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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, carefuly 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

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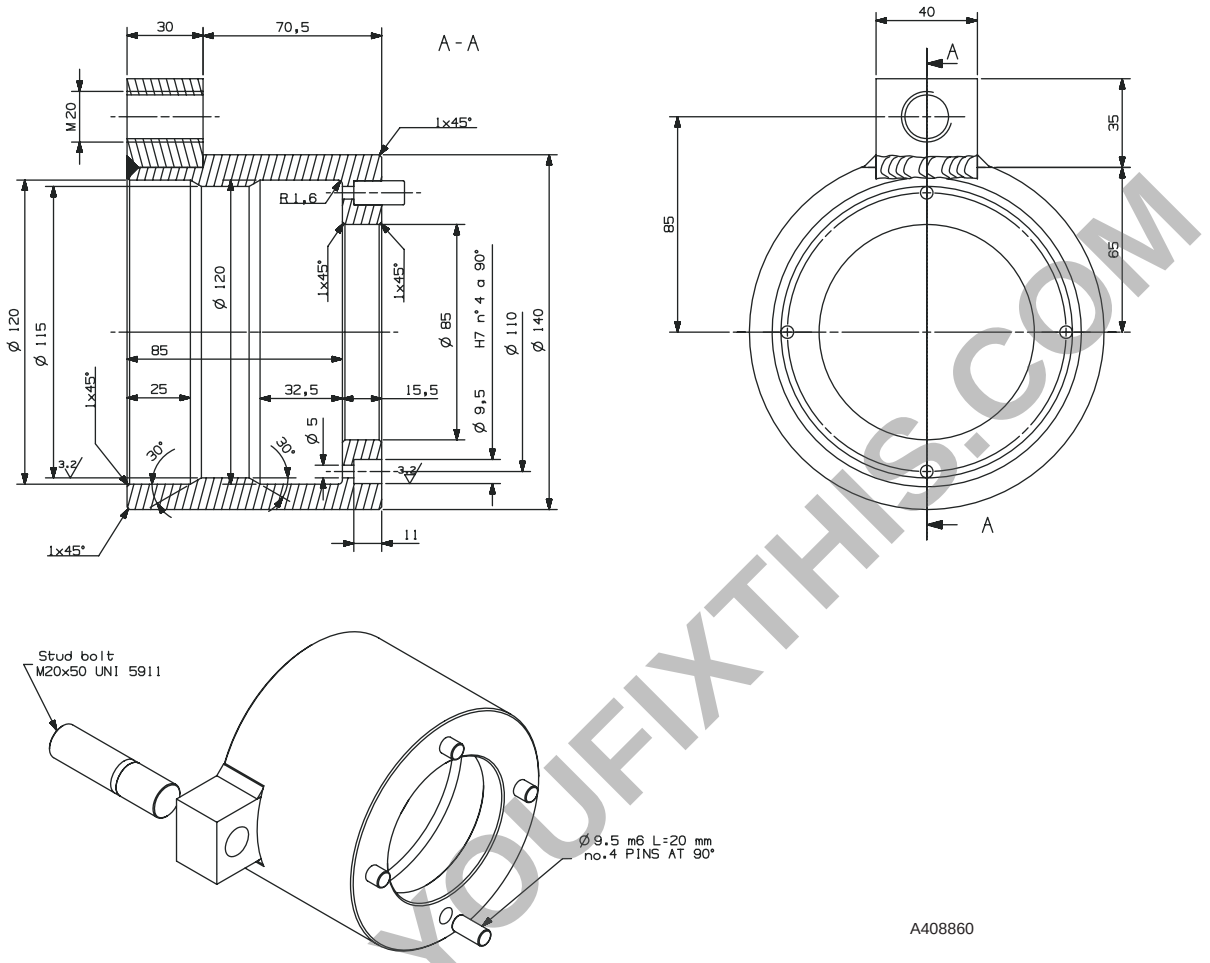


Fig 53. Nut Adapter

Note: *For disassembly and assembly of slew motor gearbox. This tool can not be ordered from JCB.*

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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

Every 10 Hours	=	Daily
Every 50 Hours	=	Weekly
Every 250 Hours	=	Monthly
Every 500 Hours	=	Three Months
Every 1000 Hours	=	Six Months
Every 2000 Hours	=	1 Year
Every 4000 Hours	=	2 Years
Every 5000 Hours	=	2 Years 6 Months

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Fluids, Lubricants and Capacities

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.

JS115 - JS145 and Variants

Table 5.

Item	Capacity	Fluid/Lubricant	JCB Part No.	Container Size(1)
ENGINE	15 litres (3.3 UK gal) (4 US gal)	JCB Engine Oil HP 15W40 -15°C to +40°C (5°F to 104°F)	4001/1505	20 Litres
		JCB Engine Oil HP 10W30 -30°C to +30°C (-22°F to 86°F)	4001/1705	20 Litres
COOLING SYSTEM	16.4 litres (3.8 UK gal) (4.3 US gal)	JCB HP Coolant ⇒ *Coolant Mixtures (3-25)*	4006/1120	20 Litres
TRACK GEARBOX	2 x 3.5 litres (2 x 0.77 UK gal) (2 x 0.9 US gal)	JCB HP90 Gear Oil	4000/0301	5 Litres
SLEW GEARBOX	2.2 litres (0.5 UK gal) (0.6 US gal)		4000/0305	20 Litres
TRACK ROLLERS AND IDLER WHEEL				
RECOIL SPRING CYLINDER		JCB Special HP Grease	4003/2017	400g
HYDRAULIC SYSTEM	124 litres (27.3 UK gal) (32.8 US gal)	JCB Hydraulic Fluid HP32 -20°C to +15°C (-4°F to 59°F)	4002/1024	200 Litres
		JCB Hydraulic Fluid HP46 -10°C to +30°C (14°F to 86°F)	4002/0803	
		JCB Hydraulic Fluid HP68 0°C to +40°C (32°F to 104°F)	4002/0701	
SLEW RING		JCB Special HP Grease	4003/2017	400g
- BEARING	60 g (0.13 lb)			
- GEAR TEETH	11 kg (24.25 lb)		4003/2006	12.5kg
ALL OTHER GREASE POINTS	--	JCB Special HP Grease		
FUEL TANK	253 litres (55.6 UK gal) (66.7 US gal)	⇒ *Fuel System (3-74)*		

(1) For information about the different container sizes that are available (and their part numbers), contact your JCB Dealer.

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Torque Settings

Zinc Plated Fasteners and Dacromet Fasteners

T11-002

Introduction

Some external fasteners on JCB machines are manufactured using an improved type of corrosion resistant finish. This type of finish is called Dacromet and replaces the original Zinc and Yellow Plating used on earlier machines.

The two types of fasteners can be readily identified by colour and part number suffix. ⇒ *Table 1. Fastener Types (1-7)*.

Table 1. Fastener Types

Fastener Type	Colour	Part No. Suffix
Zinc and Yellow	Golden finish	'Z' (e.g. 1315/3712Z)
Dacromet	Mottled silver finish	'D' (e.g. 1315/3712D)

Note: *As the Dacromet fasteners have a lower torque setting than the Zinc and Yellow fasteners, the torque figures used must be relevant to the type of fastener.*

Note: *A Dacromet bolt should not be used in conjunction with a Zinc or Yellow plated nut, as this could change the torque characteristics of the torque setting further. For the same reason, a Dacromet nut should not be used with a Zinc or Yellow plated bolt.*

Note: *All bolts used on JCB machines are high tensile and must not be replaced by bolts of a lesser tensile specification.*

Note: *Dacromet bolts, due to their high corrosion resistance are used in areas where rust could occur. Dacromet bolts are only used for external applications. They are not used in applications such as gearbox or engine joint seams or internal applications.*

Bolts and Screws

Use the following torque setting tables only where no torque setting is specified in the text.

Note: *Dacromet fasteners are lubricated as part of the plating process, do not lubricate.*

Torque settings are given for the following conditions:

Condition 1

- Un-lubricated fasteners
- Zinc fasteners
- Yellow plated fasteners

Condition 2

- Zinc flake (Dacromet) fasteners
- Lubricated zinc and yellow plated fasteners
- Where there is a natural lubrication. For example, cast iron components

Verbus Ripp Bolts

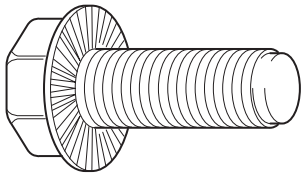


Fig 8.

Torque settings for these bolts are determined by the application. Refer to the relevant procedure for the required settings.

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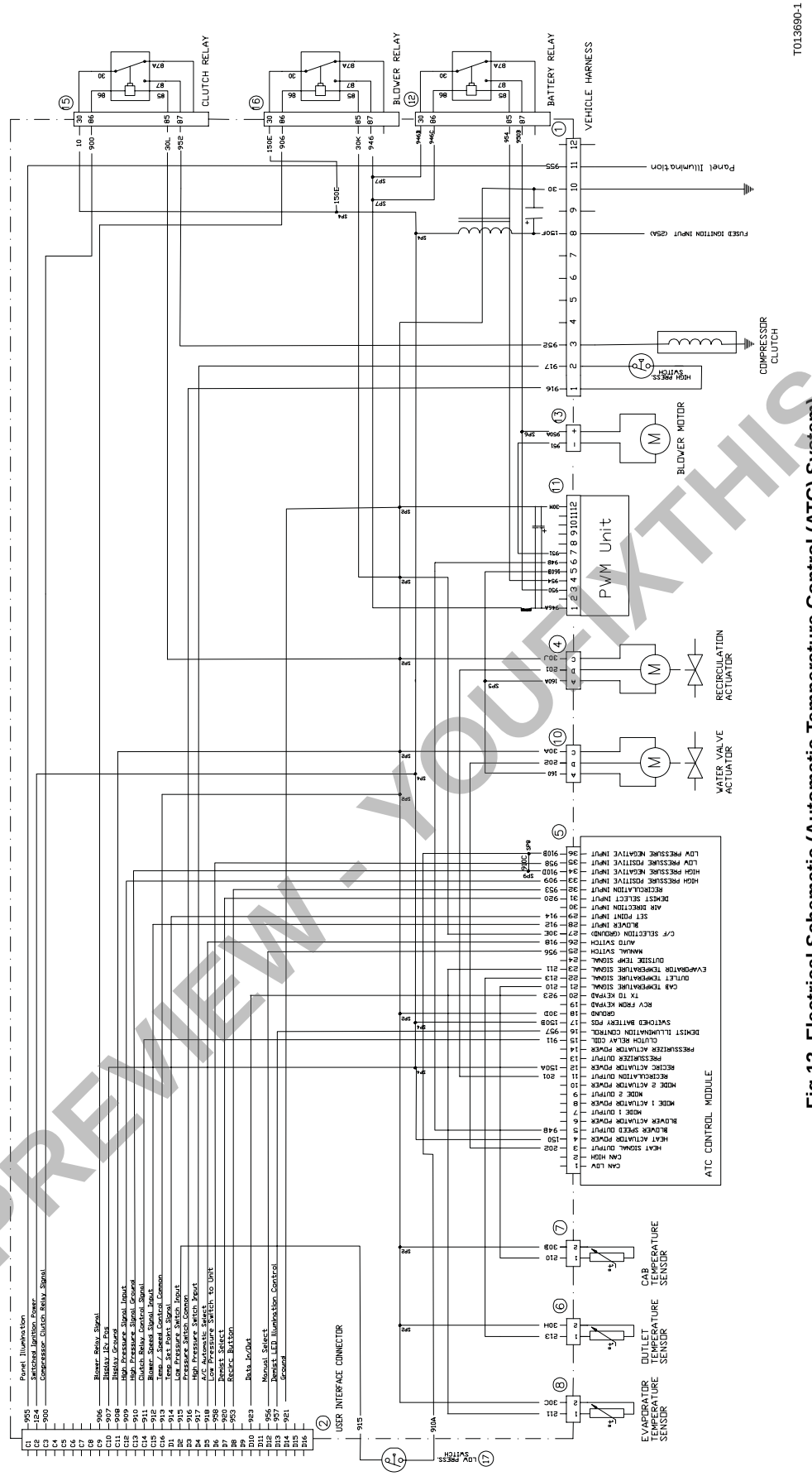


Fig 13. Electrical Schematic (Automatic Temperature Control (ATC) System)

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Electrical Fault Text Messages Displayed on the EMS.

Electrical fault error code.

Electrical errors are displayed immediately on the EMS with an alarm buzzer. Pressing "ACK" stops the buzzer and cause the messages to become repetitive.

Note: 1 *Open circuits can only be detected when the output has been turned off. Open circuit s are indicated by 100 series codes.*

Note: 2 *Short circuit conditions can only be detected when the output is turned on. Short circuits are indicated by a 200 series code.*

Note: 3 *Open circuits, short circuits and no voltage detections cannot be done on the low side drivers.*

Note: 4 *See Harness Data*

Error Codes	Error String	Description
101	CRANK	A crank signal was not detected by the ECU1.
102	FUEL	The fuel sensor is open-circuit
103	EN TMP	The engine temperature sensor is open-circuit.
104	HYD TMP	The hydraulic temperature sensor is open-circuit.
105	SET PT	The throttle set potentiometer is open-circuit.
106	SENS PT	The throttle sense potentiometer is open-circuit.
107	OIL SW	The oil pressure switch is reporting oil pressure is present when the engine is not running.
108	FLYWHEEL	The flywheel sensor is reporting an engine speed even though the engine is not running.
109	ALT	The alternator is reporting a voltage even when the engine is not running.
110	THR SOL	The throttle solenoid is open-circuit. This can only be detected when the engine is not running.
111	BOOM SP	The boom lower speed regulation output is open-circuit.
113	MAX FLW	"The max flow solenoid is open-circuit. For JS200W machines, this error can only be detected when the engine is not running due to the fact that this is a proportional valve on these machines.
115	BOOM	The boom priority solenoid is open-circuit.
116	FL PMP	The refuel pump output is open-circuit.
117	HORN	The horn output is open-circuit.
118	HYD PMP	"The hydraulic pump is open-circuit. Because this is a proportional valve, this error can only be detected when the engine is not running. "
119	SLW LCK	The slew lock solenoid is open-circuit.
120	HYD FAN	The hydraulic fan output is open-circuit. This can only be detected when the engine is not running.
121	SLW BRK	The slew brake solenoid is open-circuit.
122	SLW ST	The slew shut off solenoid is open-circuit.
127	TL CHNG	The travel change solenoid is open-circuit.
128	WASHER	The washer motor is open-circuit.
129	DOZER	The dozer solenoid is open-circuit.

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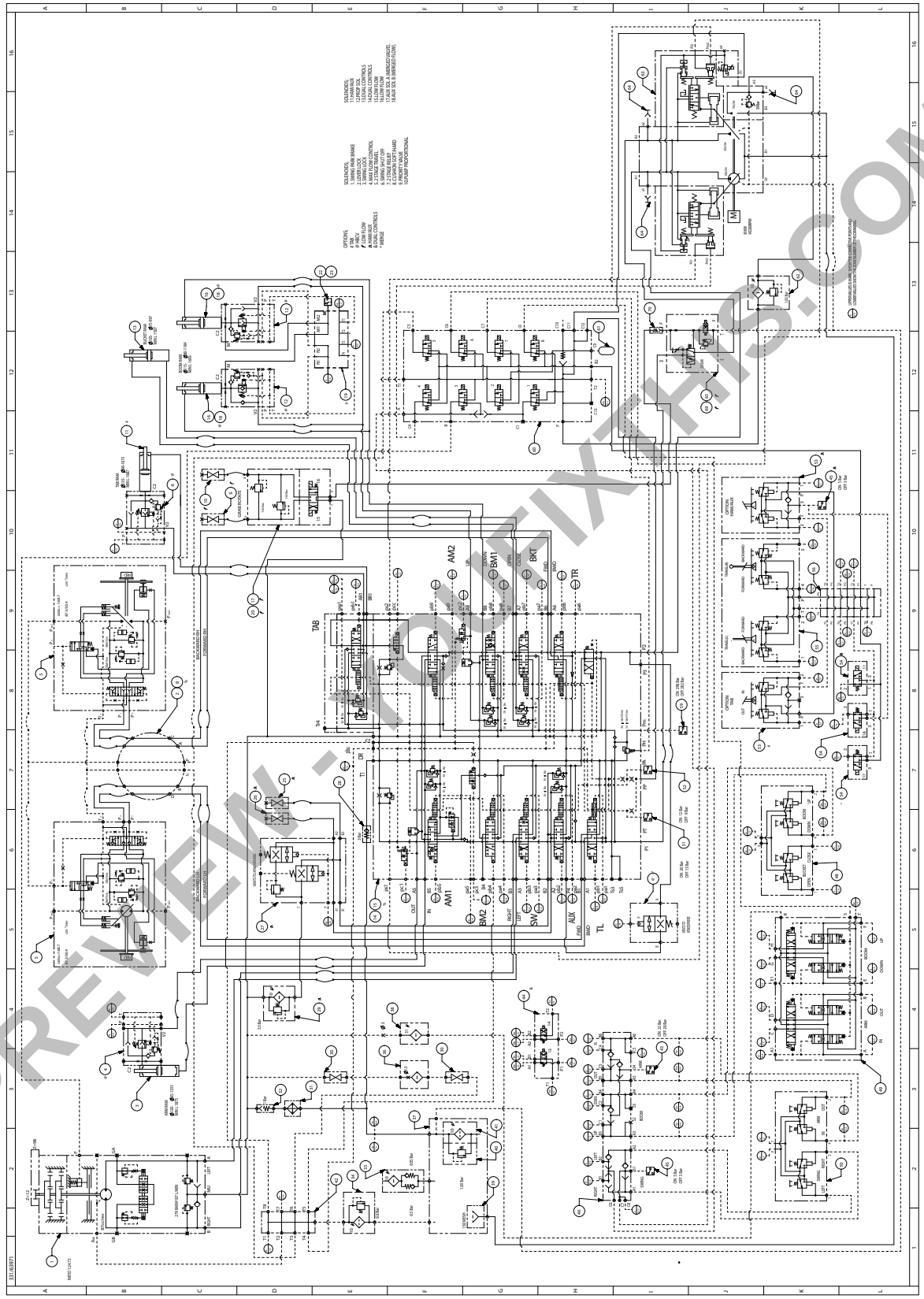


Fig 1. 331/63971 - Issue 4

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Tool Detail Reference

Section B - Body and Framework

Note: *Not all service tools are illustrated.*

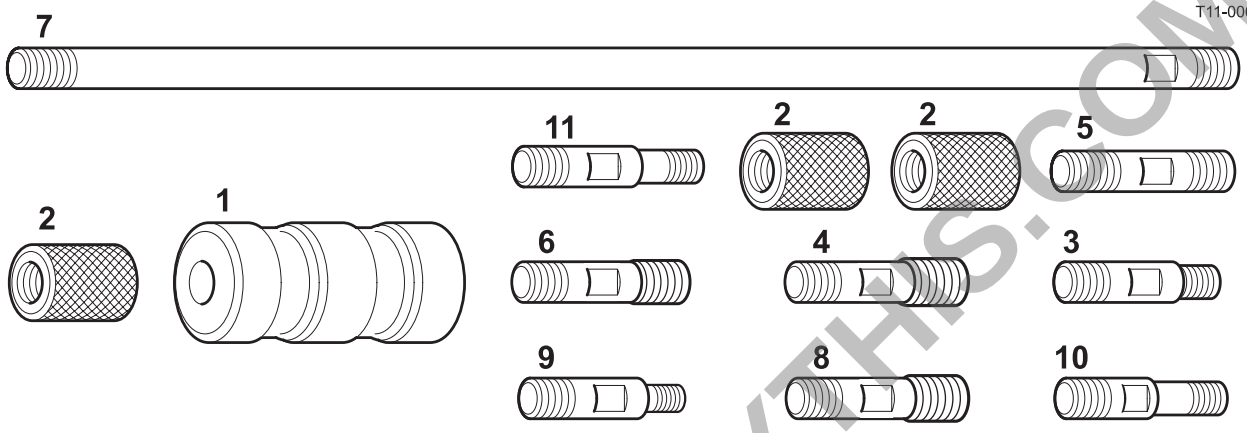


Fig 11. 993/68100 Slide Hammer Kit

1	993/68101	Slide Hammer	**7**	993/68107	Bar - M20 x M20 X 800 mm
2	993/68102	End Stops	**8**	993/68108	Adaptor - M20 x 7/8" UNF
3	993/68103	Adaptor - M20 x 5/8" UNF	**9**	993/68109	Adaptor - M20 x M12
4	993/68104	Adaptor - M20 x 1" UNF	**10**	993/68110	Adaptor - M20 x 5/8" UNF (Shoulder)
5	993/68105	Adaptor - M20 x M20	**11**	993/68111	Adaptor - M20 x 1/2" UNF
6	993/68106	Adaptor - M20 x M24			

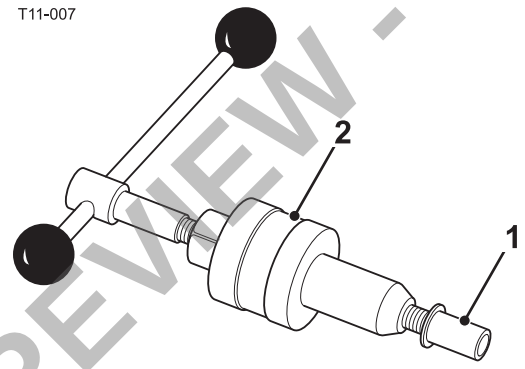


Fig 12. Rivet Nut Tool

1	826/01099	M6 x 16 mm Rivet Nut
	826/01101	M6 x 19 mm Rivet Nut
	826/01102	M8 x 18 mm Rivet Nut
	826/01103	M8 x 21 mm Rivet Nut
	826/01104	M10 x 23 mm Rivet Nut
	826/01105A	M10 x 26 mm Rivet Nut
2	-	Installation Tool available from: Bollhoff Fastenings Ltd (***www.bollhof.com***)

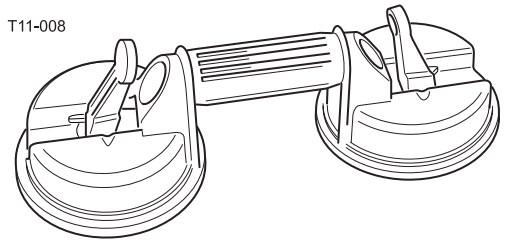


Fig 13. 892/00842 Glass Lifter

Minimum 2 off - Essential for glass installation, 2 required to handle large panes of glass. Ensure suction cups are protected from damage during storage.

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Prepare the Machine for Maintenance

Introduction

⚠ 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

Make the machine safe before you start a maintenance procedure.

Unless a maintenance procedure instructs you differently, you must lower the Excavator. Refer to ***How to Make the Machine Safe (Excavator Lowered)***.

How to Make the Machine Safe (Excavator Lowered)

Important: *Unless a maintenance procedure instructs you differently, you must lower the Excavator.*

1 Park the machine on level, solid ground.

If necessary, refer to ***Stopping and Parking the Machine*** in the Operator Manual.

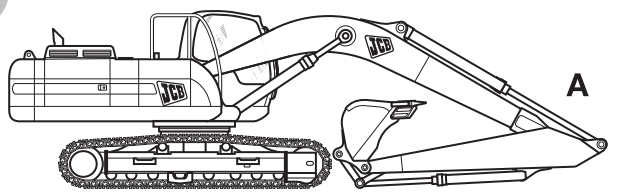
2 Lower the excavator so the attachment is flat on the ground as at **A**.

3 Stop the engine and remove the starter key.

4 Release tank pressure. Refer to ***Releasing Tank Pressure***.

5 Release the hydraulic pressure. Refer to ***Releasing the Hydraulic Pressure***.

6 Disconnect the battery to prevent accidental operation of the engine.



808071-2

Fig 4.

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Tools

Carrying Tools onto the Machine

When you carry tools onto the machine you must maintain three points of contact with the machine at all times. Lift tools onto the machine in intervals if necessary. Place the tools down before you adjust your grips on the machine. Do not try to adjust your grips on the machine while holding tools.

Locations

The machine is equipped with a a grease gun (option) and remote oil-drain tube attachment.

The grease gun is stowed into position with clips **A**, ⇨ *Fig 2. (3-28)*.

The drain tube is stowed into position by its screw thread **B**, ⇨ *Fig 3. (3-28)*.

Keep the tools in their stowage positions until they are needed. The location of the tools will vary dependant on the machine variant:

JS115-JS290

The grease gun is stowed in the toolbox. The toolbox can be locked with the key.

The drain tube is stowed in the service bay behind the cab, next to the engine air filter. The service bay can be locked with the key.

JS330/JS360

The grease gun is stowed in the service bay behind the cab. The service bay can be locked with the key.

The drain tube is stowed in the radiator bay. The radiator bay can be locked with the key.

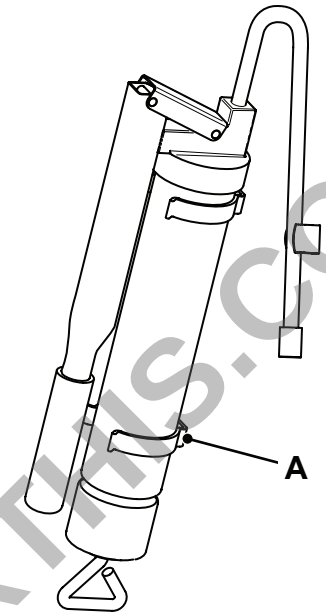


Fig 2.

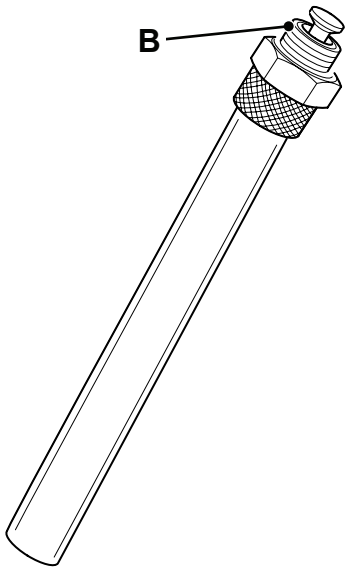


Fig 3.

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Coolant Mixtures

T3-009_3

Check the strength of the coolant mixture at least once a year, preferably at the start of the cold period.

Replace the coolant mixture according to the intervals shown in the machine's Service Schedule.

⚠ WARNING

Antifreeze can be harmful. Obey the manufacturer's instructions when handling full strength or diluted antifreeze.

7-3-4-4_1

You must dilute full strength antifreeze with clean water before use. Use clean water of no more than a moderate hardness (pH value 8.5). If this cannot be obtained, use de-ionized water. For further information advice on water hardness, contact your local water authority.

The correct concentration of antifreeze protects the engine against frost damage in winter and provides year round protection against corrosion.

The protection provided by JCB High Performance Antifreeze and Inhibitor is shown below.

50% Concentration (Standard)

Protects against damage down to -40 °C (-39 °F)

60% Concentration (Extreme Conditions Only)

Protects against damage down to -56 °C (-68 °F)

Important: *Do not exceed a 60% concentration, as the freezing protection provided reduces beyond this point.*

If you use any other brand of antifreeze:

- Ensure that the antifreeze complies with International Specification ASTM D6210.
- Always read and understand the manufacturer's instructions.
- Ensure that a corrosion inhibitor is included. Serious damage to the cooling system can occur if corrosion inhibitors are not used.
- Ensure that the antifreeze is ethylene glycol based and does not use Organic Acid Technology (OAT).

Fuel

Introduction

The quality and grade of fuel can seriously affect the service life of the fuel system. It is vitally important that the correct grade of fuel is used, a high standard of fuel storage is maintained and the use of old fuel is avoided.

The following factors should be used to ensure that the service life of the fuel system is maintained.

- ⇒ *Fuel Specifications (3-25)*
- ⇒ *Cleanliness (3-26)*
- ⇒ *Fuel Bulk Storage (3-27)*
- ⇒ *Fuel Analysis (3-27)*

Fuel Specifications

⚠ CAUTION

Consult your fuel supplier or JCB distributor about the suitability of any fuel you are unsure of.

GEN-9-2

Recommended Fuel Specification

The following fuels are recommended for use with Tier III machines.

- EN590 Diesel Fuel Types - Auto/Co/C1/C2/C3/C4.
- ASTM D975-91 Class 2, US DF1, US DF2, US DFA.
- JIS K2204 (1996) Grades 2, 3, and Special Grade 3.

Acceptable Fuel Specification

The following fuels will require some additional care and service requirements.

⚠ CAUTION

The fuel specification below is acceptable, however this fuel may reduce the life of the fuel injection equipment. The use of this fuel may also affect the engine performance.

GEN-9-3

- ASTM D975-91 Class 1-1DA.
- JP7, MIL T38219 XF63.
- NATO F63.
- French EN590 (RME5) with 5% maximum.
- RME content blended with mineral derived diesel (5% maximum)

Low Sulphur Fuels

Low sulphur fuels must have the appropriate fuel lubricity additives added to prevent premature wear of the pump

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Table 13.

	Expected value A mode		Expected value E mode		Expected value L mode	
	Port G1	Port G2	Port G1	Port G2	Port G1	Port G2
Max engine revs and no services selected	28 - 38 bar	28 - 38 bar	28 - 38 bar	28 - 38 bar	28 - 38 bar	28 - 38 bar
Select and stall boom up	343 bar for 3 seconds then 314 bar for 9 seconds (Repeating)	343 bar for 3 seconds then 314 bar for 9 seconds (Repeating)	314 bar	314 bar	343 bar	343 bar
Select and stall boom down.	294 bar	28 - 38 bar	294 bar	28 - 38 bar	294 bar	28 - 38 bar
Select and stall bucket open	343 bar for 3 seconds then 314 bar for 9 seconds (Repeating)	28 - 38 bar	314 bar	28 -38 bar	343 bar	28 - 38 bar
Select and stall bucket close	343 bar for 3 seconds then 314 bar for 9 seconds (Repeating)	28 - 38 bar	314 bar	28 -38 bar	343 bar	28 - 38 bar
Select and stall dipper in	150 bar	343 bar for 3 seconds then 314 bar for 9 seconds (Repeating)	150 bar	314 bar	150 bar	343 bar
Select and stall dipper out	150 bar	343 bar for 3 seconds then 314 bar for 9 seconds (Repeating)	150 bar	314 bar	150 bar	343 bar
Select and stall slew left	28 - 38 bar	289 bar	28 - 38 bar	289 bar	28 - 38 bar	289 bar
Select and stall slew right	28 - 38 bar	289 bar	28 - 38 bar	289 bar	28 - 38 bar	289 bar
Select and stall left hand track forward	28 - 38 bar	343 bar	28 - 38 bar	343 bar	28 - 38 bar	343 bar
Select and stall left hand track reverse	28 - 38 bar	343 bar	28 - 38 bar	343 bar	28 - 38 bar	343 bar
Select and stall right hand track forward	343 bar	28 - 38 bar	343 bar	28 - 38 bar	343 bar	28 - 38 bar
Select and stall right hand track reverse	343 bar	28 - 38 bar	343 bar	28 - 38 bar	343 bar	28 - 38 bar
Note: *When checking Main Relief Valve (MRV) the engine should be set at maximum rpm. When checking Auxiliary Relief Valves (ARV) the engine should be set at minimum rpm.*						

Note: *28 bar = 406 lb/in², 38 bar = 551 lb/in², 150 bar = 2176 lb/in², 289 bar = 4190.5 lb/in², 314 bar = 4554 lb/in², 343 bar = 4973.5 lb/in²*

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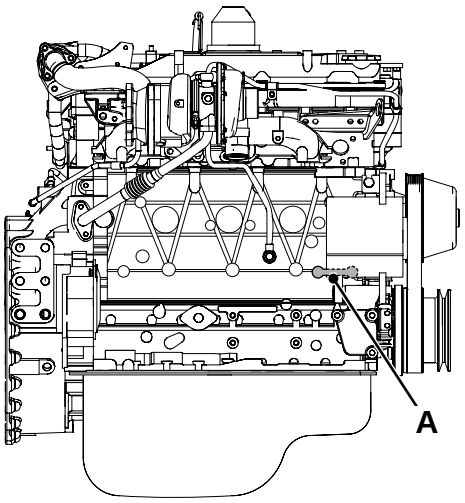
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Component Identification Plates

Typical Engine Identification Number

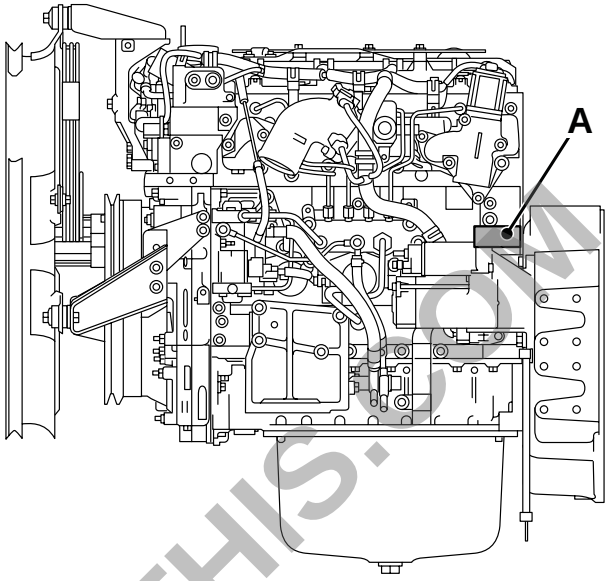
If the engine is replaced by a new one, the data plate serial number will be wrong. Either stamp the new number on the plate or stamp out the old one. This will prevent the wrong number being quoted when you order replacement parts.

The engine number is at **A**.



T016910-1

Fig 6. 4HK



T020840

Fig 7. 4JJ

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JS290 and Variants

Table 9.

Item	Capacity	Fluid/Lubricant	JCB Part No.	Container Size(1)
ENGINE	38 litres (8.4 UK gal) (10.1 US gal)	JCB Engine Oil HP 15W40 -15°C to +40°C (5°F to 104°F)	4001/1505	20 Litres
		JCB Engine Oil HP 10W30 -30°C to +30°C (-22°F to 86°F)	4001/1705	20 Litres
COOLING SYSTEM	38 litres (8.4 UK gal) (10.0 US gal)	JCB HP Coolant ⇒ *Coolant Mixtures (3-25)*	4006/1120	20 Litres
TRACK GEARBOX	2 x 3.5 litres (2 x 0.76 UK gal) (2 x 0.92 US gal)	JCB HD90 Gear Oil	4000/0301	5 Litres
SLEW GEARBOX	16 litres (3.5 UK gal) (4.2 US gal)		4000/0305	20 Litres
TRACK ROLLERS AND IDLER WHEEL				
RECOIL SPRING CYLINDER		JCB Special HP Grease	4003/2017	400g
HYDRAULIC SYSTEM	305 litres (67.1 UK gal) (80.6 US gal)	JCB Hydraulic Fluid HP32 -20°C to +15°C (-4°F to 59°F)	4002/1024	200 Litres
		JCB Hydraulic Fluid HP46 -10°C to +30°C (14°F to 86°F)	4002/0803	
		JCB Hydraulic Fluid HP68 0°C to +40°C (32°F to 104°F)	4002/0701	
SLEW RING		JCB Special HP Grease	4003/2017	400g
- BEARING	--			
- GEAR TEETH	--		4003/2006	12.5kg
ALL OTHER GREASE POINTS	--			
FUEL TANK	650 litres (143.0 UK gal) (171.7 US gal)	⇒ *Fuel System (3-74)*		

(1) For information about the different container sizes that are available (and their part numbers), contact your JCB Dealer.

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Engine One Touch Idle

Operation

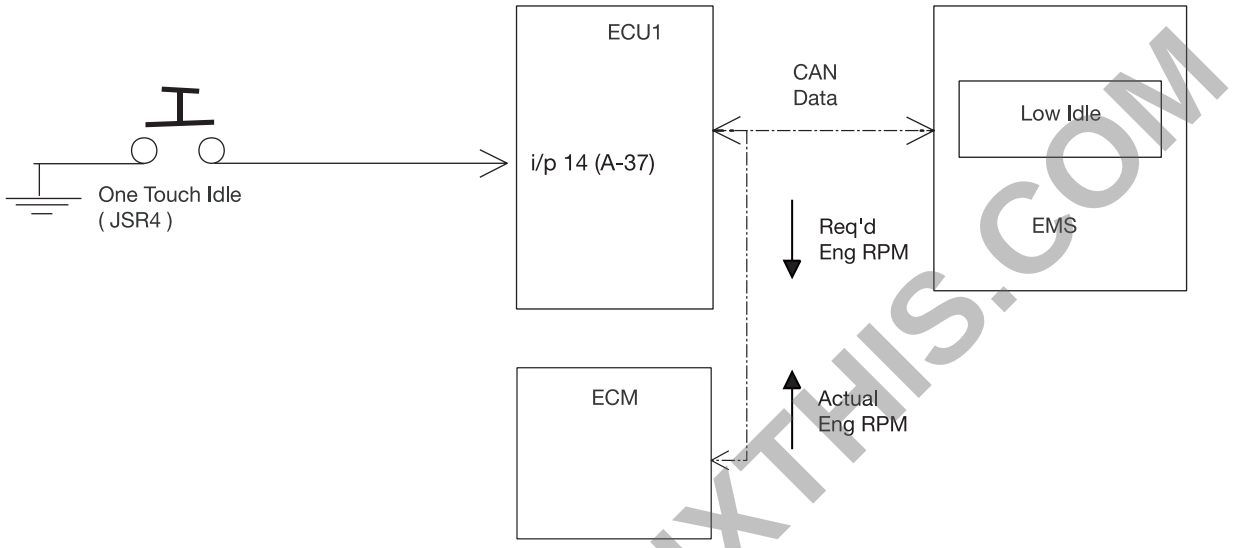


Fig 43.

When one-touch idle is selected via the button on the right hand controller the engine will return to the low idle setting, regardless of any other input, the EMS will display the "LOW IDLE" message to confirm selection.

A second press of this switch will disable the function and the engine revs will return to the setting of the throttle dial.

The status of the one touch idle is retained when switching the ignition off (e.g. If one touch idle is selected and the ignition turned off, when the vehicle is started again one touch idle is automatically activated).

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ECM Setup Tool

Selecting this icon will open the engine control setup tool used for programming ECMs Data can be copied from an old, damaged ECM and then loaded onto a replacement ECM for example.

Injector Checker

Selecting this icon will open the injector checker tool. This tool enables the user to turn each injector on or off as required, for diagnosing injector faults.

Fault Finding Guide Icon

Selecting this icon will open the JS Fault Finding guide which is located on the JCB Service Information Pack DVD, if not installed during Servicemaster 2 set up. This guide gives useful information on test procedures and fault finding on JS hydraulic and electrical systems.

Technical Data

Selecting this icon will open a pdf document containing various JS machine technical data.

Tier 3 Troubleshooting

Selecting this icon will open a pdf document describing the structure and the troubleshooting of electronic control fuel injection systems (common rail type) in 4HK1, 4JJ1 and 6HK1industrial engines (Isuzu T3).

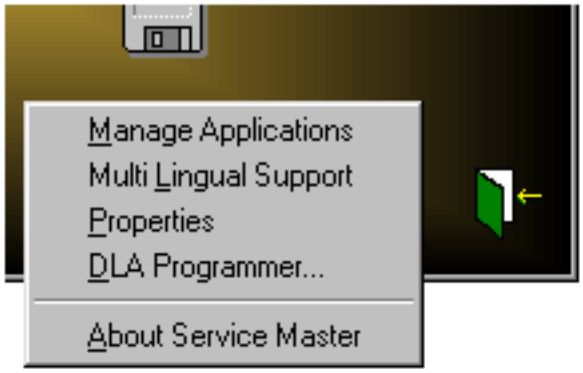
Electrical Error Codes

This shows all electrical error codes sent from the ECU's

System Menus

System menu functions are accessed by pressing the right mouse button anywhere on the main Servicemaster form.

Manage Applications	Opens the configure applications form which allows the user to add, delete, update information relating to the applications supported by product ranges.
Multi Lingual Support	Opens a text editing tool used to control application text strings which can be translated into almost any WINDOWS supported language
DLA Programmer	Opens an application for the reprogramming of the DLA module.
Properties	Used to define various options and settings used by the Servicemaster application.
About Box	Shows software version, date, developers information etc.



357800

Fig 108.

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Engine Harness - Type A

Connector Identification

Table 19.

Item	Connector	Function
1 - 8 ⇨ *Engine Harness `A' (C-216)*		
1	C258	Cab Connector C
2	C271	
3	C254	
4	C251	ECM Main Relay
5	C253	Tech 2
6	C255	Lift Pump Fuse
7	C252	T3 Engine Cab Link
8	C250	
9 - 11 ⇨ *Engine Harness `B' (C-217)*		
9	C257	ECM Engine
10	C256	ECM Engine
11	EH	Earth Header

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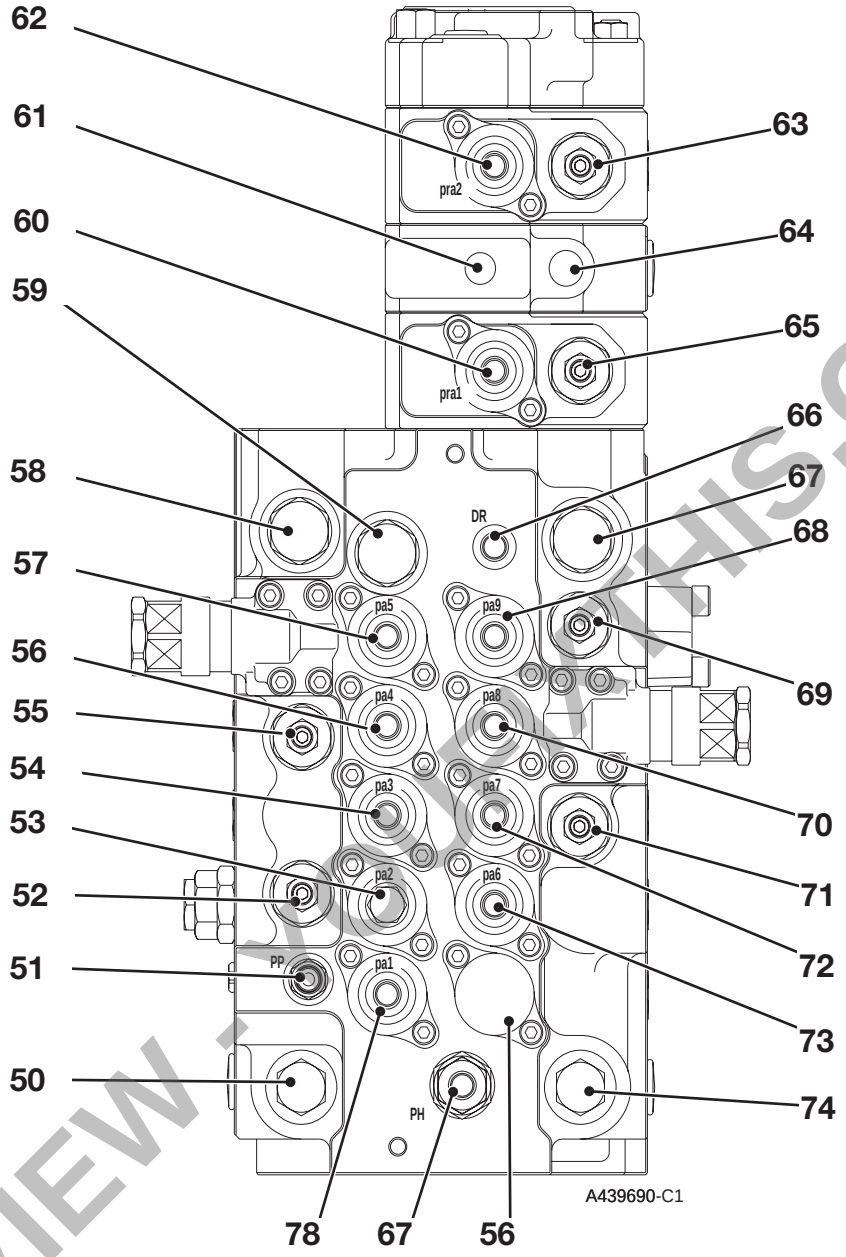


Fig 4. Main Control Valve Viewed from front of machine

⇒ *Table 3. (E-62)*.

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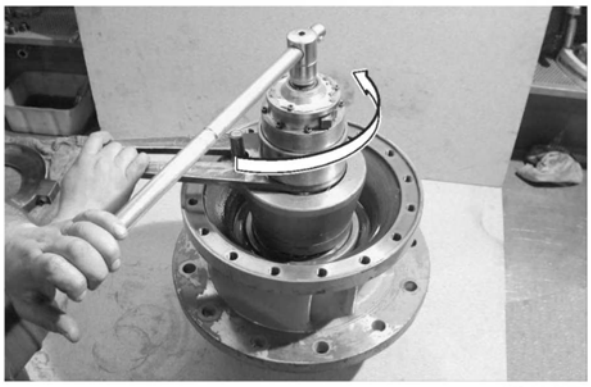
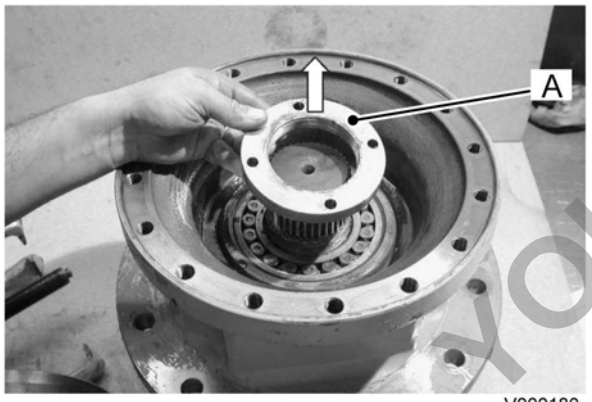

V000170

Fig 10.

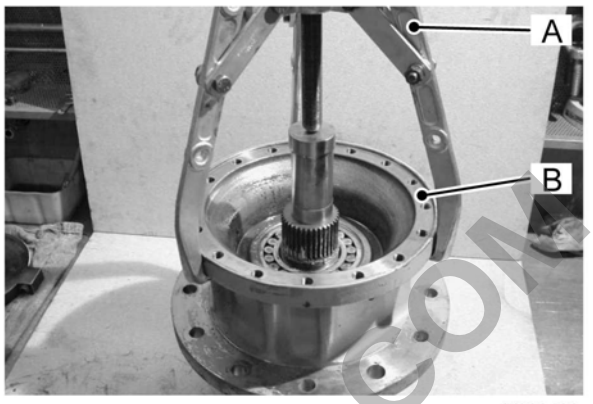
b Remove the ring nut **A**



V000180

Fig 11.

c Attach a puller/extractor **A** to the gearbox housing **B** and apply pressure to separate the pinion shaft and lower bearing from the gearbox housing. After separation, use suitable lifting tackle to raise and remove the gearbox housing.



V000190

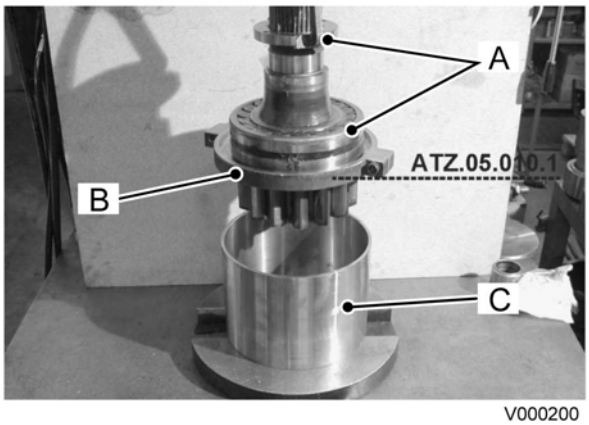
Fig 12.

5 Seperate pinion shaft from bearing.

a Use suitable lifting tackle to raise and suspend the pinion shaft and bearing **A** and fit the collar **B** of separation tool, ***see Service Tools,*** over the pinion and up against the bearing.

b Position the tubular spacer **C** of separation tool, ***see Service Tools,*** beneath the pinion shaft and bearing and lower the pinion shaft and bearing complete with collar onto the spacer.

c Use a press to separate the pinion shaft from the bearing.

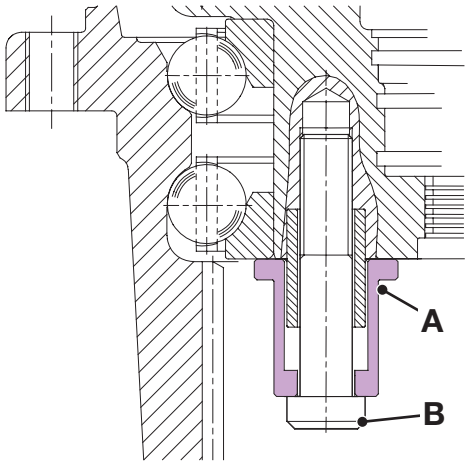


V000200

Fig 13.

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709970-C1

Fig 135.

9 Using a press and a drift **C**, push the bushes **A** against the shoulder inside their seats in the hydraulic motor **B**.

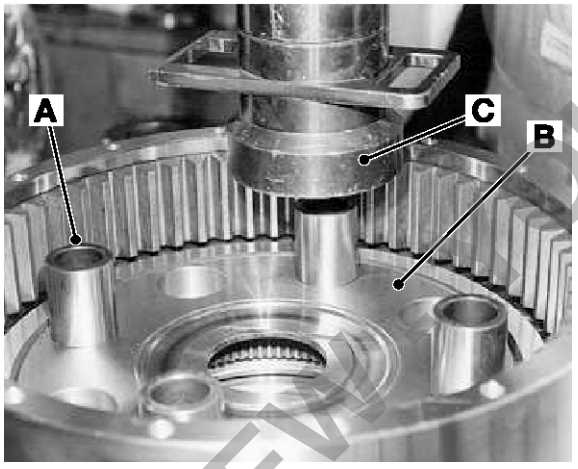


Fig 136.

10 Place the planet assemblies **A** of the third reduction unit into their seats in the hydraulic motor. Using a press **B**, push them against the shoulder inside their seats in the hydraulic motor.

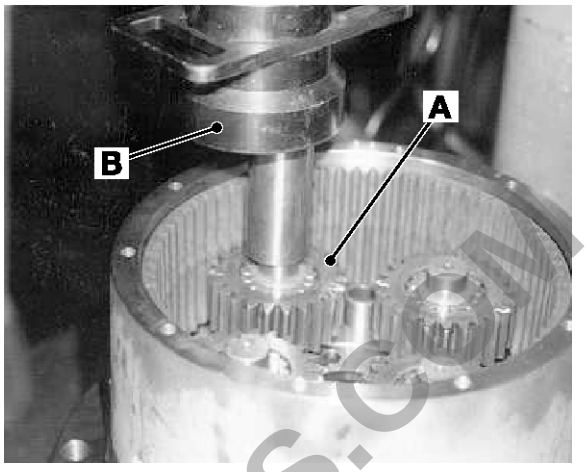


Fig 137.

11 Position the third reduction planet carrier **A** on the hydraulic motor and by using a press **B** push it against the shoulder.

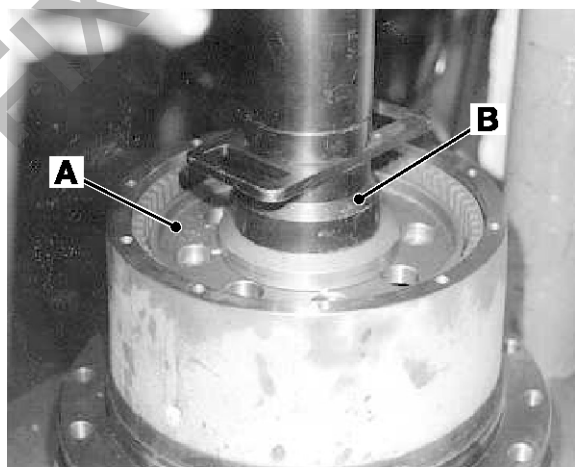


Fig 138.

12 Apply JCB Threadseal on the threads of the four M20 bolts **A** and assembly into the third reduction planet carrier **B** and torque tighten to 585 Nm (431 lb/ft).

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