CHAPTER 3 CARBURETORS AND FUEL SYSTEMS

GENERAL INFORMATION

Tecumseh uses two basic types of carburetors, float and diaphragm type carburetors. Float type carburetors use a hollow float to maintain the operating level of fuel in the carburetor. Diaphragm type carburetors use a rubber-like diaphragm. One side is exposed to intake manifold pressure and the other side to atmospheric pressure. The diaphragm provides the same basic function (maintaining the proper fuel level in the carburetor) as the float.

An advantage of the diaphragm carburetor over the float style is that the diaphragm carburetor will allow the engine to operate at a greater degree of tiltability.

Tecumseh carburetors are identified by a manufacturing number and date code stamped on the carburetor as illustrated (diag. 1).

When servicing carburetors, use the engine model and specification number to obtain the correct carburetor part number. An alternate method to finding the correct carburetor part number 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 or computer parts look-up system. A cross reference chart will convert a carburetor manufacturing number to a Tecumseh part number.

Complete carburetor replacement may be accomplished with a standard service carburetor. A standard service carburetor is a basic carburetor that may require the use of original carburetor parts or additional new parts to adapt to the specification. An instruction sheet is provided with the new service carburetor or see “SERVICE” in this chapter.

CAUTION: DRAIN THE FUEL INTO AN APPROVED CONTAINER OUTDOORS, AND AWAY FROM ANY OPEN FLAME OR COMBUSTION SOURCE. BE SURE THE ENGINE IS COOL.

NOTE: Todays fuels can cause many problems in an engines performance, due to the fuels quality and short shelf life. Always check fuel as a primary cause of engine performance.

1. Remove the air filter, heater box, or air cleaner assembly if applicable to visually check that the choke shutter completely closes or check to see if fuel comes out of the main nozzle during priming.

2. If the fuel flow from the tank is adequate and no fuel is evident during priming, the carburetor will need to be removed for service. See “Service” in this chapter or consult the “Carburetion Troubleshooting” chart to diagnose carburetor symptoms. Improper fuel flow indicates the fuel, fuel line, filter or tank require cleaning or replacement.

3. Check the engine compression using a commercially available compression tester and follow the tester's recommended procedure. Low compression, a dry spark plug, adequate fuel flow, and a known good functional carburetor indicates an internal engine problem exists. See under “Troubleshooting.”

4. A wet spark plug indicates fuel is being supplied by the carburetor. The engine may be flooded by a restricted air filter, carbon shorted or defective spark plug, excessive choking or over priming, improperly adjusted or defective carburetor. With the spark plug removed and a shop towel over the spark plug hole, turn the engine over slowly 3 or 4 times to remove excess gasoline from the engine cylinder.

CAUTION: KEEP ALL COMBUSTIVE SOURCES AWAY. AVOID THE SPRAY FROM THE SPARK PLUG HOLE WHEN CRANKING THE ENGINE OVER.

5. Replace the air filter if restricted or oil soaked. Replace the spark plug if questionable. Install the spark plug and high tension lead and try to start the engine.

6. If the engine floods and fails to start, the carburetor will require service. See the proceeding “Carburetion Troubleshooting” chart for additional causes. If the carburetor is functioning properly the problem may be ignition timing related. See “Troubleshooting” under "Ignition".
In the “CHOKE” or “START” position, the choke shutter is closed and the only air entering the engine enters through openings around the shutter. As the engine starts to rotate, downward piston travel creates a low air pressure area (or vacuum) above the piston. Higher pressure (atmospheric) air rushes into the engine and fills this 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 an increased speed. The main nozzle and both idle fuel discharge ports are supplying fuel due to the low air pressure in the engine intake. 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.

At engine IDLE speed, a relatively small amount of fuel is required to operate the engine. The throttle is almost completely closed. Fuel is supplied through the primary idle-fuel discharge orifice.

**NOTE: Dual system carburetors do not have an idle circuit.**

During INTERMEDIATE engine operation, a second orifice is uncovered as the throttle shutter opens, and more fuel is allowed to mix with the air flowing into the engine.

During HIGH SPEED engine operation, the throttle shutter is fully opened. Air flows through the carburetor at high speed. The venturi, which decreases the size of the air passage through the carburetor, further accelerates the air flow. This high speed movement of the air decreases the air pressure at the main nozzle opening. Fuel is forced out the main nozzle opening due to the difference in the air pressure on the fuel in the carburetor bowl and the reduced air pressure at the main nozzle opening.

For the fuel to flow, the carburetor bowl must be either vented externally or internally. Some internally vented float style carburetors use a tygon tube and a vent within the air intake. This tube must be present for the carburetor to operate properly (diag. 2).

Air is bled into the main nozzle and through the air bleed located in the air horn. This mixes the fuel and air prior to the fuel leaving the main nozzle. Atomization occurs as the fuel mixture contacts the fast moving air stream. This mist then flows into the intake of the engine.

**FUEL PRIMERS**

Primers may be mounted remotely or as an integral part of the carburetor. The basic function of the primer is to supply a charge of air to the carburetor main well, or carburetor bowl. On diaphragm carburetors it displaces fuel directly into the carburetor venturi. This displaced fuel provides a rich mixture necessary for engines to start easily on the first or second attempt (diag. 3 & 4).

Primers must be vented either internally (a passage in the carburetor air horn prior to the venturi) or externally (through a hole in the primer bulb). The vent allows air to fill the primer bulb after the primer bulb is released. On diaphragm carburetors a one way valve in the body prevents the fuel from being forced back into the fuel tank.

Two different methods are used to prime float style carburetors, leg prime and bowl prime. The leg prime system is used only on the dual system carburetor. Air is forced into the center leg of the carburetor, which then forces an enriched mixture of fuel up the main nozzle. The bowl prime method is used on Series 6, 8, 9 and 10 carburetors and is distinguished by a stepped or hour glass shaped primer bulb. A good seal of the primer bulbs center lip is critical to assure that a full charge of air reaches the bowl. **Also critical is a tight seal around the float bowl.**

**NOTE: Never re-use a bowl gasket.**
**IMPULSE FUEL PUMPS**

Impulse fuel pumps may either be mounted externally onto the carburetor fuel inlet or remotely mounted. These pumps are connected in the fuel line between the fuel supply and the carburetor or directly to the fuel inlet.

Impulse fuel pumps are operated by crankcase impulses created by the up and down movement of the piston. A hose called a pulse line connects the fuel pump diaphragm chamber to the crankcase and transmits these impulses to the pump diaphragm. The impulses actuate the diaphragm and flap valves to lift the fuel from the fuel tank to the carburetor (diag. 6).

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**FLOAT STYLE CARBURETORS**

A float is used to maintain the operating volume of fuel in the carburetor bowl. As the fuel is used by the engine, the fuel volume in the carburetor bowl drops and the float moves downward. This allows the inlet needle valve to move off the sealing seat. Fuel flows by gravity or a pulse pump into the fuel bowl. As the fuel volume in the bowl again rises, it raises the float. This upward float motion moves the inlet needle valve to the closed position. When the needle contacts the seat, the fuel flow is stopped. The tapered end of the inlet needle varies the fuel flow rate so that the fuel volume in the carburetor bowl will remain constant (diag. 7). The float height is set according to the service procedure.

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**DIAPHRAGM (PRESSURE DIFFERENTIAL) CARBURETORS**

This type of carburetor uses a rubber-like diaphragm which is exposed to intake manifold pressure on one side and to atmospheric pressure on the other. Tecumseh diaphragm carburetors use the diaphragm as a metering device. As the intake manifold pressure decreases due to downward piston travel, the atmospheric pressure on the vented side of the diaphragm moves the diaphragm against the inlet needle. The diaphragm movement overcomes the spring tension on the inlet needle and moves the inlet needle off the seat. This permits the fuel to flow through the inlet valve to maintain the correct fuel volume in the fuel chamber. The inlet needle return spring closes the inlet valve when the pressure on the diaphragm equalizes or a pressure higher than atmospheric exists on the intake side (upward piston travel). The diaphragm meters a correct fuel volume in the fuel chamber to be delivered to the mixing passages and discharge ports (diag. 8).

A main or idle adjustment needle may be replaced by an internally fixed jet on some models.

The main nozzle contains a ball check valve. The main purpose of this ball check is to eliminate air being drawn down the main nozzle during idle speeds and leaning the idle mixture.

An advantage of the diaphragm carburetor over the float system is that the diaphragm carburetor increases the angle that the engine may be operated at.
Check ball is not serviceable on some models.

Main Menu
CARBURETOR IDENTIFICATION

Tecumseh has a variety of carburetors. To help identify these carburetors here are some simple procedures to follow.

DUAL SYSTEM CARBURETORS

The easiest way to identify the dual system carburetor is by the presence of a large primer bulb located on the side of the carburetor. The absence of adjustment needles help to identify the carb as well. The dual system carburetor is used on 4-cycle vertical crankshaft rotary mower engines. (diag. 11).

SERIES 1 CARBURETORS

Series 1 carburetors come in a variety of styles. They are used on both 2 and 4 cycle vertical and horizontal shaft engines in the 2 through 7 h.p. range. It is a float style carburetor with a smaller venturi than the Series 3 and 4 carburetors. Some will have an adjustable idle and main and others will have a fixed main with an adjustable idle. There are also some fixed speed applications that will only have a fixed main system and the idle system will not be drilled. (diag. 12).

NOTE: Emissionized carburetors will have a fixed jet.

SERIES 3 & SERIES 4 CARBURETORS

Series 3 and 4 carburetors are generally used on 8 through 12.5 horsepower 4-cycle engines. The venturi size of these carburetors are larger than Series 1 and Dual System Carburetors. The quickest way to identify these carburetors is by the presence of bosses on each side of the idle mixture screw. To identify the Series 3 from a Series 4, view the carburetor from the throttle end. The Series 3 has (1) screw securing the throttle plate and the Series 4 uses (2) screws. (diag. 13 - 15)

DIAPHRAGM CARBURETORS

The diaphragm carburetors are unique. These carburetors can be operated at a more severe angle than float style carburetors. They still require that the fuel supply be located in a position that allows it to be gravity fed. Its most distinctive feature is the lack of a fuel bowl. (diag. 16).

NOTE: Emissionized carburetors will have a fixed jet.
SERIES 6 CARBURETORS 4-CYCLE

Series 6 carburetors are used on 2 and 4-cycle engines. They have a larger venturi than the dual system carburetor and use a simple fixed idle system. Series 6 carburetors used on both vertical and horizontal applications are nonadjustable. The 4 cycle version pictured has a stepped primer bulb. (diag. 17).

SERIES 8

The Series 8 carburetor has both a fixed main and idle circuit. The fixed idle system uses a restricted jet that meters the fuel. The idle restrictor jet will be capped to prevent access unless removed. The fixed main jet is part of the bowl nut. A ball plug is visible from the bottom, which seals the metering passage. This carburetor also has a serviceable main nozzle emulsion tube. It also has a stepped primer bulb to assist in starting. (diag. 18)

SERIES 9

The Series 9 carburetor uses the same body as the Series 8 but has a simple fixed idle system, identical to the one used on the Series 6 carburetor. It has the idle discharge port located at the 7 o’clock position on the throttle end of the carburetor. Identify this carburetor by the stepped primer bulb, the presence of a non-drilled idle mixing well and a serviceable main nozzle emulsion tube. (diag. 19)

SERIES 10 (EMISSION)

The Series 10 carburetor is identical to the Series 8 carburetor with the addition of a choke to assist in cold weather starts. It also has a fixed idle and main. The idle restrictor jet will be capped to prevent access unless the cap is removed. The fixed main jet is part of the bowl nut. A ball plug is visible from the bottom, which seals the metering passage. This carburetor also has a serviceable main nozzle emulsion tube and a stepped primer bulb to assist in starting. (diag. 20)

NON-TECUMSEH CARBURETORS

DELLORTO CARBURETOR

The Dellorto carburetor is similar to the dual system carburetor. It has no adjustments and has a primer assist start. It has a noncorrosive float and the needle is viton tipped, eliminating the viton seat found in the dual system carburetor. The angle of the fuel inlet is adjustable and attached to the carburetor body with a banjo bolt. This carburetor is used on some TVS rotary lawnmower engines.
ENGINE
TROUBLESHOOTING

**Engine Will Not Start**

Check For Spark

**Check If Spark Plug Is Wet or Dry**

Wet

- Defective Spark Plug
- Restricted Air Filter
- Improper or Stale Fuel
- Sheared or Partially Sheared Flywheel Key
- Carburetion Problems Due to Flooding, Over Priming, etc.
- Ignition System

Dry

- Check Fuel Supply and Fuel Cap Vent
- Restriction in Fuel System (filter, screen)
- Carburetion Problem
- Poor Compression
# CARBURETION TROUBLESHOOTING

## AIR SYSTEM PROBLEMS

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<th>AIR SYSTEM PROBLEMS</th>
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<td>Leaky Carburetor Gasket</td>
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<td>Throttle or Choke Shafts Worn</td>
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<td>Choke Not Functioning Properly</td>
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<td>Plugged Atmospheric Vent</td>
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<tr>
<td>Air Bleed Restricted</td>
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<tr>
<td>Damaged or Leaky &quot;O&quot; Rings</td>
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## DIAPHRAGM SYSTEM PROBLEM

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## FUEL SYSTEM PROBLEM

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<td>Plugged Tank Filter or Vent</td>
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<td>Fuel Pick-up Restricted</td>
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<td>Idle Port Restricted</td>
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<td>Incorrect Float Height</td>
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<td>Main Nozzle Restricted</td>
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<td>Dirty, Stuck Needle and Seat</td>
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<tr>
<td>Fuel Inlet Plugged</td>
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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 the spark plug. Install a commercially available spark plug tester and check for spark. If spark is evident and acceptable, proceed to step 2. If no or weak spark, see Chapter 8 under “Testing”.

2. Visually inspect the spark plug for a wet condition indicating the presence of gasoline 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 # 7. Check to see if the fuel cap vent is open. With a proper draining receptacle, remove the fuel line clamp on the carburetor fuel inlet and pull the fuel line off the fitting to examine the fuel flow and fuel condition.

4. Remove the air cleaner element or air cleaner assembly to visually check that the choke shutter completely closes or check to see if fuel comes out from the main nozzle during priming.

5. If the fuel flow is adequate and no fuel is evident during priming, the carburetor will need to be removed for service. See “Service” in this chapter or consult the “Carburetion Troubleshooting” chart if other problems exist. Improper fuel flow indicates the fuel, fuel line, filter or tank require cleaning or replacement.

6. Check the engine compression using a commercially available compression tester and follow the tester’s recommended procedure. Low compression, a dry spark plug, adequate fuel flow, and a known good functional carburetor indicates an internal engine problem exists. See Chapter 9 under “Engine Operation Problems.”

7. A wet spark plug indicates fuel is being supplied by the carburetor. The engine may be flooded by a restricted air filter, carbon shorted or defective spark plug, excessive choking or over priming, improperly adjusted or defective carburetor, or the wrong ignition timing. With the spark plug removed and a shop towel over the spark plug hole, turn the engine over slowly 3 or 4 times to remove excess gasoline from the engine cylinder.

CAUTION: KEEP ALL COMBUSTIVE SOURCES AWAY. AVOID THE SPRAY FROM THE SPARK PLUG HOLE WHEN CRANKING THE ENGINE OVER.

8. Replace the air filter if restricted or oil soaked. Replace the spark plug if questionable. Install the spark plug and high tension lead and retry starting the engine.

9. If the engine floods and fails to start, the carburetor may require service. See the preceding “Carburetion Troubleshooting” chart for additional causes. If the carburetor is functioning properly the problem may be ignition timing related. See Chapter 8 under “Ignition Troubleshooting.”

SERVICE

CARBURET TOR PRE-SETS AND ADJUSTMENT

NOTE: EMISSION GRADE CARBURETORS HAVE FIXED IDLE AND MAIN JETS. THE ABSENCE OF THE ADJUSTING SCREW INDICATES A FIXED JET OR RESTRICTOR AND NO ADJUSTMENT IS NECESSARY. THE IDLE RESTRICTOR ON THE SERIES 8 CARBURETOR APPEARS AS AN ADJUSTABLE SCREW. THIS IS NOT ADJUSTABLE AND MUST REMAIN TIGHT FOR PROPER OPERATION.

Before adjusting any mixture screws the necessary carburetor presets should be made. Check for the proper governor adjustments as outlined in Chapter 4. Identify the correct carburetor model and manufacturer to find locations of the high and low speed adjustment screws. Check the throttle control bracket for proper adjustment allowing a full choke shutter position. See Chapter 4 under “Speed Controls and Linkage”. Check to see if the normal maintenance procedures have been performed (oil changed, fresh fuel, air filter replaced or clean). Consult microfiche card #30 to find the correct R.P.M. settings for the engine, or consult Service Bulletin #107 for the revised safety specification for rotary type power lawn mowers. Start the engine and allow it to warm to operating temperature. The carburetor can now be adjusted.
PRE-SETS AND ADJUSTMENTS
(TECUMSEH AND WALBRO CARBURETORS)

NOTE: OVERTIGHTENING WILL DAMAGE THE TAPER PORTION OF THE NEEDLE. All adjustments should be made with the carburetor in the operating position.

Turn both the main and idle mixture adjusting screws in (clockwise) until finger tight.

Now back the mixture screws out (counterclockwise) to obtain the pre-set figure in the chart shown at right.

FINAL ADJUSTMENTS (NON EMISSION ENGINES)

Start the engine and allow it to warm up to normal operating temperature (3 - 5 minutes). Set the speed control to the HIGH or FAST position. From the recommended preset position, turn the main mixture adjustment screw in (clockwise) slowly until the engine begins to run erratic (lean). Note the position of the screw. Now, turn the screw out (counterclockwise) until the engine begins to run erratic (rich). Turn the screw in (clockwise) midway between these two positions. This will be the best setting. (diag. 21, 22 & 23).

Set the speed control to the IDLE or SLOW position. Adjust the idle mixture screw following the same procedure used to adjust the main mixture adjustment screw.

If further adjustment is required, the main adjustment should be made under a loaded condition.

If the engine stops or hesitates while engaging the load (lean), turn the main mixture adjusting screw out (counterclockwise) 1/8 turn at a time, testing each setting with the equipment under load, until this condition is corrected.

If the engine smokes excessively (rich), turn the main adjusting screw in (clockwise) 1/8 turn at a time, testing each setting with the equipment under load, until this condition is corrected.

After the main mixture screw is set, move the speed control to the IDLE or SLOW position. If the engine does not idle smoothly, turn the idle mixture screw 1/8 turn either in (clockwise) or out (counterclockwise) until engine idles smoothly.

Recheck the high and low R.P.M. setting and adjust as necessary.

NON-ADJUSTABLE CARBURETORS
DISASSEMBLY PROCEDURE

NOTE: Engines which are identified as compliant with CARB (California Air Resources Board) or EPA (US Environmental Protection Agency) regulations can NOT be changed from the factory unless specifically authorized.

FLOAT STYLE CARBURETORS

1. Note or mark the high and low mixture adjusting screws to aid in reassembly (if applicable). Remove the high speed adjusting screw, bowl nut, and float bowl. Remove the idle mixture screw assembly.

2. Note the position of the spring clip on the inlet needle and float, the long end of the clip must face toward the choke end of the carburetor. Remove the float hinge pin with a needlenose pliers. Some carburetors use a float dampening spring to aid the inlet valve in maintaining a steady position during rough service applications. Note the position of the hooks before removing the float hinge pin (diag. 28).

3. Remove the float, clip, and inlet needle.

4. Remove the inlet needle seat using a #4 crochet hook, a wire or paper clip with a 3/32" (2.38 mm) hook end as shown. Push the hook through the hole in the center of the seat to remove it. (diag. 29).

5. Note or mark the action of the choke and throttle shutters, and/or the hook points of the choke or throttle return spring, or seal retainer springs located on the top of the choke and/or throttle shaft. Remove the throttle shutter, throttle shaft, choke shutter, springs and choke shaft by removing the screw(s) that attach the throttle or choke shutter to the shaft inside the air horn.

6. Remove the primer bulb (if equipped) by grasping it with a pliers and pulling and twisting out of the body. Remove the retainer by prying and lifting it out with a screwdriver. Do not re-use the old bulb or retainer (diag. 30).

7. Some Tecumseh float style carburetors have a damper spring which is installed as shown. (diag. 31)
8. Remove all welch plugs if cleaning the carburetor. Secure the carburetor in a vise equipped with protective jaws. Use a small chisel sharpened to a 1/8" (3.175 mm) wide wedge point. Drive the chisel into the plug to pierce the metal, then push down on the chisel to pry the plug out of the hole (diag. 32).

**NOTE:** DO NOT REMOVE ANY BALL OR CUP PLUGS (diag. 33).

9. Note the direction of the inlet fitting. If necessary the inlet fitting can be removed. (See page 24).

10. The main nozzle on Series 8 and Series 9 carburetors can be removed by pressing the tube outward from the venturi thru the center leg. This nozzle is non-metallic and has an "O" ring seal on the top and bottom end of the tube. Do not remove a main nozzle that is made of brass from any Tecumseh carburetor. These are pressed in at the factory to a specific depth. When removing the nozzle, the top "O" ring may not come out with the tube. The "O" ring must be removed and placed on the nozzle before it is placed back into the center leg or it will not seal properly. (diag. 34)

The main nozzle on some Walbro carburetors are removable for service. If you remove it, a service nozzle with the under cut fuel passage must be installed or problems will occur (diag. 35).
Diaphragm Carburetors

1. Remove the screws holding the diaphragm cover on.
2. Remove the cover, gaskets, and diaphragm noting or marking the sequence or location to aid in reassembly.

NOTE: If a "F" designation on the choke end of the carburetor is present, place the diaphragm on first, then the gasket and cover. If no "F" is present, the gasket goes first.

3. Note or mark the high and low mixture adjustment screws. Remove the screw assemblies.
4. Note or mark the action of the choke and throttle shutters and the hook points of the choke or throttle return spring or seal retainer springs located on the top of the choke or throttle shaft. Remove the throttle shutter, throttle shaft, choke shutter, springs and choke shaft by removing the screw or screws that attach the throttle or choke shutter to the shaft inside the air horn.

5. Use a 9/32" (7.144 mm) thin wall socket to unscrew and remove the inlet needle and seat assembly (diag. 36).

6. Note and mark the direction of the inlet fitting. If necessary the inlet fitting can be removed by pulling with a pliers or vise. Some diaphragm carburetors have a strainer as an integral part of the fuel fitting. If the strainer is lacquered or cannot be cleaned, the fitting must be replaced.

7. Remove all welch plugs if cleaning the carburetor. Secure the carburetor in a vise equipped with protective jaws. Use a small chisel sharpened to a 1/8" (3.175 mm) wide wedge point. Drive the chisel into the plug to pierce the metal, then push down on the chisel to pry the plug out of the hole.

NOTE: DO NOT REMOVE ANY BALL OR CUP PLUGS.

IMPULSE FUEL PUMP

To service, disassemble the pump by removing the four (4) screws. Clean all parts with a solvent and install a new kit which consists of a coil spring, gaskets and diaphragms (diag. 37 & 38).

FLOAT ADJUSTING PROCEDURE

All Tecumseh carburetors with an adjustable float require the correct float height to achieve the proper operation and easy engine starts. To check the float height, hold the carburetor in an upside down position. Remove the bowl nut, float bowl, and "O" ring. Place an 11/64" (4.36 mm) diameter drill bit across the top of the carburetor casting on the opposite side and parallel to the float hinge pin (diag. 39). The float must just touch the drill bit when the bit is flush with the edge of the float. If the float is too high or too low, adjust the height by bending the tab accordingly. If the required adjustment is minor, the tab adjustment may be made without removing the float and carefully inserting a small bladed screwdriver to bend the tab.

Float sticking can occur due to deposits or when the fuel tank is filled for the first time, this condition can be quickly corrected by loosening the carburetor bowl nut one full turn. Turn the bowl 1/4 turn in either direction, then return the bowl to its original position and tighten the bowl nut.
INSPECTION

After careful disassembly of the carburetor and the removal of all non-metallic parts, the carburetor body and all other metallic parts should be cleaned with solvent, or commercial carburetor cleaner, no longer than 30 minutes. Use compressed air and soft tag wire to clean internal carburetor passages. To do a proper cleaning job, the welch plugs must be removed to expose the drilled passages.

NOTE: The nylon check balls used in some diaphragm carburetors are not serviceable. Nylon can be damaged if subjected to harsh cleaners for prolonged periods.

Throttle and Choke

Examine the throttle lever and shaft, choke lever and shaft, and carburetor body at the bearing points and holes into which the linkage is fastened, and replace if worn or damaged. Any looseness in these areas can cause dirt to enter the engine and cause premature wear. If dust seals are present, these should be positioned next to the carburetor body.

Idle and High Speed Mixture Adjusting Screw

Examine the idle mixture needle tip and tapered surface for damage. The tip and tapered surface of the needle must not show any wear or damage at all. If either is worn or damaged, replace the adjusting needle. Tension is maintained on the screw with a coil spring. Examine and replace the “O” ring seal if damaged (diag. 40).

Examine the tapered surface of the high speed mixture needle. If the tapered surface is damaged or shows wear, replace the needle (non-emissioned). Some Tecumseh carburetors use serviceable jet main nozzles. These are identified as being non-metallic.

Fuel Bowl Retaining Nut

The retaining nut contains the transfer passage or metering jet through which fuel is delivered to the high speed and idle circuit of the carburetor. If a problem occurs with the idle circuit, examine the small fuel passage in the annular groove in the retaining (metering) nut. This passage must be clean for the proper transfer of fuel into the idle metering circuit. Torque retaining nut to 50 in. lbs. (5.65 Nm) when reinstalling.

There are two different types of bowl nuts that are used on adjustable main, float style carburetors. One type has one fuel metering port at the bottom of the nut, and the other has two fuel inlet ports at the bottom of the nut. This difference relates to calibration changes to the carburetor and is dependent on the application (diag. 41).

NOTE: DO NOT INTERCHANGE BOWL NUTS.

The fuel inlet ports must be free of any debris to allow proper fuel flow.

Fuel Bowl, Float, Needle and Seat

The float bowl must be free of dirt and corrosion. Clean with solvent or carburetor cleaner.

Examine the float for damage. Check the float hinge bearing surfaces for wear, as well as the tab that contacts the inlet needle. Replace any damaged or worn parts.

The needle and seat should be replaced if any fuel delivery problems are experienced (flooding or starvation). Sealing problems with the inlet needle seat may not be visible, so replacement is recommended.

Diaphragms, Pulse Pumps, and Primer Bulbs

Inspect diaphragms, gaskets, and primer bulbs for cracks, tears, hardness or brittleness. Replace if necessary.
ASSEMBLY

Welch Plugs

To install a new welch plug after cleaning the carburetor, secure the carburetor in a vise equipped with protective jaws. Place the welch plug into the receptacle with the raised portion up. With a punch equal to, or greater than the size of the plug, merely flatten the plug. Do not dent or drive the center of the plug below the top surface of the carburetor. After installation of the welch plug, seal the outer diameter with finger nail polish or equivalent (diag. 42).

Throttle Shaft and Plate

When reassembling, it is important that the lines or lettering on the throttle plate are facing out when in the closed position. Position throttle plate with two lines at 12 and 3 o’clock. If the throttle plate has only one line, the line should be positioned in the 12 o’clock position on Series 1, 6, 8, and 9 carburetors, and positioned in the 3 o’clock position on Series 3 and 4 carburetors (diag. 43 & 44).

Test the operation of the throttle and return spring (if equipped). If binding occurs, correct by loosening screws and repositioning throttle plate.

Always use a new screw(s) when reinstalling the throttle shutter (Tecumseh screws are treated with dry-type adhesive to secure them in place).

NOTE: NEVER REUSE OLD SCREWS.

Choke Shaft and Plate

The choke plate is inserted into the air horn of the carburetor in such a position that the flat surface of the choke is down. Choke plates will operate in either direction. Make sure it is assembled properly for the engine. Test the operation of the choke and return spring function if equipped (diag. 45).

Always use a new screw(s) when reinstalling the choke shutter as the screws are treated with dry-type adhesive to secure them in place.

NOTE: NEVER REUSE OLD SCREWS.

The choke shaft and plate must be in the closed position prior to tightening the screws. Hard starting may be due to insufficient choking action because of a misaligned choke plate. Correct by readjusting the choke plate to close completely. Note the cut-out position of choke shutter if applicable.

Fuel Inlet Fitting

Support the carburetor body with a wood block to avoid damage to other parts. Use a bench vise or press to install the fitting squarely. Insert the tip into the carburetor body, coat the exposed portion of the shank with Loctite grade A, then press it in until the shoulder contacts the carburetor body.
High and Low Speed Adjusting Screw, Main Nozzle

When reassembling, position the coil spring on the adjusting screws, followed by the small brass washer and the “O” ring seal. Turn the high speed adjustment screw in approximately one turn into the bowl retainer nut to make an assembly (diag. 47).

On 2-7 hp. engines that use carburetors which have the metering rod in the idle circuit (carburetor should rattle when shaking), make certain that the idle adjustment screw is installed when the carburetor is in an upright position or the needle will damage the metering rod, adjustment screw and carburetor casting.

Some carburetors are of the fixed main type and would not have a high speed adjusting screw.

Inlet Needle and Seat

On float type carburetors, make sure the seat cavity is clean. Moisten the seat with oil and insert the seat with the grooved side down and away from the inlet needle. Press the seat into the cavity using a flat punch close to the diameter of the seat, making sure it is firmly seated (diag. 48).

The inlet needle hooks onto the float tab by means of a spring clip. To prevent binding, the long, straight end of the clip should face the air intake end of the carburetor as shown (diag. 49).

On diaphragm carburetors the inlet needle and seat assembly are installed by using a socket to tighten the assembly until seated.

Needle and Seat Pop-Off Test

To test the pop-off pressure, remove the carburetor from the engine. Be sure to drain any fuel into an approved container. Invert the carburetor and remove the float bowl. Place a drop of an oil based product such as WD-40 on the tip of the needle valve. Using a commercially available 0-30 psi pump and gauge, attach the pumps hose to the carburetor inlet. Apply approximately 6 psi or until the needle pops off the seat. The needle should seat at 1.5 psi or greater for a minimum of 5 minutes. If the minimum 1.5 psi cannot be maintained for this period of time, then service to the needle and seat is required.

Float Installation

Reinstall the inlet needle and float into the carburetor. The long end of the spring or clip on the inlet needle must point toward the air intake end of the carburetor. If a float dampening spring is used, reassemble using the following steps (diag. 50).

1. Place the float upside down.

2. Position the spring on the float with the long end around and to the back side of the float’s center back tang. The ends must point toward the choke end of the carburetor. Hook the inlet needle clip on the inside float tang so the clip end points to the choke end of the carburetor (diag. 50).

3. Place the float, float spring, clip and inlet needle in position between the hinge legs of the carburetor. As the float assembly nears the hinge legs, wind the outside end of the spring so it goes to the outside of the leg (counterclockwise looking from the choke end).
4. Install the hinge pin from the opposite hinge leg. The bowl gasket must be positioned over the end of the spring (diag. 51).

5. Set the proper float height. See “Float Adjusting Procedure” in this chapter.

Diaphragm Assembly

The rivet head on the diaphragm must always face toward the inlet needle valve. On carburetors with an “F” cast into the carburetor flange as illustrated, the diaphragm goes next to the carburetor body. Other diaphragm carburetors have the gasket located between the diaphragm and carburetor body. Install the cover retaining screws and tighten (diag. 52).

Fuel Bowl And Bowl Nut

Whenever a carburetor bowl is removed for service, the fuel bowl “O” ring must be replaced. For easier installation, lubricate the “O” ring with a small amount oil.

Install the float bowl by placing the detent portion opposite of the hinge pin. Make sure the deepest end of the bowl is opposite of the inlet needle. The bowl has a small dimple located in the deepest part. The purpose of this dimple is to minimize the chances of the float sticking to the bottom of the bowl caused by stale fuel (diag. 53).

On some fixed jet (non-adjustable) and adjustable carburetors, a fibered washer is required between the carburetor bowl and the bowl retaining nut.

Occasionally, on engines equipped with the dual system carburetor, some rich starting conditions have occurred when the engine is warm. This condition can be corrected by inserting a non-metallic spacer in the center leg of the carburetor, as shown (part # 632158). This spacer is designed to reduce the amount of prime charge in the main nozzle area for better starting under warm engine conditions. It can only be used on Dual System carburetors and does not lean out the carburetor mixture. (diag. 54) This spacer must be reinstalled if originally equipped in the carburetor.

Impulse Fuel Pump

The diaphragms must be installed against the center body with the gaskets against the outside covers. The parts are designed so they cannot be misassembled without damage (diag. 54).

To test the unit, assemble the carburetor to the engine, leaving the fuel line from the pump off. Use a different fuel tank remotely placed above the carburetor to provide gravity fuel flow to the carburetor inlet to run the engine while testing the pump. Make sure fuel is available in both fuel tanks and that the original fuel tank’s fuel line is connected to the fuel pump inlet. Place the pump outlet line in a proper draining receptacle. With the pulse line connected from the engine crankcase to the pump and the engine running, a definite fuel flow should result at the pump outlet.

If the flow is erratic or intermittent, the pump needs repair or replacement.
Inlet Fuel Fitting

To remove a leaking or damaged fuel inlet fitting, use a 1/4" (6 mm) bolt, 1/4" (6 mm) nut and 1/4" (6 mm) washer, along with a 1/2" (12 mm) nut. Use a pliers or vise to remove the plastic part of the inlet fitting. Tap the inside of the remaining metal portion of the fitting using a 1/4"-20 (6 mm) tap. Place a 1/2" (12 mm) nut over the fuel fitting (it may be necessary to guide one side of the nut to seat it squarely to the carburetor). Next thread the 1/4" (6 mm) nut on the bolt until it contacts the shank, add the washer, and thread the bolt into the fitting until snug. Tighten the 1/4"-20 (6 mm) nut until the fitting is removed. (diag. 56)

Final Checks

Before reinstalling a newly overhauled carburetor, pre-set the main mixture adjustment screw, the idle mixture adjustment screw and the idle speed adjustment screw. See “Pre-sets and Adjustments” in this chapter.

STANDARD SERVICE CARBURETORS

Tecumseh supplies some replacement carburetors on which parts from the old carburetors can be reused or new parts added. This Standard Service Carburetor helps to reduce dealer inventories.

Standard Service Carburetors are built in both float and diaphragm versions.

The parts from the original carburetor that are necessary to make a standard service carburetor are: choke shaft, shutter and spring, throttle lever and spring, fuel fitting, idle adjustment screw and spring. If any or all of these old parts are worn or damaged, replace each part with a new service part to assure proper function and prevent engine damage. Use the diagrams on the next page as a guide to facilitate the correct installation of parts (diag. 57 & 58).

Fuel Fitting

NOTE: MOST SERVICE CARBURETORS ARE MARKED “SVC CARB NF” IN THE PRICE LIST. THIS MEANS THAT THE CARBURETOR COMES WITH NO FUEL FITTING.

Use the parts manual to obtain the same fuel inlet fitting that was installed in the original carburetor. Install the fuel fitting in the new carburetor body in the same position as on the original carburetor. Support the carburetor body with a wood block to avoid damage to other parts. Use a bench vise or press to install the fitting squarely. Press it in until it bottoms out.

NOTE: PRESS FUEL FITTING IN SQUARELY USING CAUTION SO THAT THE CARBURETOR BODY IS NOT DAMAGED.

Inlet Fuel Fitting

To remove a leaking or damaged fuel inlet fitting, use a 1/4"(6 mm) bolt, 1/4" (6 mm) nut and 1/4" (6 mm) washer, along with a 1/2" (12 mm) nut. Use a pliers or vise to remove the plastic part of the inlet fitting. Tap the inside of the remaining metal portion of the fitting using a 1/4"-20 (6 mm) tap. Place a 1/2" (12 mm) nut over the fuel fitting (it may be necessary to guide one side of the nut to seat it squarely to the carburetor). Next thread the 1/4" (6 mm) nut on the bolt until it contacts the shank, add the washer, and thread the bolt into the fitting until snug. Tighten the 1/4"-20 (6 mm) nut until the fitting is removed. (diag. 56)

Choke Shaft

NOTE: Never reuse choke or throttle shutter screws, always replace with new Tecumseh service screws.

Remove the choke shutter screw from the original carburetor and remove the choke shaft. Observe the position of the ends of the choke return spring if one is present. Also observe the position of the cut-out and/or holes in choke shutter. Some chokes turn clockwise and some turn counterclockwise, note the position of the choke shaft prior to removal from the old carburetor.

If a choke stop spring is present on the new carburetor and is not used on the old carburetor, cut it off with a side cutter or pull it out using a pliers.

Test the action of choke shaft to make sure it moves freely and easily and does not bind in either open or closed position. If binding occurs, loosen the shutter screw; reposition the shutter and tighten the screw.
Throttle Lever

Remove the throttle lever and spring and file off the peened end of the throttle shaft until the lever can be removed. Install the throttle spring and lever on the new carburetor with the self-tapping screw furnished. If dust seals are furnished, install them under the return spring.

Idle Speed Adjustment Screw

Remove the screw assembly from the original carburetor and install it in the new carburetor. Turn it in until it contacts the throttle lever. Then an additional 1-1/2 turns for a static setting.

Final Checks

Consult the service section under “Pre-sets and Adjustments” and follow the adjustment procedures before placing the carburetor on the engine.
CHAPTER 4 GOVERNORS AND LINKAGE

GENERAL INFORMATION

This chapter includes governor assembly and linkage illustrations to aid in governor or speed control assembly.

Tecumseh 4 cycle engines are equipped with mechanical type governors. The governor's function is to maintain a constant R.P.M. setting when engine loads are added or taken away. Mechanical type governors are driven off the engine's camshaft gear. Changes in engine R.P.M. cause the governor to move the solid link that is connected from the governor lever to the throttle in the carburetor. The throttle is opened when the engine R.P.M. drops and closes as the engine load is removed.

OPERATION

As the speed of the engine increases, the governor weights (on the governor gear) move outward by centrifugal force. The shape of the governor weights force the governor spool to lift. The governor rod maintains contact with the governor spool due to the governor spring tension. As the spool rises, the governor rod rotates, causing the attached outer governor lever to pull the solid link and close the throttle opening. When the engine speed decreases, the lower centrifugal force allows the governor weights to be pulled in by the governor spring. As the spool lowers, the governor rod rotates and the solid link pushes the throttle to a more open position (diag. 1).

INTERNAL COMPONENTS (VARIOUS STYLES)

TROUBLESHOOTING

Engine problems where the governor is suspected to be the cause, may actually be the result of other engine system problems. Hunting (engine R.P.M. surging up and down) indicates that the engine is incapable of maintaining a constant R.P.M. with or without an engine load. Engine overspeeding (either with or without throttle movement) must be corrected immediately before serious engine damage occurs. Use the following procedure to diagnose a suspected governor problems.
ENGINE OVERSPEEDING

1. If the engine runs wide open (faster than normal), shut the engine off immediately.
2. Check the condition of the external governor shaft, linkage, governor spring, and speed control assembly for breakage, stretching or binding. Correct or replace binding or damaged parts.
3. Follow the governor adjustment procedure and reset the governor - see "Service" in this chapter.
4. Run the engine. Be ready to shut the engine off if an overspeed problem still exists. If the problem persists, the engine will require disassembly to inspect the governor gear assembly for damage, binding, or wear.
5. See Chapter 9 under "Disassembly Procedure" to disassemble the engine.
6. Remove the governor gear assembly. Repair or replace as necessary.

ENGINE SURGING

1. Try to stabilize the engine R.P.M. by holding steady the solid link between the governor arm and the carburetor throttle, using a pliers or fingers.
2. If the engine R.P.M. stabilizes, the governor or governor adjustment should be checked. See "Service" governor adjustment procedure in this chapter. If the engine R.P.M. does not stabilize, the engine will require additional checks, see Chapter 9 under "Troubleshooting".
3. If the problem persists after the governor adjustment, check the engine R.P.M. found on microfiche card # 30. The R.P.M. settings are critical. If the R.P.M. setting for high and low speed are within specification and a slight surge is experienced, increasing the engine idle R.P.M. setting slightly may eliminate this condition.
4. Check the governor shaft or linkages for binding, wear, or improper hookup. Check the governor spring for adequate tension. Repair or replace as necessary.

SERVICE

GOVERNOR ADJUSTMENT

With the engine stopped, loosen the screw holding the governor clamp on the governor lever. Rotate the clamp in a direction that will force the throttle shaft open and allow the governor follower arm to rest on the governor spool. Push the governor lever connected to the throttle to the wide open throttle position. Hold the lever and clamp in this position while tightening the screw (diag. 7).

GOVERNOR ADJUSTMENT PROCEDURE FOR SHORT BLOCK INSTALLATIONS

Short block installation on 3-5 h.p. vertical shaft engines built prior to 1977 may require the governor clamp (tinnerman style) to be repositioned to work properly. The clamp must be removed from the governor rod and turned to the same position as the original engine. Hook the solid link and spring to the governor lever and position the clamp on the governor rod. Follow the above governor adjustment procedure to complete the short block governor set-up. Units built after 1977 use the normal governor set up procedure. (diag. 8)
GOVERNOR GEAR AND SHAFT SERVICE

After the cylinder cover is removed from the engine, the governor spool, gear, or governor shaft can be removed. On older style governor assemblies, the retaining ring must be removed to allow the spool or gear to slide off the shaft. Newer style governor shafts (3 - 6.75 model engines) use an upset to hold the governor spool on. If the gear requires replacement, the governor shaft will have to be removed.

Governor Spool Replacement With Upset Style Governor Shaft

The spool can be replaced without removing the governor shaft. Grip the original spool in a vise and use a twisting and pulling motion on the flange until the spool is free.

Install the new spool by starting it on the shaft and then turning the flange over. This will allow the weights to hang in the proper position. Place the spool on a solid surface and push on the flange until the spool seats. The governor weights must be in position under the spool after installation. (diag. 9)

Governor Gear or Shaft Replacement, Upset Style Governor Shaft

1. Grip the original spool in a vise and use a twisting and pulling motion on the flange until the spool is free.

2. Clamp the shaft in a vise and pound gently on the flange with a wooden or plastic mallet to remove the shaft.

NOTE: DO NOT TWIST THE SHAFT WHEN REMOVING. THE SHAFT BOSS MAY BECOME ENLARGED, LEAVING THE NEW GOVERNOR SHAFT LOOSE AND CAUSING SEVERE DAMAGE.

3. To install a new shaft, first assemble the gear and washer on the shaft. Start the shaft into the hole with a few taps from a soft faced hammer.

4. Place the flange in a press with a solid piece supporting the area below the shaft boss. Press the shaft in until a shim, part # 670297 just becomes snug [.010 - .020 (.254 - .508 mm) clearance].

Governor Shaft Replacement, Retaining Ring Style

1. Remove the retaining ring, spool, gear assembly, and washers.

2. Clamp the shaft in a vise and pound gently on the flange with a wooden or plastic mallet to remove the shaft.

NOTE: DO NOT TWIST THE SHAFT WHEN REMOVING. THE SHAFT BOSS MAY BECOME ENLARGED AND THE NEW GOVERNOR SHAFT WILL BE LOOSE AND MOVE.

3. Start the new shaft into the shaft boss by tapping with a soft faced hammer.

4. Refer to the chart at right for the proper shaft exposed length. Add a drop of red Loctite 271 and press the governor shaft to the proper depth using a press or a vise. Wipe the extra Loctite off after installation (diag. 11).

5. Reassemble the governor and install the retaining ring.

<table>
<thead>
<tr>
<th>ENGINE MODEL</th>
<th>EXPOSED SHAFT LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECH90, ECV100, H 30, 35, HS 40, 50, HAV 35, LEV (all), OHM (all), OVRM (all), TNT 100, 120, TVS (all)</td>
<td>Mounting flange to Top 1.319 - 1.334&quot; (33.502 - 33.883 mm)</td>
</tr>
<tr>
<td>TVM (all), V 50, 60, 70, VH 50, 60, 70</td>
<td>Mounting flange to Top 1.319 - 1.334&quot; (33.502 - 33.883 mm)</td>
</tr>
<tr>
<td>HH 100, 120, VH 100</td>
<td>Mounting flange to Top 1.016 - 1.036&quot; (25.806 - 26.314 mm)</td>
</tr>
<tr>
<td>H 50, 60, 70, HH 60, 70, HHM80, HM 70, 80, 100</td>
<td>Mounting flange to Shoulder 1.283 - 1.293&quot; (32.588 - 32.842 mm)</td>
</tr>
</tbody>
</table>
SPEED CONTROLS AND LINKAGE

Many different types of speed controls and linkage are used for O.E.M. applications. Linkage attachment points are best recorded or marked prior to disassembly. This assures the correct placement during reassembly. The solid link is always connected from the outermost hole in the governor lever to the throttle in the carburetor. The link with the governor spring attached is connected between the control lever and the lower hole in the governor lever. Horizontal engines use one location (non-adjustable) speed control brackets. Most vertical engines use an adjustable speed control bracket mounted above the carburetor. The ignition ground out switch, idle R.P.M. and high speed R.P.M. adjustment screws are located on the speed control bracket and some models use the idle R.P.M. adjustment on the carburetor.

Vertical shaft engines must have the speed control bracket aligned when installing. To align the control bracket, use the following steps.

1. Loosen the two screws on the top of the panel.
2. Move the control lever to full wide open throttle position and install a wire or aligning pin through the hole in the top of the panel, the hole in the choke actuating lever, and the hole in the choke (diag. 12).
3. With the components aligned, tighten the two screws on the control panel.

The following pages illustrate common linkage attachment. Whenever the carburetor or the governor linkage is removed or replaced, the engine R.P.M.’s should also be checked. Use microfiche card #30 or the computer parts look-up system for the correct R.P.M. settings for the engine model and specification.

SNAP IN "STYLE SPEED CONTROL"

This style of speed control is used on 3 - 6.75 model rotary mower engines and is adjusted by two bendable tabs. Use the speed adjustment tool (part # 670326) as illustrated in diag.13 to adjust engine speed.

To adjust high speed, move the speed control lever to the high speed position and align the high speed pin holes. Place the adjustment tool on the high speed tab and move the tab to achieve the correct engine speed. Move the speed control lever to the low speed position, place the adjustment tool on the low speed tab and bend to either increase or decrease to the correct speed.
ADJUSTING RPM ON MEDIUM FRAME VERTICAL SPEED CONTROL

This speed control is adjusted to the equipment throttle control by aligning the slot in the speed control lever with the alignment hole on the mounting bracket. Place a pin through the two holes, place the equipment throttle control to the wide open position, hook the bowden cable end in the control as shown, and tighten the cable housing clamp. In this position, the gap of .040" - .070" (1.016 - 1.778 mm) should exist at the gap location as illustrated. This will assure that the carburetor will go into full choke when the control is placed in the start position.

ADJUSTING GOVERNED/NON-GOVERNED

With the engine running at its lowest speed, set the governed idle at the designated RPM by adjusting the governed idle screw or bending the idle tab. Next set the non-governed idle by pushing the bottom of the governor lever away from the control brackets so the throttle lever contacts the idle speed crack screw (on the carburetor). Hold the lever in this position and turn the crack screw to 600 RPM below the governed idle speed. This setting prevents the throttle plate from closing off when going from high speed RPM to low speed RPM. If improperly adjusted, the engine could experience an over lean condition.

The idle speed is adjusted by turning the idle speed screw clockwise to increase engine R.P.M. and counter-clockwise to decrease R.P.M. Use tool part # 670326 to adjust the high speed engine R.P.M. Place the slotted end of the tool onto the adjustment tab and bend the tab to the left (toward the spark plug end) to increase engine R.P.M. (diag. 14).

NOTE: Some engines use nylon bushings on the throttle and choke linkage hook-up points to extend the life of the linkage and to enhance the stability of the governor system. Make sure they are in good condition and in place.

ADJUSTING RPM ON MEDIUM FRAME VERTICAL
(up/down speed control)

To adjust the high speed RPM on Medium Frame Vertical engines, move the control lever to the high speed pin position (align high speed pin holes in the speed control bracket). Place the slot on the straight end of tool (number 670326) onto the high speed adjustment tab as pictured. Rotate the bent end of the tool counterclockwise to increase RPM and clockwise to decrease RPM. (diag. 15).
HORIZONTAL SHAFT ENGINES (CONTINUED)

IDLE SPEED CRACK SCREW
IDLE MIXTURE SCREW
HIGH SPEED RPM ADJUSTMENT SCREW

HORIZONTAL MEDIUM FRAME 21

IDLE SPEED SCREW
IDLE MIXTURE SCREW
MAIN MIXTURE SCREW

HMSK80-100 22

IDLE SPEED CRACK SCREW

MEDIUM FRAME 23

BEND LOOP OPEN OR CLOSED TO ATTAIN OPERATING RPM'S
IDLE SPEED CRACK SCREW
MAIN MIXTURE SCREW

SNOW KING ENGINES 24

TO INCREASE SPEED - CLOSE LOOP TO DECREASE SPEED - SPREAD LOOP

SNOW KING ENGINES 25
VERTICAL SHAFT ENGINES

TVXL 220 WITH HORIZONTAL SPEED CONTROL

STANDARD TVM ENGINE WITHOUT GOVERNOR OVERRIDE

TNT 100 VERTICAL ENGINES

TVS 115 ENGINE WITH "SNAP IN" SPEED CONTROL

BEND ← TO INCREASE SPEED
BEND → TO DECREASE SPEED

HIGH SPEED ADJUSTMENT SCREW

IDLE SPEED CRACK SCREW

IDLE MIXTURE SCREW

VERTICAL SHAFT ENGINES

Main Menu
GOVERNOR OVERRIDE SYSTEM FOR TVM170, 195 AND 220 ENGINES

This system will be found starting on 1985 production models, and will not retrofit onto older engines. It is designed to allow the governor to regulate the low and high speeds of the engine. The high speed is adjusted at the top screw of the override lever; to increase R.P.M. turn the screw out (counterclockwise), to decrease R.P.M. turn the screw in (clockwise). The low speed is adjusted at the bottom screw of the override lever; to increase R.P.M. turn the screw in or clockwise, to decrease R.P.M. turn the screw out or counterclockwise (diag. 31).

GOVERNED / NON-GOVERNED IDLE

With the engine throttle set at its lowest speed, set the governed idle at the designated RPM by bending the idle RPM tab or adjusting a screw. Next set the non-governed idle by pushing the bottom of the governor lever away from the control brackets, so the throttle lever contacts the idle speed screw. Hold the lever in this position and turn the idle adjustment screw clockwise to increase or counterclockwise to decrease engine idle speed. The setting on the carburetor screw should be set 600 RPM below the governed idle setting. This setting prevents the throttle plate from closing when going from high speed RPM to low speed RPM. If improperly adjusted, the engine could experience an over lead condition.