Service Manual

530-70, 530-110

Section 1 - General Information

Section 2 - Operator's Manual

Section B - Body and Framework

Section C - Electrics

Section E - Hydraulics

Section F - Transmission

Section G - Brakes

Section H - Steering

Section K - Engine



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Publication No.
9813/3850-2



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Issued by JCB Technical Publications, JCB Aftermarket Training, Woodseat, Rocester, Staffordshire, ST14 5BW, England. Tel +44 1889 591300 Fax +44 1889 591400

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Safety

Introduction

In this manual and on the machine there are safety notices.

The safety notices have different signal words as follows:

- DANGER
- WARNING
- CAUTION
- Notice

For an explanation of the safety notice signal words, refer to ***Section 2, Introduction, Safety***.

For general safety notices, refer to ***Section 2, Introduction, Safety Check List***.

For maintenance safety notices, refer to ***Section 2, Routine Maintenance, Health and Safety***.

For safety notices specific to maintenance procedures, refer to the relevant procedure.

If you do not fully understand a safety notice ask your employer to explain it.

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Introduction
About this Manual

Model and Serial Number

This manual provides information for the following model(s) in the JCB machine range:

Model	From:	To:
530-70	01917406	01918306
530-110	01917406	01918306

Using the Manual

This operator's manual is arranged to give you a good understanding of the product and its safe operation. It also contains maintenance and technical data.

Read this manual from the front to the back before you use the product for the first time, even if you have used machines of a similar/same type before as the technical specification, systems and controls of the machine may have changed. Particular attention must be given to all the safety aspects of operating and maintaining the product.

If there is anything you are not sure about, ask your JCB dealer or employer. Do not guess, you or others could be killed or seriously injured.

The general and specific warnings in this section are repeated throughout the manual. Read all the safety statements regularly, so you do not forget them. Remember that the best operators are the safest operators.

The illustrations in this manual are for guidance only. Where the machines are different, the text and or the illustration will specify.

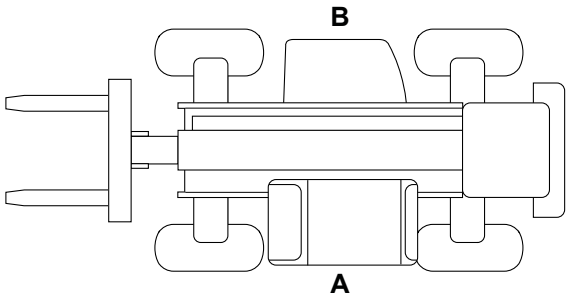
The manufacturer's policy is one of continuous improvement. The right to change the specification of the product without notice is reserved. No responsibility will be accepted for discrepancies which may occur between specifications of the product and the descriptions contained in this manual.

All of the optional equipment included in this manual may not be available in all territories

Left-Hand Side, Right-Hand Side

In this manual, 'left' and 'right' mean your left and right when you are seated correctly in the machine.

Figure 1.



A Left
B Right

Cab/Canopy

This manual frequently makes references to the cab. For example, 'do not operate the machine without an operator's manual in the cab'. These statements also apply to canopy build machines.

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Section C

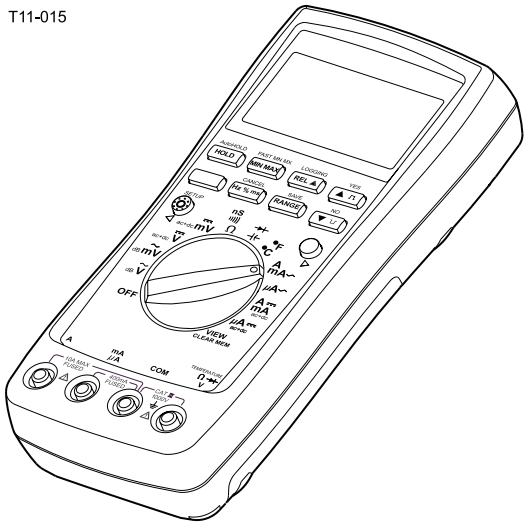


Fig 17. 892/00298 Fluke Meter

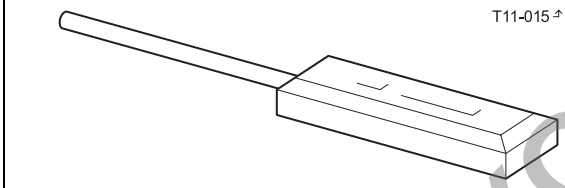


Fig 18. 892/00285 Hydraulic Temperature Probe

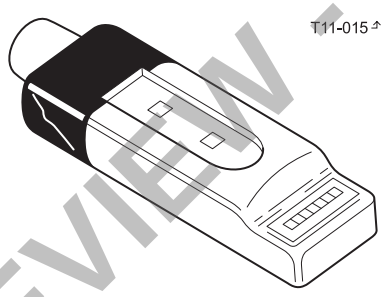


Fig 19. 892/00284 Venture Microtach Digital Tachometer

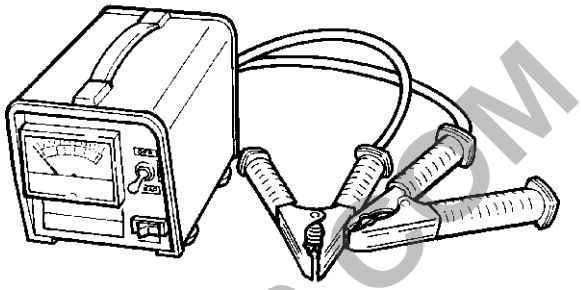


Fig 20. 993/85700 Battery Tester

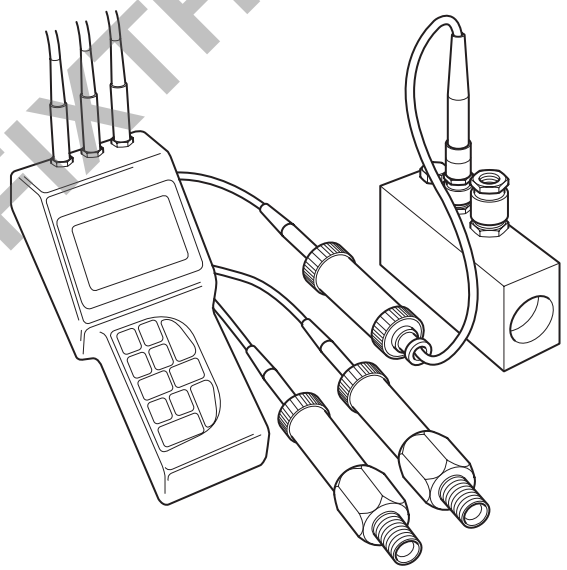


Fig 21. 998/11051 Digital Pressure Test Set

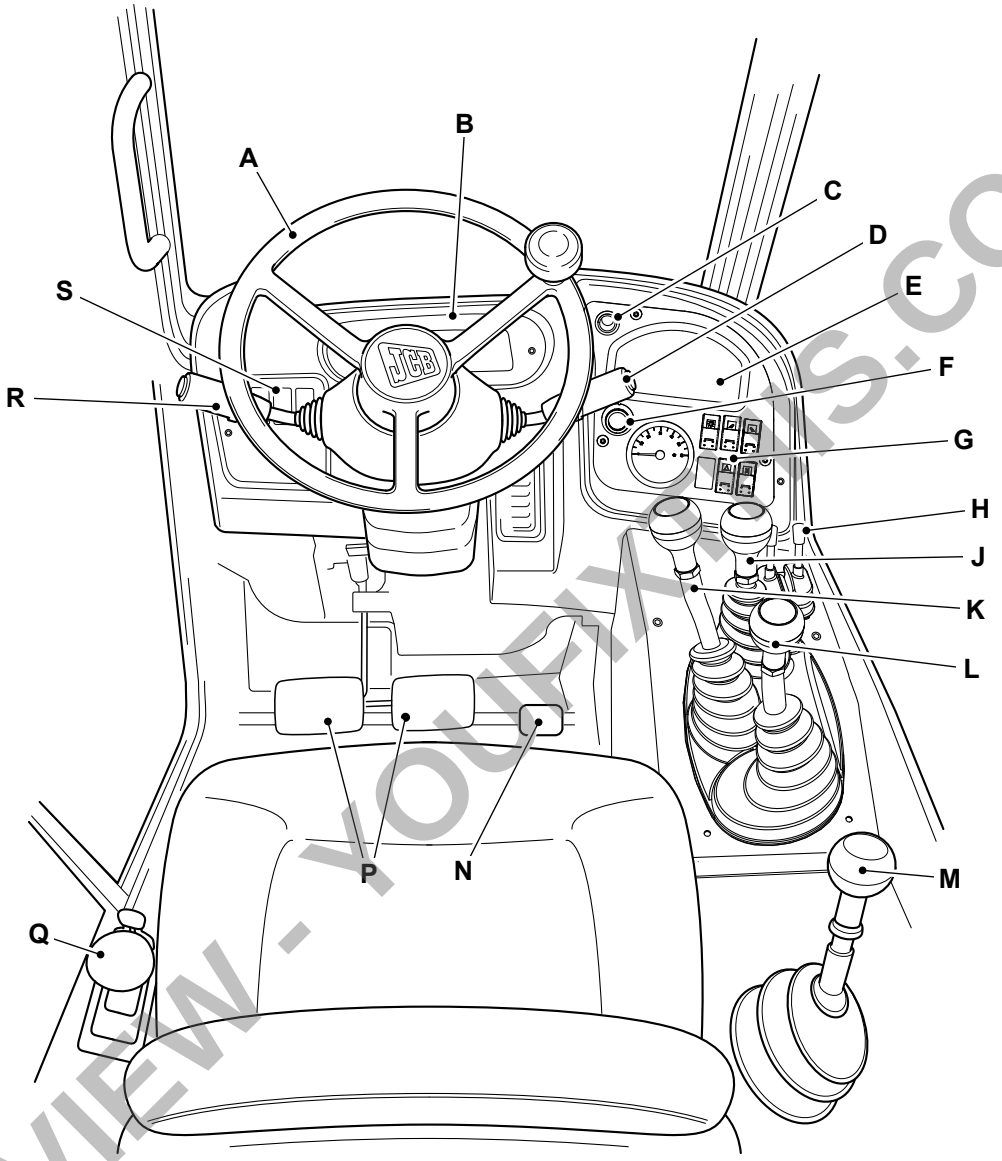
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Operator Station

Component Locations

Figure 11.



A Steering wheelRefer to: Operation > Drive Controls (Page 50).
B Warning clusterRefer to: Operation > Instruments (Page 53).
C Auxiliary socket
D Multi-purpose switch Refer to: Operation > Drive Controls (Page 50).
E Instrument panelRefer to: Operation > Instruments (Page 53).
F Ignition switchRefer to: About the Product > Interior Switches (Page 20).
G Console switchesRefer to: About the Product > Console Switches (Page 18).
H Stabiliser controlsRefer to: Operation > Operating Levers/Pedals (Page 57).
J Carriage controls Refer to: Operation > Operating Levers/Pedals (Page 57).
K Boom controlsRefer to: Operation > Operating Levers/Pedals (Page 57).
L Auxiliary controlsRefer to: Operation > Operating Levers/Pedals (Page 57).
M Gear leverRefer to: Operation > Drive Controls (Page 50).
N Accelerator pedalRefer to: Operation > Drive Controls (Page 50).
P Service brake pedalRefer to: Operation > Drive Controls (Page 50).
Q Park brakeRefer to: Operation > Drive Controls (Page 50).
R Transmission lever and gear selectionRefer to: Operation > Drive Controls (Page 50).
S Console switchesRefer to: About the Product > Console Switches (Page 18).

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Table 11. Safety Labels

Item	Part No.	Description	Qty.
A	817/70011	Fall from raised attachment. Do not stand or ride on the bucket or forks.	1
B	334/Y5240	Do not sit here.	1

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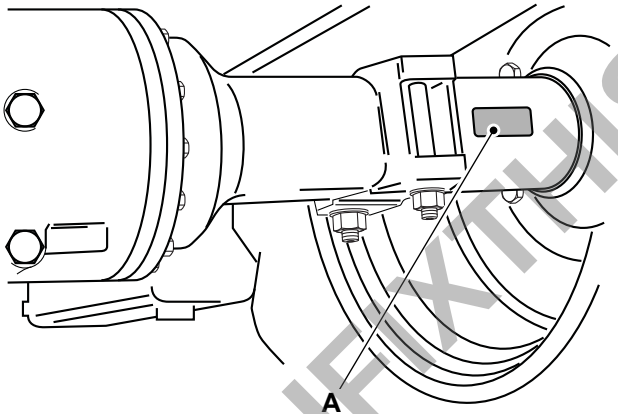
Digit	Explanation
12-16	Engine serial number
17-18	Year of manufacture

The country of manufacturer, engine serial number and year of manufacture of the engine are also stamped on the cylinder block. Refer to Figure 5.

Axle

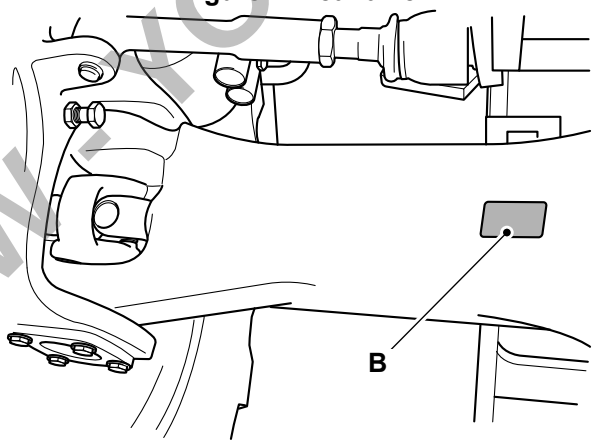
The axles have a serial number stamped on a data plate as shown.

Figure 6. Front axle



A Data plate - front axle

Figure 7. Rear axle



B Data plate - rear axle

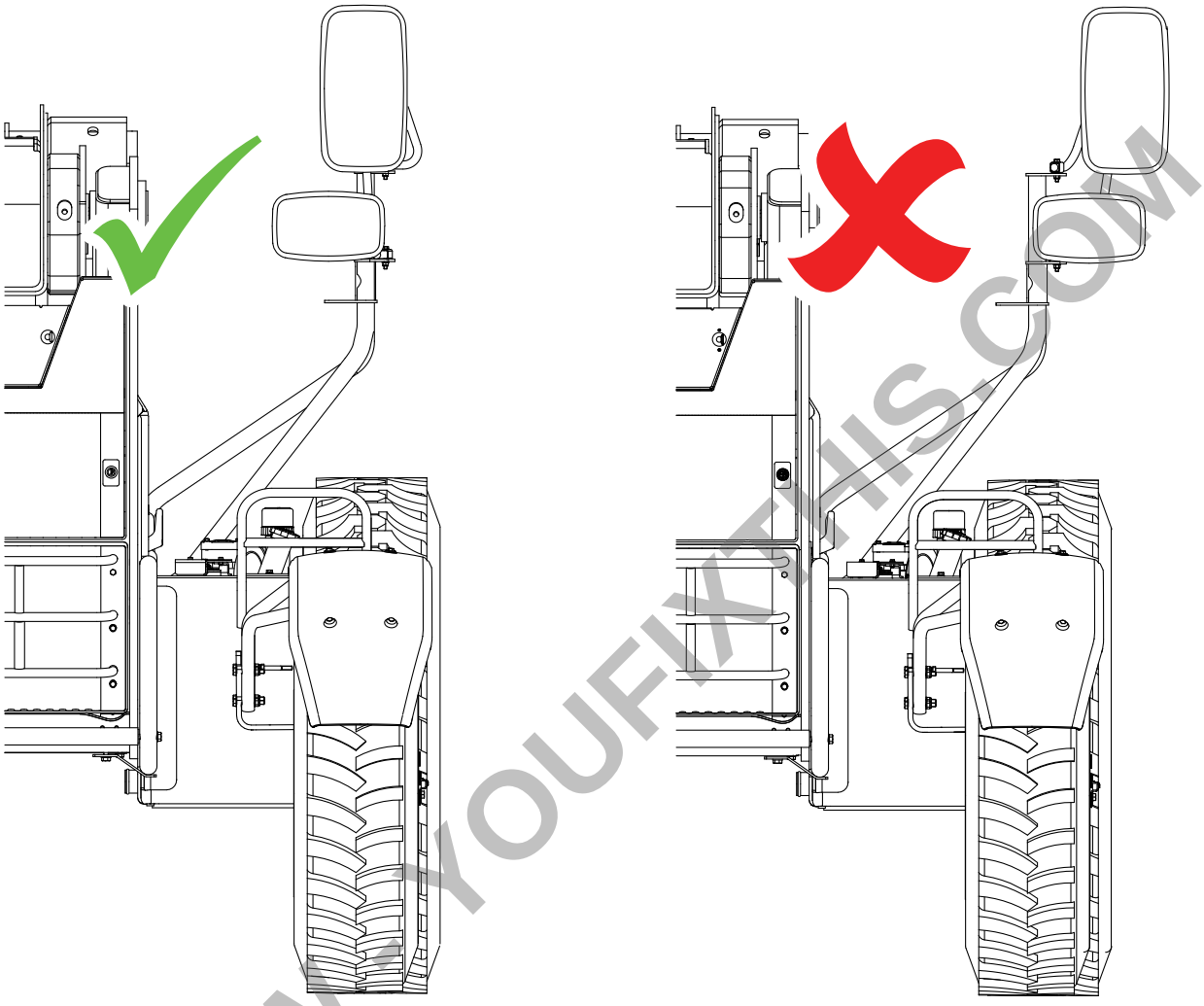
Gearbox

The gearbox has a serial number stamped on a data plate as shown.

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Figure 28.



2. Adjust the seat to suit the operator.
   Refer to: Operation > Operator Seat (Page 36).
3. Adjust the mirror(s) to suit your specific working requirements before you drive or operate the machine.
4. Check the field of vision.
   Refer to: Technical Data > Static Dimensions > Visibility Diagrams (Page 176).

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Circuit Schematics

Electrical Circuit

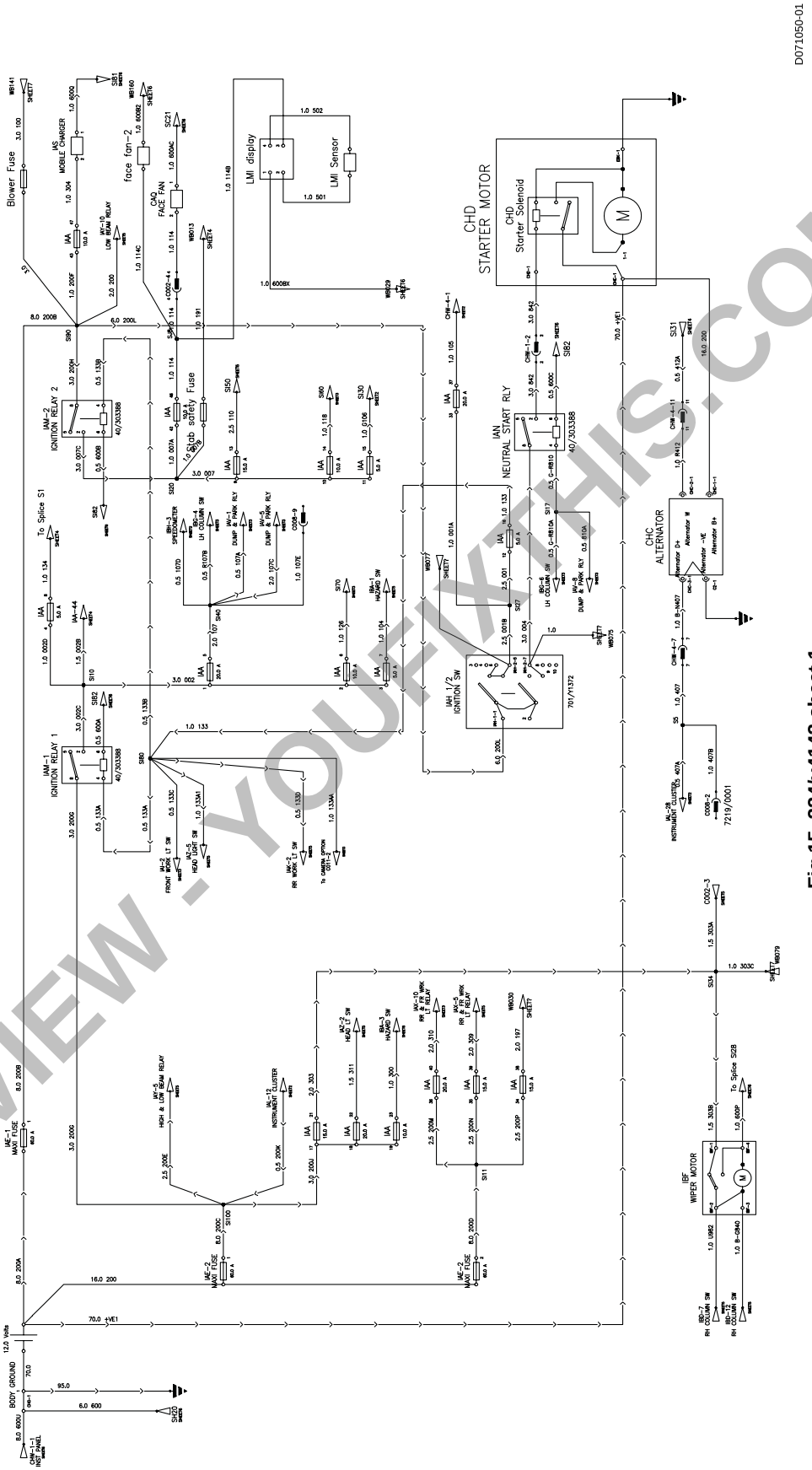


Fig 15. 334/y4143 sheet 1

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Hydraulic Schematics

530-70 Machines

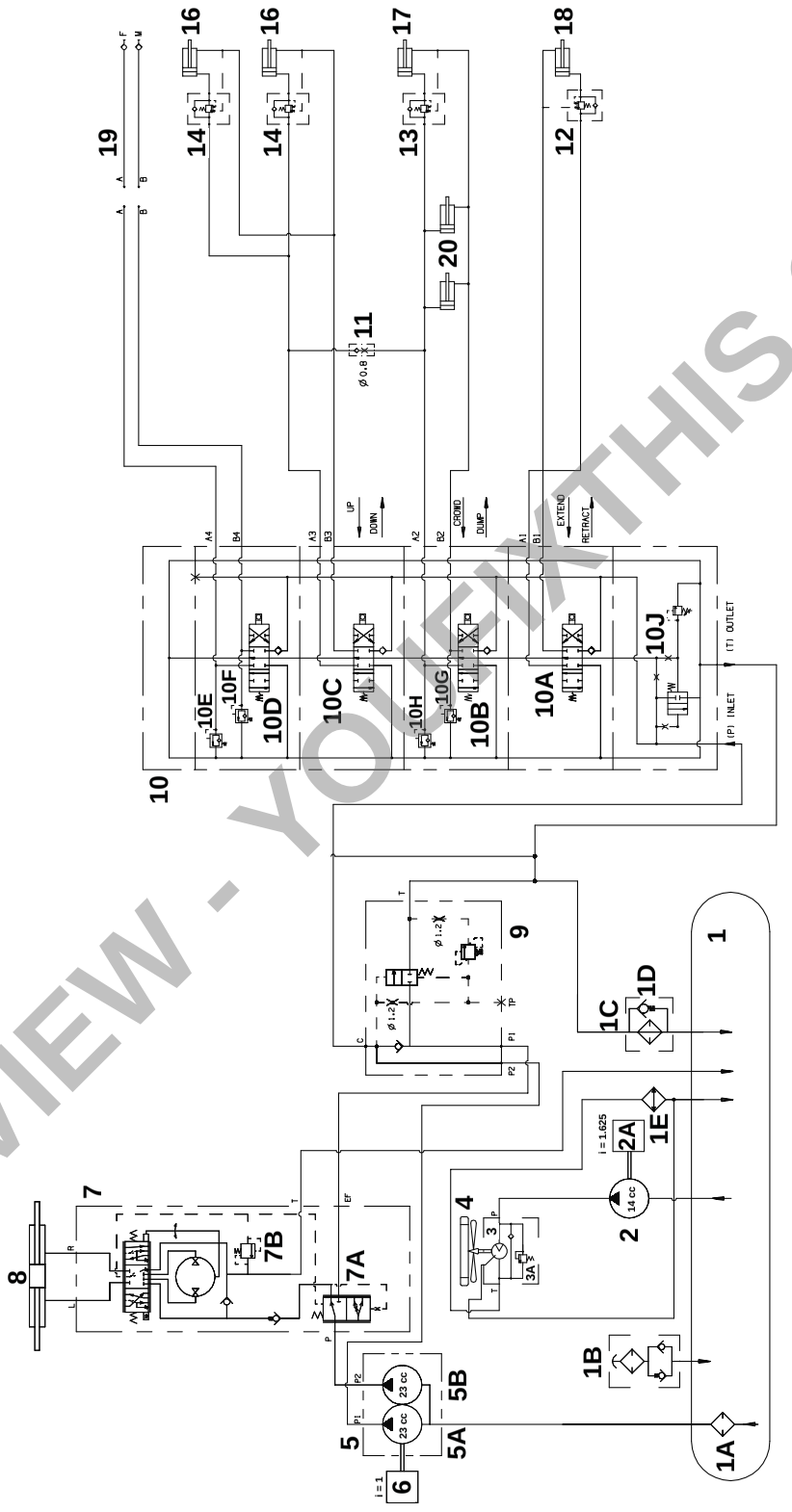


Fig 11. 334/Y2775

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Hydraulic steer unit (Eaton)

Exploded VIew

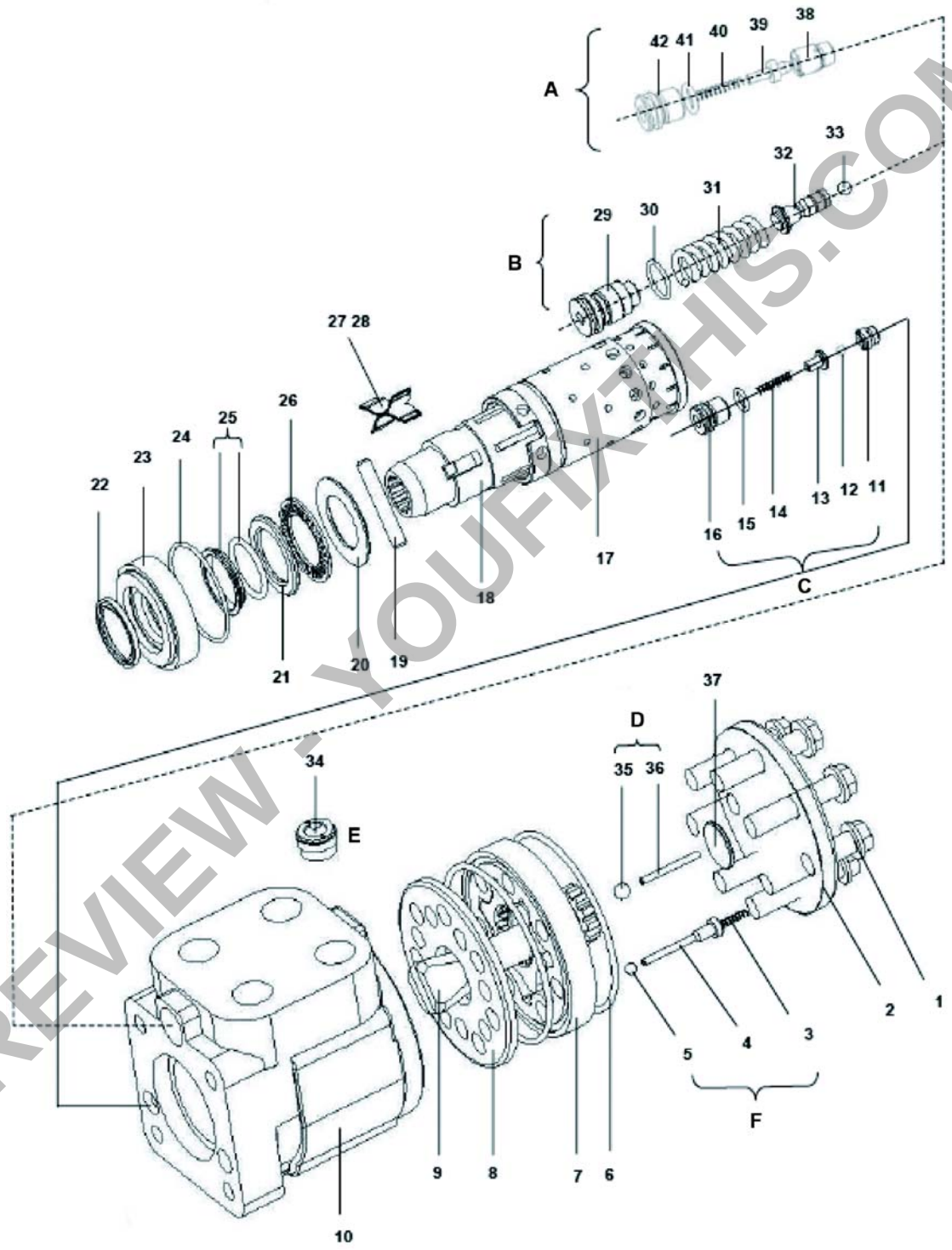


Fig 19.

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Zinc Plated Fasteners and Dacromet Fasteners

Table 3. Torque Settings - UNF Grade 'S' Fasteners

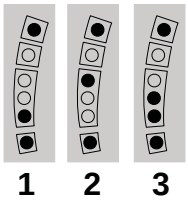
Bolt Size		Hexagon (A/F)	Condition 1			Condition 2		
in.	mm	in.	Nm	kgf m	lbf ft	Nm	kgf m	lbf ft
1/4	6.3	7/16	11.2	1.1	8.3	10.0	1.0	7.4
5/16	7.9	1/2	22.3	2.3	16.4	20.0	2.0	14.7
3/8	9.5	9/16	40.0	4.1	29.5	36.0	3.7	26.5
7/16	11.1	5/8	64.0	6.5	47.2	57.0	5.8	42.0
1/2	12.7	3/4	98.00	10.0	72.3	88.0	9.0	64.9
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

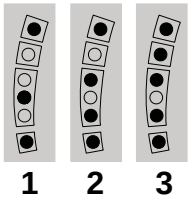
Table 4. Torque Settings - Metric Grade 8.8 Fasteners

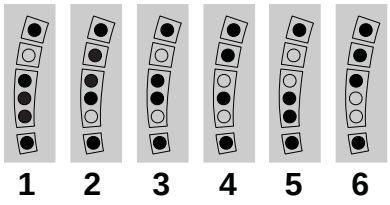
Bolt Size		Hexagon (A/F)	Condition 1			Condition 2		
ISO Metric Thread	mm	mm	Nm	kgf m	lbf ft	Nm	kgf m	lbf ft
M5	5	8	5.8	0.6	4.3	5.2	0.5	3.8
M6	6	10	9.9	1.0	7.3	9.0	0.9	6.6
M8	8	13	24.0	2.4	17.7	22.0	2.2	16.2
M10	10	17	47.0	4.8	34.7	43.0	4.4	31.7
M12	12	19	83.0	8.5	61.2	74.0	7.5	54.6
M16	16	24	205.0	20.9	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

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Fault Codes - Calibration Faults	
 D071050-22	
1	Transducer signal error
2	Calibration required error
3	Display unit error
	Fault finding table. ⇨ *Table 7. Calibration faults* (B-37), ⇨ *Table 9. External faults* (B-37)

Fault Codes - LLM External Faults	
 D071050-18	
1	Axle transducer out of range
2	Battery voltage at unit low
3	Battery voltage at unit high
	Fault finding table. ⇨ *Table 9. External faults* (B-37)

Fault Codes - LLM Unit Faults	
 C093940-C2	
1-6	LLM unit internal faults
	Fault finding table. ⇨ *Table 8. Indicator display unit faults* (B-37)

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Service Procedures

Glazing

Direct Glazing

TB-002_5

The following procedures explain how to correctly remove and install panes of glass that are directly bonded to the cab frame apertures. When carrying out the procedures, relevant safety precautions must be taken.

1 Always wear safety glasses during both removal and replacement.

2 Use protective gloves - heavy duty leather gauntlet type gloves when cutting out the broken glass; 'non-slip' type gloves when handling/moving panes of glass; surgical type gloves when using the polyurethane adhesives.

3 Wear protective overalls.

4 Do not smoke - the activators and primers used in the procedures are highly flammable.

5 Do not attempt to handle or move panes of glass unless you are using glass lifters.

Several special tools are required to successfully complete the removal and replacement procedures. Reference is made to the tools in the text. The majority of these tools can be obtained locally and the remainder from JCB Service (see ***Service Tools***).

The work must only be carried out in a dry, frost free environment. A protective canopy may be required or the machine/frame must be moved to a sheltered area. In damp or wet conditions, hinged doors and window frames can be removed from the machine and taken to a more suitable (dry) environment.

Glass should not be replaced at temperatures below 5°C (41°F).

⚠ WARNING

Laminated glass must be handled with extra care to prevent breakage. Wherever possible, store and handle it in a vertical attitude. When placing or lifting the glass in a horizontal attitude it must be supported over its whole area, not just at the edges.

BF-1-8_1

Removing the Broken Glass and Old Sealant

⚠ WARNING

Always wear safety glasses when removing or installing screen glass. Never use a power operated knife when removing the sealant around a toughened glass screen. The action of the knife could cause particles of glass to be thrown with sufficient force to cause serious injury, even when safety glasses are being worn. Use only hand operated tools when working with toughened glass.

BF-2-3_1

1 Position the machine on level ground and apply the park brake. Stop the engine. Put protective covers over the cab seat and control pedestals.

2 If a laminated pane breaks it will stay in one piece even though the glass is cracked. A toughened pane will shatter and fall apart. The method of removal of the glass depends upon which type it is.

a Laminated glass - leave installed until the old sealant has been cut away, after which it will be possible to lift the broken screen away from its frame housing in one piece.

b Toughened glass - remove as much of the shattered glass as possible prior to cutting out the old sealant.

3 Cut out the old sealant, leaving approximately 1 to 2 mm on the cab frame. There are several tools and techniques for doing this:

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Fault Finding

Table 2. Boom hoses tangle inside boom (3 stage boom only)

Possible Cause	Action
Non JCB hoses fitted.	Fit genuine JCB hoses. This is important. Special hose construction is used.
Hose twisted during assembly.	Fit hoses carefully to prevent twisting.
Steel pipes under boom bent due to previous hose failure or abuse.	Fit new pipes.
Front lower wear pads worn causing hoses to contact boom.	Fit new wear pads and shim correctly.
Hoses not greased on assembly.	Grease hoses.
Hose rollers have insufficient tension.	Adjust to tension correctly.
Hoses stretched due to three stage boom phasing problems.	Fit new genuine JCB hoses and bleed the boom extension circuit.

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Technical Data

JCB Dieselmax

Engine Specifications

Note: Full technical data for all engine variants is given in publication 9806/3000.

Engine type	Dieselmax BS III
Aspiration	Naturally Aspirated
Displacement	4.8 liters
Number of cylinders	4
Weight (dry) (1)	477 kg (1052 lb)
Nominal bore size	106 mm (4.173 in)
Stroke	135 mm (5.315 in)
Maximum governed speed	2200 r.p.m.
Gross HP	76 hp (56 KW)
Rated torque	310 Nm (31.6 kgm)
Cycle arrangement	In line
Firing Order	1-3-4-2
Engine Compression	see Note (2)
Direction of rotation (viewed from crankshaft pulley end)	Clockwise
Valves	4 per cylinder
Valve tip clearances (measured cold)	
– Inlet	0.19 to 0.27 mm (0.007 to 0.011 in)
– Exhaust	0.56 to 0.64 mm (0.022 to 0.025in)
Lubricating oil pressure (3)	>4.6 bar (67lb in^2)
Combustion system	Direct Injection
Fuel injection pump	Rotary Mechanical
Recommended fuel specifications	Refer to ***Section 2, Operator's Manual - Fuel***

(1) Dry weight. No cooling fan drive.
(2) Compression variance between each cylinder should be no greater than 3.5 bar (50 lb in2).
(3) Dependent on engine temperature and speed.

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LLMI - Calibration

The display unit must be calibrated by setting the tip point and machine calibration point.

The tip point is the point at which the machine starts to tip forward due to the load moment.

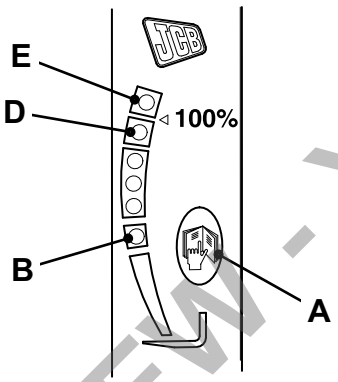
The machine calibration point is a function of the machine chassis and boom type.

Storing the tip and calibration values in the LLM unit memory enables the unit to drive the LLMI LED warning display using the correct load moment data.

Important: *There are different LLMI calibration procedures. The following procedure is for a CAN enabled LLMI system (machines with ECU controlled hydraulic systems). Be sure to use the correct procedure.*

Important: *A new LLMI unit is not calibrated. After installation of a new unit do the calibration procedure.*

Note: *The LLMI system must be correctly calibrated for the LLMC system (if fitted) to function correctly.*



C093810-C4

Fig 34.

WARNING

During the following procedure, do not raise the load more than 600 mm above ground level otherwise the machine may be able to tip forward at a dangerous angle. Keep all personnel clear of the front and rear of the machine.

ELEC-4-1

The calibration sequence requires two set points:

- Tip Forward
- 100%

Note: *A green LED will illuminate whenever power is supplied in the display unit.*

1 Park the machine on firm level ground with the wheels in the straight ahead position and facing the test weight.

Note: *If the following actions are not completed within a five minute period, the display unit will automatically leave the `Calibration Mode' and the memory will revert to the previous settings. If there is a system fault the unit will indicate the appropriate fault code. The calibration procedure cannot continue until the fault is rectified.*

2 Set the display unit to `Calibration Mode'.

a Turn the starter key to the OFF position. Press and hold button **A**.

b Start the engine with button **A** held down. Keep the button held down for approximately 30 seconds. All the display LEDs will illuminate.

c After approximately 30 seconds the display will show the red LED **E** and the alarm will emit short intermittent bleeps.

Note: *If the button is released too soon, the process must be repeated.*

d Release button **A**.

3 With the boom fully retracted, pick up the standards load. ⇨ ***Table 6. (B-34)***.

4 Slowly extend the boom, keeping the load close to the ground, until the machine is balanced about the front axle with the rear wheels off the ground.

5 Press and release button **A**. After few second the display will then change to show the red LED **E**, amber LED **D**. The setting of the tip point value is now complete.

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Circuit Descriptions

Introduction to Hydraulic Schematic Symbols

TE-001

General (Basic and Functional Symbols)

Complex hydraulic components and circuits can be described to the engineer by using graphical symbols. The following pages illustrate and give a brief description for some of the more common symbols used.

There are many symbols in use and it would be impossible to include them all here. However it should be noted that most are only variations or refinements on the basic principles explained here. If more detailed information is required you are recommended to obtain a copy of BS2917 or IS01219.

Once familiar with the symbols, the engineer can use hydraulic circuit diagrams as an aid to fault finding. It will be possible to see the complete hydraulic circuit and decipher the relationship between hydraulic components.

Table 6. General

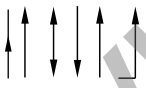
	Spring
	Flow restriction affected by viscosity
	Direction of flow
	Indication of rotation
	Indication of direction and paths of flow
	Variable control

Table 7. Rams

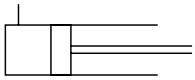
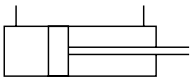
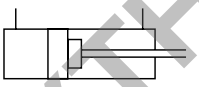
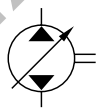
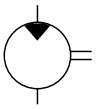
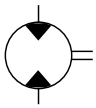
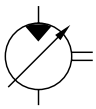
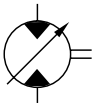
	Single acting
	Double acting
	Double ended
	Double acting with damping at rod area end

Table 8. Pumps and Motors

	Variable capacity pump two directions of flow
	Fixed capacity motor one direction of flow
	Fixed capacity motor two directions of flow
	Variable capacity motor one direction of flow
	Variable capacity motor two directions of flow

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2. Stop the engine and let it cool for at least one hour. Do not try to clean any part of the engine while it is running.
3. Make sure that all of the electrical connectors are correctly coupled. If the connectors are open, attach the correct caps or seal with water proof tape.

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Section B

Body and Framework

Service Manual - 530-70, 530-110

Section 1 - General Information

Section 2 - Operator's Manual

Section B - Body and Framework

Section C - Electrics

Section E - Hydraulics

Section F - Transmission

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Section H - Steering

Section K - Engine



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Publication No.
9813/3850-2



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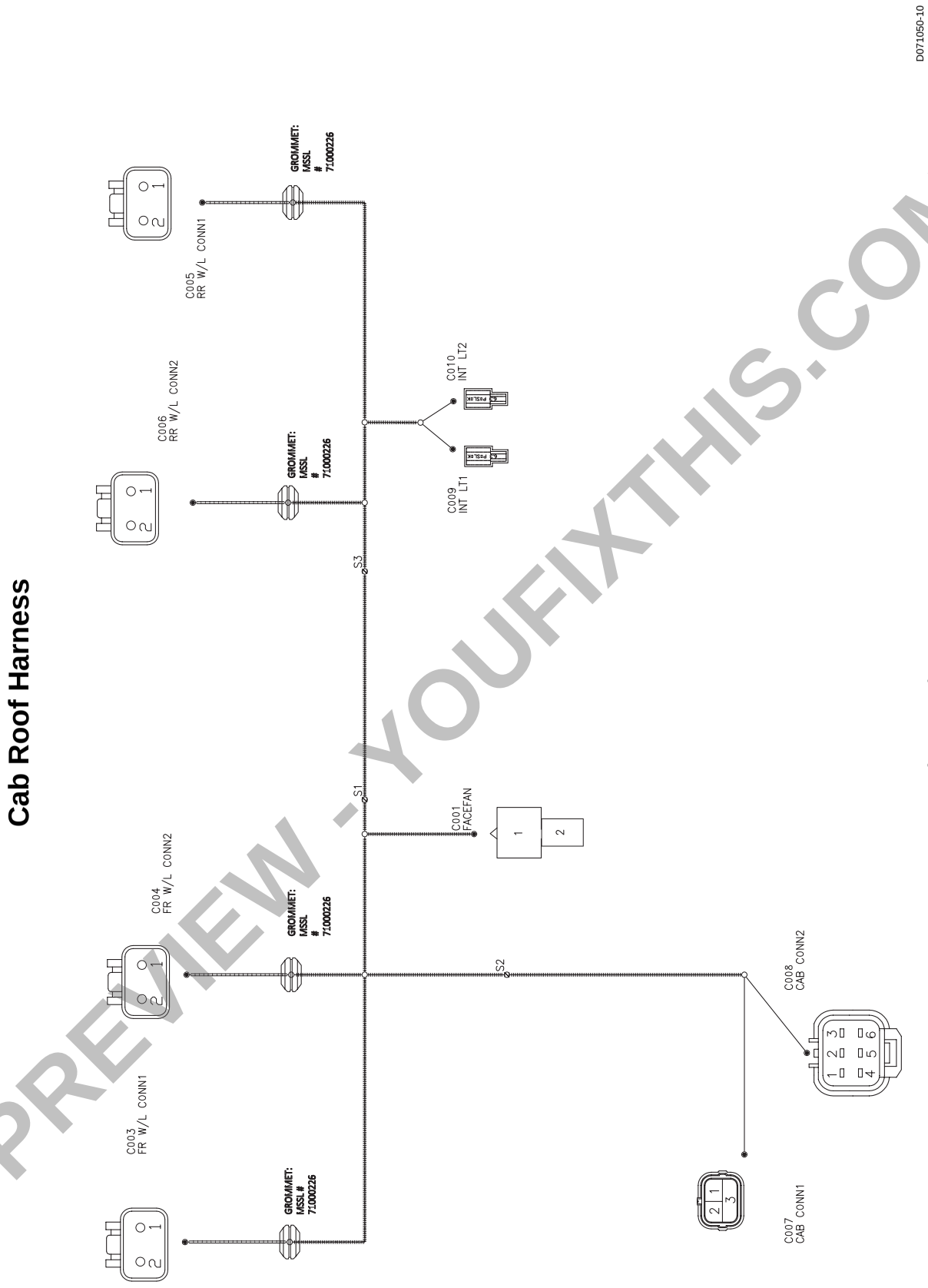


Fig 24. 334/Y1090

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