SAFETY ALERT SYMBOL

This Safety Alert Symbol means:

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

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

<table>
<thead>
<tr>
<th>Section</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>ii</td>
</tr>
<tr>
<td>Registration</td>
<td>ii</td>
</tr>
<tr>
<td>Reference Information</td>
<td>ii</td>
</tr>
<tr>
<td>Safety</td>
<td>1</td>
</tr>
<tr>
<td>Caution, Warning, &amp; Danger: What They Mean</td>
<td>1</td>
</tr>
<tr>
<td>Decals</td>
<td>1</td>
</tr>
<tr>
<td>Operator Qualifications and Training</td>
<td>1</td>
</tr>
<tr>
<td>Personal Safety</td>
<td>2</td>
</tr>
<tr>
<td>Machine Stability</td>
<td>2</td>
</tr>
<tr>
<td>Before Operating</td>
<td>3</td>
</tr>
<tr>
<td>Operation Safety</td>
<td>3</td>
</tr>
<tr>
<td>Traveling on Roadways</td>
<td>3</td>
</tr>
<tr>
<td>Model Description</td>
<td>4</td>
</tr>
<tr>
<td>Grapples</td>
<td>5</td>
</tr>
<tr>
<td>Controls</td>
<td>6</td>
</tr>
<tr>
<td>Loader Controls</td>
<td>6</td>
</tr>
<tr>
<td>Power Take-off</td>
<td>6</td>
</tr>
<tr>
<td>Swing Lock</td>
<td>6</td>
</tr>
<tr>
<td>Using the Controls</td>
<td>7</td>
</tr>
<tr>
<td>Before Operating the Machine</td>
<td>8</td>
</tr>
<tr>
<td>Check the Equipment</td>
<td>8</td>
</tr>
<tr>
<td>Know the Work Area</td>
<td>8</td>
</tr>
<tr>
<td>Safe Machine Operation</td>
<td>8</td>
</tr>
<tr>
<td>Know the Rules</td>
<td>8</td>
</tr>
<tr>
<td>Position the Loader</td>
<td>8</td>
</tr>
<tr>
<td>Protect Yourself</td>
<td>9</td>
</tr>
<tr>
<td>Mount and Dismount Properly</td>
<td>9</td>
</tr>
<tr>
<td>Operating Near Electric Power Lines</td>
<td>9</td>
</tr>
<tr>
<td>General Operating Procedures</td>
<td>10</td>
</tr>
<tr>
<td>Starting Procedures</td>
<td>10</td>
</tr>
<tr>
<td>Setting the Stabilizers</td>
<td>10</td>
</tr>
<tr>
<td>Shutdown Procedures</td>
<td>11</td>
</tr>
<tr>
<td>Lift the Load Safely</td>
<td>11</td>
</tr>
<tr>
<td>Place the Load Safely</td>
<td>11</td>
</tr>
<tr>
<td>Relocating the Loader</td>
<td>11</td>
</tr>
<tr>
<td>Maintenance</td>
<td>12</td>
</tr>
<tr>
<td>Maintenance Safety</td>
<td>12</td>
</tr>
<tr>
<td>Hydraulic Oil Hazards</td>
<td>12</td>
</tr>
<tr>
<td>General Maintenance Rules</td>
<td>13</td>
</tr>
<tr>
<td>Break-in Period</td>
<td>13</td>
</tr>
<tr>
<td>Lubricants and Fluids</td>
<td>13</td>
</tr>
<tr>
<td>Torque Specifications</td>
<td>14</td>
</tr>
<tr>
<td>Daily Lubrication and Fluid Check</td>
<td>18</td>
</tr>
<tr>
<td>Grease Locations</td>
<td>20</td>
</tr>
<tr>
<td>Scheduled Maintenance</td>
<td>21</td>
</tr>
<tr>
<td>Service Schedule</td>
<td>22</td>
</tr>
<tr>
<td>Operator Maintenance Record</td>
<td>23</td>
</tr>
</tbody>
</table>
INTRODUCTION

To ensure that your loader will provide years of safe dependable service, only trained and authorized persons should operate and service the loader. It is the responsibility of the operator to read, fully understand and follow all operational and safety related instructions contained in this manual. Do not operate the loader until you have read and fully understand these instructions. Remember, always use good safety practices to protect yourself and those around you.

REGISTRATION

The Warranty Registration Form must be filled out by the dealer and returned to SERCO Loaders indicating the date the machine went into service.

IMPORTANT

THIS OPERATORS MANUAL MUST REMAIN WITH THE LOADER AT ALL TIMES!

Should it become damaged or lost, immediately contact any authorized SERCO dealer or contact the SERCO Service Department at (218) 834-5118 for replacement.

SERCO has made every effort to provide information as complete and accurate as possible for its loaders. However, because of owner or application requirements, equipment and control variations may exist between machines. In addition, due to SERCO policy of continually striving to improve its products, occasional discrepancies may exist between machines and the descriptions and information contained herein.

SERCO reserves the right to make changes and improvements to its products at any time without public notice or obligation. SERCO also reserves the right to discontinue manufacturing any product at its discretion at any time.

REFERENCE INFORMATION

All requests for information, service or parts should include the loader model and serial numbers. For the nearest SERCO dealer contact:

SERCO Loaders
511 25th Ave.
Two Harbors, MN 55616
Phone: (218)-834-5118
Fax: (218)-834-2498
e-mail: serco@sercoloaders.com
SAFETY

CAUTION, WARNING, & DANGER: WHAT THEY MEAN

Hazards are identified by the “Safety Alert Symbol” and followed by a signal word: Caution, Warning, or Danger.

**CAUTION**

CAUTION means that a situation COULD be hazardous and MAY result in personal injury if not avoided. CAUTION is also used to alert against unsafe practices.

**WARNING**

WARNING means that a situation COULD be hazardous and MAY result in serious injury or death if not avoided.

**DANGER**

DANGER means that a situation IS HAZARDOUS AND WILL result in serious injury or death if not avoided.

DECALS

The decals on the machine provide instructions for safe and correct operation.

Never make modifications affecting safe operation or capacity without the expressed written approval of SERCO.

When SERCO approved modifications are made, the user is responsible for seeing that appropriate decals and instructions are changed.

All plates and decals must be in place and legible at all times.

OPERATOR QUALIFICATIONS AND TRAINING

- Only trained and authorized persons should operate the machine. To be qualified, you must understand the written instructions supplied by the manufacturer, have training (including actual operation of this machine) and know the safety rules and regulations of the job site.

- Do not operate the machine until you fully understand the function of all controls, indicators and instruments.
PERSONAL SAFETY
Use all protective clothing and safety devices dictated by the working conditions.

You may need...
- Hard hat
- Safety glasses, goggles or face shield
- Hearing protection
- Safety shoes
- Heavy gloves
- Reflective clothing
- Respirator or filter mask

☐ Avoid entanglement hazards. Do not wear clothing or jewelry that could get caught in machinery and cause injury. Keep hands, feet, hair, and clothing away from moving parts. Keep hands and feet within the operator platform.

☐ Know the pinch points, crushing points and rotating parts of the loader and avoid them. Make sure all safety guards are in place.

☐ Always know where to get assistance in case of an emergency. Know where to locate and how to use safety equipment such as a first aid kit and fire extinguisher.

☐ Report all injuries to your supervisor or as directed.

MACHINE STABILITY
Your SERCO loader is proven to be stable when properly operated. However, improper operation, faulty maintenance and unauthorized modifications may cause instability.

☐ Know the working ranges and capacities of the loader to avoid tipping.

WARNING
Always lower and properly set both stabilizers before operating the machine. Failure to do so may cause instability and may result in serious injury or death

☐ Properly set the stabilizers as instructed in “Setting the Stabilizers” on page 10.

☐ DO NOT operate the loader without BOTH stabilizers properly set.

CRUSHING HAZARD
Keep away from moving stabilizers. Failure to do so may result in serious injury or death

☐ DO NOT lift loads that exceed the rated capacity of the loader.
Some Conditions that Affect Stability:
  - Ground conditions
  - Grade
  - Weight of attachment
  - Contents of attachment
  - Operator judgment

BEFORE OPERATING

Important: Warn all others in the area that you are about to start operation.

- Perform the equipment check as stated in “Check the Equipment” on page 8.

- Check underneath and around the machine to make sure all personnel are clear.

- Apply the truck brakes.

OPERATION SAFETY

- Safe operation is the responsibility of the operator.

- Improper use of the machine can lead to dangerous situations for yourself, those around you, the machine and the work area. You must have safe working habits and be aware of hazardous conditions.

- Thoroughly read and understand this entire manual. Follow all safety rules and practices explained in this manual.

- Be seated in the operators seat while operating the loader.

- Seat belt to be worn at all times during loader operation.

- Do not operate without lights if conditions require them. If lights are required and your machine is not so equipped, contact your SERCO dealer for an available lighting package.

- An operator must not use drugs or alcohol which can affect his alertness and coordination. An operator on prescription or over-the-counter drugs needs medical approval to safely operate these machines.

- Report all accidents to your supervisor or as directed.

Before Leaving the Operator Platform
  - Place the boom on the rest.
  - Engage swing lock.
  - Raise Stabilizers

Before Traveling
  - Disengage Power Take

TRAVELING ON ROADWAYS

- Check transportation regulations for the route.

- Obey all highway weight, height and width limitations.

- Check all lights, including marker and trailer, for proper operation.

- Bind the attachment to the carrier to prevent unwanted movement.

- Place the boom straight on the bed (or rack, if available), lowered to complete rest.

- Engage swing lock. Fold down seat.

- Disengage Power Take Off (PTO).

- Securely bind any load on the bed.

FIGURE 1. Transport Position Examples
MODEL DESCRIPTION

- Jib Pin
- Main Boom
- Main Pin
- Operator Platform
- Turntable Bearing
- Frame
- Mounting Bolts
- Stabilizer Leg
- Stabilizer Pad
- Jib Cylinder
- Jib Boom
- Head
- Rotator
- Grapple Arm
- Grapple Head
- Hanger
GRAPPLES

SERCO Loaders offers a large selection of grapples to cover all handling needs.

The grapple is attached to the tip of the jib boom with a hanger. The hanger is connected with pins through bushed bores. It is important that these pins are greased daily.

All grapples are equipped with either a noncontinuous or a continuous rotator.

**Note:** Some noncontinuous rotation grapples are not equipped with a stop, rotation must be halted before the rotator hoses are stretched to avoid hose and fitting damage.

*Other special use grapples available.*
**CONTROLS**

**WARNING**

Do not attempt to operate the controls until you have read and fully understand the safety and operating instructions in this manual, on the safety decals and all information provided with each piece of equipment before you operate. Determine the control and how to use it for each function before operating the equipment.

**POWER TAKE-OFF**

- Fully understand the Operator's Manual from the P.T.O. manufacturer.
- Clear all people and obstructions from the loading area.
- Follow the P.T.O. manufacturer instructions for proper shifting procedure.

**Note:** Do not exceed the recommended maximum P.T.O. speed.

**SWING LOCK**

The swing lock is provided as a safety device to ensure the loader boom remains centered on trailer bed during transportation.

See Figure 2. The left view shows the lock **down** or in the **engaged** position, preventing rotation.

The right view shows the lock **up** or in the **disengaged** position, allowing rotation during operation.

---

**FIGURE 1. Loader Controls**

- Outboard Joystick
- Stabilizers
- Swing Lock (location may vary)
- Squirt Boom (optional)
- Swing Pedal

**FIGURE 2. Swing Lock**

Locked

Unlocked

Note:

Center control joysticks not shown.
Functions are the same as outboard joysticks.
USING THE CONTROLS

Note: All directions (left, right, up, down, etc.) are from the operator’s perspective, except for the stabilizers.

**Swing Pedal**

- Left foot down SWING LEFT
- Right foot down SWING RIGHT

**Squirt Boom Pedal** (option)

- Toe Down BOOM OUT
- Heel Down BOOM IN

**Stabilizers**

- Left UP
- Right UP
- Left DOWN
- Right DOWN

**Joysticks**

- Main Boom DOWN
- Jib Boom IN
- Grapple OPEN
- Grapple CLOSE
- Grapple ROTATE LEFT
- Grapple ROTATE RIGHT
- Main Boom UP
- Jib Boom OUT
BEFORE OPERATING THE MACHINE

CHECK THE EQUIPMENT

**Important:** Before you begin your workday, take the time to check your loader and have all systems in good operational condition.

**Check the following:**

- Warning decals, special instructions and operators manuals. Make sure they are legible and stored in the proper location.
- Hydraulic fluid level. Add hydraulic fluid as required.
- Grease fittings. Pump grease at all fitting locations.
- Loader mounting bolts. Check for loose or broken bolts.
- Hydraulic hoses and hose connections for wear or leaks. Repair or replace any damaged hoses or connections.
- All control levers for proper operation.
- Steps, pedals, and nonskid surfaces. Make sure they are clean and free of dirt, grease, oil, debris, snow and ice.
- Rotation bearing. Visually check for loose or damaged mounting bolts. If repair is required, refer to qualified personal.
- Grease rotation bearing ball path, ring gear, and pinion gear.
- Remove or put away tools, lunch buckets, chains, hooks or any other loose objects that could interfere with operation.
- Visually inspect all the machine structures to insure no cracks or other damage exists. Report any damage to your supervisor.

**Important:** If there is any indication that faulty equipment exists, shutdown safely, inform the proper authority and **DO NOT** operate the loader until the problem has been fixed.

KNOW THE WORK AREA

Check clearances in the work area. Do not work under obstacles within the working range of the loader. Check the location for overhead and buried power lines or other utilities before operation.

Keep all bystanders at a safe distance while performing all operations at the work area.

SAFE MACHINE OPERATION

For safe operation of this loader you must be a qualified and authorized operator (See “Operator Qualifications and Training” on page 1). To be qualified, you must understand the written instructions supplied by the manufacturer, have training (including actual operation of this machine) and know the safety rules and regulations for the job site.

An operator must not use drugs or alcohol which can affect his alertness and coordination (See “Operation Safety” on page 3). An operator on prescription or over-the-counter drugs needs medical approval to safely operate these machines.

KNOW THE RULES

Most employers have rules governing proper operation and maintenance of equipment. Before you start work at a new location, check with your supervisor or the safety coordinator. Ask about rules you may be expected to obey.

Make sure you understand the rules covering traffic at your job site. Make sure you recognize and understand the meaning of all signs, flags and markings. Make sure you understand all hand, flag, whistle, siren, or bell signals.

POSITION THE LOADER

Position the loader on firm level ground. Do not operate or position the loader on unstable or slippery ground conditions.

If level ground is not possible, position the loader to use the stabilizers to level the loader “side to side” with the “front to back” positioned up and down grade.
Before Operating the Machine

**Note:** Do not park on a grade exceeding 10% (1’ rise over the span of a 10’ run).

- Set the parking brake. If parking on a grade, block the tires.
- If it is necessary to park on a grade, position the loader to swing the empty grapple up hill and the loaded grapple down hill. Care must be taken when moving the load downhill. Swinging heavy loads down hill may overload the swing drive and result in loss of control.

**PROTECT YOURSELF**

Use all protective clothing and safety devices dictated by the working conditions.

**You may need...**

- Hard hat
- Safety glasses, goggles or face shield
- Hearing protection
- Safety shoes
- Heavy gloves
- Reflective clothing
- Respirator or filter mask

**MOUNT AND DISMOUNT PROPERLY**

Always use “Three Point Contact” when mounting or dismounting the machine. “Three Point Contact” means that three out of four arms and legs are in contact with the machine at all times during mount or dismount.

Clean your shoes and wipe your hands before mounting machine. Always use hand-hold and step when mounting.

Face the access system while climbing on or off the loader.

Never use control levers as a hand-hold when mounting or dismounting the machine. Never step on foot controls when mounting or dismounting the machine.

Never attempt to mount a moving machine.

**OPERATING NEAR ELECTRIC POWER LINES**

ELECTROCUTION HAZARD

Keep all parts of the machine at least 50 feet (16m) from powerlines. Contact with high voltage will cause serious injury or death.

All local, state/provincial and federal regulations must be met before approaching power lines, overhead or underground cables or power sources with any part of the loader. Do not operate the machine near energized power lines. Always contact the electrical power company when operating near power lines. The lines should be moved, insulated, disconnected, or de-energized and grounded before operating in the area. Keep all parts of the machine at least 50 feet (16m) away from power lines. (See also “Know the Work Area” on page 8.)
GENERAL OPERATING PROCEDURES

STARTING PROCEDURES
Before operating, walk completely around the machine. Make certain no one is under it, on it or close to it. Let all other workers and bystanders know you are preparing to start. **DO NOT** operate until everyone is clear.

Always mount the machine properly and be seated in the operators seat before operating any loader controls.

**To start...**
1. Make sure all controls are in the center (neutral) position.
2. Engage the Power Take-off.
3. Be properly seated.
4. Disengage swing lock.

Start-up In Cold Weather...
Start up must include warming the loader’s hydraulic system before operation.

5. Set the stabilizers. See “Setting the Stabilizers” below.
6. Progressively move each function a small distance back and forth until a full cycle has been accomplished. This will allow warm oil to circulate in the cylinders and other system components. Check for proper operation and loader stability.

SETTING THE STABILIZERS
Set the stabilizers to stabilize and level the empty truck or trailer bed. Adjust the stabilizers as the weight of the load on the bed increases. The stabilizers are designed to stabilize the loader, not to support the weight of a loaded bed or to lift the tires off of the ground.

**WARNING**
Always lower and properly set both stabilizers before operating the machine. Failure to do so may cause instability and may result in serious injury or death.

**CRUSHING HAZARD**
Keep away from moving stabilizers. Failure to do so may result in serious injury or death.

1. Clear all persons away from the area of the stabilizers.
2. Clear ice and snow from the area where the stabilizer pads will contact the ground.
3. Lower BOTH stabilizers making sure they are positioned on solid ground. The loader must level relative to the ground.

4. In warm weather, slowly operate all hydraulic functions through a full cycle to check proper operation and loader stability. In cold conditions, see “Start-up In Cold Weather…” on page 10 for those procedures.

SHUTDOWN PROCEDURES
Correct shutdown is important to the safe operation of the machine.

1. Return boom to the transport position.
2. Engage the swing lock.
3. Fully raise stabilizers.
4. Disengage the P.T.O. Shut down power unit, if equipped.

LIFT THE LOAD SAFELY
The hydraulic system has been preset and tested by your dealer. Do not alter hydraulic pressure settings without consulting an authorized SERCO dealer. Doing so will void the warranty and may cause structural damage, accidents or tipping.

- Make sure the load is held securely in the grapple. Do not move a load in a grapple if load is loose or dangling.
- If moving a single log, make sure the log is pinched between the grapple jaws/arms—never loosely cradle a load.
- For greater stability, knuckle the boom to bring the load closer to the center of rotation while lifting.
- Be extra careful extending the boom when the truck/trailer is empty or lightly loaded. Stability increases as the load on the truck/trailer increases.

PLACE THE LOAD SAFELY
• Properly place materials (logs, rail ties, rails, scrap or other materials) as straight and even as possible to maintain a minimum load width on truck/trailer and to avoid having materials sliding out of the pile.
• Place the load gently. Do not throw or drop the load.
• Operate the controls smoothly and gradually. Jerking the controls is hazardous, slows down operations and may cause loader damage.

RELOCATING THE LOADER
Important: Do not relocate or transport with the operator or any person on the loader.

1. Place boom on the rest. Do not leave boom raised or swung over side.
2. Fully raise stabilizers.
3. Engage swing lock.
4. Fold down seat.
5. Disengage P.T.O.

FALLING OBJECT HAZARD
Never move loads over or near people. Falling load may cause serious injury or death.
MAINTENANCE

MAINTENANCE SAFETY
Only trained and authorized persons should service the machine. To be qualified, you must have training and know the safety rules and regulations of the job. Never operate machinery if an unsafe condition exists. Inspect the equipment daily. DO NOT operate if poorly maintained or damaged. If an unsafe condition exists, immediately shut the machine down and report the situation to the proper authority. Do not alter or change the physical, mechanical or hydraulic operation of the loader as this can cause machine failures and will void the warranty. Be sure you understand service procedures before working on the equipment. DO NOT ATTEMPT REPAIRS YOU DO NOT UNDERSTAND. If any questions arise regarding a safety or maintenance procedure, contact a SERCO dealer.

HYDRAULIC OIL HAZARDS

Hot hydraulic oil and system components may cause severe burns. Wear proper protective clothing and safety equipment.

Avoid High-Pressure Oils
Escaping oil under pressure can penetrate the skin causing serious injury. Never search for leaks with your hands. Protect hands. Use a piece of cardboard to find location of escaping oil. Stop PTO and relieve pressure before disconnecting lines or working on hydraulic system. If hydraulic oil penetrates your skin, get medical attention immediately.

The hydraulic system is under pressure whenever the PTO is engaged and running, and can hold pressure after shutdown. After the boom is resting on a support, make sure pressure is relieved from all hydraulic lines and components before removing them.
Remember the following during inspection of the hydraulic system:

- Wait for fluid to cool down before disconnecting lines.
- Stay away from possible high pressure leaks. High pressure hydraulic fluid can be injected into the blood stream and will cause serious injury or death. If absolutely necessary, use a piece of cardboard or paper to search for leaks.
- Wear appropriate eye protection.
- If any hydraulic fluid is injected into the skin, get medical attention immediately.

**GENERAL MAINTENANCE RULES**

A program of regular service should be established for maintaining the loader. Use the service schedules outlined in this manual as a guide for periodic maintenance and inspection. The intervals may need to be shortened when operating in extreme conditions.

**BREAK-IN PERIOD**

During first use the loader is subject to the initial cycling of the structural and hydraulic components. This initial operation is an important time to inspect for any unusual structural circumstances and to flush impurities from the hydraulic system.

It is essential that certain procedures are performed between the first 80 to 100 hours of operation.

Refer to “Scheduled Maintenance” on page 21 to perform these procedures.

**LUBRICANTS AND FLUIDS**

Grease is an important lubricant for reducing wear on moving parts. Daily greasing prevents oxidation and flushes out old grease which may contain dirt or other abrasives that cause premature wear.

Always clean up the lubrication areas after greasing them, and dispose of waste lubricants properly.

The longevity of the hydraulic system is very dependant on the cleanliness and proper amounts of fluids. It is very important that the oil is kept clean before changing or adding to the hydraulic system. Store and transport oil in approved clean containers. The hydraulic system is equipped with filters in the reservoir. It is very important that these filters are kept clean by changing the system oil and filters every 1000 hours of use. Dispose of fluids properly.

<table>
<thead>
<tr>
<th>Item</th>
<th>Fluid/Lubricant</th>
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<tbody>
<tr>
<td>Grease Fittings</td>
<td>Lithium EP #2</td>
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<tr>
<td>Gear Teeth</td>
<td>Requires heavy-duty open gear lubricant, such as:</td>
</tr>
<tr>
<td>Gear Box</td>
<td>MIL-L-2105 or API-GL-5 lubricant. For operating in temperatures less than -10° F (-23° C) use 75 WT lubricant and for temperatures more than +10° F (-12° C) use 80–90 WT.</td>
</tr>
<tr>
<td>Hydraulic Oil</td>
<td>Choose a high-grade, multi-viscosity oil, such as:</td>
</tr>
<tr>
<td>Viscosity index:</td>
<td>100 minimum</td>
</tr>
</tbody>
</table>

**Operating Temperatures**

Hydraulic oil heater recommended when operating in temperatures below 25° F.

Normal operating temperature should not exceed 180° F. Maximum operating temperature must not exceed 190° F. Hydraulic oil cooler recommended when system operating temperature exceeds 180° F or when subjected to continuous duty.

**Note:** Do not use a molybdenum (moly) grease in the rotation bearing ball path. This is an open gear lubricant which creates a film coating that will cling to the roller balls and prevent them from rolling.
TORQUE SPECIFICATIONS

General Torques for Standard Bolts, Capscrews, and Nuts

Table 2 lists torque values for standard bolts and nuts. They are intended as a guide for typical applications. Values for specific applications take precedence over those in the following tables.

Note: Values are for plated or lubricated bolts and nuts.

**SAE BOLT HEAD MARKINGS**

![SAE Bolt Head Markings](image)

**SAE NUT MARKINGS**

![SAE Nut Markings](image)

Table 2. General Torques for Standard Bolts, Capscrews, and Nuts

<table>
<thead>
<tr>
<th>Size</th>
<th>SAE Grade 2</th>
<th>SAE Grade 5, 5.1, 5.2</th>
<th>SAE Grade 8, 8.2</th>
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<tr>
<td>8-32</td>
<td>14 in-lbs</td>
<td>22 in-lbs</td>
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<td>8-36</td>
<td>21 in-lbs</td>
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<td>10-24</td>
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<td>23 in-lbs</td>
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<td>1/4-20</td>
<td>50 in-lbs</td>
<td>75 in-lbs</td>
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<td>56 in-lbs</td>
<td>86 in-lbs</td>
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<td>96 in-lbs</td>
<td>156 in-lbs</td>
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<td>108 in-lbs</td>
<td>168 in-lbs</td>
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<td>180 in-lbs</td>
<td>276 in-lbs</td>
<td>35 ft-lbs</td>
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<td>204 in-lbs</td>
<td>300 in-lbs</td>
<td>35 in-lbs</td>
</tr>
<tr>
<td>7/16-14</td>
<td>288 in-lbs</td>
<td>35 ft-lbs</td>
<td>55 in-lbs</td>
</tr>
<tr>
<td>7/16-20</td>
<td>324 in-lbs</td>
<td>40 in-lbs</td>
<td>60 in-lbs</td>
</tr>
<tr>
<td>1/2-13</td>
<td>35 ft-lbs</td>
<td>55 in-lbs</td>
<td>80 in-lbs</td>
</tr>
<tr>
<td>1/2-20</td>
<td>40 in-lbs</td>
<td>65 in-lbs</td>
<td>90 in-lbs</td>
</tr>
<tr>
<td>9/16-12</td>
<td>50 in-lbs</td>
<td>80 in-lbs</td>
<td>110 in-lbs</td>
</tr>
<tr>
<td>9/16-18</td>
<td>55 in-lbs</td>
<td>90 in-lbs</td>
<td>130 in-lbs</td>
</tr>
<tr>
<td>5/8-11</td>
<td>70 in-lbs</td>
<td>110 in-lbs</td>
<td>170 in-lbs</td>
</tr>
<tr>
<td>5/8-18</td>
<td>80 in-lbs</td>
<td>130 in-lbs</td>
<td>180 in-lbs</td>
</tr>
<tr>
<td>3/4-10</td>
<td>120 in-lbs</td>
<td>200 in-lbs</td>
<td>280 in-lbs</td>
</tr>
<tr>
<td>3/4-16</td>
<td>140 in-lbs</td>
<td>220 in-lbs</td>
<td>320 in-lbs</td>
</tr>
<tr>
<td>7/8-9</td>
<td>110 in-lbs</td>
<td>300 in-lbs</td>
<td>460 in-lbs</td>
</tr>
<tr>
<td>7/8-14</td>
<td>120 in-lbs</td>
<td>320 in-lbs</td>
<td>500 in-lbs</td>
</tr>
<tr>
<td>1-8</td>
<td>160 in-lbs</td>
<td>440 in-lbs</td>
<td>740 in-lbs</td>
</tr>
<tr>
<td>1-12</td>
<td>170 in-lbs</td>
<td>480 in-lbs</td>
<td>740 in-lbs</td>
</tr>
</tbody>
</table>

UNC Threads in White Rows

UNF Threads in Gray Rows
Hydraulic Fitting Torques

JIC and SAE Female Swivel Nuts

The recommended method is to torque the nut to the approximate minimum value. If leaks are found, then tighten the nut without exceeding the maximum torque value. Always use two wrenches on line nuts.

Table 3. Torque for JIC and SAE Female Swivel Nuts

<table>
<thead>
<tr>
<th>Size</th>
<th>SAE Port Thread Size</th>
<th>Approx. Min. Torque</th>
<th>Max. Torque Flatsa</th>
</tr>
</thead>
<tbody>
<tr>
<td>-4</td>
<td>7/16-20</td>
<td>130 in-lbs</td>
<td>150 in-lbs</td>
</tr>
<tr>
<td>-5</td>
<td>1/2-20</td>
<td>165 &quot;</td>
<td>195 &quot;</td>
</tr>
<tr>
<td>-6</td>
<td>9/16-18</td>
<td>235 &quot;</td>
<td>265 &quot;</td>
</tr>
<tr>
<td>-8</td>
<td>3/4-16</td>
<td>44 ft-lbs</td>
<td>48 ft-lbs</td>
</tr>
<tr>
<td>-10</td>
<td>7/8-14</td>
<td>50 &quot;</td>
<td>58 &quot;</td>
</tr>
<tr>
<td>-12</td>
<td>1 1/6-12</td>
<td>79 &quot;</td>
<td>88 &quot;</td>
</tr>
<tr>
<td>-16</td>
<td>1 5/16-12</td>
<td>117 &quot;</td>
<td>125 &quot;</td>
</tr>
<tr>
<td>-20</td>
<td>1 5/8-12</td>
<td>150 &quot;</td>
<td>175 &quot;</td>
</tr>
<tr>
<td>-24</td>
<td>1 7/8-12</td>
<td>188 &quot;</td>
<td>213 &quot;</td>
</tr>
<tr>
<td>-32</td>
<td>2 1/2-12</td>
<td>250 &quot;</td>
<td>283 &quot;</td>
</tr>
</tbody>
</table>

a. Number of flats on the nut to be turned past finger tight. This method produces the approximate torque value.

Non-adjustable O-ring Fittings

To install straight thread, non-adjustable O-ring fittings:

1. Check the condition of the O-ring and replace as necessary. Do not install a fitting with a damaged O-ring.
2. Lubricate the O-ring with clean hydraulic fluid.
3. Back off the locknut fully.
4. Screw the fitting into the port until the backup washer contacts the port face.
5. Position the fitting by unscrewing a maximum of one turn.
6. Hold the fitting in position with a wrench and torque per Table 5.

Table 4. Torque for Non-adjustable O-ring Fittings

<table>
<thead>
<tr>
<th>Size</th>
<th>SAE Port Thread Size</th>
<th>Minimum Torque</th>
<th>Maximum Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2</td>
<td>5/16-24</td>
<td>85 in-lbs</td>
<td>95 in-lbs</td>
</tr>
<tr>
<td>-4</td>
<td>7/16-20</td>
<td>205 &quot;</td>
<td>235 &quot;</td>
</tr>
<tr>
<td>-6</td>
<td>9/16-18</td>
<td>25 ft-lbs</td>
<td>29 ft-lbs</td>
</tr>
<tr>
<td>-8</td>
<td>3/4-16</td>
<td>46 &quot;</td>
<td>50 &quot;</td>
</tr>
<tr>
<td>-10</td>
<td>7/8-14</td>
<td>85 &quot;</td>
<td>95 &quot;</td>
</tr>
<tr>
<td>-12</td>
<td>1 1/6-12</td>
<td>105 &quot;</td>
<td>115 &quot;</td>
</tr>
<tr>
<td>-16</td>
<td>1 5/16-12</td>
<td>154 &quot;</td>
<td>166 &quot;</td>
</tr>
<tr>
<td>-20</td>
<td>1 5/8-12</td>
<td>213 &quot;</td>
<td>237 &quot;</td>
</tr>
<tr>
<td>-24</td>
<td>1 7/8-12</td>
<td>238 &quot;</td>
<td>262 &quot;</td>
</tr>
</tbody>
</table>

Adjustable O-ring Fittings

To install straight thread, adjustable O-ring fittings:

1. Check the condition of the O-ring and replace as necessary. Do not install a fitting with a damaged O-ring.
2. Lubricate the O-ring with clean hydraulic fluid.
3. Back off the locknut fully.
4. Screw the fitting into the port until the backup washer contacts the port face.
5. Position the fitting by unscrewing a maximum of one turn.
6. Hold the fitting in position with a wrench and torque per Table 5.
O-ring Plugs

To install straight thread O-ring plugs:

1. Check the condition of the O-ring and replace as necessary. Do not install a plug with a damaged O-ring.
2. Lubricate the O-ring with clean hydraulic fluid. For hollow hex head plugs, torque per Table 6. For hex head plugs, torque per Table 7.

<table>
<thead>
<tr>
<th>Size</th>
<th>SAE Port Thread Size</th>
<th>Minimum Torque</th>
<th>Maximum Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2</td>
<td>5/16-24</td>
<td>30 in-lbs</td>
<td>40 in-lbs</td>
</tr>
<tr>
<td>-4</td>
<td>7/16-20</td>
<td>125 &quot;</td>
<td>145 &quot;</td>
</tr>
<tr>
<td>-6</td>
<td>9/16-18</td>
<td>210 &quot;</td>
<td>230 &quot;</td>
</tr>
<tr>
<td>-8</td>
<td>3/4-16</td>
<td>44 ft-lbs</td>
<td>48 ft-lbs</td>
</tr>
<tr>
<td>-10</td>
<td>7/8-14</td>
<td>70 &quot;</td>
<td>80 &quot;</td>
</tr>
<tr>
<td>-12</td>
<td>1 1/8-12</td>
<td>80 &quot;</td>
<td>90 &quot;</td>
</tr>
<tr>
<td>-16</td>
<td>1 5/16-12</td>
<td>129 &quot;</td>
<td>141 &quot;</td>
</tr>
<tr>
<td>-20</td>
<td>1 5/8-12</td>
<td>213 &quot;</td>
<td>237 &quot;</td>
</tr>
<tr>
<td>-24</td>
<td>1 7/8-12</td>
<td>238 &quot;</td>
<td>262 &quot;</td>
</tr>
</tbody>
</table>

Pipe Thread Fittings

To install National Pipe Thread (NPT) fittings:

1. Apply sealant sparingly to the male pipe threads only. Avoid the first few threads at the end of the fitting. Do not use Teflon tape or excessive amounts of sealant. This may contaminate the system.
2. Install the fitting and tighten per Table 8.

<table>
<thead>
<tr>
<th>Size</th>
<th>Thread Size (NPT)</th>
<th>Turnsa</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2</td>
<td>1/16-27</td>
<td>2–3</td>
</tr>
<tr>
<td>-4</td>
<td>1/8-27</td>
<td>2–3</td>
</tr>
<tr>
<td>-6</td>
<td>1/4-18</td>
<td>1.5–3</td>
</tr>
<tr>
<td>-8</td>
<td>3/8-18</td>
<td>2–3</td>
</tr>
<tr>
<td>-10</td>
<td>1/2-14</td>
<td>2–3</td>
</tr>
<tr>
<td>-12</td>
<td>3/4-14</td>
<td>2–3</td>
</tr>
<tr>
<td>-16</td>
<td>1-11.5</td>
<td>1.5–2.5</td>
</tr>
<tr>
<td>-20</td>
<td>1 1/4-11.5</td>
<td>1.5–2.5</td>
</tr>
<tr>
<td>-24</td>
<td>1 1/2-11.5</td>
<td>1.5–2.5</td>
</tr>
</tbody>
</table>

a. Turns past finger tight.
Boom Pivots

FIGURE 1. Boom Pivot Locations

Torque Valves for Boom Pivots:
1. Booms with tapered bearings 600-800 ft-lbs
2. Booms with bushings adjust to zero clearance, (figure 2)

Note: SERCO supplies a 2 in. wrench with each loader for this purpose.

FIGURE 2. Boom Pivot Adjustment

The pivot bolts should be adjusted according to the service schedule on page 22, and whenever play is detected at the pivots.

Turntable Bearing and Swing Motor/Gearbox Bolts

FIGURE 3. Bolt Locations

Table 9. Torques for Turntable Bearing and Swing Motor/Gearbox Bolts

<table>
<thead>
<tr>
<th>Bolt</th>
<th>Spec.</th>
<th>Ft-lbs</th>
<th>N-m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swing Motor</td>
<td>1/2-13 UNC</td>
<td>108</td>
<td>146</td>
</tr>
<tr>
<td>Swing Gearbox</td>
<td>3/4-10 UNC</td>
<td>350</td>
<td>475</td>
</tr>
<tr>
<td>Manifold</td>
<td>1/2-13 UNC</td>
<td>108</td>
<td>146</td>
</tr>
<tr>
<td>Turntable</td>
<td>3/4-10 UNC</td>
<td>350</td>
<td>475</td>
</tr>
</tbody>
</table>

Turntable bolt torque values are for bolts coated with antiseize compound. Bolts torqued to value without antiseize compound may fail. Bolts must be cleaned and threads coated with antiseize compound. **Do not** put any antiseize compound on the washer or bolt head. **Do not** use any antiseize at all when hex nuts are used.

**Antiseize Compound Specifications:**
- CRC Copper Anti-Seize
- Meets MIL-PRF-907
- Torque Coefficient (k) 0.10 on steel nuts & bolts

a. If a broken bolt is found, the bolts on each side of the broken bolt must be replaced. Torque these initially to 225 ft-lbs (305 N-m), then fully torque to the specification shown. (Continued on next page.)
b. If maintenance records do not show the service and maintenance performed on these bolts, **all** turntable bolts must be replaced at annual inspection.

Maintain torques according to the service schedule on page 22.

**Loader Mounting Bolts**

![Loader Mounting Bolts Diagram]

<table>
<thead>
<tr>
<th>Bolt</th>
<th>Spec.</th>
<th>Ft-lbs</th>
<th>N-m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting Bolt</td>
<td>1 1/4-7 UNC</td>
<td>700</td>
<td>950</td>
</tr>
</tbody>
</table>

Check that the compressions pipes are straight and secure. Maintain torques according to the service schedule on page 22.

**DAILY LUBRICATION AND FLUID CHECK**

**Grease Fittings**

(Refer to “Grease Locations” on page 20.) Pump grease into all fittings until grease is seen coming from the joints. Be sure to clean up excess grease and dispose of it properly.

**Rotation Bearing Ball Path**

Pump grease into the rotation bearing grease fitting located on the operator platform. Rotate slowly through two rotations while greasing to distribute grease.

**Rotation Bearing/Pinion Gear Teeth**

![Rotation Bearing/Pinion Gear Teeth Diagram]

**WARNING**

**PINCH HAZARD**

Keep away from pinion/ring gear meshing areas. Failure to do so may result in serious injury or death.

Use a putty knife or spray to apply an open gear lubricant. To avoid injury, keep hands away from the pinion/ring gear meshing points and DO NOT apply grease to the gear teeth with your hands.

**Hydraulic Tank Breather**

![Hydraulic Tank Breather Diagram]

(Ref. Figure 5) To clean the hydraulic tank breather:

1. Turn the breather cap to remove.
2. Clean all air passages and replace.
Hydraulic Fluid

(Ref. Figure 5) To check the hydraulic oil level:

1. Make sure the boom is straight (90° to frame) and the stabilizers are fully retracted.
2. Remove the dipstick. The oil level should be approximately five (5) inches from the cap of the stick.
3. Add oil through the breather pipe if the distance is greater than six (6) inches. Do not overfill the tank.

Swing Gearbox

(Ref. Figure 6) To check the swing gearbox fluid level:

1. Clean area around fill and full line plugs.
2. Check fluid level after remaining stationary for 1 hour.
3. Remove plug on top of gear box. Use flexible tie strap and insert in fill plug to check fluid level. 6 series (7000 & 7500 Series) require 38 oz and 8 series (8000 & larger) require 110 oz of recommended weight gear lube.
4. Replace fill plug.
GREASE LOCATIONS

Grease Fittings
1. Stabilizer Cylinder Rod Pin
2. Hydraulic Hose Swivel Fitting (if equipped)
3. Stabilizer Cylinder Base Pin
4. Rotation Bearing Ball Path
5. Pinion/Ring Gear
6. Control Lever Linkage
7. Swing Pedal pivot and Linkages
8. Main Boom Pivot Pin
9. Main Cylinder Base Pin
10. Main Cylinder Rod Pin
11. Jib Cylinder Base Pin
12. Jib Cylinder Rod Pin
13. Jib Boom Knuckle Pin
14. Hanger Pins
15. Grapple Cylinder Pins
16. Grapple Arm Pins
17. Grapple Rotation Bearings (noncontinuous only)
18. Rotation Manifold (continuous rotation)
SCHEDULED MAINTENANCE

Performing scheduled maintenance will keep your loader in the safest, most reliable condition. Inspection and lubrication of important components are explained on the following chart and pages of this manual.

Service is critical. If you are not familiar with safe service procedures, have a SERCO dealer perform these operations.

These scheduled service items are in addition to the those stated in “Daily Lubrication and Fluid Check” on page 18. The service in this section must be performed by a person qualified in these types of inspection and maintenance procedures.

The recommended intervals may need to be shortened when operating in extreme conditions.

- Read the entire Owner and Operator Manual. Be sure all personnel understand the maintenance and safety procedures.
- Use factory authorized parts. The use of unauthorized parts may compromise safety, performance and durability of the loader and void warranty.
- Follow the daily check list and maintenance intervals described in “Daily Lubrication and Fluid Check” on page 18. Extreme conditions may dictate shorter maintenance intervals.

Do not exceed bolt torque specifications. See “Torque Specifications” on page 14.

Do not work on any hydraulic component while it is hot or without relieving pressure.

Do not weld on any structural component without consulting the factory. Doing so may cause structural failure and void warranty.

Do not work on the loader before insuring it will not move. Block carrier tires and set parking brake. Completely lower boom to the ground or a rest position and relieve hydraulic pressure by moving the controls with the power off.

DO NOT operate a poorly maintained loader. If maintenance is required, repair or replace parts immediately.

Never substitute bolts or pins. Always use factory supplied pins. Replace all bolts with the same size and grade. Failure to do so may cause serious injury or death.
## SERVICE SCHEDULE

<table>
<thead>
<tr>
<th>Item</th>
<th>First 80–100 hrs</th>
<th>600 hrs / 3 months</th>
<th>1200 hrs / 6 months</th>
<th>Annual Inspection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolt Torques</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turntable Bearing (see page 17)</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
</tr>
<tr>
<td>Swing Gearbox (see page 17)</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
</tr>
<tr>
<td>Swing Motor (see page 17)</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
</tr>
<tr>
<td>Hydraulic Manifold (cont. rotation)</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
</tr>
<tr>
<td>(see page 17)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main Boom Pivot (see page 17)</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
</tr>
<tr>
<td>Jib Boom Pivot (see page 17)</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
</tr>
<tr>
<td>Cylinder Pivots</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
</tr>
<tr>
<td>Loader Mounting (see page 18)</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
</tr>
<tr>
<td>Fluids</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gearbox Lube</td>
<td>Change</td>
<td>Check</td>
<td>Change</td>
<td></td>
</tr>
<tr>
<td>Hydraulic Filters</td>
<td>Change</td>
<td>Check</td>
<td>Change</td>
<td></td>
</tr>
<tr>
<td>Hydraulic Fluid</td>
<td>Check</td>
<td>Check</td>
<td>Change</td>
<td></td>
</tr>
<tr>
<td>Hydraulic Tank Breather</td>
<td>Clean</td>
<td>Clean</td>
<td>Clean</td>
<td></td>
</tr>
<tr>
<td>General</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inspect for metal fatigue and cracks</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
</tr>
<tr>
<td>Load Range Diagram decal in place</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
</tr>
<tr>
<td>Proper hydraulic pressure</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
</tr>
<tr>
<td>Main Relief Tamper-proof seals intact</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
</tr>
<tr>
<td>Unsafe modifications</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
<td>Check</td>
</tr>
</tbody>
</table>

Follow this service schedule and circle the items performed at each recommended service interval. Service intervals may need to be shortened if operating in extreme conditions, such as dusty, hot or heavy usage conditions. Copies should be made of this schedule so the person performing the operations can sign and date in the area provide below. This record should be kept for reference and for the person performing the annual inspection.

### Annual Inspection

An annual inspection should be done to the entire loader, with particular emphasis to the items listed on the checklist in the Annual Inspection column. This inspection should be performed by a person who has the knowledge, training and experience to evaluate these items and determine if an unsafe condition needs repair or replacement.

Date: __________ Performed By: ___________________________ Model: _________ Serial No: _________________
# OPERATOR MAINTENANCE RECORD

<table>
<thead>
<tr>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
</tr>
</tbody>
</table>

Use this form to record maintenance performed by the operator, such as daily maintenance tasks. Copies should be made of this schedule so the person performing the operations can sign and date in the area provide below.

Date: ________ Performed By: ________________________ Model: _________ Serial No: ________________