MAZDA CARBURETOR MANUAL

1979-1985 RX-7

built by littlecat

MAZDA CARBURETOR REPAIR MANUAL

FORWARD

Overhaul sections in this book are designed for the technician to begin with the carburetor on the bench. All previous disassembly should already be performed as per instructions listed in the vehicle workshop manual. Please remember that all instructions for adjustment procedures are listed as if you are making a continuation of a complete overhaul. Initial steps such as warming up the engine may not appear. Therefore it is important to follow each section in order of progression through to the end. Individual adjustments may not stand alone as listed in this book, so look for such individual steps in the workshop manual.

If at all possible, make your job easier by taking your own notes concerning the customer's complaint with the vehicle. Also make a note of your OWN findings PRIOR to removing the carburetor from the vehicle.

Use extreme care when disconnecting or handling carburetor electrical components. Do not yank wiring, dip electrical parts in solvent, or force connectors. Doing any of these things may cost you lost time when the assembly is completed. Time saved by shortcuts may be lost twice over by time spent troubleshooting.

Information in this manual supercedes all other carburetor information in previous manuals, including workshop manuals. Use only the information and specifications listed in this manual when overhauling a Mazda carburetor for the vehicles covered. Do not mix information or specifications from any other sources, since this manual contains the most recent data available.

Exploded views in each section may show parts which should not be disassembled. Therefore, these illustrations are not to be used necessarily as disassembly guides, but as "maps" to show the relationship of all carburetor parts. ONLY step-by-step instructions are to be used when assembling or disassembling. For your convenience, each exploded view features a reference number to all parts. Use these illustrations to eliminate any confusion which might occur regarding names of parts, placement, attachments, or adjusting points. Also pay close attention to these illustrations to determine differences in design from year to year. Above all, do not skip steps - you may miss important information!

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CARBURETOR MANUAL

GLC CARBURETORS

GLC WAGON CARBURETORS

1979-1983

B2000 CARBURETORS

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MAZDA CARBURETOR BOOK
GLOSSARY OF TERMS

Certain terms throughout this book have been standardized for the sake of simplicity. Other terms may not commonly be used elsewhere. For instance, the terms "step jet" or "step" will not be used here even though they may appear in past Mazda service literature. Instead of "step" components and "slow" components, all are listed as "slow".

Be sure to check this section for an explanation of any term which may not be familiar to you.

Air/Fuel Ratio

Amount of air compared with the amount of fuel required to properly operate an engine.

Air Bleed

A precisely-metered opening which allows air into certain parts of the carburetor at a controlled rate.

Air/Fuel Solenoid

Electronically-operated valve which rapidly moves up and down in the feedback carburetor, controlling the air/fuel mixture according to signals sent from the control unit.

Air Horn

The top of the carburetor where the air enters. On Mazda vehicles, the air cleaner usually attaches on top of the air horn.

Air Vent Solenoid

An electrically-operated valve in the carburetor which determines whether evaporative gas from the float bowl will flow through the carburetor or to the canister.

Altitude Compensator Valve

Device that responds to changes in atmospheric pressure to provide additional air to the carburetor at high altitudes.

Bi-Metal

A sensor made of two pieces of metal bonded together. The two metals respond to temperature changes at different rates, causing the strip to bend around. Widely used on Mazda carburetors to control or assist with opening or closing of the choke.

Canister

A container of activated charcoal (carbon) which traps and stores fuel vapors.

Check Valve

(In a carburetor) Usually a precision-made ball backed by a spring or weight. The ball acts as a valve by sealing an opening shut or open according to pressure against it.

Choke

A device in the carburetor designed to enrich the air/fuel mixture in order to ease starting when the engine is cold. The choke also assists with driveability on a cold engine.

Closed Loop System

On Mazda vehicles, a system whereby the air/fuel mixture is controlled by a computer which acts based on signals it receives from the oxygen sensor and various other sensors.

Coasting Richer Solenoid

An electrically-operated valve which allows richer mixture on deceleration (see Fuel Enrichment Systems).

Dash Pot

A device used on the carburetor to prevent the throttle valve from returning too rapidly.

Diaphragm

A flexible, rubberized skin stretched across an opening between two open compartments, thereby separating them. Vacuum or suction from either side can cause the diaphragm to pull back or push in to the opposite compartment.

Duty

On Mazdas, simply an indication of the signals going to the air/fuel solenoid from the control unit. This measurement may be taken on either a duty meter or a 90° dwell meter and should fluctuate anywhere between 20°-70° under normal operation.

EGR

Short for exhaust gas recirculation.

Float

On Mazda carburetors, a block of material which floats on gasoline and thereby controls fuel entering the bowl.

Float Level

On Mazda carburetors, height of fuel in the float bowl. Also specific setting that will produce a correct fuel level.

Emulsion Tubes

On Mazda carburetors, perforated tubes on the bottom of main air bleeds which introduce air into gasoline.

Idle (or Idle Speed)

Normal operating speed (as specified on Mazdas) of engine with throttle closed.

Jet

A precisely-metered opening which allows gas into certain parts of the carburetor at a controlled rate.

Lean Mixture

An air/fuel mixture which contains a lower-than-normal amount of fuel.

Main Body

Central component of carburetor, usually containing jets, air bleeds, float bowl, etc.

MAS

On Mazda carburetors, mixture adjust screw.

Needle Valve

On Mazda carburetors, a pointed brass part (attached loosely to the float) which allows gasoline into the float bowl.

Primary System

Main system in the carburetor for fuel supply ranging from low-speed operation to cruise speeds (see Theory & Operation Section for more information).

PTC

On Mazda carburetors, positive temperature coefficient. A resistor device which increases resistance as temperature goes up.

PTC Heater

On Mazda carburetors, either an electrically-heated choke control or a de-icing plate bolted beneath the carburetor.

PCV

Positive crankcase ventilation.

Richer System

Circuit in carburetor which allows more fuel into the air/fuel mixture to meet a specific need (see Theory Section).

Richer Mixture

An air/fuel mixture which contains a higher-than-normal amount of fuel in proportion to air.

Secondary System

Supports the primary main system in the carburetor in order to provide necessary air/fuel mixture as engine speed and demands on the carburetor increase.

SFC

Short for slow fuel cut solenoid, an electrical valve which cuts the flow of fuel in the slow fuel circuit to prevent run-on (dieseling) when the engine is turned off or upon deceleration. See Theory Section for more details.

TAS

Short for throttle adjust screw.

Throttle Body

Usually the bottom-third component of the carburetor which houses throttle plates, lever assemblies, linkages, etc. On Mazdas, the TAS and MAS are usually located in this component.

Throttle Positioner

Device which automatically opens the throttle to compensate for conditions which might require higher RPM (such as engagement of the air conditioning compressor).

Venturi

The tapering openings which lead air into the carburetor. The design of these "barrels" is to speed the flow of air into the carburetor.

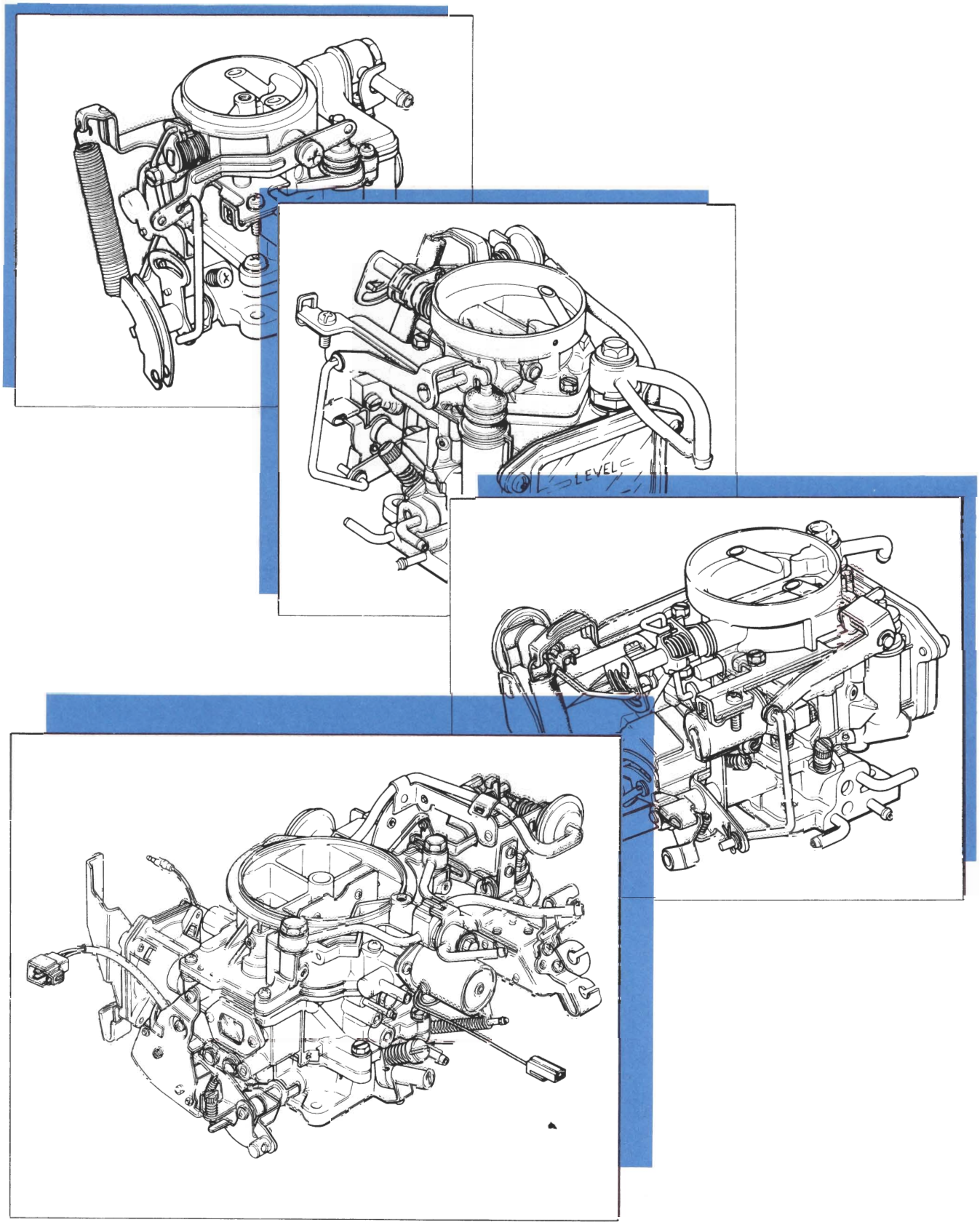
HOW TO USE THIS CARBURETOR MANUAL

1. The exploded carburetor illustrations contained in this manual are primarily for parts reference and to show relative positions. These illustrations should never be used as disassembly guides. Many parts shown in exploded views should NOT be disassembled. Instead, use the illustration and parts list as an aid in following the step-by-step procedures for disassembly and assembly. Familiarize yourself with terms or parts mentioned in the step-by-step section by checking the illustrations, parts lists and glossary.

2. Use the table of contents to find the correct section for the carburetor you are servicing. Rebuild sections are all based on the same format, but remember - do not skip steps in the overhaul and adjustment sections. You may miss important information that could affect the outcome of your repair!

3. This manual contains the latest update information available at the time of printing. The most recent information on parts changes, new adjustments, procedures, kits, etc. is included in each section. For this reason, pay close attention to instructions as they may differ from procedures you have used in the past.

INTRODUCTION



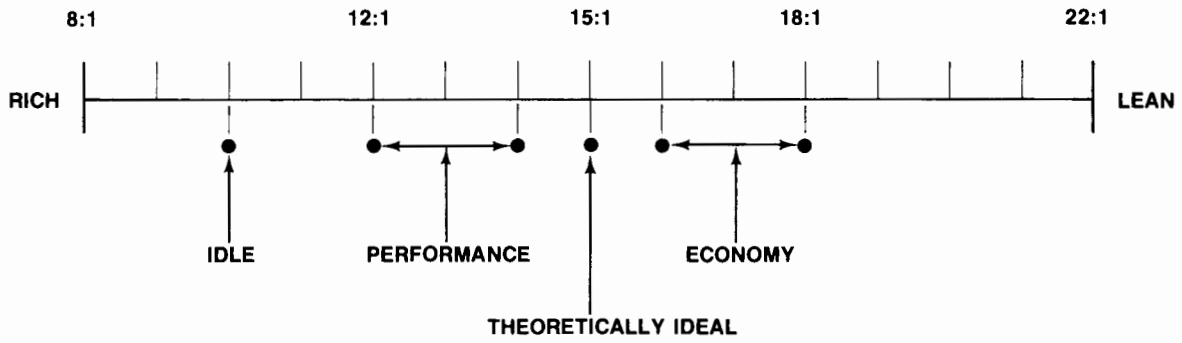
Originally the carburetor was called a mixing valve which, as the name implies, is basically what it did; it mixed air and fuel into a highly combustible state.

Modern carburetors still mix air and fuel but they are much more sophisiticated and complex.

Not only must today's carburetors provide the ideal air/fuel mixture for all engine operating conditions and performance demands, but they must also provide good fuel economy and meet emission standards.

THEORY & OPERATION

• AIR/FUEL RATIO



When we talk about air/fuel mixture or ratio we are talking about the number of parts of air compared to one part fuel, measured by weight.

The chart above illustrates some basic air/fuel ratios.

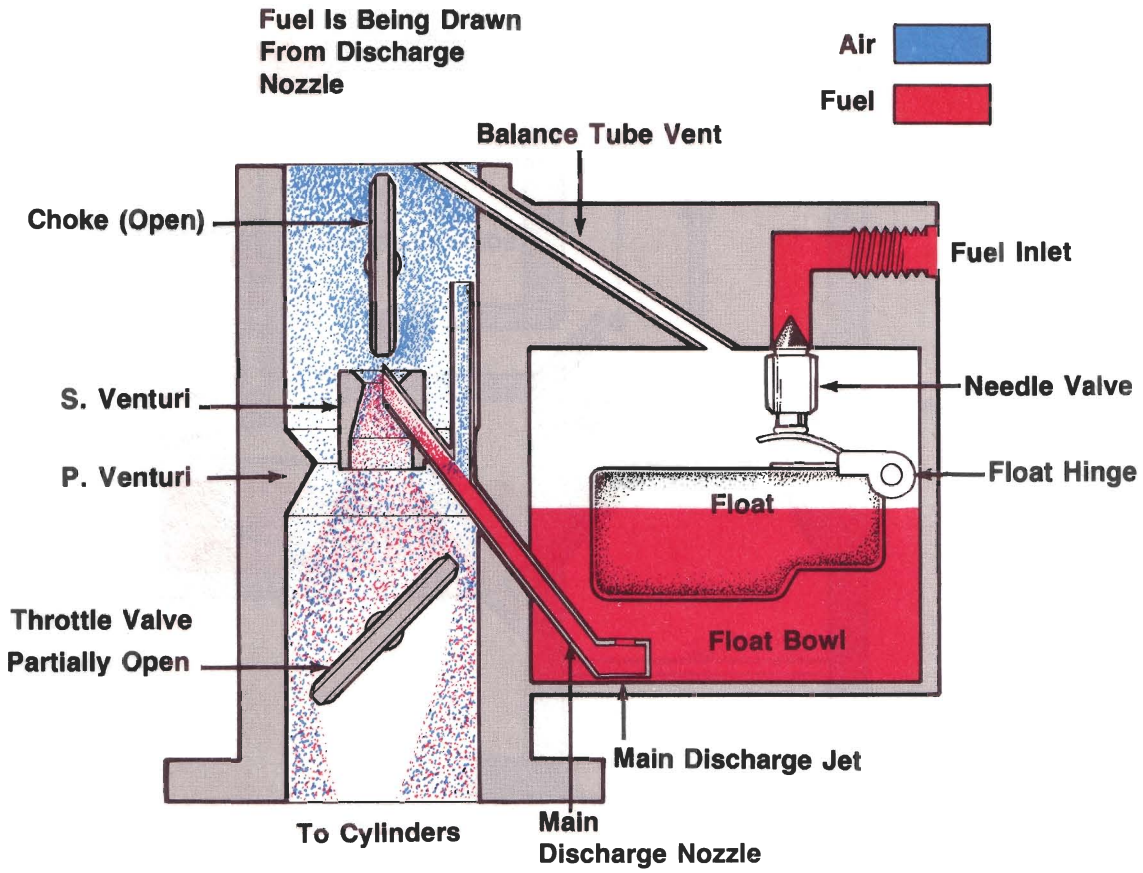
We can see that the best performance ratio is 12-14 parts air to 1 part fuel or 12-14 to 1. But because we desire to conserve fuel and lower emissions, the most efficient ratios are 16-18 to 1.

Most of the time you'll see air/fuel ratios written as two numbers separated by a colon, such as "16:1". Such a ratio should be read as "sixteen to one" or 16 to 1.

NOTE:

THEORY & OPERATION

Basic Carburetor



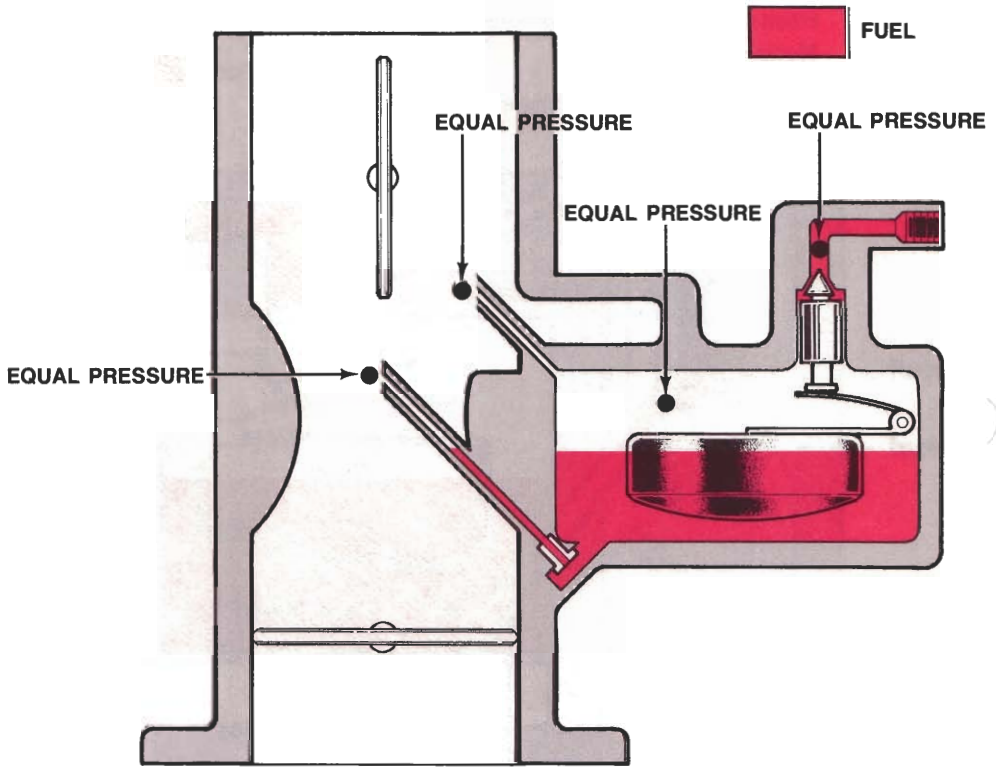
B. BASIC OPERATION AND COMPONENTS

To accomplish its task, the carburetor uses several systems (called circuits) as well as a few basic principles of physics.

For ease of understanding, the carburetor explanation can be broken down into two areas of operation. The first area covers how the air is inducted and used to atomize the fuel. The second area covers how the proper proportions of air and fuel are drawn in to meet engine demands.

NOTE:

THEORY & OPERATION

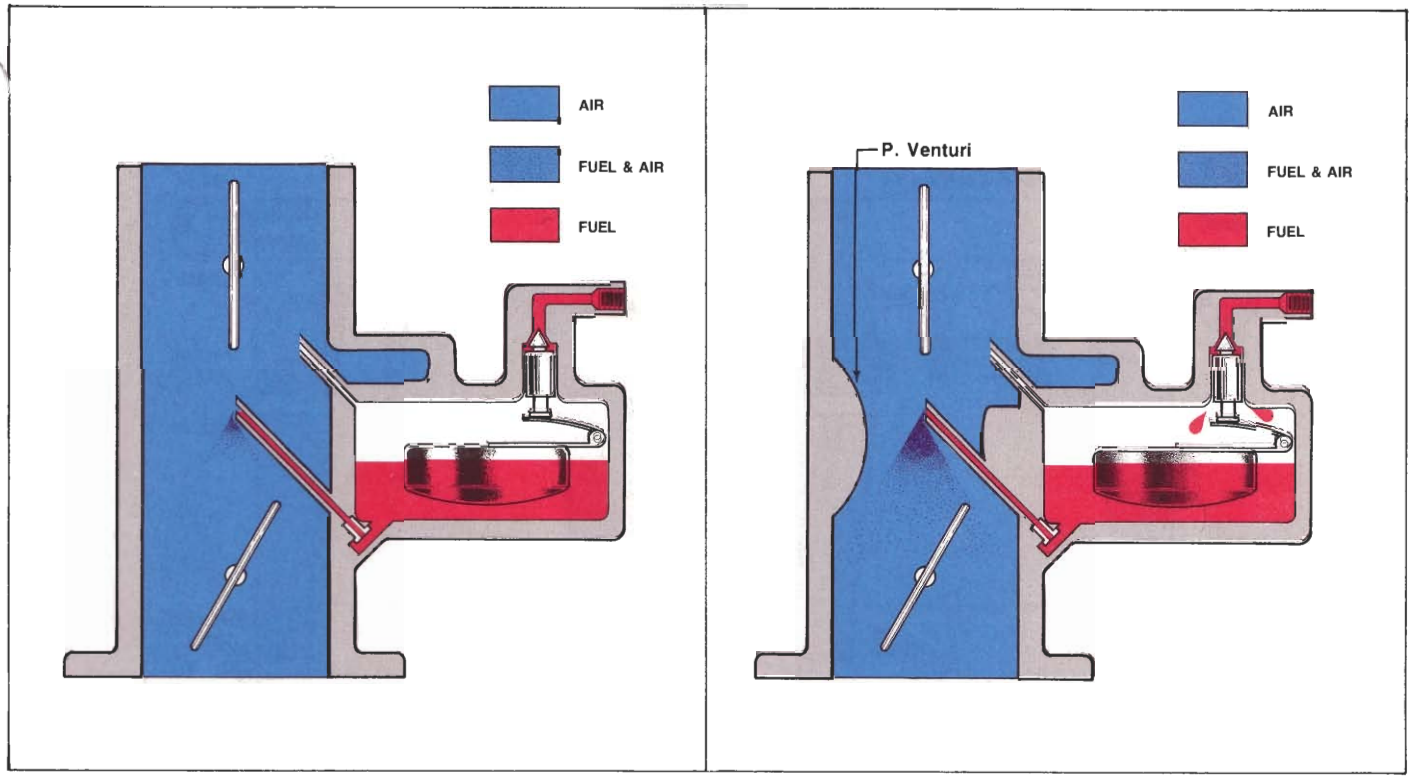


C. AIR FLOW AND ATMOSPHERIC PRESSURE

When pressure on a liquid (such as fuel in the carburetor bowl) is equal on all sides the liquid will not flow. In order for fuel to flow, we need a pressure difference. The carburetor uses air flow to create a low pressure area (vacuum) in the carburetor throat. This allows the fuel to flow (be drawn) from the float bowl into the carburetor throat and then into the engine.

NOTE:

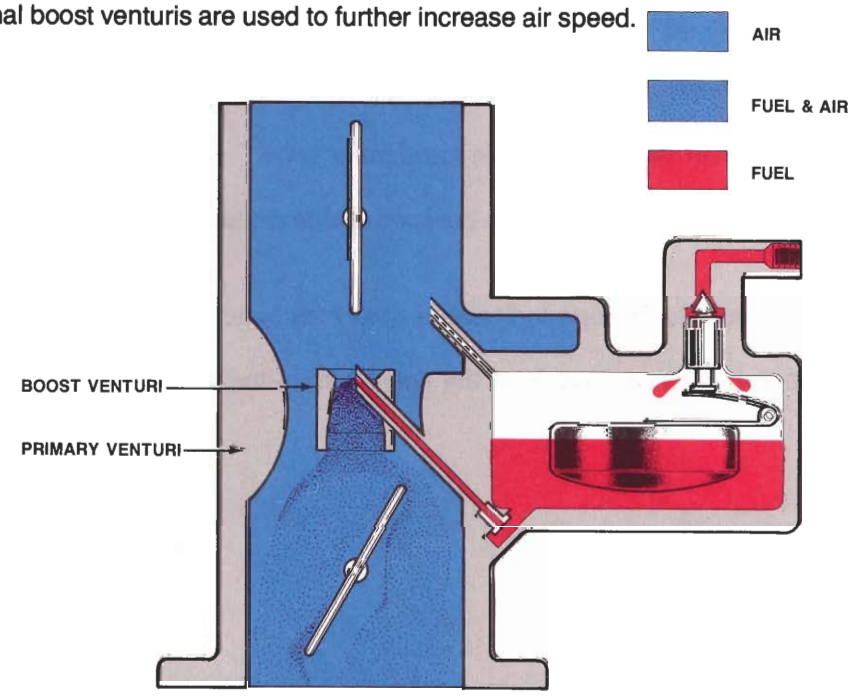
THEORY & OPERATION



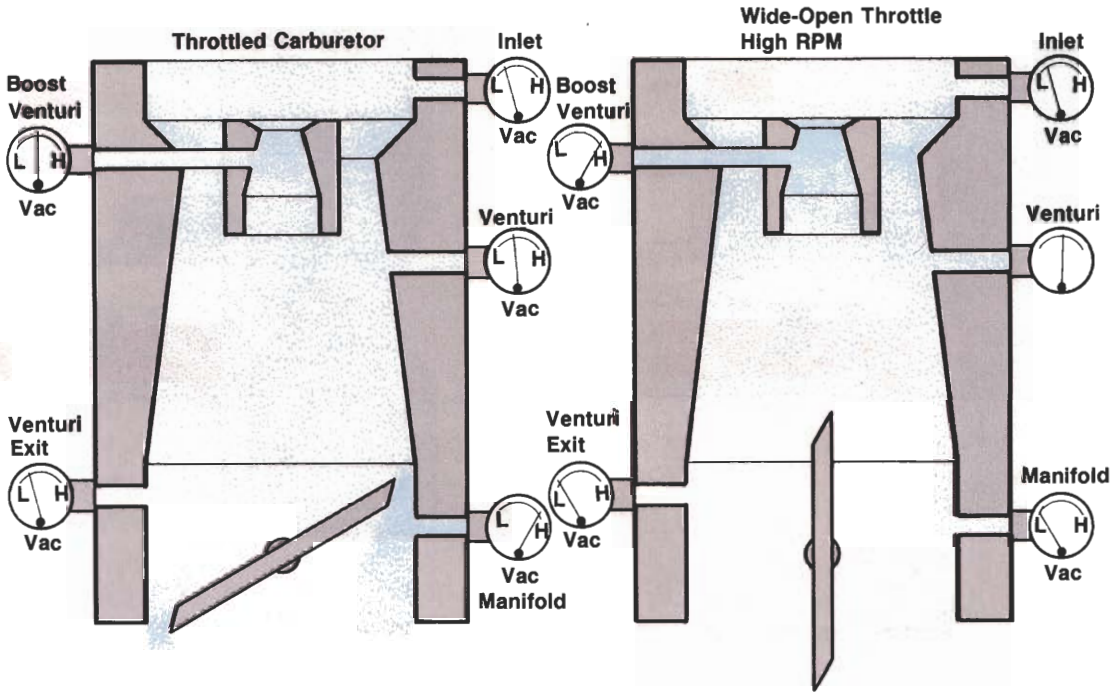
D. VENTURI EFFECT

To use the vacuum principle more effectively, a venturi or "venturi effect" was introduced. By placing a narrowing passageway in the intake tube, the vacuum increases greatly. This allows more fuel to be drawn into the passageway as shown. The increase in vacuum described here is the venturi effect.As the air flows faster, the pressure difference becomes greater and the fuel flow increases.

Quite often, additional boost venturis are used to further increase air speed.



THEORY & OPERATION



E. VACUUM

Slight vacuum at inlet represents drop across the air cleaner.

Gauge at large venturi throat shows higher vacuum because air is still at relatively high velocity.

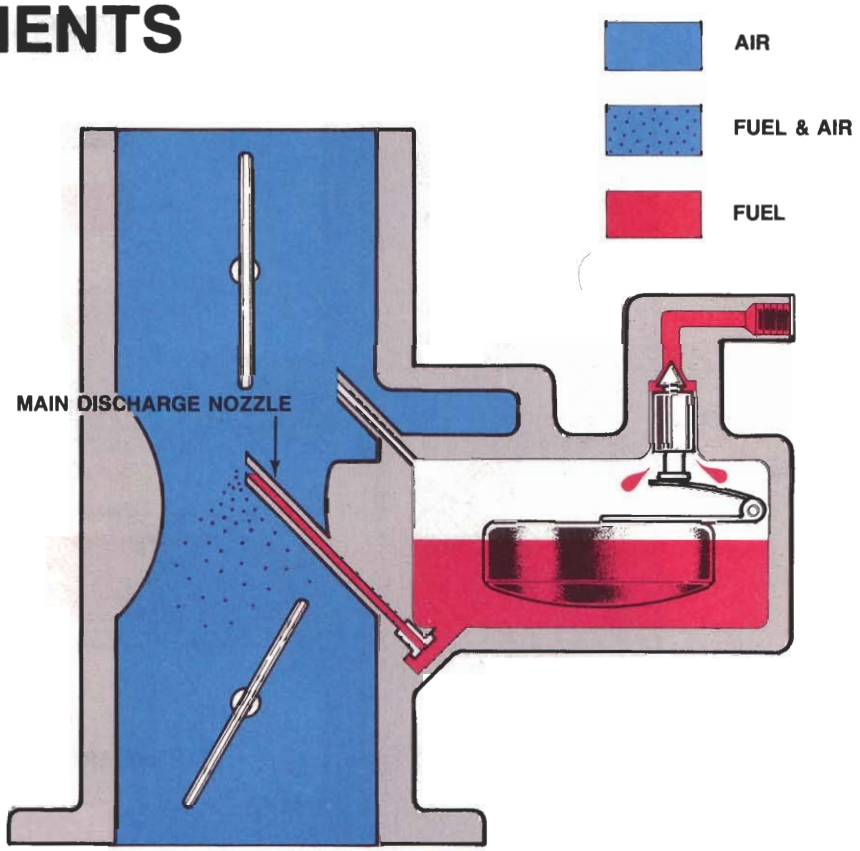
Vacuum returns almost to the inlet value just before the throttle plate.

Throttled carburetor shows very high manifold vacuum because a large pressure drop occurs across the partially opened throttle.

Wide-open carburetor's low manifold vacuum indicates a heavy-load situation.

In both cases, the highest carburetor vacuum is at the boost-venturi throat.

COMPONENTS



A. MAIN DISCHARGE NOZZLE & FLOAT BOWL

• PURPOSE

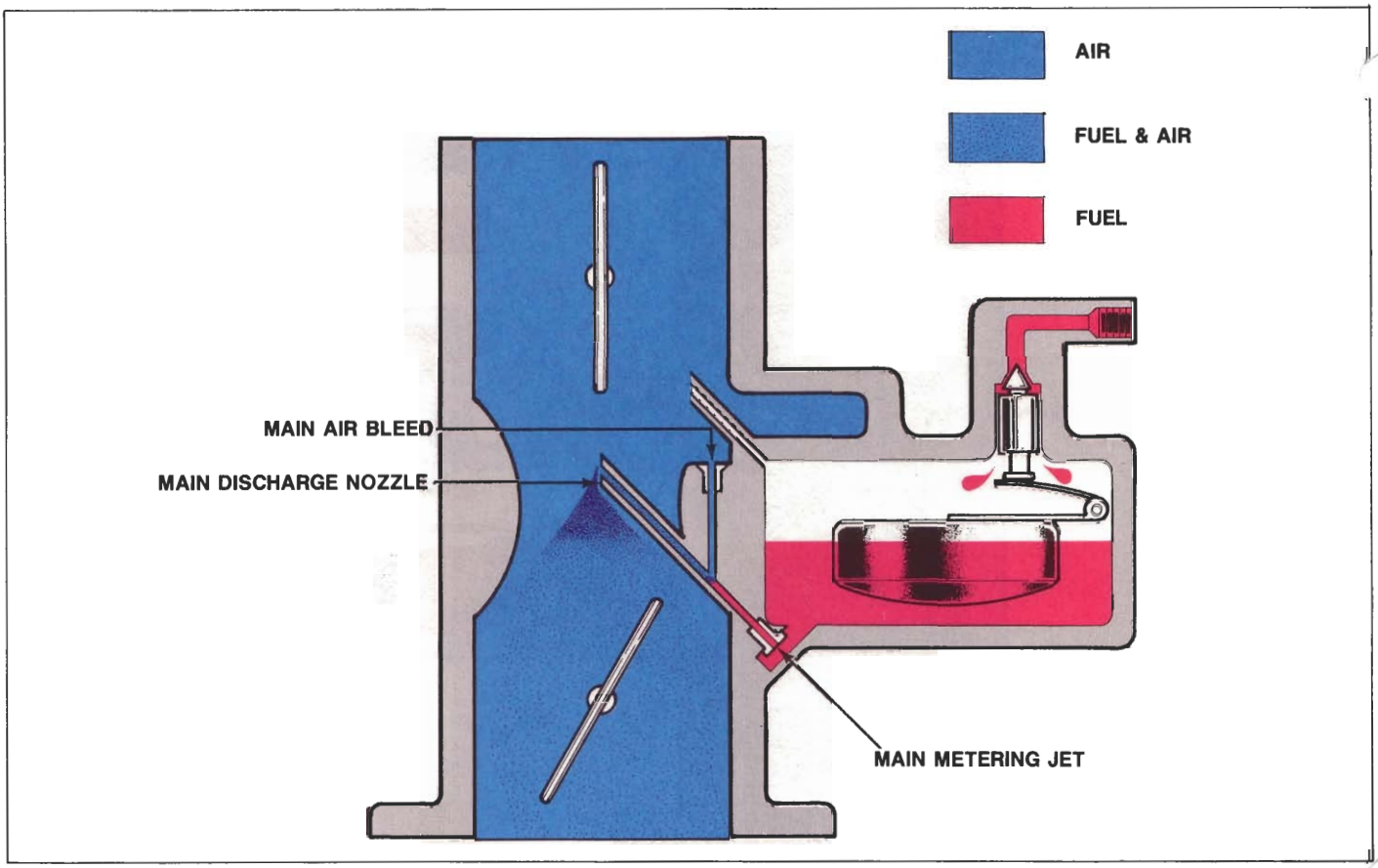
The float bowl acts as the storage tank for the fuel. The main discharge nozzle is the pipe or channel used to transfer the fuel to the carburetor throat.

• OPERATION

The fuel is drawn from the float bowl (high pressure area) through the discharge tube into the venturi (low pressure area) where it is atomized for combustion.

NOTE:

THEORY & OPERATION



B. AIR BLEEDS

● PURPOSE

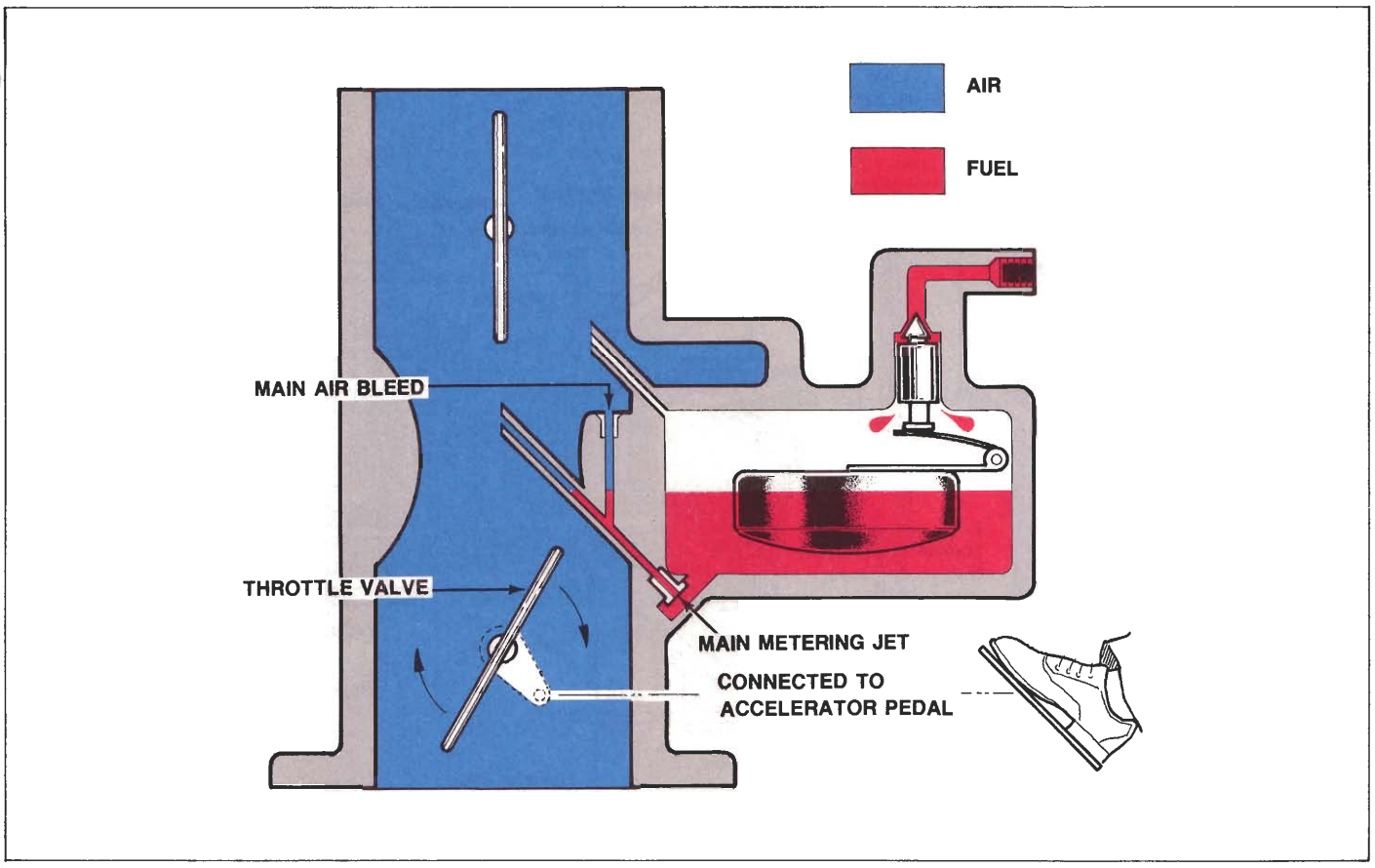
Air bleeds help to atomize the fuel.
Act as an anti-siphon bleed when the system is not operating.
Help control the vacuum effect at the discharge point.
Are carefully calibrated to insure proper mixture ratios.

● OPERATION

The air bleed can be either a brass jet which is screwed or pressed into the carburetor, or a precision drilled orifice.

Air bleeds are mounted in the top of the carburetor float bowl or in the air horn. These openings allow fresh air from the carburetor throat to bleed into the circuits that are in operation.

NOTE:



C. JETS

● DESCRIPTION

Carburetor jets are small orifices commonly made of brass. Jets are used in both the air and fuel passages. Jets normally are made to be screwed in, but may also be pressed into place depending on application.

● PURPOSE

Jets are used to meter the air or fuel flow to provide the correct air/fuel mixture.

D. THROTTLE VALVE

● DESCRIPTION

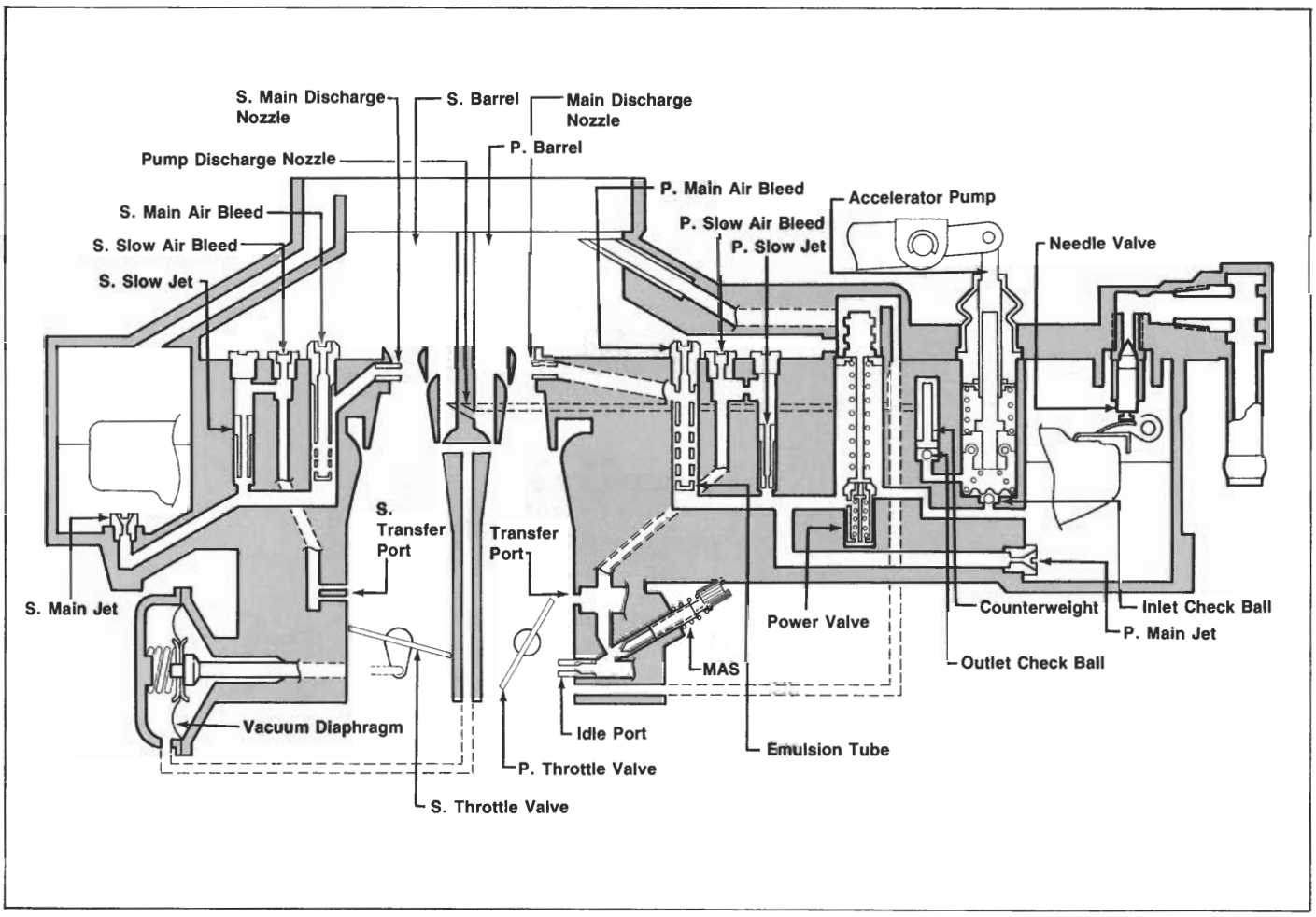
The throttle valve is usually made of brass and is positioned in the lower portion of the carburetor throat. This valve is connected to the accelerator pedal by linkage or a cable.

● PURPOSE

The throttle valve is used to control the air flow through the carburetor, thereby controlling engine speed.

So far, we have constructed a carburetor we can only operate effectively at one setting.But because we operate our vehicles at different settings, (idle, low, medium, and fast running), it is necessary to vary the air/fuel mixture to produce differing air/fuel ratios. These differing ratios are necessary to meet the demands of the engine.

THEORY & OPERATION



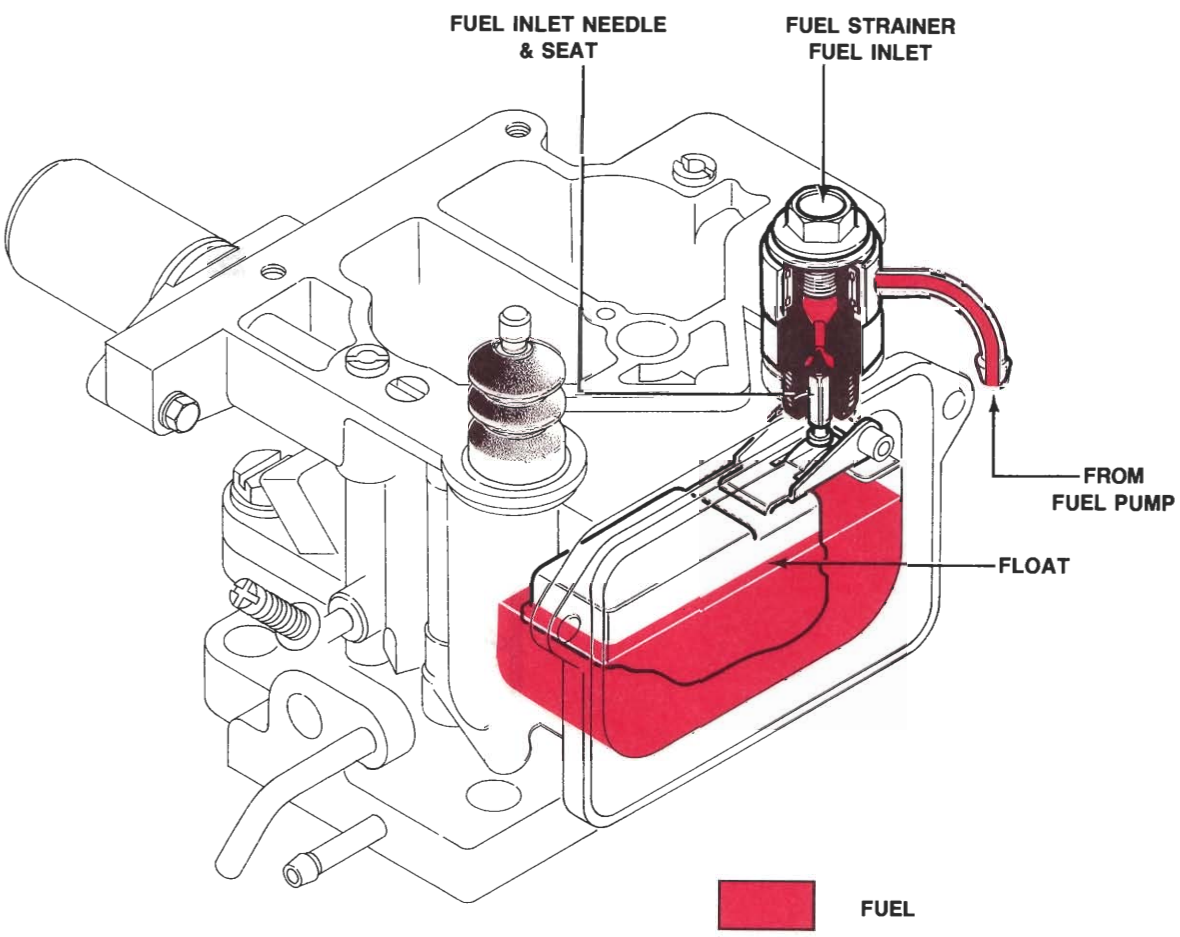
CARBURETOR CIRCUITRY

One of the primary tasks of the carburetor is to vary the air/fuel mixture. To fulfill this need, there are several basic circuits designed into a carburetor. These circuits are listed below:

CIRCUITS:

Fuel inlet (float)
Idle
Low speed
Slow fuel cut
Primary main fuel system
Secondary slow (transfer) system
Secondary main fuel system
Fuel cut valve
Fuel enrichment system
Choke system
Altitude compensator

THEORY & OPERATION



FUEL INLET SYSTEM

A. FUEL INLET (FLOAT) CIRCUIT

• PURPOSE

The inlet (float) circuit is designed to maintain the proper fuel level in the float bowl during all engine operating conditions.

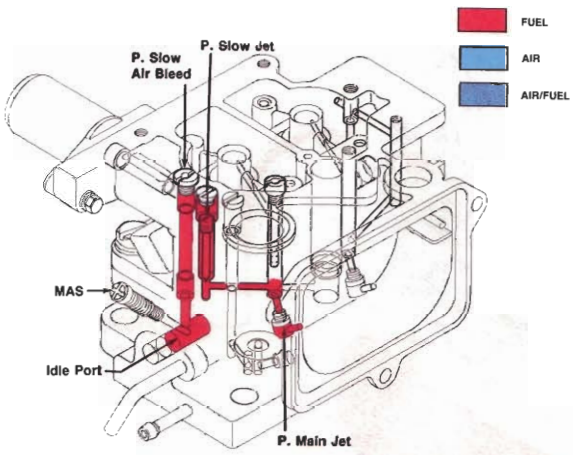
• COMPONENTS

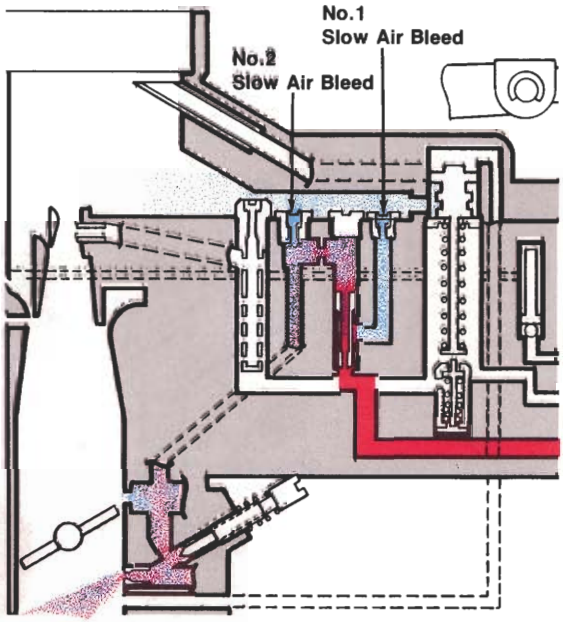
Float
Needle & Seat
Float Bowl

• OPERATION

The float pushes the needle valve up against the valve seat and restricts or shuts off the fuel flow (depending on fuel level).

Because the float circuit affects all circuits of the carburetor, its setting is very critical.





B. IDLE CIRCUIT

● PURPOSE

The idle circuit is designed to operate at idle and low speeds. The circuit features a mixture adjusting screw (MAS) so it can be set to provide the proper mixture during these conditions.

Then the throttle valve is in the idle position, there is little or no air flow through the venturi. Because of this, no vacuum is created above the throttle plate to draw fuel from the main discharge nozzle. In order for fuel to be drawn from the float bowl, the idle port is located in the high vacuum area below the throttle plate.

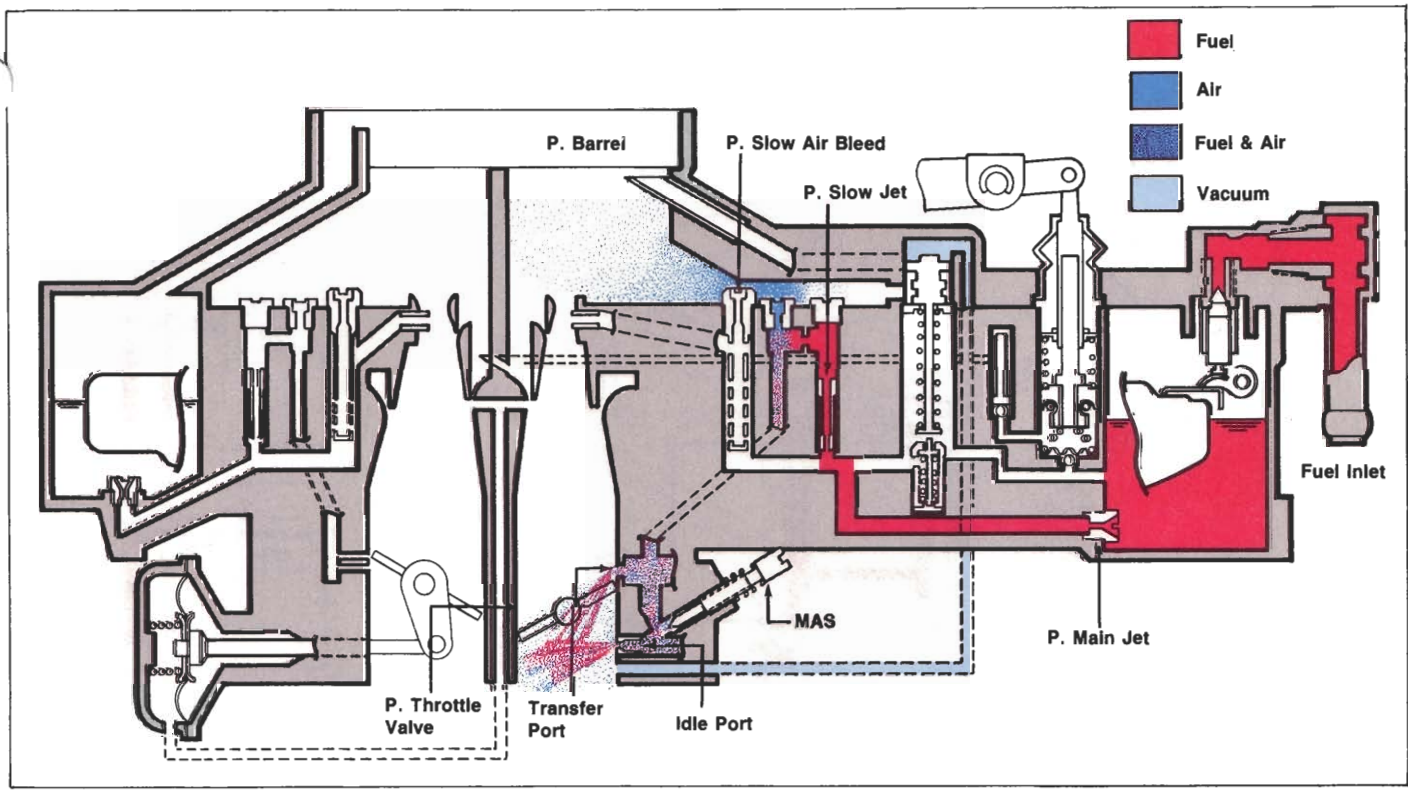
● OPERATION

Fuel flows from the float bowl through the main jet to the idle well. From here the fuel continues on through the slow jet. Just past the slow jet, the fuel mixes with air from the slow air bleed and then flows to the idle port.

At the idle port the mixture is controlled by the mixture adjust screw (MAS). This MAS matches the idle discharge flow with the air flow past the throttle plate.

As the throttle is opened, the vacuum gradually decreases as does the flow from the idle port. At this point, fuel begins to be drawn from the transfer port.

Some models use No.1 and No.2 slow air bleeds to supply additional air for engine requirements.



C. LOW SPEED CIRCUIT

• PURPOSE

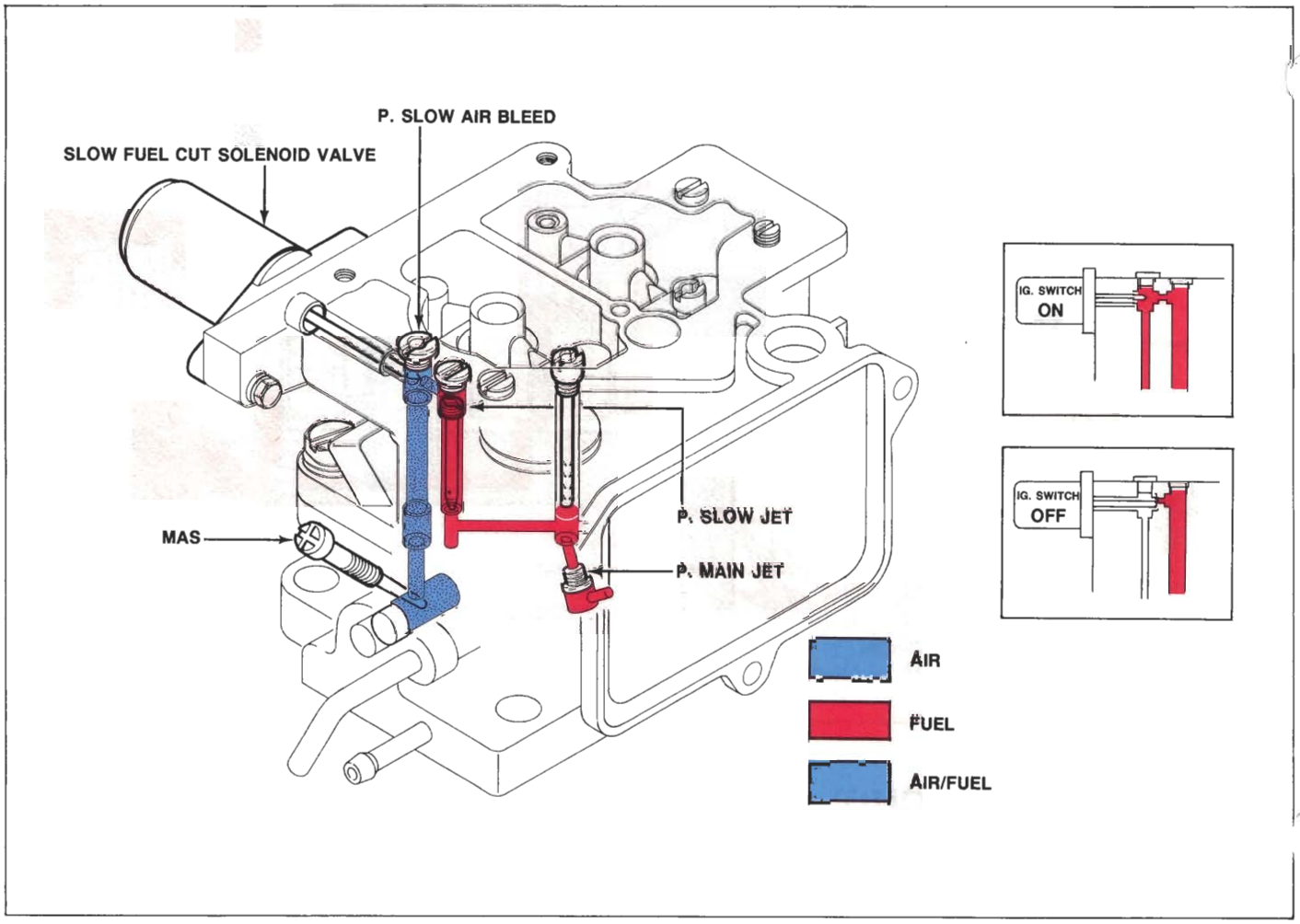
The low-speed circuit acts as a transfer circuit to provide a smooth transition from the idle circuit to the main circuit. The low-speed circuit also acts as an additional air bleed for the idle circuit.

• OPERATION

The transfer port is located immediately above the idle port and just above the throttle plate when it is in the idle position.

As the throttle is opened the transfer port is exposed to vacuum and begins to furnish fuel for the low speed operation.

This additional port prevents a hesitation which would otherwise occur during the transition from idle to the main circuit. Such a hesitation would exist because the idle circuit cannot supply enough fuel and the air flow is insufficient to supply fuel from the main discharge nozzle.



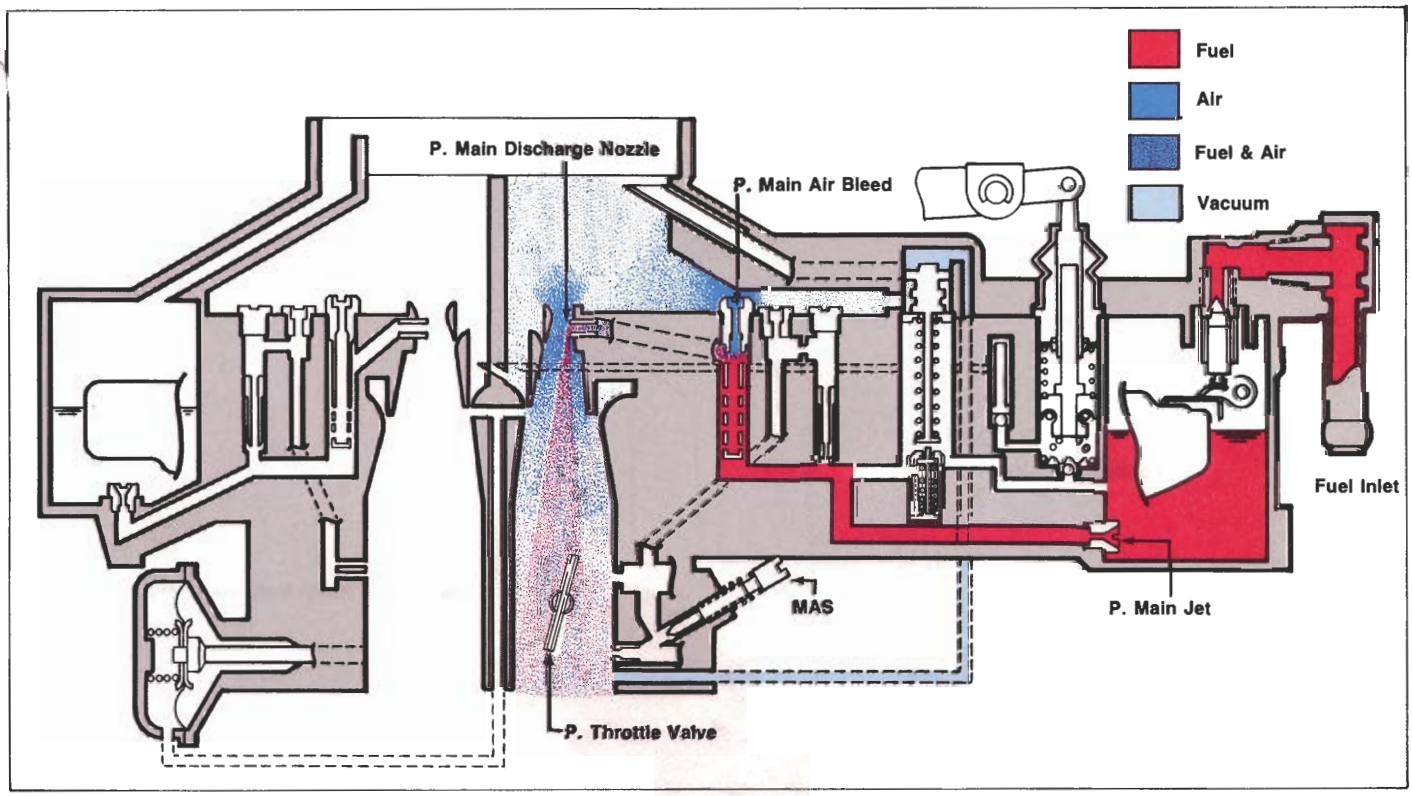
D. SLOW FUEL CUT

• PURPOSE

The slow fuel cut system is used to prevent run-on (dieseling) when the engine is shut off.

• OPERATION

An electric solenoid is placed in the idle circuit and cuts the fuel flow when the ignition switch is shut off.



E. PRIMARY MAIN FUEL SYSTEM

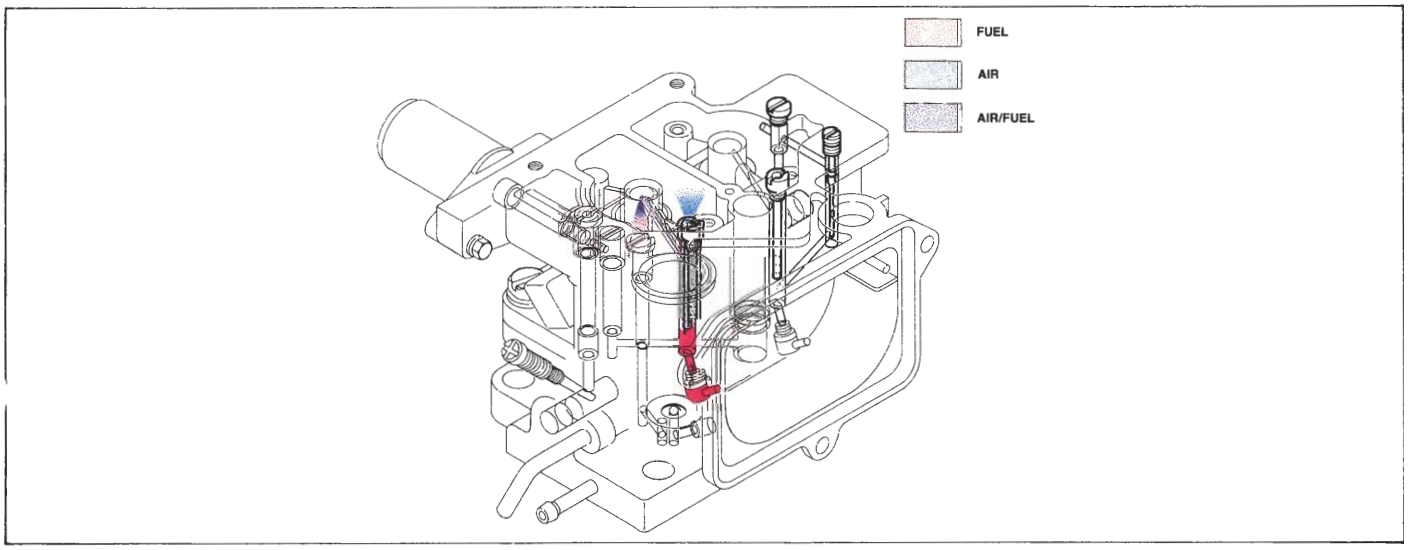
● PURPOSE

The primary main system provides the main fuel supply from low-speed operation to highway cruising. This system is designed to be the leanest circuit in the carburetor. This is because the circuit operates mainly during part-throttle operation. An engine can operate efficiently on a lean mixture during these conditions.

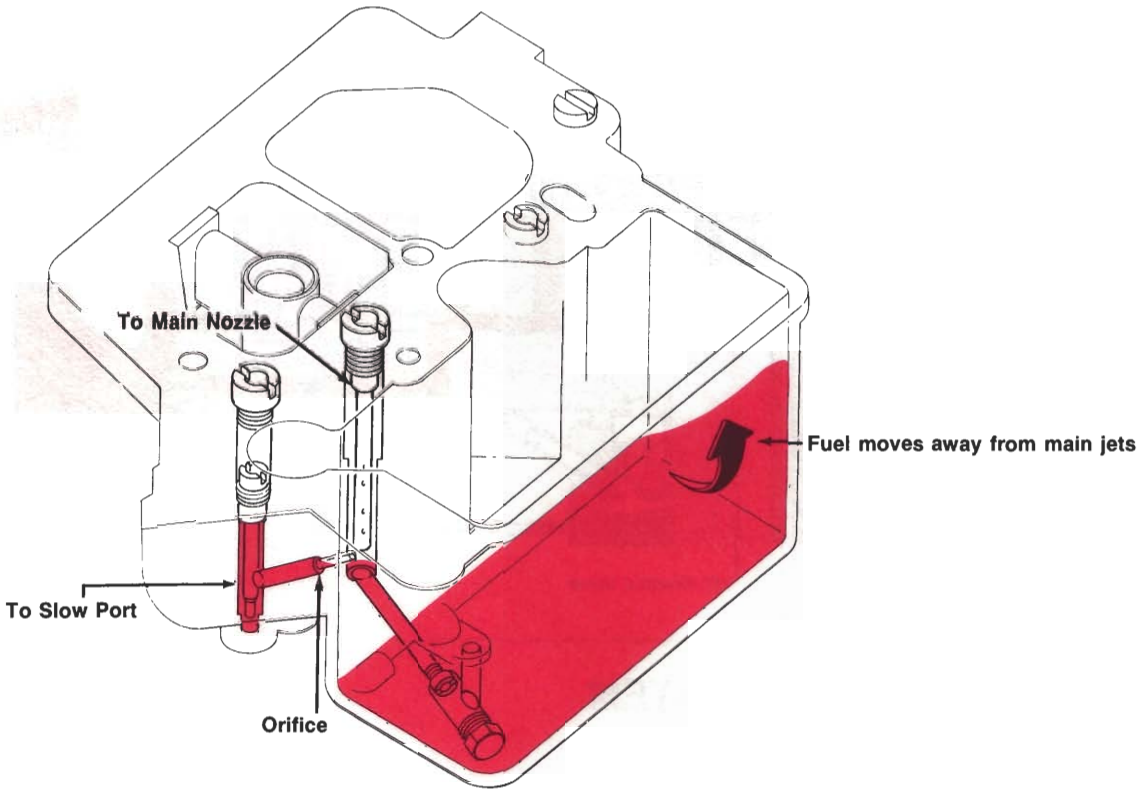
● OPERATION

As the throttle is opened it allows a sufficient amount of air to flow creating a usable vacuum at the venturi. This vacuum draws fuel from the main discharge nozzle mounted in the venturi.

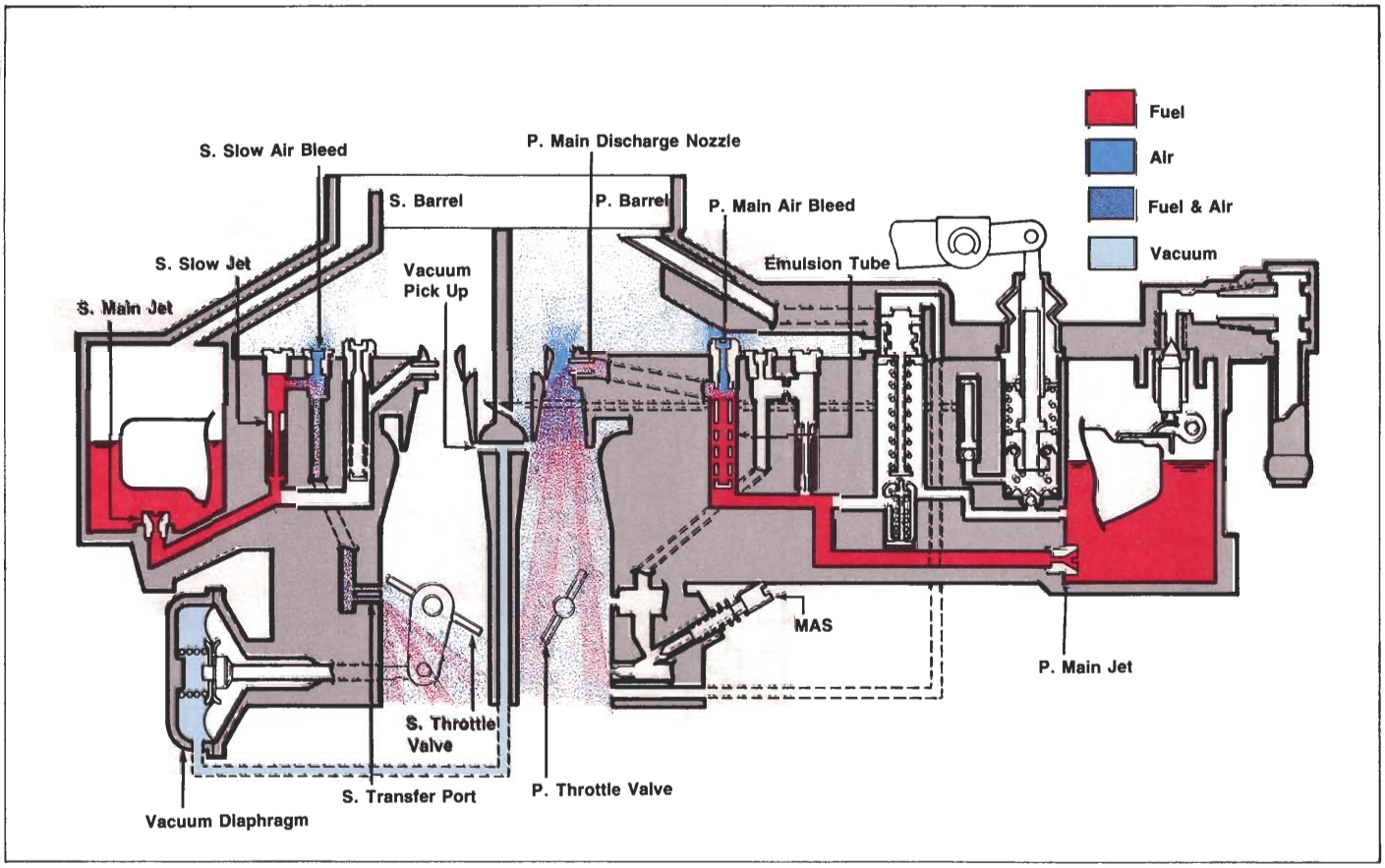
The fuel flows from the float bowl through the main jet and into the emulsion tube. At the emulsion tube the fuel is mixed with air from the main air bleed to start atomization. From the emulsion tube, the fuel flows through the main discharge nozzle and into the air stream at the venturi.Here it is further atomized and drawn into the engine.



THEORY & OPERATION



Due to the location of the carburetor on the FWD GLC, during fast left hand turns centrifugal force will cause the fuel to flow as shown.
When the fuel supply from the float chamber is stopped during hard left turns, the main system consumes the fuel in the main system passage and then the fuel in the slow passage, resulting in a fuel shortage in the slow system. To prevent the above problem, the diameter of the fuel passage is enlarged to provide a reservoir of fuel for the slow speed system and an orifice is provided in the fuel passage to restrict the fuel flowing to the main system.



F. SECONDARY SLOW (TRANSFER) SYSTEM

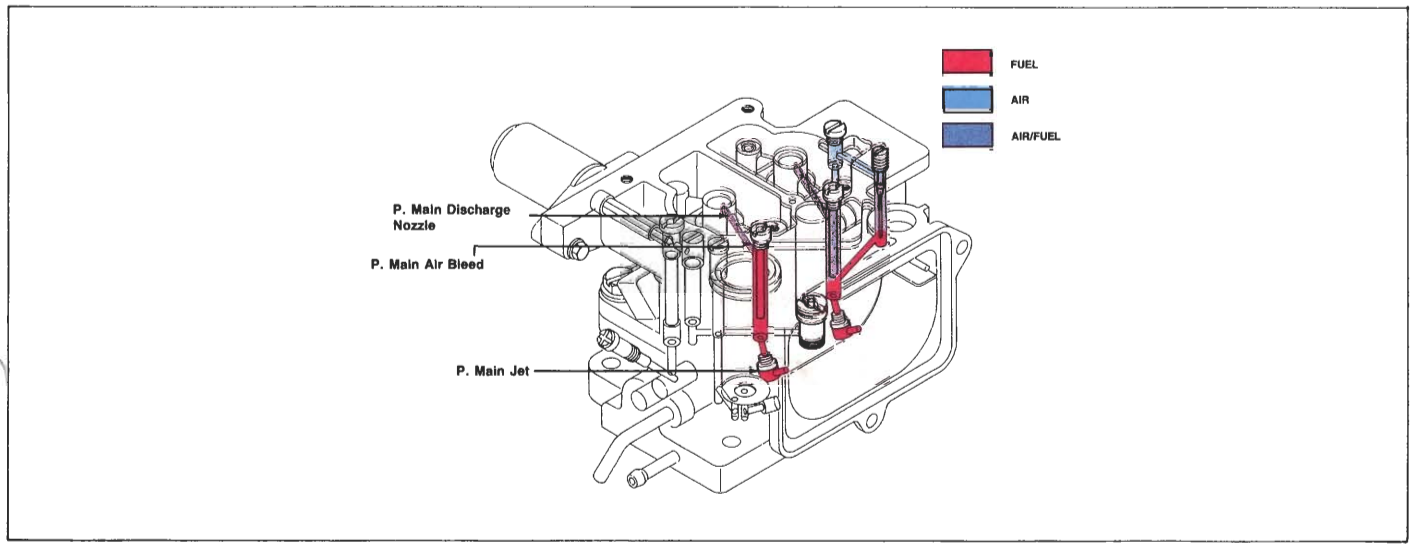
● PURPOSE

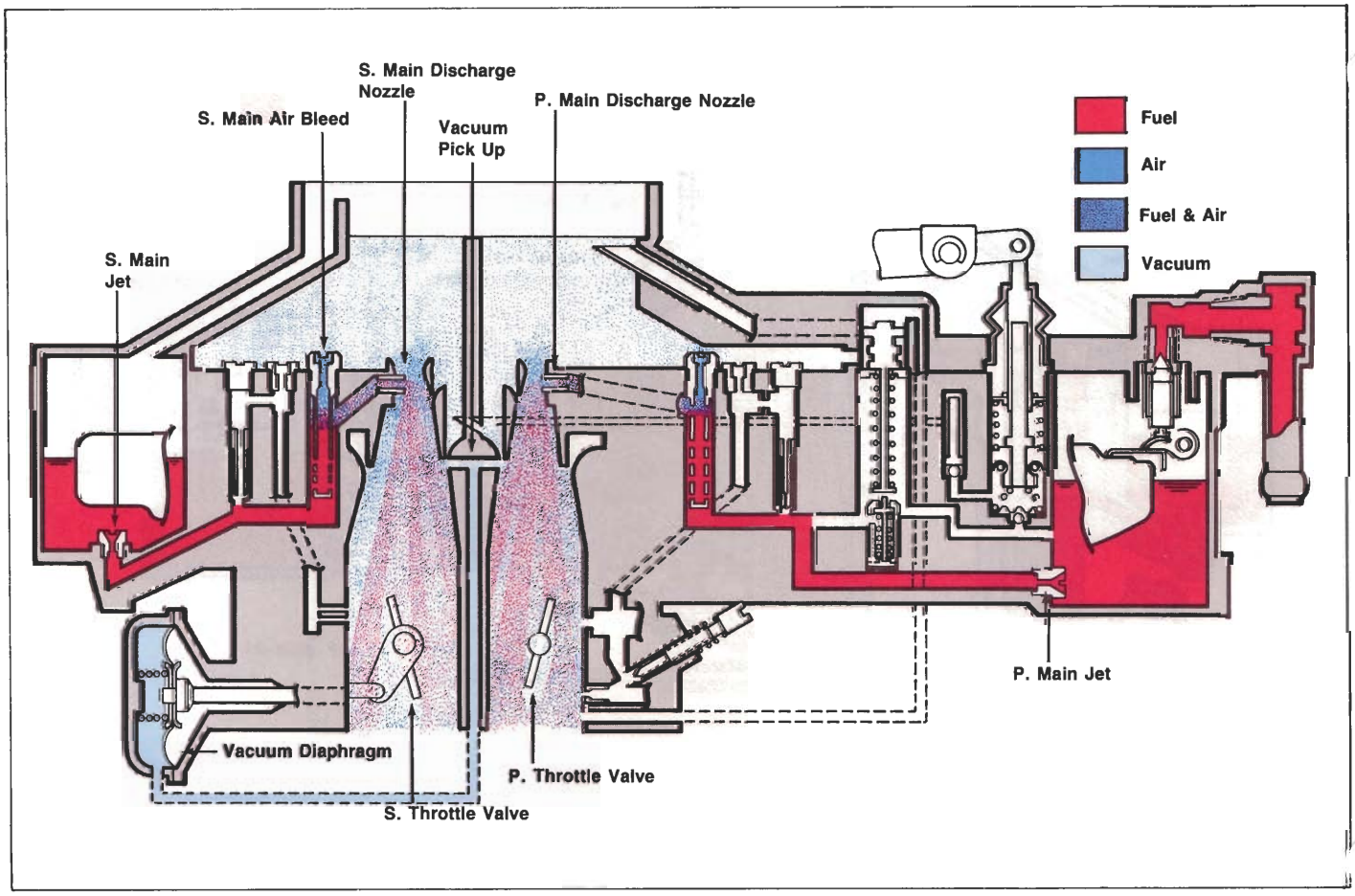
The secondary slow system provides a smooth transition from the primary to the secondary main system.

● OPERATION

The secondary transfer port is located just above the closed secondary throttle valve. As the throttle valve opens and sufficient vacuum is created, fuel begins to flow from the transfer port.

Fuel flows from the float bowl through the secondary main jet and on through the secondary slow jet. After passing through the slow jet, the fuel mixes with air from the secondary transfer port. The system operates well into the secondary main system fuel flow.





G. SECONDARY MAIN FUEL SYSTEM

● PURPOSE

To supply additional fuel and air to the engine. When the engine speed increases, the primary main system cannot supply enough air and fuel to meet the engine requirements. Therefore, the secondary main system is used to meet these additional needs.

The proper mixture and volume are then supplied by the combination of the two systems.

● OPERATION

A balanced vacuum source from the primary and secondary venturi is used to operate a vacuum diaphragm which opens the secondary throttle plates.

The secondary vacuum port acts as an air bleed during low-speed operation. This decreases the primary vacuum and delays the opening of the secondaries.

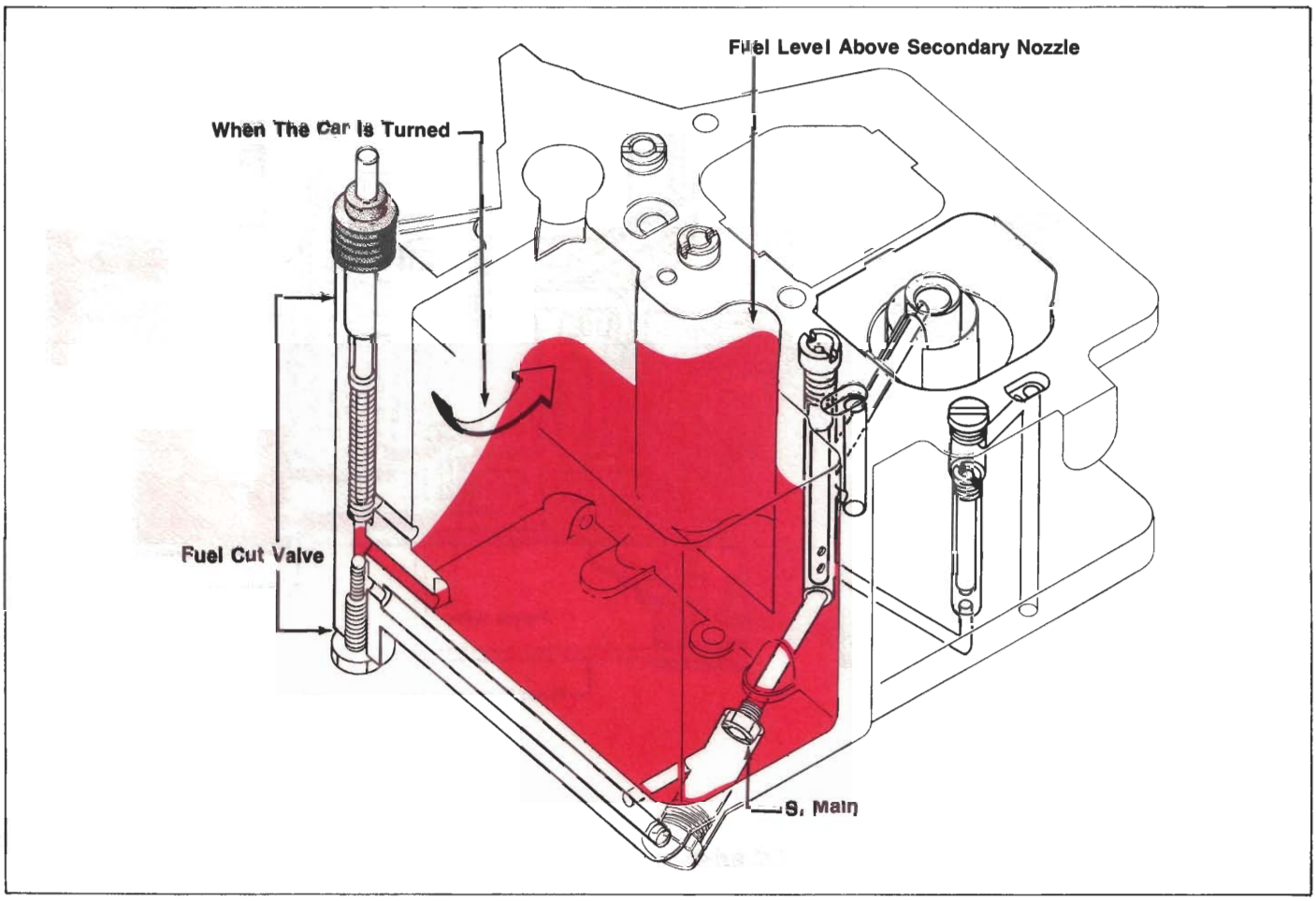
As the engine speed increases, primary vacuum also increases and begins to open the secondary throttle valve. As the secondary begins to open, vacuum is also created here and blends with the primary vacuum to fully open the secondaries.

The secondary vacuum port is also smaller than the primary vacuum port. The reason for this is to help control opening timing and to allow faster closing of the secondaries when the accelerator is released.

A lock-out is also used to prevent the secondaries from opening too soon. As the secondary throttle valve is opened it allows a sufficient amount of air to flow, creating a usable vacuum at the venturi. This vacuum draws fuel from the secondary main nozzle mounted in the venturi.

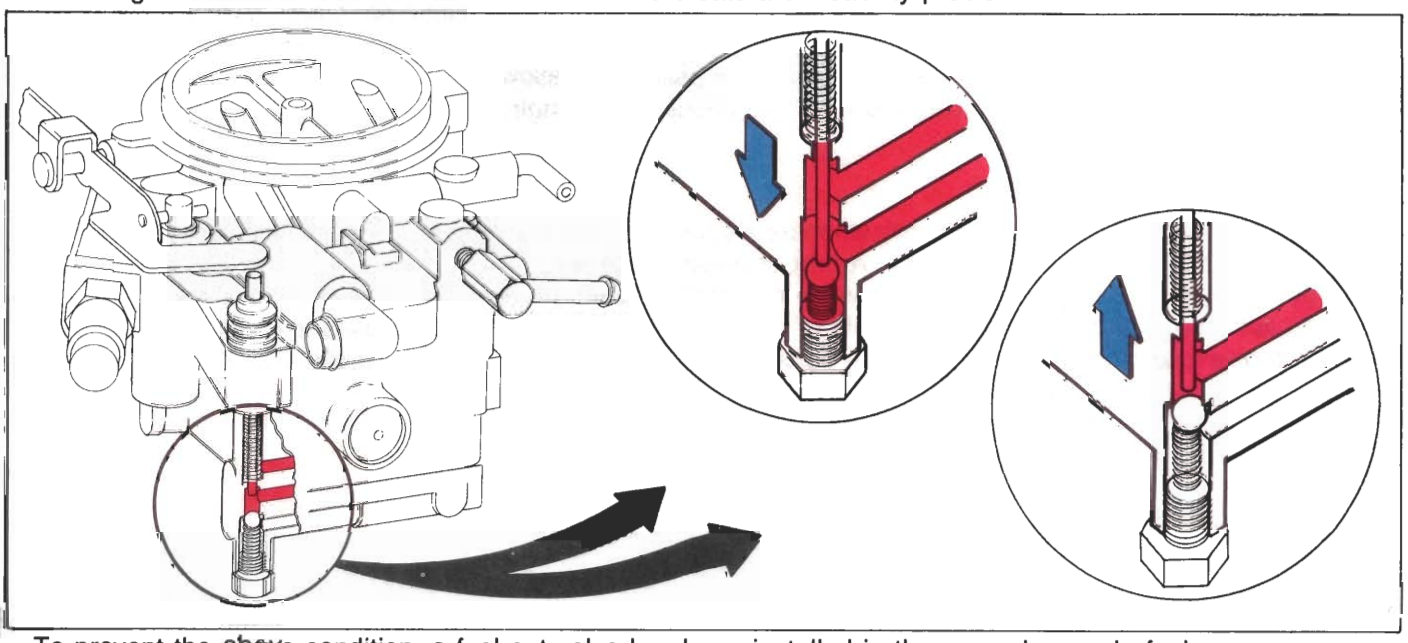
The fuel flows from the float bowl through the secondary main jet and on to the emulsion tube. At the emulsion tube the fuel mixes with air from the secondary main air bleed. Here is where atomization begins.

From the emulsion tube, fuel flows through the discharge nozzle and into the air stream at the venturi where it is further atomized and drawn into the engine.



H. FUEL CUT VALVE

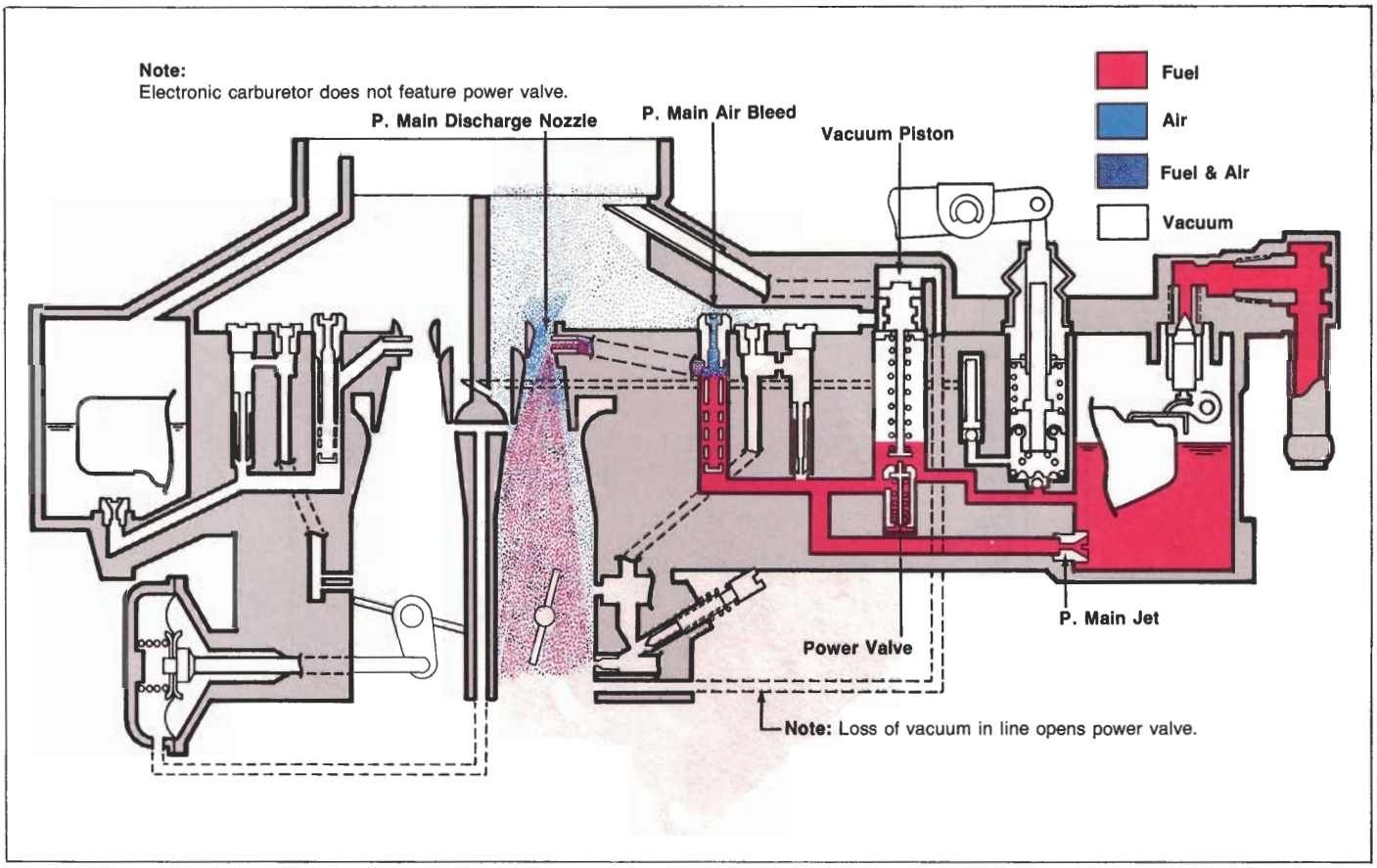
Due to the location of the carburetor on the FWD GLC, fast right turns can affect fuel levels inside. Centrifugal force will cause the fuel to move as shown and this will allow too much fuel to leak from the secondary fuel system. This leakage causes an over-rich mixture which could create a driveability problem.



To prevent the above condition, a fuel cut valve has been installed in the secondary main fuel passage. The fuel cut valve is operated by the accelerator pump lever and cuts the secondary fuel supply when the throttle is closed.

In 1983, the secondary venturi was mounted higher in the carburetor throat to eliminate the need for a fuel cut valve.

THEORY & OPERATION



I. FUEL ENRICHMENT SYSTEMS

● POWER VALVE, PISTON TYPE

● PURPOSE

The power circuit is used to provide the additional fuel needed during heavy load operation, such as acceleration or high-speed driving.

This is accomplished by providing a supplemental fuel passage to allow additional fuel to be added to the main fuel supply. The result is a richer mixture to meet the needs of the engine.

● OPERATION

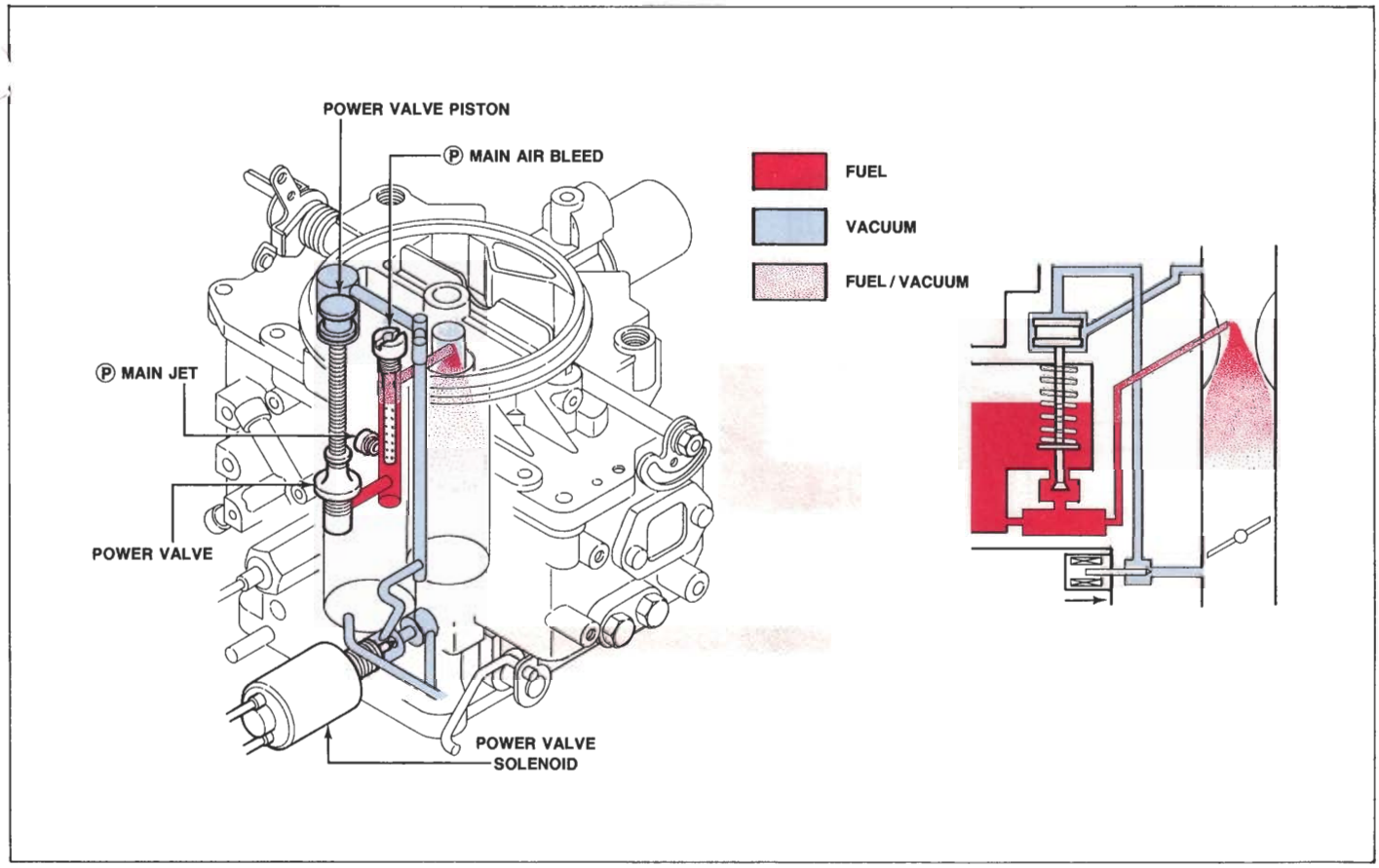
The power system must respond instantly when needed. Without such instant response, a "flat" spot or hesitation during acceleration would be encountered. A lack of power could result.

The best source of control over the power valve is engine vacuum. Engine vacuum is relative to engine load and responds accordingly. Low engine load results in high vacuum, high engine load means low vacuum.

As the engine load increases, vacuum drops below a predetermined level. This allows the piston to lower, pushing open the power valve.

The power valve also acts as the metering jet for the power circuit.

THEORY & OPERATION



• PISTON TYPE, SOLENOID CONTROLLED (as featured on RX-7)

• PURPOSE

The purpose of the solenoid-controlled power valve is to supply additional fuel during certain engine operating conditions. Other benefits are: aid in the reduction of NOx, quicker warm-up of the catalytic converter, improved high-speed performance and better acceleration.

Operating conditions may vary depending on model emission certification, (i.e. CAL, FED, CAN, etc.).

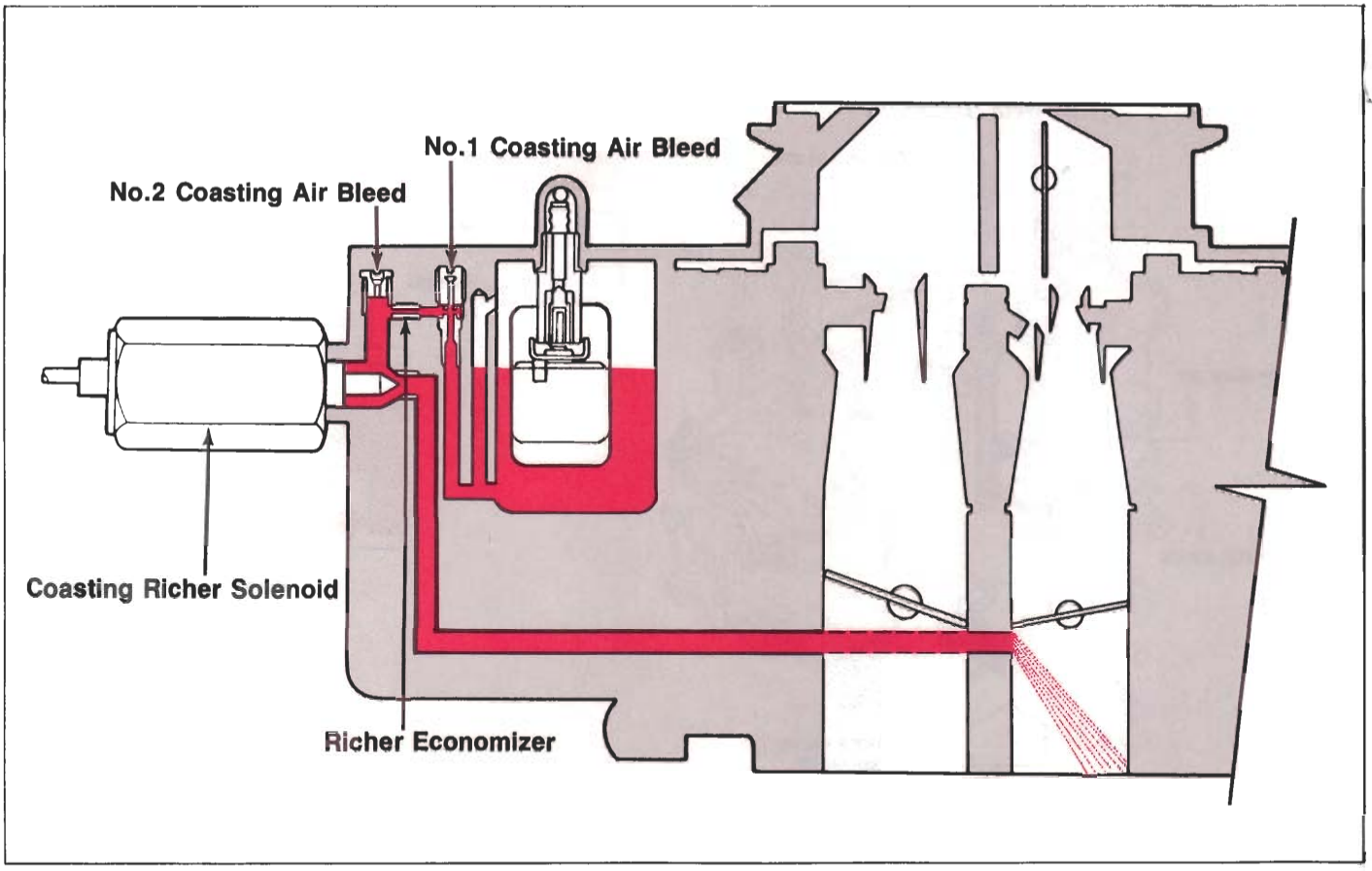
NOx is created during acceleration, heavy engine load or high speed driving because of the higher combustion temperatures created during this time. By allowing more fuel to enrich the mixture, the combustion temperature is lowered, thereby lowering NOx emissions.

During cold engine operation the choke is on and HC emissions are high. To combat this condition more fuel is added, thereby increasing burning in the thermal reactor. The result is quicker thermal reaction and improved emission control.

• OPERATION

This power valve operates the same as the non-solenoid-controlled valve, except that a solenoid controls the time the valve may engage.

The solenoid is operated by the control unit (CU) and/or a vacuum switch. This solenoid opens or closes the vacuum line to the power valve piston, thereby controlling engagement of the power valve.



● COASTING RICHER (RX-7)

● PURPOSE

The coasting richer solenoid is used to supply additional fuel during deceleration to balance the lean condition created by the coasting valve operation.

This system is used to prevent backfire or bucking that might occur during the above conditions.

● OPERATION

The coasting richer system operates during deceleration at a specified engine rpm. This rpm is detected by the low-speed and idle switches.

When the engine is at the specified rpm, power is applied to the coasting richer solenoid. This opens a passage in the carburetor to allow more fuel and to enrich the mixture.

NOTE:

THEORY & OPERATION

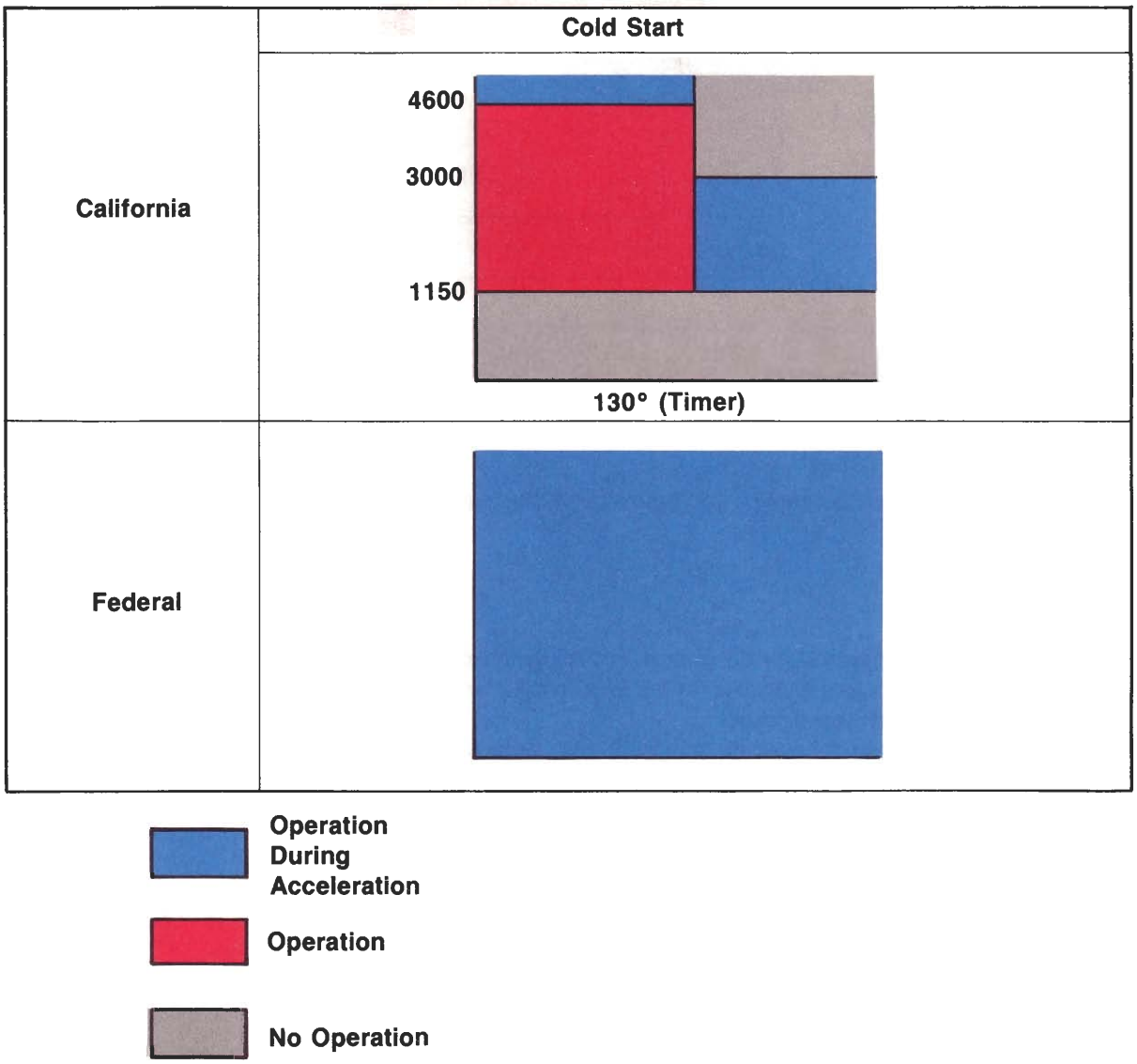
The following is a table listing the conditions when the power valve solenoid operates:

● OPERATION

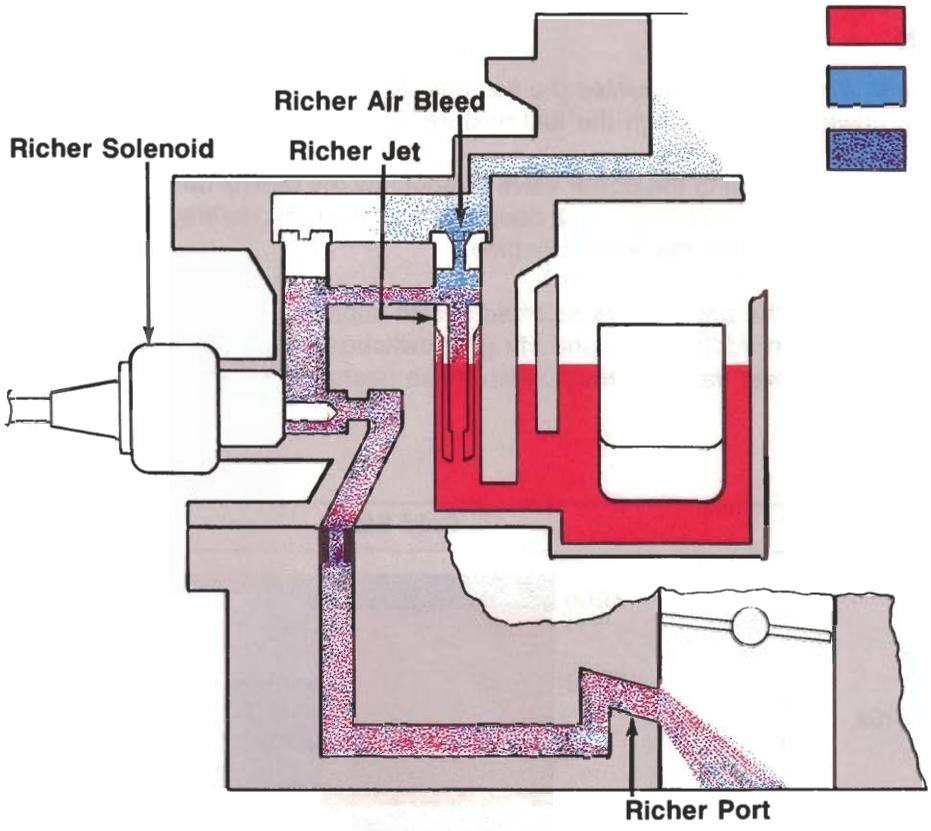
Current to the power valve solenoid actuates the solenoid to close vacuum passage to the power valve. Spring force then opens the power valve to enrich the fuel mixture delivered to the engine.

Federal- Current is supplied to the power valve solenoid by the control unit through the No.2 vacuum switch, which senses acceleration by the use of a double-acting vacuum diaphragm and a delay valve. This system has been previously used on the Rotary Engine.

California - Current to the power valve solenoid is also supplied by the control unit during choke operation by the 130 sec. time. In addition, 4th and 5th gear switches are placed in the power valve solenoid circuit to cut power to the power valve solenoid when these gears are selected.



THEORY & OPERATION



• IDLE RICHER SOLENOID

• PURPOSE

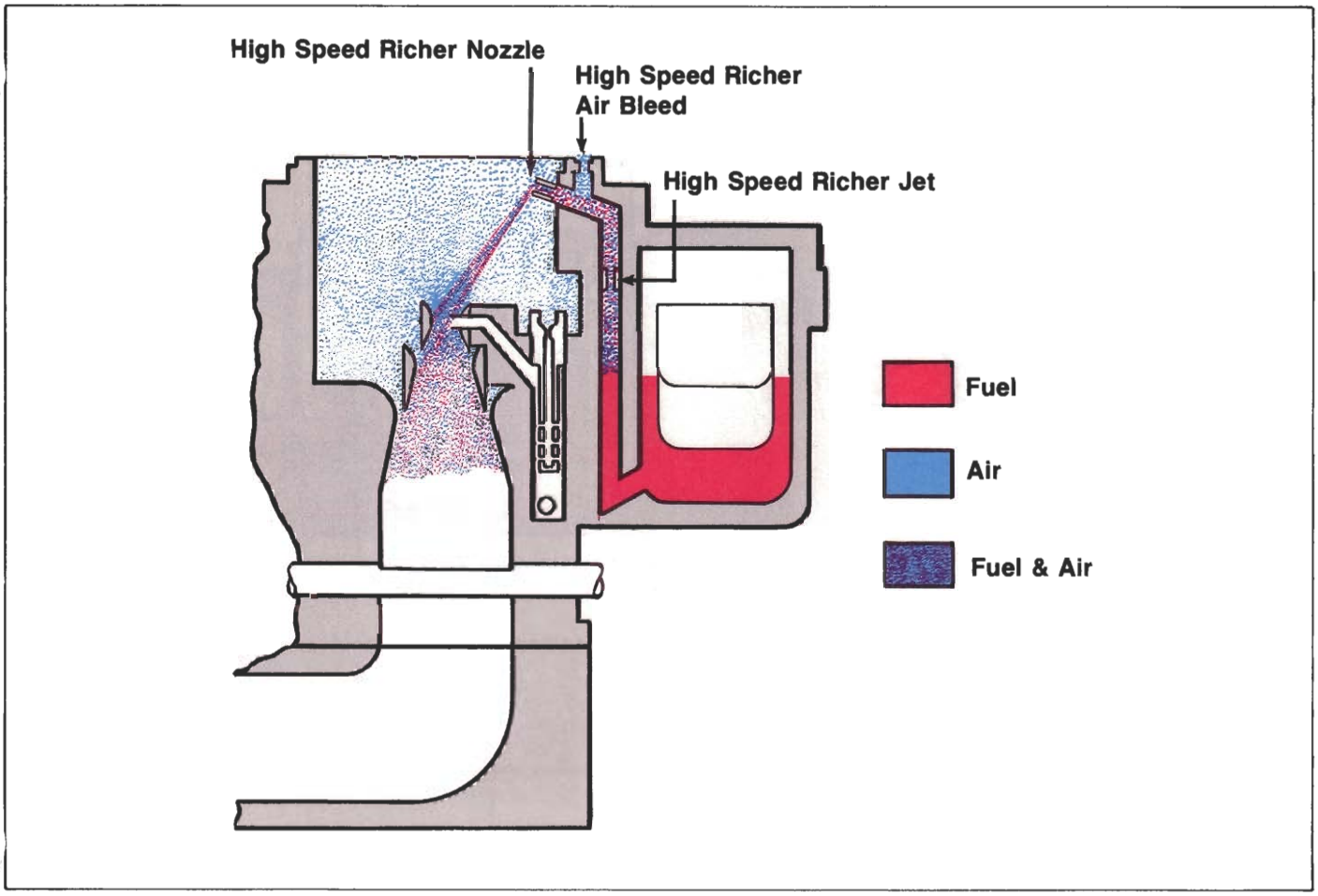
The purpose of the idle richer solenoid is to **improve emission** control and driveability during deceleration **below 1100 rpm.**

• OPERATION

The idle richer solenoid operates for **30 seconds during deceleration below 1100 rpm.**
During the specified rpm, power is applied **to the idle richer solenoid.** This opens a passage in the carburetor to allow more fuel to enrich the mixture.
The idle richer solenoid does not operate **when the idle compensator** is open or when the choke is engaged.

NOTE:

THEORY & OPERATION



• HIGH-SPEED RICHER SYSTEM (as featured on electronic carburetor)

• PURPOSE

The purpose of the high-speed richer system is to supply additional air and fuel during high-speed driving or heavy load conditions when the secondary throttle is open.

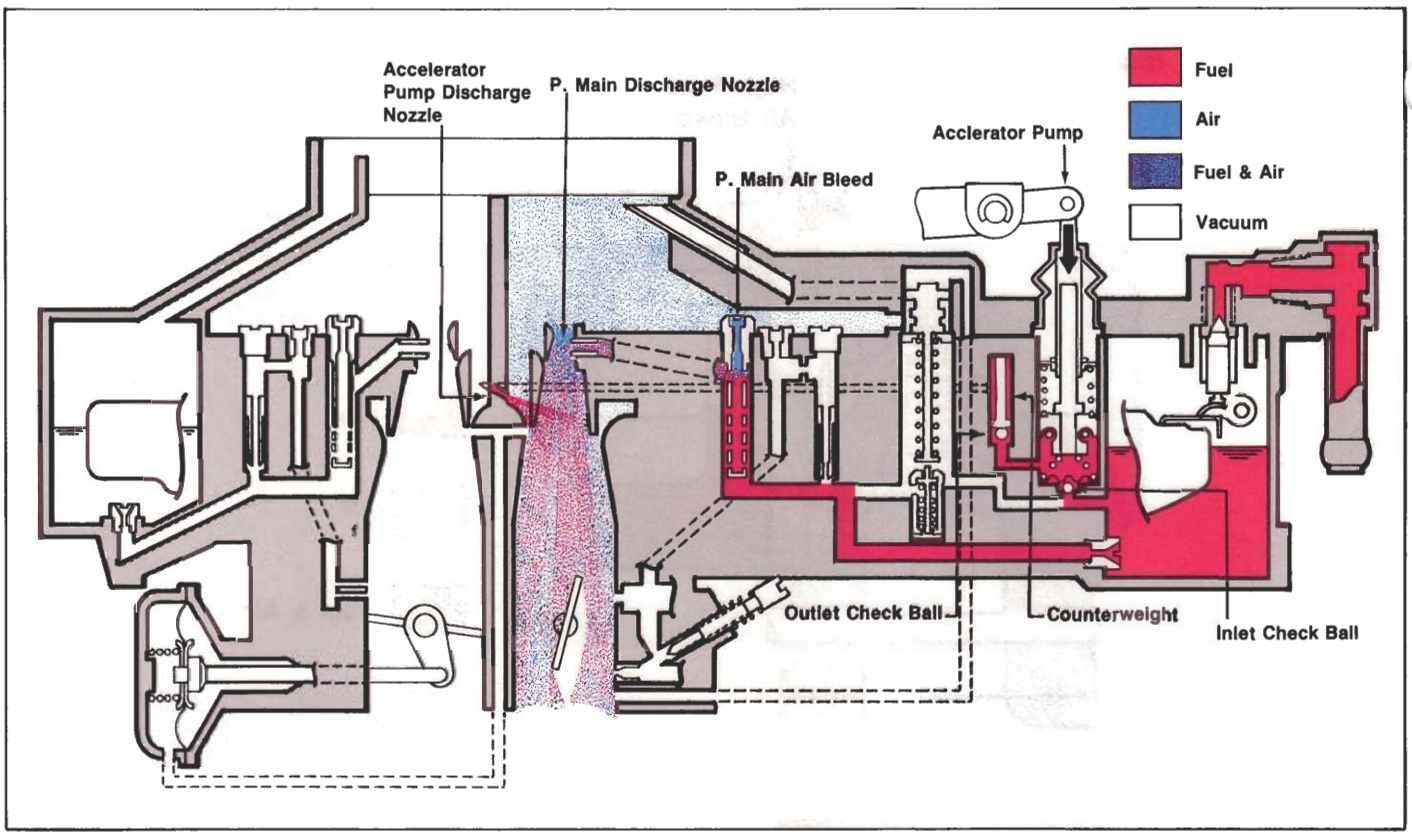
This system is necessary due to the leaner operation of the electronic carburetor.

• OPERATION

Fuel flows from the float bowl through the high-speed richer jet to the high-speed richer air bleed.

Air mixes with fuel at the air bleed and the mixture flows to the high-speed richer nozzle. From here, the mixture flows on into the carburetor throat.

THEORY & OPERATION



• ACCELERATOR PUMP CIRCUIT

• PURPOSE

The accelerator circuit is used to prevent hesitation or stumble during acceleration.

Because air is light, it will increase its volume inside the carburetor almost immediately as the throttle opens wider.

Fuel is heavy and will lag behind causing a lean mixture. This situation will result in a hesitation or stumble during acceleration.

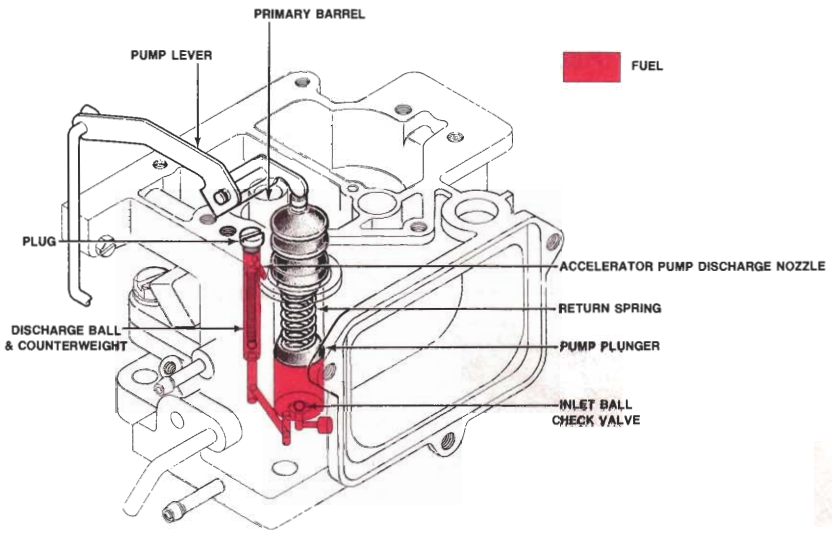
To eliminate the above problem, the accelerator pump supplies a calibrated amount of fuel for the brief period of time required to give smooth acceleration.

• OPERATION

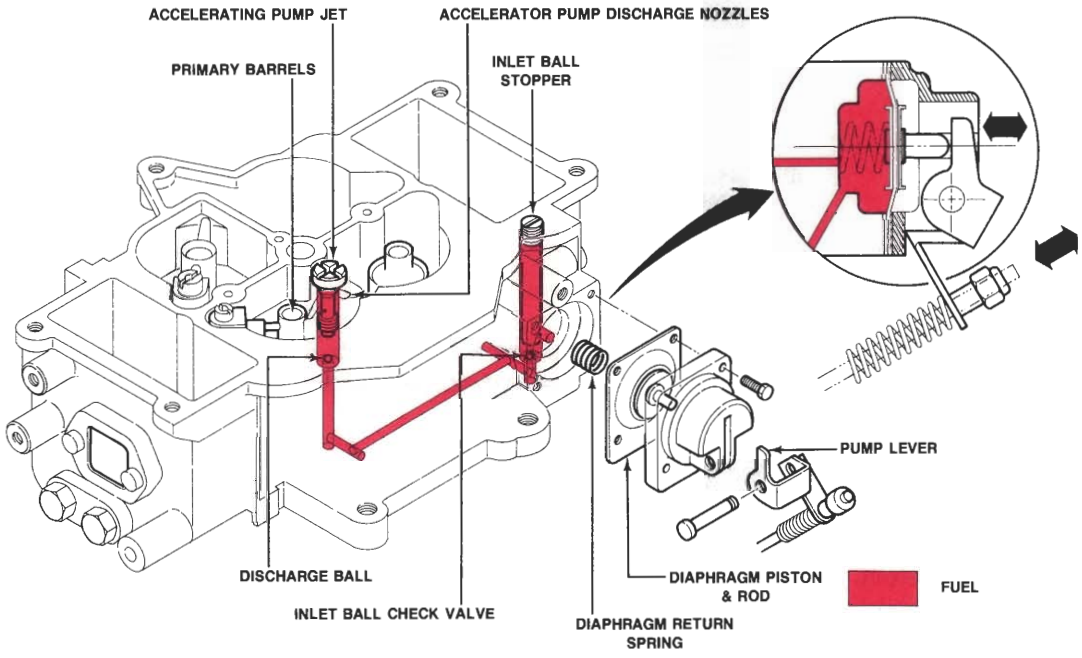
The accelerator pump is operated by the primary throttle shaft through a connecting rod and pump arm. When the throttle valve is closed, the pump plunger is raised and fuel is drawn into the pump cylinder through the inlet check ball. When the throttle valve is opened, the pump plunger is moved downward. This motion seats the inlet check ball and forces fuel through the discharge passage. Here the fuel unseats the outlet check ball and passes on through to the discharge nozzle in the venturi.

THEORY & OPERATION

PLUNGER TYPE ACCELERATOR PUMP



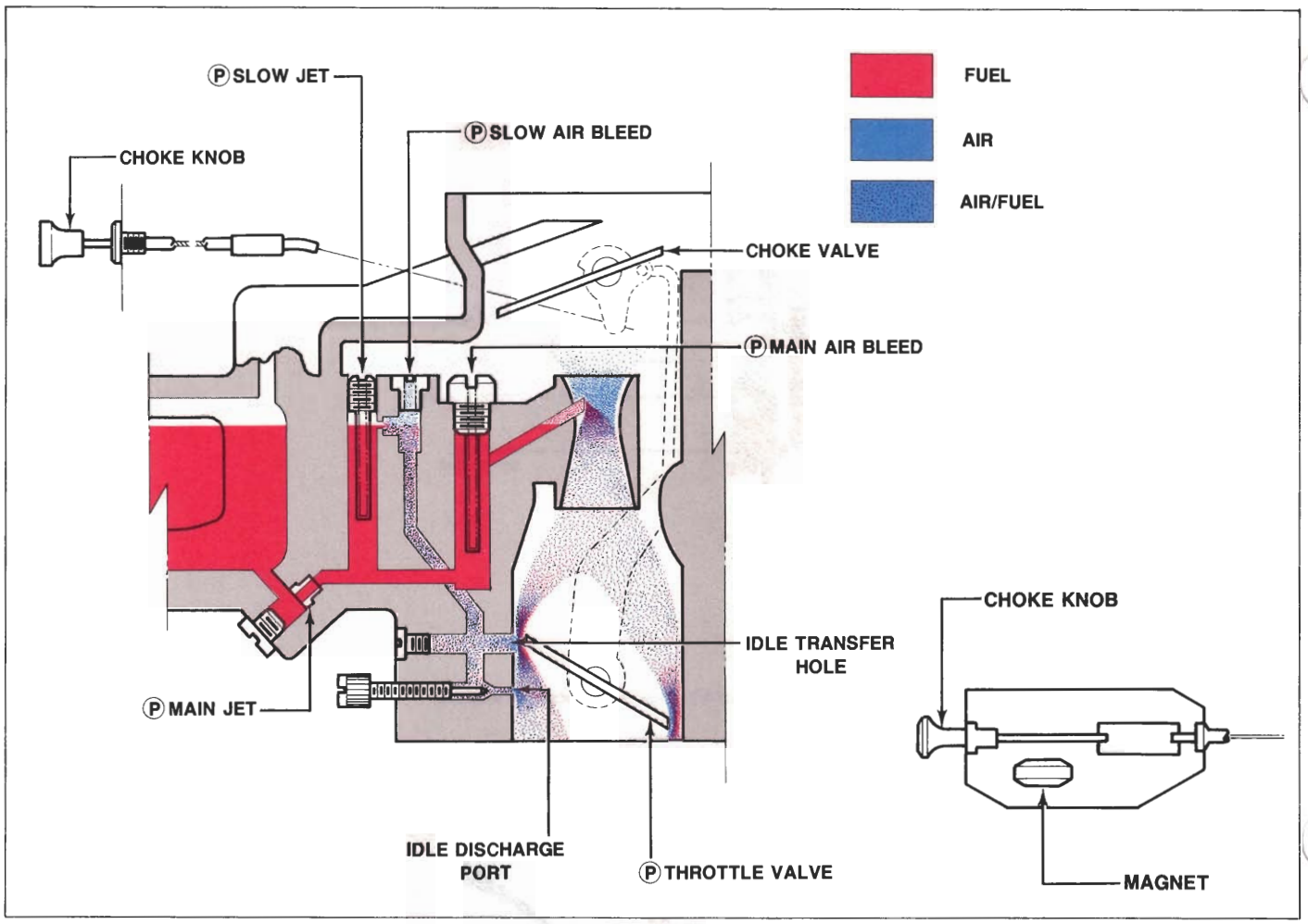
DIAPHRAGM TYPE ACCELERATOR PUMP



• TYPES OF ACCELERATOR PUMPS

Mazda uses two types of accelerator pumps: a piston type and a diaphragm type. The two pump types operate the same. Both use a metered discharge nozzle. Both are spring loaded to provide a smooth discharge regardless of how fast the accelerator is depressed.

THEORY & OPERATION



CHOKE SYSTEM

The choke system is used to supply the richer mixture needed for good combustion during cold starting.

During cold starting conditions, fuel will condense on the walls of the intake manifold. This condition creates a mixture too lean for good combustion.

A. TYPES OF CHOKE SYSTEMS

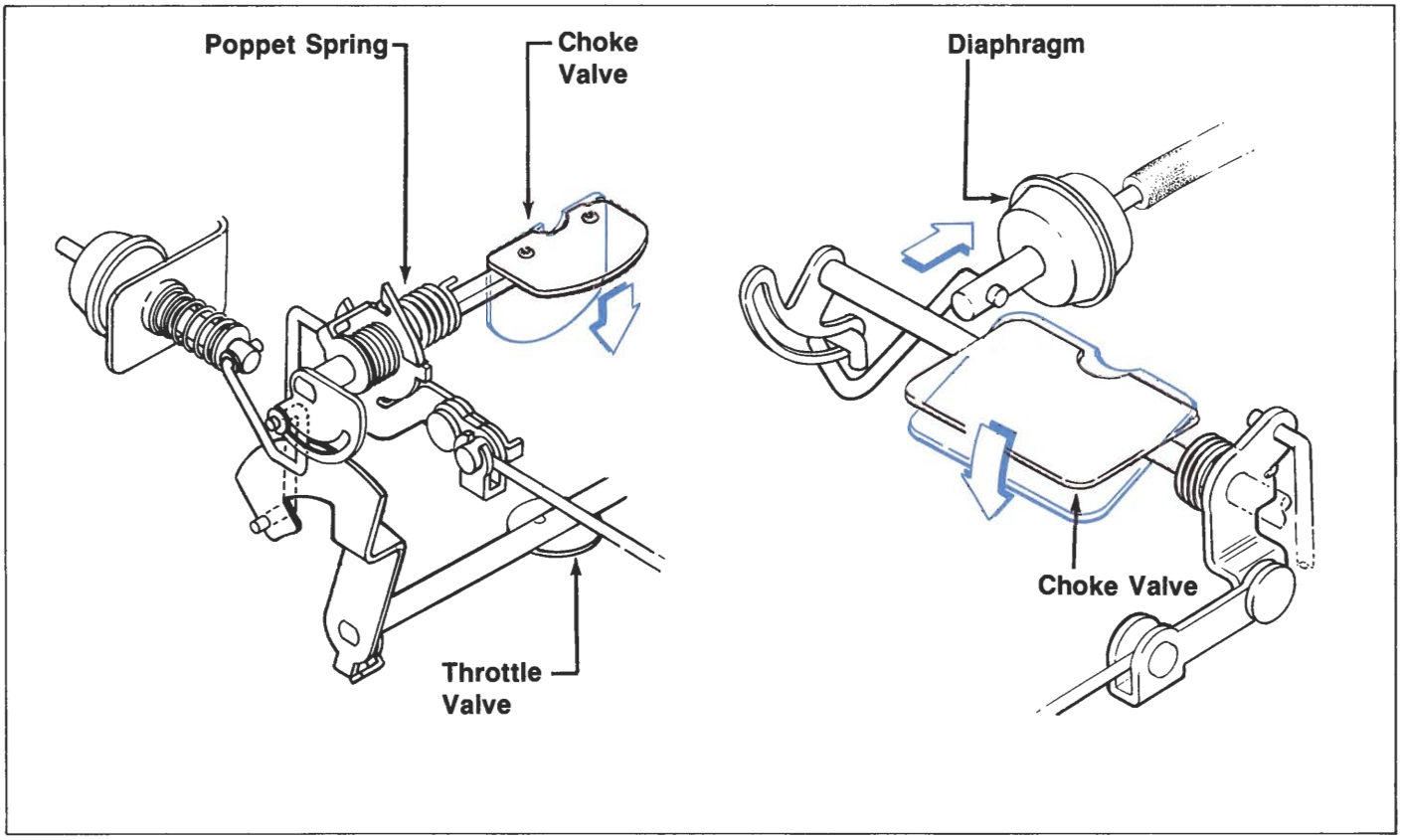
• MANUAL SYSTEM

With the manual system, a cable is used to open and close the choke valve. On some models the choke is held in the "on" position by an electro-magnet.

• OPERATION

By closing the choke valve, the air flow is restricted and a vacuum is created below the valve.
The newly-created vacuum can now pull fuel from the main nozzle as well as from the idle and slow speed port.
This additional fuel combined with the restricted air flow provides the rich mixture needed for cold starting.

THEORY & OPERATION



As soon as the engine starts, the air/fuel mixture must be leaned or the engine can stall (flood due to an over-rich mixture).

To prevent this condition, the choke must be opened slightly to bring more air into the carburetor.

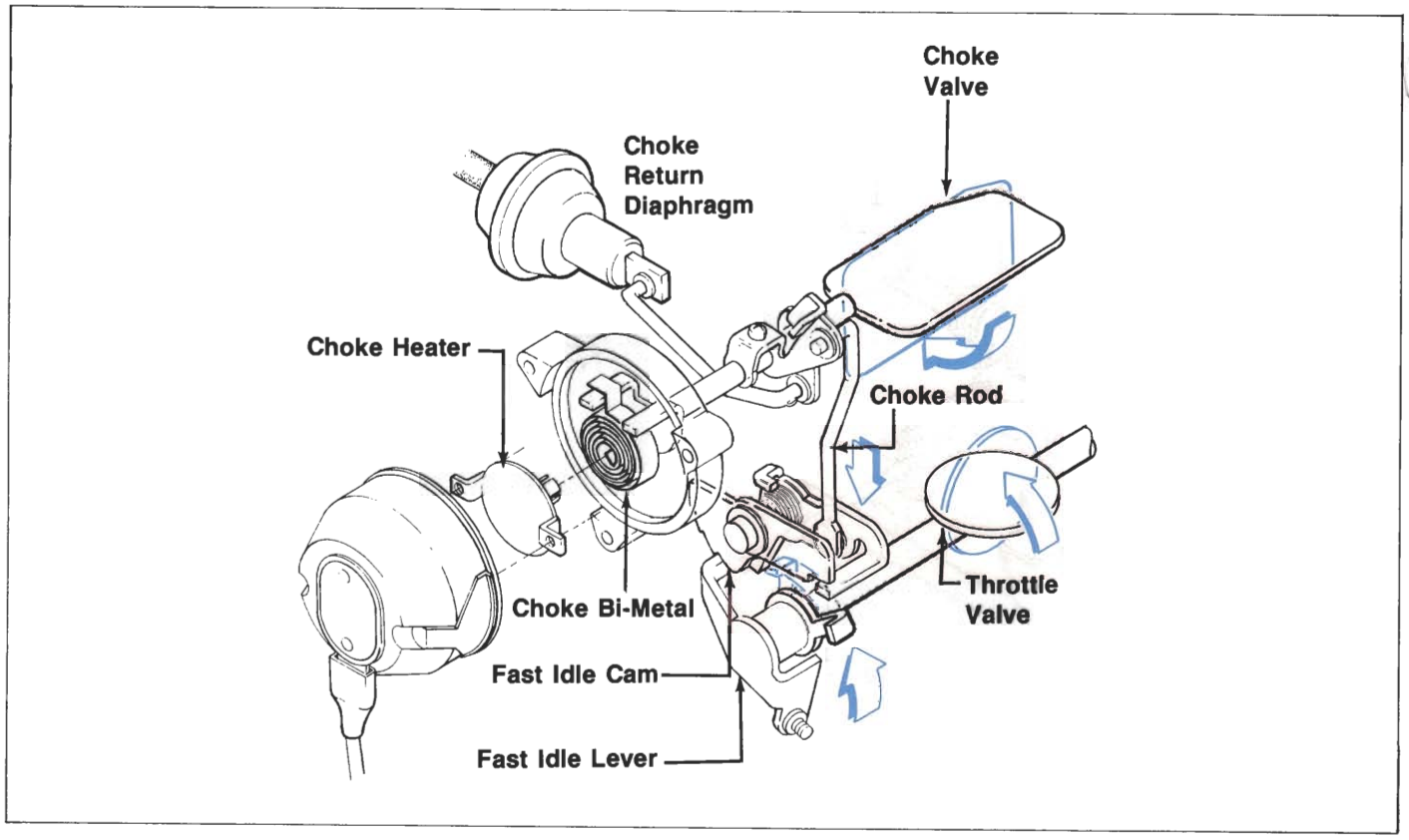
This is accomplished by mounting the choke valve off-center on the shaft and by using a spring to hold the valve closed.

The spring is calibrated so that it will allow the valve to open slightly when the engine starts. As more air enters, the mixture becomes more lean.

A vacuum diaphragm (vacuum break)is also used to mechanically open the choke immediately after starting. This slight opening of the valve prevents flooding.

One or more additional diaphragms may be used to aid in opening the choke during warm-up. This system would also help meet emission standards and prevent overheating of the catalytic converter.

NOTE:



While the choke is on, a fast-idle system is also used to help prevent stalling and to provide a smooth idle. The fast-idle is operated by the choke linkage and is used to increase idle speed.

● AUTOMATIC SYSTEM

The automatic choke system uses a (bi-metal) thermostatic coil spring to close the choke. Choke release and fast-idle are basically the same as the manual system.

During warm-up the choke is held shut by the bi-metal coil. The coil is heated by an electric heater to allow gradual release for good engine performance and emission control.

● UNLOADER SYSTEM

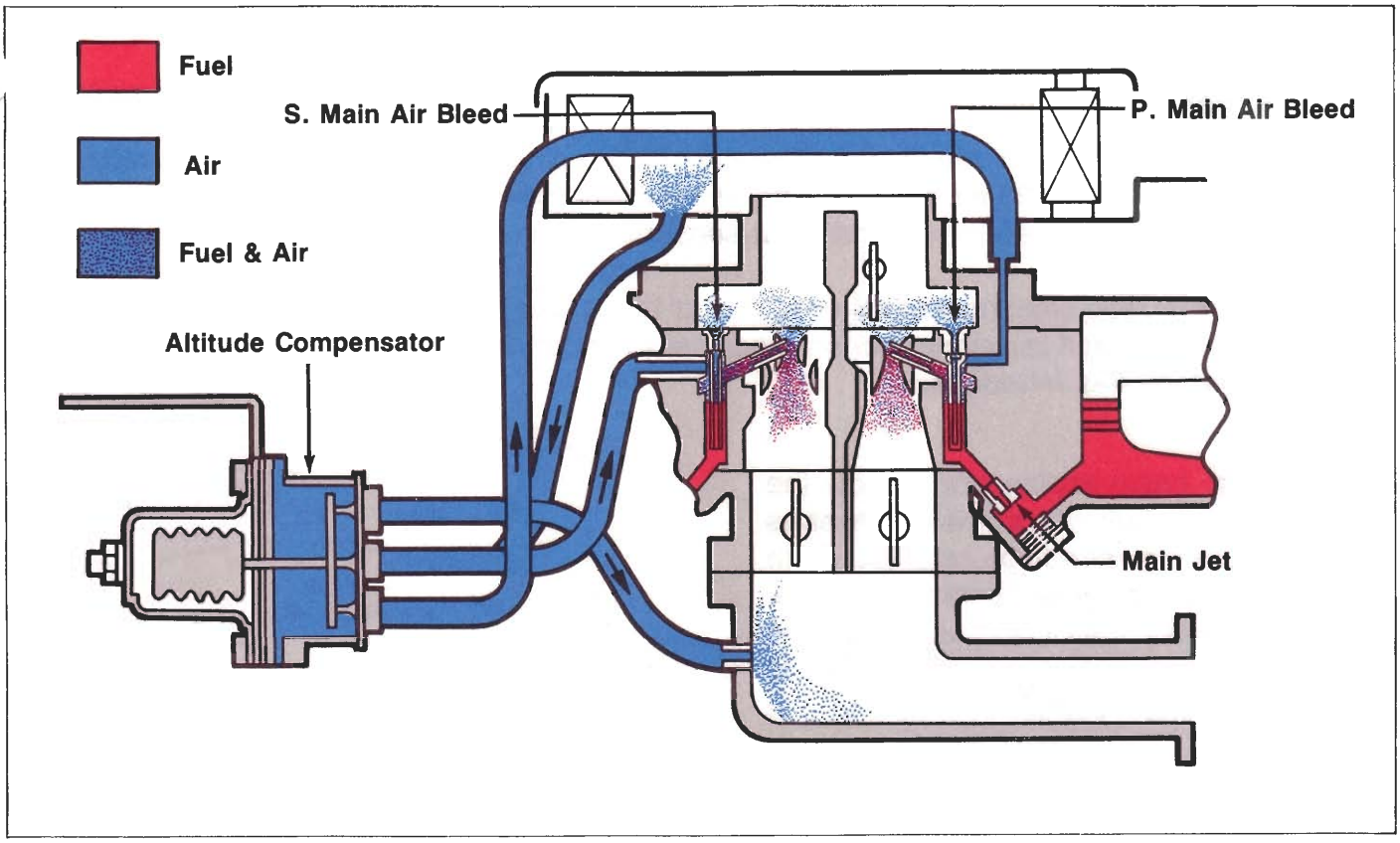
● PURPOSE

The unloader system is used as a means of manually opening the choke and allowing more air in to make the air/fuel mixture leaner should flooding occur.

This system will allow the engine to clear itself of the raw fuel and bring the mixture back to a more readily combustible state.

● OPERATION

The throttle linkage is provided with a lever designed to contact a tab on the choke linkage. This opens the choke when the accelerator is fully depressed.



ALTITUDE COMPENSATOR

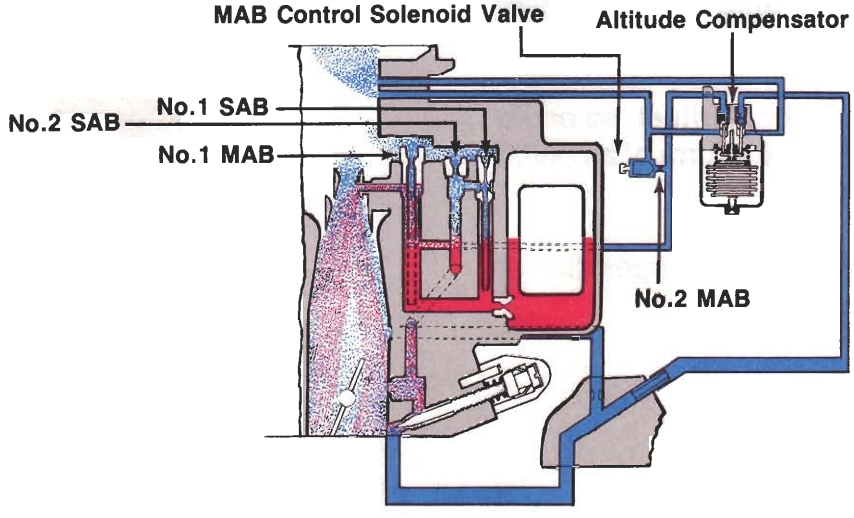
A. PURPOSE

The altitude compensator is used on some models in the Mazda line. Its function is to improve driveability by providing a more balanced air/fuel mixture at high altitudes.

B. OPERATION

When the atmospheric pressure becomes low, aneroid bellows open the air passage valves allowing additional air to flow to the intake manifold and carburetor air bleeds. This system assures an optimum air/fuel ratio. One of the three air supply hoses is led to the intake manifold to maintain smooth idling.

(1984-1985 RX-7)

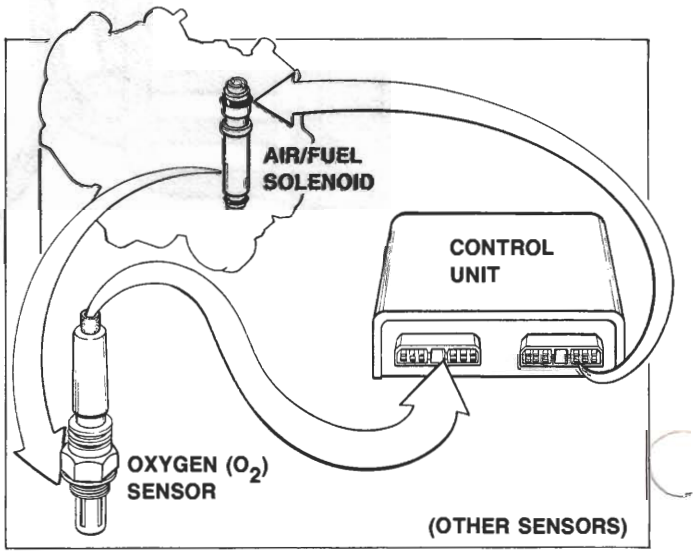


ELECTRONIC CARBURETOR

The electronic carburetor (or feedback carburetor as it is sometimes called) was introduced on two Mazda products in the 1983 model year. The electronic carburetor is one part of the **Closed Loop System** which also consists of several input sensors and an electronic control unit (CU).

When the air/fuel ratio entering the engine is kept at 14.7:1, the efficiency of the catalytic converters, gas mileage and overall carburetor performance are all improved. This is the main reason the **Closed Loop System** was introduced.

Here's a very basic explanation of how the **Closed Loop System** works: The CU receives engine operating condition signals from several sensors. These electronic signals are then calculated by the CU to one signal. The CU sends this signal to the air/fuel solenoid in the carburetor, thereby controlling the air/fuel ratio.

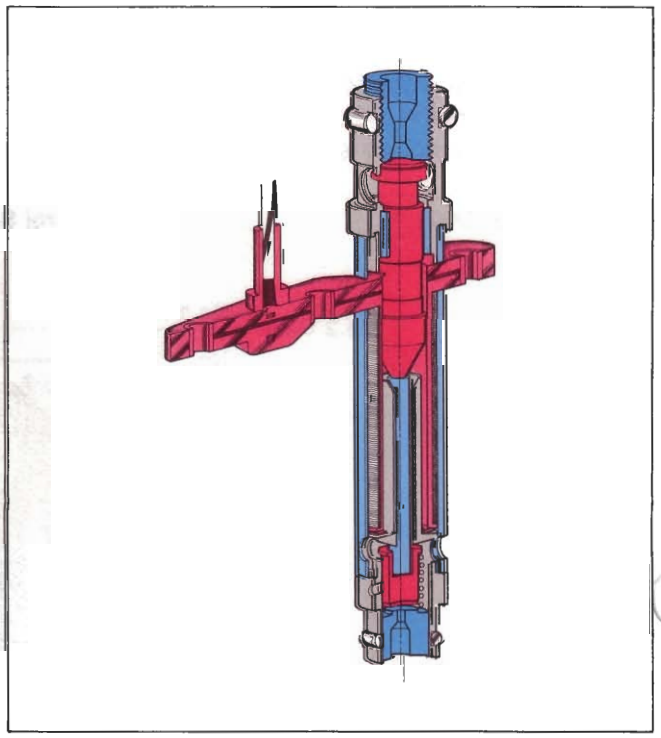


• AIR/FUEL SOLENOID

Let's take a look at the air/fuel solenoid in the carburetor first. The air/fuel solenoid is a simple on/off type valve which controls the amount of additional air entering the idle air bleed and at the same time controls the amount of additional fuel entering the primary main system.

The operation signal the air/fuel solenoid receives from the CU is in the form of an on/off pulsating type signal.

Next let's look at the mechanical operation of the air/fuel solenoid.

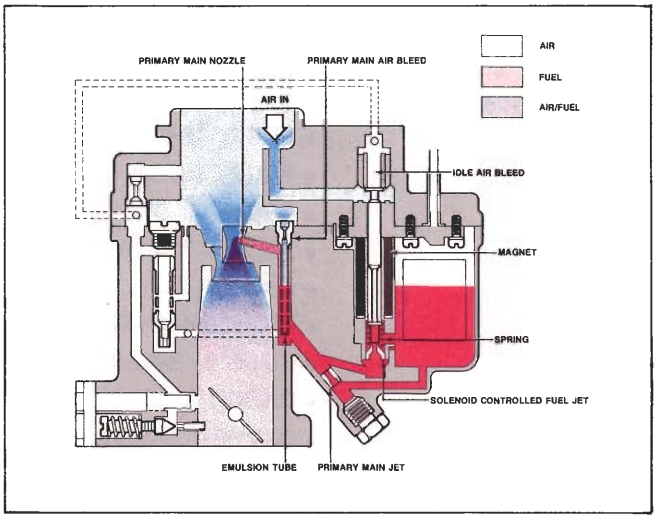


THEORY & OPERATION

- AIR/FUEL SOLENOID- NO POWER APPLIED

When the air/fuel solenoid is off (no power applied) spring tension pushes the plunger up. This prevents additional air from entering the idle air bleed.

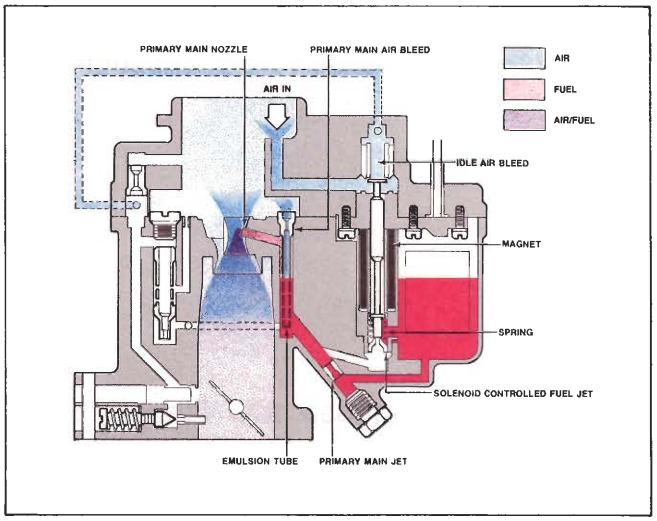
At the same time (no power applied) the solenoid-controlled fuel jet is open allowing additional fuel into the primary main system.



- AIR/FUEL SOLENOID- POWER APPLIED

When the air/fuel solenoid is on (power applied) its magnet overcomes the spring tension and pulls the plunger down. Now additional air may enter the idle air bleed.

At the same time (power applied), the solenoid-controlled fuel jet is closed preventing additional fuel from entering the primary main system.



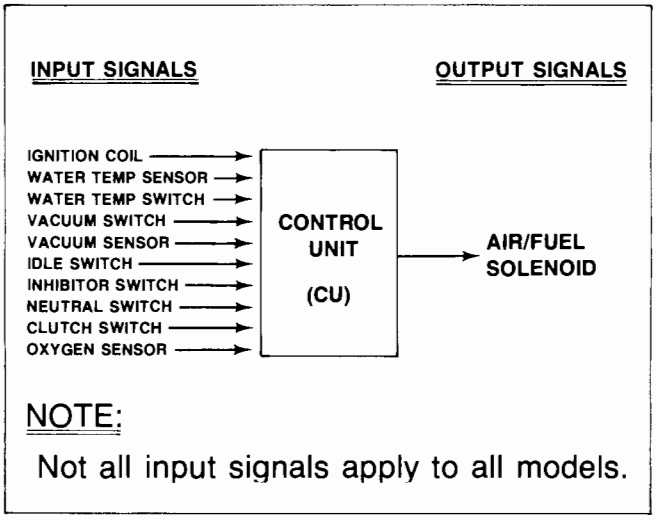
Now that we're familiar with what the air/fuel solenoid controls, let's take a look at what controls the air/fuel solenoid.

THEORY & OPERATION

For the air/fuel solenoid to operate properly, the CU must receive input signals from several sensors. Listed below are the sensors which input signals to the CU. Conditions each sensor monitors are also listed.

Input Sensors	Monitoring
• ignition coil	engine rpm
• water temp sensor	engine coolant temp
• water temp switch	radiator coolant temp
• vacuum switch	intake manifold vacuum
• vacuum sensor	intake manifold vacuum
• idle switch	throttle position
• inhibitor switch	shift lever position
• neutral switch	shift lever positon
• clutch switch	clutch pedal position
• oxygen sensor	amount of oxygen in exhaust gas

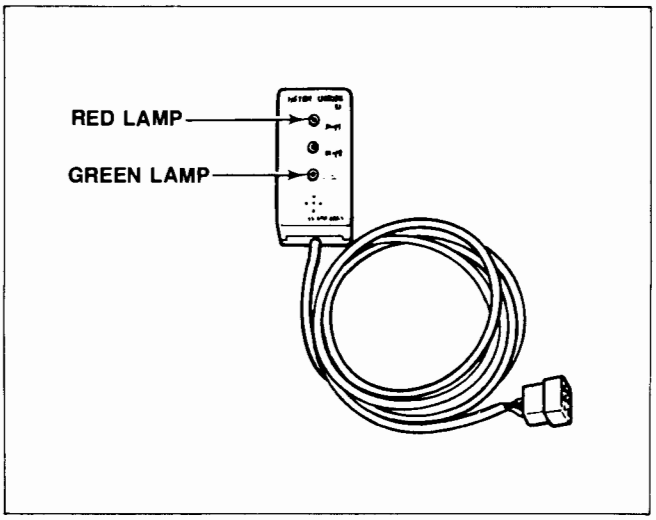
Because these sensors ultimately control the operation of the air/fuel solenoid, each one is VERY IMPORTANT. If one of these signals is missing or incorrect, the air/fuel solenoid will not operate properly. This could cause driveability problems and other difficulties as well.



NOTE:

Not all input signals apply to all models.

To help you diagnose the **Closed Loop System** and make sure the CU is receiving all the necessary signals, Mazda has introduced the **System Checker '83** as a diagnostic aid.



The **System Checker '83** will enable you to quickly check some of the inputs to the CU. There are however, some input signals the checker will not diagnose. A volt/ohmmeter should be used to check these signals. The **System Checker '83** can also partially diagnose the CU. This can be done by disconnecting the appropriate sensor connectors and listening for the **System Checker '83** to sound the proper code. If the proper code is sounded, the CU is operating as designed.

After you have driven the vehicle, re-check the duty. It should now fluctuate. If the duty still does not fluctuate you should check all those items which affect the **Closed Loop System** operation (ie. input sensors, disconnected and proper vacuum hose routing, etc.).

If you forget everything you may have ever learned about Closed Loop and duty setting, you'll still be ahead of the game if you can remember the following point. The **Closed Loop System** is designed to maintain a balanced air/fuel mixture of 14.7:1.To do this, the duty setting MUST fluctuate. This is the key to understanding duty, how the system operates and knowing when NOT to make adjustments.

NOTE:

THEORY & OPERATION

Now let's take a look at the signal the CU sends to control the air/fuel solenoid.

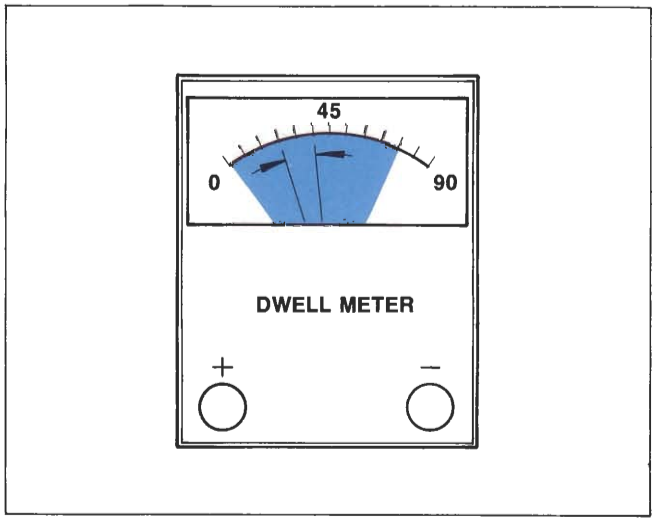
The CU sends an on/off pulsating type signal to the A/F solenoid. This signal is always being updated to maintain the proper air/fuel ratio of 14.7:1. The A/F solenoid operates at a rate of 20 times (cycles) per second. This means that for every second, the solenoid operates 20 times. This 20-times-(cycles)-per-second operation always remains constant. What changes however, is the length of time within one (1) cycle (1/20th of a second) the fuel jet or air bleed is open.

DUTY is the word used to describe the operating time of the air/fuel solenoid and is measured in percentages (%).

- If the duty is 0%, this means the fuel jet is closed 0% of 1 cycle. In other words the fuel jet is open and the air bleed is closed the entire 1 cycle (1/20th of a second).
- If the duty is 100%, this means the fuel jet is closed 100% of the 1 cycle. In other words the fuel jet is closed and the air bleed is open the entire 1 cycle (1/20th of a second).

DUTY	FUEL JET CLOSED	AIR BLEED OPEN
0	0% OF 1 CYCLE	0% OF 1 CYCLE
40	40% OF 1 CYCLE	40% OF 1 CYCLE
100	100% OF 1 CYCLE	100% OF 1 CYCLE

It may be necessary at times to measure or check the duty reading to verify proper operation of the **Closed Loop System**.



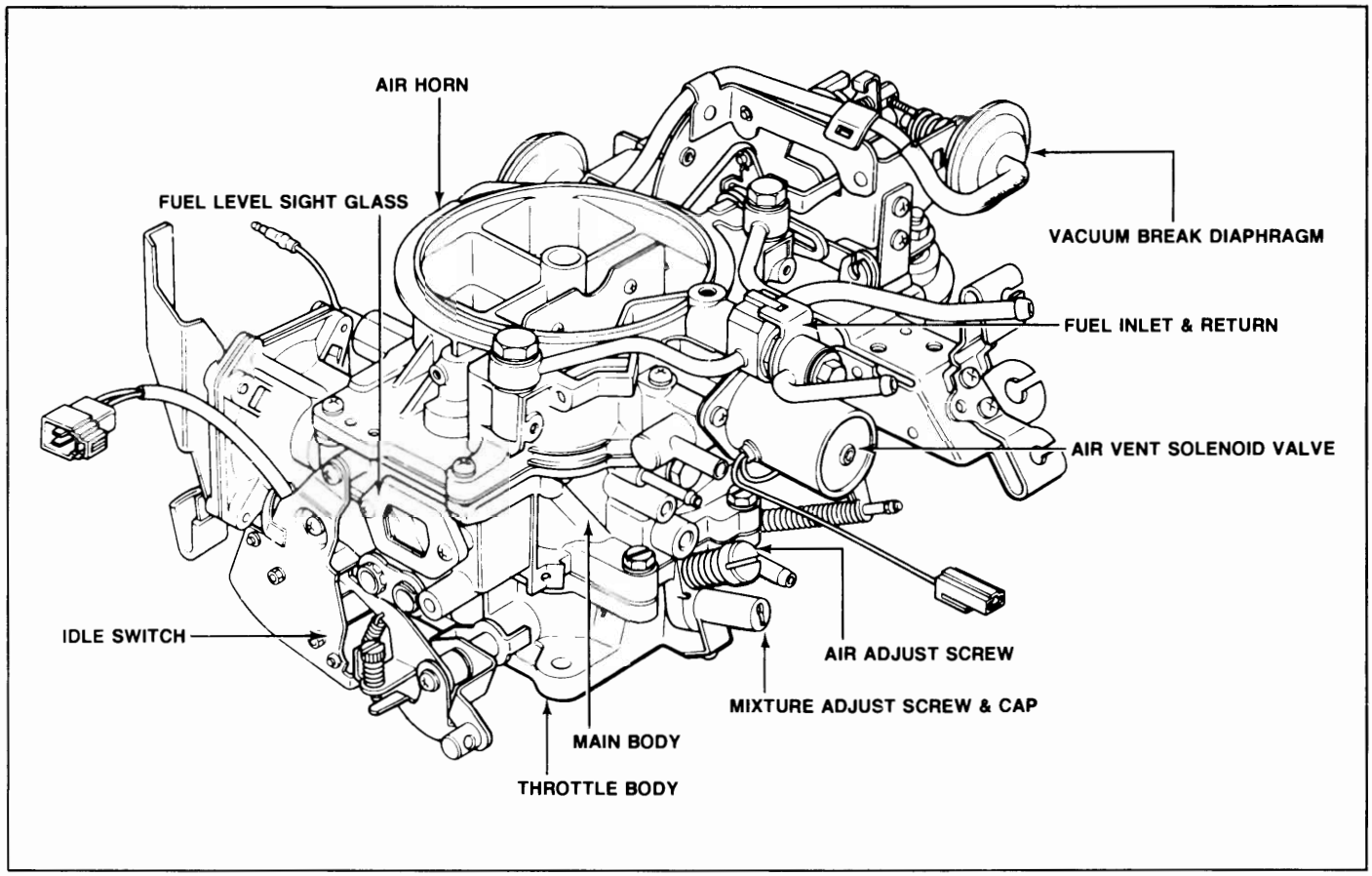
A duty meter or an ordinary dwell meter may be used to check the duty reading on a vehicle equipped with Closed Loop. If a dwell meter is used, connect the positive lead of the meter to the A/F solenoid check connector and ground the negative lead of the meter. The vehicle should be fully warmed up to operating temperature.

With the engine idling, note the reading on the dwell meter. If the centerpoint of needle fluctuation is **anywhere** between 20° to 70° the **Closed Loop System** is operating properly and NO ADJUSTMENT IS NECESSARY.

If the dwell meter does not fluctuate (fixed duty) or fluctuates outside the 20°-70° range it will be necessary to drive the vehicle for a short distance at a speed above 45 MPH. This drive will stabilize sensors in the system, whereas mere idling may not clear a fixed reading.

RX-7 CARBURETORS
1979-1980

GENERAL INFORMATION



1979 – 1985 RX-7 vehicles came equipped with NIKKI 4-barrel carburetors. These carburetors are of a downdraft design and are equipped with semi-automatic chokes. Various solenoids are installed for driveability and emissions. Some versions feature a special Sub-Zero system which injects a mixture of anti-freeze into the carburetor for easier starting in cold climates. Also featured is a system of oil injection through the carburetor.

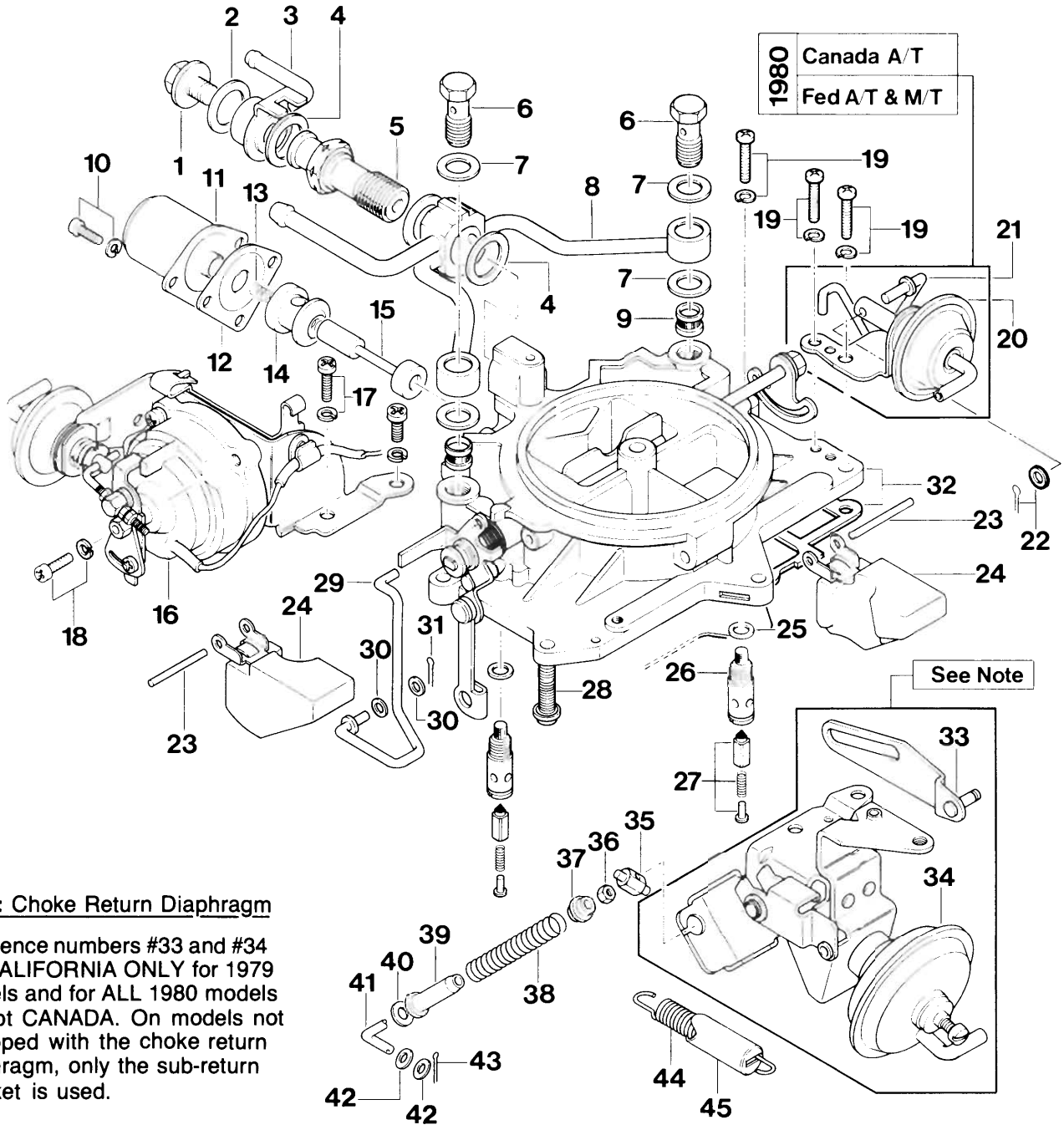
Pay close attention to the differences in these carburetors in as much as they vary from region to region, model to model and year to year.

USE ONLY THE SECTION WHICH APPLIES TO THE YEAR OF RX-7 CARBURETOR YOU ARE SERVICING! DO NOT MIX SPECIFICATIONS, ADJUSTMENTS, ETC. EACH SECTION HAS BEEN CAREFULLY LAID OUT TO GIVE YOU THE SPECIFIC INFORMATION FOR THE YEARS INDICATED. THIS INFORMATION CAN CHANGE, SO BE SURE TO USE THE CORRECT SECTION.

To eliminate possible confusion and for simplicity, this manual will refer to all coverings on choke bi-metals as "bi-metal cover" rather than using several terms such as "thermostat" or "heater" etc.

1979 – 1980 CARBURETORS

A. AIR HORN



Note: Choke Return Diaphragm

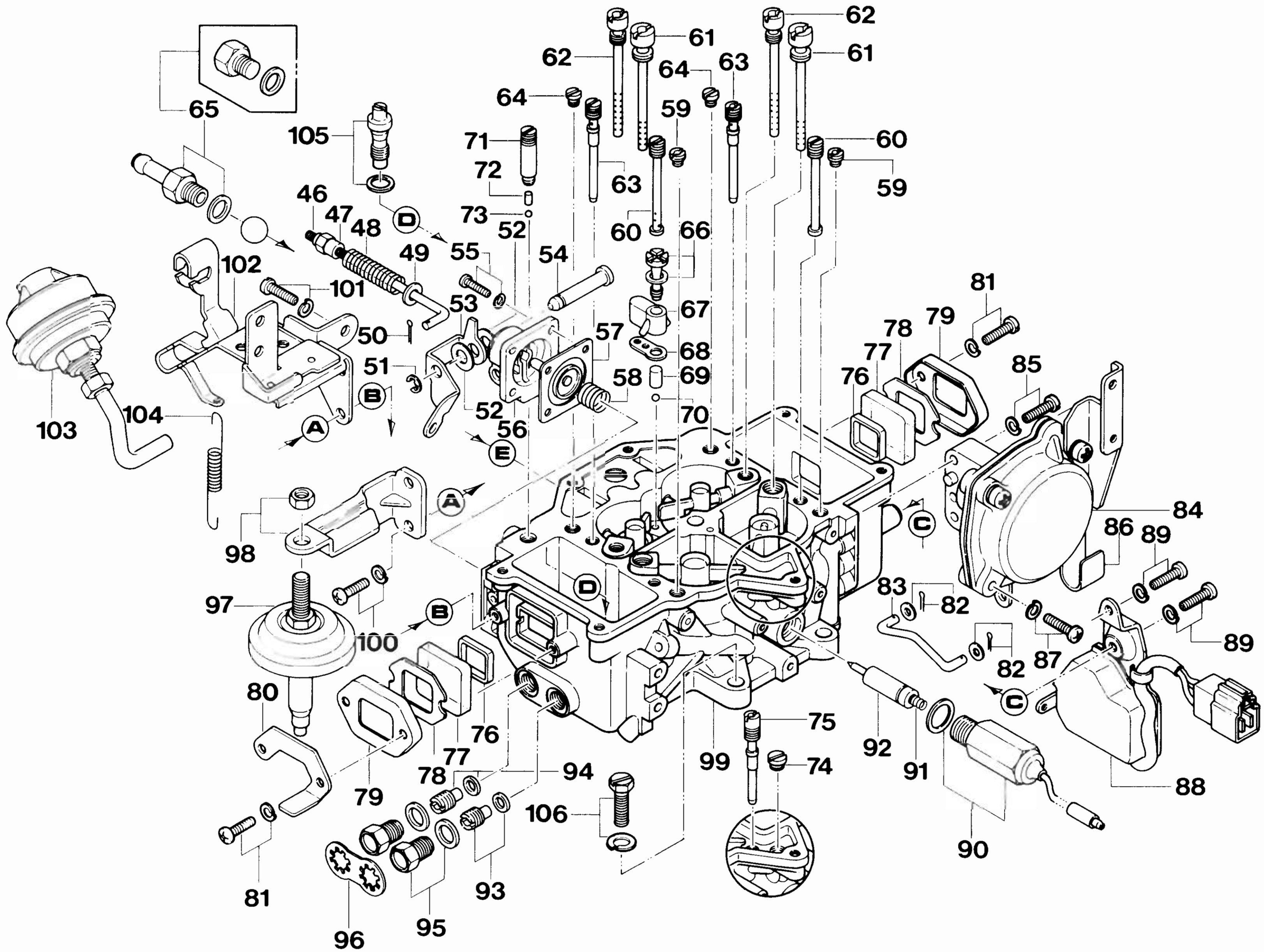
Reference numbers #33 and #34 are CALIFORNIA ONLY for 1979 models and for ALL 1980 models except CANADA. On models not equipped with the choke return diaphragm, only the sub-return bracket is used.

AIR HORN PARTS

1. Fuel inlet bolt
2. Fuel inlet bolt gasket
3. Fuel return fitting
4. Gasket- fuel inlet
5. Adapter- fuel inlet
6. Fuel inlet bolts (vertical)
7. Gaskets- fuel inlet bolts (vertical)
8. Fuel inlet fitting
9. Strainers- fuel inlet
10. Attaching screws- air vent solenoid
11. Air vent solenoid
12. Gasket- air vent solenoid
13. Spring- air vent solenoid
14. Brass bushing- air vent solenoid
15. Plunger- air vent solenoid
16. Bi-metal choke assembly & bracket
17. Screw & washers- bi-metal bracket assembly
18. Screws & washers (3 ea.) bi-metal cover
19. Screws & washers- air horn
20. #2 Choke diaphragm & bracket*
    *__Note:__
    1980 FED A/T & M/T, CAN A/T only!
21. Connecting rod- #2 choke diaphragm
22. Cotter pin & washer- #2 diaphragm rod
23. Float pin
24. Float
25. Gaskets- needle seat
26. Needle seats
27. Needle valves
28. Power valve plunger*
    *__Note:__
    (except 1979 FED, 1979-1980 CAN M/T)
29. Fast idle rod
30. Washers (4)- fast idle rod
31. Cotter pins- fast idle rod
32. Air horn & gasket
33. Slide arm & "C"-clip- choke return diaphragm*
    *__Note:__
    DO NOT DISCONNECT THIS ARM FROM THE CHOKE RETURN DIAPHRAGM ASSEMBLY! It is shown apart here for illustration only.
34. Choke return diaphragm assembly & sub-return bracket
35. Pivot nut- throttle sub-return
36. Lock nut- throttle sub-return
37. Spring retainer- throttle sub-return
38. Spring- throttle sub-return
39. Spring bushing- throttle sub-return
40. Washer- throttle sub-return
41. Sub-return rod
42. Washers- sub-return rod
43. Cotter pin- sub-return rod
44. Throttle return spring
45. Cover- throttle return spring

NOTE:

B. MAIN BODY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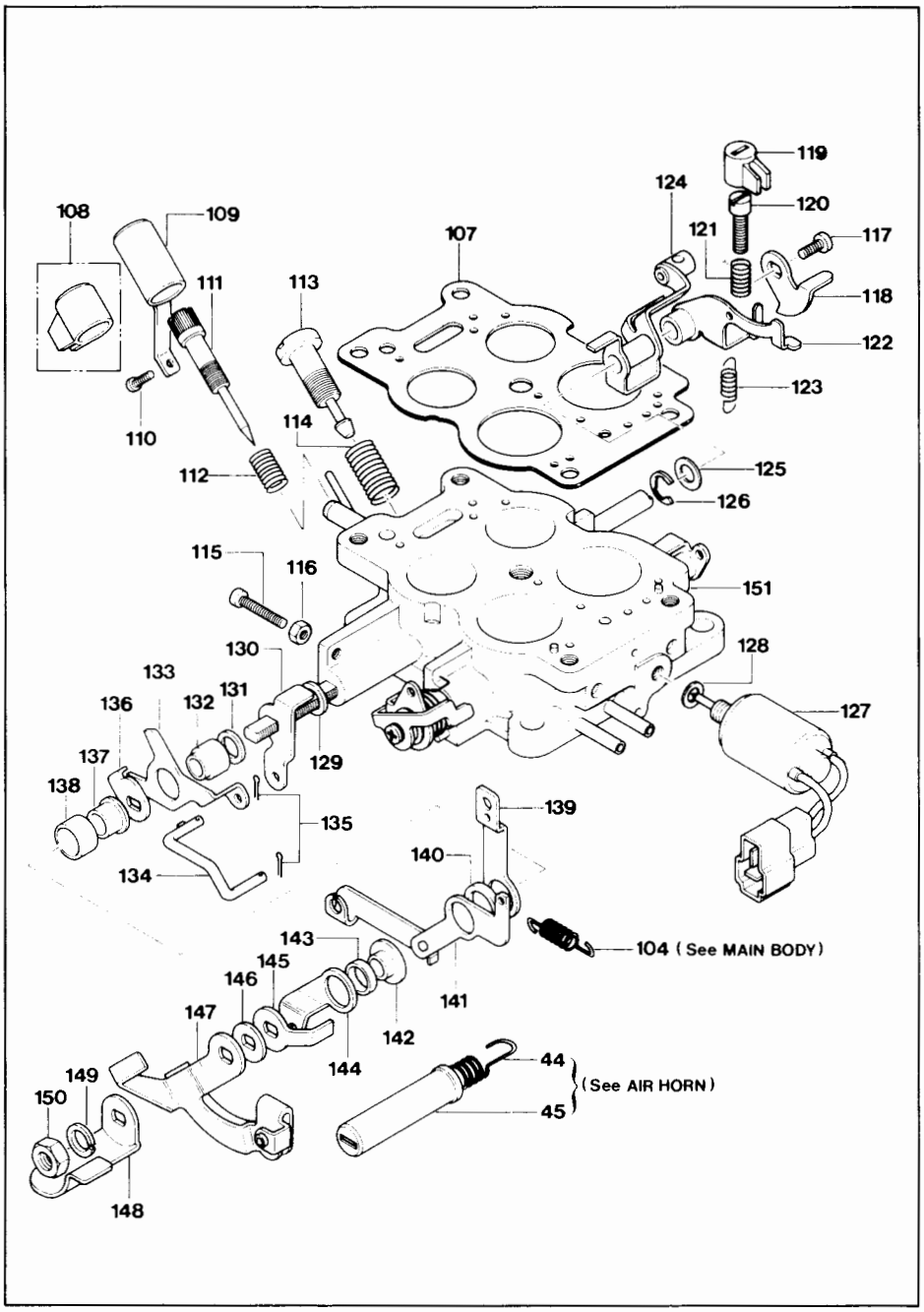
MAIN BODY PARTS

46. Accelerator pump rod (link)
47. Adjust nut- accelerator pump rod
48. Spring- accelerator pump rod
49. Washer- accelerator pump rod
50. Cotter pin- accelerator pump rod
51. "C" clip- pump pivot shaft
52. Washers (2)- pump pivot shaft
53. Accelerator pump lever
54. Accelerator pump pivot shaft
55. Accelerator pump cover screws
56. Cover- accelerator pump
57. Diaphragm- accelerator pump
58. Spring- accelerator pump
59. Secondary slow air bleed no.2
60. Secondary slow air bleed & slow jet
61. Secondary main air bleed
62. Primary main air bleed
63. Primary slow air bleed & slow jet
64. Primary slow air bleed no.2
65. Plug or fitting w/gasket- Sub-zero start assist
66. Accelerator pump outlet fitting screw & gasket
67. Nozzle- accelerator pump outlet
68. Gasket- accelerator pump outlet nozzle
69. Weight- accelerator pump outlet
70. Check ball (valve)- accelerator pump outlet
71. Check ball seat- accelerator pump inlet
72. Weight- accelerator pump inlet
73. Check ball- accelerator pump inlet
74. Plug or richer air bleed
75. Richer jet
76. Rubber gasket- sight glass
77. Sight glass- float bowl
78. Gasket- sight glass bezel
79. Bezel- sight glass
80. Stop bracket- fast idle lever
81. Screws & washers- sight glass bezel
82. Cotter pin & washer- diaphragm link rod
83. Diaphragm link rod
84. Secondary diaphragm & AAV solenoid bracket
85. Attaching screws & washers- diaphragm housing
86. Clip- wire harness
87. Screws & washers- diaphragm cover
88. Idle switch assembly
89. Screws & washers- idle switch mounting
90. Richer solenoid & gasket (M/T only)
91. Spring- richer solenoid
92. Plunger- richer solenoid
93. Secondary main jet & gasket (2 each)
94. Primary main jet & gasket (2 each)
95. Main jet plugs & gaskets (4 total)
96. Locking plate- main jet plugs (1980 only)
97. Dash pot
98. Locking nut & dash pot bracket
99. Main body
100. Screws & washers- dash pot bracket
101. Screws & washers- throttle opener bracket assembly
102. Throttle opener bracket assembly
103. Throttle opener
104. Spring- hot start assist
105. Power valve & gasket (CAL- M/T, ALL- A/T)
106. Main body bolts & washers (4 each)

NOTE:

C. THROTTLE BODY

THROTTLE BODY PARTS



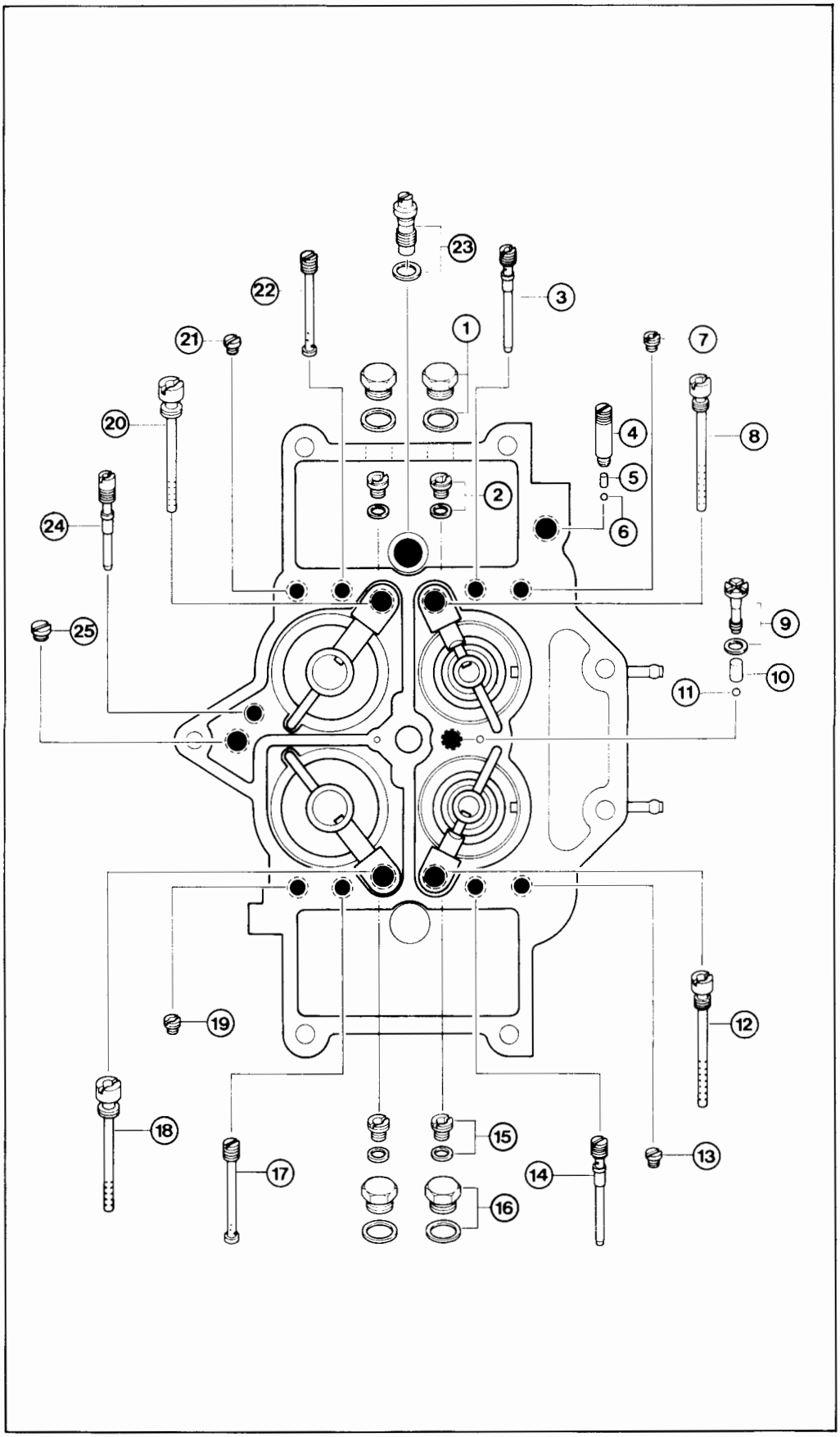
107. Main body gasket
108. Limiter cap (plastic)
109. Anti-tamper cover (1980 CAL)
110. Screw- anti-tamper cover
111. Mixture adjust screw (MAS)
112. Spring- mixture adjust screw
113. Air adjust screw
114. Spring- air adjust screw
*115. Screw- throttle valve adjust
*116. Lock nut- throttle valve adjust
117. Screw- front arm assembly
118. Idle switch adjust lever
119. Limiter cap (plastic)- idle switch adjust screw
120. Idle switch adjust screw
121. Spring- idle switch adjust screw
122. Idle switch lever
123. Spring- idle switch lever
124. Oil metering lever
125. Washer- front arm assembly
126. "C"-clip- front arm assembly
127. Power valve solenoid (except 1979 non-CAL M/T)
128. Gasket- power valve solenoid
129. Washer- rear lever assembly
130. Primary throttle valve lever
131. Washer- rear lever assembly
132. Spacer/sleeve- rear lever assembly
133. Secondary throttle link lever
134. Rod- secondary throttle link
135. Cotter pins- secondary throttle link rod
136. Stop lever- secondary throttle link
137. Sleeve- rear lever assembly
138. Plastic bushing- rear lever assembly
139. Fast idle lever
140. Spacer- rear lever assembly
141. Hot start assist lever assembly
142. Sleeve washer- rear lever assembly
143. Plastic bushing- throttle sub-return lever
144. Throttle sub-return lever
145. Hot start assist cam
146. Washer- rear lever assembly
147. Accelerator arm lever
148. Throttle dash pot lever
149. Lock washer- rear lever assembly
150. Nut- rear lever assembly
151. Throttle body

* DO NOT REMOVE OR ADJUST THESE PARTS! This screw and nut are pre-set at the factory and should not be disturbed or throttle plates may not close.

NOTE:

D. FUEL JETS & AIR BLEEDS LOCATIONS

1. Main jet plugs & gaskets
2. Primary main jet & gasket
3. Primary slow air bleed no.1 & slow jet
4. Accelerator pump inlet seat screw
5. Accelerator pump inlet weight
6. Accelerator pump inlet check ball
7. Primary slow air bleed no.2
8. Primary main air bleed
9. Pump nozzle bolt & gasket
10. Accelerator pump outlet weight
11. Accelerator pump outlet check ball
12. Primary main air bleed
13. Primary slow air bleed no.2
14. Primary slow air bleed no.1 & slow jet
15. Primary main jet & gasket
16. Main jet plugs & gaskets
17. Secondary slow air bleed no.1 & slow jet
18. Secondary main air bleed
19. Secondary slow air bleed no.2
20. Secondary main air bleed
21. Secondary slow air bleed no.2
22. Secondary slow air bleed no.1 & slow jet
23. Power valve & gasket
24. Richer air bleed & jet
25. Richer air bleed no.2 - or plug



E. FUEL JETS & AIR BLEEDS SPECIFICATIONS

YEAR	VERSION	PRIMARY	SECONDARY	MAIN JET	MAIN AIR BLEED		SLOW JET	POWER VALVE	SLOW AIR BLEED		RICHER JET	RICHER AIR BLEED
					NO.1	NO.2			NO.1	NO.2		
1979	CAL M/T	X	X	93 160	90 140	–	46 120	50	70 160	150 60	40	140
	Non-CAL M/T	X	X	93 160	90 140	–	46 120	–	70 160	150 60	40	140
	CAL A/T	X	X	94 160	90 140	–	46 120	50	70 160	150 60	–	–
	Non-CAL A/T	X	X	93 160	90 140	–	46 120	50	70 160	150 60	–	–
1980	CAL M/T	X	X	94 160	90 160	–	46 80	45	70 160	150 60	40	140
	FED M/T	X	X	93 160	90 160	–	48 100	50	70 160	150 60	40	140
	CANADA M/T	X	X	93 160	90 140	–	46 120	50	70 160	150 60	40	140
	CAL A/T	X	X	95 160	90 160	–	46 80	45	70 160	150 60	–	–
	FED A/T	X	X	93 160	90 160	–	46 120	50	70 160	150 60	–	–
	CANADA A/T	X	X	93 160	90 140	–	46 120	50	70 160	150 60	–	–

The chart shown above and the illustration on the previous page are designed to pinpoint exact locations and sizes of jets and air bleeds used during the period of 1979 to 1980. Since there were differences in these carburetors by region, equipment and year, please be sure to check the correct specifications for the carburetor you are overhauling or repairing. If the carburetor doesn't match the specs listed, then you may have an incorrect carburetor for the vehicle.

DISASSEMBLY OPERATION

A. IMPORTANT! NOTE BEFORE DISASSEMBLY

- Use exploded view as guide for parts, disassembly, etc.
- DO NOT REMOVE venturi, choke valve & shaft or throttle valve & shaft.
- Follow numerical sequence of disassembly instructions - do not skip steps or you may miss important information! Parts are also reference-numbered in **general order** of disassembly for added convenience.
- Note sizes and locations of jets and air bleeds to avoid later confusion during assembly. Be sure to check emulsion tubes for differences. Refer to charts in this section for sizes and locations.

B. SPECIAL CLEANING INSTRUCTIONS

- **DO NOT SOAK** CHOKE HEATER/BI-METAL ASSEMBLY, DIAPHRAGM ASSEMBLIES, DASH POT, FLOATS, SOLENOIDS, RUBBER OR PLASTIC PARTS, ELECTRICAL WIRING, THROTTLE SENSOR, ETC.
- Do not soak plastic limiter cap.
- Disassemble as per step-by-step instructions before cleaning.
- Use suitable cleaning solvent. Work away from sparks and above all, NO SMOKING!
- Allow enough soaking time to remove foreign material.
- Blow out passages with compressed air and inspect closely for thorough cleaning.
- Check power valve plunger operation while cleaning. If plunger cannot be cleaned to operate freely, replace air horn.
- When cleaning jets, never use a wire or insert objects since this may enlarge the hole and change carburetor calibration. Use compressed air to blow clean.

C. STEP-BY-STEP DISASSEMBLY

• AIR HORN DISASSEMBLY

With the carburetor on the bench, perform the following steps:

1. Remove all hoses.
2. Disconnect all vacuum tubes.

Remove the following:

3. Fuel inlet bolts
4. Fuel inlet strainers
5. Fuel inlet tubes
6. Air vent solenoid & gasket
7. Air vent solenoid spring, bushing & plunger
8. Throttle return spring (use care to release tension slowly, sub-return may snap back)
9. Disconnect hot start assist spring.
10. Remove dash pot bracket & dash pot as an assembly.
11. Remove throttle opener & bracket assembly.
12. Disconnect throttle sub-return.*

***Note:**
DO NOT UNSCREW sub-return pivot (see reference #35,36 on the air horn exploded view illustration)! This was pre-set at the factory. Instead, pull the sub-return spring down until the spring retainer clears the bracket. Then remove the sub-return from the bracket as an assembly. Disconnect the lower end of the sub-return rod by removing the cotter pin and two (2) washers. Set aside for later.

13. Remove "C" clip from choke cable arm and choke return slide arm (reference #33 on chart) and disconnect both arms.
14. Remove throttle sub-return bracket & choke return diaphragm.
15. Remove bi-metal spring housing & bracket assembly.
16. Disconnect fast idle rod by removing cotter pin & washer.
17. Remove #2 choke diaphragm (1980 CAN A/T, FED A/T, FED M/T).
18. Remove air horn screws.
19. Carefully lift air horn straight up from main body.
20. Remove float pins.
21. Remove floats.
22. Remove needle assemblies.
23. Remove needle seats & gaskets.
24. Remove & discard air horn gasket.

● MAIN BODY DISASSEMBLY

25. Disconnect accelerator pump rod only at low end by removing cotter pin & washer.
26. Remove "C" clip from accelerator pump pivot shaft.*

***Note:**
It is sometimes easier to remove the accelerator pump pivot shaft by performing the operation with the carburetor on its side and the shaft in a vertical position (head up). This will prevent the washers from falling into the "C"-clip slot as often happens in a horizontal position.

27. Remove three (3) exposed pump cover screws.
28. Slide pivot shaft up enough to clear 4th cover screw.
29. Remove 4th pump cover screw.*

***Note:**
Some accelerator pump pivot shafts are not easily removable when the lower left screw is still in place. This screw should always be removed **first** before attempting to move the shaft out of position.

30. Remove pump cover, return spring & diaphragm.
31. Remove pivot shaft.
32. Separate accelerator pump gasket/diaphragm from pump cover.
33. Lay accelerator pump lever aside, but do not remove rod adjust nut, etc.

34. Remove idle switch (use care not to bend lever extended inside).
35. Remove secondary vacuum diaphragm link cotter pin.
36. Disconnect secondary vacuum diaphragm link.
37. Remove secondary vacuum diaphragm attaching screws.
38. Remove secondary vacuum diaphragm cover screws & solenoid bracket.
39. Disassemble secondary vacuum diaphragm by removing cover, diaphragm & spring.
40. Remove lock plates from main jet plugs (1980).
41. Remove main jet plugs & gaskets.

Continue by removing the following:

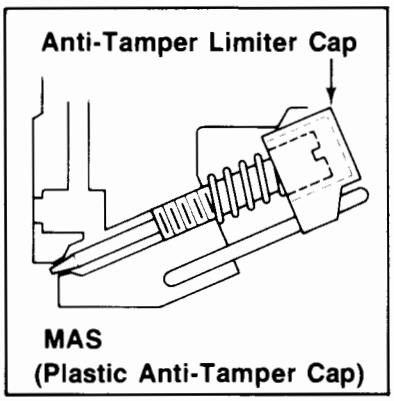
42. Main jets & gaskets
43. Accelerator pump nozzle screw & gasket
44. Accelerator pump nozzle & gasket
45. Accelerator pump outlet weight
46. Accelerator pump outlet check ball (valve)
47. Accelerator pump inlet check seat
48. Accelerator pump inlet check weight
49. Accelerator pump inlet check ball
50. All jets, air bleeds & power valve
51. Richer jet/air bleed (M/T versions)
52. Richer system plug
53. Sight glass bezel screws
54. Sight glass bezels & gaskets
55. Sight glasses
56. Sight glass gaskets
57. Richer solenoid (M/T versions)
58. Richer solenoid spring & plunger
59. Sub-zero start assist fitting (if equipped) & gasket
60. Sub-zero start assist plug (if equipped) & gasket
61. Unbolt main body from throttle body (4 bolts).
62. Remove and discard main body gasket.

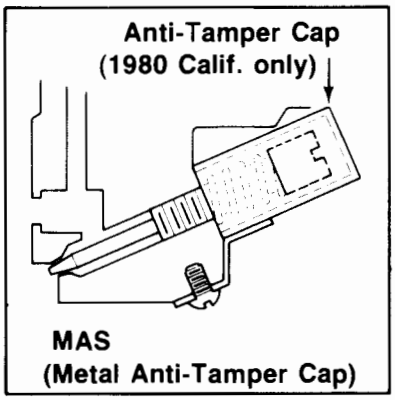
• THROTTLE BODY DISASSEMBLY

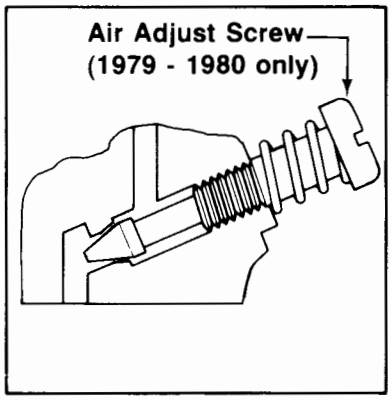
Note:

Both front and rear lever assemblies should NEVER be disassembled. Likewise, throttle plates must NOT be removed. The exploded parts chart at the beginning of this section is merely for illustration purposes only. Do not attempt to remove these parts!

Shown below are the different anti-tamper cap designs used on MAS screws for RX-7 carburetors from 1979 to 1980. Note that design #1 features a plastic cap which was merely pushed on over the screw. This plastic cap may be missing from the carburetor you are repairing. If so, it will not affect adjustments, but should be replaced if possible.







Remove the following parts:

63. Remove plastic limiter caps and/or metal anti-tamper MAS cap.
64. Remove MAS & spring.
65. DO NOT REMOVE THROTTLE VALVE ADJUST SCREW AND NUT - LEAVE IN PLACE!
66. Remove hot start assist spring.
67. Remove all gasket material.
68. Remove power valve solenoid & gasket.
69. Remove air adjust screw & spring.

STOP! You have completed disassembly of the RX-7 carburetor for overhaul.

ASSEMBLY OPERATION

A. IMPORTANT! NOTE BEFORE ASSEMBLY

- INSPECT ALL PARTS FOR DAMAGE OR WEAR. Look for burrs or ridges on needle seats, needles, mixture adjust screw, etc. Check throttle valves and choke valve for smooth operation, damage, etc.
- Check all solenoids and valves for proper operation. Check solenoid plungers for nicks or burrs. Be sure plunger is clean and free of all residue which might inhibit free movement. Also check solenoid spring. When battery power is applied to A/V and richer solenoid, plunger or stem should retract into the solenoid.
- Double check all passages to be sure of free flow. If blocked, clean again with solvent and blow out with compressed air.
- Make float adjustments on the air horn **WITH THE GASKET INSTALLED!** This procedure differs from all other Mazda carburetors in the U.S., so please pay close attention to avoid an incorrect setting.
- Check the float for saturation, contamination or other possible damage. Make sure the float actually floats as it should. Saturated float will sink lower than normal. If in doubt, match weight and floatation with known good float of the same specs.
- Inspect all diaphragms for damage and proper operation. Check for holes, wear, thin spots, tears, etc.
- Discard all old gaskets and use new ones.
- Be sure the power valve plunger operates smoothly. If it cannot be cleaned, replace the air horn.
- Make a final check to be sure all parts are absolutely clean prior to assembly!

Please Note:
If you have any questions regarding placement or description of a part, be sure to refer to the exploded illustrations in the beginning of this section. Each part is referenced with a number and description.

B. STEP-BY-STEP ASSEMBLY

• THROTTLE BODY ASSEMBLY

1. Install the new mixture adjust screw and spring. Tighten the screw lightly and then back off three (3) turns for the preliminary setting. Do the same with the air adjust screw, backing off two (2) turns.
2. Install anti-tamper cap for 1980 CAL models and secure with screw.
3. Install power valve solenoid (if equipped).
4. Install main body gasket in place.

• MAIN BODY ASSEMBLY

5. Mate main body to throttle body and bolt together using four main body bolts.
6. Install sub-zero start assist plug or fitting & gasket.
7. Install richer plunger & spring (M/T versions).

8. Install richer solenoid.
9. Install sight glass gaskets (rubber).
10. Install sight glasses.
11. Install sight glass bezels & gaskets.

Continue assembly by installing the following:

12. Richer system plug & power valve
13. Richer jet/air bleed (M/T versions)
14. All jets & air bleeds for main body (see chart- one [1] #40 goes in air horn)
15. Accelerator pump inlet check ball
16. Accelerator pump inlet check weight
17. Accelerator pump inlet seat
18. Accelerator pump outlet check ball
19. Accelerator pump outlet weight
20. Accelerator pump nozzle & gasket
21. Primary main jets & gaskets
22. Secondary main jets & gaskets
23. All main jet plugs & gaskets
24. Main jet plug lock plates (serrations facing out)
25. Secondary vacuum diaphragm spring & cover
26. Cover screws and harness clip
27. Secondary diaphragm assembly to main body using gasket and screws
28. Secondary vacuum diaphragm link using cotter pin
29. Idle switch
30. Accelerator pump return spring & diaphragm
31. Accelerator pump cover*

***Note:**
Install ONLY the top screws and lower right-hand screw. DO NOT INSTALL THE LOWER LEFT SCREW BECAUSE THE HEAD MAY NOT CLEAR THE LEVER PIVOT SHAFT! Now turn the carburetor sideways with the front levers up to perform steps #32 to #35.

32. Push accelerator pump lever into cover slot and hold in place.
33. Slide thin washer on each side of lever in pump cover pivot.
34. Slide pump lever shaft into place.
35. Secure pivot shaft with "C" clip.
36. Install lower left pump cover screw.
37. Attach accelerator pump rod to arm on throttle body with cotter pin & washer.
38. Attach throttle opener bracket assembly, throttle opener, dash pot bracket and dash pot.*

***Note:**
Dash pot should already be in position on the dash pot bracket since it should not have been removed during disassembly.

• AIR HORN ASSEMBLY

39. Install air bleed in air horn if not already done at assembly step #14.
40. Install air horn gasket.
41. Install needle valve seats.
42. Install needle valve assemblies.
43. Install float pins & floats.
44. Perform float adjustment as follows:

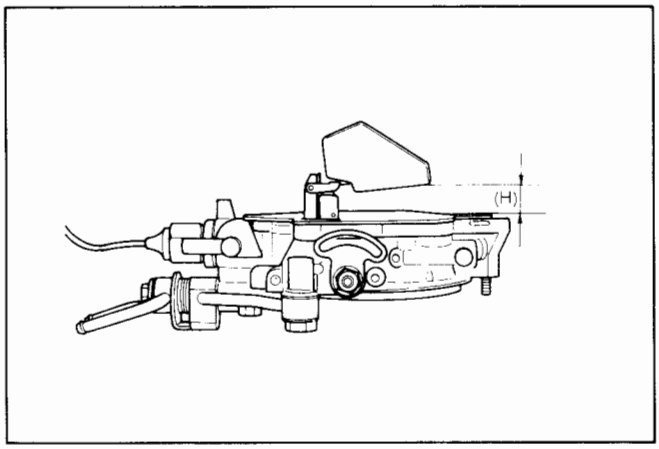
- **Float Adustment**

Perform the adjustments as follows:

. Invert the air horn on a stand and allow the float to lower by its own weight.

. Measure the clearance **(H)** between the float and the air horn gasket.

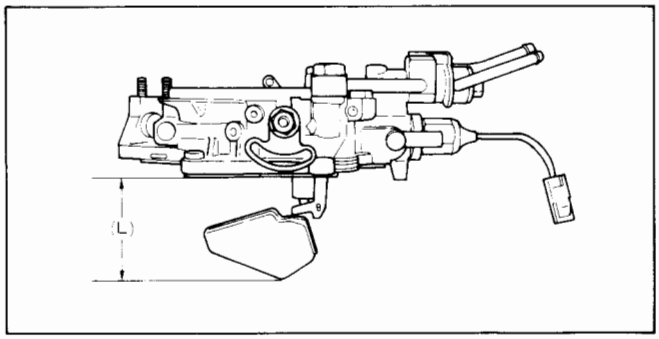
This clearance should be **16 ± 0.5 mm (0.63 ± 0.02 in)**. If the clearance is not within specifications, bend the float seat lip until the proper clearance is obtained.



. Turn the air horn to the normal position and allow the float to lower by its own weight.

. Measure the distance **(L)** between the bottom of the float and the air horn gasket.

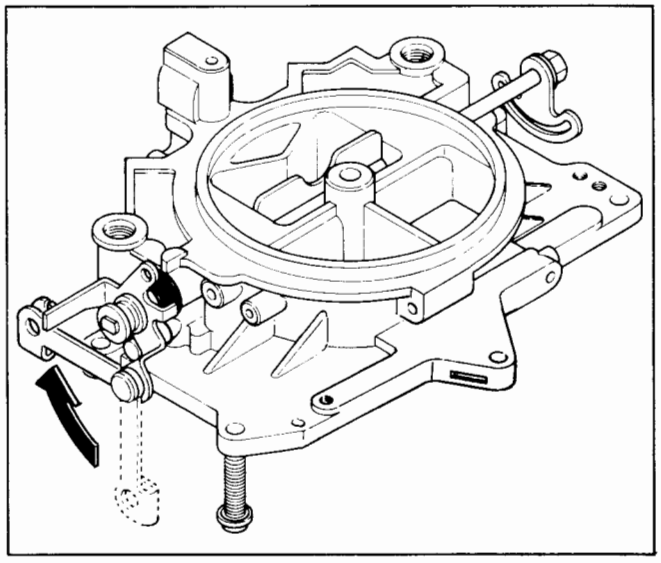
The clearance should be **51 ± 0.5 mm (2.0 ± 0.02 in)**. If the clearance is not within specifications, bend the float stopper until the proper distance is obtained.



45. Install air horn on main body with two (longest) screws near fuel inlet.
46. Install choke return slide arm over pivot shaft for choke cable arm and then install the choke cable arm on the pivot.
47. Secure the choke cable arm and return slide arm with a "C" clip.*

***Note:**
Choke cable arm MUST be installed in horizontal position because it will NOT swing past bracket assembly for hook-up with the cable. Failure to observe this caution will mean additional disassembly!

48. Connect fast idle rod by using cotter pin.



49. Install the bi-metal spring housing as follows:

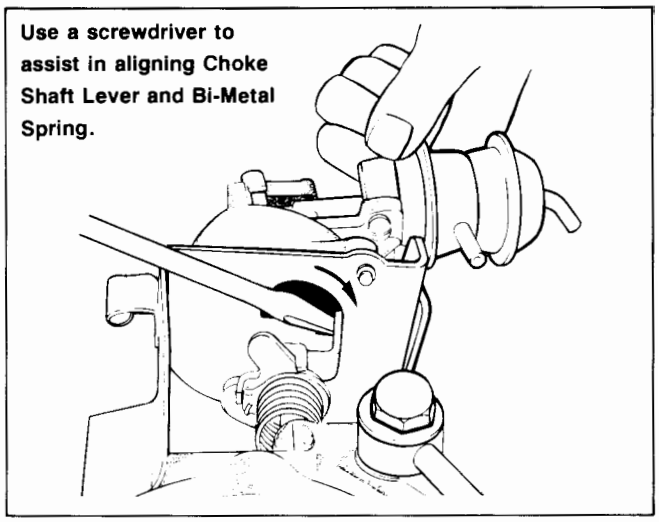
. Place the carburetor in front of you with the choke heater facing away from you.

. Close the choke valve and hold it closed.

. Now pull the vacuum diaphragm shaft back so that it retracts into the no.1 choke diaphragm. This will move the bi-metal spring clockwise making it easier to engage the bi-metal spring and the choke shaft lever.

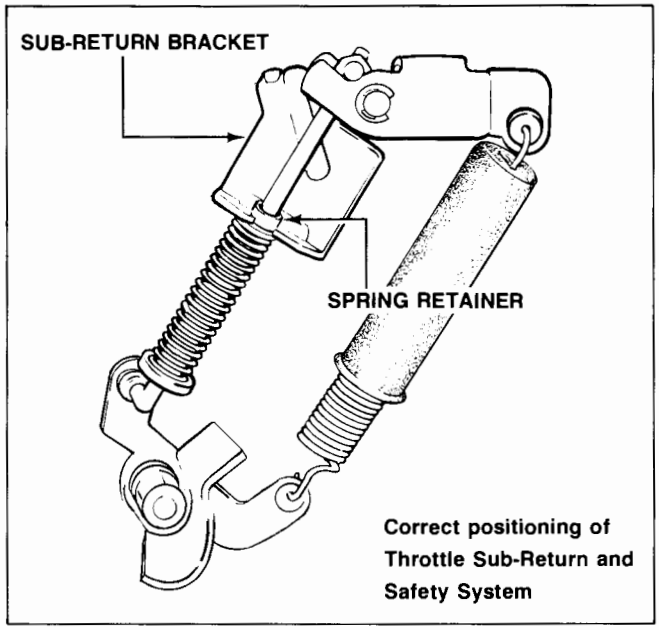
. If necessary, use a screwdriver to assist in aligning the choke shaft lever and the bi-metal spring, but be careful not to damage the bi-metal or heater element by doing so.

. While holding the housing in place, release the choke valve and immediately attach the housing by installing the short screws to the throttle opener bracket. Choke cable arm MUST be ABOVE throttle bracket assembly.



. Finish the operation by installing the sub-return bracket assembly ON TOP OF THE BI-METAL HOUSING BRACKET. Insert the two (2) longer screws downward through the sub-return bracket, through the bi-metal bracket and into the air horn. Use care to align the dimple indentations in both brackets for easiest assembly and proper fit.

Important:
Check the final assembly of the bi-metal and be ABSOLUTELY SURE that the bi-metal spring is properly engaged with the choke shaft lever.



Correct positioning of Throttle Sub-Return and Safety System

50. Complete installation of the sub-return bracket by installing side screw into main body.
51. Install throttle sub return rod & spring assembly.*

***Note:**
First attach lower end of rod with cotter pin & washers. Then slide upper end of the rod onto the sub-return bracket while depressing the spring retainer. Release the retainer once in place.

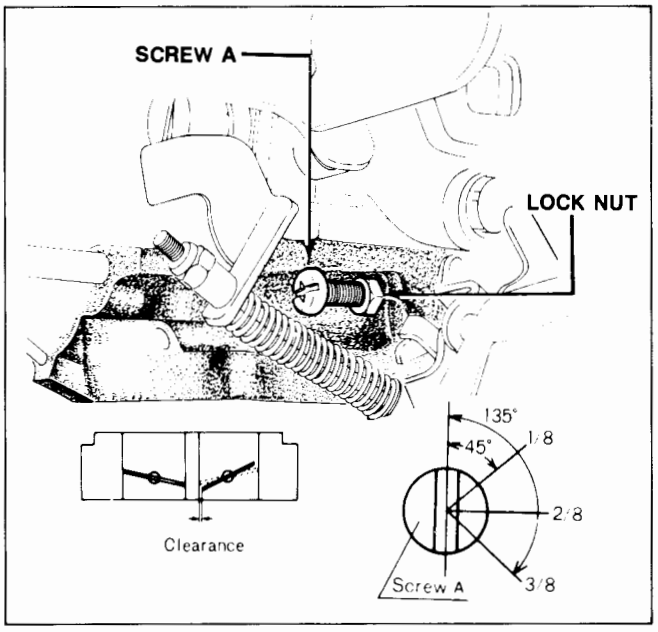
52. Install hot start assist spring between its lever assembly and the throttle opener bracket.
53. Install no.2 choke diaphragm.
54. Install all remaining air horn screws.
55. Install altitude compensator valve & gasket or blind plate & gasket.
56. Install air vent solenoid, spring & gasket.
57. Install throttle return spring using care to attach sub-return pivot without unscrewing pivot (see ref. # 35 of air horn parts).
58. Install fuel inlet tubes, strainers, fittings and bolts.
59. Connect all vacuum tubes in proper positions.

STOP! You have completed overhaul assembly. Now go back and double-check your assembly. Make sure your assembly is absolutely correct BEFORE going on to the adjustments.

OFF VEHICLE ADJUSTMENTS

A. CHECKING & ADJUSTING CARBURETORS

• PRIMARY THROTTLE VALVE INITIAL OPENING ANGLE



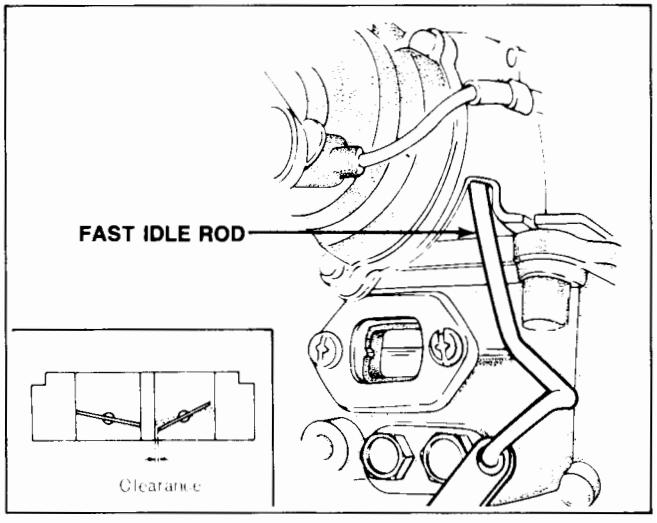
1. Loosen the lock nut and screw **A**.
2. Close the throttle valve completely and then gradually screw **A** until it just touches the throttle lock lever. Then, turn screw **A** further by **1/8 ~ 3/8** turns.
3. Tighten the lock nut.

- **Clearance:**

  0.05 mm (0.002 in)
  Initial opening angle: 1°

Note:
The above adjustment should be done when the throttle body, throttle lock lever and screw **A** have been changed.

• FAST IDLE OPENING ANGLE



With the choke valve fully closed, measure the clearance between the primary throttle valve and the wall of the throttle bore.

- **Clearance: (1979)**

  USA **1.30~1.50 mm (0.051~0.059 in)**

  Canada **0.90~1.10 mm (0.035~0.04 in)**

- **Clearance: (1980)**

  California **1.30~1.50 mm (0.051~0.059 in)**

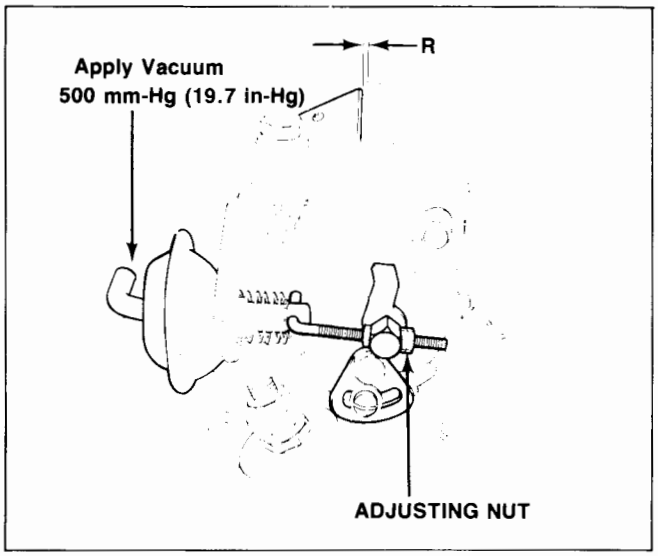
  Except for California **0.90~1.10 mm (0.035~0.04 in)**

If the clearance is not within specifications, bend the fast idle rod until the proper clearance is obtained.

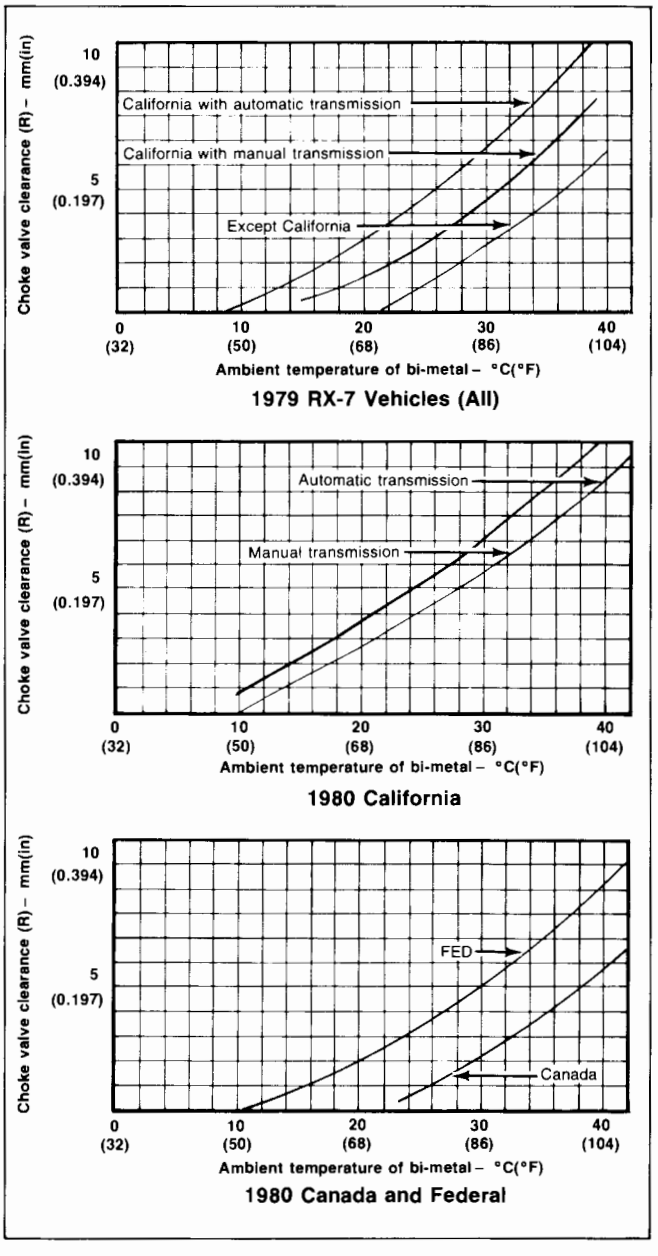
• CHOKE VALVE OPENING ANGLE

1. Disconnect the vacuum sensing tube from the vacuum diaphragm.
2. Pull the choke lever out completely and hold its position.
3. Apply vacuum of more than **500 mm-Hg (19.7 in-Hg)** to choke diaphragm.
4. Check the clearance **(R)** with wire gauge.

   If the clearance (R) is not within specification, adjust the clearance by turning the adjusting nut.

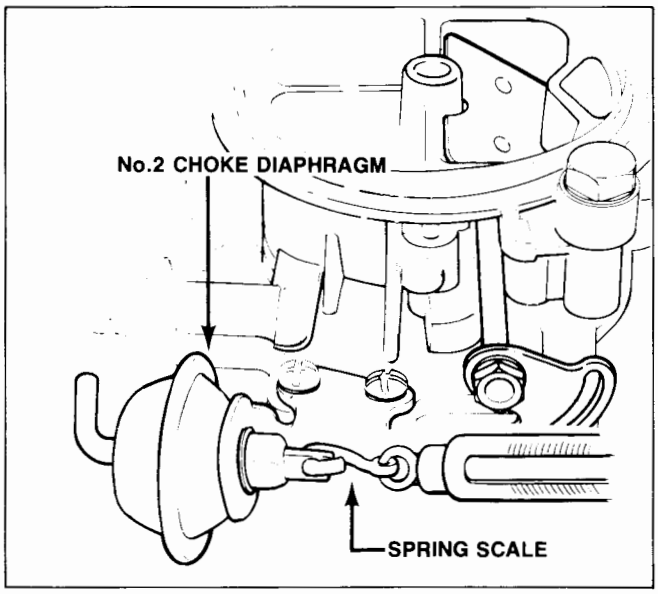


5. Measure the temperature around the bi-metal and compare the clearance **(R)** with the specifications.

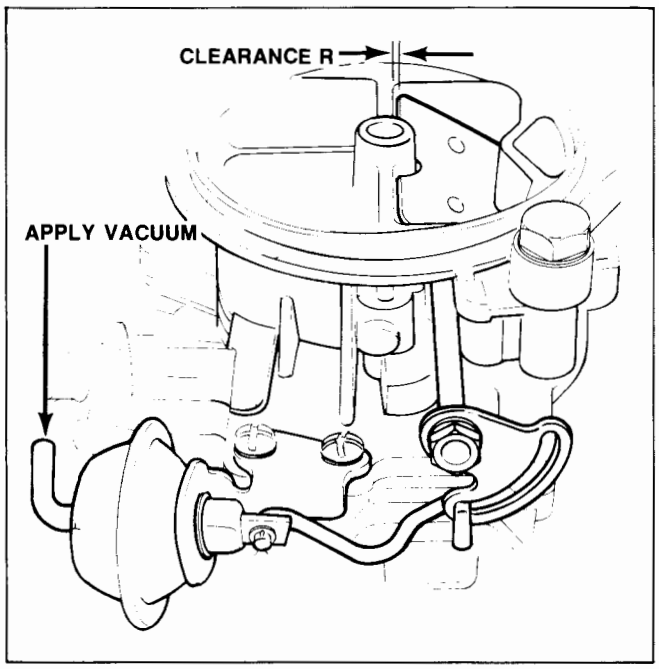


● NO.2 CHOKE DIAPHRAGM (1980- Except for California & Canada)

1. Disconnect the no.2 choke diaphragm connecting rod and hook a spring scale onto the diaphragm shaft.
2. Slowly pull the spring scale and take a reading when the diaphragm just begins to come out. The reading should be **34~52 gr (1.2~1.8 oz)**.
3. Pull the diaphragm shaft out about **3.3 ± 0.3 mm (0.13 ± 0.01 in)** and make sure the reading is **54~82 gr (1.9~2.9 oz)**.



4. Reconnect the no.2 choke diaphragm connecting rod. Pull the choke lever link out fully and hold its position.
5. Apply vacuum of **more than 450 mm-Hg (17.7 in-Hg)** to the no.2 choke diaphragm and fully push the diaphragm shaft (plastic shaft) in with a finger. Check the clearance **(R)** with wire gauge. The clearance **(R)** is **1.78~2.94 mm (0.070~0.116 in)**. Next, pull out the diaphragm shaft (plastic shaft) with fingers and check the clearance **(R)**. The clearance **(R)** is **1.02~1.38 mm (0.040~0.054 in)**.



ON VEHICLE ADJUSTMENTS

Caution:
Illustrations in this and other manuals may show the carburetor adjustments with the carburetor air cleaner off, but this is only to pinpoint locations. Perform all idle adjustments with the air cleaner installed!

A. INSTALLING CARBURETOR

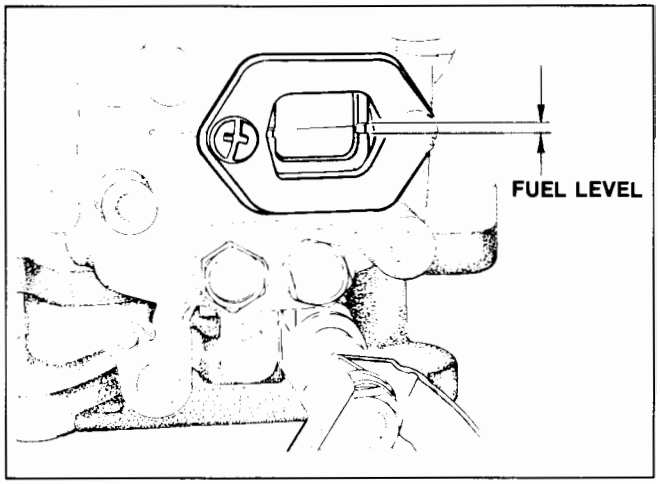
Install the carburetor in the reverse order of removing.

Caution:
Push in the hose ends of the fuel main and fuel return hoses to the carburetor fittings until the fittings are inserted to **30~35 mm (1.2~1.4 in)**. Be sure air cleaner is installed before making adjustments.

After installing, note the following:

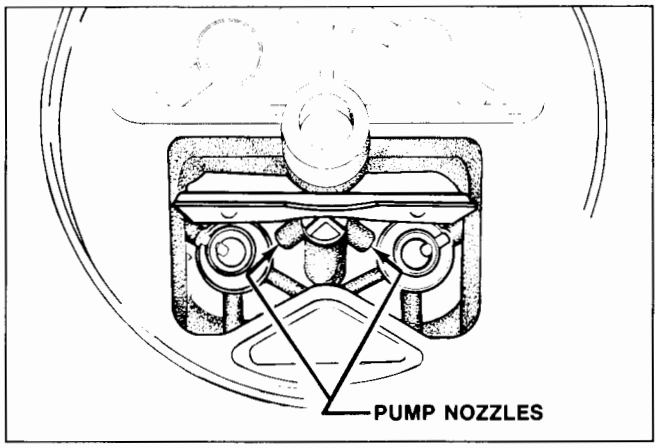
(Place the vehicle on level ground)

1. Start the engine and check for fuel leakage.
2. With the engine operating, check the fuel level. The fuel level should be in the specified mark in the sight glass.



3. Inspect the accelerator pump as follows:

   Remove the air cleaner cover. Stop the engine. Operate the throttle valve and check to see that the fuel is discharged from the nozzles of the pump. Replace air cleaner cover.

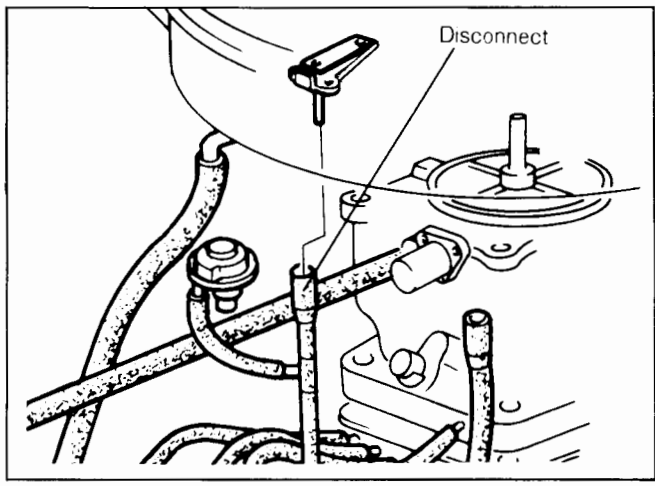


4. Adjust the idle speed and idle mixture.

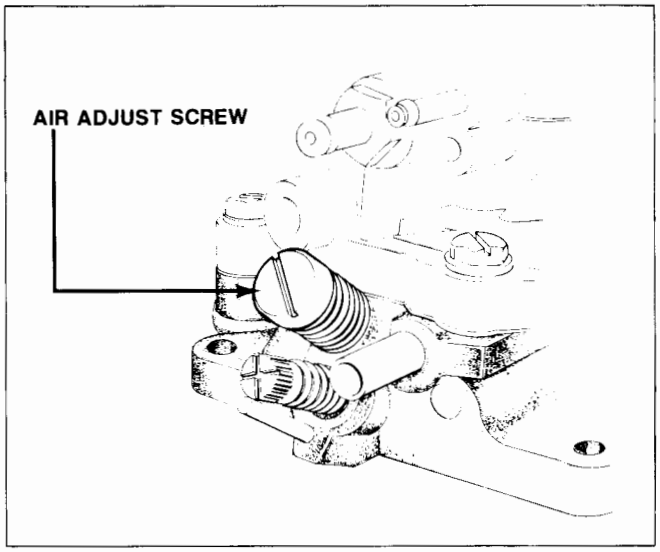
B. IDLE SPEED & IDLE MIXTURE ADJUSTMENT

Before checking or adjusting the idle speed and idle mixture, follow these directions. (Set parking brake)

1. Switch off all accessories.
2. Remove the fuel filler cap.
3. Connect a tachometer to the engine.
4. Disconnect the tube at the idle compensator in the air cleaner and plug the end of the tube.
5. Check that the dash pot rod and throttle opener (for air conditioner) do not keep the throttle lever from returning to the idle stop.
6. Warm the engine to the normal operating temperature and run it three (3) minutes at **2,000 rpm** in neutral.
7. Connect an exhaust gas analyzer to the vehicle.



● IDLE SPEED



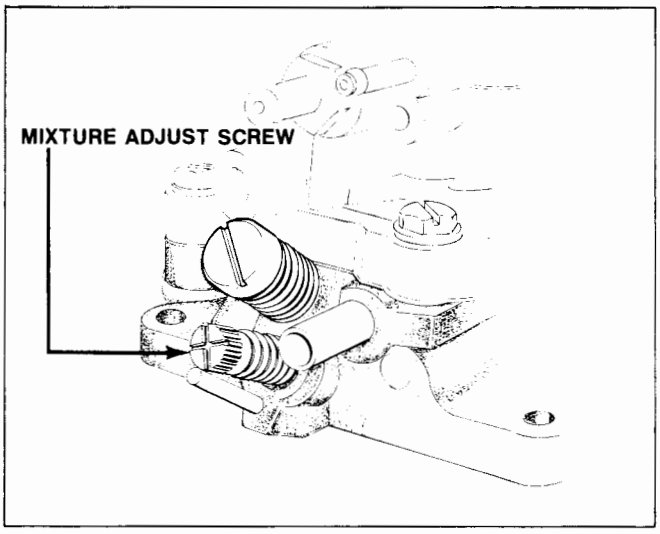
1. On vehicles equipped with automatic transmission, shift the selector lever to "D" position.
2. Check the idle speed. If the idle speed is not as specified, adjust the idle speed to **750 rpm** by turning the A/C adjust screw.

   • **Idle Speed:**

   Manual transmission: 750 rpm in neutral
   Automatic transmission: 750 rpm in "D" position

3. If the CO concentration is **less than 0.1%** and engine operation is stable after adjusting the idle speed, an idle mixture adjustment is not required. If CO concentration is otherwise, adjust the idle mixture.

● IDLE MIXTURE



1. Remove the idle limiter cap (plastic cap) from the mixture adjust screw on FED and CAN vehicles. On CAL vehicles, use the special adjust tool (49 8343 869) to reach the MAS through the special anti-tamper cap.
2. Turn the MAS clockwise until the engine surges severely.
3. Now turn the MAS counter-clockwise in small steps until CO decreases to **0.1%**. DO NOT ADJUST any further to get less than **0.1%**.
4. From this position continue to turn the MAS **counterclockwise ½ turn**. Idle CO should be **less than 0.1%** after these adjustments.
5. If idle speed shifts from the specified rpm as a result of the above procedure, adjust the idle speed and repeat procedures 2 thru 5.
6. On FED and CAN vehicles, install the plastic idle limiter cap to fix the position of the MAS. On CAL vehicles, remove the special tool using care not to turn the MAS any further.

   • **Idle Speed:**

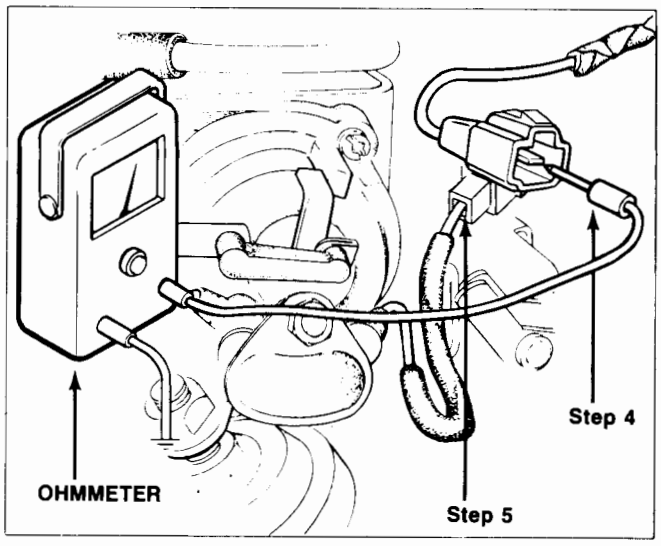
Manual transmission	750 ± 25 rpm in neutral
Automatic transmission	750 ± 25 rpm in "D" range

   • **CO Concentration (with air injection):**

All vehicles	**Less than 0.1%**

C. CHECKING CARBURETOR HEATER

1. Disconnect the connector of the water temperature switch (on 1980 models, the no.1 water tempurature switch) and connect a jumper wire to both terminals in the connector.
2. Connect a tachometer to the engine.
3. Disconnect the carburetor heater connector and hook up a voltmeter to the connector.
4. Start the engine and set speed to **2,000 rpm** with the choke knob. See that current flows to the carburetor heater lead but does not flow when the choke knob is fully pushed in.
5. Connect one (1) probe of an ohmmeter to the carburetor body. There is no meter movement, the carburetor heater circuit is open and must be replaced.



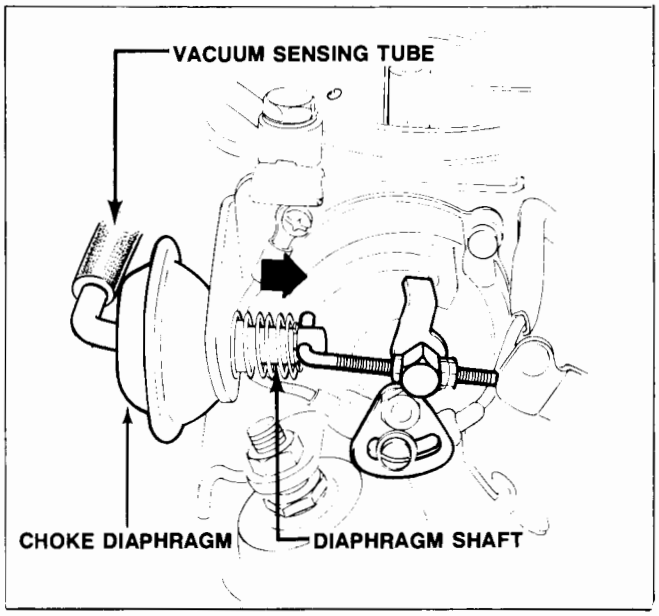
D. CHECKING CHOKE DIAPHRAGM

• CHOKE DIAHPRAGM (1979)

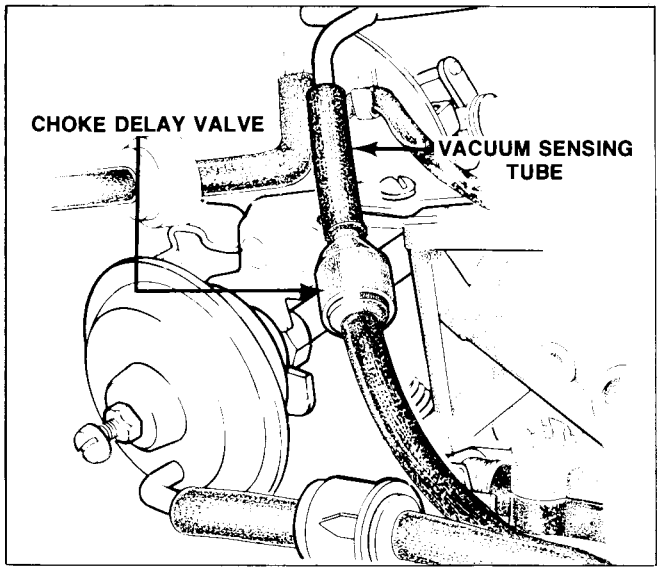
1. Remove the air cleaner assembly.
2. Start the engine and run it at idle.
3. Disconnect the vacuum sensing tube from the choke diaphragm. The diaphragm shaft should move out from the choke diaphragm.

• NO.1 CHOKE DIAPHRAGM (1980)

1. Remove the air cleaner assembly.
2. Start the engine and run it at idle.
3. Disconnect the vacuum sensing tube from the no.1 choke diaphragm. The diaphragm shaft should move out from the no.1 choke diaphragm.



E. CHECKING CHOKE DELAY VALVE

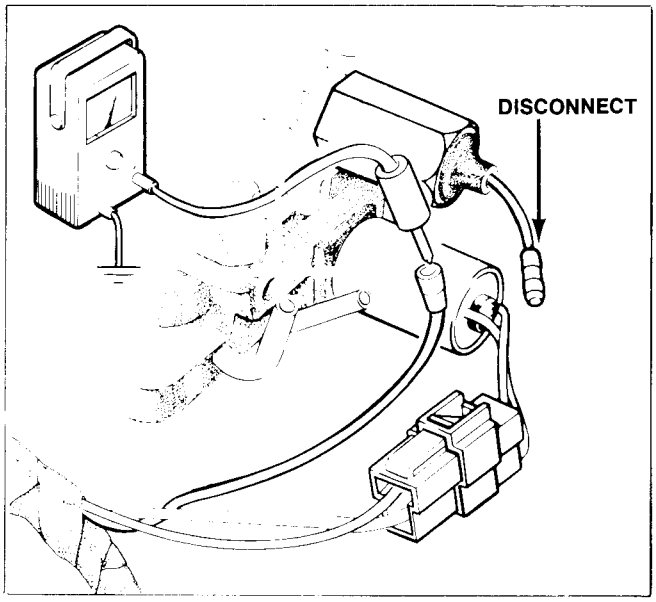


● DELAY VALVE (1979- California) (1980- Except for Canada)

1. Warm the engine to the normal operating temperature.
2. Stop the engine and remove the air cleaner assembly.
3. Disconnect the vacuum sensing tube from the choke diaphragm.
4. Start the engine and run it at idle. Check to see that the diaphragm shaft is fully pulled in to the diaphragm in **10 ~ 20 seconds** after connecting the disconnected vacuum sensing tube to the choke diaphragm.

Note:
On the vehicle equipped with automatic transmission, place the selector lever to "N" position.

F. CHECKING ENRICHMENT SYSTEM



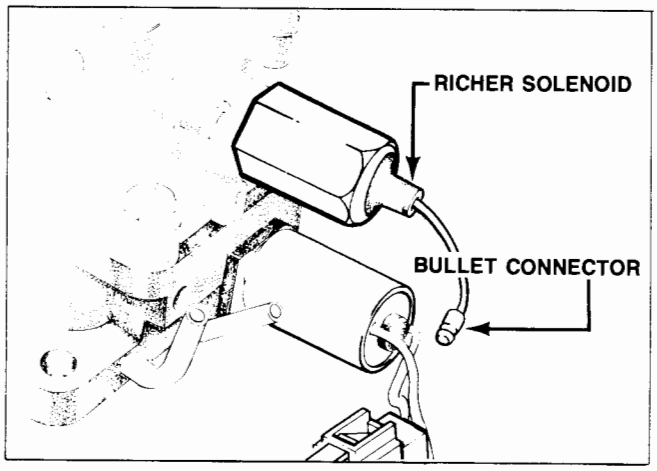
● RICHER SIGNAL INSPECTION (1979- Manual Transmission) (1980- Manual Transmission)

1. Connect a tachometer to the engine.
2. Warm the engine to the normal operating temperature.
3. Disconnect the coupler from the richer solenoid and connect a voltmeter to the terminal.
4. Disconnect the vacuum sensing tube from the dash pot diaphragm.
5. Start the engine and increase the engine speed to **3,000 rpm with the throttle**. Quickly release the throttle lever and check to see that current stops flowing to the terminal. The engine speed should be **1,150 ± 100 rpm**.

Note:
Engine speed should be **1,100 ± 100 rpm for Canada.**

• **Richer Solenoid Inspection**

1. Warm the engine to normal operating temperature and run it at idle.
2. Disconnect the bullet connector from the richer solenoid and make sure that the engine operates smoothly.
3. Apply battery power to the richer solenoid and the engine should hunt or die.



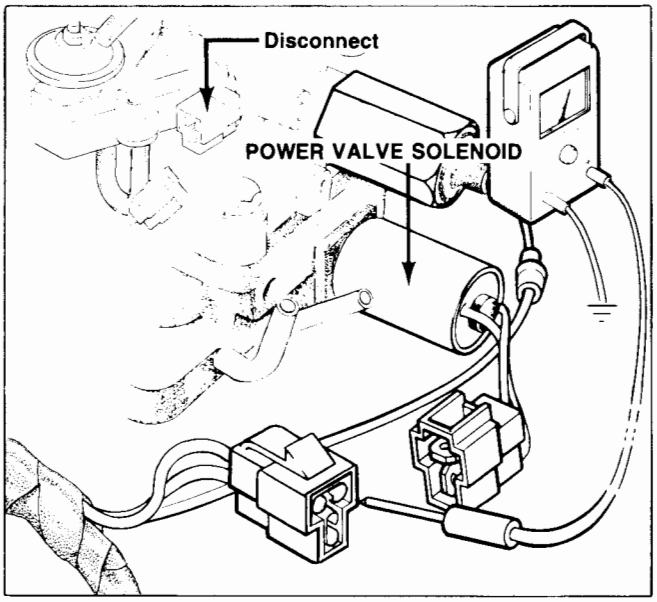
• **Relative Parts Inspection**

Check the control unit and idle switch.

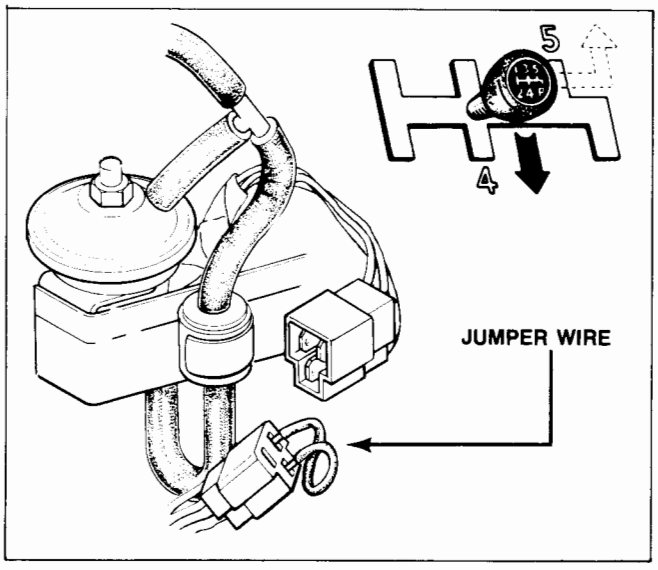
● POWER VALVE INSPECTION (1979)

• **Signal Inspection (California)**

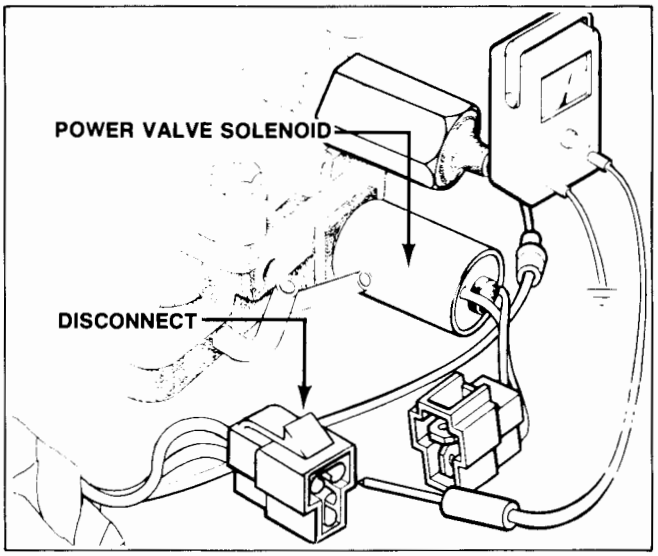
1. Warm the engine to normal operating temperature and stop the engine.
2. Disconnect the coupler from the power valve solenoid and connect a voltmeter to the terminal.
3. Disconnect the coupler from the vacuum switch.
4. Start the engine with choke knob fully pulled and push back the choke knob completely.
5. Increase the engine speed from **2,000 rpm** and check to see that current stops flowing to terminal when the engine speed is **more than 4,600 ± 400 rpm**.
6. Increase the engine speed to **2,000 rpm with the throttle** and check to see that the current stops flowing to terminal **after 130 ± 26 seconds** from engine starting Step 4.



7. Connect a jumper wire to both terminals in the disconnected vacuum switch coupler in Step 3.
8. Slowly increase the engine speed and check to see that current stops flowing to terminal when the engine speed is **more than 3,000 ± 300 rpm**.
9. On vehicles equipped with manual transmissions, set the engine speed to **2,000 rpm with throttle**. Depress the clutch pedal and check to see that current stops flowing when shifting the shift lever to 4th and/or 5th position.
10. Increase engine speed to **2,000 rpm with throttle**. Slowly decrease engine speed and record the rpm at which current stops flowing to terminal. The engine speed should be **1,150 ± 100 rpm**.

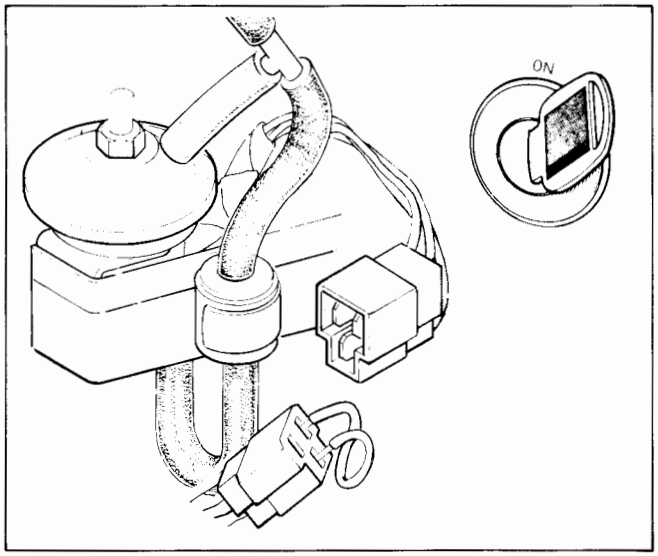


11. Slowly increase the engine speed from idle and check the engine speed at which current begins flowing. The difference between the engine speeds recorded in Steps 10 and 11 should be **150 ± 70 rpm**.



- **Signal Inspection (Automatic Transmission-Except for California)**

1. Disconnect the coupler from the power valve solenoid and connect a voltmeter to terminal in the coupler.
2. Disconnect the coupler from the vacuum switch and connect a jumper wire to both terminals in the coupler.
3. Turn the ignition switch on and check to see that the current flows to terminal.

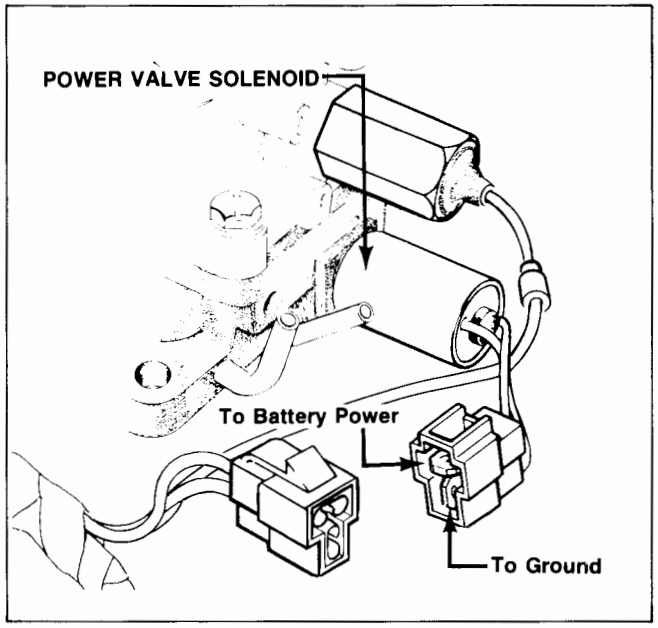


- **Power Valve Inspection (California)**

1. Disconnect the coupler from the power valve solenoid.
2. Connect battery power to the terminal in the coupler, and connect the other terminal to ground. When current is applied to the solenoid, a clicking sound is audible from the solenoid.

- **Relative Parts Inspection (California)**

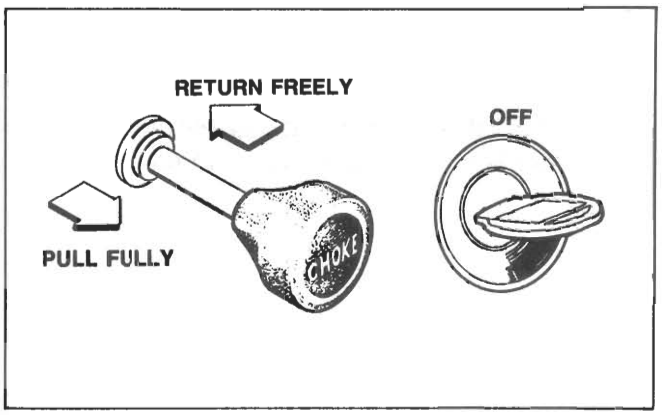
Check the following parts:
- Acceleration sensor
- Control unit (California)
- Top switch (California with manual transmission)
- Over/drive switch (California with manual transmission)



G. CHECKING AUTOMATIC CHOKE RELEASE SYSTEM

● CHECKING AUTOMATIC CHOKE RELEASE

1. When the engine is cold, pull the choke knob fully with the ignition switch off, and check that the choke knob returns automatically.



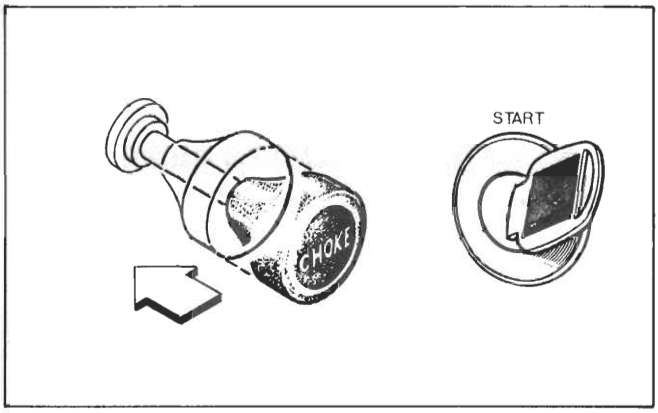
2. Connect a tachometer to the engine.

(1979):

3. On California vehicles, start the engine with the choke knob fully pulled and see that the choke knob automatically returns halfway **within 20~70 seconds after starting engine.**

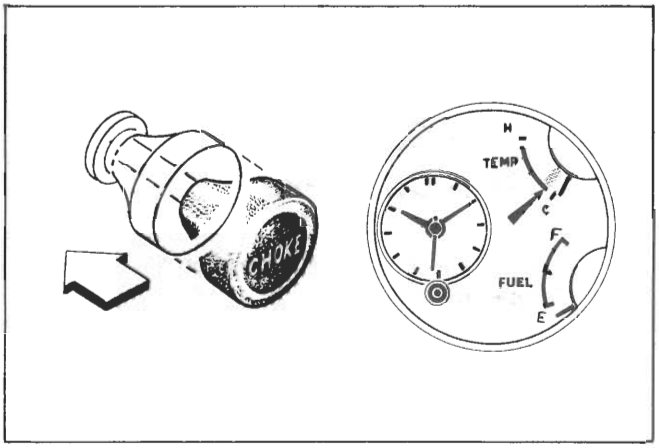
(1980):

3. On U.S.A. vehicles, start the engine with the choke knob fully pulled and see that the knob automatically returns halfway **within the specified time after starting engine.**



- **Specifications:**
  California 20~70 seconds
  Except for California 48~72 seconds

4. Set engine speed to **2,000 rpm with choke knob.**
5. **Leave** the engine running and see **that** the choke knob automatically returns completely when the temperature gauge indicates the range shown in figure.

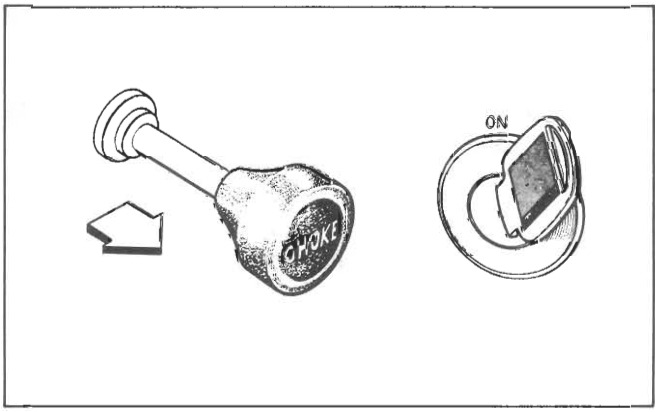


(1979):

6. On California vehicles, stop the engine. Pull the choke knob out fully with the ignition switch on. The choke knob **should be** held in that pulled position.

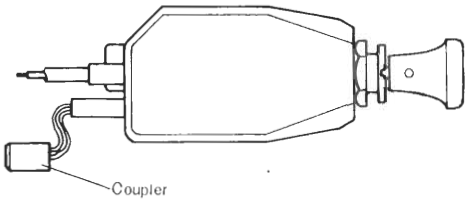
(1980)

6. On U.S.A. vehicles, stop the engine. Pull the choke knob out fully with the ignition switch on. The choke knob should be **held** in that position.

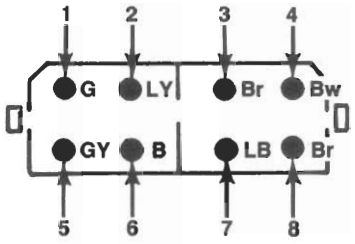


● CHECKING CHOKE MAGNET

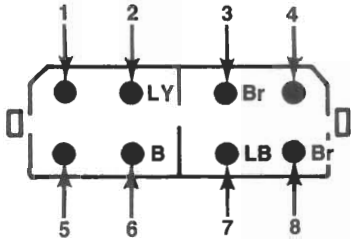
1. Disconnect the coupler from the choke switch.
2. Check the continuity between the numbered terminals in the coupler using an ohmmeter.



1979 California & 1980 ALL:
Continuity should exist between **8** and **6** terminals.

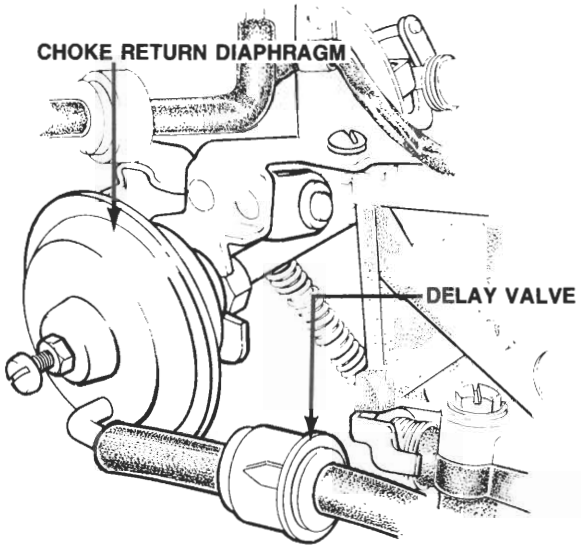


1979 Except California & 1980 Canada:
Continuity should exist between **8** and **6** terminals.



● CHECKING CHOKE RETURN DIAPHRAGM & DELAY VALVE (1979- California) (1980- California)

1. Warm the engine to the normal operating temperature.
2. Stop the engine and remove the air cleaner assembly.
3. Disconnect the vacuum sensing tube from the choke return diaphragm.
4. Start the engine and run it at idle. Make sure that the diaphragm shaft is fully pulled in to the diaphragm in **20 ~ 70 seconds** after connecting the vacuum tube to the choke return diaphragm.
   Note:
   On the vehicles equipped with automatic transmissions, place the selector lever in "N" position.

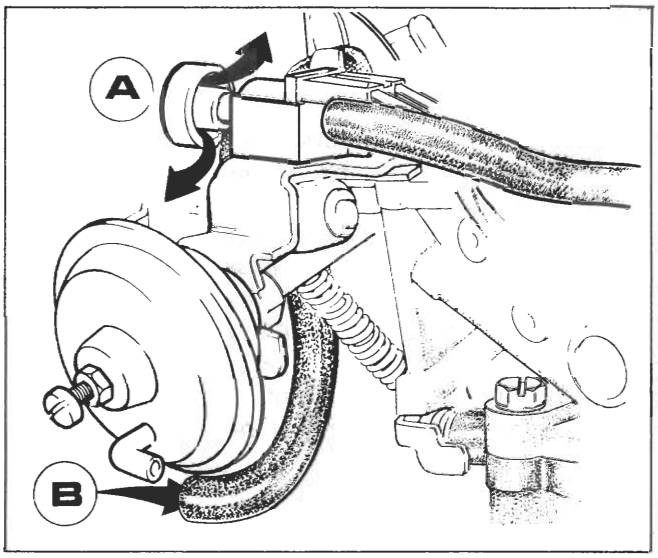


- **Relative Parts Inspection**

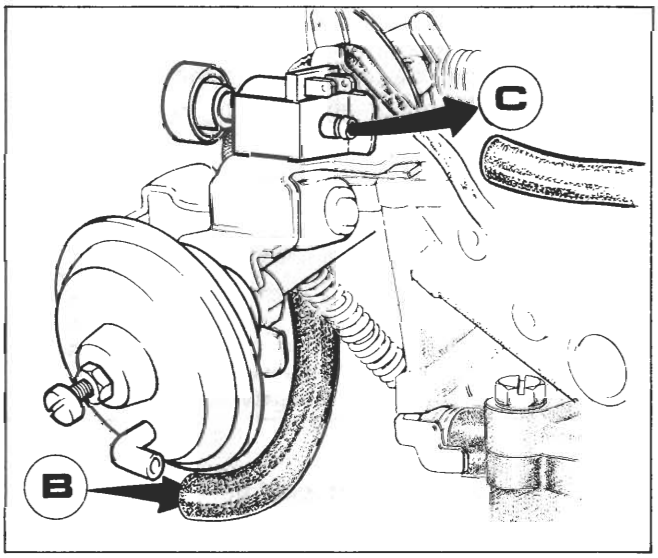
Check the following parts:
Water temperature switch
Full choke switch (California)

• CHECKING CHOKE RETURN SOLENOID VALVE (Except for California & Canada- 1980)

1. Disconnect the vacuum sensing tubes from the solenoid valve and diaphragm.
2. Using vacuum sensing tube **B**, blow through the solenoid valve. Make sure air passes through the valve and comes out air filter **A**.



3. Disconnect the coupler from the solenoid valve and connect battery power to the terminal on the valve.
4. Using vacuum sensing tube **B**, blow through the valve. Make sure air passes through the valve and comes out port **C**.

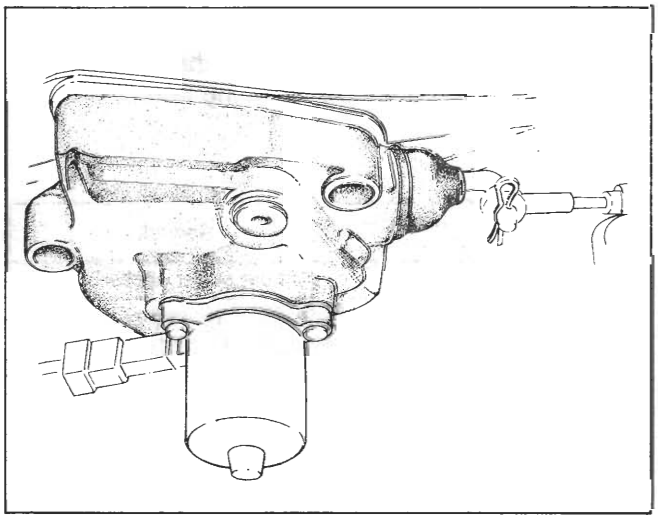


- **Relative Parts Inspection**

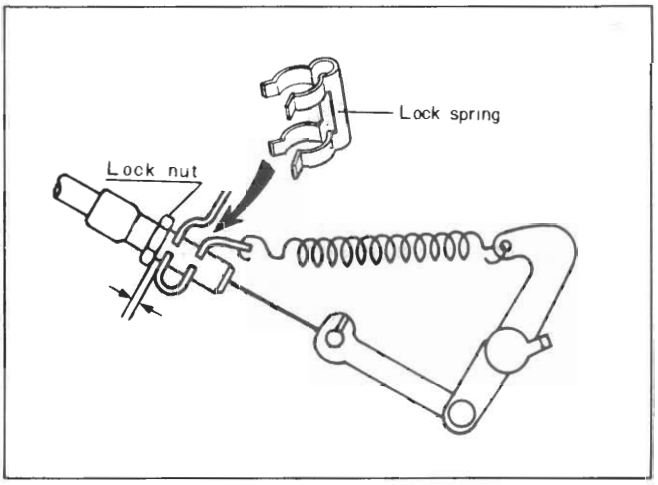
Check the following parts:
- Water temperature switch
- Full choke switch (except for Canada)
- Control unit (except for California & Canada)

H. CHECKING HOT START ASSIST SYSTEM

1. Inspect the hot start assist linkage for proper installation, no sticking or binding, and full return.
2. Warm the engine to normal operating temperature and stop the engine.
3. Disconnect the couplers for leading and trailing primary wires from the distributor.
4. Crank the engine. Check to see that the hot start lever operates and throttle valves open.

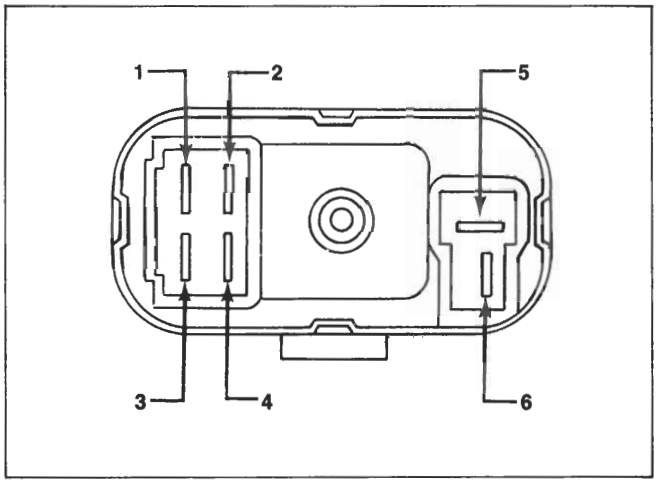


● ADJUSTING HOT START ASSIST CABLE



1. Remove the lock spring of the hot start assist cable from the cable bracket.
2. Slowly pull the outer cable until the hot start lever just touches the stopper lever. Then check the clearance between the cable bracket and the lock nut of the cable. The clearance should be **1.25 ± 0.75 mm (0.05 ± 0.03 in).** If the clearance is not within the specification, adjust it by turning the lock nut.
3. Install the lock spring of the cable securely.

● CHECKING HOT START ASSIST RELAY (1979)



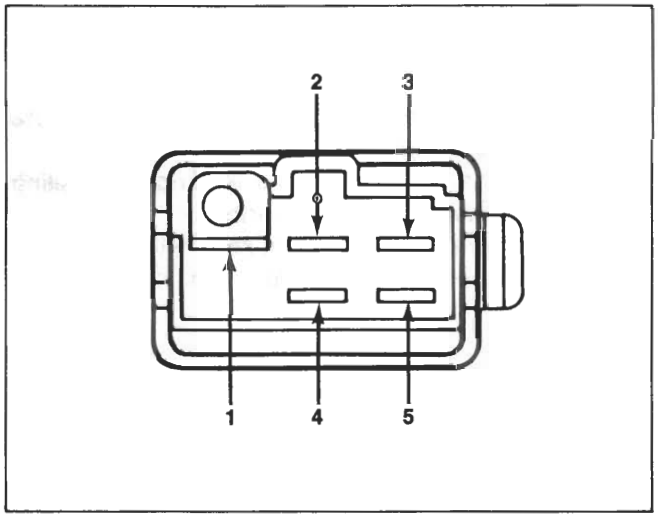
1. Disconnect the coupler from the relay.
2. Check the continuity, referring to the following table:

Numbers-continuity	Numbers-No continuity	Remarks
1 to 4	3 to 4	Without power applied
3 to 4	1 to 4	Connect the battery : positive to terminal 2 and negative to 6 and or, connect the battery : positive to terminal 5 and negative to 6.

• Relative Parts Inspection

Check the water temperature switch.

● CHECKING HOT START ASSIST RELAY (1980)



1. Disconnect the coupler from the relay.
2. Check the continuity, referring to the following table.

Numbers-continuity	Numbers-No continuity	Remarks
1 to 5	1 to 3	Without power applied
1 to 3	1 to 5	Connect the battery : positive to terminal 2 and negative to 4.

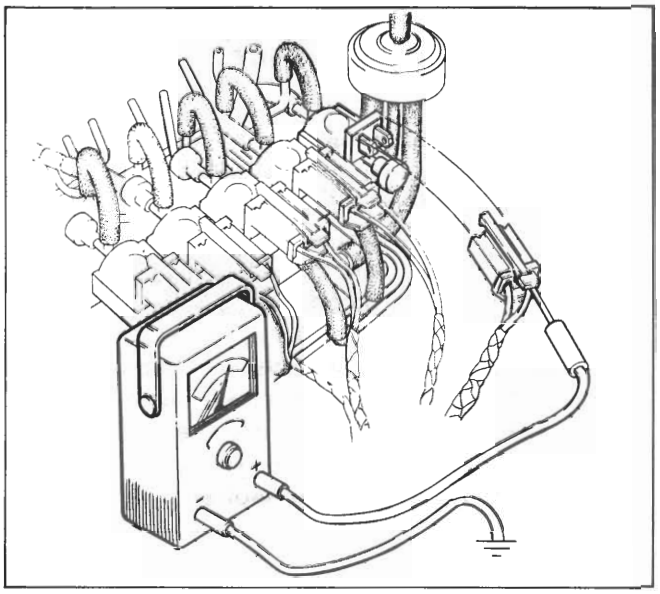
• Relative Parts Inspection

Check the water temperature switch.

I. CHECKING THROTTLE OPENER

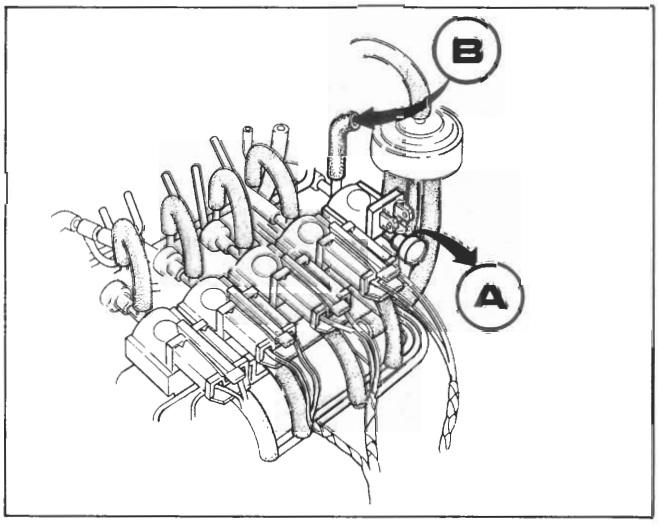
• CHECKING SIGNAL INSPECTION

1. Warm the engine to the normal operating temperature and stop the engine.
2. Connect a tachometer to the engine.
3. Disconnect the coupler from the air conditioner solenoid valve and connect a voltmeter to the terminal.
4. Start the engine and turn on the air conditioner compressor switch.
5. Increase the engine speed to **2,000 rpm with throttle**. Slowly decrease the engine speed and make sure that the current starts to flow when the engine speed is **1,150 ± 100 rpm.**

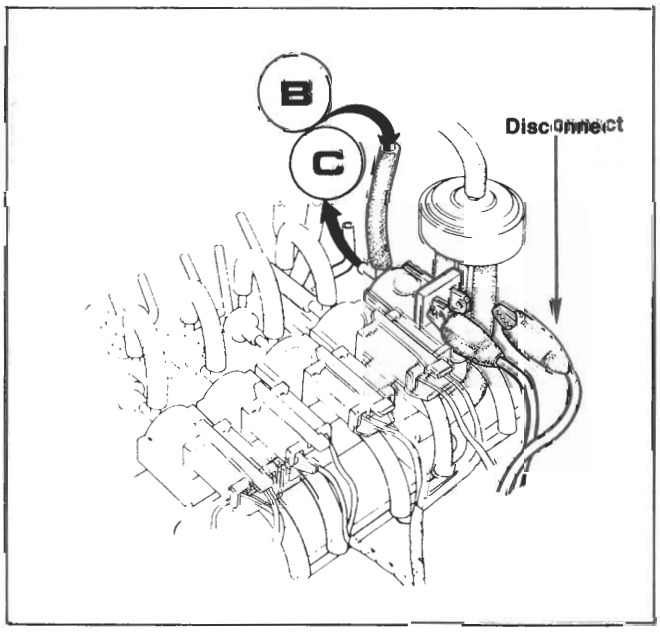


• CHECKING AIR CONDITIONING SOLENOID VALVE

1. Disconnect the vacuum sensing tubes from the solenoid valve and vacuum pipe.
2. Using tube **B,** blow through the solenoid valve. Make sure **air passes** through the valve and comes out air filter **A.**

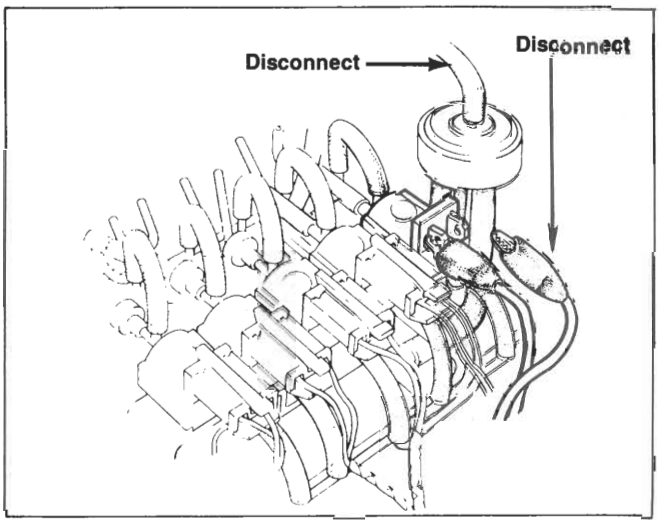


3. Disconnect the coupler from the solenoid valve and connect battery power to the terminal on the valve.
4. Using tube B, blow through the valve. Make sure air passes through the valve and comes out port C.



• CHECKING & ADJUSTING THROTTLE OPENER

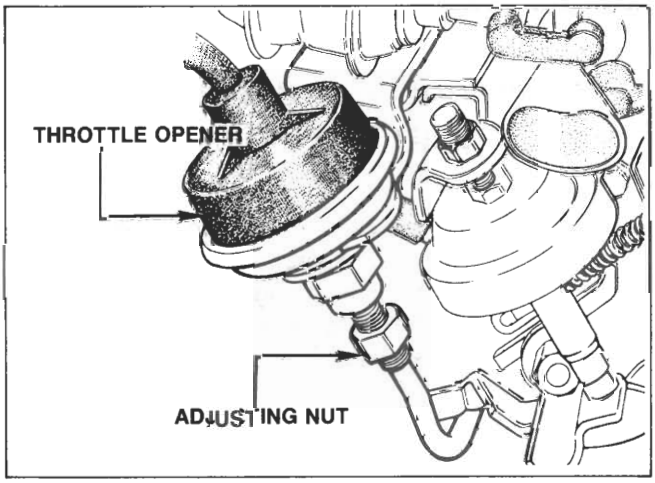
1. Switch off all of the accessories.
2. Disconnect the tube at the idle compensator in the air cleaner and plug the end of the tube.
3. Connect a tachometer to the engine and warm the engine to the normal operating temperature.
4. Turn off the air conditioner switch.
5. Disconnect the coupler from air conditioner solenoid valve. Connect the battery power to the terminal in the coupler, and connect the other terminal to ground. Check to see that the throttle opener operates and engine speed increases to **1,200 ± 50 rpm in neutral**.



6. If the engine speed is not within the specification, adjust it by turning the adjusting nut.

Note: (1979)
If the temperature inside the car is **below 10°C (50°F)**, warm to **above 10°C (50°F)** according to the following method and inspect the system explained above.

a) Place the air control lever to "MAX" position.
b) Place the temperature control lever to "HOT" position.
c) Turn the fan switch to "HI" position.



• CHECKING AIR CONDITIONING RELAY

• 1979 Air Conditioning Relay

1. Disconnect the coupler from the relay.
2. Check the continuity, referring to the following table.

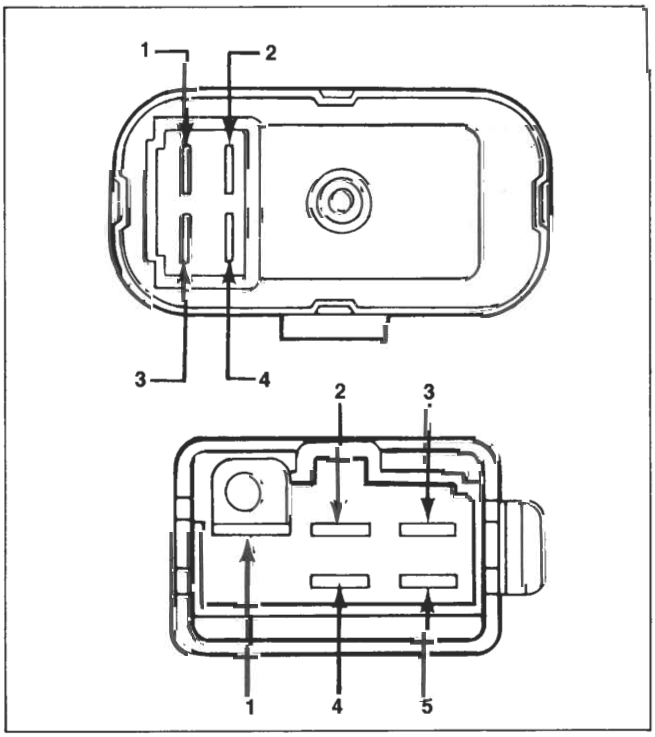
Numbers-continuity	Numbers-No continuity	Remarks
–	2 to 4	Without power applied
2 to 4	–	Connect the battery : positive to terminal 3 and negative to 1.

• 1980 Air Conditioning Relay

Numbers-continuity	Numbers-No continuity	Remarks
1 to 5	1 to 3	Without power applied
1 to 3	1 to 5	Connect the battery : positive to terminal 2 and negative to 4.

• Relative Parts Inspection

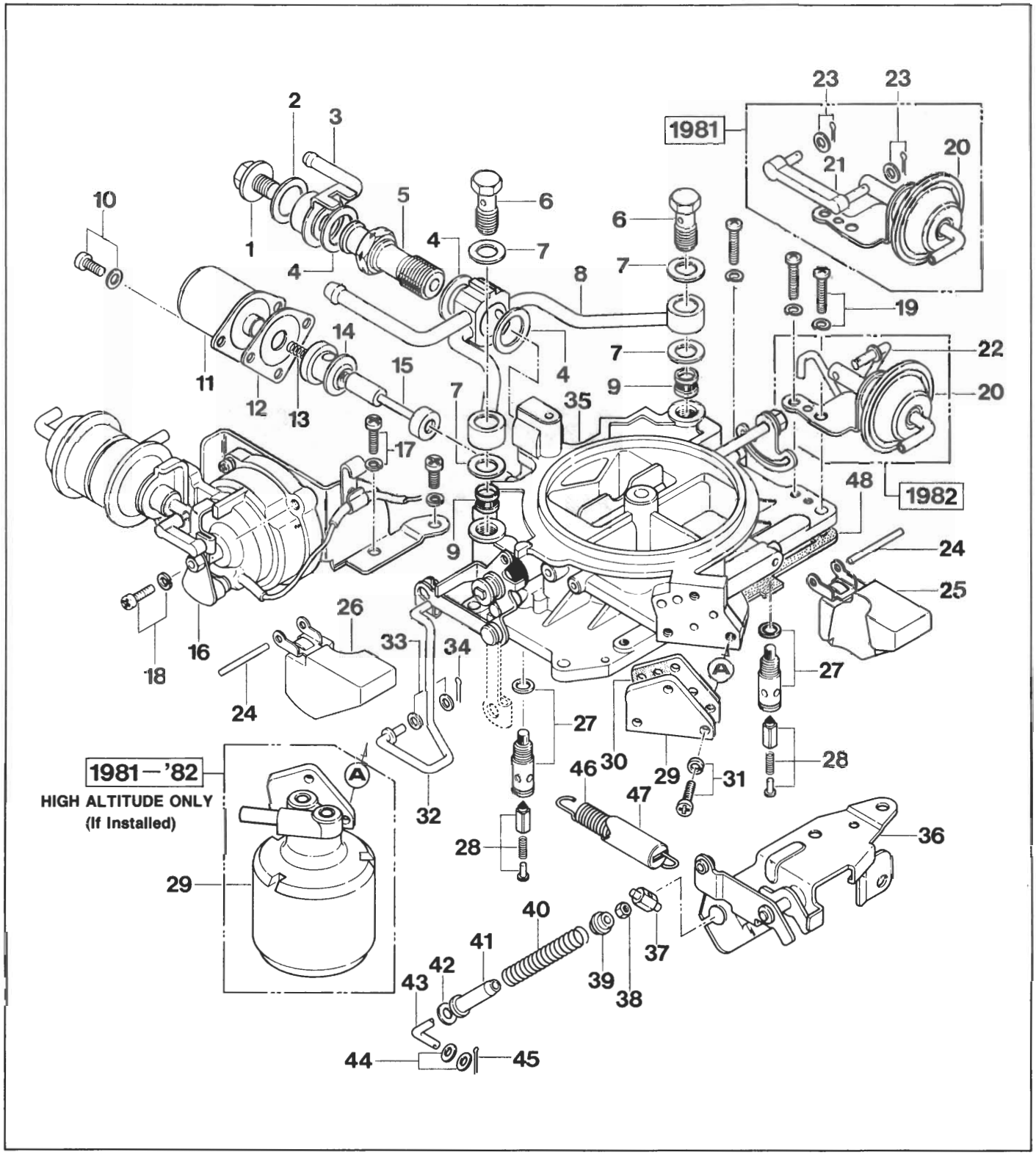
Check the control unit.



RX-7 CARBURETORS
1981-1982

1981 – 1982 CARBURETORS

A. AIR HORN



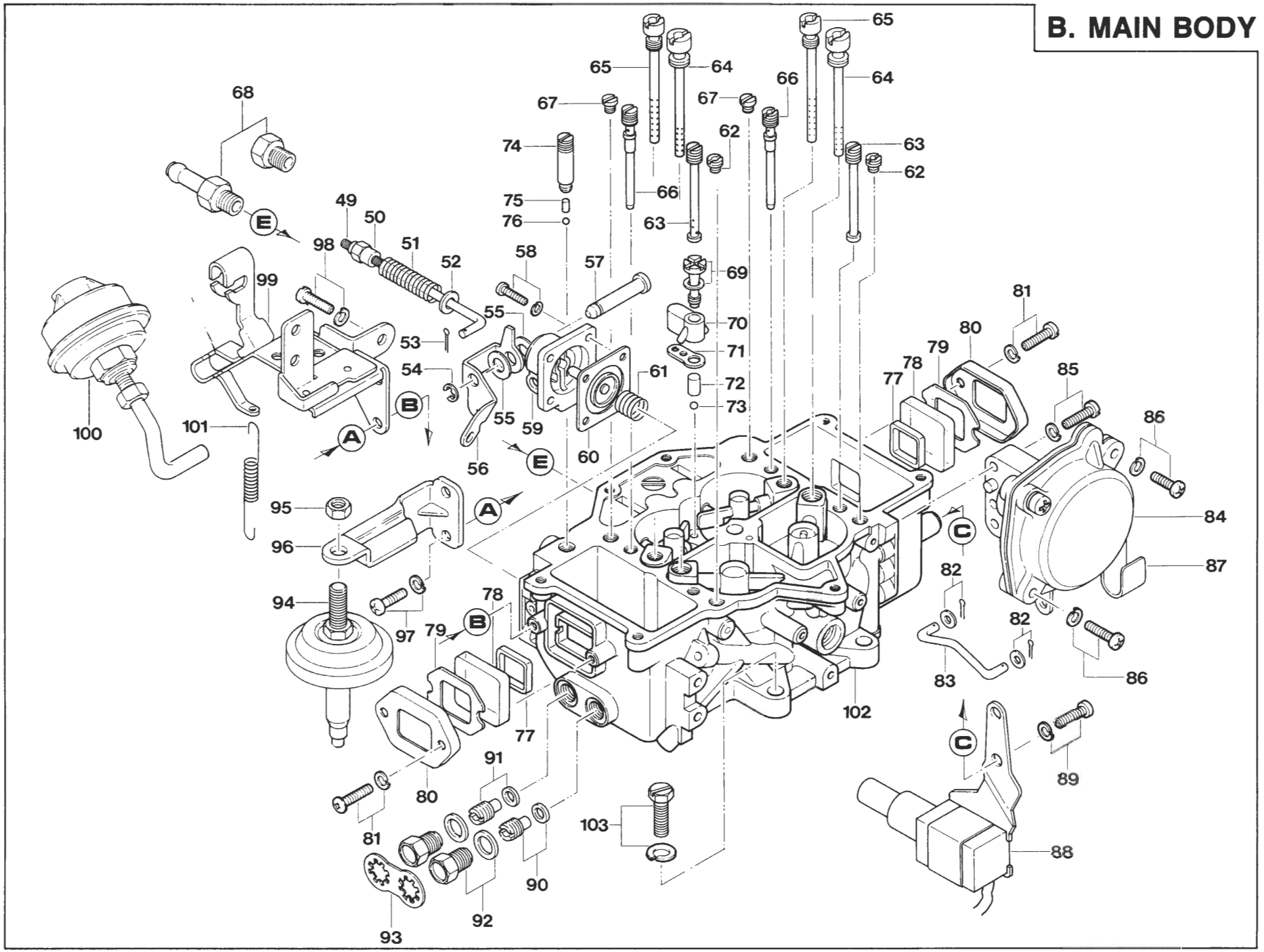
AIR HORN PARTS

1. Fuel inlet bolt
2. Gasket- fuel inlet bolt
3. Fuel return fitting
4. Gasket- fuel inlet
5. Adapter- fuel inlet
6. Fuel inlet bolts (vertical)
7. Gaskets- fuel inlet bolts (vertical)
8. Fuel inlet fitting
9. Strainers- fuel inlet
10. Attaching screws (3)- air vent solenoid
11. Air vent solenoid
12. Gasket- air vent solenoid
13. Spring- air vent solenoid
14. Brass bushing- air vent solenoid
15. Plunger- air vent solenoid
16. Bi-metal choke assembly & bracket
17. Screws & washers- bi-metal bracket assembly
18. Screws & washers- (3 ea.) bi-metal cover
19. Screws & washers- air horn
20. #2 Choke diaphragm & bracket
21. Connecting rod- #2 choke diaphragm (plastic 1981)
22. Connecting rod- #2 choke diaphragm (metal 1982)
23. Cotter pin & washer #2 diaphragm rod
24. Float pin
25. Float (right hand)
26. Float (left hand)
27. Needle seats & gaskets
28. Needle valve assemblies
29. High altitude compensator or blind plate
30. Gasket- HAC or blind plate
31. Screws- HAC or blind plate
32. Fast idle rod
33. Washers (4)- fast idle rod
34. Cotter pins (2)- fast idle rod
35. Air horn
36. Bracket assembly- throttle sub-return
37. Pivot nut- throttle sub-return
38. Lock nut- throttle sub-return
39. Spring retainer- throttle sub-return
40. Spring- throttle sub-return
41. Spring bushing- throttle sub-return
42. Washer- sub-return
43. Sub-return rod
44. Washers- sub-return rod
45. Cotter pin- sub-return rod
46. Throttle return spring
47. Cover- throttle return spring
48. Gasket- air horn

* DO NOT DISASSEMBLE!
Exploded view for illustration purposes only!

NOTE :

B. MAIN BODY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49. Accelerator pump rod (link)
50. Adjust nut- pump rod
51. Spring- accelerator pump rod
52. Washer- accelerator pump rod
53. Cotter pin- accelerator pump rod
54. "C" clip- accelerator pump pivot shaft
55. Washers (2) accelerator pump pivot shaft
56. Accelerator pump pivot lever
57. Accelerator pump pivot shaft
58. Cover screws & washers- accelerator pump
59. Cover- accelerator pump
60. Diaphragm- accelerator pump
61. Return spring- accelerator pump
62. Secondary slow air bleed no.2
63. Secondary slow air bleed & jet
64. Secondary main air bleed
65. Primary main air bleed
66. Primary slow air bleed & jet
67. Primary slow air bleed no.2
68. Fitting or plug- Sub-Zero start assist
69. Nozzle screw & gasket- accelerator pump outlet
70. Nozzle- accelerator pump outlet
71. Gasket- accelerator pump outlet nozzle
72. Weight- accelerator pump outlet
73. Check ball valve - accelerator pump outlet
74. Check valve seat- accelerator pump inlet
75. Weight- accelerator pump inlet
76. Check ball valve- accelerator pump inlet
77. Rubber gasket- sight glass
78. Sight glass
79. Gasket- sight glass bezel
80. Bezel- sight glass
81. Screws & washers- sight glass bezel
82. Cotter pins & washers- diaphragm link rod
83. Diaphragm link rod
84. Secondary diaphragm assembly
85. Attaching screws & washers- secondary diaphragm assembly
86. Screws & washers- secondary diaphragm cover
87. Clip- electric wire harness assembly
88. Throttle sensor
89. Attaching screws & washers- throttle sensor
90. Secondary main jets & washers (2 each)
91. Primary main jets & washers (2 each)
92. Main jet plugs & gaskets (4 each)
93. Locking plates (2)- main jet plugs
94. Dash pot
95. Mounting nut- dash pot
96. Bracket- dash pot
97. Mounting screws & washers- dash pot bracket
98. Mounting screws & washers- throttle opener bracket
99. Throttle opener bracket assembly
100. Throttle opener
101. Spring- hot start assist
102. Main body
103. Bolts & washers- main body

NOTE:

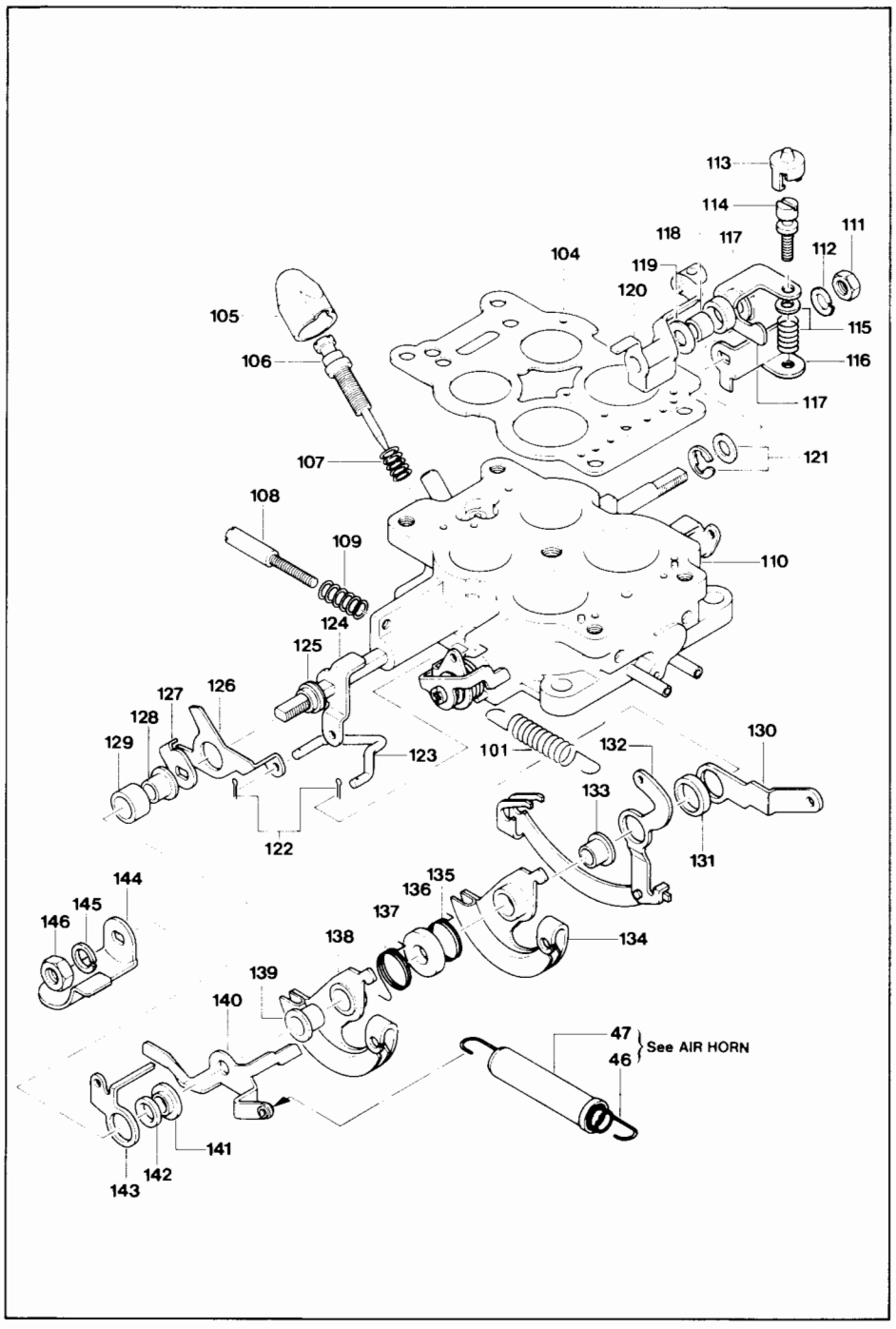
C. THROTTLE BODY

THROTTLE BODY PARTS

47. Cover- return spring (see air horn)
48. Return spring (see air horn)

101. Spring- hot start assist (see main body)

104. Main body gasket
105. Anti-tamper shell
106. Mixture adjust screw (MAS)
107. Spring- mixture adjust screw
108. Throttle adjust screw (TAS)
109. Spring- throttle adjust screw
110. Throttle body
111. Nut- front lever assembly
112. Lock washer- front lever assembly
113. Limiter cap (plastic)- throttle sensor adjust screw
114. Adjust screw- throttle sensor
115. Spring & washer- throttle adjust screw
116. Throttle sensor lever
117. Throttle sensor adjust lever & washer
118. Spacer- front lever assembly
119. Washer- oil metering lever
120. Oil metering lever
121. "C" clip & washer- front lever assembly
122. Cotter pins- secondary throttle link
123. Rod- secondary throttle link
124. Accelerator pump arm
125. Bushing- secondary throttle link lever
126. Secondary throttle link lever
127. Stop lever- secondary throttle link lever
128. Bushing- rear lever assembly
129. Sleeve- rear lever assembly
130. Fast idle lever
131. Spacer- fast idle lever
132. Hot start assist lever assembly
133. Bushing- cruise control arm
134. Cruise control arm
135. Spring- cruise control arm
136. Spacer- accelerator arm
137. Spring- accelerator arm
138. Accelerator arm
139. Bushing- accelerator arm
140. Throttle return spring lever
141. Bushing- throttle sub-return lever
142. Sleeve- throttle sub-return lever
143. Throttle sub-return lever
144. Dash pot throttle lever
145. Lockwasher- rear lever assembly
146. Nut- rear lever assembly

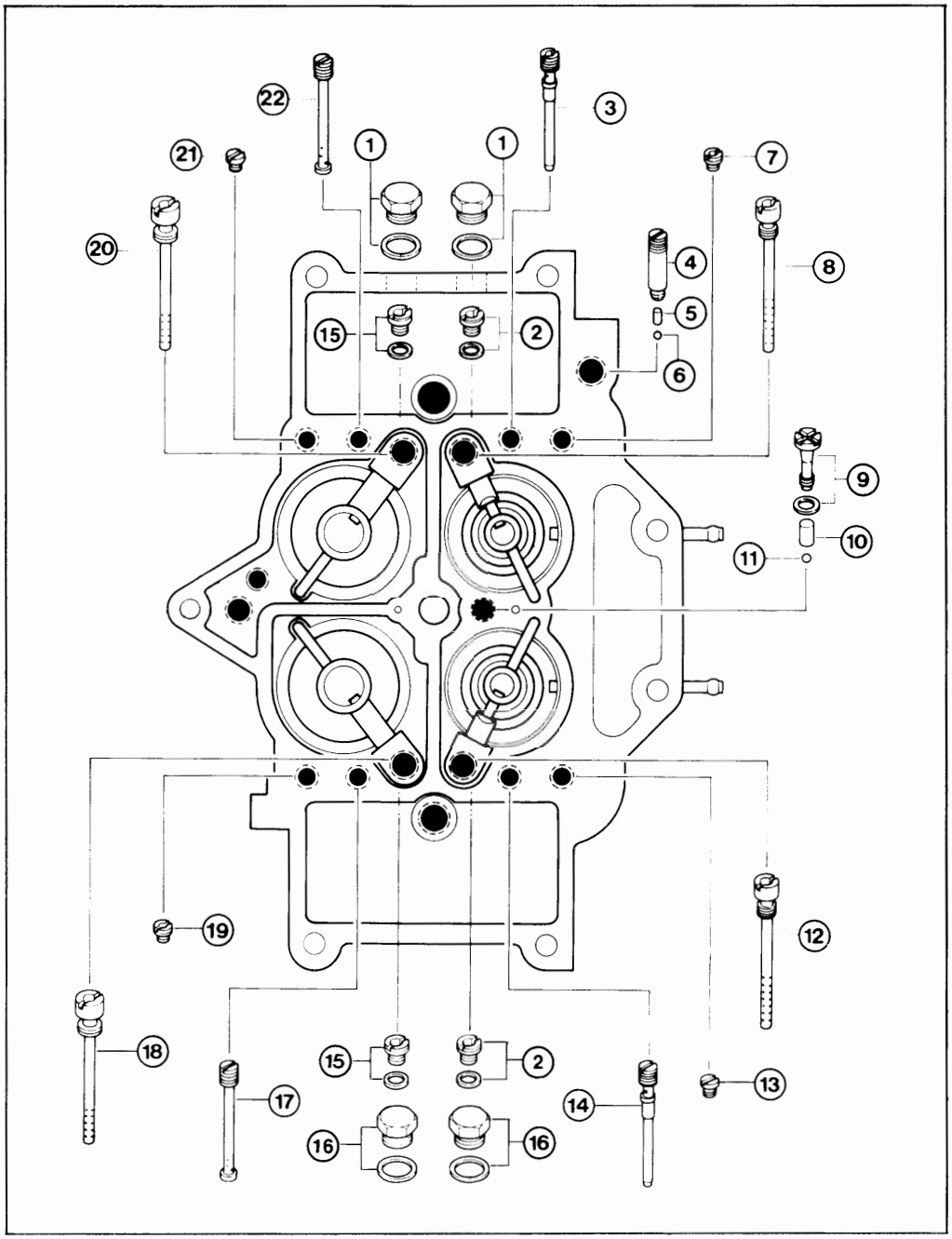


Important Note:
Throttle arm/lever assemblies are shown in exploded view here for illustration purposes ONLY! Do not disassemble the lever assemblies. REMOVE ONLY THOSE PARTS AS STATED IN THE DISASSEMBLY SECTION.

NOTE:

D. FUEL JETS & AIR BLEEDS LOCATIONS

1. Main jet plugs & gaskets
2. Primary main jet & gasket
3. Primary slow air bleed no.1 & slow jet
4. Accelerator pump inlet seat screw
5. Accelerator pump inlet weight
6. Accelerator pump inlet check ball
7. Primary slow air bleed no.2
8. Primary main air bleed
9. Pump nozzle bolt & gasket
10. Accelerator pump outlet weight
11. Accelerator pump outlet check ball
12. Primary main air bleed
13. Primary slow air bleed no.2
14. Primary slow air bleed no.1 & slow jet
15. Secondary main jet & gasket
16. Main jet plugs & gaskets
17. Secondary slow air bleed & no.1 & slow jet
18. Secondary main air bleed
19. Secondary slow air bleed no.2
20. Secondary main air bleed
21. Secondary slow air bleed no.2
22. Secondary slow air bleed no.1 & slow jet



NOTE:

E. FUEL JETS & AIR BLEEDS SPECIFICATIONS

YEAR	VERSION	PRIMARY	SECONDARY	MAIN JET	MAIN AIR BLEED		SLOW JET	POWER VALVE	SLOW AIR BLEED		RICHER JET	RICHER AIR BLEED
					NO.1	NO.2			NO.1	NO.2		
1981	MANUAL TRANS.	X		92	70	–	46	–	70	180	–	–
			X	160	140		110		160	60		
	AUTO. TRANS.	X		91	60	–	46	–	70	160	–	–
			X	160	140		110		160	60		
1982	MANUAL TRANS.	X		92	70	–	46	–	70	180	–	–
			X	160	140		110		160	60		
	AUTO. TRANS.	X		91	60	–	46	–	70	160	–	–
			X	160	140		110		160	60		

The chart shown above and the illustration on the previous page are designed to pinpoint exact locations and sizes of jets and air bleeds used during the period of 1981 to 1982. Since there were differences in these carburetors by region, equipment and year, please be sure to check the correct specifications for the carburetor you are overhauling or repairing. If the carburetor doesn't match the specs listed, then you may have an incorrect carburetor for the vehicle.

DISASSEMBLY OPERATION

A. IMPORTANT! NOTE BEFORE DISASSEMBLY

- Use exploded view as guide for parts, dissasembly, etc.
- DO NOT REMOVE venturi, choke valve & shaft or throttle valve & shaft.
- Follow numerical sequence of disassembly instructions - do not skip steps or you may miss important information! Parts are also reference-numbered in **general order** of disassembly for added convenience.
- Note sizes and locations of jets and air bleeds to avoid later confusion during assembly. Be sure to check emulsion tubes for differences. Refer to charts in this section for sizes and locations.

B. SPECIAL CLEANING INSTRUCTIONS

- **DO NOT SOAK** CHOKE HEATER/BI-METAL ASSEMBLY, DIAPHRAGM ASSEMBLIES, DASH POT, FLOATS, SOLENOIDS, RUBBER OR PLASTIC PARTS, ELECTRICAL WIRING, THROTTLE SENSOR, ETC.
- Do not soak plastic limiter cap.
- Disassemble as per step-by-step instructions before cleaning.
- Use suitable cleaning solvent. Work away from sparks and above all, NO SMOKING!
- Allow enough soaking time to remove foreign material.
- Blow out passages with compressed air and inspect closely for thorough cleaning.
- When cleaning jets, never use a wire or insert objects since this may enlarge the hole and change carburetor calibration. Use compressed air to blow clean.

C. STEP-BY-STEP DISASSEMBLY

● AIR HORN DISASSEMBLY

With the carburetor on the bench, perform the following steps:

1. Remove all hoses.
2. Disconnect all vacuum tubes.

Remove the following:

3. Fuel inlet bolts
4. Fuel inlet strainers

5. Fuel inlet tubes
6. Air vent solenoid & gasket
7. Air vent solenoid spring, bushing & plunger
8. Throttle return spring (use care to release tension slowly, sub-return may snap back)
9. Altitude compensator valve & gasket or blind plate & gasket
10. Disconnect hot start assist spring.
11. Remove dash pot & bracket assembly.
12. Remove throttle opener & bracket assembly.
13. Disconnect throttle sub-return.*

***Note:**
DO NOT UNSCREW sub-return pivot (see reference # 37on the air horn exploded view illustration)! This was pre-set at the factory. Instead, pull the sub-return spring down until the spring retainer clears the bracket. Then remove the sub-return from the bracket as an assembly. Disconnect the lower end of the sub-return rod by removing the cotter pin and two (2) washers. Set aside for later.

14. Remove throttle sub-return bracket.
15. Remove bi-metal spring housing & bracket assembly.
16. Disconnect fast idle rod by removing cotter pin & washer.
17. Remove #2 choke diaphragm.
18. Remove air horn screws.
19. Carefully lift air horn straight up from main body.
20. Remove float pins.
21. Remove floats.
22. Remove needle assemblies.
23. Remove needle seats, gaskets & air bleed.
24. Remove & discard air horn gasket.

• MAIN BODY DISASSEMBLY

25. Disconnect accelerator pump rod only at low end by removing cotter pin & washer.
26. Remove "C" clip from accelerator pump pivot shaft.*

***Note:**
It is sometimes easier to remove the accelerator pump pivot shaft by performing the operation with the carburetor on its side and the shaft in a vertical position (head up). This will prevent the washers from falling into the "C"-clip slot as often happens in a horizontal position.

27. Remove three (3) exposed pump cover screws.
28. Slide pivot shaft up enough to clear 4th cover screw.
29. Remove 4th pump cover screw.*

***Note:**
Some accelerator pump pivot shafts are not easily removable when the lower left screw is still in place. This screw should always be removed **first** before attempting to move the shaft out of position.

30. Remove pump cover, return spring & diaphragm.
31. Remove pivot shaft.
32. Separate accelerator pump gasket/diaphragm from pump cover.
33. Lay accelerator pump lever aside, but do not remove rod adjust nut, etc.
34. Remove throttle sensor.
35. Remove secondary vacuum diaphragm link cotter pin.
36. Disconnect secondary vacuum diaphragm link.
37. Remove secondary vacuum diaphragm attaching screws.

38. Remove secondary vacuum diaphragm cover screws (& solenoid bracket for 1984 – 85).
39. Disassemble secondary vacuum diaphragm by removing cover, diaphragm & spring.
40. Remove lock plates from main jet plugs.
41. Remove main jet plugs & gaskets.

Continue by removing the following:

42. Main jets & gaskets
43. Accelerator pump nozzle screw & gasket
44. Accelerator pump nozzle & gasket
45. Accelerator pump outlet weight
46. Accelerator pump outlet check ball (valve)
47. Accelerator pump inlet check seat
48. Accelerator pump inlet check weight
49. Accelerator pump inlet check ball
50. All jets & air bleeds
51. Sight glass bezel screws
52. Sight glass bezels & gaskets
53. Sight glasses
54. Sight glass gaskets
55. Sub-zero start assist fitting (if equipped) & gasket
56. Sub-zero start assist plug (if equipped) & gasket
57. Unbolt main body from throttle body (4 bolts).
58. Remove and discard main body gasket.

• THROTTLE BODY DISASSEMBLY

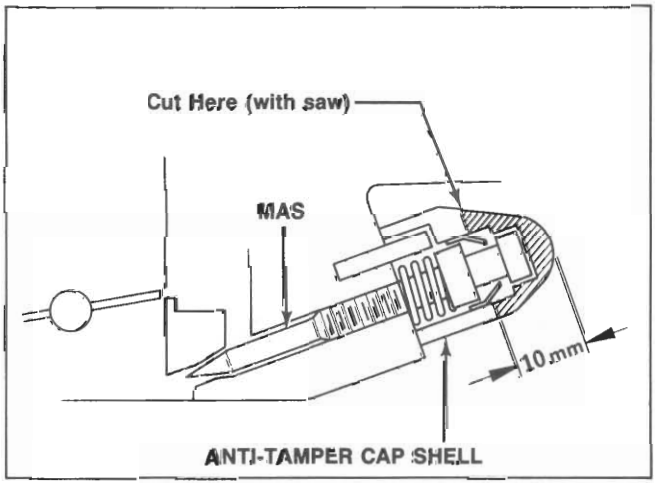
Note:

Both front and rear lever assemblies should NEVER be disassembled. Likewise, throttle plates must NOT be removed. The exploded parts chart at the beginning of this section is merely for illustration purposes only. Do not attempt to remove these parts!

Important:
Before removing the MAS on 1981 to 1982 RX-7 carburetors, you MUST saw off the metal anti-tamper cap shell over the MAS. Start sawing about **10 mm back from the tip** as shown in the illustration.

Remove the following parts:

59. Saw off MAS anti-tamper cap shell.
60. Remove MAS & spring.
61. Remove TAS & spring.
62. Remove hot start assist spring.
63. Remove all gasket material.



STOP! You have completed disassembly of the RX-7 carburetor for overhaul.

ASSEMBLY OPERATION

A. IMPORTANT! NOTE BEFORE ASSEMBLY

- INSPECT ALL PARTS FOR DAMAGE OR WEAR. Look for burrs or ridges on needle seats, needles, mixture adjust screw, etc. Check throttle valves and choke valve for smooth operation, damage, etc.

- Check all solenoids and valves for proper operation. Check solenoid plungers for nicks or burrs. Be sure plunger is clean and free of all residue which might inhibit free movement. Also check solenoid spring. When battery power is applied to A/V solenoid, plunger or stem should retract into the solenoid.

- Double check all passages to be sure of free flow. If blocked, clean again with solvent and blow out with compressed air.

- Make float adjustments on the air horn **WITH THE GASKET INSTALLED**! This procedure differs from all other Mazda carburetors in North America, so please pay close attention to avoid an incorrect setting.

- Check the float for saturation, contamination or other possible damage. Make sure the float actually floats as it should. Saturated float will sink lower than normal. If in doubt, match weight and floatation with known good float of the same specs.

- Inspect all diaphragms for damage and proper operation. Check for holes, wear, thin spots, tears, etc.

- Discard all old gaskets and use new ones.

Please Note:
If you have any questions regarding placement or description of a part, be sure to refer to the exploded illustrations in the beginning of this section. Each part is referenced with a number and description.

B. STEP-BY-STEP ASSEMBLY

• THROTTLE BODY ASSEMBLY

1. Install the new mixture adjust screw and spring. Tighten the screw lightly and then back off three (3) turns for the preliminary setting. **DO NOT** INSTALL ANTI-TAMPER SHELLCAP AT THIS TIME!
2. Install the throttle adjust screw & spring. Tighten until spring bottoms out and then back off 6½ turns for a preliminary setting.
3. Install main body gasket in place.

• MAIN BODY ASSEMBLY

4. Mate main body to throttle body and bolt together using four main body bolts.
5. Install sub-zero start assist plug or fitting & gasket.
6. Install sight glass gaskets (rubber).
7. Install sight glasses.
8. Install sight glass bezels & gaskets.

Continue assembly by installing the following:

9. All jets & air bleeds for main body
10. Accelerator pump inlet check ball
11. Accelerator pump inlet check weight
12. Accelerator pump inlet seat
13. Accelerator pump outlet check ball
14. Accelerator pump outlet weight
15. Accelerator pump nozzle & gasket
16. Primary main jets & gaskets
17. Secondary main jets & gaskets
18. All main jet plugs & gaskets
19. Main jet plug lock plates (serrations facing out)
20. Secondary vacuum diaphragm spring & cover
21. Cover screws and harness clip
22. Secondary diaphragm assembly to main body using gasket and screws
23. Secondary vacuum diaphragm link using cotter pin
24. Throttle sensor
25. Accelerator pump return spring & diaphragm
26. Accelerator pump cover*

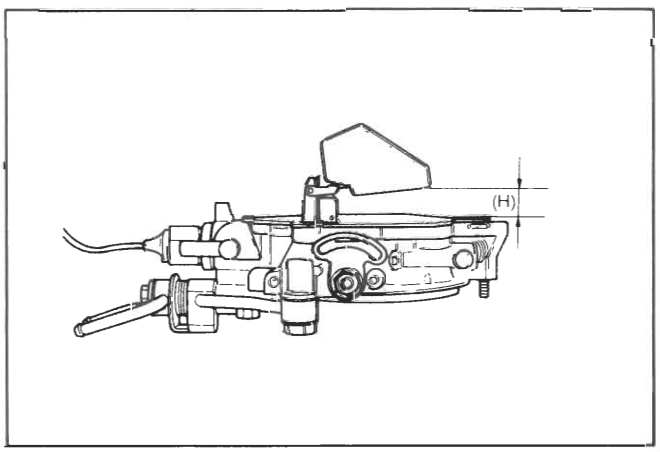
***Note:**
Install ONLY the top screws and lower right-hand screw. DO NOT INSTALL THE LOWER LEFT SCREW BECAUSE THE HEAD MAY NOT CLEAR THE LEVER PIVOT SHAFT! Now turn the carburetor sideways with the front levers up to perform steps #27 to #29.

27. Push accelerator pump lever into cover slot and hold in place.
28. Slide thin washer on each side of lever in pump cover pivot.
29. Slide pump lever shaft into place.
30. Secure pivot shaft with "C" clip.
31. Install lower left pump cover screw.
32. Attach accelerator pump rod to arm on throttle body with cotter pin & washer.
33. Attach throttle opener bracket assembly, throttle opener, dash pot bracket and dash pot.*

***Note:**
Dash pot should already be in position on the dash pot bracket since it should not have been removed during disassembly.

• AIR HORN ASSEMBLY

34. Install air bleed in air horn if not already done at step assembly step #9.
35. Install air horn gasket.
36. Install needle valve seats.
37. Install needle valve assemblies.
38. Install float pins & floats.
39. Perform float adjustment as follows:



- **Float Adustment**

Perform the adjustments as follows:

Invert the air horn on a stand and allow the float to lower by its own weight.

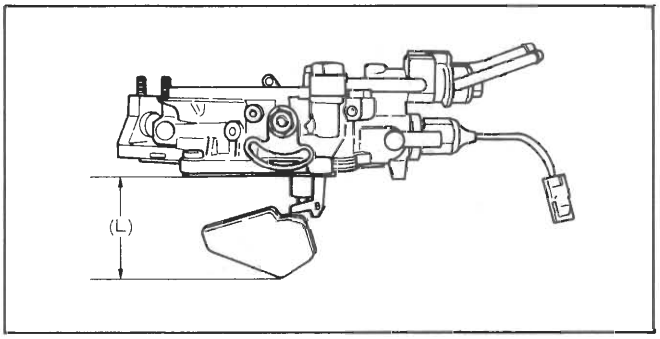
Measure the clearance **(H)** between the float and the air horn gasket.

This clearance should be **16 ± 0.5 mm (0.63 ± 0.02 in)**. If the clearance is not within specifications, bend the float seat lip until the proper clearance is obtained.

Turn the air horn to the normal position and allow the float to lower by its own weight.

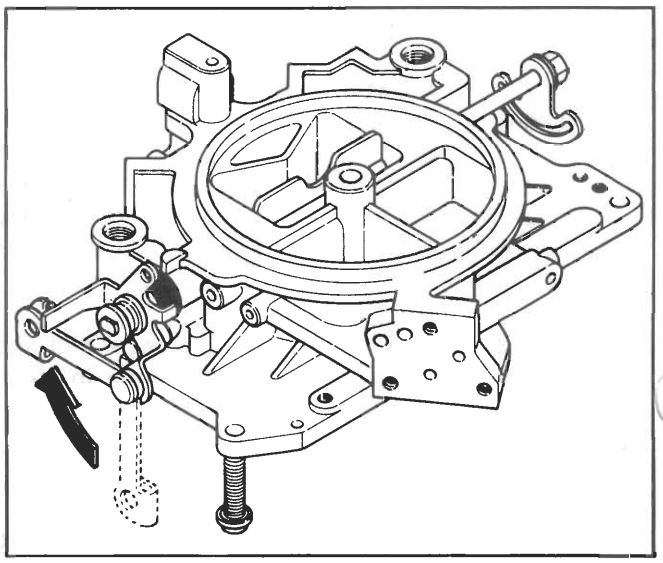
Measure the distance **(L)** between the bottom of the float and the air horn gasket.

The clearance should be **51 ± 0.5 mm (2.0 ± 0.02 in)**. If the clearance is not within specifications, bend the float stopper until the proper distance is obtained.



40. Install air horn on main body with two (longest) screws near fuel inlet.*

Note:
You MUST hold the choke cable arm in a horizontal position ABOVE the bracket assembly for the cables and throttle opener. Otherwise, you will not be able to attach the cable when installing the carburetor. If you fail to observe this caution, it will be necessary to remove the air horn and start over!

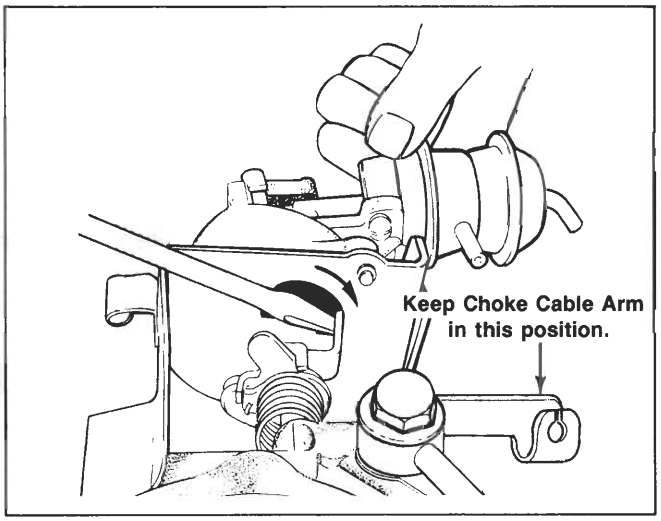


41. Connect fast idle rod by using cotter pin.
42. Install the bi-metal spring housing as follows:

Place the carburetor in front of you with the choke heater facing away from you.

Close the choke valve and hold it closed.

Now pull the vacuum diaphragm shaft back so that it retracts into the no.1 choke diaphragm. This will move the bi-metal spring clockwise making it easier to engage the bi-metal spring and the choke shaft lever.



If necessary, use a screwdriver to assist in aligning the choke shaft lever and the bi-metal spring, but be careful not to damage the bi-metal or heater element by doing so.

While holding the housing in place, release the choke valve and immediately attach the housing by installing the short screws to the throttle opener bracket. Choke cable arm MUST be ABOVE throttle bracket assembly.

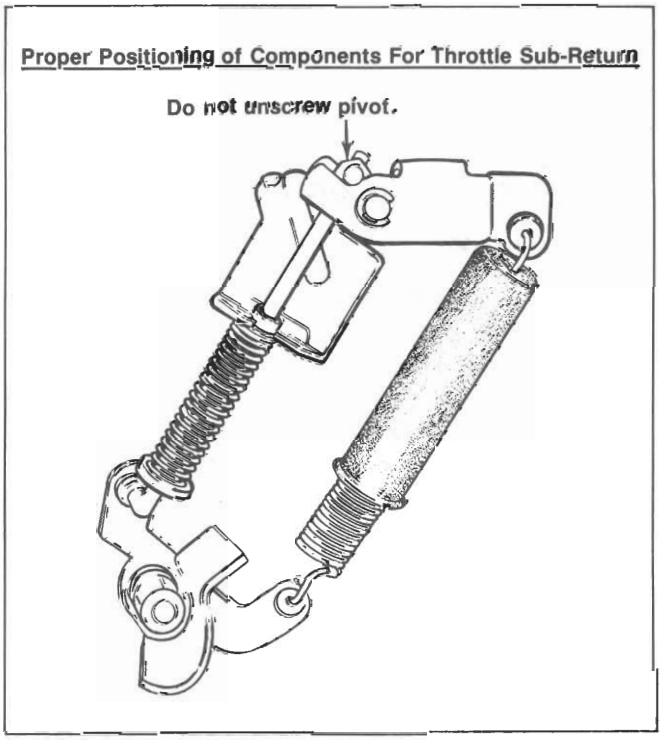
Finish the operation by installing the sub-return bracket assembly ON TOP OF THE BI-METAL HOUSING BRACKET. Insert the two (2) longer screws downward through the sub-return bracket, through the bi-metal bracket and into the air horn. Use care to align the dimple indentations in both brackets for easiest assembly and proper fit.

Important:
Check the final assembly of the bi-metal and be ABSOLUTELY SURE that the bi-metal spring is properly engaged with the choke shaft lever.

43. Complete installation of the sub-return bracket by installing side screw into main body.
44. Install throttle sub return rod & spring assembly.*

***Note:**
First attach lower end of rod with cotter pin & washers. Then slide upper end of the rod onto the sub-return bracket while depressing the spring retainer. Release the retainer once in place. (See illustration below.)

45. Install hot start assist spring between its lever assembly and the throttle opener bracket.
46. Install no.2 choke diaphragm.
47. Install all remaining air horn screws.
48. Install altitude compensator valve & gasket or blind plate & gasket.
49. Install air vent solenoid, spring & gasket.
50. Install throttle return spring using care to attach sub-return pivot without unscrewing pivot (see ref. #37 of air horn parts and see illustration).
51. Install fuel inlet tubes, strainers, fittings and bolts.
52. Connect all vacuum tubes in proper positions.



STOP! You have completed overhaul assembly. Now go back and double-check your assembly. Make sure your assembly is absolutely correct BEFORE going on to the adjustments.

OFF VEHICLE ADJUSTMENTS

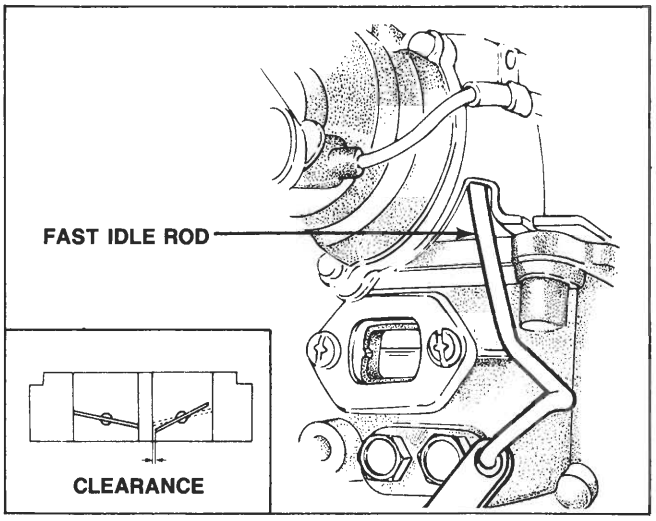
A. CHECKING & ADJUSTING CARBURETORS

● FAST IDLE OPENING ANGLE

With the choke valve fully closed, measure the clearance between the primary throttle valve and the wall of the throttle bore.

- **Clearance:**
  0.8~1.0 mm (0.032~0.040 in)

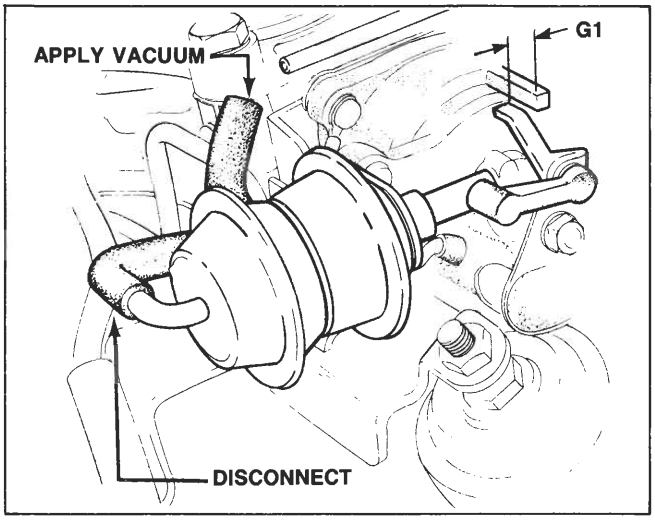
If the clearance is not within specification, bend the fast idle rod until the proper clearance is obtained.



● CHOKE VALVE OPENING ANGLE

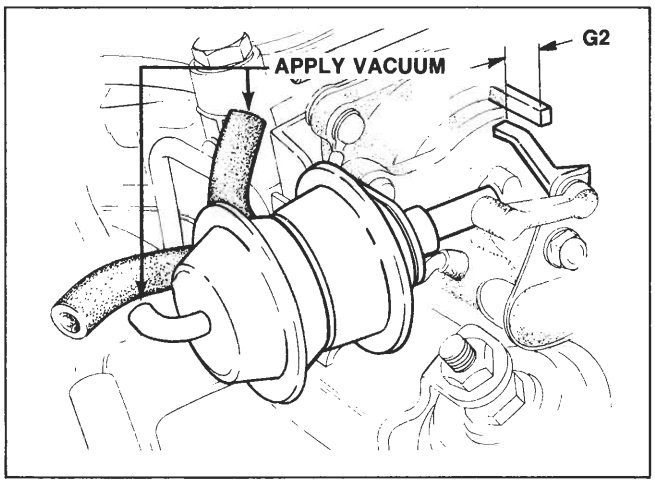
1. Disconnect the vacuum sensing tubes from the no.1 vacuum diaphragm.
2. Pull the choke lever out completely and keep its position.
3. Apply vacuum of **more than 500 mm-Hg (19.7 in-Hg)** to no.1 vacuum diaphragm and make sure the clearance **(G1)** is specified value.

- **Clearance G1:**
  5.5~6.2 mm (0.22~0.24 in)



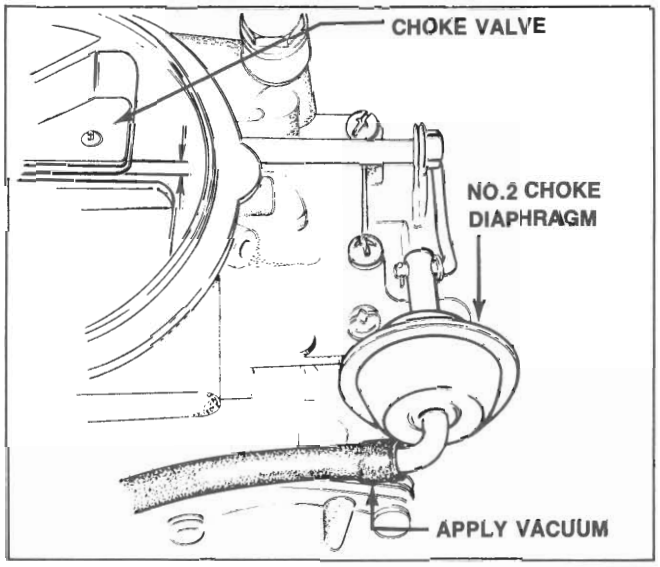
4. **Apply vacuum of more than 500 mm-Hg (19.7 in-Hg)** to no.1 vacuum diaphragms and make sure the clearance **(G2)** is specified value.

- **Clearance G2:**
  11.5~13 mm (0.45~0.51 in)



● NO.2 CHOKE DIAPHRAGM

1. Disconnect the vacuum sensing tube from the vacuum diaphragm.
2. Pull the choke lever out fully and hold its position. Make sure that the choke valve closes fully. Cool the choke bi-metal if necessary.
3. Apply vacuum of **more than 500 mm-Hg (19.7 in-Hg)** to the vacuum diaphragm and make sure the clearance **(R)** is specified value.
   - **Clearance (R):**
     1.46~1.80 mm (0.057~0.070 in)



ON VEHICLE ADJUSTMENTS

A. INSTALLING CARBURETOR

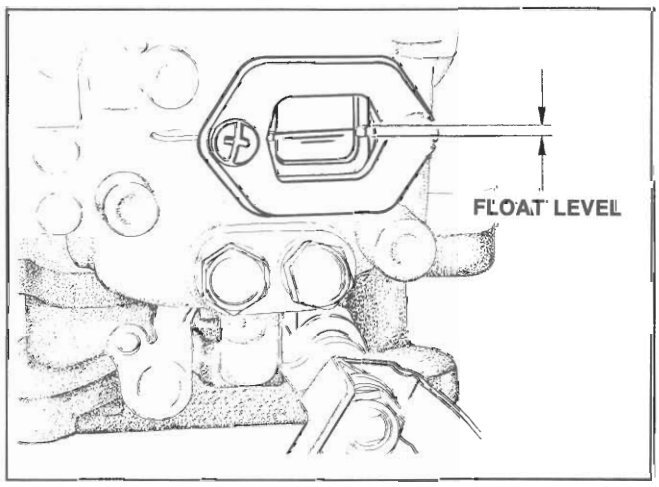
Install the carburetor in the reverse order of removing.

Caution:
Push in the hose ends of the fuel main and fuel return hoses to the carburetor fittings until the fittings are inserted to **30~35 mm (1.2~1.4 in).** Always install air cleaner before performing adjustments.

After installing, note the following:

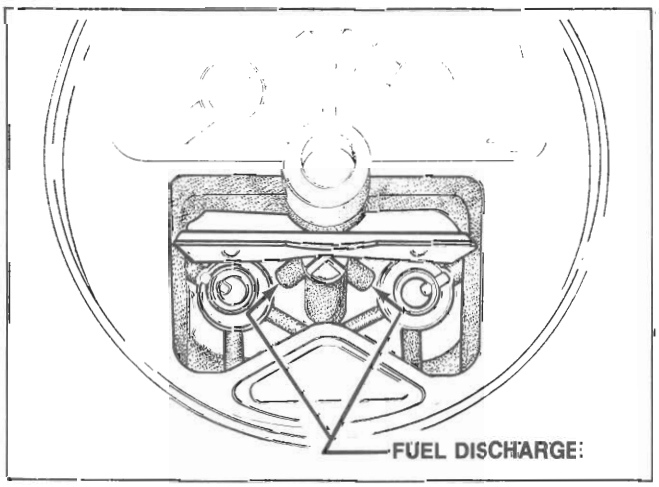
(Place the vehicle on level ground)

1. Start the engine and check for fuel leakage.
2. With the engine operating, check the fuel level. The fuel level should be in the specified mark in the sight glass.



3. Inspect the accelerator pump as follows:

   Remove the air cleaner cover.
   Stop the engine. Operate the throttle valve and check to see that the fuel is discharged from the nozzles of the pump.
   Replace air cleaner cover.

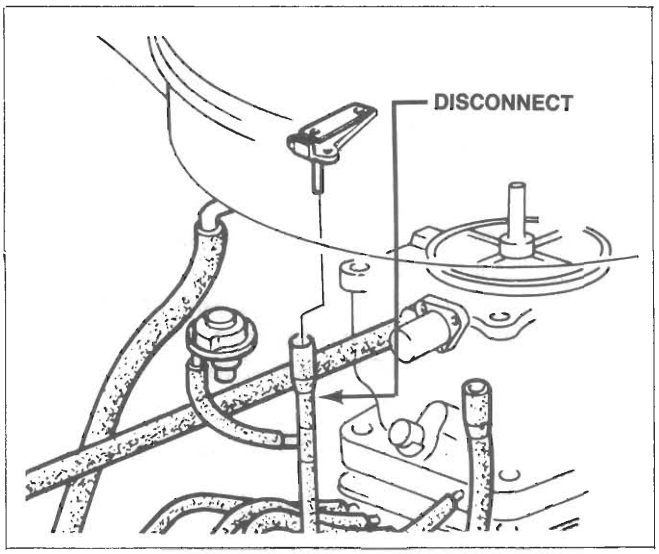


4. Adjust the idle speed and idle mixture.

B. IDLE SPEED & IDLE MIXTURE ADJUSTMENTS

Before checking or adjusting the idle speed and idle mixture, follow these directions. (Set parking brake)

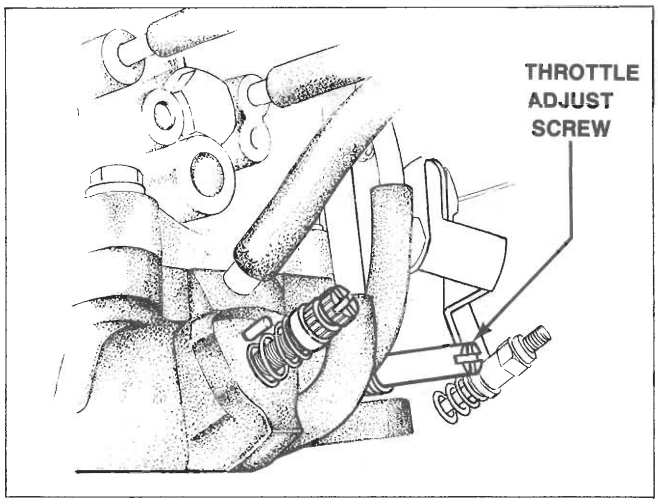
1. Switch off all accessories.
2. Remove the fuel filler cap.
3. Connect a tachometer to the engine.
4. Disconnect the tube at the idle compensator in the air cleaner and plug the end of the tube.
5. Check that the dash pot rod and throttle opener (for air conditioner) does not keep the throttle lever from returning to the idle stop.
6. Be sure air cleaner is installed prior to performing adjustments.



• CHECKING IDLE SPEED

1. Warm the engine until it reaches normal operating temperature.
2. On vehicles equipped with automatic transmission, shift the selector lever to "D" position.
3. Check the idle speed. If the idle speed is not as specified, adjust the idle speed to 750 rpm by turning the throttle adjust screw.
   - **Idle Speed:**

Manual transmission:	**750 rpm in neutral**
Automatic transmission:	**750 rpm in "D" position**

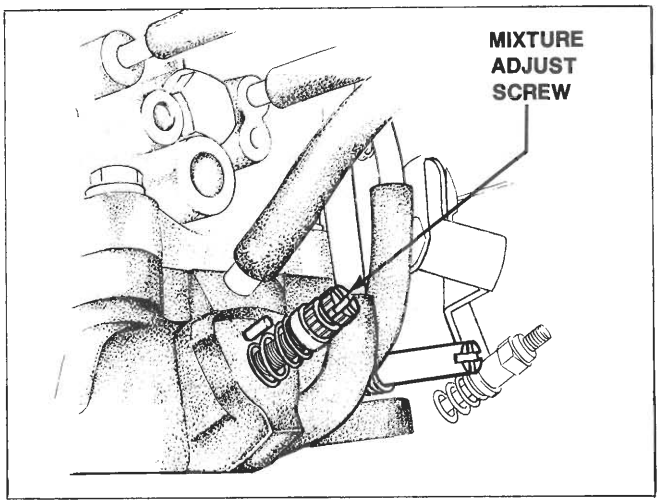


• CHECKING IDLE MIXTURE

Usually idle mixture adjustment is unnecessary. In case overhaul is necessary due to carburetor trouble, make idle mixture adjustment as follows:

1. Remove the throttle body and cut off the anti-tamper cap as instructed.
2. Fit a new mixture adjust screw as instructed.
3. Set the idle speed to the following specifications by turning the throttle adjust screw.
   - **Specifications:**

Manual transmission:	**770 rpm in neutral**
Automatic transmission:	**870 rpm in "N" position**



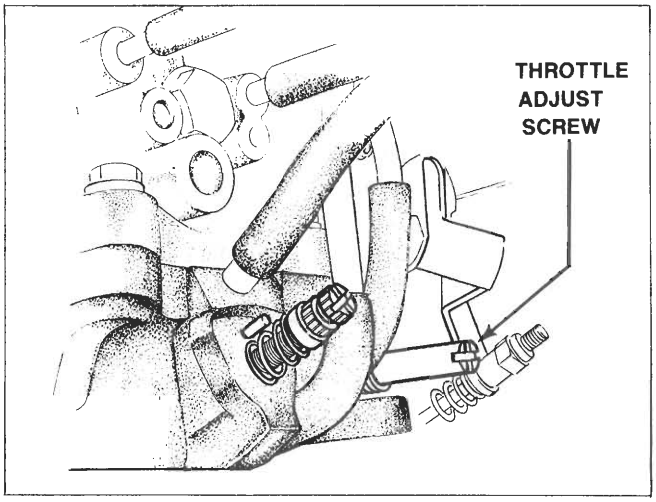
4. Set the idle speed at the highest rpm by turning the mixture adjust screw.
5. Reset the idle speed to the following by turning the throttle adjust screw.

   • **Specifications:**

   Manual transmission: 770 rpm in neutral
   Automatic transmission: 870 rpm in "N" position

6. **Screw in the mixture adjust screw and adjust the idle speed to 750 rpm for manual transmission** and **840 rpm in "N" position for automatic transmission**.
7. On vehicles equipped with automatic transmission, shift the selector lever to "D" position and adjust the idle speed to **750 rpm** by turning the throttle adjust screw.
8. AFTER IDLE MIXTURE IS COMPLETED, fit an anti-tamper cap onto the mixture adjust screw securely.

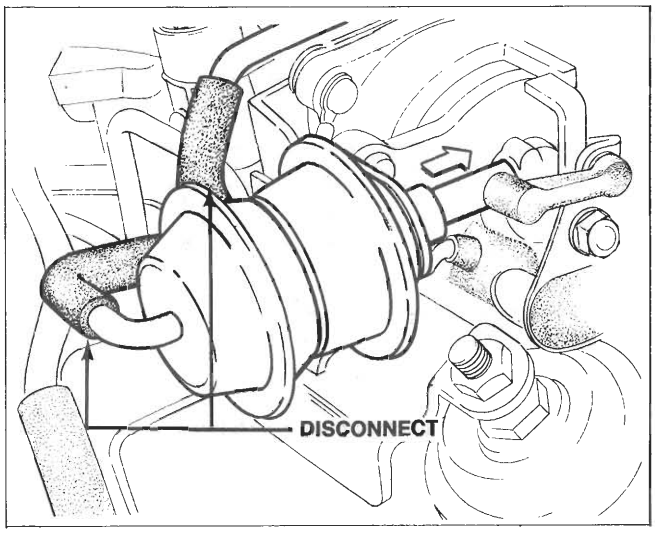
Caution:
After adjusting the idle speed, the throttle sensor on the carburetor should be adjusted.

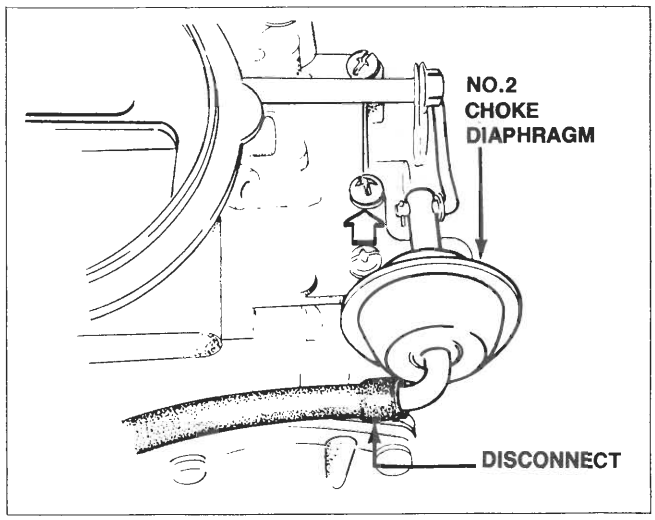


C. CHOKE SYSTEM

● CHECKING NO.1 AND NO.2 CHOKE DIAPHRAGMS

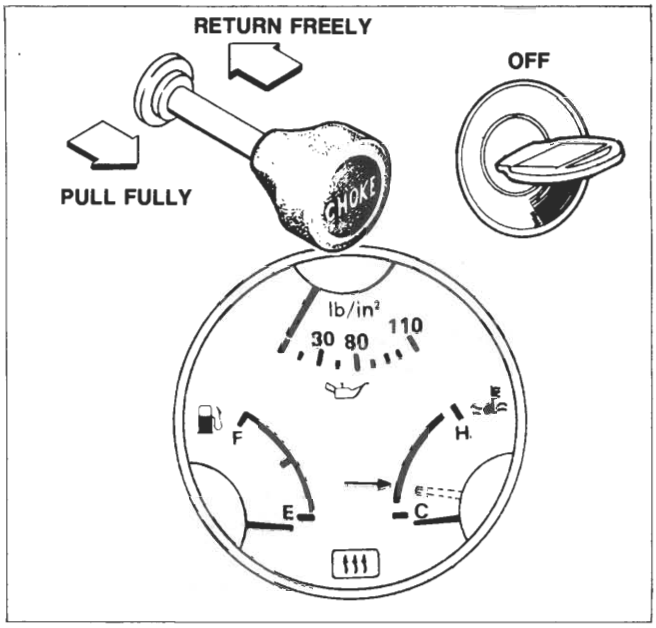
1. Remove the air cleaner assembly.
2. Start the engine and run it at idling speed.
3. Disconnect the vacuum sensing tubes from the no.1 and no.2 choke diaphragms. Each diaphragm shaft should move out from the choke diaphragm.





• CHECKING AUTOMATIC CHOKE RELEASE SYSTEM

1. When the engine is cold, pull the choke knob fully with the ignition switch off, and check that the choke knob returns automatically.
2. Connect a tachometer to the engine.
3. Set engine speed to **2,000 rpm with choke knob**.
4. Leave the engine running and see that the choke knob automatically returns completely when the temperature gauge indicates the range shown in the figure.

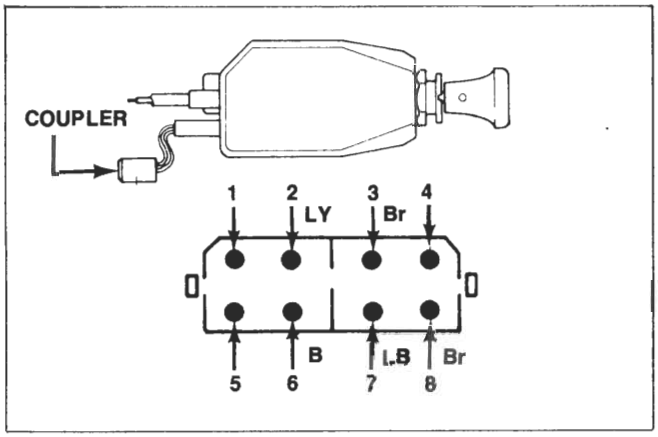


• CHOKE SWITCH & CHOKE MAGNET

To check choke switch and choke magnet, proceed as follows:

1. Disconnect the coupler from the choke switch.
2. Check the continuity between the numbered terminals in the coupler using an ohmmeter.

Choke knob pulled at	Numbers-continuity
10±2 mm (0.4±0.08 in)	**3** to **7**
Any position(choke magnet)	**6** to **8**

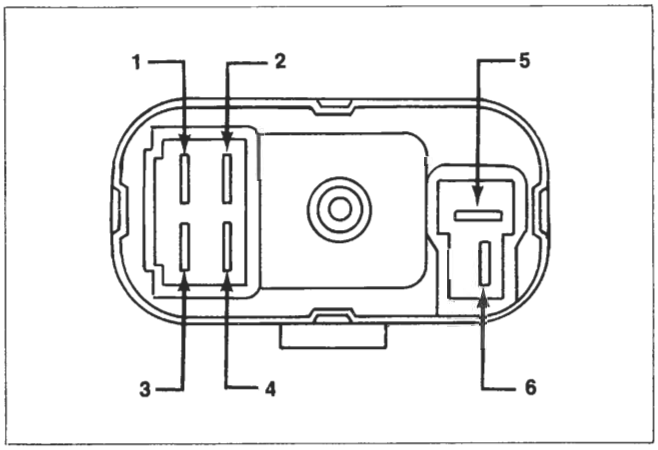


• CHOKE RELAY

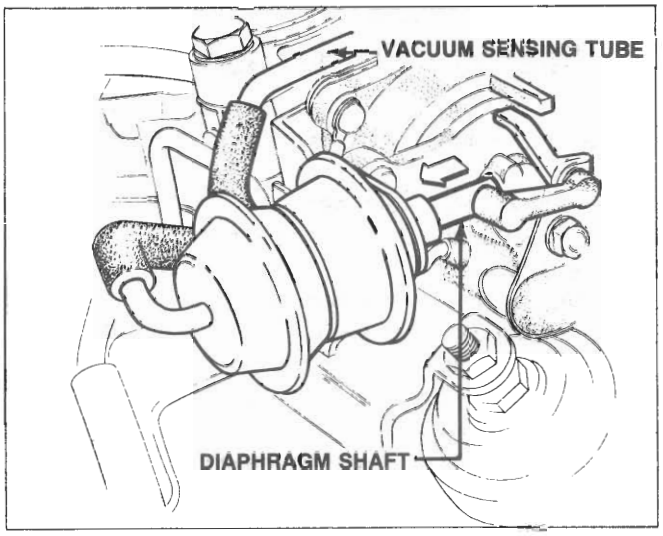
To check the relay, proceed as follows:

1. Disconnect the coupler from the relay.
2. Check the continuity between the numbered terminals using an ohmmeter.

Numbers-continuity	Numbers-No continuity	Remarks
1 to **2**	**3** to **4**	Without power applied
3 to **4**	**1** to **2**	Connect the battery : positive to terminal **6** and negative to **5**.



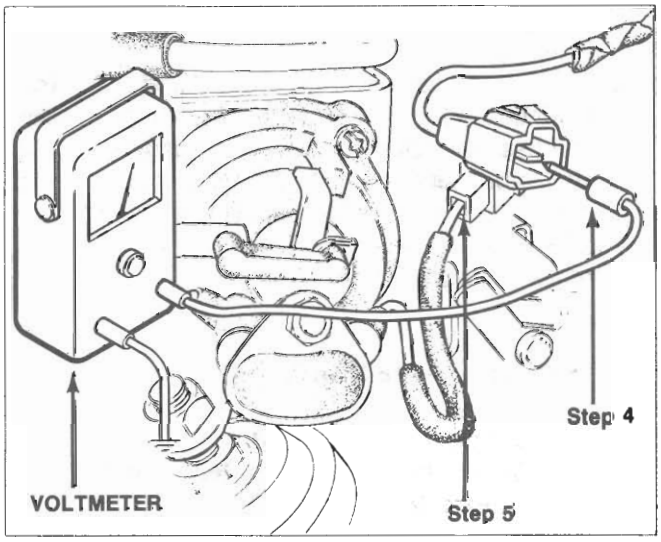
● CHECKING CHOKE DELAY VALVE



1. Warm the engine to the normal operating temperature.
2. Stop the engine and remove the air cleaner assembly.
3. Disconnect the vacuum sensing tube from the no.1 choke diaphragm.
4. Start the engine and run it at idling speed. Check to see that the diaphragm shaft is fully pulled into the diaphragm within **10 ~ 20 seconds** after connecting the disconnected vacuum sensing tube to the no.1 choke diaphragm.

Note:
On vehicles equipped with automatic transmission, place the selector lever to "N" position.

● CHECKING CARBURETOR HEATER

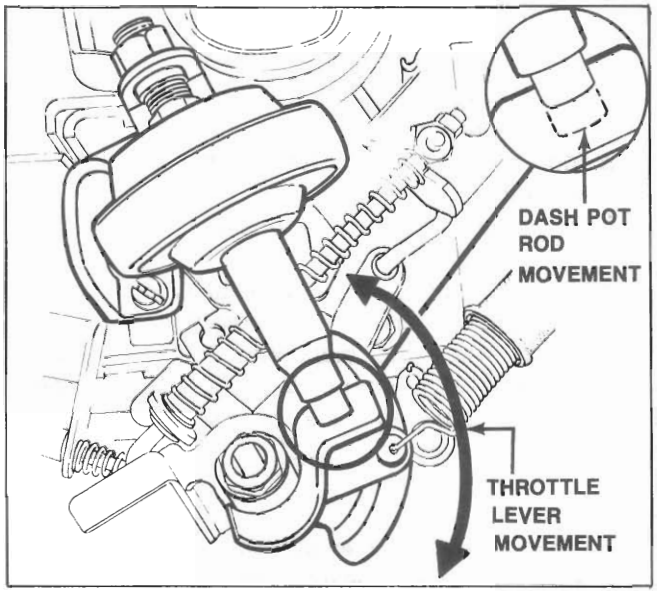


1. Disconnect the connector of the no.1 water temperature switch and connect a jumper wire to both terminals in the connector.
2. Connect a tachometer to the engine.
3. Disconnect the carburetor heater connector and connect a voltmeter to the connector.
4. Start the engine and set engine speed to **2,000 rpm** with choke knob. See that current flows to the carburetor heater lead, but it does not flow when the choke knob is pushed back completely.
5. Connect one probe of an ohmmeter to the carburetor heater lead and the other to the carburetor body. If there is no meter movement, the carburetor heater has an open circuit and must be replaced.

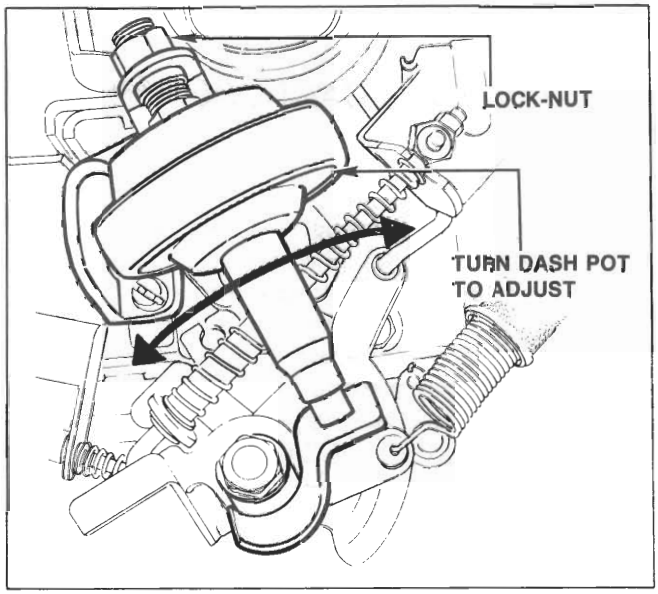
D. DASH POT (Manual Transmission)

To check and adjust the dash pot, proceed as follows:

1. Remove the air cleaner.
2. Check that the dash pot does not keep the throttle lever from returning to the idle stop.
3. Quickly operate the throttle lever fully and make sure the dash pot rod extends quickly. Release the throttle lever and make sure that the throttle lever returns slowly to idle position after it has touched the dash pot rod.
4. Connect a tachometer to the engine.



5. Start the engine and warm up the engine to the normal operating temperature. Make sure the engine operates at the specified idle speed. Operate the throttle lever until it is away from the dash pot rod.
6. Slowly decrease the engine speed and check the engine speed at which the throttle lever just touches the dash pot rod. The engine speed should be **3,800~4,200 rpm**. If the engine speed is not within the specification, loosen the lock nut and adjust the engine speed by turning the dash pot diaphragm.



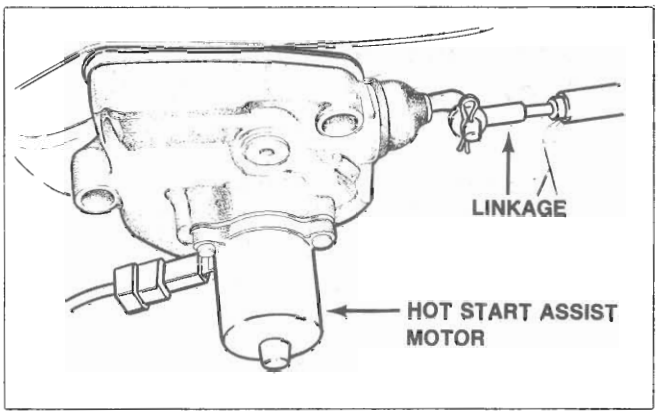
- **Relative Parts Inspection**

1. **Check the contol unit.**
2. **Check the switching solenoid valve and relief solenoid valve.**

E. HOT START ASSIST SYSTEM

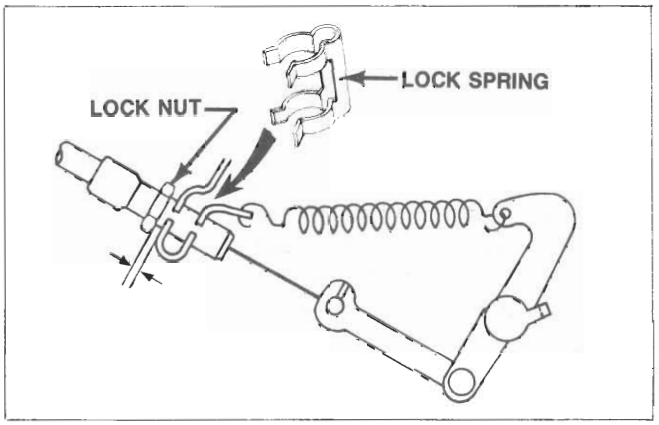
● CHECKING HOT START ASSIST SYSTEM

1. Inspect the hot start assist linkage for proper installation, no sticking or binding, and full return.
2. Warm the engine to normal operating temperature then stop the engine.
3. Disconnect the connectors for leading and trailing primary wires from the ignition coils.
4. Crank the engine. Check to see that the hot start lever operates and throttle valves open.



● ADJUSTING HOT START ASSIST CABLE

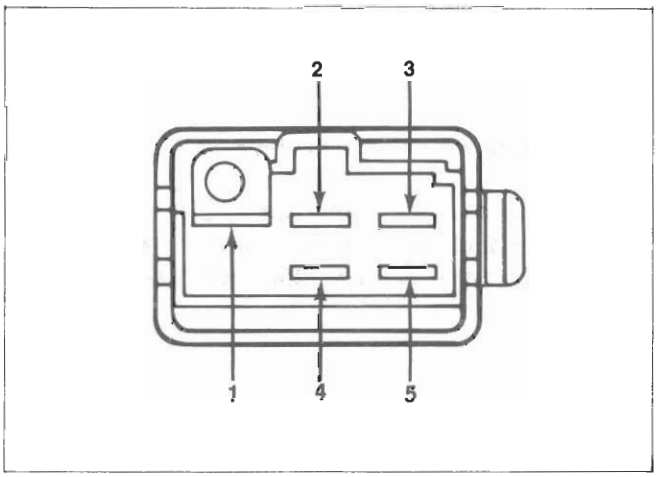
1. Remove the lock spring of the hot start assist cable from the cable bracket.
2. Slowly pull the outer cable until the hot start lever just touches the stopper lever. Then check the clearance between the cable bracket and the lock nut of the cable. The clearance should be **1.25 ± 0.75 mm (0.05 ± 0.03 in)**. If the clearance is not within the specification, adjust it by turning the lock nut.
3. Install the lock spring of the cable securely.



● CHECKING HOT START ASSIST RELAY

1. Disconnect the coupler from the relay.
2. Check the continuity, referring to the following table:

Numbers-continuity	Numbers-No continuity	Remarks
1 to **5**	**1** to **3**	Without power applied
1 to **3**	1 to **5**	Connect the battery : positive to terminal 2 and negative to 4.



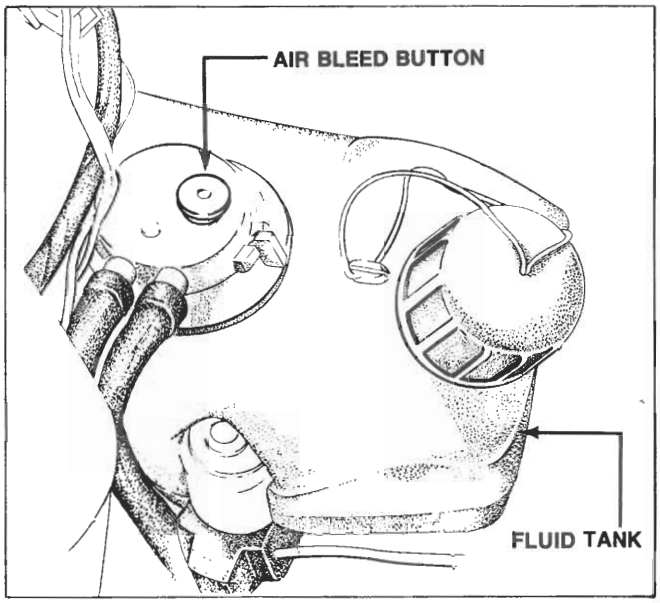
- **Relative Parts Inspection**

Check the no.1 water temperature switch.

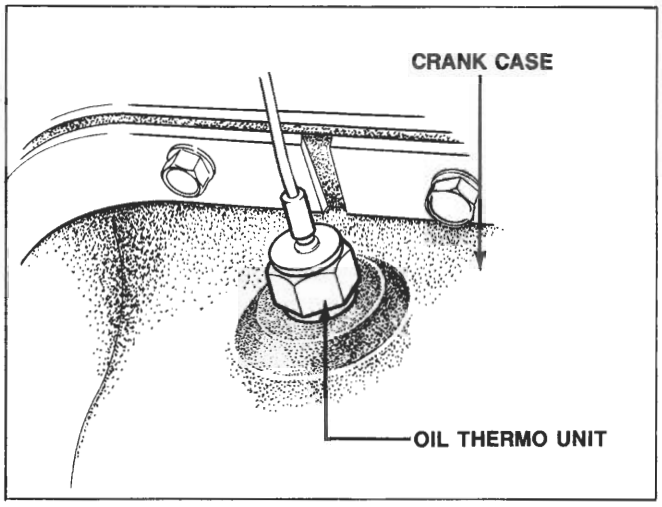
F. SUB-ZERO STARTING ASSIST DEVICE (Except for California)

● CHECKING SUB-ZERO STARTING ASSIST DEVICE

1. Make sure that there is sufficient starting assist fluid in the tank. Replenish if necessary.
2. Disconnect the connector of "S" terminal from the starting motor magnetic switch.
3. Remove the air cleaner cover.



4. Turn the ignition key to the "START" position and make sure that the starting assist fluid does not spout from the nozzle of the carburetor. [Ambient temperature should be **above -18°C (0°F)**]
5. Disconnect the connector from the oil thermo unit on the oil pan and ground the disconnected connector to the body.
6. Turn the ignition key to the "START" position. While holding the air bleed button of the tank in, make sure that the starting assist fluid spouts out from the nozzle of the carburetor.



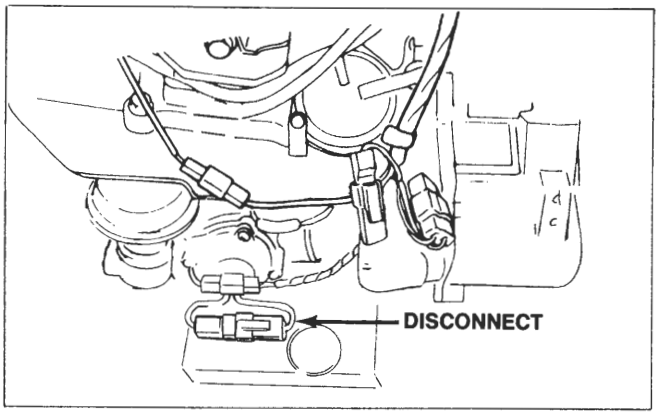
• Sub-Zero Starting Assist Fluid

The mixture proportion of starting assist fluid should be **90% high quality ethylene glycol anti-freeze solution plus 10% water**.

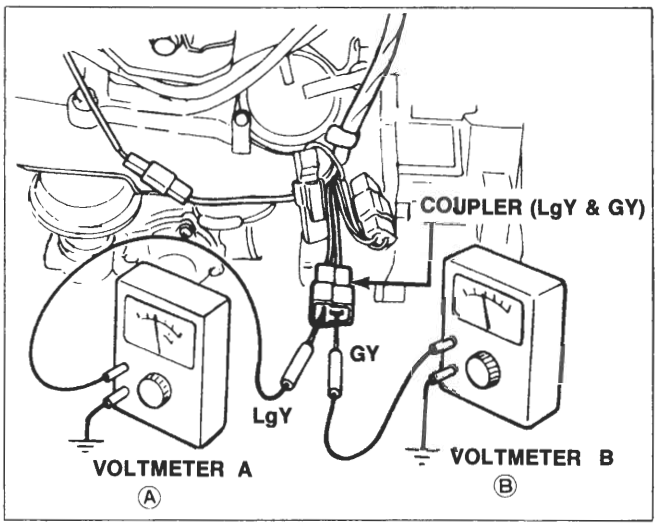
G. THROTTLE SENSOR

To check and adjust the throttle sensor, proceed as follows:

1. Warm the engine to the normal operating temperature.
2. Connect the tachometer to the engine.
3. Disconnect the coupler **(BY, GB)** as shown in the figure.

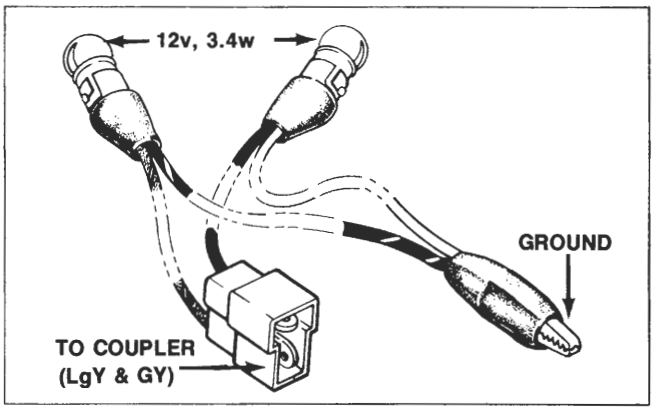


4. Connect voltmeters to each terminals (**GY** and **LgY**) in the coupler provided for testing purposes.
5. Start the engine. Quickly decelerate the engine speed from **3,000 rpm** and make sure that the current flows to both terminals simultaneously. The engine speed should be **1,100 ± 100 rpm**.

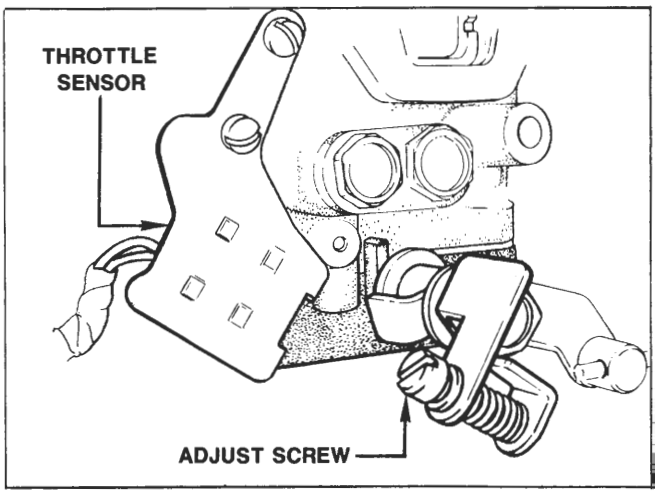


- **Reference:**

The testing light as shown in the figure can be prepared and used in place of the steps 4 and 5. In this case, the testing light turns on when current flows.



6. If the current does not start to flow to both terminals simultaneously, remove the cap from the throttle sensor adjusting screw.
7. Adjust the timing of the current flowing to the voltmeter **A (LgY)** by turning the throttle sensor adjusting screw. When the adjusting screw is screwed in, the current will begin to flow earlier, when the adjusting screw is screwed out, current will flow later.
8. After adjusting, install the cap onto the adjusting screw.

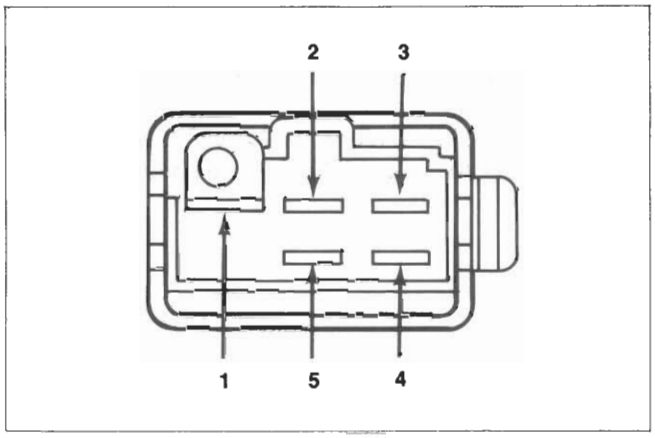


H. THROTTLE OPENER

• CHECKING AIR CONDITIONING RELAY (Manual Transmission Only)

1. Disconnect the coupler from the relay.
2. Check the continuity, referring to the following table:

Numbers-continuity	Numbers-No continuity	Remarks
1 to 5	1 to 3	Without power applied
1 to 3	1 to 5	Connect the battery : positive to terminal 2 and negative to 4.

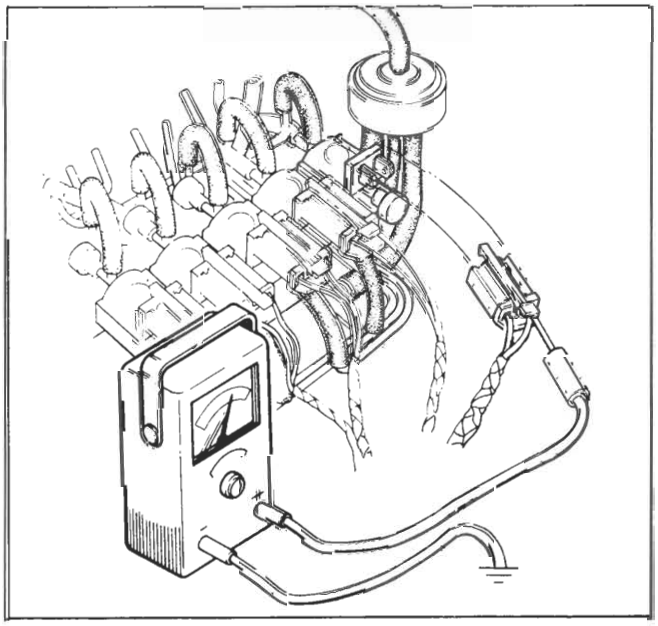


- **Relative Parts Inspection**

Check the control unit.

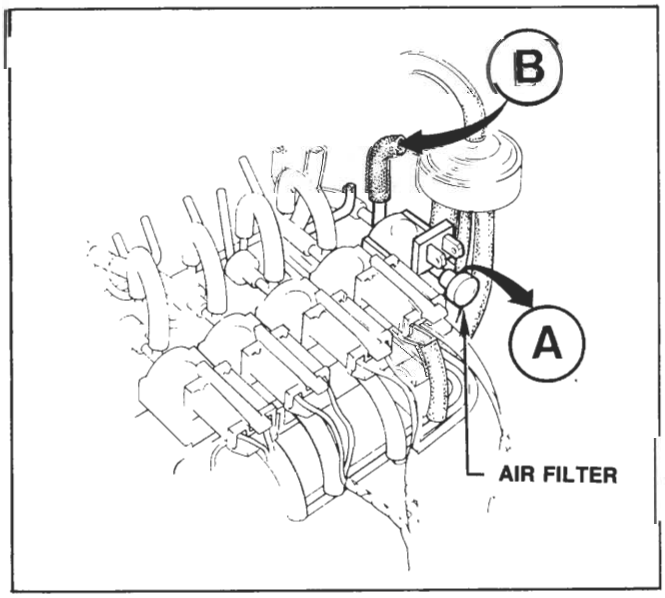
• CHECKING SIGNAL INSPECTION

1. Warm the engine to the normal operating temperature and stop the engine.
2. Connect a tachometer to the engine.
3. Connect the positive probe of the voltmeter to the negative terminal of the air conditioner solenoid valve connector (white) and ground the negative probe of the voltmeter to the body.
4. Start the engine and turn on the air conditioner compressor switch.
5. Increase the engine speed to 2,000 rpm with throttle. Slowly decrease the engine speed and check that the voltmeter reads near OV at 1,100 ± 100 rpm.

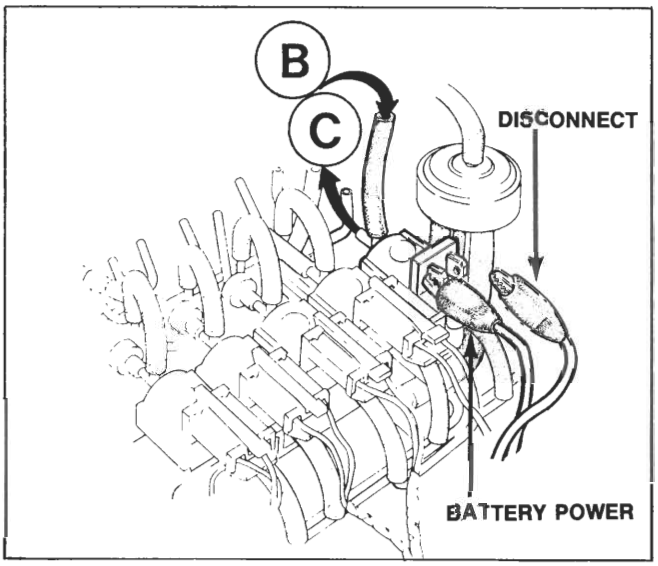


• CHECKING AIR CONDITIONING SOLENOID VALVE

1. Disconnect the vacuum sensing tubes from the solenoid valve and vacuum pipe.
2. Blow through the solenoid valve from the vacuum sensing tube **B**. Make sure the air passes through the valve and comes out from the air filter **A** of the valve.

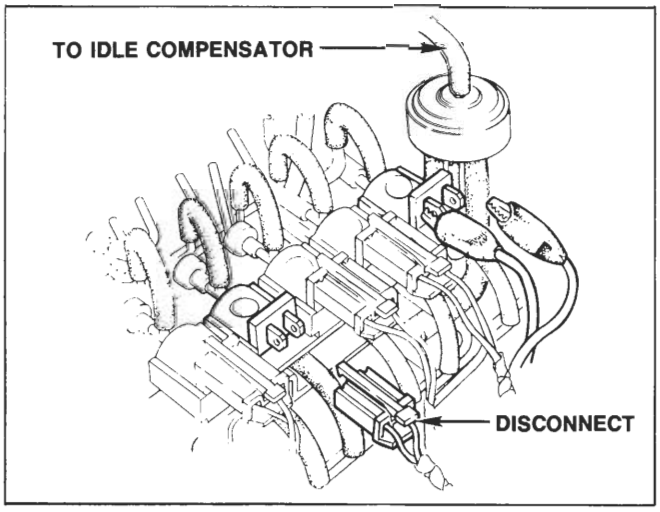


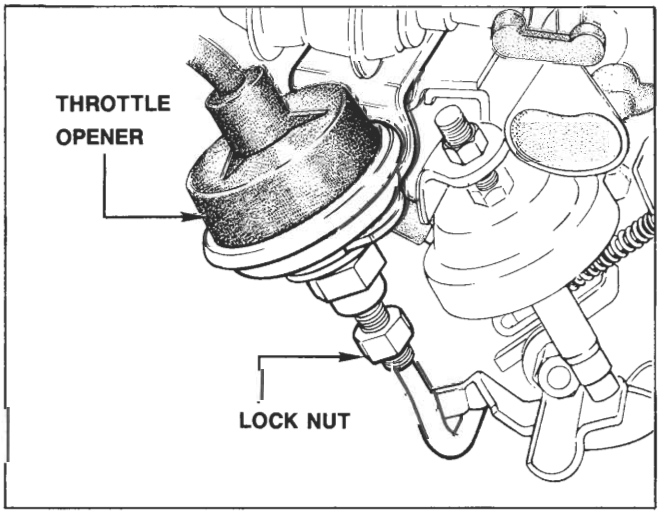
3. Disconnect the connector from the solenoid valve and connect the battery power to terminals on the valve.
4. Blow through the valve from the vacuum sensing tube **B**. Make sure the air passes through the valve and comes out from the port **C**.



● INSPECTING & ADJUSTING THROTTLE OPENER

1. Switch off all accessories.
2. Remove the fuel filler cap.
3. Disconnect the tube at the idle compensator in the air cleaner and plug the end of the tube.
4. Connect a tachometer to the engine and warm the engine to the normal operating temperature.
5. Disconnect the connector from the switching solenoid valve **(Gray)**.
6. Disconnect the vacuum sensing tubes from the leading vacuum control units on the distributor and plug the tubes (except California- Manual Transmission).
7. Turn off the air conditioner switch.
8. Disconnect the connector from air conditioner solenoid valve. Connect the battery power to the terminal in the connector and connect the other terminal to ground. Check to see that the throttle opener operates and engine speed increases to **1,200 ± 50 rpm** in neutral.
9. If the engine speed is not within the specification, adjust it by turning the adjusting screw.

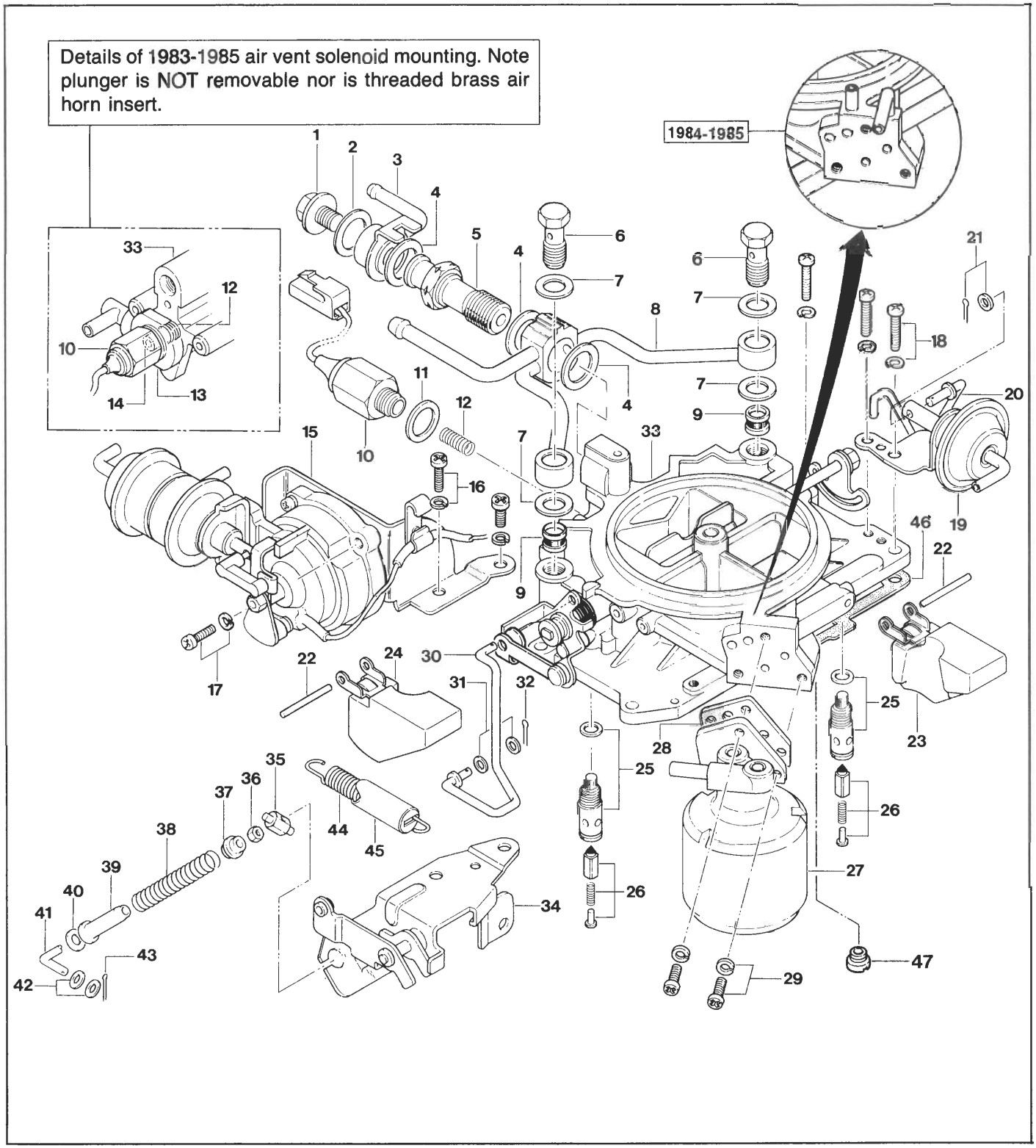




RX-7 CARBURETORS
1983-1985

1983 – 1985 CARBURETORS

A. AIR HORN



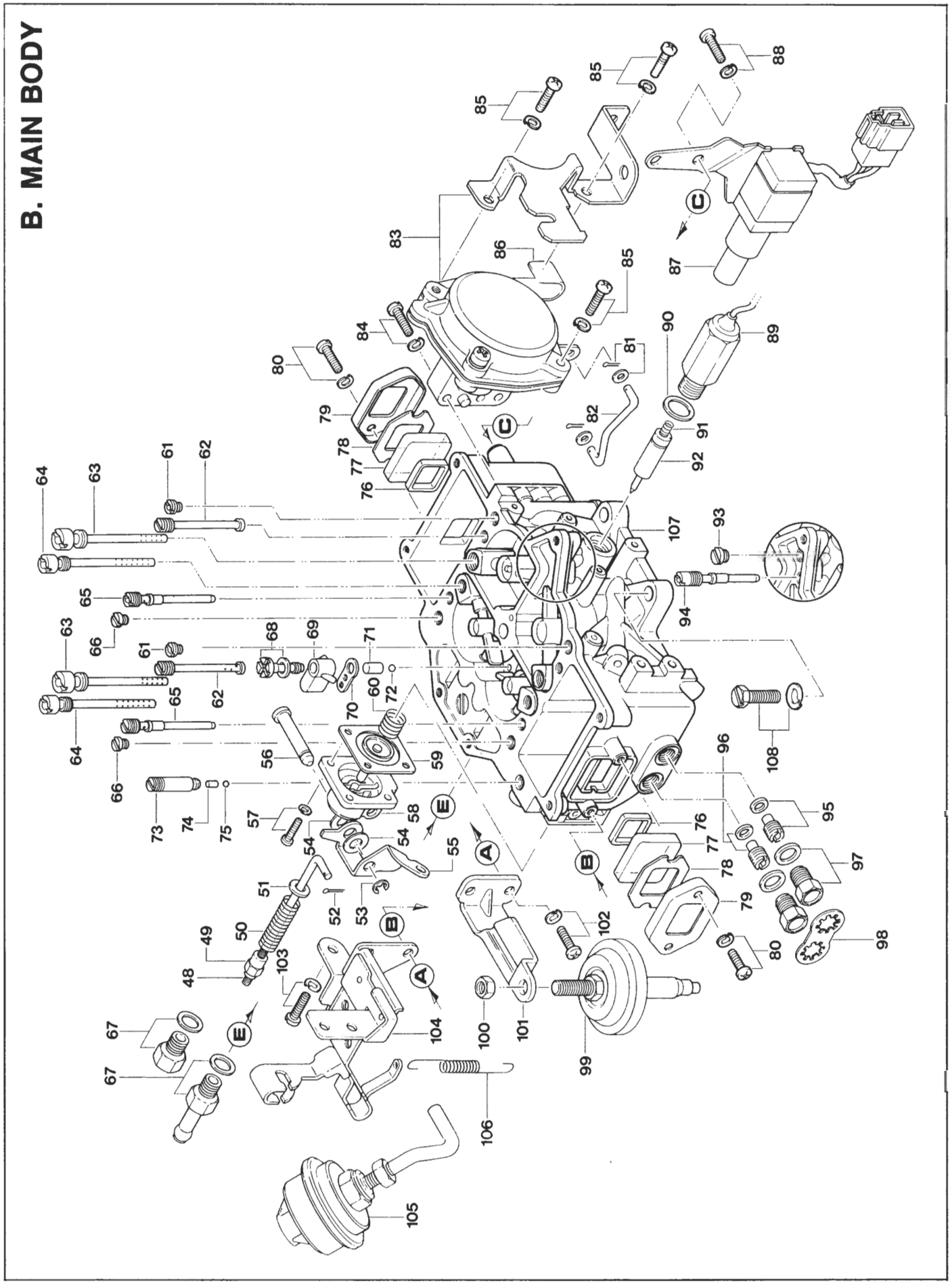
AIR HORN PARTS

1. Fuel inlet bolt
2. Gasket- fuel inlet bolt
3. Fuel return fitting
4. Gasket- fuel inlet
5. Adapter- fuel inlet
6. Fuel inlet bolts (vertical)
7. Gaskets- fuel inlet bolts (vertical)
8. Fuel inlet fitting
9. Strainers- fuel inlet
10. Air vent solenoid
11. Gasket- air vent solenoid
12. Spring- air vent solenoid
13. Brass insert (not removeable)- air vent solenoid
14. Plunger (not removeable)- air vent solenoid
15. Bi-metal choke assembly & bracket
16. Screws & washers- bi-metal bracket assembly
17. Screws & washers- (3 ea.) bi-metal cover
18. Screws & washers- air horn
19. #2 Choke diaphragm & bracket
20. Connecting rod- #2 choke diaphragm
21. Cotter pin & washer- #2 choke diaphragm rod
22. Float pin
23. Float (right)
24. Float (left)
25. Needle seats & gaskets
26. Needle valve assemblies
27. High altitude compensator (HAC)
28. Gasket- high altitude compensator
29. Screws- high altitude compensator
30. Fast idle rod
31. Washers (4)- fast idle rod
32. Cotter pins (2)- fast idle rod
33. Air horn
34. Bracket assembly- throttle sub-return
35. Pivot nut- throttle sub-return
36. Lock nut- throttle sub-return
37. Spring retainer- throttle sub-return
38. Spring- throttle sub-return
39. Spring bushing- throttle sub-return
40. Washer- throttle sub-return
41. Sub-return rod
42. Washers- throttle sub-return rod
43. Cotter pin- sub-return rod
44. Spring- throttle return
45. Cover- throttle return spring
46. Gasket- air horn
47. Air bleed

Important Note!
DO NOT DISASSEMBLE PARTS WITH REFERENCE NUMBERS 35 to 41.

NOTE:

B. MAIN BODY



MAIN BODY PARTS

48. Accelerator pump rod (link)
49. Adjust nut- pump rod
50. Spring- accelerator pump rod
51. Washer- accelerator pump rod
52. Cotter pin- accelerator pump rod
53. "C" clip- accelerator pump shaft
54. Washers (2) accelerator pump pivot shaft
55. Pivot lever- accelerator pump
56. Pivot shaft- accelerator pump
57. Cover screws & washers- accelerator pump
58. Cover- accelerator pump
59. Diaphragm- accelerator pump
60. Return spring- accelerator pump
61. Secondary slow air bleed No.2
62. Secondary slow air bleed & jet
63. Secondary main air bleed
64. Primary main air bleed
65. Primary slow air bleed & jet
66. Primary slow air bleed No.2
67. Fitting or plug- Sub-Zero start assist (with gasket)
68. Nozzle screw & gasket- accelerator pump outlet
69. Nozzle- accelerator pump outlet
70. Gasket- accelerator pump outlet
71. Weight- accelerator pump outlet
72. Check ball valve - accelerator pump outlet
73. Check valve seat- accelerator pump inlet
74. Weight- accelerator pump inlet
75. Check ball valve- accelerator pump inlet
76. Rubber gasket- sight glass
77. Sight glass
78. Gasket- sight glass bezel
79. Bezel- sight glass
80. Screws & washers- sight glass bezel
81. Cotter pins & washers- diaphragm link rod
82. Diaphragm link rod
83. Secondary diaphragm assembly
84. Attaching screws & washers- secondary diaphragm assembly
85. Screws & washers- secondary diaphragm cover
86. Clip- electric wire harness assembly
87. Throttle sensor
88. Attaching screws & washers- throttle sensor
89. Richer solenoid- (1984-1985 M/T only)
90. Gasket- richer solenoid (1984-1985 M/T only)
91. Spring- richer solenoid (1984-1985 M/T only)
92. Plunger- richer solenoid (1984-1985 M/T only)
93. Plug- richer system
94. Idle richer air bleed & jet
95. Secondary main jets & gaskets (2 each)
96. Primary main jets & gaskets (2 each)
97. Main jet plugs & gaskets (4 each)
98. Locking plates (2 each)- main jet plugs
99. Dash pot
100. Mounting nut- dash pot
101. Bracket- dash pot
102. Screws & washers- dash pot bracket
103. Screws & washers- throttle opener bracket
104. Throttle opener bracket assembly
105. Throttle opener
106. Spring- hot start assist
107. Main body
108. Bolts & washers- main body

NOTE:

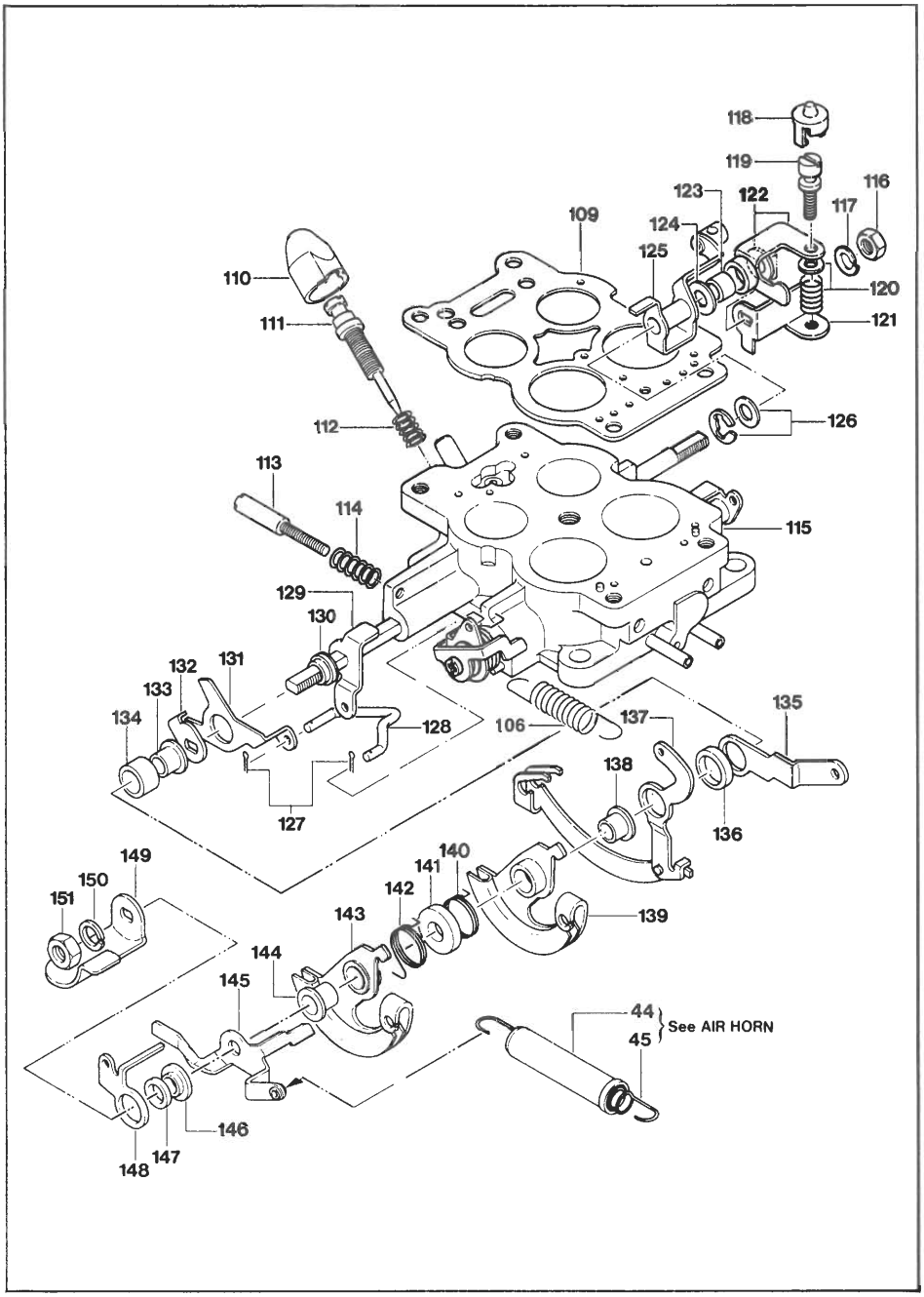
C. THROTTLE BODY

THROTTLE BODY PARTS

44. Spring- throttle return (see air horn)
45. Cover- throttle return spring (see air horn)

106. Spring- hot start assist (see main body)

109. Main body gasket
110. Anti-tamper shell
111. Mixture adjust screw (MAS)
112. Spring- mixture adjust screw
113. Throttle adjust screw (TAS)
114. Spring- throttle adjust screw
115. Throttle body
116. Nut- front lever assembly
117. Lockwasher- front lever assembly
118. Limiter cap (plastic)- throttle sensor adjust screw
119. Adjust screw- throttle sensor
120. Spring & washer- throttle adjust screw
121. Throttle sensor lever
122. Throttle sensor adjust lever & washer
123. Spacer- front lever assembly
124. Washer- oil metering lever
125. Oil metering lever
126. "C" clip & washer- front lever assembly
127. Cotter pins- secondary throttle link
128. Rod- secondary throttle link
129. Accelerator pump arm
130. Bushing- secondary throttle link lever
131. Secondary throttle link lever
132. Stop lever- secondary throttle link lever
133. Bushing- rear lever assembly
134. Sleeve- rear lever assembly
135. Fast idle lever
136. Spacer- fast idle lever
137. Hot start assist lever assembly
138. Bushing- cruise control arm
139. Cruise control arm
140. Spring- cruise control arm
141. Spacer- accelerator arm
142. Spring- accelerator arm
143. Accelerator arm
144. Bushing- accelerator arm
145. Throttle return spring lever
146. Bushing- throttle sub-return lever
147. Sleeve- throttle sub-return lever
148. Throttle sub-return lever
149. Dash pot throttle lever
150. Lockwasher- rear lever assembly
151. Nut- rear lever assembly

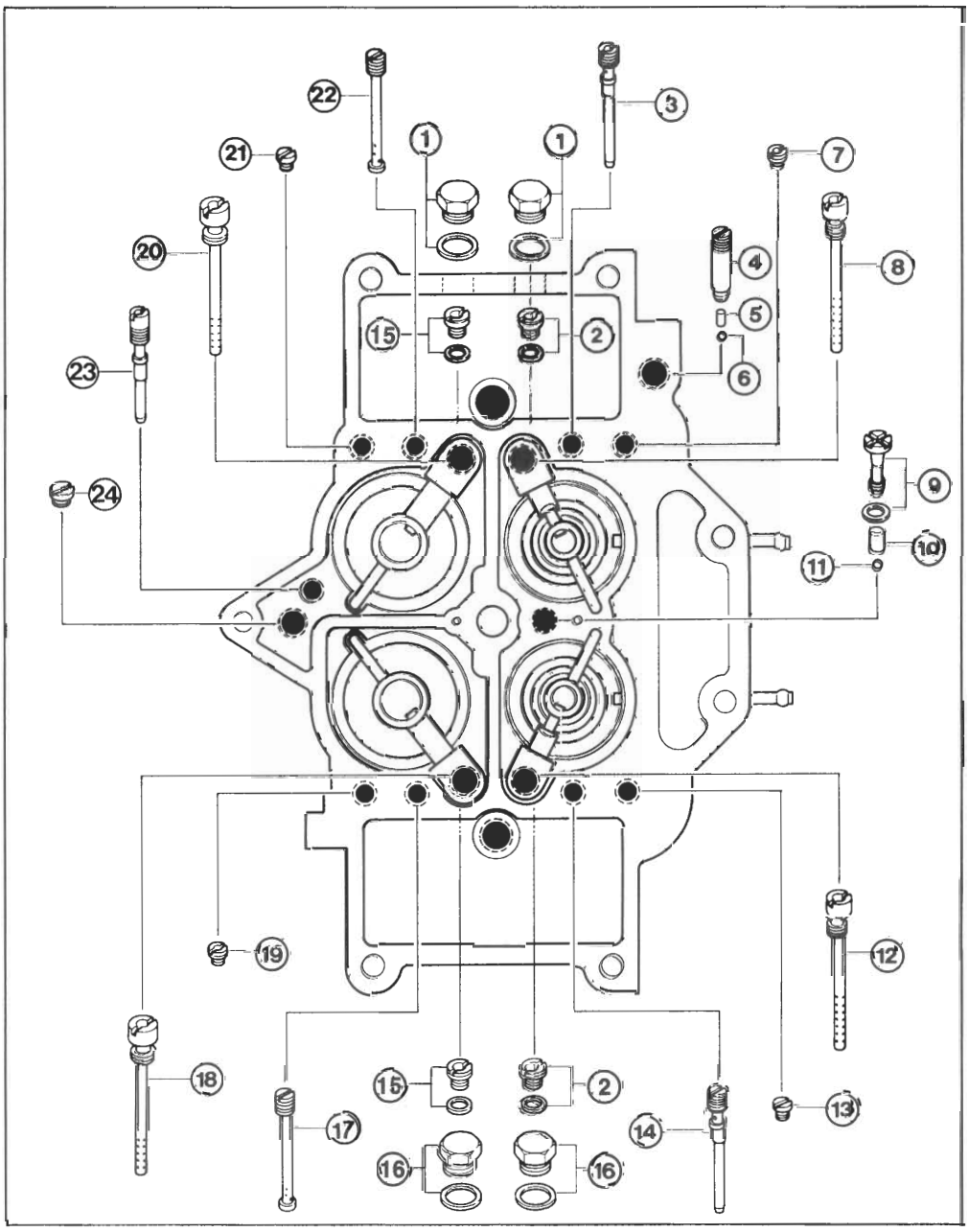


Important Note!
Throttle arm/lever assemblies are shown in exploded view here for illustration purposes ONLY! Do not disassemble the lever assemblies. REMOVE ONLY THOSE PARTS AS STATED IN THE DISASSEMBLY SECTION.

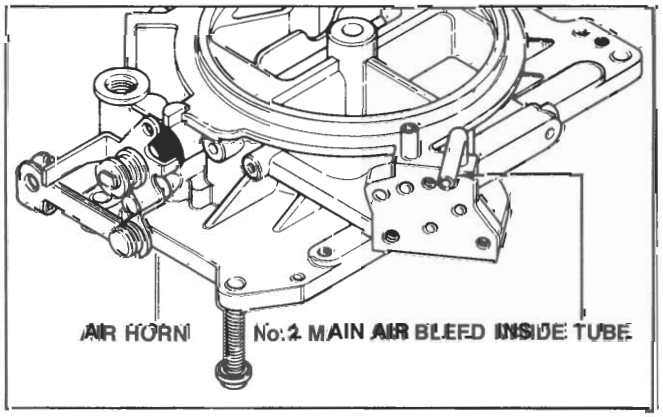
NOTE :

D. FUEL JETS & AIR BLEEDS LOCATIONS

1. Main jet plugs & gaskets
2. Primary main jet & gasket
3. Primary slow air bleed no.1 & slow jet
4. Accelerator pump inlet seat screw
5. Accelerator pump inlet weight
6. Accelerator pump inlet check ball
7. Primary slow air bleed no.2
8. Primary main air bleed
9. Pump nozzle bolt & gasket
10. Accelerator pump outlet weight
11. Accelerator pump outlet check ball
12. Primary main air bleed
13. Primary slow air bleed no.2
14. Primary slow air bleed no.1 & slow jet
15. Primary main jet & gasket
16. Main jet plugs & gaskets
17. Secondary slow air bleed & no.1 & slow jet
18. Secondary main air bleed
19. Secondary slow air bleed no.2
20. Secondary main air bleed
21. Secondary slow air bleed no.2
22. Secondary slow air bleed no.1 & slow jet
23. Richer air bleed & jet
24. Richer air bleed no.2 - or plug



Note:
A No.2 main air bleed was added for 1984-1985 models. It is located in the curved tube over the altitude compensator valve on the air horn. The No.2 main air bleed is not removeable.



E. FUEL JETS & AIR BLEEDS SPECIFICATIONS

YEAR	VERSION	PRIMARY	SECONDARY	MAIN JET	MAIN AIR BLEED		SLOW JET	POWER VALVE	SLOW AIR BLEED		RICHER JET	RICHER AIR BLEED	RICH ECONOMIZER	SLOW ECONOMIZER
					NO.1	NO.2			NO.1	NO.2				
1983	MANUAL TRANS.	X	X	92 160	70 140	–	46 110	none	70 160	180 60	–	–	–	–
	AUTO. TRANS.	X	X	91 160	60 140	–	46 110	none	70 160	160 60	–	–	–	–
1984	MANUAL TRANS.	X	X	92 160	70 140	70	46 110	none	70 160	170 60	40	130	–	–
	AUTO. TRANS.	X	X	91 160	60 140	70	46 110	none	70 160	150 60	–	–	–	–
1985	MANUAL TRANS.	X	X	92 160	70 140	70	46 110	none	70 160	170 60	40	130	–	–
	AUTO. TRANS.	X	X	91 160	60 140	70	46 110	none	70 160	150 60	–	–	–	–

The chart shown above and the illustration on the previous page are designed to pinpoint exact locations and sizes of jets and air bleeds used during the period of 1983 to 1985. Since there were differences in these carburetors by region, equipment and year, please be sure to check the correct specifications for the carburetor you are overhauling or repairing. If the carburetor does not match the specs listed, you may have an incorrect carburetor for the vehicle.

DISASSEMBLY OPERATION

A. IMPORTANT! NOTE BEFORE DISASSEMBLY

Use exploded view as a guide for parts, disassembly, etc.

DO NOT REMOVE venturi, choke valve & shaft or throttle valve & shaft.

Follow numerical sequence of disassembly instructions - do not skip steps or you may miss important information! Parts are also reference-numbered in **general order** of disassembly for added convenience.

Note sizes and locations of jets and air bleeds to avoid later confusion during assembly. Be sure to check emulsion tubes for differences. Refer to charts in this section for sizes and locations.

B. SPECIAL CLEANING INSTRUCTIONS

DO NOT SOAK CHOKE HEATER/BI-METAL ASSEMBLY, DIAPHRAGM ASSEMBLIES, DASH POT, FLOATS, SOLENOIDS, RUBBER OR PLASTIC PARTS, ELECTRICAL WIRING, THROTTLE SENSOR, ETC.

Do not soak plastic limiter cap.

Disassemble as per step-by-step instructions before cleaning

Use suitable cleaning solvent. Work away from sparks and above all, NO SMOKING!

Allow enough soaking time to remove foreign material.

Blow out all passages with compressed air and inspect closely for thorough cleaning. Be sure to check the No.2 MAB (1984-1985) for clear passage.

When cleaning jets, never use a wire or insert objects since this may enlarge the hole and change carburetor calibration. Use compressed air to blow clean.

C. STEP-BY-STEP DISASSEMBLY

With the carburetor on the bench, perform the following steps:

1. Remove all hoses.
2. Disconnect all vacuum tubes.

Remove the following:

3. Fuel inlet bolts
4. Fuel inlet strainers
5. Fuel inlet tubes
6. Air vent solenoid & gasket
7. Air vent solenoid spring
8. Throttle return spring (use care to release tension slowly, sub-return may snap back)

9. Altitude compensator valve & gasket
10. Disconnect hot start assist spring.
11. Remove dash pot & bracket assembly.
12. Remove throttle opener & bracket assembly.
13. Disconnect throttle sub-return.*

***Note:**
DO NOT UNSCREW sub-return pivot (see reference #35 on air horn exploded view illustration)! This was pre-set at the factory. Instead, pull the sub-return spring down until the spring retainer clears the bracket. Then remove the sub-return from the bracket as an assembly. Disconnect the lower end of the sub-return rod by removing the cotter pin and two washers. Set aside for later.

14. Remove throttle sub-return bracket.
15. Remove bi-metal spring housing & bracket assembly.
16. Disconnect fast idle rod by removing cotter pin & washer.
17. Remove #2 choke diaphragm.
18. Remove air horn screws.
19. Carefully lift air horn straight up from main body.
20. Remove float pins.
21. Remove floats.
22. Remove needle assemblies.
23. Remove needle seats, gaskets & air bleed.
24. Remove & discard air horn gasket.

• MAIN BODY DISASSEMBLY

25. Disconnect accelerator pump rod only at low end by removing cotter pin & washer.
26. "C"-clip from accelerator pump pivot shaft.*

***Note:**
It is sometimes easier to remove the accelerator pump pivot shaft by performing the operation with the carburetor on its side and the shaft in vertical position (head up). This will prevent the washers from falling into the "C"-clip slot as often happens in horizontal position.

27. Remove three exposed pump cover screws.
28. Slide pivot shaft up enough to clear 4th cover screw.
29. Remove 4th pump cover screw.*

***Note:**
Some accelerator pump pivot shafts are not easily removable when the lower left screw is still in place. This screw should always be removed first before attempting to move the shaft out of position.

30. Remove pump cover, return spring & diaphragm.
31. Remove pivot shaft.
32. Separate accelerator pump gasket/diaphragm from pump cover.
33. Lay accelerator pump lever aside, but do not remove rod adjust nut, etc.
34. Remove throttle sensor.
35. Remove secondary vacuum diaphragm link cotter pin.
36. Disconnect secondary vacuum diaphragm link.
37. Remove secondary vacuum diaphragm attaching screws.
38. Remove secondary vacuum diaphragm cover screws & solenoid bracket.
39. Disassemble secondary vacuum diaphragm by removing cover, diaphragm & spring.
40. Remove lock plates from main jet plugs.
41. Remove main jet plugs & gaskets.

Continue by removing the following:

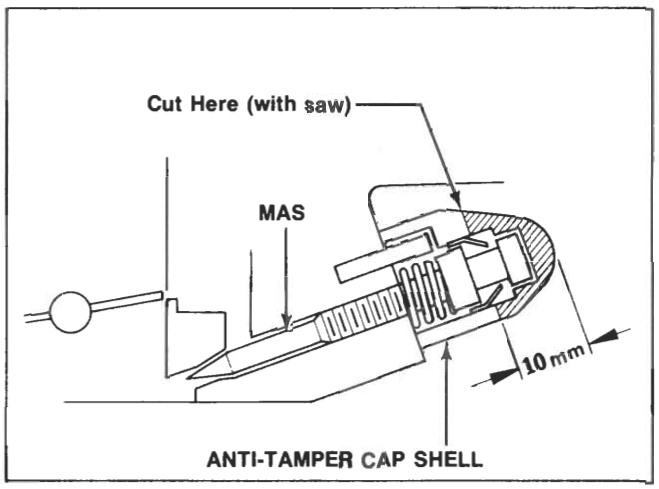
42. Main jets & gaskets
43. Accelerator pump nozzle screw & gasket
44. Accelerator pump nozzle & gasket
45. Accelerator pump outlet weight
46. Accelerator pump outlet check ball (valve)
47. Accelerator pump inlet check seat
48. Accelerator pump inlet check weight
49. Accelerator pump inlet check ball
50. All jets & air bleeds (MAB No.2 on 1984-1985 models is not removable)
51. Richer jet/air bleed (M/T versions)
52. Richer system plug
53. Sight glass bezel screws
54. Sight glass bezels & gaskets
55. Sight glasses
56. Sight glass gaskets
57. Richer solenoid (M/T versions)
58. Richer solenoid spring & plunger
59. Sub-zero start assist fitting (if equipped) & gasket
60. Sub-zero start assist plug (if equipped) & gasket
61. Unbolt main body from throttle body (4 bolts)
62. Remove and discard main body gasket.

• THROTTLE BODY DISASSEMBLY

Note:
Both front and rear lever assemblies should NEVER be disassembled. Likewise, throttle plates must NOT be removed. The exploded parts chart at the beginning of this section is merely for illustration purposes only. Do not attempt to remove these parts!

Important:
Before removing the MAS on 1983 to 1985 RX-7 carburetors, you MUST saw off the metal anti-tamper cap shell over the MAS. Start sawing about **10 mm** back from the tip as shown in the illustration.

63. Saw off MAS anti-tamper cap shell.
64. Remove MAS & spring.
65. Remove TAS & spring.
66. Remove hot start assist spring.
67. Remove all gasket material.



STOP! You have completed disassembly of the RX-7 carburetor for overhaul.

ASSEMBLY OPERATION

A. IMPORTANT! NOTE BEFORE ASSEMBLY

- **Inspect all parts for damage or wear.** Look for burrs or ridges on needle seat, needles, mixture adjust screw, etc. Check throttle valves and choke valve for smooth operation, damage, etc.
- Check all solenoids and valves for proper operation. Check solenoid plungers for nicks or burrs. Be sure plunger is clean and free of all residue which might inhibit free movement. Also check solenoid spring. When battery power is applied to air vent and richer solenoid, plunger or stem should retract into the solenoid.
- Double check all passages to be sure of free flow. If blocked, clean again with solvent and blow out with compressed air.
- Make float adjustments on the air horn **with the gasket installed!** This procedure differs from all other Mazda carburetors in North America, so please pay close attention to avoid an incorrect setting.
- Check the float for saturation, contamination or other possible damage. Make sure the float actually floats as it should. Satureted float will sink lower than normal. If in doubt, match weight and floatation with known good float of the same specs.
- Inspect all diaphragms for damage and proper operation. Check for holes, wear, thin spots, tears, etc.
- Disgard all old gaskets and use new ones.

Note:
If you have any question regarding placement or description of a part, be sure to refer to the exploded illustrations in the beginning of this section. Each part is referenced with a number and description.

B. STEP BY STEP ASSEMBLY

• THROTTLE BODY ASSEMBLY

1. Install the new mixture adjust screw & spring. Tighten the screw lightly and then back off **three turns** for the preliminary setting. **DO NOT** INSTALL ANTI-TAMPER SHELLCAP AT THIS TIME!
2. Install the throttle adjust screw & spring. Tighten until spring bottoms out and back off **6½ turns** for a preliminary setting.
3. Install main body gasket in place.

• MAIN BODY ASSEMBLY

4. Mate main body to throttle body and bolt together using four main body bolts.
5. Install sub-zero start assist plug or fitting & gasket.
6. Install richer plunger & spring (M/T versions).
7. Install richer solenoid.
8. Install sight glass gaskets (rubber).
9. Install sight glasses.
10. Install sight glass bezels & gaskets.

Continue assembly by installing the following:

11. Richer system plug
12. Richer jet/air bleed (M/T versions)
13. All jets & air bleeds for main body (see chart- one #40 goes in air horn)
14. Accelerator pump inlet check ball
15. Accelerator pump inlet check weight
16. Accelerator pump inlet seat
17. Accelerator pump outlet check ball
18. Accelerator pump outlet weight
19. Accelerator pump nozzle & gasket
20. Primary main jets & gaskets
21. Secondary main jets & gaskets
22. All main jet plugs & gaskets
23. Main jet plug lock plates (serrations facing out)
24. Secondary vacuum diaphragm spring & cover
25. Cover screws and harness clip for 1983 models
26. Cover screws and MAB solenoid control bracket for 1984-1985 models
27. Secondary diaphragm assembly to main body using gasket and screws
28. Secondary vacuum diaphragm link using cotter pin
29. Throttle sensor
30. Accelerator pump return spring & diaphragm
31. Accelerator pump cover*

***Note:**
Install ONLY the top screws and lower right-hand screw. DO NOT INSTALL THE LOWER LEFT SCREW BECAUSE THE HEAD MAY NOT CLEAR THE LEVER PIVOT SHAFT! NOW TURN THE CARBURETOR SIDEWAYS WITH THE FRONT LEVERS UP TO PERFORM STEPS #33 to 35.

32. Push accelerator pump lever into cover slot and hold in place.
33. Slide thin washer on each side of lever in pump cover pivot.
34. Slide pump lever pivot shaft into place.
35. Secure pivot shaft with "C"-clip.
36. Install lower left pump cover screw.
37. Attach accelerator pump rod to arm on throttle body with cotter pin & washer.
38. Attach throttle opener bracket assembly, throttle opener, dash pot bracket and dash pot.*

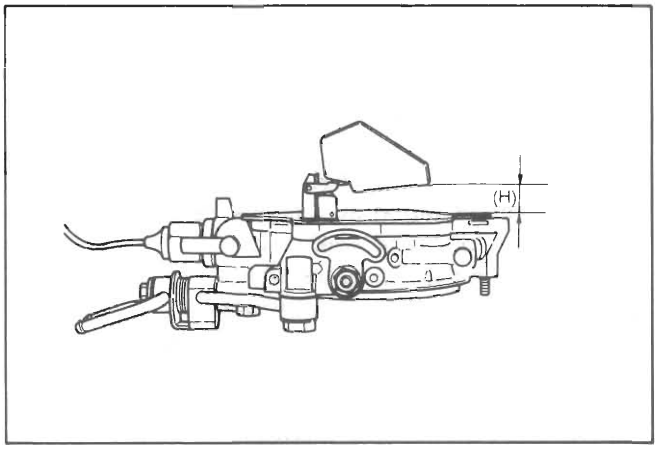
    ***Note:**
    Dash pot should already be in position on the dash pot bracket since it should not have been removed during disassembly.

• AIR HORN ASSEMBLY

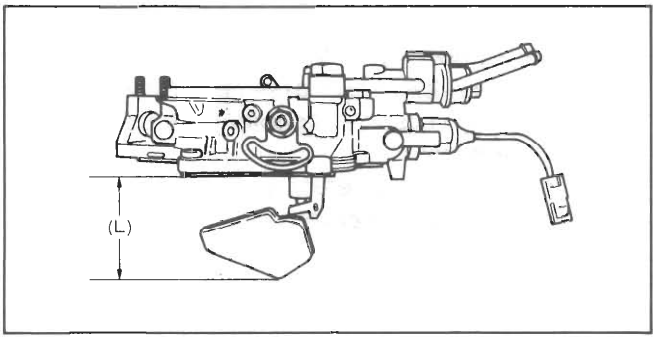
39. Install air bleed in air horn if not already done at assembly step #13.
40. Install air horn gasket.
41. Install needle valve seats.
42. Install needle valve assemblies.
43. Install float pins & floats.
44. Perform float adjustment as follows:

- **Float Adjustment**

Invert the air horn on a stand and allow the float to lower by its own weight. Measure the clearance **(H)** between the float and the air horn gasket. This clearance should be **16 ± 0.5 (0.63 ± 0.02 in)**. If the clearance is not within specifications, bend the float seat lip until the proper clearance is obtained.

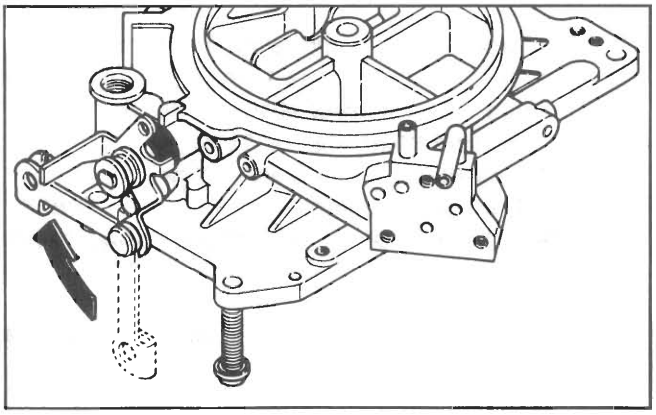


Turn the air horn to the normal position and allow the float to lower by its own weight. Measure the distance **(L)** between the bottom of float and the air horn gasket. The clearance should be **51 ± 0.5 mm (2.0 ± 0.02 in)**. If the clearance is not within specifications, bend the float stopper until the proper distance is obtained.

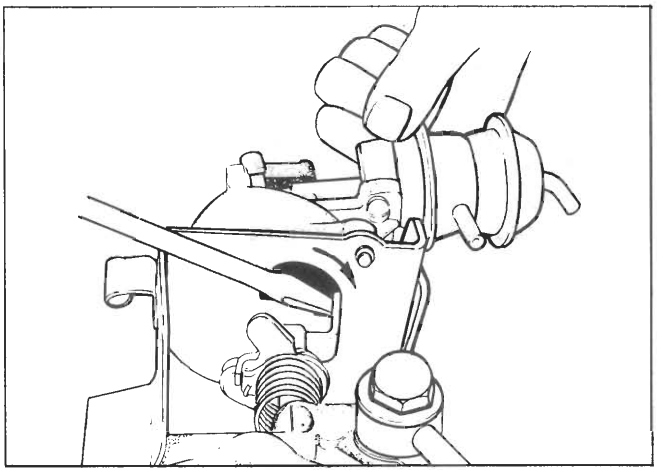


45. Install air horn on main body with two (longest) screws near fuel inlet.*

***Note:**
You MUST hold the choke cable arm in a horizontal position ABOVE the bracket assembly for the cables and throttle opener. Otherwise, you will not be able to attach the choke cable when installing the carburetor. If you fail to observe this caution, it will be necessary to remove the air horn and start over!



46. Connect fast idle rod by using cotter pin.
47. Install the bi-metal spring housing as follows:
    - Install the carburetor in front of you with the choke heater facing away from you.
    - Close the choke valve and hold it closed.
    - Now pull the vacuum diaphragm shaft back so that it retracts into the No.1 choke diaphragm. This will move the bi-metal spring clockwise making it easier to engage the bi-metal spring and the choke shaft lever.
    - If necessary, use a screwdriver to assist in aligning the choke shaft lever and the bi-metal spring, but be careful not to damage the bi-metal or heater element by doing so.



- While holding the housing in place, release the choke valve and immediately attach the housing by installing the short screws to the throttle opener bracket. Choke cable arm MUST be ABOVE throttle bracket assembly.
- Finish the operation by installing the sub-return bracket assembly ON TOP OF THE BI-METAL HOUSING BRACKET. Insert the two longer screws downward through the sub-return bracket, through the bi-metal bracket and into the air horn. Use care to align the dimple indentations in both brackets for easiest assembly and proper fit.

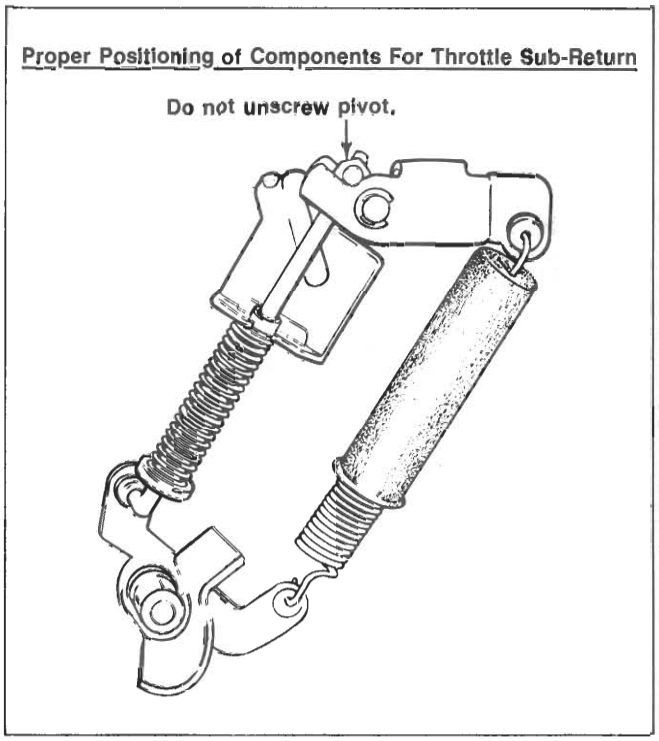
Important:
Check the final assembly of the bi-metal and be absolutely sure that the bi-metal spring is properly engaged with the choke shaft lever.

48. Complete installation of the sub-return bracket by installing side screw into main body.
49. Install throttle sub-return rod & spring assembly.*

***Note:**
First attach lower end of rod with cotter pin & washers. Then slide upper end of the rod onto the sub-return bracket while depressing the spring retainer. Release the retainer once in place. (See illustration below.)

50. Install hot start assist spring between its lever assembly and the throttle opener bracket.
51. Install No.2 choke diaphragm.
52. Install all remaining air horn screws.
53. Install altitude compensator valve & gasket.
54. Install air vent solenoid, spring & gasket.
55. Install throttle return spring using care to attach sub-return pivot without unscrewing pivot
56. Install fuel inlet tubes, strainers, fittings and bolts.
57. Connect all vacuum tubes in proper positions.

Proper Positioning of Components For Throttle Sub-Return



STOP! You have completed overhaul assembly. Now go back and double-check your assembly. Make sure it is absolutely correct before going on to the adjustment section!

OFF VEHICLE ADJUSTMENTS

A. CHECKING & ADJUSTING CARBURETORS

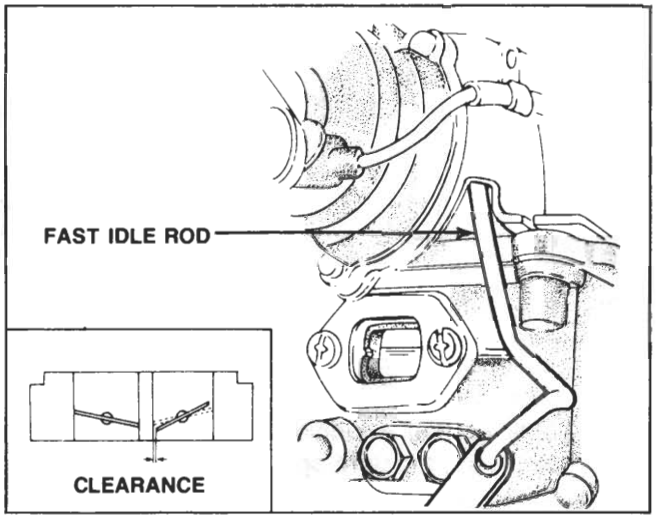
• FAST IDLE OPENING ANGLE

With the choke valve fully closed, measure the clearance between the primary throttle valve and the wall of the throttle bore.

- **Clearance:**

1.0~1.2 mm (0.040~0.047 in)

If the clearance is not within specification, bend the fast idle rod until the proper clearance is obtained.

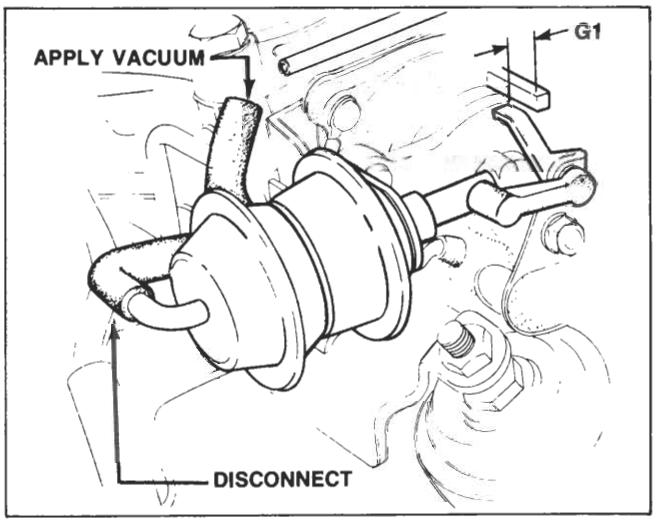


• CHOKE VALVE OPENING ANGLE

1. Disconnect the vacuum sensing tubes from the No.1 vacuum diaphragm.
2. Pull the choke lever out fully and hold its position.
3. Apply vacuum of **more than 500 mm-Hg (19.7 in-Hg)** to No.1 vacuum diaphragm and make sure the clearance **(G1)** is specified value.

- **Clearance G1:**

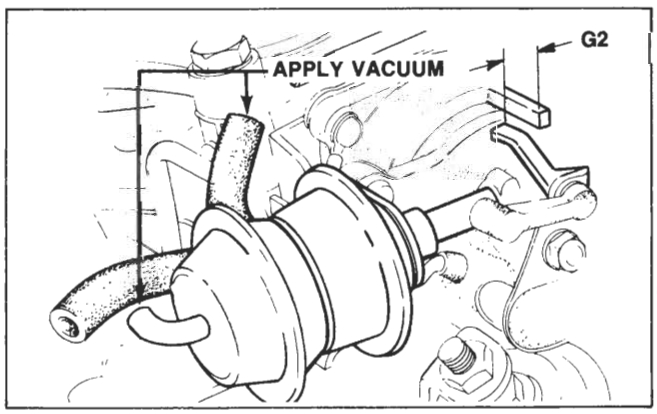
5.5~6.2 mm (0.22~0.24 in)



4. **Apply vacuum of more than 500 mm-Hg (19.7 in-Hg)** to No.1 vacuum diaphragms and make sure the clearance **(G2)** is specified value.

- **Clearance G2:**

11.5~13 mm (0.45~0.51 in)

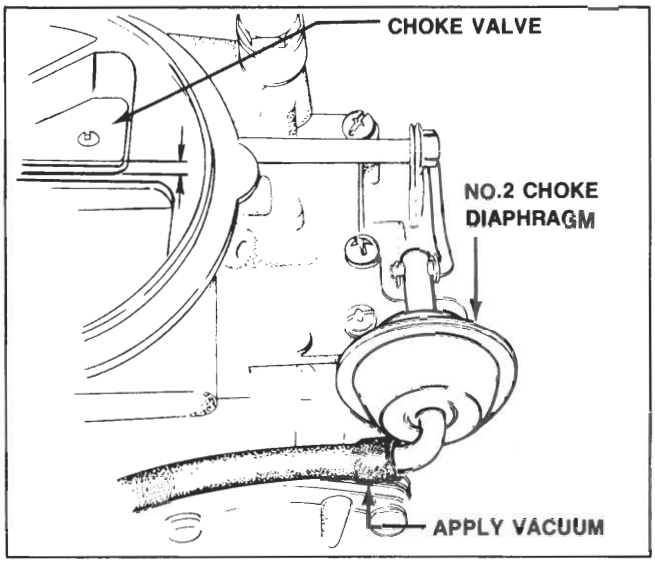


● NO.2 CHOKE DIAPHRAGM

1. Disconnect the vacuum sensing tube from the vacuum diaphragm.
2. Pull the choke lever out fully and hold its position. Make sure that the choke valve closes fully. Cool the choke bi-metal if necessary.
3. Apply vacuum of **more than 500 mm-Hg (19.7 in-Hg)** to the vacuum diaphragm and make sure the clearance **(R)** is specified value.

   • **Clearance (R):**

   1.46~1.80 mm (0.057~0.070 in)



NOTE:

ON VEHICLE ADJUSTMENTS

A. INSTALLING CARBURETOR

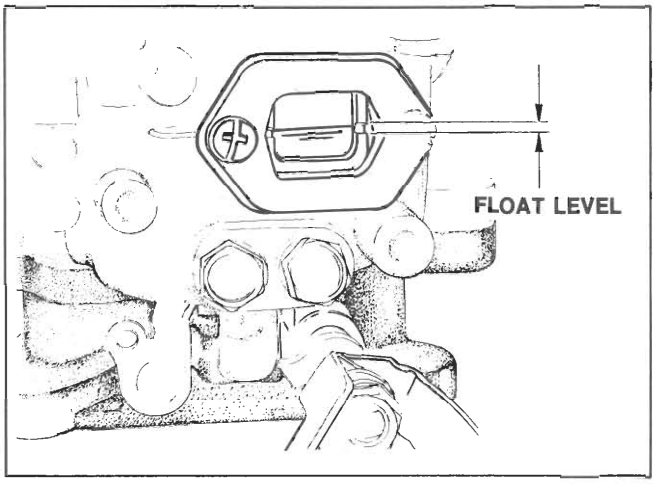
Install the carburetor in the reverse order of removing.

Caution:
Push in the hose ends of the fuel main and fuel return hoses to the carburetor fittings until the fittings are inserted to **30~35 mm (1.2~1.4 in).**

After installing, note the following:

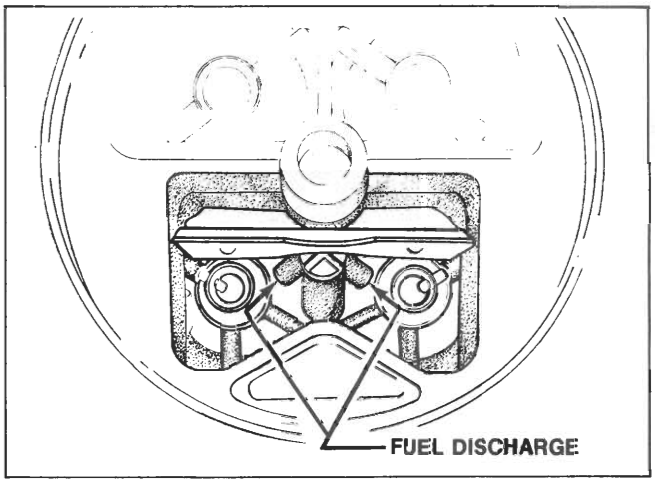
(Place the vehicle on level ground)

1. Start the engine and check for fuel leakage.
2. With the engine operating, check the fuel level. The fuel level should be in the specified mark in the sight glass.



3. Inspect the accelerator pump as follows:

   Stop the engine. Operate the throttle valve and check to see that the fuel is discharged from the nozzles of the pump.

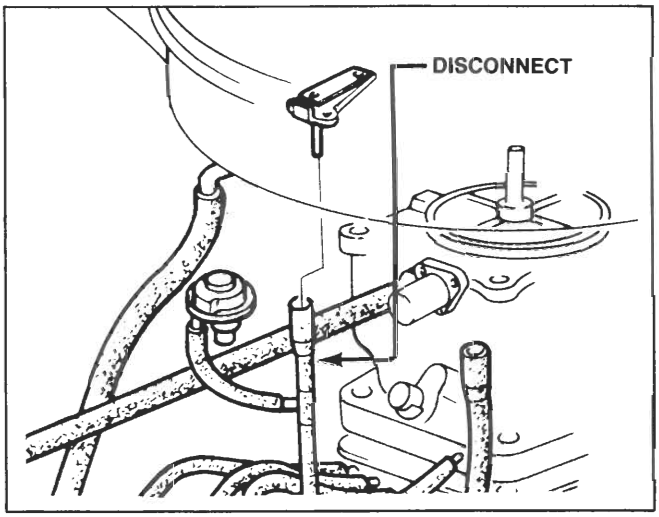


4. Adjust the idle speed and idle mixture.

B. IDLE SPEED & IDLE MIXTURE ADJUSTMENTS

Before checking or adjusting the idle speed and idle mixture, follow these directions.

1. Switch off all accessories.
2. Remove the fuel filler cap.
3. Connect a tachometer to the engine.
4. Disconnect the richer solenoid connector.
5. Be sure air cleaner is installed prior to performing adjustments.

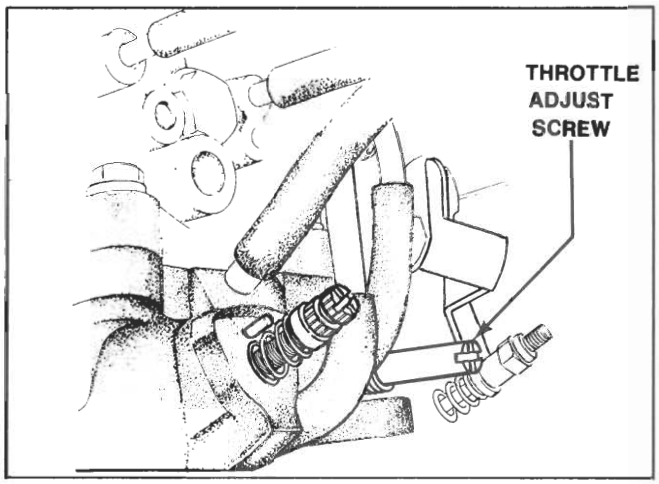


• CHECKING IDLE SPEED

1. Warm the engine until it reaches normal operating temperature.
2. On vehicles equipped with automatic transmission, shift the selector lever to "D" position.
3. Check the idle speed. If the idle speed is not as specified, adjust the idle speed to **750 rpm** by turning the throttle adjust screw.

   • **Idle Speed:**

   Manual transmission: **750 rpm in neutral**
   Automatic transmission: **750 rpm in "D" position**



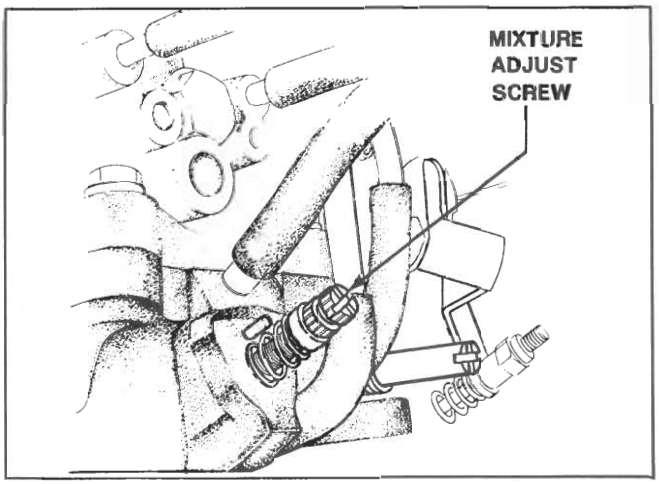
• CHECKING IDLE MIXTURE

Usually idle mixture adjustment is unnecessary. In case overhaul is necessary due to carburetor trouble, make idle mixture adjustment as follows:

1. Remove the throttle body and cut off the anti-tamper cap as instructed.
2. Fit a new mixture adjust screw as instructed.
3. Set the idle speed to the following specifications by turning the throttle adjust screw.

   • **Specifications:**

   Manual transmission: **770 rpm in neutral**
   Automatic transmission: **870 rpm in "N" position**



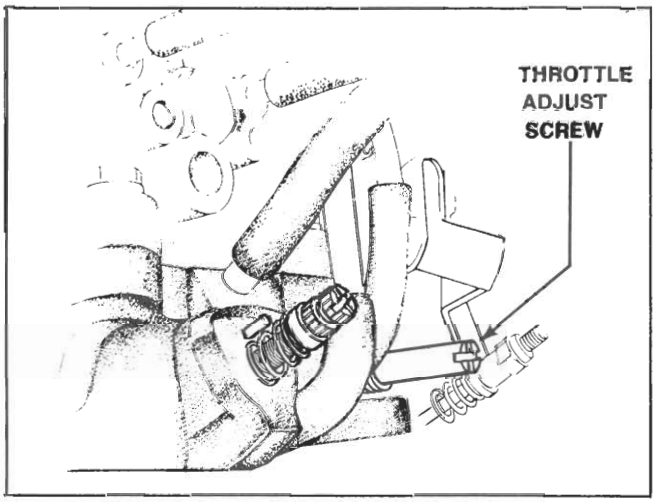
4. Set the idle speed at the highest rpm by turning the mixture adjust screw.
5. Reset the idle speed to the following by turning the throttle adjust screw.

   • **Specifications:**

   Manual transmission: **770 rpm in neutral**
   Automatic transmission: **870 rpm in "N" position**

6. **Screw in the mixture adjust screw and adjust the idle speed to 750 rpm for manual transmission and 840 rpm in "N" position for automatic transmission.**
7. On vehicles equipped with automatic transmission, shift the selector lever to "D" position and adjust the idle speed to **750 rpm** by turning the throttle adjust screw.
8. AFTER IDLE MIXTURE ADJUSTMENT IS COMPLETED, fit an anti-tamper cap onto the mixture adjust screw securely.

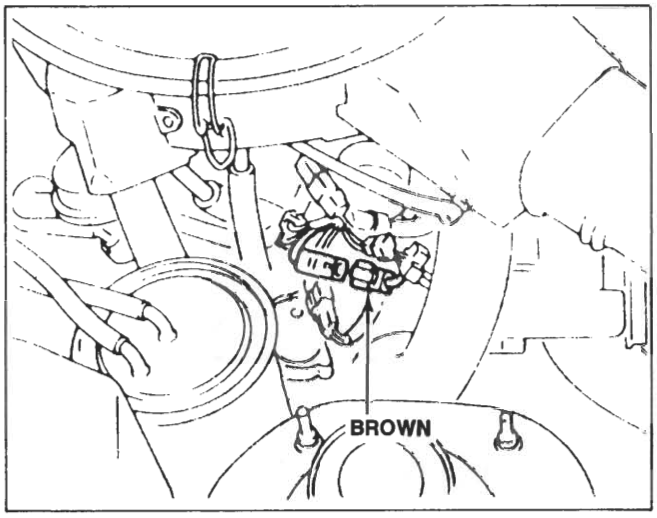
   Caution:
   After adjusting the idle speed, the throttle sensor on the carburetor should be adjusted.



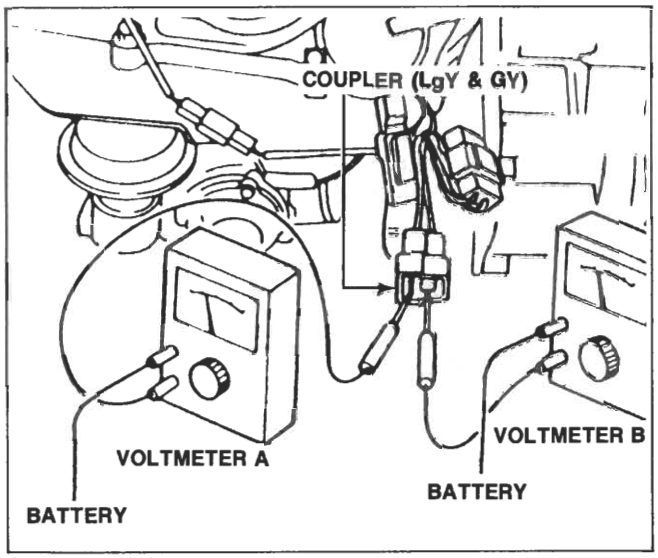
● CHECKING THROTTLE SENSOR

To check and adjust the throttle sensor, proceed as follows:

1. Warm the engine to the normal operating temperature.
2. Connect the tachometer to the engine.
3. Disconnect the connector **(Brown)** as shown in figure.

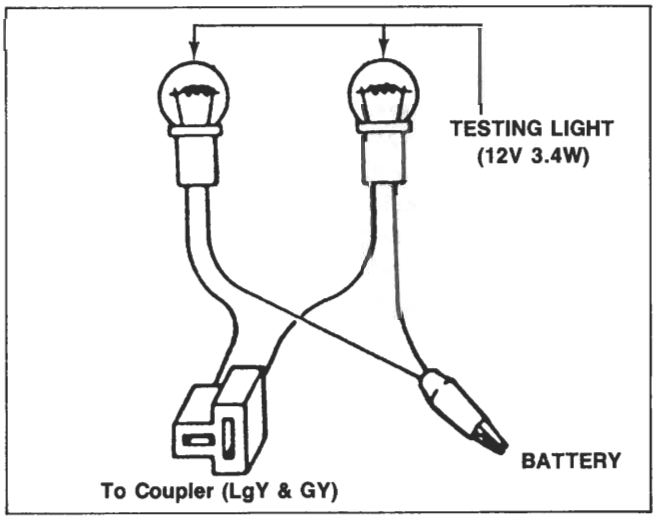


4. Connect the negative probe of the voltmeter to each terminal **(GY and LgY)** and connect the positive probe to the **B** terminal of the alternator.
5. Start the engine. Quickly decelerate the engine speed from **3,000 rpm** and make sure that the current flows to both teminals simultaneously. The engine speed should be **1,000~1,200 rpm.**



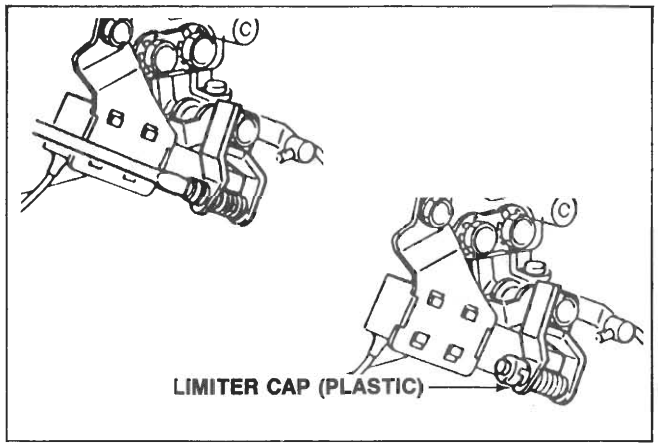
Reference:

The testing light as shown in figure can be prepared and used in place of Steps 4 and 5. In this case, the testing light turns on when current flows.



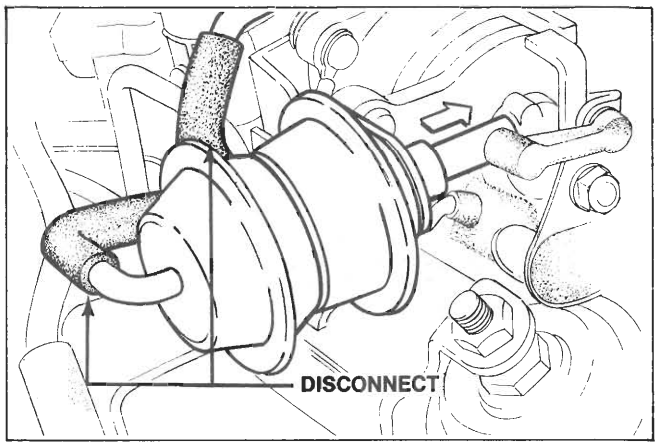
6. If the current does not start to flow to both terminals simultaneously, remove the cap from the throttle sensor adjusting screw.
7. Adjust the timing of the current flowing to the voltmeter **A (LgY)** by turning the throttle sensor adjusting screw. When the adjusting screw is screwed in, the current will begin to flow earlier, when the adjusting screw is screwed out, current will flow later.

8. After adjusting, install the plastic limiter cap onto the adjusting screw.



● CHECKING NO.1 AND NO.2 CHOKE DIAPHRAGMS

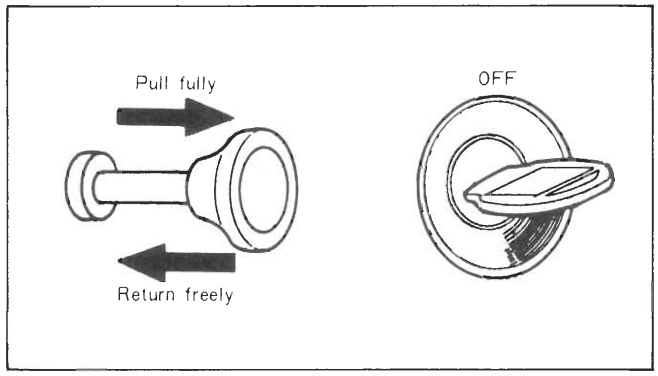
1. Remove the air cleaner assembly.
2. Start the engine and run it at idling speed.
3. Disconnect the vacuum sensing tubes from the No.1 and No.2 choke diaphragms. Each diaphragm shaft should move out from the choke diaphragm.

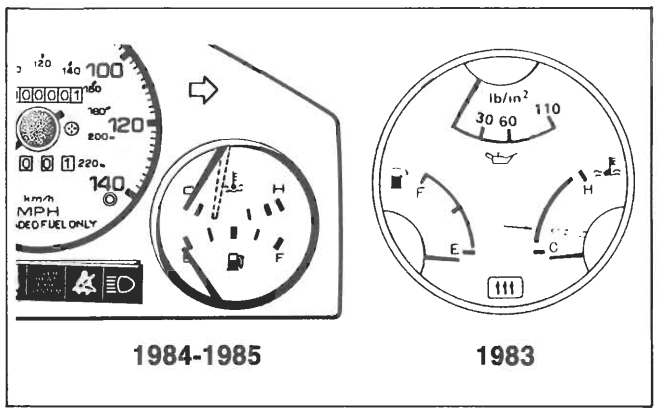


C. AUTOMATIC CHOKE RELEASE SYSTEM

● CHECKING AUTOMATIC CHOKE RELEASE SYSTEM

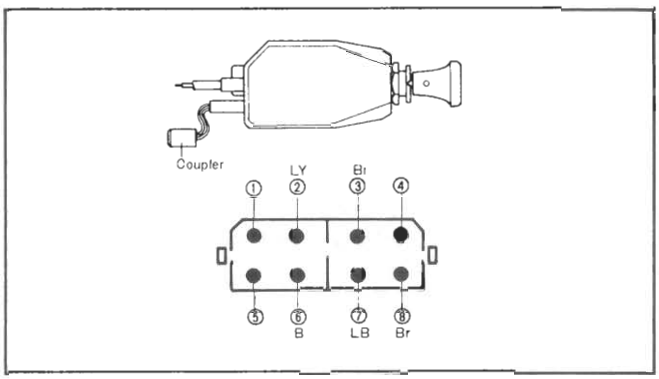
1. When the engine is cold, pull the choke knob fully with the ignition switch off, and check that the choke knob returns automatically.
2. Connect a tachometer to the engine.
3. Set engine speed to **2,000 rpm with choke knob**.
4. Leave the engine running and see that the choke knob automatically returns completely when the temperature gauge indicates the range shown in the figure.





● CHECKING CHOKE MAGNET (1983)

1. Disconnect the connector from the choke switch.
2. Check the continuity between the numbered terminals in the connector using an ohmmeter. The continuity should exist between 6 and 8 terminals.



● CHECKING CHOKE SWITCH & CHOKE MAGNET (1984-1985)

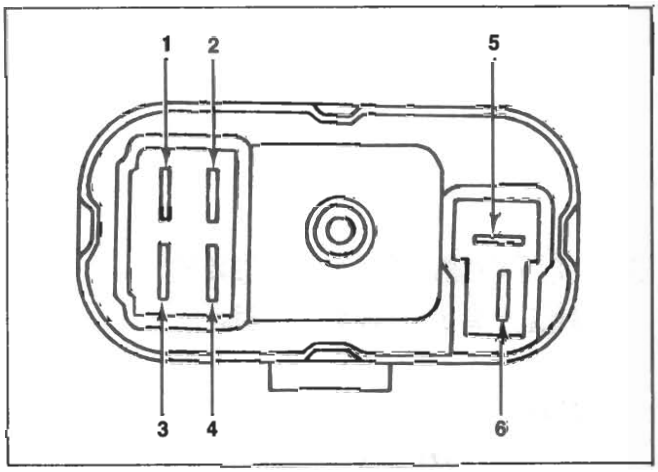
1. Disconnect the connector from the choke switch.
2. Check the continuity between the numbered terminals in the connector using an ohmmeter.

Choke knob pulled out	Numbers-continuity
10 ± 2 mm (0.4 ± 0.08 in)	3 – 7
Any position (Choke magnet)	6 – 8

● CHECKING CHOKE RELAY (1984-1985)

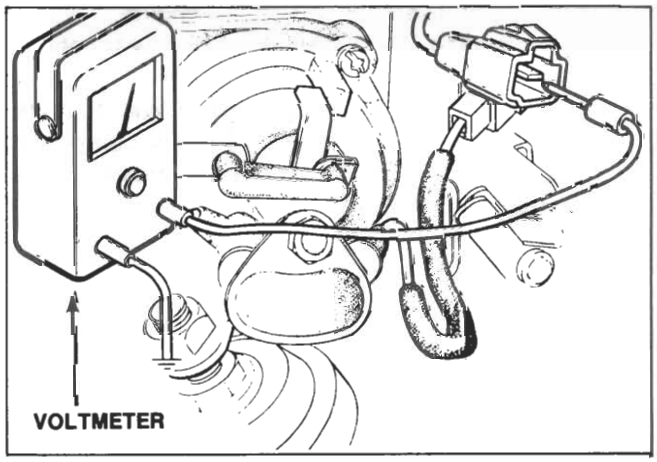
1. Disconnect the connector from the relay.
2. Check the continuity between the numbered terminals using an ohmmeter.

Numbers -continuity	Numbers -No continuity	Remarks
1 to 2	3 to 4	Without power applied
3 to 4	1 to 2	Connect the battery: position to terminal 6 and negative to 5.



● CHECKING CARBURETOR HEATER

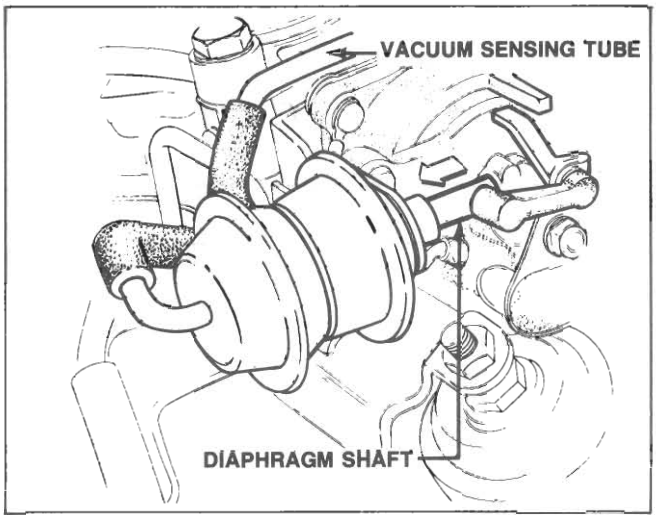
1. Disconnect the connector of the No.1 water temperature switch and connect a jumper wire to both terminals in the connector.
2. Connect a tachometer to the engine.
3. Disconnect the carburetor heater connector and connect a voltmeter to the connector.
4. Start the engine and set engine speed to 2,000 rpm with choke knob. See that current flows to the carburetor heater lead, but it does not flow when the choke knob is pushed back completely.
5. Connect one probe of an ohmmeter to the carburetor heater lead and the other to the carburetor body. If there is no meter movement, the carburetor heater has an open circuit and must be replaced.



● CHECKING CHOKE DELAY VALVE

1. Warm the engine to the normal operating temperature.
2. Stop the engine and remove the air cleaner assembly.
3. Disconnect the vacuum sensing tube from the No.1 choke diaphragm.
4. Start the engine and run it at idling speed. Check to see that the diaphragm shaft is fully pulled in to the diaphragm within **26~38 seconds** after connecting the disconnected vacuum sensing tube to the No.1 choke diaphragm.

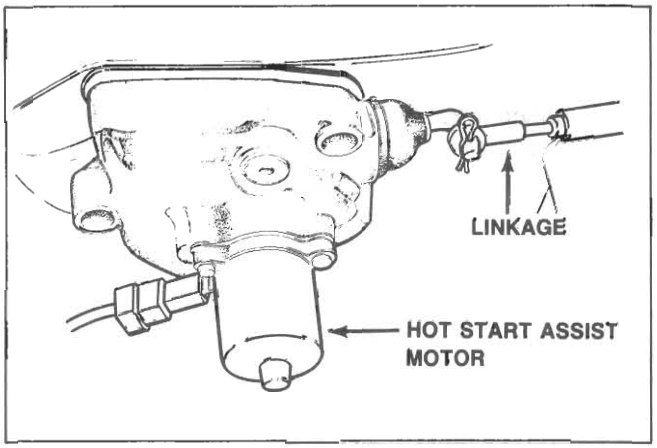
   Note:
   On vehicles equipped with automatic transmission, place the selector lever to "N" position.



D. HOT START ASSIST SYSTEM

● CHECKING HOT START ASSIST SYSTEM

1. Inspect the hot start assist linkage for proper installation, no sticking or binding, and full return.
2. Warm the engine to normal operating temperature then stop the engine.
3. Disconnect the connectors for leading and trailing primary wires from the ignition coils.
4. Crank the engine. Check to see that the hot start lever operates and throttle valves open.

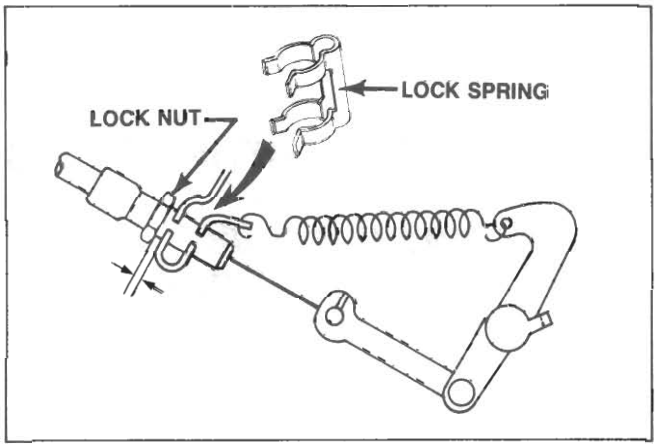


● ADJUSTING HOT START ASSIST CABLE

1. Pull the start assist motor inner cable until the stopper lever touches to the start lever and check the free play.

   Free play: 1~2 mm (0.04~0.08 in)

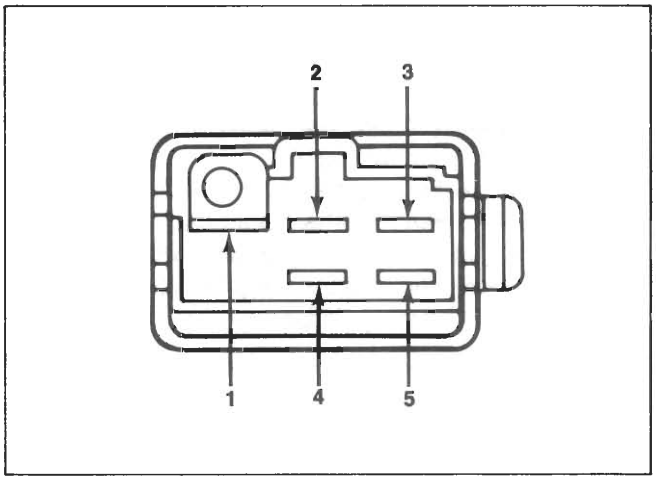
2. **If** the free play is not within the specified value, loosen the screw and adjust it.



● CHECKING HOT START ASSIST RELAY (1983 only)

1. Disconnect the coupler from the relay.
2. Check the continuity, referring to the following table:

Numbers-continuity	Numbers-No continuity	Remarks
1 to 5	1 to 3	Without power applied
1 to 3	1 to 5	Connect the battery : positive to terminal 2 and negative to 4.



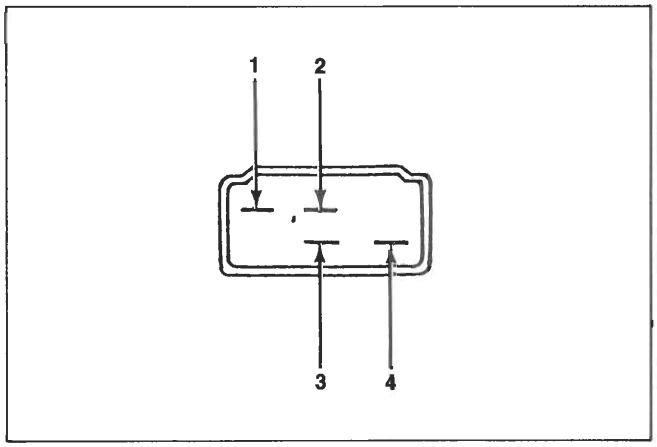
• **Relative Parts Inspection**

Check the No.1 water temperature switch.

● CHECKING HOT START ASSIST RELAY (1984-1985)

1. Disconnect the connector from the relay.
2. Check the continuity between 1 and 4 terminals, referring to the following table:

Continuity	Remarks
Closed	Without power applied
Open	Connect the battery: positive to terminal 2 and negative to 3.



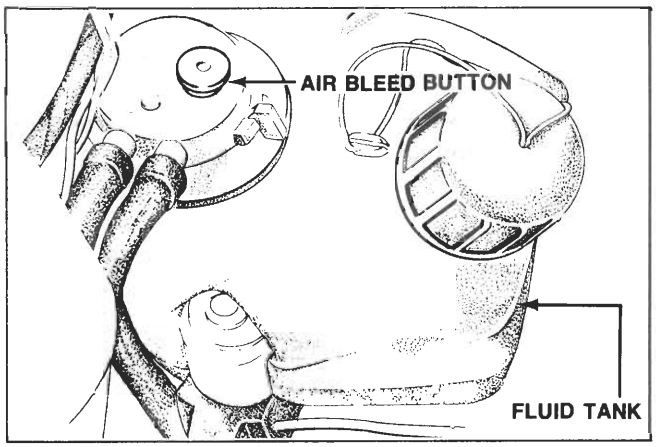
• **Relative Parts Inspection**

Check the No.1 water temperature switch.

E. SUB-ZERO STARTING ASSIST DEVICE (Except for California)

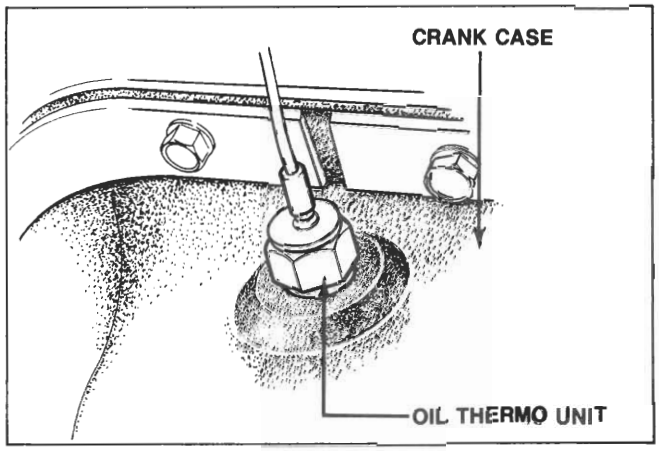
● CHECKING SUB-ZERO STARTING ASSIST DEVICE

1. Make sure that there is sufficient starting assist fluid in the tank. Replenish if necessary.
2. Disconnect the connector of "S" terminal from the starting motor magnetic switch.
3. Remove the air cleaner cover.
4. Turn the ignition key to the "START" position and make sure that the starting assist fluid does not spout from the nozzle of the carburetor. [Ambient temperature should be **above -18°C (0°F)**]



5. Disconnect the connector from the oil thermo unit on the oil pan and ground the disconnected connector to the body.
6. Turn the ignition key to the "START" position with the air bleed button of the tank kept pushed, make sure that the starting assist fluid spouts out from the nozzle of the carburetor.
   - **Sub-Zero Starting Assist Fluid**

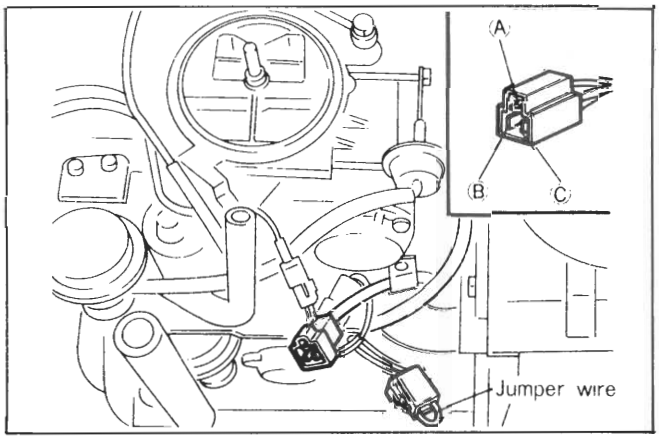
   The mixture proportion of starting assist fluid should be **90% high quality ethylene glycol anti-freeze solution plus 10% water.**



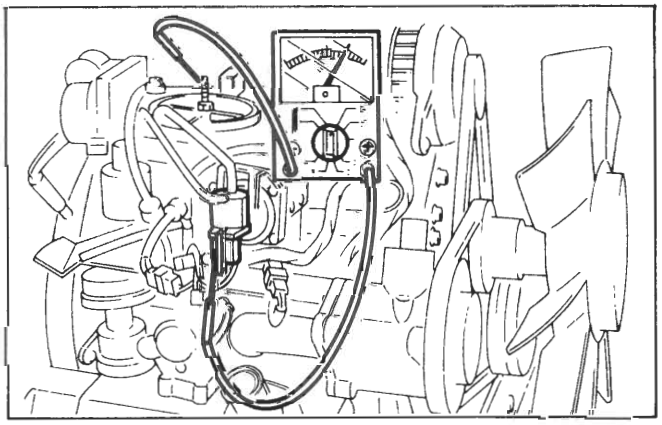
F. MAIN AIR BLEED CONTROL SOLENOID VALVE (1984-1985 only)

● CHECKING SIGNAL FOR MAIN AIR BLEED CONTROL SOLENOID VALVE

1. Warm the engine and run it at idling speed.
2. Connect a tachometer to the engine.
3. Disconnect the connector from the throttle sensor and connect a jumper wire to A and C terminals of the connector.



4. Connect a voltmeter to the main air bleed control solenoid (Br) terminal and ground.
5. Increase the engine speed and observe the voltmeter reading.



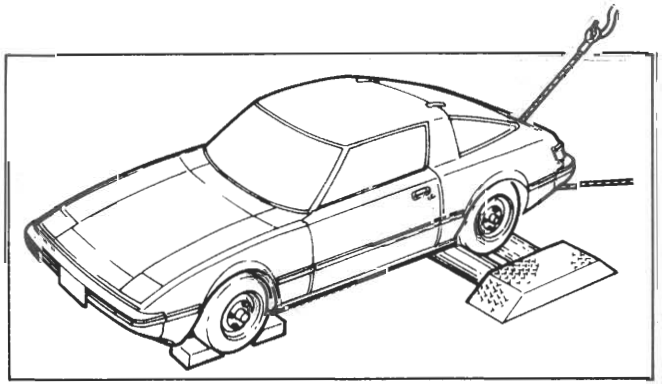
Engine speed (rpm)	Voltage (V)
Idling speed ~ 3,000	approx.12
3,000 ~ 4,000	below 2
more than 4,000	approx.12

6. Disconnect the jumper wire connected in Step 3 and connect the connector to the throttle sensor.
7. Position the vehicle on a rolling-road tester.

   Warning:
   Use wire rope to secure the vehicle so it does not move forward.

8. Increase the vehicle speed and observe the voltmeter reading.

   Below 50 mph - approx.12V
   Above 50 mph - below 2V



G. HIGH ALTITUDE COMPENSATOR SYSTEM

• CHOKE PISTON ROD (Federal Vehicles)

There are 7 kinds of choke piston rods which vary in length. Each rod changes the choke valve opening angle 5 degrees. If problems occur with an over-rich mixture upon cold-starting, please refer to the following table.

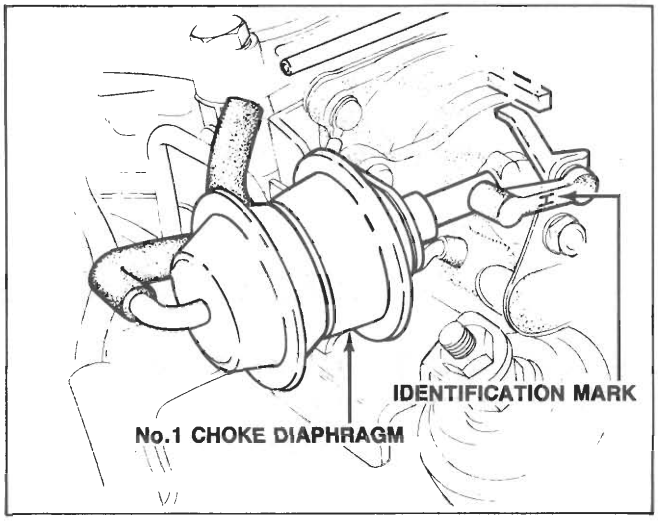
Install the choke piston rod according to the following table.

Identification Marking							
Before Modification	E	F	G	H	I	J	K
After Modification	C	D	E	F	G	H	I

Example:
If vehicle is equipped with a choke piston rod marked "G" it should be replaced by rod "E".

These choke piston rods are made of black plastic and attach to the No.1 choke diaphragm (see illustration).

Use the various rods to make adjustments to the choke valve on any Federal spec RX-7 with the high altitude compensator system (HAC).

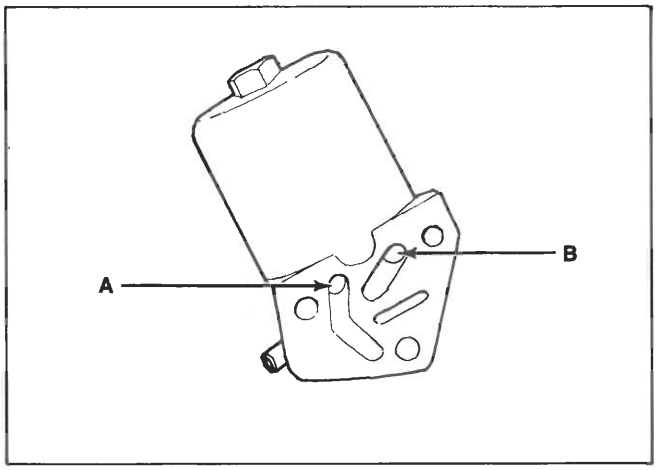


• CHECKING ALTITUDE COMPENSATOR VALVE

An altitude compensator valve is fitted to the carburetor to optimize the air fuel mixture at high altitude by supplying additional air into the carburetor to overcome excessively rich mixture due to low atmoshperic pressure at high altitudes.

To check the altitude compensator valve, proceed as follows.

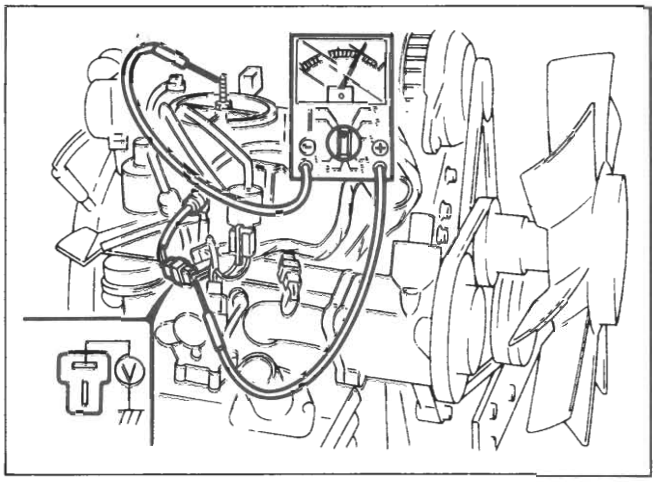
1. Remove the air cleaner and start the engine. Make sure the engine operates smoothly.
2. Blind the slow port on the carburetor air horn by using a finger and make sure the idle speed drops at altitude of more than **500~1,500 m (1,640~4,920 ft)**. If not, perform the following test.
   a) Remove the altitude compensator valve.
   b) Blow through the valve from port **A** and **B**,and check to see that the air passes through the valve when the altitude is more than **500~1,500 m (1,640~4,920 ft)**.



Note:
The operating specification of the altitude compensator valve will be changed by atmospheric pressure.

H. RICHER SOLENOID VALVE (1984-1985 M/T only)

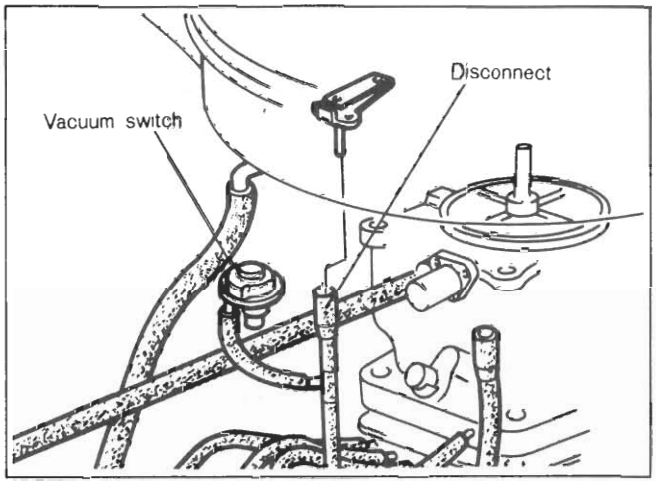
• CHECKING SIGNAL FOR RICHER SOLENOID VALVE



1. Start the engine and run it at idling speed.
2. Connect a voltmeter to the richer solenoid **(WR)** terminal and ground, then take a reading.

   Voltage: 12V

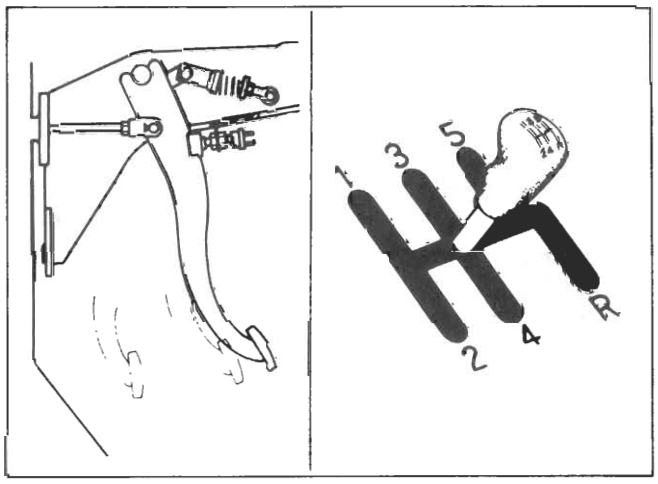
3. Increase the engine speed more than **1,500 rpm** and then decrease it. Observe the voltmeter reading. The voltmeter should show **below 2V for 30 seconds** when the engine speed becomes **1,100 rpm** or less.



4. Disconnect the vacuum sensing tube of the vacuum switch at the idle compensator and take a voltmeter reading.

   Votage: 0V

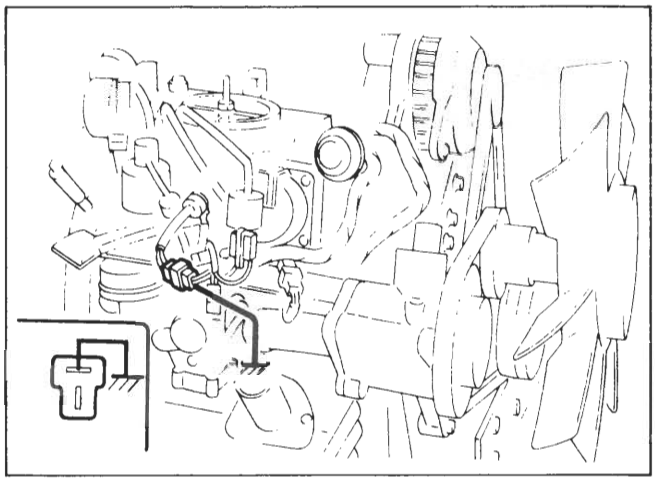
5. Reconnect the vacuum sensing tube to the idle compensator.



6. Disconnect the connector for clutch switch.
7. Depress the clutch pedal and shift into 1st~5th gear. Increase the engine speed more than **1,150 rpm** and then decrease it. Observe the voltmeter reading. **The voltmeter** should show **12V.**

● CHECKING RICHER SOLENOID VALVE

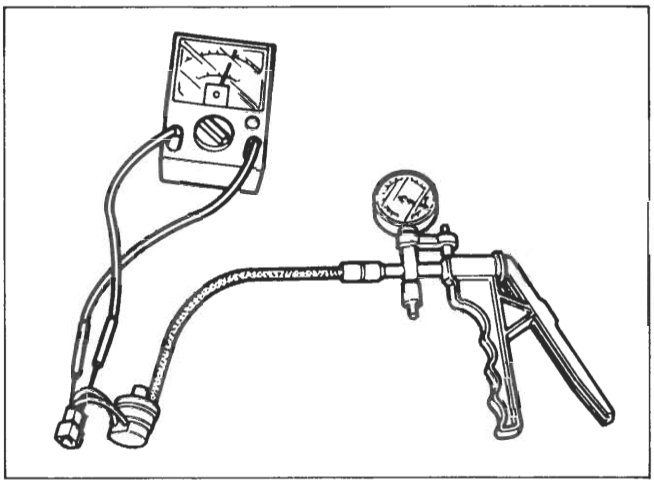
1. Start the engine and run it at idling speed.
2. Ground the richer solenoid **(WR)** terminal and make sure that the operating sound (clicking) is heard.



● CHECKING VACUUM SWITCH

1. Remove the vacuum switch.
2. Connect a vacuum pump to the vacuum switch.
3. Connect an ohmmeter to the vacuum switch, and then check the continuity between the switch terminals.

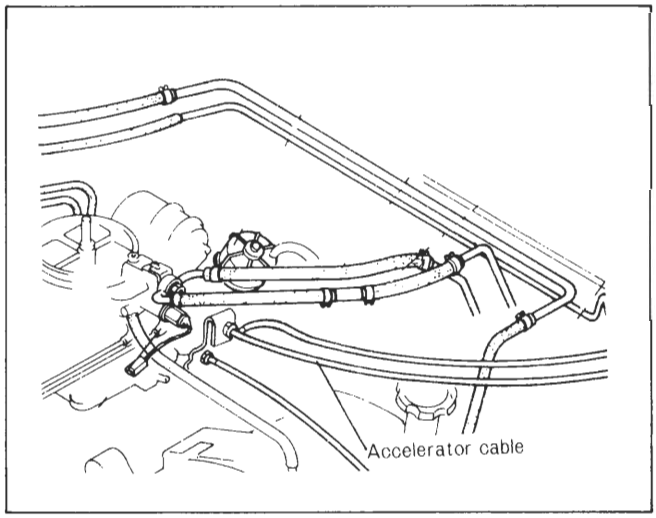
Vacuum	Switch
0 ~ 120 mm-Hg (4.7 in-Hg)	Open
more than 120 mm-Hg (4.7 in-Hg)	Closed



I. ACCELERATOR LINKAGE

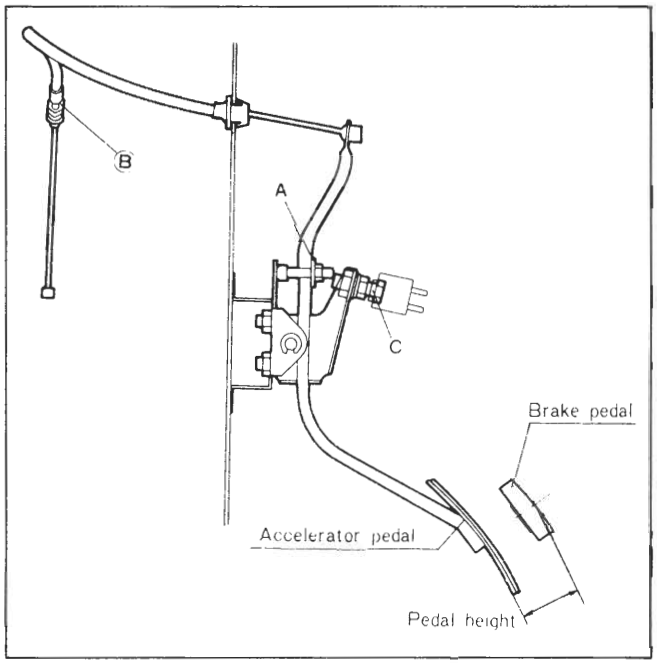
● CHECKING ACCELERATOR LINKAGE

Remove the air cleaner and, with the accelerator pedal fully depressed, observe the position of the carburetor throttle valves. They should be vertical (wide open position). Check that the accelerator linkage returns fully and does not bind. Examine the choke control for free operation.



• ADJUSTING ACCELERATOR CABLE

1. Check the accelerator pedal position. The accelerator pedal height should be **42 ± 5 mm (1.7 ± 0.2 in)** lower than the brake pedal height. If necessary, adjust the nut **A** to obtain the correct position.
2. Check the free play of the cable at the carburetor. It should be **1~3 mm**. If the free play is not within the specifications, adjust it with the nut **B**.
3. Depress the accelerator pedal all the way down to the floor and check to see that the throttle valves are wide open. If necessary, adjust the stopper bolt **C**.

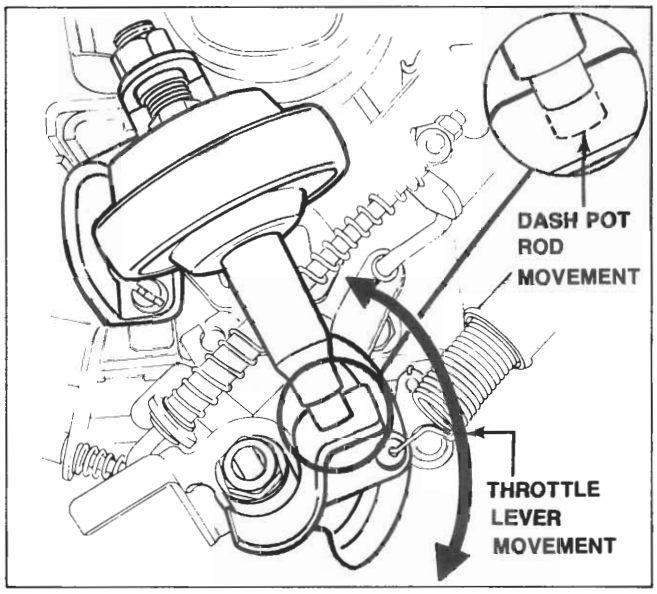


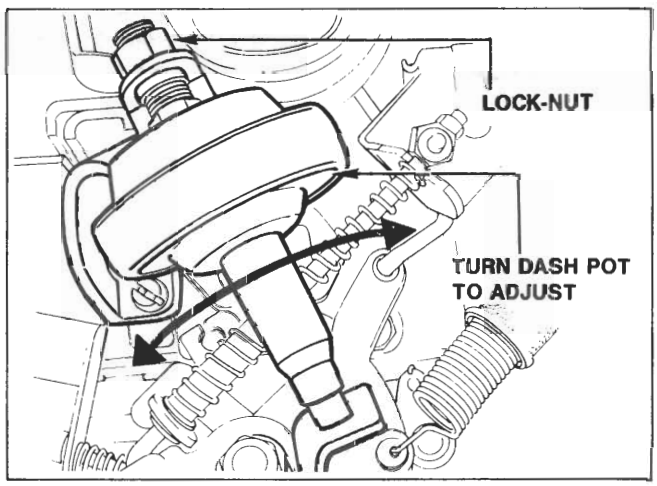
J. DASH POT

• CHECKING AND ADJUSTING DASH POT

To check and adjust the dash pot, proceed as follows:

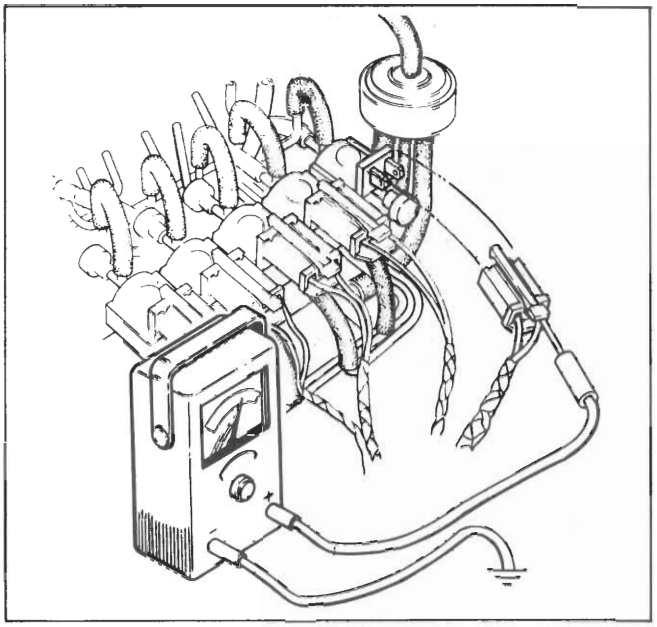
1. Remove the air cleaner.
2. Check that the dash pot does not keep the throttle lever from returning to the idle stop.
3. Quickly operate the throttle lever fully and make sure the dash pot rod extends quickly. Release the throttle lever and make sure that the throttle lever returns slowly to idle position after it has touched the dash pot rod.
4. Connect a tachometer to the engine.
5. Start the engine and warm up the engine to the normal operating temperature. Make sure the engine operates at the specified idle speed. Operate the throttle lever until it is away from the dash pot rod.
6. Slowly decrease the engine speed and check the engine speed at which the throttle lever just touches the dash pot rod. The engine speed should be **3,800~4,200 rpm**. If the engine speed is not within the specification, loosen the lock nut and adjust the engine speed by turning the dash pot diaphragm.





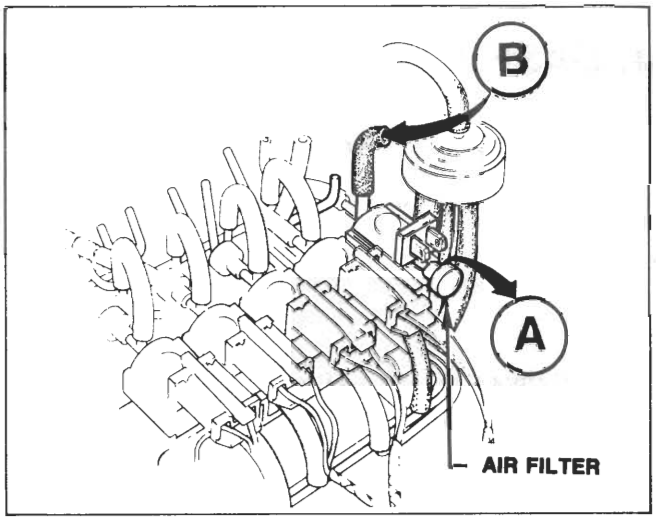
K. THROTTLE OPENER

• CHECKING SIGNAL INSPECTION

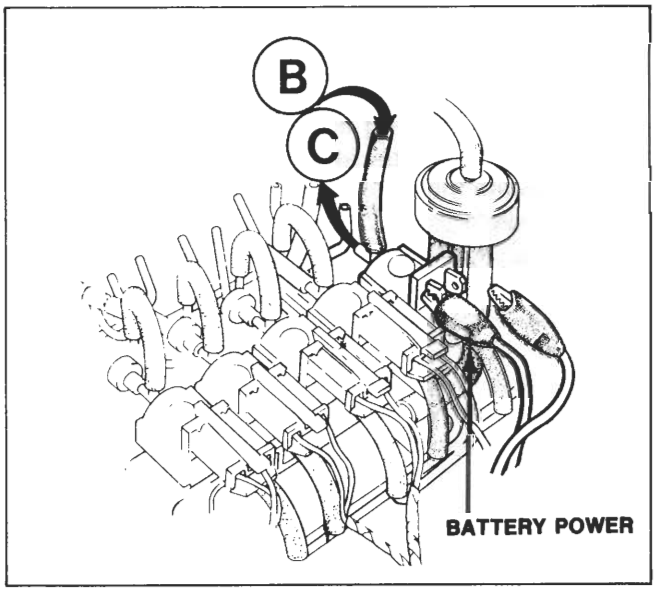


1. Warm the engine to the normal operating temperature and stop the engine.
2. Connect a tachometer to the engine.
3. Connect the positive probe of the voltmeter to the negative terminal of the air conditioner solenoid valve connector **(white)** and ground the negative probe of the voltmeter to the body.
4. Start the engine and turn on the air conditioner compressor switch.
5. Increase the engine speed to **2,000 rpm** with throttle. Slowly decrease the engine speed and check that the voltmeter reads near OV at **1,100 ± 100 rpm**.

• CHECKING AIR CONDITIONING SOLENOID VALVE



1. Disconnect the vacuum sensing tubes from the solenoid valve and vacuum pipe.
2. Blow through the solenoid valve from the vacuum sensing tube **B**. Make sure the air passes through the valve and comes out from the air filter **A** of the valve.

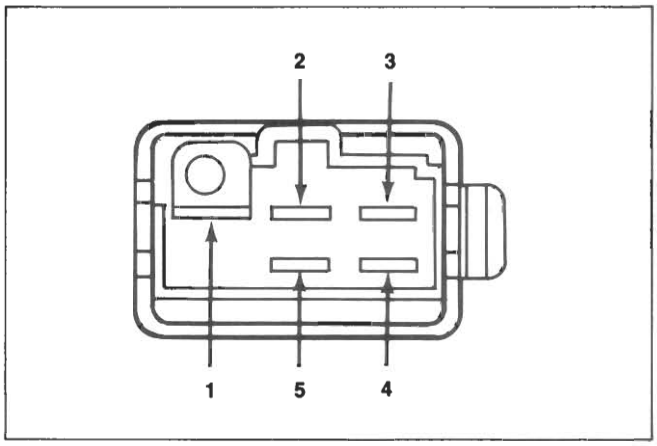


3. Disconnect the connector from the solenoid valve and connect the battery power to terminals on the valve.
4. Blow through the valve from the vacuum sensing tube **B**. Make sure the air passes through the valve and comes out from the port **C**.

• CHECKING AIR CONDITIONING RELAY (1983 M/T only)

1. Disconnect the coupler from the relay.
2. Check the continuity, referring to the following table:

Numbers-continuity	Numbers-No continuity	Remarks
1 to 5	1 to 3	Without power applied
1 to 3	1 to 5	Connect the battery : positive to terminal 2 and negative to 4.



- **Relative Parts Inspection**

Check the control unit as described.

• INSPECTING & ADJUSTING THROTTLE OPENER

1. Switch off all accessories.
2. Remove the fuel filler cap.
3. Disconnect the tube at the idle compensator in the air cleaner and plug the end of the tube.
4. Connect a tachometer to the engine and warm the engine to the normal operating temperature.
5. Disconnect the connector from the switching solenoid valve **(Gray)**.
6. Disconnect the vacuum sensing tubes from the leading vacuum control units on the distributor and plug the tubes.
7. Turn off the air conditioner switch.
8. Disconnect the connector from air conditioner solenoid valve. Connect the battery power to the terminal on the solenoid and connect the other solenoid terminal to ground. Check to see that the throttle opener operates and engine speed increases to **1,200 ± 50 rpm** in neutral.
9. If the engine speed is not within the specification, adjust it by turning the adjusting screw on 1984-1985. On 1983, turn the adjusting nut.