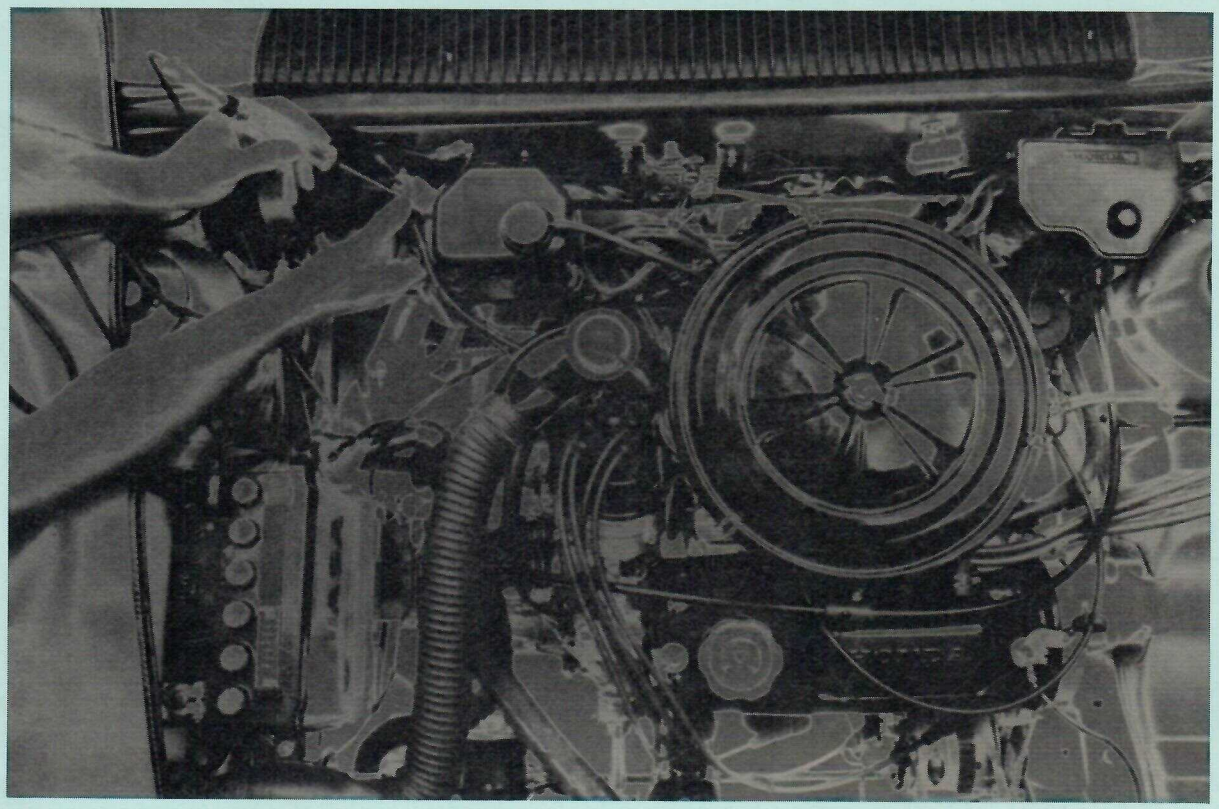
HONDA

AUTOMOBILE TECHNICAL TRAINING



1980 EMISSION CONTROL TROUBLESHOOTING

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INTRODUCTION

This booklet introduces the Emission Control Systems for the 1980 models. Changes in the system reflect the continuing concern for customer satisfaction and improved technology.

The first section presents an overview of the Emission Control Systems as well as other operations which have an effect on emission control standards. The overview includes functions, operations, and troubleshooting summaries.

The second section is a Troubleshooting chart which describes common symptoms and lists the possible causes for each in a logical troubleshooting order. The chart enables the technician to proceed in a direct line from symptom, to most likely cause, to functional test.

The third section contains functional test procedures listing the key steps and specifications for checking each system.

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2ND EDITION 7/80

ASS-1939-8007

CIVIC/ACCORD/PRELUDE

The emission control systems used on the 1980 Honda automobiles are listed below.

The 1980 Civic/Accord/Prelude emission controls are covered in detail in the Emissions Supplement accompanying this booklet.

SYSTEM	1300	1500 49 St.	1500 CA Hi Alt	1800 49St/ Hi Alt	1800 CA MT	1800 CA AT
CVCC Engine design	X	X	X	X	X	X
Fuel System						
Power Valve	X	X	X	X	X	
Auto Choke	X	X	X	X	X	X
Thermovalve	X	X	X	X	X	X
AJC			X	X	X	X
Ignition System						
Igniter in distributor	X	X	X			X
Igniter on firewall				X	X	
Crankcase Controls	X	X	X	X	X	X
Evaporative Controls	X	X	X	X	X	X
By-pass solenoid valve				X	X	
Power Valve Vacuum holding valve					X	
Intake Air Temp Controls	X	X	X	X	X	X
Ignition Timing Controls						None
Manifold advance (cold)	X	X				
Manifold advance (all times)		X(MTonly)				
Ported advance thru delay		X(HMonly)	X			
Ported advance (all times)				X		
Ported advance/manifold retard hot					X	
Throttle controls	X	X	X	X	X	X
Exhaust gas recirculation			X			X
Catalytic Converter		X	X			X
Anti-afterburn valve	X			X	X	

INTRODUCTION TO 1980 MAINTENANCE SCHEDULE

Beginning with the 1980 models, the routine maintenance schedule will be greatly decreased. The first major inspection of the Emission Control Systems will be conducted at 60 thousand miles.

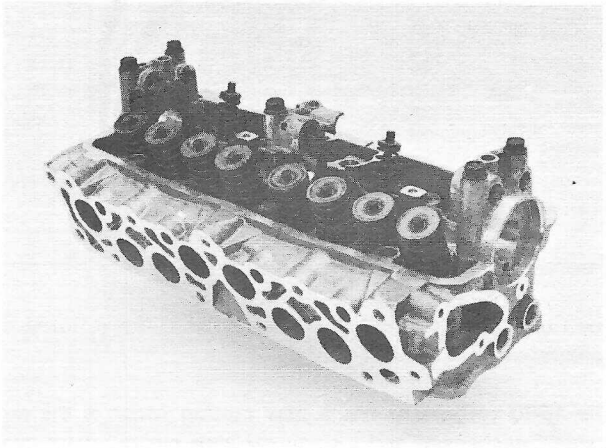
Honda has initiated this maintenance schedule in response to ever increasing demands to make the automobiles more reliable and easier and less costly to maintain. There have been many design changes to the 1980 cars which make it possible to eliminate many of the routine maintenance inspections and to reduce the frequency of many parts replacements.

As a technician, you will find 1980 cars in your service bay far less frequently. This makes it more important than ever for you to be able to recognize potential or developing problems, and to properly diagnose existing conditions of which the customer may not even be aware.

ENGINE DESIGN

All 1980 models use a form of the CVCC stratified charge engine as a means of meeting the emission control regulations, as well as achieving the desired levels of performance and economy of operation.

Operation



For 1980 there are four different configurations of the CVCC cylinder head. The 1300 cc engine has a small prechamber with a single torch hole into the combustion chamber. The 1500 cc head has a larger prechamber with several torch holes. The 1800 cc head has a prechamber with 2 torch holes and an internal baffle. The California 3 speed 1800 car has a large prechamber configured like the 1500 cc head.

Also new for 1980 is the exhaust port configuration in the 1500 cc engine and the California 1800 cc 3 speed. There are now four exhaust ports and a much smaller exhaust manifold. The manifold no longer contains baffles.

In the 1300 and 1800 cc engine the exhaust ports are siamesed as in previous models.

The intake manifold is also different on California and high altitude 1500 cc and the California 3 speed 1800 cc models to accomodate the exhaust gas recirculation.

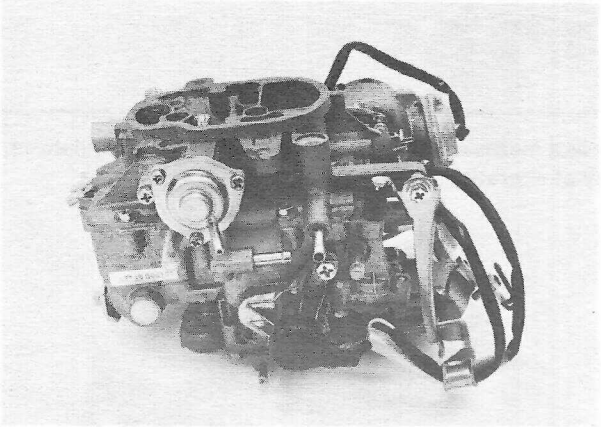
NOTES

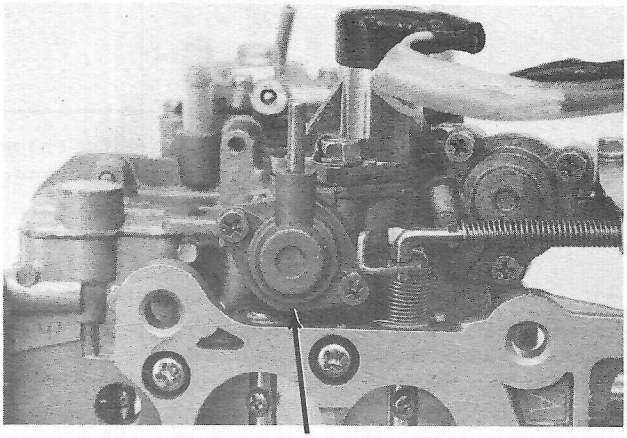
FUEL SYSTEM

CAR / TRANS	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HI ALT	1800 CAL
MANUAL	■	■	■	■	■
HONDAMATIC		■	■		
3 SPEED AUTO				■	■

Function

Provides the correct fuel/air ratio to the combustion chambers.





POWER VALVE

Operation

The Fuel Pump, located near the fuel tank, draws liquid fuel from the tank, through a fuel filter and pumps it on into the carburetor.

The 1980 carburetor has a new casting which is the same for 1300, 1500, and 1800 models. It also has a new choke opener mechanism and a single air vent cut-off diaphragm. A power valve, operated by manifold vacuum, has also been added on all models except the California 1800 or 3 speed.

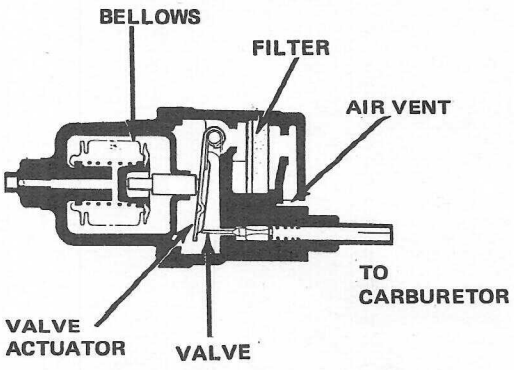
The power valve, located on the carburetor, provides additional fuel when the engine is operating under heavy load.

The valve is held closed while manifold vacuum is stronger than the force of the power valve spring such as during idling or operating under slight load conditions.

When manifold vacuum is weaker than the force of the spring, the power valve is lifted by the force of the spring and additional fuel goes through the power jet to the primary fuel passage.

CAL and HI/ALT models this year are both equipped with an Air Jet Controller (AJC) that controls the amount of air to the slow air jet and main air jet of the auxiliary carburetor and to the slow air jet of the main carburetor.

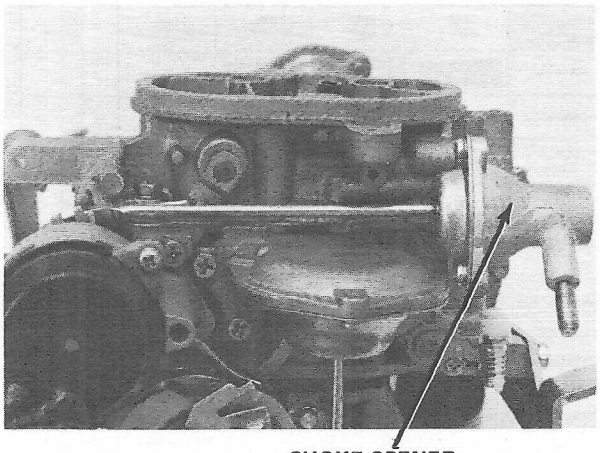
The AJC contains a bellows which is sensitive to changes in atmospheric pressure. Thus, the best air fuel mixture is maintained regardless of altitude.



AIR JET CONTROLLER
ALL CAL + HI ALT

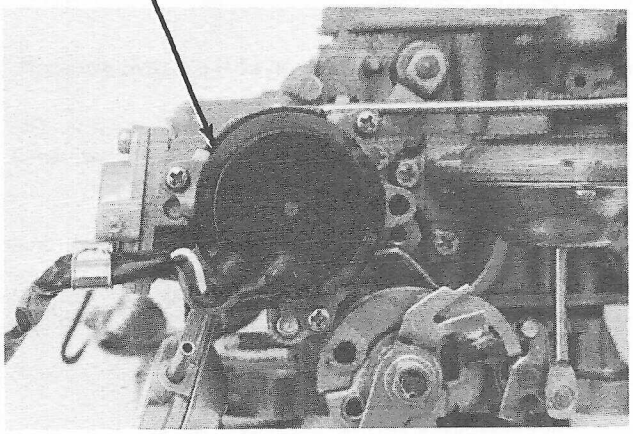
The Choke Opener, as in previous models, serves to partially open the choke blade when manifold vacuum is supplied to the opener diaphragm.

For 1980 models, there is a vacuum bleed to regulate the amount of opening. When the engine is cold, vacuum is bled off the choke opener diaphragm through the thermo valve located on the cylinder head. The choke blade is allowed to open more slowly by bleeding off the vacuum from the diaphragm.



CHOKE OPENER

AUTOMATIC CHOKE



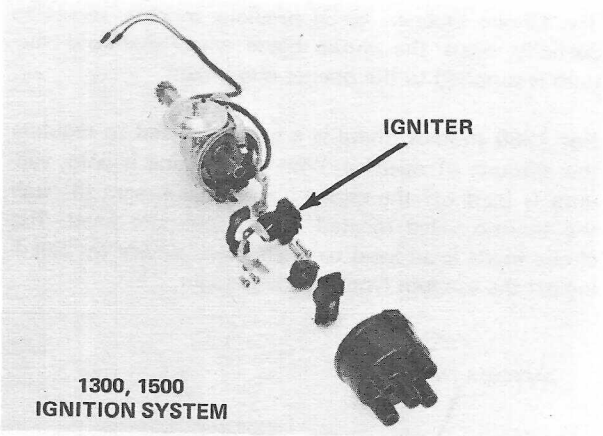
As coolant temperature rises, the thermo valve closes and the choke opener diaphragm pulls the choke blade as far open as possible.

The Automatic choke on all models this year, relies on electrical flow through the thermistor, and the air temperature sensor in the air cleaner case for its opening rate as on previous model Accords.

NOTES

ELECTRONIC IGNITION SYSTEM

CAR / TRANS	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HIALT	1800 CAL
MANUAL	■	■	■		
HONDAMATIC		■	■		
3 SPEED AUTO					■



1300, 1500
IGNITION SYSTEM

Function

Replaces contact points and condensor in distributor and creates a stable ignition pulse signal that does not change timing with mileage as do contact points.

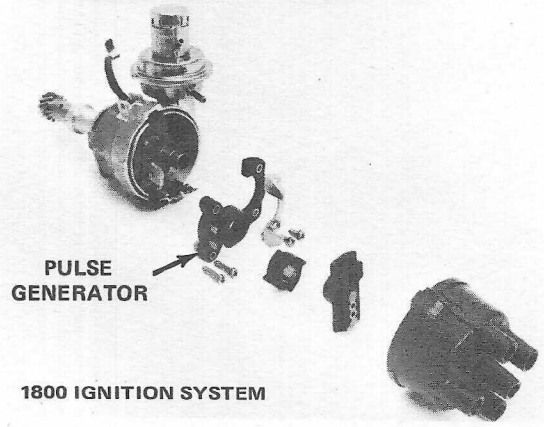
Operation

The magnetic pulse generator generates a pulse signal which is synchronized with the revolution of the distributor shaft.

The pulse signal is amplified by a Signal Amplifier. The pulse signal is then transmitted to the Power Transistor. The power transistor switches the primary current to the ignition coil on and off. On the 1300 and 1500 cc engines, dwell time is controlled by a Duty Control Amplifier. All these components are in the igniter, which is in the distributor.

The duty control amplifier functions throughout a wide range of engine operations. It controls the apparent dwell time for the ignition primary coil current. Thus, coil saturation time varies with engine speed to give the optimum performance as rpm increases.

CAR / TRANS	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49STHIALT	1800 CAL
MANUAL				■	■
HONDAMATIC					
3 SPEED AUTO				■	



1800 IGNITION SYSTEM

The system for Accord and Prelude is the same as in the 1979 and consists of the igniter unit, ignition coil, breaker-less ignition distributor and spark plugs. The igniter unit is a module separate from the distributor, and is mounted next to the coil on the firewall.

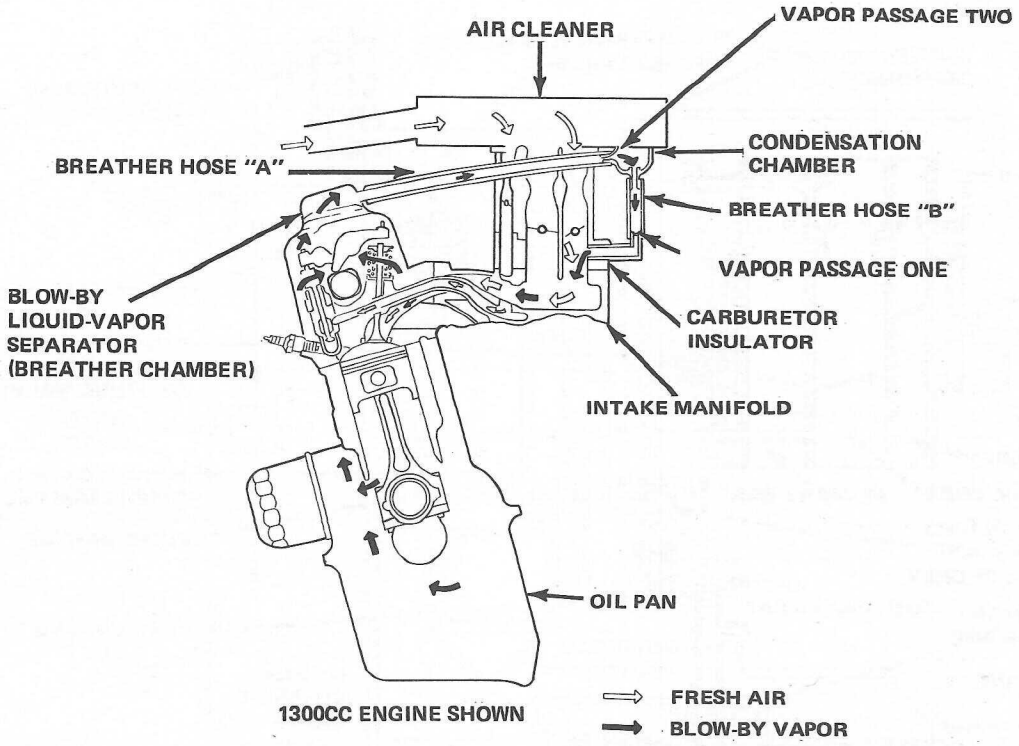
The magnetic pulse generator generates pulse signals synchronized with the distributor shaft revolutions. These pulse signals give switch signals to the power transistor through the signal amplifier and drive amplifier in the igniter unit. The power transistor switches on and off the current to the ignition primary coil. There is no control over coil saturation in this unit.

CRANKCASE CONTROLS

CAR / TRANS	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HI ALT	1800 CAL
MANUAL	■	■	■	■	■
HONDAMATIC		■	■		
3 SPEED AUTO				■	■

Function

Recycles crankcase vapors.



1300CC ENGINE SHOWN

Operation

Crankcase vapors are controlled by a "Dual Return System" as on previous models.

When the throttle valve is closed (idle) or partially open, blow-by vapor is returned to the intake manifold through breather hoses A & B and passage one (fixed orifice).

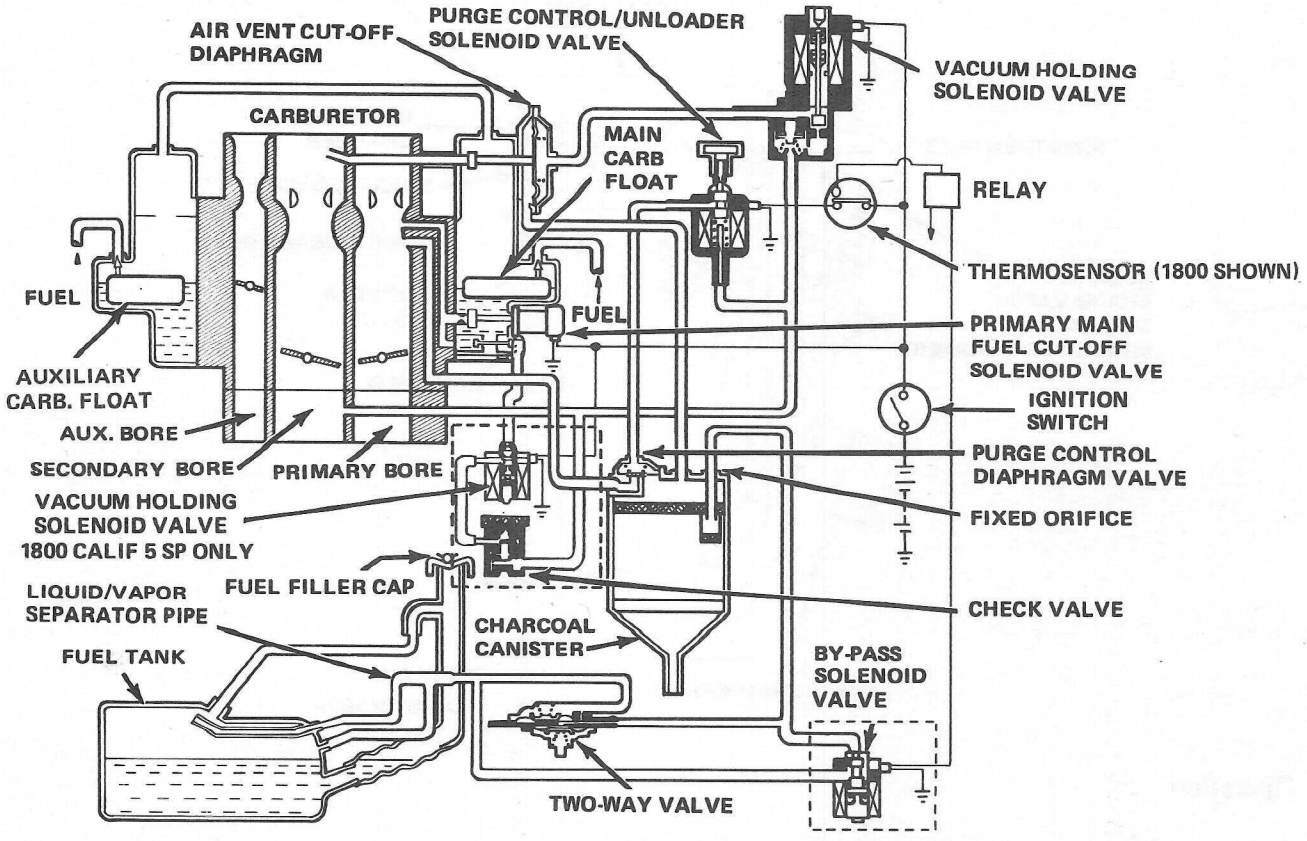
When the throttle valve is wide open, vacuum in the air cleaner increases and vacuum of passage one decreases. Blow-by vapor is drawn into the air cleaner through passage two, from the condensation chambers and breather hose A. A small amount of vapor is returned through passage one (fixed orifice).

EVAPORATIVE CONTROLS

TRANS \ CAR	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HI ALT	1800 CAL
MANUAL	■	■	■	■	■
HONDAMATIC		■	■		
3 SPEED AUTO				■	■

Function

Prevents fuel vapors from escaping from the carburetor and fuel tank into the atmosphere.



EVAPORATIVE SYSTEM

Operation

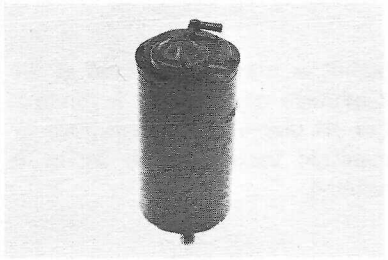
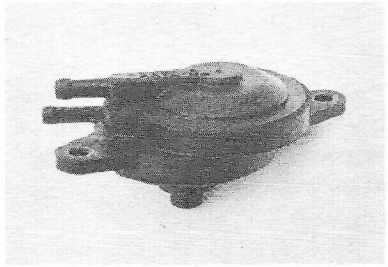
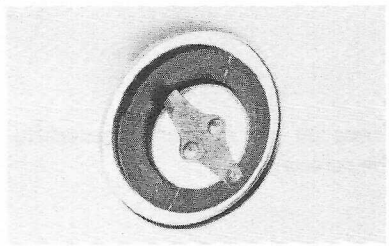
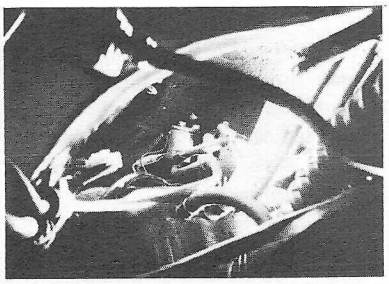
The evaporative emission system operates much the same as on previous models except that: (1) The charcoal canister is purged to the carburetor only when the coolant reaches operating temperature and the thermosensor switches, (2) there is only one air vent cut-off diaphragm for both float bowl vents, and (3) the vacuum holding valve is now a solenoid. Operation of the system is as follows: When the fuel vapor pressure increases, it forces open the two way valve. Fuel vapor moves up the liquid/vapor separator where liquid fuel drops out and goes back to the tank. The vapor passes through the two way valve to the charcoal canister where the charcoal adsorbs the fuel particles from the vapor and the air is vented to the atmosphere.

When the engine is started, the primary main fuel cut-off solenoid valve opens and manifold vaccum is available to both the purge control/unloader solenoid valve and vacuum holding solenoid valve. The vacuum holding valve allows vacuum through it to the air vent cut-off diaphragm, allowing air into the float bowl vents so the engine can run. When the engine warms up and the thermosensor opens, manifold vacuum can go through the purge control/unloader solenoid valve to the

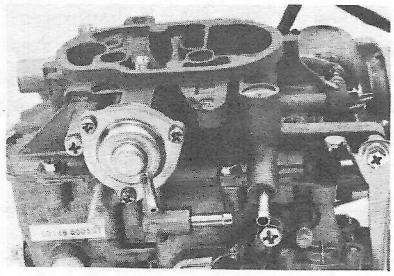
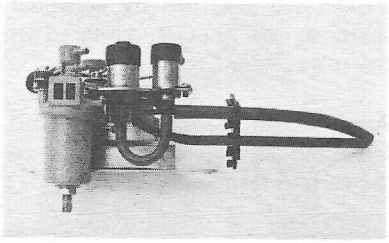
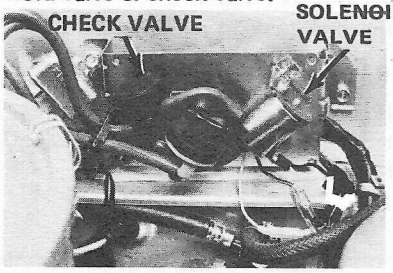
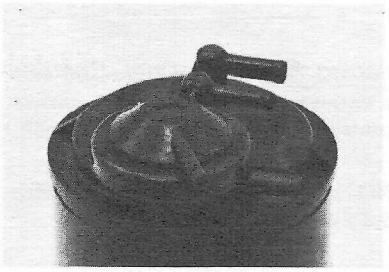
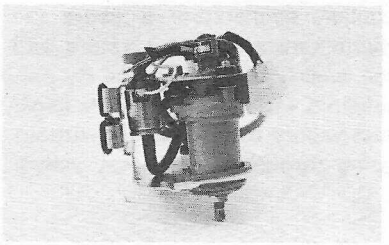
EVAPORATIVE CONTROLS (cont'd)

charcoal canister diaphragm valve. The purge control diaphragm valve opens, and anytime venturi vacuum from the carburetor gets high enough it will draw air through the bottom of the canister. The air will pick up the fuel in the canister as it passes through and carry the fuel into the engine where it will be burned.

When the hot engine is shut off, the fuel in the float bowls expands and vaporizes. The air vent cut-off diaphragm is closed, as is the primary main fuel cut-off solenoid valve. This prevents the vapors from getting into the atmosphere, and instead, directs the vapors to the charcoal canister where they are stored. As the engine and fuel tank cool down at night, the fuel and vapor contracts and creates a vacuum in the fuel tank. The two way valve opens when the vacuum gets high enough, drawing air and fuel vapors through the charcoal canister and back into the tank.

COMPONENT	LOCATION	FUNCTION
Charcoal Canister 	On the firewall below emission control box.	Receives and stores fuel vapors from the fuel tank and carburetor. Vapors are adsorbed by activated charcoal, and the air is vented to the atmosphere. Accumulated vapors are purged from the canister and returned to the carburetor.
Two way valve 	On top of fuel tank	Allows fuel vapor to escape from the fuel tank as vapor pressure increases with temperature. Relieves fuel tank vacuum when temperature decreases and when fuel is pumped out of tank.
Fuel filler cap  (Civic Cap Shown)	At the fuel filler pipe	Accord & Prelude Only. Contains a two-way valve to relieve excessive pressure or vacuum in the fuel tank. NOTE: Later model Civics will also have Accord style gas caps.
By-pass solenoid valve 	On top of fuel tank w/two-way valve.	Accord and Prelude only. When the coolant temperature is above the thermosensor set temperature and the engine is running, the By-pass solenoid valve is turned on to allow fuel vapors to the canister without going through the two-way valves.

EVAPORATIVE CONTROLS (cont'd)

COMPONENT	LOCATION	FUNCTION
Air vent cut-off diaphragm 	On carburetor above float bowls	Cuts off air vent passages in the main and auxiliary float chambers when engine is not running. Cut-off diaphragm is held open by manifold vacuum when engine is running.
Vacuum holding solenoid valve. 	In emission control box on fire-wall, center of front row.	Stabilizes manifold vacuum at the diaphragm when engine is running. Cut-off diaphragm is held open by manifold vacuum when engine is running.
Power valve vacuum holding solenoid valve & check valve. 	In emission control box #2 on fire-wall, driver's side.	*CAL 5 speed Accord and Prelude only. Holds manifold vacuum to the power valve when key is turned off to keep valve closed.
Purge control diaphragm valve. 	On charcoal canister.	Turns on and off purge vacuum to the canister.
Purge control unloader solenoid valve. 	In emission control box left side of back row.	Allows purge control diaphragm to open when coolant temperature is above set temperature of thermo-sensor. Also controls vacuum to fast idle unloader.

EVAPORATIVE CONTROLS (cont'd)

The THERMOSENSOR, located in the block below the thermostat housing, provides an electrical current to the purge control/unloader solenoid valve when the engine is cold. Also controls the by-pass solenoid valve.

A LIQUID/VAPOR SEPARATOR attached to the fuel tank carries fuel vapor to the charcoal canister and allows liquid fuel to return to the fuel tank.

Evaporative System Troubleshooting

PROBLEM	POSSIBLE SYMPTOMS/RESULTS	POSSIBLE CAUSES
System does not collect vapors/ purge when cold	Poor cold start	Open thermosensor Purge control solenoid stuck open
System does not purge canister/ canister saturated	Gas smell under hood Canister overflow	Purge control solenoid inoperative Purge diaphragm leak
Gas tank does not vent	Gas tank collapsed or expanded	Two-way valve inoperative
Air vent cut-off does not open	Rough Idle or stalling after start	Vacuum holding solenoid valve or vacuum block or leakage

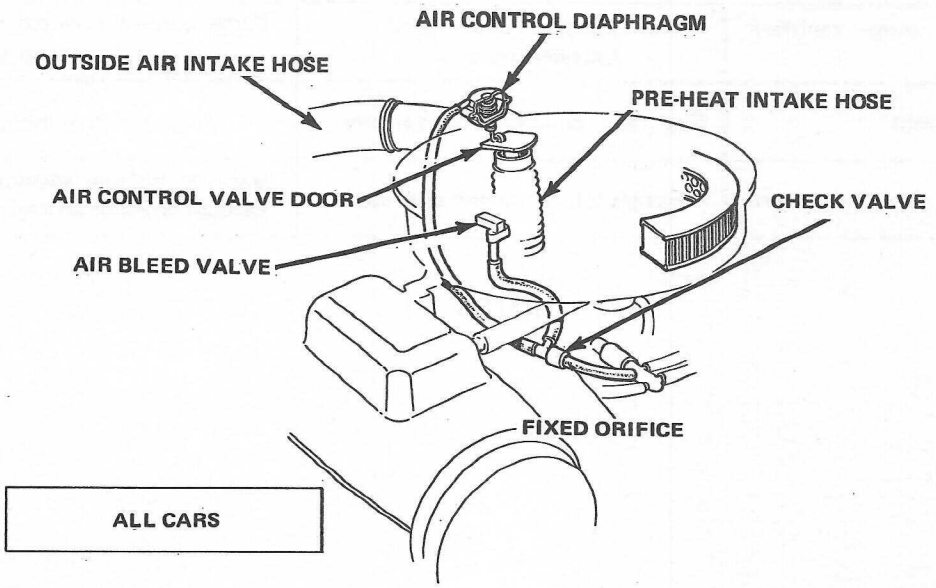
NOTES

INTAKE AIR CONTROL

TRANS \ CAR	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HI ALT	1800 CAL
MANUAL	■	■	■	■	■
HONDAMATIC		■	■		
3 SPEED AUTO				■	■

Function

Maintains uniform air temperature inside the air cleaner (about 100°F) to promote proper mixing of the air and fuel in the carburetor.



Operation

The operation of the intake air temperature control system is the same as on previous models except that the orifice is now in the check valve. The operation is as follows: When the engine is running and the temperature of the air in the air cleaner is less than 100°F, manifold vacuum goes through the check valve and pulls the diaphragm and air control door up. Thus only hot air from around the exhaust system can get into the air cleaner. When the temperature in the air cleaner gets up to approximately 100°F the bi-metal strip on the air bleed heats up and begins to open, bleeding off manifold vacuum to the diaphragm. The diaphragm and door drop, allowing fresh air into the air cleaner. If the fresh air is less than 100°F, the air bleed bi-metal strip cools down, closing the air bleed and the valve door comes back up. Therefore, the system maintains the temperature in the air cleaner at approximately 100°F.

Part \ Condition	COLD – Below 100°F (approx.)	HOT – Above 100°F (approx.)
Air Bleed Valve	Closed, manifold vacuum builds.	Open, manifold vacuum bleeds off.
Diaphragm	Vacuum pulls up on valve door.	Internal spring pushes down on valve door.
Air Control Valve Door	When raised, allows pre-heated air into cleaner (outside air blocked).	When door falls, outside air enters (heated air blocked).
Check Valve	Prevents vacuum loss from air control diaphragm at wide open throttle	
Fixed Orifice	Prevents rapid pressure changes and a large vacuum leak when air bleed is open. Allows smooth operation of valve door.	

INTAKE AIR CONTROL (cont'd)

Air Intake Temperature Control Troubleshooting

PROBLEM	POSSIBLE SYMPTOMS/RESULTS	POSSIBLE CAUSES
Air temp control door stuck up	1) Poor hot engine driveability 2) Lack of power 3) Spark knock or detonation 4) Engine stall after high speed drive	Binding linkage Air bleed valve stuck closed
Air temp control door stuck down	1) Poor driveability on cold engine 2) Carburetor icing in cold weather 3) Slow engine warm-up on cold start	Binding linkage Air bleed valve stuck open Leaking door control diaphragm

NOTES

IGNITION TIMING CONTROLS

TRANS \ CAR	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HI ALT	1800 CAL
MANUAL	■	■	■	■	■
HONDAMATIC		■	■		
3 SPEED AUTO				■	

Function

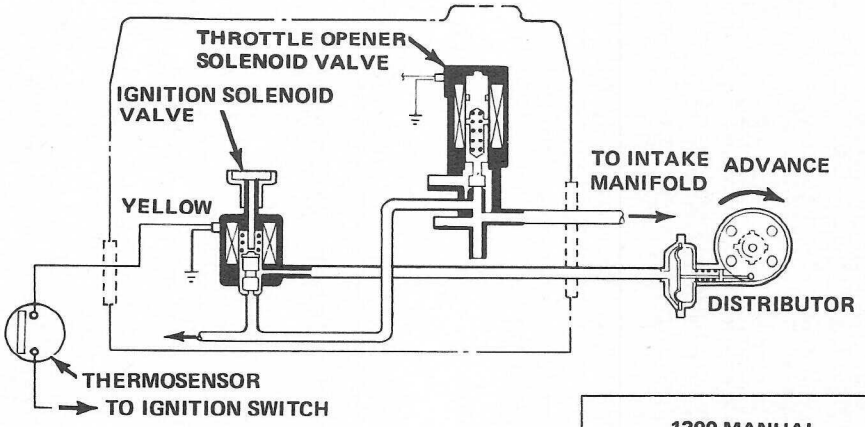
Changes ignition timing to provide the best possible gas mileage and driveability while meeting strict emission control standards.

Operation

The ignition spark timing is controlled according to the speed, load, and coolant temperature of the engine.

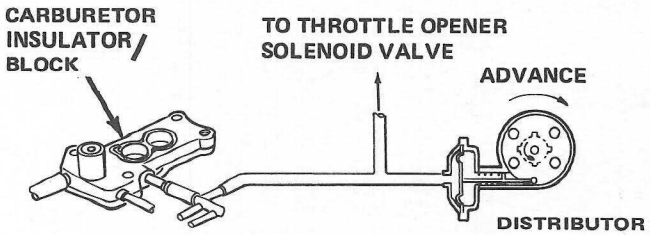
TRANS \ CAR	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HI ALT	1800 CAL
MANUAL	■				
HONDAMATIC					
3 SPEED AUTO					

In the 1300 49ST model, the thermosensor energizes the ignition solenoid valve when the coolant temperature is below 167°F. Direct manifold vacuum then enters the distributor vacuum advance diaphragm. When the engine warms up there is no vacuum advance.



1300 MANUAL

TRANS \ CAR	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HI ALT	1800 CAL
MANUAL		■			
HONDAMATIC					
3 SPEED AUTO					

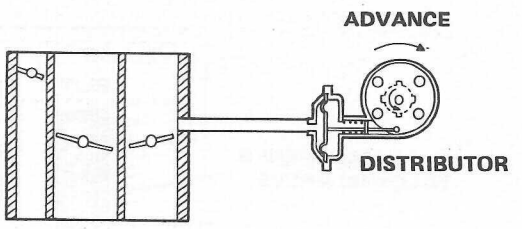


The vacuum advance for the 1500 49ST manual is provided by manifold vacuum all the time.

1500 49 ST MANUAL

IGNITION TIMING CONTROLS (cont'd)

CAR / TRANS	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HI ALT	1800 CAL
MANUAL			■		
HONDAMATIC		■	■		
3 SPEED AUTO					

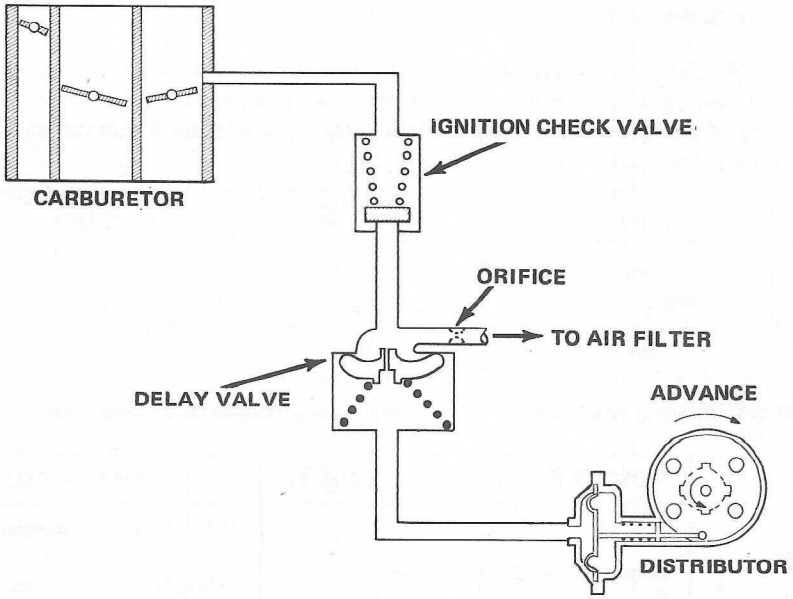


1500 49 STATE HM
CAL/HI ALT MT / HM

For 1500 CAL/HIALT and 1500 49ST Hondamatic models, there is vacuum advance whenever there is sufficient ported vacuum.

CAR / TRANS	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HI ALT	1800 CAL
MANUAL				■	
HONDAMATIC					
3 SPEED AUTO				■	

The system for the Accord and Prelude 49ST high and low altitude 5 speed transmission and 3 speed automatic transmission is more complex. Ported vacuum is routed through the Ignition Check Valve and the Delay Valve to the Vacuum Advance Unit. An orifice in the delay valve is set to bleed off vacuum at a set rate.



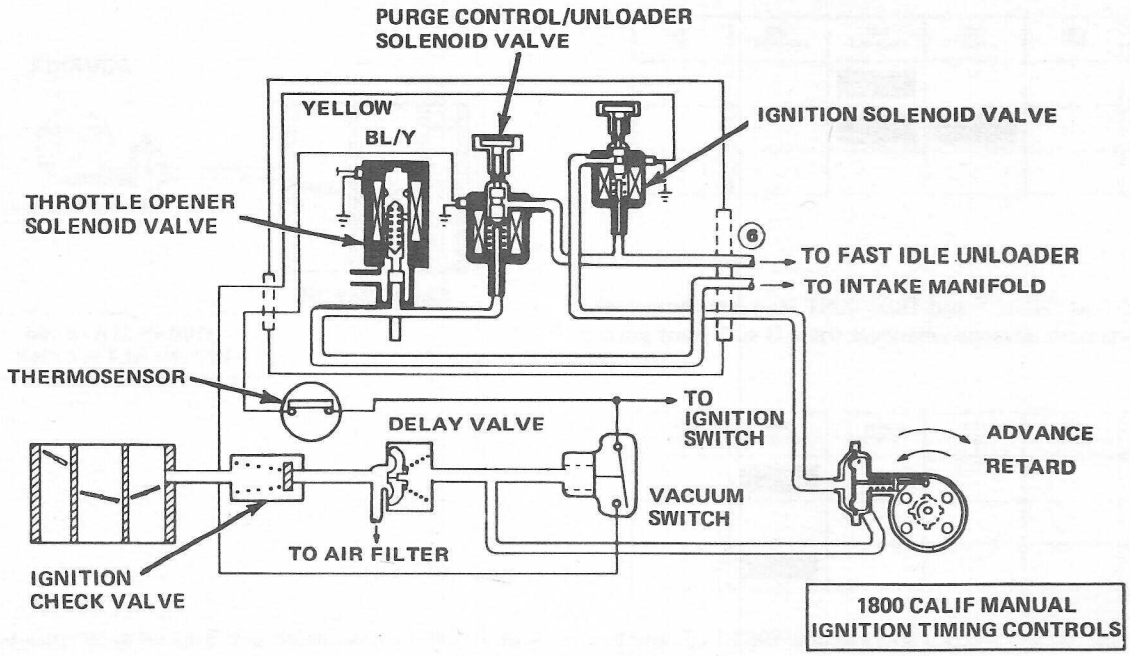
ALL 1800 49 ST

CAR / TRANS	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HI ALT	1800 CAL
MANUAL					■
HONDAMATIC					
3 SPEED AUTO					

The CAL 5 speed Accord and Prelude have a dual vacuum system.

Ported vacuum through the Ignition Check Valve and Delay Valve provides vacuum to the Vacuum Advance Unit which advances the ignition timing. The ported vacuum also controls the vacuum switch.

IGNITION TIMING CONTROLS (cont'd)



Manifold vacuum from the carburetor insulator block through the Purge Control Solenoid Valve and Ignition Solenoid Valve to the vacuum Retard Unit retards the ignition timing.

The purge control/unloader solenoid valve is controlled by the thermosensor and opens when coolant temperature is above about 167°F. The ignition solenoid valve receives electrical current from the vacuum switch which opens and closes the valve according to the availability of ported vacuum. Thus the dual system provides for either timing retard or advance according to engine temperature, speed, and load.

	Cold	Hot Idle	Hot Cruise
Advance	Yes Above Idle	No	Yes
Retard	No	Yes	No

NOTE: The 1800 cc California 3 speed cards do not have any vacuum advance on the distributor.

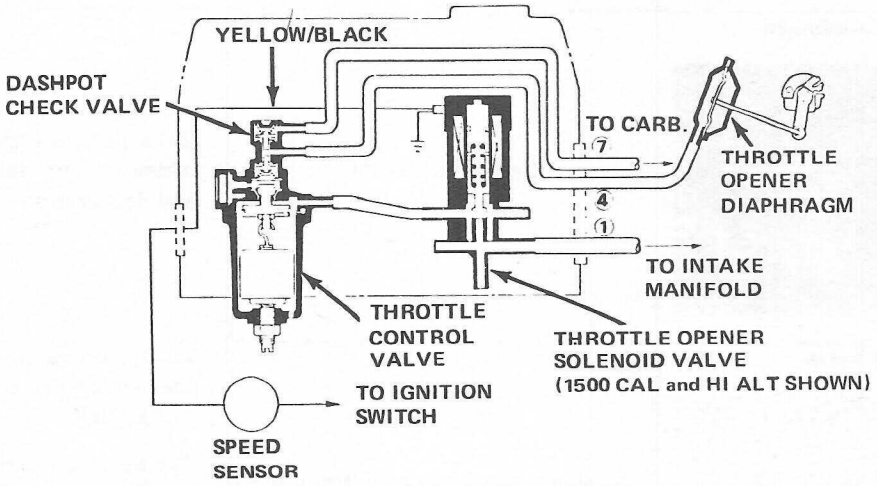
PROBLEM	POSSIBLE SYMPTOMS/RESULTS	POSSIBLE CAUSES
On 1300, 1500 and 1800 49 ST/ HI ALT No vacuum advance	Poor cold driveability Reduced gas mileage	(1300) failed thermosensor or ignition solenoid valve (1500/1800) vacuum leak or blockage, plugged delay valve or check valve
On 1800 California Manual (Cold) no vacuum advance Vacuum retard	Poor cold driveability or stalling after cold start	Blocked delay valve or vacuum line
(Hot) no vacuum retard	High idle speed, detonation on hard acceleration	Thermosensor or ignition solenoid valve
Retard won't shut off during cruise	Poor gas mileage	Vacuum switch or blocked vacuum advance

THROTTLE CONTROLS

TRANS \ CAR	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HI ALT	1800 CAL
MANUAL	■	■	■	■	■
HONDAMATIC		■	■		
3 SPEED AUTO				■	■

Function

Holds the throttle blade partially open during periods of deceleration and during gear shifting to maintain a combustible air fuel mixture.



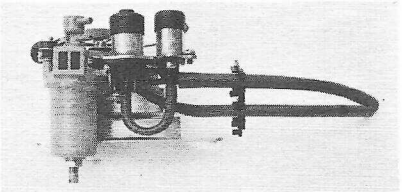
Operation

The Throttle Control System operates to improve combustion during gear shifting and deceleration. Operation is similar to previous models.

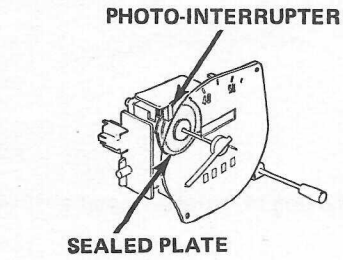
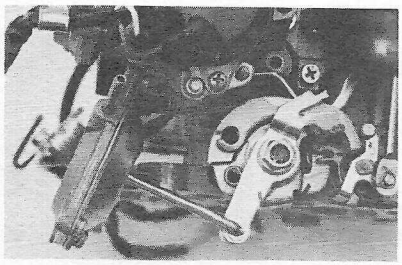
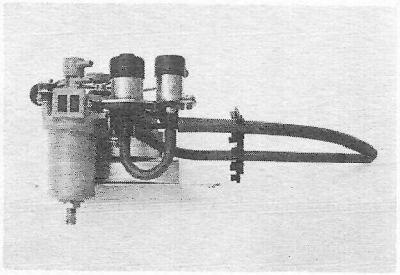
Dashpot System ported vacuum is applied to the throttle opener diaphragm through the dashpot check valve when the engine is running above idle. During deceleration, vacuum bleeds off through the orifice in the check valve, allowing the throttle to close gradually. Closing time is 1-4 seconds.

The Throttle Opener System delays throttle closing according to speed and vacuum. Above about 20 mph the speed sensor opens the solenoid valve allowing manifold vacuum to enter the control valve. During deceleration, the control valve opens and the throttle opener diaphragm holds the throttle open a fixed amount to improve combustion. As long as manifold vacuum remains high enough, the throttle control valve holds the throttle open. Below about 10 mph the speed sensor and throttle opener solenoid valve are shut off, and vacuum is vented to the atmosphere allowing the throttle to close.

The throttle control valve and dashpot check valve are incorporated in a single unit. Closing time of the throttle is regulated by both the dashpot check valve and throttle control valve.

COMPONENT	LOCATION	FUNCTION
Throttle Opener Solenoid Valve 	In emission control box, front row —right hand side	From current supplied by the speed sensor, opens at speed above 20 mph to allow manifold vacuum to enter the control valve. Closes at speed below about 10 mph.

IGNITION TIMING CONTROLS (cont'd)

COMPONENT	LOCATION	FUNCTION
Speed Sensor  	In the speedometer	Opens and closes the throttle opener solenoid valve according to vehicle speed.
Throttle Opener Diaphragm 	On the carburetor	Holds throttle slightly open to admit additional air during gear shifting and deceleration.
Throttle Control Valve 	In emission control box, front row —left hand side	The throttle control valve and dash pot check valve are incorporated in a single unit. The throttle control valve controls manifold vacuum to the carburetor. The closing time of the throttle is regulated by both the dashpot check valve and the throttle control valve aneroid bellows which is sensitive to changes in atmospheric pressure.

Throttle Controls Troubleshooting Summary

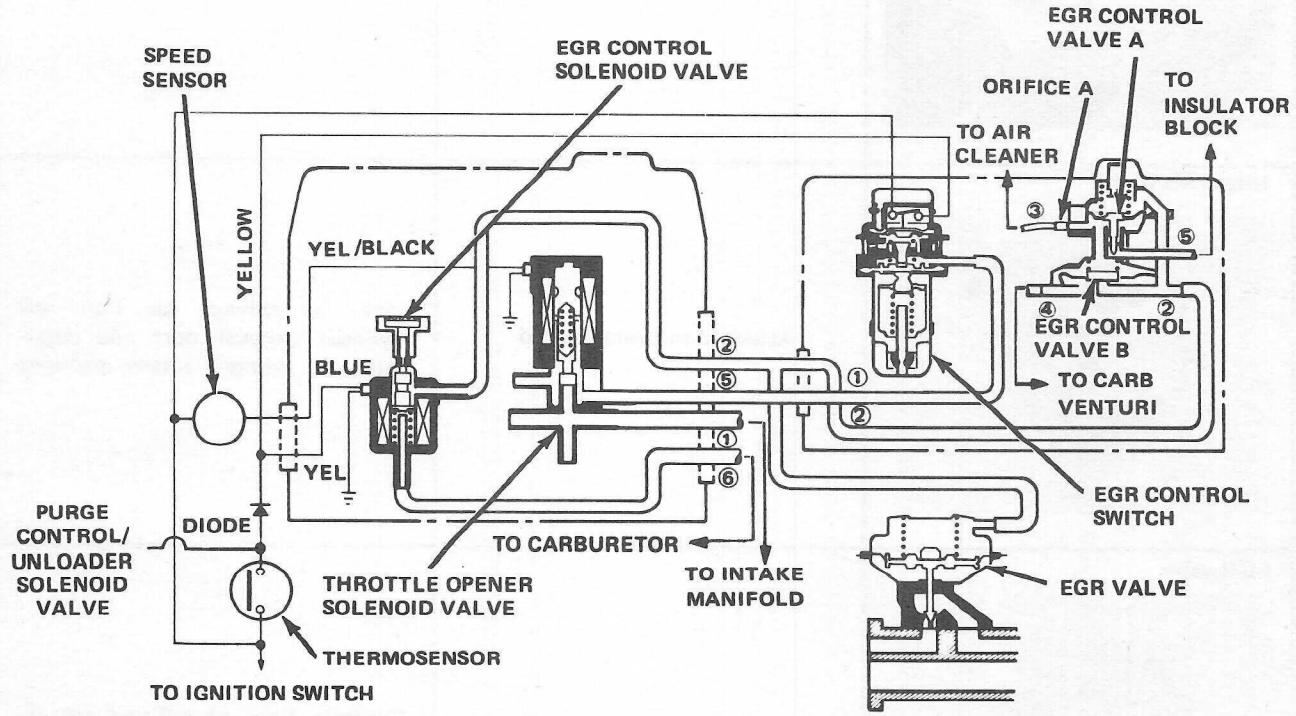
PROBLEM	POSSIBLE SYMPTOMS/RESULTS	POSSIBLE CAUSES
Throttle blade does not close on shifting	RPM does not drop during gearshift	Dashpot check valve bleed orifice blocked or control valve defection
Throttle blade closes too rapidly on deceleration or shifting	Popping or afterburn in exhaust system Surging on long deceleration	Throttle control valve or dashpot check valve inoperative

EXHAUST GAS RECIRCULATION (EGR)

TRANS \ CAR	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HIALT	1800 CAL
MANUAL			■		
HONDAMATIC			■		
3 SPEED AUTO					■

Function

Reduces emissions of nitrogen (NO_X) by diluting the air fuel mixture with some exhaust gas from the number 4 exhaust port. The exhaust goes through the EGR valve and then into the intake manifold.



Operation

The EGR system is designed to operate only when the engine is warm and while cruising or accelerating. It is during cruising and acceleration that most of the NO_X emissions are created. EGR does not operate:

- When the engine is cold

  When the engine coolant temperature is below the thermosensor set temperature, the thermosensor is on. The EGR control solenoid valve is also energized and the EGR valve is closed. EGR is cut off.

- When decelerating from speeds above 20 mph

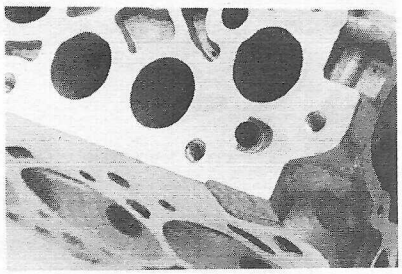
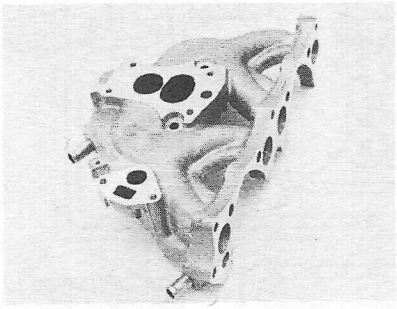
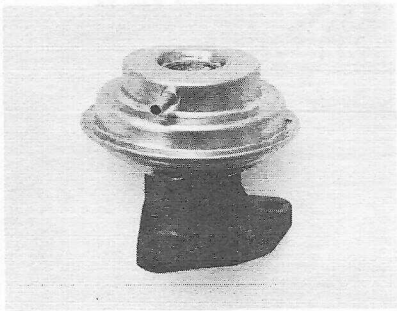
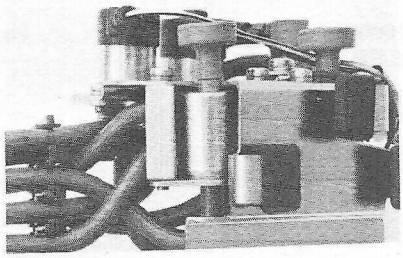
  During deceleration, the intake manifold vacuum rises and the EGR control switch is turned on. This activates the EGR control solenoid valve, cutting off the EGR flow.

  When the vehicle speed drops below approximately 20 mph, the speed sensor deactivates the throttle opener solenoid valve which shuts off vacuum to the EGR control switch.

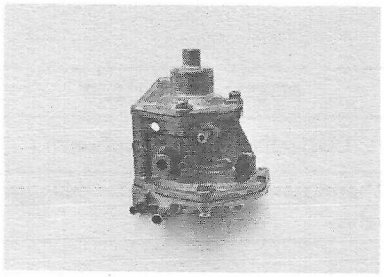
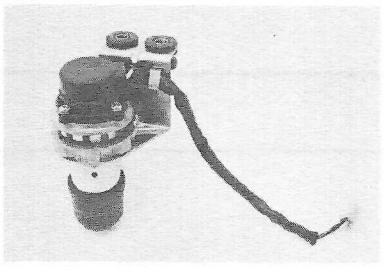
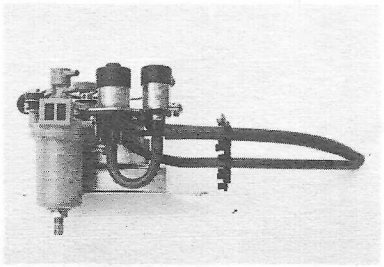
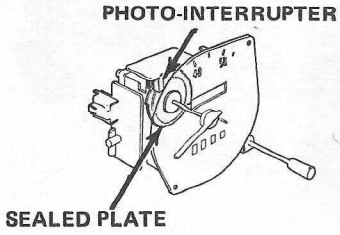
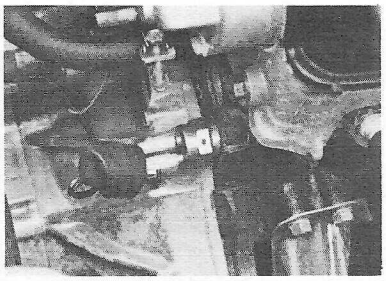
EXHAUST GAS RECIRCULATION (EGR) (cont'd)

- At Idle

At idle, there is no ported vacuum, so there is no vacuum available to open the EGR valve.

COMPONENT	LOCATION	FUNCTION
Cylinder Head 	Attached to cylinder block	Provides small passage from #4 exhaust port to intake manifold
Intake Manifold 	Attached to cylinder head	Picks up exhaust gas from #4 cylinder exhaust port and circulates to primary intake passages
EGR valve 	On intake manifold	Controls flow of exhaust gas to intake manifold
EGR control solenoid valve 	In emissions control box on firewall	When coolant temperature is above the set temperature, the valve allows ported vacuum to open the EGR valve.

EXHAUST GAS RECIRCULATION (EGR) (cont'd)

COMPONENT	LOCATION	FUNCTION
EGR control valve "A" + "B" 	In EGR control box on firewall	Regulates flow of exhaust gas through EGR valve based on signals from ported vacuum, venturi vacuum, and manifold vacuum by bleeding off vacuum to EGR valve.
EGR control switch 	In EGR control box on firewall	A vacuum switch turns off EGR flow during periods of high manifold vacuum as when shifting gears or decelerating. It turns on EGR solenoid valve during deceleration.
Throttle opener solenoid valve 	In emissions control box on firewall	Turns on & off the flow of manifold vacuum to EGR control switch (also used in throttle controls)
Speed Sensor 	In the speedometer	Provides current to throttle opener solenoid valve. (Also provides current to throttle control systems.)
Thermosensor 	In the cylinder block below thermostat housing	Normally closed, it provides current to EGR control solenoid valve when engine coolant is cold (also provides current to purge control solenoid)

EXHAUST GAS RECIRCULATION (EGR) (cont'd)

EGR System Troubleshooting Summary

PROBLEM	POSSIBLE SYMPTOMS/RESULTS	POSSIBLE CAUSES
EGR valve stays open	Poor idle, no idle, low power	EGR valve seat or diaphragm
EGR on when cold	Poor cold acceleration and low power	Thermosensor or EGR solenoid valve

CATALYTIC CONVERTER

CAR / TRANS	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HI ALT	1800 CAL
MANUAL		■	■		
HONDAMATIC		■	■		
3 SPEED AUTO					■

Function

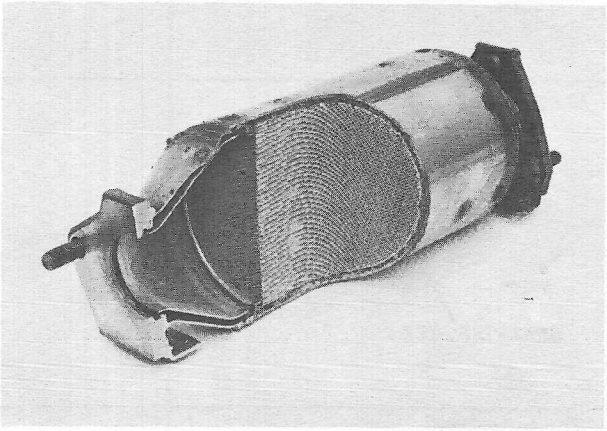
Reduces carbon monoxide (CO) and hydrocarbon (HC) pollutants in the exhaust gas.

Operation

The converter is constructed as a sealed unit. The flow of hot exhaust gases activates the catalyst in the converter. A chemical reaction takes place at high temperature oxidizing the CO and HC gases into CO_2 (carbon dioxide) and H_2O (water).

Because of the high operating temperature, a heat shield is attached to the catalyst.

Only unleaded fuel can be used. Leaded fuels will contaminate the catalyst destroying it's efficiency. It is also essential that the carburetor and ignition systems be properly adjusted as excessively rich mixtures will overheat the catalyst, also reducing its efficiency.



PROBLEM	POSSIBLE SYMPTOMS/RESULTS	POSSIBLE CAUSES
Improper air fuel ratio arriving in catalyst	Sulfur smell of "rotten eggs"	1) throttle controls 2) idle mixture improperly set
Converter plugged with lead deposits	Low power, poor gas mileage	1) use of leaded fuel
Loose heat shield	Rattle or clatter under car	Loose nuts

ANTI-AFTERBURN VALVE

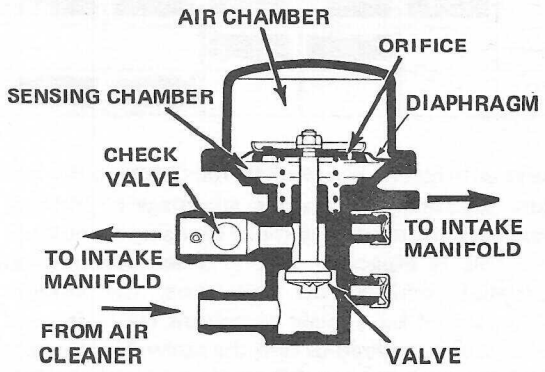
CAR / TRANS	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HIALT	1800 CAL
MANUAL	■			■	■
HONDAMATIC					
3 SPEED AUTO				■	

Function

Lets fresh air into the intake manifold during sudden deceleration to improve combustion.

Operation

When manifold vacuum suddenly increases, such as during sudden deceleration, the diaphragm/valve unit is pulled downward allowing fresh air into the intake manifold.



ANTI AFTERBURN VALVE
ALL 1800 + 1300

Within a few seconds the pressure is equalized between the air chamber and sensing chamber by air flow through the orifice, and the spring pushes the diaphragm up, closing the valve.

PROBLEM	POSSIBLE SYMPTOMS/RESULTS	POSSIBLE CAUSES
Anti-afterburn valve does not close after deceleration	Rough idle, no idle or engine stall after start	Blocked bleed port
Anti-afterburn valve does not open under sudden deceleration	Popping or afterburn in exhaust	Failed valve or blocked manifold vacuum signal

NOTES

IDLE SPEED ADJUSTMENT
Using Propane Enrichment

TRANS \ CAR	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HI ALT	1800 CAL
MANUAL	■	■	■	■	■
HONDAMATIC		■	■		
3 SPEED AUTO				■	■

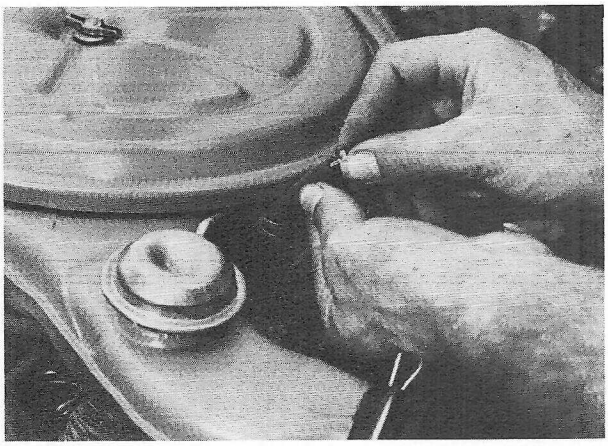
Propane enrichment is a method for checking the idle mixture adjustment. It has the advantage of allowing you to check the mixture without changing the mixture screw. This is especially helpful when working on CAL/HIALT vehicles. On these cars, the mixture screw is covered by a shield to prevent tampering and a special tool is required to turn the screw. The propane method has replaced the CO meter test and the idle drop procedure for idle mixture adjustment.

CAUTION

Do not smoke or have an open flame in the area while using propane.

NOTE: Check propane bottle for adequate gas before beginning test procedure.

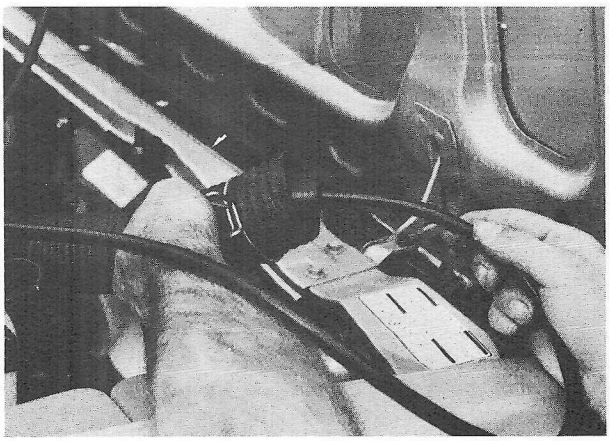
1. Start engine, warm up to normal operating temperature — cooling fan will come on.
2. Remove the vacuum tube from the intake air control diaphragm and plug the tube end.



3. Connect Tachometer
4. Check idle speed with headlights, cooling fan and air conditioner off.

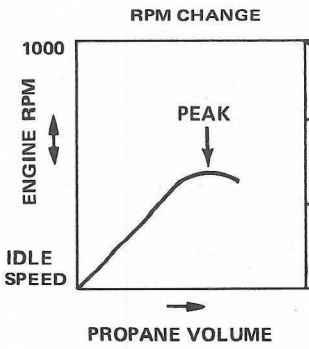
   Idle speed should be as listed on the under hood label.

   - Adjust idle speed as required by turning throttle screw.
5. Remove the air cleaner intake tube from air duct on the radiator bulkhead.
6. Insert the tube of the propane enrichment kit about 4 inches into the air cleaner intake tube.



7. The propane enrichment of the mixture should cause a change in engine speed according to the volume of propane injected. If the mixture adjustment is correct the engine speed will peak at the specified rpm.

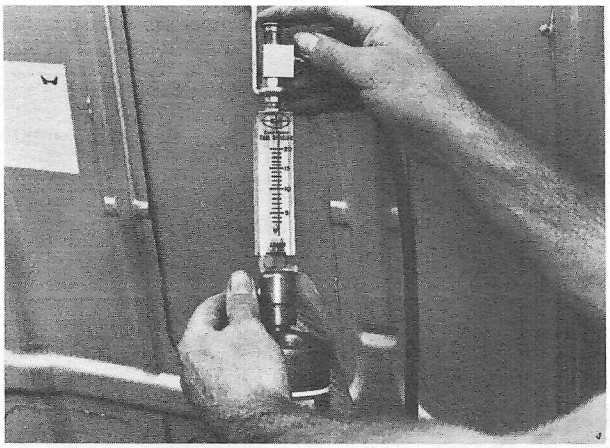
The chart below shows the rpm change by volume of propane and the maximum rpm specifications.



MAXIMUM RPM INCREASE			
ENG / TRANS	1300	1500	1800
MANUAL	120	100	70
HONDA-MATIC (IN GEAR)	—	50	50

With engine idling, slowly open the propane control valve.

IDLE SPEED ADJUSTMENT (cont.d)

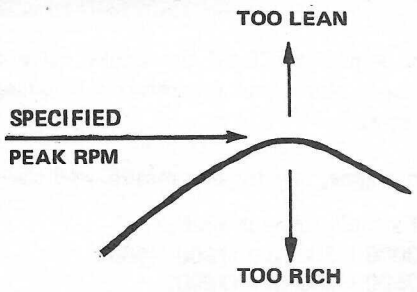


NOTE: A sudden injection of propane may stall the engine.

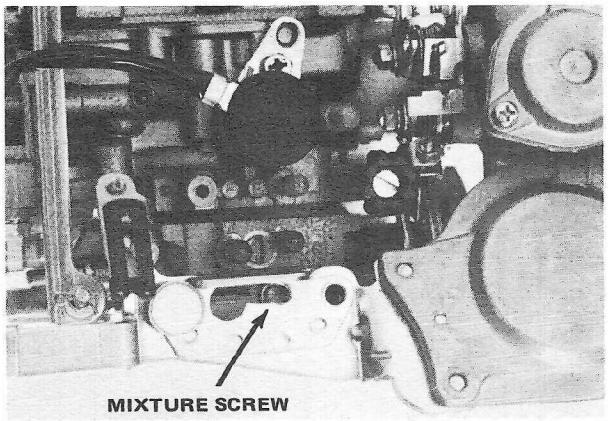
Increase the volume of propane until the engine reaches a maximum speed then starts to decline with further increase of propane.

Note the maximum rpm and compare to the chart.

- If the engine speed does not peak as specified, the mixture screw is improperly adjusted.



- If the peak rpm is below specified maximum speed, lean out the mixture (with propane on) until idle speed increases.



- If the peak rpm is above maximum speed, the mixture is too lean and should be enriched with the idle mixture screw.

- Repeat the propane injection for maximum rpm.

8. Close the propane control valve and recheck idle speed.

- If idle speed is correct, proceed to step 9.

- If not within specification, again adjust the idle speed by turning the throttle stop screw.

NOTE: It may take several adjustments of the idle mixture screw and throttle stop screw to bring idle speed into specifications.

9. Remove the propane enrichment kit. Reconnect air cleaner intake tube to air duct on radiator bulkhead. Reconnect vacuum tube to intake air control diaphragm.

10. If car is equipped with air conditioning, also check idle speed with air conditioner on. Idle speed should remain as listed on the label.

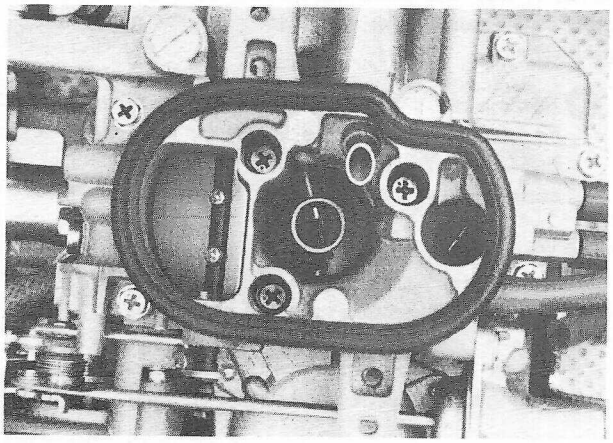
    Adjust idle speed as required by turning the adjusting screw of the idle boost diaphragm.

AUTOMATIC CHOKE AND CHOKE OPENER

CAR / TRANS	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HI ALT	1800 CAL
MANUAL	■	■	■	■	■
HONDAMATIC		■	■		
3 SPEED AUTO				■	■

COLD ENGINE

1. Remove air cleaner
2. With the engine off, open and close throttle fully to engage the fast idle cam.
   - Choke butterfly valve should fully close.



3. Start Engine
   - Choke butterfly valve should partially open.

HOT ENGINE

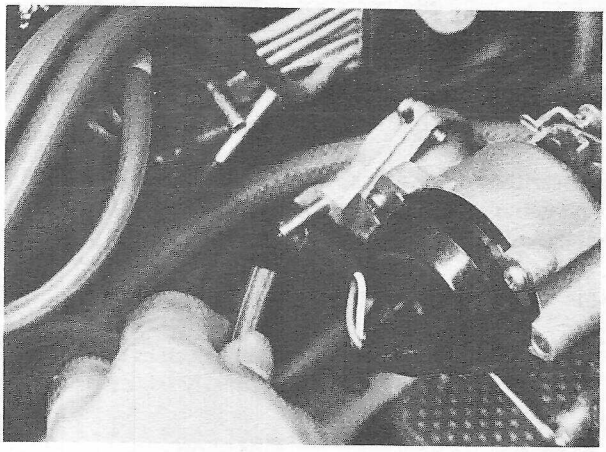
4. Allow engine to warm up.
   - Choke butterfly valve should open fully as engine warms up.

FAST IDLE UNLOADER

CAR / TRANS	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HI ALT	1800 CAL
MANUAL	■	■	■	■	■
HONDAMATIC		■	■		
3 SPEED AUTO				■	■

HOT ENGINE

1. Connect tachometer
2. Disconnect and plug the hose from fast idle unloader.



3. With engine off, hold the choke valve closed, and open and close the throttle to engage fast idle cam.
4. Start engine, run for one minute and check idle.
   - Fast idle speed should be:
     3000 + 500 rpm (1300, 1500)
     2500 + 500 rpm (1800)
5. Reattach fast idle unloader hose.
   - Engine speed should drop to less than 1400 rpm.

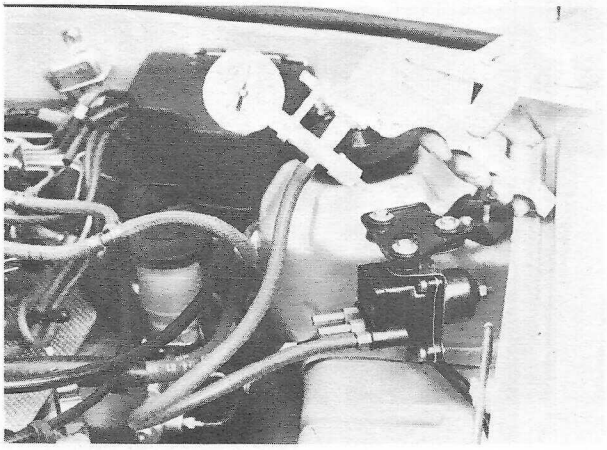
* Test Is Complete

*Refer to the appropriate Service Manual for any test failures.

AIR JET CONTROLLER

TRANS \ CAR	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HIALT	1800 CAL
MANUAL			■	■	■
HONDAMATIC			■		
3 SPEED AUTO				■	■

1. Disconnect hose from AJC.
2. Connect hand vacuum pump to AJC using hose of the same length and inside diameter as hose to the carburetor (5.5 mm ID x 630-690 mm)



3. Slowly apply more than 200 mm Hg (8 in. Hg) to each port in turn. Observe time it takes for vacuum to drop to zero.
   - Elevations below 500 meters (1500 feet) — time for each port should be longer than 5 seconds.
   - Elevations between 500 and 1000 meters (1500 and 3000 feet) — time may be either longer or around 5 seconds on each port
   - Elevations above 1000 meters (3000 feet) — time should be shorter than 5 seconds on each port

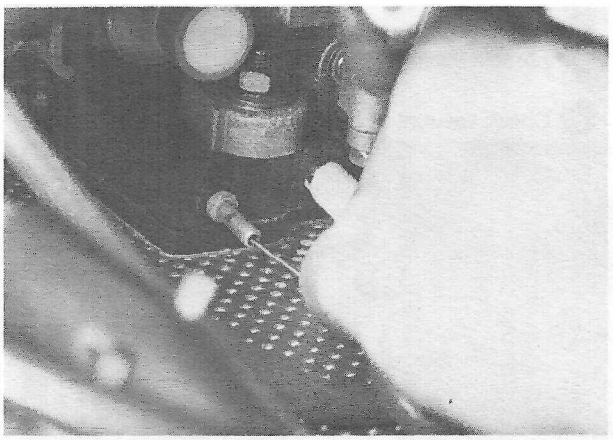
* Test Is Complete

CRANKCASE CONTROLS

TRANS \ CAR	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HIALT	1800 CAL
MANUAL	■	■	■	■	■
HONDAMATIC		■	■		
3 SPEED AUTO				■	■

COLD ENGINE

1. Disconnect breather hose from carburetor insulator.



2. Clean orifice with a 1.09 mm (No. 57) bit for 1300, 1500 or 1.4 mm (No. 54) bit for 1800, or with compressed air.
3. Inspect condensation chamber and hoses. If necessary, remove and clean chamber and hoses.

*Refer to the appropriate Service Manual for any test failures.

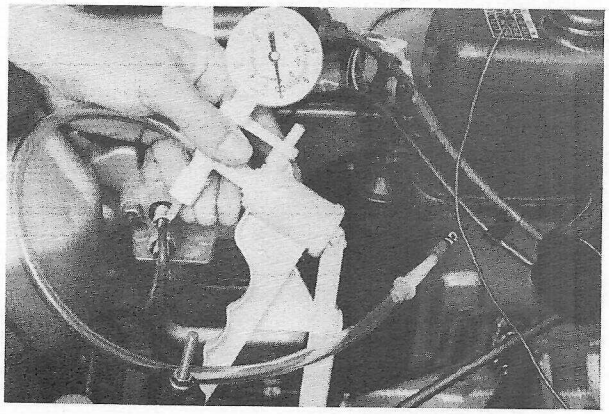
EVAPORATIVE CONTROLS

TRANS \ CAR	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HIALT	1800 CAL
MANUAL	■	■	■	■	■
HONDAMATIC		■	■		
3 SPEED AUTO				■	■

COLD ENGINE

NOTE: Engine coolant temperature must be below thermosensor set temperature. Thermosensor must have continuity.

1. Disconnect upper hose at purge control diaphragm valve (PCV).
2. Check vacuum at hose with engine at idle.

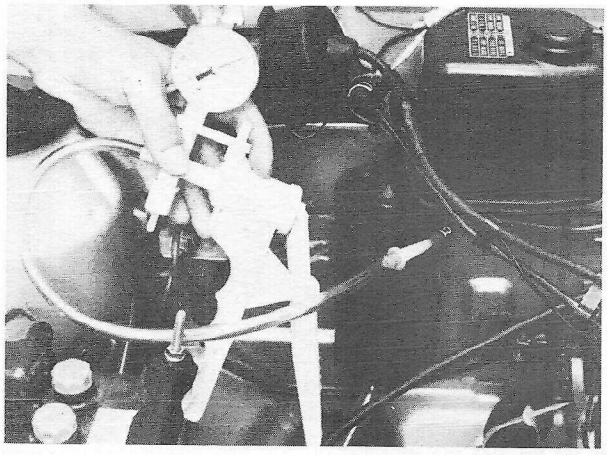


- There should be no vacuum

HOT ENGINE

NOTE: Engine coolant temperature must be above the thermosensor set temperature. No continuity across thermosensor.

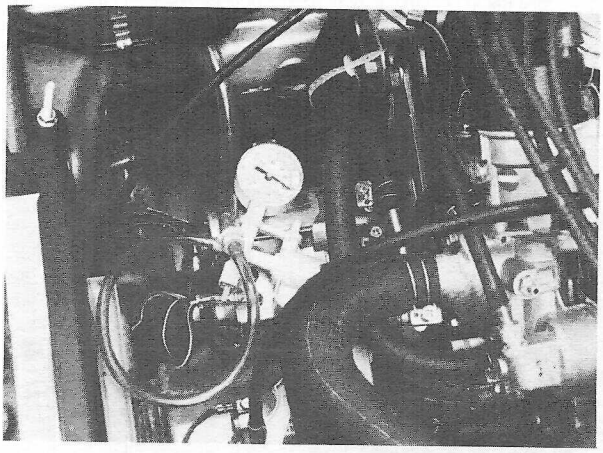
1. Disconnect upper hose at the purge control diaphragm valve.
2. Check vacuum at hose with engine at idle.



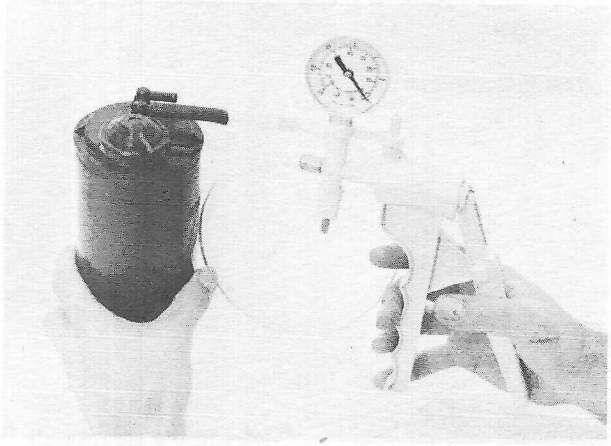
- There should be vacuum with engine warm.

CHARCOAL CANISTER

1. Remove gas cap.
2. Remove canister purge air hose from frame and connect to vacuum gauge.



3. Run engine at 3500 rpm. Vacuum should appear on gauge within 1 minute.
   - If vacuum appears, proceed to step 4
   - If vacuum does not appear, begin troubleshooting procedures
4. Connect vacuum pump to canister tank fitting.
   - You should not be able to draw vacuum

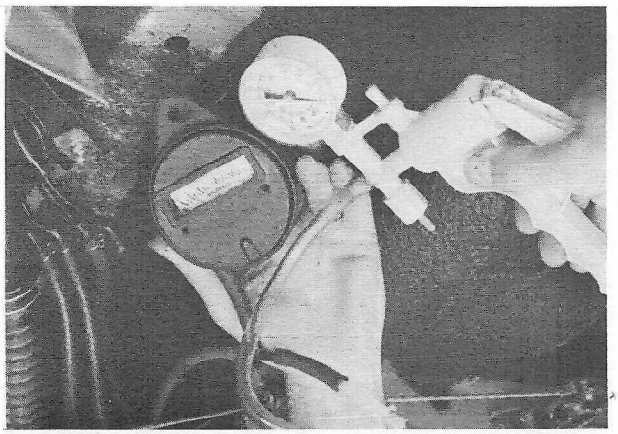


EVAPORATIVE CONTROLS (cont'd)

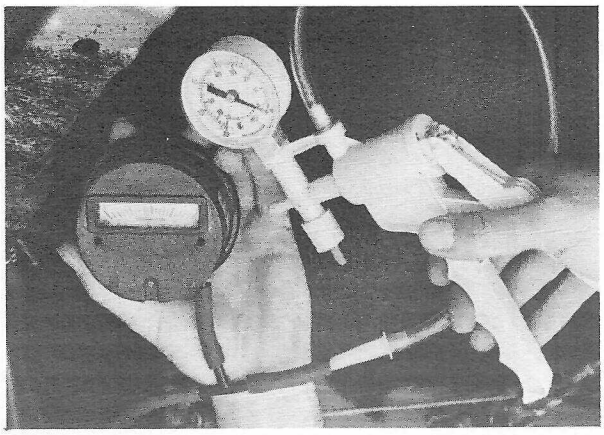
TWO WAY VALVE

TRANS \ CAR	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HI ALT	1800 CAL
MANUAL	■	■	■	■	■
HONDAMATIC		■	■		
3 SPEED AUTO				■	■

1. Remove gas cap.
2. Disconnect fuel vapor hose from liquid/vapor separator. Attach vacuum hand pump with 0.4 in. Hg. vacuum gauge.
3. Slowly draw a vacuum while observing gauge.
   - Vacuum should stabilize at 5 to 15 mm Hg. (.2 - .6 in Hg.) as the two-way valve opens



4. Reverse hose connections on both vacuum gauge and vacuum hand pump to the pressure side.



5. Slowly pressurize the line.
   - Pressure should momentarily stabilize at 35-70 Hg. (1.4 to 2.8 in. Hg.) as the two-way valve opens.

BY-PASS SOLENOID VALVE

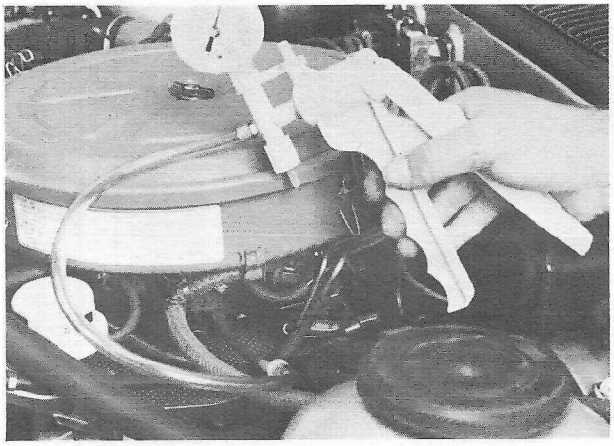
TRANS \ CAR	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HI ALT	1800 CAL
MANUAL				■	■
HONDAMATIC					
3 SPEED AUTO				■	■

1. With engine running and cooling fan on, remove top hose from canister and check for vacuum. Vacuum should be available.
   - If you feel vacuum go to step 2
   - If there is no vacuum refer to shop manual
2. Reconnect hose and remove fuel filler cap.
3. Remove tank vapor line hose from canister fitting and connect hand vacuum pump.
4. With engine running, pump the hand vacuum continuously.
   - Vacuum should drop to zero

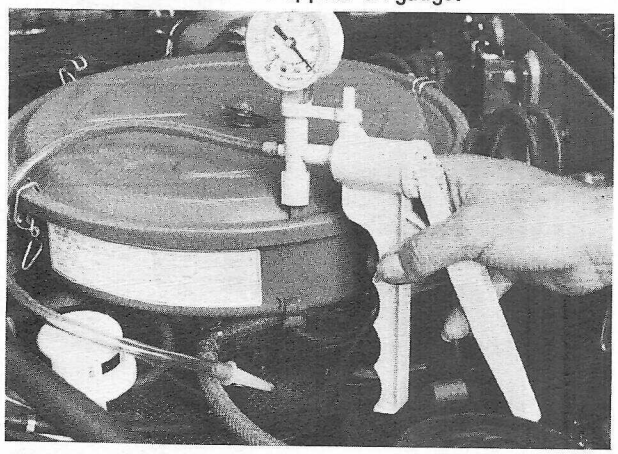
POWER VALVE VACUUM HOLDING SOLENOID

TRANS \ CAR	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HI ALT	1800 CAL
MANUAL					■
HONDAMATIC					
3 SPEED AUTO					

1. Remove hose from power valve on carburetor and attach vacuum pump to valve. Draw vacuum on valve.
   - Vacuum should remain steady



2. Switch vacuum pump to hose from 4 or 5 way-joint. Start engine.
   - Vacuum should appear on gauge.

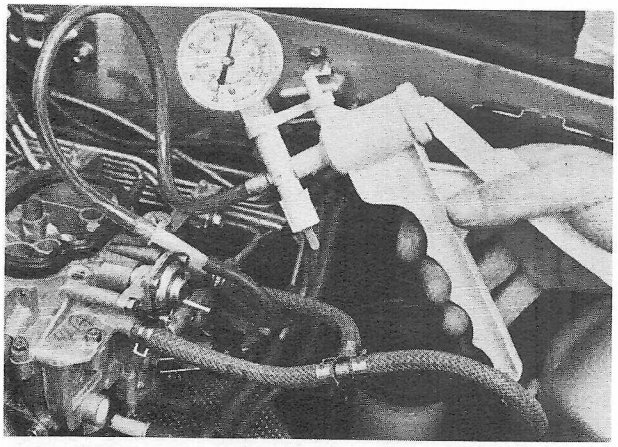


3. Turn engine off.
   - Vacuum should not drop.

VACUUM HOLDING SOLENOID VALVE

TRANS \ CAR	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HI ALT	1800 CAL
MANUAL	■	■	■	■	■
HONDAMATIC		■	■		
3 SPEED AUTO				■	■

1. Remove hose at air vent cut-off diaphragm and attach vacuum pump to the hose.

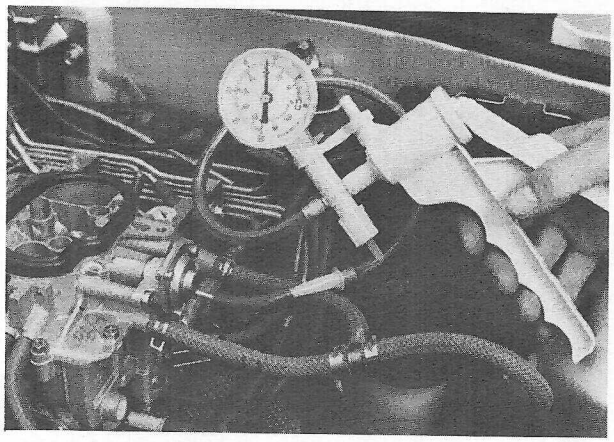


2. Turn ignition switch on.
3. Draw a vacuum on the pump.
   - Vacuum should remain steady
4. Turn ignition switch off.
   - Vacuum should drop to zero

AIR VENT CUT-OFF DIAPHRAGM

TRANS \ CAR	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HI ALT	1800 CAL
MANUAL	■	■	■	■	■
HONDAMATIC		■	■		
3 SPEED AUTO				■	■

1. Remove hose at air vent cut-off diaphragm and attach a vacuum pump to the hose.
2. Start engine. Vacuum should appear on gauge.
3. Connect vacuum pump to air vent cut-off diaphragm and draw vacuum. Vacuum should remain steady.



*Test Is Complete

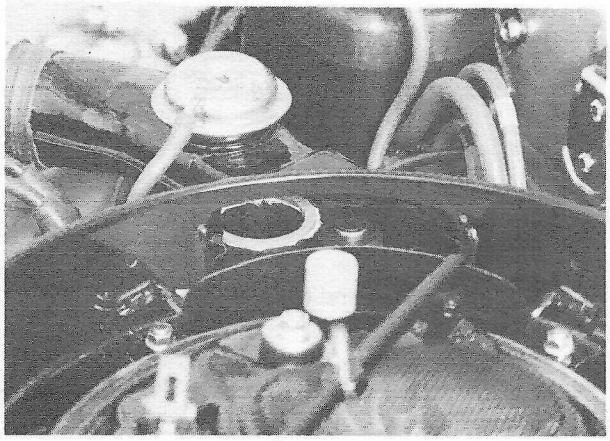
*Refer to the appropriate Service Manual for any test failures.

INTAKE AIR CONTROLS

TRANS \ CAR	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HI ALT	1800 CAL
MANUAL	■	■	■	■	■
HONDAMATIC		■	■		
3 SPEED AUTO				■	■

COLD ENGINE

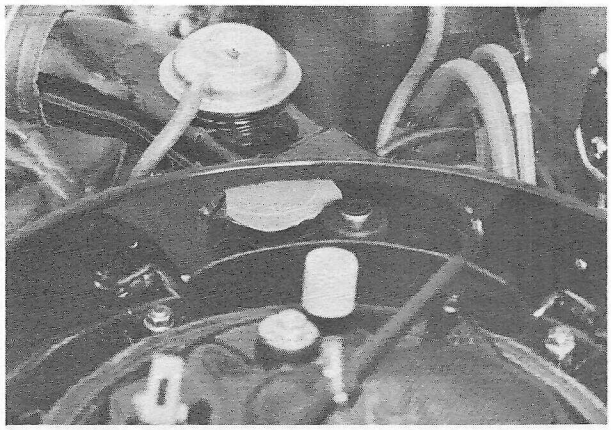
1. Idle engine (with air temperature less than 100°F.
2. Remove air cleaner element and check Air Control Valve door.



- Door should be up

HOT ENGINE

1. With engine idling, remove Air Cleaner element and check Air Control Valve door.



- Door should be down

*Test Is Complete

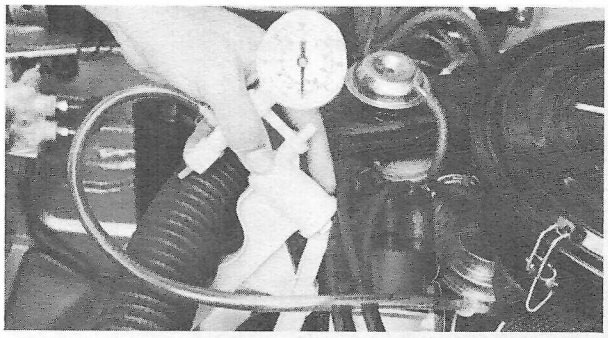
IGNITION TIMING CONTROLS

TRANS \ CAR	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HI ALT	1800 CAL
MANUAL	■				
HONDAMATIC					
3 SPEED AUTO					

COLD ENGINE

NOTE: Engine coolant temperature must be below thermosensor set temperature; thermosensor must have continuity.

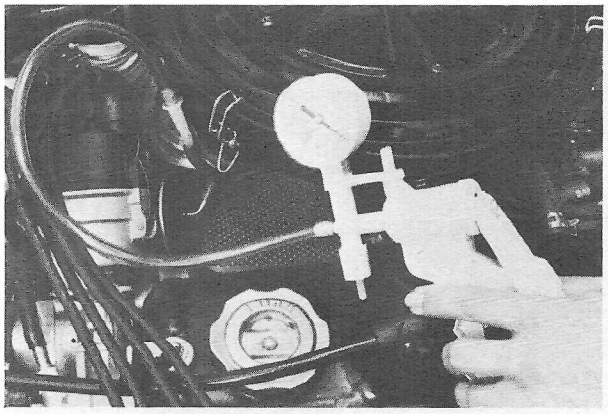
1. Connect vacuum gauge to vacuum advance hose.



2. Start engine and check for vacuum.
   - There should be vacuum.

HOT ENGINE

3. Wait for engine to warm up. Check for vacuum at the distributor vacuum advance unit at idle.
   - There should be no vacuum
4. Attach hand vacuum pump to advance diaphragm. Start engine and pull 150mm Hg. (6 in. Hg.) vacuum.
   - Timing should advance.



*Test Is Complete

*Refer to the appropriate Service Manual for any test failures.

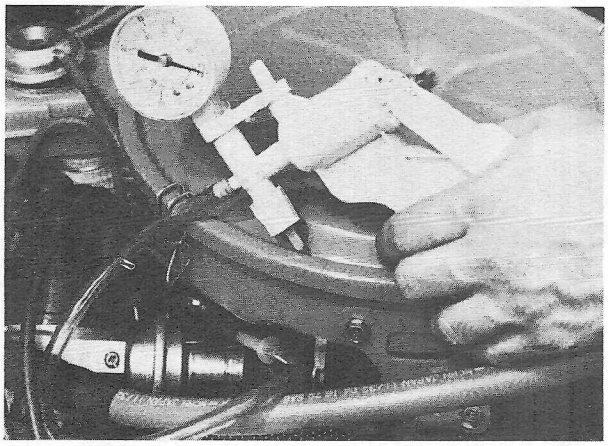
IGNITION TIMING CONTROLS

NOTE: There is no vacuum advance system on the California 1800 cc 3 speed models.

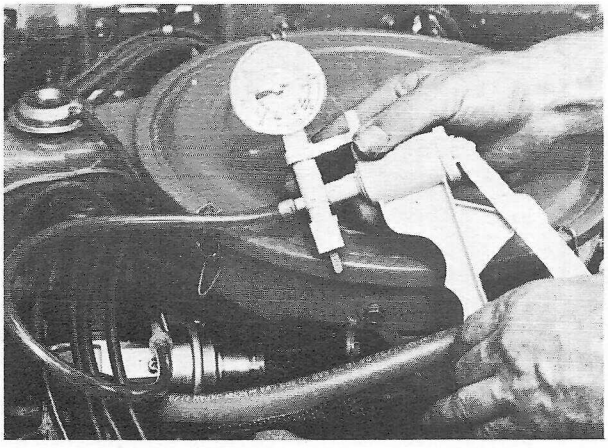
TRANS \ CAR	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HIALT	1800 CAL
MANUAL					■
HONDAMATIC					
3 SPEED AUTO					

COLD ENGINE

1. Connect vacuum pump to vacuum hose from RETARD side of distributor advance/retard.
2. Start engine and check for vacuum.
   - There should be no vacuum



3. Connect vacuum gauge to vacuum hose from ADVANCE side of distributor diaphragm.
4. Check for vacuum at 3500 rpm.
   - Vacuum should be available



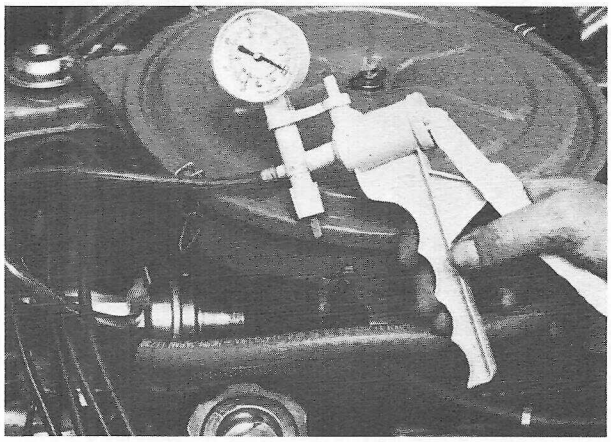
IGNITION TIMING CONTROLS (cont'd)

HOT ENGINE

5. Allow engine to warm up. Check RETARD vacuum hose for vacuum at idle.
   - There should be vacuum
6. Remove delay valve and replace with a T-fitting connected to vacuum gauge.

   Start engine and gradually raise engine speed until vacuum level reaches 140 to 160 mm Hg. (7.5 to 8.7 in. Hg.)

   Check retard hose for vacuum.
   - Vacuum at the retard hose should disappear
7. Remove delay valve. Use hand pump and a 280 mm length of 3.5 mm I.D. hose to test it as follows:
   - Plug two ends of delay valve. Apply vacuum. to the other end to check for leaks.
   - Apply vacuum to distributor side of valve to check for restriction. Gauge should show no vacuum
   - Apply vacuum to the carburetor side of green delay valve. Vacuum should decrease from 380 to 130 mm Hg. (15 to 6 in. Hg.) within 4-9 seconds.
8. Connect hand vacuum pump to distributor advance diaphragm.



Start engine and pull 280 mm Hg. (16 in. Hg.) vacuum.
- Timing should advance

*Refer to the appropriate Service Manual for any test failures.

IGNITION TIMING CONTROLS (Cont'd.)

9. Connect hand vacuum pump to retard side of distributer diaphragm.

   Start engine and apply vacuum.

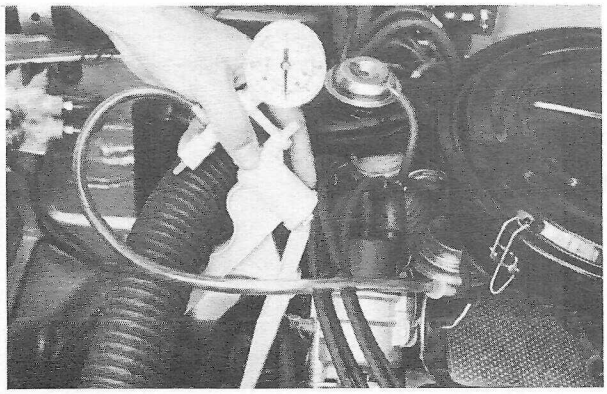
   - Timing should retard

*Test Is Complete

CAR / TRANS	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HI ALT	1800 CAL
MANUAL		■	■	■	
HONDAMATIC		■	■		
3 SPEED AUTO				■	

HOT ENGINE

1. Connect vacuum gauge to vacuum advance hose. Start engine and check vacuum.



1800:

- There should be vacuum at 3500 rpm within 1 minute

1500:

- 49ST Manual: There should be vacuum at idle
- 49ST Hondamatic, ALL CAL, and HI ALT: There should be vacuum at 3500 rpm.

2. Attach hand vacuum pump to vacuum advance diaphragm.

   Start engine and pull 200 mm Hg. (8 in. Hg.) vacuum.

   - Timing should advance

*Test Is Complete

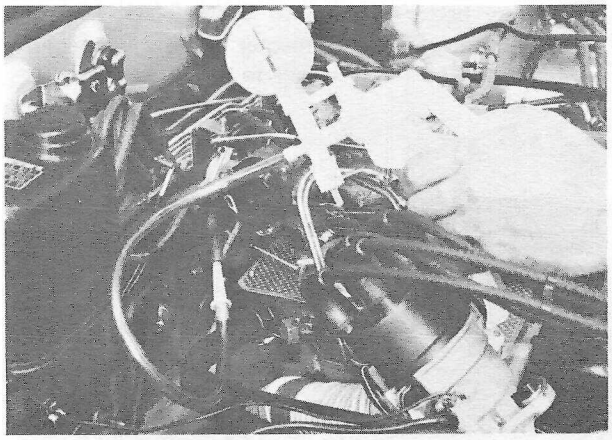
THROTTLE CONTROLS

Diaphragm Set Speed

CAR / TRANS	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HI ALT	1800 CAL
MANUAL	■	■	■	■	■
HONDAMATIC		■	■		
3 SPEED AUTO				■	■

HOT ENGINE

1. Connect a vacuum pump directly to the vacuum port of the throttle opener diaphragm.



2. With engine running, draw a vacuum greater than 400 mm Hg. (16 in. Hg.). Engine speed should be:

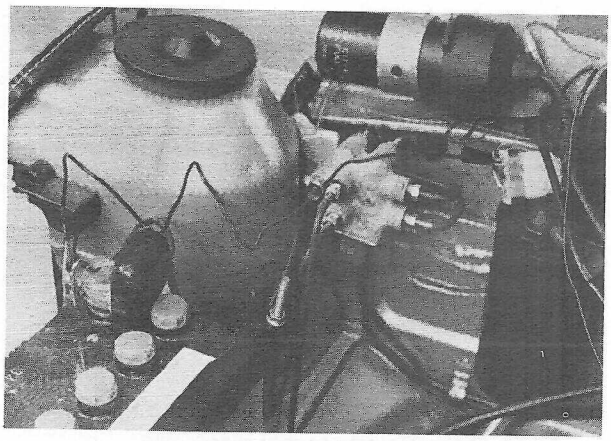
   - 1500 Manual: 3000 ± 500 rpm
   - 1300 and 1500 Hondamatic: 2800 ± 500 rpm
   - All 1800: 2500 ± 500 rpm within 1 minute

Dashpot

1. Reconnect vacuum line
2. Slowly raise engine speed to 3500 rpm and maintain for 2 to 3 seconds.
3. Release throttle. Watch for the arm to fully extend and count time for throttle to close.

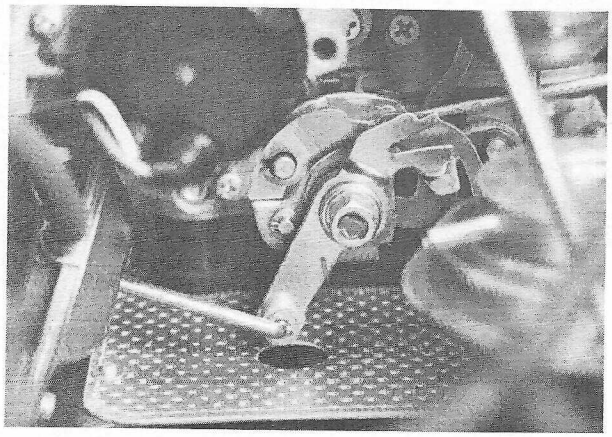
   - Should be 1 to 4 seconds

*Refer to the appropriate Service Manual for any test failures.



Throttle Opener

1. Apply battery voltage to yellow/black wire at the control box connector block (connector jumper wire from battery to yellow/black wire).

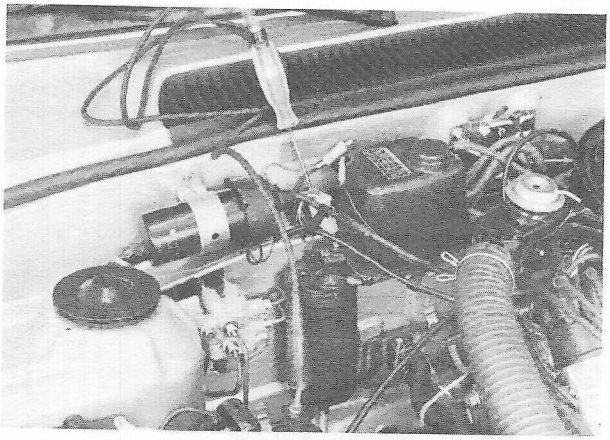


2. Slowly raise engine speed to 3500 rpm and release throttle and count closing time. Watch for the arm to fully extend.

   - Throttle closing time must be longer than the dashpot check time but no longer than 6 seconds

Speed Sensor

1. Connect volt meter, or 12V test light, positive probe to the yellow/black wire at the control box connector block. Connect negative probe to any convenient body ground.



2. Raise both front wheels off the ground. (use Safety stands)

3. Start engine. Select second gear or the 2 position. Accelerate slowly and check voltage.

   - Should show battery voltage above 20 mph
   - There should be no voltage below 10 mph

*Test Is Complete

*Refer to the appropriate Service Manual for any test failures.

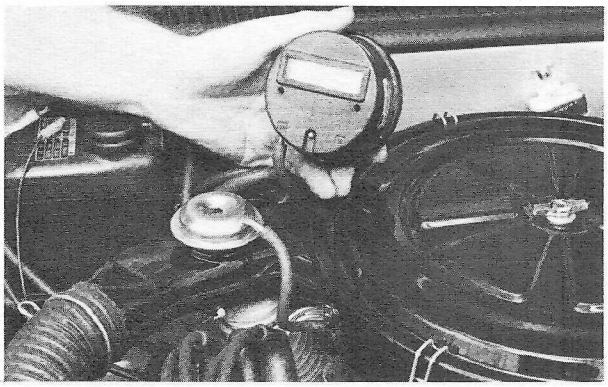
EXHAUST GAS RECIRCULATION

CAR / TRANS	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HI ALT	1800 CAL
MANUAL			■		
HONDAMATIC			■		
3 SPEED AUTO					■

COLD ENGINE

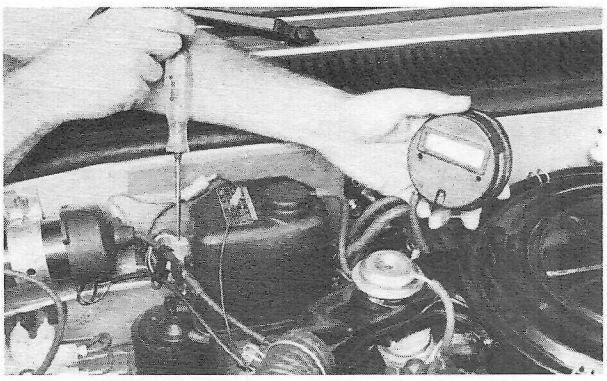
NOTE: Engine coolant temperature must be below thermosensor set temperature; thermosensor must have continuity.

1. Disconnect vacuum hose from E.G.R. Valve.
2. Raise engine speed to 5,000 rpm and check vacuum at E.G.R. valve hose.
   - There should be no vacuum

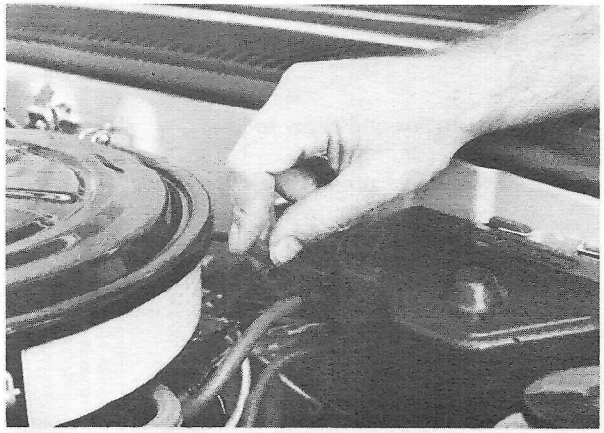


HOT ENGINE

1. Disconnect vacuum hose from E.G.R. valve and connect 0-4 in. Hg. vacuum gauge to hose.
2. Connect volt meter positive probe, or test light, to yellow wire (E.G.R. solenoid valve wire) at control box connector block. Connect negative probe to any convenient body ground.



3. Raise both front wheels off the ground. Support with safety stands. Block rear wheels.
4. Vacuum and voltage should be as shown in box.



CONDITION	VACUUM OF EGR HOSE	VOLTAGE AT YELLOW WIRE AT CONTROL BOX CONNECTOR BLOCK
Idle	No	No
Neutral 4500 rpm	Yes	No
4500 rpm with blocked vacuum bleed	Less than 2" hg.	No
Rapid acceleration under load	Yes	No
Deceleration above 20 mph	No	Yes

* Test is complete.

5. Attach pump gauge to E.G.R. Valve.

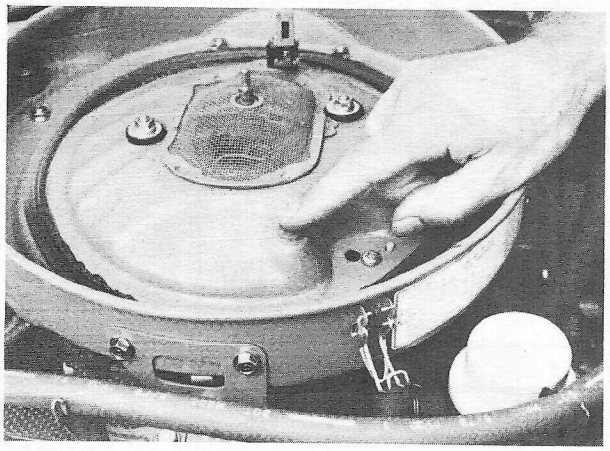
   With engine at idle, draw vacuum on gauge. Engine should die.

*Refer to the appropriate Service Manual for any test failures.

ANTI-AFTERBURN VALVE

TRANS \ CAR	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49ST/HIALT	1800 CAL
MANUAL	■			■	■
HONDAMATIC					
3 SPEED AUTO				■	■

1. Start engine and allow to idle.
2. Check for vacuum at the valve inlet.
   - There should be no vacuum.



3. Quickly raise engine speed to 3500 rpm and close the throttle suddenly.
   - There should now be vacuum at the inlet.

*Test Is Complete

NOTES

* Refer to the appropriate Service Manual for any test failures.

APPROACH TO TROUBLESHOOTING

Troubleshooting can be learned in two different ways (1) trial and error or (2) following a common sense system that identifies the most likely causes of a problem.

Trial and error can be very time consuming and wasteful. It is also a never ending process. As systems are changed or added, a new, lengthy learning process begins. It would take one person a long time to experience all the different possibilities.

Honda has structured a common sense approach to troubleshooting by compiling information from experienced, skilled technicians and from experiments of creating component failures. The data on existing systems and the results of the experiments on new systems have been compiled into a single Troubleshooting Chart. The chart proceeds from a symptom or complaint to the most likely causes of the problem. The troubleshooting approach is a 5-step process.

1. Verify the symptom – the customer's complaint is the starting point. Whenever possible, verify the nature of the complaint and observe for additional symptoms.

2. Identify, on the chart, the possible causes.

3. From the order on the chart, test the system in which the probable cause lies.

4. Correct the problem according to the procedure in the Shop Manual.

5. Verify the solution – be sure the symptom has been eliminated. Observe for other symptoms which may now show up.

EMISSION CONTROL RELATED TROUBLESHOOTING CHART

SYMPTOM	ITEMS TO CHECK
	Items are arranged from most likely to least likely.
❶ NO IDLE	1. Plugged Circuit in Carburetor 2. Fuel Cut-Off Solenoids 3. Float Level Needle Valve and Seat Stuck 4. Vacuum Leak 5. Valve Adjustment Too Tight or Burned Valves 6. E.G.R. Valve Open 7. Anti-Afterburn Valve Stuck Open
❷ ROUGH IDLE	1. Idle Mixture Misadjusted 2. Plugged or Partially Plugged Idle Circuit 3. Secondary Throttle Blade Stuck Open 4. Main Jet Pullover 5. Needle and Seat Leaking 6. Choke Operation 7. Air Vent Cut-Off Hoses, Diaphragms and Solenoids 8. E.G.R. Valve Stays Open 9. Vacuum Leak 10. Compression Low (One Cylinder) 11. Fuel Cut-Off Solenoids 12. Anti-Afterburn Valve Stuck Open
❸ ENGINE STALLS **Intermittently**	1. Fuel Cut-off Solenoids Poor Connection 2. Restricted Fuel Filter 3. Intermittent Fuel Pump Operation 4. Ignition Switch 5. Defective Coil 6. Poor Electrical Connection 7. Needle Valve and Seat Stuck
After Start	1. EGR Valve Leaking 2. Choke Operation 3. Plugged Idle Circuit 4. Fuel Cut-off Solenoids Not Operating 5. Anti- After Burn Valve Open
After High Speed Drive	1. Float Level or Needle and Seat 2. Partially Plugged Idle Circuit 3. Air Intake Temperature Control Door Stuck Up 4. Two-way Valve

❹ MISFIRE

All The Time

1. Spark Plugs
2. Secondary Ignition Wires
3. Burned or Misadjusted Valves
4. E.G.R. Valve Open
5. Float Level — Needle and Seat
6. Defective Coil

At Idle

1. Plugged or Partially Plugged Idle Circuit
2. Vacuum Leak
3. Burned or Misadjusted Valve
4. E.G.R. Valve Leaking
5. Float Level or Needle and Seat
6. Defective Coil

High Speed

1. Spark Plugs or Ignition Wires
2. Defective Coil
3. Hoses Reversed on Vacuum Holding Valve

❺ DRIVEABILITY

Stumbles On Acceleration

1. Accelerator Pump Discharge Insufficient
2. Idle Mixture Screw Misadjusted
3. Float Level Too Low
4. Vacuum Leak
5. Timing Misadjusted
6. Centrifugal Timing Advance Inoperative or Sticking
7. Spark Plugs Fouled
8. Main Carburetor Circuit Restricted
9. Choke Operation (Cold Complaint Only)

Surge Or Flat Spots At Steady Speed

1. Float Level Too Low
2. Main Carburetor Circuit Restricted
3. Spark Plugs or Ignition Wires
4. Choke Operation (Cold Complaint Only)
5. E.G.R. Operation

RPM Does Not Drop Between Shifts

1. Dashpot Orifice Plugged
2. Sticking Throttle Shafts
3. Vacuum Hoses 3 & 4 Switched at Carburetor
4. Throttle Control Valve Misadjusted

COMPLETE EMISSION CONTROL FUNCTIONAL TEST FOR ALL 1980 AUTOMOBILES

1. Inspect and Clean Crankcase Emission Control System (Cold Check).
   - Clean crankcase orifice with a No. 54 (1.4 mm diameter) drill (1800) or No. 57 (1.09 mm) drill (1300, 1500).
   - Inspect condensation chamber and hoses. If necessary, remove chamber and clean chamber and hose passages.

2. Inspect Automatic Choke (Engine Cold).
   - Remove air cleaner cover.
   - Pump accelerator once to engage auto choke. Butterfly should be fully closed.
   - Start engine. Choke should partially open.

3. Inspect Fast Idle Unloader.
   - Engine should hold fast idle.

4. Evaporative Controls (Engine Cold, continuity across thermosensor)
   a. Disconnect upper hose at purge control diaphragm valve and connect vacuum gauge to hose.
   b. Start engine. No. vacuum should be indicated on gauge.

5. Inspect Exhaust Emission Controls (Engine Cold).
   a. Intake Air Temperature Control System
      - With engine idling, remove the air cleaner element. Check that air control valve door is up.
   b. Timing Control – HI ALT / 49 ST (1800) and 49 ST HM, CAL/HI ALT MT & HM (1500) and 1300 49 ST
      - Check that vacuum is present at distributor advance diaphragm (hose 2) at 3500 rpm.
      - Apply vacuum to distributor advance diaphragm with a vacuum pump, timing should advance.
   c. E.G.R. (CAL & HI ALT only)
      - Disconnect vacuum hose from E.G.R. valve.
      - Raise engine speed to 5,000 rpm and check that there is no vacuum at E.G.R. valve hose.

   1800 CALIF
      - Check that there is no vacuum at retard side of distributor at idle.
      - Check that there is vacuum at the advance side of the distributor at 3500 rpm.

6. Inspect Exhaust Emission Controls (Engine Hot).
   a. Timing Control

   1300 MT
      - Check that there is no advance vacuum with engine hot.

   1800 MT CAL only
      - At idle, check that vacuum is available to the retard diaphragm.
      - Connect vacuum gauge to vacuum advance hose. Start engine and gradually raise engine speed until vacuum level reaches 140-160 mm Hg. (5.5 - 6.3" Hg.). Vacuum in retard hose should disappear.
      - Release throttle; vacuum should drop to zero.
      - Apply vacuum to advance side of distributor advance retard unit and check to see if timing advances.
      - Apply vacuum to retard side of distributor advance retard unit and check to see if timing retards.

   b. Intake Air Temperature Control System
      - With engine idling, remove the air cleaner element. Check that air control valve door is down.

7. Inspect Ignition Timing (16.17)

TRANS \ CAR	1300 49ST	1500 49ST	1500 CAL/HIALT	1800 49STHIALT	1800 CAL
MANUAL	2° BTDC	15° BTDC (sedan) 10° BTDC (wagon)	0° TDC	0° TDC	0° TDC 4° ATDC (sedan)
HONDAMATIC		0° TDC	0° TDC		
3 SPEED AUTO				0° TDC	

8. Inspect Automatic Choke (Engine Hot)
   - Butterfly valve should open fully as engine warms up. Engine speed should drop to below 1400 rpm.
   - With engine off, disconnect vacuum hose from choke unloader.
   - While pushing on the choke linkage to hold the choke valve closed, open and close the throttle to engage the fast idle cam.
   - Start engine and run for one minute. Engine fast idle should be: 2500 ± 500 rpm.
   - Reconnect vacuum hose to choke unloader: Engine speed should drop below 1400 rpm.
   - Reinstall air filter and cover.

9. Inspect Throttle Controller
   a. Diaphragm Set Speed
      - Connect a vacuum pump directly to the vacuum port of the throttle controller diaphragm. Draw a vacuum greater than 16 in. Hg. (400 mm Hg.). Engine speed should be
        2500 ± 500 rpm within 1 minute (all 1800)
        3000 ± 500 rpm within 1 minute (1500, 1300 MT)
        2800 ± 500 rpm within 1 minute (1500 HM)
   b. Dashpot
      - Reconnect vacuum line.
      - Raise engine speed slowly to 3500 rpm and maintain for 2 to 3 seconds.
      - Release throttle suddenly, throttle opener arm should fully extend in 1 to 4 seconds.
   c. Throttle Opener
      - Bypass the speed sensor by jumping battery (+) voltage to yellow/black wire at the emission control box connector.
      - Raise engine speed to 3500 rpm and release throttle. Time for throttle opener arm to fully extend must be longer than dashpot time but

not longer than 6 seconds.

d. Speed Sensor
- Jack up front of car, support with safety stands, block rear wheels and set brake.
- Push positive lead of test light at voltmeter into yellow/black wire terminal at snap connector of emission control box. Connect negative lead to any suitable ground.
- Start engine and using 2nd gear, accelerate slowly. Test light or voltmeter should indicate battery voltage above approximately 20 mph and no voltage below 10 mph.

10 E.G.R. (CAL + HI ALT 1500 only)

a. Disconnect vacuum hose from E.G.R. valve and connect 0-4 in. Hg. vacuum gauge to hose.

b. Connect voltmeter positive probe or test light to yellow wire (EGR solenoid valve wire) control box connector block and connect negative probe to any convenient body ground.

c. Raise both front wheels off the ground, support with safety stands, block rear wheels.

d. Vacuum and voltage should be as shown in box.

CONDITION	VACUUM AT EGR HOSE	VOLTAGE AT YELLOW WIRE (EGR SOLENOID VALVE)
Idle	No	No
Neutral 4500 rpm	Yes	No
4500 rpm with blocked vacuum bleed	Less than 2" hg.	No
Rapid acceleration under load	Yes	No
Deceleration above 20 mph	No	Yes

11 Check Idle Speed & Mixture Using Propane Enrichment Method. (See page 22 for Specification)

12 Inspect Idle Control System (A/C Only)
- Recheck idle speed with A/C on (see underhood label for speed).
  - — If out of tolerance, adjust by turning screw on idle boost diaphragm.

13 Anti-Afterburn Valve
- Remove air cleaner cover.
- Start engine and allow to idle. There should be no vacuum at inlet tube.
- Quickly raise engine speed to 3500 rpm and release throttle. There should now be vacuum at inlet tube.

14 Inspect Evaporative Controls

a. Purge Control Unloader Solenoid Valve.
- Disconnect upper hose from the purge control diaphragm. Connect a vacuum gauge to the hose.
- Start engine. Vacuum should appear on gauge.

b. Charcoal Canister and By-pass Solenoid Valve
- Remove gas cap.
- Pry purge air tube out of frame and connect to 0-4 in. Hg. vacuum gauge.
- Raise engine speed to 3500 rpm. Vacuum should appear on gauge within one minute.
- Connect vacuum pump to tank fitting on charcoal canister and pump the pump. Canister should not hold vacuum.
- Connect vacuum pump to tank fitting hose and start engine.
- No vacuum should appear on gauge.
- Stop engine and turn ignition switch on. Draw a vacuum. Vacuum should remain steady.

c. Two Way Valve
- Remove fuel filler cap.
- Disconnect vapor line from liquid/vapor separator pipe. Connect a T fitting and attach a 0-4 in. Hg. vacuum gauge and a vacuum hand pump. Slowly draw a vacuum on the pump while observing vacuum gauge.
- Vacuum should stabilize at 5 to 15 mm Hg. (.2 — .6 in. Hg.) as the two-way valve opens.
- Move the hose connections to the pressure side of both the hand pump and the gauge and slowly pressurize the line. Pressure should momentarily stabilize at 35 to 70 mm Hg. (1.4 to 2.8 in. Hg.) as the two-way valve opens.

d. Air Vent Cut-Off Diaphragm and Vacuum Holding Solenoid Valve
- Disconnect the hose at the air vent cut-off diaphragm and install a vacuum pump to the hose.
- Turn ignition switch on and draw a vacuum. Vacuum should remain steady.
- Turn ignition switch off. Vacuum should drop to zero.
- Start engine and allow to idle. Vacuum should appear on gauge.
- Connect vacuum pump to air vent cut-off diaphragm and draw a vacuum.
- Vacuum should remain steady.

e. Vacuum Holding Solenoid Valve (CAL only) For Power Valve
- Disconnect hose at power valve and connect vacuum pump to hose.
- Start engine. Vacuum should appear on gauge.
- Turn ignition switch off. Vacuum should not drop.

f. Power Valve
- Disconnect hose at power valve and install vacuum pump to hose.
- Start engine and allow to idle. Vacuum should be available.
- Connect vacuum pump to power valve and draw a vacuum. Vacuum should remain steady.

15 A.J.C. (CAL and HI ALT Only)
- Attach vacuum pump to each port of AJC in turn.
- Slowly draw a vacuum of 200 mm Hg. (8 in. Hg.) and observe time for vacuum to drop to zero.
- Above 1000 meters (3000 ft.): less than 5 seconds.
- Between 500 meters and 1000 meters: time may be either longer or shorter than 5 seconds.
- Below 500 meters (1500 ft.): time should be longer than 5 seconds.