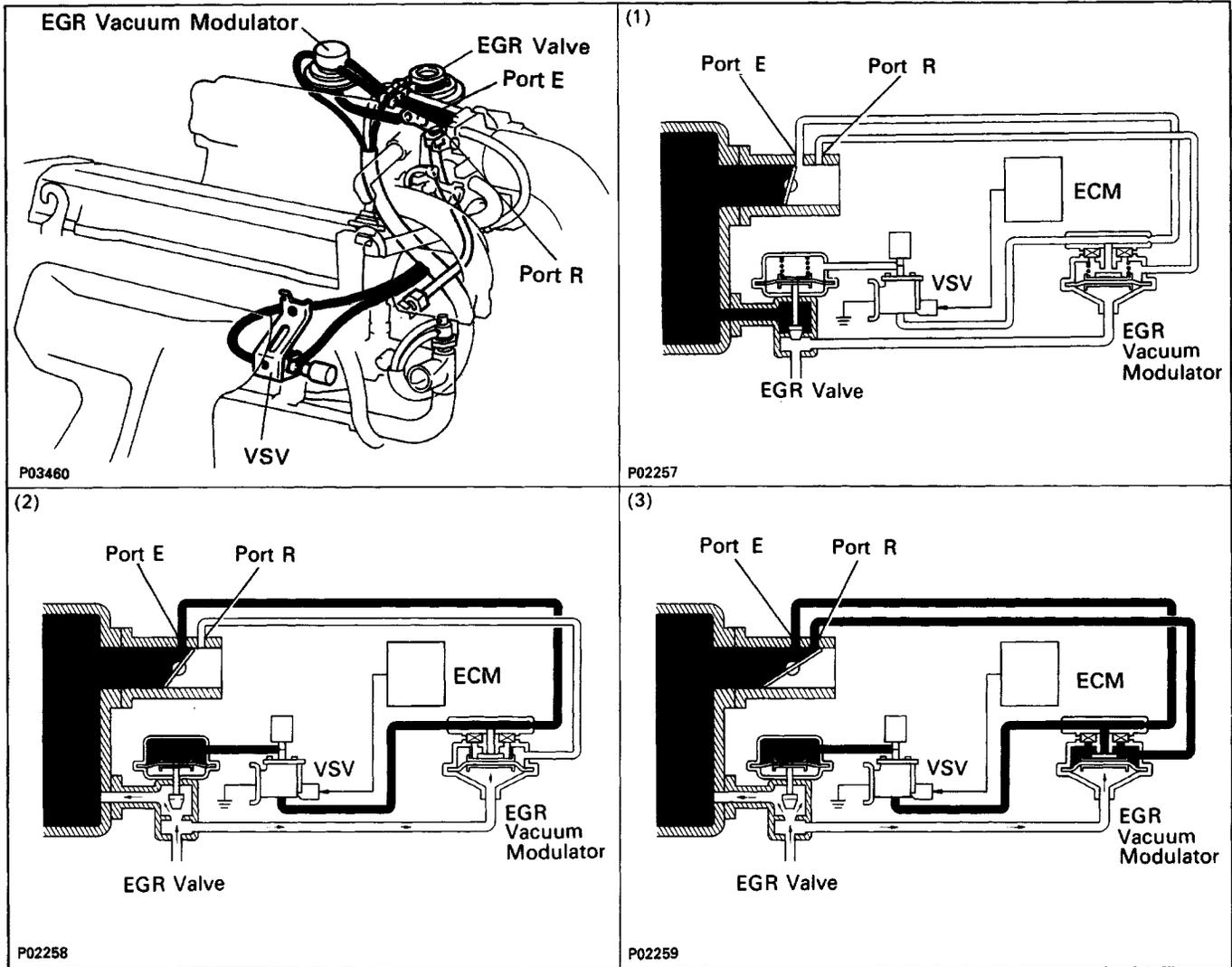


EXHAUST GAS RECIRCULATION (EGR) SYSTEM

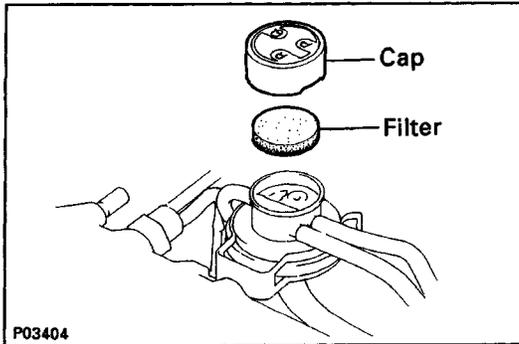


Engine Coolant Temp.	Engine RPM	PIM (ECU)	VSV	Throttle Valve Opening Angle	Pressure in the EGR Valve Pressure Chamber	EGR Vacuum Modulator	EGR Valve	Exhaust Gas	
Below 55°C (131°F)	-	-	CLOSED	-	-	-	CLOSED	Not recirculated	
Above 60°C (140°F)	Below 4,000 rpm	OFF	CLOSED	Positioned below port E	-	-	CLOSED	Not recirculated	
			CLOSED	Positioned below port E	(1)	-	CLOSED	Not recirculated	
	Above 4,000 rpm	ON	OPEN	Positioned between port E and port R	(2) HIGH	*	CLOSES passage to atmosphere	OPEN	Recirculated
			OPEN	Positioned above port R	(3) HIGH	**	CLOSES passage to atmosphere	OPEN	Recirculated (increase)
Above 4,000 rpm	Above 4,000 rpm	OFF	CLOSED	-	-	-	CLOSED	Not Recirculated	

* Pressure increases → Modulator closes → EGR valve opens → Pressure drops
 ← EGR valve closes ← Modulator opens ←

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

*** If terminals TE1 and E1 of data link connector 1 are connected, the VSV switches ON.



INSPECTION OF EGR SYSTEM

1. INSPECT AND CLEAN FILTERS IN EGR VACUUM MODULATOR

- Remove the cap and filter.
- Check the filters for contamination or damage.
- Using compressed air, clean the filter.
- Reinstall the filter and cap.

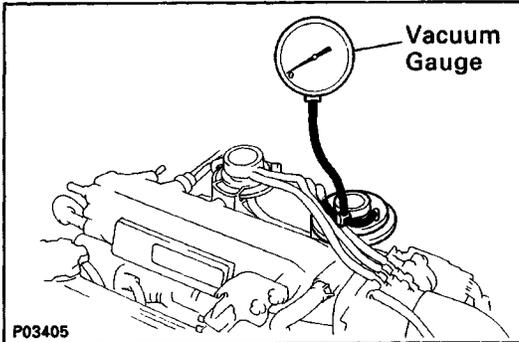
HINT: Install the filters with the coarser surface facing the atmospheric side (outward).

2. INSTALL VACUUM GAUGE

Using a 3-way connector, connect a vacuum gauge to the hose between the EGR valve and VSV.

3. INSPECT SEATING OF EGR VALVE

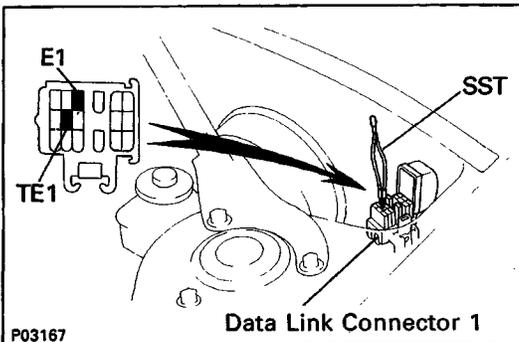
Start the engine and check that the engine starts and runs at idle.



4. CONNECT TERMINALS TE1 AND E1 OF DATA LINK CONNECTOR 1

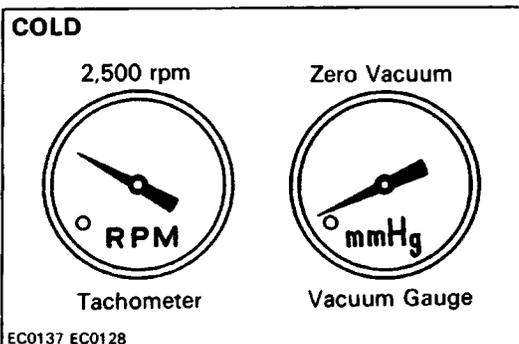
Using SST, connect terminals TE1 and E1 of the data link connector 1.

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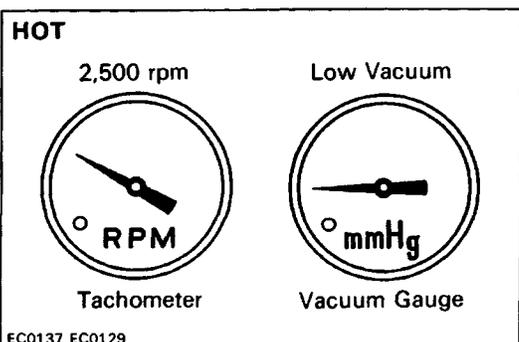
5. INSPECT VSV OPERATION WITH COLD ENGINE

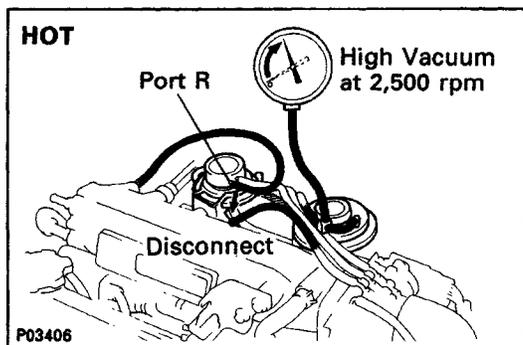
- The engine coolant temperature should be below 55°C (131°F).
- Check that the vacuum gauge indicates zero at 2,500 rpm.



6. INSPECT VSV OPERATION OF AND EGR VACUUM MODULATOR WITH HOT ENGINE

- Warm up the engine above 60°C (140°F).
- Check that the vacuum gauge indicates low vacuum at 2,500 rpm.





(c) Disconnect the vacuum hose port R of the EGR vacuum modulator and connect port R directly to the intake manifold with another hose.

(d) Check that the vacuum gauge indicates high vacuum at 2,500 rpm.

HINT: As a large amount of exhaust gas enters, the engine will misfire slightly.

7. REMOVE VACUUM GAUGE

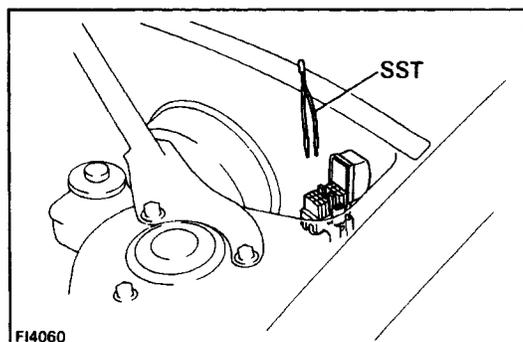
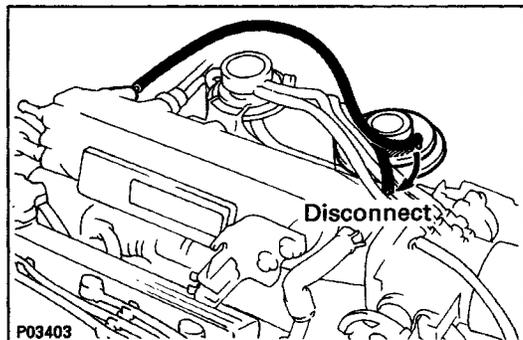
Remove the vacuum gauge, and reconnect the vacuum hoses to the proper locations.

8. INSPECT EGR VALVE OPERATION

(a) Apply vacuum directly to the EGR valve with the engine idling.

(b) Check that the engine runs rough or dies.

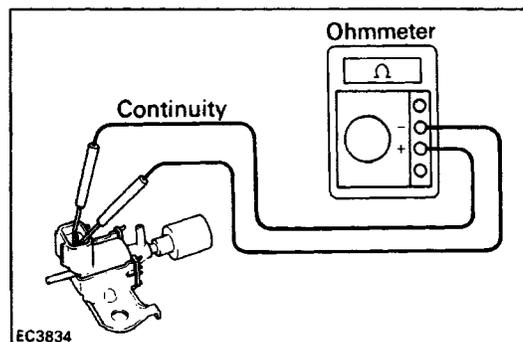
(c) Reconnect the vacuum hoses to the proper locations.



9. REMOVE SST FROM DATA LINK CONNECTOR 1

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IF NO PROBLEM IS FOUND WITH THIS INSPECTION, SYSTEM IS NORMAL; OTHERWISE INSPECT EACH PART



INSPECTION OF VSV

1. REMOVE VSV

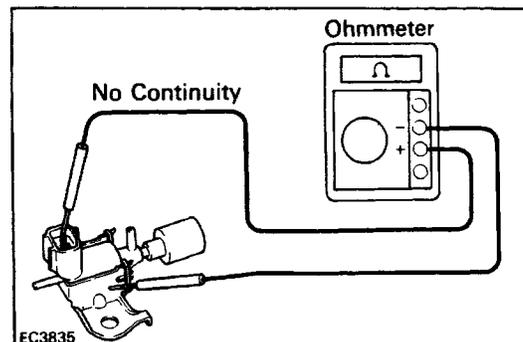
2. INSPECT VSV

A. Inspect VSV for open circuit.

Using an ohmmeter, check that there is continuity between the terminals.

Resistance (Cold): 33 – 39Ω

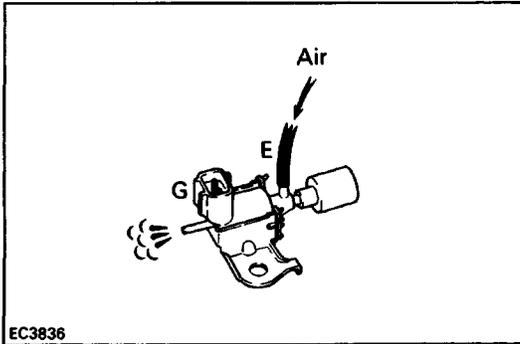
If there is no continuity, replace the VSV.



B. Inspect VSV for ground

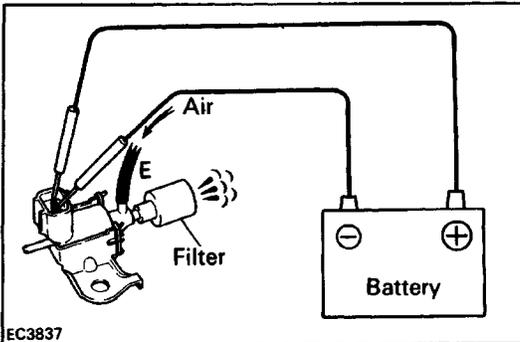
Using an ohmmeter, check that there is no continuity between each terminal and the body.

If there is continuity, replace the VSV.



C. Inspect VSV operation

- (a) Check that the air flows from ports E to G.

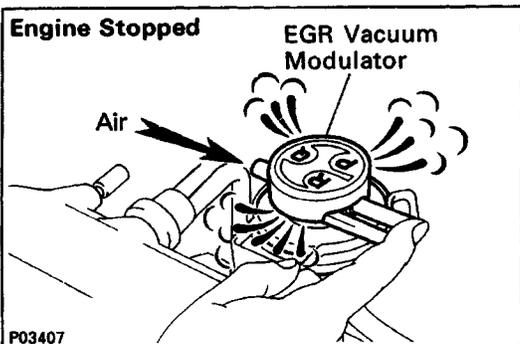


- (b) Apply battery voltage across the terminals.

- (c) Check that the air flows from port E to the filter.

If operation is not as specified, replace the VSV.

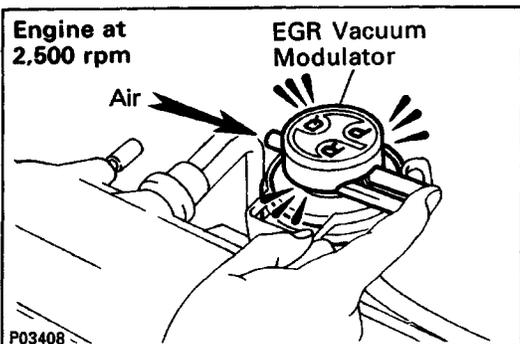
3. REINSTALL VSV



INSPECTION OF EGR VACUUM MODULATOR

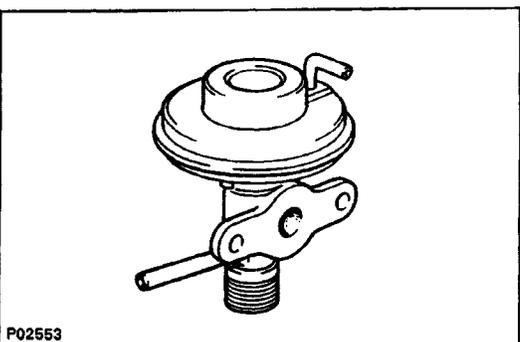
INSPECT OPERATION OF EGR VACUUM MODULATOR

- (a) Disconnect the vacuum hoses from ports P, Q and R of the EGR vacuum modulator.
- (b) Block ports P and R with your finger.
- (c) Blow air into port Q, and check that the air passes through to the air filter side freely.
- (d) Start the engine, and maintain speed at 2,500 rpm.
- (e) Repeat the above test. Check that there is a strong resistance to air flow.



- (f) Reconnect the vacuum hoses to the proper locations.

If operation is not as specified, replace the vacuum modulator.



INSPECTION OF EGR VALVE

1. REMOVE EGR VALVE

2. INSPECT EGR VALVE

Check for sticking and heavy carbon deposits.

If a problem is found, replace the valve.

3. REINSTALL EGR VALVE

Install a new gasket.