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2020.0 DEFENDER (LE), 303-03C

ENGINE COOLING – INGENIUM I6 3.0L PETROL (G2400955)

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PRINCIPLES OF OPERATION

For a detailed description of the Engine Cooling system, refer to the relevant Description and Operation section in the workshop manual. REFER to: [Engine Cooling](#) (303-03C Engine Cooling - INGENIUM I6 3.0L Petrol, Description and Operation).

INSPECTION AND VERIFICATION

 CAUTION:

Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

 NOTES:

- If a control module or a component is at fault or may be at fault and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual, or determine if any prior approval program is in operation, prior to the installation of a new module/component.
- When performing voltage or resistance tests, always use a digital multimeter that has the resolution ability to view 3 decimal places. For example, on the 2 volts range can measure 1 mV or 2 kΩ range can measure 1 Ω. When testing resistance always take the resistance of the digital multimeter leads into account.
- Inspect and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

1. Verify the customer concern
2. Visually inspect for obvious signs of damage and system integrity

Visual Inspection

MECHANICAL

ELECTRICAL

MECHANICAL	ELECTRICAL
■ Coolant leaks ■ Coolant hoses ■ Coolant expansion tank ■ Radiator ■ Coolant pump ■ Coolant pump drive belt ■ Cooling fans ■ Turbocharger ■ Oil cooler ■ Charge air coolant pump ■ Electric thermostat with heater element	■ Fuses ■ Wiring harnesses and connectors ■ Powertrain control module ■ Engine coolant temperature sensor ■ Electric thermostat with heater element ■ Electric cooling fan ■ Viscous cooling fan ■ Auxiliary coolant pump

3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step
4. If the cause is not visually evident, verify the symptom and refer to the Symptom Chart, alternatively check for Diagnostic Trouble Codes (DTCs) and refer to the DTC Index
5. Check JLR claims submission system for open campaigns. Refer to the corresponding bulletins and SSMS which may be valid for the specific customer complaint and complete the recommendations as required

SYMPTOM CHART

SYMPTOM	POSSIBLE CAUSES	ACTION
Coolant loss	■ Coolant leak ■ Hoses ■ Hose connections ■ Radiator ■ Coolant pump ■ Heater core ■ Gaskets ■ Engine casting cracks ■ Cylinder block core plugs	■ Perform a visual inspection. If there are no obvious leaks, perform a cooling system pressure test. Rectify any leaks as necessary

SYMPTOM	POSSIBLE CAUSES	ACTION
Engine overheats	■ Low /contaminated coolant ■ Thermostat stuck closed ■ Cooling fan failure ■ Radiator airflow restricted ■ Engine management system fault	■ Inspect the coolant level and condition. Complete a cooling system pressure test. Rectify as necessary ■ Inspect the thermostat and rectify as necessary ■ Inspect the operation of the viscous fan. Rectify as necessary ■ Inspect the radiator for obstructions to the airflow. Rectify as necessary. ■ Using the Jaguar Land Rover approved diagnostic equipment, check the powertrain control module for related DTCs and refer to the relevant DTC index
Engine not reaching normal temperature	■ Thermostat stuck open ■ Cooling fan failure	■ Inspect the thermostat and rectify as necessary ■ Inspect the operation of the viscous fan. Rectify as necessary

DTC INDEX

For a list of Diagnostic Trouble Codes (DTCs) that could be set on this vehicle, please refer to Section 100-00. REFER to: [Diagnostic Trouble Code Index - INGENIUM I6 3.0L Petrol, Vehicles With: MHEV, DTC: Powertrain Control Module \(PCM\) B1087-88 to P0634-00](#) (100-00 General Information, Description and Operation).