CARBURETOR SERVICE INSTRUCTIONS

TYPICAL VIEW HOLLEY CARBURETOR MODEL 4160

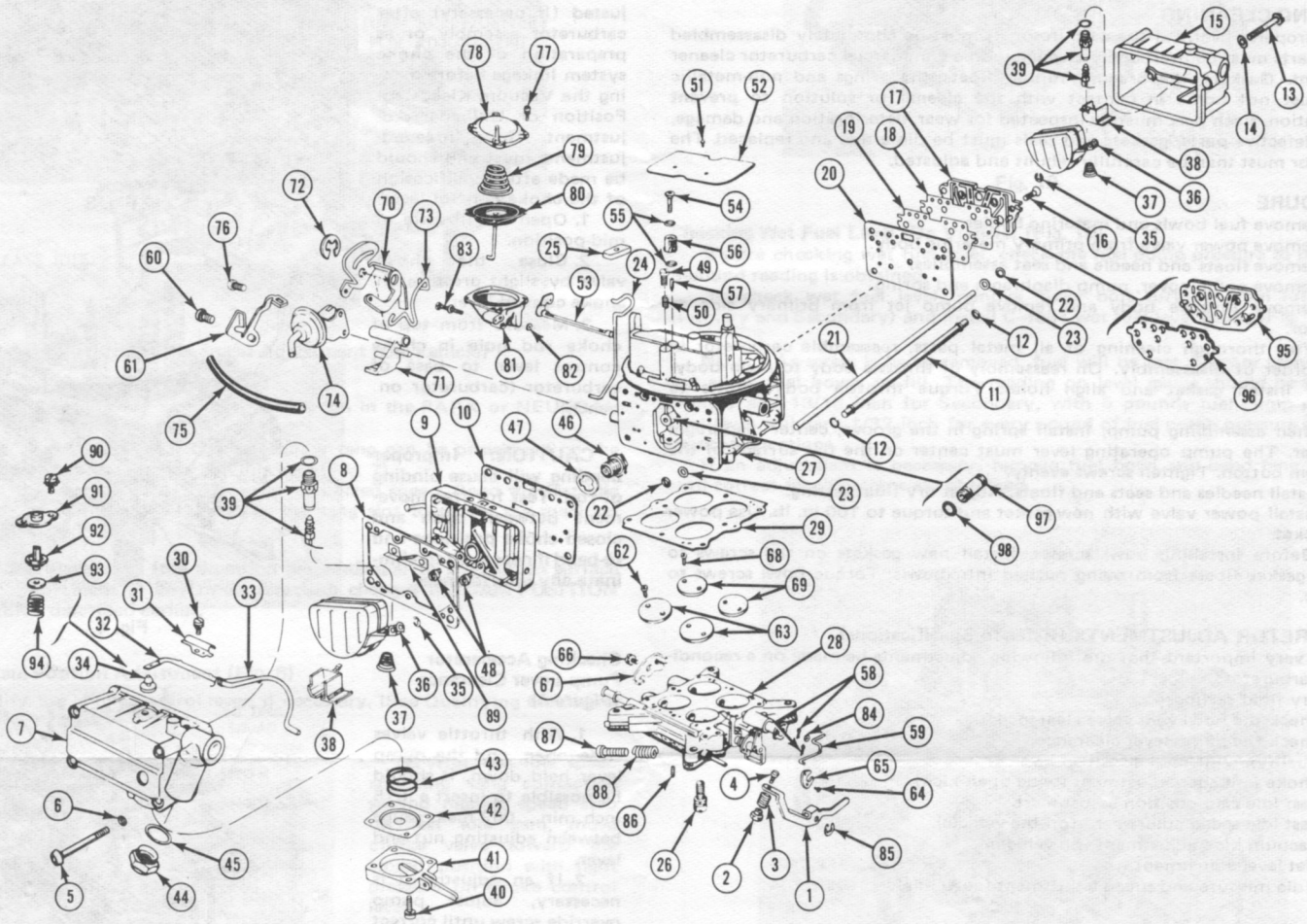


Fig. 1 – Carburetor Assembly (Exploded View)

1–Lever, Pump Operating
2–Locknut
3–Spring, override
4–Screw, Pump Adjusting
5–Screw, Fuel Bowl (Primary)
6–Gasket, Bowl Screw
7–Fuel Bowl (Primary)
8–Gasket, Fuel Bowl
9–Metering Body (Primary Side)
10–Gasket, Metering Body
11–Fuel Tube (Float Bowl Connecting)
12–"O" Rings, Fuel Tube
13–Screw, Fuel Bowl (Secondary)
14–Gasket, Bowl Screw
15–Fuel Bowl (Secondary)
16–Screw, Metering Body (Secondary)
17–Metering Body (Secondary)
18–Gasket, Metering Body (Secondary)
19–Plate, Metering Body (Secondary)
20–Gasket, Metering Body Plate
21–Balance Tube
22–Washers, Balance Tube
23–"O" Rings, Balance Tube
24–Choke Link
25–Seal, Choke Rod
26–Throttle Body Screws
27–Main Body
28–Throttle Body
29–Gasket, Main to Throttle Body
30–Screw, Bowl Vent Valve Rod Clamp
31–Clamp, Valve Rod
32–Rod, Bowl Vent Valve
33–Spring Vent Valve Rod
34–Valve, Bowl Vent
35–Retainer, Clip, Float
36–Float
37–Spring, Float
38–Baffle, Float
39–Needle Valve and Seat
40–Screws, Fuel Pump Cover
41–Cover Assembly, Fuel Pump
42–Diaphragm, Fuel Pump
43–Spring, Fuel Pump Diaphragm
44–Fitting, Fuel Inlet
45–Gasket, Fuel Inlet, Fitting
46–Valve Assembly, Power
47–Gasket, Power Valve
48–Primary Jets
49–Needle, Idle Adjusting (Left Hand Thread)
50–Spring, Idle Needle
51–Screws, Choke Valve
52–Choke Valve
53–Choke Shaft & Lever Assembly
54–Discharge Nozzle Screw, Pump
55–Gasket, Nozzle Screw
56–Nozzle, Pump Discharge
57–Needle, Pump Discharge Jet
58–Cotter Pins, Connecting Rods
59–Rod, Secondary Connecting
60–Screw and Lockwasher, Fast Idle Cam Lever
61–Lever, Fast Idle Cam
62–Screws, Primary Throttle Valve
63–Throttle Valves, Primary
64–Screw, Pump Cam
65–Pump Cam
66–Screw and Lockwasher, Secondary Stop Lever
67–Lever, Secondary Stop
68–Screws, Secondary Throttle Valves
69–Throttle Valves, Secondary
70–Fast Idle Cam Lever
71–Fast Idle Cam
72–Retainer (E-Clip)
73–Choke Diaphragm Link
74–Choke Diaphragm Assembly
75–Choke Vacuum Hose
76–Choke Diaphragm Bracket Screw
77–Secondary Diaphragm Cover Screw
78–Diaphragm Cover (Machine)
79–Secondary Diaphragm Return Spring
80–Secondary Diaphragm Assembly
81–Secondary Diaphragm Housing (Machine)
82–Secondary Diaphragm Housing Gasket
83–Secondary Diaphragm Assembly Screw
84–Throttle Connecting Rod Retainer Washer
85–Pump Operating Lever (E-Clip)
86–Secondary Stop Screw
87–Throttle Stop Screw
88–Throttle Stop Screw Spring
89–Baffle
90–Vent Valve Screw
91–Vent Valve Clamp Assembly
92–Vent Valve Body
93–Vent Valve Seal
94–Vent Valve Spring
95–Secondary Metering Body (Machine)
96–Secondary Metering Body Plate Gasket
97–Tube
98–"O" Ring

IMPORTANT

1. Timing, spark plugs and ignition points are as much a part of good engine tune-up as carburetion.

2. When cleaning the carburetor, only metal parts should be immersed in the cleaner fluid. Use fresh, commercial cleaner.

3. This kit may contain a universal gasket package, therefore, one or more gaskets not required on this job may be found in the packet. In each case of duplicate gaskets or parts, compare with old piece.

CARE AND CLEANING

To properly overhaul the carburetor, it must be completely disassembled and all parts must be thoroughly cleaned with a commercial carburetor cleaner or solvent. Gaskets, diaphragms, rubber floats, "O" rings and non-metallic parts must not come in contact with the cleaner or solution to prevent deterioration. Each part must be inspected for wear, deterioration and damage, and all defective parts, gaskets and seals must be discarded and replaced. The carburetor must then be carefully rebuilt and adjusted.

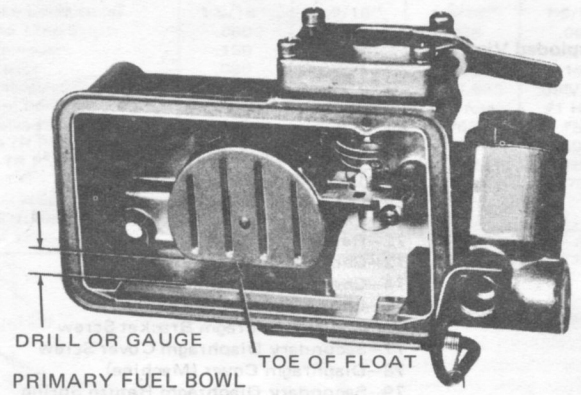
PROCEDURE

1. Remove fuel bowls and metering bodies.
2. Remove power valve from primary metering body.
3. Remove floats and needle and seat assemblies.
4. Remove pump cover, pump diaphragm and spring.
5. Remove throttle body and remove pump jet from primary side of carburetor.
6. After thorough cleaning of all metal parts, reassemble carburetor in reverse order of disassembly. On reassembly of throttle body to main body, carefully install gasket and align holes. Torque throttle body screws to 50 in. lb.
7. When assembling pump, install spring in the groove, center diaphragm and cover. The pump operating lever must center on the flat surface of the diaphragm button. Tighten screws evenly.
8. Install needles and seats and floats. Adjust dry float setting.
9. Install power valve with new gasket and torque to 100 in. lb. Use power valve socket.
10. Before installing bowl screws, install new gaskets on the screws to prevent gasket fibers from being pushed into bowls. Torque bowl screws to 50 in. lb.

CARBURETOR ADJUSTMENTS (Refer to Specifications)

It is very important that the following adjustments be made on a reconditioned carburetor:

1. Dry float setting.
2. Check the bowl vent valve clearance.
3. Check the pump lever clearance.
4. Qualifying the choke control lever.
5. Choke unloader adjustment (wide open kick).
6. Fast idle cam position adjustment.
7. Fast idle speed adjustment (on the vehicle).
8. Vacuum kick adjustment (on vehicle).
9. Wet level adjustment.
10. Idle mixture and speed adjustment (curb idle).



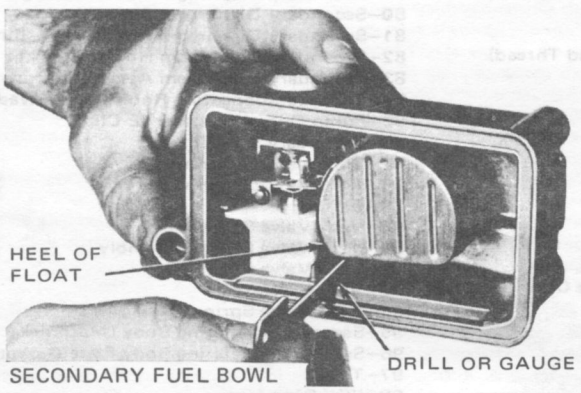


Fig. 2 – Checking Float Setting

Qualifying Choke Control Lever (Fig. 3)

Adjustment of the choke control lever is necessary to provide correct relationship between choke valve, thermostatic coil spring and the fast idle cam. It should be checked and adjusted (if necessary) after carburetor assembly or as preparation of the choke system linkage before making the Vacuum Kick, Cam Position or Unloader Adjustment. These three adjustments must and should be made after qualification of the choke control lever.

1. Open the throttle to mid-position.

2. Close the choke valve by slight pressure on choke control lever.

3. Measure from top of choke rod hole in choke control lever to base of carburetor (carburetor on bench).

CAUTION: Improper bending will cause binding of rod. Test for free movement between open and closed choke positions and re-bend if necessary to eliminate any interferences.

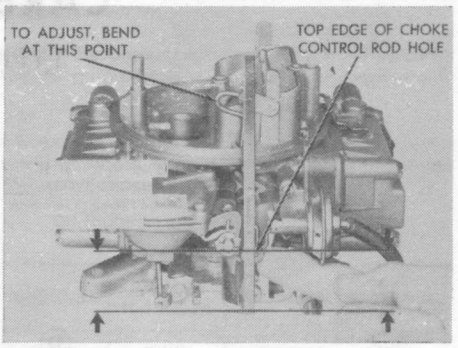


Fig. 3

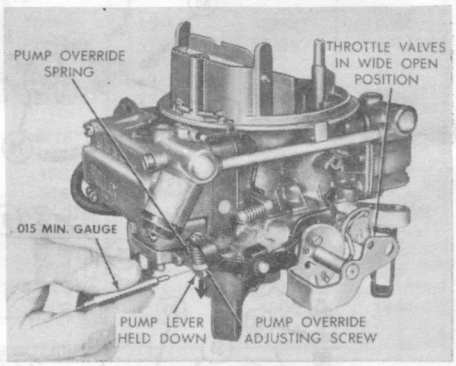


Fig. 4

Checking Accelerator Pump Lever Clearance (Figure 4)

1. With throttle valves wide open, and the pump lever held down, it should be possible to insert a .015 inch min., .062 max. gauge between adjusting nut and lever.

2. If an adjustment is necessary, adjust pump override screw until correct clearance has been obtained.

3. There must be no free movement of pump leverage when throttle is at curb idle.

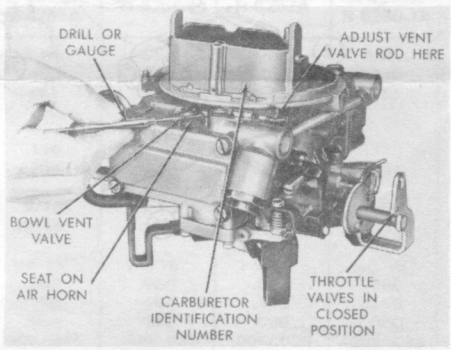


Fig. 5—Checking Bowl Vent Valve Clearance

Choke Unloader Adjustment (wide open kick) (Fig. 6)

The choke unloader is a mechanical device to partially open the choke at wide open throttle. It is used to eliminate choke enrichment during cranking of an engine. Engines which have been flooded or stalled by excessive choke enrichment can be cleared by use of the unloader. Adjust the system as follows:

1. Qualify the choke control lever, if necessary. (See Qualifying Choke Control Lever Paragraph.)

2. Hold the throttle valves in the wide open position. Insert the specified drill between the upper edge of the choke valve and the inner wall of the air horn (see specifications).

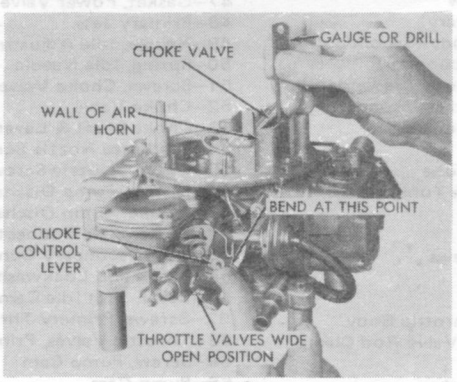


Fig. 6.

3. With a finger lightly pressing against the choke control lever, a slight drag should be felt as the drill is being withdrawn. If an adjustment is necessary, bend the indicated tang until correct opening has been obtained.

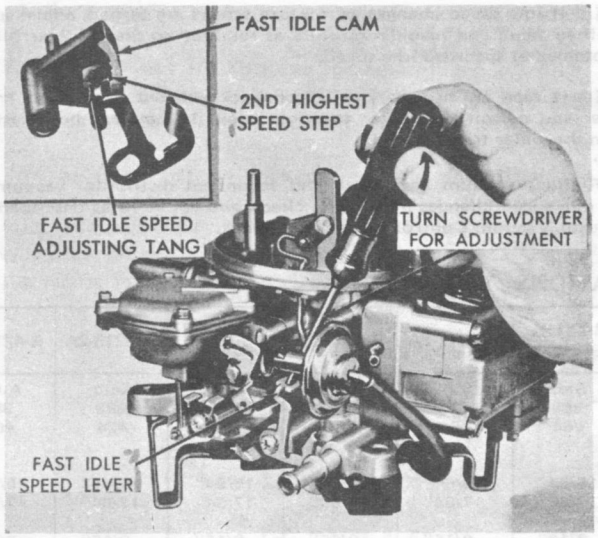


Fig. 7 – Fast Idle Speed Adjustment (On Vehicle)

Normalized Engine Temperature

1. With the engine off and the transmission in the PARK or NEUTRAL position, open the throttle slightly.

2. Close choke valve until fast idle screw tang can be positioned on the second highest-speed step of the fast idle cam (Fig. 7).

3. Start the engine and determine the stabilized speed. Bend the fast idle tang by use of a screwdriver placed in the tang slot to secure the specified speed.

CAUTION: Bend only in a direction perpendicular to the contact surface of the cam. Movement in any other direction changes the CAM POSITION ADJUSTMENT described earlier.

Fast Idle Cam Position Adjustment (Fig. 8)

1. Qualify the choke control lever, if necessary. (See Qualifying the Choke Control Lever Paragraph.)

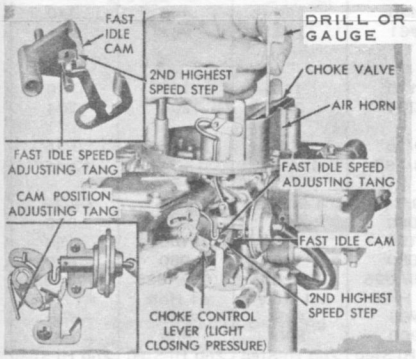


Fig. 8

2. With fast idle speed adjusting tang contacting second highest speed step on fast idle cam, move choke valve toward the closed position with light pressure on choke control lever.

3. Insert specified drill between the choke valve and wall of the air horn. An adjustment will be necessary if a slight drag is not obtained as the drill is being removed.

4. To adjust, bend the indicated tang until the correct choke valve opening has been obtained.

Vacuum Kick Adjustment (Fig. 9)

1. With the engine running, position the fast idle tang (Fig. 9) (Cam position adjustment) to allow choke closure to kick position.

2. Insert the specified drill between the choke valve and the wall of the air horn.

Apply sufficient closing pressure on the lever to which the choke rod attaches to provide a minimum choke valve opening without distortion of the diaphragm link. Note that the cylindrical stem of the diaphragm will extend as an internal spring is compressed. This spring must be fully compressed for proper measurement of the vacuum kick adjustment.

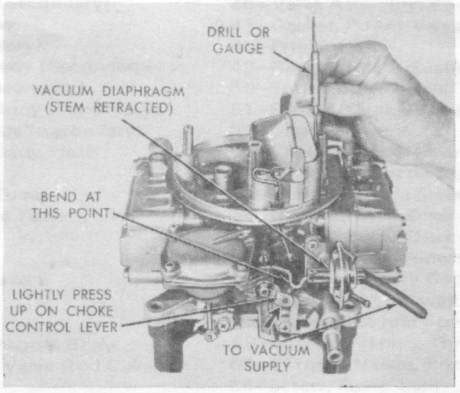


Fig. 9

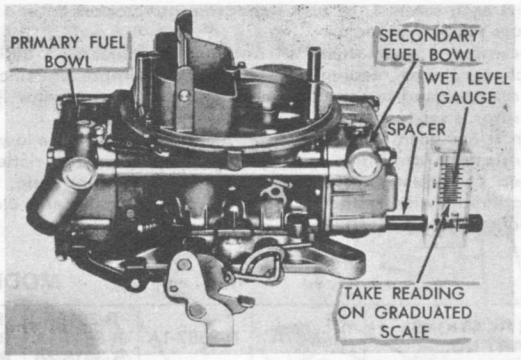


Fig. 10

Checking Wet Fuel Level (On Vehicle) (Fig. 10)

Before checking wet fuel level, check the fuel pump pressure to be certain 5-pound reading is obtained.

To check wet fuel level, remove lower bolt furthest from fuel supply (Primary and Secondary) and install C-4051 wet fuel level gauge (Fig. 10).

NOTE: As screw is being removed, fuel will be lost. Start or crank engine and allow fuel bowls to fill. The reading on level gauge should be 9/16 for Primary and 13/16 inch for Secondary, with 5 pounds fuel pump pressure. Fuel level will vary 1/32 inch for every pound of fuel pump pressure under or over specifications.

If an adjustment is necessary, remove fuel bowl and bend tang on float until correct specifications are obtained.

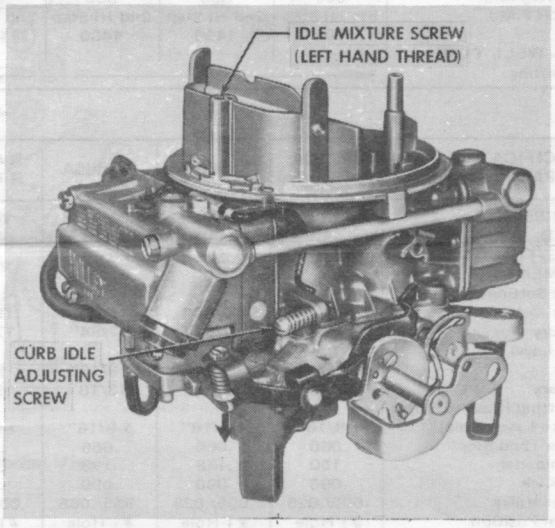


Fig. 11

Idle Speed Adjustment (Curb Idle) (Fig. 11)

To make the idle speed adjustment on carburetors, secure an accurate ignition tachometer and a Sun Electric Combustion-Vacuum Unit, Model 80, Exhaust Condenser, Model EC, and Hose 669-14 or equivalent.

PROCEED AS FOLLOWS

1. Engine running at normal operating temperature, and timing checked (refer to Distributor Specifications).
2. Air Cleaner installed.
3. Automatic transmissions in neutral position (not in park position).
4. On air conditioned cars, turn air conditioning off.
5. Connect ignition tachometer.
6. Insert probe of exhaust gas analyzer in tail pipe as far as possible (2 ft. minimum distance). On dual exhaust cars use left side tail pipe (side opposite heat valve). It is very important that probe and connecting tubing be free of leaks to prevent erroneous reading. If a garage exhaust system is used to conduct exhaust gases away, a plenum chamber or other means must be used to reduce vacuum of exhaust system to 1/2 inch water or less.
7. Connect exhaust gas analyzer, warm up and calibrate according to manufacturer's instructions.
8. After checking initial timing with distributor vacuum line disconnected and vacuum gage attached to read manifold vacuum, attach vacuum gage to distributor fitting on the carburetor.
9. Reduce idle speed until vacuum gage reads 4" or less.
10. **IMPORTANT:** When adjusting mixture screw to obtain air/fuel ratio specified, do not turn the mixture screw more than 1/16 turn at a time. The combustion analyzer is so sensitive that the ratio must be changed in very small increments if accurate readings are to be obtained. The meters read in air/fuel ratio so that a higher reading indicates a leaner mixture and vice versa.

(a) Adjust each screw 1/16 turn richer (counterclockwise) and wait 10 seconds before reading meter.

(b) If necessary, repeat step "a" until meter indicates a definite increase in richness (lower reading). This step is very important since meter reverses its readings and indicates a richer mixture as carburetor is leaned out if carburetor is set too lean.

(c) When it has been established that meter is indicating a lower reading (richer mixture) when idle mixture screws are turned in richer direction, proceed to adjust carburetor to give 14.2 air/fuel ratio, turning screws counterclockwise (richer) to lower meter reading and clockwise (leaner) to increase meter reading.

(d) If idle speed changes as mixture screws are turned, adjust speed to specified value and readjust mixture as required so that 14.2 air/fuel ratio is obtained at specified idle speed.

(e) It may be necessary to disconnect exhaust hose from analyzer meter and permit the meter to purge itself. It may also be necessary to clean the water trap.

11. Remove vacuum gage hose and reconnect distributor vacuum valve hose. If idle speed changes materially, check and set valve as described under "Distributor Vacuum Control Valve Adjustment."

MODEL 4160 SPECIFICATIONS

SPECIFICATIONS PART NO.	R-3667A	R-3667-1A	R-3918A R-3918-1A R-3918-2A	R-4166A R-4166-1A R-4166-2A	R-4440A R-4440-1A R-4440-2A	R-4217A R-4217-1A	R-4217-2A	R-4217-3A	R-4218A R-4218-1A	R-4218-2A	R-4218-3A
TRANSMISSION	Auto.	Auto.	Auto.	Auto.	Auto.	Std.	Std.	Std.	Auto.	Auto.	Auto.
ENG. C.I.D. APPLICATION	440	440	440	440	383	383	383	383	383	383	383
MAIN METERING JET	#65	#65	#64	#64	#64	#64	#64	#64	#64	#64	#64
ADJUSTMENTS:											
Dry Float Setting											
Primary	15/64"	15/64"	15/64"	15/64"	15/64"	15/64"	15/64"	15/64"	15/64"	15/64"	15/64"
Secondary	17/64"	17/64"	17/64"	17/64"	17/64"	17/64"	17/64"	17/64"	17/64"	17/64"	17/64"
Wet Fuel Level											
Primary	9/16"	9/16"	9/16"	9/16"	9/16"	9/16"	9/16"	9/16"	9/16"	9/16"	9/16"
Secondary	13/16"	13/16"	13/16"	13/16"	13/16"	13/16"	13/16"	13/16"	13/16"	13/16"	13/16"
Choke Setting (Base to Top of Choke Lever Hole)		1-23/32"	1-23/32"	1-23/32"	1-23/32"	1-9/16"	1-9/16"	1-9/16"	1-9/16"	1-9/16"	1-9/16"
Cam Index (2nd Step)		.082	.082	.084	.084	.060	.042	.066	.060	.042	.066
Choke Unloader	.168	.168	.158	.160	.160	.150	.140	.158	.150	.140	.158
Vacuum Kick	.082	.082	.115	.084	.084	.170	.162	.176	.080	.068	.091
Bowl Vent Value	.070/.100	.070/.100	.055/.085	.055/.085	.055/.085	.005/.025	.005/.025	.005/.025	.005/.025	.005/.025	.005/.025
Pump Cam Position	#1 Hole	#1 Hole	#1 Hole	#1 Hole	#1 Hole	#1 Hole	#1 Hole	#1 Hole	#1 Hole	#1 Hole	#1 Hole
Power Valve (Stamped)	#65	#65	#65	#65	#65	#65	#65	#65	#65	#65	#65
Curb Idle (R.P.M.)	550	600	600	600	600	750	750	750	750	750	750
Fast Idle (R.P.M.)	5th Hi-Step 700	2nd Hi-Step 1400	2nd Hi-Step 1400	2nd Hi-Step 1400	2nd Hi-Step 1600	2nd Hi-Step 2000	2nd Hi-Step 2000	2nd Hi-Step 2000	2nd Hi-Step 1800	2nd Hi-Step 1800	2nd Hi-Step 1800
CHOKE — WELL TYPE											
Control Setting	← 2 Notches Rich →										

SPECIFICATIONS PART NO.	R-4360A R-4360-1A	R-4360-2A	R-4366A	R-4668A R-4735A	R-6160A R-6160-1A	R-6191A R-6193A	R-6252A R-6254A	R-6253A R-6255A	R-6256A	R-6257A	R-6290A R-6290-1A
TRANSMISSION	Auto.	Auto.	Auto.	Auto.	Auto.	Std.	Std.	Auto.	Std.	Auto.	Auto.
ENG. C.I.D. APPLICATION	440	440	440	383	440	383	440	440	440	440	440
MAIN METERING JET	#64	#64	#64	#64	#61	#64	#61	#61	#62	#62	#61
ADJUSTMENTS:											
Dry Float Setting											
Primary	15/64"	15/64"	15/64"	15/64"	.110	15/64"	.110	.110	.110	.110	.110
Secondary	17/64"	17/64"	17/64"	17/64"	.204	17/64"	.204	.204	.204	.204	.204
Wet Fuel Level											
Primary	9/16"	9/16"	9/16"	9/16"	9/16"	9/16"	9/16"	9/16"	9/16"	9/16"	9/16"
Secondary	13/16"	13/16"	13/16"	13/16"	13/16"	13/16"	13/16"	13/16"	13/16"	13/16"	13/16"
Choke Setting (Base to Top of Choke Lever Hole)	1-9/16"	1-9/16"	1-9/16"	1-9/16"	1-9/16"	1-9/16"	1-9/16"	1-9/16"	1-9/16"	1-9/16"	1-9/16"
Cam Index (2nd Step)	.060	.066	.066	.060	.060	.060	.060	.060	.060	.060	.060
Choke Unloader	.150	.158	.158	.082	.150	.170	.150	.150	.150	.150	.150
Vacuum Kick	.080	.090	.090	.150	.080	.150	.140	.080	.140	.080	.080
Bowl Vent Valve	.005/.025	.005/.025	.055/.085	.005/.025	.005/.025	.005/.025	.005/.025	.005/.025	.005/.025	.005/.025	.005/.025
Pump Cam Position	#1 Hole	#1 Hole	#1 Hole	#1 Hole	#1 Hole	#1 Hole	#1 Hole	#1 Hole	#1 Hole	#1 Hole	#1 Hole
Power Valve (Stamped)	#65	#65	#65	#65	#65	#65	#65	#65	#65	#65	#65
Curb Idle (R.P.M.)	650	650	650	800	750	900	900	900	800	900	700
Fast Idle (R.P.M.)	2nd Hi-Step 1600	2nd Hi-Step 1600	2nd Hi-Step 1600	2nd Hi-Step 1700	2nd Hi-Step 1600	2nd Hi-Step 1800	2nd Hi-Step 1800	2nd Hi-Step 1600	2nd Hi-Step 2000	2nd Hi-Step 1800	2nd Hi-Step 1500
CHOKE — WELL TYPE											
Control Setting	← 2 Notches Rich →				Fixed	2 Notches Rich	←		Fixed	→	

Litho U.S.A.