KE: Idle Air Control (IAC) Valve

KE: Introduction

KE1 CHECK FOR DIAGNOSTIC TROUBLE CODES (DTCS)

Are DTCs P0505, P0506, P0507, P0511, P1504, P1506, or P1507 present?

Yes	No
For DTCs P0505, P0506, P0511, P1504 or P1507, GO to KE2 . For DTCs P0507 or P1506, GO to KE15 .	For all other symptoms without DTCs, GO to KE2 .

KE2 DTCS P0505, P0506, P0511, P1504 OR P1507: CHECK FOR INTAKE AIR LEAKS (OR STARTS ONLY AT PART THROTTLE)

- With the engine running at idle (if possible), 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:
  - damaged or loose IAC air tubes.
  - cracked or punctured intake air tube.
  - loose intake air tube at the air cleaner housing or throttle body.
  - IAC valve or gasket seal.
  - EGR valve gasket seal.
  - vacuum supply connector and hose.
  - PCV valve, connectors and hoses.

Are any leaks present?

Yes	No
REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test.	GO to KE3 .

KE3 CHECK FOR VOLTAGE TO THE IAC SOLENOID

Note: If EGR DTC P0402 is output during the self-test, diagnose it first before continuing with this pinpoint test.

- IAC connector disconnected.
- Ignition ON, engine OFF.
- Measure the voltage between:

(+) IAC Connector, Harness Side	(-) Vehicle Battery
PWR - Pin 1	Negative terminal

Is the voltage greater than 10 V?

Yes	No

GO to KE4 .	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

KE4 CHECK THE RESISTANCE OF THE IAC VALVE

- Ignition OFF.
- IAC connector disconnected.
- Measure the resistance between:

(+) IAC Connector, Component Side	(-) IAC Connector, Component Side
PWR - Pin 1	IAC - Pin 2

Is the resistance between 6 ohms - 15 ohms?

Yes	No
GO to KE5 .	INSTALL a new IAC valve. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls. CLEAR the DTCs. REPEAT the self-test.

KE5 CHECK THE IAC VALVE FOR AN INTERNAL SHORT TO THE IAC CASE

- Measure the resistance between:

(+) IAC Connector, Component Side	(-) IAC Connector, Component Side
IAC - Pin 2	IAC Case

Is the resistance greater than 10K ohms?

Yes	No
GO to KE6 .	INSTALL a new IAC valve. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls. CLEAR the DTCs. REPEAT the self-test.

KE6 CHECK THE IAC CIRCUIT FOR AN OPEN CIRCUIT IN THE HARNESS

- IAC connector disconnected.
- PCM connector disconnected.
- Measure the resistance between:

(+) IAC Connector, Harness Side	(-) PCM Connector, Harness Side
IAC - Pin 2	IAC - Pin E33

Is the resistance less than 5 ohms?

Yes	No
For IAC-RC applications, GO to KE7 .	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

For all others, GO to KE8 .	

KE7 CHECK IAC-RC FOR VOLTAGE

- Measure the voltage between:

(+) PCM Connector, Harness Side	(-)
IAC-RC	Ground

Is the voltage greater than 10 V?

Yes	No
GO to KE8 .	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

KE8 CHECK THE IAC CIRCUIT FOR A SHORT TO VOLTAGE IN THE HARNESS

- Ignition ON, engine OFF.
- Measure the voltage between:

(+) PCM Connector, Harness Side	(-) Vehicle Battery
IAC - Pin E33	Negative terminal

Is the voltage less than 1 V?

Yes	No
GO to KE9 .	REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.

KE9 CHECK THE IAC CIRCUIT FOR A SHORT TO GROUND IN THE HARNESS

- Ignition OFF.
- Measure the resistance between:

(+) PCM Connector, Harness Side	(-)
IAC - Pin E33	Ground

Is the resistance greater than 10K ohms?

Yes	No
GO to KE10 .	REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.

KE10 CHECK FOR A DROP IN IDLE RPM WITH THE IAC DISCONNECTED

- PCM connector connected.
- IAC connector connected.
- Ignition ON, engine running.

- Bring the engine to normal operating temperature.
- Transmission in PARK or NEUTRAL.
- Disconnect the IAC valve.

Does the RPM drop or the engine stall?

Yes	No
GO to KE12 .	GO to KE11 .

KE11 CHECK FOR A STUCK IAC PINTLE

- Ignition OFF.
- Inspect the entire intake air system for debris, blockage or other damage.
- Remove and inspect the IAC valve and check the pintle movement.
- Check the air tubes (if equipped) for blockage or damage.
- Remove and inspect the air cleaner element for excessive dirt.

Is the IAC valve OK?

Yes	No
GO to KE12 .	INSTALL a new IAC valve. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls. CLEAR the DTCs. REPEAT the self-test.

KE12 VERIFY THE DTC

Is DTC P0511 or P1504 present in continuous memory or from the KOER self-test?

Yes	No
GO to KE22 .	GO to KE13 .

KE13 CHECK THE IAC SIGNAL FROM THE PCM

Note: If stalling occurs, place a shim under the hard stop screw to maintain idle conditions.

Note: With the engine at normal operating temperature, closed throttle and all accessories off, the IAC duty cycle should be between approximately 22% and 65%.

- PCM connector connected.
- IAC connector connected.
- Ignition ON, engine running.
- Access the PCM and monitor the RPM PID.
- Access the PCM and monitor the IAC PID.
- Slowly increase the engine speed to 3,000 RPM and return to closed throttle. (Note: If closed throttle RPM is significantly higher than normal, ignore this step).

Is the Percentage between 22 - 65%?

Yes	No
	INSTALL a new IAC valve. REFER to the Workshop Manual Section 303-14, Electronic

GO to KE14 .	Engine Controls. CLEAR the DTCs. REPEAT the self-test.

KE14 VERIFY THE DTC

Is DTC P0506, P0511, P1504 or P1507 present in continuous memory?

Yes	No
GO to KE20 .	INSPECT the throttle body for damage. REPAIR as necessary. If OK, INSTALL a new IAC valve. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls. RESET the keep alive memory (KAM). REFER to Section 2, Resetting The Keep Alive Memory (KAM) .

KE15 DTCS P0507 OR P1506: CHECK FOR INTAKE AIR LEAKS

- Ignition ON, engine running.
- With the 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:
  - damaged or loose IAC air tubes.
  - cracked or punctured intake air tube.
  - loose intake air tube at the air cleaner housing or throttle body.
  - IAC valve or gasket seal.
  - EGR valve gasket seal.
  - vacuum supply connector and hose.
  - PCV valve, connectors and hoses.

Are any leaks present?

Yes	No
REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test.	GO to KE16 .

KE16 CHECK FOR EVAP DTCS

Note: EVAP system concerns can cause IAC DTCs or idle speed concerns.

Are any EVAP DTCs present?

Yes	No
DISREGARD the current diagnostic trouble code (DTC) at this time. DIAGNOSE the next DTC. GO to Section 4, Diagnostic Trouble Code (DTC) Charts and Descriptions .	GO to KE17 .

KE17 CHECK THE IAC VALVE FOR CORRECT FUNCTION

- Ignition ON, engine running.

- Bring the engine to normal operating temperature.
- Transmission in PARK or NEUTRAL.
- Disconnect the IAC Valve.

Does the RPM drop or the engine stall?

Yes	No
GO to KE18 .	INSPECT the throttle body for damage. REPAIR as necessary. If OK, INSTALL a new IAC valve. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls. RESET the keep alive memory (KAM). REFER to Section 2, Resetting The Keep Alive Memory (KAM) . CLEAR the DTCs. REPEAT the self-test.

KE18 CHECK THE IAC CIRCUIT FOR A SHORT TO GROUND IN THE HARNESS

Note: Refer to the PCM connector pin numbers in the beginning of this pinpoint test.

- Ignition OFF.
- Scan tool connector disconnected.
- PCM connector disconnected.
- Measure the resistance between:

(+) PCM Connector, Harness Side	(-) Vehicle Battery
IAC - Pin E33	Negative terminal

Is the resistance greater than 10K ohms?

Yes	No
GO to KE19 .	REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.

KE19 VERIFY THE SYMPTOM

Is a fast idle symptom currently present?

Yes	No
GO to KE22 .	GO to KE20 .

KE20 CHECK THE IAC SYSTEM FOR AN INTERMITTENT OPEN OR SHORT

- PCM connector connected.
- Ignition ON, engine running.
- Access the PCM and monitor the IAC PID.
- Access the PCM and monitor the RPM PID.
- With the engine at normal operating temperature, closed throttle and all accessories off, the IAC duty cycle should be between approximately 22% and 65%.
- Observe the PIDs while carrying out the following at idle:
  - Lightly tap on the and wiggle the 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 bulkhead and from the bulkhead to the PCM.

Do the IAC or RPM PIDs suddenly change in value, indicating a concern?

Yes	No
ISOLATE the concern. REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test.	GO to KE21 .

KE21 VERIFY THE SYMPTOM

Is an idle quality, starting or stalling symptom currently present?

Yes	No
INSTALL a new IAC valve. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls. CLEAR the DTCs. REPEAT the self-test.	RETURN to Section 3, No Diagnostic Trouble Codes (DTCs) Present Symptom Chart Index , to diagnose fast idle concerns.

KE22 CHECK FOR CORRECT PCM OPERATION

- Disconnect all the PCM connectors.
- Visually inspect for:
  - pushed out pins
  - corrosion
- Connect all the PCM connectors and make sure they seat correctly.
- Carry out the PCM self-test and verify the concern is still present.

Is the concern still present?

Yes	No
INSTALL a new PCM. REFER to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) , Programming the VID Block for a Replacement PCM.	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.