Service Manual

TM310

Service Manual - TM310
Section 1 - General Information
Section 2 - Care and Safety
Section 3 - Routine Maintenance
Section B - Body and Framework
Section C - Electrics
Section E - Hydraulics
Section F - Transmission
Section G - Brakes
Section H - Steering
Section K - Engine
Section M - Network Systems



PREVIEW - YOUFIXTHIS.COM

Publication No.
9803/9520-9



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 Service, World Parts Centre, Beamhurst, Uttoxeter, Staffordshire, ST14 5PA, England. Tel +44 1889 590312 Fax +44 1889 593377

World Class
Customer Support

Download full manual at youfixthis.com

Contents **Page No.**

Introduction
About this Manual 1-1
Machine Model and Serial Number 1-1
Using the Service Manual 1-1
Section Numbering 1-1
Left Side, Right Side 1-2
Cross References 1-2
Identifying your Machine 1-3
Machine Identification Plate 1-3
Component Identification Plates 1-4

Torque Settings
Zinc Plated Fasteners and Dacromet Fasteners 1-7
Introduction 1-7
Bolts and Screws 1-7
Hydraulic Connections 1-11
'O' Ring Face Seal System 1-11
'Torque Stop' Hose System 1-14

Service Tools
Numerical List 1-15
Tool Detail Reference 1-16
Section B - Body and Framework 1-16
Section C - Electrics 1-20
Section E - Hydraulics 1-23
Section H - Steering 1-31
Section K - Engine 1-32

Service Consumables
Sealing and Retaining Compounds 1-35

Terms and Definitions
Colour Coding 1-37
Hydraulic Schematic Colour Codes 1-37

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Zinc Plated Fasteners and Dacromet Fasteners

Table 2. Torque Settings - UNF Grade 'S' Fasteners

Bolt Size		Hexagon (A/F)	Condition 1			Condition 2		
in.	mm	in.	Nm	kgf m	lbf ft	Nm	kgf m	lbf ft
1/4	6.3	7/16	11.2	1.1	8.3	10.0	1.0	7.4
5/16	7.9	1/2	22.3	2.3	16.4	20.0	2.0	14.7
3/8	9.5	9/16	40.0	4.1	29.5	36.0	3.7	26.5
7/16	11.1	5/8	64.0	6.5	47.2	57.0	5.8	42.0
1/2	12.7	3/4	98.00	10.0	72.3	88.0	9.0	64.9
9/16	14.3	13/16	140.0	14.3	103.2	126.0	12.8	92.9
5/8	15.9	15/16	196.0	20.0	144.6	177.0	18.0	130.5
3/4	19.0	1 1/8	343.0	35.0	253.0	309.0	31.5	227.9
7/8	22.2	1 15/16	547.0	55.8	403.4	492.0	50.2	362.9
1	25.4	1 1/2	814.0	83.0	600.4	732.0	74.6	539.9
1 1/8	31.7	1 7/8	1181.0	120.4	871.1	1063.0	108.4	784.0
1 1/4	38.1	2 1/4	1646.0	167.8	1214.0	1481.0	151.0	1092.3

Table 3. Torque Settings - Metric Grade 8.8 Fasteners

Bolt Size		Hexagon (A/F)	Condition 1			Condition 2		
ISO Metric Thread	mm	mm	Nm	kgf m	lbf ft	Nm	kgf m	lbf ft
M5	5	8	5.8	0.6	4.3	5.2	0.5	3.8
M6	6	10	9.9	1.0	7.3	9.0	0.9	6.6
M8	8	13	24.0	2.4	17.7	22.0	2.2	16.2
M10	10	17	47.0	4.8	34.7	43.0	4.4	31.7
M12	12	19	83.0	8.5	61.2	74.0	7.5	54.6
M16	16	24	205.0	20.9	151.2	184.0	18.8	135.7
M20	20	30	400.0	40.8	295.0	360.0	36.7	265.5
M24	24	36	690.0	70.4	508.9	621.0	63.3	458.0
M30	30	46	1372.0	139.9	1011.9	1235.0	125.9	910.9
M36	36	55	2399.0	244.6	1769.4	2159.0	220.0	1592.4

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

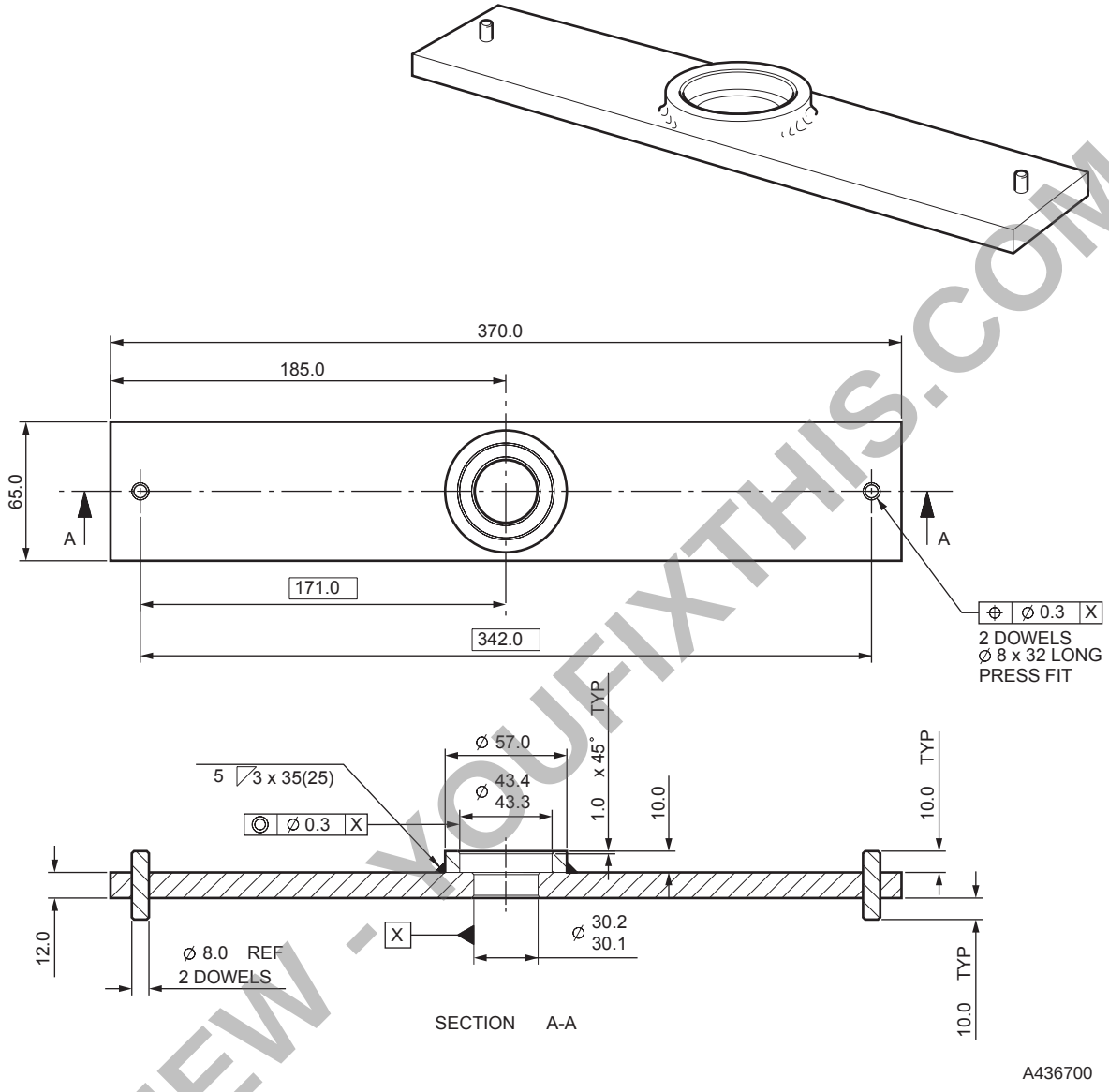


Fig 72. 892/01110 Torque Converter Alignment Tool

For use with 12" and W300 torque converters

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Safety Notices

Important Information

T1-042

The Operator Manual

⚠ WARNING

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

INT-1-4-2

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

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

Safety Warnings



This safety alert system identifies important safety messages in this manual. When you see this symbol, be alert, your safety is involved, carefully read the message that follows, and inform other operators.

In this publication and on the machine, there are safety notices. Each notice starts with a signal word. The signal word meanings are given below.

⚠ DANGER

Denotes an extreme hazard exists. If proper precautions are not taken, it is highly probable that the operator (or others) could be killed or seriously injured.

INT-1-2-1

⚠ WARNING

Denotes a hazard exists. If proper precautions are not taken, the operator (or others) could be killed or seriously injured.

INT-1-2-2

⚠ CAUTION

Denotes a reminder of safety practices. Failure to follow these safety practices could result in injury to the operator (or others) and possible damage to the machine.

INT-1-2-3

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Service Schedules

Introduction

T3-036_3

⚠ WARNING

Maintenance must be done only by suitably qualified and competent persons.

Before doing any maintenance make sure the machine is safe, it should be correctly parked on level ground.

To prevent anyone starting the engine, remove the starter key. Disconnect the battery when you are not using electrical power. If you do not take these precautions you could be killed or injured.

8-3-1-1

A badly maintained machine is a danger to the operator and the people working around him. Make sure that the regular maintenance and lubrication jobs listed in the service schedules are done to keep the machine in a safe and efficient working condition.

Apart from the daily jobs, the schedules are based on machine running hours. Keep a regular check on the hourmeter readings to correctly gauge service intervals. When there is no hourmeter fitted, use the calendar equivalents to determine the service intervals. Refer to ***Calendar Equivalents***. Do not use a machine which is due for a service. Make sure any defects found during the regular maintenance checks are rectified immediately.

How to Use the Service Schedules

T3-012_4

In the example shown, **A** shows all service requirements to be carried out every 10 hours and **B** shows the requirements to be carried out every 500 hours.

Important: *Services should be carried out at either the hourly interval or calendar interval, whichever occurs first. Refer to* ***Calendar Equivalents****.*

Important: *The intervals given in the schedules must not be exceeded. If the machine is operated under severe conditions (high temperature, dust, water, etc.), shorten the intervals.*

Pre-start Cold Checks, Service Points and Fluid Levels

	Operation	A: 10	50	100[1]	B: 500	1000	2000	8000
ENGINE								
Coolant Quality and Level	- Check	□	□	□	□	□		
Cooling System	- Drain and Refill						□	□
Oil level	- Check	□	□					
Oil and Filter[2][3][4]	- Change				□	□	□	□
Air Cleaner Dust Valve[5]	- Change				□	□	□	□
Air Cleaner Outer Element[5]	- Change					□	□	□
Air Cleaner Inner Element	- Change						□	□
Pre-Cleaner (if fitted)	- Check			□				
Water Seperator	- Check for contamination and Drain		□	□	□	□	□	□
Engine Fuel Filter	- Change					□	□	□
Front End Accessory Drive (FEAD) Belt Condition	- Check				□	□	□	□
Front End Accessory Drive (FEAD) Belt	- Change							□
Engine Mounting Bolts for Tightness	- Check			□	□	□	□	□
All Hoses - Condition	- Check			□	□	□	□	□
Radiator[5]	- Clean				□	□	□	□
Crankcase Ventilation Filter	- Change					□	□	□

795390-1

Calendar Equivalents

T3-051

Every 10 Hours = Daily

Every 50 Hours = Weekly

Every 500 Hours = Six Months

Every 1000 Hours = Yearly

Every 2000 Hours = 2 Years

Every 6000 Hours = 6 Years

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Fluids, Lubricants and Capacities

Specifications

JCB recommend that you use the JCB lubricants shown as they have been verified by JCB for use on JCB machines. However, you could use other lubricants that are equivalent to the JCB standards and quality or offer the same machine component protection.

Table 14.

Item	Capacity		Fluid/Lubricant	JCB Part Number	Container Size(1)
	Litres	UK Gal			
Fuel System	160	35	Diesel		
Engine (Oil)			JCB Engine Oil EP 15/W40	4001/1805	20 Litres
- Minimum	11.5	2.5	-10^{0}C to +50^{0}C (5^{0}F to 122^{0}F)(2)		
- Maximum	14	3.1	Caution: Do not use ordinary engine oil		
Engine (Coolant)	25	5.6	JCB HP Antifreeze HP/Coolant	4006/1120	20 Litres
Gearbox	19	4.2	JCB Transmission Fluid EP 10W	4000/2505	20 Litres
Transfer Box	1.3	0.3	JCB Gear Oil HP 90	4000/0305	20 Litres
Axles	20	4.4	JCB Gear Oil HP	4000/0505	20 Litres
Hydraulic System	135	30	JCB Hydraulic Fluid EP 46	4002/1605	20 Litres
			JCB Biodegradable Hydraulic 46 Fluid	4002/2605	20 Litres
Grease Points	---	---	JCB Special MPL-EP Grease	4003/1501	24x400g
Wear Pad Runways	---	---	JCB Waxoyl	4004/0502	5 Litres

(1) For information about the different container sizes that are available (and their part numbers), contact your JCB Dealer
(2) Superior grade oils may be more appropriate for heavy duty applications (such as sustained high loads and operation at elevated temperatures).

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Technical Data

Air Conditioning (Option)

Pressure Switch Settings	Set Pressure	Reset Pressure
Low Pressure	15 PSI (1.03 bar) Increasing	4 PSI (0.27 bar) Decreasing
High Pressure	390 PSI (26.8 bar) Increasing	320 PSI (22 bar) Decreasing

Refrigerant

R-134a 1200g

Oil

Type

Quantities - Recharge the system (1)

Component Replacement
Condenser
Evaporator
Hoses
Receiver Drier
Compressor

(1) The quantity of oil replaced should be the same as that taken out during `Recovery' procedure.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Fault Finding

Air Conditioning

The following fault finding checks can be undertaken without discharging the air conditioning system.

Procedures that require charging or discharging the system are not given in this manual as they require special equipment that is usually held only by trained refrigeration engineers.

The system will not function in very low ambient temperatures, therefore tests should be carried out in a warm environment.

It is recommended that, to locate faults on the system accurately and quickly, an electronic leak detector and a refrigerant pressure gauge should be used. However, if a leak detector is not available an approximate source of leakage can be found by applying soap solution to suspect areas.

Table 2. General Fault Indications

There are several indications that may help to determine the fault area on a system not working efficiently:

a)	Poor performance	Low accumulator pressure	Repair or renew accumulator Evacuate and recharge
		Plugged orifice tube	Renew orifice tube Evacuate and recharge
		Condenser coil air flow restricted	Remove debris from around coil using compressed air or low pressure water.
		System overcharged	Evacuate and recharge
b)	Blower does not operate on all speeds .	Blower resistor failed	Renew resistor
c)	Compressor clutch continually cuts out	Condenser coil blockage	Remove debris from around coil/renew condenser
		Overcharging of refrigerant system	Evacuate and recharge system
d)	System does not provide cool air	Water temperature control valve to heater coil not fully closed	Adjust cable

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Slide Hammer Kit

TB-003

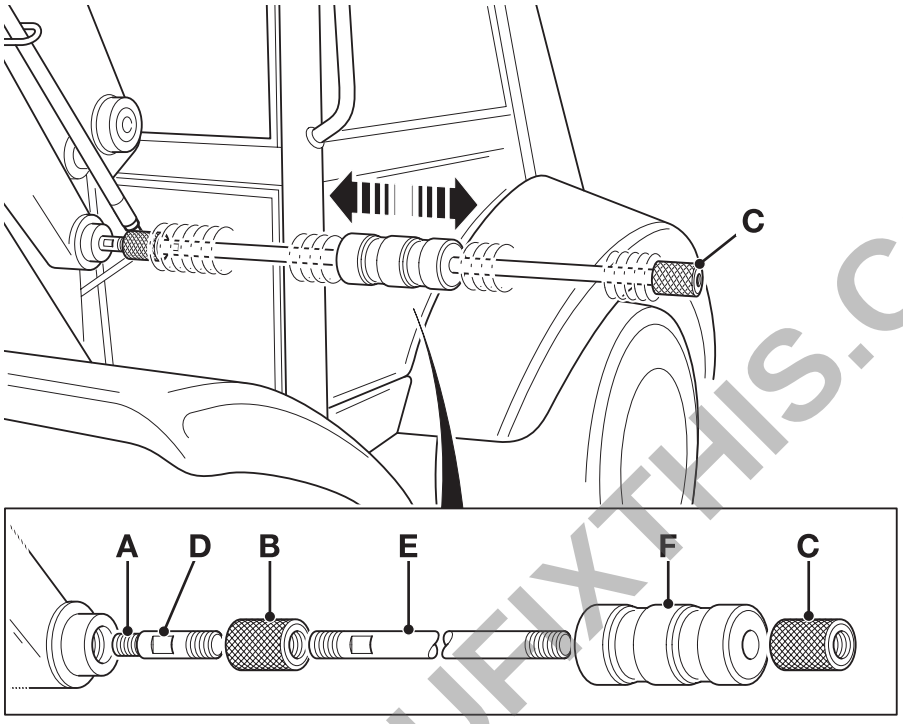


Fig 21. Typical M/c. Installation

The slide hammer kit is used to remove pivot pins that must be extracted, i.e. cannot be 'knocked through'. The purpose of this description is to explain how the kit and the various components are used to remove the pivot pins.

The adaptors **21-A** that form part of the kit have a screwed thread at each end. One of the threads will always be M20 size, this is to accommodate the end stops, items **21-B** and **21-C**. The other end of the adaptor will have varying thread sizes to suit the different size of threads in the pivot pins.

Fitting Procedure

1 Prepare the pivot pin, for instance, if fitted, remove the pivot pin retaining bolt.

2 Determine the thread size of the pivot pin and then fit the appropriate adaptor **21-A** as shown. Use the spanner flats **21-D** to securely fit the adaptor.

3 Fit an end stop **21-B** onto the other end of the adaptor (M20 thread size), make sure that the adaptor threads are fully engaged.

4 Fit the 'slide bar' **21-E** into the end stop. Again make sure that the threads are fully engaged.

5 Fit the 'slide hammer', item **21-F**, onto the slide bar as shown.

6 Finally, fit another end stop, item **21-C**, at the end of the slide bar, as shown. The slide hammer kit is now ready to use.

7 To extract the pivot pin, slide the hammer along the bar until it contacts end stop **21-C**. Repeat this step until the pivot pin is released.

8 To remove the slide hammer kit, reverse steps 2 to 7.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

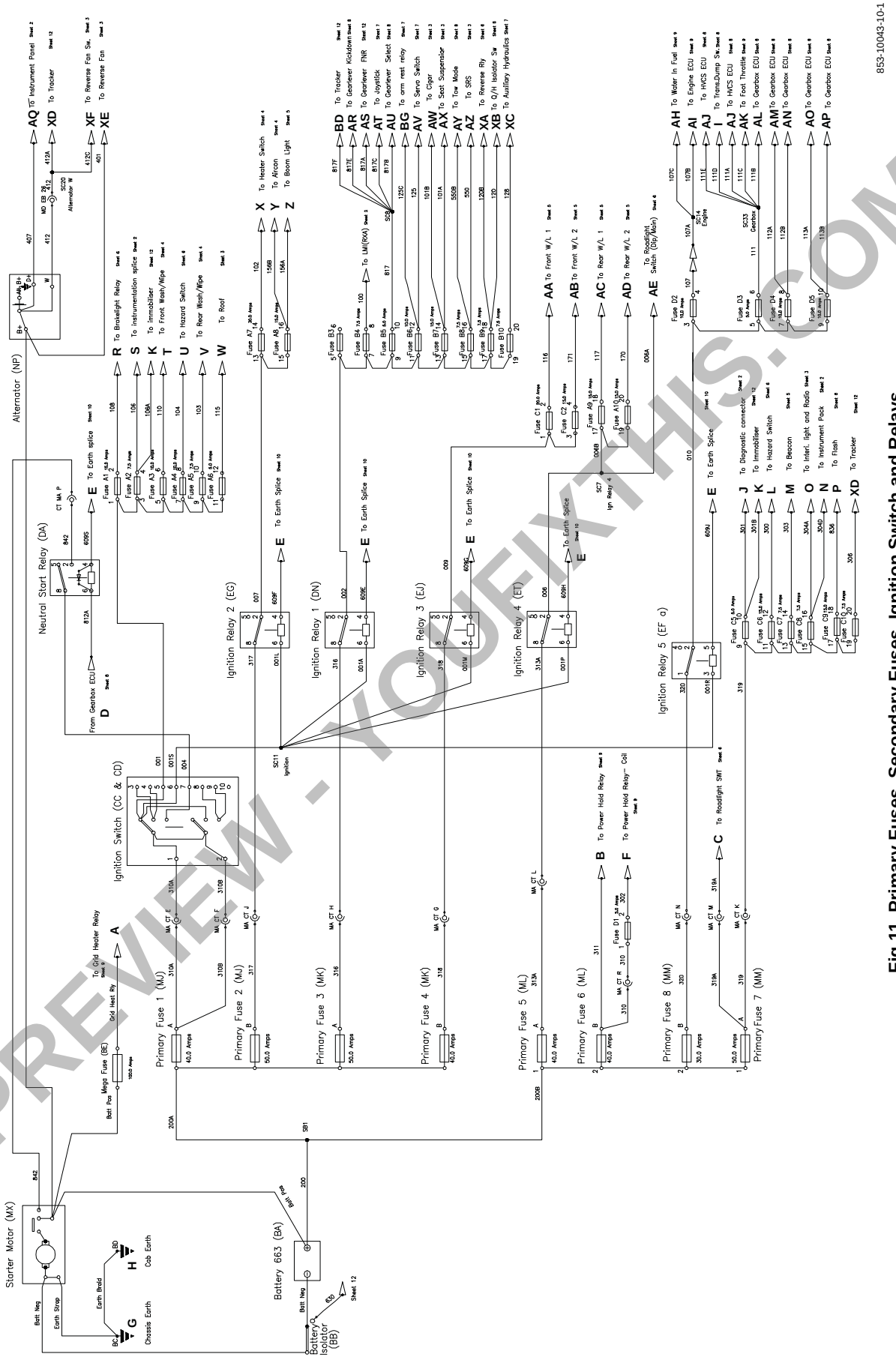


Fig 11. Primary Fuses, Secondary Fuses, Ignition Switch and Relays

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

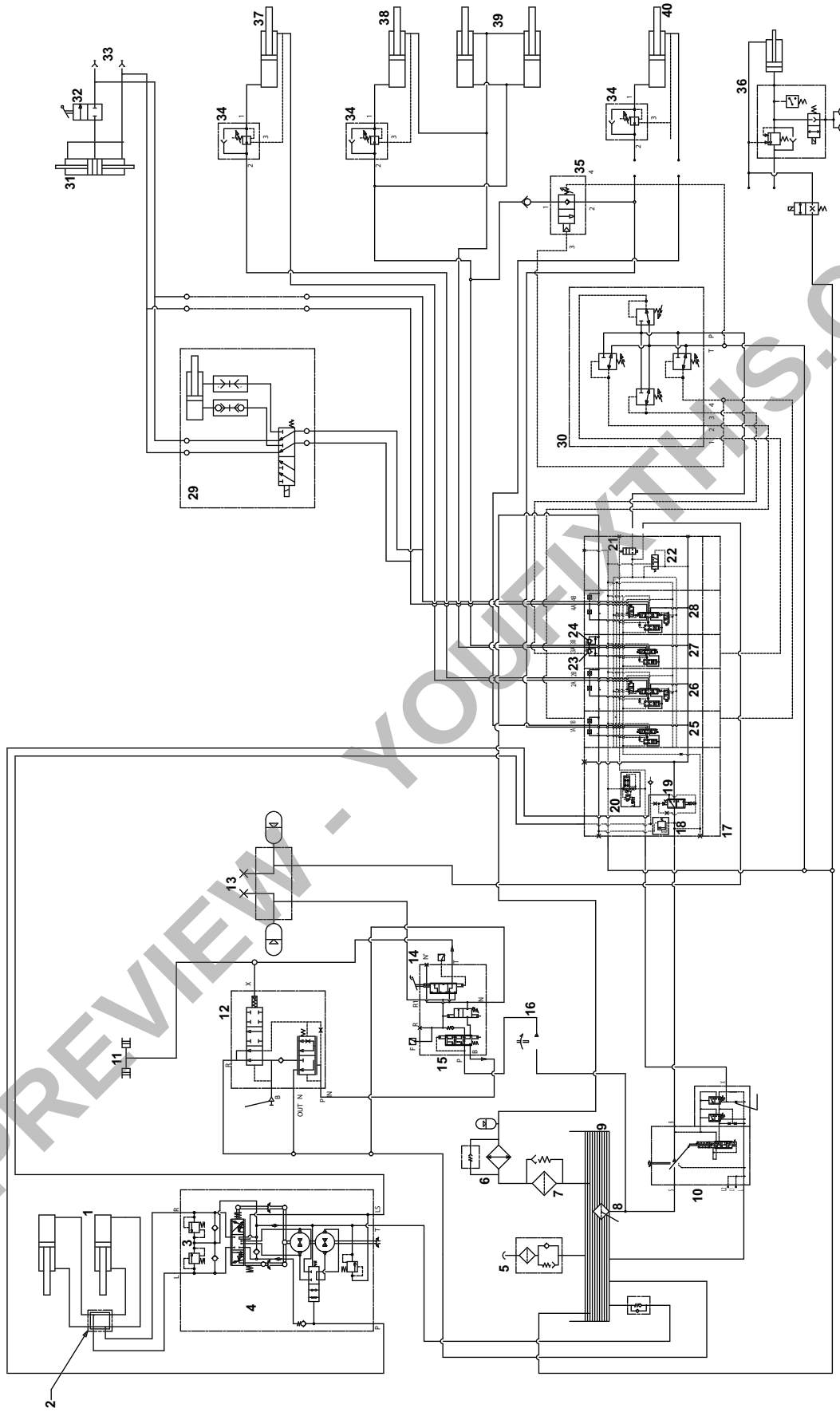


Fig 13.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Fault Code List

Engine ECU Fault Codes

Fault Code	Description	Warning Displays	
E001	CANbus communication failure between LMS ECU and Engine ECU.	Message displayed on LCD.	E001
E002	Engine RPM - data erratic, intermittent or incorrect.	Message displayed on LCD	E002
E008	Inlet manifold pressure sensor fault - voltage above normal or shorted high.	Message displayed on LCD	E008
E009	Inlet manifold pressure sensor fault - voltage below normal or shorted low.	Message displayed on LCD	E009
E010	Accelerator Pedal Position sensor fault - voltage above normal or shorted high.	Message displayed on LCD	E010
E011	Accelerator Pedal Position sensor fault - voltage below normal or shorted low.	Message displayed on LCD	E011
E012	Hand Throttle Position sensor fault - voltage above normal or shorted high.	Message displayed on LCD	E012
E013	Hand Throttle Position sensor fault - voltage below normal or shorted low.	Message displayed on LCD	E013
E014	Engine Oil Pressure sensor fault - voltage above normal or shorted high.	Message displayed on LCD	E014
E015	Engine Oil Pressure sensor fault - voltage below normal or shorted low.	Message displayed on LCD	E015
E017	Engine Coolant Temperature sensor fault - voltage above normal or shorted high.	Message displayed on LCD	E017
E018	Engine Coolant Temperature sensor fault - voltage below normal or shorted low.	Message displayed on LCD	E018
E023	Intake Manifold Temperature sensor fault - voltage above normal or shorted high.	Message displayed on LCD	E023
E024	Intake Manifold Temperature sensor (TMAP) fault - voltage below normal or shorted low.	Message displayed on LCD	E024
E027	Sensor Supply Voltage 3 fault - voltage above or below normal or shorted low or high.	Message displayed on LCD	E027
E036	Sensor Supply Voltage 3 - data erratic, intermittent or incorrect.	Message displayed on LCD	E036
E040	Ground Speed Sensor circuit fault - data erratic, intermittent or incorrect.	Message displayed on LCD	E040
E041	Ground Speed Sensor circuit fault - data abnormal rate of change.	Message displayed on LCD	E041
E047	Fuel Temperature Sensor fault - voltage above normal or shorted high.	Message displayed on LCD	E047
E048	Fuel Temperature Sensor fault.	Message displayed on LCD	E048

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

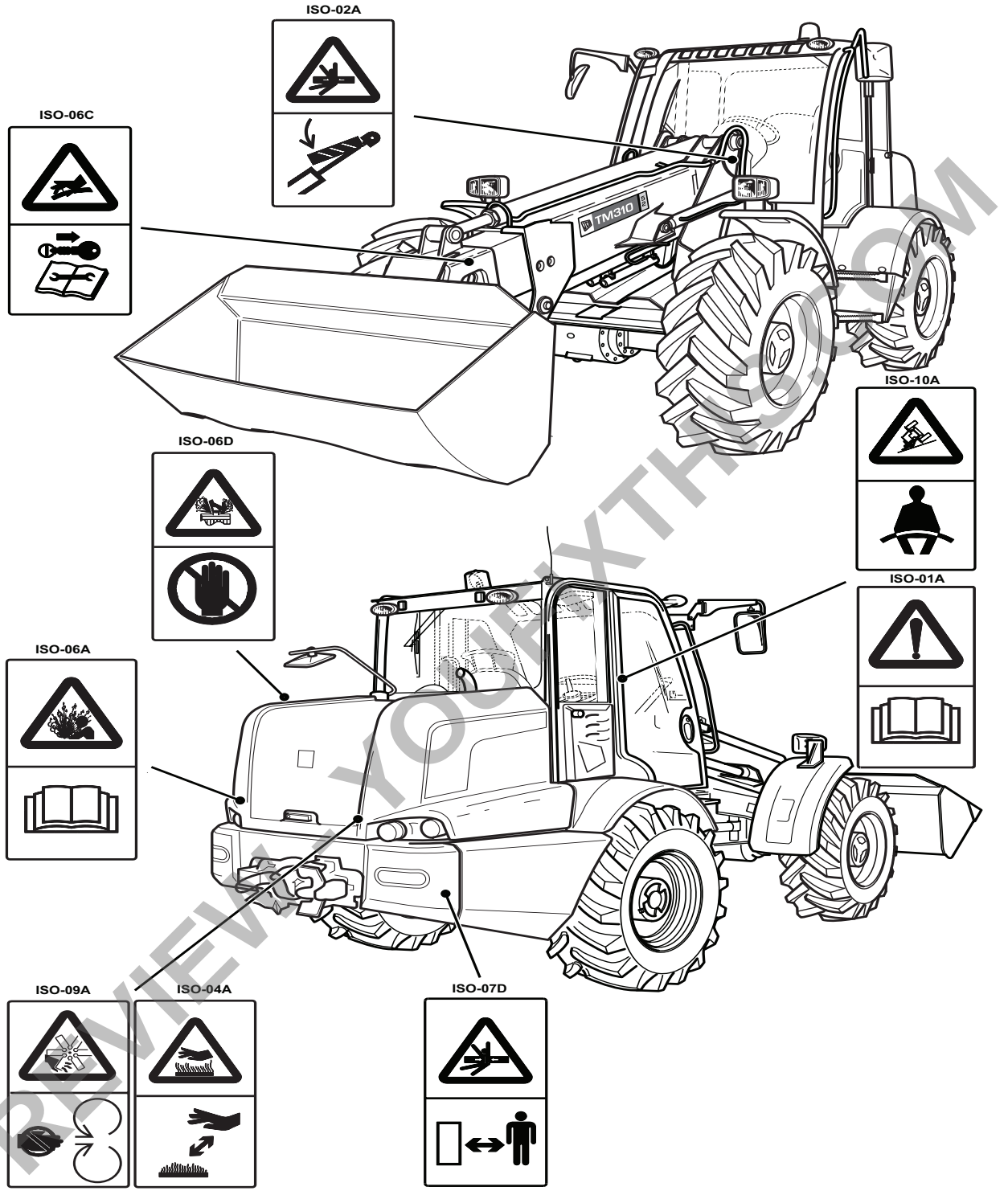


Fig 1.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Changing the Water Separator Pre-Filter

T3-076

1 Get access to the Water Separator. Refer to ***Water Separator and Engine Fuel Filter, Introduction***.

2 Drain and remove the water separator bowl **C**. Refer to ***Draining the Water Separator and Engine Fuel Filter***.

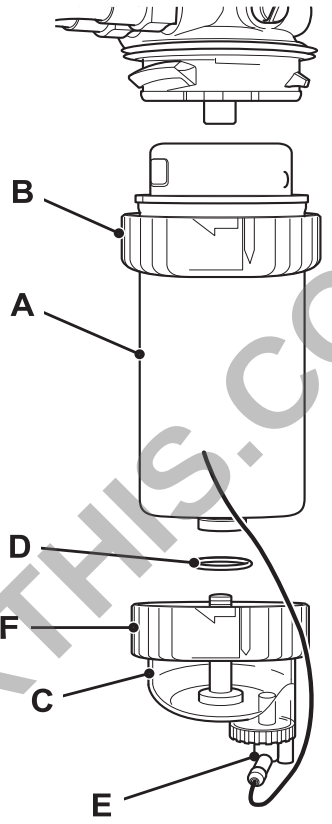
3 To remove the filter element **A**, release locking ring **B** and discard element.

4 Fit new element and secure in position with locking ring **B**.

5 Refit the bowl, secure in position with locking ring **B**.

Important: *Ensure the seal **D** is seated correctly before refitting the bowl.*

6 Make sure that the electrical connector **E** is correctly fitted.



C007030-5

Fig 23.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

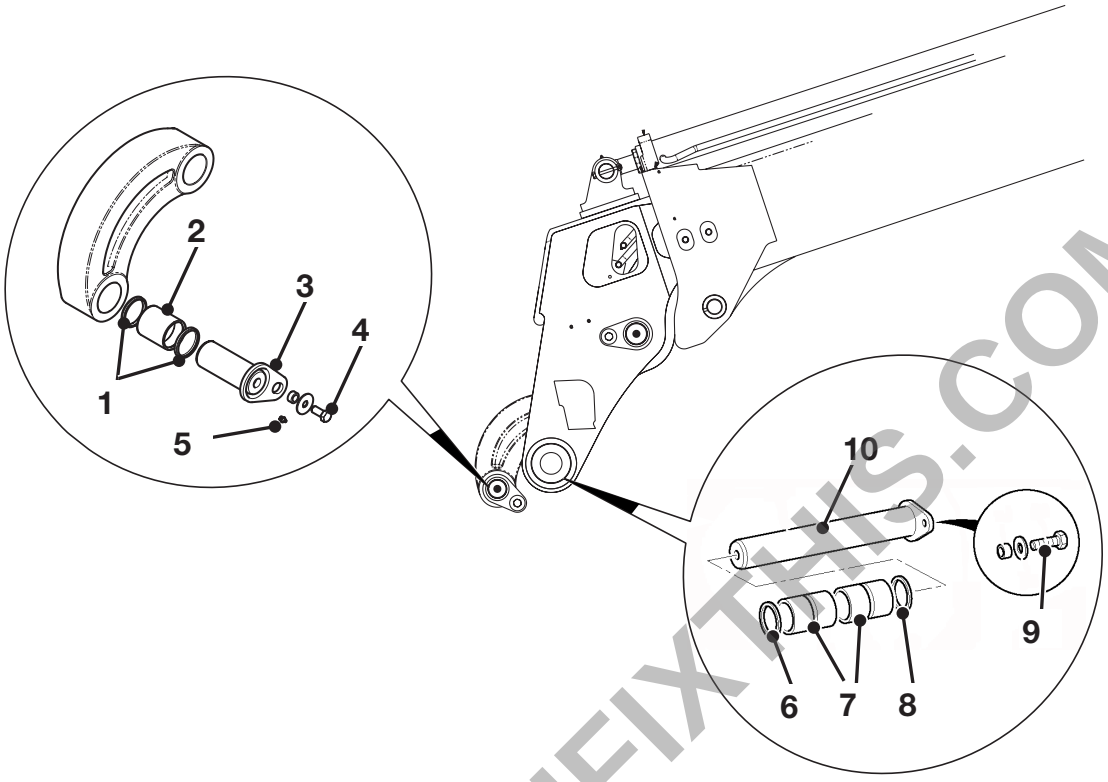


Fig 43.

Replacement

Replacement is the opposite of removal.

Do a check of the condition of the pivot bushes **43-2** & **43-7**. Replace if damaged.

Use new seals **43-1**, **43-6** & **43-8**.

Do a check of the condition of the grease nipple **43-5**. Clean if blocked or replace if damaged.

Grease the pivot pins, see ***Section 3 - Service Schedules.***

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

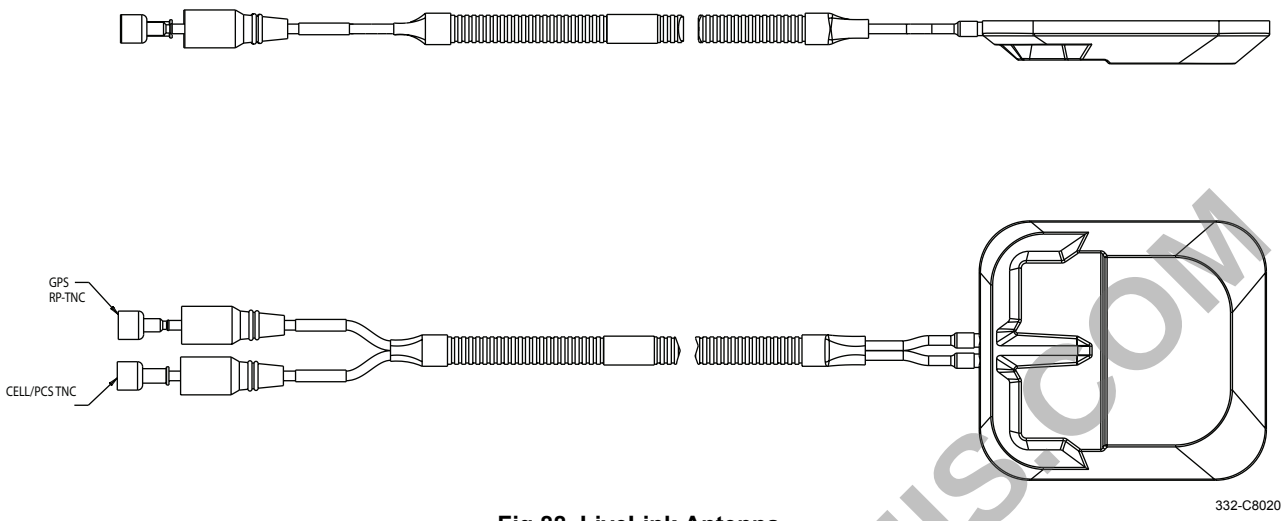


Fig 88. LiveLink Antenna

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Page left intentionally blank

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

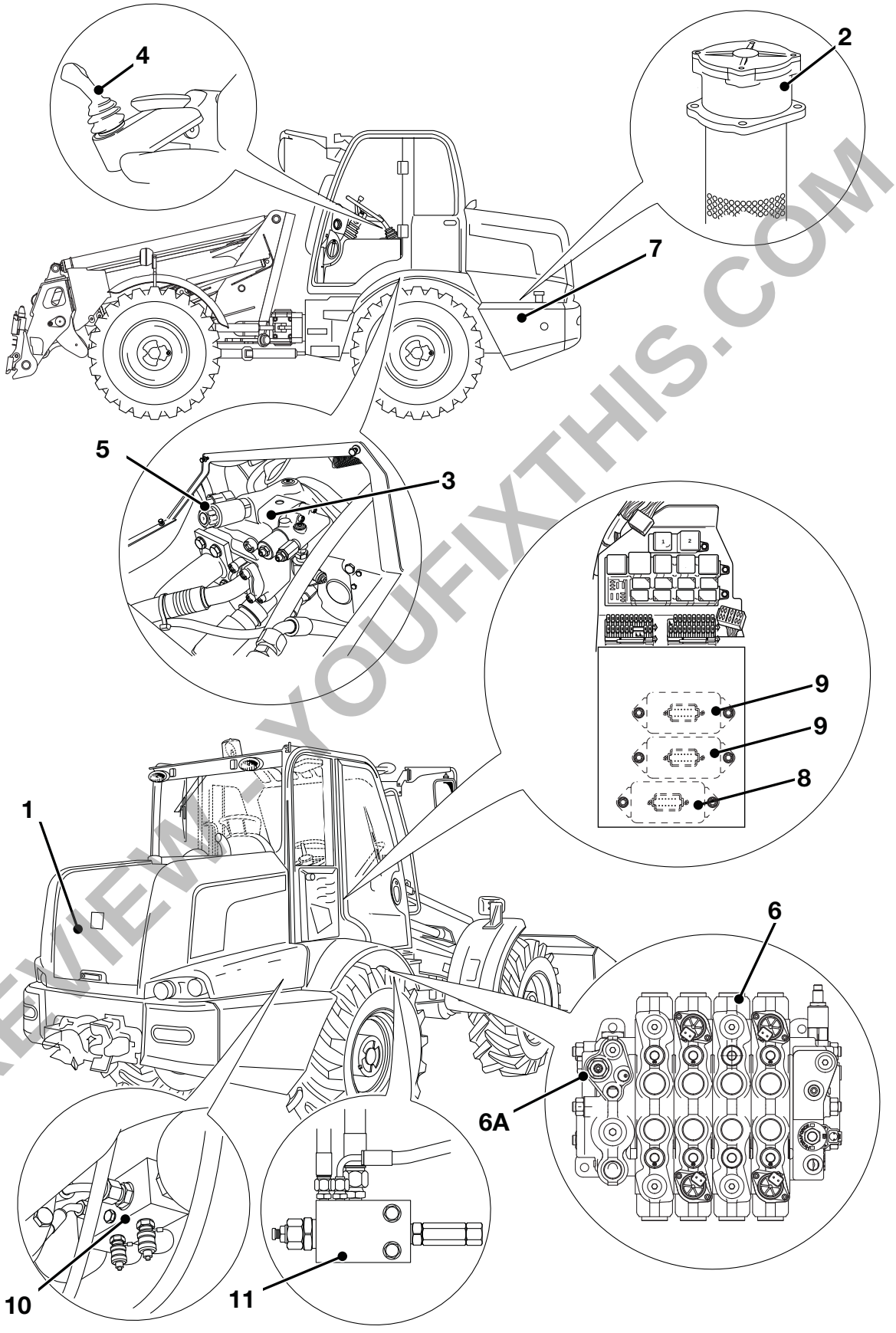


Fig 4. Component Location

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Description

Smooth Ride System (SRS) will enhance the comfort of the ride by damping the forces imposed on the machine by the movement of the boom as the machine travels over uneven surfaces.

In order to engage the system, the lift ram must be fully closed or the weight of the boom must be supported. This is sensed by a pressure switch built into the head end of the main lifting ram.

Note: *It is only intended for use whilst travelling. The system will be automatically disabled when the loader control servo is operated.*

The boom will move up and down independently of the machine with SRS selected. Make sure there is adequate ground clearance below the boom and attachments to allow for this movement.

When a switch in the cab is operated, a solenoid built into the head end of the lift ram is energised and opens. Hydraulic oil from the head end of the lift ram is channelled through internal galleries to act against the pressurised pistons in the accumulators. The rod side of the ram, again via internal galleries is connected to the tank to make up or dissipate oil as required.

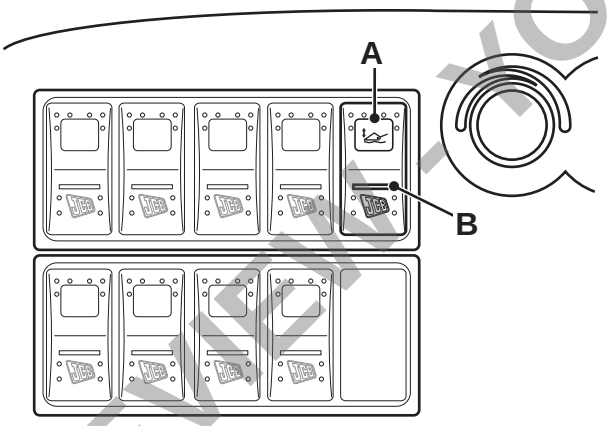


Fig 49.

Table 15. Component Key

A	Operating Switch
B	Warning Light

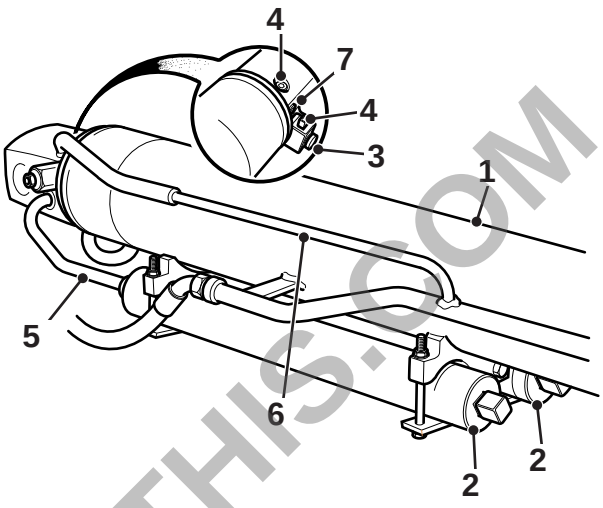


Fig 50.

Table 16. Component Key

1	Main Lift Ram
2	Accumulators
3	Operating Solenoid
4	Internal Operation Spool Valve Location
5	Link Pipe, Ram Head to Accumulators
6	Rod Side Link Pipe to Spool Valve and Tank
7	Pressure Switch

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Table 7. 3-Speed Powershift

Gear	Clutches engaged	
	Forward	**Reverse**
1st	**T**, **Z**	**W**, **Z**
2nd	**U**, **Z**	**V**, **Z**
3rd	**T**, **Y**	**W**, **Y**

Table 8. 6-Speed Powershift

Gear	Clutches engaged	
	Forward	**Reverse**
1st	**X**, **Z**	**W**, **Z**
2nd	**T**, **Z**	**V**, **Z**
3rd	**U**, **Z**	**W**, **Y**
4th	**X**, **Y**	**V**, **Y**
5th	**T**, **Y**	-
6th	**U**, **Y**	-

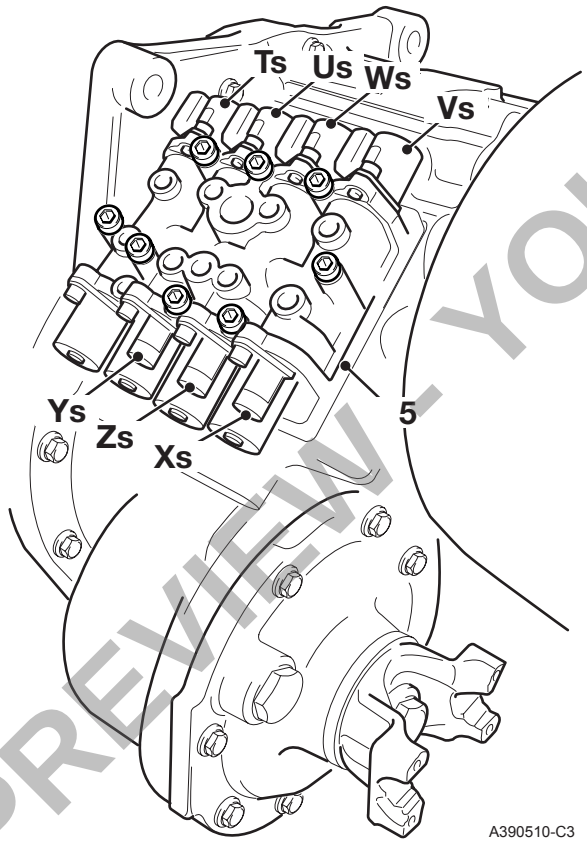


Fig 14. Solenoids

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Page left intentionally blank

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Silencer

Removal and Replacement

Removal

1 Park the machine and make it safe. Obey the general safety procedures. Make sure that the engine cannot be started. See ***Section 2 - General Procedures.***

2 If the engine is hot let it cool for one hour.

3 Lift the engine canopy, see ***Section 3 - Engine Canopy.***

4 Remove the exhaust manifold nuts **A**.

5 Support the silencer **F**. Remove the two bolts **E** and lift the clamping straps **D**.

6 Lift off the silencer **F**.

7 Remove and discard the gasket **B**.

8 Examine the studs **C** on the engine exhaust manifold. If they are defective replace them with new ones.

Replacement

Note: *Do not use a defective silencer. If the silencer is defective replace it with a new one.*

Replacement is the opposite of the removal procedure. During the replacement procedure do this work also:

– Use a new gasket **B**.
– Torque tighten the bolts **E**.

Table 1. Torque Settings

Item	Nm	kgf m	lbf ft
2-E	22	2.2	16

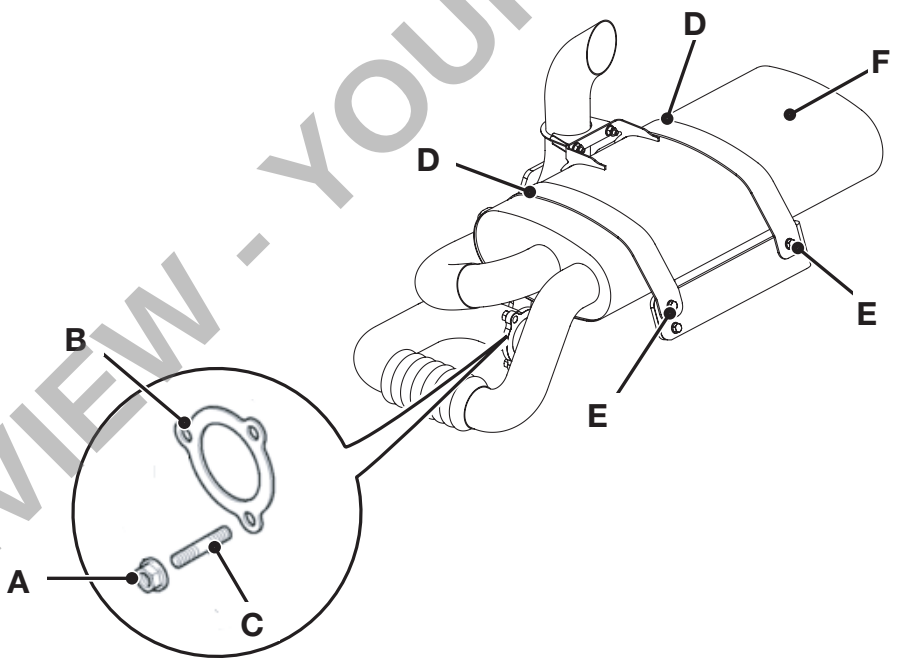


Fig 2.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Fault Code	Description	Warning Displays	
E787	Intake air heater 2- relay enable fault - current below normal or open circuit	Message displayed on LCD	E787
E788	Intake air heater 2- relay enable fault - current above normal or grounded circuit	Message displayed on LCD	E788
E789	Ground Speed Sensor circuit fault - current above normal or grounded circuit.	Message displayed on LCD	E789
E790	Ground Speed Sensor circuit fault - mechanical system not responding or out of adjustment.	Message displayed on LCD	E790
E791	Ground Speed Sensor circuit fault - voltage above normal or shorted high.	Message displayed on LCD	E791
E792	Auxiliary Output 1 (temperature gauge/lamp) fault - voltage above normal or shorted high.	Message displayed on LCD	E792
E793	Auxiliary Output 2 (oil pressure gauge/lamp) fault - voltage above normal or shorted high.	Message displayed on LCD	E793
E794	Intake air heater 2- relay enable fault - voltage above normal or shorted high.	Message displayed on LCD	E794
E795	Sensor Supply Voltage 2 fault - data erratic, intermittent or incorrect.	Message displayed on LCD	E795
E796	ECU Power Output Supply 2 fault - voltage below normal or shorted low.	Message displayed on LCD	E796
E797	ECU Power Output Supply 1 fault - voltage below normal or shorted low.	Message displayed on LCD	E797
E798	ECU Power Output Supply 1 fault - current below normal or open circuit.	Message displayed on LCD	E798
E799	ECU Power Output Supply 1 fault - current above normal or grounded circuit.	Message displayed on LCD	E799

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

PREVIEW ONLY

You're viewing 24 of 690 pages

The full manual includes:

- All 690 pages, complete
- Searchable PDF (find any keyword)
- No watermarks
- Instant download
- Print-ready quality

GET FULL MANUAL NOW

Jcb TM310, TM310S, TM310WM, TM320 Service Manual

Scan or click anywhere
youfixthis.com

Click anywhere on this page to get the full manual