18. PERIODIC MAINTENANCE

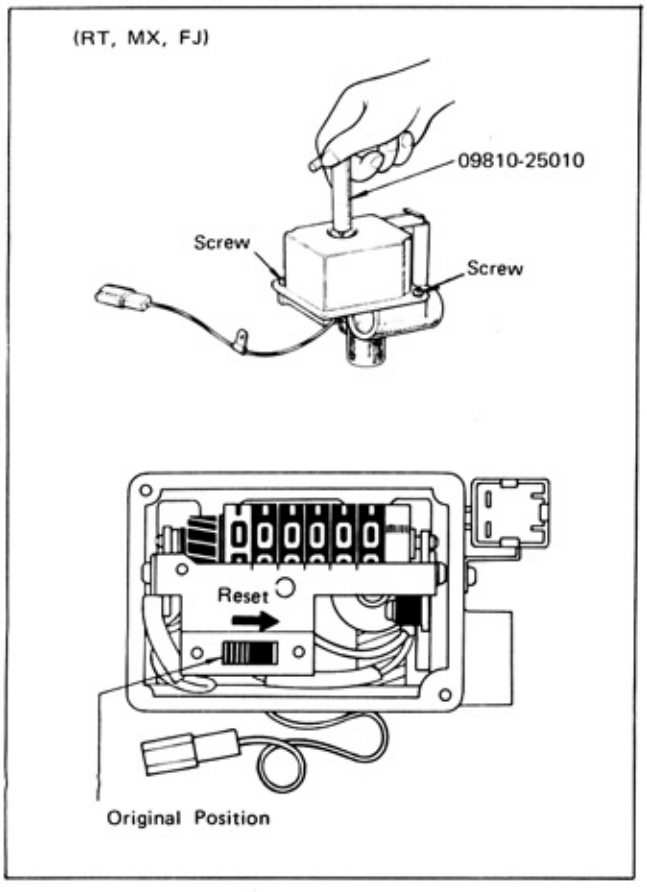
CONTENTS

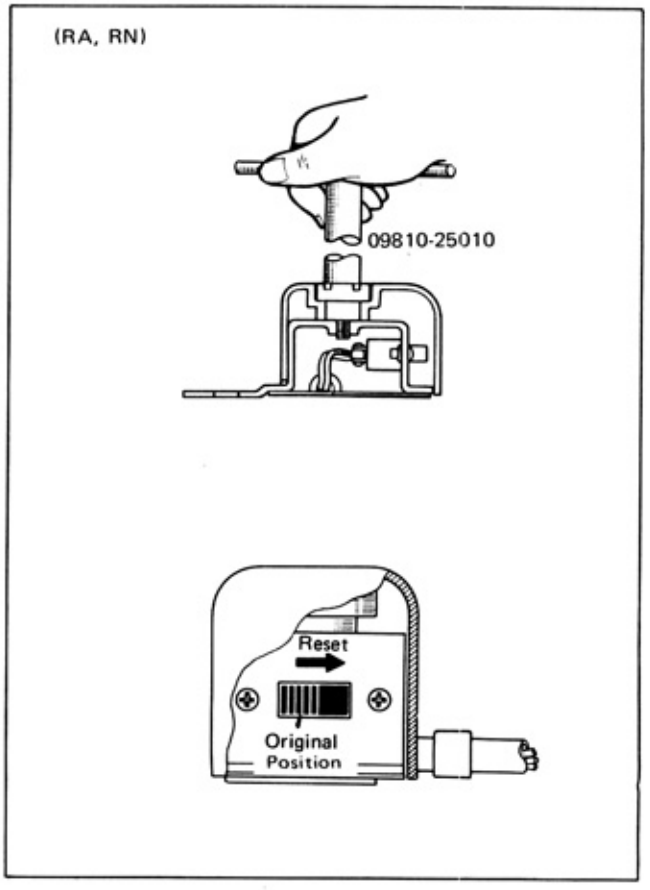
18. PERIODIC MAINTENANCE

GENERAL

1. This section covers the working procedures for periodic maintenance of the emission control systems and the engine for the purpose of keeping their performances at top level for long time.
2. In the various inspection items, work at cold engine and that after warming up are specified. There are also many operations that are duplicated. Therefore, the working procedures in this should be well understood from an overall viewpoint in order to perform the jobs with best efficiency.
3. EGR warning light will switch on when the 25,000 or 50,000 mile point is reached. In such case, all of the work called for in the 25,000 or 50,000 maintenance must be completely finished before resetting the EGR warning light. To reset:

   - Using SST (09810-25010), remove the cover from EGR warning detector or warning cancel switch.
   - Tilt the reset switch toward the side opposite from where it is now.
   - Check to make sure that the warning light will turn off when the ignition is switched on, and turn on when the starter is turned.
   - Reinstall the cover.





4. The code letters used in the periodic maintenance tables denote the following operations:

   A : Adjust R : Replace or change C : Cleaning
   I : Inspect (correct or replace if necessary)

MAINTENANCE TABLE

Item		Maintenance Interval								
	mile	1,000	6,000	12,500	19,000	25,000	31,000	37,500	44,000	50,000
	month	1	6	12	18	24	30	36	42	48
I Basic mechanical components (Engine)										
1	Valve lash	A		A		A		A		A
2	Drive belts	A		I		R		I		R
3	Engine bolt torque	A		I		I		I		I
4	*Engine oil and oil filter		R	R	R	R	R	R	R	R
5	Engine coolant (long life coolant)					R				R
6	Cooling system, hoses and connections			I		I		I		I
7	Vacuum fittings hoses and connections			I		I		I		I
8	Engine compression pressure					I				I
9	Oil cooler hoses (4M family only)			I		I		I		I
10	Exhaust pipes and mountings			I		I		I		I
II Fuel system										
11	Curb idle speed and air/fuel mixture			A		A		A		A
12	Engine idle speed (curb idle speed and fast idle speed)	A								
13	Cold starting enrichment system (includes fast idle speed setting)	A		A		A		A		A
14	Fuel filter					R				R
15	** Air filter			I		R		I		R

Item		Maintenance Interval								
	mile	1,000	6,000	12,500	19,000	25,000	31,000	37,500	44,000	50,000
	month	1	6	12	18	24	30	36	42	48
16	Inlet air and exhaust gas heat control valve			I		I		I		I
17	Idle stop deceleration solenoid or throttle delay	I		I		I		I		I
18	Fuel system cap, tank lines and connections	I				I				I
19	Fuel tank cap gasket					R				R
20	Auxiliary acceleration pump			I		I		I		I
III	Ignition system									
21	Ignition timing, dwell angle	A		A		A		A		A
22	Distributor breaker points	C		C		R		C		R
23	Spark plugs			R		R		R		R
24	Ignition wiring			I		I		I		I
25	Distributor, cap and rotor			I		I		I		I
26	Operating parts of distributor (advance mechanism)			I		I		I		I
27.	Spark control modulation [Vacuum delay valve only for 2T-C family to be sold in 49-states]			I		I [R]		I		I [R]
IV	Crankcase emission control system									
28	PCV valve			I		R		I		R
29	Ventilation hoses and connections			I		I		I		I

Item		Maintenance Interval								
	mile	1,000	6,000	12,500	19,000	25,000	31,000	37,500	44,000	50,000
	month	1	6	12	18	24	30	36	42	48
30	Oil filler cap			I		I		I		I
V	External exhaust emission control system									
31	Secondary air injection system, hoses and connection			I		I		I		I
32	Air pump and control valves [Vacuum delay valve for 2T-C and 20R engine family only]					I [R]				I [R]
33	Exhaust gas recirculation system [Except 2T-C engine family]					I				I
VI	Fuel evaporative emission control system									
34.	Carbon storage media			I		I		I		R
35	Fuel vapor check valve			I		R		I		R
36	Charcoal canister storage system hoses and connections			I		I		I		I
VII	Miscellaneous									
37	Wiring harnesses and connections			I		I		I		I

Remark * Under severe driving conditions change engine oil and engine oil filter every 3,000 miles or 3 months.
Severe driving condition:
(a) Operating in extremely cold weather
(b) Pulling trailers
(c) Continuously making short trips
(d) Driving on dusty roads

Remark ** Under continuous driving condition on dusty roads such as unpaved roads, inspect air filter every 4,000 miles or 4 months and replace air filter every 25,000 miles or 24 months.

Remark *** 2F engine family only.

1,000-MILE MAINTENANCE

COLD ENGINE OPERATIONS

1. DRIVE BELT ADJUSTMENT

(1) The drive belt should deflect the specified amount when pressed down at specified pressure (22 lbs.)

(2) If the deflected amount is not at specified value, adjust by shifting the position of the alternator and air pump.

Caution:
Do not attempt to shift the air pump by prying its die cast part with a lever. Pry the rear cover or bolt pin in making the adjustment.

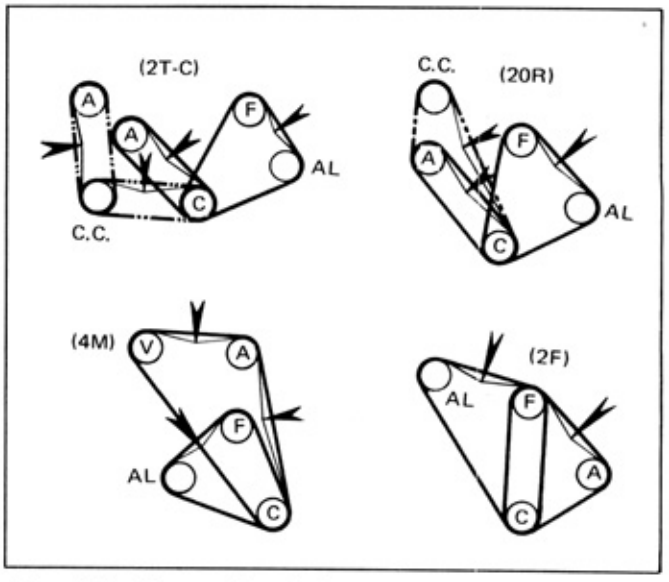


Fig. 18-1 Inspection Points

Drive Belt Tension (at 22 lbs.)

Checking Portion	2T-C	20R	4M	2F
Fan Pulley to Alternator Pulley	0.31 to 0.47"	0.31 to 0.51"	0.31 to 0.47"	0.51 to 0.59"
Air Pump Pulley to Vane Pump Pulley	–	–	0.31 to 0.41" (w/ Vane Pump)	–
Air Pump Pulley to Crank Pulley	0.51 to 0.71"	0.31 to 0.51" (w/o Cooler)	0.71 to 0.85" (w/o Vane Pump)	–
Air Pump Pulley to Fan Pulley	–	–	–	0.28 to 0.39"
Crank Pulley to Cooler Compressor Pulley	0.43 to 0.55" (w/ Cooler)	0.43 to 0.51" (w/ Cooler)	–	–
Air Pump Pulley to Cooler Compressor Pulley	0.39 to 0.55" (w/ Cooler)	–	–	–

2. FUEL SYSTEM CAP AND TANK LINES AND CONNECTIONS INSPECTION

(1) Fuel tank cap

- Visually check the gasket for damage and deformation, and replace the gasket if found defective.
- Visually check the safety valve for rust and sticking. If defective, replace the cap.

(2) Fuel tank

- Visually check the fuel tank for gasoline leakage and for injury or deformation in tank. If defective, repair or replace.

(3) Fuel and vapor lines

- Visually check the pipes and hoses. If there is any gasoline leakage, improper connection or clamping, or excessive bending, repair or replace as found necessary.

3. ENGINE BOLT TORQUE ADJUSTMENT

(1) Disconnect the various hoses connected to the air cleaner, and remove the air cleaner.

(2) Remove the cylinder head cover.

(3) In the 4M, and 2F engines, remove the valve rocker supports.

(4) Tighten the cylinder head bolts at specified torque.

Note
Tighten uniformally, starting from the center of cylinder head and working outward.

(5) In the 4M, and 2F engines, install the valve rocker supports and tighten their bolts at the specified torque.

(6) In the 20R engine, remove the heat insulator from the exhaust manifold.

(7) Tighten the exhaust manifold bolts or nuts at specified torque.

Note
In 2F engine, it is not require to retighten the No. 2 nut from front.

(8) In the 20R engine, install the heat insulator.

(9) Install the cylinder head cover.

Tightenting Torque (ft-lb)

Engine Family	Cylinder Head	Exhaust Manifold	Rocker Arm Support
2T-C	52.1 to 63.7	7.2 to 11.6	(52.1 to 63.7)
20R	52.1 to 63.7 (12 mm bolt)	28.9 to 36.2	(52.1 to 63.7)
4M	10.8 to 20.3 (8 mm bolt) 54.2 to 61.5 (10 mm bolt)	12.3 to 16.6	22.4 to 32.5
2F	83.2 to 97.6	28.2 to 36.9	14.5 to 21.7 (8 mm bolt) 21.7 to 32.6 (10 mm bolt)

4. COLD STARTING ENRICHMENT SYSTEM ADJUSTMENT (Includes Fast Idle Speed Setting)
5. ENGINE IDLE SPEED (Curb Idle and Fast Idle) ADJUSTMENT
6. VALVE CLEARANCE ADJUSTMENT
7. DISTRIBUTOR BREAKER POINT CLEANING
8. IGNITION TIMING AND DWELL ANGLE ADJUSTMENT

Note
The operations 4 to 8 above include work that must be performed on cold engine and also work that is repeated, so that in order to accomplish these operations with best efficiency, proceed as follows:

(1) Visually check the carburetor.
a. Check all connections for tightness, and retighten any found loose.
b. Check the linkage for wear, snap rings to see if any is missing, and throttle shaft for excessive clearance, and correct any defect found.

(2) Check the choke mechanism (except 2F engine).
a. Check the standard mark on the thermostatic case to see that it is aligned with that on the coil housing. If not aligned, correct by turning the case.

Caution:
In the 20R engine, do not loosen the bolt at case center as this will allow the coolant to come out. Make the adjustment by loosening the three outer screws.

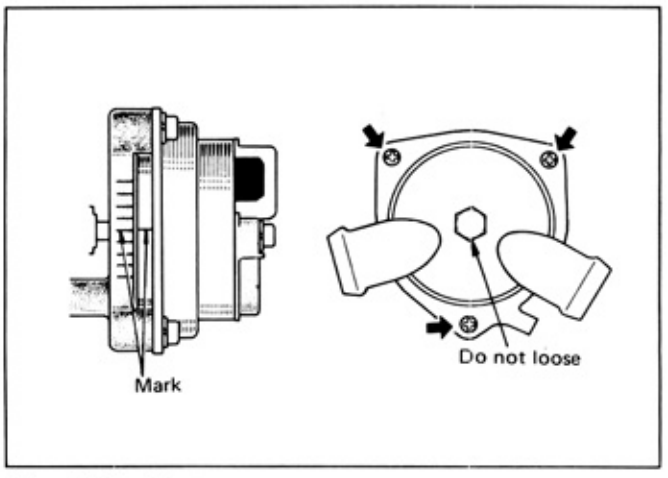


Fig. 18-2 Marks

b. At cold engine (coolant temp.: below 40°F), and with the engine stopped, check the choke valve to see that it will close fully when the accelerator pedal is stepped on lightly and then released. If defective, repair or replace the link or bimetal.

c. With the choke valve full closed and the engine stopped, use SST [09240-00011] and check to see that the choke valve will open to the specified angle (unloader angle) when the throttle valve is fully opened.
If the unloader angle is not at specified angle, adjust by bending the link (at part A).

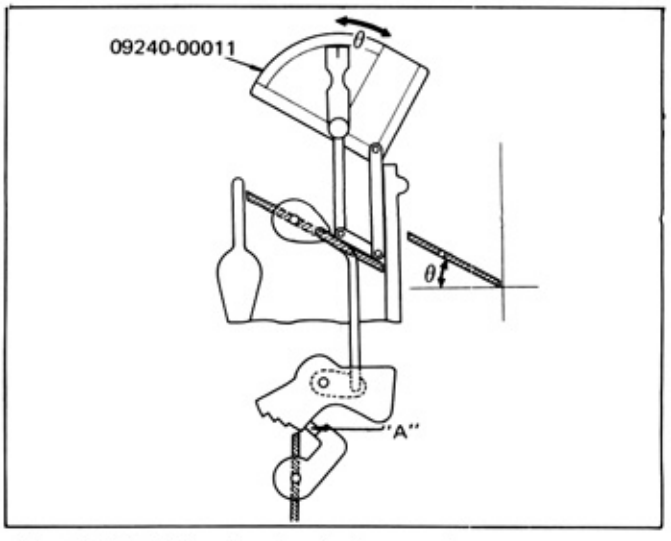


Fig. 18-3 Unloader Angle Inspection

Unloader Angle (θ)

2T-C	47°
20R	50°
4M	40°

(3) CHOKE OPENER SYSTEM INSPECTION (20R Engine, and 2T-C Engine for Calif.)

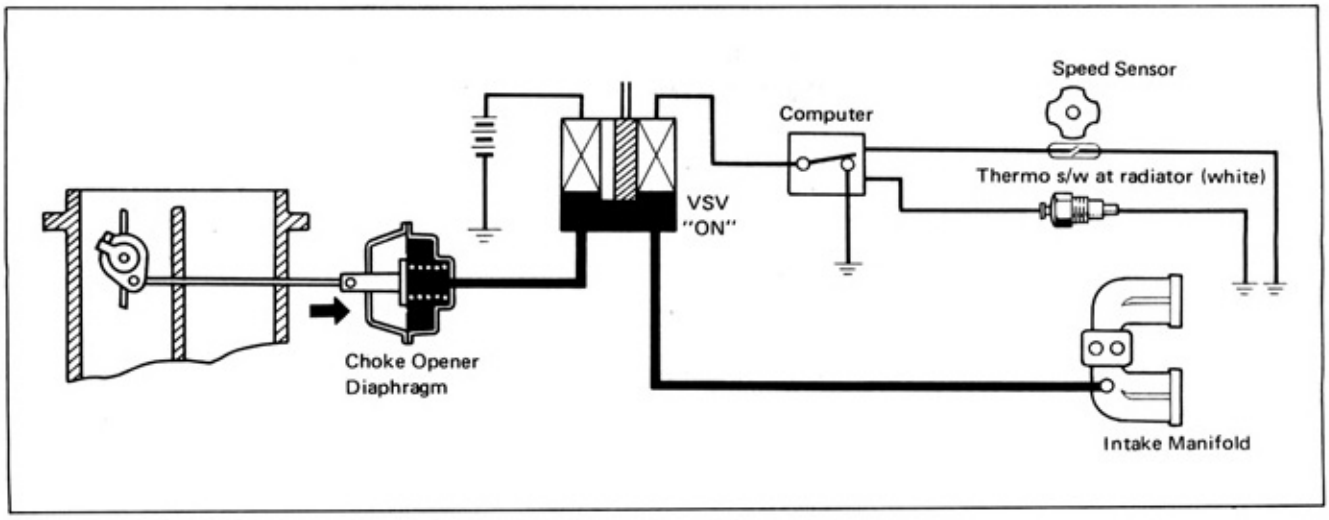


Fig. 18-4 Choke Opener System (2T-C Engine for Calif.)

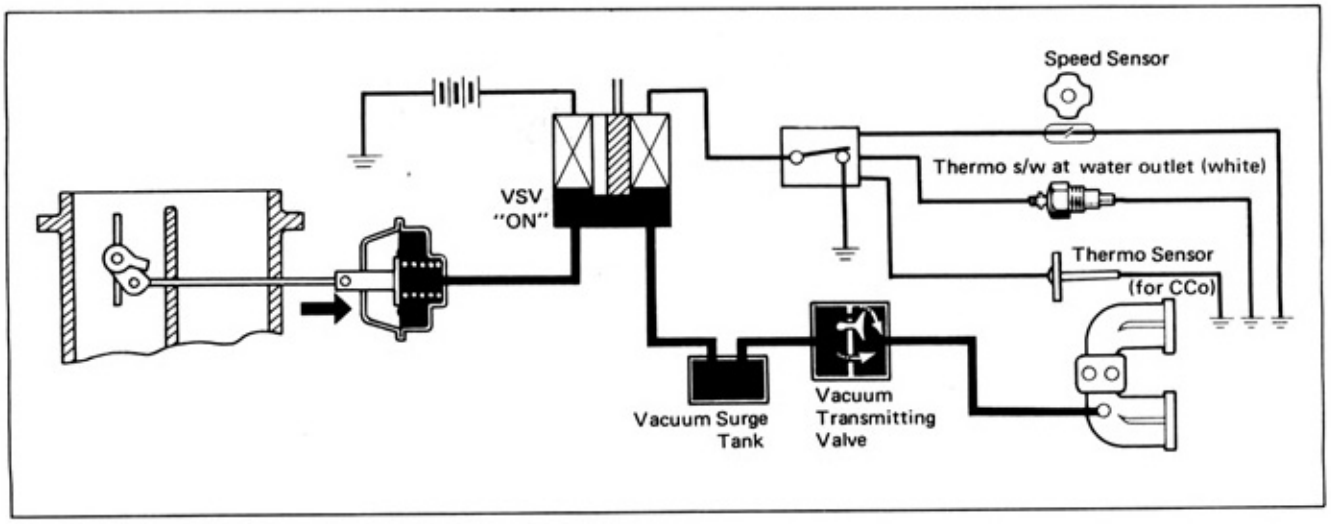


Fig. 18-5 Choke Opener System (20R Engine)

a. Visually check the vacuum hoses and wiring for disconnection and damages, and correct any defect found.

b. With the choke valve closed, check to see that it will open when the choke opener diaphragm hose is sucked in with mouth, and that it will close when the mouth is released.
If faulty, repair or replace the link or diaphragm.

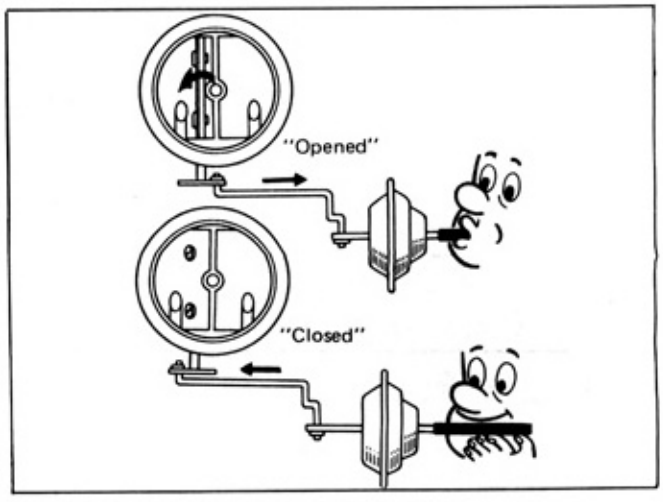


Fig. 18-6 Choke Opener Inspection

[When Checker is used]

a. Connect the checker to the inspection connector and VSV connectors. (P.22-6)

b. At cold engine (coolant temperature below 40°F), set the dial "P" to "20R" "2T" and tilt the switches "K" to "O" toward the "VEHICLE" side.

c. Switch on the ignition.

- In the 2T-C engine, lights "C" and "J" should be extinguised.
- In the 20R engine, lights "C" and "J" should be extinguished. In the passenger cars for California, light "D" should be on.

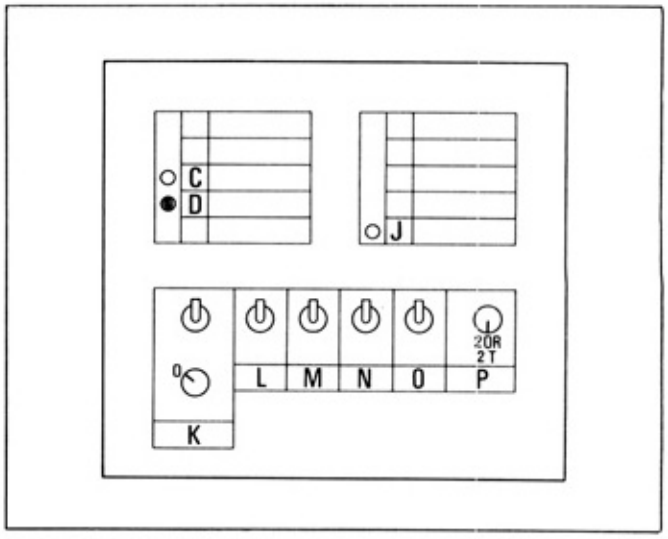


Fig. 18-7 Choke Opener Inspection (2T-C, 20R)

OPERATIONS AFTER WARMING UP ENGINE

a. Disconnect the hose between the vacuum switching valve (VSV) and choke opener diaphragm, and connect a vacuum gauge to the VSV pipe (No. 7 pipe in 2T-C engine and No. 11 pipe in 20R engine).

b. At idling, 2T-C engine should not shown vacuum.
The 20R engine should show vacuum at this time.

c. In case of 2T-C, vacuum should be shown when driven at 20 to 30 mph.

d. Replace the vacuum hose to former connections.

- If faulty, inspect in accordance with the inspection procedures in the section Choke Opener System.

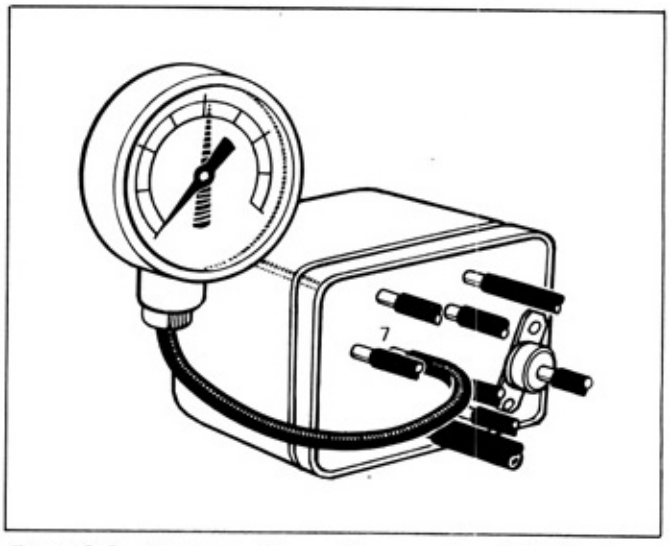


Fig. 18-8 Vacuum Gauge Connection (2T-C)

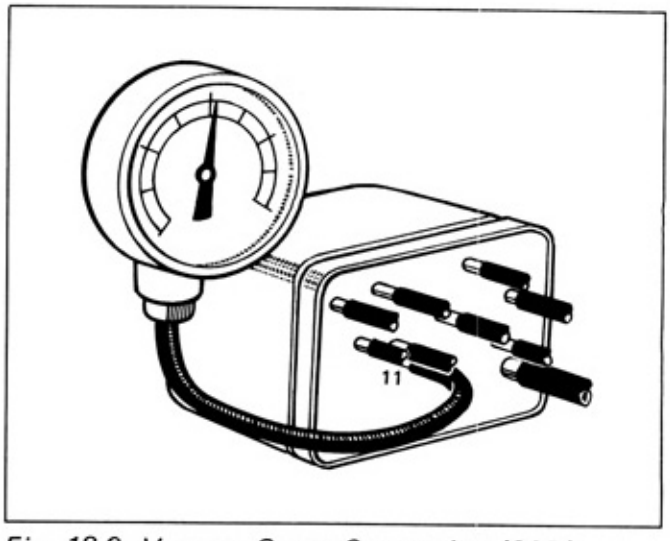


Fig. 18-9 Vacuum Gauge Connection (20R)

[When Checker is used]

a. (2T-C engine)

- Light "C" should be on and light "J" should be off.
- Have the engine idling.
- Change-over switch "K" to the "SIMULATION" side.
- Turn the dial "K". Between 20 and 30 mph, light "J" should turn on and at same time, the choke opener diaphragm link should be drawn in. (Fig. 18-10)

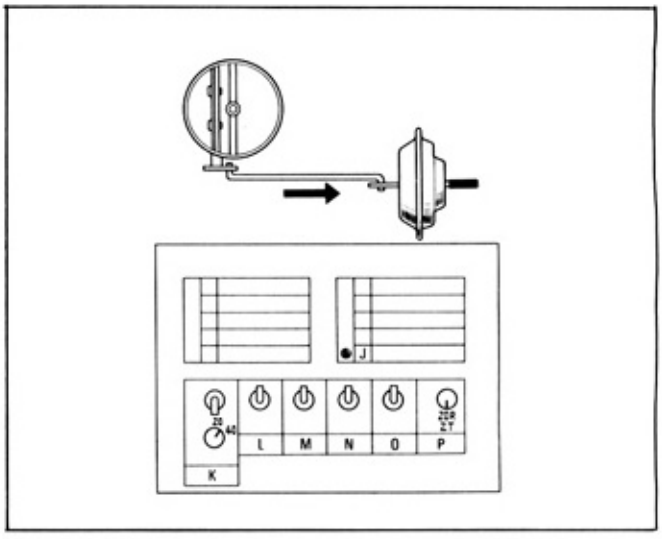


Fig. 18-10 Choke Opener Inspection (2T-C)

- At this condition, change-over switch "M" to the "SIMULATION" side. Light "J" should turn off and the diaphragm link should return. (Fig. 18-11)
- With the checker still connected, set all switches to the "VEHICLE" side.

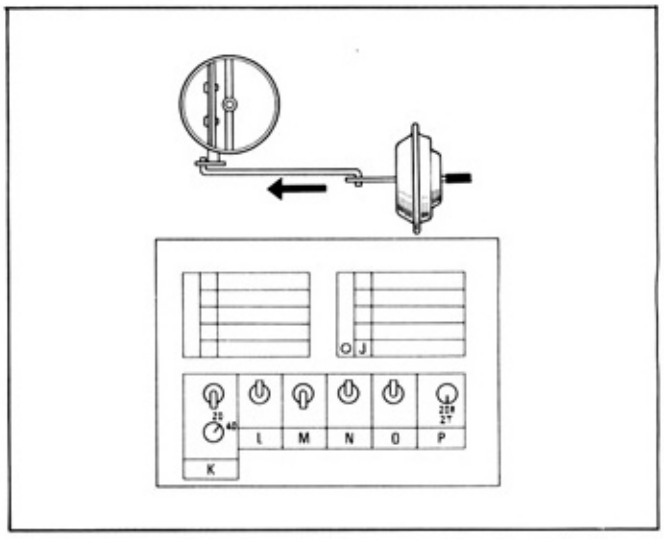


Fig. 18-11 Choke Opener Inspection (2T-C)

b. (20R engine)

- Lights "C", "D" (passenger cars for California only), and "J" should be on, and at idling, the choke opener diaphragm link should be drawn in.
- When switch "K" is changed over to the "SIMULATION" side and dial "K" set to 70 mph, light "J" should turn off and the link should return.
- When switch "M" is changed over to the "SIMULATION" side, light "J" should turn off and the link should return. (Fig. 18-13).
- Return the switch "M" to "VEHICLE" side.
- When switch "N" is changed over to the "SIMULATION" side, light "J" should turn off and the link should return. (Passenger cars for Calif. only)
- Have the checker still connected.

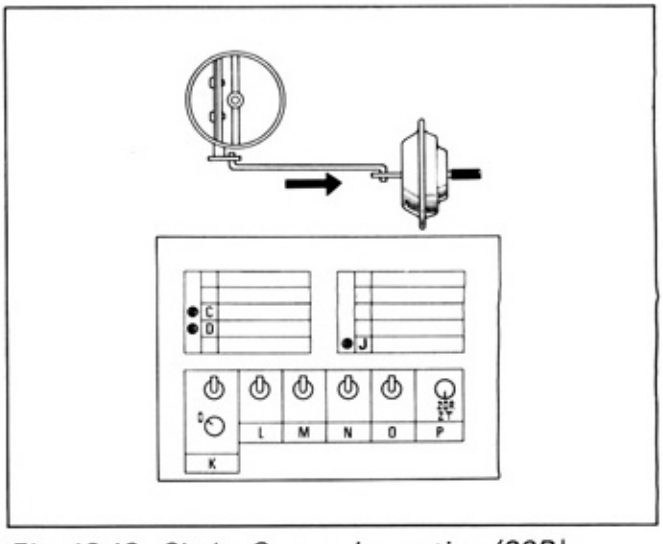


Fig. 18-12 Choke Opener Inspection (20R)

○ Have the switches "K" to "O" set at the "VEHICLE" side.

c. If the light "C" or "D" does not operate properly, replace the thermo switch or thermo sensor.

d. If the light "J" does not operate properly, replace the computer.

e. If the diaphragm does not operate properly, check the diaphragm and link, if not found defective, replace the VSV.

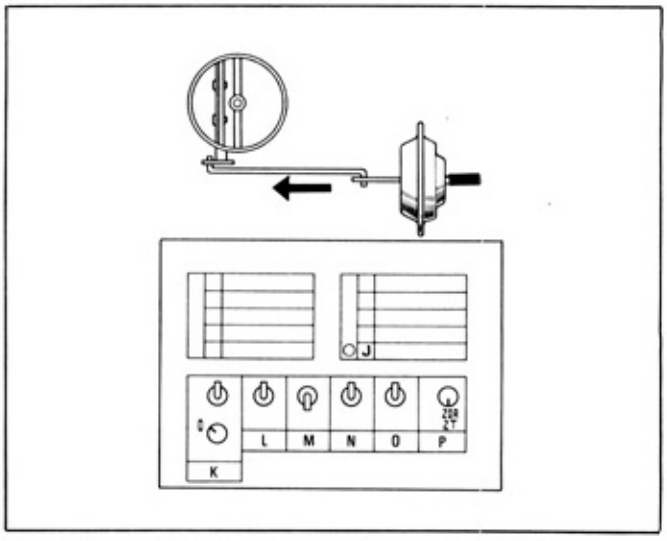


Fig. 18-13 Choke Opener Inspection (20R)

(4) FAST IDLE BREAKER SYSTEM INSPECTION (4M Engine Only)

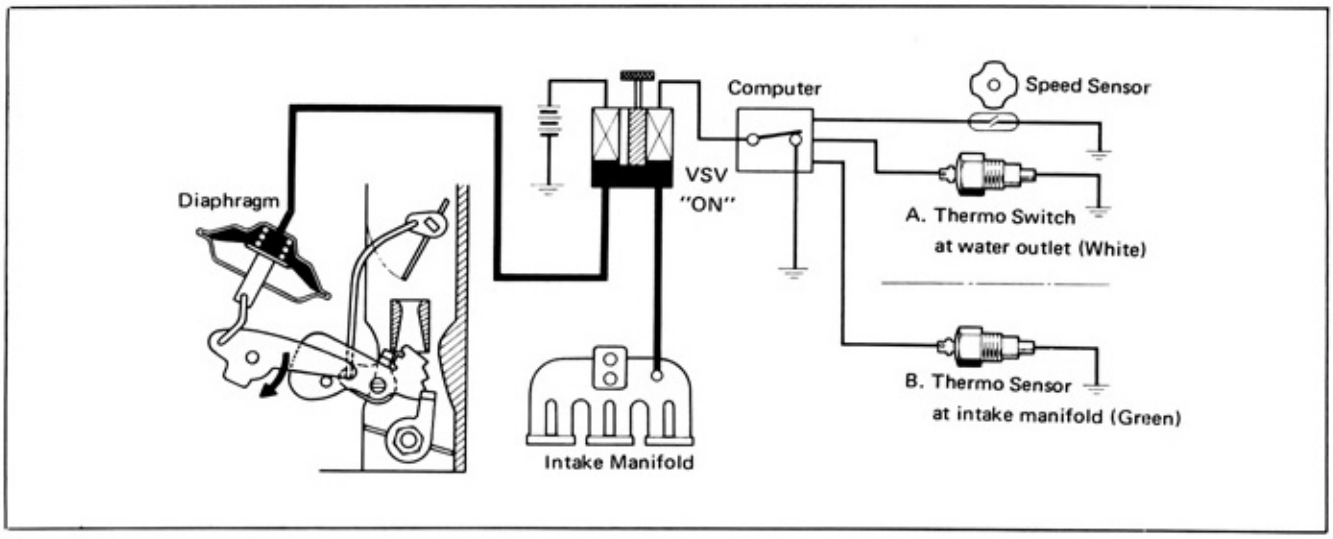


Fig. 18-14 Fast Idle Breaker System

a. Visually check the vacuum hose and wiring for disconnection and damages, and correct any defect found.

b. With the choke valve closed, check to see that the choke valve will open when the *fast idle* breaker diaphragm hose is sucked in with mouth, and that it will close when the mouth is released from the hose.
If faulty, repair or replace the link or diaphragm.

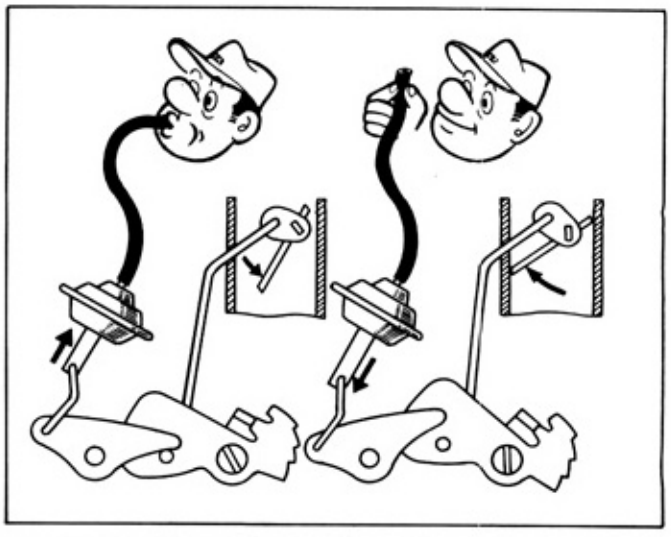


Fig. 18-15 Choke Valve Operation

[When Checker is used]

a. Plug in the checker to the inspection connector and VSV connector.

b. Set the dial "P" to "4M", and tilt the switches "K" to "O" to the "VEHICLE" side.

c. At cold engine (coolant temperature below 40°F), lights "B", "C", and "J" should be extinguished.

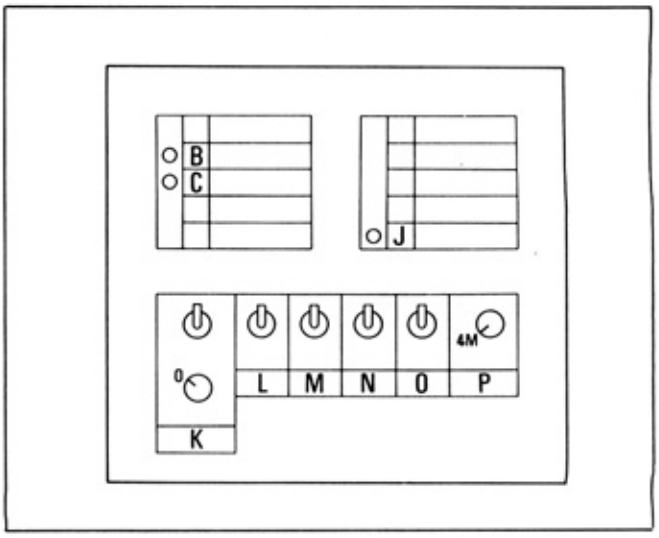


Fig. 18-16 Fast Idle Breaker Inspection (4M)

OPERATION AFTER WARMING UP ENGINE

a. Disconnect the hose between the vacuum switching valve (VSV) and the diaphragm, and connect a vacuum gauge to the VSV No. 3 pipe.

b. Disconnect the thermo sensor wiring terminal and make road test. When the vehicle speed is gradually raised up to around 20 to 30 mph, the intake manifold vacuum should be indicated on the gauge.

c. Reconnect the thermo sensor terminal.

d. Replace the vacuum hose to former connection.

- If faulty, inspection in accordance with the inspection procedures in the section Fast Idle Breaker System.

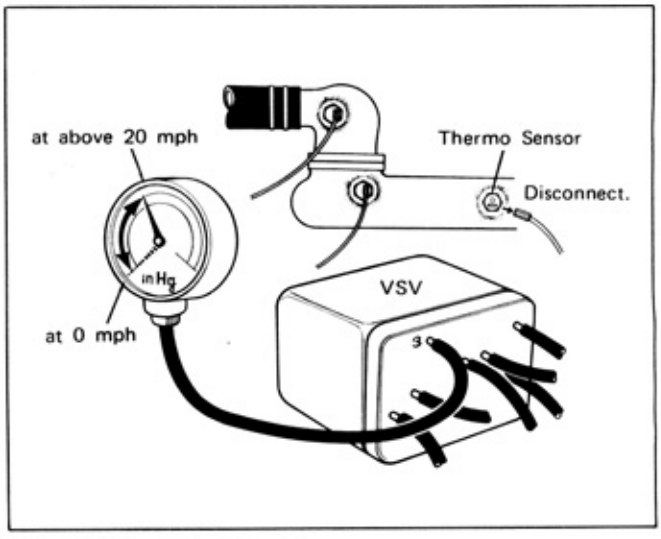


Fig. 18-17 Checking Vacuum

[When Checker is used]

a. Lights "B" and "C" should turn on and light "J" should be on.

b. Disconnect the terminal from the thermo sensor on the intake manifold.

c. Have the engine idling.

d. Change-over switch "K" to "SIMULATION" side.

e. Turn the dial "K", Between 20 and 30 mph, light "J" should turn on and at same time, the diaphragm link should be drawn in. (Fig. 18-18).

f. Connect the terminal to the thermo sensor on the intake manifold.

g. At this condition, check light "J" to see that it does not turn off when switch "M" is changed over to the "SIMULATION" side.

h. At this condition, change over switch "L" to the "SIMULATION" side. Light "J" should turn off and at same time, the diaphragm link should return.

i. Have the checker still connected.

Note:
Have the switches "K" to "O" changed over to the "VEHICLE" side.

j. If light "B" or "C" does not operate properly, replace the thermo switch or thermo sensor.

k. If light "J" does not operate properly, replace the computer.

l. If the diaphragm does not operate, check the diaphragm and link, and if found to be in normal condition, replace the VSV.

(5) VALVE CLEARANCE ADJUSTMENT

a. Run the engine until thoroughly warmed up. (Coolant temperature about 180°F).

b. Remove the cylinder head cover.

c. For the 2F engine, check the valve clearance with thickness gauge while idling, and adjust if found necessary to do so.

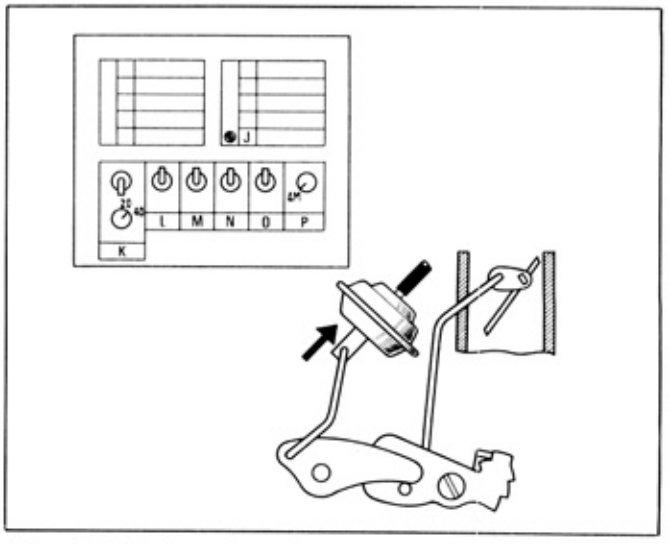


Fig. 18-18 Fast Idle Breaker Inspection (4M)

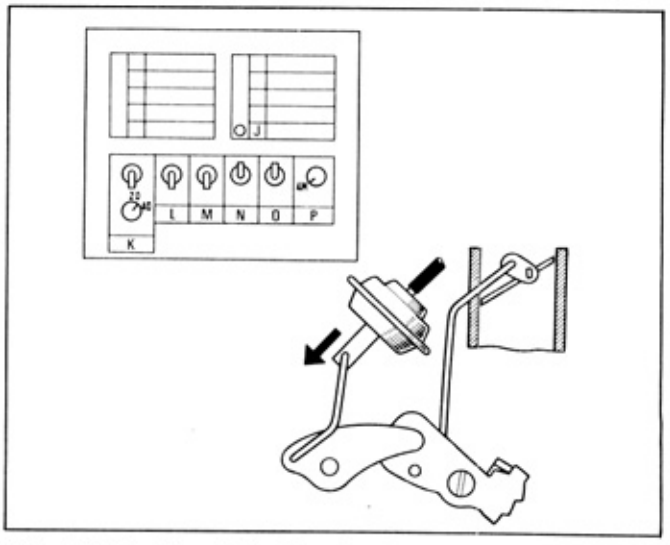


Fig. 18-19 Fast Idle Breaker Inspection (4M)

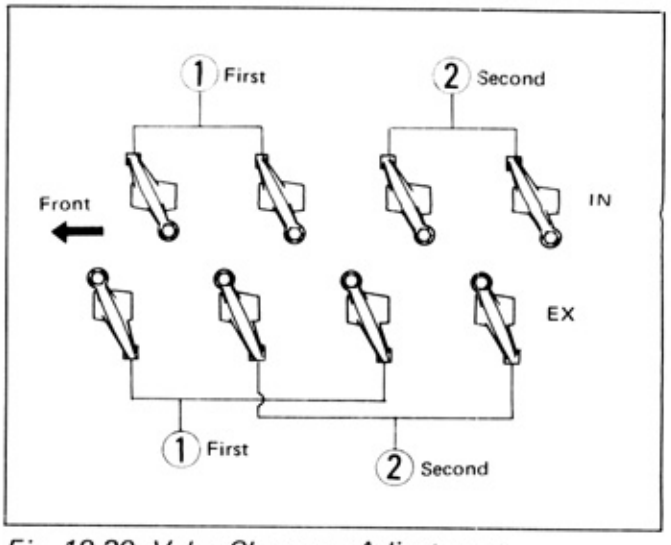


Fig. 18-20 Valve Clearance Adjustment Order (2T-C)

d. For the 2T-C and 20R engines, turn the crankshaft with a wrench and set the No. 1 piston at compression top dead center.

- Check and adjust the valve clearances (1) shown in Fig. 18-20 or 18-21.
- Then, turn the crankshaft one full rotation and check and adjust the valve clearance (2) shown in Fig. 18-20 or 18-21.

Note
1. Check and adjust the valve clearance quickly after warming up.
2. Check and adjust the valve clearance by inserting the thickness gauge between the adjusting screw and valve stem end.

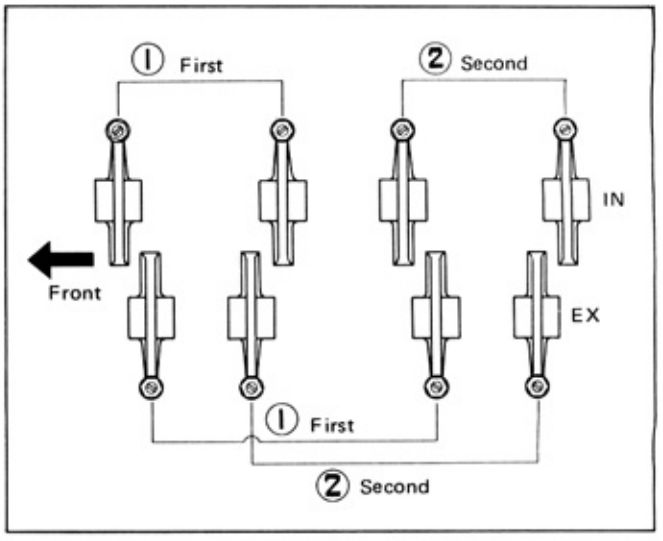


Fig. 18-21 Valve Clearance Adjustment Order (20R)

e. For the 4M engine, remove the engine front under pan and by turning the crankshaft with a wrench, set the No. 1 piston to compression top dead center.

- Check and adjust the valve clearances (1) shown in Fig. 18-22.
- Then, turn the crankshaft one full rotation and check and adjust the valve clearances (2) shown in Fig. 18-22.

Note
1. Check and adjust the valve clearance quickly after warming up.
2. Check and adjust the valve clearance by inserting the thickness gauge between the adjusting screw and valve stem end.

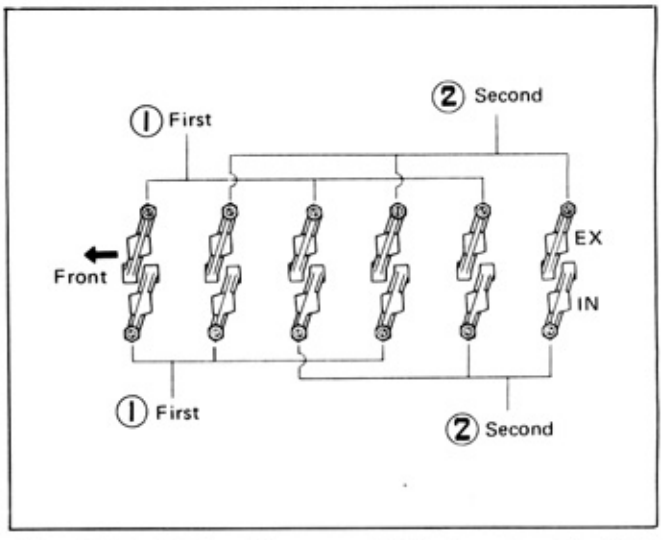


Fig. 18-22 Valve Clearance Adjustment order (4M)

f. Install the cylinder head cover.

g. Install the air cleaner and hose.

Valve Clearance (Hot) – Inch

Engine Family	Intake Valves	Exhaust Valves
2T-C	0.008	0.013
20R	0.008	0.012
4M	0.007	0.010
2F	0.008	0.014

(6) CLEANING DISTRIBUTOR BREAKER POINT

a. Remove the distributor cap, rotor, and dust cover.

b. Clean the point surface with a piece of cotton wetted with trichloroethylene.

c. If the point surface is pitted, remove the point and correct the surface with an oil stone. If badly pitted, replace the point.

d. If the sliding surface of the cam, breaker heel, or breaker is dry, apply molybdenum grease.

e. Install the dust cover, rotor, and distributor cap.

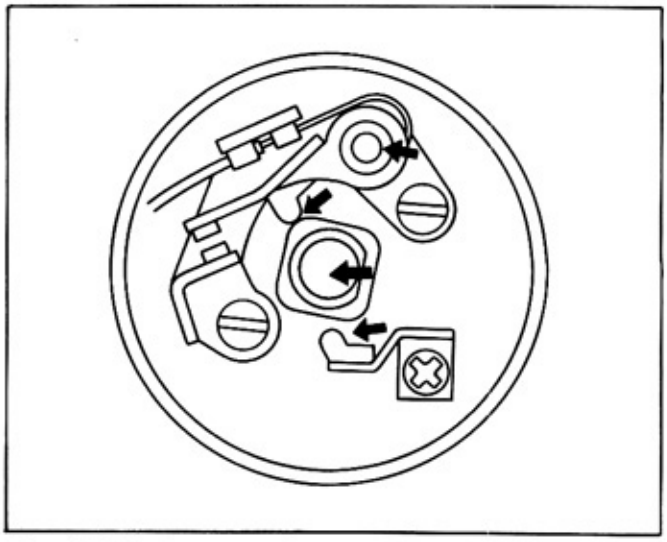


Fig. 18-23 Greasing Portions

(7) IGNITION TIMING AND DWELL ANGLE ADJUSTMENTS

a. Rewarm the engine and check the choke valve to see that it is full open.

b. Connect a tachometer and dwell meter on the engine.

> Caution
> Connect the tachometer (+) terminal to the ignition coil (—) terminal. Do not connect it to the distributor side.

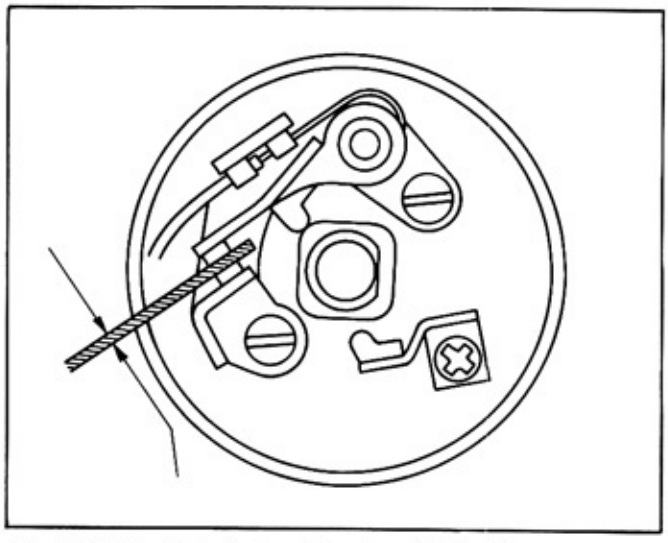


Fig. 18-24 Distributor Breaker Point Gap

c. Set the engine to the specified idling speed by turning the carburetor throttle adjusting screw. (Refer to P. 8-17)

d. Check the dwell angle with the dwell angle meter. If not at the specified angle, adjust the point gap. In checking dwell angle of dual point distributor sub-point (at octane selector side), have the wiring connector of thermo switch (described later) grounded.

Distributor Point Gap: 0.016 to 0.020 in (Reference)

Distributor Dwell Angle

4-Cylinder Engine	52 degree (50 to 54 degree)
6-Cylinder Engine	41 degree (38 to 44 degree)
Main Point (Dual Point Distributor)	57 degree
Sub. Point (Dual Point Distributor)	52 degree (50 to 54 degree)

e. In the 4M engine, install the engine front under pan.

f. Using a timing light, check the ignition timing.
   - In case the ignition timing is far off, loosen the distributor clamp and correct by turning the distributor to either side.
   - If only slightly out-of-adjustment, correct by turning the octane selector (2F engine is not equipped with octane selector).

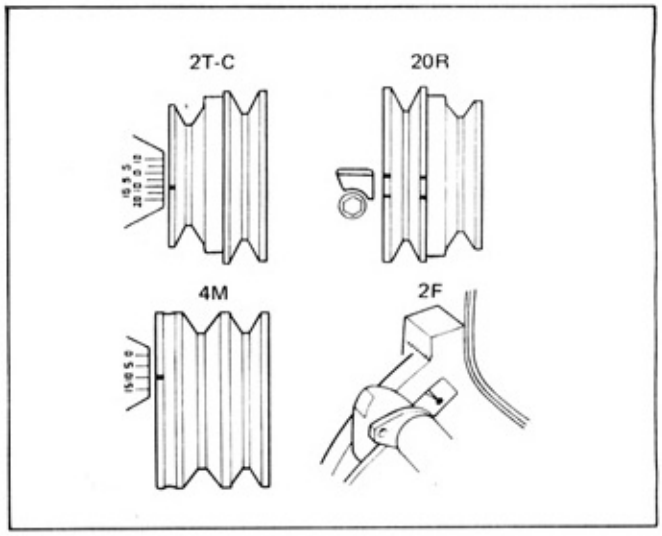


Fig. 18-25 Timing Marks

Initial Ignition Timing (Transmission in "N" Range)

Engine Family	Transmission	Except California	for California only
2T-C	M/T, A/T	10° BTC/850 rpm	←
20R	M/T, A/T	8° BTC/850 rpm	←
4M	M/T	10° BTC/800 rpm	5° BTC/800 rpm
	A/T	10° BTC/750 rpm	5° BTC/750 rpm
2F	M/T	7° BTC/650 rpm	–
2T-C (Dual Point Dis.)	M/T, A/T	Main Point –12° BTC/850 rpm	–
		Sub. Point –19~25° BTC	–

   - In engine equipped with dual point distributor, adjust the main point ignition timing as described above, and after grounding the thermo switch wiring connector, check the sub-point ignition timing.
   - In case the sub-point ignition timing is off, adjust the sub-point gap so that the sub-point dwell angle will be 52°.
   - Reconnect the thermo switch wiring.

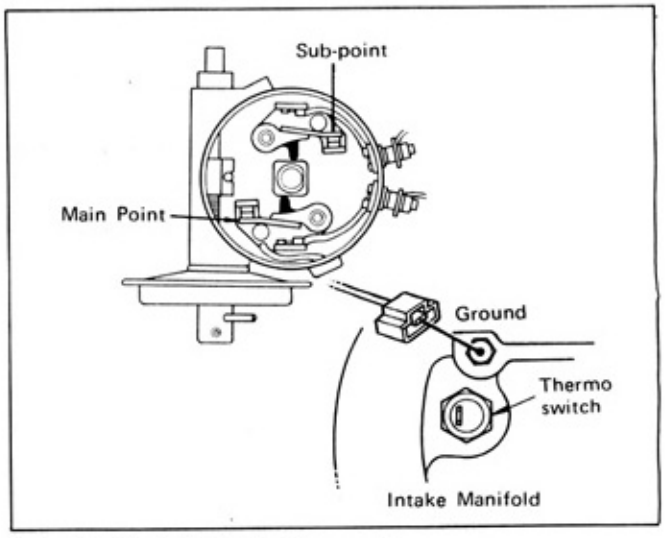


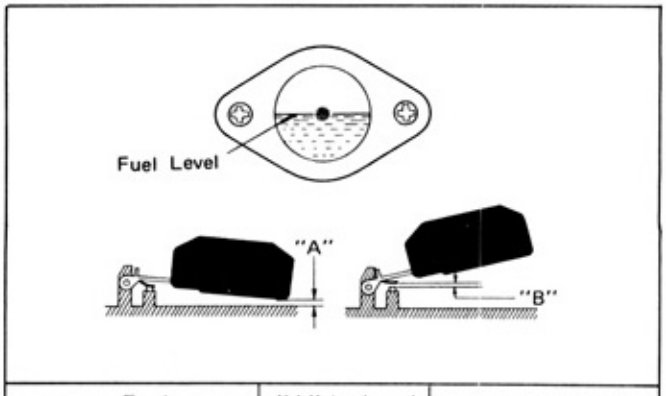
Fig. 18-26 Sub-Point Inspection

(8) ENGINE IDLE SPEED ADJUSTMENT

a. Check the following items beforehand.
   1) Coolant temperature – Approximately 180°F.
   2) Choke valve – Full open
   3) Accessory parts – Switched off
   4) Air cleaner installed

b. While idling, check the carburetor fuel level. If the fuel level is not aligned with the standard line in the sight glass, adjust the float level.

c. Adjust to the specified idle speed by turning the idle speed adjusting screw. (Do not adjust with the idle mixture adjusting screw)



Engine	"A" in (mm)	"B" in (mm)
2T-C	0.138 (3.5)	0.047 (1.2)
20R	0.197 (5.0)	0.039 (1.0)
4M	0.394 (10.0)	0.039 (1.0)
2F	0.161 (4.1)	0.039 (1.0)

Fig. 18-27 Fuel Level

Idle Speeds (rpm)

Engine Family	Transmission	Idle Speed (rpm)
2T-C	M/T, A/T	850 ± 50
20R	M/T, A/T	850 ± 50
4M	M/T	800 ± 50
	A/T	750 ± 50
2F	M/T	650 ± 50

(9) FAST IDLE ADJUSTMENT

a. Stop the engine and fully close the choke valve.
   - Remove the air cleaner cap.
   - With the throttle valve slightly open, close the choke valve with finger and then close the throttle valve.
   - The choke valve will now be fully closed.

b. Start the engine without stepping on the accelerator pedal.

c. Check the engine speed to see if it is at the specified fast idle speed. If not, correct by turning the fast idle adjusting screw.

> Note
> In the 20R engine, check and adjust the fast idle speed with the EGR system turned off (Vacuum hose disconnected from EGR valve).

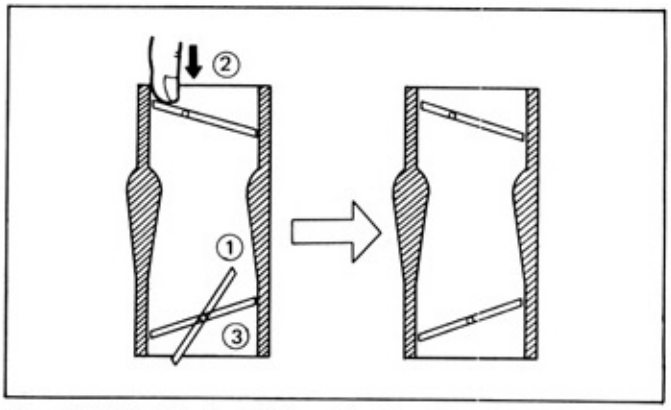


Fig. 18-28 Choke Valve Closing Sequence

Fast Idle Speeds (rpm)

Engine Family	Fast Idle Speed (rpm)
2T-C	3000 ± 200
2T-C (for California only)	2700 ± 200
20R	2400 ± 200 w/o EGR
4M	2600 ± 200
4M (for California only)	2400 ± 200
2F	1800 ± 200

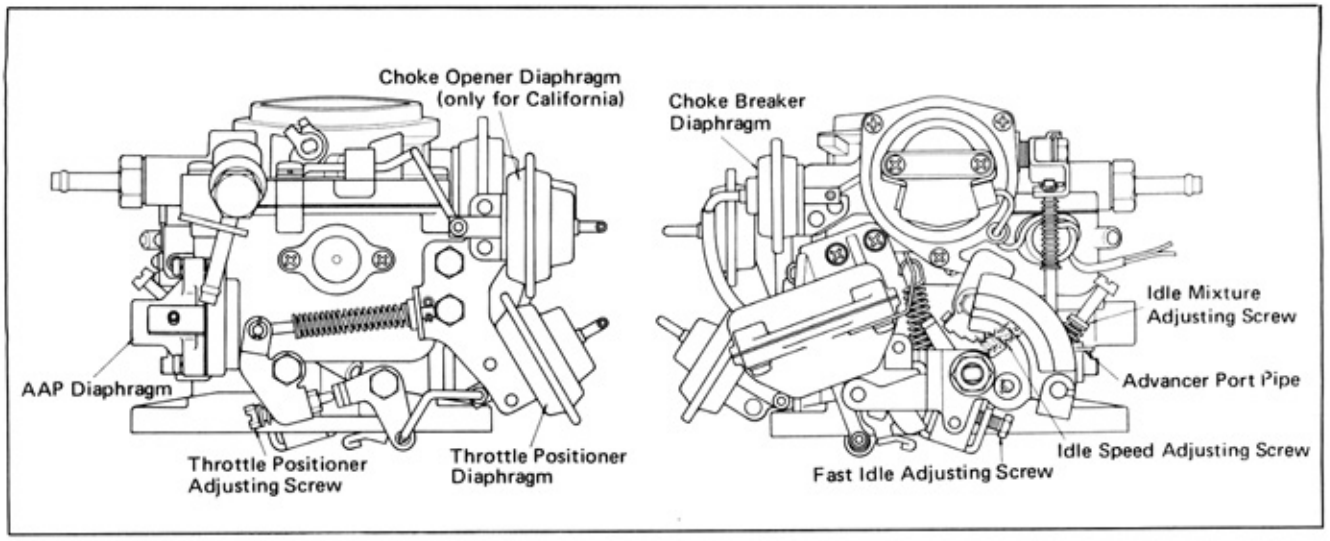


Fig. 18-29 Carburetor (2T-C Engine)

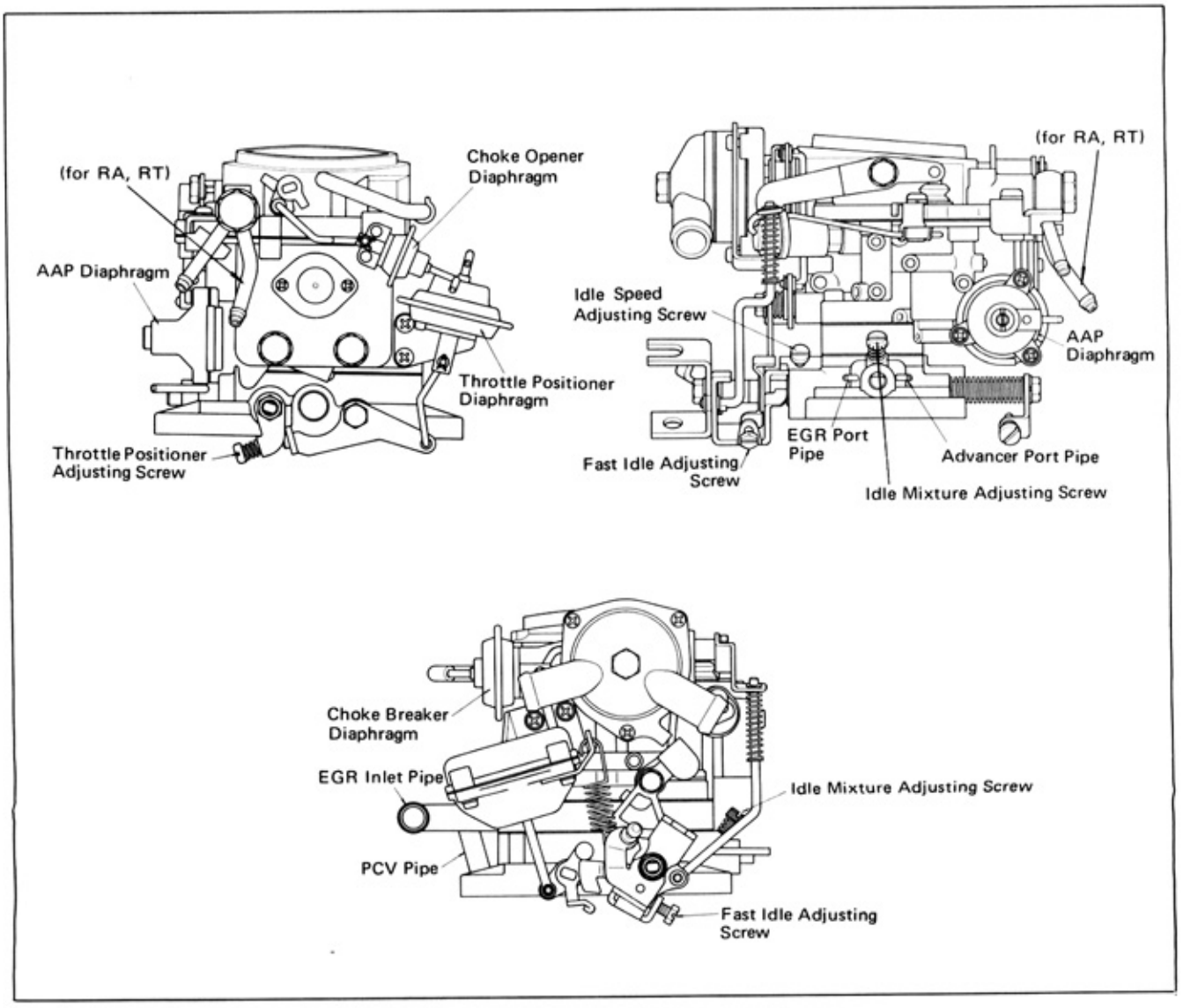


Fig. 18-30 Carburetor (20R Engine)

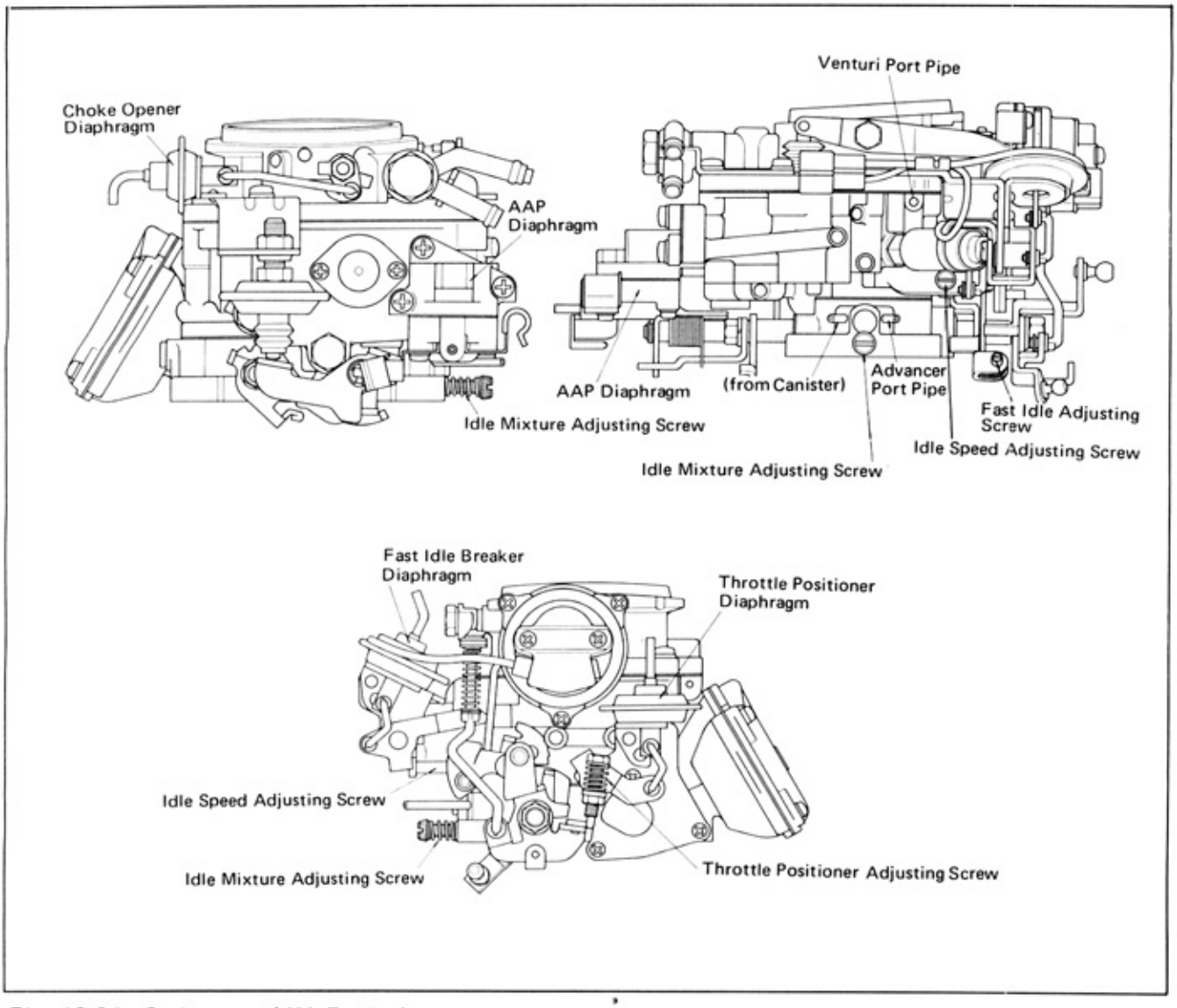


Fig. 18-31 Carburetor (4M Engine)

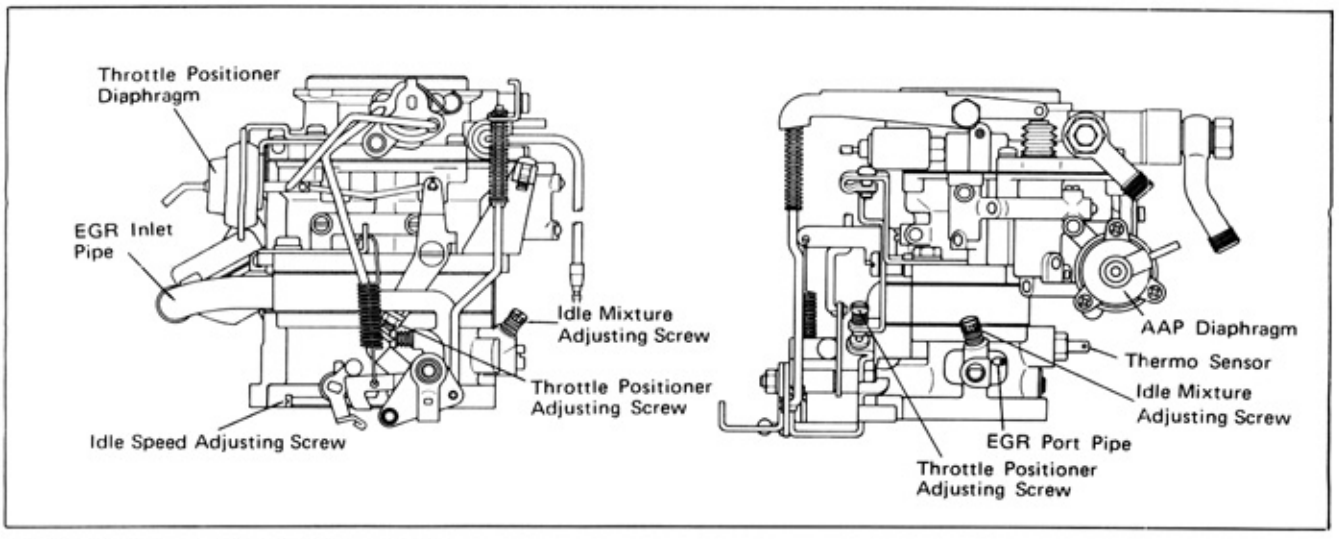


Fig. 18-32 Carburetor (2F Engine)

9. THROTTLE POSITIONER SYSTEM INSPECTION

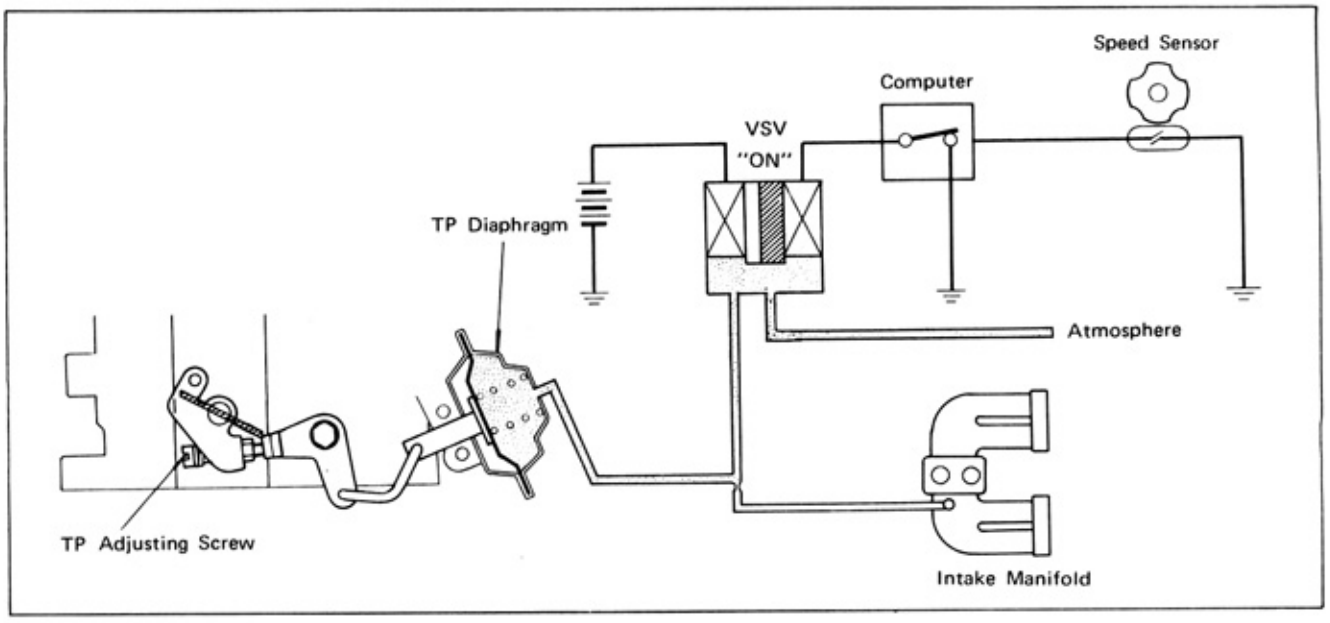


Fig. 18-33 Throttle Positioner System

(1) Visually check the hoses and wiring for disconnection and damage and correct any defect found.

(2) Check the throttle positioner operation.

- Have the engine idling.
- Disconnect the TP diaphragm sensing hose.
- Race the engine and then remove the foot from the accelerator pedal.
  At this time, the TP adjusting screw should hook on to the throttle valve lever and the engine should turn faster than at idle.

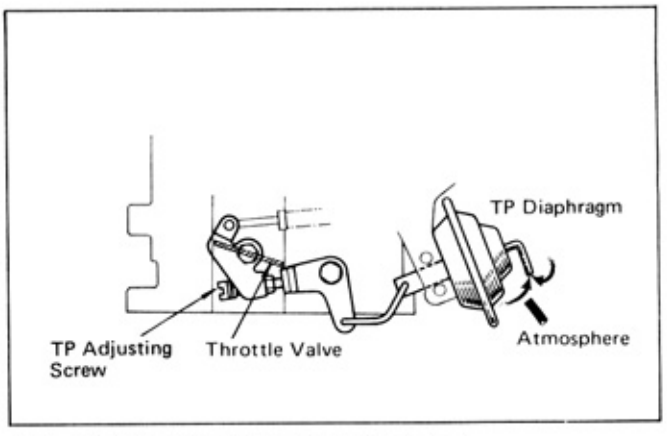


Fig. 18-34 TP Operation Inspection

- Under the above condition, connect the TP diaphragm to the intake manifold with vacuum hose. The TP adjusting screw unhook from the throttle valve lever and the engine should return to idle speed.
- If defective, check the diaphragm and linkage.

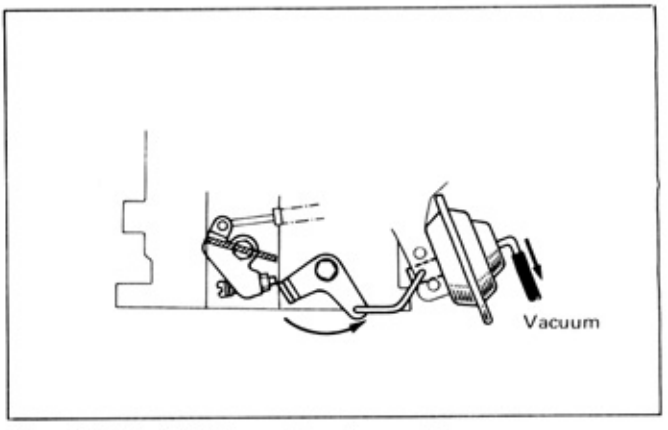


Fig. 18-35 TP Operation Inspection

(3) Check the throttle positioner setting speed.
- o After warming up, check the idle speed.
- o Disconnect the TP diaphragm sensing hose.
- o Race the engine and then remove the foot from accelerator pedal.
  Check the engine speed at this time and if not at specified speed, correct by turning the TP adjusting screw.

TP Setting Speeds (rpm)

Engine Family	Transmission	Speed
2T-C	M/T A/T	1500 ± 100 1400 ± 100
20R	M/T A/T	1400 ± 100 1050 ± 100
4M	M/T A/T	1300 ± 100 1200 ± 100
2F	M/T	1200 ± 100

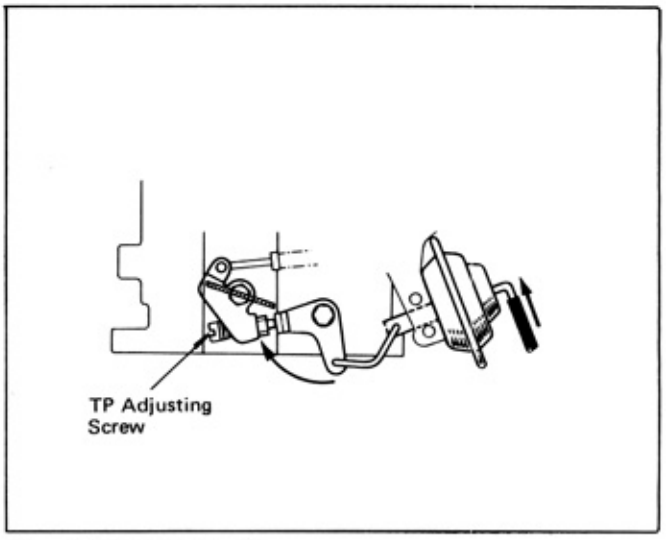


Fig. 18-36 TP Setting

(4) Check the system from speed sensor to VSV.
- o Disconnect the vacuum hose between the TP diaphragm and VSV.
- o Connect a vacuum gauge on the VSV and set the gauge at the driver's seat.
- o Road test while observing the speedometer and vacuum gauge.

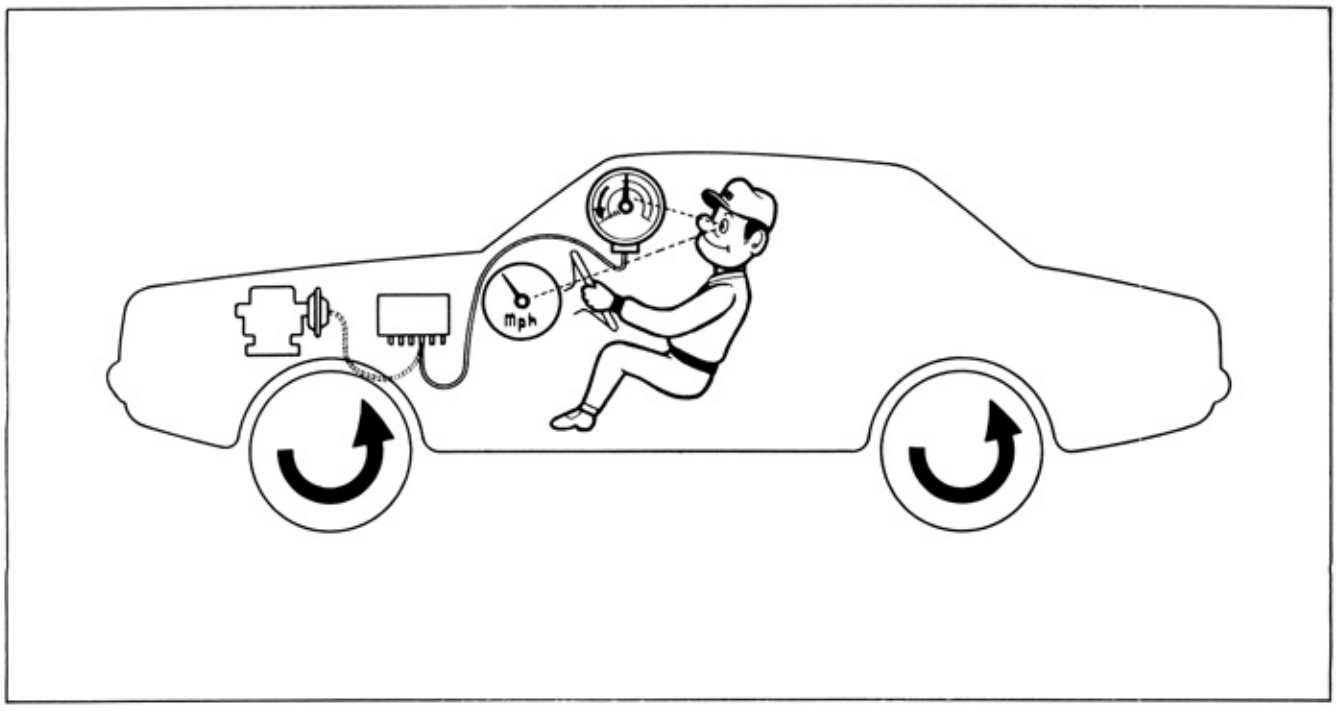


Fig. 18-37 TP System Inspection

- o Check the vacuum gauge to see that it registers vacuum when idling.
- o Check the vacuum gauge to see that it does not register when driving at 30 mph.
- o If defective, check the system in accordance with the inspection procedures shown in Page 4-3.

[When Checker is Used] (Excluding 2T-C engine for USA)

(1) Connect the checker to the inspection connector and VSV connectors. (Refer to Page. 22-6.)

> Note
> On vehicles equipped with choke opener, the checker should already be connected.

(2) Set the dial "P" to the engine to be checked and tilt the switch "K" to "VEHICLE" side.

(3) Check the throttle positioner adjusting screw to see that it is free from the throttle valve lever when the engine is idling.

(4) Tilt the switch "K" to the "SIMULATION" side.

(5) Turn the dial "K" until the vehicle speed is up to 30 mph. At this time, the light "G" should turn on, and at the same time, the throttle positioner adjusting screw should contact on the throttle valve lever.

(6) If the light "G" does not operate properly, replace the computer.

(7) If the TP diaphragm does not operate properly, check the diaphragm and the linkage. If these are not at fault, replace the VSV.

(8) At the above condition, open and then return the throttle valve.
The throttle positioner adjusting screw will catch on the throttle valve lever and the engine will be turning faster than at idle. At this time read the engine speed on the tachometer. If not at the specified value, correct by turning the throttle positioner adjusting screw.

TP Setting Speeds (rpm)

Engine Family	Transmission	Speed
2T-C	M/T A/T	1500 ± 100 1400 ± 100
20R	M/T A/T	1400 ± 100 1050 ± 100
4M	M/T A/T	1300 ± 100 1200 ± 100
2F	M/T	1200 ± 100

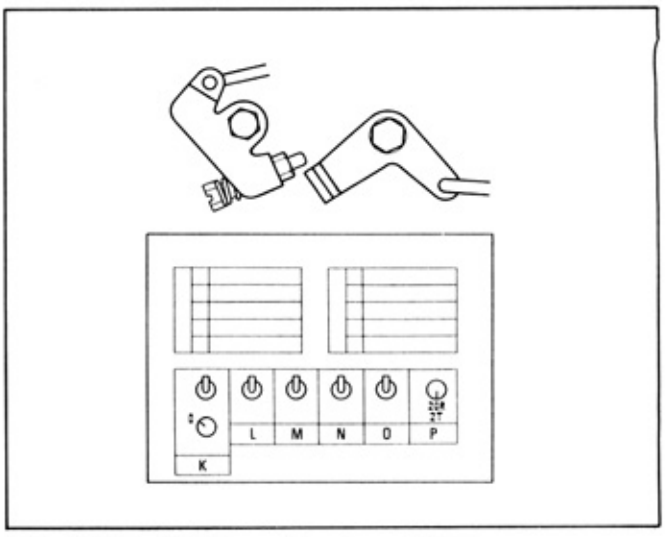


Fig. 18-38 TP Operation Inspection

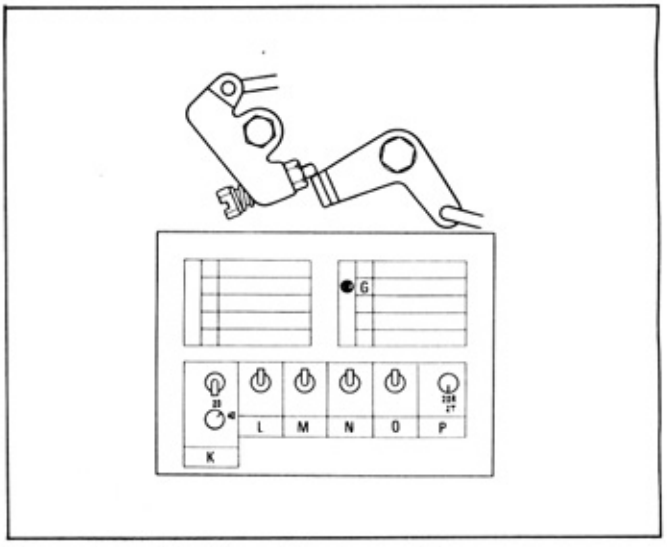


Fig. 18-39 TP Operation Inspection

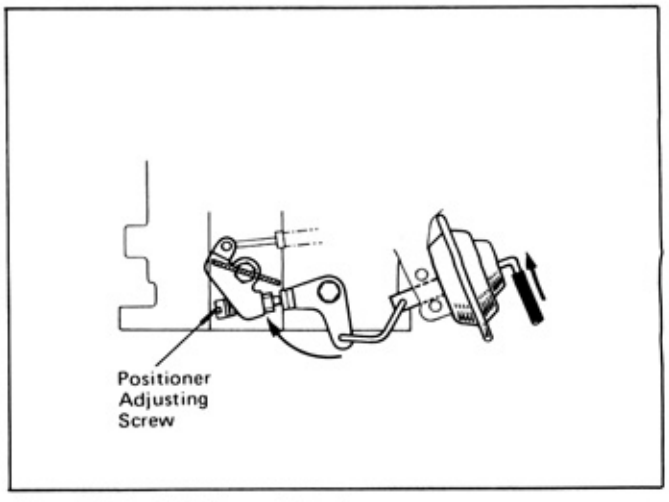


Fig. 18-40 TP Speed Setting

9. In case the checker is used, the vehicle speed is simulated so that the speed sensor must also be checked.
   (1) Tilt the checker switch "K" to the "VEHICLE" side.
   (2) Set the checker at the driver's seat.
   (3) Run the vehicle at low speed (about 5 mph). If the light "A" flashes properly, the speed sensor is in normal condition.
   (4) If light "A" flashes irregularly or does not flash, check the speed sensor connector, computer connector, and wiring. If these are in normal condition, replace the speedometer assembly.

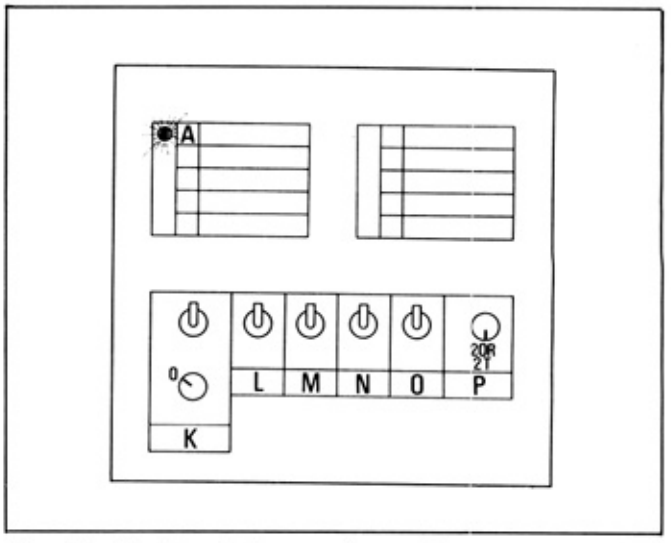


Fig. 18-41 Speed Sensor Inspection

6,000 · 19,000 · 31,000 · 44,000-MILE MAINTENANCE

ENGINE OIL AND OIL FILTER REPLACEMENT

(1) Lift up the vehicle and place an oil receiver under the engine.

(2) Remove the drain plug of the oil pan and drain out the oil.

(3) Place an oil receiver under the oil filter,' and remove the oil filter with special service tool (SST).

(4) Install the new oil filter, tightening it securely with hand.

Caution:
1. Apply engine oil onto the rubber ring, if not applied grease on it.
2. Do not tighten it with a tool.

(5) After the oil has completely drained out, install the oil plug on the oil pan over a gasket.

(6) Fill the new engine oil (API Service SE Classification engine oil) through the oil filler hole in the cylinder head cover.

(7) After warming up the engine, check for leakage and the oil level.

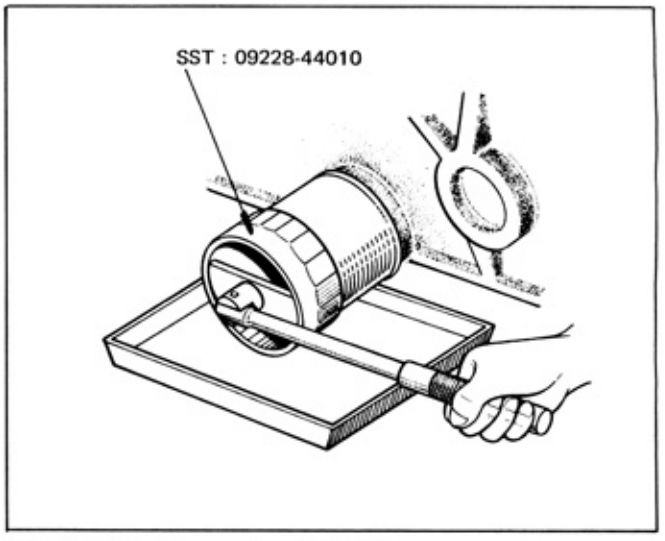


Fig. 18-42 Removing Oil Filter

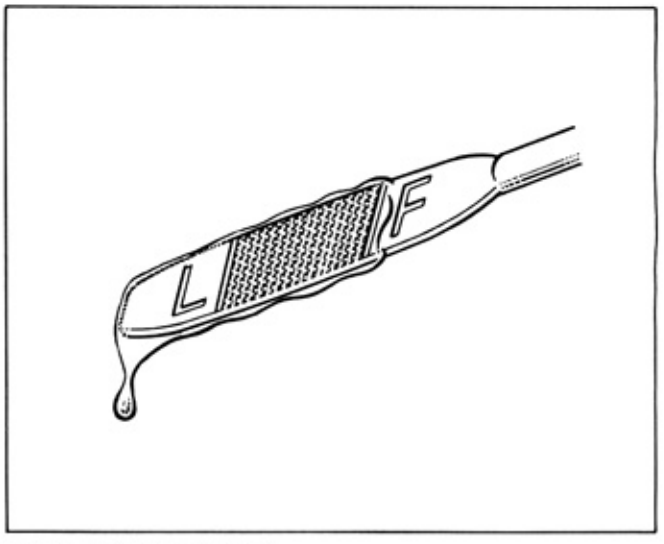


Fig. 18-43 Oil Level

Oil Capacity:

Engine Family		Total Capacity US qts. (ℓ)	Oil Pan Capacity US qts. (ℓ)
2T-C		4.6 (4.4)	3.7 (3.5)
20R	RT.	5.3 (5.0)	4.4 (4.2)
	RA, RN	4.8 (4.5)	3.9 (3.7)
4M		5.9 (5.6)	5.1 (4.8)
2F		8.5 (8.0)	7.4 (7.0)

Oil Grade: API Service SE Classification Engine Oil

12,500 · 25,000 · 37,500 · 50,000-MILE MAINTENANCE

COLD ENGINE OPERATIONS

1. DRIVE BELT INSPECTION [12,500 and 37,500 miles]

(1) Visually check the drive belt for cracks, deformation, and wear.

(2) Visually check the belt for adherence of oil or grease.

(3) Visually check the belt to see that its inner side is not contacting on the pulley groove bottom.

If defective, clean or replace.

2. DRIVE BELT REPLACEMENT [25,000 and 50,000 miles]

(1) Loosen the alternator or air pump adjusting bolt and pivot bolt, and shift the alternator or air pump toward the inside.

(2) Replace the drive belts.

(3) Shift the alternator or air pump toward the outside and adjust the drive belt tension. Tighten the adjusting bolt and pivot bolt. (Refer to Page 18-5)

3. COOLING SYSTEM, HOSE AND CONNECTION INSPECTION

(1) Visually inspect for coolant leakage.

(2) Visually inspect the hose for cracks and damages, and the state of hose clamps. Repair or replace any defect found.

4. OIL COOLER HOSE INSPECTION (4M Engine Family only)

(1) Visually inspect for oil leakage.

(2) Visually inspect the hose for cracks and damages, and the state of hose clamps. Repair or replace any defect found.

5. ENGINE OIL AND OIL FILTER REPLACEMENT

(1) Lift up the vehicle and place an oil receiver under the engine.

(2) Remove the drain plug of the oil pan and drain out the oil.

(3) Place an oil receiver under the oil filter, and remove the oil filter with special service tool (SST).

(4) Install the new oil filter, tightening it securely with hand.

Caution:
1. Apply engine oil onto the rubber ring, if not applied grease on it.
2. Do not use a tool for tightening.

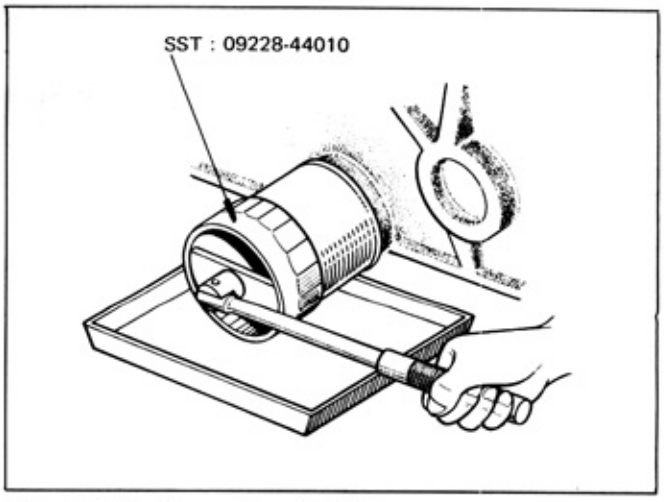


Fig. 18-44 Removing Oil Filter

(5) After the oil has completely drained out, install the oil plug on the oil pan over a gasket.

(6) Fill the new engine oil (API Service SE Classification engine oil) through the oil filler hole in the cylinder head cover. Fill it up to the "F" level of the dip stick.

Note
Do not warm up the engine at this stage as this will prevent making the successive cold engine check ups. Oil level check up should be done after warming up.

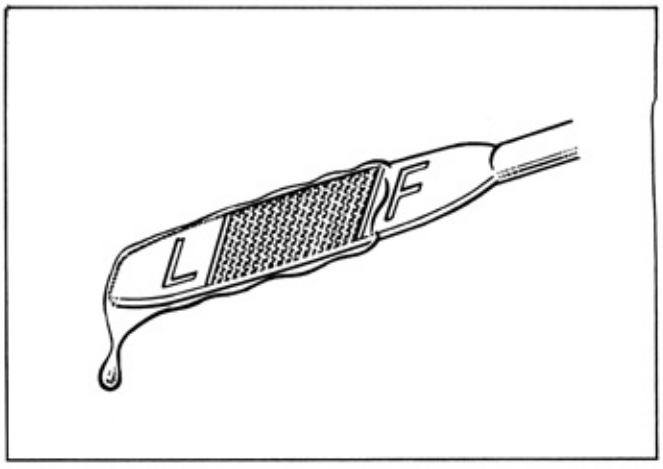


Fig. 18-45 Oil Level

Oil Capacity:

Engine Family		Total Capacity US qts. (ℓ)	Oil Pan Capacity US qts. (ℓ)
2T-C		4.6 (4.4)	3.7 (3.5)
20R	RT.	5.3 (5.0)	4.4 (4.2)
	RA, RN	4.8 (4.5)	3.9 (3.7)
4M		5.9 (5.6)	5.1 (4.8)
2F		8.5 (8.0)	7.4 (7.0)

Oil Grade: API Service SE Classification Engine Oil

6. ENGINE COOLANT (Long-Life Coolant) Replacement [25,000 and 50,000 miles]

(1) Open the radiator and engine coolant drain cocks and completely drain out the coolant.

(2) Fill in specified amount of coolant.

Note
Do not warm up the engine at this time as this will prevent making the successive engine check ups. Accurate checking of coolant level should be done after warming up.

Coolant Copacity (W/Heater or Air Conditioner)

Engine Family		Total US qts. (ℓ)
2T-C	M/T	8.2 (7.8)
	A/T	8.1 (7.7)
20R		8.5 (8.0)
4M		12.3 (11.6)
2F	FJ40	16.9 (16.0)
	FJ55	17.4 (16.5)

7. AIR CLEANER ELEMENT INSPECTION [12,500 and 37,500 miles]

(1) Visually check the air cleaner element for damage and adherence of oil, and replace if found defective.

(2) Clean the air cleaner element by blowing compressed air from the inner side and then from the outer side.

8. AIR CLEANER ELEMENT REPLACEMENT [25,000 and 50,000 miles]

(1) Replace the used air cleaner with new one.

9. OIL FILLER CAP INSPECTION

(1) Remove the oil filler cap visually inspect it to see if deformed or damaged. Replace with new cap if defective.

10. PCV VALVE INSPECTION [12,500 and 37,500 miles]

(1) Remove the PCV valve.

> Note
> Work will be made easier if removed together with hose.

(2) Attach a clean piece of hose on the PCV valve and blow in from the crankcase end (4M and 2F) and from cylinder head end (2T-C and 20R). The air should pass through.

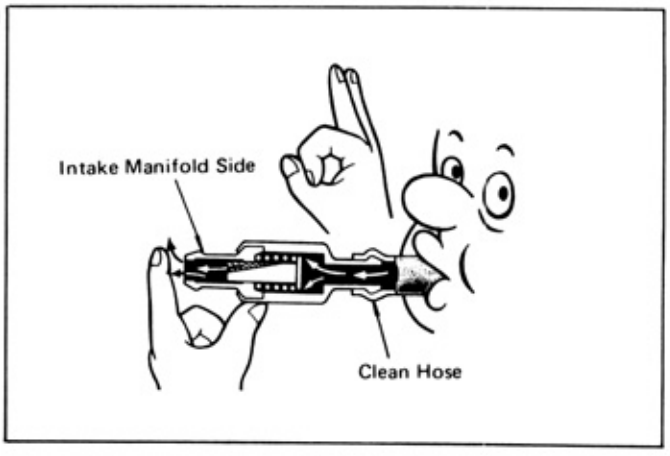


Fig. 18-46 PCV Valve Inspection

(3) In the same manner, blow in from the intake manifold end. The air should not pass through.

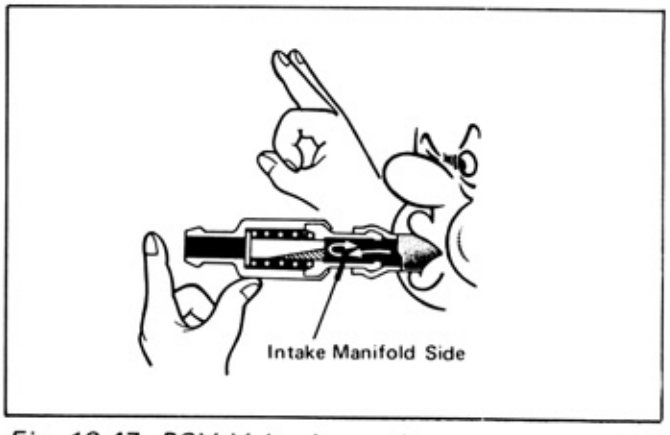


Fig. 18-47 PCV Valve Inspection

11. PCV VALVE REPLACEMENT [25,000 and 50,000 miles]

(1) Replace the PCV valve with new part.

> Note
> Make sure to install it correctly positioned. (Refer to Fig. 18-46)

12. VENTILATION HOSE AND CONNECTION INSPECTION

(1) Visually check the condition of hose connections and clamped parts.

(2) Visually check the PCV line gasketed parts for adherence of oil.

Note
If oil is present, inspect for cause.
If defective, repair or replace.

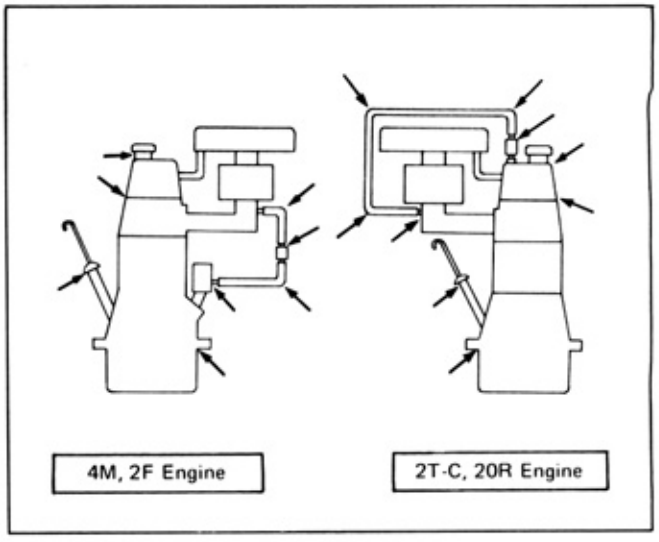


Fig. 18-48 PCV Line Inspection

13. FUEL FILTER REPLACEMENT [25,000 and 50,000 miles]

(1) Place an fuel receiver under the fuel filter.

(2) Disconnect the hoses, and replace the fuel filter.

14. FUEL TANK CAP GASKET REPLACEMENT [25,000 and 50,000 miles]

(1) Remove the fuel tank cap and take out the gasket.

(2) Without using tools, carefully install the new gasket to the cap.

15. FUEL SYSTEM CAP, TANK, LINES AND CONNECTIONS INSPECTION [25,000 and 50,000 miles]

(1) Fuel tank cap

- Visually check the safety valve for rust and sticking. If defective, replace the cap.

(2) Fuel tank

- Visually inspect for gasoline leakage, and tank damage and deformation, and repair or replace if found defective.

(3) Fuel line and vapor line

- Visually inspect the pipes and hoses. If there is gasoline leakage, injury, faulty connection, improper clamping, or excessive bends, repair or replace.

16. CHARCOAL CANISTER INSPECTION [12,500·25,000 and 37,500 miles] CHARCOAL CANISTER REPLACEMENT [50,000 miles only]

(1) Disconnect the hoses from the charcoal canister.

(2) As shown in Fig. 18-49, plug the pipe "B" with finger and blow air at 40 psi (3kg/cm^2) through pipe "A". The air should come out from pipe "C" without resistance.

(3) At this time, the activated carbon must not be blown out with the air.
If defective, replace the charcoal canister.

Caution:
Charcoal canister must not be washed.

[In case of 4M engine]

(1) Disconnect the hoses from the charcoal canister.

(2) As shown in Fig. 18-50, when air is blown in through pipe "A", it should flow out without resistance from pipes "B" and "C". At this time, the activated carbon should not be blown out.

(3) When air blown in through pipe "B", air must not come out from pipes "A" and "C".
If defective, replace the charcoal canister.

Caution:
Charcoal canister must not be washed.

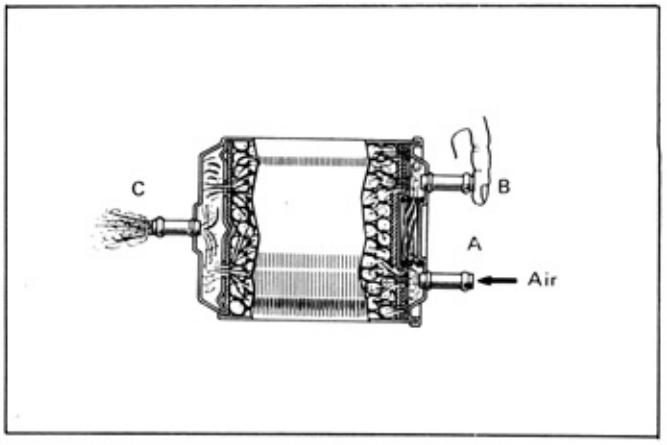


Fig. 18-49 Charcoal Canister Inspection

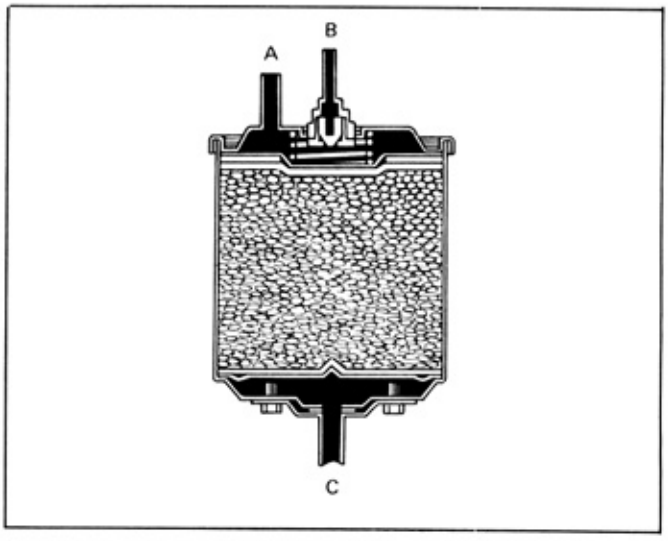


Fig. 18-50 Charcoal Canister Inspection (4M)

17. FUEL VAPOR CHECK VALVE INSPECTION [12,500 and 37,500 miles]

(1) When blown in from the fuel tank end, the valve should open with slight resistance and then open.

(2) When blown in from the canister end, the valve should open with slight resistance and then open.
If faulty, replace the fuel vapor check valve.

Note
1. This check must be made by blowing in. Never suck on the valve as it will be injurious to health.
2. When connecting the check valve to the pipe line, make sure that it is positioned in the correct direction.

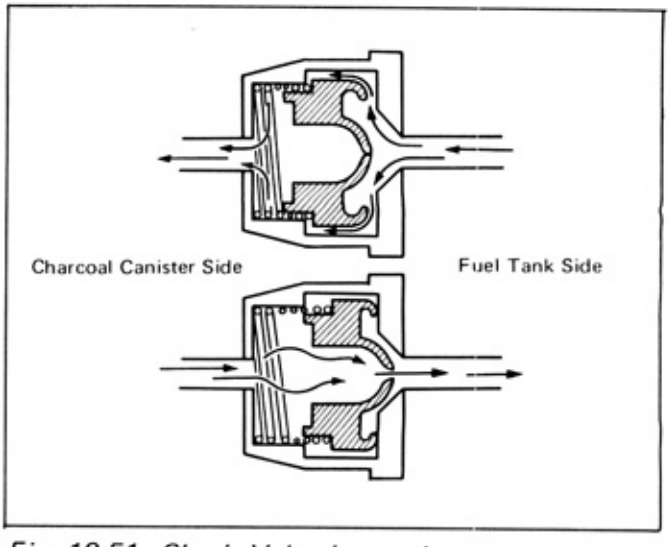


Fig. 18-51 Check Valve Inspection

18. FUEL VAPOR CHECK VALVE REPLACEMENT [25,000 and 50,000 miles]

Installed Locations of Fuel Vapor Check Valves

Vehicle Model	Valve Location
TE, RT, MX	Inside engine compartment
RA	Inside trunk room
RN	Side of fuel tank
FJ	Right center piller (FJ40), inside left rear trim (FJ55)

Note:
In installing the check valve in the pipe line, position the larger diameter end toward the fuel tank.

19. FUEL EVAPORATIVE EMISSION CONTROL SYSTEM HOSE AND CONNECTIONS INSPECTION

(1) Check the fuel tank for deformation, cracks, and fuel leakage.

(2) Visually inspect for faulty condition of hoses and connections, presence of damages, insecure clamping, and excessive bends.

> Note
> Make sure to inspect the vapor lines that pass under the fuel tank cover and quarter trim board.

Repair or replace any defective parts found.

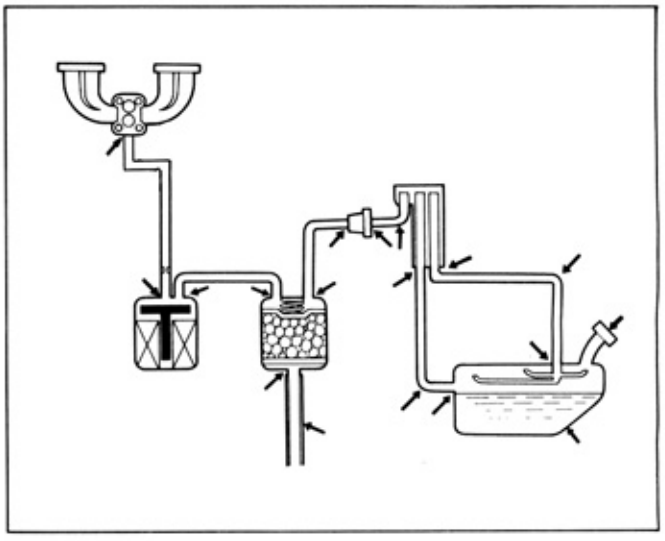


Fig. 18-52 Vapor Line Inspection

20. EXHAUST PIPES AND MOUNTINGS INSPECTION

(1) Visually inspect the exhaust pipe connections for loosening and exhaust gas leakage.

(2) Visually inspect the exhaust pipes for damage and deformation. Repair or replace any defective parts found.

21. ENGINE BOLT TORQUE INSPECTION

(1) Disconnect the various hoses connected to the air cleaner, and remove the air cleaner.

(2) Remove the cylinder head cover.

(3) In the 4M, and 2F engines, remove the valve rocker suppots.

(4) Check the cylinder head bolts with a torque wrench to see that they tightened at the specified torque.

Note
Check from the center of cylinder head and work successively toward the outer ends.

(5) In the 4M, and 2F engines, install the valve rocker supports and tighten their bolts at the specified torque.

(6) In the 20R engine, remove the heat insulator from the exhaust manifold.

(7) Tighten the exhaust manifold bolts and nuts at the specified torque or check with torque wrench.

Note
In 2F engine, it is not required to retighten the No. 2 nut from front.

(8) In the 20R and 2F engines, install the heat insulator.

(9) Install the cylinder head cover.

Tightening Torque (ft-lbs)

Engine Family	Cylinder Head	Exhaust Manifold	Rocker Arm Support
2T-C	52.1 to 63.7	7.2 to 11.6	(52.1 to 63.7)
20R	52.1 to 63.7 (12 mm bolt)	28.9 to 36.2	(52.1 to 63.7)
4M	10.8 to 20.3 (8 mm bolt) 54.2 to 61.5 (10 mm bolt)	12.3 to 16.6	(22.4 to 32.5)
2F	83.2 to 97.6	28.2 to 36.9	14.5 to 21.7 (8 mm bolt) 21.7 to 32.6 (10 mm bolt)

22. INSPECTION OF VACUUM FITTINGS, HOSES AND CONNECTIONS

(1) Visually check the hoses for damages and cracks.

(2) Visually check the hoses for disconnection and faulty clamping.

(3) Visually check for presence of excessive bending in hose.

Repair or replace any defective parts found.

23. INSPECTION OF WIRING HARNESSES AND CONNECTIONS

(1) Check the wiring connectors of the sensors, VSV, and computer to see that they are properly plugged in.

(2) Visually inspect the wiring for damages and defective clamping.
Repair or replace any defective parts found.

Computer Installed Location

Vehicle Model	Computer Location
TE	Inside left cowl side trim board
RA	Left cowl upper
RT	Inside right cowl side trim board
RN	Left cowl side panel
MX	Pedal bracket
FJ	Left front panel (FJ40), Center cowl upper (FJ55)

24. EXHAUST GAS HEAT CONTROL VALVE INSPECTION (2F Engine Only)

○ When the heat control valve shaft is turned by hand, it should rotate smoothly up to the stopper, and when released, it should return smoothly.

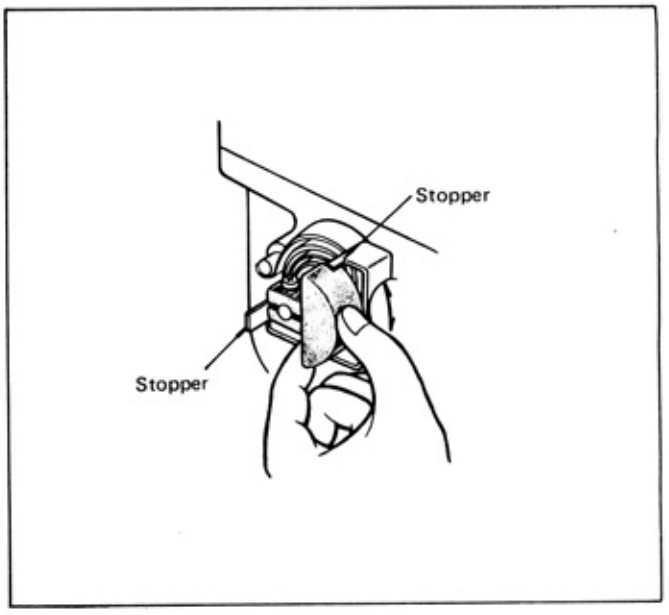


Fig. 18-53 Heat Control Valve Inspection

25. CARBURETOR INSPECTION

(1) Inspect the carburetor visually.

a. Check the screwed parts to see if tight. Retighten any loose part found.

b. Check for wear in the linkage, missing snap rings, and excessive looseness in the throttle shaft, and correct any defect found.

(2) Check the choke mechanism (except 2F engine)

a. Check the standard mark on the thermostatic case to see that it is aligned with the mark on the coil housing. If not in alignment, correct by turning the case.

> Caution:
> In the 20R engine, do not loosen the bolt at the center of case as this will allow the coolant to come out.

b. At cold engine (below 40°F) and with the engine stopped, check the choke valve to see that it will fully close when the accelerator pedal is lightly stepped down and then released.
If defective, repair or replace the link or diaphragm.

c. With the choke valve fully closed and the engine stopped, use SST [09240-00011] and check the choke valve to see that it will only open up to the specified angle (unloader angle) when the throttle valve is fully opened. If the unloader angle is not at specified angle, correct by bending the link (A part).

Unloader Angle (θ)

Engine Family	Unloader Angle
2T-C	47°
20R	50°
4M	40°

d. Choke opener inspection (20R engine, and 2T-C engine for Calif.)
With the choke valve closed, check to see that the choke valve will open when the choke opener diaphragm hose is sucked in with mouth, and will return when the mouth is released from the hose.
If defective, repair or replace the link and diaphragm.

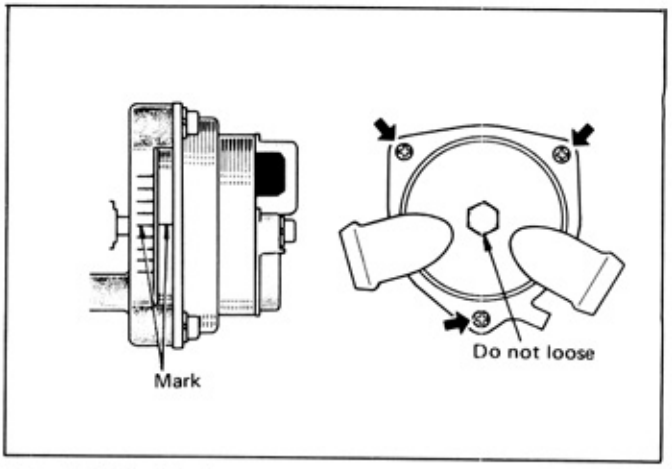


Fig. 18-54 Marks

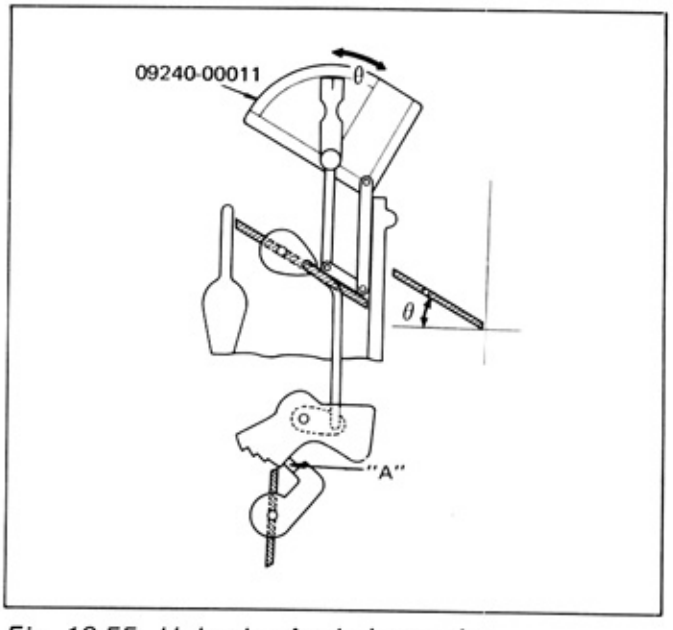


Fig. 18-55 Unloader Angle Inspection

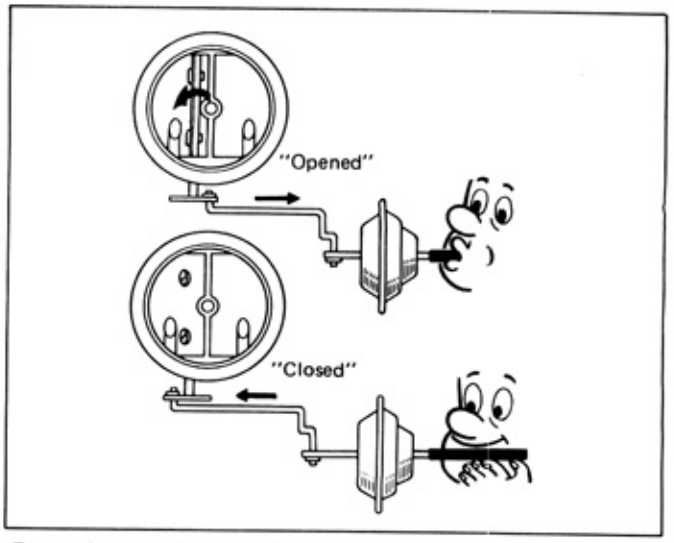


Fig. 18-56 Choke Opener Inspection

e. Fast idle breaker inspection
(4M engine only)
With the choke valve closed, check to see that the choke valve will open when the fast idle breaker diaphragm hose is sucked in with mouth, and will return when the mouth is released from the hose.
If defective, repair or replace the link and diaphragm.

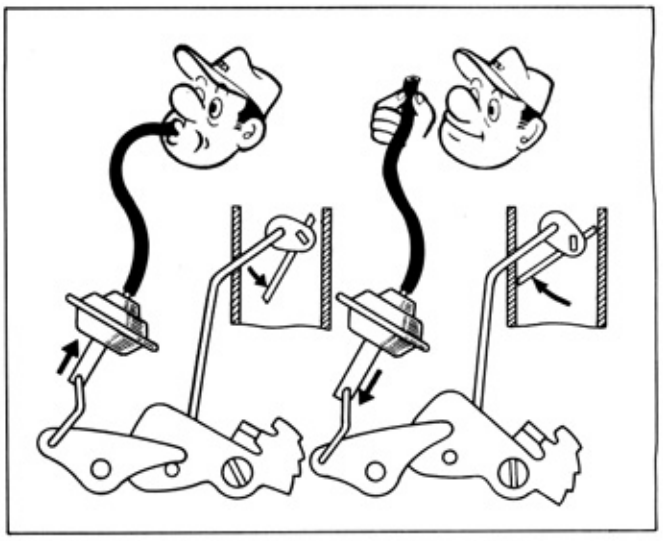


Fig. 18-57 Choke Valve Operation (4M)

(3) Auxiliary acceleration pump (AAP) inspection

a. At cold engine (coolant temperature below 75°F), start the engine. Then, quickly stop the engine while pinching the AAP diaphragm hose with finger so as to keep the vacuum circuit closed.

b. Open the choke valve with finger, and while observing the acceleration nozzle, check to see that gasoline will be temporarily ejected from the acceleration nozzle when the pinched hose is released.

If faulty, inspect the AAP or thermostatic vacuum switching valve.

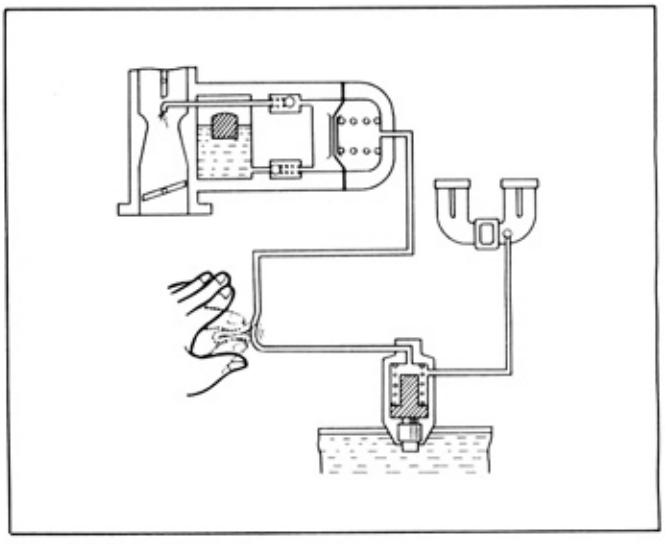


Fig. 18-58 AAP Inspection

Note
1. Perform this test as quickly as possible. If the engine is turned too long, the coolant will heat up and prevent making the subsequent inspections.
2. Inspection of AAP after warming up is described on Page 18-46.

26. SPARK CONTROL MODULATION SYSTEM INSPECTION

(1) Spark delay system (2T-C engine except for Calif.)

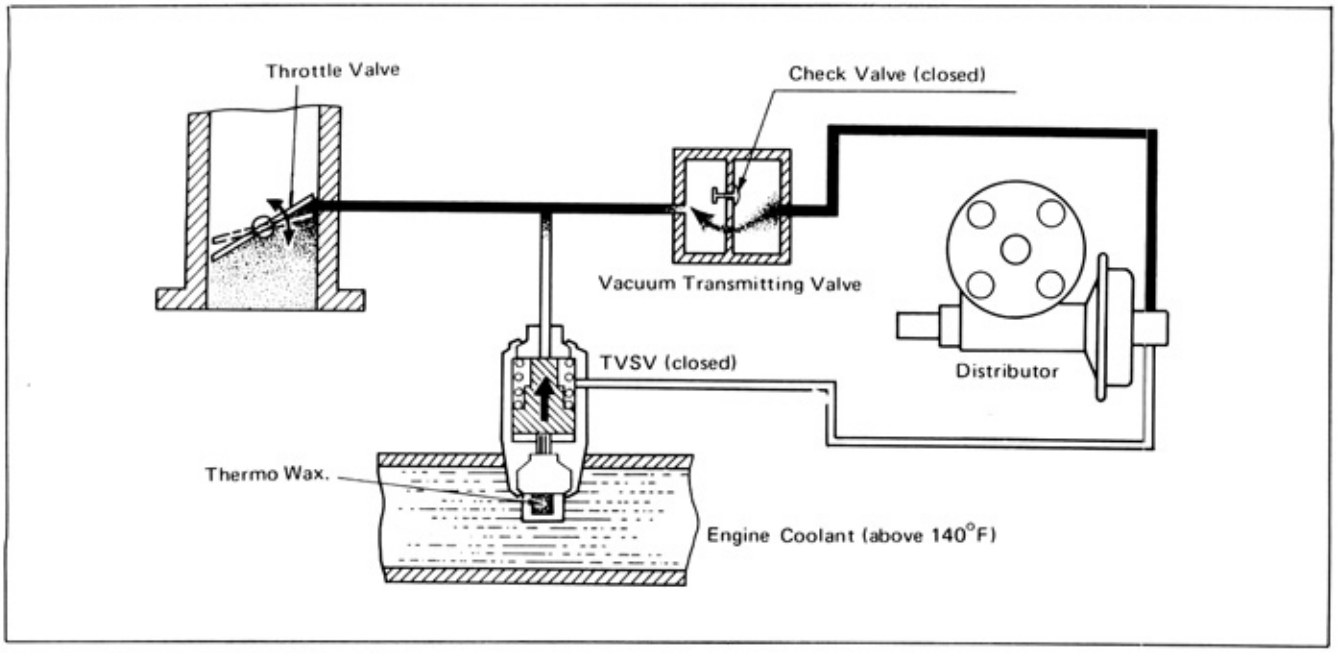


Fig. 18-59 Spark Delay System

a. At 25,000 and 50,000 mile maintenance, replace the vacuum transmitting valve.

b. At coolant temperature below 95°F, start the engine.
With the hose "A" shown in Fig. 18-60 pinched with finger, check the distributor octane selector to see that it will move when the throttle valve is opened and closed.

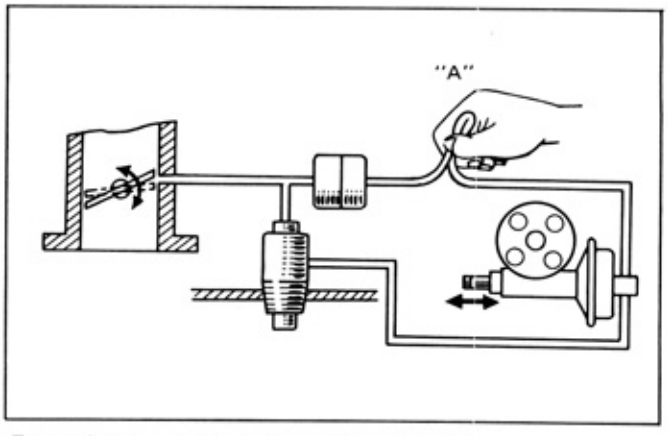


Fig. 18-60 TVSV Inspection (Cold)

HOT ENGINE OPERATIONS

c. After warming up the engine, make the same check.
The octane selector should remain at the engine stop line without moving.

If found defective at either b or c inspection, inspect distributor diaphragm or TVSV.

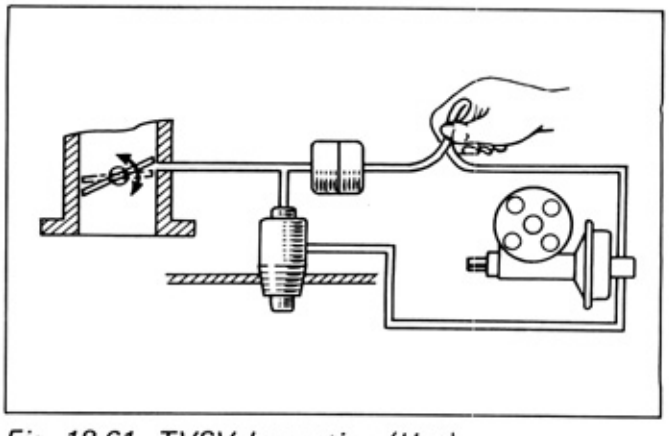


Fig. 18-61 TVSV Inspection (Hot)

d. ○ At idling, pinch the hoses closed at part "B" as shown in the diagram below.
○ Set the engine speed at 2,000 rpm, and check the octane selector to see that it will start moving in 4 to 12 seconds after the hose "B" part is released.
○ Check the octane selector to see that it will return quickly when the engine speed is brought back to idling.
○ If defective, replace the vacuum transmitting valve.

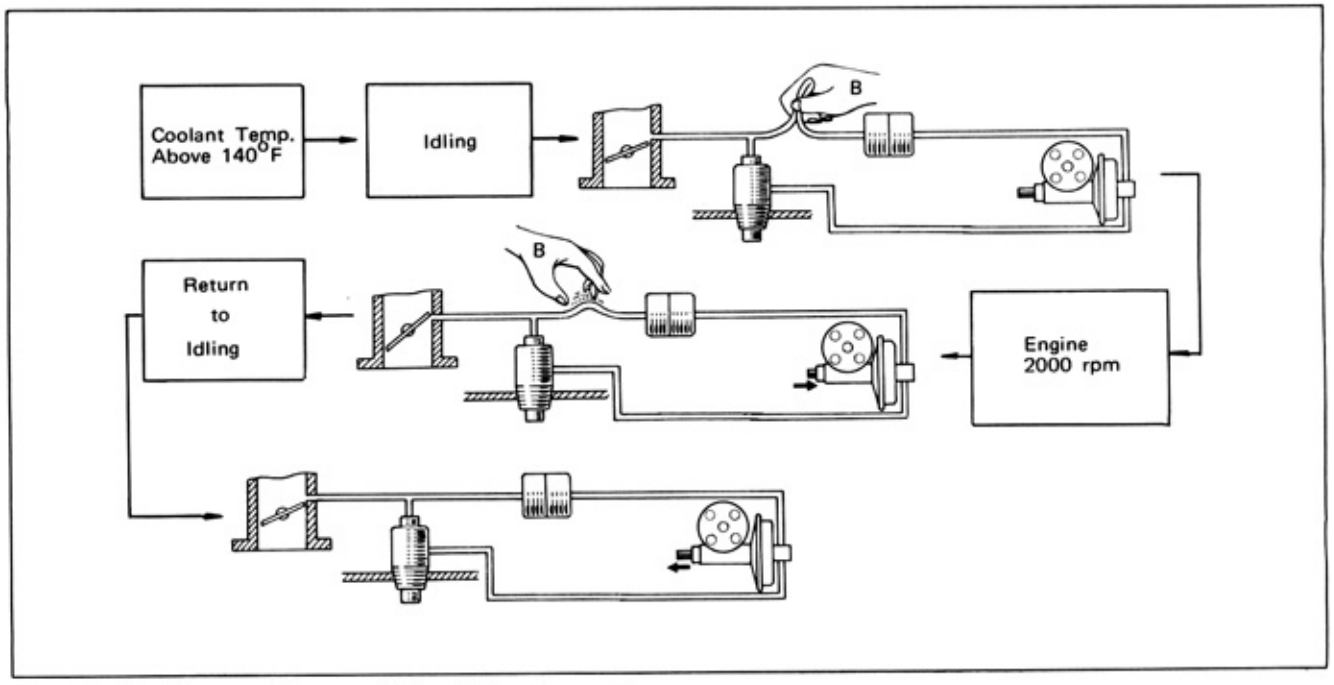


Fig. 18-62 Vacuum Transmission Valve Inspection

(2) TCS system (20R and 4M engines, and 2T-C engine for Calif.)

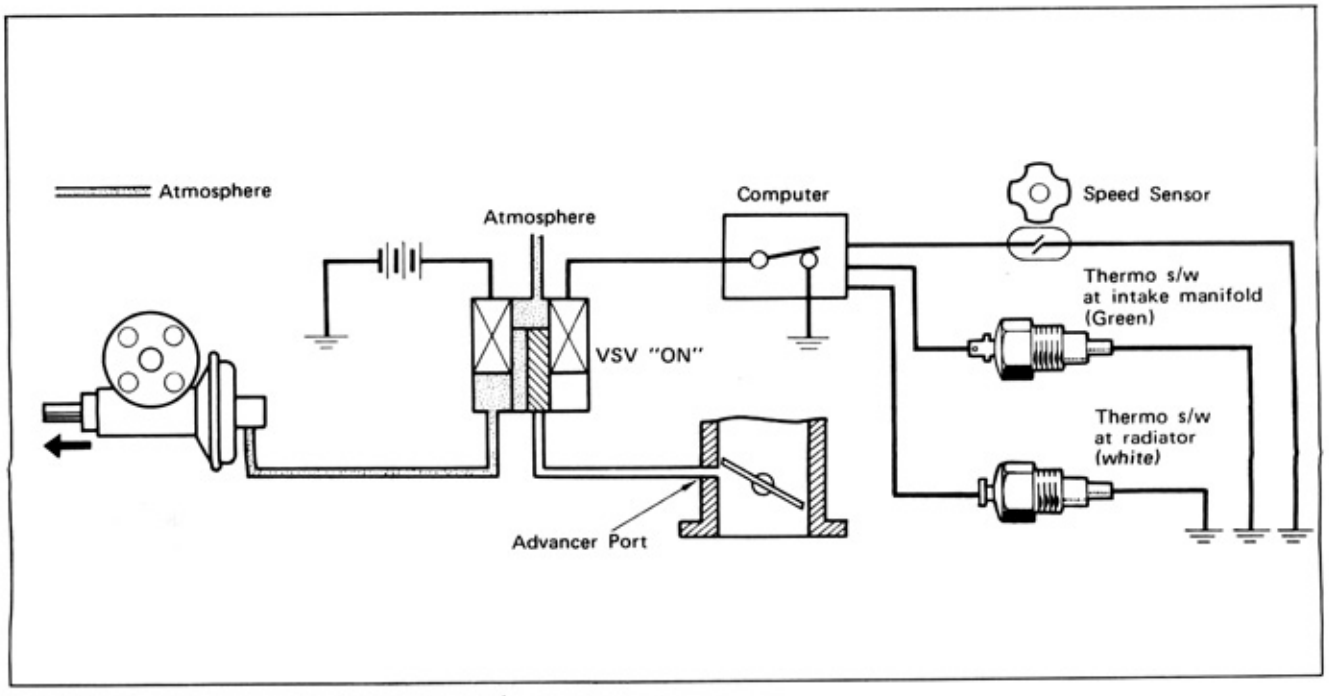


Fig. 18-63 TCS System (2T-C Engine)

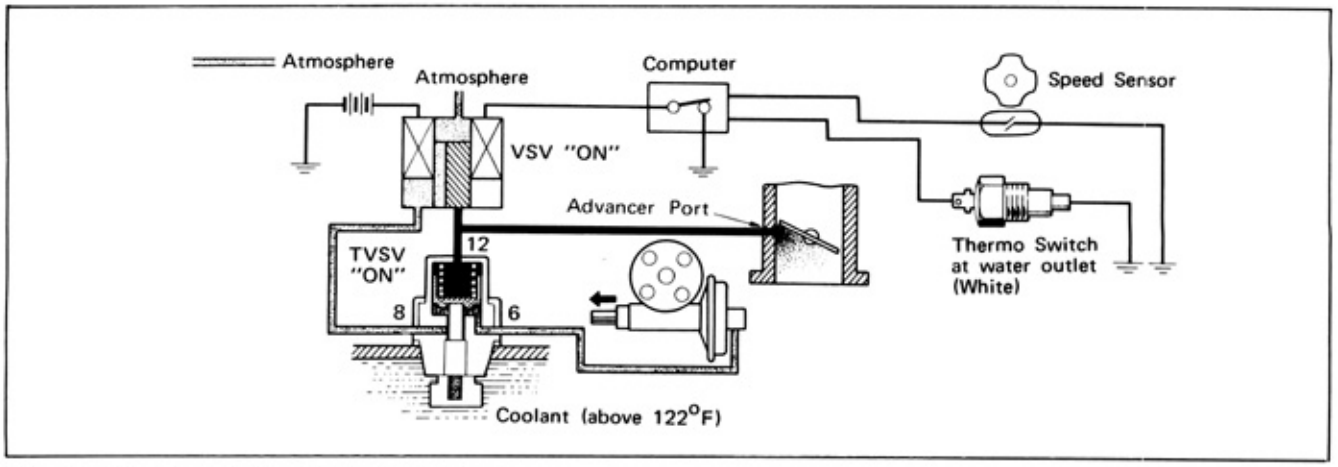


Fig. 18-64 TCS System (20R Engine)

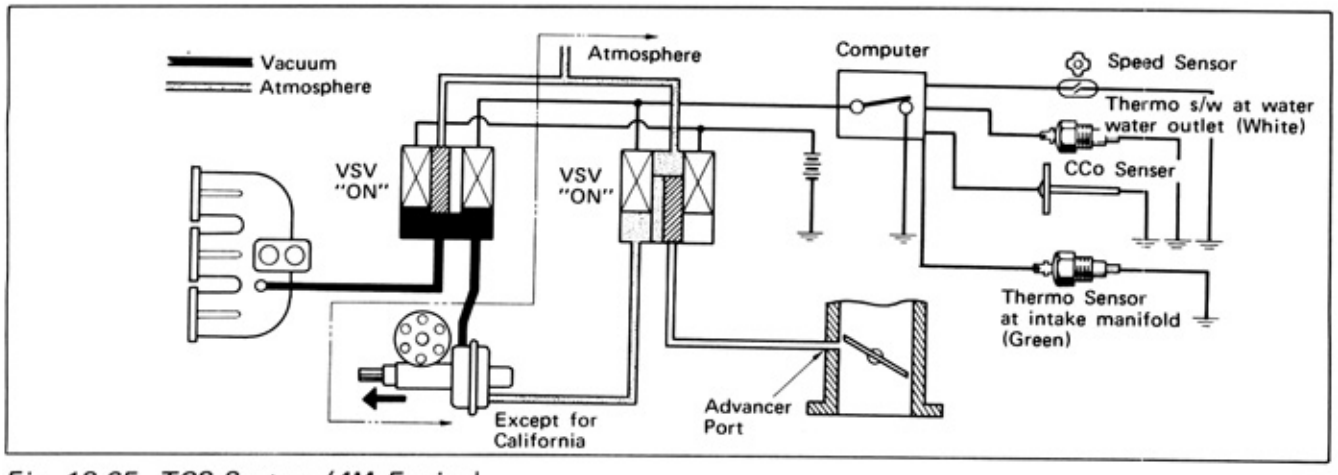


Fig. 18-65 TCS System (4M Engine)

a. At coolant temperature below 75°F, start the engine and check the distributor octane selector to see that it will move when the throttle valve is opened and closed.

HOT ENGINE OPERATION

b. After warming up, make similar check.
   - At this condition, the octane selector should remain at the engine stop line without moving (2T-C and 4M engines).
   - In the 4M engine for California, the octane selector should move toward the retard side.
   - In the 20R engine, the octane selector should still move. But when the hose No. 8 shown in Fig. 18-64 is reconnected to the distributor, the octane selector should not move.

c. If defective, refer to the inspection procedures for the TCS system.

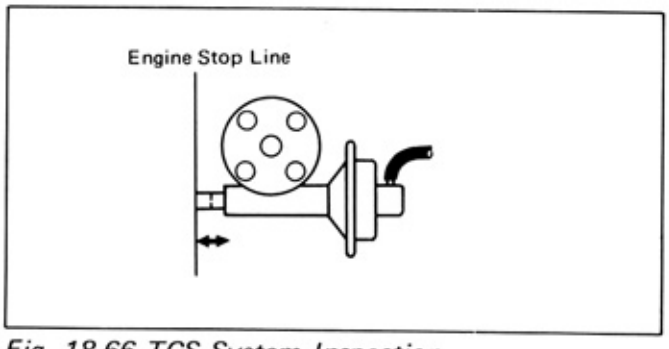


Fig. 18-66 TCS System Inspection

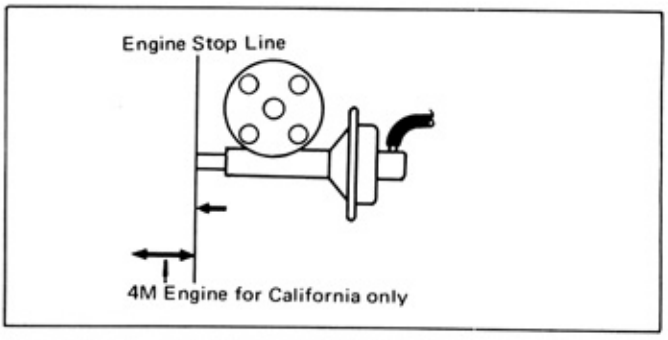


Fig. 18-67 TCS System Inspection

(3) TCS system (2F engine)

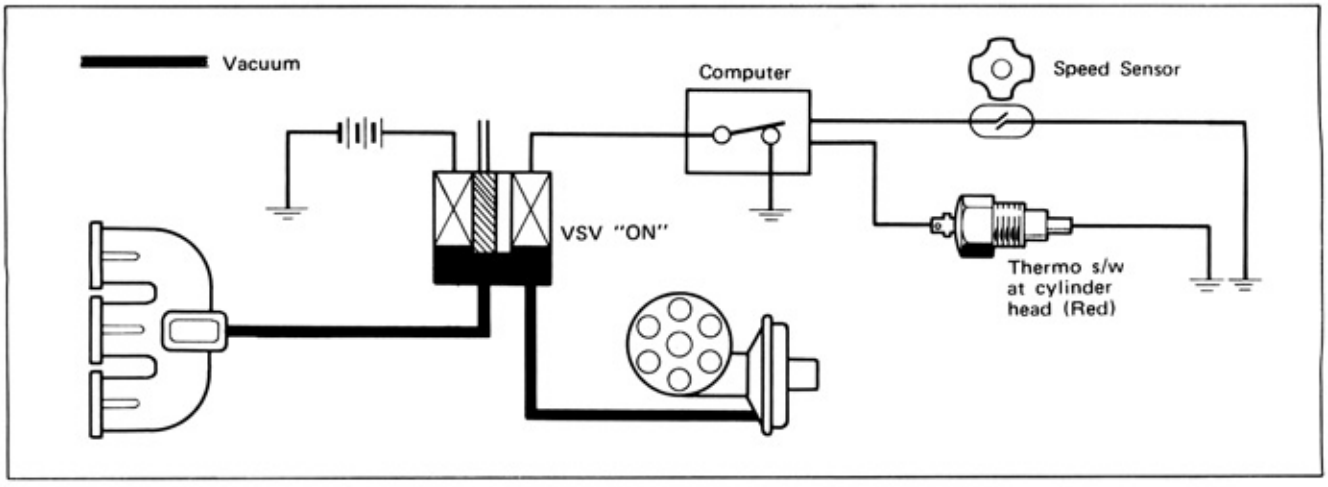


Fig. 18-68 TCS System (2F Engine)

Note
Since the 2F engine TCS system inspection will involve road testing, the throttle positioner system vehicle speed inspection is performed at the same time.

a. Install the air cleaner and connect the hoses.

b. Disconnect the hoses No. 1 and No. 6 from the VSV and connect a vacuum gauge to each pipe.

c. At coolant temperature below 100°F, and at vehicle speed 0 to 5 mph, vacuum gauge "A" should indicate zero and vacuum gauge "B" should indicate vacuum.

d. At coolant temperature below 100°F, and at vehicle speed raised to about 15 mph, vacuum gauges "A" and "B" should both indicate zero.

HOT ENGINE OPERATIONS

e. After warming up and at vehicle speed 0 to 5 mph, vacuum gauge "A" should indicate zero and vacuum gauge "B" should indicate vacuum.

f. When vehicle speed is raised to about 15 mph, vacuum gauge "A" should indicate vacuum and vacuum gauge "B" should indicate zero.

g. If defective, refer to the inspection procedures for the TCS system (Page 6-14).

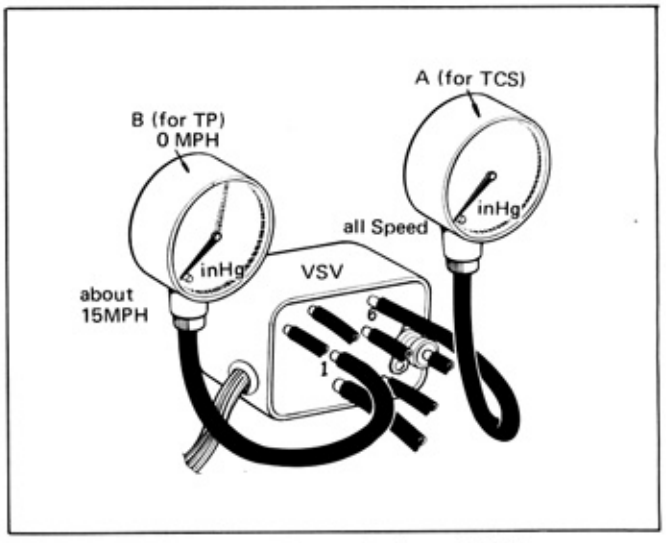


Fig. 18-69 Coolant Temp. below 100°F

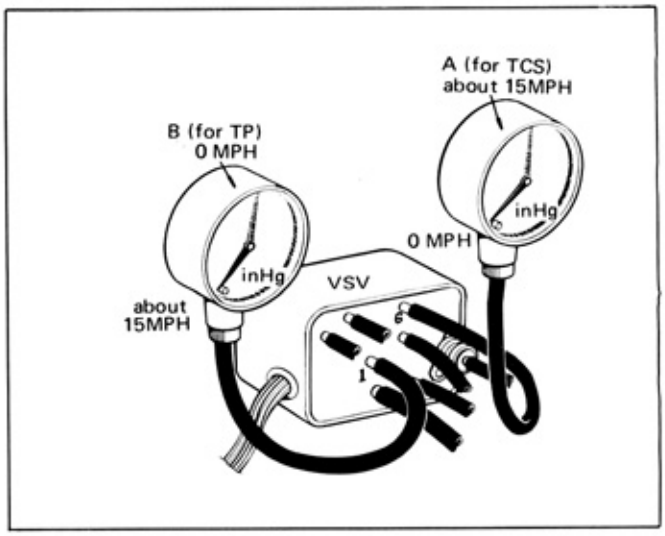


Fig. 18-70 Engine Warmed Up

27. VALVE CLEARANCE ADJUSTMENT

(1) Rurn the engine until thoroughly warmed up. (Coolant temperature about 180°F).

(2) Remove the cylinder head cover.

(3) For the 2F engine, check the valve clearances with thickness gauge while idling, and adjust if found necessary to do so.

(4) For the 2T-C and 20R engines, turn the crankshaft with a wrench and set the No.1 piston at compression top dead center.

- Check and adjust the valve clearances ① shown in Fig. 18-71 or 18-72.
- Next, turn the crankshaft one full rotation, and check and adjust the valve clearances ② shown in Fig. 18-71 or 18-72.

Note
1. Check and adjust the valve clearance quickly after warming up.
2. Check and adjust the valve clearance by inserting the thickness gauge between the adjusting screw and valve stem head.

(5) For the 4M engine, remove the engine front under pan, and set the No. 1 piston to compression top dead center by turning the crankshaft with a wrench.

- Check and adjust the valve clearances ① shown in Fig. 18-73.
- Next, turn the crankshaft one full rotation, and check and adjust the valve clearances ② shown in Fig. 18-73.

Note
1. Check and adjust the valve clearance quickly after warming up.
2. Check and adjust the valve clearance by inserting the thickness gauge between the adjusting screw and valve stem head.

(6) Install the cylinder head cover.

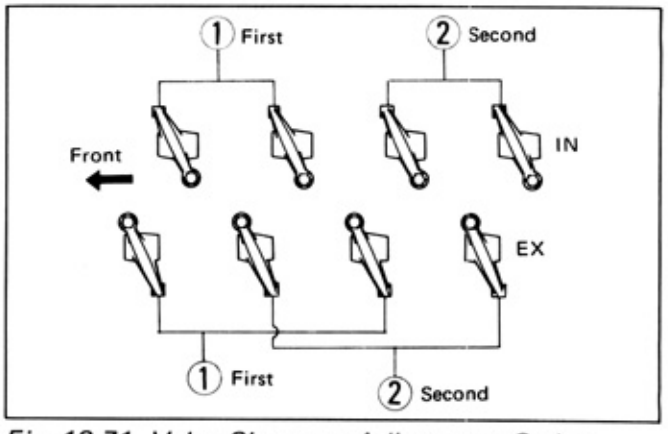


Fig. 18-71 Valve Clearance Adjustment Order (2T–C)

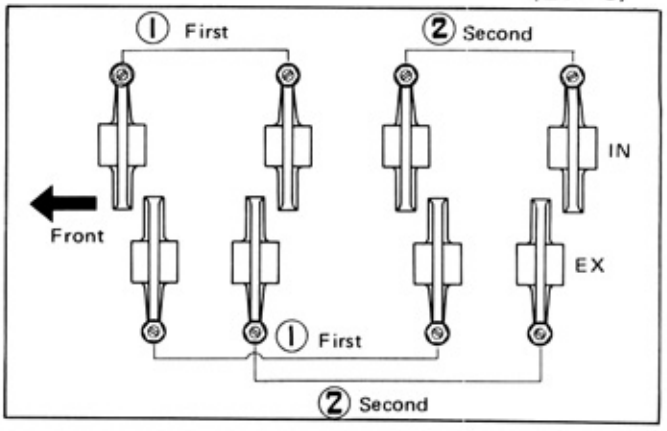


Fig. 18-72 Valve Clearance Adjustment Order (20R)

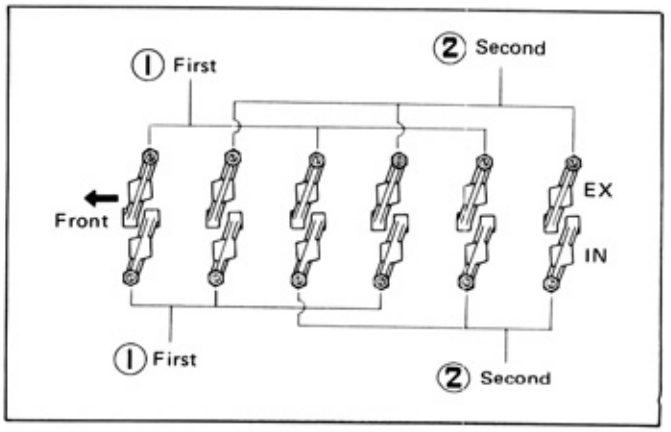


Fig. 18-73 Valve Clearance Adjustment Order (4M)

(7) Install the air cleaner and hose.

Valve Clearance (Hot) — Inch

Engine Family	Intake Valves	Exhaust Valves
2T-C	0.008	0.013
20R	0.008	0.013
4M	0.007	0.010
2F	0.008	0.014

28. SPARK PLUG REPLACEMENT

(1) Pull out the spark plug cords.

> Note
> When pulling out the spark plug cord from the plug, always pull the end of plug cord.
> Never pull the cord itself as there will be danger of breaking the resistance cord inside.

(2) Using a plug wrench, remove the spark plugs.

(3) After checking the gaps in the new spark plugs, install by using plug wrench.

> Note
> In the 25,000 and 50,000 mile maintenance, install the spark plugs after completing compression measurement.

Engine Family	Maker	Heat Range	Plug Gap
2T-C, 20R, 4M	ND (NGK)	W16EP BP5ES-L	0.03"
2F	ND (NGK)	W14EX BP5EZ	0.037"

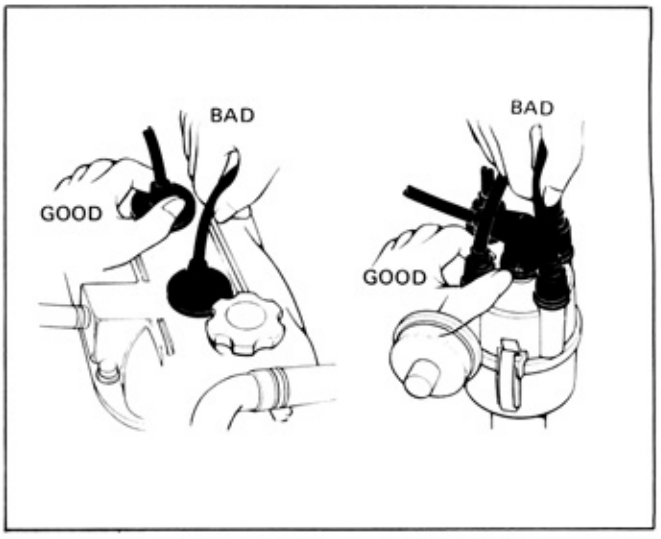


Fig. 18-74 Method of Pulling Out Plug Cord

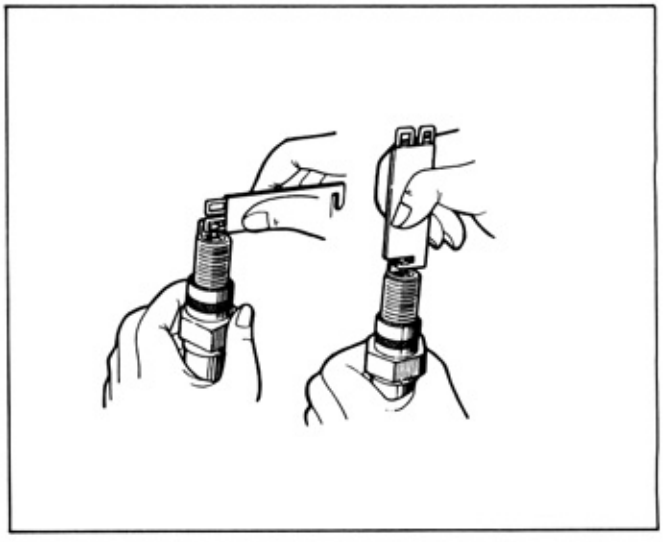


Fig. 18-75 Spark Plug Gap

29. ENGINE COMPRESSION PRESSURE INSPECTION [25,000 and 50,000 Miles]

(1) After warming up, remove all spark plugs.

(2) Pull out the coil cord from the ignition coil.

(3) Securely mount a compression gauge into the spark plug hole.

(4) Depress the accelerator pedal all the way.

(5) Turn the starter and read the gauge.

Note
- Have the engine turning at least 250 rpm.
- The engine compression measurement must be made in a short time as possible.

(6) Make the same measurement twice.

(7) The maximum value at the time the compression gauge needle remains steady should be at the specified value.

(8) Install the spark plugs and coil cord.

- In case the compression measures below the specified limit, check the cylinder head gasket, valve system, cylinders, and pistons.

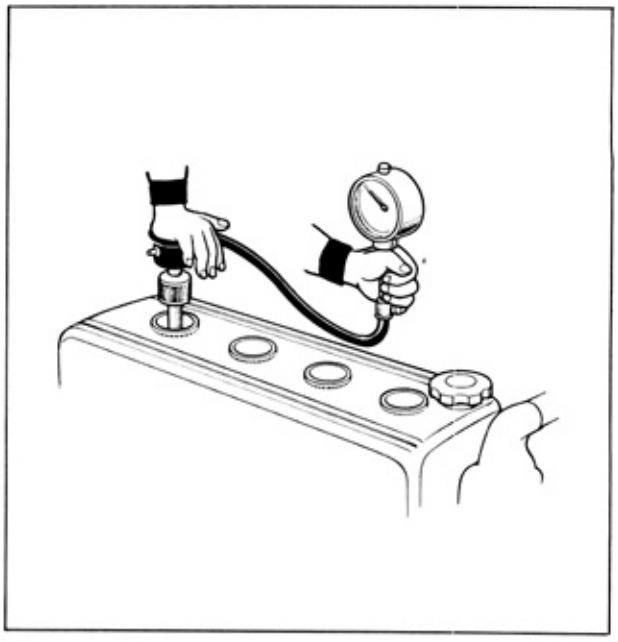


Fig. 18-76 Measuring Compression

Engine Compression Pressure at 250 RPM kg/cm² (psi)

Engine family	2T-C	20R	4M	2F
Specified pressure	12.0 (171)	11.0 (156)	11.0 (156)	10.5 (149)
Pressure limit	10.0 (142)	9.0 (128)	9.0 (128)	8.0 (114)

30. IGNITION WIRING INSPECTION

(1) Check the spark plug cords and coil cord for cracks and damages.

(2) Check the terminals of all cords for burning.

(3) Using a circuit tester (ohm-meter), measure the resistances of the cords.

Note
Shake the cord while measuring the resistance. The purpose of this is to check if the cord is just about to break.

Resistances

Standard resistance	16 kilo Ohms
Service limit	25 kilo Ohms

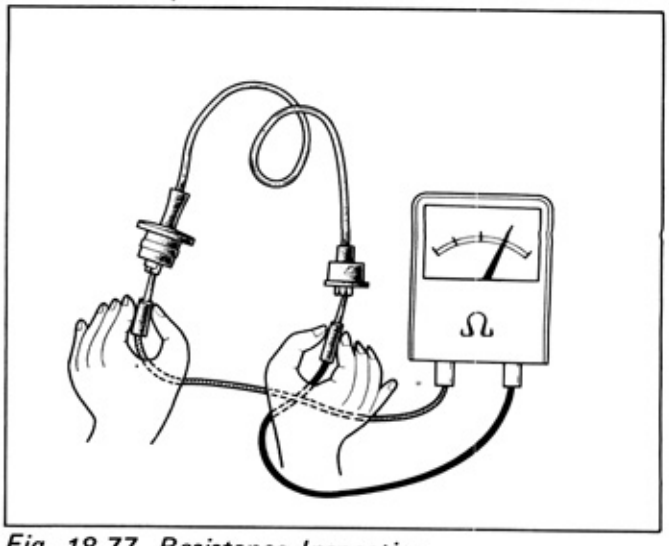


Fig. 18-77 Resistance Inspection

31. DISTRIBUTOR CAP AND ROTOR INSPECTION

(1) Check the distributor cap and rubber cap for cracks and damages.
(2) Check the cord terminals for corrosion, burning, and looseness.
(3) Check the side electrodes for burning.
(4) Check the center electrode for wear, and for loss in spring tension.
(5) Check the rotor for cracks and damages.
(6) Check the rotor electrode for dirt and burning.

If any defects are found, correct by cleaning or replacing.

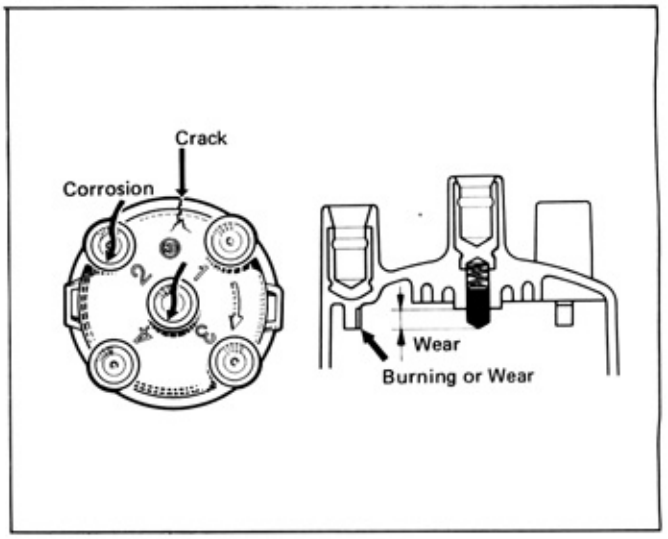


Fig. 18-78 Distributor Cap Inspection

32. DISTRIBUTOR BREAKER POINT CLEANING [12,500 and 37,500 miles]

(1) Remove the distributor cap, rotor, and dust cover.

(2) Clean the point surface with a piece of cotton wetted with trichloroethylene.

(3) If the point surface is pitted, remove the point and correct the surface with oil stone. If badly pitted, make necessary replacement.

(4) If the sliding surface of the cam, breaker heel, or breaker is dry, apply molybdenum grease.

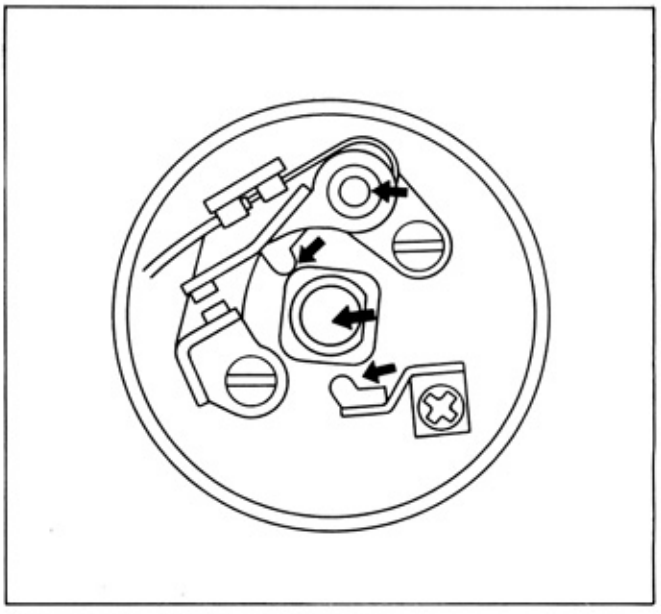


Fig. 18-79 Greasing Portions

33. DISTRIBUTOR BREAKER POINT REPLACEMENT [25,000 and 50,000 miles]

(1) Remove the screws and snap ring, and take off the distributor kit parts.
(2) Install new distributor kit, and secure with screws and snap ring.
(3) Set the distributor breaker heel on top of cam lobe, and adjust the point gap to between 0.016" and 0.020".

34. DISTRIBUTOR OPERATING PARTS INSPECTION

(1) Check the rotor to see that when turned clockwise and released, it will return smoothly

- If the rotor fails to return smoothly, disassemble the distributor and check the governor.

(2) Check the rotor for excessive looseness.

- If too loose, tighten the cam mounting screw. If still too loose, replace the rotor.

(3) Install the distributor cap and the various cords.

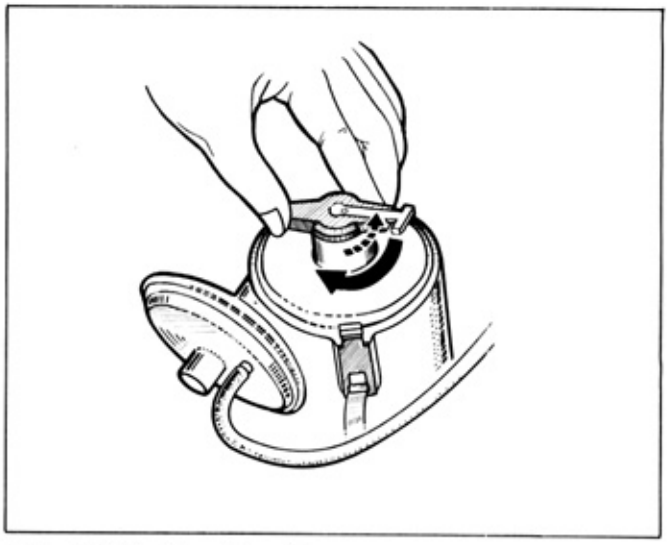


Fig. 18-80 Checking Governor

(4) Disconnect the vacuum hose from the distributor. Start the engine and while observing the timing mark with timing light, keep on opening and closing the throttle valve. At this time, the timing mark should vary in accordance with the opening and closing of the throttle valve.

- If defective, check the governor.

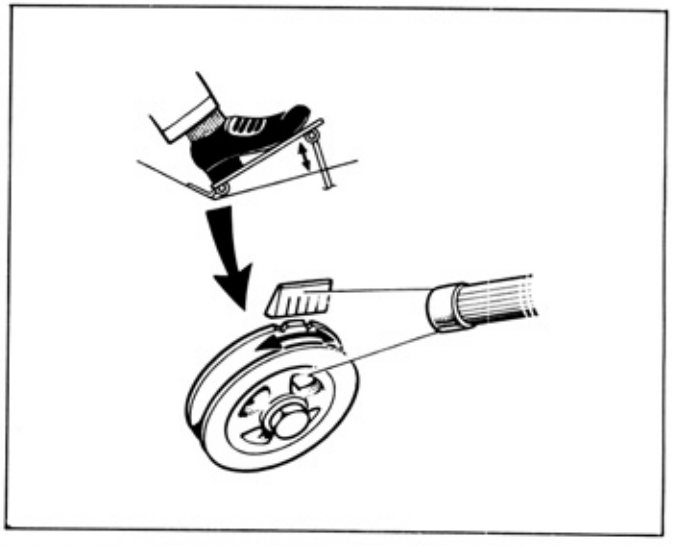


Fig. 18-81 Checking Governor Advance

(5) Next, keep on connecting and disconnecting the distributor vacuum hose from the intake manifold. When checked with timing light, the timing mark should fluctuate in accordance with change of vacuum.

- If defective, check the operation of the diaphragm and diaphragm shaft.

(6) Reconnect the vacuum hose to former location.

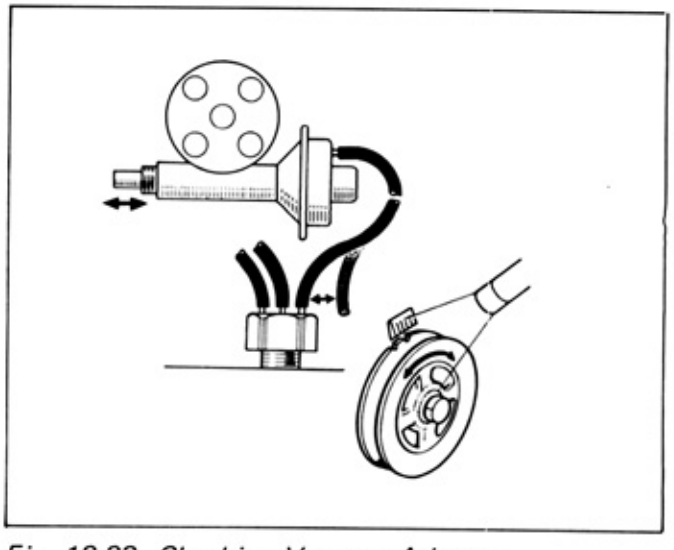


Fig. 18-82 Checking Vacuum Advance

35. IGNITION TIMING AND DWELL ANGLE ADJUSTMENT

(1) If the breaker points were replaced, set the distributor breaker heel on top of cam lobe, and adjust the point gap 0.016" to 0.020".

(2) Install the dust cover, rotor, and distributor cap.

> Note
> If the operations (1) and (2) have already been performed, they need not be repeated here.

(3) Warm up the engine once more, and check the choke valve to see that it is full open.

(4) Connect a tachometer and dwell meter on the engine.

> Caution
> Connect the tachometer (+) terminal to the ignition coil (–) terminal. Do not connect it to the distributor side.

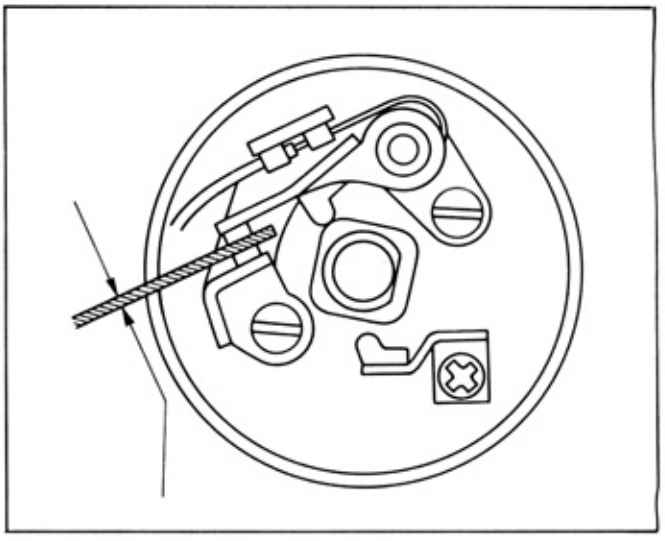


Fig. 18-83 Checking Point Gap

(5) Set the engine to specified idle speed by turning the carburetor throttle adjusting screw. Refer to Page 18-48.

(6) Check the dwell angle with the dwell angle meter, and if not at specified angle, readjust the point gap.

(7) In case of dual point distributor.

a. Check the main point in same manner as above.

b. In checking the sub-point, have the thermo switch wiring connector grounded.

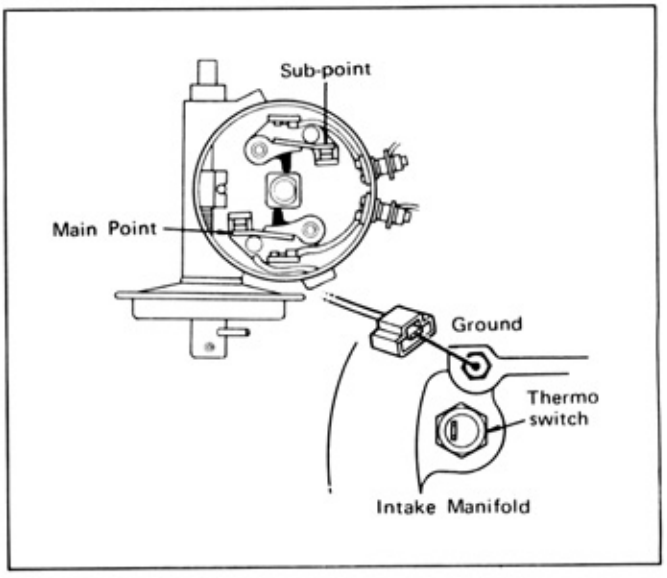


Fig. 18-84 Sub-Point Inspection

Distributor Dwell Angles

4-Cylinder engine	52 degrees (50 to 54 degrees)
6-Cylinder engine	41 degrees (38 to 44 degrees)
Dual point distributor main point	57 degrees
Dual point distributor sub-point	52 degrees (50 to 54 degrees)

(8) Using a timing light, check the ignition timing.

a. In case the ignition timing is far off, loosen the distributor clamp, and correct by turning the distributor to either side.

b. If only slightly off, correct by turning the octane selector. (2F engine is not equipped with octane selector)

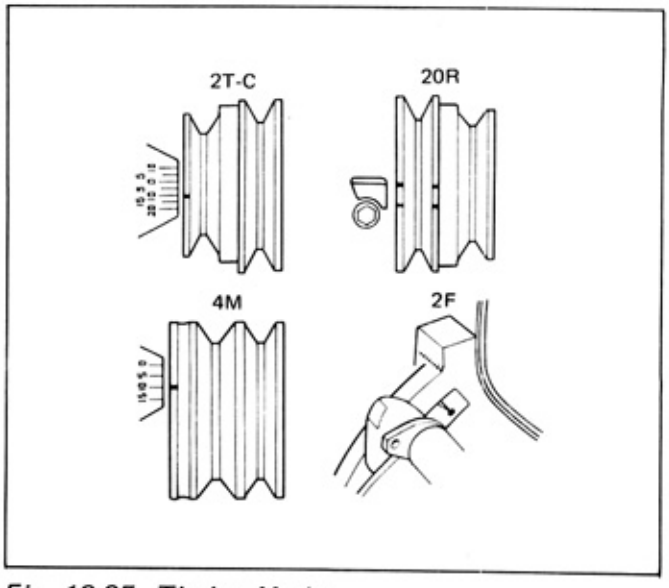


Fig. 18-85 Timing Marks

Initial Ignition Timing (Transmission in "N" Range)

Engine Family	Transmission	Except California	for California only
2T-C	M/T, A/T	10° BTC/850 rpm	←
20R	M/T, A/T	8° BTC/850 rpm	←
4M	M/T	10° BTC/800 rpm	5° BTC/800 rpm
	A/T	10° BTC/750 rpm	5° BTC/750 rpm
2F	M/T	7° BTC/650 rpm	←
2T-C (Dual Point Dis.)	M/T, A/T	Main Point –12° BTC/850 rpm	–
		Sub, Point –19~25°BTC	–

c. In case of engine with dual point distributor, adjust the ignition timing at main point side by method already described. Next, ground the thermo switch wiring connector and check the timing at sub-point side.

d. If the sub-point ignition timing is off, adjust the sub-point gap so that the sub-point dwell angle will be 52°.

e. Reconnect the thermo-switch wiring.

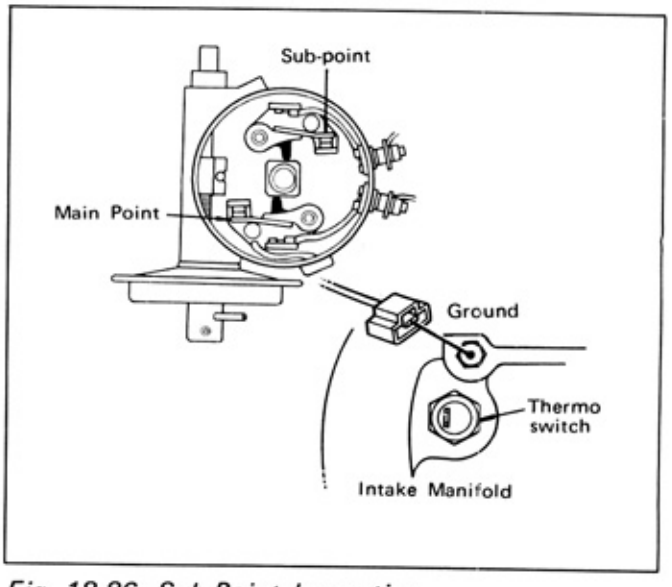


Fig. 18-86 Sub-Point Inspection

36. AUXILIARY ACCELERATION PUMP INSPECTION (Inspection after warming up)

(1) Start the engine and with the vacuum circuit closed by pinching the AAP diaphragm hose with finger, stop the engine.

(2) While observing the acceleration nozzle, check to see that gasoline will not be ejected out from the acceleration nozzle when the pinched hose is released.
In defective, check the AAP or thermostatic vacuum switching valve.

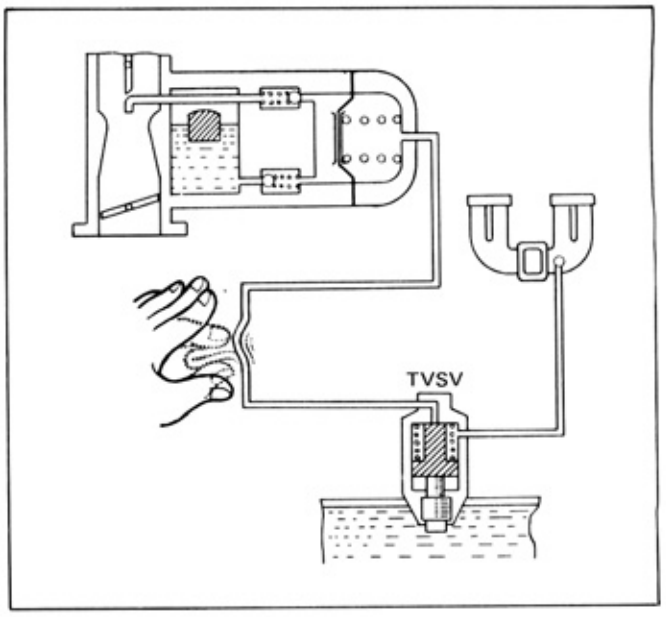


Fig. 18-87 AAP Inspection

37. HOT AIR INTAKE SYSTEM INSPECTION

(1) Vacuum type HAI system inspection

a. With the air cleaner removed and the cold air intake opening open, sucking vacuum hose of the intake manifold side with mouth should cause the cold air intake opening to close.

b. After installing the air cleaner and warming up the engine, the cold air intake opening should remain open when the engine is idling.
- If defective, check the diaphragm by sucking it directly with mouth.
- If the diaphragm checks out to be good, replace the thermo valve.

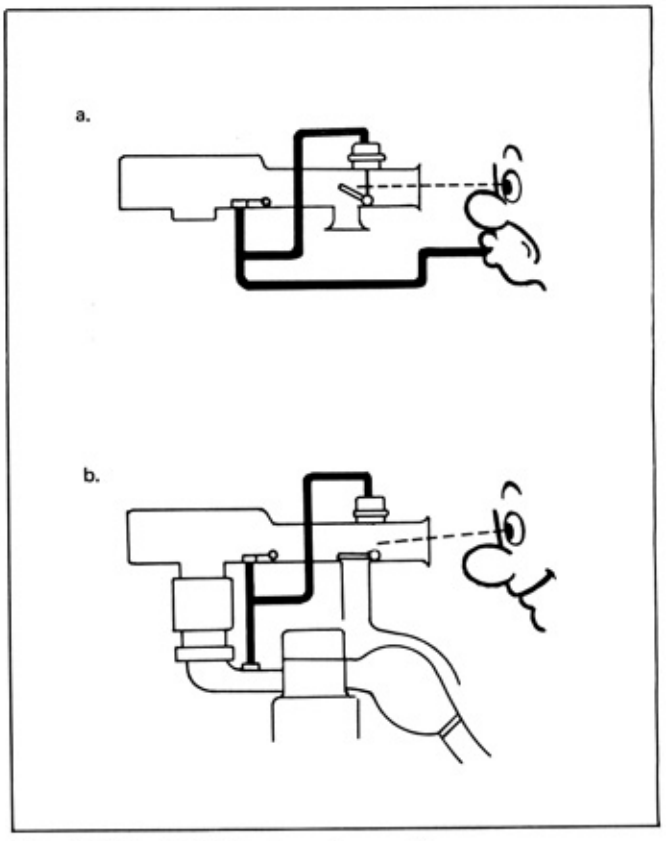


Fig. 18-88 HAI System Inspection

(2) Wax type HAI system inspection (2F engine)

a. With the air cleaner removed, the cold air intake opening should be closed.

b. After installing the air cleaner and warming up the engine, the cold air intake opening should be open.

○ If defective check the link. If the link is in normal condition, the thermo wax would be at fault.

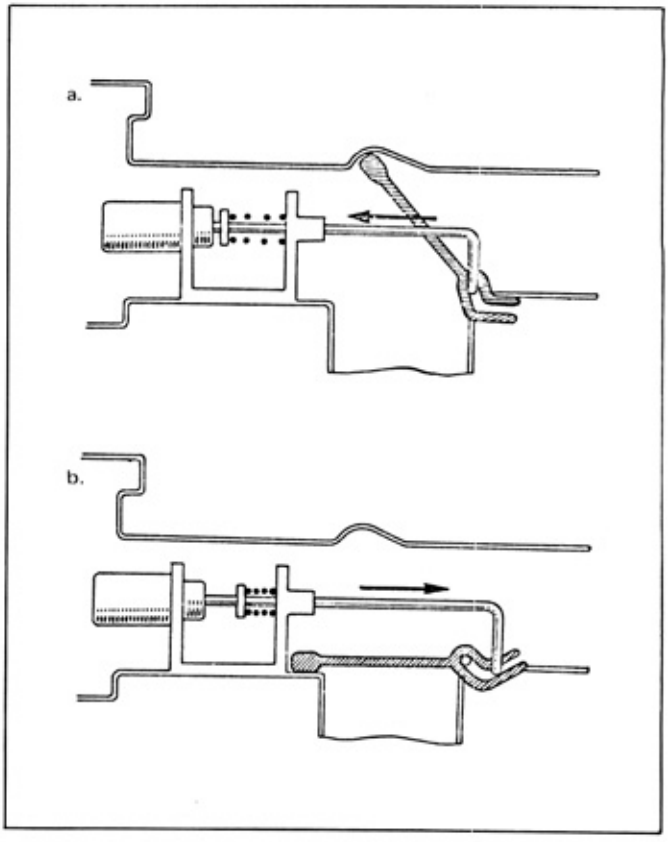


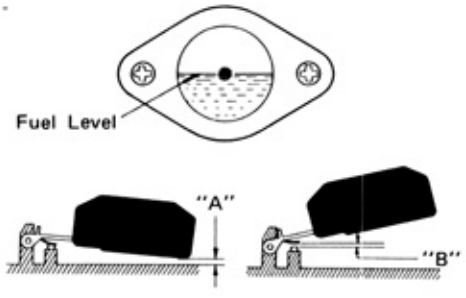
Fig. 18-89 HAI System Inspection

38. CURB IDLE SPEED AND AIR/FUEL MIXTURE ADJUSTMENT (Includes Fast Idle Speed Setting)

(1) Check the following items beforehand.

1) Coolant temperature – Approximately 180°F
2) Choke valve – Full open
3) Accessory parts (wipers, heater, lights, air conditioner, etc.,) – All switched off.
4) Vacuum lines – All lines connected.
5) Ignition timing – Initial set position
6) Transmission – In "N" range.

(2) While idling, check the carburetor fuel level. If the fuel level is not aligned with the standard line in the sight glass, check the carburetor needle valve and float level, and repair or replace if found faulty.



Engine	"A" in (mm)	"B" in (mm)
2T-C	0.138 (3.5)	0.047 (1.2)
20R	0.197 (5.0)	0.039 (1.0)
4M	0.394 (10.0)	0.039 (1.0)
2F	0.161 (4.1)	0.039 (1.0)

Fig. 18-90 Fuel Level and Float Level

(3) Set to the maximum speed by turning the Idle Mixture Adjusting screw.

(4) Set to the idle mixture speed by turning the Idle Speed Adjusting Screw.

(5) Keep on repeating the adjustments (3) and (4) until the maximum speed will not rise any further no matter how much the Idle Mixture Adjusting Screw is adjusted before moving to the next steps.

(6) Set to the initial idle speed by screwing in the Idle Mixture Adjusting Screw.

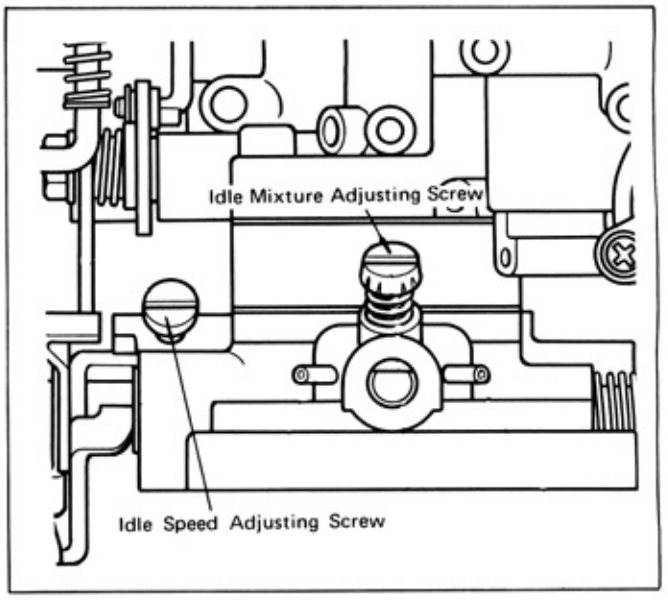


Fig. 18-91 Adjusting Screws

Initial Idle Speed & Idle Mixture Speed

Engine Family	Initial Idle Speed (rpm)		Idle Mixture Speed (rpm)	
	M/T	A/T	M/T	A/T
2T-C	850	850	930	930
20R	850	850	900	900
4M	800	750	870	820
2F	650		690	

(7) Adjust the fast idle speed

a. Stop the engine and fully close the choke valve.
- Remove the air cleaner cap.
- With the throttle valve slightly open, close the choke valve with finger, and then close the throttle valve.
- The choke valve will now be fully closed.

b. Start the engine without stepping on the accelerator pedal.

c. Check the engine speed to see if it is at the speficied fast idle speed.
If not, correct by turning the fast idle adjusting screw.

> Note
> In the 20R engine, check and adjust the fast idle speed with the EGR system turned off. (Vacuum hose disconnected from EGR valve)

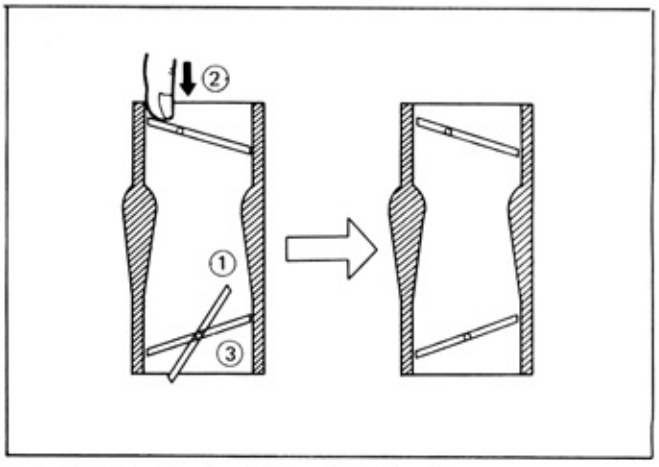


Fig. 18-92 Choke Valve Closing Sequence

Fast Idle Speed (rpm)

Engine Family	Fast Idle Speed
2T-C	3000 ± 200
2T-C (for California only)	2700 ± 200
20R	2400 ± 200 w/o EGR
4M	2600 ± 200
4M (for California only)	2400 ± 200
2F	1800 ± 200

39. CHOKE OPENER SYSTEM INSPECTION (20R engine, and 2T-C engine for Calif.)

(1) Disconnect the hose between the vacuum switching valve (VSV) and choke opener diaphragm, and connect a vacuum gauge to the VSV pipe (No. 7 for 2T-C engine engine and No. 11 for 20R engine.)

(2) At idling, 20R engine should indicate vacuum on the gauge. The 2T-C engine should not indicate any vacuum.

(3) In case of 2T-C engine, vacuum should be shown when running at 20 to 30 mph.

(4) Reconnect the vacuum hose to former location.

(5) If defective, check in accordance with the inspection procedures for choke opener system.

Note
If the TP system check is done together with this system check, it is best efficiency.

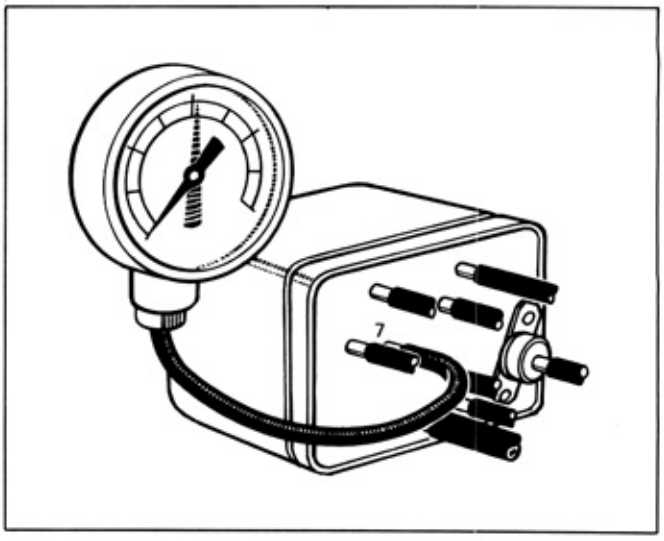


Fig. 18-93 Vacuum Gauge Connection (2T-C)

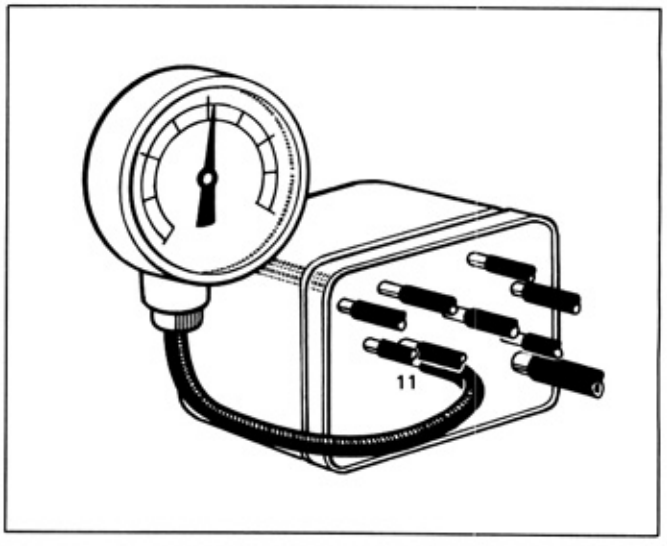


Fig. 18-94 Vacuum Gauge Connection (20R)

40. FAST IDLE BREAKER SYSTEM (4M engine)

(1) Disconnect the hose between the vacuum switching valve (VSV) and the diaphragm and connect a vacuum gauge to the VSV pipe No. 3.

(2) Disconnect the thermo sensor wiring terminal and perform road test.

(3) Raise the vehicle speed gradually. When up to around 20 to 30 mph, the vacuum gauge should indicate intake manifold vacuum.

(4) Reconnect the thermo sensor wiring, and reconnect the vacuum hose to its fromer location.

(5) If defective, refer to the inspection procedures for fast idle breaker system (Page 10-8).

Note
If the TP system check is done together with this system check, it is best efficiency.

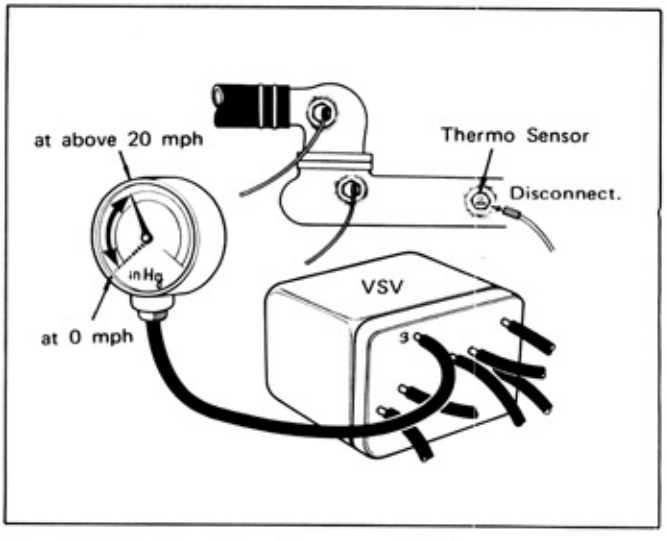


Fig. 18-95 Checking Vacuum (4M)

41. THROTTLE POSITIONER SYSTEM INSPECTION

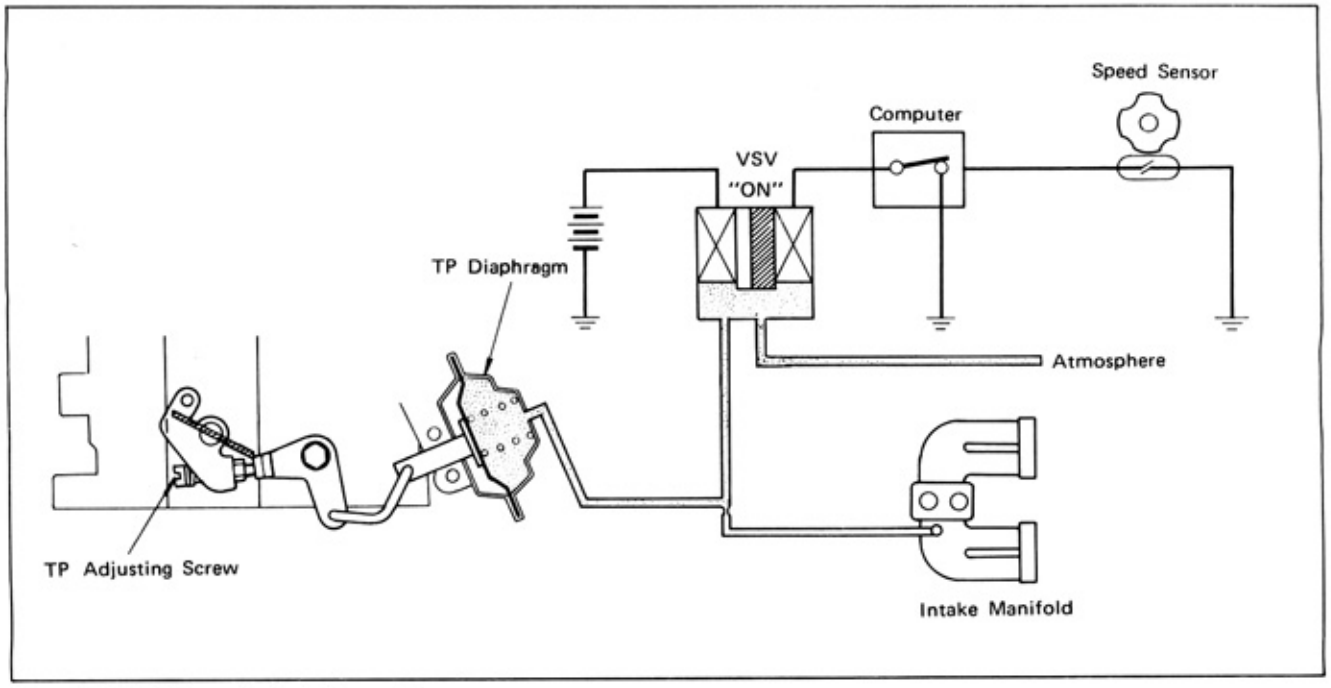


Fig. 18-96 Throttle Positioner System

(1) Visually check the hoses and wiring for disconnection and damage, and correct any defect found.

(2) Check the throttle positioner operation.
- Have the engine idling.
- Disconnect the sensing hose from the TP diaphragm.
- Race the engine and then remove the foot from the accelerator pedal.
  At this time, the TP adjusting screw should hook on to the throttle valve lever and cause the engine to turn faster than its idling speed.
- At the above condition, connect the TP diaphragm to the intake manifold with vacuum hose. The TP adjusting screw should release from the throttle valve lever and allow the engine to return to idling speed.
- If defective, check the diaphragm and linkage.
- After completing the inspection, replace the vacuum hose disconnected for the test to its former location.

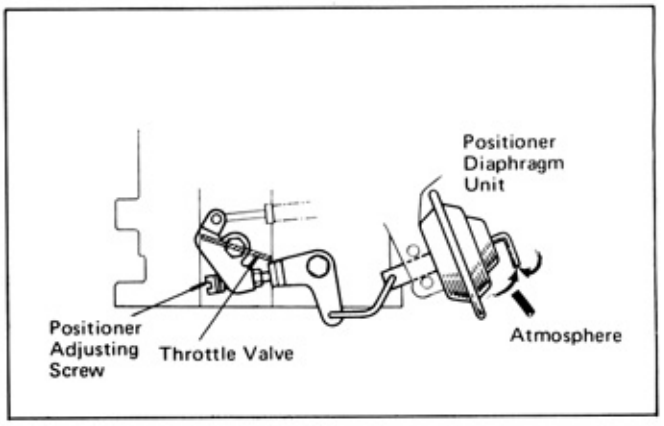


Fig. 18-97 TP Operation Inspection

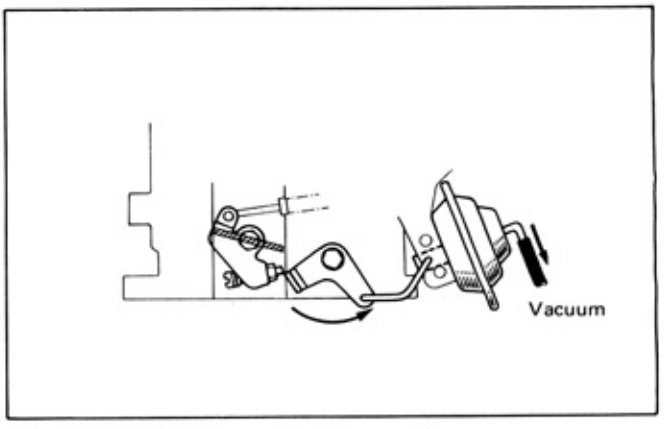


Fig. 18-98 TP Operation Inspection

(3) Check the throttle positioner setting speed.

- After warming up, check the idling speed.
- Disconnect the TP diaphragm sensing hose.
- Race the engine and then remove the foot from the accelerator pedal. At this time, check the engine speed. If not at specified speed, correct by turning the TP adjusting screw.

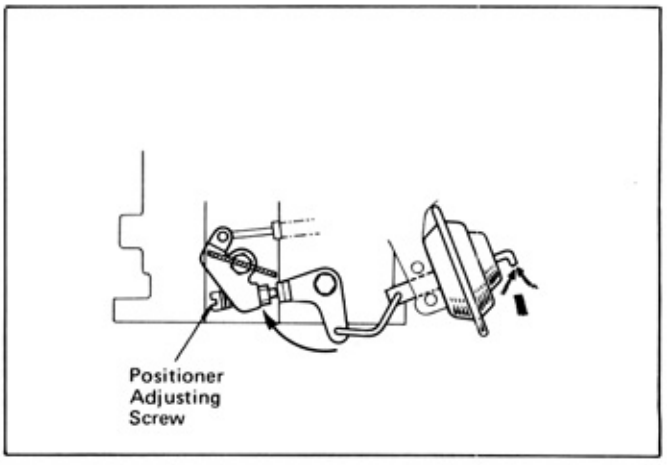


Fig. 18-99 TP Setting

TP Setting Speeds (rpm)

Engine Family	Transmission	Speed
2T-C	M/T	1500 ± 100
	A/T	1400 ± 100
20R	M/T	1400 ± 100
	A/T	1050 ± 100
4M	M/T	1300 ± 100
	A/T	1200 ± 100
2F	M/T	1200 ± 100

(4) Check the system from speed sensor to VSV.

- Disconnect the vacuum hose between the TP diaphragm and VSV.
- Connect a vacuum gauge to the VSV, and set the gauge at the driver's seat.
- Perform road test while observing the speedometer and vacuum gauge.

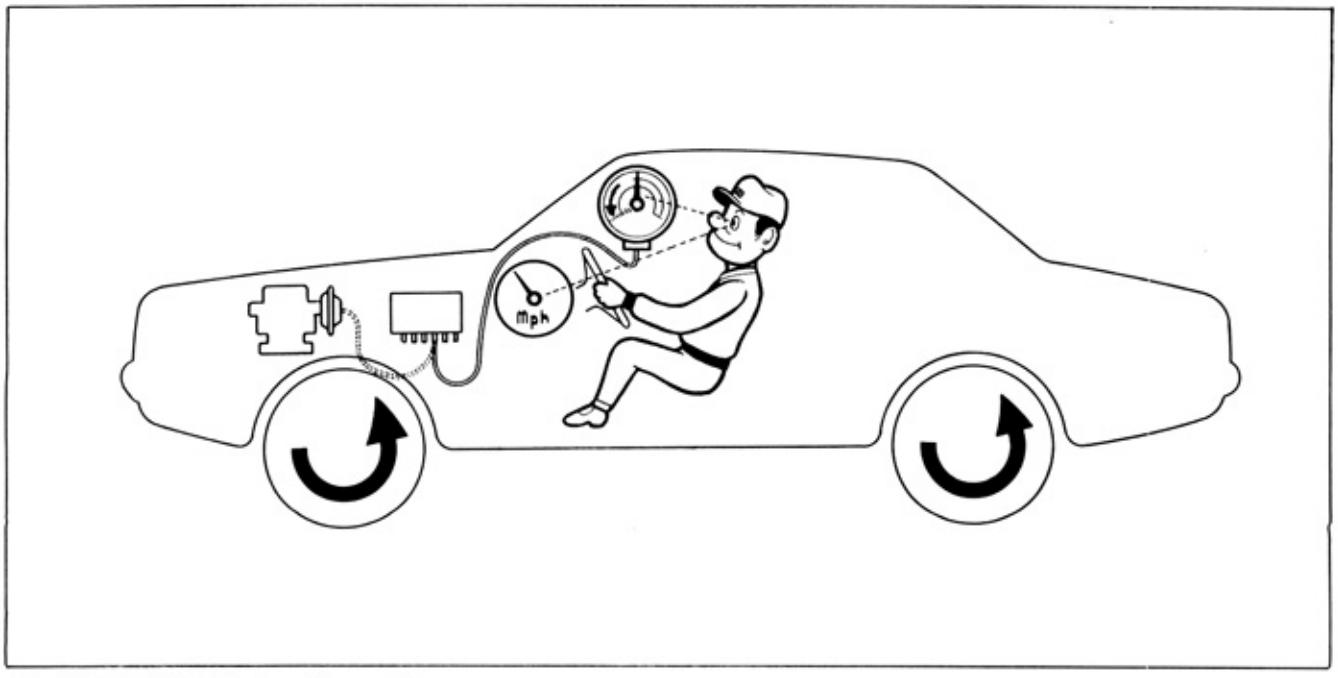


Fig. 18-100 TP System Inspection

- While idling, check the vacuum gauge to see that it indicates vacuum.
- At 30 mph vehicle speed, check the vacuum gauge to see that it does not indicate vacuum.
- If defective, check in accordance with the inspection procedures described on Page 4-3.

42. EXHAUST GAS RECIRCULATION (EGR) SYSTEM INSPECTION (25,000 and 50,000 miles)

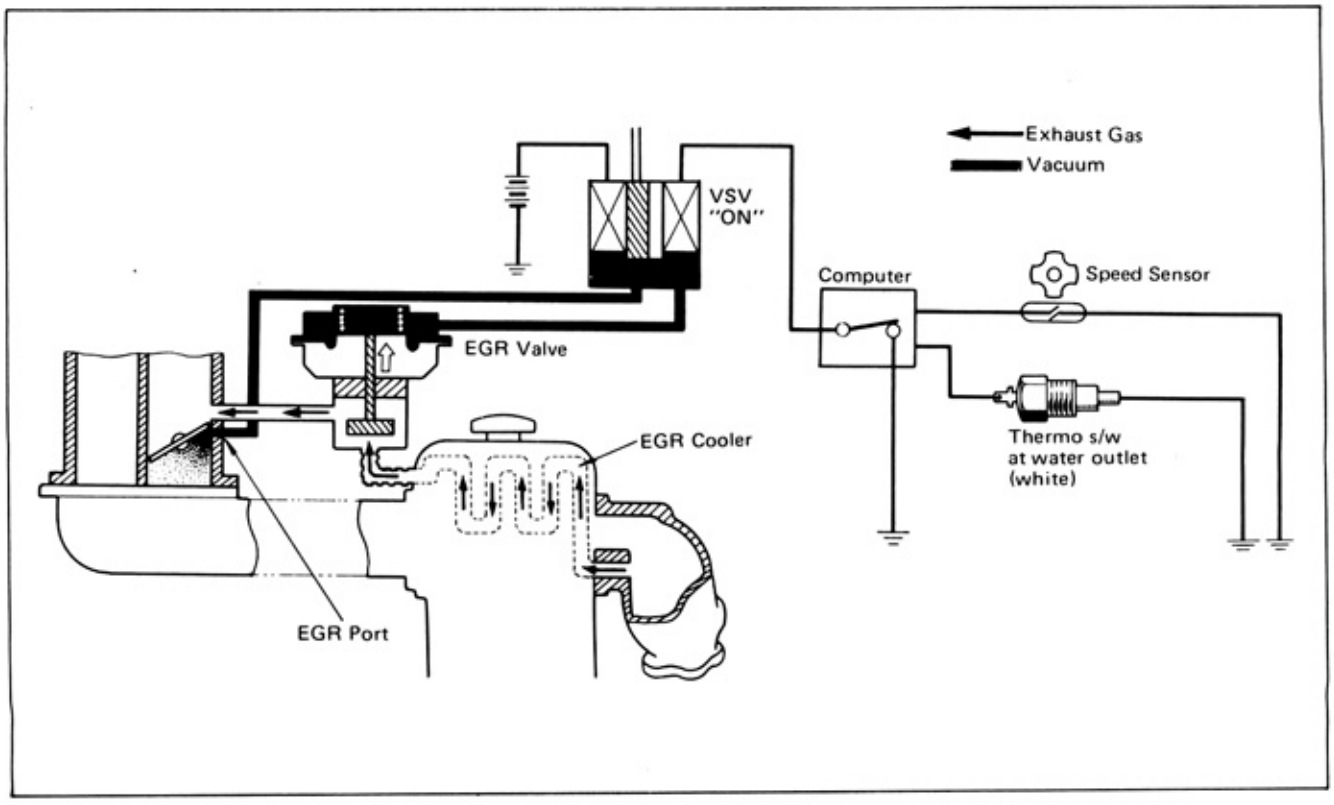


Fig. 18-101 EGR System (20R Engine)

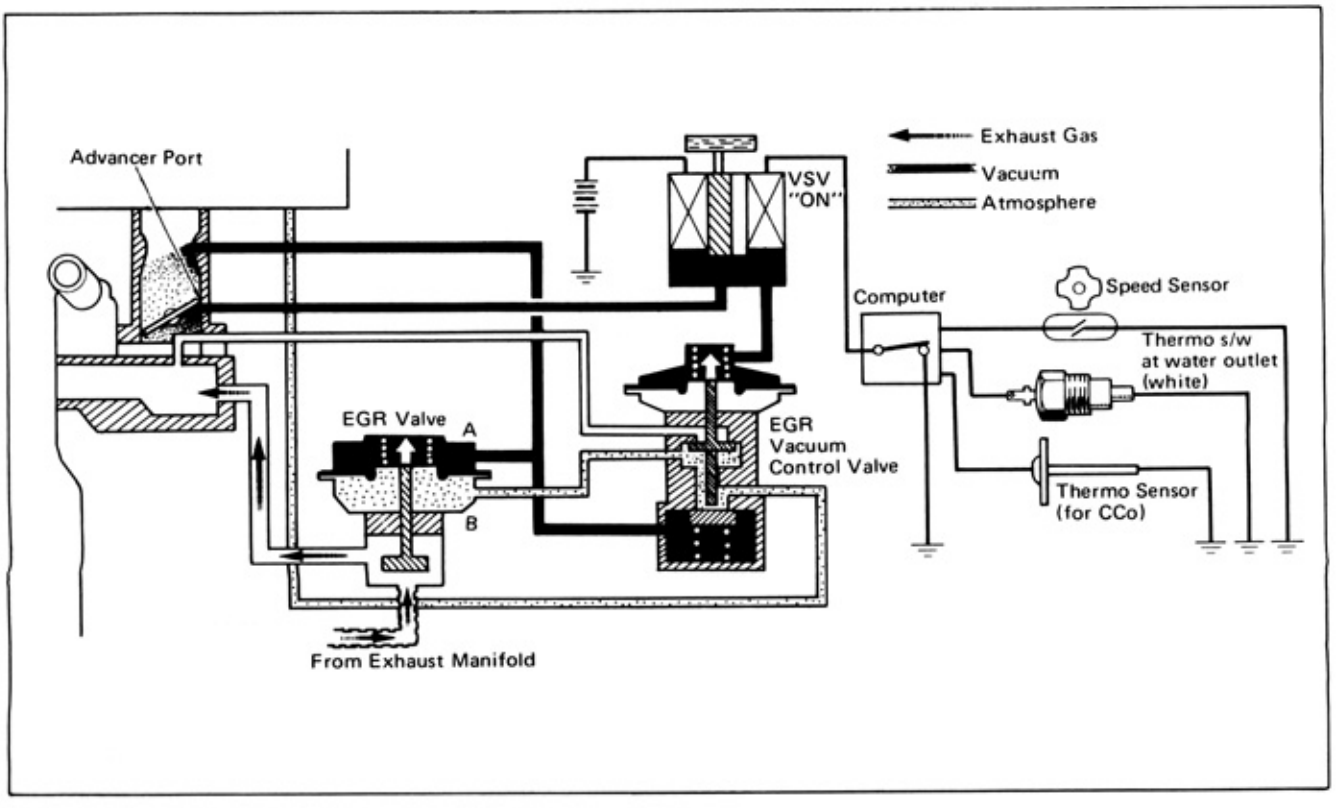


Fig. 18-102 EGR System (4M Engine)

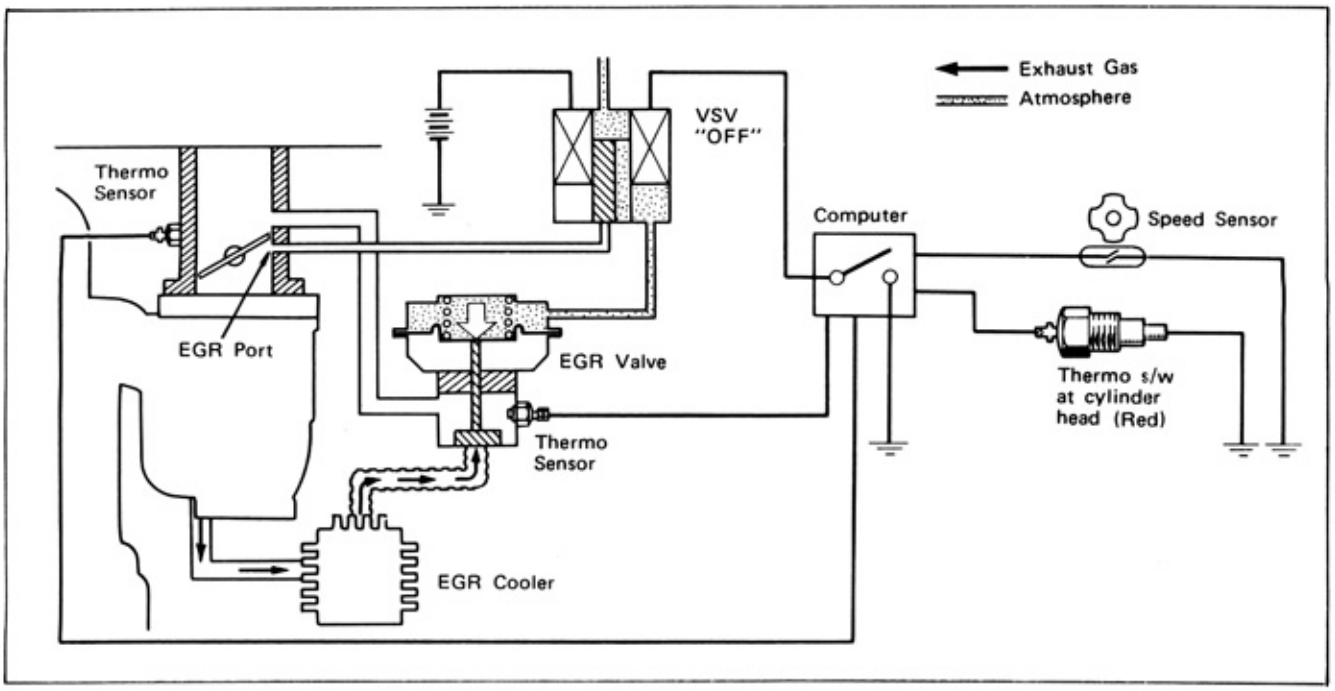


Fig. 18-103 EGR System (2F Engine)

(1) EGR valve inspection (20R and 2F engines)

a. Remove the air cleaner cap.

b. With the engine idling, connect the EGR valve directly to the intake manifold with vacuum hose.
At this time, a bubbling sound should be heard at the carburetor.

c. When this hose is removed from the intake manifold the bubbling sound should stop.

○ If defective, replace the EGR valve.

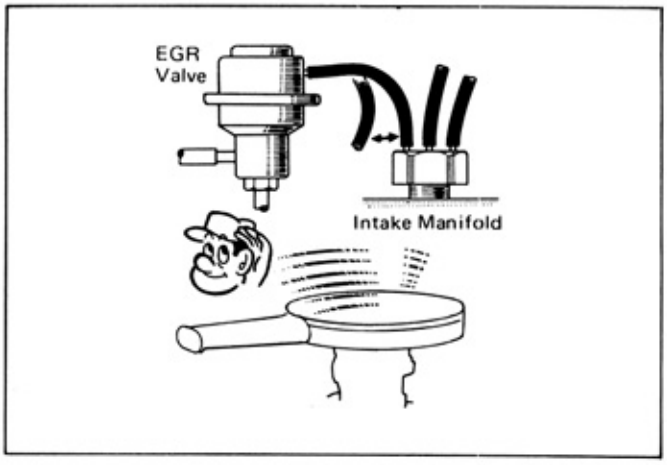


Fig. 18-104 EGR Valve Inspection (20R, 2F)

(2) EGR vacuum control valve inspection (4M engine)

a. Connect the EGR vacuum control valve directly to the carburetor advancer port as shown in Fig. 18-105.

b. Disconnect the two hoses from the EGR valve, and connect a vacuum gauge to each of the disconnected hoses.

c. With the engine raced, the vacuum gauges should indicate as follows:

EGR valve "A" chamber	Venturi vacuum
EGR valve "B" chamber	Atmospheric pressure

d. With the engine idling, disconnecting the hose from the carburetor advancer port should cause the vacuum gauges to indicate as follows:

EGR valve "A" chamber	Nearly atmospheric pressure
EGR valve "B" chamber	Intake manifold vacuum

e. If defective, replace the EGR vacuum control valve.

f. Reconnect the vacuum hoses to their former locations.

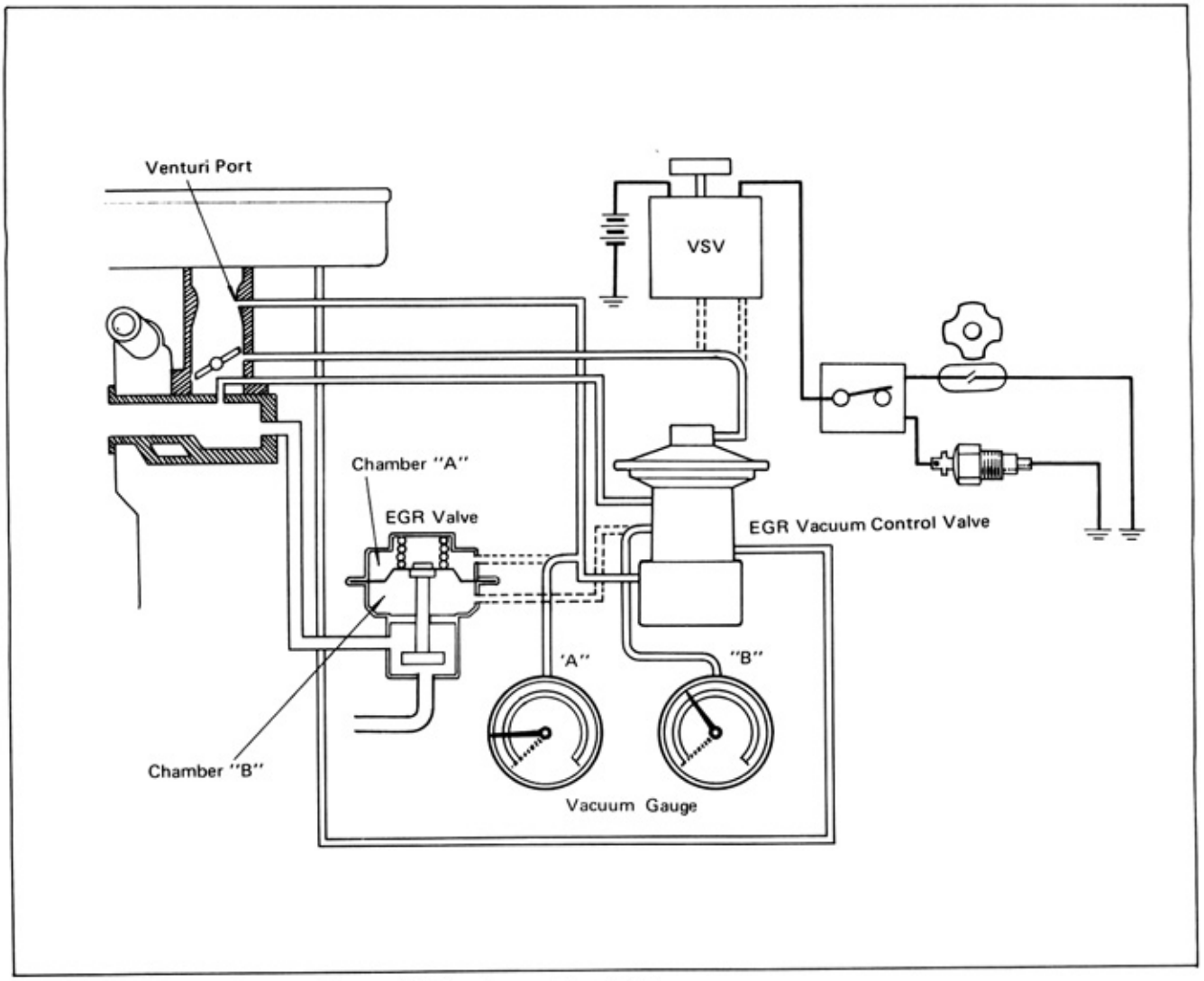


Fig. 18-105 EGR Vacuum Control Valve Inspection (4M)

(3) EGR valve inspection (4M engine)

- With the engine idling, interchange the connections of the upper and lower EGR valve hoses. This should cause the engine to rough idle or stall.
- If defective, replace the EGR valve.

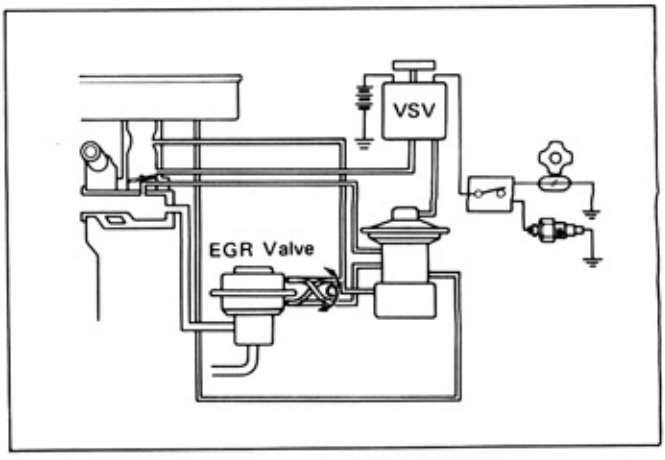


Fig. 18-106 EGR Valve Inspection (4M)

43. AIR INJECTION (AI) SYSTEM, AND HOSE AND CONNECTION INSPECTION.

(1) Visually check the hoses and tubes to see if cracked, injured or deformed.

(2) Check the hose and tube connections to see if in proper condition.

(3) Check the hose and tube clamping to see that the hoses and tubes are not contacting on other parts.

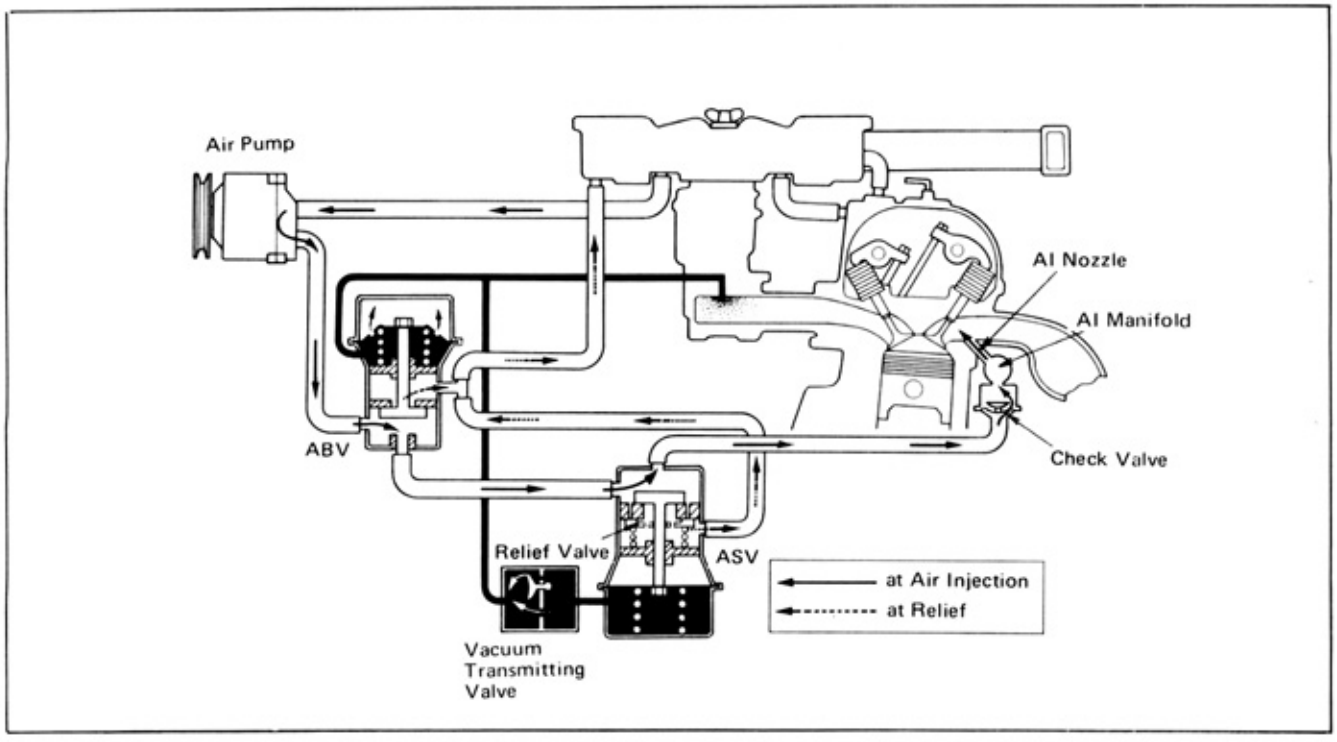


Fig. 18-107 Air Injection System (2T-C Engine Except for California)

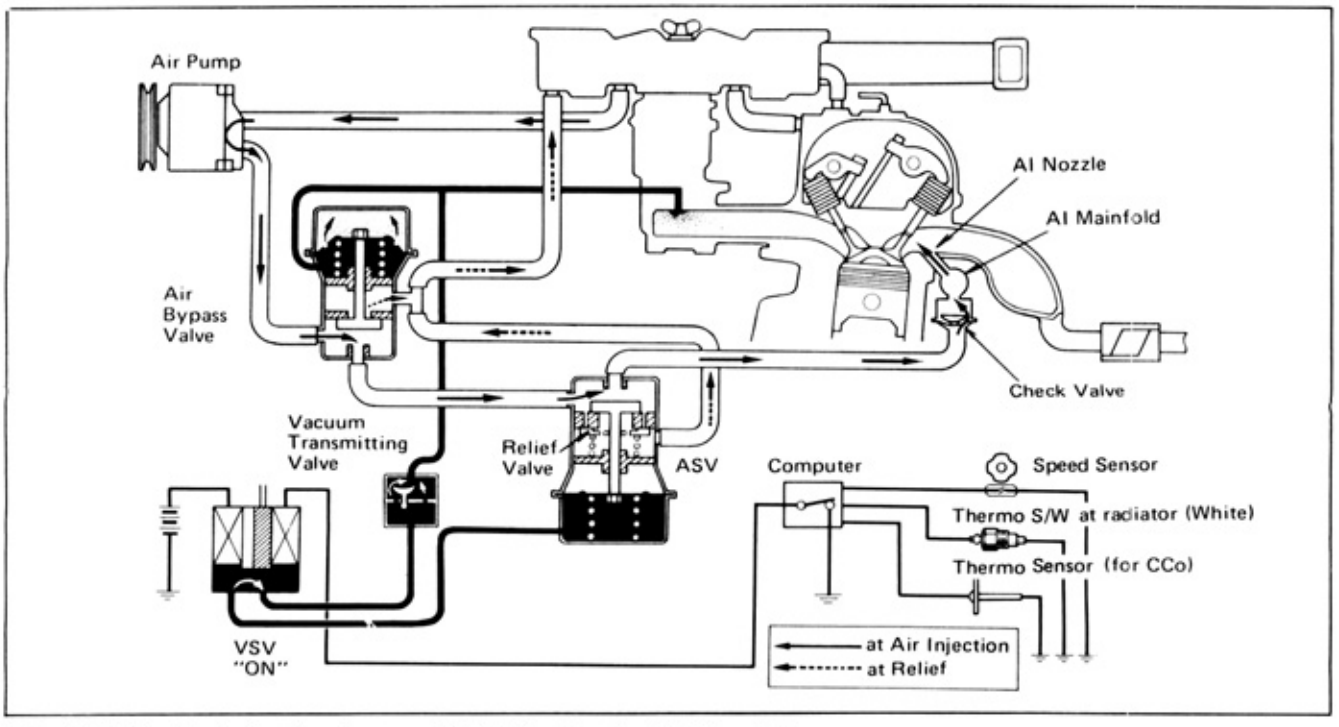


Fig. 18-108 Air Injection System (2T-C Engine for California)

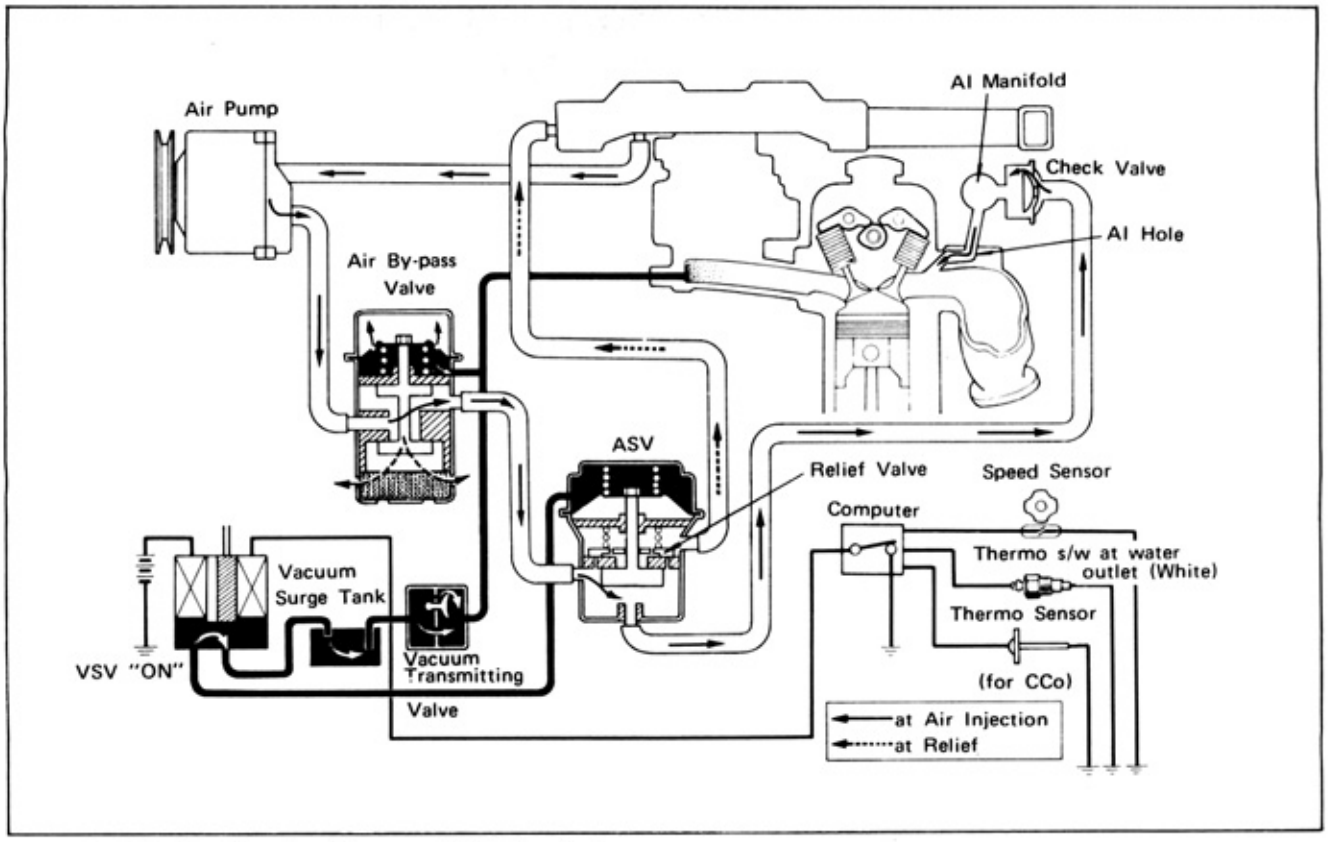


Fig. 18-109 Air Injection System (20R Engine)

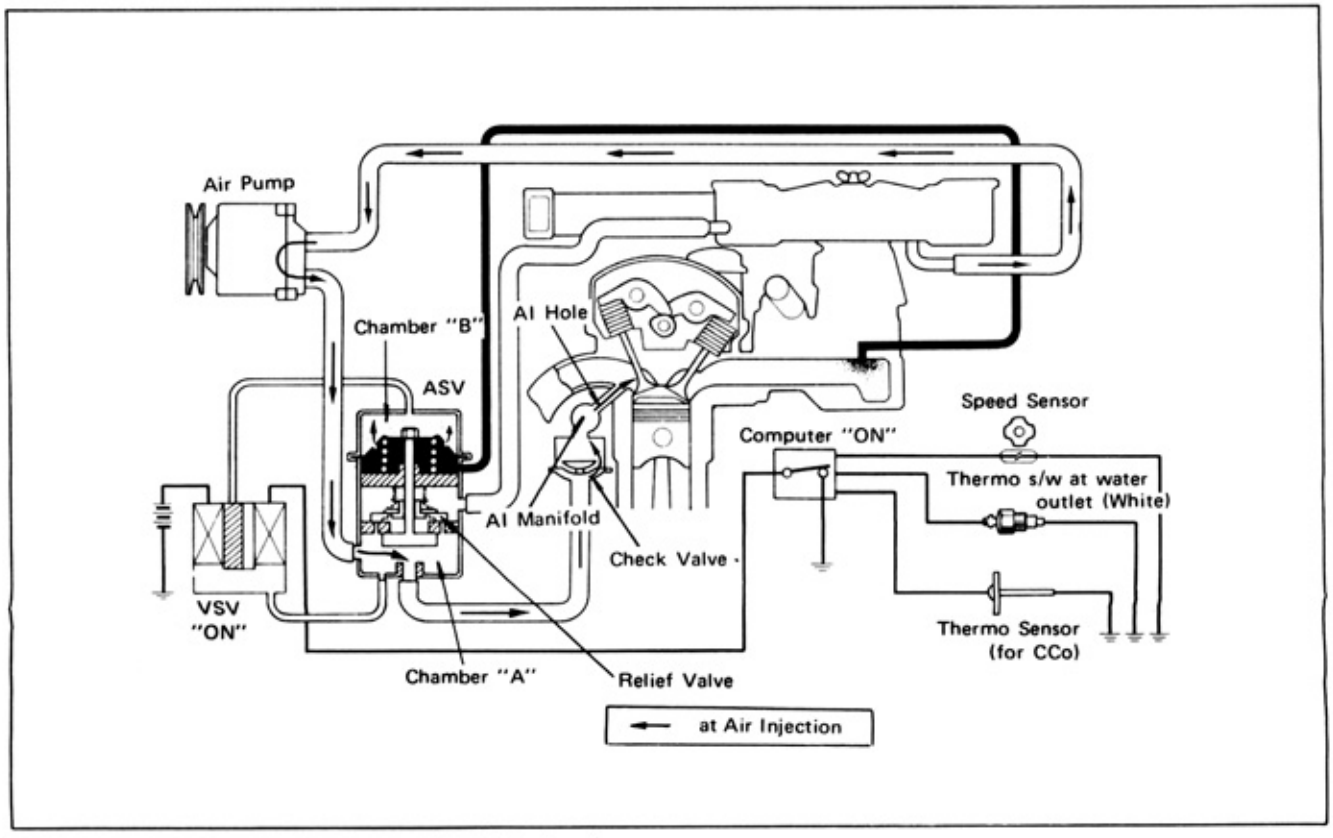


Fig. 18-110 Air Injection System (4M Engine)

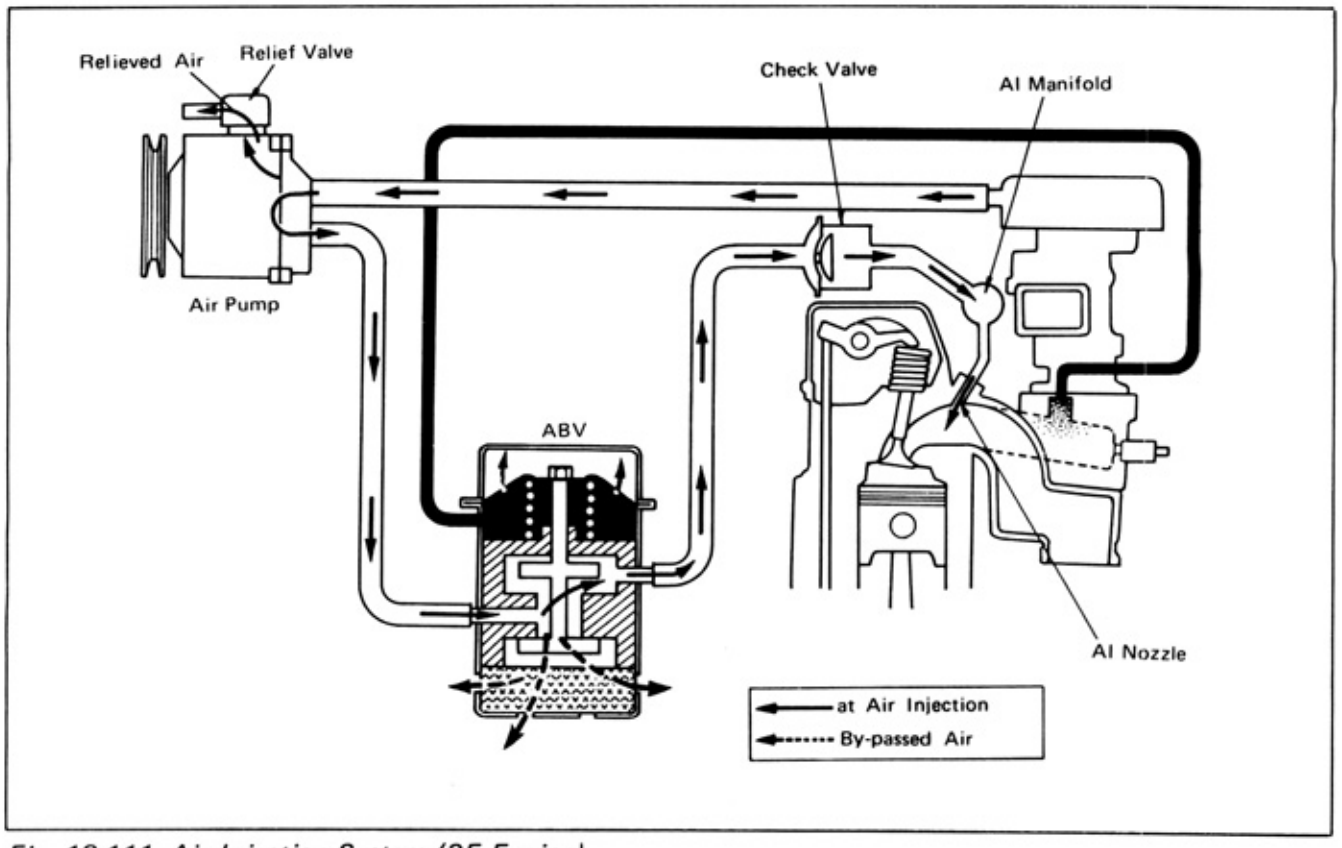


Fig. 18-111 Air Injection System (2F Engine)

44. AIR PUMP AND CONTROL VALVE INSPECTION, AND VACUUM TRANSMITTING VALVE INSPECTION [25,000 and 50,000 miles]

(1) Air pump inspection

a. Check the air pump for abnormal noise.

b. Check the air pump discharge pressure.

- Connect the air pump tester [09258-14010] to the hose at air pump discharge side.
- Set the engine to the specified speed. The tester pointer should be at the green zone.
- If the tester pointer is at the red zone, replace the air pump assembly.
- In case of 2F engine, if the tester pointer is at the red zone, close the relief valve discharge port with hand and recheck. If the pointer moves to the green zone, replace the relief valve. If the pointer remains at the red zone, inspect the air pump and repair or replace as found necessary.

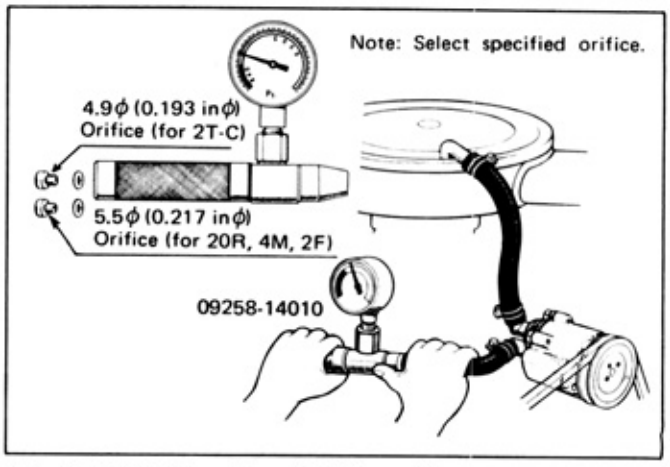


Fig. 18-112 Checking Discharge Pressure

Discharge Pressure & Engine RPM

Discharge Pressure		Tester Green Zone (2.1 Psi, minimum)
Engine rpm	2T-C 20R	1800 rpm
	4M	1750 rpm
	2F	1450 rpm

(2) Air by-pass valve (ABV) inspection (2T-C 20R, and 2F engines)

a. At idling, the air from the air pump should discharge out toward the check valve (2F) or the ASV (2T-C and 20R).

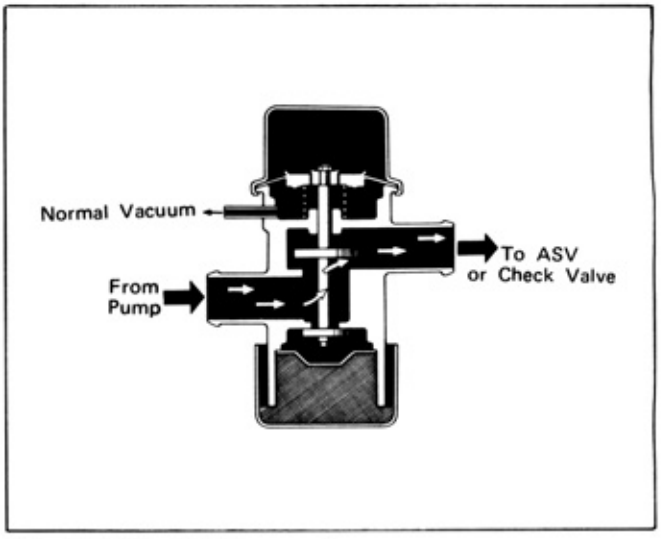


Fig. 18-113 ABV Inspection

b. When the throttle valve is suddenly closed while racing the engine, the air from the air pump should temporarily be relieved out to the atmosphere (20R and 2F) or to the air cleaner (2T-C).

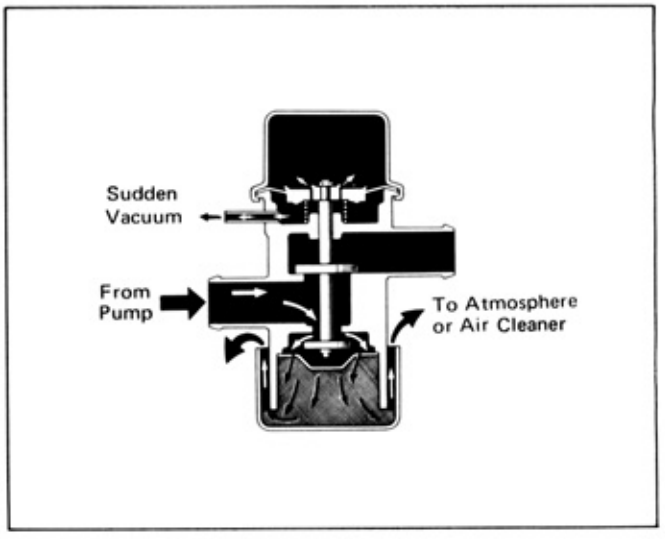


Fig. 18-114 ABV Inspection

(3) Check valve inspection

- o When air is passed in from the ASV or ABV (2F) side, it should flow out from the AI manifold side.
- o If passed in from the AI manifold side, the air should not pass out to the ASV or ABV side.

1. Disconnect the hose from the check valve.
2. At idling, the vacuum should be felt when placing hand over the check valve inlet.
3. When the throttle valve is opened and closed, pressure should not be felt when placing hand over the check valve inlet.

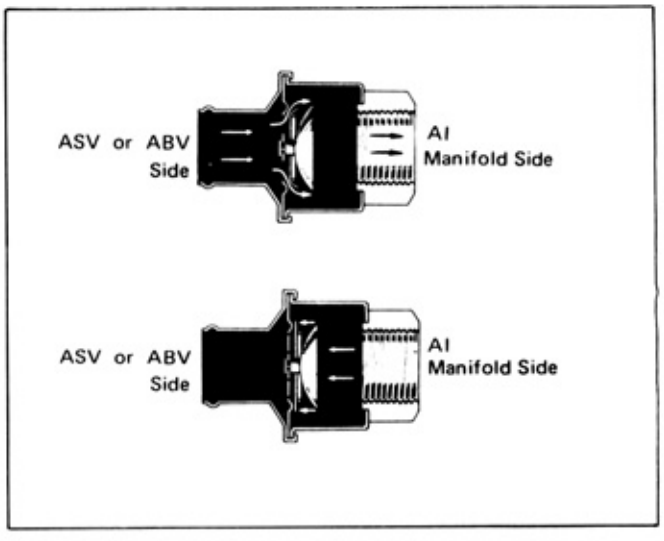


Fig. 18-115 Check Valve Inspection

(4) Air switching valve inspection (except 2F engine)

a. Remove the air cleaner cap. Disconnect the hose between check valve and ASV from the check valve and connect the air pump tester [09258-14010] to the hose.

> Note
> In the 2T-C engine, the hose is too short to allow connecting tester. Thus, have a longer hose available and connect one end to the ASV discharge side and the other end to the tester.

b. At idling, air should be ejected from the tester orifice and not be relieved out to the air cleaner.

c. Close the tester orifice with finger and raise the engine speed gradually. The air should be relieved out to the air cleaner at the specified relief valve opening pressure.

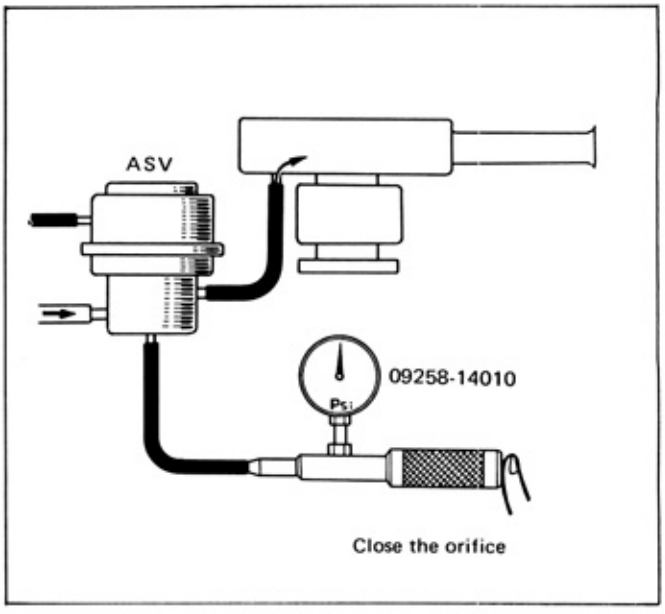


Fig. 18-116 ASV Inspection

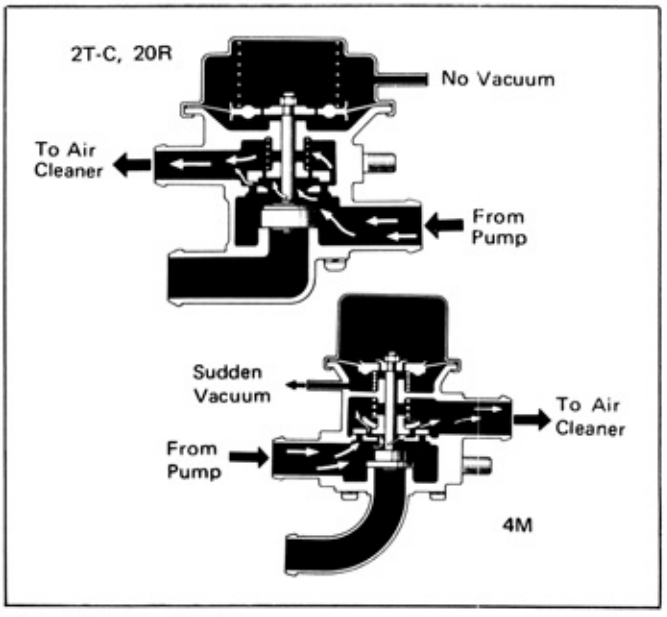


Fig. 18-117 ASV Inspection

Relief Valve Opening Pressures

Engine Family	Relief Valve Opening Pressure Psi. (kg/cm²)
2T-C	2.7 to 6.5 (0.19 to 0.46)
20R	2.7 to 6.5 (0.19 to 0.46)
4M	3.7 to 7.7 (0.26 to 0.54)

d. Connect the disconnected hose to the check valve.

e. (2T-C and 20R Engine)
Set the engine speed to 2000 rpm and when the ASV vacuum sensing hose is disconnected, the air should discharge out toward the air cleaner.

f. (4M Engine)
Race the engine and suddenly close the throttle valve. The air should be temporarily discharged out toward the air cleaner.

g. In the 20R and 4M engines, and the 2T-C engine for California, the air should be relieved out to the air cleaner on grounding the terminal of wiring for coolant thermal switch (at radiator in 2T-C, and at water outlet for 20R and 4M).

h. Check the wiring and connector for catalytic converter thermo sensor, and correct any defect found. (Catalytic converter equipped cars)

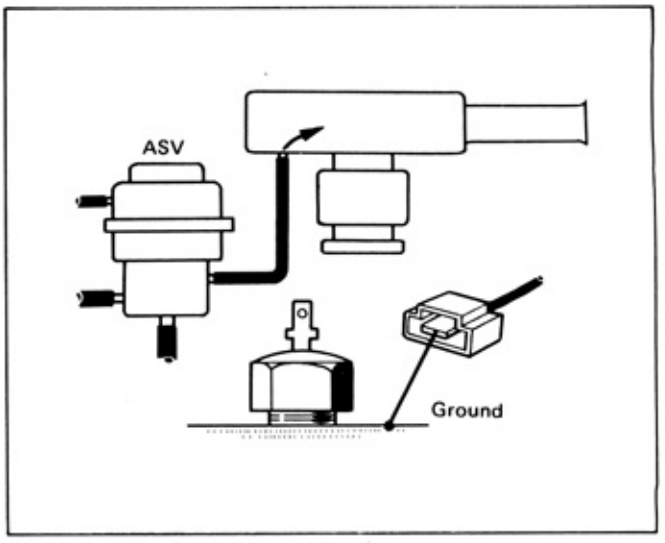


Fig. 18-118 ASV Inspection

(5) Vacuum transmitting valve inspection (2T-C and 20R engines)

a. Replace the vacuum transmitting valve with new part.

> Note
> Use care to install in correct direction.

b. In same manner as described in (4) above, connect the air pump tester [09258-14010] to the ASV discharge side.

c. Set the engine speed to 2,000 rpm and while observing the tester, disconnect the hose between the vacuum transmitting valve and intake manifold. The pressure should then drop down gradually to atmospheric pressure.

2T–C : about 7 to 17 seconds
20R : about 5 to 10 seconds

d. When the disconnected hose is reconnected, pressure should quickly be indicated on the gauge.

○ If defective, replace the vacuum transmitting valve.

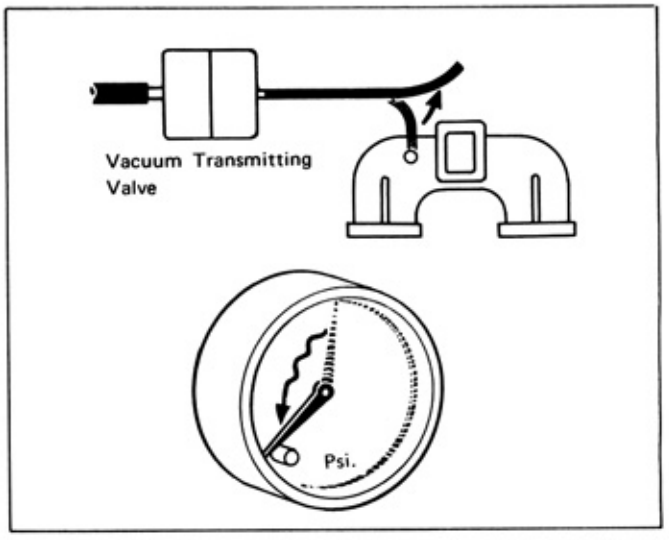


Fig. 18-119 Vacuum Transmitting Valve Inspection

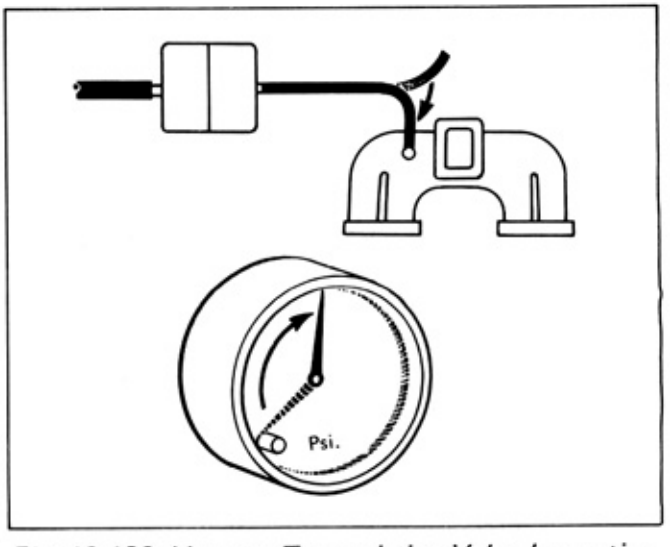


Fig. 18-120 Vacuum Transmitting Valve Inspection

[EMISSION CONTROL SYSTEM INSPECTION BY USING CHECKER]

Systems to be inspected (Checker cannot be used on 2T-C engines except those for California)

System	Engine Family	Interval (x 1000 Miles)
TCS System	2T-C, 20R, 4M, 2F	12.5, 25, 37.5, 50
TP System	2T-C, 20R, 4M, 2F	12.5, 25, 37.5, 50
EGR System	20R, 4M, 2F	25, 50
AI System	2T-C, 20R, 4M	25, 50
Choke opener system	2T-C, 20R	12.5, 25, 37.5, 50
Fast idle breaker system	4M	12.5, 25, 37.5, 50

OPERATIONS AT COLD ENGINE (Engine Coolant Temperature Below 40°F)

1. Connect the checker to the inspection connector and VSV connectors. (Page 22-6).
2. Turn the checker dial "P" and set it to the applicable engine.
3. Tilt all switches from "K" to "O" to the "VEHICLE" side.
4. Switch on the ignition.
5. The checker indicator lights should turn on as shown in Fig. 18-121 to -123.

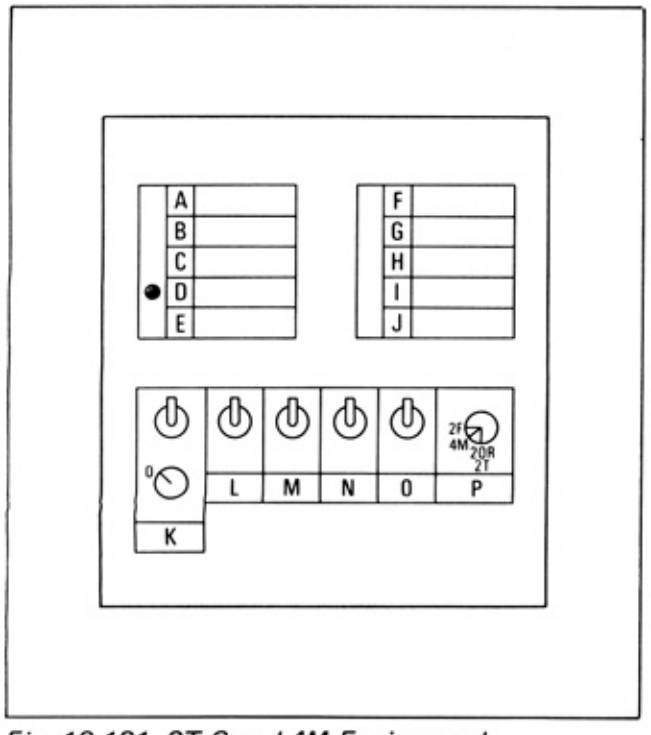


Fig. 18-121 2T-C and 4M Engines and 20R Enginew/CCo

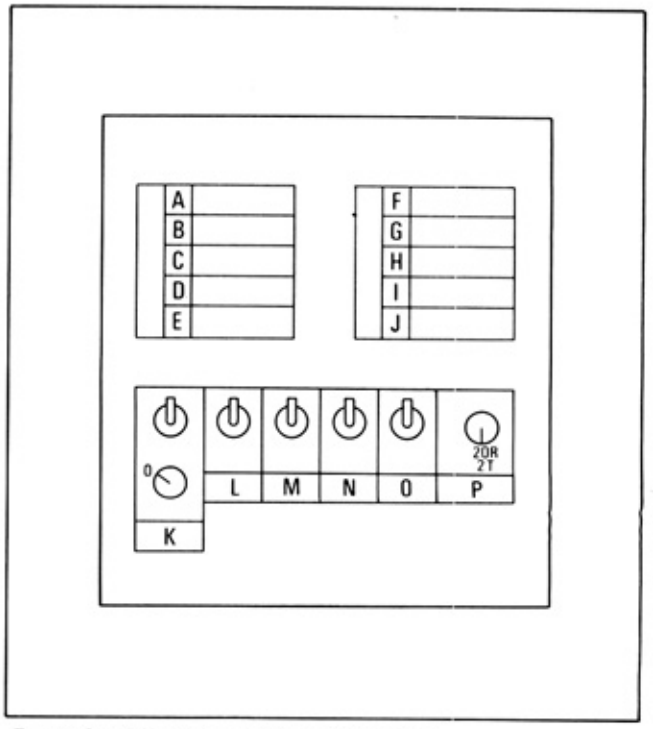


Fig. 18-122 20R Engine w/o CCo

Note
If the coolant temperature or carburetor flange temperature is not up to 40°F, the following lights will also turn on.

2T-C	C, I
20R	C, F, H, J
4M	C, H, I
2F	B

○ In this case, ground the terminal of wiring for thermo switch (white head and with 13,105 marking). For 2F engine, unplug the carburetor flange thermo sensor wiring connector.
At this time, the check lights should turn on as shown in Fig. 18-121 and Fig. 18-123.

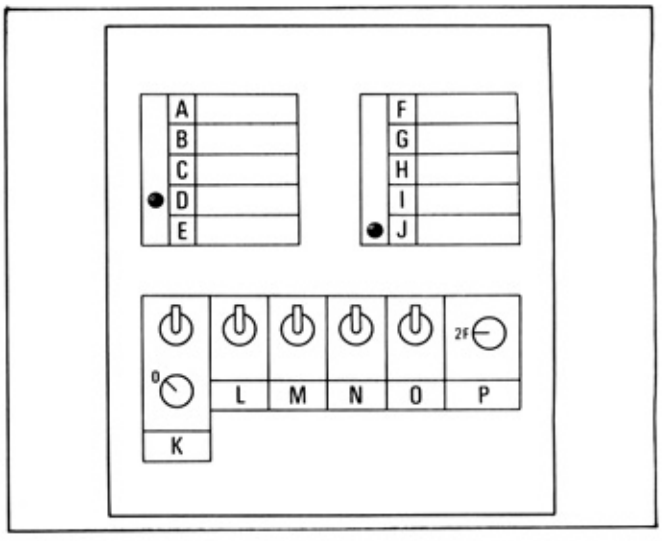


Fig. 18-123 2F Engine

○ When checked as described above, remove the thermo switch and make conductivity inspection. There should be conductivity at about 40°F and no conductivity at 70°F. In the case of 2F engine, remove the carburetor thermo sensor and measure the resistance with a circuit tester. The resistance should be large at low temperature and should become smaller at high temperature.

OPERATIONS AFTER WARMING UP (Coolant temperature about 180°F)

6. After warming up, the checker lights should turn on as shown in Fig. 18-124 to -128.

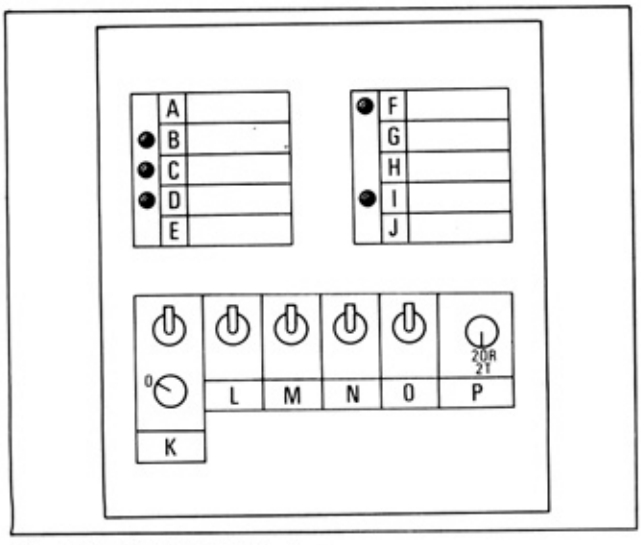


Fig. 18-124 2T-C Engine

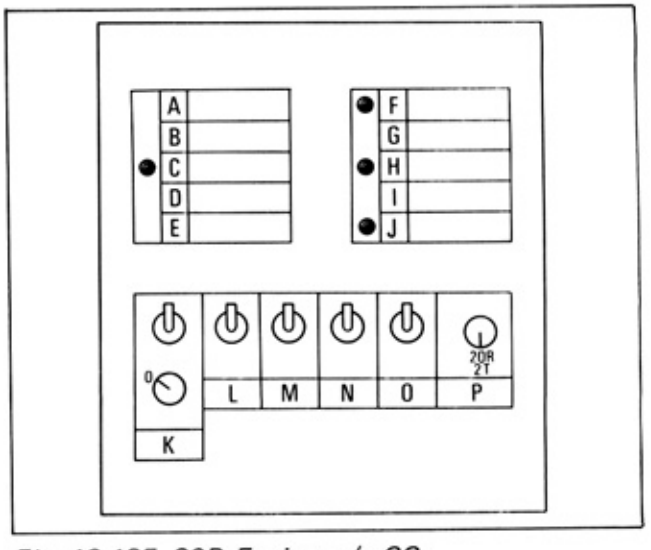


Fig. 18-125 20R Engine w/o CCo

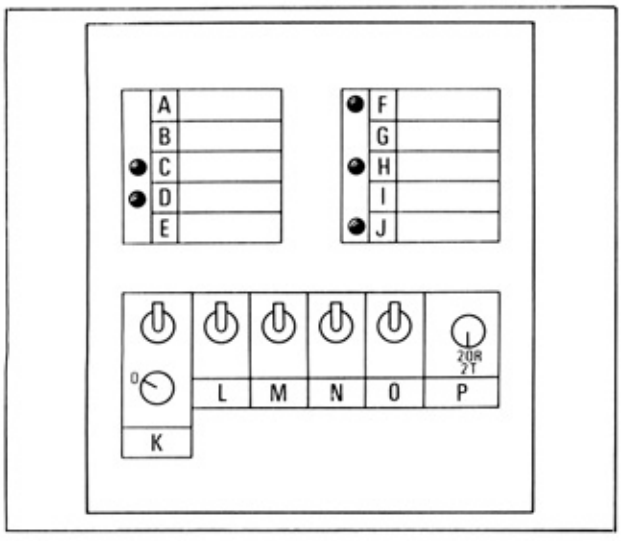


Fig. 18-126 20R Engine W/CCo

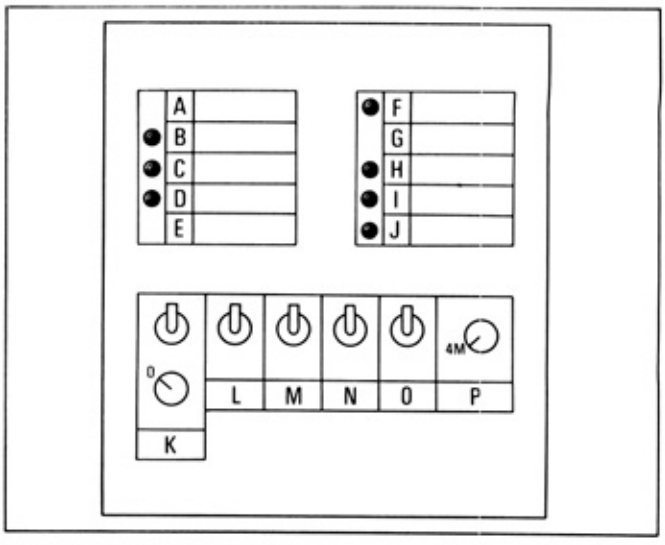


Fig. 18-127 4M Engine

7. Tilt the checker switch "K" to "SIMULATION" side.

   ○ In the following operations, checker lights "A" to "E" need not be checked.

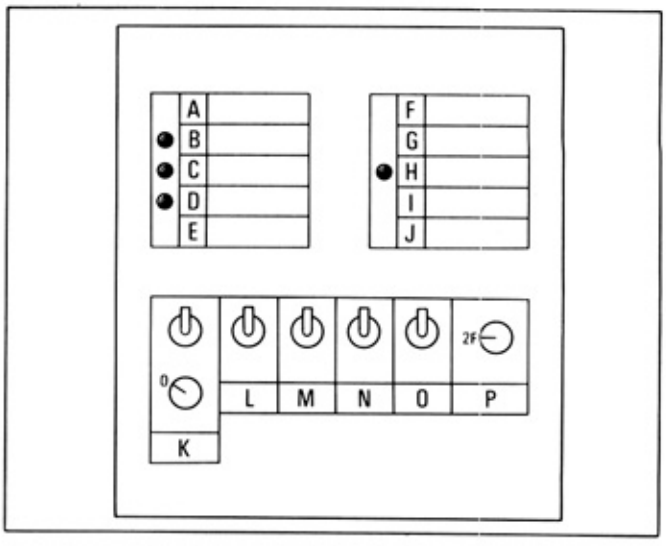


Fig. 18-128 2F Engine

8. For 2F engine, slowly turn dial "K" clockwise and set the speed to 20 mph.

   Note
   Make the setting at rising speed. If the 20 mph is exceeded, return the dial to zero mph and reset once more.

   In this case, the lights "F", "G", and "H" should turn on. (Refer to Fig. 18-129).

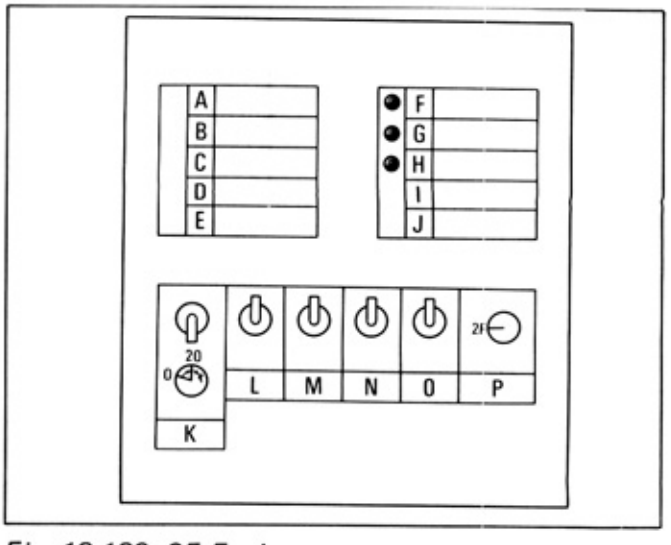


Fig. 18-129 2F Engine

9. Turn the dial "K" and set the speed to 80 mph. The checker lights should turn on as shown in Fig. 18-130 and Fig. 18-131.

> Note
> Lights A to E can be neglected.

10. If the checker lights turn on as specified when the operations 1 to 9 are performed, the thermo switches, thermo sensors, computer, and the related wirings are in normal condition.
    (1) If the light "B", "C", or "D" does not operate as specified, check the connectors to see if plugged in tightly, the fuse if blown out, and the wiring if damaged or incorrectly connected. If these are not at fault, replace the thermo switch or thermo sensor.
    (2) If the lights "B", "C", and "D" all operate properly but the lights "F" to "J" do not operate as specified, check the computer wiring connector to see if in properly plugged in state. If not defective, replace the computer.

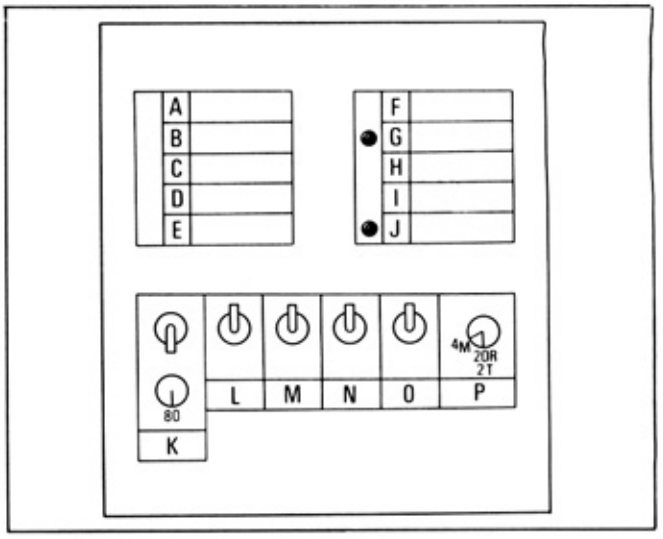


Fig. 18-130 2T-C and 4M Engines

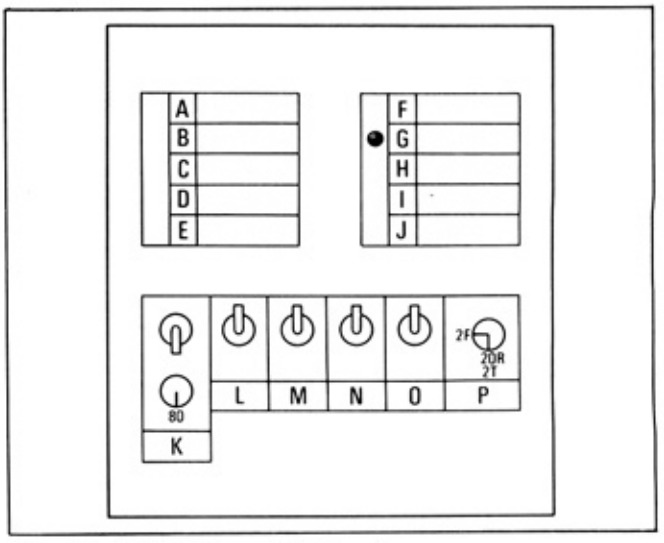


Fig. 18-131 20R and 2F Engines

Relationship between Checker Lights to Thermo Switches and Thermo Sensors

Light		2T-C	20R	4M	2F	Mark
B	Name	Thermo switch		Thermo sensor	Thermo sensor	L
	Color & Mark	Green, 60B		Green, none	Black, none	
	Location	Intake manifold		Intake manifold	Carburetor	
C	Name	Thermo switch	Thermo switch	Thermo switch	Thermo switch	M
	Color & Mark	White, 13-105	White, 13-105	White, 13-105	Red, 50B	
	Location	Radiator	Water outlet	Water outlet	Cylinder head	
D	Name	Thermo sensor	Thermo sensor	Thermo sensor	Thermo sensor	N
	Location	CCo	CCo	CCo	EGR Valve	

11. CHOKE OPENER SYSTEM INSPECTION

(2T-C Engine)

(1) At the condition shown in Fig. 18-124, and with the engine idling, the choke opener link should be in returned state.

(2) Tilt the checker switch "K" to the "SIMULATION" side, and with dial "K" set the speed to 30 mph. The choke opener valve should then be pulled in. If defective, check the diaphragm and link. If these are in normal condition, replace the vacuum switching valve (VSV).

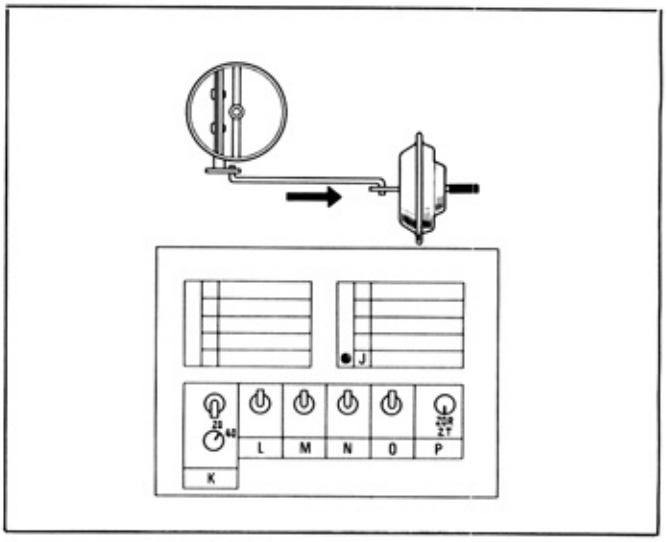


Fig. 18-132 Choke Opener System Inspection (2T-C)

(20R engine)

(1) At the condition shown in Fig. 18-125 and Fig. 18-126, and with the engine idling, the choke opener link should be pulled in.

(2) Tilt checker switch "M" or "N" to the "SIMULATION" side. The choke opener link should then return.
If defective, check the diaphragm and link. If these are in normal condition, replace the VSV.

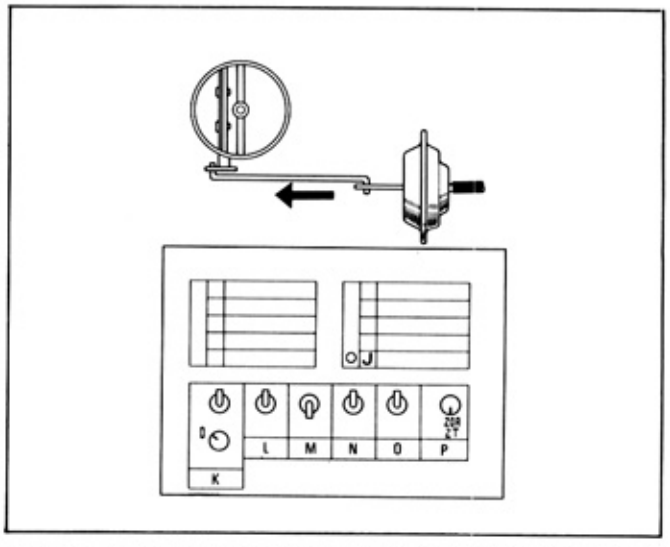


Fig. 18-133 Choke Opener System Inspection (20R)

12. FAST IDLE BREAKER SYSTEM INSPECTION (4M engine only)

(1) At the condition shown in Fig. 18-127, and with the engine idling, the fast idle link should be pulled in.

(2) Tilt checker switch "L" to the "SIMULATION" side. The fast idle link should then return.
If defective, check the diaphragm and link. If these are in normal condition, replace the VSV.

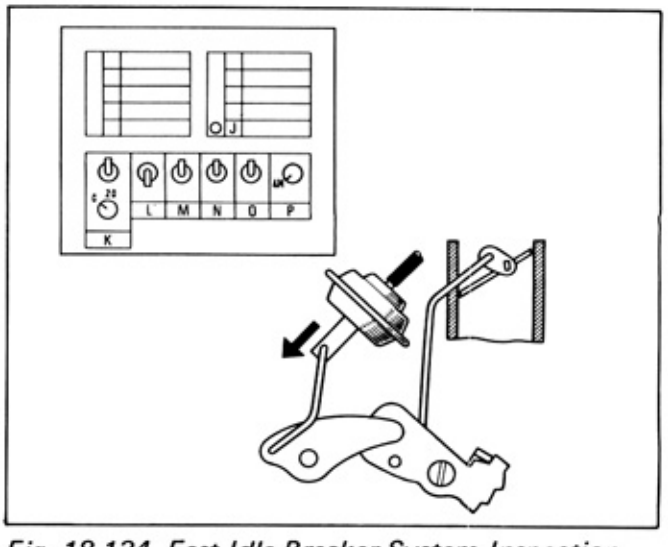


Fig. 18-134 Fast Idle Breaker System Inspection (4M)

13. THROTTLE POSITIONER (TP) SYSTEM *INSPECTION*

(1) With engine idling, set all checker switches to the "VEHICLE" side. The TP adjusting screw should be free from the throttle valve lever. (Fig. 18-135)

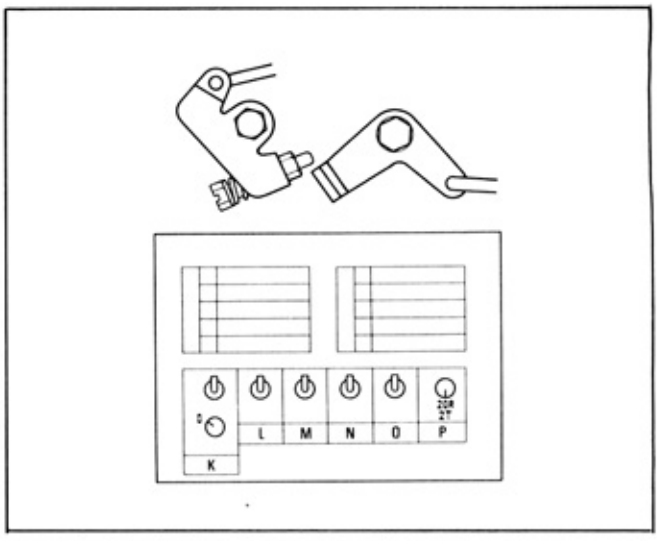


Fig. 18-135 TP Operation Inspection

(2) Tilt the switch "K" to the "SIMULATION" side and set the dial "K" to 30 mph. The TP adjusting screw should contact the throttle valve lever.
If defective, check the diaphragm and link. If these are in normal condition, replace the VSV.

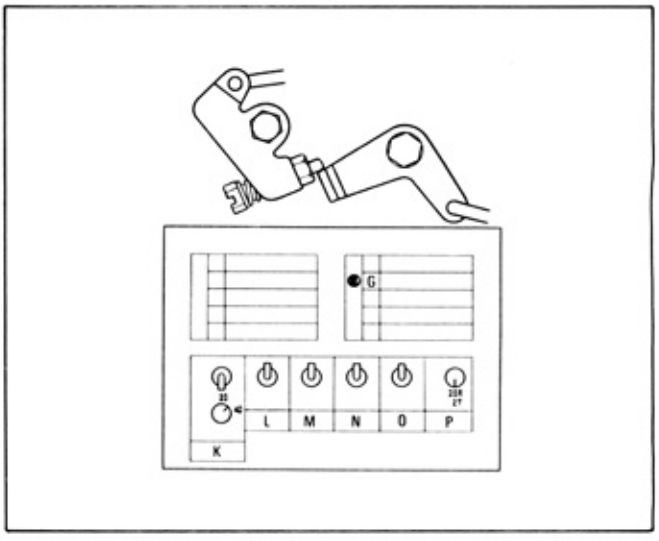


Fig. 18-136 TP Operation Inspection

(3) If at this condition, the throttle valve is opened and then closed, the TP adjusting screw will catch on the throttle valve lever so that the engine speed will turn faster than at idle speed.
With a tachometer, check the engine speed at this time.
If not at specified speed, correct by turning the TP adjusting screw.

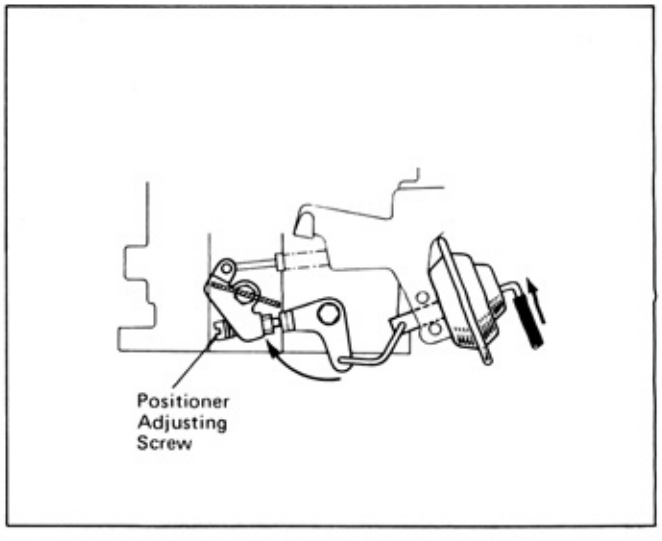


Fig. 18-137 TP Operation Inspection

TP Setting RPM

Engine Family	Transmission	RPM
2T-C	M/T	1500 ± 100
	A/T	1400 ± 100
20R	M/T	1400 ± 100
	A/T	1050 ± 100
4M	M/T	1300 ± 100
	A/T	1200 ± 100
2F	M/T	1200 ± 100

14. TCS SYSTEM INSPECTION

(2T-C, 20R, and 4M engines)

(1) Tilt all checker switches to the "VEHICLE" side, start the engine, and keep opening and closing the throttle valve.
- At this time, the octane selector should be at the engine stop line without moving. (2T-C and 4M engines)
- In the 4M engine for California, the octane selector should move back and forth at the retard side.
- In the 20R engine, the octane selector should move at the above condition. When the TVSV No. 8 hose is connected directly to the distributor, the octane selector should not move. (After inspection, reconnect the hose to former position).

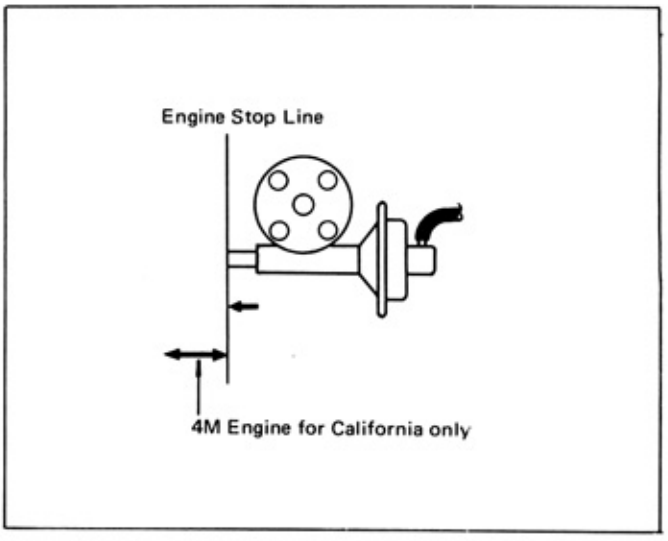


Fig. 18-138 TCS System Inspection

(2) Tilt switch "M" to the "SIMULATION" side, and keep opening and closing the throttle valve. The octane selector should move.

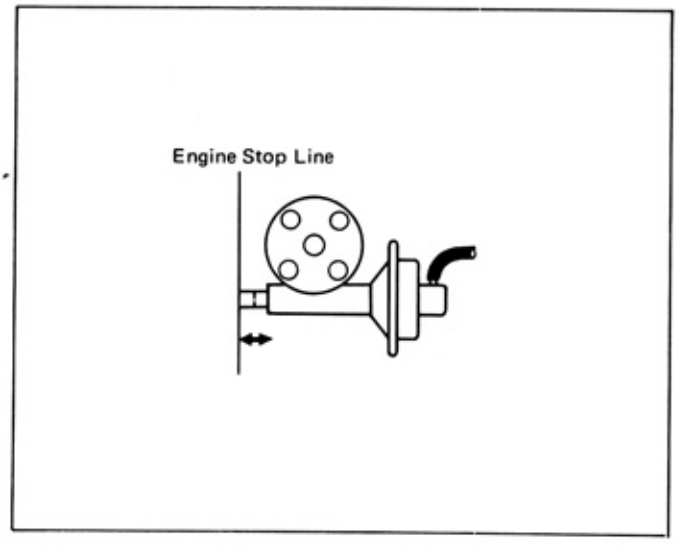


Fig. 18-139 TCS System Inspection

If defective, check the octane selector to see that it will move when the distributor vacuum hose is connected on and off from the intake manifold. Replace the VSV if the octane selector moves, and replace the diaphragm if octane selector does not move.

In the 20R engine, check the TVSV before replacing the VSV. If the TVSV is faulty, replace it, and if in normal condition, replace the VSV.

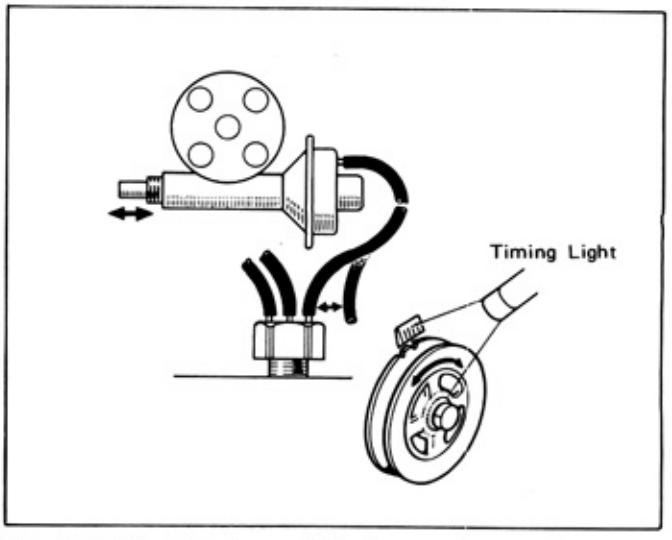


Fig. 18-140 Distributor Diaphragm Inspection

(2F engine)

(1) Tilt all checker switches to the "VEHICLE" side, and set the engine speed to 2000 rpm.

(2) Tilt the checker switch "K" to "SIMULATION" side, and slowly turn dial "K". At 20 mph, the engine speed should drop slightly (about 50 rpm).

> Note
> If the engine rpm change is difficult to determine, use a timing light and observe the ignition timing while performing operation 2).
> At about 20 mph, the ignition timing should be slightly delayed.

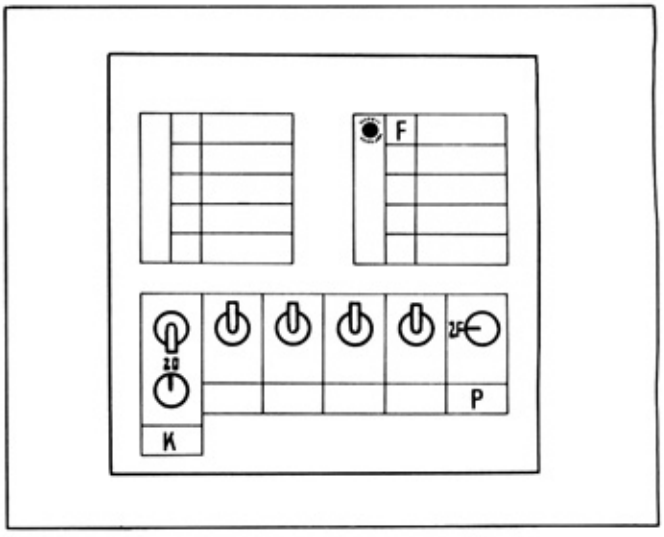


Fig. 18-141 TCS System Inspection (2F)

If defective, check the distributor breaker plate to see that it will move when the distributor vacuum hose is connected on and off from the intake manifold.
If the plate does not move, replace, the distributor diaphragm assembly.
If the plate does move, replace the VSV.

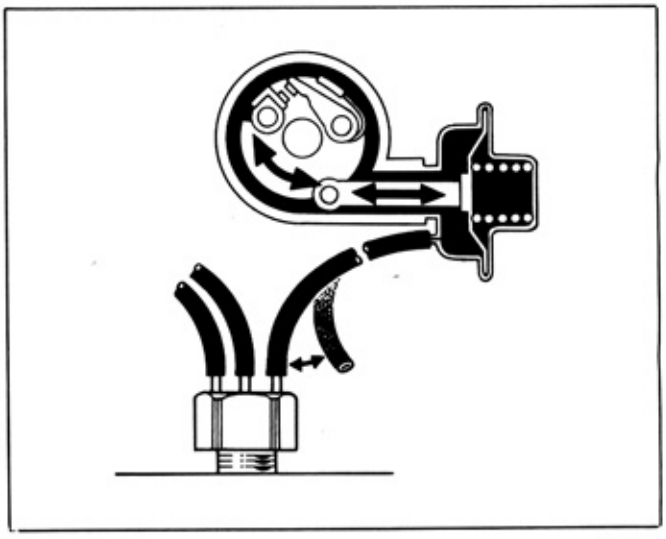


Fig. 18-142 Distributor Diaphragm Inspection (2F)

15. EGR SYSTEM INSPECTION (25,000 and 50,000 miles only)

(20R and 2F engines)

(1) Remove the air cleaner cap.

(2) Tilt all checker switches to the "VEHICLE" side.

(3) Disconnect the hose from the EGR port and connect it to the intake manifold.

(4) At idling, a bubbling sound will be heard at the carburetor. If at this condition, the checker switch "M" is tilted to the "SIMULATION" side, the bubbling sound should disappear.

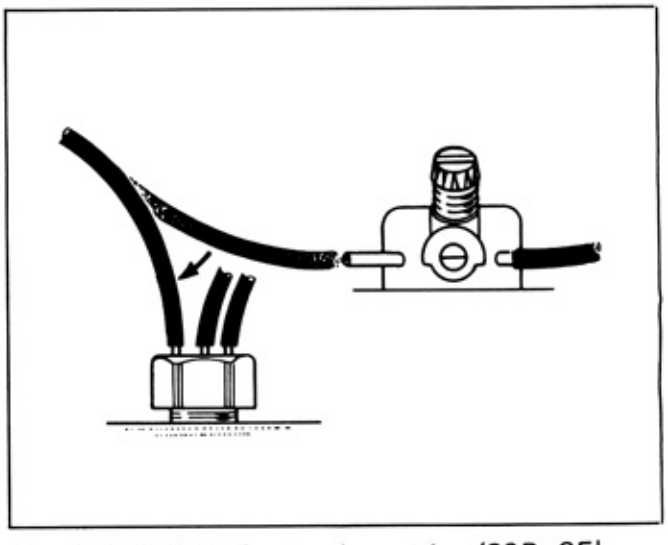


Fig. 18-143 EGR System Inspection (20R, 2F)

○ If defective, tilt the switch "M" to the "VEHICLE" side. Pull out the hose from the EGR valve and close its end with finger. (Vacuum gauge can be connected instead).
Set the engine speed to 3000 rpm. If at this time, vacuum can be sensed, replace the EGR valve. If vacuum cannot sensed, replace the VSV.

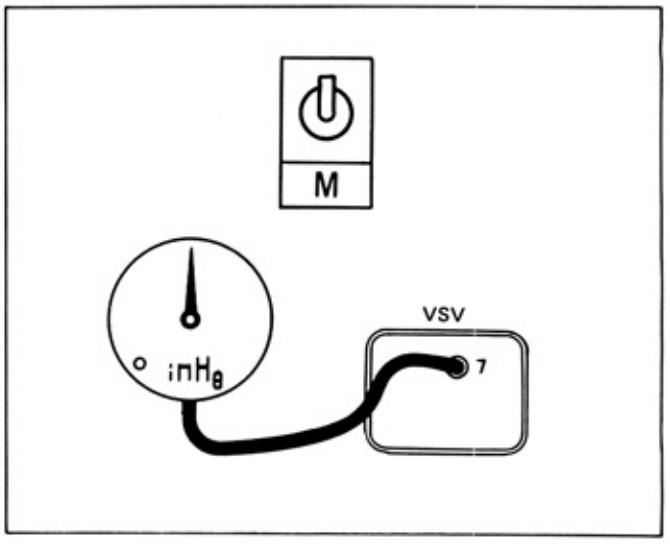


Fig. 18-144 EGR System Inspection (20R, 2F)

(4M engine)

(1) Tilt the checker switch "M" to the "SIMULATION" side, and all switches to the "VEHICLE" side.

(2) Hold the engine speed at 3000 rpm and tilt the switch "M" to the "VEHICLE" side. If the engine speed changes slightly at this time, the EGR system is in normal condition.

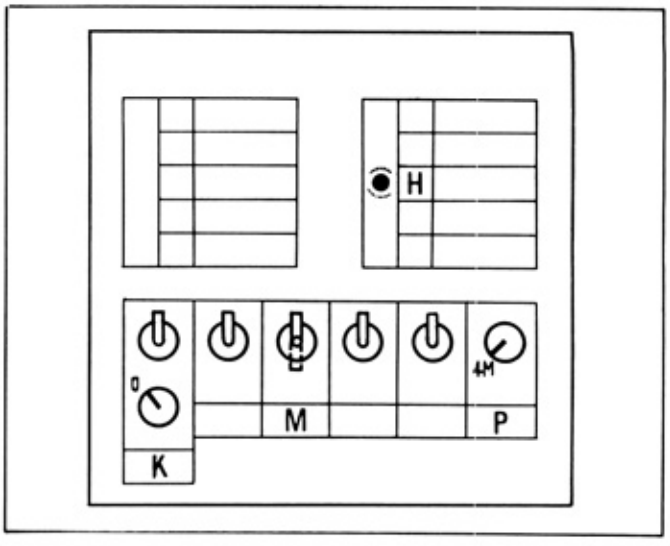


Fig. 18-145 EGR System Inspection (4M)

○ If the engine speed does not change at this time, tilt all checker switches to the "VEHICLE" side. With engine idling, interchange the EGR valve upper and lower hoses.
If the engine rough idles or stalls at the time, the EGR system is in normal condition. If the engine speed does not change, replace the EGR valve.

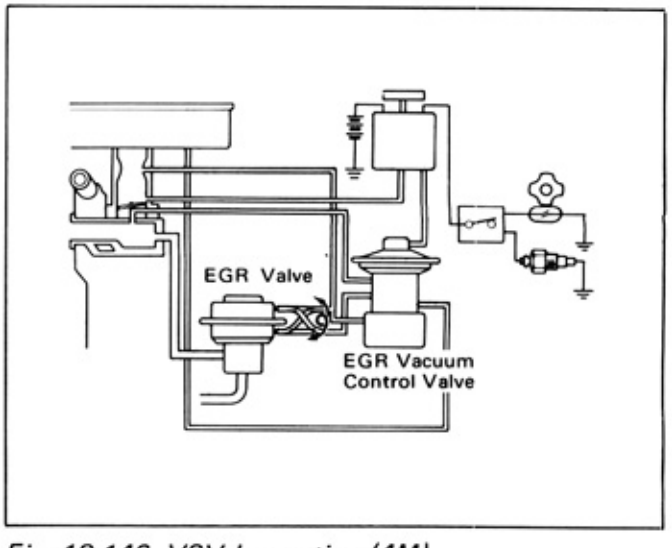


Fig. 18-146 VSV Inspection (4M)

- If the EGR valve is in normal condition, perform the following inspection.
  a. Disconnect the hose between the VSV and EGR vacuum control valve, and connect a vacuum gauge to the VSV pipe (No. 1).
  b. Set the engine speed to 3000 rpm and with all checker switches at the "VEHICLE" side, tilt the switch "M" to the "SIMULATION" side. If the vacuum gauge indicates zero at this time, the VSV is working properly.
  c. In case, the VSV is in normal condition, replace the EGR vacuum control valve.

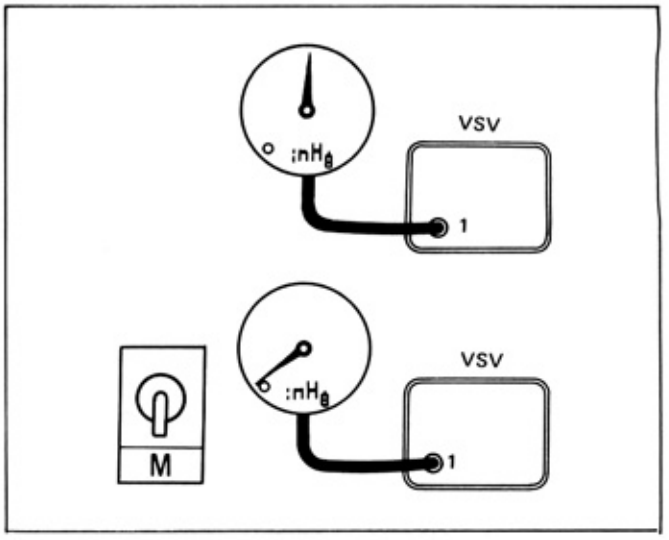


Fig. 18-147 VSV Inspection (4M)

16. AIR INJECTION SYSTEM INSPECTION (25,000 and 50,000 miles)

(2T-C and 20R engines)

(1) Disconnect the hose between the VSV and ASV, and connect a vacuum gauge to the VSV pipe (No. 4).

(2) At idling and with all checker switches at the "VEHICLE" side, tilt the switch "M" to the "SIMULATION" side. If the vacuum gauge indicates zero at this time, the VSV is in normal condition.
If defective, replace the VSV.

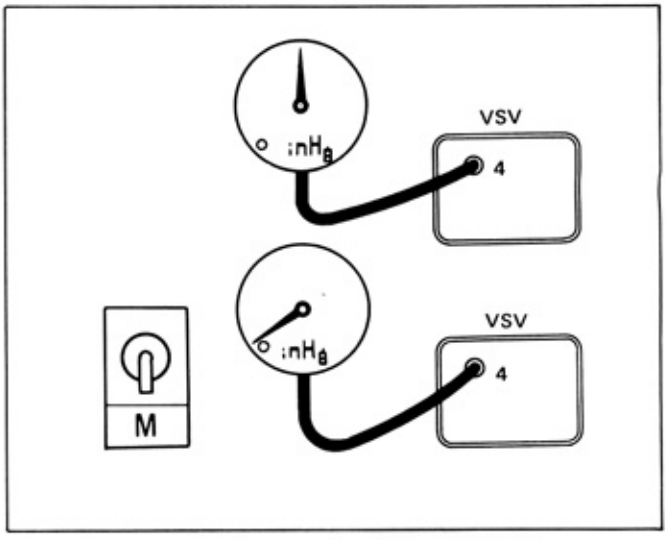


Fig. 18-148 VSV Inspection (2T–C, 20R)

(4M engine)

(1) Disconnect the two VSV hoses from the ASV.

(2) With all checker switches at the "VEHICLE" side, cut off the vacuum circuit and tilt the switch "M" to the "SIMULATION" side. If the vacuum circuit becomes continuous at this time, the VSV is in normal condition.
If defective, replace the VSV.

Note
- In the 2T-C, 20R, and 4M engines, perform the above VSV inspection first before working on the operations described in pages 18-55 to 18-60.
- In the 2F engine, in similar manner, work on the operations in pages 18-55 to 18-60.

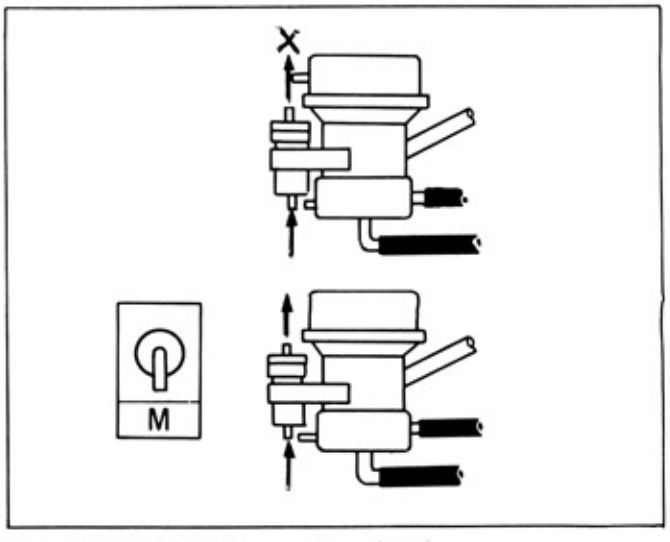


Fig. 18-149 VSV Inspection (4M)

17. SINCE THE VEHICLE SPEED IS SIMULATED WHEN THE CHECKER IS USED, THIS MAKES IT NECESSARY TO CHECK THE SPEED SENSOR.

(1) Tilt the checker switch "K" to the "VEHICLE" side.

(2) Set the checker at the driver's side.

(3) Move the vehicle at low speed (5 mph). If the light "A" flashes properly at this time, the speed sensor is in normal condition.

(4) If the light flashes irregularly or does not flash at all, check the speed sensor and computer connectors to see if plugged in securely and inspect the wiring to see if in proper condition. If these are in proper state, replace the speedometer assembly.

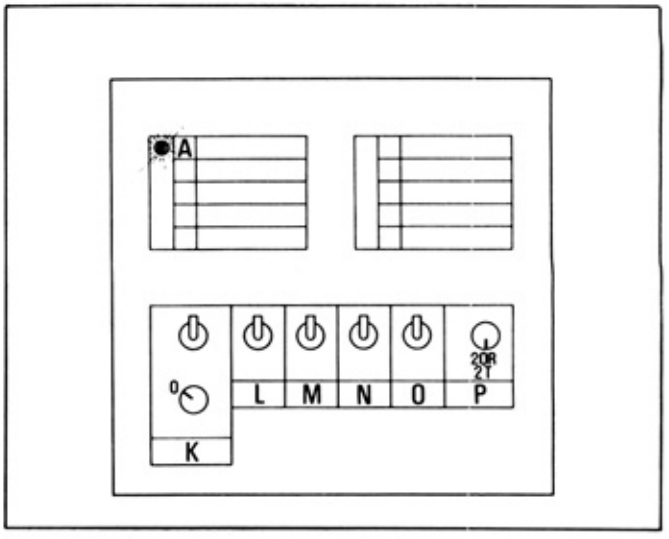


Fig. 18-150 Speed Sensor Check

18. REMOVE THE CHECKER FROM THE VEHICLE, AND PROPERLY PLUG IN ALL CONNECTORS REMOVED FOR THE INSPECTION.