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Boom Safety Strut (P1)

Note: *If you lift the boom to get access for maintenance, you must install the maintenance strut on the boom.*

Installing

⚠ WARNING

You could be killed or injured if the boom drops while you are working under it. Fit the safety strut as instructed before doing any maintenance work with the boom raised.

Keep people away from the machine while you fit or remove the strut.

5-3-1-2_1

Before installing the safety strut remove any load on the forks and make sure that buckets or attachments are empty.

1 Fully retract the boom (unless it necessary to extend it for maintenance). Lift the boom sufficiently to install the strut.

2 Stop the engine. Make sure the park brake is engaged and the transmission is in neutral. Remove the starter key.

⚠ CAUTION

You will have to climb onto the machine to fit or remove the strut. Take care, especially if the machine is wet. Remove mud and oil before climbing onto the machine. Do not use the exhaust as a handhold. It can burn you.

5-3-1-4_1

3 Remove the strut from its stowage position **A**.

Note: *All possible stowage positions **A** are shown.*

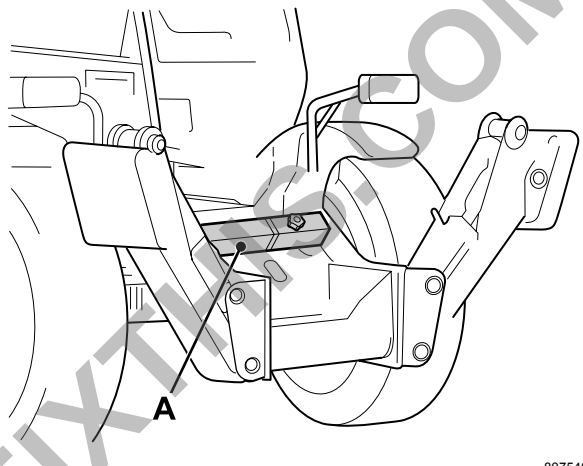
4 Put the strut **B** around the lift ram piston rod. Use the strap to attach it to the ram piston rod.

5 To prevent boom creeping down and causing injury the boom must be lowered onto the strut.

Note: *Lower the boom carefully, to prevent possible damage to the strut. Stop as soon as the weight of the boom is on the strut.*

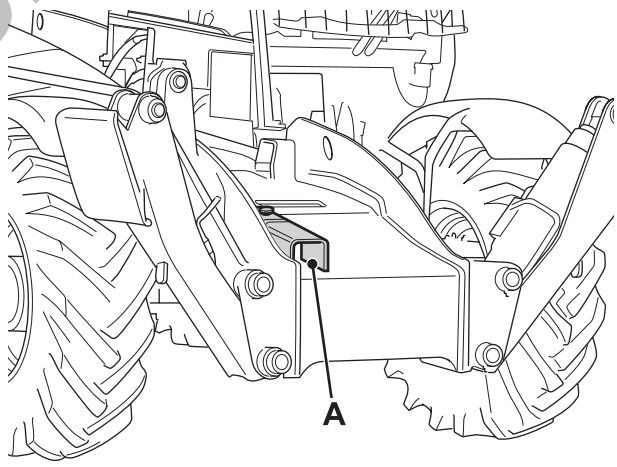
6 Disconnect the battery to prevent accidental operation of the engine.

7 If necessary, put chocks against the two sides of the wheels before you get below the machine.



807540-1

Fig 3.



T012120-2

Fig 4.

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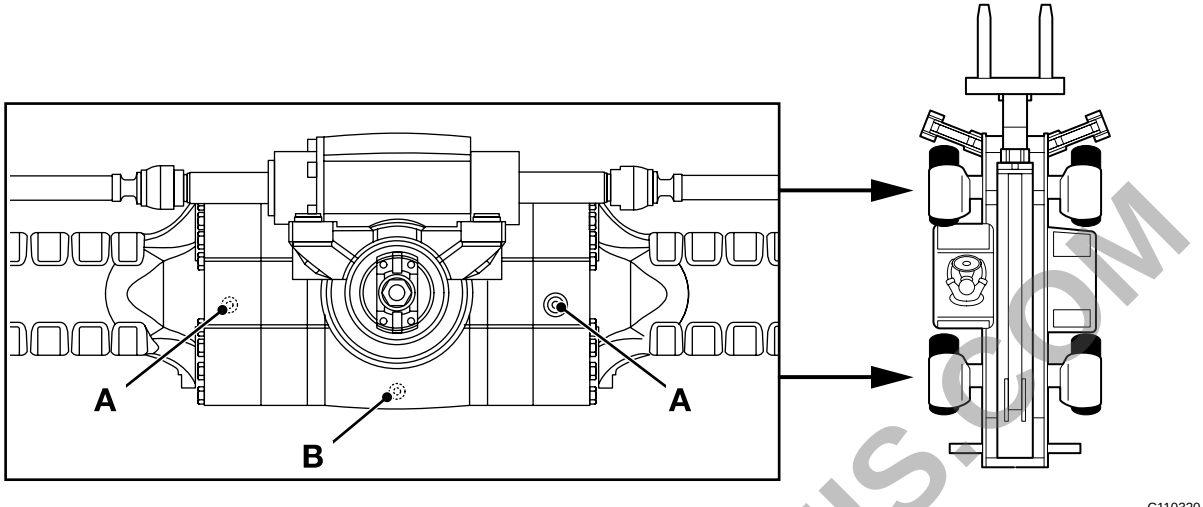


Fig 70. 550-80

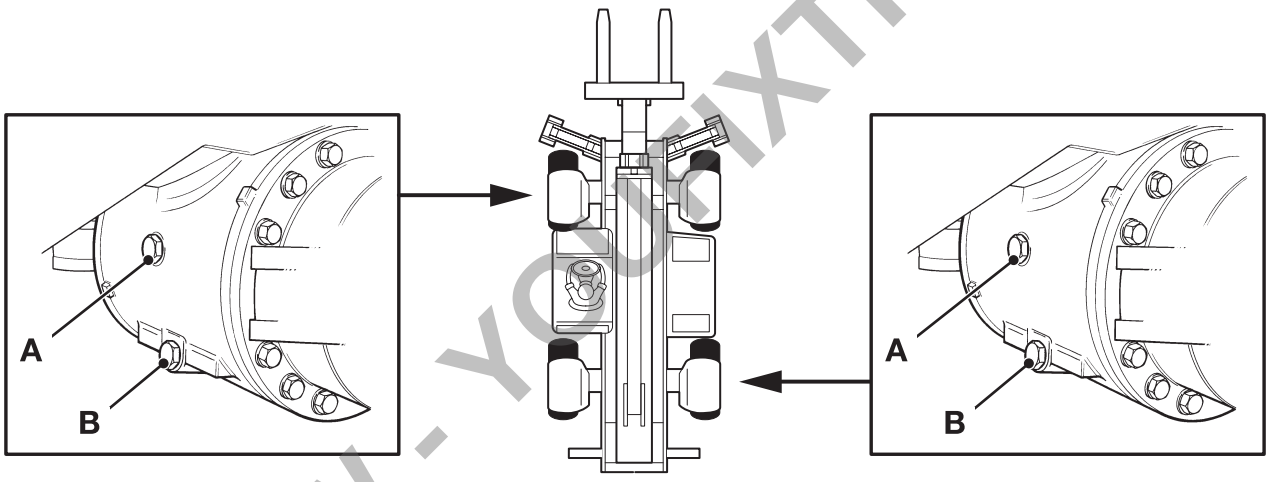


Fig 71. Machines with Powered Track Rods (535-125 HiViz, 535-140 HiViz)

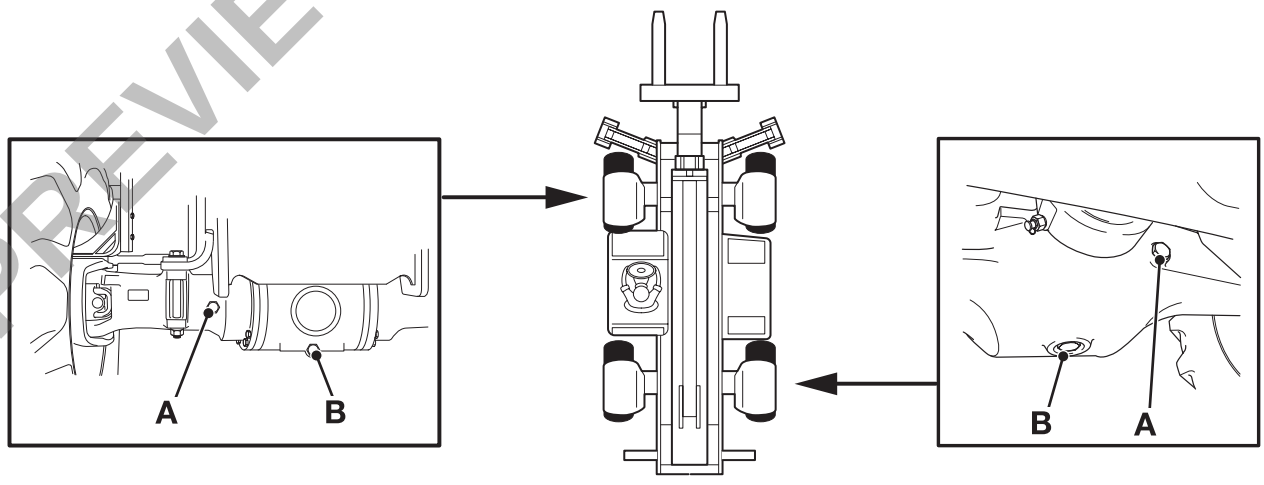


Fig 72. Machines with Powered Track Rods (Other models)

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Electrical Operation and Schematics

.

Key	
A	Secondary Fuse Box A
B	Heater Fan Switch

Key	
C	Heater Connector
D	HVAC Unit

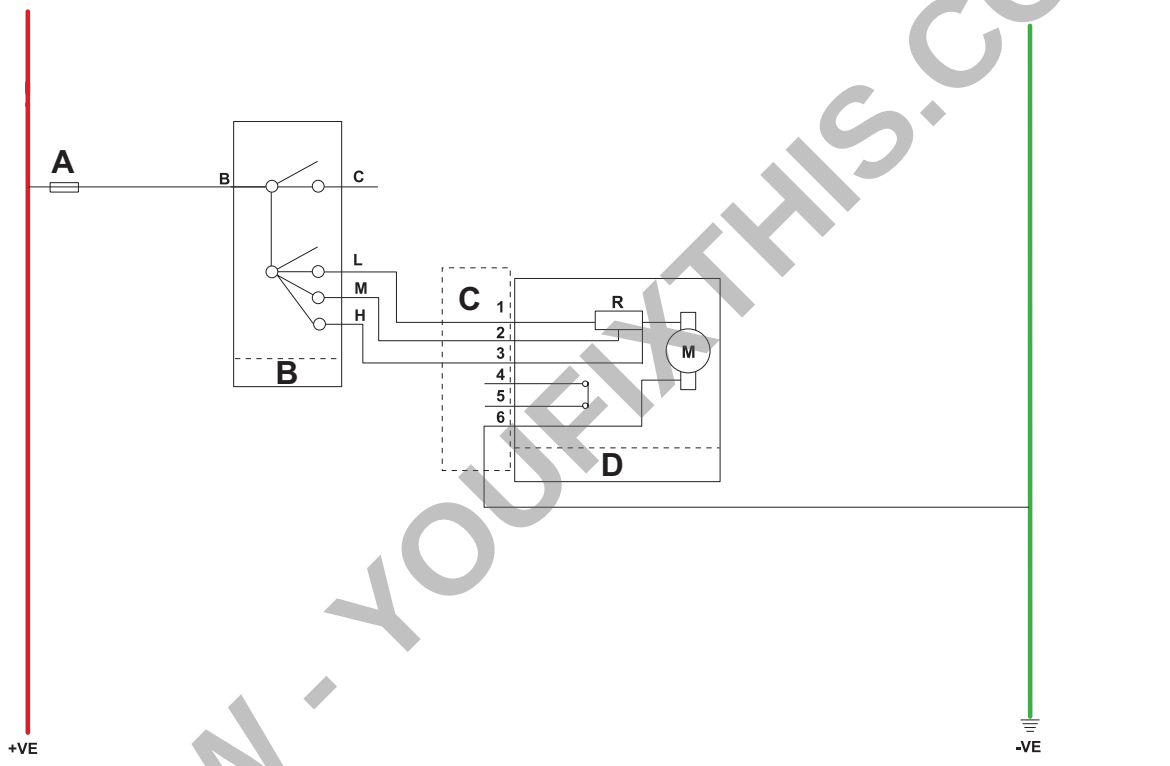


Fig 2.

Note: *The schematic shown is for illustration purposes only. For electrical details of individual devices refer to the Harness Drawings or Electrical Schematics in* ***Section C****.*

⇨ *Related Topics (* B2-2)

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Wiper Motor Front

Removal and Replacement

Removal

1 Remove the front trim panel. Refer to ***Instrument Panels***. ⇨ *Instrument Panels (B6-10)*

2 Disconnect the wiper motor electrical connector **A**

3 Remove the tube **B** at the cab bulkhead adapter.

4 Remove the nuts **C** and pull the wiper arm assembly **D** off the motor shafts.

5 With the aid of one more person hold the wiper motor **E** and at the same time remove the nuts **F**.

6 Remove the wiper motor **E**.

Replacement

Note: *If the wiper motor is defective it must be replaced. It is not possible to repair a defective wiper motor.*

Replacement is the opposite of the removal procedure.

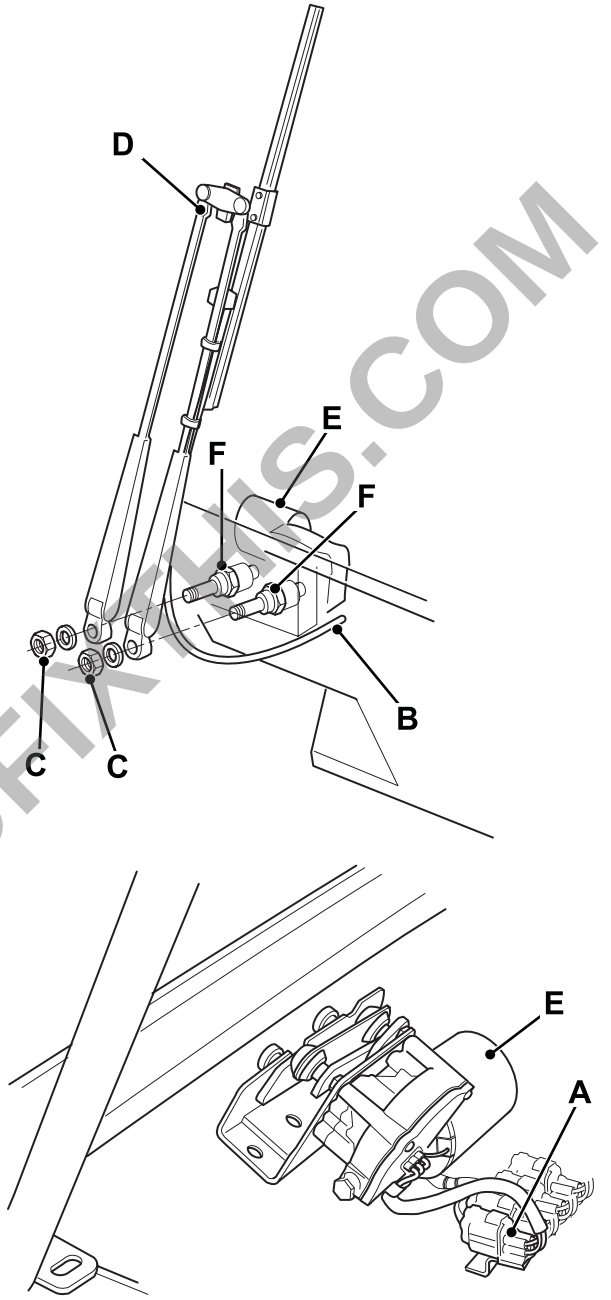


Fig 20.

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Longitudinal Load Moment Indicator Unit

Introduction

This topic contains information about a machine DEVICE. Make sure you are referring to the correct device. Refer to the applications table.

Descriptions and procedures relate to the device and not related systems. For information about the systems refer to the relevant topics.

⇒ *Related Topics (B21-2)*

⇒ *Removal and Replacement (B21-3)*

⇒ *Removal (B21-3)*

⇒ *Replacement (B21-4)*

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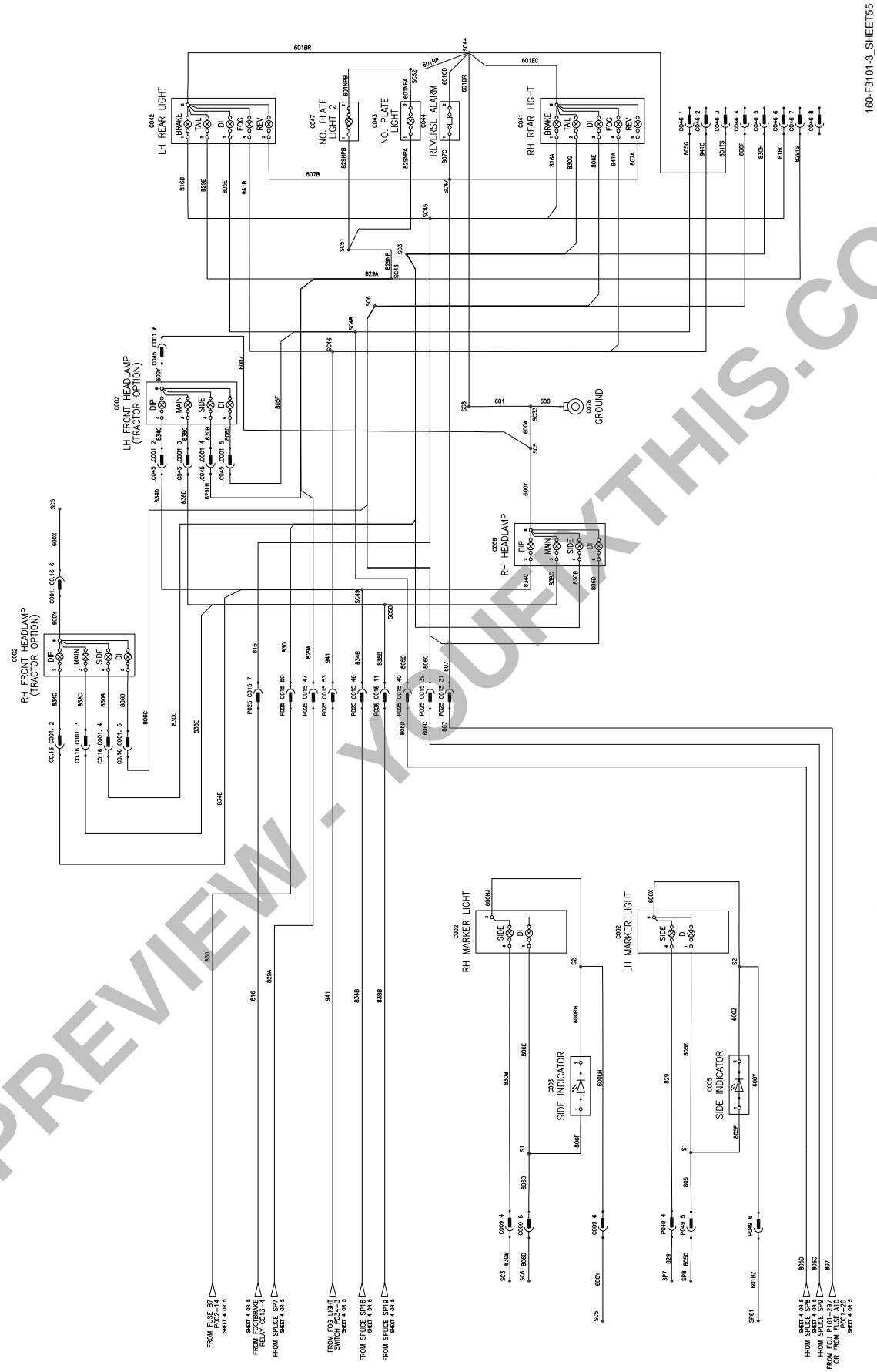
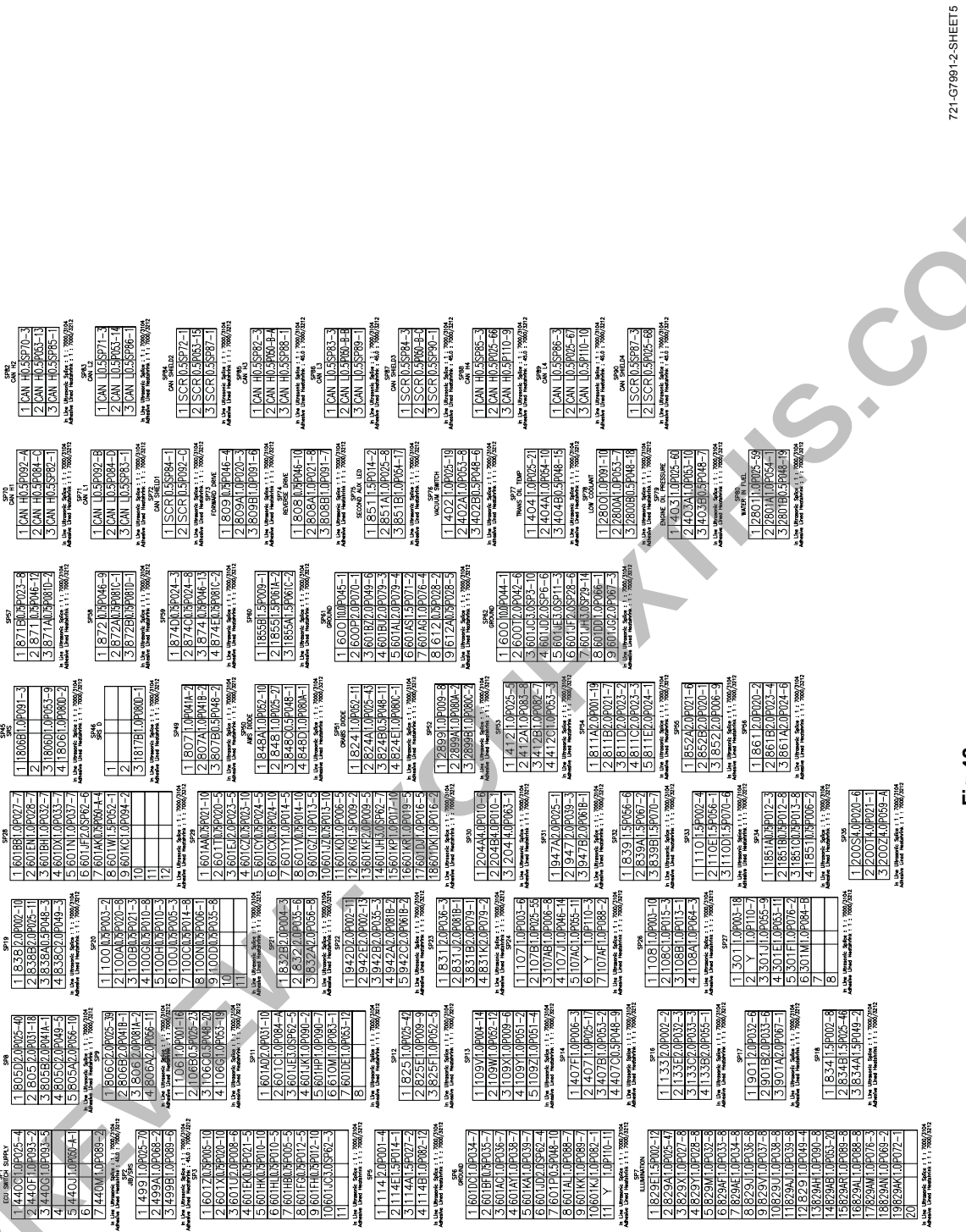


Fig 55. Sheet 55 - Light Variation Including Tractor Light Option

⇒ Component Keys (C2-63) | ⇒ Sheets (C2-4)

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721-G7991-2-SHEET5

Fig 42.

⇒ 721/G7991 Issue 2 (C3-62)

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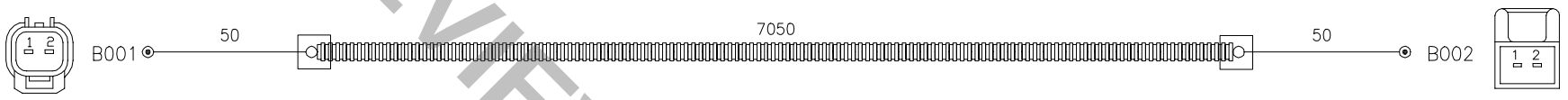
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721/G8199 Issue 1

⇒ *Fig 129. (C3-185)*

Key to Connectors:	
B001	Chassis Harness Connector

B002	Change Over Solenoid Connector



B001
MAIN HARNESS

Cav ID	Tag	Size	Destination
1	851	1.50	B002-1
2	600AE	1.50	B002-2

2 Way HW090 Pin Housing : 1 : 7212/0002
2 Way HW090 Pin Retainer : 1 : 7212/0004

B002
C/O SOLENOID

Cav ID	Tag	Size	Destination
1	851	1.50	B001-1
2	600AE	1.50	B001-2

2 Way Junior Power Timer Housing : 1 : 7212/0013

721-G8199-1-SHEET1

Fig 129.

⇒ *721/G8199 Issue 1 (C3-185)*

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Related Topics

Table 2. Related Topics in This Publication

The table lists other topics in the manual that contain information related to this topic. Refer to the applicable topics to complete your procedures. Where applicable the text in this section contains cross references to this page to help you find the correct information. Some machines have different systems and devices. Make sure you refer to the correct topic, refer to ***Section 1 - Applications***.

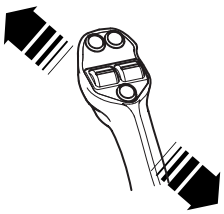
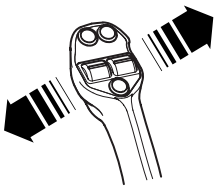
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1	***Service Tools***	ALL
2	ALL (Care and Safety)(1)	ALL
3	***Hydraulic System***	***Checking the Hydraulic Fluid Level***
B	***Applications***	ALL
B	***Longitudinal Load Moment SYSTEM***	ALL
C	***Fuses and Relays***	ALL
C	***Electrical Harness SYSTEM***	ALL
E	***⇒ Systems and Schematics (E1-1)***	ALL
E	***⇒ Parallel Hydraulic SYSTEM (E2-1)***	ALL
E	***⇒ Variable Pump Operation (E31-1)***	ALL
E	***⇒ Variflow Pump Removal and Replacement (E33-1)***	ALL
E	***⇒ Sway/Fan Changeover Valve (E45-1)***	ALL
E	***⇒ Auxiliary Relief Valve (ARV) Operation (E7-1)***	ALL
E	***⇒ Main Relief Valve (MRV)/Load Sense Relief Valve (LSRV) Operation (E8-1)***	ALL
E	***⇒ Pressure Compensator Operation (E9-1)***	ALL
E	***⇒ Parallel Lift Operation (E-60-05) (E10-1)***	ALL
E	***⇒ Universal Hydraulic Circuit Faults (E12-1)***	ALL
E	***⇒ LSP Electro Servo Circuit Faults (E14-1)***	ALL
E	***⇒ Sway Circuit - Bleed Procedure (E51-1)***	ALL
E	***⇒ Smooth Ride SYSTEM (SRS) - Parallel/ Electro Servo (E-05-12) (E19-1)***	ALL
E	***⇒ Electro Servo Control Valve (E-06-33) (E25-1)***	ALL
E	***⇒ Pilot Pressure Supply Valve (E-10-17) (E27-1)***	ALL
E	Hydraulic Cooling Fan Motor - Fixed	ALL
E	***Electro Servo Control Lever***	ALL
E	***⇒ Hydraulic Oil Cooler By-Pass SYSTEM (E46-1)***	ALL

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Electro Servo Control Lever

The control lever **1** operates in two axis. It also includes two thumbwheel switches.

	Control Mode	Control System	Actuation
	Control lever - AXIS One	Proportional analogue electrical signal	Hydraulic control ECU via CAN message from the powerbase ECU
	Control lever - AXIS Two	Proportional analogue electrical signal	Hydraulic control ECU via CAN message from the powerbase ECU
	Thumbwheel One	Proportional analogue electrical signal	Hydraulic control ECU via CAN message from the powerbase ECU
	Thumbwheel Two	Proportional analogue electrical signal	Hydraulic control ECU via CAN message from the powerbase ECU

Note: *The control lever also incorporates switches for transmission control. Refer to* ***Section F****.* ⇨ ***Related Topics (E5-2)***

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Main Relief Valve (MRV)

The main relief valve is not serviceable. Replace the complete valve if it is defective.

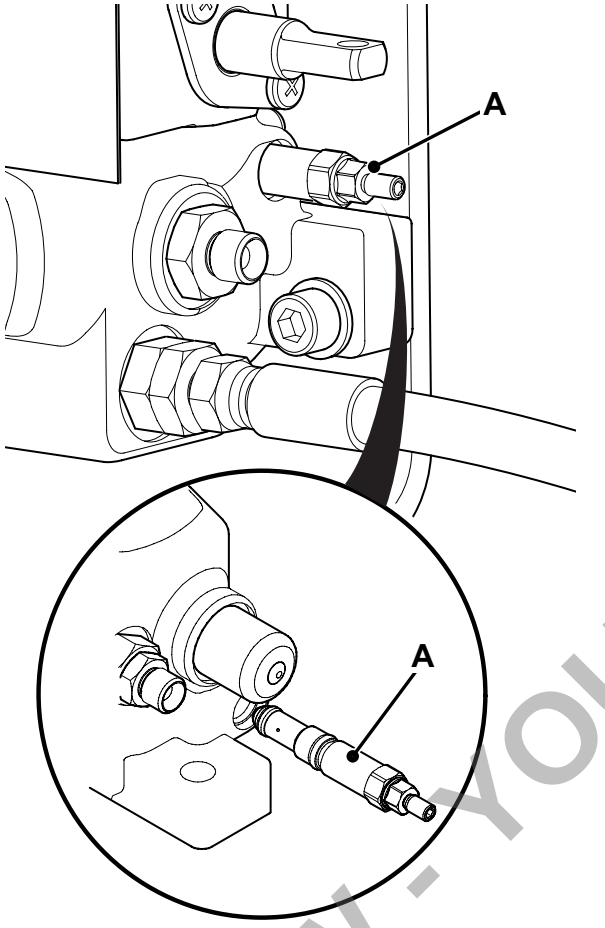


Fig 5.

Removal

1 Remove the valve assembly **A** from the valve block.

2 Remove the 'O' rings.

Note: *When removing 'O' Rings and seals, use a rounded tool that will not cause any damage to the seal grooves. Discard all 'O' Rings. Do not use worn or damaged items.*

Replacement

Replacement is the opposite of the removal procedure.

During the replacement procedure do this work also:

- Replace all 'O' rings.
- Lubricate the parts with JCB Hydraulic Fluid before assembling.
- Torque tighten the valve. ⇨ *Table 3. Torque Settings (E23-8)*
- Adjust the pressure setting as required.

Table 3. Torque Settings

Item	Nm	kgf m	lbf ft
A	20	2	14.7

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Removal and Replacement - Single Ram (P2)

⇨ *Fig 2. (E40-6)*

IMPORTANT: This procedure is only applicable to some machine models. Refer to the table at the front of this topic for the applicable machine models. ⇨ *Table 1. Procedure Variants (E40-1)*

Removal

1 Park the machine and make it safe. Vent the hydraulic pressure. Obey the care and safety procedures. ⇨ *Related Topics (E40-2)*

2 Remove the lift ram. ⇨ *Related Topics (E40-2)*.

WARNING

Hydraulic Pressure

Hydraulic fluid at system pressure can injure you. Before connecting or removing any hydraulic hose, residual hydraulic pressure trapped in the service hose line must be vented. Make sure the hose service line has been vented before connecting or removing hoses. Make sure the engine cannot be started while the hoses are open.

INT-3-1-11_2

3 Support the boom.

4 Lift the boom using the correct lifting equipment to get access to the displacement ram top pivot.

5 Put a label on each hose before disconnecting to help identification when replacing.

6 Disconnect and plug displacement ram hydraulic hoses **A**.

7 Support the displacement ram **F**.

WARNING

This component is heavy. It must only be removed or handled using a suitable lifting method and device.

BF-4-1_1

8 Remove the lock bolt **B** and remove the pivot pin **C** from rod end. Use the slide hammer kit, see ***Section 1 - Service Tools***. ⇨ *Related Topics (E40-2)*

9 Remove the lock bolt **D** and remove the pivot pin **E** from cylinder end. Use the slide hammer kit, see ***Section 1 - Service Tools***. ⇨ *Related Topics (E40-2)*

10 Remove ram from the machine.

Replacement

Replacement is opposite of the removal procedure.

During the replacement procedure do this work also:

– Grease the ram pivot pins. ⇨ *Related Topics (E40-2)*
– Check the hydraulic fluid level. ⇨ *Related Topics (E40-2)*

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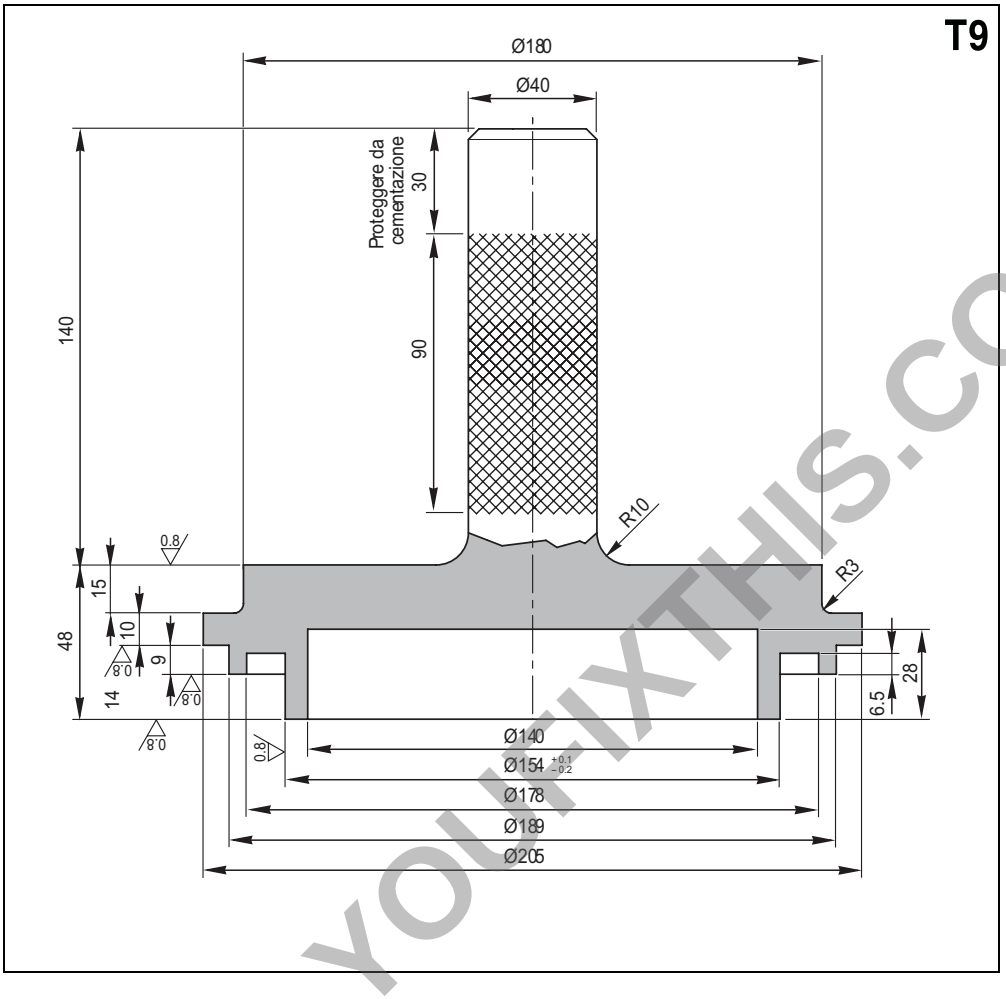
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P025900-C2

Fig 7.

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Related Topics

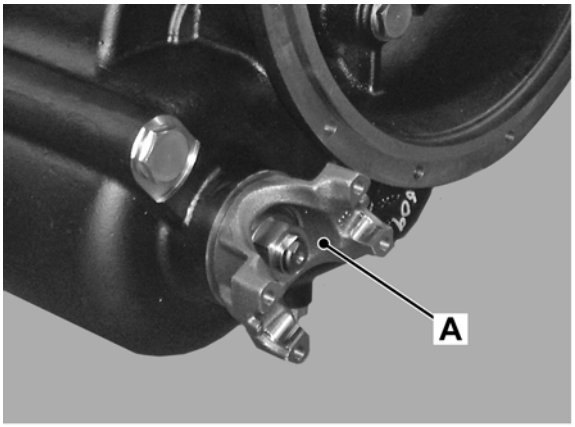
Table 1. Related Topics in This Publication

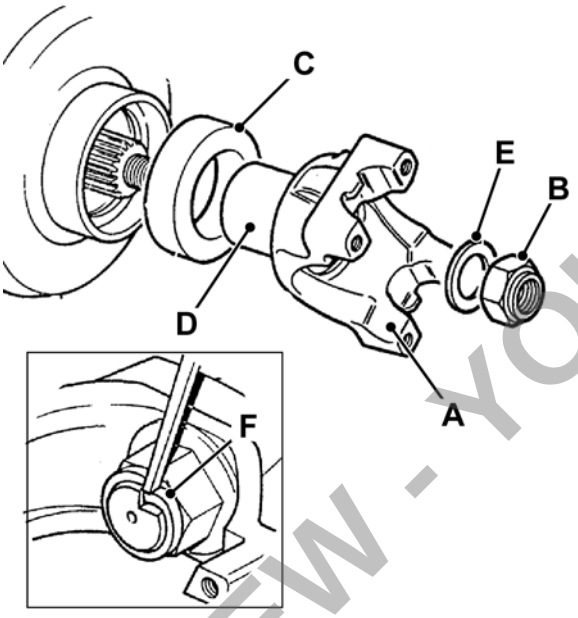
The table lists other topics in the manual that contain information related to this topic.	
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Generic Procedures	
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4 Wheel Drive Yoke and Oil Seal - Removal and Replacement





C088910

Fig 5.

Removal

1 Bend back the stake nut locking ring **F**.

2 Clean the area around the yoke **A**. Do not allow particles of grit to fall into the gearbox

3 Using service tool 892/00812 hold the yoke **A** and at the same time undo the nut **B**. The nut is very tight, the help of an assistant will be required. Discard the nut.

4 Remove the yoke **A**.

5 Remove washer **E**.

6 If necessary remove the oil seal **C**. Do not damage the seal housing.

Replacement

1 Make sure that the oil seal interface **D** on the yoke is clean and free from wear or damage.

2 If necessary fit a new oil seal **C**.

3 Apply JCB HP grease to the lips of oil seal **C**.

4 Fit the yoke **A**.

5 Fit washer **E**.

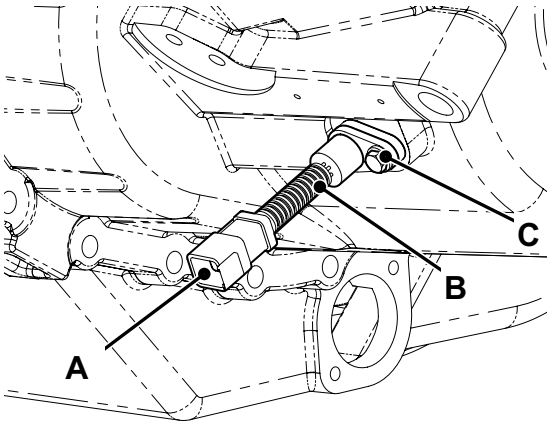
6 Fit a NEW stake nut **B**. Torque tighten to 400 Nm (296 lbf ft).

7 Stake the nut to the shaft using a square ended staking tool, as shown at **F**.

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Removal and Replacement



C106990-C1

Fig 3.

Removal

1 Park the machine and make it safe. Obey the care and safety procedures. ⇒ *Related Topics (F26-2)*

2 Disconnect the speed sensor electrical connector **A**.

3 Remove the sensor securing screw **C**.

4 Remove the speed sensor **B** from the housing.

Replacement

Replacement is the opposite of the removal procedure.

During the replacement procedure do this work also:

– Check the condition of the sealing ‘O’ ring. If the ‘O’ ring is damaged replace it with a new one.
– Apply locking fluid to the threads of the securing screw **C**.

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Removal and Replacement

Removal

1 Park the machine and make it safe. Obey the care and safety procedures. ⇨ *Related Topics (G7-2)*

2 Put chocks under the wheels. Release the park brake.

3 Remove the rubber gaiter **A**.

4 Disconnect the electrical connector **C** from the switch connector **D**.

5 Hold the switch **B** and remove screw **E**.

6 Remove the switch **B**.

Replacement

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

– To align the switch correctly, engage the switch location dowel **F** with hole in the mounting bracket **G**.

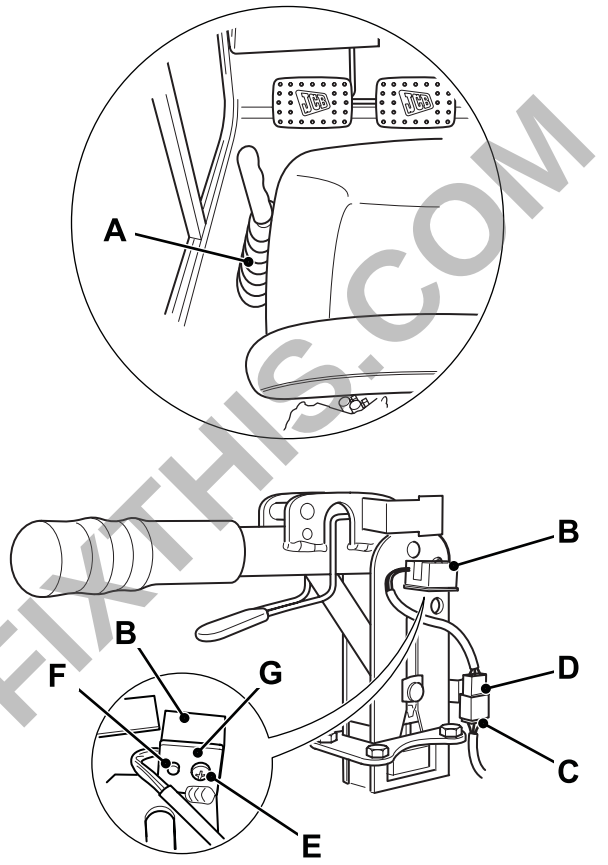
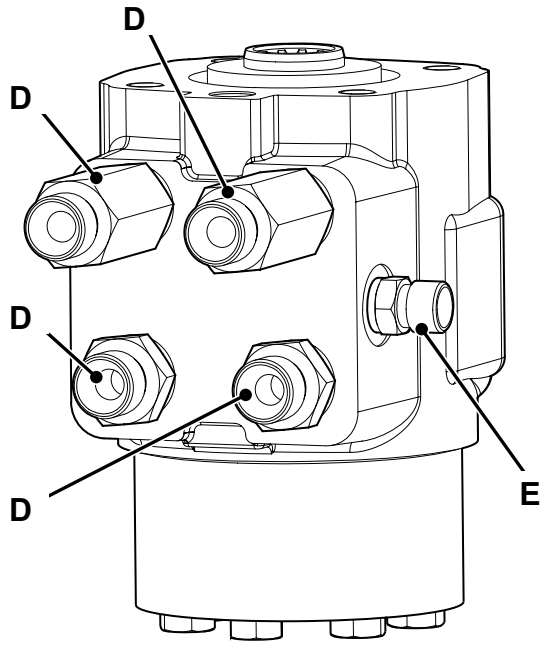


Fig 1.

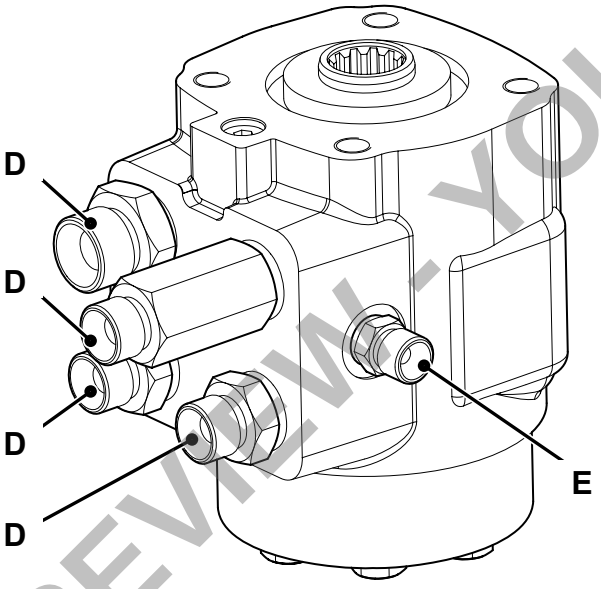
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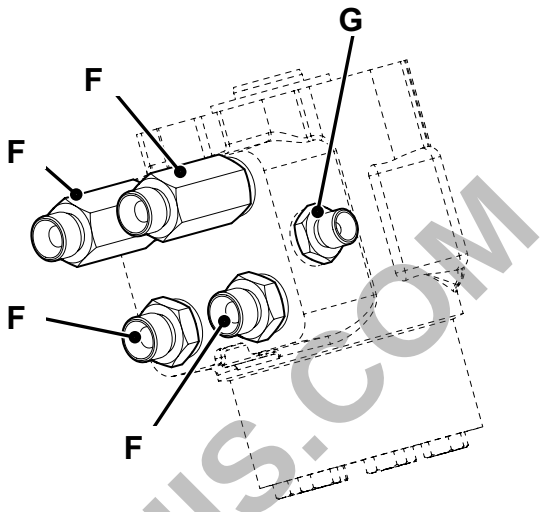
C106180

Fig 11. 540-140 and 550-140 machines



C106190

Fig 12. 540-170, 550-170 and 540-200 machines



C106200

Fig 13. 535-125 HiViz and 535-140 HiViz Machines

Table 6. Torque Settings

Item	Nm	kgf m	lbf ft
C	45	4.6	33
D	77	7.8	56.7
E	22	2.2	16.2
F	48	4.9	35.5
G	14	1.4	10.3

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10 Loosen the locknut **R** on the cooling pack stabiliser bar **S** and lift the bar from the bracket.

11 Support the cooling pack assembly, unscrew bolts from positions **N** and carefully lift the assembly away from the machine.

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Fault Code Display (S1)

Depending on the machine specification fault codes recorded by the engine ECU can be accessed and displayed in several ways:

CAN Enabled Display

The machine may be equipped with a CAN enabled display. Such a display will be capable of displaying all recorded codes, for example **E127**. All logged codes will be displayed. The operator may also have a facility to erase the fault code log. See the applicable machine documentation for further information.

Malfunction Indicator Light (MIL)



Amber/Red light. The MIL light comes on to show that a system error has been detected.

- Red light. The light comes ON (and a continuous audible alarm sounds) to indicate faults that may result in serious damage to the machine or make the machine dangerous to operate. This is known as a 'STOP NOW' fault.
- Amber light. The light comes ON (and a audible alarm sounds for one second) to indicate faults that may result in reduced machine performance but are not dangerous. They are unlikely to damage the machine. This is known as a 'SERVICE' fault.

When the MIL light comes on other applicable system warning can come on. These lights can show a blink code. ⇨ *Blink Codes (M3-27)*

Blink Codes

Some machine systems are equipped with a dedicated indicator light. If there is a system fault the light can display fault codes as a series of blinks.

For example code **E127** can be displayed as a series of blinks as follows:

1	Blink						
2 second delay							
2	Blink	Blink					
2 second delay							
7	Blink	Blink	Blink	Blink	Blink	Blink	Blink

The light will be ON for approximately 1 second and OFF for approximately 0.5 seconds. There is an OFF time of approximately 2 seconds between error code digits.

When a blink code is displayed the MIL light can also come on. ⇨ *Malfunction Indicator Light (MIL) (M3-27)*

Refer to the applicable system topic for details about the related blink codes.

CANbus Connected Computer

Error codes logged can be accessed via a suitable laptop computer running the applicable diagnostics software. The computer must be connected to the machine CANbus socket using a data link adapter (DLA). Once connected all recorded codes can be displayed, for example **E127**. The engineer also has a facility to erase the fault code log.

Fault Code Log

The monitoring system electronic control unit (ECU) incorporates a 'data logging' feature for recording fault codes.

The log enters the fault code together with the current time and date.

The fault code log can be read on the LCD. Alternatively use the JCB diagnostics tool.

Reading the Fault Code Log on the LCD

The machine graphical user interface (GUI) is one of two types:

- When centre LCD panel is present it is used to display the fault code log. *Fig 1. (M3-28)*
- When centre LCD panel is not present the fault code log is displayed on LMS LCD panel. *Fig 2. (M3-28)*

1 Operate the info button **4** with quick presses (less than 2 seconds) until the 'time until next service' is displayed.

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JCB 4.4L Tier 3 SE Engine Setup - User Guide

For the Engine Setup tool user guide refer to the ***JCB Dieselmax Engine Service Manual publication number 9806/3030***. ⇨ *Related Topics (M7-2)*

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