MODEL E2ME-E2MC CARBURETORS

Figure 1 Model E2ME Carburetor (Typical)

Figure 2 Model E2MC Carburetor (Typical)

GENERAL DESCRIPTION

The Dualjet 210 Model E2ME - E2MC carburetors, used with the Computer Command Control (CCC)* system, are electronically controlled, single stage units of down draft design, with 1-3/8" bores (See Figure 1 and 2).

The E2ME - E2MC carburetors include special design features for optimum air/fuel mixture control during all ranges of engine operation.

An electrically operated mixture control solenoid is used to control air and fuel metered to the idle and main metering systems of the carburetor. Fuel metering is controlled by (2) special stepped metering rods, operating in the jets, positioned by a plunger located in the mixture control solenoid. The plunger in the solenoid is controlled by an electrical output signal which is received from the Electronic Control Module (ECM) - a small "on board" computer. The ECM, responding to an electrical signal from the oxygen sensor in the exhaust, energizes the solenoid to move the plunger down to the lean position, or partially energized, up to the rich position where it can control air and fuel delivery to the idle and main metering systems. Simultaneously, air metering to the idle system is controlled by an idle bleed valve, located in the air horn, which follows movement of the mixture control solenoid plunger to control the amount of air bleed into the idle system to lean or richen the idle and off-idle fuel mixtures. The movement (or "cycling") of the solenoid plunger, down (lean) or up (rich) occurs ten times per second thereby controlling fuel and air mixtures to achieve, as near as possible, ideal air/fuel mixture ratios.

Exhaust gas oxygen content is constantly monitored by the Computer Command Control system and air/fuel mixtures adjusted accordingly for controlling exhaust emissions, and provide good engine performance and economy. (Fig. 3).

The carburetor has internally balanced venting through two (2) "D" shaped vent holes cast in the air horn (next to the idle air bleed valve), and a vent slot in the air horn, which is located directly over the float chamber.

It is also externally vented through a tube (location T) in the air horn to meet evaporative emission requirements.

An Exhaust Gas Recirculation system (E.G.R.) is used to control oxides of nitrogen (NOx). A throttle body vacuum supply port provides the vacuum signal to operate the manifold located E.G.R. valve.

CARBURETOR IDENTIFICATION - FIGURE 4.

The carburetor model identification is stamped vertically on the rear left corner of the float bowl. If replacing the float bowl, follow the manufacturer's instructions which are contained in the service package. In this way, the identification number can be transferred to the new float bowl. Refer to the part number when servicing the carburetor.

*System formerly termed Computer Controlled Catalytic Converter (C-4)
OPERATING SYSTEMS
FLOAT SYSTEM - FIGURE 5.

The float system consists of the centrally located fuel chamber, a check valve type fuel filter, a single closed-cell plastic float pontoon with integral float lever, a float hinge pin, float needle valve and pull-clip, float valve seat (with or without “windows”), internal vents and an external vent connector tube.

The float hanger is designed to allow use of an electrical solenoid in the float bowl. Thus, the float is not interchangeable with any previous models.

A plastic filler block is located in the top of the fuel chamber over the float needle valve to prevent fuel slosh in this area. A cavity insert is also used in the fuel chamber on some models to reduce fuel slosh on turns.

An integral pleated fuel filter is mounted in the front of the float bowl behind the fuel inlet nut to filter dirt from the incoming fuel. A check valve is pressed into the neck of the fuel filter. The check valve consists of a plastic disc contained in a viton retainer. It is held in the normally closed position by a small spring which exerts pressure on the check valve. When the engine starts and fuel flow pressure from the fuel pump enters the inlet nut, it pushes the small check valve off its seat. Fuel flow passes the valve into the inside of the filter and continues on through the filter to the float needle valve and seat. With the engine off, the check valve closes and shuts off fuel flow to the carburetor to prevent fuel leaks if a vehicle roll-over should occur (U.S. Motor Vehicle Safety Standard 301).

The check valve retainer also has a flanged neck which seals between the filter and fuel inlet nut.

The fuel filter is held in position by the force of a spring located between the filter assembly and the fuel inlet nut cavity. The spring is of the non-relief type.

The float system operates in the following manner:

Fuel flow from the fuel pump enters the carburetor fuel inlet nut. It opens the check valve in the filter against spring tension and flows through the filter element, and then passes from the filter chamber up through the float valve seat and flows past the float needle valve on into the fuel chamber. As the incoming fuel fills the fuel chamber to the prescribed level, the float pontoon rises and forces the float needle valve closed, shutting off fuel flow. As fuel is used from the fuel chamber, the float pontoon drops to open the float needle valve allowing fuel to again fill the chamber. This cycle continues, maintaining a near constant fuel level in the fuel chamber for all ranges of engine operation.

A pull clip, fastened to the float needle valve and hooked over the edge of the float lever, is used to assist in lifting the float valve off its seat whenever fuel level in the fuel chamber is low.

The float valve seat is brass and uses a double angle staked seat with a Viton® tipped float valve. This combination reduces valve seat wear and aids in preventing the float valve from possibly sticking in the seat due to fuel gum formation. Milled slots are included in the float valve seat on some applications for improved fuel delivery to the fuel chamber.

The carburetor fuel chamber is internally vented to filtered air in the air cleaner. The internal vent balances air pressure acting on the fuel chamber with air pressure in the air cleaner. In this way, balanced air/fuel mixture ratios can be maintained throughout the full range of carburetor operation.

The fuel chamber is externally vented through a tube (Location T) in the air horn. Gasoline vapors that form in the fuel chamber flow through this tube, and connect-
Inlet hose, to a vacuum operated vapor vent valve located in a vapor canister mounted in the engine compartment. The canister vapor vent valve is a spring loaded normally open valve which is closed by manifold vacuum during engine operation and opened by spring pressure when the engine is off, thus allowing the carburetor fuel vapors to be collected in the canister until normally purged. The venting of the carburetor bowl to the vapor canister meets U.S. federal and state evaporative emission requirements and improves hot engine starting.

**IDLE SYSTEM - FIGURE 6.**

Each bore of the carburetor has a separate and independent idle system to provide the correct air/fuel mixture to the engine during idle and off-idle operation. Since air flow through the carburetor venturi is not sufficient to obtain efficient metering from the main discharge nozzles, the idle system is used.

The idle system operates as follows:

During curb idle, the throttle valves are held slightly open by the idle speed screw or electronic solenoid plunger. The small amount of air passing between the throttle valve and bore is controlled by adjusting the position of the solenoid plunger or idle speed screw to obtain the specified engine idle speed. Fuel is added to the air to produce a combustible mixture by the direct application of vacuum (low pressure) from the intake manifold to the idle discharge hole which is located below the throttle valve. With the idle discharge hole in a very low pressure area and the fuel in the fuel chamber vented to atmosphere, the idle system operates as follows:

Fuel flows from the fuel chamber down through the main metering jet into the main fuel well. It is picked up in the main fuel well by the idle tube which extends into the well. The fuel is metered at the lower tip of the idle tube and passes up through the idle tube. The fuel is then mixed with air at the top of each tube through the solenoid controlled idle air bleed valve. The air bleed valve which is located in the air horn controls the air metering in the idle system. The idle air bleed valve follows movement of the mixture control solenoid plunger to control the amount of air bled into the idle system to lean or enrich the mixtures. The movement (or "cycling") of the solenoid plunger, down (lean) or up (rich), occurs ten times per second, thereby controlling air and fuel to achieve ideal air/fuel mixture ratios.

The fuel mixture crosses over to the idle down channel where it is further bled with air at the side idle bleed and then passes through a calibrated restriction. It then continues downward in the idle channel where it is mixed with air at the lower idle air bleeds and off-idle discharge ports and then passes through the adjustable idle mixture discharge holes where it enters the carburetor bores and blends with air/fuel mixture then passes through the intake manifold into the engine cylinders.

The idle mixture needles are sealed with hardened steel plugs at the factory to discourage unauthorized tampering in the field. If adjustment becomes necessary due to a driver performance complaint, emission failure, major carburetor overhaul, or throttle body replacement, special factory service procedures, listed in the Carburetor Calibration Procedure Section, must be followed carefully.

**MAIN METERING SYSTEM - FIGURE 7.**

The main metering system supplies fuel to the engine from off-idle to wide-open throttle. The system supplies air and fuel during this range through plain tube nozzles and the venturi principle.
The multiple venturi in each bore produces excellent fuel metering control due to its sensitivity to air flow.

The main metering system begins to operate as air flow increases through the venturi system. It supplies fuel from each bore to maintain the required air/fuel mixture to the engine during part throttle to wide open throttle operation. Fuel from the idle system gradually diminishes as the lower pressure is now in the venturi system.

The main metering system consists of main metering jets, an electrically operated solenoid plunger, main metering rods and springs, main well air bleeds, main discharge nozzles, triple venturi, fuel pull-over enrichment (some applications).

Fuel metering is controlled by (2) special stepped metering rods, operating in the main metering jets positioned by a plunger in the mixture controlled solenoid. The solenoid plunger is controlled (or "pulsed") by an electrical output signal received from the Electronic Control Module (ECM). The ECM, responding to an electrical signal from the oxygen sensor in the exhaust, energizes the solenoid to move the plunger (and rods) down against spring tension to the lean position to control fuel delivery to the main metering system. As mentioned earlier, this movement up or down of the solenoid plunger and rods in the jets occurs ten times per second.

Changes in engine load and corresponding throttle positions require different air/fuel mixtures in the cylinders to deliver proper engine performance and maintain low emissions. To supply the ECM with the necessary input signal to determine the correct air/fuel mixture for various throttle positions, a throttle sensing switch is incorporated with the E2MC - E2ME carburetors. Depending on carburetor model, a throttle position sensor (TPS) or a wide open throttle (WOT) switch is used.

The throttle position sensor (TPS), where used, is mounted internally in the float bowl and is actuated by the pump lever through a TPS plunger. The TPS is used to electrically signal the ECM, various throttle position changes as they occur. As throttle position is changed by the driver, the pump lever moves the TPS plunger thereby changing the electrical signal to the ECM. The ECM refers to stored memory and momentarily "holds" the last known air/fuel mixture ratio for good engine response during throttle changes. In addition, during wide-open throttle operation, the pump lever moves the TPS plunger to change the electrical output signal from the ECM to the carburetor meter control solenoid. When this happens, the plunger is "cycled" (or "pulsed") by the ECM in a pre-programmed rich operating mode to obtain the richer mixtures needed for power requirements.

Figure 7 Main Metering System

The wide-open throttle (WOT) switch, where used, is mounted externally on the side of the float bowl. The WOT switch differs from the TPS sensor in that its function is to trigger the ECM under wide open throttle conditions only. The switch is opened by a tang on the throttle lever in the wide open position to change the electrical output signal from the ECM to the mixture control solenoid. In this way, the solenoid plunger is "cycled" by the ECM in a pre-programmed rich operating mode for power requirements.

The lean mixture screw in the float bowl and the rich mixture stop screw and idle air bleed valve in the air horn, are factory adjusted to provide the most ideal air/fuel mixtures required with the Computer Command Control* system. No attempt should be made to change these adjustments in the field except during major carburetor overhaul, or during air horn or float bowl replacement, at which time service instructions must be followed carefully.

Pull-Over Enrichment (P.O.E.)

A supplemental source of fuel to the main metering system is used on some carburetor models to provide added enrichment and improved fuel control during high engine speed and carburetor air flows.

*System formerly termed Computer Controlled Catalytic Converter (C-4)
A calibrated hole in each bore is located just above the choke valve and feeds fuel from a tube that extends into the fuel chamber. During high carburetor air flows, low pressure created in the air horn bores pulls fuel from the pull-over enrichment fuel feed hole supplementing fuel flow from the main metering system. The pull-over enrichment system feeds fuel at high engine speeds to provide additional fuel needed for good engine performance.

**PUMP SYSTEM**

**ACCELERATING PUMP SYSTEM - FIGURE 8.**

During quick accelerations when the throttle is opened rapidly, air flow through the carburetor bores and intake manifold change almost instantaneously. However, the fuel, which is heavier, tends to lag behind causing a momentary leanness. To prevent this, the accelerator pump system is used to provide the extra fuel necessary for smooth acceleration.

The accelerating pump system consists of a spring loaded pump plunger and pump return spring (operating in a fuel well), fuel passage, discharge check ball, retainer, and pump jets (one in each bore).

An expander (garter) spring is used in the pump cup for constant pump cup to pump wall contact. The pump cup is of the "floating" design: i.e., the up and down movement of the cup on the plunger head either "seats" to provide a solid charge of fuel on the down-stroke, or "unseats" on the filling of the pump well (upstroke). The cup remains unseated when there is no pump plunger movement which allows vapor to vent from the pump well.

The pump system operates as follows:

The pump plunger is operated by a pump lever on the air horn which is connected directly to the throttle lever by a pump rod. During throttle closing, the pump plunger is forced upward in the pump well through a vertical slot located in the side of the pump well. It flows past the "unseated" pump cup to fill the bottom of the pump well and pump discharge passage.

When the throttle valves are opened, the pump rod and lever forces the pump plunger downward. The pump cup seats against the pump plunger forcing fuel through the pump jets into the venturi area of the carburetor bores.

The pump plunger duration spring is balanced against the pump well return spring so that a smooth, sustained charge of fuel is delivered during acceleration. The duration spring is selected by the factory to control the differences in rate of movement between the pump linkage and the plunger head for correct pump fuel delivery.

The pump discharge check ball seats in the pump discharge passage so that air will not be drawn into pump passage during upward movement of the accelerator pump and prevent proper pump fill.

During higher air flows through the carburetor bores, a vacuum exists at the pump jets. A passage which is located just behind the pump jets leads to the top of the air horn to vent the pump fuel circuit outside the carburetor bores. This acts as a suction breaker so that, when the pump is not in operation, fuel will not be pulled out of pump jets into venturi area. This insures a full pump stream when needed and prevents any fuel "pull-over" from the pump discharge passage.

**CHOKE SYSTEM - GENERAL**

The choke system used on the E2ME - E2MC models consists of a choke valve, integral choke housing mounted on the side of the float bowl, thermostatic choke coil, two (2) vacuum break diaphragm assemblies, fast idle cam, and connecting linkage. The thermostatic choke coil operates the choke valve through connecting linkage to provide the correct air/fuel mixture to the engine for good cold engine starting and warm-up.

The choke system operates as follows:

When the engine is cold, prior to starting, depressing the accelerator pedal to the floor opens the carburetor throttle valves. This allows the fast idle cam follower lever to clear the steps on the fast idle cam. At this point, torque from the thermostatic coil closes the choke valve and rotates the fast idle cam so that the cam follower comes to rest on the highest step of the fast idle cam. (This opening of the throttle valves also pumps a priming mist of fuel through the pump jets into the throttle bores to aid starting). During cranking, engine vacuum below the choke valve pulls fuel from the idle system and main discharge nozzles. This provides adequate enrichment for good cold starts.
When the engine is started cold, vacuum is applied to the positive acting vacuum break assembly, front or rear, opening the choke valve against tension of the thermostatic choke coil to a point where the engine will run without loading or stalling. Vacuum break diaphragm opening may be delayed through various means to delay the choke valve from opening too fast and prevent stalling. Features of vacuum break units are explained later in this section.

As the engine continues to warm-up, the thermostatic choke coil being heated by electrical resistance or hot air begins to relax, allowing the choke valve to open and the engine to run at normal air/fuel mixtures.

The fast idle cam has graduated steps so that the fast idle speed is lowered gradually during the engine warm-up period. The fast idle cam movement (and step position) is a function of choke valve position. When the engine is warm and the choke valve is completely open, the fast idle cam follower will be off the steps of the fast idle cam. At this point, the idle speed screw or solenoid controls normal (warm) engine idle speeds.

The choke system is equipped with an unloader feature which is designed to open the choke valve partially, should the engine become flooded or loaded. To unload the engine, the accelerator pedal must be depressed to the floor so that the throttle valves are held wide open. A throttle shaft lever tang contacts the fast idle cam and, through the intermediate choke shaft, forces the choke valve open slightly. This allows extra air to enter the carburetor bores and pass on into the engine manifold to lean out the fuel mixture so that the engine will start.

**VACUUM BREAK DIAPHRAGM ASSEMBLY FEATURES:**

The vacuum break assemblies used on the E2ME-E2MC models are either positive acting or time delayed vacuum diaphragm mechanisms used to control choke valve opening during engine start and warm-up. Positive acting vacuum break units respond immediately to applied vacuum. These units provide the correct choke valve opening during engine cranking and initial startup to prevent stalling or engine loading. Time delayed vacuum break units respond more slowly to applied vacuum and are usually used to open the choke valve further after a few seconds of engine operation. Timing of vacuum break units is accomplished by an integral delay valve or by restricting vacuum to the diaphragm chamber or to the unit itself.

The internal delay valve vacuum break uses an internal bleed check valve mounted inside the diaphragm chamber. Engine vacuum acting on the internal check valve bleeds air through a small hole in the valve which allows the vacuum diaphragm plunger to move slowly inward.

The vacuum restriction type vacuum break uses a small restrictor orifice in the integral vacuum tube. The restriction acts to delay engine vacuum from building up too quickly inside the diaphragm chamber. This acts to delay the inward movement of the diaphragm plunger.

Some choke systems rely on a temperature sensitive vacuum switch to control applied vacuum to the vacuum break unit itself. The Thermal Vacuum Switch (T.V.S.) is mounted in the engine air cleaner housing. With this arrangement, manifold vacuum to the T.V.S. is prevented from reaching the front or rear vacuum break unit, where applicable, until the carburetor inlet air temperature (at the air cleaner) reaches the correct temperature.

In addition to the delayed vacuum break unit which retards choke valve opening, an internal plunger (bucking spring) has been added to the vacuum break plunger on certain E2ME - E2MC models.

The purpose of the plunger (bucking spring) is to offset tension of the thermostatic coil. With the addition of the bucking spring in the vacuum break diaphragm plunger, the choke valve can be modulated through the thermostatic coil so that leaner mixtures are maintained during warmer temperatures and richer mixtures for colder temperature operation. This is accomplished in the following manner:

During extreme cold operation, the thermostatic coil has considerable more tension than during warmer temperatures; consequently, the thermostatic coil operating against the bucking spring on the vacuum diaphragm plunger compresses the plunger spring further and thus the choke valve does not open as far, allowing richer mixtures for the colder temperature. Conversely, during warmer temperatures, the thermostatic coil has less tension during the starting period so that the plunger "bucking" spring is not compressed as much and consequently, the vacuum break diaphragm plunger opens the choke valve further, supplying a leaner mixture for the warm-up period. In this manner, choke valve opening through the vacuum break diaphragm can be varied to give the correct fuel mixtures, dependent upon outside temperature.

Another feature on certain vacuum break units is a clean air purge. During engine operation, vacuum acting upon the diaphragm pulls a small amount of filtered air through a bleed hole to purge the system of any fuel vapors and dirt which may possibly enter the delay valve to disrupt choke operation. The purge also allows the
vacuum diaphragm to release quickly under low/no vacuum conditions.

The clean air purge consists of a purge filter and bleed hole located in the back (tube side) of the metal housing, or on some assemblies, beneath a rubber cover around the tube outside the metal housing.

During adjustment of the vacuum break assemblies with this feature, it will be necessary to cover the bleed hole with a piece of tape. The assemblies that use the rubber cover over the filter and bleed hole require that the cover be removed to expose the hole to be taped.

Some internal delay type vacuum break units may also have an inlet check ball located in the vacuum tube. The purpose of the inlet check ball is to prevent excess dirt and vapors from plugging the small delay valve in the diaphragm units in case of engine “backfire” or “diesel ing” conditions.

**CHOKE SYSTEM - MODEL E2ME - FIGURE 9.**

The E2ME model carburetors feature an electric choke coil mounted in an internal choke housing mounted on the side of the float bowl. This system uses electric current supplied to the choke coil combined with the offset choke valve and throttle position to control choke operation. Electric current to the thermostatic choke coil is supplied through the oil pressure switch so that the electric choke is activated only when the engine is running. The electric choke is heated by current supplied to a ceramic resistor in the electric choke assembly. This warms the thermostatic coil for precise timing of choke valve opening for good warm-up performance. Initial choke opening against choke coil tension is controlled by two vacuum break units. Some models have vacuum break units that have their operation time delayed through an internal delay valve. Some rear vacuum break units may have an internal plunger (bucking spring) for further refinement of choke valve opening. Operation and features of the vacuum break units are previously explained under the Choke System - General.

The electric choke operates as follows:

The electric choke receives an electric current operating through the engine oil pressure switch whenever the engine is running. The electric current flows to a ceramic resistor that is divided into separate sections -- a small section for gradual heating of the thermostatic coil, and a large section for rapid heating of the thermostatic coil.

**CHOKE SYSTEM - MODEL E2MC - FIGURE 10.**

The E2MC model carburetors feature an exhaust heated thermostatic choke coil mounted in an integral choke housing located on the side of the float bowl. This system uses exhaust heated air combined with intake manifold vacuum, the offset choke valve, and throttle position, to control choke operation.

Hot air is supplied to the choke housing and thermostatic choke coil through connecting tubing from an exhaust heated well, located in the intake manifold. Fresh air for the system is channeled from a source in the carburetor through connecting tubing to the manifold well where it is heated. The choke housing in this system has an integral vacuum passage that connects to the float bowl and an external connection for the “clean air tube”.

Initial choke opening against choke coil tension is controlled by two vacuum break units. Some models have vacuum break units that are time delayed through a Thermal Vacuum Switch (T.V.S.) mounted in the air cleaner housing. Some rear vacuum break units may...
have an internal plunger (bucking spring) for further refinement of choke valve opening. Operation and features of the vacuum break units are previously explained under Choke System - General.

The hot air choke operates as follows:
When the engine is started cold, manifold vacuum is applied through the connecting passage in the carburetor to the choke housing. The applied vacuum draws air from the fresh air source through the manifold well into the choke housing. As the engine warms up the air being drawn into the choke housing becomes heated in the manifold well and acts to relax choke coil tension. Thus, the choke valve is allowed to move gradually to the full open position.

CARBURETOR CALIBRATION PROCEDURE (ON CAR)

GENERAL DESCRIPTION

The Computer Command Control (CCC)* system is designed to provide precise control of carburetor air/fuel mixtures during all ranges of engine operation. The E2ME-E2MC model carburetors used with the Computer Command Control system are calibrated at the factory and normally should not need adjustment in the field. However, if necessary due to results of system diagnosis, contamination, tampering, replacement of parts, etc., it can be adjusted using the following procedures.

NOTICE: Before any attempt is made to adjust the carburetor, the following checks should have been made:

1. Normal engine tune-up items: ignition system including distributor, timing, spark plugs and wires. Check air cleaner, Evaporative Emission Systems, EFE System, PCV System, EGR Valve and engine compression. Also inspect intake manifold, vacuum hoses and hose connections for leaks, and carburetor mounting bolt torque.

2. The “Diagnostic Circuit Check” of the Computer Command Control system. Refer to vehicle manufacturer’s service manual or AC-Delco Tune-Up Specifications Manual (SD-100) for Diagnostic Circuit Check.

3. The “System Performance Check”, which should be performed BEFORE and AFTER any repairs or adjustments are made on the carburetor or any other Computer Command Control System component. Refer to vehicle manufacturer’s service manual or AC/Delco Tune-Up Specifications Manual (SD-100) for System Performance Check.

*System formerly termed Computer Controlled Catalytic Converter (C-4)

CARBURETOR CALIBRATION EXTERNAL GAGE CHECK

Mixture control solenoid travel should be checked before proceeding with any carburetor adjustments or disassembly.

Using Float Gage BT-7720 or equivalent (used to externally check float level setting), insert gage in the vertical vent “D” shaped hole in the air horn casting (next to the Idle Air Bleed Valve Cover), Figure 11. It may be necessary to file or grind material off the gage to allow it to enter the vent hole freely. Gage will be used to determine total mixture control solenoid travel.

With engine off, air cleaner removed, measure mixture control solenoid travel as follows:

Figure 11 Mixture Control Solenoid Travel
a. Insert modified float gage down "D" shaped vent hole. Press down on gage and release, observing that gage moves freely and does not bind. With gage released (Solenoid up position), reading at eye level record mark on gage (in inches) that lines up with top of air horn casting (upper edge).

b. Then, lightly press down on gage until bottomed (solenoid down position). Record in inches mark on gage that lines up with top of air horn casting.

c. Subtract gage up dimension (item "a") from gage down position (item "b") and record difference (in inches). The difference in dimensions is total solenoid travel.

d. If total solenoid travel (difference in item "c") is not within 2/32" - 4/32", make mixture control solenoid adjustments as follows. If difference is within 2/32" - 4/32", proceed to Idle Air Bleed Valve Adjustment.

3. With air horn inverted, drive lean mixture screw plug out of the air horn from bottom side using suitable punch (Fig. 13). DISCARD PLUG.

4. Reinstall air horn and new gasket on float bowl, temporarily retaining with two screws and recheck solenoid plunger travel. If travel is correct, complete assembly of air horn to bowl and proceed to step 8.

5. If solenoid travel is incorrect, remove and invert air horn assembly and remove rich mixture stop screw from bottom side of air horn using Tool BT-7967A or equivalent (Fig. 14). With rich mixture stop screw removed, drive screw plug out of air horn from bottom side using a suitable punch. DISCARD PLUG. Reinstall stop screw in air horn until screw is bottomed lightly.

6. Reinstall air horn and gasket on float bowl.

7. Insert gage in vent hole and with Tool BT-7928 or equivalent, turn stop screw clockwise until total sole-
noid plunger travel is 3/32” (see External Gage Check).

8. With solenoid plunger travel correctly set, install plugs (supplied in service kits) in air horn as follows:
   a. Install plug (hollow end down) in hole over lean mixture screw in air horn casting (Fig. 15) and, using a
      suitable punch, drive plug in air horn until upper surface of plug is even with lower edge of hole chamfer.

**NOTICE:** Plug must be installed to retain the setting of the lean mixture screw (in float bowl) and to prevent escape of fuel vapors which will upset emissions.

b. If removed, install plug (hollow end down) in air horn over rich mixture stop screw located next to the
   Idle Air Bleed Valve Cover (Fig. 15) and, using a suitable punch, drive plug in place until it is approximately
   1/16” (.062”) below the surface of the air horn casting.

**NOTICE:** Plug must be installed to retain the setting of the rich mixture stop screw (in air horn).

9. If necessary, proceed to Idle Air Bleed Valve Adjustment.

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**IDLE MIXTURE ADJUSTMENT**

1. Before proceeding:
   a. Set parking brake and block drive wheels.
   b. Disconnect and plug hoses as directed on the Emission Control Information Label under the hood.
   c. Check ignition timing as shown on the Emission Control Information Label.
   d. Connect dwell meter and tachometer as noted in the “System Performance Check”. Refer to vehicle manufacturer’s service manual or AC-Delco Tune-Up Specifications Manual (SD-100) for System Performance Check.

2. Start engine and run at idle until fully warm and a varying dwell is noted on the dwell meter. It is absolutely essential that the engine is operated for a sufficient length of time to ensure the engine coolant sensor, and the oxygen sensor in the exhaust, are at full operational temperature.

3. Check engine idle speed and compare to specifications on underhood label. If necessary, adjust curb idle speed.

4. With engine idling in drive (neutral for manual transmission), observe dwell reading on the 5 cylinder scale. If varying somewhere within the 10-50° range, adjustment is correct. If not, it will be necessary to proceed as follows. Turn engine off.

5. **Idle Air Bleed Valve Cover Removal** - To gain access to the idle air bleed valve for adjustment or servicing, it will first be necessary to remove the idle air bleed valve cover.
   a. Cover internal bowl vents and air inlets to bleed valve with masking tape or equivalent. Cover carburetor air intakes with masking tape or equivalent to prevent metal chips from entering carburetor and engine.
   b. Carefully align a #35 (.110”) drill on the steel rivet head holding the idle air bleed valve cover in place and drill only enough to remove rivet head (Fig. 16). Drill the rivet head and then use a drift and small hammer to drive the remainder of the rivets out of the idle air bleed valve cover in the air horn casting.

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**INSTALLING LEAN AND RICH MIXTURE SCREW PLUGS IN AIR HORN**

**Figure 15**

**IDLE MIXTURE AND SPEED ADJUSTMENT**

The idle mixture screws and the idle air bleed valve are sealed during original equipment production. These plugs are not to be removed unless required for cleaning or part replacement or dictated as part of recommended idle mixture adjustment procedure.

Before suspecting the carburetor as the cause of poor engine performance or rough idle, check ignition system including distributor, timing, spark plugs and wires.
service manual or AC-Delco Tune-Up Specifications Manual (9D-100) for dwell specifications. Perform this step carefully. The idle air bleed valve is very sensitive and should be turned only in 1/8 turn increments.

c. If after performing step (6), above, the dwell reading does not vary and is not within the specified range, it will be necessary to readjust the idle mixture needles (see procedure below).

7. Idle Mixture Needle Plug Removal

a. Remove carburetor from engine, following normal service procedures, to gain access to the plugs covering the idle mixture needles.

b. Invert carburetor and drain fuel in container.

c. Place carburetor on a suitable holding fixture - manifold side up.

NOTICE: Use care to avoid damaging linkage, tubes, and parts protruding from air horn.

d. Make two parallel cuts in the throttle body on either side of the locator points beneath the idle mixture needle plug (manifold side) with a hack saw (Fig. 18). The cuts should reach down to the steel plug but should not extend more than 1/8" beyond the locator points. The distance between the saw marks depends on size of the punch to be used.

e. Place a flat punch at a point near the ends of the saw marks in the throttle body. Holding the punch at a 45° angle, drive it into the throttle body until the casting breaks away, exposing the steel plug.

f. Holding a center punch vertical, drive it into the steel plug. Then holding the punch at a 45° angle, drive the plug out of the casting.
NOTICE: Hardened plug will break rather than remaining intact. It is not necessary to remove the plug completely; instead, remove loose pieces.

g. Repeat procedure for the remaining mixture needle.

8. Idle Mixture Needle Adjustment

a. Using Tool BT-7610A or BT-7610B or equivalents, turn each idle mixture needle inward until lightly seated. Then back out each mixture needle specified number of turns. Refer to vehicle manufacturer’s service manual or “D” section of Delco Carburetor Manual (9X) for specifications.

b. Reinstall carburetor, except do not install air cleaner and gasket.

c. Start engine, run until fully warm, and repeat Idle Air Bleed Valve Adjustment. If unable to set to specified dwell, and dwell is below specification, turn both mixture needles OUT an additional turn. If dwell is above specification, turn both mixture needles IN an additional turn. Then, readjust Idle Air Bleed Valve to obtain dwell limits.

NOTICE: After adjustments are complete, seal the idle mixture needle setting using silicone sealant RTV rubber or equivalent. The sealer is required to prevent tampering with the setting and to prevent the possibility of loss of fuel vapors.

9. If necessary, reset curb idle speed to specifications on underhood label.

10. Check and, if necessary, adjust fast idle speed as described on Emission Control Information Label.

11. Disconnect dwell meter and tachometer.

12. Unplug and reconnect vacuum hoses.

13. Reinstall air cleaner, and gasket.

THROTTLE POSITION SENSOR (TPS) ADJUSTMENT (ON CAR)

NOTICE: The plug covering the TPS adjustment screw (Fig. 19) is used to provide a tamper-resistant design and retain the factory setting during vehicle operation. DO NOT REMOVE the plug unless, in diagnosis, the "System Performance Check" indicates the TPS SENSOR is not adjusted correctly or it is necessary to replace the air horn assembly, float bowl, TPS sensor, or TPS adjustment screw. This is a critical adjustment that must be performed accurately and carefully to ensure proper vehicle performance and control of exhaust emissions.

If necessary to adjust the TPS sensor:

- Using a No. 48 (.076") drill, drill hole in aluminum plug covering TPS adjustment screw (Fig. 20), drilling only enough to start self-tapping screw (approximate drilling depth 1/16" to 1/8").

NOTICE: Use care in drilling to prevent damage to adjustment screw head.

- Start a #8×1/2" long self-tapping screw in drilled hole in plug, turning screw in only enough to ensure good thread engagement in hole.

- Placing a wide-blade section of screwdriver between screw head and air horn casting, pry against screw head to remove plug. DISCARD PLUG.

- Using Tool BT-7967A or equivalent, remove screw (Fig. 21).
UNIT REPAIR

GENERAL DESCRIPTION

The following procedures apply to the complete carburetor overhaul with the carburetor removed from the engine. However, in many cases, service adjustments of individual systems may be completed without removing the carburetor from the engine.

A complete carburetor overhaul includes disassembly, thorough cleaning, inspection and replacement of all gaskets, diaphragms, seals, worn or damaged parts and service adjustment of individual systems, plus restoring tamper-resistant features where applicable.

CARBURETOR DISASSEMBLY

NOTICE: Before performing any service on the carburetor, it is essential that the carburetor be placed on a holding fixture such as Tool BT-30-15. Without the use of the holding fixture, it is possible to bend or nick throttle valves.

(Wide Open Throttle Switch and Idle Speed Solenoid)

Removal

1. Remove screws securing wide open throttle switch and/or idle speed solenoid and bracket assembly to float bowl. Remove wide open throttle switch bracket, and/or idle speed solenoid and bracket assembly.

NOTICE: THE WIDE OPEN THROTTLE SWITCH AND IDLE SPEED SOLENOID SHOULD NOT BE IMMERSED IN ANY TYPE OF CARBURETOR CLEANER AND SHOULD ALWAYS BE REMOVED BEFORE COMPLETE CARBURETOR OVERHAUL.

AIR HORNS

Removal

1. Remove upper choke lever from the end of choke shaft by removing retaining screw (Fig. 22). Then rotate
5. Remove seven air horn to bowl screws and lockwashers; then remove two countersunk attaching screws located next to the venturi (Fig. 24).

6. Remove air horn from float bowl by lifting straight up. The air horn gasket should remain on the float bowl for removal later (Fig. 25).

**NOTICE:** When removing air horn from float bowl, use care to prevent damaging the solenoid connector, TPS adjustment lever, and the pull over enrichment tubes (if so equipped). These tubes are permanently pressed into the air horn casting. **DO NOT REMOVE.**
AIR HORN - DISASSEMBLY

1. Remove front vacuum break attaching screws (2) and remove vacuum break and bracket assembly (Fig. 26).

NOTICE: Do not place vacuum break assembly in carburetor cleaner.

2. Remove Throttle Position Sensor plunger (if used) by pushing plunger up through seal in air horn (Fig. 27).

NOTICE: Use fingers only to remove plunger to prevent damage to sealing surface.

3. When air horn is removed, it is necessary to remove the lean mixture screw plug from the air horn (Fig. 28). With air horn inverted, drive plug out of air horn from bottom side using suitable punch. DISCARD PLUG.

NOTICE: Do not turn rich mixture stop screw in air horn unless necessary to replace screw or the solenoid travel check; performed prior to disassembly, shows adjustment is incorrect.

If necessary to replace screw, or readjust mixture control solenoid travel during reassembly, the rich mixture stop screw can be removed using tool BT-7967A or equivalent (Fig. 29). With stop screw removed, drive plug out of air horn to gain access to the stop screw (when installed). DISCARD PLUG.

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**Figure 26** Front Vacuum Break

**Figure 27** TPS Plunger

**Figure 28** Air Horn - Bottom View (Typical)

**Figure 29** Rich Mixture Stop Screw
4. Remove pump plunger stem seal and T.P.S. plunger seal (if used), by inverting air horn and use a small screwdriver to remove staking holding seal retainer in place (Fig. 30). Remove and discard retainer and seal.

**NOTICE:** Use care in removing the T.P.S. plunger seal retainer and pump plunger stem seal retainer to prevent damage to air horn casting. New seals and retainers are required for reassembly.

Further disassembly of the air horn is not required for cleaning purposes.

The air horn assembly includes an Idle Air Bleed Valve which is preset at the factory and covered. (2) special “O” rings are used to seal the valve in the air horn.

**NOTICE:** The air horn assembly with Idle Air Bleed Valve in place, should be cleaned using only a low volatile cleaning solvent. DO NOT PLACE AIR HORN ASSEMBLY IN CARBURETOR CLEANER. To do so may damage the “O” rings sealing the Idle Air Bleed Valve.

The Computer Command Control system* is sensitive to carburetor air/fuel mixture adjustments. The rich mixture stop screw, T.P.S. adjustment screw, and Idle Air Bleed Valve in the air horn are preset at the factory during carburetor flow test. Then, plugs and covers are installed in the air horn to provide a tamper-resistant design. DO NOT REMOVE plug covering the rich mixture stop screw, T.P.S. adjustment screw or Idle Air Bleed Valve in the air horn during normal carburetor cleaning and servicing unless the Computer Command Control system* diagnosis procedures indicate the carburetor as a source of trouble for engine performance, fuel economy, and exhaust emission complaints, in which case special factory service procedures listed in the Carburetor Calibration Procedure Section, must be followed carefully. Refer to vehicle manufacturer’s service manual or AC-Delco Tune-Up Specifications Manual (SD-100) for diagnostic procedures.

1. If necessary to replace the idle air bleed valve or disassemble the air horn for immersion in carburetor cleaner, proceed as follows (See Notice, above):

a. Support air horn to prevent damage to protruding parts and carefully align a #35 (.110”) on the steel rivet head holding the idle air bleed valve cover in place. Drill only enough to remove rivet head (Fig. 31). Drill the remaining rivet head and then use a drift and small hammer to drive the remainder of the rivets out of the idle air bleed valve tower in the air horn casting.

**NOTICE:** Use care in drilling to prevent damage to the air horn casting.

b. Lift out cover over idle air bleed valve and remove remainder of rivets from inside tower in air horn casting. **DISCARD COVER AFTER REMOVAL.** A missing cover indicates the idle air bleed valve setting has been changed from its original factory setting and will require realignment on the vehicle.

c. Using a screwdriver, turn bleed valve counterclockwise to remove from air horn. Remove and discard “O” ring seals from around valve. (Fig. 32). (New “O” ring seals are required for reassembly). The idle air bleed valve is serviced only as a complete assembly.

The air horn assembly on some models also includes a lever, and an adjustment screw, used to position the Throttle Position Sensor in the float bowl when the air horn is installed. The T.P.S. adjustment screw is preset at the factory and plugged (Fig. 33).

*System formerly termed Computer Controlled Catalytic Converter
FLOAT BOWL - DISASSEMBLY (Fig. 34)

1. Holding down on pump plunger stem, raise corner of air horn gasket and remove pump plunger from pump well.

2. Remove solenoid-metering rod plunger by lifting straight up (Fig. 35).

3. Remove rubber seal from around mixture control solenoid plunger.

4. Remove air horn gasket by lifting off of dowel locating pins on float bowl.

5. Remove pump return spring from pump well.

6. On models equipped with Throttle Position Sensor (T.P.S.), remove staking holding Throttle Position Sensor in bowl as follows:

NOTICE: The plug covering the T.P.S. adjustment screw is used to provide a tamper-resistant design and retain the factory setting during vehicle operation. Do not remove the plug unless, in diagnosis, the "System Performance Check" indicated the T.P.S. sensor is not adjusted correctly or it is necessary to replace the air horn assembly, float bowl, T.P.S. sensor or T.P.S. adjustment screw. This is a critical adjustment that must be performed accurately and carefully to ensure proper vehicle performance and control of exhaust emissions. If adjustment is required, refer to Carburetor Calibration Procedure, page 14.
a. Lay a flat tool or metal piece across bowl casting to protect gasket sealing surface.

b. With a small screwdriver, lightly depress and hold T.P.S. sensor down against spring tension.

c. Using adequate safety precautions, pry upward with a small chisel or equivalent to remove bowl staking, making sure prying force is exerted against the metal piece and not against the bowl casting.

**NOTICE:** Use care not to damage the T.P.S. sensor.

d. Push up from bottom on electrical connector and remove T.P.S. and connector assembly from bowl (Fig. 36).

Remove spring from bottom of T.P.S. well in float bowl (Fig. 37).

7. Remove plastic filler block over float valve.

8. Carefully lift each metering rod out of the guided metering jet, checking to be sure the return spring is removed with each metering rod. Then remove return spring by sliding off end of rod (Fig. 38).

**NOTICE:** Use extreme care when handling these critical parts to avoid damage to metering rod and spring.

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**Figure 36** Throttle Position Sensor and Connector Assembly (Typical)

**Figure 37** T.P.S. Tension Spring

**Figure 38** Main Metering Rods and Return Springs (Typical)

**Figure 39** Solenoid Connector (Typical)
9. Remove the mixture control solenoid from the float bowl using the following procedure:

a. Remove screw(s) attaching solenoid connector to float bowl (Fig. 39). Do not remove solenoid connector from float bowl until called for (see below).

b. Using Tool BT-7928 or equivalent on upper end of lean mixture screw in float bowl, observe number of turns while turning screw clockwise until bottomed lightly (Fig. 40). RECORD NUMBER OF TURNS COUNTED FOR LATER REASSEMBLY. Then, turn screw counterclockwise and remove screw from float bowl. Carefully lift the mixture control solenoid and connector assembly from the float bowl. Do not remove plunger return spring or connector and wires from the solenoid body. The mixture control solenoid and connector are serviced only as a complete assembly.

c. If used, remove plastic aneroid cavity insert from cavity in float bowl beneath solenoid connector.

d. Remove lean mixture screw tension spring (next to float hanger pin) (Fig. 41).

10. Remove float assembly and float needle by pulling up on retaining pin. Remove needle seat and gasket using seat remover BT-3006M or equivalent (Fig. 42).

11. Remove large mixture control solenoid tension spring from boss on bottom of float bowl located between guided metering jets (Fig. 41).

12. If necessary, remove the main metering jets using special Tool BT-7928 or equivalent (Fig. 43).

NOTICE: Use care in placing tool on jet to prevent damage to the metering rod guide (upper area).
13. Remove pump discharge check ball retainer and check ball (Fig. 44).

14. Remove pump well fill slot baffle only if necessary.

15. Remove rear vacuum break hose (if used) noting tube locations for reassembly. Then remove (2) screws from bracket and rotate the assembly to remove vacuum break rod from slot in plunger head (Fig. 45).

**NOTICE:** Do not place vacuum break assembly in carburetor cleaner.

**CHOKE DISASSEMBLY**

The tamper-resistant choke cover design is used to discourage readjustment of the choke thermostatic cover and coil assembly in the field. However, it will be necessary to remove the cover and coil assembly during carburetor overhaul for complete assembly cleaning.

**Removal of Choke Cover:**

1. Support float bowl and throttle body as an assembly on a suitable holding fixture such as Tool BT-30-15.

2. Carefully align a #21 drill (.159") on rivet head and drill only enough to remove rivet head (Fig. 46). Drill the two (2) remaining rivet heads and then use a drift and small hammer to drive the remainder of the rivets out of the choke housing.

**NOTICE:** Use care in drilling to prevent damage to choke cover or housing.

3. Remove the two conventional retainers, retainer with tab (location A, Fig. 46), choke cover gasket (if used), and choke cover assembly from choke housing.

Do not remove baffle plate from beneath the thermostatic coil on the choke cover (hot air choke models).

4. Remove choke housing assembly from float bowl by removing retaining screw and washer inside the choke housing (Fig. 47). The complete choke assembly can be removed from the float bowl by sliding outward. Remove lower choke rod lever (inside bowl).

5. Remove plastic tube seal (hot air models only) from vacuum inlet boss on choke housing.

6. Remove rear vacuum break rod from intermediate choke lever.

7. To disassemble intermediate choke shaft from choke housing, remove coil lever retaining screw at end of shaft inside the choke housing. Then remove choke coil lever from flats on intermediate choke shaft. Remove intermediate choke shaft from the choke housing.
LEVER RETAINING SCREW
RETAINING SCREW AND WASHER
CHOKE COIL LEVER

Figure 47 Removing Choke Housing

by sliding outward. The fast idle cam can now be removed from the intermediate choke shaft (Fig. 48).

NOTICE: Remove the cup seal from inside the choke housing shaft hole (hot air choke models) if the housing is to be immersed in carburetor cleaner. Also, remove the cup seal from the float bowl insert for bowl cleaning purposes. DO NOT ATTEMPT TO REMOVE INSERT.

REMAINING FLOAT BOWL PARTS

Disassembly
1. Remove fuel inlet nut, gasket, check valve filter assembly and spring.
2. Remove four throttle body to bowl attaching screws

FAST IDLE CAM
TUBE SEAL—HOT AIR CHOKE MODELS
CHOKE HOUSING
CUP SEAL—HOT AIR CHOKE MODELS (LIP FACES INWARD TOWARD BOWL)

Figure 48 Choke Housing (Typical)

FAST IDLE SCREW
THROTTLE BODY ATTACHING SCREWS
THROTTLE VALVES
THROTTLE LEVER

Figure 49 Throttle Body Attaching Screws

and lockwashers and remove throttle body assembly (Fig. 49).
3. Remove throttle body to bowl insulator gasket.

THROTTLE BODY

Disassembly

NOTICE: Place throttle body assembly on carburetor holding fixture to avoid damage to throttle valves.

1. Remove pump rod from throttle lever by rotating rod until tang on rod aligns with slot in lever.
2. DO NOT REMOVE plugs covering the idle mixture needles during normal carburetor cleaning and servicing unless diagnosis indicates the carburetor is the cause of a driver complaint or emissions failure, or the idle mixture needles or throttle body must be replaced, in which case the plugs may be removed and the idle mixture adjusted on the vehicle, carefully following factory recommended procedures. (Refer to Carburetor Calibration Procedure page 12).

Further disassembly of the throttle body is not required for cleaning purposes. The throttle valve screws are permanently staked in place AND SHOULD NOT BE REMOVED. THE THROTTLE BODY IS SERVICED AS A COMPLETE ASSEMBLY.

CLEANING AND INSPECTION

Except for the air horn assembly with idle air bleed valve installed, the carburetor parts should be cleaned in a cold immersion type cleaner such as Carbon X (X-55) or its equivalent. The air horn assembly, with idle air bleed valve in place, should be cleaned using only a low volatile cleaning solvent.
NOTICE: The air horn (with bleed valve), rubber parts, electric choke, idle speed solenoid, mixture control solenoid, throttle enrichment switch, throttle position sensor, plastic parts, diaphragms, pump plunger, pump stem and TPS plunger seals, and plastic filler block should not be immersed in carburetor cleaner as they will harden, swell, or become distorted. Also, provide special protection for the metering rods, metering jets, and idle air bleed valve (if removed) when cleaning to prevent damage to these critical parts.

1. Thoroughly clean all metal parts and blow dry with compressed air. Make sure all fuel passages and metering parts are free of burrs and dirt. Do not pass drills or wire through jets.
2. Inspect upper and lower surfaces of carburetor castings for damage.
3. Inspect holes in levers for excessive wear or out of round conditions. If worn, levers should be replaced.
4. Check, repair or replace parts if the following problems are encountered.

A. FLOODING
1. Inspect float needle and seat for dirt, deep wear grooves, scores and proper seating.
2. Inspect float needle pull clip for proper installation (Fig. 55). Be careful not to bend needle pull clip.
3. Inspect float for damage or porosity, float arm and hinge pin for distortion, bends, and burrs.
4. Replace fuel inlet filter and check valve.

B. HESITATION
1. Inspect pump plunger for cracks, scores or excessive cup wear. A used pump cup will shrink when dry. If dried out- soak in fuel for 8 hours before testing.
2. Inspect pump duration and return springs for being weak or distorted.
3. Check all pump passages and jets for dirt, improper seating of discharge check ball and scores in pump well. Check condition of pump discharge check ball.
4. Check pump linkage for excessive wear; repair or replace as necessary.

C. HARD STARTING
1. Check choke valve and linkage for excessive wear, binds or distortion.
2. Inspect choke vacuum diaphragms for leaks.
3. Replace carburetor fuel filter.
4. Inspect needle for sticking, dirt, etc.
5. Examine fast idle cam for wear or damage.
6. Also check items under “Flooding”.

D. POOR PERFORMANCE - POOR GAS MILEAGE
1. Clean all fuel and vacuum passages in castings.
2. Check choke valve for freedom of movement.
3. Check metering rods for dirt, sticking, binding, damaged parts or excessive wear.
4. Check mixture control solenoid plunger for sticking, binding, damaged parts or excessive wear.
5. Inspect metering jets for being dirty, loose, worn or damaged.
6. Check idle air bleed valve for sticking, binding, dirt, damaged or missing “O” rings.
7. Check T.P.S. sensor plunger for sticking, binding, or improper adjustment. Plunger must move freely in seal in air horn.

E. ROUGH IDLE
1. Inspect gasket and gasket mating surfaces on castings for damage to sealing beads, nicks, burrs and other damages.
2. Clean all idle fuel passages.
3. If removed, inspect idle mixture needle for ridges, burrs or being bent.
4. Check idle air bleed valve for sticking, binding, dirt or missing “O” rings.
5. Check throttle lever and valves for binds, nicks and other damage.
6. Check all diaphragms for possible ruptures or leaks.
7. Clean plastic parts only in a stoddard solvent - never in gasoline.

CARBURETOR ASSEMBLY
THROTTLE BODY
Assembly
1. Install lower end of pump rod in throttle lever by aligning tang on rod with slot in lever. End of rod should point outward toward throttle lever.
2. If removed- install idle mixture needles, washers (if used), and springs. Lightly seat each needle and then
back out specified number of turns. Refer to vehicle manufacturer's service manual or "D" section of Delco Carburetor Manual (9X) for specifications. Final idle mixture adjustment must be made on car using the procedures described under Carburetor Calibration Procedure (page 12).

FLOAT BOWL
Assembly

NOTICE: If a new float bowl assembly is used, stamp or engrave the model number on the new float bowl (Fig. 50).

1. Install new throttle body to bowl insulator gasket over two locating dowels on bowl.
2. Install throttle body making certain throttle body is properly located over dowels on float bowl; then install (4) throttle body to bowl screws and lockwashers and tighten evenly and securely (Fig. 49).
3. Place carburetor on proper holding fixture such as BT-30-15.

![Figure 50 Carburetor Identification](image)

4. Install fuel inlet filter spring, check valve filter assembly, new gasket and inlet nut (Fig. 51) and tighten nut to 24 N.m (18 ft. lbs.).

NOTICE: When installing a service replacement filter, make sure the filter is the type that includes the check valve to meet U.S. motor vehicle safety standards (M.V.S.S.). General Motors service replacement filters with check valve meet this requirement.

NOTICE: When properly installed, hole in filter faces toward inlet nut. Ribs on closed end of filter element prevent filter from being installed incorrectly unless forced. Tightening beyond specified torque can damage nylon gasket to cause fuel leak.

CHoke HOUSING TO FLOAT BOWL
Assembly

1. Install new cup seal into insert on side of float bowl for intermediate choke shaft. Lip on cup seal faces outward.
2. Install new cup seal into choke housing shaft hole (hot air choke models). Lip on seal faces inward, toward float bowl (Fig. 48).
3. Install fast idle cam onto the intermediate choke shaft (steps on cam face downward).
4. Carefully install fast idle cam and intermediate choke shaft assembly in choke housing, then install thermostatic coil lever onto flats on intermediate choke shaft. Inside thermostatic choke coil lever is properly aligned when both inside and outside levers face toward fuel inlet (Fig. 48). Install inside lever retaining screw into end of intermediate choke shaft. Tighten securely.
5. On hot air choke models, insert plastic tube seal (to float bowl) in vacuum inlet hole on choke housing (Fig. 48).
6. Install rear vacuum break rod in hole in intermediate choke lever. End of rod faces toward choke housing when installed properly (Fig. 52).
7. Install lower choke rod lever into cavity in float bowl. Install choke housing to bowl sliding intermediate choke shaft into lower choke rod lever (Fig. 53).

Tool BT-6911 or equivalent can be used to hold the lower choke lever in correct position while installing the choke housing.

The intermediate choke shaft lever and fast idle cam are in correct position when the tang on lever is beneath the fast idle cam. Do not install choke cover and coil assembly until inside coil lever is adjusted. (Refer to...
4. If removed, carefully install main metering jets in bottom of float bowl using Tool BT-7928 or equivalent (Fig. 43).

**NOTICE:** Use care installing jets to prevent damage to metering rod guide.

5. Install large mixture control solenoid tension spring over boss on bottom of float bowl (Fig. 41).

6. Install needle seat assembly, with gasket, using seat installer BT-3006M or equivalent (Fig. 42).

7. To make adjustment easier, carefully bend float arm upward at notch in arm before assembly.

8. Install float needle onto float arm by sliding float lever under needle pull clip. Correct installation of the needle pull clip is to hook the clip over the edge of the float on the float arm facing the float pontoon (Fig. 55).

**NOTICE:** Do not install float needle pull clip into holes in float arm.

9. Install float hinge clip into float arm with end of loop of clip facing pump well. Then, install float assembly by aligning needle in the seat and float hinge clip into locating channels in float bowl.

10. Carefully adjust float level following procedures and specifications listed in vehicle manufacturer's service manual or "D" section of Delco Carburetor Manual (9X).

11. If used, install plastic cup insert (that goes beneath the mixture control solenoid connector) in float bowl cavity, aligning recess at bottom of bowl cavity. Notch in insert faces notched section in bowl casting. (Fig. 56).

12. Install lean mixture screw tension spring between raised bosses next to float hanger clip (Fig. 41).

13. Install mixture control solenoid and connector assembly as follows:

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**COMPLETION OF FLOAT BOWL ASSEMBLY**

1. Install end of vacuum break rod in slot in rear vacuum break plunger (Fig. 54). Then, install rear vacuum break and bracket assembly to float bowl using two large countersunk attaching screws. Tighten screws securely.

2. If removed, install baffle inside of pump well with slot toward bottom.

3. Install pump discharge check ball and retainer screw in passage in float bowl next to pump well (Fig. 44). Tighten screw securely.

---
NOTICE: Overtightening lean mixture screw may break screw head.

d. From bottomed position, turn lean mixture screw counterclockwise until the screw is backed out number of turns noted during disassembly. If solenoid plunger travel was incorrect when checked before disassembly or if tampering is suspected, the lean mixture must be reset. Refer to vehicle manufacturer's service manual or "D" section of Delco Carburetor Manual (9X) for specifications.

14. Align solenoid wires with notch in plastic insert and connector lugs with recesses in bowl; then, install connector attaching screw(s) (Fig. 39). Tighten securely.

NOTICE: Overtightening screw could damage connector.

15. Install Throttle Position Sensor return spring in bottom of well in float bowl (Fig. 37).

16. Install Throttle Position Sensor and connector assembly in float bowl by aligning groove in electrical connector with slot in float bowl casting. Push down on connector and sensor assembly so that wires are located below bowl casting surface. (Fig. 36).

17. Install plastic filler block over float valve, pressing downward until properly seated (flush with bowl casting surface).

18. Slide metering rod return spring over metering rod tip until small end of spring stops against shoulder on rod (Fig. 38). Carefully install metering rod and spring assemblies through holes in plastic filler block and gently lower the metering rods into the guided metering jets.

NOTICE: Do not force metering rod down in jet. Use extreme care when handling these critical parts to avoid damage to rod and spring.

19. Install pump return spring in pump well.

20. Install pump plunger assembly in pump well.

21. Holding down on pump plunger assembly against return spring tension, install air horn gasket by aligning pump plunger stem with hole in gasket, and aligning holes in gasket over Throttle Position Sensor (where applicable), metering rods, solenoid attaching screws and electrical connector. Position gasket over two dowel locating pins on the float bowl.

22. Install large rubber seal over the mixture control solenoid connector (Fig. 34).

23. Holding down on air horn gasket and pump plunger assembly, install the solenoid-metering rod plunger in the solenoid, aligning slot in end of plunger with solenoid attaching screw (Fig. 35).

Check to be sure plunger arms engage top of each metering rod.

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Figure 56 Installing Cavity Insert

a. Carefully lower solenoid into the float chamber, aligning pin on end of solenoid with hole in raised boss at bottom of bowl. Align solenoid connector wires to fit in slot in plastic insert.

b. Install lean mixture screw through hole in solenoid bracket and tension spring in bowl. Start screw in bowl making sure of proper thread engagement.

c. Using Tool BT-7928 or equivalent or suitable wrench, turn lean mixture screw clockwise until solenoid is bottomed lightly in bowl, making sure arms on solenoid bracket clear and raised bosses in float bowl (Fig. 40).
AIR HORN

Assembly

1. Install new pump plunger stem seal and retainer in air horn casting. Lip on seal faces upward, toward top of air horn. Lightly stake seal retainer in three places, choosing locations different from the original stakings.

2. If used, install new Throttle Position Sensor plunger seal and retainer in air horn casting. Lip on seal faces upward, toward top. Lightly stake seal retainer in three places, similar to pump stem seal.

3. If removed, install rich mixture stop screw from bottom side of air horn until screw is bottomed lightly using Tool BT-7967A or equivalent (Fig. 29).

NOTICE: The rich mixture stop screw must be reinserted following procedures for Carburetor Calibration (page 11).

4. If removed, install idle air bleed valve in air horn using the following procedure:

a. Install new "O" ring seals (2) on air bleed valve body, checking to be sure "O" rings seat in grooves (Fig. 57).

b. Install idle air bleed valve in air horn and, using a screwdriver that fully fits the slot, turn the bleed valve clockwise until valve is lightly seated in air horn.

c. From bottomed position, turn bleed valve counterclockwise until the valve is backed out of the air horn four (4) turns.

NOTICE: Final adjustment of the idle air bleed valve must be made on the vehicle. Refer to Carburetor Calibration Procedure (page 12).

AIR HORN TO BOWL

Installation

1. Carefully lower air horn assembly onto float bowl while positioning the T.P.S. adjustment lever over the T.P.S. sensor, and guiding pump plunger stem through seal in air horn casting. To ease installation, insert a thin screwdriver between air horn gasket and float bowl to raise the T.P.S. adjustment lever (Fig. 58) to position it over the T.P.S. sensor. Make sure that the Pull Over Enrichment tubes (if used) are positioned properly through the holes in the air horn gasket. Do not force the air horn assembly onto bowl.

2. Install (7) air horn attaching screws and lockwashers and (2) countersunk screws located next to the carburetor venturi. Tighten all screws evenly and securely following air horn screw tightening sequence (Fig. 59).

3. Install front vacuum break control and bracket assembly to air horn using two retaining screws through the bracket. Tighten screws securely (Fig. 26). Do not attach vacuum hose on vacuum break assembly until adjustment has been completed.

4. Install T.P.S. actuator plunger in air horn (if used), by carefully pushing plunger through seal in air horn until seated against T.P.S. stem. Check that plunger moves freely.
5. It will be necessary to install a new lean mixture screw plug and a rich mixture stop screw plug (if removed) following mixture control solenoid plunger travel adjustment. Refer to Carburetor Calibration Procedure (page 11).

6. Connect upper end of pump rod to pump lever by placing rod in specified hole in lever, noted at disassembly. Place lever between raised bosses on air horn casting, making sure lever engages T.P.S. actuator plunger (if used) and the pump plunger stem. Align hole in pump lever with holes in air horn casting bosses (using a small drift or rod the diameter of the pump lever roll pin will aid alignment). With a diagonal (sidecutter) pliers, pry the roll pin through enough to insert a thin bladed screwdriver between the end of the roll pin and the air cleaner locating boss (Fig. 60). Using a screwdriver, push pump lever roll pin back through casting until end of pin is flush with casting bosses on air horn.

**NOTICE:** Use care installing the roll pin to prevent damaging pump lever bearing surface and casting bosses.

7. Connect choke rod into lower choke lever inside bowl cavity; then install choke rod into slot in upper choke lever and retain the choke lever to the end of the choke shaft with attaching screw. Tighten securely (Fig. 22). Make sure that the flats on the end of the choke shaft align with flats in the choke lever.

**NOTICE:** The choke coil pick-up lever (inside the choke housing) must be indexed properly and the front and rear vacuum breaks, fast idle cam (choke rod) must be adjusted before installing the choke cover and coil assembly. Refer to the adjustment procedures and specifications in vehicle manufacturer’s service manual or “D” section of Delco Carburetor Manual (92X).

8. After the vacuum break, fast idle cam, and inside thermostatic coil lever are adjusted, install the cover and coil assembly in choke housing as follows:

   a. Place cam follower on highest step of fast idle cam.

   b. Install the thermostatic cover and coil assembly, and gasket (if used), in the choke housing, making sure coil tang engages choke coil lever (Fig. 61).

   **NOTICE:** On E2ME models, ground contact for the electric choke is provided by a metal plate located at the rear of the choke cover assembly. Do not install a choke cover gasket between the electric choke assembly and the choke housing.

   c. Align notch in choke cover with locating retainer.
**EXPLODED VIEW PART DESCRIPTION**

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</tbody>
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**FIGURE 62** Installing Replacement Retainer Rivets

- Install blind rivet through retainer into choke housing using riveting tool.
- Install the remaining (2) retainers and blind rivets, similarly.
- Install vacuum hoses (if used) from vacuum break assemblies to correct tube locations on the carburetor.
- Position solenoid-bracket assembly and/or wide open throttle switch-bracket assembly on float bowl; retaining with two large countersunk screws. Tighten screws securely.