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2020.0 DEFENDER (LE), 303-07C

ENGINE IGNITION – INGENIUM I6 3.0L PETROL (G2400972)

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PRINCIPLES OF OPERATION

For a detailed description of the Engine Ignition system, refer to the relevant Description and Operation section in the workshop manual. REFER to: [Engine Ignition](#) (303-07C Engine Ignition - 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**ELECTRICAL**

- Fuses
- Wiring harnesses
- Loose or corroded connectors
- Ignition coils
- Engine sensors
- Powertrain control module

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
Engine cranks but does not start	■ Engine management system fault ■ Positive crankcase ventilation system blocked /leaking ■ Ignition system fault ■ Fuel system fault	■ Using the Jaguar Land Rover approved diagnostic equipment, check the powertrain control module for related DTCs and refer to the relevant DTC index ■ Inspect the integrity of the positive crankcase ventilation system. Rectify as necessary
Engine cranks and fires but will not start	■ Engine management system fault ■ Evaporative emissions system fault ■ Fuel system fault ■ Spark plugs ■ HT short to ground	■ Using the Jaguar Land Rover approved diagnostic equipment, check the powertrain control module for related DTCs and refer to the relevant DTC index ■ Refer to the relevant section of the workshop manual and inspect the evaporative emissions system. Rectify as necessary ■ Refer to the relevant section of the workshop manual and inspect the fuel system. Rectify as necessary ■ Inspect the spark plugs for cracks, damage, carbon build up, wet fouling, electrode gap too large/small, center electrode condition, ground electrode condition. Rectify as necessary ■ Inspect the ignition coil rubber boots for cracks/damage. Rectify as necessary

SYMPTOM	POSSIBLE CAUSES	ACTION
Engine difficult to start (cold engine)	■ Engine management system fault ■ Engine coolant level and specific gravity ■ Battery /charging system fault ■ Fuel system fault ■ Evaporative emissions system fault	■ Using the Jaguar Land Rover approved diagnostic equipment, check the powertrain control module for related DTCs and refer to the relevant DTC index ■ Inspect the coolant level and specific gravity. Rectify as necessary ■ Refer to the relevant section of the workshop manual and inspect the battery and charging system. Rectify as necessary ■ Refer to the relevant section of the workshop manual and inspect the fuel system. Rectify as necessary ■ Refer to the relevant section of the workshop manual and inspect the evaporative emissions system. Rectify as necessary
Engine difficult to start (warm/hot engine)	■ Engine management system fault ■ Fuel injector leaking ■ Evaporative emissions system fault ■ Fuel system fault ■ Ignition system fault	■ Using the Jaguar Land Rover approved diagnostic equipment, check the powertrain control module for related DTCs and refer to the relevant DTC index ■ inspect the fuel injectors for leaks. Rectify as necessary ■ Refer to the relevant section of the workshop manual and inspect the evaporative emissions system. Rectify as necessary ■ Refer to the relevant section of the workshop manual and inspect the fuel system. Rectify as necessary ■ Inspect the ignition coil rubber boots for cracks/damage. Rectify as necessary
Engine difficult to start after hot soak (vehicle standing, engine off, after engine has reached operating temperature)	■ Engine management system fault ■ Fuel injector leaking ■ Evaporative emissions system fault ■ Fuel system fault ■ Ignition system fault	■ Using the Jaguar Land Rover approved diagnostic equipment, check the powertrain control module for related DTCs and refer to the relevant DTC index ■ Inspect the fuel injectors for leaks. Rectify as necessary ■ Refer to the relevant section of the workshop manual and inspect the evaporative emissions system. Rectify as necessary ■ Refer to the relevant section of the workshop manual and inspect the fuel system. Rectify as necessary ■ Inspect the ignition coil rubber boots for cracks/damage. Rectify as necessary

SYMPTOM	POSSIBLE CAUSES	ACTION
Engine stalls soon after start	■ Engine management system fault ■ Positive crankcase ventilation system blocked /leaking ■ Intake air system restricted ■ Air filter element restricted /blocked ■ Intake pipe disconnected /damaged after the air cleaner ■ Fuel system fault	■ Using the Jaguar Land Rover approved diagnostic equipment, check the powertrain control module for related DTCs and refer to the relevant DTC index ■ Inspect the integrity of the positive crankcase ventilation system. Rectify as necessary ■ Inspect the intake air system for restrictions. Rectify as necessary ■ Install a new air filter element as necessary ■ Inspect the intake system for correct installation and damage. Rectify as necessary ■ Refer to the relevant section of the workshop manual and inspect the fuel system. Rectify as necessary
Engine hesitates / poor acceleration	■ Engine management system fault ■ Fuel system fault ■ Fuel injector leaking ■ Intake pipe disconnected /damaged after the air cleaner ■ Accelerator pedal movement restricted (carpet, mats, etc) ■ Ignition system fault ■ Transmission system fault	■ Using the Jaguar Land Rover approved diagnostic equipment, check the powertrain control module for related DTCs and refer to the relevant DTC index ■ Refer to the relevant section of the workshop manual and inspect the fuel system. Rectify as necessary ■ Inspect the fuel injectors for leaks. Rectify as necessary ■ Inspect the intake system for correct installation and damage. Rectify as necessary ■ Check that the accelerator pedal is free from restriction. Rectify as necessary ■ Inspect the ignition coil rubber boots for cracks/damage. Rectify as necessary ■ Using the Jaguar Land Rover approved diagnostic equipment, check the transmission control module for related DTCs and refer to the relevant DTC index

SYMPTOM	POSSIBLE CAUSES	ACTION
Engine backfires	■ Engine management system fault ■ Fuel system fault ■ Intake pipe disconnected /damaged after the air cleaner ■ Ignition system fault ■ Variable camshaft timing system stuck active	■ Using the Jaguar Land Rover approved diagnostic equipment, check the powertrain control module for related DTCs and refer to the relevant DTC index ■ Refer to the relevant section of the workshop manual and inspect the fuel system. Rectify as necessary ■ Inspect the intake system for correct installation and damage. Rectify as necessary ■ Inspect the ignition coil rubber boots for cracks/damage. Rectify as necessary ■ Inspect the operation of the variable camshaft timing system. Rectify as necessary
Engine surges	■ Engine management system fault ■ Intake pipe disconnected /damaged after the air cleaner ■ Accelerator motor ■ Fuel system fault ■ Ignition system fault	■ Using the Jaguar Land Rover approved diagnostic equipment, check the powertrain control module for related DTCs and refer to the relevant DTC index ■ Inspect the intake system for correct installation and damage. Rectify as necessary ■ Inspect the accelerator system for correct operation. Rectify as necessary ■ Refer to the relevant section of the workshop manual and inspect the fuel system. Rectify as necessary ■ Inspect the ignition coil rubber boots for cracks/damage. Rectify as necessary
Engine detonates/knocks	■ Engine management system fault ■ Fuel system fault ■ Intake pipe disconnected /damaged after the air cleaner ■ Variable camshaft timing system stuck active	■ Using the Jaguar Land Rover approved diagnostic equipment, check the powertrain control module for related DTCs and refer to the relevant DTC index ■ Refer to the relevant section of the workshop manual and inspect the fuel system. Rectify as necessary ■ Inspect the intake system for correct installation and damage. Rectify as necessary ■ Inspect the operation of the variable camshaft timing system. Rectify as necessary
No accelerator response	■ Engine management system fault ■ Accelerator motor	■ Using the Jaguar Land Rover approved diagnostic equipment, check the powertrain control module for related DTCs and refer to the relevant DTC index ■ Inspect the accelerator system for correct operation. Rectify as necessary

SYMPTOM	POSSIBLE CAUSES	ACTION
Accelerator response poor	■ Engine management system fault ■ Positive crankcase ventilation system blocked /leaking ■ Transmission system fault ■ Intake pipe disconnected /damaged after the air cleaner	■ Using the Jaguar Land Rover approved diagnostic equipment, check the powertrain control module for related DTCs and refer to the relevant DTC index ■ Inspect the integrity of the positive crankcase ventilation system. Rectify as necessary ■ Using the Jaguar Land Rover approved diagnostic equipment, check the transmission control module for related DTCs and refer to the relevant DTC index ■ Inspect the intake system for correct installation and damage. 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).

cmIjaGFyZG1vbnRvbjsyMDIwLTA5LTE2VDIyOjM3OjQ3LjAwN1o7OTAuMTk5LjEyMS4xMTc7