

# ENGINE/EMISSIONS DIAGNOSIS

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**SECTION 13**

**Emission Maintenance Warning Light/  
Check Engine Warning Light**

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## **Application, Description and Operation**

### **VEHICLE APPLICATION**

All 1988-49 state 2.0L Rangers and all 1988-49 state 6.1L and 7.0L Heavy Duty Trucks. (Gasoline engines only.)

### **DESCRIPTION AND OPERATION**

The Emission Maintenance Warning (EMW) Light System on 6.1L and 7.0L trucks and the Check Engine Warning (CEW) Light System on 2.0L Rangers consists of an instrument panel mounted amber lens (with the words "CHECK ENGINE" printed on it) that is electrically connected to a sensor module located under the instrument panel. The purpose of the system is to alert the customer that 60,000 mile emission system maintenance is required on the vehicle. Specific emission system maintenance requirements are shown in the vehicle Owner Guide (Medium and Heavy Duty Truck) or the vehicle Maintenance Schedule and Record Log (Light Trucks).

The EMW Light module actually measures accumulated vehicle ignition Key On time and is designed to continuously close an electrical circuit to the amber lens after 2000 hours of vehicle operation. Assuming an average vehicle speed of 30 mph, the 2000 hours equates to 60,000 miles of vehicle operation. Actual vehicle mileage intervals will vary considerably as individual driving habits vary.

Note that when the ignition key is initially placed in the ON position, the EMW/CEW system microprocessor will activate the amber lens for 2 to 5 seconds to indicate proper function of the system. When approximately 60,000 miles of vehicle operation is reached, the EMW/CEW light will remain on continuously, indicating that emission system maintenance is required. After the vehicle's emission system maintenance has been performed, the technician should reset the sensor for another 60,000 mile period.

## **When To Use This Diagnostic Procedure**

Emission maintenance should be performed if the emission maintenance warning light or check engine warning light is on continuously and either of the following is true:

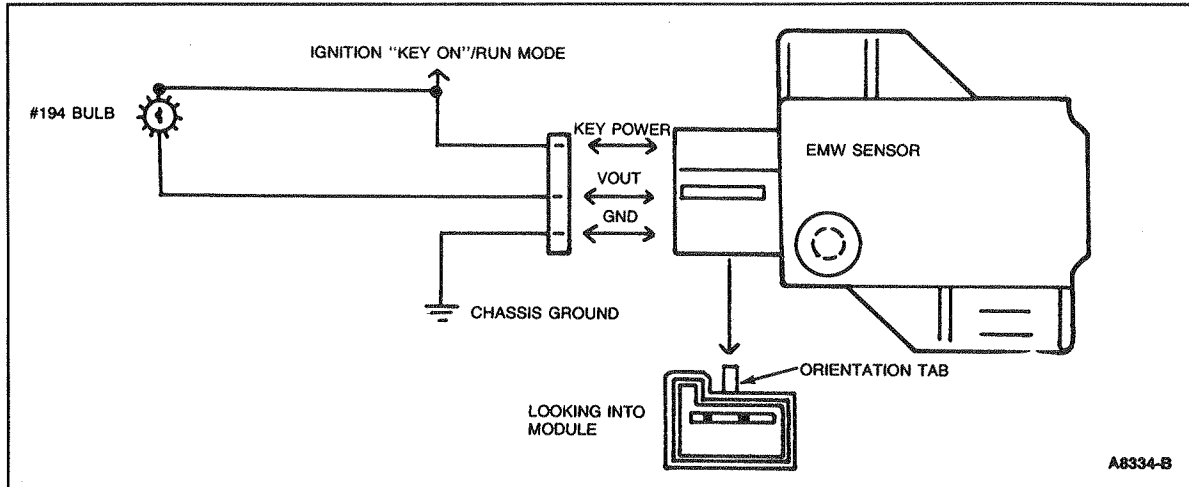
- Mileage is between 45,000 and 75,000 miles with no previous emission maintenance.
- Mileage is greater than 105,000 miles.

**Use this procedure only when the specified mileage does not apply or if the EMW module cannot be reset after emission maintenance is completed.**

## Emission Maintenance Warning Light (EMW) Check Engine Warning Light (CEW)

### SYSTEM SCHEMATIC

2.0L Rangers and 6.1L and 7.0L Heavy Duty Trucks



# Emission Maintenance Warning Light (EMW)

## Pinpoint Test

## EM

**NOTE:** The Emission Maintenance Warning Light (EMW) and the Check Engine Warning Light (CEW) will be referred to as the Emission Maintenance Warning Light (EMW) only, for the remainder of this Section.

TEST STEP		RESULT	ACTION TO TAKE
<b>EM1</b>	VERIFY EMW LIGHT STATUS		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Turn key to ON position.</li> <li>• Does EMW light come on for 2-5 seconds and go off?</li> </ul>		Yes	System OK.
		No	GO to <b>EM2</b> .
<b>EM2</b>	CHECK MODULE POWER		
<ul style="list-style-type: none"> <li>• EMW connected.</li> <li>• Key on.</li> <li>• DVOM, Rotunda 007-00001 or equivalent, on 20 volt scale.</li> <li>• Measure voltage between keypower and ground circuits at the EMW sensor.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>		Yes	GO to <b>EM3</b> .
		No	SERVICE open in keypower or ground circuit.
<b>EM3</b>	CHECK SENSOR OUTPUT		
<ul style="list-style-type: none"> <li>• Key Off.</li> <li>• DVOM on 20 volt scale.</li> <li>• EMW connected.</li> <li>• Turn key On.</li> <li>• Measure voltage between keypower and vout circuits at the EMW sensor.</li> <li>• Is voltage greater than 10.5 volts for 2-5 seconds and then drops to less than 4.0 volts?</li> </ul>		Yes	GO to <b>EM4</b> .
		No	GO to <b>EM5</b> .

## Emission Maintenance Warning Light (EMW)

## Pinpoint Test

## EM

TEST STEP		RESULT	ACTION TO TAKE
<b>EM4</b>	CHECK CONTINUITY OF KEYPOWER AND VOUT CIRCUITS		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect EMW sensor.</li> <li>• DVOM 200 ohm scale.</li> <li>• Measure resistance between keypower terminal and EMW bulb.</li> <li>• Measure resistance between vout terminal and EMW bulb.</li> <li>• Is resistance of both circuits less than 5 ohms?</li> </ul>		Yes	REPLACE bulb. RECONNECT EMW sensor. REPEAT <b>EM1</b> .
		No	SERVICE open circuit. RECONNECT EMW sensor and REPEAT <b>EM1</b> .
<b>EM5</b>	CHECK VOUT FOR SHORTS TO GROUND OR POWER		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect EMW sensor.</li> <li>• Disconnect EMW bulb.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between vout and battery negative terminal and between vout and battery positive.</li> <li>• Is resistance greater than 10,000 ohms in both checks?</li> </ul>		Yes	RECONNECT EMW sensor. RECONNECT EMW bulb. If light is always on in <b>EM1</b> , GO to Table 2. If light is always off in <b>EM1</b> , GO to Table 1.
		No	SERVICE short circuit. Reconnect EMW module. Reconnect EMW bulb. REPEAT <b>EM1</b> .

**Emission Maintenance Warning Light (EMW)  
EMW Light Never On****Table 1**

SITUATION	ACTION TO TAKE
0 to 15,000 Miles	REPLACE module with 2000 hour "time out" module. No emission maintenance required.
15,000 to 45,000 Miles	REPLACE module with pretimed 1000 hour module. No emission maintenance required.
45,000 to 75,000 Miles (no previous emission maintenance was done).	REPLACE module with 2000 hour "time out" module. Perform required emission maintenance.
60,000 to 75,000 Miles (previous emission maintenance has been done).	REPLACE module with 2000 hour "time out" module. No emission maintenance required.
75,000 to 105,000 Miles	REPLACE module with 1000 hour module. No emission maintenance required.
Greater than 105,000 Miles	REPLACE module with 2000 hour "time out" module. Perform required emission maintenance.

**Emission Maintenance Warning Light (EMW)  
EMW Light Always On****Table 2**

SITUATION	ACTION TO TAKE
0 to 15,000 Miles	RESET EMW module*. No emission maintenance required.
15,000 to 45,000 Miles	INSTALL new 1000 hour pretimed EMW module. No emission maintenance required.
45,000 to 75,000 Miles (no previous emission maintenance was done).	RESET EMW module*. Perform emission maintenance.
60,000 to 75,000 miles (previous emission maintenance has been done).	RESET EMW module*. No emission maintenance required.
75,000 to 105,000 Miles	INSTALL new 1000 hour pretimed EMW module. No emission maintenance required.
Greater than 105,000 Miles	RESET EMW module*. Perform emission maintenance.

**\*Refer to Table 3 for reset procedure. If not a resetable type module, replace with 2000 hour "time out" EMW module. If any module cannot be reset as described in Table 3, replace with a 2000 "time out" EMW module.**



## **Emission Maintenance Warning Light (EMW) Reset Procedure**

### **Table 3**

#### **RESET PROCEDURE FOR EMW MODULE**

The timer may be reset either before or after the timeout period has been exceeded. The procedure is the same for either condition.

##### **Step 1**

Turn the ignition switch to the OFF position.

##### **Step 2**

Lightly push a Phillips screwdriver through the .2 inch diameter hole with the sticker labeled 'RESET' and lightly press down and hold. Go to Step 3.

##### **Step 3**

Still pressing the screwdriver down, turn the ignition switch to the RUN position. The EMW lamp will then light and should remain lighted for as long as the screwdriver is pressed down. Hold the screwdriver down for approximately five seconds. Go to Step 4.

##### **Step 4**

Remove the screwdriver. The lamp should go out within approximately 2 to 5 seconds indicating a reset has occurred. (If the lamp does not go out then begin again with Step 1). Turn the ignition switch to the OFF position and go to Step 5.

##### **Step 5**

Turn the ignition switch to the RUN position. The EMW lamp will light for approximately 2 to 5 seconds and will then go out. This verifies that a proper reset of the module has been accomplished. If the lamp remains on, then the proper reset has not occurred and the reset procedure should be repeated. Turn the ignition switch to the OFF position.