



BELT CONVEYOR

NOT RECOMMENDED FOR

**SEED QUALITY USE
WHEN MATERIAL IS**

SMALLER THAN 1/16"!

MANUAL



Cardinal™ Brand Grain Handling Equipment One Year Limited Warranty

Novae Corp. warrants to the original owner that your Cardinal equipment will be free from defects in material and workmanship for the one (1) year period commencing with the date of purchase, except as herein limited. The obligation of this warranty is limited to repairing or replacing any part or parts which, in the opinion of Novae Corp. is/are defective in material or workmanship under normal use and service.

90 Day Limited Warranty

Excluded from this One Year Limited Warranty are driveline components such as gearboxes, PTO drive shafts, chain and belt drives, and universal joints, which are warranted for a 90 day period commencing with the date of purchase.

Warranty Validation

Your new equipment should be registered with Novae Corp within ten (10) days of the original purchase. Warranty registration forms are available on the web at www.cardinalgrain.com or by calling customer service at 888-400-3545 to have one mailed to you.

How to Obtain Service

1. All warranty claims must be presented to Novae Corp. and proper arrangements must be made and approved by Novae Corp. prior to any work being done.
2. All warranty repairs must be performed at Novae Corp. unless prior approval is obtained from Novae Corp. In certain cases, Novae Corp may, at its sole discretion, elect to have warranty work performed by a qualified repair facility.
3. Novae Corp. will not be obligated in any way to pay for: repairs made without specific advance approval, labor charges in excess of those deemed reasonable by Novae Corp., or for any part costs in excess of the cost if Novae Corp. had supplied the parts. The cost of any replacement items will be limited to the amount of the original cost of that item as installed and sold by Novae Corp.
4. Any charges for: overtime labor, service calls, towing charges, expediting, freight or transportation costs are the sole responsibility of the consumer and will not be paid by Novae Corp.

Items Not Covered In This Warranty

1. Wheels and Tires. Contact the tire manufacturer for warranty information
2. Running Gear including axle and suspension assemblies. Present all claims directly to the axle manufacturer or their authorized dealers.
3. Paint finish and durability are not covered under this warranty.
4. Damage or defects resulting from misuse (including, but not limited to, improper operation, negligence, alteration, accident or lack of maintenance.)
5. Maintenance items that are worn through normal use.
6. Damage caused by loose nuts, bolts or screws including improperly torqued wheel lug nuts.
7. Damage caused by improper hitching or improper installation of drive motors.
8. Loss of time, inconvenience, loss of equipment use, rental or substitute equipment, loss of revenues, or any other losses.
9. Damage or loss resulting from towing equipment that exceeds the tow vehicle manufacturer's specific towing limitations.
10. Any travel time or expenses, such as food, fuel, lodging, etc., incurred to obtain service.

Any express warranty not provided herein, and any remedy for breach of contract which, but for this provision, might arise by implication or operation of law, is hereby excluded and disclaimed. The implied warranties for merchantability and of fitness for a particular purpose are expressly limited to a term of one (1) year. Under no circumstances will Novae Corp. be liable to purchaser or any other person for any special, incidental, or consequential damages, whether arising out of a breach of warranty, breach of contract or otherwise. This warranty gives you specific legal rights and you may have other rights which vary from state to state.

Novae Corp. neither assumes nor authorizes any other person to give any other warranty on its behalf. This warranty is not transferable from the original owner.

Cardinal™ Equipment Warranty Registration Form

Model: _____ Date: _____

Serial Number: _____

Owners Name: _____ Phone Number: _____

Street: _____

City, State Zip: _____

Primary Use: _____

Store and Location where purchased: _____ Delivery Date: _____

Store Representative: _____ Owner Signature: _____

(Fold to conceal information, tape closed, affix postage and mail)

.....
Name: _____

Address: _____

City, State Zip: _____

PLACE
POSTAGE
HERE

**NOVAE CORP. / CARDINAL GRAIN
607 S CHAUNCEY ST
COLUMBIA CITY, IN 46725**



CGS

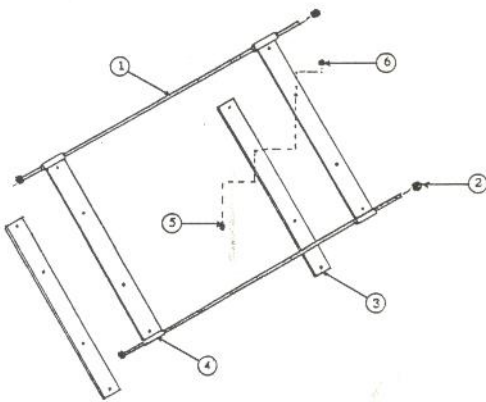
CARDINAL GRAIN SYSTEMS, INC.

POST OFFICE BOX 992 607 SOUTH CHAUNCEY ST. ~ COLUMBIA CITY, INDIANA 46725
 Phone (260) 244-4654 ~ Fax (260) 244-7355

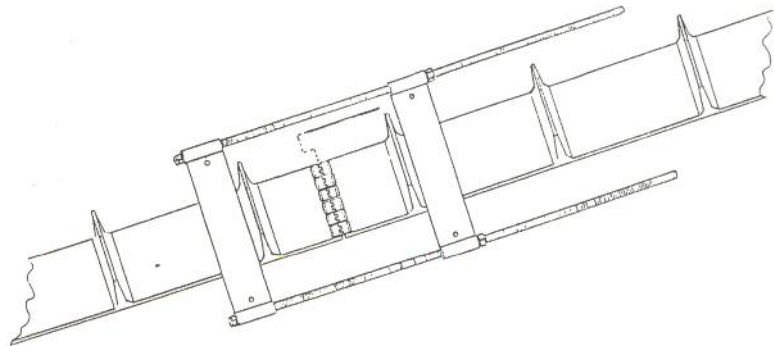
OPERATION AND MAINTENANCE THINGS TO KNOW AND WATCH FOR:

- A.) **KEEP BELT TIGHT!**
 1.7% STRETCH IN LIFETIME- TIGHTEN TAKEUP BOLTS EVENLY ON HEAD UNIT TO MAINTAIN CENTER TRACKING OF BELT. BELT WILL LAG BACK WHEN RUNNING AS IT BECOMES LOOSE. THE HEAD PULLEY WILL SPIN UNDER THE BELT AND BURN THRU IT!
- B.) **TRACK BELT IN CENTER OF TROUGH!**
 THE SPACE DOWN EACH SIDE OF THE BELT IS EVEN. (NOT ALL ON ONE SIDE!) THIS WILL WEAR THE BELT EDGE DOWN. YOU WILL EVENTUALLY DEVELOPE LEAKAGE OF THE MATERIAL YOUR MOVING. IF THE BELT TRACKS ON ONE SIDE (TIGHTEN THAT SIDE) TAKEUP BOLT TO MOVE BELT TO CENTER.
- C.) **PERIODICALLY OPEN SLIDE GATE IN END OF BOOT AND CLEANOUT!**
 EXCESS MATERIAL CAN BUILD UP AND CAKE. THIS WILL EVENTUALLY DAMAGE THE CLEATS ON THE BELT AS THEY COME AROUND THE BOOT PULLEY.
- D.) **BOOT PULLEY HAS SEALED BEARINGS!**
 BOOT SHAFT WILL NOT NECESSARILY ROTATE ON OUTSIDE OF CONVEYOR WHERE FLANGED BEARINGS ARE LOCATED. THE BOOT PULLEY IS LOCKED ONTO BOOT SHAFT BY SEALED BEARING LOCK COLLARS.
- E.) **HEAD DRIVE PULLEY!**
 IS KEYED AND HAS (2) SET SCREWS HOLDING IT FIRM TO THE HEAD SHAFT. TO GET TO THE SET SCREWS YOU GO THRU HOLES IN THE LAGGING ON THE PULLEY.
- F.) **REPLACE OR REPAIR CLEATED BELT!**
 YOU MUST USE A BELT CLAMP TO PULL THE BELT TOGETHER ABOVE THE TROUGH TOP EDGE. A COPY OF HOW TO MAKE AND USE BELT CLAMP IS INCLUDED IN THE MANUAL.
- G.) **LONGER LENGTH CONVEYORS!**
 YOU WILL EVENTUALLY RUN OUT OF TAKEUP, BECAUSE OF THE BELT STRETCH. AT THIS TIME YOU WILL HAVE TO USE THE BELT CLAMP AND CUT A PIECE OF BELT OFF. MOVE TAKEUP NUTS BACK SO THAT THE HEAD PULLEY IS UP AGAINST TROUGH EDGE AND START OVER AGAIN. (EXAMPLE) 35 FOOT CONVEYOR HAS 14.28 INCHES OF STRETCH IN THE BELTS LIFETIME AT 1.7% STRETCH.

BELT CLAMP



Available for purchase from Cardinal
 Cardinal part # 31517



KEY NO.	DESCRIPTION	QUANTITY
1	1/2" Dia. threaded rod with 1/2" nut welded to one end.	2
2	1/2-13 nut	2
3	1/4 X 2 1/2 HFS bar 12" long for 6" and 10"	2
3A	1/4 X 2 1/2 HFS bar 26" long for 16" and 24"	2
4	1/4 X 2 1/2 HFS bar 12" long with 1/2" pipe 3" long welded to one end	2
4A	1/4 X 2 1/2 HFS bar 26" long with 1/2" pipe 3" long welded to one end	2
5	3/8-16 X 1 Hex Head Cap Screw	4
6	3/8-16 Hex Head Nut	4

Q ALL-STATE
BELTING COMPANY

Spec. Date: 11/18/93

Product Code: PFR150 PC X FS

Product: PERFORMER 150 PLANISHED COVER X FRICTION SURFACE

Construction: Textile - 100% POLYESTER
Compound - POLYVINYLCHLORIDE

Rated Load: 150 PIW

Elongation @ Rated Load: 1.7%

Gauge: 0.175 (+ or - 0.015)

Weight: 1.050 LBS PER SQUARE FOOT

Ultimate Tensile: 1,250 LBS/INCH NOMINAL

Tear Resistance: 150 LBS

Coefficient of Friction: Cover Surface - 0.700 (KINETIC)
Bottom Surface - 0.280 (KINETIC)

Modulus: 8,500.00

Fire Resistance: ASTM OR ISO AVAILABLE

Recommended Pulley Size: 3.00 in. Minimum

Temperature Range: 0 - 180 DEGREES F.

Notes: BUCKET PROJECTION - 4"

TO THE OWNER:

This manual is provided to acquaint the operator in the care, operation and maintenance of your Cardinal Portable Auger. Your Cardinal Auger has been designed and manufactured to produce years of dependable service. Following the recommended procedure from this manual will help insure a long and safe period of trouble-free life from your new auger.



GENERAL SAFETY STATEMENT

Watch This Symbol. It Points Out Important Safety Precautions. It means "ATTENTION - Become Alert! Your Safety Is Involved." Read The Message That Follows And Be Alert To The Possibility Of Personal Injury Or Death.

Occupational safety is of prime concern to Corporation. This Portable Auger Manual was written with the safety of the operator and others who come in contact with the equipment as our prime concern. The manual presents day to day work problems encountered by the operator and other personnel. We wrote this manual to help you understand safe operating procedures for augers. We want you as our partner in safety.

It is your responsibility as an owner or operator or supervisor, to know what specific requirements, precautions and work hazards exist and to make these known to all other personnel working with the equipment or in the area, so that they too may take any necessary safety precautions that may be required.

Failure to read this Portable Auger Manual and its Safety Instructions is a misuse of the equipment.

Should any of the safety decals on your Portable Auger become damaged or illegible, be sure to order replacements through your Cardinal Dealer.

SIGN OFF SHEET



As a requirement of OSHA, it is necessary for the employer to train the employee in the safe operation and safety procedures with this auger. We include this sign off sheet for your convenience and personal recordkeeping.

DATE	EMPLOYER SIGNATURE	EMPLOYEE SIGNATURE



READ AND UNDERSTAND THIS MANUAL BEFORE OPERATING!



CAUTION! This symbol is used to call your attention to specific instructions relating to safety. It is recommended that you review the entire contents of this manual, paying particular attention to items preceded by this symbol.

FAILURE TO HEED THESE INSTRUCTIONS CAN RESULT IN PERSONAL INJURY!

OPERATOR QUALIFICATIONS



Operation of this farmstead equipment shall be limited to competent and experienced persons. In addition, anyone who will operate or work around power equipment must use good common sense. In order to be qualified, he must also know and meet all other requirements, such as:



1. Some regulations specify that no one under the age of 16 may operate power machinery. This includes farmstead equipment. It is your responsibility to know what these regulations are in your own area or situation.



2. Current OSHA regulations state in part: "At the time of initial assignment and at least annually thereafter, the employer shall instruct every employee in the safe operation and servicing of all equipment with which the employee is, or will be involved."*



3. Unqualified persons are to stay out of the work area. The "Work Area" is defined as any area within 20 feet of storage bins or buildings or the loading or unloading system.



4. A person who has not read and understood all operating and safety instructions is not qualified to operate the machine.

*Federal Occupational Safety & Health Standards for Agriculture Subpart D, Section 1928.57 (a) (6)

MACHINE INSPECTION

After completion of assembly and before each use, inspection of the equipment is mandatory. This inspection should include but not be limited to:



1. Check to see that all guards listed in the assembly instructions are in place and secured, and functional. PTO shields must rotate easily.



2. Are all fasteners tight?
3. Are all belts and chains properly adjusted? (See Service Section.)
4. Check oil levels in drive boxes. (See Service Section.)

DRIVES AND LOCK OUT

It is essential to inspect your drive before adding power and know how to shut down in an emergency. Whenever you must service or adjust your equipment, make sure you shut down and lock out your power source.

A. PTO

PTO—Shaft



1. Never use a PTO shaft without a rotating shield in good working order. Also see that the power drive system safety shields are in place at the equipment gear box and the power source.



2. Be certain that the PTO shaft is securely attached to the gear box and the power source.



3. Do not exceed maximum recommended operating length or angularity of PTO shaft.
4. Before starting power source, be certain power to PTO is off.
5. Stay out of the hazard area of an operating PTO.

Lock Out



1. Remove ignition key or coil wire from power source. If this is impossible, remove the PTC shaft from the work area.

B. Electric

Power Source



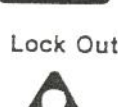
1. Electric motors and controls shall be installed by a qualified electrician and must meet the standards set by the National Electrical Code and all local and state codes.



2. A magnetic starter should be used to protect your motor.



3. You must have a manual reset button.



4. You must disconnect power before resetting your motor.



5. Reset and motor starting controls must be located so that the operator has a full view of the entire operation.

Lock Out

6. Keep all guards and shields in place.

A main power disconnect switch capable of being locked only in the Off position shall be provided. This shall be locked whenever work is being done on the equipment.

C. Gasoline Engines

Power Source



1. Never attempt to adjust or service engine while it is in operation.

2. Shut down and allow engine to cool before filling with fuel.

3. Keep all guards and shields in place.

Lock Out



1. For engines with rope or crank start, remove spark plug wire or spark plug.

2. For engines with electric start, remove ignition key, spark plug wire or spark plug.

D. HYDRAULIC POWER

Power Source



1. Refer to the above rules and regulations applicable to the power source operating your hydraulic drive.

2. Do not disconnect hydraulic lines while system is under pressure. Consult your hydraulic systems operators manual for proper procedures.

3. Keep all hydraulic lines away from moving parts.

Lock Out



Refer to the above rules and regulations applicable to the lock out of the power source operating your hydraulic drive.

FULL LOAD OPERATING PROCEDURES

During the regular operation of your farmstead equipment, one person shall be in a position to monitor the operation.

It is also good practice to visually inspect the equipment periodically during the actual operation. You should be alert for unusual vibrations, noises, and the loosening of any fasteners.

Caution:



1. Observe work area restrictions.
2. Keep all safety shields and devices in place.
3. Make certain everyone is clear before operating or moving farmstead equipment.



4. Keep hands, feet, and clothing away from moving parts.
5. Shut off power to adjust, service, or clean.

SHUTDOWN

A. Normal Shutdown

Make certain that the equipment is empty before stopping the unit.

Before the operator leaves the work area, the power source shall be locked out.

B. Emergency Shutdown

1. Should the equipment be immediately shut down under a load—disconnect and lock out the power source. Clear as much grain from hopper and auger as you can. Never attempt to restart when full.
2. Reconnect power source and clear the equipment gradually.
3. Starting equipment under load may result in damage to equipment. Such damage is considered abuse of the equipment.

WORK AREA SAFETY AND DIAGRAMS



1. Designated work areas shall be marked off with colored nylon or plastic rope hung as portable barriers to define the designated work areas.



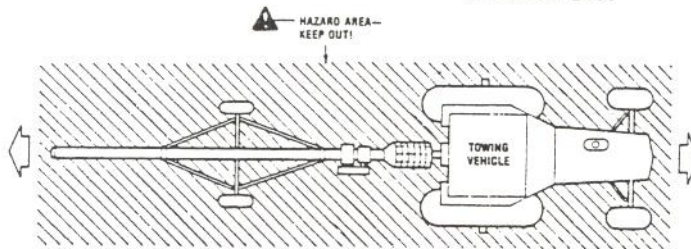
2. Under no circumstances should persons not involved in the operation be allowed to trespass into the work area.



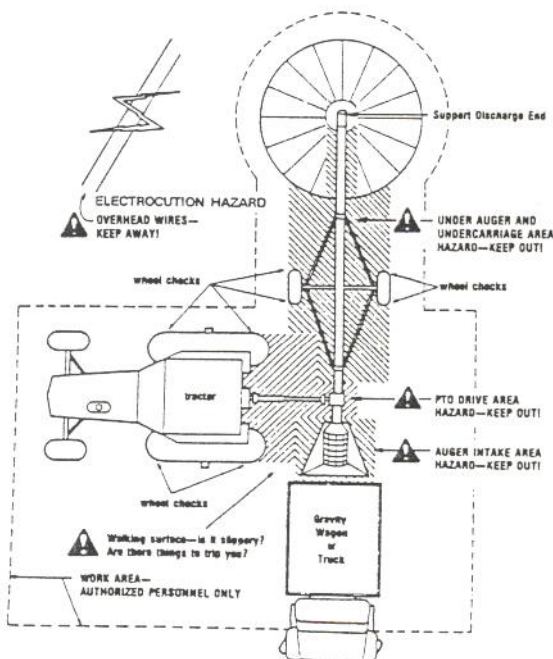
3. It *shall* be the duty of all operators to see that children and/or other persons stay out of the work area: Trespass into the work area by anyone not involved in the actual operation, or trespass into a hazard area by anyone, shall result in an immediate shut down by the operator.

4. Prior to start up and during operation, it shall be the responsibility of all operators to see that the work area has secure footing, is clean and free of all debris and tools which might cause accidental tripping and/or falling.

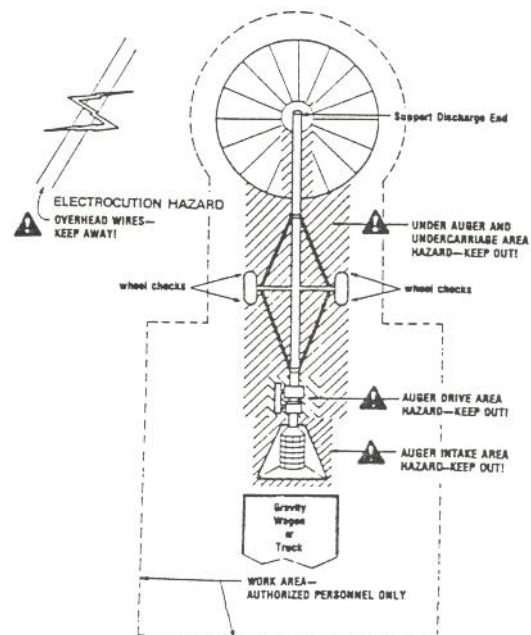
TRANSPORT



PTO DRIVE



GAS, ELECTRIC AND HYDRAULIC



MANUAL WINCH OPERATION



**READ BEFORE EACH USE!
SEE WINCH**

1. This winch is equipped with a brake that is actuated by turning the handle. Turn the handle clockwise to raise the auger, and counterclockwise to lower the auger. The brake is designed to hold the auger in position.
2. **CAUTION:** The brake is not fully locked until the handle is turned clockwise far enough to hear two clicks.
3. **CAUTION:** The brake disc will get HOT when lowering auger. If brake is smoking, or squeals, stop lowering and let the brake cool for 15 minutes. **DO NOT TOUCH BRAKE!**
4. **NEVER CONTINUE TURNING THE HANDLE COUNTERCLOCKWISE IF THE AUGER DOES NOT LOWER; THIS WILL DISENGAGE THE BRAKE MECHANISM.**
5. Brake disc inspection (items 9). To physically check the wear on these parts, they must be removed from the winch. Measure the discs for wear and if they are worn to 1/16 of an inch, replace both discs.



READ MANUAL SHIPPED IN WINCH CARTON.

TRANSPORTING AND POSITIONING



Your auger is designed for maximum balance when empty and in down position. Auger must be empty and in lowest position before moving. Partially filled augers can be dangerous and difficult to handle. Before transporting on county or state highways, contact your local sheriff's department or State Highway Patrol office for laws governing the transportation of the equipment in question. Care should be exercised when traveling on rough and uneven terrain and in turning and cornering to avoid upsetting. Auger is designed for transport at tractor speeds. Be alert to overhead obstructions and electrical wires and devices.



**ELECTROCUTION HAZARD
OVERHEAD WIRES
KEEP AWAY**



**ELECTROCUTION HAZARD!
THIS MACHINE IS NOT INSULATED. KEEP AWAY FROM OVERHEAD WIRES AND DEVICES. ELECTROCUTION CAN OCCUR WITHOUT DIRECT CONTACT. FAILURE TO KEEP AWAY WILL RESULT IN SERIOUS INJURY OR DEATH!**

Leave auger in the full down position while moving. Raise auger to necessary height and back into position at bin or building making sure all persons are clear of the hazard area. Auger must be hooked up to the tractor for transport, raising and placement. DO NOT push or pull in any other manner. Operation site should be firm and level. When in place, unhook from tractor, lower to final position, remove hitch and install the proper hopper. Install the necessary wheel chocks, supports and anchors needed to secure auger. When operation is complete, move auger slowly out of the working position with towing vehicle--not by hand. If not in transport position, lower auger to the full down position immediately upon clearance of any obstruction. Transport to the new work area or storage area. We recommend that the auger be stored in the full down position with the intake end anchored.

BEFORE OPERATING AUGER



Make certain everyone is clear of the auger before starting or moving it.



Electric drives should have manual resets on auger. Wiring must be done by a qualified electrician making certain it meets all safety laws and ordinances.



Make certain all guards and shields are in place before starting.

CAUTION: Auger should be securely fastened to bin or building during operation or when raised and unattended.

BREAK-IN INSTRUCTIONS

Augers should be broken in properly and never run empty. Do not try out new auger prior to season by running it empty. This will result in serious damage to your auger.

Idle engine and be sure a supply of grain is available. Slowly engage clutch lever and increase R.P.M. to handle grain supply. New augers should always be run at reduced capacity until tube and screw become polished, therefore auger should be broken in at reduced RPM's. This would also be true of an auger which has not been used for some time.

ANGLE OF OPERATION

Your auger is designed to operate between 15° and 45°. Capacity decreases and power requirements increase as the angle of operation increases, therefore the lower the angle of operation the greater the efficiency of the auger.

RAISING AND LOWERING



FAILURE TO HEED THESE INSTRUCTIONS CAN RESULT IN PERSONAL INJURY.

1. Never fully extend the cable. Always keep three (3) complete turns of the cable around the drum.
2. Always inspect the cable for damage prior to each use. Replace frayed or kinked cable.
3. The operator must keep all persons clear of the auger when it is being raised or lowered.
4. Never operate winch with wet or oily hands and always use a firm grip on the handle.
5. Auger should be in the down position or secured to bin or building when unattended.
6. Always keep the winch lubricated per lubrication instructions. Remember that worn parts cause unsafe conditions.
7. Whenever raising auger with a manual winch, listen for a "clicking sound" of the ratchet. If the clicking sound stops, keep a firm grip on the handle and return the auger to the full down position by turning the handle counterclockwise. Repair the ratchet. There will not be a clicking sound when the auger is being lowered.
8. The winch is designed for raising the auger weight only! **DO NOT LIFT OTHER ITEMS WITH THE AUGER!**

-MAINTENANCE AND LUBRICATION-

-Periodic Inspection-

The auger is subject to some vibration. Even though all the nuts are locking types, the auger should be checked at least once a week during operation for loose bolts and nuts. Especially check in critical areas; such as the tube joiners, chassis hook-up, drive shafts, PTO shafts, trailer hitches, ect. This is especially true with a new auger. One mistightened bolt could cause a lot of down time. Check your new auger closely.

-Lubrication-

Lubrication and care of this auger will determine its useful life. The more care, the greater its life.

PTO SHAFTS-Grease the fittings on each yoke each eight hours of operation and right before storage. Pull the sliding members apart and grease the surface of the solid square shaft at least twice a year.

GEARBOX-Fill with EP 90 Gear Oil. Check level through plug in the side of gearbox housing. Be sure vent plug is in the top of the gearbox.
PINION SHAFT @ BLACK PLUG IN GUARD-MUST BE GREASED PERIODICALLY TO GET LUBRICATION TO SHAFT BEARINGS!

TOP DRIVE-This unit has a screw type take-up for the roller chain drive. The chain should be lubricated every 40-50 hours of operation with S.A.E. 20 or 30 oil.

WHEELS-Repack each wheel hub at least once a year and check before transporting long distances. Lubricate each wheel right before storage. Periodically check the wheel bearing for excessive wear.

WINCH-All gears should have a film of grease on them at all times. The bushings should be wet with oil. Do not lubricate any part of the friction brake. (See instructions included in the winch carton.)



Shut off power to adjust, service or clean.