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Safety

Safety - Yours and Others

All machinery can be hazardous. When a machine is correctly operated and maintained, it is a safe machine 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 machine you will find warning messages, you must 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 machine you must be thinking of what hazards there might be and how to avoid them.

Do not work with the machine 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 machine or the work, ask someone who knows. Do not assume anything.

Remember:

- Be careful
- Be alert
- Be safe.

Safety Warnings

In this manual 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 machine damage.

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

Figure 4. The safety alert system symbol



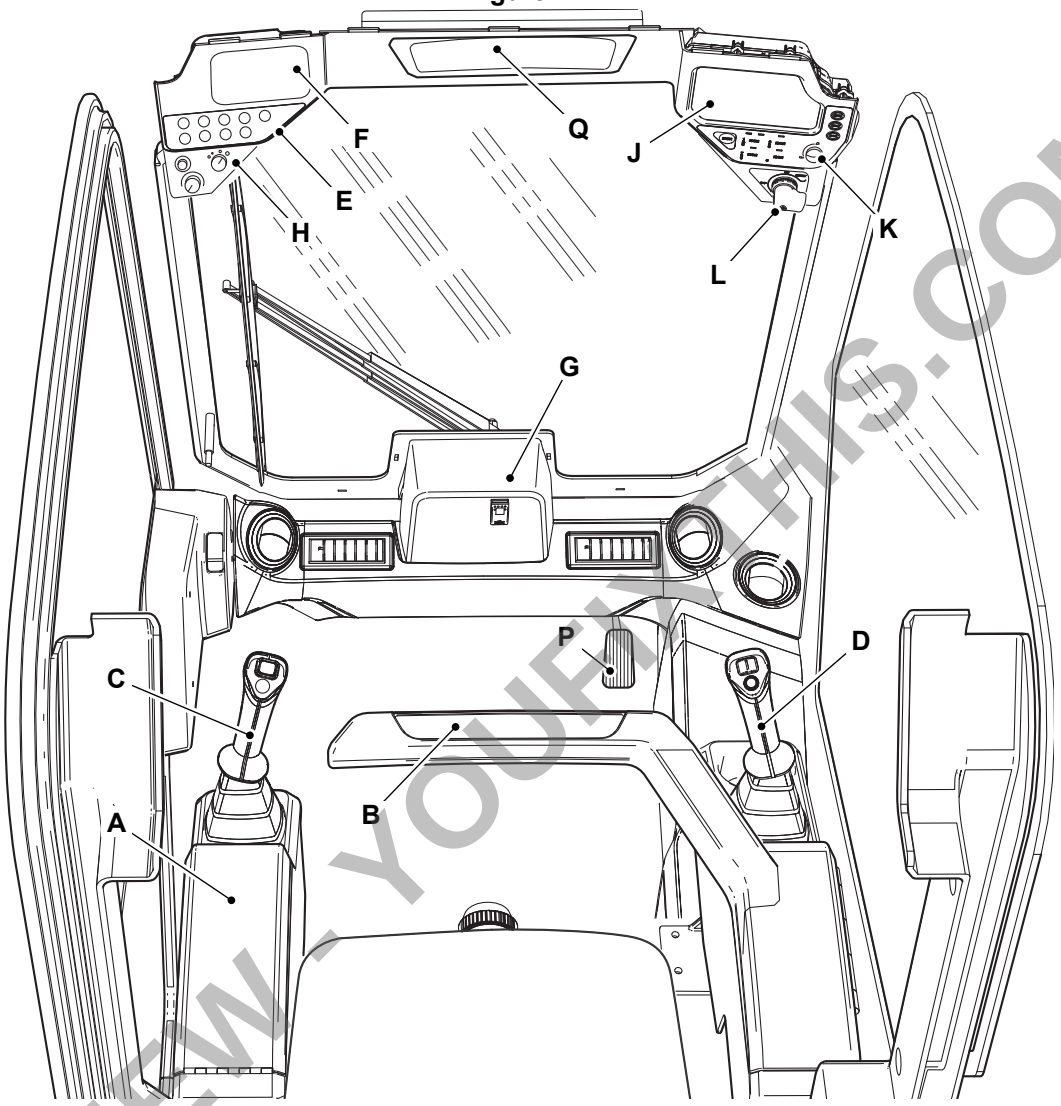
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Operator Station

Component Locations

Figure 12.



A Left armrest (contains 12V accessory socket), Refer to: Safety Equipment (Page 54).
B Right interlock bar,Refer to: Safety Equipment (Page 54).
C Left joystick control lever, Refer to: Drive Controls (Page 56).
D Right joystick control Lever, Refer to: Operating Levers/Pedals (Page 86).
E Left switch panel, Refer to: General (Page 64).
F Radio, Refer to: General (Page 101).
G Front panel, Refer to: Console Switches (Page 19).
H Cab HVAC (Heating Ventilation Air Conditioning), (optional)Refer to: Heating, Ventilating and Air-Conditioning (HVAC) (Page 99).
J Instruments, Refer to: Instruments (Page 64).
K Hand throttle, Refer to: Safety Equipment (Page 54).
L Ignition switch, Refer to: Ignition Switch (Page 17).
P Foot throttle control (optional), Refer to: Drive Controls (Page 56).
Q Interior rear view mirror, Refer to: General (Page 44).

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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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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.

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 engine until you are sure of the voltage of the booster (slave) supply. The negative (-) terminal on the battery is connected to frame earth.

1. Lower the lift arm to the ground, if it is not already there.
2. Set all switches in the cab to their off positions.
3. Get access to the battery.
   Refer to: Access Apertures (Page 177).
4. Connect the booster cables:
   4.1. Connect the positive booster cable to the positive (+) terminal on the machine battery. Connect the other end of this cable to the positive (+) terminal of the booster supply.
   4.2. Connect the negative (-) booster cable to a good frame earth on the machine, away from and below the battery. A good frame earth is a part of the machine frame, free from paint and dirt. Do not use a pivot pin for an earth.
   4.3. Connect the other end of this cable to the negative (-) terminal on the booster supply.
5. Do the pre-start checks.
6. Start the engine.
7. Disconnect the booster cables:
   7.1. Disconnect the negative booster cable from the machine frame earth. Then disconnect if from the booster supply.
   7.2. Disconnect the positive booster cable from the positive (+) terminal on the battery. Then disconnect it from the booster supply.

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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.

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 tyres. Make sure the machine will not foul on the ramp angle.

Check the condition of the transport vehicle before the machine is loaded on to its trailer.

Make sure that the transport trailer is suitable for the dimensions and weight of your machine. Refer to: Static Dimensions (Page 225).

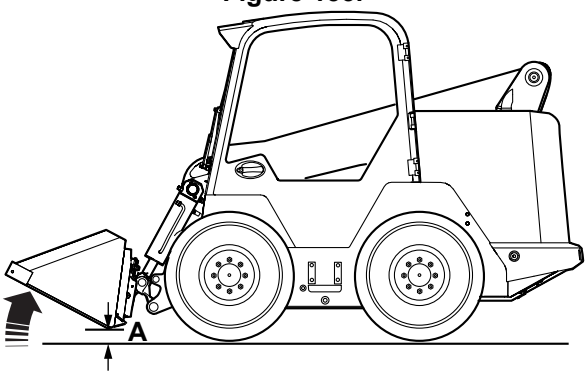
Before transporting the machine make sure you will be obeying the local rules and laws regarding machine transportation of all the areas that the machine will be carried through.

Loading the Machine onto the Transporting Vehicle/Trailer

Using a Trailer

1. Position the trailer on solid, level ground.
   1.1. If the machine is disabled it will be necessary to align the trailer with the rear of the machine.
   1.2. For an operational machine any convenient position will be suitable.
2. Block the trailer wheels and position the ramps.
   2.1. Make sure the ramps are correctly in place and secure.
3. Loading a disabled machine onto the trailer:
   Refer to: Moving a Disabled Machine (Page 105).
4. Loading a serviceable machine onto the trailer:
   4.1. Raise the lift arm to position the shovel/ attachment approximately to the required dimension from the ground.
   Dimension: 305mm

Figure 153.



A Dimension = 305mm

   4.2. Carefully reverse the machine onto the trailer.
   4.3. When the machine is safely in position, lower the lift arm to its lowest position.
   4.4. Apply the park brake.
   4.5. Switch off the engine.

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Table 10.

Component	Task	10	50	500	1,000	1,500	2,000
Attachments/Optional Equipment							
As required	Lubricate	○	○	□	□	□	□
As required	Check (condition)	○	○	□	□	□	□
Body and Framework							
General	Clean	○	○	□	□	□	□
General	Check (condition)	○	○	□	□	□	□
Pivot pins	Lubricate	○	○	□	□	□	□
Operator Station							
Operator protective structure	Check (condition)	○	○	□	□	□	□
Seat, seat belt	Check (condition)	○	○	□	□	□	□
Cab heater/air-conditioning filter	Replace			□	□	□	□
Engine[4]							
Oil	Check (leaks)	○	○	□	□	□	□
Oil	Check (level)	○	○	□	□	□	□
Oil[1]	Replace			□	□	□	□
A/C compressor belt (if fitted)	Check (condition)			□	□	□	□
FEAD belt	Check (condition)			□	□	□	□
FEAD belt[3]	Replace						
Air inlet security/air cleaner elements	Check (condition)	○	○	□	□	□	□
Exhaust system security	Check (condition)			□	□	□	□
Exhaust spark arrester	Clean		○	□	□	□	□
Fuel tank water and sediment	Clean			□	□	□	□
Fuel level	Check (level)	○	○	□	□	□	□
Engine Air Filter[4]							
Air inlet security/air cleaner elements	Check (condition)	○	○	□	□	□	□
Air filter (outer)[2]	Replace			□	□	□	□
Air filter (inner)	Replace						□
Air filter (dust valve)	Clean			□	□	□	□
Air filter (dust valve)	Replace						□
Air pre-cleaner (if fitted)	Clean			□	□	□	□
Crankcase ventilation filter (if installed)	Clean					□	□
Fuel System[4]							
Fuel system	Check (leaks)	○	○	□	□	□	□
Main fuel filter/sedimenter	Replace			□	□	□	□
Main fuel filter/sedimenter	Clean		○	□	□	□	□
Engine fuel filter	Replace			□	□	□	□
Cooling System							

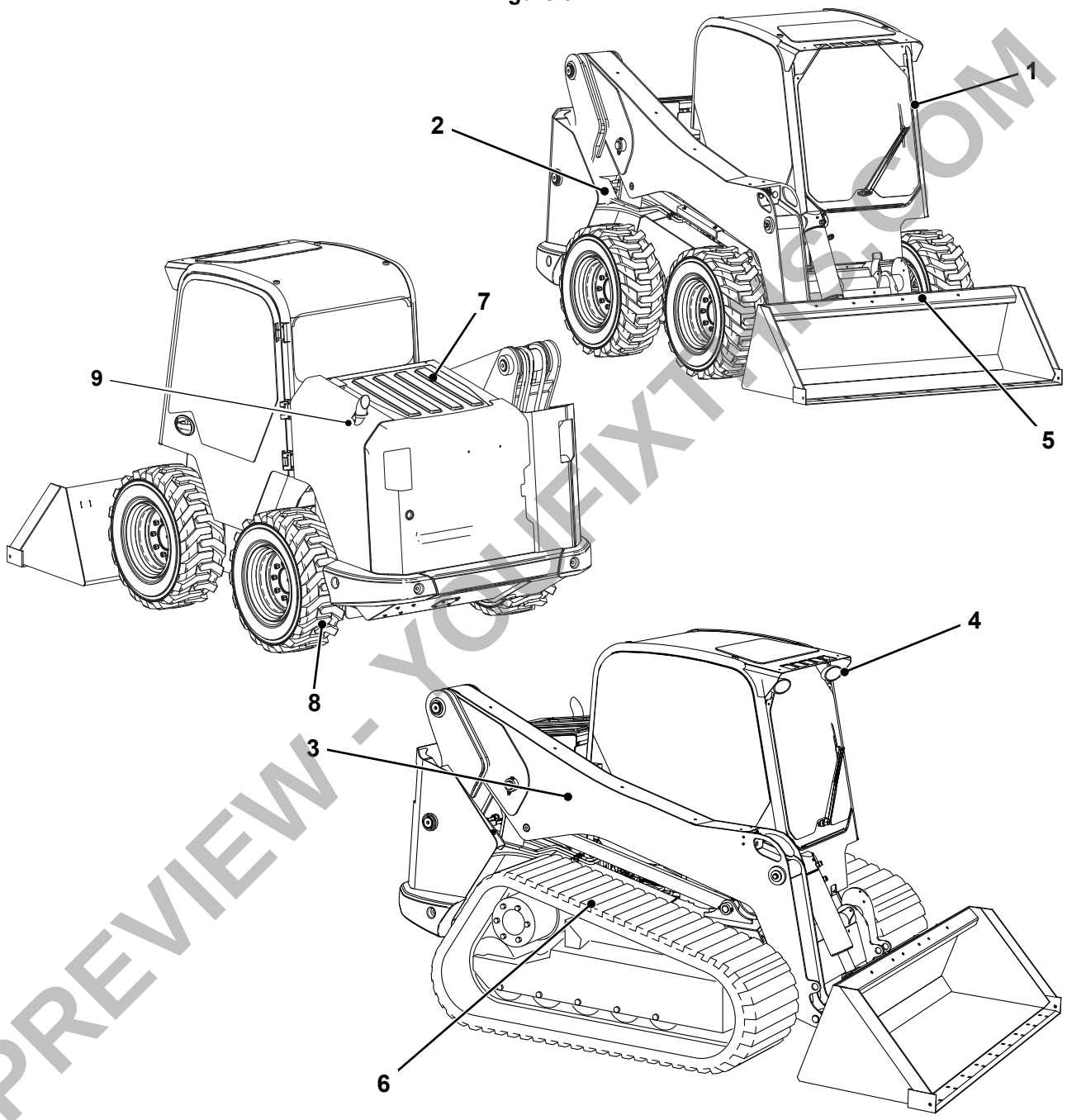
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Main Component Locations

The illustration shows a typical machine model. Your machine may look different from the one shown.

Figure 5.

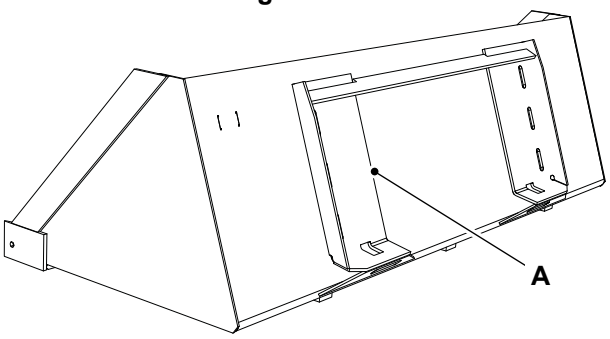


1 ROPS/FOPS cab
2 Fuel tank filler point
3 Lift arm/boom
4 Front working lights
5 Quickhitch
6 Rubber tracks
7 Engine top cover
8 Wheels/tyres
9 Exhaust

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Figure 157.



A Integral framework

Before selecting an attachment for use, assess the application and select the appropriate attachment. The density of any materials being handled will affect the selection of the appropriate attachment.

Remember, do not operate attachments until you have read and fully understand the attachment operating instructions.

These attachments will help increase the productivity of your machine, for more information contact your JCB dealer.

Do not operate or work with attachments until the machine hydraulic oil has reached its normal working temperature.

Hydraulic attachments are only compatible with auxiliary couplers positioned on the right hand side of the lift arm, and not with the left hand auxiliary coupler option.

* = For use on this machine model.

Table 5.

Model	Part No.	Item	155	175	210	215	150T	210T	215T
AUGERS									
PASF	332/L3978	Planetary Drive Auger - Standard Flow	*	*	*	*	*	*	*
PAHF	332/L3979	Planetary Drive Auger - HIGH FLOW			*	*			
AUGER EXTENSIONS									
	980/L7271	Hex Drive Extension - 12"	*	*	*	*	*	*	*
	980/L7272	Hex Drive Extension - 18"	*	*	*	*	*	*	*
	980/L7273	Hex Drive Extension - 24"	*	*	*	*	*	*	*
AUGER BITS - STANDARD DUTY									
	980/A2019	6" x 4' Standard Auger 2" Hex	*	*	*	*	*	*	*
	980/A2021	9" x 4' Standard Auger 2" Hex	*	*	*	*	*	*	*
	980/A2023	12" x 4' Standard Auger 2" Hex	*	*	*	*	*	*	*
	980/A2025	15" x 4' Standard Auger 2" Hex	*	*	*	*	*	*	*
	980/A2027	18" x 4' Standard Auger 2" Hex	*	*	*	*	*	*	*
	980/A2028	24" x 4' Standard Auger 2" Hex	*	*	*	*	*	*	*
	980/A2029	30" x 4' Standard Auger 2" Hex	*	*	*	*	*	*	*
	980/A2030	36" x 4' Standard Auger 2" Hex	*	*	*	*	*	*	*

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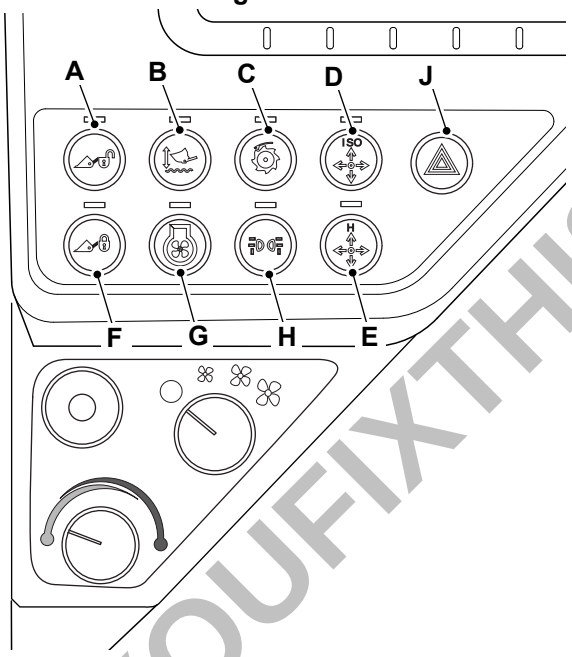
Instruments

General

Left Hand Switch Panel

When a function is installed and enabled its switch is back lit (dark when not fitted or enabled). The LED (Light Emitting Diode) above each switch is illuminated solid when the function is activated/selected.

Figure 56.



A Powered Quickhitch unlock (option)
B SRS (Smooth Ride System)
C High flow auxiliary (option)
D ISO (International Organization for Standardization) control pattern
E H control pattern (option)
F Powered Quickhitch lock (option)
G Reversing fan (option)
H Sidelights (option)
J Hazard warning lights (option)

Powered Quickhitch Unlock (Option)

Figure 57.



Press and hold to unlock the Quickhitch.Refer to: Quickhitch (Page 133).

Smooth Ride System (SRS) (Option)

Figure 58.



When the lift arm is fully lowered press to activate SRS.

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Fluids, Lubricants and Capacities

General

For: 150T [T4F], 155 [T4F], 175 [T4F], Kohler KDI 1903 TCR ..... Page 239
For: 210 [T4F], 210T [T4F], 215 [T4F], 215T [T4F], Kohler KDI 2504 TCR ..... Page 239

(For: 150T [T4F], 155 [T4F], 175 [T4F], Kohler KDI 1903 TCR)

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 38. Machines with JCB Diesel Engine by Kohler

Item	Capacity	Fluid/Lubricant	JCB Part Number	Container Size[1]	Specification
Fuel Tank	98L (radial lift), 92L (vertical lift)	Diesel Oil			
Engine (Oil)[2]	Min5.5L Max7.4L	JCB Engine Oil EP 5W40	4001/2705	20L	API CJ4, ACEA E6-E9, Low SAPS
Engine (Coolant)[3]	10L	JCB Antifreeze HP	4006/1120	20L	ASTM D3306, ASTM D4985, ASTM D6210, SAE J1034, BS6580 (1992), AFNOR NF R15-601
Hydraulics System[4]	System:43.5L Tank:26L	JCB Extreme Performance Hydraulic Fluid 46 (climates between -20°C (-4°F) and 46°C (115°F)	4002/2900	200L	
Chain Cases (each side)	19L	JCB Engine Oil EP 15W40	4001/1805	20L	
Grease Points		JCB Special HP Grease (blue)[5]	4003/2017	24 x 0.4kg cartridges	

(1) For information about the different container sizes that are available (and their part numbers), contact your JCB dealer.
(2) Do not use ordinary engine oil.
(3) It is recommended that the cooling system be filled at a maximum rate of 6L (1.6gal) per minute. If the fill rate is any higher than this then there is a possibility of air becoming trapped in the system.
(4) This is nominal capacity. The total hydraulic system capacity depends on the equipment being used. Fill with all cylinders closed. Watch level sight glass when filling.
(5) JCB Special HP Grease is the recommended specification grease. If JCB Special MPL-EP Grease is used, all 50h greasing operations must be carried out at 10h intervals; all 500h greasing operations must be carried out at 50h intervals.

(For: 210 [T4F], 210T [T4F], 215 [T4F], 215T [T4F], Kohler KDI 2504 TCR)

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 39. Machines with JCB Diesel Engine by Kohler

Item	Capacity	Fluid/Lubricant	JCB Part Number	Container Size[1]	Specification
Fuel Tank	92L	Diesel Oil			
Engine (Oil)[2]	Min7.8L Max10.2L	JCB Engine Oil EP 5W40	4001/2705	20L	API CJ4, ACEA E6-E9, Low SAPS

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Torque Values

General

Operator Protective Structure

Refer to: Operator Station (Page 190).

Table 42.

Mounting Nuts	Torque
A, B	205N·m

Refer to: General (Page 108).

Table 43.

Lifting Eyes	Torque
A	190N·m

Wheels

Refer to: Wheels (Page 208).

Table 44.

Front	Rear
220N·m	220N·m

Tracks

Refer to: Tracks (Page 212).

Table 45.

	Torque
Access plate bolts	140N·m
Track sprocket bolts	368N·m

Engine

Table 46.

	Torque
Oil filter cartridge cap Refer to: Oil (Page 193).	25N·m
Fuel filter cartridge Refer to: Fuel System (Page 202).	17N·m
Engine fuel filter sensor housing	5N·m
Engine oil drain plug Refer to: Oil (Page 193).	40N·m
Alternator belt adjustment bolt	40N·m
Compressor belt adjustment bolt	47N·m

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