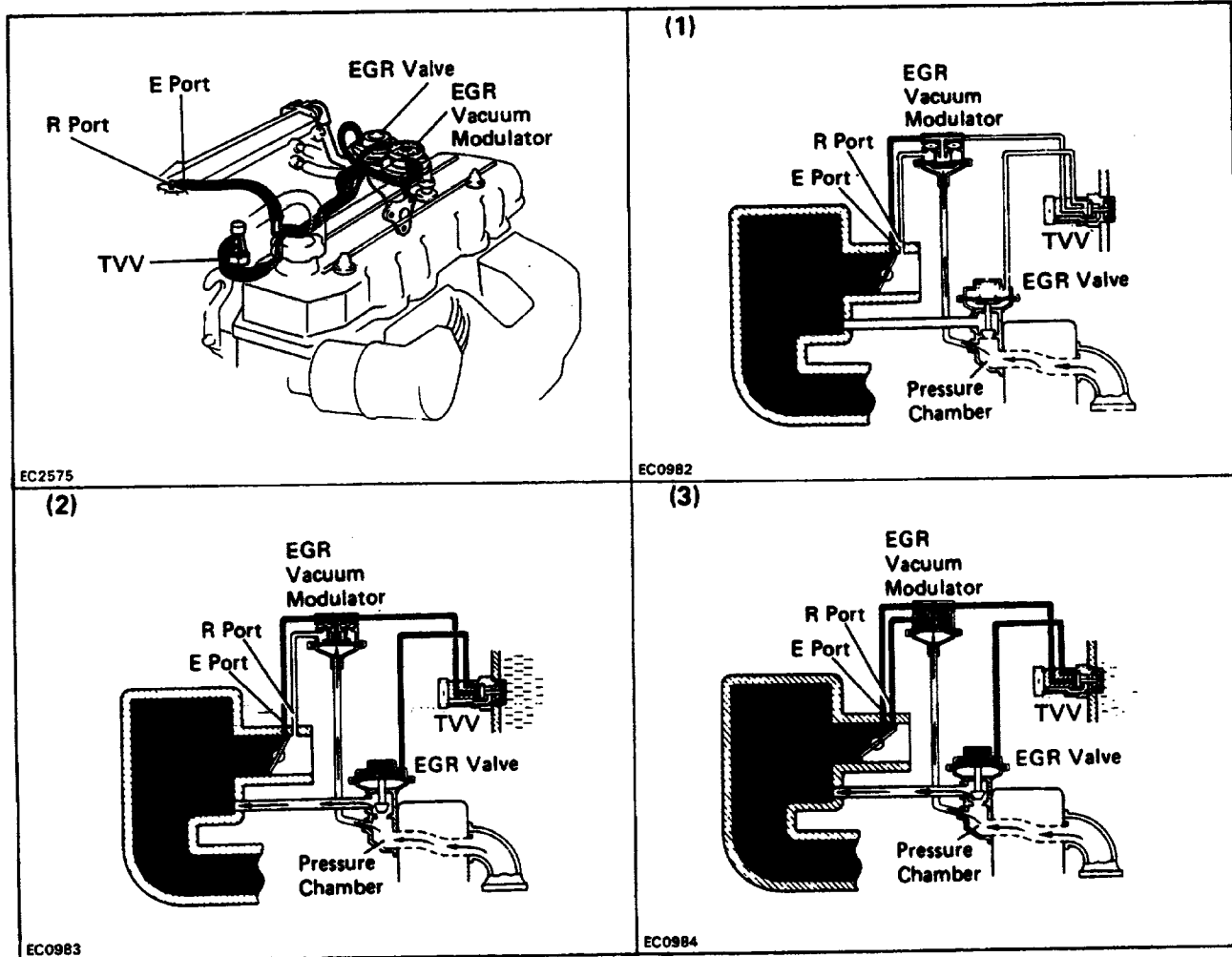


# EXHAUST GAS RECIRCULATION (EGR) SYSTEM (Federal and Canada)



To reduce NO<sub>x</sub> emission, part of the exhaust gases are recirculated through the EGR valve to the intake manifold to lower the maximum combustion temperature.

Coolant Temp.	TVV	Throttle Valve Opening Angle	Pressure in the EGR Valve Pressure Chamber	EGR Vacuum Modulator	EGR Valve	Exhaust Gas
Below 30°C (86°F)	CLOSED	—	—	—	CLOSED	Not recirculated
Above 44°C (111°F)	OPEN	Positioned below E port	—	—	CLOSED	Not recirculated
		Positioned between E port and R port	(1) LOW	*Pressure constantly alternating between low and high	CLOSED	Not recirculated
			(2) HIGH		OPEN	Recirculated
		Positioned above R port	(3) HIGH	**	OPEN	Recirculated (increase)

Remarks: \* Pressure increases → Modulator closes → EGR valve opens → Pressure drops

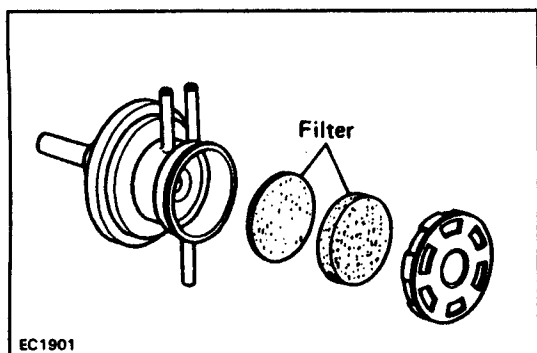
← EGR valve closes ← Modulator opens

\*\*When the throttle valve is positioned above the R port, the EGR vacuum modulator will close the atmosphere passage and open the EGR valve to increase the EGR gas, even if the exhaust pressure is insufficiently low.

## EGR SYSTEM INSPECTION

### 1. CHECK AND CLEAN FILTER IN EGR VACUUM MODULATOR

- Check the filter for contamination or damage.
- Using compressed air, clean the filter.

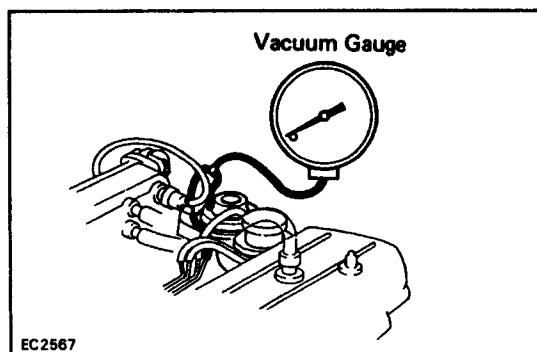


### 2. PREPARATION

Disconnect the vacuum hose from the EGR valve and, using a three way union, connect a vacuum gauge to it.

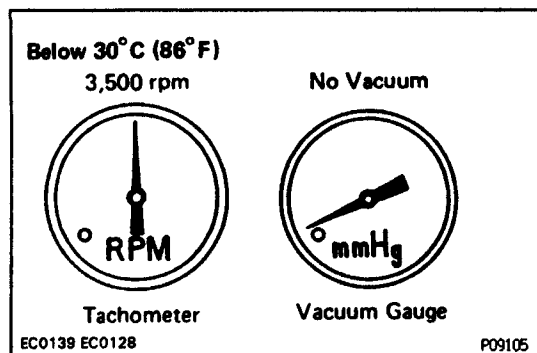
### 3. CHECK SEATING OF EGR VALVE

Start the engine and check that the engine starts and runs at idle.



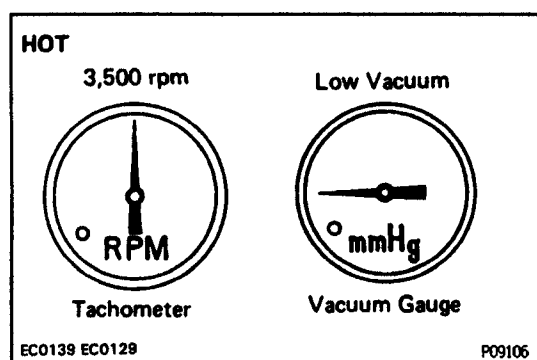
### 4. CHECK TVV WITH COLD ENGINE

- The coolant temperature should be below 30°C (86°F).
- Check that the vacuum gauge indicates zero at 3,500 rpm.



### 5. CHECK TVV AND EGR VACUUM MODULATOR WITH HOT ENGINE

- Warm up the engine.
- Check that the vacuum gauge indicates low vacuum at 3,500 rpm.

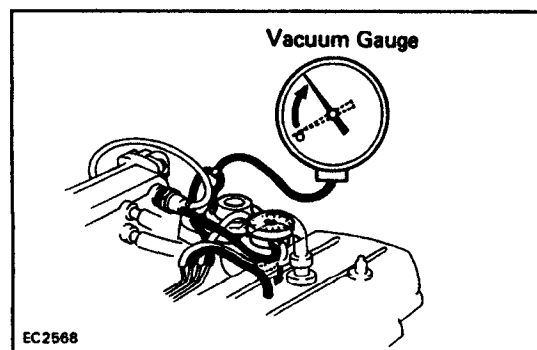


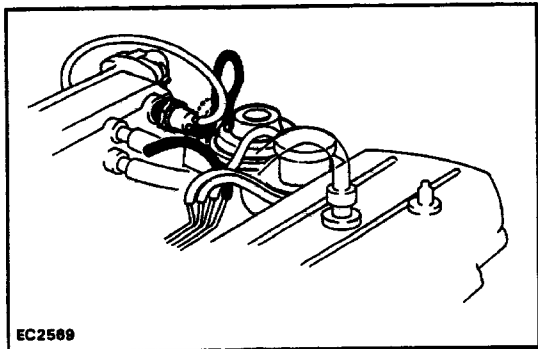
- Disconnect the vacuum hose from R port of the EGR vacuum modulator and connect R port directly to the intake manifold with another hose.

- Check that the vacuum gauge indicates high vacuum at 3,000 rpm.

HINT: As exhaust gas is increasingly recirculated the engine will start to misfire.

- Disconnect the vacuum gauge and reconnect the vacuum hoses to the proper locations.

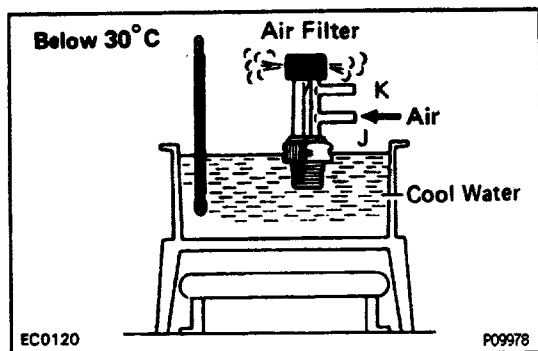




## 6. CHECK EGR VALVE

- Apply vacuum directly to the EGR valve with the engine idling.
- Check that the engine runs rough or dies.
- Reconnect the vacuum hoses to the proper locations.

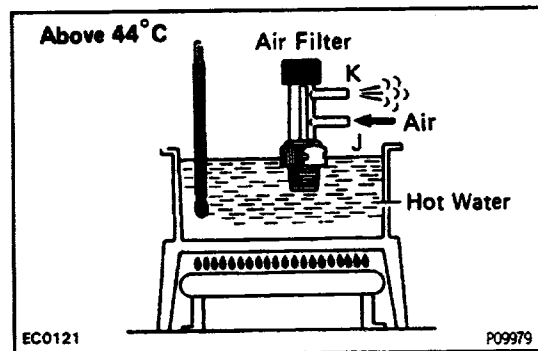
**IF NO PROBLEM IS FOUND WITH THIS INSPECTION, THE SYSTEM IS OK; OTHERWISE INSPECT EACH PART**



## TVV INSPECTION

### CHECK TVV BY BLOWING AIR INTO PIPE

- Drain the coolant from the radiator into a suitable container.
- Remove the TVV.
- Cool the TVV to below 30 °C (86 °F).
- Check that the air flows from pipe J to the air filter.

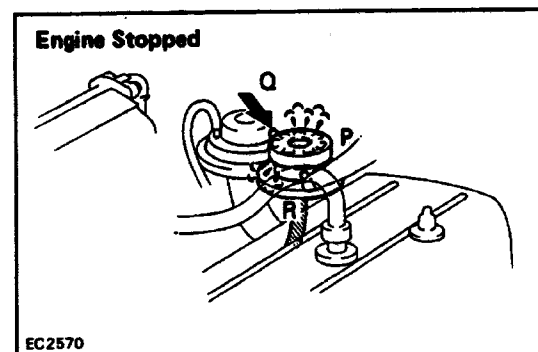


- Heat the TVV to above 44 °C (111 °F).
- Check that the air flows from pipe J to pipe K.
- Apply sealant to the threads of the TVV and reinstall.

### Sealant:

**Part No. 08833-00070, THREE BOND 1324 or equivalent**

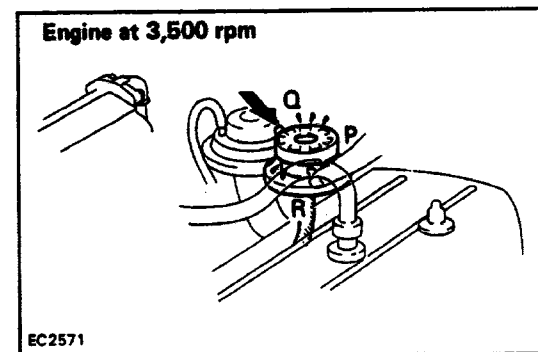
- Fill the radiator with coolant.
- If a problem is found, replace the TVV.



## EGR VACUUM MODULATOR INSPECTION

### CHECK EGR VACUUM MODULATOR OPERATION

- Disconnect the vacuum hoses from ports Q and R of the EGR vacuum modulator.
- Plug ports P and R with your finger.
- Blow air into port a. Check that the air passes through to the air filter side freely.
- Start the engine and maintain the speed at 3,500 rpm.
- Repeat the above test. Check that there is a strong resistance to air flow.
- Reconnect the vacuum hoses to the proper locations



## **EGR VALVE INSPECTION**

### **1. REMOVE EGR VALVE**

Check the valve for sticking and heavy carbon deposits. If a problem is found, replace it. ”

### **2. INSTALL EGR VALVE WITH NEW GASKET**