Mayo

BRUSH WASHER

OPERATING 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 850 BED STYLE GRADING TABLE

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 Brush Roller
_____ Check Condition of Chain/Sprocket Setting
_____ Check that all Nozzles Flow Freely

SAFETY

_____ All Decals Installed
_____ Review Operating and Safety Instructions

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

Date _____ Dealer's Rep. Signature _____

Signature _____

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

Date _____ Owner's Signature _____

WHITE	YELLOW	PINK
MAYO MFG., INC.	DEALER	CUSTOMER

SERIAL NUMBER LOCATION

Always give your dealer the serial number of your Mayo Bed Style Brush Washer 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

SECTION	DESCRIPTION	PAGE
1	**Introduction**	**1**
2	**Safety**	**3**
2.1	General Safety	4
2.2	Equipment Safety Guidelines	5
2.3	Storage Safety	5
2.4	Safety Training	6
2.5	Safety Signs	6
2.6	Preparation	7
2.7	Installation Safety	7
2.8	Lock-Out Tag-Out Safety	7
2.9	Operating Safety	8
2.10	Maintenance Safety	8
2.11	Electrical Safety	9
2.12	Employee Sign-Off Form	10
3	**Safety Sign Locations**	**11**
4	**Operation**	**15**
4.1	To the New Operator or Owner	15
4.2	Machine Components	16
4.3	General Operation Theory	17
4.4	Machine Break-In	18
4.5	Pre-Operation Checklist	19
4.6	Machine Preparation	20
4.7	Operating	22
4.8	Storage	28
5	**Service and Maintenance**	**29**
5.1	Service	29
5.2	Maintenance	35
6	**Trouble Shooting**	**43**
7	**Specifications**	**45**
7.1	Mechanical	45
7.2	Bolt Torque	46
7.3	Electrical Schematic	47
8	**Index**	**49**

1 INTRODUCTION

Congratulations on your choice of a Mayo Model 850 Bed Style Brush Washer 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 Brush Washer requires that you, and anyone else who will be operating or maintaining the Brush Washer, 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 850 Bed Style Brush Washers manufactured by Mayo. Certain options may be available to specifically tailor the Brush Washer to your operation and may not be included in this manual. Please contact the manufacturer regarding additional information about these options. Use the Brush Washer 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 discharge end of the Brush Washer is the front. The gearboxes are on the right 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 Bed Style Brush Washer 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 Bed Style Brush Washer. **YOU** must ensure that you and anyone else who is going to operate, maintain or work around the Brush Washer 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 Brush Washer.

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 Brush Washer.

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

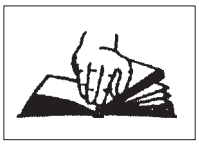
- A person who has not read and understood all operating and safety instructions is not qualified to operate this machine. An untrained operator exposes himself and bystanders to possible serious injury or death.

- 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 Brush Washer.



2. Only trained, competent persons shall operate the Brush Washer. 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 Bed Style Brush Washer 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 Brush Washer.

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 Brush Washer.

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, Brush Washers, 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.

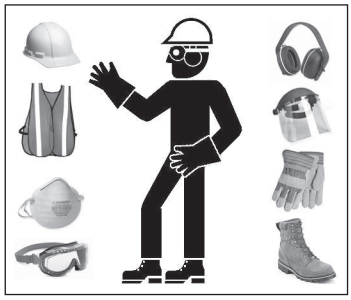
5. Safety signs are available from your authorized Distributor or Dealer Parts Department or the factory.

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 Bed Style Brush Washer 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 Brush Washer 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 Bed Style Brush Washer 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 Brush Washer 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 Brush Washer.

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

4. Do not service or maintain the Brush Washer 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 Bed Style Brush Washer 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 Brush Washer.

6. **Do not work on Brush Washer 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 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 Bed Style Brush Washer is properly grounded at the power source.

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

2.12 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!

A

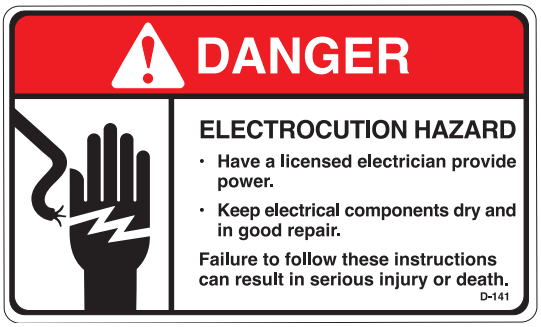
B

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

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!

C



D

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- Think SAFETY! Work SAFELY!

E

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- Think SAFETY! Work SAFELY!

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

4 OPERATION

OPERATING SAFETY

- Make sure that anyone who will be operating the Brush Washer 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 Bed Style Brush Washer is designed to be used as a stand-alone unit or part of a system to wash potatoes and move them from one location to another. Be familiar with the machine before starting.

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

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

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

4.2 MACHINE COMPONENTS

The Mayo Bed Style Brush Washer is designed to wash potatoes in a potato processing plant. It can be installed as a stand alone unit or as part of a potato processing system. Customers must provide a means to bring potatoes to the washer and take them away.

Customers also need to provide a steady clean supply of water to the nozzles over the wash bed. Water from the nozzles flows over the potatoes washing them as the brush rollers turn the potatoes.

The water flows over the potatoes and into a collection pan in the bottom of the frame where it can be cleaned/filtered and re-used.

Electric motors through gearboxes and roller chain drives turn the brush rollers. One roller conveys the rotational power across the frame where a series of sprockets are driven by a roller chain transfer the rotational power to all the adjacent rollers.

FIG. 1 MACHINE COMPONENTS

4.3 GENERAL OPERATION THEORY

Bed Style Brush Washers are designed to roll potatoes as they move through the wash bed while nozzles spray water over them. Each side of the potato is turned toward the nozzles as it moves through the machine for cleaning.

Potatoes are placed into the washer by a conveyor from a piler, stinger or storage facility and removed by another conveyor for storage or packaging.
The best results are obtained when clean water is placed into the water piping system. Clean water prevents nozzle plugging to maintain even, consistent cleaning across the machine.

Water flows from the nozzles over the potatoes, through the brush rollers and into the water collection pan in the bottom of the frame. It is recommended that the water be filtered and recycled to reduce the need for new water.

Inspect the brush rollers at the start of each day and remove any entangled material. Turn the water on and check the spray pattern from each nozzle. Clean if any are plugged or have a distorted flow pattern.

Washer

Nozzles

FIG. 2 DAILY INSPECTION (TYPICAL)

4.4 MACHINE BREAK-IN

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

A. **Before Starting:**

1. Read Brush Washer and auxiliary equipment manuals before starting.

2. Turn gearbox breather 1/4 turn to open breather and remove tag.

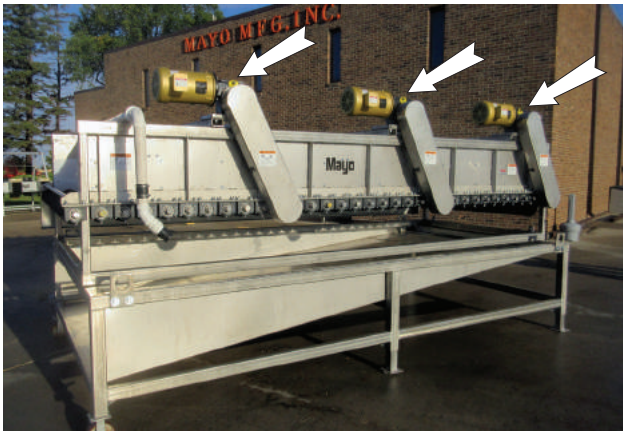


FIG. 3 BREATHER

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. Check integrity of water supply, pipping and nozzles. Clean nozzles if any are plugged or have a distorted spray pattern.

4. Inspect each brush roller for entangled material. Remove material.

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

6. Check oil level in speed reduction gear box for the 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 all roller and sprocket drive chains. Realign or tighten as required.

4. Check oil level in speed reduction gear box for the drive. Top up as required.

5. Check integrity of water supply, pipping and nozzles. Clean nozzles if any are plugged or have a distorted spray pattern.

6. Inspect each brush roller for entangled material. Remove material.

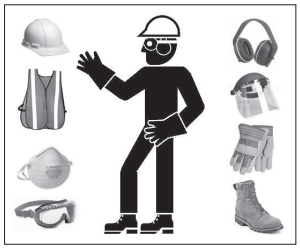
7. Then go to the regular servicing and maintenance schedule as defined in the Maintenance Section.

4.5 PRE-OPERATION CHECKLIST

Safe and efficient operation of your new Bed Style Brush Washer 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 Brush Washer. The checklist should be performed before operating the Brush Washer and prior to each operation thereafter.

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

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



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

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

4. Check integrity of water supply, pipping and nozzles. Clean nozzles if any are plugged or have a distorted spray pattern.

5. Inspect each brush roller for entangled material. Remove material.

6. Check the alignment and tension of all roller and sprocket drive chains. Realign or tighten as required.

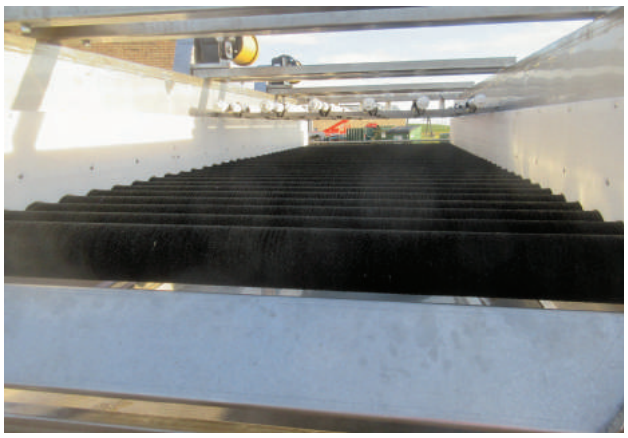
7. Check oil level in speed reduction gear box for the drive. Top up as required.

8. Check that the roller drive chains are centered on the head and tail sprockets. Adjust if necessary as outlined in the "Maintenance Section".

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

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

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



Brush Rollers

Nozzles (Typical)

FIG. 4 INSPECTION (TYPICAL)

4.6 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. Potatoes in.

   b. Water supply.

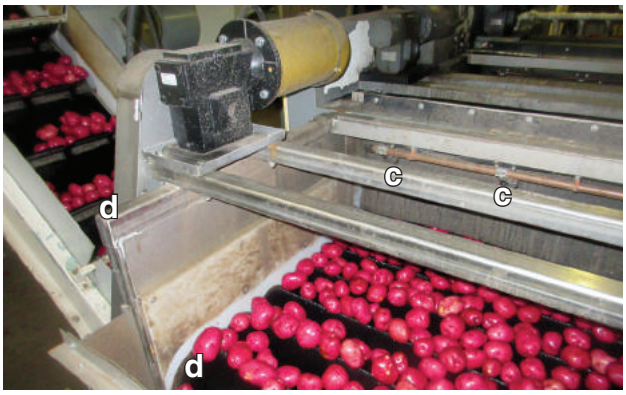
   c. Nozzle spray.

   d. Potato discharge.

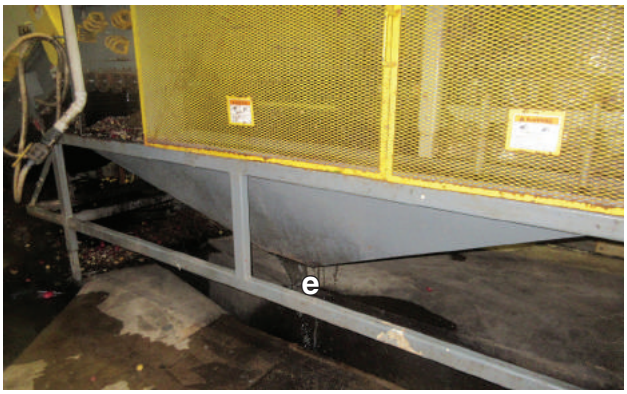
   e. Waste water.

3. **Controls:**
   Controls for the Brush Washer 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.

Intake



Discharge



Water Discharge

FIG. 5 INSTALLATION (TYPICAL)

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

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.

Drive Side

Wall Spacing

FIG. 6 ACCESS (TYPICAL)

5. **Equipment Attachment:**
Each customer must provide a means of supplying a steady flow of potatoes to the Bed Style Brush Washer. Normally this is done by using another piece of equipment such as a grader or another conveyor. When the Brush Washer 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.

Intake

Discharge

FIG. 7 AUXILLIARY EQUIPMENT

4.7 OPERATING

OPERATING SAFETY

- Make sure that anyone who will be operating the Brush Washer 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 Brush Washer:

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. 8 WASH SYSTEM (TYPICAL)

3. **Starting Brush Washer:**

   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 the emergency stop switch (if so equipped).

   e. Turn the main equipment ON that moves potatoes away from the Brush Washer.

   f. Turn water supply ON.

   g. Turn the Brush Washer ON.

   h. Turn the equipment ON that moves potatoes to the Brush Washer.

4. **Stopping Machine:**

   a. Turn OFF the equipment that brings potatoes to the Brush Washer.

   b. Wait until the potatoes have moved off the end of the Brush Washer.

   c. Turn water supply OFF.

   d. Turn the Brush Washer OFF.

   e. Turn OFF the conveyor that moves potatoes away from the Brush Washer.

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 (Optional):**

   It is recommended that a licensed electrician be used to provide power to the machine and system. An Emergency Stop control should be part of the control system and easily accessible to personnel. Always train personnel before allowing them to work with the system.

System

Nozzles

FIG. 9 STARTING/STOPPING (OPTIONAL)

FIG. 10 OPERATING SYSTEM

6. **Equipment Position:**
Each customer must provide a means of supplying a steady flow of potatoes to the Brush Washer. Normally this is done by using another piece of equipment such as a grader, another Brush Washer or washers. When the Brush Washer 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.

Intake

Discharge

FIG. 11 EQUIPMENT ATTACHMENT

7. **Nozzles:**
Each tube is equipped with nozzles that direct the water over the potatoes to wash them. Inspect the nozzles daily to check that they have a good spray pattern. Generally the only times the spray pattern is affected is when the nozzle is plugged by dirty water. Always provide clean water to the system by passing the water through a filter.

Position (Typical)

Washing

FIG. 12 NOZZLES

8. **Water Shut-Off Valve:**
It is recommended that Shut-Off valve to be place in the line bringing water to the machine. Open and close valve as required when operating the Brush Washer.

Intake

Water Discharge

FIG. 13 SHUT-OFF VALVE

9. **Auxiliary Equipment:**
Generally conveyors are used to bring potatoes to and take them away from the Brush Washer. Clean potatoes can then go to a grading table, storage facility or other destination. Secure conveyor to washer to prevent movement.

Intake (Typical)

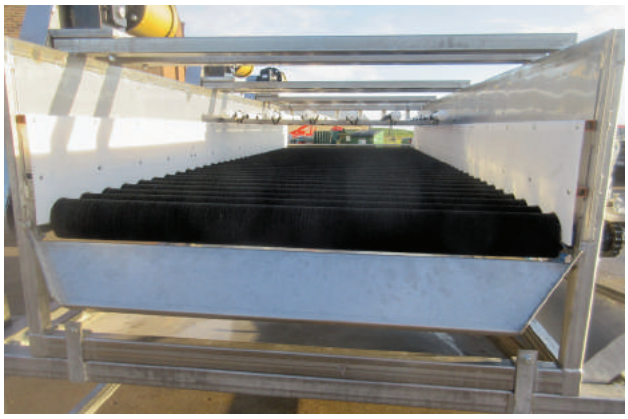
Storage (Typical)

FIG. 14 SHUT-OFF VALVE

10. **Drop Height:**
Potatoes are sensitive to bruising during the gathering, transporting and handling phases of harvesting. Bruising is kept to a minimum by maintaining a full flow of potatoes through each machine and minimizing all drop heights. 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. 15 DROP HEIGHT

11. **Brushes:**
Each machine is equipped with rotating brushes under the nozzles. The rotating brushes turn each potato as it goes under the nozzles and manually removes any dirt from the potatoes. Inspect the brushes at the start of each day and remove any entangled material.



Brushes

Machine

FIG. 16 BRUSHES

12. **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 Brush Washer as full as possible to minimize bruising during the washing process.

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

g. Inspect the brushes on each roller daily and remove all debris.

h. Inspect the spray pattern of each nozzle at the start of the day. Clean the nozzle if the spray is distorted in any way. Always provide clean water to machine.

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

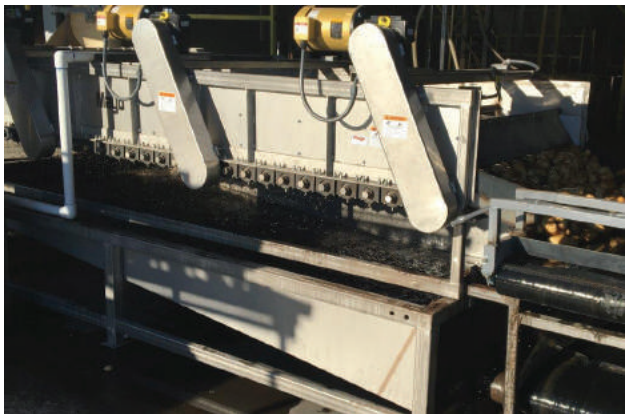


FIG. 17 MACHINE (TYPICAL)

FIG. 18 WASHING

4.9 STORAGE

STORAGE SAFETY

- Store the Brush Washer 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 Brush Washer.
- 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 Brush Washer.

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 brushes.
5. Clean any nozzles with a distorted spray pattern.
6. Thoroughly wash the machine using a pressure washer to remove all dirt, mud, debris or residue.
7. Lubricate all grease fittings. Make sure all grease cavities have been filled with grease to remove any water residue from the washing.
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.
8. Inspect water distribution system. Seal any leaks by tightening fittings or replacing leaking components.
10. Check the oil level in the gearbox. Top up as required.
11. Touch up all paint nicks and scratches to prevent rusting.
12. Select a storage area that is dry, level and free of debris.

FIG. 19 STORED (TYPICAL)

4.9.2 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 and water systems and components.
   b. Brush rollers and nozzles.
   c. Chains and sprockets.
   d. Oil level in gearbox.
   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 Brush Washer.
- Do not work on Brush Washer 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. **Brush Washer Bearings:**
   Only sealed bearings are used on the Brush Washer. 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 spray pattern of each nozzle. Clean if any nozzle has a distorted spray pattern.

Nozzle

Washing

FIG. 20 NOZZLE INSPECTION (TYPICAL)

2. Inspect the brushes. Remove any entangled material.

FIG. 21 BRUSHES

3. Inspect electrical system and all components.

FIG. 22 ELECTRICAL (TYPICAL)

150 Hours or Monthly

1. Check the tension of the input drive roller chain (3 locations).

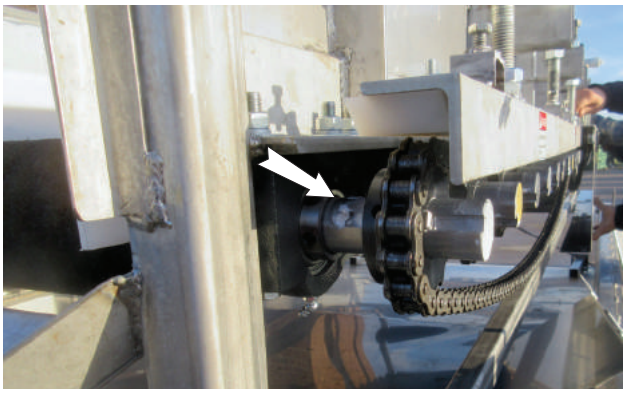
WARNING

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. 23 INPUT DRIVE ROLLER CHAIN

2. Check the tension and clearance of the brush roller sprocket/chain drive system. Move plastic slider closer to chain if chain is slipping a tooth on a sprocket.

Engaged



Disengaged

FIG. 24 SPROCKET/CHAIN DRIVE SYSTEM

3. Check oil level in gearboxes.

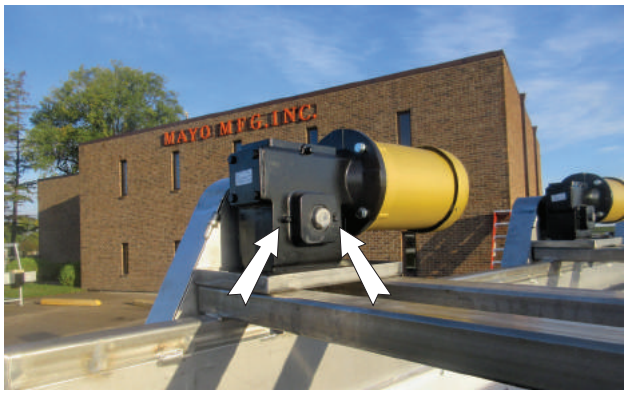


FIG. 25 LEVEL PLUG (TYPICAL)

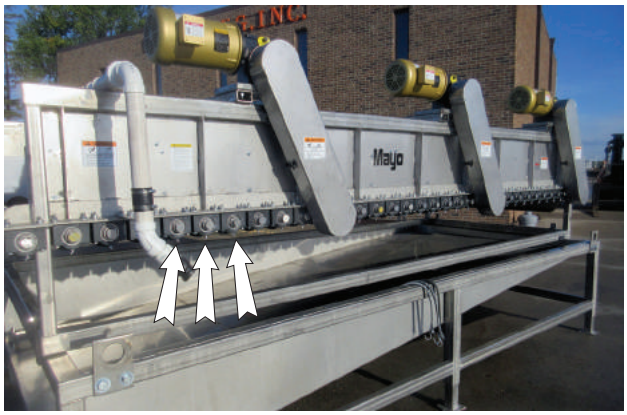
4. Grease Bed Style Brush Washer shaft bearings with one shot of grease (2 locations each shaft).

IMPORTANT

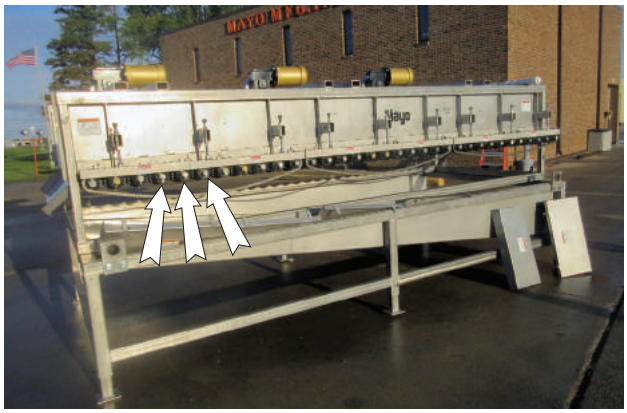
Only sealed bearings are used on the Brush Washer shaft. Do not over-grease. Do not give bearing more than one shot of grease each time it is greased. Once the bearing seal is broken, the bearing must be greased each day or the bearing will fail.

a. Drive.

b. Driven.



Drive (Typical)



Driven (Typical)

FIG. 26 SHAFTS (TYPICAL)

Annually

1. Clean machine.

FIG. 27 MACHINE

Bi- Annually or Every Two Years

1. Check the oil level in the speed reducing gearbox in the drive system (1 location).

a. Level Plug b. Fill Plug c. Drain Plug

FIG. 28 GEARBOXES (TYPICAL)

2. Clean the gearbox breather.

FIG. 29 BREATHER

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																							
CK Nozzle Spray Pattern																							
IN Brushes																							
IN Electrical System																							
150 Hours or Monthly																							
CK Nozzle Spray Pattern																							
CK Tension/Clearance of Brush Roller Drive Chain																							
CK Gearbox Oil Levels																							
G Shaft Bearings																							
Annually																							
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 Brush Washer. 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.

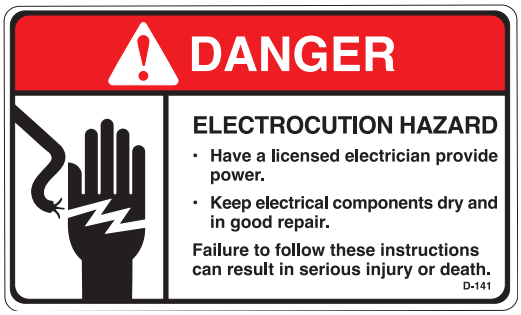
   c. Cut or cracked insulation.

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.

FIG. 30 ELECTRICAL INSPECTION (TYPICAL)



5.2.2 SPEED REDUCER GEARBOX OIL

The Brush Washer is driven by an electric motor that is attached to a high ratio speed reducing gearbox 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 Brush Washer until the gearbox is warm. Warm oil will remove more contaminants than cold stagnate oil.

2. Stop the Brush Washer.

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.

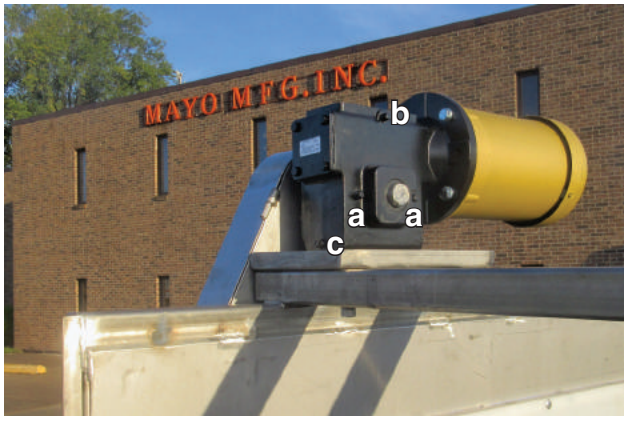
   d. Install and tighten the drain plug.

   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.



a. Level Plug b. Fill Plug c. Drain Plug

FIG. 31 GEARBOX (TYPICAL)

   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

The 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. 32 BREATHER (TYPICAL)

5.2.4 DRIVE CHAIN TENSION/ALIGNMENT OR REPLACEMENT

Roller chains are used to transmit rotational power from the gearboxes to the brush rollers under the nozzles. The roller chains 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 and controlled by the Snap Idle tensioning components on the chain. The tension is properly set when the Snap Idle assembly is 4 inches (100 mm) or more above the bottom sprocket.

   To adjust tension, follow this procedure:

   a. Remove the connecting bolt on one side of the assembly.

   b. Re-assemble by installing the connecting bolt through the hole to move the side of the assembly closer together.

Chain Drive

Snap Idle

FIG. 33 TENSION ADJUSTMENT (TYPICAL)

5. **Alignment:**
   Lay a straightedge or sight across the faces of the sprockets. If there is more than 1/8 inch (3 mm) offset, the sprockets need to be adjusted to bring into alignment.

   To adjust, follow this procedure:

   a. Loosen set screws on sprocket hubs.

   b. Slide or tap the sprocket to move it into alignment.

   c. Tighten setscrew to its specified torque.

FIG. 34 ALIGNMENT

6. **Replacement:**

   a. Remove the Snap Idle 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 Snap Idle to set tension.

FIG. 35 REPLACEMENT

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.

7. Close and secure the guard.

5.2.5 CHAIN/SPROCKET CLEARANCE

3 electric motors through a gearbox and roller chain drive provides rotational power to 3 brush rollers under the nozzles. The 3 rollers turned y the primary drives convey the rotational power across the frame to the other side. On the other side, a roller chain meshing with sprockets turns the adjacent rollers. A plastic slide above the roller chain hold the chain links into the sprocket teeth to turn the ascent rolls.

To maintain the system, follow this procedure:

1. Place all controls in their OFF or neutral position.
2. Turn power off at the master panel and lock out.
3. Remove the guard(s) over the chain/sprocket drive system.
4. Check the clearance between the plastic slide and the roller chain.
5. The best results are obtained when the clearance is set at 1/8 inch (3 mm) or less.

⚠ 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.

Drive (Typical)

Drive (Typical)

Driven (Typical)

FIG. 36 CHAIN/SPROCKET DRIVE

6. Use the position bolts on top of the plastic slide frame to change and set the clearance:
   a. Loosen the position bolt jam nuts.
   b. Turn the position bolt to set the clearance.
   c. Tighten jam nuts to their specified torque.

FIG. 37 POSITION BOLT

7. Check the tension of the roller chain annually.

8. Remove a link to shorten the chain when required.

Sag

Link

FIG. 38 CHAIN TENSION

6 TROUBLE SHOOTING

The Mayo Brush Washer uses turning rolls to present all sides of potatoes to graders to remove debris and damaged potatoes.

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.
Brush Washer won't run.	No power.	Turn power ON.
	Sheared motor key.	Replace key.
	Roller chain broken.	Replace roller chain.
Brush rollers don't turn.	Failed roller chain.	Replace roller chain.
	Plastic slide too high.	Adjust slide position.
	Roller chain stretched.	Remove link from roller chain.
Potatoes not clean.	Nozzles plugged.	Remove debris from nozzles.
		Provide clean water to system.

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

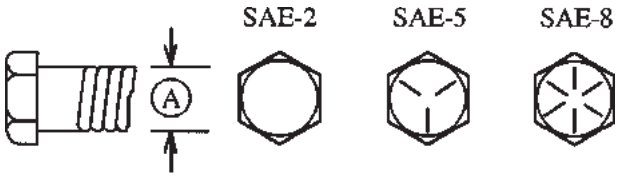
7.2 BOLT TORQUE

CHECKING BOLT TORQUE

The Brush Washers 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.

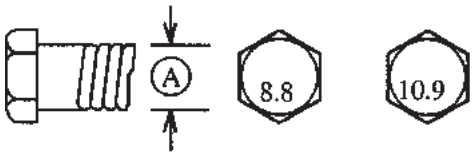
ENGLISH TORQUE SPECIFICATIONS

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

PAGE

I

Introduction....1

O

Operation....15
- General Operation Theory....17
- Machine Break-In....18
- Machine Components....16
- Machine Preparation....20
- Operating....22
- Pre-Operation Checklist....19
- Storage....28
- To The New Operator or Owner....15

PAGE

S

Safety....3
- Electrical Safety....9
- Employee Sign-Off Form....10
- Equipment Safety Guidelines....5
- General Safety....4
- Installation Safety....7
- Lock-Out Tag-Out Safety....7
- Maintenance Safety....8
- Operating Safety....8
- Preparation....7
- Safety Signs....6
- Safety Training....6
- Storage Safety....5
- Safety Sign Locations....11

Service and Maintenance....29
- Maintenance....35
- Service....29

Specifications....45
- Bolt Torque....46
- Electrical Schematic....47
- Mechanical....45

T

Trouble Shooting....43

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