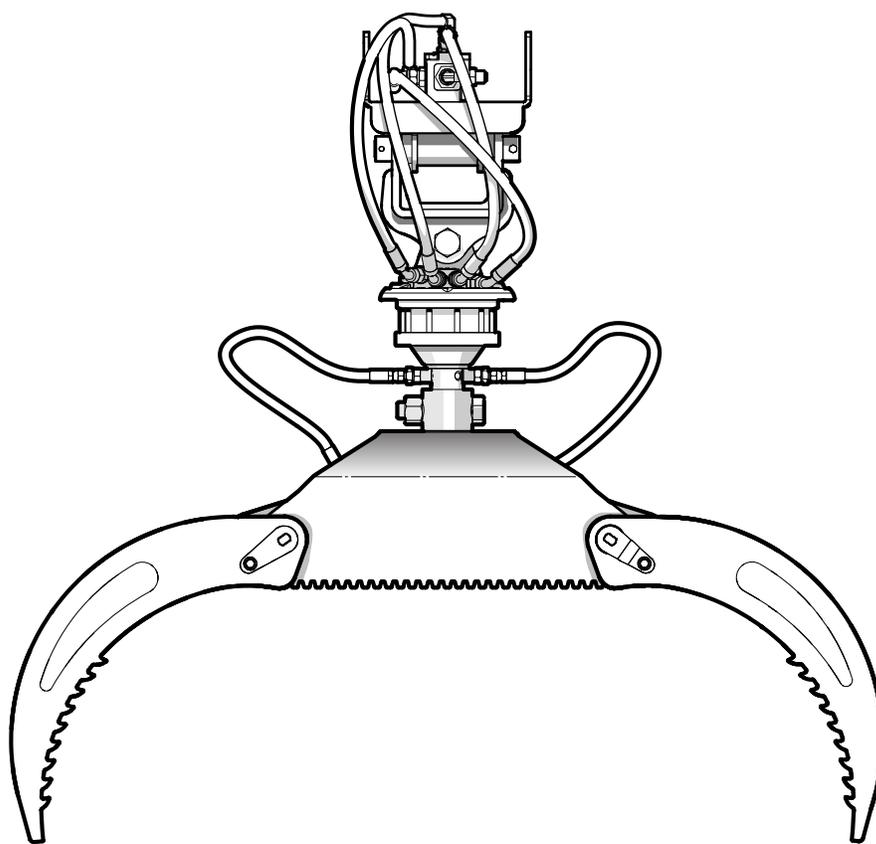


OPERATOR'S MANUAL

LXG520R Excavator Log Grapple



1. Foreword

1.1 Introduction

Congratulations on your choice of a Wallenstein Log Grapple!

The Wallenstein **LXG520R** Log Grapple is suitable to mount on small excavators in place of the bucket. It is designed for loading / carrying logs in a small-scale timber industry or landscaping business.

The utility log grapple requires two auxiliary circuits from the main control valve to open, close, and rotate. If two circuits are not available, a selector valve kit must be installed. The mounting bracket and whip hoses are not included with the log grapple and must be supplied by the customer.

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, information or additional copies of the manual.

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

Wallenstein Equipment Inc. • © 2022. All rights reserved.

No part of this work may be copied, reproduced, replaced, distributed, published, displayed, modified, or transferred in any form or by any means except with the prior permission of Wallenstein Equipment Inc.



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

Table of Contents

1. Foreword	2
1.1 Introduction.....	2
1.2 Delivery Inspection Report.....	4
1.3 Serial Number Location	5
1.4 Types of Decals on the Machine	6
2. Safety	7
2.1 Safety Alert Symbol.....	7
2.2 Signal Words.....	7
2.3 Why SAFETY is Important.....	7
2.4 Safety Rules.....	8
2.5 Create a Safe Work Site.....	9
2.6 Sign-Off Form	11
3. Safety Signs	12
3.1 Safety Sign Locations.....	12
3.2 Safety Sign Explanations	13
3.3 Replace Damaged or Missing Safety Signs	14
4. Familiarization.....	15
4.1 New Operator	15
4.2 Major Components.....	16
5. Installation.....	17
5.1 Excavator Matching.....	17
5.2 Mount the Grapple.....	17
5.3 Hydraulic Connections.....	19
5.4 Hydraulic Circuit Requirements.....	20
5.5 Grapple Removal.....	22
5.6 Storage.....	22
6. Controls	23
7. Operating Instructions	24
7.1 Operating Safety.....	24
7.2 Machine Break-In	24
7.3 Pre-start Checklist.....	25
7.4 Loading.....	25
7.5 Moving the Excavator while Carrying a Load	26
7.6 Transport	26
8. Service and Maintenance.....	27
8.1 Maintenance Safety	27
8.2 Grease Point	28
9. Troubleshooting.....	29
10. Specifications	30
10.1 Machine Specifications.....	30
10.2 Common Bolt Torque	31
10.3 Hydraulic Fitting Torque.....	32
11. Product Warranty.....	33
12. Index	34

1.2 Delivery Inspection Report

Wallenstein LXG520R Log Grapple

To activate the warranty, register your product through the Support page at WallensteinEquipment.com.

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

I received the product manuals and was thoroughly instructed about the care, adjustments, safe operation, and applicable warranty policy.

I thoroughly instructed the customer about the equipment care, adjustments, safe operation, and applicable warranty policy, and reviewed the manuals with them.

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

Dealer Inspection Checklist

- _____ All fasteners are tightened to the correct torque.
- _____ All grease points are lubricated.
- _____ Grapple functions correctly.
- _____ Pivot assembly moves freely.
- _____ Rotor functions correctly.
- _____ Hydraulic connections are tight, and hoses and fittings are in good condition.
- _____ Hydraulic system and cylinders function correctly.
- _____ There are no hydraulic leaks.
- _____ Operator's Manual is in the storage tube.
- _____ Purchased accessories are included, if applicable.

Safety Checks

- _____ All safety sign decals are applied and legible.
- _____ Operating and safety instructions were reviewed.

1.3 Serial Number Location

Always provide the model and serial number of your Wallenstein product when ordering parts or requesting service or other information. The product information plate location is shown in the following illustration.

Record your product's serial number in the following table for future reference.

Record Product Information Here	
Model:	LXG520R
Serial Number:	

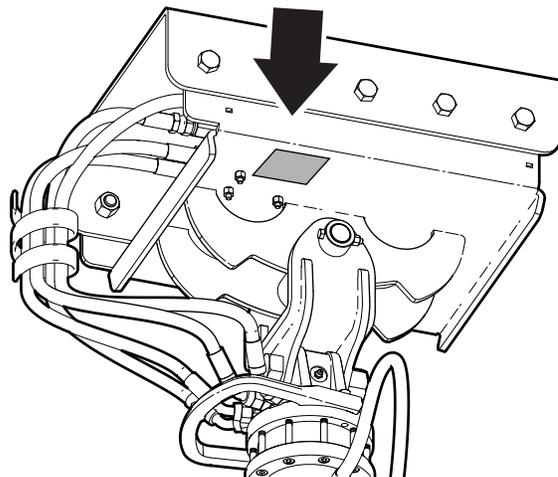
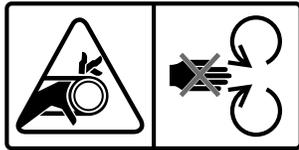


Fig. 1 –Product information plate location

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



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.

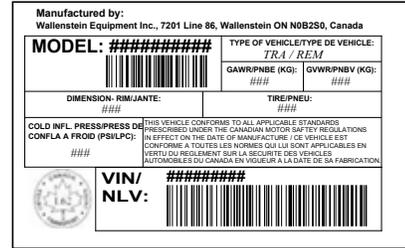


01313

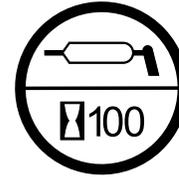
Informative Decals are generally pictorial with a white background and can vary in the number of panels. This type of decal provides additional information to the operator or explains the operation of a control.



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.



For safety sign decal definitions, see *Safety Sign Explanations on page 13*. For a complete illustration of decals and decal locations, download the parts manual for your model product at 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 shields 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.



Provides additional information that is helpful.

2.3 Why SAFETY is Important

- **Accidents disable and kill people.**
- **Accidents cost money.**
- **Accidents are preventable.**

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

CAUTION!

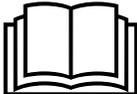


Hearing loss hazard. Prolonged exposure to loud noise may cause permanent hearing loss. Use suitable protection while operating the machine.

W016

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.

For safety information that is specific to machine operation, service, or maintenance, see the applicable section in this manual.

- It is the operator's responsibility to read, understand, and follow ALL safety and operating instructions in this manual. 
- If you do not understand any part of this manual or require assistance, contact your local dealer, the distributor, or Wallenstein Equipment.
- The operator of this grapple must be a responsible, properly trained and physically-able person familiar with machinery and trained in the operation of an excavator. 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 the safety information in this manual and the safety decals on the machine.
- If the machine is loaned or rented, it is the owner's responsibility to make sure that, before using the machine, every operator:
 - Reads and understands this manual.
 - Is instructed in the safe and correct use of the machine and related equipment.
 - Understands and knows how to set the machine to a **Safe Condition**. For instructions, see *Safe Condition on page 9*.
- 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 the contents. 

- Keep a fire extinguisher available for use, should the need arise, and know how to use it. 
- Never consume alcohol or drugs before or during machine operation. Alertness or coordination can be affected. Consult your doctor about operating this machine while taking prescription medications.
- Stay a minimum 20 ft (6 m) away from power lines. Power lines as well as the surrounding air space which insulates the line can be hazardous. Electricity can arc or jump through the insulating air space. The higher the voltage, the more likely it is for an arc to occur.
- 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.
- Wear the appropriate PPE when operating, servicing, or maintaining the machine. This includes, but is not limited to:
 - A hard hat.
 - Heavy gloves.
 - Hearing protection.
 - Protective shoes with steel toes and slip resistant soles.
 - Protective glasses, goggles, or a face shield.
- Avoid wearing loose fitting clothing, loose or uncovered long hair, jewelry, and loose personal articles. These can get caught in moving parts and cause injury. Jewelry may also ground a live electrical circuit causing injury and machine damage.
- Prolonged exposure to loud noise may cause permanent hearing loss. Power equipment with or without a vehicle 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 at least 10 ft (3 m) from the stacking zone. Mark the zone with safety cones.
- Never allow anyone to ride on the machine.
- Use the machine only in daylight or good artificial light.
- Before starting work, complete the tasks described in the *Pre-start Checklist on page 25*.
- Do not risk injury or death by ignoring good safety practices.

2.4.1 Equipment Safety Guidelines

A few seconds of thought and a careful approach to handling equipment can prevent accidents.

- Replace safety or instruction signs (decals) that are not readable or missing. For locations and explanations, see *Safety Signs on page 12*.
- Do not modify the equipment in any way. Unauthorized modifications may affect the integrity of the machine or the ability of the machine to perform as designed. Modifications can impair safety or function. They can affect the life of the equipment and void the warranty.
- Make sure the machine is correctly stationed, adjusted, and in good operating condition.
- Never exceed the limitations of the machine. If its ability to do the job, or to do it safely is in question—**STOP!**
- Protective cab shields must be provided on a log loader unless the absence of shields does not pose a hazard to the operator.

2.4.2 Safe Condition

References are made to **safe condition** throughout this manual. Safe condition means putting the machine in a state that makes it safe to service or maintain.

Before starting any service or maintenance, complete the following:

SAFE CONDITION
<ol style="list-style-type: none"> 1. Remove material from the grapple. 2. Lower the grapple to ground. 3. Turn off the excavator engine. 4. Engage the hydraulic control lockout device. 5. Turn off the main hydraulic switch. 6. Move the hydraulic controls to make sure that there is no movement.

2.5 Create a Safe Work Site

For more information, see *Fig. 2 on page 10*.

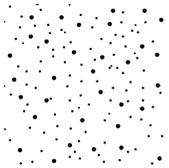
2.5.1 Designated Safe Area

A **Safe Area** must be designated for workers who are on foot and in close proximity to the equipment.

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

2.5.2 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 in a Work Zone in a forestry operation must be planned and the work area must be located, constructed, maintained, and operated to ensure 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 are able to 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 excavator being used to handle the logs.



1. Designated safe area

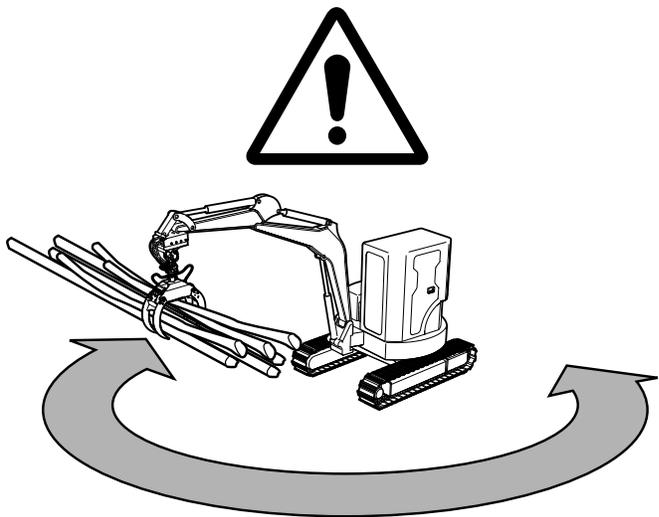
The area outside of the work zone is designated a safe area for coworkers.



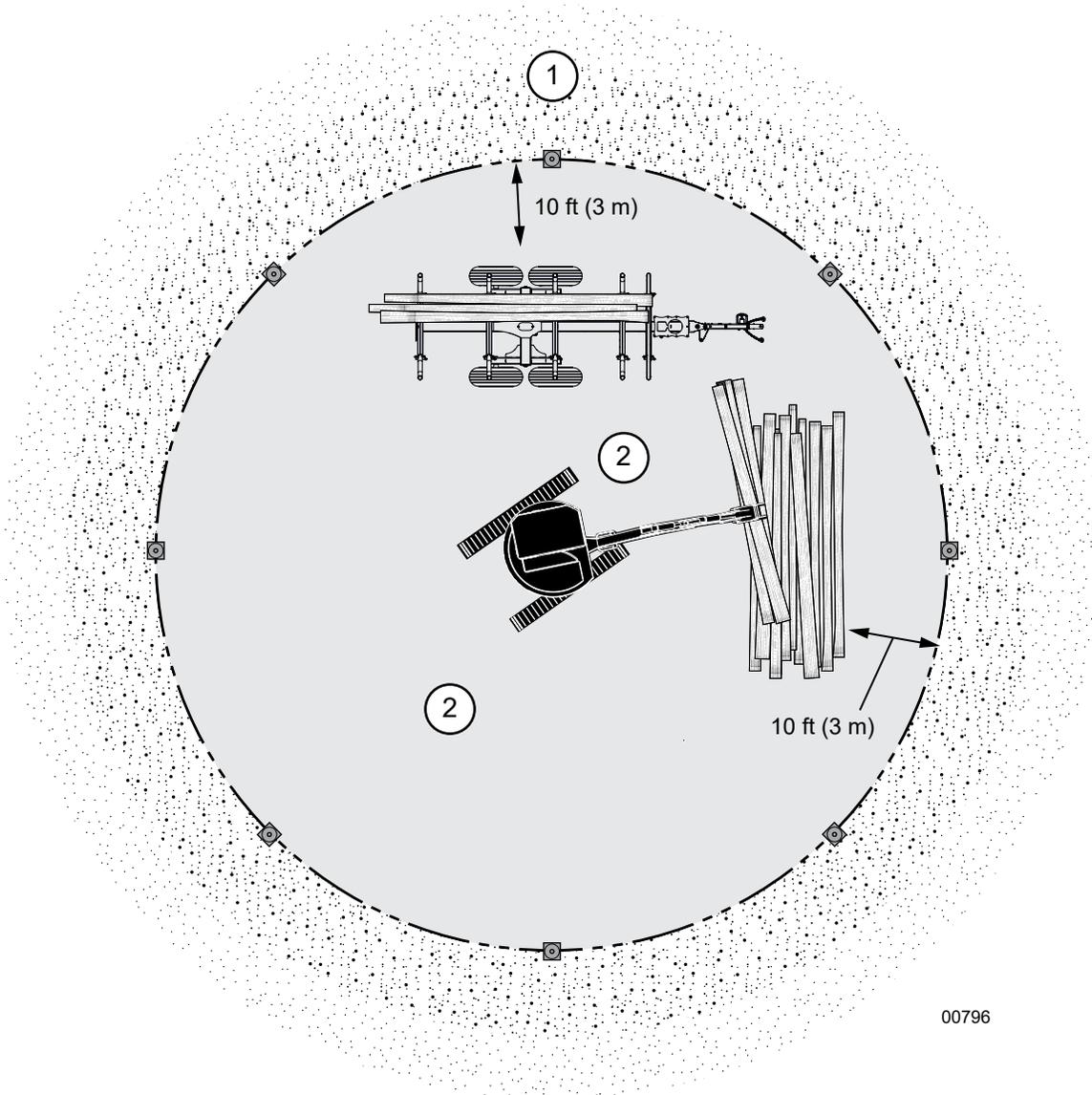
2. Work zone

Injury may occur from heavy material falling / dropping in this area. Material on a rotating boom creates a collision hazard if workers or bystanders are inside the work zone.

Place safety cones around the work zone to warn others.



00797



00796

Fig. 2–Work zone arrangement and designated safe area

3. Safety Signs

Safety

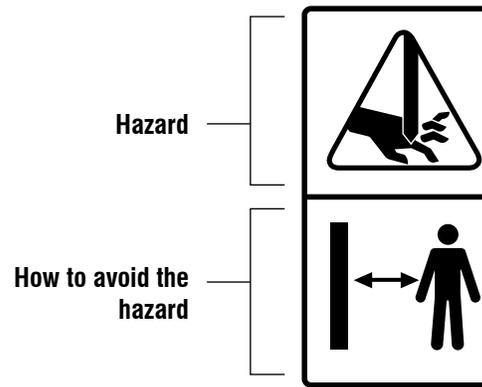
! WARNING!

Risk of personal injury. Replace safety signs that are removed, damaged, or illegible. If a part with a safety sign on it is replaced, a new safety sign must be applied.

W100

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

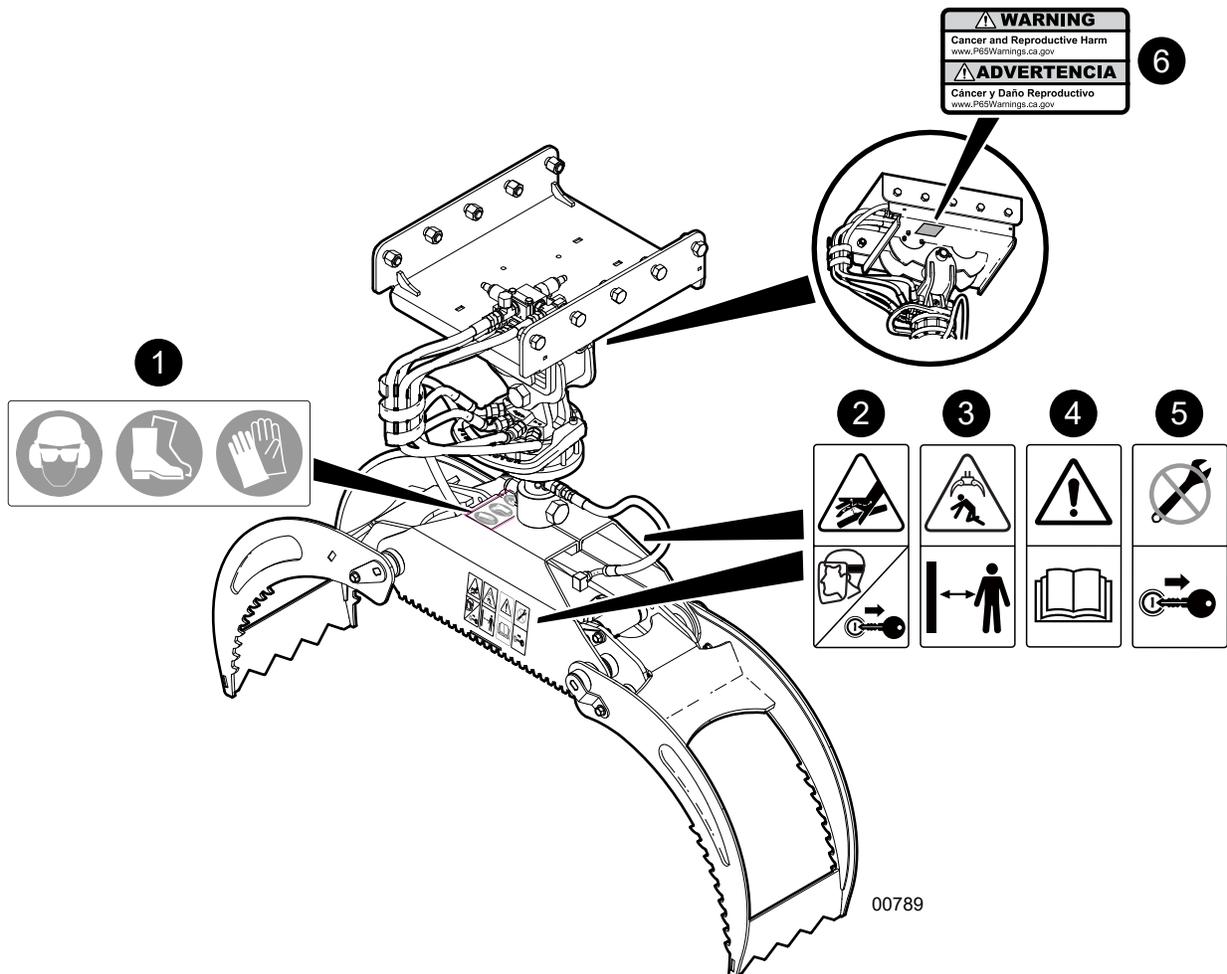
The top panel (or left-hand panel for horizontal signs) shows the safety alert (potential hazard), and the bottom (or right-hand) panel shows the message (how to avoid the hazard).



Think SAFETY! Work SAFELY!

3.1 Safety Sign Locations

Numbers correspond with the *Safety Sign Explanations on page 13*.



00789

Fig. 3—Safety sign locations

3.2 Safety Sign Explanations

1. Warning!

Always wear the appropriate PPE during operation:

- A hard hat.
- Heavy gloves.
- Hearing protection.
- Protective footwear with steel toes and slip resistant soles.
- Protective glasses, goggles, or a face shield.



2. Warning!

High-pressure injection hazard

Hydraulic fluid is under pressure. In the event of a leak, turn off the machine. Do not use your bare hands to check for leaks. Use a piece of cardboard, wood, or plastic to locate the leak. Wear the proper hand and eye protection when searching for a high-pressure hydraulic leak.



3. Warning!

Impact and crush hazard

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

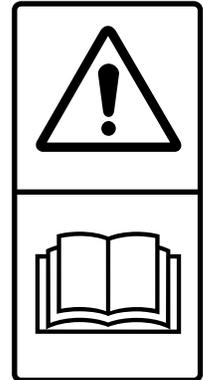


4. Caution!

Read the Operator's Manual

Read ALL operating instructions and safety information in the manual. Learn the meaning of ALL safety signs on the machine.

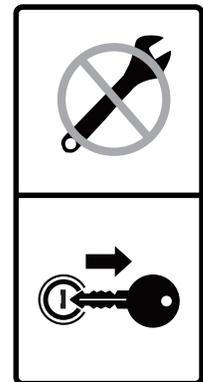
The best safety feature is an informed operator.



5. Caution!

Risk of serious injury or death if the engine is on during service or maintenance.

Turn off the engine and remove the key before maintenance or service.



6. Warning!

Risk of cancer and reproductive harm

The machine materials contain chemicals or machine operation may produce gases or dust that are identified by the state of California as causes of cancer, birth defects, or other reproductive harm.

This warning is required by the state of California, USA to comply with Proposition 65: the Safe Drinking Water and Toxic Enforcement Act of 1986.



3.3 Replace Damaged or Missing 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 Wallenstein Equipment.
- Keep the safety signs clean and legible at all times.
- Parts replaced that had a safety sign (decal) on them must also have the safety sign replaced.

Requirements

- The installation area must be clean and dry.
- The application surface must be clean and free of grease or oil.
- The ambient temperature must be above 50 °F (10 °C).
- A squeegee, plastic bank card, or similar tool is required to smooth out the decal.

Procedure



Determine the exact position for the decal before removing the backing paper. If possible, align the decal with an edge on the machine.

1. Peel the decal off the backing paper.
2. Position the decal above the location where it is being applied to the machine.
3. Starting at 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 an appropriate tool to smooth out the decal, working from one end to the other.
Small air pockets can be pierced with a pin and smoothed out using a piece of the decal backing paper.

4. Familiarization

The log grapple mounts on a small excavator in place of the bucket. It is designed for loading and carrying logs in a small-scale timber industry or landscaping business.

4.1 New Operator

WARNING!

Make sure all operators understand how to place the machine in a safe condition before performing any service, maintenance, or storage preparation. For instructions, see *Safe Condition* on page 9.

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 Work Site Familiarization

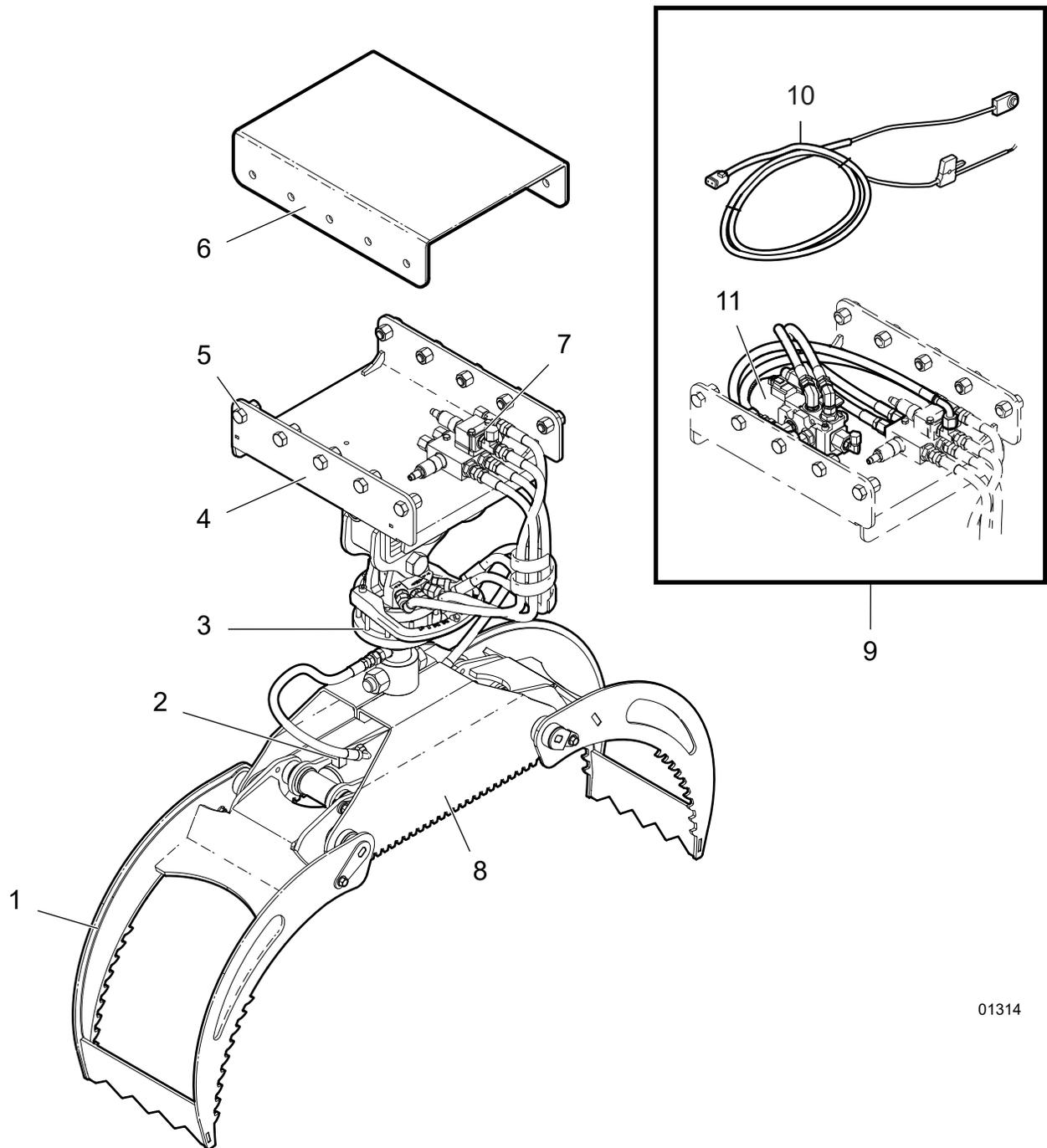
It is the responsibility of the operator to be thoroughly familiar with the work site before starting work. Avoid unsafe situations and make every effort to prevent accidents.

For more information, see *Create a Safe Work Site* on page 9.

When you set up a work site, consider the following things:

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

4.2 Major Components



01314

Fig. 4–LXG520R log grapple major components

- | | |
|-----------------------------------|---|
| 1. Grapple forks | 7. Hydraulic hose connections / circuit relief valves |
| 2. Hydraulic cylinder | 8. Grapple housing |
| 3. Hydraulic rotator assembly | 9. Selector valve kit (if required) |
| 4. Main frame | 10. Electrical harness / power adapter / control switch |
| 5. Mounting bolts | 11. Selector valve |
| 6. Excavator universal base plate | |

5. Installation

5.1 Excavator Matching

Use the table below as a guide to match the grapple to an excavator for safe and reliable operation.

Excavator Requirements	
Recommended hp range	10–30 hp (7.5–22 kW)
Excavator maximum weight	9000 lb (4090 kg)
Excavator boom lift capacity	3500 lb (1588 kg)
Auxiliary hydraulic circuit	Bi-directional control valve
	5 US gpm (19 Lpm)
Auxiliary circuit / whip hose minimum size	#8 (1/2 inch)

5.2 Mount the Grapple

IMPORTANT! When mounting the grapple to an excavator, the following considerations must be met.

- 1. A mounting bracket must be manufactured to fit your excavator.** The grapple is not supplied with a mounting bracket.
- 2. One of the following hydraulic circuits is required to power the grapple:**
 - **Two auxiliary circuits**, one for the open/close function and one for the rotate function.
 - **One auxiliary circuit plus a selector valve kit** (shown in the following image) to divert fluid flow between the open/close and rotate functions.
- 3. If a selector valve kit is installed, 12 VDC electric power must be supplied by the excavator.** The electrical harness must be routed along the boom and connected to a power supply on the excavator.

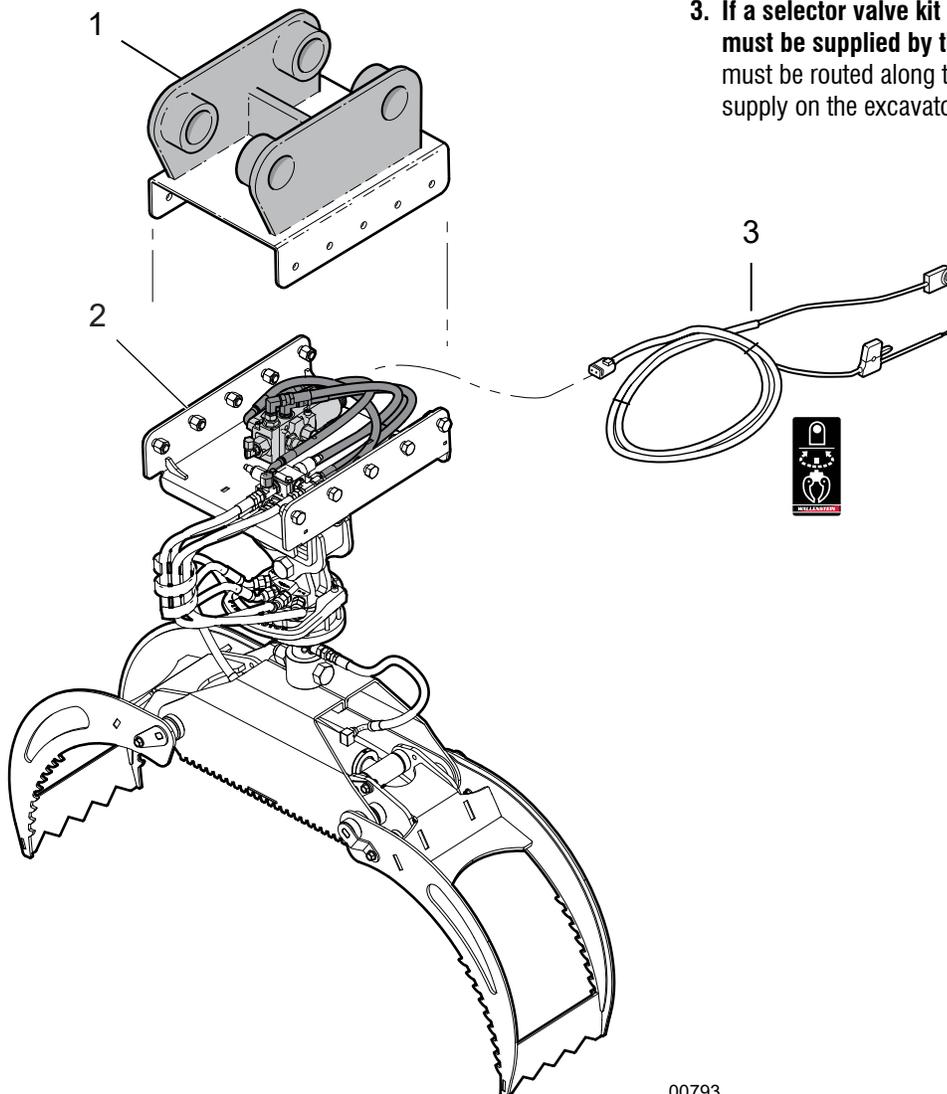


Fig. 17—Log grapple installation

00793

5.2.1 Mounting Bracket

! WARNING!

Use a quality supplier with knowledge of excavator attachments to manufacture the mounting bracket. Wallenstein Equipment Inc. cannot be held responsible for failure resulting from poor workmanship or use of substandard material.

The grapple is not supplied with a mounting bracket. A custom mounting bracket must be manufactured to fit your excavator using the universal base plate supplied.

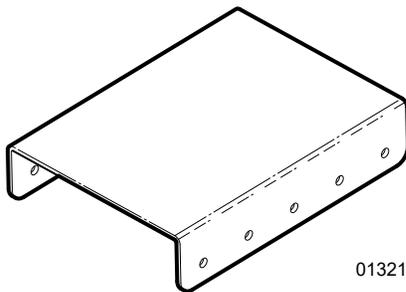


Fig. 5—Universal base plate

Use the dimensions of your bucket to get the correct fit for the stick and link on your excavator.

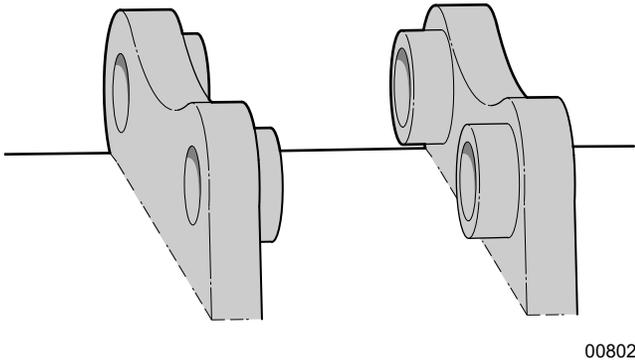


Fig. 6—Excavator bucket dimensions



Reuse pins and fasteners from the bucket for the grapple mount.

1. Remove the bucket from the excavator.
2. Measure the bucket mount precisely, considering all tolerances. Determine the dimensions for stick and link widths on the excavator.
3. Manufacture side plates that correctly match the original bucket and weld them on to the Universal base Plate to make the finished mounting bracket assembly.

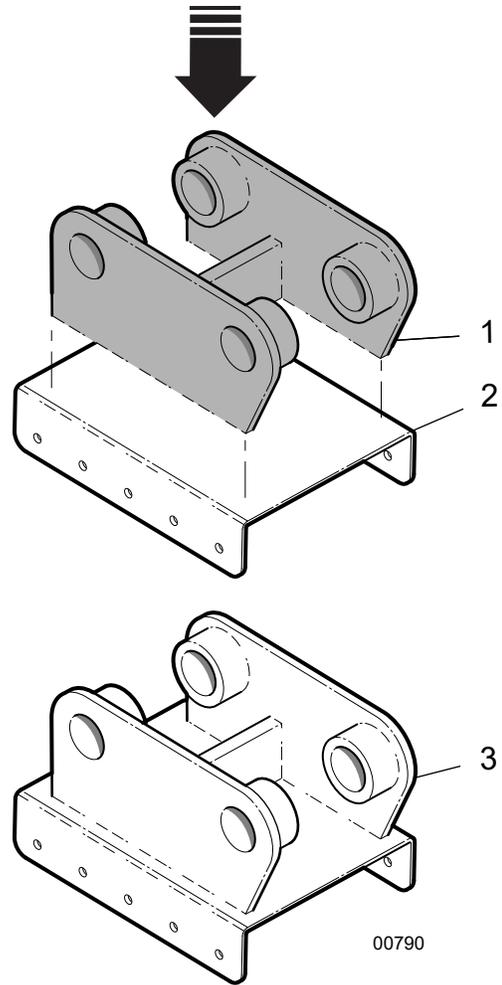


Fig. 7—Mounting bracket

1. Mounting bracket side plates
2. Universal base plate (supplied)
3. Finished mounting bracket welded assembly

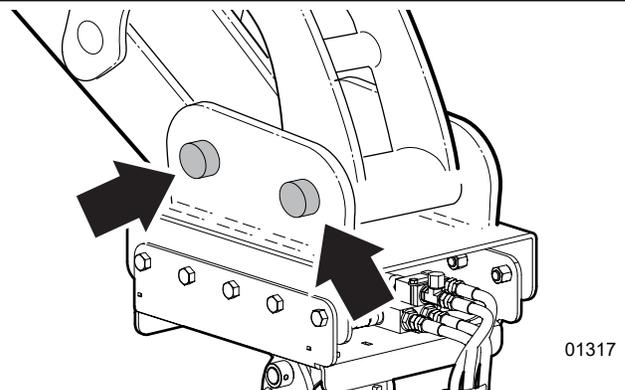


Fig. 8—Excavator mount

4. Bolt the mounting bracket to the grapple mount using the ten 5/8"NC x 1-1/2" bolts supplied. Torque-tighten to **180 lbf•ft (215 N•m)**.
5. Remove the bucket from the excavator and install the excavator mounting bracket in its place. Reuse the bucket pins and fasteners.

5.3 Hydraulic Connections

IMPORTANT! Customer-supplied hydraulic hoses must meet SAE J517 or DIN 20066 standards for high-pressure hydraulic hoses and hose ends.



Using quick-disconnect fittings on hose ends can cause a pressure drop and flow restriction.

Most excavators are equipped with auxiliary hydraulic circuits for attachments. Auxiliary control valves can be adjusted to provide the correct fluid flow at the proper relief pressure setting for attachments.

Auxiliary circuits must have hoses or steel tubes routed along the excavator boom out to the boom nose.

For this grapple, whip hoses must be provided by the customer to connect the grapple control valve to the auxiliary circuit at the boom nose. Hose length can vary depending on the excavator.

If the grapple is going to be removed and installed, use shut-off valves or quick-disconnect fittings on the whip hose ends. The hydraulic lines are isolated if disconnecting or connecting, reducing the risk of releasing high pressure fluid and fluid loss.

If disconnecting hydraulic lines, always use dust caps to keep dirt and contamination out.

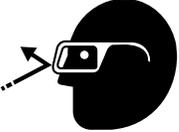
Arrows on the Rotator Body Indicate Function

 Grapple Open

 Grapple Close

 Grapple Rotate

5.3.1 Hydraulic System Safety

- Make sure that all hydraulic system components are kept clean and in good condition.
- Relieve pressure on the hydraulic system before working with it. The hydraulic system operates under extremely high pressure.
- Before applying pressure to the hydraulic system, make sure that all the connections are tight, and the hoses and fittings are not damaged.
- Immediately replace any hydraulic hose that shows signs of swelling, wear, leaks, or damage. A swollen, worn, damaged, or leaking hose can burst and cause a hazardous and unsafe condition.
- High-pressure hydraulic fluid leaks:
 - Do not use your hand to check for hydraulic fluid leaks. Hydraulic fluid escaping under pressure can penetrate the skin causing serious injury or death. Use a piece of cardboard or wood to check for leaks. 
 - Wear the correct hand and eye protection when searching for a high-pressure hydraulic leak. 
 - Seek medical attention immediately if injured by a concentrated high-pressure stream of hydraulic fluid. Serious infection or toxic reaction can develop after hydraulic fluid pierces the skin's surface.
- Do not attempt any makeshift repairs to the hydraulic lines, fittings, or hoses. Do not use tape, clamps, or cements to attempt a repair. Doing so can cause sudden failure and create a hazardous and unsafe condition.
- Do not bend or strike high-pressure lines, tubes, or hoses, or reinstall them in a bent or damaged condition.
- Make sure that hydraulic hoses are routed to avoid chafing.
- Never adjust a pressure relief valve or other pressure-limiting device to a higher pressure than specified.

5.4 Hydraulic Circuit Requirements

For the most efficient operation and ease of handling, the hydraulic controls should provide variable-flow, and preferably be fingertip-controlled. A simple on-off control is not desirable. You want to be able to pick up your load cleanly and not smash down on top of it.



If your excavator does not have an auxiliary circuit, or an extra spool on the main control valve, other provisions must be made and are not covered in this manual. Contact your distributor, dealer, or Wallenstein Equipment.

At least one auxiliary bidirectional hydraulic circuit is required on your excavator to power the grapple (a bidirectional valve is able to supply controlled hydraulic fluid flow in two directions). Hydraulic fluid flow must be supplied to either side of the grapple allowing it to open and close, and rotate.

Hydraulic circuit requirements for the grapple can be setup on an excavator two different ways:

- 1. The excavator has two auxiliary circuits** available to power grapple functions (1) open/close and (2) rotate.
- 2. The excavator has one auxiliary circuit** to power the grapple functions and the fluid flow must be redirected to (1) open/close and (2) rotate. In this case, an auxiliary selector valve kit must be installed and connected to a 12 VDC electrical power supply.

5.4.1 Excavator with Two Auxiliary Circuits

For a log grapple, two auxiliary circuits are ideal. The control valve must be bidirectional, and permit setting flow and pressure. If there is only one circuit available on your excavator, an extra control valve must be installed that can shift fluid flow between the rotate and open/close. See *Excavator with One Auxiliary Circuit* on page 21.

Grapple Hydraulic Connections

Valve Port	Function	Size
1	Grapple close	1/2" JIC (#8)
2	Grapple open	
3	Grapple rotate	

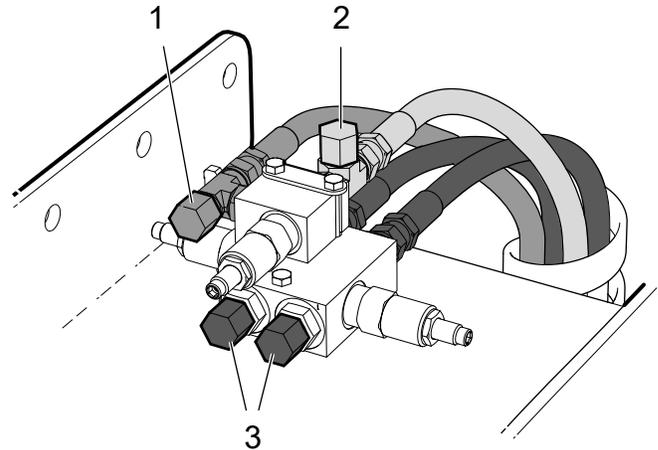


Fig. 9 – Control valve connections

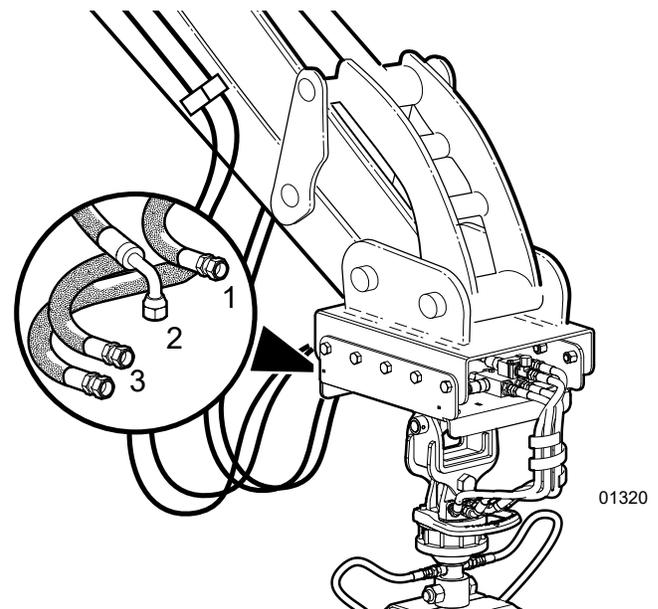


Fig. 10 – Hydraulic connections

Set Flow Rate and Relief Pressure

IMPORTANT! After installation is complete, cycle the grapple, and then check the excavator hydraulic fluid level.

Check and adjust the grapple circuit so it is within the specification.

- Set fluid 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.

5.4.2 Excavator with One Auxiliary Circuit

With only one circuit available for the two grapple functions, the **Selector Valve Kit** must be installed.

- To **Open or Close the grapple**, actuate the auxiliary circuit in either direction.
- To **Rotate** the grapple, press the momentary switch, while actuating the auxiliary circuit in either direction. The momentary switch is connected to the 12 V coil on the grapple control valve. The valve spool shifts to divert fluid to the grapple rotator.

Selector Valve Kit

IMPORTANT! If the excavator auxiliary circuit relief pressure is set above 2900 psi (200 bar), the selector valve must have a case drain line connected at port 'L' that returns uninterrupted back to tank.

- The excavator auxiliary circuit hoses are connected to ports **A1** and **A2** on the grapple control valve. The valve ports are 1/2" JIC (#8). See illustration.
- The grapple open/close function works through ports **A1**, **A2** and **B1**, **B2** ports. Shifting the valve spool diverts fluid to **C1** and **C2** ports to rotate the grapple.
- Connect 3/8" JIC (#6) case drain line **L** back to the reservoir.

Valve Port Name	Function	Size
A1	Pressure / return (bidirectional)	1/2" JIC (#8)
A2		1/2" JIC (#8)
B1	Grapple close	1/2" JIC (#8)
B2	Grapple open	1/2" JIC (#8)
C1	Grapple rotate	1/2" JIC (#8)
C2	Grapple rotate	1/2" JIC (#8)
L	Case drain (return to reservoir)	3/8" JIC (#6)

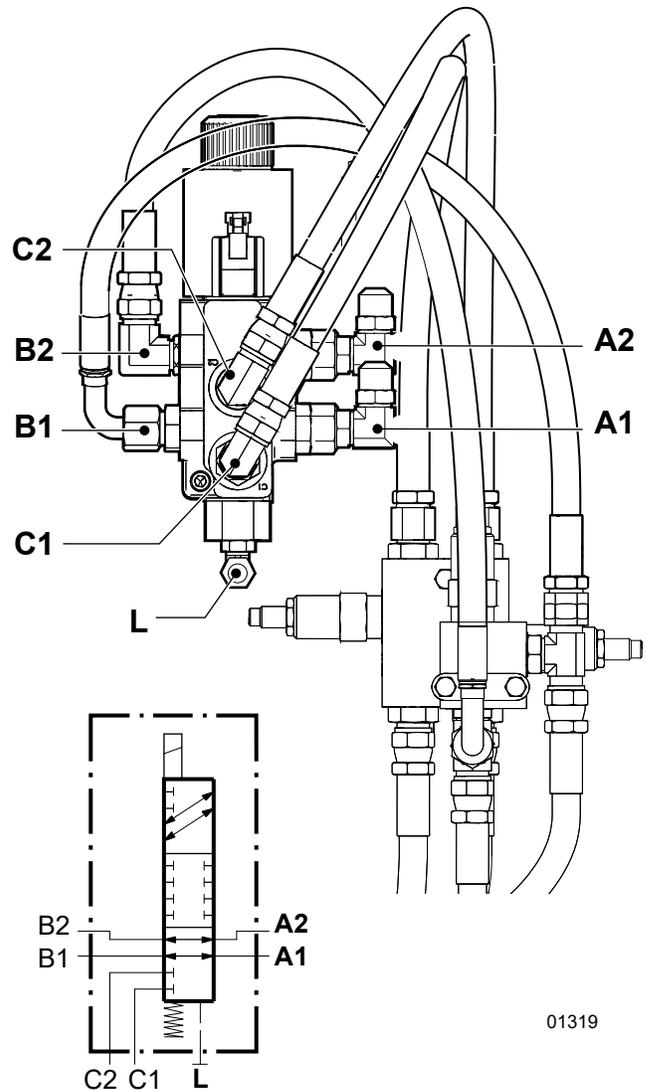


Fig. 11—Control valve connections

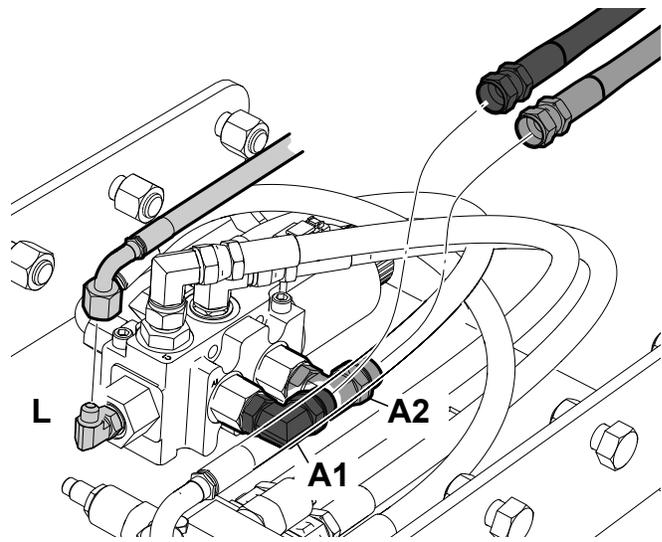


Fig. 12—Excavator hose connections

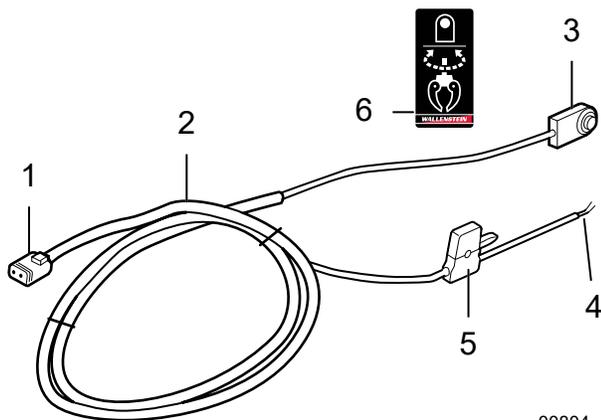
Set Flow Rate and Relief Pressure

IMPORTANT! After installation is complete, cycle the grapple, and then check the excavator hydraulic fluid level.

Check and adjust the grapple circuit so it is within the specification.

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

5.4.3 Electrical Connections



00804

Fig. 13—Electrical harnesses

- | | |
|----------------------------|---------------------|
| 1. Control Valve Connector | 4. Power Connection |
| 2. Harness | 5. Fuse |
| 3. Control Switch | 6. Control Decal |

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 auxiliary hoses and route along the boom to the cab. Secure the harness to avoid chafing or pinching.
- In the cab, mount the control switch in a convenient place. It should be positioned to easily toggle back and forth when operating. For example, tie wrap it to the auxiliary valve control handle. Place the decal near the control so it is clearly visible.
- Connect the harness to a 12 VDC power supply.

5.5 Grapple Removal

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

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.
3. Shut down the excavator and apply the hydraulic circuit lockout device. 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. Remove the stick and link pins. Move the boom out of the attachment bracket.

5.6 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

WARNING!



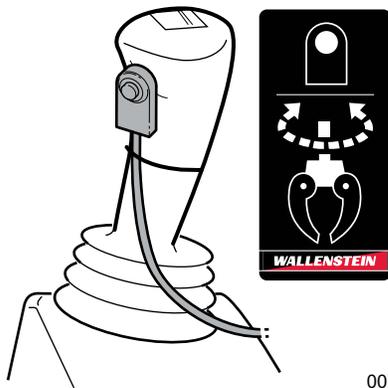
Risk of collision / crushing / pinching injury from the grapple forks when it rotates.

Stand clear of the grapple when in operation.

W088

The hydraulic functions for the LXG520R grapple are managed using the excavator controls in the cab.

- An excavator with two auxiliary circuits can operate the grapple using the cab controls the same as other attachments. One circuit is used for grapple open/close, the other for rotate clockwise or counterclockwise.
- An excavator that has one auxiliary circuit, must have the selector valve kit installed. The grapple operates using the cab control lever for the auxiliary circuit. Toggle between open/close and rotate by pressing the momentary switch mounted in the cab. Press and hold the button, and then actuate the control lever to toggle between clockwise rotation and counterclockwise rotation.



00794

Fig. 14–Cab controls

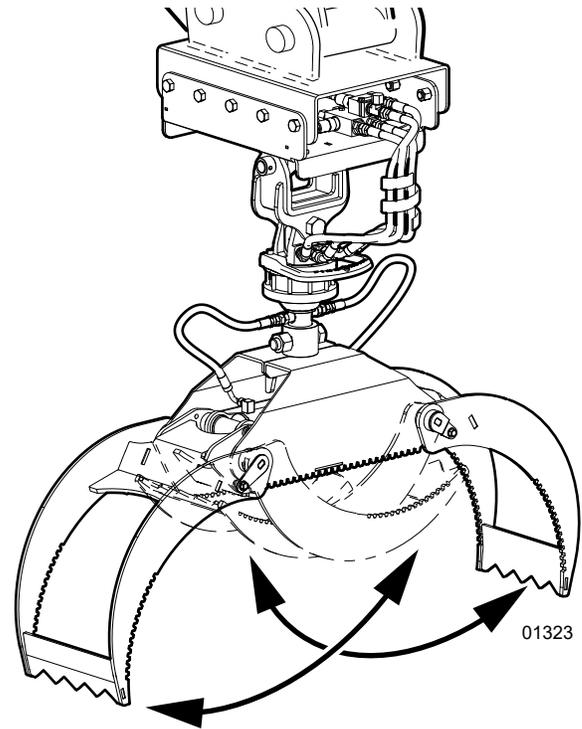


Fig. 15–Grapple open / close

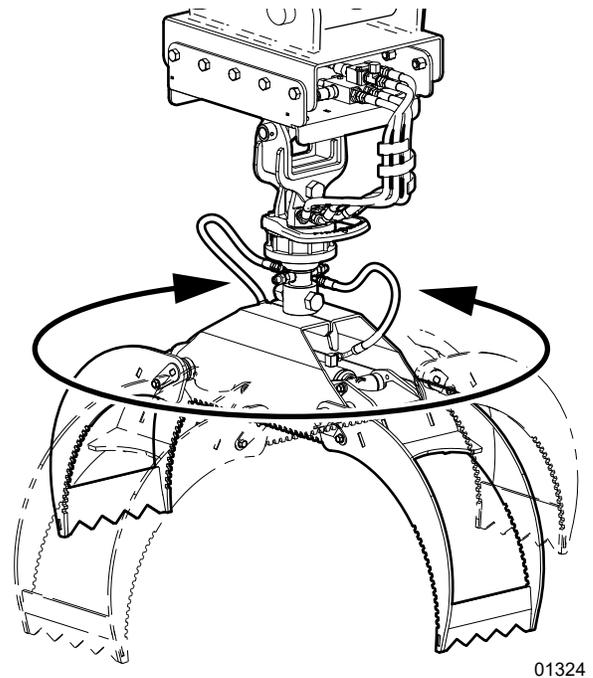


Fig. 16–Grapple 360 ° rotation

7. Operating Instructions

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

- Use the excavator controls to operate the LXG520R grapple.
- 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 excavator on firm, level ground.

7.1 Operating Safety

WARNING!

Wear the personal protective equipment (PPE) that is required to complete the work safely.

For example; a hard hat, hearing protection, protective eye wear, protective footwear, respirator, and gloves.

W101

WARNING!

Electrocution Hazard. Be aware of overhead or underground power lines. Stay at least 20 ft (6 m) or more away. Serious injury or death could occur from electrocution. Electrocution is possible without direct contact (arcing).

W015

- **Create a Work Zone for the machine and the load. Mark it with safety cones or barricades to warn bystanders to stay outside of it.**
- **Know where coworkers are at all times and be alert for unexpected workers or bystanders entering your Work Zone. Make eye contact with anyone entering the zone.**
- **Do not allow anyone near the grapple while in operation. Always keep coworkers and bystanders in full view at all times while loading.**
- **Protective cab shields must be provided on a log loader unless the absence of shields does not pose a hazard to the operator.**
- **Always wear the seat belt while operating the grapple. Remain seated in the operator's seat during operation.**
- **Never lift, move or swing a load over personnel, the cab of other machines, or vehicles in the area.**
- **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.**
- **Use more than one of the excavator controls at a time so movements are smooth.**
- **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 grapping.**
- **Place the grapple on the ground and stop the engine before exiting the excavator.**

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. Complete the tasks described in the *Pre-start Checklist* on page 25 .
2. Lubricate the rotor hanger bearing. See *Grease Point* on page 28.

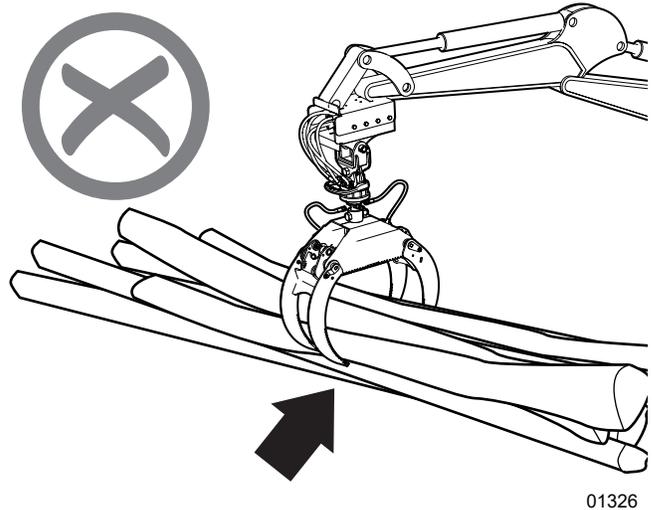
After 20 hours of operation

Repeat the steps listed under *After 1–5 hours of operation*.

7.3 Pre-start Checklist

Items to Complete	✓
Check the machine for entangled material. Remove any twine, wire, or other material that has become entangled.	
Check that all the fasteners are installed and tightened to the correct torque.	
Make sure that your equipment is working properly and in good repair.	
Check the hydraulic system for leaks. Use a safe method to inspect for leaks. Tighten fittings or replace components, as required.	
Check the hydraulic fluid level. Add hydraulic fluid, as required.	

- Balance loads carefully. 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.



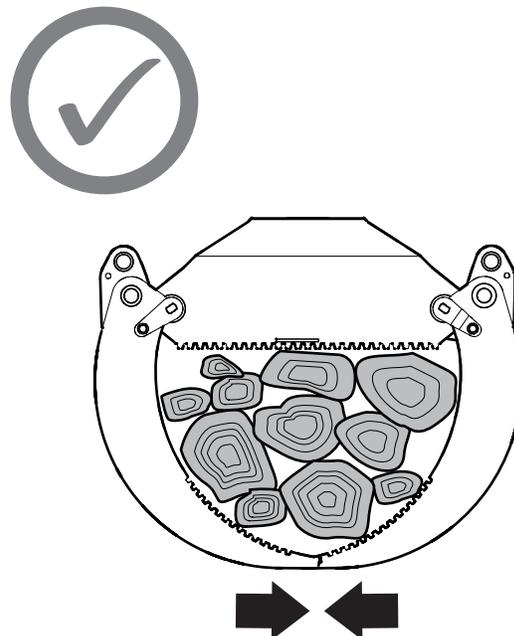
01326

Fig. 18—Make sure the grapple contacts all of the load

7.4 Loading

- All coworkers must be in view before logs or equipment are moved.
- Have the logs ready to be loaded so work can be done in a safe manner. Turn logs that must be loaded but end first to eliminate extra maneuvering when loading.
- Load logs to ensure the stability of the vehicle and load while in transit.
- Load and unload from the side of the truck or trailer. Make sure there is enough clearance for the excavator to swing between the trailer/truck and other obstacles.
- Do not overload trucks or trailers. Keep the loads uniform by alternating butt ends of logs. Conform to regulations for height, weight, and length of loads.
- Position logs to avoid excessive strain on trailer stakes. Lay logs onto the trailer tightly, in a consistent manner without crowding.
- Never place split, cracked, or shattered logs on the bottom of the bunk or up against the bunk stakes.
- Operate carefully when the grapple is loaded. Elevated loads reduce machine stability on unstable ground.
- Balance loads in the grapple so the weight is evenly distributed and stable.
- Reduce speed before turning or swinging a load.
- Logs must extend past bunk stakes 12 inches (30 cm).
- Place two tiers of logs onto the bunk before loading shorter, smaller diameter logs.
- Take care to balance the load on the trailer or truck. An unbalanced load could cause a tip over.

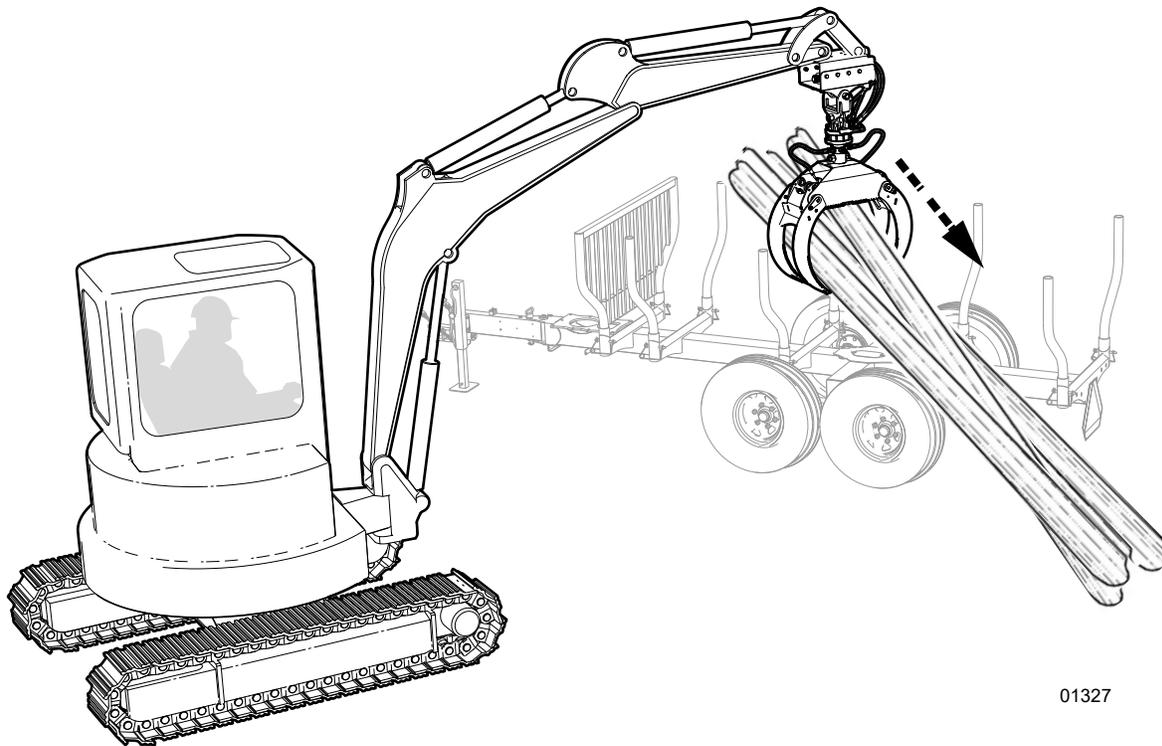
- Make sure grapple forks have full contact with all the pieces you are lifting. Otherwise the load could become unstable causing a dangerous situation to coworkers.



01328

Fig. 19—Grapple forks must be around the load when they are closed

- Pick loads up so that the weight is balanced in the grapple. This point may not be at the exact center of the load. The stump-end of a log for example, may cause it to be heavier at that end so you have to pick it up closer to that end.



01327

Fig. 20 – Balance Loads Carefully

7.5 Moving the Excavator while Carrying a Load

- If traveling with a load is necessary, carry the load as low as possible for better visibility and stability. Do not raise the grapple until close to the truck or trailer.
- Do not start, stop, or turn quickly when transporting a load.
- Do not change directions quickly when carrying a load.

7.6 Transport

IMPORTANT! Equipment that is transported on a public roadway must comply with the local laws that govern the safety and transport of machinery.

Before taking any machine on a public roadway, make sure it has the required lighting, reflectors, and markings, and that they are in good, working condition.

For specific requirements, contact your local transportation authority.

- Never allow riders on the machine.
 - Be a safe and courteous driver. Yield to oncoming traffic in all situations (for example; a narrow bridge, narrow road, or intersection).
 - Watch for traffic when near or crossing roadways.
 - Do not operate an excavator while you are impaired by alcohol, drugs, lack of sleep, or other reasons.
 - After the excavator is prepared for transport, complete a circle check to make sure everything is safe, secure, and functions correctly.
 - Do not exceed a safe travel speed.
- Clean off all dirt and debris.
 - Make sure the grapple is securely mounted to the excavator and close the forks.
 - Check that all the required lights, reflectors, and markings are installed and in good working condition.

8. Service and Maintenance

CAUTION!

Do not risk being injured by working in an unsafe situation. Make sure machine is shut down properly and is safe to work on before performing any maintenance or service procedure. Allow hot components to cool.

W067

WARNING!

Wear the personal protective equipment (PPE) that is required to complete the work safely.

For example; a hard hat, hearing protection, protective eye wear, protective footwear, respirator, and gloves.

W101

WARNING!

Shut down the excavator and lockout the hydraulic system before performing maintenance on the grapple to avoid the risk of serious injury.

- Never operate an engine inside a closed building. The exhaust fumes may cause asphyxiation.
- Wait for the machine to cool before starting work. Components and liquids may be hot enough to cause burns.
- Never work under equipment unless it is securely supported with blocks.
- When replacement parts are necessary, use genuine factory replacement parts 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 a fire extinguisher and first aid kit readily accessible at all times.

8.1 Maintenance Safety

Before performing any maintenance procedure, place the excavator in a safe condition.

SAFE CONDITION

1. Remove material from the grapple.
2. Lower the grapple to ground.
3. Turn off the excavator engine.
4. Engage the hydraulic control lockout device.
5. Turn off the main hydraulic switch.
6. Move the hydraulic controls to make sure that there is no movement.

- Follow good shop practices:
 - Keep the work area clean and dry.
 - Ground electrical outlets and tools.
 - Have adequate light for good visibility.
- Use tools that are in good condition and correct for the task. Make sure that you understand how to use the tools before performing any service work.

8.2 Grease Point

With the exception of the rotator hanger bearing, pivot points on the grapple do not require lubrication. The bearings are made of a self-lubricating composite material that is designed for heavy loads.

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 the rotator hanger bearing every 50 hours of use.

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

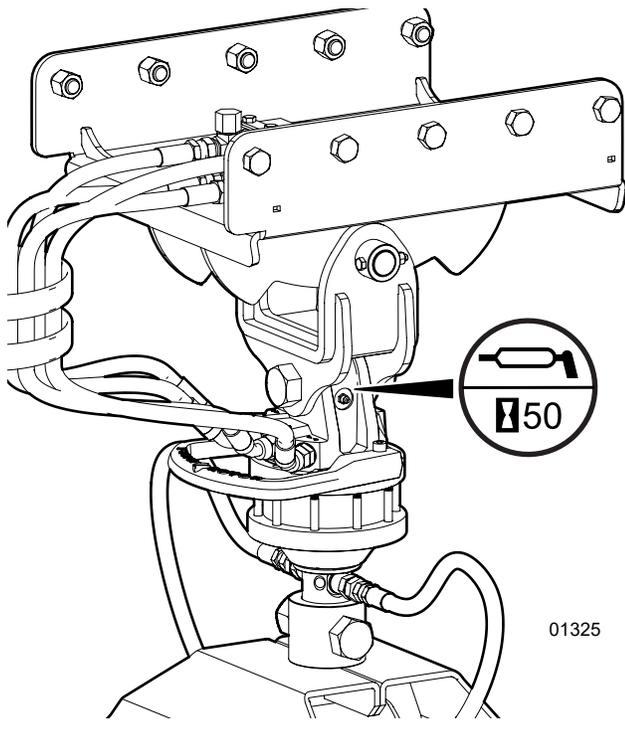


Fig. 21 – Rotator hanger bearing

9. Troubleshooting



WARNING!

Before troubleshooting, read and understand the *Maintenance Safety on page 27*. Set the machine to a safe condition.

The following table lists some of the problems that you may encounter and provides possible causes and solutions.

If you encounter a problem that is difficult to solve, even after reading this information, please contact your local dealer, the distributor, or Wallenstein Equipment. Before you call, please have the serial number for your product handy.

To find the serial number on your machine, see *Serial Number Location on page 5*.

Problem	Possible Cause	Solution
Hydraulics functions move slowly or do not move.	No pressurized hydraulic fluid. The filter is plugged.	Change the filter.
	Low hydraulic fluid level.	Add hydraulic fluid, as required.
	Hoses are connected incorrectly.	Correct the hose connections.
	Low hydraulic fluid flow. Flow control set too low.	Adjust the hydraulic fluid flow control.
	Selector valve is not powered (machines that require a selector valve kit).	Connect the selector valve solenoid to a 12 VDC electrical power source.
	Wrong function is selected. (machines that require a selector valve kit).	Make sure that the electrical harness is connected to the correct function.
	Electrical harness connector is loose or damaged (machines that require a selector valve kit).	Check the connection. Inspect the electrical harness for damage. Repair or replace a damaged electrical harness.
	Low excavator engine speed.	Increase the excavator engine speed.
Hydraulic functions are jerky.	Leak in the hydraulic system. Air getting into the system.	Tighten all hydraulic connections. Check for leaks in the hoses.
	Hydraulic hose couplers are dirty or incompatible.	Clean the hose couplers. Make sure that the connecting couplers are the correct type.
Leaking hydraulic hose.	Hydraulic hose is worn, damaged, or a connector is loose.	Inspect the hose for damage. Replace damaged hydraulic hoses immediately. Make sure that all the connectors are tight. For specifications, see <i>Hydraulic Fitting Torque on page 32</i> .
Leaking hydraulic cylinder.	Cylinder seals are worn or damaged.	Disassemble and overhaul the cylinder. Check the fluid for debris.

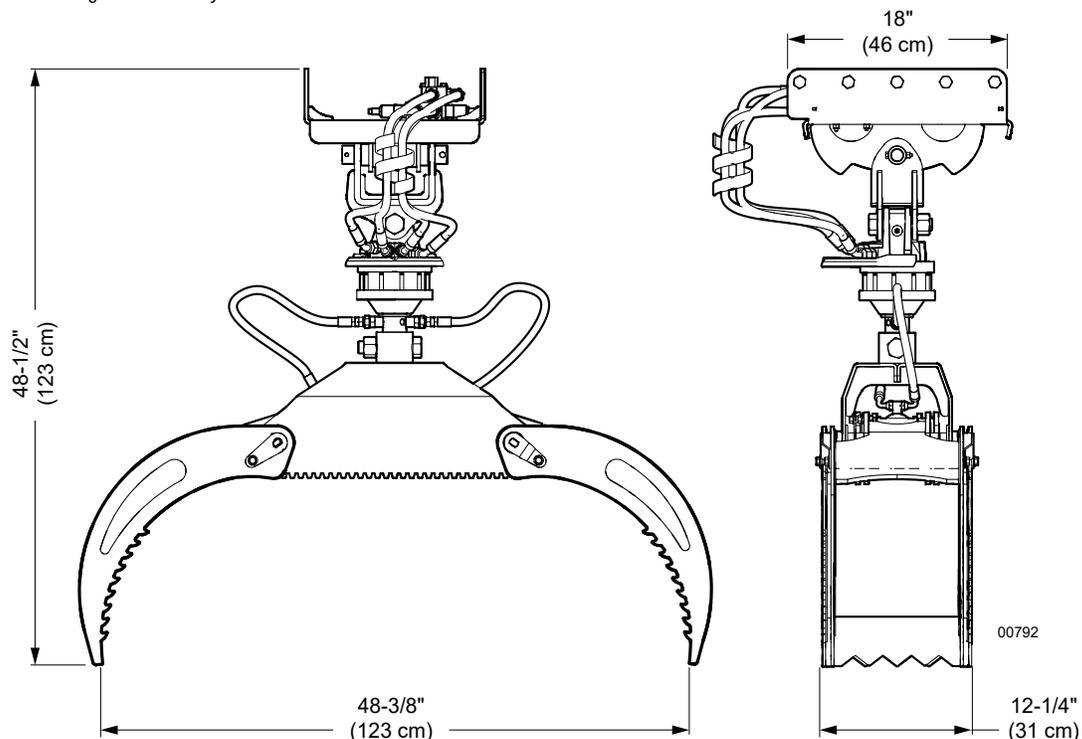
10. Specifications

IMPORTANT! Customer-supplied hydraulic hoses must meet SAE J517 or DIN 20066 standards for high-pressure hydraulic hoses and hose ends.

10.1 Machine Specifications¹

Specification	LXG520R Grapple	LXG520R Grapple with Selector Valve
Rotation angle	360°	
Excavator HP recommended	10–30 hp (7.5–22 kW)	
Excavator maximum lift range	500–3500 lb (227– 1588 kg)	
Required hydraulic fluid flow	5 US gpm (19 Lpm)	
Grapple opening	3"–48" (8 cm–122 cm)	
Clamp force	9400 lb (4264 kg)	
Lift capacity–rotator/pivot	6750 lb (3062 kg)	
Total weight	345 lb (156 kg) (estimated)	350 lb (159 kg) (estimated)
Dimensions (LxWxH)	51" x 52" x 20"	
Mounting system	Blank ear plate ²	
Function selection	Excavator auxiliary function and hydraulics	Switch and harness included
Case drain required	No	Over 2900 psi (200 bar)
Customer supplied	Mounting bracket and auxiliary hydraulic lines.	Mounting bracket and auxiliary hydraulic pressure, return, and drain lines

- 1 Specifications are subject to change without notice
- 2 Matches BaumaLight excavator system



10.2 Common Bolt Torque

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%.



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



SAE Gr. 2



SAE Gr. 5



SAE Gr. 8

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



8.8



10.9

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

12. Index

	A			O
Arrows, rotator body.....		19	Operating instructions	24
	B		Loading	25
Bolt torque.....		31	Moving the excavator carrying a load	26
Break-in.....		24	Safety.....	24
	C			P
Components.....		16	Pre-start checklist.....	25
Controls.....		23		R
	D		Remove grapple.....	22
Decal types		6	Replace safety signs	14
	E			S
Electrical connections		22	Safe condition	9
Equipment safety guidelines		9	Safety	7
Excavator matching.....		17	Alert symbol.....	7
	F		Equipment guidelines	9
Familiarization		15	Hydraulic system	19
New operator.....		15	Maintenance	27
Training.....		15	Operating	24
Work site.....		15	Rules.....	8
Foreword			Safe condition	9
Delivery inspection report		4	Signal words	7
	G		Signs.....	12
Grease point.....		28	Work site.....	9
	H		Safety signs, replace.....	14
Hydraulic			Selector valve kit.....	21
Connections.....		19	Serial number.....	5
Fitting torque.....		32	Service and maintenance.....	27
Requirements		20	Grease point	28
Safety.....		19	Safety.....	27
Selector valve kit.....		21	Signal words.....	7
	I		Sign-off form.....	11
Indicators, rotator body function.....		19	Specifications	30
Installation.....		17	Common bolt torque	31
Excavator matching		17	Hydraulic fitting torque	32
Excavator with one auxiliary circuit.....		21	Machine	30
Electrical connections.....		22	Standards.....	11
Flow rate and relief pressure.....		22	Storage.....	22
Selector valve kit		21		T
Excavator with two auxiliary circuits		20	Training	15
Flow rate and relief pressure.....		21	Transport.....	26
Hydraulic connections		20	Troubleshooting	29
Hydraulic circuit requirements		20		W
Mount the grapple.....		17	Warranty.....	33
Hydraulic connections		19	Work Site	
Mounting bracket.....		18	Familiarization.....	15
	M		Safety.....	9
Maintenance.....		27		
Mount the grapple		17		



A series of 25 horizontal lines spanning the width of the page, providing a template for writing.



WallensteinEquipment.com