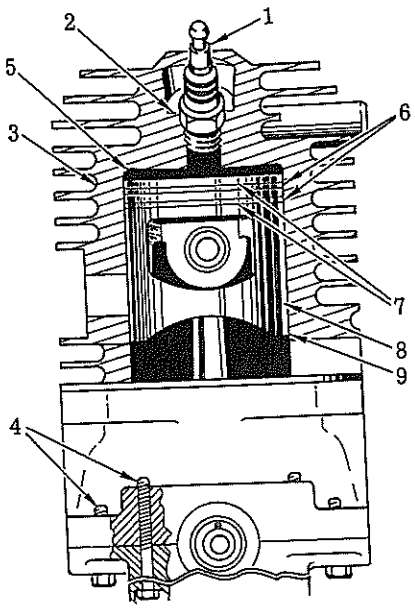
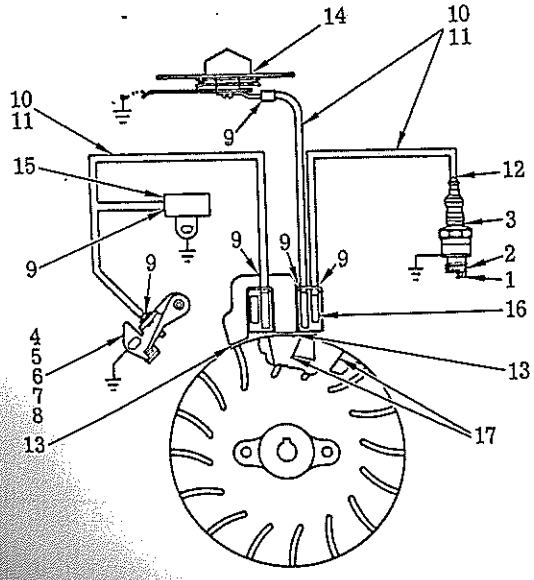
TROUBLE SHOOTING GENERAL FAULTS

FAULT	POSSIBLE CAUSE
Poor Compression 	1. Loose spark plug 2. Damaged spark plug seat 3. Cracked cylinder crankcase 4. Loose or missing crankcase bolts 5. Compression loss in the crankcase 6. Broken or worn piston rings 7. Broken or worn piston lands 8. Scored piston 9. Scored cylinder
Weak Or No Spark (Ignition System) 	Spark plug 1. Fouled 2. Wrong gap 3. Cracked or dirty insulation Breaker points 4. Dirty or greasy 5. Burned or pitted 6. Wrong gap 7. Poor alignment 8. Breaker block worn Wiring 9. Loose terminals 10. Broken wires 11. Frayed insulation 12. Connector pulled from lead Lamination 13. Wrong air gap Switch 14. Grounding out or in "OFF" position Condenser 15. Defective Coil 16. Defective Magnet 17. Weak

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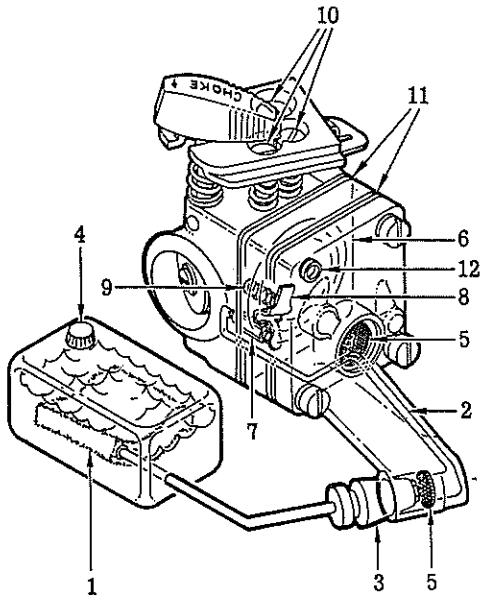	1. Filter dirty 2. Passages plugged 3. Fuel fitting cut or damaged 4. Cap not venting 5. Filter screen dirty 6. Diaphragm defective 7. Inlet valve dirty or damaged 8. Inlet valve lever bent 9. Inlet valve spring deformed 10. Adjustment needle dirty, deformed or out of adjustment 11. Defective gasket 12. Check valve dirty or damaged

TROUBLE SHOOTING PROCEDURE

In the trouble shooting procedure described here, the service man should have at his disposal the following test units and equipment.

Spark Plug
Condenser
Coil
Flywheel and Magnet Assembly
Compression Gauge
Timing Light or Coil Test Equipment

The test units should be at full strength, in perfect condition and known to be completely reliable when used in a substitution test.

Checking Compression

Check compression of the engine by pulling on the starter rope and turning the crankshaft through several revolutions. There should be strong resistance on the compression stroke with a definite "bounce" as the piston comes up to top dead center. If the point of greatest resistance cannot be found, or there is a noticeable lack of "snap-back", the trouble is probably poor compression. This can be confirmed by measurement. If there is any doubt, a check should be made.

Remove the spark plug and install a compression gauge in the spark plug hole, Pull the starter rope for at least six pulls or until the gauge needle no longer rises. The compression gauge should read a minimum of 140 pounds per square inch, maximum 150 pounds per square inch.

A reading below 140 P.S.I. can indicate any of the troubles listed in the first chart, broken ring lands, and out-of-round cylinder or rings that have lost flexibility because of operation under conditions of extreme heat.

When tests and checks show poor compression, look first for the most common causes such as a damaged spark plug seat. Such faults can be quickly corrected and the engine rechecked for improvement. The more serious faults such as a damaged piston or cylinder will require a complete engine tear-down.

Checking Ignition System

When the spark plug removed from the engine is wet with unburned fuel, it is a good indication that the engine trouble is in the ignition system. To check this, ground the spark plug on the engine, pull the starter rope and watch for the spark to jump the spark plug gap. If no spark occurs or if the spark is weak and has a yellow appearance, examine the electrodes. If they are burned away leaving the gap too wide, or they are bent and touching each other, or completely fouled, no arcing can occur. A heavy coating of dirt and grease on the outside of the porcelain will also ground the current and prevent an arc at the electrodes. Install a new test plug and repeat the test. A strong blue spark with the test plug will show that the original plug is at fault. If there is still no spark, or it is very weak, continue the check of other components of the ignition system.

NOTE: Abrasive cleaning (sand-blast) of spark plugs is not recommended.

To see if the ignition switch is shorting out the coil, remove the switch lead and check again for a spark. Examine the wiring for frayed insulation or a bare wire grounding out on the engine. Look for loose, broken or disconnected wires. Check the lamination gap. It should be 0.010 to 0.015. Reset if necessary and repeat the spark test. If there is still no spark, check breaker points and timing. The breaker point surfaces should be clean, bright, smooth and in good alignment. Breaker point gap should be 0.018-inch (0.457 mm) when the points are in the fully open position. Clean the points and reset the gap if necessary. This may be done most accurately with the use of a timing light.

Continue the check of the ignition system by testing the condenser and the coil. Both may be checked by substituting test units which are known to be good or by using a coil tester. The condenser should be checked first, with a spark test after each part substitution. While it is very unlikely that the ignition will be faulty because of a defective magnet, it too can be checked by the substitution of a test flywheel and magnet assembly in the same way that the other test units are employed. This completes the check of the ignition system with the result that any possible faulty component has been located and corrected either by repair, adjustment or replacement. With a strong blue spark and good compression as first established in the trouble shooting procedure, the third phase is a check of the fuel system.

Checking Fuel System

It is entirely possible that a malfunction of the fuel system would be discovered when the spark plug was removed from the engine. The absence of wet fuel at the plug would indicate that no fuel was reaching the combustion chamber. This can also be checked by placing a thumb over the spark plug hole and pulling the starter rope several times, after making sure that the ignition switch is in OFF position. If the fuel system is working properly, fuel will be discharged into the combustion chamber and your thumb will become wet with the fuel mixture in the chamber.

Disconnect the fuel fitting from the carburetor and blow air through it. If the passage is open, air will be heard bubbling up through the fuel in the tank. Drain the fuel from the tank, remove the cover and inspect the filter. Check for dirt and water soaking.

If the pickup filter and fuel fitting are clean and open, remove the carburetor. Check the pulsation passage by pulling on the starter rope four or five times after smearing a small quantity of grease over the small hole in the carburetor mounting flange of the airbox. If the grease is not blown away, run a small diameter wire through the passage to clear it of the obstruction.

Fuel system troubles will, at this point, be narrowed to malfunction of the carburetor or the fuel pump diaphragm assembly. The next step is to remove the base plate from the carburetor and look for the cause of trouble in the supply of fuel between the fuel strainer and the discharge of fuel and air mixture into the crankcase. These troubles will most likely be found in dirty and clogged fuel strainers, dirt in the fuel transfer passages or defective fuel pump diaphragms. Diaphragm damage could consist of cuts, breaks, holes or curled flapper valves that will not seat. Defective parts must be replaced. Fuel strainers may be removed, washed in clean gasoline and blown dry. With the carburetor completely disassembled, fuel passages may be blown out to remove dirt and clogging material.

CAUTION

Never blow compressed air through carburetor or fuel pump passages while diaphragms are in place. The force of this air could rupture an otherwise good diaphragm.

Another possible source of carburetor trouble is in damage to the fuel adjustment needles. Remove the adjustment needles. Look for a broken or bent point or a deformed taper of the point caused by jamming the point into its seat with such force that it can no longer meter the fuel and provide a correct mixture. Physical damage may also be found in the carburetor inlet valve.