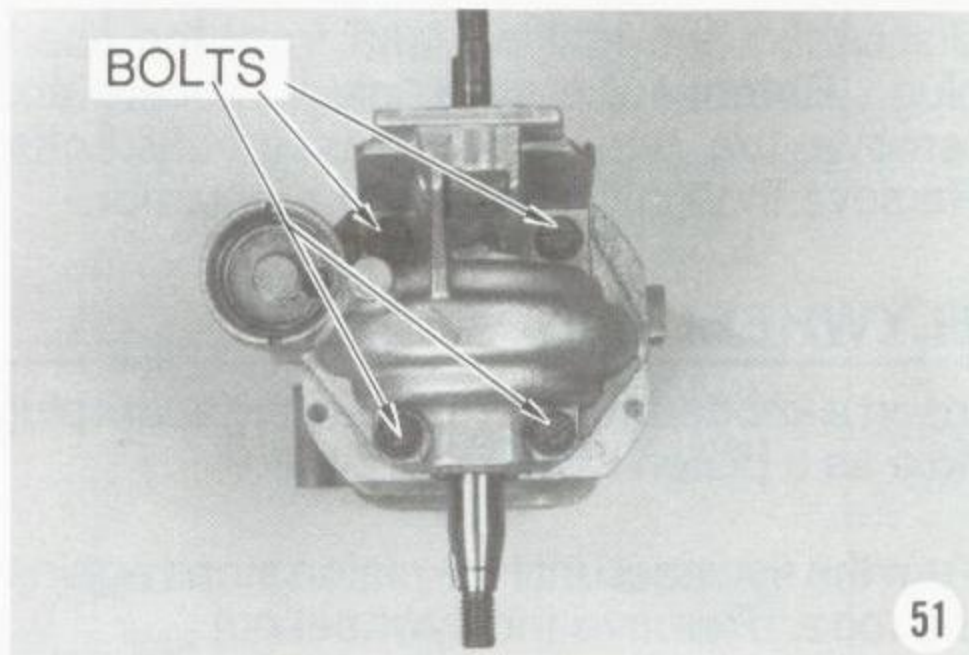
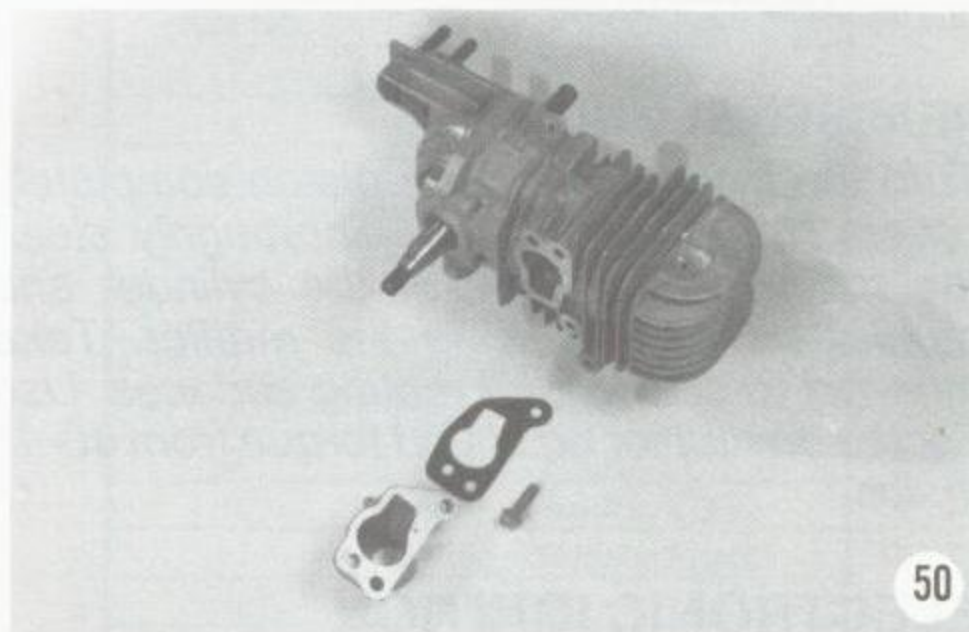
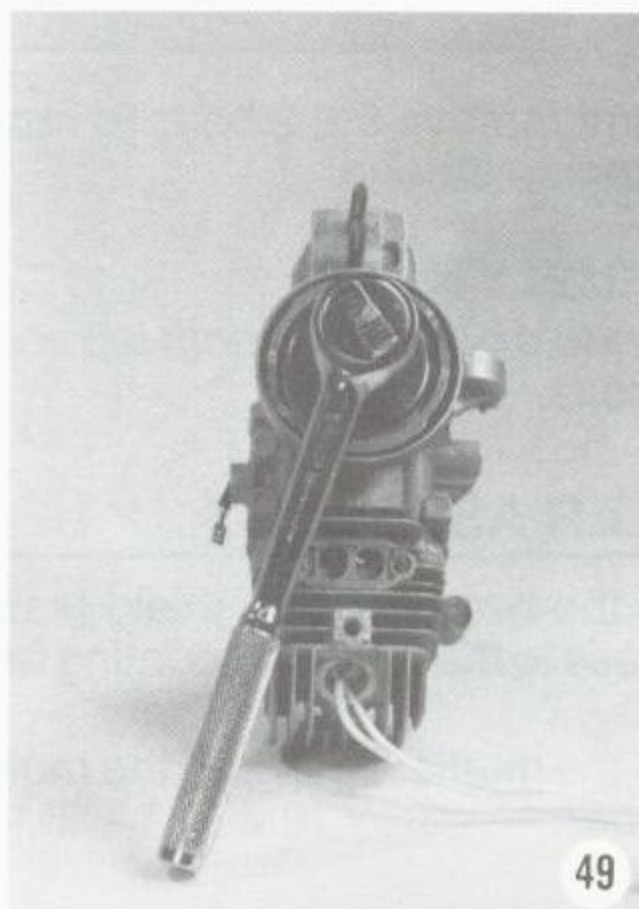
REASSEMBLY NOTE:

Clutch nut torque is 160 in. lbs.

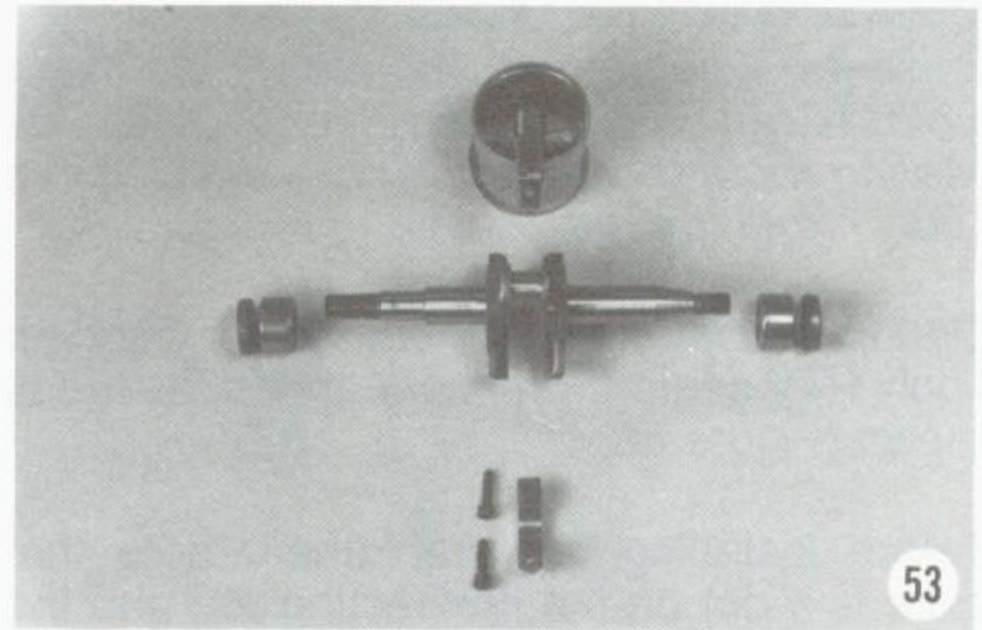
CYLINDER

The cylinder and piston can be serviced by first removing the 4 cylinder bolts (Figure 51).

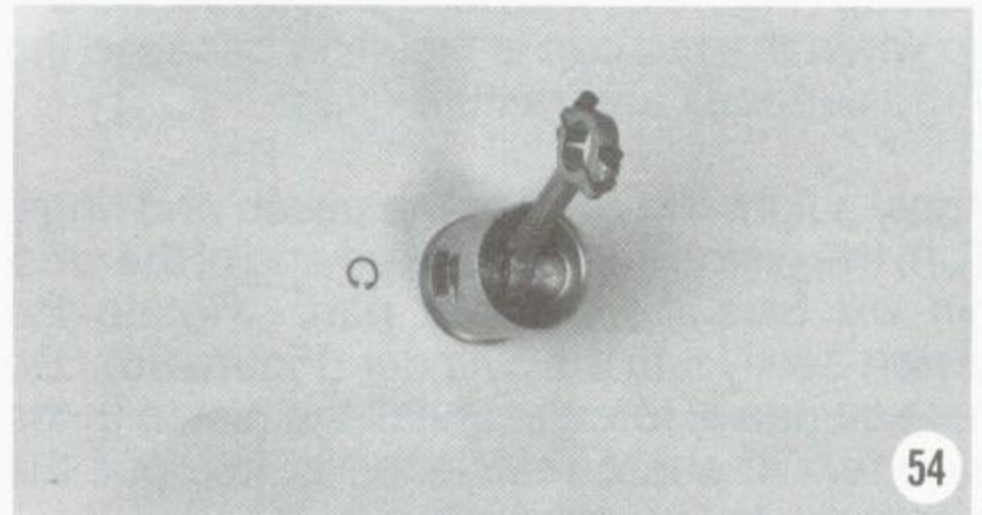
Lightly tap the crankcase with a plastic mallet to break the sealant. Remove the crankcase and carefully remove the crankshaft, connecting rod and piston from the cylinder.



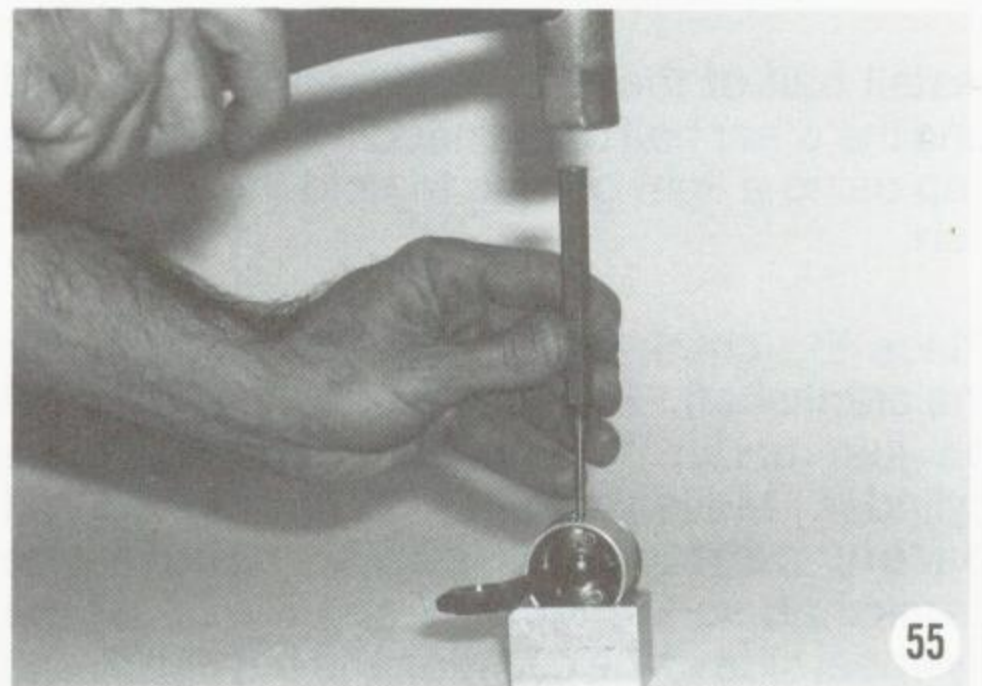
The crankshaft is shown in Figure 53, along with the bearings, seals and connecting rod/piston removed.



To remove the piston from the connecting rod, remove the two wrist pin retaining rings.



Using a punch and hammer, lightly tap the wrist pin through the connecting rod bearing (Figure 55).



The rod contains a single wrist pin bearing. The needles will be loose when no longer held in place by the wrist pin. Pull the rod out slowly to keep from losing any bearings.

New bearings are wax retained. The wax is highly soluble in fuel and washes out almost immediately when an engine is run.

REASSEMBLY NOTE:

Press the new bearing into the rod so that it protrudes an equal amount on each side. The bearing should not protrude more than .13 mm (.005") from the rod.

Clean the cylinder and crankcase flanges. Apply RTV sealant very sparingly in the areas shown (Figure 56).

Before installing the crankshaft, note that there is a dot on the connecting rod and the rod cap (Figure 57). These 2 dots should line up when the rod cap is installed because the 2 rod surfaces are fracture fitted.

Apply a light film of oil to the piston and rings. Turn the piston so the covered end of the wrist pin will face the exhaust port. Rotate the piston gently into the cylinder (Figure 58). Do not use heavy force to install the piston in the cylinder. If sharp resistance is felt, pull the piston out to investigate the cause.

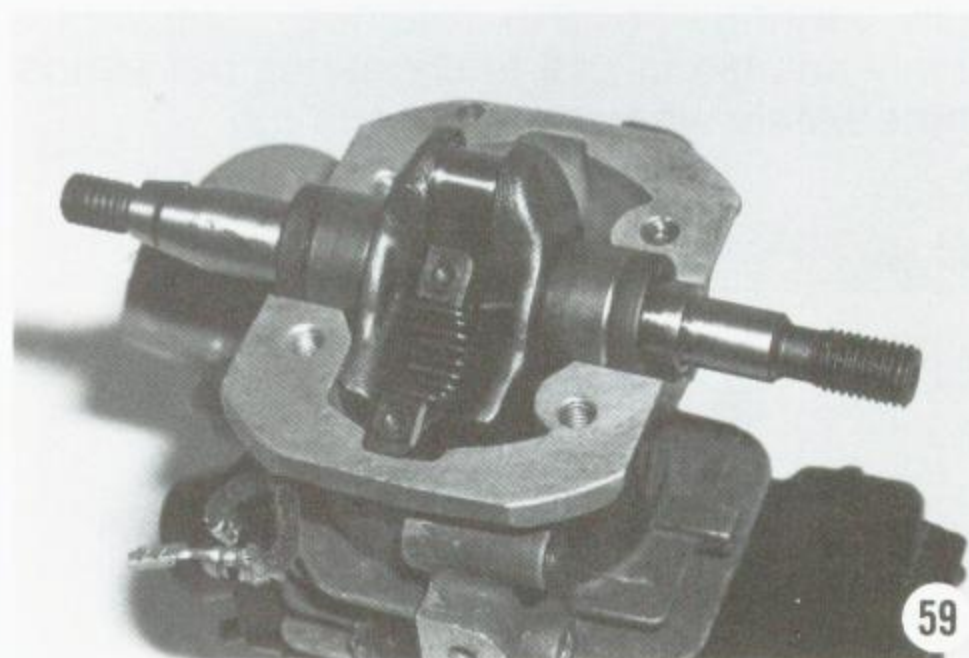
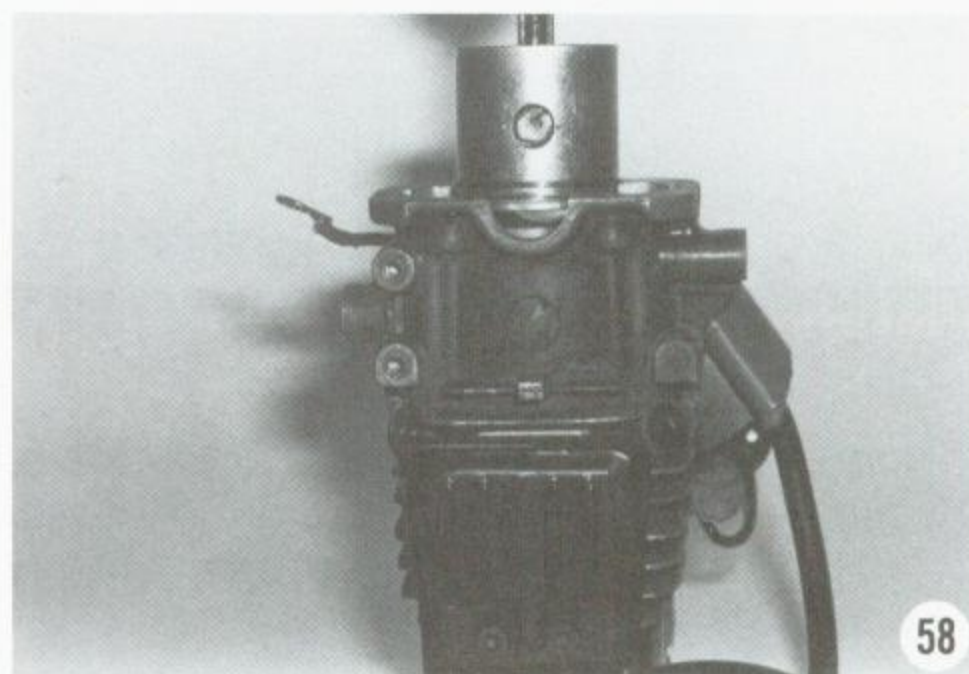
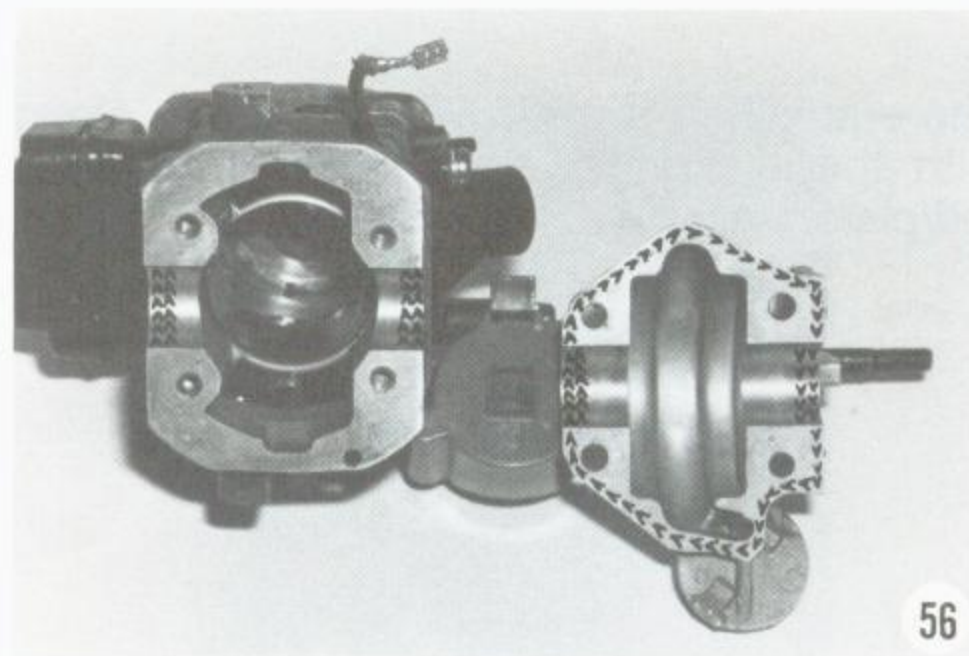
Install half of the needle bearings in the rod and the other half of the needle bearings in the cap using a light grease to hold them in position.

Place the crankshaft bearings and seals on the crankshaft. Position the seals so they will be just under the outside surface of the cylinder. Move the bearings so they will just barely contact the seals. Locate the crankshaft so the tapered end will be on the flywheel side of the cylinder and the clutch end on the exhaust side (Figure 59).

Pull the rod into position on the crankshaft throw. Install the rod cap, taking great care to match the surface of the rod cap to the rod until they fit perfectly. Torque the rod screws to 35-40 inch pounds.

Install the crankcase with the bar bolt to the exhaust side of the cylinder and torque the cover screws to 60-70 inch pounds. Rotate the crankshaft several times. It must turn freely with little resistance. If it binds or catches, disassemble the unit to locate the cause of the problem.

Reassemble the rest of the components in the reverse order of disassembly.



IV. TEST PROCEDURES

CARBURETOR PRESSURE TEST

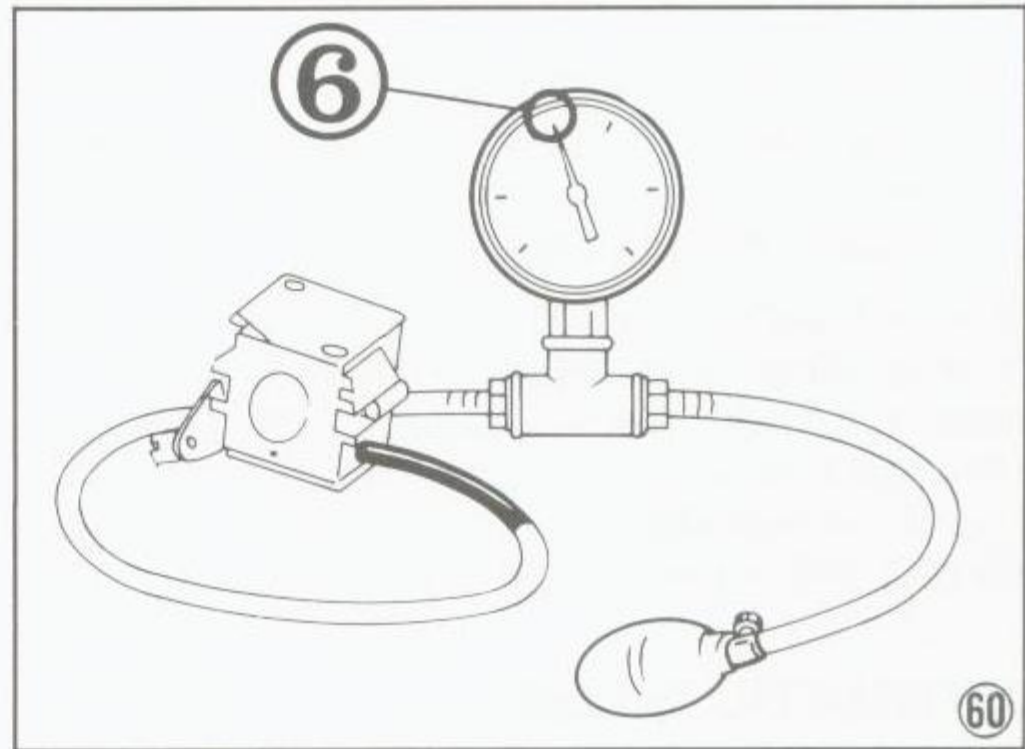
1. Remove the airbox cover and the carburetor.
2. Attach pressure test hose to the fuel inlet fitting using connector, P/N 85231, and a 300 Series pulse hose. This procedure will test the fuel side of the inlet lever.

Pressurize to 6 P.S.I. There should be no loss of pressure. If there is a loss of pressure, submerge the carburetor in liquid (not water) to locate the leak area.

To check the welch plug and seal around the high speed jet and the fuel control diaphragm:

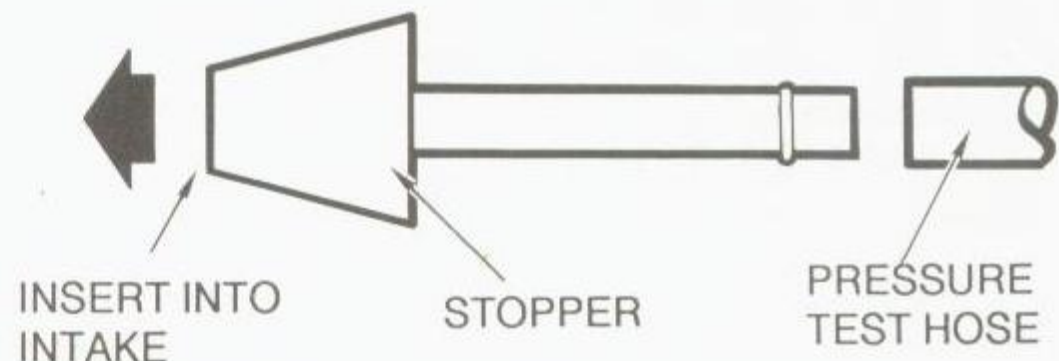
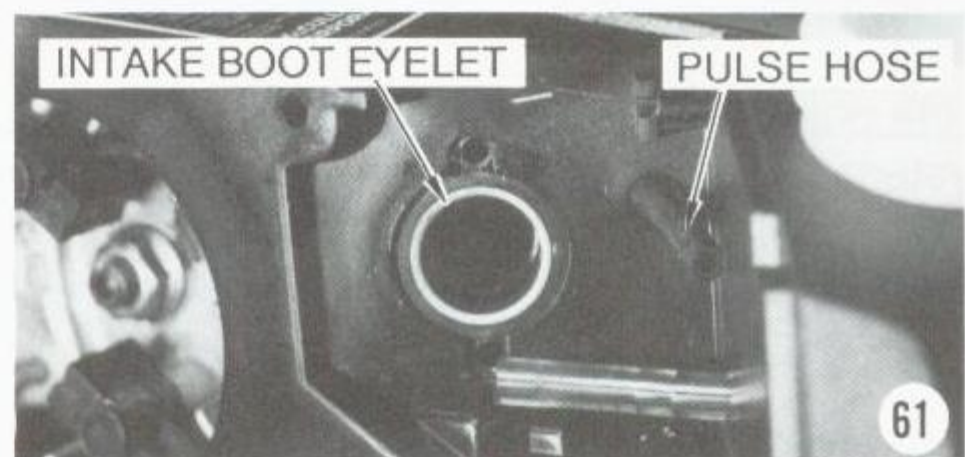
1. Remove the control diaphragm cover, then the inlet needle.
2. Replace the cover along with the gasket and diaphragm.
3. Tightly seat the carburetor "HIGH" speed needle.
4. Pressurize to 1 P.S.I. There may be a slight leak around the adjustment needle threads.

Submerge in liquid. Leaks out the idle jets indicate a leaking welch plug. Seal with clear lacquer nail polish. A leak around the high speed jet may indicate that it is loose. This can also be sealed around the edge with clear lacquer nail polish.



CYLINDER PRESSURE TEST

1. Remove the muffler and carburetor.
2. Install exhaust port adapter, P/N 68917.
3. Install stopper, P/N 85230, to the end of pressure test hose, P/N 215432. Plug the pulse hose air tight. Remove the intake boot eyelet.



4. Insert stopper securely into the intake. Pressurize to 6 P.S.I. A leak rate of 1 P.S.I. per minute is acceptable. If the leak rate is more than 1 P.S.I. per minute, the leak must be found. Squirt oil around the most likely sources of leaks such as:

- a. The pressure test adapters.
- b. The intake boot and pulse tube at the insulator fitting and the oil discharge hole in the bar pad.

If the leak cannot be located, remove the fan housing, electronic ignition assembly and the intake insulator. Attach adapter, P/N 94416, to the cylinder and recheck at 6 P.S.I. Check around the cylinder/crankcase flange. A leak rate of 1 P.S.I. per minute is allowable.

AUTOMATIC OILER PRESSURE TEST

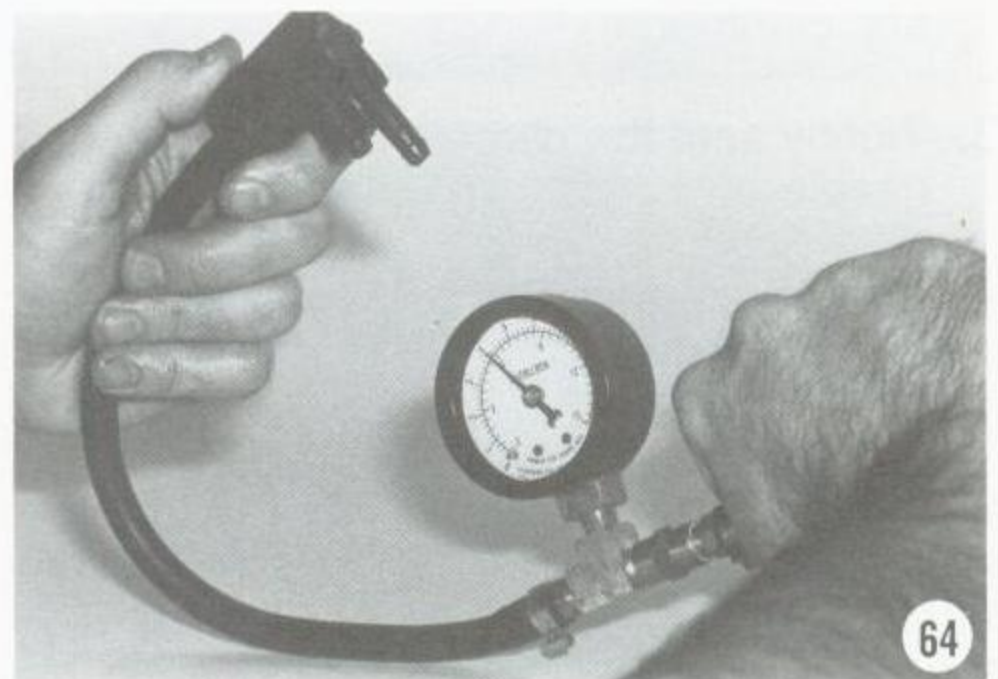
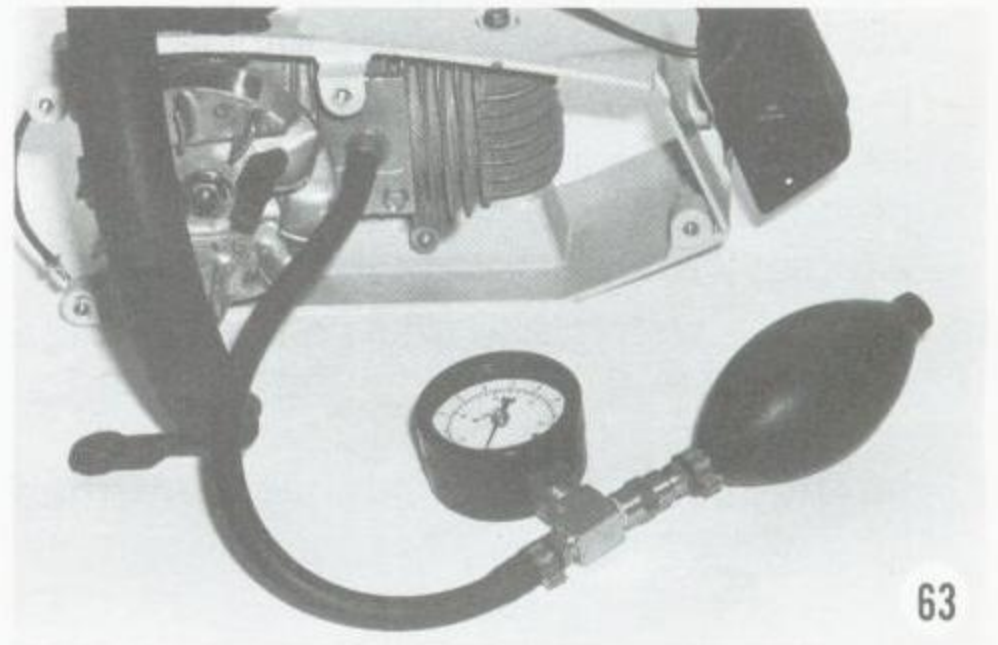
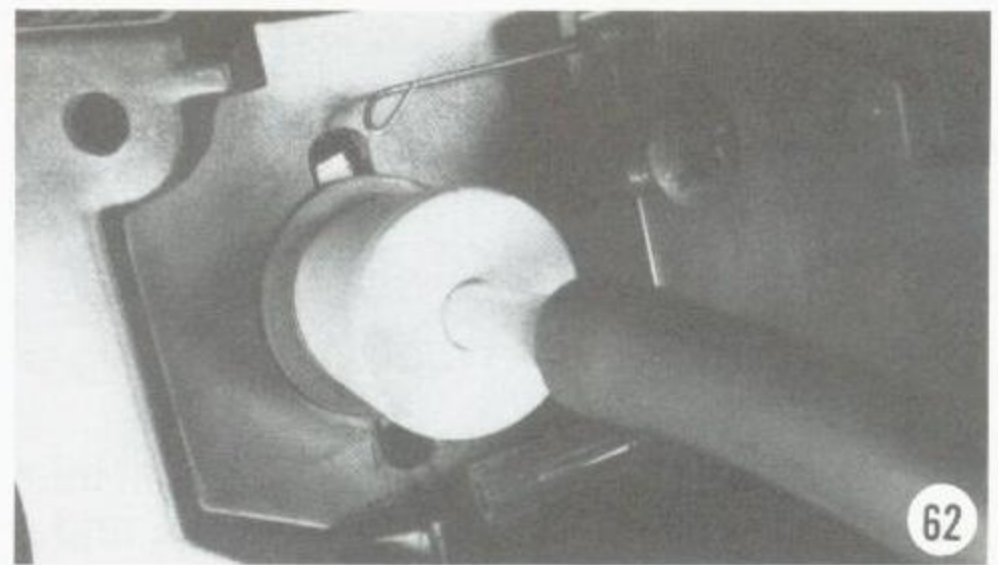
1. Remove the oiler pump assembly.
2. Remove the automatic pump piston, spring and guide.
3. Place the pressure test hose completely over the cylinder. Cover the oil intake fitting.

Pressurize to 6 P.S.I. It should hold this pressure. If it does, pressurize to 12 P.S.I. The pressure should be released between 6 and 12 P.S.I.

Repeat this test. The system should hold and lose pressure 3 out of 5 times the test is performed.

If the pump will not hold 6 P.S.I., flush out the system by forcing oil through the oil intake fitting. Repeat the test. If the pump will not hold pressure, the entire assembly will have to be replaced.

If the pressure is not released between 6 to 12 P.S.I., push a thin rod down the cylinder to be certain the ball check is not stuck. If the ball is not stuck and still will not release pressure at 12 P.S.I., the entire assembly will have to be replaced.



V. TROUBLESHOOTING

CARBURETOR

| | | |
|------------------------------------|--|----|
| START | • WON'T OR HARD START (ENGINE COLD) | 1 |
| | • WON'T OR HARD START (ENGINE HOT) | 2 |
| | • FUEL DRIPPING FROM CARBURETOR | 3 |
| | • ENGINE FLOODS WHEN NOT RUNNING | 4 |
| IDLE | • WILL NOT IDLE | 5 |
| | • RICH IDLE (LOADS UP WHILE IDLING) | 6 |
| | • IDLES WITH LOW SPEED NEEDLE CLOSED | 7 |
| | • ERRATIC IDLE | 8 |
| | • "L" NEEDLE NEEDS FREQUENT ADJUSTMENT | 9 |
| ACCELERATION OR DECELERATION | • WILL NOT ACCELERATE | 10 |
| | • ENGINE DIES ON DECELERATION | 11 |
| | • POOR ACCELERATION | 12 |
| | • SLOW DECELERATION | 13 |
| HIGH SPEED | • WILL NOT RUN AT W.O.T. | 14 |
| | • POOR OR LOW POWER UNDER LOAD | 15 |
| | • WILL NOT 4-CYCLE UNDER NO LOAD AT W.O.T. | 16 |
| | • "H" NEEDLE NEEDS FREQUENT ADJUSTMENT | 17 |

NOTE:

This guide should only be used when standard engine troubleshooting procedures indicate a problem with the fuel system.

- verify fuel condition
- verify adequate secondary engine compression
- verify adequate ignition and timing
- no primary air leaks and must hold adequate primary crankcase compression
- initial carburetor low speed, high speed and idle adjustment set to manufacturer's recommendations

W.O.T. = WIDE OPEN THROTTLE

MINOR ADJUSTMENTS

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|
| • LOW SPEED NEEDLE | • | • | | | • | • | | | | • | • | • | • | | • | | |
| • HIGH SPEED NEEDLE | • | | | | | | | | | • | • | • | • | • | • | | |
| • IDLE SPEED SCREW | | • | | | • | | | | | | | • | | | | | • |

FUEL SUPPLY SYSTEM

| | | | | | | | | | | | | | | | | | |
|--|---|---|---|--|---|---|--|---|---|---|--|---|---|---|---|--|---|
| • FUEL CAP VENT (RESTRICTED/PLUGGED) | | • | | | • | • | | | | • | | | | • | • | | |
| • FUEL FILTER, LINE (RESTRICTED/PLUGGED) | • | | | | • | | | | | • | | • | • | • | • | | • |
| • FUEL LINE (LOOSE/DAMAGED) | • | | • | | • | | | • | | • | | • | • | • | • | | • |
| • DIRT IN FUEL PASSAGE | | | | | | | | | • | • | | | | | | | • |

AIR INTAKE AND FUEL PUMP SYSTEM

| | | | | | | | | | | | | | | | | | |
|--|---|---|---|--|---|---|--|---|--|---|---|---|---|---|---|---|---|
| • AIR FILTER (RESTRICTED) | | • | | | | • | | | | • | • | • | | • | • | | |
| • CARBURETOR BOLTS, GASKETS (LOOSE/LEAKING) | | • | | | | | | • | | • | • | • | • | • | • | | |
| • THROTTLE SHAFT, PLATE (LOOSE/WORN) | • | • | | | | | | • | | | • | | • | | | | • |
| • THROTTLE SHAFT, PLATE (BENT/BINDING) | • | • | | | • | | | | | | | • | | | | • | |
| • CHOKE SHAFT, PLATE (LOOSE/WORN/BENT) | • | | | | | | | | | | | | | | | | |
| • PULSE PASSAGE (LEAKING/RESTRICTED) | | • | | | • | | | • | | • | • | • | • | • | • | | |
| • FUEL PUMP DIAPHRAGM, GASKET (LEAKING/STIFF/MISASSEMBLED), COVER SCREWS (LOOSE) | | | • | | • | • | | • | | • | • | • | • | • | • | | |
| • INLET SCREEN (RESTRICTED/PLUGGED) | • | • | | | • | | | | | | | • | | | • | | |
| • THROTTLE PLATE SCREW (LOOSE) | | | | | | | | • | | | | | | | | | |
| • THROTTLE RETURN SPRING (DEFECTIVE) | | | | | • | | | | | | | | | | | | |
| • THROTTLE STOP (BENT/DAMAGED) | | | | | • | | | | | | | | | | | | |

METERING SYSTEM

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| • INLET NEEDLE (STICKING) | • | | | | | | | | | • | • | | | • | | | • |
| • INLET NEEDLE LEAKING (DIRTY/WORN TIP/WORN SEAT) | | • | • | • | | • | | • | | | | | | • | | | • |
| • INLET LEVER, SPRING (WORN/BENT/IMPROPERLY INSTALLED) | • | • | | | • | • | | • | • | | | • | | • | • | | • |
| • INLET LEVER (SET TOO HIGH) | | • | • | • | • | | | | • | | | | | | | | |
| • INLET LEVER (SET TOO LOW) | • | | | | | | | | | • | | • | | • | • | | • |
| • METERING DISK (WORN) | | | | | | | | • | | | | | | | | | |
| • METERING COVER VENT HOLE (RESTRICTED/PLUGGED) | • | | | | • | | | | | | | • | | | | | |
| • METERING DIAPHRAGM, GASKET (LEAKING/DAMAGED/IMPROPERLY INSTALLED), COVER SCREWS (LOOSE) | • | | • | | • | | | • | • | • | • | • | • | | | • | • |
| • WELSH PLUGS (LEAKING) | | • | | | • | • | | | | | | | | | | | |
| • LOW SPEED FUEL PASSAGES (RESTRICTED/PLUGGED) | • | • | | | • | | | • | | | | • | | | | | • |
| • HIGH SPEED FUEL PASSAGES (RESTRICTED/PLUGGED) | • | | | | | | | | | | | | | | | | • |
| • LOW OR HIGH SPEED NEEDLE, SEAT (DAMAGED/WORN) | | • | | | • | • | • | • | • | • | | | | | | | • |
| • LOW OR HIGH SPEED TENSION SPRING (DISTORTED/WEAK) | | • | | | • | • | • | • | • | • | | | | | | | • |
| • MAIN NOZZLE CHECK VALVE (STICKING/BLOCKED) | • | | | | | | | | | • | | • | | | | | • |
| • MAIN NOZZLE CHECK VALVE (LEAKING) | | • | | | | | | | | • | • | • | • | | | | |

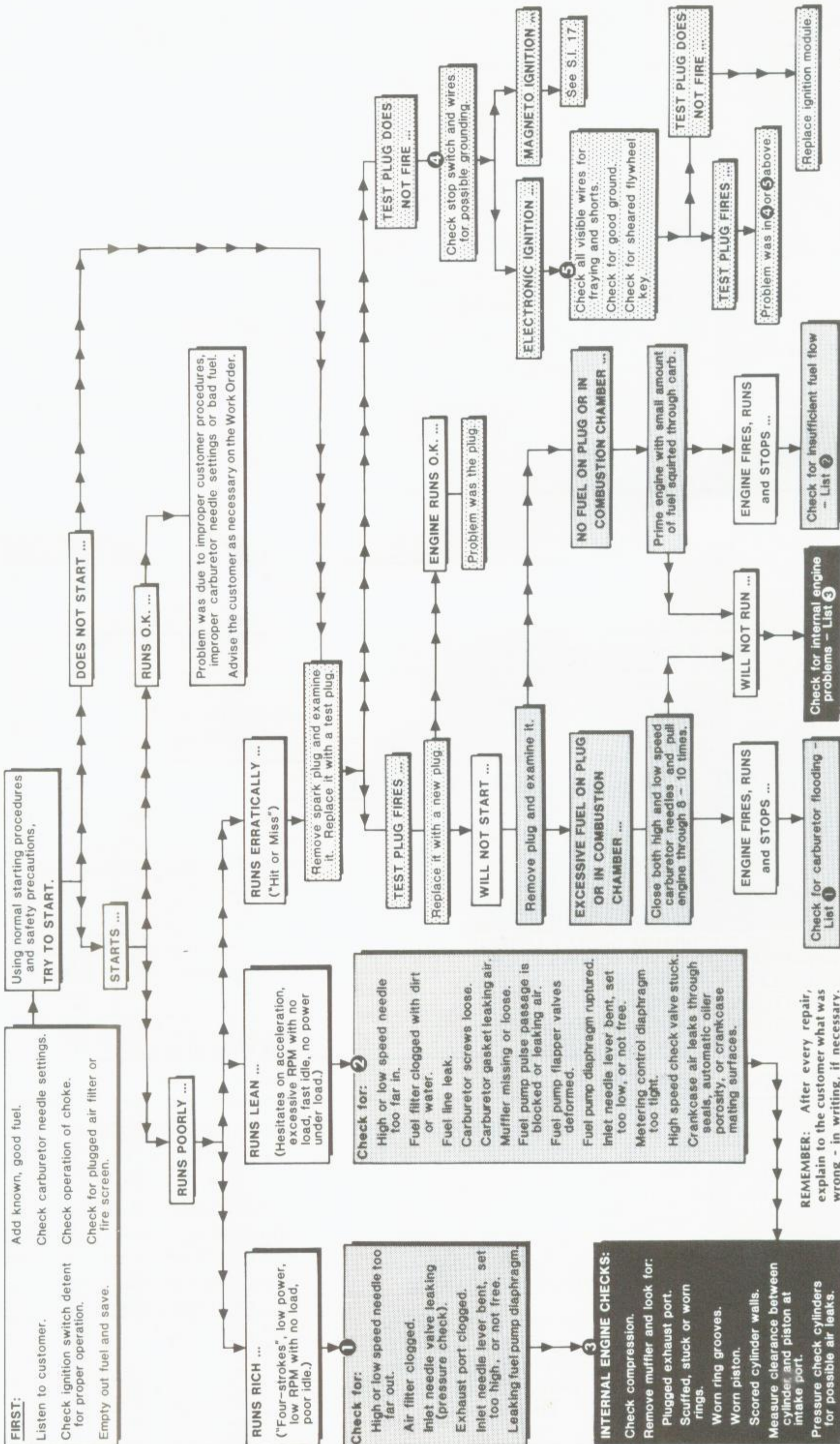
MCCULLOCH TWO-CYCLE ENGINE TROUBLESHOOTING PROCEDURES

NOTE: To insure customer satisfaction, always make certain the chain is properly sharpened and tensioned. Whenever possible, cut with repaired saw. (All chain saw running checks are made with bar and chain installed.)

CODE:

- Fuel (carburetion)
- Electrical (ignition)
- Mechanical (internal engine)

Black



VI. SPECIFICATIONS

| | 300 SERIES, EAGER BEAVER 2.1 | WILDCAT |
|-----------------------|---|-----------------|
| Displacement | 35 cc 2.1 ci | 38 cc 2.3 ci |
| Bore and Stroke | 38 x 30.5 mm | 39.7 x 30.5 mm |
| Bar Bolts | 1 | 2 |
| Main Bearings | Needle | |
| Intake System | 3rd Port Piston Timed | |
| Cylinder | Aluminum Chrome Bore | |
| Fuel Capacity | 330 cc/11.2 oz. | |
| Oil Tank Capacity | 11 cc/3.4 oz. | |
| Oiler Type | Manual and Auto (Pulse) | |
| Carburetor | 2 Needle External Adj. | |
| Clutch Engagement RPM | 3800 RPM | |
| Idle RPM | 2700 - 2900 RPM | |
| Maximum RPM | 10,500 - 11,000 | |
| Ignition (Electronic) | 24° - 26° BTDC | |
| Spark Plug | RDJ6 AC CS 45T (RFI) | |
| Sprocket Type | Spur (.375 Pitch) | |