CHAPTER 3 CARBURETORS AND FUEL SYSTEMS

GENERAL INFORMATION

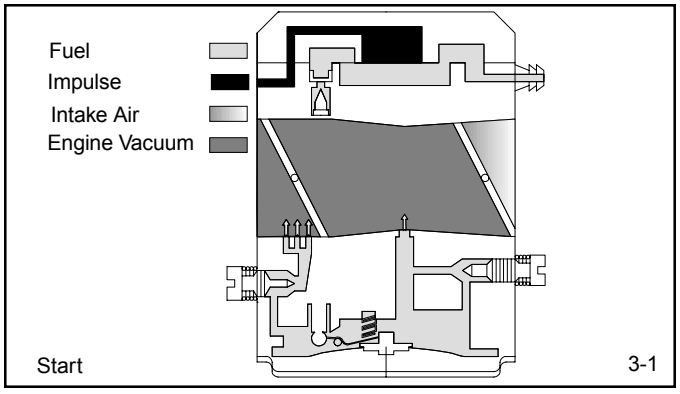
TC engines almost exclusively use diaphragm-type carburetors to be able to run effectively at any operating angle. The diaphragm carburetors are produced by Walbro and Tillotson for Tecumseh. The carburetors use an internal diaphragm fuel pump to supply the fuel to the carburetor fuel metering chamber. The metering diaphragm has one side exposed to intake manifold pressure and one side exposed to atmospheric pressure. This diaphragm provides the same basic function (maintaining the proper fuel level in the carburetor) as the float.

A limited number of TC engines were produced as outboards using a Tecumseh Series II float style carburetor. Consult the Two Cycle Technician's Handbook (part # 692508) if service is required on this series of carburetor.

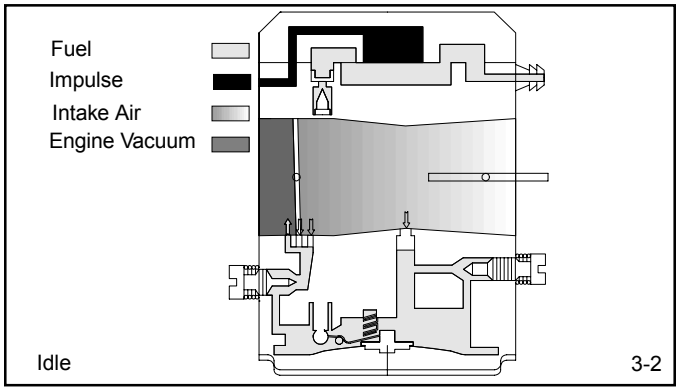
When servicing carburetors, use the engine model and specification number to obtain the correct carburetor part number. An alternate method to find the correct carburetor part number on float type carburetors is to use the manufacturing number and date code stamped on the carburetor and convert this number to a part number. In the carburetor section of the Master Parts Manual or Microfiche Catalog, a cross reference chart will convert a carburetor manufacturing number to a Tecumseh part number.

OPERATION

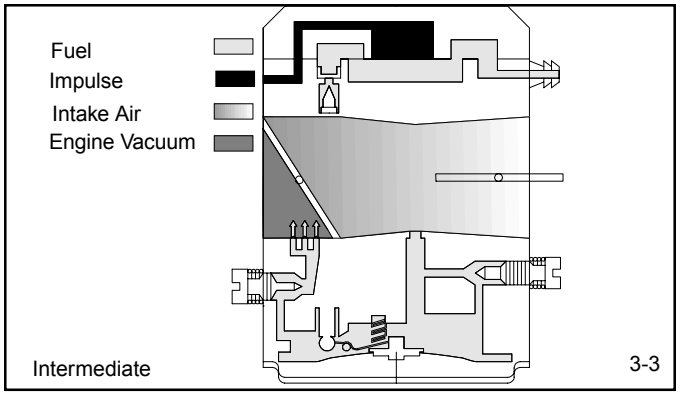
In the "CHOKE" or "START" position, the choke shutter is closed, and the only air entering the engine flows through openings around the choke shutter. As the recoil assembly is operated to start the engine, downward piston travel creates a low pressure area in the engine cylinder above the piston. Higher pressure atmospheric air rushes into the engine to fill the created low pressure area. Since the majority of the air passage is blocked by the choke shutter, a relatively small quantity of air enters the carburetor at increased speed. The main nozzle and both idle fuel discharge ports are supplying fuel due to the low air pressure in the intake of the engine and the fuel side of the main diaphragm. Atmospheric air pressure on the opposite side of the main diaphragm forces the diaphragm upward, depressing the inlet control lever, overcoming inlet spring pressure and allowing fuel to enter the fuel chamber through the inlet valve. A maximum fuel flow through the carburetor orifices combined with the reduced quantity of air that passes through the carburetor, make a very rich fuel mixture which is needed to start a cold engine (diag. 3-1).



At IDLE the throttle shutter is almost closed, the low pressure acts only on the primary idle fuel discharge port due to throttle plate position. A relatively small quantity of fuel is needed to operate the engine (diag. 3-2).



During INTERMEDIATE throttle operation, the secondary idle fuel discharge port supplies fuel after it is uncovered by the throttle plate. As the throttle plate opens progressively further, engine speed increases. The velocity of air going through the carburetor venturi creates a low pressure area to develop at the main fuel discharge port while diminishing the effect of the low pressure area on the engine side of the throttle plate. When the pressure at the venturi throat is less than that existing within the fuel chamber, fuel is forced through the high speed mixture orifice and out the main fuel discharge port (diag. 3-3).



TESTING

1. After repeated efforts to start the engine using the procedure listed in the operator's manual fail, check for spark by removing the high tension lead and removing the spark plug. Install a commercially available spark plug tester and check for spark. If the spark is bright blue and fires every revolution, proceed to step # 2. If no spark, weak spark, or intermittent spark see Chapter 6 "Ignition" under "Troubleshooting".
2. Remove the spark plug and visually check the removed spark plug for a wet condition indicating the presence of fuel mixture in the cylinder.
3. If the spark plug is dry, check for restrictions in the fuel system before the carburetor. If the spark plug is wet, continue with step # 6. Check the fuel cap vent, the cap must allow air to be blown through it when testing. Using a proper draining receptacle, remove the fuel line from the carburetor inlet fitting (Type I) or fuel tank (Type II) and pull off the fuel line. Examine the fuel flow and fuel condition. Improper fuel flow indicates the fuel, fuel line, filter, or tank require cleaning or replacement.
4. Visually inspect the choke shutter for complete closing or check to see fuel flowing from the main nozzle during priming. Remove the air cleaner element or air cleaner assembly to provide access for visual inspection.
5. If the fuel flow to the carburetor is adequate and no fuel flows out the main nozzle during priming or choking, the carburetor will require service. Consult the Troubleshooting Carburetion Chart for possible causes for the lack of fuel.
6. Check the engine compression using a commercially available compression tester and follow the tester's recommended procedure. Low compression, no fuel present on the spark plug, adequate fuel flow and a known good functional carburetor indicates an internal engine problem exists. See Chapter 7 under "Troubleshooting".

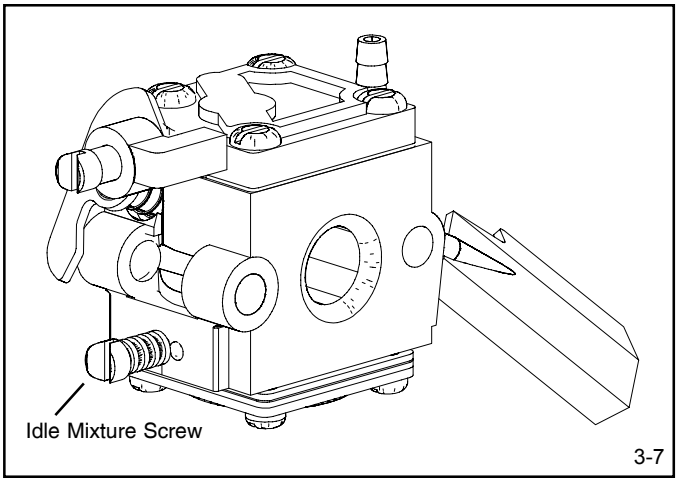
SERVICE

CARBURETOR PRE-SET AND ADJUSTMENT

Both the Walbro and the Tillotson carburetors used on TC engines have non-adjustable main mixture jets. Only the idle mixture is adjustable by turning the idle mixture screw. Use the following procedure to pre-set the idle mixture screw. Turn the idle mixture screw (clockwise) finger tight to the closed position, then turn the screw counterclockwise to obtain the proper preset (diag. 3-7).

Walbro model WTA, WT 1 - 1 1/8 turns

Tillotson model HU 1 1/4 - 1 3/8 turns



3-7

Final Idle Mixture Adjustment

Start the engine and allow it to reach normal operating temperature (after 3-5 minutes). As the speed control is set at the idle position, turn the idle mixture screw slowly clockwise until the engine R.P.M. just starts to decrease. Stop and note this screw position. Turn the idle mixture screw slowly counterclockwise. The engine will increase R.P.M. Continue to slowly turn the screw until the engine R.P.M. starts to decrease. Note this position and turn the mixture screw back clockwise halfway between the two engine R.P.M. drop off positions. The idle mixture adjustment is complete.