

**TILLOTSON CARBURETOR  
SERVICE CHECK LIST, TESTS AND REPAIRS**

Some dealers currently experience difficulty in diagnosis of problems encountered in Tillotson carburetors used on 1966 and later Sportsters, and 1967 and later Electra Glides. Many return the carburetor and request credit under warranty where simple corrections could be made at the dealer level.

Effective January 1, 1968, motorcycle carburetors not exhibiting major defects will be repaired and returned at the dealer's expense. The purpose of this bulletin, then, is to aid the dealer in a step by step procedure for correction of minor faults.

**ADJUSTING CARBURETOR**

Before trying to correct carburetor performance by any disassembly of parts, it should first be established that the external adjustments are correct, since in many cases the intermediate and idle speed needles are incorrectly adjusted causing poor carburetion.

Correct adjustment can be determined in the shop and verified by road test according to the following procedure.

1. Seat both idle needle and intermediate needle gently and open both 7/8 turn.
2. Start engine and warm up for at least 3 minutes at fast idle.
3. Set engine throttle so engine runs at approximately 2000 RPM.
4. Without changing throttle setting, turn intermediate needle slowly in direction which produces highest engine speed (RPM). Engine should not miss or surge at this adjustment position.
5. Back off intermediate needle 1/8 turn to slightly richen mixture. This is the correct intermediate needle adjustment.
6. Readjust idle needle and idle speed stop screw to produce a smooth idle at desired idle speed (900 to 1100 RPM).

**NOTE**

Use of an electric tachometer is recommended.

**CHECK LIST**

The following check list should be used to locate carburetor defects. Each item is explained in detail later in this bulletin.

1. Check accelerator pump operation.

2. Blow out passages through high speed screw plug hole.
3. Tighten cover screws and pressure-test inlet valve.
4. Check intermediate adjustment spring, needle, and needle seating.
5. Test main nozzle ball check valve with tool.
6. Inspect idle needle and seat.
7. Inspect choke relief disc.
8. Inspect and clean discharge ports, diaphragms and gaskets, screens and passages. Diaphragm plate must not turn.
9. Check inlet lever setting — must be flush to 1/64 inch above floor of casting. Lever and needle must be the shackled type.
10. Test economizer ball check valve with tool.
11. Check assembly order — gasket next to body, then diaphragm, last cover.

**TESTS**

ALL TESTS SHOULD BE PERFORMED, IN THE SEQUENCE SHOWN BELOW, BEFORE FURTHER DISASSEMBLY OR REPAIRS ARE MADE.

**PRIOR TO REMOVAL OF CARBURETOR FROM ENGINE**

1. The accelerator pump should be inspected for proper operation first. Remove air cleaner, prime carburetor by inserting a toothpick through small hole in bottom of plastic pump cover and gently working diaphragm several times. Operate the throttle lever both rapidly and slowly several times, with the fuel valve turned on. The pump should deliver a strong and constant jet of fuel with each stroke. Failure to do so indicates diaphragm valves or pump plunger as being defective.

2. In cleaning of high, intermediate and low speed channels, the following procedure, most likely, will dislodge any loose dirt lodged in the passages.

Remove high speed screw plug located on rear side of carburetor, opposite intermediate adjustment

needle. Lightly seat intermediate needle and apply air hose pressure (90 pounds maximum) to screw plug hole. Open intermediate and idle needles three or four turns and again apply 90 pounds maximum air pressure. Reset both adjustment screws (see ADJUSTING CARBURETOR). Evaluate carburetor's performance by road testing.

3. Check inlet needle and seat for leakage, as follows:

See that all plastic cover screws are tight. Remove fuel and vent lines, install bulb tester, Part No. 94750-68, to carburetor fuel inlet fitting, plug vent fitting with finger and pressurize tester noting any leakage. A moistened needle and seat should hold 1 to 1-1/2 pounds approximately, and release at approximately 3 to 5 pounds. A dry needle and seat will not hold as well as a moist one. See Figure 1.

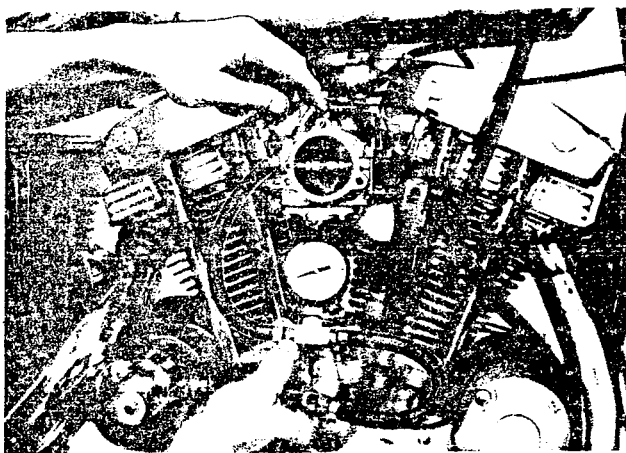


Figure 1. Checking inlet needle and seat for leakage

#### NOTE

This test can be used also on golf car pulse pump type carburetors to check inlet valve and/or fuel pump diaphragm for leakage. In this case holding pressure should be 5 to 7 pounds and release pressure 12 to 16 pounds.

#### REMOVE CARBURETOR BUT DO NOT DISASSEMBLE

4. Inspect intermediate adjustment needle and spring to see if spring coils are binding before needle seats. If needle does not seat grind a small amount of material from each end of spring. You can check to see if needle is seating by applying blue dye to needle taper and screwing down lightly into seat and noting mark on needle taper.

5. Check main nozzle ball check valve for leakage, as follows:

Seal one side of venturi with finger and apply alternate pressure and vacuum by mouth using grommet end of tool, Part No. 96960-68, seated in venturi as shown in Figure 2.

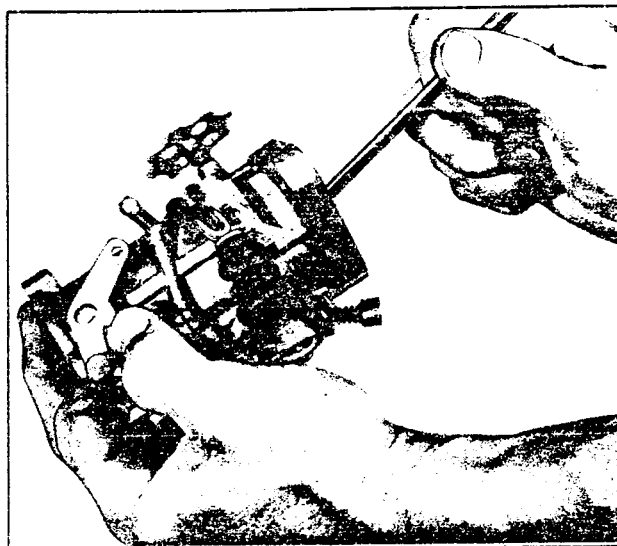


Figure 2. Checking main nozzle ball check valve for leakage

Vacuum should release ball, and pressure should seat ball in nozzle assembly.

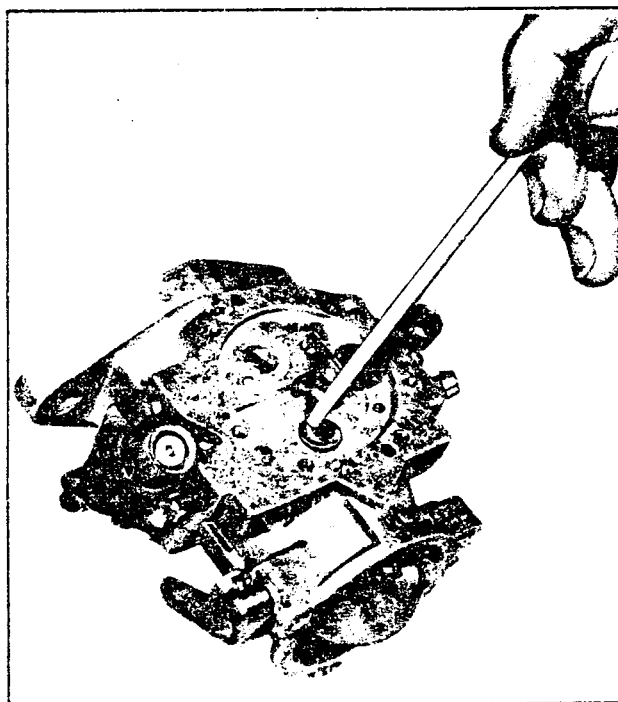


Figure 3. Removing main nozzle welch plug

If leakage is evident, carburetor must be disassembled and main nozzle check valve assembly replaced. To replace main nozzle, puncture welch plug with pointed tool, avoiding center, as shown in Figure 3. Remove nozzle welch plug and use stepped end of punch, Part No. 96962-68, on nozzle, tapping it through into venturi using plastic hammer. See Figure 4. Use larger end of tool to install the new check valve in the same manner. See Figure 5.

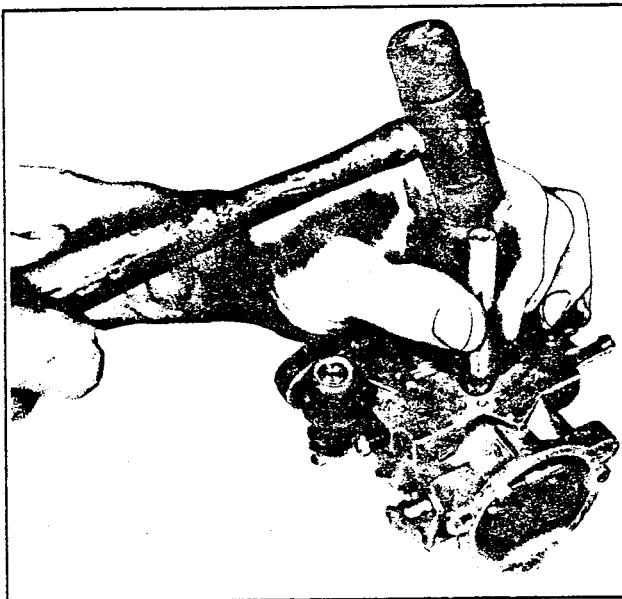


Figure 4. Removing main-nozzle

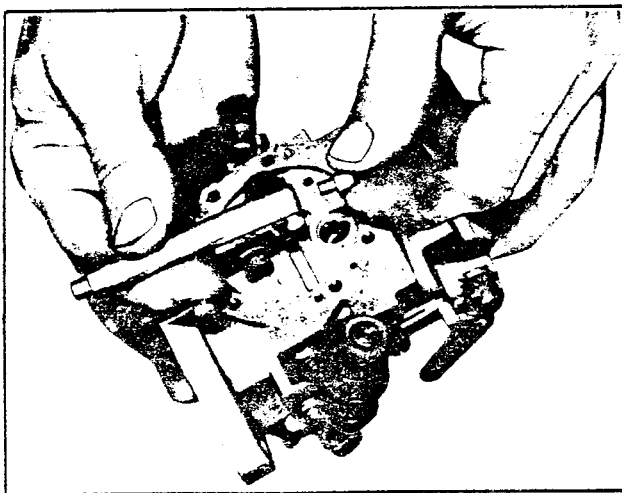


Figure 5. Installing main nozzle

6. Inspect idle needle and seat in carburetor bore for any distortion or a cracked casting.

7. Inspect choke relief disc (upper half of choke) for distortion or stress cracks at the area rotating on choke shaft.

#### DISASSEMBLY, INSPECTION AND REPLACEMENT OF PARTS

REPLACE DAMAGED PARTS ONLY AFTER COMPLETING ALL TESTS.

8. Remove plastic diaphragm cover. Inspect accelerator pump leather for fold-over or coil spring out of correct position.

Check accelerator pump outlet ball check valve to see that ball is free (Late 1968).

Inspect gasket and diaphragm for distortion or misplacement on carburetor body. Diaphragm must not be stretched or have a rippled appearance particu-

larly within the valley portion which should be uniform in shape. (Gasket should be assembled next to body.)

Lightly make attempt to rotate metal diaphragm washer, riveted to upper side of diaphragm. If diaphragm plate rotates freely with no drag, replace diaphragm assembly. Diaphragm plate should not be loose.

Prior to removal of the inlet lever the initial needle seat leakage test should be performed 10 to 12 times with the bulb tester, as follows: Close bulb valve. Apply pressure to the inlet, sealing the vent fitting. Open bulb valve and again apply pressure. This repetition checks the sealing of the needle in the seat insuring that it is not sticking open at lever pin or at groove in needle.

9. Inspect inlet needle lever for correct adjustment. It should be flush with surrounding floor of carburetor body. If not equipped with shackled needle, replace with kit No. 27588-66. Tighten seat to 45 in.-lbs. torque. See Figure 6.

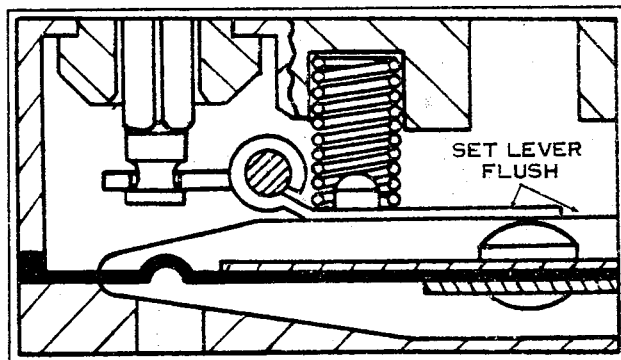


Figure 6

10. Test economizer ball check for leakage and correct operations as follows:

Using hose end of tool, Part No. 96960-68, place it over economizer welch plug hole so it seals off surrounding area. With alternate pressure and vacuum applied with mouth, as shown in Figure 7, ball check should release and seal. Replace any defective parts.

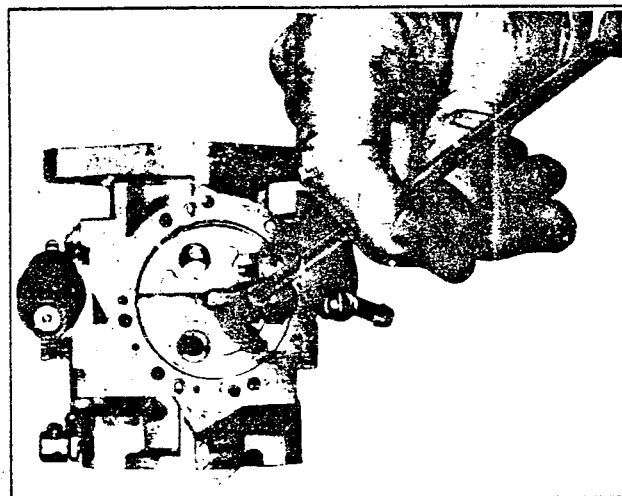


Figure 7. Checking economizer ball check valve for leakage

### CLEANING AND FINAL TEST

After plastic cover has been removed, remove welch plug at idle adjuster, all gaskets, diaphragms, needle and seat, and high speed nozzle before cleaning carburetor in a caustic carburetor cleaner, since the caustic cleaner will damage gasket material and the high speed nozzle plastic check ball. Only gaskets which are in perfect condition should be reused. The metal parts may also be cleaned in lacquer thinner with a small brush and blown dry.

Inspect by attempting to rotate, or move all welch plugs in body. A close inspection of wall area around welch plugs can disclose a leaking condition. Whenever a welch plug is removed, a new one should be reinstalled. If leakage is suspected due to rough or damaged welch plug seat in casting, apply a small amount of seal-all to edge of welch plug after installing it in recess.

After carburetor has been reassembled, recheck accelerator pump per item 1 under TESTS.

### SPECIAL TOOLS

1. Needle-seat bulb-type leakage tester, tool Part No. 94750-68.

2. High speed nozzle and economizer check valve tester, tool Part No. 96960-68.

3. Main nozzle punch, tool Part No. 96962-68.

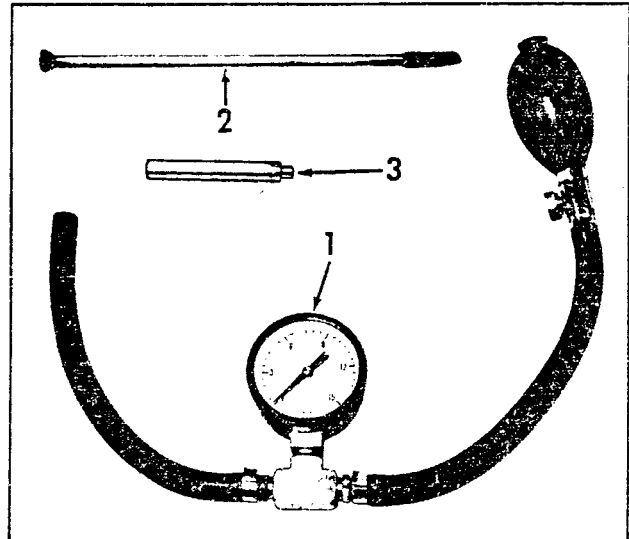


Figure 8. Carburetor service tools