

ROTOBEC

ELITE 910



OPERATOR'S MANUAL

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Labels



This label points out a useful fact.



DANGER. This label identifies a hazard or unsafe practice that will result in severe personal injury or death.



WARNING. This label identifies a hazard or unsafe practice that could result in severe personal injury or death.



CAUTION. This label denotes an instruction which, if not followed, could severely damage components.

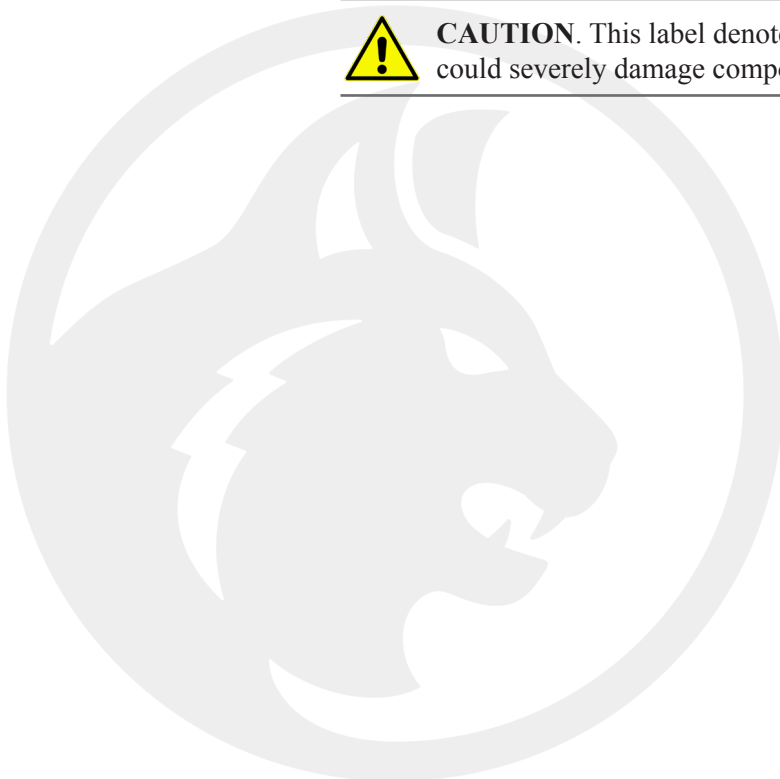


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About This Manual

This manual contains instructions for the installation, maintenance, and repair of the Rotobec Elite 910 Loader. It also contains information on controls, as well as instructions on operating the loader safely. The parts and components used in Rotobec products are specifically designed and manufactured to ensure the highest standards of performance and durability.



IMPORTANT! Before operating, servicing or performing any maintenance on this product, Rotobec recommends that you always refer to and follow the standard *ASME B30.20-2010 "Below the hook lifting devices"* to maximize the safety of your operations.

The illustrations, technical information and specifications within this manual were accurate at the time of printing. However, Rotobec reserves the right to revise specifications, instructions, and design.

If you have any questions about the information in the manual, please consult the nearest Rotobec branch (for a list of branches, see the back cover).



WARNING! Rotobec assumes no liability or responsibility for damages or injury that may arise as a result of using parts in the rotator other than Rotobec parts, not following the instructions in this manual or for the improper use of the Rotobec loader.

Safety Guidelines

This section provides guidelines to help provide for the safety of the people working with and around the loader and to prevent damage to the loader. You should read and understand these guidelines and the Warnings of the potential for serious personal injury or death. Rotobec assumes no liability or responsibility for injury or damages that may arise if these guidelines are not followed.

Operators have the legal and moral responsibility to comply with all instructions, warnings and safety regulations to provide for their safety and the safety of others.

General Guidelines

- Follow all federal and state or provincial safety regulations for hydraulic mechanisms, lifting devices, grapples, spillage and disposal of hydraulic oil.
- This manual should be stored in an area so that all personnel have ready access to these safety and maintenance guidelines at all times.
- Ensure that the loader is equipped to comply with local safety regulations.
- Rotobec attachments should be operated only by qualified knowledgeable personnel.
- Whenever conditions, environment or circumstances cause there to be any doubt to safety, operators should refrain from handling a load and consult a designated person.
- Operators must be aware that a load or partial load could fall at any time due to inadvertent activation of controls or otherwise.
- An attachment should never be loaded in excess of its listed capacity or used to handle any load for which it is not designed.
- Loads must be appropriate for the attachment and carefully distributed.
- The operator shall not ride, nor shall he allow others to ride any attachment.
- Do not allow the attachment or load to come into contact with any obstruction.
- Never leave a suspended load unattended.
- Before leaving, attempting to lock out, turning off or otherwise stop use of the machine, the operator should land any attached load and place it on a firm base.

Seat Belt Guidelines

Rotobec offers a seat belt as an option on Truck mount Loaders. You should only equip your loader with a seat belt after consulting with a knowledgeable safety professional who can help you determine whether a seat belt is appropriate for your loader based on the environment and application in which the loader will be used. If you choose to equip your loader with a seat belt, you must be aware of the following:

- Use of a seat belt may affect your ability to jump free from the loader or otherwise move quickly in case of emergency.
- Even if wearing a seat belt, you should never be seated in the operator's station while the truck or trailer on which the loader is mounted, is in motion.
- Exposure to weather and routine use may result in tearing or fraying of the seat belt. You should visually inspect the seat belt on a daily basis to make certain the integrity of the belt has not been compromised.

Service and Maintenance Guidelines

- Installation, removal, service and repair of the loader and all attachments and other components must be performed by qualified personnel, wearing appropriate personal protective equipment (including safety glasses).
- Welding on the loader can cause electrical and structural damage. Before welding on the loader:
 - Contact your Rotobec representative for authorization,
 - Disconnect the ECU power plug, both battery cables, radio, and all electric throttle and alternator connections, and
 - Make sure the welding machine ground wire is fixed close to the welding area and verify that the ground signal will not have to go through a moving part of the loader (slewing ring, hydraulic swivel joint, etc.).



WARNING! Loose or over-torqued bolts can cause parts to separate which can result in property damage, severe injury, or death. Keep the bolts correctly torqued by inspecting the nuts and bolts regularly according to the *Maintenance Schedule* and the procedures in *Checking the Tightness of Nuts and Bolts*.

Power Line Guidelines

To prevent the loader from contacting a power line, do the following:

- Before starting the loader, inspect the work area for power lines that you might have to work under.
- If necessary, contact the utility company responsible for electricity in the work area and request that the power in that area be disconnected.
- Treat all power lines as live and dangerous.



WARNING! Keep a distance between power lines and all parts of the loader, the load, and the carrier according to this formula: twice the line insulator length plus 10 feet (3 m).

For example: if the line insulator is 6 inches (0.15 m) long, the distance to keep away is $2 \times 6 \text{ inches (0.25 m)} = 12 \text{ inches (0.30 m)}$ (1 foot) plus 10 feet (3 m), which equals 11 feet (3.35 m). You must stay at least 11 feet (3.35 m) from the power line (see *Figure 3*).

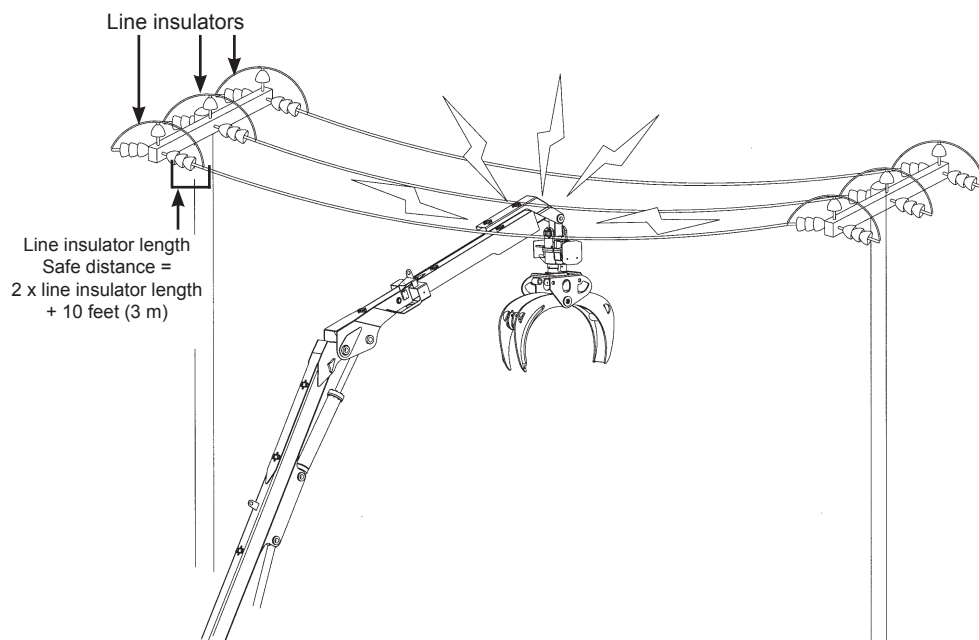


Figure 1 - Power line safety guidelines

If the loader or carrier touches a power line, do the following:

- Stay in the loader.
- Do not let anyone touch the loader, the load, or the carrier.
- Do not let anyone touch anything that might have directly or indirectly had contact with the power line or something else that touched it. Even a brief contact can create a charge.
- If you think you can move the loader, or load away from the line without pulling the line down, move away slowly and smoothly.

Or

- If you think you **will** pull the line down if you move away, have someone contact the utility company to disconnect power from the line.

Or

- If it is not possible to disconnect the power or if the loader or the load begins to burn, jump away from the loader in this way:
 1. Your whole body must leave the loader at the same time. If part of your body touches the ground while another part is still in contact with the loader, the electricity in the line will go through your body.
 2. Hold both arms in front and close to your body and both legs and feet together.
 3. Jump with your body forward so that you will not fall back towards the loader when you have landed.
- Jump as far away from the loader as you can without falling. The charge is less the farther away you are.
- Once you have landed, quickly shuffle away from the loader (with your arms still close to you body) to at least the same distance as determined by the formula given on *Page 11* of this document. Lifting a foot or placing one foot more than an inch from the other foot can change the charge in your body considerably and increase the chances of the electricity running through you.



DANGER! Do not directly or indirectly touch someone who is being electrocuted. The current will run through you as well. Call 9-1-1 or the emergency number of the power company for the area for information on the safe handling of the situation.

- Notify the utility company immediately about the situation, whether the loader or the load is still touching the power line or not.

Operation Guidelines

- Read the Operator's Manual completely and make sure you understand it before operating the loader.
- Inspect the loader regularly, according to the *Maintenance Schedule*.
- Repair any damage found during inspections before operating the loader.
- To prevent a fall while climbing onto or off the loader, remove oil, grease, mud, snow, and other debris from the ladders, the floor and the seat.
- All personnel in the area where the loader is operating must be at least 28 yards (25 meters) from the loader, booms and grapple.



WARNING! Only the operator should be on the loader once the loader is started up. Operating the loader with riders on the loader could result in severe injury or death.

- Pay attention to clothing or other items that may catch on or knock the joysticks when climbing into or out of the cab of the loader. Inadvertent activation of the booms or grapple can result in a dangerous fall.



WARNING! Jumping off the loader could cause severe injury or death. Do not jump off the loader, unless the loader has touched a live power line and/or is starting to burn.

To learn the safe way to jump off the loader if the loader has touched a live power line, read the instructions on *Page 12*.

- Memorize the operation of all the controls.



WARNING! Lower the stabilizers onto firm level ground. The loader, its load or the carrier can topple over if the stabilizer is on a slippery surface such as ice, an uneven surface like rocks, stumps, or curbs; or on soft or unstable ground. This could result in property damage, severe injury or death.

- When the stabilizers are being lowered or raised, they can cause severe injury or death. Keep bystanders away from the stabilizers. If a stabilizer starts to lift from the ground, buckles or breaks, immediately lower the boom then lighten the load.
- The loader is designed such that the operator has full visibility of and control over the loader controls, the boom, grapple and load. You should always be aware of the placement of your hands and feet in relation to the loader controls, the proximity of the load to the operator's station and the height of the load in relation to the guard at the front of the station.

- Never manipulate or otherwise allow your hands or feet to contact the loader controls in a manner that would cause or allow the operator's station to inadvertently rotate or cause or allow the load/attachment to contact the operator, operator's station or the loader controls.
- All or part of the load can fall at any time and can cause property damage, sever injury or death. Keep personnel at least 28 yards (25 meters) from the working area.
- It is important that the attachment be appropriate for the application for which the loader is being used. If you have a question about the appropriateness or proper use of an attachment, you should contact Rotobec or consult with a qualified industry professional of your choice.



WARNING Misuse of an attachment or use of an inappropriate attachment can result in damage to the loader and personal injury or death to persons on or around the loader.



DANGER! If the loader is leaking hydraulic oil, turn off the power supply. High-pressure hydraulic oil can penetrate skin causing severe injury, gangrene, or death.

- Do not readjust the factory-set pressure of the hydraulic oil. Too much pressure can cause leaks or other damage.
- Before leaving the loader, always lock the swing mechanism to prevent the boom from suddenly swinging around. An unexpected movement of the boom can cause severe injury or death to anyone within its range.



DANGER! Exceeding the lift capacity of the truck-mount loader can result in a mechanical failure, severe injury or death (the loader's nominal lift capacity is located in the *Technical Specifications* section).

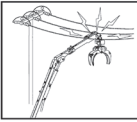
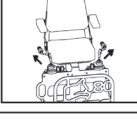
- **Even** when wearing a seat belt, never sit in the operator's station while the truck or trailer on which the loader is mounted is in motion.



Rotobec has the rotator and attachments with the load capacity to match your loader. For information, contact one of the Rotobec branches listed on the back cover.

Safety Labels

- Check regularly that the following safety labels are on the loader in the places shown in *Figure 2 on page 18*.
- Check regularly that the safety labels on the loader are readable.
- If labels are missing or need to be replaced because they are damaged, you can order the Safety Labels Kit from Rotobec. For the part number, check your *Parts Manual* or contact your Rotobec dealer. Rotobec branches are listed on the back cover.

 DANGER	
	KEEP AWAY
 WARNING	
	UNSTABLE MACHINE Do not operate loader without lowering the stabilizers on firm level ground and checking for adequate stability.
	CRUSHING HAZARD Stabilizers can cause severe injuries or death. Keep bystanders away from stabilizers.
	FALLING BOOM OR LOAD Can cause death or severe injury. Do not move boom or load over people.
	FOLD DOWN JOYSTICKS Always leave joysticks in the folded down position at all times, except when using loader functions.
146-1051	

 WARNING	
	READ Before using this equipment, carefully read and understand the included documents pertaining to this equipment.
	FALLING HAZARD Keep 3 points of contact with hands and feet when getting on or off the machine. Do not jump off machine.
	HYDRAULIC PRESSURE Hydraulic leaks can penetrate skin causing severe injuries, gangrene or death. Do not change factory-set pressures without Rotobec's Inc. written approval.
NOTICE	
	Grease gear and slewing ring every 60 hours. See the operator's manual.
146-1053 v2	

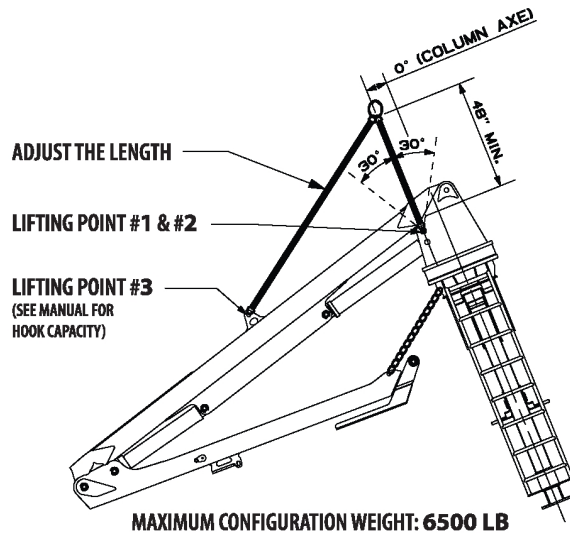
 WARNING	STAY CLEAR
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EMERGENCY CUT-OFF SWITCH	146-0249
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WARNING

GENERAL GUIDELINES

ALWAYS USE APPROVED LIFTING AND RIGGING EQUIPEMENT.



LABEL P/N: 146-1454

WARNING

The operator must keep windows clean at all times with the intention of avoiding serious accidents caused by reduced visibility.

146-1035v2

WARNING

Never operate the loader with an open cab door. Before lowering the cab for transportation, always close the windows and shut the door. Failure to respect these recommendations can result in severe injuries, death of the operator or cause damage to the cab.

146-1056v2

WARNING

While the cab is in the up or down position, the cab pivot **MUST BE LOCKED AT ALL TIMES.**

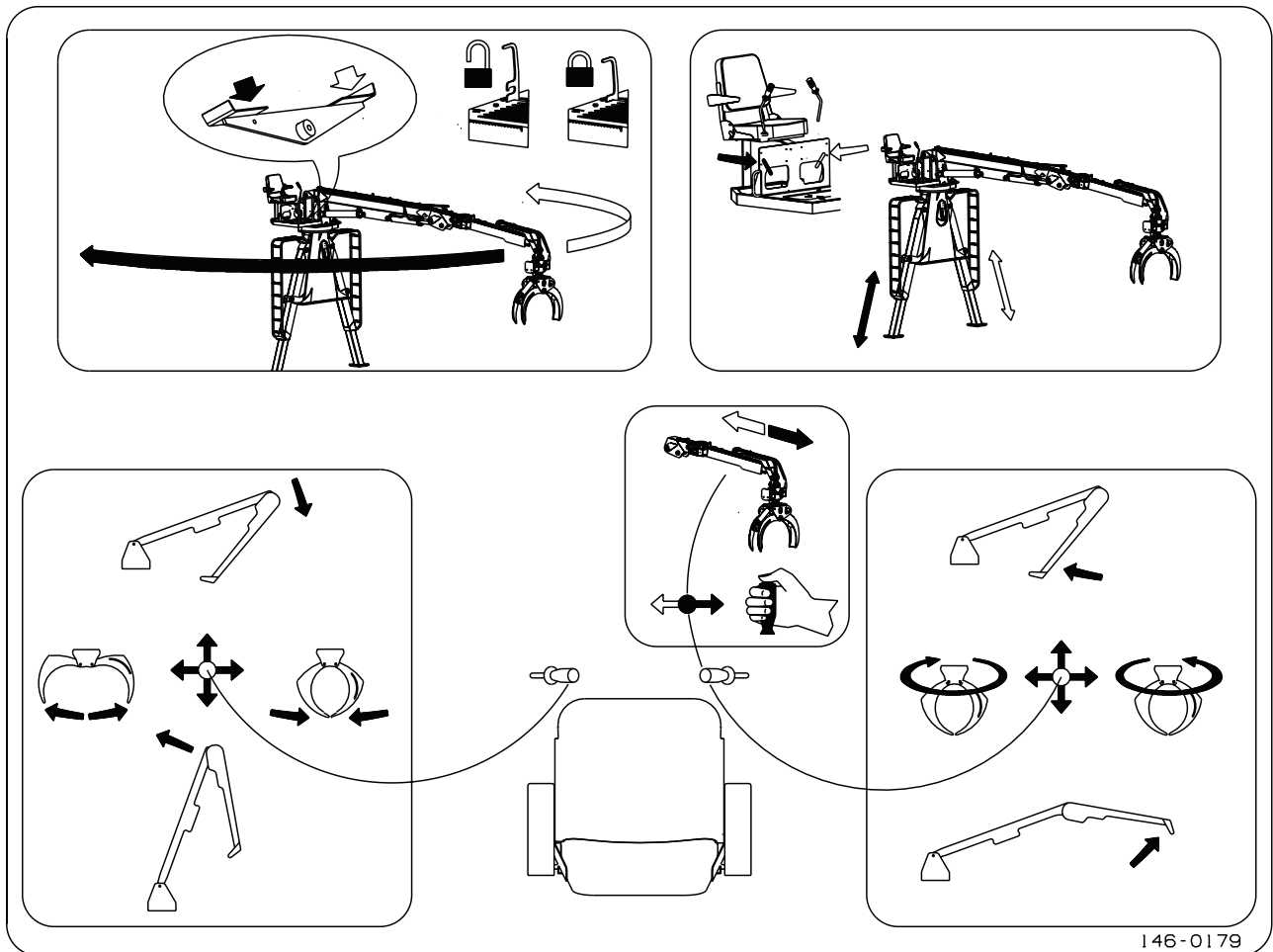
Failure to respect this recommendation can result in severe injuries or death.

NOTICE

TO TILT THE CAB:

- Close the door and windows.
- Pull the handle and turn it to the UNLOCK position.
- Use the switch to tilt the cab.
- Turn the handle to the LOCK position and make sure it is engaged completely.

LABEL P/N: 146-1177



- You should only equip your loader with a seat belt after consulting with a knowledgeable safety professional who can help you determine whether a seat belt is appropriate for your loader based on the environment and application in which the loader will be used.



WARNING

Use of the seat belt may inhibit your choice to jump freely from the loader in an emergency.

146-0235v1

- For safety reasons, install the label shown below in the carrier's cab. It tells you how to prepare the loader to be transported. For more information on transporting the loader, see *Shutting down the loader to transport it REF.*



Location of labels

- 1 Loader functions
- 2 Grease arrow
- 3 Warning stay clear
- 4 Danger label
- 5 Warning Label
- 6 Lifting guidelines
- 7 Light switch

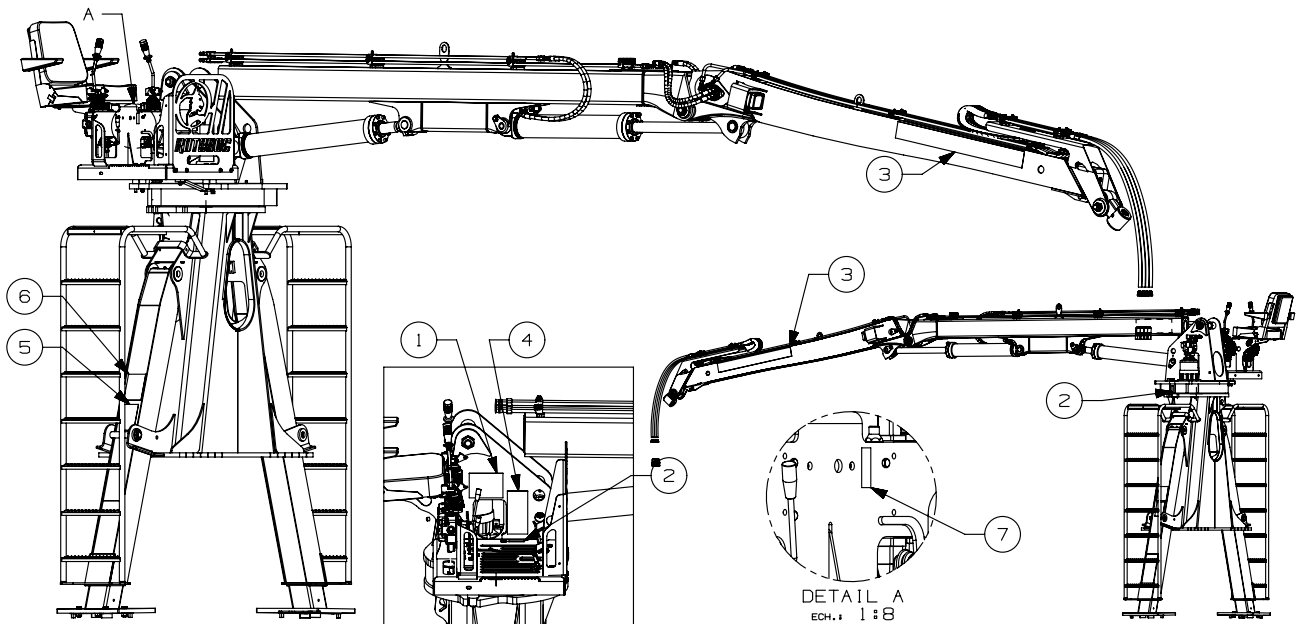


Figure 2 - Location of safety labels

Location of Safety labels on or in the cab

Check regularly that the following safety labels are on or inside the cab in the locations displayed in *Figure 3*, below.

- 1 Up/Down
- 2 Emergency Switch
- 3 Window washer
- 4 Keep windows clean
- 5 Rotate the cab
- 6 Rotobec Logo
- 7 Rotobec Logo
- 8 Rotobec Logo
- 9 Rotobec logo
- 10 Lock/Unlock cabin
- 11 Cab lock warning
- 12 Cab heater

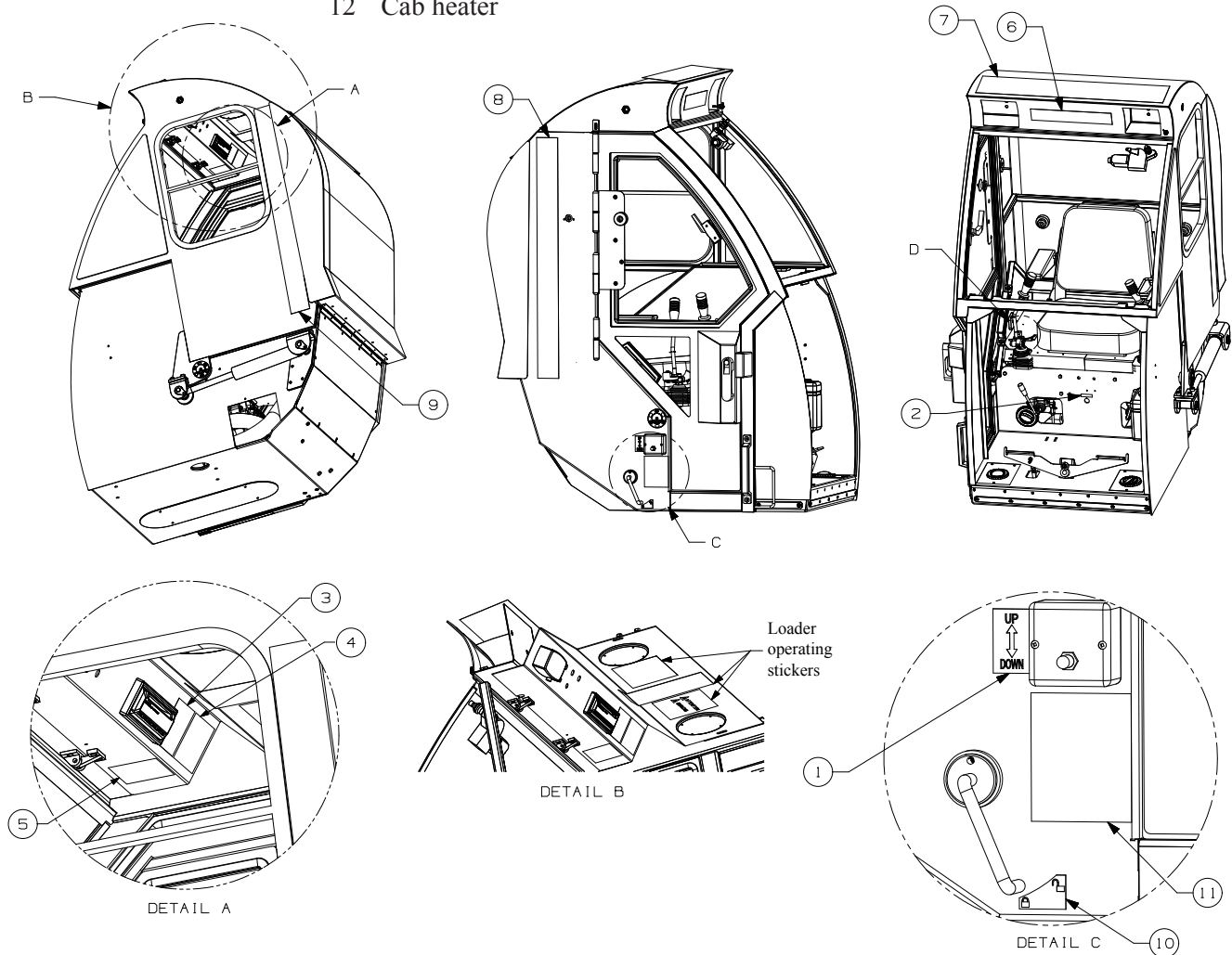


Figure 3 - Location of safety labels on or inside the cab

Overview

The Rotobec Elite 910 Loader is an A-frame self-loader with a nominal lift capacity of 8,890 lb (4,032 kg) at 10 ft (3 m).

The Elite Loader can be used in a number of different industries, including forestry, waste/debris removal and railway. Depending on a number of variables including the environment/application in which the loader is being used, how the loader is mounted and the type of materials.

The loader is designed to load/unload the truck or trailer on which it is installed. Equipped with an optional oil cooler it can occasionally be used to load/unload other trucks or trailers as well.

The Elite 910 Loader is sold with the following standard components:

- Standard 22-foot (6.72 m) boom
 - Continuous rotation
 - Electric swivel
 - Boom mounted lights

Loader options:

- Four optional booms are available with the loader, two of these are telescopic and the largest one offers a reach of 30 ft.
- Oil cooler
- Seat belt
- Tilt cab

The tilt cab is designed to protect the operator from the weather elements **ONLY**, the cab is **NOT** designed to protect the operator from impacts that may come from a load.

Several grapples are offered to match your application and loader configuration. As a general rule, the longer the boom, the smaller the grapple. When sizing a grapple, you must remember these lift charts do not consider the loader stability. If the truck or trailer is too small or too light, a smaller grapple must be used.

The grapple type and model selection also vary depending on the material to be handled and its density, weight and other physical properties.

The following are some grapple models depending on their intended application:

- For trash or refuse - the 045W or 060W grapple
- For short pulpwood, 4 ft (1.2 m) or 8 ft (2.4 m) - a 045 or 060 pulpwood grapple is suggested
- For mixed length or debarked wood, a 5609 or 6007 combination grapple are probably a better choice.
- For long saw logs the 4542 or 4642 grapple will probably be preferred.

It is important that the attachment be appropriate for the application for which the loader is being used. If you have a question about appropriateness or proper use of an attachment, you should contact Rotobec or consult with a qualified industry professional of your choice.

In comparison with competitive models, the hydraulic system of the Rotobec Elite Loader produces exceptionally smooth movement resulting in:

- Less wear on the loader,
- Better control of the load, and
- A smoother ride for the operator.
- The lighter-weight of the Elite Loader allows for a larger payload to be loaded on the carrier.
- The Elite is also offered in stationary mounted version with an electric



For information on other loader models, or other Rotobec products, contact one of the Rotobec branches listed on the back cover.

Technical Specifications

Booms

Standard model reach	22' (6.72 m)
Pivot points	2" (50.8 mm) diameter, induction-tempered, and chromed steel pins mounted on bronze bushings
Main Boom	
Length	148" (3759 mm)
Structure	Rectangular 6" x 8" (152 mm x 203 mm) high tension steel
Complete cycle time	8.2 sec. with 19.9 gpm (75.3 lpm)
Stick Boom	
Length	163" (4140 mm), telescope extended 121" (3073 mm), telescope retracted
Structure	Rectangular 6: x 6" (152 mm x 152 mm) High tensile steel
Complete cycle time	6.5 sec. with 19.9 gpm (75.3 lpm)
Lights	55-watt halogen light on each side

Cylinders

Main Boom	
Bore	5" (127 mm)
Rod	2.5" (63.5 mm)
Stick Boom	
Bore	5" (127 mm)
Rod	2.5" (63.5 mm)
Stabilizer	
Bores	3" (76.2 mm)
Rods	1.75" (44.5 mm)

Hydraulic System

Controls	Foot pedal controls swing mechanism Joysticks control booms and attachment Levers control the stabilizers
Pump	Double pump, 19.9/19.9 US gallons/minute (75.3/75.3 liters/minute) at 1800 rpm.
Swivel mechanism	8 hydraulic ports (with an option of 2 ports for the cooling system)
Standard:	5 Section electric swivel, (5 x 30A & 24V)
Optional:	12 section electric swivel, (2 x 80A & 240V, 2 x 20A & 28VDC, 8 x 7.5A & 28VDC)
Operating Pressure	
Main boom:	3045 psi (210 bars)
Stick boom and loader	
swing:	3263 psi (225 bars)

Swing Mechanism

Rotation	360° at 9.5 rpm with 19.9 gpm (75.3 L/m)
Slewing ring diameter	Outside diameter is 26.45" (673 mm)

Telescopic Stabilizers

When lowered	9'6" (2895 mm) spread between stabilizers 18" (457) below ground
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Weight

Loader Configuration	6109 lb. (2780 kg) approximate weight with telescopic boom, excluding grapple options, accessories and installation kit
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Grapples

Choice of grapple depends on the application and environment in which the loader is being used and the nature of the materials to be handled.

Options

Boom Configurations:	M21, M23, MT24, MT26, MT27, MT29
Pump:	Double gear pump
Hydraulic oil tank:	Aluminum, 55 US gallons (208 liters), return lines with filters and magnets, installed on the side of the truck frame
Loader mounting kit:	Including spacer (if required)
Installation kit:	For hydraulic components
Other options:	Hydraulic oil cooler Seat belt Heated joysticks Rotocab • Front Wipers • 4,000 W heater • Air conditioning • AM/FM/CD radio with dual speakers



Rotobec reserves the right to change specifications and improve their products without notice or obligation.

Visual Overview of the Elite 910 Loader

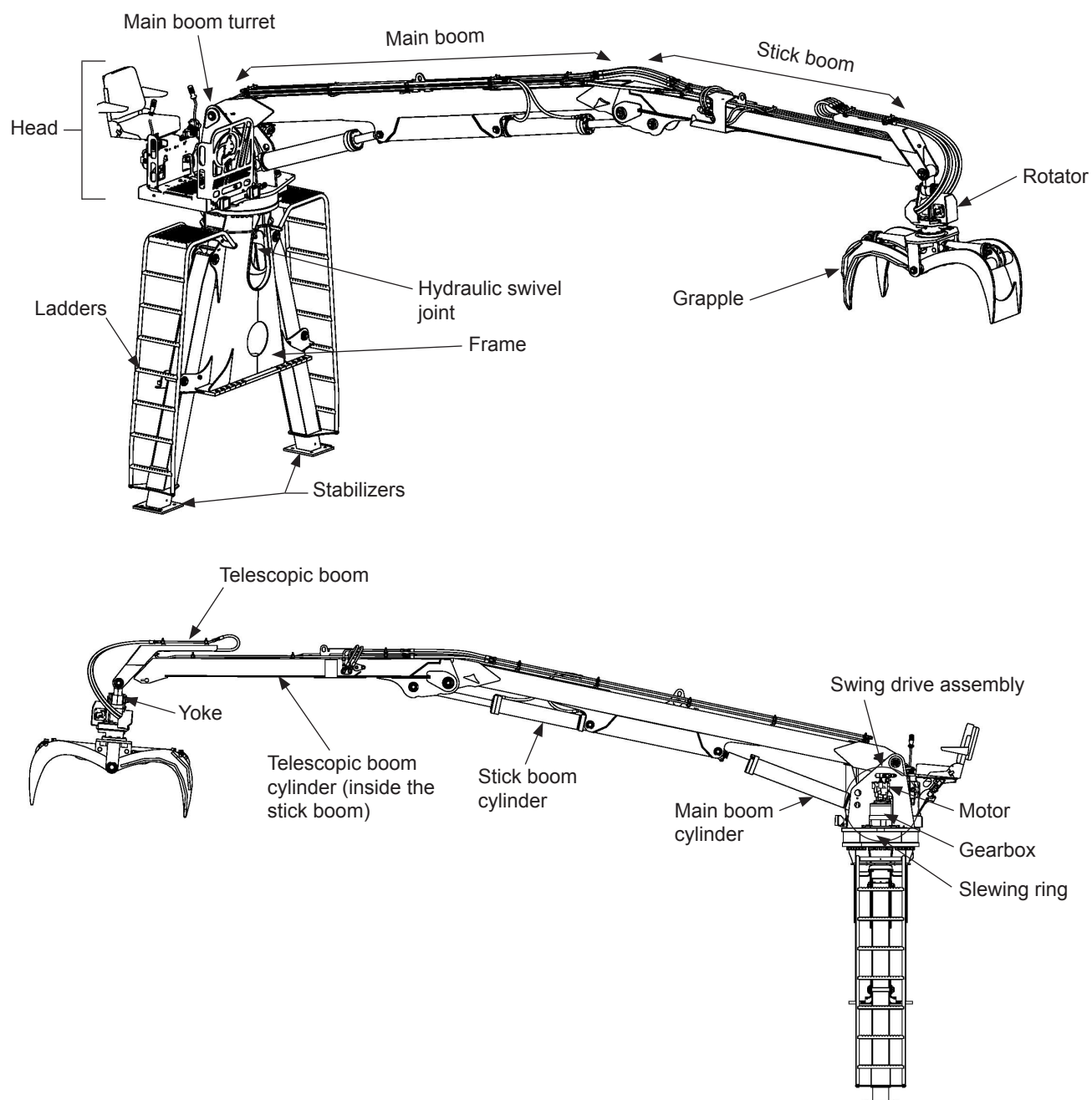
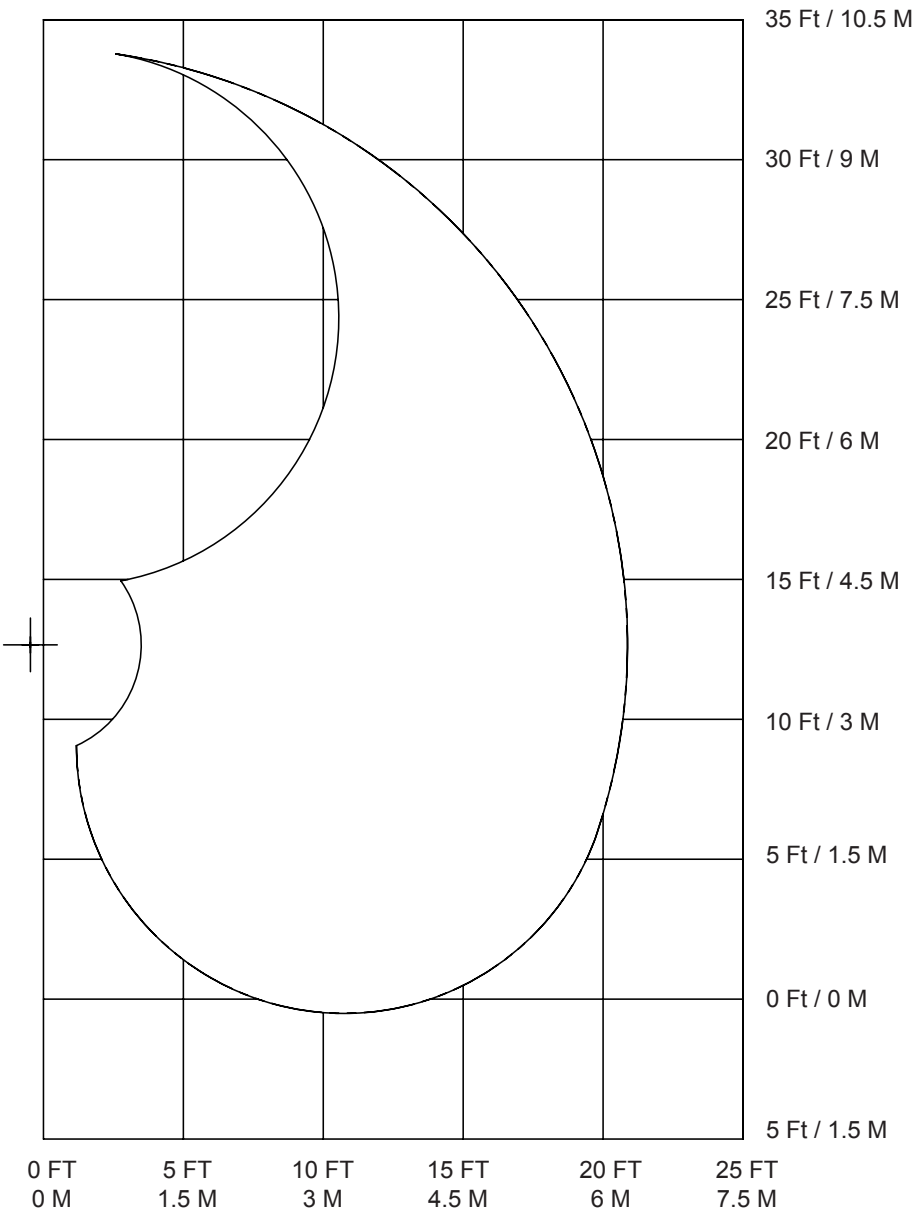


Figure 4 - Standard Elite loader parts

Elite Boom Configuration

This section provides the information on the loader hydraulic lift capacity for the boom and covers the M21, M23, MT24, MT26, MT27 and MT29.

Elite 910 with M21 Boom

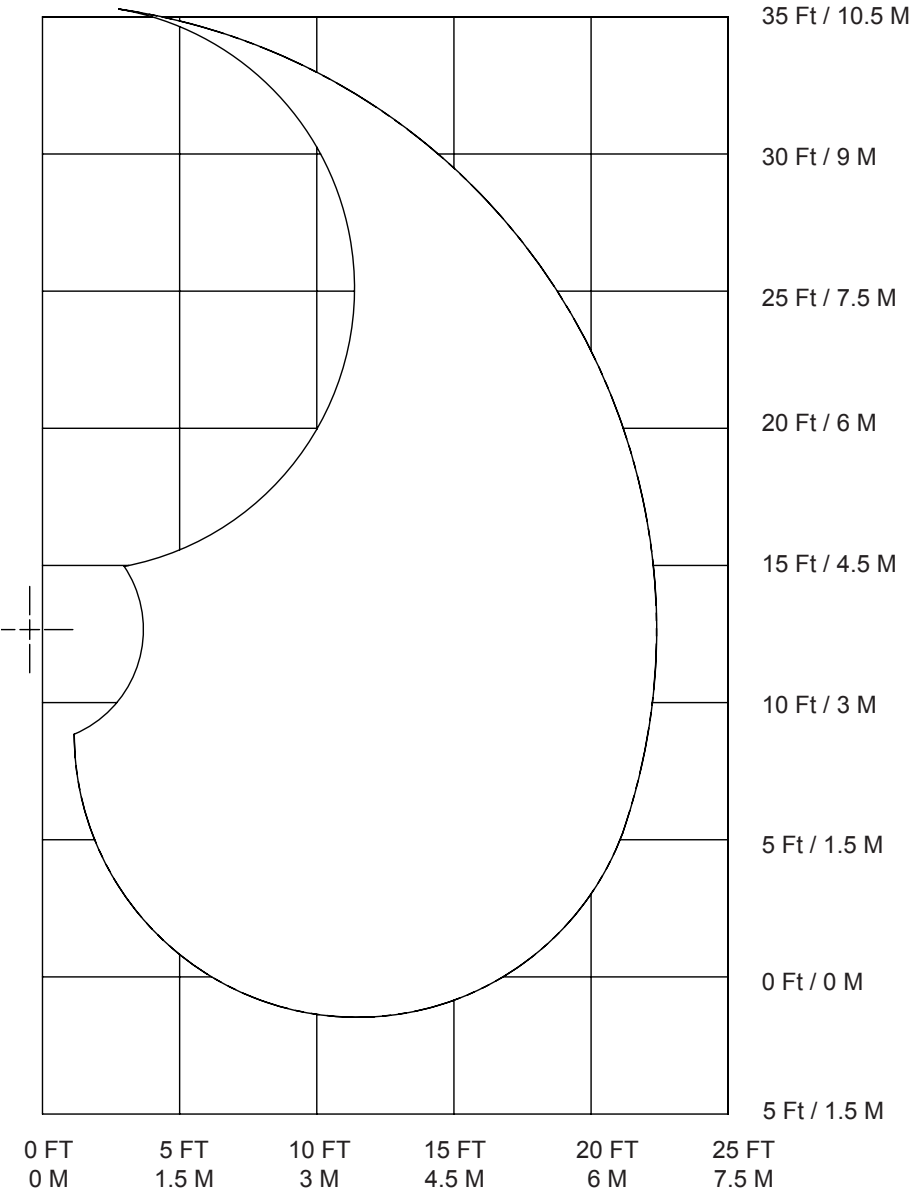


HEIGHT FT (M)	DISTANCE FROM THE CENTERLINE OF THE ROTATION			
	5 (1.5)	10 (3)	15 (4.5)	20 (6)
30 (9)	+	*5830 (*2930 kg)	+	+
25 (7.5)	+	+	*5340 (*2515 kg)	+
20 (6)	+	6600 (3035 kg)	5490 (2520 kg)	+
15 (4.5)	*8770 (***4070 kg)	7850 (3635 kg)	5800 (2670 kg)	*3640 (2000 kg)
10 (3)	*4560 (*1955 kg)	8860 (***4070 kg)	5920 (2730 kg)	3750 (1790 kg)
5 (1.5)	*6550 (*2940 kg)	8070 (3700 kg)	5170 (2385 kg)	+
0 (0)	+	4920 (2260 kg)	+	+

1. This is not a stability chart

- Lifting capacities shown must not be exceeded. Weight of the grapple and all lifting accessories must be deducted from the above lifting capacities.
- Lifting capacities are shown at 100% of hydraulic capacities. Capacities marked with an asterisk (*) are limited by the stick boom's hydraulic capacities.
*** Maximum load that must never be exceeded = 8970 lbs (4070 kg).
- Capacities apply only to the machine as originally manufactured and normally equipped by the manufacturer.
- We reserve the right to change specification and improve our products without notice or obligation.

Elite 910 with M22 Boom

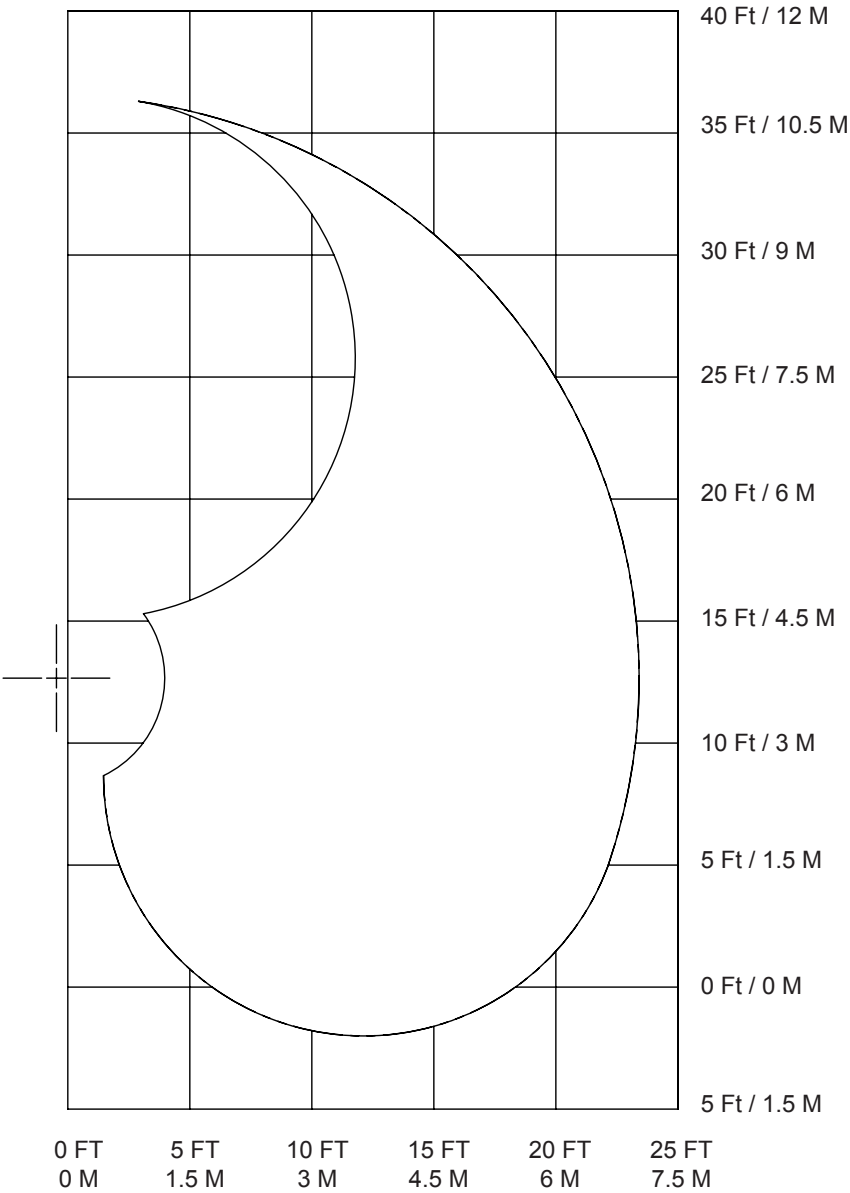


HEIGHT FT (M)	DISTANCE FROM THE CENTERLINE OF THE ROTATION			
	5 (1.5)	10 (3)	15 (4.5)	20 (6)
30 (9)	+	*6520 +	+	+
25 (7.5)	+	+	5200 (*2365 kg)	+
20 (6)	+	+	5280 (2425 kg)	*3920 (2025 kg)
15 (4.5)	*7760 (*3860 kg)	7690 (3560 kg)	5660 (2610 kg)	4380 (2025 kg)
10 (3)	*3580 (*1535 kg)	8760 (4040 kg)	5880 (2710 kg)	4140 (1920 kg)
5 (1.5)	*5380 (*2415 kg)	8140 (3735 kg)	5340 (2465 kg)	3060 (1470 kg)
0 (0)	+	5480 (2520 kg)	3380 (1585 kg)	+

1. This is not a stability chart

- Lifting capacities shown must not be exceeded. Weight of the grapple and all lifting accessories must be deducted from the above lifting capacities.
- Lifting capacities are shown at 100% of hydraulic capacities. Capacities marked with an asterisk (*) are limited by the stick boom's hydraulic capacities.
*** Maximum load that must never be exceeded = 8960 lbs (4065 kg).
- Capacities apply only to the machine as originally manufactured and normally equipped by the manufacturer.
- We reserve the right to change specification and improve our products without notice or obligation.

Elite 910 with M23 Boom



HEIGHT FT (M)	DISTANCE FROM THE CENTERLINE OF THE ROTATION			
	5 (1.5)	10 (3)	15 (4.5)	20 (6)
35 (10.5)	+	+	+	+
30 (9)	+	+	*3120 (*1985 kg)	+
25 (7.5)	+	+	5030 (2295 kg)	+
20 (6)	+	+	5190 (2385 kg)	4330 (1990 kg)
15 (4.5)	*8500 (***4040 kg)	7670 (3555 kg)	5590 (2580 kg)	4350 (2005 kg)
10 (3)	*2690 (*1160 kg)	8690 (4005 kg)	5830 (2685 kg)	4200 (1940 kg)
5 (1.5)	*4600 (*2070 kg)	8060 (3700 kg)	5360 (2470 kg)	3440 (1610 kg)
0 (0)	+	5610 (2575 kg)	3690 (1715 kg)	+

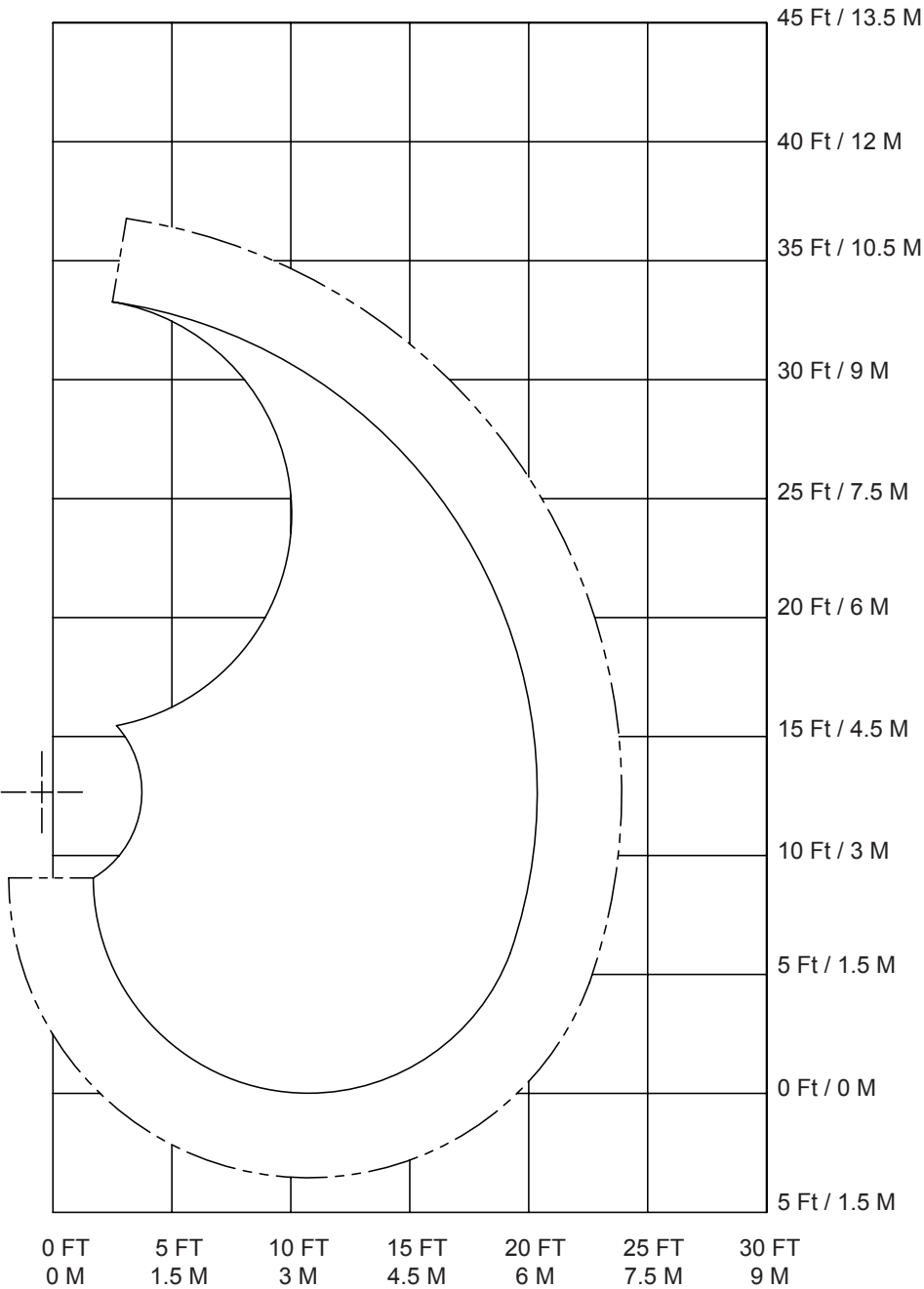
1. This is not a stability chart

- Lifting capacities shown must not be exceeded. Weight of the grapple and all lifting accessories must be deducted from the above lifting capacities.
- Lifting capacities are shown at 100% of hydraulic capacities. Capacities marked with an asterisk (*) are limited by the stick boom's hydraulic capacities.

*** Maximum load that must never be exceeded = 8910 lbs (4040 kg).

- Capacities apply only to the machine as originally manufactured and normally equipped by the manufacturer.
- We reserve the right to change specification and improve our products without notice or obligation.

Elite 910 with MT24 Boom



HEIGHT FT (M)	DISTANCE FROM THE CENTERLINE OF THE ROTATION			
	5 (1.5)	10 (3)	15 (4.5)	20 (6)
35 (10.5)	+	+	+	+
30 (9)	+	*4270 (*2708 kg)	*3660 (*1905 kg)	+
25 (7.5)	+	6330 +	*4710 (*2460 kg)	+
20 (6)	+	6630 (3055 kg)	5390 (2470 kg)	4170 (1910 kg)
15 (4.5)	***8770 (***3980 kg)	7800 (3615 kg)	5630 (2595 kg)	4240 (*1430 kg)
10 (3)	*3900 (*1685 kg)	8610 (3965 kg)	5660 (2610 kg)	4210 (*1405 kg)
5 (1.5)	*6550 (*2945 kg)	7570 (3470 kg)	4750 (2195 kg)	3670 (1715 kg)
0 (0)	*8340 (*3730 kg)	6820 (3140 kg)	4280 (1990 kg)	+

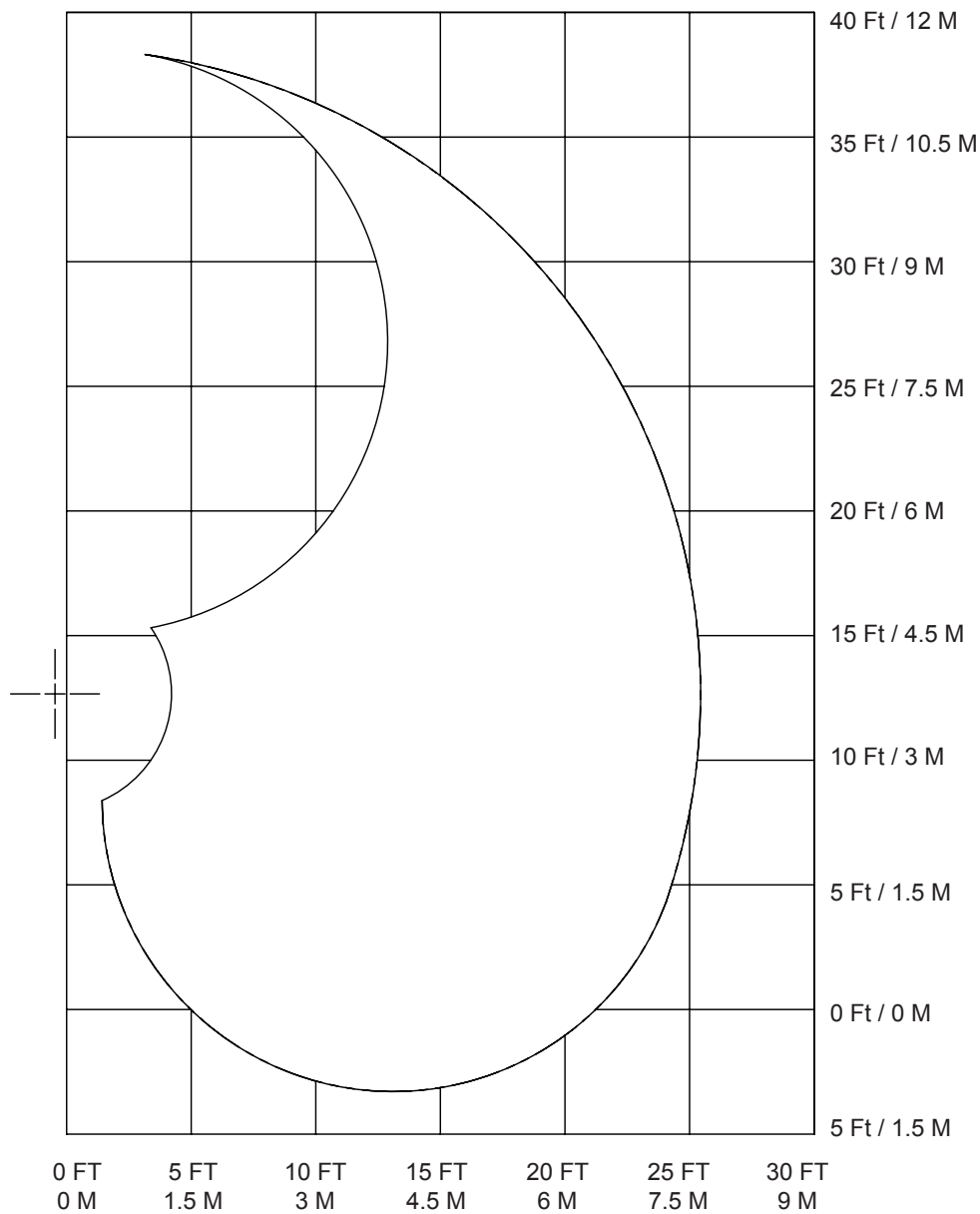
1. This is not a stability chart

- Lifting capacities shown must not be exceeded. Weight of the grapple and all lifting accessories must be deducted from the above lifting capacities.
- Lifting capacities are shown at 100% of hydraulic capacities. Capacities marked with an asterisk (*) are limited by the stick boom's hydraulic capacities.

*** Maximum load that must never be exceeded = 8770 lbs (3980 kg).

- Capacities apply only to the machine as originally manufactured and normally equipped by the manufacturer.
- We reserve the right to change specification and improve our products without notice or obligation.

Elite 910 with M25 Boom



HEIGHT FT (M)	DISTANCE FROM THE CENTERLINE OF THE ROTATION				
	5 ft (1.5 m)	10 ft (3 m)	15 ft (4.5 m)	20 ft (6 m)	25 ft (7.5 m)
35 (10.5)	+	*5200 (2580 kg)	+	+	+
30 (9)	+	+	4980 (2210 kg)	+	+
25 (7.5)	+	+	4720 (2160 kg)	4150 (1895 kg)	+
20 (6)	+	+	4970 (2285 kg)	4170 (1915 kg)	+
15 (4.5)	*7170 (*3890 kg)	7480 (3470 kg)	5430 (2205 kg)	4260 (1965 kg)	+
10 (3)	*1980 (*855 kg)	8530 (3935 kg)	5730 (2640 kg)	4220 (1950 kg)	+
5 (1.5)	*3630 (*1635 kg)	8050 (3695 kg)	5410 (2495 kg)	3760 (1745 kg)	+
0 (0)	*6050 (*2715 kg)	5990 (2745 kg)	4140 (1915 kg)	2380 (1145 kg)	+

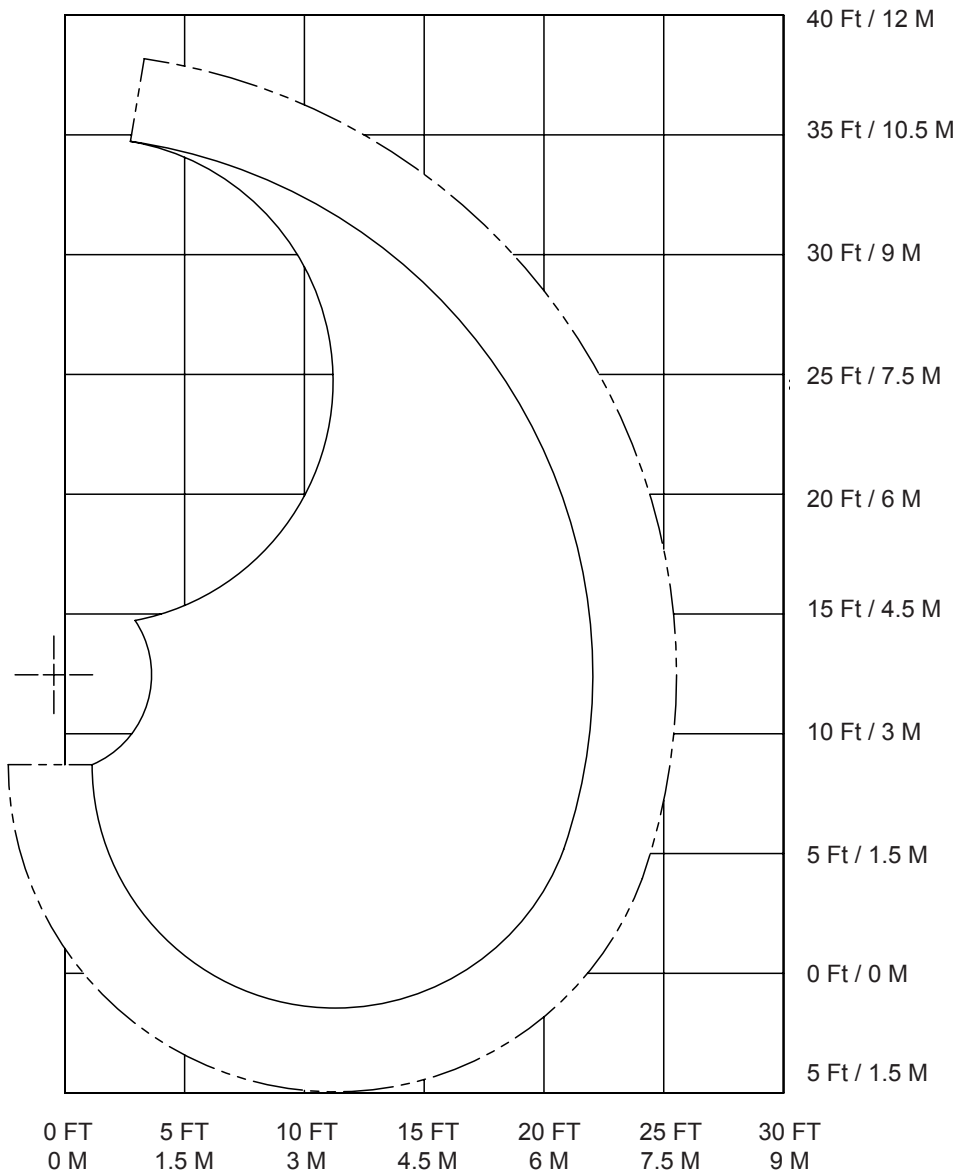
1. This is not a stability chart

- Lifting capacities shown must not be exceeded. Weight of the grapple and all lifting accessories must be deducted from the above lifting capacities.
- Lifting capacities are shown at 100% of hydraulic capacities. Capacities marked with an asterisk (*) are limited by the stick boom's hydraulic capacities.

*** Maximum load that must never be exceeded = 8850 lbs (4015 kg).

- Capacities apply only to the machine as originally manufactured and normally equipped by the manufacturer.
- We reserve the right to change specification and improve our products without notice or obligation.

Elite 910 with MT26 Boom



HEIGHT FT (M)	DISTANCE FROM THE CENTERLINE OF THE ROTATION				
	5 ft (1.5 m)	10 ft (3 m)	15 ft (4.5 m)	20 ft (6 m)	25 ft (7.5 m)
35 (10.5)	+	+	+	+	+
30 (9)	+	6340 +	4490 (2015 kg)	+	+
25 (7.5)	+	+	4990 (2270 kg)	*3800 (1790 kg)	+
20 (6)	+	+	5070 (2330 kg)	*3750 (1925 kg)	+
15 (4.5)	*7450 (*3760 kg)	7450 (3455 kg)	5430 (2505 kg)	4150 (1920 kg)	*2180 (*1260 kg)
10 (3)	*3430 (*1420 kg)	8470 (3910 kg)	5630 (2595 kg)	3900 (1815 kg)	*2280 (*1310 kg)
5 (1.5)	*5220 (*2345 kg)	7830 (3595 kg)	5080 (2340 kg)	2820 (1360 kg)	+
0 (0)	*6850 (*3065 kg)	5170 (2375 kg)	3120 (1460 kg)	2810 (1335 kg)	+

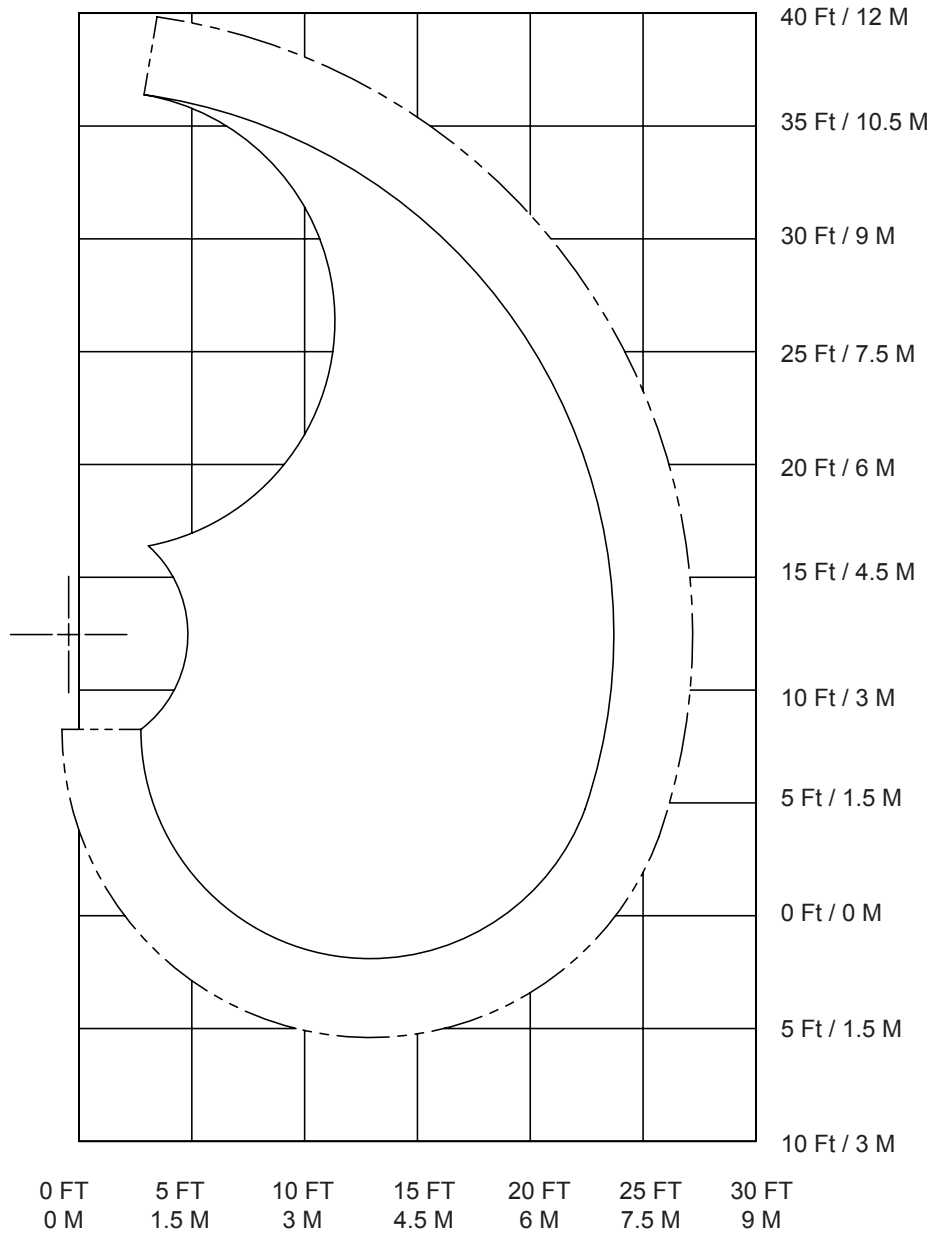
1. This is not a stability chart

- Lifting capacities shown must not be exceeded. Weight of the grapple and all lifting accessories must be deducted from the above lifting capacities.
- Lifting capacities are shown at 100% of hydraulic capacities. Capacities marked with an asterisk (*) are limited by the stick boom's hydraulic capacities.

*** Maximum load that must never be exceeded = 8750 lbs (3965 kg).

- Capacities apply only to the machine as originally manufactured and normally equipped by the manufacturer.
- We reserve the right to change specification and improve our products without notice or obligation.

Elite 910 with MT27 Boom



HEIGHT FT (M)	DISTANCE FROM THE CENTERLINE OF THE ROTATION				
	5 ft (1.5 m)	10 ft (3 m)	15 ft (4.5 m)	20 ft (6 m)	25 ft (7.5 m)
35 (10.5)	+	+	*3040 (*1705 kg)	+	+
30 (9)	+	+	*4530 (2275 kg)	*2920 (*1540 kg)	+
25 (7.5)	+	+	4790 (2190 kg)	*2580 (*1680 kg)	+
20 (6)	+	6420 (2970 kg)	4990 (2295 kg)	*4050 (1860 kg)	*2970 (1490 kg)
15 (4.5)	***8700 (***3945 kg)	7660 (3550 kg)	5360 (2470 kg)	4070 (1880 kg)	3200 (1480 kg)
10 (3)	*1080 (*475 kg)	8320 (3830 kg)	5490 (2530 kg)	3910 (1810 kg)	3040 (1415 kg)
5 (1.5)	*3550 (*1605 kg)	7350 (3365 kg)	4940 (2275 kg)	3230 (1505 kg)	2470 (1180 kg)
0 (0)	*5260 (*2360 kg)	4870 (2225 kg)	3350 (1550 kg)	3050 (1425 kg)	+
-5 (-1.5)	+	3900 (1815 kg)	2620 (1235 kg)	+	+

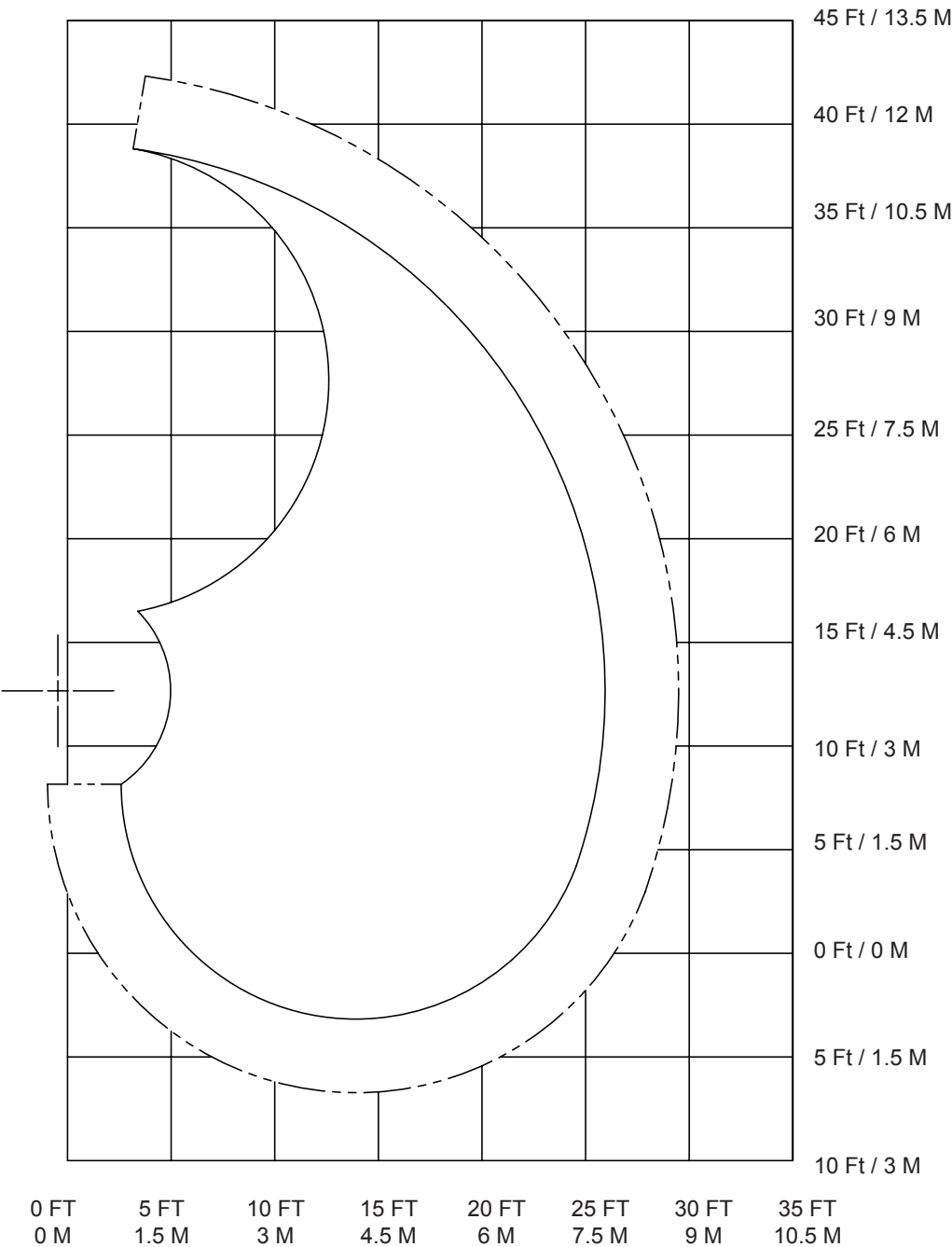
1. This is not a stability chart

- Lifting capacities shown must not be exceeded. Weight of the grapple and all lifting accessories must be deducted from the above lifting capacities.
- Lifting capacities are shown at 100% of hydraulic capacities. Capacities marked with an asterisk (*) are limited by the stick boom's hydraulic capacities.

*** Maximum load that must never be exceeded = 8700 lbs (3945 kg).

- Capacities apply only to the machine as originally manufactured and normally equipped by the manufacturer.
- We reserve the right to change specification and improve our products without notice or obligation.

Elite 910 with MT29 Boom



HEIGHT FT (M)	DISTANCE FROM THE CENTERLINE OF THE ROTATION				
	5 ft (1.5 m)	10 ft (3 m)	15 ft (4.5 m)	20 ft (6 m)	25 ft (7.5 m)
40 (12)	+	*3010 (*1990 kg)	+	+	+
35 (10.5)	+	*5580 (*2670 kg)	*4110 (*1945 kg)	+	+
30 (9)	+	+	4640 (2105 kg)	3630 (*1645 kg)	+
25 (7.5)	+	+	4550 (2085 kg)	3890 (*1780 kg)	*2720 (*1395 kg)
20 (6)	+	6200 (2870 kg)	4810 (2220 kg)	3920 (1805 kg)	3160 (1450 kg)
15 (4.5)	***8650 (***3925 kg)	7490 (3475 kg)	5230 (2415 kg)	4010 (1850 kg)	*2670 (1380 kg)
10 (3)	*840 (*365 kg)	8220 (3785 kg)	5430 (2505 kg)	3940 (1820 kg)	2540 (1225 kg)
5 (1.5)	*2880 (*1300 kg)	7420 (3400 kg)	5020 (2310 kg)	3470 (1610 kg)	2780 (1300 kg)
0 (0)	*4440 (*1990 kg)	5270 (2410 kg)	3740 (1730 kg)	2220 (1060 kg)	1840 (905 kg)
-5 (-1.5)	+	4480 (2075 kg)	3150 (1470 kg)	1820 (885 kg)	+

1. This is not a stability chart

- Lifting capacities shown must not be exceeded. Weight of the grapple and all lifting accessories must be deducted from the above lifting capacities.
- Lifting capacities are shown at 100% of hydraulic capacities. Capacities marked with an asterisk (*) are limited by the stick boom's hydraulic capacities.

*** Maximum load that must never be exceeded = 8650 lbs (3925 kg).

- Capacities apply only to the machine as originally manufactured and normally equipped by the manufacturer.
- We reserve the right to change specification and improve our products without notice or obligation.

Operation

The safety of all the personnel in the work area depends on the proper operation, use and maintenance of the loader. This section explains how to operate the Rotobec Elite Loader properly. The following procedures are covered:

- Preparing to start up the loader
- Starting the loader
- Operating the stabilizers
- Controlling the swing mechanism
- Controlling the booms and grapple
- Shutting down the loader
- Shutting down the loader for transportation

Refer to provincial or state regulations for the minimum age, training, and qualifications required to operate a loader.



WARNING! Use the loader for loading and unloading materials only in accordance with the instructions given in this manual, as well as any applicable work safety regulations.

Never attempt to perform hazardous operations including, but not limited to, lifting people or lifting or carrying loads with persons on the grounds within the radius of the boom.

Preparing to Start Up the Loader

To help provide for the safety of all personnel in the work area and to prevent damage to the carrier or loader, follow these steps before operating the loader:

1. Position the carrier on firm level ground to keep it stable during loading operations.
2. Position the carrier where the loader can operate fully without encountering any obstacles (power lines, trees, fences, buildings, other vehicles, etc.).
3. Shut down the carrier's engine and remove the key from the ignition.



WARNING! Prior to cleaning, inspecting or performing any maintenance on the loader, shut down the carrier's engine and remove the key. Running the carrier's engine during those procedures can cause unexpected movements of the carrier or loader, which could result in personal injury or death.

4. Note the location of any power lines in the area. If possible, get the power disconnected from them (see *Power Line Guidelines REF*).

5. Follow these guidelines to avoid falling and getting injured when climbing onto and off the loader:
 - To prevent a fall while climbing onto or off the loader, remove oil, grease, mud, snow and other debris.
 - Pay attention to clothing or other items that may catch on or knock the joysticks when climbing onto or off of the head of the loader. Any unexpected movement of the booms or grapple can result in a dangerous fall, destabilize the carrier or cause other problems.



WARNING! Do not jump off the loader. Only jump off the loader if the loader or carrier has touched a live power line and you must leave the loader quickly. To learn the safe way to jump off the loader in this case, read *Power Line Guidelines* on page 11.

6. Perform the daily inspection (see *Maintenance Schedule* on page 61).
7. Repair any problems found during the inspection before operating the loader.
8. Clear ice, snow, rocks, or other debris from the area where the stabilizer pads will be lowered.



WARNING! Lower the stabilizers onto firm and level ground and check for adequate stability. The loader, its load, or the carrier can topple over if a stabilizer is on a slippery surface (ice), an uneven surface (rocks, stumps, curbs), or on a soft or unstable ground.

9. Alert personnel in the area that the loader is about to begin operating. They must be at a distance of at least 28 yards (25 meters) from the carrier, booms and grapple.
10. Verify that all the controls on the loader head (joysticks, stabilizer levers, and the swing control pedal) are in the neutral position and free from obstructions/interference and the swing mechanism is locked before starting up the loader.



For the location of these controls, refer to *Figure 5* on page 46. The controls are shown in the proper positions for starting up the loader.

Starting Up the Loader

When the steps in the previous section, “*Preparing to Start Up the Loader*”, have been completed, you can safely start the loader.



WARNING! Only the operator should be on or around the loader or carrier once the loader is started up. Do not operate the loader with riders on the loader or carrier.

Starting the hydraulic pump

1. Verify that the carrier's parking brake is on.
2. Start up the carrier's engine.
3. Start the loader's hydraulic pump by engaging the PTO. Refer to the carrier's manual for the proper procedure.
4. When increasing the RPM of the carrier's engine, stay below the maximum RPM for the hydraulic pump.



CAUTION! The maximum RPM of the carrier's engine has been calculated to prevent the Rotobec-supplied hydraulic pump from exceeding 1800 RPM or 20 GPM. This would overheat the hydraulic oil and send too much oil into the loader's hydraulic system. This results in erratic operation and reduced life of the loader's hydraulic and mechanical components.

Operating the stabilizers

1. Climb onto the loader's platform and, to prevent falling sit in the operator's seat.

The control levers for the stabilizers are located on both sides of the seat below the joysticks (see *Figure 5*, below).

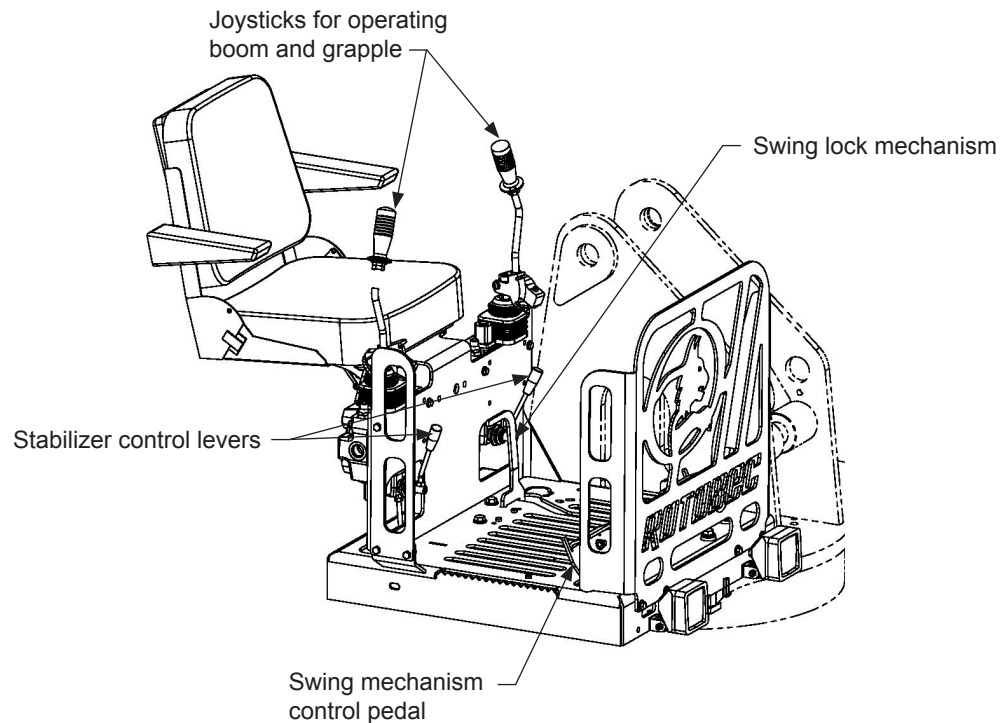


Figure 5 - Operator's seat and location of controls

2. Lower both stabilizers to the ground



WARNING! Always operate the loader with the stabilizers properly positioned and lowered firmly on the ground. Operating the loader with the stabilizers raised or improperly positioned and lowered can cause the carrier to topple over.

The stabilizers are **lowered** by pushing and holding the stabilizer control levers **forward** from the neutral position.

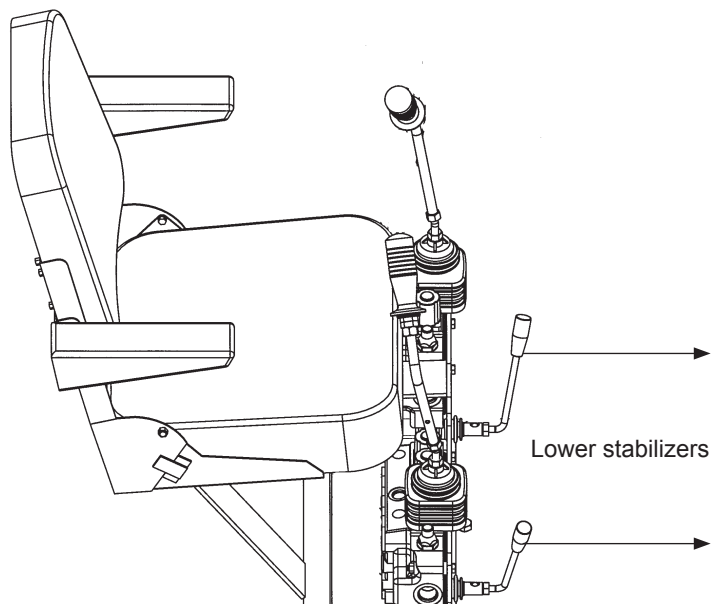


Figure 6 - Lowering the stabilizers

The stabilizers are **raised** by pulling and holding the stabilizer control levers **back** towards the seat.

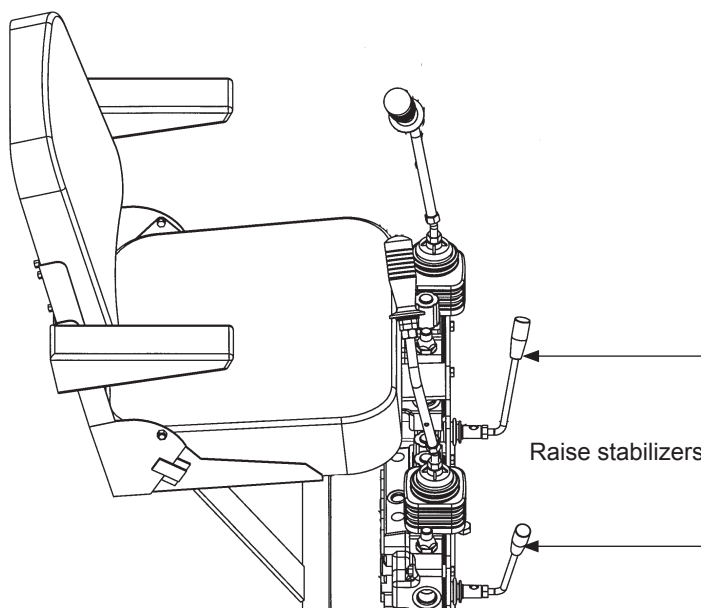


Figure 7 - Raising the stabilizers

3. Set the stabilizers to balance the empty carrier. The carrier's wheels and the stabilizers must both be firmly on the ground. The stabilizers are designed to help prevent the carrier from tipping, **not** to bear its weight.

Learning the controls

1. Read the section on *Controlling the Booms and Grapple* on page 51.
2. Locate the lock handle of the swing mechanism on the left side of the floor. It should be in locked position down and 90° to the right.

If the lock handle is not in the locked position, lock it until you are ready to use it.

3. Locate the swing mechanism control pedal at your feet (see *Figure 5* on page 46). Do not use the pedal until the swing mechanism is unlocked.



WARNING! Memorize the operation of the joysticks and the swing mechanism control pedal before lifting loads. Operating the controls without knowing them can result in unexpected movements of the booms or of the grapple. To avoid inadvertent contact with the controls and possible unintended rotation of the loader or movement of the boom/load, always be aware of the placement of your hands and feet in relation to the swing pedal and joysticks.

- The loader swings to the **right** when you press the swing control pedal down on the **right** side (see *Figure 8*, below).

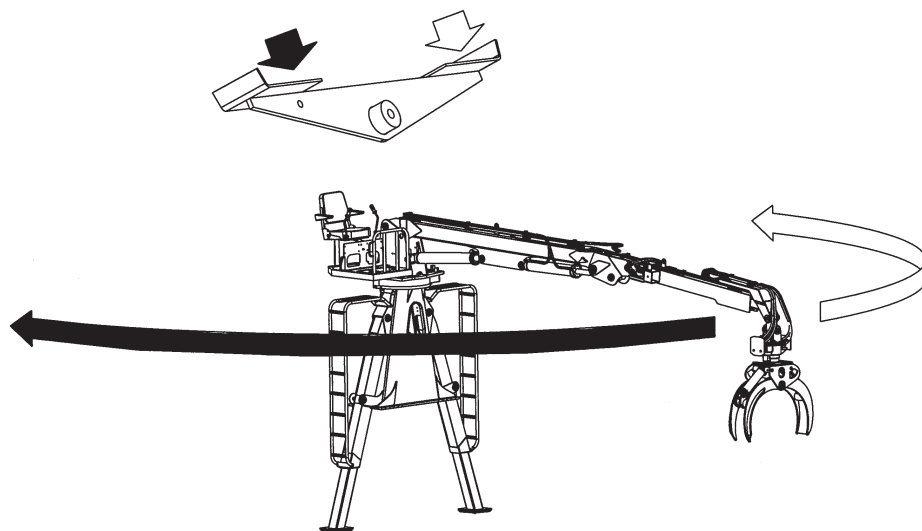


Figure 8 - Swing control pedal operation

The loader swings to the **left** when you press the swing control pedal down on the **left** side (see *Figure 8*, above).

4. Unlock the swing mechanism.

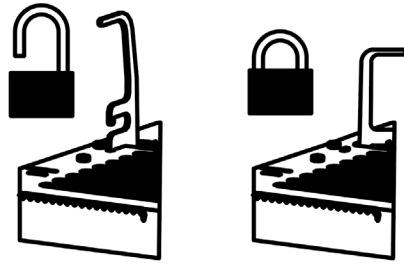


Figure 9 - Loader swing lock mechanism

5. Lift the boom from its resting or transportation position by pulling the **left** joystick **back** towards the seat (see *Figure 11 on page 53*).
6. Practice controlling the joysticks without a load until they are memorized.

Lifting loads



WARNING! Never move the carrier while the operator is on the loader. This can cause the operator to fall.

1. If the ground and stabilizers are firm, start loading.
 If the ground is not firm, reposition the carrier so the stabilizers are on firm ground (see *Shutting down the loader to transport it on page 55*).
 If the ground is firm, it is safe to start loading.
2. Adjust the stabilizers at least three times during a loading period. The carrier remains level and the ground and excessive weight on the stabilizers is relieved.

Adjust the stabilizers by doing the following;

- Raise the stabilizers until the carrier is resting with its full weight on the ground.
- Lower the stabilizers again until they are firmly on the ground.



CAUTION! Adjust the stabilizers to relieve them of the weight of the carrier and its load and to maintain the stability of the carrier. Carrying the weight of both the carrier and the load can damage the stabilizers.

3. Prior to lifting materials, you should determine whether it is safe and appropriate to lift those materials under the existing circumstances. Consideration should be given to the type of attachment being used, the environment in which the loader is being operated and the dimensions, weight and other physical properties of the material being lifted.

4. The loader is designed such that the operator has full visibility and control over the boom, grapple and load. You should always be aware of the proximity of the load to the operator's station and the height of the load in relation to the guard at the front of the station.
5. Never manipulate the loader controls in a manner that would allow the load/attachment to contact the operator, operator's station or the loader controls.
6. In order to avoid inadvertent activation/movement, always be aware of the proximity of your hands and feet in relation to the controls.
7. Always adequately secure materials in the attachment prior to lifting.
8. The attachment, with or without a load, should never be lifted over the operator or persons on the ground.



WARNING! Always clamp the load fully with the grapple jaws, making certain it is adequately secured. Seizing a load by pinching the sides with the tips of the grapple's jaws can cause the load to fall when rotating the booms.



Rotobec has the rotator and attachment with the load capacity to match your carrier. For information on them, contact the nearest Rotobec branch listed on the back cover.

Controlling the Booms and Grapple

The joystick controls for the booms and the grapple are located within easy reach on both sides of your seat as shown in *Figure 10*, below.

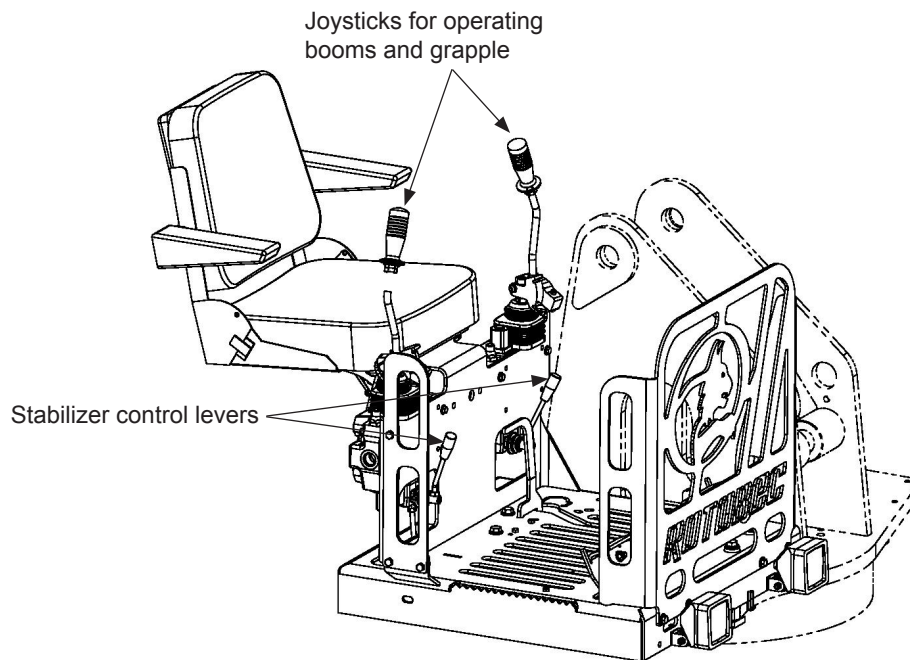


Figure 10 - Joysticks and stabilizer controls



WARNING! Memorize the operation of the joysticks before lifting loads. Unplanned movements or rotation of the booms and grapple or accidental opening of the grapple can result in loss of control of the load.

Using the joysticks properly does the following:

- Maintains the stability of the carrier and the loader,
- Maintains control of the load,
- Prevents the load/attachment from making contact with the operator, operator's station and loader controls,
- Prolongs the working life of the loader, and prevents strain and potential injury to the operator.

The proper ways to operate the joysticks are the following:

- Always hold the joystick. If released, it pops back to neutral and can cause a sudden and dangerous movement of the booms and grapple.
- Move the joysticks slowly from neutral to the starting position to produce a smooth controlled movement of the booms or grapple.
- Move the joysticks slowly back to neutral to stop the booms or grapple in a controlled smooth movement.
- Always move the joysticks slowly through neutral first to change a position. This produces a control movement of the booms and grapple.



WARNING! Rough or improper manipulation of the joysticks can result in damage to the loader and its controls and/or destabilize/cause uncontrolled movement of the load that could result in the load coming into contact with the operator or others working around the loader, potentially resulting in severe personal injury or death.



DANGER! The hydraulic hoses for the booms and grapple must be connected to the joysticks to produce the operating sequences displayed in *Figure 11*. Altering the sequence (for example, switching the hoses of the stick boom with the hoses of the main boom) can cause confusion about operations.

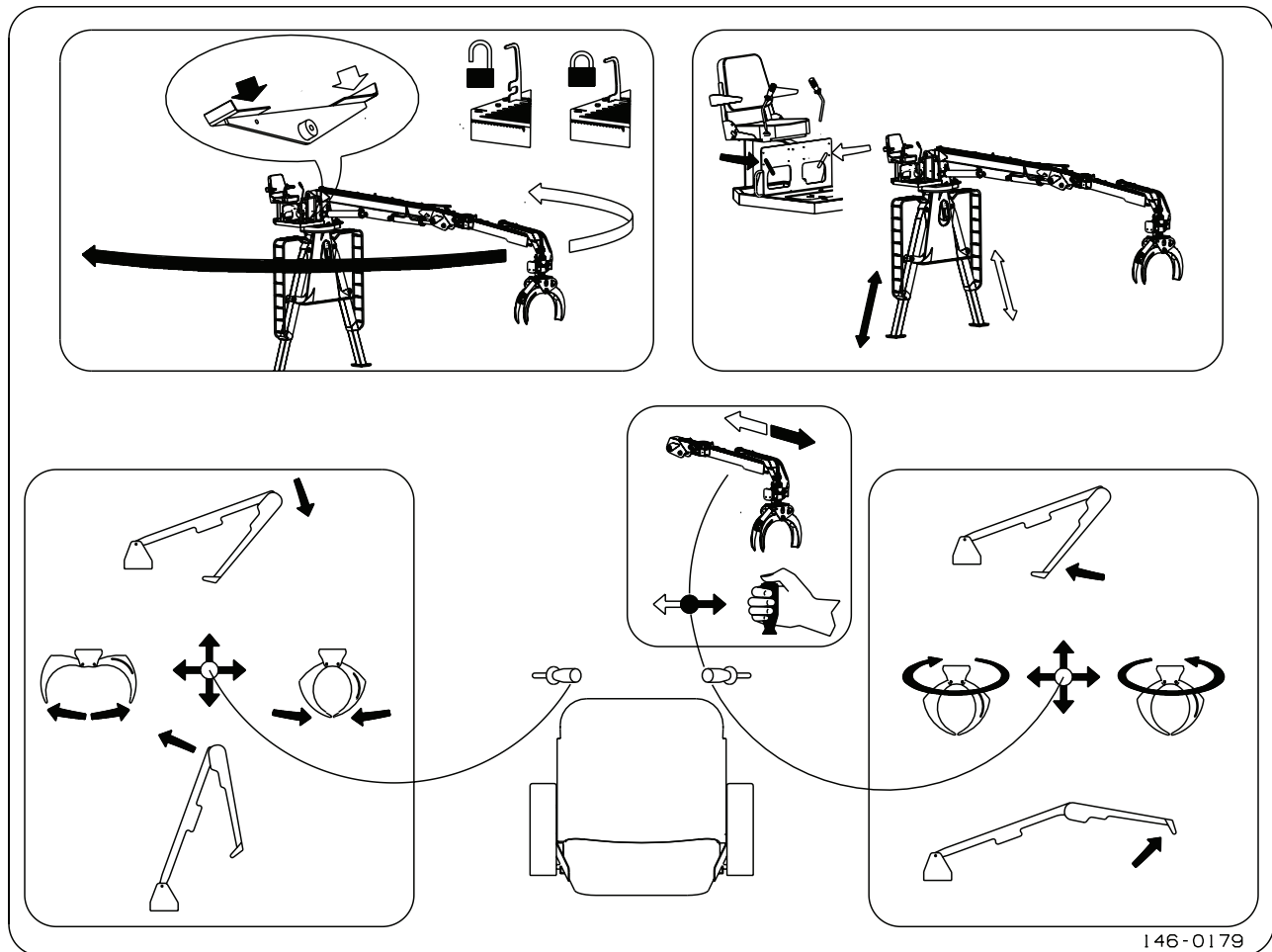


Figure 11 - Standard view of loader controls

Operating the telescopic boom



CAUTION! The telescopic boom is designed to reach for a load that is farther than the boom reach without extension, and bring it toward the loader before lifting it. It is **not** designed to lift a load far from the loader with the telescopic boom extended. **Never** lift materials with the telescopic boom extended. Working with the telescopic boom extended can damage the boom and create premature wear on the moving parts.

Shutting Down the Loader

The loader can be shut down and left to resume work in the same area, or be shut down to be transported to another work area.

Shutting down the loader without transporting it

1. Retract the telescopic boom, if there is one.
2. Position the booms at a 90° angle from the stabilizers, facing either front or back (as shown in *Figure 4 on page 25*).



WARNING! The swing mechanism lock only works when the booms are positioned at a 90° angle from the stabilizers. The booms will not lock while they are in a position other than 90° as this can result in the booms swinging unexpectedly.

3. Rest the booms on the carrier or on the ground.



WARNING! Always support the booms when they are not moving or when the loader is shut down. The booms can fall if they are not properly supported.

4. To lock the swing mechanism:
 - Pull the lock handle
 - Turn it 90° to the left
 - Release it
 - Turn the handle 90° to the right in locked position.

It will snap down (for the locked position see *Figure 9 on page 49*).



WARNING! Always lock the swing lock mechanism when not lifting loads. Failure to lock the swing mechanism can result in the booms swinging unexpectedly.

5. Shut down all the controls in the loader for the accessories (lights, fans, etc.).
6. Turn the Rotocut activation switch to off, if there is one.
7. Dismount from the loader following the guidelines given in *Power Line Guidelines on page 11*.

8. Shut down any controls in the carrier's cab for accessories.
9. Shut down the hydraulic pump, for the proper instructions, refer to the carrier's manual for disengaging the power take-off.
10. Shut down the carrier's engine.

Shutting down the loader to transport it

1. Retract the telescopic boom, if there is one.
2. Lower the main and stick booms to below the legal maximum height required for road travel.
3. If there is a cradle for the booms and grapple, place them in it.

Or

If there is not cradle and the carrier is filled with wood, place the booms and the grapple in the transportation position shown in *Figure 12*, below.

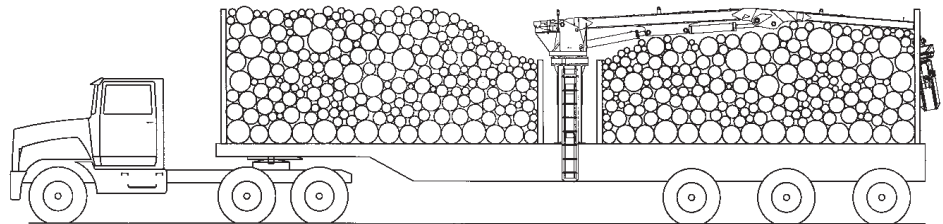


Figure 12 - Carrier filled with wood

Or

If there is no cradle and the carrier is empty, place the booms and grapple in the transportation position shown in *Figure 13*, below.

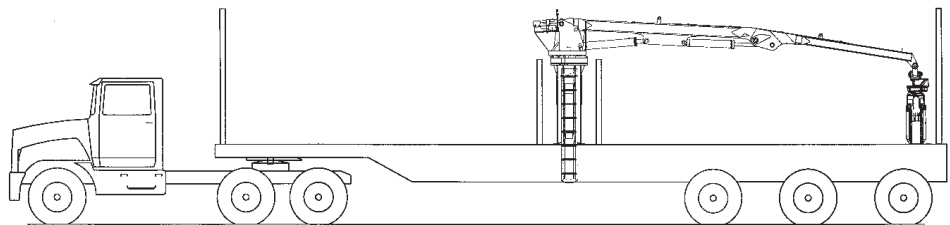


Figure 13 - Empty carrier



WARNING! Position the loader according to the illustrations above. Improper positioning of the loader for transportation can result in uncontrolled movements of the loader.

4. Lock the swing mechanism by pulling the lock handle forward and releasing it. It will snap down (for the locked position see *Figure 9 on page 49*).



WARNING! Always lock the swing mechanism when not lifting loads. The swing mechanism lock only works when the booms are positioned at a 90° angle from the stabilizers. Failure to lock the swing mechanism can result in the booms swinging unexpectedly.

5. Shut down the controls for all the accessories controlled in the loader (lights, fans, etc.).
6. Raise the stabilizers completely (see *Operating the stabilizers on page 46*).
7. Flip the back of the operator's seat forward to conform to the legal height for transportation.
8. Dismount from the loader following the procedures given in *Step 5 on Page 54*.
9. Lower the tilt cab if equipped.
10. Shut down any controls in the carrier's cab for accessories.
11. Shut down the hydraulic pump, for the proper instructions, refer to the carrier's manual for disengaging the power take-off.

Storage

This section explains how to store the loader while it is installed on a carrier. Proper storage provides for the safety of personnel and prolongs the loader's working life.

If the loader needs to be removed from the carrier to be stored, have it removed by authorized Rotobec personnel, who will also provide information on how the loader should be stored. See the back cover for a list of Rotobec branches.

Before Storage

Before storing the loader, do the following:

1. Hose the loader down thoroughly.
2. With a rag and solvent, remove remaining dirt, oil, and grease. This debris can hide cracks, leaks, loose bolts, and other problems.
3. Inspect the loader for cracks, wear, loose or missing parts, vandalism, leaks or other damage (follow the guidelines for the daily inspection in the *Maintenance Schedule on page 61*).
4. Repair any damage found during the inspection before storing the loader.
5. Protect the cylinder rods from rusting by retracting the following:
 - The telescopic boom (if there is one),
 - The stick boom,
 - The main boom, and
 - The stabilizers.

If it is not possible to retract the cylinder rods because of the way the loader must be positioned for storage, generously coat the rods with grease.



Grease the attachment's hydraulic cylinder rods and pins at the same time. See the rotator and attachment manuals for their storage requirements.

6. Lubricate the loader according to its next required lubrication as determined by the maintenance schedule (see *Maintenance Schedule on page 61*).

7. Store the loader in the position shown in *Figure 14*, below, if possible. It prevents rusting of the cylinder rods.

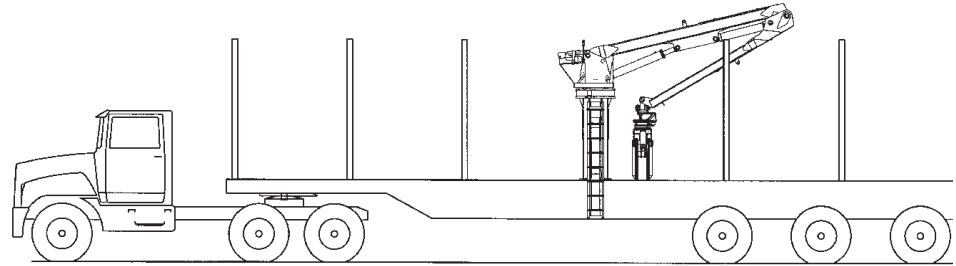


Figure 14 - Loader position on carrier for storage

After Storage

After storage and before operating the loader again, follow these procedures:

1. Hose the loader down thoroughly.
2. With a rag and solvent, remove remaining dirt, oil and grease. This debris can hide cracks, leaks, loose bolts, or other problems.
3. Inspect the loader for cracks, wear, loose or missing parts, vandalism, leaks, or other damage (follow the guidelines for the daily and quarterly inspections in the *Maintenance Schedule on page 61*).
4. Repair any damage found during the inspection before operating the loader.
5. If the loader has been in storage for three months or more, lubricate it according to both the daily and the weekly schedule of lubrication in the *Maintenance Schedule on page 61*.
6. If the loader has been in storage for a year or more, change the hydraulic oil (see *Cleaning the Oil Tank and Changing the Oil on page 86*).

Maintenance

This section explains how to prolong the life of your Rotobec Elite Loader with regular maintenance. Maintenance involves regularly performing these tasks:

- Cleaning the loader
- Inspecting the loader for damage, leaks or wear
- Maintaining oil levels
- Tightening bolts
- Changing filters
- Lubricating the moving parts of the loader to prevent damage and wear,
- Lubricating the cab and the cylinder pivots
- Cleaning the oil tank and changing the hydraulic oil
- Changing the gearbox oil
- Lubricating the electric swivel.



WARNING! In general, before cleaning, inspecting, or lubricating the loader, shut off the carrier's engine and remove the key so no one else can start the engine.

However, the engine needs to be running to grease the slewing ring ball bearings (done weekly) and to inspect certain electrical components (done every three months).



CAUTION! Making unauthorized modifications to the loader voids the warranty. Modifications may impair the safety and the functioning of the loader.

Maintenance Schedule

To keep your loader in peak working condition and to help ensure the safety of personnel, follow the maintenance schedules given in this section.

If your loader is used in extreme temperatures (either below 0°F/-20°C or above 100°F/40°C), or difficult conditions (a foundry or mill yard for example), or works more than 60 hours a week, inspect and lubricate the loader at shorter intervals than those given below.

Preparing for maintenance

Thoroughly clean the loader before each inspection in the following ways:

- Hose it down,
- Remove remaining dirt, excess oil, and grease that may hide cracks, leaks, loose bolts, or other problems.

Maintenance Schedule

The following table shows the maintenance schedule that will keep the Elite Loader in the most efficient working condition. It is recommended that the lubrication procedures be performed first in each time period.

Daily		
<i>Inspect:</i>	Loader's structure for damage Hydraulic system for leaking oil For low hydraulic oil level Seat belt for damage (if equipped) Seat back for tightness.	p. 71 p. 72 p. 73
Semiweekly (every 10 working hours or 3 days, whichever comes first)		
<i>Lubricate:</i>	All booms Pinion gear and slewing ring teeth	p. 63 p. 64
Weekly (every 20 working hours or weekly, whichever comes first)		
<i>Inspect:</i>	For low gearbox oil level	p. 75
<i>Lubricate:</i>	Swing mechanism control pedal Power take-off Slewing ring ball bearings Cab and cylinder pivots	p. 64 p. 67 p. 68 p. 70
On a new loader (After 50 working hours)		
<i>Inspect:</i>	All nuts and bolts for tightness	p. 77
<i>Change:</i>	Hydraulic filters Oil in the loader's gearbox.	p. 85 p. 91
Quarterly (every 250 working hours or 3 months, whichever comes first)		
<i>Inspect:</i>	All nuts and bolts for tightness All electrical components	p. 77 p. 84
Semiannually (every 500 working hours or 6 months, whichever comes first)		
<i>Change:</i>	Hydraulic filters	p. 85

Annually (every 1000 working hours or 1 year, whichever comes first)		
Clean:	Hydraulic oil tank	p. 89
Change:	Oil in the hydraulic oil tank	p. 86
	Oil in the loader's gearbox	p. 91
Lubricate:	Electric swivel	p. 65

Table 1: Regular Maintenance Schedule.

Lubricating the Loader

Lubricate the loader after it has been working for several hours because the new grease penetrates more easily when the old grease is hot. After lubricating, wipe excess grease from all surfaces of the loader.

Materials needed

- An extreme-pressure grease (Shell Albida LC E.P.2, or an equivalent).
The grease should have excellent water-repulsion durability, anti-rust capabilities, adhesive abilities and mechanical stability.
- A grease gun adjusted to eject 2 cc/0.12 cubic inch of grease per pump. If you are using any automatic grease gun, verify that it pumps the correct amount.

Safety Procedure

- Shut down the loader properly so working around it is safe (see *Shutting Down the Loader* on page 54).

Greasing the booms

Grease the booms every 10 working hours or every three days (whichever comes first).

- Pump the grease gun **2 times** each into both the main boom bushing and the stick boom bushing.
- Pump the grease gun **once** into each of the 6 other grease fittings on the booms (for their locations, see *Figure 15*, below).

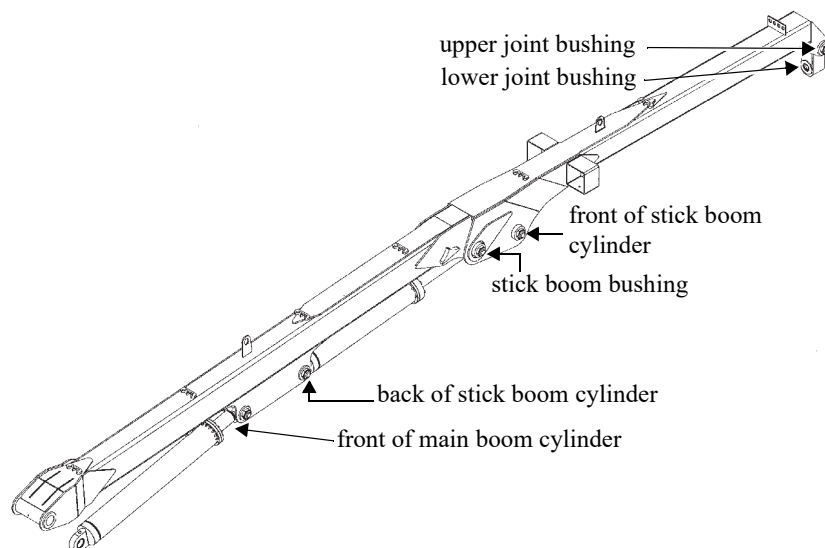
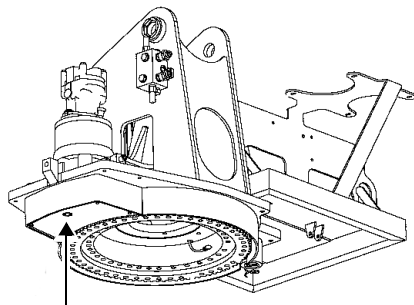


Figure 15 - Location of grease fittings on the boom

Greasing the pinion gear and slewing ring

Grease the pinion gear and slewing ring teeth every 10 working hours or every three days (whichever comes first).

Pump the grease gun **6 times** into the grease fitting located under the floor of the head of the loader (see *Figure 16*).



Grease fitting for pinion gear and slewing ring teeth

Figure 16 - Location of grease fitting for pinion gear and slewing ring teeth

Greasing the swing mechanism control pedal

Grease the grease fittings of the swing mechanism control pedal every 20 working hours or weekly (whichever comes first).

- Pump the grease gun **once** into each of the 3 grease fittings of the swing mechanism control pedal (see *Figure 17*, below).

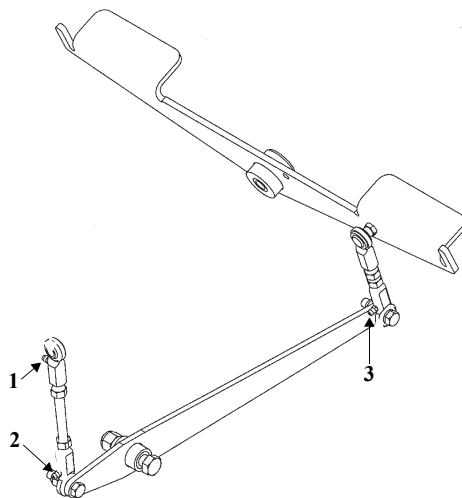


Figure 17 - Location of control pedal grease fittings



WARNING! Failure to properly maintain the swing mechanism control pedal could result in sticking of the pedal, which could result in uncontrolled rotation of the operator's station.

Lubricating the electric swivel

The electric swivel is mounted on the hydraulic swivel underneath the main boom. See *Figure 18*, below.

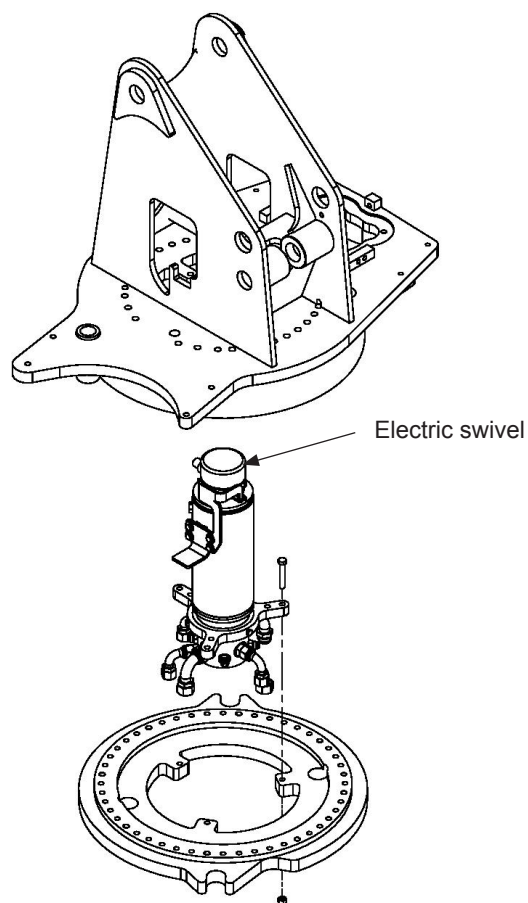


Figure 18 - Location of the electric swivel

Maintenance: every year or 1000 hours, the electric swivel must be cleaned and the slip ring must be lubricated with the contact oil Electrolube EML.2.

Lubricating the hydraulic swivel with high temperature grease

The hydraulic swivel needs to be greased with high temperature grease (LLG NLGI-2 PEERLESS or equivalent). There are 2 grease points located in the positions shown on *Figure 19* below.

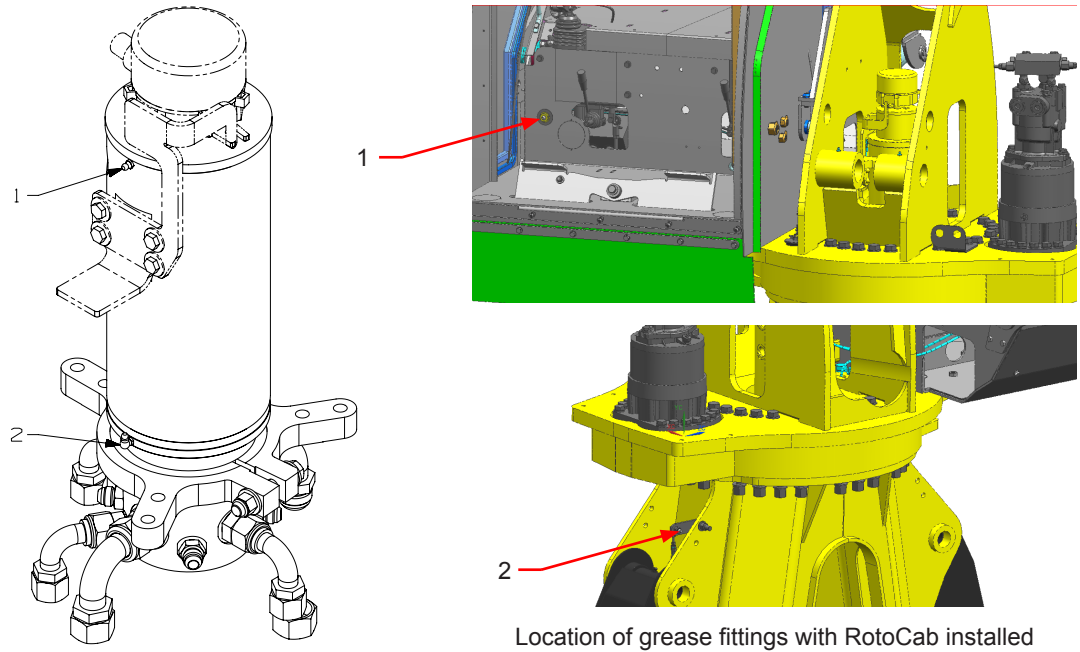


Figure 19 - Location of grease fittings on hydraulic swivel

Grease needs to be added every 500 working hours or 3 months.

High temperature grease is required. If normal temperature grease is used, it can cause the grease to spill out of the swivel when it is hot and will appear that the hydraulic swivel is leaking.

A label is added on the head assembly to notify the operator to use high temperature grease (refer to *Figure 20*, below).

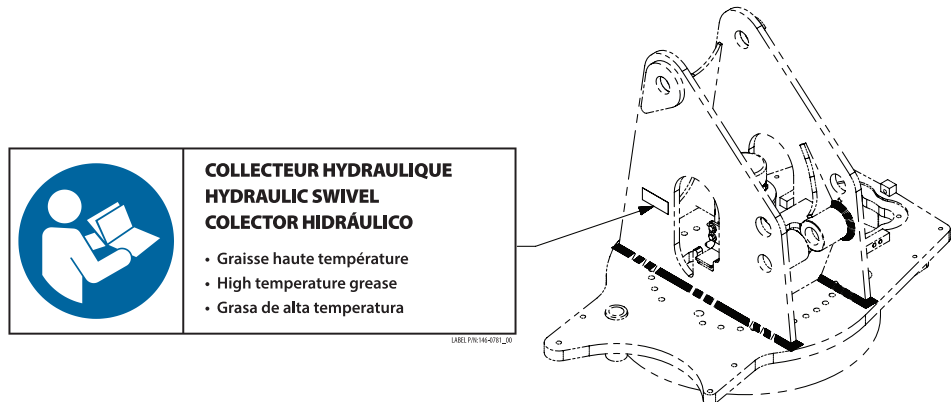


Figure 20 - Location of hydraulic swivel grease label

Greasing a power take-off

Grease the power take-off every 20 working hours or weekly (whichever comes first) to prevent rust from eroding the splines.

- Pump the grease gun **twice** into the grease fitting on the side of the power take-off (see *Figure 21*, below).

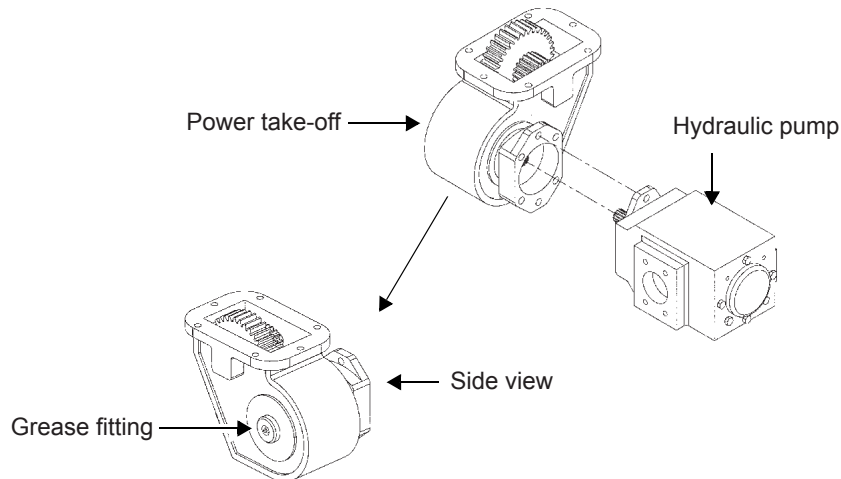


Figure 21 - Power take-off view

Greasing other models of the power take-off

For the models of the power take-off that do not have a grease fitting, the pump shaft should be greased by hand every 250 working hours or three months (whichever comes first). Follow the steps below.



Some models of the power take-off have an adaptor flange with open holes. If your does, fill the holes with high-quality silicone or similar product in order to prevent water and sand from getting into the shaft's splines and causing deterioration and premature failure.

1. Remove the bolts that attach the pump to the power take-off.
2. Grease the shaft by hand.
3. Reattach the pump to the power take-off.



For some models of the power take-off, you may have to remove a small cover over the grease nipple on the end of the shaft. Pump the grease gun **twice** into the grease nipple

Greasing the slewing ring ball bearings

Grease the slewing ring ball bearings every 20 working hours or weekly (whichever comes first).

Do this procedure at the end of the inspection because the carrier's engine and the hydraulic pump must be started up.



WARNING! The booms turn 360° during this procedure. Ensure the work area is free of all bystanders and obstacles.

Safety procedures

1. Alert bystanders in the area that the loader is about to begin operating and the booms will be making a complete circle. Bystanders must be at a distance of at least 28 yards (25 meters) from the stabilizers, booms, and grapple.
2. Verify that all the controls on the loader head (joysticks, stabilizer levers, and the swing control pedal) are in the neutral position and the swing mechanism is locked before starting up the loader.
3. Start up the loader according to the instructions in *Starting Up the Loader on page 45*.
4. Unlock the swing mechanism (for instructions, see *Step 4 Page 43*).
5. Position the booms so that they can make a complete circle without coming into contact with anything including the carrier.

Greasing procedures

- Rotate the booms slowly while you pump the grease gun **6 times** during the rotation into the grease fitting on the floor of the loader's head (see *Figure 22 on page 69*). Pump the grease evenly (1 pump every 60°).

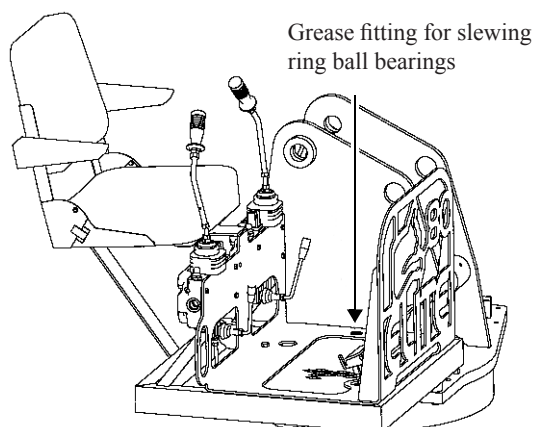


Figure 22 - Location of grease fitting for slewing ring ball bearings



If you are also performing the three month maintenance, it is suggested that at this time, you check the slewing ring bolts (see *Slewing ring nuts and bolts on page 80*) and the electrical components (see *Checking the Electrical Components on page 84*). These procedures also require the engine to be running.

Lubricating the cylinder and cab pivots

Grease the cab pivot on both sides of the cab and grease the two cylinder pivots (see *Figure 40*) every week or 20 working hours whichever comes first. Use the same type of grease used to lubricate all other loader fittings.

- Pump the grease gun **twice** into each pivot.

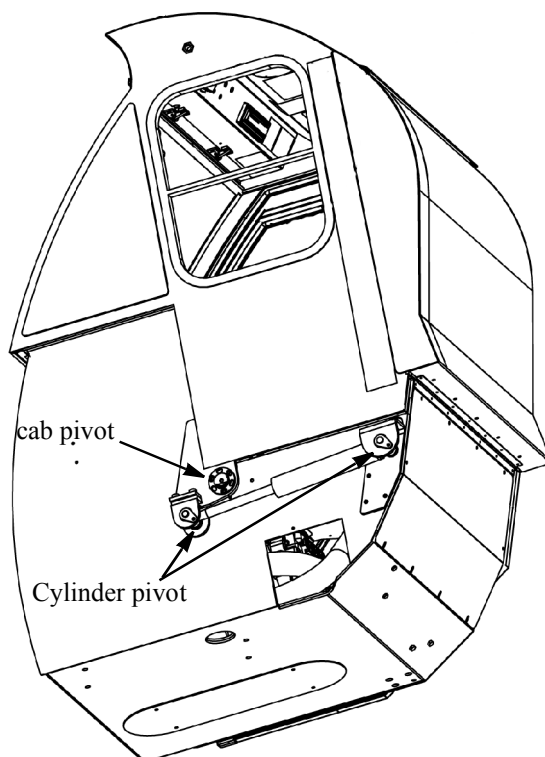


Figure 23 - Location of cylinder and cab pivots

Inspecting for Damage

Look for signs of damage to the loader daily.

Safety procedures

- Shut down the loader properly (see *Shutting Down the Loader* on page 54).
- Repair any damage before using the loader again.

Inspecting for damage

Look for cracks or cracked paint that could indicate fatigue, wear on the parts, loose or missing parts, vandalism, or other damage on all of the following:

- All welds and joints
- Both stabilizers
- The entire head of the loader
- The swing drive assembly (gearbox and hydraulic motor)
- The main boom turret and all booms
- The yoke
- The hydraulic oil tank
- The anchoring ties where the loader is mounted onto the carrier (for their location, see *Figure 27* on page 77).
- The frame
- The hydraulic pump and power take-off where they are installed near the carrier's transmission
- Seat belt (if equipped)
- Cab components (if equipped)
- Seat back for tightness (to prevent wearing of the seat cover)



Ensure that the seat back is tightened sufficiently so it will not flop during transport; this will prevent wearing the seat cover.

Inspecting for Leaking Oil

Inspect for leaking oil twice daily, both before starting the loader and after operating it for a while (warm hydraulic oil flows more easily, and therefore, leaks more easily)

Safety procedure

- Shut down the loader properly so working around it is safe (see *Shutting Down the Loader on page 54*).



DANGER! Disengage the power take-off to shut down the hydraulic pump before checking for leaks. High-pressure hydraulic oil can penetrate the skin causing severe injury, gangrene, or death.

Checking for leaks

Look for puddles of oil underneath the loader and its booms or hydraulic oil on any part listed below:

- The suction hoses that run from the hydraulic oil tank to the pump and their adapters
- The hydraulic pump under the carrier.
- The hydraulic tubes, hoses, and fittings from the beginning to the end
- The rods, cylinder heads, tubing, and welded adaptors of the cylinders
- The hydraulic filter on the entry line of the oil tank (see *Figure 24 on page 73*).
- The hydraulic oil tank (see *Figure 24 on page 73*).
- The hydraulic swivel joint (See *Figure 28 on page 78*).

Checking the Oil Level in the Hydraulic Tank

Check the level of oil in the hydraulic tank daily.



CAUTION! Keep the oil level above the hydraulic inlet line leading to the pump (see *Figure 24*, below). The pump will be seriously damaged if oil does not flow into it.

Safety procedure

- Shut down the loader properly so working around it is safe (see *Shutting Down the Loader on page 54*).

Checking the oil level

The oil tank is located on the side of the carrier. The oil level gauge is located on the side of the tank (see *Figure 24*, below).

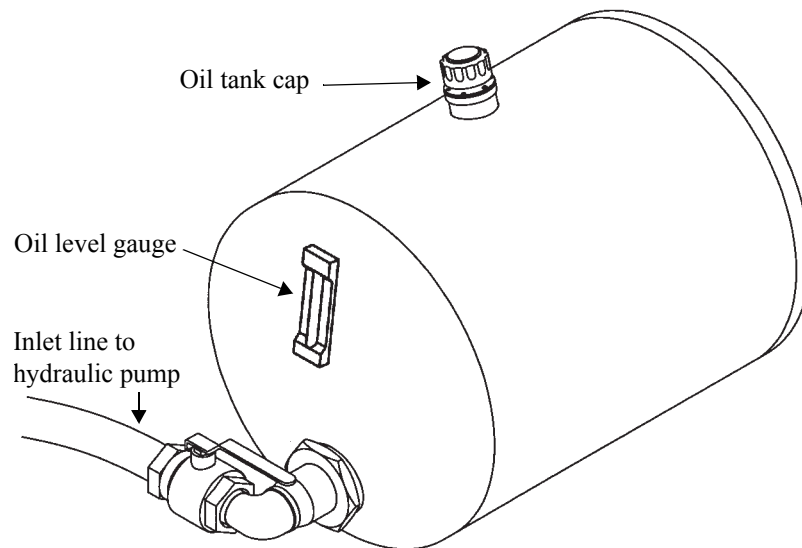


Figure 24 - Location of cap, gauge and inlet line on oil tank

The line of the oil level should be seen at the top of the gauge. If the level is higher than the top of the gauge, the oil can overflow. If the level is lower, the hydraulic system can overheat and cause damage to the hydraulic components (the pump, control valves and seals).

If the oil needs to be topped up, do the following:

1. Choose the same type of oil as already in the tank (for the types of oil to use and when to use them, see *Table 2 on page 86*).



To change the type of oil being used, follow the instructions for *Draining the oil tank and the boom cylinders* on page 88.

2. Unscrew the cap on the top of the tank and add the oil while watching the gauge (see *Figure 24*).

Checking the Oil Level in the Gearbox

Check the level of oil in the gearbox every 6 months or 1000 working hours (whichever comes first).

Safety procedure

- Shut down the loader properly so working around it is safe (see *Shutting Down the Loader* on page 54).

Materials needed

- 60 oz (1.7 liters) of the extreme-pressure synthetic oil, Traxxon Synthetic 75W90.

Checking the oil level

The loader's gearbox is located on the head of the loader, to the left of the operator's seat and the turret supporting the main boom (see *Figure 25*, below).

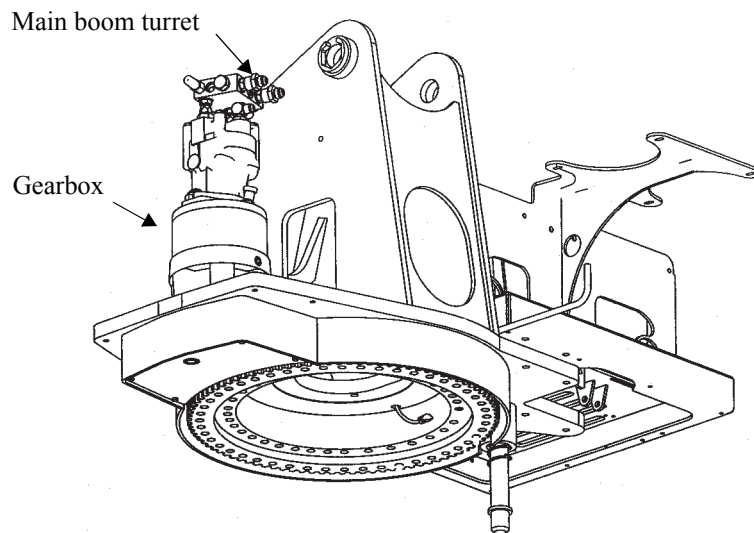


Figure 25 - Location of the gearbox on the main turret

1. Unscrew the hydraulic fitting on the top of the gearbox (see *Fig Ref*, below).

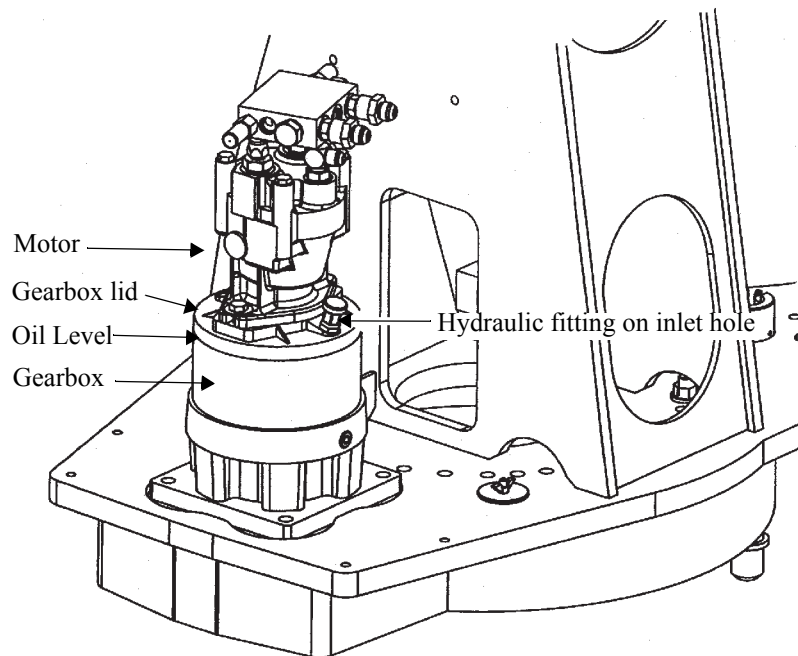


Figure 26 - Swing drive component identification

2. Look in the inlet hole. The oil should come to the bottom of the gearbox lid as shown in *Figure 26*, above. This completely covers the gear with oil.
3. Add oil, if necessary, to bring the level to the bottom of the gearbox lid.
4. Screw the hydraulic fitting back on the inlet hole.

Checking the Tightness of Nuts and Bolts

Check the loader's nuts and bolts for tightness every 250 working hours or three months (whichever comes first).

Materials needed

- Torque wrench
- Loctite 243, 263

Safety procedure

- Shut down the loader properly so working around it is safe (see *Shutting Down the Loader* on page 54).



WARNING! Apply Loctite (if indicated) to loosen bolts and tighten them to the proper torque value. Loose bolts can result in parts separating from each other.

Checking torque values

1. The anchoring tie nuts are located where the loader's frame is mounted onto the carrier. Check one nut from each of the eight pairs for a torque of **900 ft-lb (1220 N-m)** (see *Figure 27*, below).

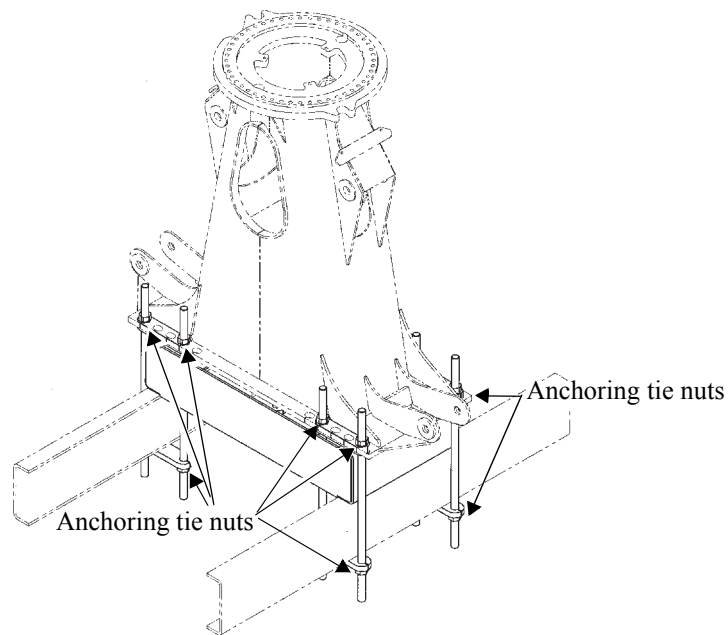


Figure 27 - Location of nuts to be torqued

2. Check the two sets of swivel joint bolts shown in *Figure 28*, below for the correct torque values.

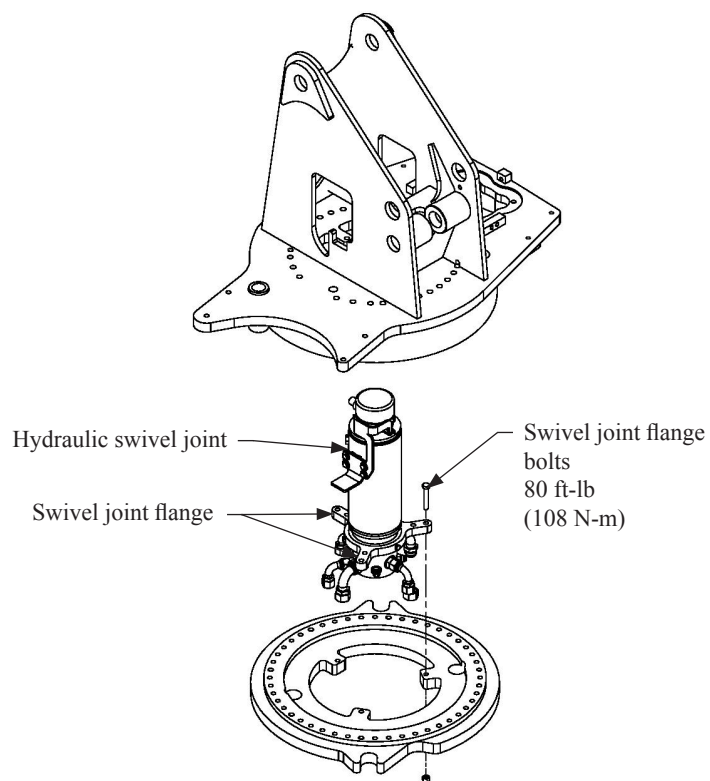


Figure 28 - Location of swivel joint bolts

3. If the bolts are loose, apply Loctite 243 and torque the bolts to their proper values.

4. Check the two sets of installation bolts of the hydraulic swing assembly, shown in *Figure 29*, below, for the correct torque values.

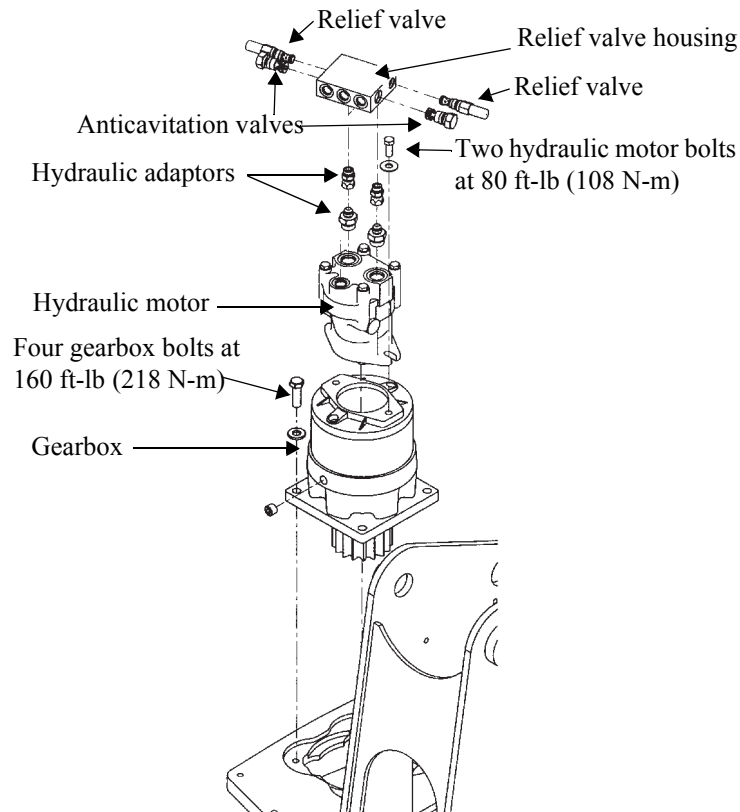


Figure 29 - Location of installation bolts

5. If the bolts are loose, apply Loctite (263 to the motor bolts and 243 to the gearbox bolts), then torque the bolts to their proper values.
6. Check all other bolts on the loader visually (except for the slewing ring bolts shown in *Figure 30*) and tighten loose bolts, according to the values given in the *Parts Manual*.

Slewing ring nuts and bolts

You must check the three sets of slewing ring nuts and bolts shown in *Figure 30*, below, at the end of the inspection because you must turn the booms to access the #3 bolts.

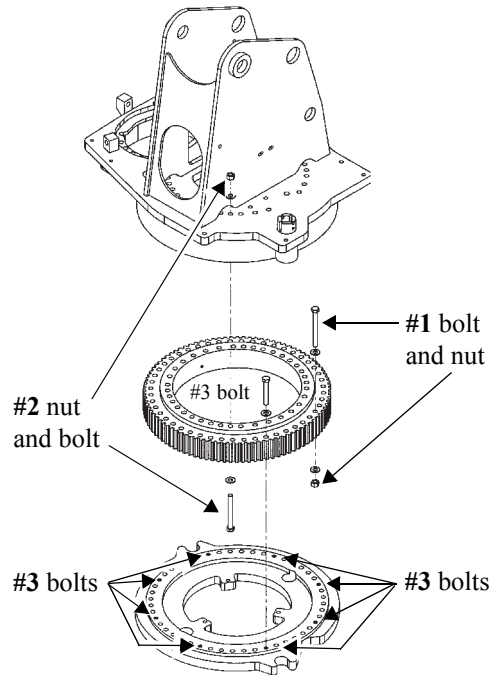


Figure 30 - Location of nuts and bolts

Check the nuts and bolts with the torque wrench for a torque value of **100 ft-lb (135 N-m)** (or 140 ft-lb (190 N-m) for a new installation) according to the following procedure:



Whenever possible, apply the torque wrench to the nut. However, if you cannot access it, you may apply the torque wrench to the bolt. To ensure adequate torque, hold the end opposite to the one you are torquing and prevent it from turning.

1. Check the torque value of the 40 #1 nuts that are visible around the plate protecting the slewing ring and tighten if necessary (see *Figure 31*, below).

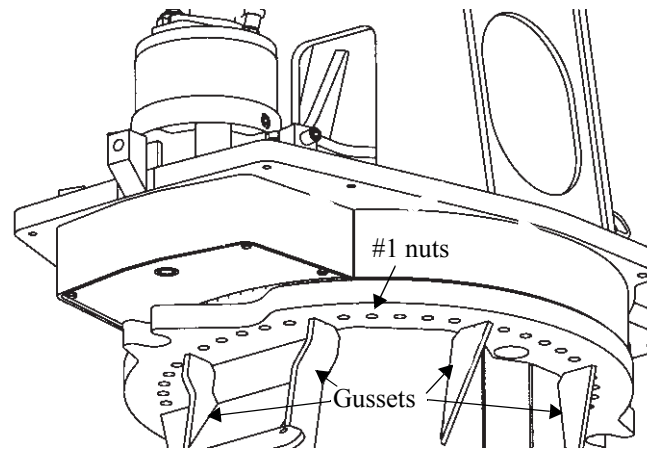


Figure 31 - Location of #1 nuts

2. Check the torque value of the 32 #2 nuts that are visible on the loader head and tighten if necessary (see *Figure 31*, above).
3. To gain access to the 8 #3 bolts, first follow the procedures listed below:
 - Alert people in the area that the loader is about to begin operating and the booms will be making a complete circle. People must be at a distance of at least 28 yards (25 meters) from the stabilizers, booms and grapple.
 - Verify that all the controls on the loader head (joysticks, stabilizer levers, and the swing control pedal) are in the neutral position and the swing mechanism is locked before starting up the loader.
 - Start up the loader according to the instructions in *Starting Up the Loader on page 45*.
 - Unlock the swing mechanism (for instructions, see *Step 4 Page 49*).
 - Position the booms so that they can make a complete circle without coming into contact with anything, including the carrier.

4. Unscrew both access plugs, located on either side of the gearbox (see *Figure 32*, below).

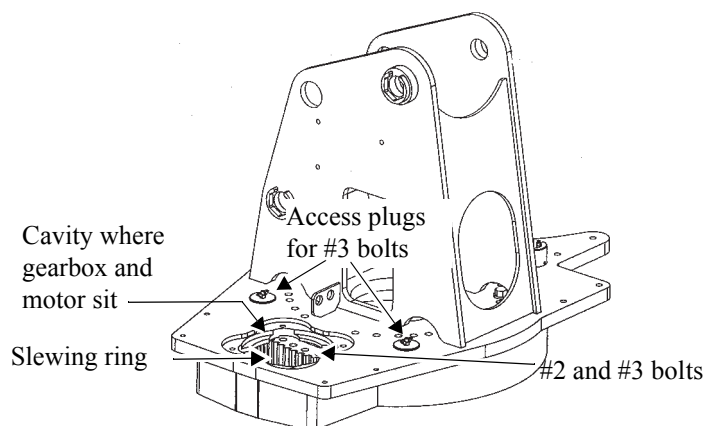


Figure 32 - Location of bolt access plugs

5. Starting with the booms straight out from the frame as in *Figure 4* on page 25, turn the booms 22° clockwise. This should align the first pair of bolts with the access holes (the bolts are indicated by the black points in the mounting in *Figure 32*, and are aligned with the gussets visible in *Figure 31*).

You may have to adjust the position of the booms slightly to complete the alignment.

6. Check the torque value of both bolts seen through the access holes.
7. Turn the booms 45° clockwise to align the second pair of bolts with the access holes.
8. Check the torque value of both bolts seen through the access holes.
9. Turn the boom 180° clockwise to align the third pair of bolts with the access holes and check their torque values.
10. Turn the booms **counterclockwise** 45° to access the fourth pair of bolts and check their torque values.



If you are greasing the slewing ring's ball bearings during this inspection (a weekly procedure), we suggest that you do it now (see *Greasing the pinion gear and slewing ring* on page 64). We also recommend that you check the electrical components that require the engine to be running (see *Checking the Electrical Components* on page 84).

Tightening the boom pins

If you need to change the brass bushings on the main boom or the seal kit in the main or stick boom cylinder, follow the instructions below when you tighten the boom pins while reassembling the boom.

Materials needed

- Torque wrench

Tightening the boom pins

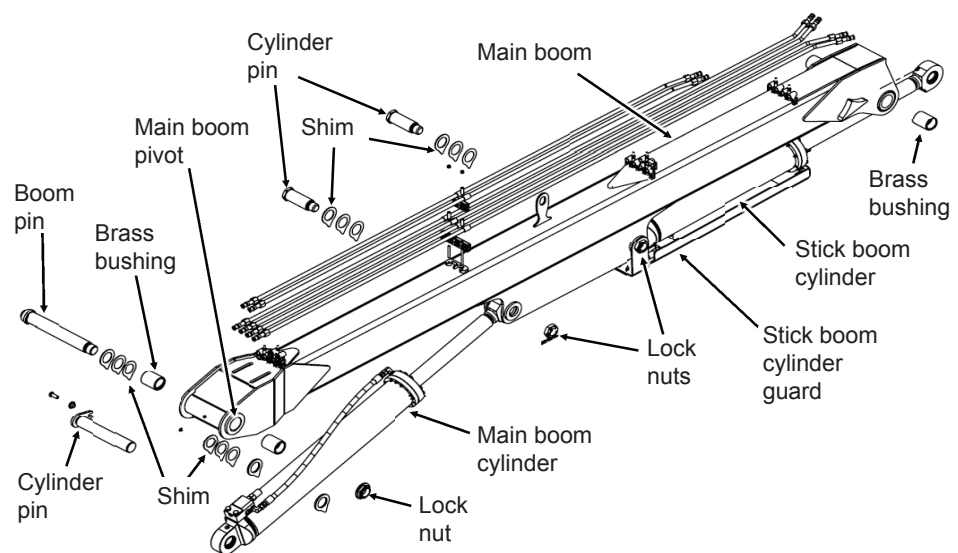


Figure 33 - Location of pins on main boom

1. On the main boom pivot, fill extra space with shims. With the torque wrench set to 100 ft-lb (136 N-m), tighten the boom pins. If some play remains, increase the torque up to a maximum of 300 ft-lb (407 N-m).
2. On the main boom at the attachment of the cylinder rod, fill extra space with shims, but leave between 0.03 (0.76 mm) and 0.06 inches (1.52 mm) of play. With the torque wrench set to 100 ft-lb (136 N-m), tighten the boom pins.

Tightening the stick boom pins

- On the boom pin nut between the main boom and stick boom (not illustrated), with the torque wrench set to 100 ft-lb (136 N-m), tighten the boom pin.

Checking the Electrical Components

Inspect the electrical components of the loader every 250 working hours or three months (whichever comes first).

1. Check all along the electrical cables for damage.
2. Check for loose or hanging cables. They can get caught in the machinery and be cut, causing a short circuit.



Because the carrier's engine needs to be running for the next part of the inspection, do it last, after having checked the torque of the slewing ring bolts (see *Slewing ring nuts and bolts on page 80*). If you are greasing the slewing ring's ball bearings during this inspection (a weekly procedure), it is suggested that you do it now (see *Greasing the slewing ring ball bearings on page 68*).

3. Check that the following components work:
 - Lights
 - Cab accessories like the wiper, fan ventilator and heater
 - Switch for the saw valve (if applicable).

Changing the Hydraulic Filters

Change the hydraulic filters every 500 working hours or six months (whichever comes first).

Parts needed

- Two hydraulic filters (see the *Parts Manual* for the correct part number).

Safety procedure

- Shut down the loader properly (see *Shutting Down the Loader* on page 54).

Changing the filters

1. Locate the hydraulic filters on the entry line running into the hydraulic tank on the side of the carrier (see *Figure 34*, below).

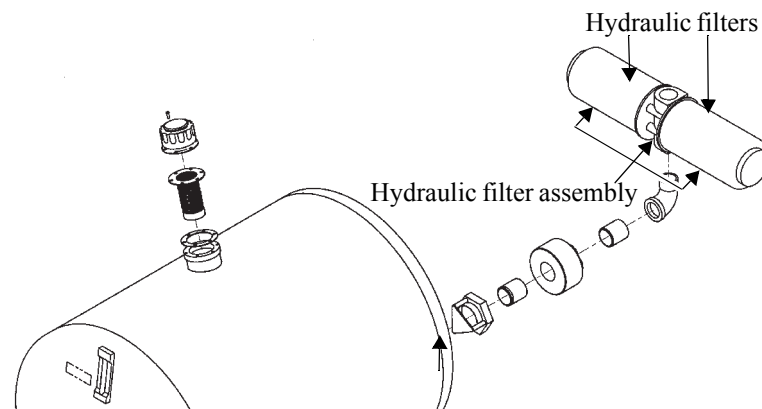


Figure 34 - Location of hydraulic filters

2. Unscrew the two hydraulic filters and replace them with new ones.

Cleaning the Oil Tank and Changing the Oil

Clean the hydraulic oil tank and change the oil ever 1000 working hours or once a year (whichever comes first).

Parts needed

- Two hydraulic filters (see the *Parts Manual* for the correct part number).

Materials needed

- Empty container (90 US gallons (340 Liters)).
- Non-flammable solvent
- Pipe wrench
- A hydraulic oil with a high viscosity index (for example, Petro-Canada Hydrex MV).



Dextron-type automatic transmission oil is **not** recommended.

It is recommended to use a high-quality anti-wear oil in your loader. For the best results, choose an oil viscosity suitable to the weather conditions, according to the table below.

Oil Viscosity	Maximum viscosity for the loader start-up is 9000 cP	Oil viscosity service range form 750 cP to 13 cST
Recommended hydraulic oil or equivalent	Minimum oil temperature when starting loader	Oil temperature when operating the loader
Petro Canada Oil	*	**
Hydrex MV Arctic 15	-54° C -65° F	-45° C to 23° C -49° F to 73° F
Hydrex MV 22	-41° C -42° F	-25° C to 57° C -13° F to 135° F
Hydrex MV 36	-35°C -31°F	-18° C to 66° C 0° F to 151° F
Hydrex MV 60	-26° C -15° F	-5° C to 81° C 23° F to 178° F
* Temperature at which the oil attains a viscosity of 9000 cP. This information was retrieved from the supplier's publication. ** Range at which the oil viscosity is between 750 cP and 13 cST. This information was retrieved from the supplier's publication.		

Table 2: Recommended oil viscosity

What to do in very cold weather

- If the oil viscosity is higher than 9000 cP, do not start the machine.
- If the oil viscosity is between 750 cP and 9000 cP, the hydraulic pump must run without a load until the oil viscosity reaches the service range. When this range has been reached, you may slowly begin operations.

Draining the oil tank

If you need to fill the tank with a different type of oil from what is already in the system, drain the system completely. This means the tank and the boom cylinders. For the instructions on how to do this, skip this section and go to the next section, *Draining the oil tank and the boom cylinders*.

If you are going to fill the tank with the same type of oil that it already contains, you only need to drain the oil that is in the tank **not** the cylinders. Follow the steps for draining the oil tank given below:

1. Support the boom and grapple on the empty carrier bed or on the ground.
2. Lock the swing mechanism (see *Step 4 on Page 54*).
3. Shut down the loader's hydraulic pump by disengaging the power take-off.
4. Shut down the carrier's engine.
5. Place an empty container (90 US gallons (340 liters)) under the drain hole of the tank to catch the oil (see *Figure 35 on page 89*).
6. Unscrew the drain hole's magnetic plug and let the oil drain completely from the tank (see *Figure 35 on page 89*).
7. Dispose of the oil as per regulations.

Draining the oil tank and the boom cylinders

If you are going to fill the tank with the same type of oil that it already contains, you do not need to totally drain the system. In this case, follow the instructions in the previous section, *Draining the oil tank*, above.

If you need to fill the tank with a different type of oil than what is already in the system, drain the system completely. To do this, follow the steps given below:

1. Set the boom towards the back or on either side of the truck where it can safely and completely extended.
2. Extend the stick boom fully
3. Lift the main boom to its maximum position.
4. Lock the swing mechanism (see *Step 4 on Page 54*).
5. Shut down the loader's hydraulic pump by disengaging the power take-off.
6. Shut down the carrier's engine.
7. Place an empty container (90 US gallons (340 liters)) under the drain hole of the tank to catch the oil (see *Figure 35 on page 89*).
8. Unscrew the drain hole's magnetic plug and let the oil drain completely (see *Figure 35 on page 89*).
9. Dispose of the oil as per regulations.



CAUTION! For the following step, do not start the hydraulic pump. Because the oil tank is empty and there is no oil in the system, starting the pump now would severely damage it.

10. Retract the stick boom completely and lower the main boom completely. Place the booms on the empty carrier bed or on the ground.

Cleaning the oil tank

1. Remove the cap on the top of the oil tank (see *Figure 35*, below).
2. Lift out the suction filter located just under the cap (see *Figure 35*, below).

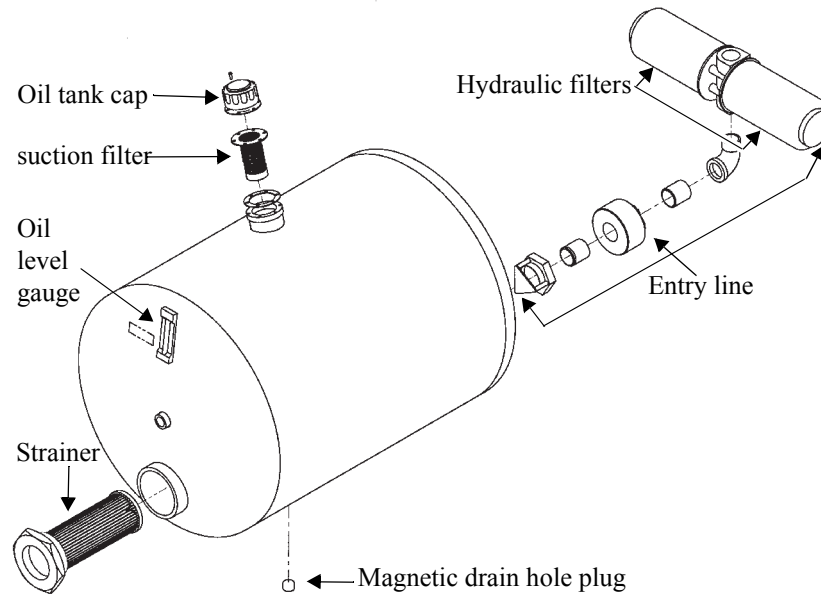


Figure 35 - Location of oil tank parts

3. Clean the suction filter by soaking it in an oil-based solvent, then wiping it with a rag.
4. Unscrew and remove the strainer located on the side of the oil tank (see *Figure 35*, above).
5. Clean the strainer by soaking it in an oil-based solvent, then wiping it with a rag.
6. Use a pipe wrench to disassemble the entry line (see *Figure 35*, above).
7. Remove any dirt and sediment from inside the oil tank by wiping the inside with a rag:
 - Reach inside the tank through the strainer hole on one side (see *Figure 35*, above),
 - Reach inside the tank through the entry line hole on the other side (see *Figure 35*, above).
8. Replace the hydraulic filters with new ones.
9. Reassemble the entry line.
10. Re-insert the strainer
11. Clean the magnetic plug with a rag and solvent and screw it back into the drain hole on the bottom of the oil tank (see *Figure 35*, above).

Filling the oil tank

1. Remove the oil tank cap.
2. Using the appropriate oil for the season (see *Table 2 on page 86*), fill the tank until the oil reaches the top of the oil gauge on the side of the tank (see *Figure 36, below*).
3. Replace the oil tank cap.
4. Check that the valve on the inlet line to the pump is open completely (see *Figure 36, below*).

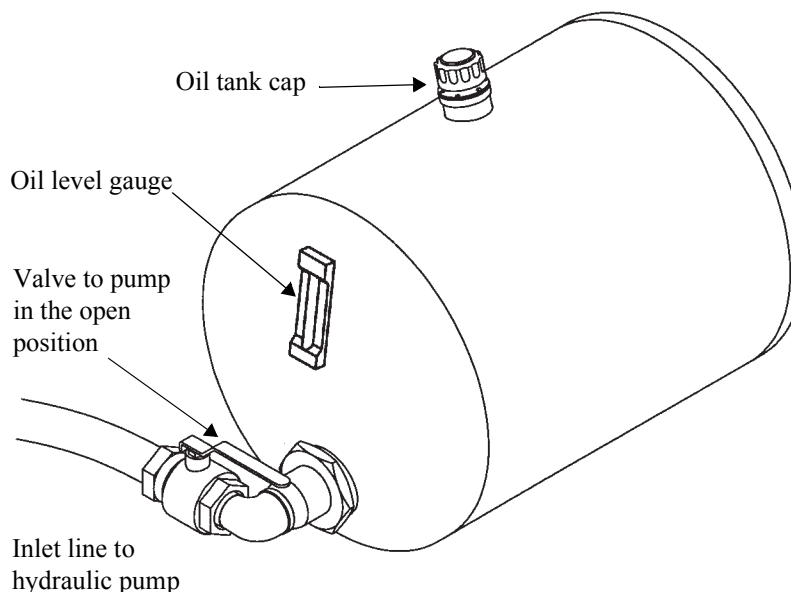


Figure 36 - View of oil tank with gauge, valve and cap

5. Verify that all the controls on the loader's head are in the neutral position (see *Figure 5 on page 46*).
6. Start the carrier's engine and engage the power take-off to start the hydraulic pump.
7. Let the pump run for several minutes to circulate the oil through the system.
8. Check the oil level again and add oil if the level is below the top of the oil gauge.
9. Lift the main boom and extend the stick boom completely.
10. Re-check the oil level and top up the oil if necessary.



CAUTION! Keep the oil level above the hydraulic inlet line that leads to the pump (see *Figure 36, above*). The pump will be seriously damaged if oil does not flow into it. The same oil must be used in the tank and boom cylinders.

Changing the Gearbox Oil

Change the oil in the loader's gearbox every 1000 working hours or once a year (whichever comes first).

The loader's gearbox is located on the head of the loader, to the left of the operator's seat and the turret supporting the main boom (see *Figure 37*, below).

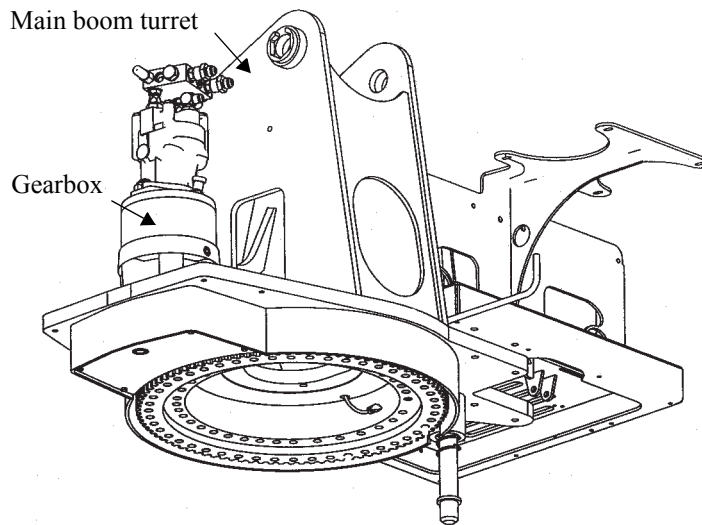


Figure 37 - Main boom turret and gearbox

Materials needed

- 60 oz (1.7 liters) of the extreme-pressure synthetic oil, Traxxon Synthetic 75W90.
- An empty container (60 oz. (1.7 liters)).

Safety procedure

- Shut down the loader properly (see *Shutting Down the Loader* on page 54).

Adjusting the Pinion Gear Backlash

1. Turn the loader swing to place the pinion gear in the zone shown in *Figure 38*, below.

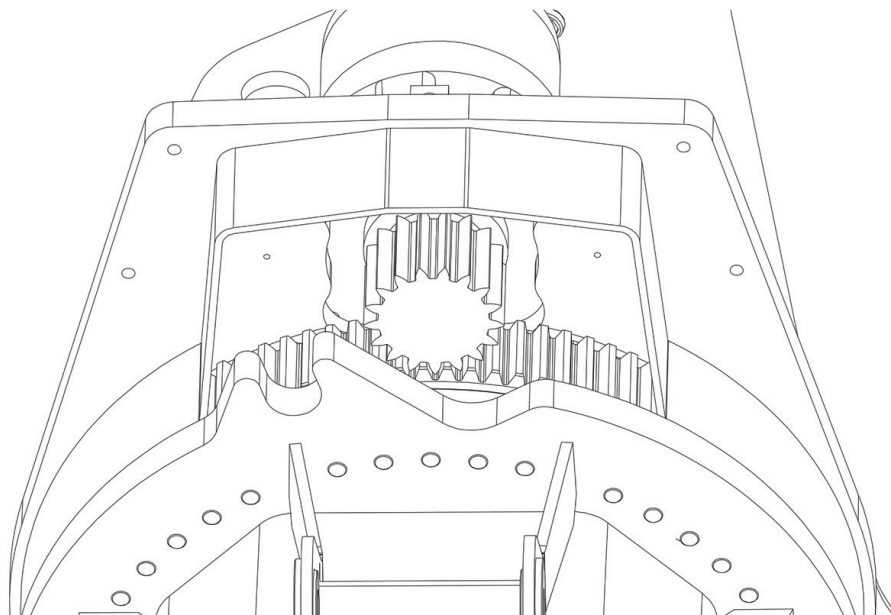


Figure 38 - Pinion gear backlash

2. Loosen the mounting bolts of the gearbox.

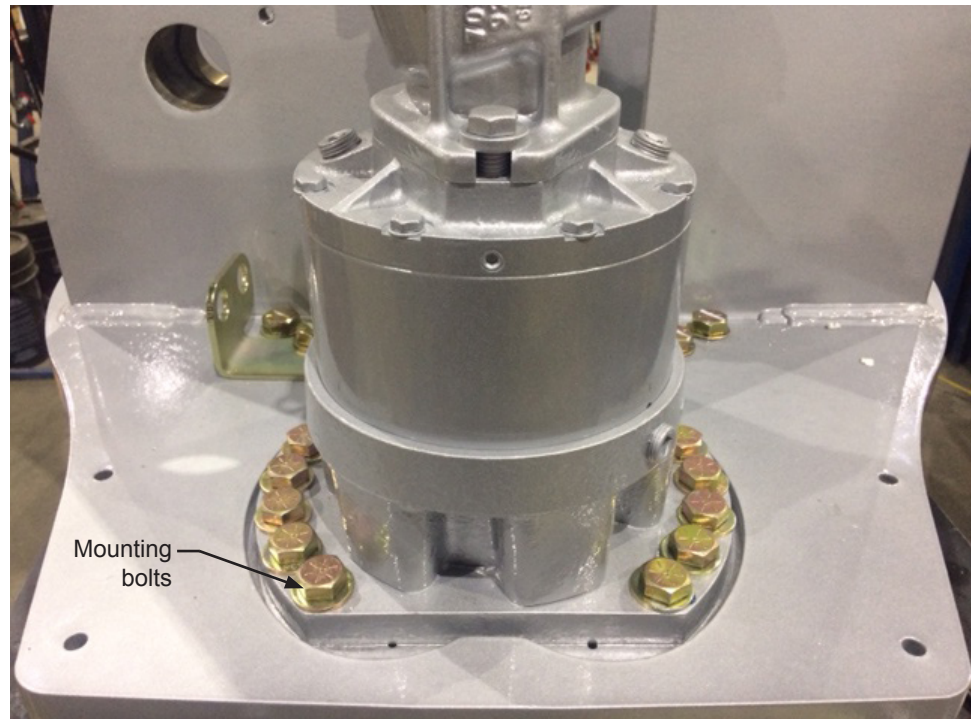


Figure 39 - Location of mounting bolts for gearbox



CAUTION! The pinion gear and teeth must be cleaned with a de-greaser prior to starting the adjustment procedure to obtain an accurate backlash.

3. Insert a filler gauge of .015" (.38 mm) between the pinion and the crown teeth.
4. Tighten the mounting bolts for the gearbox, while putting pressure on the gearbox towards the slewing ring. The pinion must be tightened so you can remove the filler gauge by pulling on it (do not remove the filler gauge immediately).
5. Tighten the mounting bolts to 160 ft-lb (217 N-m) using loctite 263. Be sure the measurement of the backlash did not change while the bolts were tightened.

Changing the oil

1. Hold an empty container (60 oz. (1.7 liters)) under the drain hole of the gearbox (see *Figure 40*, below).

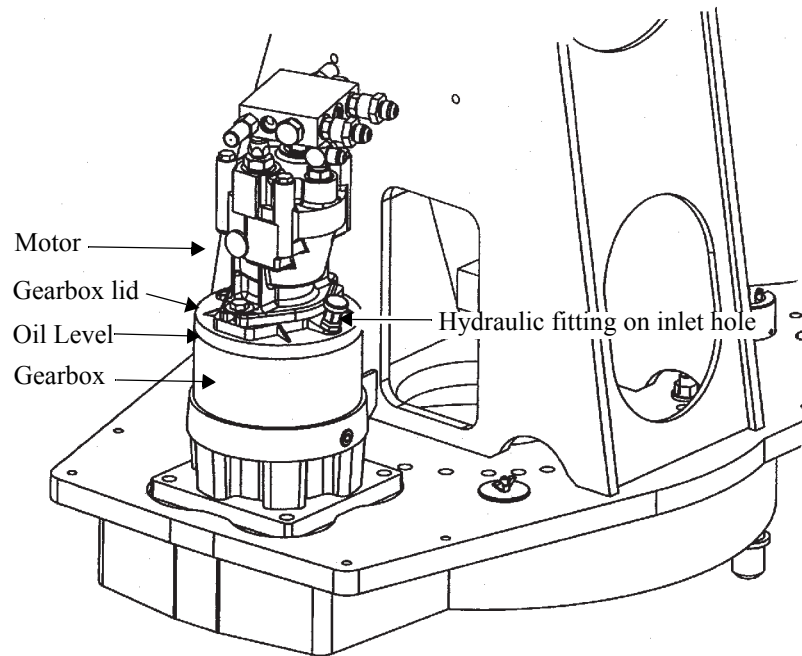


Figure 40 - Location of drain hole

2. Remove the plug from the drain hole in the side of the gearbox and let the old oil drain out.
3. Clean the drain plug and reinsert it into the drain hole.
4. Dispose of the old oil as per regulations.
5. Unscrew the hydraulic fitting on the top of the gearbox (see *Figure 40*, above).
6. Fill the gearbox with new oil to the bottom of the gearbox lid as shown in *Figure 40*, above. This completely covers the sun gear with oil (you must look in the hole where you are pouring the oil to see the level of the oil).
7. Screw the hydraulic fitting back on the inlet hole.

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