Mayo

BIN PILER

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.

BIN PILER

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 _____

Address _____

City, State/Prov., Code _____

Phone Number (_____) _____

Dealer's Name _____

Address _____

City, State/Prov., Code _____

Conveyor Model _____

Serial Number _____

Delivery Date _____

DEALER INSPECTION REPORT

_____ Tire Pressure Checked
_____ Wheel Bolts Torqued
_____ Inspect Electrical System
_____ Hydraulic Hoses Free
_____ Hydraulic Fittings Tight
_____ Lubricate Machine
_____ Conveyor Tensioned and Aligned
_____ Speed Reducer Gearbox Oil Level Checked

SAFETY

_____ Guards/Shields Installed & Secured
_____ All Decals Installed & Legible
_____ All Required Lights & Reflectors Installed, Clean & Working
_____ Safety Chain on Hitch
_____ 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

TABLE OF CONTENTS

SERIAL NUMBER LOCATION

Always give your dealer the serial number of your Mayo Bin Piler 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 _____

Serial Number _____

1 INTRODUCTION

Congratulations on your choice of a Mayo Bin Piler 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 Bin Piler requires that you, and anyone else who will be operating or maintaining the Bin Piler, read, understand and practice ALL of the Safety, Operation, Maintenance and Trouble Shooting recommendations contained within this Operator's Manual.

This manual applies to all Bin Pilers manufactured by Mayo. Certain options may be available to specifically tailor the Bin Piler 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 end of the Bin Piler is the front. All electrical controls are on the left side.

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 Bin Piler 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:

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

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

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

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 Bin Piler. **YOU** must ensure that you and anyone else who is going to operate, maintain or work around the conveyor 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 conveyor.

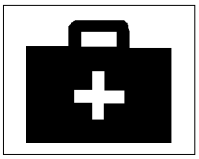
Remember, **YOU** are the key to safety. Good safety practices not only protect you but, also the people around you. Make these practices a working part of your safety program. Be certain that **EVERYONE** operating this machine is familiar with the procedures recommended and follows safety precautions. 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 conveyor.
- Bin Piler owners must give operating instructions to operators or employees before allowing them to operate the conveyor, 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!

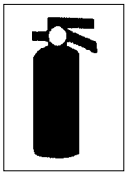
2.1 GENERAL SAFETY

1. Read and understand the Operator's Manual and all safety signs before supplying power to, operating, maintaining or adjusting the Bin Piler.

2. Only trained, competent persons shall operate the Bin Piler. 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, shut down and lockout power supply, relieve hydraulic pressure 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 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 Bin Pilers 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.

2.4 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.

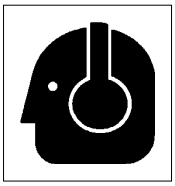
How to Install Safety Signs:

- 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.

2.5 PREPARATION

1. Never operate the Bin Piler 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 Bin Piler 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.

2.6 STORAGE SAFETY

1. Store the Bin Piler 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 Bin Piler.

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 Bin Piler.

2.7 INSTALLATION SAFETY

1. Disconnect and remove all mechanical locks, anchor chains and any other transport devices that would hinder or prohibit the normal functioning of the Bin Piler 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. Have at least one extra person available to assist when elevating, moving or connecting to other equipment.

4. Make certain that sufficient amperage, at the proper voltage and frequency (60Hz) is available before connecting power. If you are uncertain, have a licensed electrician provide power to the machine.

5. Make certain that sufficient amperage, at the proper voltage and frequency (60Hz) is available before connecting power. If you are uncertain, have a licensed electrician provide power to the machine who follows ANSI/NFPA 70 Wiring Standard.

6. If using Bin Piler 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 Bin Piler.

3. Provide tags at the work site and a sign-up sheet to record tag out details.

4. Do not servcie or maintain the Bin Piler unless motors are OFF and the power locked out at the master panel. Keep others away.

2.9 OPERATING SAFETY

1. Read and understand the Operator's Manual and all safety signs before operating, maintaining, adjusting or repairing the Bin Piler.

2. Turn machine OFF, shut down and lock out power source, unplug power cord and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.

3. Keep all electrical components tight, dry and in good repair.

4. Keep all hydraulic components tight and in good repair.

5. Replace all worn or failed components immediately.

6. Install and secure all guards before operating.

7. Keep hands, feet, hair and clothing away from moving parts.

8. Install safety locks on the boom before transporting or working under it.

9. Lower boom to safety locks, center boom, retract boom and install all safety locks and chain before transporting.

10. Use pilot vehicles when transporting.

11. Stay away from overhead power lines and obstructions when moving or positioning. Electrocution can occur without direct contact.

12. Do not stand between the boom and other structures when extending/retracting or swinging the boom. Keep others away.

13. Do not stand or climb on machine when running. Keep others off.

14. Have only a qualified electrician provide power to the machine.

15. Make certain that sufficient amperage, at the proper voltage and frequency (60Hz) is available before connecting power. If you are uncertain, have a licensed electrician provide power to the machine who follows ANSI/NFPA 70 Wiring Standard.

16. 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, 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:

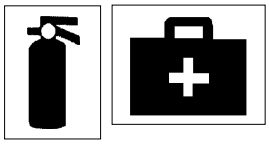
   - Keep service area clean and dry.
   - Be sure electrical outlets and tools are properly grounded.
   - Use adequate light for the job at hand.

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 Bin Piler.

7. Do not work on Bin Piler 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.

8. A fire extinguisher and first aid kit should be kept readily accessible while performing maintenance on this equipment.



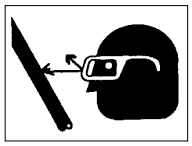
2.11 HYDRAULIC SAFETY

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.

6. Relieve pressure on hydraulic system before servicing, maintaining or repairing the hydraulic system.

2.12 ELECTRICAL SAFETY

1. Have only a qualified licensed electrician supply power to the machine by following ANSI/NFPA 70 Wiring Standard.

2. Make certain that the Bin Piler is properly grounded at the power source.

3. Make certain that all electrical switches are in the OFF position before plugging the Bin Piler 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 Bin Piler 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 over-inflate 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 wheels and tires are in good repair and that tires are inflated to proper pressure. Do not under-inflate or over-inflate.

3. Make certain that all wheel bolts/lug nuts are tightened to proper torque specifications (refer to specification chart in Section 7.2).

4. Fully retract boom section and secure before transporting.

5. Install and secure the boom swing and height lock brackets in the frame before transporting.

6. Disconnect steering cylinder from anchor and tie up.

7. Configure power wheel cover with center pin depressed to disengage drive gears.

8. Make certain that all mechanical locks are safely and positively connected before loading or transporting.

9. Raise outriggers into their fully up position and secure with lock pins.

10. Wrap up and tie all loose hydraulic and electrical ends to the frame.

11. Be sure that any necessary SMV (slow moving vehicle) signs, reflectors and lights required by law are in proper place and are clearly visible to oncoming and overtaking traffic.

12. Be sure that the Bin Piler is positively hitched to the towing vehicle. Use a safety chain to assure a safe hitch hook-up when transporting.

13. Follow local regulations regarding maximum weight, width and length when transporting.

14. Do not exceed 15 MPH (25 Km/H). Reduce speed on rough roads and surfaces.

15. Do not allow anyone to ride on the Bin Piler or towing vehicle during transport.

16. Always use hazard flashers on the towing vehicle when transporting.

17. Always use pilot vehicles in front and behind when towing on a public road.

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

DATE	EMPLOYEE'S SIGNATURE	EMPLOYER'S SIGNATURE

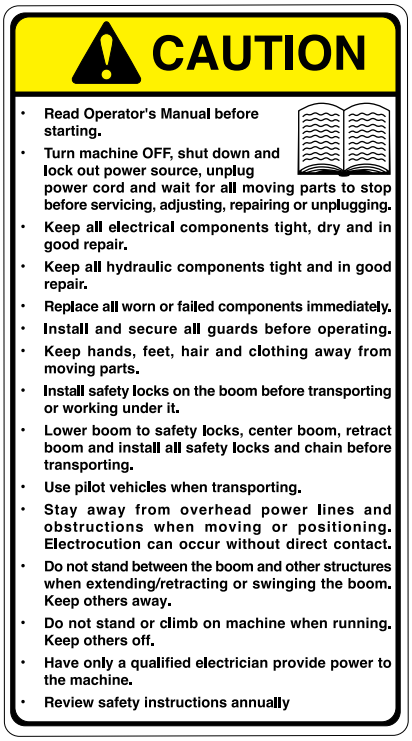
3 SAFETY SIGN LOCATIONS

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



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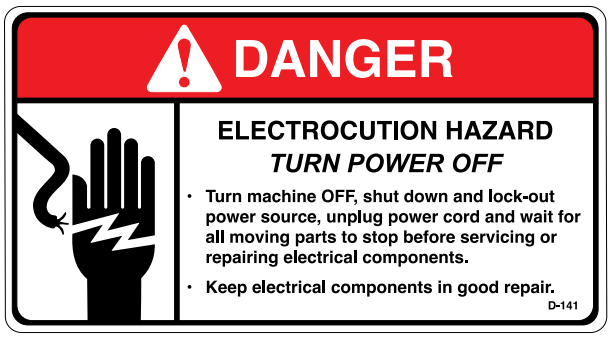

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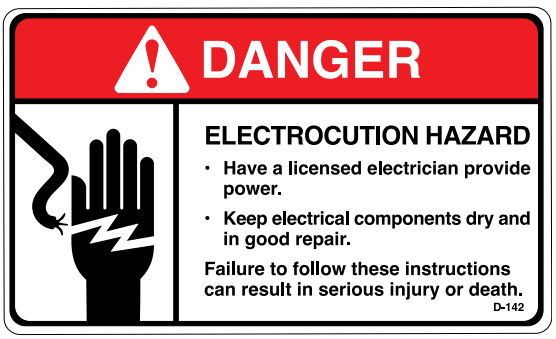

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• Think SAFETY! Work SAFELY!

K

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.

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.

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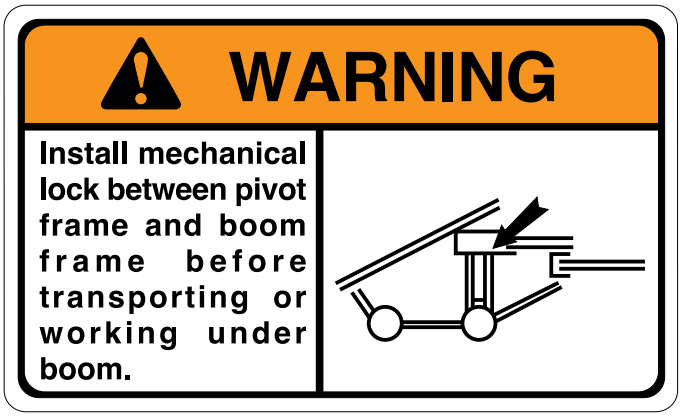

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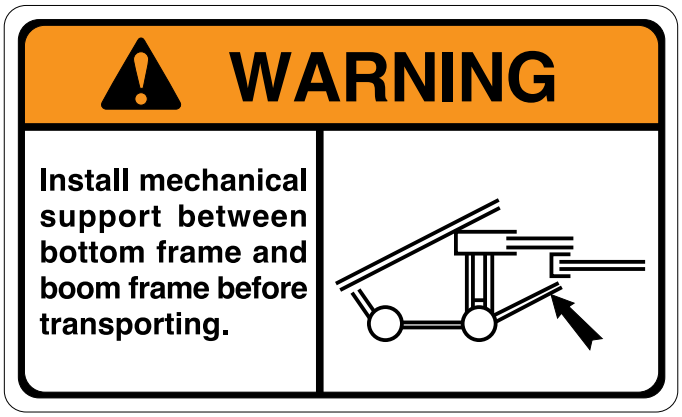

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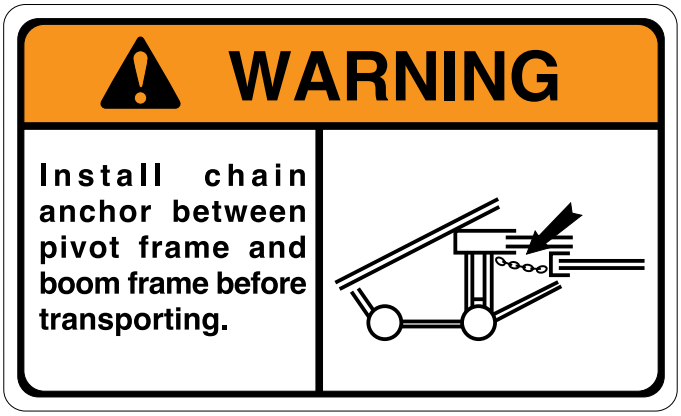

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4 OPERATION

OPERATING SAFETY

- Read and understand the Operator's Manual and all safety signs before operating, maintaining, adjusting or repairing the Bin Piler.
- Turn machine OFF, shut down and lock out power source, unplug power cord and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
- Keep all electrical components tight, dry and in good repair.
- Keep all hydraulic components tight and in good repair.
- Replace all worn or failed components immediately.
- Install and secure all guards before operating.
- Keep hands, feet, hair and clothing away from moving parts.
- Install safety locks on the boom before transporting or working under it.
- Use pilot vehicles when transporting.
- Lower boom to safety locks, center boom, retract boom and install all safety locks and chain before transporting.
- Stay away from overhead power lines and obstructions when moving or positioning. Electrocution can occur without direct contact.
- Do not stand between the boom and other structures when extending/retracting or swinging the boom. Keep others away.
- Do not stand or climb on machine when running. Keep others off.
- Have only a qualified electrician provide power to the machine.
- Make certain that sufficient amperage, at the proper voltage and frequency (60Hz) is available before connecting power. If you are uncertain, have a licensed electrician provide power to the machine who follows ANSI/NFPA 70 Wiring Standard.
- Review safety instructions annually

4.1 TO THE NEW OPERATOR OR OWNER

The Mayo Manufacturing Bin Piler is designed to be used for filling bins for storage or loading trucks. 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. In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, and prudence of personnel involved in the operation, transport, maintenance and storage of equipment or in the use of facilities.

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.

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 Bin Piler will provide many years of trouble-free service.

4.2 MACHINE COMPONENTS

The Mayo Manufacturing Bin Piler consists of a hopper, elevator and boom assembly for conveying produce into a storage bin or truck. Produce is distributed from side-to-side by swinging the boom or moving the entire machine. The boom can extend or retract and raise or lower for exact placement of produce where required. Electric motors power each conveyor and an electric motor drives the pump on the hydraulic system. A hydraulic motor is used to extend and retract the boom.

All electrical controls are mounted on a central control panel and the hydraulic controls are mounted at the center frame. The elevator height hydraulic control is located at the lower end of the elevator.

The front wheels steer and the rear wheels drive the machine for positioning. Outrigger wheels are located at the center pivot point. Many additional optional features can be incorporated into the Piler per customer requirements.

A Drive Wheels
B Steering Wheels
C Attaching Frame
D Frame Weights
E Tow Hitch
F Hopper
G Elevator
H Boom-Upper
J Boom-Lower
K Discharge
L Electric Control Panel
M Hydraulic Controls
N Elevator Lift Control
O Hydraulic Pump
P Oil Reservoir
Q Outrigger
R Remote Control
S Remote Receiver

FIG. 1 MACHINE COMPONENTS

4.3 GENERAL OPERATION THEORY

The Bin Piler is positioned in the center aisle way of the bin to be filled, with the boom fully extended and within a couple of feet of the end of the bin. The boom is lowered to it's lowest position and is now ready to begin the piling operation.

Potatoes are fed into the elevator hopper of the Bin Piler by one of several types of conveying machines which could include, but is not limited to a telescoping conveyor, a straight conveyor, a sizing conveyor, a chain conveyor, a transport truck, a holding hopper, etc.

From the elevator hopper the potatoes are carried by flighted belting or chain up into the flighted or smooth boom conveyor sections which ultimately discharges the potatoes into the storage bins for long term storage.

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

The three hydraulic piling functions (lift, telescope and swing) allow for smooth, level piling throughout the full width, height and length of the bin.

For truck loading, move the boom into the truck box. Position so boom can extend to the front of trailer. Like filling a storage facility, use a conveyor to provide an even, steady supply of product to the hopper. Use the boom to distribute product from side to side and front to rear. Move the frame as required to completely fill the trailer.

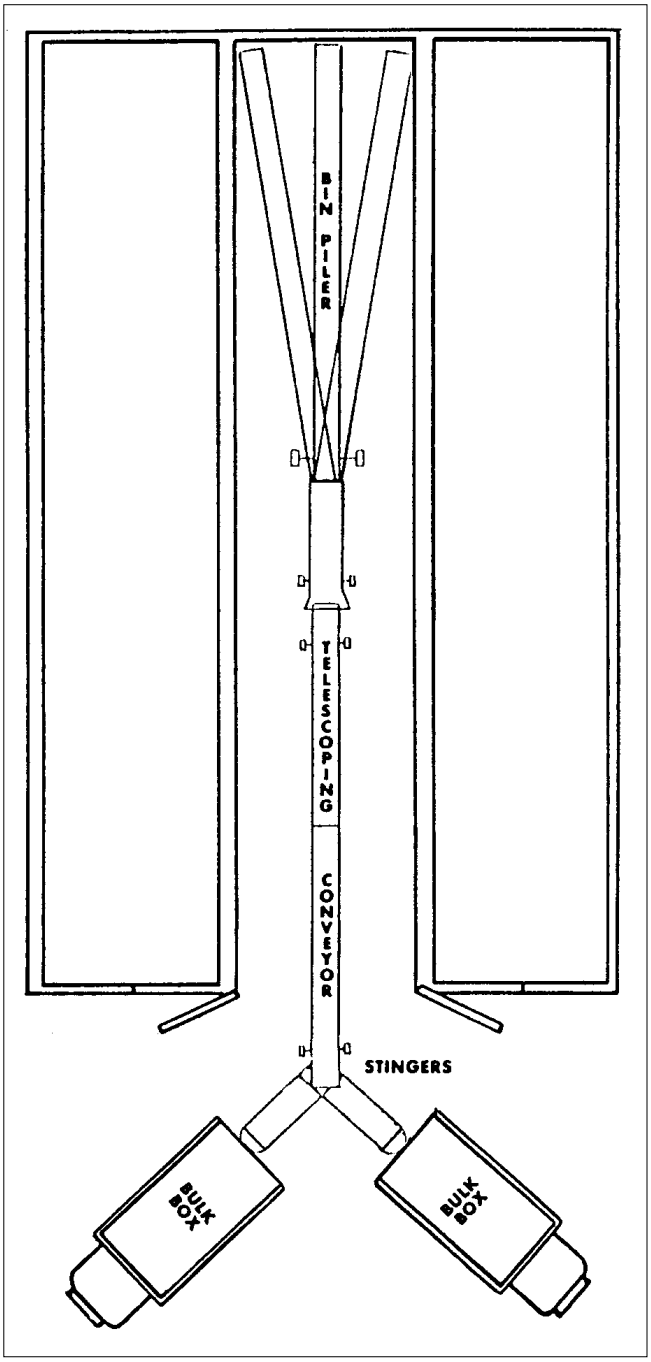


FIG. 2 POSITIONED (TYPICAL)

4.3.1 BOOM SWING PILER

The Piler is designed to work in tight areas that would restrict side to side movement of a different type of machine. That is because the main side to side movement and the swing function only affects the boom. This makes the Piler highly maneuverable. When moving the Piler through corridors or around other equipment or buildings it is possible to swing the boom left or right to "bend" the Piler through tight turns.

The boom functions of this Piler offer the following degrees of movement:

1. Lift - 21 feet of vertical height adjustment ranging from 3 to 24 feet above the ground.

2. Telescope - 18.5 feet of additional boom extension resulting in 30.5 feet to 49 feet of extension beyond front face of the drive wheels.

3. Swing - 35° of movement, 17.5° left or right of center line. 54 feet of total straight line width.

FIG. 3 BIN PILER

4.4 MACHINE BREAK-IN

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

A. Read Piler and auxiliary equipment manuals before starting.

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

1. Retorque all wheel bolts.
2. Retorque all other fasteners and hardware.
3. Check that all electrical connections are tight and cords are routed out of the way or protected.
4. Check for leaks in hydraulic system. Retorque fittings that leak.
5. Check that no hydraulic lines are being pinched or crimped. Reroute as required.
6. Check oil level in hydraulic reservoir. Top up as required.
7. Check the alignment and tension of all conveyor belts and chains. Realign or tighten as required.
8. Check all drive sprockets to make sure none has moved. Re-align and tighten any sprocket that has moved.
9. Check oil level in each speed reduction gear box for each drive. Top up as required.
10. Lubricate all grease fittings.

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

1. Check the alignment of all conveyor belts and chains. Realign as required.
2. Retorque all other fasteners and hardware.
3. Check that all electrical connections are tight and cords are routed out of the way or protected.
4. Check for leaks in hydraulic system. Retorque fittings that leak.
5. Check that no hydraulic lines are being pinched or crimped. Reroute as required.
6. Check oil level in hydraulic reservoir. Top up as required.
7. Check the alignment and tension of all conveyor belts and chains. Realign or tighten as required.
8. Check all drive sprockets to make sure none has moved. Re-align and tighten any sprocket that has moved.
9. Check oil level in each speed reduction gear box for each drive. Top up as required.
10. Then go to the regular servicing and maintenance schedule as defined in the Maintenance Section.

D. **After 25 hours of operation:**

1. Change the hydraulic system oil filter.

4.5 PRE-OPERATION CHECKLIST

Safe and efficient operation of your new Bin Piler 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 Bin Piler. The checklist should be performed before operating the Bin Piler 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. Check the oil level in the hydraulic reservoir as prescribed in the Maintenance Section.

4. Check for hydraulic leaks. Tighten fittings or reroute hoses as required to maintain a leak-free system.

5. Insure that all safety guards and shields are in good repair and securely in place.

6. Check that the conveyor belts are centered on the head and tail rollers. Adjust if necessary as outlined in the Maintenance Section.

7. Make sure that all electrical switches are in the OFF position before supplying power.

8. Check that all electrical connections are tight and cords are routed out of the way or protected.

9. 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. **Control Panel:**

   a. **Hydraulic Pump ON/OFF:**
   These 2 buttons control the power to the pump for the Piler hydraulic system. Depress the top green button to turn the pump ON. Depress the bottom red button to stop the hydraulic system pump. The pump must be turned ON before using any hydraulic function.

   b. **Conveyors ON/OFF:**
   These 2 buttons control the power to the conveyors. Depress the top green button to turn the conveyors ON. This initiates the internal motor starting sequence that has a 2-3 second delay between the elevator, upper boom and lower boom motors. Depress the bottom red button to stop the conveyors.

   c. **Lights ON/OFF:**
   This 2 position rotary switch controls the power to the auxiliary flood lights on the machine. Turn counterclockwise to turn the lights OFF and clockwise to turn ON.

   d. **Remote ON/OFF:**
   This 2 position rotary switch controls the power to the remote control antenna box. Turn counterclockwise to turn OFF and clockwise to turn ON and operate the machine with the remote.

   e. **Speed Control:**
   This potentiometer controls the speed of the conveyors. Turn the dial clockwise to increase the conveyor speed and counter-clockwise to slow them.

   f. **Emergency STOP Control:**
   This red push/pull button is the emergency STOP control for the machine and stops all electrical and hydraulic functions including the remote. Push the control in for emergency STOP. Place all the individual controls in their OFF position. Before the machine can be restarted, the Emergency STOP button must be pulled out. If the individual controls are not all placed in their OFF position when the STOP button is pulled out, all the motors will try to start at the same time. DO NOT use the emergency STOP switch as a master start switch. The high current draw with all motors starting at the same time will overload the system and trip all the breakers.

   g. **Master Power ON/OFF:**
   This 2 position rotary switch controls the power to the entire machine. Turn counterclockwise to turn OFF and clockwise to turn ON.

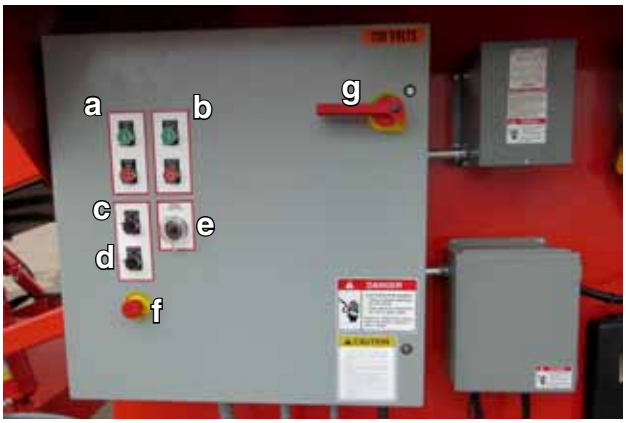


FIG. 4 CONTROL PANEL

2. **Hydraulic Controls - Center:**

a. **Boom Swing:**
This 3 position spring-loaded to center neutral hydraulic valve controls the angle of the boom. Move the lever down and hold to swing the boom to the left. Move the lever up and hold to swing to the right.

b. **Steering:**
This 3 position spring-loaded to center neutral hydraulic valve controls the steering function on the front wheels. Move the lever down and hold to steer to the left and up and hold for turning to the right. Move to the center and the wheels will not turn any more.

c. **Drive:**
This 3 position spring-loaded to center neutral hydraulic valve controls the driving function of the rear wheels. Move the lever down and hold to move the machine forward. Move up and hold to move back.

d. **Boom Height:**
This 3 position spring-loaded to center neutral hydraulic valve controls the height of the boom. Move the lever down and hold to lower the boom and up and hold to raise.

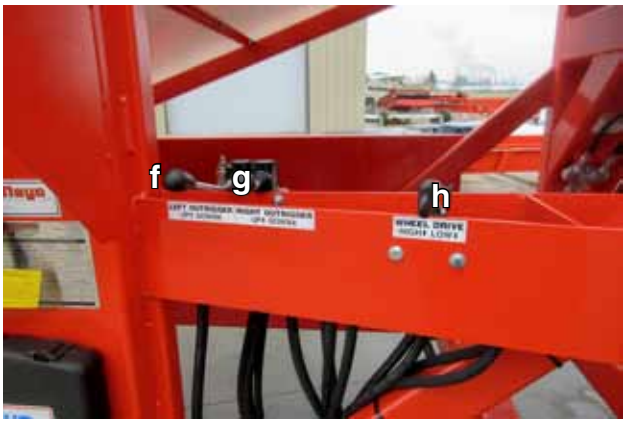
e. **Boom Length:**
This 3 position spring-loaded to center neutral hydraulic valve controls the length of the boom. Move the lever down and hold to retract the boom. Move the lever up and hold to extend.

f. **Left Outrigger:**
This 3 position spring-loaded to center neutral hydraulic valve controls the position of the left outrigger. Move the lever up and hold to raise the left outrigger. Move down and hold to lower the outrigger.

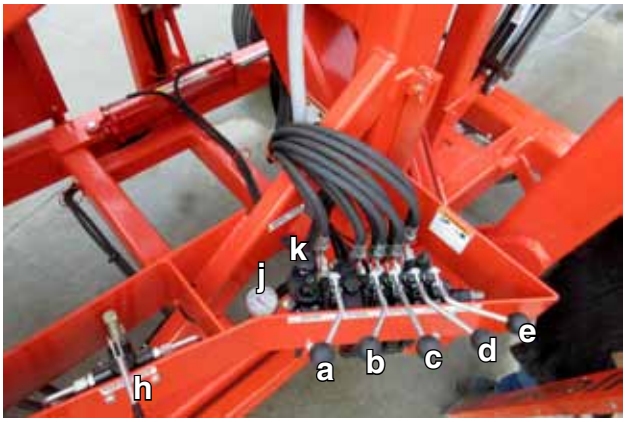
g. **Right Outrigger:**
This 3 position spring-loaded to center neutral hydraulic valve controls the position of the right outrigger. Move the lever up and hold to raise the right outrigger. Move down and hold to lower the outrigger.

h. **Speed Range:**
This 2 position hydraulic valve sets the drive wheels' speed range. Move lever down to set in the low range and up for the high range.

Rear - Center



Front- Center



Top

FIG. 5 HYDRAULIC CONTROLS

j. **Pressure Gauge:**
This gauge displays the pressure in the hydraulic system. It seldom exceeds 1200 - 1500 psi on a momentary basis.

k. **Swing Speed:**
This needle valve sets and controls the boom swing speed. Turn knob clockwise to turn valve in and slow the swing speed. Turn counter-clockwise to increase swing speed.

3. **Hydraulic Control - Front:**

   a. **Elevator Position:**
   This 3 position spring-loaded to neutral center hydraulic valve controls the height of the elevator. Move the lever up and hold to raise the elevator and down and hold to lower it.

   b. **Hitch Position:**
   This 3 position spring-loaded to neutral center hydraulic valve controls the position of the hitch used to connect to adjacent equipment. Move the lever down and hold to lower hitch. Move up and hold to raise it.

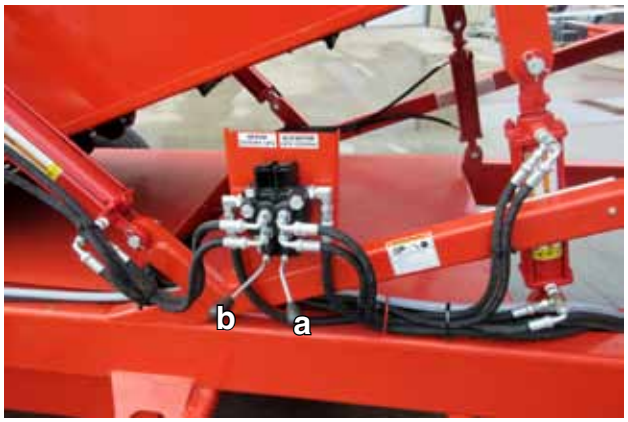


FIG. 6 FRONT HYDRAULIC CONTROLS

4. **Radio Controlled Remote (Optional):**
This hand-held radio-controlled box controls the boom movement functions of raise/lower, extend/retract and swing plus starting and stopping the machine. It has a range of approximately 200 feet. Place the mode switch on the electrical panel into the REMOTE ON position to activate the receiver on the panel. All control circuits are wired in parallel so the machine can be controlled by the panel or the remote at any time.

   a. **Emergency Stop:**
   This red button is the Emergency Stop switch for the machine and disconnects all power to the machine. Depress it to stop the machine. Correct the condition before restarting the machine. Turn the red button in either direction to release the stop button and it will pop out.

   b. **OFF/ON/START:**
   This 2 position rotary switch controls the power to the machine. Turn counter-clockwise to turn the power off and clockwise to turn it on. The switch must be turned on before the Piler can be operated.

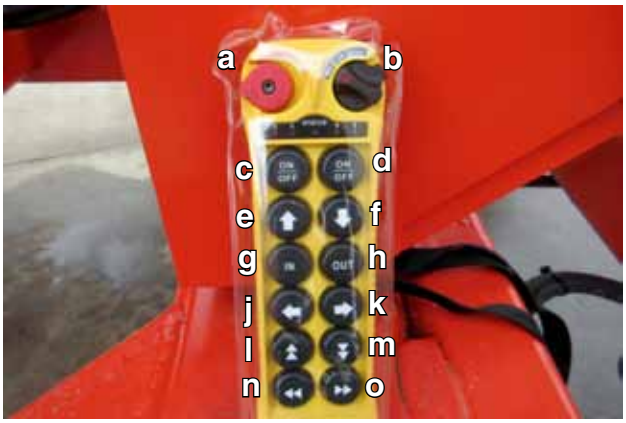
   c. **ON/OFF (Hydraulic System):**
   This 2 position latching switch turns the hydraulic pump on and off. Depress once to turn the pump on. Depress again to turn off.

   d. **ON/OFF (Conveyors):**
   This 2 position latching switch is the master start switch for the machine. Depress this switch to sequentially turn on the bottom boom conveyor, top boom conveyor and the elevator in that order. There is a few seconds of time - delay between starting each conveyor to prevent over-loading the power circuit or plugging the machine. Depress the switch again to turn the conveyors off.

   e. **Boom UP ▲:**
   This spring-loaded momentary-contact button controls the boom UP function of the machine. Depress the button and hold to move the boom UP to the desired position. Release the button to stop.

   f. **Boom DOWN ▼:**
   This spring-loaded momentary-contact button controls the boom DOWN function of the machine. Depress the button and hold to move the boom DOWN to the desired position. Release the button to stop.

Antenna Box



Control Pad

FIG 7. RADIO CONTROLLED REMOTE SYSTEM

   g. **Boom LEFT ◄:**
   This spring-loaded momentary-contact button controls the boom swing LEFT function of the machine. Depress this button and hold to swing the boom toward the left to its desired position. Release the button to stop.

   h. **Boom RIGHT ►:**
   This spring-loaded momentary-contact button controls the boom swing RIGHT function of the machine. Depress this button and hold to swing the boom toward the right to its desired position. Release the button to stop.

   j. **Boom IN:**
   This spring-loaded momentary-contact button controls the boom retract IN function of the machine. Depress this button and hold to retract the boom IN to its desired position. Release the button to stop.

k. **Boom OUT:**
This spring-loaded momentary-contact button controls the boom extend OUT function of the machine. Depress the button and hold to extend the boom OUT to its desired position. Release the button to stop.

l. **Moving Direction ▲▲:**
This spring-loaded momentary contact button controls the movement of the machine. Depress and hold the button to move the machine forward (in direction of elevator). Release the button to stop movement.

m. **Moving Direction ▼▼:**
This spring-loaded momentary contact button controls the movement of the machine. Depress and hold the button to move the machine rearward (in direction of boom). Release the button to stop movement.

n. **Steering Direction ◀◀:**
This spring-loaded momentary contact button controls the steering direction of the machine. Depress and hold the button to move the steering wheels to the left (elevator end toward control panel). Release the button to stop steering wheels.

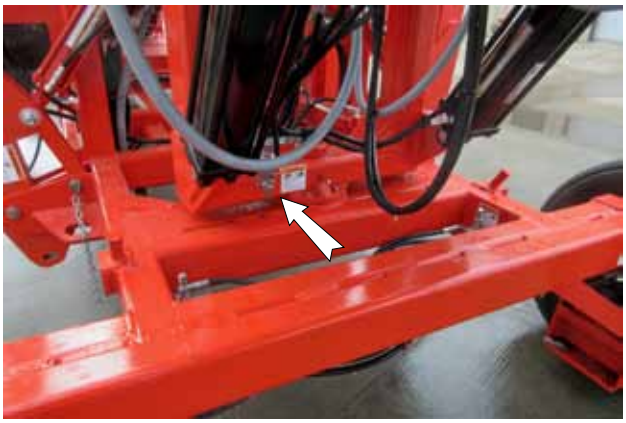
o: **Steering Direction ▶▶:**
This spring-loaded momentary contact button controls the steering direction of the machine. Depress and hold the button to move the steering wheels to the right (elevator away from control panel). Release the button to stop steering wheels.

5. **Check Valves:**

   a. **Pilot Operated Check Valves:**
   Check valves are included in the elevator height, boom height, boom length, boom angle and outrigger position circuits to prevent control valve leak-down or settling. These valves are not adjustable.

Boom Swing

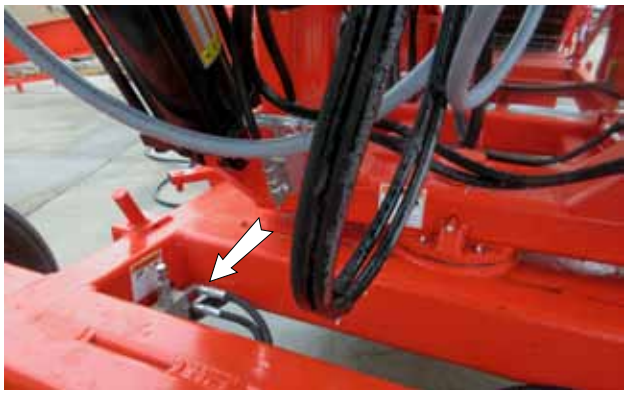
Boom Extend



Boom Lift

FIG. 8 CHECK VALVES

b. **Cushion Valves:**
The drive circuit hydraulic system is designed with cushion valves to prevent the machine from moving back and forth when stopping. These valves are not adjustable.



Left

Right

FIG. 9 CUSHION VALVES

6. **Driving Components:**
The machine is propelled by power wheels on each rear wheel. The gears must be disengaged before transporting the unit. Configure the cover on the power wheel with the center pin depressed to disengage the gears for towing. The center pin must be extended for the gears to mesh and for the Piler to move under its own power. Depress the 2 outer pins to extend the center pin.

Retracted

Extended

FIG. 9 CUSHION VALVES

7. **Auxiliary Electrical System (Optional):**
An optional 120 V electrical system is available to connect the machine control system into the controls of other equipment in the loading/unloading system. Plug the cords into the adjacent machine control system to start and stop the system machines.

FIG. 11 AUXILIARY ELECTRICAL SYSTEM

4.7 MACHINE PREPARATION

The machine must be properly prepared prior to using. Before starting machine, be sure that the following items are appropriate for your machine and operating requirements:

1. **Power:**
   Have a licensed electrician who follows ANSI/ NFPA 70 Wiring Standard provide power at the required voltage, phase and amperage for your machine. An improper source of power will cause damage to electrical components and could create an electrical hazard to the operator, workers or bystanders.

   Be sure to use an extension cord of the correct specifications for the power being carried. Route the cord so that it does not interfere with the working area. Provide appropriate protection when people or equipment must go over the cord. Inspect the cord occasionally to be sure it is not damaged. Replace immediately if it is damaged.

2. **Hitch:**
   Bin Pilers are equipped with a hitch for towing. The hitch must be removed or retracted prior to the Bin Piler being used to prevent interfering with workers or adjacent equipment. Extend the hitch and install anchor pin before towing.

Retracted

Extended

FIG. 12 TOW HITCH ANCHOR PIN

3. **Tractive Drive System:**
   Configure the tractive drive into its operating mode. Check the cover on each power wheel. Configure so the center pin on the cover is depressed to allow the internal gears to mesh.

FIG. 13 PIN DEPRESSED

4. **Steering:**
Bin Pilers are equipped with a steering system on the front wheels to provide maneuverability. Use the steering control hydraulic lever on the side of the frame or the remote to turn the front wheels as required. Disconnect the steering cylinder anchor pin before towing the unit.

Cylinder

Lever

Remote

FIG. 14 STEERING (TYPICAL)

5. **Remote Controller Location:**
Two remote controllers are provided with each machine and are shipped inside the electrical panel. Before providing power to the Bin Piler, open the panel and retrieve the remote controllers. Store one in a warm, dry location. Use the other one as appropriate for your application.

FIG. 15 REMOTE CONTROLLER LOCATION

6. **Equipment Attachment:**
   Each customer must provide a means of supplying a steady flow of potatoes to the Piler. Normally this is done by using another piece of equipment such as a grader or another conveyor. The piler is equipped with a hitch on the front that is used to connect the two pieces of equipment together. By connecting the equipment securely together, the Piler can be moved slightly in its working location without missing any potatoes flowing through the system.

   Disconnect the hitch and move the other equipment before repositioning or moving the Piler.

Piler Hitch

Attached

FIG. 16 EQUIPMENT ATTACHMENT

7. **Outriggers:**
The Bin Piler is designed with an outrigger on each side to stabilize the machine. Lower both outriggers when the machine is in position. Use the turnbuckle on the extendable frame on the outrigger to match the wheel to the ground. The wheel must contact the ground to stabilize the frame. A pilot operated check valve in the hydraulic circuit that will hold the outriggers in place until pressure is applied to the circuit again.

Left

Right

Lock Pin

Turnbuckle

FIG. 17 OUTRIGGERS

8. **Bin Position:**
Locate the Piler in the center of the storage bin so the boom can reach from side-to-side. Position the machine at the far end of the empty bin with boom fully extended and a couple of feet from the end. Move the other conveying equipment to the hopper end and connect securely. Retract the boom as the bin fills. Use the integral front wheel steering and rear wheel drive to more the Piler when repositioning.

9. **Truck Loading:** The boom can be used to convey potatoes into a transport truck when loading the truck or unloading a storage facility.

   Back the truck around the boom and extend the boom until it reaches the front of the truck. Attach and secure the equipment conveying into the hopper. Extend the outriggers to stabilize the frame. Start the Piler and conveying equipment and load the produce. Retract the boom as the truck fills. Pull the truck forward if required to fill the back part of the truck.

   Do not go into the truck when loading the trailer. Keep others out.

Storage Facility

Truck

FIG. 18 POSITIONING

4.8 OPERATION

OPERATING SAFETY

- Read and understand the Operator's Manual and all safety signs before operating, maintaining, adjusting or repairing the Bin Piler.
- Turn machine OFF, shut down and lock out power source, unplug power cord and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
- Keep all electrical components tight, dry and in good repair.
- Keep all hydraulic components tight and in good repair.
- Replace all worn or failed components immediately.
- Install and secure all guards before operating.
- Keep hands, feet, hair and clothing away from moving parts.
- Install safety locks on the boom before transporting or working under it.
- Use pilot vehicles when transporting.
- Lower boom to safety locks, center boom, retract boom and install all safety locks and chain before transporting.
- Stay away from overhead power lines and obstructions when moving or positioning. Electrocution can occur without direct contact.
- Do not stand between the boom and other structures when extending/retracting or swinging the boom. Keep others away.
- Do not stand or climb on machine when running. Keep others off.
- Have only a qualified electrician provide power to the machine.
- Make certain that sufficient amperage, at the proper voltage and frequency (60Hz) is available before connecting power. If you are uncertain, have a licensed electrician provide power to the machine who follows ANSI/NFPA 70 Wiring Standard.
- Review safety instructions annually

Follow this procedure when using the Bin Piler:

1. Review Section 4.7 Machine Preparation and follow all the instructions.
2. Review and follow the pre-operation checklist (See Section 4.5).
3. Review the location and function of all controls (See Section 4.6).

4. **Starting Bin Piler:**

   a. Clear the area of bystanders. Know where everyone is before starting.

   b. Place all controls in the OFF or neutral position, including the remote controls (if so equipped).

   c. Turn the power to the machine ON at the master panel.

   d. Turn the hydraulic pump ON (refer to section 4.6 Controls).

   e. After 2 to 3 seconds, turn the conveyors ON.

   NOTE
   The control circuit is designed to wait for 2 or 3 seconds between turning each system on to prevent electrical overload.

   f. Set the system to manual or interlock if it is part of a conveying system.

   g. Select the manual or remote mode as desired. Selecting remote allows the operator to use the remote control box.

   h. Turn the equipment ON that moves potatoes to the Piler.

5. **Stopping Machine:**

   a. Turn OFF the equipment that brings potatoes to the Piler.

   b. Wait until the potatoes have moved off the end of the lower boom conveyor.

   c. Turn the conveyors OFF.

   d. Turn the operating mode switch to its OFF position if equipped with a radio controlled remote.

   e. Turn the hydraulic pump OFF.

An alternative is to depress the red Master STOP button on the control panel or on the radio controlled remote box but then the operator must go through steps a through e to turn all the controls OFF before restarting.

Panels

Hydraulics

Remote

FIG. 20 CONTROLS

6. **Emergency STOP:**
   Depress the red STOP button on the control panel or the STOP button on the hand held radio controlled box. This will stop all the conveyors and the hydraulic pump. Be sure to turn all the individual control switches to their OFF position before restarting the machine.

7. **Equipment Attachment:**
The Piler is equipped with a high hitch on the hopper end and that should be used when attaching to other Mayo conveyors. The hitch is mounted to a pivot that allows it to move up and down to assist in attaching to other equipment. Lower the hopper as low as it will go, lower hitch and move the conveyor into position and secure. Raise the hitch and the hopper as high as it will go without interfering with conveyor to minimize the drop height.

Hitch

Controls

Operating

FIG. 21 EQUIPMENT ATTACHING

8. **Moving:**
The Piler is equipped with a drive system on each rear wheel for moving the machine slowly in confined areas. Raise the outriggers prior to moving to reduce the width.

The boom can also swing from side-to-side as required when maneuvering around corners. It is recommended that the machine be moved in 20 foot increments as the end of the storage facility fills. Extend the boom to the potatoes after the machine has been moved. Adjust the length of the feeding conveyors as required when the Piler is moved.

NOTE

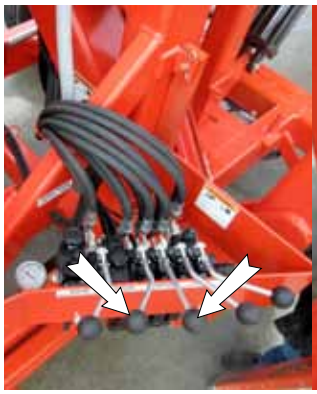
Be sure the power wheel cover center pin is depressed so the drive wheel gears are engaged.

It is recommended that the front hitch be extended and pinned, the drive power wheels disengaged, boom locks installed, outriggers raised and pinned and the machine towed with a tractor when transporting from location to location (refer to section 4.9 Transporting).

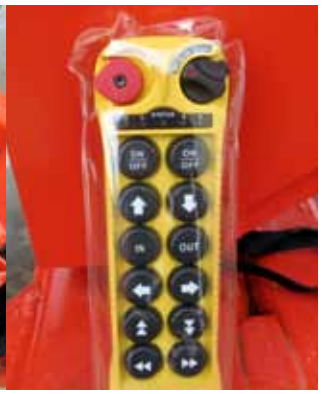
Power Wheels

Center Pin

Steering Cylinder



Valve Bank



Remote

FIG. 22 DRIVE SYSTEM

9. **Outriggers:**
The Bin Piler is designed with outriggers to give the machine a wider stance and more stability when operating. The outriggers should be raised and locked tor moving and transporting. Extend into their lowest position and pinned during piling.

When using the outriggers, follow this procedure:

a. Place all controls in OFF or neutral.

b. Turn the hydraulic pump ON.

c. Extend the left outrigger into its fully Down position.

d. Extend the right outrigger into its fully Down position.

e. Install lock pins through outrigger frames.

f. Use turnbuckles to lower wheels to the ground to provide support to Piler and provide stability.

e. Proceed with starting other systems to operate the Piler.

f. Raise both outrigger struts when maneuvering in a storage facility or transporting.

IMPORTANT

Always use lock pins through outrigger frames when configured in the up or down position.

NOTE

Each outrigger hydraulic circuit is designed with a pilot operated check valve in line that will keep the outrigger in position until pressure is applied to the circuit again.

Left - Lowering

Lock Pin (Typical)

Turnbuckle

Extended

FIG. 23 OUTRIGGERS

10. **Piling:**
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. Bruising during the piling phase can be minimized by keeping the drop height between the boom and the pile as small as possible. Use the up/down, extend/ retract and swing function to build a shelf from the bottom of the pile to the top. Use the same technique when loading trucks to minimize bruising.

FIG. 24 DROP HEIGHT

11. **Boom Movement:**
The Bin Piler boom is designed to move up-and-down, side-to-side and in-and-out. Use the hydraulic control levers on the left side of the frame or the wireless remote to move the boom.

Move the boom as appropriate for the application.

Hydraulic Levers

Wireless Remote

FIG. 25 BOOM CONTROLS

a. **Up-and-Down:**
24 feet for maximum height.

Down

Up

FIG. 26 UP-AND-DOWN (TYPICAL)

b. **Side-To-Side:**
35° total swing - ± 17.5°.

Centered

Full - Left

Full - Right

FIG. 27 SIDE-TO-SIDE (TYPICAL)

c. **In-And-Out:**
Boom extends 18.5 feet.

Retracted

Mid-Range

Extended

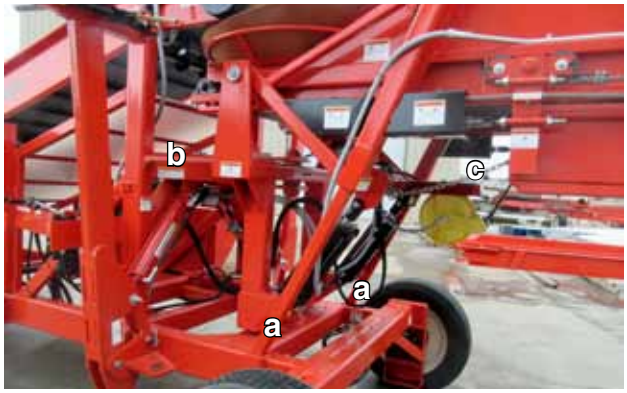
FIG. 28 IN-AND-OUT (TYPICAL)

12. **Transport/Storage Locks:**
The machine is designed with locks on the boom to hold it in position for storage and before transport. Always remove and stow the locks before operating.

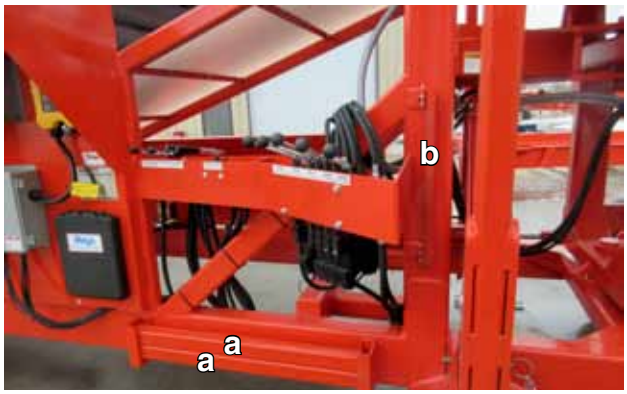
    a. Boom supports.

    b. Boom swing.

    c. Boom extend.



Installed



Stowed

FIG. 29 TRANSPORT/STORAGE LOCKS

13. **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 Piler as full as possible to minimize bruising during the conveying process.

f. Use the boom movement functions to keep the end of the boom as close to the pile as possible to minimize the drop height.

g. Establish, train and follow a tag-out lock-out policy and procedure for the work site. Be sure everyone follows the procedure.

FIG. 30 OPERATING SYSTEM

4.9 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 wheels and tires are in good repair and that tires are inflated to proper pressure. Do not underinflate or overinflate.
- Make certain that all wheel bolts/lug nuts are tightened to proper torque specifications (refer to specification chart in Section 7.2).
- Fully retract all telescoping Bin Piler section and secure before transporting.
- Install and secure the boom swing lock bracket in the frame before transporting.
- Make certain that all mechanical locks and integral anchor chains are safely and positively connected before loading or transporting.
- Raise and secure all jack stands if applicable.
- Wrap up and bind to the frame all loose hydraulic and electrical ends.
- Be sure that any necessary SMV (slow moving vehicle) signs, reflectors and lights required by law are in proper place and are clearly visible to oncoming and overtaking traffic.
- Be sure that the Bin Piler is positively hitched to the towing vehicle. Use a safety chain to assure a safe hitch hook-up when transporting.
- Adhere to local regulations regarding maximum weight, width and length.
- Do not exceed 15 MPH (25 Km/H). Reduce speed on rough roads and surfaces.
- Do not allow anyone to ride on the Bin Piler or towing vehicle during transport.
- Always use hazard flashers on the towing vehicle when transporting.

Mayo Pilers are designed to be easily and conveniently moved from location to location. The term moving is used to describe the action of moving the machine under its own tractive capability and is covered in section 4.8 Operating. Transporting is used to describe when the machine is being towed by a tractor or other power unit. When transporting, follow this procedure:

1. Disconnect and remove all auxiliary equipment from the Piler and position so the tractor can back up to the front of the machine.
2. Prepare towing system components:
   a. Center the steering wheels, disconnect the steering cylinder and tie up.
   b. Extend tow hitch and secure with anchor pin.

Steering Cylinder

Tow Hitch Anchor Pin

FIG. 31 TOW SYSTEM COMPONENTS

3. Retract the boom to its shortest position.
4. Move the boom to its centered and lowest position.
5. Install the boom locks.
    a. Boom extend.
    b. Boom height.
    c. Boom swing.

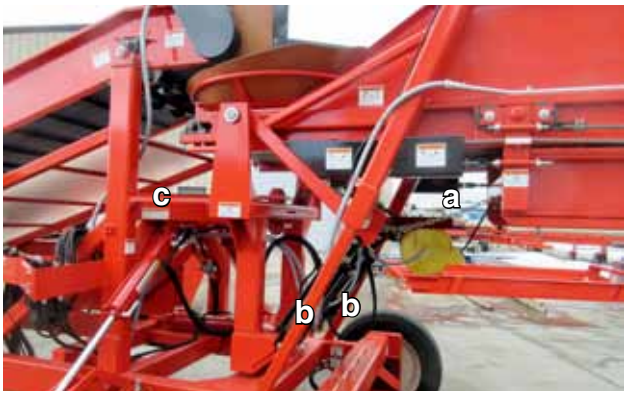


FIG. 32 BOOM LOCKS

5. Raise the outriggers and install lock pins.

Outrigger (Typical)

Lock Pin

FIG. 33 OUTRIGGERS

6. Configure both the power wheel caps with the center pin depressed to disengage driving gears.

7. Attach the tow hitch to the tractor. Be sure to use a mechanical retainer through the drawbar pin.

8. Attach the safety cables between the hitch and the drawbar cage to prevent unexpected separation.

9. Install an SMV on the rear frame.

10. Use pilot vehicles and install extra lights on the machine when transporting.

11. Clean all the reflectors.

12. Place all controls in their OFF or neutral position.

13. Turn the power OFF at the master panel and lock out.

14. Unplug and remove the power cord.

15. Be sure all bystanders are clear of the machine.

16. Keep to the right and yield the right-or-way to allow faster traffic to pass. Drive on the road shoulder, if permitted by law.

17. Make sure the SMV (Slow Moving Vehicle) emblem and all the lights and reflectors that are required by the local highway and transport authorities are in place, are clean and can be seen clearly by all overtaking and oncoming traffic.

18. It is not recommended that the machine be transported faster than 15 mph (25 km/hr). Table 1 gives the acceptable transport speed as the ratio of tractor weight to Piler weight.

IMPORTANT

The hitch weighs 7000 pounds. Be sure the drawbar or hitching system can support this weight before hooking up to the tow vehicle.

19. Do not allow riders on the machine or tractor.

20. Always use hazard flashers on the tractor when transporting unless prohibited by law.

21. Stay away from overhead power lines. Electrocution can occur without direct contact.

FIG. 34 POWER WHEEL CAPS

Table 1 Travel Speed vs Weight Ratio

Road Speed	Weight of fully equipped or loaded implement(s) relative to weight of towing machine
Up to 25 km/h (15 mph)	1 to 1, or less
Up to 16 km/h (10 mph)	2 to 1, or less
Do not tow	More than 2 to 1

4.10 STORAGE

STORAGE SAFETY

- Store the Bin Piler 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 Bin Piler.
- 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 Bin Piler.

4.10.1 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. Start the hydraulic pump and run for 10 minutes to bring the oil to operating temperature. Change the hydraulic filter. Change the hydraulic oil as specified in the Maintenance Section.
2. Inspect each conveyor belt. Realign if the belt is not tracking in the center of the frame. Replace if the edges are damaged from rubbing on the frame. Properly tension each belt.
3. Turn the power OFF at the master electrical panel and lock out.
4. Unplug and remove power cord from 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 hydraulic hoses, lines, fittings and cylinders. Tighten any loose fittings. Replace any hose that is badly cut, nicked, abraded or separating from a fitting. Replace any damaged components.
8. 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.
9. Inspect each boom extend/retract drive system. Check the condition of the roller chain. Replace if badly worn. Check the alignment of the sprockets. Align if required. Properly tension each drive chain.
10. Apply a light coat of oil to each roller chain to prevent rusting.
11. Check all rotating parts for entangled material. Remove.
12. Touch up all paint nicks and scratches to prevent rusting.
13. Select a storage area that is dry, level and free of debris.

4.10.2 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. Hydraulic and electrical systems and components.
   c. Conveyor 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 4.5) before starting.
5. Go through the pre-operation checklist (Section 4.5) 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.
- Exercise extreme caution when working around, or with, high-pressure hydraulic systems. Depressurize the system before working on it.
- 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.
- 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.
- Make sure all guards and doors are in place and properly secured when operating the Bin Piler.
- Do not work on Bin Piler 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 - Amco All-Purpose Hydraulic Oil or Equivalent.

   Reservoir Capacity: (15 US. gals, 50 liters).

3. **Speed Reducer Gear Box Lubricant:**
   Use a Browning Worm Gear high-temperature GL32HT lubricant (AGMA Comp. #8) or equivalent.

   Capacities: 1 qt (1 liter) each gear box.

4. **Roller Chain Lubricating Oil**

CHAIN TYPE*	AMBIENT TEMP. 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
RS100	SAE 20	SAE 30	SAE 40
RS120/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.

2. Inspect hydraulic system and all components.

3. Inspect electrical system and all components.

Boom Conveyor - Tension

Booms - Alignment

Elevator - Alignment

FIG. 35 CONVEYOR TENSION AND ALIGNMENT

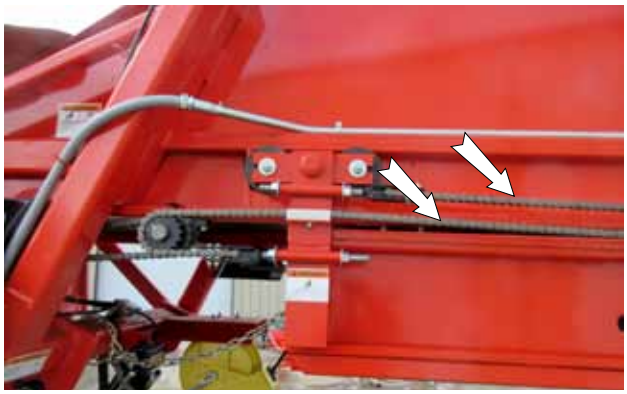
4. Check oil level in hydraulic reservoir.

FIG. 36 OIL LEVEL

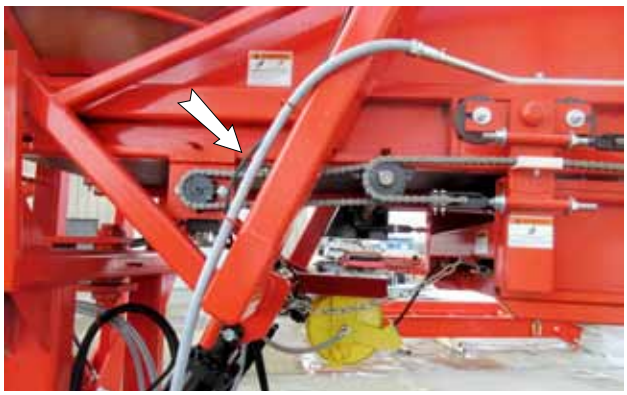
Weekly or 50 Hours

1. Oil each boom extend/retract drive system roller chains.

Right Side



Left Side



Drive Chain

FIG. 37 BOOM EXTEND/RETRACT ROLLER CHAIN

2. Oil each conveyor drive system roller chains.

Elevator

Top Boom

Bottom Boom

FIG. 38 CONVEYOR DRIVE ROLLER CHAINS

3. Grease 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.

a. Elevator drive, driven and guide shafts (2 locations each shaft).

Drive and Guide (Right)

Drive and Guide (Left)

Tail Pulley

FIG. 39 ELEVATOR CONVEYOR SHAFTS

b. Boom drive and driven shafts (2 locations each shaft).

Right Side

Left - Bottom

Left -Top

Discharge

FIG. 40 BOOM CONVEYOR SHAFTS

100 Hours or Annually

1. Grease the steering wheel spindle shafts (4 locations).

FIG. 41 STEERING SPINDLE SHAFTS (TYPICAL)

2. Grease the boom swing pivot bushings (2 locations).

Bottom - Rear

Bottom - Front

Top

FIG. 41 BOOM SWING PIVOT BUSHINGS

3. Grease the elevator raise/lower pivot bushings.

Left

Right

FIG. 43 ELEVATOR RAISE/LOWER PIVOTS

4. Grease boom raise/lower pivot bushings.

Left

Right

FIG. 44 BOOM RAISE/LOWER PIVOTS

5. Grease the boom extend/retract drive cross shaft bearings (2 locations).

FIG. 45 CROSS SHAFT

6. Grease each turnbuckle with 1 shot of grease (2 locations each turnbuckle).

Left

Right

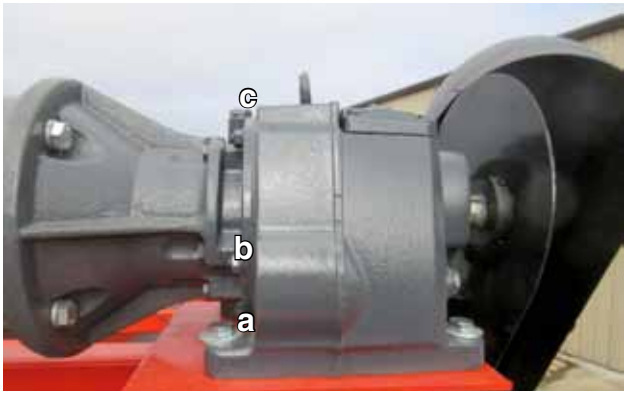
FIG. 46 OUTRIGGER TURNBUCKLES

7. Check the oil level in each speed reducing gear box in the drive systems (1 location each gear box).

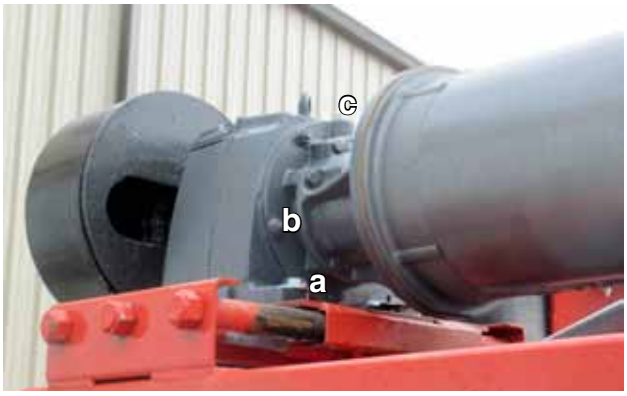
   a. Drain.

   b. Level.

   c. Fill/Breather.



Elevator



Top Boom

FIG. 47 GEARBOXES (TYPICAL)

500 Hours or Annually

1. Change the hydraulic system filter (1 location).

2. Change the oil in the hydraulic system.

a. Filter b. Sight Glass c. Drain Plug

FIG. 48 HYDRAULIC SYSTEM

3. Clean each gear box breather plug (each conveyor drive gearbox).

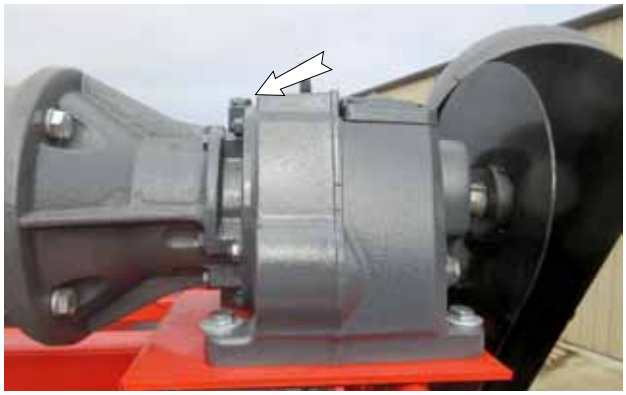


FIG. 49 BREATHER PLUG (TYPICAL)

4. Repack each wheel bearing on the steering wheels.

FIG. 50 WHEELS (TYPICAL)

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

Hours																							
Serviced by																							
8 Hours or Daily																							
G Conveyor Tension and Alignment																							
CK Hydraulic System																							
CK Electrical System																							
CK Hydraulic Oil Level																							
50 Hours or Weekly																							
G Boom Extend/Retract System Roller Chains																							
G Conveyor Drive Roller Chains																							
G Conveyor Shaft Bearings																							
100 Hours or Annually																							
G Steering Wheel Spindle Shafts																							
G Boom Swing Pivot Bushings																							
G Elevator Raise/Lower Pivot Bushings																							
G Boom Raise/Lower Pivot Bushings																							
G Boom Extend/Retract Cross Shaft Bearings																							
G Turnbuckles																							
CK Oil level in all Gearboxes																							
500 Hours or Annually																							
CH Hydraulic System Filter																							
CH Hydraulic System Oil																							
R Wheel Bearings																							

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 HYDRAULIC MAINTENANCE

A hydraulic system provides power to move the machine. The system consists of an electrically powered pump, reservoir, lines, hoses, solenoid valves, directional valves, motors and cylinders. To maintain the integrity of the system and provide a safe working environment for the operator, it is important that a daily inspection be done to make sure that the entire system and all components are in good working condition.

When inspecting the hydraulic 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 lockout before starting the inspection.
3. Inspect all hydraulic components looking for:
    a. Leaks.
    b. Damaged hoses or lines.
    c. Damaged or leaking cylinders.
    d. Leaking motors or fittings.
    e. Damaged or leaking solenoid and directional valves.
    f. Leaking pump or fittings.
4. Tighten any leaking fittings and replace any damaged components.
5. Change the hydraulic oil and filter every 500 hours or annually per the Service schedule. Change more frequently if operating in harsh conditions such as extreme heat or cold, extreme dust or dirt, and/or extreme humidity.

5.2.2 ELECTRIC SYSTEM INSPECTION

Electricity provides power to all systems on the Piler. 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:
    a. Damaged 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 not 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.

5.2.3 ELECTRIC MOTOR RESTART

Two types of electrical starting systems have been used on the Bin Pilers and restart procedure for each system is covered in this section. It is recommended that only a licensed electrician perform maintenance work on the electrical system.

All electric motors are supplied with power through an individual circuit that includes a circuit breaker, switch, contactor and overload relay that are all incorporated into a single electrical component inside the control panel. The contactor is the main connecting device for power to the motor. If the current is greater than the adjustable dial of the relay, the relay will trip and cut off power to the coil of the contactor. When this happens, the contactor dial will move to a new position and indicates the cause of the overload. It must be reset before the motor can be restarted.

When a motor will not start:

1. Depress the red OFF button.

2. Depress the green ON button.

3. If the motor will not start, turn machine OFF and lock out power at the master control panel before opening the control panel.

4. Reset the contactor dial to the ON contactor open position.

5. Close and secure the panel door and turn the power to the machine ON.

6. If the motor still will not start you have one of the following conditions:

    a. The motor is hot and must cool a period of time before attempting to restart.

    NOTE

    If your conveyor utilizes single phase motors, chances are good that the motor has a thermal overload located on the electrical junction box of the motor itself. If this is the case then, fully depress the reset button to make certain that the overload circuit is closed.

    b. The overload is adjusted incorrectly for the amperage of the motor and must be properly adjusted.

    c. The overload and/or contactor has fulfilled it's service life and is in need of replacement.

FIG. 51 MOTOR RESTART

    d. The motor is bad and needs replacing.

    e. An electrical short exists somewhere in the circuit.

5.2.4 HYDRAULIC OIL & FILTER CHANGE

Every 500 operating hours or annually, whichever comes first, the oil and filter in the hydraulic system should be changed. To change the oil and filter, follow this procedure:

1. Run the hydraulic pump until the oil is warm. Warm freshly agitated oil removes more contaminants when drained than cold stagnate oil.

2. Stop the pump and place all controls in their OFF or neutral position.

3. Turn the power OFF at the master panel and lock-out.

4. Place a container under the drain plug. More than one container may be required since the tank holds 15 gals (55 liters).

5. Remove the drain plug and allow the system to drain for 10 minutes.

6. Use a banded filter removal tool to loosen and remove the filter.

7. Dip your finger in the oil and wet the rubber seal on the top of the new replacement filter to aid in sealing.

8. Install the replacement filter.

NOTE

Always use genuine Mayo replacement parts to insure proper oil filtration.

9. Hand tighten until the filter is seated. Then tighten the canister another 1/2 turn using the banded filter tool. Do not overtighten.

10. Install and tighten the drain plug. Use teflon tape or pipe sealant compound on the plug to prevent leaking.

11. Dispose of the used oil in an environmentally safe manner.

12. Fill with 15 gallons (56 liters) of Amoco All-Purpose Hydraulic Oil or equivalent.

13. Add to the oil level until it reaches the middle of the sight glass on the side of the tank or measure 1 1/2 inches (37 mm) from the fill neck to fill the tank.

14. Install the fill cap.

15. Start and run the system and check for leaks.

16. Tighten any fitting that leaks.

a. Filter b. Sight Glass c. Drain Plug d. Fill Cap

FIG. 52 HYDRAULIC SYSTEM (TYPICAL)

5.2.5 SPEED REDUCER GEARBOX OIL

Each coneyor is driven by an electric motor that is attached to a high ratio speed reducing gearbox to give the required operating speed. Each gearbox is equipped with a drain, level and fill plug. Every 100 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 hydraulic system and conveyors until the gearbox is warm. Warm oil will remove more contaminants than cold stagnate oil.

2. Stop the conveyors and pump.

3. Place all controls in their OFF or neutral position.

4. Turn the power OFF at the master panel and lock-out.

5. Gearbox Plugs:

    a. Drain.

    b. Level.

    c. Fill.

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.

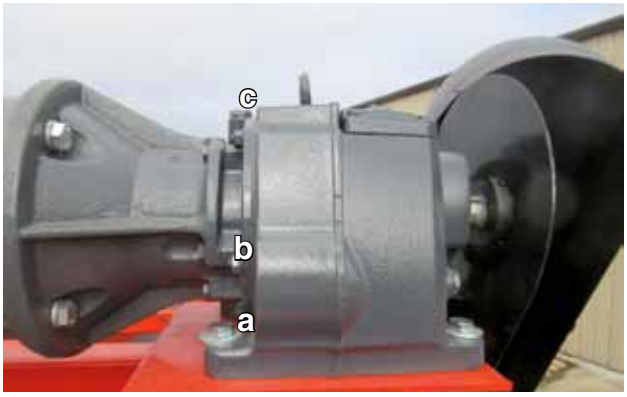
    b. Remove the drain.

    c. Allow 10 minutes to drain.

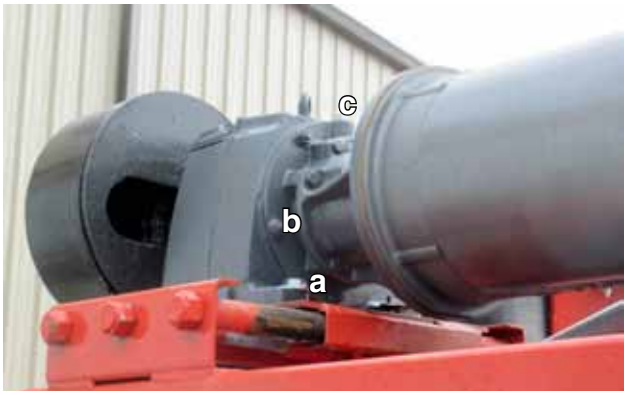
    d. Install and tighten the drain plug.

NOTE

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



Elevator



Top Boom

FIG. 53 GEARBOXES (TYPICAL)

    e. Add approximately 1 qt (1 liter) of Browning Worm Gear GL 32HT lubricant or equivalent. Use the level plug to determine the proper amount of oil.

    f. Check that the air passage through the breather is open.

    g. Install and tighten the fill and level plugs.

    h. Dispose of the used oil in an environmentally safe manner.

5.2.6 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.

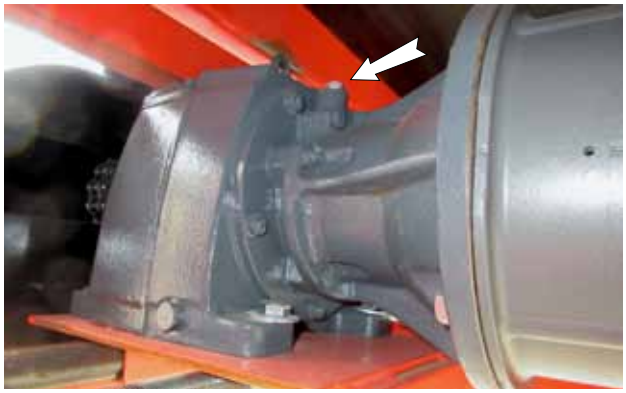


FIG. 54 BREATHER (TYPICAL)

5.2.7 CONVEYOR BELT TENSION/ALIGNMENT OR REPLACEMENT

Rubber belts or potato chains can be used to move potatoes with the Bin Piler. The tension and alignment of the Bin Pilers should be checked daily to insure proper function. Replace the Bin Piler when damaged or badly worn. To maintain Bin Piler, 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. **Tension:**
   The belts are tensioned correctly when they do not slip during operation.

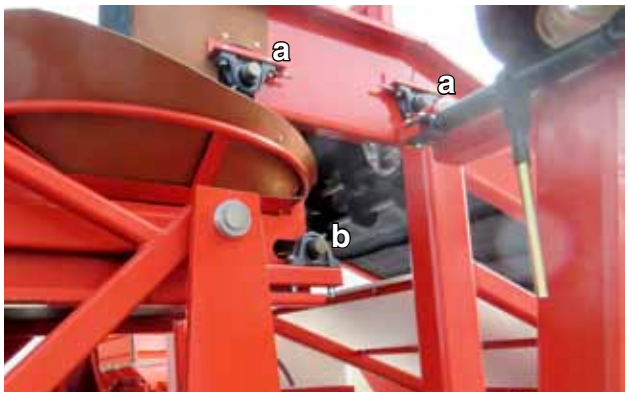
   Move the drive or tail shaft to set belt tension. Loosen set screw on bearing housing mount, move bearing and retighten set screw.

   a. Elevator.

   b. Top Boom.

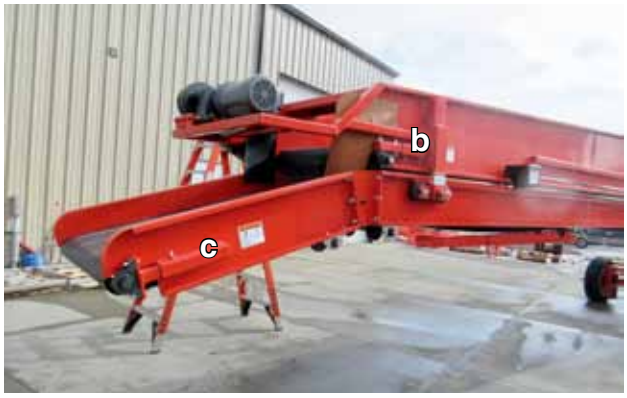
   c. Bottom Boom.

Elevator Tail



Elevator Drive

FIG. 55 ELEVATOR TENSION ADJUSTMENT

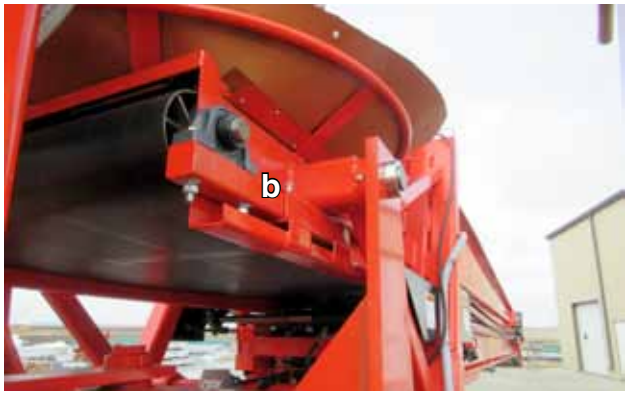


Boom Discharge - Right

Boom Discharge - Left

FIG. 56 BOOM DISCHARGE TENSION ADJUSTMENT

Boom Pivot -Lower



Boom Pivot - Top

FIG. 57 BOOM PIVOT TENSION ADJUSTMENT

4. **Alignment:**

   a. **Belts:** They are properly aligned when the belt runs in the center of the frame panels and the shafts. Be sure to run the conveyor 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 conveyor but always maintain the proper tension.

5. **Replacement:**

   a. Move one or both of the shafts into their loosest position.

   b. Open the conveyor by removing the connecting rod on the belt.

   c. Attach the replacement conveyor to the end of the old conveyor belt/chain.

   d. Slowly pull the old conveyor out of the machine and thread the new one into position.

   e. Disconnect the old conveyor and connect the ends of the new one together.

   f. Move the shaft into position to set the tension of the conveyor and secure the bearing assemblies.

   g. Check the tension and alignment of the conveyor frequently during the first 10 hours of operation and set as required. Then, go to the regular maintenance schedule. Normally a conveyor will seat itself during the first 10 hours of operation and then require less adjustment.

Booms

Elevator

FIG. 58 CONVEYOR TENSION AND ALIGNMENT

FIG. 59 BELT CONNECTOR (TYPICAL)

5.2.8 ROLLER CHAIN DRIVES

The boom extend/retract function is powered by a hydraulic motor, roller chains and a cross shaft. Through the cross shaft, both sides of the lower boom are pulled evenly. The roller chains must be oiled on a weekly basis and tension/alignment checked monthly.

When maintaining the roller chain, follow this procedure:

1. **Weekly Oiling:**

   a. Place the boom in its fully down position.

   b. Remove the guards over the conveyor drive systems.

   c. Use an oil can or brush to apply oil to the slack side of the chain.

WARNING

Use special care when working around exposed moving parts.

   d. Refer to the following table for oil type.

CHAIN TYPE*	AMBIENT TEMP. 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
RS100	SAE 20	SAE 30	SAE 40
RS120/MORE	SAE 30	SAE 40	SAE 40

* Stamped on chain link side plate

   e. Install and secure all the guards.

2. **Weekly Sprocket Alignment:**

   a. Check alignment by:

      i. Lay a straight edge across the faces of the sprockets. When the straight edge is flush with the faces of the sprockets, they are aligned, or

      ii. Visually sight across the faces of the sprockets. If sprockets are in the same plane they are aligned.

   b. Loosen set screw in sprocket hub if alignment is required.

   c. Move sprocket to required position.

Right Side

Left Side

Boom Chain (Typical)

FIG. 60 ROLLER CHAIN DRIVES

   d. Tighten set screw(s) to their specified torque.

   e. Install and secure all the guards.

WARNING

Machine is shown with guards removed for illustrative purposes only. Do not operate with guards removed.

3. **Weekly Roller Chain Tension:**
Each roller chain drive system is equipped with an adjustable anchor bolt to maintain the required tension on the chain during operation. Check the tension when the machine is OFF and not moving. The short chain should move up or down 1/2 inch (12 mm) in the center of the span when tensioned properly. Each long chain should be able to move up or down 3 inches in the center of the long span when tensioned properly.

When setting the tension of the short driving chain, follow this procedure:

a. Loosen the hydraulic motor mounting bracket.

b. Loosen adjusting bolt jam nut.

c. Use the adjusting bolt to move the bracket or tap it into position.

d. Tighten the adjusting bolt jam nut to its specified torque.

e. Tighten motor mounting bracket bolts to their specified torque.

FIG. 61 DRIVING CHAIN

Follow this procedure when setting the tension of the long chains:

a. Loosen the jam nut on the adjusting bolt.

b. Use the adjusting bolt to set the tension.

c. Tighten jam nut to its specified torque.

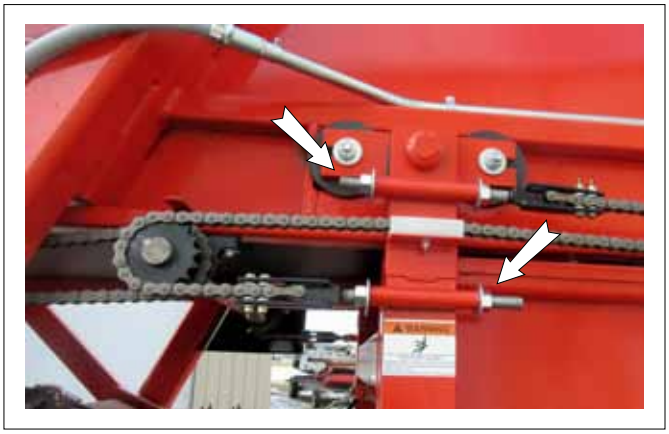


FIG. 62 LONG CHAIN ANCHOR BOLTS (TYPICAL)

WARNING

Turn power OFF at the master panel and lock-out before performing any maintenance work.

5.2.9 CONVEYOR DRIVE ROLLER CHAIN

All conveyors on the Bin Piler are powered by electric motors through a roller chain drive system. The system should be oiled every week or 50 hours and tension and alignment checked every 100 hours.

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

1. **Weekly Oiling:**

   a. Place boom in its fully down and retracted position.

   b. Turn machine and controls off, lock-out tag-out master power source.

   c. Open the guards over the drive systems.

Elevator

Boom - Top

Boom - Bottom

FIG. 63 DRIVE SYSTEMS

2. **100 Hour Chain Tension and Sprocket Alignment:**

   a. Place boom in its fully down and retracted position.

   b. Turn machine and controls off, lock-out tag-out master power source.

   c. Open the guards over the drive systems.

   d. The roller chain is properly tensioned when a link can be turned 15° in the middle of the low side of the chain when turned by hand. Or if there is a slight sag in the loose side of the chain.

   e. Use the elevator driving shaft bearing position bolt to set chain tension if appropriate.

   f. Use the elevator motor mounting position bolts to set chain tension if appropriate.

   g. Use boom conveyor driving shaft bearing position adjustment assembly to set chain tension if appropriate.

   h. Use the boom conveyor motor mounting position bolts to set chain tension if appropriate.

Elevator

Boom - Top

Boom - Bottom

FIG. 64 CHAIN TENSION ADJUSTMENTS

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 if alignment is required.

   d. Move sprockets to required position.

   e. Tighten set screw to specified torque.

   f. Install and secure all guards.

Elevator

Boom - Bottom

Boom - Top

FIG. 65 ALIGNMENT (TYPICAL)

5.2.10 TRACTION DRIVE

Pilers are equipped with a tractive power wheel drive system on each rear wheel that is used to move the machine under its own power. Both systems must be placed into their operating configuration to move the machine. The cover on the power wheels engage or disengage the internal driving gears. Both covers must be set the same for moving or transporting. When setting the drive system, 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 before performing any maintenance work.

3. Set the center pin on both covers the same.

4. Depress the center pin to disengage drive gears and allow for towing and transporting.

5. Use the two outside pins to extend the center pin to allow the Piler to move under its own power.

Hydraulic Drive Motors

Power Wheel Cover

FIG. 66 TRACTION DRIVE

5.2.11 RADIO REMOTE BATTERIES

The hand-held radio-transmitter remote control is a simple, reliable and self-contained system. It comes in a clear plastic cover so the unit can be operated while enclosed in the case. Removal from the case is not required unless the batteries need replacing. Always test the battery condition at the start of each day and turn the transmitter off when not being used to prevent battery drain. When the useful range of the transmitter decreases, the useful life of the internal batteries is ending and they should be replaced. To replace the batteries, follow this procedure:

1. Place the mode switch on the Piler control panel in the HAND or OFF position.

2. Turn the remote OFF.

3. Remove the remote from its case.

4. Remove the battery cover from the back of the case and open.

5. Replace the power pak with new "AA" sized batteries. Be sure to mount with the correct polarity.

6. Close the back cover.

7. Test the condition of the batteries. The green light should come on when any of the function buttons are depressed. The red weak battery light should not come on.

8. Install in the case and close.

9. Place the mode switch into AUTO.

FIG. 67 RADIO REMOTE CONTROLLER

5.2.12 RADIO REMOTE RECEIVER VALVES

Each Piler using a radio controlled remote is equipped with a receiver valve bank on the left side of the frame. Internal solenoids move the hydraulic valve spools to their respective position per the signal from the hand-held radio remote. Since the hydraulic circuits are plumbed in parallel, either the remote or the manual valves can be used to control the machine. If the radio receiver solenoid/spool sticks or binds, the machine will continue to move per its latest instruction and not stop. To correct this condition, follow this procedure:

1. Shut the machine OFF immediately.

2. Check the position of the spool on each valve.

3. The center of the rubber boot on each end of the valve body indicates the position of the spool. When the spool is centered or in neutral, the spool end will be flush with the body of the valve.

4. Check the position of all the spools.

5. Manually push on the out-of-position spool to center it.

6. Determine the cause of the problem and correct it before using the remote again.

FIG. 68 RECEIVER VALVE BANK

6 TROUBLE SHOOTING

The Mayo Bin Piler uses an elevator and extendable boom to convey potatoes into a storage facility or a truck. 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
Piler won't run.	No power.	Plug machine in. Turn power ON at master panel.
	Tripped Circuit breaker.	Reset circuit breaker.
Conveyor won't run.	No power.	Plug machine in. Turn conveyor ON.
	Tripped motor starter.	Reset starter.
	Binding.	Align conveyor.
Piler won't move.	Power wheel disengaged.	Position cover with center pin depressed.
	Low oil.	Add oil to hydraulic reservoir.
	Oil filter plugged.	Replace oil filter.
	Suction strainer plugged.	Clean/replace suction strainer.
Radio remote won't work.	Remote switch in wrong position.	Turn switch to ON.
	Power switch on transmitter is OFF.	Turn switch ON.
	Emergency stop push-button is depressed.	Pull button out.
	Batteries have low charge.	Replace batteries.
	Fuses blown.	Replace blown 230V & 115V control circuit fuses.
Boom swing doesn't work.	Transport bar is attached.	Remove transport bar.
	Pump not running.	Push hydraulic pump start switch to reset starter.
		Replace any blown 230V & 115V control circuit fuses.
	Pump running backward.	Call licensed electrician to change phasing of Piler.
	Valve stuck in work position.	Return all manual and remote valve spools to neutral position.

PROBLEM	CAUSE	SOLUTION
Boom extend doesn't work.	Transport chain attached.	Remove transport chain.
	Pump not running.	Push hydraulic pump start switch.
		Replace any blown 230V & 115V control circuit fuses.
	Pump running backward.	Call licensed electrician to change phasing of Piler.
	Valve stuck in work position.	Return all manual and remote valve spools to neutral position.

7 SPECIFICATIONS

7.1 MECHANICAL

7 SPECIFICATIONS

7.1 MECHANICAL

		36” PILER	42” PILER
DIMENSIONS		**BOOM SWING**	
Length:	Extended	75’	75’
	Retracted	57’	57’
Width:		102”	108”
Height:	Boom Up	24’	24’
	Boom Down	3’	3’
Boom Swing Angle:		28°	28°
Weight:		22000 LBS	26000 LBS
Tongue Weight:		5800 LBS	7000 LBS
POWER			
Type:		1ph, 230v, 112 amp 3ph, 230v, 61 amp 3ph, 460v, 31 amp	1ph, 230v, 112 amp 3ph, 230v, 61 amp 3ph, 460v, 31 amp
Elevator:		5 hp	7.5 hp
Upper Boom:		5 hp	7.5 hp
Lower Boom:		5 hp	7.5 hp
Hydraulic:		7.5 hp	7.5 hp
HYDRAULIC SYSTEM			
Speed:		1770 RPM	1770 RPM
Flow:		5 gpm	5 gpm
Pressure:	Maximum	2250 psi	2250 psi
	Operating	1500 psi	1500 psi

TIRES

	SIZE	**PRESSURE**
Steering:	11L – 15 12Ply	Foam Filled
Traction:	255/70R22.5	120 psi
Outriggers:	195/60R15	44 psi

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

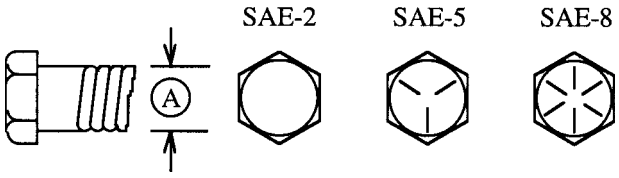
7.2 BOLT TORQUE

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.

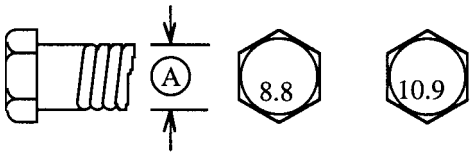
ENGLISH TORQUE SPECIFICATIONS

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	575	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.

8 INDEX

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