HM: Secondary Air Injection (AIR) System

HM: Introduction

HM1 CHECK FOR DIAGNOSTIC TROUBLE CODES (DTC)

Are DTCs P0410, P0412, P0491, P2257, P2258, or P2448 present?

Yes	No
GO to HM2.	For all others, GO to Section 4, Diagnostic Trouble Code (DTC) Charts and Descriptions.

HM2 VISUALLY INSPECT THE SECONDARY AIR SYSTEM COMPONENTS AND HOSES

- Visually inspect the secondary AIR system components, connectors and hoses for:
  - damaged hoses
  - obstructions
  - exhaust damage
  - restricted secondary AIR pump inlet
  - water or ice

Are the secondary AIR system components and hoses OK?

Yes	No
GO to HM3.	REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test.

HM3 CHECK THE VPWR VOLTAGE TO THE SECONDARY AIR RELAY

- Secondary AIR relay removed.
- Ignition ON, engine OFF.
- Measure the voltage between:

(+) Secondary AIR Relay Connector, Harness Side	(-)
VPWR - Pin 85	Ground
B+ - Pin 30	Ground

Are the voltages greater than 10 V?

Yes	No
GO to HM4.	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

HM4 CHECK THE SECONDARY AIR RELAY

- Ignition OFF.

- Carry out the relay component test. Refer to the Wiring Diagrams Cell 149 Component Testing.

Does the relay pass the component test?

Yes	No
GO to HM5 .	INSTALL a new secondary AIR relay. CLEAR the DTCs. REPEAT the self-test.

HM5 CHECK THE SECONDARY AIR PUMP GROUND CIRCUIT FOR AN OPEN CIRCUIT IN THE HARNESS

- Secondary AIR Pump Motor connector disconnected.
- Measure the resistance between:

(+) Secondary Air Pump Connector, Harness Side	(-)
AIR_GND - Pin 1	Ground

Is the resistance less than 5 ohms?

Yes	No
GO to HM6 .	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

HM6 CHECK THE SECONDARY AIR PUMP CIRCUIT(S) FOR AN OPEN IN THE HARNESS

- Measure the resistance between:

(+) Secondary AIR Relay Connector, Harness Side	(-) Secondary Air Pump Connector, Harness Side
AIR_PWR - Pin 87	AIR_PWR - Pin 2

Is the resistance less than 5 ohms?

Yes	No
GO to HM7 .	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

HM7 CHECK THE SECONDARY AIR CIRCUIT(S) FOR AN OPEN IN THE HARNESS

- PCM connector disconnected.
- Measure the resistance between:

(+) PCM Connector, Harness Side	(-) Secondary AIR Relay Connector, Harness Side
AIR - Pin B1	AIR - Pin 86
AIRM - Pin B50	AIR_PWR - Pin 87

Are the resistances less than 5 ohms?

Yes	No

GO to HM8 .	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

HM8 CHECK THE SECONDARY AIR MONITOR CIRCUIT AND THE SECONDARY AIR PUMP VOLTAGE CIRCUIT FOR A SHORT TO GROUND

- Measure the resistance between:

(+) PCM Connector, Harness Side	(-)
AIRM - Pin B50	Ground
AIR - Pin B1	Ground

Are the resistances greater than 10K ohms?

Yes	No
GO to HM9 .	REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.

HM9 CHECK THE SECONDARY AIR MONITOR CIRCUIT AND THE SECONDARY AIR PUMP VOLTAGE CIRCUIT FOR A SHORT TO VOLTAGE

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

(+) PCM Connector, Harness Side	(-)
AIRM - Pin B50	Ground
AIR - Pin B1	Ground

Is any voltage present?

Yes	No
REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.	GO to HM10 .

HM10 MEASURE THE VACUUM AT THE SECONDARY AIR SOLENOID VALVE

NOTICE: Running the secondary AIR pump with OTM longer than 2 minutes may overheat and damage the secondary AIR pump. Refer to Section 2, {Output Test Mode}.

- Ignition OFF.
- Secondary AIR relay installed.
- Secondary AIR Solenoid connector connected.
- PCM connector connected.
- Ignition ON, engine OFF.
- Connect a vacuum gauge to the control vacuum outlet at the secondary AIR valve.
- Enter output test mode. Refer to Section 2, Output Test Mode (OTM) .
- Command the outputs ON.
- Observe the vacuum gauge reading at the secondary AIR valve.
- Command the outputs OFF.

- Exit output test mode.

Is vacuum present at the secondary AIR diverter valve?

Yes	No
GO to HM11 .	INSTALL a new secondary AIR valve. REFER to the Workshop Manual Section 303-08A, Engine Emission Control. CLEAR the DTCs. REPEAT the self-test.

HM11 CHECK THE SECONDARY AIR PUMP OPERATION

- Enter output test mode. Refer to Section 2, Output Test Mode (OTM) .
- Disconnect the inlet hose from the secondary AIR valve.
- Command the outputs ON.
- Place your hand over the secondary AIR valve inlet hose.
- Command the outputs OFF.
- Exit output test mode.

Is there any air flow from the secondary AIR inlet valve hose?

Yes	No
INSTALL a new secondary AIR valve. REFER to the Workshop Manual Section 303-08A, Engine Emission Control. CLEAR the DTCs. REPEAT the self-test.	INSTALL a new secondary AIR pump. REFER to the Workshop Manual Section 303-08A, Engine Emission Control. CLEAR the DTCs. REPEAT the self-test.