

## 9. CATALYTIC CONVERTER (CCo) SYSTEM

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9. CATALYTIC CONVERTER (CCo) SYSTEM

DESCRIPTION

- The catalytic converter consists of 2 to 4 mm (0.08 to 0.12") diameter granular alumina carrier, coated with an activated material called catalyst metal, such as platinum and palladium, and filled into heat-resistant steel case.
- When the mixture of exhaust gases and secondary air is passed through the catalytic converter, the hydrocarbon (HC) and carbon monoxide (CO) contained in the exhaust gases are oxidized and converted into water (H<sub>2</sub>O) and carbon dioxide (CO<sub>2</sub>).
- The air blown into the exhaust port by the air injection (AI) system is also utilized as the oxygen source for the oxidizing reaction.
- If the air supply should be cut off, the catalyst will be unable to perform sufficient oxidation.
- The catalyst when cold will be unable to perform sufficient oxidation.
- The catalyst will display normal cleaning performance when its temperature rises.
- The catalyst temperature will rise excessively when a large volume of unburnt gases passes through. To ensure greater safety, a warning light has been provided to warn the driver by lighting when the temperature rises abnormally. Thus, when this warning light turns on, the trouble must be located and remedied.

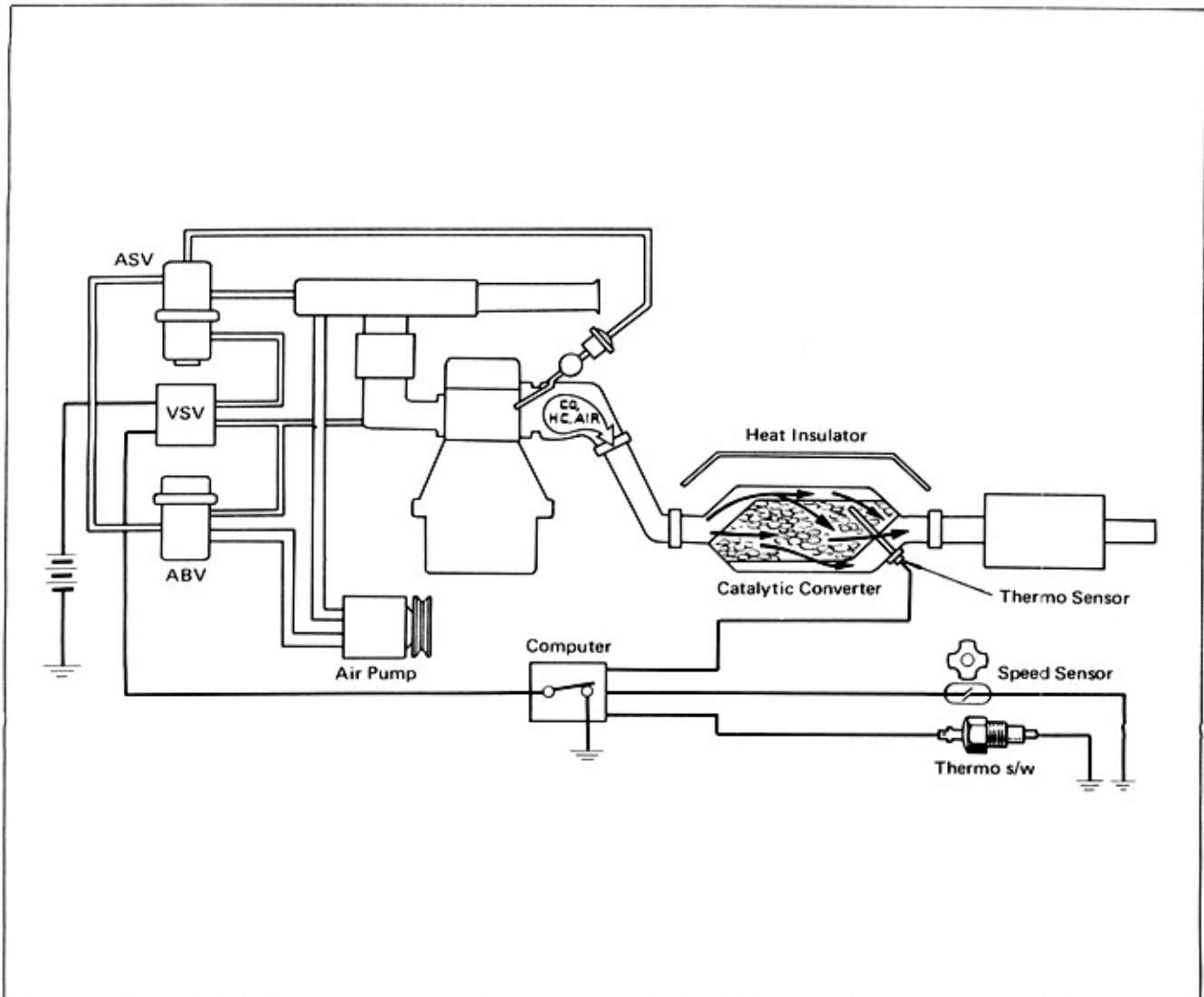


Fig. 9-1 Catalytic Converter System

## OPERATION

## 1. System Operation

- While the air is being injected into the exhaust port by the air injection system, the HC and CO in the exhaust gases will be oxidized in the catalytic converter and changed to H<sub>2</sub>O and CO<sub>2</sub>. As the oxidizing progresses, the temperature inside the converter will rise.
- When the air injection system by-passes the air so that it is no longer injected in the exhaust port, the oxygen source for performing the oxidizing reaction within the catalytic converter is stopped, resulting in no further oxidation. Therefore, the temperature in the converter will drop, provided that the system is operating properly.
- For operation of the air injection system, refer to the section on the AI system.

## 2. Warning Light "EXH. TEMP" Operation

- (1) When the temperature within the converter is below the specified value, the computer will be "OFF", and there will be no current flowing through the warning light.
- (2) If the temperature rises above the specified value, the computer, acting on the signal from the sensor, closes the warning light circuit. Thus, the warning light turns on to warn the driver.

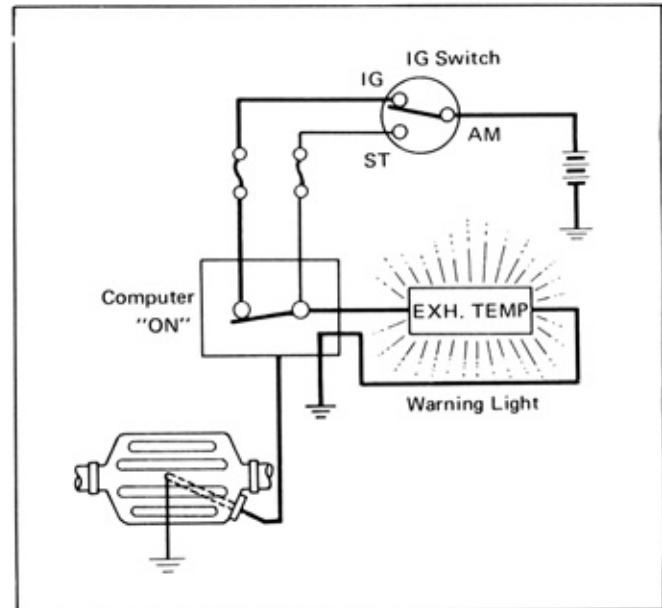


Fig. 9-2 Excessive High Temperature

- (3) Turning the ignition switch to the "START" position will close the warning light inspection circuit. Thus, the warning light will turn on when the starter is revolving to allow checking the light to see that it operates properly.
- (4) The warning light operation temperature range is shown in Fig. 9-4.

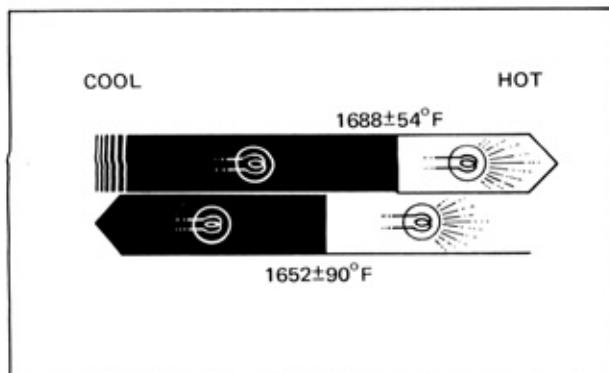


Fig. 9-4 Temperature Range

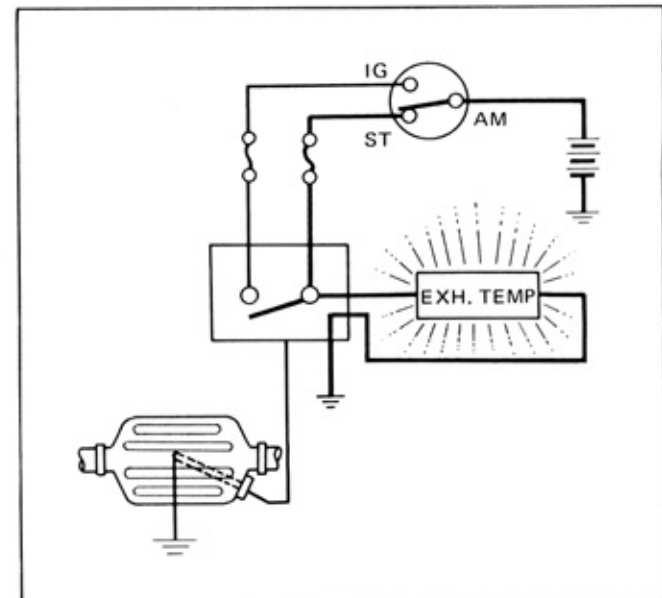


Fig. 9-3 At Cranking

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**INSPECTION****1. Warning Light Inspection**

If the warning light fails to turn on when the starter is revolving, check the fuse, warning light bulb, and wiring.

**2. Inspection Procedure on Vehicle Having Warning Light Turned On.**

Inquire the customer in detail the conditions that caused the warning light to turn on.

- (1) If from cold start, the warning light turns on while cranking but continues to light after starting, the computer or wiring could be at fault.
- (2) If while decelerating on long downward road, the light turns on only temporarily and since it will not light again, there is nothing wrong with the system.

In such case, advise the customer to keep the engine speed as low as possible and also to step on the accelerator pedal from time to time while driving.

**Note**

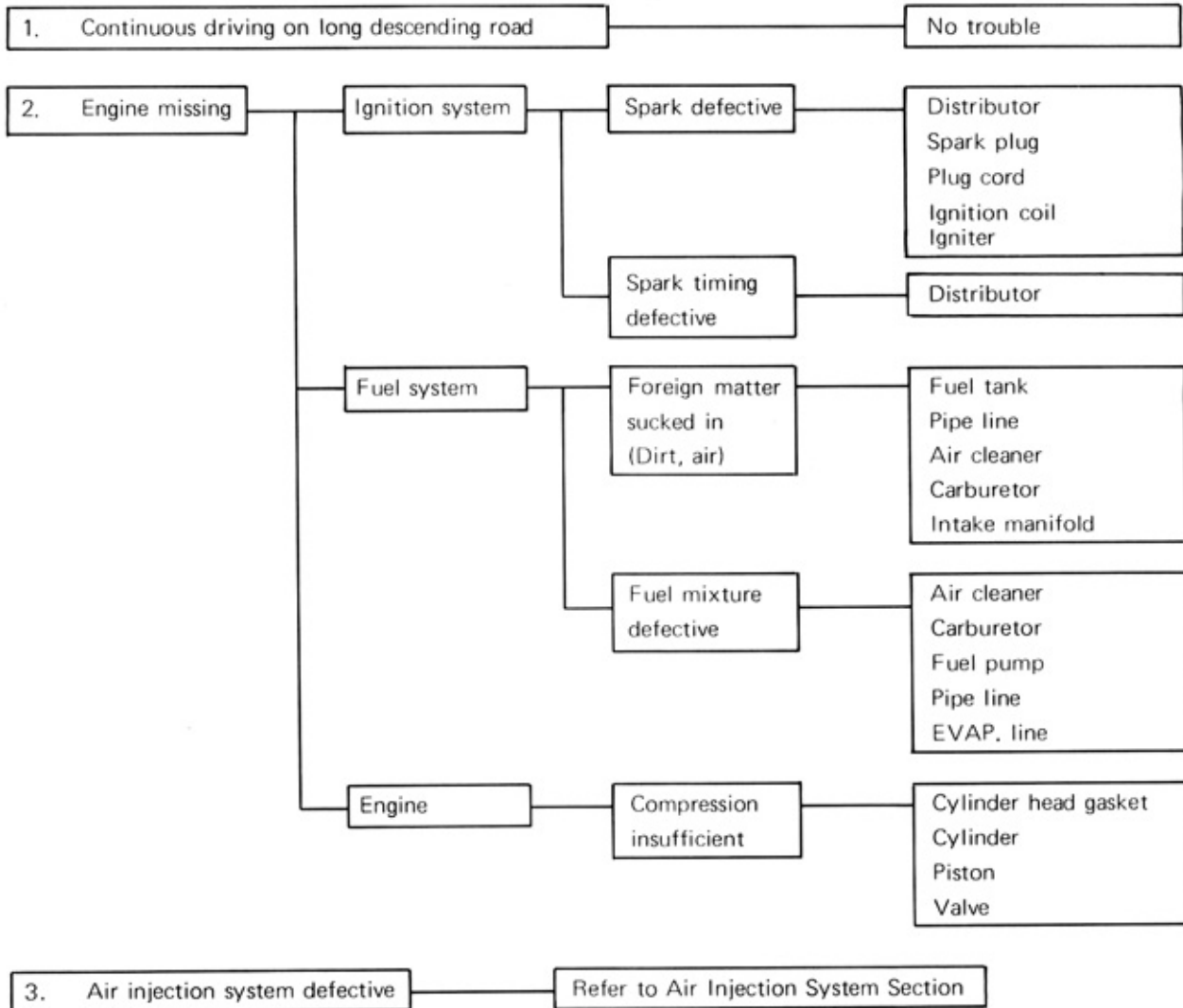
In case the vehicle is driven continuously at deceleration, the engine will be in half missing condition and cause the converter temperature to rise.

If the engine speed is lowered or the accelerator pedal depressed, the engine will recover from the missing condition and result in lowering the converter temperature.

- (3) When a large volume of unburnt gases flows into the converter (such as during misfire) or when the AI system control is defective, the converter temperature will rise abnormally and cause the warning light to turn on.

In such case, take necessary measure as next page.

POSSIBLE LOCATION OF TROUBLE IN CASE THE WARNING LIGHT TURNS ON.



**REMOVAL AND INSTALLATION OF CATALYTIC CONVERTER**

**Removal**

1. Unplug the thermo sensor wiring connector.
2. Remove the wiring protector.
3. Remove the pipe clamps at front and rear of catalytic converter.
4. While pushing the rear exhaust pipe toward the rear, remove the catalytic converter with the thermo sensor attached.
5. Hold the converter with the thermo sensor positioned upward so as to prevent the catalyst from spilling out and remove the thermo sensor from the converter.

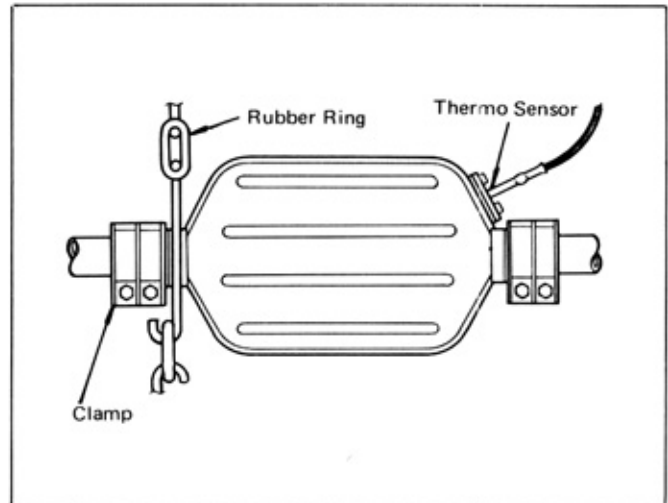
**Installation**

1. Place a new gasket on the thermo sensor, push the thermo sensor into the converter, and screw on the two bolts.

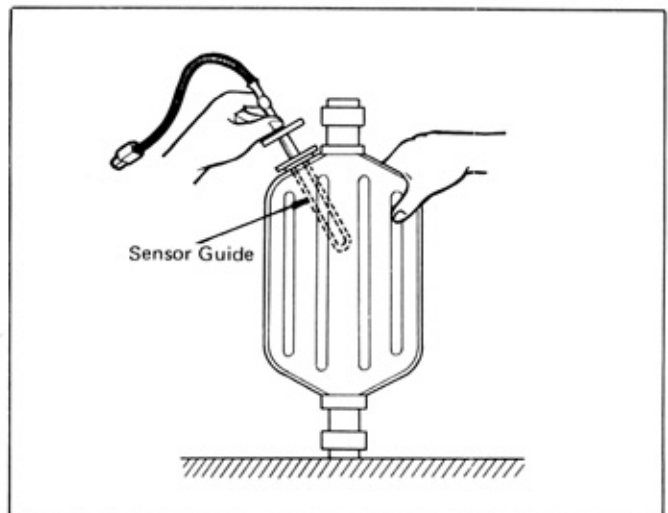
**Note**

- Service purpose converter is provided with a plastic thermo sensor guide. Insert the sensor into this guide.
- The sensor guide should not be removed as it will be difficult to insert the sensor without it.

2. Place new gaskets on the converter front and rear pipes, and connect the converter to the exhaust pipes.
3. Install the pipe clamps.
4. On vehicle provided with rubber rings, secure the converter to the body with the rubber rings.



*Fig. 9-5 Catalytic Converter*



*Fig. 9-6 Catalytic Converter*

5. Properly plug in the thermo sensor connector and install the floor grommet.
6. Install the wiring protector.

**Removal and Installation of Thermo Sensor**

The removal and installation of the thermo sensor must be performed by the procedures described above. Do not attempt to pull out the thermo sensor while on vehicle as the catalyst will spill out.

**Note**

1. The thermo sensor wiring must not be pulled.
2. If the thermo sensor should be dropped on a hard floor from a height of more than 3 feet, it must not be used.
3. After installing, check the sensor wire to see that it is not excessively bent and that it is not interfering with other parts.

**Precaution on Handling Vehicles Equipped with Catalytic Converter**

1. Only unleaded gasoline must be used in the vehicle equipped with catalytic converter.
2. The fast idle speed should be reduced by depressing the accelerator pedal once, when the needle of the coolant temperature gauge registers near 120°F during warming up the engine.  
Avoid continuous engine running at fast idle speed for more than 10 minutes and at idle speed for more than 20 minutes respectively.
3. The plug cord must not be removed to make spark inspection.  
If it is necessary to check the spark condition by spark jumping, either carry out the checking for a short period as much as possible with the engine operating at idle speed or crank the starter motor. Never race the engine when checking.
4. The engine compression measurement must be made in a short time as possible.
5. The engine must not be turned when the fuel supply is nearly gone.
6. Avoid coasting with the ignition turned off or severely engine braking.
7. In case a tachometer is to be connected to the ignition system, connect the tachometer (+) terminal to the ignition coil (-) terminal. Do not connect the tachometer (+) terminal to the distributor.
8. Do not throw away the used catalyst in the same place, where the parts adhered with gasoline or oil are disposed.