SERVICE MANUAL

HS750

EN - 9823/0200 - ISSUE 1 - 10/2017

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

Copyright 2017 © JCB SERVICE
All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any other means, electronic, mechanical, photocopying or otherwise, without prior permission from JCB SERVICE.

www.jcb.com

Foreword

The Operator's Manual

⚠

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.

Contents

01 - Machine
06 - Body and Framework
24 - Brake System
27 - Driveline
30 - Hydraulic System
33 - Electrical System
72 - Fasteners and Fixings
75 - Consumable Products
78 - After Sales

MidWestTech | JCB HS750 Transmission Axle Service Manual | Publication 9823-0200 Order the manual at mid-west-tech.com >

01 - Machine

Contents **Page No.**

Acronyms Glossary 01-2

01-03 Safety
- 01-03-03 Safety - Yours and Others 01-3
- 01-03-06 Safety Warnings 01-4
- 01-03-09 General Safety 01-5
- 01-03-12 Maintenance Safety 01-6
- 01-03-18 Operating Safety 01-8

01-06 About this Manual
- 01-06-00 General 01-11
- 01-06-06 Using the Manual 01-12

01-30 Towing
- 01-30-00 General 01-15

MidWestTech | JCB HS750 Transmission Axle Service Manual | Publication 9823-0200 **Order the manual at mid-west-tech.com >**

03 - Safety

Contents **Page No.**

01-03-03 Safety - Yours and Others 01-3
01-03-06 Safety Warnings 01-4
01-03-09 General Safety 01-5
01-03-12 Maintenance Safety 01-6
01-03-18 Operating Safety 01-8

MidWestTech | JCB HS750 Transmission Axle Service Manual | Publication 9823-0200 Order the manual at mid-west-tech.com >

27 - Driveline

Contents **Page No.**

Acronyms Glossary 27-2

27-06 Semi-Automatic Gearbox

27-06-00 General 27-3
27-06-07 Clutch - 2WD/4WD 27-27
27-06-08 Clutch - Layshaft 27-39
27-06-09 Clutch - Main Shaft 27-48
27-06-11 Clutch - Forward (Input) 27-56
27-06-15 Solenoid Control Valve 27-66
27-06-18 Pressure Relief Valve 27-70
27-06-27 Speed Sensor 27-71
27-06-30 Oil Pressure Sensor 27-73
27-06-33 Oil Temperature Sensor 27-75
27-06-39 Filter 27-77
27-06-40 Suction Strainer 27-79
27-06-45 Piston Ring Seal 27-81
27-06-47 Oil Seal 27-83
27-06-54 Main Shaft 27-85
27-06-56 Layshaft 27-88
27-06-57 Input Shaft 27-89
27-06-58 Output Shaft 27-90
27-06-85 Oil Feed Pipe 27-97
27-06-86 Oil Transfer Pipe 27-98
27-06-90 Front Case 27-99
27-06-91 Rear Case 27-103
27-06-95 Coupling Yoke 4WD 27-105

MidWestTech | JCB HS750 Transmission Axle Service Manual | Publication 9823-0200 **Order the manual at mid-west-tech.com >**

Technical Data

Table 8. HS750 4- Speed 2/4 Wheel Drive

Designation	HS750 Powershift	
Description	Full electro-hydraulic transmission unit with input, layshaft and mainshaft drive clutch packs giving 4 speeds. Electrically controlled gear selection. Permanent 4 wheel drive or selectable 2/4 wheel drive variants.	
Weight (dry)	2/4 wheel drive	215kg

Table 9. Gear ratios

Gear	Ratio
1st	6.58:1
2nd	3.71:1
3rd	1.773:1
4th	1:1

Reverse and forward gears have the same ratio.

Gearbox Specifications

Table 10. Oil Pressures

Pressures (in neutral)		Pressure
Oil output to cooler at 50°C (121.9°F)	1000 RPM (Revolutions Per Minute)	2.75–4.1bar (39.9–59.4psi)
	2000 RPM	4.82–6.25bar (69.9–90.6psi)

For new gearboxes (i.e. under 100 hours service), or gearboxes that have been fully serviced, the pressures will be slightly higher than those shown (approximately 0.7–1bar (10.1–14.5psi)).

Table 11. Oil Flow

Flow		Flow rate
Oil output to cooler at 50°C (121.9°F)	1000 RPM	14.4L/min

Table 12. Mainline Oil Pressure

Pressures		Pressure
Mainline oil pressure at 50°C (121.9°F)	1000 RPM	10bar (144.9psi)
	2000 RPM	11bar (159.4psi)

Table 13. Clutch Oil Pressures

Pressures		Pressure
Clutch pressures (all clutches) 50°C (121.9°F)	1000 RPM	9–10bar (130.4–144.9psi)
	2000 RPM	9.5–11bar (137.7–159.4psi)

MidWestTech | JCB HS750 Transmission Axle Service Manual | Publication 9823-0200 Order the manual at mid-west-tech.com >

Cause	Remedy
Gearbox oil cooler faulty, gearbox oil contaminated with engine coolant. (Liquid to liquid oil coolers only.)	Remove and test the oil cooler.
Gearbox casings damaged.	Inspect the gearbox casing. Renew missing or damaged parts. Drain the oil and flush the gearbox. Refer to driveline- semi-automatic gearbox, refer to (PIL 27-06).
Gearbox oil circuit pipework or hoses damaged.	Inspect the pipework and hoses. Renew missing or damaged parts. Drain the oil and flush the gearbox. Refer to driveline- semi-automatic gearbox, refer to (PIL 27-06).

Table 27. Consequential Faults (Gearbox faults caused typically by water contamination and other factors related to the gearbox oil.)- Pressurisation of gearbox casing. Dipstick blows out and oil escapes from dipstick tube.

Cause	Remedy
Water in the oil combined with heat may cause steam.	Replace or renew the dipstick.
	Drain the oil and flush the gearbox. Refer to driveline- semi-automatic gearbox, refer to (PIL 27-06).

Table 28. Consequential Faults (Gearbox faults caused typically by water contamination and other factors related to the gearbox oil.)- Clutch failure due to friction lining separation.

Cause	Remedy
Water ingress.	Remove and dismantle gearbox. Inspect relevant clutch components for signs of damage or excessive wear. Install new as applicable.
Overheating transmission oil.	Drain the oil and flush the gearbox. Refer to driveline- semi-automatic gearbox, refer to (PIL 27-06).

Table 29. Consequential Faults (Gearbox faults caused typically by water contamination and other factors related to the gearbox oil.)- Badly worn or noisy bearings.

Cause	Remedy
Water ingress.	Remove and dismantle the gearbox. Inspect all components for signs of damage or excessive wear. Install new components as applicable.
Insufficient lubrication.	Drain the oil and flush the gearbox. Refer to driveline- semi-automatic gearbox, refer to (PIL 27-06).
	Carry out oil pressure and flow tests. Refer to driveline- semi-automatic gearbox, refer to (PIL 27-06).

Table 30. Gear shifts fail to function normally or shifts occur at the incorrect road speed.

Cause	Remedy
Gear selector switch faulty	Check the function of the gear selector switch. Also Inspect the condition of the associated electrical wiring, plugs and connectors for damage and make sure that the relevant fuses are intact.

MidWestTech | JCB HS750 Transmission Axle Service Manual | Publication 9823-0200 Order the manual at mid-west-tech.com >

06 - Relay

Operation

Relays are used in electrical circuits for a variety of reasons. However, the more usual application is to protect components like switches etc. from being overloaded. A relatively small current (from the switch) energises the relay coil, this coil causes internal contacts to open (or close) and therefore controls a larger current in another circuit.

Although relays look similar, internally they can be different, for example, they can be single contact or double contact; normally closed or normally open. Make sure you install the correct type of relay, otherwise the machine electrical circuits will not function properly.

Relays are normally not supplied with the gearbox. It is the responsibility of the O.E.M. to provide relays for the protection of components.

MidWestTech | JCB HS750 Transmission Axle Service Manual | Publication 9823-0200 Order the manual at mid-west-tech.com >

Gear	Clutches engaged	Solenoids energised Refer to Figure 14.
3rd gear	Low ratio	D
	Mainshaft	B
4th gear	High ratio	A
	Mainshaft	B
4WD (Four Wheel Drive)	4WD	C

Hydraulic operation and schematics

The engine drives the hydrostatic pump which provides drive to the gearbox.

The High / Low ratio clutch assembly contains two hydraulically operated clutches: one clutch gives a low ratio drive and the other gives a high ratio drive. The clutches are controlled by a three position solenoid valve. When the applicable solenoid is energised, pressurised oil is directed to either the low or high clutch.

Both the mainshaft and the layshaft assemblies have a single clutch each. Both clutches are controlled by a three position solenoid valve. When energised, solenoid E directs pressurised oil to the layshaft clutch and solenoid B directs pressurised oil the mainshaft clutch.

When a gear is selected through the control switch, two clutches are always engaged. When you select different pairs of clutches different gear ratios are engaged. The ECU electrically controls the solenoids. All the clutches work on the same principle.

2 and 4 Wheel Drive Clutch Operation

An electrical switch is used to send a signal to the gearbox ECU to energise or de energise the 4WD / 2WD (Two Wheel Drive) control solenoid.

4 Wheel Drive Operation

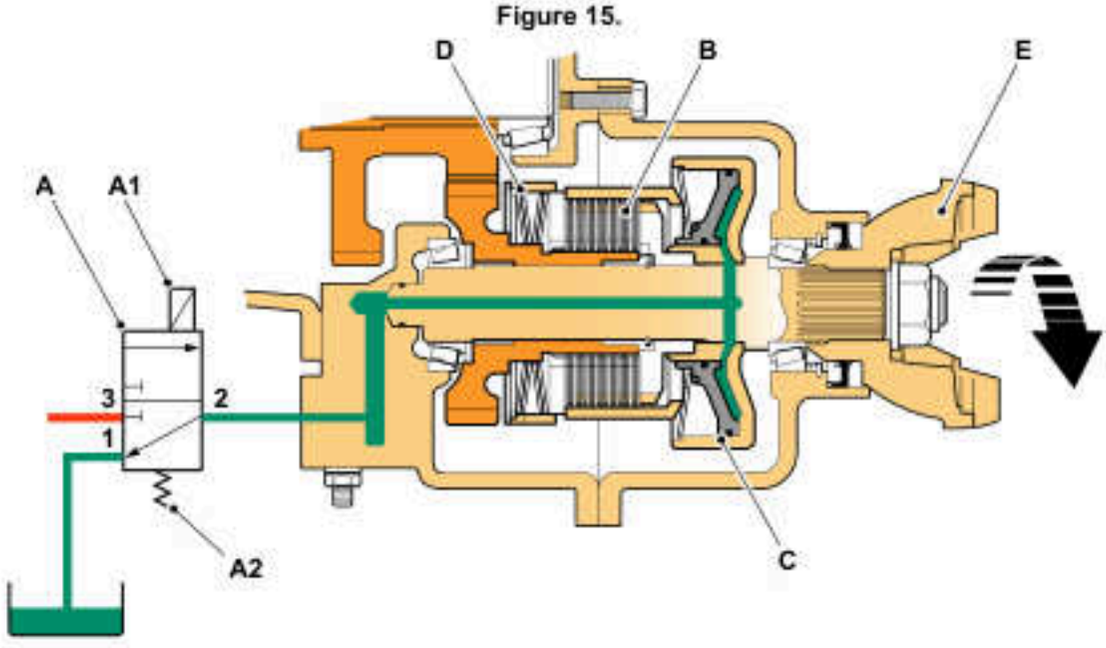
This clutch is of the Spring-ON (4WD)/Pressure-OFF (2WD) type.

The clutch is engaged and disengaged by introducing or dumping pressurised oil behind the piston via a solenoid valve.

When the switch is in the 4WD position, the solenoid valve is de-energised. With the solenoid de-energised, the valve spool moves under the force of the spring. The oil supply to the piston is blocked. At the same time oil vents from the back of the piston to the sump via ports 1 and 2.

Because there is no pressure behind the piston, the clutch friction / counter plates of the clutch pack are forced together by the disc springs, thus driving the output yoke.

Figure 15.



A Solenoid control valve

A1 Solenoid 1

MidWestTech | JCB HS750 Transmission Axle Service Manual | Publication 9823-0200 Order the manual at mid-west-tech.com >

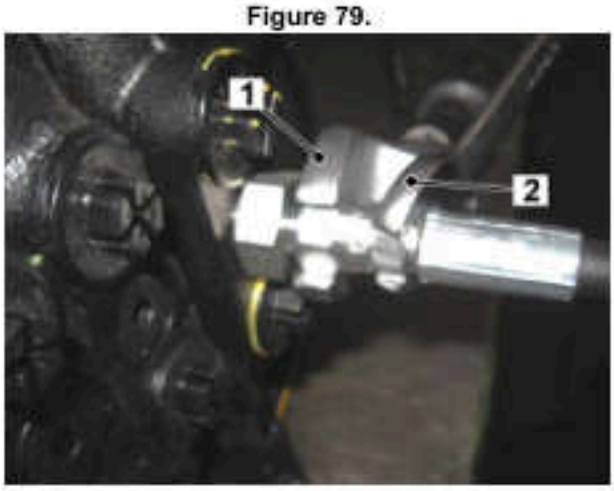
Remove and Install

The hose fittings are for flat face components for resistance over torque. The ORFS (O-Ring Face Seal) offers 100% reliability.

When you remove or install components, make sure all of the hydraulic fittings are tightened to the correct torque value during the assembly procedure.

To prevent damage to the ORFS during the assembly procedure it is important to use the double-spanner method to tighten the fittings.

Figure 79.

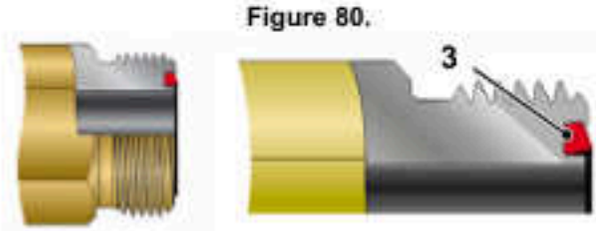


1 Torque spanner
2 Open ended combination spanner

Install

1. Always coat the ORFS with hydraulic oil before installation.
2. The rubber ORFS is compressed into a precision machined groove in the adaptor to form a tight seal against a flat surface of the sleeve.

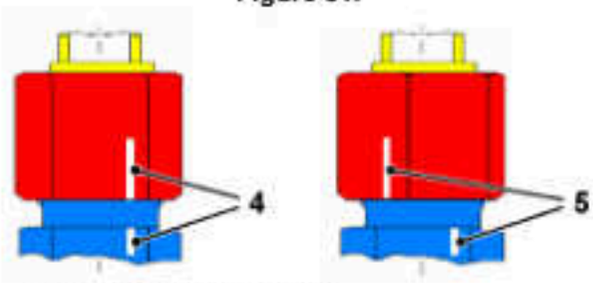
Figure 80.



3 ORFS

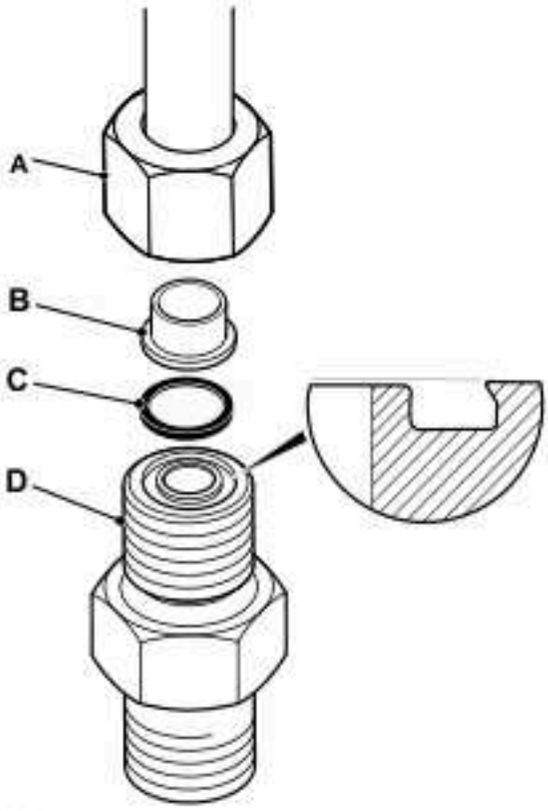
3. Use the swivel nut line marking. Tighten the nut to the correct torque value to compress the fitting. Refer to Technical Data.

Figure 81.



4 Swivel nut - Hand tight
5 Swivel nut - Torque tightened

Figure 82.



A Nut
B Sleeve
C ORFS
D Adaptor

MidWestTech | JCB HS750 Transmission Axle Service Manual | Publication 9823-0200 Order the manual at mid-west-tech.com >