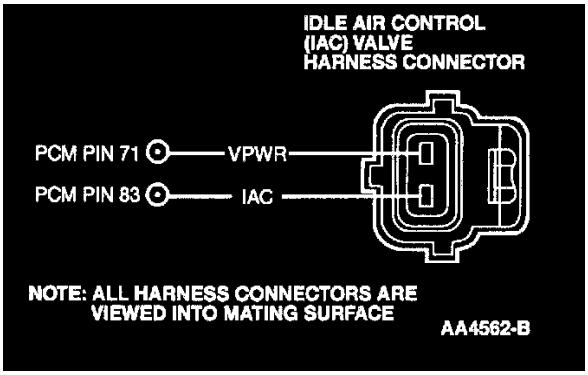
Computers and Control Systems: Pinpoint Tests
KE - Idle Air Control (IAC) Valve Assembly

Test Notes

This Pinpoint Test is intended to diagnose the following:

- Idle Air Control **(IAC)** Valve
- Harness Circuits: IAC and VPWR
- Powertrain Control Module **(PCM)**

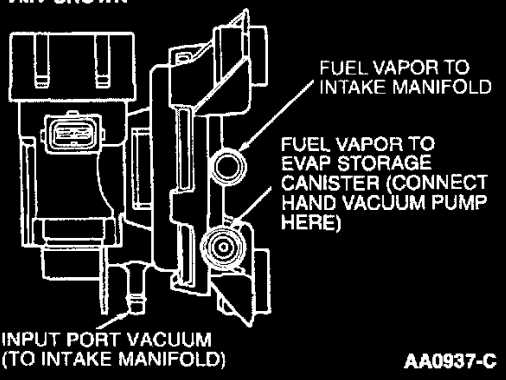


Test Step		Result ▶	Action to Take
KE1	IDLE CONCERNS OR STALLS: RUN KOER SELF-TEST AND OUTPUT CONTINUOUS MEMORY DTCS		
	The Symptom Charts have indicated that there was no change in idle quality when the IAC valve was disconnected. • Retrieve all Continuous Memory DTCs. • NOTE: If unable to perform KOER Self-Test to completion, go directly to KE2. Run Key On Engine Running (KOER) Self-Test. • **Is DTC P0505, P1504 or P1507 retrieved during KOER Self-Test or from Continuous Memory?**	Yes ▶ No ▶	KEY OFF. GO to KE2. The IAC system is OK. RETURN to Symptom Charts.
KE2	DTC P0505, P1504, P1507 OR STARTS ONLY AT PART THROTTLE: CHECK VPWR VOLTAGE TO IAC VALVE		
	NOTE: If EGR DTC P0402 was output during Self Test, diagnose it first before continuing with this Pinpoint Test. • Disconnect IAC valve. • Key on, engine off. • Measure VPWR circuit voltage at the IAC valve harness connector. • **Is voltage greater than 10.5 volts?**	Yes ▶ No ▶	KEY OFF. GO to KE3. REPAIR open circuit.
KE3	CHECK IAC VALVE RESISTANCE		
	• IAC valve disconnected. Measure IAC valve resistance. • **Is resistance between 6.0 and 13.0 ohms?**	Yes ▶ No ▶	GO to KE4. REPLACE IAC valve.
KE4	CHECK IAC VALVE FOR AN INTERNAL SHORT TO IAC CASE		
	• Measure the resistance from either IAC valve pin to IAC valve case. • **Is resistance greater than 10,000 ohms?**	Yes ▶ No ▶	**For DTC P1504:** GO to KE7. **All others:** GO to KE5. REPLACE IAC valve.
KE5	CHECK AIR INLET FOR PLUGGING		
	• Inspect the entire intake air system for debris, blockage and other damage. • Remove and inspect IAC air tubes (if equipped) for blockage and other damage. • Remove and inspect the air cleaner element for excessive dirt. • **Is the intake air system OK?**	Yes ▶ No ▶	RESTORE inlet air system. GO to KE6. REPAIR as necessary.
KE6	CHECK FOR INLET AIR LEAKS		
	• Key on, engine running. • With engine running at idle, listen for vacuum leaks. • Inspect the entire intake air system from the mass air flow (MAF) sensor to the intake manifold for leaks such as: — Cracked or punctured intake air tube. — Damaged or loose IAC air tubes. — Loose intake air tube at air cleaner housing or throttle body. — IAC valve or gasket seal. — EGR valve gasket seal. — Vacuum supply connector and hose. — PCV connectors and hose. • **Are any leaks detected in the above areas?**	Yes ▶ No ▶	REPAIR as necessary. KEY OFF. GO to KE7.

Test Step		Result ▶	Action to Take
KE7	CHECK IAC CIRCUIT FOR OPEN IN HARNESS		
	NOTE: Refer to the PCM connector pin numbers in the beginning of this Pinpoint Test. • IAC valve disconnected. • Disconnect PCM. • Measure resistance of IAC circuit between PCM harness connector pin and IAC valve harness connector. • **Is resistance less than 5.0 ohms?**	Yes ▶ No ▶	GO to KE8. REPAIR open circuit.
KE8	CHECK IAC CIRCUIT FOR SHORT TO PWR IN HARNESS		
	• Key on, engine off. • Measure voltage on IAC circuit between PCM harness connector pin and battery negative post. • **Is voltage less than 1.0 volt?**	Yes ▶ No ▶	KEY OFF. GO to KE9. REPAIR short circuit.
KE9	CHECK IAC CIRCUIT FOR SHORT TO GROUND IN HARNESS		
	• Disconnect scan tool from DLC. • Measure resistance between IAC and PWR GND circuits at the PCM harness connector. • **Is each resistance greater than 10,000 ohms?**	Yes ▶ No ▶	GO to KE10. REPAIR short circuit.
KE10	CHECK IAC SIGNAL FROM PCM		
	• Reconnect PCM and IAC valve. NOTE: If stalling occurs place a shim under the hard stop screw to maintain idle conditions). • Key on, engine running. • Access IAC and RPM PIDS. • With engine at normal operating temperature, accessories OFF and at closed throttle, the IAC duty cycle must be between approximately 22 percent and 45 percent. • Slowly increase engine speed to 3000 rpm and return to closed throttle (Note: If closed throttle rpm is significantly higher than normal, ignore this step). • **Is the IAC duty cycle within specification at closed throttle and does the duty cycle respond to the change in rpm?**	Yes ▶ No ▶	**For Continuous Memory DTCs P1504 and P1507:** GO to KE30. **All others:** KEY OFF. INSPECT throttle body for damage. REPAIR as necessary. If OK, REPLACE IAC valve. RESET Keep Alive Random Access Memory (RAM). For DTC P1507, REPLACE IAC valve, otherwise REPLACE PCM.

Test Step	Result ▶	Action to Take
KE20 DTC P1506: CHECK FOR VACUUM LEAKS		

• Key on, engine running.
• With the engine at idle, listen for vacuum leaks.
• Inspect the entire intake air system from the mass air flow (MAF) sensor to the intake manifold for damage or leaks such as:
  • Cracked or punctured intake air tube.
  • Loose or cracked IAC air tubes.
  • Loose intake air tube at the air cleaner housing or throttle body.
  • IAC valve or gasket seal.
  • Intake manifold assembly or gasket seal.
  • EGR valve gasket seal.
  • Vacuum supply connectors and hose.
  • PCV valve, connectors and hose.
• **Are any leaks detected in the above areas?**
	Yes ▶
	No ▶
		KEY OFF. REPAIR as necessary.
		KEY OFF. GO to KE21.

KE21 CHECK EVAP SYSTEM FOR A STUCK OPEN VALVE		
• Disconnect hoses at EVAP canister purge valve (or VMV). • Connect a hand vacuum pump at the fuel vapor port to EVAP canister at the EVAP canister purge valve (or VMV). • Apply 53 kPa (16 in-Hg) of vacuum to EVAP canister purge valve (or VMV). **VMV SHOWN**  • **Does the EVAP canister purge valve (or VMV) hold vacuum for 20 seconds?**	Yes ▶ No ▶	RECONNECT hoses. GO to KE22. REPLACE EVAP canister purge valve.

Test Step	Result ▶	Action to Take
KE22 CHECK IAC VALVE FOR PROPER FUNCTION		
• Key on, engine running. • Bring engine to normal operating temperature. • Transmission in PARK or NEUTRAL. • Disconnect IAC valve. • **Does the rpm drop or engine stall?**	Yes ▶ No ▶	KEY OFF. GO to KE23. KEY OFF. INSPECT throttle body for damage. REPAIR as necessary. If OK, REPLACE IAC valve. RESET Keep Alive Random Access Memory (RAM).
KE23 CHECK IAC CIRCUIT FOR SHORT TO GND IN HARNESS		
NOTE: Refer to the PCM connector pin numbers in the beginning of this Pinpoint Test. • Disconnect scan tool from DLC. • Disconnect PCM. • Measure resistance between IAC circuit at the PCM harness connector and battery negative post. • **Is each resistance greater than 10,000 ohms?**	Yes ▶ No ▶	**For fast idle symptom currently present:** REPLACE PCM. **All others:** RESTORE vehicle. GO to KE30. REPAIR short circuit.
KE30 CHECK IAC SYSTEM FOR INTERMITTENT OPEN OR SHORT		
• Scan tool connected. • Key on, engine running. • Access IAC PID and RPM PIDs. • With engine at normal operating temperature, accessories off and at idle, the IAC duty cycle must be between 20% and 45%. • Observe the PIDs for an indication of a fault while completing the following at idle: — Lightly tap on IAC valve and wiggle harness connector to simulate road shock. — Grasp the vehicle harness closest to the IAC valve. Shake and bend a small section of the harness from the IAC to the dash panel and from the dash panel to the PCM. • **Do the IAC or RPM PIDs suddenly change in value indicating a fault?**	Yes ▶ No ▶	ISOLATE fault and REPAIR as necessary. **For idle quality, starting or stalling symptoms currently present:** REPLACE IAC valve. **All others:** Unable to duplicate or identify fault at this time. GO to Pinpoint Test Step Z1.