SERVICE MANUAL

LOADALL (ROUGH TERRAIN VARIABLE REACH TRUCK)
508-66, 509-45, 510-44, 510-55

EN - 9813/9450 - ISSUE 1 - 11/2017

This manual contains original instructions, verified by the manufacturer (or their authorized representative).

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Foreword

The Operator's Manual

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You and others can be killed or seriously injured if you operate or maintain the machine without first studying the Operator's Manual. You must understand and follow the instructions in the Operator's Manual. If you do not understand anything, ask your employer or JCB dealer to explain it.

Do not operate the machine without an Operator's Manual, or if there is anything on the machine you do not understand.

Treat the Operator's Manual as part of the machine. Keep it clean and in good condition. Replace the Operator's Manual immediately if it is lost, damaged or becomes unreadable.

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Table 56. Engine - Noise Excessive

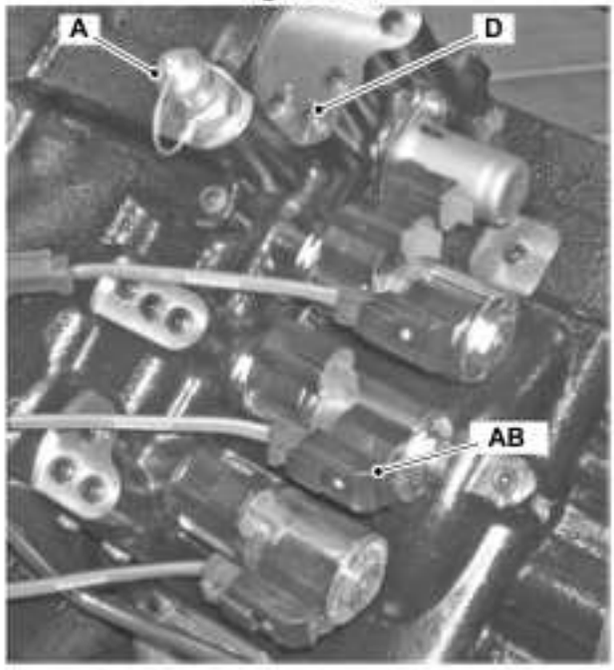
Cause	Remedy
Drive belt squeal, insufficient tension or abnormally high loading.	Check the tensioner and inspect the drive belt for loading. deterioration, Make sure water pump, tensioner pulley, fan, alternator turn freely. Check for paint/oil or other material on pulleys. Check the tension of accessory drive belts.
Coolant temperature sensor fault.	Check the electrical connection at the coolant sensor. Check the correct electrical wires for open or short circuits.
Air intake or exhaust leaks.	See Also: Table 62. Engine - Exhaust Smoke Excessive (Black Smoke)
ECM or electrical sensor fault.	Check the electronic fault codes. Check the electrical connections at theECM and sensors.
Fuel is contaminated or incorrect grade diesel fuel used.	Stop the engine. Replace the fuel filters. Operate the engine with a temporary supply of the correct grade of clean fuel. Monitor the engine performance. Dirty fuel will cause damage to the high pressure fuel pump and injectors.
Inlet and exhaust valve clearances set incorrectly.	Set the valve clearances to the recommended clearances.
Turbocharger noise.	Check turbocharger impeller and turbine wheel for housing contact.
Inlet and exhaust valve springs broken.	Check and install new valve springs.
Worn crank/connecting rod bearings (knocking under load).	Check/replace rod and main bearings.
Excessive camshaft bearing wear.	Check bearings (engine overhaul required).
Worn or damaged pistons and/or piston rings.	Check piston assemblies (engine overhaul required).
One or more fuel injectors worn or malfunctioning.	Check the electronic fault codes. Check the electrical connections at the injectors.
Gear train noise.	Visually inspect and measure gear backlash. Replace gears as required.
Loss of Pilot injection on one or more cylinders.	Use service master to disable pilot injections to identify audibly if they are still present.

Table 57. Engine - Compression Knocks

Cause	Remedy
Fuel is aerated.	Check the fuel system for loose connections and possible air ingress points. Rectify and bleed the fuel system.
Fuel is contaminated or incorrect grade diesel fuel used.	Stop the engine. Replace the fuel filters. Operate the engine with a temporary supply of the correct grade of clean fuel. Monitor the engine performance. Dirty fuel will cause damage to the high pressure fuel pump and injectors.
ECM or electrical sensor fault.	Check the electronic fault codes. Check the electrical connections at the ECM and sensors.
Inlet and exhaust valve springs broken.	Check and install new valve springs.
One or more fuel injectors worn or malfunctioning.	Check the electronic fault codes. Check the electrical connections at the injectors.
Coolant operating temperature incorrect.	Check and if necessary replace engine thermostat.

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Figure 699.



A Mainline pressure (test point)
AB Layshaft clutch solenoid (3029)
D Forward high ratio clutch pressure (test point)

Before you carry out individual clutch leakage tests, we can confirm that the forward high clutch is leaking:

Individual clutch leakage test

In the following procedures the forward high clutch is tested, therefore in step 2 a pressure gauge is connected to the forward high clutch test point.

When you test the other suspect clutches, connect a gauge to the relevant suspect clutch test point. Because the forward high clutch is suspect, a gear must be selected that will use the forward high clutch, in this instance 2nd gear forward.

1. Stop the engine. Connect a pressure gauge of the specified to the mainline pressure test point. Refer to Figure 699.

   Pressure: 0–20bar (0.0–289.9psi)
   Special Tool: Pressure Gauge (0-40 Bar) (Qty.: 1)

2. Connect a pressure gauge of the specified vale to the forward high ratio clutch test point. Refer to Figure 699.

   Pressure: 0–20bar (0.0–289.9psi)
   Special Tool: Pressure Gauge (0-40 Bar) (Qty.: 1)

3. Remove the electrical connector from the layshaft clutch solenoid. This will ensure that only the forward high clutch is energised when 2nd gear forward is selected. Refer to Figure 699.

4. Make sure that both sides of all four wheels are chocked. Apply the foot brake and park brake. Refer to Figure 699.

5. When fully engaged, the park brake electrically disconnects the transmission drive, this prevents the machine from being driven with the park brake on. Therefore, so that we can complete the test, move the park brake lever fractionally forward until the warning light is just extinguished; hold the lever in this position for the duration of the test. Refer to Figure 699.

6. Do not move the lever too far forward, otherwise the park brake will not be fully operational. Alternatively, disconnect the switch at the park brake. Refer to Figure 699.

7. Start engine and run at 1000 RPM, select 2nd gear forward. Note the pressure readings on both gauges, which should not vary more than the specified value. If the difference on the gauges is greater than the specified value do the following. Refer to Figure 699.

   Pressure: 0.7bar (10.1psi)

   7.1. Stop the engine and interchange the gauges. Refer to Figure 699.

   7.2. Start the engine and run at 1000 RPM, select 2nd gear forward. If the difference on the gauges is still greater than the specified

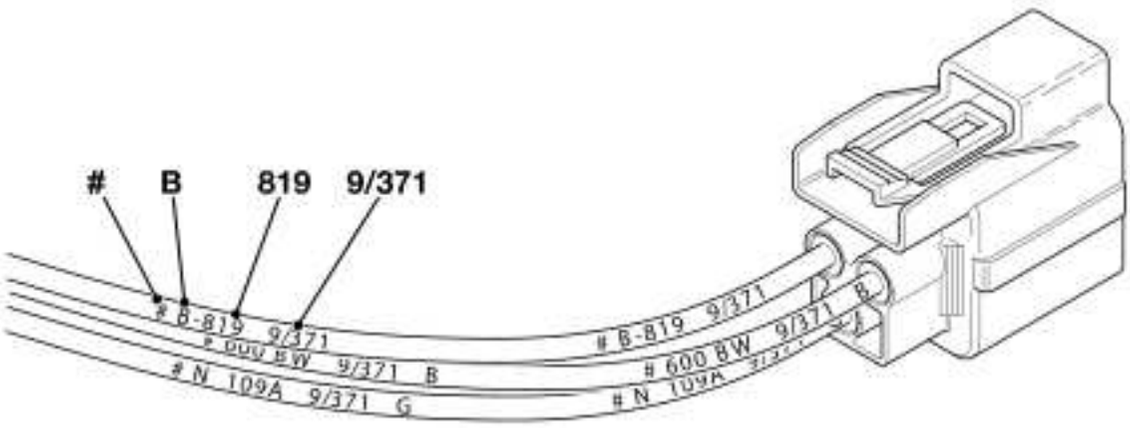
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Component Identification

Wire and Harness Number Identification

This section details the allocation of wire numbers and the identification of wires in the wiring harness.

Figure 1287.



The illustration shows a typical connector and wires. Each wire has an individual identification number permanently marked on it, at regular intervals along it's length. The number stamped on the wire identifies the following:

Table 493. Wire and Harness Number Identification

Identification Number	Description
#	The # indicates the start of the identification number. It is always printed to the left of the identification number.
B	If applicable- The colour of the flying lead that the harness wire should mate with. For instance, if wire 819 from harness 719/37100 mated with a flying lead coloured black (colour code B) then the number printed on the wire would be B-819 9/371.
819	The wire's unique identification number. The wire functions and numbers allocated to them are consistent through out the JCB range of products. Refer to Wire Numbers and Functions.
9/371	If applicable- The part number of the harness that the wire originates from. If the harness part number is 719/37100, the number printed on the harness wires will be 9/371 (71 and 00 are common numbers and therefore deleted).

Wire Numbers and Functions

Table 494. Wires 000-199 (These numbers are reserved for ignition feeds, heater start circuits and start circuits)

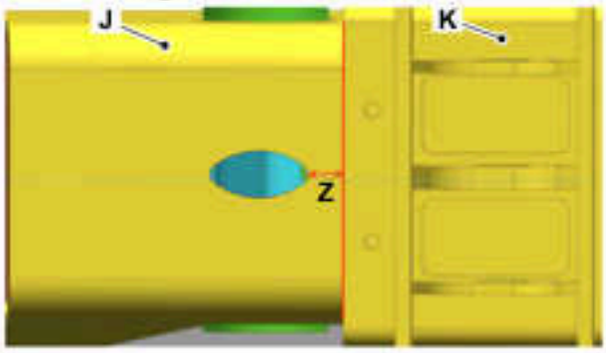
Wire Number	Description
Wires 000 - 099	Unfused ignition feeds
Wires 100 - 199	Fused ignition feeds

Table 495. Wires 200-399 (These numbers are reserved for battery feeds)

Wire Number	Description
Wires 200 - 299	Unfused battery feeds
Wires 300 - 399	Fused battery feeds

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Figure 111. Measurement Z



J Inner top side
K Third intermediate top side
Z 30–35mm

Figure 112. Measurement X set up- side view



Figure 113. Measurement X set up- view from underside of machine



Figure 114. Measurement Y set up

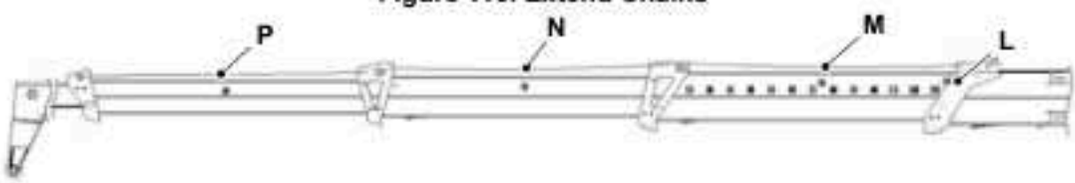


Figure 115. Measurement Z set up



Phasing and Tensioning Procedure.

Figure 116. Extend Chains



L Retract decal marker A 0.5m

M First intermediate measuring point 73–83mm

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Remove and Install

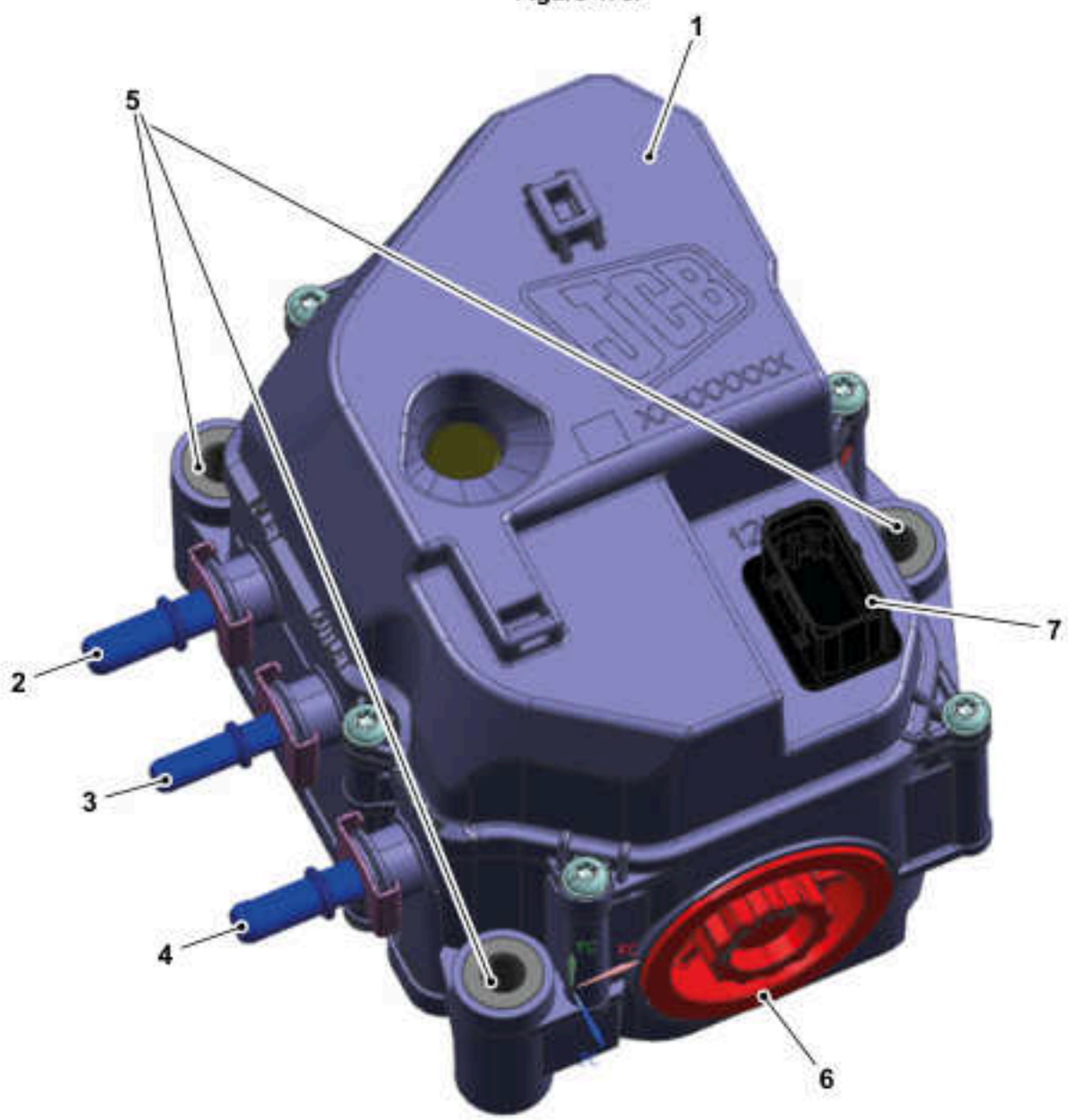
This component is not serviceable, if the component fails replace the complete module.

Before Removal

1. Make sure that the engine is safe to work on. If the engine has been running, let it cool before you start the service work.
2. Get access to the pump supply module.
3. Ensure that the area around the pump supply module is clean to prevent contamination of the SCR (Selective Catalytic Reduction) system.

Remove

Figure 478.



1 Pump supply module

2 DEF (Diesel Exhaust Fluid) inlet spigot

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