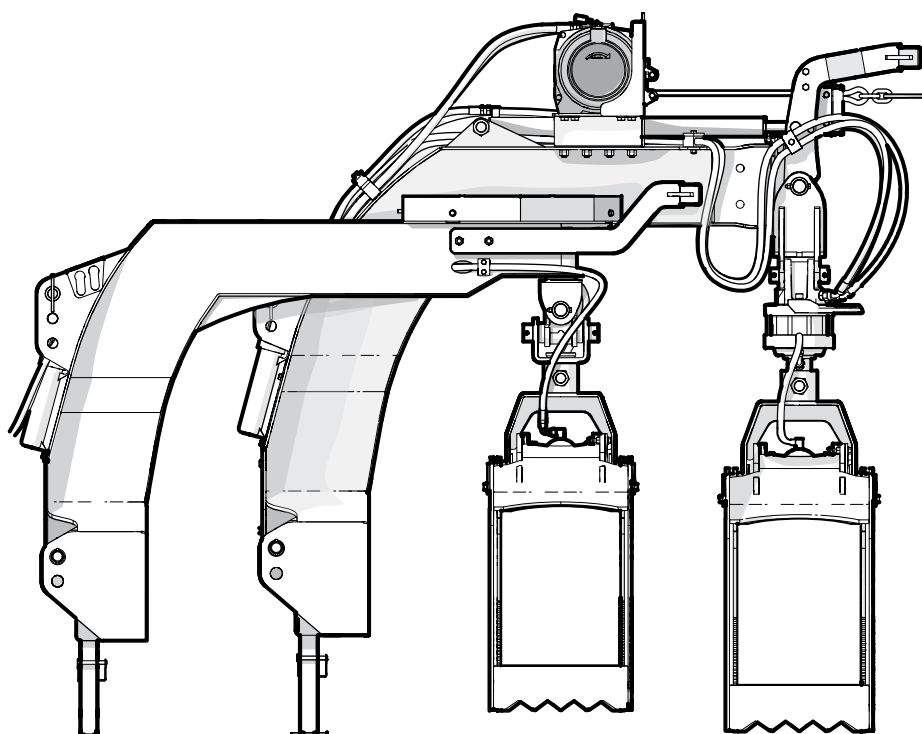


# OPERATOR'S MANUAL

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## LXG300 Series 3-Point Hitch Log Grapple



# 1. Foreword

## 1.1 Introduction

### Congratulations on your choice of a Wallenstein LXG300 Series Log Grapple!

Wallenstein **LXG300 Series Log Grapples** are designed to mount on a tractor 3-point hitch. The grapple can be used for loading / carrying logs in a small-scale timber industry or landscaping business. The following table outlines some basic differences in the models.

Model	Grapple Opening	Features
LXG320S	48" (122 cm)	180° Spring-centered Rotation
LXG320R	48" (122 cm)	360° Hydraulic Rotator
LXG330S	72" (183 cm)	180° Spring-centered Rotation
LXG330R	72" (183 cm)	360° Hydraulic Rotator
LXG330RP	72" (183 cm)	360° Hydraulic Rotator Hydraulic Winch Extendable Boom

Safe, efficient and trouble-free operation of this Wallenstein product requires that anyone using or maintaining the machine reads and understands the Safety, Operation, and Maintenance information contained within the Operator's Manual.

Keep this manual handy for frequent reference and to pass on to new operators or owners. Call your Wallenstein dealer or the Distributor if you need assistance, further information, or additional copies of the manual.

Units of measurement in Wallenstein Equipment technical manuals are written as:  
US Customary (SI metric)

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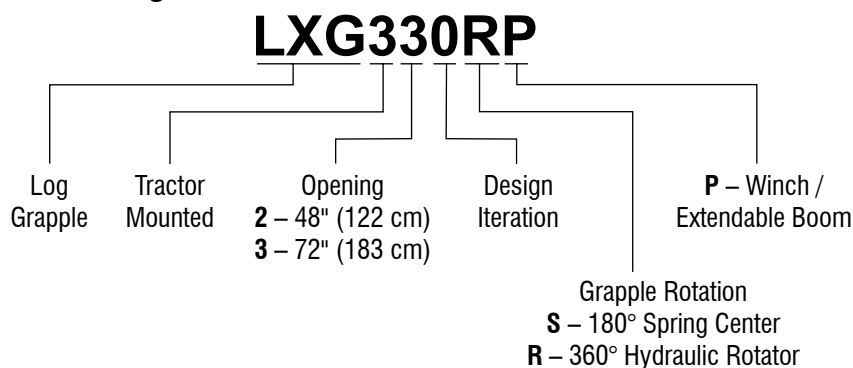
**WARNING!**

**Do not attempt to start or operate the machine without thoroughly reviewing this manual for safe and proper operation.**

**Always keep this manual with the machine.**

W034

### Model Configuration



[www.wallensteinequipment.com](http://www.wallensteinequipment.com)

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## 1.2 Delivery Inspection Report

### Wallenstein LXG300 Series Grapples

To activate warranty, register your product at: [www.wallensteinequipment.com](http://www.wallensteinequipment.com)

This form must be filled out by the dealer at the time of delivery, then signed by the dealer and customer.

The product manuals have been received by me and I have been thoroughly instructed as to care, adjustments, safe operation, and applicable warranty policy.

I have thoroughly instructed the buyer on the equipment care, adjustments, safe operation and applicable warranty policy and reviewed the manuals.

Customer

Dealer

Address

Address

City, State/Province, ZIP/Postal Code

City, State/Province, ZIP/Postal Code

( )

( )

Phone Number

Phone Number

Contact Name

Model

Serial Number

Delivery date

### 1.2.1 Dealer Inspection Report

\_\_\_\_\_ Check Condition of Hydraulic Hoses

\_\_\_\_\_ Check that all Fasteners are Tight

\_\_\_\_\_ Check Hydraulic Functions

\_\_\_\_\_ Check Grapple Function

\_\_\_\_\_ Check Pivot Assembly Moves Freely

\_\_\_\_\_ Check Guards and Shields Installed

\_\_\_\_\_ Check Rotator Function

#### LXG330RP Models

\_\_\_\_\_ Check Extension Arm Function

\_\_\_\_\_ Check Winch Function

\_\_\_\_\_ Check Selector Switch Function

#### Safety Checks—All Models

\_\_\_\_\_ All Safety Decals Installed and in Good Condition

\_\_\_\_\_ Operating and Safety Instructions Reviewed

## 1.3 Serial Number Location

Always provide your dealer with the serial number of your Wallenstein product when ordering parts or requesting service or other information.

The Serial Number Plate location is shown in the illustration. **Please record the product Model and Serial Number in the space provided below for easy reference.**

Record Product Information Here	
Model:	
Serial Number:	

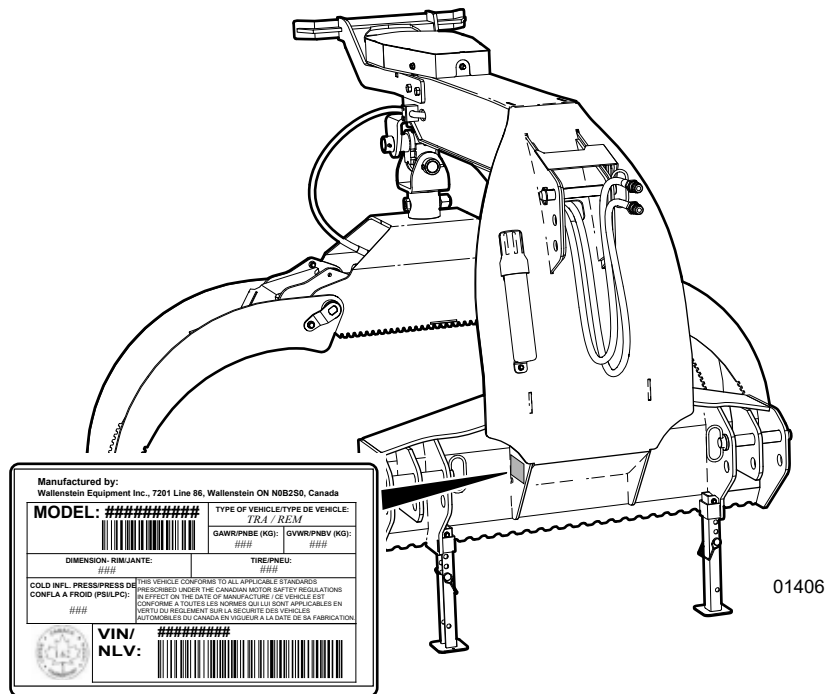
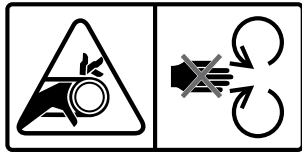


Fig. 1 – Serial Number Plate Location (typical)

## 1.4 Types of Decals on the Machine

When getting familiar with the Wallenstein product, notice that there are numerous decals located on the machine. There are different types of decals for safety, information, and product identification. The following section explains what they are for and how to read them.

**Safety Decals** have a yellow background and are generally two panel. They can be either vertical or horizontal orientation.



**Safety Notice Decals** are pictorial with a blue background and generally rectangular with single or multiple symbols. This decal informs what Personal Protective Equipment is required for safe operation.

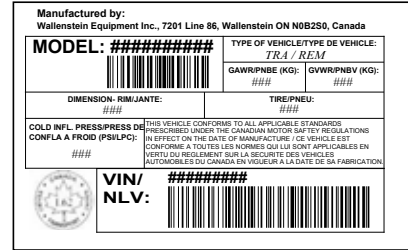


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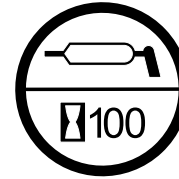
Informative Decals are generally pictorial with a white background and can vary in the number of panels. This type of decal provides additional information to the operator or explains the operation of a control.



Product Decals indicate machine model and serial number, and other important information.



Maintenance Decals have a green background. The decal indicates a maintenance procedure and frequency interval.



See the section on safety signs for safety decal definitions. For a complete illustration of decals and decal locations, download the parts manual for your model product at [www.wallensteinequipment.com](http://www.wallensteinequipment.com).

## 2. Safety

### 2.1 Safety Alert Symbol

This Safety Alert Symbol means:

**ATTENTION! BE ALERT!**  
**YOUR SAFETY IS INVOLVED!**

The Safety Alert Symbol identifies important safety messages on the machine and in the manual.

When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.



### 2.2 Signal Words

The signal words **DANGER**, **WARNING** and **CAUTION** determine the seriousness level of the warning messages in this manual. The appropriate signal word for each message in this manual has been selected using the following guidelines:

#### **DANGER –**

Indicates an imminently hazardous situation that, if not avoided, **will** result in death or serious injury. This signal word is to be limited to the most extreme situations typically for machine components which, for functional purposes, cannot be guarded.

#### **WARNING –**

Indicates a potentially hazardous situation that, if not avoided, **could** result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

#### **CAUTION –**

Indicates a potentially hazardous situation that, if not avoided, **may** result in minor or moderate injury. It may also be used to alert against unsafe practices.

**IMPORTANT –** To avoid confusing equipment protection with personal safety messages, a signal word **IMPORTANT** indicates a situation that if not avoided, could result in damage to the machine.

### 2.3 Why SAFETY is Important

#### Three Big Reasons:

- **Accidents Disable and Kill**
- **Accidents Cost**
- **Accidents Can Be Avoided**



**YOU** are responsible for the SAFE operation and maintenance of your Wallenstein product. **YOU** must make sure that anyone who is going to use, maintain or work around the machine is familiar with the operating and maintenance procedures and related **SAFETY** information contained in this manual. This manual alerts you to all good safety practices that should be used while using your Wallenstein equipment.

**YOU** are the key to safety. Good safety practices not only protect you but also the people around you. Make these practices a working part of your safety program. Be certain that **EVERYONE** using this equipment is familiar with the recommended operating and maintenance procedures and follows all the safety precautions.

**Do not risk injury or death by ignoring good safety practices.**

## 2.4 Safety Rules

Safety is a primary concern in the design and manufacture of Wallenstein products. Unfortunately, efforts to provide safe equipment can be wiped out by a single careless act.


- It is the operator's responsibility to read, understand and follow ALL safety and operation instructions in this manual. 
- The operator of this grapple must be a responsible, properly trained and physically able person familiar with machinery and trained in the operation of a tractor. Learn the controls and how to stop the machine quickly in an emergency before working with the grapple.
- An employer has the responsibility to train employees how to operate the equipment they are using. When someone does not understand the basic operation of a piece of equipment, they can create dangerous situations very quickly. Operators must completely understand:
  - Safety section of this manual
  - Safety decals on the machine
  - Tractor operator's manual
- If this machine is used by any other person, loaned or rented, it is the owner's responsibility to make certain that prior to using, every operator is fully trained.
- Review safety related items annually with all personnel who will be operating or performing maintenance.
- Keep a first-aid kit available for use should the need arise and know how to use it. 
- Never consume alcohol or drugs when operating this equipment. Alertness or coordination can be affected. Consult your doctor about operating this machine while taking prescription medications.
- Never swing a load if the operator's line of sight is obstructed. Do not lift it higher than is necessary to provide unobstructed vision for the equipment operator.
- Always wear PPE when operating or servicing the machine. Hard hats, protective glasses, protective shoes, gloves, reflector type vests and ear protection are types of equipment that may be required.
- Avoid loose fitting clothing, loose or uncovered long hair, jewelry, and loose personal articles. These can get caught in moving parts. Jewelry may also ground a live circuit.

- Prolonged exposure to loud noise may cause permanent hearing loss! Power equipment with or without equipment attached can often be noisy enough to cause permanent, partial hearing loss.



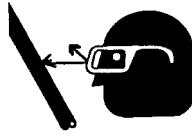
- Wear hearing protection on a full-time basis if the noise in the operator's cab exceeds 80 dB. Noise over 85 dB on a long-term basis can cause severe hearing loss. Noise over 90 dB adjacent to the operator over a long-term basis may cause permanent, total hearing loss.
- Keep bystanders away at a safe distance at least 10 ft (3 m) from stacking zone. Mark the zone with safety cones.
- Use the machine only in daylight or good artificial light.
- On winch-equipped LXG330RP, replace synthetic rope if kinked, badly frayed, has knots, cuts, or broken strands. If rope fails under tension it can snap back with great force causing injury or death. Avoid sudden jerks, quick starts or stops. Start slowly and smoothly.
- Perform the **Pre-start Checks** before starting work (see *page 30*).
- Do not risk injury or death by ignoring good safety practices.

### Equipment Safety Guidelines

- Replace any safety sign or instruction sign that is not readable or is missing. Location and explanation of safety signs start on *page 16*.
- Do not modify the equipment in any way. Unauthorized modification may result in serious injury or death and may impair the function and life of the equipment. Unapproved modifications void warranty.
- Never exceed the limits of machine if its ability to do a job, or to do so safely is in question.
- Protective cab guards must be provided on a log loader unless the absence of guards does not pose a hazard to the operator.
- Shut down the machine and place it in a Safe Condition before performing any service, maintenance work or storage preparation.
- Make sure that all the components in the hydraulic system are kept in good condition and are clean.
- Before applying pressure to the system, make sure all connections are tight. Check lines, hoses, and couplings for damage. 



- Do not attempt any makeshift repairs to the hydraulic lines, fittings or hoses by using tape, clamps or cements. The hydraulic system operates under extremely high pressure. Such repairs can fail suddenly and create a hazardous and unsafe condition.
- Wear proper hand and eye protection when searching for a high-pressure hydraulic leak. Use a piece of wood or cardboard as a backstop instead of hands to isolate and identify a leak.
- If injured by a concentrated high-pressure stream of hydraulic fluid, seek medical attention immediately. Serious infection or toxic reaction can develop from hydraulic fluid piercing the skin surface.
- Relieve pressure on hydraulic system before working on system.



### 2.4.1 Safe Condition

Throughout this manual, we talk about a 'Safe Condition'. What this means is parking the machine in a manner that makes it safe to service or repair.

**Place the machine in a Safe Condition before performing any service, maintenance work, or storage preparation by performing the following:**

- Empty material from grapple.
- Lower grapple to ground.
- Shut down tractor engine.
- Move controls to verify there is no movement.

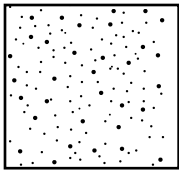
### Designated Safe Area

(See following page.)

- A *Safe Area* must be designated for workers on foot near this equipment.
- The boundaries of a designated **Safe Area** must be communicated to all workers within and near the **Work Zone**.
- No equipment should enter or proceed through a **Safe Area** unless—
  - The equipment operator first obtains permission in a clear and unmistakable manner from all the workers in that safe work area or from the supervisor of those workers, and
  - Those workers take a safe position.

### Work Zone Arrangement

- A *Work Zone* includes any area where work with this grapple is done but does not include the traveled portion of a road unless that portion of the road is being used as a landing.
- Work being done inside a **Work Zone** in a forestry operation must be planned, and the work area must be located, constructed, maintained, and operated to make sure that:
  - Logs can be moved safely in the area
  - Log piles and equipment used to handle the logs do not become unstable or otherwise create a hazard
  - Workers can work in locations clear of moving logs and equipment
  - Workers are not exposed to incoming or runaway logs or other debris
  - The area is kept free from buildup of bark and other debris to the extent that it would pose a risk to workers
  - An effective method of dust control is used and maintained
- Log piles must, to the extent practicable, be located on stable and relatively level ground.
- Log piles must not be higher than the safe operating reach of the tractor being used to handle the logs.



### 1. Safe Area

The area outside of the Work Zone is designated a Safe Area for coworkers.



### 2. Work Zone

Injury may occur from heavy material falling / dropping in this area. Material on a grapple can create a collision hazard if workers or bystanders are inside the Work Zone.

Place safety cones around the area to warn others.

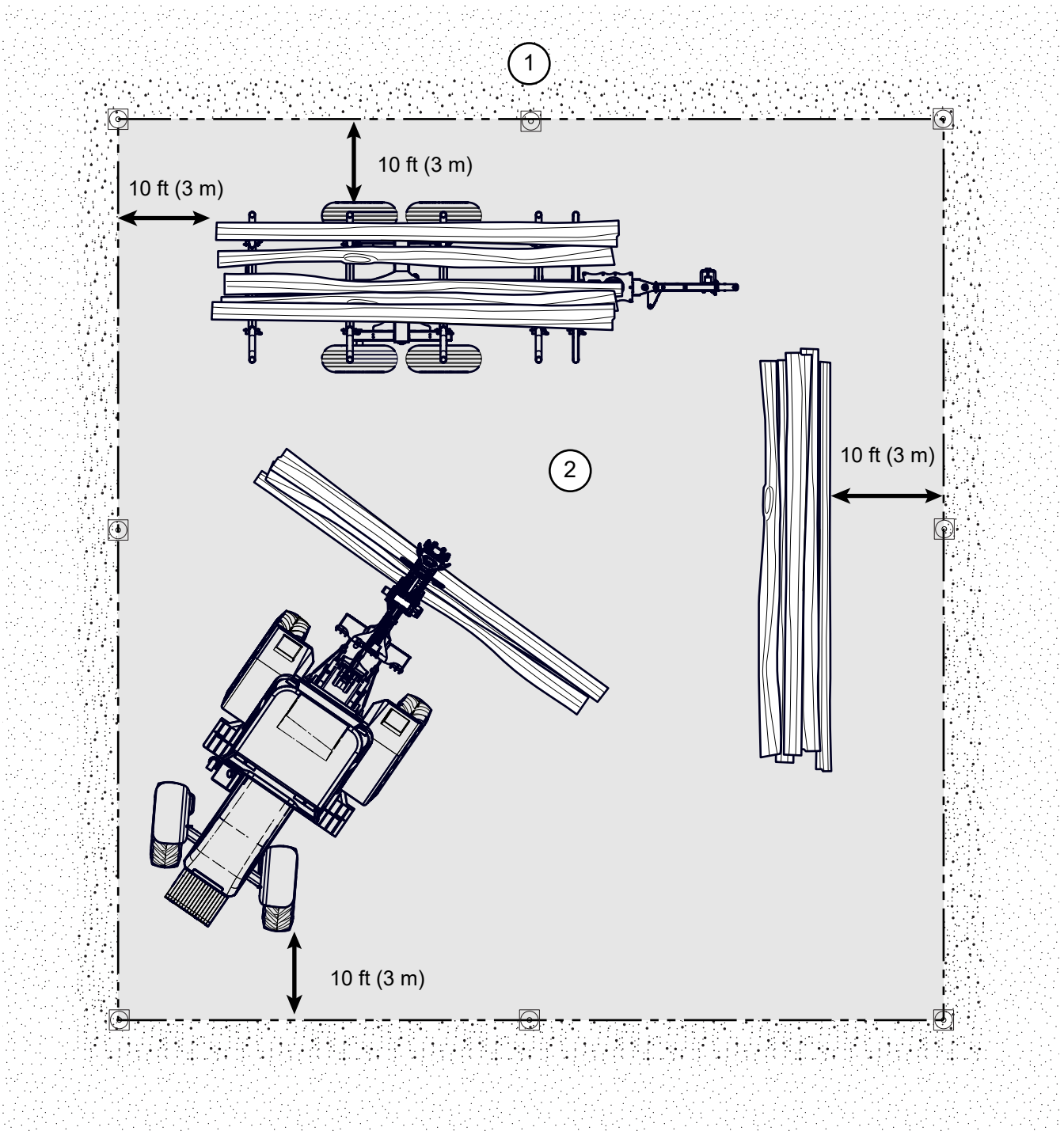


Fig. 2 – Work Zone and Safe Zone

## 2.5 Winch Safety

### (LXG330RP only)

Refer to winch manual included with your machine.

- Never stand in line with the path of a rope under tension. Stand at least 10 ft (3 m) to the side to activate the winch. If a rope breaks under tension, it can snap back in an unpredictable direction with great force. The recoil may cause injury or death to a person in its path.
- Always keep hands clear of winch rope, hook loop, hook and fairlead opening during installation, operation, and when spooling in or out.
- Always be certain the anchor you select can withstand the load and the strap or chain cannot slip.
- Always stand clear of winch rope and load and keep others away while winching.
- Never touch winch rope or hook while under tension or under load.
- Never engage or disengage clutch if winch is under load, winch rope is in tension or drum is moving.
- Do not use a tractor without a ROPS.
- For stability, open grapple forks and lower to the ground before operating the winch.
- Check rope condition before using winch. Rope may break during operation if knotted, has broken strands, or sharp kinks. Replace rope if damaged. Do not touch rope during operation.
- Do not allow anyone within 20 ft (6 m) of logs when winching. Logs can roll in unpredictable ways.
- Choose a flat, solid skidding route for the tractor. Avoid steep slopes.
- Wind the rope under load. Rope does not wind in properly with no load.
- Check that the winching trail is clear of other trees and obstructions so logs can be winched in easily.
- Never exceed a winching angle of  $\pm 25^\circ$  from the centerline of the tractor. If unsure of winch angle, reposition tractor or use a snatch block. Whenever possible winch in line with the tractor.

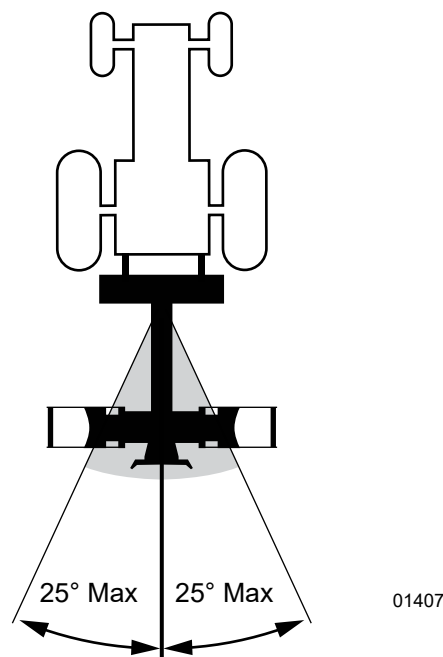


Fig. 3—Safe Winch Angle

- When using snatch block, be aware of danger zone created between the log, snatch block, and tractor.

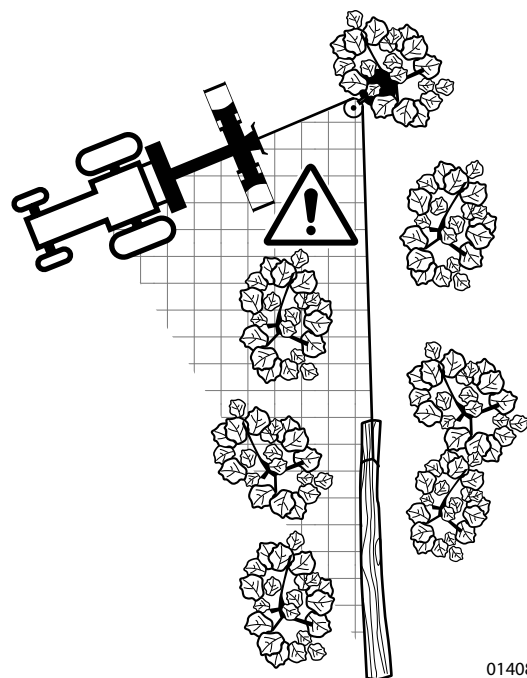
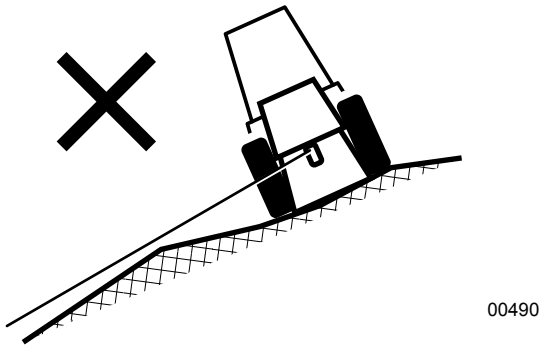


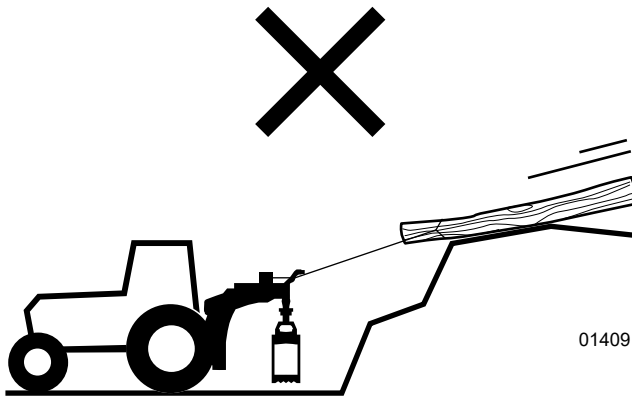
Fig. 4—Using Snatch Block or Self-releasing Pulley

- Do not winch across a slope. Winching across a slope could cause a rollover. Do not operate on hillsides or when working area is cluttered, wet, muddy or icy to prevent slipping and tripping.



**Fig. 5**—Never Winch from the Side on a Slope

- Never winch down slope. Winching down a slope could cause the log to roll or slide causing crushing injuries. Always winch up-slope when possible.

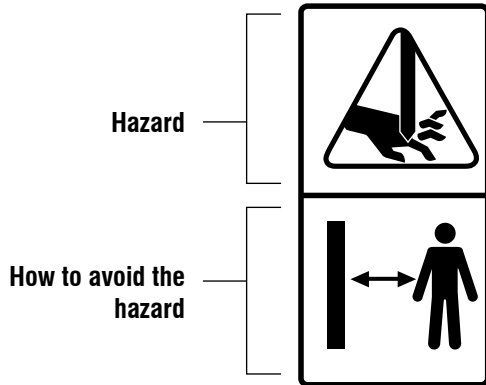


**Fig. 6**—Never Winch Down Slope



### 3. Safety Signs

The top (or left-hand) panel on the decal shows the safety alert (the potential hazard), and the bottom (or right-hand) panel shows the message (how to avoid the hazard).



#### 3.1 Safety Sign Locations

Practicing good safety means becoming familiar with safety signs and warnings and being aware of the situations that require alertness.

**Think SAFETY! Work SAFELY!**

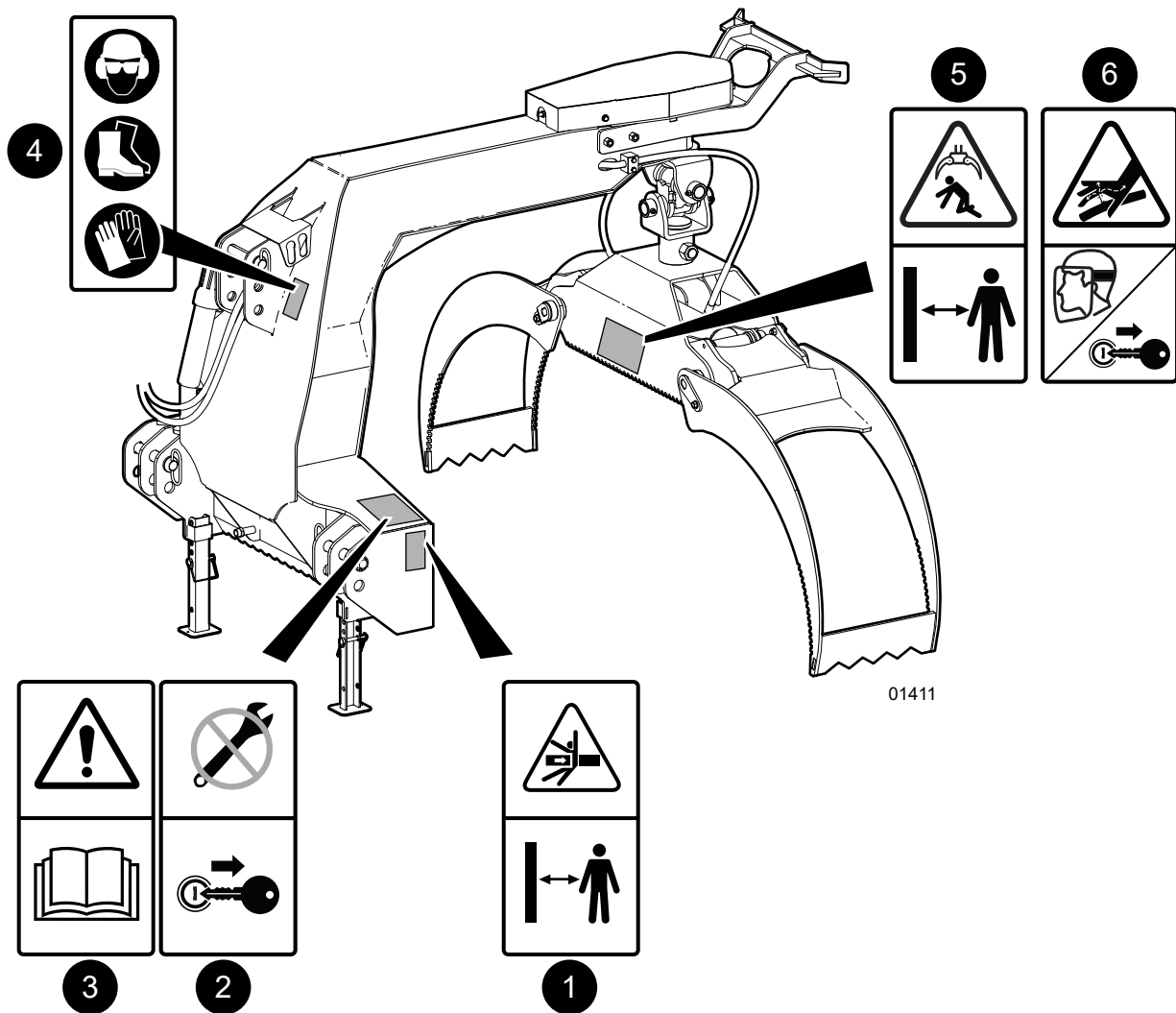


Fig. 7 – Safety Decal Locations (Typical)

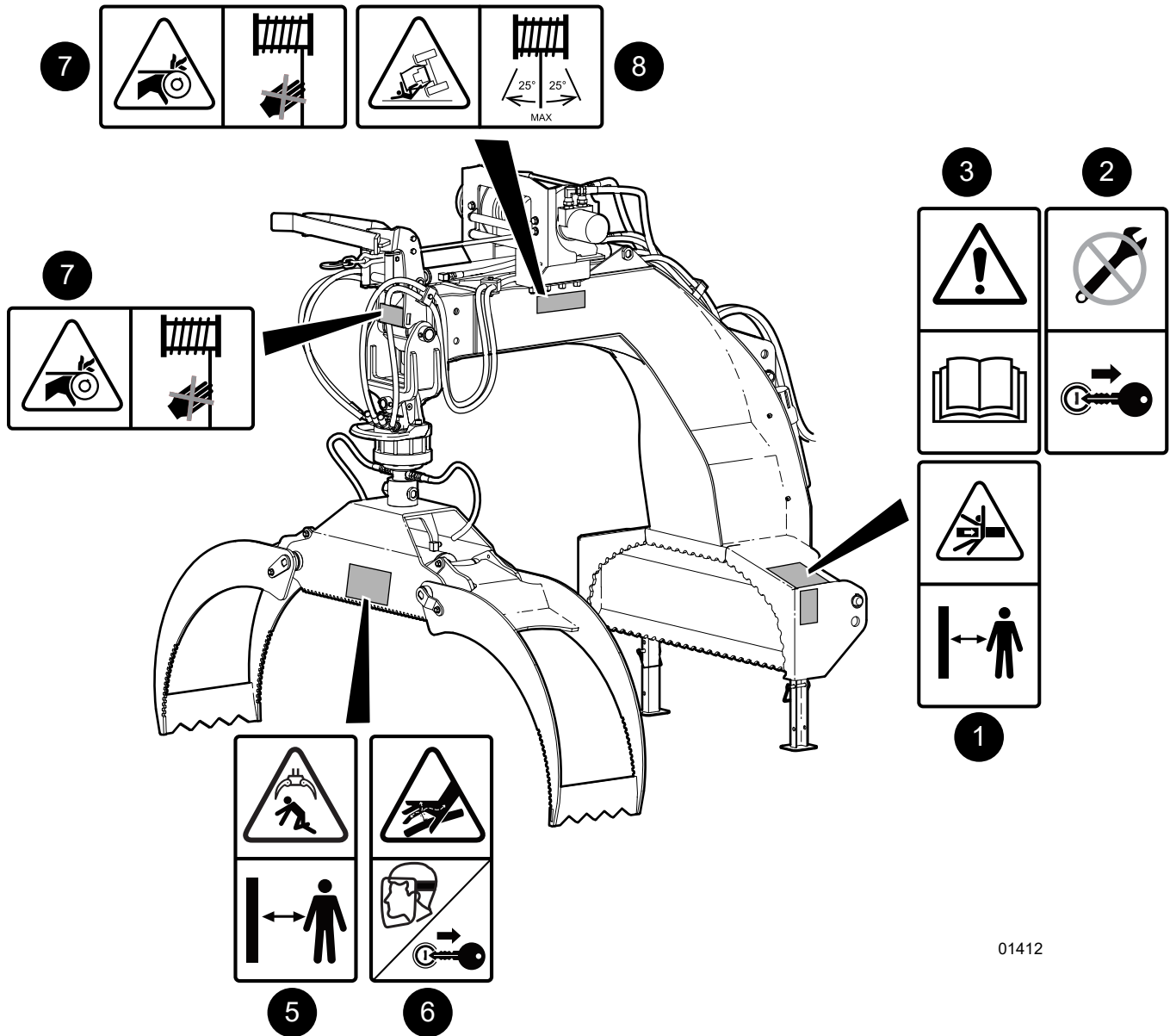


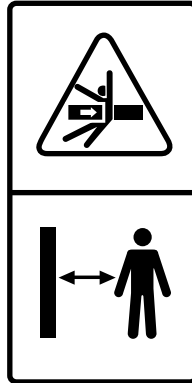
Fig. 8 – Safety Decal Locations (LXG330RP)

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### 3.2 Safety Sign Explanations

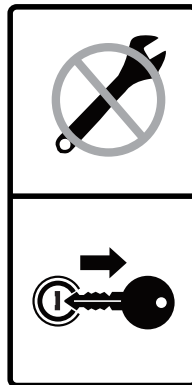
#### 1. Caution!

Be aware of pinch hazards from moving parts such as boom, grapple, and logs.



#### 2. Caution!

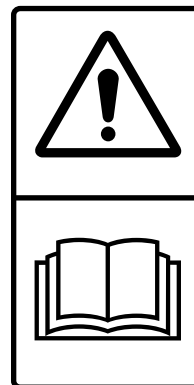
Risk of machine moving unexpectedly causing injury when servicing or repairing. Shut down machine before performing maintenance procedures. Remove the ignition key.



#### 3. Caution!

Refer to the operator's manual. Read ALL operating instructions in the manual and learn the meaning of ALL safety signs on the machine.

The best safety feature is an informed operator.



#### 4. Warning!

Always wear appropriate Personal Protective Equipment when using this machine. For example:

- A hard hat
- Heavy gloves
- Hearing protection
- Protective shoes with slip resistant soles
- Protective glasses, goggles or face shield



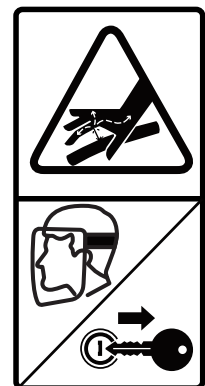
#### 5. Warning!

Risk of falling debris from grapple. Do not lift any load that cannot be safely secured by the grapple. Never allow anyone to walk under overhead load. Keep bystanders at a safe distance.



#### 6. Caution!

Hydraulic fluid under pressure. In the event of a leak, shut machine down. Do not check for leaks with bare hands. Wear proper hand and eye protection when searching for a high-pressure hydraulic leak.

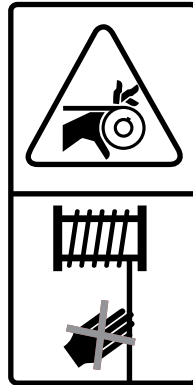




## 7. Caution!

Risk of entanglement in winch line.

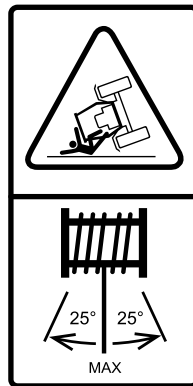
Keep hands, loose clothing, and long hair away from winch line while it is operating. LXG330RP models only.



## 8. Caution!

Risk of machine rollover. Do not winch at angles greater than 25° from centerline of tractor.

Use snatch blocks when winching at angles greater than 25°. LXG330RP models only.



**IMPORTANT!** If parts are replaced that have safety signs on them, new signs must be applied. Safety signs must always be replaced if they become damaged, are removed, or become illegible.

Replacement safety decals are available from your authorized dealer or distributor.

## 3.3 Replacing Damaged Safety Signs

- Always replace safety signs that are missing or have become illegible. Replacement safety signs are available from your authorized distributor, dealer parts department, or the factory.
- Always keep safety signs clean and legible.
- Parts replaced that had a safety decal on them must also have the safety sign replaced.

### Procedure

Installation area must be clean and dry. Make sure the surface is free of grease or oil. Ambient temperature must be above 50 °F (10 °C).



*Determine exact position before removing the backing paper on the decal.*

1. Peel the decal off the backing sheet.
2. Align the decal with an edge on the machine if possible.
3. Starting on one edge, carefully press the center of the exposed sticky backing in place, smoothing it out as you work from one side to the other.
4. Use a squeegee, credit card or similar to smooth it out. Work from one end of the decal to the other end.

Small air pockets can be pierced with a pin and smoothed out using the piece of sign backing paper.

## 4. Familiarization

### 4.1 To the New Operator

It is the responsibility of the owner or operator to read this manual and to train all other operators before they start working with the machine.

By following recommended procedures, a safe working environment is provided in the area around the work site.

Untrained operators are not qualified to use the machine.

#### 4.1.1 Training

Each operator must be trained in the proper operating procedures prior to using the machine.

1. Review control location, function and movement directions.
2. Move the unit to a large open area to allow the operator to become familiar with control function and machine response.
3. When a new operator is familiar and comfortable with the machine, they can proceed with the work.

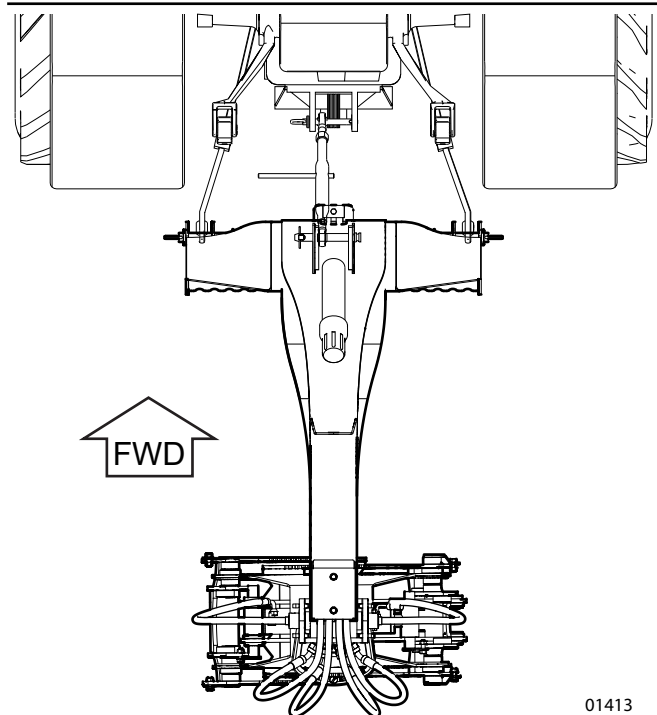
#### 4.1.2 Job Site Familiarization

Become familiar with the work site prior to beginning. Avoid the possibility of problems or accidents by reviewing the following.

- Determine a safe work area / trailer-load location:
  - Area must be clear of stones, branches or hidden obstacles that might cause a tripping, hooking or snagging hazard.
  - Ground should be firm and level.
- Determine a safe log stack location:
  - Stack should be on level ground.
  - Make sure stack location does not interfere with safe operation of the machine.
- Precut and de-limb logs.

### 4.2 Operator Orientation

**IMPORTANT!** The directions for left-hand, right-hand, backward and forward mentioned throughout this manual are determined when sitting in the tractor seat, facing the direction of forward travel.



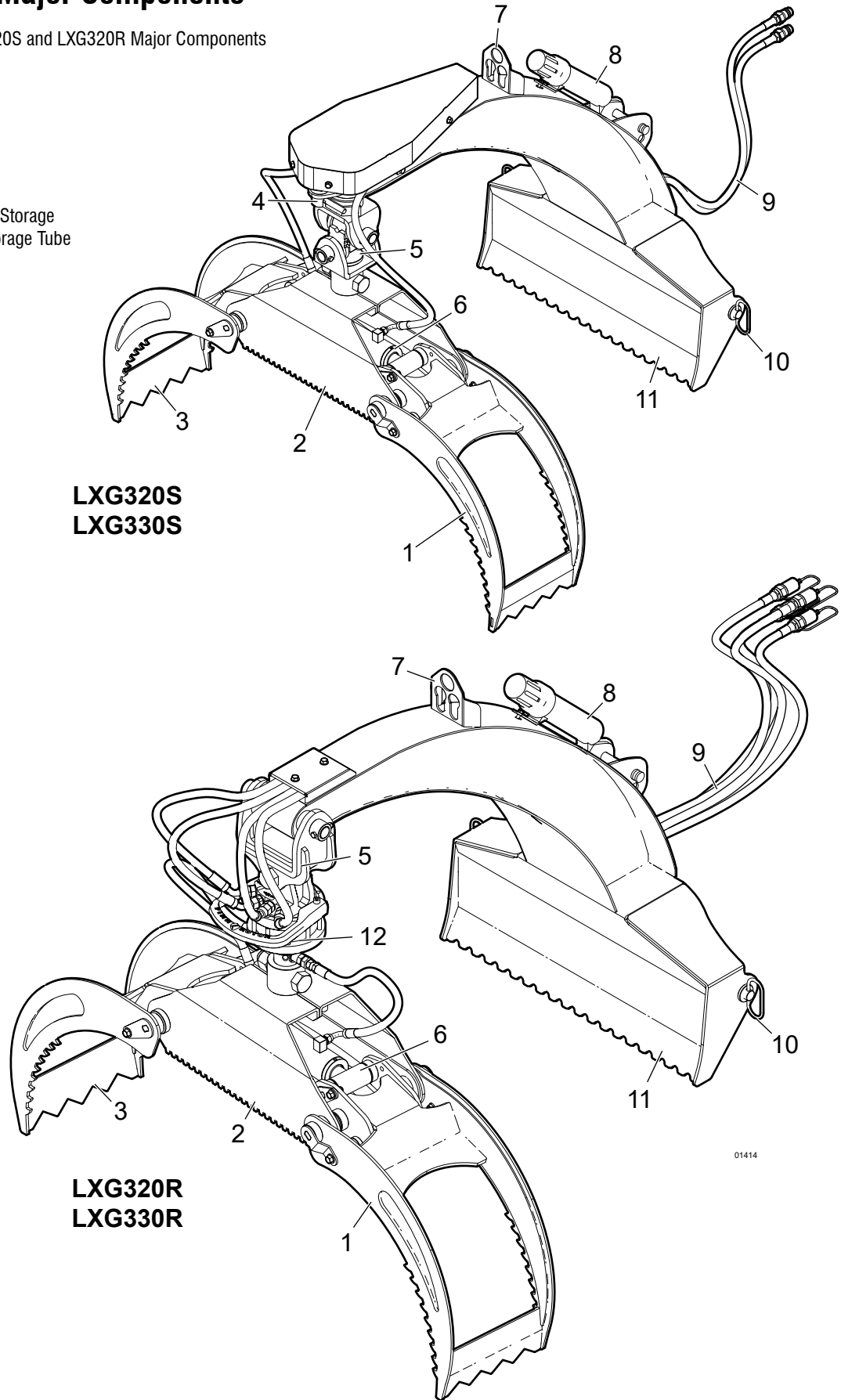
01413

**Fig. 9** – Direction of forward travel

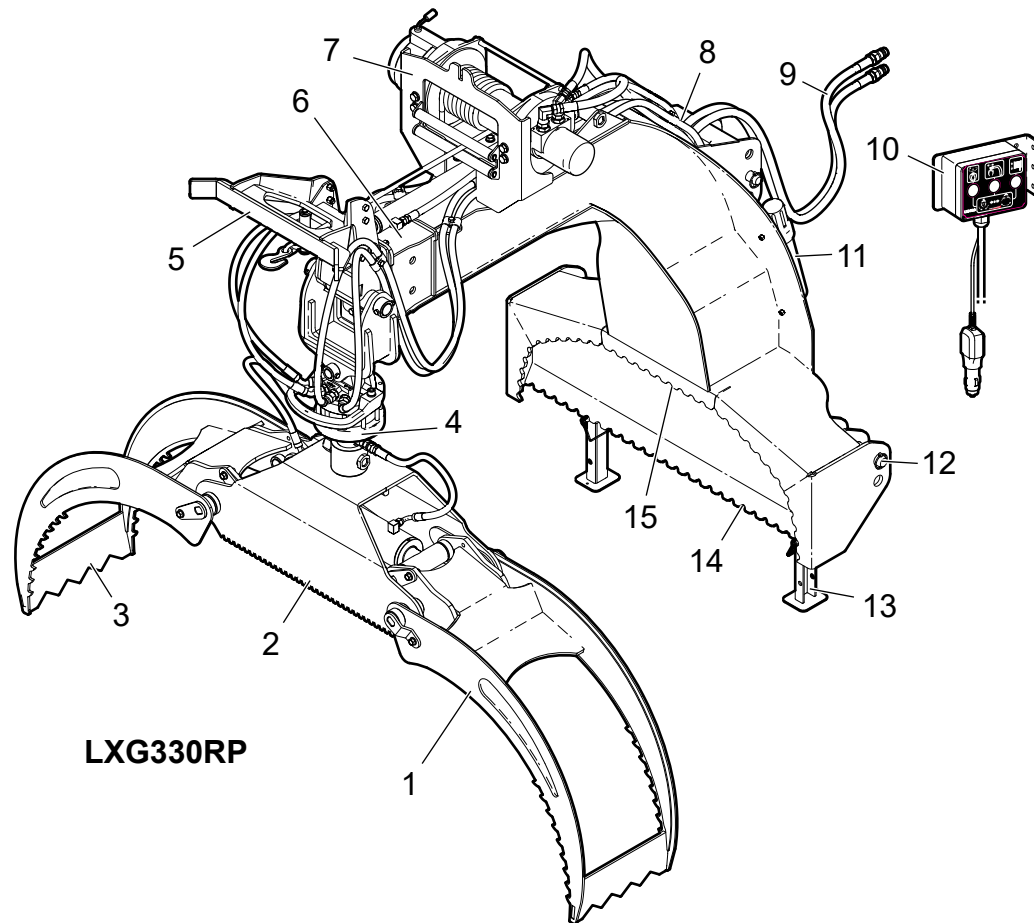
### 4.3 Grapple Major Components

Fig. 10—LXG320S and LXG320R Major Components

- 1. Grapple Inner Fork
- 2. Grapple Housing
- 3. Grapple Outer Fork
- 4. Spring Return Pivot
- 5. Main Pivot
- 6. Hydraulic Cylinder
- 7. Hydraulic Hose End Storage
- 8. Operator Manual Storage Tube
- 9. Hydraulic Hoses
- 10. Hitch Pin
- 11. Grapple Main Frame
- 12. Hydraulic Rotator



01414



**Fig. 11**—LXG330RP Major Components

- |                         |                                  |                           |
|-------------------------|----------------------------------|---------------------------|
| 1. Grapple Inside Fork  | 7. Winch                         | 13. Support Legs          |
| 2. Grapple Housing      | 8. Hydraulic Hose End Storage    | 14. Main Frame            |
| 3. Grapple Outside Fork | 9. Hydraulic Hoses               | 15. Cantilever Log Cradle |
| 4. Hydraulic Rotator    | 10. Remote Grapple Control Box   |                           |
| 5. Push Bar             | 11. Operator Manual Storage Tube |                           |
| 6. Extendable Boom      | 12. Hitch Pin                    |                           |

## 5. Installation

The tractor should have a front loader installed or a full complement of weights to balance the load of the grapple.



### WARNING!

**Risk of ROPS failure. Do not install attachment on tractor if total equipment weight exceeds ROPS certification.**

W022

### 5.1 Matching Grapple to Tractor

Use the following table as a reference guide.

Grapple Model	Recommended Engine Power	Required Hydraulic Oil Flow	Grapple Weight
LXG320S	25–65 hp (19–48 kW)	5 US gpm (19 Lpm)	350 lb (159 kg)
LXG320R	25–65 hp (19–48 kW)	5 US gpm (19 Lpm)	353 lb (160 kg)
LXG330S	55–120 hp (41–89 kW)	5 US gpm (19 Lpm)	836 lb (380 kg)
LXG330R	55–120 hp (41–89 kW)	5 US gpm (19 Lpm)	836 lb (380 kg)
LXG330RP	55–120 hp (41–89 kW)	10 US gpm (38 Lpm)	1229 lb (558 kg)

#### 5.1.1 Three-point Hitch Category

- LXG320S and LXG320R models are Category I only.
- LXG330S, LXG3230R, LXG330RP models are both Category I and II.

**NOTE:** LXG300 Series Grapples are neither Quick Hitch nor iMatch™ compatible.

### 5.2 Hydraulic Connection Requirements

**(LXG320S, LXG330S models)**

Grapple 'S' models require one remote pressure and one return connection.

**(LXG320R and LXG330R models)**

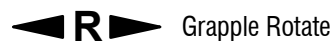
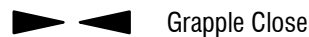
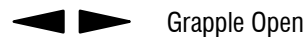
Grapple 'R' models require two sets of remote pressure and return connections—one set for the grapple open/close, the other for the hydraulic rotator.

#### LXG330RP

The LXG330RP model requires one remote pressure and one return connection. This model is equipped with a flow divider valve so that the boom extend and winch are controlled with the same hose connections.

### Arrows on the Rotator Body Indicate Function

For reference, models equipped with the hydraulic rotator have connection functions indicated on the rotator body.



### 5.3 Connecting to the Tractor

Make sure there is enough room and clearance to safely back the tractor up to the winch.



### WARNING!

**Never let anyone stand between the tractor and the implement during hitching. Too fast of an approach or the operator's foot slipping from the clutch can lead to injury or fatality to the person standing nearby.**

W048

1. Move the tractor drawbar for clearance, if required.
2. Place the tractor lift arms in their full sway position. Remove the hitch pins from the grapple.
3. At the slowest speed, reverse the tractor up keeping it lined up with the grapple.
4. When reversing, raise or lower the tractor lift arms to align them to the hitch pins.
5. Once properly aligned, apply the tractor park brake and turn the engine off.
6. Slide a hitch pin through the lower lift arm holes and hitch pin holes on both sides. Install the lynch pin retainers on each pin.
7. Remove the top pin and install the top link.
8. Adjust turnbuckle to align the top link. Insert the hitch pin and retainer. Adjust so the grapple is level.
9. Connect the hydraulic lines as required

10. For LXG330RP models, fit the control selector in the tractor cab and connect it to a 12 V power supply.

### 5.3.1 Set Flow Rate and Relief Pressure

- Set oil flow rate at **5.3 US gpm (20 Lpm)**.
- Set relief pressure at **3000 psi (207 bar)**

Check and adjust both grapple circuits so they are within the specification.

**IMPORTANT!** After installation is complete, cycle grapple then check tractor hydraulic oil level.

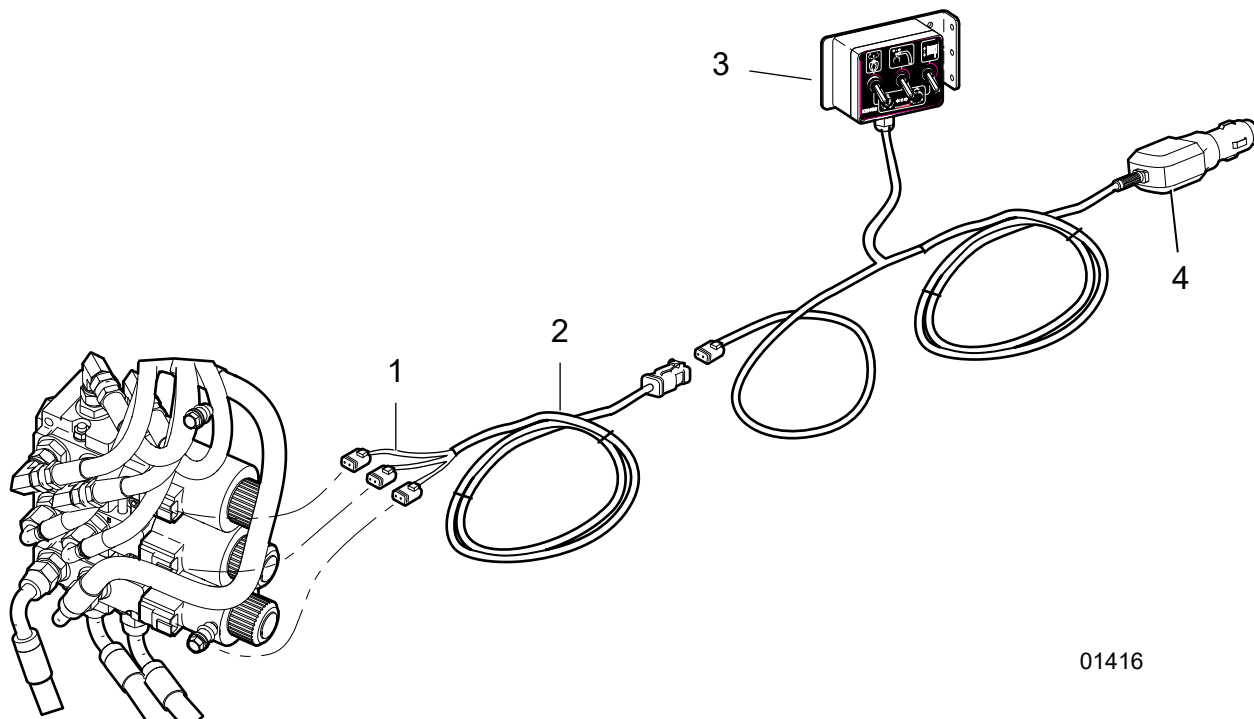
### 5.3.2 LXG330RP Electrical Connections

In addition to the hydraulic grapple and rotator, the LXG330RP also features a hydraulic winch and an extendable boom. The LXG330RP requires 12 VDC to power the hydraulic control valve for these functions from the cab.

**IMPORTANT!** When assembling wire harnesses, apply a thin coating of silicone dielectric grease to the harness connectors. The grease helps to stop any possibility of future corrosion.

Clean the ends, then apply a small amount to the surfaces of the connectors where they meet. Wipe off any excess.

- Connect the harness to the control valve on the grapple. Tie-wrap the harness to the hoses and route along the boom to the cab. Secure the harness to avoid chafing or pinching.
- In the cab, mount the control switch box in a convenient place. It should be positioned to easily toggle back and forth when operating.
- Connect the harness to a 12 VDC power supply, for example a cigar lighter.



01416

Fig. 19—LXG330RP Electrical Harnesses

- |                             |                        |
|-----------------------------|------------------------|
| 1. Control Valve Connectors | 3. Grapple Control Box |
| 2. Valve Harness            | 4. Power Connection    |

## 5.4 Grapple Removal

1. Select an area to store the grapple that is dry, level and free of debris, away from human activity.
2. Open the grapple forks for maximum stability. Set it down on wood planks to keep it off the ground. Make sure the grapple is stable.

### **WARNING!**

**Risk of serious injury from escaping high-pressure oil. Actuate controls after engine shut down to relieve trapped pressure before loosening hydraulic connections.**

W080

3. Shut down the tractor engine. Actuate hydraulic controls to relieve any trapped pressure in the circuit. Disconnect the hydraulic hoses from the grapple and cap the lines to prevent dirt from getting into the couplers.
4. On LXG330 models, lower and secure the support legs.
5. Disconnect the hitch pins. Move the tractor out away from the grapple.

## 5.5 Storage

Store the grapple away from human activity in a dry, level area. Place wood planks under it to keep it off the ground. If the grapple cannot be stored inside, cover with a waterproof tarp.

1. Clean the grapple to remove all dirt, mud, and entangled material.
2. Inspect the cylinder, rotator, pivot and grapple for damage. Repair or replace damaged parts.
3. Touch up all paint nicks and scratches to prevent rusting.

## 6. Controls

The grapple functions are powered from the tractor hydraulic system. The following section outlines the different types of controls specific to each model type.

### 6.1 Grapple Forks

(All Models)

All LXG300 Series grapple forks are powered from the tractor's rear remote hydraulics. The grapple has an inner and outer fork that bypass each other when closing. A closed grapple can grasp material as small as 3" (8 cm).

#### Grapple Maximum Opening

Model	Opening Size
LXG320S, LXG320R	48" (122 cm)
LXG330S, LXG330R, LXG330RP	72" (182 cm)

- LXG320S, LXG320R, LXG330S, LXG330R grapples are controlled directly using the tractor's rear remote hydraulic connections.
- LXG330RP grapple forks, boom extend and winch are controlled using the tractor's rear remote hydraulic connections with a control box to activate each function.

### 6.2 Spring-return Pivot

(LXG320S, LXG330S models)

The LXG-**S** model grapples have a mechanical pivot that allows the grapple forks to rotate 90° in either direction when unlocked. A spring in the pivot forces the grapple to center itself (perpendicular to the grapple boom) when the load permits. While skidding for example, the pivot can rotate as the load turns.

The pivot has three lock positions—two parallel with the boom (one each end of the 90°) and one parallel to the base. Locking is recommended to be used when carrying, lining up and stacking logs or whenever the pivoting feature is not desirable. Unlock the pivot when skidding.

**IMPORTANT!** Make sure the pivot is **UNLOCKED** during skidding. Damage to the pivot can occur if locked when turning or contacting other objects.



The pivot is protected by a shear bolt if excessive torque loads occur.

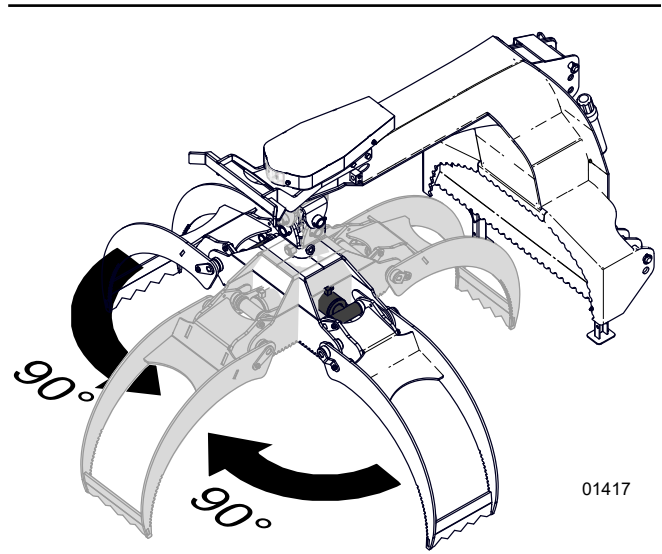


Fig. 12—Spring-return Pivot

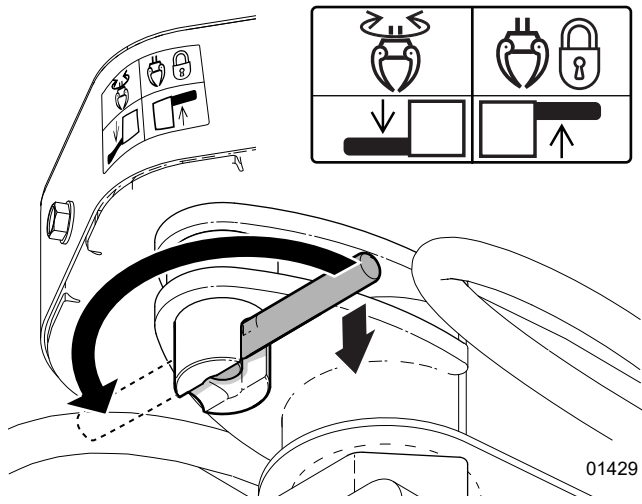


Fig. 13—Grapple Pivot Lock Lever

#### **CAUTION!**



**Risk of injury from collision with the grapple forks when locking or unlocking the pivot. The grapple fork pivot is under spring tension, and when unlocked can rotate the grapple with force unexpectedly.**

**Stand clear of the grapple when unlocking the pivot.**



## 6.3 Hydraulic Rotator

(LXG320R, LXG330R models)

The LXG-'R' model grapples have a hydraulic rotator providing 360° of rotation. The rotator is powered from the tractor's rear remote hydraulics. These models require two pressure and return circuits for the grapple forks and rotator functions.

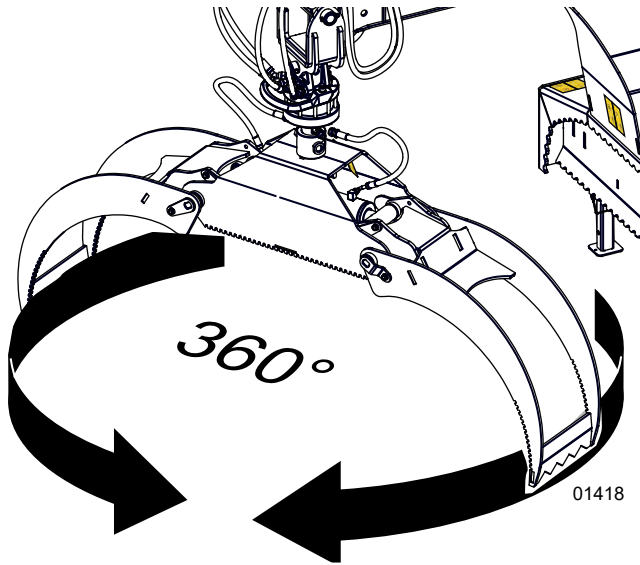


Fig. 14—Hydraulic Rotator

## 6.4 Support Legs

(LXG330S, LXG330R, LXG330RP models)

The support legs on these models are used to keep the grapple in an upright position when in storage and not attached to a tractor.

- Raise and secure the support legs out of the way when not in use.
- Before detaching the grapple from the tractor, remove the snap lock pin and lower the support leg to the lowest bottom position. Insert and secure the snap pin.

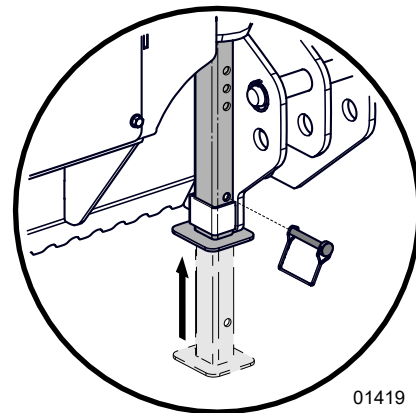


Fig. 15—Support Legs

### **WARNING!**



Risk of collision / crushing / pinching injury from the grapple forks when it rotates.



Stand clear of the grapple when in operation.

W088

## 6.5 Push Bar

(LXG330S, LXG330R, LXG330RP models)

The LXG330 model grapples have a heavy duty 19" (48 cm) push bar that can be used to aid in felling trees.

Back the tractor up to the tree and use the push bar to press on the tree, pushing it in direction of your fall-line. The push bar can help reduce the need for wedging and cabling.

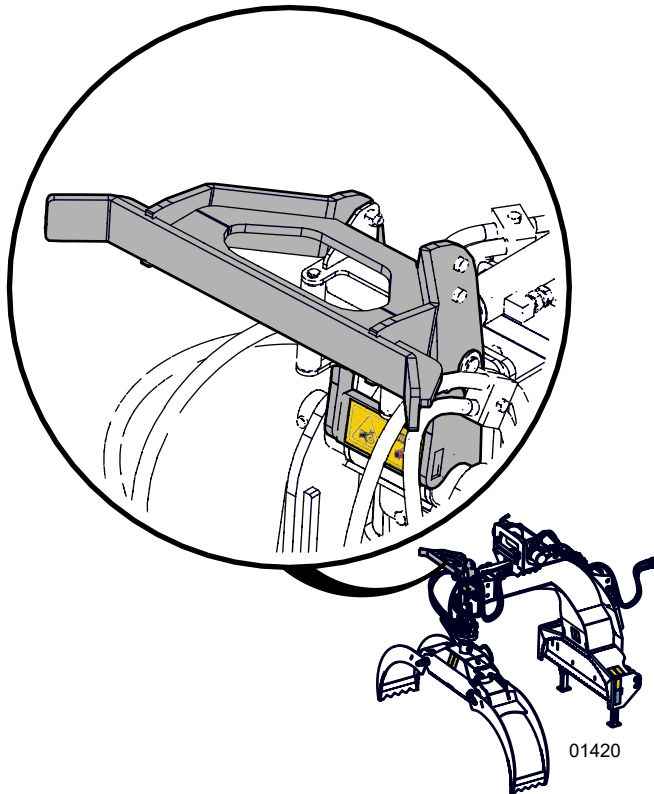


Fig. 16—Push Bar

### **! WARNING!**

Risk of injury or death from falling trees. Plan tree fall direction ahead of time.

**IMPORTANT!** Do not subject the push bar to severe impact. Damage to the machine can result.

## 6.6 Cantilever Cradle

(LXG330S, LXG330R, LXG330RP models)

The LXG330 model grapples have a heavy-duty cantilever log cradle used for lifting, stacking, and transporting logs. The serrated edge prevents the log from sliding off the cradle as you transport or position the log for stacking.

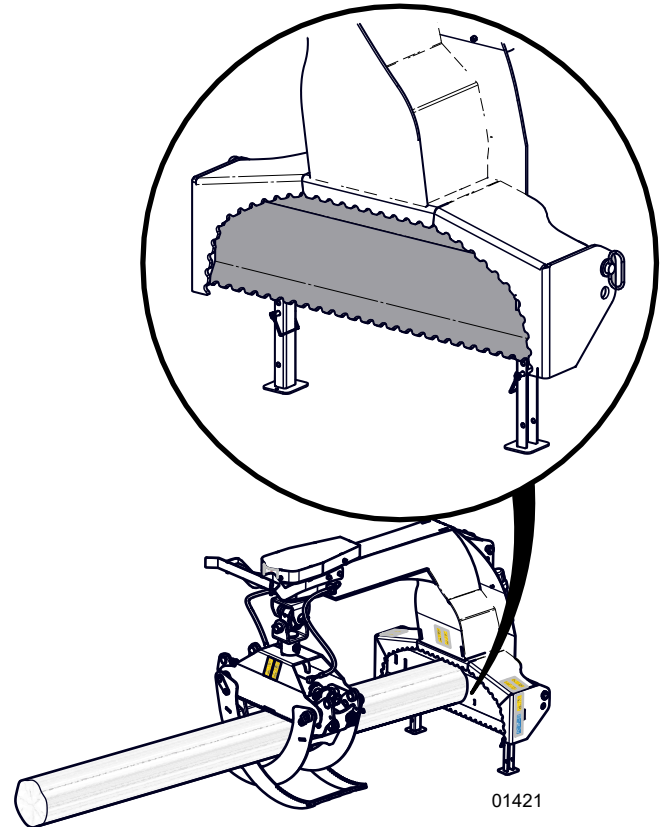
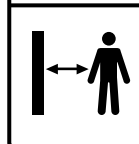


Fig. 17—Cantilever Cradle

### **! WARNING!**



Be aware of potential collision hazard from the swing radius of the log while transporting. Plan the route ahead of time.

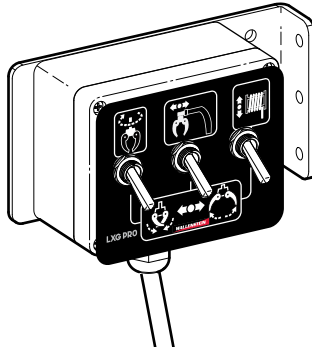


Keep bystanders 20 ft (6 m) away from the machine.

## 6.7 LXG330RP Controls

(LXG330RP models)

### 6.7.1 Hydraulic Control Selector



01422

**Fig. 18**—LXG330RP Hydraulic Control Selector

The hydraulic control selector box needs to be mounted in a convenient location inside the cab of the tractor, so that the grapple can be easily and safely controlled.

The control requires a 12-volt source and can be connected through the 12 V adaptor plug into a standard cigar lighter receptacle. For convenience, the plug comes with a 72" (182 cm) lead. When mounting the control, make sure the cable is routed to avoid:

- The operator getting entangled when exiting or entering the cab
- Being hit or pinched by the machine or material

The main harness features a connector that allows the controller to be detached from the grapple, allowing the controller to remain in the cab when the grapple has been removed and stored.

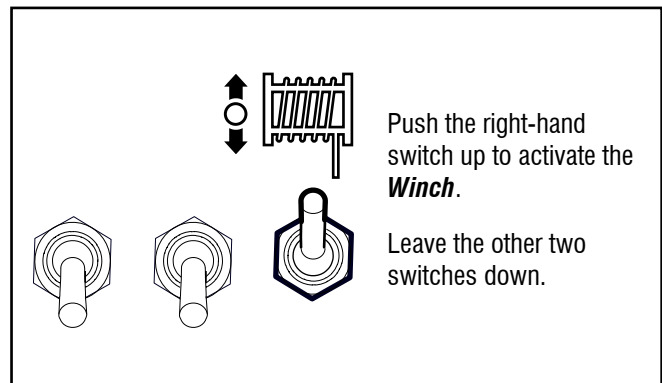
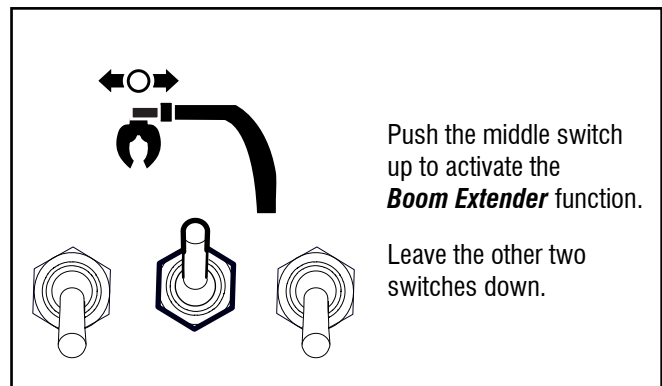
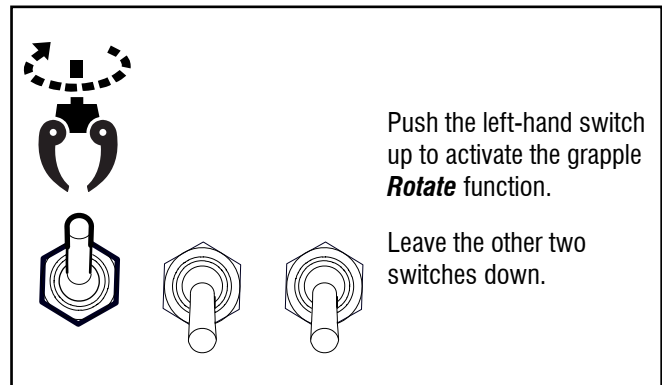
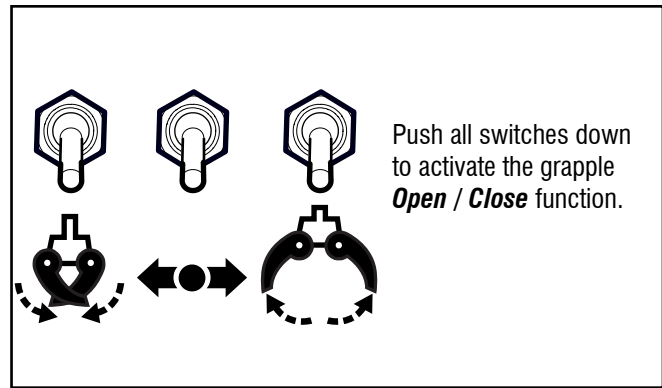
The hydraulic control selector box provides a way of controlling all four grapple functions from a single hydraulic control in the tractor cab. The position of the switches determines which function is active at the hydraulic control valve.

Activate a switch to perform a specific grapple function.

### **CAUTION!**

**Avoid the risk of injury from unexpected grapple movement. Activate one control switch at a time. Grapple functions can perform unexpectedly if more than one switch is activated.**

W085



## 6.7.2 Hydraulic Winch

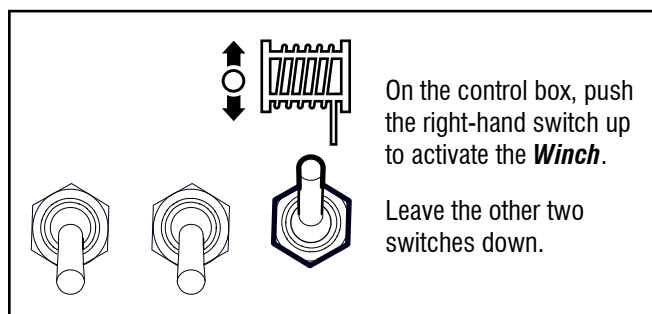
The single speed hydraulic winch has a capacity of 9,000 lb (4082 kg). The winch rope is 1/2" x 100' (12.7 mm x 30 m) long and made of high-strength, braided ultra-high molecular weight polyethylene. The rope is abrasion resistant, has low stretch, light weight, made with a 12-strand braided construction. The rope also floats on water.

- Winch Forward and Reverse is activated in cab using the control selector box and the tractor's rear hydraulic remote control.
- Disengaging and engaging the winch is done manually from the left-hand side of the grapple, using the clutch lever on the top side of the winch.
- When the clutch is **engaged**, the gear train is coupled to the winch drum and power can be transferred from the winch motor.
- When the clutch is **disengaged**, the drum is in the *freespool* position and the gear train and winch rope drum are uncoupled, allowing the drum to rotate freely. Use freespool to pull the rope out to the load.

**IMPORTANT!** For complete instructions on winch operation, refer to the **WARN® Winch operator's manual** provided with the manual set for this grapple in the operator's manual tube.

**IMPORTANT!** To prevent damage to the winch, never engage or disengage clutch when winch is under load, winch rope is in tension, or drum is moving.

Always fully engage or fully disengage clutch lever.



## Disengage winch (freespool)

- Press down on the clutch control lever and move fully to the right, towards the grapple. Release the lever to lock it.
- Pull out enough rope for the winching operation.

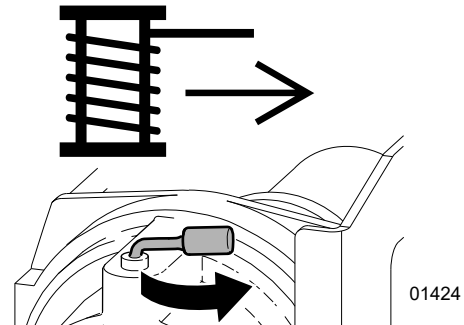


Fig. 20 – Winch Control Disengaged (Freespool)

**IMPORTANT!** Never spool out further than five wraps of rope around the drum. Rope end could come loose. Rope attachment to the drum is not designed to hold a load.

## Engage winch

- Press down on the clutch control lever and move fully to the left, towards the front of the tractor. Release the lever to lock it.

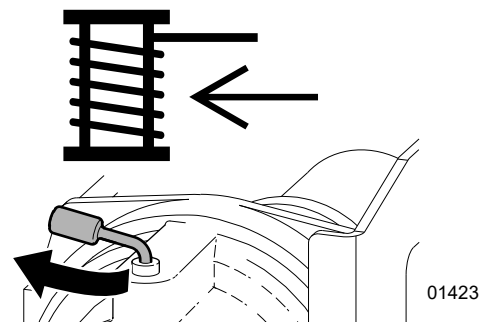


Fig. 21 – Winch Control Engaged

- Power in winch rope evenly keeping winch rope tight on the drum.
- Avoid shock loads when spooling such as pulsing the control to take up slack. Shock loads can exceed rope rating.

### 6.7.3 Hydraulic Boom Extension

The grapple boom can be extended and retracted up to 24" (60 cm) with the tractor's rear hydraulic control. Extend the boom when more reach is required.

- On the control box, set the toggle switch to Boom Extender function.

**IMPORTANT!** Make sure that the winch hook is not in the boom fairlead. Damage to the machine can result if the hook becomes jammed in the fairlead as the boom is extended.

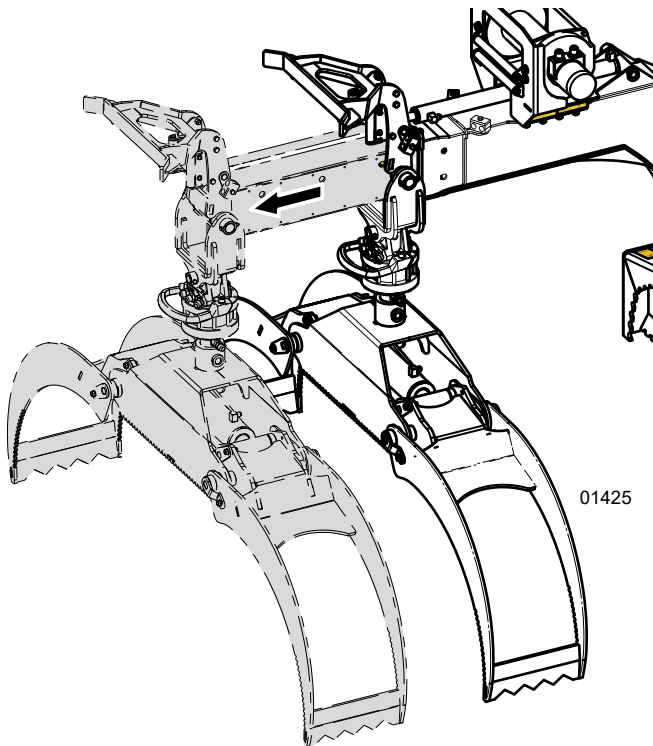
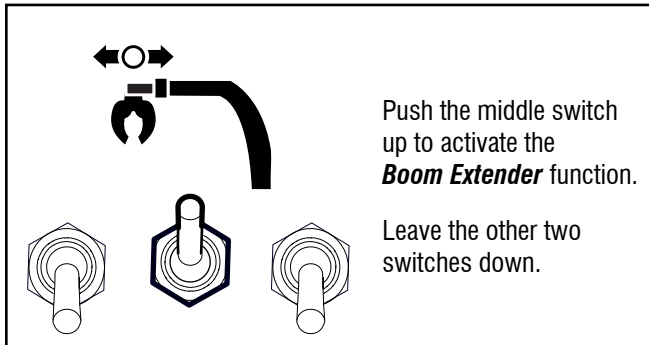


Fig. 22 – Hydraulic Boom Extension

**IMPORTANT!** Do not skid a load with the boom extended. Damage to the machine can result.

## 7. Operating Instructions

The LXG300 Series grapples are strong, rugged machines that can be used for piling, skidding, and generally managing logs in the woodlot.

**The operator is responsible to be familiar with and follow all operating and safety procedures.**

- Learn the basic operation of the grapple to prevent the chance of creating a dangerous situation with the load.
- When using the grapple, position the tractor on firm, level ground.

### 7.1 Operating Safety

- **Do not allow anyone near the grapple while in operation. Always keep coworkers and bystanders in full view while loading.**
- **Always wear the seat belt while operating the grapple. Remain seated in the operator's seat during operation.**
- **Never exit the machine leaving a load suspended. When leaving the machine for any reason, always lower the grapple to the ground.**
- **Close the grapple completely around logs. Avoid pinching a log with the grapple.**
- **Avoid operating where there is a possibility of the grappled load striking other obstacles.**
- **If piling logs, piles should be in a level, clear area to prevent logs from rolling. Make even piles so logs are parallel and ends match.**
- **Clean debris from the loading area. Debris may interfere with grappling.**
- **Place the grapple on the ground and stop the engine before exiting the machine.**

#### **WARNING!**



**Be aware of potential collision hazard from the swing radius of the log while transporting. Plan the route ahead of time.**



**Keep bystanders 20 ft (6 m) away from the machine.**

### 7.2 Machine Break-in

Although there are no operational restrictions on the machine when used for the first time, it is recommended that the following mechanical items be checked:


#### **After 1–5 hours of operation:**

1. Check all nuts, bolts and other fasteners. Tighten to their specified torque.
2. Check hydraulic system for leaks. Tighten leaking connections and replace any leaking components.
3. Check tractor hydraulic oil reservoir level. Top up as required.
4. Check for entangled material. Remove before resuming work.
5. Lubricate grapple rotator hanger bearing (if equipped).

#### **After 20 hours of operation:**

6. Repeat the above steps.

### 7.3 Pre-start Checks

Items to Check	
Check for entangled material. Remove any twine, wire or other material from the grapple.	
Check and tighten all fasteners. Make sure your equipment is working properly and in good repair.	
Check for hydraulic leaks. Tighten fittings or replace components to stop leaks.	
Check tractor hydraulic fluid level. Top level up as required.	
On winch-equipped LXG330RP, check the condition of the winch rope for visible damage. Replace if kinked, frayed, has knots, cuts, or any broken strands. Failure to replace could result in breakage.	

## 7.4 Skidding Logs

- Position the grapple over the end of the log, a foot (25 cm) or so from the end.
- Lower the grapple onto the log and close the forks around it.
- Raise the grapple and move on to the next log or begin skidding ahead with the tractor. Carry the load as low as possible for better visibility and stability.

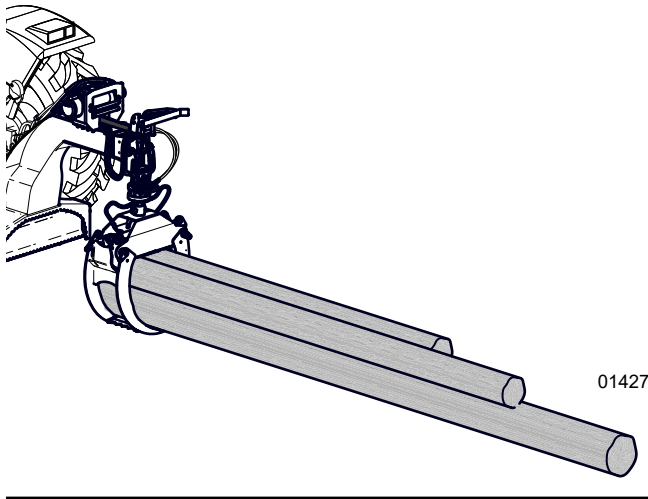


Fig. 23—Skidding

## 7.6 Parallel Lifting with Cantilever Cradle

(LXG330S, LXG330R, LXG330RP models)

- Position the grapple cantilever over the end of the log.
- Lower the grapple and reverse the tractor slightly into the log end. Close the grapple forks until there is a good grip on the log.
- Raise the grapple to carry the log.

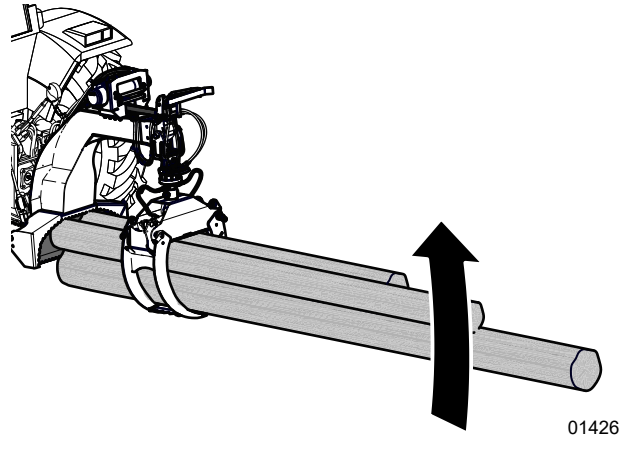


Fig. 25—Parallel Lift with Cantilever

## 7.5 Right Angle Lifting

- Determine where the center of the load is in order to pick it up safely. The stump end of logs can be heavier and the smaller ends lighter. Balance loads carefully.
- Make sure grapple forks have full contact with all the pieces you are lifting. Otherwise the load could become unstable causing a dangerous situation.

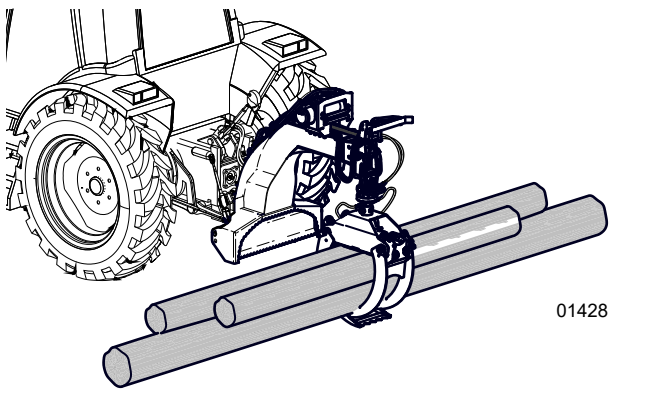


Fig. 24—Lifting

## 7.7 Spring-return Pivot

(LXG320S, LXG330S models)

The LXG-S models have a return-to-center spring pivot on the grapple. The pivot can be locked, or left unlocked for carrying a load or skidding. The pivot is protected by a shear bolt if excessive torque loads occur.

The same lifting and skidding procedures can be applied to spring return pivot, but the grapple must be manually positioned. Follow the procedure below:

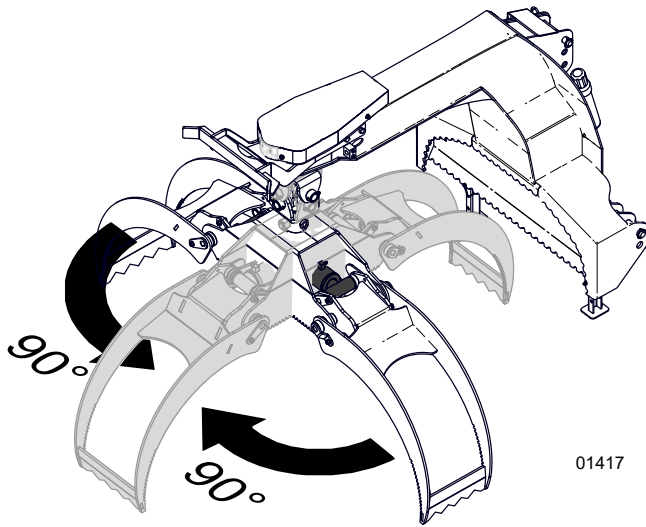


Fig. 26 – Spring-return Pivot

**IMPORTANT!** Make sure the pivot is **UNLOCKED** during skidding. Damage to the pivot can occur if locked when turning or contacting other objects.

### 7.7.1 To Unlock Pivot

- Pull down on the grapple lock lever out of the Lock position notch. Turning the grapple slightly may be required.
- Rotate the lock lever around by hand to the far side and release it into the Unlock position notch. The grapple can now rotate freely.
- Reverse the procedure to lock the pivot.

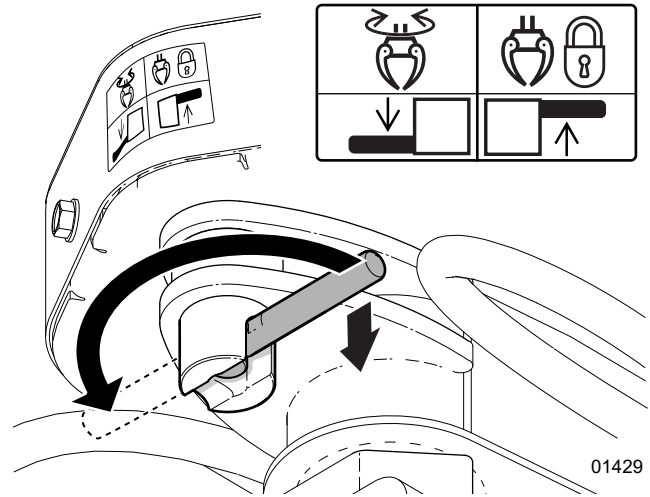


Fig. 27 – Grapple Pivot Lock Lever

### 7.7.2 To Lock Pivot

1. Pull the grapple lock lever down out of the Unlock notch. Rotate the lever around and release into the Lock position notch.
2. Rotate the grapple by hand one way or the other to one of the 90° locking positions. Listen for a 'click' sound as the pin locks into the hole.

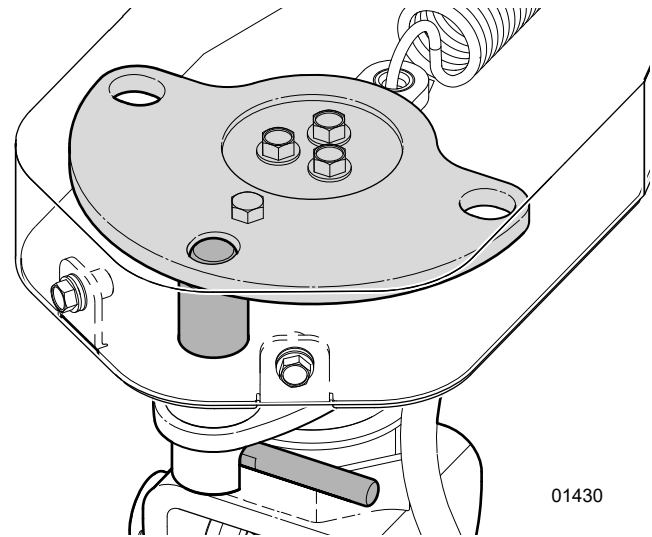


Fig. 28 – Pivot Lock



## 7.8 Grapple Push Bar

(LXG330S, LXG330R and LXG330RP models)

The LXG330 models have a heavy duty 19" (48 cm) push bar to aid in felling trees. Use the push bar to help direct the fall path of the tree when it is being cut down.

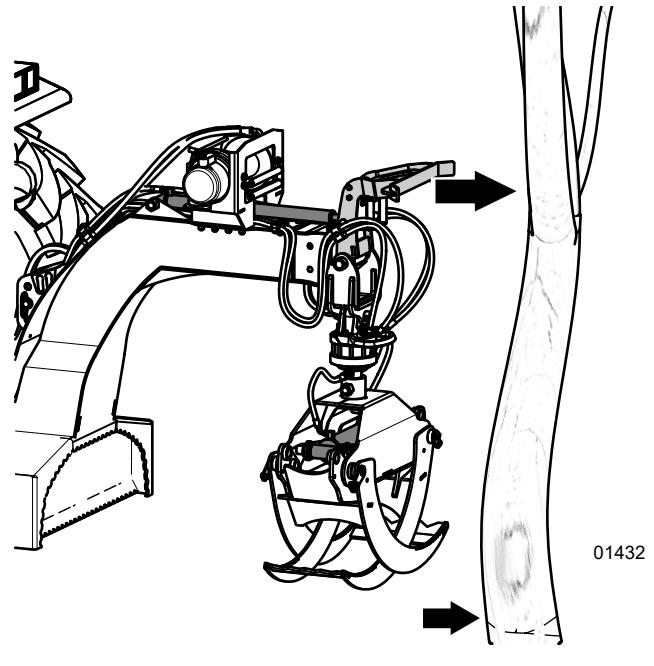
**IMPORTANT!** Do not subject the push bar to severe impact. Damage to the machine can result.

### **WARNING!**

**Risk of injury or death from falling trees. Plan tree fall direction ahead of time. Check surrounding conditions prior to cut.**

There are several factors that may affect and change the intended direction of fall, e.g. wind, lean of tree, sloping ground, one-sided limb structure, wood structure, decay, snow load, and so on. To reduce the risk of severe or fatal injury to yourself or others, look for these conditions prior to beginning the cut, and be alert for a change in direction during fall.

1. Check the fall path is clear. There are no bystanders in the area.
2. Check for hazards such as utilities, dead hanging branches, and so on.
3. Check for tree lean. Make sure that the tree can fall in the direction you want it.
4. Plan an escape route. Make sure you have a clear path to get out of the way.
5. Back the tractor up to the tree in the direction of the fall line. Use the push bar to apply slight pressure to the upper tree.
6. Cut a notch in the side of the tree fall direction.
7. Begin back cut at the bottom of the tree, on the same side as the grapple.
8. When the tree begins to fall, stop cutting and stand clear of the tree base.

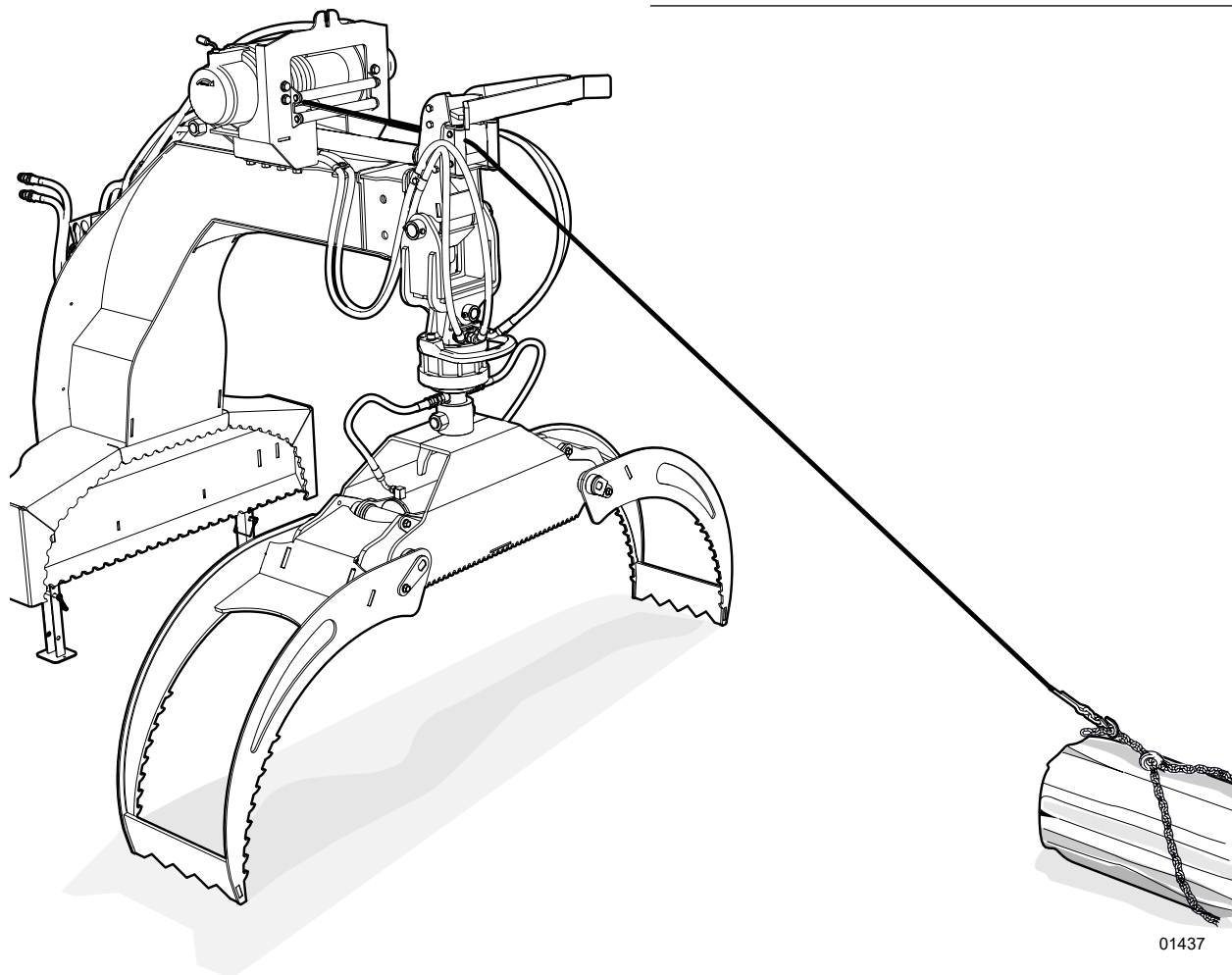


**Fig. 29** – Using Grapple Push Bar

## 7.9 Winching

(LXG330RP models)

**IMPORTANT!** Always use a choker chain. NEVER wrap the winch rope around the log or hook the forged end back onto the rope. Damage to the rope can result that is not covered by warranty.



01437

Fig. 30 – Winching Logs

Read the winch operator's guide supplied with the machine to familiarize yourself with its safe operating procedures.

Review Winch Safety on page 11.

The single speed hydraulic winch has a capacity of 9,000 lb (4082 kg) and can be used to winch up logs that are otherwise inaccessible.

### **! WARNING!**

Synthetic rope that fails under tension can snap back with great force causing injury or death. Avoid sudden jerks, quick starts or stops. Start slowly and smoothly. Replace if kinked, badly frayed, has knots, cuts, or broken strands.

W095

### **! CAUTION!**

Avoid the risk of rope failure. Do not replace rope with one that is not approved for use on this winch. Rope properties may be unknown and failure could result. Refer to the parts manual for replacement rope type.

W094

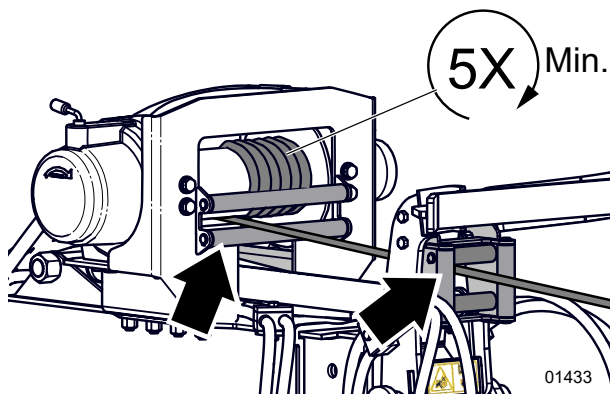
### 7.9.1 Winch Safety

- Never stand in line with the path of a rope under tension. Stand at least 10 ft (3 m) to the side to activate the winch. If a rope breaks under tension, it can snap back in an unpredictable direction with great force. The recoil may cause injury or death to a person in its path.

- Do not risk a rollover by exceeding a winching angle of  $\pm 25^\circ$  from the centerline of the tractor. If unsure of winch angle, reposition tractor or use a snatch block. Whenever possible winch in-line with the tractor.
- Do not allow anyone within 20 ft (6 m) of logs when winching. Logs can roll in unpredictable ways.
- Choose a flat, solid skidding route for the tractor. Avoid steep slopes.
- Check that the winching trail is clear of other trees and obstructions so logs can be winched in easily.
- Make sure the grapple is lowered and the parking brake is applied.

### When preparing to winch

- Equip the tractor with weights on the front or a front loader to provide stability. Weight on the front reduces the chance of the tractor tipping back or to the side.
- Set the tractor park brake whenever the winch is being used or the operator is leaving the seat. If operating on steep slopes is necessary, place chocks behind all the tires to prevent the tractor from slipping.
- Lower three-point hitch and grapple to the ground to anchor the winch and the tractor.
- Do not use the winch rope as a choker to attach directly to the log. The rope can be damaged while winching along the ground. Always use a winch strap or choker to attach to the log. Damaging the rope weakens it and could break under load.
- When operating the winch with no load, make sure there is some tension on the rope, so it winds in correctly and to prevent tangling while unwinding.
- Never use the winch with less than five wraps on the winch drum, the rope may pull free from its anchor point under load.



**Fig. 31**—Winch rope must pass through guides. Leave minimum five wraps on drum.

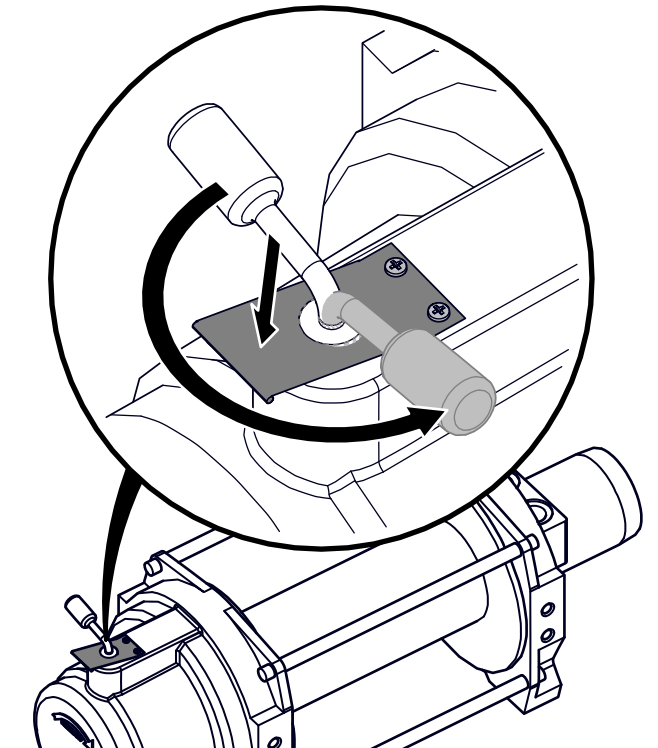
- Never touch rope while pulling a load, if someone is at the controls, or while operating winch.

- Always wind in cable under load. Cable does not wind in properly when not under load.
- Use a log chain or choker chain to connect to the winch cable. Do not use a rope or strap to prevent breakage from abrasion or snagging. Choker chains have a probe on the end that makes it easier to pass the chain underneath the log.

**IMPORTANT!** Avoid continuous side pulls which can pile up the rope at one end of the drum. This pile up can cause rope damage.

**Stand to the left-hand side of the grapple.**

1. Make sure the rope is passing through the guides to provide maximum rope protection.
2. Release the winch rope by moving the winch gear lever to the right.



**Fig. 32**—Winch Disengaged (Freepool)

3. Grasp the hook on the winch rope and pull the rope out to the logs.
4. Wrap the strap or choker around the log. You may need to roll the log onto the strap.
5. Attach the winch hook onto the winch strap or choker.
6. Engage winch drive mechanism with the winch gear lever.
7. Select the winch switch on the control selector.



8. Activate the winch to pull log up to the grapple.
9. Make sure the log is stable, then disengage the winch gear.
10. Pull out the rope slightly to detach. Remove the strap.

- Push the probe end of the choker under the log.
- Pull the ends together and push the probe end through the loop.
- Attach the chain on the probe end to the keyhole slider on the cable.

## Spooling in with no load

**IMPORTANT!** If spooling the rope in with no load, keep a light tension on it to avoid entanglement. Make sure the rope is tightly and evenly layered.

- Lay the rope on the ground so it cannot kink or get tangled on obstacles as it is spooled in.
- Make sure the rope layers tightly and evenly on the drum. Have an assistant help.

## Rope Inspection

It is a good idea to check the entire rope for wear and re spool it neatly after every use. Check the winch rope for any cut strands, fraying parts, abrasion, or heat damage from the winch. After use, all winch lines will get a little fuzzy from abrasion. This is normal, but **if an entire strand is cut the winch line needs to be replaced or fixed**. For the winch line to work properly and maintain its strength, all strands must be intact.

Both heat and UV exposure break down the fibers of the synthetic rope weakening it and making it brittle over time. Frequent use in mud, dirt and sandy conditions can also damage a synthetic rope if it is not properly cleaned and cared for.

## Cleaning Synthetic Rope

When dirt and grit become lodged in between the strands of the winch line they cause abrasion to the fibers when the winch line is put under a load. Over time this can cause a breakdown in the integrity and strength of the rope.

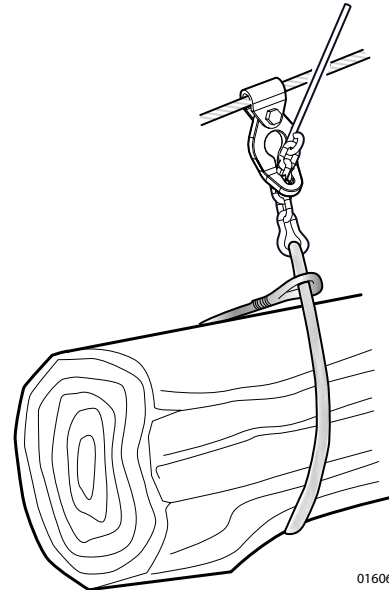
Wash winch rope if it gets dirty by unspooling the entire line from the winch and lay it on a clean surface. Once the line is laid out, rinse it well with water from a hose.

To really get the strands free of dirt and grit, fill a bucket with water and mild soap. Push together on the rope to open the strands up and rinse in the water. Run the entire length of the winch line through the water until it is cleaned.

## 7.9.2 Synthetic Chokers

Synthetic chokers are available as an accessory. These chokers weigh less than the steel chain chokers and are easier to handle, however are more susceptible to abrasion.

Before each use, check the condition of the choker for visible damage. Replace if kinked, frayed, has knots, cuts, or any broken strands. Failure to replace could result in breakage.



**Fig. 33**—Synthetic Choker

- A synthetic choker is very susceptible to damage from rubbing up against or sliding along rough ground or surfaces.
- Synthetic choker strength can be reduced if subjected to sudden jerking, or quick starts and stops. Avoid high shock loads on the rope by starting slowly and smoothly.

## 7.10 Operating Hints

### General

- De-limb all tree trunks to make them easier and safer for handling.
- If working with a trailer, make sure it is securely attached to the tow vehicle. This provides required stability when loading / unloading heavy logs.
- Stay away from overhead power lines to prevent serious injury or death from electrocution. Remember, electrocution can occur without direct contact.
- Position the trailer as close to the material stack possible. This will make maneuvering the grapple easier especially with heavy logs.

### Engine Speed

It is recommended that the tractor engine operate at no less than 1/4 throttle. LXG Grapples are designed to operate with a hydraulic flow between 5–10 gpm (19–38 Lpm). LXG330RP requires 10–20 gpm (38–75 Lpm).

### Tractor Weights

It is recommended that the tractor be equipped with a full complement of weights on the front of the tractor or a loader to provide stability. This reduces the chance of the tractor tipping back or to the side.

### Rough Terrain

The machine can be used in a variety of conditions including rugged terrain. Try to work on firm, level ground whenever possible.

- Reduce speed over rough terrain.
- If equipped with a winch, release the winch so it can freespool, then drive the tractor over the rough area. Once across, engage the winch and pull the load across.

### Working on Slopes

- Make sure that there are no bystanders on the slope.
- When skidding, confine your travel to straight up and down slopes.
- Do not attempt to travel across steep slopes to avoid a potential rollover.
- Travel at safe speeds. Avoid turns on slopes.

### Points to Remember

- Be aware of the swing radius of the logs while carrying them at right angle or parallel.
- Plan your skidding path so that it is free of debris and obstacles.

- Always pull logs forward. Never try to reverse with the grapple holding a log.
- While carrying logs, avoid hitting objects with the ends of the logs.

### LXG330RP Models

- Use a choker chain or winch strap to connect to the winch rope. Do not use the winch rope to prevent breakage from abrasion or snagging.
- Refrain from skidding or carrying a load with the boom extended.
- Never winch at an angle greater than 25° from the centerline of the tractor. Never winch across a slope.

## 7.11 Traveling

(No load in the grapple.)

- **Always install transport locks, pins or brackets before transporting.**
  - **Turn into curves or go up or down hills only at a low speed and at a gradual steering angle. Make certain that at least 20% of the tractor's weight is on the front wheels to maintain safe steering. Slow down on rough or uneven surfaces.**
  - **A heavy load can cause instability of the tractor. Use extreme care during travel. Slow down on turns and watch out for bumps.**
  - **Never allow riders on either tractor or machine.**
1. Be sure all bystanders are clear of the machine.
  2. Check the machine is securely attached to the tractor and all retainer pins are installed.
  3. Close the forks. Be aware of grapple head swing. Tie off grapple head for extended road travel or driving over rough terrain.
  4. Attach a slow moving vehicle sign at the back of the grapple. Check tractor lights function properly.
  5. Be sure you follow all applicable lighting and marking regulations when transporting. Check with your local authorities.
  6. Be sure your machine can clearly be seen by overtaking and oncoming traffic.
  7. Be aware of tail swing when turning corners.
  8. Keep to the right and yield the right-of-way to allow faster traffic to pass. Drive on the road shoulder if permitted by law.
  9. Always use hazard flashers on the tractor when transporting unless prohibited by law.
  10. LXG330RP models—make sure Boom Extender is retracted.
- **Store the unit in a dry, level area. Support the frame with planks or wood blocking as required.**
1. Thoroughly wash the machine using a pressure washer to remove all dirt, mud, debris and residue. Be cautious when pressure washing around hydraulic and electrical components, direct pressure could cause damage.
  2. Inspect the cylinder, rotator or pivot and grapple for damage or entangled material. Repair or replace damaged parts. Remove all entangled material.
  3. Touch up all paint nicks and scratches to prevent rusting.
  4. Select a dry, level area and free of debris away from human activity.
  5. Open the grapple forks to provide maximum stability. Lower the support legs (if equipped). Make sure snap pins are securely installed.
  6. Carefully lower grapple and make sure the machine is stable. Unhook from tractor.
  7. If the machine cannot be stored inside, cover with a waterproof tarp.

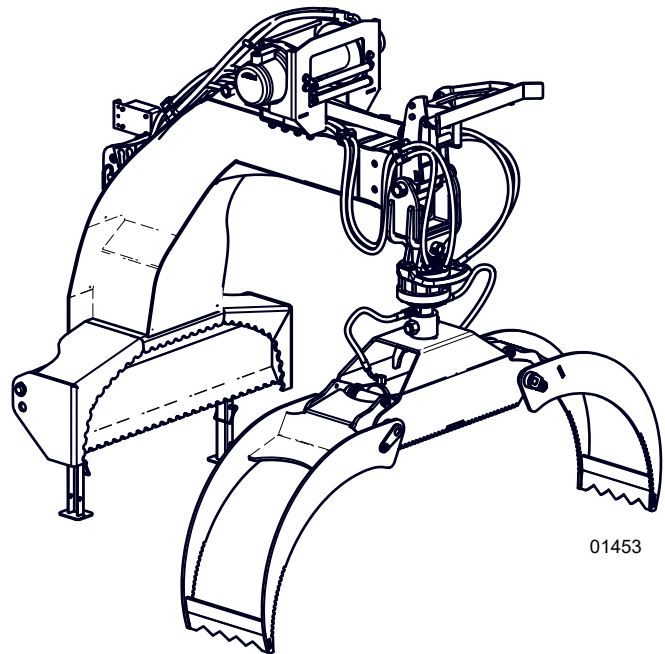


Fig. 34—Grapple in Storage

## 7.12 Storage

After the season's use, the machine should be thoroughly inspected and prepared for storage. Repair or replace any worn or damaged components to prevent any unnecessary down time at the start of next season. To insure a long, trouble free life, this procedure should be followed when preparing the unit for storage:

- **Store the unit in an area away from human activity.**
- **Do not permit children to play on or around the stored machine.**

## 8. Service and Maintenance

### 8.1 Maintenance Safety

Before performing any maintenance procedure, place the machine in a Safe Condition to work on.

- Empty material from grapple.
- Lower grapple to ground.
- Turn tractor engine off.
- Move controls to verify there is no movement.
  
- Follow good shop practices:
  - Keep service area clean and dry.
  - Be sure electrical outlets and tools are properly grounded.
  - Use adequate light for the job at hand.
  
- Never operate the engine in a closed building. Exhaust fumes may cause asphyxiation.
- Never work under equipment unless it is blocked or supported securely.
- When performing any service or maintenance work always wear appropriate PPE.
- Where replacement parts are necessary, genuine factory replacement parts must be used to restore your equipment to original specifications. The manufacturer cannot be responsible for injuries or damages caused by use of unapproved parts or accessories.
- Keep hands away from moving parts. NEVER grease or work on the grapple when it is moving.
- Always use proper tools, that are in good condition. Make sure you understand how to use them, before performing any service work.

### 8.2 Greasing

All LXG grapples use composite bearings in the grapple head assembly. LXG320R, LXG330R and LXG330RP models use composite bearings on the upper hanger assembly. Models LXG320S and LXG330S use them on the entire hanger assembly and the pivot.

These bearings are made of a self-lubricating composite material designed for heavy loading. The only exception is the hanger bearing on LXG320R, LXG330R and LXG330RP models with the rotator.

For the Rotator Hanger Bearing, use an SAE multipurpose, high-temperature grease with extreme pressure (EP) performance. Also acceptable is an SAE multipurpose lithium base grease.

**Lubricate Rotator Hanger Bearing every 50 hours of use.**

1. Use a hand-held grease gun. Wipe grease fitting with a clean cloth before greasing, to avoid injecting dirt and grit.
2. Replace and repair broken fittings immediately.
3. If fitting does not take grease, remove and clean thoroughly. Also, clean lubricant passageway. Replace fitting if necessary.

### 8.3 Service Illustration

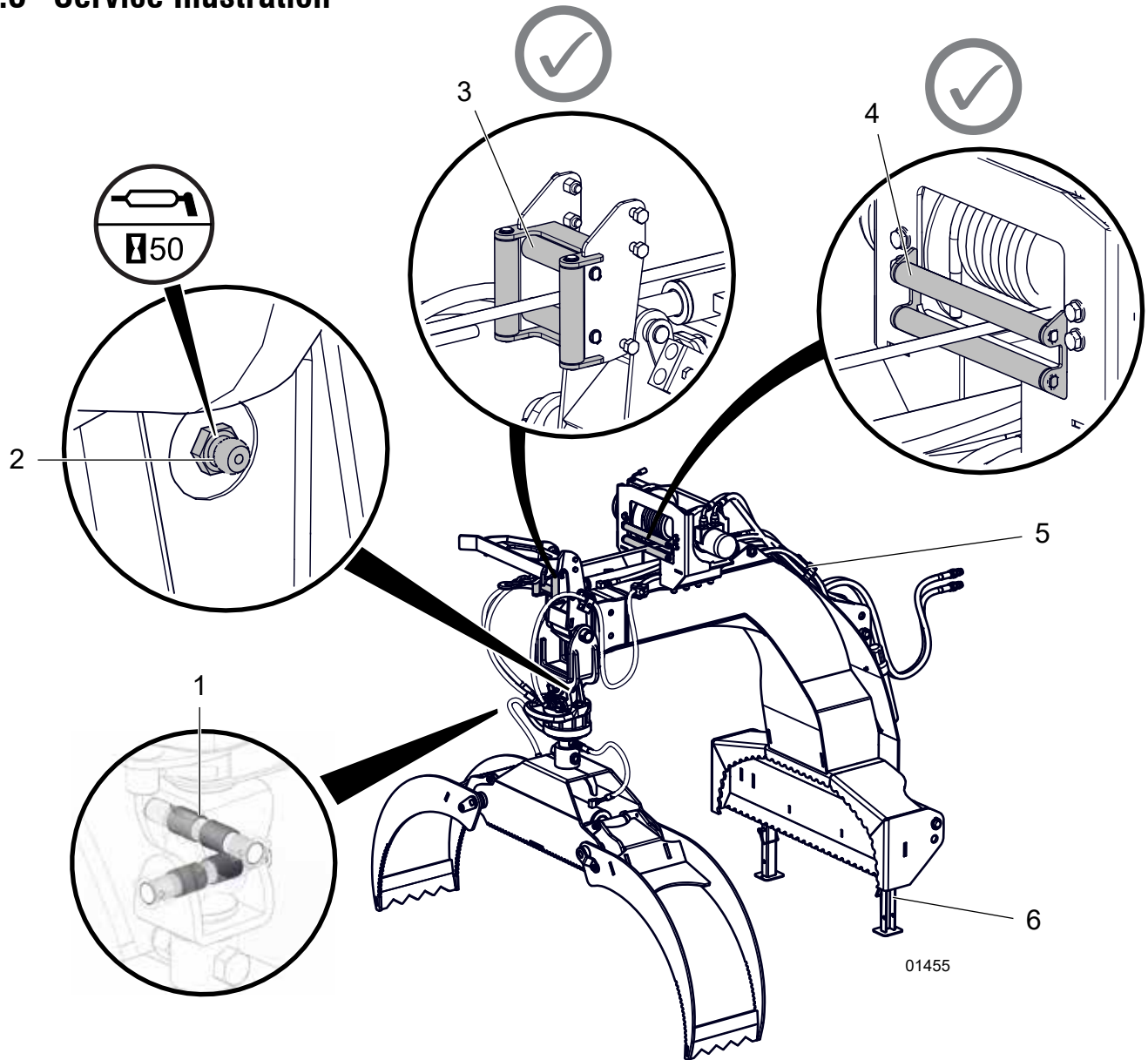


Fig. 35—Service Illustration

Location	Action Required
1	Self-lubricating bearings. No service action required.
2	Rotator hanger bearing—grease every <b>50 hours or weekly</b> (if equipped).
3	Check condition of winch rope every use. (Winch-equipped models.)
4	Fairlead rollers—Inspect every <b>50 hours or weekly</b> . (Winch-equipped models only.)
5	Hydraulic hoses and connections—check for leaks and overall condition every <b>100 hours or annually</b> .
6	Support legs—check every <b>50 hours or weekly</b> (if equipped).

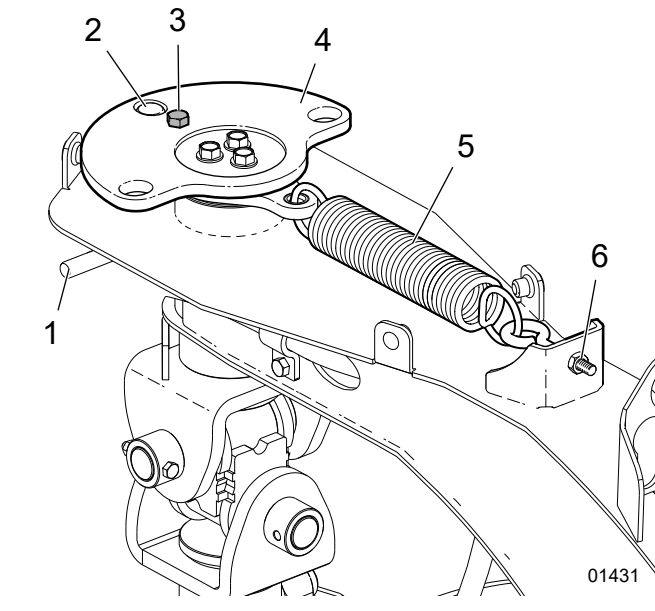


## 8.4 Grapple Pivot Shear Bolt

(LXG320S, LXG330S models)

The pivot is protected by a shear bolt on the lockout plate. If excessive torque loads occur, the bolt can shear off.

Remove the spring guard to replace the shear bolt.



**Fig. 36**—Grapple Pivot

1. Lockout Handle
2. Grapple Lock Pin
3. Shear Bolt
4. Lockout Plate
5. Spring
6. Spring Tension Adjuster

## 9. Troubleshooting

In the event a problem occurs with the grapple, the following table lists some probable causes and solutions.

If a problem exists that is difficult to solve, call your local dealer, distributor, or Wallenstein Equipment. Have the grapple serial number handy.

Problem	Possible Cause	Solution
Hydraulics functions move slowly or do not move.	No pressurized hydraulic oil. Filter plugged.	Change Filter
	Low oil level	Top up as required.
	Hoses connected incorrectly.	Correct.
	Low oil flow. Flow control set too low.	Adjust control.
	Selector valve not powered (machines with optional selector valve kit).	Connect selector valve solenoid to 12 VDC source.
	Wrong function selected (machines with optional selector valve kit).	Check harness is connected to correct function.
	Harness connector loose or damaged (machines with optional selector valve kit).	Check connection. Inspect for damage. Repair or replace.
	Low engine speed	Increase engine speed.
Hydraulic functions are jerky.	Leak in hydraulic system. Air getting into the system.	Tighten all connections. Check for leaks in hoses.
	Hose couplers dirty or incompatible.	Clean couplers. Make sure mating couplers are correct type.
	Tractor has closed-center hydraulic circuit.	Contact service technician.
Leaking hydraulic hose.	Hose worn and damaged, or connector is loose.	Inspect hose for damage. Replace if damaged. Check to make sure connectors are tight. See <i>page 45</i> for connector torque requirements.
Leaking hydraulic cylinder.	Cylinder seals worn or damaged.	Disassemble and overhaul cylinder. Check oil for debris.
Pivot does not lock.	Shear pin broken.	Replace.
Pivot does not return to neutral position.	Spring broken.	Replace.
	Lock lever engaged.	Release.

## 10. Specifications

### 10.1 Machine Specifications<sup>1</sup>

Specification	LXG320S	LXG320R	LXG330S	LXG330R	LXG330RP
Rotation Angle	180°	360°	180°	360°	
Recommended Tractor Power	25–65 hp (19–48 kW)		55–120 hp (41–89 kW)		
Lift Capacity	3,000 lb (1 361 kg)		4500 lb (2 041 kg)		
Required Hydraulic Flow	5 US gpm (19 Lpm)				10 US gpm (38 Lpm)
Grapple Opening	3"–48" (8 cm–122 cm)		3"–72" (8 cm–182 cm)		
Clamp Force	9,400 lb (4264 kg)		21,000 lb (9 525 kg)		
Rotator/Pivot Rating	6,750 lb (3062 kg)		9,000 lb (4 082 kg)		
Total Weight	350 lb (159 kg)	353 lb (160 kg)	836 lb (380 kg)		1,229 lb (558 kg)
Push Bar Width	N/A	N/A	19" (48 cm)		
Dimensions (L x W x H)	51" x 52" x 43" (130 cm x 132 cm x 110 cm)	51" x 52" x 46" (130 cm x 132 cm x 117 cm)	76" x 76" x 56" (178 cm x 193 cm x 143 cm)		68" x 76" x 70" (173 cm x 193 cm x 178 cm)
Mounting System	Cat I		Cat I and II		
Winch Pulling Capacity	N/A				9,000 (4 082 kg)
Winch Rope Length	N/A				100' (30 m)

<sup>1</sup> Specifications subject to change without notice


## 10.2 Common Bolt Torque Values

### Checking Bolt Torque

The tables shown give correct torque values for various bolts and capscrews. Tighten all bolts to the torque values specified in the table, unless indicated otherwise. Check tightness of bolts periodically.

**IMPORTANT!** If replacing hardware, use fasteners of the same grade.

**IMPORTANT!** Torque figures indicated in the table are for non-greased or non-oiled threads. Do not grease or oil threads unless indicated otherwise. When using a thread locker, increase torque values by 5%.

 **NOTE:** Bolt grades are identified by their head markings.

Imperial Bolt Torque Specifications						
Bolt Diameter	Torque Value					
	SAE Gr. 2		SAE Gr. 5		SAE Gr. 8	
	lbf•ft	N•m	lbf•ft	N•m	lbf•ft	N•m
1/4"	6	8	9	12	12	17
5/16"	10	13	19	25	27	36
3/8"	20	27	33	45	45	63
7/16"	30	41	53	72	75	100
1/2"	45	61	80	110	115	155
9/16"	60	95	115	155	165	220
5/8"	95	128	160	215	220	305
3/4"	165	225	290	390	400	540
7/8"	170	230	420	570	650	880
1"	225	345	630	850	970	1320



Metric Bolt Torque Specifications				
Bolt Diameter	Torque Value			
	Gr. 8.8		Gr. 10.9	
	lbf•ft	N•m	lbf•ft	N•m
M3	0.4	0.5	1.3	1.8
M4	2.2	3	3.3	4.5
M6	7	10	11	15
M8	18	25	26	35
M10	37	50	52	70
M12	66	90	92	125
M14	83	112	116	158
M16	166	225	229	310
M20	321	435	450	610
M30	1,103	1 495	1,550	2 100



## 10.3 Hydraulic Fitting Torque

### Tightening Flare Type Tube Fittings

1. Check flare and flare seat for defects that might cause leakage.
2. Align tube with fitting before tightening.
3. Hand-tighten swivel nut until snug.
4. To prevent twisting the tube, use two wrenches. Place one wrench on the connector body and tighten the swivel nut with the second. Torque to values shown.

If a torque wrench is not available, use the FFFT (Flats From Finger Tight) method.

Hydraulic Fitting Torque							
Tube Size OD	Hex Size Across Flats	Torque value		Flats From Finger Tight			
		Inches	Inches	lbf•ft	N•m	Flats	Turns
3/16	7/16			6	8	2	1/6
1/4	9/16			11–12	15–17	2	1/6
5/16	5/8			14–16	19–22	2	1/6
3/8	11/16			20–22	27–30	1-1/4	1/6
1/2	7/8			44–48	59–65	1	1/6
5/8	1			50–58	68–79	1	1/6
3/4	1-1/4			79–88	107–119	1	1/8
1	1-5/8			117–125	158–170	1	1/8

Values shown are for non-lubricated connections.

## 11. Product Warranty



### LIMITED WARRANTY

Wallenstein products are warranted to be free of defects in materials and workmanship under normal use and service, for a period of

#### **Five Years for Consumer Use**

#### **Two Years for Commercial/Rental Use**

from the date of purchase, when operated and maintained in accordance with the operating and maintenance instructions supplied with the unit. Warranty is limited to the repair of the product and/or replacement of parts.

This warranty is extended only to the original purchaser and is not transferable.

Repairs must be done by an authorized dealer. Products will be returned to the dealer at the customer's expense. Include the original purchase receipt with any claim.

#### **This warranty does not cover the following:**

- 1) Normal maintenance or adjustments
- 2) Normal replacement of wearable and service parts
- 3) Consequential damage, indirect damage, or loss of profits
- 4) Damages resulting from:
  - Misuse, negligence, accident, theft or fire
  - Use of improper or insufficient fuel, fluids or lubricants
  - Use of parts or aftermarket accessories other than genuine Wallenstein parts
  - Modifications, alteration, tampering or improper repair performed by parties other than an authorized dealer
  - Any device or accessories installed by parties other than an authorized dealer
- 5) Engines. Engines are covered by the manufacturer of the engine for the warranty period they specify. For the details of your engine warranty, see your engine owner's manual. Information about engine warranty and service is also available in the FAQ section at [www.wallensteinequipment.com](http://www.wallensteinequipment.com)

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