Service Manual

Wheeled Loading Shovel - 412S, 414S, 416S

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Section 3 - Routine Maintenance

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Section B - Body and Framework

Section C - Electrics

Section E - Hydraulics

Section F - Transmission

Section G - Brakes

Section H - Hydraulic Steering

Section K - Engine



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Drawings

Drawings are reproduced from production electrical harness drawings. Each harness drawing includes tables showing wire connections and destinations for all the connectors on the harness. To identify the correct harness drawing for a particular machine refer to the relevant Harness Interconnection page for the machine serial number range.

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adjusted by the fitting of a shim using the procedure described below:

Measure the dimension from the tip of the teeth on the spur gear to the housing face (dimension 1).

Also measure the dimension from the end face to the shoulder on the inductive transmitter (dimension 2).

Work out the size of the shim required as follows:

Dimension 1	26.20 mm
Required clearance	- 0.70 mm
Difference = adjustment dimension	25.50 mm
Dimension 2	26.50 mm
Adjustment dimension	- 25.50 mm
Difference = shim size	1.00 mm

Assemble the shim to the inductive transmitter, fit a new O-ring into the ring groove and screw the inductive transmitter into the housing.

Note: *Later models are fitted with two inductive transmitters.*

Note: *This procedure also applies to the transmission fitted to 414S machines.*

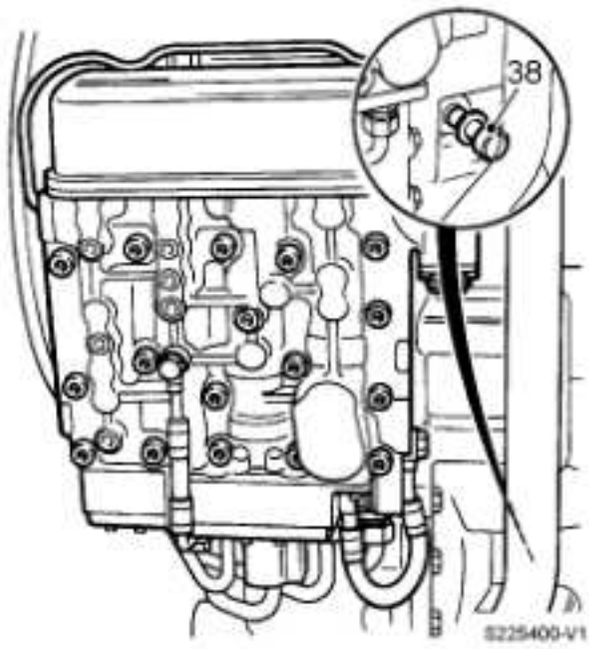


Fig 85.

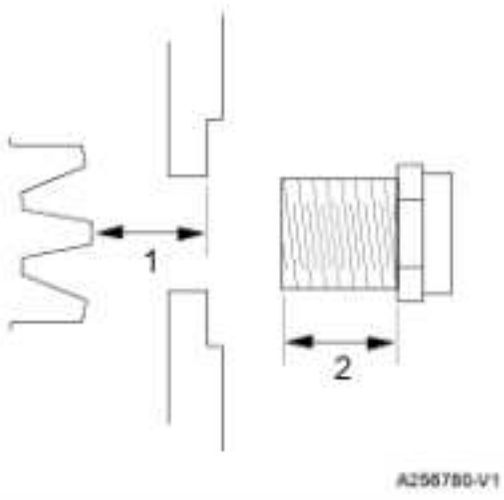


Fig 86.

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FC	SPN	FMI	IC	Description of the Fault Code	Reaction of the TCU	Repair Procedures
AC	5640	5	161	An Open Circuit, Customer Specific Function-5		
				The TCU senses an incorrect voltage at the output pin, that could be an OC: -A cable/connector is defective, it has an OC to the TCU -The CS function-5 device has an internal defect	CS	Check the cables and the connectors between the TCU and the CS function-5 device Check the resistance of the CS function-5 device
AD	5650	4	163	A Short Circuit to Earth, Customer Specific Function-6		
				The TCU senses an incorrect voltage at the output pin, that could be a SC to earth: -A cable/connector is defective, it has a SC to earth -The CS function-6 device has an internal defect -A connector pin has a SC to earth	CS	Check the cables and the connectors between the TCU and the CS function-6 device Check the resistance of the CS function-6 device
AE	5650	3	165	A Short Circuit to the Battery, Customer Specific Function-6		
				The TCU senses an incorrect voltage at the output pin, that could be a SC to the battery: -A cable/connector is defective, it has a SC to the battery -The CS function-6 device has an internal defect -A connector pin has a SC to the battery	CS	Check the cables and the connectors between the TCU and the CS function-6 device Check the resistance of the CS function-6 device
AF	5650	5	164	An Open Circuit, Customer Specific Function-6		
				The TCU senses an incorrect voltage at the output pin, that could be an OC: -A cable/connector is defective, it has an OC to the TCU -The CS function-6 device has an internal defect	CS	Check the cables and the connectors between the TCU and the CS function-6 device Check the resistance of the CS function-6 device

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Fig 242.

Note: *For these diagnostic tools to work correctly, the Data Link Adaptor (892/01174) must be connected (in conjuction with the interrogation lead 71820237) between the Diagnostic Connector and the PC, and the machine's ignition must be turned ON.*

EMS Tools

Following is an outline of the available software tools and how they are to be used.

Service Tools

1 

Flash Loader program – to download the latest software files to the EMS (these are called Application files). This can be used by double clicking the icon as shown.

2 

Set-up program – to enter the machine Serial Number, Rolling Radius etc. and Languages. This program can be used by double clicking the icon as shown

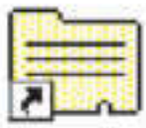
Service Tools

3 

Diagnostics program – to help fault find on the machine. This includes information about the Electronic Engine, Transmission and the EMS. This program can be used by double clicking the icon as shown.

4 

Service History program – for checking when the machine was last maintained by a JCB Dealer. This program can be used by double clicking on the icon as shown.

5 

Data Logger program – this program logs various conditions of the machine before a failure, which will help in the diagnosis of certain problems. This program can be selected by double clicking on the icon as shown.

Flash Loader Program

In order to download the latest software, the following has to be done: -

1 Connect the DLA (Data Link Adapter), to the 9 Pin Deutsch diagnostic connector in the cab and to the PC. ⇨ ***Connecting the Interrogation Lead (C-344)***.

2 Turn the ignition to the first position so that the EMS is powered up.

3 Double click on the "Flash Loader" icon. ⇨ ***EMS Tools (C-336)***.

This icon is used to download the latest Software to the EMS. This Software is referred to as the "Application code". The icon launches a windows application called the "Flash Downloader".

4 The following "Flash Downloader" screen will appear:

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Loader Valve - Auxiliary Services

When the port **B** power is set for the Auxiliary Services (Quickhitch and/or Auxiliary circuit) the servo-pressure is applied to the Loader Valve section **LV3** or **LV4**.

The spool **A** is moved from the neutral position to block the neutral gallery and send the oil over the waisted section at **B** to the port **B**.

From port **B** the oil is sent to the piston heads of the service rams.

Simultaneously the line from the rod side of the ram that enters the valve at port **A** is connected to the exhaust at **C**.

The rams extend and operate the service.

When the port **A** power is set, the servo-pressure moves the spool so that the service line galleries are reversed, the pressure oil is sent from port **A** and port **B** to the exhaust.

The rams retract and reverse the service operation.

The port **B** power is shown.

When installed, the auxiliary service spool **LV4** is set by operation of a switch on the operators console.

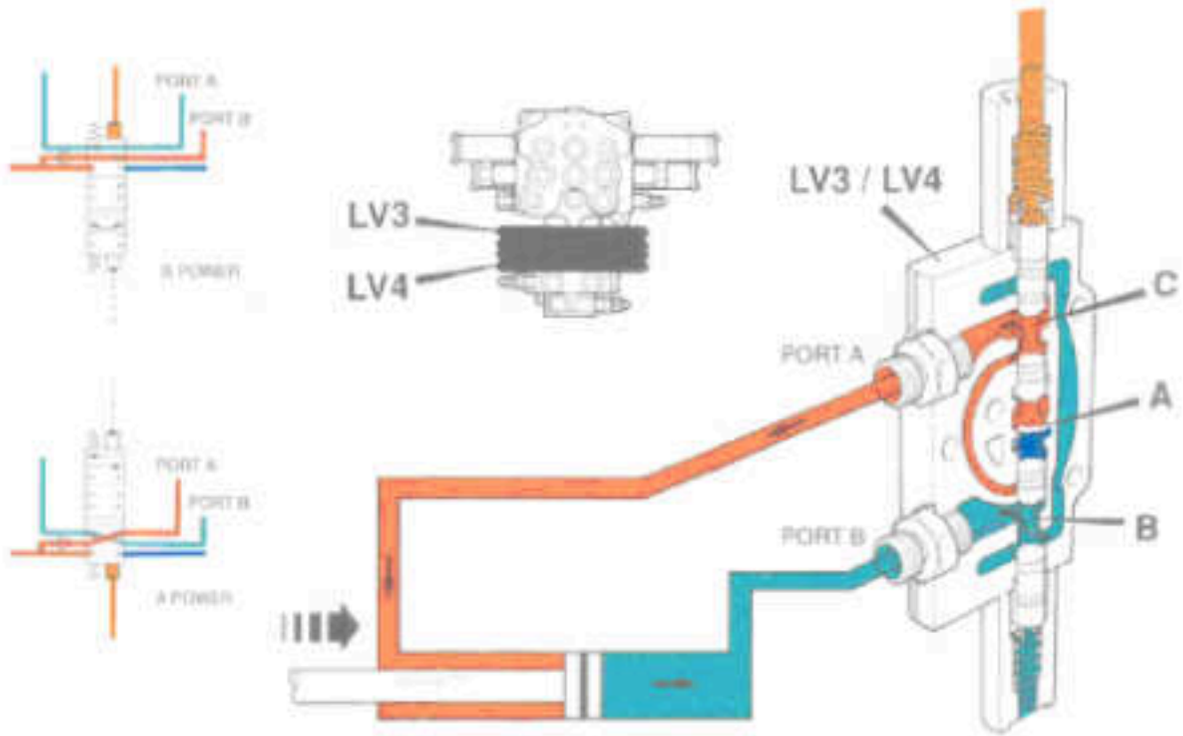


Fig 32.

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