ZENITH 63M AND 263M SERIES
MARINE CARBURETORS
OPERATION AND SERVICE

Figure 1

The Zenith 63M and 263M Series are updraft carburetors of the double venturi type, designed for marine application. The 63M Series incorporates the conventional idle discharge port, whereas the 263M Series employs the two-hole idle system.

Two rustproofed iron body castings are used, with brass parts. The fuel bowl hugs the center line of the carburetor and together with the duplex float makes it possible for these series to maintain proper metering of air and fuel to the engine, without flooding, when operated at extreme angles. They are “sealed” and “balanced” carburetors in that all air for bowl ventilation and idling must come through the flame arrestor. Two venturis are employed to aid in the complete vaporization of fuel. The power jet and accelerating pump systems operated by engine vacuum, are completely enclosed and protected from dirt.

MODEL IDENTIFICATION
Type—Single updraft.
Material—Body and bowl castings, cast iron—brass parts.
Styles—63M discharge port idle system.
263M two-hole idle system.

Letter Designation:
A—Throttle and choke shafts parallel.
E—Elbow air horn.
M2—Marine construction.
W—Vacuum operated accelerating pump and power jet valve.

<table>
<thead>
<tr>
<th>Size Designation</th>
<th>Nominal Size</th>
<th>Throttle Bore Diameter</th>
<th>Flange Size S.A.E. Std. C to C</th>
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<tbody>
<tr>
<td>10</td>
<td>1 3/4”</td>
<td>1.417”-1.51”</td>
<td>13/32”</td>
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<td>11</td>
<td>11/16”</td>
<td>1.535”-1.63”</td>
<td>1 1/4”</td>
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<td>12</td>
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<td>1.653”-1.75”</td>
<td>1 1/2”</td>
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<td>14</td>
<td>3/4”</td>
<td>1.889”-1.99”</td>
<td>1”</td>
</tr>
<tr>
<td>16</td>
<td>1”</td>
<td>2.163”-2.4”</td>
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Pressures in Bowl and Air Entrance. In the ordinary carburetor atmospheric pressure always exists in the fuel bowl regardless of air intake restriction because the fuel bowl is vented to the outside air. In the Zenith 63M and 263M Series, pressures in the fuel bowl and air entrance are balanced by venting the fuel bowl from the air entrance. In other words, if a dirty flame arrestor causes a lower pressure in the air entrance, the pressure in the fuel bowl will be equally reduced. In this way the air-fuel mixture supplied to the engine will remain normal because the same force that is moving air into the engine is used to move fuel through the jets. So that the choke valve will actually choke when closed for cold starting, the vent is located between the choke valve and flame arrestor.

IDLE SYSTEM (63M SERIES) (Fig. 3)
Function of the Idle System. The idle system controls the mixture at closed throttle positions to idle the engine and at slow speeds until the throttle is opened wide enough to allow the main metering system to function. It is independent of the
other systems. This system consists of an idle discharge port located in the side of the throttle body, an idle jet to meter fuel, a vacuum passage connecting with the idle port, an idle adjusting needle and an idle air intake passage.

As the throttle plate is opened wider the idle system gradually ceases to function and less fuel is delivered to the engine by this system.

**Idle System (263M Series) (Fig. 1)**

This special idle system identifies the Zenith 263M Series carburetor, and is the only departure from the regular 63M Series. It is referred to as a two-hole idle system. The idle fuel-air mixture is discharged into the air stream of the carburetor through two calibrated holes located in the throttle body. The location of these holes is in direct relation to and is determined by the position of the throttle plate when completely closed.

The idle fuel supply for this series is identical to the regular 63M Series as described under idle system (63M Series).

The discharge of the idle fuel mixture into the air stream is controlled directly by the idling adjusting needle located in the throttle body at the upper idle discharge hole.

**Operation of the Idle System.** At idling speeds of the engine the throttle plate is slightly advanced from a completely closed position. Fuel from the fuel bowl chamber flows through the main jet into the metering well. Fuel for idling flows from the well through the feed holes in the main discharge jet to the idle well to be metered through the idle jet calibration. The idle well is restricted at the bottom to control the amount of fuel delivered to the idle system. As the fuel leaves the idle jet and enters the vacuum passage leading to the idle discharge port, it is mixed with a variable amount of air admitted from behind the venturi through the idle air passage. This emulsified mixture then passes through the idle vacuum passage to be discharged into the manifold at the idle discharge port. Turning the idle adjusting needle screw towards the seat increases the suction on the idle jet and, hence, more fuel flows through calibration. Turning the idle adjusting needle screw away from the seat reduces the suction on the idle jet and as a result less fuel flows through the idle jet.

**Relation of the Idle to High Speed System.** As the throttle plate opening is increased, more of the idle discharge port is revealed to the engine suction and more air passes the throttle plate. This permits more fuel to be discharged through the idle system into the intake manifold. Increasing the opening of the throttle plate until the edge of the plate is a short distance beyond the idle port will permit enough air to pass the throttle plate to create a suction on the main discharge jet and cause the high speed system to begin functioning.

Turning the idle adjusting needle in (clockwise) creates a leaner idle fuel mixture because less of the fuel mixture is discharged into the air stream through the idle discharge hole. Turning the idle adjusting needle out (counter-clockwise) creates a richer idle fuel mixture, because more of the fuel mixture is discharged into the air stream through the idle discharge hole.

The fuel is metered by the idle jet and is mixed with air admitted by the fixed idle air bleed located in the air intake of the carburetor. This fixed air bleed meters air directly to the idle jet where it mixes with the fuel metered through the idle jet calibration. This idle fuel mixture is drawn down the idle mixture passage, and its discharge into the air stream is controlled by the idling adjusting needle.

Note that in this type of idle system the idling adjusting needle controls the amount of the idle fuel mixture that is discharged into the air stream.
THE HIGH SPEED SYSTEM (Fig. 5)

Function of the High Speed System. The high speed system controls the mixture at part throttle cruising speed, and together with the power jet, the mixture at wide open throttle. This system consists of a main venturi controlling the maximum volume of air admitted into the engine; a secondary (small) venturi to increase the suction on the discharge jet; a metering jet (main jet) with variable adjustment which regulates the flow of fuel from the float chamber to the main discharge jet; a compensating or high speed air bleed (well vent jet) which maintains uniform mixture ratio under changing suction and engine speeds; and a main discharge jet which delivers the fuel into the air stream.

Operation of the High Speed System. The main jet controls the fuel delivery during the cruising range from about one-quarter to three-quarter throttle opening. To maintain a constant mixture ratio a small amount of air is admitted through the well vent jet (high speed bleeder) into the discharge jet through the air bleed holes in the discharge jet at a point below the level of fuel in the metering well. Introducing air into the discharge jet below the level of fuel in the metering well reduces the surface tension of the fuel; in other words, helps fuel flow at low suction and by admitting air restricts fuel flow through the main jet under high suction.

When the throttle plate is opened to a point just above the idle position, enough air passes through the carburetor to lower the pressure at the tip of the discharge jet. The float chamber is vented to atmospheric pressure; consequently, the greater pressure in the float chamber will cause fuel to flow from the fuel bowl through the main jet, into the metering well, and then through the discharge jet to be discharged into the air stream passing through the secondary (small) venturi. The annulus (space) between the power jet and the inside diameter of the discharge jet serves as a passage for the main jet fuel. The emulsion of fuel from the main discharge jet and the air through the secondary venturi is discharged into air stream passing through the main venturi.

Figure 5

VACUUM PASSAGE
VACUUM PISTON
BOWL VENT
MAIN JET
MAIN JET ADJUSTMENT
WELL VENT JET
DISCHARGE JET
POWER JET
AIR BLEED HOLES
POPET VALVE
MAIN JET FUEL PASSAGE

THE HIGH SPEED SYSTEM
Power Jet in Operation (Fig. 6)

Function of the Power Jet. The power jet meters the additional fuel necessary for maximum power at wide open throttle. This part of the high speed system consists of a power jet valve which restricts the flow of fuel to the powerjet, a vacuum controlled piston assembly for operating the power jet valve, and an accelerating pump (disc type) check valve located in the fuel bowl controlling the passage from the fuel bowl into the accelerating pump cylinder.

Operation of the Power Jet Valve. The vacuum piston assembly is operated by engine vacuum. The vacuum in the intake manifold at idling speed is approximately 19" to 20" of mercury. When the throttle is opened quickly to accelerate the engine, the vacuum may drop to below 2" of mercury. The vacuum cylinder is connected to the intake manifold through a vacuum passage. Thus, only the vacuum existing in the intake manifold is used to operate the power jet system.

The vacuum piston is held up to the top of the vacuum cylinder if the manifold vacuum is greater than 6" of mercury. Quick throttle opening for acceleration will cause the manifold vacuum to drop below 6" of mercury allowing the tension of the spring of the vacuum piston assembly to force the assembly downward to hold the power jet valve open.

Opening the power jet valve allows fuel to flow from the fuel bowl through the check valve into the pump cylinder. This fuel then passes through the power jet valve to the power jet where it is metered and discharged into the discharge jet. The power jet fuel entering the discharge jet adds to that metered by the main jet and is discharged into the air stream along with the main jet fuel.
The power jet system is a means of changing from a lean mixture suitable for cruising speeds to the richer one which is necessary for maximum power. Being controlled by engine vacuum, this system functions automatically with the load on the engine whether the throttle is opened fast or slow so the engine vacuum will be determined by the engine revolutions and the amount of throttle opening.

Figure 7

**THE ACCELERATING PUMP SYSTEM (Fig. 7)**

**Function of the Pump System.** The accelerating pump system controls a small amount of fuel that is discharged into the air stream momentarily when the throttle is opened quickly. This extra amount of fuel is necessary to insure instantaneous response from the engine on acceleration.

This system consists of a pump cylinder, a vacuum controlled pump piston to discharge the fuel; a check valve (disc type) located in the fuel bowl to control the passage from the fuel bowl into the pump cylinder; and accelerating jet located in the center of the main discharge jet to meter the amount of fuel used.

**Operation.** The accelerating pump piston is controlled by engine vacuum. At idling or low speeds, with the throttle held in a steady position, the vacuum in the manifold will be from 10" to 15" of mercury. Under these conditions the manifold vacuum is strong enough to hold the pump piston up to the top of its stroke. Sudden throttle opening will cause the manifold vacuum to drop allowing the accelerating pump spring to force the piston downward in the cylinder. The downward travel of the pump piston creates enough pressure on the fuel below to force it past the power jet valve to the accelerating jet which meters the rate at which it is discharged into the air stream. Fuel is supplied to the pump cylinder through the check valve located in the fuel bowl. The check valve serves two purposes. It permits a supply of fuel to reach the pump cylinder but closes on the down stroke of the piston preventing the fuel from being pushed back into the bowl.

Figure 8

**THE CHOKE SYSTEM (Fig. 8)**

Function of the Choke Valve. The choke system consists chiefly of a valve (choke) mounted on a shaft located in the air entrance and operated externally by lever mounted on the shaft. The choke valve is used to restrict the air entering the carburetor and to increase the suction on the jets when starting the engine. The choke valve in the 63M and 263M Series Zenith Carburetor is of the "Semi-Automatic" type and is manually operated by the driver. It has a poppet valve incorporated in its design, which is controlled by a spring. The poppet valve opens automatically when the engine starts admitting air to avoid Over-choking or Flooding of the engine.

**AUTOMATIC DRAIN SYSTEM**

The Pick-up Tube removes the fuel which collects in the Air Intake during starting and warming up period. One end of the Pick-up Tube is located above the Throttle Plate, the other end at the lowest point of the carburetor Air Intake. Fuel accumulating at this point is immediately picked up and discharged into the Intake Manifold. A metering orifice in the Throttle Body controls the rate of fuel discharge from the Air Intake (Sump) and prevents the mixture from becoming too rich.

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**SERVICE PROCEDURE**

IDENTIFY CARBURETOR — Check numbers on metal identification disc riveted to top of float bowl cover against carburetor specifications in manual or parts list. The inside number next to the rivet is the Zenith assembly number, and the one next to the outer edge of the disc is the vehicle manufacturer's.

The disassembled view (Figure 9) will identify the various component parts and show the relation to the
assembly. Use Figure 9 to identify and locate parts when performing the disassembly and reassembly operations which follow.

DISASSEMBLY

SEPARATE CARBURETOR BODIES
1. Remove the 13/16" hex plug (18) and washer (19) located in top of throttle body.

NOTE: Some models have a hex plug, filter body, and screen located on the side of the throttle body. Remove these parts when working on those models.

2. Remove the six assembly screws (4) and lockwashers (5) which attach the throttle body to the fuel bowl, using a 3/8" or 5/16" wrench, or large screwdriver.

3. Separate the throttle body (3) from the fuel bowl (35) slightly and loosen the gasket from the bowl, then lift clear being careful to avoid damaging the float (26).

Figure 9 — Disassembled View

DISASSEMBLE THROTTLE BODY
4. Remove the assembly gasket (29) from the machined surface of the throttle body.
5. Remove the pump piston assembly (28).
6. Remove float axle.
   (a) Press screwdriver against the float axle (27) at slotted side of float hinge bracket and force through hinge bracket.
   (b) Remove float axle completely with fingers from opposite side and remove float (26).
7. Remove the fuel valve needle (23) and fuel valve seat (25) and washer (22) from machined surface of throttle body using Zenith wrench C161-85 or 3/8" socket wrench.
8. Remove the idle jet (24) from passage in machined surface of throttle body, near fuel valve seat, using a small screwdriver.
9. Remove the idle adjusting needle valve (21) and friction spring (20) from the side of throttle body.
10. Remove large hex plug and washer from side of throttle body opposite fuel inlet (on those models where used) using a 3/8" socket wrench.
11. Remove venturi seat screw (16) and lockwasher (17) from side of throttle body.
12. Remove primary and secondary venturi assembly (25) from throttle body bore as a unit.
13. Remove the throttle plate (2), screws (1), shaft and stop lever assembly (9), throttle lever (15).
   (a) Unscrew throttle stop screw (12) until threaded end is flush with lever.
   (b) Make match marks with center punch or file on throttle body and all levers to act as a guide to reassemble these parts in the same position as removed.
   (c) Loosen throttle lever (clamp) screw (14) and remove lever from shaft.

NOTE: Some carburetors have the throttle lever and stop lever riveted together. Omit step (e) if this type lever is used.
(d) If a floating lever is used, loosen clamp screw and remove lever.
(e) File off the riveted end of the throttle plate screws (1).

NOTE: The threaded end of the two screws are riveted and must be filed flat before removal to avoid breaking or stripping of threads in the shaft. In some cases it may be necessary to use a small (1/8") round file and cut slightly below the surface of the shaft because of a slight counterbore around the screw hole. Be sure to avoid striking and cutting the side of the throttle body bore or the throttle plate when filing the screws.
(f) Remove the screws and pull out the throttle plate (2).
(g) Remove the throttle shaft and stop lever assembly (9) from the throttle body.
14. Remove the throttle shaft packing (7) and packing retainers (8) and (15) from the shaft holes.

NOTE: Some models do not have shaft packing.
   (a) Screw a fine thread tap into packing retainer until firmly seated.
   (b) Insert long punch or rod through opposite shaft hole and drive piston back against the end of the tap until retainer is free of the body.
   (c) Repeat above operation to remove retainer from opposite shaft hole.
15. Remove the pick-up tube jet (63) from the inside throttle body bore near mounting flange, using a screwdriver.

DISASSEMBLE FUEL BOWL
16. Remove the main jet passage plug (67) and washer (66) using a 3/16" or 1/4" wrench as the case may be.

NOTE: Some models will have a main jet adjustment in place of the passage plug.
17. Remove the large hex plug (61) and washer (60) from bottom of fuel bowl using 3/8" or 1/2" wrench as the case may be.
18. Remove the hex plug (47) from bottom of fuel bowl using 5/8" wrench.
19. Remove the power and accelerating jet (59) and washer (58) from threaded angle passage in outside bottom of bowl using a screwdriver.
20. Remove main jet (55) and washer (54) from threaded passage in bottom side of fuel bowl, using Zenith C161-1 main jet wrench for jet, used with main jet adjustment or C161-82 wrench for standard main jet.
21. Remove main discharge jet (30) and washer (31) from center of large opening in machined surface of fuel bowl, using Zenith C161-9 or C161-10 wrench.
22. Remove power jet valve (48) from bottom of pump cylinder, using Zenith C161-121 wrench.
23. Remove well vent jet (43) from center of large opening in machined surface of the fuel bowl, using a screwdriver.

NOTE: The 63M and 263M 14 and 16 size carburetors require the use of C161-50 wrench to remove the hex headed well vent jet.

DISASSEMBLE CHoke—63M and 263M 10, 11, 12 Models
24. Remove choke lever spring (40).
25. Remove the choke lever retaining nut (42) and lockwasher (41) and remove lever (44) from end of shaft, using a 3/32" end wrench.
26. Remove the choke bracket retaining screw (46) and remove bracket (37), using a 1/4" socket wrench.

NOTE: To avoid confusion at reassembly, place match marks on the choke bracket and intake body to be sure the bracket is reassembled in the correct position.
27. Remove the choke plate screws (32) and lockwashers (33).
28. Remove the choke plate assembly (34).
29. Remove the choke shaft retaining screw (52) and washer (51).
30. Remove the choke shaft (50).

DISASSEMBLE CHoke—63M and 263M 14, 16 Models
31. Remove the two screws, lockwashers, dust cover plate and gasket from side of air intake.
32. Make match marks with a center punch or file on choke bracket, air intake body and lever to act as a guide in reassembling parts in the correct position.
33. Loosen choke lever clamp screw and remove lever from shaft.
34. Remove the two screws and lockwashers and remove choke bracket from side of air intake.
35. Remove the three choke plate screws and lockwashers and pull out the plate.
36. Remove horseshoe shaped thrust collar from end of choke shaft on end opposite lever.
37. Remove the choke shaft from side of air intake opposite lever.
38. Remove felt packing washer from counter bore in choke shaft hole.

CLEAN AND INSPECT PARTS
39. Clean all metal parts thoroughly with cleaning solution and rinse in solvent.
40. Blow out passages in the air intake, fuel bowl, and throttle body.

NOTE: Be sure all carbon deposits have been removed from throttle bore and idle port or idle holes. It is advisable to reverse flow of compressed air in all passages to insure all dirt has been removed. Never use a wire or drill to clean out jets.

INSPECT PARTS
41. Float assembly (26). Replace if loaded with gasoline, damaged, or if float axle bearing is worn excessively. Inspect top side of float lever for wear where it contacts the fuel valve needle.
42. Float Axle (27). Replace if any wear can be visually detected on the bearing surface.
43. Fuel Valve Seat and Needle Assembly (23). Replace this assembly because both parts wear and may cause improper float level.
44. Idling Adjusting Needle (21) and Spring (29). Inspect point of needle. This must be smooth and free of ridges.
45. Throttle Plate (2). Inspect plate for burrs or damaged edges. Never clean a throttle plate with a sharpening stone, for evidencing of scratching or ridges.
46. Vacuum Piston Assembly (28). Both pistons must be free of scratches, burrs, carbon and must fit cylinder at operating end within .005". Replacement return spring must be free of excessive wear and cannot be determined by visual inspection.
47. Power Jet Valve (48). Replace this part because extent of wear cannot be determined by visual inspection.
48. Air Shutter (Choke) (31). Inspect for bends, burrs or sharp edges.
49. Air Shutter (Choke) Shaft (50). Check bearing surfaces for wear, see that shaft is straight.
50. Fuel Bowl (35). Examine pump cylinder at lower end for evidence of excessive wear, deep scratches, ridges or any mutilation of cylinder head. Desirable clearance between vacuum piston and pump cylinder at lower operating end is .001", maximum clearance .005". Any clearance in excess of .005" will allow dirt or grit to pass into engine and result in excessive wear of cylinders, pistons, rings, etc.
51. Accelerating Pump Check Valve (19). Replace because this part is damaged in removal or extent of wear cannot be determined by visual inspection.
52. Gaskets. Replace all gaskets and fibre washers every time the carburetor is disassembled.
53. Check specifications. Venturi; Main Jet; Discharge Jet; Well Vent Jet; Accelerating and Power Jet; Power Jet Valve; Pick-up Tube Jet; Idle Jet; and Fuel Valve Seat.

REPAIR AND REBUILDING OF PARTS

THROTTLE BODY
54. Remove throttle shaft bushings (6) from throttle body.

NOTE: Do not attempt to remove the throttle shaft bushings unless new bushings are available for replacement. New bushings are under shaft size and require reaming with a line reamer to fit shaft properly. Both bushings and reamer must be available to successfully complete this operation.
(a) Screw a taper tap 1/16 larger than the throttle shaft hole into bushing until it is firmly seated.
(b) Insert long punch or rod in opposite shaft hole and drive punch against end of tap until bushing is free of bushing.
(c) Repeat above operation to remove second bushing in opposite shaft hole.
55. Install new throttle shaft bushings (if removed) as follows, with Zenith C161-72-4 bushing driver.
(a) Place new bushing on bushing driver with taper end of bushing away from shoulder.
(b) Start bushing into shaft hole and drive it in until it bottoms using a light hammer.
(c) Repeat this operation to install second bushing in opposite shaft hole.

NOTE: The above bushing driver is used with 5/16" shaft hole bushings. For 3/16" shaft hole bushings use driver Zenith C161-72-3.
56. Line ream the two throttle shaft bushings using special reamer tool Zenith C161-71-3 for 3/16" shaft size, or reamer Zenith C161-71-4 for 1/4" shaft size.

FUEL BOWL BODY
57. Remove the accelerating pump check valve assembly (49 in Fig. 9) from the bottom of the fuel bowl alongside of the pump cylinder.
(a) Insert tapered thread end of Zenith C161-15 plug extractor into check valve and screw in (counterclockwise) until tool is firmly fastened on check valve body.

(b) Strike bent-over end of Zenith C161-15 extractor with light hammer withdrawing check valve body from fuel bowl.

(c) Remove check valve disc from passage underneath check valve body.

61. Install new pump check valve assembly in bottom of fuel bowl.

(a) Start check valve assembly into counterclockwise with small opening out and alline so even so that it is not cocked on an angle.

(b) For 63M and 263M 14, 16, insert formed end of Zenith C161-324 check valve tool into check valve body and drive check valve into counter bore with a light hammer until it strikes bottom. For 63M and 263M 10, 11, 12, use a ⅛” flat-end punch and drive the check valve squarely into the channel.

NOTE: The top of the valve should be just below the top end of the channel when in place.

FUEL BOWL BODY

62. Choke Parts—63M and 263M 10, 11, 12 Models

(a) Hold fuel bowl facing air entrance, machined surface up.

(b) Insert choke shaft (50) in shaft holes.

(c) Rotate choke shaft to face flat section down.

(d) Insert choke plate (31) into air entrance, poppet valve first and with spring of poppet valve facing down.

(e) Center choke plate close it, align screw holes with the threaded holes in the shaft and install screws (32) and lockwashers (33) loosely.

(f) Tap the choke plate lightly to center it and tighten the screws evenly and firmly.

(g) Install choke shaft retainer screw (52) and washer (51).

(h) Install choke bracket (37) and retainer screw (46) in the same position as it was in before removal.

(i) Hold choke plate in wide open position.

(j) Place choke lever (44) on shaft so that the lug on the lever contacts the lug on the lower end of bracket.

NOTE: Check travel of lever to make sure the choke plate will fully open and close.

(k) Install choke lever retainer nut (42) and lockwasher (41) and tighten firmly.

(l) Install choke lever spring (49).

63. Choke Parts—63M and 263M 14, 16 Models

(a) Insert choke shaft felt packing into countercountercare in side of air intake.

(b) Install choke bracket, screws, and lockwashers.

(c) Hold fuel bowl facing air entrance with machined surface up.

(d) Insert choke shaft into choke shaft holes with grooved end of shaft opposite bracket.

(e) Install choke shaft thrust collar (horseshoe) on grooved end of shaft.

(f) Rotate choke shaft to face flat section down.

(g) Insert choke plate into air entrance, poppet valve first and with spring of poppet valve facing down.

(h) Center the choke plate, close it, align the screw holes with the threaded holes in the shaft and install the screws and lockwashers loosely.

(i) Tap the choke plate lightly to center it and tighten the screws evenly and firmly.

(j) Install dust cover plate, gasket, two screws, and lockwashers on side of air intake over shaft thrust collar.

(k) Install choke clamp lever on shaft with swivel facing body and adjust lever so that swivel is aligned with the tube holder set screw when choke is closed. Tighten lever clamp screw.

(6) Install main discharge jet (30) and fibre washer (31) in fuel bowl and tighten firmly using C161.3 wrench for 10, 11 and 12 sizes, and C161.10 wrench for 14 and 16 size carburetors.

(6) Install well vent jet (53) and tighten lightly with screwdriver for 10, 11 and 12 sizes, and with C161.30 wrench for 14 and 16 size carburetors.

66. Install accelerating and power jet (59) and fibre washer (58) in threaded angle passage in bottom of fuel bowl using a screwdriver.

67. Install main jet (55) and fibre washer (54) in large threaded passage in side of fuel bowl, with C161-1 wrench for jet used with main jet adjustment, or C161-22 wrench for standard jet with lower plug.

68. Install passage plug (61) and fibre washer (60) in threaded passage over accelerating jet using ⅞” or ⅜” wrench, as case may be.

69. Install main jet passage plug (57) and fibre washer (56) or main jet adjustment, in threaded passage over main jet using ⅜” or ⅞” wrench as case may be.

70. Install drain plug (47) in threaded passage on bottom of fuel bowl using a ⅜” wrench.

71. Fit the power jet valve (48) on the formed end of tool C161-121 power jet valve wrench and install the valve in the bottom of pump cylinder.

THROTTLE BODY

72. Install the two throttle shaft packings (7) and retainers (8) and (15) in throttle body. Use bushing driver tool C161-72-3 for ⅜” throttle shaft packing and C161-72-4 for the ⅝” size.

(a) Assemble packing and retainer and place completed assembly on bushing driver tool with packing facing small end of tool.

(b) Insert small end of tool into throttle shaft bushing, start retainer into counter bore in body and lightly drive retainer into body until it is flush with machined surface.

NOTE: The packing retainer must be flush with machined surface or slightly below to avoid striking throttle lever.

(c) Repeat above operation to install second packing and retainer in opposite shaft hole.

73. Install the throttle shaft and stop lever assembly (9), throttle plate (2) and screws (1).

(a) Place throttle body on bench with two hole mounting flange up and facing the idling port plug on the inside of the throttle body bore.

(b) Insert shaft in throttle body in the correct position to allow levers to be assembled in the same position as removed.

NOTE: Refer to matching marks placed on throttle levers and throttle body during disassembly.

(c) Rotate shaft to face countersunk side of throttle shaft screw holes with slot in shaft in a vertical position.

(d) Insert the throttle plate (2), center it and then rotate shaft (counterclockwise) to close it.

NOTE: The screw holes in the throttle plate are off center. Start the side of the throttle plate with the shortest distance between the screw holes and beveled edge into the shaft first. The throttle plates are made with two opposite edges beveled to fit the throttle body bore when the plate is closed. The throttle plate will not close tightly if installed upside down. To properly center the plate in the throttle body bore, the screws should be started in the shaft and then with the plate closed, it should be tapped on the mounting flange side. Pressure on the plate must be maintained with the finger until the screws are tightened. When properly installed, the side of the throttle plate farthest away from the mounting flange will be aligned with the idle port when the plate is closed.

(e) Turn the throttle body over and start the screws into shaft loosely. Tap the plate lightly to center it and tighten screws securely.
NOTE: Do not attempt to rivet threaded ends of the throttle plate screws.
74. Install throttle clamp lever (13) in same position as removed. Refer to match marks placed on lever and throttle body during disassembly step.

Figure 10

75. Install pick-up tube jet (63) in threaded angle passage in throttle body bore near mounting flange.
76. Install idle adjusting needle (21) and friction spring (20) in threaded passage on side of throttle body. Seat lightly with screwdriver and back out 1/8 full turns, as a preliminary adjustment.
77. Insert venturi (23) in throttle body bore, large opening first, rotate to align screw hole with hole in body, and install locating screw (16) and lockwasher (17) and tighten securely.
78. Install idle jet (24) in counterbored passage in machined surface next to venturi.
79. Install fuel valve seat (23) and fibre washer (22) using a %27" socket wrench for 14 and 16 size carburetors. The 10, 11 and 12 size carburetors require C161-88 fuel valve seat wrench.

NOTE: Be sure that the correct fuel valve seat fibre washer is used for the 14 and 16 size carburetors. There are two washers available and the choice is determined by which of two floats is used. The T56-67 fibre washer is .065" thick and T56-10 is .040" thick. T56-67 is required when C86-77 float is used, while T56-10 is required with C85-83 float, which is identified by the hardened button on the float lever where it contacts the fuel valve needle. T56-10 fibre washer is used also with the Filter Plug, Fuel Inlet, Channel Plug and the Main Jet Passage Plug or Adjustment.
80. Install the fuel valve needle (23) in seat, followed by float (26) and float axle (27).
81. Fuel Level. Check position of float assembly for correct measurement to obtain proper fuel level. The float should move freely on its axle and the dimension (shown in Fig. 10) should be 1/8" for the 10 size, 1 3/4" for the 11 and 12 sizes, and 2 3/8" for the 14 and 16 sizes. A tolerance of plus or minus 1/8" is allowable.

NOTE: Do not bend, twist, or apply pressure on the float bodies.
(a) With bowl cover assembly in an inverted position, viewed from free end of float, the float bodies must be centered and at right angles to the machined surface. The float setting is measured from the machined surface (no gasket) of cover to top side of float bodies at highest point.
(b) Setting Float Lever. To increase or decrease distance between float body and machined surface use long nosed pliers and bend lever close to float body.

NOTE: Replace with new float if position is off more than 1/8 ".
82. Install vacuum piston assembly (28) in vacuum cylinder in throttle body. Check for free movement of piston in cylinder.
83. Place assembly gasket (29) on machined surface of throttle body.

ASSEMBLE CARBURETOR BODIES
84. Assemble the two completed bodies using screws (4) and lockwashers (5). Tighten screws evenly and firmly.
85. Install hex plug (18) and fibre washer (19) in threaded passage in throttle body.

NOTE: Some models use a hex plug, filter body, and screen in place of these parts. Install the filter body, screen, plug, and two washers in threaded passage on side of body. Install the fuel inlet plug and washer on side of inlet opposite the filter body and screen.
86. Hold the throttle lever (13) in a closed position and turn the throttle stop screw (12) in until it just contacts the stop pin on the body, then screw in 1 1/2 additional turns.

RECOMMENDED SERVICE TOOLS
C161-1 Main Jet Wrench (for main jet used with main jet adjustment).
C161-9 Main Discharge Jet Wrench (for 10, 11, 12 sizes).
C161-10 Main Discharge Jet Wrench (for 14 and 16 sizes).
C161-15 Check Valve Extractor Tool.
C161-80 Well Vent Jet Wrench.
C161-82 Main Jet Wrench (for standard main jet).
C161-85 Fuel Valve Seat Wrench (for 10, 11, 12 sizes).
C161-121 Power Jet Valve Wrench.
C161-124 Pump Check Valve Tool (to install—for 14 and 16 sizes).
C161-71-3 %4" Line Reamer.
C161-71-4 %4" Line Reamer.
C161-72-3 %4" Bushing Driver.
C161-72-4 %4" Bushing Driver.

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