

Cool Logic Diagnostic Guide



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 **BorgWarner**

Prior to diagnosis, check the following:

1. Radiator and coolers in front of fan are clean and free of debris.
2. Visually inspect the wiring harness for fan drive. (No cuts, abrasion etc.)
3. Verify all fan drive electrical harness connectors are securely connected and seated.
4. Verify that proper fan for the application is installed (BorgWarner logo on fan blade).
5. Verify proper battery voltage.
6. Verify outside of fan drive is clean and free of debris.
7. Air conditioning controls in vehicle cabin should be in the OFF position for all tests.

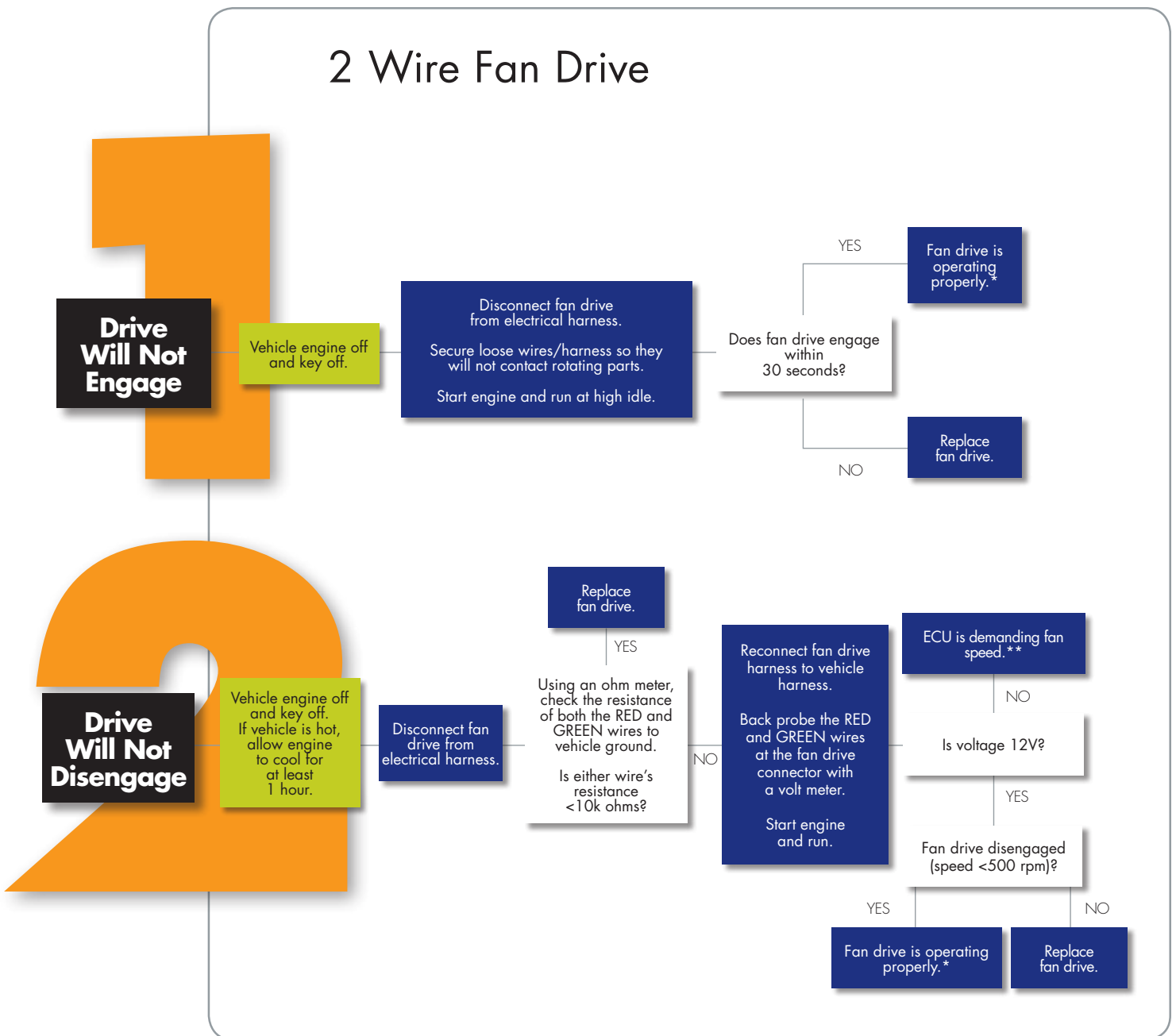
CONDITION

TEST

ACTION

Operate the fan through the ECU using the engine/chassis control system diagnostics.
 If the fan drive does not respond correctly, the steps below should be followed in order to determine if the drive is faulty.
 If it is determined the fan drive is functional, return to the control input on the vehicle to detect the problem.

2 Wire Fan Drive



4 Wire Fan Drive

Drive Will Not Engage

Vehicle engine off and key off.

Disconnect fan drive from electrical harness.

Using an ohm meter, measure the resistance across the two black wires.

Is the resistance < 50 ohms?

NO

Replace fan drive.

YES

Secure loose wires/harness so they will not contact rotating parts.

Start engine and run at high idle.

Fan should fully engage within 30 seconds.

Does fan drive engage within 30 seconds?

YES

Fan drive is operating properly.*

NO

Replace fan drive.

Drive Will Not Disengage

Vehicle engine off and key off. If vehicle is hot, allow engine to cool for at least 1 hour.

Disconnect fan drive from electrical harness.

Using an ohm meter, measure the resistance across the two black wires.

Is the resistance < 50 ohms?

NO

Replace fan drive.

Replace fan drive.

YES

Using an ohm meter, check the resistance of both the RED and GREEN wires to vehicle ground.

Is either wire's resistance < 10k ohms?

YES

NO

Reconnect fan drive harness to vehicle harness.

Back probe the RED and GREEN wires at the fan drive connector with a volt meter.

Start engine and run.

ECU is demanding fan speed.**

NO

Is voltage 12V?

YES

Fan drive disengaged (speed < 500 rpm)?

YES

Fan drive is operating properly.*

NO

Replace fan drive.

*Fan drive is operating properly, refer to vehicle engine control unit and wiring harness trouble-shooting guide.

** One of the cooling systems is demanding fan speed. Shut the vehicle down and allow 1 hour for cooling. Re-run checks from the beginning.

Cool Logic™ Heavy-Duty Multi-Speed (HDMS) Overview

Cool Logic™ is a multi-speed or modulating electronically controlled fan drive that provides improved fuel economy and reduced fan noise. This fan drive is completely self-contained and sealed with zero maintenance required.

Routine Inspection of Fan and Fan Drive

Visually inspect fan and fan drive installation during each scheduled maintenance. Check for appropriate fan-to-shroud clearances and look for any foreign objects that may be located in the path of the fan or fan drive. Examine fan drive for fluid leakage and make sure fan drive housing is free of any debris or signs of damage. Inspect electrical harness for proper mounting and for adequate clearance from drive belts or other rotating components.

Electrical Harness Damage

A 2-wire or 4-wire electrical harness exits from the rear of the fan drive assembly. If the drive will not disengage the electrical harness may be damaged. Carefully inspect for frayed or cut wires (Figure 1). If damage is found, the fan drive assembly must be replaced.

Normal Grease Purge

Grease purge (figure 2) from hub bearings is normal. This is due to any manufacturing overfill of grease being forced out when the bearing reaches standard operating temperature.

Fan-To-Drive Mounting

The fan should be mounted to the drive using only BorgWarner approved hardware. Fan mounting hardware should be tightened using the following sequence (Figure 3) and torque specification:

RECOMMENDED TORQUE FOR ATTACHING FAN TO Drive: 34 Nm (25 ft-lb)

NOTE: Use of inappropriate fan-to-drive mounting hardware may result in damage to fan drive housing. Order BorgWarner's Cool Logic fan drive fan mounting kit (Part # 010021860).



Figure 1 Frayed wire



Figure 2 Normal grease purge

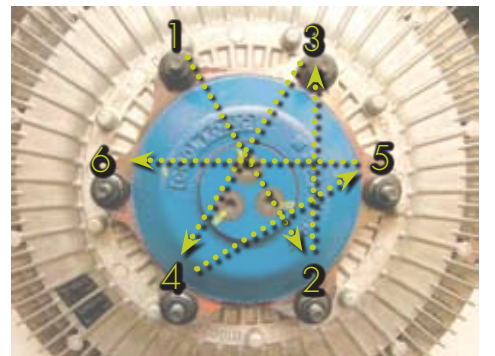


Figure 3 Torque sequence

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For Further Information on BorgWarner
Thermal Systems contact
Tech Services 800-927-7811
info@bwthermal.com

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