ZENITH 68-SERIES CARBURETORS

DESCRIPTION AND OPERATION

DESCRIPTION

The 68-Series Carburetor is of the single barrel updraft design, with a single venturi, twin floats, and a semi-concentric fuel bowl to permit operation at quite extreme angles without flooding or starving the engine. It is of the "balanced" and "sealed" type since all air for fuel bowl ventilation and idle operation must enter through the air cleaner. The fuel supply system is made up of the threaded fuel inlet, fuel valve (needle and seat), float assembly and the float chamber. The idle system consists of

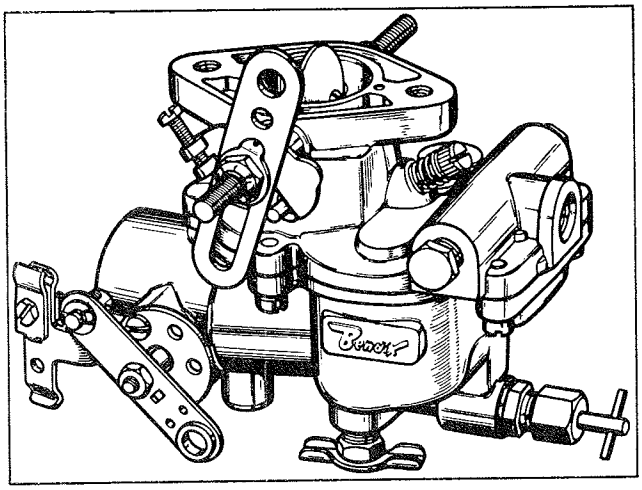


Fig. 1. External View

two idle discharge holes, idle air passage, idle adjusting needle, idle jet, and fuel pick-up passage. The high speed (main metering) system consists of the venturi, main jet, main discharge and well vent. Some models also include a main jet adjustment. The choke system is of the semi-automatic type and is made up of a choke plate, with a spring loaded poppet valve, mounted on a shaft located within the air intake and operated externally by a lever attached to the choke shaft.

OPERATION

FUEL SUPPLY SYSTEM - Fuel under pressure is supplied through the fuel inlet fitting, fuel valve (needle and seat) to the float chamber, see Figure 2. The float in the float chamber automatically regulates the opening through the fuel valve (needle and seat) to maintain the proper

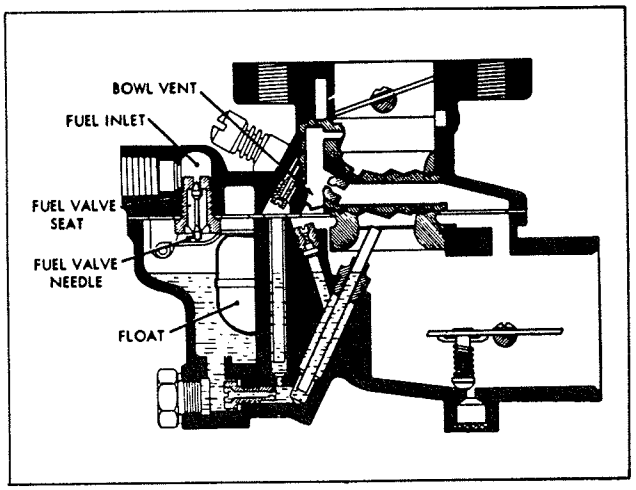


Fig. 2. Fuel Supply System

level of fuel in the fuel bowl and to meet the demands of the engine according to engine load and speed.

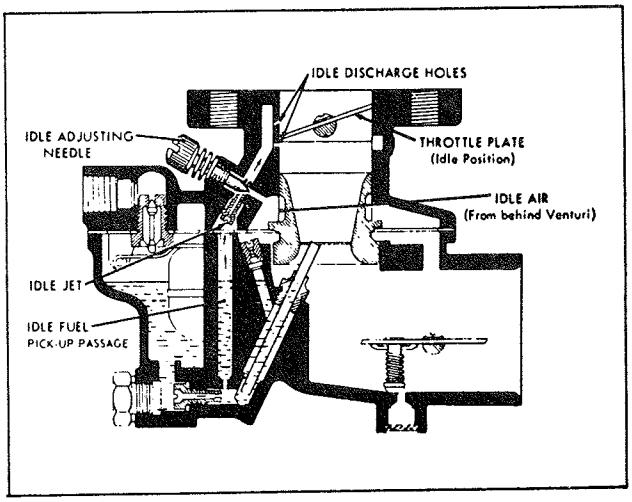


Fig. 3. Idle System

IDLE SYSTEM - At idle speed the throttle plate is advanced slightly to expose the upper idle discharge hole to engine manifold vacuum (suction), see Figure 3. This suction is transmitted to the idle jet through a passage connecting the idle discharge holes with the idle jet. Fuel for idle is supplied through the main jet to a well at the bottom of the discharge jet. The fuel for idle flows out of this well through a restricted drilling at the bottom of the idle fuel pick-up passage. From here the fuel is metered through the idle jet calibration before entering the vacuum passage leading to the idle discharge holes. As the fuel leaves the idle jet it is mixed with air that originates back of (or from behind) the ven-

turi. The position of the idle adjusting needle in this passage controls the suction on the idle jet and thereby the idle fuel-air mixture. Turning the idle adjusting needle IN (clockwise) results in a greater suction on the idle jet with a smaller amount of air admitted to give a richer mixture. Turning the needle OUT (counterclockwise) increases the amount of idle air admitted and reduces the suction on the idle jet resulting in a leaner mixture. This idle fuel-air mixture is then discharged through the idle discharge holes into the air stream.

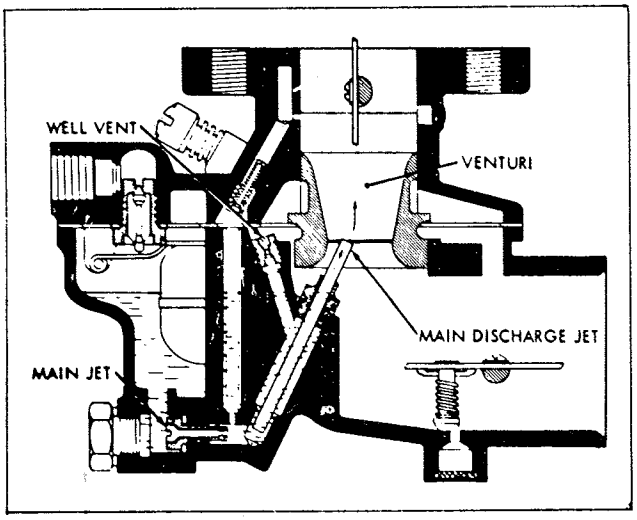


Fig. 4. High Speed System

HIGH SPEED (MAIN METERING) SYSTEM - As the throttle is advanced to approximately one-quarter opening, the amount of air passing through the venturi creates a suction on the tip of the main discharge jet. This suction causes the fuel to flow from the fuel chamber through the main jet and into the main discharge jet where it is mixed with air admitted by the well vent jet. This mixture is then discharged into the air stream through the discharge jet, see Figure 4. The main jet controls the fuel delivery from about one-quarter to full throttle opening. To maintain a proper mixture ratio a small amount of air is admitted through the well vent into the discharge jet through air bleed holes located in the discharge jet at a point below the level of fuel in the metering well.

CHOKE SYSTEM - Closing the choke plate when starting a cold engine restricts the air entering the carburetor through the air cleaner and creates an increase in suction on the jets. This increase in suction causes more fuel to be drawn into the engine and provides a richer mixture necessary for starting a cold engine.

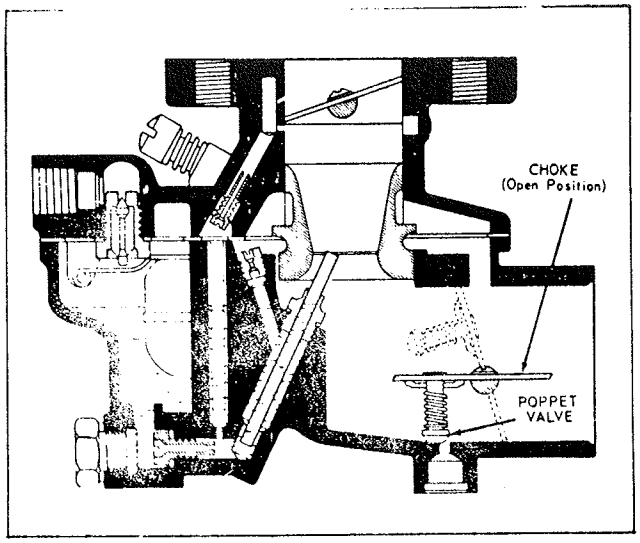


Fig. 5. Choke System

As soon as the engine starts to operate, the spring-loaded poppet valve located within the choke plate opens to prevent over-choking. As the engine warms, the choke must be opened manually to the wide open position.

SERVICE PROCEDURE

IDENTIFY CARBURETOR - See page 2 for illustration and procedure to follow.

The exploded view, Figure 6, identifies the component parts and shows their relationship to the complete carburetor. Use the exploded view key numbers to identify and locate the position of parts when performing both the disassembly and the assembly operations. For correct Repair Kit to use and for parts identification refer to Zenith Parts Catalog page and Specification Sheet for the carburetor that is to be repaired.

DISASSEMBLY

SEPARATION OF THROTTLE AND FUEL BOWL BODIES

1. Remove hex head plug (7) and filter screen (if used) from side of throttle body, using 7/16" wrench.

2. Remove four bowl to body screw and lockwasher assemblies (28), using a screwdriver.

3. Raise throttle body slightly and separate gasket from fuel bowl flange, then lift off throttle body assembly being careful not to damage float assembly.

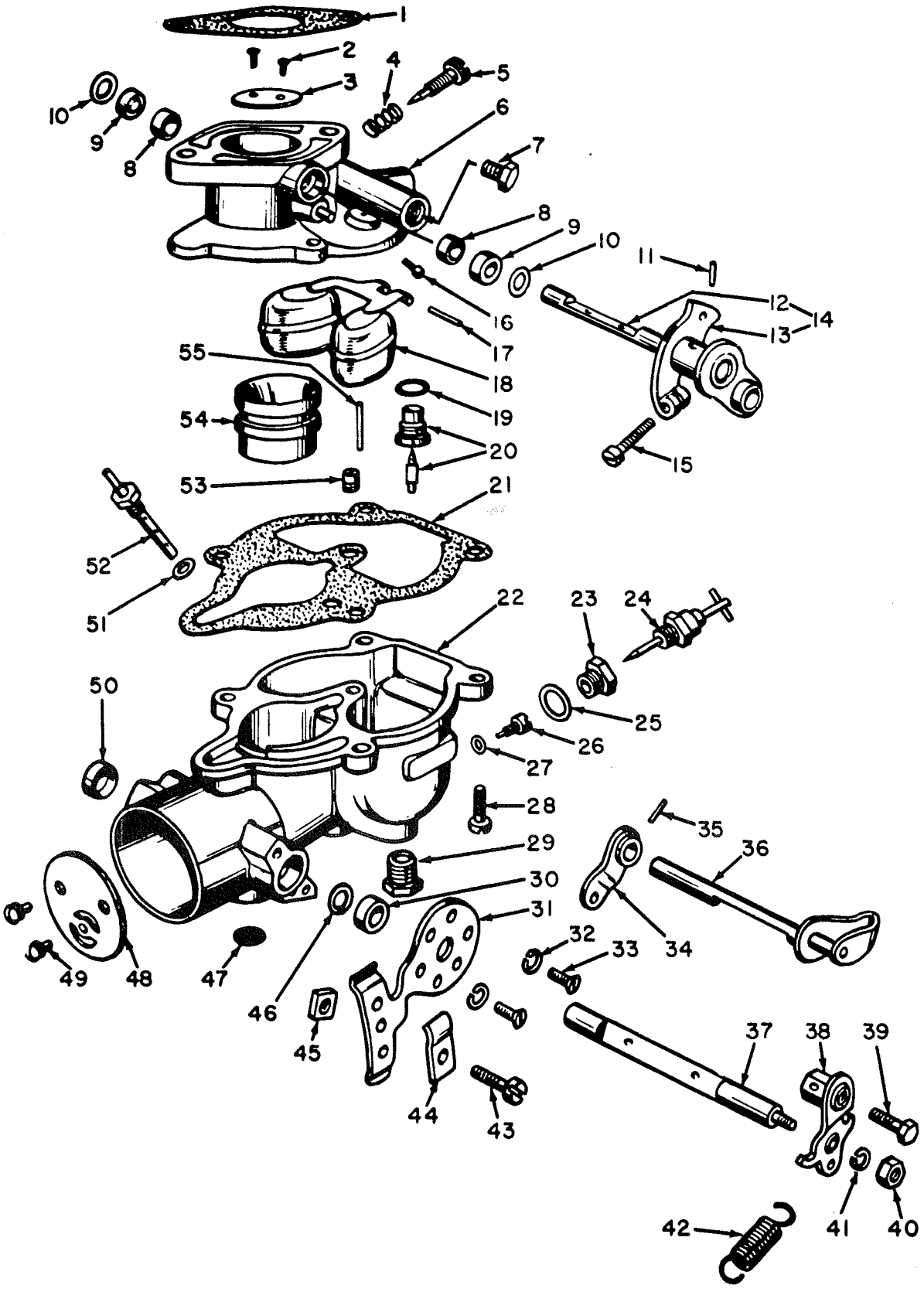


Fig. 6. Exploded View

DISASSEMBLY OF THROTTLE BODY

1. Press screwdriver against float axle (17) at slotted side of float hinge bracket and force axle through slotted side of bracket, then remove axle with fingers from opposite side of bracket and remove float assembly (18).

2. Remove fuel valve needle (part of 20), bowl to body gasket (21) and venturi (54).

3. Remove fuel valve seat (20) and fiber washer (19), using C161-82 wrench.

4. Remove idle jet (16) from machined surface of throttle body, using a small screwdriver.

5. Remove idle adjusting needle (5) and friction spring (4) from side of throttle body.

6. Unscrew throttle stop screw (15) until threaded end of screw is flush with throttle lever.

7. Close throttle and scribe across throttle body and throttle levers as a guide to correct re-assembly of parts.

8. File off riveted or peened end of throttle plate screws, being careful not to damage throttle plate or throttle body bore.

9. Remove throttle plate screws (2) and throttle plate (3); then remove throttle shaft and lever assembly (14).

10. To remove throttle shaft packing and packing retainer from throttle shaft hole, screw a 5/16" fine thread taper tap into packing retainer (10) until firmly seated. Insert long punch or rod in opposite shaft hole and drive punch against end of tap until retainer is free of throttle body. Remove tap and repeat operation for removal of packing and retainer from opposite shaft hole.

NOTE: Do not disassemble throttle plate, throttle shaft and stop lever assembly, throttle packings and packing retainers from throttle body unless throttle shaft is bent or otherwise damaged or unless there is damage or visible wear to other components of throttle assembly. Do not remove throttle shaft bushings unless inspection indicates replacement is necessary. For removal and replacement of throttle shaft bushings refer to Replacement of Bushings and Re-assembly.

DISASSEMBLY OF FUEL BOWL BODY

1. Remove main jet adjustment assembly (24) and fiber washer (25), using a 1/2" wrench.

NOTE: Some models have main passage plug (23) in place of main jet adjustment.

2. Remove hex drain plug (29) from bottom of fuel bowl, using C161-10 wrench.

3. Remove main jet (26) and fiber washer (27), using C161-83 jet wrench to remove jet.

4. Remove main discharge jet (52) and fiber washer (51) from center of large opening in machined surface of fuel bowl, using C161-9 jet wrench.

5. Remove well vent jet (53) from center of large opening in machined surface of fuel bowl, using a small screwdriver.

6. Scribe across air intake body section, choke bracket and choke lever as a guide to correct re-assembly of parts, then remove choke lever spring (42) from choke lever and choke bracket.

7. Remove choke shaft nut (40) and lockwasher (41), using C161-25 wrench, then remove choke lever (38).

8. Remove choke bracket screws (33) and lockwashers (32) and remove choke bracket (31).

9. Remove choke shaft hole plug (50) from opposite side of air intake.

10. Remove choke plate screws (49), choke plate (48) and choke shaft (37) from air intake section.

11. To remove choke shaft packing and packing retainer from choke shaft holes, screw a 5/16" fine thread taper tap into packing retainer (30) until firmly seated. Then insert long punch or rod in opposite shaft hole and drive punch against end of tap until retainer is free of air intake body. Remove tap from retainer.

12. On models which include choke lever (34), remove taper pin (35) and then remove lever.

NOTE: Do not disassemble choke assembly bracket, choke levers, shaft and choke plate unless there is damage to any of above parts or damage to any of the other component parts of the assembly.

CLEANING

Thoroughly clean all metal parts in Bendix Metalclene or Speedclene and rinse in solvent. Blow out all passages and channels in the castings with compressed air. Reverse the air flow through each passage to insure the removal of all dirt particles. NEVER USE A WIRE OR DRILL TO CLEAN OUT THE JETS.

INSPECTION

Inspect all parts and replace any that are damaged or worn. Replace throttle shaft if shaft is bent or if shaft shows evidence of wear on the bearing surfaces. Replace throttle shaft bushings if a new shaft has more than .005" side play. Always use a Zenith Repair Kit. For correct Repair Kit, refer to Zenith Parts Catalog Specification Page. Follow procedure outlined below for Removal and Replacement of Throttle Shaft Bushings.

RE-ASSEMBLY

Removal and Replacement of Throttle Shaft Bushings.

NOTE: Do not remove throttle shaft bushings unless new shaft bushings C9-75 are available along with C161-72-1 Bushing Driver and C161-71-1 Line Reamer.

1. To remove throttle shaft bushing, screw a 3/8" taper tap into bushing at one end of throttle shaft bore until firmly seated in bushing. Then insert long punch or rod in opposite shaft hole and drive punch against end of tap until bushing is free of throttle body. Remove bushing from tap.

2. Repeat above operation to remove bushing from opposite shaft hole.

3. To install throttle shaft bushing, place new throttle shaft bushing on C161-72-1 Bushing Driver with taper end of bushing away from shoulder of driver. Start bushing into shaft hole and drive bushing in until bottomed, using a light hammer.

4. Repeat this operation to install bushing in opposite shaft hole.

5. Line ream the two shaft bushings, using C161-71-1 Line Reamer.

ASSEMBLY OF FUEL BOWL BODY

1. Insert packing (46) in open side of packing retainer (30) and place assembly on C161-72-1 bushing driver with packing facing small end of driver.

2. Insert small end of driver into choke shaft hole; start retainer into counter bore in body and lightly drive retainer into body until flush with machined surface.

3. Insert choke shaft (37) or choke shaft and lever (36), as the case may be, into the air intake and install choke plate (48) in same position in air intake with poppet valve facing the same way as it was before disassembly.

4. Align holes in plate with holes in shaft and install choke plate screws (49), leaving screws loose. Close choke for best closing and then tighten screws, using a small screwdriver.

5. Install choke shaft hole plug (50) or install choke lever (34) with taper pin (35) if carburetor includes lever.

6. Place choke bracket (31) in position on air intake with bracket aligned to scribe marks and attach bracket with screws (33) and lockwashers (32).

7. Place choke lever (38) on choke shaft, close choke and position lever to align with scribe marks. Then assemble choke shaft nut (40) and lockwasher (41) and securely tighten nut, using C161-25 wrench.

8. Attach choke lever spring (42) to choke bracket and to choke lever.

9. Install main discharge jet (52) and fiber washer (51) in fuel bowl and tighten jet firmly, using C161-9 jet wrench.

10. Install well vent jet (53) in fuel bowl and tighten, using a small screwdriver.

11. Place fiber washer (27) on main jet (26) and install jet in threaded opening at side of fuel bowl, using C161-83 jet wrench.

12. Install main jet adjustment (24) and fiber washer (25) or main passage plug (23), as the case may be, in threaded passage at side of fuel bowl, using 1/2" wrench.

ASSEMBLY OF THROTTLE BODY

1. Insert packing (9) in open side of packing retainer (10) and place assembly on C161-72-1 bushing driver with packing facing small end of driver.

2. After inserting small end of driver into hrottle shaft hole, start retainer into counter-bore in throttle body and lightly drive retainer into body until flush with machined surface or slightly below surface to avoid striking throttle lever.

3. Insert throttle shaft and lever assembly (14) in throttle body. Rotate shaft to wide open; then insert throttle plate (3) in shaft and rotate to closed position, holding plate in position with fingers. Make certain beveled sides of plate fit against throttle bore when plate is closed.

4. Start throttle plate screws (2), leaving screws loose. Close throttle plate several times, making sure plate is centered in throttle bore. Then tighten screws, using small screwdriver.

5. Install idle adjusting needle (5) and friction spring (4) in threaded passage at side of throttle body. Turn needle in lightly against its seat, then back out needle 1-1/4 turns as a preliminary adjustment.

6. Install idle jet (16) in machined surface of throttle body, using a small screwdriver.

7. Install fuel valve seat (20) and fiber washer (19), using C161-82 wrench.

8. Install venturi (54) in throttle bore, large opening end first. Then place new bowl to body gasket (21) on machined surface of throttle body, making sure venturi flange is set in throttle body recess below gasket.

9. Install fuel valve needle (20) in seat and position float assembly (18) in hinge bracket.

10. Insert float axle through hinge bracket and float lever bushing from side opposite slot in hinge bracket with fingers only. Then press float axle (17) through slotted side of bracket, using handle of screwdriver.

11. To insure correct fuel level in the float chamber, check distance "A" from top of floats to machined surface of throttle body (no gasket) with throttle body inverted, see Figure 7. This dimension should be 1-5/32" plus or minus 1/32". To increase or decrease distance from top of float bodies to machined surface, use long nose pliers and bend lever close to float body.

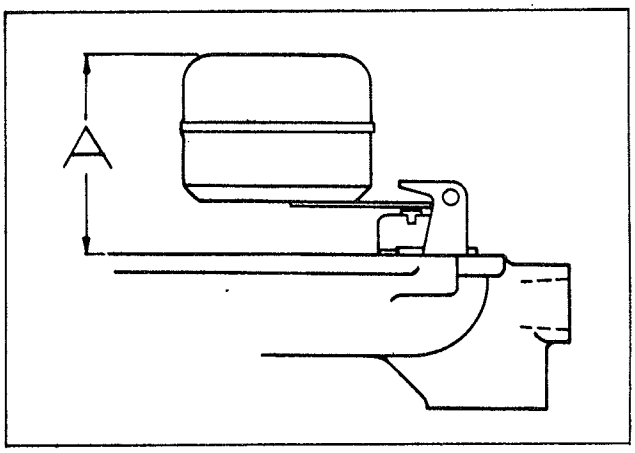


Fig. 7. Float Setting

NOTE: Do not bend, twist or apply pressure on the float bodies. The float bodies when viewed from the free end of the bodies must be centered and at right angles to the machined surface and must move freely on the float axle.

ASSEMBLY OF THROTTLE AND FUEL BOWL BODIES

1. Place fuel bowl assembly in position on throttle body, being careful not to damage floats. Then align holes in fuel bowl with holes in gasket and throttle body.

2. Install four bowl to body screw and lock-washer assemblies (28) and tighten screws securely, using screwdriver.

3. Install hex head plug (7) and filter screen (if used) in threaded passage in throttle body, using C161-10 wrench.

4. With throttle held in closed position, turn throttle stop screw (15) in until stop screw just contacts throttle stop and then turn stop screw IN 1-1/2 additional turns as a preliminary idle speed setting.

Assembly is now completed.

SPECIAL TOOLS REQUIRED

C161-9	Main Discharge Wrench
C161-10	Plug Wrench
C161-25	Shaft Nut Wrench
C161-71-1	Bushing Line Reamer
C161-72-1	Bushing Driver
C161-82	Fuel Valve Seat Wrench
C161-83	Main Jet Wrench