

CARTER THERMO-QUAD (FORD) 4-BARREL

FORD MOTOR CO.

Ford Carb. No.
Auto. Trans.

Application ①
460" (Exc. Mk IV & Lincoln)..... D4AE-BC

① — Some 460" models use Motorcraft 4300 Carburetor. See Motorcraft 4300 4-Bbl. Carburetor in this section.

DESCRIPTION

Carburetor has three main parts; air horn, main body, and throttle body. Air horn houses choke valve, air valve for secondaries, fuel inlet system, accelerator pump system, primary boost venturis, vacuum controlled step-up piston and metering rods, and low and high speed fuel metering system.

Main body houses primary jets and is constructed of Phenolic plastic resin (for cooler fuel temperatures). Throttle body houses throttle valves and linkage, initial choke pull-down diaphragm, and delayed choke pull-down diaphragm. Initial choke pull-down diaphragm operates by manifold vacuum and is connected to secondary air valve. It functions to provide positioning of air valve within air horn, as choke unloader, when throttles are wide open, and as a restraint for secondary air valve opening.

ADJUSTMENTS

Adjustments should be made in sequence listed. Nearly all adjustments can be made either on or off car. However, carburetor must be removed to adjust secondary throttle link and automatic choke linkage.

SECONDARY THROTTLE LINKAGE

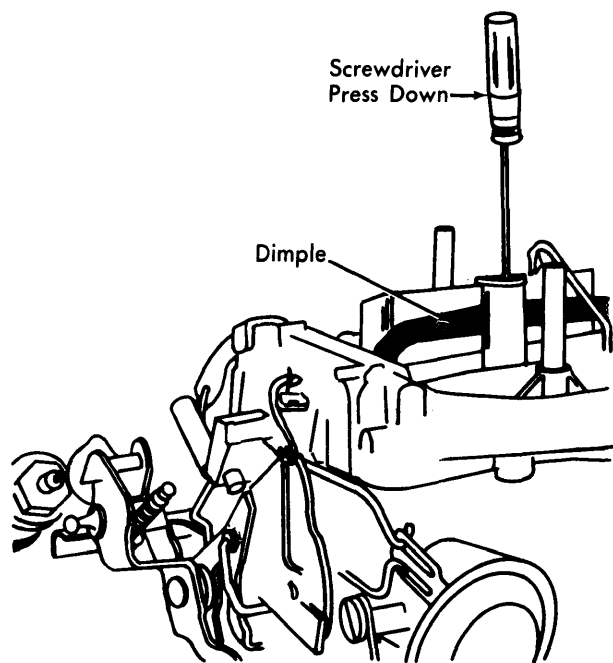
Block choke valve in wide open position, invert carburetor, and rotate throttle shaft to wide open position. Wide open stops on both primary and secondary throttle shafts should contact stops, on throttle body housing, at same time.

METERING RODS

1) With throttle solenoid positioner (TSP) disconnected, solenoid idle speed adjusting screw backed off to allow full throttle plate closure, and choke valve wide open, insert small screwdriver in slot of step-up piston actuating rod and press downward to bottom of travel.

2) Turn adjusting screw counterclockwise until piston is in full down position. Now turn screw clockwise 1½ turns. *NOTE — This is only preliminary adjustment and may be modified as follows:*

3) If engine response is unacceptable, turn actuating rod clockwise to raise piston (richer) or counterclockwise (leaner) to lower. Check operation of mechanical linkage by raising and lowering rod (open and close throttle). If rod does not bind, adjustment is satisfactory.

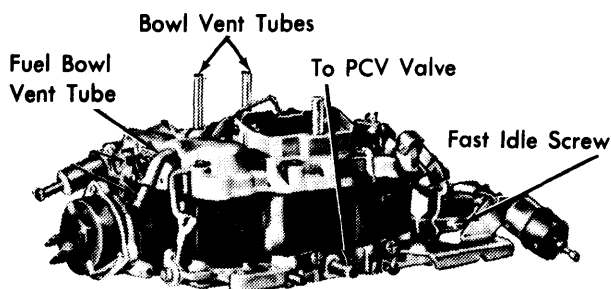


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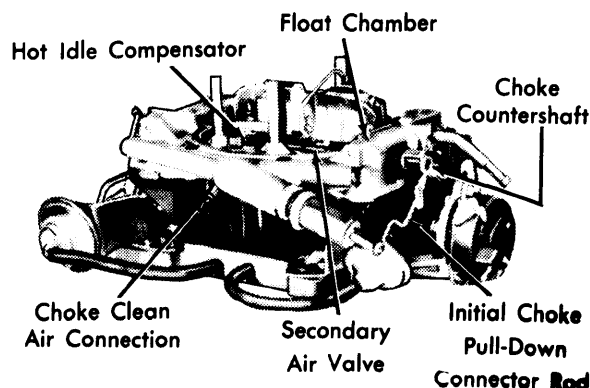
METERING ROD ADJUSTMENT

SECONDARY AIR VALVE OPENING

With air valve in closed position, opening between long side of air valve and air horn gasket should be maximum and parallel. With air valve in wide open position, opening at air valve on short side and air horn should be to specifications for particular carburetor involved. Corner of air valve is notched for adjustment. Bend corner to provide proper opening.

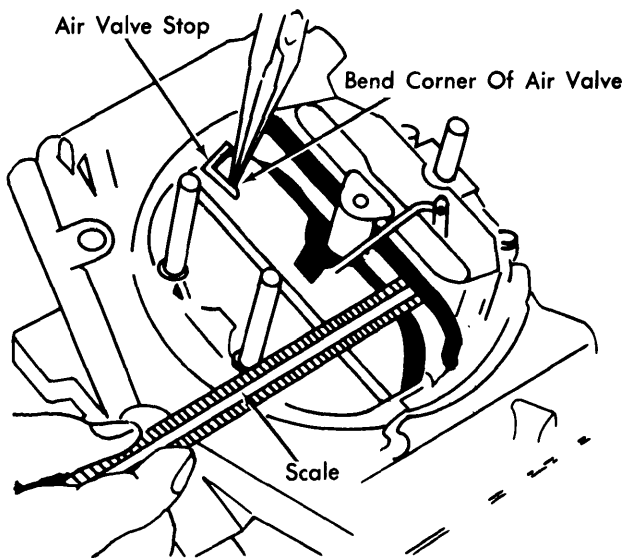


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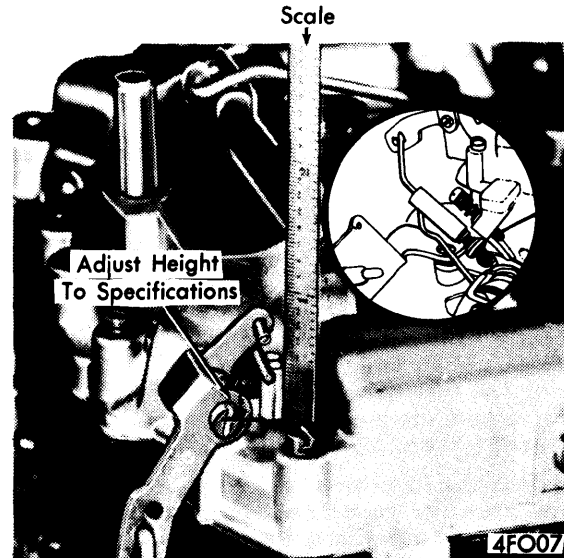
CARTER THERMO-QUAD CARBURETOR (TYPICAL)

CARTER THERMO-QUAD (FORD) 4-BARREL (Cont.)



ADJUSTING AIR VALVE OPENING

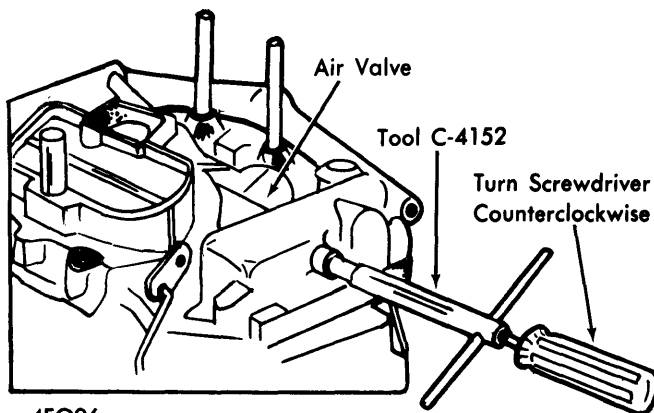
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ADJUSTING ACCELERATOR PUMP STROKE

SECONDARY AIR VALVE TENSION

Using a hollow handle wrench (Carter C-4152) loosen air valve lock plug. Using long handle screwdriver (through handle of wrench) turn plug counterclockwise until air valve lightly contacts stop, then turn additional $1\frac{1}{4}$ turns. Hold adjustment plug with screwdriver and tighten lock plug with wrench, making sure adjustment does not move. Test valve for freedom of movement.



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ADJUSTING AIR VALVE SPRING TENSION

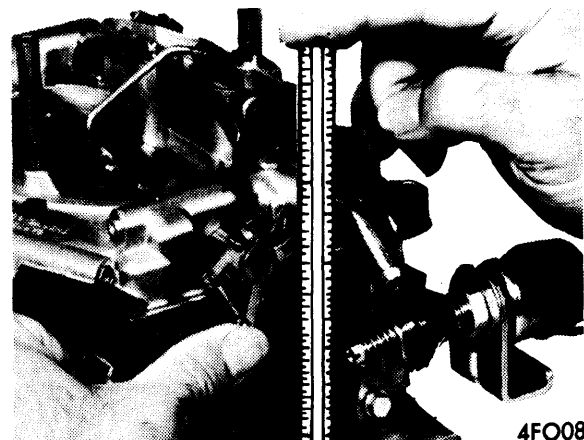
ACCELERATOR PUMP STROKE

Move choke valve to wide open position, to release fast idle cam. Back off idle speed adjusting screw (curb idle) until throttles are seated in bores. Make sure throttle connector rod is installed in specified hole of accelerator pump arm. Close choke valve tightly and measure distance between top of bowl cover and end of plunger shaft. This measurement should be as specified. If necessary to adjust, bend throttle connector rod at lower angle until correct travel is obtained.

CHOKE CONTROL LEVER ADJUSTMENT

NOTE — This adjustment must be made off car.

Place carburetor on flat object, with surface flush against bottom of flange and extending out under choke control lever. Close choke valve by pushing on choke lever. With throttle partially open, measure distance from top of rod hole (in control lever) down to flat surface. This dimension should be as specified. Adjust by bending link connecting choke shaft to secondary air valve.



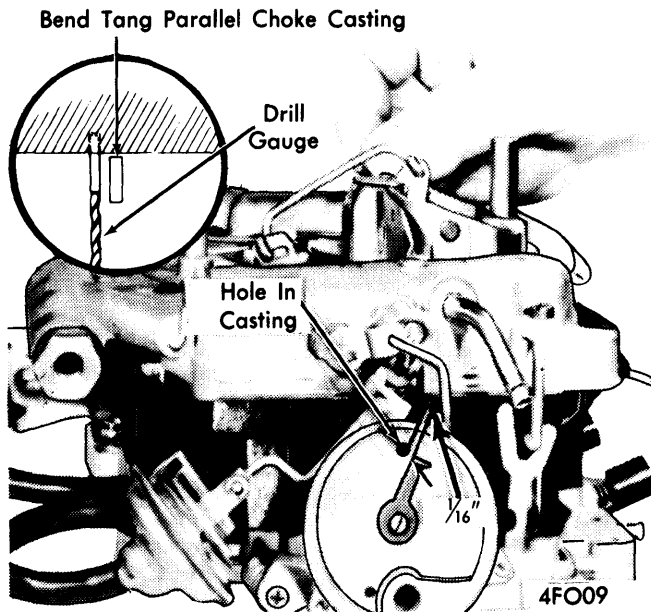
ADJUSTING CHOKE CONTROL LEVER

CHOKE CONTROL LEVER CONNECTING ROD

NOTE — This adjustment is made with choke thermostat housing, spacer and gasket removed.

- 1) Open throttle so that choke may be held in full closed position. Observe position of choke operating lever inside housing. With light pressure to right (clockwise) on lever, edge of lever should be $\frac{1}{16}$ " from edge of hole in casting.
- 2) Adjust clearance by bending choke control lever connecting rod at upper bend. Install choke baffle plate with dimple in manifold heat hole and slot over operating lever. Be sure tang is free to allow full travel. Install thermostat housing, gasket and adjust to specifications.

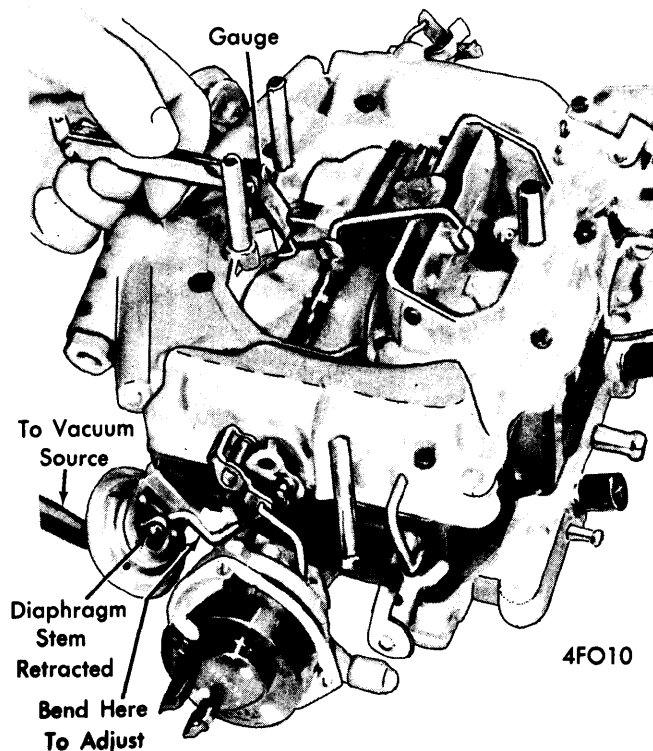
CARTER THERMO-QUAD (FORD) 4-BARREL (Cont.)



PROPER CHOKE OPERATING LEVER POSITION

CHOKE DIAPHRAGM CONNECTING ROD (SECONDARY AIR VALVE CONTROL)

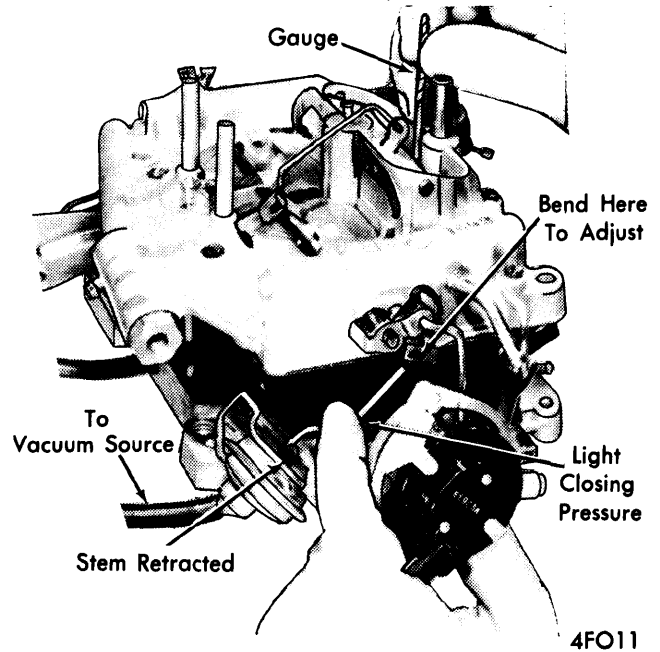
Make sure diaphragm is securely mounted to carburetor. Apply vacuum to diaphragm, to fully retract stem. With air valve closed, adjust connector rod to provide specified clearance between air valve and stop.



INITIAL CHOKE PULL-DOWN TO AIR VALVE CONNECTOR ROD ADJUSTMENT

INITIAL CHOKE PULL-DOWN

- 1) Position choke at fully closed position, with fast idle speed adjusting screw on top step. Disconnect diaphragm vacuum supply hose at carburetor end and connect vacuum supply of at least 10 in. Hg, making sure diaphragm is securely mounted to carburetor.
- 2) Insert specified drill size between long side of choke valve and air horn wall on accelerator pump side of carburetor. Apply sufficient closing force to extend spring between choke lever tang and adjusting lever tang, but do not distort choke valve. A slight drag should be felt when drill is withdrawn (if choke pull-down is correct). If adjustment is necessary bend tang on choke adjusting lever.
- 3) With no vacuum applied, choke valve should move freely from open to closed. If not, check for misalignment or interference, and correct as necessary.



INITIAL CHOKE PULL-DOWN ADJUSTMENT

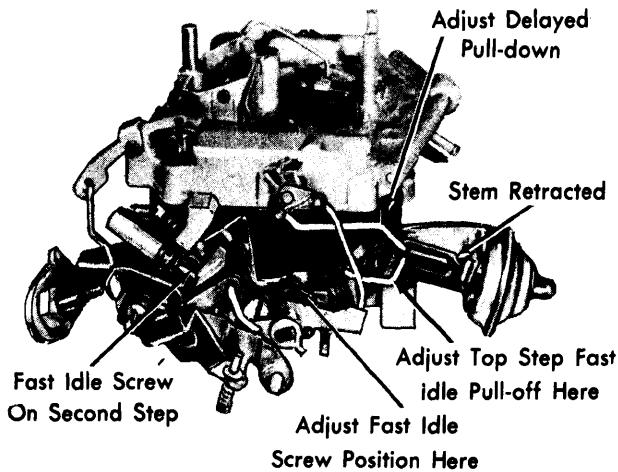
TOP STEP FAST IDLE PULL-OFF

NOTE — Delayed Vacuum Diaphragm stem must be fully retracted to adjust. Use vacuum source of at least 10 in. Hg.

- 1) Disconnect top (delayed choke pulldown) control lever at choke counter shaft. Open throttle enough to position fast idle adjusting screw on top step of fast idle cam. Disconnect delayed vacuum diaphragm supply hose at carburetor and connect auxiliary vacuum supply. Using a stop watch or other timing device, measure time it takes to fully retract vacuum diaphragm. If not within specifications check carburetor passages and supply hose for obstructions and/or replace diaphragm.
- 2) With stem fully retracted, lower control rod should be seated in end of stem slot, intermediate lever should be touching secondary throttle shaft, and fast idle adjusting screw should be on second step of fast idle cam. If necessary, adjust intermediate lever position by bending lower control rod at bend. Adjust fast idle screw position by bending tang of fast idle lever where it contacts intermediate lever. Cycle fast idle pull-off and again check adjustment.

1974 Carter Carburetors

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FAST IDLE PULL-OFF ADJUSTMENT

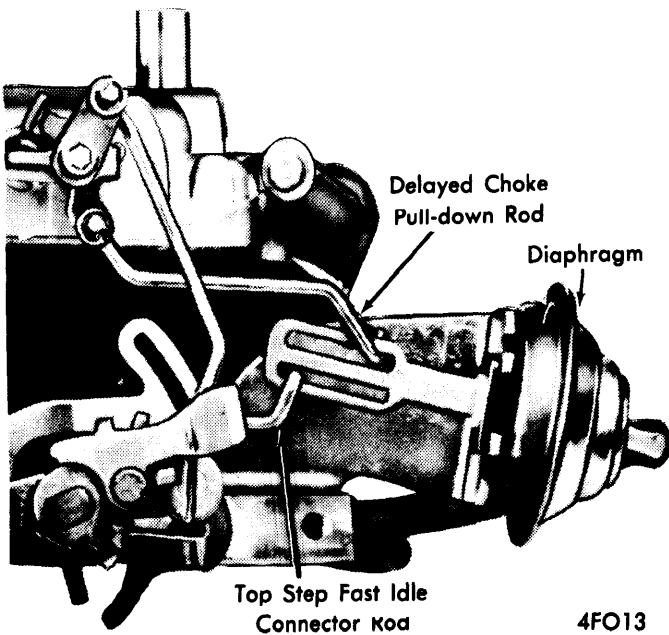
DELAYED CHOKE PULL-DOWN

NOTE — Upper rod of delayed vacuum diaphragm controls pull-off of choke valve. Use vacuum source of at least 10 in. Hg.

1) Disconnect control lever from initial choke pulldown diaphragm, at choke countershaft. Disconnect initial pulldown diaphragm hose and plug vacuum port. Disconnect delayed vacuum diaphragm supply hose and connect external vacuum supply.

2) Insert specified drill size between long side of choke valve and air horn wall, on accelerator pump side. Apply sufficient closing pressure to extend spring between choke lever tang and adjusting lever tang, but not enough to distort choke valve.

3) If clearance is correct a slight drag will be felt when drill is withdrawn. If necessary to adjust, bend upper control rod.

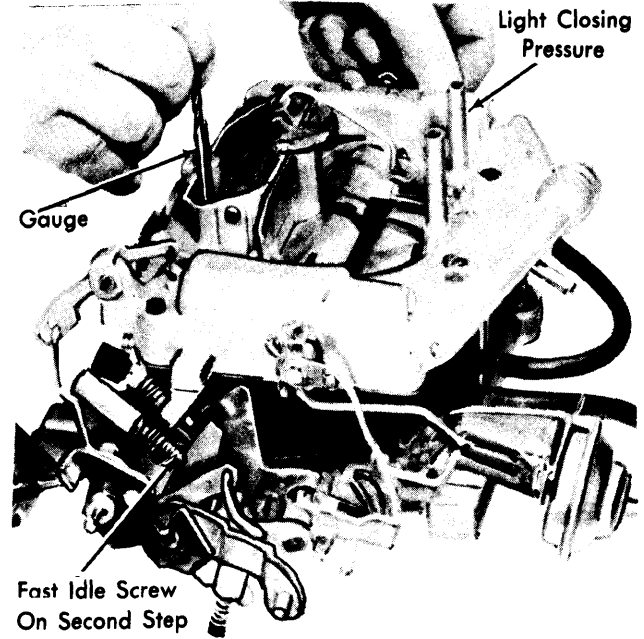


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ADJUSTING DELAYED CHOKE DIAPHRAGM

FAST IDLE CAM & LINKAGE

With fast idle screw on second step of fast idle cam and against shoulder of first step, adjust fast idle connector rod to obtain correct opening between air horn wall and lower edge of choke valve.

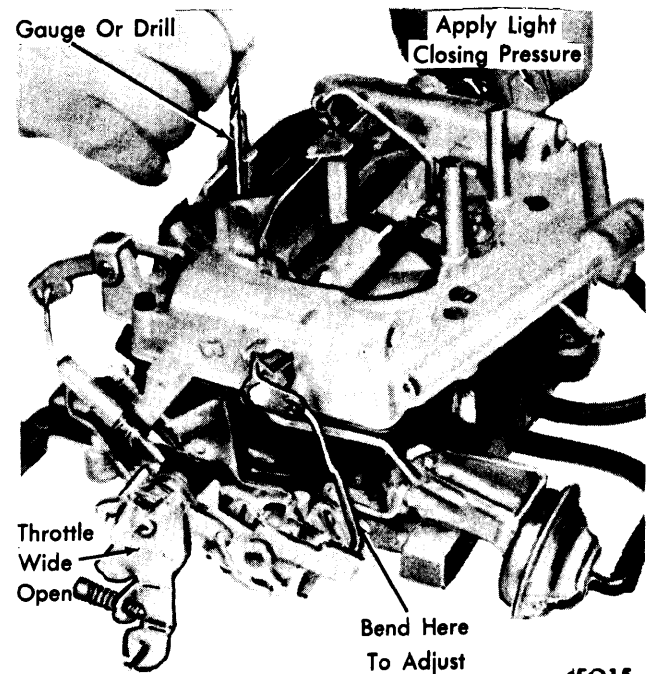


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ADJUSTING FAST IDLE LINKAGE

CHOKE UNLOADER/WIDE OPEN THROTTLE

With throttle in wide open position, insert specified drill between choke valve lower edge and air horn wall on accelerator side of carburetor.



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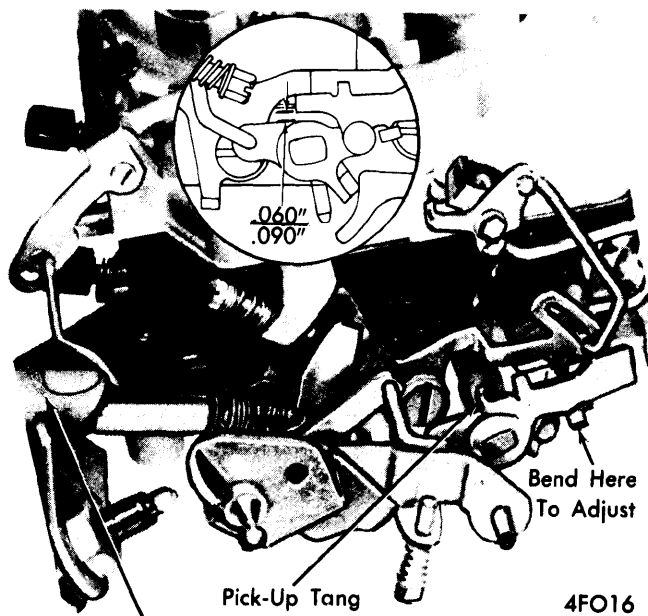
ADJUSTING CHOKE UNLOADER

CARTER THERMO-QUAD (FORD) 4-BARREL (Cont.)

SECONDARY THROTTLE PICKUP LEVER

1) Since secondary throttle pickup lever is designed to prevent operation of secondary throttle plates until choke is completely open, all adjustments should be made with choke lever in fully open position. With control lever in fully open position, measure distance between pickup lever and its stop.

2) If clearance is not to specifications, bend outer tang on fast idle operating lever to adjust. Cycle throttle to make sure that pickup lever is operating properly.

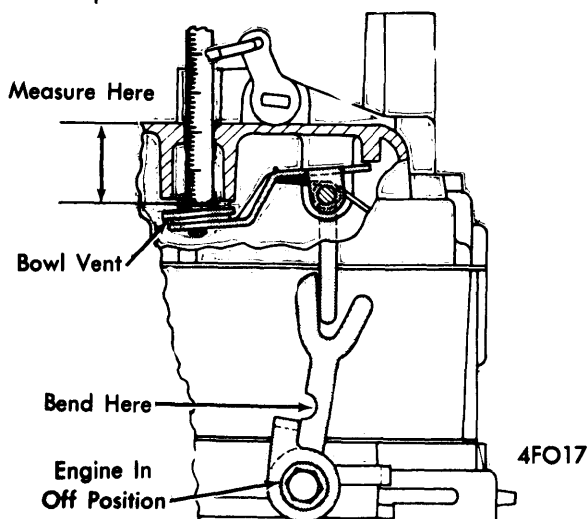


Light Downward Pressure

ADJUSTING SECONDARY THROTTLE PICK-UP LEVER

FUEL BOWL VENT VALVE

Remove inspection hole plug from fuel bowl cover and set throttle at curb idle position (solenoid extended). Insert narrow scale into checking hole to make light contact with spring-loaded valve. If distance is incorrect, bend vent operating lever to adjust.



ADJUSTING BOWL VENT VALVE

IDLE SPEED

NOTE — In order to comply with emission standards, specifications shown on engine compartment emission control tune-up decal must be used in all instances. Decal information should be considered the most valid information available.

Preparations For Adjustments — Block wheels and apply parking brake. Start and warm engine to normal operating temperature. Set timing and idle. Turn mixture screw to its full rich stop. Remove air cleaner, disconnect and plug evaporator canister to air cleaner hose. Disconnect A.I.R. at check valve.

Adjustment — With solenoid energized (if equipped), adjust solenoid screw, or if not equipped with solenoid adjust carburetor idle speed screw to obtain specified idle RPM. De-energize solenoid (if equipped), place automatic transmission in "N" and adjust idle screw to obtain 500-550 RPM. Connect solenoid wire and allow solenoid plunger to extend. On all models, stop engine, replace air cleaner and connect all vacuum hoses. Restart engine and check idle RPM. Readjust solenoid (if equipped) or idle speed screw and idle mixture screws (within range of limiters) to obtain smoothest idle RPM at correct CO level and at specified idle RPM.

IDLE MIXTURE (EXHAUST GAS ANALYZER PROCEDURE)

NOTE — Do not allow engine to idle more than two minutes, at one time. If adjustments take longer, raise engine speed to 2000 RPM to stabilize engine temperature, then continue adjustments.

1) Preparations for adjustments must be completed. See *Idle Speed*. Connect and calibrate exhaust gas analyzer. Place automatic transmission in "D" or manual transmission in Neutral. If idle CO level is not within specified limits, recheck meter calibrations.

2) If idle CO level is still not within specifications, remove air cleaner and idle mixture limiter caps. Adjust mixture screws equally to obtain specified CO level and immediately readjust idle speed to specifications, if necessary. Install air cleaner and recheck CO level. If necessary repeat adjustment procedure until correct CO level is obtained at specified idle RPM. Install new (blue) service limiter caps on screws.

UNIVERSAL CARBURETOR ADJUSTMENTS

Application	Spec.
Bowl Vent Valve .....	.90±.020"
Delayed Pull-Down .....	.200"
Kickdown Pull-Off Index .....	.130"
Delayed Pull-Off Timing	3-10 Sec.
Diaphragm Adjustment (Air Valve Clearance) .....	.040"
Pump Rod Position	Inner
Air Valve Setting .....	.468"

CARTER THERMO-QUAD (FORD) 4-BARREL (Cont.)

CARBURETOR ADJUSTMENT SPECIFICATIONS								
Carter Carb. No.	Idle Speed (Engine RPM)		Fast Idle Cam Position	Vacuum Kick	Accel. Pump Stroke ^①	Choke Unloader Setting	Float Setting	Auto. Choke
	Hot	Fast						
D4AE-BC	650±15	.....	.099"	.150"	$\frac{5}{16}$ "	.250"	1 $\frac{1}{16}$ "	Index

① — From top of bowl cover to bottom of "S" link, with solenoid disconnected.

OVERHAUL

DISASSEMBLY

Carburetor — 1) Remove rod retainers holding throttle connector rod to accelerator pump arm and throttle lever, remove rod from carburetor. Remove accelerator pump arm screw and disengage from pump rod "S" link (leave "S" link connected to pump rod) and remove lever. Disengage lever from countershaft, then swing fast idle connector rod at an arc until it can be freed from fast idle operating lever.

2) Remove rod retainers and washer holding choke diaphragm connector rod to choke vacuum diaphragm and air valve lever, then remove lever. Remove rod retainer holding choke connector rod to choke countershaft, then disengage rod and swing rod at an arc to free choke shaft lever assembly.

3) Remove step-up piston cover plate attaching screw and cover plate, then remove step-up piston and link assembly with step-up rods. Remove step-up piston spring. Remove pump jet housing screw, housing with gasket, and then invert carburetor and remove discharge check needle. Remove ten screws, two of the bowl cover screws are located between choke valve and wall of bowl cover, remove bowl cover and invert on bench to protect floats.

Bowl Cover — 1) Remove float lever pins and lift out float assemblies, mark float removed from pump side so that floats may be reinstalled in their respective positions. Remove two needle valves from their locations, mark needle valve removed from pump side to aid in reassembly, then using a wide blade screwdriver, remove needle valve seats. Be sure each needle valve is returned to its original seat at reassembly.

2) Remove secondary jets (small screwdriver slots). Remove acceleration pump passage tube (plastic). Remove accelerator pump rod "S" link, using a small rod placed on upper end of plunger shaft and tapping lightly with a small hammer. **CAUTION** — Use care not to damage plunger shaft hole in bowl cover, place fingers under lower portion of pump cylinder in order to catch intake check seat, disc, disc retainer, spring (light) and spring (heavy).

3) If plunger can be reused, place in a jar of clean gasoline or kerosene to prevent leather from drying out. Note position of bowl vent connector rod and arm spring before removing retainer clip from connector rod, then remove rod from bowl vent operating arm. Remove grommet seal from operating arm, then remove fuel inlet fitting and gasket.

Throttle Body — 1) Remove choke diaphragm and bracket assembly, with hose, and place aside for special cleaning (liquid cleaners may damage diaphragm material). **NOTE** —

Carburetor vacuum fitting hides a very small vacuum passage restriction, clean passage only with compressed air.

2) Remove hot idle compensator valve and gasket. Remove plastic limiter caps from idle air mixture screws, being sure to count the number of turns to seat screws (from stop), as the same number of turns must be maintained at reassembly. Remove idle mixture screws and springs. **NOTE** — It is not recommended that throttle shafts or valves be removed unless wear or damage necessitates the installation of new parts.

CLEANING & INSPECTION

Check all parts for wear or damage, replace as necessary. Check all passages for restrictions. Be sure choke and throttle shafts are not bent or scored, replace any broken or distorted springs. Clean all parts thoroughly, but do not immerse main body for prolonged periods of time.

REASSEMBLY

Using all new gaskets, reverse disassembly procedures and note the following:

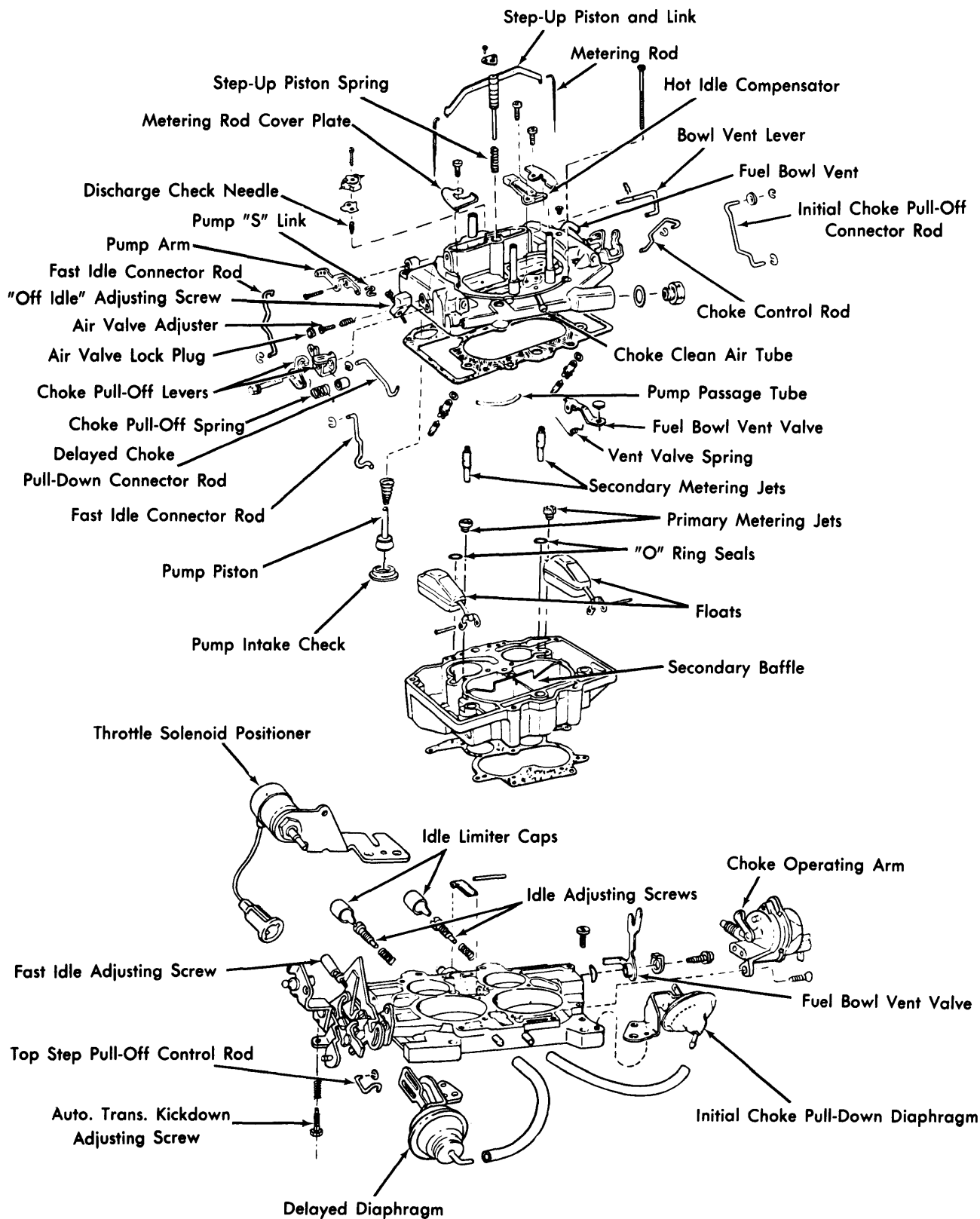
Valve Installation — Slide new throttle valves in position on throttle shaft with the valve number on the bottom (flange side) and opposite the vacuum port. Install new screws, but do not tighten. Be sure idle speed adjusting screw is backed out. Hold valves in place with fingers (hold high side of valves), then tap valves lightly with screwdriver, tighten screws securely and stake screws, being sure to support shaft when staking.

Idle Mixture Screws & Limiter Cap Installation — Install idle mixture screws and springs, tapered portion must be straight and smooth; if tapered portion grooved or ridged, a new screw must be installed. **NOTE** — Do not use a screwdriver when installing. Turn screws lightly against their seats with fingers, then back off the same number of turns counted at disassembly. **NOTE** — Do not reinstall limiter caps until carburetor has been installed on engine and idle mixture is correct.

Choke Vacuum Diaphragm (Also Air Valve Dashpot) — Leak test diaphragm by depressing diaphragm stem, then placing finger over fitting to seal opening. Release stem; if stem moves more than $\frac{1}{16}$ " in ten seconds, leakage is excessive and assembly must be replaced.

Accelerator Pump — Pour clean gasoline into main body ($\frac{1}{2}$ " deep), and lower bowl down on main body. Raise plunger and press lightly on plunger shaft to expel air from passage. Install accelerator pump discharge check needle, then using a small rod, hold discharge check needle firmly on its seat. Raise plunger and press downward, no fuel should be emitted from the passage. Fuel leakage from passage indicates the presence of dirt or a damaged check needle.

CARTER THERMO-QUAD (FORD) 4-BARREL (Cont.)



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CARTER (FORD) THERMO-QUAD ASSEMBLY (TYPICAL)