

PRO GRAIN

EQUIPMENT



PRO GRAIN EXTRACTOR OPERATOR'S MANUAL

WARRANTY DURATION

Pro Grain Equipment (hereafter referred to as 'Pro Grain') products are designed to provide years of dependable service when proper use and maintenance is followed.

The Limited Warranty Period shall start on the date of delivery of the new Pro Grain product to the original customer.

Pro Grain provides a 2 year limited warranty on all bagger and extractor models, and a 1 year limited warranty on all transfer augers, transfer conveyors, and bagger attachments.

If any Pro Grain product is used as rental equipment or on a commercial basis, the warranty period extends for 30 days from the delivery date to the original customer.

WARRANTY LIMITATIONS

Machinery and / or attachment warranty covers defects in materials and workmanship. Machinery and / or attachment must be properly set up and operated in accordance with the recommendations set forth in the Pro Grain operator's manual as well as Pro Grain videos, brochures, or other operator training material found at www.prograinequip.com.

This Limited Warranty provides no coverage for common wear or maintenance items, product misuse, negligence, accident, environmental condition and/or contamination. Common wear items are excluded from warranty, as their life span is dependent on what material is being conveyed.

Common wear or maintenance items include but are not limited to;

- Auger tubes
- Auger flighting
- Auger flighting wear plates
- Conveyor belts
- Bearings
- Chain
- Brakes and brake pads
- Blade or knife parts

Items of product misuse, negligence, accident, environmental condition and/or contamination include but are not limited to;

- Lack of lubrication
- Striking foreign objects, physical abuse, or accidental impact
- Operating product beyond rated capacity or operating guidelines (such as speeds or pressures)
- Operating equipment in adverse environmental conditions
- Use of product in manner for which it was not designed or not intended
- Modification and alterations to design or components
- Removal of components

Tires are the warranty of the manufacturer of the tire.

WARRANTY REQUIREMENTS & COVERAGE

This warranty shall only apply to any machine or attachment which has or will be repaired at the Pro Grain factory, an authorized Pro Grain dealership, or through replacing them as Pro Grain shall elect.

All warranty claims and repairs must be approved by Pro Grain. A warranty registration form must be completed and returned to Pro Grain to start any warranty claim. Registration forms are available in the operator manual or on the company website www.prograinequip.com. Pro Grain may elect to have an area representative evaluate the condition of the machine before warranty is considered.

Warranty parts must be approved by Pro Grain prior to repair or replacement. Labor rate and time must be approved by Pro Grain prior to warranty repair. At Pro Grain's discretion, failed parts must be returned to the manufacturer. Shipping fees on parts are the responsibility of the customer. Warranty does not include freight or delivery charges incurred when returning machinery for servicing. Other charges such as dealer mileage, pick up / delivery fees, third party service calls are the responsibility of the customer

If the product is sold by the first owner within the Limited Warranty Period, the warranty will transfer to the new owner provided written notice or warranty registration is provided to Pro Grain along with proof of original delivery and proof of sale to new owner.

EXCLUSION OF WARRANTY

Except as otherwise expressly stated herein, Pro Grain makes no representation or warranty of any kind, ex-pressed or implied, and makes no warranty of merchantability in respect to its machinery and/or attachments and makes no warranty that its machinery and/or attachments are fit for any particular purpose other than that which is described in this manual.

Pro Grain shall not be liable for incidental or consequential damages for any breach of warranty, including but not limited to inconvenience, rental or re-placement equipment, loss of profits or other commercial loss. Upon purchase, the buyer assumes all liability, all personal injury and property damage resulting from the handling, possession or use of the goods by the buyer. No agent, employee, or representative of Pro Grain has any authority to bind Pro Grain to any affirmation, representation or warranty concerning its machinery and/or attachments except as specifically set forth here-in. Pro Grain reserves the rights to modify the warranty terms, product specifications, product designs, product operating procedure without previous notice and without obligation to the product already delivered.

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 Name _____

Address _____

Address _____

City, State/Prov., Code _____

City, State/Prov., Code _____

Phone Number (____) _____

Extractor Model _____

Serial Number _____

Delivery Date _____

DEALER INSPECTION REPORT

- _____ Tire Pressure Checked
- _____ Wheel Bolts Torqued
- _____ Inspect Electrical System
- _____ Check Gearbox Oil Levels
- _____ Hydraulic Hoses Free and Fittings Tight
- _____ Lubricate Machine
- _____ Chain Drive Systems Tensioned and Aligned
- _____ Main and Cross Augers Turn Freely

SAFETY

- _____ Guards and Shields Installed and Secured
- _____ Safety Signs Installed and Legible
- _____ Reflectors and Lights Clean and Operating
- _____ 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 _____

Always give your dealer the serial number of your Arc Pro Grain Extractor 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 _____

Production Year _____

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Congratulations on your choice of a Pro Grain Equipment Ltd. Pro Grain Extractor to complement your agricultural storage operation. This equipment has been designed and manufactured to meet the needs of the discriminating buyer for the efficient unloading of grain or pulse crops from a plastic storage bag.

Safe, efficient and trouble free operation of your Pro Grain Extractor requires that you and anyone else who will be operating or maintaining the Extractor, read and understand the Safety, Operation, Maintenance and Trouble Shooting information contained within the Operator's Manual.



This manual covers the Model E-X2 and E-1610 Pro Grain Extractor made by Pro Grain Equipment Ltd. Use the Index or Table of Contents as a guide when searching for specific information.

Keep this manual handy for frequent reference and to pass on to new operators or owners. Call your Pro Grain Equipment Ltd. distributor or dealer if you need assistance, information or additional copies of the manual.

OPERATOR ORIENTATION - The directions left, right, front and rear, as mentioned throughout the manual, are as seen from the tractor driver's seat and facing in the direction of the travel.

If you have any questions not answered in this manual or require additional copies or the manual is damaged, please contact your dealer or Pro Grain Equipment Ltd., Box 188, Colonsay, SK S0K 0Z0, Ph. 306-255-2112, Fax 306-255-2113.

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 Pro Grain Equipment Ltd. Pro Grain Bagger 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 distributor, dealer or Pro Grain Equipment Ltd., Box 188, Colonsay, SK S0K 0Z0, Ph. 306-255-2112, Fax 306-255-2113.




YOU are responsible for the SAFE operation and maintenance of your Pro Grain Equipment Ltd. Pro Grain Bagger. YOU must ensure that you and anyone else who is going to operate, maintain or work around the Bagger 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 that should be adhered to while operating the Pro Grain Bagger.

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 equipment is familiar with the recommended operating and maintenance procedures and follows all the safety precautions. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

- Pro Grain Bagger owners must give operating instructions to operators or employees before allowing them to operate the machine, 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 them. Most accidents can be avoided.
- 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.
- 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 operating, maintaining, adjusting or unplugging the Pro Grain Bagger. 
2. Only trained competent persons shall operate the Pro Grain Bagger. An untrained operator is not qualified to operate the machine.
3. Have a first-aid kit available for use should the need arise and know how to use it. 
4. Provide a fire extinguisher for use in case of an accident. Store in a highly visible place.
5. Do not allow children, spectators or bystanders within hazard area of machine.
6. Wear appropriate protective gear. This list includes but is not limited to:
 - A hard hat
 - Protective shoes with slip resistant soles
 - Protective goggles
 - Heavy gloves
 - Hearing protection
 - Respirator or filter mask
7. Place all controls in neutral or off, stop engine, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing, or unplugging.
8. Review safety related items annually with all personnel who will be operating or maintaining the Pro Grain Bagger.

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. Use a tractor equipped with a Roll Over Protective Structure (ROPS).
7. 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.
8. 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.
9. 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.
10. In addition to the design and configuration of this implement, including Safety Signs and Safety Equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence, and proper training of personnel involved in the operation, transport, maintenance, and storage of the machine. Refer also to Safety Messages and operation instruction in each of the appropriate sections of the auxiliary equipment and machine Manuals. Pay close attention to the Safety Signs affixed to the auxiliary equipment and the machine.

2.3 SAFETY TRAINING

1. Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by a single careless act of an operator or bystander.
2. In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of this equipment.
3. It has been said, “The best safety feature is an informed, careful operator.” We ask you to be that kind of an operator. It is the operator’s responsibility to read and understand ALL Safety and Operating instructions in the manual and to follow these. Accidents can be avoided.
4. Working with unfamiliar equipment can lead to careless injuries. Read this manual, and the manual for your auxiliary equipment, before assembly or operating, to acquaint yourself with the machines. If this machine is used by any person other than yourself. It is the machine owner’s responsibility to make certain that the operator, prior to operating:
 - Reads and understands the operator’s manuals.
 - Is instructed in safe and proper use.
5. Know your controls and how to stop augers, PTO, hydraulic system and any other auxiliary equipment quickly in an emergency. Read this manual and the one provided with your other equipment.
6. Train all new personnel and review instructions frequently with existing



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

2.4 SAFETY SIGNS

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

How to Install Safety Signs:

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

2.5 PREPARATION

1. Never operate the Pro Grain Extractor 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 tractor, Pro Grain Extractor 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 80 db. Noise over 85 db on a long-term basis can cause severe hearing loss. Noise over 90 db 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 pinned to the tractor, 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, loose chains and make necessary repairs. Always follow maintenance instructions.

2.6 OPERATING SAFETY

1. Make sure that anyone who will be operating the Pro Grain Extractor 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. Keep all bystanders, especially children, away from the machine when loading or unloading is being done, or when authorized personnel are carrying out maintenance work.
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. Place all controls in neutral or off, stop engine, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing, or unplugging.
5. Keep working area clean and free of debris to prevent slipping or tripping.
6. Do not enter bag or approach augers unless the hydraulic hoses have been disconnected and stowed.

7. Keep hands, feet, hair and clothing away from rotating flighting, bag gathering roll, main and cross auger and moving parts. Keep others away.
8. Stay 100 feet (30 m) away from power lines. Electrocutation can occur without direct contact.
9. Install and secure all guards before starting.
10. Keep all hydraulic components in good condition before operating.
11. Fold main auger completely, rest in the support cradle, secure bag gathering roll in its storage position, raise frame fully and install lock over wheel position cylinder ram before storing or transporting.
12. Clean all lights and reflectors before transporting. Be sure all lights are working.
13. Review safety related items annually with all personnel who will operating, using or maintaining the Pro Grain Extractor.

2.7 MAINTENANCE SAFETY

1. Good maintenance is your responsibility. Poor maintenance is an invitation to trouble.
2. 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.
3. Make sure there is plenty of ventilation. Never operate the engine in a closed building. The exhaust fumes may cause asphyxiation.
4. Before working on this machine, shut off the engine and remove the ignition keys.
5. Never work under equipment unless it is blocked securely.

6. Always use personal protection devices such as eye, hand and hearing protectors, when performing any service or maintenance.
7. Where replacement parts are necessary for periodic maintenance and servicing, genuine factory replacement parts must be used to restore your equipment to original specifications. The manufacturer will not be responsible for injuries or damages caused by use of unapproved parts and/or accessories.
8. A fire extinguisher and first aid kit should be kept readily accessible while performing maintenance on this equipment.
9. Periodically tighten all bolts, nuts and screws and check that all cotter pins are properly installed to ensure unit is in a safe condition.
10. When completing a maintenance or service function, make sure all safety shields and devices are installed before placing unit in service.

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 unloading system.
3. Provide tags on the machine and a sign-up sheet to record tag out details.

2.9 STORAGE SAFETY

1. Store the unit in an area away from human activity.
2. Do not permit children to play on or around the stored machine.
3. Store the unit in a dry, level area. Support the jack with planks if required.

2.10 TRANSPORT SAFETY

1. Comply with state and local laws governing safety and transporting of farm machinery on public roads.
2. Check that all the lights, reflectors and other lighting requirements are installed and in good working condition.
3. Do not exceed a safe travel speed. Slow down for rough terrain and when cornering.
4. Fold main auger completely, rest in the support cradle, secure bag gathering roll in its storage position, raise frame fully and install lock over wheel position cylinder ram before storing or transporting.
5. Clean all lights and reflectors before transporting. Be sure all lights are working.
6. Be sure that the machine is hitched positively to the towing vehicle and a retainer is used through the drawbar pin. Always attach a safety chain between the hitch and the towing vehicle.
7. Stay away from overhead power lines. Electrocutation can occur without direct contact.
8. Plan your route to avoid heavy traffic.
9. Do not drink and drive.
10. Be a safe and courteous driver. Always yield to oncoming traffic in all situations, including narrow bridges, intersections, etc. Watch for traffic when operating near or crossing roadways.
11. Never allow riders on the hitch or frame when transporting.

2.11 HYDRAULIC SAFETY

1. Always place all tractor hydraulic controls in neutral before disconnecting from tractor or working on hydraulic system.
2. Make sure that all components in the hydraulic system are kept in good condition and are clean.
3. Replace any worn, cut, abraded, flattened or crimped hoses and steel lines.
4. Do not attempt any makeshift repairs to the hydraulic fittings or hoses by using tape, clamps or cements. The hydraulic system operates under extremely high-pressure. Such repairs will fail suddenly and create a hazardous and unsafe condition.
5. Wear proper hand and eye protection when searching for a high-pressure hydraulic leak. Use a piece of wood or cardboard as a backstop instead of hands to isolate and identify a leak.
6. If injured by a concentrated high-pressure stream of hydraulic fluid, seek medical attention immediately. Serious infection or toxic reaction can develop from hydraulic fluid piercing the skin surface.



2.12 TIRE SAFETY

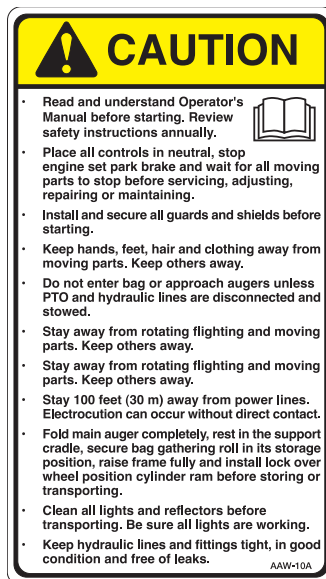
1. Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion which may result in serious injury or death.
2. Do not attempt to mount a tire unless you have the proper equipment and experience to do the job.
3. Have a qualified tire dealer or repair service perform required tire maintenance.
4. When replacing worn tires, make sure they meet the original tire specifications. Never undersize.

The types of safety signs and locations on the equipment are shown in the illustration below. Good safety requires your SAFETY AWARENESS in the following areas:

- That you familiarize yourself with the various Safety Signs
- The type of warning and the area.
- Particular function related to area.



A



B



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

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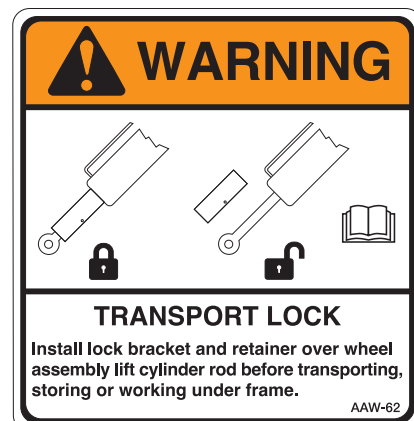
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G



H



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OPERATING SAFETY

- Make sure that anyone who will be operating the Pro Grain Extractor 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.
- Keep all bystanders, especially children, away from the machine when loading or unloading is being done, or when authorized personnel are carrying out maintenance work.
- 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.
- Place all controls in neutral or off, stop engine, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing, or unplugging.
- Keep working area clean and free of debris to prevent slipping or tripping.
- Do not enter bag or approach augers unless the hydraulic hoses have been disconnected and stowed.
- Keep hands, feet, hair and clothing away from rotating flighting, elevator, swing auger and moving parts. Keep others away.
- Stay 100 feet (30 m) away from power lines. Electrocutation can occur without direct contact.
- Install and secure all guards before starting.
- Keep all hydraulic components in good condition before operating.
- Fold main auger completely, rest in the support cradle, secure bag gathering roll in its storage position, raise frame fully and install lock over wheel position cylinder ram before storing or transporting.
- Clean all lights and reflectors before transporting. Be sure all lights are working.
- Review safety related items annually with all personnel who will be operating, using or maintaining the Pro Grain Extractor.

4.1 TO THE NEW OPERATOR OR OWNER

The Pro Grain Equipment Ltd. E-X2 and E-1610 Pro Grain Extractor is designed to efficiently remove grain or pulse crops from plastic storage bags. PTO and hydraulic power is provided by a tractor on the front of the machine. Be familiar with the machine before starting.

It is the responsibility of the owner or operator to read this manual and to train all other operators before they start working with the machine. In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, and prudence of personnel involved in the operation, transport, maintenance and storage of equipment or in the use and maintenance of facilities.

4.1 TO THE NEW OPERATOR OR OWNER

The Pro Grain Equipment Ltd. E-X2 and E-1610 Pro Grain Extractor is designed to efficiently remove grain or pulse crops from plastic storage bags. PTO and hydraulic power is provided by a tractor on the front of the machine. Be familiar with the machine before starting.

It is the responsibility of the owner or operator to read this manual and to train all other operators before they start working with the machine. In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, and prudence of personnel involved in the operation, transport, maintenance and storage of equipment or in the use and maintenance of facilities.

4.2 MACHINE COMPONENTS

The Pro Grain Equipment Ltd. E-X2 and E-1610 Pro Grain Extractor is designed to empty or remove the material from inside a large plastic storage bag. It consists of cross auger for breaking up and moving the material to the center of the frame where it is lifted by the paddles to the main auger. The augers are powered by the tractor PTO through a chain drive gearbox.

Pressurized oil from the tractor provides hydraulic power for the main auger extend/fold, frame movement, bag roll up tube, wheel position and the spout position.

The Pro Grain Extractor rolls up the plastic of the bag on a roller in the center of the frame and pulls the machine into and through the bag as it removes the material. A needle valve in the bag rolling tube drive is used to set the tube speed and how fast the extractor rolls into the bag.

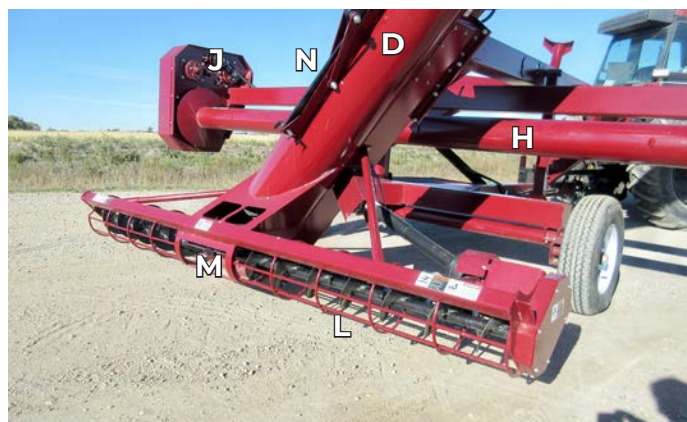
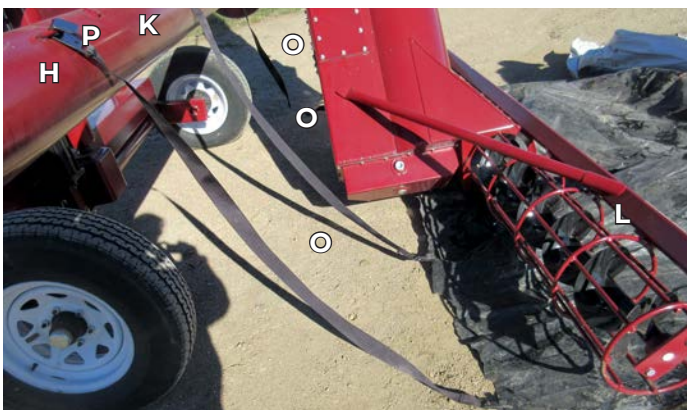
Cross auger on the end of the main auger move the material into the paddles where it is moved

into the main auger. A bag cutter is located on the bottom of the main auger to cut the bag when operating.

All the hydraulic controls are mounted on the left side of the frame. A hydraulic motor on the roller drives the tube and rolls up the bag. A 'U' bracket lock is used over the wheel position to secure the frame position UP for transport and DOWN for operation.



- | | |
|----------------------|----------------------|
| A Hitch | J Bag Roller Drive |
| B PTO Shaft | K Bag Roller Working |
| C Auger Folded | L Cross auger |
| D Main Auger | M Paddles |
| E Spout | N Bag Cutter |
| F Hydraulic Hoses | O Bag Recovery |
| G Hydraulic Controls | Straps |
| H Bag Roller | P Bag Roller Anchors |



4.3 PRE-OPERATION CHECKLIST

Efficient and safe operation of the Pro Grain Equipment Ltd. E-X2 and E-1610 Pro Grain Extractor requires that each operator reads and understands the operating procedures and all related safety precautions outlined in this section. A pre-operation checklist is provided for the operator. It is important for both the personal safety and maintaining the good mechanical condition of the Pro Grain Extractor that this checklist is followed.

Before operating the Pro Grain Extractor and each time thereafter, the following areas should be checked off:

1. Service the machine per the schedule outlined in Section 5 Service and Maintenance.
2. Use only a tractor that provides oil at the required pressure and flow to operate the machine. Pro Grain Extractor needs one outlet with 56 lpm (15 gpm) at 2200 psi (11,000 kpa).
3. Check that all guards are installed, secured and functioning as intended. Do not operate with missing or damaged shields.
4. Check worksite. Clean up working area to prevent slipping or tripping.
5. Check the cross auger pick-up head. Remove any twine, plastic or other material that has become entangled.
6. Check that all bearings turn freely. Replace any that are rough or seized.
7. Check for hydraulic leaks. Tighten any leaking fittings.
8. Check that the PTO and driveline shields turn freely and that the driveline can telescope easily.
9. Check oil level in gearboxes.

4.4 MACHINE BREAK-IN

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

- A. Before starting work:
 1. Read the Pro Grain Extractor and tractor's Operator's Manuals.
- B. After operating or for the first 1/2 hour:
 1. Re-torque all the fasteners and hardware.
 2. Check that all safety signs are installed and legible. Apply new signs if required.
 3. Check the drive chain tensions and alignment (input, roller drive and cross auger). Tension or align as required.
 4. Check that all guards are installed and working as intended.
 5. Check that the PTO and driveline shields turn freely.
 6. Check condition of driveline, cross and main auger bearings.
 7. Check the cross auger, paddles and main auger for entangled material. Remove any entangled material.
 8. Check oil level in gearboxes. Top up as required.
 9. Lubricate all grease fittings.
- C. After operating for 5 hours and 10 hours:
 1. Repeat items 1 through 9 above.
 2. Then go to the normal servicing and maintenance schedule as defined in the Maintenance Section.

4.5 CONTROLS

Before starting to operate the Pro Grain Extractor, all operators should review this section to familiarize themselves with the location and function of the controls. Each machine is designed with a set of hydraulic valves on the left side of the machine.

1. Hydraulic Control Bank:
 - a. Spout Position:

This 3 position spring-loaded to center-neutral controls the operation of the main auger spout position. Push and hold the lever to lower the spout. Pull and hold to raise the spout. Release the lever and it will return to its centered neutral position and the spout will stop moving.

IMPORTANT

The tractor hydraulic system must be placed in detent to provide a flow of pressurized oil to any of the systems.

- b. Main Auger Extend/Fold:

This 3 position spring-loaded to center-neutral controls the position of the main auger. Pull the lever forward and hold to move/extend the auger into its working/unloading position. Push and hold the lever to retract/fold the auger into its storage or transport configuration. Release the lever and it will return to its neutral position and the auger will stop moving.



FIG. 2 CONTROLS

d. Bag Roller:

This 3 position spring-loaded to center-neutral lever controls the bag roll-up function. Pull and hold to gather and roll-up the bag. Push and hold to unroll the bag. Release the lever and it will return to its centered neutral position and the bag roll-up components will stop moving.

NOTE

The operator must pull and hold the lever to roll up the bag and pull the machine into the bag.

e. Roller Speed Control:

This rotary dial controls the position of the needle valve in the bag roller drive system. Turn the dial clockwise to close the needle valve and slow the roller speed. Turn the dial counter-clockwise to open the valve and increase roller speed. When the dial has stopped being turned, the roller will remain at its current speed.

NOTE

Do not set the speed too high and tear the bag.



Disengaged



Engaged

FIG. 3 BAG ROLLER DRIVE

2. Bag Roller Drive:

The bag roller system is driven by a hydraulic motor on the left end of the tube. Two spring loader anchor pins are used to lock the drive sprocket to the roller flange.

Turn handle counter-clockwise (up the tapering guide) to disengage the system. Place handle on top of the guide ring around the pin.

Turn the handle clockwise (down the tapering ring guide) into the guide ring gap to engage the pins.

NOTE

The sprocket may have to turn a little to align the pins and holes to engage the drive system.

4.6 ATTACHING/UNHOOKING

The Pro Grain Extractor uses a tractor for operation and at times for moving or transporting. A truck can also be used for transporting from location to location.

4.6.1 TRUCK

When attaching the machine to a truck, follow this procedure:

1. Clear the area of bystanders, especially small children.
2. Make sure there is enough room and clearance to safely back up to the machine.

3. Remove the end of the PTO shaft to prevent it from contacting the truck.
4. Slowly back the truck until the hitch is aligned.

IMPORTANT

Only use a 3/4 ton truck or larger to transport the machine on a public road.

- a. Install the drawbar pin through the hitch.
- b. Install the retainer through the drawbar pin.



FIG. 4 ALIGNED



FIG. 5 DRAWBAR PIN/RETAINER

5. Cross the safety chains under the hitch when attaching to support the hitch in the event of failure and to prevent unexpected separation.



FIG. 6 SAFETY CHAIN

6. Retract the jack.
 - a. Pull anchor pin on jack.



Down

- b. Raise base up into its storage position and re-pin.

7. Connect the wiring harness to the truck if transporting on a public road and equipped with optional lighting bar. Be sure to secure to the hitch and provide sufficient slack when turning.
8. Reverse the above procedure when unhooking from truck.

4.6.2 TRACTOR

When attaching the machine to a tractor, follow this procedure:

1. Clear the area of bystanders, especially small children.
2. Make sure there is enough room and clearance to safely back up to the machine.
3. While backing up, align the hitch and drawbar.
4. Stop tractor, set park brake, remove ignition key and wait for all moving parts to stop before dismounting.



FIG. 8 ALIGNING

5. Use a drawbar pin with provisions for a mechanical retainer. Install the retainer.



FIG. 9 DRAWBAR PIN/RETAINER

6. Install the end of the PTO shaft if it was removed for transport or storage.



FIG. 10 PTO SHAFT

7. Connect the wiring harness to the tractor to provide power to the machine. Be sure to secure to the hitch and provide sufficient slack for turning.



FIG. 11 WIRING HARNESS

8. Attach the safety chain around the drawbar cage to prevent unexpected separation.



FIG. 12 SAFETY CHAIN

9. Unpin, raise and re-pin jack.



Down



Raised

FIG. 13 JACK

10. Attach the PTO Driveline:

- a. Check the driveline telescopes easily and the shield rotates freely.



FIG. 11 WIRING HARNESS

8. Attach the safety chain around the drawbar cage to prevent unexpected separation.

9. Unpin, raise and re-pin jack.



FIG. 12 SAFETY CHAIN



Down



Raised

FIG. 13 JACK

10. Attach the PTO Driveline:

- a. Check the driveline telescopes easily and the shield rotates freely.



FIG. 14 DRIVELINE

- b. Attach the driveline to the tractor by retracting the yoke collar, slide the yoke over the shaft and push on the yoke until the lock pin clicks into position. Pull on the yoke to be sure it is locked in position.



FIG. 15 ATTACHED

11. Connect the Hydraulic System:

- a. Use a clean cloth or paper towel to clean the dirt and build-up from around the couplers and male tips.

NOTE

Always connect the hoses to the circuit on the tractor that is equipped with a detent. The circuit must be placed in detent to continuously provide oil to the Pro Grain Extractor.

- b. Insert the male tips into the couplers. Make sure they are locked in place.
- c. Route the hoses along the hitch and secure in place with clips, tape or tie wraps. Be sure they do not drop to the ground or get pinched when turning. Provide sufficient slack for turning.



Hose 1



Hose 2

FIG. 16 HYDRAULIC SYSTEMS

4.7 EXTRACTOR ENTERING BAG

The most important aspect of operating the Pro Grain Extractor is preparing the machine and starting it into the bag. When properly set, the Pro Grain Extractor removes the material from the bag with minimal problems.

Follow this procedure when entering the bag:

1. Clear the area of bystanders, especially small children.
2. Move tractor and Pro Grain Extractor up to the bag.
3. Align the gathering augers with the center of the bag.
4. Start the tractor and set engine at 1/4 rated RPM.

5. Place the hydraulic circuit connected to the Extractor in detent.



FIG. 17 PRO GRAIN EXTRACTOR

6. Extend the unloading auger.

IMPORTANT

Stay away from overhead power lines when extending auger to prevent electrocution.



7. Stop tractor engine, set park brake and remove ignition key.



Auger



Extended

FIG. 18 MAIN AUGER

8. Convert the Pro Grain Extractor bag roller into its working configuration:

a. Lift the side brace anchor pin to release the bag roller support frame.



Transport

b. Swing support frame forward and latch on the anchor bracket.



Latched

FIG. 19 SUPPORT FRAME

c. Release the bag roller front anchor pin.



FIG. 20 ANCHOR PIN

d. Swing bag roller around into its working position.



Swinging

- e. Release support frame from its stowed position.



Positioned

FIG. 20 BAG ROLLER

- f. Swing support frame down and secure in transport configuration with anchor pin.



FIG. 22 SUPPORT FRAME

- g. Engage bag roller frame with support frame anchor pin.
 - Align latch with anchor assembly.



Align

- Raise anchor pin.



Pin Raised

- Move hatch into its anchor position.
- Lower anchor pin to secure bag roller.



Secured

FIG. 23 SECURING BAG ROLLER FRAME

- 9. Engage the bag roller drive system:

- a. Open door over drive system sprockets.



Door

- b. Turn handles clockwise to engage the lock pins.



Handles - Engaged

FIG. 24 DRIVE SYSTEM

- 10. Convert the bag cutter into its working configuration:

- Remove blade anchor pin from the bottom of its support frame.



Stowed

- Pull blade out and turn 180°.

IMPORTANT

Use care when handling blade. It must be kept sharp to cut bag during operation. Do not cut yourself.



Turning

- Pin long end to the top mounting hole to secure.



Pinned

FIG. 25 BAG CUTTER

- 11. Start tractor engine, place hydraulics into detent and convert the frame into its working configuration:

- a. Raise frame into its highest position by extending wheel position cylinder.
- b. Remove long transport/storage lock.



Transport/Storage

- c. Open storage box or manual cannister and retrieve short lock.
- d. Install and pin short lock around wheel position cylinder ram.
- e. Lower wheel frame and rest on lock.



Short



Lowered

FIG. 26 WHEEL FRAME POSITION

- 12. Place lock in storage box or manual cannister to keep it with machine.



Storage

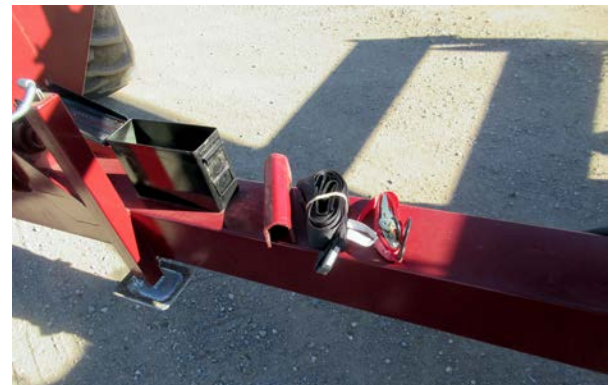


Cannister

FIG. 27 LOCKS

- 13. Prepare bag roller for operation when the bag tears:

- Open storage box and remove straps and cylinder locks.



Storage Box

- Attach black straps to roller.



Strap

- Attach other two straps.



Straps

- Check that box clamps close as required.



Bag Clamp

FIG. 28 BAG ROLLER

14. Reverse this procedure when the bag(s) have been emptied and the Extractor needs to be converted back into its transport configuration.

4.8 OPERATING



OPERATING SAFETY

- Make sure that anyone who will be operating the Pro Grain Extractor 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.
- Keep all bystanders, especially children, away from the machine when loading or unloading is being done, or when authorized personnel are carrying out maintenance work.
- 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.
- Place all controls in neutral or off, stop engine, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing, or unplugging.
- Keep working area clean and free of debris to prevent slipping or tripping.
- Do not enter bag or approach augers unless the hydraulic hoses have been disconnected and stowed.
- Keep hands, feet, hair and clothing away from rotating flighting, elevator, swing auger and moving parts. Keep others away.
- Stay 100 feet (30 m) away from power lines. Electrocutation can occur without direct contact.
- Install and secure all guards before starting.
- Keep all hydraulic components in good condition before operating.
- Fold main auger completely, rest in the support cradle, secure bag gathering roll in its storage position, raise frame fully and install lock over wheel position cylinder ram before storing or transporting.
- Clean all lights and reflectors before transporting. Be sure all lights are working.
- Review safety related items annually with all personnel who will operating, using or maintaining the Pro Grain Extractor.

When using the Pro Grain Extractor, follow this procedure:

1. Clear the area of bystanders, especially small children, before starting.
2. Hook up tractor to machine.
3. Review the Pre-Operation Checklist (Section 4.4) before starting.
4. Keep all spectators and bystanders out of the working and machine area. Should anyone enter this area, stop immediately.
5. Prepare the machine per Section 4.7.
6. Back up and position cross auger in the middle of the bag.



FIG. 29 POSITIONING

7. Open the door over the roller drive system and engage the drive. Close and latch door.



FIG. 30 ROLLER DRIVE

8. Remove any foreign material from the top of the bag.



FIG. 31 SNOW REMOVAL

9. Open the bag:
 - a. Sealed with 2 x 4's:
 - Remove screws and 2 x 4's or cut off the end.
 - Spread out end of bag.
 - b. End is tied:
 - Pull end out from under bag.
 - Remove tie or cut off the end.



FIG. 32 2 X 4'S (TYPICAL)

- b. Cut the top center of the bag about 2/3rd of the way up to the top of the bag.
- c. Pull each side of the bag to the side to the side to expose the grain and open the bag.

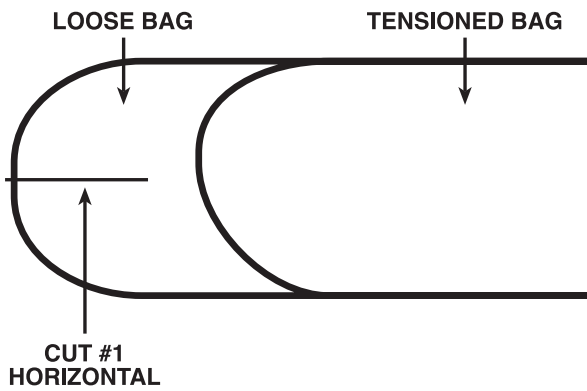


FIG. 33 CUTTING BAG



FIG. 34 BAG

- 10. Hook bag to the roller.



Side



Center

FIG. 35 BAG CLIPS

- 11. Move Extractor into bag:
 - a. Pull each side of bag away from center line.
 - b. Start the tractor and place the hydraulic circuit into its detent position.
 - c. Use the valve on the control bank to engage the bag roller system.



Bag Connected



Starting To Roll

IMPORTANT

The roller control valve is spring-loaded to OFF. The operator must hold the lever in its operating position or it will return to Neutral OFF.

NOTE

Use the needle valve next to roller control to set the bag roll-up speed and how fast the bag is emptied.



Controls

- d. Do not starve main auger to obtain maximum capacity.
- e. Roll up the bag until the cross auger reaches the grain in the bag.



Rolling

FIG. 36 POSITIONING

- 12. Position the edges of the bag so they clear the ends of the cross auger.



FIG. 37 BAG ENDS (TYPICAL)

- 13. Check that the bag blade cuts the bag in the center and the edges flow smoothly around the ends of the cross auger.



FIG. 38 KNIFE

- 14. Always install the short lock over the wheel frame position cylinder ram for operation. This will provide a clearance of 3 inches (75 mm) under the cross auger during operation and minimize the chance of catching the bag or the ground.



Cylinder Lock



Height (Typical)

FIG. 39 CROSS AUGER HEIGHT

15. Drive truck under auger discharge and set brake.



FIG. 40 TRUCK

16. Starting:

- a. Start the tractor and run at low idle.

NOTE

Do not use a tractor of more than 125 PTO HP to operate Extractor. A larger tractor will be too heavy for the bag rolling process to pull the tractor into the bag during operation.

- b. Place the hydraulic circuit in detent. Engage the PTO.

IMPORTANT

Do not set park brake on tractor. The Pro Grain Extractor must be able to move both the machine and the tractor into the bag during operation. Setting the park brake on the tractor will prevent this.

- c. Increase engine speed to mid-range or 1800 RPM.

- d. Pull and hold the lever for the roller to start rolling up the bag and pulling the Extractor and tractor into the bag.

- e. Use the needle valve to control and set the speed of the roller or how fast the machine is pulled into the bag.

- f. Avoid over or under feeding main auger.

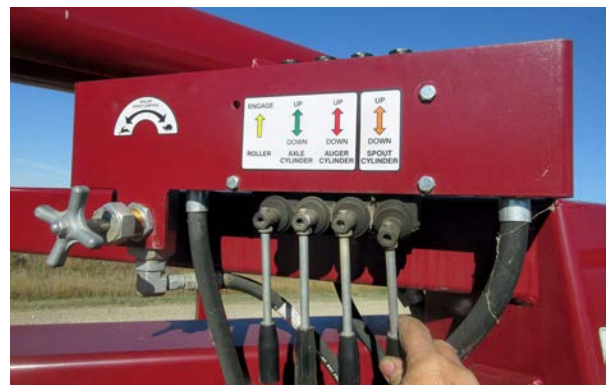


FIG. 41 CONTROLS

17. Stopping:

- a. Release the hydraulic lever controlling the bag roller to stop rolling.
- b. Run until the cross auger assembly is empty.
- c. Run until the main auger is empty.
- d. Slow engine RPM to low idle.
- e. Place hydraulic circuit and PTO in neutral or OFF and stop engine.

18. Emergency Stopping:

Although all the augers should be emptied before shutting down, in an emergency situation shut down all power and power units immediately. Correct the emergency before resuming work.

19. Restarting (Unit Full):

When the machine is shut down inadvertently or for an emergency, the augers and pick-up assembly will still be full of grain. When restarting, the starting loads will be higher than normal. When restarting, follow this procedure:

- a. Start the tractor and place the hydraulic lever in detent.
- b. Set the engine RPM to low idle.
- c. Engage the PTO to start the augers.
- d. Increase engine speed to 3/4 throttle position and completely empty the augers.
- e. Place the hydraulic system in detent.
- f. Pull and hold the roller hydraulic lever to start moving the Extractor into the bag.
- g. Increase engine speed to 1800 RPM.



FIG. 42 STOPPING

20. Starting Bag:

The most critical part of bag extracting operation is the starting phase. The Pro Grain Extractor must move into the bag and remove the grain while rolling the bag up and winding it around the roller in the middle of the frame. Monitor the following items when starting the bag:

- a. Be sure both sides of the bag are being evenly pulled on to the roller.



Starting Bag

- b. Be sure the bag clears the ends of the cross auger.
- c. Stop rolling up bag if there is too much grain in bottom of bag and a chance of bag to tear.

- Stop rolling up the bag to allow time for the cross auger to remove the grain.
 - Slow the bag rolling speed to allow the augers time to empty the bag.
- d. Keep bag tight to move grain into cross auger.



Bag Ends



Bag Rolling (Typical)

FIG. 43 ROLLING BAG

21. Operator Responsibility:
It is the operator's responsibility to monitor the operation of the Pro Grain Extractor and set it to provide maximum performance:
- Rolling up the bag to move grain into the cross auger.
 - Move the machine into the bag as required to keep the cross auger covered and full of grain.

22. Operating Speed:
The operating speed is determined by the PTO speed and the flow divider settings.
- PTO Speed:
It is recommended that the engine speed be set at 1800 RPM to provide a PTO speed of 450 RPM.
 - Needle Valve:
The needle valve flow divider on the control panel is used to set the speed of the bag roller. As the bag is rolled up, the machine is pulled into the bag for emptying. Set the bag rolling speed to keep the cross auger full as they move into the bag.



Loading



Needle Valve

FIG. 44 OPERATING SPEED

23. Discharge Spout:

The spout on the end of the main auger is equipped with a cylinder to move it up and distribute it across the width of the truck. Use the hydraulic lever on the control bank to move the spout as required.



Up



Down

FIG. 45 DISCHARGE SPOUT

24. Roller:

The Pro Grain Extractor is designed with a bag roller in the middle of the frame. It is large enough to accept 10 foot bags.



FIG. 46 ROLLER

25. Knife:

The Extractor is equipped with a knife on the back of the main auger to cut the bag as it is emptied of grain and gathered on the roller. The knife must be sharp to cut the bag as it moves up onto the roller.



FIG. 47 KNIFE

26. End Of Bag:

Move the elevator and gathering augers into the end of the bag to pick-up most of the material. Lift the last portion of the bag to move the grain into the cross auger. A bag with a square end works best.



FIG. 48 END OF BAG

27. Unplugging:

Although the Pro Grain Extractor is designed with a large capacity, in unusual circumstances, it can plug. Follow this procedure when unplugging:

to let machine clear itself. If the plug doesn't clear itself?

- b. Stop moving into the bag and raise the frame/cross auger to stop bringing grain into the machine. Run until augers clear themselves. Then set for normal operation. If the plug doesn't clear?
- c. Stop PTO and raise the frame/cross auger to allow the grain to drain out of the bottom of the main auger to clear plug. If plug doesn't clear?
- d. Disengage the roller drive to release the bag. Drive forward 3-4 feet (1.3 m) to provide access to into the bag.

- Raise frame/cross auger.
- Stop tractor and set park brake.
- Use a shovel to remove grain from the cross and main augers and the paddles.
- Remove any obstructions.
- Engage roller drive.
- Start tractor, engage PTO and place hydraulic system in detent.
- Lower frame into its DOWN position.
- Start bag roller to move Extractor into bag.
- Empty the bag.



Cross Auger



Roller Engaged



Paddle

FIG. 49 UNPLUGGING

- 28. Shear Bolts:
The Pro Grain Extractor is designed with a shear bolt in the tractor yoke to prevent overloading any drive components. Always correct the problem after the shear pin is replaced and before resuming work.



FIG. 50 SHEAR BOLT



FIG. 51 DRIVE DISENGAGED

29. Bag Removal:

When the bag has been emptied and it has been wound on the roller, it must be removed. Follow this procedure when removing bag:

- a. Clear the area of bystanders, especially small children.
- b. Open the roller drive door and disengage drives.
- c. Raise the frame.
- d. Pull the end of the bag off the roller and under the cross auger.
- e. Drive slowly forward to allow the bag to be pulled off the roller.

NOTE

It may be necessary to load the end of the bag to create a resistance to pull bag off the roller.

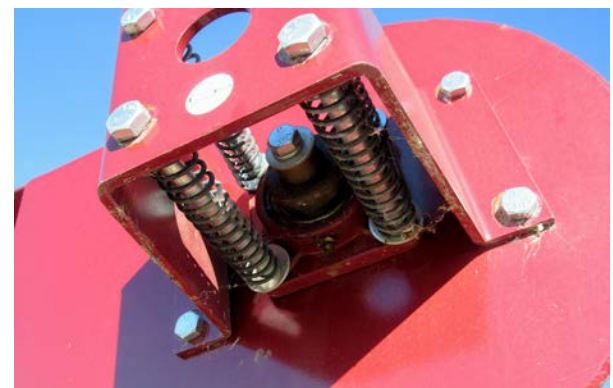
- f. Stop when bag is off the roller and disconnect straps. Store straps in tool box.



FIG. 52 BAG OFF ROLLER

30. Auger Mating:

The bottom end of the main auger drives the top end when the auger is extended. A pin on the upper auger will slide into one of three driving slots on the lower auger. If the pin doesn't slip into its driving slot when upper auger is extended, the upper auger is designed to move up until it does slip into position. Springs on the top bearing assembly will push the auger down into the driving position when the auger turns.



Springs



Driving Pin

FIG. 53 MAIN AUGER

31. Operating hints:

- a. Use the needle valve flow control on the control panel to control and set the speed of the bag roller for moving the machine into the bag. Turn the control IN to slow or stop the roller and out to increase the speed.
- b. Center the truck under the spout when loading for the best results.



FIG. 54 FLOW CONTROL



FIG. 55 TRUCK

- c. Stay away from overhead power lines when extending or folding the main auger to prevent electrocution. Extend unloading auger when machine is in working configuration only.



- d. Attach bag to the rollers using bag hooks on roller.

NOTE

Use straps and clamps to recover a bag if torn.



Bag Hook



Straps

FIG. 56 BAG ROLLER

- e. Use the short lock on the wheel frame position cylinder to set the best height of the cross auger in the bag.



FIG. 57 SHORT LOCK

4.9 STORAGE



OPERATING SAFETY

- Store the unit in an area away from human activity.
- Do not permit children to play on or around the stored machine.
- Store the unit in a dry, level area. Support the jack with planks if required.

After the season's use, 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 start of next season. To insure a long, trouble free life, this procedure should be followed when preparing the unit for storage:

1. Clear the area of bystanders, especially small children.
2. Remove all residual material from the bag roller, cross auger and the main auger.
3. Lower main auger and rest on its cradle.
4. Thoroughly wash the entire machine using a pressure washer to remove all dirt, mud, debris or residue.
5. Inspect all moving or rotating parts to see if anything has become entangled in them. Remove the entangled material.
6. Lubricate all grease fittings to remove any moisture in the bearings.
7. Run the machine slowly for 1 minute to distribute lubricant to all surfaces.
8. Install the long lock over the wheel frame position cylinder.

9. Remove the end of the PTO input shaft and store in a secure location if there is any chance of vandalism.
10. Touch up all paint nicks and scratches to prevent rusting.
11. Select an area that is dry, level and free of debris.
12. Store machine inside if possible.
13. Do not allow children to play on or around the stored machine.
14. Unhook from truck or tractor (See sections 4.6.1 or 4.6.2 respectively).



FIG. 60 STORED



FIG. 58 LOCK



FIG. 59 PTO SHAFT

4.10 TRANSPORTING



TRANSPORT SAFETY

1. Comply with state and local laws governing safety and transporting of farm machinery on public roads.
2. Check that all the lights, reflectors and other lighting requirements are installed and in good working condition.
3. Do not exceed a safe travel speed. Slow down for rough terrain and when cornering.
4. Fold unloading auger completely, rest in the support cradle and tilt frame fully forward before storing or transporting.
5. Clean all lights and reflectors before transporting. Be sure all lights are working.
6. Be sure that the machine is hitched positively to the towing vehicle and a retainer is used through the drawbar pin. Always attach a safety chain between the hitch and the towing vehicle.
7. Stay away from overhead power lines. Electrocutation can occur without direct contact.
8. Plan your route to avoid heavy traffic.
9. Do not drink and drive.
10. Be a safe and courteous driver. Always yield to oncoming traffic in all situations, including narrow bridges, intersections, etc. Watch for traffic when operating near or crossing roadways.
11. Never allow riders on the hitch or frame when transporting.

Pro Grain Equipment Ltd. Pro Grain Extractors are designed to be easily and conveniently moved from location to location. When transporting, follow this procedure:

1. Clear the area of bystanders, especially small children before starting.
2. Be sure the Pro Grain Extractor is hitched securely to the tractor or truck. Always use a safety chain between the machine and the tow vehicle and a retainer on the drawbar pin.
3. Keep to the right and yield the right-of-way to allow faster traffic to pass. Drive on the shoulder if permitted by law.
4. Make sure all the lights and reflectors required by local highway and transport authorities are in place, clean, in good working order and clearly visible to all overtaking and on-coming traffic.
5. After folding the roller into its transport position fold the main auger and rest into its transport/storage bracket and install the long lock over the wheel frame position cylinder ram before transporting or storing.



Folded



Long Lock

FIG. 61 TRANSPORT CONFIGURATION

- 6. Do not allow riders on the machine or tractor.
- 7. Always use a 3/4 ton or larger truck to provide sufficient control when transporting.



Tractor

FIG. 62 TRANSPORTING



Truck



MAINTENANCE SAFETY

- Good maintenance is your responsibility. Poor maintenance is an invitation to trouble.
- 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 there is plenty of ventilation. Never operate the engine in a closed building. The exhaust fumes may cause asphyxiation.
- Before working on this machine, shut off the engine and remove the ignition keys.
- Never work under equipment unless it is blocked securely.
- Always use personal protection devices such as eye, hand and hearing protectors, when performing any service or maintenance.
- Where replacement parts are necessary for periodic maintenance and servicing, genuine factory replacement parts must be used to restore your equipment to original specifications. The manufacturer will not be responsible for injuries or damages caused by use of unapproved parts and/or accessories.
- A fire extinguisher and first aid kit should be kept readily accessible while performing maintenance on this equipment.
- Periodically tighten all bolts, nuts and screws and check that all cotter pins are properly installed to ensure unit is in a safe condition.
- When completing a maintenance or service function, make sure all safety shields and devices are installed before placing unit in service.

5.1 SERVICE

5.1.1 FLUIDS AND LUBRICANTS

1. Grease:
Use an SAE multi-purpose high temperature grease with extreme pressure (EP) performance. Also acceptable is an SAE multi-purpose lithium based grease.
2. Gearbox Oil:
Use an SAE 85W90 multi-viscosity oil meeting the American Petroleum Institute (API) classification of SF, SG, SH or SJ for normal operating temperatures.
Gear Box Capacity: 1 US qt (1 litre) or 1/2 full when on level surface up to fill plug.
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

Use the Maintenance Checklist provided to keep a record of all scheduled maintenance.

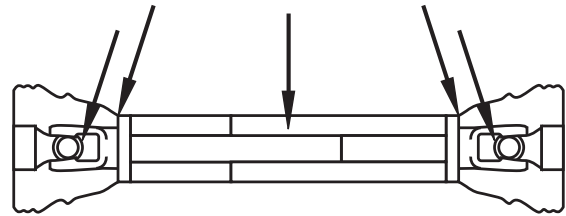
1. Use a hand-held grease gun for all greasing.
2. Wipe grease fitting with a clean cloth before greasing, to avoid injecting dirt and grit.
3. Replace and repair broken fittings immediately.
4. If fittings will not take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace fitting if necessary.

5.1.3 SERVICING INTERVALS

The period recommended is based on normal operating conditions. Severe or unusual conditions may require more frequent lubrication or oil changes.

10 Hours or 5 Bags

1. Grease PTO drivelines.
 - a. PTO Driveline.
 - b. Cross Auger.



Schematic



Input



Cross Auger

FIG. 63 DRIVELINES

2. Cross auger:

a. Right end.



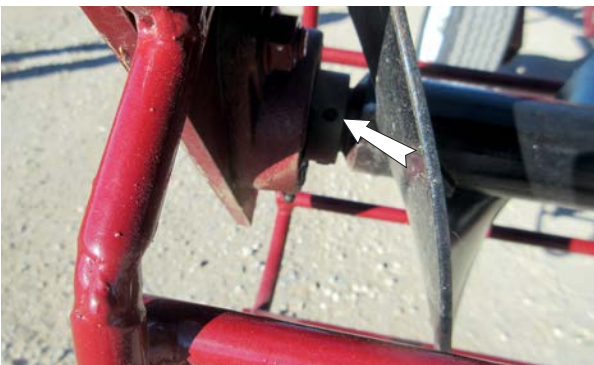
Right End

b. Center.



Center

c. Left end.



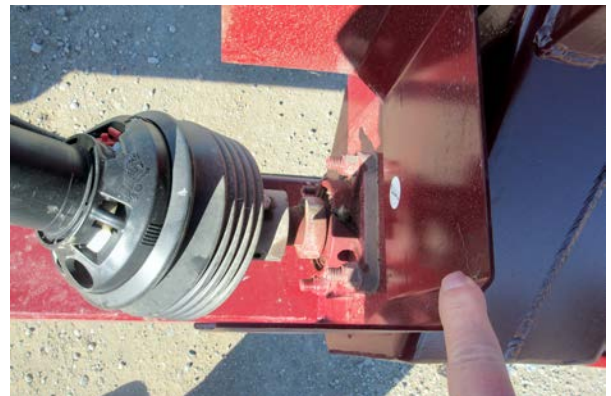
Left End

FIG. 64 CROSS AUGER

40 Hours or 20 Bags

1. Grease bearings with one shot of grease.

a. Grease input support shaft.



Front



Rear

FIG. 65 SUPPORT SHAFT

b. Grease upper input shaft.



FIG. 66 UPPER INPUT SHAFT

c. Grease longitudinal drive shaft bearings.



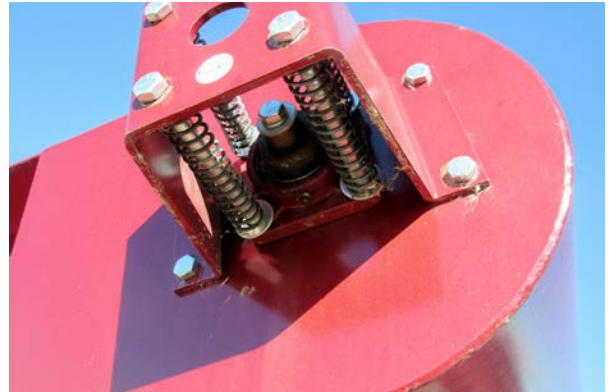
Front



Rear

FIG. 67 LONGITUDINAL DRIVE SHAFT

d. Grease main auger bearings.



Top



Center

FIG. 68 MAIN AUGER BEARINGS

e. Bag roller bearings.



Drive



Idler

FIG. 69 BAG ROLLER BEARINGS

100 Hours or 50 Bags

1. Grease sprout position bushings.



FIG. 70 SPOUT POSITION BUSHINGS

2. Grease bag roller anchor bushings.



FIG. 71 BAG ROLLER ANCHOR BUSHINGS

3. Check roller chain tension:
 - a. Input drive.



Input

- b. Drive roller.



Drive Roller

- c. Cross auger drive.



Cross Auger

FIG. 72 ROLLER CHAIN TENSION

⚠ WARNING

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

4. Check oil level in gearboxes.



Top



Middle

FIG. 73 GEARBOXES (TYPICAL)

b. Bag roller drive.



Bag Roller

c. Cross auger drive.



Cross Auger

FIG. 74 ROLLER CHAIN

Annually

1. Lubricate roller chains:

a. Input drive.



Input



2. Lubricate drive couplers:

a. Input.



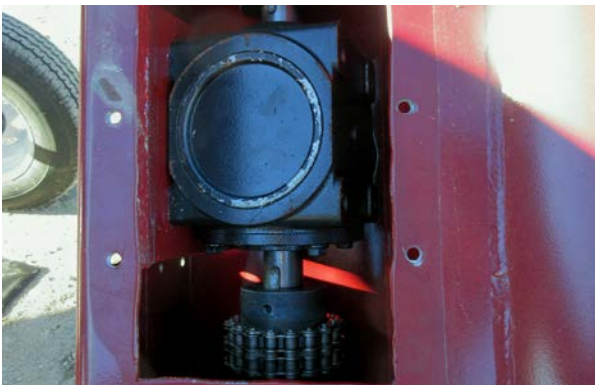
Input

b. Top gearbox.



Top Gearbox

c. Center gearbox (3).



Center Gearbox

FIG. 75 DRIVE COUPLERS

3. Clean machine.



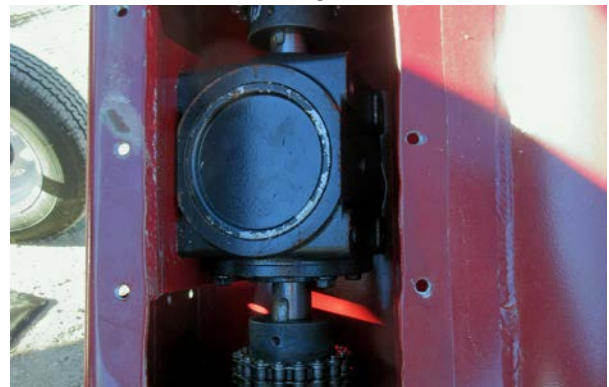
FIG. 76 MACHINE

Every Two Years

1. Change oil in gearboxes.



Top



Middle

FIG. 77 GEARBOXES (TYPICAL)

5.2 MAINTENANCE

By following a careful service and maintenance program for your machine, you will limit the risk of downtime.

5.2.1 DRIVELINE MAINTENANCE

The PTO driveline is designed to telescope to allow for dimensional changes as the machine goes through its operational range. A tubular guard encloses the driving components and is designed to turn relative to the driving components. The driveline should telescope easily and the guard turn freely on the shaft at all times. Annual disassembly, cleaning and lubrication is recommended to insure that all components function as intended. Disassemble and clean driveline if the guards do not turn freely or if shaft doesn't telescope easily. To maintain the driveline, follow this procedure:

1. Remove the driveline from the machine.
2. Pull driveline apart.



Driveline



Apart

FIG. 78 PTO DRIVELINE (TYPICAL)

3. Use a screwdriver to flip the red lock tab on the bell on male end of driveline.



Tab



Flipped

FIG. 79 LOCK TABS

4. Slide white tab over to release bell.



Tab



Tab Slid Over

FIG. 80 WHITE TAB



Removed

FIG. 82 TUBE GUARD

5. Slide bell off the end of yoke and end of shaft.

7. Use a cloth and solvent to remove all the old grease from the bearing and groove.



FIG. 81 BELL



FIG. 83 CLEANING

6. Spread the white bearing ring to release tube guard and remove from shaft.

8. Clean the male portion of the shaft.



Bearing Rings



FIG. 84 CLEAN SHAFT

9. Apply a layer of fresh grease to the bearing and groove.



FIG. 85 GREASE BEARING

10. Use a screwdriver to flip the red lock tab on bell on female end of the driveline.



Red Tab



Flipped

FIG. 86 RED LOCK TAB

11. Slide the white tab over to release the bell.



FIG. 87 WHITE TAB

12. Remove bell from bearing.



FIG. 88 BEARING

13. Release tube guard:

- a. Spread the ends of the white plastic bearing to release bearing.



Bearing

b. Remove bearing.



Removed

FIG. 89 BEARING

14. Use rag, paper towel or solvent to clean bearing and groove.



FIG. 90 CLEANING

15. Grease bearing and groove.



FIG. 91 BEARING AND GROOVE

16. Slide the guard and bell back around bearing.



FIG. 92 BELL

17. Slide white tabs into their locked position.



FIG. 93 WHITE TABS

18. Flip red tab into its locked position.



FIG. 94 RED TAB

19. Grease the telescoping section of the shaft.



FIG. 95 TELESCOPING SECTION

c. Flip red tab into its locked position.



Red Tab

FIG. 96 GUARD ASSEMBLY

20. Assemble guard:

a. Slide bell and tube guard over male shaft.



Tube Guard

21. Check the indexing tabs on the male portion of the shaft and insert into female section.



Male

b. Slide white tabs into locked position.



White Tab



Female



Assembled

FIG. 97 INDEXING

22. Check that each guard turns freely on the shaft.
23. Rotate guard until greasing access hole exposes grease fitting.
24. Grease fitting.



FIG. 98 GREASE FITTING

25. Check the driveline telescopes freely.
26. Replace any components that are damaged or worn.
27. Install driveline on machine.

5.2.2 SHEAR BOLT

A shear bolt is provided at the yoke to the tractor to protect the drive system during an overload.

To change the shear bolt, follow this procedure:

1. Clear the area of bystanders, especially small children.
2. Place all controls in neutral or off, stop engine, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing, or unplugging.
3. Disconnect driveline if the shaft can't be turned by hand.
4. Turn PTO shaft by hand to locate and align the shear bolt holes.
5. Carefully remove remaining shear bolts using hammer and drift if necessary. Be careful not to enlarge the hole.

NOTE

Inspect shear bolt mounting components to verify that the holes are not enlarged. If deformed in any way, replace yoke.

6. Install the new shear bolts and tighten to their specified torque. Do not over-tighten.

IMPORTANT

All shear bolts must be 1/2" x 1 1/4" Grade 5 to provide the required protection.

Always use a locknut or double nut on the bolts to insure the required clamping force is maintained across the shear plane in the yoke.

Always check the integrity of the shear bolt holes when replacing bolts. When holes are enlarged, replace yoke.

7. Reconnect driveline.



FIG. 99 SHEAR BOLT (TYPICAL)

5.2.3 DRIVE CHAIN TENSION AND ALIGNMENT

Roller chains are used to transmit the primary input power to the machine, the cross auger and the bag roller. They must be kept properly tensioned and the sprockets aligned to obtain the expected performance and life.

To check the tension and alignment, follow this procedure:

1. Clear the area of bystanders, especially small children.
2. Turn machine off, stop engine, remove ignition key and place in pocket and wait for all moving parts to stop.
3. Remove guards or open access door on bag roller.

NOTE

Refer to Fig. 74 to view chain drives.

4. The chain should have +/- 1/8 inch (3 mm) of play to be properly tensioned.
5. To adjust chain tension on primary drive:
 - a. Remove bottom guard on primary drive.
 - b. Loosen idler mounting bolt.
 - c. Move the idler to the required position to set chain tension.
 - d. Tighten mounting bolt to its specified torque.



Primary



Cross Auger

FIG. 100 CHAIN DRIVE SYSTEM TENSION

6. To replace chain:
 - a. Move chain to its loosest position.
 - b. Split and replace chain.
 - c. Check and set sprocket alignment if required.
 - d. Close and secure guards.
 - e. Check frequently during the first ten hours and set chain tension as required.



- d. Tighten bearing assembly anchor bolts and position bolt jam nuts to their specified torque.



FIG. 101 BAG ROLLER CHAIN DRIVE TENSION

9. Sight across the sprocket faces to check alignment. Adjust alignment if sprocket faces vary more than 1/32 inch (.7 mm).



7. To adjust chain tension on cross auger drive:
 - a. Remove guard over input jackshaft.
 - b. Loosen bearing housing anchor bolt.
 - c. Tap or slide bearing housing into position to set chain tension.
 - d. Tighten bearing housing anchor bolt to specified torque.
 - e. Install and secure jackshaft guard.
8. To adjust chain tension on bag roller drive:
 - a. Loosen bearing assembly anchor bolts.
 - b. Loosen jam nuts on anchor bolts.
 - c. Use adjusting bolt to move bearing assembly.

The Pro Grain Extractor uses a series of augers and a paddle elevator to gather, raise and discharge grain from a storage bag into a truck. It is a simple and reliable system that requires minimal maintenance.

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

If you encounter a problem that is difficult to solve, even after having read through this trouble shooting section, please call your local Pro Grain Equipment Ltd. dealer, distributor or factory. Before you call, please have this Operator's Manual and the serial number from your machine ready.

PROBLEM	CAUSE	SOLUTION
Augers will not run.	Not turned ON.	Engage PTO clutch.
	Failed PTO clutch.	Replace PTO clutch on tractor.
	Shear bolt failed.	Replace shear bolt.
		Reduce load on machine to prevent shear bolt failure. Remove obstructions from work area before starting
Machine doesn't move.	Tractor hydraulics OFF.	Place tractor hydraulics in detent.
	Machine hydraulics OFF.	Use flow divider to turn hydraulic circuit ON.
		Use hydraulic lever to turn bag roller drive system ON.
	Bag tearing.	Slow bag roll up speed. Manually push grain into intake to reduce load on bag.
		Tractor is too heavy. Change to lighter tractor.
	Grain caked or frozen.	Break up grain lumps.
Low unloading capacity.	Slow operating speed.	Increase PTO speed by increasing tractor engine RPM.
	Grain caked or frozen.	Break up grain lumps.

7.1 MECHANICAL

	Dimensions	
Total Weight	5,270 lbs.	
Overall Width in Transport	E-X2: 11' 1"	E-1610: 9' 2"
Overall Height	8' 7" (Transport) / 15' (Operating)	
Overall Length	22'	
Bag Size	10'	
PTO	540	
Horsepower Required	80	
Shaft Type	6 Spline	
Required Hydraulic Flow	15 GPM	
PSI Required	2200	
Main Auger Size	16"	
Wheel Size	16"	

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

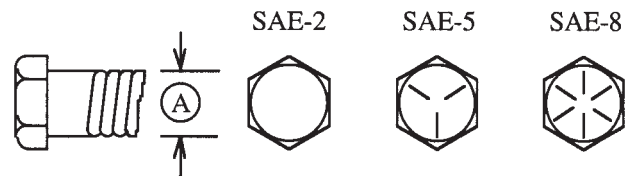
7.2 BOLT TORQUE

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		SAE 5		SAE 8	
	N.m	(lb-ft)	N.m	(lb-ft)	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	(70)	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)



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 HYDRAULIC FITTING TORQUE

TIGHTENING FLARE TYPE TUBE FITTINGS *

1. Check flare and flare seat for defects that might cause leakage.						
2. Align tube with fitting before tightening.	Tube Size OD	Nut Size Across Flats	Torque Value*		Recommended Turns To Tighten (After Finger Tightening)	
3. Lubricate connection and hand tighten swivel nut until snug.	(in.)	(in.)	(N.m) (lb-ft)		(Flats)	(Turn)
4. To prevent twisting the tube(s), use two wrenches. Place one wrench on the connector body and with the second tighten the swivel nut to the torque shown.	3/16 1/4 5/16 3/8	7/16 9/16 5/8 11/16	8 12 16 24	6 9 12 18	1 1 1 1	1/6 1/6 1/6 1/6
* The torque values shown are based on lubricated connections as in reassembly.	1/2 5/8 3/4 7/8	7/8 1 1-1/4 1-3/8	46 62 102 122	34 46 75 90	1 1 3/4 3/4	1/6 1/6 1/8 1/8

TIGHTENING O-RING FITTINGS *

1. Inspect O-ring and seat for dirt or obvious defects.	Tube Size OD	Nut Size Across Flats	Torque Value*		Recommended Turns To Tighten (After Finger Tightening)	
2. On angle fittings, back the lock nut off until washer bottoms out at top of groove.	(in.)	(in.)	(N.m) (lb-ft)		(Flats)	(Turn)
3. Hand tighten fitting until back-up washer or washer face (if straight fitting) bottoms on face and O-ring is seated.	3/8 7/16 1/2	1/2 9/16 5/8	8 12 16		2 2 2	1/3 1/3 1/3
4. Position angle fittings by unscrewing no more than one turn.	9/16 3/4 7/8	11/16 7/8 1	24 46 62		2 2 1-1/2	1/3 1/3 1/4
5. Tighten straight fittings to torque shown.	1-1/16 1-3/16 1-5/16 1-5/8	1-1/4 1-3/8 1-1/2 1-7/8	102 122 142 190		1 1 3/4 3/4	1/6 1/6 1/8 1/8
6. Tighten while holding body of fitting with a wrench.	1-7/8	2-1/8	217		1/2	1/2

* The torque values shown are based on lubricated connections as in reassembly.



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