Dear JCB Customer

Even if you have operated this type of equipment before, it is very important that your new machines operations and functions are explained to you by a JCB Dealer Representative following delivery of your new machine.

Following the installation you will know how to gain maximum productivity and performance from your new product.

Please contact your local JCB dealer if the Installation Form has not yet been completed with you.

Your Local JCB Dealer is:

OPERATOR MANUAL

THIS MANUAL SHOULD ALWAYS STAY WITH THE MACHINE

GENERATOR SET - G144, G144Q, G175, G175Q, G220, G220Q, G130R, G160R, G200R

ENGLISH - 9811/2850 - ISSUE 1 - MAY 2008

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Health and Safety

T3-001_3

Lubricants

Introduction

It is most important that you read and understand this information and the publications referred to. Make sure all your colleagues who are concerned with lubricants read it too.

Hygiene

JCB lubricants are not a health risk when used properly for their intended purposes.

However, excessive or prolonged skin contact can remove the natural fats from your skin, causing dryness and irritation.

Low viscosity oils are more likely to do this, so take special care when handling used oils, which might be diluted with fuel contamination.

Whenever you are handling oil products you should maintain good standards of care and personal and plant hygiene. For details of these precautions we advise you to read the relevant publications issued by your local health authority, plus the following.

Storage

Always keep lubricants out of the reach of children.

Never store lubricants in open or unlabelled containers.

Waste Disposal

⚠ CAUTION

It is illegal to pollute drains, sewers or the ground. Clean up all spilt fluids and/or lubricants.

Used fluids and/or lubricants, filters and contaminated materials must be disposed of in accordance with local regulations. Use authorised waste disposal sites.

INT-3-2-14

All waste products should be disposed of in accordance with all the relevant regulations.

The collection and disposal of used oil should be in accordance with any local regulations. Never pour used engine oil into sewers, drains or on the ground.

Handling

New Oil

There are no special precautions needed for the handling or use of new oil, beside the normal care and hygiene practices.

Used Oil

Used engine crankcase lubricants contain harmful contaminants.

Here are precautions to protect your health when handling used engine oil:

1 Avoid prolonged, excessive or repeated skin contact with used oil.

2 Apply a barrier cream to the skin before handling used oil. Note the following when removing engine oil from skin:

- **a** Wash your skin thoroughly with soap and water.
- **b** Using a nail brush will help.
- **c** Use special hand cleansers to help clean dirty hands.
- **d** Never use petrol, diesel fuel, or paraffin for washing.

3 Avoid skin contact with oil soaked clothing.

4 Don't keep oily rags in pockets.

5 Wash dirty clothing before re-use.

6 Throw away oil-soaked shoes.

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Service Schedule Checklist

		Interval (hrs)					At Least
	Operation	**10**	**50**	**500**	**1000**	**2000**	**Annually**
Oil Level	- Check	☐	☐	☐	☐	☐	
Coolant Quality and Level	- Check	☐	☐	☐	☐	☐	
Oil, Fuel or Coolant Leakage	- Check	☐	☐	☐	☐	☐	
Air Filter Cyclone	- Clean	☐	☐	☐	☐	☐	
Water Separator and Engine Fuel Filter	- Drain		☐	☐	☐	☐	
Air Cleaner(1)	- Check		☐	☐	☐	☐	
Cooling System (from outside)	- Check		☐	☐	☐	☐	
Oil and Filter(2)	- Change			☐	☐	☐	☐
Fan Belt Tightness(3)	- Check			☐	☐	☐	☐
Battery Fluid Level	- Check			☐	☐	☐	☐
Fuel Filter Cartridge(4)	- Change			☐	☐	☐	☐
Water Separator Fuel Filter(5)	- Change			☐	☐	☐	☐
Water From Fuel Tank	- Drain			☐	☐	☐	☐
Coolant Pump	- Grease			☐	☐	☐	☐
Valve Clearances(6)	- Adjust				☐	☐	
Injectors	- Clean and Check					☐	
Turbocharger and Intercooler(7)	- Inspection	Every 4800 Hours					
Cooling System	- Drain and Refill						☐
Door Hinge Pins	- Grease						☐

(1) Clean and change if necessary.
(2) The oil service interval will be affected if there is a high sulphur content in the fuel and check breather hose.
(3) Grease spring loaded belt tensioner.
(4) Or once a year.
(5) If the engine is difficult to start or the engine has poor performance, fit new filters.
(6) Adjust the valve clearances first time after 500 hours and after that every 1000 running hours.
(7) Authorised workshop.

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Setting the Clock

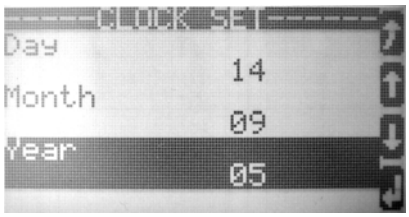


Fig 51.

The real-time clock on the JCB Digital Control Panel is factory set to GMT. However, adjustment of the clock values (Hour-Second-Minute-Day-Month-Year) can be made by following the steps below:



Fig 52. Access Main Menu



Fig 53. Scroll down to highlight `System Parameter'



Fig 54. Enter the System Parameter Menu



Fig 55. Scroll Down to Highlight `Clock Set' and Enter



Fig 56. Scroll to and Enter Value Requiring Change

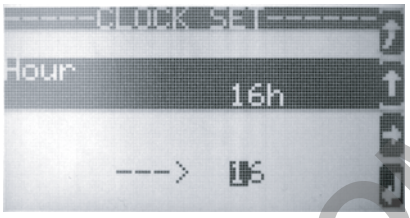


Fig 57.



Fig 58. To Highlight Specific Digits



Fig 59. To SCroll 0-9 for the Digit



Fig 60. Accept Changes Made



Fig 61. Exit without Making Changes

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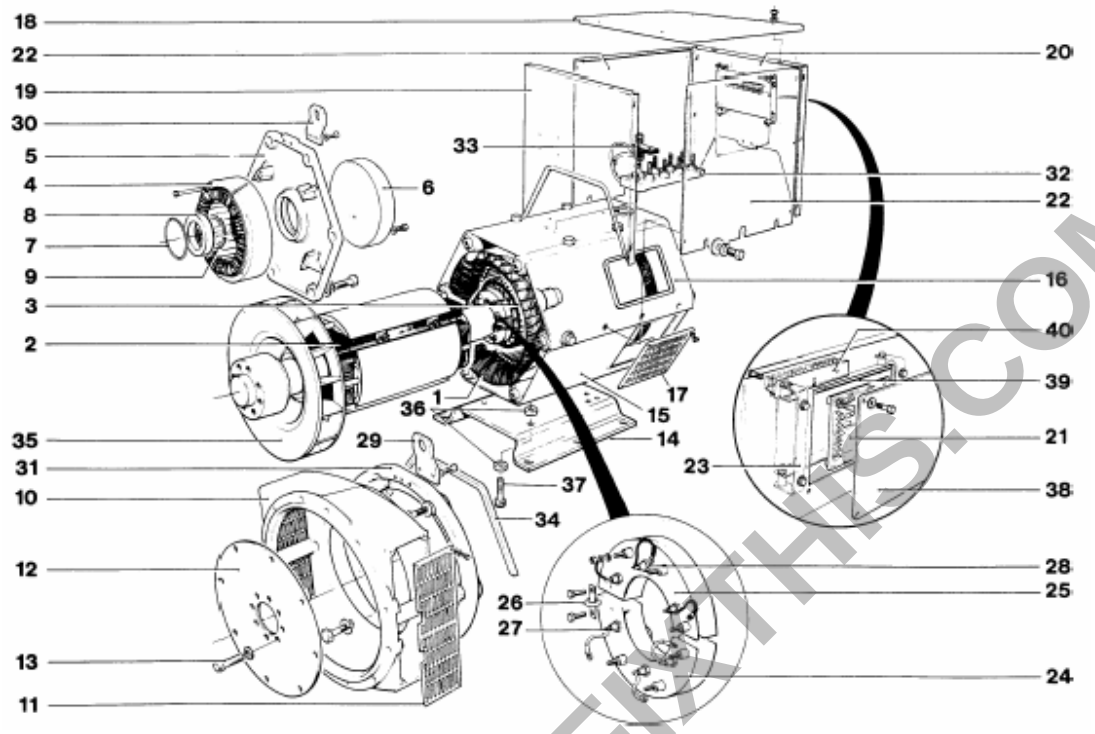
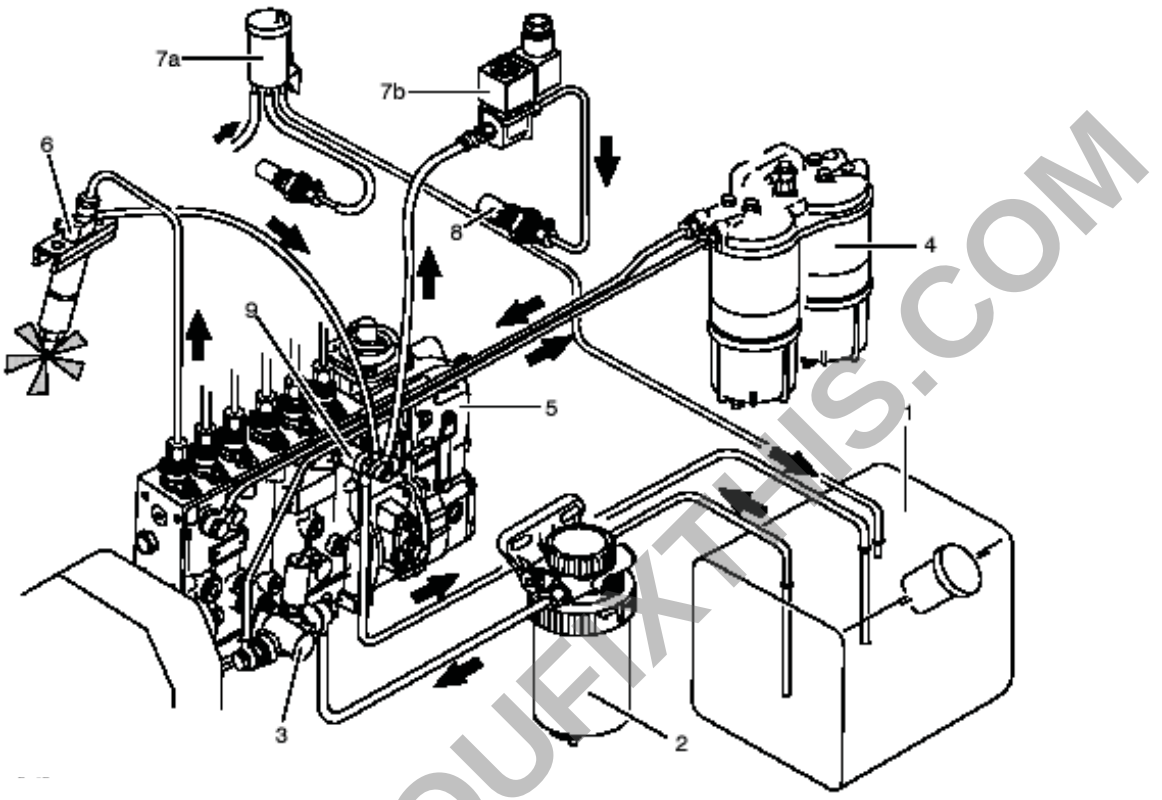


Fig 68.

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Fuel System



C081500

Fig 79. Fuel System (Showing a Bosch-P Injection Pump)

Item	⇒ *Fig 79. (🗋 77)*
1	Fuel tank
2	Prefilter
3	Feed pump
4	Fuel filter
5	Injection pump
6	Injector
7a	Thermostart fuel reservoir
7b	Solenoid valve
8	Glow plug
9	Overflow valve

The SisuDiesel engines are equipped with a Stanadyne rotary injection pump.

⇒ *Fig 79. (🗋 77)*. The fuel flows from the tank via a prefilter to the feed pump and through the filter to the injection pump. The injection pump forces the fuel into the injector that feeds fuel into the combustion space in a fine spray.

The fuel system is often equipped with the Thermostart device to be used in cold conditions. The glow plug receives fuel from a separate reservoir of the thermostart device or from the overflow valve of the injection pump regulated by the magnetic valve.

The fuel is gas oil that must be clean and free from water.⇒ *Fuel quality requirements (🗋 113)*

Note: *Use of anti-freeze solution is not useful and not at all recommended!*

Water is removed from the system by draining the water trap periodically and by cleaning the fuel tank before frost season. ⇒ *Before the cold season (🗋 109)*

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Tightening Torques

Object	Torque (Nm)
Cylinder head bolts	80 Nm + 90° + 90°
Cylinder head studs to cylinder block	30
Main bearing bolts	200
Connecting rod bolts	40 Nm + 90°
Crankshaft nut	1000
Crankshaft pulley bolts	30
Flywheel bolts	140
Flywheel housing bolts:	
- Outer ring M12	110
- Inner ring M10	60
Idler gear bolts:	
- M10	60
- M14	200
Idler gear retaining screws (with ball bearing:	
- The bigger bolt	180
- The bolts for holding the bearing	22
Balancing weights (420)	60
Piston cooling valve (620/634)	30
Oil pump retaining screws	60
Oil cooler connecting piece	60
Coolant pump pulley nut	120
Exhaust manifold bolts	50
Intake manifold bolts	30
Injection pump pressure valve holder	45
Injection pump gear retaining nut	90
Injection pump gear retaining nut (Bosch-P)	200
Injector attaching nuts (on studs)	15
Injector nozzle sleeve	60
Compressor pulley nut (Knorr)	80

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Before the cold season

- Drain water out of the fuel tank.
- Drain water out of the water trap.
- Replace the fuel filter and pre-filter.
- Ensure that the fuel in the fuel tank is of winter quality.
- Check the engine oil (winter quality)
- Check the battery condition.
- Move the control rod to the running position after the engine has been stopped (engines without electrical stop device).
- Ensure that the fuel in the thermostart fuel container and the fuel pipe between the container and the glow plug is of winter quality. If there is fuel of summer quality, it becomes solid and the glow plug is glowing without fuel. The result is that the engine fails to start and the glow spiral is burnt off. The easiest way to change the fuel in the thermostart container:

  - Remove the fuel pipe at the glow plug and let the container drip empty.

  - After this replace the fuel pipe and fill the container e.g. with a drip can through the bleed hole in the container.

  - Remove the fuel pipe carefully to ensure that the glow plug gets fuel, thus also the fuel pipe becomes air free.

- Check externally by hand the glow plug function when the glow plug is fitted and the glowing current is switched on. If the glow plug is working it is warm on the top.
- Check the function of the engine pre-heater.

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Engine - Technical Data and Specifications

Technical Data

Table 4. Engine Technical Data

Engine variants	**620**	**634**
Number of cylinders	6	6
Displacement (ltr)	6,6	7,4
Cylinder bore (mm)	108	108
Stroke (mm)	120	120
Combustion	Direct injection	
Compression ratio	16,5 / 18,5 : 1	
Ignition timing (B.T.D.C)	Marked on the crankshaft pulley	
Valve clearance - intake and exhaust (mm)	0,35	
Direction of rotation from the front of the engine	Clockwise	

Table 5. Fuel System Technical Data

Engine variants		**620**	**634**
Injection pump		Stanadyne, rotary type	
Fuel		Gas oil. ⇨ *Fuel quality requirements (🗋 113)*	
Feed Pressure, in-line pump			
	Overflow valve opening pressure	0,6 - 1,0 bar	
	Static	2,7 bar	
Feed Pressure, rotary type pump			
	Static	0,48 bar	
	min. pressure	0,20 bar / max. rpm.	
Injection order		1 - 5 - 3 - 6 - 2 - 4	
Injector		Five - hole nozzle	
Opening pressure of the nozzle		See 20/34 - series Workshop Manual	
Adjusting pressure of the nozzle		See 20/34 - series Workshop Manual	
Fuel filter		Bosch / CAV	

Table 6. Lubrication System Technical Data

Engine variants	**620**	**634**
Oil pressure in hot engine at running speed	2,5 - 4,0 bar	
Oil pressure at idle speed, min.	1,0 bar	
Oil capacity (ltr) without filter and oil cooler(1)	24	24

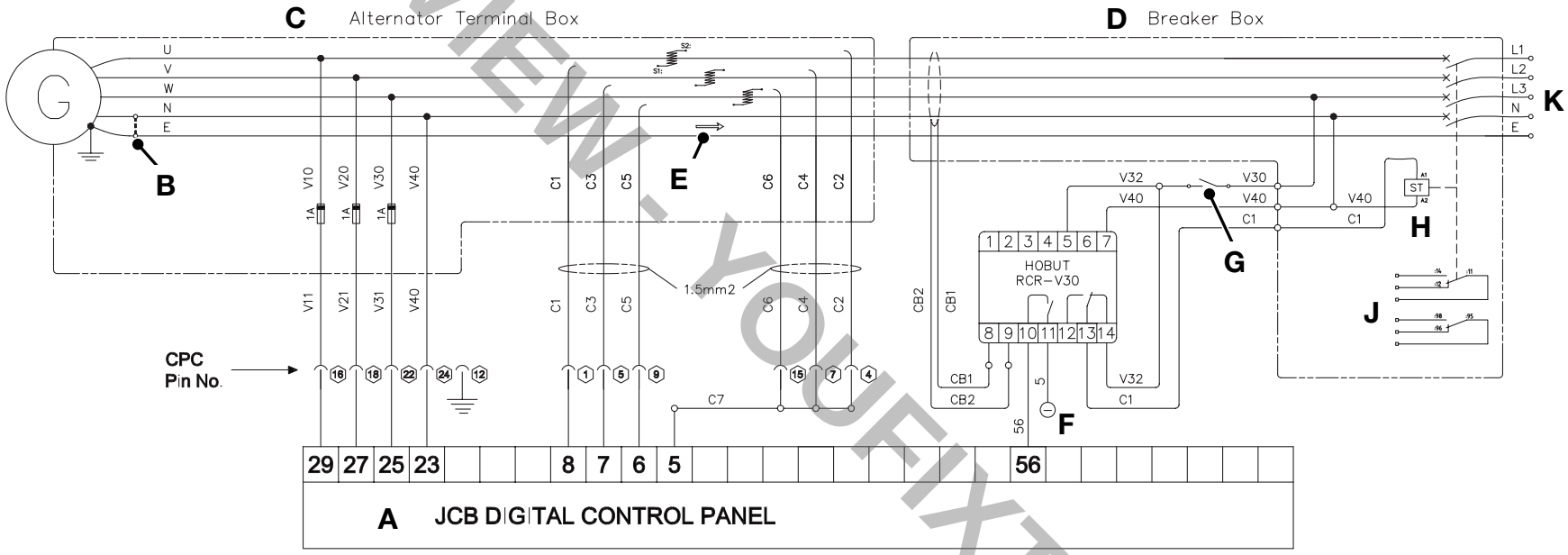
(1) Different sumps of many engine variants have not the same oil capacity. Capacities shown above are for standard oil sumps

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Connection and Wiring Diagrams

AC Wiring



C081890

Fig 115.

Key to Components: ⇒ *Fig 115. (🗋 121)*

A JCB Digital control panel
B Earth-neutral link (if fitted)
C Alternator terminal box
D Breaker box
E Current transformers
F Battery negative
G 6A MCB
H Shunt trip (option)
J Breaker auxiliaries
K Genset output (to load or ATP)

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Mains Value Details

All Mains parameters measured are displayed on this screen.

Mains voltages line-line and line-neutral; mains current; mains frequency; mains real/reactive power and power factor.

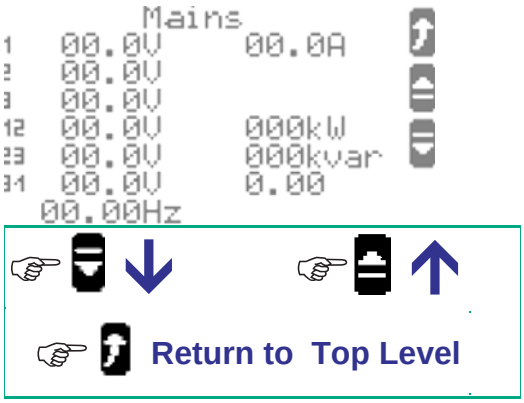


Fig 33.

Generator Peak Currents

Displays the peak (maximum), generator and mains currents per phase.

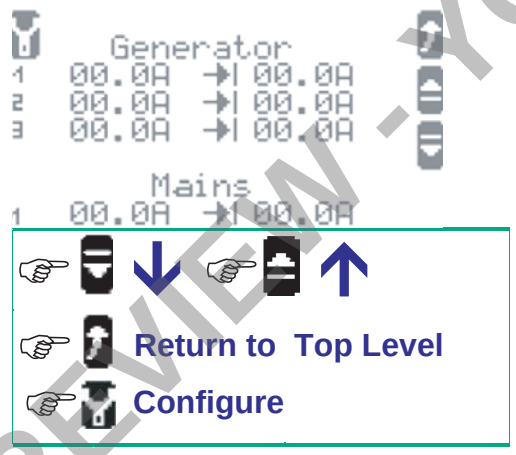


Fig 34.

Analogue Inputs

This screen displays the information from the analogue inputs. Feedback is provided about the status of battery voltage, oil pressure and coolant temp.

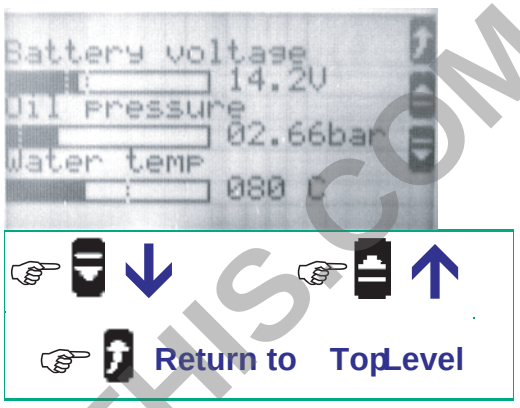


Fig 35.

Digitial Inputs and Outputs

Information is provided about the digital inputs and outputs. An input / output is set if the corresponding block is seen as shaded.

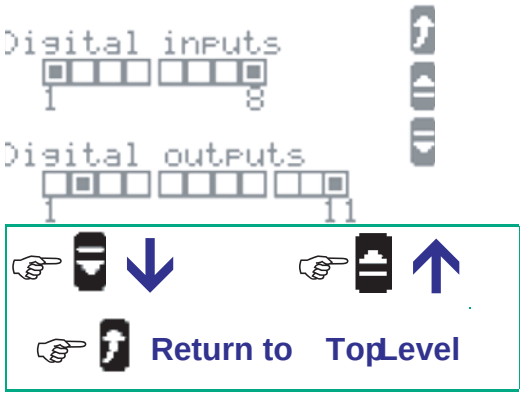


Fig 36.

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