Service Manual

JCB 403

Section 1 - General Information

Section 2 - Care and Safety

Section 3 - Maintenance

Section A - Attachments

Section B - Body and Framework

Section C - Electrics

Section E - Hydraulics

Section K - Engine



Publication No.

9803-9490-4



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 403 Compact Wheel Loader Service Manual | Publication 9803-9490-4

Order the manual at mid-west-tech.com >

Contents Page No.

About this Manual
Introduction 1-1
Using the Service Manual 1-1
Units of Measurement 1-1
Section Numbering 1-1
Cross References 1-1
Using the Machine 1-1
Hydraulic Schematic Colour Codes 1-2

Identifying the Machine
Serial Numbers 1-3
Machine Model and Serial Number 1-3
Data Plate 1-3
Typical Vehicle Identification Number (VIN) 1-3
Typical Engine Identification Number 1-3

Standard Torque Settings
Zinc Plated Fasteners and Dacromet Fasteners 1-4
Introduction 1-4
Bolts and Screws 1-4
Hydraulic Connections 1-8
'O' Ring Face Seal System 1-8
'Torque Stop' Hose System 1-11

Service Tools
Numerical List 1-12
Tool Detail Reference 1-16
Section B - Body and Framework 1-16
Section C - Electrics 1-17
Section E - Hydraulics 1-18

Moving a Disabled Machine
Towing or Winching 1-22

Service Consumables
Sealing and Retaining Compounds 1-24

MidWestTech | JCB 403 Compact Wheel Loader Service Manual | Publication 9803-94... Order the manual at mid-west-tech.com >

Contents **Page No.**

Safety Check List
Safety First 2-1
Safety - Yours and Others 2-1
General Safety 2-1
Operating Safety 2-3
Maintenance Safety 2-5
Safety Decals 2-10

MidWestTech | JCB 403 Compact Wheel Loader Service Manual | Publication 9803-94... Order the manual at mid-west-tech.com >

Contents **Page No.**

Routine Maintenance
Service Requirements 3-1
Introduction 3-1
Owner/Operator Support 3-1
Service/Maintenance Agreements 3-1
Initial Service and Inspection 3-1
Fit for Purpose Tests for Lifting Equipment 3-2
Obtaining Replacement Parts 3-2
Health and Safety 3-3
Lubricants 3-3
Battery 3-5
Service Schedules 3-7
Introduction 3-7
How to Use the Service Schedules 3-7
Calendar Equivalents 3-7
Pre-Start Cold Checks, Service Points and Fluid Levels 3-8
Functional Test and Final Inspection 3-10
Fluids, Lubricants and Capacities 3-11
Coolant Mixtures 3-12
Fuels 3-13
Fuel 3-13
Prepare the Machine for Maintenance 3-15
Introduction 3-15
How to Make the Machine Safe (Loader Arm Lowered) 3-15
How to Make the Machine Safe (Loader Arm Raised) 3-16
Cleaning the Machine 3-18
Introduction 3-18
Preparing the Machine for Cleaning 3-18
Checking for Damage 3-19
Check the Machine Body and Structure 3-19
Check the Tyres 3-19
Check the Seat and Seat Belt 3-19
Check the Electrical Circuits 3-19
Checking the ROPS Structure 3-20
Check the Hydraulic Hoses and Fittings 3-20
Greasing 3-21
Introduction 3-21
Preparing the Machine for Greasing 3-21
Grease the Machine 3-22
Access Panels 3-23
Engine Cover 3-23
Brakes 3-24
Park Brake 3-24
Electrical System 3-25
Battery 3-25
Battery Isolation - Deutz 3-26
Battery Isolator - Kohler 3-26
Jump Starting the Engine 3-27
Fuses and Relays 3-28
Engine - Deutz 3-30
Oil and Filter 3-30
Cooling System 3-32
Fan Belt 3-34
Fuel System 3-34

MidWestTech | JCB 403 Compact Wheel Loader Service Manual | Publication 9803-94... Order the manual at mid-west-tech.com >

Section E - Hydraulics

T11-010



Fig 10. Male Adaptors

	Male Adapters - BSP x NPT (USA only)
816/00439	3/8 in. x 1/4 in.
816/00440	1/2 in. x 1/4 in.
816/15007A	3/8 in. x 3/8 in.
816/15008	1/2 in. x 3/8 in.

	Male Adapters - BSP x BSP
1606/2052	3/8 in. x 1/4 in.
1604/0003A	3/8 in. x 3/8 in.
892/00071	3/8 in. x 3/8 in. taper
1606/0004	1/2 in. x 1/4 in.
1606/0007A	1/2 in. x 3/8 in.
1604/0004A	1/2 in. x 1/2 in.
1606/0017	5/8 in. x 1/2 in.
1606/0008	3/4 in. x 3/8 in.
1606/0009	3/4 in. x 1/2 in.
1604/2055	3/4 in. x 3/4 in.
1606/0012	3/4 in. x 1 in.
1606/0014	3/4 in. x 1.1/4 in.
1606/0015	1 in. x 1.1/4 in.

T11-010-1

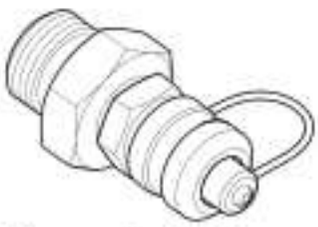


Fig 11. Pressure Test Adapters

892/00255	1/4 in. BSP x Test Point
892/00256	3/8 in. BSP x Test Point
892/00257	1/2 in. BSP x Test Point
892/00258	5/8 in. BSP x Test Point
816/15118	3/4 in. BSP x Test Point
892/00259	1 in BSP x Test Point
892/00260	1.1/4 in. BSP x Test Point
892/00261	5/8 in. UNF x Test Point

T11-010-2

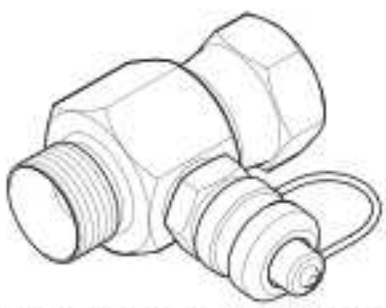


Fig 12. Pressure Test 'T' Adapters

816/55045	1/4 in. M BSP x 1/4 in. F BSP x Test Point
816/55038	3/8 in. M BSP x 3/8 in. F BSP x Test Point
816/55040	1/2 in. M BSP x 1/2 in. F BSP x Test Point
892/00263	5/8 in. M BSP x 5/8 in. F BSP x Test Point
892/00264	3/4 in. M BSP x 3/4 in. F BSP x Test Point
892/00265	1 in. M BSP x 1 in. F BSP x Test Point
892/00266	1.1/4 in. M BSP x 1.1/4 in. F BSP x Test Point
892/00267	1.1/4 in. M BSP x 1.1/2 in. F BSP x Test Point

MidWestTech | JCB 403 Compact Wheel Loader Service Manual | Publication 9803-94... Order the manual at mid-west-tech.com >

Harnesses

Wire and Harness Number Identification

TC-603_2

Introduction

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

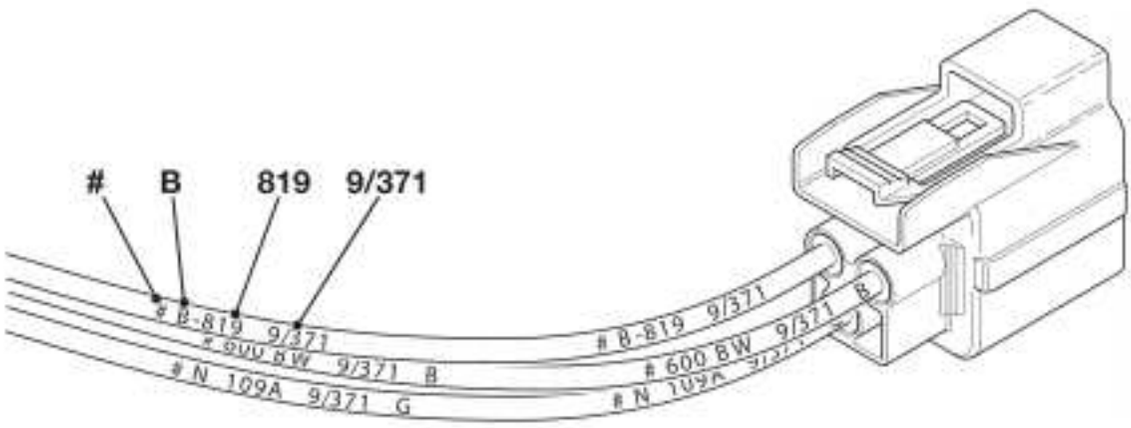


Fig 1. Typical Wire and Harness Number

⇨ *Fig 1. (C-18)*. 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 1. Wire and Harness Number Identification

Ident. No.	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. ⇨ *Wire Numbers and Functions (C-19).*
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).

MidWestTech | JCB 403 Compact Wheel Loader Service Manual | Publication 9803-94... Order the manual at mid-west-tech.com >

Table 10. Engine emissions - Black smoke

Possible Cause	Action
Air cleaner element is clogged.	Clean/Replace elements as necessary.
Air cleaner sensor is defective.	Check/Replace as necessary.
Air filter intake hose is restricted.	Check/Repair as necessary.
Incorrect valve clearances.	Check and adjust the valve clearances. ***Deutz Engine Manual, 9806-2295 T2, 9806-4020 T3***.
Injector valve is defective.	Test and replace as necessary. ***Deutz Engine Manual, 9806-2295 T2, 9806-4020 T3***.
Charge air line is leaking.	Check the charge air line.

Table 11. Lubricating oil in the exhaust system

Possible Cause	Action
Engine is operated continuously at idle rpm.	Run the engine at flight rpm.

MidWestTech | JCB 403 Compact Wheel Loader Service Manual | Publication 9803-94... Order the manual at mid-west-tech.com >

Earthing

Table 9.

Connections: See ⇨ *Fig 5. (C-17)*	
BA	⇨ *Fig 2. (C-11)*
BB	⇨ *Fig 2. (C-11)*
BC	⇨ *Fig 2. (C-11)*
BD	⇨ *Fig 2. (C-11)*
BE	⇨ *Fig 2. (C-11)*
CA	⇨ *Fig 3. (C-13)*
CC	⇨ *Fig 3. (C-13)*
CD	⇨ *Fig 3. (C-13)*
CE	⇨ *Fig 3. (C-13)*
CF	⇨ *Fig 3. (C-13)*
CG	⇨ *Fig 3. (C-13)*
CK	⇨ *Fig 3. (C-13)*
CL	⇨ *Fig 3. (C-13)*
CN	⇨ *Fig 3. (C-13)*
CO	⇨ *Fig 3. (C-13)*
CP	⇨ *Fig 3. (C-13)*
CR	⇨ *Fig 3. (C-13)*
CS	⇨ *Fig 3. (C-13)*
CT	⇨ *Fig 3. (C-13)*
D	⇨ *Fig 1. (C-9)*
DA	⇨ *Fig 4. (C-15)*
DB	⇨ *Fig 4. (C-15)*
DC	⇨ *Fig 4. (C-15)*
DD	⇨ *Fig 4. (C-15)*
DE	⇨ *Fig 4. (C-15)*
DF	⇨ *Fig 4. (C-15)*
DG	⇨ *Fig 4. (C-15)*
DH	⇨ *Fig 4. (C-15)*
DJ	⇨ *Fig 4. (C-15)*
DK	⇨ *Fig 4. (C-15)*
DL	⇨ *Fig 4. (C-15)*
DM	⇨ *Fig 4. (C-15)*
DN	⇨ *Fig 4. (C-15)*
DP	⇨ *Fig 4. (C-15)*
DR	⇨ *Fig 4. (C-15)*
DS	⇨ *Fig 4. (C-15)*
DV	⇨ *Fig 4. (C-15)*
DW	⇨ *Fig 4. (C-15)*
O	⇨ *Fig 1. (C-9)*
P	⇨ *Fig 1. (C-9)*
R	⇨ *Fig 1. (C-9)*

For **previous** schematic	⇨ *Fig 4. (C-15)*
For component key	⇨ *Table 7. (C-14)*
For connecting schematics key	⇨ *Table 8. (C-14)*

MidWestTech | JCB 403 Compact Wheel Loader Service Manual | Publication 9803-9490-4
Order the manual at mid-west-tech.com >

Typical Loader Ram

Dismantling and Assembly

The numerical sequence shown on the illustration is intended as a guide to dismantling.

For assembly the sequence should be reversed.

When Dismantling

Discard all seals and 'O' rings.

⚠ WARNING

To avoid burning, wear protective gloves when handling hot components. To protect your eyes, wear goggles when using a brush to clean components.

HYD-1-3_2

When Assembling

Thoroughly clean the threads of piston head **6**, piston rod **7**, end cap **1** and cylinder with a wire brush. Use new seals and 'O' rings throughout. ⇨ *JCB Ram Sealing Procedure (E-66)* Ensure that all threads are free from grease, hydraulic oil and old locking fluids using JCB Cleaner/Degreaser. Allow solvent to dry for 15 minutes before applying JCB Activator.

Fit and torque-tighten the piston head. ⇨ *Table 23. Torque Settings (E-65)*

Fit the locking dowel **5** to the piston head/rod as follows:

New rod and piston head

If both are required, the following procedure should be followed:

1 Drill through the piston head into the piston rod, shown. ⇨ *Fig 63. (E-64)* Use an undersized diameter drill first as a guide and then drill using the correct size diameter drill to suit. ⇨ *Table 22. Drilling Details For Piston Head Retention (all dimensions in mm) (E-65)*

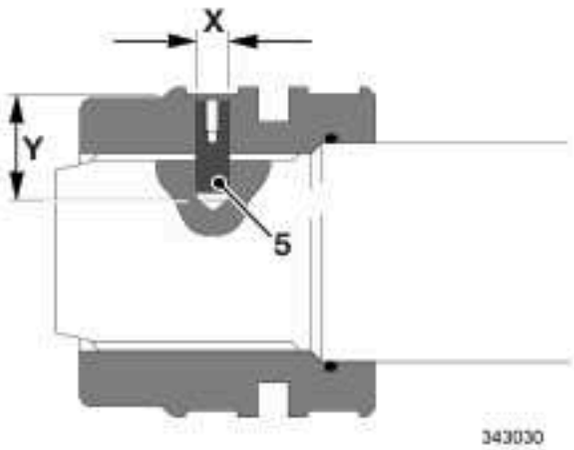


Fig 63.

2 Remove all swarf and contamination. Insert dowel **5** into the drilled hole, making sure that the tapped extractor hole is to the outside.

New piston head fitted to a pre-drilled piston rod

1 Redrill and dowel **BOTH** the piston head and piston rod at 90° from the existing drilled dowel hole in the piston rod. Follow the correct procedure. ⇨ *New rod and piston head (E-64)*

New piston rod fitted to a pre-drilled piston head

Use the pre-drilled hole in the piston head. Care must be taken not to elongate the existing hole in the piston head.

1 Use a drill of the same diameter as the pre-drilled hole in the piston head to make a 'centre mark' in the piston rod. **DO NOT** drill the piston rod at this stage.

2 Use an undersized diameter drill as a guide and drill into the piston rod to the required depth making sure that the drill has centred correctly on the 'centre mark' made in step 1. ⇨ *Table 22. Drilling Details For Piston Head Retention (all dimensions in mm) (E-65)*

3 Use the correct size diameter drill to suit the dowel and drill to the required depth. ⇨ *Table 22. Drilling Details For Piston Head Retention (all dimensions in mm) (E-65)*

MidWestTech | JCB 403 Compact Wheel Loader Service Manual | Publication 9803-94... Order the manual at mid-west-tech.com >