DATSUN

1980 ELECTRONIC FUEL INJECTION

Jerome Wabler

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DATSUN

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1980 MODELS

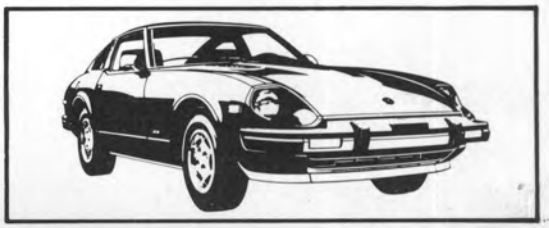

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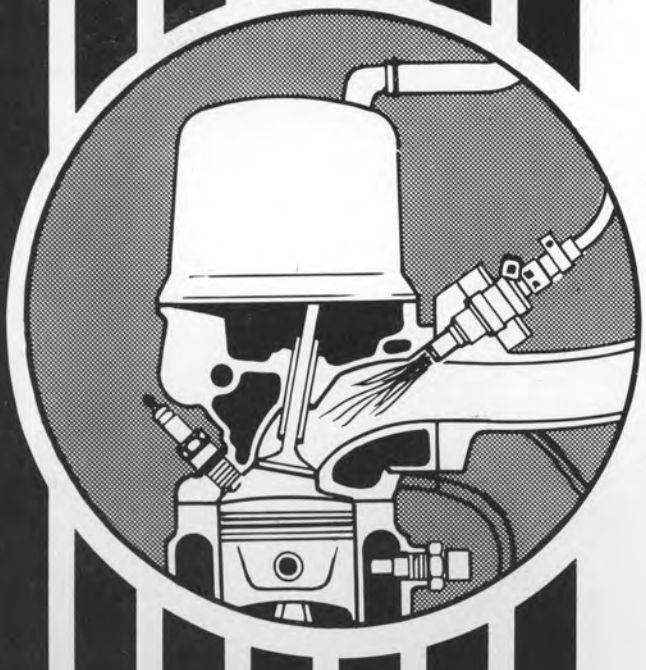
TABLE OF CONTENTS

Page



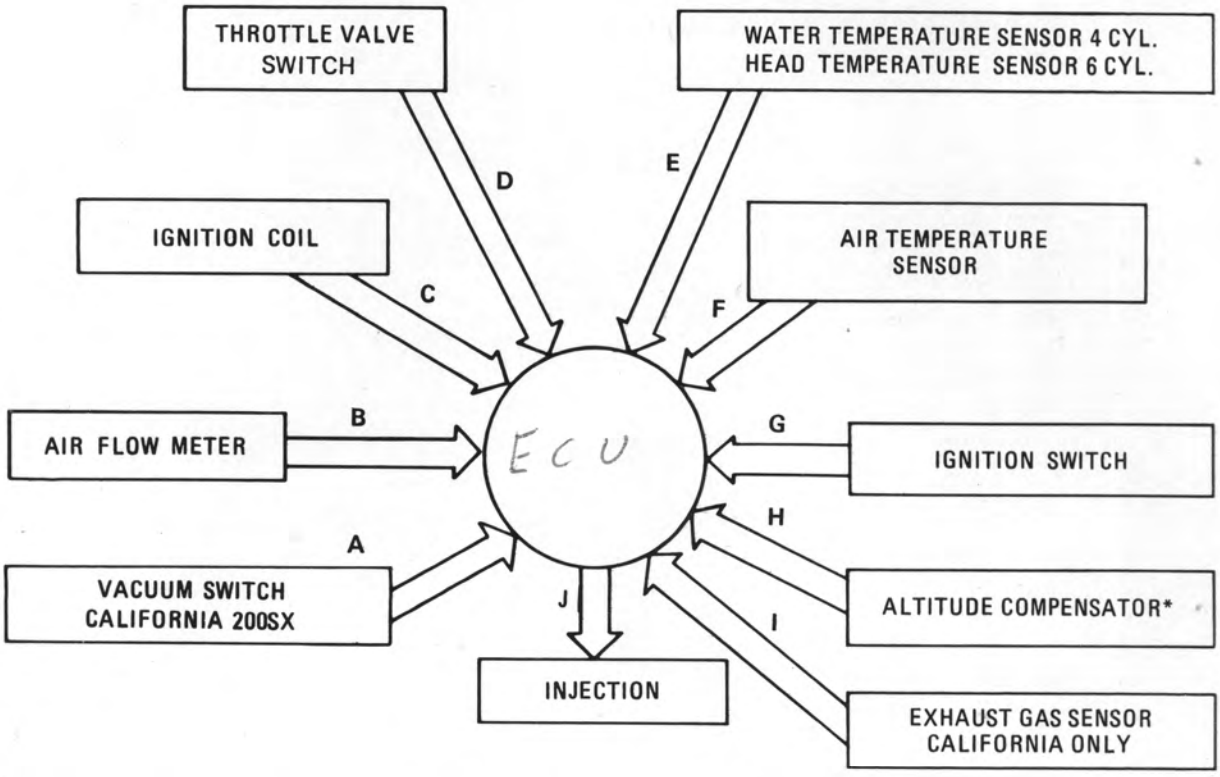
PRINCIPLES OF OPERATION

→Fuel Flow

→Air Flow

→Electrical System

DATSUN



Signal		Device	Item to be Monitored or Actuated
Input	A	Vacuum switch California 200SX	Manifold Vacuum
	B	Air flow meter	Quantity of intake air
	C	Ignition coil negative terminal	Engine rpm, fuel shut off during coasting
	D	Throttle valve switch	Opening of throttle valve; (idle and full enrichment, fuel shut off during coasting)
	E	Water Temp. sensor 4 cyl. Head Temp. sensor 6 cyl.	Engine coolant or head temperature (enriches mixture during cold running)
	F	Air temperature sensor	Temperature of intake air (enriches mixture if intake air is cold)
	G	Ignition switch "START" position	Starting enrichment
	H	Altitude compensator*	Leans mixture at high altitude
	I	Exhaust gas sensor California only	Density of oxygen in exhaust gas
Output	J	Injector	Injects fuel into intake manifold/port

*1977-78 & 1980 California models only.

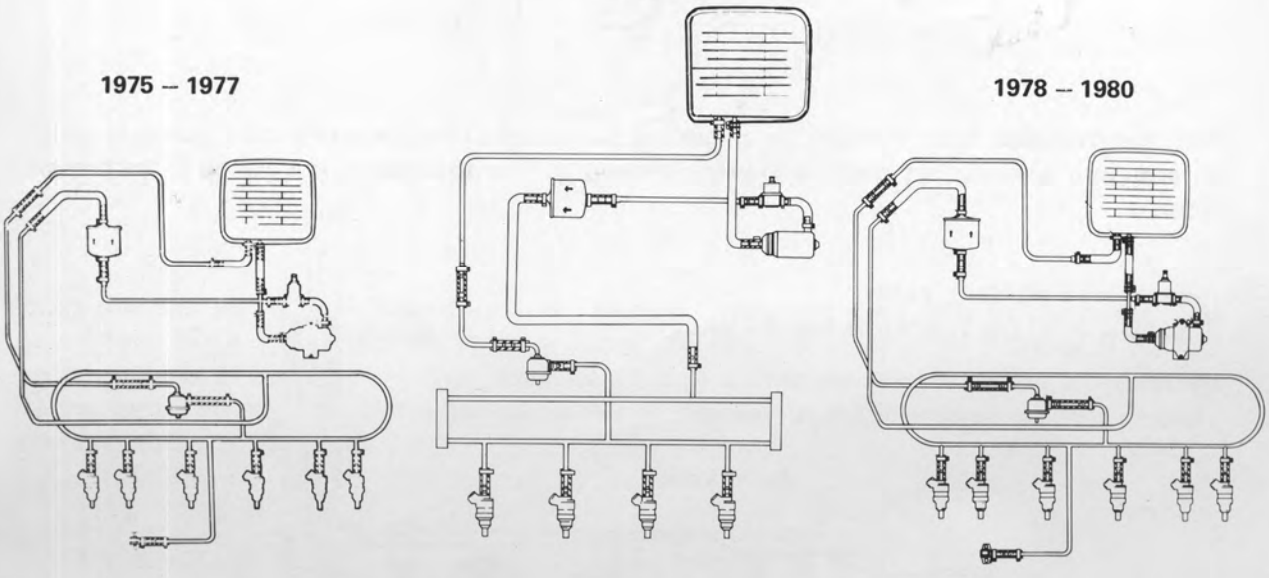
DATSUN ELECTRONIC FUEL INJECTION

Although Nissan Motor Co., Ltd. had been installing Electronic Fuel Injection on vehicles sold in Japan for several years, 1975 was the first year for the importation of this system to the United States.

The system used on Datsuns is similar to the so-called "L-Jetronic" system developed by Bosch in Germany, and employed by various auto manufacturers. It is called "L" Jetronic because it operates on the principle of air flow measurement. The "L" stands for "Luft," which is the German word for "air."

THE FUEL CIRCUIT

1980 – Later
200-SX

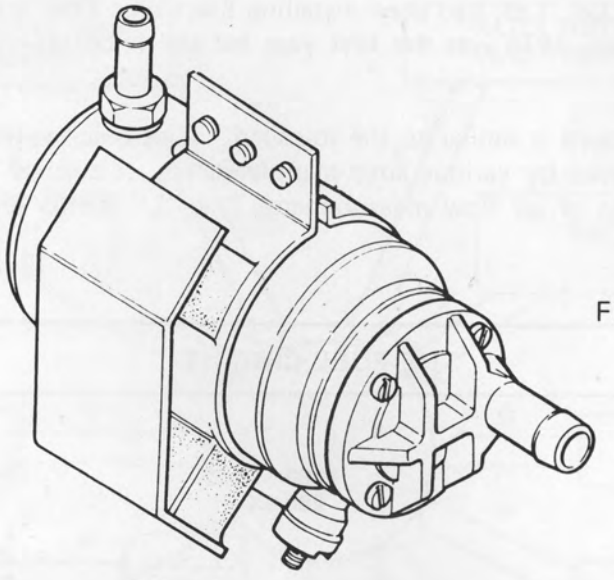


1975 – 1977

1978 – 1980

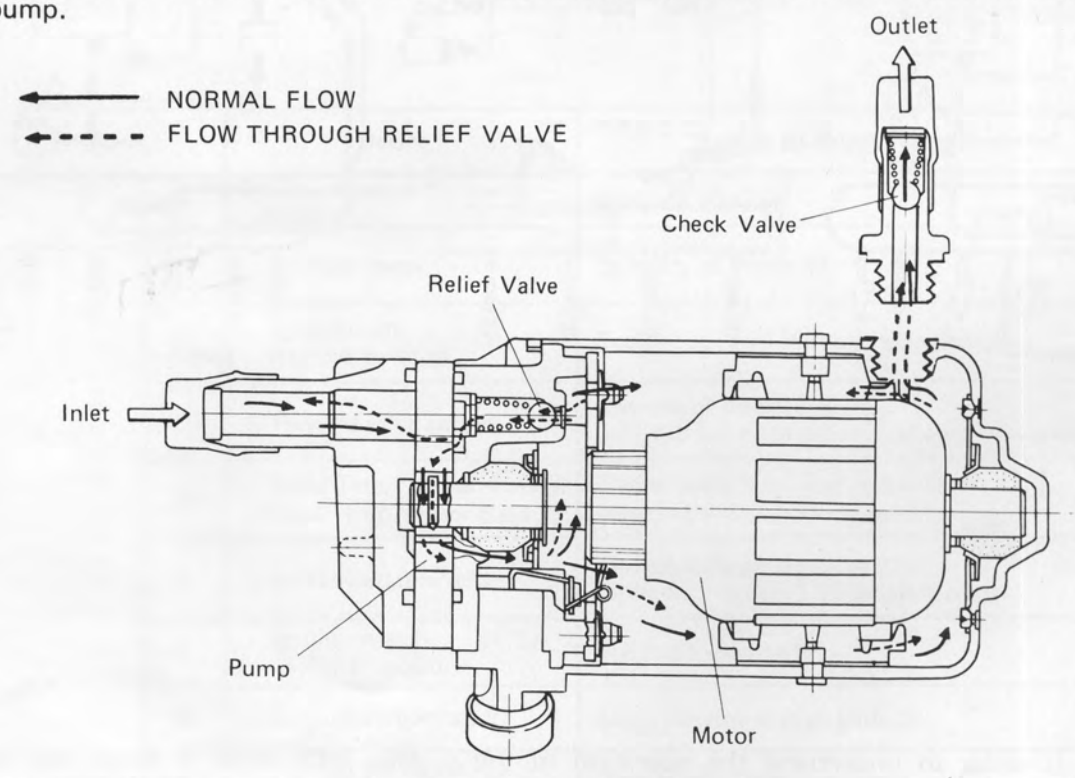
To make it easier to understand the operation of the system, let's break it down into its component subsystems. Here you can see the Fuel Circuit. Let's take a look at how this circuit works.

Fuel Pump



FUEL PUMP

First, fuel is drawn from the tank by an electric fuel pump. This is a rotary roller pump in which the armature actually has gasoline flowing around it. For this reason it is called a "wet" type pump.

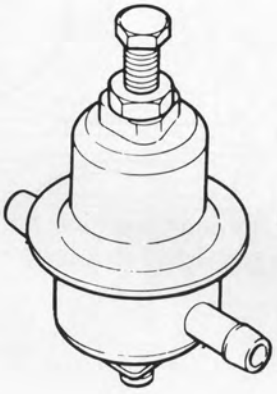


FUEL PUMP SECTIONAL VIEW

The fuel pump runs constantly whenever the engine is either running or being cranked. It will not run if the engine stops, even if the key is left in the "Ignition On" position.

The fuel pump also contains a pressure relief valve, which will let fuel recirculate in the pump when pressure goes above 43 to 64 psi. Due to the high fuel pressure present in this system, you should torque all hose clamps to 10–15 kg-cm (9–13 in.lbs.). Use an accurate torque driver or special tool J-26361. One thing to remember about this type of pump is that it is cooled and lubricated by liquid fuel, so running it dry might cause problems.

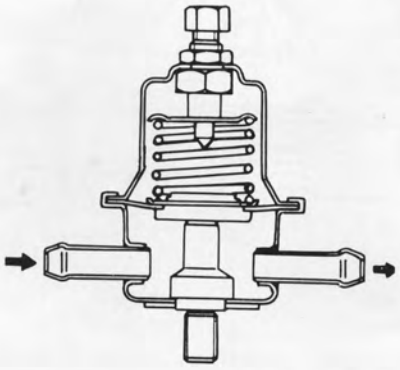
Fuel Damper



FUEL DAMPER

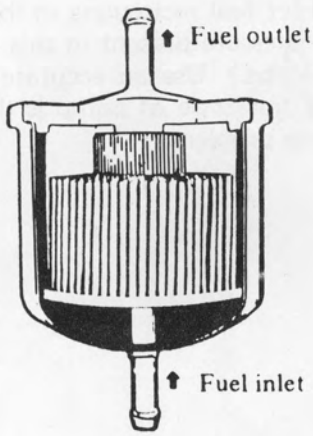
From the fuel pump, fuel flows to a fuel "damper," mounted right next to the pump. The damper acts like a shock absorber. It has a diaphragm which is under spring pressure. If the fuel pump puts out pressure surges, then these surges push against the diaphragm and are absorbed by the spring instead of making themselves felt all the way to the injectors, and thus possibly affecting engine performance.

FUEL
DAMPER
SECTIONAL
VIEW

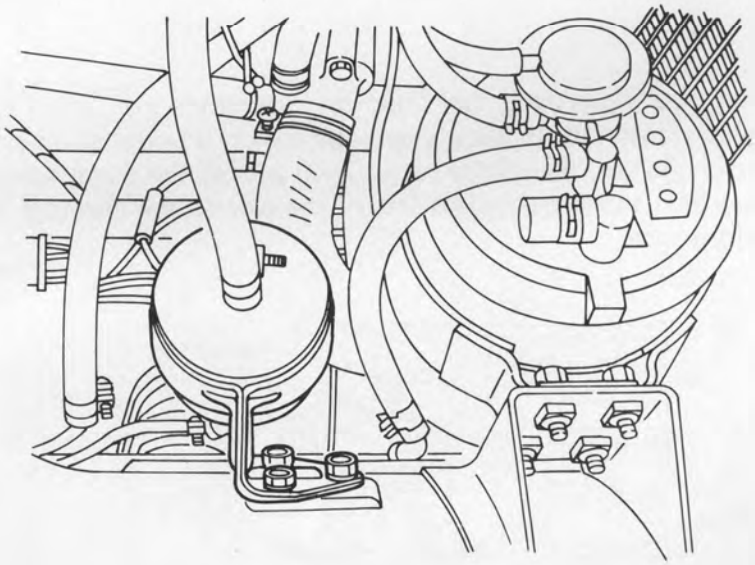


The fuel damper also acts as a muffler – that is, it keeps the pressure surges from making noises which could be heard by the driver.

Fuel Filter

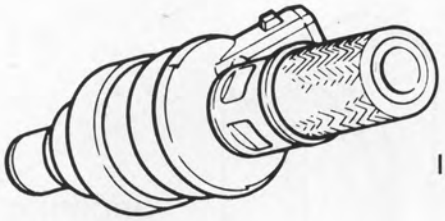


From the fuel damper, the fuel passes through the line to the engine compartment where it goes through a special filter, mounted on the right hand fender panel.



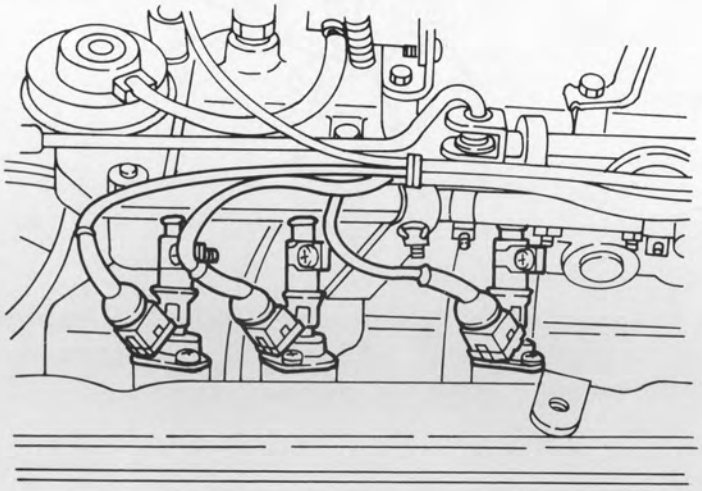
This filter is critical to proper engine operation, since if even the smallest particle becomes wedged in one of the injectors, the operation of that cylinder might be adversely affected. This filter should be changed every 25,000 miles on 1975–77 models, and every 30,000 miles on 1978 and later models. Sampling the fuel trapped in the fuel filter, both on the inlet and on the outlet side of the filter, will show you the condition of the fuel in the system.

Injectors

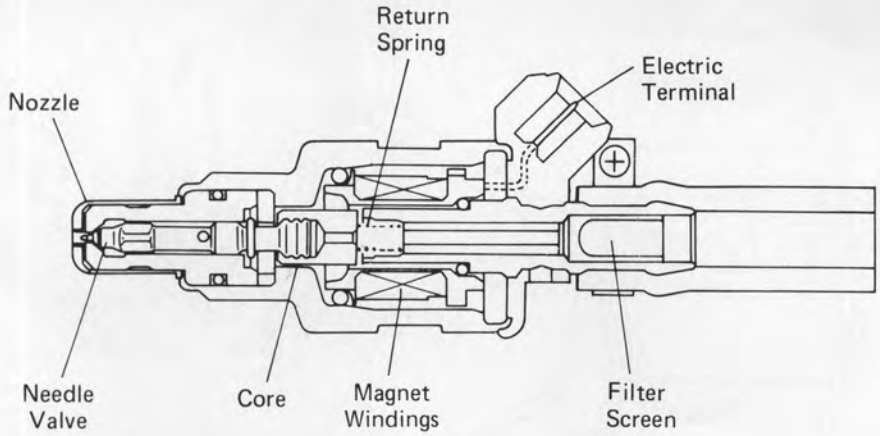


INJECTOR

From the fuel filter, gasoline flows through the line to the injectors. Thus, the injectors have fuel pressure behind them at all times.



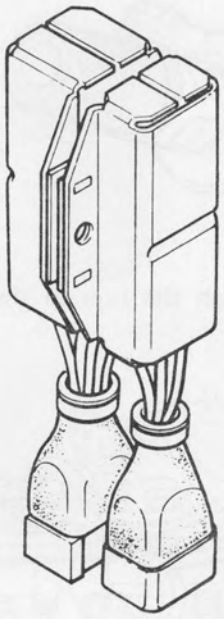
The injectors are mounted on the intake manifold next to the cylinder head intake ports. (Because of the injectors' location, this type of system is called manifold injection.)



The injectors are really solenoid valves. When they are energized, they open; gasoline is then squirted into the intake manifold. The longer they stay open, the more gasoline will be injected.

On Datsun fuel injection, all six injectors open and close at the same time. This happens once every revolution of the engine, triggered by the ignition coil through the E.C.U.

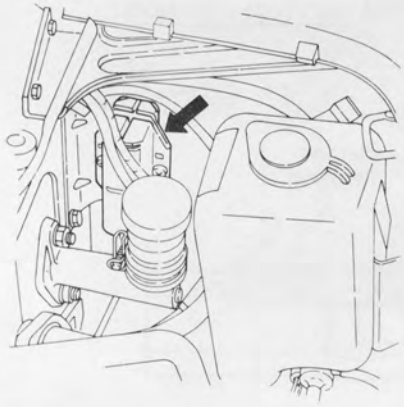
Injector Operation



DROPPING
RESISTOR

When the system is operating, the battery is connected directly to each injector through a resistor. Thus there are six resistors on the 280Z and 810. The resistor causes a voltage drop so that the injector operates on less than battery voltage.

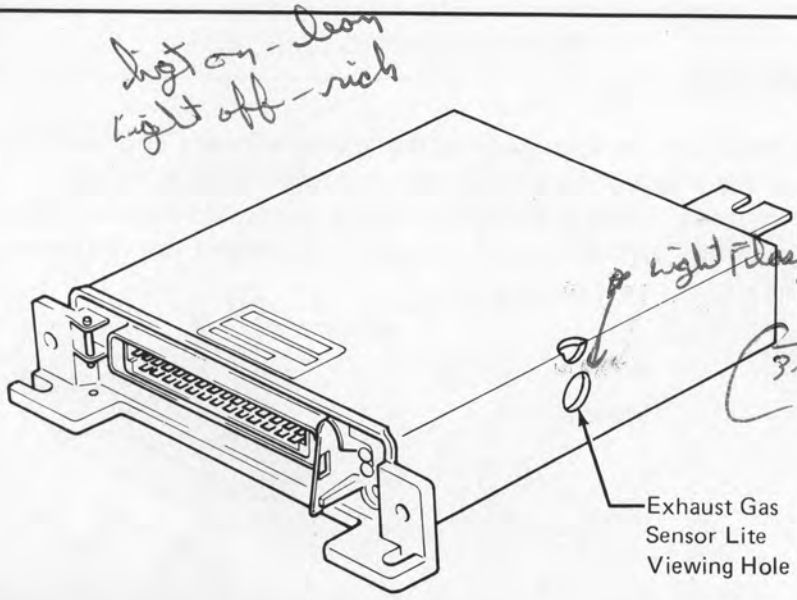
280Z & 280ZX
1975 and later



810 & 200SX
1977 – 80

The resistor also protects the injector from voltage surges coming from the alternator and from the effects of other components in the electrical system.

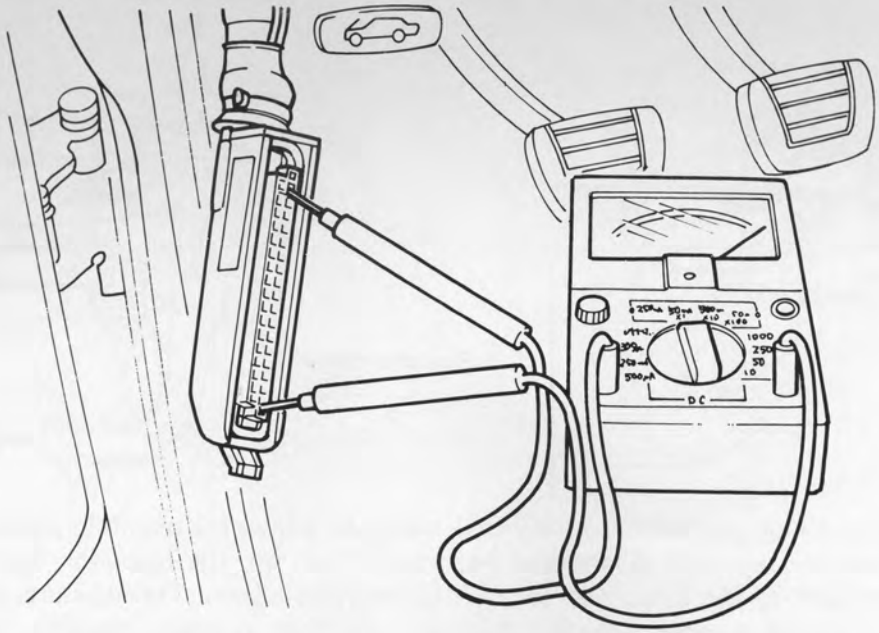
Control Unit



The injectors are grounded inside the Electronic Control Unit, or ECU. This unit controls the injectors by turning their ground on and off, just the way the transistor ignition control unit turns the coil ground on and off.

When the control unit grounds the injectors, current runs from the battery, through the resistor, through the injector and then finally into the control unit. Since the circuit is complete, the injector is energized. It opens and gasoline is injected into the manifold.

This is the basic principle of fuel injection operation. The control unit can govern how much fuel is injected by holding the injectors open for longer or shorter periods of time.



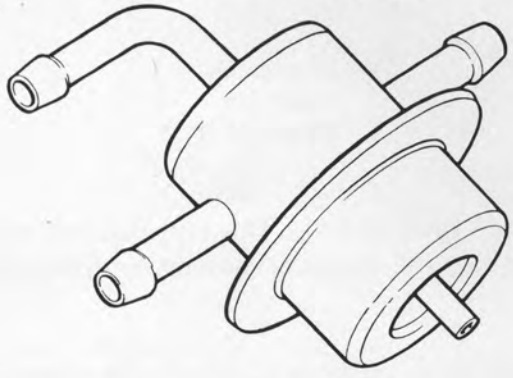
The ECU is mounted on the driver's side kick panel behind a protective cover. By the way, the large connector at this unit can be used to test the entire Fuel Injection System.

Fuel Pressure Regulation

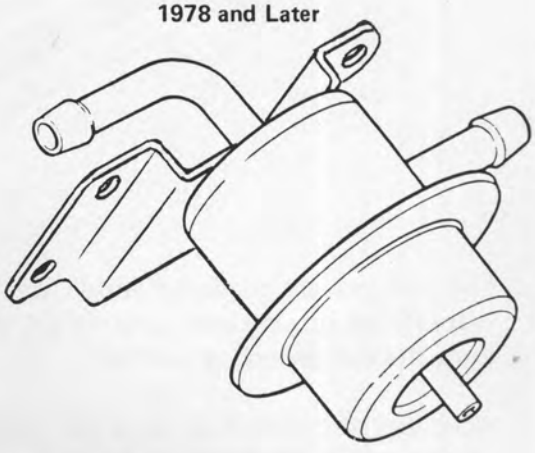
Obviously, the pressure of the fuel going to the injectors is very important. If the pressure goes up, more fuel will be injected during a certain period of time. If the pressure goes down, then less fuel will be injected. There is also the effect of manifold vacuum: if the vacuum gets very high, more fuel will be "sucked" out of the injectors; while if the vacuum drops, less fuel will pass through them.

Pressure Regulator

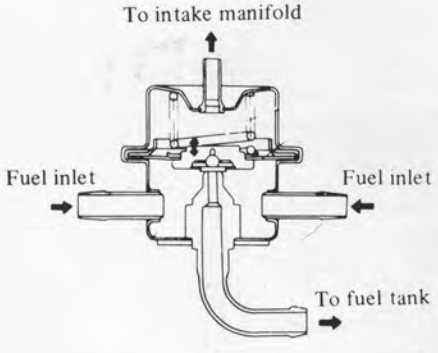
1975–77

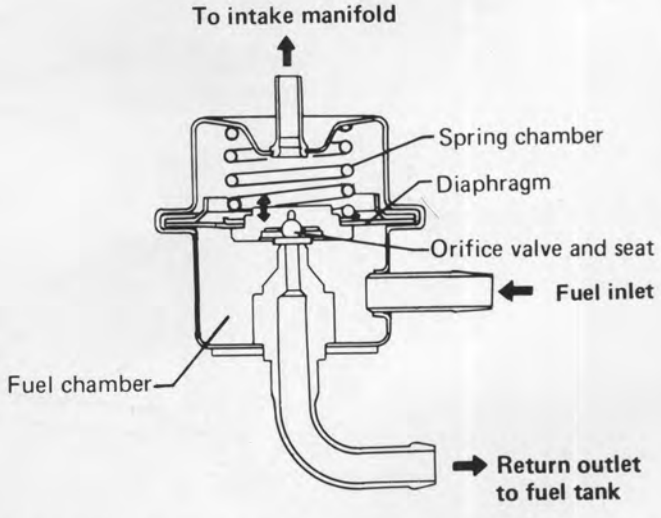


1978 and Later



Therefore, the system includes a fuel pressure regulator. When the pressure in the line gets too high, then this pressure regulator opens and allows some fuel to flow back to the fuel tank by the return line. When the engine is running, there is actually a constant bleed of gasoline back to the fuel tank.

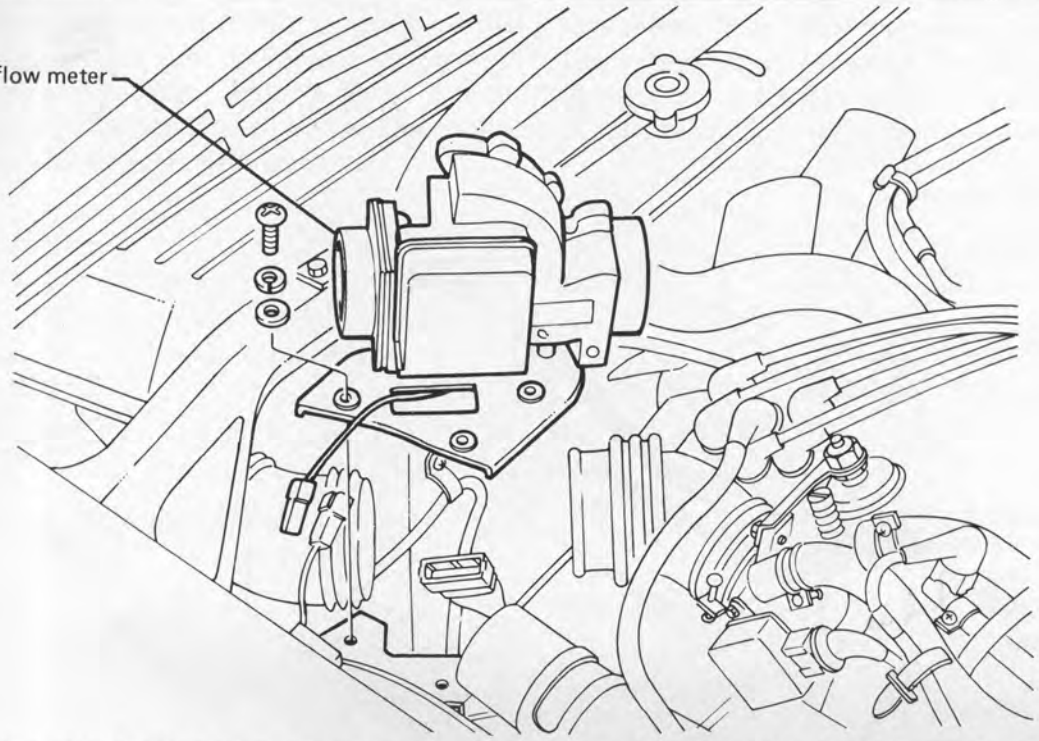




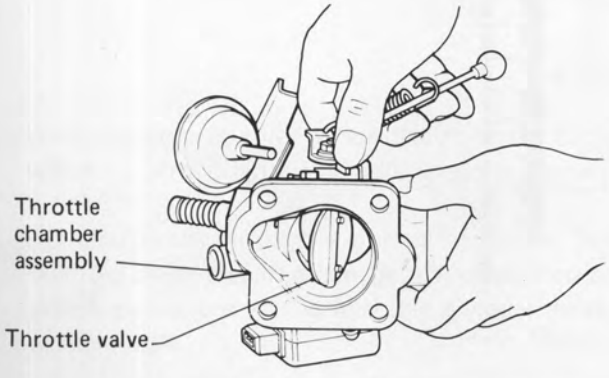
A vacuum sensing line, connected to the intake manifold, allows the manifold vacuum to operate against the pressure regulator diaphragm. As vacuum goes up, the regulator thus allows more fuel to bleed back to the tank, and so the fuel pressure lowers. The pressure regulator thus maintains a constant balance between fuel and manifold pressure, keeping the difference between them at 36 psi.

The pressure regulator is pre-set and cannot be adjusted.

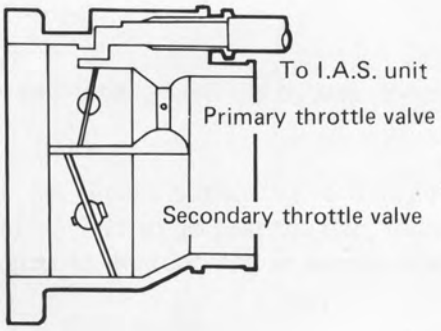
FUEL INJECTION AIR FLOW



How does the Control Unit know how much gasoline should be injected? The main source of information is the Air Flow Meter, which is mounted between the air cleaner and the throttle plate. This meter measures the amount of air coming into the intake manifold, in much the same manner as the gas tank gauge measures the amount of fuel in the tank.

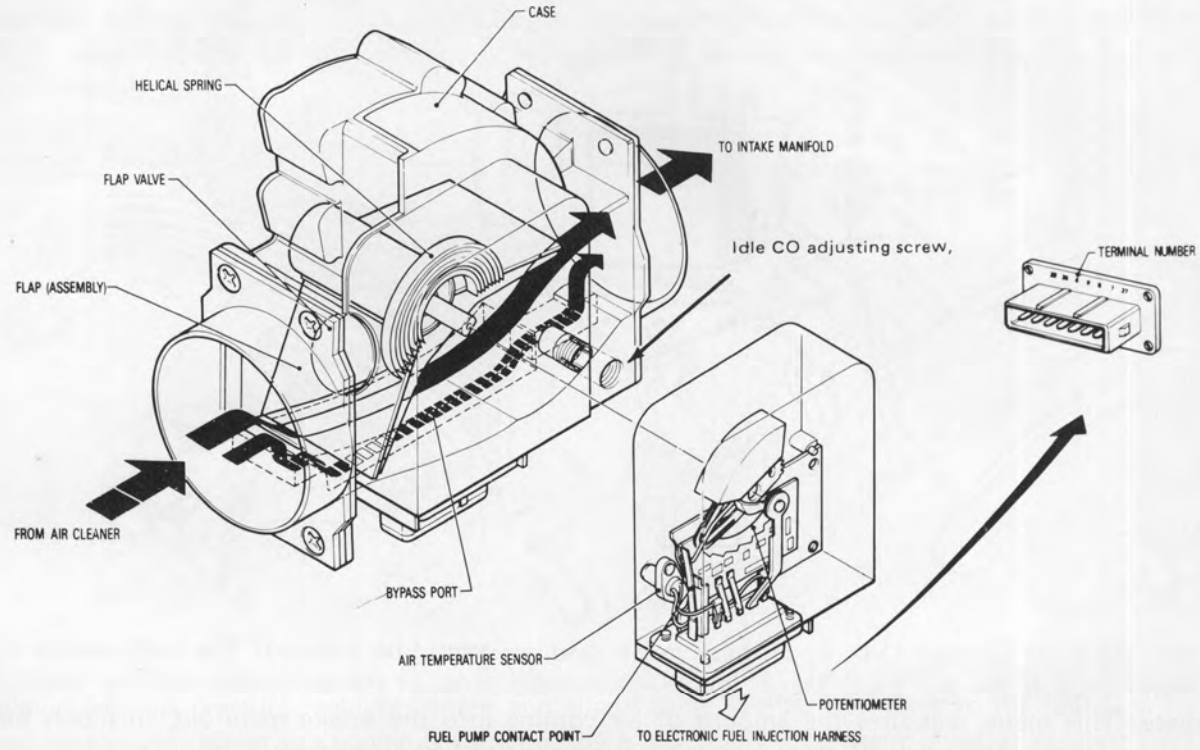


1980 – Later 200-SX

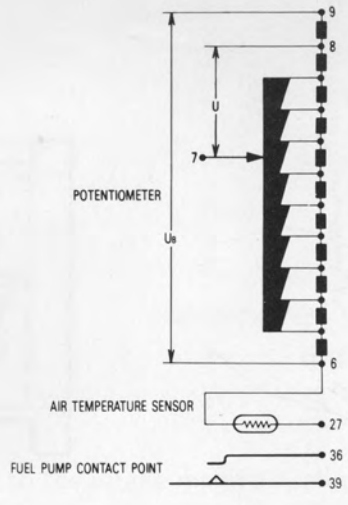


Just as with a carbureted engine, the speed of the engine is determined by the throttle. When the throttle is opened, air passes through the air filter and into the air flow meter. In the 200SX model this 2-stage throttle chamber is used.

Air Flow Meter



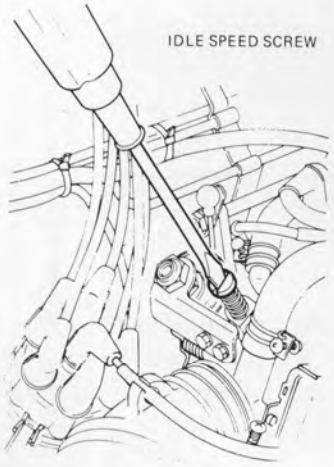
(Not used on 1978 and later models)



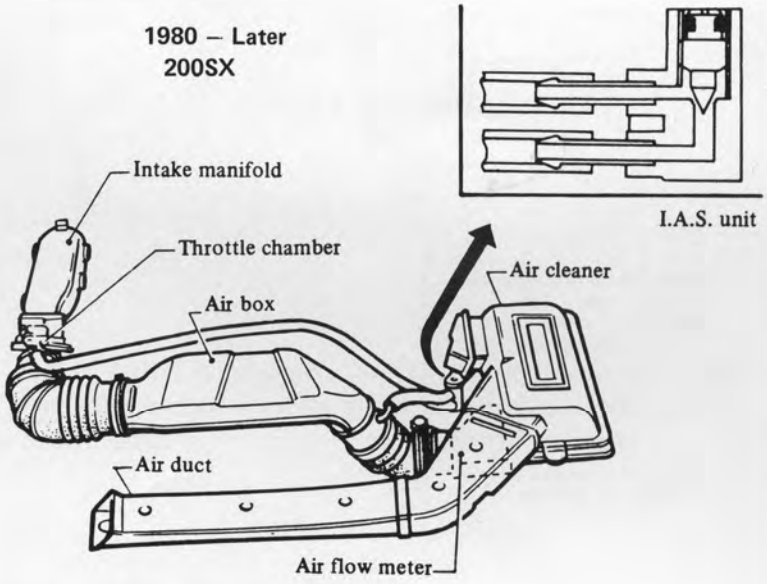
(Not used on 1978 and later models)

In order to pass through the meter, the air must push open a hinged flap. The more air passing through, the farther the flap will be pushed open. The air will then pass by the throttle plate and travel on into the cylinders.

The air flow meter is connected to the control unit, and sends a voltage signal to it. The farther the flap is pushed open, the stronger the signal which the air flow meter supplies to the control unit. The control unit then responds by holding the injectors open longer so they inject more fuel. Thus the air flow meter is the control unit's most important source of information which it uses to judge the fuel-air ratio. The control unit, the injectors, and the air flow meter form the heart of the fuel-injection system.



1980 – Later
200SX



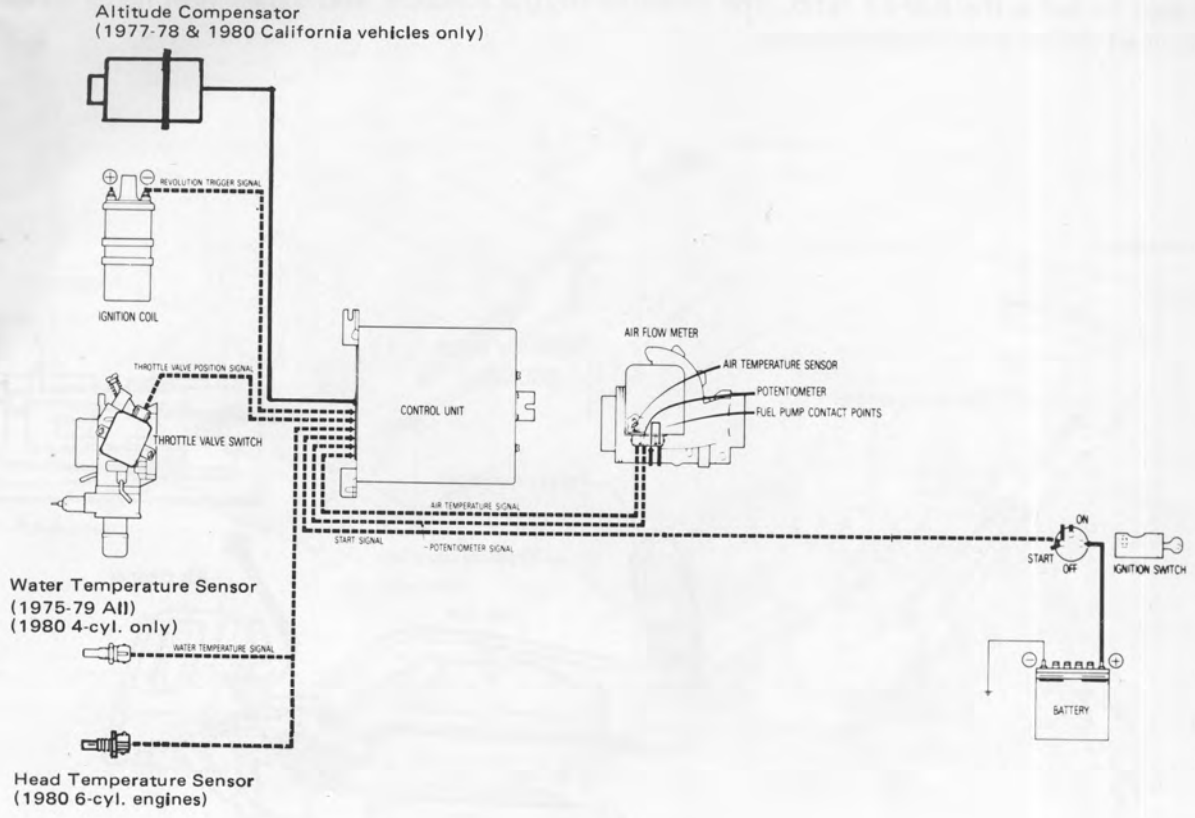
What happens at idle? When the throttle is closed, air passes through an idle bypass, the size of which is controlled by an idle speed adjusting screw.

Air also flows through a bypass in the air flow meter. (This bypass is installed so that air flow into the engine at idle can be uniform. You see, if all the air had to go past the flap, individual piston pulsations at the low idle speed would cause the flap to shudder, and an uneven fuel mix would result.

As you can see, the air flow in our injection system is even easier to understand than was the fuel flow. There is one point, however, which is very IMPORTANT: ANY VACUUM LEAK AT ALL, from the air flow meter to the intake valve, WILL CAUSE THE IDLE SPEED AND AIR-FUEL MIXTURE RATIO TO CHANGE, since this leaking air will not be measured by the air flow meter.

SENSOR INPUTS TO THE CONTROL UNIT

So far, we have looked at how the fuel and air actually reach the engine. We have also looked at the air flow meter, which is the principal source of input to the control unit.



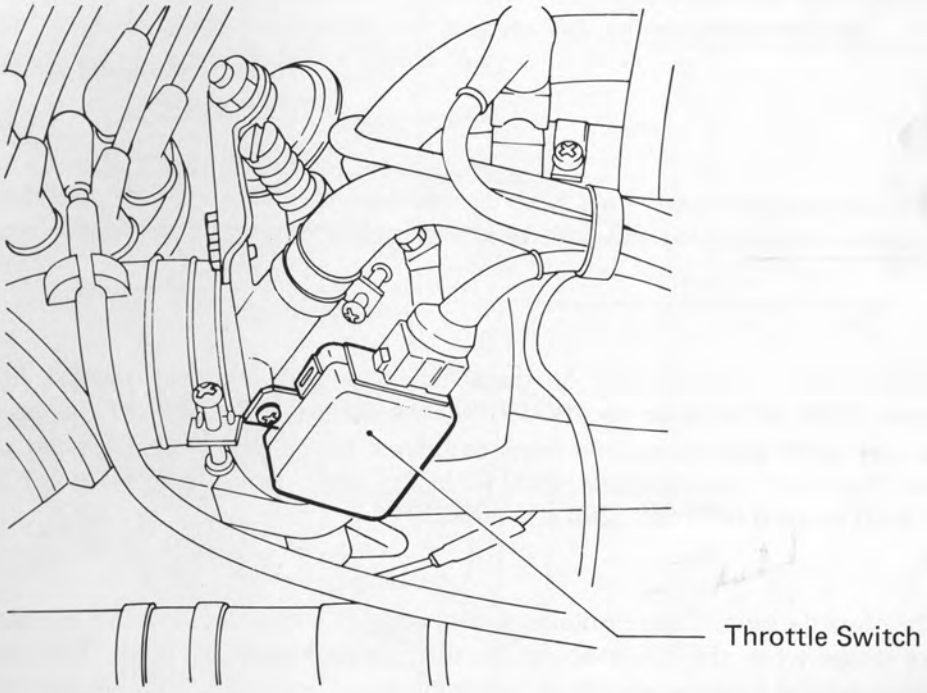
ELECTRONIC FUEL INJECTION SYSTEM (ELECTRONIC SIGNAL)

Actually, though, there are a total of seven inputs to the control unit which all work together to determine the final mixture ratio. Let's take a look at the other six sensor inputs.

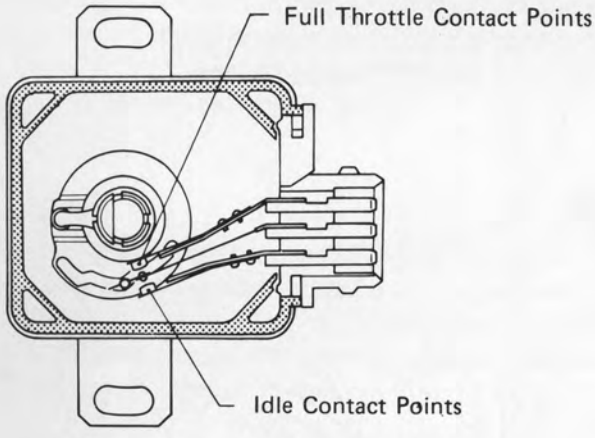
Coil

First, there is the ignition coil, which tells the control unit how fast the engine is turning. In other words, this is a tachometer hookup. The control unit can vary the mixture ratio with speed, since engine requirements change from idle to very high RPM. Also, this connection to the negative side of the coil tells the unit when the cylinders are firing, and therefore it serves to time the moment of injection. The control unit fires all the injectors at the same time, once per crankshaft revolution.

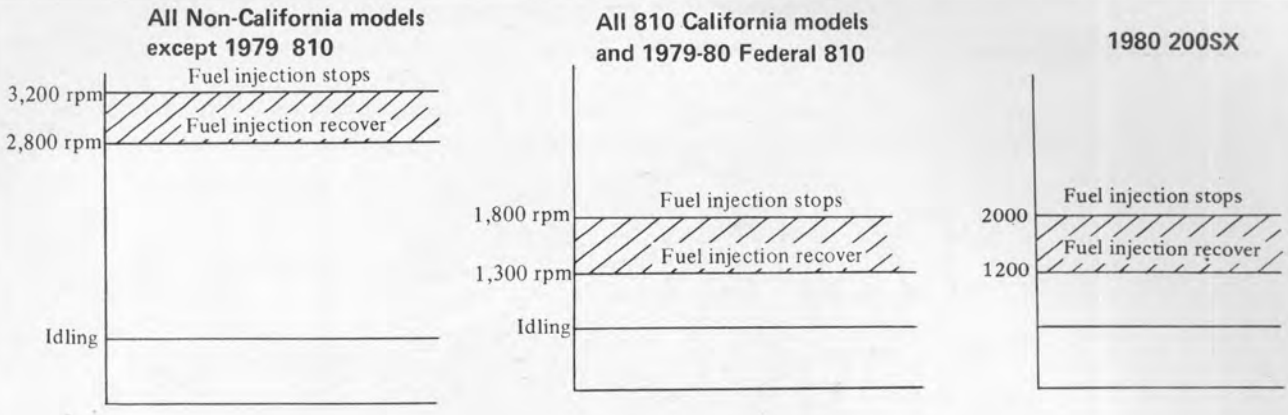
Throttle Switch



The next sensor input comes from a switch which is mounted on the throttle chamber, and which is therefore called the throttle switch. This sensor actually contains two separate switches, and supplies two different signals to the control unit.



The first of these is the idle switch, which is closed when the driver releases the throttle. This tells the control unit that the engine is either idling or decelerating. You can see that the ignition coil input tells the control unit which is the case. If the engine is idling, then the control unit can richen the mixture ratio slightly, just as the idle circuit in a carburetor supplies a slightly richer mixture than does the main circuit.

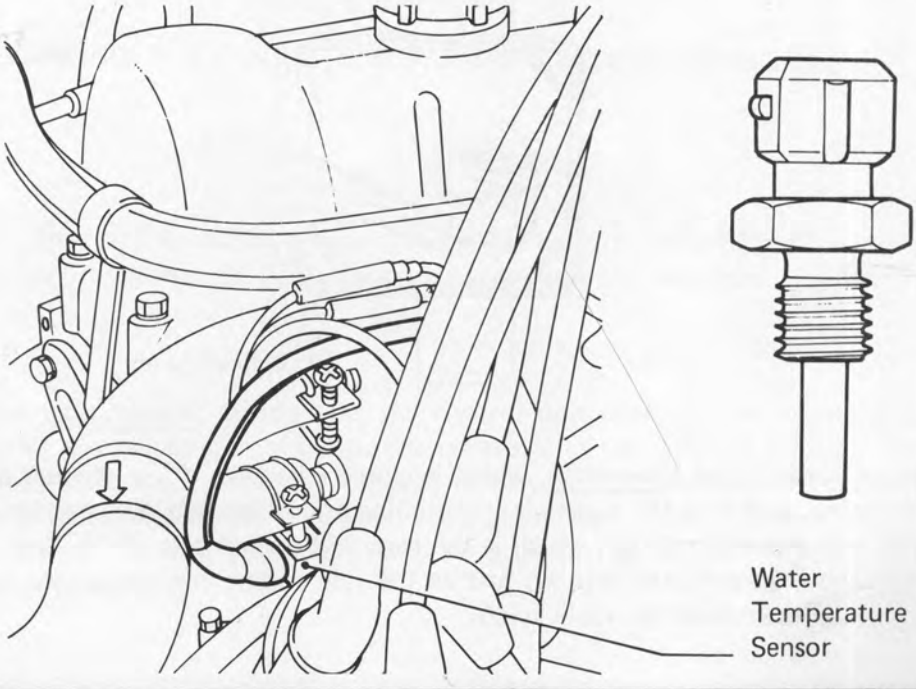


If the engine is decelerating, on the other hand, then less gas is needed; in fact, from any speed above 3200 RPM down to 2800 RPM, the control unit turns off the gas completely. Thus we can get better gas mileage and fewer emissions. (In all California 810's and 1979-80 Federal 810's, this "fuel cut" occurs above 1800 RPM and down to 1300 RPM. In the 1980 200SX the fuel shut-off range is between 1200 and 2000 RPM.)

The throttle switch also contains another set of contacts called the **full throttle** contacts. These are closed when the driver opens the throttle past a certain point. The control unit responds by richening the mixture according to engine speed and load. Thus we can obtain both acceleration and heavy load enrichment.

Water Temperature Sensor

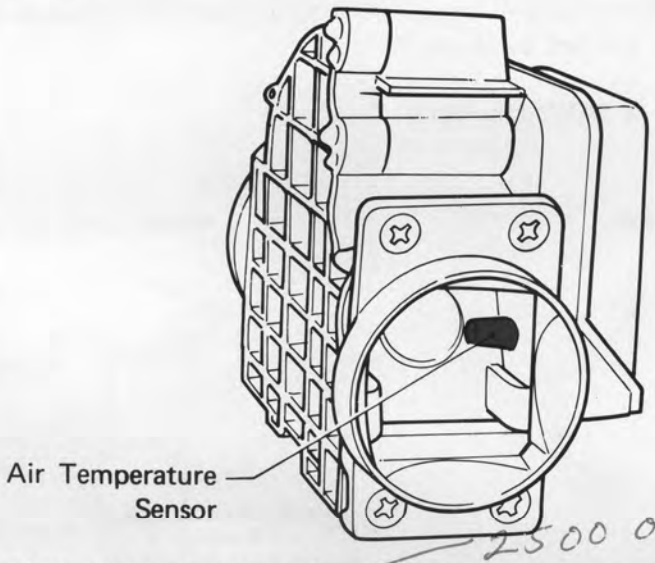
Next, a water temperature sensor, located in the thermostat housing, allows the control unit to richen the mixture until the engine arrives at operating temperature. While the engine is warming up, the oil is thicker; there is more internal friction and fuel vaporization is poor, so more fuel is needed.



This sensor is just like the sensor which controls the water temperature gauge in the dash. That is, it changes its resistance as the engine temperature changes. The warmer the engine, the leaner the mixture, until the water temperature reaches 150 degrees Fahrenheit. (After warmup, this sensor should not affect injection operation.)

Air Temperature Sensor

When the intake air is colder, it is denser. Or, in other words, there are more molecules (particles) of air in a given space. Therefore, more fuel must be mixed with this cold air than would be necessary with hot air.



An air temperature sensor measures the temperature of the air coming in from the air cleaner. While the air is warming up to 68 degrees, additional fuel is metered to the cylinders by the control unit. This temperature sensor works like the water temperature sensor; so the colder the intake air, the richer the mixture. Thus it is not necessary to preheat the air using vacuum motors and breather preheating tubes as are used on our carbureted engines.

Start Signal

The control unit also receives a signal from the ignition switch while the engine is being cranked. This is because an engine requires additional fuel while starting since additional power is needed to move from a standstill to idling RPM, and because the air velocity through the manifold is is not sufficient to cause a complete mixture of fuel and air. The control unit therefore responds to the start signal by holding the injectors open longer during cranking.

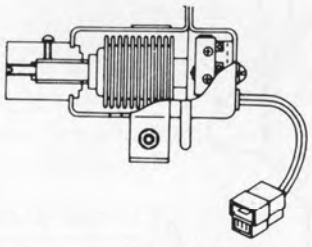
Altitude Compensator

Air at high altitudes is less dense than air at sea level – there are fewer molecules of air in any given volume. The result is that there is really less air to combine with the fuel in the cylinders. Since the air flow meter measures volume flow, it cannot compensate for this thin air. Consequently, the air/fuel mixture gets richer the higher up we go, adversely affecting both emissions and fuel economy.

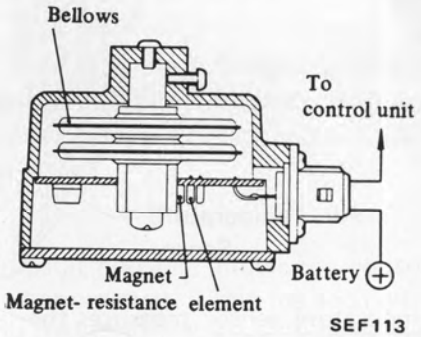
To prevent this, California 810 and 280Z models built during 1977 and 1978, have an altitude compensator switch. When the vehicle reaches an altitude of approximately 3700 feet, the altitude compensator switch automatically closes, sending an electrical signal to the ECU. The control unit then leans the fuel mixture by about 6%.

Note: This compensator is NOT adjustable.

1977–1979

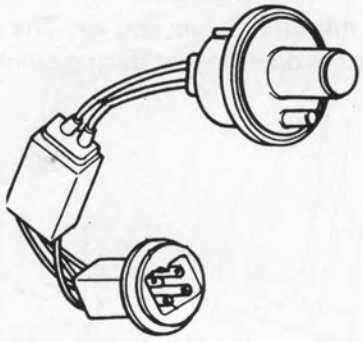


1980 & Later



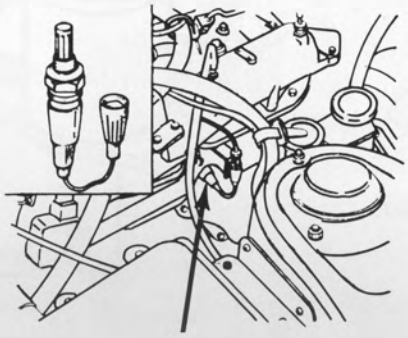
Vacuum Switch (2005X Cal only)

On California cars, the vacuum switch compensates for high load / low manifold vacuum conditions when the full throttle contacts have not been activated, but additional fuel is needed.



Exhaust Gas Sensor

For California 6 cylinder engines, the density of oxygen in the exhaust gas is monitored by the exhaust gas sensor. With this information the ECU can adjust the air/fuel ratio accordingly.



Summary

Here again are the nine sensor inputs to the control unit:

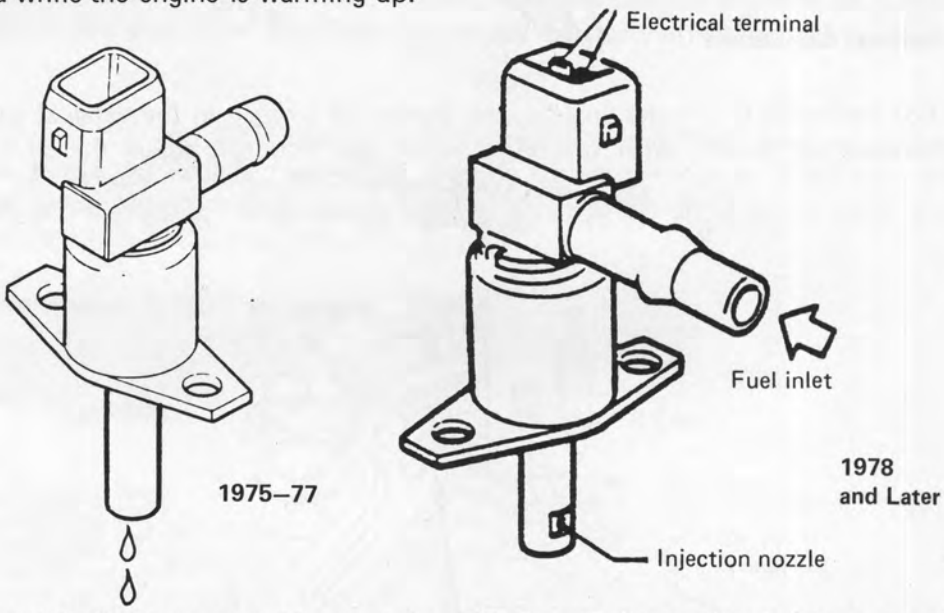
1. Air Flow Meter
2. Ignition Coil
3. Throttle Switch (2 positions)
4. Water Temperature Sensor (4 Cyl.)
   Cylinder Head Temp. Sensor (6 Cyl.)
5. Air Temperature Sensor
6. Ignition Switch Start Signal
7. Altitude Compensator (1977-78, 1980)
8. Vacuum Switch (1980 200SX)
9. Exhaust Gas Sensor

} Calif. Only

THE COLD START SYSTEM

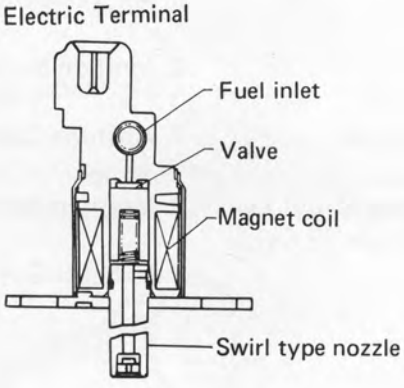
Just like a carbureted engine, the fuel-injected engine needs a **choke system** which supplies very large amounts of fuel only during starting. Also, like a carbureted engine, we need a fast idle to raise the engine speed while the engine is warming up.

Cold Start Valve



To inject the additional fuel, we use a cold start valve. This is actually a seventh injector, and is mounted behind the throttle plate where it can spray fuel into the air which is going to all the cylinders. When you crank the engine, current goes from the ignition switch to this valve, which is then energized and sprays a very fine mist of fuel into the manifold. When you release the key, the current to this valve is cut off. This is very important to remember: THE COLD START VALVE GETS CURRENT ONLY WHEN THE STARTER IS CRANKING.

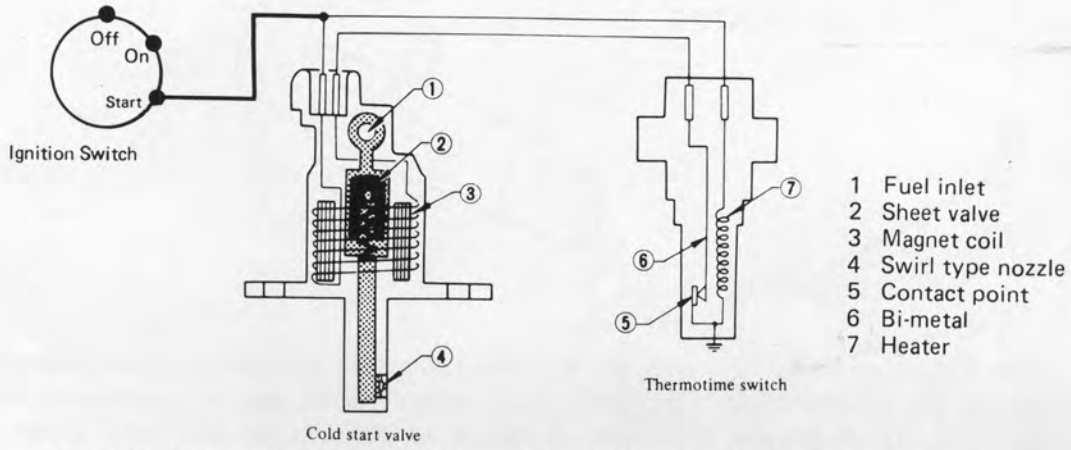
SECTIONAL VIEW OF COLD START VALVE



Now suppose the engine is in need of new spark plugs, and the ignition system is therefore not firing as well as it should. You would have to crank the starter longer before the engine would start. You can see that if the cold start valve continued to stay open, the engine might flood.

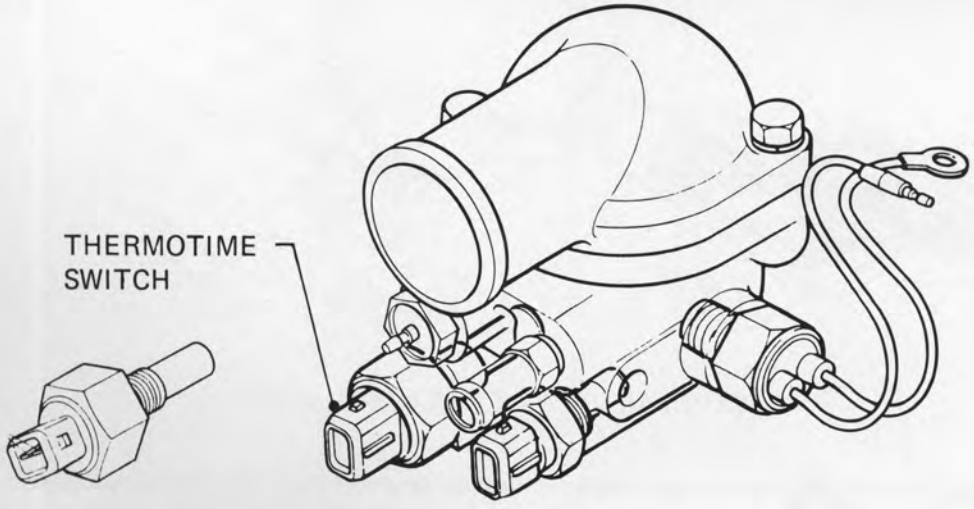
Thermotime Switch

This problem is avoided by grounding the cold start valve through a switch with a little heating element in it. When the starter is being cranked, current runs from the ignition switch through the cold start valve to this switch and thus to ground. While this is happening, the little heater in the switch is operating; and after a certain time, the heat causes the switch (bimetal) to open.



COLD START VALVE – THERMOTIME SWITCH SCHEMATIC

Because this switch operates according to both temperature and time, we call it the Thermotime Switch.

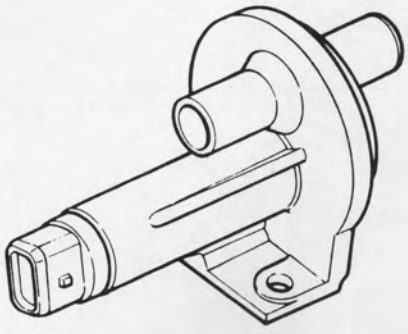


This switch is screwed into the thermostat housing next to the water temperature sensor. This is because a cold engine will need the cold start valve operation for a longer period of time than will a warm engine; and a hot engine will not need the valve at all. So, the engine heat also acts on the switch and makes it turn off the cold start valve. Therefore, the length of time that the cold start valve operates depends directly on engine temperature. (Incidentally, the maximum time for valve operation is between 9 12 seconds.)

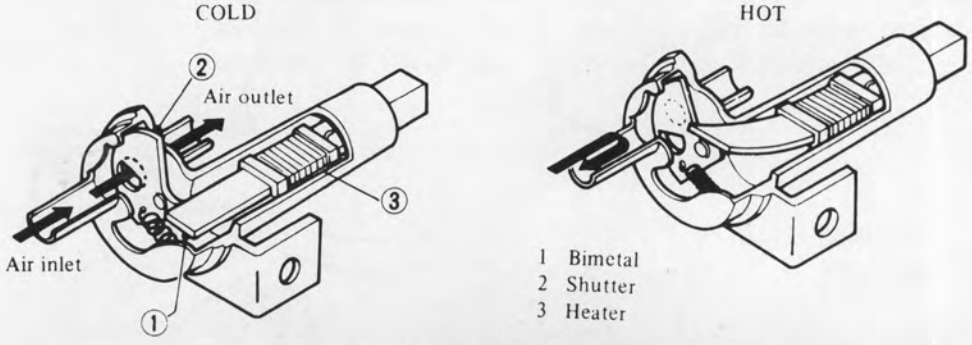
Auxiliary Air Regulator

As we mentioned before, we also need some form of "fast idle" system to supply additional air during warmup.

AIR
REGULATOR



With fuel injection, this is easy to do. You know that idle speed can be raised by simply by-passing the throttle plate. During warmup, we do exactly that by using an air valve, called an Auxiliary Air Regulator. This valve is similar to the electric automatic choke used on our carbureted engines. That is, it contains a heating element. Let's look at how this valve operates.



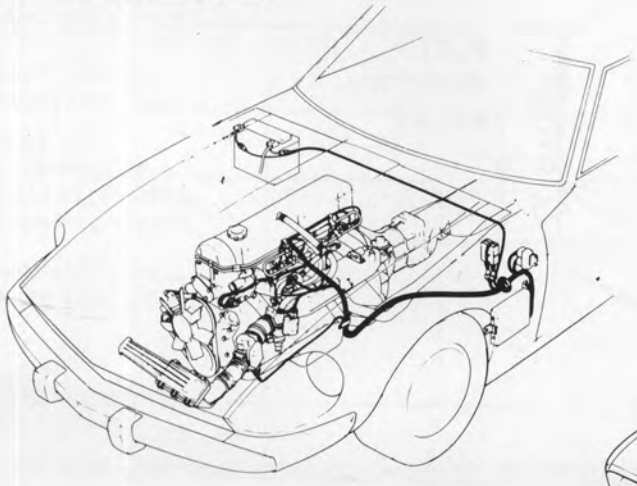
SECTIONAL VIEW OF AIR REGULATOR

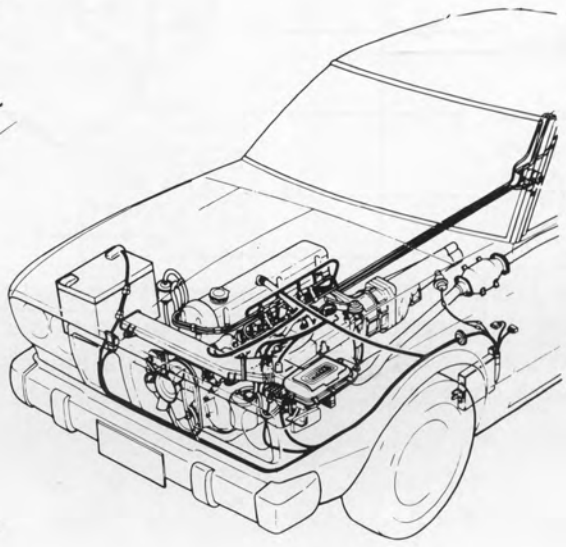
When the engine is cold, the valve is open; so when the engine starts, air can bypass the throttle plate and go through the valve. Now as long as the engine is running, current is supplied from the battery to the heating element in the valve. As the element heats up, a bimetal causes the valve to close slowly, closing off the air passage. Thus, the engine idle speed is progressively lowered.

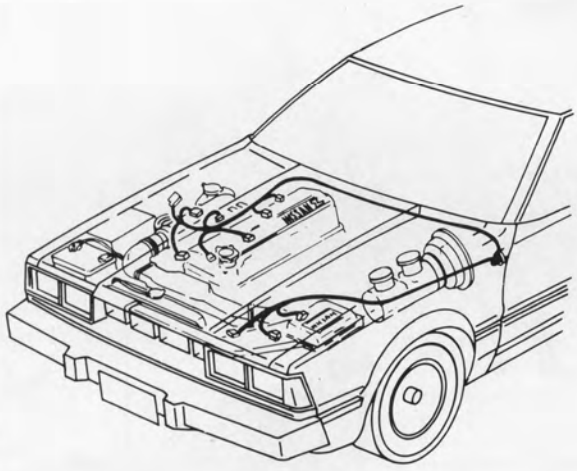
Note one important point here: This valve is not controlled electrically by either the Cold Start Valve or by the Control Unit.

THE FUEL INJECTION ELECTRICAL SYSTEM

Fuel Injection Harness





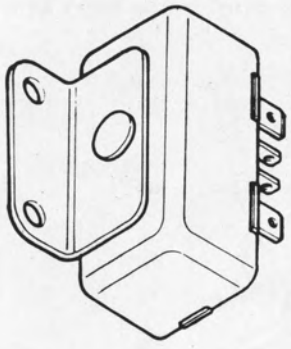


On the 280Z and 810, the wiring harness for the fuel injection system is completely separate from the other electrical circuitry in the vehicle. This makes troubleshooting easier. The harness also employs special plugs which lock securely in place, thus minimizing the possibility of poor connections.

All of the circuits in the system can be traced using the large 35-pin connector at the control unit. (See Troubleshooting Section.)

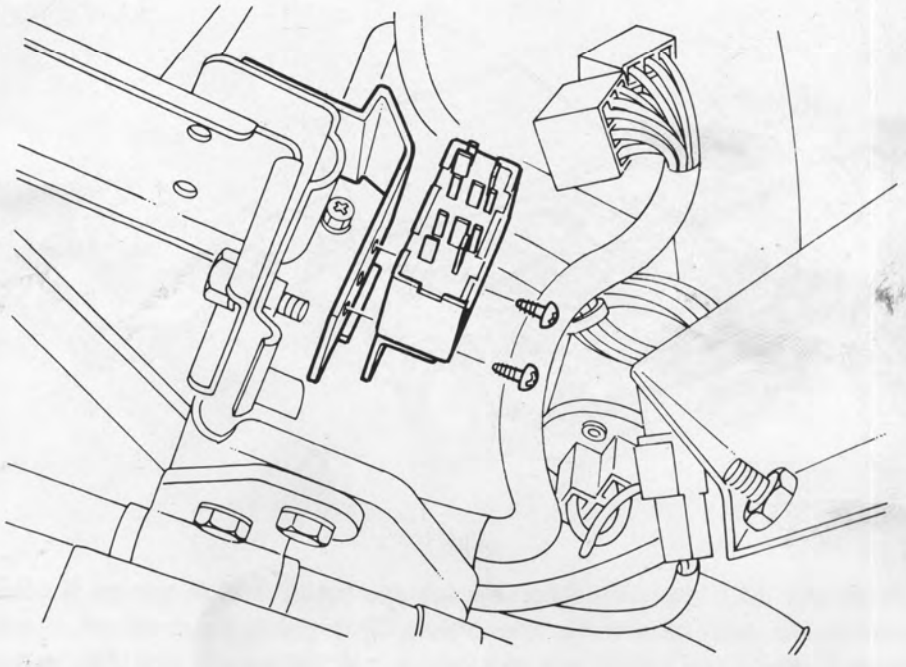
1975–77 EFI CONTROL RELAY

Injection Relay



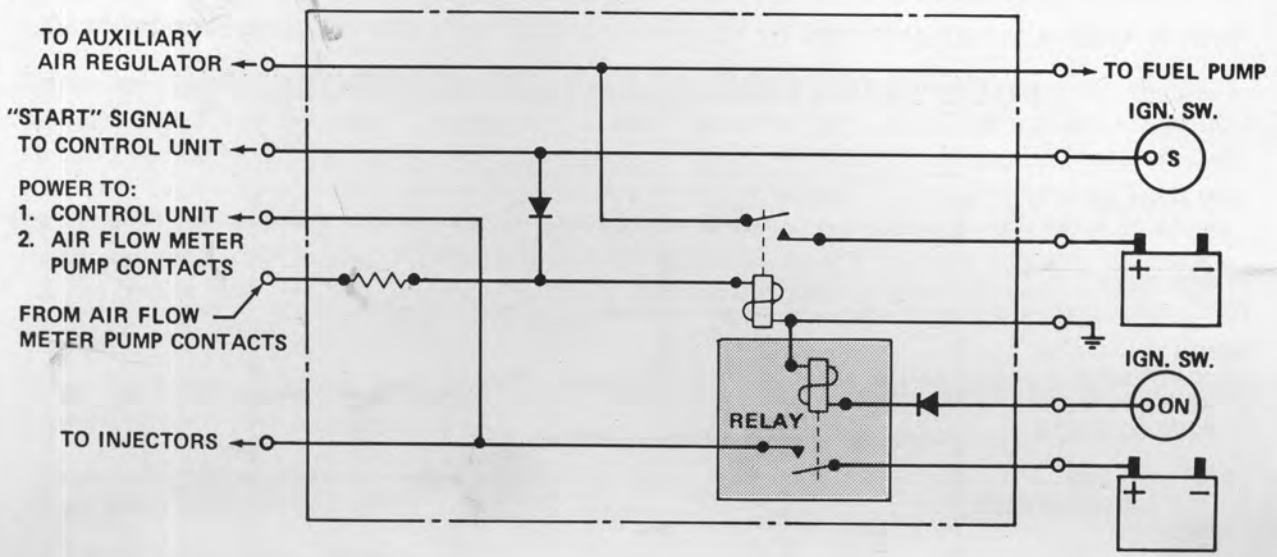
FUEL
INJECTION
RELAY

The heart of the electrical system is the Fuel Injection Relay, which sends current to everything from the control unit to the fuel pump to the injectors. This is mounted on the left hand kick panel, above the control unit, on 280Z models, and inside the underhood relay bracket on 810's (see pp. IV and V).



The fuel injection relay is really two relays in one. Let's take a look at them and at what they do.

POWER RELAY

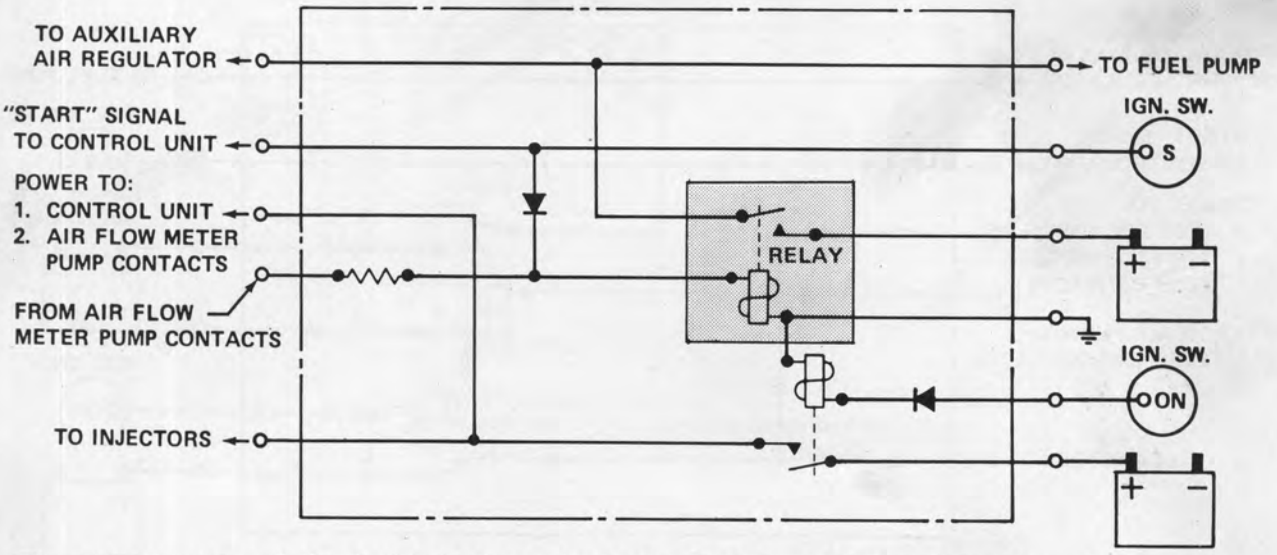


The first part of the relay acts as a power relay. This is the main power source for the injection system. It sends current from the battery to the control unit, so that the unit can then operate all of its sensors and its own internal circuits.

This power relay also sends current to the fuel injectors. As you know, the current goes first to the injector resistors, and then to the injectors.

Finally, the power relay also sends current to a special set of contacts in the air flow meter. We'll look more closely at these contacts in a moment.

FUEL PUMP RELAY

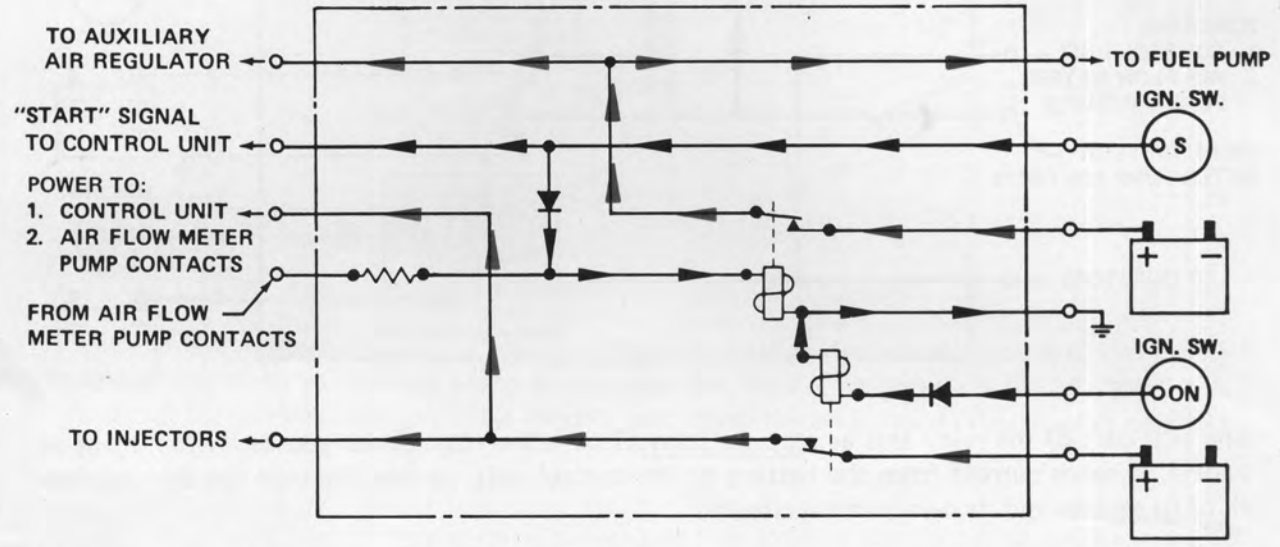


The other section of the fuel injection relay is the Fuel Pump Relay. This relay sends current from the battery to the fuel pump. At the same time, it energizes the heating element in the Auxiliary Air Regulator.

Relay Operation

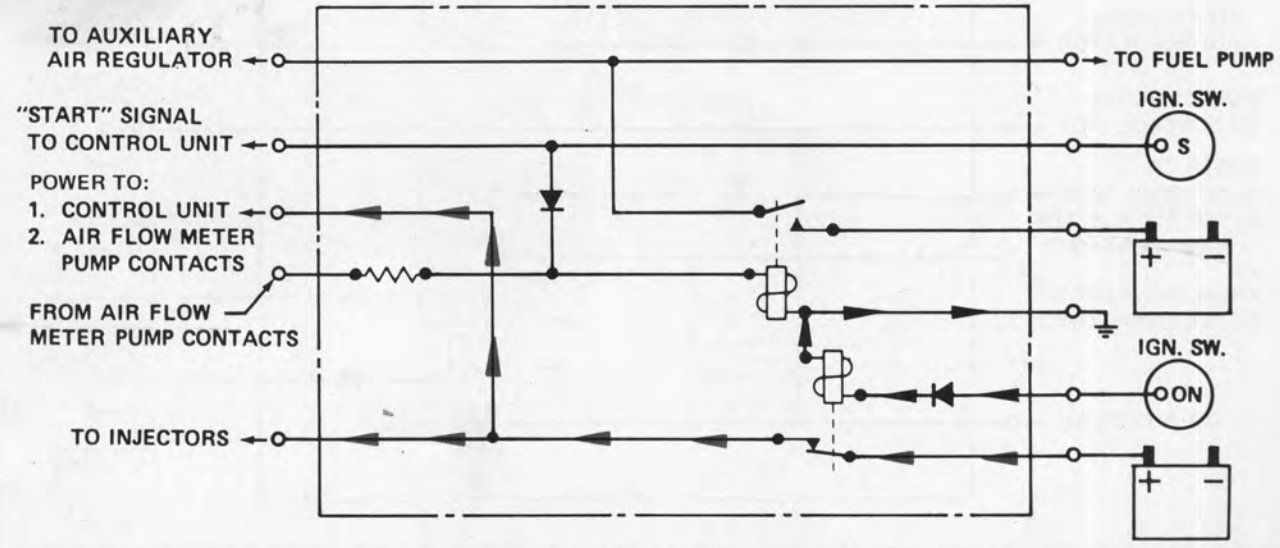
Both of these relays are controlled by the ignition switch. Let's take a look at how they work.

FUEL INJECTION RELAY (START POSITION)



When the ignition key is turned to the "start" position, both relays are energized directly. That is, the power relay is energized, and current runs to the control unit, to the injectors, and to the air flow meter contacts. At the same time, current also runs to the fuel pump relay, which in turn sends battery current to the fuel pump and to the Auxiliary Air Regulator.

POWER RELAY: IGNITION ON



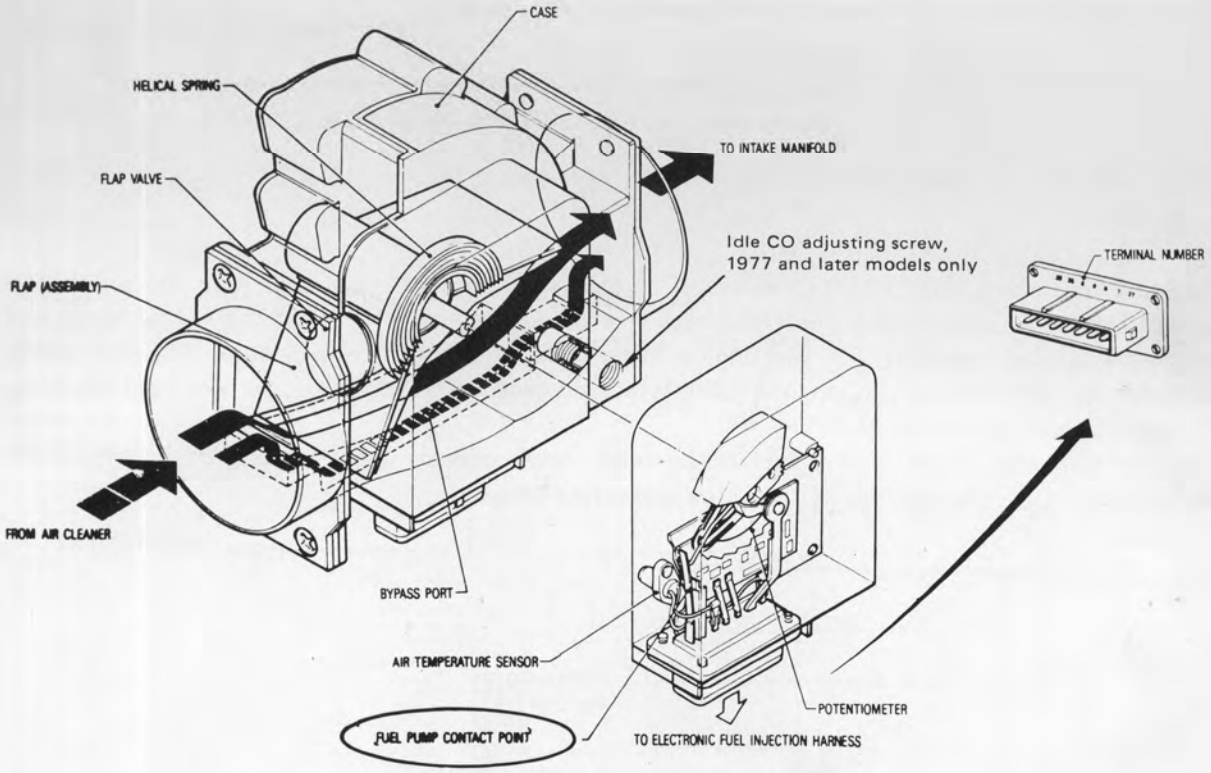
Now when we release the key, current continues to run to the power relay, which remains energized. So the control unit, injectors, and air flow meter contacts continue to receive current.

The fuel pump relay, however, no longer receives current directly from the ignition switch once it reaches the "on" position. That means that the fuel pump and the auxiliary air regulator are not automatically energized when the key is in this position.

There are two reasons for this: (1) Suppose the vehicle is in an accident where the engine is stopped and a fuel line has been damaged? If the fuel pump were allowed to continue running because the key was "on," then fuel might spray all over, creating a fire hazard. Therefore, we must see to it that the fuel pump stops when the engine stops; (2) Suppose you start the car on a cold day, and then go inside the house while the engine warms up – if the engine dies, and the auxiliary air regulator continues to receive current from the ignition switch, then there will no longer be a fast idle. The engine would then be difficult to start. The air regulator must therefore stop working when the engine stops.

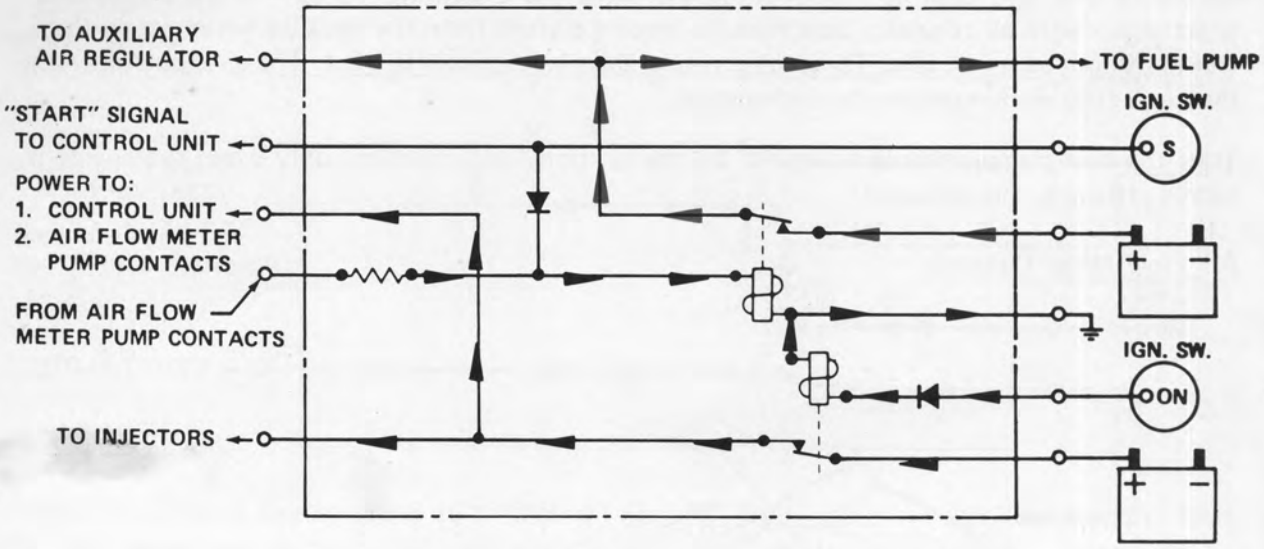
Thus the fuel pump relay is energized (in the ignition "on" position) only when the engine is running. How is this managed?

Air Flow Meter Contacts



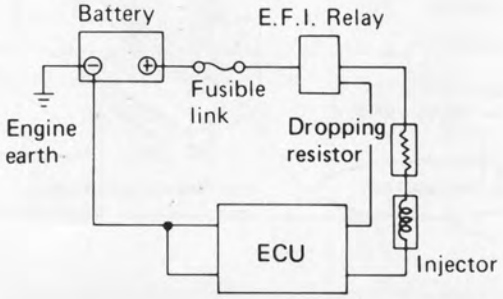
In order to sense when the engine is running, the engineers have installed a special fuel pump switch in the air flow meter. As soon as the engine starts, the air flow through the meter pushes the flap far enough to close the switch contacts.

FUEL PUMP RELAY: ENGINE RUNNING



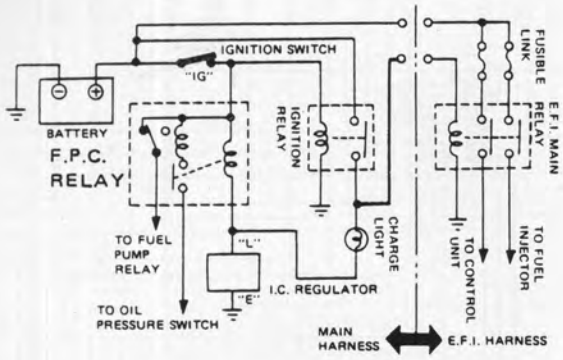
Now current flows from the power relay, through the contacts, and back into the fuel pump relay. The fuel pump relay is therefore activated, and sends current to work the fuel pump and the auxiliary air regulator. If the engine stops, then the air flow will stop. The fuel pump contacts in the meter will open, the relay will disengage, and the fuel pump will stop working.

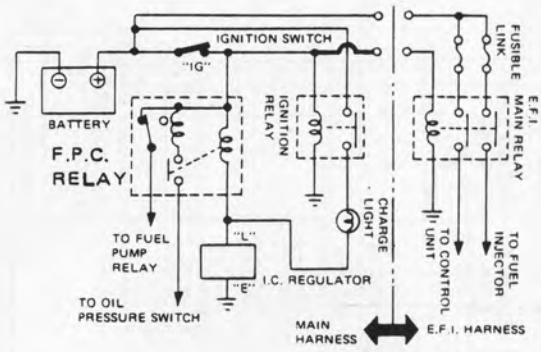
By the way, the diode in the fuel pump relay keeps current from feeding back toward the starter when the relay is working. Here is a simplified schematic.



A thorough understanding of these basic principles is invaluable to fuel injection troubleshooting. Most important is an understanding of the wiring diagrams which you will find in the 280Z and 810 Service Manuals.

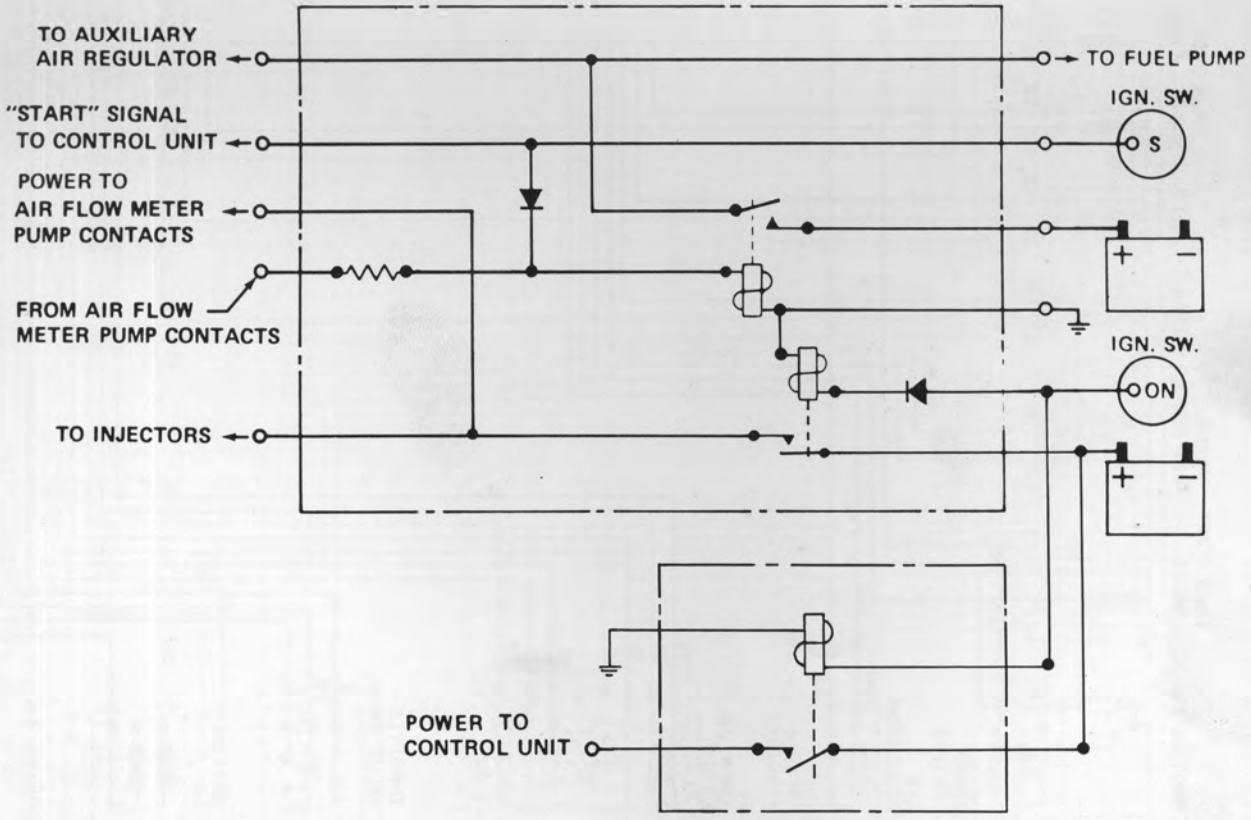
Production Modification to 1977 810 EFI System



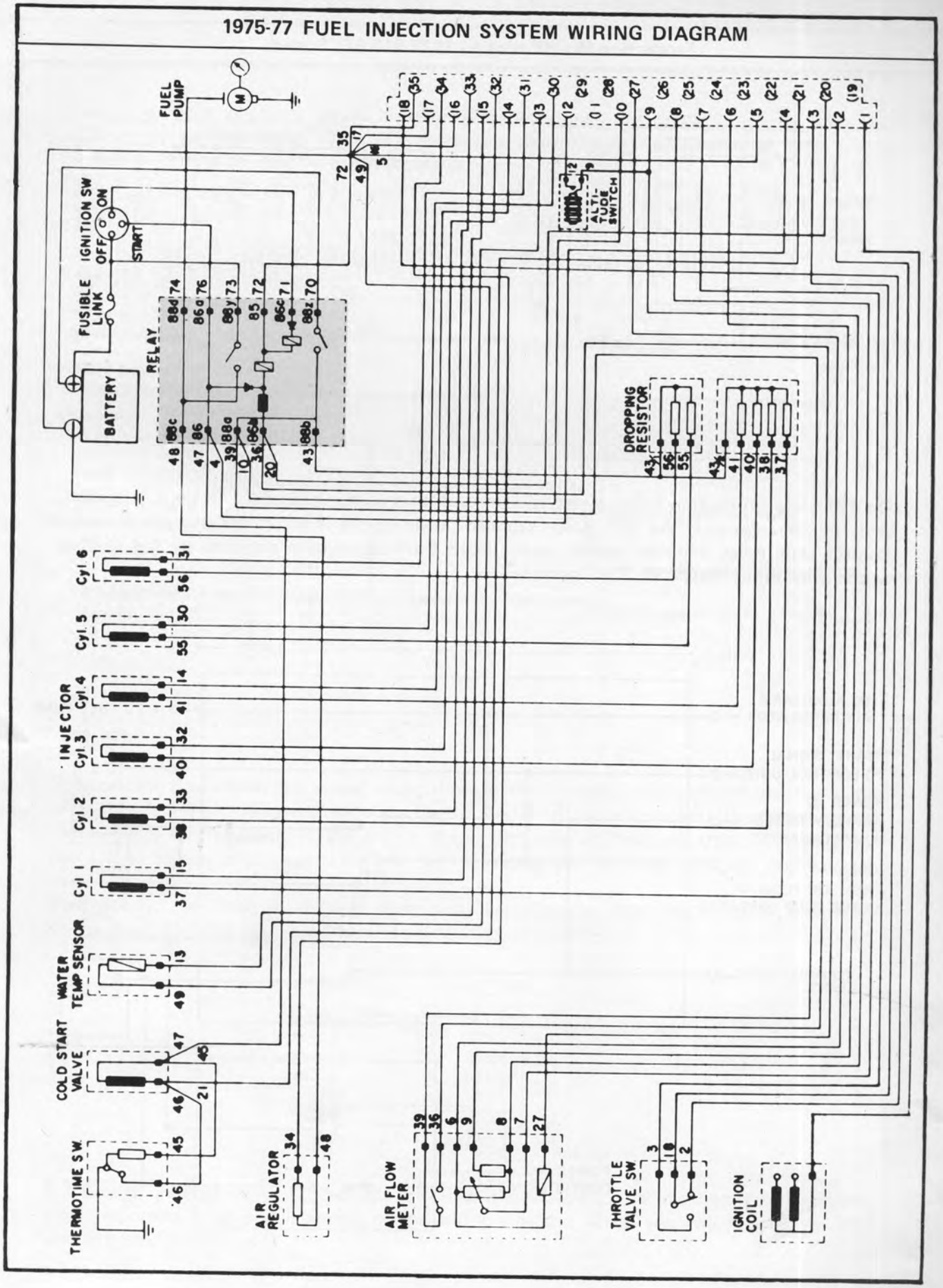


Beginning Serial Number
HLG810-110020
WHLD810-829618

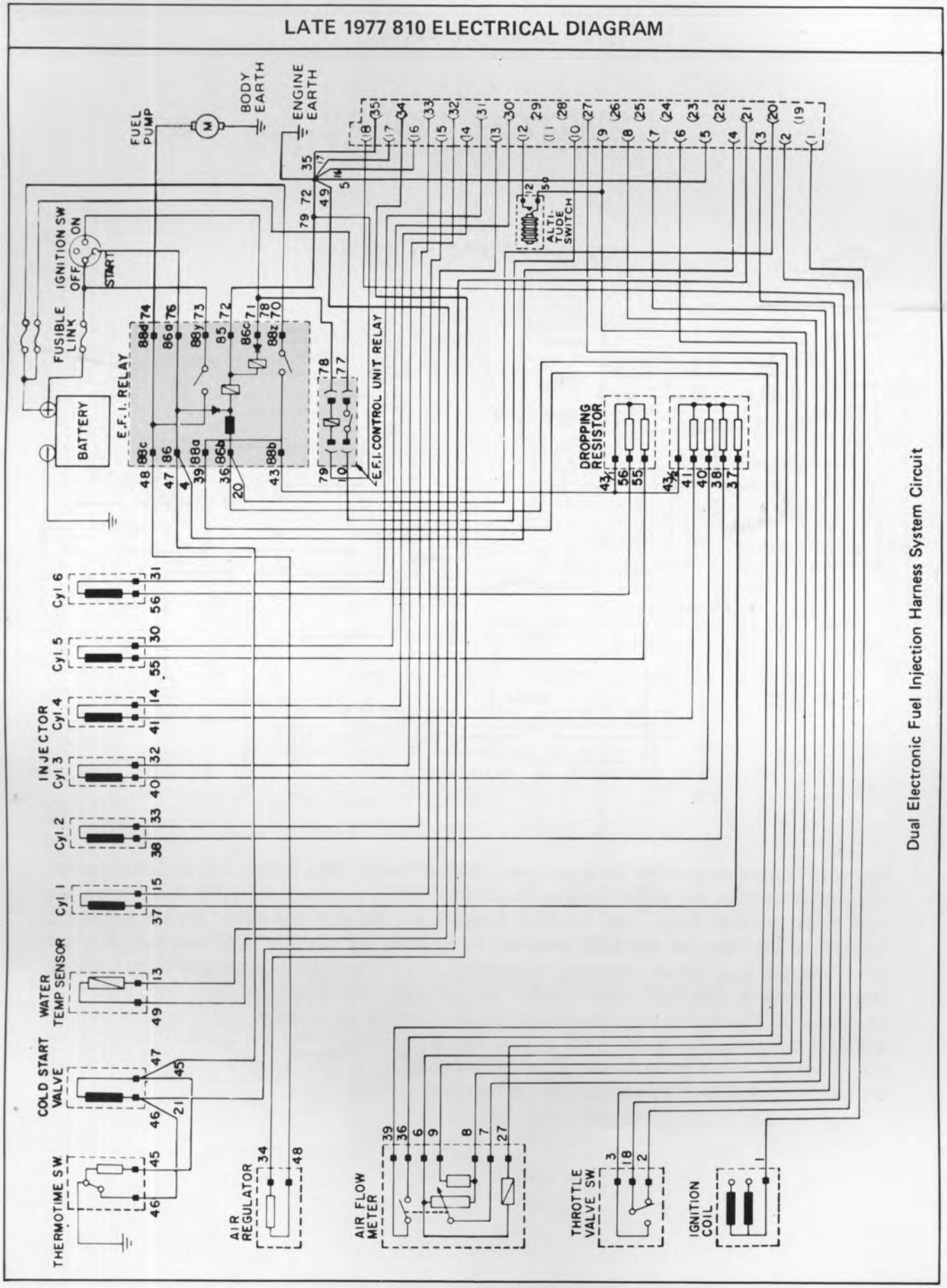
On 1977 late production 810's, a second relay and fusible link were added to the EFI system. With this arrangement, the EFI Relay supplied power to the injectors and the newly added Control Unit Relay supplied power to the ECU. Both relays were activated by the ignition switch when in the "Start" or "On" positions.



1975-77 FUEL INJECTION SYSTEM WIRING DIAGRAM



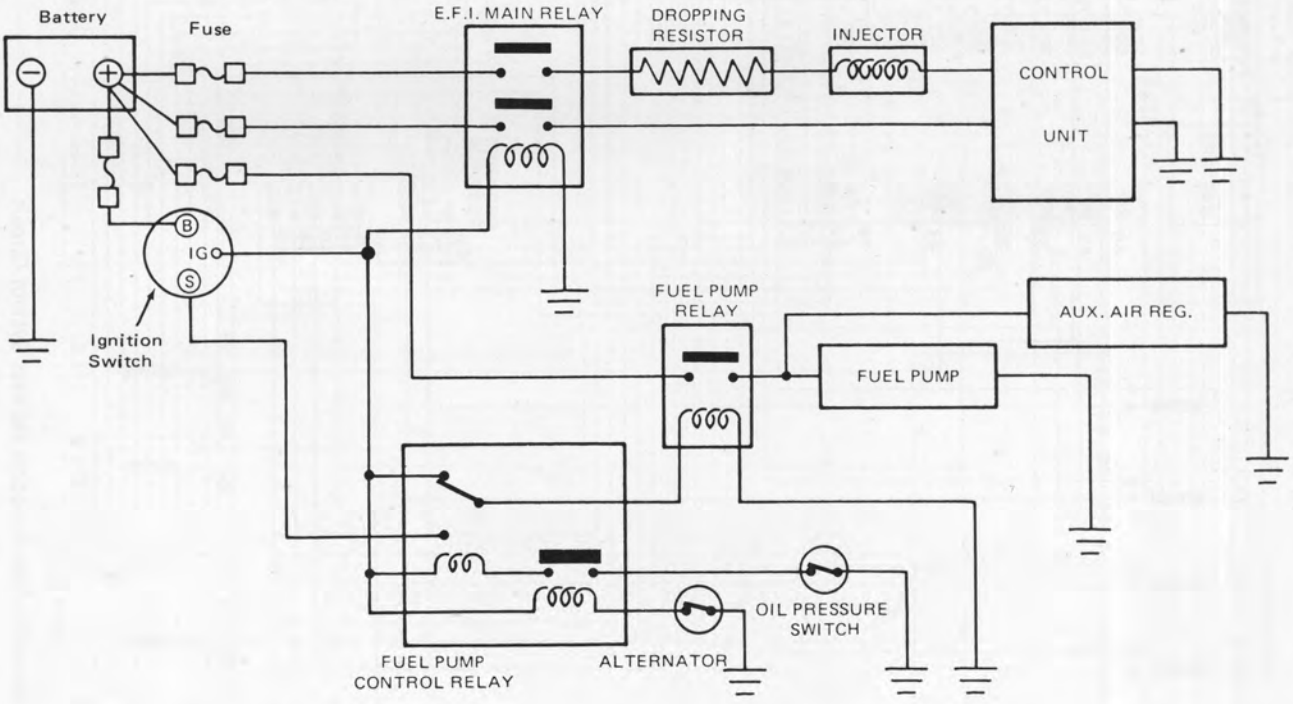
LATE 1977 810 ELECTRICAL DIAGRAM



Dual Electronic Fuel Injection Harness System Circuit

SWITCH "OFF"

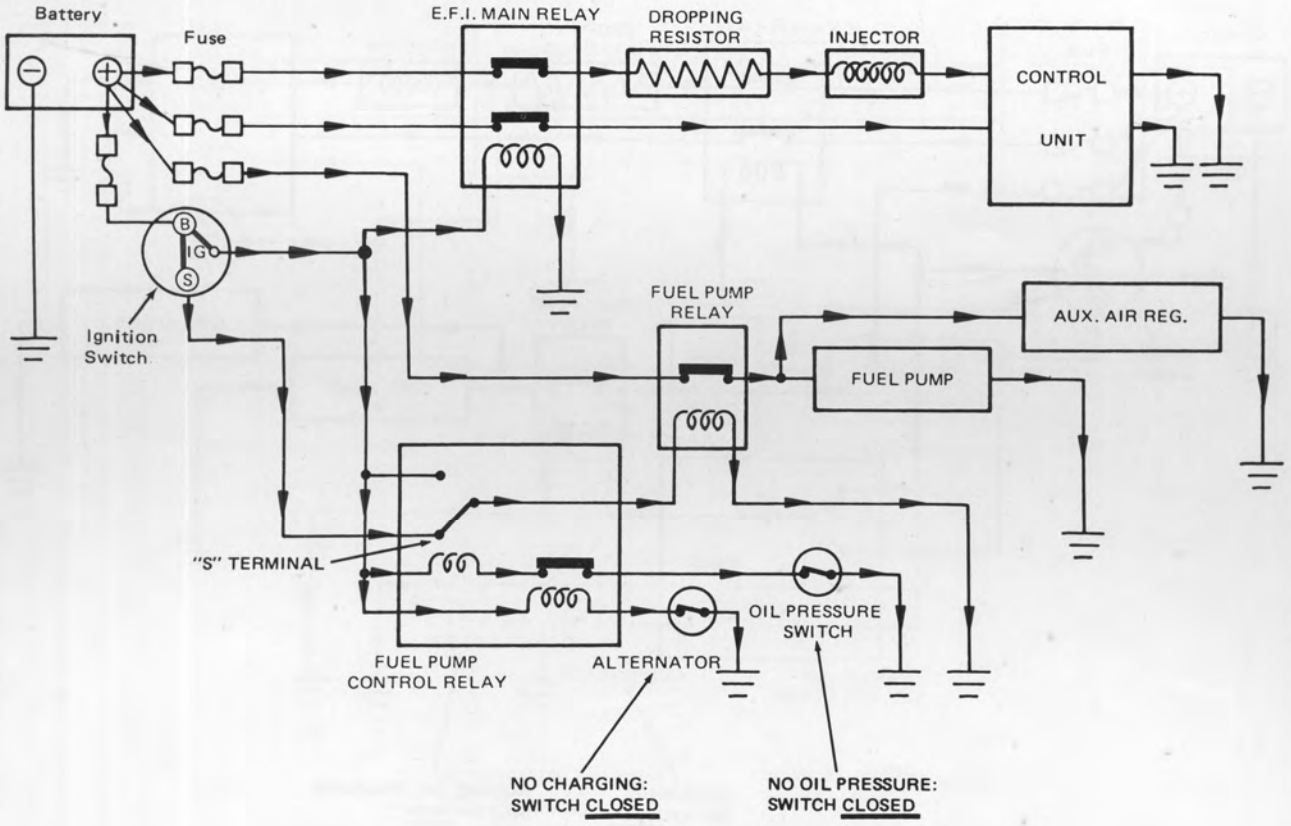
1978 AND LATER E.F.I. SYSTEM



The relay control system for 1978 and later 280Z, 810 and 1980 200SX fuel injection is somewhat different from the earlier systems. In all, three relays are used: the E.F.I. Main Relay, the Fuel Pump Control Relay, and the Fuel Pump Relay. As with the earlier system, current is supplied to the injectors and ECU anytime the ignition key is in the "ON" position. But, the fuel pump and auxiliary air regulator will operate only if the engine is running or being cranked. The difference in the 1978 system is the way in which "engine running" is sensed. Instead of air flow into the engine, the new circuit monitors engine oil pressure and alternator output. If BOTH oil pressure and alternator output are lost, the fuel pump and auxiliary air regulator will no longer receive current, even if the key remains in the "ON" position. If only one is lost, the fuel pump and auxiliary regulator will continue to operate.

SWITCH AT "START"

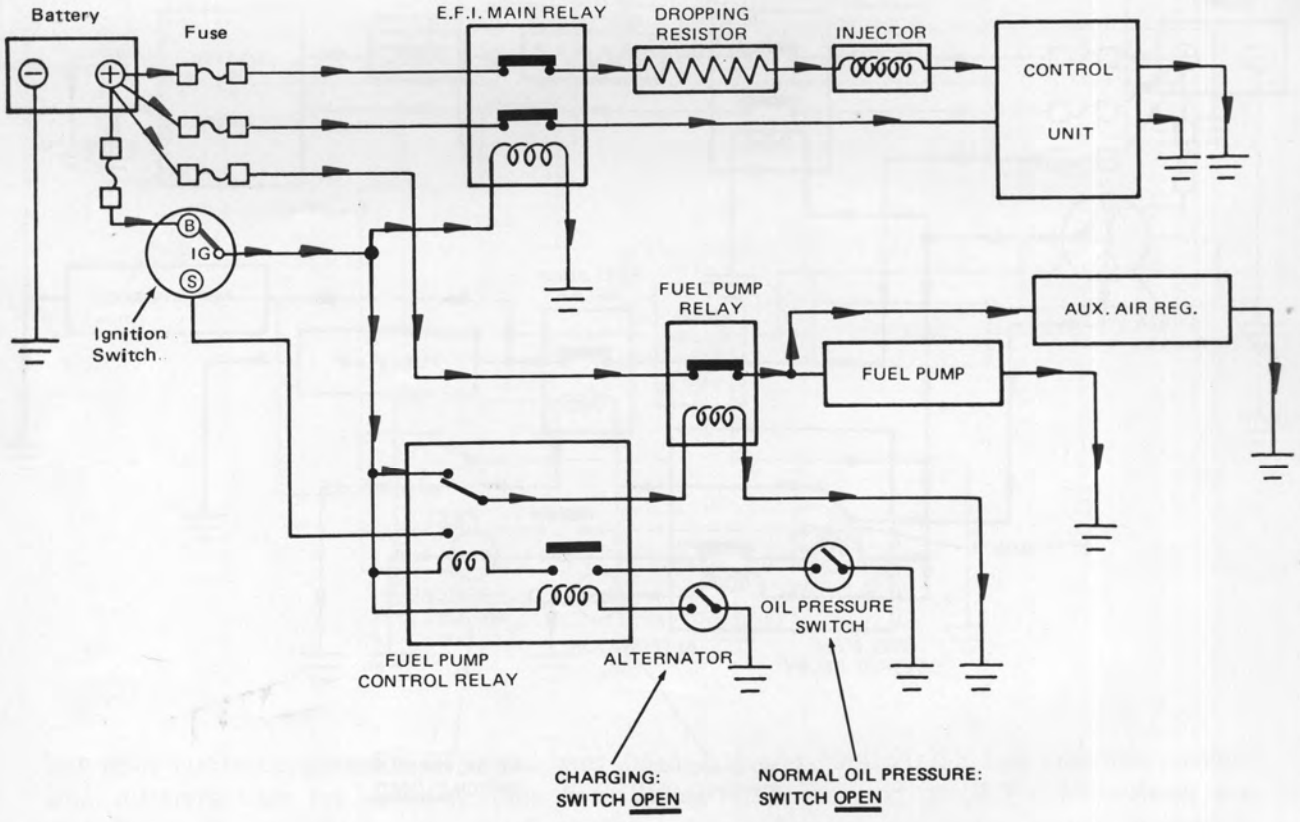
1978 AND LATER E.F.I. SYSTEM



With the key in the "Start" position, the ignition relay activates the EFI Main Relay to send power to the injectors and ECU. Current is also sent to the fuel pump control relay. The "S" terminal of the ignition switch also sends current to the fuel pump control relay "S" terminal and it energizes the fuel pump relay. Thus, during starting, the fuel pump will run even though there is no alternator output or oil pressure.

SWITCH AT "IGN." ENGINE RUNNING

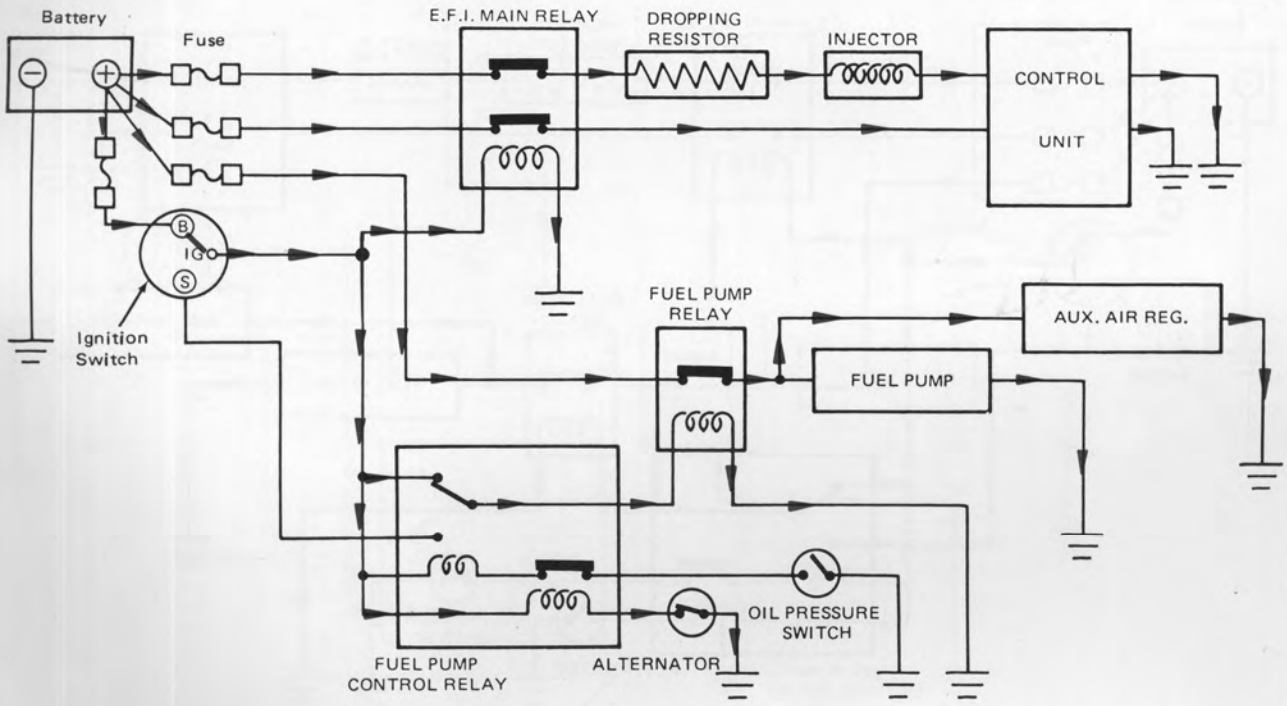
1978 AND LATER E.F.I. SYSTEM



With the key in the "ON" position and the engine running, the ignition relay activates the EFI main relay to send current to the injectors and ECU. Current also flows to the fuel pump control relay, which merely passes it on to the fuel pump relay. Thus, the fuel pump and auxiliary air regulator will be activated.

SWITCH AT "IGN.", ENGINE RUNNING ALTERNATOR FAILURE

1978 AND LATER E.F.I. SYSTEM



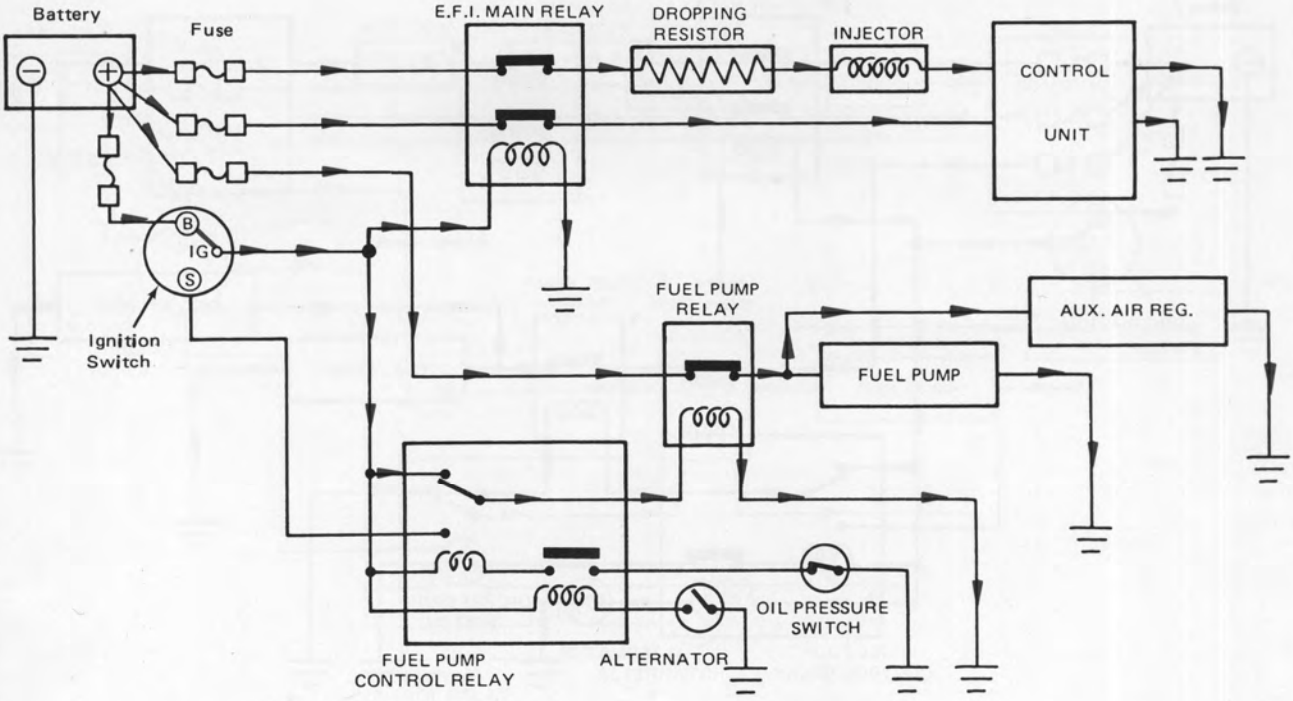
ALTERNATOR FAILURE:
SWITCH CLOSED

NORMAL OIL PRESSURE:
SWITCH OPEN

In the event of alternator failure, one set of windings in the fuel pump control relay will be grounded at the alternator "L" terminal. This closes the corresponding contacts, but since the oil pressure switch is still open, the second set of contacts in the fuel pump control relay will not be energized. The fuel pump relay will continue to receive current, and the fuel pump will keep running.

SWITCH AT "IGN.", ENGINE RUNNING OIL PRESSURE FAILURE

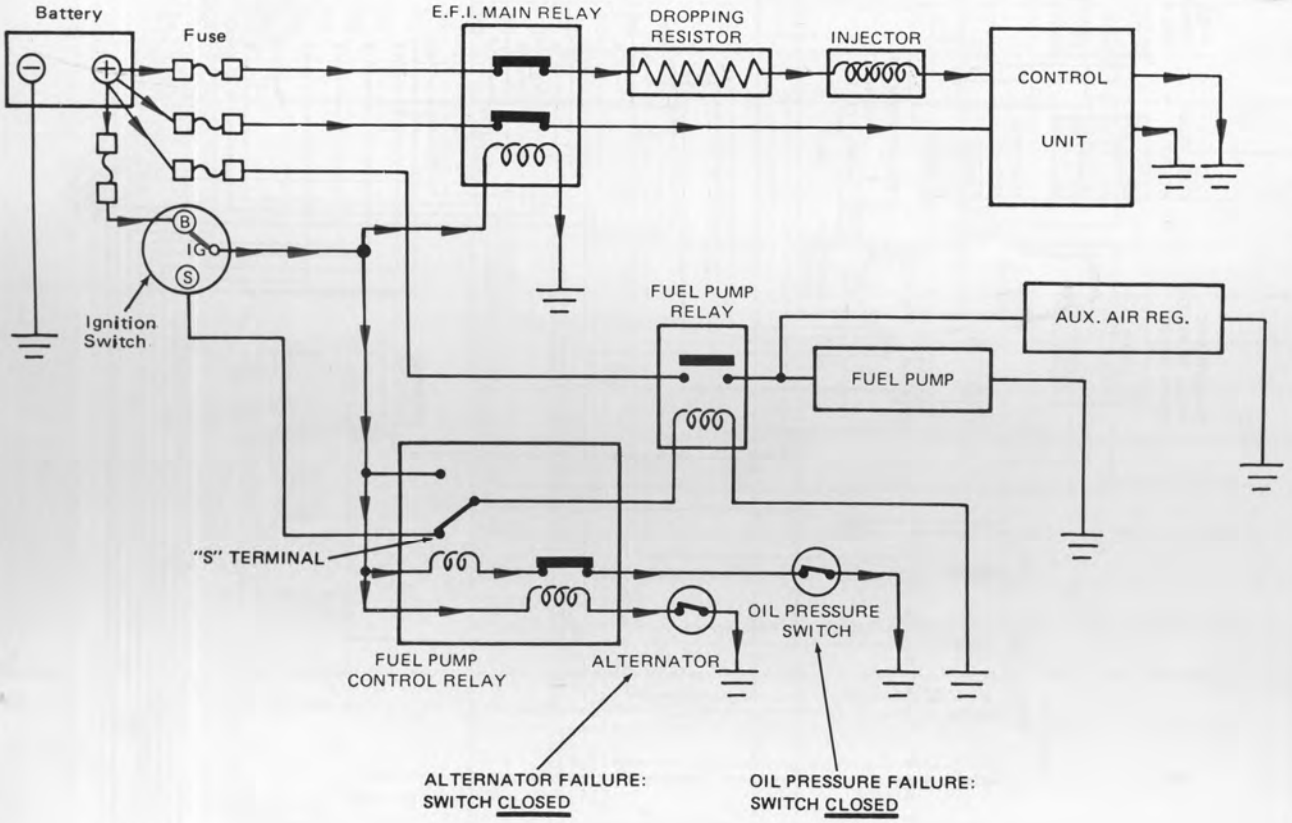
1978 AND LATER E.F.I. SYSTEM



On the other hand, if engine oil pressure drops, the oil pressure switch contacts will close. But, since the alternator output is normal, there will be no additional current flow through the fuel pump control relay, and the fuel pump will continue to be energized by the fuel pump relay.

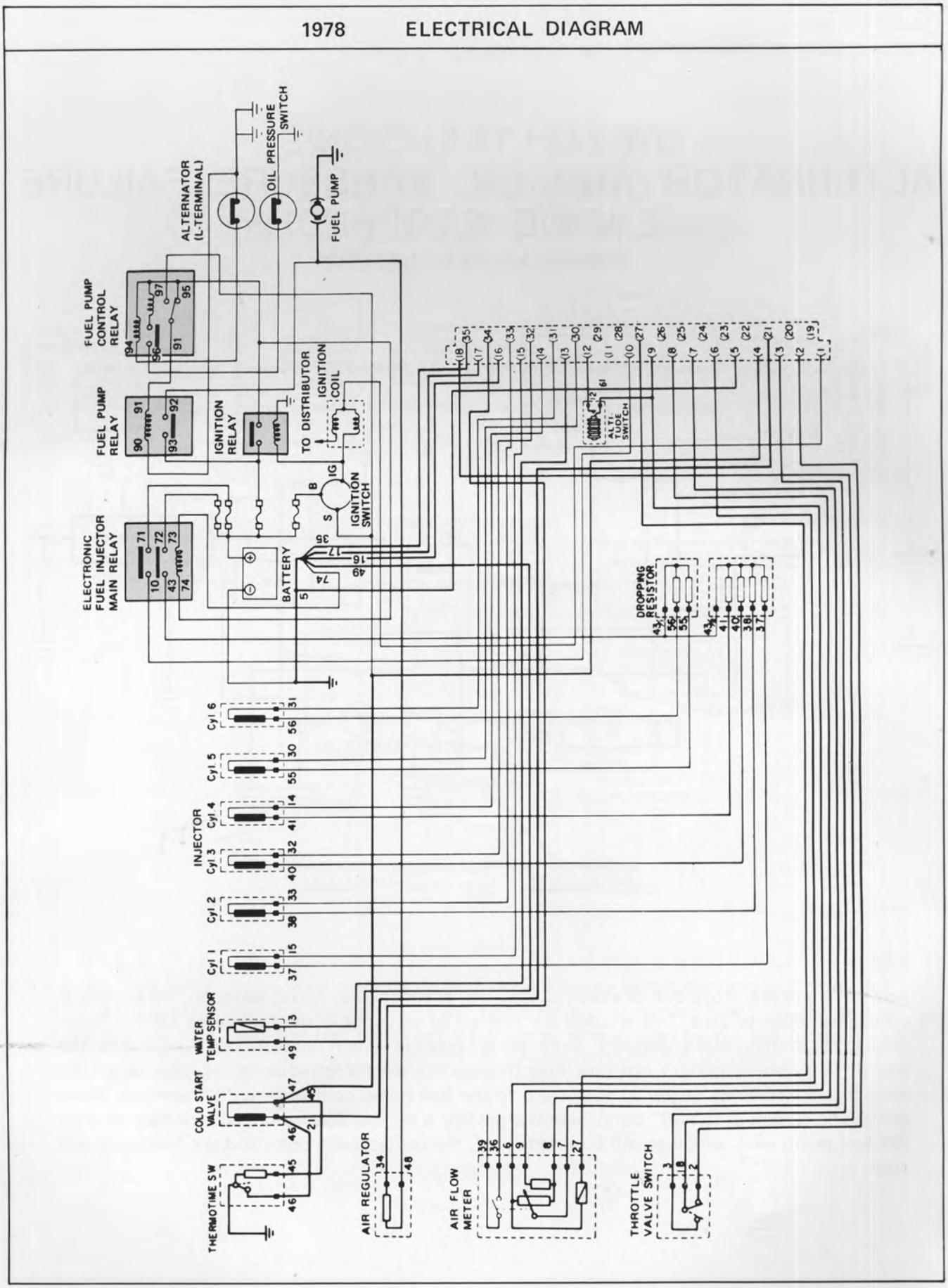
SWITCH AT "IGN." ALTERNATOR AND OIL PRESSURE FAILURE (ENGINE STOPPED)

1978 AND LATER E.F.I. SYSTEM



Now, if the engine stops due to a severed fuel line, or simply dies during warm-up, the alternator output will drop to zero. This grounds the first set of windings in the fuel pump control relay, closing the corresponding contacts. Since the oil pressure switch contacts will close due to the loss of oil pressure, current can now flow through the second set of windings. This causes the double contact arm to be pulled downward to the fuel pump control relay "S" terminal. Since there is no current at this "S" terminal unless the key is in "Start" position, current flow through the fuel pump relay windings will be interrupted, the contacts will open, and the fuel pump will stop.

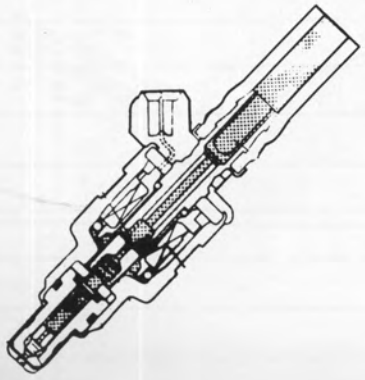
1978 ELECTRICAL DIAGRAM



E.F.I. COMPONENT REVIEW

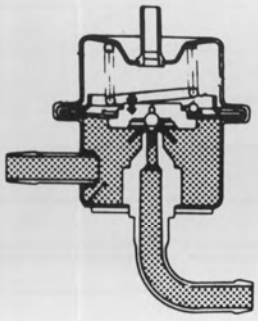
Name the component and briefly tell its function in the E.F.I. system.

1.



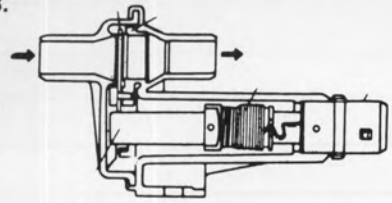
Name/Description

2.



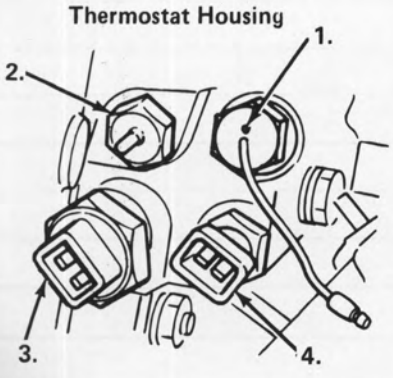
Name/Description

3.



Name/Description

4.



Name/Description

1=

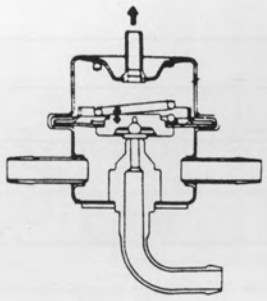
2=

3=

4=

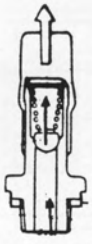
Name the component and briefly tell its function in the E.F.I. system.

5.



Name/Description

6.



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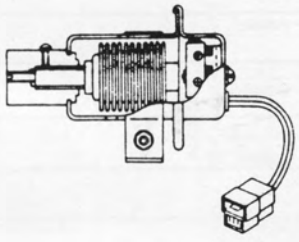

Name/Description

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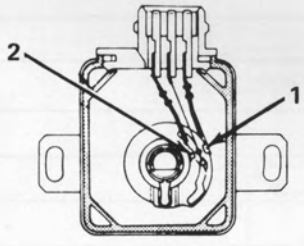


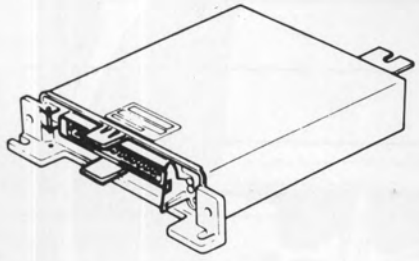
Name/Description

1=

2=

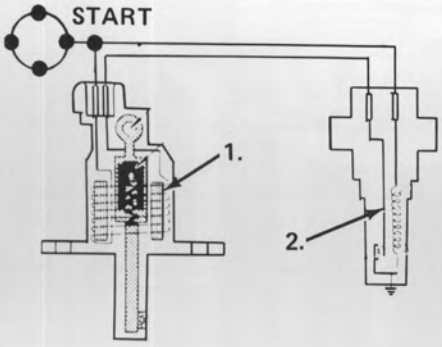
Name the component and briefly tell its function in the E.F.I. system.

9.



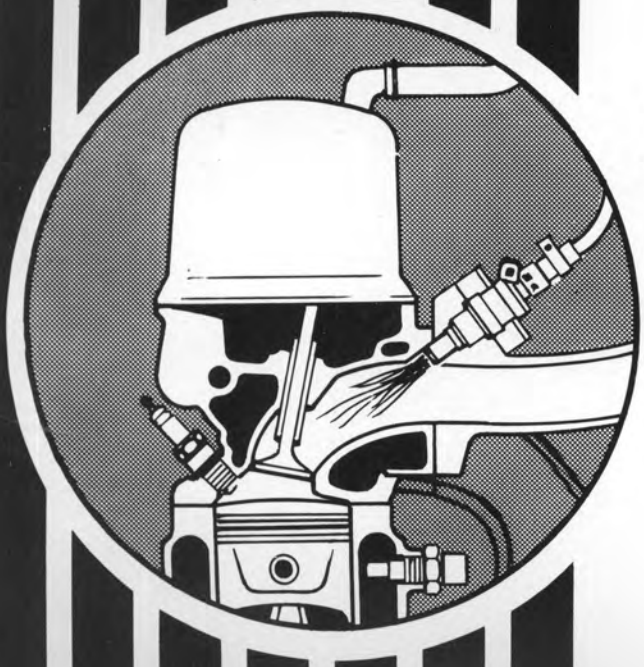
Name/Description

10.



Name/Description

NOTES



FUEL INJECTION TROUBLESHOOTING

→Quick Checks

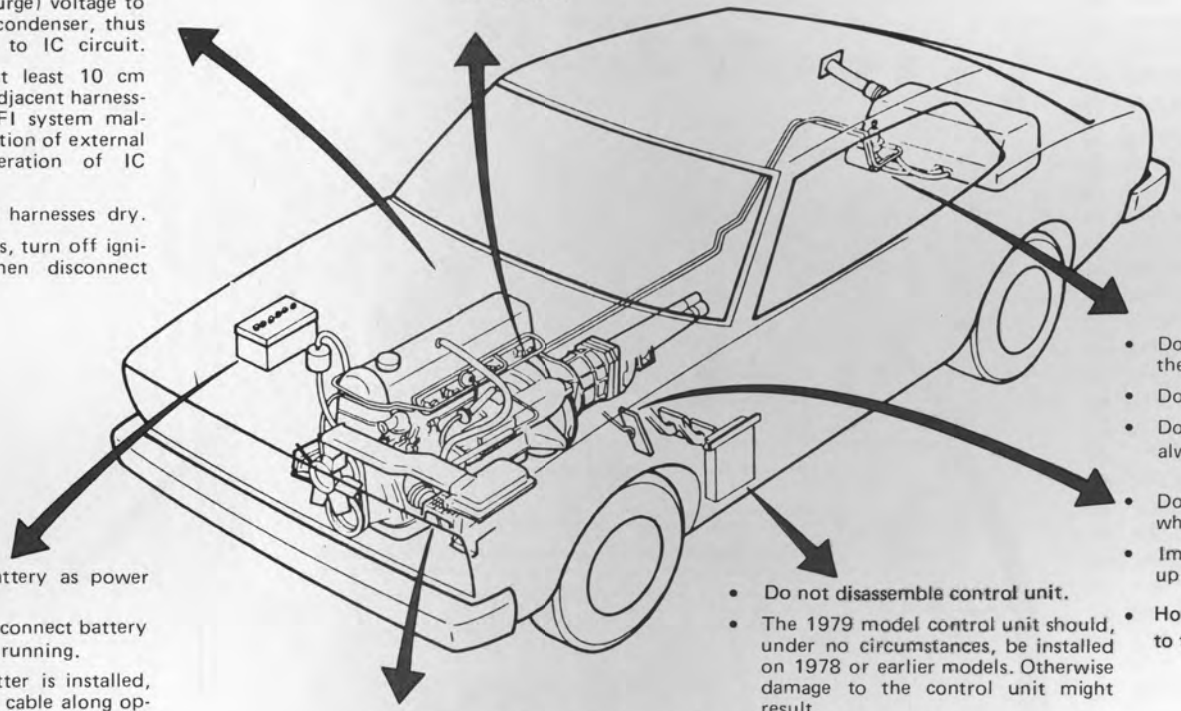
DATSUN

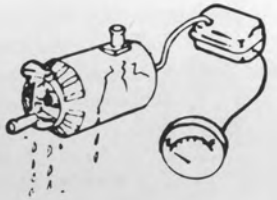
PRECAUTIONS FOR AN EFI ENGINE

Pay close attention to the following points when inspecting or servicing an EFI car.

- Securely connect EFI harness connector. A poor connection can cause an extremely high (surge) voltage to develop in coil and condenser, thus resulting in damage to IC circuit.
- Keep EFI harness at least 10 cm (3.9 in.) away from adjacent harnesses, to prevent an EFI system malfunction due to reception of external noise, degraded operation of IC circuit, etc.
- Keep EFI parts and harnesses dry.
- Before removing parts, turn off ignition switch and then disconnect battery ground cable.

- Do not apply battery power directly to injectors.

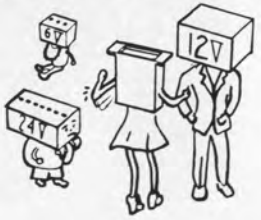




- Do not operate fuel pump when there is no fuel in lines.
- Do not use anti-freeze agents in fuel.
- Do not reuse fuel hose clamps, and always torque them to specifications.

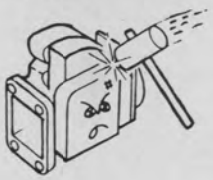
- Do not depress accelerator pedal when starting cold.
- Immediately after starting, do not rev up engine unnecessarily.
- Hot restart, depress accelerator all the to the floor.

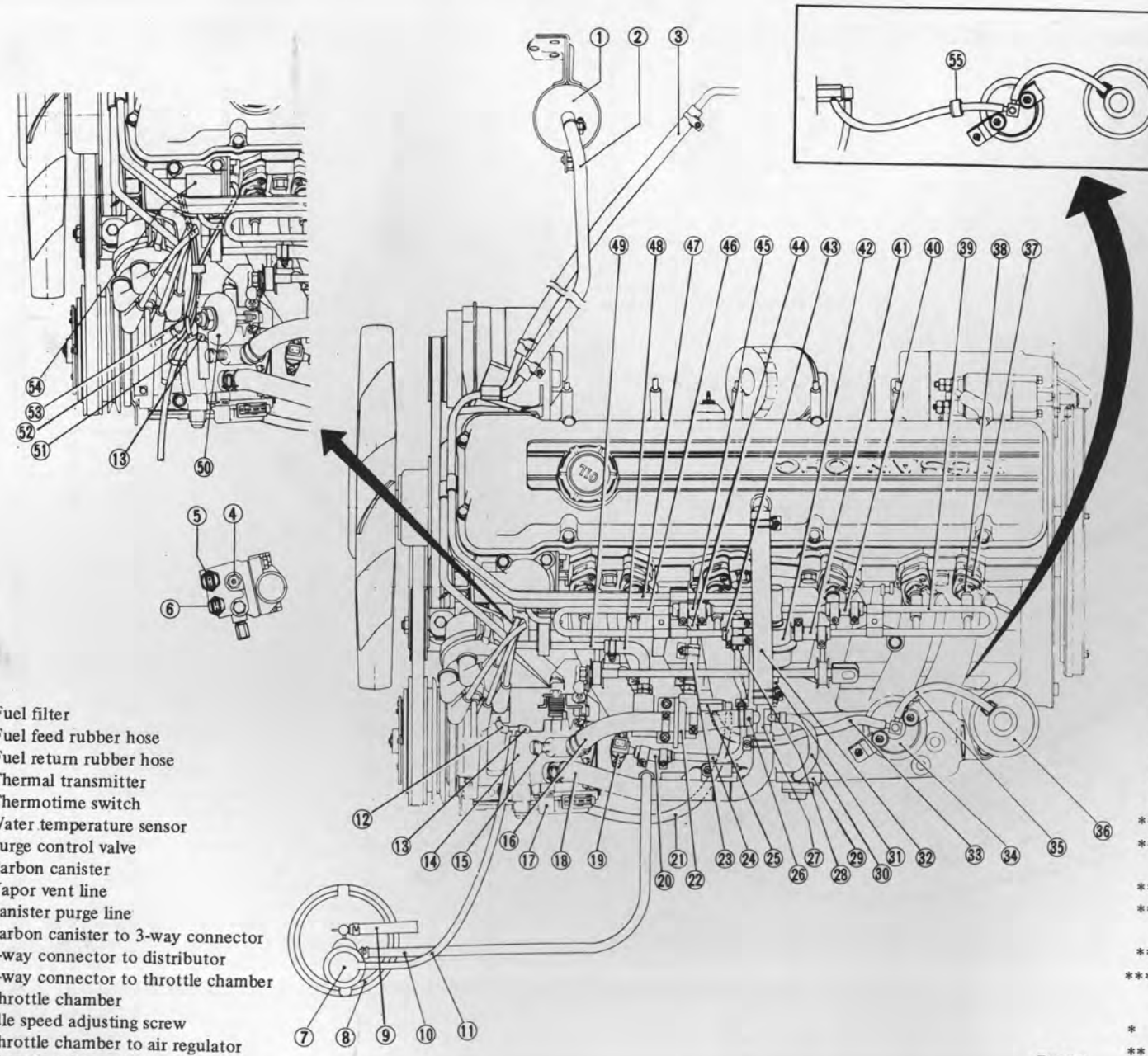
- Always use 12-volt battery as power source.
- Do not attempt to disconnect battery cables while engine is running.
- If a receiver-transmitter is installed, route antenna feeder cable along opposite side from EFI harness and control unit. Make sure that there is no interference while engine is idling.



- Do not disassemble control unit.
- The 1979 model control unit should, under no circumstances, be installed on 1978 or earlier models. Otherwise damage to the control unit might result.

- Handle air flow meter carefully to avoid damage.
- There must not be even a slight leak in air intake system.

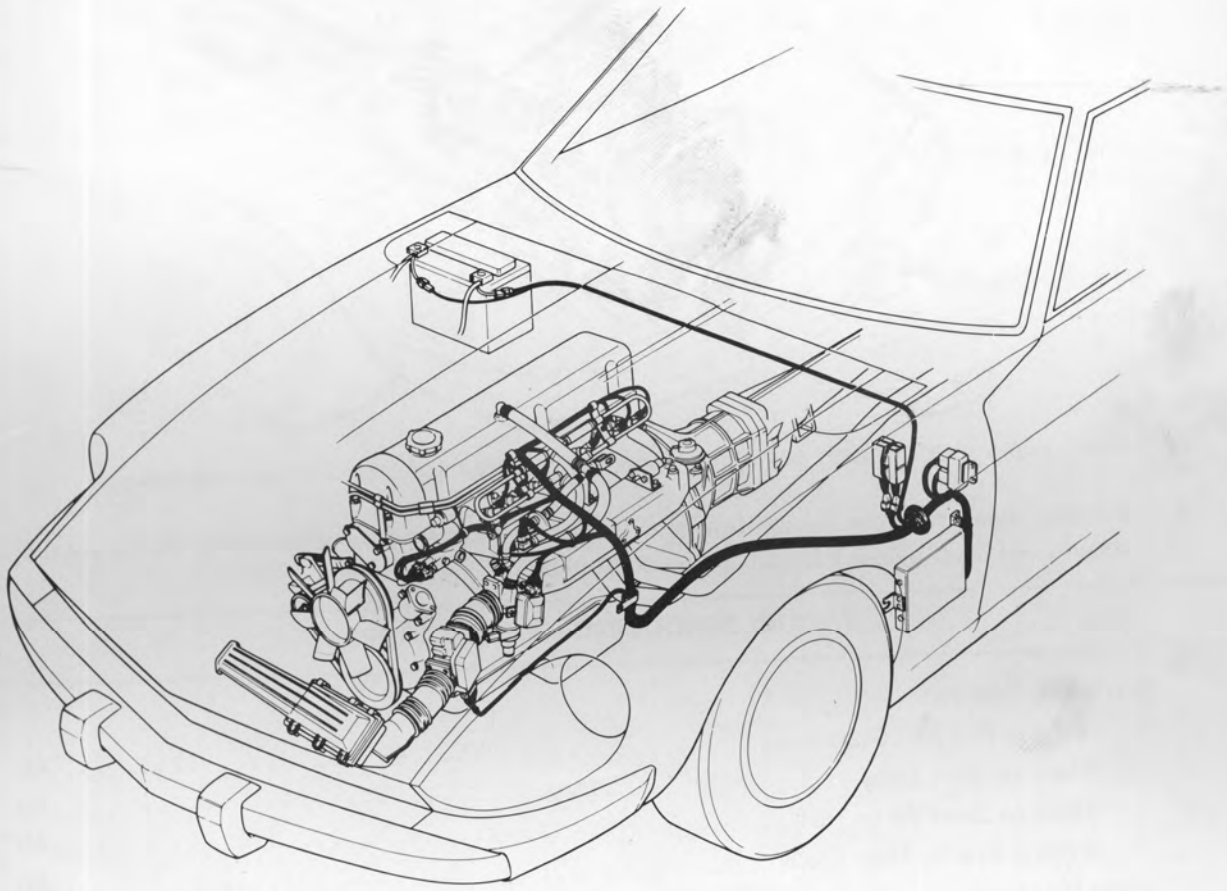




1 Fuel filter
2 Fuel feed rubber hose
3 Fuel return rubber hose
4 Thermal transmitter
5 Thermotime switch
6 Water temperature sensor
7 Purge control valve
8 Carbon canister
9 Vapor vent line
10 Canister purge line
11 Carbon canister to 3-way connector
*12 3-way connector to distributor
13 3-way connector to throttle chamber
14 Throttle chamber
15 Idle speed adjusting screw
16 Throttle chamber to air regulator
17 Throttle valve switch
18 Throttle chamber to 3-way connector
19 Cold start valve
20 Cold start valve to fuel pipe D
21 Throttle chamber to thermal vacuum valve
22 Air regulator
23 Heater housing to water pipe
24 Fuel pipe D
25 Thermal vacuum valve
26 Air regulator to 3-way connector
27 3-way connector (4-way connector for air conditioner equipped model)
28 Fuel pipe D to fuel pipe A
29 F.I.C.D. for air conditioner
30 F.I.C.D. to 4-way connector
31 Pressure regulator to intake manifold
32 3-way connector to rocker cover
33 Thermal vacuum valve to B.P.T. valve
34 B.P.T. valve
35 B.P.T. valve to E.G.R. control valve
36 E.G.R. control valve
37 Injector holder
38 Injector
39 Fuel pipe C
40 Fuel pipe A to fuel pipe C
41 Pressure regulator to fuel pipe C
42 Pressure regulator
43 Pressure regulator to fuel pipe B
44 Rubber hose to water pipe
45 Fuel pipe A to fuel pipe B
46 Fuel pipe B
47 Fuel pipe A
48 Heater housing to water pipe
49 Rubber hose to cylinder head water pipe
**50 Anti-stall dashpot
**51 Vacuum switching valve to throttle chamber
**52 Vacuum switching valve to distributor
**53 3-way connector to vacuum switching valve
**54 Vacuum switching valve
***55 Vacuum delay valve

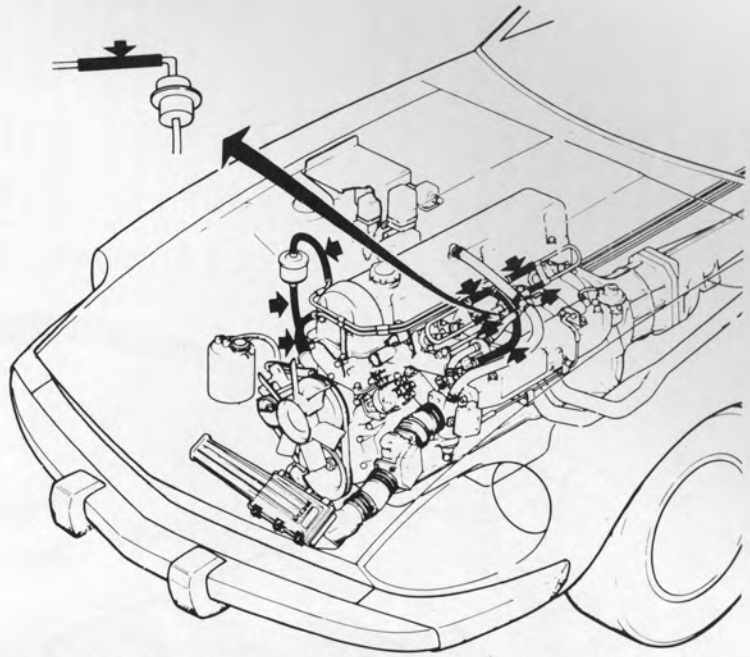
* Automatic transmission model only
** Manual transmission model only
*** California automatic transmission model only

First Steps:



1. The greatest problem source with a system of this type lies in the connections between components. Save time by performing a quick check of all connectors for (a) looseness and (b) corrosion. Pull all connectors off and reconnect after inspecting terminals.

HOSES

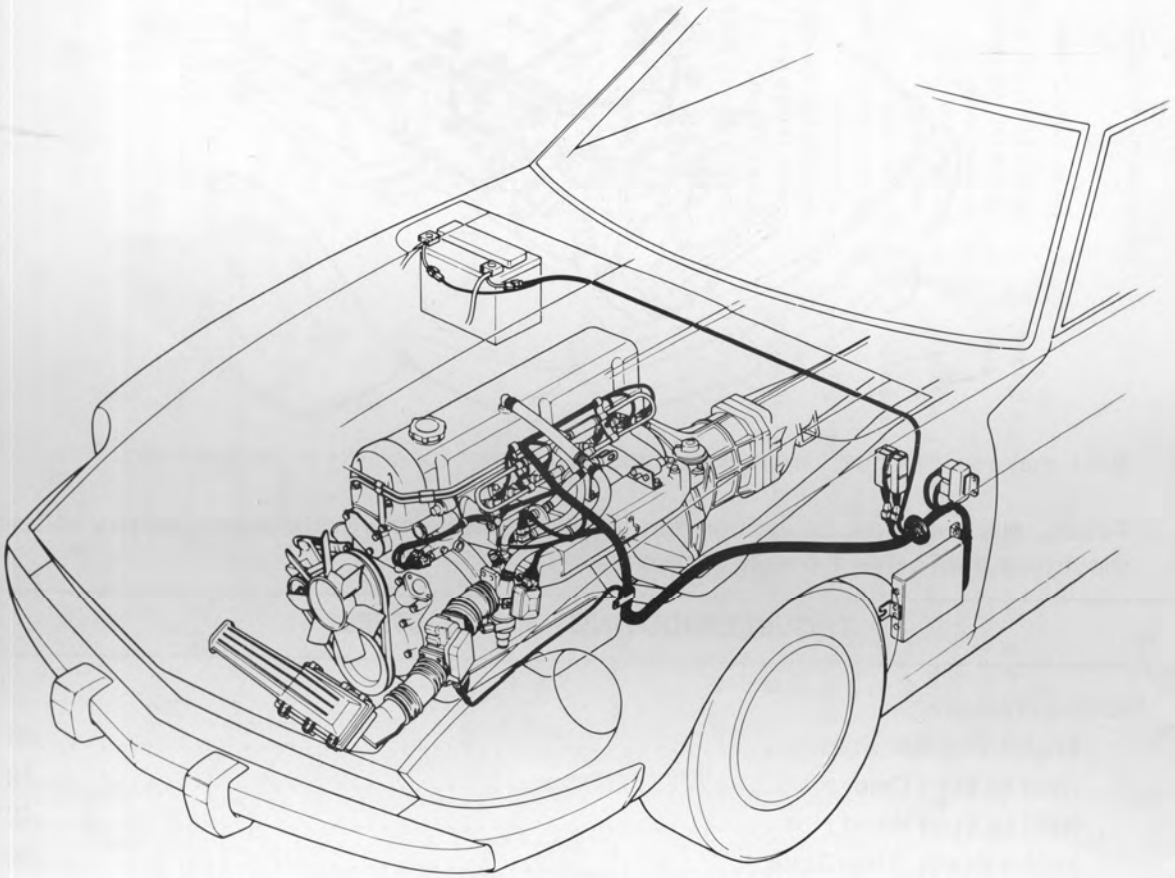


2. Next, make sure all hoses are in good condition. Check for cracks or vacuum leaks.

3. Finally, make sure the (a) ignition and (b) starting systems are satisfactory. Battery voltage should not drop below 9.6 volts while cranking.

TROUBLESHOOTING – QUICK STEPS

First Steps:



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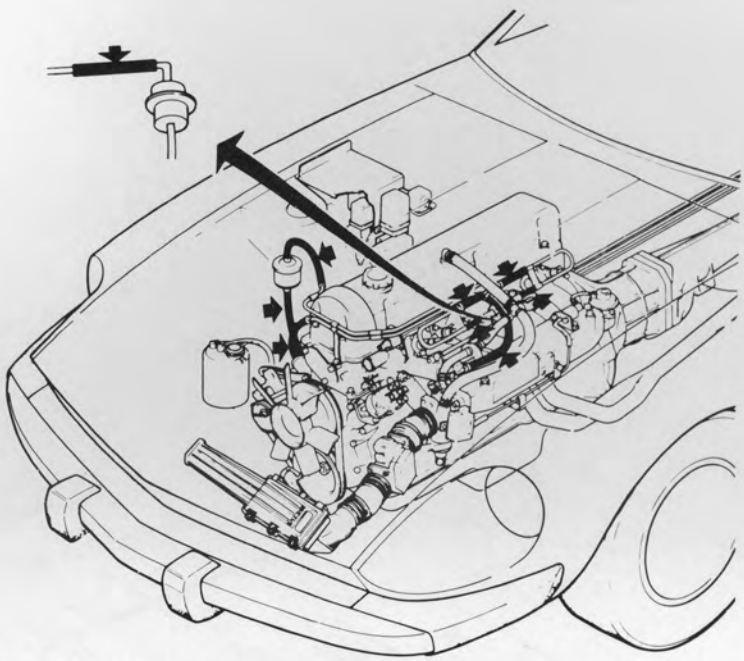
HOSES



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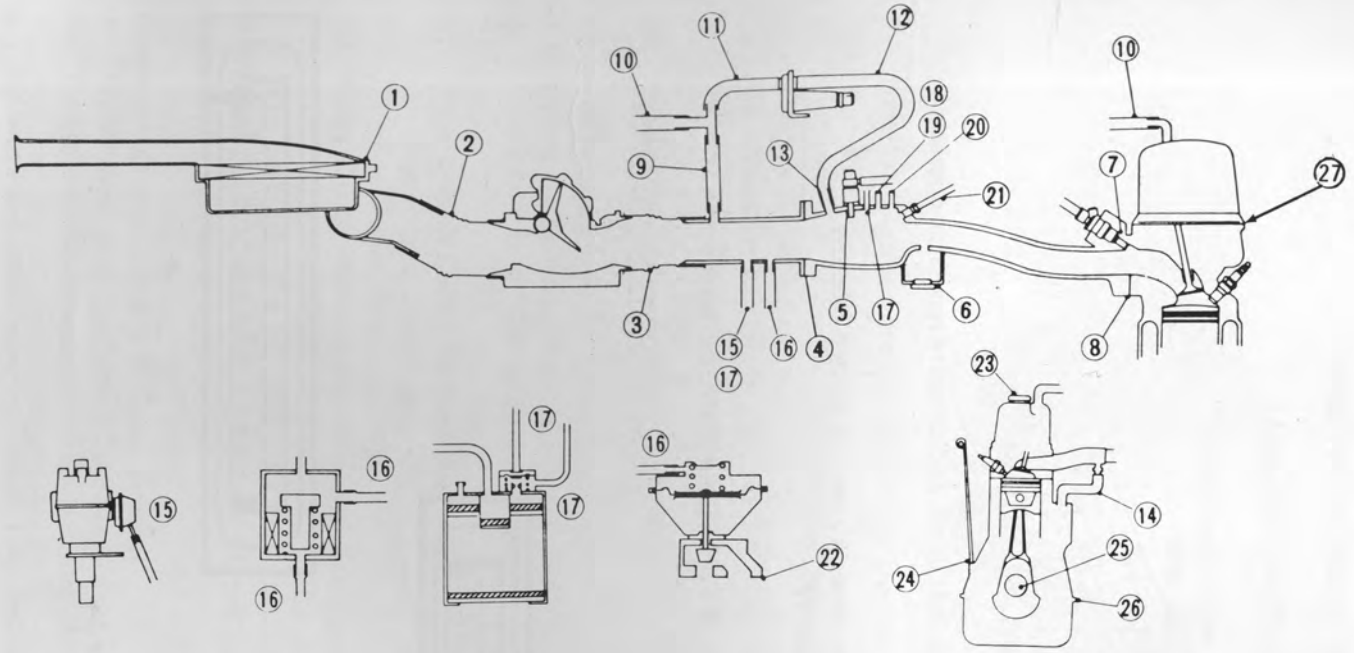
TROUBLESHOOTING – QUICK STEPS



1 Air cleaner element
2 Air duct (air cleaner to AFM)
3 Air duct (AFM to throttle chamber)
4 Flange (throttle chamber to intake manifold)
5 Cold start valve mounting surface
6 Blind plug (E.G.R.), (California models only)
7 Injector mounting surface in intake manifold
8 Cylinder head mounting surface in intake manifold
9 Hose (throttle chamber to 3-way connector), both sides
10 Hose (3-way connector to rocker cover), both sides
11 Hose (3-way connector to air regulator), both sides
12 Hose (air regulator to throttle chamber connector), both sides
13 Throttle chamber connector mounting surface
14 Hose (pipe connector to P.C.V. valve), both sides
15 Distributor vacuum line
16 E.G.R. vacuum line (California models only)
17 Canister vacuum and purge line
18 Master-Vac line } Same vacuum hole
19 Cooler vacuum line }
20 Automatic transmission vacuum line
21 Pressure regulator vacuum line
22 E.G.R. valve mounting surface (California models only)
23 Oil filler cap
24 Oil level gauge
25 Oil seal (on front and rear of crankshaft)
26 Oil pan gasket mounting surface.
27 Valve cover gasket

Checking air leakage in air intake system

ENGINE WILL NOT START

1. Check the Ignition System – verify spark plug application and condition.
   - Scope
   - Pull Coil Wire out of distributor and check for hot spark

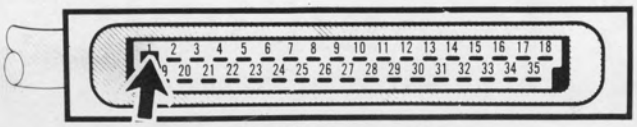
2. Verify fuel pressure and quality (drain off fuel from tank)

3. Check for vacuum leaks (See diagram on previous page)
   - PCV valve, dip stick seal, oil filler cap seal
   - Air flow meter hoses and clamps
   - Manifold gaskets
   - Valve cover gasket

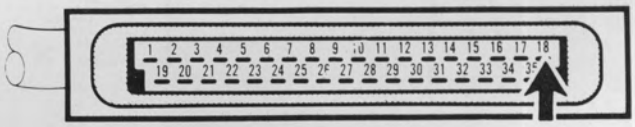
4. Fuel pump pressure regulator operation:
   - Pull Solenoid lead off starter
   - Turn key to "Start" and listen for fuel pump and pressure regulator operation.

   Results:
   (a) Fuel Pump Runs and pressure regulator buzzes: Go to step 5 below.
   (b) No Noise: Check power relay page 47.

5. Ignition signal input:
   - Touch Pin No. 1 (75–78), Pin No. 18 (79–Later) in 35 pin connector.
   - Key on check for current with test light.



75-78

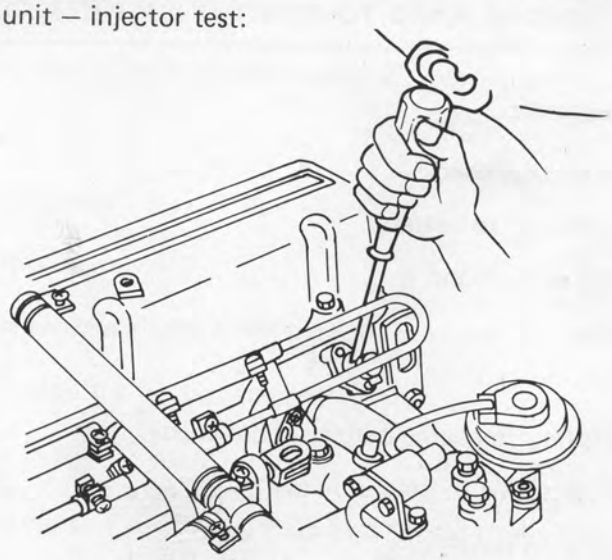


79 - ↑

- Locate Ignition Lead Wire To Control Unit (Next To Power Relay-See Drawing).
- Key On Check For Current With Test Light.

Results:
(a) Light On: Check power relay, control unit and injector circuits.
(b) Light Off: Check ignition circuit (for Service Manual page reference, see page 88)

6. Power relay – control unit – injector test:



- Key "On", ground the (–) terminal of the coil several times. Listen to the injectors.

Results:

(a) Injectors click irratically: Perform the following circuit checks at the 35-pin connector in the order below:
   (1) Water Temp. Circuit, page 79
   (2) A.F.M. Resistance, pages 74–76
   (3) Cold Start Circuit, page 98
   (4) Fuel Pump Circuit, page 78
   (5) Start Signal, page 96
   (6) Aux. Air Regulator, page 97

(b) Injectors do not click: Go to Step 7 below.

7a. Power relay check: (1975–77 models only)
- Locate power relay. Place your hand over it.
- Turn key first to "On" and then to "Start".

Results:

(a) Relay doesn't Click: Perform the following circuit checks in the order below:
   (1) Start Signal Circuit, page 96
   (2) Fuel Pump Relay, page 78
   (3) Aux. Air Regulator, page 80

(b) Relay Clicks: Perform the following circuit checks in the order below:
   (1) ECU Power Input, page 89
   (2) Coil Input Circuit, page 88
   (3) ECU Ground Circuits, pages 81–84
   (4) Injector Electric Circuits, pages 90–95

If problem persists, reconnect harness to ECU and perform Step 6 again. If test is still negative, try another control unit.

7b. Power circuit check: (1978 and later models)
- Main Power relay: perform ECU Power Input, page 89
- Fuel pump control circuit: (1) ignition key "On", (2) disconnect oil pressure sending unit lead, and (3) disconnect alternator field plug.

Results:

(a) Pump runs: check wiring.

(b) Pump doesn't run: check in order:
   (1) Ignition relay
   (2) Fuel pump control relay
   (3) Fuel pump relay
   (4) Fuel pump
   (5) Alternator and IC regulator
   (6) Wiring

(See section EF of appropriate Service Manual.)

ENGINE HARD TO START ONLY WHEN COLD

1. Verify valve adjustment.
2. Battery cranking voltage check:
   - Connect voltmeter to battery
   - Pull coil wire and ground it
   - Crank engine

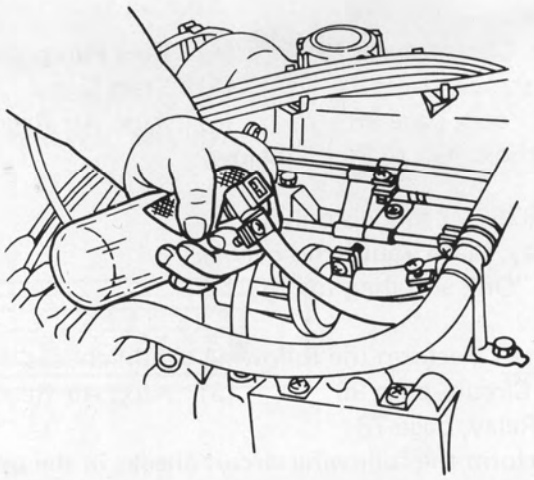
   Results:

   (a) Below 9.6 volts: Recharge battery and recheck.

   (b) Above 9.6 volts: To to Step 3 below
3. Perform the following tests:

   (1) Cold Start System, page 98

   (2) Verify that cold start and water temperature sensor connectors aren't interchanged.



   (3) Component test: Cold start valve (280Z Service Manual, page EF-54, 810 Service Manual, page EF-56).
4. Inspect throttle valve switch circuit, page 72–73

ENGINE HARD TO START ONLY WHEN HOT (ABOVE 170°F)

1. Check valve adjustment, ignition and emission systems. (Verify spark plug application)

2. Cold start system test (a)

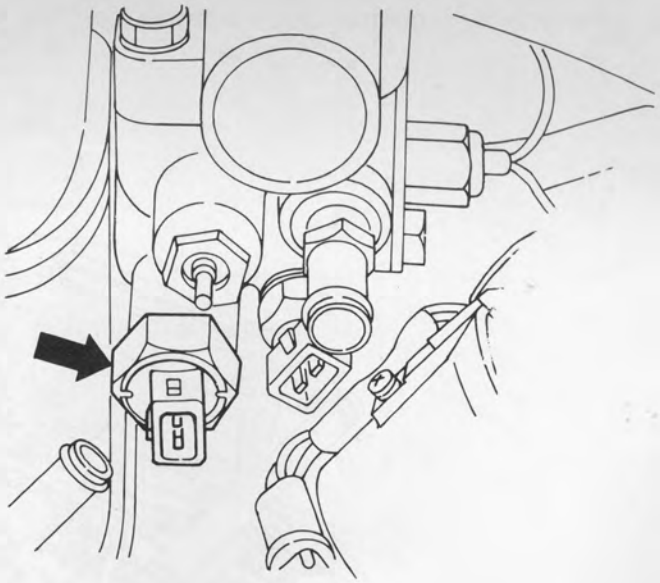
   - Disconnect cold start valve
   - Unplug coil wire, ground it
   - Crank engine a few times with the spark plugs out to clean out excess fuel
   - Reconnect coil wire and try to start engine

   Results:
   (a) Engine starts easily: Go to Step 3 below
   (b) Engine still hard to start: Perform the following checks in the order below:
      (1) Fuel Pump Relay, page 78
      (2) A.F.M. Resistance, pages 74–76
      (3) Perform fuel pressure test, page 116
      (4) Component test: Injectors, Service Manual, EF Section

   If no problem is found, proceed to "Engine will not start" on page 46.

3. Cold Start System Test (b)

   - Reconnect Cold Start Valve
   - Disconnect Thermotime Switch

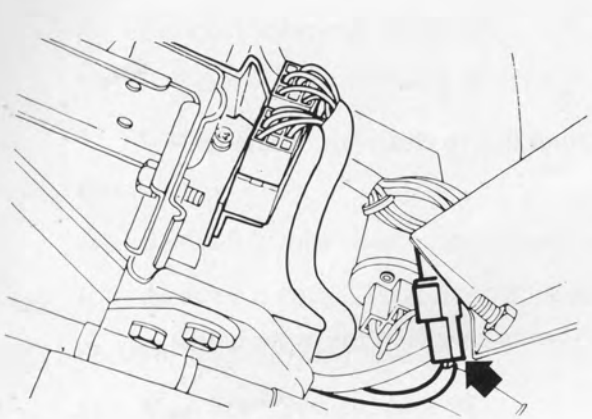


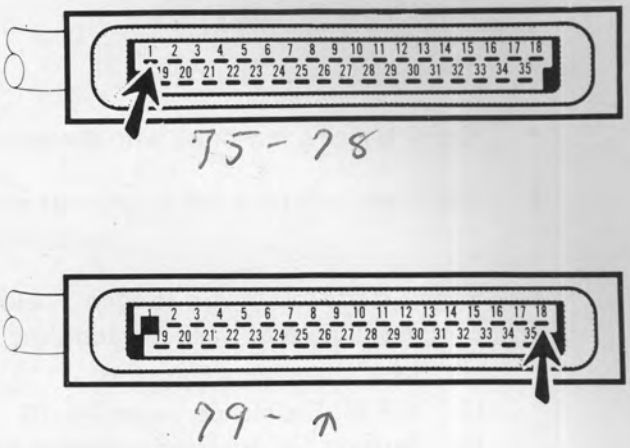
   - Try to Start Engine

   Results:
   (a) Engine Hard To Start: Check cold start valve (280Z Service Manual, page EF-54, 810 Service Manual, page EF-56) and replace if necessary.
   (b) Engine Starts Easily: Check thermotime switch (280Z Service Manual, page EF-53, 810 Service Manual, page EF-55) and replace if necessary.

ENGINE STARTS, THEN STALLS

1. Ignition Signal Input:

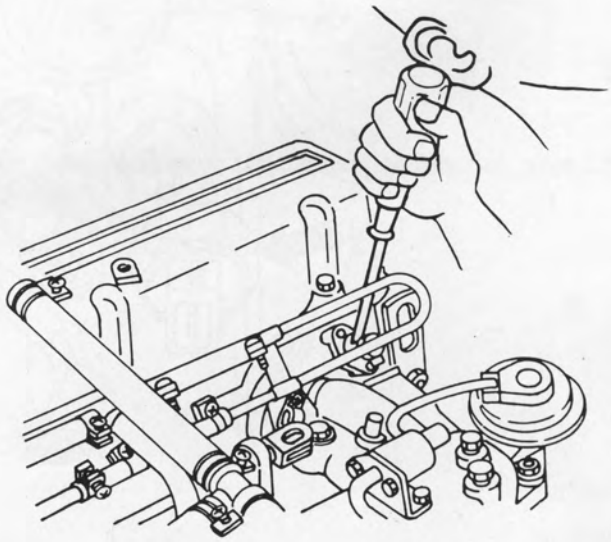




- On plug 35 pin connector
- Locate pin 1 (75 – 78), pin 18 (79 – Later)
- Key "On", check for current with test light

Results:
(a) Light "On": Go to Step 2 below.
(b) Light "Off": Check ignition circuit. (For Service Manual page reference, see page 88.

2. Power relay – control Unit – injector test:



- Key "On", ground coil (–) terminal several times. Listen to the injectors.

Results:
(a) Injectors click erratically: Go to Step 4 below.
(b) Injectors don't click: Go to Step 3 below.

3a. Power relay check: (1975-77 models only)

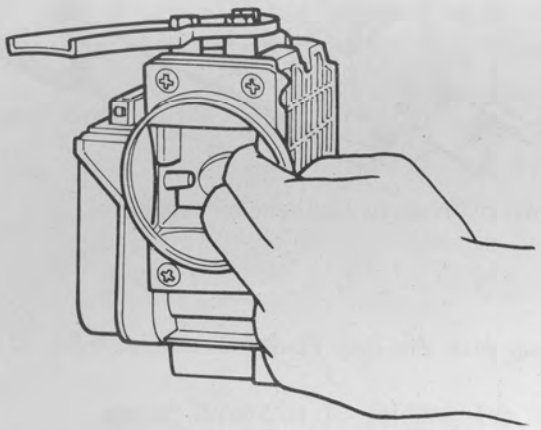
- Locate power relay and place your hand over it.
- Turn key first to "On" and then to "Start".

Results:
(a) Relay clicks twice: Go to Step 4 below.
(b) Relay clicks only once or not at all: Perform the following circuit tests in the order below:
(1) Start Signal Circuit, page 96
(2) Water Temp. Resistance, page 79
(3) Aux. Air Regulator & Fuel Pump Circuit, page 80

3b. Power relay check: (1978 and later models only) refer to page 47, No. 6b.

4. Air flow meter pump contacts: (1975–77 models only)

- Remove front hose to air flow meter
- Ignition "On"



- Using a finger, reach in and push open the air flow meter flap.

Results:
(a) Fuel pump operates: Go to Step 5 below.
(b) Fuel pump does not operate: A.F.M. fuel pump contacts, page 78.

5. A.F.M. fuel pump contacts, page 78

6. Aux. Air regulator and fuel pump, page 80.

If no problem is found, proceed to "Engine Will Not Start" on page 46.

ENGINE IDLES TOO FAST – CANNOT BE ADJUSTED WITH SPEED SCREW OR ENGINE IDLE IS UNSTABLE

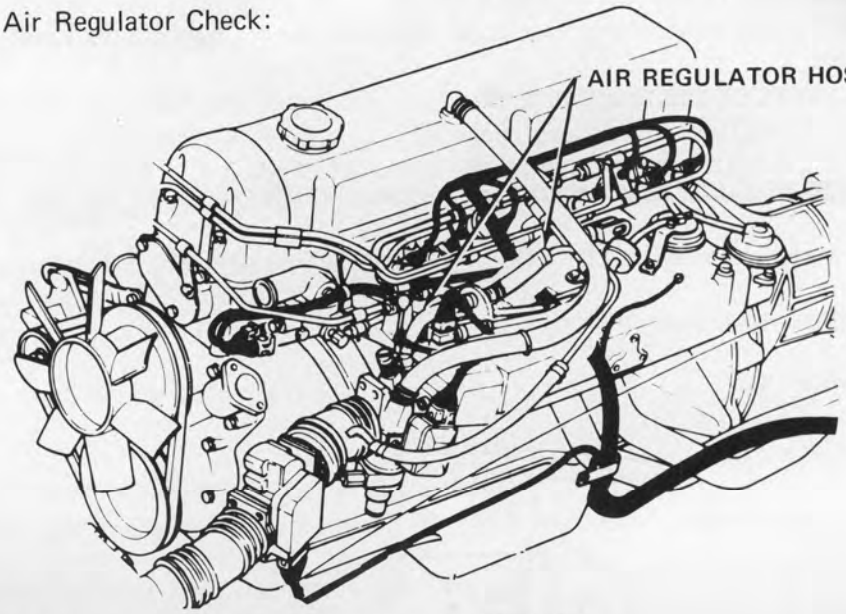
1. Unstable Idling: Check Valve Adjustment and spark plug application

2. Check That Throttle Plate Is Closing When Throttle Is Released

3. Check That EGR Valve Is Not Sticking Open.

4. Check That B.C.D.D. Valve Is Not Open At Idle And That Relief Solenoid Is Connected

5. Auxiliary Air Regulator Check:



- Using pliers, pinch off hose to auxiliary air regulator.

Results:

(a) Idle drops: Check Aux. Air Reg. Power Circuit page 80. If no fault is found, replace regulator.

(b) Idle remains high or unstable: Go to Step 6, below.

6. Check for manifold vacuum leaks, including at PCV valve, valve cover gasket, dip stick and oil filler cap seals. (See diagram page 45).

If no problem is found, perform the following circuit tests in the order below:

(1) Throttle Valve Switch Idle, page 72
(2) Throttle Valve Switch Full, page 73
(3) Air Temp. Sensor, page 77
(4) A.F.M. Fuel Pump Controls, page 78
(5) ECU Ground, pages 81–84
(6) A.F.M. Resistance, pages 74–76
(7) Aux. Air Reg. & Fuel Pump, page 80
(8) Aux. Air Reg., page 97
(9) Coil Trigger Input, page 88
(10) ECU Power Circuit, page 89
(11) Injector Power Circuit, pages 90–95

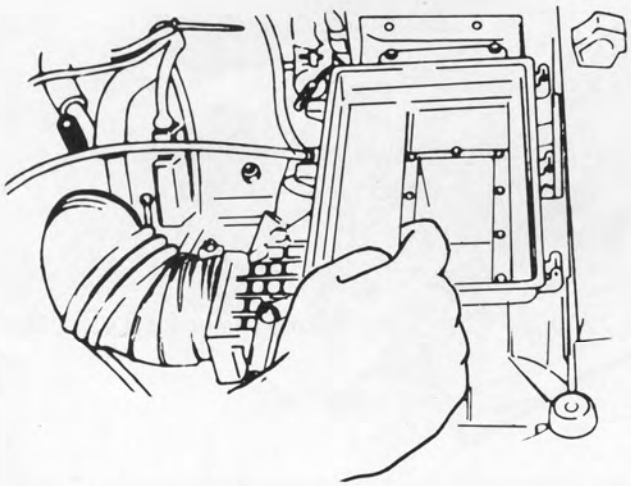
Then proceed to "Component Checks", page 99.

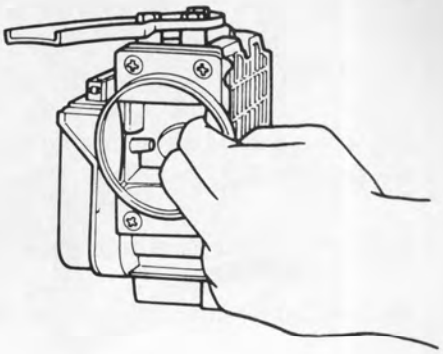
ENGINE MISFIRES – HC READING TOO HIGH

1. Check engine oil for high gas content.
2. Check ignition circuit thoroughly.
3. Check charging system voltage regulator setting.
4. Pull all fuel injection connectors apart and check for looseness and corrosion (including ground circuits). Don't forget iginition input lead inside the car.
5. Check fuel circuit:
   - Fuel Filter
   - Injectors
   - Lines
6. Tap control unit while driving to see if this aggravates or alleviates the problem. If so, try another ECU.
7. Perform fuel pressure test, page 116.
8. Perform all circuit tests starting on page 72, or perform Kent-Moore Tester tests page 101.
9. Perform component tests. See page 99.

ENGINE WILL NOT REV. – LACK OF POWER

1. Check for exhaust system restriction.
2. Check cam timing.
3. Check transistor ignition thoroughly, including pickup coil(s), and ignition coil. (See Engine Analysis Service Guide)
4. Make sure throttle plate is opening fully when accelerator is fully depressed.
5. Check air flow meter mechanical movement:
   - Remove front (intake hose)

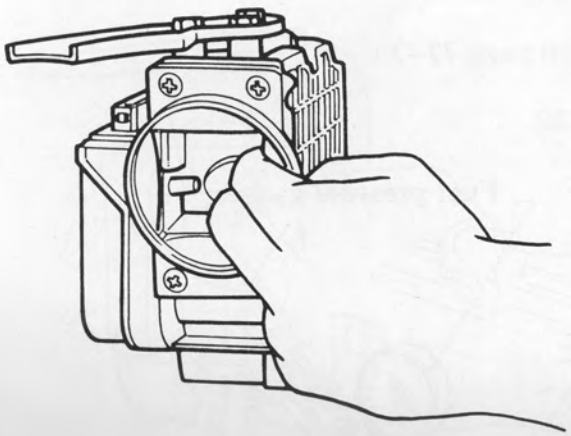




   - Using a finger, push the flap open, checking that it opens smoothly and fully.
6. Check for blockage in fuel circuit:
   - Fuel Filter
   - Lines
7. Perform fuel pressure test, page 116.
8. Perform the following circuit tests in the order below:
   (1) Full throttle switch, page 72–73
   (2) Ignition Coil Input, page 88
   (3) ECU Power Input, page 89
   (4) Injector Circuit, pages 90–95
   (5) AFM Resistance, pages 74–76
   (6) Air Temp. Sensor, page 77
   (7) Fuel Pump Contacts, page 78
   (8) Aux. Air Regulator & Fuel Pump Circuit, page 80
   (9) Altitude Compensator, page 85
9. Perform component tests, page 99.

HESITATION – STUMBLE ON ACCELERATION

1. Check ignition system thoroughly. (See Engine Analysis Service Guide.)
2. Check fuel pressure page 116.
3. Throttle valve switch pages 72–73.

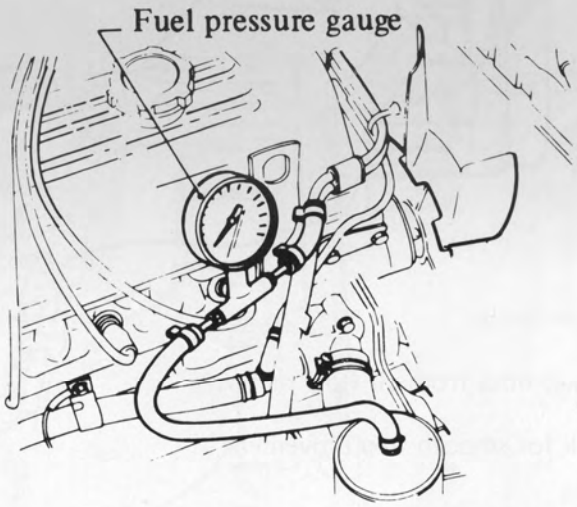


4. Air flow meter mechanical check:
   - Remove front (intake) hose from air flow meter.
   - Using a finger, check for smooth flap movement

   Results:
   (a) Resistance points felt: Replace air flow meter
   (b) Movement is normal: Go to step 5 below.
5. Check for intake manifold leaks (see diagram page 45).
   - PCV valve
   - Dip stick and oil filler cap seals
   - Valve cover gasket
   - Manifold gaskets
   - Air flow meter hoses
6. Check AFM idle CO% adjustment, page 132.
7. Perform complete circuit test, starting on page 72.
8. Perform component checks, page 99.

POOR GAS MILEAGE, OR CO READING TOO HIGH

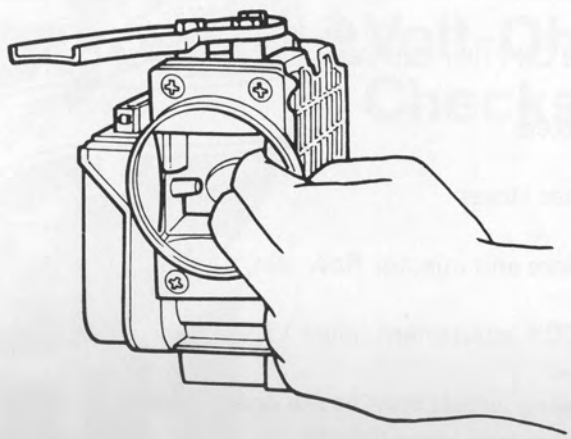
1. Check timing; check ignition system for "Hot" spark (use Scope if available).
2. Check air cleaner element
3. Fuel Pressure test page 116.
4. Water temperature circuit, page 79.
5. Throttle valve switch pages 72–73.
6. Check CO% page 132.



7. Perform the following circuit tests in the order below:
   (1) Air Temperature, page 77
   (2) Air flow meter, pages 74–76
   (3) Aux. Air Regulator, page 97
   (4) Aux. Air Regulator & Fuel Pump page 80
   (5) Injector Power Circuit, pages 90–95
8. Then proceed to component checks, page 99.

SURGE

1. Check valve adjustment and spark plug application
2. Air flow meter mechanical check:
   - Remove front (intake) air hose from air flow meter.



   - Using a finger, check flap movement for smoothness of operation. If no resistance is felt, go to step 3 below.
3. Check for manifold leaks (see diagram page 45).
   - PCV valve
   - Valve Cover Gasket
   - Dip Stick and Oil Filler Cap Seals
   - Manifold Gaskets
   - Air Flow Meter Hoses
4. Perform fuel pressure test, page 116.
5. Check AFM idle CO% adjustment, page 132.
6. Perform the following circuit tests in the order below:
   (1) Throttle Valve switch, pages 72–73
   (2) AFM Resistance, pages 74–76
   (3) Fuel Pump Contacts, page 78
   (4) ECU Ground, pages 81–84
   (5) Air Temp. Sensor, page 77
   (6) Aux. Air Regulator & Fuel Pump, page 80
   (7) Altitude Compensator, page 85
   (8) Coil Trigger Circuit, page 88
   (9) ECU Power Circuit, page 89
   (10) Injector Power Circuits, pages 90–95
7. Then proceed to component tests, page 99.

BACKFIRING (POPPING IN INTAKE MANIFOLD)

1. Check basic tune-up specifications.

2. Check for manifold vacuum leaks. (See diagram page 45)

   - PCV Valve
   - Valve Cover Gasket
   - Dip Stick and Oil Filler Cap Seals
   - Manifold Gaskets
   - Air Flow Meter Hoses

3. Perform fuel pressure and injector flow test, page 116.

4. Check AFM idle CO% adjustment, page 132.

5. Perform the following circuit tests in the order listed:

   (1) Throttle valve switch, page 72–73
   (2) AFM, pages 74–76
   (3) Air Temp. Sensor, page 77
   (4) Fuel pump contacts, page 78
   (5) Altitude Compensator, page 85
   (6) Coil Trigger Circuit, page 88
   (7) ECU Power Circuit, page 89
   (8) Injector Power Circuit, pages 90–95

   Then proceed to the component tests on page 99.

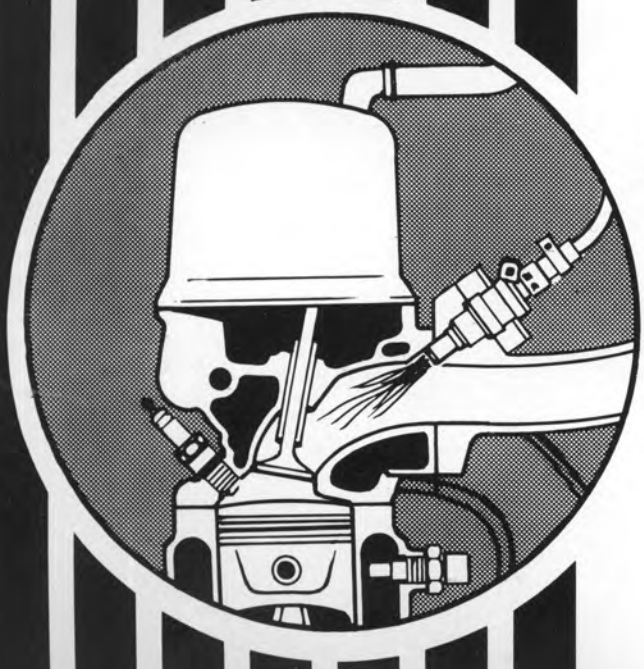
AFTERFIRE OR AFTERBURNING (POPPING IN TAIL PIPE)

1. Check exhaust system for air leaks.

2. Perform the following circuit tests in the order listed:

   (1) Throttle Valve Switch, pages 72–73
   (2) AFM, pages 74–76
   (3) Air Temp. Sensor, page 77
   (4) Fuel Pump Relay, page 78
   (5) Injector Power Circuits, pages 90–95
   (6) Start Signal, page 96

3. Then proceed to component checks, page 99 or Kent-Moore Analyzer, page 101.

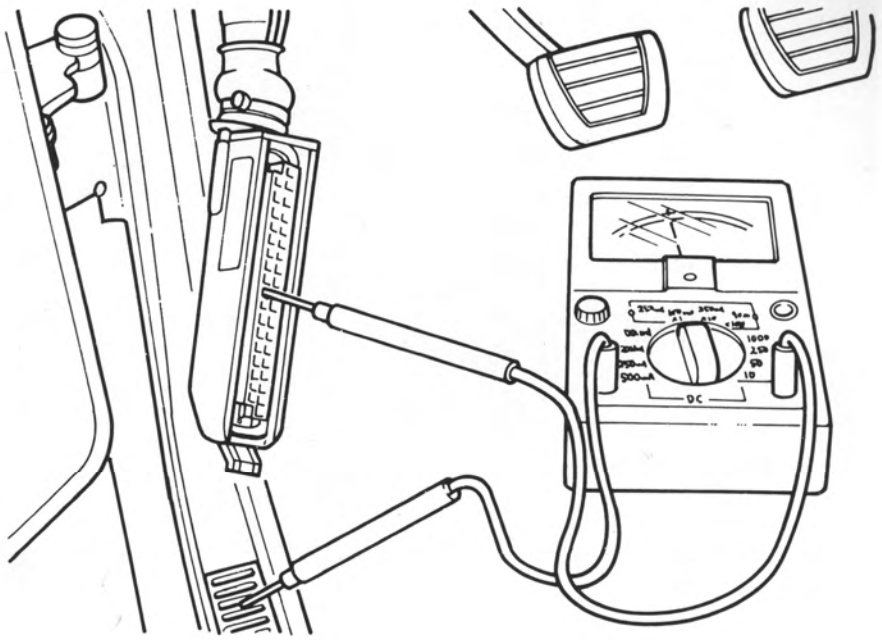


FUEL INJECTION TROUBLESHOOTING

→ Volt-Ohmmeter Checks

DATSUN

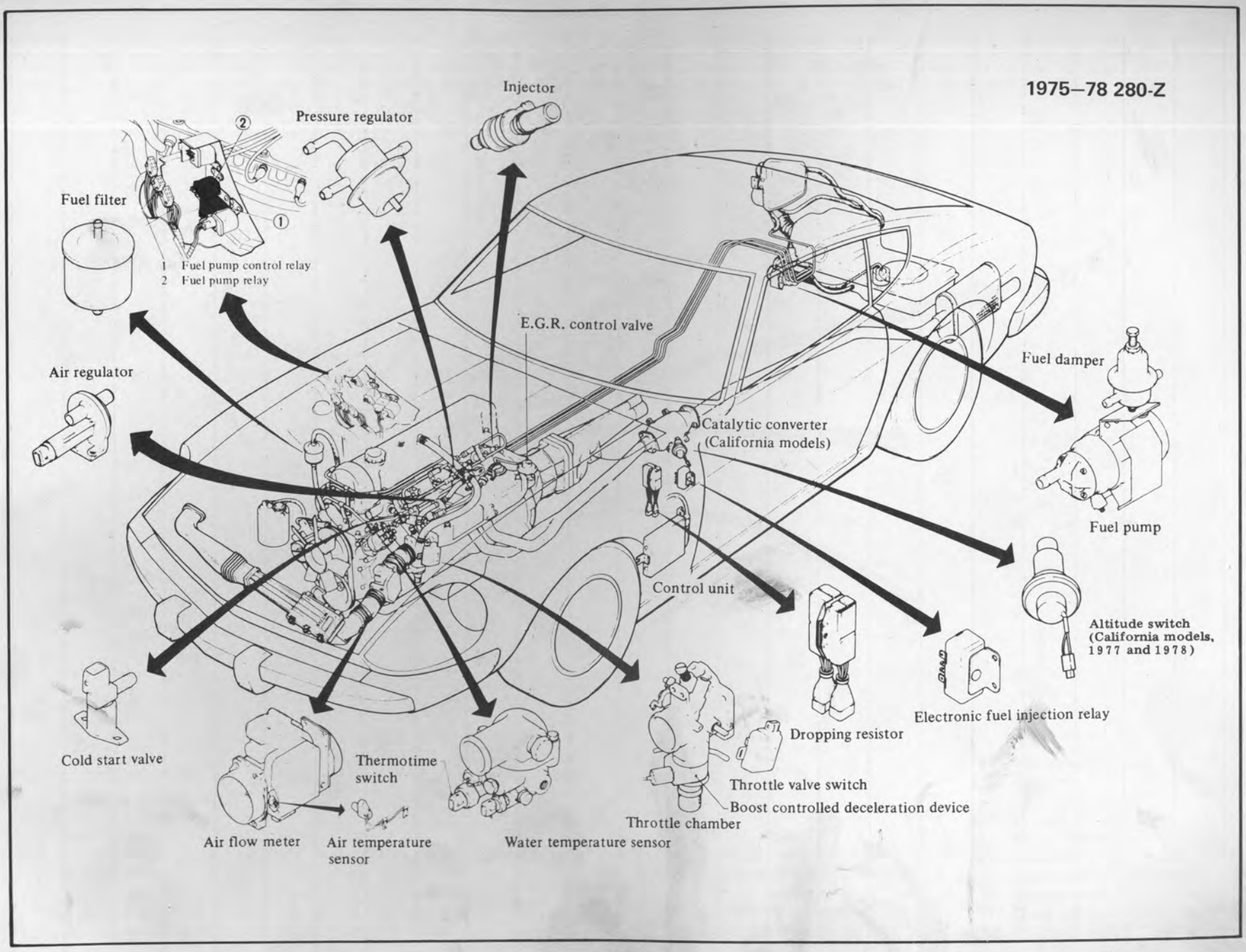
EFI HARNESS CONNECTOR TESTING

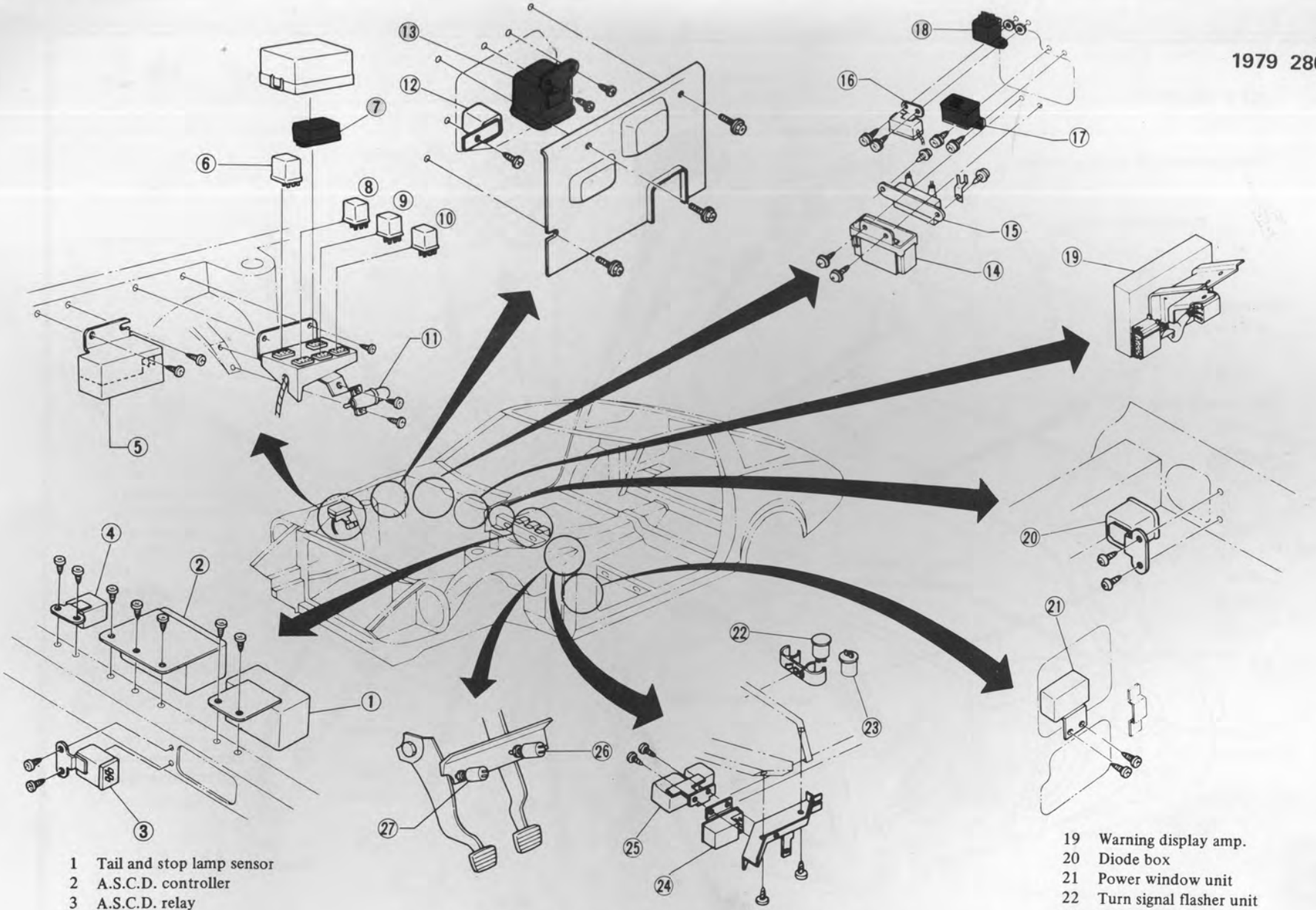


CAUTION

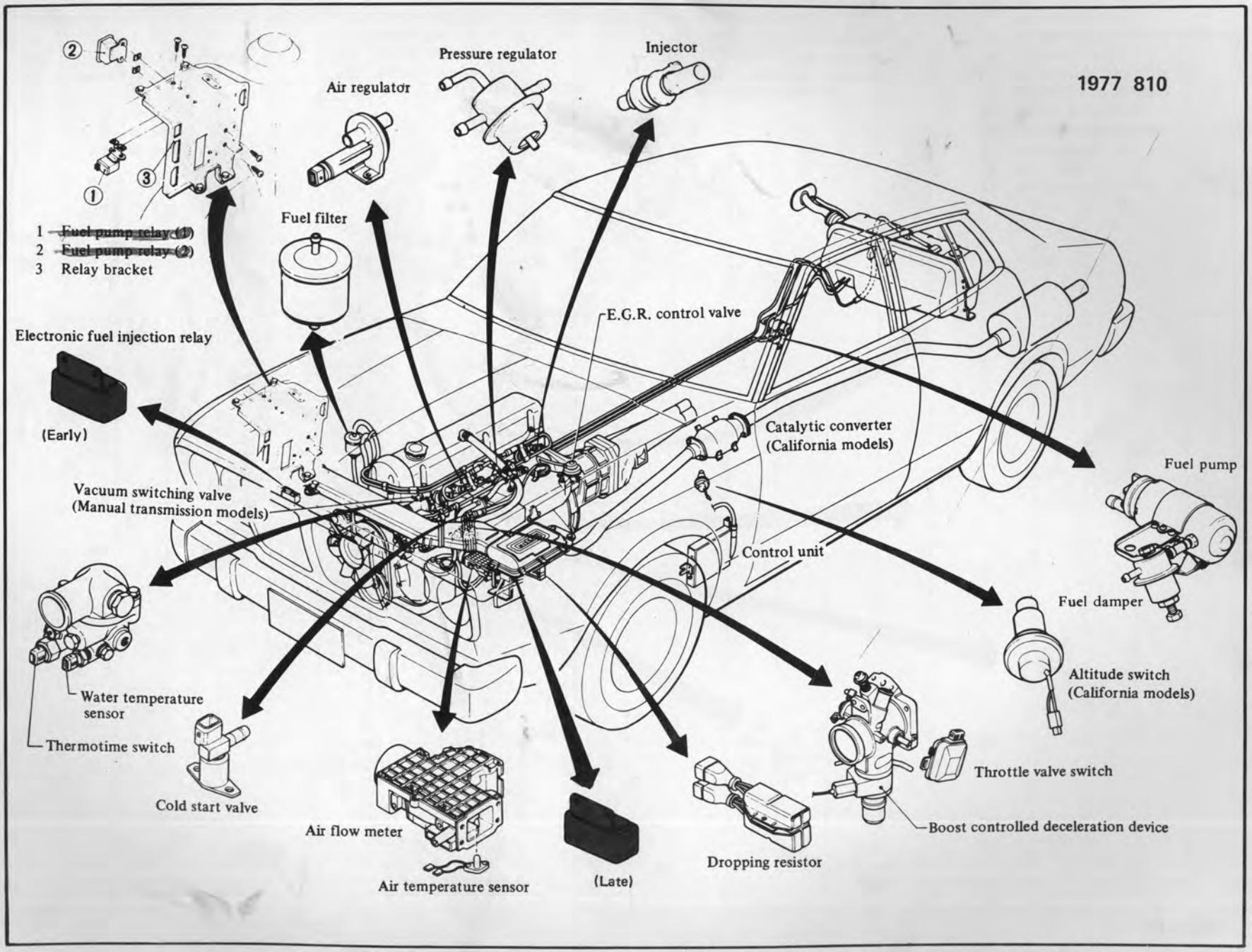
Always turn ignition key to "OFF" before disconnecting 35 pin connector from ECU.

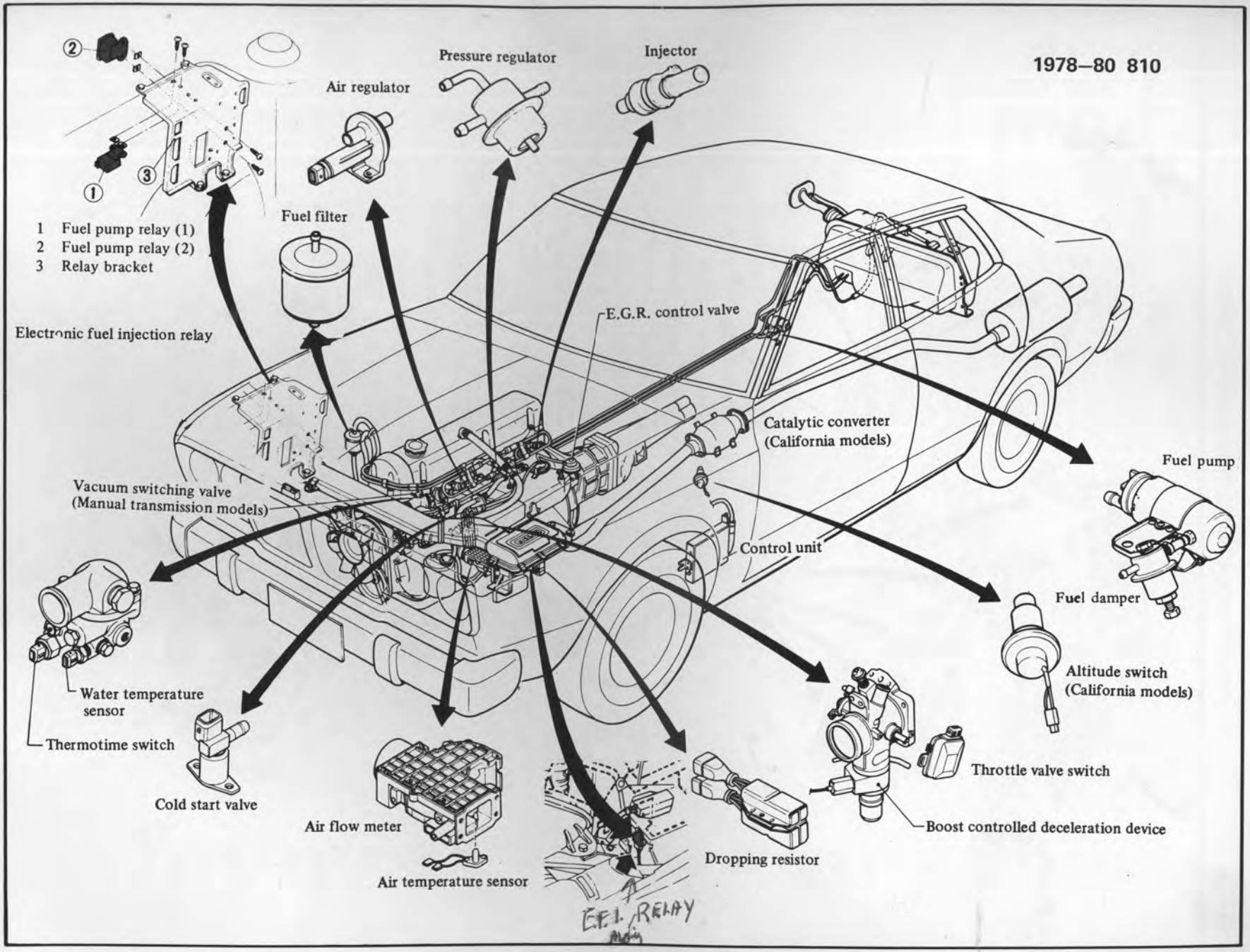
Also, the harness socket connectors are fragile. Never force the tester probe into the sockets.


1975—78 280-Z
Injector
Pressure regulator
Fuel filter
1 Fuel pump control relay
2 Fuel pump relay
E.G.R. control valve
Air regulator
Fuel damper
Catalytic converter
(California models)
Fuel pump
Control unit
Altitude switch
(California models,
1977 and 1978)
Electronic fuel injection relay
Dropping resistor
Cold start valve
Thermotime
switch
Throttle valve switch
Boost controlled deceleration device
Throttle chamber
Air flow meter
Air temperature
sensor
Water temperature sensor

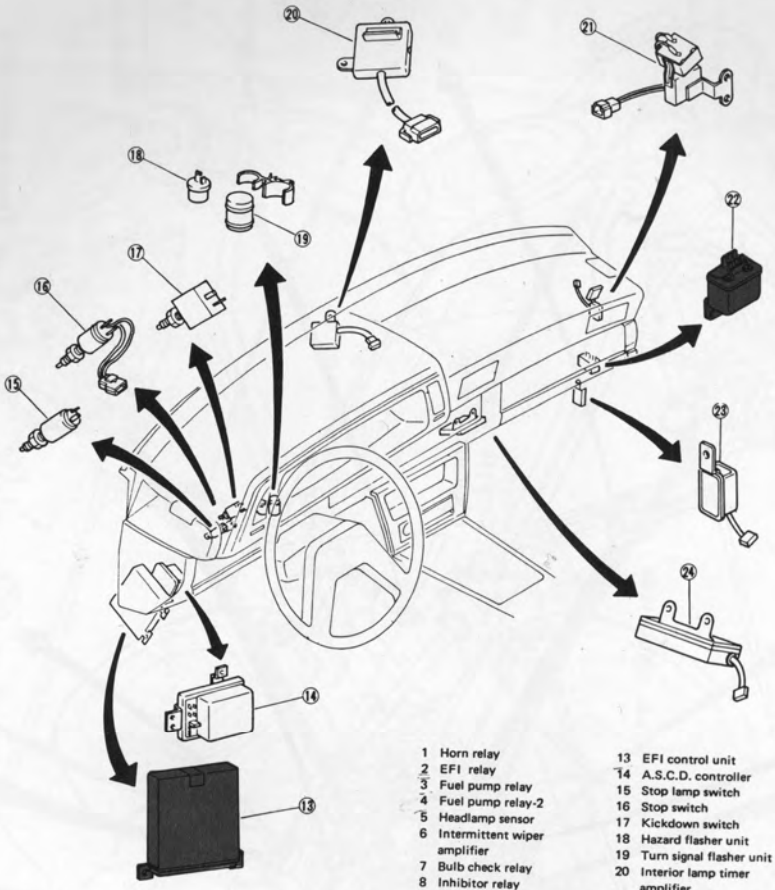


1 Tail and stop lamp sensor
2 A.S.C.D. controller
3 A.S.C.D. relay
4 Antenna relay
5 Headlamp sensor
6 Inhibitor relay (A/T model)
7 Fuel pump relay (2)
8 Air con. relay
9 Warning lamp bulb check relay
10 Lighting relay
11 Inspection lamp
12 Horn relay
13 E.F.I. relay
14 Fan motor timer unit
15 Power window circuit breaker
16 Seat belt warning timer unit
17 Ignition and Accessory relay
18 Fuel pump relay (1)
19 Warning display amp.
20 Diode box
21 Power window unit
22 Turn signal flasher unit
23 Hazard flasher unit
24 Intermittent wiper amp.
25 Intermittent warning buzzer
26 Stop lamp switch
27 Clutch switch (A.S.C.D. equipped M/T models only)

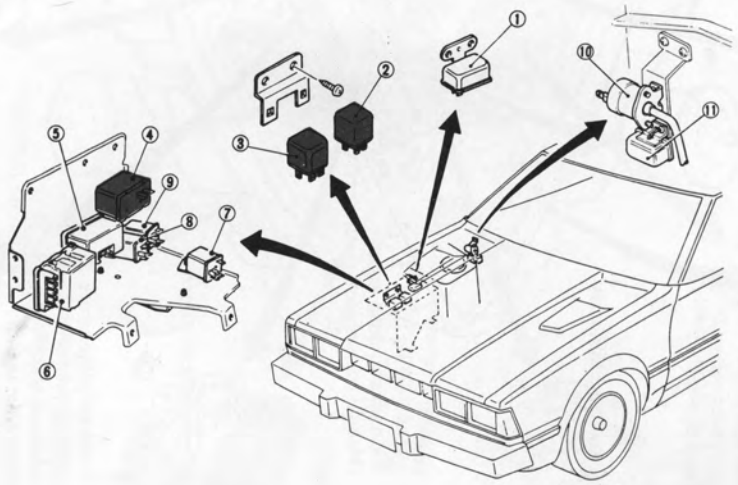

1977 810
Pressure regulator
Injector
Air regulator
Fuel filter
1 Fuel pump relay (1)
2 Fuel pump relay (2)
3 Relay bracket
Electronic fuel injection relay
(Early)
E.G.R. control valve
Catalytic converter
(California models)
Fuel pump
Vacuum switching valve
(Manual transmission models)
Control unit
Fuel damper
Altitude switch
(California models)
Water temperature
sensor
Thermotime switch
Cold start valve
Air flow meter
Air temperature sensor
(Late)
Dropping resistor
Throttle valve switch
Boost controlled deceleration device


1978–80 810
1 Fuel pump relay (1)
2 Fuel pump relay (2)
3 Relay bracket
Air regulator
Pressure regulator
Injector
Fuel filter
Electronic fuel injection relay
E.G.R. control valve
Catalytic converter (California models)
Fuel pump
Vacuum switching valve (Manual transmission models)
Control unit
Fuel damper
Altitude switch (California models)
Water temperature sensor
Thermotime switch
Cold start valve
Air flow meter
Air temperature sensor
Dropping resistor
Throttle valve switch
Boost controlled deceleration device
E.F.I. RELAY

RELAY LOCATIONS 1980 – LATER 200SX

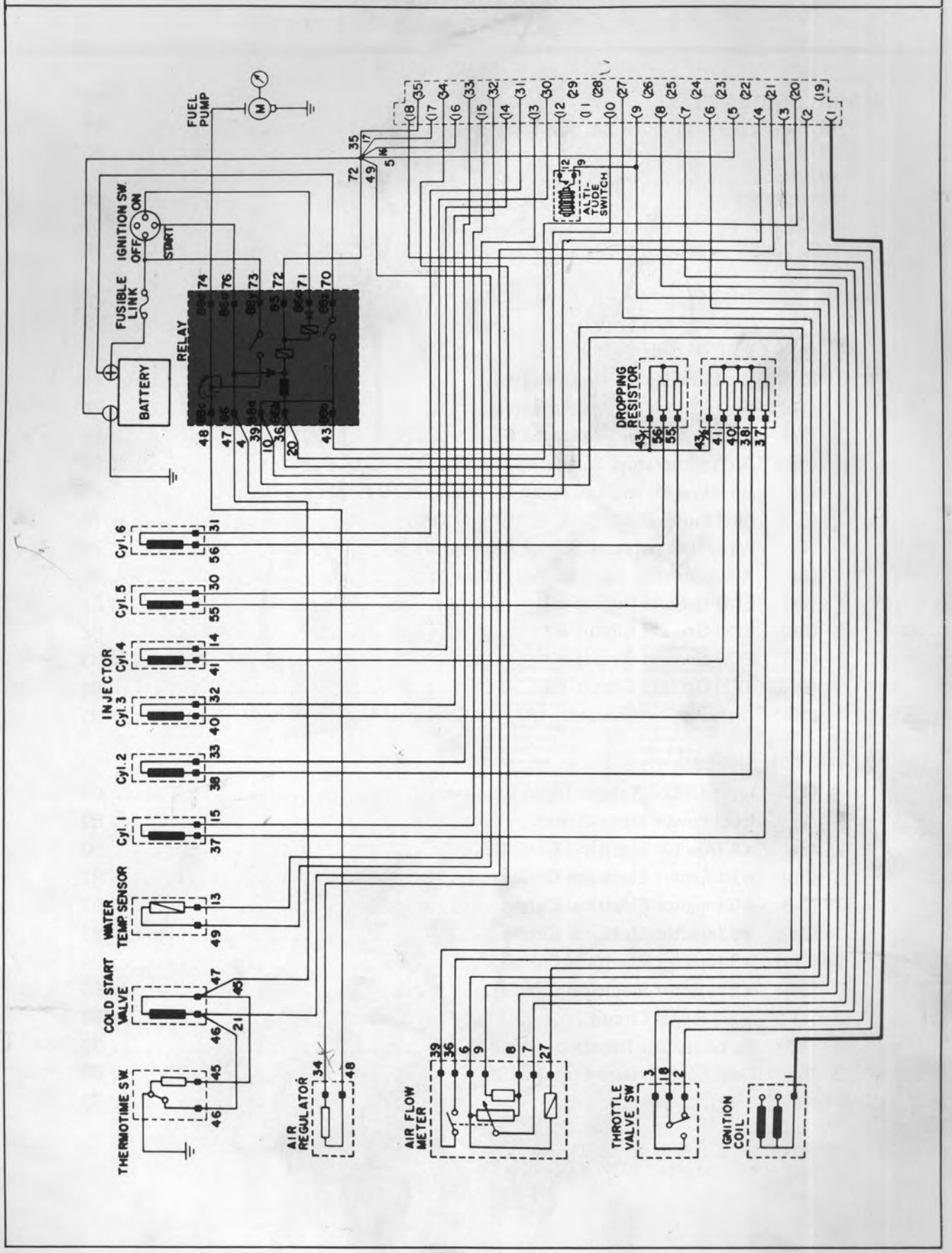


1 Horn relay
2 EFI relay
3 Fuel pump relay
4 Fuel pump relay-2
5 Headlamp sensor
6 Intermittent wiper amplifier
7 Bulb check relay
8 Inhibitor relay
9 A.S.C.D. relay
10 Magnet valve
11 Air conditioner relay
12 Tail and stop relay
13 EFI control unit
14 A.S.C.D. controller
15 Stop lamp switch
16 Stop switch
17 Kickdown switch
18 Hazard flasher unit
19 Turn signal flasher unit
20 Interior lamp timer amplifier
21 Warning chime
22 Ignition and accessory relay
23 Seat belt timer
24 Multi-warning amplifier

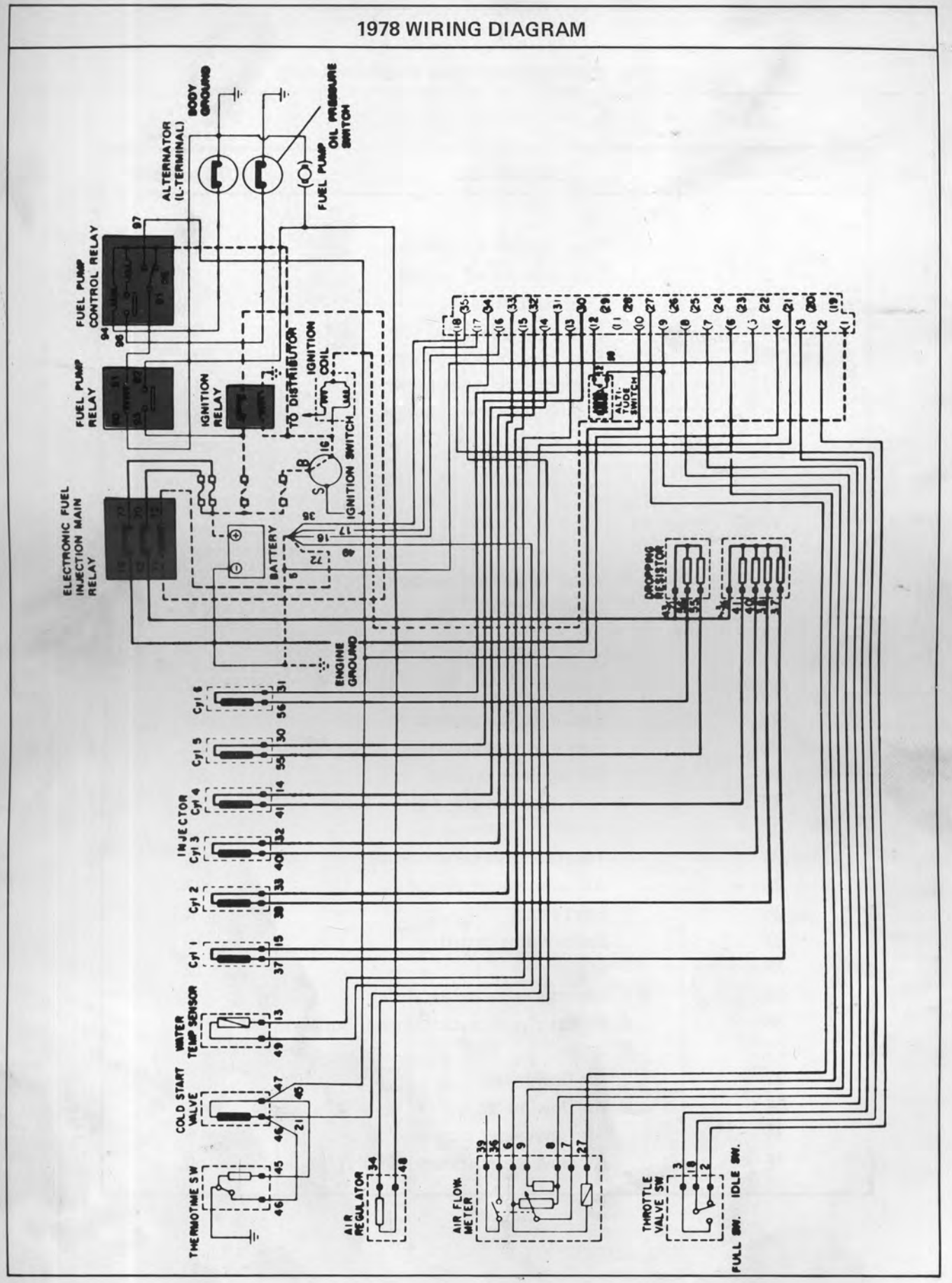


CIRCUIT TESTING

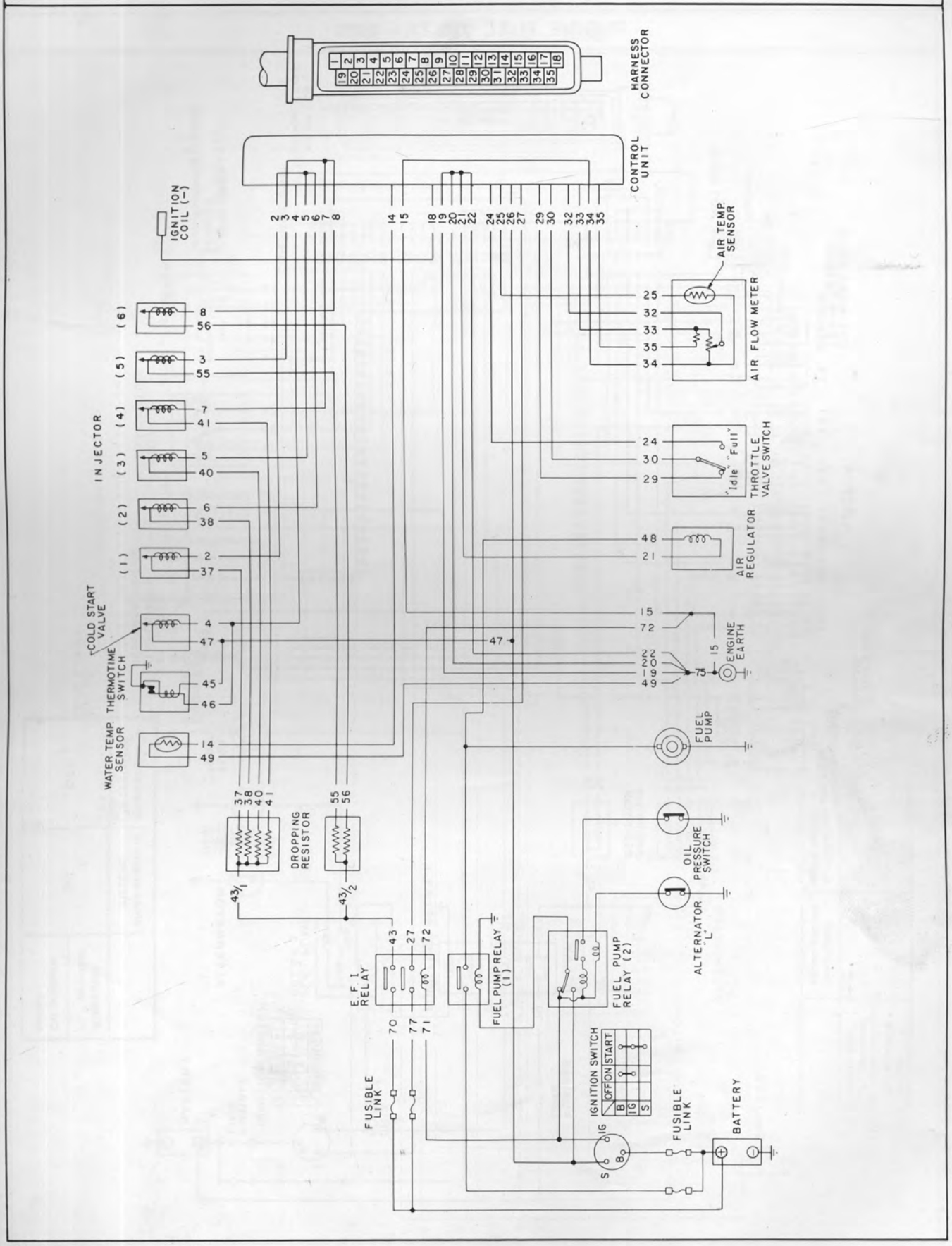
1975–77 WIRING DIAGRAM



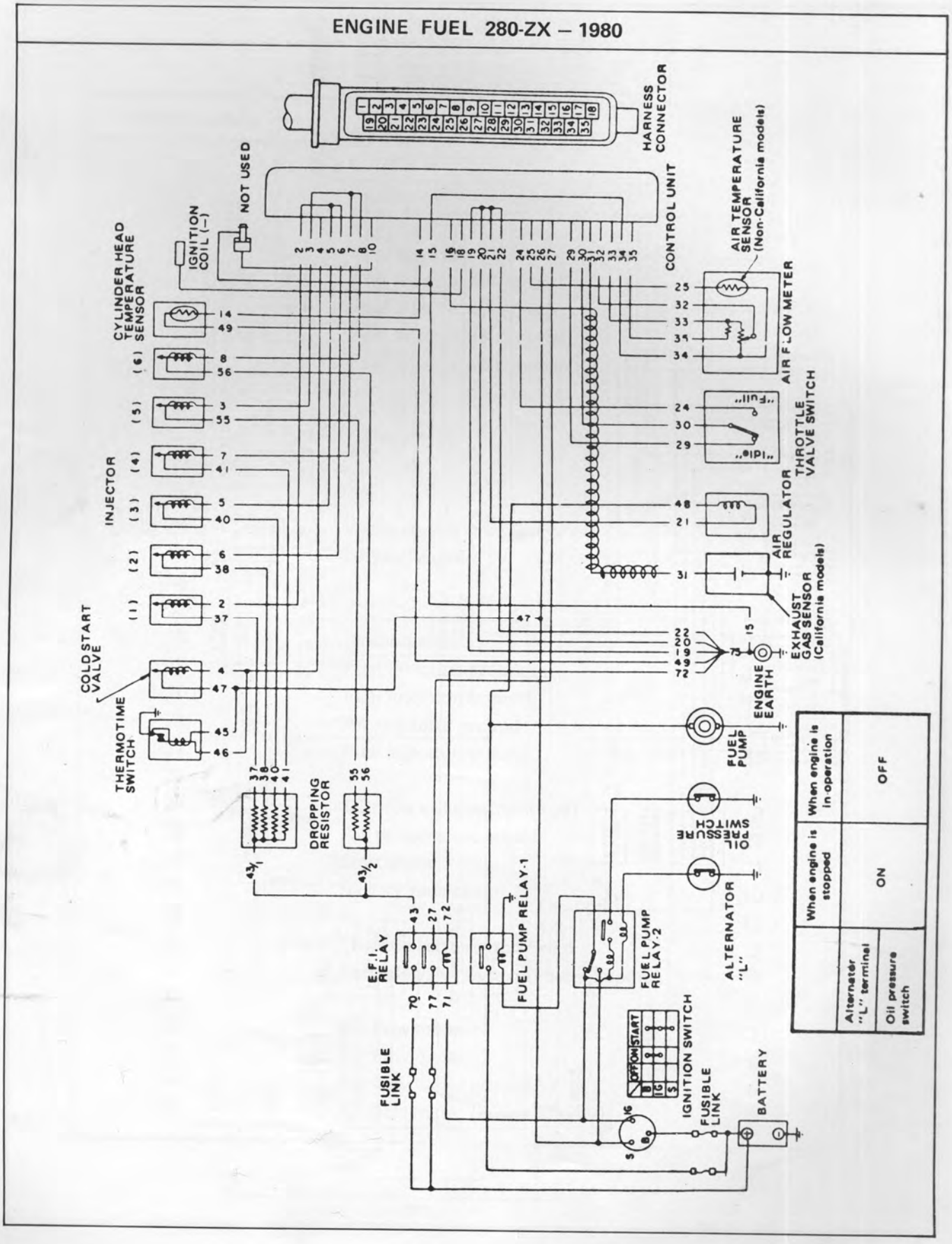
1978 WIRING DIAGRAM



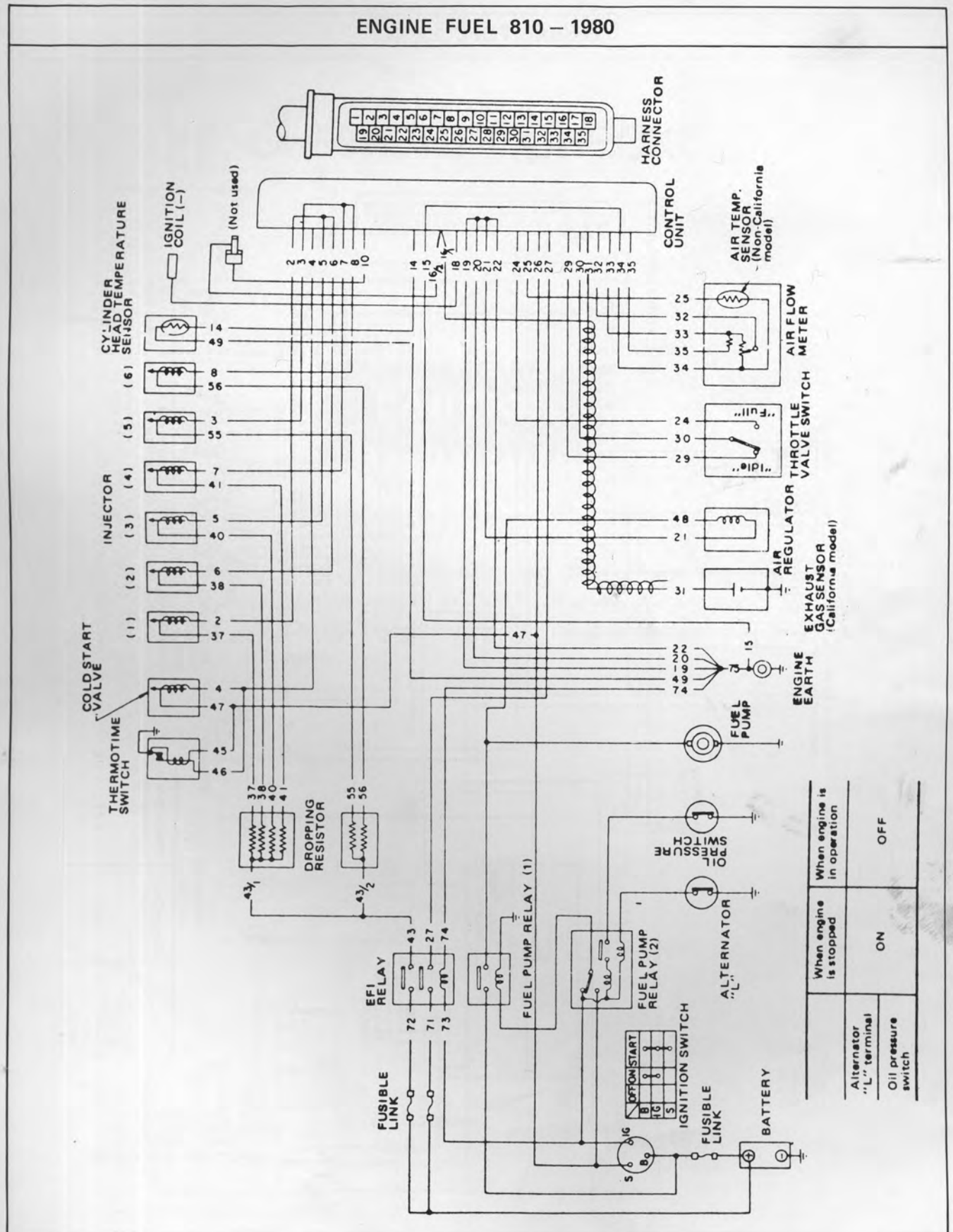
1979 WIRING DIAGRAM

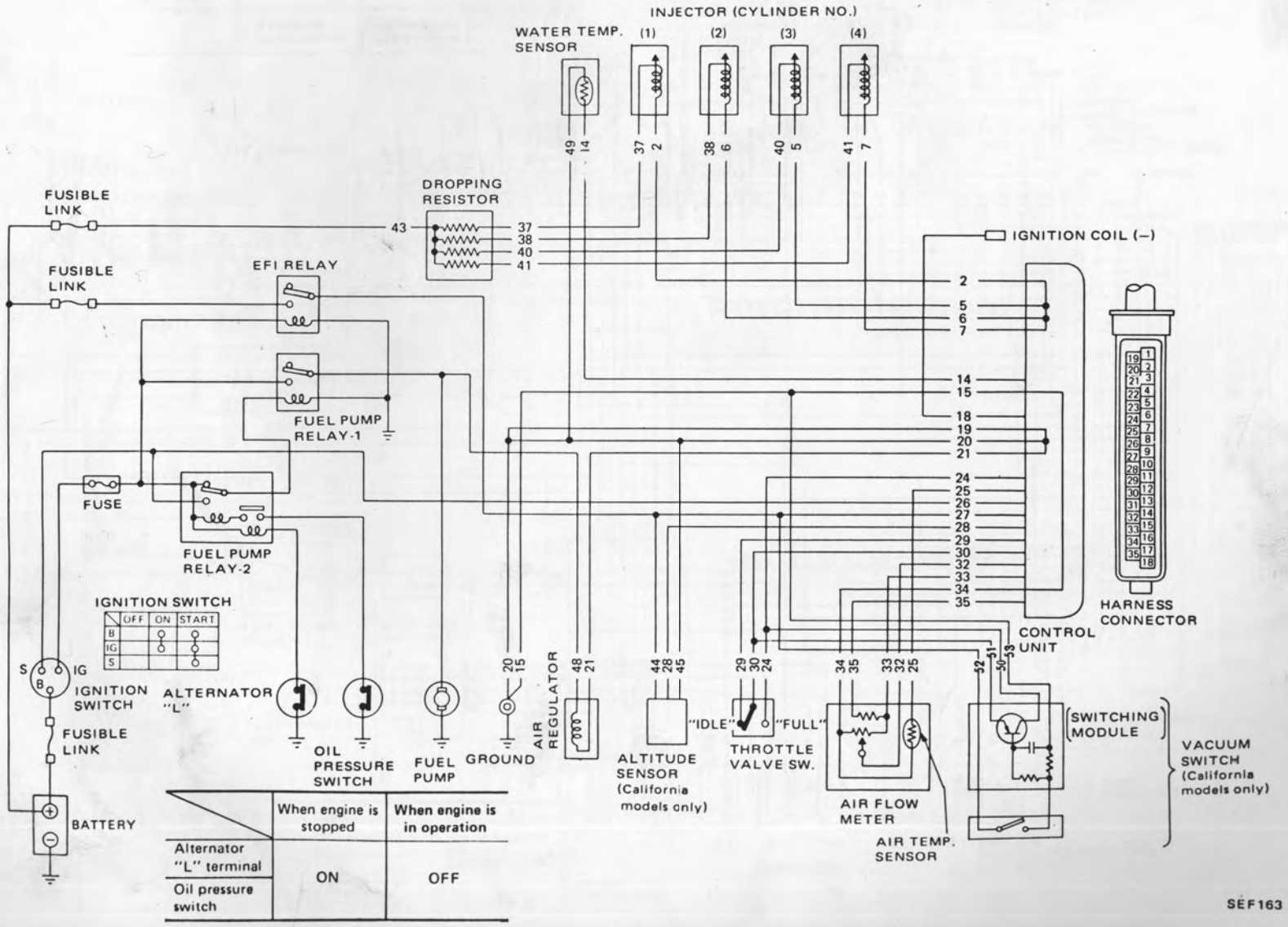


ENGINE FUEL 280-ZX – 1980



ENGINE FUEL 810 – 1980



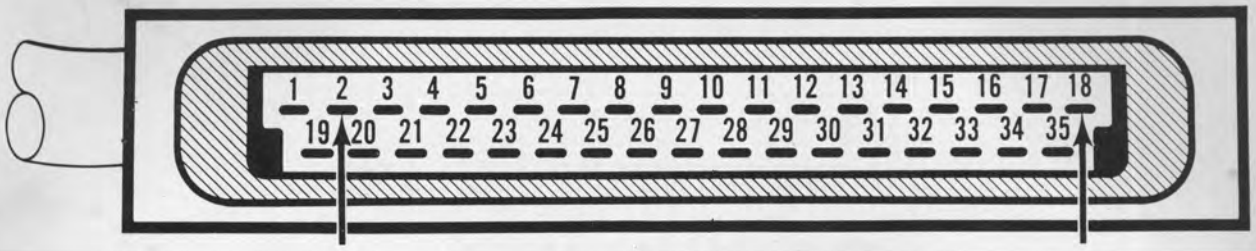

INJECTOR (CYLINDER NO.)
WATER TEMP. SENSOR
(1)
(2)
(3)
(4)
49 14
37 2
38 6
40 5
41 7
FUSIBLE LINK
DROPPING RESISTOR
43
37
38
40
41
IGNITION COIL (–)
FUSIBLE LINK
EFI RELAY
2
5
6
7
14
15
18
19
20
21
24
25
26
27
28
29
30
32
33
34
35
FUEL PUMP RELAY-1
FUSE
FUEL PUMP RELAY-2
HARNESS CONNECTOR
CONTROL UNIT
IGNITION SWITCH
OFF ON START
B
IG
S
S IG B
IGNITION SWITCH
ALTERNATOR "L"
FUSIBLE LINK
BATTERY
OIL PRESSURE SWITCH
FUEL PUMP
GROUND
20 15
AIR REGULATOR
48 21
44 28 45
ALTITUDE SENSOR (California models only)
"IDLE"
"FULL"
29 30 24
THROTTLE VALVE SW.
34 35
33 32 25
AIR FLOW METER
AIR TEMP. SENSOR
52 51 50 53
SWITCHING MODULE
VACUUM SWITCH (California models only)
When engine is stopped
When engine is in operation
Alternator "L" terminal
Oil pressure switch
ON
OFF
SEF163

OHMMETER CHECKS

NOTE: When performing ohmmeter checks, make sure ignition key is in "OFF" position. Failure to observe this precaution will result in damage to meter.

TEST #1 -(1): IDLE THROTTLE SWITCH – 1975-78

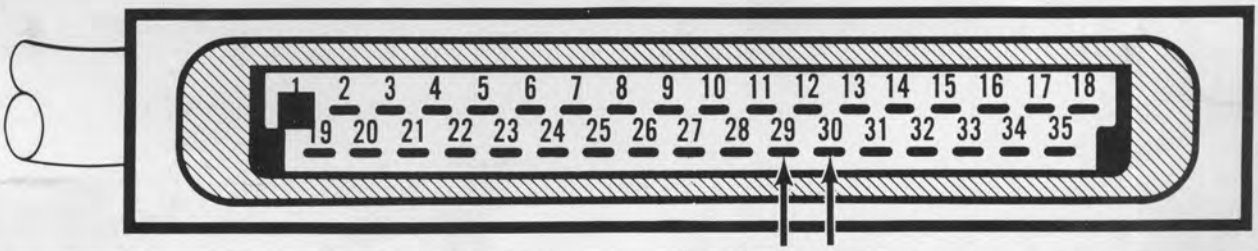
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Ohmmeter	2	18	Throttle released	FULL Continuity
			Throttle depressed	No Continuity
			Perform throttle switch adjustment	



If test is unsatisfactory, check:	Service Manual Page No. '75 280	'76 280	'77 280	'77 810	'78 280	'78 810
1. Throttle Valve Switch	EF-56	EF-56	EF-57	EF-58	EF-34	EF-34
2. Wiring Harness	EF-50	EF-50	EF-51	EF-52	EF-29	EF-29

TEST #1 -(1): IDLE THROTTLE SWITCH – 1979 & LATER

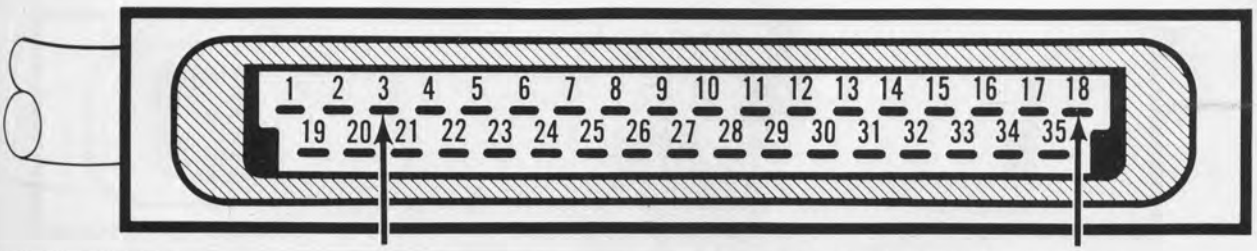
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Ohmmeter	29	30	Throttle released	FULL Continuity
			Throttle depressed	No Continuity
			Perform throttle switch adjustment	



If test is unsatisfactory, check:	Service Manual Page No. '79 280	'79 810	'80 280ZX	'80 810	'80 200SX	
1. Throttle Valve Switch	EF-40	EF-40	EF-26	EF-25	EF-32	
2. Wiring Harness	EF-22	EF-23	EF-22	EF-21	EF-21	

TEST #1 - (2): FULL THROTTLE SWITCH – 1975-78

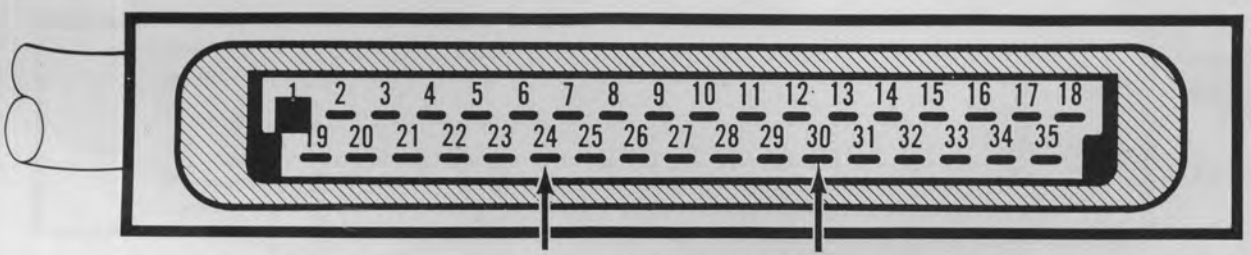
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Ohmmeter	3	18	Throttle released	No Continuity
			Full throttle	FULL Continuity
			Perform throttle switch adjustment	



If test is unsatisfactory, check:	Service Manual Page No. '75 280	'76 280	'77 280	'77 810	'78 280	'78 810
1. Throttle Valve Switch	EF-56	EF-56	EF-57	EF-58	EF-34	EF-34
2. Wiring Harness	EF-50	EF-50	EF-51	EF-52	EF-29	EF-29

TEST #1 - (2): FULL THROTTLE SWITCH – 1979 & LATER

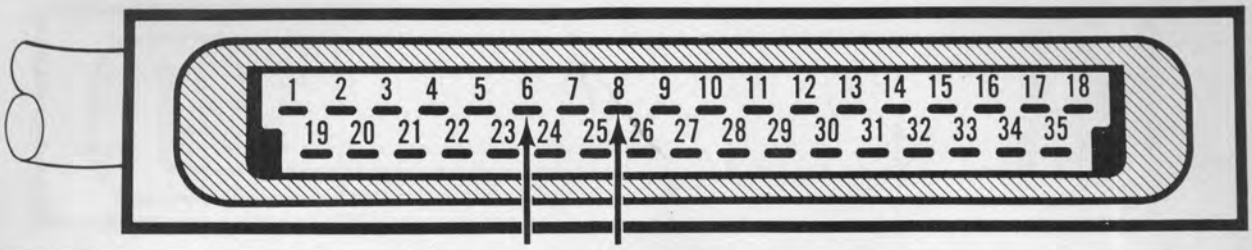
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Ohmmeter	24	30	Throttle released	No Continuity
			Full Throttle	FULL Continuity
			Perform throttle switch adjustment	



If test is unsatisfactory, check:	Service Manual Page No. '79 280	'79 810	'80 280ZX	'80 810	'80 200SX	
1. Throttle Valve Switch	EF-40	EF-40	EF-26	EF-25	EF-32	
2. Wiring Harness	EF-22	EF-23	EF-22	EF-21	EF-21	

TEST #1 - (3a): AIR FLOW METER RESISTANCE #1 – 1975-78

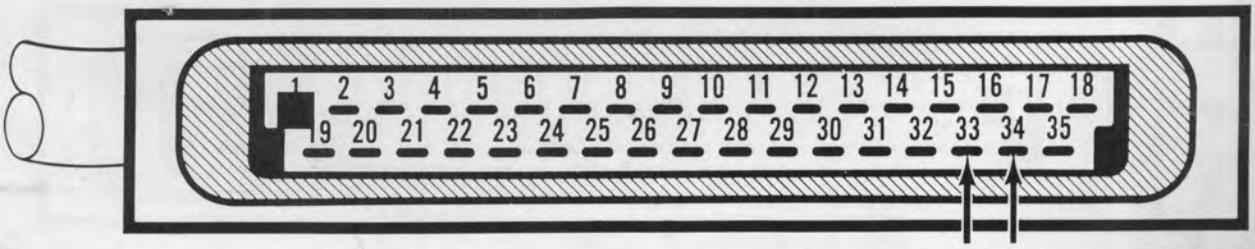
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Ohmmeter	6	8		Approximately 180 ohms



	If test is unsatisfactory, check:	Service Manual Page No. '75 280	'76 280	'77 280	'77 810	'78 280	'78 810
1.	Air Flow Meter	EF-51	EF-51	EF-52	EF-53	EF-30	EF-30
2.	Wiring Harness	EF-50	EF-50	EF-51	EF-52	EF-29	EF-29

TEST #1 - (3a): AIR FLOW METER RESISTANCE #1 – 1979 & LATER

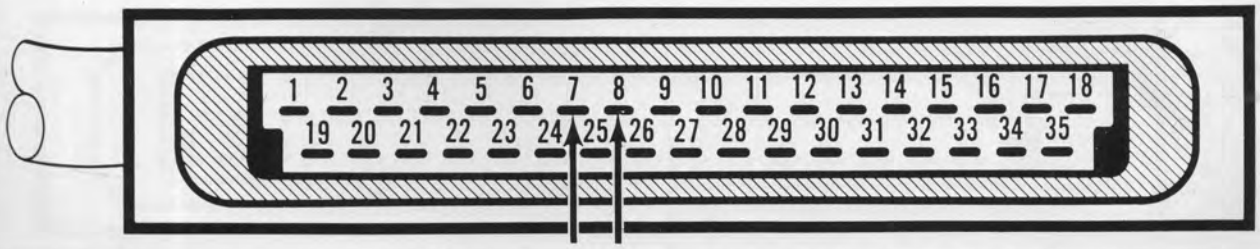
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Ohmmeter	33	34		Approximately 200 ohms



	If test is unsatisfactory, check:	Service Manual Page No. '79 280	'79 810	'80 280ZX	'80 810	'80 200SX	
1.	Air Flow Meter	EF-38	EF-38	EF-38	EF-36	EF-30	
2.	Wiring Harness	EF-22	EF-23	EF-22	EF-21	EF-21	

TEST #1 - (3b): AIR FLOW METER RESISTANCE #2 – 1975-78

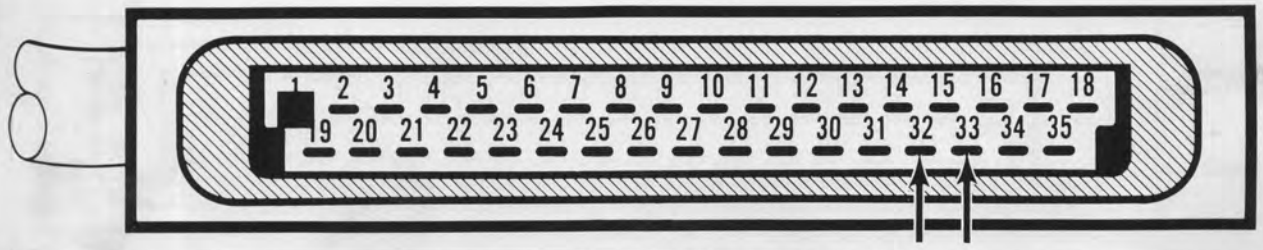
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Ohmmeter	7	8		Approximately 150 ohms



If test is unsatisfactory, check:	Service Manual Page No. '75 280	'76 280	'77 280	'77 810	'78 280	'78 810
1. Air Flow Meter	EF-51	EF-51	EF-52	EF-53	EF-30	EF-30
2. Wiring Harness	EF-50	EF-50	EF-51	EF-52	EF-29	EF-29

TEST #1 - (3b): AIR FLOW METER RESISTANCE #2 – 1979 & LATER

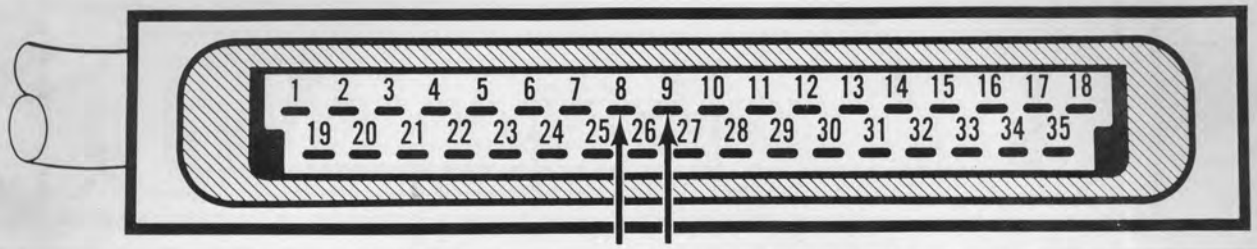
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Ohmmeter	32	33		Approximately ~~240~~ 200 ohms



If test is unsatisfactory, check:	Service Manual Page No. '79 280	'79 810	'80 280ZX	'80 810	'80 200SX	
1. Air Flow Meter	EF-38	EF-38	EF-38	EF-36	EF-30	
2. Wiring Harness	EF-22	EF-23	EF-22	EF-21	EF-21	

TEST #1 - (3c): AIR FLOW METER RESISTANCE #3 – 1975-78

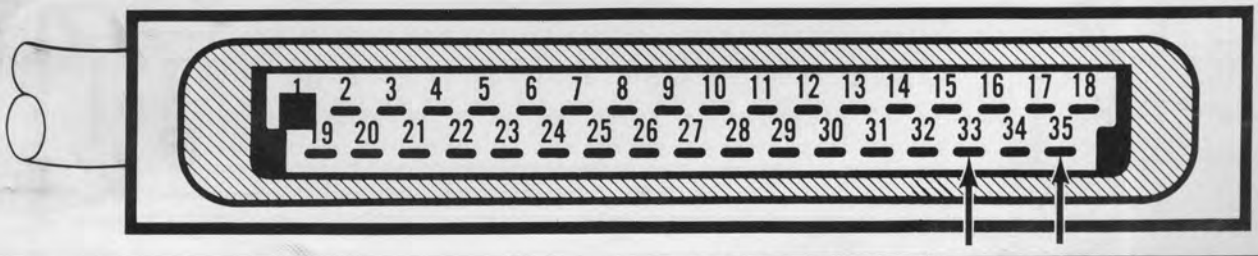
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Ohmmeter	8	9		Approximately 100 ohms



If test is unsatisfactory, check:		Service Manual Page No. '75 280	'76 280	'77 280	'77 810	'78 280	'78 810
1.	Air Flow Meter	EF-51	EF-51	EF-52	EF-53	EF-30	EF-30
2.	Wiring Harness	EF-50	EF-50	EF-51	EF-52	EF-29	EF-29

TEST #1 - (3c): AIR FLOW METER RESISTANCE #3 – 1979 & LATER

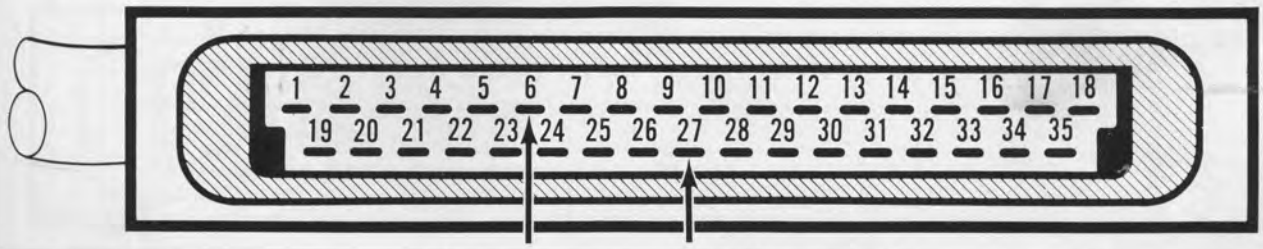
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Ohmmeter	33	35		Approximately 100 ohms



If test is unsatisfactory, check:		Service Manual Page No. '79 280	'79 810	'80 280ZX	'80 810	'80 200SX	
1.	Air Flow Meter	EF-38	EF-38	EF-38	EF-36	EF-30	
2.	Wiring Harness	EF-22	EF-23	EF-22	EF-21	EF-21	

TEST #1 - (4): AIR TEMPERATURE SENSOR RESISTANCE – 1975-78

Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
			Intake Air Temperature	
Ohmmeter	6	27	50°F	3250 – 4150 ohms
			68°F	2250 – 2750 ohms
			122°F	740 – 940 ohms



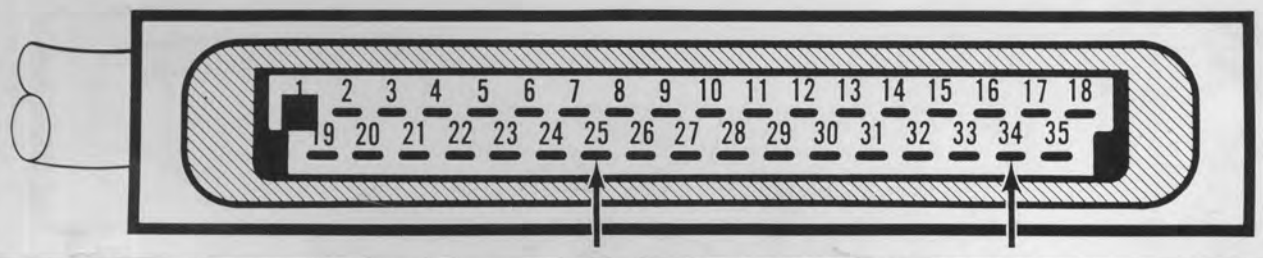
If test is unsatisfactory, check:		Service Manual Page No. '75 280	'76 280	'77 280	'77 810	'78 280	'78 810
1.	Air Temperature Sensor	EF-52	EF-52	EF-53	EF-54	EF-31	EF-31
2.	Wiring Harness	EF-50	EF-50	EF-51	EF-52	EF-29	EF-29

Refer to Graph on page 109

TEST #1 - (4): AIR TEMPERATURE SENSOR RESISTANCE – 1979 & LATER

N.A. 1980 CAL. 810-280

Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
			Intake Air Temperature	
Ohmmeter	25	34	50°F N.A. 1980 CAL. 810-280	3250 – 4150 ohms
			68°F	2250 – 2750 ohms
			122°F	740 – 940 ohms

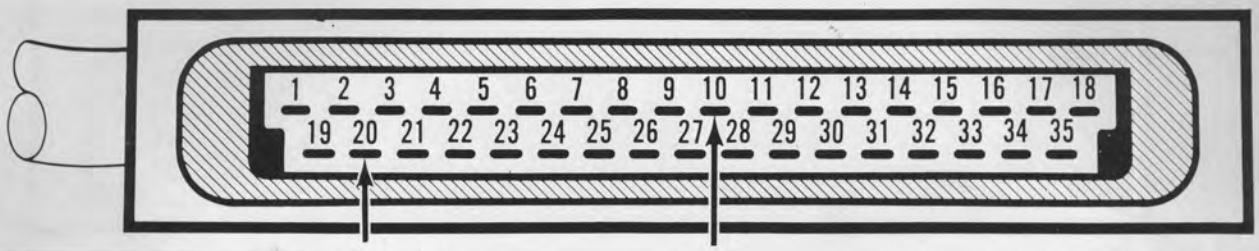


If test is unsatisfactory, check:		Service Manual Page No. '79 280	'79 810	'80 280ZX	'80 810	'80 200SX	
1.	Air Temperature Sensor	EF-38	EF-38	EF-38	EF-36	EF-30	
2.	Wiring Harness	EF-22	EF-23	EF-22	EF-21	EF-21	

Refer to Graph on page 109

TEST #1 - (5): AIR FLOW METER FUEL PUMP CONTACTS – 1975-77 ONLY

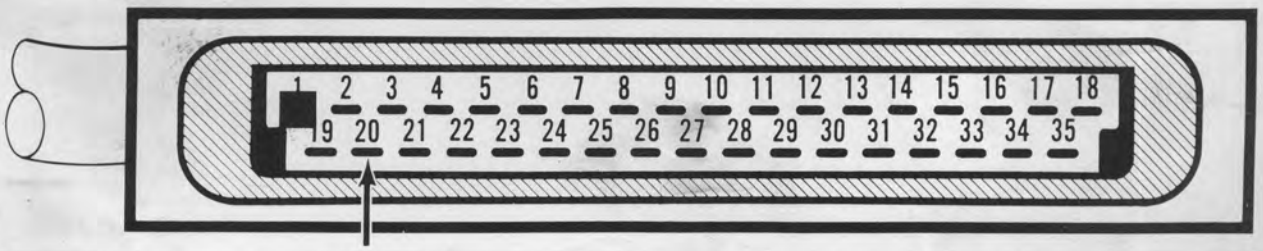
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Ohmmeter	10	20	Air flow meter flap at rest	No Continuity
			Air flow meter flap pushed open	Continuity
			This test not applicable to 1978 and 1979 models	



If test is unsatisfactory, check:	Service Manual Page No. '75 280	'76 280	'77 280	'77 810		
1. Fuel Pump Contact Points	EF-52	EF-52	EF-53	EF-54		
2. Wiring Harness	EF-50	EF-50	EF-51	EF-52		

TEST #1 - (6): FUEL PUMP RELAY CIRCUIT – 1975-77 ONLY

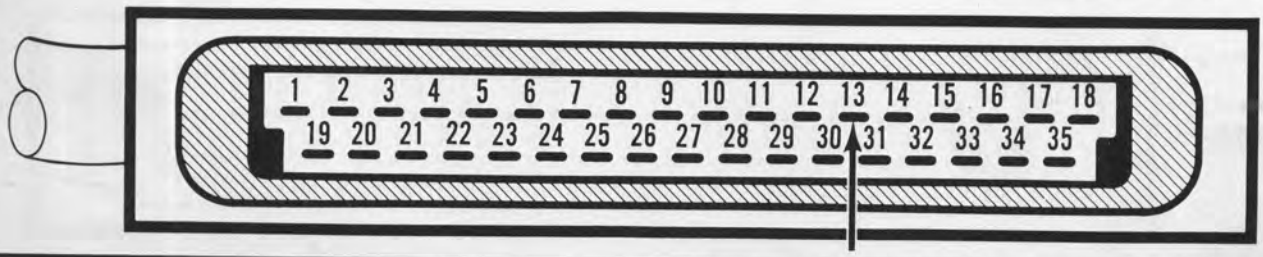
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Ohmmeter	20	Vehicle Ground		Continuity
			This test not applicable to 1978 and 1979 models	



If test is unsatisfactory, check:	Service Manual Page No. '75 280	'76 280	'77 280	'77 810		
1. EFI Relay	EF-54, 55	EF-54, 55	EF-55,56, 57	EF-56, 57, 58		
2. Wiring Harness	EF-50	EF-50	EF-51	EF-52		

TEST #1 - (7): WATER TEMPERATURE SENSOR RESISTANCE – 1975-78

Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Ohmmeter	13	Vehicle Ground	Engine Coolant Temperature	
			50° F	3250 – 4150 ohms
			68° F	2250 – 2750 ohms
			122° F	740 – 940 ohms
			176° F	240 – 360 ohms

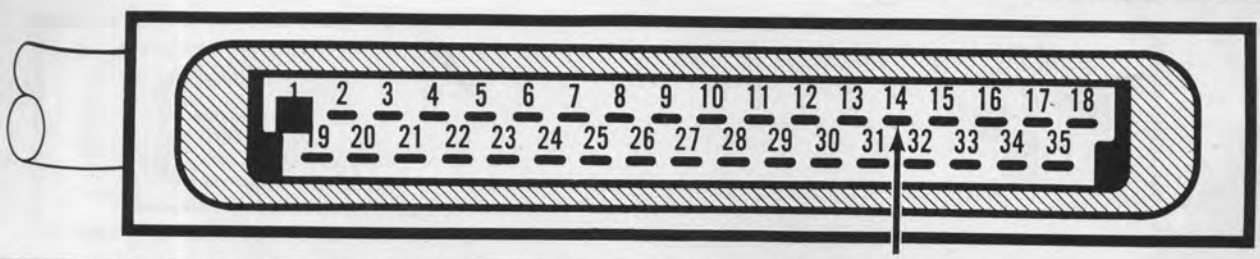


If test is unsatisfactory, check:	Service Manual Page No. '75 280	'76 280	'77 280	'77 810	'78 280	'78 810
1. Water Temperature Sensor	EF-52	EF-52	EF-53	EF-54	EF-31	EF-32
2. Wiring Harness	EF-50	EF-50	EF-51	EF-52	EF-29	EF-29

Refer to Graph on page 107

TEST #1 - (7): WATER TEMPERATURE SENSOR RESISTANCE – 1979 & LATER

Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Ohmmeter	14	Vehicle Ground	Engine Coolant Temperature	
			50° F	3250 – 4150 ohms
			68° F	2250 – 2750 ohms
			122° F	740 – 940 ohms
			176° F	240 – 360 ohms

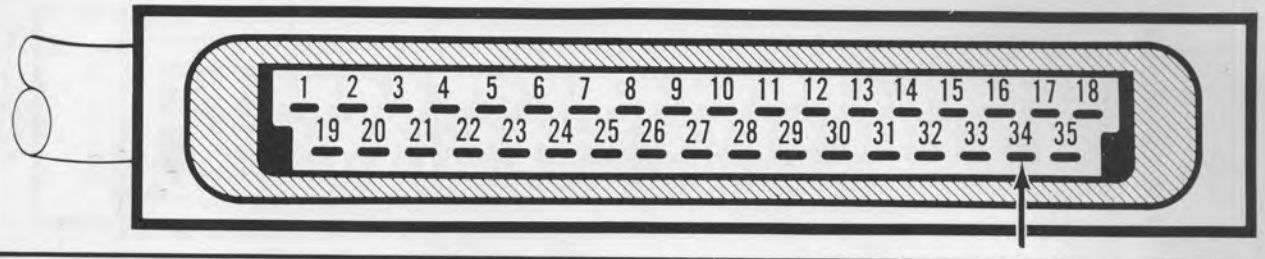


If test is unsatisfactory, check:	Service Manual Page No. '79 280	'79 810	'80 280ZX	'80 810	'80 200SX
1. Water Temperature Sensor	EF-40	EF-40	EF-40	EF-38	EF-30
2. Wiring Harness	EF-22	EF-23	EF-22	EF-21	EF-21

Refer to Graph on page 107

TEST #1 – (8): AIR REGULATOR AND FUEL PUMP CIRCUIT – 1975-78

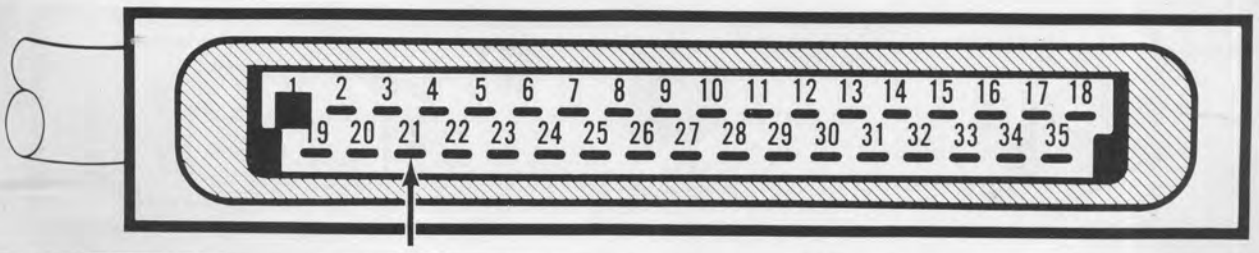
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Ohmmeter	34	Vehicle Ground		45-65 OHMS Continuity



If test is unsatisfactory, check:		Service Manual Page No. '75 280	'76 280	'77 280	'77 810	'78 280	'78 810
1.	Aux. Air Regulator	EF-58	EF-58	EF-59	EF-60	EF-38	EF-38
2.	Fuel Pump	EF-56	EF-56	EF-58	EF-59	EF-37	EF-37
3.	Wiring Harness	EF-50	EF-50	EF-51	EF-52	EF-29	EF-29

TEST #1 - (8): AIR REGULATOR AND FUEL PUMP CIRCUIT – 1979 & LATER

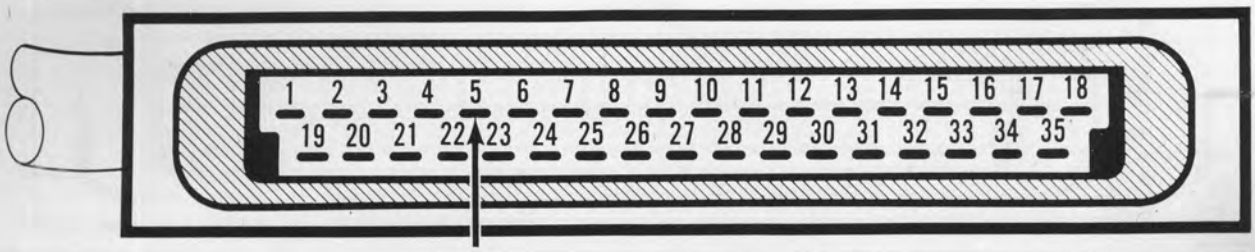
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Ohmmeter	21	Vehicle Ground		45-65 OHMS Continuity



If test is unsatisfactory, check:		Service Manual Page No. '79 280	'79 810	'80 280ZX	'80 810	'80 200SX	
1.	Aux. Air Regulator	EF-39	EF-39	EF-39	EF-24	EF-31	
2.	Fuel Pump	EF-36	EF-36	EF-36	EF-8	EF-29	
3.	Wiring Harness	EF-22	EF-23	EF-22	EF-21	EF-21	

TEST #1 - (9a): ECU GROUND CIRCUIT #1 – 1975-78

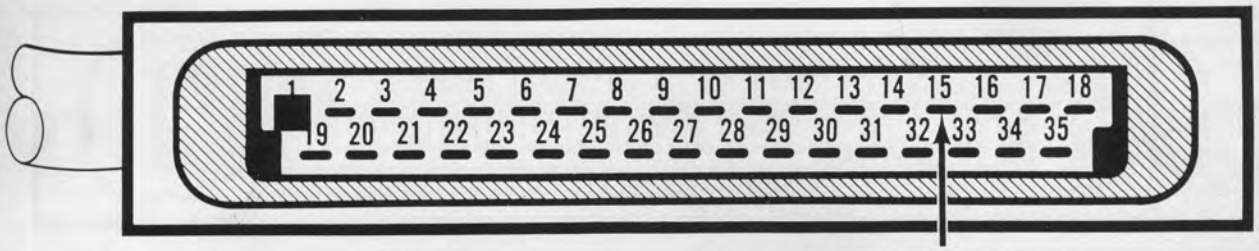
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Ohmmeter	5	Vehicle Ground		FULL Continuity



If test is unsatisfactory, check:		Service Manual Page No. '75 280	'76 280	'77 280	'77 810	'78 280	'78 810
1.	Wiring Harness	EF-50	EF-50	EF-51	EF-52	EF-29	EF-29

TEST #1 - (9a): ECU GROUND CIRCUIT NO. 1 – 1979 & LATER

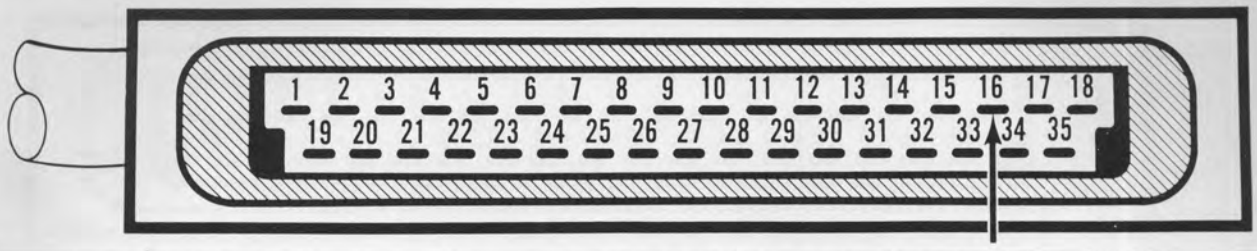
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Ohmmeter	15	Vehicle Ground		FULL Continuity



If test is unsatisfactory, check:		Service Manual Page No. '79 280	'79 810	'80 280ZX	'80 810	'80 200SX	
1.	Wiring Harness	EF-22	EF-23	EF-22	EF-21	EF-21	

TEST #1 - (9b): ECU GROUND CIRCUIT #2 – 1975-78

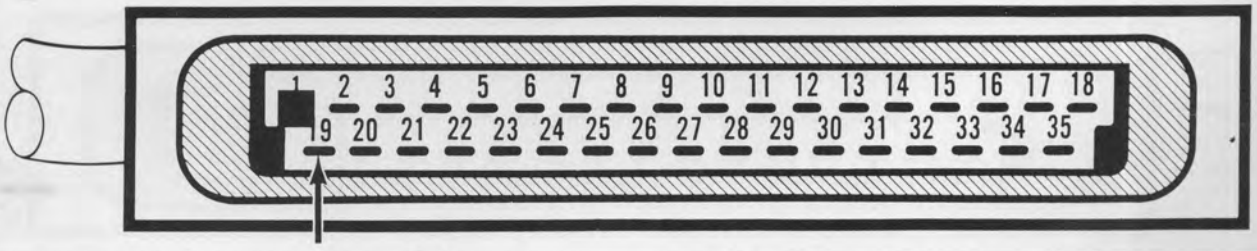
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Ohmmeter	16	Vehicle Ground		FULL Continuity



If test is unsatisfactory, check:		Service Manual Page No. '75 280	'76 280	'77 280	'77 810	'78 280	'78 810
1.	Wiring Harness	EF-50	EF-50	EF-51	EF-52	EF-29	EF-29

TEST #1 - (9b): ECU GROUND CIRCUIT NO. 2 – 1979 & LATER

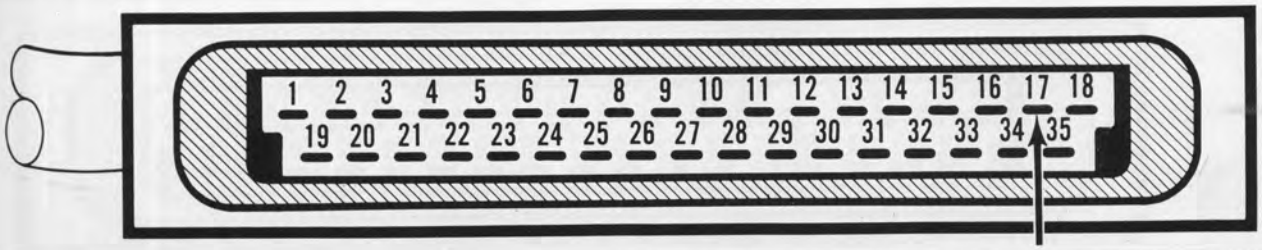
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Ohmmeter	19	Vehicle Ground		FULL Continuity



If test is unsatisfactory, check:		Service Manual Page No. '79 280	'79 810	'80 280ZX	'80 810	'80 200SX	
1.	Wiring Harness	EF-22	EF-23	EF-20	EF-21	EF-21	

TEST # 1 - (9c): ECU GROUND CIRCUIT #3 – 1975-78

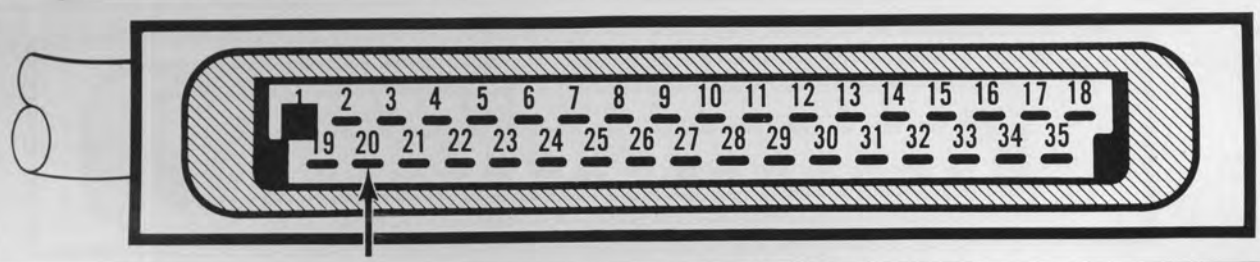
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Ohmmeter	17	Vehicle Ground		FULL Continuity



If test is unsatisfactory, check:	Service Manual Page No. '75 280	'76 280	'77 280	'77 810	'78 280	'78 810
1. Wiring Harness	EF-50	EF-50	EF-51	EF-52	EF-29	EF-29

TEST #1 - (9c): ECU GROUND CIRCUIT NO. 3 – 1979 & LATER

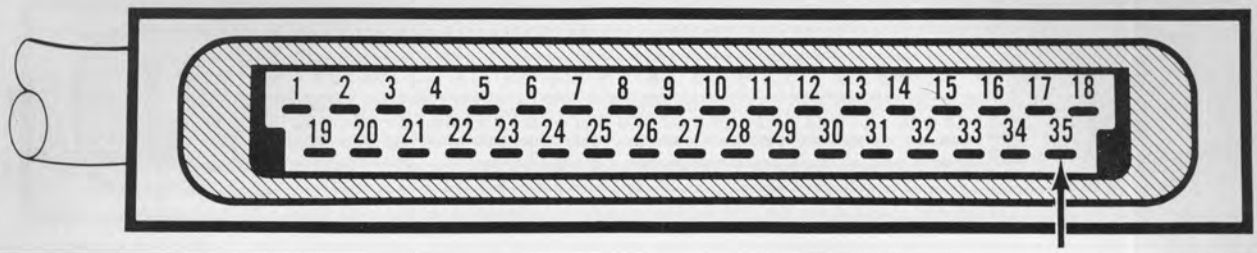
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Ohmmeter	20	Vehicle Ground		FULL Continuity



If test is unsatisfactory, check:	Service Manual Page No. '79 280	'79 810	'80 280ZX	'80 810	'80 200SX	
1. Wiring Harness	EF-22	EF-23	EF-22	EF-21	EF-21	

TEST #1 - (9d): ECU GROUND CIRCUIT #4 – 1975-78

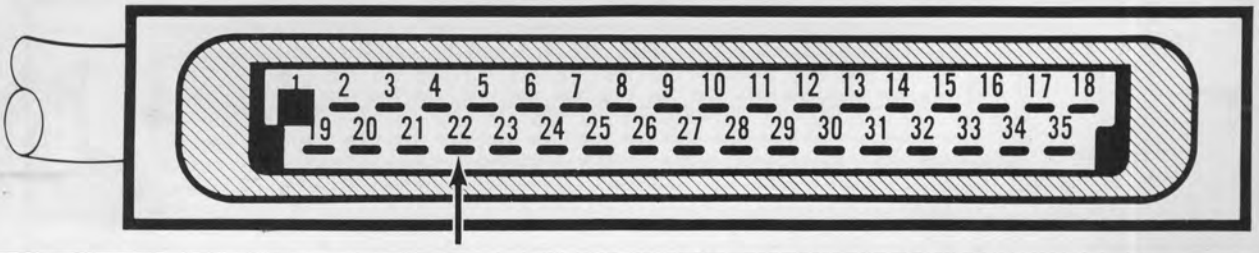
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Ohmmeter	35	Vehicle Ground		FULL Continuity



If test is unsatisfactory, check:	Service Manual Page No. '75 280	'76 280	'77 280	'77 810	'78 280	'78 810
1. Wiring Harness	EF-50	EF-50	EF-51	EF-52	EF-29	EF-29

TEST #1 - (9d): ECU GROUND CIRCUIT NO. 4 – 1979 & LATER

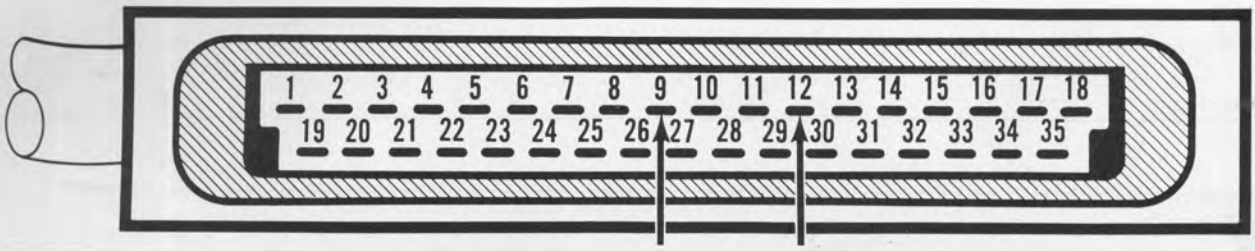
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Ohmmeter	22	Vehicle Ground		FULL Continuity



If test is unsatisfactory, check:	Service Manual Page No. '79 280	'79 810	'80 280ZX	'80 810	'80 200SX	
1. Wiring Harness	EF-22	EF-23	EF-22	EF-21	EF-21	

TEST #1 - (10): ALTITUDE COMPENSATOR – (1977-78 CALIF. MODELS ONLY)

Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Ohmmeter	9	12	Below 3600 ft.	No Continuity
			Above 3700 ft.	FULL Continuity



If test is unsatisfactory, check:		Service Manual Page No. '77 280	'77 810	'78 280	'78 810		
1.	Altitude Compensator	EF-57	EF-58	EF-34	EF-34		
2.	Wiring Harness	EF-50	EF-50	EF-29	EF-29		

THIS CONCLUDES THE SECTION ON OHMMETER TESTING.

ALL FURTHER TESTS ARE PERFORMED WITH A VOLTMETER.

NOTES

VOLTMETER TESTS

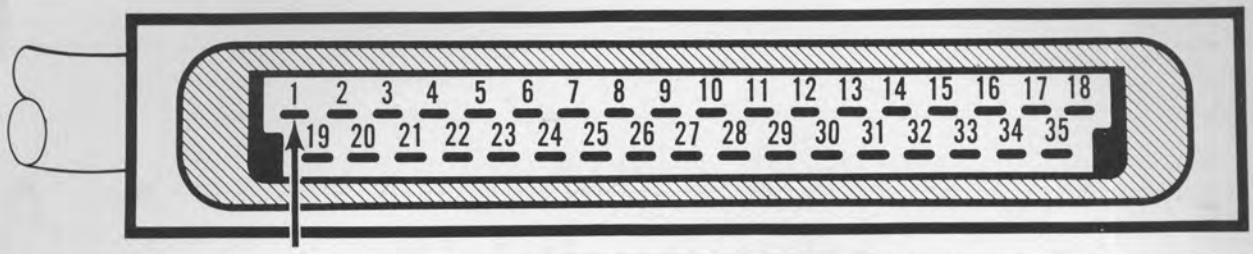
CAUTION

NOTE: Ignition key must be in "ON" position for voltmeter checks (but remember to turn key to "OFF" when disconnecting or reconnecting 35 pin connector).

Be sure to observe correct test lead polarity when performing checks, or your meter could be damaged.

TEST #2 - (1): IGNITION COIL TRIGGER INPUT CIRCUIT – 1975-78

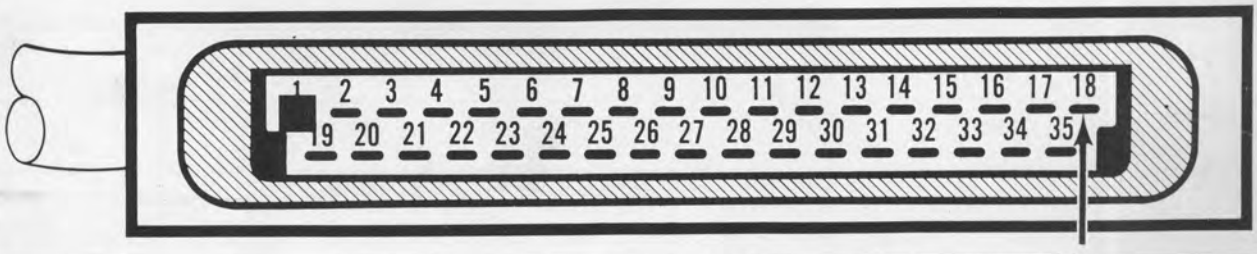
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Voltmeter	1	Vehicle Ground	Ignition "On"	Battery Voltage



If test is unsatisfactory, check:		Service Manual Page No. '75 280	'76 280	'77 280	'77 810	'78 280	'78 810
1.	Ignition Input Circuit	EF-39	EF-39	EF-40	EF-41	EF-29	EF-29
2.	Inline Harness Connector	EF-50	EF-50	EF-51	EF-52	EF-19	EF-19

TEST #2 - (1): IGNITION COIL TRIGGER INPUT CIRCUIT – 1979 & LATER

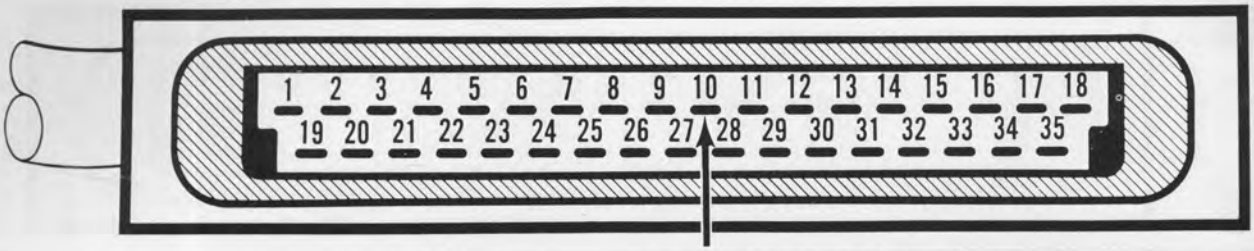
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Voltmeter	18	Vehicle Ground	Ignition "On"	Battery voltage



If test is unsatisfactory, check:		Service Manual Page No. '79 280	'79 810	'80 280ZX	'80 810	'80 200SX	
1.	Ignition Input Circuit	EF-35	EF-35	EF-9	EF-41	EF-7	
2.	Inline Harness Connector	W.D.	W.D.	W.D.	W.D.	W.D.	

TEST #2 - (2): ECU POWER INPUT CIRCUIT – 1975-78

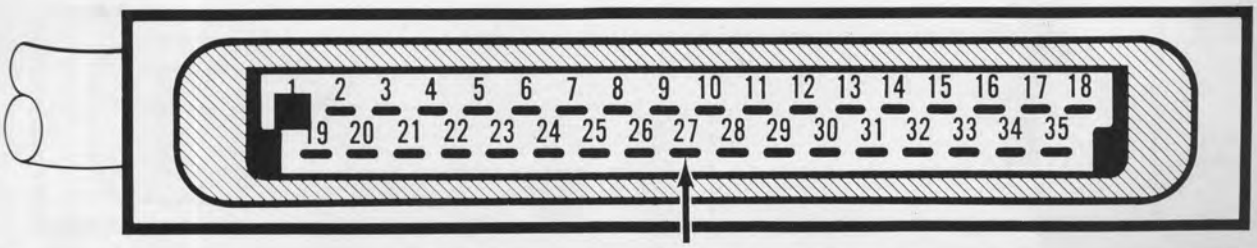
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Voltmeter	10	Vehicle Ground	Ignition "On"	Battery voltage



If test is unsatisfactory, check:		Service Manual Page No. '75 280	'76 280	'77 280	'77 810	'78 280	'78 810
1.	Power Relay	EF-54	EF-54	EF-55	EF-56	N/A	N/A
2.	EFI Main Relay	N/A	N/A	N/A	N/A	EF-33	EF-33
3.	Ignition Relay	N/A	W.D.	W.D.	W.D.	EE-5	EE-5
4.	Wiring Harness	EF-50	EF-50	EF-51	EF-52	EF-29	EF-26

TEST # 2 - (2): ECU POWER INPUT CIRCUIT -- 1979 & LATER

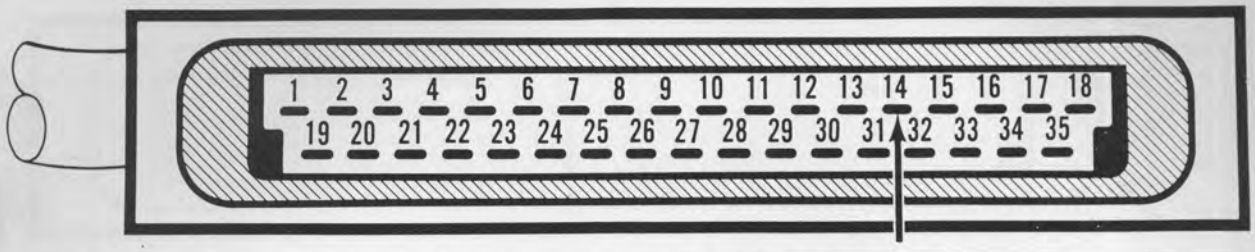
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Voltmeter	27	Vehicle Ground	Ignition "On"	Battery voltage



If test is unsatisfactory, check:		Service Manual Page No. '79 280	'79 810	'80 280ZX	'80 810	'80 200SX	
1.	EFI Main Relay	EF-41	EF-41	EF-42	EF-39	EF-34	
2.	Ignition Relay	W.D.	W.D.	W.D.	W.D.	W.D.	
3.	Wiring Harness	EF-22	EF-23	EF-22	EF-21	EF-21	

TEST #2 - (3a): #4 INJECTOR ELECTRICAL CIRCUIT – 1975-78

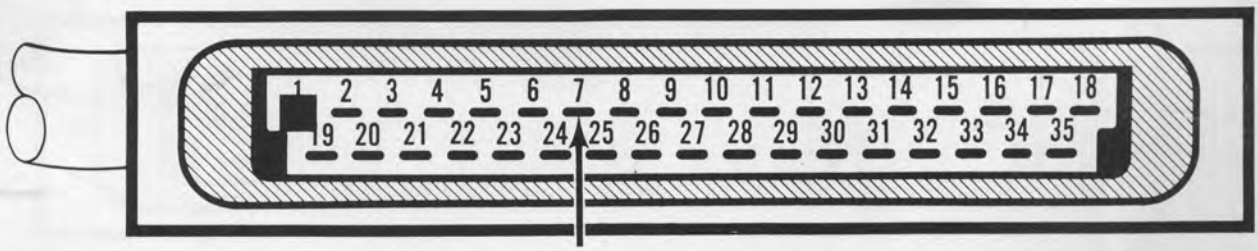
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Voltmeter	14	Vehicle Ground	Ignition "On"	Battery Voltage



If test is unsatisfactory, check:		Service Manual Page No. '75 280	'76 280	'77 280	'77 810	'78 280	'78 810
1.	Wiring	EF-50	EF-50	EF-51	EF-52	EF-29	EF-29
2.	Resistor	EF-56	EF-56	EF-56	EF-56	EF-34	EF-34
3.	Injector	EF-57	EF-57	EF-59	EF-60	EF-37	EF-37
4.	EFI Power Relay	EF-54	EF-54	EF-55	EF-56	N/A	N/A
5.	Ignition Relay	N/A	W.D.	W.D.	W.D.	EE-5	EE-5
6.	EFI Main Relay	N/A	N/A	N/A	N/A	EF-33	EF-33

TEST #2 - (3a): NO. 4 INJECTOR ELECTRICAL CIRCUIT – 1979 & LATER

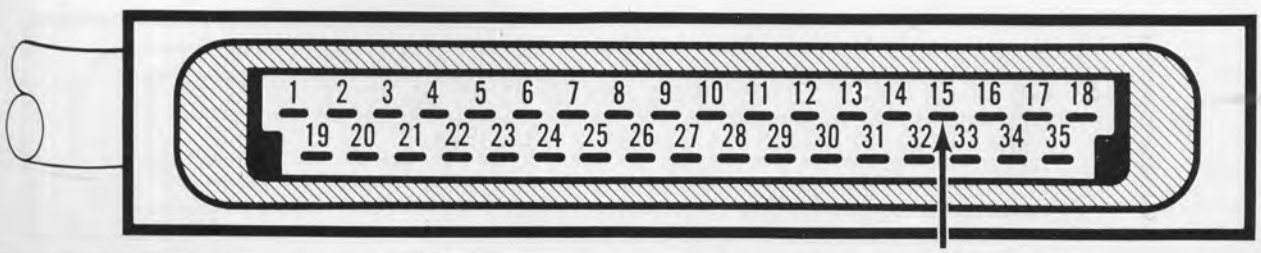
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Voltmeter	7	Vehicle Ground	Ignition "On"	Battery Voltage



If test is unsatisfactory, check:		Service Manual Page No. '79 280	'79 810	'80 280ZX	'80 810	'80 200SX	
1.	Wiring	EF-22	EF-23	EF-22	EF-21	EF-21	
2.	REsistor	EF-41	EF-41	EF-42	EF-19	EF-33	
3.	Injector	EF-36	EF-36	EF-36	EF-19	EF-29	
4.	Ignition Relay	W.D.	W.D.	W.D.	W.D.	W.D.	
5.	EFI Main Relay	EF-41	EF-41	EF-42	EF-39	EF-34	

TEST #2 - (3b): #1 INJECTOR ELECTRICAL CIRCUIT – 1975-78

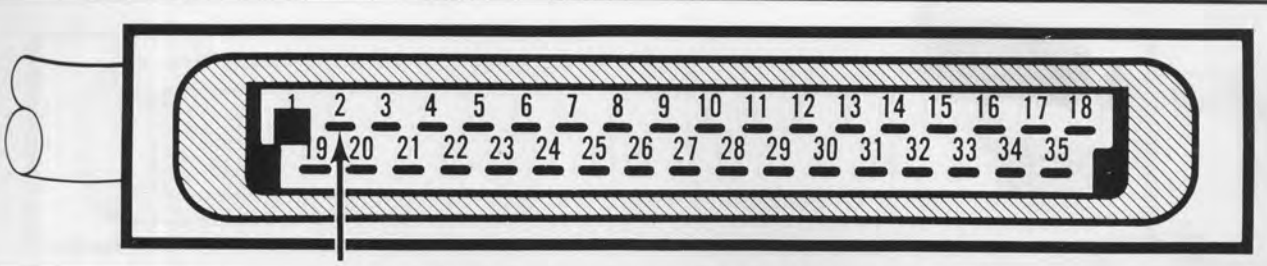
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Voltmeter	15	Vehicle Ground	Ignition "On"	Battery Voltage



If test is unsatisfactory, check:	Service Manual Page No. '75 280	'76 280	'77 280	'77 810	'78 280	'78 810
1. Wiring	EF-50	EF-50	EF-51	EF-52	EF-29	EF-29
2. Resistor	EF-56	EF-56	EF-56	EF-56	EF-34	EF-34
3. Injector	EF-57	EF-57	EF-59	EF-60	EF-37	EF-37
4. EFI Power Relay	EF-54	EF-54	EF-55	EF-56	N/A	N/A
5. Ignition Relay	N/A	W.D.	W.D.	W.D.	EE-5	EE-5
6. EFI Main Relay	N/A	N/A	N/A	N/A	EF-33	EF-33

TEST #2 - (3b): NO. 1 INJECTOR ELECTRICAL CIRCUIT – 1979 & LATER

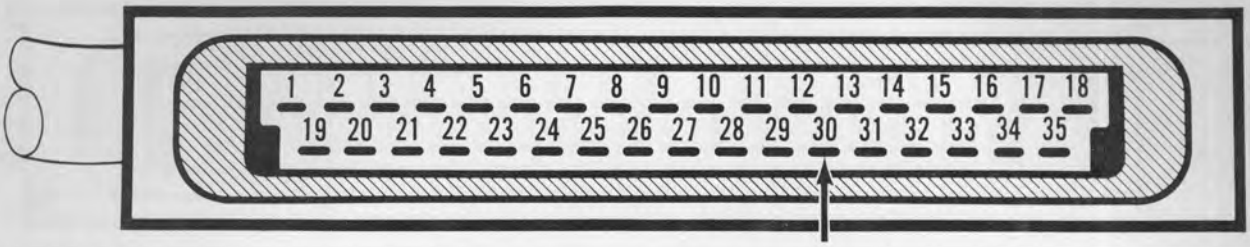
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Voltmeter	2	Vehicle Ground	Ignition "On"	Battery Voltage



If test is unsatisfactory, check:	Service Manual Page No. '79 280	'79 810	'80 280ZX	'80 810	'80 200SX	
1. Wiring	EF-22	EF-22	EF-22	EF-21	EF-21	
2. Resistor	EF-41	EF-41	EF-42	EF-19	EF-33	
3. Injector	EF-36	EF-36	EF-36	EF-19	EF-29	
4. Ignition Relay	W.D.	W.D.	W.D.	W.D.	W.D.	
5. EFI Main Relay	EF-41	EF-41	EF-42	EF-39	EF-34	

TEST #2 - (3c): #5 INJECTOR ELECTRICAL CIRCUIT – 1975-78

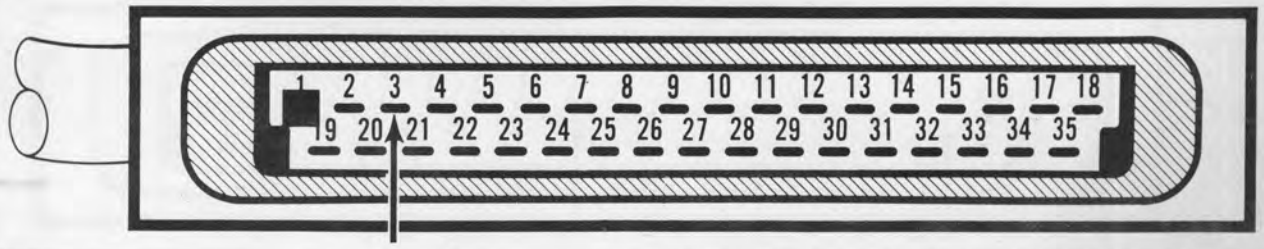
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Voltmeter	30	Vehicle Ground	Ignition "On"	Battery Voltage



If test is unsatisfactory, check:	Service Manual Page No. '75 280	'76 280	'77 280	'77 810	'78 280	'78 810
1; Wiring	EF-50	EF-50	EF-51	EF-52	EF-29	EF-29
2. Resistor	EF-56	EF-56	EF-56	EF-56	EF-34	EF-34
3. Injector	EF-57	EF-57	EF-59	EF-60	EF-37	EF-37
4. EFI Power Relay	EF-54	EF-54	EF-55	EF-56	N/A	N/A
5. Ignition Relay	N/A	W.D.	W.D.	W.D.	EE-5	EE-5
6. EFI Main Relay	N/A	N/A	N/A	N/A	EF-33	EF-33

TEST #2 - (3c): NO. 5 INJECTOR ELECTRICAL CIRCUIT – 1979 & LATER

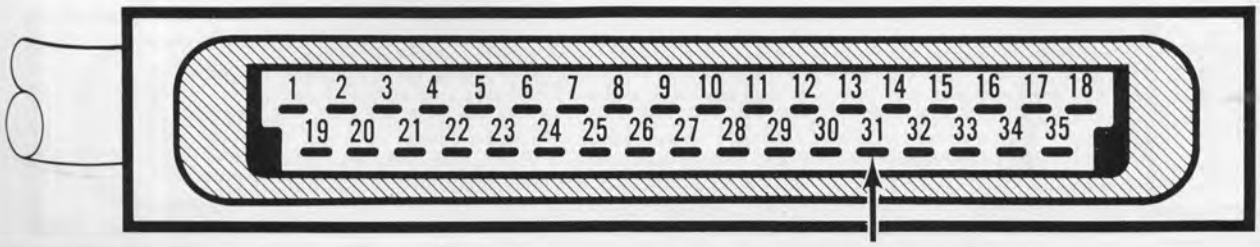
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Voltmeter	3	Vehicle Ground	Ignition "On" N.A. 200SX	Battery Voltage



If test is unsatisfactory, check:	Service Manual Page No. '79 280	'79 810	'80 280ZX	'80 810	'80 200SX
1. Wiring	EF-22	EF-22	EF-22	EF-21	EF-21
2. Resistor	EF-41	EF-41	EF-42	EF-19	EF-33
3. Injector	EF-36	EF-36	EF-36	EF-19	EF-29
4. Ignition Relay	W.D.	W.D.	W.D.	W.D.	W.D.
5. EFI Main Relay	EF-41	EF-41	EF-42	EF-39	EF-34

TEST #2 - (3d): #6 INJECTOR ELECTRICAL CIRCUIT – 1975-78

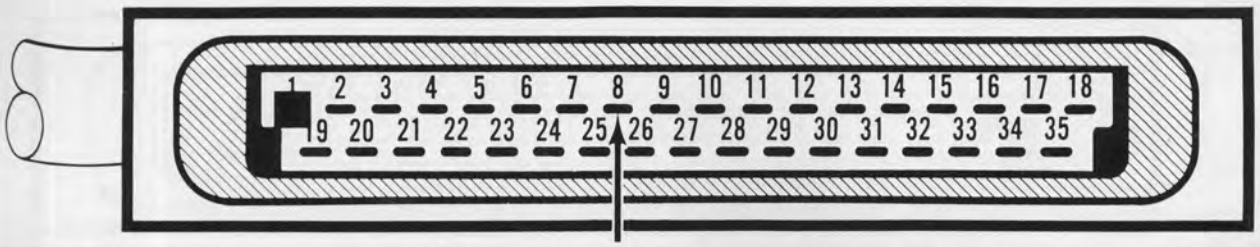
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Voltmeter	31	Vehicle Ground	Ignition "On"	Battery Voltage



If test is unsatisfactory, check:		Service Manual Page No. '75 280	'76 280	'77 280	'77 810	'78 280	'78 810
1.	Wiring	EF-50	EF-50	EF-51	EF-52	EF-29	EF-29
2.	Resistor	EF-56	EF-56	EF-56	EF-56	EF-34	EF-34
3.	Injector	EF-57	EF-57	EF-59	EF-60	EF-37	EF-37
4.	EFI Power Relay	EF-54	EF-54	EF-55	EF-56	N/A	N/A
5.	Ignition Relay	N/A	W.D.	W.D.	W.D.	EE-5	EE-5
6.	EFI Main Relay	N/A	N/A	N/A	N/A	EF-33	EF-33

TEST #2 - (3d): NO. 6 INJECTOR ELECTRICAL CIRCUIT – 1979 & LATER

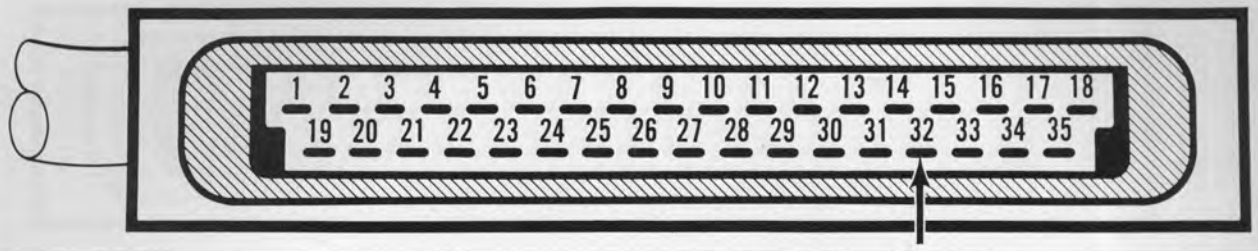
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Voltmeter	8	Vehicle Ground	Ignition "On" NA. 200SX	Battery Voltage



If test is unsatisfactory, check:		Service Manual Page No. '79 280	'79 810	'80 280ZX	'80 810	'80 200SX	
1.	Wiring	EF-22	EF-22	EF-22	EF-21	EF-21	
2.	Resistor	EF-41	EF-41	EF-42	EF-19	EF-33	
3.	Injector	EF-36	EF-36	EF-36	EF-19	EF-29	
4.	Ignition Relay	W.D.	W.D.	W.D.	W.D.	W.D.	
5.	EFI Main Relay	EF-41	EF-41	EF-42	EF-39	EF-34	

TEST #2 - (3e): #3 INJECTOR ELECTRICAL CIRCUIT – 1975-78

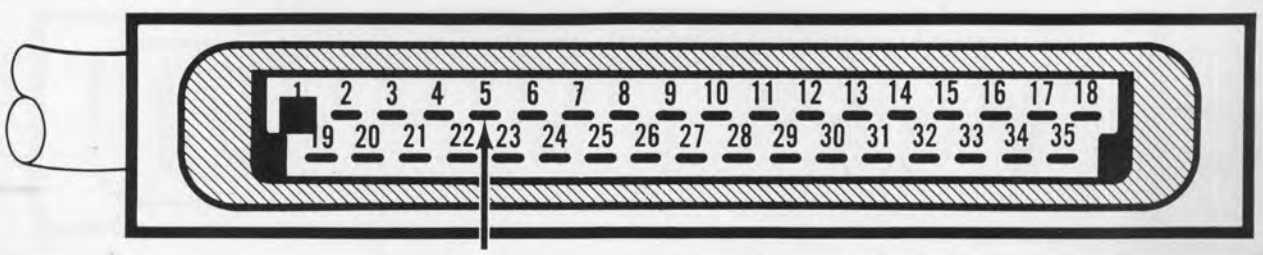
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Voltmeter	32	Vehicle Ground	Ignition "On"	Battery Voltage



If test is unsatisfactory, check:		Service Manual Page No. '75 280	'76 280	'77 280	'77 810	'78 280	'78 810
1.	Wiring	EF-50	EF-50	EF-51	EF-52	EF-29	EF-29
2.	Resistor	EF-56	EF-56	EF-56	EF-56	EF-34	EF-34
3.	Injector	EF-57	EF-57	EF-59	EF-60	EF-37	EF-37
4.	EFI Power Relay	EF-54	EF-54	EF-55	EF-56	N/A	N/A
5.	Ignition Relay	N/A	W.D.	W.D.	W.D.	EE-5	EE-5
6.	EFI Main Relay	N/A	N/A	N/A	N/A	EF-33	EF-33

TEST #2 - (3e): NO. 3 INJECTOR ELECTRICAL CIRCUIT – 1979 & LATER

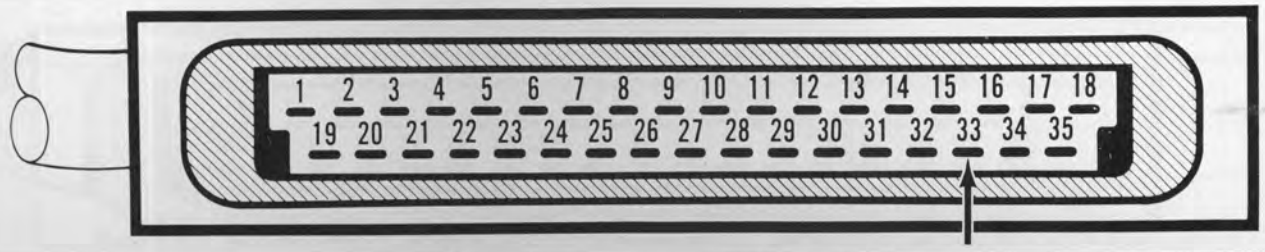
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Voltmeter	5	Vehicle Ground	Ignition "On"	Battery Voltage



If test is unsatisfactory, check:		Service Manual Page No. '79 280	'79 810	'80 280ZX	'80 810	'80 200SX	
1.	Wiring	EF-22	EF-22	EF-22	EF-21	EF-21	
2.	Resistor	EF-41	EF-41	EF-40	EF-19	EF-33	
3.	Injector	EF-36	EF-36	EF-36	EF-19	EF-29	
4.	Ignition Relay	W.D.	W.D.	W.D.	W.D.	W.D.	
5.	EFI Main Relay	EF-41	EF-41	EF-42	EF-39	EF-34	

TEST #2 - (3f): #2 INJECTOR ELECTRICAL CIRCUIT – 1975-78

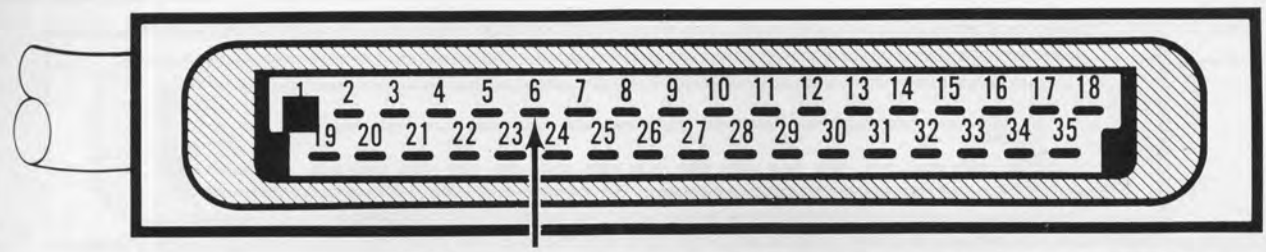
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Voltmeter	33	Vehicle Ground	Ignition "On"	Battery Voltage



If test is unsatisfactory, check:		Service Manual Page No. '75 280	'76 280	'77 280	'77 810	'78 280	'78 810
1.	Wiring	EF-50	EF-50	EF-51	EF-52	EF-29	EF-29
2.	Resistor	EF-56	EF-56	EF-56	EF-56	EF-34	EF-34
3.	Injector	EF-57	EF-57	EF-59	EF-60	EF-37	EF-37
4.	EFI Power Relay	EF-54	EF-54	EF-55	EF-56	N/A	N/A
5.	Ignition Relay	N/A	W.D.	W.D.	W.D.	EE-5	EE-5
6.	EFI Main Relay	N/A	N/A	N/A	N/A	EF-33	EF-33

TEST #2 - (3f): NO. 2 INJECTOR ELECTRICAL CIRCUIT – 1979 & LATER

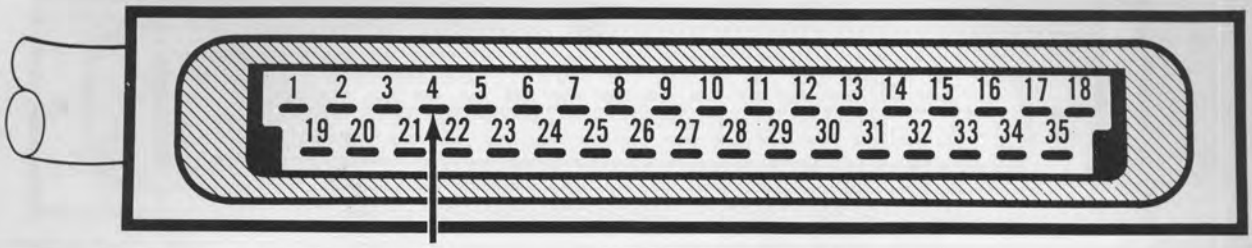
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Voltmeter	6	Vehicle Ground	Ignition "On"	Battery Voltage



If test is unsatisfactory, check:		Service Manual Page No. '79 280	'79 810	'80 280ZX	'80 810	~~'80 810~~ 80 200SX	
1.	Wiring	EF-22	EF-22	EF-22	EF-21	EF-21	
2.	Resistor	EF-41	EF-41	EF-42	EF-19	EF-33	
3.	Injector	EF-36	EF-36	EF-36	EF-19	EF-29	
4.	Ignition Relay	W.D.	W.D.	W.D.	W.D.	W.D.	
5.	EFI Main Relay	EF-41	EF-41	EF.42	EF-39	EF-34	

TEST #3 - (1): START SIGNAL CIRCUIT – 1975-78

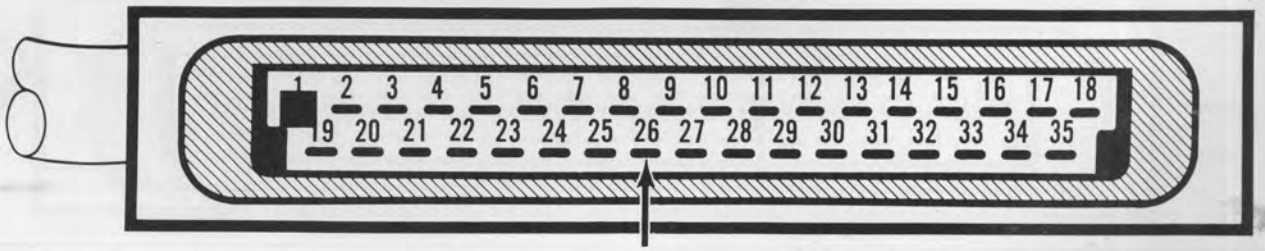
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Voltmeter	4	Vehicle Ground	1. Starter solenoid lead disconnected. 2. Cold start valve disconnected. 3. Key in "Start" position.	Battery Voltage



If test is unsatisfactory, check:	Service Manual Page No. '75 280	'76 280	'77 280	'77 810	'78 280	'78 810
1. Wiring Harness	EF-50	EF-50	EF-51	EF-52	EF-29	EF-29

TEST #3 - (1): START SIGNAL CIRCUIT – 1979 & LATER

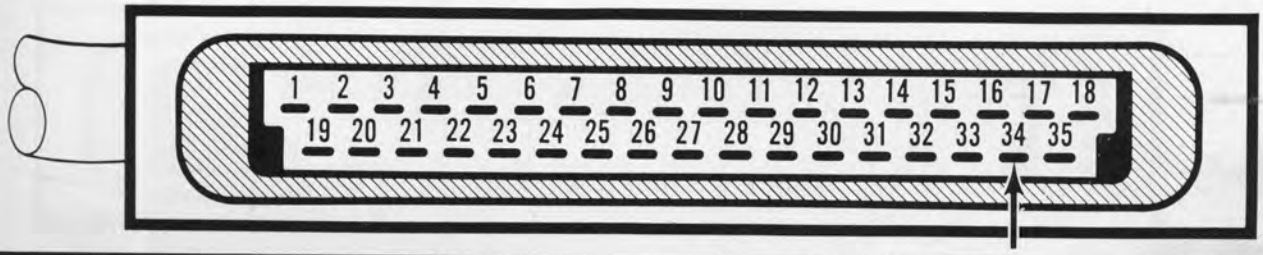
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Voltmeter	26	Vehicle Ground	1. Starter solenoid lead disconnected. 2. Cold start valve disconnected. 3. Key in "Start" position.	Battery Voltage



If test is unsatisfactory, check:	Service Manual Page No. '79 280	'79 810	'80 280ZX	'80 810	'80 200SX	
1. Wiring Harness	EF-22	EF-23	EF-22	EF-21	EF-21	

TEST #3 - (2): AUX. AIR REGULATOR CIRCUIT – 1975-78

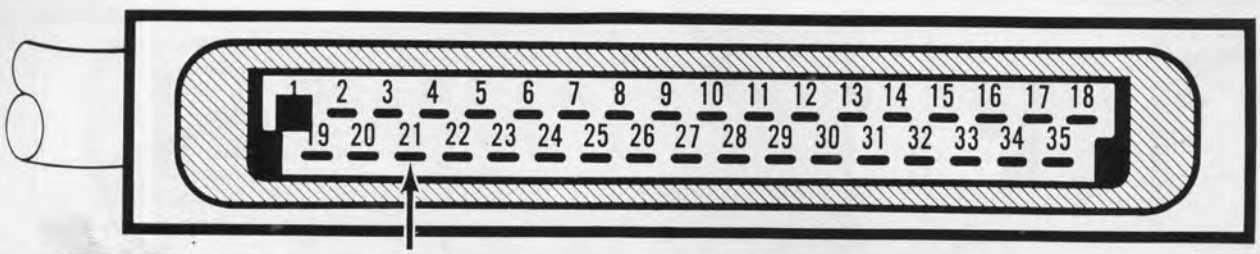
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Voltmeter	34	Vehicle Ground	1. Starter solenoid lead disconnected. 2. Cold start valve disconnected. 3. Key in "Start" position.	Battery Voltage



If test is unsatisfactory, check:		Service Manual Page No. '75 280	'76 280	'77 280	'77 810	'78 280	'78 810
1.	Aux. Air Regulator	EF-58	EF-58	EF-59	EF-60	EF-38	EF-38
2.	Wiring Harness	EF-50	EF-50	EF-51	EF-52	EF-29	EF-29

TEST #3 - (2): AUX. AIR REGULATOR CIRCUIT – 1979 & LATER

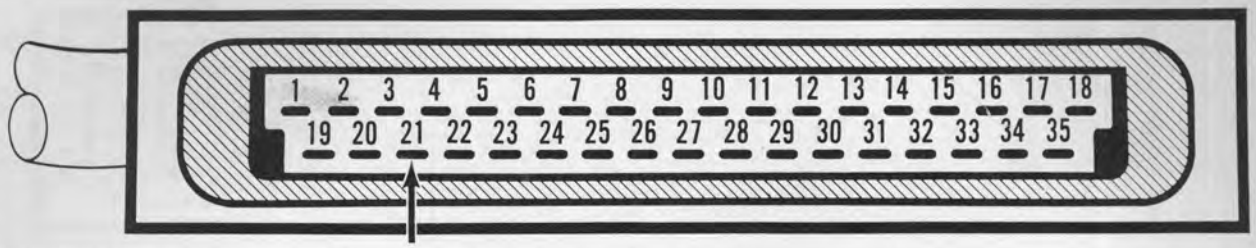
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Voltmeter	21	Vehicle Ground	1. Starter solenoid lead disconnected. 2. Cold start valve disconnected. 3. Key in "Start" position.	Battery Voltage



If test is unsatisfactory, check:		Service Manual Page No. '79 280	'79 810	'80 280ZX	'80 810	'80 200SX	
1.	Aux. Air Regulator	EF-39	EF-39	EF-39	EF-24	EF-30	
2.	Wiring	EF-22	EF-23	EF-22	EF-21	EF-21	

TEST #3 - (3): COLD START SYSTEM CIRCUIT – 1975-78

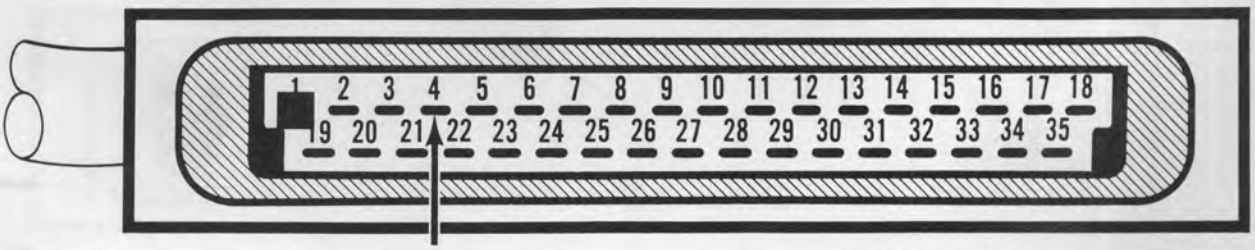
Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Voltmeter	21	Vehicle Ground	1. Starter solenoid lead disconnected. 2. Key to "Start" position. 3. Some vehicle harnesses do not include pin 21. Connect (+) of voltmeter to cold start valve terminal.	A. Water temp. below 57°: little or no voltage at first, then full battery voltage within 15 sec. B. Water temp. between 57° and 71°: may or may not show voltage right away, but must show battery voltage within 10 sec. C. Water temp. above 71°: full battery voltage right away. Note: Recheck sensor after water temp. drops below 57°.



If test is unsatisfactory, check:		Service Manual Page No. '75 280	'76 280	'77 280	'77 810	'78 280	'78 810
1.	Cold start valve	EF-54	EF-54	EF-55	EF-56	EF-33	EF-33
2.	Thermotime Switch	EF-53	EF-53	EF-54	EF-55	EF-32	EF-32
3.	EFI Relay	EF-54	EF-54	EF-55	EF-56	N/A	N/A
4.	Wiring Harness	EF-50	EF-50	EF-51	EF-52	EF-29	EF-29

TEST #3 - (3): COLD START SYSTEM CIRCUIT – 1979 & LATER

Tester	Leads To Pins (+)	Leads To Pins (–)	Notes	Should Read
Voltmeter	4	Vehicle Ground	1. Starter solenoid lead disconnected. 2. Key to "Start" position.	A. Water temp. below 57°: little or no voltage at first, then full battery voltage with 15 sec. B. Water temp. between 57° and 71°: may or may not show voltage right away, but must show battery voltage within 10 sec. C. Water temp. above 71°: full battery voltage right away. Note: Recheck sensor after water temp. drops below 57°.



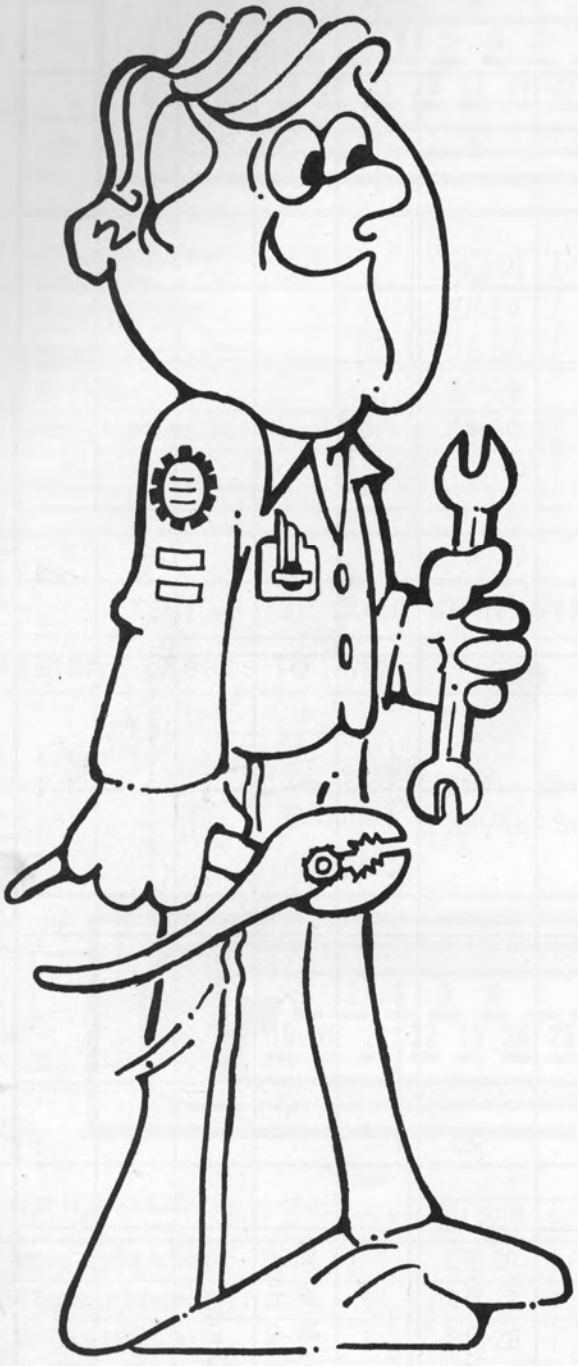
If test is unsatisfactory, check:		Service Manual Page No. '79 280	'79 810	'80 280ZX	'80 810	'80 200SX	
1.	Cold Start Valve	EF-37	EF-37	EF-37	EF-35	N/A	
2.	Thermotime Switch	EF-37	EF-37	EF-37	EF-35	N/A	
3.	Wiring Harness	EF-22	EF-23	EF-22	EF-21	N/A	

COMPONENT CHECKS

(To Be Performed Only After Circuit Tests Are Completed)

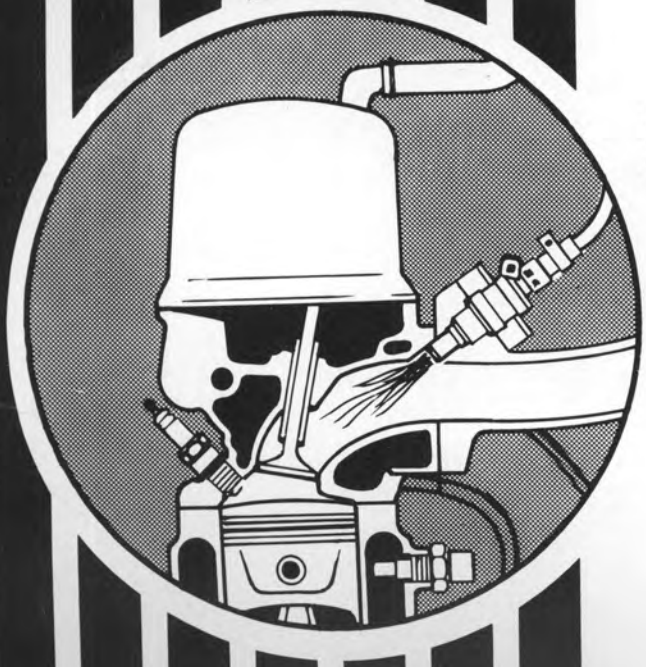
Problem	Injector Sound	Cold Start Valve	Auxiliary Air Regulator	Relay	Control Unit Replacement	Air Flow Meter		Fuel System			
						Flap Operation	Resistance Voltage Meas.	Fuel Pressure Test	Injector Leakage	Cold Start Valve Leakage	Pressure Regulator
Engine Will Not Start	X			X	X	X	X	X	X	X	X
Idle Too High Or Too Rough	X							X	X	X	X
Engine Misfires — HC Reading Too High	X		X		X	X	X	X			X
Lack Of Power — Engine Will Not Rev.	X					X	X	X	X	X	X
Hesitation — Stumble						X	X	X	X	X	X
Poor Gas Mileage, Or CO Too High		X			X		X	X			X
Engine Surges			X		X	X	X	X	X	X	X
Backfiring					X	X	X	X			
Afterburning					X	X	X	X			

Sammy Service Sez:



Remember, all the electrical testing in the world won't find or cure problems like poor valve adjustment, low fuel pressure, air and vacuum leaks, incorrect ignition timing, idle speed and CO%, or misadjusted dashpots or BCDD.

ALWAYS CHECK THE BASICS FIRST!



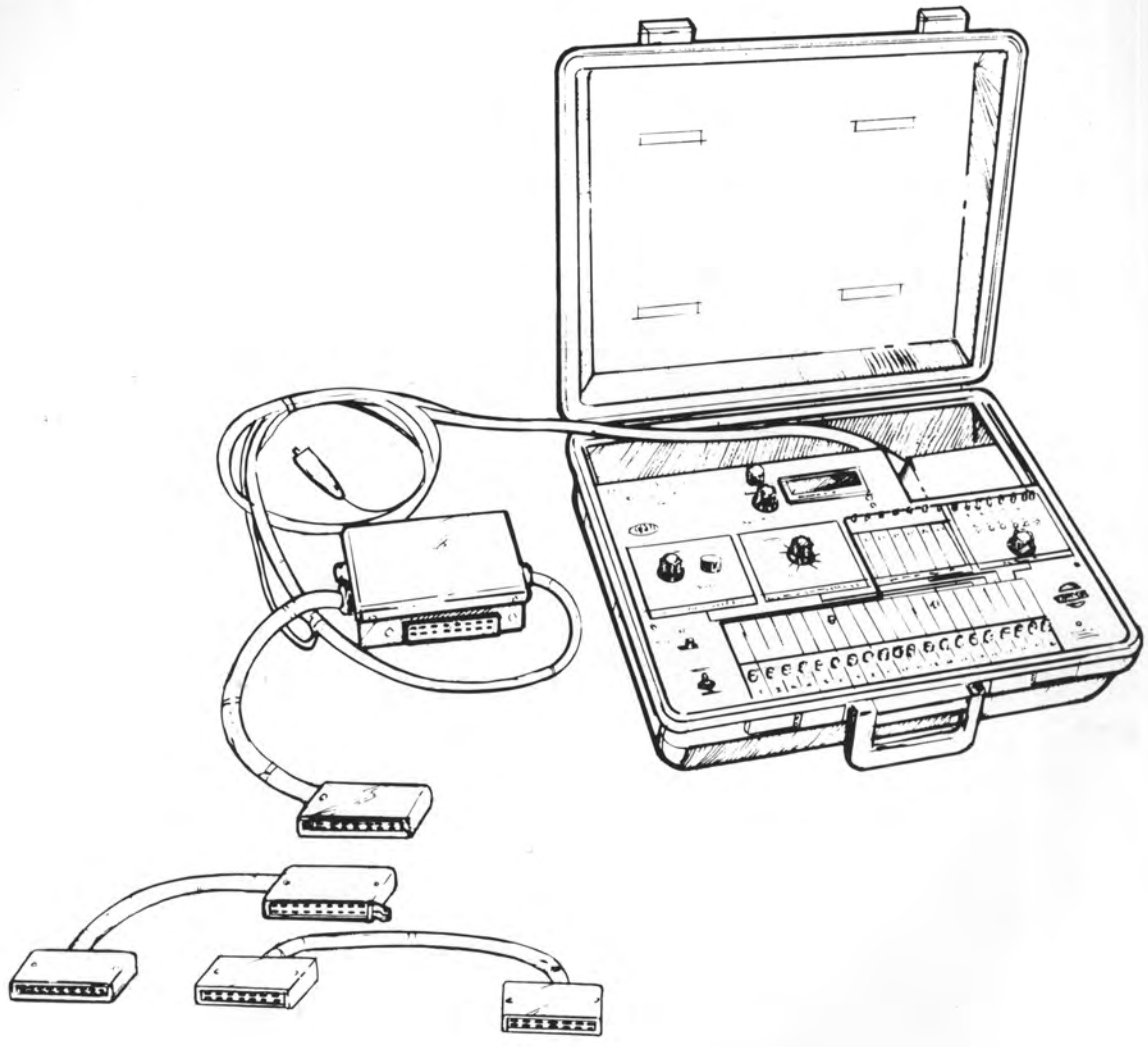
FUEL INJECTION TROUBLESHOOTING

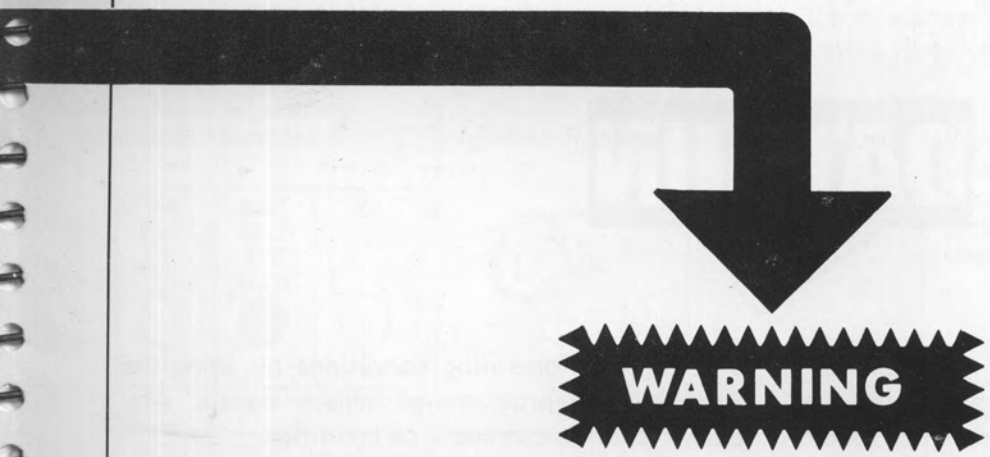
→Using the Kent-Moore J-25400 EFI Analyzer

DATSUN

J25400

Electronic Fuel Injection Analyzer





Whenever using the J-25400 Analyzer, BE SURE to use the correct extender harness and adapter for the year model you're working on.

A. Use the extender harness ALONE for 1975–78 models.

B. Use the extender harness AND the twin adapter harness (J-25400-36) on 1979 models.

FAILURE TO USE THE CORRECT HARNESS/ADAPTER COMBINATION CAN RESULT IN SERIOUS DAMAGE TO BOTH THE VEHICLE AND THE ANALYZER.

Repair Information

Kent-Moore
TOOL DIVISION
29784 LITTLE MACK, ROSEVILLE, MI. 48066

DATSUN

The Kent-Moore Electronic Fuel Injection (EFI) System Analyzer – J25400 – is a universal diagnostic tester for all EFI systems and can be used on different EFI systems by purchasing the appropriate adapter kit. The instructions included in this manual pertain only to the Datsun 280-Z, 280-ZX, 810 and 200SX.

The test procedures of this diagnostic analyzer are designed so that they can be used either sequentially or individually to diagnose EFI problems.

Refer to the *Datsun Electronic Fuel Injection Manual* for theory of operation of the Fuel injection System and to find the specific electrical circuits.

All test values, ranges and other parameters included in these instructions have been supplied by Nissan Motor Corporation in U.S.A.

Analyzer Test Buttons 1 through 16 permit static tests for supply voltages, sensor resistances, continuity of wiring and switches.

Analyzer Test Button 17 permits dynamic testing of the fuel pressure system and actual flow testing of each injector while it is still in the engine.

Analyzer Test Button 18 permits temporary engine operation using the Analyzer as a substitute Electronic Control Unit, and serves as a dynamic check of the Air Flow Meter.

Analyzer Test Button 19 permits a check of the car's Electronic Control Unit (ECU) for response to changes in operating conditions by using the Analyzer's pre-programmed sensor signals. Any faulty responses can easily be identified.

Analyzer Test Button 20 permits normal engine operation using the Analyzer as a monitor for the EFI components.

(HAVE ASSISTANCE FOR ROAD TEST)

NOTE: This test position also permits roadtesting of the car so that intermittent faults occurring under actual operating conditions can easily be identified.

SPECIAL NOTES

Open Circuit Light: On tests 1 thru 17 if open circuit light is on, this indicates an open circuit.

On tests 18 thru 20, the open circuit light is normally on. On all tests, note the open circuit light.

X 1000 Light: When this light is on, the digital reading is multiplied by 1000.

Short circuits are indicated by digital readings of zero or readings approaching zero.

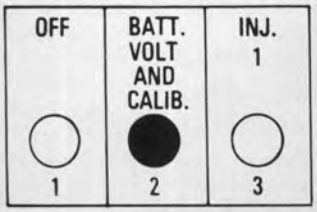
Whenever electrical or fuel connections are made or broken, make sure ignition switch and analyzer are both in the 'OFF' position.

If analyzer functings improperly, check the fuse located on the analyzer and the fuse located on the extender harness box and replace if necessary with equivalents.

J 25400 ELECTRONIC FUEL INJECTION ANALYZER

The following symbols are used throughout this instruction manual to indicate specific operations or analyzer results. Please familiarize yourself with these symbols prior to using the instructions.

Button Depressed



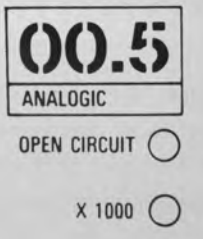
Ignition Position

Throttle Action

Variable Vacuum Source (J 23738 Mity-Vac)

Fuel Pressure Gauge

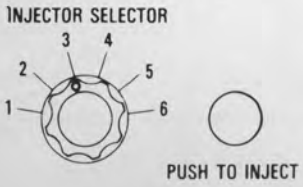
Indication that lights are on



Readings shown throughout the instructions are typical readings for that test. Ranges are given to the right under the result column.

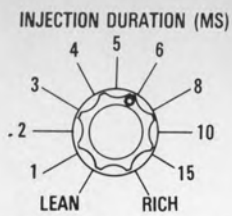
Always check the "open circuit" and "X 1000" lights for illumination and compare with the result column.

Rotary knob selects injector. Push button activates selected injector for ten cycles per push.

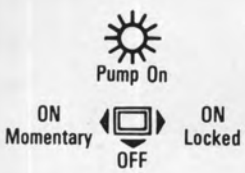


Injector Flow

Rotary knob selects injector duration in milliseconds (ms) for analyzer operation of the car.



Substitute Electronic Control Unit



Fuel Pump

Compare light with results column, place switch according to test procedure.

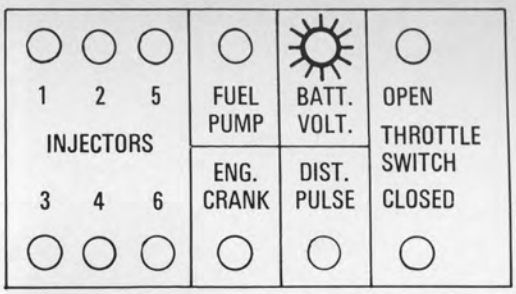
CAD

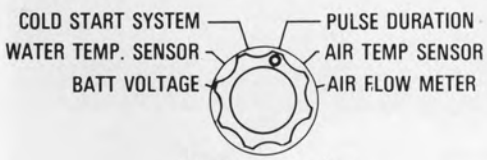
DAT

Set to the "Datsun" position for all tests.

Observe the twelve indicator lights while referring to the result column throughout the test.

Rotary knob is used to select the circuit for monitor test.





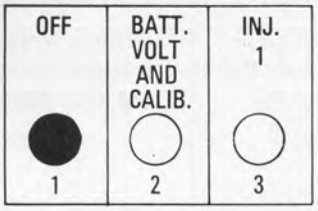
System Monitor

PREPARATION FOR TEST

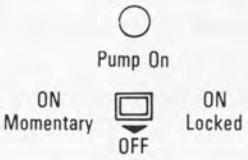
- Ignition Key *OFF.*

- Transmission in Neutral or Park.
- Hand brake on.

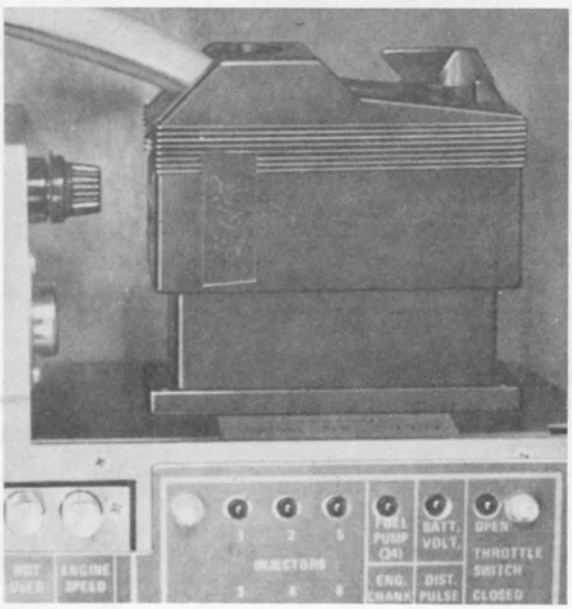
- Push Analyzer Test Button 1.



- Fuel Pump Switch OFF.



- Attach J 25400-32 Extender Harness to tester.
  1979 – Later, use Adapter Harness.



- Remove cover from ECU.
- Remove Car Harness Connector from ECU.

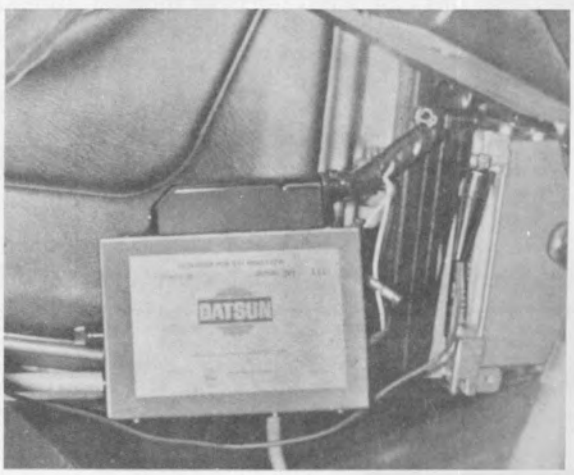
  NOTE: Locking clip has to be raised to release connector.

- Attach Car Harness Connector to J25400-32 Extender Harness.

CAUTION

NOTE:

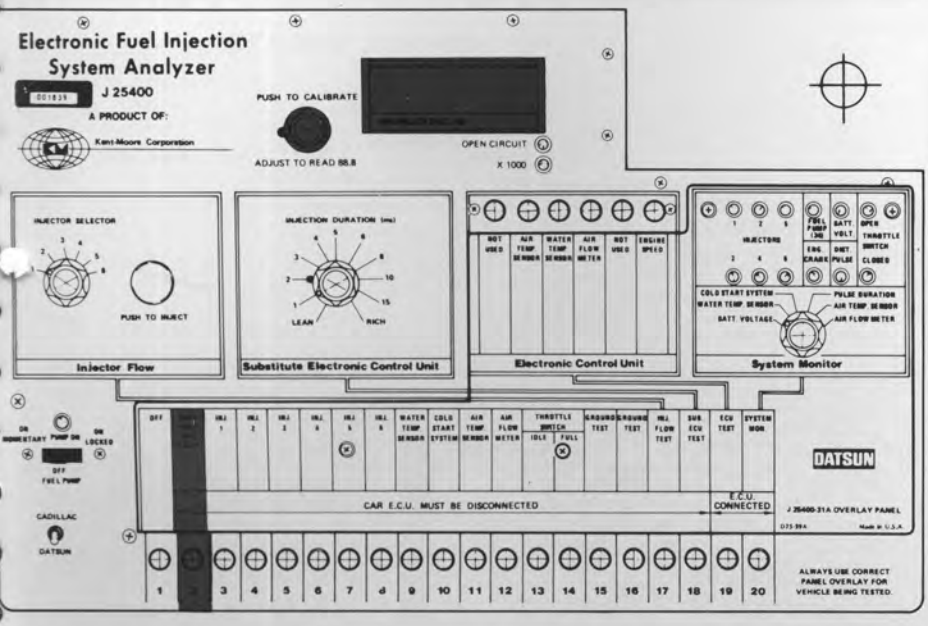
On 1979 models, be sure to insert Adapter Harness J-25400-36 between Car Harness and Extender Harness. Failure to do so can result in serious damage to both the vehicle and the Analyzer. On the other hand, NEVER attempt to use Adapter Harness J-25400-36 when testing 1975 thru 1978 vehicles, because both the car and the analyzer can be damaged.



- Attach ground clip to good chassis ground.
- DO NOT CONNECT EXTENDER HARNESS TO VEHICLE ECU AT THIS TIME.

Battery Voltage and Calibration 2

OBJECTIVE:
Calibration of digital volt/ohm meter to built-in tester standards and to make sure correct battery voltage is available for proper operation of the Electronic Control Unit (ECU).



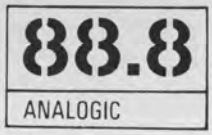
NORMAL RESULTS:

Ignition key ON supplies power to Analyzer shown by BATT. VOLT. light ON.

If no light, check:

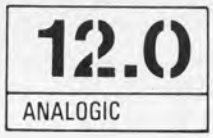
1. EFI Relay
2. Control Unit Power Input Circuit
   Electronic Fuel Injection page 82. - 89

- Ignition key "ON"
- Hold CALIBRATE button in and
  Adjust to read 88.8



If Digital Reading cannot be set to **88.8,** Analyzer is not operating properly

- Release CALIBRATE button and
  Read battery voltage



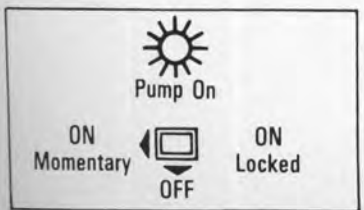
Digital Reading must show **11.0 volts or higher.** If not, check:

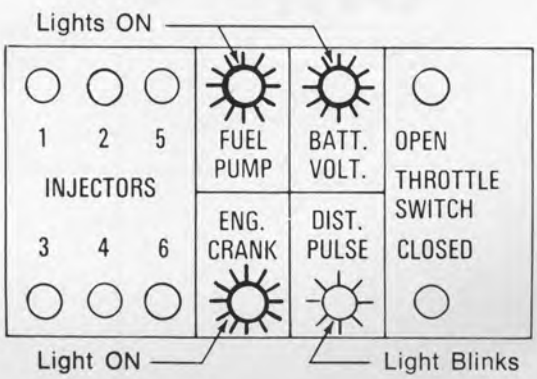
1. Battery-Charging System
2. Control Unit Power Input Circuit
   Electronic Fuel Injection page 82. 89

- Crank engine
  Read cranking voltage

Digital Reading must show **09.0 volts or higher.** If not, discontinue test until battery is properly charged or starter circuit repaired

Lights indicate circuits for starter, fuel pump and distributor pulse are complete. If lights do not come on, check:





Fuel Pump Light:*
1. Air regulator circuit
   Electronic Fuel Injection page 90. - 97
2. Air regulator and fuel pump circuit
   Electronic Fuel Injection page 78. 80

Engine crank light:
1. "Start" signal circuit
   Electronic Fuel Injection page 89. 96

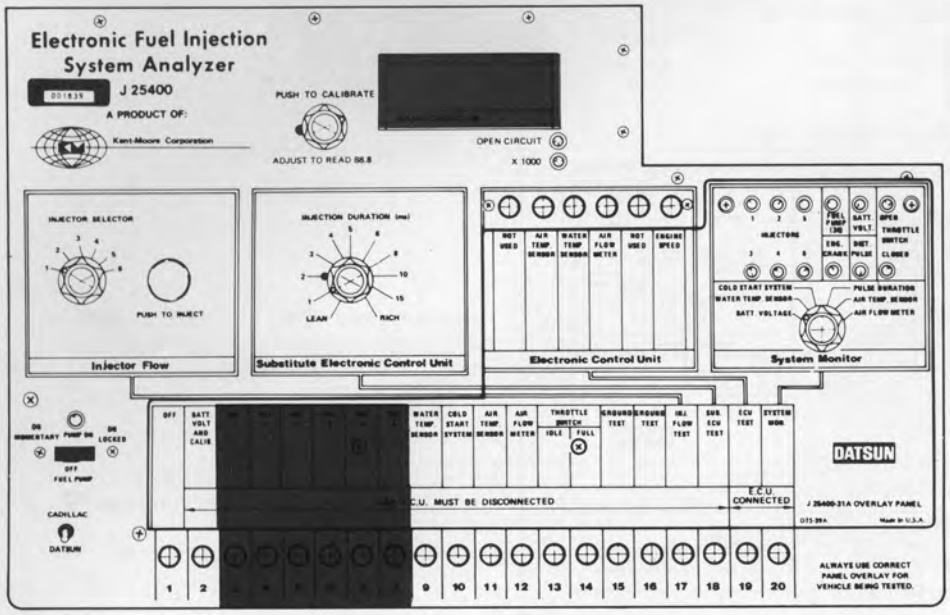
Dist pulse light:
1. Ignition coil trigger input circuit
   Electronic Fuel Injection page 87. 94

Pump switch light:*
1. Fuel pump relay circuit
   Electronic Fuel Injection page 78. 90

*Not operative when testing 1978 and later

Injector Tests 3·8

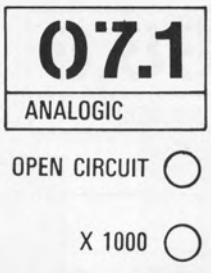
OBJECTIVE:
Check for SHORT or OPEN CIRCUITS in injector harness, dropping resistors and related wiring using digital reading to check resistance in ohms.



NORMAL RESULTS:

Ignition key ON supplies power to Analyzer shown by BATT VOLT light ON.

- **Ignition key "ON" (Do not start engine)**



Digital reading must be between **6.0 and 10.0 ohms.**

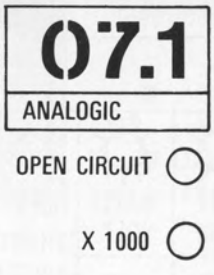
- Read Resistance (ohms)

- **REPEAT TEST PROCEDURE:**
  (Injector 1 above) for each injector by pushing Analyzer Test Buttons 4, 5, 6, 7 and 8. Observe digital reading for each injector.

INJ. 2	INJ. 3	INJ. 4	INJ. 5	INJ. 6
4	5	6	7	8

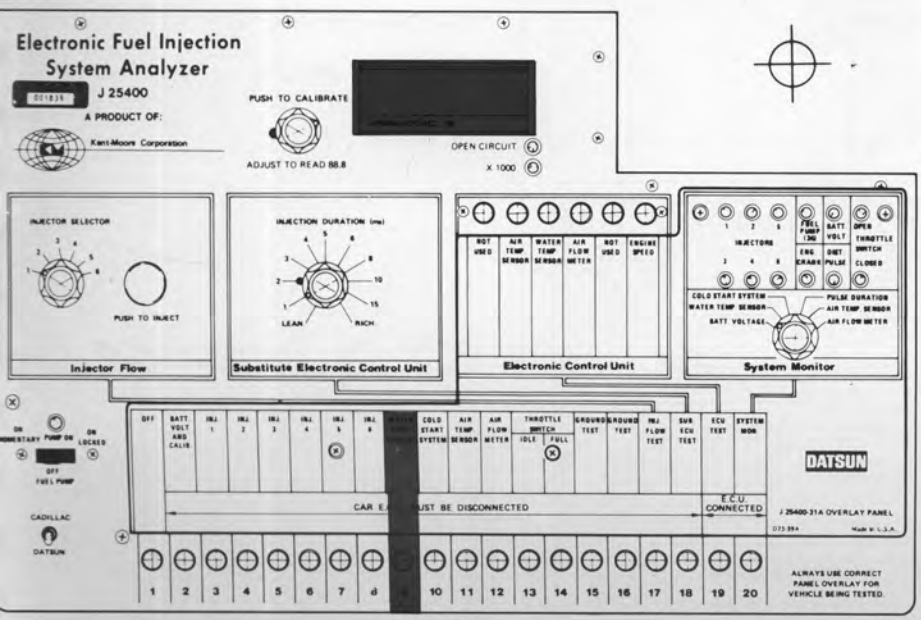
All digital readings must be between **6.0 and 10.0 ohms.**

Injector circuit(s) that is out of range *Electronic Fuel Injection pages* ~~88-88~~ 90-95.



Water Temperature Sensor 9

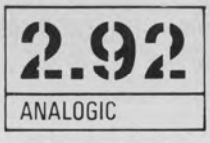
OBJECTIVE:
Check for OPEN and SHORT CIRCUITS and compare sensor resistance (ohms) with water (engine) temperature as sensor signal to ECU richens air/fuel ratio during engine warm-up.



NORMAL RESULTS:

Ignition key ON supplies power to Analyzer shown by BATT. VOLT. light ON.

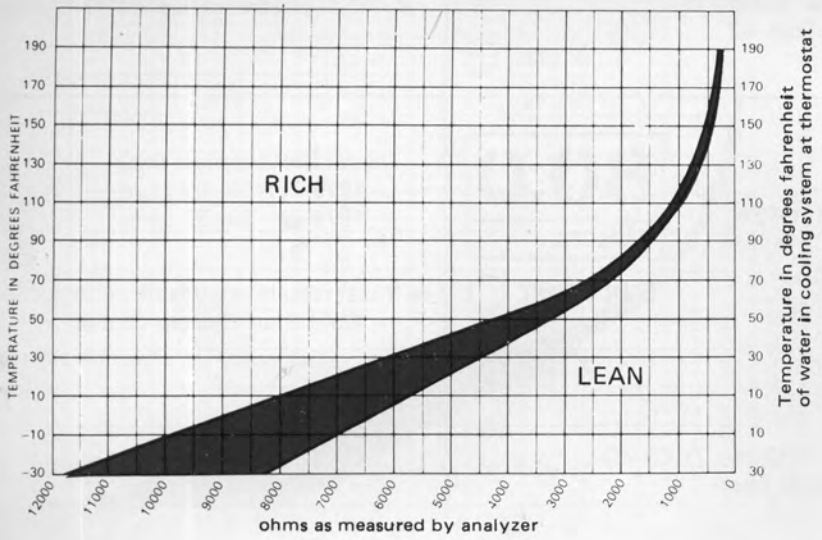
- Ignition key "ON"



Digital reading must show **240 to 10,800 ohms.**

Read X 1000 if light is ON.

- Compare Digital Reading to *approximate* engine temperature as shown on graph

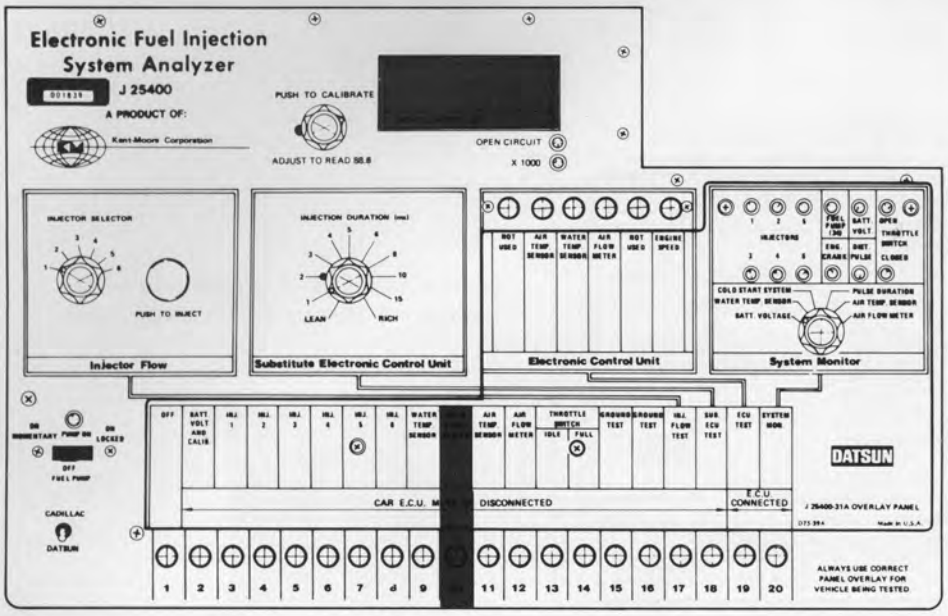


As engine temperature *increases*, resistance must *decrease.*

If test results are unsatisfactory, check:
Water Temperature Sensor Circuit
Electronic Fuel Injection page 72. 79

Cold Start System 10

OBJECTIVE:
Determine if COLD START VALVE and THERMOTIME SWITCH are connected and if the switch is open or closed. This system (like a choke) supplies extra fuel to all cylinders for cold starting conditions.



- Turn ignition key ON (Do not start engine)
- Disconnect starter Motor "S" terminal
- Cars with catalytic converters: Temporarily remove FLOOR-TEMP lamp fuse from fuse block. Replace fuse after testing. (On 810 models, remove SOLENOID fuse.)

Approximate Engine Temperature	Thermotime Switch Points	Digital Reading
57° F (or colder)	CLOSED	00.5 ANALOGIC OPEN CIRCUIT ◯ X 1000 ◯
71° F (or hotter)	OPEN	80.0 ANALOGIC OPEN CIRCUIT ◯ X 1000 ◯

NOTE: It may be necessary to allow Thermotime Switch to cool down from Test #2

NOTE: At temperatures between 57°F and 71°F the THERMOTIME SWITCH can be either closed or open.

NORMAL RESULTS:

N.A. 2005X

Ignition key ON supplies power to Analyzer shown by BATT VOLT light ON.

Digital Reading must show **00.0 to 01.0 ohms.**

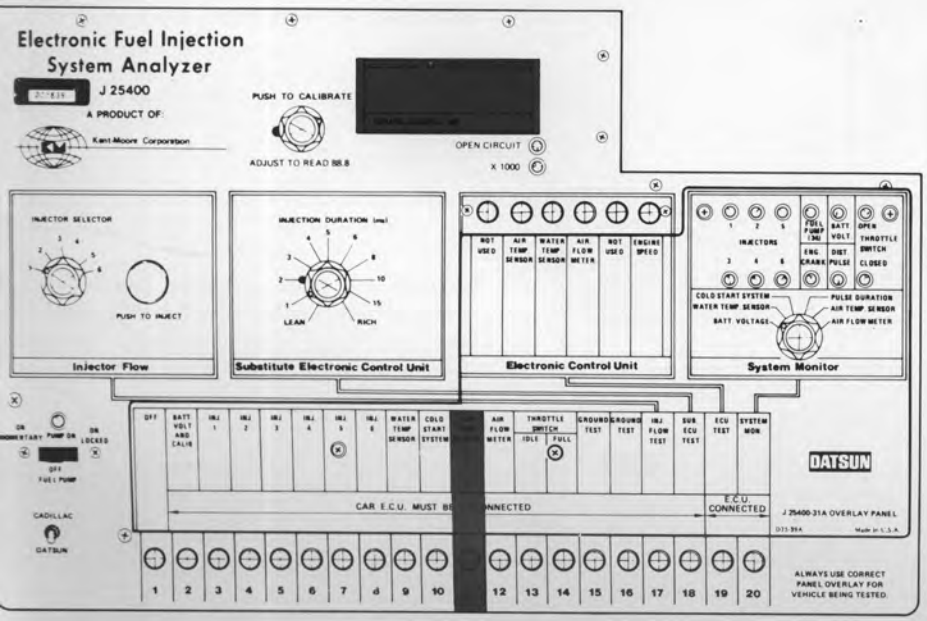
If test results are unsatisfactory, check:
Cold Start System Circuit
Electronic Fuel Injection page 97.

Digital Reading must show:
1975-77: 70–85 ohms
1978-79: 30–50 ohms

If test results are unsatisfactory, check:
Cold Start System Circuit
Electronic Fuel Injection page 97.

Air Temperature Sensor 11

OBJECTIVE:
Check for OPEN and SHORT CIRCUITS and compare sensor resistance (ohms) with air intake temperature, as sensor signal to ECU enriches air/fuel ratio at intake air temperatures below 68°F.

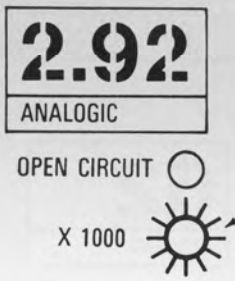


NORMAL RESULTS:

NA. CAL.
1980 810 280

Ignition key ON supplies power to Analyzer shown by BATT. VOLT. light ON.

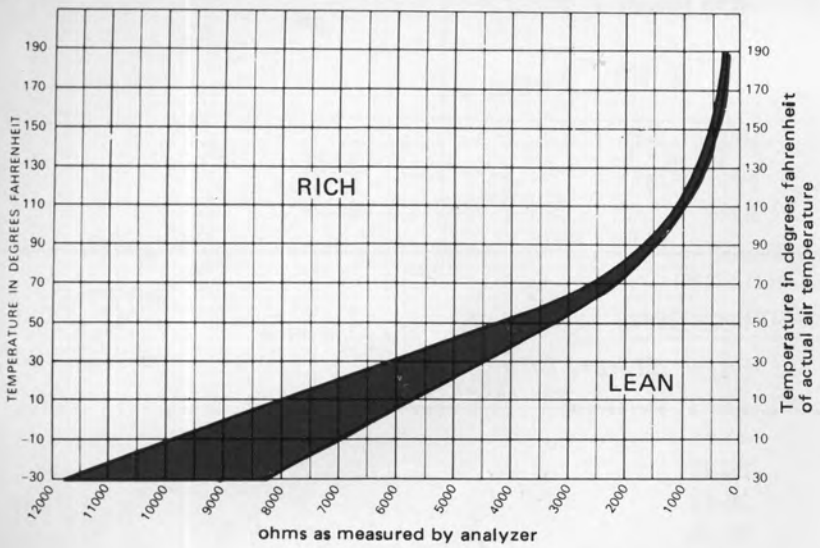
- **Ignition key "ON"**



Digital reading must show **290 to 10,800 ohms.**

Read X 1000 if light is ON.

- Compare Digital Reading to *approximate* air temperature as shown on graph



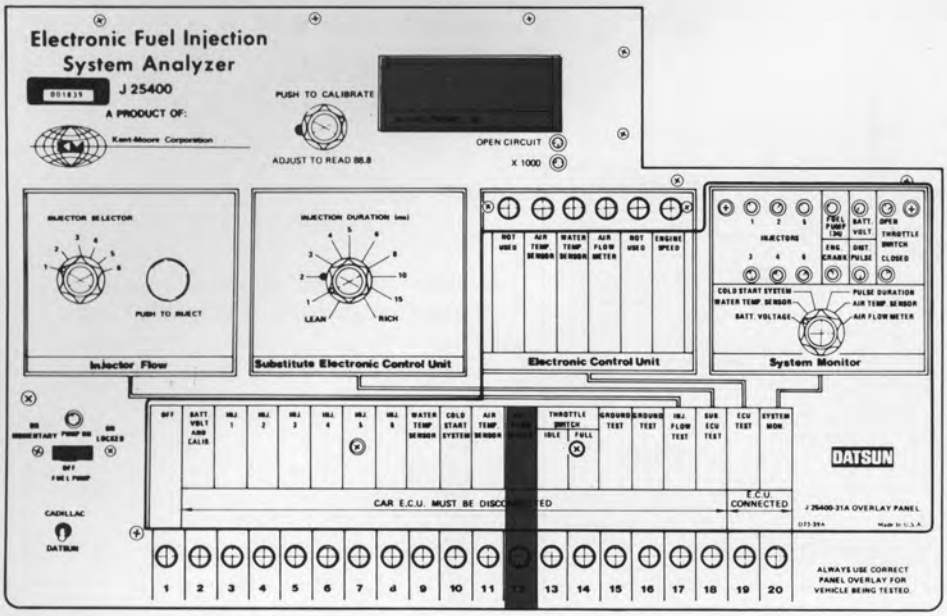
As air intake temperature *increases*, resistance must *decrease*.

If test results are unsatisfactory, check:

Air Temperature Sensor Circuit
Electronic Fuel Injection page 77.

Air Flow Meter 12

OBJECTIVE:
Determine if Air Flow Meter circuit resistance is correct with engine off. Also to check for an OPEN or SHORT CIRCUIT.



- Ignition key "ON"

NORMAL RESULTS:

Ignition key ON supplies power to Analyzer shown by BATT. VOLT. light ON.

- Check Reading

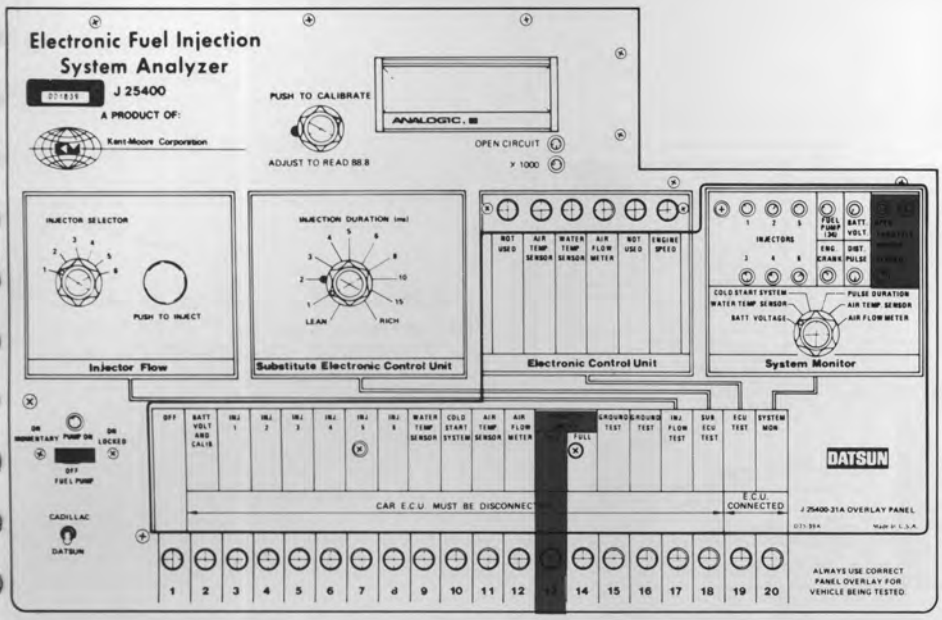
62
ANALOGIC
OPEN CIRCUIT ○
X 1000 ○

If test result is unsatisfactory, check:
Air Flow Meter Resistance
Electronic Fuel Injection pages ~~67~~ ~~69~~. 74-76

YEAR	MODEL	SPECIFICATION
1975, 76	280Z	60-65 BLACK LABEL (BOSCH)
1976, 75	280Z	47-53 Green "
1977	280Z	41-47
1977	810	28-33
1978	280Z	36-46
1978	810	36-45
1979	280ZX	41-47 — FED. W/ cat. 51-58
1979	810	41-47
1980	280ZX	41-47
1980	810	41-47
1980	200SX	29-35

Throttle Switch — Idle 13

OBJECTIVE:
Check operation of the IDLE switch (coupled to the throttle valve) which signals ECU to enrich air/fuel ratio at idle.



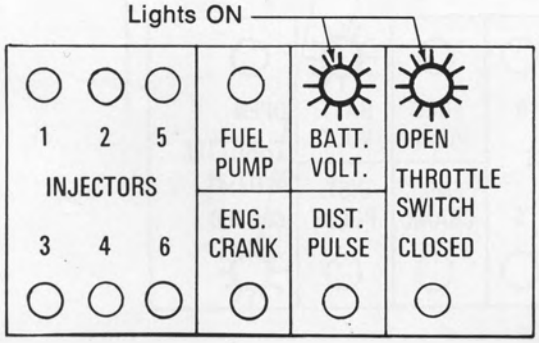
NORMAL RESULTS:

Ignition key ON supplies power to Analyzer shown by BATT. VOLT. light ON.

THROTTLE SWITCH CLOSED light ON.

- Ignition key "ON"

- Throttle part way OPEN



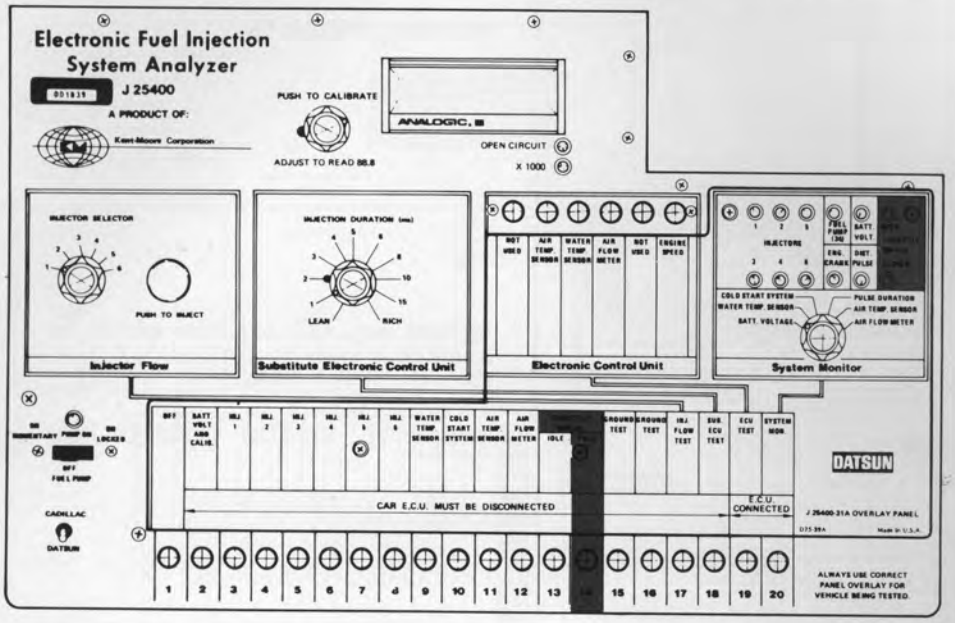
THROTTLE SWITCH OPEN light ON.

Open light should come on immediately upon moving throttle past idle position.

If test result is unsatisfactory, check:
Idle Throttle Switch Circuit
Electronic Fuel Injection page 72.

Throttle Switch — Full 14

OBJECTIVE:
Check operation of FULL (wide open throttle) portion of THROTTLE SWITCH which signals ECU to supply additional fuel enrichment at wide open throttle.



NORMAL RESULTS:

Ignition key ON supplies power to Analyzer shown by BATT. VOLT. light ON. THROTTLE SWITCH OPEN light ON.

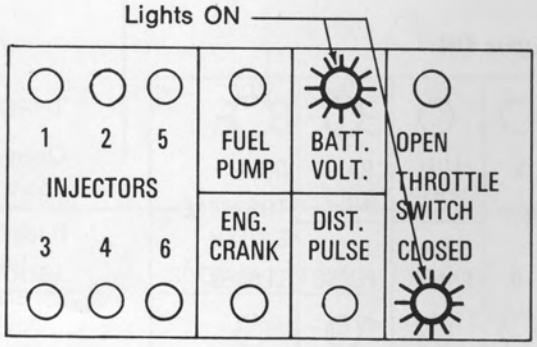
- Ignition key "ON"

THROTTLE SWITCH CLOSED light ON.

Closed light should come on at approximately one-third throttle.

If test result is unsatisfactory, check:
Full Throttle Switch Circuit
Electronic Fuel Injection page 73.

- Throttle WIDE OPEN
  Observe Lights ON

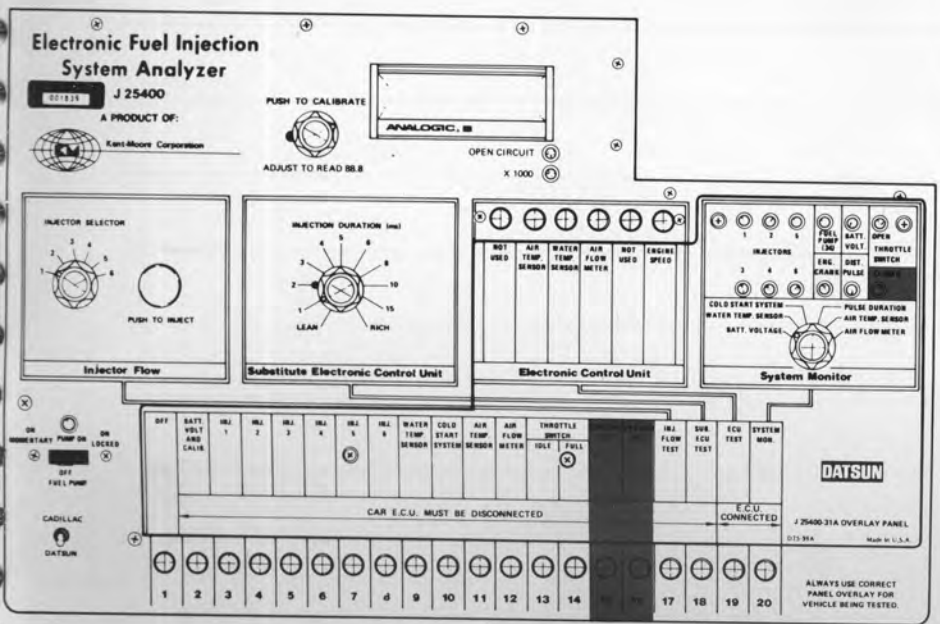


Ground Test #1–#2

TEST PROCEDURE:

PUSH ANALYZER TEST BUTTON 15·16

OBJECTIVE:
Check continuity of ground circuit by using THROTTLE SWITCH OPEN and CLOSED Lights.



- Ignition key "ON"

NORMAL RESULTS:

Closed light ON indicates good EFI circuit ground exists.

If test result is unsatisfactory, check:
Control Unit Ground Circuits #1, #2, #3, and #4

Electronic Fuel Injection pages 81 – 84.

Always be extra careful when disconnecting the high pressure fuel lines. Cover the hose end with a rag to avoid spraying gasoline all over.

When reconnecting the lines, always use new clamps and be sure to position them correctly.

AND DON'T FORGET TO USE A TORQUE DRIVER TO TIGHTEN THOSE CLAMPS!!

Check torque on two screws that hold the injectors in the manifold.

NOTES

NOTES

Fuel Pressure Gauge Installation

Fuel pressure gauge must be installed before proceeding with Analyzer Test 17.

TEST PROCEDURE:

PUSH ANALYZER TEST BUTTON 1

(OFF)

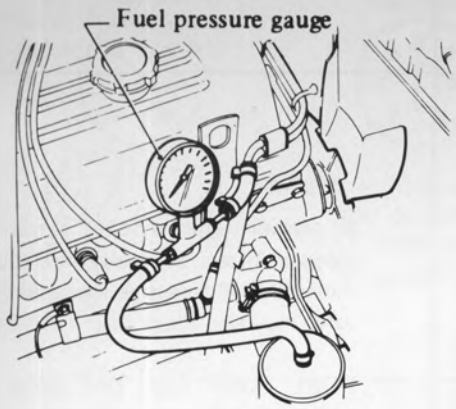
OFF	BATT. VOLT AND CALIB.	INJ. 1
●	○	○
1	2	3

- Turn ignition key OFF

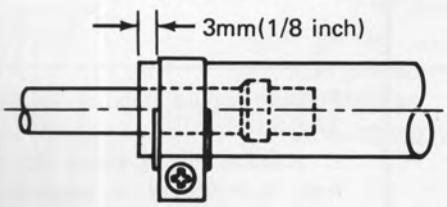
Install pressure gauge into high-pressure fuel line (shown below)

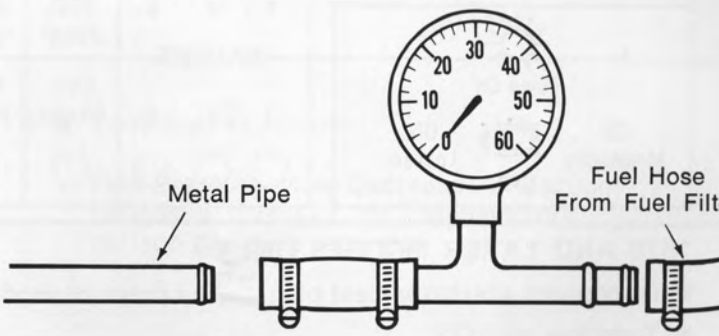
WARNING: FUEL IN SYSTEM MAY BE UNDER HIGH PRESSURE WHICH COULD SPRAY OUT AND RESULT IN A FIRE HAZARD AND POSSIBLE PERSONAL INJURY.

- Install Pressure Gauge (J 25400-34) between fuel filter hose and metal pipe at point shown. For convenience in later tests — position gauge so that it can be read from driver's seat.



NOTE:
ALWAYS REINSTALL HOSES USING NEW CLAMPS, AND TORQUE ALL CLAMPS TO 10-15 kg-cm (9-13 in.lbs.)



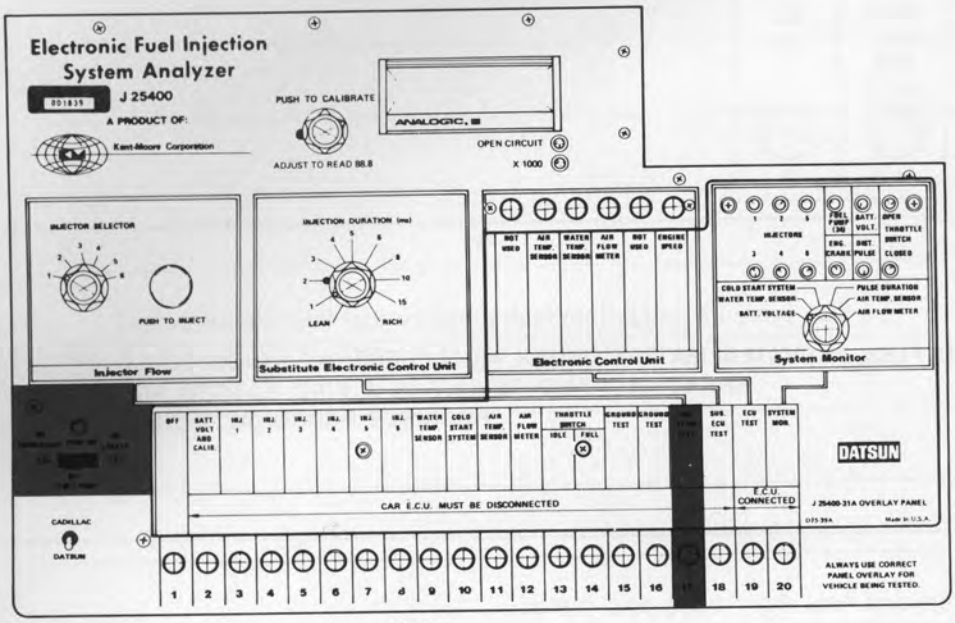


Tighten clamps securely to prevent fuel leaks

CONT'D

Fuel System Pressure Test 17

OBJECTIVE:
Check High Pressure Fuel System (relay, pump, damper, filter, regulator and related wiring) for proper operation.



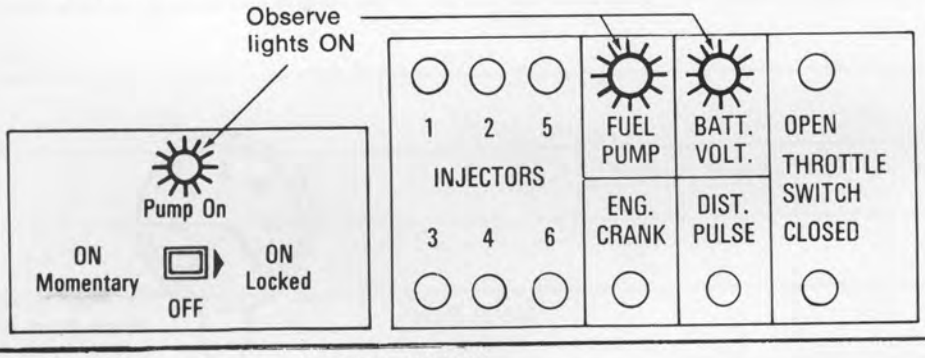
- Ignition key "ON"

NORMAL RESULTS:

Ignition key ON supplies power to Analyzer shown by BATT. VOLT. light ON.

1975 - 77 MODELS ONLY

- Watch fuel pressure gauge and turn fuel pump switch to locked-on position



If pressure rises slowly, a restriction, clogged filter, or faulty fuel pump is indicated. A defective fuel pump check valve may also cause this.

FUEL PUMP lights ON* when pump switch is ON and pressure rises to **36 to 37 P.S.I.** in about 1-4 seconds.

*Fuel pump lights not operative on 1978-79 models.

1978 AND LATER MODELS ONLY

- Disconnect alternator field plug and oil pressure sending unit lead wire.
- Turn key to "ON"

- Return the fuel pump switch or ignition switch to "OFF" position

Read Gauge

Pressure should stabilize, to about **33 to 37 P.S.I.**

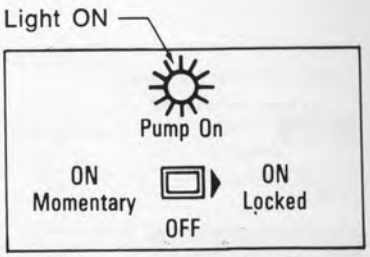
If pressure drops below 30 P.S.I., a leak is indicated or pressure regulator valve is malfunctioning. A faulty fuel pump check valve could also cause this.

Fuel Pressure System Test continued

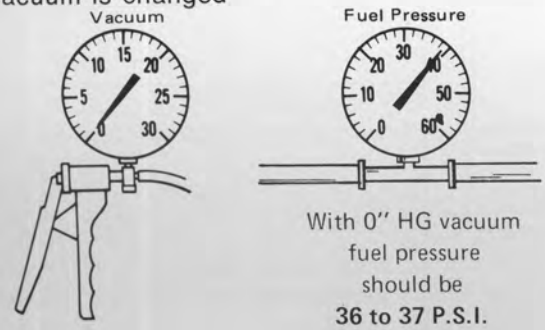
1 ● Connect variable vacuum source, J 23738 or equiv. to fuel regulator. Disconnect fuel pressure regulator vacuum hose from intake manifold and attach hose to variable vacuum source.

2 ● 1975-1977 Models: Light ON
Turn fuel pump switch to Locked-On position.

● 1978 and Later Models:
Disconnect alternator field plug and oil pressure sending unit lead wire.
Turn key to "ON".

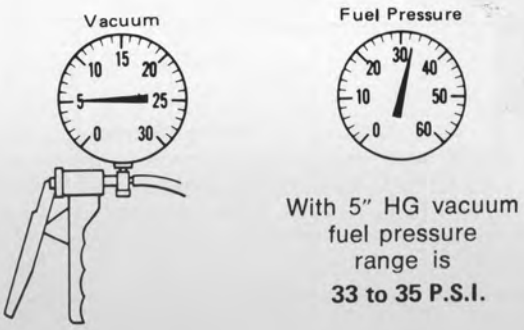


3 ● Observe fuel pressure readings as vacuum is changed



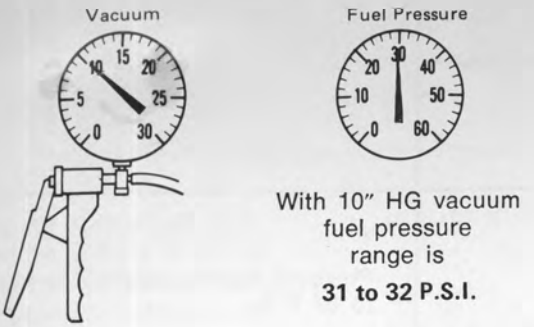
With 0" HG vacuum fuel pressure should be **36 to 37 P.S.I.**

4 ●



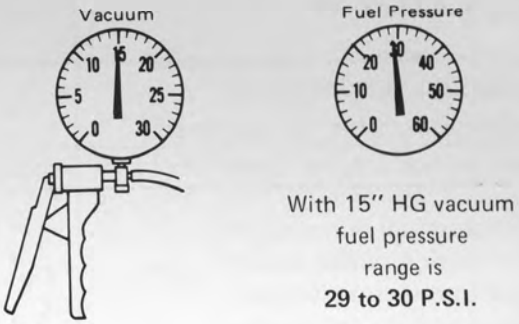
With 5" HG vacuum fuel pressure range is **33 to 35 P.S.I.**

5 ●



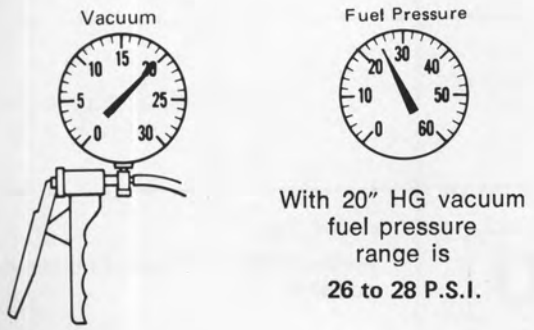
With 10" HG vacuum fuel pressure range is **31 to 32 P.S.I.**

6 ●



With 15" HG vacuum fuel pressure range is **29 to 30 P.S.I.**

7 ●



With 20" HG vacuum fuel pressure range is **26 to 28 P.S.I.**

8 ● Turn Fuel Pump Off

Fuel Pressure Must **Decrease** As Vacuum **Increases.** If results are unsatisfactory, replace pressure regulator

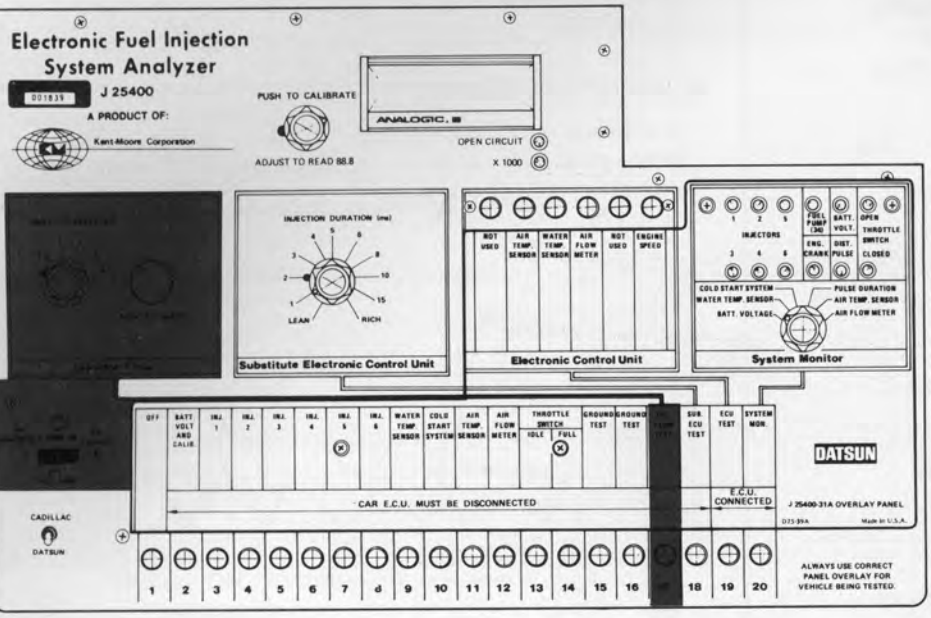
9 ● Disconnect variable vacuum source and connect fuel pressure regulator vacuum hose to intake manifold

10 ● Reconnect any wires which you disconnected

CONT'D

Injector Flow Test 17

OBJECTIVE:
Check injector fuel flow by activating each injector an equal number of times and then comparing injector to injector pressure drops.



NORMAL RESULTS:

- Ignition key "ON"

Ignition key ON supplies power to Analyzer shown by BATT. VOLT. light ON.

Fuel pump lights ON when pump switch is ON and pressure rises to **36 to 37 P.S.I.** in about one to four seconds. (Fuel pump light not operative on 1978-79 models).

1978 AND LATER MODELS:

A. Disconnect starter "S" terminal
B. Turn ignition key to "Start", hold for 5 seconds.

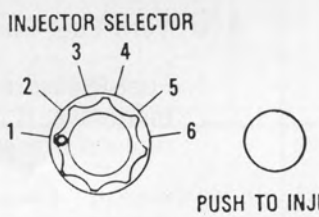
4 ● Release fuel pump switch or ignition switch to OFF position (spring loaded)

5 ● Read and record pressure

Wait for pressure to stabilize

Pressure should stabilize at about **33 to 37 P.S.I.**

6 ● Turn INJECTOR SELECTOR to NO. 1

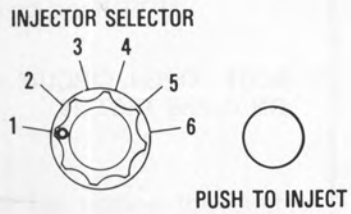


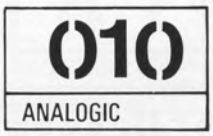
7 ● Push CALIBRATE BUTTON to zero digital meter

Meter at 000 so injector pulses may be counted.

Injector Flow Test continued

8 ● Depress PUSH TO INJECT button one time (Analyzer is conveniently programmed to operate injector 10 times each time INJECT button is pushed)





NORMAL RESULTS:

Digital meter should **read 010.**

9 ● Push INJECT BUTTON nineteen (19) additional times, *pausing* between each push

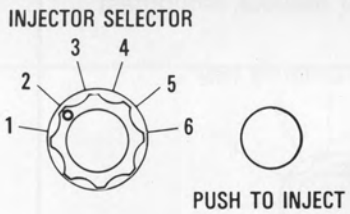
With a total of **20** pushes on INJECT Button, meter should **read 200.**

10 ● Read pressure and **record**

PSI Pressure drop is difference between this reading and initial pressure.

EXAMPLE:	33 PSI	(initial)
	—28 PSI	
Pressure Drop	5 PSI	

● Repeat above test procedure (Steps 3-10) for each of the remaining 5 injectors. Turn injector selector knob to select each injector to be tested



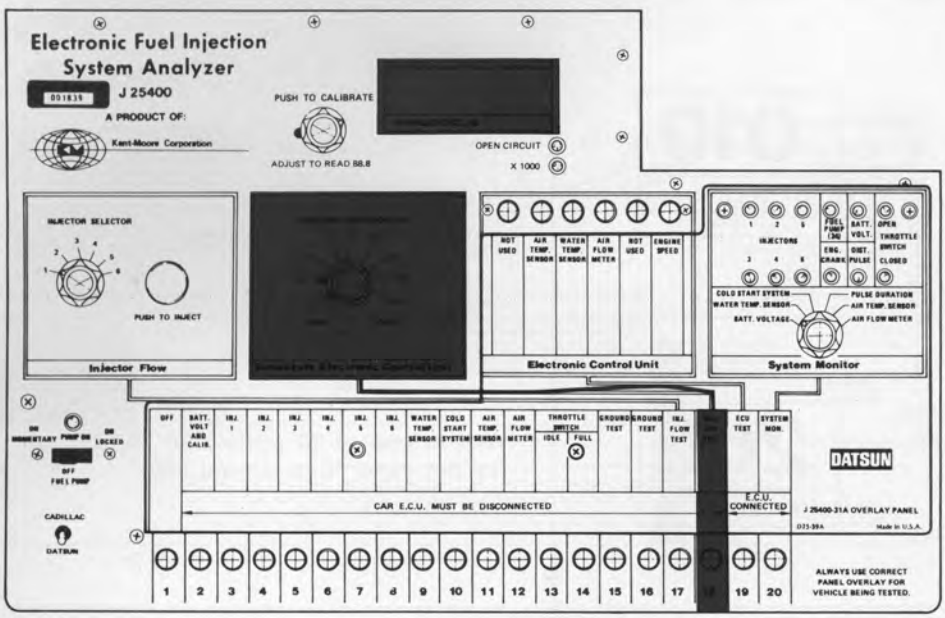
● Compare pressure drops of all 6 injectors

All Pressure Drops should be within **2 P.S.I.**

If the pressure drop with any injector varies more than 2 P.S.I., that injector or its harness is at fault.

Substitute Electronic Control Unit Test 18

OBJECTIVE:
Analyzer replaces car's ECU allowing temporary engine operation. The engine is operated using only the fuel pump, injectors, and distributor pulse of the car's EFI system.

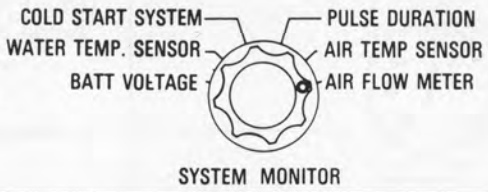


NORMAL RESULTS:

NOTE: OPEN CIRCUIT light remains ON during TEST 18.

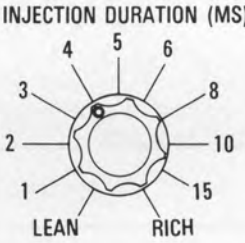
A setting of 4-6 ms is usually sufficient to start engine. It may be necessary to go outside these limits on some vehicles.

- Ignition key "ON"
- Turn SYSTEM MONITOR knob to AIR FLOW METER

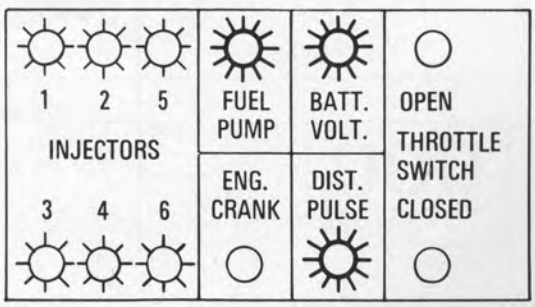


- Turn ignition key and START engine

- Turn INJECTION DURATION (ms) knob to obtain leanest, smoothest engine idle



- With engine running, observe:
- NOTE: Fuel pump light not operative when testing 1978 and 1979 models.



BATT. VOLT., FUEL PUMP & DIST. PULSE lights ON* – INJECTOR lights – BLINKING.

NOTE: On 1975-1977 vehicles, if engine starts, then stalls when ignition key is returned to the "ON" position, check Air Flow Meter Fuel Pump Contact Circuit *Electronic Fuel Injection page 78.* If engine will not run at all, the fault lies in an area other than the EFI system (e.g. Ignition System).

Substitute Electronic Control Unit Test continued

TEST PROCEDURE:

- Read VOLTAGE
  Open throttle to 2000 and 4000 RPM and read voltage at each RPM

IDLE RPM — 4.1 ANALOGIC

2000 RPM — 4.7 ANALOGIC

4000 RPM — 5.3 ANALOGIC

NOTE:

1. Warm up engine thoroughly.
2. Air flow through auxiliary air regulator must be restricted to obtain idle speed.
3. A small adjustment of the Injection Duration knob to a "richer" condition may be required to obtain 2000 and 4000 rpm.

NORMAL RESULTS:
Digital reading should be about:

	280-Z	810
IDLE RPM	3.6 to 4.4	3.6 to 4.6
2000 RPM	4.2 to 5.0	4.2 to 5.2
4000 RPM	4.6 to 5.6	4.6 to 5.8

Voltage reading will increase at each increase in RPM if AIR FLOW METER flap and potentiometer are operating properly. Reading should return to initial value when throttle is released.

NOTE: Some models may give slightly higher readings.

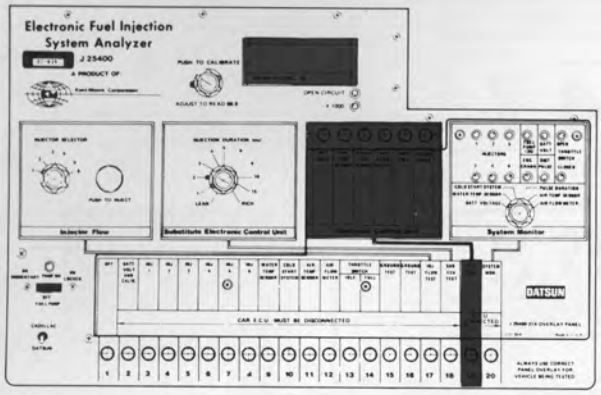
- Turn ignition key OFF

All lights OFF. Power to Analyzer OFF.

If test result is unsatisfactory, check:
Smoothness of movement of air flow meter flap
Air Flow Meter Resistance =1, =2, and =3 Circuits
Electronic Fuel Injection pages 74–76.

Electronic Control Unit Test 19

OBJECTIVE:
Check to see if Electronic Control Unit (ECU) is operating properly. The Analyzer is programmed to send substitute signals to the ECU which in turn should change the PULSE DURATION readings displayed on the digital meter.

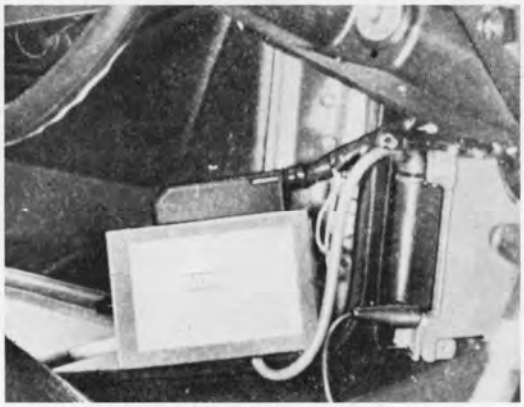


NORMAL RESULTS:

Turns power to Analyzer OFF.

- Connect analyzer extender harness to vehicle—ECU

NOTE: When testing 1979 and later models, be sure that adapter harness J-25400-36 is inserted between ECU and Extender Harness. Failure to do so can result in serious damage to vehicle and analyzer.



Never use the adapter harness when testing 1975–78 models.

Connects Analyzer in series with ECU and car harness so that substitute signals can be sent to the ECU.

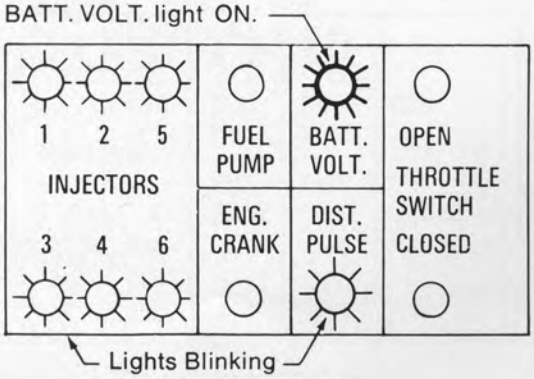
- Turn ignition key ON (Do not start engine)

WARNING:
Do not turn Fuel Pump ON during this test. If Fuel Pump lights are ON, turn ignition switch OFF immediately. (If Fuel Pump is ON excessive fuel will be injected into the cylinders.)

Ignition key ON supplies power to Analyzer shown by BATT. VOLT. light ON.

NOTE: Open Circuit light remains ON during TEST 19.

- Observe lights



INJECTOR and DIST. PULSE lights on (blinking)

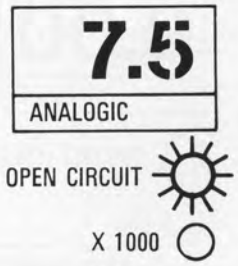
continued on next page

Electronic Control Unit Test continued

TEST PROCEDURE:

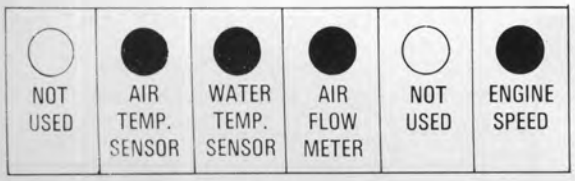
NORMAL RESULTS:

- Allow time for meter to stabilize



Digital Reading shows Pulse Duration in milliseconds (ms): Reading should be **5.0 to 10.0.**

This is the "Base" Reading.

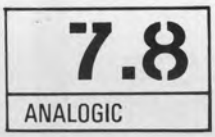


Electronic Control Unit substitute sensor buttons must be held in long enough to allow Digital Reading to stabilize.

- Hold AIR TEMP. SENSOR button in and read meter

N.A. 1980 Col 280 & 510

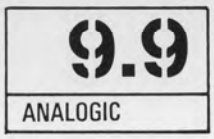
Release button



Digital Reading shows *increase* in PULSE DURATION while button is held in: Reading should be **6.0 to 10.5 ms.** (Usually = base reading plus approx. .4; 1979 models may increase somewhat more.)

- Hold WATER TEMP. SENSOR button in and read meter

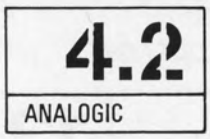
Release button



Digital Reading shows *increase* in PULSE DURATION while button is held in: Reading should be **7.5 to 10.5 ms.** (Usually = base reading plus approx. 2.4; 1979 models may increase somewhat more.)

- Hold AIR FLOW METER button in and read meter

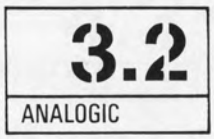
Release button



Digital Reading shows *decrease* in PULSE DURATION while button is held in: Reading should be **3.3 to 4.8 ms.**

- Hold ENGINE SPEED button in and read meter

Release button

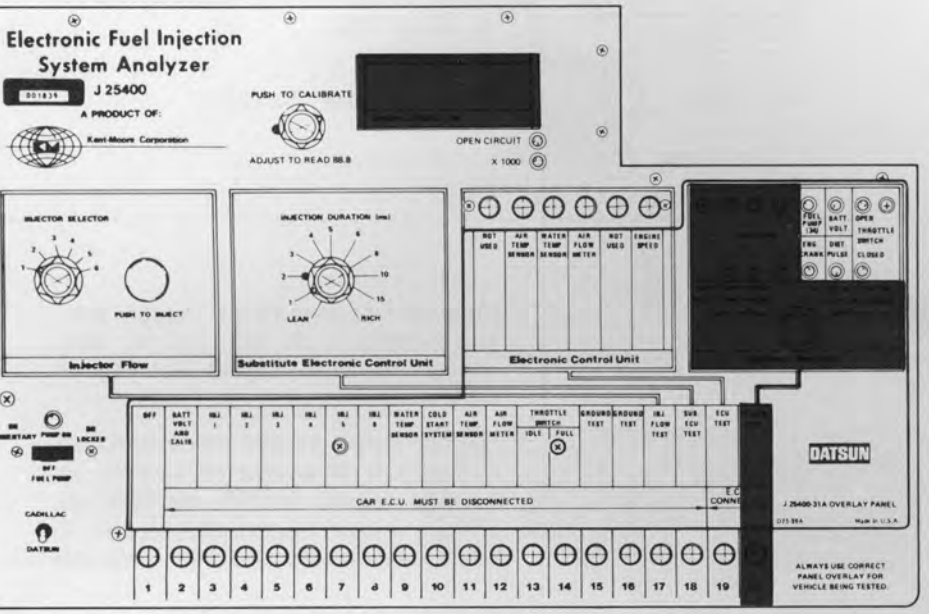


Digital Reading shows *decrease* in PULSE DURATION while button is held in: Reading should be **2.4 to 3.8 ms.**

If tests results are unsatisfactory, install new ECU and retest:
If results using new ECU are satisfactory, ECU was at fault.

System Monitor Test 20

OBJECTIVE:
This test permits normal operation of the car with the Analyzer used as a voltage monitor for battery voltage, water temp. sensor, cold start system, air temp. sensor and air flow meter. It will also monitor pulse duration (ms) of the injectors **AND CAN BE USED DURING ROAD TESTS TO IDENTIFY INTERMITTENT FAULTS AS THEY OCCUR.** If values do not fall in ranges indicated, recheck sub-system affected.



NORMAL RESULTS:

NOTE: Open Circuit light remains ON during TEST 20.

Ignition key ON supplies power to Analyzer shown by BATT. VOLT. light ON.

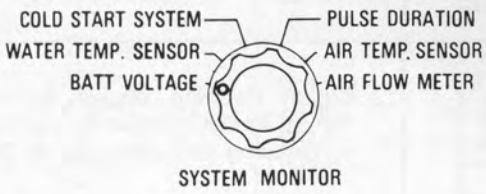
- Ignition key "ON" and engine running

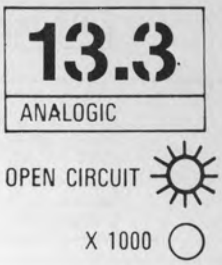
BATT. VOLT., Fuel Pump Switch,* and Dist. Pulse lights ON.

INJECTOR lights blinking.

* Fuel Pump Switch light inoperative on 1978 and later models.

- Turn System Monitor switch to BATT. VOLTAGE

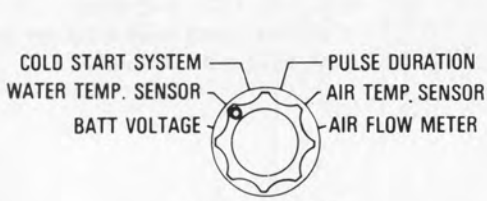




Digital Reading should be **12 to 15 volts.** If outside these limits, check charging system.

OPEN CIRCUIT light ON and remains ON during TEST 20.

- Turn System Monitor switch to WATER TEMP SENSOR



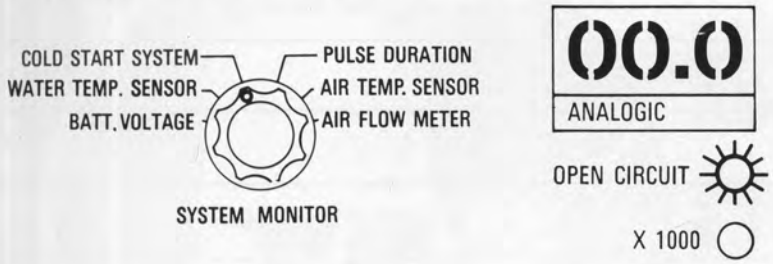
Digital Reading should be **1.0 to 7.0 volts.** (May vary with engine speed and load, but 280 usually = 1.9–2.1 v. at normal operating temperature.)

continued next page

System Monitor Test continued

NORMAL RESULTS:

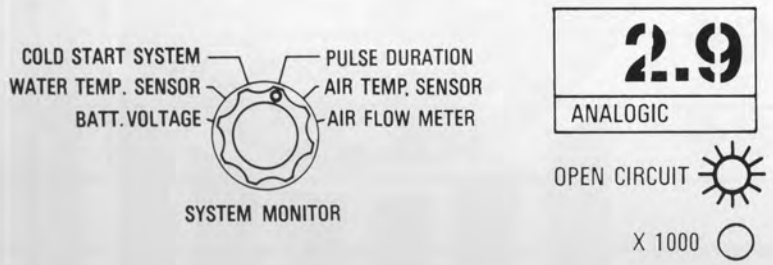
- Turn System Monitor switch to COLD START SYSTEM



Digital Reading should be **00.0 to 01.0.**

N.A. 2005Y

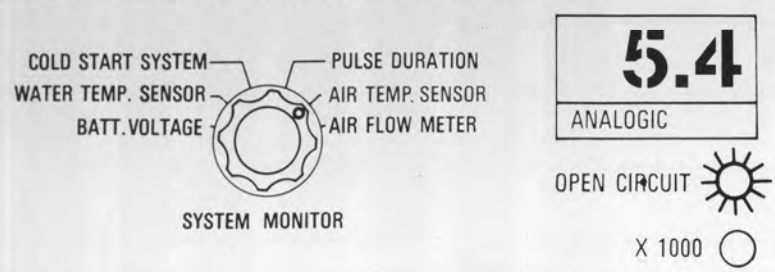
- Turn System Monitor switch to PULSE DURATION



Digital Reading should be **2.0 to 3.8 ms** at idle. (Pulse duration will vary with engine load and speed.)

NOTE:
Normal 280Z no-load idle pulse duration at normal operating temp. = 2.6 - 2.9. 810 pulse duration under same conditions is 2.4 - 2.6.

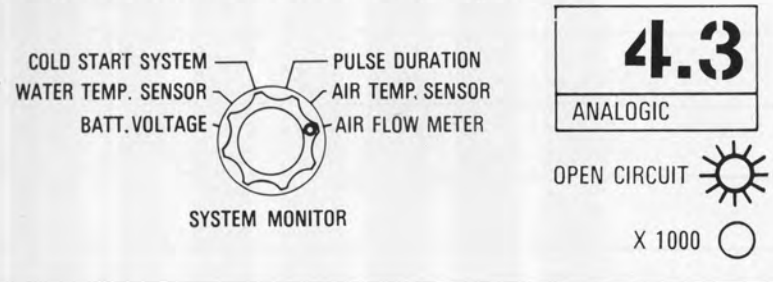
- Turn System Monitor switch to AIR TEMP. SENSOR



Digital Reading should be **2.0 to 7.0 volts.** (May vary with vehicle speed.)

N.A. 1980 Cal
810 & Z

- Turn System Monitor switch to AIR FLOW METER



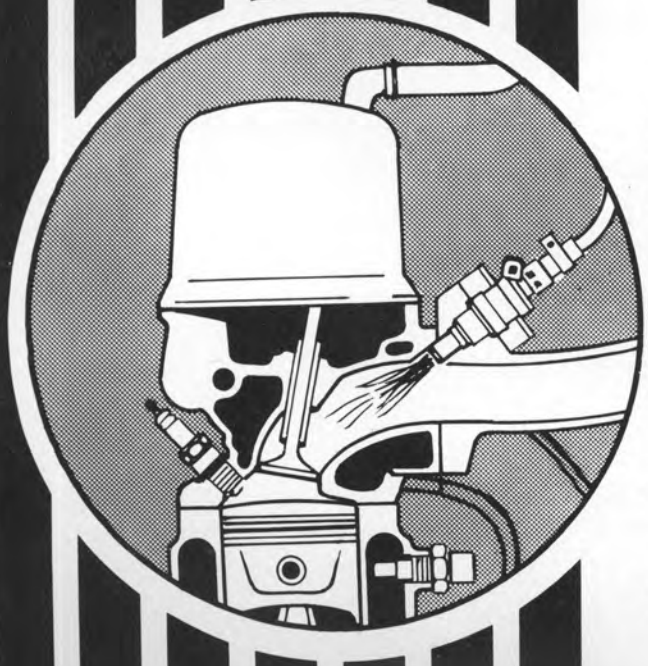
Digital Reading should be **2.0 to 6.8 volts** at idle. (Will increase as engine speed and/or load increases.)

Test Termination

- **Ignition Key Off**

- Disconnect J-25400-32 Analyzer extender harness from ECU and car harness. Connect car harness to ECU.
- Make sure fuel lines are reconnected and do not leak.
- Make sure fuel pressure regulator vacuum hose is reconnected.

NOTES

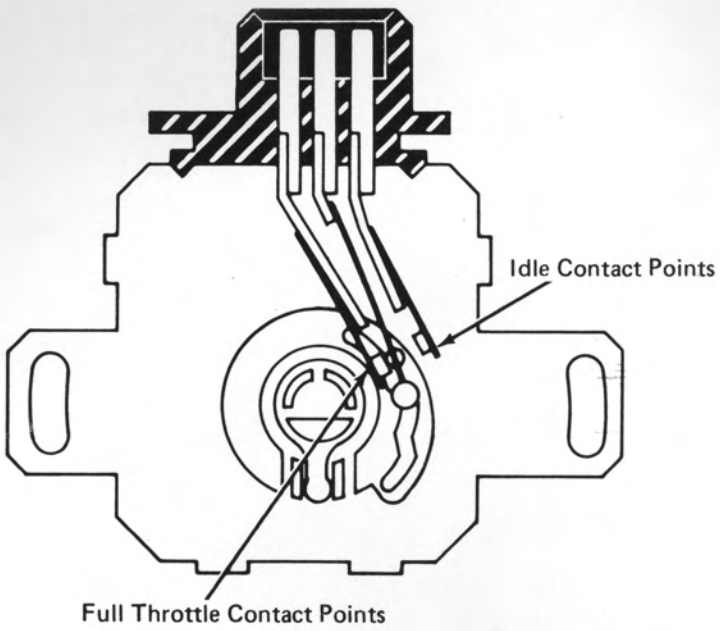


EFI AND RELATED ADJUSTMENTS

- →Throttle switch
- →Idle mixture
- →Dashpot
- →BCDD

DATSUN

A. Throttle Switch



Improper throttle switch adjustment causes or aggravates rough idle, poor idle-to-cruise transition, stumble or sluggish acceleration, poor fuel economy, surging, bucking on deceleration, and foul odors from cars equipped with catalytic converters.

Since throttle switch operation affects nearly all areas of engine performance, adjustment should be carefully performed at the Pre-Delivery Inspection, whenever the throttle switch or throttle chamber is replaced, and whenever any of the above symptoms occur. In addition to the basic adjustment of the throttle switch, the operation of the full throttle contacts should be checked.

Throttle Switch Adjustment

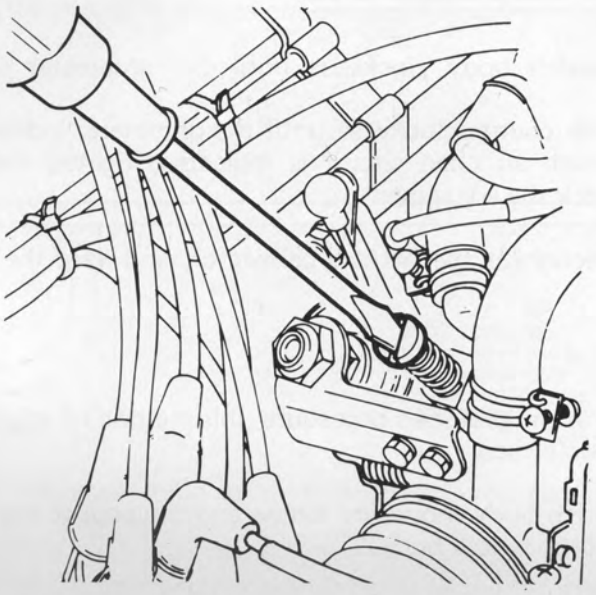
Ohm Meter Method

1. Verify that ignition system is functioning properly.

2. Verify that valve adjustment (cold) is correct and that no air leaks exist.

3. Verify that fuel pressure is correct.

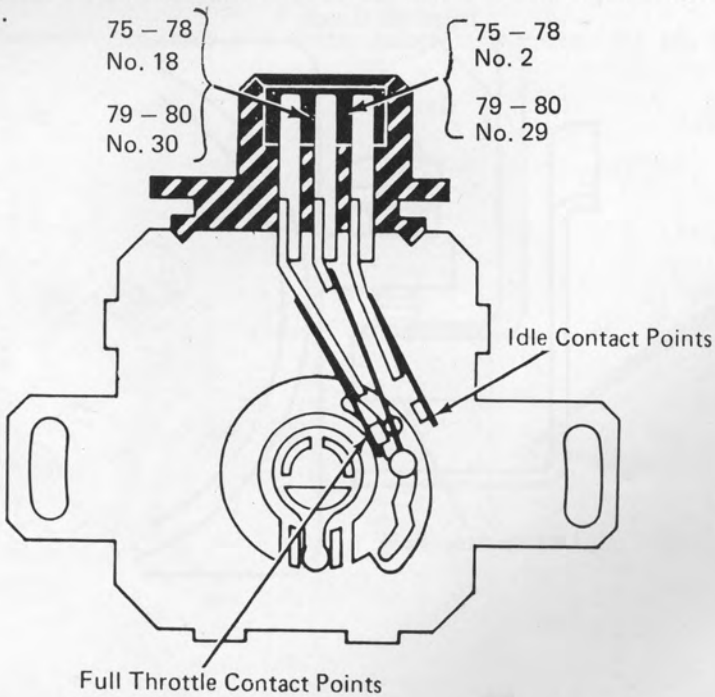
4. With the engine at normal operating temperature, use the Idle Speed Screw to set the idle speed to specifications.



5. Disconnect the throttle switch harness connector from the throttle switch body.

6. Loosen the throttle switch body mounting screws.

7. Connect an ohmmeter to the right and middle terminals of the throttle switch body (terminals number 2 and 18).



8. Raise the engine speed to 1400 rpm (900 rpm for 1979 Federal 810), by manually opening the throttle. NOTE: Do not use the idle speed screw. **Also, do not, under any circumstances, disturb the setting of the linkage stopper screw.**

9. Rotate the throttle switch body clockwise until the ohmmeter shows a closed circuit.

10. Slowly rotate the switch counterclockwise until the ohmmeter indicates an open circuit. At the exact point at which an open circuit is indicated, tighten the throttle switch body mounting screws. Recheck the adjustment.

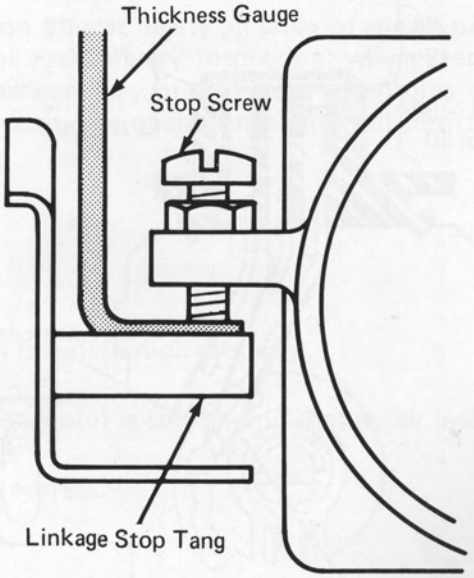
11. Release the throttle, reconnect the harness connector, and reset the idle speed if necessary.

Feeler Gauge Method

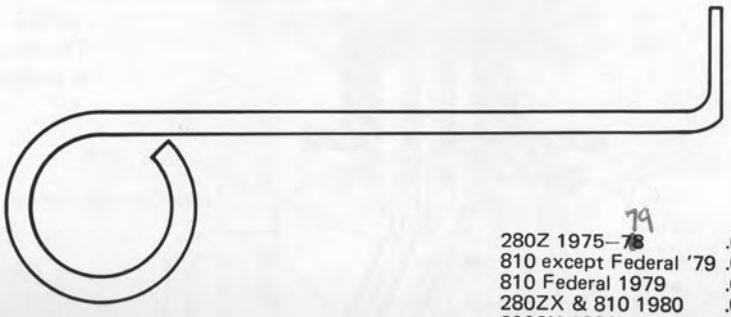
Although not as accurate as the preferred procedure, this method of adjusting the throttle switch is acceptable if carefully performed.

1. Loosen the throttle switch body mounting screws and disconnect the throttle switch harness connector from the throttle switch body.

2. Manually open the throttle linkage and place a feeler gauge of the appropriate thickness between the linkage stop tang and the red stopper screw.



Due to the air flow meter design and limited working space on early models, you will have to make a feeler gauge of the proper thickness out of a coat hanger or welding rod.



280Z 1975–79	.051 (1.3mm)	1400 rpm
810 except Federal '79	.047 (1.2mm)	1400 rpm
810 Federal 1979	.020 (.5mm)	900 rpm
280ZX & 810 1980	.020 (.5mm)	900 rpm
200SX 1980	.012 (.3mm)	800 rpm

On later models with the newer type of air flow meter, you can use a standard flat blade feeler gauge.

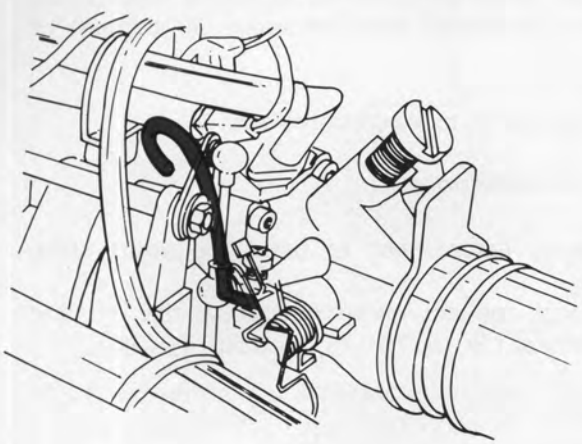
3. Connect an ohmmeter to the right and middle terminals of the throttle switch body (terminals 2 and 18).

4. Rotate the throttle switch body clockwise until the ohmmeter shows a closed circuit.

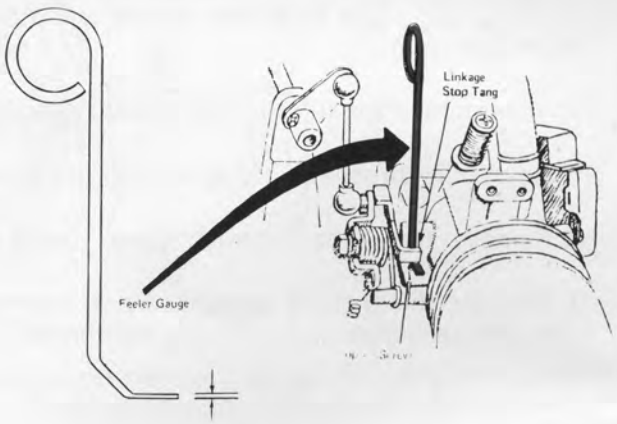
5. Slowly rotate the switch counterclockwise until the ohmmeter indicates an open circuit. At the exact point at which the ohmmeter indicates an open circuit, tighten the throttle switch body mounting screws. Recheck the adjustment.

6. Disconnect the ohmmeter, remove the feeler gauge and reconnect the harness connector.

Early

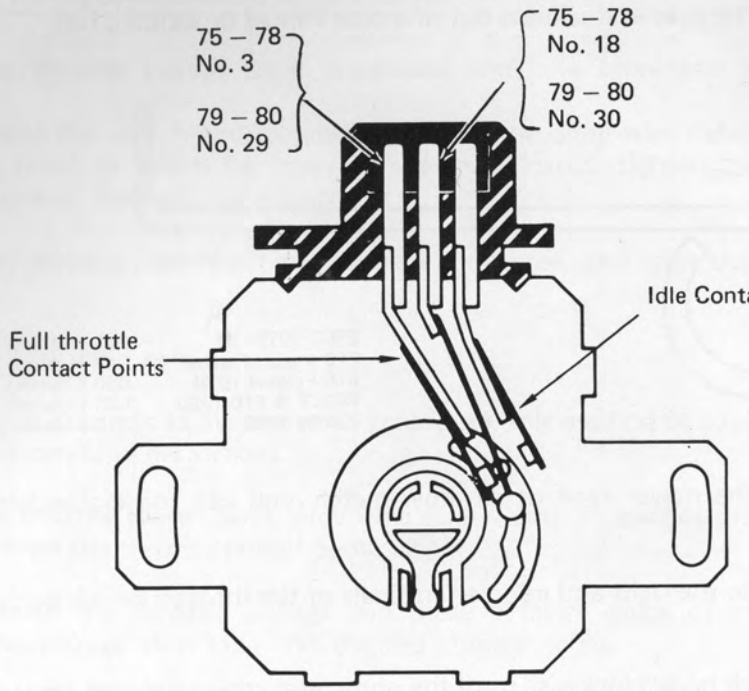


Later



CONTINUED

Checking The Operation Of The Full Throttle Contacts



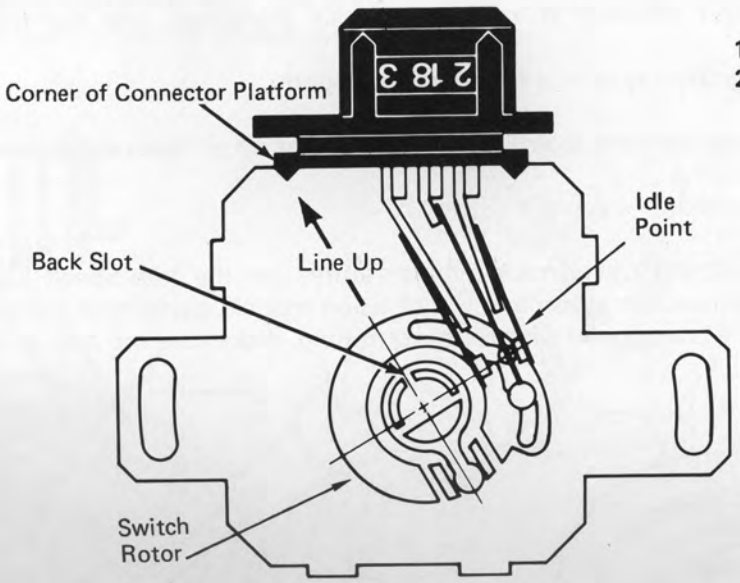
1979.5 – Later
Throttle valve switch cover is sealed

The full throttle contacts must enrich the mixture smoothly and quickly as the throttle is applied. If the full throttle points close too soon, the engine will run constantly rich, emissions will be high, and fuel economy will be poor. If the points close too late or not at all, there will be a lag in acceleration and high speed power will be poor. When the throttle switch is functioning properly, the cycle from idle points open to full points closed requires about 30 degrees of throttle rotation.

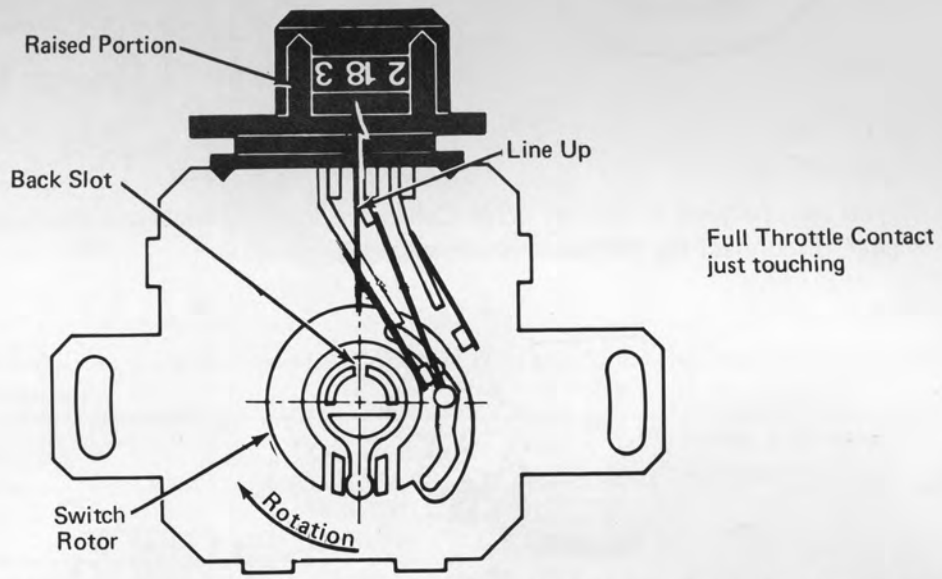
To determine if the full throttle points are operating properly, proceed as follows:

1. Adjust the throttle switch according to the previous instructions.
2. Remove the throttle switch cover, being extremely careful not to bend the point arms.
3. Remove the throttle switch harness connector and connect an ohmmeter to the left and middle terminals of the throttle switch body (terminals 3 & 18, 75–78; 29 & 30, 79–80).

4. Push down on the throttle linkage until the back slot on the switch rotor lines up with the corner of the connector platform. The idle point should be just about to open.



5. Push the throttle down farther until the rotor back slot lines up with the number "8" of the "18" on the connector body. The ohmmeter should now indicate that the full throttle points have closed.



6. If the ohmmeter indicates that the full throttle points have not closed, OR that they closed long before the rotor slot lined up with the corner of connector raised portion, the switch assembly is defective and must be replaced.

NOTE: DO NOT, UNDER ANY CIRCUMSTANCES, BEND EITHER OF THE POINT ARMS.

B. Idle Mixture Adjustment, 1975 to 1979

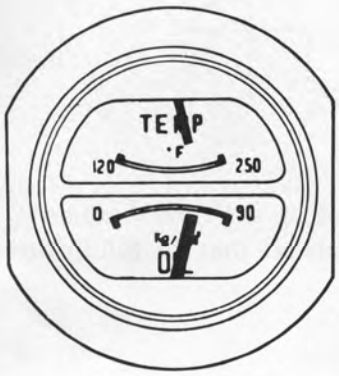
Just as in carbureted engines, idle mixture has a great deal to do with low emissions, smooth idle, and surge-free cruising. Therefore, on 1977 and later models, the idle CO% should be adjusted at PDI and checked at regular intervals thereafter. Use the following procedure:

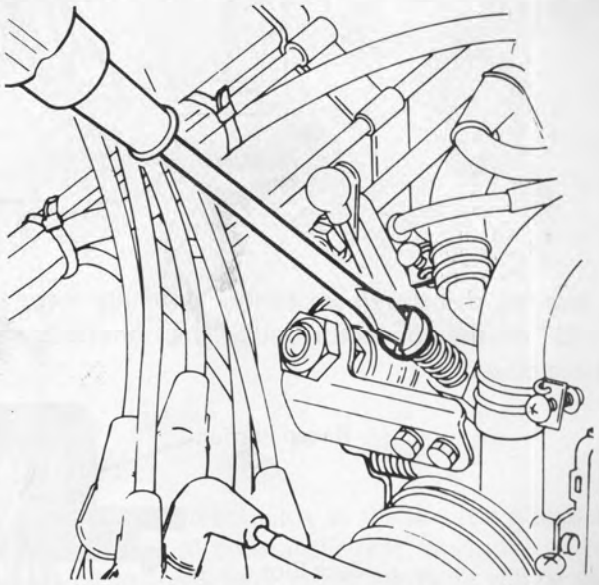
1. Verify that the ignition system is functioning properly.

2. Verify that valve adjustment (cold) is correct and that no air leaks exist.

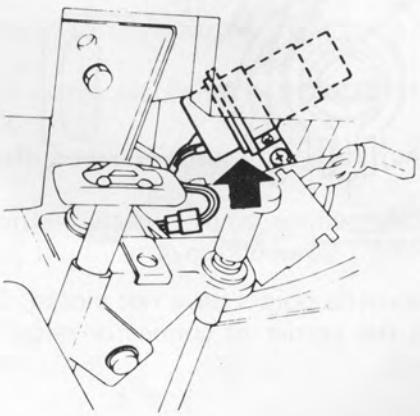
3. Verify that fuel pressure is correct.

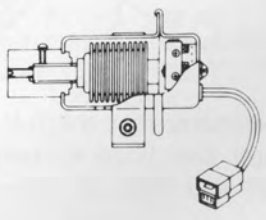
4. With the engine at normal operating temperature, use the Idle Speed Screw to set the idle speed to specifications. On automatic transmission models, perform this adjustment in "drive". Also, if the vehicle is equipped with air conditioning, make sure the A/C is "off".





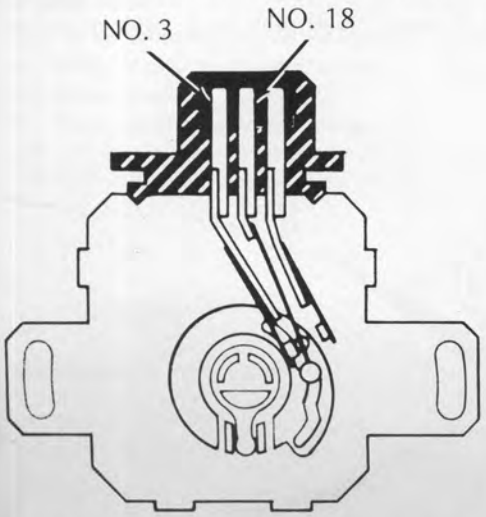
5. If you are checking a 1977 or 1978 California model vehicle and your elevation is 2500 ft. or higher, disconnect the altitude compensator harness plug.

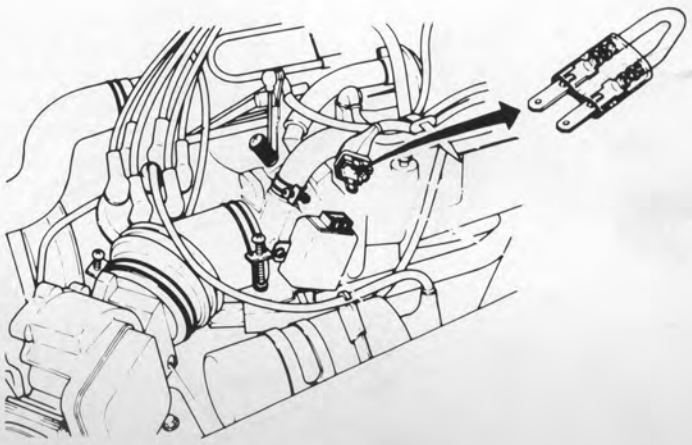




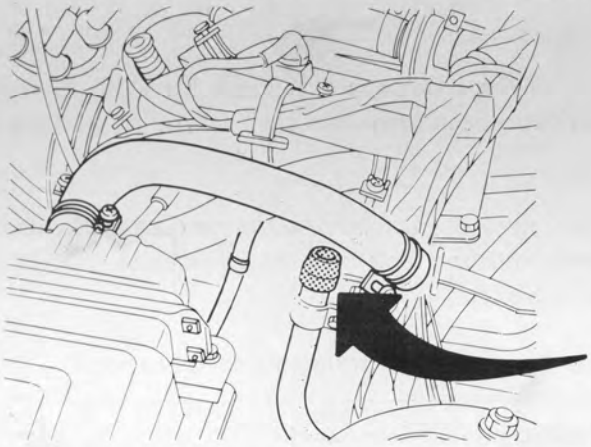
6. Insert the probe of a properly calibrated and fully warmed up infra-red exhaust gas analyzer into the tailpipe.

7. Remove the throttle switch harness connector. Using a short jumper wire or a small paper clip, connect terminals 3 and 18 to each other.





8. On 1979 Federal 810's, disconnect and plug the Exhaust Air Induction System.



EAI pipe plugged

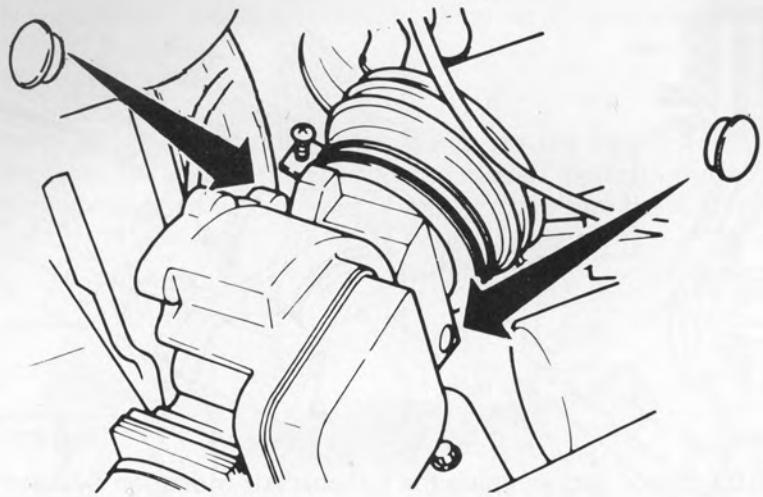
9. After the CO meter stabilizes, note the reading. Compare it to the following chart to determine if it is within specifications.

Altitude	CO% (full enrichment) FED.		1979 Fed. 810 only (EAI Plugged)
	Without Catalizer	With Catalizer	
0 to 600 m (0 to 2,000 ft.)	3.3%	5.1%	6.2%
600 to 1,200 m (2,000 to 4,000 ft.)	4.7%	6.4%	7.6%
1,200 to 1,800 m (4,000 to 6,000 ft.)	5.7%	7.3%	8.6%
Above 1,800 m (6,000 ft.)	6.7%	8.3%	9.5%

Note: On automatic transmission models, be sure the transmission is in "Drive".

10. If the CO% is outside specifications, remove the plastic blind plug from the air flow meter and adjust the idle mixture by turning the idle mixture air bypass screw. Turn clockwise to richen the mixture and counterclockwise to lean the mixture.

    On 1979 models, you can use either or both air bypass screws to obtain the proper mixture.



11. Race the engine to 3000 rpm two or three times, and recheck the CO%. Readjust if necessary. **(Be sure to place the transmission back into "Neutral" if you're working on an automatic transmission model!)**

12. Remove the jumper wire and reconnect the throttle switch harness lead. Also, be sure to reconnect the altitude compensator and/or E.A.I. hose (if applicable). Finally, replace the air flow meter plastic plug with a new one.

13. Check the CO% again. It should correspond to the following specifications:

California Models	.5% or Lower
Federal Models	1.0% or Lower
1979 Federal 810 ONLY	EAI blocked: 2.0% or lower
	EAI NOT blocked: .3% or lower

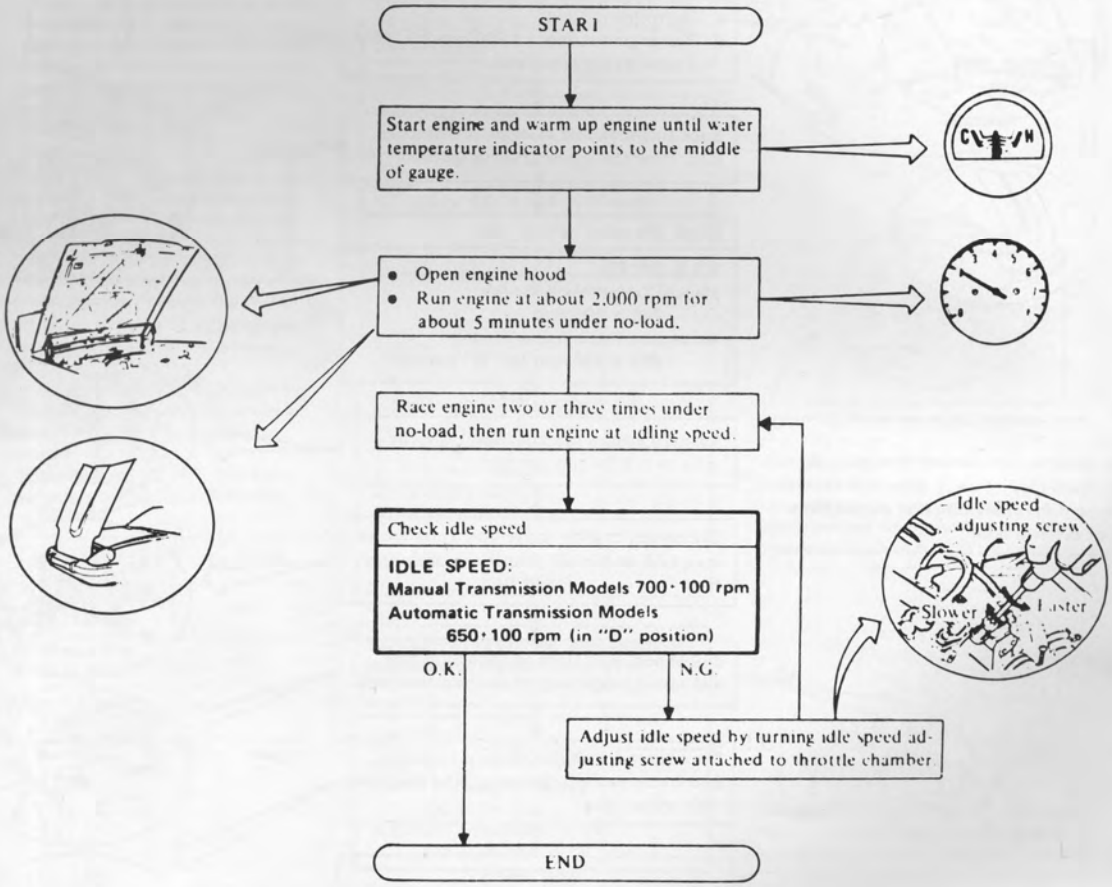
ADJUSTING IDLE RPM – 1980 280ZX, 810 (CALIFORNIA MODELS)

Preparation

1. On air conditioner equipped models, checks should be carried out while the air conditioner is "OFF".
2. On automatic transmission equipped models, checks should be carried out while shift lever is in "D" position.

WARNING:
a. When selector lever is shifted to "D" position, apply parking brake and block both front and rear wheels with chocks.
b. Depress brake pedal while accelerating the engine to prevent forward surge of car.
c. After the adjustment has been made, shift the lever to the "N" or "P" position and remove wheel chocks.

Maintenance procedure



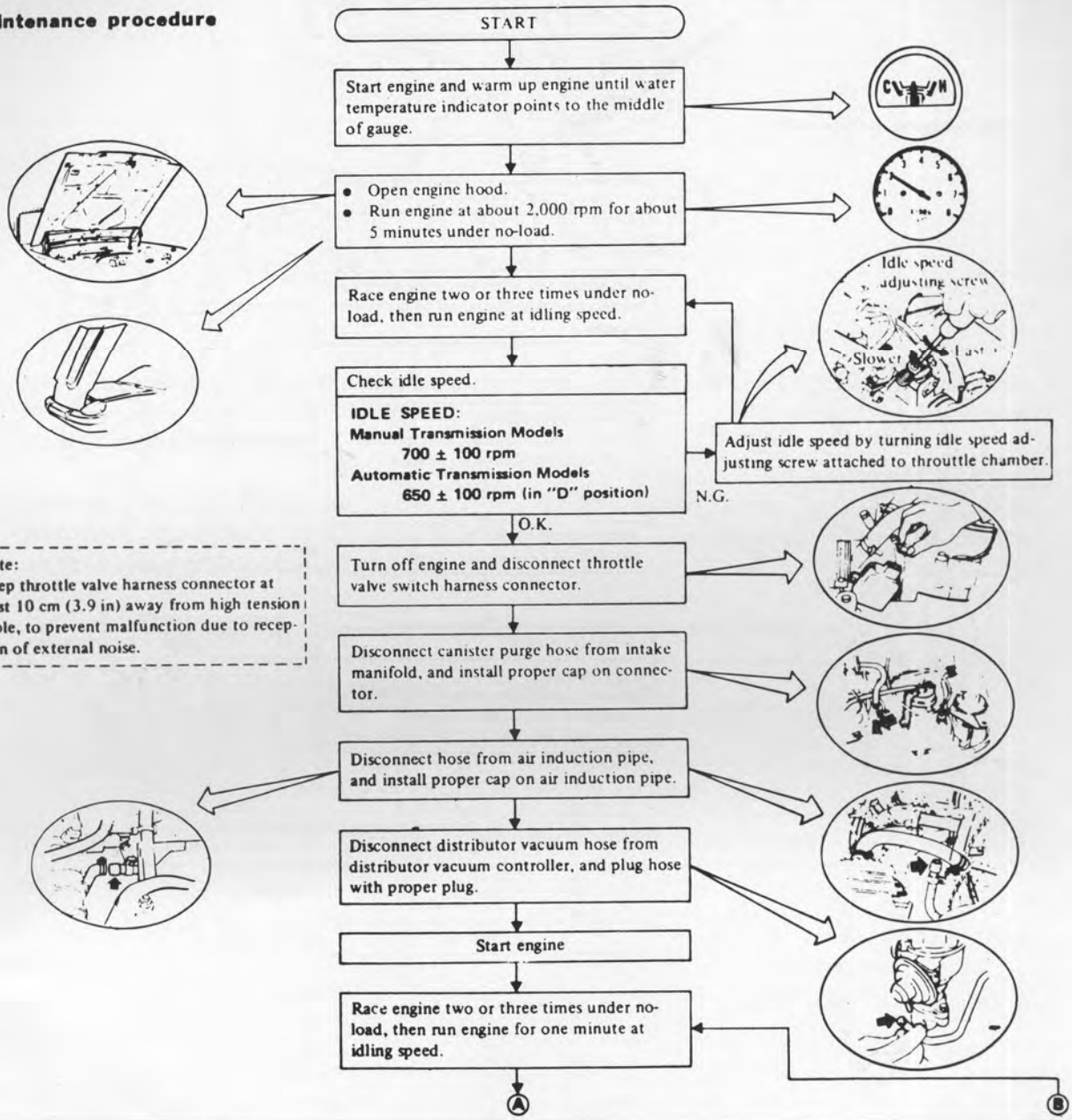
CO% ADJUSTMENT PROCEDURE – 1980 280ZX, 810 (FEDERAL MODELS)

Preparation

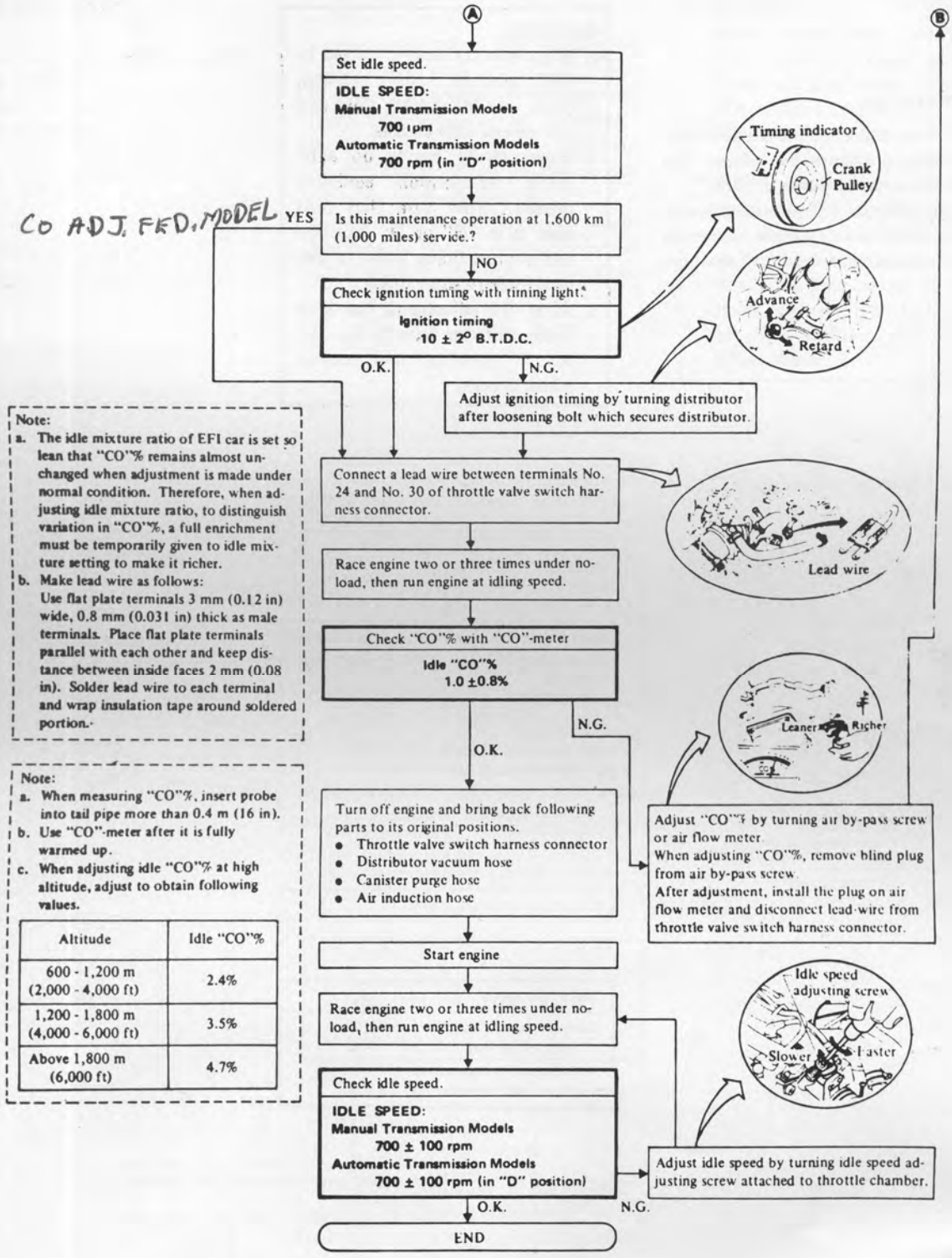
1. When checking idle mixture ratio "CO" %, make sure that the following parts are in good order.
   - Battery
   - Ignition system
   - Engine oil and coolant levels
   - Fuses
   - EFI component parts
   - EFI harness connectors
   - Hoses
   - Oil filler cap and oil level gauge
   - Valve clearance, engine compression
2. On air conditioner equipped models, checks should be carried out while the air conditioner is "OFF".
3. On automatic transmission equipped models, checks should be carried out while shift lever is in "D" position.

WARNING:
a. When selector lever is shifted to "D" position, apply parking brake and block both front and rear wheels with chocks.
b. Depress brake pedal while accelerating the engine to prevent forward surge of car.
c. After the adjustment has been made, shift the lever to the "N" or "P" position and remove wheel chocks.

Maintenance procedure



Note:
Keep throttle valve harness connector at least 10 cm (3.9 in) away from high tension cable, to prevent malfunction due to reception of external noise.


A
B
Set idle speed.
IDLE SPEED:
Manual Transmission Models
700 rpm
Automatic Transmission Models
700 rpm (in "D" position)
CO ADJ. FED. MODEL YES
Is this maintenance operation at 1,600 km (1,000 miles) service.?
NO
Check ignition timing with timing light.
Ignition timing
10 ± 2° B.T.D.C.
O.K.
N.G.
Adjust ignition timing by turning distributor after loosening bolt which secures distributor.
Timing indicator
Crank Pulley
Advance
Retard
Note:
a. The idle mixture ratio of EFI car is set so lean that "CO"% remains almost unchanged when adjustment is made under normal condition. Therefore, when adjusting idle mixture ratio, to distinguish variation in "CO"%, a full enrichment must be temporarily given to idle mixture setting to make it richer.
b. Make lead wire as follows:
Use flat plate terminals 3 mm (0.12 in) wide, 0.8 mm (0.031 in) thick as male terminals. Place flat plate terminals parallel with each other and keep distance between inside faces 2 mm (0.08 in). Solder lead wire to each terminal and wrap insulation tape around soldered portion.
Connect a lead wire between terminals No. 24 and No. 30 of throttle valve switch harness connector.
Lead wire
Race engine two or three times under no-load, then run engine at idling speed.
Check "CO"% with "CO"-meter
Idle "CO"%
1.0 ±0.8%
N.G.
O.K.
Leaner
Richer
Adjust "CO"% by turning air by-pass screw or air flow meter.
When adjusting "CO"%, remove blind plug from air by-pass screw.
After adjustment, install the plug on air flow meter and disconnect lead wire from throttle valve switch harness connector.
Note:
a. When measuring "CO"%, insert probe into tail pipe more than 0.4 m (16 in).
b. Use "CO"-meter after it is fully warmed up.
c. When adjusting idle "CO"% at high altitude, adjust to obtain following values.
Altitude
Idle "CO"%
600 - 1,200 m (2,000 - 4,000 ft)
2.4%
1,200 - 1,800 m (4,000 - 6,000 ft)
3.5%
Above 1,800 m (6,000 ft)
4.7%
Turn off engine and bring back following parts to its original positions.
• Throttle valve switch harness connector
• Distributor vacuum hose
• Canister purge hose
• Air induction hose
Start engine
Race engine two or three times under no-load, then run engine at idling speed.
Idle speed adjusting screw
Slower
Faster
Check idle speed.
IDLE SPEED:
Manual Transmission Models
700 ± 100 rpm
Automatic Transmission Models
700 ± 100 rpm (in "D" position)
Adjust idle speed by turning idle speed adjusting screw attached to throttle chamber.
O.K.
N.G.
END

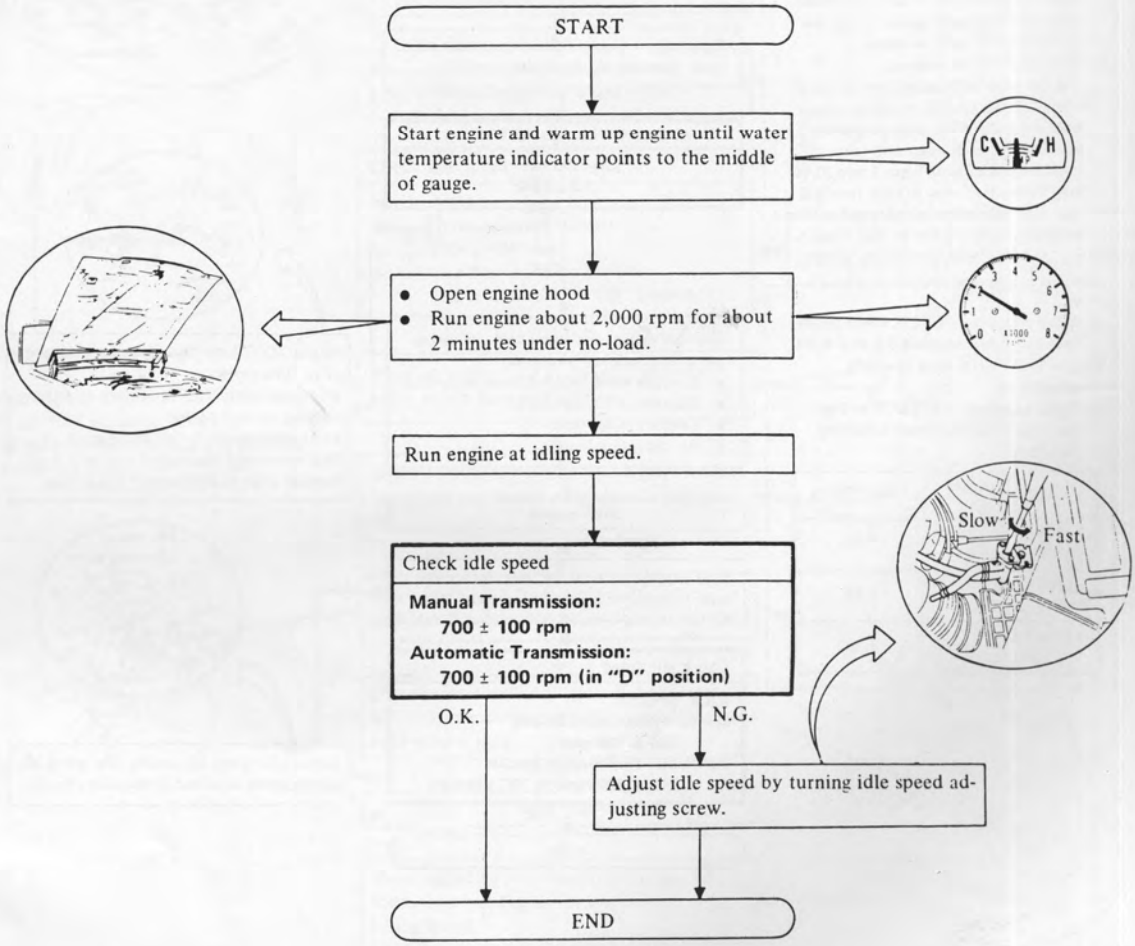
ADJUSTING IDLE RPM – 1980 200SX (CALIFORNIA MODELS)

WARNING:
a. When selector lever is shifted to "D" position, apply aprking brake and block both front and rear wheels with chocks.
b. When racing engine on automatic transmission equipped models, make sure that shift lever is in "N" or "P" position and depress brake pedal to prevent forward surge of car.
c. After the adjustment has been made, shift the lever to the "N" or "P" position and remove wheel chocks.

Preparation

1. On air conditioner equipped models, checks should be carried out while the air conditioner is "OFF".
2. On automatic transmission equipped models, checks should be carried out while shift lever is in "D" position.

Maintenance procedure



CO% ADJUSTMENT PROCEDURE – 1980 200SX (FEDERAL)

Preparation

1. Make sure that the following parts are in good order.
- Battery
- Ignition system
- EFI harness connectors
- Vacuum hoses
- Air intake system (Oil filler cap, oil level gauge etc.)

2. Connect engine tachometer and timing light in their proper positions.

3. On air conditioner equipped models, checks should be carried out while the air conditioner is "OFF".

4. On automatic transmission equipped models, checks should be carried out while shift lever is in "D" position.

WARNING:
a. When selector lever is shifted to "D" position, apply parking brake and block both front and rear wheels with chocks.
b. When racing engine on automatic transmission equipped models, make sure that shift lever is in "N" or "P" position and depress brake pedal to prevent forward surge of car.
c. After the adjustment has been made, shift the lever to the "N" or "P" position and remove wheel chocks.

Maintenance procedure

START

Start engine and warm up engine until water temperature indicator points to the middle of gauge.

- Open engine hood.
- Run engine at about 2,000 rpm for about 2 minutes under no-load.

Run engine at idling speed.

Disconnect hose from air induction pipe, and install proper cap on air induction pipe.

Race engine two or three times under no-load.
Then run engine for one minute at idle speed.

Check idle speed.

Manual Transmission:
700 ± 100 rpm
Automatic Transmission
700 ± 100 rpm (in "D" position)

O.K.

N.G.

Adjust idle speed by turning idle speed adjusting screw.

Is this maintenance operation at 1,600 km (1,000 miles) service or rechecking idle "CO" %?

YES

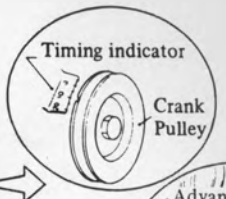
NO

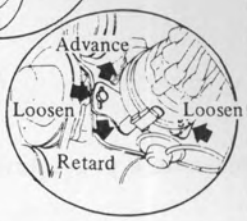
Ⓐ

Ⓑ

Ⓒ Ⓓ

CO ADJ. 1980 200SX FED





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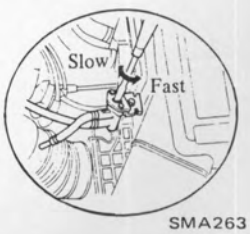


SMA263

Note:
a. When measuring "CO" %, insert probe into tail pipe more than 0.4 m (16 in).
b. Use "CO"-meter after engine is fully warmed up.
c. When adjusting idle "CO" % at high altitude, adjust to obtain following values.

Unit: m (ft)

Altitude	Idle CO%
600 - 1,200 (2,000 - 4,000)	2.7%
1,200 - 1,800 (4,000 - 6,000)	3.8%
Above 1,800 (6,000)	5.0%

Ⓐ Ⓑ Ⓒ Ⓓ

Check ignition timing with timing light.
8 ± 2° B.T.D.C.

O.K.

N.G.

Adjust ignition timing by turning distributor after loosening bolts which secure distributor.

Race engine two or three times under no-load, then run engine at idle speed.

Check "CO"% with "CO"-meter.
1.3 ± 1%

N.G.

Adjust "CO"% by turning air by-pass screw on air flow meter.
When adjusting "CO"%, remove blind plug from air by-pass screw.
After adjustment, install the plug on air flow meter.

O.K.

Turn off engine and connect air induction hose to air induction pipe.

Start engine.

Race engine two or three times under no-load, then run engine at idle speed.

Check idle speed.
Manual Transmission:
700 ± 100 rpm
Automatic Transmission:
700 ± 100 rpm (in "D" position)

O.K.

N.G.

Adjust idle speed by turning idle speed adjusting screw.

END

Inspection Procedure

START

Start engine and warm up engine until water temperature indicator points to the middle of gauge.

- Open engine hood.
- Run engine at about 2,000 rpm for about 5 minutes under no-load.

Race engine two or three times under no-load, then run engine at idle speed.

Check idle speed.

IDLE SPEED:

Manual Transmission Models

700 ± 100 rpm

Automatic Transmission Models

700 ± 100 rpm (in "D" position)

Adjust idle speed by turning idle speed adjusting screw attached to throttle chamber.

O.K.

Check ignition timing with timing light.

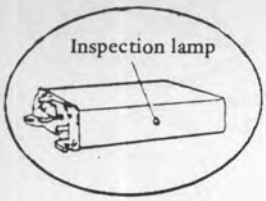
Ignition timing

10 ± 2° B.T.D.C.

O.K. N.G.

Adjust ignition timing by turning distributor after loosening bolt which secures distribution.

Run engine at about 2,000 rpm under no-load.



Make sure that inspection lamp on control unit goes on and off more than 5 times during 10 seconds.

O.K. N.G.

END

Check exhaust gas sensor harness:

1. Turn off engine and disconnect battery ground cable.
2. Disconnect EFI 35-pin connector from control unit.
3. Disconnect exhaust gas sensor harness connector and connect terminal for exhaust gas sensor to ground with a jumper wire.
4. Check for continuity between terminal No. 31 of EFI 35-pin connector and ground metal on car body.

   Continuity exists.....O.K.

   Continuity does not exists.....N.G.

O.K.

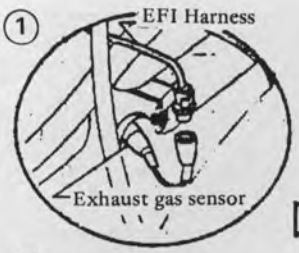
Connect EFI 35-pin connector to control unit and connect battery ground cable

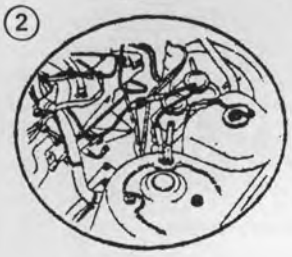
N.G.

Correct or replace EFI harness

(A)

(B)





(A)

Check EFI Control Unit:
1. Start engine and warm up engine until water temperature indicator points to the middle of gauge.
2. Run engine at about 2,000 rpm under no-load.
3. Check inspection lamp on control unit as following conditions.

Harness connector of exhaust gas sensor	Inspection lamp
① Disconnected	Does not glow
② Grounded	Glows

4. Turn off engine.

O.K.

N.G.

Replace control unit.

NOTE:
Keep throttle valve switch harness connector at least 10 cm (3.9 in.) away from high tension cable, to prevent malfunction due to reception of external noise.

Disconnect throttle valve switch harness connector and connect a lead wire between terminals No. 24 and No. 30 of throttle valve switch harness connector.

NOTE:
a. The idle mixture ratio of EFI car is set so lean that "CO%" remains almost unchanged when adjustment is made under normal condition. Therefore, when adjusting idle mixture ratio, to distinguish variation in "CO%", a full enrichment must be temporarily given to idle mixture setting to make it richer.
b. Make lead wire as follows:
Use flat plate terminals 3mm (0.12 in.) with, 0.8mm (0.031 in.) thick as male terminals. Place flat plate terminals parallel with each other and keep distance between inside faces 2mm (0.08 in.). Solder lead wire to each terminal and wrap insulation tape around soldered portion.

Disconnect canister purge hose from intake manifold, and install proper cap on connector.

Start engine and warm up engine until water temperature indicator points to the middle of gauge.

Race engine two or three times under no-load, then run engine at idle speed.

Check "CO%" with "CO" meter

Idle "CO%"
With full enrichment.
With exhaust gas sensor harness disconnected
Less than 5%

NOTE:
a. When measuring "CO%", insert probe into tail pipe more than 0.4m (16in).
b. Use "CO" meter after it is fully warmed up.

O.K.

N.G.

Does engine run smoothly?

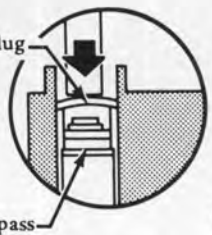
Yes

No

NOTE:
a. The air by-pass screw which has been preset at the factory should be adjusted to lower exhaust emission as directed by official inspections.
The steel plug which seals air by-pass screw should not be removed during routine maintenance.
Adjusting mixture using other than the following method may violate Federal or other State and Provincial laws.

Turn off engine and remove air flow meter from car.

Drill a hole in steel plug which seals air by-pass screw and remove steel plug.

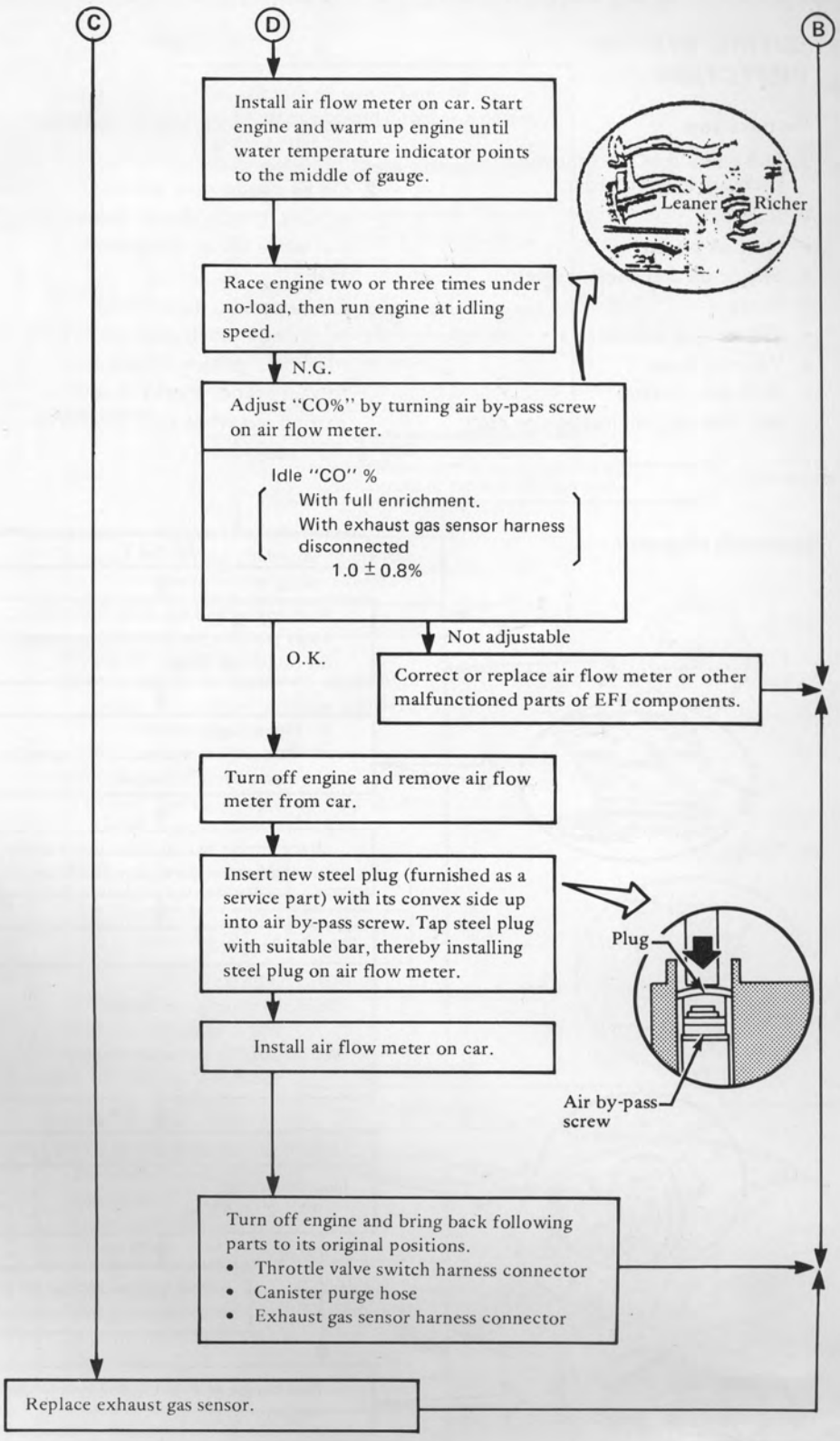


NOTE:
After drilling, be sure to remove shavings and dust.

(C)

(D)

(B)


C
D
B
Install air flow meter on car. Start engine and warm up engine until water temperature indicator points to the middle of gauge.
Leaner
Richer
Race engine two or three times under no-load, then run engine at idling speed.
N.G.
Adjust "CO%" by turning air by-pass screw on air flow meter.
Idle "CO" %
With full enrichment.
With exhaust gas sensor harness disconnected
1.0 ± 0.8%
Not adjustable
O.K.
Correct or replace air flow meter or other malfunctioned parts of EFI components.
Turn off engine and remove air flow meter from car.
Insert new steel plug (furnished as a service part) with its convex side up into air by-pass screw. Tap steel plug with suitable bar, thereby installing steel plug on air flow meter.
Plug
Air by-pass screw
Install air flow meter on car.
Turn off engine and bring back following parts to its original positions.
• Throttle valve switch harness connector
• Canister purge hose
• Exhaust gas sensor harness connector
Replace exhaust gas sensor.

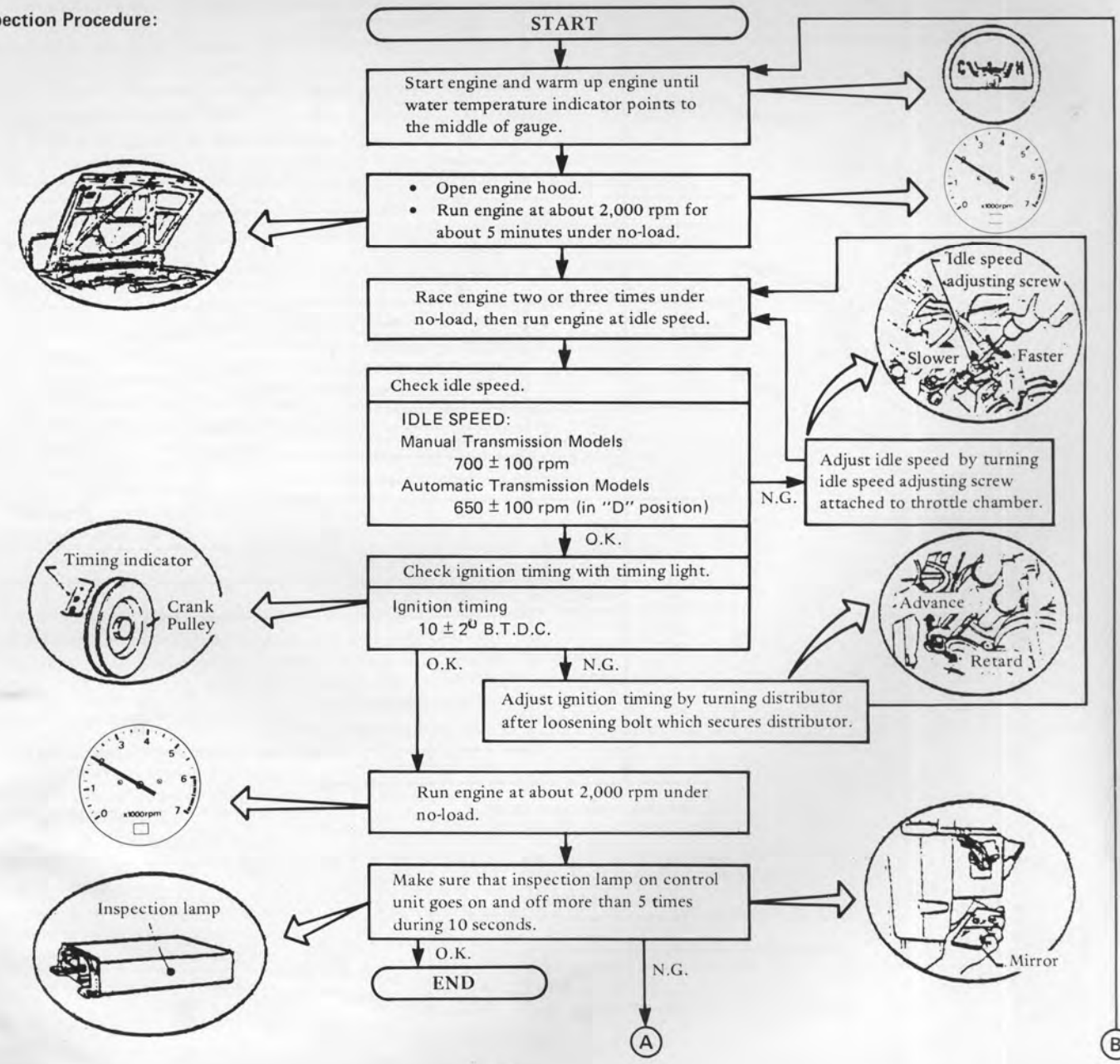
ENTIRE SYSTEM INSPECTION

Preparation

1. Make sure that the following parts are in good order.
- Battery
- Ignition system
- Engine oil and coolant levels
- Fuses
- EFI harness connectors
- Vacuum hoses
- Air intake system (oil filler cap, oil level gauge etc.)
- Valve clearance, engine compression
2. On air conditioner equipped models, checks should be carried out while the air conditioner is "OFF".
3. On automatic transmission equipped models, when checking idle rpm, ignition timing and mixture ratio, checks should be carried out while shift lever is in "D" position.

WARNING:
a; When selector lever is shifted to "D" position, apply parking brake and block both front and rear wheels with chocks.
b. Depress brake pedal while accelerating the engine to prevent forward surge of car.
c. After the adjustment has been make, shift the lever to the "N" or "P" position and remove wheel chocks.

Inspection Procedure:



(A)

Check exhaust gas sensor harness:
1. Turn off engine and disconnect battery ground cable.
2. Disconnect EFI 35-pin connector from control unit.
3. Disconnect exhaust gas sensor harness connector and connect terminal for exhaust gas sensor to ground with a jumper wire.
4. Check for continuity between terminal No. 31 of EFI 35-pin connector and ground metal on car body.
   Continuity exists.....O.K.
   Continuity does not exist.....N.G.

O.K.

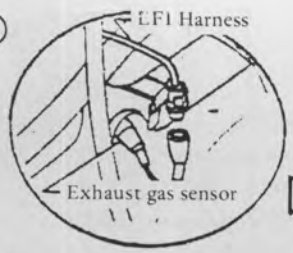
N.G.

Correct or replace EFI harness.

(B)

Connect EFI 35-pin connector to control unit and connect battery ground cable.

(1)

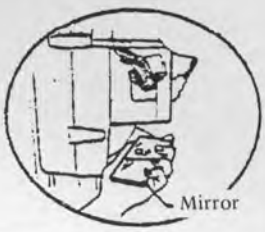


(2)

Check EFI Control Unit:
1. Start engine and warm up engine until water temperature indicator points to the middle of gauge.
2. Run engine at about 2,000 rpm under no-load.
3. Check inspection lamp on control unit as following conditions.

Harness connector of exhaust gas sensor	Inspection lamp
(1) Disconnected	Does not glow
(2) Grounded	Glows

4. Turn off engine.



O.K.

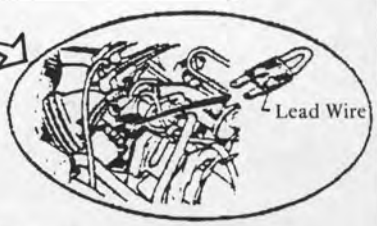
N.G.

Replace control unit.

NOTE:
Keep throttle valve switch harness connector at least 10 cm (3.9 in) away from high tension cable, to prevent malfunction due to reception of external noise.

NOTE:
a. The idle mixture ratio of EFI car is set to lean that "CO"% remains almost unchanged when adjustment is made under normal condition. Therefore, when adjusting idle mixture ratio, to distinguish variation in "CO"%, a full enrichment must be temporarily given to idle mixture setting to make it richer.
b. Make lead wire as follows:
   Use flat plate terminals 3mm (0.12 in.) wide 0.8mm (0.031 in) thick as male terminals. Place flat plate terminals parallel with each other and keep distance between inside faces 2mm (0.08 in). Solder lead wire to each terminal and wrap insulation tape

Disconnect throttle valve switch harness connector and connect a lead wire between terminals No. 24 and No. 30 of throttle valve switch harness connector.



Disconnect canister purge hose from intake manifold, and install proper cap on connector.

Start engine and warm up engine until water temperature indicator points to the middle of gauge.

Race engine two or three times under no-load, then run engine at idle speed.

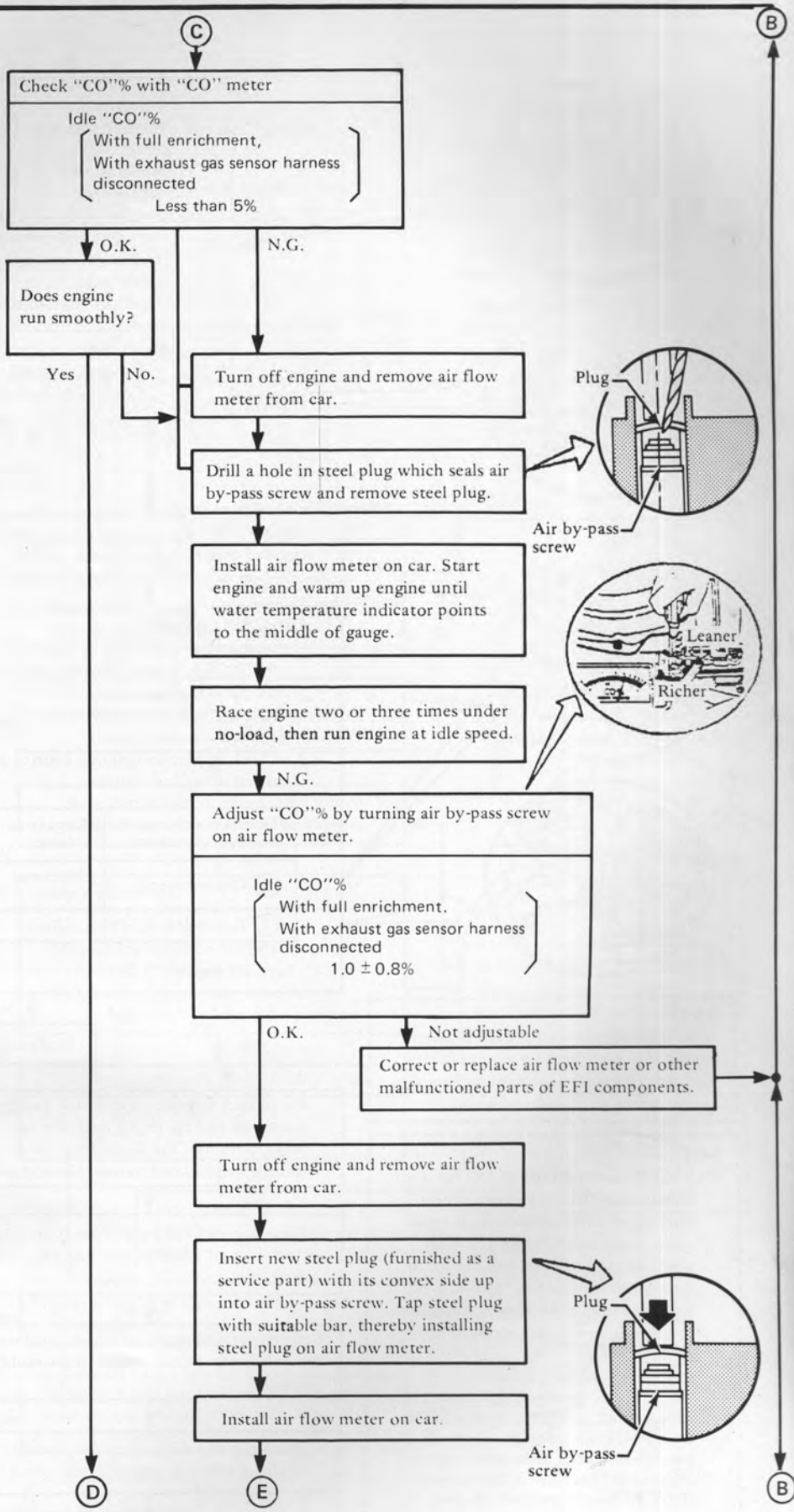
(C)

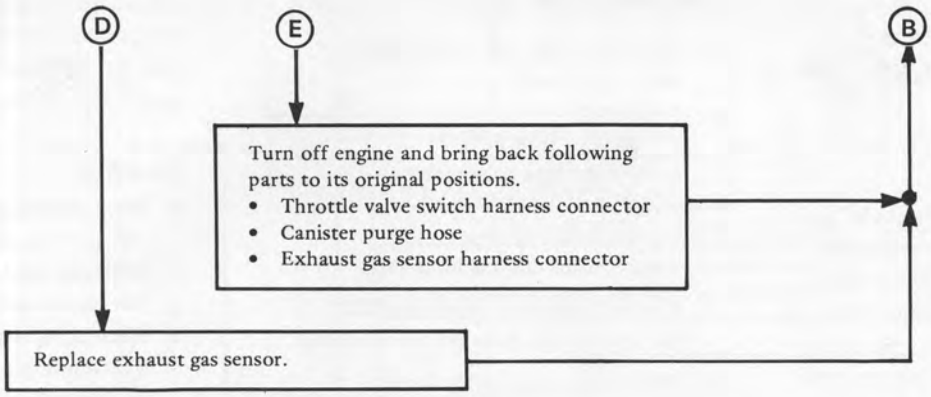
(B)

NOTE:
a. When measuring "CO"%, insert probe into tail pipe more than 0.4m (16 in).
b. Use "CO" meter after it is fully warmed up.

NOTE:
a. The air by-pass screw which has been preset at the factory should be adjusted to lower exhaust emission as directed by official inspections.
The steel plug which seals air by-pass screw should not be removed during routine maintenance.
Adjusting mixture using other than the following method may violate Federal or other State and Provincial laws.

NOTE:
After drilling, be sure to remove shavings and dust.





CATALYTIC CONVERTER SYSTEM

DESCRIPTION

California Models

The three-way catalytic converter utilizes a catalyst to accelerate the recombustion of HC and CO and reduce NOx in the exhaust gas, changing them into harmless CO_2 H_2O and N_2.

To accomplish the oxidization and reduction of such harmful contents, the exhaust gas sensor monitors O_2 level, feeds it back to the E.C.U. and maintains the mixture ratio to the stoichiometric point at all times.

Non-California Models

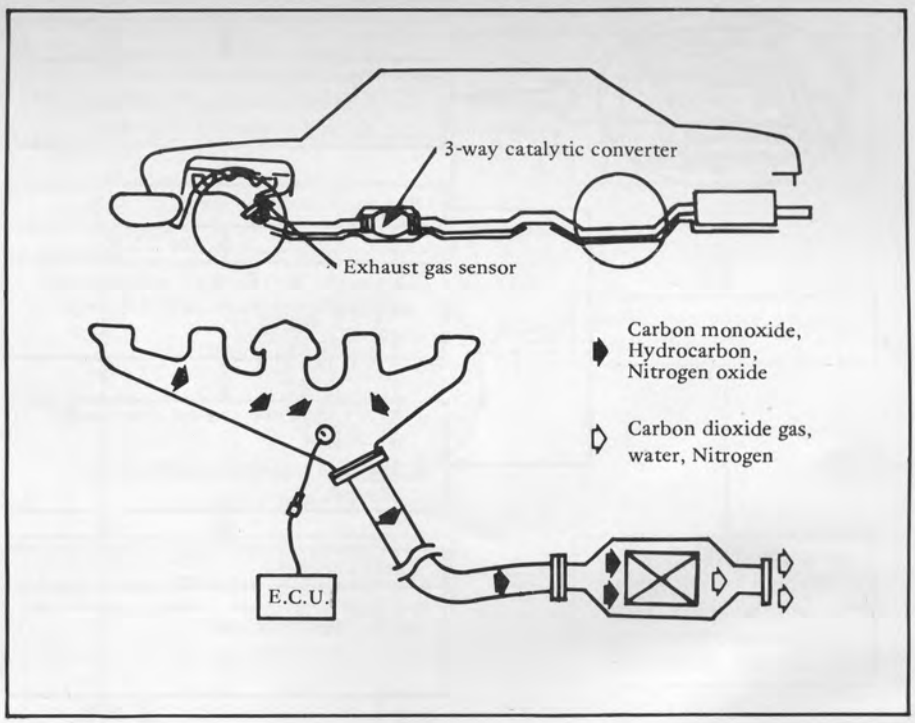
The catalytic converter accelerates the chemical reaction of hydrocarbons (HC) and carbon monoxide (CO) in the exhaust gas, and changes them into harmless carbon dioxide (CO_2) and water (H_2O). This chemical reaction process requires the proper amount of air, which is induced by the air induction valve (Refer to the item "A.I.S."). This air is called "secondary air".

OPERATION

California Models

The exhaust gas from the engine contains unburned, harmful components. The mixture ratio feedback system reduces such harmful components in the exhaust gas. In this system, an exhaust gas sensor monitors the contents of O_2 density to determine the combustion condition and maintains the mixture ratio to the stoichiometric point.

While the mixture ratio is so maintained, the three-way catalytic converter activates to change the harmful components (HC, CO, and NOx) into harmless CO_2, H_2O and N_2. In this way, the catalytic converter cleans the exhaust gas and discharges H_2O, CO_2 and N_2 into the atmosphere.



CHECKING AND ADJUSTING IDLE RPM, IGNITION TIMING AND MIXTURE RATIO

PRECAUTION

a. To discourage tampering with the idle mixture adjusting screw on California models, it is sealed with steel blind plug after adjustment of idle mixture at factory. So the blind plug should not be removed during routine maintenance except that case as directed by official inspections to lower exhaust emission.

b. Adjusting mixture using other than the method below may violate Federal and/or California or other State and Provincial laws.

PREPARATION

1. Make sure that the following parts are in good order.
   - Battery
   - Ignition system
   - EFI harness connectors
   - Vacuum hoses
   - Air intake system
     (Oil filler cap, oil level gauge etc.)
2. Connect engine tachometer and timing light in their proper positions.
3. When measuring CO%, insert probe into tail pipe more than 0.4m (16 in.).
4. Use "CO" meter after it is fully warmed up.
5. On air conditioner equipped models, checks should be carried out while the air conditioner is "OFF".
6. On automatic transmission equipped models, checks should be carried out while shift lever is in "D" position.

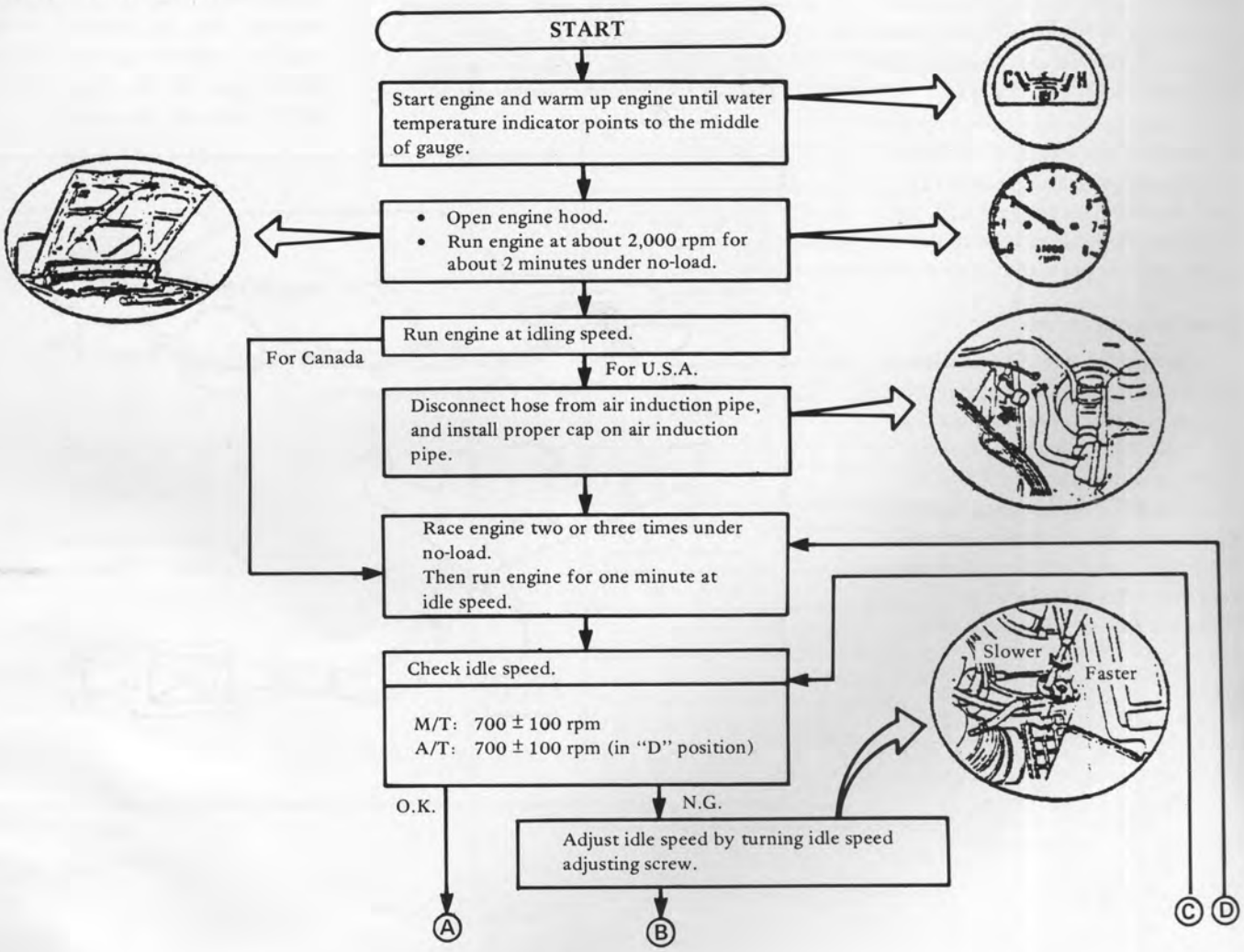
WARNING:

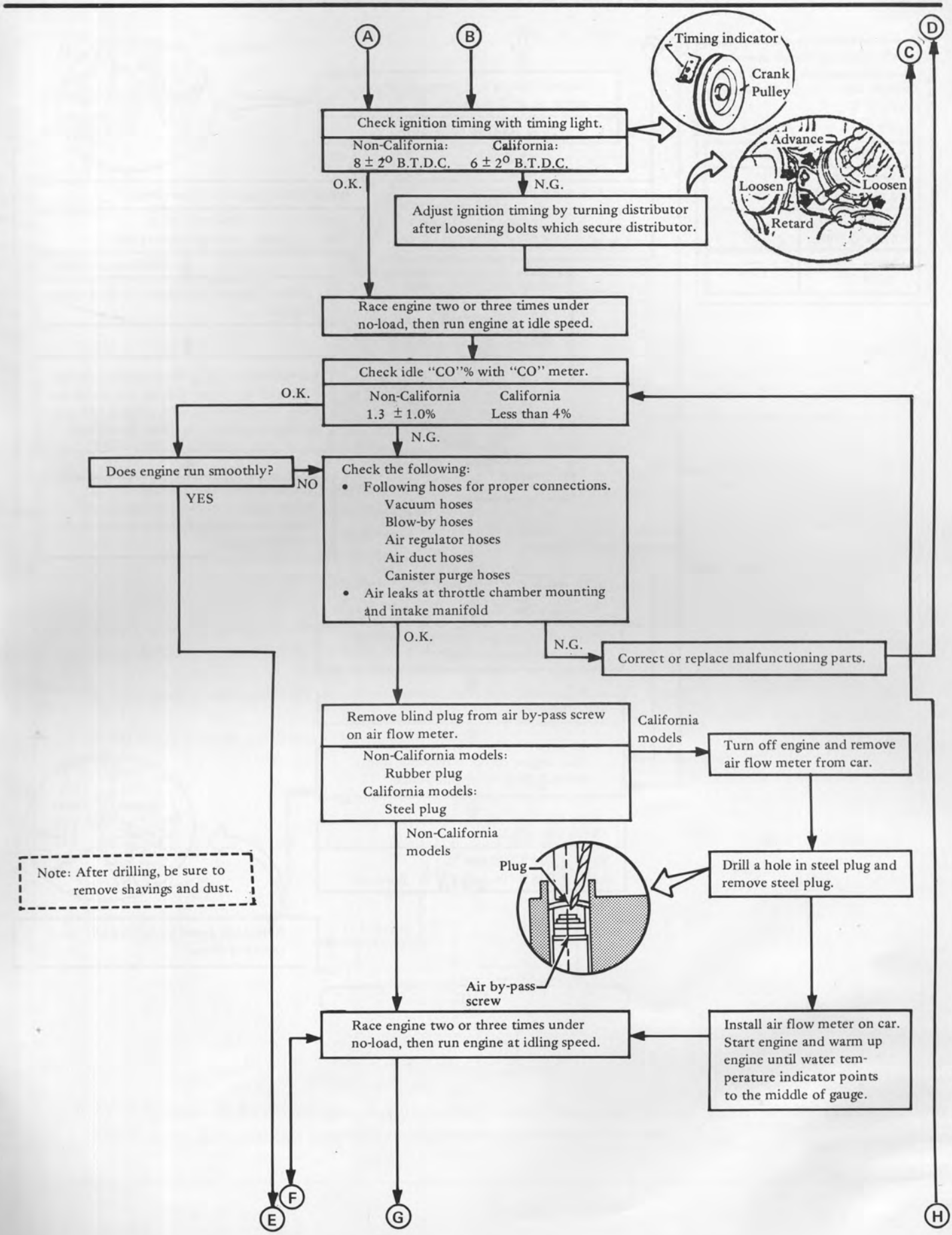
a. When selector lever is shifted to "D" position, apply parking brake and block both front and rear wheels with chocks.

b. When racing engine on automatic transmission equipped models, make sure that shift lever is in "N" or "P" position and depress brake pedal to prevent forward surge of car.

c. After the adjustment has been made, shift the lever to the "N" or "P" position and remove wheel shocks.

INSPECTION PROCEDURE




A
B
Timing indicator
Crank Pulley
C
D
Check ignition timing with timing light.
Non-California: 8 ± 2° B.T.D.C.
California: 6 ± 2° B.T.D.C.
O.K.
N.G.
Advance
Loosen
Loosen
Retard
Adjust ignition timing by turning distributor after loosening bolts which secure distributor.
Race engine two or three times under no-load, then run engine at idle speed.
Check idle "CO"% with "CO" meter.
O.K.
Non-California 1.3 ± 1.0%
California Less than 4%
N.G.
Does engine run smoothly?
NO
YES
Check the following:
• Following hoses for proper connections.
Vacuum hoses
Blow-by hoses
Air regulator hoses
Air duct hoses
Canister purge hoses
• Air leaks at throttle chamber mounting and intake manifold
O.K.
N.G.
Correct or replace malfunctioning parts.
Remove blind plug from air by-pass screw on air flow meter.
Non-California models: Rubber plug
California models: Steel plug
California models
Turn off engine and remove air flow meter from car.
Non-California models
Plug
Drill a hole in steel plug and remove steel plug.
Air by-pass screw
Note: After drilling, be sure to remove shavings and dust.
Race engine two or three times under no-load, then run engine at idling speed.
Install air flow meter on car. Start engine and warm up engine until water temperature indicator points to the middle of gauge.
E
F
G
H

Only for non-California models:
When adjusting idle "CO"% at high altitude, adjust to obtain following values.

Unit: m(ft.)

Altitude	Idle CO%
600-1,200 (2,000-4,000)	2.7%
1,200-1,800 (4,000-6,000)	3.8%
Above 1,800 (6,000)	5.0%

Ⓔ Ⓕ Ⓖ

Adjust "CO"% by turning air by-pass screw on air flow meter.

Idle "CO"%: 1.3 ± 1.0%

N.G.

Not adjustable in this case.
Correct or replace air flow meter or other malfunctioned parts of fuel injection system.

O.K.

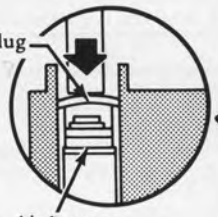
Install blind plug on air flow meter.

California: New steel plug
Non-California: Original rubber plug

California models

Turn off engine and remove air flow meter from car.

Non-California models



Insert new steel plug (furnished as a service part) with its convex side up into air by-pass screw. Tap steel plug with suitable bar, thereby installing steel plug on air flow meter.

Install air flow meter on car.
Start engine and warm up engine until water temperature indicator points to the middle of gauge.

Ⓗ

For U.S.A.

For Canada

For Canada

For U.S.A.

Turn off engine and connect air induction hose to air induction pipe.

Start engine.

Race engine two or three times under no-load, then run engine at idle.

Check idle speed.

M/T: 700 ± 100 rpm
A/T: 700 ± 100 rpm (in "D" position)

O.K.

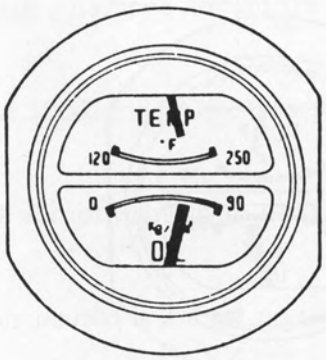
N.G.

Adjust idle speed by turning idle speed adjusting screw.

END

C. Dashpot Adjustment

1. Make sure engine is at normal operating temperature.

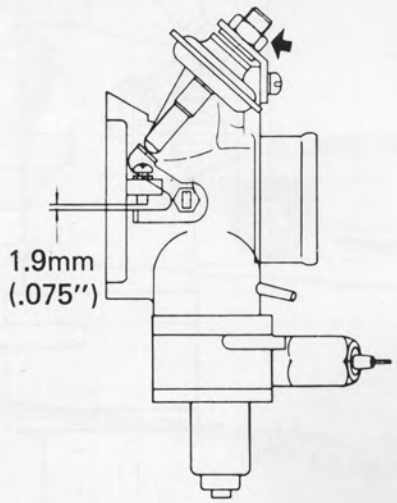


2. Verify that the fuel pressure is correct, that no air leaks exist, and that the following adjustments are correct:

   A. Valves
   B. Idle mixture
   C. Idle speed
   D. Throttle switch
   E. Ignition timing and spark plug gap

3. Insert a feeler gauge of 1.9mm (.075 in.) thickness between idle stopper screw and throttle lever. Engine speed should increase to 2000 rpm ± 100.

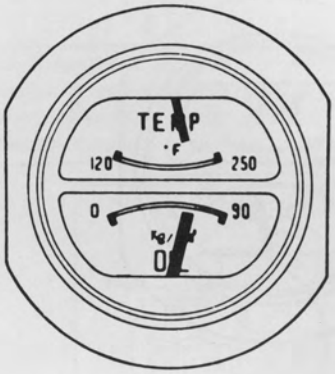
   - If engine speed is out of specified range, recheck items 2A – 2E above.
   - NEVER disturb setting of idle stopper screw.



4. At this time, dashpot plunger should be just barely touching throttle lever. If not, loosen locknut and turn dashpot assembly until correct clearance is obtained.

D. BCDD Set Pressure Adjustment

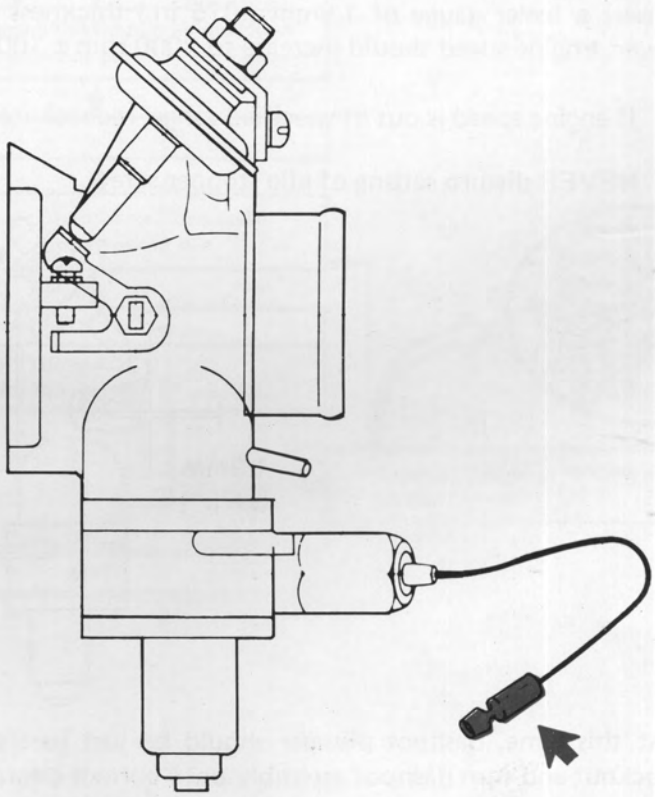
1. Make sure engine is at normal operating temperature.



2. Verify that the fuel pressure is correct, that no air leaks exist, and that the following adjustments are correct:

   A. Valves
   B. Idle mixture
   C. Idle speed
   D. Throttle switch
   E. Ignition timing and spark plug gap

3. Disconnect relief solenoid lead wire.



4. Connect a vacuum gauge to the intake manifold.

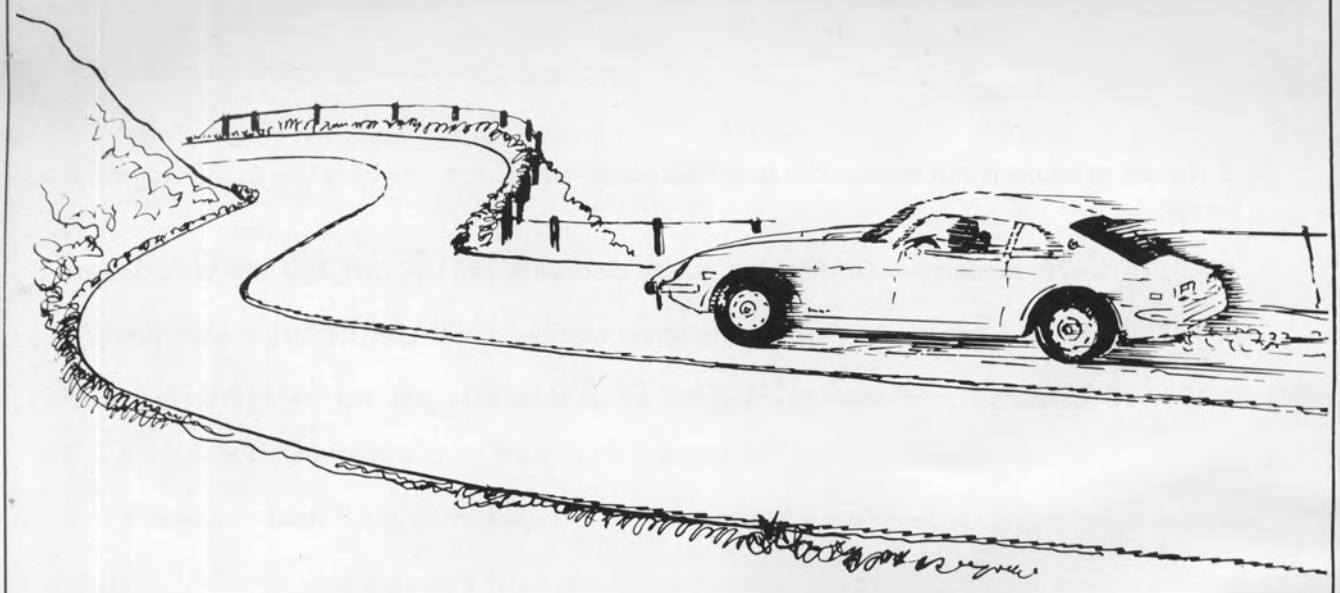
5. If the vehicle is equipped with a dashpot, retract the plunger so that it will not contact the throttle lever.

6. Raise the engine rpm to about 3000, and let the throttle snap shut while observing the vacuum gauge.

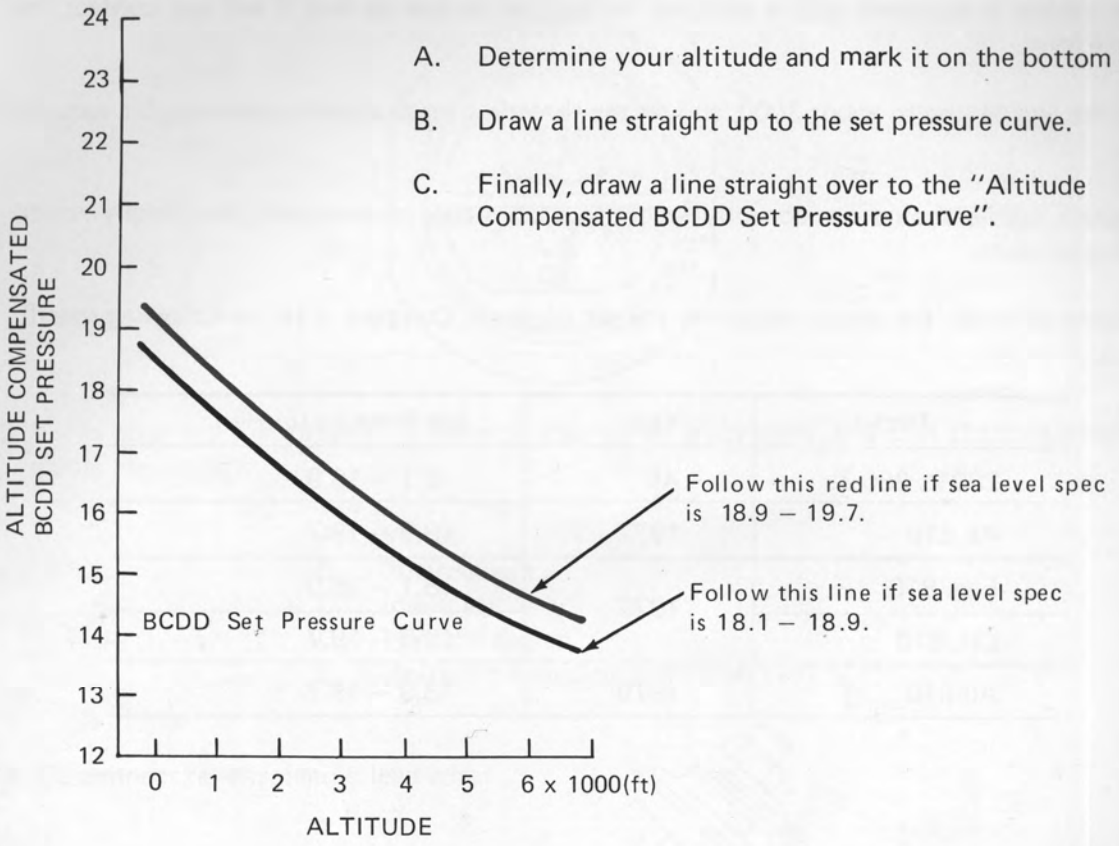
   The gauge needle should rise abruptly, begin to drop, pause momentarily, and finally return to idling vacuum.

   The point at which the needle paused is the set pressure. Compare it to the following specifications:

Model	Year	Set Pressure (in.Hg.)
280-Z, 280-ZX	All	18.1 – 18.9
All 810	1977	18.9 – 19.7
Fed. 810	1978	18.1 – 18.9
Cal. 810		18.9 – 19.7
All 810	1979	18.9 – 19.7



The BCDD set pressure of California models varies according to altitude. Determine the correct set pressure for your dealership's altitude from the chart below.

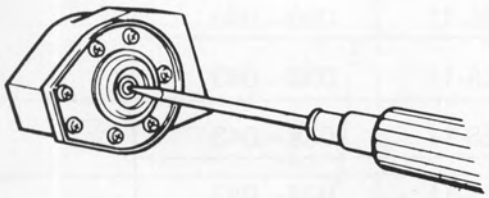


7. If the set pressure is not within the specified range, adjust it by turning the BCDD adjusting Screw:

   A. All 1975–76 models – Turning the screw clockwise will DECREASE the set pressure.

   B. 1977-79 Federal models – Turning the screw clockwise will DECREASE the set pressure

   C. 1977-79 California models – Turning the screw clockwise will INCREASE set pressure.



Adjusting set pressure

Adjusting set pressure

NOTE: Do not remove lock spring when adjusting set pressure.

8. Recheck set pressure and readjust if necessary.

9. Reconnect relief solenoid lead wire and readjust dashpot if necessary.

NOTE: On EFI equipt models the BCDD Valve serves to reduce ~~oil consumption~~ HC EMISSION during deceleration, therefore, it is important that it be adjusted properly.

CHECKING FUEL FLOW WITH A CO/HC ANALYZER AND TACHOMETER

1. Warm up and calibrate CO/HC Analyzer.
2. Warm engine to operating temperature.
3. Raise idle RPM to 1000 with idle bypass screw.
4. Note CO%, HC and RPM readings.
5. Unplug one spark plug wire at a time.
6. When the needles stabilize, record CO, HC and RPM readings.
7. Reconnect spark plug and let the engine run until CO/HC needles stabilize.
8. Proceed to Step 5 for all cylinders until measurements have been recorded for all cylinders.

NOTE: Any readings that vary from the average reading by a large amount denotes a cylinder that could cause driving problems.

A similar test can be performed by unplugging injectors – test results will indicate a leaking injector.

SPARK PLUG CHART

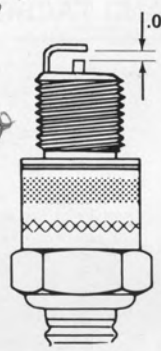
1975 280Z	B6ES	.028–.031
1976 280Z	B6ES	.028–.031
1977 810	B6ES-11	.039–.043
1977 280Z	B6ES-11	.039–.043
1978 810	B6ES-11	.039–.043
1978 280Z	B6ES-11	.039–.043
1979 810	B6ES-11	.039–.043
1979 280ZX	B6ES-11	.039–.043
1980 280ZX	BP6ES-11	.039–.043
1980 810	BP6ES-11	.039–.043
1980 200SX	BP6ES	.031–.035

Long Life Plug

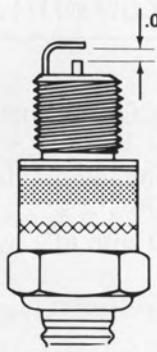
B6ES Plugs are used in **richer** running engines. Where as the B6ES-11 Plugs are used with **leaner** mixtures.

Interchangeability is **not** recommended because it will cause a stumbling, irratic idle condition.

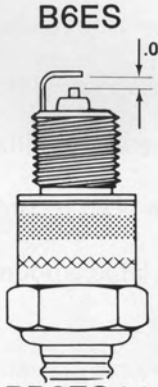
B width of thrd
6 - heat range
E - Length
S - super wide heat range
11 - gap .040
P - EXT TIP
5 - hotter



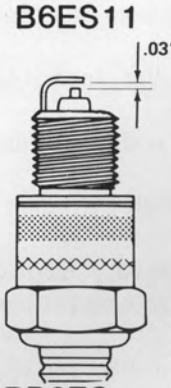
B6ES



B6ES11



BP6ES11



(for 1980 cars)
Long Life Plug has Five (5) External Ribs

BP6ES
BP6ES11

NOTES

E - VOLTS

I - AMPS

R - OHMS

W - WATTS

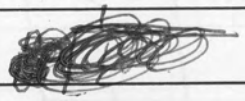
E
I | R

E
I | R I X R = E VOLTS

E ÷ R = I

E ÷ I = R

E X I = W



E
I | R

KENT MORE J25400
EFI ANALYZER REPORT

DATSUN

SERVICE TECHNICAL TRAINING DEPT.
Nissan Motor Corporation in U.S.A.

Vehicle Owner _____ Test Operator _____

Serial No. _____ Mileage _____ Date _____ R.O. No. _____

	TEST	TEST BUTTON & OPERATIONS	RESULT	SPECIFICATIONS
Vehicle ECU Unplugged	Battery	2–A Tester Calibration		88.8
		B Battery Voltage		11.0 v or higher
		C Cranking Voltage		9.0 v or higher
	Injector Tests	3 – Inj. 1		6 – 10 ohms
		4 – Inj. 2		
		5 – Inj. 3		
		6 – Inj. 4		
		7 – Inj. 5		
		8 – Inj. 6		
	Cylinder Head Sensor Water Temperature Sensor	9		240 – 10,800 ohms
	Cold Start System	10		1975 – 1977: 70–85 Hot 1978 – 1979: 30–50 Hot Cold: 0.0 – 1.0
	Air Temp. Sensor	11		290 – 10,800 ohms
	Air Flow Meter	12		1975: 60–65 '77 280: 41–47 All 1978: 36–46 1976: 47–53 '77 810: 28–33
	Throttle Switch Test	13 Idle		Closed – ON Open – ON
		14 Full		Open – ON Closed – ON
	Ground Test	15		Closed – ON
		16		Closed – ON
	Fuel System Pressure Test	17		36–37 psi within 4 seconds; stable at 33–37 psi
	Fuel Pump "ON"	17 (0" Vac)		36–37 psi
		17 (5" Vac)		33–35 psi
		17 (10" Vac)		31–32 psi
		17 (15" Vac)		29–30 psi
		17 (20" Vac)		26–28 psi
	Injector Flow Test	17 – Inj. 1		Maximum difference between any two injectors not to exceed 2 psi
		17 – Inj. 2		
		17 – Inj. 3		
		17 – Inj. 4		
		17 – Inj. 5		
		17 – Inj. 6		
	Substitute E.C.U. (Air Flow Meter)	18 – Idle		280: 3.6–4.4 810: 3.6–4.6 Note: Some models may give slightly higher readings
		2000		280: 4.2–5.0 810: 4.2–5.2
		4000		280: 4.6–5.6 810: 4.6–5.8
Vehicle ECU Plugged In	Electronic Control Unit (E.C.U.)	19 – Pulse Duration		5.0 – 10.0 ("Base Reading")
		19 – Air Temp. Sensor		6.0 – 10.0 ("Base" + Approx. .4)
		19 – Water Temp. Sensor		7.5 – 10.5 ("Base" + approx. 2.4)
		19 – Air Flow Meter		3.3 – 4.8
		19 – Engine Speed		2.4 – 3.8
	System Monitor	20 – Battery Voltage		12.0 – 15.0
		20 – Water Temp. Sensor		1.0 – 7.0
		20 – Cold Start System		0.0 – 1.0
		20 – Pulse Duration (Idle)		2.3 – 3.8
		20 – Air Temp. Sensor		2.0 – 7.0
		20 – Air Flow Meter		2.0 – 6.8

(FOR ADDITIONAL WORKSHEETS ZEROX THIS PAGE)