

# Mayo



## **HOPPER UNLOADER**

### **OPERATORS MANUAL**



## **MAYO MANUFACTURING, INC. LIMITED WARRANTY**

THE FOLLOWING WARRANTIES FOR MACHINERY, EQUIPMENT OR PARTS SOLD BY MAYO MANUFACTURING, INC. ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, OR THOSE WARRANTIES IMPOSED BY STATUE, INCLUDING, BUT NOT LIMITED TO ANY AND ALL IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND OF ANY AND ALL OTHER WARRANTY OBLIGATIONS ON THE PART OF MAYO MANUFACTURING, INC. (The Company).

The Company warrants the machinery, equipment or parts delivered against faulty workmanship or the use of parts delivered against faulty workmanship or the use of defective materials for a period of one (1) year from the date of shipment.

The Company's warranties set forth above are the only warranties made by the Company and shall not be enlarged, diminished or affected by, and no obligation or liability shall arise out of the Company's rendering technical or other advice or service in connection with the machinery, equipment or parts.

Parts or components furnished to the Company by third persons are guaranteed only to the extent of the original manufacturer's guarantee to the Company, a copy of which will be supplied to the Purchaser upon written request to the Company.

### **LIABILITY**

THE COMPANY'S SOLE AND EXCLUSIVE MAXIMUM LIABILITY, AND PURCHASER'S SOLE AND EXCLUSIVE REMEDY under the above warranty shall be, at the Company's option, the repair, or replacement of the machine, equipment or part which is found to be defective due to faulty workmanship or defective materials, and is returned by the Purchaser to the Company within the warranty period. Shipment both ways and in transit damage shall be at the purchaser's risk and expense. If the Company elects to repair or replace the machine, equipment, or part, the Company will have a reasonable time within which to do so.

The remedies set forth above are available upon the following conditions:

1. Purchaser has promptly notified Company upon discovery that the machinery, equipment, or parts are defective due to faulty workmanship or defective materials; and
2. Purchaser provides Company with a detailed description of the deficiencies; and
3. Company's examination discloses that the alleged deficiencies exist and were not caused by accident, fire, misuse, neglect, alteration, or any other hazard or by Purchaser's improper installation, use or maintenance.

Such repair or replacement shall constitute fulfilment of all Company's liability to Purchaser, whether based on contract or tort.

This warranty does not apply to any machine that has been altered outside the factory in any way so as, in the judgement of Mayo, to affect its operation, reliability or safety, or which has been subject to misuse, neglect or accident.

In the event the Company breach any other provisions of the Purchase Agreement, the Company's EXCLUSIVE MAXIMUM LIABILITY AND PURCHASER'S EXCLUSIVE REMEDY, whether in contract or tort, otherwise shall not in any event exceed the contract price for the particular machine, piece of equipment or parts involved.

IN NO EVENT SHALL COMPANY BE LIABLE TO ANYONE FOR SPECIAL, COLLATERAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES FOR BREACH OF ANY PROVISIONS OF THIS CONTRACT OR WARRANTY. SUCH EXCLUDE DAMAGES INCLUDE, BUT ARE NOT LIMITED TO, costs of REMOVAL AND REINSTALLATION OF ITEMS, Loss of GOODWILL, LOSS OF PROFITS, LOSS OF USE OR INTERRUPTION OF BUSINESS.

**WARRANTY VOID IF NOT REGISTERED**



# MAYO MANUFACTURING, INC.

## MODEL 950 HOPPER UNLOADER

### WARRANTY REGISTRATION FORM & INSPECTION REPORT

#### WARRANTY REGISTRATION

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

Customer's Name \_\_\_\_\_

Dealer's Name \_\_\_\_\_

Address \_\_\_\_\_

Address \_\_\_\_\_

City, State/Prov., Code \_\_\_\_\_

City, State/Prov., Code \_\_\_\_\_

Phone Number ( \_\_\_\_\_ ) \_\_\_\_\_

Conveyor Model \_\_\_\_\_

Serial Number \_\_\_\_\_

Delivery Date \_\_\_\_\_

#### DEALER INSPECTION REPORT

\_\_\_\_ Tire Pressure Checked  
\_\_\_\_ Wheel Bolts Torqued  
\_\_\_\_ Inspect Electrical System  
\_\_\_\_ Lubricate Machine  
\_\_\_\_ Conveyor Tensioned and Aligned  
\_\_\_\_ Speed Reducer Gearbox Oil Level Checked  
\_\_\_\_ Wheel Drive Chain and Sprockets Aligned  
\_\_\_\_ Frame Anchor Chain Connected

#### SAFETY

\_\_\_\_ All Decals Installed  
\_\_\_\_ All Guards Installed  
\_\_\_\_ Review Operating and Safety Instructions

I have thoroughly instructed the buyer on the above described equipment which review included the Operator's Manual content, equipment care, adjustments, safe operation and applicable warranty policy.

Date \_\_\_\_\_

Dealer's Rep. Signature \_\_\_\_\_

Signature \_\_\_\_\_

The above equipment and Operator's Manual have been received by me and I have been thoroughly instructed as to care, adjustments, safe operation and applicable warranty policy.

Date \_\_\_\_\_

Owner's Signature \_\_\_\_\_

WHITE	YELLOW	PINK
MAYO MFG., INC.	DEALER	CUSTOMER



## SERIAL NUMBER LOCATION

Always give your dealer the serial number of your Mayo Scale Conveyor when ordering parts or requesting service or other information.

The serial number plate is located where indicated. Please mark the number in the space provided for easy reference.



### SERIAL NUMBER LOCATION

Model Number \_\_\_\_\_

Serial Number \_\_\_\_\_





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# 1 INTRODUCTION

Congratulations on your choice of a Mayo Model 950 Hopper Unloader and welcome to Mayo's quality line of potato handling equipment. This equipment is designed and manufactured to meet the needs of a discriminating buyer in the agricultural industry for the loading, unloading, processing and storing of harvest yields.

Safe, efficient and trouble free operation of your new Mayo Hopper Unloader requires that you, and anyone else who will be operating or maintaining the Hopper Unloader, read, understand and practice ALL of the Safety, Operation, Maintenance and Troubleshooting recommendations contained within this Operator's Manual.



This manual applies to all Model 950 Hopper Unloaders manufactured by Mayo. Certain options may be available to specifically tailor the Hopper Unloader to your operation and may not be included in this manual. Please contact the manufacturer regarding additional information about these options. Use the Table of Contents and Index as a guide to find specific information.

Keep this manual handy for frequent reference and so that it will be passed on to new operators or owners. Call your Mayo dealer if you need assistance, information or additional copies of this manual.

**MACHINE ORIENTATION** - The hopper of the Hopper Unloader is the front. All electrical controls are on the left side of the frame.



## 2 SAFETY

### SAFETY ALERT SYMBOL

This Safety Alert symbol means  
**ATTENTION! BECOME ALERT!**  
**YOUR SAFETY IS INVOLVED!**



The Safety Alert symbol identifies important safety messages on your Mayo Hopper Unloader 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.

**Why is SAFETY important to you?**

#### 3 Big Reasons

**Accidents Disable and Kill**  
**Accidents Cost You Money**  
**Accidents Can Be Avoided**

#### **SIGNAL WORDS:**

Note the use of the signal words **DANGER**, **WARNING** and **CAUTION** with the safety messages. The appropriate signal word for each message has been selected using the following guide-lines:

- |                  |                                                                                                                                                                                                                                                                |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>DANGER -</b>  | 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 that, for functional purposes, cannot be guarded. |
| <b>WARNING -</b> | Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.                               |
| <b>CAUTION -</b> | 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.                                                                                               |

If you have any questions not answered in this manual or require additional copies or the manual is damaged, please contact your dealer or Mayo, P.O. Box 497, Bus Highway 2, East Grand Forks, Minnesota, 56721. (Telephone) 218-773-1234, (FAX) 218-773-6693 or toll free at 1-800-223-5873.





## SAFETY

**YOU** are responsible for the **SAFE** operation and maintenance of your Mayo Hopper Unloader. **YOU** must ensure that you and anyone else who is going to operate, maintain or work around the Unloader be familiar with the operating and maintenance procedures and related **SAFETY** information contained in this manual. This manual will take you step-by-step through your working day and alerts you to all good safety practices while operating the Unloader.

Remember, **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** operating this machine is familiar with the procedures recommended and follows safety precautions. Remember, most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

- Read and understand the Operator's Manual and all safety signs before supplying power to, operating, maintaining or adjusting the Unloader.
- Hopper Unloader owners must give operating instructions to operators or employees before allowing them to operate the Unloader, and at least annually thereafter.
- The most important safety device on this equipment is a **SAFE** operator. It is the operator's responsibility to read and understand ALL Safety and Operating instructions in the manual and to follow these. Most accidents can be avoided.
- A person who has not read and understood all operating and safety instructions is not qualified to operate this machine. An untrained operator exposes himself and bystanders to possible serious injury or death.
- Do not modify the equipment in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the equipment.
- Think **SAFETY!** Work **SAFELY!**

## 2.1 GENERAL SAFETY

1. Read and understand the Operator's Manual and all safety signs before supplying power to, operating, maintaining or adjusting the Hopper Unloader. 
2. Only trained, competent persons shall operate the Hopper Unloader. An untrained operator is not qualified to operate this machine.
3. Provide a first-aid kit for use in case of an accident. Store in a highly visible place. 
4. Provide a fire extinguisher for use in case of an accident. Store in a highly visible place. 
5. Install and properly secure all guards and shields before operating.
6. Wear appropriate protective gear. This list includes but is not limited to:
  - Protective shoes with slip resistant soles
  - Protective glasses or goggles
  - Heavy gloves
  - Hearing protection
7. Turn machine OFF, place all controls in their OFF position, relieve hydraulic pressure, shut down and lockout power supply and wait for all moving parts to stop before servicing, adjusting, maintaining, repairing or cleaning. (Safety lockout devices are available through your Mayo dealer parts department).
8. Know the emergency medical center number for your area.
9. Review safety related items with all operators annually.

## 2.2 EQUIPMENT SAFETY GUIDELINES


1. Safety of the operator and bystanders is one of the main concerns in designing and developing a machine. However, every year many accidents occur which could have been avoided by a few seconds of thought and a more careful approach to handling equipment. You, the operator, can avoid many accidents by observing the following precautions in this section. To avoid personal injury or death, study the following precautions and insist those working with you, or for you, follow them.
2. In order to provide a better view, certain photographs or illustrations in this manual may show an assembly with a safety shield removed. However, equipment should never be operated in this condition. Keep all shields in place. If shield removal becomes necessary for repairs, replace the shield prior to use.
3. Replace any safety sign or instruction sign that is not readable or is missing. Location of such safety signs is indicated in this manual.
4. Never use alcoholic beverages or drugs which can hinder alertness or coordination while operating this equipment. Consult your doctor about operating this machine while taking prescription medications.
5. **Under no circumstances should young children be allowed to work with this equipment. Do not allow persons to operate or assemble this unit until they have read this manual and have developed a thorough understanding of the safety precautions and of how it works. Review the safety instructions with all users annually.**
6. This equipment is dangerous to children and persons unfamiliar with its operation. The operator should be a responsible, properly trained and physically able person familiar with farm machinery and trained in this equipment's operations. If the elderly are assisting with farm work, their physical limitations need to be recognized and accommodated.
7. Never exceed the limits of a piece of machinery. If its ability to do a job, or to do so safely, is in question - **DON'T TRY IT.**
8. Do not modify the equipment in any way. Unauthorized modification result in serious injury or death and may impair the function and life of the equipment.
9. In addition to the design and configuration of this implement, including Safety Signs and Safety Equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence, and proper training of personnel involved in the operation, transport, maintenance, and storage of the machine. Refer also to Safety Messages and operation instruction in each of the appropriate sections of the auxiliary equipment and machine Manuals. Pay close attention to the Safety Signs affixed to the auxiliary equipment and the machine.

## 2.3 STORAGE SAFETY

1. Store the Hopper Unloader on a firm level surface.
2. If required, make sure the unit is firmly blocked up.
3. Make certain that all mechanical locks are safely and positively connected before storing.
4. Store away from areas of human activity.
5. Do not allow children to play on or around the stored Hopper Unloader.
6. Lock out power by turning off master control panel or junction box and padlocking the door shut to prevent electrocution or unauthorized start up of the Hopper Unloader.



## 2.4 SAFETY TRAINING

1. Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by a single careless act of an operator or bystander.
2. In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of this equipment.
3. It has been said, "The best safety feature is an informed, careful operator." We ask you to be that kind of an operator. It is the operator's responsibility to read and understand ALL Safety and Operating instructions in the manual and to follow these. Accidents can be avoided.
4. **Working with unfamiliar equipment can lead to careless injuries. Read this manual, and the manual for your auxiliary equipment, before assembly or operating, to acquaint yourself with the machines. If this machine is used by any person other than yourself. It is the machine owner's responsibility to make certain that the operator, prior to operating:**
  - a. **Reads and understands the operator's manuals.**
  - b. **Is instructed in safe and proper use.**
5. Know your controls and how to stop pilers, stingers, Unloaders and any other auxiliary equipment quickly in an emergency. Read this manual and the one provided with your other equipment.
6. Train all new personnel and review instructions frequently with existing workers. Be certain only a properly trained and physically able person will operate the machinery. A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death. If the elderly are assisting with farm work, their physical limitations need to be recognized and accommodated.

## 2.5 SAFETY SIGNS

1. Keep safety signs clean and legible at all times.
2. Replace safety signs that are missing or have become illegible.
3. Replaced parts that displayed a safety sign should also display the current sign.
4. Safety signs displayed in Section 3 each have a part number in the lower right-hand corner. Use this part number when ordering replacement parts.
5. Safety signs are available from your authorized Distributor or Dealer Parts Department or the factory.

### How to Install Safety Signs:

- Be sure that the installation area is clean and dry.
- Be sure temperature is above 50°F (10°C).
- Determine exact position before you remove the backing paper. (See Section 3).
- Remove the smallest portion of the split backing paper.
- Align the sign over the specified area and carefully press the small portion with the exposed sticky backing in place.
- Slowly peel back the remaining paper and carefully smooth the remaining portion of the sign in place.
- Small air pockets can be pierced with a pin and smoothed out using the piece of sign backing paper.



## 2.6 PREPARATION

1. Never operate the Hopper Unloader and auxiliary equipment until you have read and completely understand this manual, the auxiliary equipment Operator's Manual, and each of the Safety Messages found on the safety signs on the machine and auxiliary equipment.

2. Personal protection equipment including hard hat, safety glasses, safety shoes, and gloves are recommended during assembly, installation, operation, adjustment, maintaining, repairing, removal, or moving the implement. Do not allow long hair, loose fitting clothing or jewelry to be around equipment.



3. **PROLONGED EXPOSURE TO LOUD NOISE MAY CAUSE PERMANENT HEARING LOSS!** Motors or equipment attached can often be noisy enough to cause permanent, partial hearing loss. We recommend that you wear hearing protection on a full-time basis if the noise in the Operator's position exceeds 80db. Noise over 85db on a long-term basis can cause severe hearing loss. Noise over 90db adjacent to the Operator over a long-term basis may cause permanent, total hearing loss. **NOTE:** Hearing loss from loud noise (from tractors, chain saws, radios, and other such sources close to the ear) is cumulative over a lifetime without hope of natural recovery.
4. Clear working area of debris, trash or hidden obstacles that might be hooked or snagged, causing injury, damage or tripping.
  5. Operate only in daylight or good artificial light.
  6. Be sure machine is properly anchored, adjusted and in good operating condition.
  7. Ensure that all safety shielding and safety signs are properly installed and in good condition.
  8. Before starting, give the machine a "once over" for any loose bolts, worn parts, cracks, leaks, frayed belts and make necessary repairs. Always follow maintenance instructions.



## 2.7 INSTALLATION SAFETY

1. Disconnect and remove all mechanical locks, anchor chains and any other locking devices that would hinder or prohibit the normal functioning of the Hopper Unloader upon start up. Serious damage to the machine and/or personal injury to the operator and bystanders may result from attempting to operate the machine while mechanical locking devices are still attached.
2. Position the machine on firm, level ground before operating.
3. Use leg ratchets to set the height of the discharge before loading.
4. Have at least one extra person available to assist when elevating, moving or connecting to other equipment.
5. Make certain that sufficient amperage, at the proper voltage and frequency (60Hz) is available before connecting power. All wiring should comply with ANSI/NFPA 70 electrical requirements. If you are uncertain, have a licensed electrician provide power to the machine.
6. If using Hopper Unloader as part of material handling system, anchor securely to other equipment before starting.

## 2.8 LOCK-OUT TAG-OUT SAFETY

1. Establish a formal Lock-Out Tag-Out program for your operation.
2. Train all operators and service personnel before allowing them to work around the Unloader.
3. Provide tags at the work site and a sign-up sheet to record tag out details.
4. Do not service or maintain the Unloader unless motors are OFF and the power locked out at the master panel. Keep others away.

## 2.9 OPERATING SAFETY

1. Make sure that anyone who will be operating the Hopper Unloader or working on or around the unit reads and understands all the operating, maintenance and safety information in the operator's manual. Also read and follow the instructions in the manuals of other equipment in the system.
2. **Turn machine OFF, place all controls in their OFF position, shut down and lock out power supply (safety lockout devices are available through your Mayo dealer parts department), relieve hydraulic pressure and wait for all moving parts to stop before servicing, adjusting, maintaining or repairing.**
3. Establish a lock-out tag-out policy for the work site. Be sure all personnel are trained in and follow all procedures. Lock-out tag-out all power sources before servicing the unit or working around loading/unloading equipment.
4. Install and properly secure all guards and shields before operating.
5. Replace all worn or failed components immediately.
6. Keep hands, feet, hair and clothing away from all moving parts.
7. Clear the area of bystanders, especially small children, before starting.
8. Make sure all control switches are in the off position before connecting power supply.
9. Keep all electrical components tight, dry and in good repair.
10. Use the turnbuckles to set the height of the discharge before loading.
11. Before supplying electrical power to the machine, be sure that you have adequate amperage at the proper phase and voltage to run it by following ANSI/NFPA 70 Wiring Standard. If you do not know or are unsure, consult a licensed electrician.
12. Keep the working area clean and dry.
13. Review safety instructions annually.

## 2.10 MAINTENANCE SAFETY

1. Read and understand all the information contained in the Operator's Manual regarding operating, servicing, adjusting, maintaining and repairing.
2. **Turn machine OFF, place all controls in their OFF position, shut down and lock out power supply (safety lockout devices are available through your Mayo dealer parts department), relieve hydraulic pressure and wait for all moving parts to stop before servicing, adjusting, maintaining or repairing.**
3. Exercise extreme caution when working around, or with, high-pressure hydraulic systems. Depressurize the system before working on it.
4. Follow good shop practices:
  - Keep service area clean and dry.
  - Be sure electrical outlets and tools are properly grounded.
  - Use adequate light for the job at hand.
5. Wear heavy gloves and eye protection when searching for suspected hydraulic leaks. Use a piece of wood or cardboard as a backstop instead of hand to isolate and identify a leak. A high pressure concentrated stream of hydraulic fluid can pierce the skin. If such happens, seek immediate medical attention as infection and toxic reaction could develop.
6. Make sure all guards and doors are in place and properly secured when operating the Hopper Unloader.
7. **Do not work on Unloader electrical system unless the power cord is unplugged or the power supply is locked out. Lock-out tag-out power source before performing any maintenance work.**

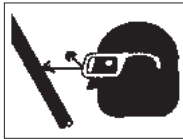


## 2.11 HYDRAULIC SAFETY

1. Make sure that all the components in the pump system are kept in good condition and are clean.
2. Before applying pressure to the system, make sure all components are tight, and that lines, hoses and couplings are not damaged.
3. Do not attempt any makeshift repairs to the hydraulic lines, fittings or hoses by using tapes, clamps or cements. The hydraulic system operates under extremely high pressure. Such repairs will fail suddenly and create a hazardous and unsafe condition.
4. Wear proper hand and eye protection when searching for a high pressure hydraulic leak. Use a piece of wood or cardboard as a backstop instead of hands to isolate and identify a leak.



5. If injured by a concentrated high-pressure stream of hydraulic fluid, seek medical attention immediately. Serious infection or toxic reaction can develop from hydraulic fluid piercing the skin surface.



## 2.12 ELECTRICAL SAFETY

1. Have only a qualified licensed electrician supply power. All wiring should comply with ANSI/NFPA 70 electrical requirements.
2. Make certain that the Hopper Unloader is properly grounded at the power source.
3. Make certain that all electrical switches are in the OFF position before plugging the Unloader in.
4. **Turn machine OFF, shut down and lock out power supply (safety lockout devices are available through your Mayo dealer parts department), relieve hydraulic pressure and wait for all moving parts to stop before servicing, adjusting, maintaining or repairing.**
5. Disconnect power before resetting any motor or breaker overload.
6. Replace any damaged electrical plugs, cords, switches and components immediately.
7. Do not work on Unloader electrical system unless the power cord is unplugged or the power supply is locked-out tagged-out.

## **2.13 TIRE SAFETY**

1. Inflate tires to proper pressure as specified on the side wall of each tire. Do not overinflate or under-inflate.
2. Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion which may result in serious injury or death.
3. Do not attempt to mount a tire unless you have the proper equipment and experience to do the job.
4. Have a qualified tire dealer or repair service perform required tire maintenance.

## **2.14 TRANSPORT SAFETY**

1. Make certain that you are in compliance with local, state/provincial and federal regulations regarding transporting agricultural equipment on public roadways.
2. Make certain that all mechanical locks and integral anchor chains are safely and positively connected before loading or transporting.
3. Fully retract the frame.
4. Rotate power cord boom parallel to machine frame.
5. Wrap up and bind to the frame all loose electrical ends.
6. Use a forklift to lift and position machine on a transport truck.
7. Securely tie down and anchor frame to truck before moving and transporting.

## 2.15 EMPLOYEE SIGN-OFF FORM

Mayo Manufacturing, Inc. follows the general Safety Standards specified by the American Society of Agricultural Engineers (ASAE) and the Occupational Safety and Health Administration (OSHA). Anyone who will be operating and/or maintaining a Mayo built machine must read and clearly understand ALL Safety, Operating and Maintenance information presented in this manual.

Do not operate or allow anyone else to operate this equipment until such information has been reviewed. Annually review this information before the season start-up.

Make these periodic reviews of SAFETY and OPERATION a standard practice for all of your equipment. We feel that an untrained operator is unqualified to operate this machine.

A sign-off sheet is provided for your record keeping to show that all personnel who will be working with the equipment have read and understand the information in the Operator's Manual and have been instructed in the operation of the equipment.

## SIGN-OFF FORM

[illegible]



### 3 SAFETY SIGN LOCATIONS

The types of safety signs and locations on the equipment are shown in the illustrations that follow. Good safety requires that you familiarize yourself with the various Safety Signs, the type of warning and the area, or particular function related to that area, that requires your SAFETY AWARENESS.

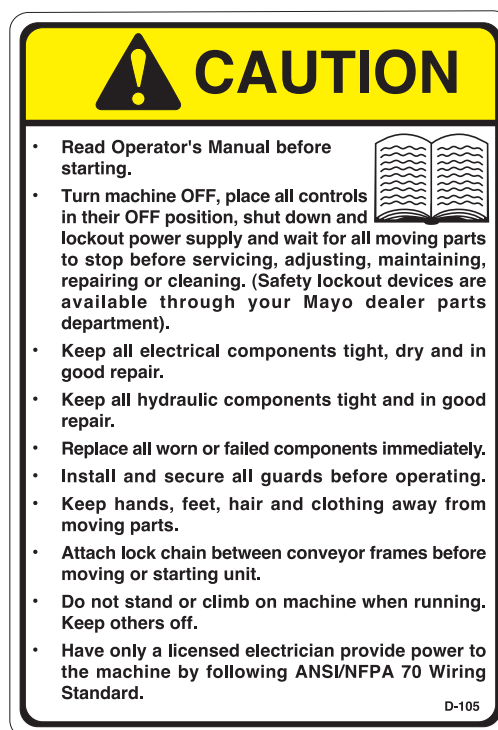
- Think SAFETY! Work SAFELY!



A



B



REMEMBER - If Safety Signs have been damaged, removed, become illegible or parts replaced without safety signs, new signs must be applied. New safety signs are available from your authorized dealer.

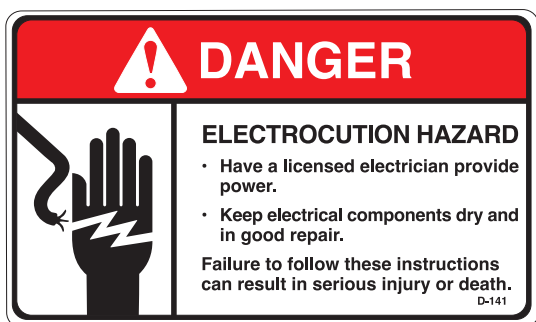


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- Think SAFETY! Work SAFELY!



C



D

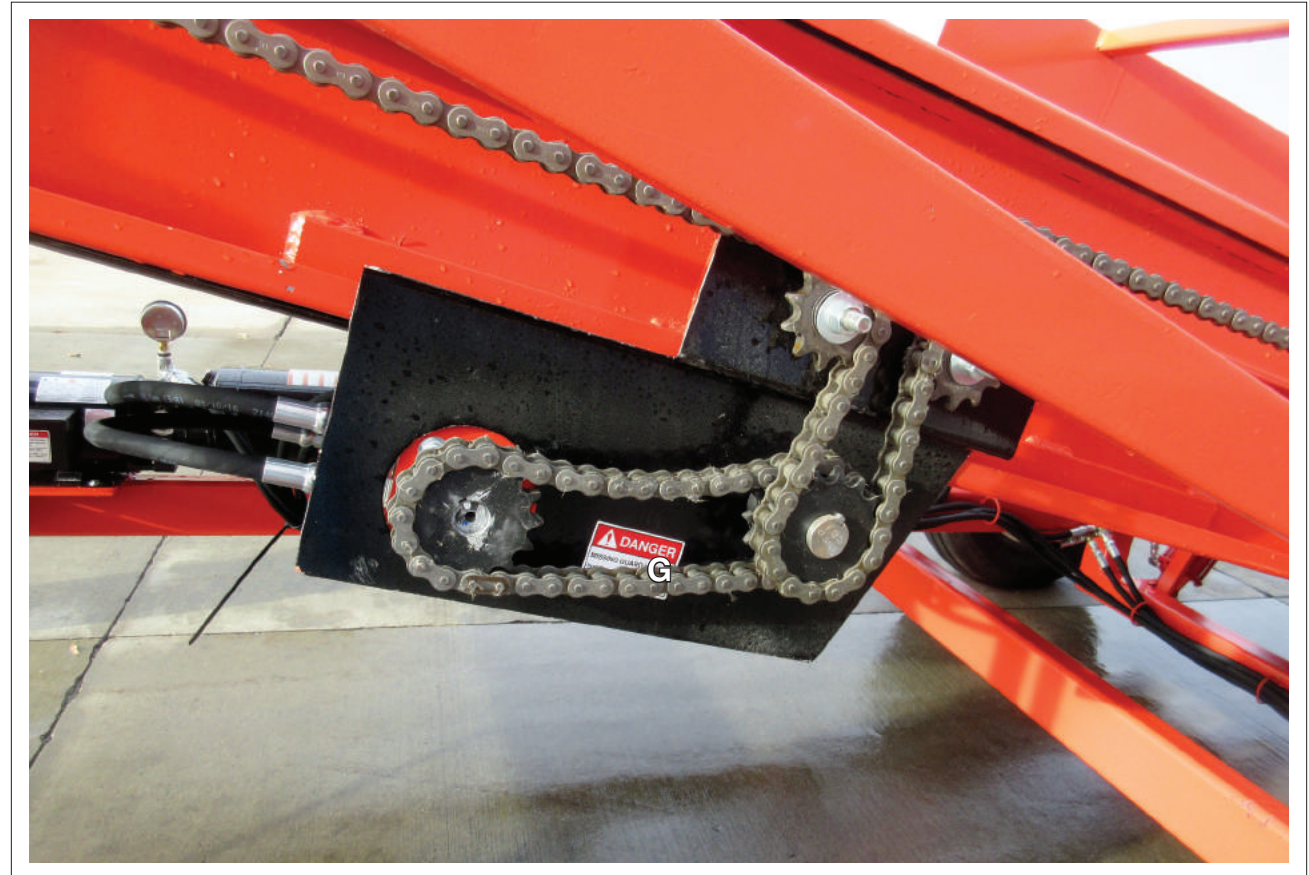


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- Think SAFETY! Work SAFELY!



E



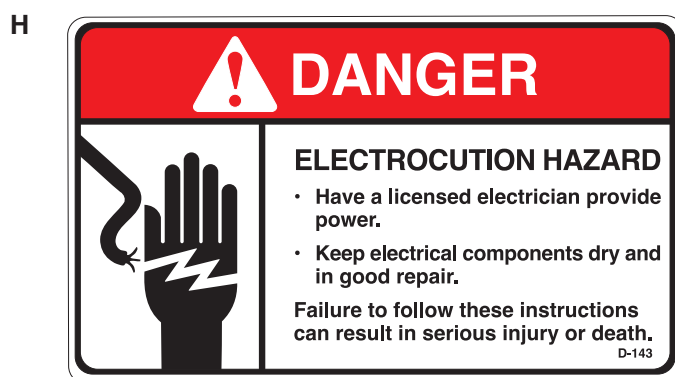
F



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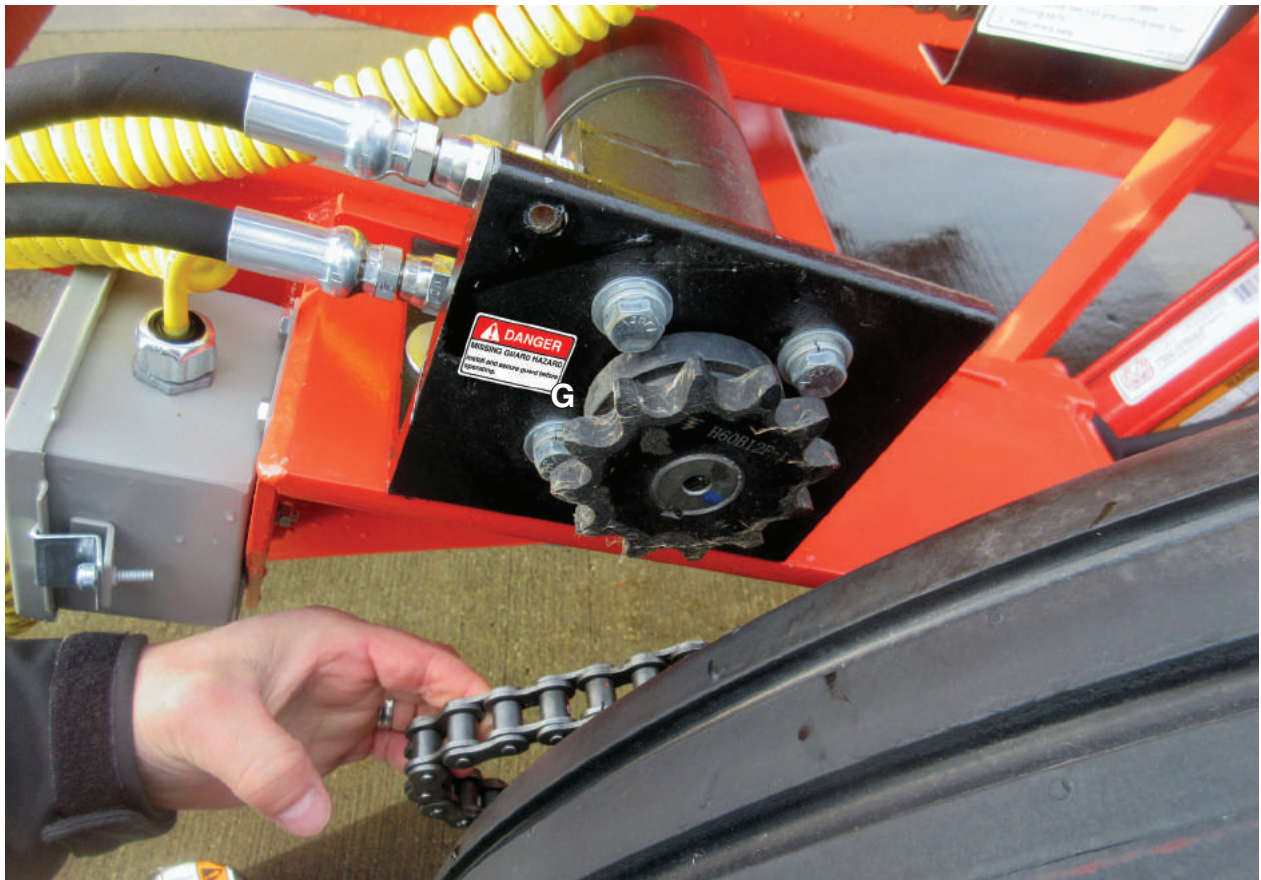
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- Think SAFETY! Work SAFELY!



**REMEMBER** - If Safety Signs have been damaged, removed, become illegible or parts replaced without safety signs, new signs must be applied. New safety signs are available from your authorized dealer.







## 4 OPERATION



### OPERATING SAFETY

- Make sure that anyone who will be operating the Hopper Unloader or working on or around the unit reads and understands all the operating, maintenance and safety information in the operator's manual. Also read and follow the instructions in the manuals of other equipment in the system.
- Turn machine OFF, place all controls in their OFF position, shut down and lock out power supply (safety lockout devices are available through your Mayo dealer parts department), relieve hydraulic pressure and wait for all moving parts to stop before servicing, adjusting, maintaining or repairing.
- Establish a lock-out tag-out policy for the work site. Be sure all personnel are trained in and follow all procedures. Lock-out tag-out all power sources before servicing the unit or working around loading/unloading equipment.
- Install and properly secure all guards and shields before operating.
- Replace all worn or failed components immediately.
- Keep hands, feet, hair and clothing away from all moving parts.
- Clear the area of bystanders, especially small children, before starting.
- Make sure all control switches are in the off position before connecting power supply.
- Keep all electrical components tight, dry and in good repair.
- Use the turnbuckles to set the height of the discharge before loading.
- Before supplying electrical power to the machine, be sure that you have adequate amperage at the proper phase and voltage to run it by following ANSI/NFPA 70 Wiring Standard. If you do not know or are unsure, consult a licensed electrician.
- Keep the working area clean and dry.
- Review safety instructions annually.

#### 4.1 TO THE NEW OPERATOR OR OWNER

The Mayo Manufacturing Hopper Unloader is designed to be used as a stand-alone unit or part of a system to convey potatoes from the hopper discharge of a transport truck to another conveyor. Be familiar with the machine before starting.

**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. Follow all safety instructions exactly. Safety is everyone's business. By following recommended procedures, a safe working environment is provided for the operator, bystanders and the area around the worksite. Untrained operators are not qualified to operate the machine.**

**Follow all safety instructions exactly. Safety is everyone's business. By following recommended procedures, a safe working environment is provided for the operator, bystanders and the area around the worksite. Untrained personnel are not qualified to operate this machine.**

Many features incorporated into this machine are the result of suggestions made by customers like you. Read this manual carefully to learn how to operate the machine safely and how to set it to provide maximum efficiency. By following the operating instructions in conjunction with a good maintenance program, your Hopper Unloader will provide many years of trouble-free service.



## 4.2 MACHINE COMPONENTS

The Mayo Manufacturing Hopper Unloader is a belted conveyor used to move potatoes. It is designed to telescope allowing the hopper to fit under a transport truck discharge. It consists of a top and bottom conveyor which can move relative to each other, providing the telescoping function. The conveyors are powered by electric motors through speed reducing gearboxes. All controls are mounted on the left side of the frame.

Manual turnbuckle jacks are used to set the height of the discharge to minimize drop height. Each front wheel is driven by a hydraulic motor for moving and steering the machine. A hydraulic motor and cross shaft transmits an equal telescoping force to both sides of the frame. Hydraulic cylinders on the hopper end frame positions the hopper to fit under a truck and minimize drop height.

- A Hopper
- B Top Conveyor
- C Bottom Conveyor
- D Left Drive Wheel
- E Right Drive Wheel
- F Hopper Height Cylinder
- G Telescoping Drive
- H Conveyor Drive
- J Hydraulic Pump
- K Control Panel
- L Hydraulic Controls
- M Discharge
- N Turnbuckles



FIG. 1 MACHINE COMPONENTS

### 4.3 GENERAL OPERATION THEORY

Potatoes are loaded from transport trucks into the hopper of the unloader. From the hopper, they are carried by belted conveyor into the next conveyor.

The top conveyor moves the potatoes onto the bottom conveyor which feeds into another conveyor, bin piler or directly into a processing plant for long term storage or processing.

All hopper-to-conveyor and conveyor-to-conveyor transition points are designed for minimum drop to prevent bruising of the potatoes.

The telescoping action between the top and bottom conveyor frames allows for 5 to 8 feet of adjustment between the conveyor and trucks during operation.

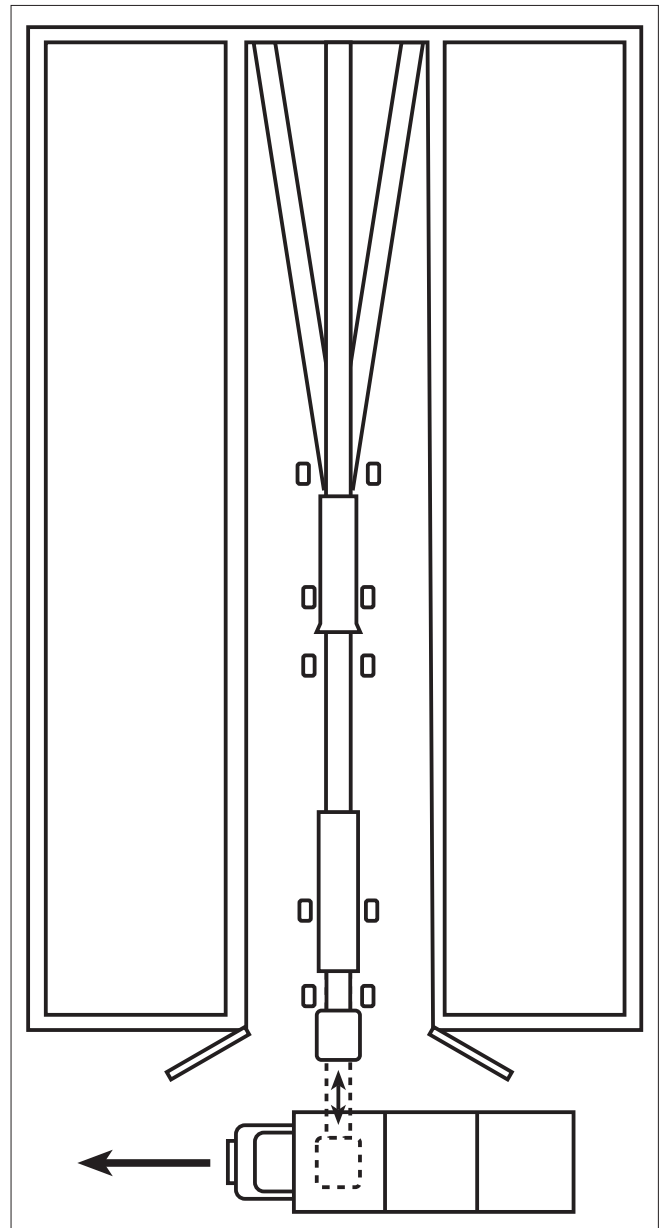


FIG. 2 POSITIONED (TYPICAL)

## 4.4 MACHINE BREAK-IN

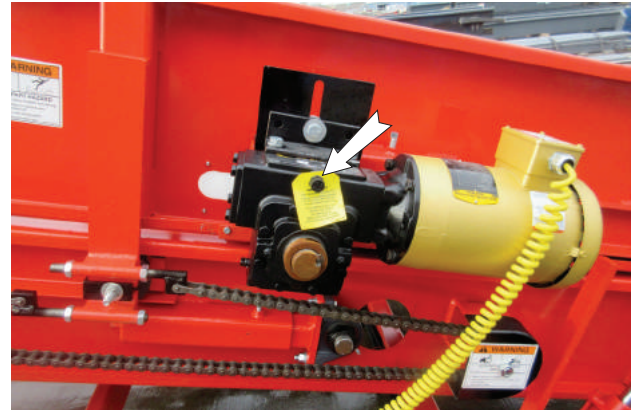
Although there are no operational restrictions on the Hopper Unloader when used for the first time, it is recommended that the following mechanical items be checked:

### A. Before Starting:

1. Read Unloader and auxiliary equipment manuals before starting.
2. Turn gearbox breather 1/4 turn to open breather and remove tag.



Top



Bottom

FIG. 3 BREATHER

### B. After operating for 1/2 hour:

1. Retorque all wheel bolts.
2. Retorque all fasteners and hardware.
3. Check that all electrical connections are tight and cords are routed out of the way or protected.
4. Check the alignment and tension of all conveyor belts. Realign or tighten as required.
5. Check tension and alignment of the telescoping and wheel drive systems.
6. Check oil level in speed reduction gearboxes. Top up as required.
7. Lubricate all grease fittings.

### C. After 2, 5 and 10 hours of operation:

1. Retorque all other fasteners and hardware.
2. Check that all electrical connections are tight and cords are routed out of the way or protected.
3. Check the alignment and tension of all conveyor belts. Realign or tighten as required.
4. Check tension and alignment of the telescoping and wheel drive systems.
5. Check oil level in speed reduction gearboxes. Top up as required.
6. Then go to the regular servicing and maintenance schedule as defined in the Maintenance Section.

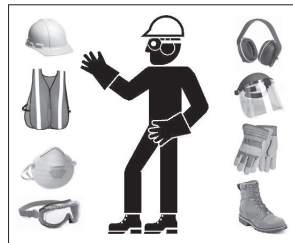


## 4.5 PRE-OPERATION CHECKLIST

Safe and efficient operation of your new Hopper Unloader requires that each operator reads and follows all safety precautions and operating procedures contained in this section. Performing the following pre-operation checklist is important for personal safety as well as for continued mechanical soundness and longevity of your new Mayo Unloader. The checklist should be performed before operating the Unloader and prior to each operation thereafter.

1. Lubricate the machine according to the schedule prescribed in the "Maintenance Section".
2. Insure that proper protective gear is in good repair and available for use by each operator. Make certain that each operator uses the protective gear. Protective gear includes but, is not limited to:

- Leather gloves
- Safety glasses or face shield
- Full length protective clothing
- Steel toed boots with slip resistant soles.



3. Insure that all safety guards and shields are in good repair and securely in place.
4. Check that the Unloader belts are centered on the head and tail rollers. Adjust if necessary as outlined in the "Maintenance Section".
5. Check the tension and alignment of the telescoping and wheel drive roller chain systems.
6. Make sure that all electrical switches are in the OFF position before supplying power.
7. Check that all electrical connections are tight and cords are routed out of the way or protected.
8. Be sure the working area is clean and dry to prevent tripping or slipping.

## 4.6 CONTROLS

It is recommended that all operators review this section of the manual to familiarize themselves with the location and function of all machine controls before starting. Some machines may vary slightly due to custom features but they are similar and all controls are labelled.

### 1. **Pump ON/OFF:**

This 2 position rotary switch controls the power to the hydraulic pump. Turn the switch counter-clockwise to turn the pump OFF and clockwise to turn ON. Pump must be on to move the machine, raise or extend it.

### 2. **Belt ON/OFF:**

This 2 position rotary switch controls the power to the electric motors driving the conveying belts. Turn the switch counter-clockwise to turn conveyors OFF and clockwise to turn ON.

### 3. **Emergency STOP:**

This red push-pull switch is the master ON/OFF switch on the panel itself and should be used as an emergency shut down switch. Push the switch in to turn all the power off. The switch will remain in unless pulled out. It must be pulled out for any of the other controls to work. Turn the switch clockwise and it will be released and pop out.

### 4. **Pressure Gauge:**

This gauge displays the pressure in the hydraulic system. It will normally indicate between 1000 to 1500 psi when hydraulic functions are being used.

### 5. **Hydraulic Controls:**

#### a. **Left Steer:**

This 3-position spring-loaded to center neutral hydraulic valve controls the oil flow to the traction drive motor on the left wheel. Pull the lever and hold for the wheel to move back and push to move forward.

#### b. **Boom Height:**

This 3-position spring-loaded to center neutral hydraulic valve controls the direction of oil flow to the hopper lift cylinders. Pull on lever and hold to lower hopper and push to raise.

#### c. **Boom In/Out:**

This 3-position spring-loaded to center neutral hydraulic valve controls the direction of oil flow to the telescoping motor. Push on the valve and hold to retract the unit and pull to extend.

#### d. **Right Steer:**

This 3-position spring-loaded to center neutral hydraulic valve controls the oil flow to the traction drive motor on the right wheel. Pull the lever and hold for the wheel to move back and push to move forward.

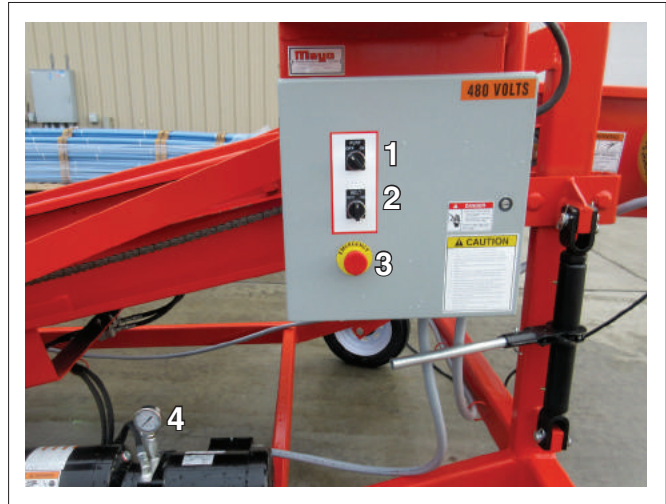


FIG. 4 CONTROL BOX

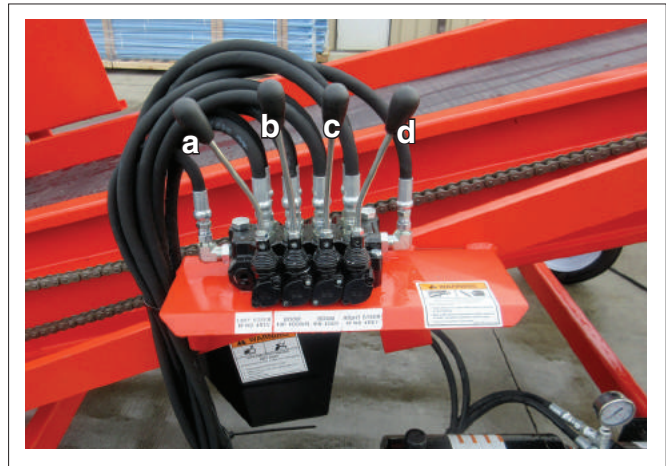


FIG. 5 HYDRAULIC CONTROLS

6. **Turnbuckle Jacks:**

Turnbuckle jacks are mounted on each corner of the discharge frame. Use the pawl at the handle base to set the direction of rotation. Extend the turnbuckle to raise the discharge and retract it to lower. Always set the discharge height to reduce potato drop distance and minimize bruising.



**Pawl**



**Turnbuckles**

**FIG. 14 TURNBUCKLE JACKS**

## 4.7 OPERATING



# OPERATING SAFETY

- Make sure that anyone who will be operating the Hopper Unloader or working on or around the unit reads and understands all the operating, maintenance and safety information in the operator's manual. Also read and follow the instructions in the manuals of other equipment in the system.
- Turn machine OFF, place all controls in their OFF position, shut down and lock out power supply (safety lockout devices are available through your Mayo dealer parts department), relieve hydraulic pressure and wait for all moving parts to stop before servicing, adjusting, maintaining or repairing.
- Establish a lock-out tag-out policy for the work site. Be sure all personnel are trained in and follow all procedures. Lock-out tag-out all power sources before servicing the unit or working around loading/unloading equipment.
- Install and properly secure all guards and shields before operating.
- Replace all worn or failed components immediately.
- Keep hands, feet, hair and clothing away from all moving parts.
- Clear the area of bystanders, especially small children, before starting.
- Make sure all control switches are in the off position before connecting power supply.
- Keep all electrical components tight, dry and in good repair.
- Use the turnbuckles to set the height of the discharge before loading.
- Before supplying electrical power to the machine, be sure that you have adequate amperage at the proper phase and voltage to run it by following ANSI/NFPA 70 Wiring Standard. If you do not know or are unsure, consult a licensed electrician.
- Keep the working area clean and dry.
- Review safety instructions annually.

Follow this procedure when using the Hopper Unloader:

1. Review and follow the pre-operation checklist (See Section 4.5).
2. Review the location and function of all controls (See Section 4.6).



FIG. 7 MACHINE (TYPICAL)

### 3. Starting Hopper Unloader:

- a. Clear the area of bystanders. Know where everyone is before starting.
- b. Place all controls in the OFF or neutral position.
- c. Turn the power to the machine and ON at the master panel.
- d. Turn the main equipment ON that moves potatoes away from the Hopper Unloader.
- e. Turn pump ON.
- f. Turn the belt ON.
- g. Move hopper into position under the truck (extend frame).
- h. Open truck discharge and unload.

### 4. Stopping Machine:

- a. Close truck discharge.
- b. Wait until the potatoes have moved off the end of the Hopper Unloader.
- c. Turn the pump and belt OFF.
- d. Turn OFF the equipment that moves potatoes away from the Hopper Unloader.

If the machine is wired up as part of a conveying system, wait until all the potatoes have moved through the system. Then turn the system OFF.

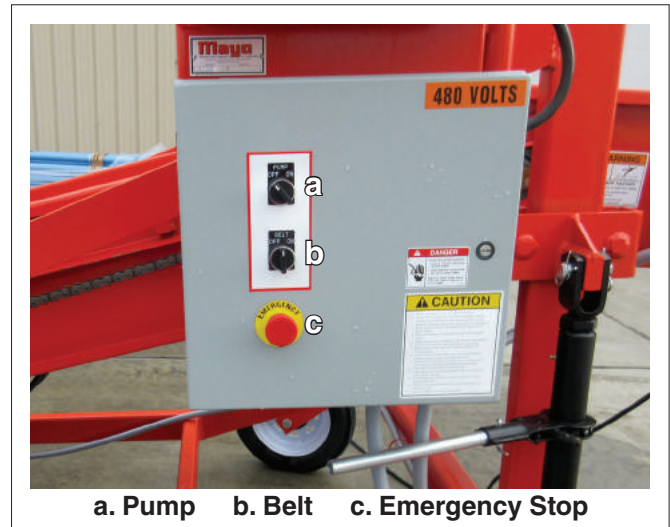
### 5. Emergency STOP:

Depress the red STOP switch on the control panel as required.

#### **IMPORTANT**

Turn all controls OFF before restarting.

Turn the switch clockwise to release the STOP switch so the system can run again. If a problem occurred requiring emergency stopping, correct the condition before resuming work.



**FIG. 8    CONTROLS**



**FIG. 9    OPERATING SYSTEM**



6. **Equipment Positioning:**

Hopper Unloaders are positioned at the end of a conveying system to move potatoes from a hopper bottom transport truck. The Hopper Unloader input is designed to be low enough to fit under the truck with clearance for the potatoes to unload. Retract the frame when the Hopper Unloader is not being used.

Drive the transport truck into position in front of the machine and align the hopper bottom discharge with the machine hopper. Extend the Hopper Unloader frame to move the hopper under the truck. Start conveyors, open discharge and proceed with unloading. Always provide sufficient space for the truck(s) to drive up to the machine for unloading. Retract the Hopper Unloader frame when completed and the truck can drive safely away.



**Working**



**Extended**



**Retracted**

**FIG. 10 POSITIONING**

7. **Hopper Height:**

The front of the frame is equipped with 2 cylinders to raise and lower the hopper as required. Raise the hopper when extending the frame to keep it clear of the ground. Adjust height when positioned to minimize drop height.



**FIG. 11 HOPPER HEIGHT**

8. **Moving:**

The machine is designed with powered front wheels for moving, turning and positioning the hopper. Each wheel is equipped with a hydraulic motor drive. Control valves direct the oil to move each wheel independently for or backward for moving or steering. Use the drive wheels to move the machine around the working area as required. Load the unit on a truck to move from location to location.



Left Wheel (Typical)



Drives

FIG. 12 WHEEL DRIVES

9. **Power Cord Boom:**

Each machine is designed with a power cord that attaches to a pivoting boom to keep the cord clear of the working area. Swing to the right or left as required to direct it to the power source and keep the cord out of the working area.



FIG. 13 POWER CORD BOOM

**10. Drop Height:**

Potatoes are sensitive to bruising during the gathering, transporting and handling phases of harvesting. Bruising is kept to a minimum by maintaining a full flow of potatoes through each machine and minimizing all drop heights. Use the ratchet jacks on discharge end to set the drop height. Use the cylinders on the hopper end to minimize the drop between the truck and hopper.



**FIG. 14 DROP HEIGHT**

**11. Operating Hints:**

- a. Be sure that all workers and operators are supplied with and use the required safety gear.
- b. Keep the working area clean and dry to prevent slipping and tripping.
- c. Train all operators before starting. An untrained operator is not qualified to operate this machine and can expose himself and others to needless hazards.
- d. Secure all pieces of equipment together to prevent unexpected movement and separation.
- e. Keep the Hopper Unloader as full as possible to minimize bruising during the unloading process.
- f. Set the height of the discharge so the drop height to the adjacent piece of equipment is at a minimum to prevent bruising.
- g. Establish a Lock-Out Tag-Out program for your operation and require all employees to follow it.



**FIG. 15 MACHINE**



## 4.8 TRANSPORT



### TRANSPORT SAFETY

- Make certain that you are in compliance with local, state/provincial and federal regulations regarding transporting agricultural equipment on public roadways.
- Make certain that all mechanical locks and integral anchor chains are safely and positively connected before loading or transporting.
- Fully retract the frame.
- Rotate power cord boom parallel to machine frame.
- Wrap up and bind to the frame all loose electrical ends.
- Use a forklift to lift and position machine on a transport truck.
- Securely tie down and anchor frame to truck before moving and transporting.

Mayo Hopper Unloaders are designed to be easily and conveniently moved from location to location at the worksite. The action of moving is described in Section 4.7 Operation as part of operating machine. Transporting is used to describe when the machine is loaded on a transport truck and moved to the next worksite.

When transporting, follow this procedure:

1. Fully retract the frame.
2. Attach and secure the anchor lock chain between the frames.
3. Turn machine off, disconnect power cord and remove all auxiliary equipment from the machine.
4. Turn power off at master panel and lock out.
5. Turn power cord boom parallel to the frame and secure.
6. Use a forklift to load machine on a transport truck for transporting to the next work location.
7. Securely tie down and anchor frame to truck before moving and transporting.



FIG. 16 ANCHOR LOCK CHAIN



FIG. 17 POWER CORD BOOM

## 4.9 STORAGE



### STORAGE SAFETY

- Store the Hopper Unloader on a firm level surface.
- If required, make sure the unit is firmly blocked up.
- Make certain that all mechanical locks are safely and positively connected before storing.
- Store away from areas of human activity.
- Do not allow children to play on or around the stored Hopper Unloader.
- Lock out power by turning off master control panel or junction box and padlocking the door shut to prevent electrocution or unauthorized start up of the Hopper Unloader.

#### 4.11.1 PLACING IN STORAGE

At the end of the season, the machine should be thoroughly inspected and prepared for storage. Repair or replace any worn or damaged components to prevent any unnecessary down time at the beginning of the next season. Follow this procedure:

1. Retract frame and install lock chain.
2. Turn the power OFF at the master electrical panel and lock out.
3. Unplug and remove power cord from machine.
4. Lock out power by closing control panel or junction box and padlocking the door shut to prevent electrocution or unauthorized start up of the machine.
5. Thoroughly wash the machine using a pressure washer to remove all dirt, mud, debris or residue.
6. Lubricate all grease fittings. Make sure all grease cavities have been filled with grease to remove any water residue from the washing.
7. Inspect all the electrical cords, lines, junction boxes and motors. Tighten any loose connections. Replace any cord that is badly cut, nicked or abraded. Replace any damaged components.



**FIG. 18 LOCK CHAIN**

8. Inspect all hydraulic hoses, lines, fittings and cylinders. Tighten any loose fittings. Replace any hose that is badly cut, nicked, abraded or separating from any fitting. Replace any damaged components.
9. Apply a light coat of oil to the roller chain to prevent rusting.
10. Check all rotating parts for entangled material. Remove.
11. Touch up all paint nicks and scratches to prevent rusting.
12. Select a storage area that is dry, level and free of debris.



**FIG. 19 STORED (TYPICAL)**

#### **4.11.2 REMOVING FROM STORAGE**

When preparing to use the machine at the start of the season, follow this procedure:

1. Transport or move to the working area.
2. Check
  - a. Hydraulic tank oil level.
  - b. Electrical and hydraulic systems and components.
  - c. Unloader belts and drive systems.
  - d. All hardware. Tighten as required.
  - e. Air pressure in tires. Add as required.
3. Replace any defective components.
4. Go through the pre-operation checklist (Section 4.6) before starting.



## 5 SERVICE AND MAINTENANCE



### MAINTENANCE SAFETY

- Read and understand all the information contained in the Operator's Manual regarding operating, servicing, adjusting, maintaining and repairing.
- Turn machine OFF, shut down and lock out power supply (safety lockout devices are available through your Mayo dealer parts department), relieve hydraulic pressure and wait for all moving parts to stop before servicing, adjusting, maintaining or repairing.
- Follow good shop practices:
  - Keep service area clean and dry.
  - Be sure electrical outlets and tools are properly grounded.
  - Use adequate light for the job at hand.
- Make sure all guards and doors are in place and properly secured when operating the Hopper Unloader.
- Do not work on Unloader electrical system unless the power cord is unplugged or the power supply is locked out. Lock-out tag-out power source before performing any maintenance work.

## 5.1 SERVICE

### 5.1.1 FLUIDS AND LUBRICANTS

1. **Grease:**  
Use an SAE multi-purpose high temperature grease with extreme pressure (EP) performance meeting or exceeding the NLGI #2 rating for all requirements.

2. **Hydraulic Oil:**  
Use Mobil DTE FM32 Hydraulic Oil or equivalent.

Reservoir Capacity: 2 US gal (8.5 l).

3. **Speed Reducer Gearbox Lubricant:**  
Use Mobil Deluxe Synthetic 75w90 (PO SAE GL-5 75w90) or equivalent.

Capacity: 1 qt (1 liter).

4. **Roller Chain Lubricating Oil:**

CHAIN TYPE*	AMBIENT TEMP. RANGE		
	14°F-32°C	14°F-32°C	14°F-32°C
RS-50 / less	SAE 10	SAE 20	SAE 30
RS-60/RS-80	SAE 20	SAE 30	SAE 40
RS-100	SAE 20	SAE 30	SAE 40
RS-120 / more	SAE 30	SAE 40	SAE 40

\* Stamped on chain link side plate.

5. **Storing Lubricants:**  
Your machine can operate at top efficiency only if clean lubricants are used. Use clean containers to handle all lubricants. Store them in an area protected from dust, moisture and other contaminants.

## 5.1.2 GREASING

Refer to Section 5.1.1 for recommended grease. Use the Maintenance Checklist provide to keep a record of all scheduled maintenance.

1. Use only a hand-held grease gun for all greasing. Air powered greasing systems can damage the seals on bearings and lead to early bearing failure.
2. Wipe grease fitting with a clean cloth before greasing to avoid injecting dirt and grit.
3. Replace and repair broken fittings immediately.
4. If a fitting will not take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace fitting if necessary.
5. **Conveyor Bearings:**  
Only sealed bearings are used on the conveyor bearings. Sealed bearings should never be greased more often than weekly or every 50 hours. Do not over-grease. Do not give bearing more than 1 shot of grease each time it is greased. Once the bearing seal is broken, the bearing must be greased each day or the bearing will fail.

## 5.1.3 SERVICING INTERVALS

### 8 Hours or Daily

1. Check the conveyor tension and alignment.  
Tension or align as required.



**Tension (Typical)**



**Alignment - Top**



**Alignment - Bottom**

**FIG. 20 CONVEYOR TENSION AND ALIGNMENT**

2. Inspect hydraulic system and all components.
3. Inspect electrical system and all components.



**FIG. 21 SYSTEMS**



## Weekly or 50 Hours

1. Oil each side of frame extend/retract drive system roller chains and check the tension.



2. Oil each wheel drive roller chain.



Drive

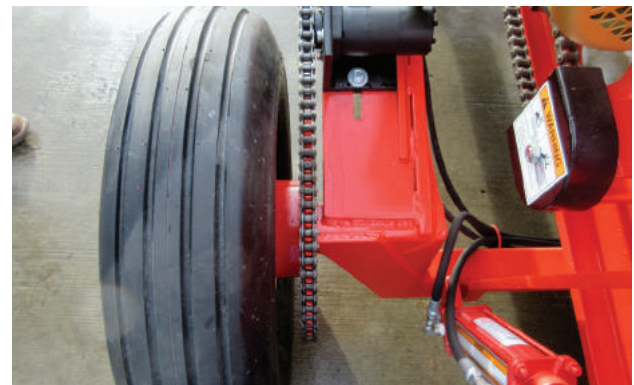


Driven

FIG. 22 EXTEND/RETRACT ROLLER CHAINS



Right



Left

FIG. 23 WHEEL DRIVE ROLLER CHAINS

- Grease top conveyor shaft bearings with 1 shot of grease.

### IMPORTANT

Only sealed bearings are used on the conveyor bearings. Sealed bearings should never be greased more often than weekly or every 50 hours. Do not over grease. Do not give bearing more than 1 shot of grease each time it is greased. Once the bearing seal is broken, the bearing must be greased each day or the bearing will fail.



Drive End (Right)



Drive End (Left)



Tail Shaft

FIG. 24 TOP CONVEYOR SHAFTS

- Check oil level in hydraulic reservoir.

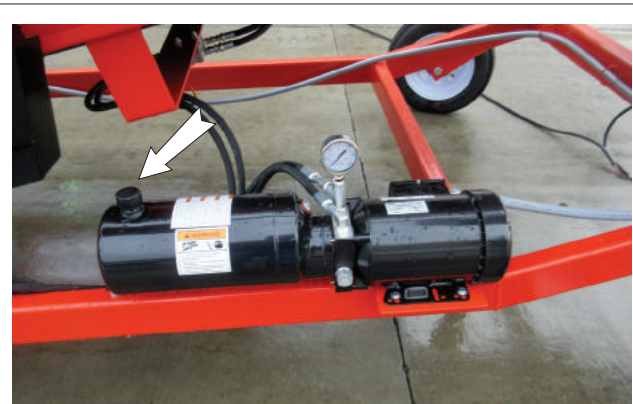
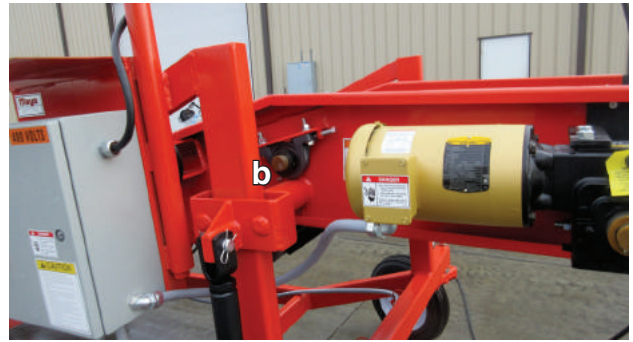


FIG. 25 OIL LEVEL

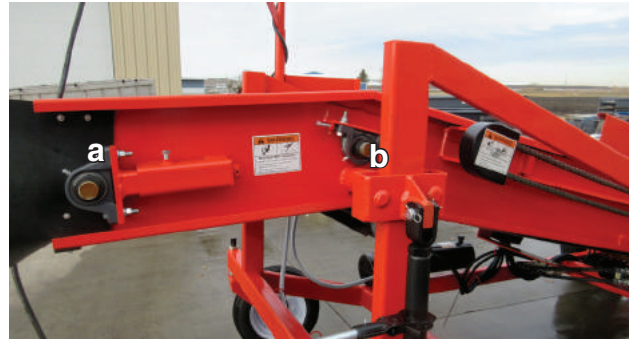


5. Grease bottom conveyor shafts:

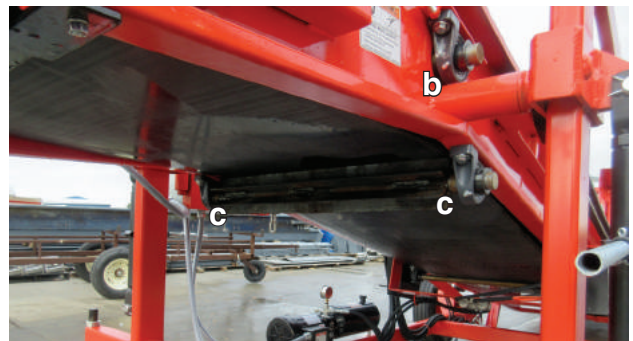
- a. Drive.
- b. Dog leg.
- c. Return.
- d. Tail.



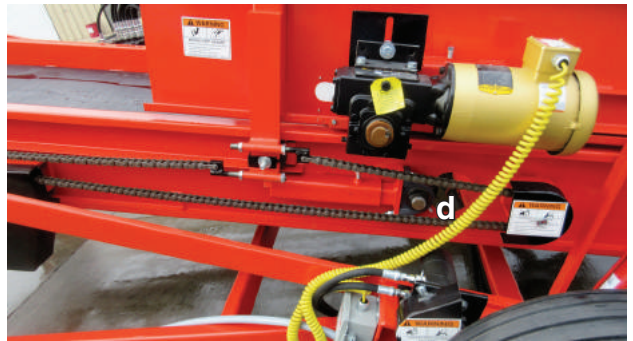
Drive - Left Side



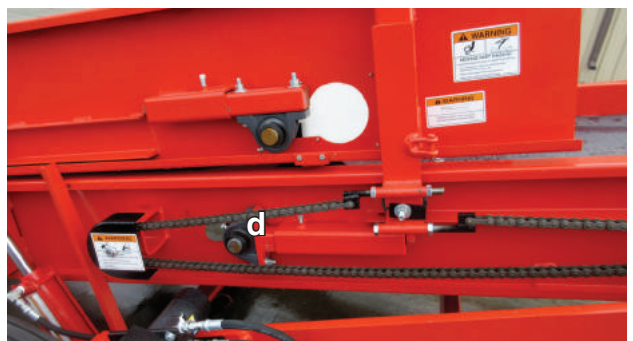
Drive - Right Side



Tail - Right Side



Return



Tail - Left Side

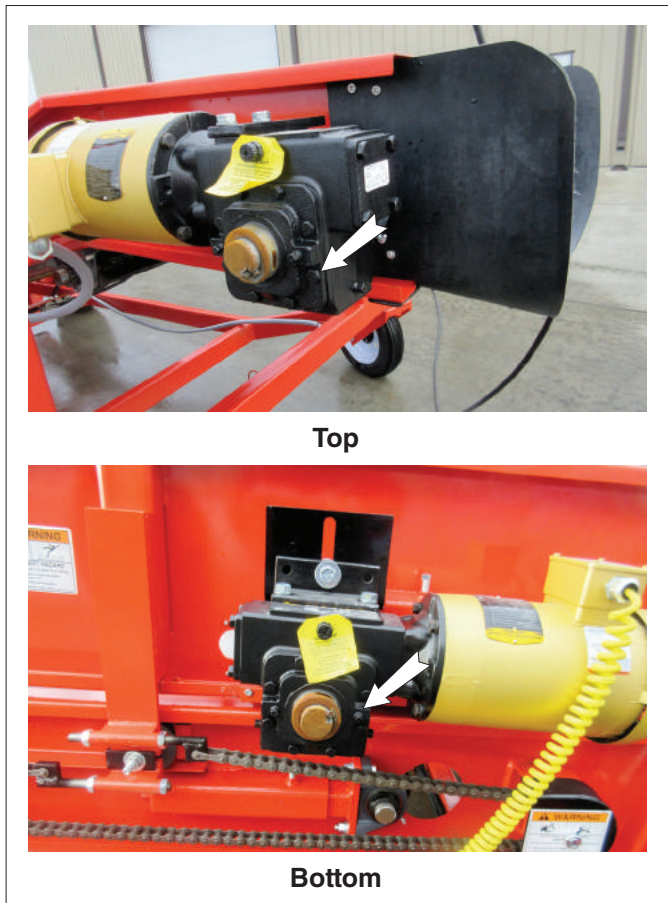
FIG. 26 BOTTOM CONVEYOR SHAFTS

6. Grease extend/retract frame drive cross shaft bearings.



**FIG. 27 CROSS SHAFT**

7. Check oil level in speed reducer gearboxes.



**FIG. 28 LEVEL PLUGS**

## 100 Hours or Annually

1. Grease the castor wheel spindle bushings.



FIG. 29 SPINDLE BUSHINGS

2. Grease the ratchet jacks.

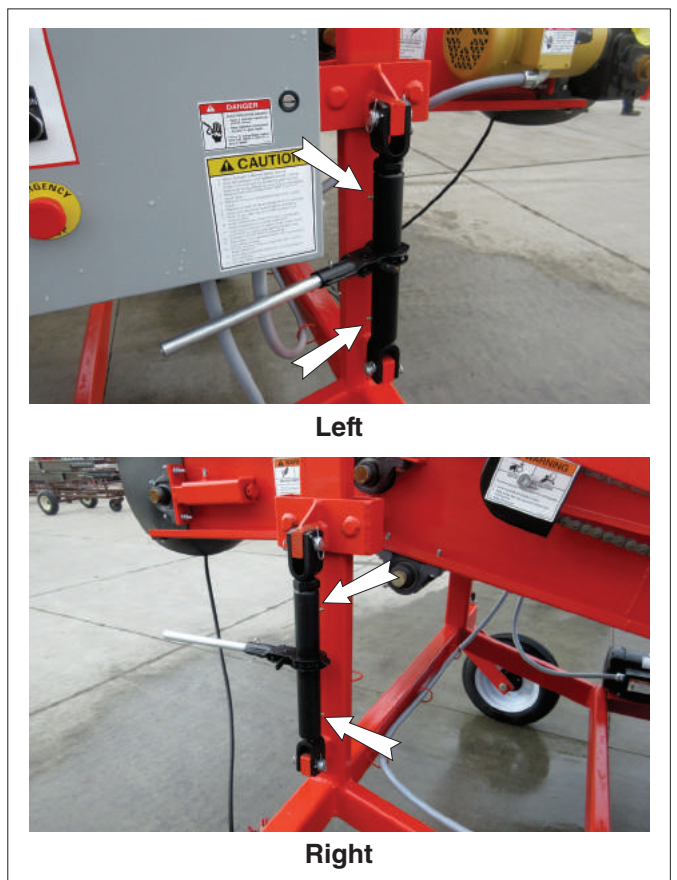
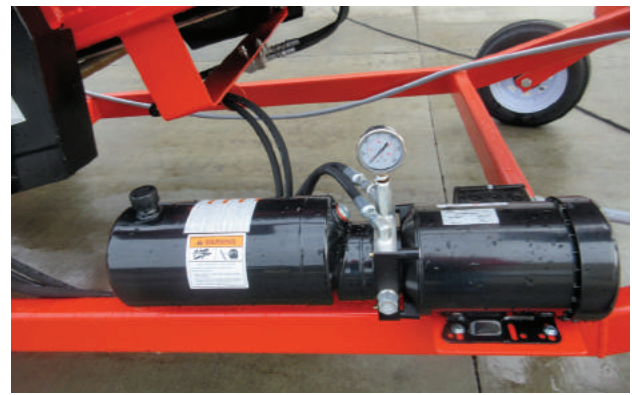


FIG. 30 RATCHET JACKS



### 500 Hours or Annually

1. Change the oil in the hydraulic system.

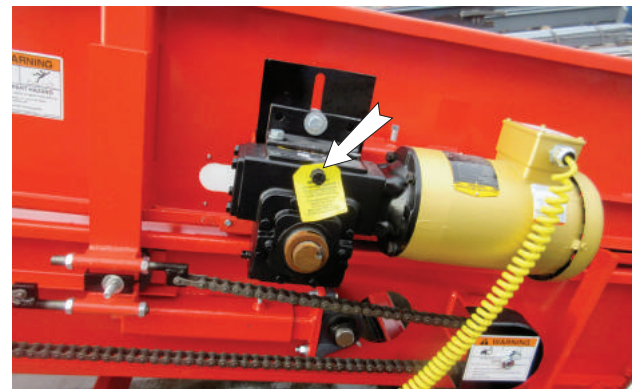


**FIG. 31 HYDRAULIC SYSTEM**

2. Clean the breather plugs on each gearbox.



**Top**



**Bottom**

**FIG. 32 BREATHER PLUGS**

3. Clean machine.



**FIG. 33 MACHINE**

#### 5.1.4 SERVICE RECORD

See Lubrication and Maintenance sections for details of service. Copy this page to continue record.

ACTION CODE: CL CLEAN CK CHECK G GREASE R REPACK CH CHANGE

## Maintenance

[illegible]

## 5.2 MAINTENANCE

By following a careful service and maintenance program on your machine, you will enjoy many years of trouble-free use.

### 5.2.1 ELECTRIC SYSTEM INSPECTION

Electricity provides power to all systems on the Hopper Unloader. To maintain the integrity of each system and provide a safe working environment for the operator, it is important that a daily inspection be done to make sure that all systems and components are in good working condition. To provide a safe working environment, have a licensed electrician provide power to the machine.

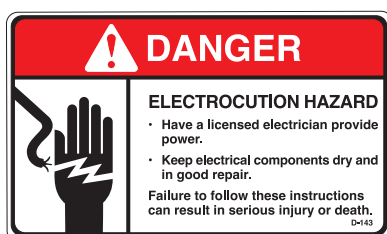
When inspecting the electrical system and components, follow this procedure:

1. Place all controls in the OFF or neutral position.
2. Turn power OFF at the master panel and lock-out before starting the inspection.
3. Inspect all electrical components looking for:

#### IMPORTANT

Do not operate the machine unless the master panel is equipped with a lock-out device. Always engage lock-out device before performing any maintenance work. Lock-out devices are available from your dealer or the factory.

- a. Physical damage. (Includes all components: starters, switches, enclosures, as well as plugs).
  - b. Frayed or loose wires.
  - c. Cut or cracked insulation.
4. Replace any damaged components immediately.
  5. Be sure all components are grounded.
  6. Be sure there is no water or moisture in any junction box or enclosure. Dry the components before turning power on. Be sure that all compartments seal properly when closed.



Machine



Control Panel



Opened

FIG. 34 ELECTRICAL INSPECTION

## 5.2.2 SPEED REDUCER GEARBOX OIL

The Hopper Unloader is driven by electric motors attached to a high ratio speed reducing gearboxes to give the required operating speed. Each gearbox is equipped with a drain, level and fill plug. Every 50 hours, the oil level should be checked. Every 500 operating hours or annually, whichever comes first, the oil should be replaced. Check more frequently if there are leaks around any of the plugs or shaft seals. When checking oil level or changing oil, follow this procedure.

1. Run the machine until the gearboxes are warm. Warm oil will remove more contaminants than cold stagnate oil.
2. Stop the machine.
3. Place all controls in their OFF or neutral position.
4. Turn the power OFF at the master panel and lock-out.
5. **Checking oil level:**
  - a. When the gearbox is cold, remove the level plug from the side of the gearbox.
  - b. When the oil just fills the threads of the level plug, it is at the correct level.
  - c. Add oil through the fill plug as required.
  - d. Install and tighten level and fill plugs.
6. **Changing oil:**
  - a. Place a container under the drain plug.
  - b. Remove the drain.
  - c. Allow 10 minutes to drain.
  - d. Install and tighten the drain plug.
  - e. Remove the level and fill plugs.
  - f. Add approximately 1 qt (1 liter) of Mobil Deluxe Synthetic 75w90 or equivalent. Use the level plug to determine the proper amount of oil.

### NOTE

It may be necessary to add teflon tape or pipe sealant to the drain plug prior to installation to prevent leaking.

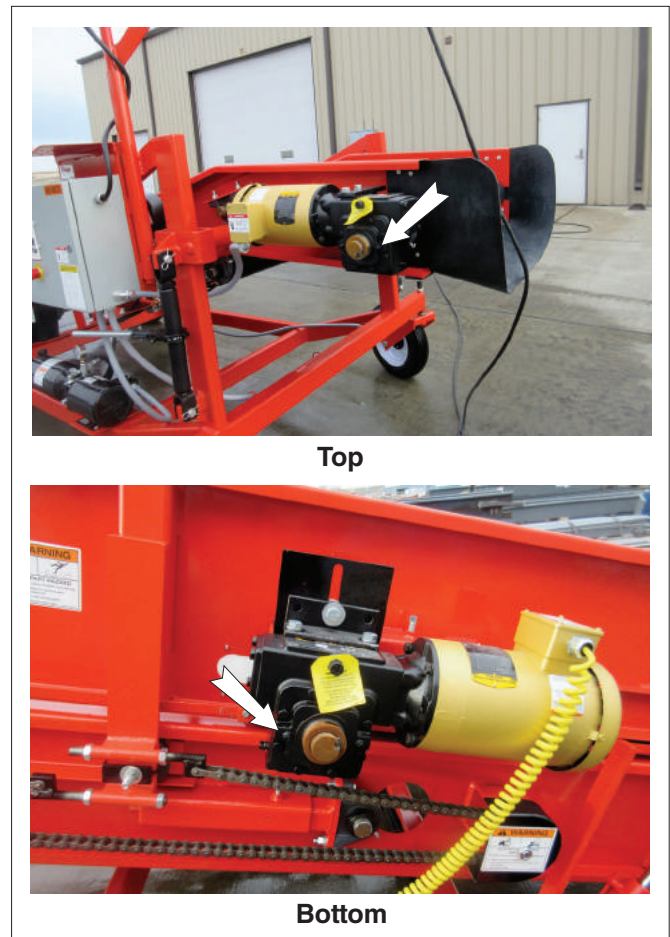


FIG. 35 GEARBOX LEVEL PLUGS

- g. Check that the air passage through the breather is open.
- h. Install and tighten the fill and level plugs.
- i. Dispose of the used oil in an environmentally safe manner.



### 5.2.3 BREATHER CLEANING

Each gearbox is equipped with a breather in the fill plug that vents the internal pressure to atmosphere. As the gearbox temperature increases and decreases during the operating and stopped modes, the pressure in the gearbox will increase or decrease if it is not vented to atmosphere. An increase in internal pressure will cause the shaft seals to leak until the gearbox runs low on or out of oil. To check on or clean the breather, follow this procedure:

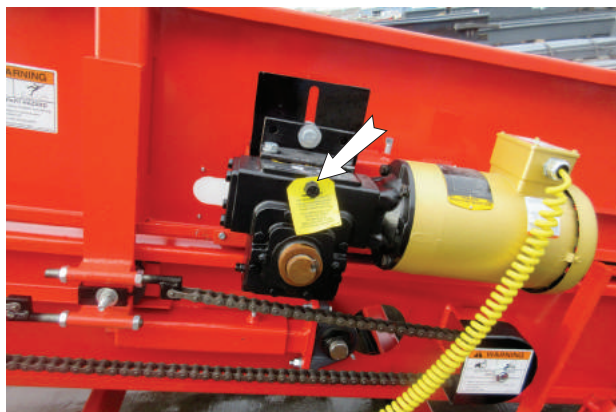
1. Place all controls in their OFF or neutral position.
2. Turn the power OFF at the master panel and lock-out.
3. Remove the fill plug/breather from the gearbox.
4. Check that the vent passage through the plug is open.
5. If plugged, soak in a solvent over night.
6. Use a high-pressure air hose to blow the passage open. Use a probe to clear the passage if the hole is caked with dirt.
7. Install and tighten the breather plug.

#### **IMPORTANT**

Always clean the breather if any leaks are noticed around shafts.



**Top**



**Bottom**

**FIG. 36 BREATHERS (TYPICAL)**



#### 5.2.4 CONVEYOR TENSION/ALIGNMENT OR REPLACEMENT

Belts are used to move potatoes with the Hopper Unloader. The tension and alignment of the Unloader should be checked daily to insure proper function. Replace the Unloader when damaged or badly worn. To maintain Unloader, follow this procedure:

1. Place all controls in their OFF or neutral position.
2. Turn the power OFF at the master panel and lock-out.
3. **Conveyor Belt Tension:**  
They are tensioned correctly when there is a 1 to 2 inch (25 to 50 mm) sag between the frame or slack side of the Unloader during operation.



Top



Bottom

FIG. 37 TENSION (TYPICAL)

4. **Tension Adjustment:**

Each conveyor belt runs on a drive and tail shaft. Each shaft end is supported on an adjustable bearing housing that is used to adjust tension and alignment.

To adjust tension, follow this procedure:

- a. Loosen jam nuts on adjusting bolt.
- b. Loosen bearing housing anchor bolts.
- c. Use adjusting bolt to move bearing housing.
- d. Tighten bearing housing anchor bolts and jam nuts to their specified torque.



**Top Left - Hopper**



**Left Side**



**Right Side**

**FIG. 38 BEARING ADJUSTMENT (TYPICAL)**

5. **Conveyor Belt Alignment:**

It is properly aligned when the belt runs in the center of the frame panels and the shafts. Be sure to run the Hopper Unloader a full revolution to check the entire belt. the belt can move from side-to-side while it is turning as long as it doesn't contact the sides. If it contacts the sides, it must be aligned. Align by loosening the shaft bearing assembly on the tight side or tightening the bearing assembly on the loose side. Move the bearing assemblies on either the drive or driven shafts to align the Unloader but always maintain the proper tension.



Top

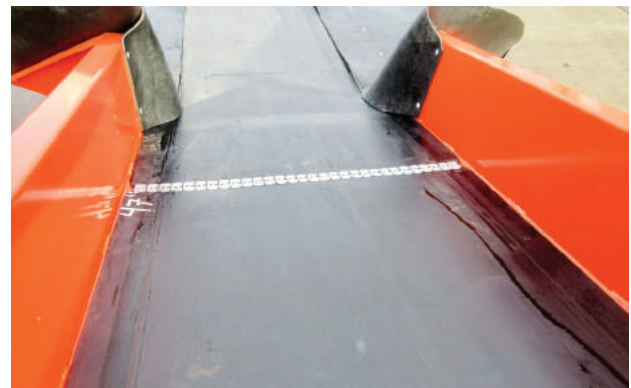


Bottom

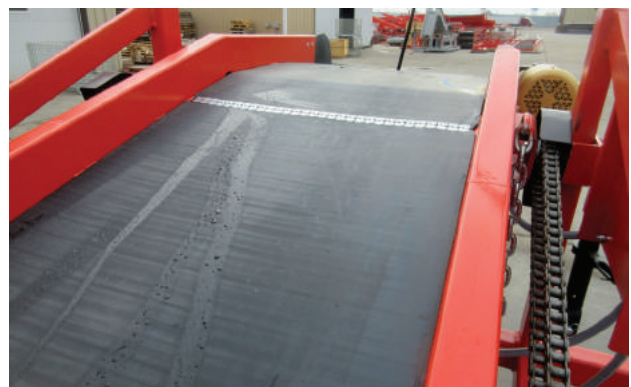
FIG. 39 ALIGNMENT (TYPICAL)

6. **Replacement:**

- a. Move one or both of the shafts into their loosest position.
- b. Open the Unloader by removing the connecting rod on the belt.
- c. Attach the replacement Unloader to the end of the old Unloader belt.
- d. Slowly pull the old belt out of the machine and thread the new one into position.
- e. Disconnect the old belt and connect the ends of the new one together.
- f. Move the shaft into position to set the tension of the Unloader and secure the bearing assemblies.
- g. Check the tension and alignment of the Unloader frequently during the first 10 hours of operation and set as required. Then, go to the regular maintenance schedule. Normally a Unloader will seat itself during the first 10 hours of operation and then require less adjustment.



Top



Bottom

FIG. 40 BELT CONNECTOR (TYPICAL)



### 5.2.5 EXTEND/RETRACT DRIVE ROLLER SYSTEM:

The frame extend/retract function on the Hopper Unloader is powered by a hydraulic motor through a roller chain and cross shaft drive system. The system should be oiled every week or 50 hours and tension and alignment checked.

When maintaining the extend/retract roller chain drive system, follow this procedure:

1. Weekly Oiling:
  - a. Fully retract frame and connect lock chain.
  - b. Turn machine and controls off, lock-out tag-out master power source.
  - c. Open the guard over the drive system.



- d. Use an oil can or brush to apply oil to the slack side of the chain.
- e. Refer to the following table for oil type.

Chain Type*	Ambient Temperature Range		
	14°F - 32°F	32°F - 104°F	104°F - 122°F
RS-50 /Less	SAE 10	SAE 20	SAE 30
RS-60/RS-80	SAE 20	SAE 30	SAE 40
RS-100	SAE 20	SAE 30	SAE 40
RS-120/More	SAE 30	SAE 40	SAE 40

\* Stamped on chain link side plate

- f. Install and secure the guards.



Drive



Driven

FIG. 41 ROLLER CHAIN DRIVE SYSTEM



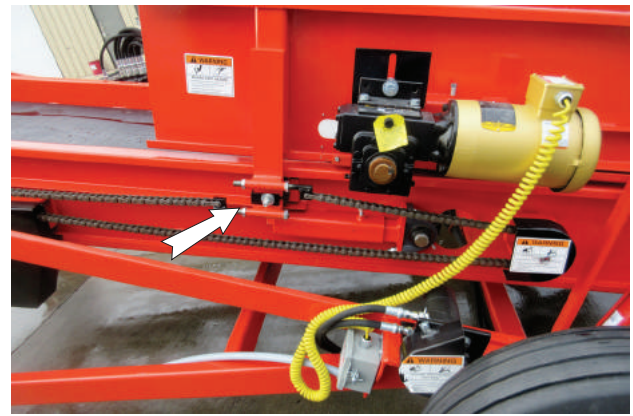
2. **Weekly Roller Chain Tension:**

The roller chain drive system is equipped with an adjusting bolt on the end of each chain to maintain the required tension on the chain during operation. Check the tension when the machine is OFF and not moving. The chain should be snug to the sprockets when the machine is not running. To set the tension:

- a. Loosen jam nut on the adjusting bolt.
- b. Use the adjusting bolt to set the chain tension.
- c. Tighten jam nut to its specified torque.

3. **Check alignment by:**

- a. Lay a straight edge across the faces of the sprockets. When the straight edge is flush with the sprocket faces they are aligned, or
- b. Visually sight across the sprocket faces. If the sprockets are in the same plane, they are aligned.
- c. Loosen set screw in sprocket hub or adjust the number of washers on mounting bolt if alignment is required.
- d. Move sprockets to required position.
- e. Tighten set screw or mounting bolt to specified torque.
- f. Install and secure the guard.



**Right**



**Left**

**FIG. 42 TENSION BOLTS**



**FIG. 43 ALIGNMENT (TYPICAL)**



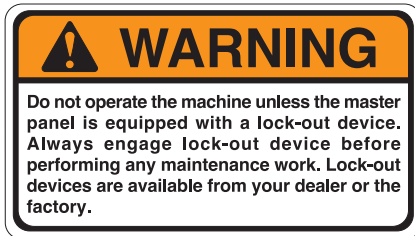
## 5.2.6 WHEEL DRIVE ROLLER CHAIN

The wheel drive on the Hopper Unloader is powered by hydraulic motors through a roller chain drive system. The system should be oiled every week or 50 hours and tension and alignment checked.

When maintaining the roller chain drive system, follow this procedure:

### 1. Weekly Oiling:

- a. Turn machine and controls off, lock-out tag-out master power source.
- b. Open the guard over the drive system.



- c. Use an oil can or brush to apply oil to the chain.
- d. Refer to the following table for oil type.

Chain Type*	Ambient Temperature Range		
	14°F - 32°F	32°F - 104°F	104°F - 122°F
RS-50 /Less	SAE 10	SAE 20	SAE 30
RS-60/RS-80	SAE 20	SAE 30	SAE 40
RS-100	SAE 20	SAE 30	SAE 40
RS-120/More	SAE 30	SAE 40	SAE 40

\* Stamped on chain link side plate

- e. Install and secure the guards.

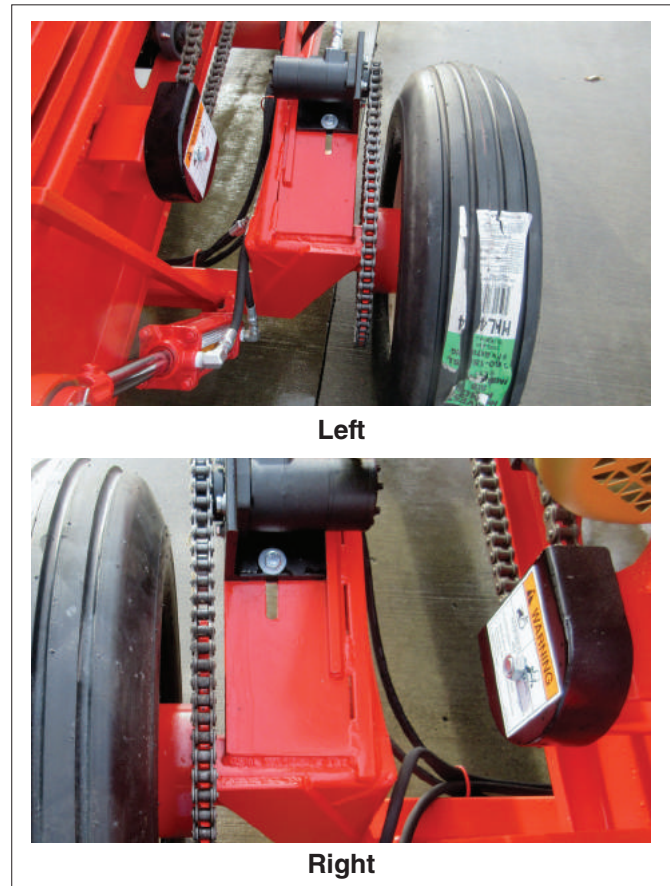


FIG. 44 WHEEL DRIVE ROLLER CHAINS

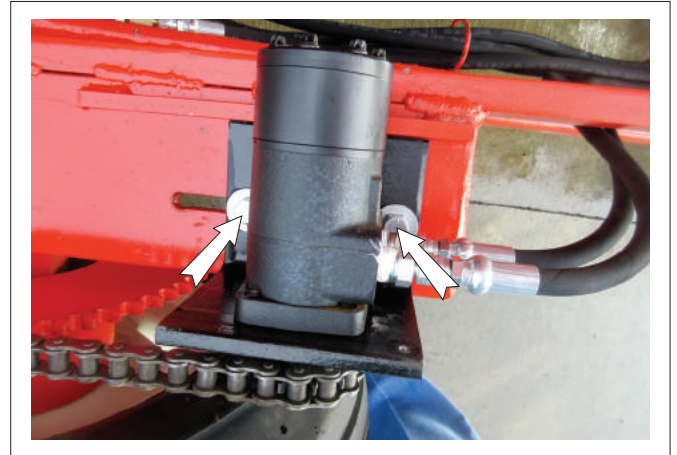
## 2. **Weekly Roller Chain Tension:**

The roller chain drive system is designed with a hydraulic motor on a moveable base to maintain the required tension on the chain during operation. Check the tension when the machine is OFF and not moving. The chain should be snug to the sprockets when the machine is not running. To set the tension:

- Remove guard over drive system.
- Loosen lock nuts on the hydraulic motor mounting bolts.
- Slide or tap the motor base to the desired position.
- Tighten mounting bolts and lock nuts to its specified torque.
- Close and secure guard.

## 3. **Check alignment by:**

- Lay a straight edge across the faces of the sprockets. When the straight edge is flush with the sprocket faces they are aligned, or
- Visually sight across the sprocket faces. If the sprockets are in the same plane, they are aligned.
- Loosen hydraulic motor mount bolts if alignment is required.
- Move sprockets to required position.
- Tighten hydraulic motor mount anchor bolts to specified torque.



**FIG. 45 HYDRAULIC MOTOR (TYPICAL)**



**Left**



**Right**

**FIG. 46 ALIGNMENT (TYPICAL)**

- Install and secure the guard.



## 6 TROUBLE SHOOTING

The Mayo Hopper Unloader uses a straight telescoping design to convey potatoes. It is a simple and reliable system that requires minimum maintenance.

In the following section, we have listed many of the problems, causes and solutions to the problems that you may encounter.

If you encounter a problem that is difficult to solve, even after having read through this trouble shooting section, please contact your local Mayo dealer or the factory. Before you call, please have this Operator's Manual from your machine ready.

PROBLEM	CAUSE	SOLUTION
System won't run.	No power.	Turn power ON at master panel.
	Tripped circuit breaker.	Reset circuit breaker.
Conveyor belt won't run.	No power.	Turn conveyor belt ON.
	Sheared motor key.	Replace key.
	Sheared reducer key.	Replace key.
	Binding.	Align conveyor.





## 7 SPECIFICATIONS

### 7.1 MECHANICAL

Hopper Unloader Mechanical Specifications: Model: 950				
Description	Unit of Measure	Model		Comment
		950		
Features of the machine				
Conveyor Width	In	30"		
Total length of the machine – retracted	Ft-in	18’10"		-
Total length of the machine – extended	Ft-in	24’5"		-
Total width of the machine	Ft-in	7’3"		-
Total height of the machine – Condition-1	Ft-in	6’0"		Electrical Swivel removed
Total height of the machine – Condition-2	Ft-in	7’3"		w/ electrical swivel
Machine weight and mass balance				
Total Weight of Machine (no product)	Lbs	3000		Estimated shipping weight
Machine Tire and Wheel Information				
Tire – 7.60-15SL	Lbs	1930		Max Operating Load
Tire – Inflation Pressure	Psi	40		Max Pressure (cold)
Tire – 4.80-12	Lbs	990		Max Operating Load
Tire – Inflation Pressure	Psi	90		Max Pressure (cold)
Machine Hydraulic System				
Hydraulic Tank Capacity	Gal	2		Design Tank Capacity
Hydraulic Relief Set point	Psi	1600		Main Relief pressure set point
Machine Electrical System				
Incoming Power Supply 208-240V/480V 3PH	Amps	20/10		(3) 2HP 3PH motors plus elec.
Onboard Control system 120V 1PH	Amps	3/1.5		Integrated Transformer
Remote control / Interlock				Per customer specification

MAYO MFG. RECOMMENDS THE FOLLOWING MOBIL PRODUCTS OR THEIR EQUIVALENTS				
Lubricant Type	Component	Specification	Recommended Lubricant	Recommended Temperature / Service Interval
Hydraulic Oil	Hydraulic Reservoir	ISO 32, Synthetic Food Grade, NSF-H1	Mobil SHC Cibus 32	All Temperatures/Oil sample guidance or 12 months
	Hydraulic Reservoir	ISO 32, Food Grade, NSF-H1	Mobil DTE FM 32	10F to 140F/Oil sample guidance or 12 months
Grease	Greased Bearings/ Points	Food Grade	Mobilgrease FM 222	All/Weekly or as needed
	Greased Bearings/ Points	Non-Food	Mobilgrease XHP 222	
Gear Oil	Winsmith Worm Gear Reducer	Poly Alkylene Glycol (PAG) ISO 460 NSF H1	Mobil Glygoyle 460	All/See Manual Note: Do not Substitute
	Browning Helical Gear Reducer	Synthetic, PAO Type ISO 220 NSF H1	Mobil SHC 630 or Mobil SHC Cibus 220 (NSF H1)	All/Change Every Two Years
	Auburn Planetary Wheel Drives	SAE GL-5 75w90	Mobil Delvac Synthetic 75w90	All/Change Every Two Years

**SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE**

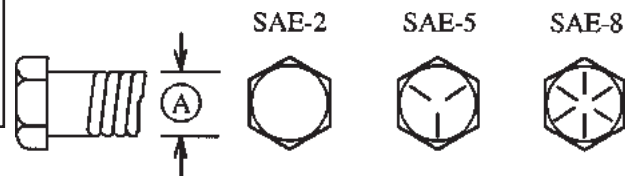
## 7.2 BOLT TORQUE

### CHECKING BOLT TORQUE

The tables shown below give correct torque values for various bolts and capscrews. Tighten all bolts to the torques specified in chart unless otherwise noted. Check tightness of bolts periodically, using bolt torque chart as a guide. Replace hardware with the same strength bolt.

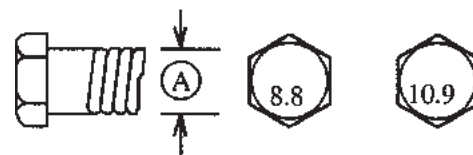
#### ENGLISH TORQUE SPECIFICATIONS

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



#### METRIC TORQUE SPECIFICATIONS

Bolt Diameter "A"	Bolt Torque*			
	8.8 (N.m) (lb-ft)		10.9 (N.m) (lb-ft)	
M3	.5	.4	1.8	1.3
M4	3	2.2	4.5	3.3
M5	6	4	9	7
M6	10	7	15	11
M8	25	18	35	26
M10	50	37	70	52
M12	90	66	125	92
M14	140	103	200	148
M16	225	166	310	229
M20	435	321	610	450
M24	750	553	1050	774
M30	1495	1103	2100	1550
M36	2600	1917	3675	2710



Torque figures indicated above are valid for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or capscrews unless otherwise specified in this manual. When using locking elements, increase torque values by 5%.

\* Torque value for bolts and capscrews are identified by their head markings.

### **7.3 ELECTRICAL SCHEMATIC**

Line phasing, line voltage, control voltage, and accessory options can vary substantially for each machine.

Please contact factory at 1-800-223-5873 for your machine's specific electrical layout.

**SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE**



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