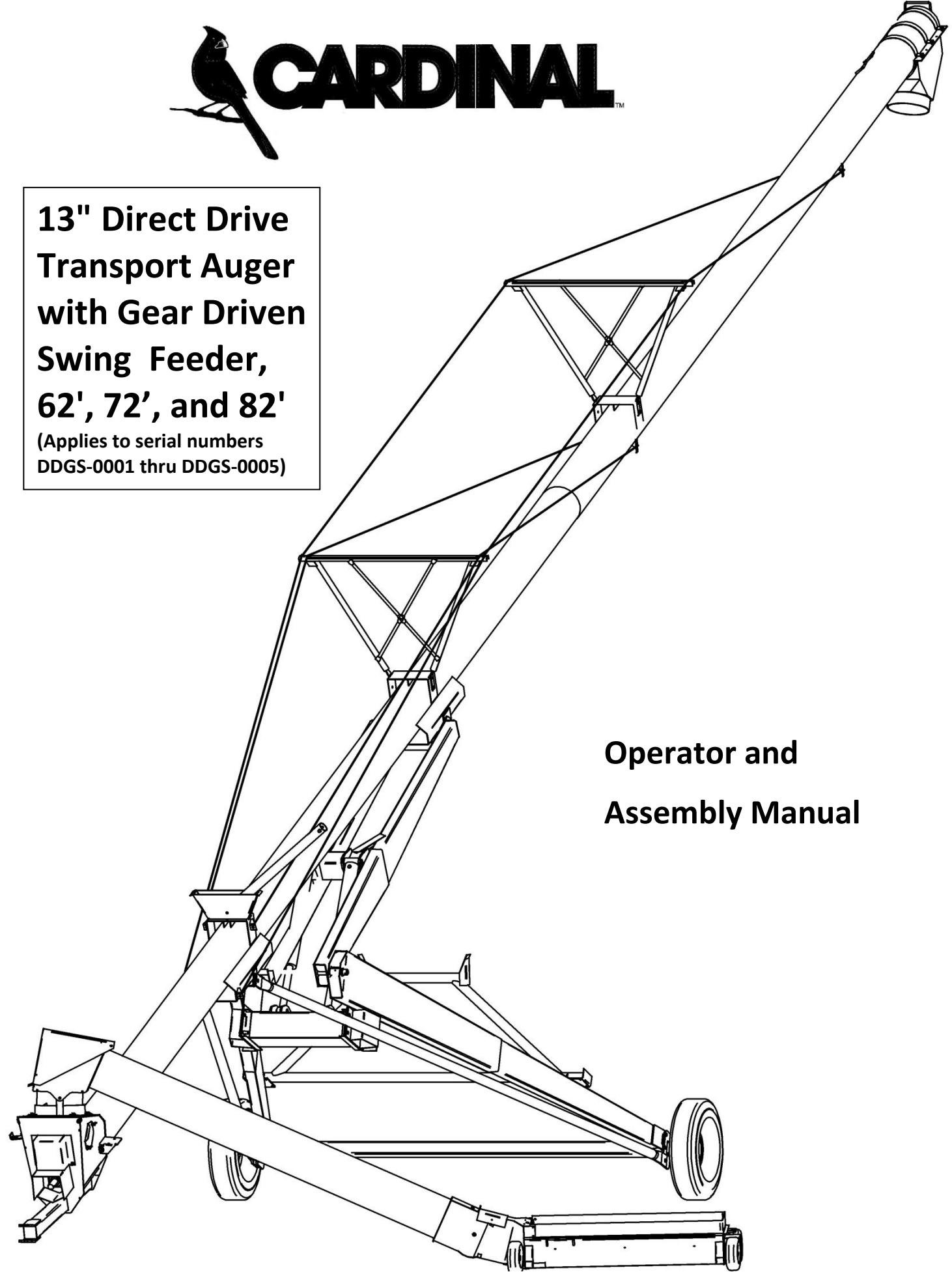




CARDINALTM

13" Direct Drive Transport Auger with Gear Driven Swing Feeder, 62', 72', and 82'

(Applies to serial numbers
DDGS-0001 thru DDGS-0005)



**Operator and
Assembly Manual**

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SAFETY INSTRUCTIONS

Cardinal Grain is sincerely interested in the safe operation of our grain handling equipment. Therefore, we recommend the following precautions should be taken when operating, starting or doing any maintenance work on this auger.

- Read and understand the operator's manual before operating.
- Always transport the auger in the fully down position, supporting the weight of the auger on the lift support pad and not on the hydraulic cylinder.
- The auger should never be towed without a safety chain securely attached between the auger hitch and the towing vehicle. Always check that the hitch pin is held securely in place before towing.
- When moving the auger on a public road, use a red flag, SMV (Slow Moving Vehicle) sign, and/or warning lights to provide adequate warning to operators of other vehicles. The overall width exceeds 8 ft 6 in. It is the operator's responsibility to know and comply with regulations regarding transport on a public road.
- Exercise extreme caution in maneuvering on or around tight corners; the end of the auger extends far beyond the axle, so remember that it will follow a wide path around a corner.
- The auger must be on a level surface and wheels free to move when raising or lowering. Everyone should be kept clear during these operations.
- Empty the auger before moving, to prevent upending.
- The auger must be attached to the drawbar of the tractor at all times during operation.
- Keep hands, feet, hair, and clothing away from exposed flighting and all moving parts.
- Do not allow children or anyone other than the operator close to the auger when in operation. Make certain everyone is clear before operating or moving auger.
- Stop engine, disconnect the power source, and wait for all machine movement to stop before servicing, adjusting, cleaning, or unclogging the equipment.
- Make sure everyone is clear of machinery before starting the engine, engaging power, or operating the auger.
- Auger should be stored in the fully down position. Chock the wheels so that there is no chance of auger moving.
- Each time you prepare to use the auger, check the PTO drive shaft to see that it is securely attached at both ends. The guard must be in good condition and rotate freely.
- Before operating the auger, make certain that all safety shields and devices are in place and in good condition.

- OSHA regulation 1928.57(a)(6) states, "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 covered equipment with which he is or will be involved."

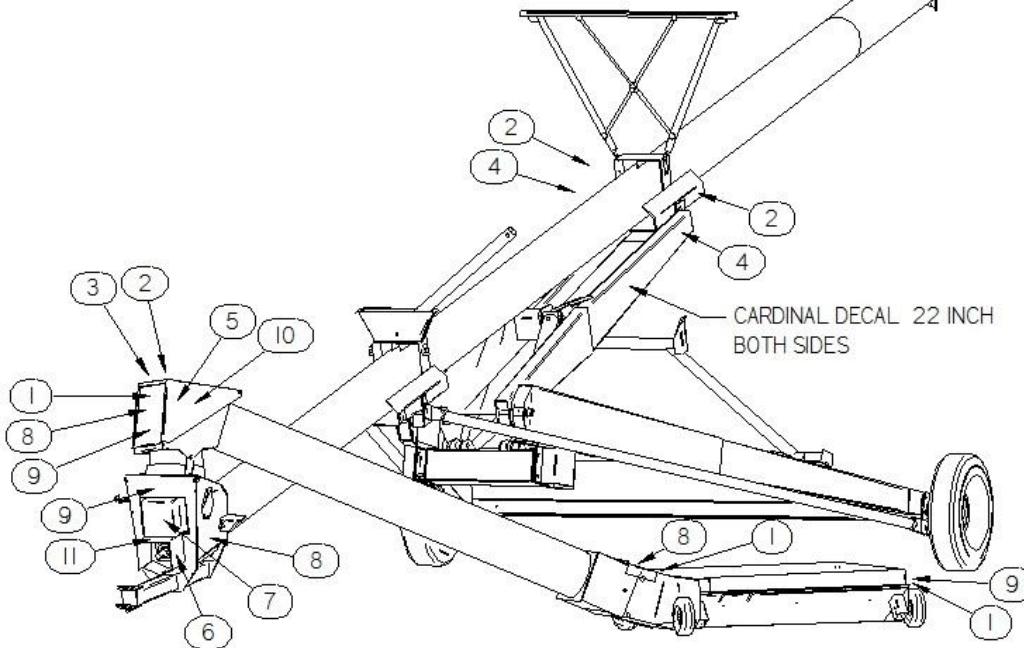
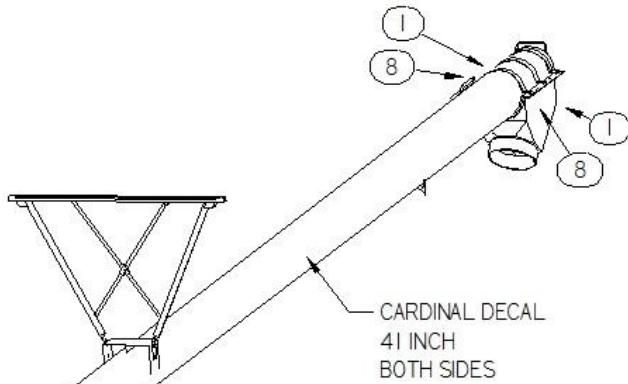
We encourage you to follow this practice. Below is a sign-off sheet to facilitate your record keeping to show compliance with this regulation.

TRAINING RECORD LOG

SAFETY DECAL

POSITIONS

Replacement safety decals can be obtained free of charge from your local Cardinal Dealer, or by calling: 1-888-400-3545



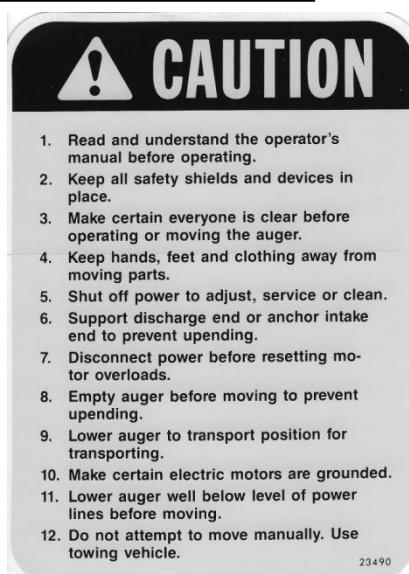
Item 1 : Part # 23491



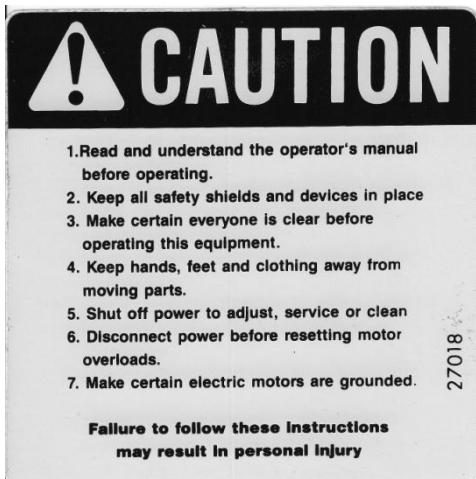
Item 2 : Part # 27017



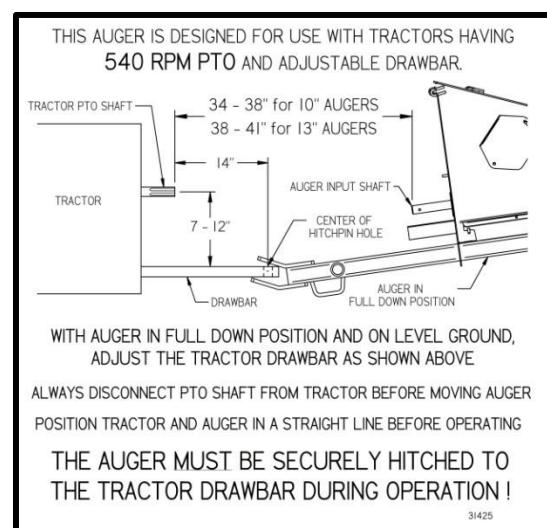
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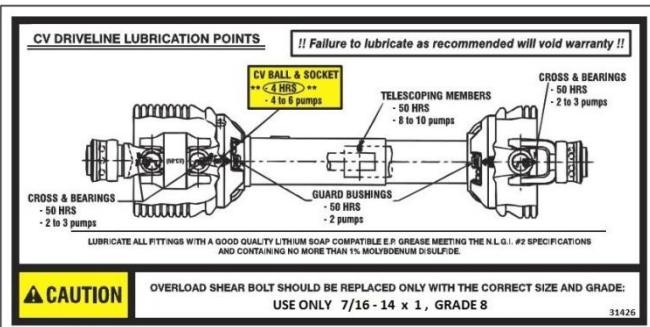
Item 4 : Part # 27018



Item 5 : Part # 31425



Item 6 : Part # 31426



Item 10 : Part # 30798



Item 7 : Part # 30795



Item 8 : Part # 30796



Item 9 : Part # 30797

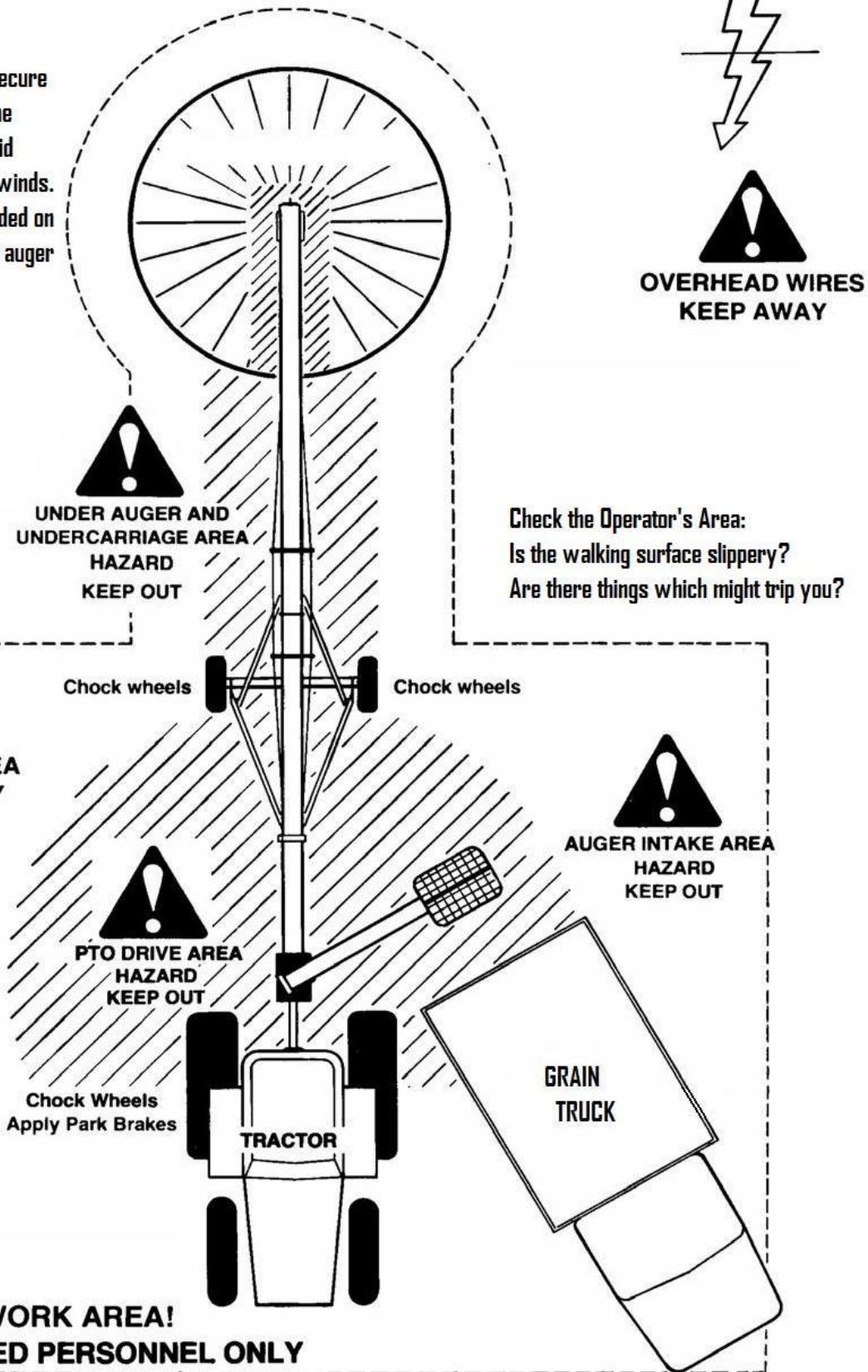


Item 11 : Part # 31427



DESIGNATED WORK AREA

It is good practice to secure the discharge end of the auger to the bin to avoid possible upset in high winds. Tie-off loops are provided on the end of the Cardinal auger for this purpose.





This safety alert symbol means...

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

It will be used throughout this manual to call your attention to specific instructions relating to safety. Please pay particular attention to the items preceded by this symbol.



Operator Qualifications

1. This portable auger shall be operated ONLY by competent and experienced persons. Anyone who will operate or work around this auger must use good common sense.
2. Some regulations specify a minimum age requirement for the operation of power machinery. It is your responsibility to know and abide by the applicable regulations for your area or situation.
3. OSHA regulation 1928.57(a)(6) states, "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 covered equipment with which he is or will be involved."
4. Unqualified persons are to stay out of the work areas as shown in the work area diagrams.
5. A person who has not read and understood all operating and safety instructions is not qualified to operate this auger.



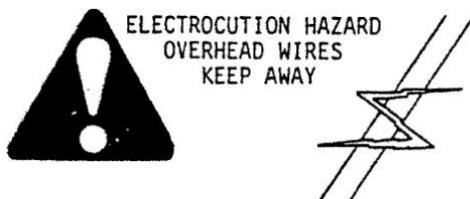
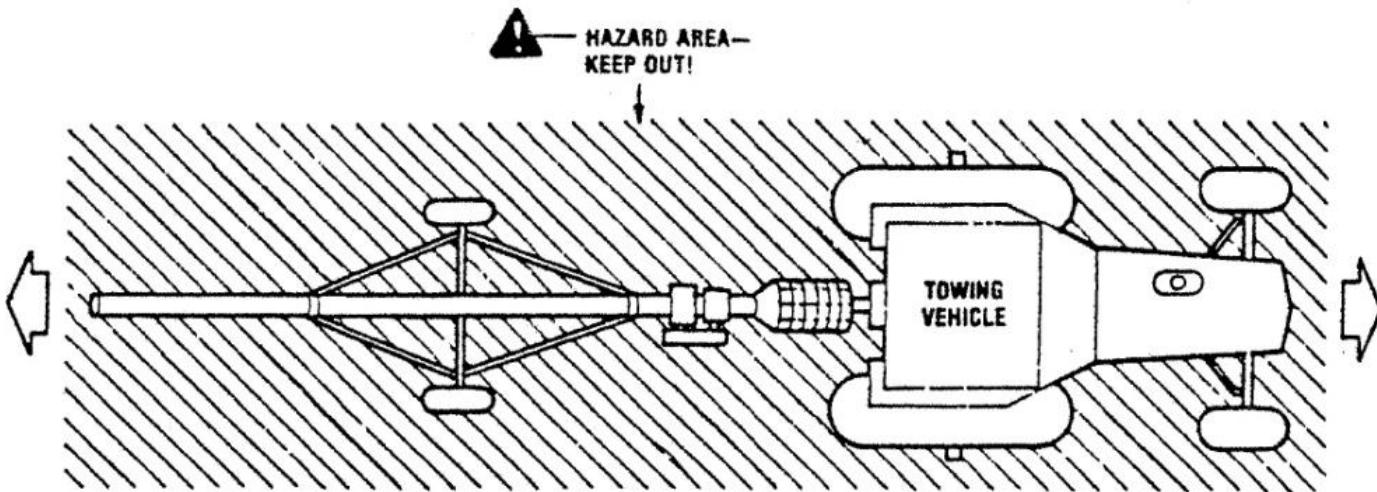
DESIGNATED WORK AREA

Before starting the auger, a designated work area should be established and properly marked. See diagram on facing page. The boundaries shall be marked off with colored nylon or plastic rope hung as portable barriers to define the designated work area.

RULES FOR SAFE WORK AREA

1. Under no circumstances should persons not involved in the operation be allowed to trespass into the work area.
2. It shall be the duty of all operators to see that children and/or other persons stay out of the work areas! 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.
3. 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. It shall also be their responsibility to keep the work area clean and orderly during the operation.

TRANSPORT and PLACEMENT



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!

Transport : Moving the auger with the towing vehicle to or from the work area.

1. Your grain auger should always be empty and in the "full down" position for transport. The upper arm of the scissor lift should be seated on the lift support pad, leaving no pressure on the hydraulic cylinder.
2. The swing out hopper should be in the fully raised position and secured with the safety chain. It is recommended that a strap be used to secure the rear handle of the hopper to the chassis frame tube to prevent the hopper from swinging out unexpectedly.
3. The hitch pin should be securely attached and a safety chain connected between the auger and the towing vehicle. Disconnect PTO shaft from tractor to prevent damage to the CV joint.
4. You are responsible for knowing and maintaining compliance with the applicable state and local regulations governing marking, towing, and maximum width. A slow moving sign should be displayed at the output end of the auger.
5. Auger is designed for transport at tractor speeds. Don't travel faster than 20 mph.
 6. Care should be exercised when travelling on rough and uneven terrain to avoid upset. Be particularly cautious when turning!
 7. Watch for overhead obstructions and electrical wires. Electrocution can occur without direct contact.
 8. **Never** allow anyone to stand underneath or ride on an auger while it is being operated or transported.



Placement : Moving the auger with the tow vehicle into or out of its working position

1. Never move an auger manually. Use a vehicle, preferably a tractor. Augers should always be empty before lifting or moving.
2. Before raising the auger, release the strap securing the rear handle of the feed hopper to the chassis frame tube, if one was used during transport. **Failure to do so will result in damage !**
3. Also before raising the auger, release the safety chain hook on the feed hopper lift arm. This will be too high to reach after the auger is raised. Do not lower the hopper to the ground yet.
4. The auger must be on a level surface, attached to a vehicle, and its wheels must be free to move as it is raised or lowered. Keep travel distance to a minimum when placing a raised auger.
5. Make sure the entire area above the auger and in the line of travel is clear of obstructions and electrical wires.
6. Slowly move the auger into working position with the towing vehicle--never by hand! Make certain everyone is clear of the work area.
7. Once in place, the auger should remain hitched to the tractor at the intake end, and/or supported at the discharge end. Wheels on the auger and the tractor should be chocked on both sides. **Never attempt to increase auger height by positioning wheels on lumber or blocks.**
8. Lastly, the swing out feed hopper can be lowered to the ground and positioned as desired.

**DO NOT LIFT OTHER ITEMS WITH THE AUGER !**

The hydraulic scissor lift is designed for lifting the auger weight only!

MACHINE INSPECTION

After delivery of a new auger and/or 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 are in place and secured, and functional.
PTO shields must rotate easily.
2. Check all safety signs and replace any that are worn, missing, or illegible.
Contact your Cardinal dealer for replacements.
3. Check to see that the access panels are in place and secured.
4. Check for loose or missing fasteners.
5. Are all belts and chains properly adjusted?
6. Are there any oil leaks in the hydraulic hose and fittings? Oil leaking from the gearboxes?
7. Wheels : Are the tires properly inflated? Are the lug nuts tight? Is there side-to-side play that might indicate loose wheel bearings?
8. Truss Cables : Are the cables taut? Is there excessive downward bow in the auger tube?

PTO Driveline, Hydraulic Power, and Lock Out

It is essential that you inspect your driveline before adding power and that you 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.**

- 
1. Never use a PTO shaft without a rotating shield in good working order. Also see that the driveline safety shields are in place on the auger and on the tractor.
 2. Be certain that the PTO shaft is securely attached at both ends, to the tractor and the auger input shaft.
 3. Do not exceed maximum recommended operating length or angularity of the PTO shaft.
 4. Before starting power source, be certain that power to the PTO is off.
 5. Stay out of the hazard area of an operating PTO driveline.
 6. Do **NOT** disconnect hydraulic lines while system is under pressure.
 7. Keep all hydraulic lines away from moving parts.

Lock Out - Remove ignition key or coil wire from power source. If this is impossible, remove the PTO shaft from the work area.

BEFORE OPERATING AUGER

- 
1. Make certain everyone is clear of the auger before starting or moving it.
 2. Make certain all guards and shields are in place before starting.
 3. **CAUTION** Auger should be securely fastened to the 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 the tractor engine and be sure a supply of grain is available. Slowly engage PTO clutch and increase RPM to handle grain supply. New augers should always be run at reduced capacity until tube and screw become polished. 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 8 and 45 degrees angle of elevation on the main tube. Capacity decreases and power requirement increases as the angle of operation increases. Therefore, it will be most efficient to operate at the lowest angle which will serve your needs.

Extended periods of operation at angles above 37 degrees can cause excessive wear on the PTO drive shaft and lead to premature failure.

OPERATION

During the regular operation of your auger, 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.



1. Observe work area restrictions, as outlined in previous sections.
2. Keep all safety shields and devices in place.
3. Make certain everyone is clear before operating or moving the auger.
4. Keep hands, feet, hair, and clothing away from moving parts.
5. Shut off and lock out power to adjust, service, or clean any part of the auger.

A) Normal Shutdown

1. Make certain that the equipment is empty before stopping the unit.
2. Before the operator leaves the work area, the power source should be locked out.

B) Emergency Shutdown

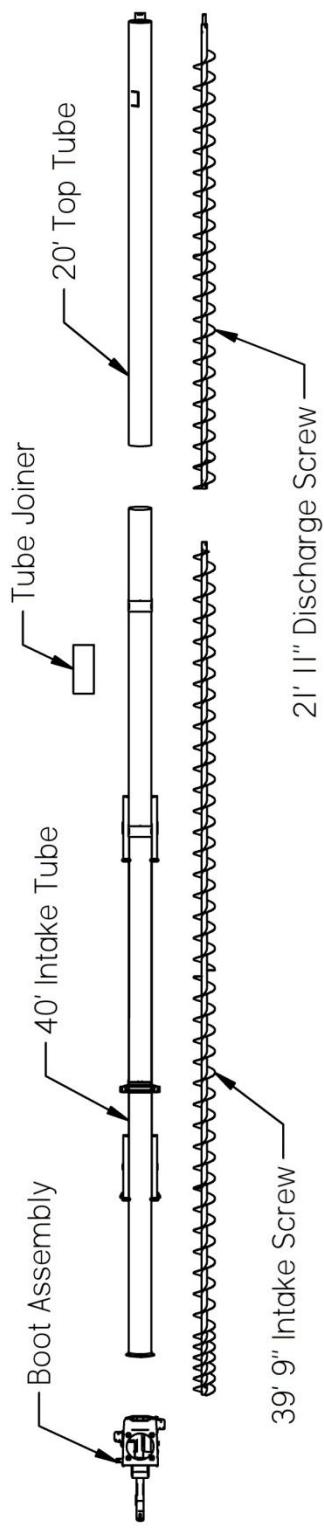
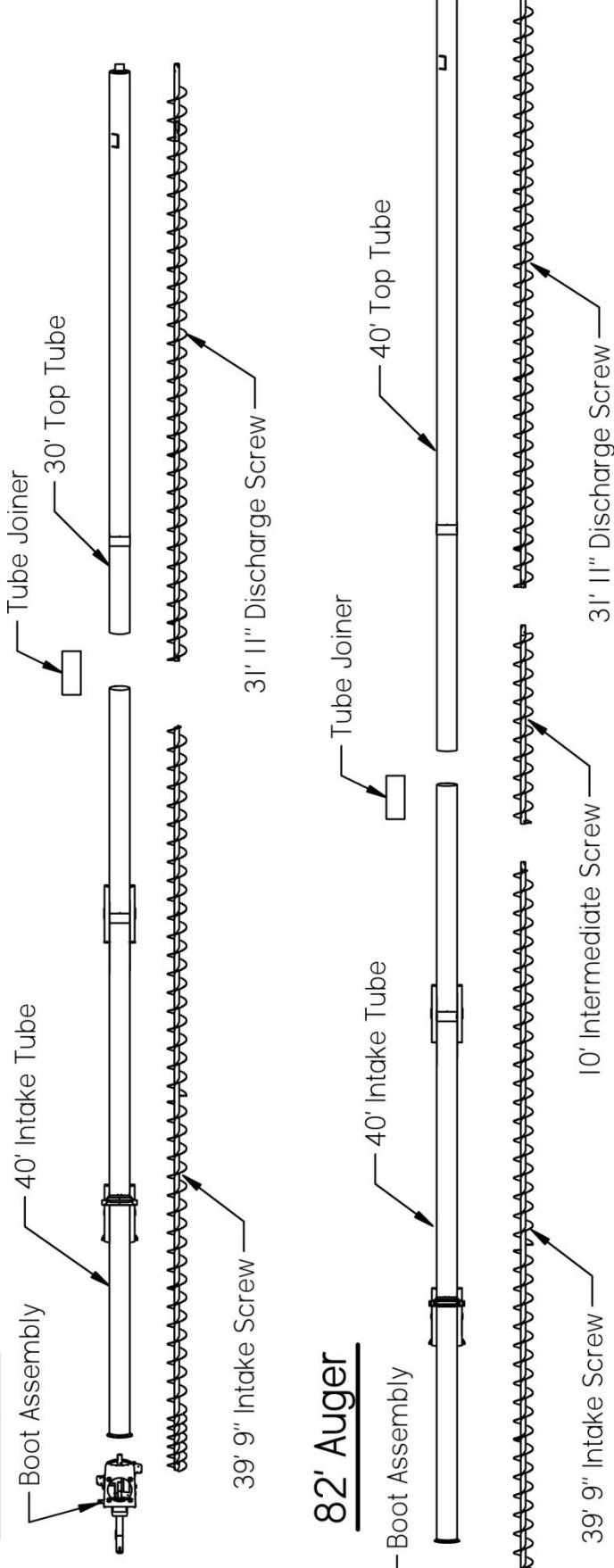
1. Should the auger be immediately shut down under a load - disconnect and lock out the power source. Clear as much grain as you can from the hopper and auger. Never attempt to restart when full.
2. Reconnect power source and clear the auger gradually.
3. Starting the auger under load may result in damage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

CLEAN UP AND STORAGE

1. Clean entire work area.
2. Remove anchors, supports, and chocks. If the auger has been tied off to the bin on top, remember to remove the tie-off straps before moving the auger out of position.
3. Raise the swing out hopper with the manual winch.
4. Disconnect the PTO shaft from the tractor.
5. Move the auger slowly out of working position with towing vehicle, not by hand. Make certain everyone is clear, and watch out for obstructions.
6. Lower the auger to the "full down" position immediately upon clearance of any obstructions.
7. Before transport, be sure the swing out hopper is in raised position and secured with the safety chain.
8. Transport to the new work area or storage area. Observe previous transport and placement instructions.
9. It is recommended that auger be stored in the "full down" position with the intake end anchored. This protects the auger against toppling over during a wind storm. It also eliminates the possibility of an inexperienced operator hooking up to a raised auger and driving the unit into an overhead power line.

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Figure 1

MAIN TUBE AND SCREW LAY-OUT62' Auger72' Auger

1. Prepare Work Area

- An open, level area will be needed for assembly. There must be enough room to lay out the full length of the auger with room to work.
- A lifting device with sufficient capacity to lift the auger to a height of approximately 8' will be needed.
- The tubes may be assembled at ground level, but you may find the job easier if sturdy saw horses or stands are available to support the tubes at a convenient height. Secure the tubes with clamps or straps to prevent them from rolling off the saw horses.

2. Prepare Parts and Read the Manual

- Unpack the parts and check for shipping damage.
- Some of the necessary hardware is loosely secured in place at the factory. However, there are also some items that are shipped in the accessories box. Unpack these items and arrange them in a convenient place.
- It will be helpful if you take the time to read through all of the assembly steps before you begin. This will allow you to keep the big picture in mind and may help to prevent some mistakes.

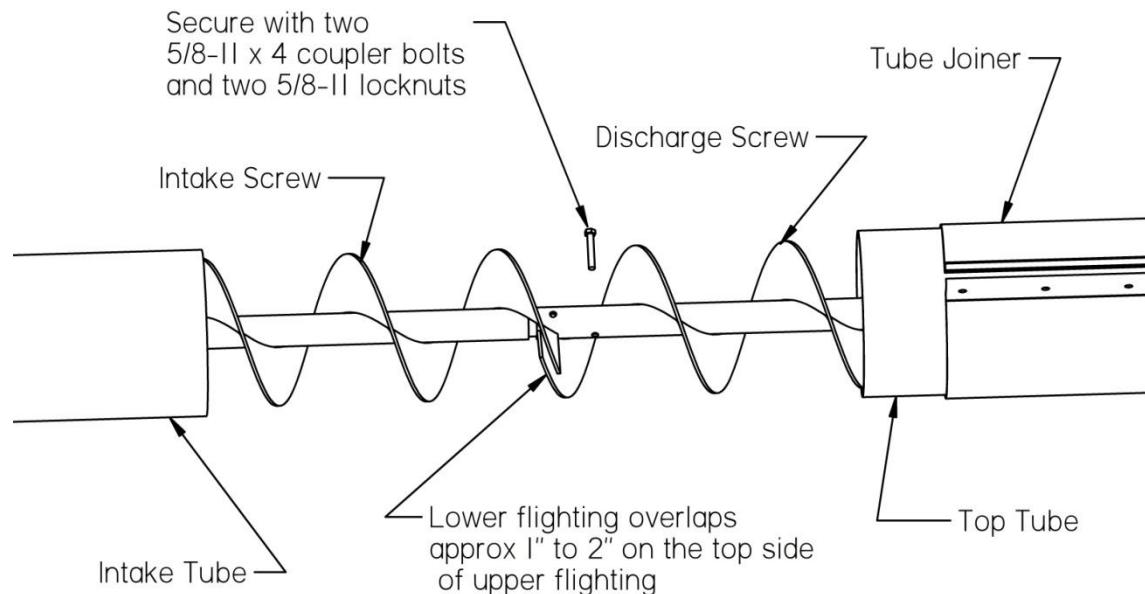
3. Arrange the Tubes (Refer to Figure 1)

- Arrange the main tubes and screws in the proper order. The screws are shipped from the factory inside the correct tube, so it should not be necessary to remove the screws from the tubes. Refer to the Lay-Out diagram in Figure 1.

4. Couple the Screws (Refer to Figure 2)

- Make sure that the tube joiner is in place on the upper tube (as shown in Figure 2) before joining the screws together.
- Slide the intake screw up to join the two screws as shown in Figure 2 and secure with two coupler bolts (#31163 Bolt, 5/8-11 x 4) and two nuts (#01277 Hex Lock Nut, 5/8-11).
- Make sure that the flighting of the lower screw laps over the upper face of the flighting of the upper screw. In other words, the lap should be on the side towards the discharge end of the auger.
- If the bolts will not slide into place, it may be necessary to ream the holes with a 5/8" drill bit.
- If there are any sharp edges or burrs at the outer edges of the flighting at the joint, use a grinder or sander to smooth them. This will help prevent damage to the tube if the auger is run empty.

Figure 2

Joint Details

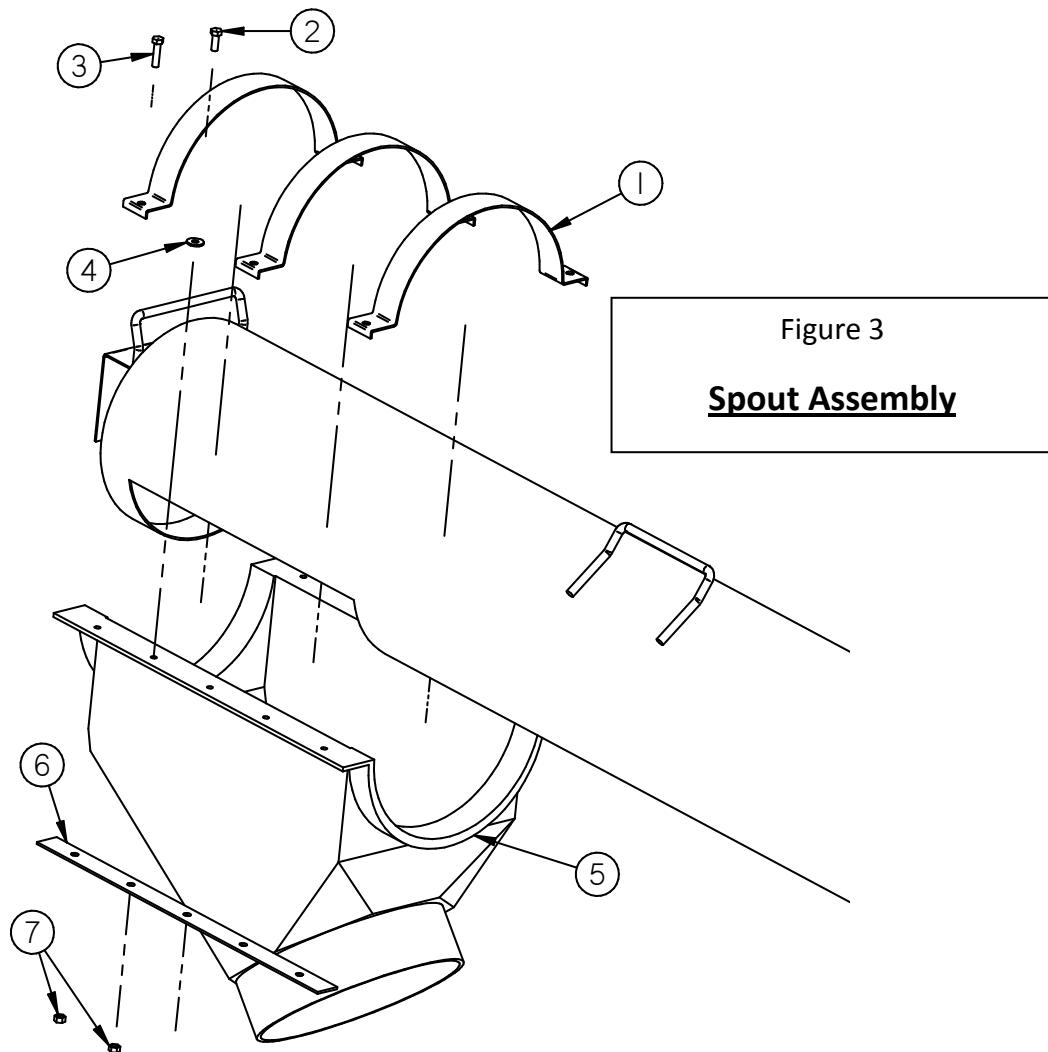
➤ **DO NOT couple the screws with the flighting ends 180 degrees apart. The bolt holes will still line up, but your auger will not operate efficiently.**

5. Join the Tubes

- Slide the intake tube to butt against the top tube.
- Position the tube joiner centered over the joint with the bolt flanges on top.
- Check the overall alignment as the tubes are joined to be sure of maintaining a straight auger. To help provide a reference for aligning the intake tube with the top tube, the truss supports can be attached at this time (see figure 5).
- Tighten the bolts in the tube joiner evenly, starting with the center bolts and working your way to the ends of the joiner. Repeat the pattern until a torque reading of 35 foot-pounds is achieved.

6. Assemble the Top End (Refer to Figure 3)

- Mount the discharge spout using the three clamp bands and included hardware.

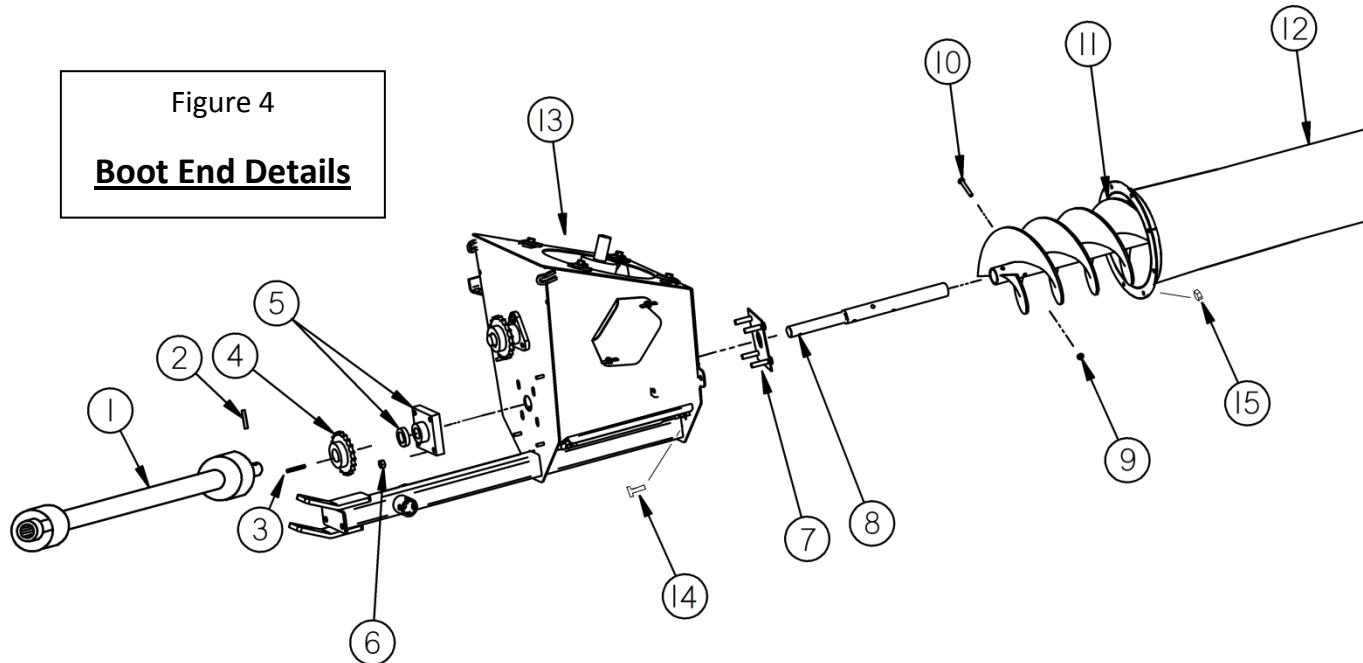


Item #	Part #	Description	Quantity
1	30845	Clamp Band Half for 13 inch	3
2	01175	Bolt 3/8-16 x 1, grade 5	4
3	01404	Bolt, 3/8-16 x 1-1/2, grade 5	6
4	01294	Flat Washer, 3/8	4
5	31063	13" Discharge Spout – Black Poly, 50 deg	1
6	30846	Backer Plate for 13" Spout	2
7	01276	Hex Nut, 3/8-16, center lock, grade 5	10

7. Assemble the Boot End (Refer to Figure 4)

- Remove the chain guard and access covers from the boot.
- Insert the intake shaft (item 8) into the end of the intake screw (item 11) and secure with three coupler bolts and lock nuts (items 9 and 10).
- Place the bearing bolt plate (item 7) on the intake shaft.
- Maneuver the boot assembly so that the intake shaft passes through the hole in the boot end plate. The welded loops on the boot provide a convenient lift attachment point if needed. As the intake shaft is sliding into place, guide the bearing bolts (item 7) to pass through the slots in the boot end.
- Slide the bearing(item 5) on the shaft. Position the bearing so that the grease zerk is accessible from the side. Secure the bearing with nuts (item 6).
- Secure the intake tube to the boot with bolts and nuts (items 14 and 11).
- Lock the intake shaft to the bearing with the eccentric locking collar. This is done by turning the collar in the direction of shaft rotation (counter-clockwise when viewed from the hitch end). A hammer and punch can be used to make sure the collar is tight. Tighten the setscrew to lock the collar in place.
- Mount the square key and sprocket (items 3 and 4) on the intake shaft. Tighten the setscrews.

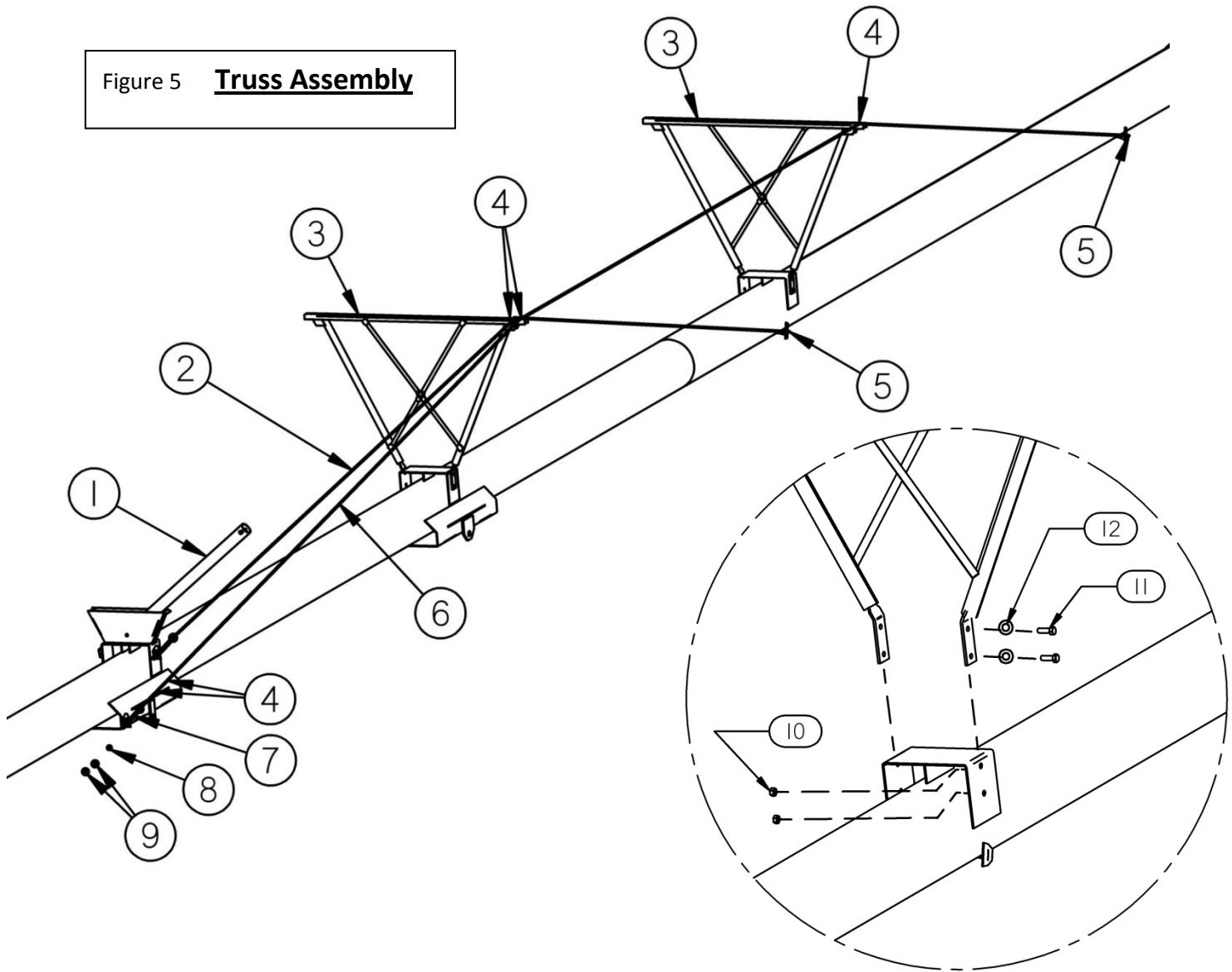
Figure 4
Boot End Details



Item #	Part #	Description	Quantity
1	30810	PTO Shaft	1
2	31165	Spring pin, 3/8 x 2-1/2	1
3	21362	Key, 3/8 square x 3	1
4	31293	Sprocket, #80, 20 tooth	1
5	31139	Bearing w/ lock collar	1
6	01276	Locknut, 1/2-13	4
7	30834	Bearing Bolt Plate	1
8	30807	Intake Shaft	1

Item #	Part #	Description	Qty
9	01277	Locknut 5/8-11	3
10	31163	Bolt, 5/8-11 x 4	3
11	31251	Intake Screw	1
12	31259	Intake Tube	1
13	31272	Boot Assembly	1
14	01428	Bolt 7/16-14 x 1-1/2	12
15	01284	Locknut 7/16-14	12

Figure 5 **Truss Assembly**

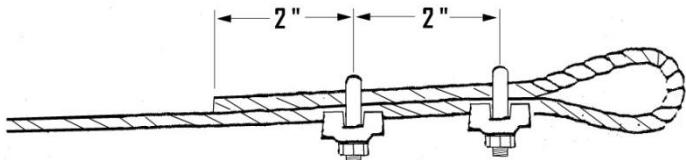


Item	Description	13 x 62	13 x 72	13 x 82
		Part # (Quantity)		
1	Hopper Lift Arm	31417 (1)	30737 (1)	
2	3/8" Steel Cable (short cable)	NA	71 ft (1)	85 ft (1)
3	Truss Support		30898 (2)	
4	3/8 Cable Clamp	31280 (8)	31280 (14)	
5	3/8 Cable Clamp with short saddle	31402 (2)	31402 (4)	
6	3/8" Steel Cable (long cable)	96 ft (1)	110 ft (1)	130 ft (1)
7	Eyebolt, 5/8-11 x 10	30787 (2)	30787 (4)	
8	Flat Washer	01296 (2)	01296 (4)	
9	Nut, 5/8-11	01330 (4)	01330 (8)	
10	Locknut 1/2-13		01276 (8)	
11	Bolt, 1/2-13 x 1-1/4		01189 (8)	
12	Flat Washer, 1/2 in		01295 (8)	

8. Assemble the Cable Truss (Refer to Figure 5)

**** NOTE: For the 62 ft model, the short cable (item 2) is not used.

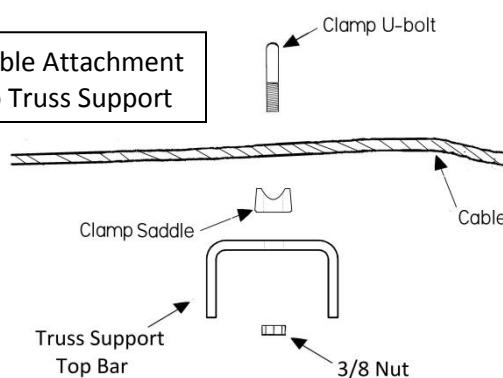
- As shown in the detail circle in figure 5b, mount the truss supports (30898) on the auger tubes with 1/2-13 x 1-1/4 bolts (01189), 1/2 flat washers (01295), and 1/2-13 locknuts (01276).
- Lift one end of the auger approximately 4" to 6" to put a slight bow in the main auger tube.
- With the end of the long length of cable (item 6), make a loop through the eye of a 5/8-11 x 10 eyebolt (30787). Secure with two 3/8 cable clamps (31280) as shown below.



To achieve maximum holding power, the saddles should be positioned on the live side of the cable loop, with the u-bolts on the dead side, as shown here.

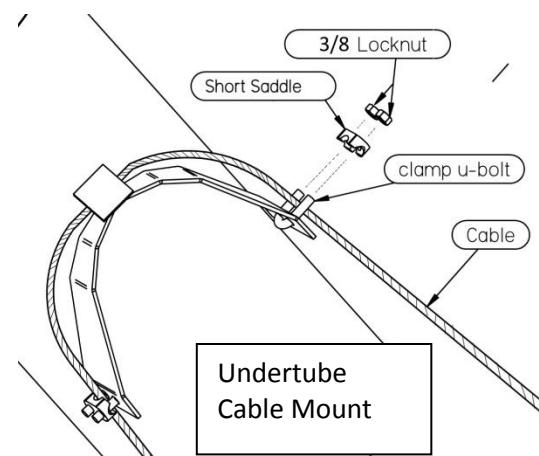
- Insert the stud end of the eyebolt through the anchor gusset at the chassis hook up point. Slip on a flat washer (01296) and thread on a 5/8-11 nut (01330) just a few turns.
- Run the long cable up over both truss supports, down around the auger tube at the lower cable mount, then back up over the truss supports on the other side. Use 3/8 cable clamps (31280) to loosely attach the cable to the tops of the truss supports. At the lower cable mount, use cable clamps with short saddles (31402). Do not tighten the clamps at this time - the cable should be free to slide.

Cable Attachment to Truss Support



Cable Attachment to Truss Support

Clamp U-bolt
Cable
Clamp Saddle
Truss Support Top Bar
3/8 Nut

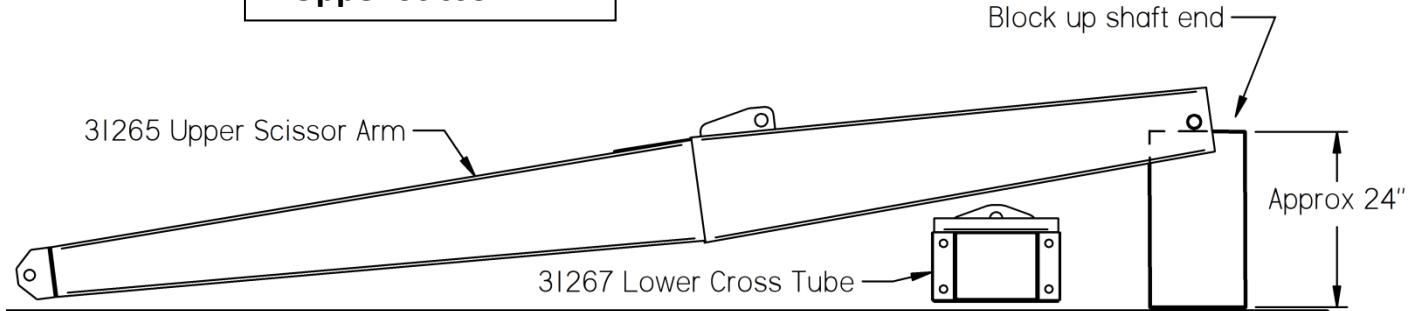


- Install a second eyebolt in the anchor gusset on the other side of the tube and secure with a washer and a few turns of a 5/8 nut (01330). Insert the free end of the long cable through the eyebolt and pull the cable tight as possible. Secure with two 3/8 cable clamps (31280) as shown above.
- These 3 steps do not apply to the 62 ft model :
 - Fasten an end of the short truss cable to a 30787 eyebolt as explained above. Insert the stud end through the mount hole on one side of the base of the hopper lift arm. Slip on a flat washer (01296) and thread on a 5/8-11 nut (01330) just a few turns.
 - Run the cable up over one truss support, then down around the auger tube at the cable mount, then back up over the truss support. Install cable clamps to loosely hold the cable in place.
 - Mount another 30787 eyebolt on the opposite side of the hopper lift arm base and attach the free end of the short cable, pulling the cable as tight as possible.
- Tighten the nuts on the stud ends of the eyebolts to increase tension in the cables until taut. It is best to alternate sides to tighten cables evenly. Check side to side alignment to be sure that the auger is straight. Lock the eye bolts by tightening a second nut (01330) against the first one.
- Tighten the nuts on the cable clamps holding the cables to the truss supports and the cable mounts. Do not over tighten.
- Lower the end of the auger back down to its resting position.
- Attach the hopper lift arm (item 1) using a 5/8-11 x 4 bolt (31163) and 5/8-11 locknut (01277).

9. Assemble the Chassis Lift (Refer to Figures 6, 7, and 8)

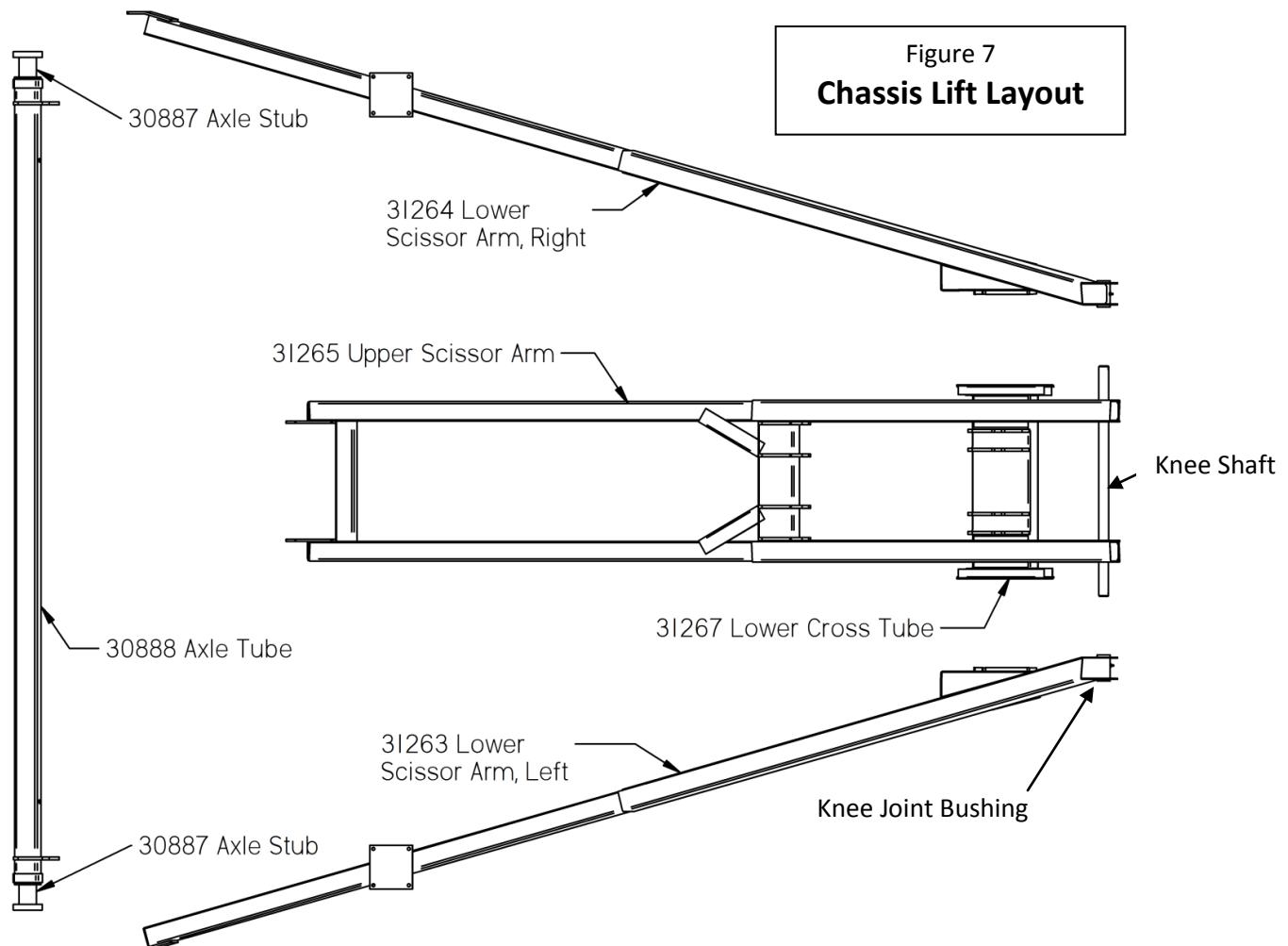
- Place the upper scissor arm on the floor of your work area. Use sturdy blocking to support the shaft end at about 24 inches off the ground. Position the lower cross tube under the upper arm as shown.

Figure 6
**Block up shaft end of
Upper Scissor Arm**



- The right and left lower scissor arms can now be fitted as shown in figure 7, sliding the knee joint bushings of the lower arms onto the knee shaft of the upper arm.

Figure 7
Chassis Lift Layout



- Fasten the lower cross tube between the lower scissor arms with 7/8-9 x 2 bolts and nuts. Do not fully tighten the bolts yet.
- Attach the axle to the lower scissor arms with 7/8-9 x 2 bolts and nuts. Note that the scissor arms must be mounted to the inside face of the axle bracket as shown in Figure 8.

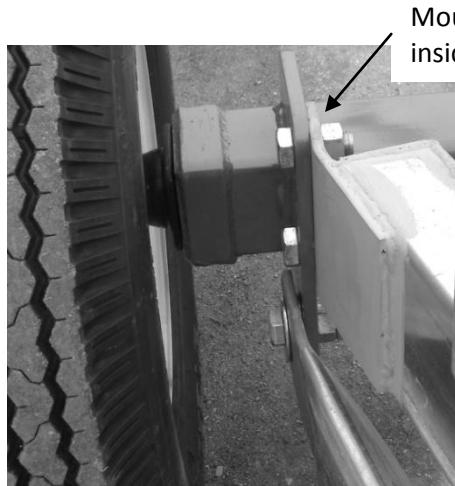


Figure 8
Attach Lower Arm to Axle

- Tighten the twelve 7/8-9 x 2 bolts and nuts installed in the previous two steps. Install 3/8 x 2-1/2 spring pins in knee shaft.
- Raise the free end of the upper scissor arm high enough to allow installation of the lift support. Attach the lift support with eight ½-13 x 1-1/4 bolts and nuts. Lower the upper scissor arm to rest on the lift support.
- Position the hydraulic cylinders to allow insertion of the cylinder mount pins in the cylinder mounts. Secure with 3/8 x 2-1/2 spring pins.

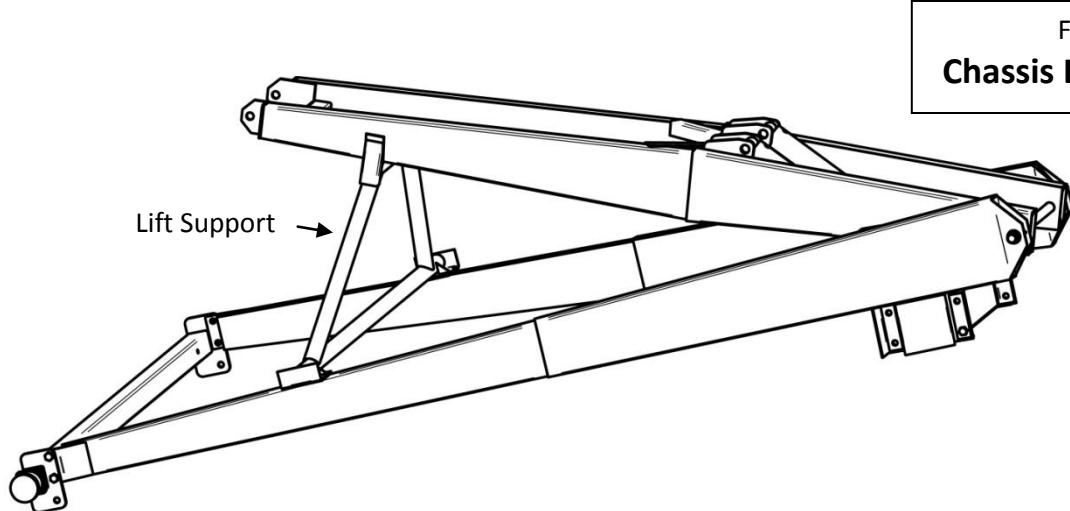


Figure 9
Chassis Lift Assembly

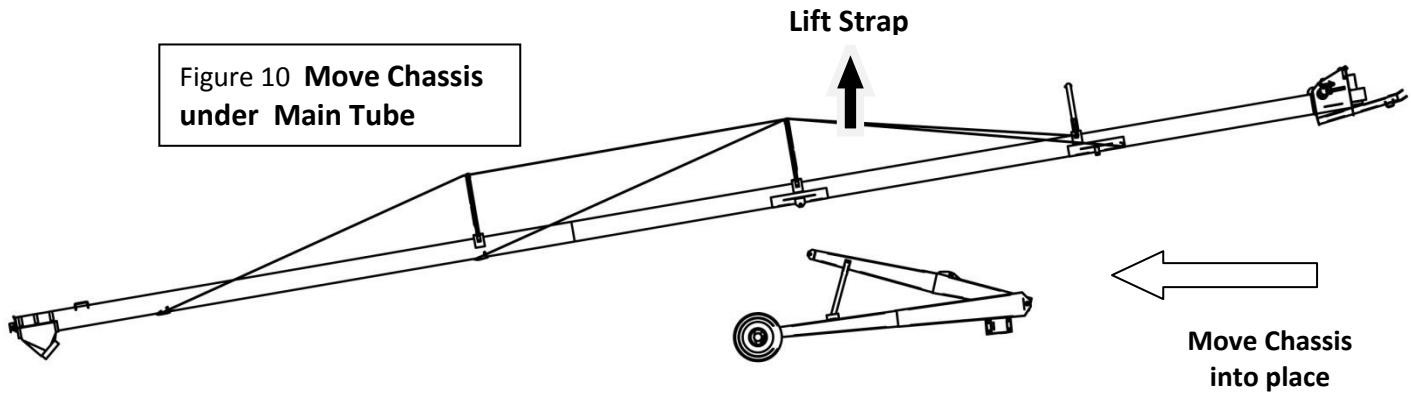
- Raise the axle just high enough to place the wheels on the axle hubs. Secure with lugnuts.

10. Mount Main Tube on Chassis Lift

This can be done in several different ways, depending on your preferences and the equipment available. Some assemblers prefer to position the chassis to one side of the main tube, then use two forklifts to pick up the main tube and maneuver it over the chassis. Whatever procedure you decide to use, please be sure that your lifting equipment is secure and that you are proceeding in a safe manner.

Here is one method:

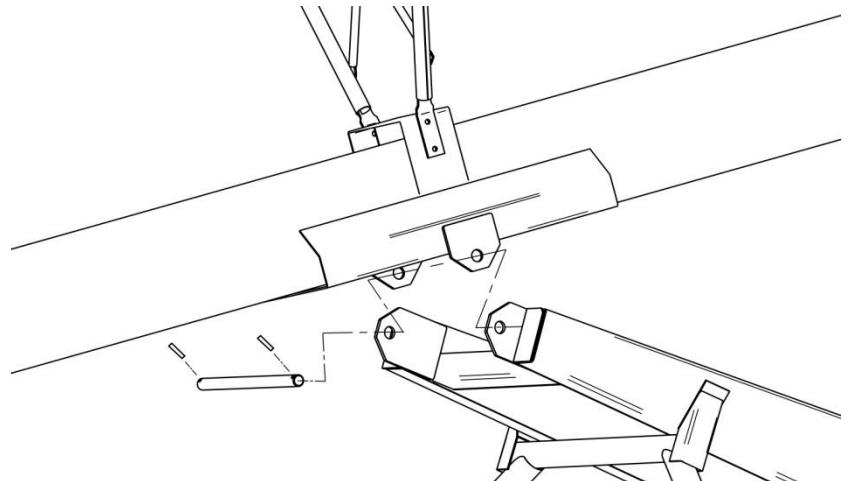
- Attach a lift strap to the main tube assembly at the position indicated in figure 7. Be watchful that your lifting equipment does not interfere with the truss cables.
- Lift the assembly high enough to allow room to maneuver the chassis lift assembly into place. The boot end will be high in the air and the discharge end will remain at ground level.
- Move the Chassis Lift into position under the tube, as shown in figure 10.



- Align the holes and attach the Chassis Lift to the hook up point on the tube with the hardware as shown in figure 11.

Figure 11 Lift Hook Up Hardware

Part #	Description	Qty
31165	Spring Pin, 3/8 x 2-1/2	2
31216	Hook Up Pin (1-1/4 shaft x 22-3/4" long)	1

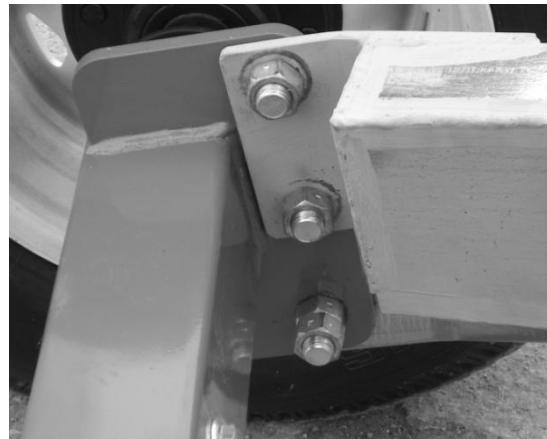
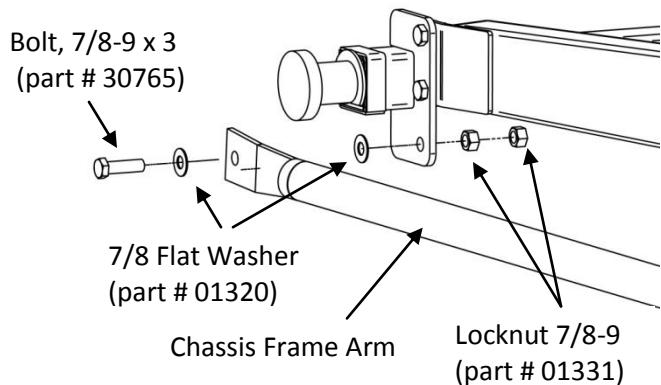


- After the chassis lift is firmly attached, lower the main tube assembly slowly. On the 62' model, the boot end will come down to rest at ground level and the discharge end will go up in the air. On the 72' and 82' models, it will be necessary to lift the discharge end to bring the boot end down. Secure the hitch to a tractor to anchor the auger until assembly is completed.

11. Attach the Chassis Frame Arms

- Attach one end of the chassis frame arms to the lower hole on the axle brackets. Note that the frame arms must be mounted to the outside face of the axle brackets as shown in figure 12. Use 7/8-9 x 3 bolts (part # 30765) with double locknuts (part # 01331) and two 7/8 flat washers (part # 01320). Place one washer on the head of the bolt. Place the second washer between the frame arm and the axle bracket. Tighten the first nut until bolt is snug, then tighten the second nut against the first.

Figure 12 Attach Chassis Frame Arm to Axle



- Raise the end of the chassis lift assembly at the point shown in Figure 13. Adjust the height so that the holes in the free end of the chassis frame tubes will align with the holes at the attachment point on the intake tube. Fasten with the indicated hardware as shown in Figure 14.

Figure 13 Lift Point

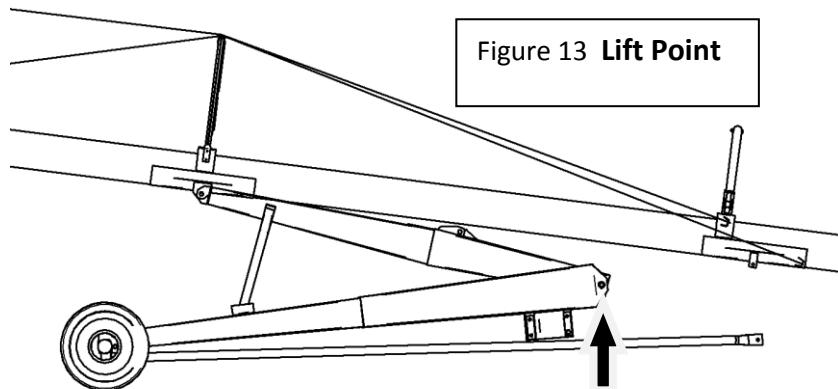


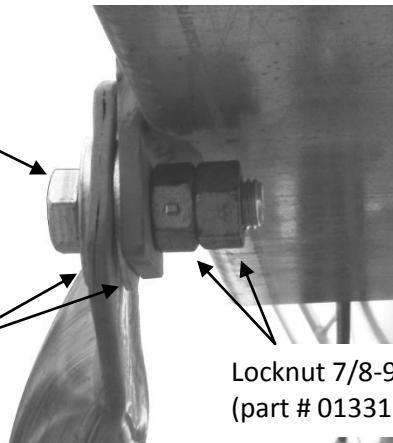
Figure 14

Attach Chassis Frame Arm to Intake Tube

Bolt, 7/8-9 x 3
(part # 30765)

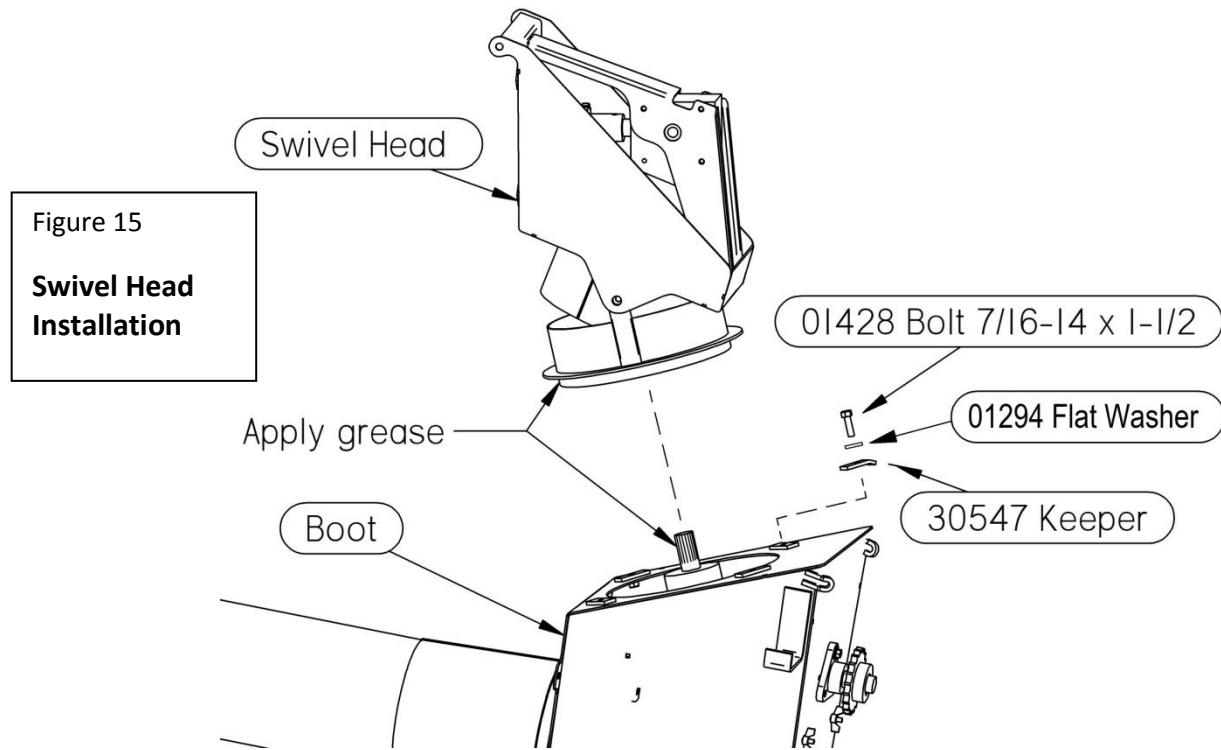
7/8 Flat Washer
(part # 01320)

Locknut 7/8-9
(part # 01331)

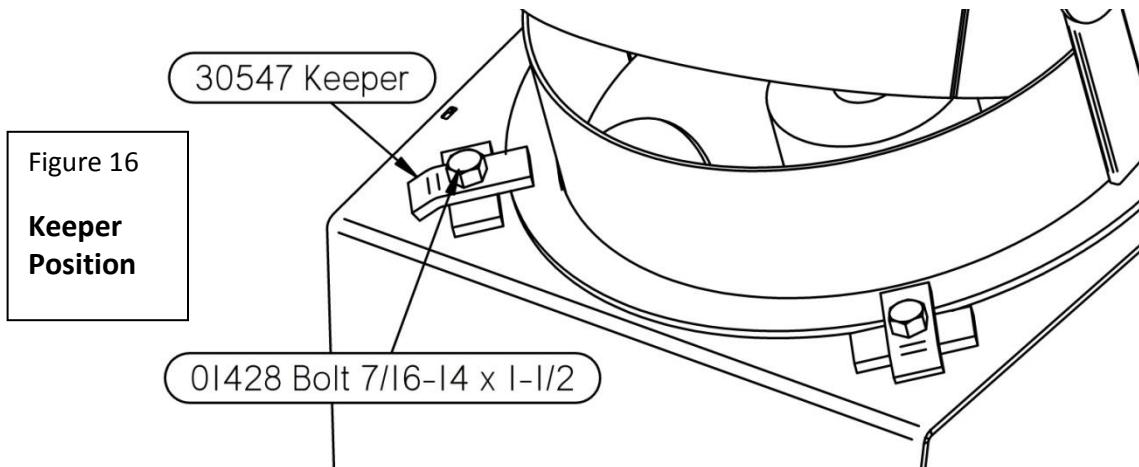


12. Install Swivel Head on top of Boot (Refer to Figure 15)

- Remove the bolts and keepers from the top of the boot assembly.
- Remove the flip up cover from the swivel head assembly. Attach a lift strap and suspend the swivel head over the boot.
- Apply a little grease to the lower side of the swivel ring and the splined shaft of the lower gearbox. As the swivel head is lowered into place, guide the u-joint to slip over the splined shaft.



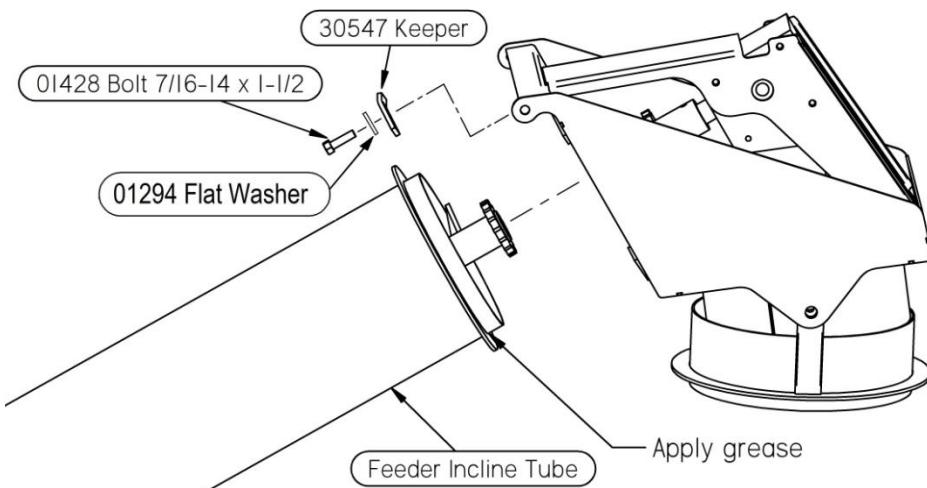
- Re-install the 4 bolts and 4 keepers as shown in figure 16.



13. Hook up Incline Tube to Swivel Head (Refer to Figures 17,18, and 19)

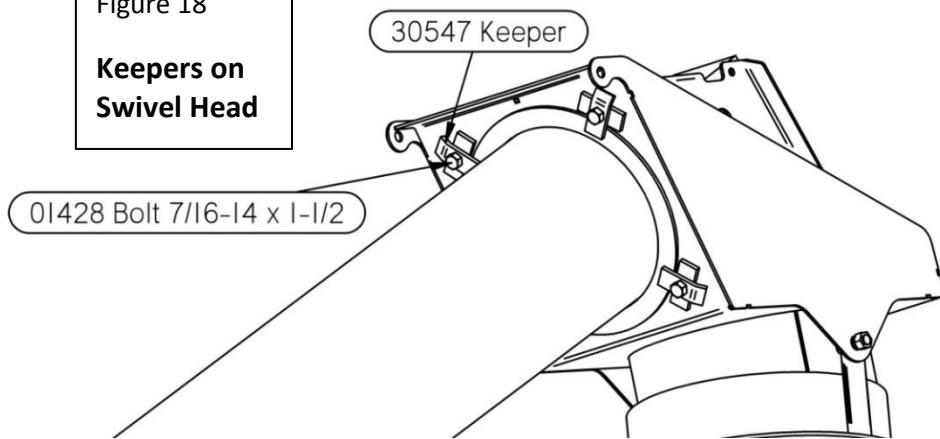
- Remove the bolts and keepers from the swivel head.
- Apply a little grease to the end of the incline tube and insert it into the swivel head.

Figure 17
**Insert
Incline
Tube**



- Re-install the 4 bolts and 4 keepers as shown in figure 18.

Figure 18
**Keepers on
Swivel Head**



Couple these 2 sprockets
with #50 double roller chain

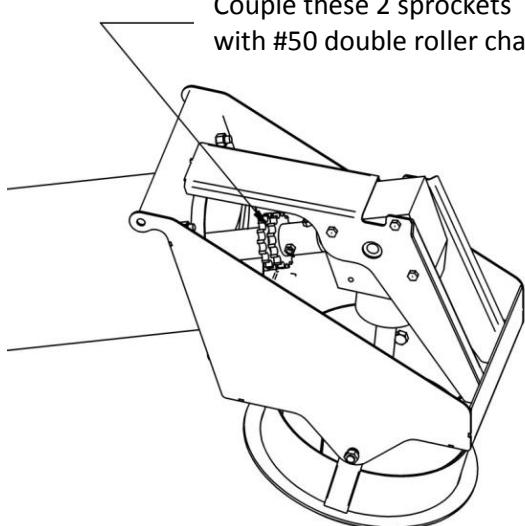


Figure 19
**Chain Coupler
in Swivel Head**

- Use #50 double roller chain (part # 31296) to couple the incline screw to to the swivel head gearbox. Secure with connecting link (part # 00132)
- Replace the flip up cover on the swivel head and secure with the two 1/2-13 x 1 bolts.

14. Hook up Feeder Assembly to Incline Tube (Refer to Figures 20 and 21)

- Remove the pivot box cover and the pivot spacer hardware from the feeder assembly. Loosen the bolts for the hanger bearing on the incline tube.
- Position the pivot end of the feeder near the pivot end of the incline tube so that the u-joint on the incline screw can be slipped onto the shaft of the pivot screw.
- Align the holes at the pivot joint and insert the 01370 bolts. Slip on the 30507 pivot spacers and secure with the 01332 whiznuts. The hook ring on the retainer spring can be slipped over the whiznut to hook on the welded sleeve. A flat washer (01295) is used to make the ring non-removable on one side only. The cover can still be easily opened by detaching the hook ring on the opposite side. The photos in figure 21 show how this is done.

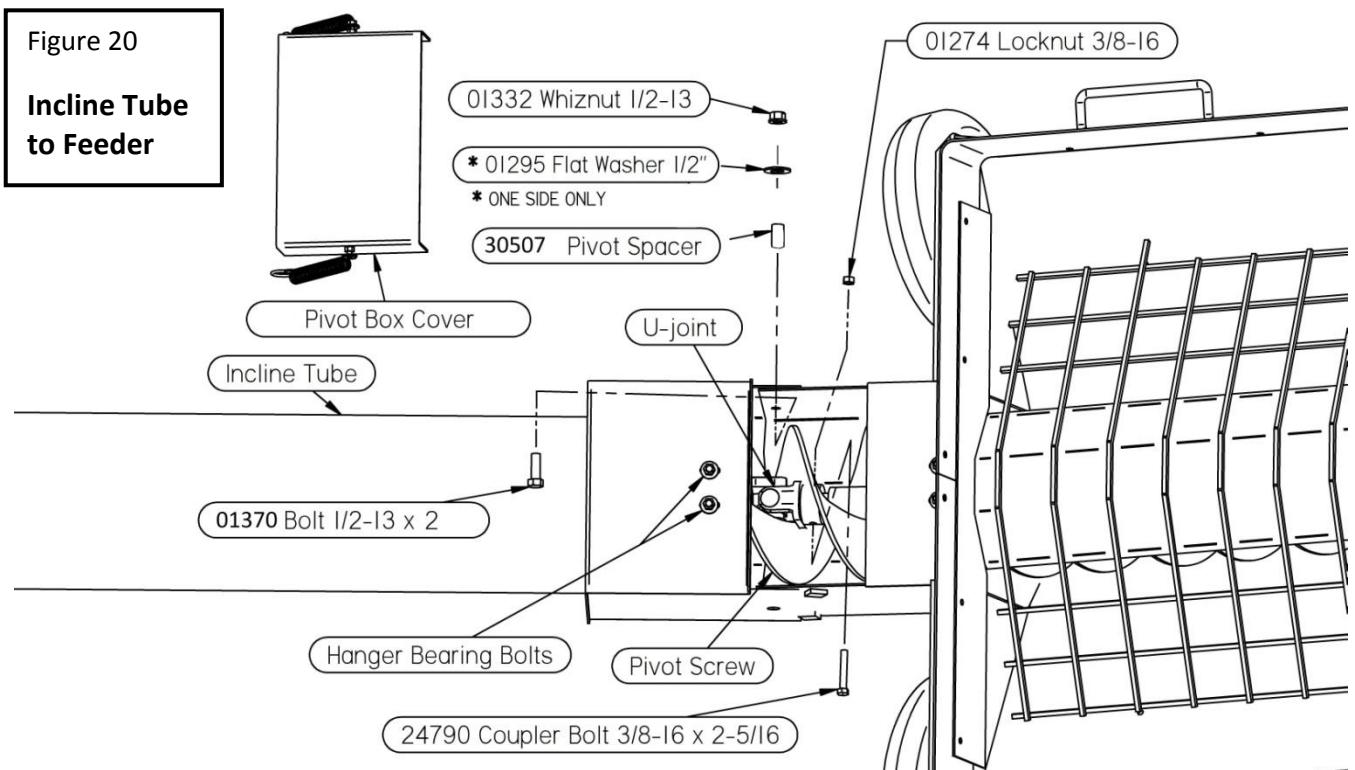
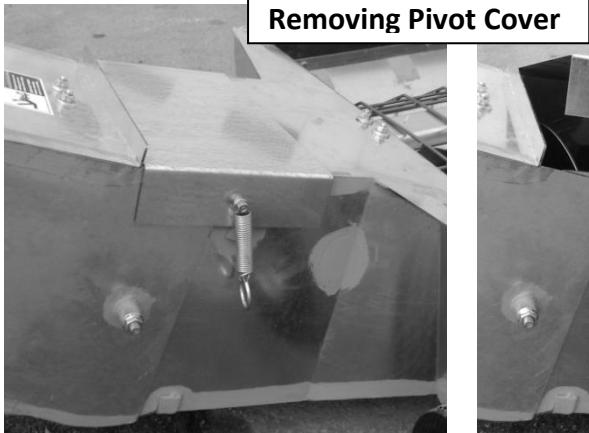


Figure 21

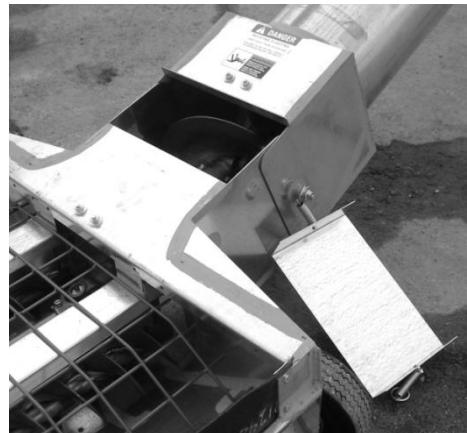
Removing Pivot Cover



Detach hook ring on one side.



Lift one side of cover.



Cover remains attached when open.

- Turn the incline screw or the pivot screw until the holes line up for the coupler bolt. Insert the 3/8 x 2-5/16 coupler bolt (part # 24790) and secure with the 3/8 locknut (part # 01274). In some cases, it may be necessary to move the pivot screw forward or backward in order to line up the holes for the coupler bolt. The following steps show how this can be done :

To move the Pivot Screw forward or back :

- Remove the chain guard from the end of the feed hopper.
- Remove the two drive chains from the sprockets.
- Loosen the setscrew and turn the lock collar to release it from the feeder drive shaft.

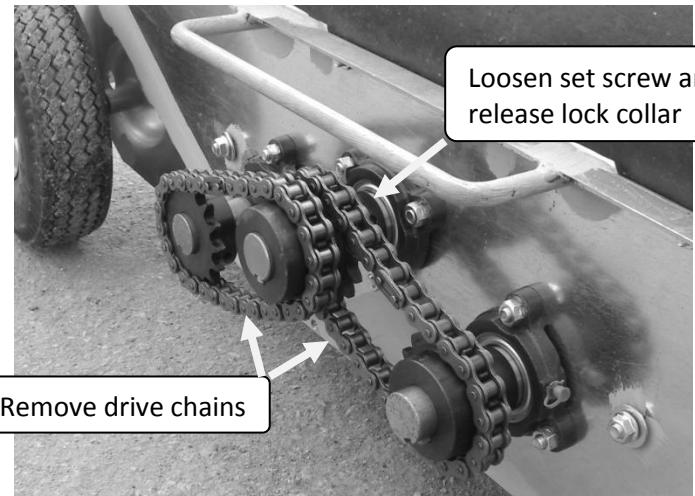


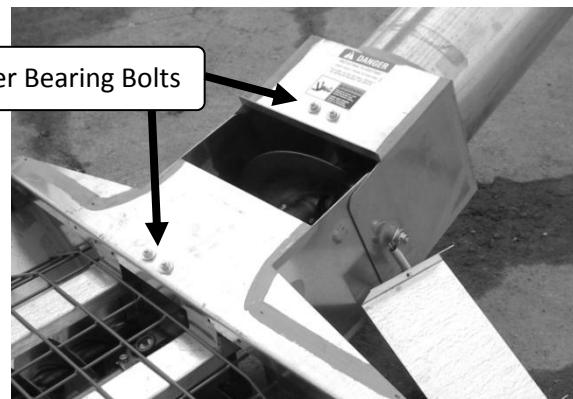
Figure 22

**Remove Guard, Chains,
and Lock Collar**

- Loosen the bolts on the two hanger bearings located near the feeder pivot .

Figure 23

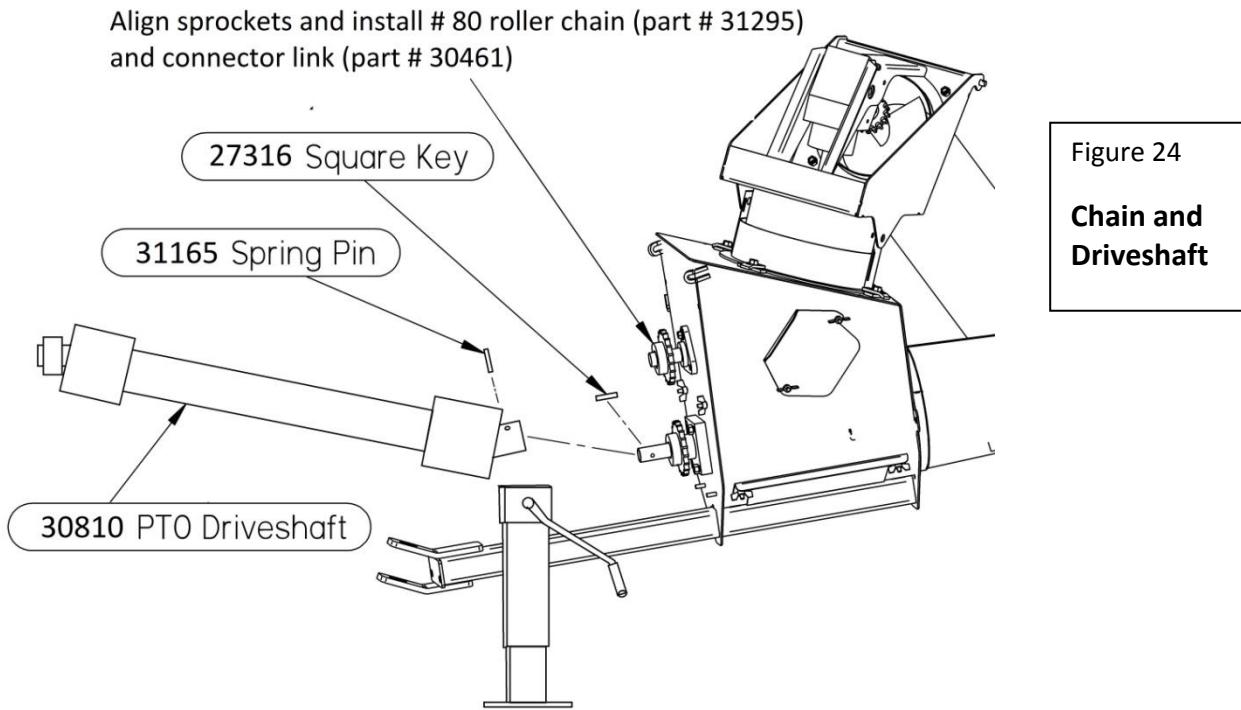
**Loosen Hanger
Bearing bolts**



- The feeder drive shaft and pivot screw can now be shifted backward or forward to align the holes for the coupler bolt to be inserted.
- When the driveshaft has been positioned as desired, lock the shaft to the bearing by turning the collar in the direction the shaft will spin in operation (counter-clockwise looking at the end of the shaft). Tighten the setscrew to secure the collar.
- Adjust sprocket positions to maintain proper alignment. Install the drive chains. The three bolt bearing on the drive shaft can be raised or lowered to adjust chain tension.
- Tighten the bolts on the hanger bearings, being watchful that the bearings are positioned properly on the screw shafts.
- Replace the chain guard cover.

15. Install Chain and PTO Driveshaft (Refer to figure 24)

- If they are not already loose, loosen the nuts on the intake shaft bearing. Lift the shaft to move the bearing up as far as possible and tighten one or two nuts to hold it temporarily in this position.
- Loosen the setscrew in the upper sprocket. Align this sprocket with the lower one using a straight edge. Re-tighten the setscrew.
- Install the #80 roller chain (part # 31295) and connecting link (part # 30461).
- Again loosen the nuts on the bearing to allow the intake shaft to move down to tension the chain. Tighten the four nuts to secure the bearing in this position.
- Install the PTO shaft with the square key and spring pin. Tighten the setscrew to lock the square key in place.

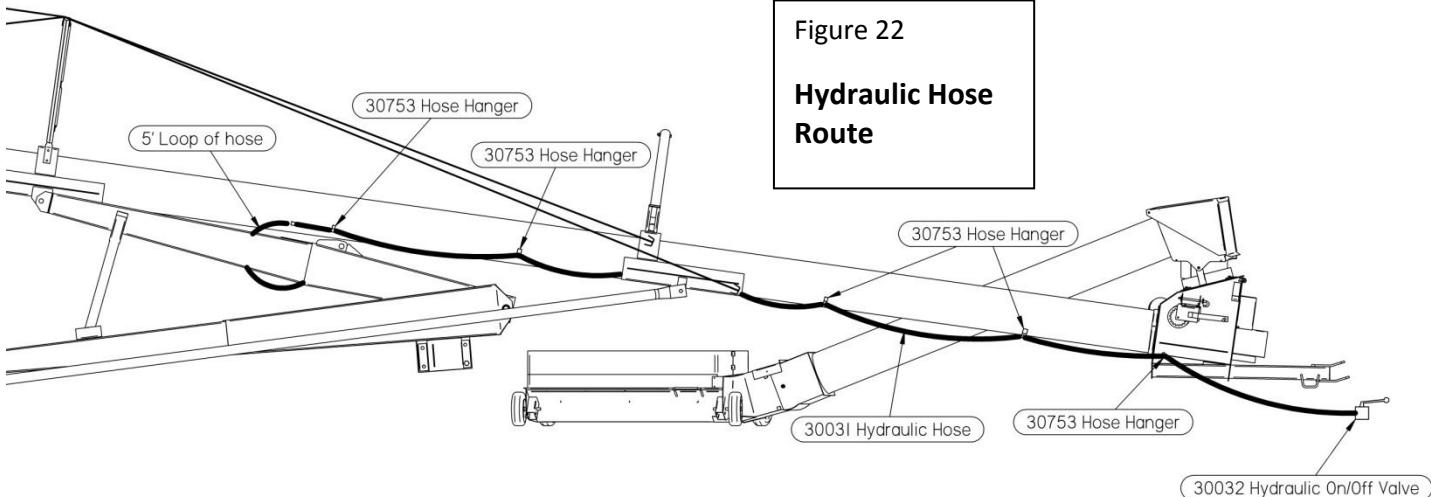


16. Install Hydraulic Hose

- Thread sealant should be used to seal all the threaded joints as they are assembled. (Note: Teflon thread tape is not recommended because pieces of the tape could possibly enter the hydraulic system of the tractor and cause problems.)
- Connect one end of the hydraulic hose to the straight coupler fitting on the 6' hydraulic hose on the upper lift arm.
- Route the hose as shown in figure 22, passing through the opening between the chassis hook-up channel and the auger tube. Suspend the hose with: 30753 Hose Hanger, 01291 Flat Washer 1/4 in, and 01271 Locknut 1/4-20.

*****Leave a 5 foot loop of hose between the hose hanger on the upper lift arm and the first hose hanger on the auger tube. This is necessary for the increased distance between these points when the auger is in raised position.**

- Thread the 30032 hydraulic on/off valve onto the free end of the hose. At the inlet of the valve, thread



in the 1/2 inch hydraulic nipple (27487), and attach your own coupler to mate with your tractor hydraulic supply port.

- The excess hose can be coiled and stored on the hook on the side of the auger boot as shown here :



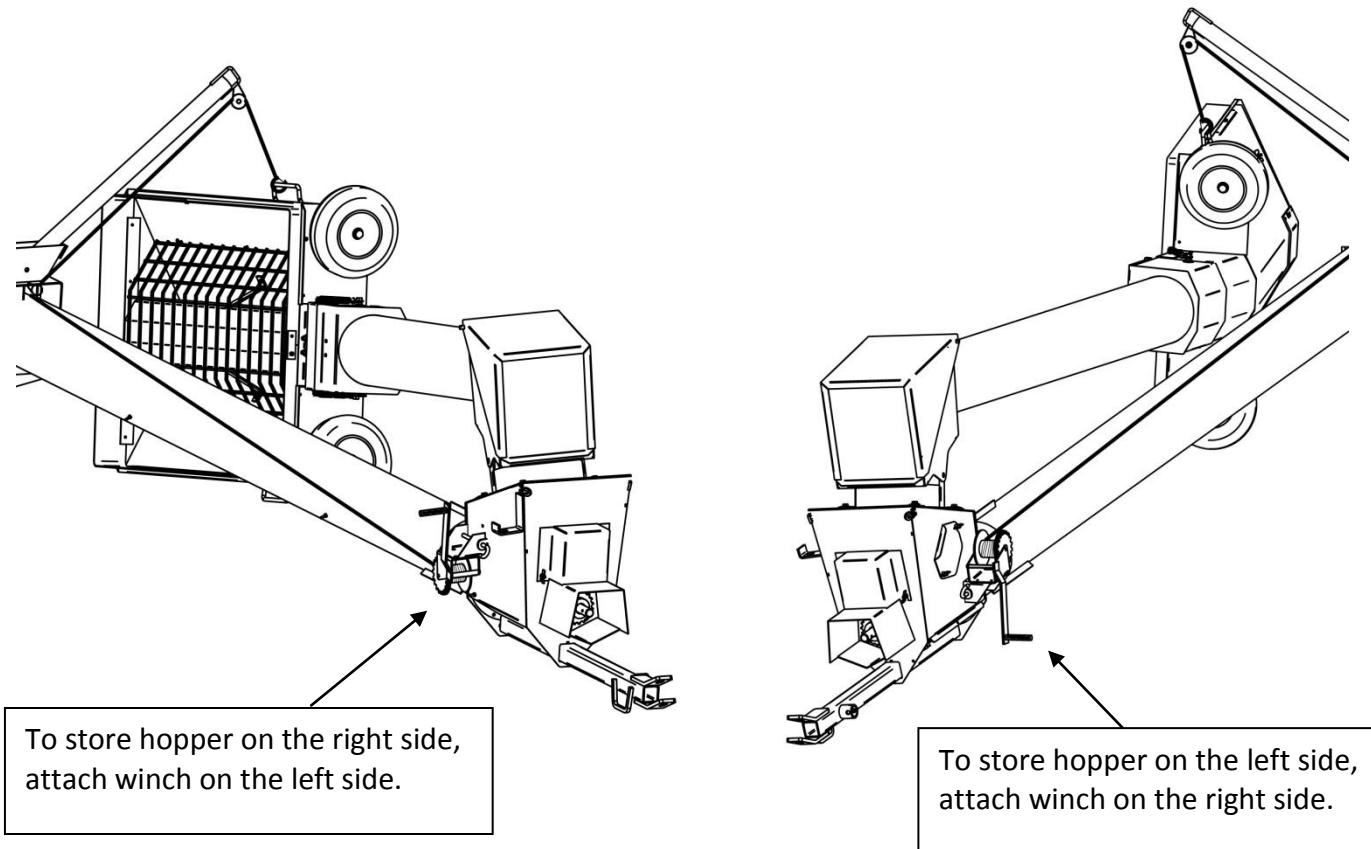
CAUTION: Do not connect or disconnect hydraulic components when there is pressure within the system. Hydraulic systems are highly pressurized. Escaping hydraulic oil, even an invisible pinhole leak, can penetrate body tissues and cause serious injury. When looking for leaks, use a piece of wood or cardboard; NEVER use the hands or other parts of the body. When reassembling, make absolutely certain that all connections are tight. If injured by hydraulic oil escaping under pressure, see a doctor immediately. Serious infection or reaction may occur if medical attention is not received at once.

17. Rig Feeder Lift Cable and Winch

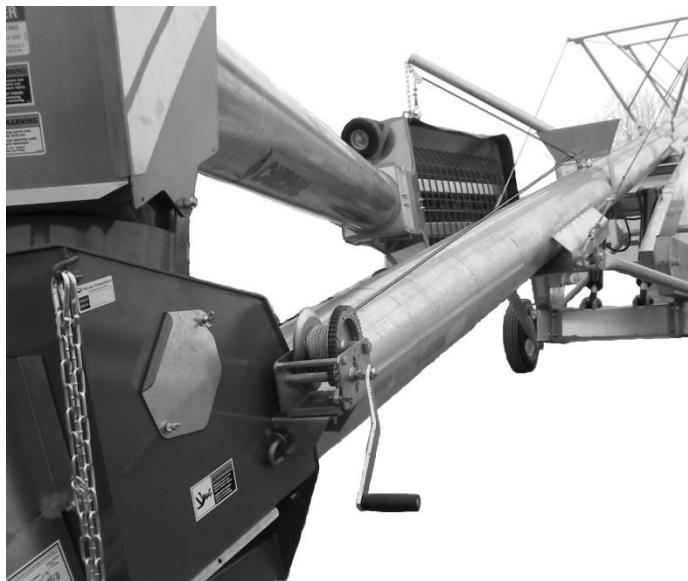
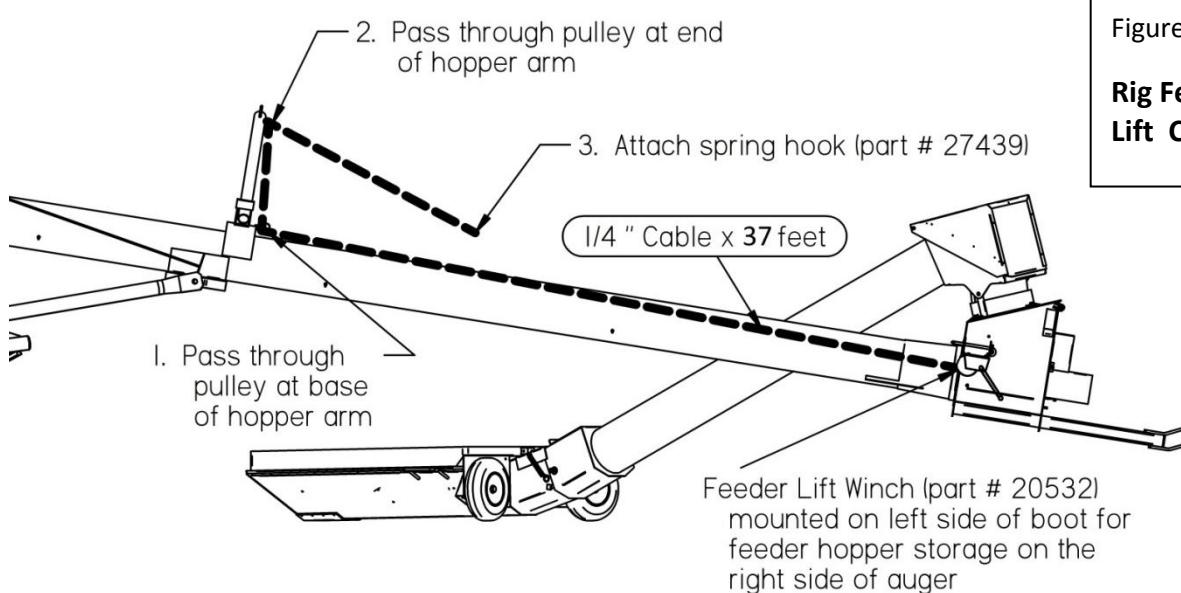
- Attach the cable ratchet winch (part # 20385) to the winch mount plate (part # 30598) with 3 bolts (part # 01175 bolt 3/8-16 x 1), 3 washers (part # 01294), and 3 nuts (part # 01274 Locknut 3/8-16).
- Secure one end of the 1/4 inch cable to the winch drum as shown in figure 24 : From inside of drum, pass the cable through one of the dimpled holes in the outer plate. Loop the cable around the drum bearing, under itself, and leave 1" extending past the clamp. Tighten the clamp nuts to approx 2 ft-lbs.



- Assemble the winch handle onto the flatted input shaft end. Tighten the $\frac{1}{2}$ "-13 locknut against handle and torque to 22-25 ft-lbs. Do not over torque. Do not adjust the double locknuts on the long end of the input shaft.
- Attach the winch mount plate to the intake boot using the connecting pin (part # 103002) and hitch clip pin (part #102042). The winch should be attached on the side opposite to that desired for hopper storage position.



- Thread the free end of the cable through the pulley attached to the base of the hopper lift arm support and then through the pulley at the end of the hopper lift arm. (Figure 24)



This photo shows the feeder lift winch mounted on the right side of the boot for swing feeder storage on the left side of the auger tube.

- Attach the spring hook to the end of the cable using two $\frac{1}{4}$ " cable clamps (part # 15266) and thimble (part # 19480). Electrical tape can be wrapped around the cable end to guard against sharp edges.

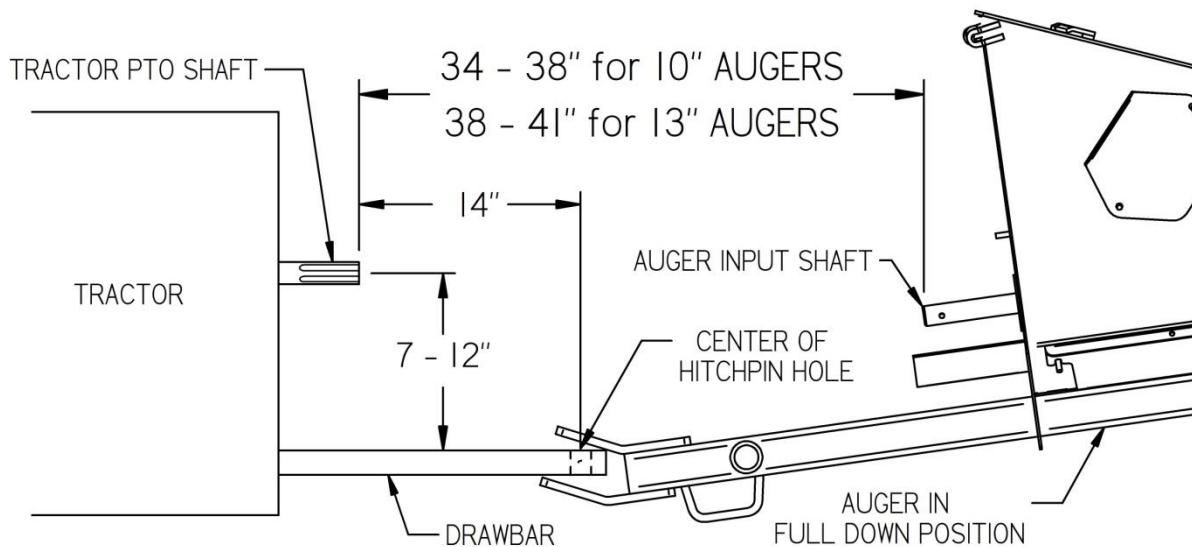
18. Replace All Guards and Access Covers

- When assembly is complete, make sure that all the guards and access covers are securely in place.

TRACTOR PTO and HITCH

This auger is meant to be used with a tractor having a Type I, 540 rpm PTO. The hydraulic lift on the 82' auger will require 1450 psi pressure from the tractor hydraulic system to lift the auger empty. The 72' auger will require 1350 psi, and the 62' auger will require approximately 1100 psi.

With the auger in full down position and on level ground, check to see that your tractor drawbar is adjusted to conform to the measurements shown below.



PTO Overload Protection

There is an overload shear device built into the PTO driveline. If the maximum operating torque is exceeded, the bolt will shear to protect the equipment. Replace the shear bolt only with the correct size and grade of bolt: For the Cardinal 13" swing auger, the bolt should be 7/16-14 x 1, grade 8.

Tractor and auger should be positioned in a straight line before engaging PTO drive.

The auger must be securely hitched to the tractor during operation !

Disconnect PTO shaft from tractor before moving the auger to prevent damage to the CV joint. **Your warranty will be void if this practice is not followed.**

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 are in place and secured, and functional.
2. PTO driveline: Firmly attached to auger intake shaft? Shields rotate easily?
3. Check all safety signs and replace any that are worn, missing, or illegible.
Contact your Cardinal dealer for replacements.

4. Check to see that the access panels are in place and secured.
5. Check for loose or missing fasteners.
6. Are all belts and chains properly adjusted?
7. Are there oil leaks in the hydraulic cylinder, hose or fittings? Oil leaking from the gearboxes?
8. Wheels : Are the tires properly inflated? Are the lug nuts tight? Is there side-to-side play that might indicate loose wheel bearings?
9. Truss Cables : Are the cables taut? Is there excessive downward bow in the auger tube?

TRANSPORTING

Before moving your portable auger, it would be a good idea to scout ahead on your intended route to avoid dangerous obstacles and loss of time.

When hitched to a drawbar at 18" off the ground :

- ❖ The transport height for the 62' model is **12' 6"**
- ❖ The transport height for the 72' model is **12' 10"**
- ❖ The transport height for the 82' model is **14' 4"**

Be careful to maintain plenty of clearance below overhead electric lines and obstructions.



Be alert to overhead obstructions and electrical wires. Failure to do so may result in electrocution!

1. Your grain auger should always be empty and in the "full down" position for transport. The upper arm of the scissor lift should be seated on the lift support pad, leaving no pressure on the hydraulic cylinder.
2. The swing out hopper should be in the fully raised position and secured with the safety chain. It is recommended that a strap or rope be used to secure the rear handle of the hopper to the chassis frame tube to prevent the hopper from swinging out unexpectedly.
3. The hitch pin should be securely attached and a safety chain connected between the auger and the towing vehicle. Disconnect PTO shaft from tractor to prevent damage to the CV joint.
4. You are responsible for knowing and maintaining compliance with the applicable state and local regulations governing marking, towing, and maximum width.
5. The auger is designed for transport at tractor speeds. Don't travel faster than 20 mph.
 6. Care should be exercised when travelling on rough and uneven terrain to avoid upset. Be particularly cautious when turning! The end of the auger extends far beyond the axle, so remember that it will follow a wide path around a corner!
 7. Watch for overhead obstructions and electrical wires. Electrocution can occur without direct contact.
 8. **Never** allow anyone to stand underneath or ride on an auger while it is being transported.



POSITIONING to load a BIN

1. Never move an auger manually. Use a vehicle, preferably a tractor. Augers should always be empty before lifting or moving.
2. Locate the auger close to the bin. Plan ahead to allow adequate room for the feed hopper to swing out to the point where your truck or wagon will unload.
3. Before raising the auger, **release the strap** securing the rear handle of the feed hopper to the chassis frame tube, if one was used during transport.
Failure to do so will result in damage !
4. Also before raising the auger, release the safety chain hook on the feed hopper lift arm. This will be too high to reach after the auger is raised. Do not lower the hopper to the ground yet.
5. The auger must be on a level surface, attached to a vehicle, and its wheels must be free to move as it is raised or lowered. Keep travel distance to a minimum when placing a raised auger.
6. Make sure the entire area above the auger and in the line of travel is clear of obstructions and electrical wires.
7. Open the hydraulic shut-off valve. Run the tractor at idle speed and slowly raise the auger to the height needed to clear the bin. Close the hydraulic shut-off valve.
8. Back the auger slowly into working position with the tractor--never by hand! Make certain everyone is clear of the work area.



Make certain that everyone is clear of the work area when moving the auger. To prevent tip-over when backing, avoid rolling a tire into a pot hole or over an obstruction. Also avoid moving the auger at right angles to a slope. If the auger must be set up on a slope, approach the bin uphill.

MAKE SURE ENTIRE AREA ABOVE AUGER AND IN LINE OF TRAVEL IS CLEAR OF OVERHEAD OBSTRUCTIONS AND ELECTRICAL WIRES ! !

- ❖ **NOTE :** When positioning the auger, remember that the discharge end will lower as the auger tube fills with grain during operation. If discharging into a grain spreader, allow at least 12 inches space between the discharge spout and the spreader.

9. Once in place, the auger should remain hitched to the tractor at the intake end, and/or supported at the discharge end. Wheels on the auger and the tractor should be chocked on both sides. **Never attempt to increase auger height by positioning wheels on lumber or blocks.**
10. It is good practice to tie off the discharge end of the auger to the bin. This may save you a lot of trouble if a storm comes up with high winds which could blow the auger over.
11. Lastly, the swing out feed hopper can now be lowered to the ground and positioned as desired.



DO NOT USE THE AUGER AS A CRANE TO LIFT OTHER ITEMS !

The hydraulic scissor lift is designed for lifting the auger weight only!

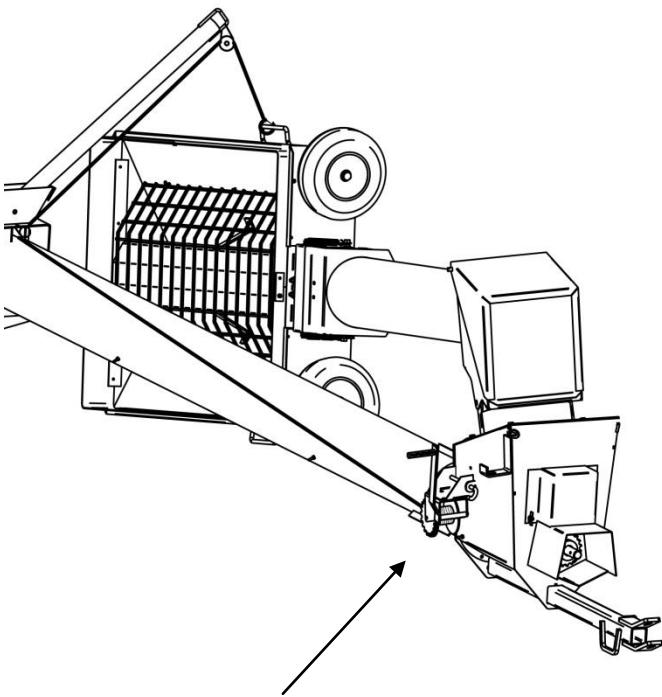
FEED HOPPER POSITION

The swing-out feed hopper can be positioned on the right or left side of the auger. If you wish to change sides, follow this procedure:

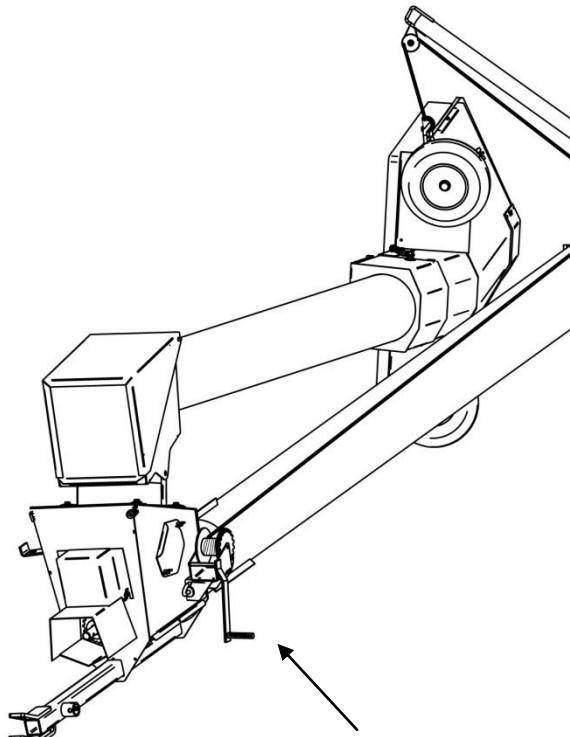
1. Support the auger hitch with the jack. Unhook the PTO shaft and the auger hitch from the tractor.
2. Pull the tractor ahead to allow room to swing the feed hopper around to the other side of the auger.
3. With the feed hopper on the desired side, reattach the tractor to the auger.

To change sides for the hopper storage position :

1. Push the hopper lift arm up and over until it pivots over to the other side of the auger.
2. Remove the connecting pin holding the cable winch to the boot. Pass the winch over the top of the main auger tube and reconnect it on the opposite side of the boot.



To store hopper on the right side,
attach winch on the left side.



To store hopper on the left side,
attach winch on the right side.

- Note that the feed hopper may be lifted into storage position with either side facing out.

PTO Driveline, Hydraulic Power, and Lock Out

It is essential that you inspect your driveline before adding power and that you 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.**



1. Never use a PTO shaft without a rotating shield in good working order. Also see that the driveline safety shields are in place on the auger and on the tractor.
2. Be certain that the PTO shaft is securely attached at both ends, to the tractor and the auger input shaft.
3. Do not exceed maximum recommended operating length or angularity of the PTO shaft.
4. Before starting power source, be certain that power to the PTO is off.
5. Stay out of the hazard area of an operating PTO driveline.
6. Do **NOT** disconnect hydraulic lines while system is under pressure.
7. Keep all hydraulic lines away from moving parts.

Lock Out - Remove ignition key or coil wire from power source. If this is impossible, remove the PTO shaft from the work area.

BEFORE OPERATING AUGER



1. Set up your work area as outlined in the safety section of this manual.
2. Make certain everyone is clear of the auger before starting or moving it.
3. Make certain all guards and shields are in place and secure before starting.
4. **CAUTION** Auger should be securely fastened to the bin or building during operation or when raised and unattended.
5. Check to see that the clean-out doors and access panels are in place and secured. The flip-up cover on the swivel head should be closed.
6. The tractor should be positioned in a straight line with the auger to avoid unnecessary stress on the PTO joints.

MOVING GRAIN

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 the tractor engine and be sure a supply of grain is available. Slowly engage PTO clutch and increase RPM to handle grain supply. New augers should always be run at reduced capacity until tube and screw become polished. This would also be true of an auger which has not been used for some time.

Be alert for any unusual vibrations or noises that might indicate a need for service or repair.

- ❖ Engage the PTO slowly at low rpm to minimize shock loads. Then gradually Increase the rpm to your desired operating speed.

NORMAL OPERATION

While the auger is running, it is good practice to visually inspect the equipment periodically. Be alert for unusual vibrations, noises, and the loosening of any fasteners. **The operator should be in a position to monitor the operation of the auger at all times.**

In the event that the grain is conveyed into the boot faster than it can be taken up the main tube, the flip-up cover on the swivel head will be pushed up and grain will spill out. This is a safety feature to avoid plugging the main tube. If this happens, regulate the flow into the feed hopper to reduce the amount of grain delivered to the boot. **DO NOT OPEN THE FLIP-UP COVER DURING OPERATION !**

- 
1. Observe work area restrictions, as outlined in previous sections.
 2. Keep all safety shields and devices in place.
 3. **Make certain everyone is clear before operating or moving the auger.**
 4. **Keep hands, feet, hair, and clothing away from moving parts.**
 5. Shut off and lock out power to adjust, service, or clean any part of the auger.

A) Normal Shutdown

1. Make certain that the equipment is empty before stopping the unit.
 - ❖ Stopping and starting the auger under load may result in damage to the equipment. Such damage is considered abuse of the equipment.
2. Before the operator leaves the work area, the power source should be locked out.

- ❖ **Do not stop the auger under load, except for an emergency. The auger may 'freeze up', especially if the flight and tube are not yet well polished, or if the grain is extremely wet.**

B) Restarting after Emergency Shutdown

1. After an emergency shut down under a load - disconnect and lock out the power source.
2. Clear as much grain as possible from the hopper and auger. Never attempt to restart with the auger completely full.
3. Reconnect power source and clear the auger gradually.

ANGLE OF OPERATION

Your auger is designed to operate between 8 and 44 degrees angle of elevation on the main tube. Capacity decreases and power requirement increases as the angle of operation increases. Therefore, it will be most efficient to operate at the lowest angle which will serve your needs.

Extended periods of operation at angles above 37 degrees can cause excessive wear on the PTO drive shaft and lead to premature failure.

CLEAN UP AND TAKE DOWN

1. Clean entire work area.
2. The grain remaining in the bottom of the boot can be cleaned out by removing the lower access cover.



Be sure to shut off and lock out power before removing any access covers or guards.

3. Remove anchors, supports, and chocks. If the auger has been tied off to the bin on top, remember to remove the tie-off straps before moving the auger out of position.
4. Disconnect the PTO shaft from the tractor.
5. Raise the feed hopper with the manual winch.
6. Move the auger slowly out of working position with towing vehicle, not by hand. Make certain everyone is clear, and watch out for obstructions.
7. Open the hydraulic shut-off valve. Lower the auger to the "full down" position immediately upon clearance of any obstructions.

❖ **As you lower the auger, be watchful that the swing-out hopper does not become entangled with the chassis frame tube. If you see a problem developing, stop and reposition the feed hopper before continuing to lower the auger.**

8. Before transport, be sure the swing out hopper is in raised position and secured with the safety chain.
9. Transport to the new work area or storage area. Observe previous transport and placement instructions.

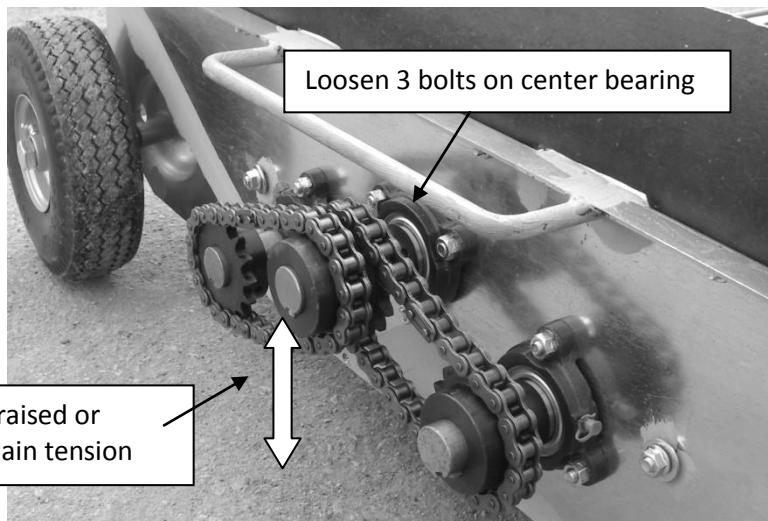
STORAGE

It is recommended that auger be stored in the "full down" position with the intake end anchored. This protects the auger against toppling over during a wind storm. It also eliminates the possibility of an inexperienced operator hooking up to a raised auger and driving the unit into an overhead power line.

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PERIODIC INSPECTION

1. The auger is subject to some vibration. Check at least once a week during operation for loose bolts and nuts. Pay special attention to critical areas such as : tube joiners, chassis lift assembly, PTO driveline, and retainer hardware on guards and access covers.
2. Inspect the truss cables. They should be taut and in good condition. If there is excessive downward bow in the auger tube, the truss cables should be tightened. Maintaining a straight auger tube will reduce noise and wear.
 - ❖ When tightening the cables, it will be helpful to provide a support at the discharge end of the auger to make the auger tube straight or bowed slightly upward. Use the adjusting nuts on the eyebolts to tighten the cable. If there is insufficient take-up in the eyebolts to achieve the necessary tension, the cables should be re-rigged. (Refer to Step # 8 and Figure 5 in the Assembly section of this manual)
3. Check the tension in the chain drive on the boot. To tighten the chain, loosen the four nuts on the intake shaft bearing. The bearing will slide downward to tighten the chain. Re-tighten the four nuts on the bearing. (Refer to Step # 15 and Figure 24 in the Assembly section)
4. Check the tension in the two chains on the end of the swing feeder. To adjust these chains, loosen the three bolts on the center shaft bearing. The center shaft can now be raised to increase chain tension.



5. Inspect the hydraulic hose and fittings and repair any leaks. The hydraulic cylinder has a breather vent in the lower port - if there is oil continually leaking from this vent, it would indicate that the internal seals need to be replaced.

(Note that a new cylinder may leak some oil from the breather vents soon after the auger is assembled. The cylinders have a small amount of residual oil when shipped from the factory. This will normally leak from the breather vent in the first few weeks after the auger is assembled, and does not indicate bad seals.)



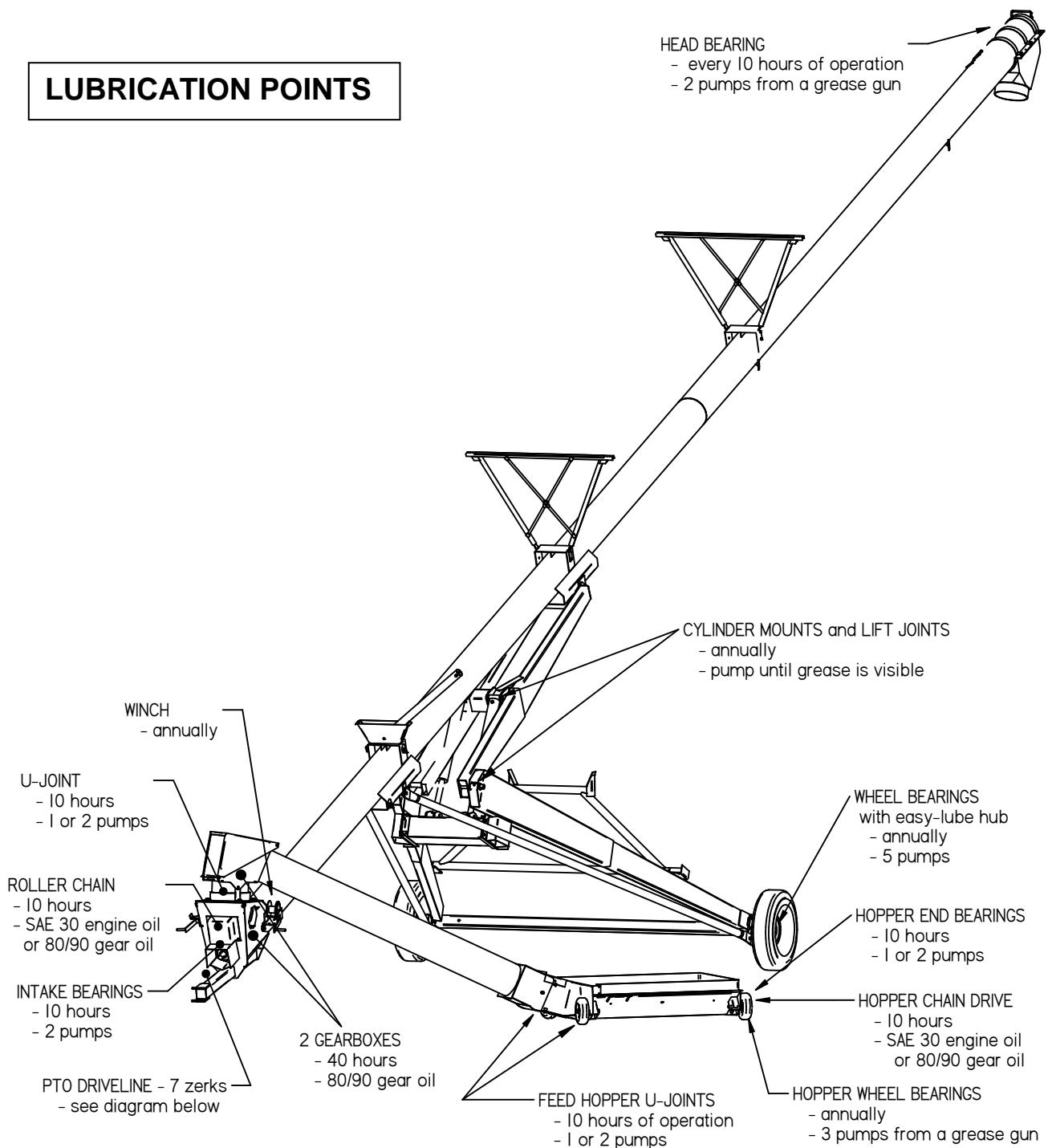
CAUTION: Hydraulic systems are highly pressurized. Escaping hydraulic oil, even an invisible pinhole leak, can penetrate body tissues and cause serious injury. When looking for leaks, use a piece of wood or cardboard; NEVER use the hands or other parts of the body. If injured by hydraulic oil escaping under pressure, see a doctor immediately. Serious infection or reaction may occur if medical attention is not received at once.

6. Check the upper and lower gearboxes. Oil level should be up to the fill plug on the side of each box. Oil leaking from the gearboxes could indicate a bad bearing or seal. (Refer to the gearbox diagrams in the Parts section for replacement parts)
7. Visually inspect the 4 hanger bearings in the swing feeder assembly. If the bronze bushings are badly worn, they can be replaced without buying the entire hanger bearing assembly. (The replacement bushings are available from Cardinal Grain - part # 23416). Press out the old bushings and press in the new ones.
8. Wheels : Are the tires properly inflated? Are the lug nuts tight? Is there side-to-side play that might indicate loose wheel bearings?
9. Check all safety signs and decals and replace any that are damaged, missing, or unreadable. Refer to the diagram in the first section of this manual showing the safety decals and their locations on the auger.

PTO Overload Protection

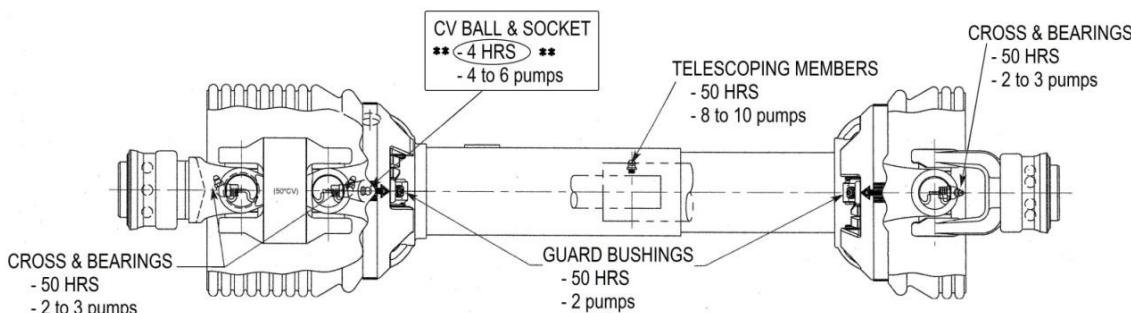
There is an overload shear device built into the PTO driveline. If the maximum operating torque is exceeded, the bolt will shear to protect the equipment. Replace the shear bolt only with the correct size and grade of bolt: For the Cardinal 13" swing auger, the bolt should be 7/16-14 x 1, grade 8.

LUBRICATION POINTS



CV DRIVELINE LUBRICATION POINTS

!! Failure to lubricate as recommended will void warranty !!

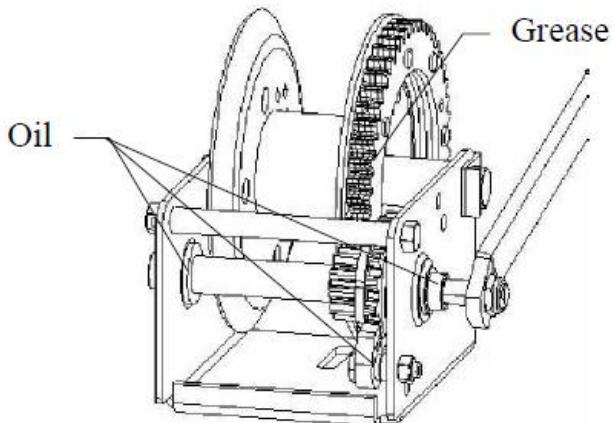
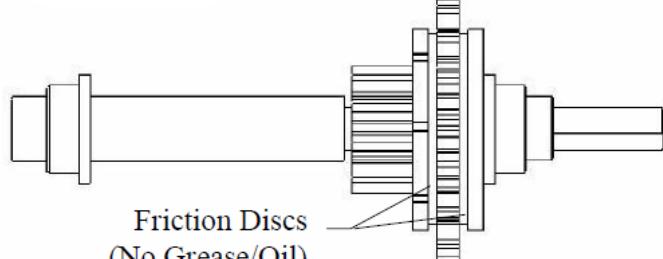


LUBRICATE ALL FITTINGS WITH A GOOD QUALITY LITHIUM SOAP COMPATIBLE E.P. GREASE MEETING THE N.L.G.I. #2 SPECIFICATIONS AND CONTAINING NO MORE THAN 1% MOLYBDENUM DISULFIDE.

WINCH MAINTENANCE

The following procedures should be performed at least annually :

1. The gears and bushings of the winch must be kept lubricated. Apply a thin film of grease to the gear teeth, and oil the bushings as needed.
2. The ratchet pawl pivot point must be kept lubricated with a thin oil.
3. **Do not get oil or grease on the friction**



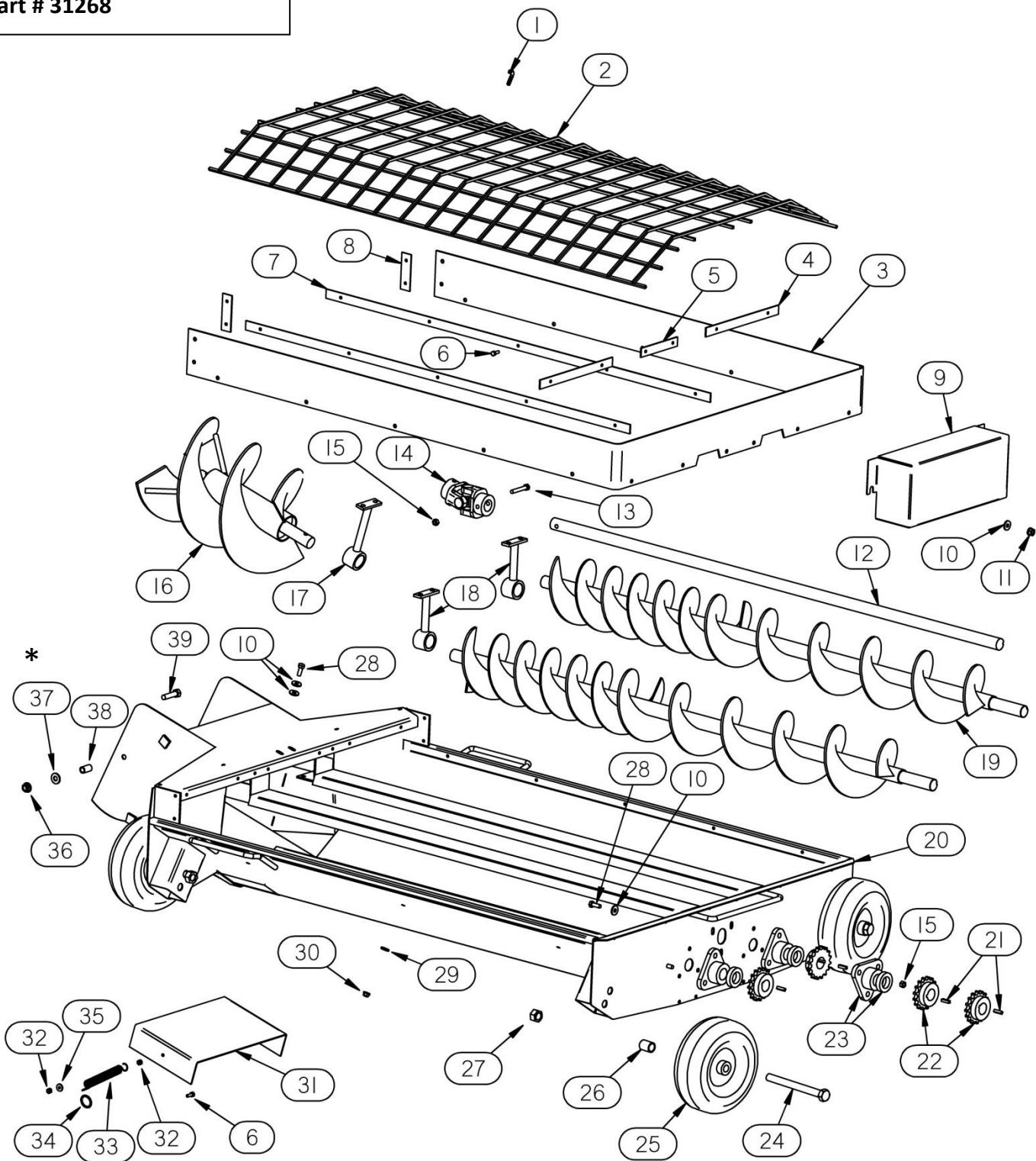
discs!

Replacement parts for the winch are available through Cequent Trailer Products Customer Service Department at (715) 693-1700, or (800) 604-9466. The product model number will be needed. Additional details can be found at www.cequentgroup.com

PARTS

Swing Feeder Assembly

part # 31268



* Item 37 (1/2" Flat Washer) is used on one side only.

Swing Feeder Assembly, complete - order part # 31268

- consists of :

Item #	Part #	Description	Qty
1	30723	J-bolt, 5/16-18 x 1-1/2	3
2	31240	Hopper Guard Mesh	1
3	31248	Rubber Splash Guard (standard, 5 in width)	1
4	31335	End Splash Retainer	2
5	31239	Splash Retainer, short	1
6	102233	Bolt, 1/4-20 x 3/4	22
7	30561	Splash Guard Retainer	2
8	30572	Splice Plate	2
9	31238	Chain Guard, hopper end	1
10	01294	Flat Washer, 3/8	9
11	31174	Flanged Whiznut, 3/8-16	2
12	31247	Hopper Drive Shaft	1
13	24790	Coupler Bolt, 3/8 x 2-5/16	2
14	25320	Universal Joint, 1-1/4	1
15	01274	Nut, 3/8-16, centerlock	17
16	31244	Pivot Screw	1
17	31288	Hanger Bearing	1
18	30593	Hanger Bearing	2
19	31245	Hopper Screw	2
20	31257	Feed Hopper Weld Assbly	1

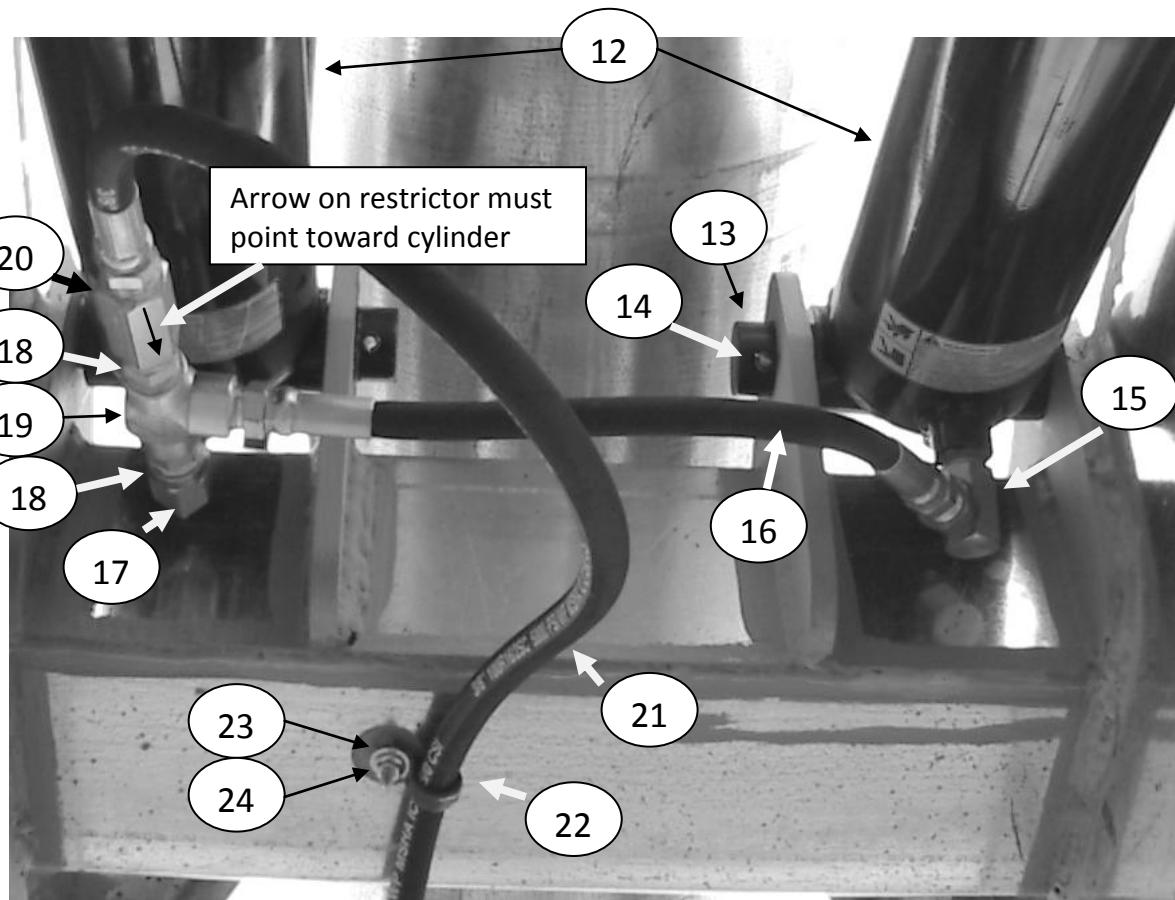
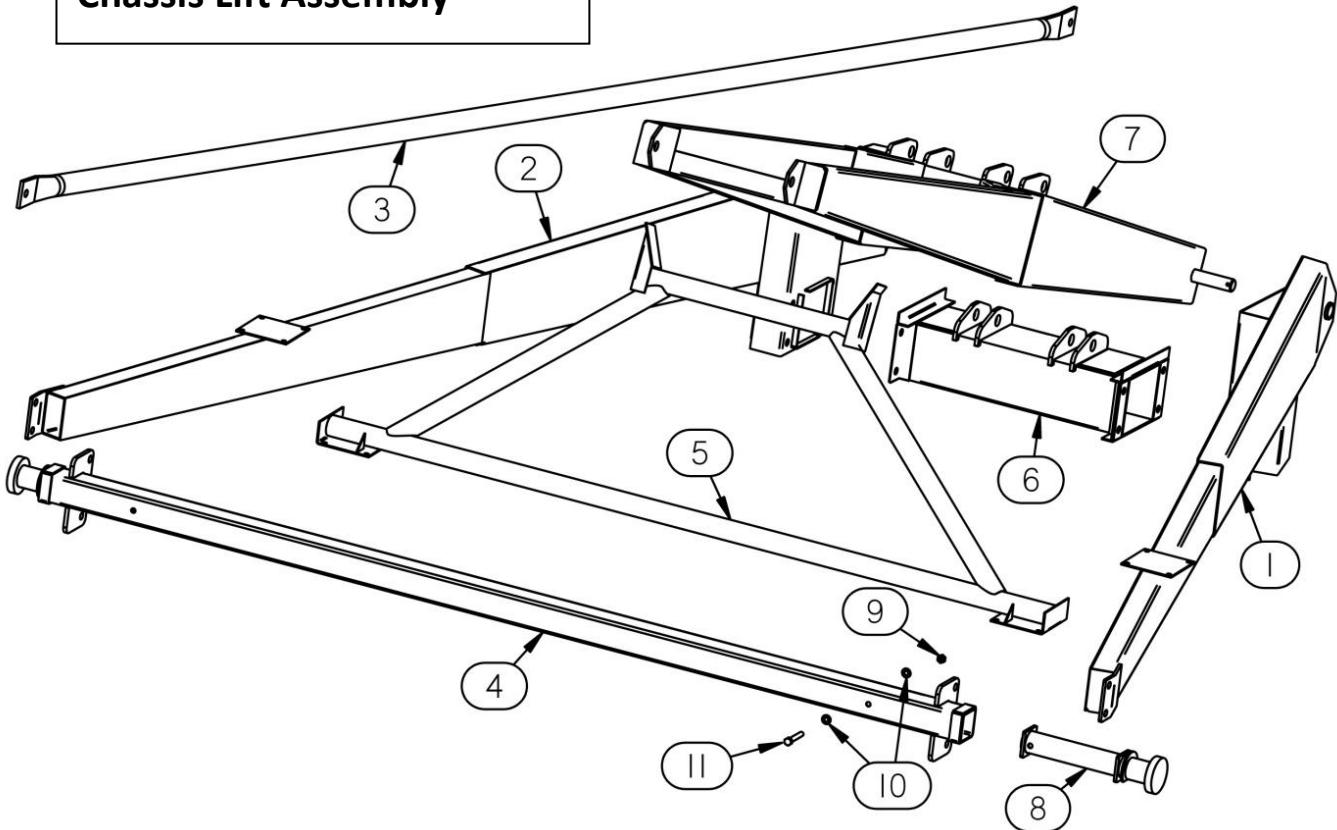
Item #	Part #	Description	Qty
21	25139	Square Key 1/4 x 1	4
22	31289	Sprocket, #50, 16 tooth	4
23	20648	Bearing, 3-bolt flange with lock collar	3
24	30714	Bolt, 3/4-10 x 8	4
25	31060	Wheel, 10 inch, flat-free	4
26	30726	Stand-off Spacer	4
27	01278	Nut, 3/4-10, centerlock	4
28	01175	Bolt, 3/8-16 x 1	15
29	01293	Washer, 5/16 flat	3
30	30624	Flanged Whiznut, 5/16-18	3
31	31223	Pivot Box Cover	1
32	01271	Nut, 1/4-20, centerlock	24
33	30724	Extension Spring	2
34	30725	Hook Ring, #6 x 1-1/4	2
35	102060	Washer, 1/4 flat	2
36	01332	Flanged Whiznut, 1/2 -13	2
37	01295	Washer, 1/2 flat	1
38	30507	Pivot Tube Spacer	2
39	01370	Bolt, 1/2 -13 x 2	2
Not shown	00128	Chain, # 50 x 34 pitches	2
	15767	Connector Link, RC50	2

Optional **12 inch Tall Splash Guard** consists of the following items :

31334	Tall Rubber Splash Guard, 12 in	1
31335	End Splash Retainer	3
30572	Splice Plate	4
102233	Bolt, 1/4 -20 x 3/4	10
01271	Nut, 1/4-20 centerlock	10

NOTE : A bronze bushing insert (part # 23416) is available as a repair part for the hanger bearings (items 17 + 18)

Chassis Lift Assembly



Chassis Lift Assembly

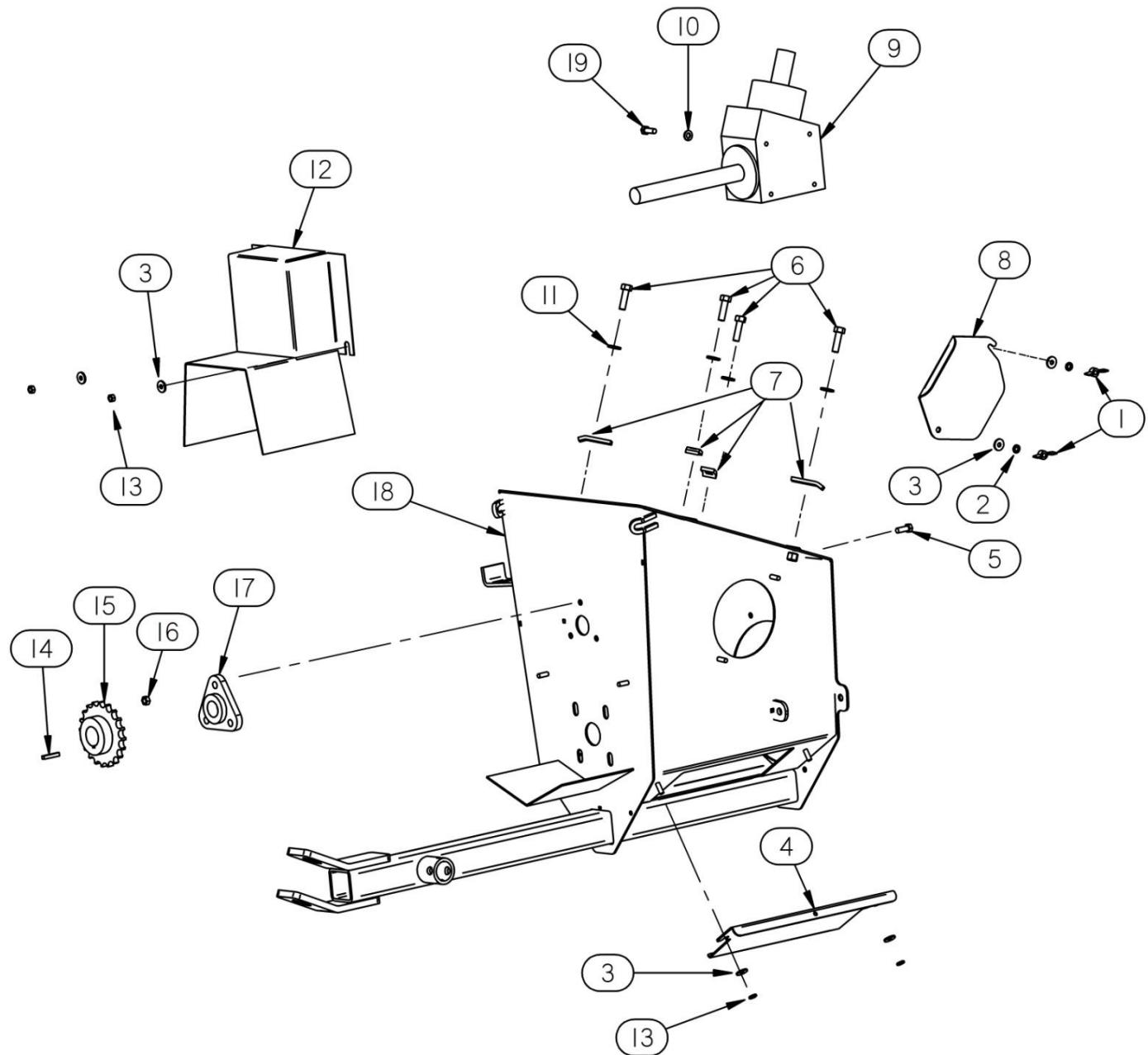
Item #	13 x 62	13 x 72 and 13 x 82	Description	Qty
	Part #			
1	31406	31263	Lower Arm – left	1
2	31405	31264	Lower Arm - right	1
3	31404	30871	Chassis Frame Arm	2
4	31403	30888	Axle Tube	1
5	31266		Lift Support	1
6	31267		Lower Cross Tube	1
7	31265		Upper Arm	1
8	30887		Axle Stub	2
9	01277		Nut, 5/8-11, centerlock	2
10	01296		Washer, flat	4
11	31164		Bolt, 5/8-11 x 5	2
12	31294		Hydraulic Cylinder, 4 x 30	2
13	30811		Cylinder Pin, long	2
14	31165		Spring Pin, 3/8 x 2-1/2	10
15	27486		Elbow, 90 deg with swivel	1
16	31400		Hydraulic Hose, 3/8 x 15 in	1
17	30039		Hydraulic Street Elbow, ½ in	1
18	27487		Hydraulic Nipple, ½ in	2
19	31422		Hydraulic Tee, ½ in female	1
20	30006		Hydraulic Restrictor, ½ in female	1
21	31277		Hydraulic Hose, 3/8 x 6 ft	1
22	30753		Hose Hanger	1
23	01291		Washer, flat ¼ in	1
24	01384		Whiznut, ¼-20	1

Additional Hardware for Chassis :

Part #	Description	Qty
30812	Cylinder Pin, short	2
01189	Bolt, ½-13 x 1-1/4	8
01276	Nut, ½-13 center lock	8
01409	Bolt, 7/8-9 x 2	12
01320	Flat Washer, 7/8	8
01331	Nut, 7/8-9 center lock	20
30765	Bolt, 7/8-9 x 3	4
31206	Wheel Lugnut	16

Boot Assembly

part # 31272



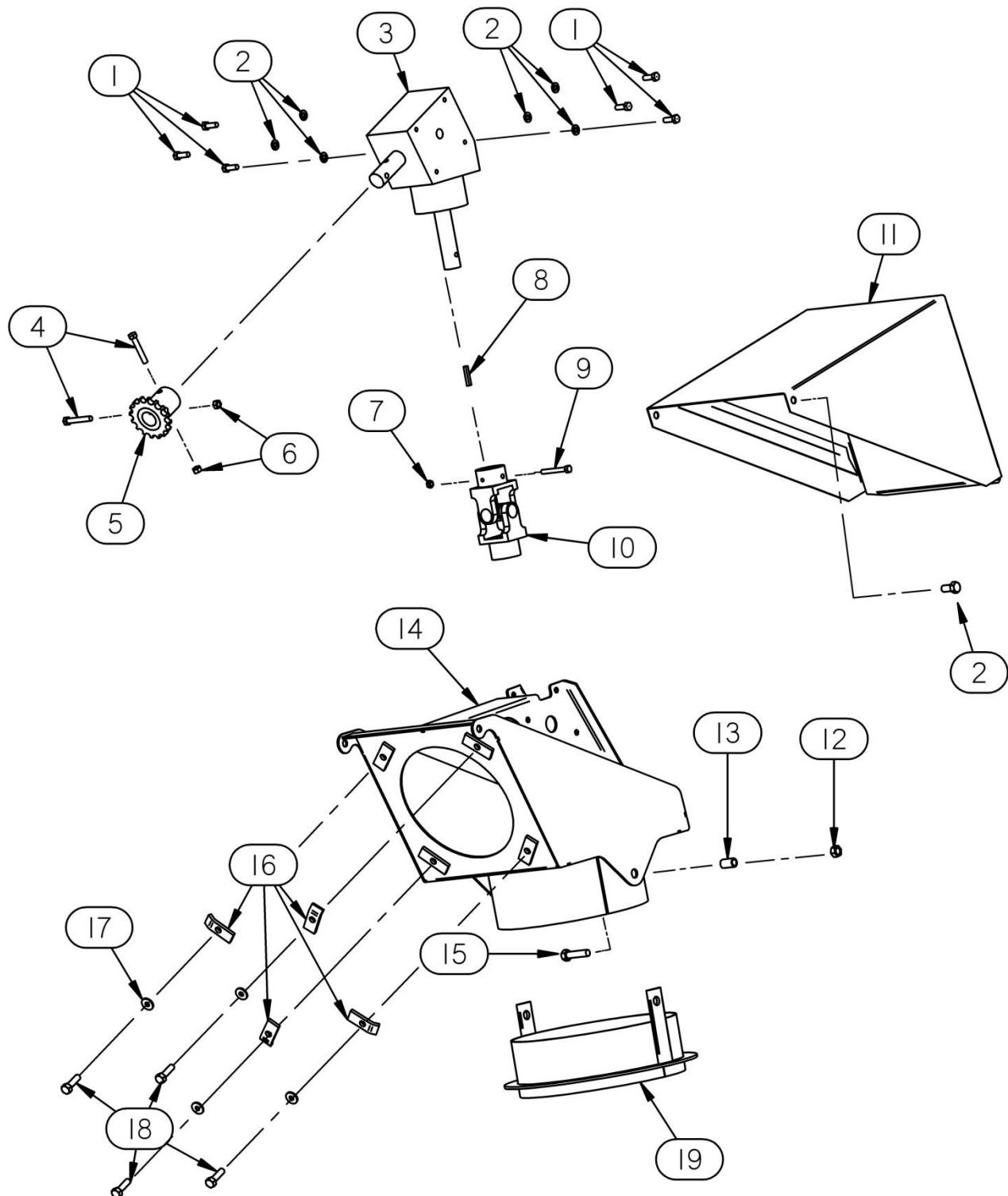
Boot Assembly, part # 31272

- consists of :

Item #	Part #	Description	Qty
1	18570	Wingnut, 5/16-18	2
2	102064	Lock Washer, 5/16	2
3	01293	Flat Washer, 5/16	6
4	30548	Access Cover, lower	1
5	01175	Bolt, 3/8-16 x 1	3
6	01428	Bolt, 7/16-14 x 1-1/2	4
7	30547	Keeper	4
8	30551	Access Cover, middle	1
9	30809	Gearbox, lower	1
10	01303	Lock Washer, 1/2	4
11	01294	Flat Washer, 3/8	4
12	30831	PTO Guard	1
13	30624	Whiznut, 5/16-18	4
14	19179	Square Key, 1/4 x 1-1/2	1
15	31292	Sprocket, #80, 20 tooth	1
16	01274	Nut, 3/8-16, centerlock	3
17	20648	Flange Bearing, 1-1/4, 3-bolt	1
18	31261	Boot Weld Assembly	1
19	01187	Bolt, 1/2-13 x 1	4
Not Shown	30769	Chain, #2 straight link, approx 50"	1
	30770	Snap Hook	1

Swivel Head Assembly

part # 31273



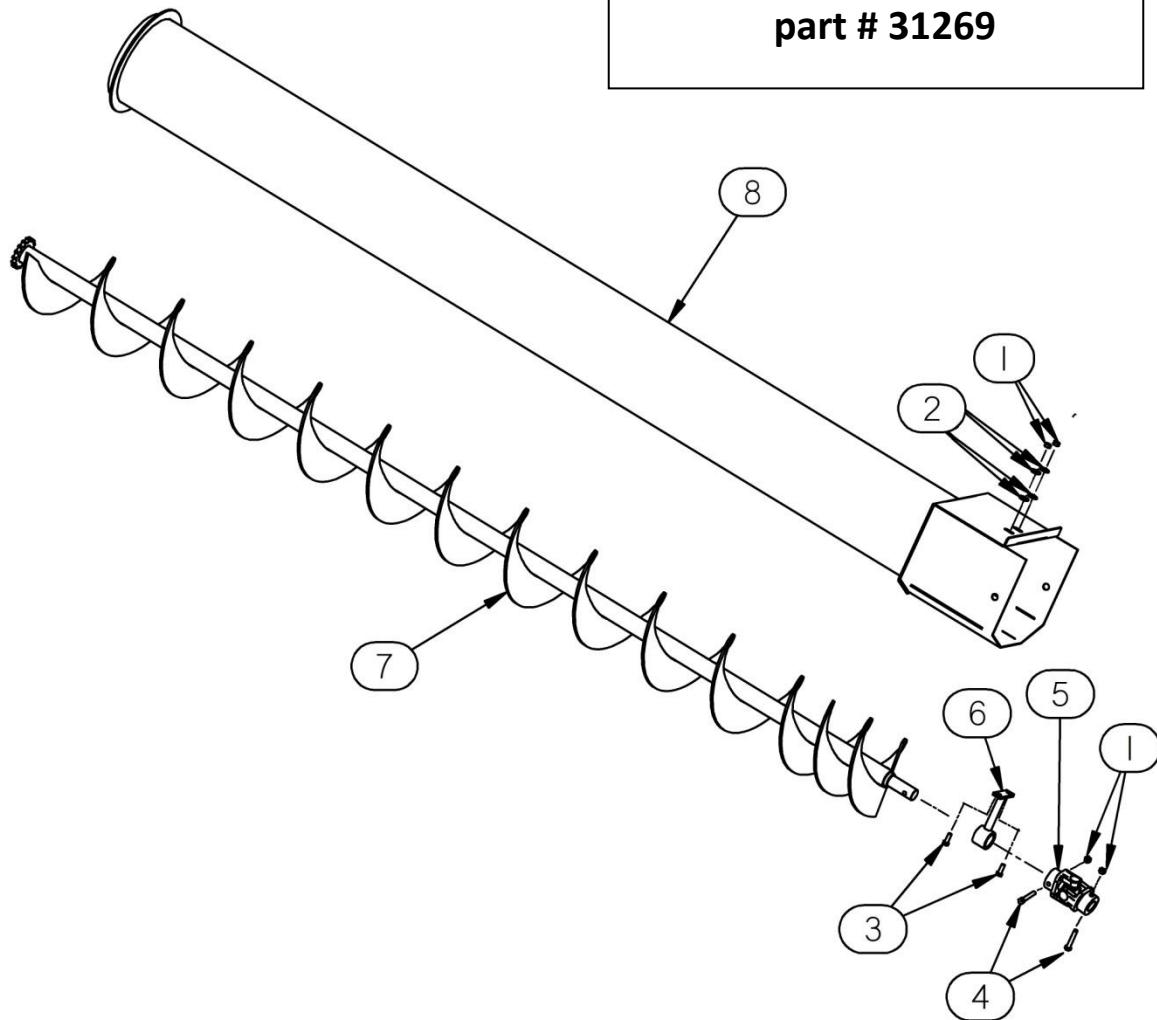
Swivel Head Assembly, part # 31273

- consists of :

Item #	Part #	Description	Qty
1	01187	Bolt, 1/2-13 x 1	8
2	01303	Lock Washer, 1/2	6
3	30808	Gearbox, upper	1
4	24790	Coupler Bolt, 3/8-16 x 2-5/16	2
5	30843	Half Coupling	1
6	01274	Nut, 3/8-16, centerlock	2
7	01273	Nut, 5/16-18, centerlock	1
8	19179	Square Key, 1/4 x 1-1/2	1
9	30759	Bolt, 5/16-18 x 2-1/2	1
10	30563	U-joint, 1-3/8 spline x 1-1/4 round	1
11	30838	Swivel Head Cover	1
12	01276	Nut, 1/2-13, centerlock	2
13	30507	Pivot Tube Spacer	2
14	31262	Swivel Head Weld Assembly	1
15	01370	Bolt, 1/2-13 x 2	2
16	30547	Keeper	4
17	01294	Flat Washer	4
18	01428	Bolt, 7/16-14 x 1-1/2	4
19	30842	Swivel Pivot Weld Assembly	1
Not shown	30805	D-Bulb Weatherstrip, approx 45 in	1

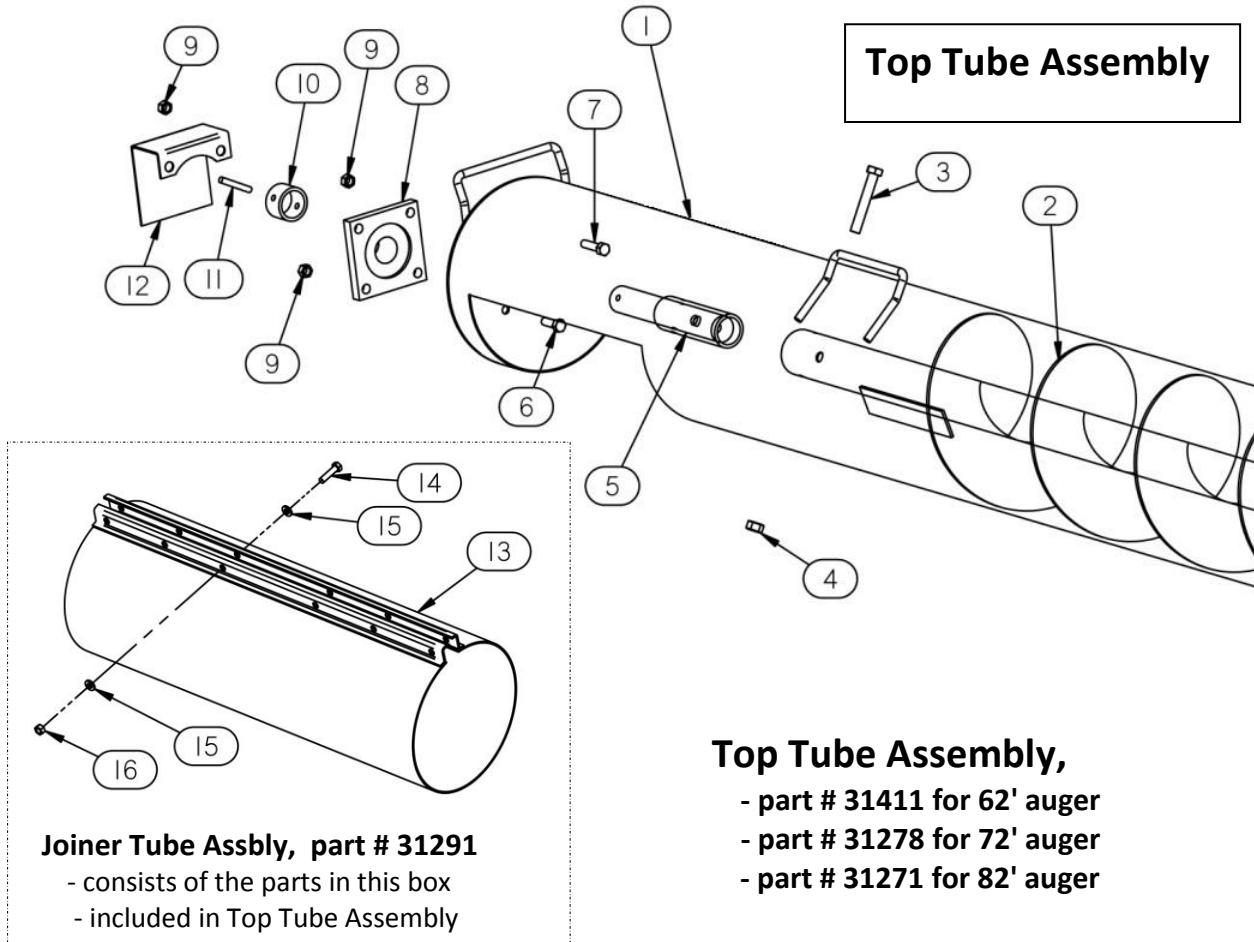
Incline Tube Assembly

part # 31269



Item #	Part #	Description	Qty
1	01274	Nut, 3/8-16, centerlock	4
2	01294	Washer, 3/8 flat	4
3	01175	Bolt, 3/8-16 x 1	2
4	24790	Coupler Bolt, 3/8-16 x 2-5/16	2
5	25320	Universal Joint, 1-1/4 bore	1
6	31288	Hanger Bearing	1
7	31254	Srew Weld Assbly	1
8	31258	Incline Tube Weld Assembly	1

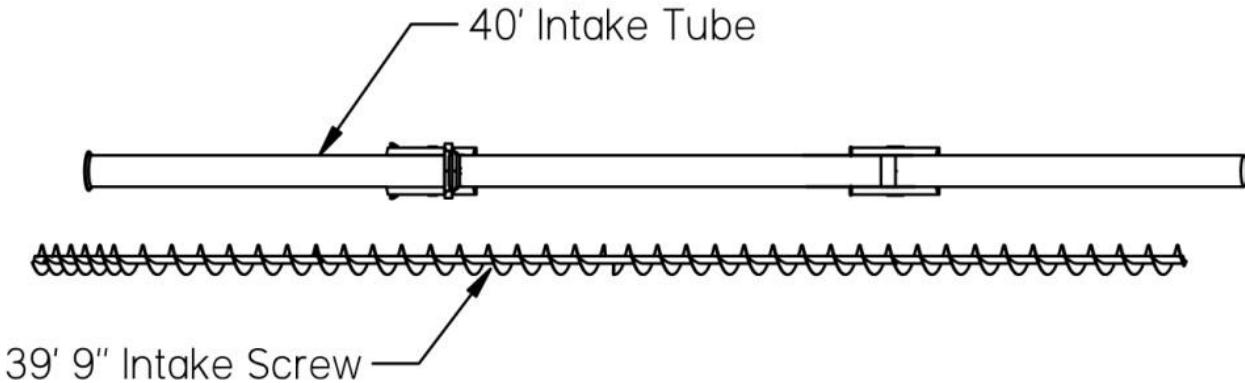
NOTE : A bronze bushing insert (part # 23416) is available as a repair part for the hanger bearing (item 6)

**Top Tube Assembly,**

- part # 31411 for 62' auger
- part # 31278 for 72' auger
- part # 31271 for 82' auger

Item #	Part #	Description	Quantity		
			13x62	13x72	13x82
1	31412	Top Tube WA for 62' auger	1		
	31260	Top Tube WA for 72' auger		1	
	31256	Top Tube WA for 82' auger			1
2	31413	Discharge Screw for 62' auger	1		
	31252	Discharge Screw for 72' and 82' auger		1	1
Not shown	31253	Intermediate Screw, 10 ft length			1
	31402	3/8 Cable Clamp with short saddle	2	4	
3	31163	Bolt, 5/8-11 x 4	2	4	
4	01277	Nut, 5/8-11, center lock	2	4	
5	31290	Discharge Shaft		1	
6	01190	Bolt, 1/2-13 x 1-1/2		2	
7	01370	Bolt, 1/2-13 x 2		2	
8	31139	Flange Bearing, 1-3/4", 4-bolt, w/ lock collar		1	
9	01276	Nut, 1/2-13, centerlock		6	
10	31338	Thrust Collar		1	
11	31165	Spring Pin, 3/8 x 2-1/2		1	
12	31339	Top Guard		1	
13	30897	Joiner Band weld assembly		1	
14	01404	Hex Bolt, 3/8-16 x 1-1/2, grade 8		8	
15	28453	Clamp Washer, SAE 3/8		16	
16	28456	Nut, 3/8-16, centerlock		8	

Intake Tube Assembly



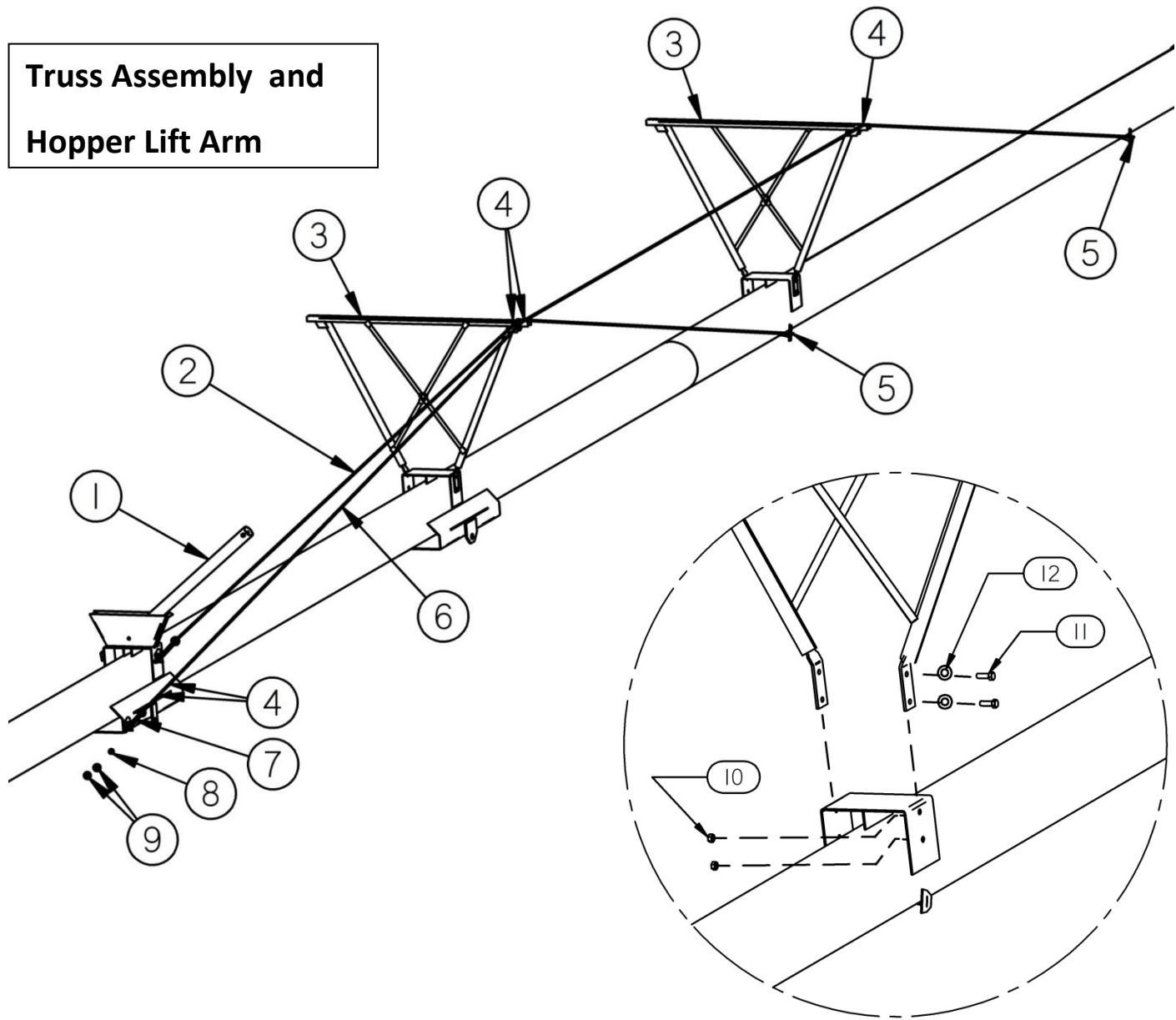
Intake Tube Assembly,

- order part # 31410 for 62' auger
or part # 31270 for 72' and 82' augers

- consists of :

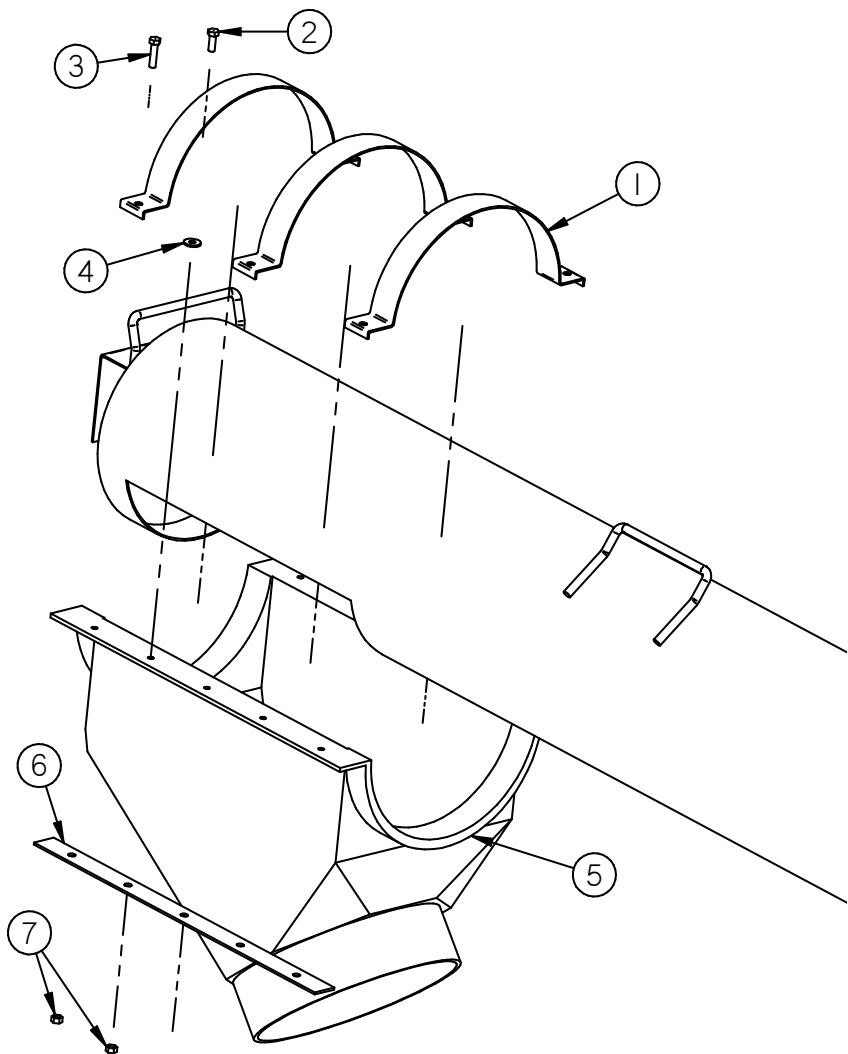
Part #	Description	Quantity
31409	Intake Tube Weld Assembly for 13x62 auger	1
31259	Intake Tube WA for 13x72 and 13x82	
31251	Intake Screw, 39 ft 9 in	1

**Truss Assembly and
Hopper Lift Arm**



Item	Description	13 x 62	13 x 72	13 x 82
		Part # (Quantity)		
1	Hopper Lift Arm	31417 (1)	30737 (1)	
2	3/8" Steel Cable (short cable)	NA	71 ft (1)	85 ft (1)
3	Truss Support		30898 (2)	
4	3/8 Cable Clamp	31280 (8)	31280 (14)	
5	3/8 Cable Clamp with short saddle	31402 (2)	31402 (4)	
6	3/8" Steel Cable (long cable)	96 ft (1)	110 ft (1)	130 ft (1)
7	Eyebolt, 5/8-11 x 10	30787 (2)	30787 (4)	
8	Flat Washer	01296 (2)	01296 (4)	
9	Nut, 5/8-11	01330 (4)	01330 (8)	
10	Locknut 1/2-13		01276 (8)	
11	Bolt, 1/2-13 x 1-1/4		01189 (8)	
12	Flat Washer, 1/2 in		01295 (8)	

Spout Assembly



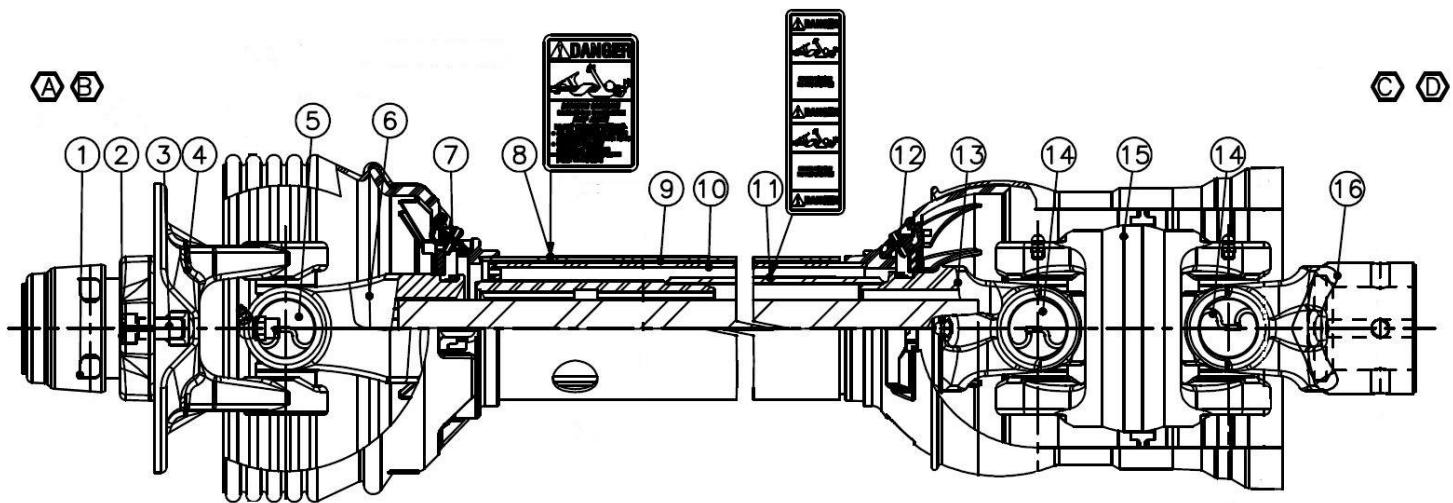
Item #	Part #	Description	Quantity
1	30845	Clamp Band Half for 13 inch	3
2	01175	Bolt 3/8-16 x 1, grade 5	4
3	01404	Bolt, 3/8-16 x 1-1/2, grade 5	6
4	01294	Flat Washer, 3/8	4
5	31063	13" Discharge Spout – Black Poly, 50 deg	1
6	30846	Backer Plate for 13" Spout	2
7	01276	Hex Nut, 3/8-16, center lock, grade 5	10

Additional Parts and Hardware

Part #	Description	Quantity
00111	Cable, 1/4 galv (7x19) 37 feet	1
20385	Cable Winch, 1500 lb	1
31139	Flange Bearing, 1-3/4 in, 4-bolt	1
30032	Hydraulic On/Off Valve	1
27487	Hydraulice Nipple ½ inch	1
31293	Sprocket, #80, 20 tooth, 1-3/4 in bore	1
30810	PTO Driveshaft	1
28408	Jack, swivel mount side wind	1
30031	Hydraulic Hose, 3/8 x 34 ft	1
30807	Intake Drive Shaft	1
30598	Winch Mount	1
103002	Connecting Pin	1
102042	Pin, Hitch Clip, 2-5/8 long	1
30834	Bearing Bolt weld assembly	1
31216	Hook up pin	1
01299	Washer, Flat, 1-1/4 in	2
31167	Wheel, 16 in, 8 holes on 6.5 in circle	2
26321	Decal, Cardinal 41 inch	2
26320	Decal, Cardinal 22 inch	2
00132	Connector Link for #50 Double Chain	1
31296	Double Roller Chain, RC50, 22 pitches	1
30461	Connector Link for #80 Roller Chain	1
31295	Roller Chain, RC80, 40 pitches	1
27439	Rigid Eye Spring Hook	1
30753	Hose Hanger	5
01384	Whiznut, 1/4-20	5
01291	Flat Washer, 1/4 in	5
31165	Spring Pin, 3/8 x 2-1/2	3
31163	Bolt, 5/8-11 x 4	5
01277	Nut, 5/8-11	5
26190	Cable Thimble, 1/4 in	1
15188	Cable Clamp, ¼ in	2
27316	Square Key, 3/8 x 1-3/4	2
01175	Bolt, 3/8-16 x 1	3
01274	Nut, 3/8-16, centerlock	3
01294	Washer, Flat, 3/8	3
01276	Nut, 1/2-13, centerlock	4
01428	Bolt, 7/16-14 x 1-1/2	12
01284	Nut, 7/16-14, centerlock	12

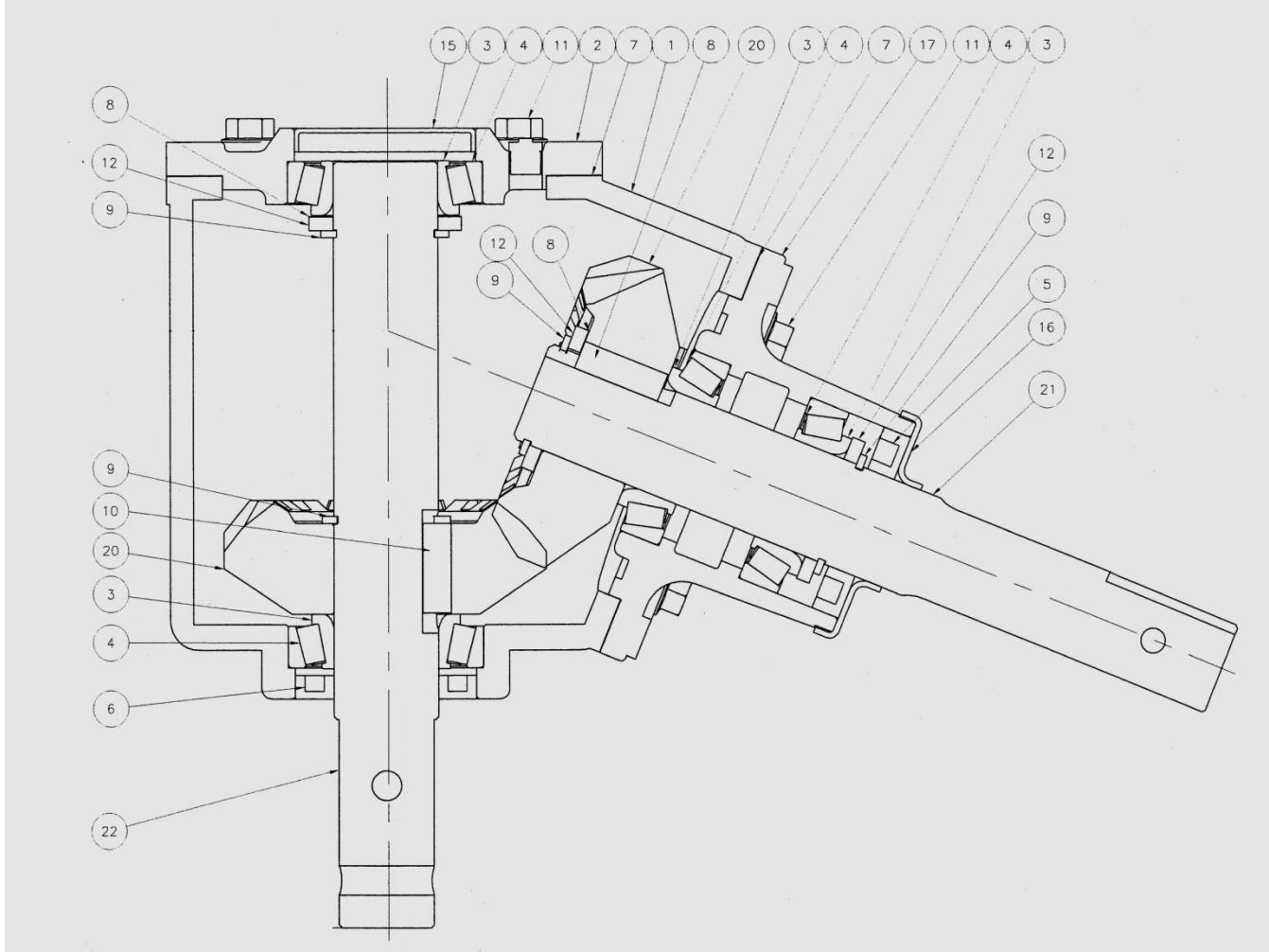
PTO DRIVELINE

part # 30810



PARTS LIST

ITEM	QTY.	PART NUMBER	DESCRIPTION
A	1	93-25483	JOINT & SHAFT HALF ASM. w/GUARD
B	1	95-25483	JOINT & SHAFT HALF ASM
C	1	92-25483	JOINT & TUBE HALF ASM. W/GUARD
D	1	94-25483	JOINT & TUBE HALF ASM.
1	1	26-15120	SSL/AUTO-LOK REPAIR KIT
2	1	11-14629	BOLT, 7/16-14 x 1.00 LG., GR. 8
3	1	11-11142	LOCKNUT, 7/16-14
4	1	40-10096	BALL SHEAR ASM.
5	1	03-15303	35E CROSS KIT
6	1	99-25483	YOKE & SHAFT (1.19 SQUARE)
7	1	19-15126	GUARD REPAIR KIT
8	1	13-10021	SAFETY SIGN
9	1	97-25483	OUTER GUARD
10	1	96-25483	INNER GUARD
11	1	13-10022	SAFETY SIGN
12	1	19-15129	GUARD REPAIR KIT
13	1	98-25483	YOKE, TUBE & SLIP SLEEVE
14	2	03-15287	35EBL CROSS KIT
15	1	35271-1880	CV CENTER HOUSING
16	1	35441-1001	YOKE



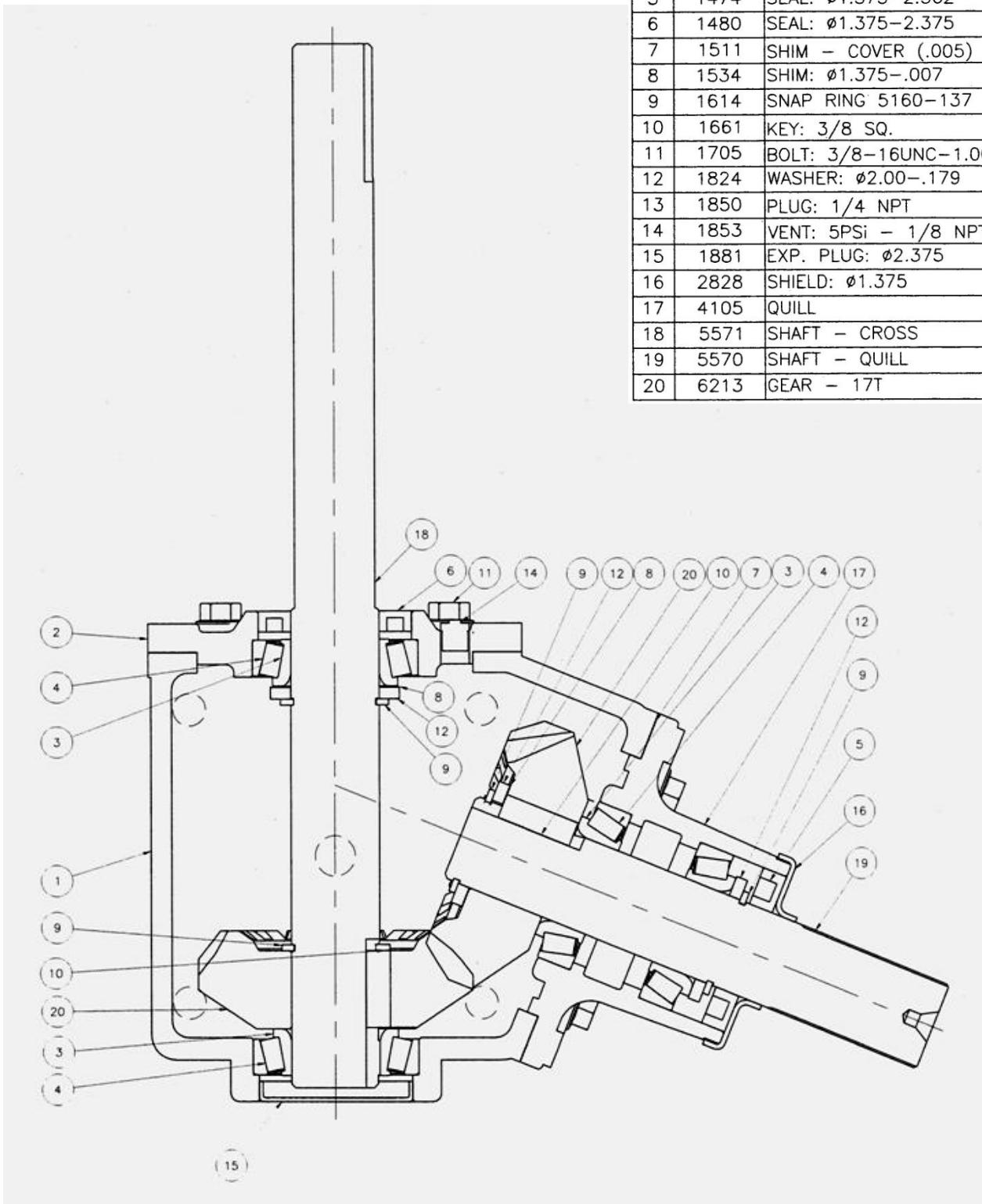
UPPER GEARBOX
part # 30808

30808 Parts List			
ITEM	PART NO.	DESCRIPTION	QTY
1	1089	CASE - 668	1
2	1140-2	COVER - 1/8 NPT	1
3	1410	BRG. CONE LM48548	4
4	1411	BRG. CUP LM48510	4
5	1474	SEAL: Ø1.375-2.562	1
6	1480	SEAL: Ø1.375-2.375	1
7	1511	SHIM - COVER (.005)	2
8	1534	SHIM: Ø1.375-.007	2
9	1614	SNAP RING 5160-137	4
10	1661	KEY: 3/8 SQ.	2
11	1705	BOLT: 3/8-16UNC-1.00	8
12	1824	WASHER: Ø2.00-.179	3
13	1850	PLUG: 1/4 NPT	2
14	1853	VENT: 5PSI - 1/8 NPT	1
15	1881	EXP. PLUG: Ø2.375	1
16	2828	SHIELD: Ø1.375	1
17	4105	COVER - QUILL	1
21	5568	QUILL SHAFT	1
22	5569	CROSS SHAFT	1
20	6213	GEAR - 17T	2

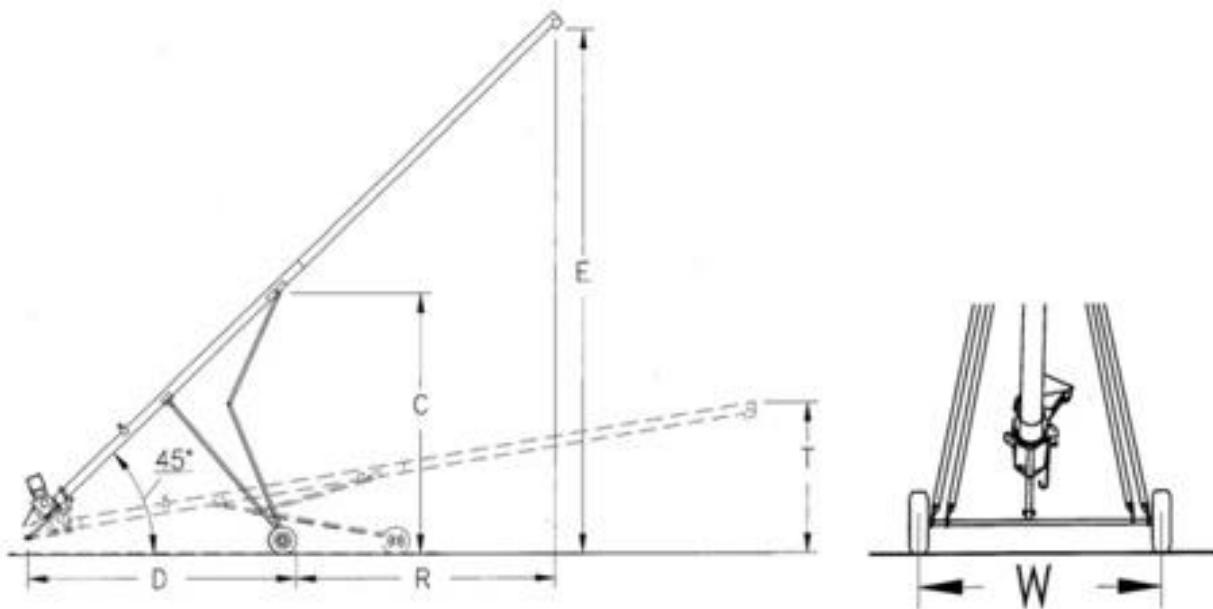
LOWER GEARBOX

part # 30809

Parts List			
ITEM	PART NO.	DESCRIPTION	QTY
1	1089	CASE - 668	1
2	1140-2	COVER - 1/8 NPT	1
3	1410	BRG. CONE LM48548	4
4	1411	BRG. CUP LM48510	4
5	1474	SEAL: Ø1.375-2.562	1
6	1480	SEAL: Ø1.375-2.375	1
7	1511	SHIM - COVER (.005)	2
8	1534	SHIM: Ø1.375-.007	2
9	1614	SNAP RING 5160-137	4
10	1661	KEY: 3/8 SQ.	2
11	1705	BOLT: 3/8-16UNC-1.00	8
12	1824	WASHER: Ø2.00-.179	3
13	1850	PLUG: 1/4 NPT	2
14	1853	VENT: 5PSI - 1/8 NPT	1
15	1881	EXP. PLUG: Ø2.375	1
16	2828	SHIELD: Ø1.375	1
17	4105	QUILL	1
18	5571	SHAFT - CROSS	1
19	5570	SHAFT - QUILL	1
20	6213	GEAR - 17T	2



Diameter	13"	13"	13"
Length	62'	72'	82'
Dry Grain Capacity 30 deg.	8000 bushels per hour		
Main Tube Gauge	12 gauge		
Main Tube Flighting	1/4"		
Feed Tube Flighting	1/4"		
Trussing	Double 3/8" Galv Cable		
PTO Driveline	35 Series w/ Extended Lube Bearings		
Main Screw RPM	540 RPM		
Lift Type	Hydraulic Scissor Lift		
Wheel	16" Trailer Style		
Hub Style	8 stud on 6.5 BC		
(E) Elevation	44' 5"	51' 9"	58'
(R) Reach	21'	24' 6"	31' 9"
(C) Clearance	22' 10"	28'	28'
(D) Distance	24' 9"	28'4"	28'4"
(W) Wheel Track Width	132"	147"	147"
(T) Transport Height @ 18" Hitch	12' 6"	12'9"	14'3"
Hopper Size	41"x60"x11"		
Horsepower Required	90	100	110
Hydraulic Lift Pressure (psi)	1150	1350	1450



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Cardinal_{TM} 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**





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.cardinalfarm.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.



Portable Grain Augers

www.Cardinalfarm.com

Friendly, knowledgeable customer service professionals
are ready to say... **YES WE CAN!** Call the new
Cardinal Grain and see what we can do for you.

888-400-3545

Novae Corp.

607 South Chauncey St.
Columbia City, IN 46725
(260) 244-4654
Fax (260) 244-7355

E-Mail: cardinalgrain@novaecorp.com