OPERATOR'S MANUAL



411HT, 413S, 417HT

EN - 9821/7050
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THIS MANUAL SHOULD ALWAYS STAY WITH THE MACHINE

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Contents **Page No.**

Acronyms Glossary viii

Introduction
About this Manual
Model and Serial Number 1
Using the Manual 1
Left-Hand Side, Right-Hand Side 1
Cab/Canopy 1
Cross References 2
Safety
Safety - Yours and Others 3
Safety Warnings 3
General Safety 4
Clothing and Personal Protective Equipment (PPE) 5

About the Product
Introduction
General 7
Name and Address of the Manufacturer 7
Product Compliance 7
Description
General 8
Intended Use 8
Log Moving/Object Handling 8
Optional Equipment and Attachments 8
Danger Zone 8
Main Component Locations 9
Product and Component Identification
Machine 11
Engine 11
Operator Protective Structure 12
Safety Labels
General 14
Safety Label Identification 15
Operator Station
Component Locations 17
Console Switches
General 19
Road Lights 19
Rear Fog Lights 19
Hazard Warning Lights 19
Work Lights 20
Transmission Mode 20
Smooth Ride System (SRS) 20
Beacon 20
Seat Heater 20
Heated Mirrors 20
Lift Arm Quickhitch 20
Controls Isolation 21
Up/Down Divert 21

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Safety

Safety - Yours and Others

All machinery can be hazardous. When a product is correctly operated and maintained, it is a safe product to work with. When it is carelessly operated or poorly maintained it can become a danger to you (the operator) and others.

In this manual and on the product you will find warning messages, read and understand them. They inform you of potential hazards and how to avoid them. If you do not fully understand the warning messages, ask your employer or JCB dealer to explain them.

Safety is not just a matter of responding to the warnings. All the time you are working on or with the product you must be thinking of what hazards there might be and how to avoid them.

Do not work with the product until you are sure that you can control it.

Do not start any work until you are sure that you and those around you will be safe.

If you are not sure of anything, about the product or the work, ask someone who knows. Do not assume anything.

Remember:

- Be careful
- Be alert
- Be safe.

Safety Warnings

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

The signal word 'DANGER' indicates a hazardous situation which, if not avoided, will result in death or serious injury.

The signal word 'WARNING' indicates a hazardous situation which, if not avoided, could result in death or serious injury.

The signal word 'CAUTION' indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

The signal word 'Notice' indicates a hazardous situation which, if not avoided, could result in product damage.

The safety alert system (shown) also helps to identify important safety messages in this manual and on the product. When you see this symbol, be alert, your safety is involved, carefully read the message that follows, and inform other operators.

Figure 2. The safety alert system



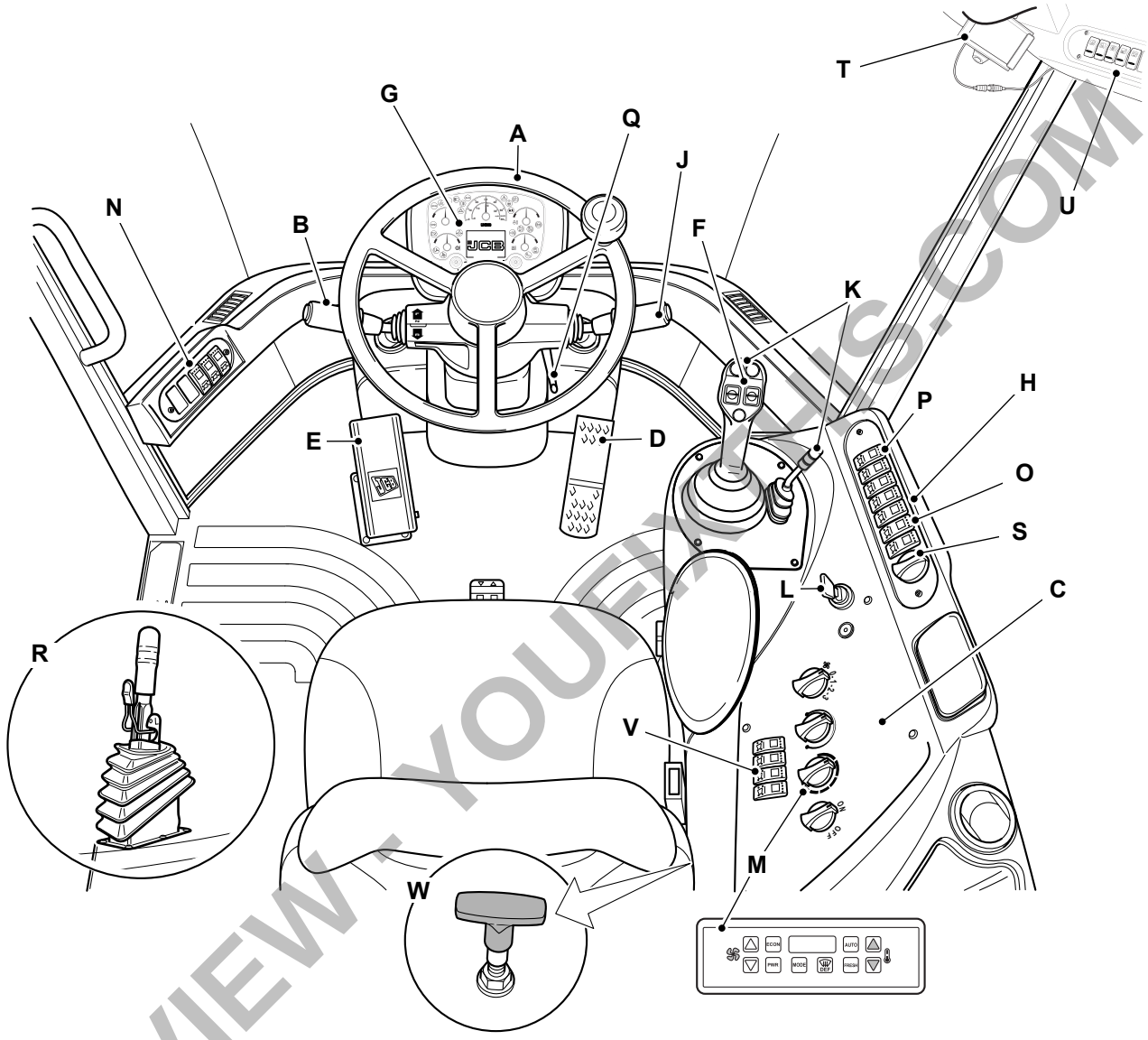
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Operator Station

Component Locations

Figure 8.



A Steering wheelRefer to: Operation > Drive Controls > Steering Wheel (Page 68).
B TransmissionRefer to: Operation > Drive Controls > Forward, Neutral and Reverse Switch (Page 69).
C Power outletRefer to: Operation > Power Sockets > Auxiliary Power Socket (Page 102).
D Accelerator pedalRefer to: Operation > Drive Controls > Accelerator Pedal (Page 68).
E Service brake pedalRefer to: Operation > Drive Controls > Service Brake Pedal (Page 69).
F Drive controls, switches and instruments (Depending on machine specification)Refer to: Operation > Drive Controls (Page 63).
G Instrument clusterRefer to: Operation > Instruments (Page 73).
H Right console switchesRefer to: About the Product > Console Switches (Page 19).
J Multi purpose steering column switchRefer to: Operation > Drive Controls > Steering Column (Page 68).
K Operating leversRefer to: Operation > Operating Levers/Pedals (Page 85).
L Starter switchRefer to: About the Product > Interior Switches > Ignition Switch (Page 23).
M Heater / Air conditioning operationRefer to: Operation > Heating, Ventilating and Air-Conditioning (HVAC) (Page 98).
N Left console switchesRefer to: About the Product > Console Switches (Page 19).
O Loader arm control isolation switchRefer to: About the Product > Console Switches > Controls Isolation (Page 21).

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Operation
Introduction

General

The aim of this part of the manual is to guide the operator step-by-step through the task of learning how to operate the machine efficiently and safely. Read the Operation section through from beginning to end.

The operator must always be aware of events happening in or around the machine. Safety must always be the most important factor when you operate the machine.

When you understand the operating controls, gauges and switches, practice using them. Drive the machine in an open space, clear of people. Get to know the 'feel' of the machine and its driving controls.

Do not rush the job of learning, make sure you fully understand everything in the Operation section. Take your time and work efficiently and safely.

Remember:

- Be careful.
- Be alert.
- Be safe.

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Maintenance
Introduction

General

Your product has been designed and built to give maximum performance, economy and ease of use under a wide variety of operating conditions. Prior to delivery, your product was inspected both at the factory and by your dealer to make sure that it reaches you in optimum condition. To maintain this condition and trouble free operation it is important that the routine services, as specified in this manual, are done by an approved JCB dealer at the recommended specified intervals and it is recommended that this is done by an approved JCB dealer using genuine JCB parts.

This section of the manual gives full details of the service requirements necessary to maintain your JCB product at peak efficiency. A service manual for your product is available from your JCB dealer. The service manual contains information on how to repair, disassemble and assemble your product correctly.

It can be seen from the service schedules on the following pages that many essential service checks must only be done by a JCB trained specialist competent person. Only the Your JCB dealer service engineers have been trained by JCB to do such specialist tasks, and only the JCB dealer service engineers are equipped with the necessary special tools and test equipment to do such tasks, thoroughly, safely, accurately and efficiently.

JCB regularly updates its dealers to advise them of any product developments, changes in specifications and procedures. Therefore only a JCB dealer is fully able which makes them best placed to maintain and service your product.

A service record sheet or book is provided which will enable you to plan your service requirements and keep a service history record. It must be dated, signed and stamped by your dealer each time your product is serviced.

Remember, if your product has been correctly maintained, not only will it give you improved reliability but its resale value will be greatly enhanced.

Owner/Operator Support

JCB together with your dealer wants you to be completely satisfied with your new JCB product. However, if you do have a problem, you can contact your dealers service department who are there to help you!

You will have been given the names of the relevant service contacts at your dealer when the product was supplied.

To get the most from your dealer please help them to satisfy you by:

1. Giving your name, address and telephone number.
2. Quoting your product model and serial number.
3. Date of purchase and hours of work.
4. Nature of the problem.

Remember, only your JCB dealer has access to the vast resources available at JCB to help support you. In addition, your dealer is able to offer a variety of programmes covering warranty, fixed price servicing, safety inspections, including weight tests, covering both legal and insurance requirements.

Service/Maintenance Agreements

To help plan and spread the costs of maintaining your product, we strongly recommend you take advantage of the many service and maintenance agreements your dealer can offer. These can be tailor made to meet your operating conditions, work schedule etc.

Please consult your JCB dealer for details.

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Moving a Disabled Machine

General

If the machine becomes disabled, the machine must be made safe, lifted onto a transporter and moved to a location where it can be repaired.

You must contact your nearest JCB dealer before you try to tow, winch or push the machine.

Towing, winching or pushing the machine without following the correct procedure will damage parts of the hydraulic system. If possible, repair the disabled machine where it stands.

Getting the Machine Unstuck

If the wheels are stuck and are not turning, do not apply full power for more than 10s in forward or reverse drive. Full power for more than 10s will cause the transmission to overheat.

If the transmission overheats during this procedure:

1. Put the transmission in neutral. Do not move the transmission from the neutral to the forward drive or reverse drive positions when the engine is above idle.

   Refer to: Operation > Operating Levers/Pedals (Page 85).

2. Run the engine at 1200-1500 rpm until it is cool.

   Duration: 2–3min

If the machine is stuck in sand, snow, or mud, it may be possible to 'rock' the machine out:

1. Put the transmission in forward drive.
2. Apply a steady light pressure to the accelerator pedal (never apply full pressure). When the machine has moved forward as far as possible, engage and hold the foot brake.
3. When the engine has returned to idle, put the transmission in reverse drive.
4. Release the foot brake and apply a steady light pressure to the accelerator pedal. When the machine has moved backwards as far as possible, engage and hold the foot brake.
5. Let the engine return to idle.

Do the procedure again until the machine is free or can not move any further backwards or forwards.

Jump-Starting the Engine

⚠ **Warning!** In temperatures below freezing, the battery electrolyte may freeze if the battery is discharged or poorly charged. Do not use a battery if its electrolyte is frozen. To prevent the battery electrolyte from freezing, keep the battery at full charge.

If you try to charge a frozen battery or jump-start and run the engine, the battery could explode.

Batteries produce a flammable gas, which is explosive. Do not smoke when checking the electrolyte levels.

When jump-starting from another vehicle, make sure that the two vehicles do not touch each other. This prevents any chance of sparks near the battery.

Switch off all circuits which are not controlled by the ignition key.

Do not connect the booster (slave) supply directly across the starter motor.

Use only sound jump leads with securely attached connectors. Connect one jump lead at a time.

The machine has a negative earth electrical system. Check which battery terminal is positive (+) before making any connections. Keep metal watch straps and jewellery away from the jump lead connectors and the battery terminals - an accidental short could cause serious burns and damage equipment. Make sure you know the voltage of the machine. The booster (slave) supply must not be higher than that of the machine. Using a higher voltage supply will damage your machine's electrical system. If you do not know the voltage of your booster (slave) supply, then contact your JCB dealer for advice. Do not attempt to jump-start the

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Transporting the Machine

General

⚠ **Warning!** The safe transit of the load is the responsibility of the transport contractor and driver. Any machine, attachments or parts that may move during transit must be adequately secured.

Warning! Make sure that the ramp incline does not exceed the machine's operational limits.

Caution! Before moving the machine onto the trailer, make sure that the trailer and ramp are free from oil, grease and ice. Remove oil, grease and ice from the machine tracks. Make sure the machine will not foul on the ramp angle.

Make sure that the transporting machine is suitable for the dimensions of your machine. Refer to: Technical Data > Static Dimensions (Page 203).

1. Put the trailer in position:
   1.1. If the machine is serviceable, use any available position.
   1.2. If the machine is un-serviceable, you must align the trailer with the rear of the machine.
2. Put blocks at the front and rear of the trailer wheels.
3. Make sure the ramps onto the trailer are in the correct position and are attached securely.
4. Set the lift arms to the road travel position
5. Move the machine onto the trailer:
   5.1. Carefully reverse a serviceable machine onto the trailer.
   5.2. Lift an unserviceable machine into position on the trailer.
6. Engage the park brake and set the transmission to the neutral position. Put blocks at the front and rear of all four tyres.
7. Put blocks at the front and rear of all four tyres of the machine.
8. When the machine is safely in position, lower the attachment onto the trailer, then stop the engine.
9. Install the articulation lock
10. Make sure the total height of the load is within regulations, adjust the height if necessary.
11. Put a cover on the exhaust stack
12. Use the tie-down points to secure the machine to the trailer with suitable chains or restraints. The chains or restraints used must have a work load limit equal to or higher than the requirement and a factor of safety equal to or greater than 2. The requirement is

    Weight/Force: 100,000N

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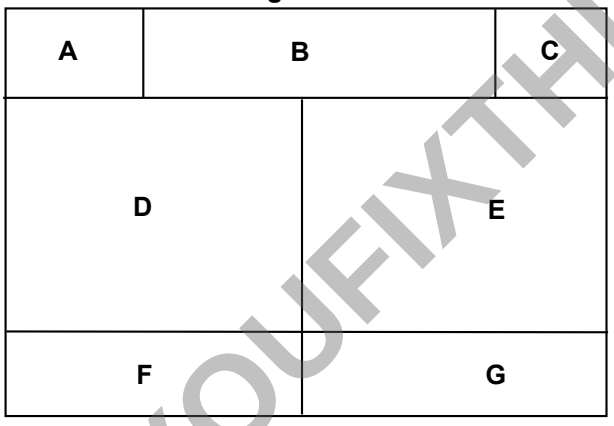
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Information: The operator can choose the information shown in this field. Push the P2 button to cycle through the available information:

- Elapsed operating hours.
- Instantaneous fuel consumption. The average amount of fuel used (in litres, gallons or US gallons per hour) over a short period of time.
- Trip fuel consumption. The average amount of fuel used (in litres, gallons or US gallons per hour) since the last reset. To reset the value, push and hold the P2 button.
- Range. The approximate amount of operating time remaining with the current fuel level. If there is less than one hour of fuel remaining the screen will show --:--
- Odometer. The distance the machine has travelled in kilometers or miles since the last reset. To reset the value, push and hold the P2 button.
- Ground speed. The current speed of the machine in kilometers or miles per hour.

Fault Mode

Figure 48.



A Current direction
B Current gear
C Automatic/Manual mode
D Current engine speed
E Fault symbol field
F Clock
G Fault code field

The fault symbol field and the fault code field alert the operator to specific faults with the machine.

- Y = Is a currently active fault code:
- Z = ‘’Text’’.

Table 24.

Fault Symbol	Description	Fault Code
	Engine malfunction: Amber	Y
	Engine stop: Red	Y
	Engine start: Green	Z: Ok
	Transmission malfunction: Red	Y

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Fluids, Lubricants and Capacities

General

For: 411HT ..... Page 215
For: 413S ..... Page 216
For: 417HT ..... Page 217

(For: 411HT)

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

Table 50. Specifications

Item	Capacity	Fluid/Lubricant	JCB Part Number	Container Size[1]	Specification
Fuel Tank	Main 133L	Diesel			
	Auxiliary 113L				
Engine (Oil)	14L	JCB Engine Oil Ultra Performance 5W40-30 (-22) and below 50 (122)	4001/3405 USA	20L	ACEA E2/B3/A3, API CH-4 or CJ-4
		JCB Engine Oil Ultra Performance 5W40-30 (-22)and below46 (115)	4001/2705 (Except USA)	20L	ACEA E2/B3/A3, API CH-4
		JCB Engine Oil Ultra Performance 10W30-10 (14)and below46 (115)	4001/3005	20L	ACEA E2/B3/A3, API CJ-4
Engine (Coolant)	26L	JCB Antifreeze HP/Coolant (ASTM D6210)	4006/1120	20L	
Gearbox[2]	27L	JCB HP Universal ATF	4000/2305	20L	
Axles[2]	25L	JCB Gear Oil HP Plus	4000/2205	20L	
Hydraulic system[3, 4]	155L	JCB Hydraulic Fluid EP46	4002/1605	20L	
Grease points		JCB Special HP Grease[5]	4003/2017	24x400g	
Auto greasing system (If Fitted)		JCB Special MPL EP Grease	4003/1501	24x400g	

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Pre-start Cold Checks, Service Points and Fluid Levels

Table 28.

	Operation	10	50	100[1]	100	500	1,000	2,000
Attachments								
Hydraulic tow hitch	Check (operation)	O	O	□	□	□	□	□
Hydraulic tow hitch	Check (condition)	O	O	□	□	□	□	□
Hydraulic tow hitch	Grease	O	O	□	□	□	□	□
Engine								
Oil level	Check	O	O	□	□	□	□	□
Oil and Filter	Change[2]					□	□	□
Coolant	Change							□
Coolant Level	Check	O	O	□	□	□	□	□
Coolant strength and condition	Check					□	□	□
CCV Filter (If fitted)	Change[3]							
Air cleaner dust valve	Clear[4]			□	□	□	□	□
Air cleaner outer element	Change[5]					□	□	□
Air cleaner inner element	Change							□
Fuel system for leaks and contamination	Check	O	O	□	□	□	□	□
Fuel filter	Drain		O	□	□	□	□	□
Fuel filter	Change					□	□	□
Fuel sedimenter / Water separator	Drain		O	□	□	□	□	□
Fuel sedimenter / Water separater	Change					□	□	□
Fan belt condition[6]	Check			□		□	□	□
valve clearances	Check / adjust							□
External oil leaks	Check	O	O	□	□	□	□	□
Radiator	Clean					□	□	□
All hoses for condition and security	Check			□		□	□	□
Rocker cover and injector seals[7]	Check							□
High pressure fuel lines[8]	Check							
Transmission and Axles								
Transmission Oil level	Check	O	O	□	□	□	□	□
Differential Oil level	Check			□		□	□	□
Differential oil[9]	Change					□	□	□
Hub Oil Level	Check			□		□	□	□
Hub Oil	Change					□	□	□
Axle Breathers	Clean					□	□	□
Tyre Pressures and Condition	Check	O	O	□	□	□	□	□
Wheel Nut Security	Check	O	O	□	□	□	□	□

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Torque Values

General

For: 411HT, 413S ..... Page 223
For: 417HT ..... Page 223

(For: 411HT, 413S)

Table 58. Torque Values

Item	Torque
	N·m
ROPS (Roll-Over Protective Structure)/FOPS (Falling Object Protective Structure) (cab mounts) Bolts	330
Front and rear wheel nut	500

(For: 417HT)

Table 59. Torque Values

Item	Torque
	N·m
ROPS/FOPS (cab mounts) Bolts	330
Front and rear wheel nut	600

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