Service Manual

Backhoe Loader

Section 1 - General Information

Section 2 - Care and Safety

Section 3 - Maintenance

Section A - Attachments

Section B - Body and Framework

Section C - Electrics

Section D - Controls

Section E - Hydraulics

Section F - Transmission

Section G - Brakes

Section H - Steering

Section K - Engine

Section L - Servo Controls



Publication No.

9803/3290-16



Copyright © 2004 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.

Issued by JCB Technical Publications, JCB Aftermarket Training, Woodseat, Rocester, Staffordshire, ST14 5BW, England. Tel +44 1889 591338 Fax +44 1889 591400

World Class Customer Support

MidWestTech | JCB 3C, 3CX, 4CX Backhoe Loader Service Manual | Publication 9803-329... Order the manual at mid-west-tech.com >

Contents **Page No.**

Introduction
About this Publication 1-1
Using the Service Manual 1-1
Section Numbering 1-1
Units of Measurement 1-1
Left Side, Right Side 1-2
Cab/Canopy 1-2
Cross References 1-2
Machine Nomenclature 1-2
Identifying the Machine 1-3
Machine Identification Plate 1-3
Component Identification Plates 1-4
Fuel 1-8
Types of Fuel 1-8

Torque Settings
Zinc Plated Fasteners and Dacromet Fasteners 1-11
Introduction 1-11
Bolts and Screws 1-11
Hydraulic Connections 1-15
'O' Ring Face Seal System 1-15
'Torque Stop' Hose System 1-18
'Quick-Connect' Pilot Hoses 1-19
Disconnecting 1-19
Connecting 1-19

Service Tools
Numerical List 1-20

Service Aids
Sealing and Retaining Compounds 1-23

Terms and Definitions
Colour Coding 1-24
Hydraulic Schematic Colour Codes 1-24

MidWestTech | JCB 3C, 3CX, 4CX Backhoe Loader Service Manual | Publication 9803... Order the manual at mid-west-tech.com >

Contents **Page No.**

Safety Notices
Important Information 2-1
The Operator Manual 2-1
Safety Warnings 2-1
Safety Check List 2-2
Safety - Yours and Others 2-2
General Safety 2-2
Operating Safety 2-4
Maintenance Safety 2-7
Safety Labels 2-12
Introduction 2-12
Safety Label Identification 2-12

MidWestTech | JCB 3C, 3CX, 4CX Backhoe Loader Service Manual | Publication 9803... Order the manual at mid-west-tech.com >

Contents **Page No.**

Routine Maintenance
Health and Safety 3-1
Lubricants 3-1
Battery 3-3
Service Schedules 3-5
Introduction 3-5
Fuel System 3-5
How to Use the Service Schedules 3-5
Calendar Equivalents 3-5
Pre-start Cold Checks, Service Points and Fluid Levels 3-6
Functional Test and Final Inspection 3-9
Lubricants and Capacities 3-11
Coolant Mixtures 3-13
Prepare the Machine for Maintenance 3-14
Introduction 3-14
How to Make the Machine Safe (Loader Arms Lowered) 3-14
How to Make the Machine Safe (Loader Arm Lifted) 3-14
Cleaning the Machine 3-16
Introduction 3-16
Preparing the Machine for Cleaning 3-16
Cleaning the Machine 3-17
Checking for Damage 3-20
Check the Machine Body and Structure 3-20
Check the Tyres 3-20
Check the Seat and Seat Belt 3-20
Check the Hydraulic Hoses and Fittings 3-20
ROPS/FOPS Structure 3-22
Checking The ROPS/FOPS Structure 3-22
Greasing 3-23
Introduction 3-23
Preparing the Machine for Greasing 3-23
Loader Arms 3-24
Backhoe and Quickhitch 3-25
Front Axle (2 Wheel Drive Machines) 3-26
Front Axle (4 Wheel Drive Machines) 3-26
Front Axle (All Wheel Drive Machines) 3-27
Rear Axle (All Wheel Drive Machines) 3-27
Extending Dipper 3-28
Driveshafts 3-28
6 - In - 1 Clamshovel 3-29
Stabilisers (Centremount Machines) 3-29
Loader Quickhitch 3-29
Power Sideshift 3-29
Kingpost 3-30
Knuckle (if fitted) 3-30
Backhoe Quickhitch (Hydraulic) 3-31
Access Panels 3-32
Engine Cover 3-32
Front Grille 3-34
Heater and Air Conditioning 3-35
Cleaning the Cab Heater Fresh Air Filter 3-35
Changing the Cab Heater Recirculation Filter(s) (if fitted) 3-36
Brakes 3-37
Park Brake 3-37
Foot Brake 3-39

MidWestTech | JCB 3C, 3CX, 4CX Backhoe Loader Service Manual | Publication 9803... Order the manual at mid-west-tech.com >

Side Console - CAD 332/E7211 Issue 2

Key to Connectors: ⇨ *Fig 81. (🗋 C-157)*

CP1	Front Console Harness Connector
CP2A	Transmission Harness Connector
CP2B	Transmission Harness Connector
CP3	Earth Ring
CP4	Earth Ring
CP5	Earth Ring
CP6	Mainframe Harness Connector
CP9A	Diode
CP9B	Diode
CP9C	Diode
CP9D	Diodes
CP10	Worklight Connector
CP10A	Worklight Link
CP11	HSC Pushbutton
CP12	Heater Unit
CP13	HTC/Front Quickhitch Connector
CP14	Auxiliary Buzzer Diode
CP15G	Auxiliary Hydraulics Harness Connector
CP15S	Steer Mode Harness Connector
CP16	Park Brake Switch
CP17	Relay
CP18	Relay
CP19	Relay
CP20	Hazards
CP21	Fusebox C
CP22	Transmission Dump Pushbutton
CP23	Relay
CP24	Relay
CP25	Relay
CP26	Relay (Spare)
CP27	Fusebox B
CP29	Relay
CP30	Relay
CP31	Relay
CP32	Relay
CP33	Fusebox A
CP43	Headliner
CP44	Cab Roof Harness Connector
CP49	Rear Wiper
CP51	Diode
CP55A	Ignition Switch
CP55B	Ignition Switch
CP57	Instrument Panel (J1)
CP57	Instrument Panel (J2)
CP60	Auxiliary Power Socket
CP61	Radio Cassette Power
CP61A	Radio Speaker
CP63	Smooth Ride System (SRS) Switch
CP64	Hydraulic Speed Control (HSC) Switch
CP65	Beacon Switch
CP66	Front Worklight Switch
CP67	Shovel Reset Switch
CP68	Auxiliary Hydraulics Switch
CP69	Rear Worklight Switch
CP70	Rear Wash/Wipe Switch
CP71	Hydraclamp Switch
CP72	Seat Harness Connector
CP87	Boom Overload Alarm Switch
CP96	Telematics
CP99	Power Link
CP110	Diodes

Housing Reference		Relay Function
CP17	1-5	Blank
	6-10	Boom Overload Alarm Relay
CP18	1-5	Rear Horn Relay
	6-10	Parkbrake Relay
CP19	1-5	Neutral Start Relay
	6-10	Blank
CP20		Direction Indicators Relay
CP23	1-5	Rear Worklights Relay
	6-10	Stabiliser Legs Alarm Relay
CP24	1-5	Front Worklight Relay
	6-10	Stabiliser Legs Alarm Relay
CP25	1-5	Ignition 2 Relay
	6-10	Blank
CP26		Blank
CP29	1-5	Warning Lights Buzzer Relay
	6-10	HSC Relay
CP30	1-5	Engine Run Relay
	6-10	Headlights Relay
CP31	1-5	Jaw Bucket Relay
	6-10	Hammer Relay
CP32	1-5	Ignition 1 Relay
	6-10	Blank

MidWestTech | JCB 3C, 3CX, 4CX Backhoe Loader Service Manual | Publication 9803-3290-16
Order the manual at mid-west-tech.com >

Specification

Table 12. PS764 2005

Description	Full electro-hydraulic transmission unit with input, reverse, layshaft, mainshaft, and 4 wheel drive clutch packs giving 4 forward and 4 reverse speeds. Electrically (relay) controlled gear selection (electronically controlled gear selection on lock up torque converter variant). Integral wet multi-plate park brake.		
Weight (dry)			
	4WD	242 kg (533 lb)	
Gear Ratios		Forward	
	1st	7.97:1	
	2nd	4.29:1	
	3rd	1.86:1	
	4th	1.00:1	

Torque Converter		
Torque Converter Dia.	310 mm (12.2 in.)	
Torque Converter Identification	04/600784	04/600786
Torque Multiplication at Stall	2.52:1	3.01:1

Lock Up Torque Converter		
Torque Converter Dia.	310 mm (12.2 in.)	
Torque Converter Identification	04/600785	
Torque Multiplication at Stall	2.52:1	

MidWestTech | JCB 3C, 3CX, 4CX Backhoe Loader Service Manual | Publication 9803... Order the manual at mid-west-tech.com >

Table 2.

Fault	Possible Cause	Action
No servo controls, the joysticks do not function.	**1** Fault in electrical interlock circuit wiring, or operation of electrical interlock switches.	Check the condition of the associated electrical wiring for damage and that the fuses are intact. For details of the electrical circuit and connections ⇨ *Joysticks Enable Circuit (L-213).*
	a Seat sensor switch defective.	Check the seat is locked in the rear facing position and that the seat sensor switch is operating.
	b Enable pushbutton defective.	Check the function of the joystick enable pushbutton.
	c Solenoid(s) at the servo pressure supply valve not energised.	Check the condition of the associated electrical wiring for damage and that the fuses are intact.
	d Solenoid coil faulty.	Check the solenoid for open or short circuits. Measure the solenoid coil resistance.
	2 Servo pilot pressure too low.	Measure the servo pilot pressure. ⇨ *Checking the Servo Pressure (L-229).*
	a Due to faulty servo regulating valve.	Renew the servo pressure supply valve. Refer to ***Servo Pressure Supply Valve - Removal and Replacement.***
	b Servo pilot filter blocked due to contamination.	Renew the filter element.

⇨ *Fault Finding Tables (L-223).*

MidWestTech | JCB 3C, 3CX, 4CX Backhoe Loader Service Manual | Publication 9803... Order the manual at mid-west-tech.com >

ShiftMaster Diagnostics 2.2 - User Guide



Introduction

The **ShiftMaster Diagnostics** software tool is part of the **JCB Service Master** software suite. The diagnostics software is designed to be an easy to use fault finding tool for Powershift PS760 series electronically controlled gearboxes.

ShiftMaster Diagnostics employs the graphical strengths of the Microsoft Windows operating environment to simplify electrical fault finding within the gearbox ECU control system.

ShiftMaster Diagnostics is only intended for use with ECU 2 and ECU 2.2 controlled PS760 gearboxes. The system is not compatible with relay controlled gearboxes. Older versions of Powershift Controllers used on the PS750 series gearboxes are not supported.

This software is intended for use on IBM Compatible Personal Computers **(PCs)** running **Windows 9x**, **Windows2000** and **WindowsXP** operating systems but is not compatible with either earlier versions of **Windows 3.x**. Ideally the computer should be a laptop type.

Care and Safety

⚠ WARNING

Be sure to read and follow any on screen instructions. Failure to follow correct procedure could result in death or injury.

2-4-5-5



Fig 128.

MidWestTech | JCB 3C, 3CX, 4CX Backhoe Loader Service Manual | Publication 9803... Order the manual at mid-west-tech.com >

Pressure Switch Renewal

The overload warning pressure switch **A** is located in the steel pipe at the boom ram.

Removal

1 Lower the excavator to the ground. Engage the park brake, stop the engine and remove the starter key.

2 Operate the control levers back and forth several times to vent any residual hydraulic system pressure. Slowly release the hydraulic tank filler cap.

3 Clean off all debris and dirt from around the pressure switch **A**.

4 Disconnect the harness electrical connector at the pressure switch, then carefully unscrew the pressure switch from the pipe.

Plug the open port to prevent loss of fluid and ingress of dirt.

Replacement

Replacement is the opposite of the removal procedure, but note the following:

The pressure switches are non-adjustable, and are colour coded to indicate their pressure setting:

Colour Code:	Pressure Setting:
Khaki	130 bar; 132 kg cm^2; 1885 lb in^2
Mint Green	145 bar; 148 kg cm^2; 2100 lb in^2
Lilac/Purple	155 bar; 158 kg cm^2; 2250 lb in^2
Yellow	170 bar; 173 kg cm^2; 2450 lb in^2
Red	180 bar; 184 kg cm^2; 2600 lb in^2
Blue	190 bar; 194 kg cm^2; 2750 lb in^2
Silver/Grey	215 bar; 219 kg cm^2; 3100 lb in^2

Important: *DO NOT replace a pressure switch with one that has a different pressure setting. If you are unsure about the type of pressure switch contact JCB Service.*

On completion, operate the excavator and check for hydraulic leaks. Set the overload warning system switch to ON, and check that the overload warning functions correctly.

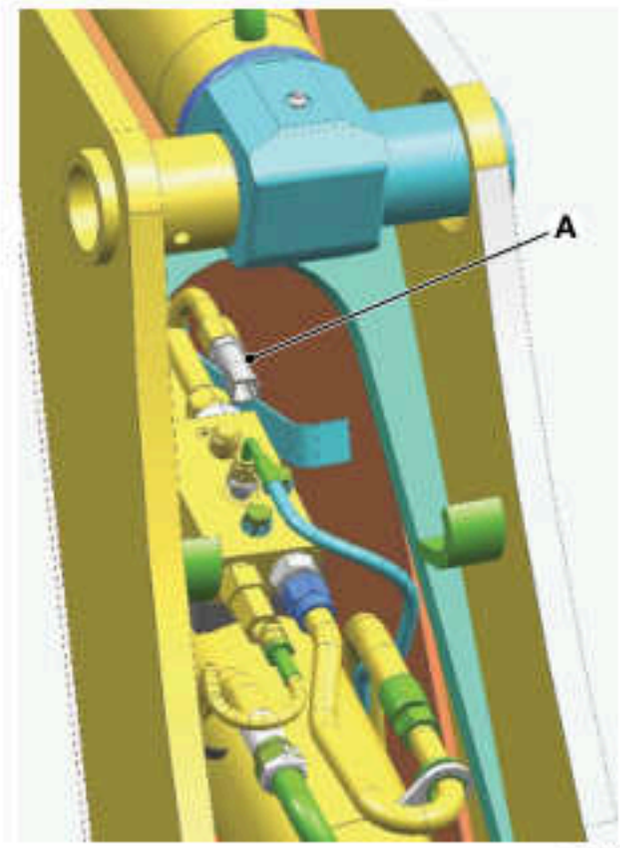


Fig 7. Excavator with Boom Hose Burst Check Valve shown.

MidWestTech | JCB 3C, 3CX, 4CX Backhoe Loader Service Manual | Publication 9803... Order the manual at mid-west-tech.com >