

- The fuel cap is designed to hold a pressure of 1/2 to 3 PSI and to release above these pressures. If the fuel tank and cap fail to hold or reach these pressures, submerge the fuel tank in fuel mix and re-apply pressure. Bubbles will indicate the source of the leak.
- If the fuel cap fails to hold a minimum of 1/2 PSI or to release above 3 PSI, install a new fuel cap. If there is leakage at the seam between the front and back of the fuel tank, repair the leakage with any standard epoxy. Follow the manufacturer's instructions. If leakage is around the black rubber fuel tank fitting, install a new fitting. Follow removal and installation instructions in the paragraphs headed "Fuel Filter and Fuel Tank Fitting" which follow these tests.

CARBURETOR PRESSURE TESTS

Remove the fan housing to test the carburetor.

- Install the outlet tube and fitting in the carburetor and connect the pressure tool as shown in Figure 3-13.
- Pump up pressure until the gauge reads 5 PSI.
- If the carburetor fails to hold or reach 5 PSI, locate the source of leakage by removing the carburetor and submerging it in fuel mix, applying pressure and watching for the source of bubbles. Carburetor servicing is covered in the "Carburetor" paragraphs at the end of this section.

FUEL FILTER & FUEL TANK FITTING

The fuel filter and black rubber fuel tank fitting can be removed through the fuel tank filler opening.

- Push the black rubber fitting (Figure 3-14) into the tank.
- Use a needle nose pliers to coil the filter upon itself in the tank until you can grasp one corner of the fil-

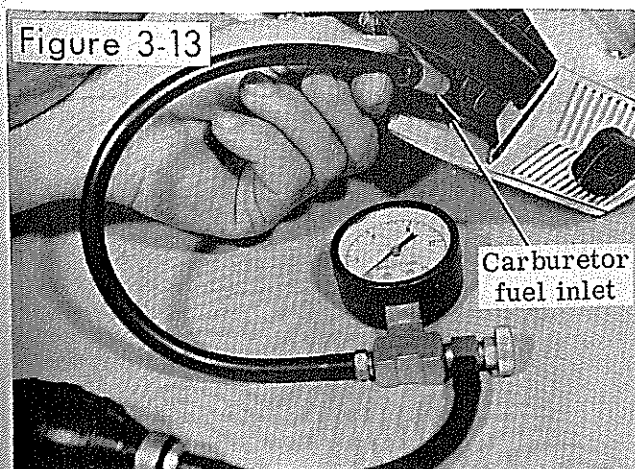
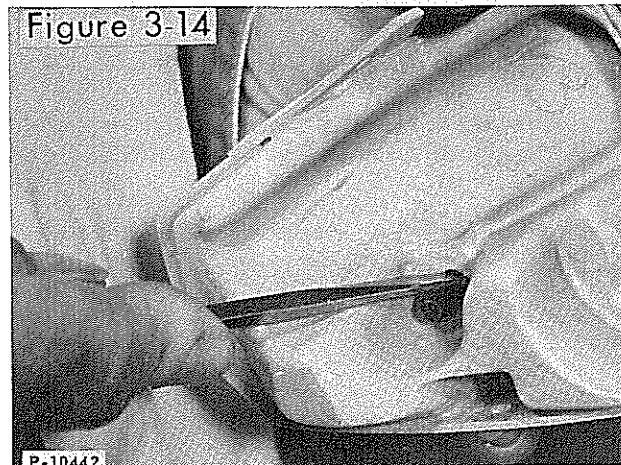


Figure 3-13



P-10442

ter and work the filter and fitting out of the fuel tank (Figure 3-15).

- Work the fitting out of the filter.

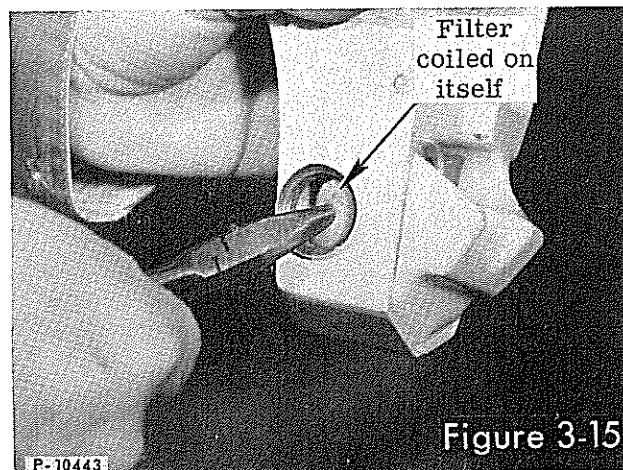


Figure 3-15

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SERVICING THE FUEL FILTER

- Poor Fuel Flow to Carburetor

Poor fuel flow to carburetor can be caused by a dirty or water soaked fuel filter or a plugged fuel fitting.

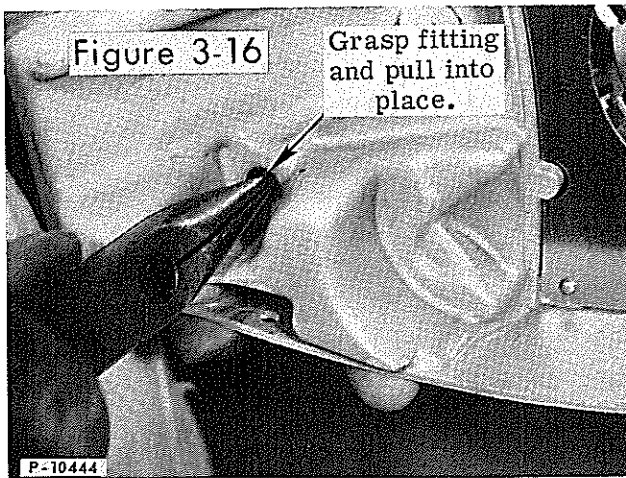
If the filter is dirty, clean it in solvent or gasoline. If the filter is water soaked, hang it up to dry and then clean with gasoline or solvent. Do not place the filter near an open flame or in an oven to dry!

- Lean Fuel Mixture and Poor Fuel Flow

A lean mixture which cannot be corrected by adjusting the carburetor and poor fuel flow can be caused by a cracked or broken fuel fitting which will allow air to be drawn into the fuel pump. The fitting should be flexible and without cracks or tears. The three tips at the carburetor end of the fitting should be undamaged.

INSTALLATION

1. Insert the fuel fitting into the fuel filter.
2. Roll the filter into a long roll with the fitting inside the roll. Roll the filter from top to bottom, not end to end.
3. Insert the short end of the rolled filter into the fuel tank and spread the filter out with a screwdriver. Work the fuel fitting until the top fits into the fitting hole in the side of the tank.
4. Grasp the tip of the fitting with a needle nose pliers and pull the fitting through the hole until it is properly seated (Figure 3-16). Straighten out the rest of the filter inside the tank.



IGNITION SYSTEM

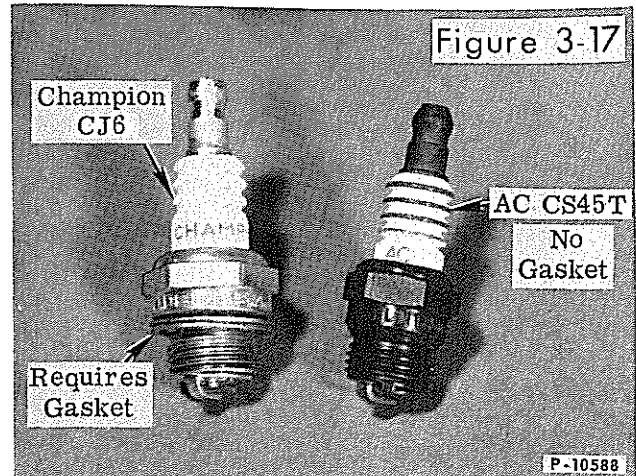
The ignition system consists of the spark plug, coil and lamination assembly, condenser, breaker points, ignition switch and connecting wires.

The spark plug is installed on the right rear side of the saw. The ignition switch is mounted on the underside of the upper shroud. The coil and lamination are beneath the fan housing. The breaker points and condenser are located under the flywheel.

SPARK PLUG

The standard spark plug is a conical seal type AC CS45T spark plug. It does not use a spark plug gasket. Use a 5/8-inch spark plug wrench to remove the plug. Some difficulty may be experienced in removing the plug from new engines. This is a normal seating-in condition and usually occurs only the first time the original plug is removed.

Champion CJ6 or CJ8 spark plugs can be used as alternates. Figure 3-17 shows the difference between the AC and Champion plugs. Champion plugs have flat seats and require a spark plug gasket. Before installing,



make sure the plug hole in the cylinder head is free of nicks and scratches. Use a 3/4-inch spark plug wrench with Champion plugs.

SERVICING THE SPARK PLUG

- a. Spark Plug Check on Correct Fuel/Air Mixture

If the porcelain base of the center electrode of the spark plug is covered with black or sludgy oil deposits, the fuel/air mixture has been too rich. If the base has chalky white deposits, the fuel/air mixture has been too lean. Proper fuel/air mixture will result in a light tan to tannish gray base.

- b. Spark Plug Check on Air Filter and Air Filter Duct

If the saw has been operated without an air filter or air duct or with a disconnected air duct, the center electrode base and inner portion of the metal shell will be covered with carbonized particles.

- c. When to Install a New Spark Plug

When overhauling an engine, it is advisable to install a new spark plug rather than risk the lowered efficiency of a used plug. A new plug must be installed if there are cracks or blisters on the base, if the electrodes are burned or pitted or if the porcelain exterior is cracked.

CLEANING

Oxide and carbon deposits can be removed with a sharp knife or emery paper. Blow the plug clean with low (three to five pounds) pressure air.

CAUTION: Do not clean the spark plug in a grit blast machine. The oil sludge trapped between the center electrode base and the shell will catch and hold the grit. Compressed air in the machine will not always remove this grit. Later, when the engine is run, combustion will break down the sludge and release the grit which can damage the piston and cylinder.

ELECTRODE GAP

Electrode gap should be set at 0.025 inch. Use a wire gauge to measure the gap (Figure 3-18). Bend the side electrode only. Do not try to bend the center electrode.

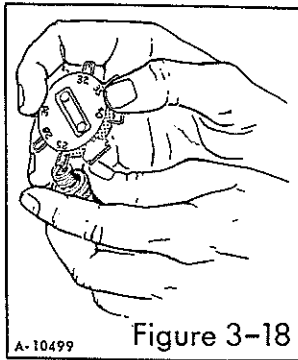


Figure 3-18

INSTALLATION

Test the spark plug before installing it.

1. Connect the spark plug to the spark plug wire. Ground the spark plug on the engine. Move the ignition switch to ON. Pull the starter rope to spin the crankshaft.

CAUTION: Do not ground the spark plug over the spark plug hole. Air/fuel mixture will be blown out of the hole by the piston and can be ignited by the spark between the electrodes.

2. The plug should spark each time the crankshaft revolves. If the plug fails to spark, try a second plug. If both plugs fail, use the Ignition System Electrical Checks to locate the cause of trouble.
3. If the plug sparks, install the plug. Tighten the plug to a torque value of 144 to 180 inch pounds. Securely connect the spark plug wire to the plug.

IGNITION SYSTEM ELECTRICAL TESTS

The electrical tests are designed to test individual parts of the ignition system. Make each test before removing any parts concerned and again after parts are installed. All tests except primary wire grounding check, are made with the Model 98, Merc-O-Tronic tester. Remove the fan housing for all tests.

The flywheel magnet is cast inside the flywheel. The two "magnets" which are in the flywheel rim are the magnet laminations. Do not confuse the magnet laminations with the coil laminations in the following electrical tests.

PRIMARY WIRE GROUNDING CHECK

The primary wire and coil terminal (Figure 3-19) on early production saws should be coated with a non-conducting sealant (Dow Corning Silastic RTV 732 or similar) to prevent the wire grounding out when the fan housing is installed. Later saws have a plastic sleeve on the wire end and no sealant is required. If the saw cannot be started or runs rough when the fan housing is installed, check to make sure the primary wire is not grounding out on the fan housing. If this is the case, apply the sealant liberally to the primary wire and coil terminals.

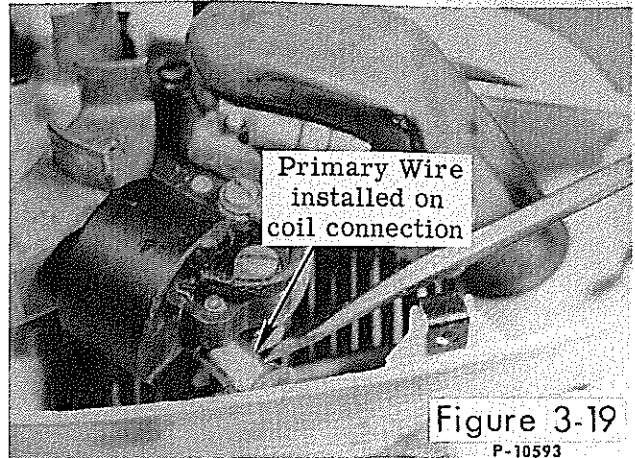


Figure 3-19

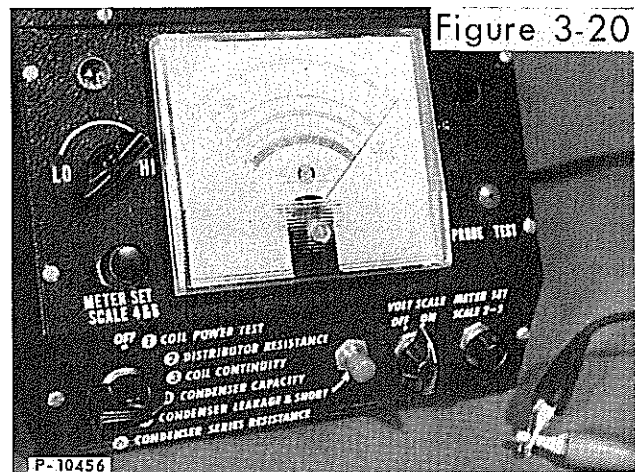
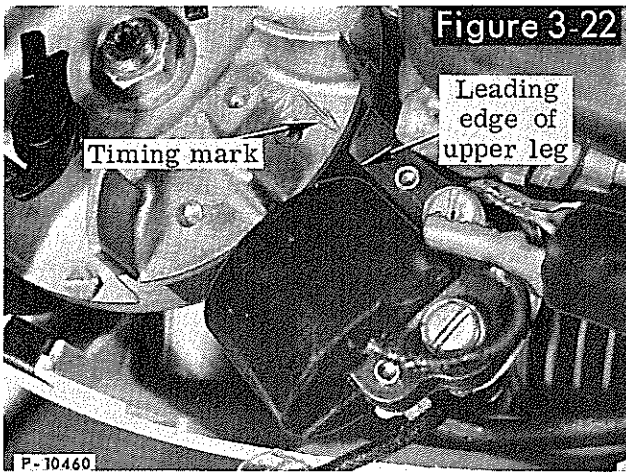
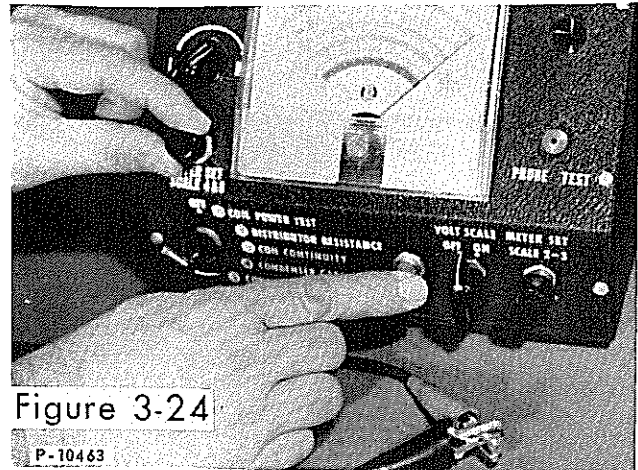
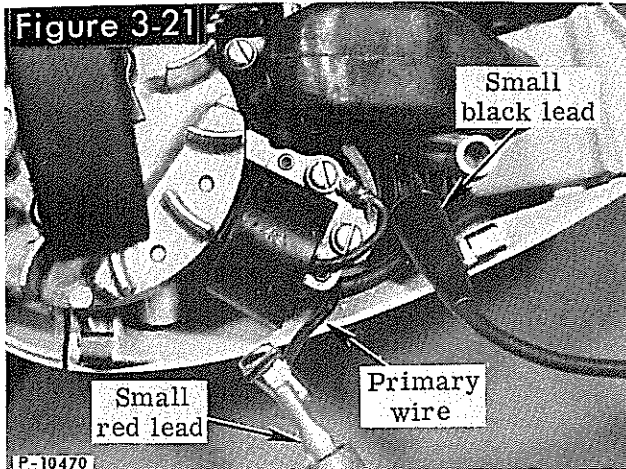


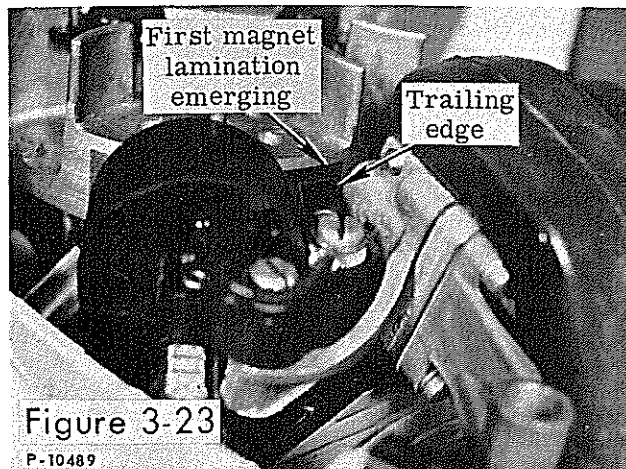
Figure 3-20

TIMING CHECK

1. Turn the selector switch on the Merc-O-Tronic tester to the number 3 position. Short the small red and black leads together and adjust the meter set knob for scale 2 and 3 until the meter pointer lines up with the SET line on the number 3 scale (Figure 3-20).
2. Disconnect the primary wire from the coil terminal and connect it to the small red lead. Connect the small black lead to any good ground on the engine (Figure 3-21). Make sure the ignition switch is in the ON position.
3. Turn the flywheel counterclockwise until the meter pointer indicates the points are breaking by moving to the left side of the scale. The timing mark on the flywheel should line up with the leading edge of the upper leg of the coil lamination (Figure 3-22). This is the correct position for the timing -- 26 degrees BTC. If the flywheel does not have a timing mark, the leading edge of the first magnet lamination in the rim of the flywheel should be just emerging from beneath the trailing edge of the upper leg of the coil lamination (Figure 3-23).



- Turning the flywheel approximately 1/32 inch either way should result in a full scale deflection of the meter pointer. If it does not do this, the breaker points must be adjusted.
- When reinstalling the primary wire, make sure the plastic sleeve covers the wire and coil connection or apply a liberal amount of non-conductive sealer (Dow Corning Silastic RTV 732 or similar) to the



connection to prevent grounding the coil when the fan housing is installed.

CONDENSER CAPACITANCE TEST

- Plug the Merc-O-Tronic tester into a 110 volt, 60 cycle AC outlet. Short the small red and black leads together. Place the selector switch in the number 4 position. Press the red button and adjust the meter knob for scale 4 and 5 until the meter pointer lines up with the SET line on the number 4 scale (Figure 3-24).
- Connect small red lead to the primary ground wire and the small black lead to ground on the engine (Figure 3-25). Make sure the ignition switch is in the ON position. Turn the flywheel until the second magnet lamination in the flywheel rim is about an inch past the upper coil lamination leg and press the red button. The reading on scale 4 should be 0.18 to 0.22 MFD. Any other reading indicates a new condenser must be installed.

CONDENSER LEAKAGE & SHORT TEST

- With the Merc-O-Tronic tester plugged into a 110 volt, 60 cycle AC outlet and the coil ground wire

