

1974-79 FUEL SYSTEMS

Hitachi 4-Barrel Carburetors

Mazda: Cosmo, RX4, RX7

DESCRIPTION

Carburetor is of 4-barrel, 2-stage design. Primary stage includes idle system, slow speed circuit, accelerator pump system and main metering system. Fluid from sub-zero starting device, if equipped, and oil from metering oil pump is admitted into primary stage. Secondary stage contains secondary vacuum diaphragm operating system, stepping circuit, and main metering system.

Some manual transmission vehicles are equipped with an electric idle switch, coasting richer valve, and a dashpot with dashpot delay valve. Some California vehicles are equipped with a choke return diaphragm, choke return delay valve, and choke delay valve.

ON VEHICLE ADJUSTMENTS

IDLE SPEED & MIXTURE

See appropriate TUNE-UP PROCEDURES article.

COLD (FAST) IDLE RPM

See appropriate TUNE-UP PROCEDURES article for on vehicle adjustment.

IDLE COMPENSATOR

1979 Models - 1) Locate idle compensator in air cleaner. Apply vacuum to idle compensator air tube. If idle compensator leaks, replace idle compensator assembly.

2) Check that idle compensator is closed when bimetallic valve temperature is lower than operating temperature. Valve opening temperature should be 141-157°F (61-69°C). When bimetallic valve temperature is more than 157°F (69°C), valve should be open. If not, replace idle compensator assembly.

ALTITUDE COMPENSATOR

1979 Models - 1) Disconnect altitude compensator hose from carburetor hose fitting. Start and run engine at specified idle speed. On automatic transmission equipped models, place selector lever in Neutral.

2) Plug altitude compensator hose opening with finger and check that engine speed RPM drops as specified. See Fig. 1. Engine speed varies according to altitude.

AUTOMATIC CHOKE RELEASE

1979 Models - 1) With engine cold and ignition off, pull out fully on choke knob and release. Knob should return automatically and freely. Connect a tachometer to engine.

2) On California vehicles, start engine with choke knob pulled fully outward. Knob should return halfway automatically within 20-70 seconds after starting. Set engine speed at 2000 RPM with choke knob. Let engine run and when temperature gauge reaches range choke knob should automatically return completely inward. See Fig. 2.

3) On California vehicles, stop engine. Pull choke knob fully outward with ignition switch on. Choke knob should be held in this position (should not return).

CHOKE DELAY VALVE

California Models - Warm up engine to normal operating temperature. Stop engine and remove air cleaner assembly. Disconnect vacuum sensing tube from choke diaphragm. Start engine and run at idle speed. Diaphragm shaft should move fully inward within 10-20 seconds after reconnecting vacuum sensing tube to choke diaphragm.

CHOKE RETURN DELAY VALVE

California Models - Warm up engine to normal operating temperature. Stop engine and remove air cleaner assembly. Disconnect vacuum sensing tube from choke return diaphragm. With automatic transmission in Neutral, start and run engine at idle speed. Reconnect vacuum sensing tube to choke return diaphragm. Diaphragm shaft should be fully pulled into diaphragm within 20-70 seconds.

Altitude	Drops in Idle Speed
0-3280 feet (0-1000 meters)	10-100 RPM
3280-6560 feet (1000-2000 meters)	50-200 RPM
More Than 6560 feet (More than 2000 meters)	More Than 100 RPM

Fig. 1: Checking Altitude Compensator

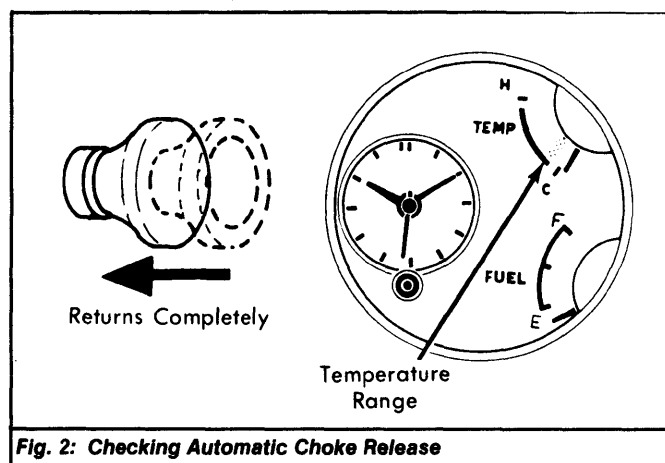


Fig. 2: Checking Automatic Choke Release

THROTTLE OPENER

1979 A/C Equipped Models - 1) Turn off all accessories. Disconnect vacuum tube at idle compensator (in air cleaner). Plug end of tube. Connect tachometer to engine and warm engine to normal operating temperature. Turn off air conditioner switch.

2) Disconnect coupler from air conditioning solenoid valve. Connect battery power to one terminal and ground to second terminal. Check to see that throttle opener operates and engine speed increases to 1150-1250 RPM in Neutral. If engine speed is incorrect, turn adjusting nut. See Fig. 3.

ACCELERATOR CABLE

1979 Models - 1) Check accelerator pedal position. Pedal should be 1.5-1.9" (37-47 mm) lower than brake pedal. See Fig. 4. If necessary, adjust nut "A" to obtain correct position.

2) Check cable free play at carburetor for .04-.12" (1-3 mm). To adjust cable free play, adjust nut "B". Depress accelerator all the way to the floor and check that throttle valves are wide open. If necessary, adjust stopper bolt "C".

HOT START ASSIST CABLE

1979 Models - 1) Remove lock spring of hot start assist cable from cable bracket. Slowly pull outer cable until hot start lever just touches stopper lever.

2) Check clearance between cable bracket and lock nut on cable. See Fig. 5. Clearance should be .02-.08" (0.5-2.0 mm). If not within specifications, adjust by turning lock nut. Then install lock spring securely on cable.

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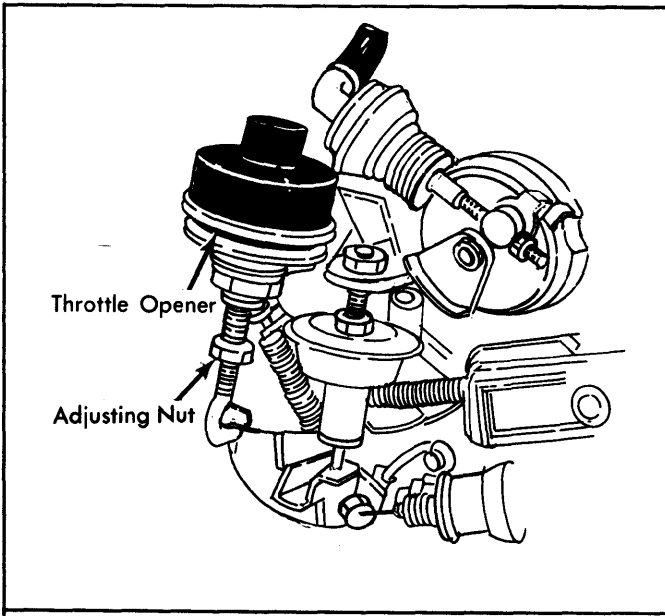


Fig. 3: Throttle Opener Adjustment

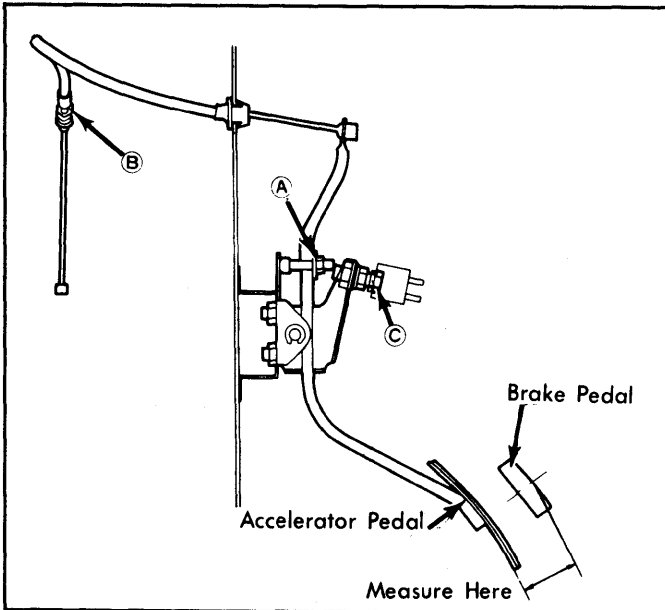


Fig. 4: Accelerator Cable Adjustment

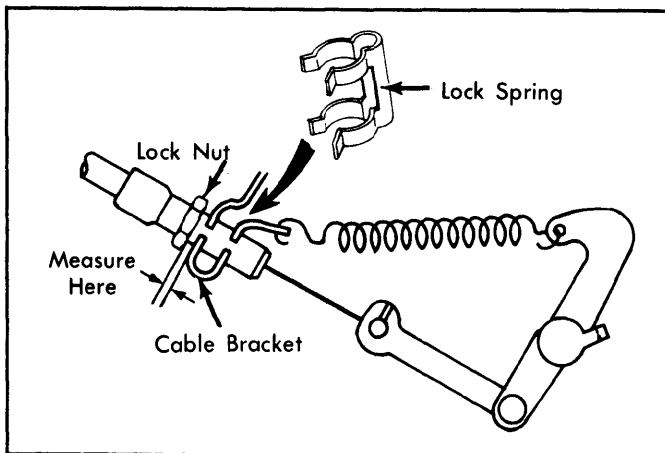


Fig. 5: Hot Start Assist Choke Adjustment

DASHPOT

- 1979 Models** - 1) Remove air cleaner and check all sensing tubes for correct routing or damage. Be sure dashpot does not keep throttle lever from returning to idle stop. Quickly operate throttle lever fully and make sure dashpot extends quickly.
- 2) Release throttle lever and make sure lever returns slowly to idle position after it has touched dashpot rod. Connect a tachometer to engine and warm to normal operating temperature. Be sure engine operates at specified idle speed.
- 3) Disconnect vacuum sensing tube from dashpot diaphragm and operate throttle lever until it is away from dashpot rod. Close vacuum inlet to dashpot diaphragm with finger.
- 4) Release throttle lever and check engine speed at which dashpot rod stops moving after it has been pushed in by throttle lever. Engine speed should be 1650-1850 RPM. If not, loosen lock nut and rotate dashpot diaphragm to obtain specified engine speed. Tighten lock nut.

BENCH ADJUSTMENTS

FLOAT LEVEL

Invert air horn and allow float to drop by its own weight. Measure clearance between float and air horn gasket surface. See Fig. 6 Clearance should be within specifications. See appropriate CARBURETOR ADJUSTMENT SPECIFICATIONS table in this article. If not, bend float seat lip as necessary.

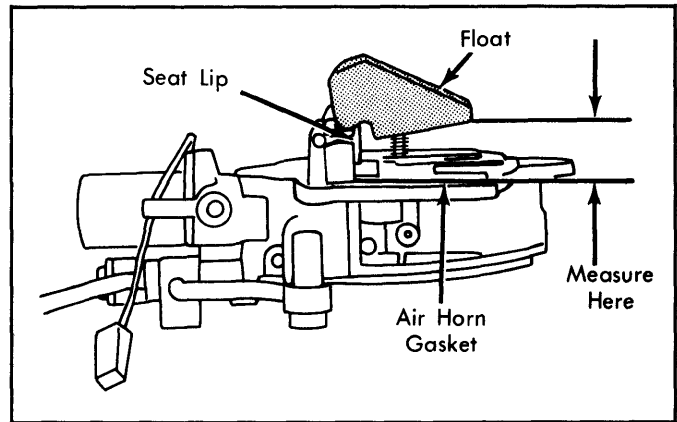


Fig. 6: Float Level Adjustment

FLOAT DROP

With air horn held in its normal position, allow float to hang by its own weight. Measure distance between bottom of float and air horn gasket surface. See Fig. 7. If distance is incorrect, bend float stopper to obtain proper distance.

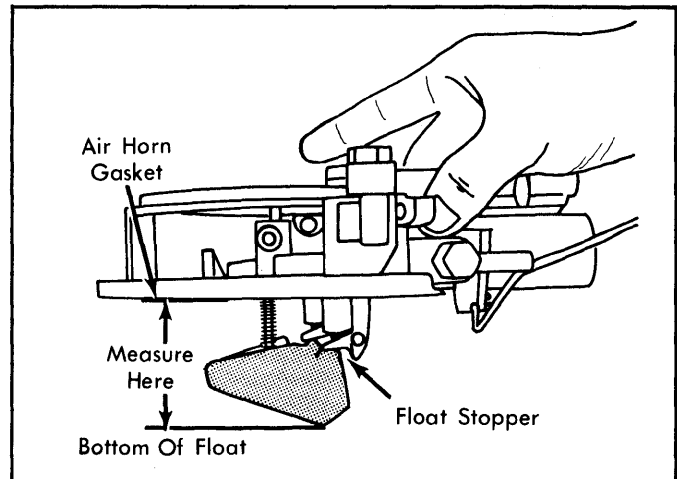


Fig. 7: Float Drop Adjustment

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CHOKE (FAST IDLE) OPENING

Fully close choke valve. Measure clearance between primary throttle valve and wall of throttle bore. Clearance for Federal vehicles should be .035-.040" (.9-1.1 mm); for California vehicles, .051-.059" (1.3-1.5 mm). If not, bend fast idle rod until proper clearance is obtained. See Fig. 8.

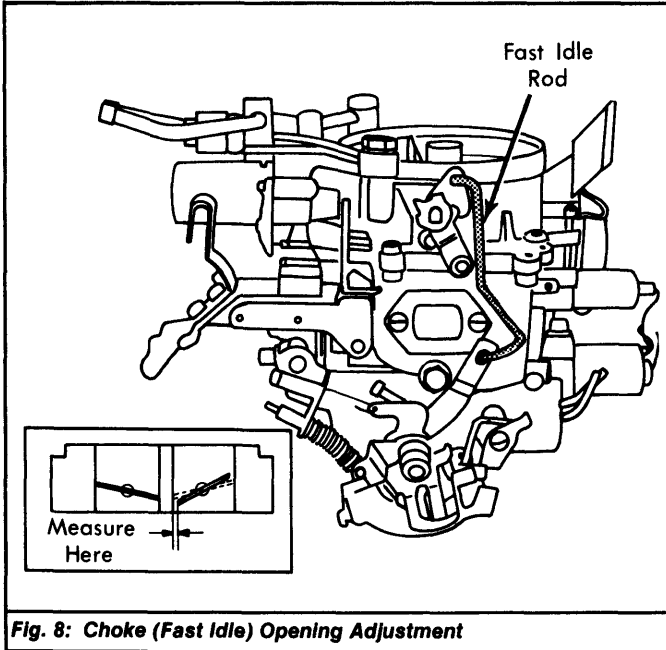


Fig. 8: Choke (Fast Idle) Opening Adjustment

CHOKE VALVE OPENING

- 1) Disconnect vacuum sensing tube from vacuum diaphragm. Pull choke lever link out fully and hold in place. See Fig. 9. Apply approximately 15.7 in. Hg to vacuum diaphragm. Check clearance between choke valve and inward wall of choke bore.
- 2) Measure temperature around choke bimetallic cover and compare clearance with chart. See Fig. 10. If not to specifications, adjust by turning adjusting nut on end of vacuum diaphragm shaft.

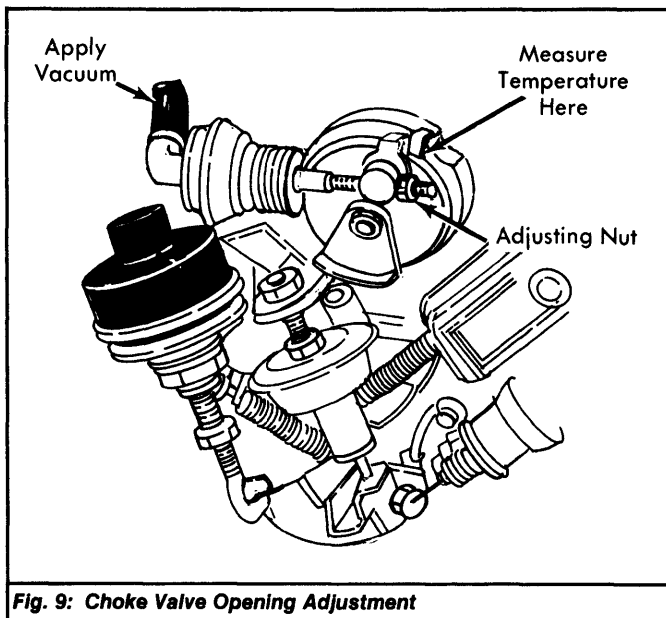


Fig. 9: Choke Valve Opening Adjustment

PRIMARY THROTTLE VALVE INITIAL OPENING ANGLE

NOTE: The following adjustment should ONLY be made when throttle body, throttle lock lever or lock lever adjusting screw have been replaced.

1979 Models - Loosen lock nut and back off adjusting screw from lock lever. Close throttle valve completely and turn screw in gradually until it just touches throttle lock lever. Then turn adjusting screw "A" an additional 1/8-3/8 turn. Tighten lock nut. Throttle valve clearance should be 1 degree. See Fig. 11.

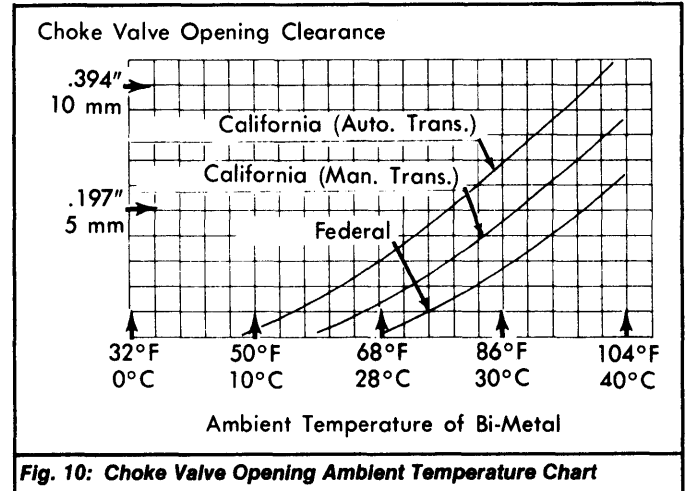


Fig. 10: Choke Valve Opening Ambient Temperature Chart

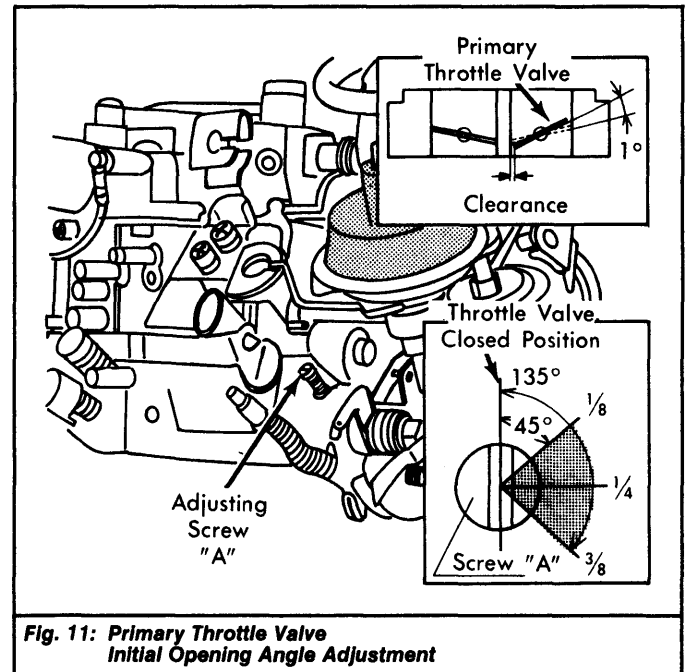


Fig. 11: Primary Throttle Valve Initial Opening Angle Adjustment

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OVERHAUL

NOTE: *Disassembly and reassembly procedures will vary slightly between carburetors. Some carburetors may not have all parts mentioned in the following procedures.*

DISASSEMBLE

1) Remove choke return delay and choke delay valves (if equipped). Remove heater lead and dashpot delay valve (if equipped). Remove throttle opener and bracket assembly. Remove dashpot diaphragm (if equipped). Disconnect vacuum sensing tube. Remove thermostatic choke housing and throttle return spring.

2) From air horn, disconnect choke connecting rod by removing cotter pin, washer, and spring. Remove throttle sub-return spring. Remove "E" clip and choke lever. Remove choke return diaphragm and bracket (if equipped). Remove hot start assist lever spring, fast idle rod, and bracket.

3) Remove accelerator pump connecting rod by removing cotter pin. Remove bolt, fuel inlet fitting, and filter. Remove air horn assembly from main body. Remove float pin, float, needle valve, spring, and retainer.

4) Remove accelerator pump lever and piston. Remove starting assist fluid inlet fitting (if equipped). Remove primary slow air bleeds. Remove accelerator pump and secondary throttle valve rod.

5) Remove idle switch return spring and idle switch (if equipped). Disconnect connecting rod from secondary operating diaphragm and remove diaphragm. Remove screws attaching main body to throttle body.

6) From main body, remove accelerator pump injection nozzle, gasket, weight, and outlet check valve. Remove jets and air bleeds, noting their position and number for reassembly reference. See Fig. 12.

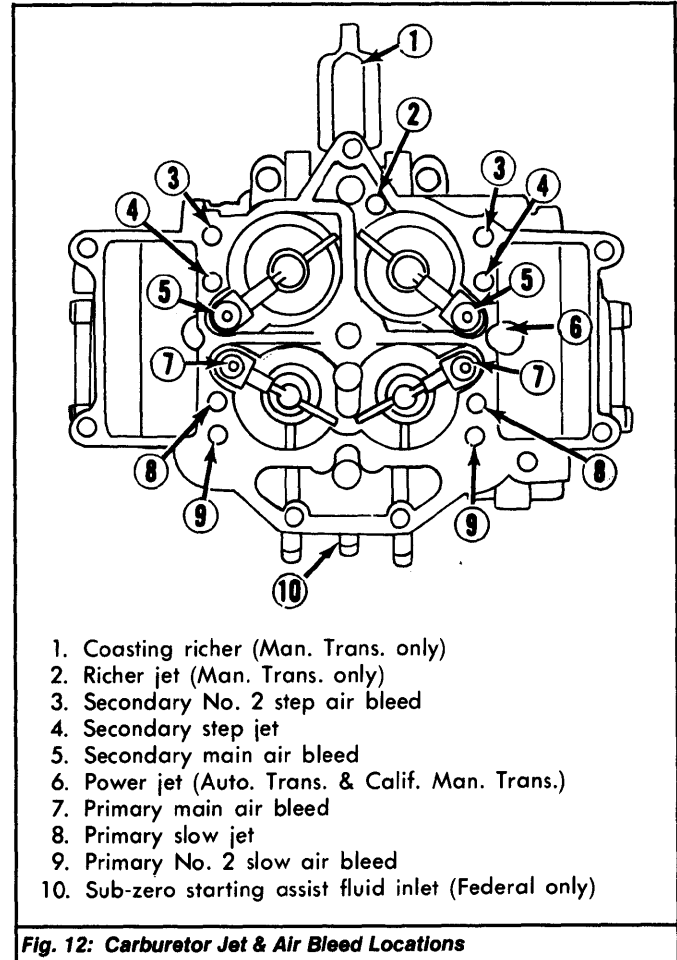
7) Remove power valve solenoid (if equipped). From throttle body, remove mixture screw and idle speed screw. Remove richer solenoid (if equipped). If necessary, remove throttle lever attaching hardware.

CLEANING & INSPECTION

Wash parts in carburetor cleaner (solvent). DO NOT soak any components containing rubber, leather, or plastic. Soak components long enough to thoroughly clean all surfaces and passages of foreign matter. Remove any residue after cleaning components in solvent. Blow out all fuel passages dry with compressed air. Inspect all parts for wear or damage and replace as necessary.

REASSEMBLY

To reassemble, reverse disassembly procedure. Prevent primary and secondary circuit parts from becoming mixed. When installing choke housing, carefully fit choke shaft lever to bimetallic spring. Close choke valve and pull on diaphragm shaft to ensure that choke closes properly.



1. Coasting richer (Man. Trans. only)
2. Richer jet (Man. Trans. only)
3. Secondary No. 2 step air bleed
4. Secondary step jet
5. Secondary main air bleed
6. Power jet (Auto. Trans. & Calif. Man. Trans.)
7. Primary main air bleed
8. Primary slow jet
9. Primary No. 2 slow air bleed
10. Sub-zero starting assist fluid inlet (Federal only)

Fig. 12: Carburetor Jet & Air Bleed Locations

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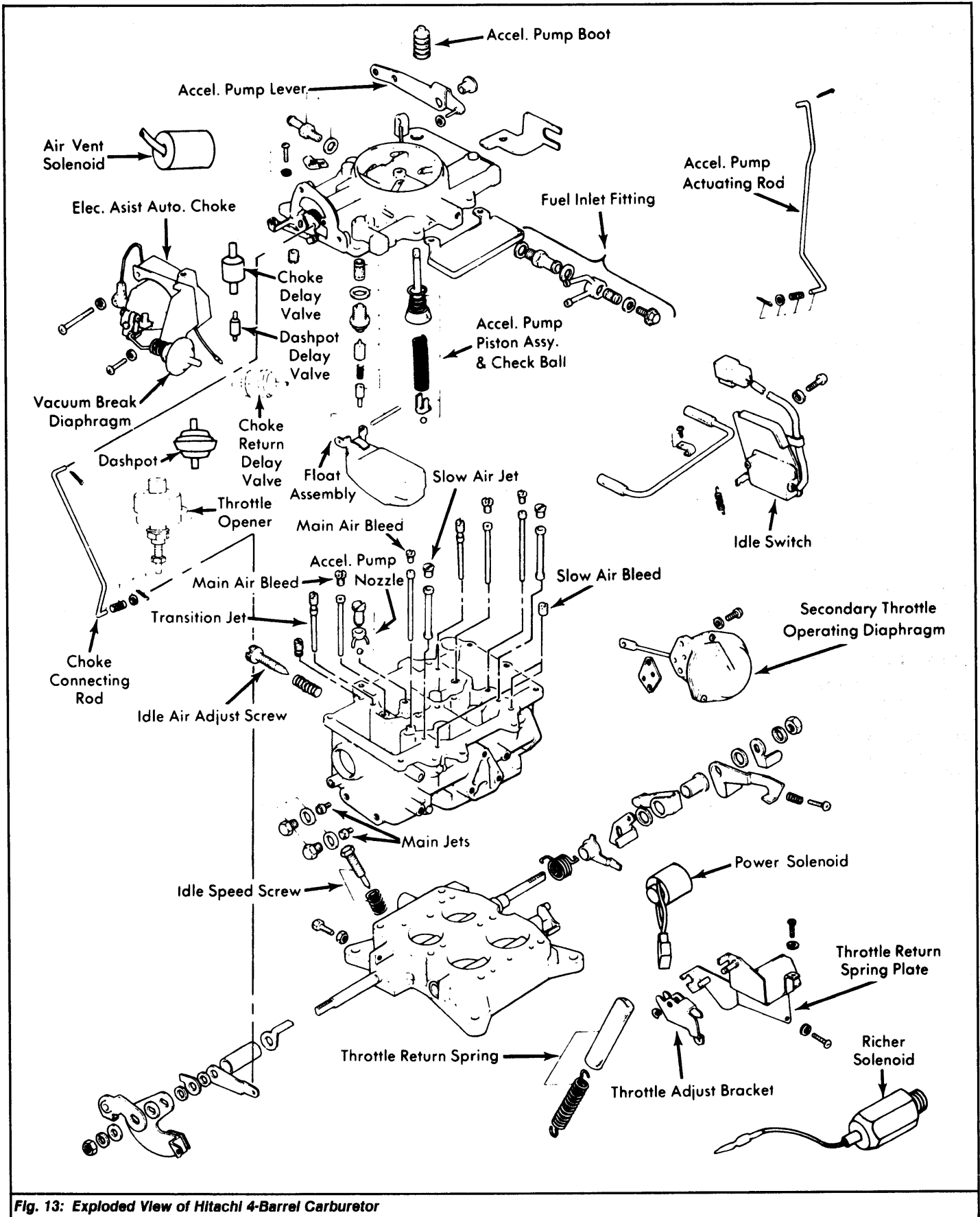


Fig. 13: Exploded View of Hitachi 4-Barrel Carburetor

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1978 CARBURETOR ADJUSTMENT SPECIFICATIONS							
Application	Idle Speed (Engine RPM)		Float Level Setting In. (mm)	Float Drop Setting In. (mm)	Choke Linkage (Off Car) In. (mm)	Accelerator Pump Volume ^①	Choke Valve Opening ^② In. (mm)
	Hot	Fast					
RX-4 & Cosmo	750±25	3000-3500	.45-.49 (11.5-12.5)	2.11-2.15 (53.5-54.5)	.067-.079 (1.7-2.0)	6.8-9.2	.169-.185 (4.3-4.7)

- ① — Measured in cubic centimeters (cc). Amount of fuel that should have been drawn from container (burette) in 10 strokes.
 ② — Measured between stopper and bimetal spring lever.

1979 CARBURETOR ADJUSTMENT SPECIFICATIONS							
Application	Idle Speed (Engine RPM)		Float Level Setting In. (mm)	Float Drop Setting In. (mm)	Choke Linkage (Off Car) In. (mm)	Accelerator Cable Free Play	Choke Valve Opening ^② In. (mm)
	Hot	Fast					
RX-7	750±25	①	.61-.65" (11-21)	1.8-2.2" (46-56)	.035-.040" ^② (0.9-1.1) ^②	.04-.12" (1-3)	③

- ① — Manufacturer does not supply fast idle speed. See Choke Linkage (Fast Idle Opening Angle).
 ② — Federal clearance. California vehicles should have .051-.059" (1.3-1.5 mm) clearance.
 ③ — Varies with ambient temperature. See Fig. 5.