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

Figure 3. The safety alert system



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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.

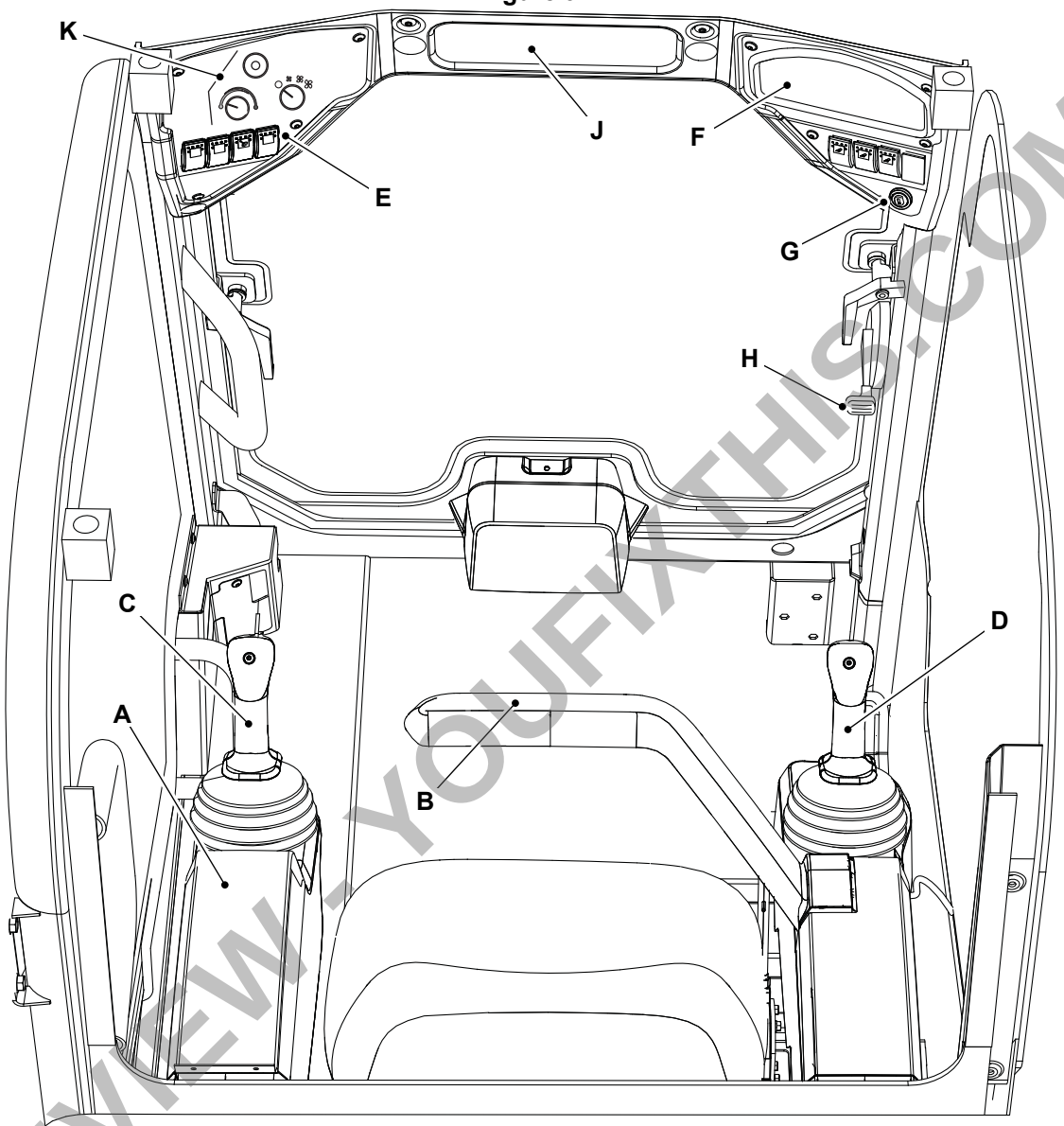
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Operator Station

Component Locations

Figure 9.



A Left armrest (contains 12V accessory socket), Refer to: Safety Equipment.
B Right interlock bar,Refer to: Safety Equipment.
C Left control lever, Refer to: Drive Controls.
D Right control Lever, Refer to: Operating Levers/ Pedals.
E Left switch panel, Refer to: General.
F Instruments, Refer to: Instruments.
G Ignition switch, Refer to: Ignition Switch.
H Hand throttle, Refer to: Drive Controls.
J Interior rear view mirror, Refer to: Mirrors.
K Air conditioning, Refer to: Heating, Ventilating and Air-Conditioning (HVAC).

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Working with the Lift Arm

General

⚠ **WARNING** Always drive a loaded machine forward uphill and in reverse downhill. Always drive an unloaded machine in reverse uphill and forward downhill.

WARNING When transporting a load on a slope, drive slowly and keep the load uphill of the machine. This will increase stability.

WARNING If the machine should accidentally tip forward, stop the engine as soon as possible after righting the machine and check the engine oil level. Some oil loss can occur if this happens.

WARNING A high load can block your view and reduce the machine's stability. Travel with the load low to the ground. Travel slowly and with caution over rough, muddy or loose surfaces.

WARNING Operating the boom while you travel can cause accidents. You will not have total control of the machine. Never operate the boom when you travel.

CAUTION A raised boom can strike overhead objects. Always check for overhead clearance before raising the boom.

CAUTION Loads stacked on uneven ground can topple. Never stack loads on uneven ground.

Remember that you will be driving the machine while you are using the lift arm. Keep alert for bystanders and possible hazards. Stay in the correct driving position. Keep your seat belt fastened.

Keep the lift arm fully down when travelling. This increases your visibility and makes the machine more stable.

Never lower the left arm rest and interlock bar unless you or someone suitably qualified is seated correctly in the machine and the door is properly closed and latched.

Lifting (Object Handling)

Do not use this machine for lifting or craning operations.

Loading a Truck

Put the truck(s) at an angle of about 45° to the pile. This cuts out unnecessary manoeuvring. Allow enough distance for the shovel to reach its unloading height while you are travelling, without slowing down.

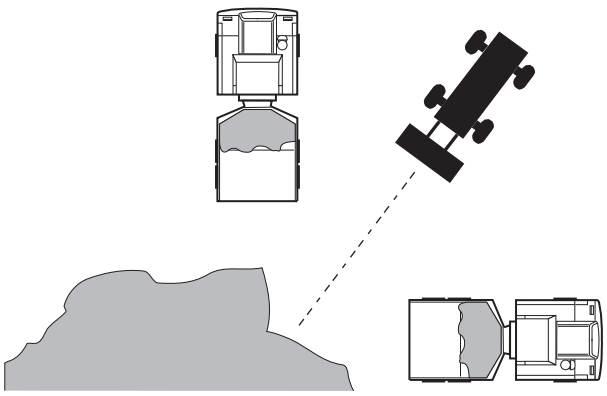
Keep the wind on your back. This keeps dust away from you and your machine.

Move your machine as close as possible to the truck before unloading.

If the truck body is about as long as a shovel's width, tip the load into the centre of the truck. If the truck is two shovel width's long or more, load the front of the truck first.

Do not dump the material in one sudden movement. Roll the shovel forward in stages until it is empty. Use the control lever to rock the shovel back and forth to loosen any sticky material.

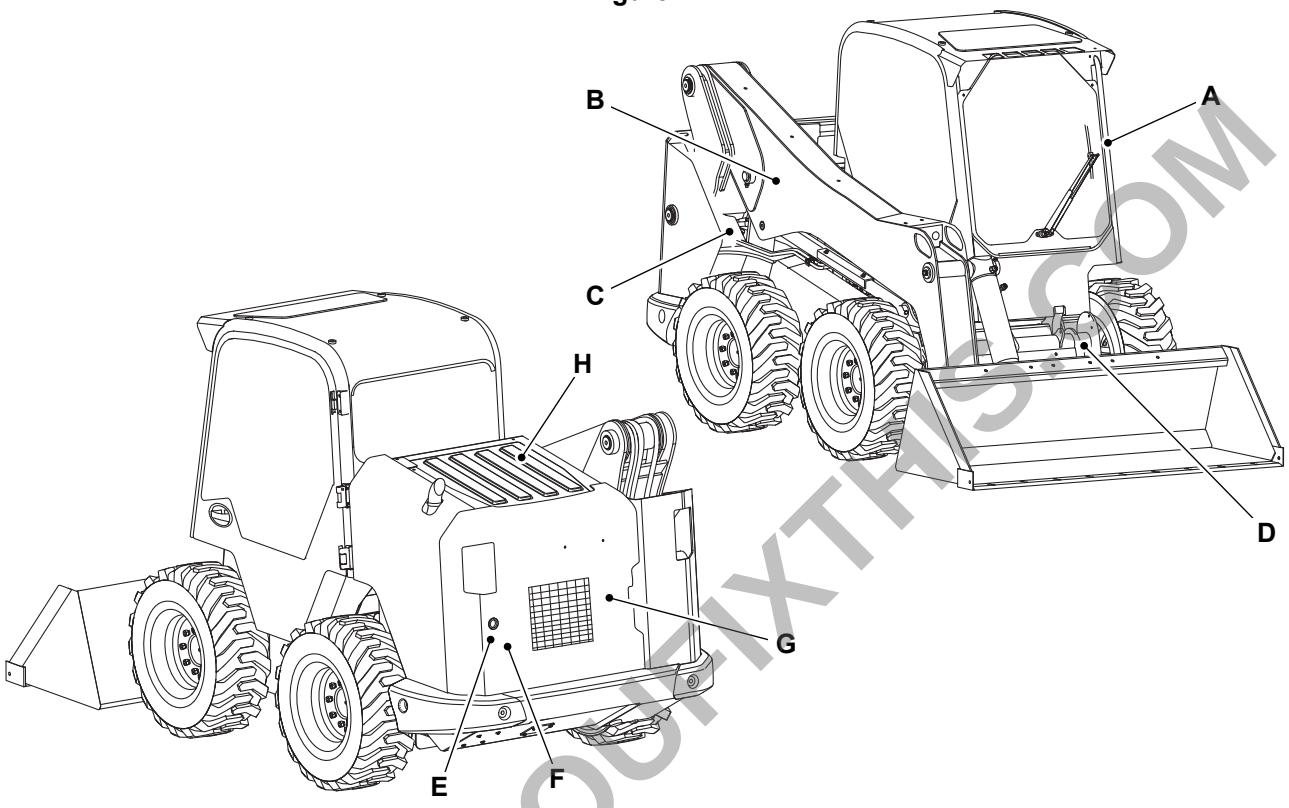
Figure 45.



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Main Component Locations

Figure 4.



A Cab
B Lift arm/boom
C Fuel tank
D Quickhitch
E Hydraulic tank
F Battery
G Engine compartment rear door
H Engine top cover

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Safety Label Identification

Figure 8.

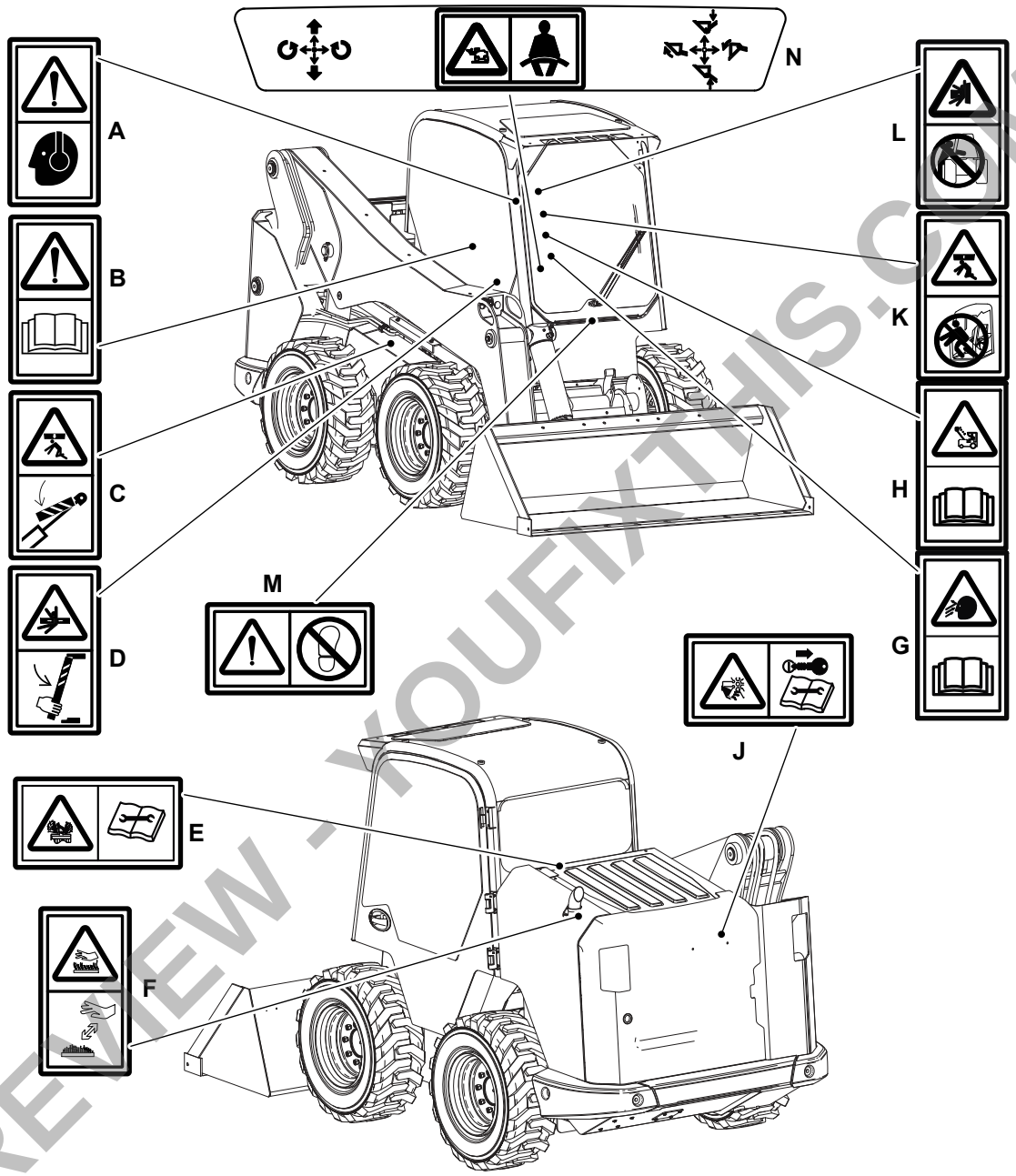


Table 5. Safety Labels

Item	Part No.	Description	Qty.
A	332/L8248	Noise warning. Wear ear protection.	1
B	817/70014	Warning. Read the Operator's Manual before you operate the machine.	1
C	817/70104	Crushing of whole body. Insert the boom support device before you complete any service or maintenance work underneath the boom.	1
D	332/P7181	Crushing of whole body. Attach/use the support or prop to lockout for service, maintenance or any access.	1
E	332/P7131	Pressure hazard. Read the Service Manual.	1
F	817/70004	Burns to fingers and hands. Stay a safe distance away.	1
G	332/L7456	Flying debris warning. Read the Operator's Manual.	1

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Fluids, Lubricants and Capacities

General

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 24. Machines with Perkins Engines

Item	Capacity	Fluid/Lubricant	JCB Part Number	Specification
Fuel Tank	98L	Diesel Oil		
Engine (Oil)	Min8.9L	JCB Engine Oil Max	4001/3200	ACEA E6-E9, Low SAPS
	Max10.6L	JCB Engine Oil EP 5W40 (climates between -12°C to 10°C)	4001/2700	
Cooling system	10L	JCB Antifreeze HP	229/01233	JIS K2234 CLASS II
Hydraulics System	System:43.5L Tank:26L	JCB HVI Hydraulic Fluid	229/00024	
		JCB Hydraulic Oil ISO 22 (climates between -12°C to 10°C)	4002/2900	
Chain Cases	19L (each side)	JCB Engine Oil Max	4001/3200	
Grease Points		JCB HP Grease or JCB Special MPL EP Grease	4003/2000	

Fuel

General Information

Every attempt is made to provide accurate, up to date information. By use of this document you agree that Perkins Engines Company Limited is not responsible for errors or omissions.

These recommendations are subject to change without notice. Contact your local Perkins distributor for the most up to date recommendations.

Diesel Fuel Requirements

Satisfactory engine performance is dependent on the use of a good quality fuel.

The use of a good quality fuel will give the following results: long engine life and acceptable exhaust emissions levels.

The fuel must meet the minimum requirements that are stated in the tables.

Table 25. Perkins Specification for Distillate Diesel Fuel

Property	Units	Requirements	ASTM Test	ISO Test
Aromatics	% volume	35% maximum	D1319	ISO 3837
Ash	% Weight	0.02% maximum	D482	ISO 6245
Carbon Residue on 10% Bottoms	% Weight	0.35% maximum	D524	ISO 4262
Cetane Number[2]		40 minimum	D613/D6890	ISO 5165
Cloud Point	°C	The cloud point must not exceed the lowest expected ambient temperature.	D2500	ISO 3015
Copper Strip Corrosion		No. 3 maximum	D130	ISO 2160
Density at 15°C[3]	Kg/m3	801 minimum and 876 maximum	No equivalent test	ISO 3675, ISO 12185

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Pre-start Cold Checks, Service Points and Fluid Levels

Table 13.

Component	Task	10	50	500	1,000	1,500	2,000
Attachments/Optional Equipment							
As required	Lubricate	O	O	□	□	□	□
As required	Check (condition)	O	O	□	□	□	□
Body and Framework							
General	Clean	O	O	□	□	□	□
General	Check (condition)	O	O	□	□	□	□
Pivot pins	Lubricate	O	O	□	□	□	□
Doors and hinges	Lubricate			□	□	□	□
Operator Station							
Operator protective structure	Check (condition)	O	O	□	□	□	□
Seat, seat belt	Check (condition)	O	O	□	□	□	□
Engine[3]							
Oil	Check (leaks)	O	O	□	□	□	□
Oil	Check (level)	O	O	□	□	□	□
Oil[1]	Replace			□	□	□	□
Oil filter[1]	Replace			□	□	□	□
FEAD belt	Check (condition)			□	□	□	□
FEAD belt	Replace				□		□
Air inlet security/air filter blocked indicator	Check (condition)	O	O	□	□	□	□
Exhaust system security	Check (condition)			□	□	□	□
Exhaust spark arrester (if installed)	Clean		O	□	□	□	□
Fuel tank water and sediment	Clean			□	□	□	□
Fuel level	Check (level)	O	O	□	□	□	□
Valve	Check (condition)				□		□
Air Filter[3]							
Air filter (outer)[2]	Replace			□	□	□	□
Air filter (inner)	Replace						□
Air filter (dust valve)[2]	Change			□	□	□	□
Fuel System[3]							
Fuel system	Check (leaks)	O	O	□	□	□	□
Main fuel filter/sedimenter	Replace			□	□	□	□
Main fuel filter/sedimenter	Clean	O	O	□	□	□	□
Engine fuel filter (Secondary)	Replace				□		□
Cooling System							
Coolant	Check (leaks)	O	O	□	□	□	□
Coolant	Check (condition)	O	O	□	□	□	□
Coolant	Check (level)	O	O	□	□	□	□

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Starting the Engine

General

⚠ **WARNING** Care should be applied to the first few operations of the drive control. Failing to verify control response behaviour could result in an instance of uncontrolled machine operation causing possible injury, death or damage to property.

Notice: Do not use ether or other starting fluids to assist cold starting. Using these fluids may result in an explosion causing possible injury and/or damage to the engine.

1. Make sure that the drive control lever is in the neutral position.
   Refer to: Before Starting the Engine.
2. Turn the ignition switch to position 'I' and allow the display to self-check.
   Duration: 3s
   Refer to: Ignition Switch.
3. Set the throttle lever to its minimum position.
   Refer to: Instruments.
4. Turn the ignition switch fully clockwise against the spring to position 'II' to start the engine.
   Refer to: Ignition Switch.
5. As soon as the engine starts, release the switch, which will return to position 'I'.
6. Once the engine has warmed up, set the throttle knob to the required speed.
7. Check for normal machine operation prior to starting work.

The starter should be operated for no longer than 15s at any one time. If the engine fails to start, allow the starter to cool for a few minutes before trying again.

Make sure all the warning lights are off when the engine is running. If any warning lights remain on, stop the engine immediately and investigate the cause.

New engines do not require a running-in period. The engine/machine should be used in a normal work cycle immediately; glazing of the piston cylinder bores resulting in excessive oil consumption could occur if the engine is gently run-in.

Ambient Temperatures -12°C to 0°C

1. Turn the ignition switch to position 'I'.
   Refer to: Ignition Switch.
2. Set the throttle knob to its minimum position.
3. Turn the ignition switch to position 'II' and wait for few seconds. This will allow the glow plug to operate.
   Duration: 15s
   Refer to: Instruments.
4. Turn the ignition switch fully clockwise against the spring to position 'III' to start the engine.
   Refer to: Ignition Switch.
5. As soon as the engine starts, release the ignition switch which will return to position 'I'.
6. Let the engine idle for few minutes.
   Duration: 5–6min
7. Operate the lift arm and shovel services to warm the hydraulic oil. Stall the lift arm and shovel momentarily on each cycle.
   Duration: 10min

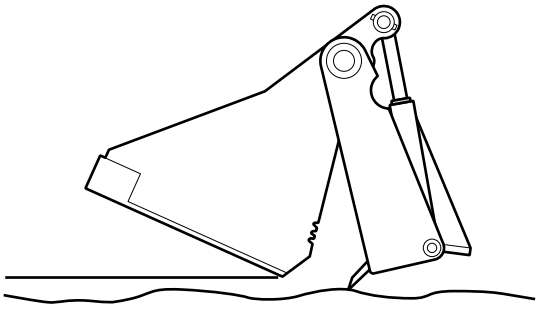
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Notes:

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Figure 62.



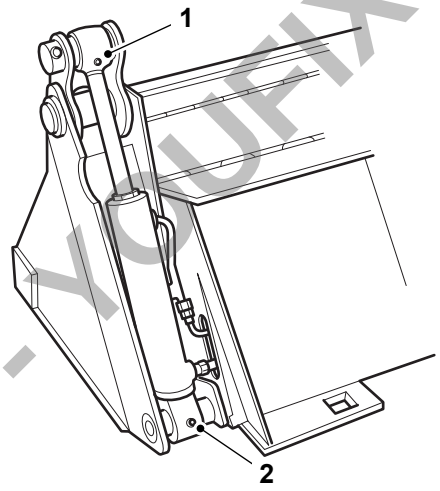
Preparing for Travel

Close the clam then treat as a standard shovel.

Grease Points

There are 4 grease points. Two grease points as shown and the other two are on the opposite side.

Figure 63.



1 Front grease point (top)

2 Front grease point (bottom)

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