

## HV: Cooling Fan Clutch

← HV: Introduction

### HV1 CHECK FOR DIAGNOSTIC TROUBLE CODES (DTCS)

Are DTCs P0480, P0483 or P0528 present?

Yes	No
For KOEO and KOER DTC P0480, GO to <a href="#">HV4</a> . For KOEO and KOER DTCs P0483 or P0528, GO to <a href="#">HV2</a> . For continuous memory DTCs P0480 or P0528, GO to <a href="#">HV10</a> .	GO to <a href="#">HV2</a> .

### HV2 CHECK THE COOLING FAN CLUTCH FOR MECHANICAL BINDING

**Note:** The cooling fan clutch uses a viscous coupling. The viscous drag should be smooth during fan rotation. The amount of resistance is dependant upon the final cooling fan operational state before engine shutdown.

- Ignition OFF.
- Manually rotate the cooling fan.

Does the cooling fan clutch rotation feel rough or binding?

Yes	No
INSTALL a new cooling fan clutch. REFER to the Workshop Manual Section 303-03, Engine Cooling. CLEAR the DTCs. REPEAT the self-test.	GO to <a href="#">HV3</a> .

### HV3 CHECK THE COOLING FAN CLUTCH OPERATION

- Ignition ON, engine running.
- Set the heater controls to OFF.
- Access the PCM and monitor the FANSS PID.

Does the FANSS PID indicate any RPM?

Yes	No
GO to <a href="#">HV4</a> .	GO to <a href="#">HV11</a> .

### HV4 KOEO AND KOER DTC P0480: CHECK THE COOLING FAN CLUTCH ACTUATOR VALVE SOLENOID RESISTANCE

**Note:** If necessary, install terminal adapters on the component side pins to carry out the resistance

measurement.

- Ignition OFF.
- Cooling Fan Clutch connector disconnected.
- Measure the resistance between:

( + ) Cooling Fan Clutch Connector, Component Side	( - ) Cooling Fan Clutch Connector, Component Side
FCV - Pin 6	VPWR - Pin 2

Is the resistance between 6 - 12 ohms?

Yes	No
GO to <a href="#">HV5</a> .	INSTALL a new cooling fan clutch. REFER to the Workshop Manual Section 303-03, Engine Cooling.  CLEAR the DTCs. REPEAT the self-test.

## HV5 CHECK THE COOLING FAN CLUTCH ACTUATOR VALVE SOLENOID RESISTANCE

- Measure the resistance between:

( + ) Cooling Fan Clutch Connector, Component Side	( - )
FCV - Pin 6	Ground

Is the resistance greater than 10K ohms?

Yes	No
GO to <a href="#">HV6</a> .	INSTALL a new cooling fan clutch. REFER to the Workshop Manual Section 303-03, Engine Cooling.  CLEAR the DTCs. REPEAT the self-test.

## HV6 CHECK THE VPWR VOLTAGE TO THE COOLING FAN CLUTCH ACTUATOR VALVE SOLENOID

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

( + ) Cooling Fan Clutch Connector, Harness Side	( - )
VPWR - Pin 2	Ground

Is the voltage greater than 10 V?

Yes	No
GO to <a href="#">HV7</a> .	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

## HV7 CHECK THE FCV CIRCUIT FOR AN OPEN CIRCUIT IN THE HARNESS

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

<b>( + ) Cooling Fan Clutch Connector, Harness Side</b>	<b>( - ) PCM Connector, Harness Side</b>
FCV - Pin 6	FCV

Is the resistance less than 5 ohms?

<b>Yes</b>	<b>No</b>
GO to <a href="#">HV8</a> .	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

## HV8 CHECK THE FCV CIRCUIT FOR A SHORT TO GROUND IN THE HARNESS

- Measure the resistance between:

<b>( + ) Cooling Fan Clutch Connector, Harness Side</b>	<b>( - )</b>
FCV - Pin 6	Ground

Is the resistance greater than 10K ohms?

<b>Yes</b>	<b>No</b>
GO to <a href="#">HV9</a> .	REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.

## HV9 CHECK THE FCV CIRCUIT FOR A SHORT TO VOLTAGE IN THE HARNESS

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

<b>( + ) Cooling Fan Clutch Connector, Harness Side</b>	<b>( - )</b>
FCV - Pin 6	Ground

Is any voltage present?

<b>Yes</b>	<b>No</b>
REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.	GO to <a href="#">HV19</a> .

## HV10 CONTINUOUS MEMORY DTCS P0480 OR P0528: INTERMITTENT CHECK

**Note:** Keep the coil arm of the cooling fan clutch secure while checking the wiring harness. If the coil arm rotates, incorrect readings may occur.

- Ignition ON, engine OFF.
- Access the PCM and monitor the FANSS PID.
- Access the PCM and monitor the FANVAR PID.
- While observing the PID wiggle, shake, and bend small sections of the wiring harness while working from the cooling fan clutch to the PCM.
- Check the cooling fan clutch and the PCM connectors for damage and corrosion.

**Is a concern present?**

Yes	No
ISOLATE the concern and REPAIR as necessary.	DISREGARD the current diagnostic trouble code (DTC) at this time. DIAGNOSE the next DTC. GO to Section 4, <a href="#">Diagnostic Trouble Code (DTC) Charts and Descriptions</a> .

**HV11 KOEO AND KOER DTC P0528: CHECK THE VOLTAGE AND GROUND TO THE FSS SENSOR**

- Cooling Fan Clutch connector disconnected.
- Ignition ON, engine OFF.
- Measure the voltage between:

( + ) Cooling Fan Clutch Connector, Harness Side	( - ) Cooling Fan Clutch Connector, Harness Side
VBPWR - Pin 3	PWRGND - Pin 5

**Is the voltage greater than 10 V?**

Yes	No
GO to <a href="#">HV15</a> .	GO to <a href="#">HV12</a> .

**HV12 CHECK THE VOLTAGE TO THE FSS SENSOR**

- Measure the voltage between:

( + ) Cooling Fan Clutch Connector, Harness Side	( - )
VBPWR - Pin 3	Ground

**Is the voltage greater than 10 V?**

Yes	No
GO to <a href="#">HV14</a> .	GO to <a href="#">HV13</a> .

**HV13 CHECK THE VOLTAGE CIRCUIT TO THE FSS SENSOR FOR AN OPEN IN THE HARNESS**

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

( + ) Cooling Fan Clutch Connector, Harness Side	( - ) PCM Connector, Harness Side
VBPWR - Pin 3	VBPWR

**Is the resistance less than 5 ohms?**

Yes	No
GO to <a href="#">HV19</a> .	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

## HV14 CHECK THE GROUND CIRCUIT TO THE FSS SENSOR FOR AN OPEN IN THE HARNESS

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

( + ) Cooling Fan Clutch Connector, Harness Side	( - ) PCM Connector, Harness Side
PWRGND - Pin 5	PWRGND

Is the resistance less than 5 ohms?

Yes	No
GO to <a href="#">HV19</a> .	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

## HV15 CHECK THE FSS CIRCUIT FOR AN OPEN CIRCUIT IN THE HARNESS

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

( + ) Cooling Fan Clutch Connector, Harness Side	( - ) PCM Connector, Harness Side
FSS - Pin 4	FSS

Is the resistance less than 5 ohms?

Yes	No
GO to <a href="#">HV16</a> .	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

## HV16 CHECK THE FSS CIRCUIT FOR A SHORT TO GROUND IN THE HARNESS

- Measure the resistance between:

( + ) Cooling Fan Clutch Connector, Harness Side	( - )
FSS - Pin 4	Ground

Is the resistance greater than 10K ohms?

Yes	No
GO to <a href="#">HV17</a> .	REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.

## HV17 CHECK THE FSS CIRCUIT FOR A SHORT TO VOLTAGE IN THE HARNESS

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

<b>( + ) Cooling Fan Clutch Connector, Harness Side</b>	<b>( - )</b>
FSS - Pin 4	Ground

**Is any voltage present?**

<b>Yes</b>	<b>No</b>
REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.	GO to <a href="#">HV18</a> .

## **HV18 CHECK THE FUNCTIONALITY OF THE FSS CIRCUIT**

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

<b>( + ) Cooling Fan Clutch Connector, Harness Side</b>	<b>( - )</b>
FSS - Pin 4	Ground

**Is the voltage greater than 10 V?**

<b>Yes</b>	<b>No</b>
INSTALL a new cooling fan clutch. REFER to the Workshop Manual Section 303-03, Engine Cooling.  CLEAR the DTCs. REPEAT the self-test.	GO to <a href="#">HV19</a> .

## **HV19 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?**

<b>Yes</b>	<b>No</b>
INSTALL a new PCM. REFER to Section 2, <a href="#">Flash Electrically Erasable Programmable Read Only Memory (EEPROM)</a> , 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.

