

# Mayo



## **ROLLER GRADING TABLE OPERATORS MANUAL**



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

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

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

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

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

### **LIABILITY**

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

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

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

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

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

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

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

**WARRANTY VOID IF NOT REGISTERED**



# MAYO MANUFACTURING, INC.

## MODEL 710 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 \_\_\_\_\_

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

Address \_\_\_\_\_

Address \_\_\_\_\_

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

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

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

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

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

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

#### DEALER INSPECTION REPORT

\_\_\_\_\_ Inspect Electrical System  
\_\_\_\_\_ Lubricate Machine  
\_\_\_\_\_ Conveyor Chain Tensioned and Aligned  
\_\_\_\_\_ Speed Reducer Gearbox Oil Level Checked  
\_\_\_\_\_ Check Condition of Rolls

#### SAFETY

\_\_\_\_\_ All Decals Installed  
\_\_\_\_\_ Lights, Reflectors and SMV Clean  
\_\_\_\_\_ 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 Grading Table 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 \_\_\_\_\_





# 1 INTRODUCTION

Congratulations on your choice of a Mayo Model 710 Series Grading Table 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 Grading Table requires that you, and anyone else who will be operating or maintaining the Grading Table, 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 710 Series Grading Tables manufactured by Mayo. Certain options may be available to specifically tailor the Grading Table 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 drive and discharge end of the Grading Table is the rear. The gearbox 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 Grading Table and in the manual. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

**Why is SAFETY important to you?**

#### 3 Big Reasons

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

#### **SIGNAL WORDS:**

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

- |                  |  |
|------------------|--|
| <b>DANGER -</b>  | Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations, typically for machine components that, for functional purposes, cannot be guarded. |
| <b>WARNING -</b> | Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.                               |
| <b>CAUTION -</b> | Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.   |

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



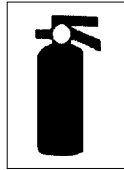

## SAFETY

**YOU** are responsible for the **SAFE** operation and maintenance of your Mayo Grading Table. **YOU** must ensure that you and anyone else who is going to operate, maintain or work around the table 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 table.

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 table.
- Grading Table owners must give operating instructions to operators or employees before allowing them to operate the table, 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 Grading Table. 
2. Only trained, competent persons shall operate the Grading Table. 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 Grading Table 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 table.
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 table.

## 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, tables 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.

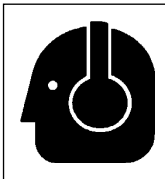
## 2.6 PREPARATION

1. Never operate the Grading Table 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 table 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 Grading Table 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 Grading Table as part of material handling system, anchor securely to other equipment before starting.

## 2.8 LOCK-OUT TAG-OUT SAFETY

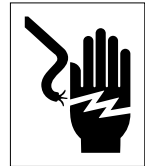
1. Establish a formal Lock-Out Tag-Out program for your operation.
2. Train all operators and service personnel before allowing them to work around the table.
3. Provide tags at the work site and a sign-up sheet to record tag out details.
4. Do not service or maintain the table unless motors are OFF 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 Grading Table 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 Grading Table.
6. **Do not work on table 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 Grading Table is properly grounded at the power source.
3. Make certain that all electrical switches are in the OFF position before plugging the table 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 table 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

[illegible]

### 3 SAFETY SIGN LOCATIONS

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

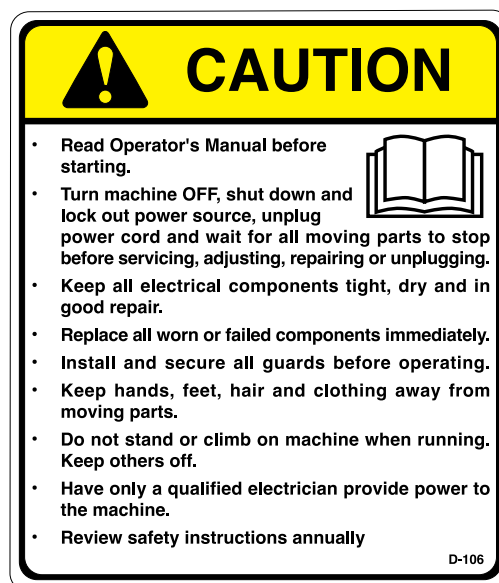
- Think SAFETY! Work SAFELY!



A



B



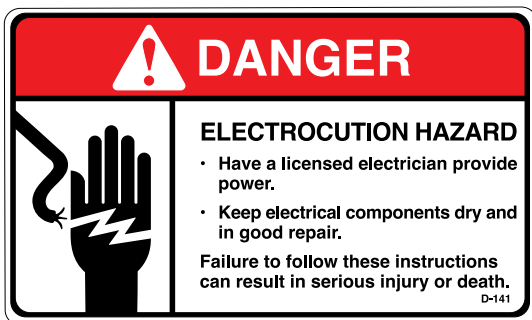
REMEMBER - If Safety Signs have been damaged, removed, become illegible or parts replaced without safety signs, new signs must be applied. New safety signs are available from your authorized dealer.

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



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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!



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 Grading Table 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 Grading Table is designed to be used as a stand-alone unit or part of a system to convey potatoes 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 Grading Table will provide many years of trouble-free service.



## 4.2 MACHINE COMPONENTS

The Mayo Manufacturing Grading Tables are designed to move potatoes to a place where personnel can stand on both sides of the frame to remove trash and rejects. Rolls across the width of the machine are moved on a roller across the frame. Fabric strips are positioned in the center of the frame under the top rolls. The friction rotates the rolls as the potatoes move across the table so graders can see all sides of the potatoes.

Graders on the sides of the frame can remove those that are damaged or not up to spec. Debris can also be removed. All removed material can be placed into the adjustable debris chutes along the side of the frame.

A speed reducing gearbox powered by an electric motor turns the roller chain on each end of the rolls. An optional drip pan is available to mount under the gearbox to prevent spills.



FIG. 1 MACHINE COMPONENTS



### 4.3 GENERAL OPERATION THEORY

Both Low and High Profile Grading Tables are used in a potato grading operation. Both function the same. The rolls in the conveying system "roll" the potatoes as they move through/over the table to allow personnel standing on each side of the frame to view all sides of the product. Damaged or split product will be seen and can be removed. Dirt, stones, stones, stones and other debris can fall between the rolls or be removed by personnel.

Low Profile units generally are positioned at or near the finished floor. They are used as a secondary grading operation for final inspection, usually in the packaging operation.

The High Profile Table is generally mounted at a higher elevation and at a preliminary grading operation at the wash plant. It would see more vines and debris that would fall between the rolls. The higher elevation and exposure to more tare products creates the need for and easier access to "clean out" between the rolls.

Both types of machine need to be inspected daily between the rolls and cleaned before starting work.



**High Profile**



**Low Profile**

**FIG. 2 DAILY INSPECTION (TYPICAL)**

## 4.4 MACHINE BREAK-IN

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

### A. Before Starting:

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

### 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 the alignment and tension of all roll drive chains. Realign or tighten as required.
4. Check oil level in speed reduction gear box for the drive. Top up as required.
5. 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 roll drive chains. Realign or tighten as required.
4. Check oil level in speed reduction gear box for the drive. Top up as required.
5. Then go to the regular servicing and maintenance schedule as defined in the Maintenance Section.



**FIG. 3 BREATHER**

## 4.5 PRE-OPERATION CHECKLIST

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

1. Lubricate the machine according to the schedule prescribed in the "Maintenance Section".
2. Insure that proper protective gear is in good repair and available for use by each operator. Make certain that each operator uses the protective gear. Protective gear includes but, is not limited to:
  - Leather gloves
  - Safety glasses or face shield
  - Full length protective clothing
  - Steel toed boots with slip resistant soles.
3. Insure that all safety guards and shields are in good repair and securely in place.
4. Check that the Grading Table rolls are centered on the head and tail sprockets. Adjust if necessary as outlined in the "Maintenance Section".
5. Inspect the spaces between the rolls and remove any debris from cavity.
6. Make sure that all electrical switches are in the OFF position before supplying power.
7. Check that all electrical connections are tight and cords are routed out of the way or protected.
8. Be sure the working area is clean and dry to prevent tripping or slipping.



**High Profile**



**Low Profile**

**FIG. 4 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.

### 1. Power On/Off:

Grading tables are generally part of a larger potato processing system as a final preparation prior to bagging. As a result, the power to its electric motor is controlled from a central control location. When the system is turned on, the table is turned on as well. The machine stops when the Emergency Stop is tripped.

### 2. Emergency STOP (Optional):

The Grading Table is designed with an emergency stop system consisting of a cable above the table attached to the stop switch. Push or pull on the cable to pull the switch plunger out, break the circuit and stop the machine and system. Depress the "R" button on top of the switch and power can flow (machine/system can run).

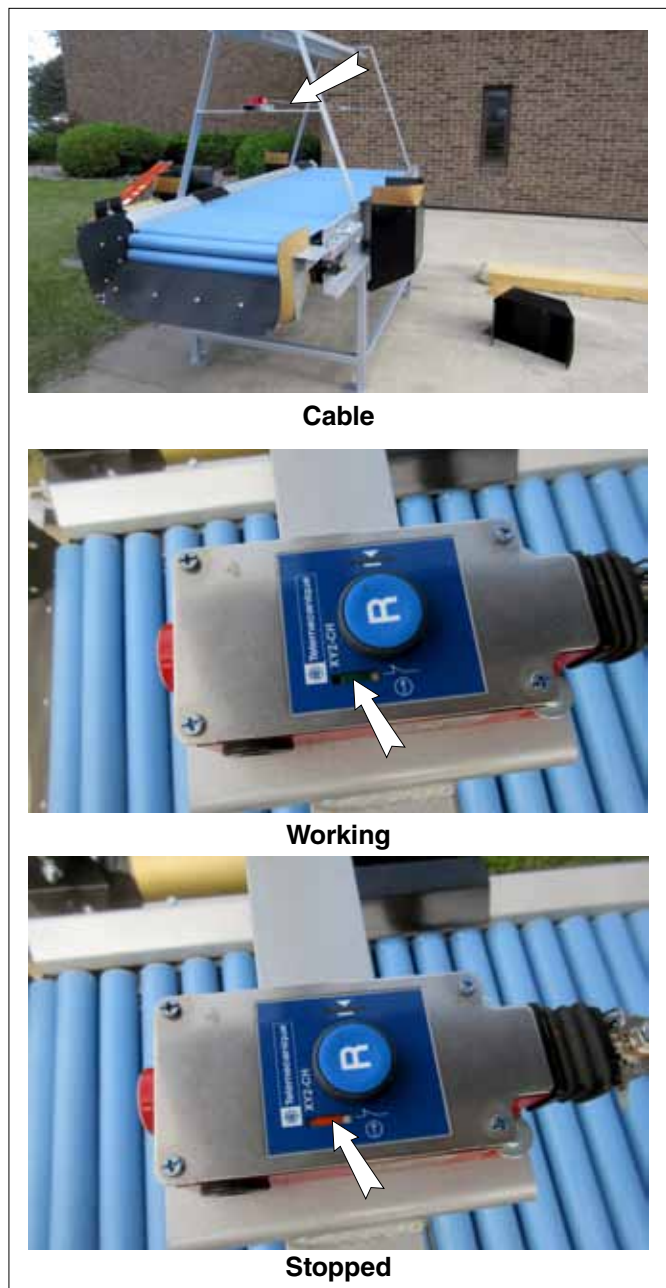


FIG. 5 EMERGENCY STOP



## 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. **Debris Chutes:**

Optional debris chutes are available for grading personnel to place debris and rejects in. Customers can use the chutes to direct the debris to another conveyor or into a pile for removal. Always provide space to remove debris as required.

3. **Emergency Stop (Optional):**

Depress the switch on the emergency stop control box to release the stop and allow power to flow.



**Chutes Installed**



**Removed**



**Conveyor**

**FIG. 6 DEBRIS CHUTES**



**FIG. 7 EMERGENCY STOP**

4. **Access:**

It is the responsibility of the customer to provide access for personnel to reach the Grading Table when operating. Always plan for the auxiliary equipment needed to work with the Grading Table.



**Ground Level**



**Conveyor Under**

5. **Equipment Attachment:**

Each customer must provide a means of supplying a steady flow of potatoes to the Grading Table. Normally this is done by using another piece of equipment such as a grader, another conveyor or washer. When the Grading Table 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.



**Working**

**FIG. 8 ACCESS**



**FIG. 9 EQUIPMENT ATTACHED**

## 4.8 OPERATING



### OPERATING SAFETY

- Make sure that anyone who will be operating the Grading Table 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 Grading Table:

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



FIG. 10 CONVEYING SYSTEM (TYPICAL)



#### 4. Starting Grading Table:

- 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.
- e. Turn the main equipment ON that moves potatoes away from the table.
- f. Turn the Grading Table ON.
- g. Turn the equipment ON that moves potatoes to the Grading Table.

#### 5. Stopping Machine:

- a. Turn OFF the equipment that brings potatoes to the Grading Table.
- b. Wait until the potatoes have moved off the end of the table.
- c. Turn the Grading Table OFF.
- d. Turn OFF the conveyor that moves potatoes away from the Grading Table.

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.

#### 6. Emergency STOP (Optional):

Push or pull on the cable above the table to stop the machine or the system.

##### **IMPORTANT**

Turn all controls OFF before restarting.

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



**Cable**



**Switch**

**FIG. 11 EMERGENCY STOP SYSTEM (OPTIONAL)**



**FIG. 12 OPERATING SYSTEM**



6. **Equipment Position:**

Each customer must provide a means of supplying a steady flow of potatoes to the Grading Table. Normally this is done by using another piece of equipment such as a grader, another table or washers. When the table 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.



**FIG. 13 EQUIPMENT ATTACHMENT**

7. **Moving:**

The Grading Table is generally moved with a forklift. Use extended forks and place under bottom frames when moving the machine. Load the unit on a transport truck when moving from location to location.



**Stand Alone**



**Double**

**FIG. 14 MOVING**

8. **Conveyors:**

Generally another conveyor is used to bring potatoes to the Grading Table. They usually come from other cleaning or washing equipment and the Grading Table is the last machine to provide a "final" cleaning before potatoes go to a "bagger" in preparation for retail.



FIG. 15 UNLOADING CONVEYOR

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. 16 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. Keep the Grading Table as full as possible to minimize bruising during the unloading process.
- f. Set the position of each end of the Grading Table so the drop height to the adjacent piece of equipment is at a minimum to prevent bruising.
- g. Inspect the cavity between the rolls daily and remove all debris.
- h. Establish a Lock-Out Tag-Out program for your operation and require all employees to follow it.



**FIG. 17 OPERATING SYSTEM**



**High Profile**



**Low Profile**

**FIG. 18 CAVITY (TYPICAL)**



## 4.10 STORAGE



### STORAGE SAFETY

- Store the Grading Table 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 table.
- 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 table.

#### 4.11.1 PLACING IN STORAGE

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

1. 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 all debris from cavity between rolls.
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. Inspect the rolls, fabric strips and chain that moves the rolls around the frame. Replace any rolls that are cracked or broken. Replace chain if stretched or broken. Tension and align chain and sprockets as required.

9. Check the oil level in the gearbox. Top up as required.
10. Check the condition of the fabric strips under the rolls. Clean or replace as required.

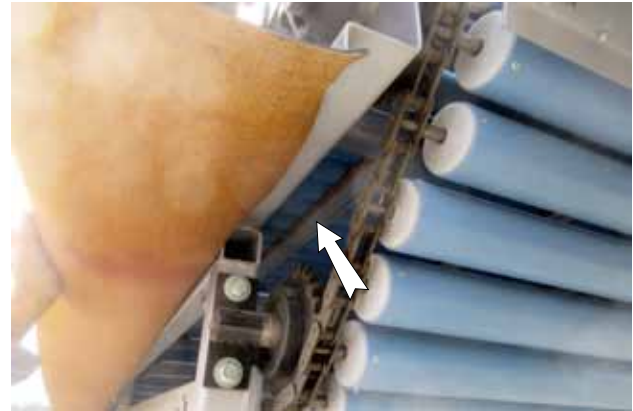


FIG. 19 FABRIC STRIPS

11. Check all rotating parts for entangled material. Remove.
12. Touch up all paint nicks and scratches to prevent rusting.
13. Select a storage area that is dry, level and free of debris.



Low Profile



High Profile

FIG. 20 STORED (TYPICAL)

#### **4.11.2 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 systems and components.
  - b. Rolls and fabric strips.
  - c. Chain 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 Grading Table.
- Do not work on table 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.  
  
Capacity: 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

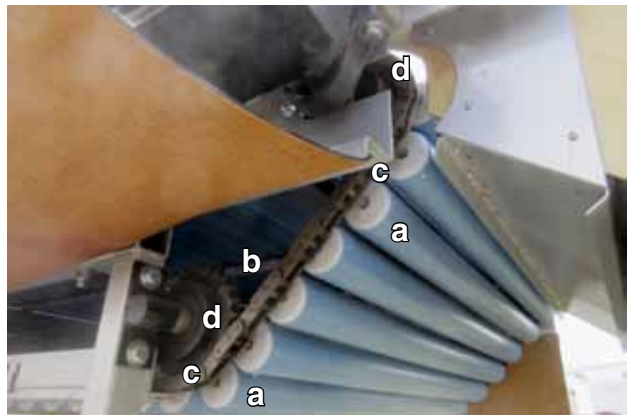
Refer to Section 5.1.1 for recommended grease. Use the Maintenance Checklist provide to keep a record of all scheduled maintenance.

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

### 5.1.3 SERVICING INTERVALS

#### 8 Hours or Daily

1. Check the rolls, fabric strips, chain tension and alignment. Replace cracked or broken rolls. Replace fabric if worn away. Tension or align chain as required.
2. Remove all material from between rolls and/or cavity between rolls.
  - a. Rolls
  - b. Fabric strip
  - c. Chain
  - d. Sprockets
  - e. Access doors



**High Profile**



**Low Profile**

**FIG. 21 SERVICING (TYPICAL)**

3. Inspect electrical system and all components.



**FIG. 22 ELECTRICAL (TYPICAL)**



4. Check function of Emergency Stop system.  
Engage and disengage switch.



**Engaged**



**Disengaged**

**FIG. 14 MOVING**

## 50 Hours or Weekly

1. Grease Grading Table drive shaft bearings with one shot of grease (2 locations each shaft).

### IMPORTANT

Only sealed bearings are used on the Grading Table shaft. Sealed bearings should never be greased more often than weekly or every 50 hours. 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.



Drive

- b. Driven.



Driven

FIG. 22 SHAFT

### 100 Hours or Annually

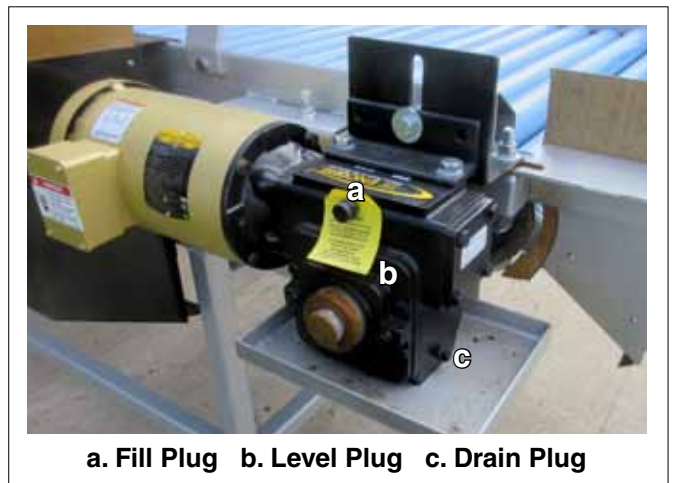
1. Check the oil level in the speed reducing gearbox in the drive system (1 location).



**FIG. 23 LEVEL PLUG (TYPICAL)**

### 500 Hours or Annually

1. Change the oil in the gearbox.
2. Clean the gearbox breather plug.



**FIG. 24 GEARBOX (TYPICAL)**

3. Clean machine.



**Low Profile**



**High Profile**



**Roll Cavity (High Profile)**



**Roll Cavity (Low Profile)**

**FIG. 25 MACHINE (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

[illegible]

## 5.2 MAINTENANCE

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

### 5.2.1 ELECTRIC SYSTEM INSPECTION

Electricity provides power to all systems on the Grading Table. 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.

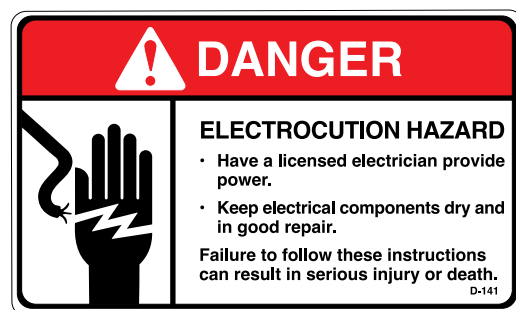


Motor



Lights (Optional)

FIG. 26 ELECTRICAL INSPECTION





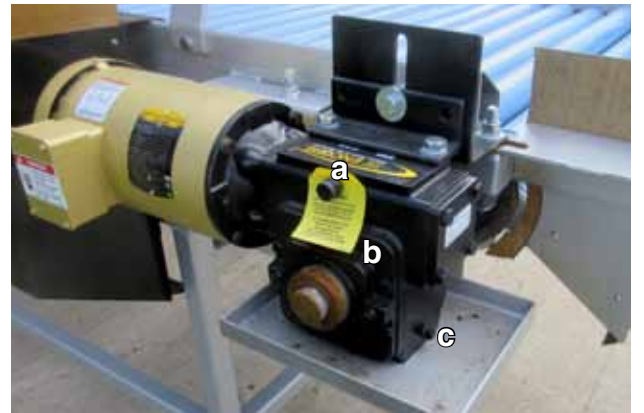
## 5.2.2 SPEED REDUCER GEARBOX OIL

The Grading Table 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 100 hours, the oil level should be checked. Every 500 operating hours or annually, whichever comes first, the oil should be replaced. Check more frequently if there are leaks around any of the plugs or shaft seals. When checking oil level or changing oil, follow this procedure.

1. Run the Grading Table until the gearbox is warm. Warm oil will remove more contaminants than cold stagnate oil.
2. Stop the Grading Table.
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. Fill Plug b. Level Plug c. Drain Plug

**FIG. 27 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. 28 BREATHER (TYPICAL)**



## 5.2.4 TENSION/ALIGNMENT OR REPLACEMENT

Roller chains on both ends of the rolls move the rolls across the table. 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. **Tension:**  
Chain tension must be set so a link can be turned 15 to 20° in the center of long span. Use the adjustable bearing mount on the gearbox shaft to adjust and set chain tension.
  - a. Loosen setscrew.
  - b. Use position bolt to set bearing and shaft position.
  - c. Tighten setscrew to its specified torque.
4. **Alignment:**  
The chain is properly aligned when the links center on the sprockets. Use the tensioning adjusting system to adjust chain alignment.



FIG. 29 TENSION ADJUSTMENT (TYPICAL)

**5. Replacement:**

- a. Move the drive shaft into its loosest position.
- b. Remove the connection link on both sides of the chain.
- c. Connect the ends of the replacement chain assembly to the ends of the chain.
- d. Pull the old chain assembly out and thread the replacement assembly into position.
- e. Move the bearing assemblies into position and secure with their setscrews.

## 6 TROUBLE SHOOTING

The Mayo Grading Table 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.
Grading Table won't run.	No power.	Turn power ON.
	Sheared motor key.	Replace key.
	Sheared reducer key.	Replace key.
	Binding.	Align roller chain.
Roll doesn't turn.	Roll(s) cracked or broken.	Replace roll(s).
	Fabric strip failed.	Replace fabric strip.



## 7 SPECIFICATIONS

### 7.1 MECHANICAL

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

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

**SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE**

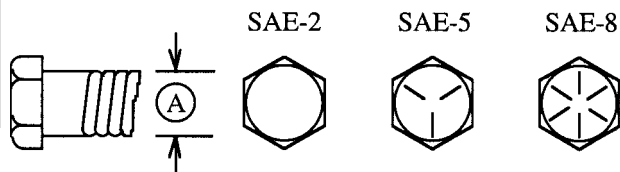
## 7.2 BOLT TORQUE

### CHECKING BOLT TORQUE

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

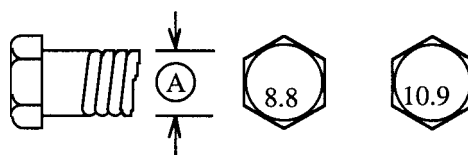
#### ENGLISH TORQUE SPECIFICATIONS

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



#### METRIC TORQUE SPECIFICATIONS

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



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

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

### **7.3 ELECTRICAL SCHEMATIC**

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

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

**SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE**





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