Mayo

BELTED SCREEN SIZER

Model 750

OPERATOR'S MANUAL

MAYO MANUFACTURING, INC. LIMITED WARRANTY

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

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

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

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

LIABILITY

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

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

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

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

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

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

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

WARRANTY VOID IF NOT REGISTERED

MAYO MANUFACTURING, INC.

MODEL 750 BELTED SCREEN SIZER

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 _____

Washer Model _____

Serial Number _____

Delivery Date _____

DEALER INSPECTION REPORT

_____ Inspect Electrical System
_____ Lubricate Machine
_____ Drive Chain Tensioned and Aligned
_____ Speed Reducer Gearbox Oil Level Checked
_____ Check Condition of Sizing Belt
_____ Check Condition, Tension and Alignment of Elevator, Inline and Cross Conveyor System Components

SAFETY

_____ All Decals Installed
_____ Review Operating & Safety Instructions

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

Date _____ Dealer's Rep. Signature _____

Signature _____

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

Date _____ Owner's Signature _____

WHITE	YELLOW	PINK
MAYO MFG., INC.	DEALER	CUSTOMER

SERIAL NUMBER LOCATION

Always give your dealer the serial number of your Mayo Belted Screen Sizer when ordering parts or requesting service or other information.

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

SERIAL NUMBER LOCATION

Model Number _____

Serial Number _____

TABLE OF CONTENTS

TABLE OF CONTENTS

1 INTRODUCTION

Congratulations on your choice of a Mayo Model 750 Belted Screen Sizer 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, sizing and storing of harvest yields.

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

This manual applies to all Model 750 Belted Screen Sizers manufactured by Mayo. Certain options may be available to specifically tailor the Screen Sizer 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 intake end of the frame is the front. The control panel is on the left side of the frame.

2 SAFETY

SAFETY ALERT SYMBOL

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

The Safety Alert symbol identifies important safety messages on your Mayo Belted Screen Sizer 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

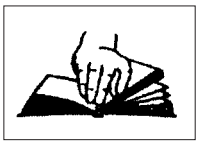
YOU are responsible for the **SAFE** operation and maintenance of your Mayo Belted Screen Sizer. **YOU** must ensure that you and anyone else who is going to operate, maintain or work around the Screen Sizer be familiar with the operating and maintenance procedures and related **SAFETY** information 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 Screen Sizer.

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 Screen Sizer.
- Screen Sizer owners must give operating instructions to operators or employees before allowing them to operate the Screen Sizer, 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 Screen Sizer.



2. Only trained, competent persons shall operate the Screen Sizer. 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 and wait for all moving parts to stop before servicing, adjusting, maintaining, repairing or cleaning. (Safety lockout devices are available through your Mayo dealer parts department).
8. Know the emergency medical center number for your area.
9. Review safety related items with all operators annually.

2.2 EQUIPMENT SAFETY GUIDELINES

1. Safety of the operator and bystanders is one of the main concerns in designing and developing a machine. However, every year many accidents occur which could have been avoided by a few seconds of thought and a more careful approach to handling equipment. You, the operator, can avoid many accidents by observing the following precautions in this section. To avoid personal injury or death, study the following precautions and insist those working with you, or for you, follow them.

2. In order to provide a better view, certain photographs or illustrations in this manual may show an assembly with a safety shield removed. However, equipment should never be operated in this condition. Keep all shields in place. If shield removal becomes necessary for repairs, replace the shield prior to use.

3. Replace any safety sign or instruction sign that is not readable or is missing. Location of such safety signs is indicated in this manual.

4. Never use alcoholic beverages or drugs which can hinder alertness or coordination while operating this equipment. Consult your doctor about operating this machine while taking prescription medications.

5. **Under no circumstances should young children be allowed to work with this equipment. Do not allow persons to operate or assemble this unit until they have read this manual and have developed a thorough understanding of the safety precautions and of how it works. Review the safety instructions with all users annually.**

6. This equipment is dangerous to children and persons unfamiliar with its operation. The operator should be a responsible, properly trained and physically able person familiar with farm machinery and trained in this equipment's operations. If the elderly are assisting with farm work, their physical limitations need to be recognized and accommodated.

7. Never exceed the limits of a piece of machinery. If its ability to do a job, or to do so safely, is in question - **DON'T TRY IT.**

8. Do not modify the equipment in any way. Unauthorized modification result in serious injury or death and may impair the function and life of the equipment.

9. In addition to the design and configuration of this implement, including Safety Signs and Safety Equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence, and proper training of personnel involved in the operation, transport, maintenance, and storage of the machine. Refer also to Safety Messages and operation instruction in each of the appropriate sections of the auxiliary equipment and machine Manuals. Pay close attention to the Safety Signs affixed to the auxiliary equipment and the machine.

2.3 STORAGE SAFETY

1. Store the Belted Screen Sizer 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 Screen Sizer.

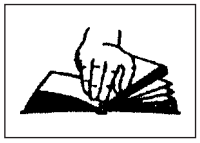
6. Lock out power by turning off master control panel, junction box or unplugging the power cord and padlocking the door shut to prevent electrocution or unauthorized start up of the Screen Sizer.

2.4 SAFETY TRAINING

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

2. In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of this equipment.

3. It has been said, "The best safety feature is an informed, careful operator." We ask you to be that kind of an operator.



It is the operator's responsibility to read and understand ALL Safety and Operating instructions in the manual and to follow these. Accidents can be avoided.

4. **Working with unfamiliar equipment can lead to careless injuries. Read this manual, and the manual for your auxiliary equipment, before assembly or operating, to acquaint yourself with the machines. If this machine is used by any person other than yourself. It is the machine owner's responsibility to make certain that the operator, prior to operating:**

   a. Reads and understands the operator's manuals.

   b. Is instructed in safe and proper use.

5. Know your controls and how to stop pilers, stingers, Screen Sizers, conveyors and any other auxiliary equipment quickly in an emergency. Read this manual and the one provided with your other equipment.

6. Train all new personnel and review instructions frequently with existing workers. Be certain only a properly trained and physically able person will operate the machinery. A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death. If the elderly are assisting with farm work, their physical limitations need to be recognized and accommodated.

2.5 SAFETY SIGNS

1. Keep safety signs clean and legible at all times.

2. Replace safety signs that are missing or have become illegible.

3. Replaced parts that displayed a safety sign should also display the current sign.

4. Safety signs displayed in Section 3 each have a part number in the lower right-hand corner. Use this part number when ordering replacement parts.

5. Safety signs are available from your authorized Distributor or Dealer Parts Department or the factory.

How to Install Safety Signs:

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

2.6 PREPARATION

1. Never operate the Belted Screen Sizer 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 Screen Sizer and auxiliary equipment.

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

3. 
PROLONGED EXPOSURE TO LOUD NOISE MAY CAUSE PERMANENT HEARING LOSS! Motors or equipment attached can often be noisy enough to cause permanent, partial hearing loss. We recommend that you wear hearing protection on a full-time basis if the noise in the Operator's position exceeds 80db. Noise over 85db on a long-term basis can cause severe hearing loss. Noise over 90db adjacent to the Operator over a long-term basis may cause permanent, total hearing loss. **NOTE:** Hearing loss from loud noise (from tractors, chain saws, radios, and other such sources close to the ear) is cumulative over a lifetime without hope of natural recovery.

4. Clear working area of debris, trash or hidden obstacles that might be hooked or snagged, causing injury, damage or tripping.

5. Operate only in daylight or good artificial light.

6. Be sure machine is properly anchored, adjusted and in good operating condition.

7. Ensure that all safety shielding and safety signs are properly installed and in good condition.

8. Before starting, give the machine a "once over" for any loose bolts, worn parts, cracks, leaks, frayed belts and make necessary repairs. Always follow maintenance instructions.

2.7 INSTALLATION SAFETY

1. Disconnect and remove all mechanical locks, anchor chains and any other transport devices that would hinder or prohibit the normal functioning of the Belted Screen Sizer 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. All wiring should comply with ANSI/NFPA 70 electrical requirements. If you are uncertain, have a licensed electrician provide power to the machine.

5. If using Screen Sizer 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 Screen Sizer.

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

4. Do not service or maintain the Screen Sizer unless motors are OFF and the power locked out at the master panel. Keep others away.

2.9 OPERATING SAFETY

1. Make sure that anyone who will be operating the Belted Screen Sizer or working on or around the unit reads and understands all the operating, maintenance and safety information in the operator's manual. Also read and follow the instructions in the manuals of other equipment in the system.

2. **Turn machine OFF, shut down and lock out power supply (safety lockout devices are available through your Mayo dealer parts department) and wait for all moving parts to stop before servicing, adjusting, maintaining or repairing.**

3. Establish a lock-out tag-out policy for the work site. Be sure all personnel are trained in and follow all procedures. Lock-out tag-out all power sources before servicing the unit or working around loading/unloading equipment.

4. Install and properly secure all guards and shields before operating.

5. Replace all worn or failed components immediately.

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

7. Clear the area of bystanders, especially small children, before starting.

8. Make sure all control switches are in the off position before connecting power supply.

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

10. Before supplying electrical power to the machine, be sure that you have adequate amperage at the proper phase and voltage to run it by following ANSI/NFPA 70 Wiring Standard. If you do not know or are unsure, consult a licensed electrician.

11. Keep the working area clean and dry.

12. 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. 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. Make sure all guards and doors are in place and properly secured when operating the Screen Sizer.

6. Always use personal protection devices such as eye, hand and hearing protectors, when performing any service or maintenance.

7. Where replacement parts are necessary for periodic maintenance and servicing, genuine factory replacement parts must be used to restore your equipment to original specifications. The manufacturer will not be responsible for injuries or damages caused by use of unapproved parts and/or accessories.

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

9. Periodically tighten all bolts, nuts and screws and check that all cotter pins are properly installed to ensure unit is in a safe condition.

10. When completing a maintenance or service function, make sure all safety shields and devices are installed before placing unit in service.

11. **Do not work on Belted Screen Sizer electrical system unless the power cord is unplugged or the power supply is locked out. Lock-out tag-out power source before performing any maintenance work.**

2.11 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. Raise elevator fully up before transporting to prevent dragging the hopper on the ground when going through low spots.

5. Raise and secure the frame outriggers before transporting or moving.

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

7. 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.

8. Be sure that the Screen Sizer is positively hitched to the towing vehicle. Use a safety cable to assure a safe hitch hook-up when transporting.

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

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

11. Do not allow anyone to ride on the Screen Sizer or towing vehicle during transport.

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

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

2.12 ELECTRICAL SAFETY

1. Have only a qualified licensed electrician supply power. All wiring should comply with ANSI/NFPA 70 electrical requirements.

2. Make certain that the Belted Screen Sizer is properly grounded at the power source.

3. Make certain that all electrical switches are in the OFF position before plugging the Screen Sizer 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 Screen Sizer electrical system unless the power cord is unplugged or the power supply is locked-out tagged-out.

2.13 EMPLOYEE SIGN-OFF FORM

Mayo Manufacturing, Inc. follows the general Safety Standards specified by the American Society of Agricultural Engineers (ASABE) 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!

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

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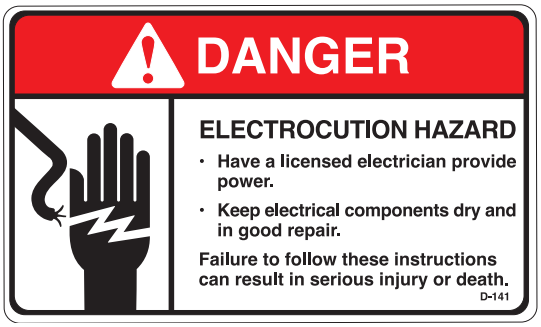

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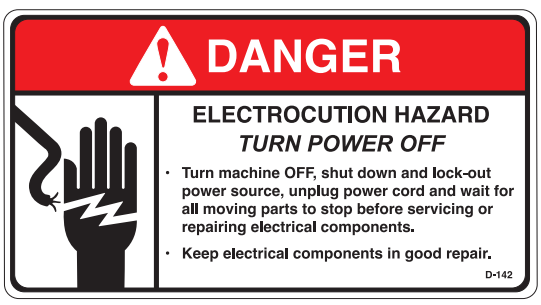

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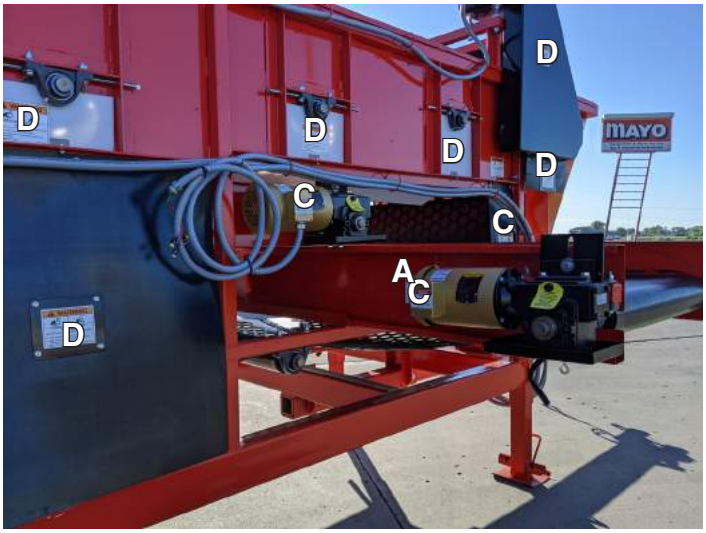
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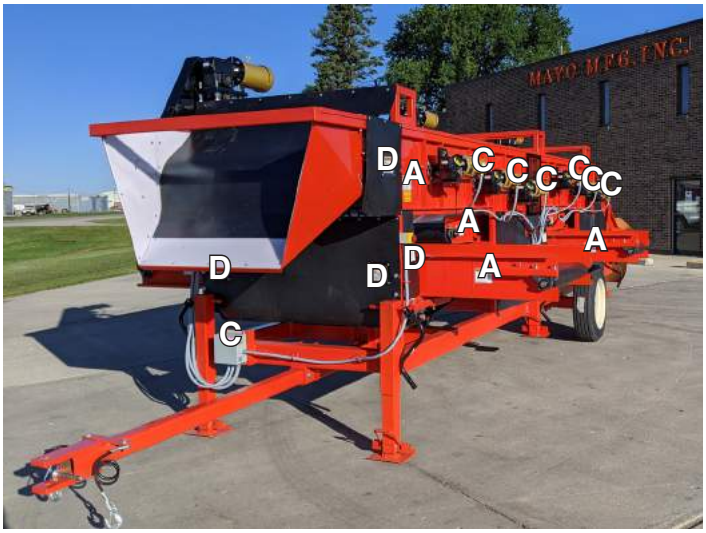
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4 OPERATION

OPERATING SAFETY

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

4.1 TO THE NEW OPERATOR OR OWNER

The Mayo Manufacturing Belted Screen Sizer is designed to be used as a stand-alone unit or part of a system to size potatoes in a cleaning, storing or processing line. Be familiar with the machine before starting.

It is the responsibility of the owner or operator to read this manual and to train all other operators before they start working with the machine. Follow all safety instructions exactly. Safety is everyone's business. By following recommended procedures, a safe working environment is provided for the operator, bystanders and the area around the worksite. Untrained operators are not qualified to operate the machine.

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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 Screen Sizer will provide many years of trouble-free service.

4.2 MACHINE COMPONENTS

The Mayo Belted Screen Sizer is a flat rubber belt with specifically sized holes for sizing potatoes as they pass over it. Generally, the sizer is a part of a potato storage or processing facility. It is used when customers want potatoes of a specific size range with all the over-sized and under-sized removed.

Two flat belts are mounted in the frame to separate the flow into their respective size category. The front belt (Sizer B) is designed with small holes to allow the small potatoes to fall through and be removed from the flow. All the remaining potatoes are conveyed to the rear belt (Sizer A) with the larger holes. The holes in Sizer A are designed to allow only potatoes of the required size to go through. All the large potatoes are moved out the discharge.

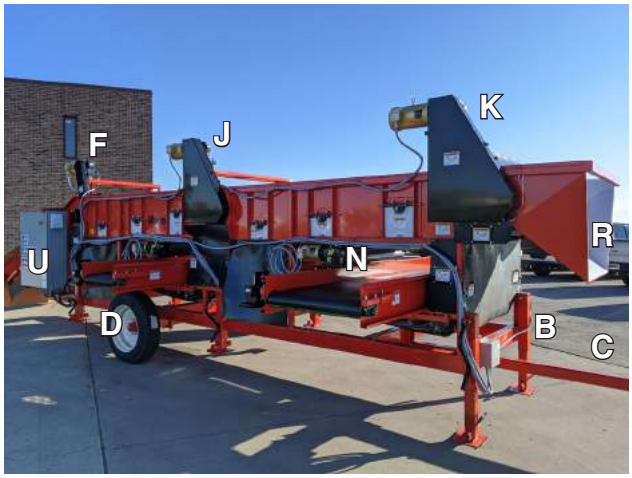
Cross conveyors under the sizers move the small and specified potatoes from the flow. Oversized potatoes go out the discharge. Inline conveyors inside each sizer belt move potatoes that fall through the sizer belt onto their respective cross conveyor.

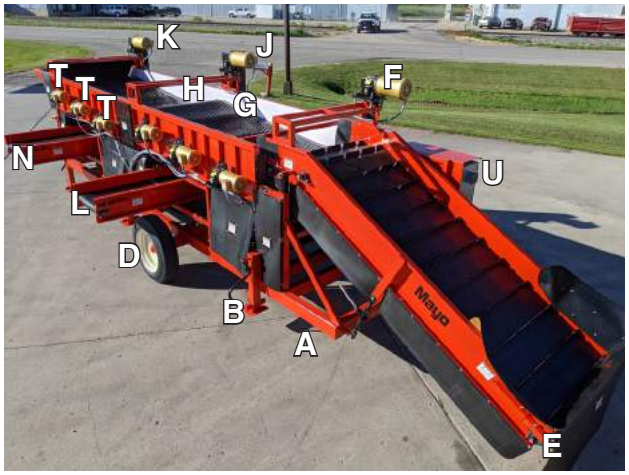
Each sizer belt is equipped with 3 shakers to move the potatoes through the hole(s) from the shaking.

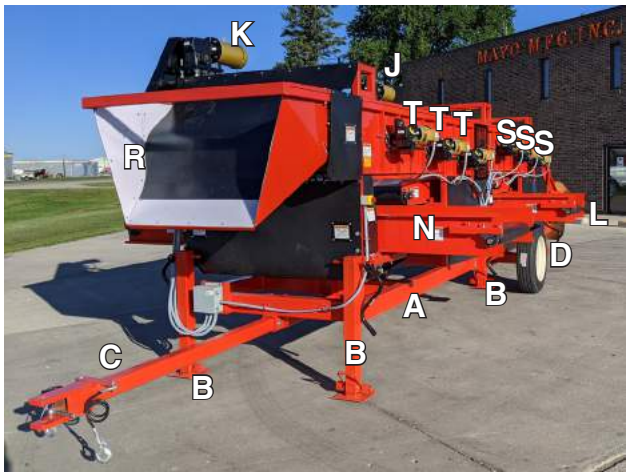
Electric motors power all the systems on the machine. Chain drive system drive the elevator and each sizer from the left side. Speed reducing gearboxes drive the cross and inline conveyors from the left side. Shakers are all mounted on the right side and driven through speed reducing gearboxes.

The customer is responsible to provide a steady flow of potatoes to and away from the machine. Generally the machine is a part of a larger processing system and can be wired into its control system. If it is used as a separate unit, the control panel is mounted on the left side of the frame.

The frame is equipped with 3 jacks on each side to support it during operation. A hitch on the rear and 2 wheels are used when moving the machine.







A Frame
B Jack
C Hitch
D Wheels
E Elevator
F Elevator Drive
G Sizer B
H Sizer A
J Sizer B Drive
K Sizer A Drive
L Cross Conveyor - (Sizer B)
M Cross Conveyor Drive - (Sizer B)
N Cross Conveyor - (Sizer A)
O Cross Conveyor Drive - (Sizer A)
P Inline Conveyor - Sizer B
Q Inline Conveyor - Sizer A
R Discharge
S Shakers - Sizer B
T Shakers - Sizer A
U Control Panel

FIG. 1 MACHINE COMPONENTS


R
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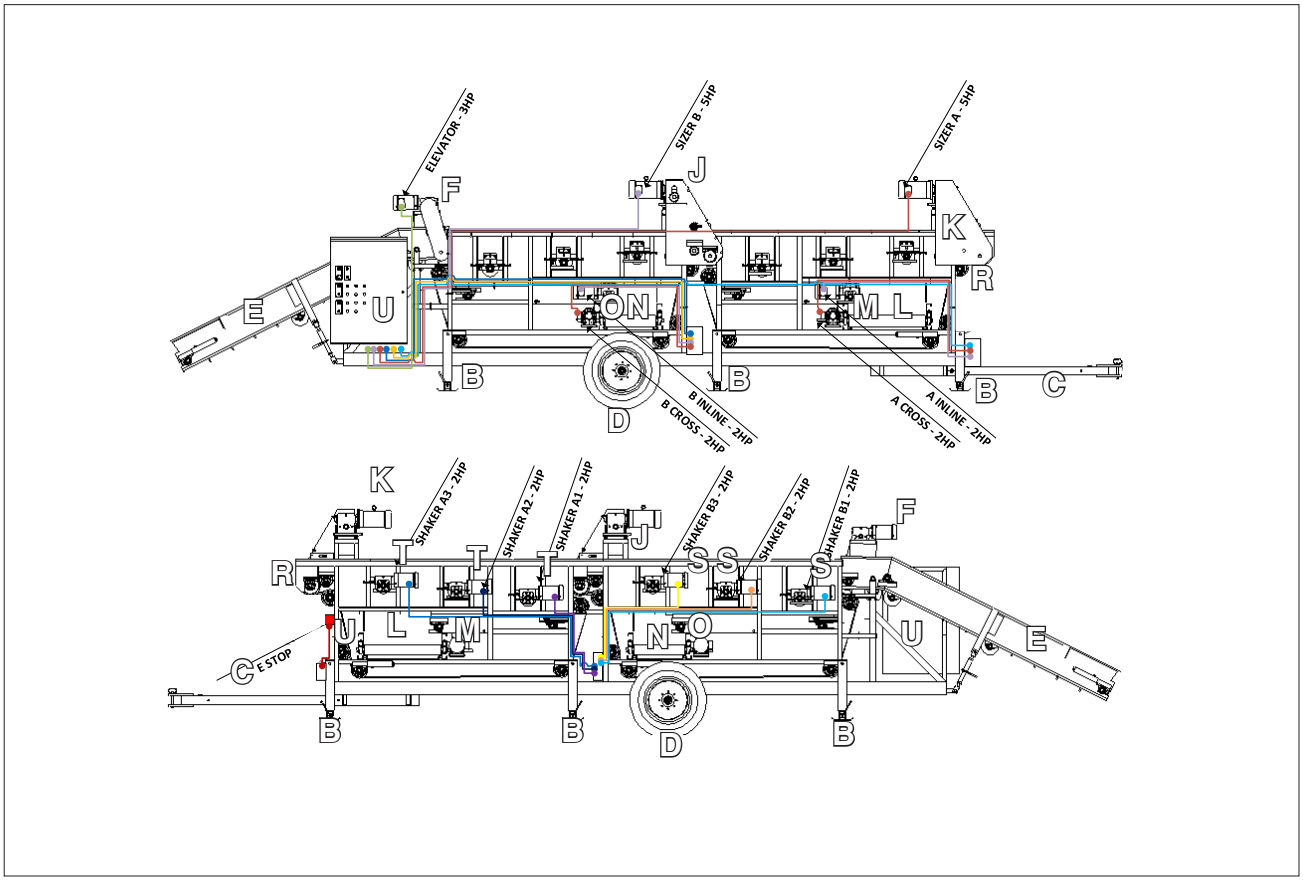
ELEVATOR - 3HP
SIZER B - 5HP
SIZER A - 5HP
F
J
K
R
E
U
O
N
M
L
B
B
B
C
D
B INLINE - 2HP
B CROSS - 2HP
A CROSS - 2HP
A INLINE - 2HP
K
SHAKER A3 - 2HP
SHAKER A2 - 2HP
SHAKER A1 - 2HP
SHAKER B3 - 2HP
SHAKER B2 - 2HP
SHAKER B1 - 2HP
F
T
T
T
J
S
S
S
R
U
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E STOP
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B

4.3 GENERAL OPERATION THEORY

Belted Screen Sizers are designed to be part of a potato conveying line and separate potatoes by size. Belts are designed with holes of a specific size that will allow smaller and correct sized potatoes to drop through the belt sizing hole but retain the larger ones.

Auxiliary conveyors move the potatoes to the sizer intake, remove potatoes from the discharge and remove the small and correct sized ones from under the top belt span.
Power to move the belt is provided by an electric motor through a roller chain drive on the left side of the frame. Six electric motors on the right side of the frame turns the shakers to clear the potatoes if they get caught in the holes.

Select the feed rate such that the potatoes are one layer deep across the belts so they all are touching the belt as they move through the machine. Do not feed the machine too fast.

Intake

Discharge

Operation

FIG. 1 OPERATION (TYPICAL)

4.4 MACHINE BREAK-IN

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

A. **Before Starting:**

1. Read Screen Sizer and auxiliary equipment manuals before starting.

2. Turn gearbox breathers 1/4 turn to open and remove tag.
   a. Elevator
   b. Sizer
   c. Cross
   d. Inline
   e. Shaker

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

1. Retorque all fasteners and hardware.

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

3. Inspect each inline and cross conveyor for entangles material. Remove material.

4. Inspect each sizing belt for entangled material. Remove material.

5. Check the alignment and tension of roller and sprocket drive chain. Realign or tighten as required.

6. Check oil level in speed reduction gearboxes for each drive. Top up as required.

7. Lubricate all grease fittings.

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

1. Retorque all other fasteners and hardware.

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

3. Check the alignment and tension of roller and sprocket drive chain. Realign or tighten as required.

4. Check oil level in speed reduction gearboxes for each drive. Top up as required.

5. Inspect each sizing belt for entangled material. Remove material.

6. Then go to the regular servicing and maintenance schedule as defined in the Maintenance Section.

Left Side

Cross / Inline

Right Side

Shakers

FIG. 2 BREATHERS (Typical)

4.5 PRE-OPERATION CHECKLIST

Safe and efficient operation of your new Belted Screen Sizer 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 Screen Sizer. The checklist should be performed before operating the Screen Sizer and prior to each operation thereafter.

1. Lubricate the machine according to the schedule prescribed in the "Maintenance Section".

2. Insure that proper protective gear is in good repair and available for use by each operator. Make certain that each operator uses the protective gear. Protective gear includes but, is not limited to:

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

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

4. Inspect sizing belt inline and cross conveyors for entangled material. Remove material.

5. Check the alignment and tension of the roller and sprocket drive chain. Realign or tighten as required.

6. Check oil level in speed reduction gearboxes for each drive. Top up as required.

7. Check that the sizing belts inline and cross conveyors are centered on the head and tail rollers. Adjust if necessary as outlined in the "Maintenance Section".

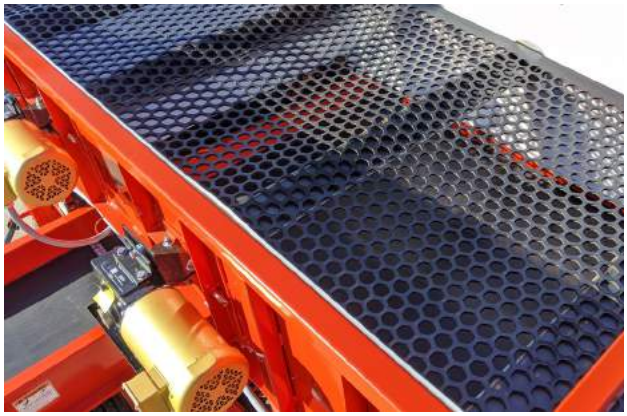
8. Make sure that all electrical switches are in the OFF position before supplying power.

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

10. Be sure the working area is clean and dry to prevent tripping or slipping.

Elevator

Cross Conveyor (Typical)



Sizer Belt (Typical)

Sizer Belt Drive (Typical)

FIG. 3 INSPECTION (TYPICAL)

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.

FIG. 4 CONTROL PANEL

1. Controls Panel:

a. Mode Switch:
This 3 position selector switch turns the control system off or selects its operating mode. Turn switch fully CCW (Counterclockwise) to operate in the HAND (Manual) mode. Turn switch so the pointer is pointing in the vertical direction to turn the system off. Turn switch fully CW (clockwise) to run the system in the AUTO (Automatic) mode.

b. Auto ON - Indicator Lamp:
Blue indicator lamp is illuminated to indicate the machine is running. The lamp is activated after the Mode Selection is set to Auto and the System Start Button has been pressed. The lamp will deactivate after the System Stop Button has been pressed, or the Mode Selector changed from the Auto position.

c. System Start:
Pressing this 2 position green momentary push button will start the machine when the Mode Selection is set to Auto.

d. System Stop:
Pressing this 2 position red momentary push button will stop the machine when the Mode Selection is set to Auto.

e. Sizer A Off/On:
This 2 position selector switch controls the power to the Sizer A belt when the HAND (manual) operating mode is selected. Turn CCW (counterclockwise) to turn the belt off. Turn CW (clockwise) to turn the belt ON.

f. Sizer A Speed Control:
This 270° potentiometer controls the low voltage speed input to the Variable Frequency Drive to allow variable speed of the Sizer A belt. Turn the dial fully counterclockwise (CCW) to its 0 position to slow the belt to minimum speed. Turn fully clockwise (CW) to its 270 degree or 100% to run the belt at maximum speed. Move the dial to any position in the 270 degree arc to operate the belt at the desired speed for the application.

g. Sizer B Off/On:
This 2 position selector switch controls the power to the Sizer B belt when the HAND (manual) operating mode is selected. Turn CCW (counterclockwise) to turn the belt off. Turn CW (clockwise) to turn the belt ON.

h. Sizer B Speed Control:
This 270° potentiometer controls the low voltage speed input to the Variable Frequency Drive to allow variable speed of the Sizer B belt. Turn the dial fully counterclockwise (CCW) to its 0 position to slow the belt to minimum speed. Turn fully clockwise (CW) to its 270 degree or 100% to run the belt at maximum speed. Move the dial to any position in the 270 degree arc to operate the belt at the desired speed for the application.

i. Shaker A Off/On:
This 2 position selector switch controls the power to the Shaker A motors when the HAND (manual) operating mode is selected. Turn CCW (counterclockwise) to turn the shakers off. Turn CW (clockwise) to turn the shakers ON.

j. Shaker A Speed Control:
This 270° potentiometer controls the low voltage speed input to the Variable Frequency Drive to allow variable speed of the Shaker A motors. Turn the dial fully counterclockwise (CCW) to its 0 position to slow the shakers to minimum speed. Turn fully clockwise (CW) to its 270 degree or 100% to run the shakers at maximum speed. Move the dial to any position in the 270 degree arc to operate the belt at the desired speed for the application.

k. Shaker B Off/On:
This 2 position selector switch controls the power to the Shaker B motors when the HAND (manual) operating mode is selected. Turn CCW (counterclockwise) to turn the shakers off. Turn CW (clockwise) to turn the shakers ON.

l. Shaker B Speed Control Off/On:
This 270° potentiometer controls the low voltage speed input to the Variable Frequency Drive to allow variable speed of the Shaker B motors. Turn the dial fully counterclockwise (CCW) to its 0 position to slow the shakers to minimum speed. Turn fully clockwise (CW) to its 270 degree or 100% to run the shakers at maximum speed. Move the dial to any position in the 270 degree arc to operate the belt at the desired speed for the application.

m. Elevator Off/On:
This 2 position selector switch controls the power to the Elevator belt when the HAND (manual) operating mode is selected. Turn CCW (counterclockwise) to turn the belt off. Turn CW (clockwise) to turn the belt ON.

n. Elevator Speed Control:
This 270° potentiometer controls the low voltage speed input to the Variable Frequency Drive to allow variable speed of the Elevator belt. Turn the dial fully counterclockwise (CCW) to its 0 position to slow the belt to minimum speed. Turn fully clockwise (CW) to its 270 degree or 100% to run the belt at maximum speed. Move the dial to any position in the 270 degree arc to operate the belt at the desired speed for the application.

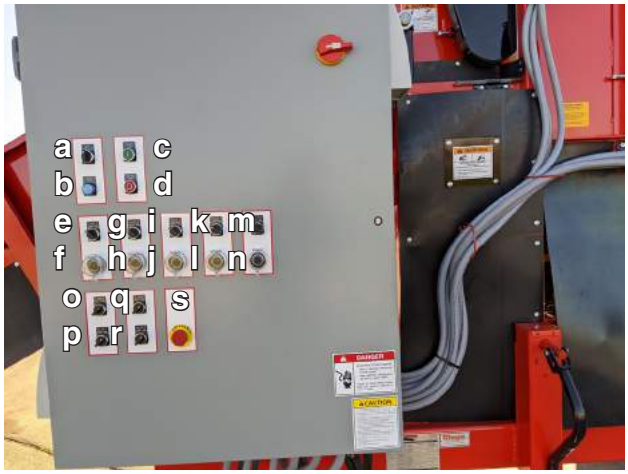


FIG. 4 CONTROL PANEL

o. Cross Rev/Off/Fwd:
This 3 position selector switch controls the power and direction to the A-Cross belt when the HAND (manual) or AUTO operating mode is selected. Turn CCW (counterclockwise) to turn the belt in reverse direction. Turn CW (clockwise) to turn the belt in forward direction. Position the switch in the center to switch the belt off.

p. Inline A:
This 2 position selector switch controls the power to the Inline A belt when the HAND (manual) operating mode is selected. Turn CCW (counterclockwise) to turn the belt off. Turn CW (clockwise) to turn the belt ON.

q. B - Cross Rev/Off/Fwd:
This 3 position selector switch controls the power and direction to the B-Cross belt when the HAND (manual) or AUTO operating mode is selected. Turn CCW (counterclockwise) to turn the belt in reverse direction. Turn CW (clockwise) to turn the belt in forward direction. Position the switch in the center to switch the belt off.

r. Inline B Off/On:
This 2 position selector switch controls the power to the Inline B belt when the HAND (manual) operating mode is selected. Turn CCW (counterclockwise) to turn the belt off. Turn CW (clockwise) to turn the belt ON.

s. **Emergency STOP (Control Panel):**
This red two-position push-pull switch controls the power to the machine. Push the switch in to cut power and turn all functions off. Turn the switch 1/4 turn clockwise and the switch will pop out. Either this switch or the frame mounted emergency stop switch will cut the power to the machine but both must be pulled out for the machine to operate.

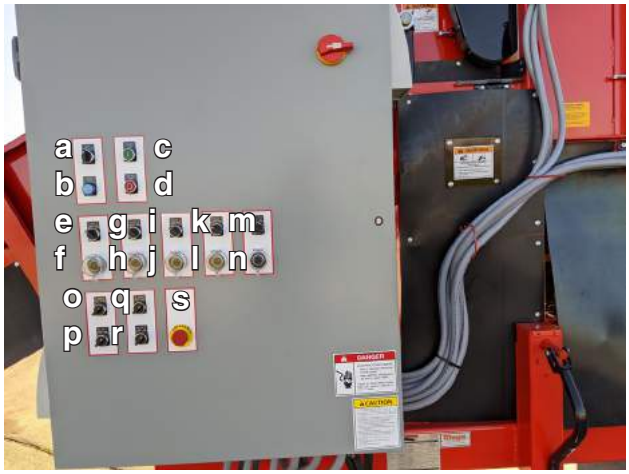


FIG. 4 CONTROL PANEL

2. **Emergency STOP (Frame Mounted):**
This red two-position push-pull switch controls the power to the machine. Push the switch in to cut power and turn all functions off. Turn the switch 1/4 turn clockwise and the switch will pop out. Either this switch or the control panel mounted emergency stop switch will cut the power to the machine but both must be pulled out for the machine to operate.

FIG. 5 EMERGENCY STOP - FRAME

3. **Elevator Height Turnbuckle:**
The elevator is equipped with a turnbuckle on each side of the frame to set the height of the hopper. Set the height appropriate for the application.

FIG. 6 TURNBUCKLES

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 provide power at the required voltage, phase and amperage for your machine by following ANSI/NFPA 70 Wiring Standard. 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. **Installation:**
   Although the unit can be used as a stand-alone machine, it generally is part of a processing line in a potato operation. In either case, these items, at a minimum need to be provided:

   a. Potato intake.

   b. Sizer B potato discharge.

   c. Sizer A potato discharge.

   d. Auxiliary conveyor(s).

   e. Large potato discharge.

Elevator

Sizer Belt (Typical)

Discharge

Operation

FIG. 7 INSTALLATION (TYPICAL)

3. **Controls:**
Controls for the Screen Sizer are generally part of the system controls and are in the control room. Review and train all personnel in the use of controls for stopping, starting or how to stop in any emergency.
When the machine is used in a stand alone application, the control panel is mounted on the left front corner of the frame. Review the controls section before operating unit.

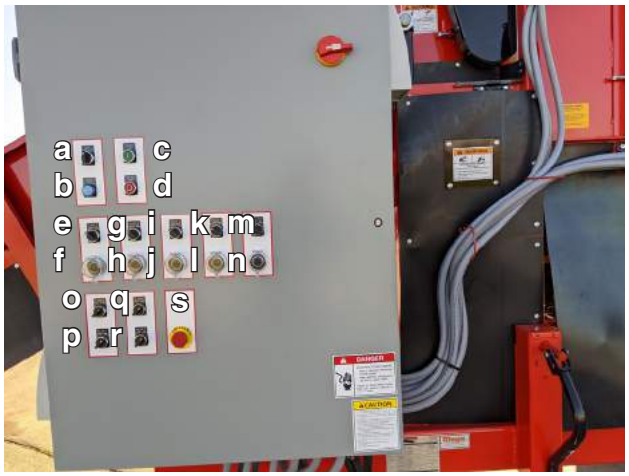


FIG. 8 CONTROL PANEL

4. **Access:**
It is the responsibility of the customer to provide access for personnel to reach the Screen Sizer when operating or servicing. Always plan and position the machine for access to all sides of the unit.

WARNING

Machine is shown with guards removed or doors opened for illustative purposes only. Do not operate machine without all guards in place and doors closed.

FIG. 9 ACCESS (TYPICAL)

5. **Equipment Attachment:**
Each customer must provide a means of supplying a steady flow of potatoes to the Belted Screen Sizer. Normally this is done by using another piece of equipment such as a grader or another conveyor. In addition, customers must provide a means to remove small, large and good sized potatoes from the machine. When the Screen Sizer is used as a component in a processing system, it is recommended that it be securely attached to the adjacent piece of equipment. Set the height of the equipment for minimal drop height to minimize bruising.

FIG. 10 AUXILIARY EQUIPMENT

4.8 OPERATING

OPERATING SAFETY

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

Follow this procedure when using the Screen Sizer:

1. Review Section 4.6 Machine Preparation and follow all the instructions.
2. Review and follow the pre-operation checklist (See Section 4.5).

FIG. 11 SIZING SYSTEM (TYPICAL)

3. **Starting Screen Sizer:**

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

   b. Place all controls in the OFF or neutral position.

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

   d. Release both the emergency stop switches.

   e. Turn the equipment ON that move potatoes away from the Screen Sizer.

   f. Turn the Screen Sizer ON.

   g. Turn the equipment ON that moves potatoes to the Screen Sizer.

4. **Stopping Machine:**

   a. Turn OFF the equipment that brings potatoes to the Screen Sizer.

   b. Wait until the potatoes have moved off the end of the Screen Sizer and off the cross conveyor.

   c. Turn the Screen Sizer OFF.

   d. Turn OFF the conveyors that move potatoes away from the Screen Sizer.

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

5. **Emergency STOP:**

   It is recommended that a licensed electrician be used to provide power to the machine and system. Each machine is designed with 2 emergency stop switches; one on the control panel and one on the frame next to the discharge and easily accessible to personnel. Always train personnel before allowing them to work with the system.

FIG. 12 STARTING/STOPPING (OPTIONAL)

FIG. 13 OPERATING SYSTEM

FIG. 14 EMERGENCY STOP - FRAME

6. **Equipment Position:**
Each customer must provide a means of supplying a steady flow of potatoes to the Screen Sizer. Normally this is done by using another piece of equipment such as a grader, a conveyor or washers. In addition, customers must provide a means to remove small, large and good sized potatoes from the machine. When the Screen Sizer is used as a component in a conveying system, it is recommended that it be securely attached to the adjacent piece of equipment. Set the height of the equipment for minimal drop height to minimize bruising.

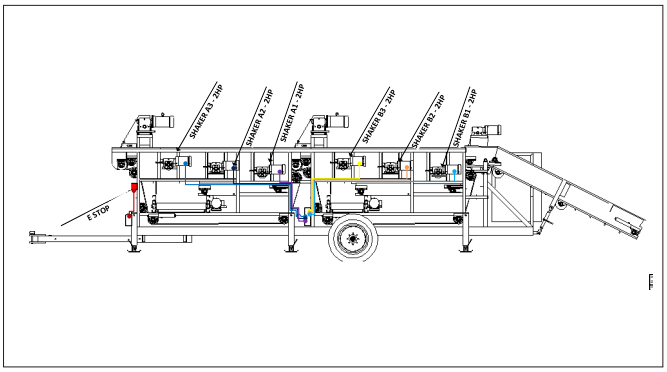
System

Intake

Discharge

FIG. 15 EQUIPMENT ATTACHMENT

7. **Shakers:**
Each machine is designed with 3 shaker shafts in the center of the top belt span of each sizer belt. It consists of a rotating, triangular-shaped shaft that moves the belt up and down as it rotates. This action moves the belt to allow the small potatoes to fall through the belt. An electric motor on the right side of the frame through a speed reducing gearbox turns the triangular shaft.



Schematic

Shaker Shafts

Drives

Working

FIG. 16 SHAKER

8. **Frame Jacks:**
The machine is designed with 3 jack stands on each side of the frame to support it when operating. They also allow for good support if positioned on an uneven surface.
Release anchor pin and lower foot to the ground. Use the handle to set the height of the jack appropriate for the application. Always support the weight of the machine on the jacks and not on the tires.

FIG. 17 FRAME JACKS (TYPICAL)

9. **Drop Height:**
Potatoes are sensitive to bruising during the gathering, transporting and handling phases of harvesting. Bruising is kept to a minimum by maintaining a full flow of potatoes through each machine and minimizing all drop heights. Bruising during the conveying phase can be minimized by keeping the drop height between each piece of conveying equipment as small as possible. Each customer is responsible to arrange the worksite to minimize drop height between each machine to minimize bruising.

FIG. 18 DROP HEIGHT

10. **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. Feed potatoes in a single layer across the belt to allow each potato to go across a hole in the belt.

f. Set the position of each end of the Screen Sizer so the drop height to the adjacent piece of equipment is at a minimum to prevent bruising.

g. Establish a Lock-Out Tag-Out program for your operation and require all employees to follow it.

Machine

Holes (Typical)

Operation

FIG. 19 SIZING

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 under-inflate or over-inflate.
- Make certain that all wheel bolts/lug nuts are tightened to proper torque specifications (refer to specification chart in Section 7.2).
- Raise elevator fully up before transporting to prevent dragging the hopper on the ground when going through low spots.
- Raise and secure the frame outriggers before transporting or moving.
- Wrap up and tie all loose electrical ends to the frame.
- 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 Screen Sizeris positively hitched to the towing vehicle. Use a safety cable to assure a safe hitch hook-up when transporting.
- Follow local regulations regarding maximum weight, width and length when transporting.
- Do not exceed 15 MPH (25 Km/H). Reduce speed on rough roads and surfaces.
- Do not allow anyone to ride on the Screen Sizer or towing vehicle during transport.
- Always use hazard flashers on the towing vehicle when transporting.
- Always use pilot vehicles in front and behind when towing on a public road.

Mayo Screen Sizers are designed to be moved from location to location. The term moving is used to describe the action of moving the machine within the working area. Transporting is used to describe when the machine is being towed by a tractor or other power unit or loaded on a flat bed. When transporting, follow this procedure:

1. Disconnect and remove all auxiliary equipment from the Screen Sizer and position so the tractor or tow unit can back up to the front of the machine.
2. Install or extend the hitch.
3. Use the turnbuckles under the elevator to raise the elevator into its fully up position.

FIG. 20 HITCH EXTENDED

FIG. 21 TURNBUCKLES

4. Disconnect and remove all auxiliary equipment / conveyors:

   a. System bringing potatoes to machine.

FIG. 22 SYSTEM

   b. Systems that remove potatoes from machine.

5. Attach tow unit to hitch using a hardened pin and retainers. Attach safety chain.

FIG. 23 HITCH

6. Raise the outriggers. Three outriggers on each side of the frame.

7. Install an SMV on the rear frame if towing with a tractor on a public road.

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

9. Clean all the reflectors.

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

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

12. Unplug and tie up the power cord.

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

14. 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.

15. 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.

Left Side

Right Side

FIG. 24 OUTRIGGERS

16. 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 Screen Sizerweight.

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

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

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 Screen Sizer 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 Screen Sizer.
- 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 Screen Sizer.

4.9.1 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. Turn the power OFF at the master electrical panel and lock out.
2. Unplug and remove power cord from machine.
3. Lock out power by closing control panel or junction box and padlocking the door shut to prevent electrocution or unauthorized start up of the machine.
4. Remove entangled debris from belt, conveyors and rollers.
5. Thoroughly wash the machine using a pressure washer to remove all dirt, mud, debris or residue.
6. Lubricate all grease fittings. Make sure all grease cavities have been filled with grease to remove any water residue from the washing.
7. Inspect all the electrical cords, lines, junction boxes and motors. Tighten any loose connections. Replace any cord that is badly cut, nicked or abraded. Replace any damaged components.
8. Check the oil level in the gearboxes. Top up as required.
9. Touch up all paint nicks and scratches to prevent rusting.
10. Select a storage area that is dry, level and free of debris.

FIG. 25 STORED (TYPICAL)

4.9.2 REMOVING FROM STORAGE

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

1. Move to the working area.
2. Check
   a. Electrical system and components.
   b. Rollers, conveyors and sizing belt.
   c. Sprockets and roller chains.
   d. Oil level in gearboxes.
   e. All hardware. Tighten as required.
3. Replace any defective components.
4. Go through the pre-operation checklist (Section 4.6) before starting.

5 SERVICE AND MAINTENANCE

MAINTENANCE SAFETY

- Read and understand all the information contained in the Operator's Manual regarding operating, servicing, adjusting, maintaining and repairing.
- Turn machine OFF, shut down and lock out power supply (safety lockout devices are available through your Mayo dealer parts department), relieve hydraulic pressure and wait for all moving parts to stop before servicing, adjusting, maintaining or repairing.
- Follow good shop practices:
  - Keep service area clean and dry.
  - Be sure electrical outlets and tools are properly grounded.
  - Use adequate light for the job at hand.
- Make sure all guards and doors are in place and properly secured when operating the Screen Sizer.
- Do not work on Screen Sizer 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. **Speed Reducer Gear Box Lubricant:**
   Use a Winsmith Worm Gear high-temperature Mobil Glygoyle 460 (details pg. 45) or equivalent.

   Capacitiy: 1 qt (1 liter).

3. **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. **Belted Screen Sizer Bearings:**
   Only sealed bearings are used on the Screen Sizer. 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. Inspect the sizing belt. Remove any entangled material.

FIG. 26 SIZING BELT (TYPICAL)

2. Inspect electrical system and all components.

Left Side

Right Side

FIG. 27 ELECTRICAL (TYPICAL)

150 Hours or Monthly

1. Check the tension of the roller chain drives.

WARNING

Machine is shown with guards removed or doors opened for illustative purposes only. Do not operate machine without all guards in place and doors closed.

Elevator

Sizers (Typical)

FIG. 28 ROLLER CHAIN DRIVES

2. Check the sizing belt drive roller alignment and wrapping. Adjust if required.

Alignment

Rollers

FIG. 29 BELT DRIVE SYSTEM

3. Check oil level in gearboxes.

Cross

Shaker

Inline

Sizer Belt (Typical)

FIG. 30 LEVEL PLUG (TYPICAL)

4. Check cross conveyor tension and alignment.

FIG. 31 CROSS CONVEYOR

5. Check tension and alignment of elevator conveyor.

FIG. 32 ELEVATOR

6. Check tension and alignment of inline conveyors.

FIG. 33 INLINE CONVEYOR

Annually

1. Grease elevator shaft bearings with one shot of grease (2 locations each shaft).

IMPORTANT

Only sealed bearings are used on the Screen Sizer shafts. Do not over-grease. Do not give bearing more than one 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. Right side.

   b. Left side.

Right Side

Left Side

FIG. 34 ELEVATOR SHAFTS

2. Grease cross conveyor shaft bearings with one shot of grease:

   a. Drive.

   b. Driven.

Drive

Driven

FIG. 35 CROSS CONVEYOR (TYPICAL)

3. Grease shaker shaft bearings with 1 shot of grease:

   a. Drive.

   b. Driven.

Drive

Driven

FIG. 36 SHAKER SHAFT (TYPICAL)

4. Grease inline conveyor shaft bearings with 1 shot of grease:

   a. Drive.

   b. Driven.

Drive

Driven

FIG. 37 INLINE CONVEYOR (TYPICAL)

5. Grease sizer shaft bearings with 1 shot of grease:

   a. Drive.

   b. Center.

   c. Bottom - Front.

   d. Bottom - Rear.

Drive

Center

Bottom - Front

Bottom - Rear

FIG. 38 SIZER SHAFTS (TYPICAL)

6. Grease both elevator turnbuckles with 2 shots of grease.

FIG. 39 TURNBUCKLES (TYPICAL)

7. Clean machine.

FIG. 40 MACHINE

Bi-**Annually or Every Two Years**

1. Change the oil in the speed reducing gearboxes in the drive systems.

Inline

Shaker

Sizer

Cross

FIG. 41 GEARBOXES (TYPICAL)

7. Clean the gearbox breather.

Inline / Cross Belt Drives

Shakers

FIG. 42 BREATHERS (TYPICAL)

5.1.4 SERVICE RECORD

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

ACTION CODE:	CK	CHECK	CH	CHANGE	CL	CLEAN
	LU	LUBRICATE	RE	REPACK	IN	INSPECT

Maintenance

Hours																							
Serviced by																							
8 Hours or Daily																							
IN Sizing Belt																							
IN Electrical System																							
150 Hours or Monthly																							
CK Input Drive Roller Chain																							
CK Sizing Belt Drive Roller																							
CK Oil Level in Gearboxes																							
Annually																							
LU Screen Sizer Shaft Bearings																							
CL Machine																							
Bi-Annually or Every 2 Years																							
CH Gearbox Oil Level																							
CL Gearbox Breathers																							

5.2 MAINTENANCE

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

5.2.1 ELECTRIC SYSTEM INSPECTION

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

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

1. Place all controls in the OFF or neutral position.

2. Turn power OFF at the master panel and lock-out before starting the inspection.

3. Inspect all electrical components looking for:

IMPORTANT

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

   a. Physical damage. (Includes all components: starters, switches, enclosures, as well as plugs).

   b. Frayed or loose wires.

   c. Cut or cracked insulation.

4. Replace any damaged components immediately.

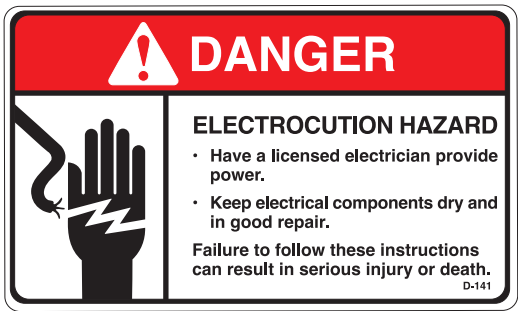
5. Be sure all components are grounded.

6. Be sure there is no water or moisture in any junction box or enclosure. Dry the components before turning power on. Be sure that all compartments seal properly when closed.

Right Side

Left Side

FIG. 43 ELECTRICAL INSPECTION (TYPICAL)



5.2.2 SPEED REDUCER GEARBOX OIL

The Screen Sizer is driven by electric motors that are attached to high ratio speed reducing gearboxes to give the required operating speed. The gearbox is equipped with a drain, level and fill plug. Every 150 hours, the oil level should be checked. Every 2 years or bi-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 Screen Sizer until the gearbox is warm. Warm oil will remove more contaminants than cold stagnate oil.

2. Stop the Screen Sizer.

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

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

5. **Checking oil level:**

   a. When the gearbox is cold, remove the level plug from the side of the gearbox.

   b. When the oil just fills the threads of the level plug, it is at the correct level.

   c. Add oil through the fill plug as required.

   d. Install and tighten level and fill plugs.

6. **Changing oil:**

   a. Place a container under the drain plug.

   b. Remove the drain.

   c. Allow 10 minutes to drain.

   d. Install and tighten the drain plug.

   e. Remove the level and fill plugs.

   f. Add approximately 1 qt (1 liter) of Winsmith Worm Gear Mobil Glygoyle 460 lubricant or equivalent (Details pg. 45). Use the level plug to determine the proper amount of oil.

NOTE

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

Shaker

Belt

FIG. 44 GEARBOXES

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

   h. Install and tighten the fill and level plugs.

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

5.2.3 BREATHER CLEANING

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

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

IMPORTANT

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

Belt Drive

Shaker

FIG. 45 BREATHERS

5.2.4 DRIVE CHAIN TENSION/ALIGNMENT OR REPLACEMENT

A roller chain is used to transmit rotational power from the gearboxes to the sizing belt. The roller chain and sprockets must be kept in good condition and at the correct tension and alignment to obtain the expected life. To maintain the roller chains, 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. Unlatch and open guard over drive.

4. **Tension:**
   Chain tension is set by an idler in the system. Loosen anchor bolt and slide idler to its required position. Tighten anchor bolt to its specified torque.

   The chain has proper tension when long span is just snug and a link can be twisted slightly.

5. **Replacement:**

   a. Remove the idler sprocket to place the chain into its loosest position.

   b. Remove the connecting clips and side plates on the chain link.

   c. Remove the old chain.

   d. Thread the replacement chain around the sprockets.

   e. Pull the ends together and install the connecting link and side plate.

   f. Install idler sprocket to set tension.

6. Close and secure the guard.

Chain Drive

Idler

FIG. 46 TENSION ADJUSTMENT (TYPICAL)

5.2.5 SIZING BELT TENSION/ALIGNMENT OR REPLACEMENT

A rubber belt with specifically sized holes is used to size potatoes with the machine. The tension and alignment should be checked daily to insure proper function. Replace the belt when damaged or badly worn. To maintain the Screen Sizer belts, follow this procedure:

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

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

3. **Tension:**
   The belt is tensioned correctly when it does not slip during operation.

   Move the drive, or bottom tail shaft to set tension. Loosen set screw on bottom housing mount, move beaaring and retighten set screw. Use bearing housing bolts to move the bottom tail shafts.

FIG. 47 TENSION ADJUSTMENT

4. **Alignment:**
   It is properly aligned when the belt runs in the center of the frame panels and the shafts. Be sure to run the belt 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, driven or bottom shafts to align the belt but always maintain the proper tension.

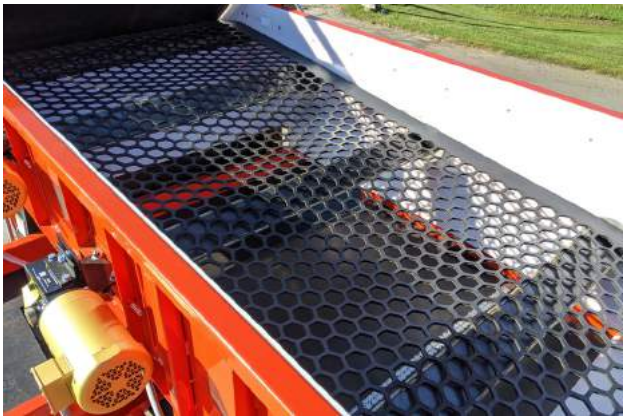


FIG. 48 ALIGNMENT

5. **Replacement:**

   a. Move all shafts into their loosest position.

   b. Open the belt by removing the connecting rod.

   c. Attach the replacement belt to the end of the old belt.

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

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

   f. Move the shafts into position to set the tension of the belt and secure the bearing assemblies.

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

FIG. 49 BELT CONNECTOR (TYPICAL)

5.2.6 ELEVATOR BELT TENSION/ALIGNMENT OR REPLACEMENT

A cleated flat conveyor belt is used to convey potatoes up the elevator. The tension and alignment of the conveyor should be checked daily to insure proper function. To maintain elevator conveyor, follow this procedure:

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

2. Turn the power OFF at the master panel using the emergency stop switch and lock-out.

3. Unplug power cord.

4. **Conveyor Tension:**
   It is adjusted correctly when there is a 12 to 14 inch sag under the frame on the bottom or slack side of the conveyor during operation.

5. **Conveyor Alignment:**
   It is properly aligned when the conveyor centers in the frame. If the conveyor runs on the side of the frame, align the belt. Align by loosening the shaft bearing assembly on the loose side. Move the bearing assemblies on either the drive or driven shafts but always maintain the proper tension.

6. **Replacement:**

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

   b. Open the conveyor belt by removing the connector link.

   c. Attach the replacement belt to the end of the old belt.

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

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

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

   g. Check the tension and alignment of the new conveyor belt frequently during the first 10 hours of operation and set as needed. Normally a conveyor belt will seat itself during the first 10 hours of operation and then require less adjustment.

Conveyor

Drive

Driven

FIG. 50 ALIGNMENT

5.2.7 CROSS CONVEYOR TENSION/ALIGNMENT OR REPLACEMENT

Flat belts are used as cross conveyors to remove small and good potatoes from the machine. The tension and alignment of the conveyor should be checked daily to insure proper function. To maintain the cross conveyors, follow this procedure:

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

2. Turn the power OFF at the master panel using the emergency stop switch and lock-out.

3. Unplug power cord.

4. **Conveyor Tension:**
   It is adjusted correctly when there is a 2 to 4 inch sag under the frame on the bottom or slack side of the conveyor during operation. The conveyor also should not slip during operation.

5. **Conveyor Alignment:**
   It is properly aligned when the conveyor centers in the frame. If the conveyor runs on the side of the frame, align the belt. Align by loosening the shaft bearing assembly on the loose side. Move the bearing assemblies on either the drive or driven shafts but always maintain the proper tension.

6. **Replacement:**

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

   b. Open the conveyor belt by removing the connector link.

   c. Attach the replacement belt to the end of the old belt.

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

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

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

   g. Check the tension and alignment of the new conveyor belt frequently during the first 10 hours of operation and set as needed. Normally a conveyor belt will seat itself during the first 10 hours of operation and then require less adjustment.

Centred

Drive

Driven

FIG. 51 ALIGNMENT

FIG. 52 CONVEYOR CONNECTOR LINK

5.2.8 INLINE CONVEYOR BELT TENSION/ALIGNMENT OR REPLACEMENT

Flat belts are used to convey potatoes from under the sizing belt to the cross conveyor for removal from machine. Both sizer belts are equipped with an inline conveyor to remove product that went through holes. The tension and alignment of the conveyor should be checked daily to insure proper function. To maintain inline conveyors, follow this procedure:

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

2. Turn the power OFF at the master panel using the emergency stop switch and lock-out.

3. Unplug power cord.

4. **Conveyor Tension:**
   It is adjusted correctly when there is a 2 to 4 inch sag on the bottom or slack side of the conveyor during operation. The conveyor also should not slip during operation.

5. **Conveyor Alignment:**
   It is properly aligned when the conveyor centers in the frame. If the conveyor runs on the side of the frame, align the belt. Align by loosening the shaft bearing assembly on the loose side. Move the bearing assemblies on either the drive or driven shafts but always maintain the proper tension.

6. **Replacement:**

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

   b. Open the conveyor belt by removing the connector link.

   c. Attach the replacement belt to the end of the old belt.

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

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

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

   g. Check the tension and alignment of the new conveyor belt frequently during the first 10 hours of operation and set as needed. Normally a conveyor belt will seat itself during the first 10 hours of operation and then require less adjustment.

Drive

Driven

FIG. 53 ALIGNMENT (TYPICAL)

6 TROUBLE SHOOTING

The Mayo Belted Screen Sizer is designed as a large, flat rubber belt with holes in it set to remove any over and undersized potatoes from the flow.

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

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

PROBLEM	CAUSE	SOLUTION
System won't run.	No power.	Turn power ON at master panel.
Screen Sizer won't run.	No power.	Turn power ON.
	Sheared motor key.	Replace key.
	Roller chain broken.	Replace roller chain.
Shaker doesn't turn.	Seized gearbox.	Replace gearbox.
Small potatoes in good flow.	Holes in Sizer B belt plugged.	Clean Sizer B belt.
		Replace belt.
Good potatoes in discharge	Holes in Sizer A plugged.	Clean Sizer A Belt.
		Replace belt
Potatoes coming out of side of frame	Inline conveyor stopped.	Start inline conveyor.
	Seized gearbox.	Replace Gearbox
	Cross conveyor stopped.	Start cross conveyor.
	Seized gearbox.	Replace gearbox.

7 SPECIFICATIONS

7.1 MECHANICAL

Please contact factory at 1-218-773-1234 or 1-800-223-5873 for your machines particular specifications.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

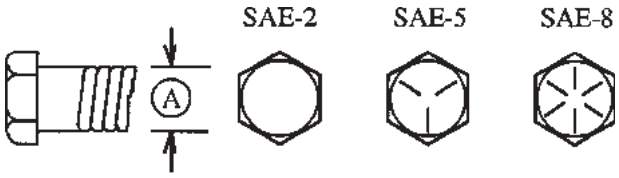
7.2 BOLT TORQUE

CHECKING BOLT TORQUE

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

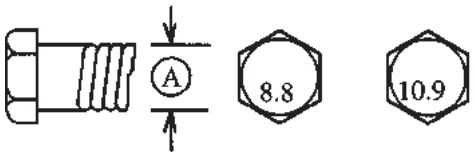
ENGLISH TORQUE SPECIFICATIONS

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



METRIC TORQUE SPECIFICATIONS

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



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

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

7.3 ELECTRICAL SCHEMATIC

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

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

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

8 INDEX

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