



V-MAC III - Smart Fan Will Not Disengage

> Internal Content

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V-MAC III - Smart Fan Will Not Disengage

System area:

V-MAC Electrical

Description:

Smart Fan Will Not Disengage

Solution:

1. DIAGNOSTIC PROCEDURES & COMMON REPAIRS

This section identifies the components that should be checked. These components include:

- Fan Clutch Solenoid
- A/C High Pressure Switch
- V-MAC III Programming
- Engine Temperature Sensors

To assist in the diagnostic process, the operation and control of each smart fan component is described.

1.1 Fan Clutch Solenoid

The fan clutch solenoid has two types of controls, air and electrical.

1.1.1 Air Supply

Depending on the type of smart fan, low supply air pressure to the fan clutch solenoid can cause the fan to engage (lock) or disengage (unlock).

- For a Kysor type clutch, if the air supply to the clutch is low or lost, the fan will engage and remain on all the time.
- For a Horton type clutch, if the air supply to the clutch is low or lost, the fan will disengage and remain off all the time.
- Check the fan clutch solenoid air supply circuit.

1.1.2 Electrical Power Supply

If the switched power supply to the fan clutch solenoid is disconnected, the fan will engage.

Check the fan clutch solenoid power supply and ground return circuits as follows:

NOTE: The fan clutch solenoid must be energized for the smart fan to disengage (cycle off). If the power supply to the fan clutch is lost or if the ground circuit to the fan clutch is lost, the smart fan will engage (cycle on) and remain engaged all the time.

- With the ignition switch in the ON position, there should be 12 volts across circuit breaker (fuse) 41. Also, there should be 12 volts supplied to terminal A of the fan clutch solenoid. The fan clutch solenoid is located on the left-hand side of the radiator. As necessary, repair open or shorted circuitry.
- The Engine ECU is the component that controls (sinks) the ground to terminal B of the clutch solenoid. When there are no engine related fan requests, excessive engine or intake air temperatures, or excessive refrigerant high side pressure, the fan clutch solenoid should have a sinking ground signal at terminal B of the fan clutch solenoid. This will result in energizing the fan clutch solenoid and disengaging the fan. As necessary, repair the open or shorted circuitry between terminal B of the clutch solenoid and terminal EJ1-9 at the EECU.

1.2 A/C High Pressure Switch

Under normal conditions, the A/C high pressure switch connects a 12 volt switched power signal to the EECU. The A/C high pressure switch is a normally closed switch and is forced open whenever the refrigerant discharge pressure exceeds the programmed limit. As the switch is forced open, the 12 volt signal to the EECU is disconnected. When an open refrigerant high pressure switch is detected, the EECU assumes a refrigerant high pressure fan request. This inhibits the EECU from sinking the ground at terminal B at the fan clutch solenoid and engages the fan. The A/C high pressure switch electrical signal to the EECU is controlled by both the power supply and the high side refrigerant pressure.

1.2.1 Electrical Power Supply

Check the A/C high pressure switch electrical circuitry as follows:

NOTE: Using the switch status tool in service diagnostics is an easy way to check if the high pressure switch circuitry is complete. If the switch status is ON, the refrigerant high pressure circuitry is complete.

- Fuse 41 supplies 12 volts to terminal A of the refrigerant high pressure switch. The normally closed switch (switch on) delivers the 12 volt signal to terminal EJ1-7. The refrigerant high pressure switch is located in the refrigerant liquid line on the right hand side of the radiator.
- To eliminate the refrigerant high pressure switch from the circuitry, pull the connector plug off the switch and jump the two terminals in the connector plug with a jumper wire.
- As necessary, repair any open or shorted circuitry to and from the refrigerant high pressure switch.

1.2.2 Refrigerant High Side Pressure

If the refrigerant is overcharged in the A/C system, the refrigerant high pressure switch may appear faulty (open all the time) even though it is in good working order. Therefore, discharge and recharge the A/C system as necessary.

1.3 Customer Data Programming

The smart fan customer data parameters can also effect fan engagement and disengagement. The EECU monitors the engine temperature and if the engine temperatures exceed the programming limits, the EECU assumes a engine temperature fan request. This inhibits the EECU from sinking the ground at terminal B at the fan clutch solenoid and engages the fan.

1.3.1 Step 4 Customer Data Programming

Set the Engine Control Parameters to the defaults as follows:

Fan Engagement Thresholds

Coolant Temperature = 200 degrees F

Intake Air Temperature = 175 degrees F

Fan Override Switch Features (switch optional)

Allow Override When Moving = No

Override Time When Moving = 60 sec.

Allow Override When Parked = No

Freon (refrigerant) High Pressure Switch Feature

High Freon Pressure Fan On Time = 60 sec.

Fan Enabling Feature

On/Off Fan Installed = Factory Set, ON If Equipped with a Smart Fan

1.3.1 Step 5 Customer Data Programming

- Set the Engine Control Parameters to the defaults as follows:

Fan Engagement Threshold Features

Coolant Temperature = 200 degrees F

Intake Air Temperature = 175 degrees F

Freon (refrigerant) High Pressure Switch Feature

High Freon Pressure Fan On Time = 60 sec.

Fan Enabling Feature

On/Off Fan Installed = Factory Set, ON If Equipped with a Smart Fan

- Set the Cab Fan Controls to the defaults as follows

Fan Override Switch Features (switch optional)

Allow Override When Moving = No

Override Time When Moving = 60 sec.

Allow Override When Parked = No

Engine Brake Feature

Engage Fan with Engine Brake = No

Engage Fan With PTO ON Features

PTO1 = No

PTO2 = No

PTO3 = No

PTO4 = No

1.4 Engine Temperature Sensors

The EECU temperature sensor inputs must be complete and unaltered. If the circuits are shorted high this could cause a unwarranted engine temperature fan request.

Check the engine temperature circuits as follows:

- With the engine at room temperature, using the Monitor Parameter Tool in Service Diagnostics, check the coolant and intake air temperature sensor fields.
- If the temperature sensor fields report temperatures which exceed the Customer Data Programming fan engagement threshold temperatures, the EECU will assume a fan request, inhibit the fan clutch solenoid from energizing, and engage the fan. As necessary, replace or repair the temperature sensor circuitry.

2. UNCOMMON REPAIR PROCEDURES

If everything to this point checks out okay, replace the EECU and begin the diagnostic process again.

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