

Series II Sweep Protected Cord Slip Ring Sump

Installation Manual

PNEG-1722

Date: 12-07-09

GSI GROUP



PNEG-1722

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Product Information

1. The Series II Sweep hopper with collector ring includes the following components:

- Hopper
- Collector ring
- Center brace support
- Collector ring shield



NEVER enter a grain bin unless ALL power driven equipment has been shut down. Disconnect and lock out power before entering the bin or servicing the equipment.

General Information

1. GSI reserves the right to improve its product whenever possible and practical to do so. We reserve the right to change, improve and modify products at any time without obligation to make changes, improvements and modifications on equipment sold previously.
2. This new hopper with collector ring has been engineered and manufactured to give years of dependable service. The care and maintenance of this equipment will affect the satisfaction and service obtained. By following the instructions and suggestions recommended, the owner should receive quality service for many years. If additional information or assistance should be required, please contact GSI.
3. It is important to check both the quantity of parts and their descriptions with the packing list enclosed within each package. All claims for freight damage or shortage must be made by the consignee within ten (10) days from the date of the occurrence of freight damage. The consignee should accept the shipment after noting the damage or loss.

Capacities and Specifications

Electrical controls and wiring should be installed by a qualified electrician. The motor disconnect switches and conductor cables should comply with the National Electrical Code and any local codes which apply. Reset and motor starting stations should be located so that the operator can see that all personnel are clear of the equipment.

1. Disconnect and lock out the power before entering the bin.
2. Disconnect and lock out the power before servicing the equipment.



There should ALWAYS be two (2) people in the work area.



A main power disconnect switch capable of being locked only in the OFF position should be used. It should be locked whenever work is being done on the hopper.

Slip Ring Introduction

Slip rings must be enclosed and protected from any contact by personnel.

Specifications and Listings

1. R-Series slip ring products are built to UL specifications but are not generally certified or listed by any independent certifying or regulatory body.
2. The following specifications apply to all R-Series slip rings:
 - a. R-Series slip rings are intended for industrial use and require a permanent mounting means.
 - b. Maximum RPM for units w/o ball bearings is 125. Maximum for units with ball bearings is 500 RPM.

Temperature and Ampere/Voltage Ratings

1. R-Series slip rings withstand a maximum ambient temperature of 220°F.
2. The model number of the slip ring assembly indicates the ampacity and voltage rating of each type of ring and brush included on the assembly. *(See Page 30.)* **NOTE:** *The actual ampacity may be affected by the type and size of the core lead wire (refer to NEC Table 310-16, 17, 18, 19 and applicable notes).*

Markings

1. Every slip ring is marked with a label on the outboard bearing (or enclosure) which includes the Insul-8/IER name and logo, the product catalog number and the individual product serial number.
2. The marking on slip rings includes the maximum amperage and voltage.

Safety Guidelines

This manual contains information that is important for you, the owner/operator, to know and understand. This information relates to protecting **personal safety** and **preventing equipment problems**. It is the responsibility of the owner/operator to inform anyone operating or working in the area of this equipment of these safety guidelines. To help you recognize this information, we use the symbols that are defined below. Please read the manual and pay attention to these sections. Failure to read this manual and its safety instructions is a misuse of the equipment and may lead to serious injury or death.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.



CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.



NOTE indicates information about the equipment that you should pay special attention.

Safety Instructions

Our foremost concern is your safety and the safety of others associated with this equipment. We want to keep you as a customer. This manual is to help you understand safe operating procedures and some problems which may be encountered by the operator and other personnel.

As owner and/or operator, it is your responsibility to know what requirements, hazards and precautions exist, and to inform all personnel associated with the equipment or in the area. Safety precautions may be required from the personnel. Avoid any alterations to the equipment. Such alterations may produce a very dangerous situation where **SERIOUS INJURY** or **DEATH** may occur.

This equipment shall be installed in accordance with the current installation codes and applicable regulations which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made.

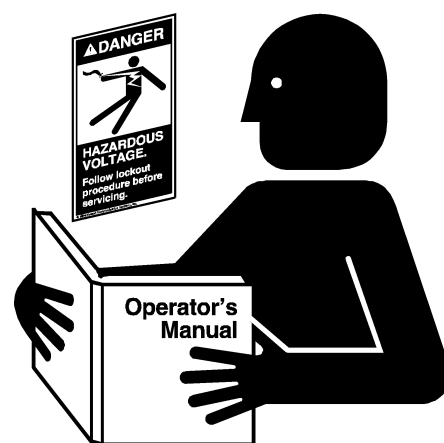
Follow Safety Instructions

Carefully read all safety messages in this manual and safety signs on your machine. Keep signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from the manufacturer.

Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.

Keep your machinery in proper working condition. Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.

If you do not understand any part of this manual or need assistance, contact your dealer.



Read and Understand Manual

Rotating Flight

Grain augers can kill or dismember.

Keep clear of all augers and never enter the bin unless all power is disconnected and locked out. Failure to do so will result in serious injury or death.



Rotating Flight

Install and Operate Electrical Equipment Properly

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

Disconnect and lock out all power sources before installing wires/cables or servicing equipment.



Electric Shock Hazard

ELECTRICAL WARNINGS

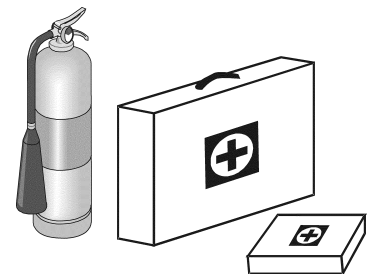
- A. Install and ground the slip ring and the entire unit in accordance with the National Electric Code and local codes and/or ordinances.
- B. DANGER: Hazard of electrical shock or burn. Always disconnect the power from the collector ring before attempting to perform any service function. Follow lock out/tag out procedures as outlined in O.S.H.A., section 1910.147 where appropriate.
- C. Do not use this slip ring with electrical loads greater than the rated current and voltage.
- D. Information regarding the current and voltage rating of each slip ring is recorded on a tag permanently fastened to the ring assembly.
- E. 1 R-Series Slip Rings withstand a maximum ambient temperature of 220°F.
- F. The model number of the slip ring assembly indicates the ampacity and voltage rating of each type of ring and brush included on the assembly. **NOTE:** *The actual ampacity may be affected by the type and size of the core lead wire (refer to NEC Table 310-16, 17, 18, 19 and applicable notes).*

Prepare for Emergencies

Be prepared if fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital and fire department near your telephone.



Keep Emergency Equipment Quickly Accessible

Wear Protective Clothing

Wear close fitting clothing and safety equipment appropriate to the job.

Remove all jewelry.

Long hair should be tied up and back.

Safety glasses should be worn at all times to protect eyes from debris.

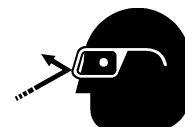
Wear gloves to protect your hands from sharp edges on plastic or steel parts.

Wear steel toe boots to help protect your feet from falling debris. Tuck in any loose or dangling shoe strings.

A respirator may be needed to prevent breathing potentially toxic fumes and dust.

Wear hard hat to help protect your head.

Wear appropriate fall protection equipment when working at elevations greater than six feet (6').

Eye Protection**Gloves****Steel Toe Boots****Respirator****Hard Hat****Fall Protection**

Operate Unload Equipment Properly

- Untrained operators subject themselves and others to **SERIOUS INJURY** or **DEATH**. **NEVER** allow untrained personnel to operate this equipment.
- **NEVER** work alone.
- Keep children and other unqualified personnel out of the working area at **ALL** times. Refer to the **Start-Up** section of this manual for diagrams of the work area.
- Make sure **ALL** equipment is locked in position before operating.
- **NEVER** start equipment until **ALL** persons are clear of the work area.
- Keep hands and feet away from the auger intake and other moving parts.
- **NEVER** attempt to assist machinery operation or to remove trash from equipment while in operation.
- Be sure all operators are adequately rested and prepared to perform all functions of operating this equipment.
- **NEVER** allow any person intoxicated or under the influence of alcohol or drugs to operate the equipment.
- Make sure someone is nearby who is aware of the proper shut down sequence in the event of an accident or emergency.
- **ALWAYS** think before acting. **NEVER** act impulsively around the equipment.
- **NEVER** allow anyone inside a bin, truck or wagon which is being unloaded by an auger or conveyor. Flowing grain can trap and suffocate in seconds.
- Use ample overhead lighting after sunset to light the work area.
- Keep area around intake free of obstacles such as electrical cords, blocks, etc., that might trip workers.
- **NEVER** drive, stand or walk under the equipment.
- Use caution not to hit the auger when positioning the load.
- **ALWAYS** lock out **ALL** power to the equipment when finished unloading a bin.
- Be aware of pinch points. A pinch point is a narrow area between two surfaces that is likely to trap or catch objects and so is a potential safety hazard.



**Operate Unload
Equipment Safely**

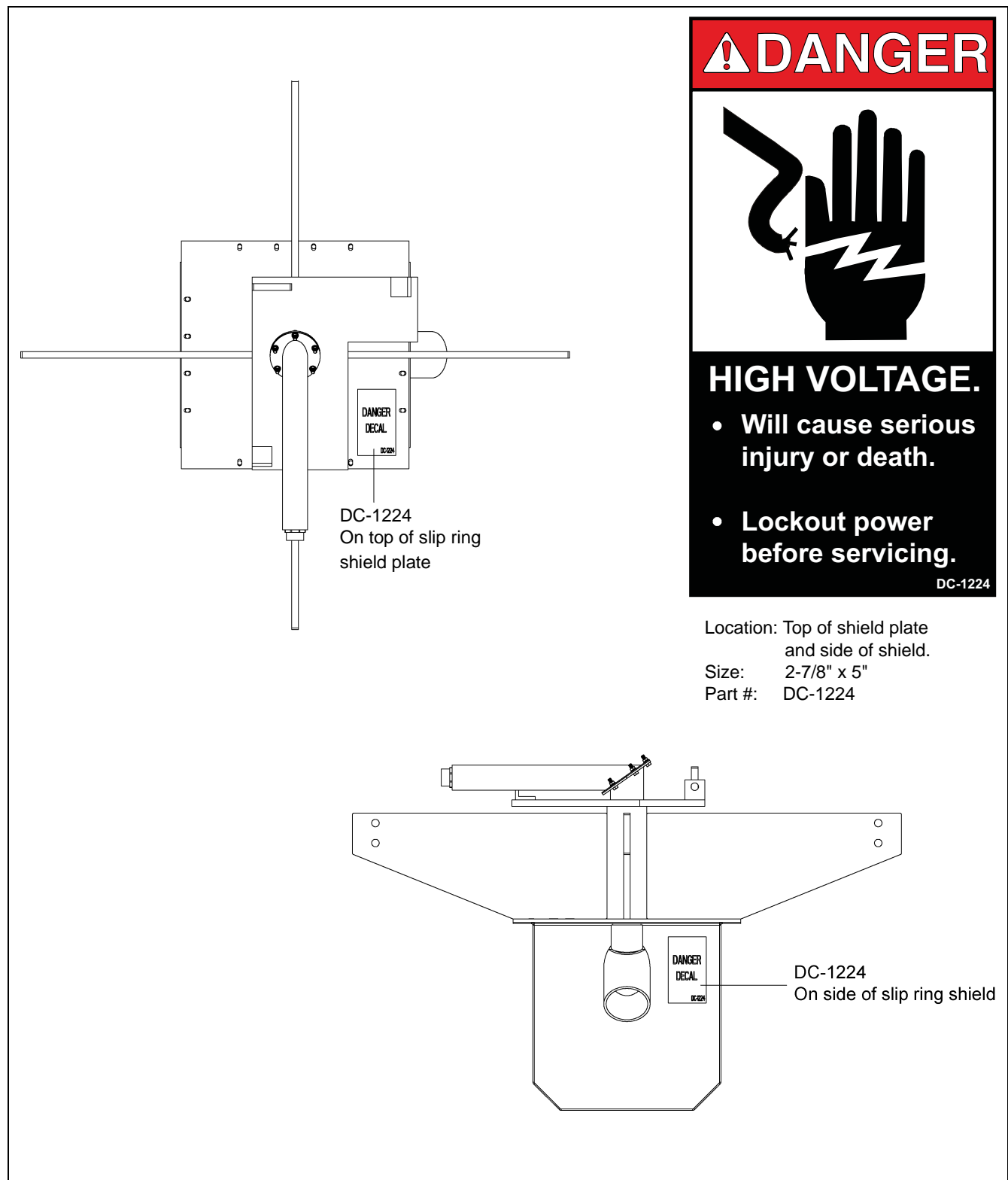
Operator Qualifications

- A. The User/Operator must be competent and experienced to operate auger equipment. Anyone who works with or around augers must have good common sense in order to be qualified. These persons must also know and meet all other qualifications, such as:
- i. Any person who has not read and/or does not understand all operation and safety procedures is not qualified to operate any auger systems.
 - ii. Certain regulations apply to personnel operating power machinery. Personnel under the age of 18 years may not operate power machinery, including augers. It is your responsibility, as owner and/or supervisor, to know what these regulations are in your area or situation.
 - iii. Unqualified or incompetent persons are to remain out of the work area.
 - iv. O.S.H.A. (Occupational Safety and Health Administration) regulations state: "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". (Federal Occupational Safety and Health Standards for Agriculture. Subpart D, Section 1928.57 (a) (6)).
- B. As a requirement of O.S.H.A., it is necessary for the employer to train the employee in the safe operating and safety procedures for this auger. The sign-off sheet is provided for your convenience and personal record keeping. All unqualified persons are to stay out of the work area at all times. It is strongly recommended that another qualified person who knows the shut down procedure is in the area in the event of an emergency.

[illegible]

3. Decals

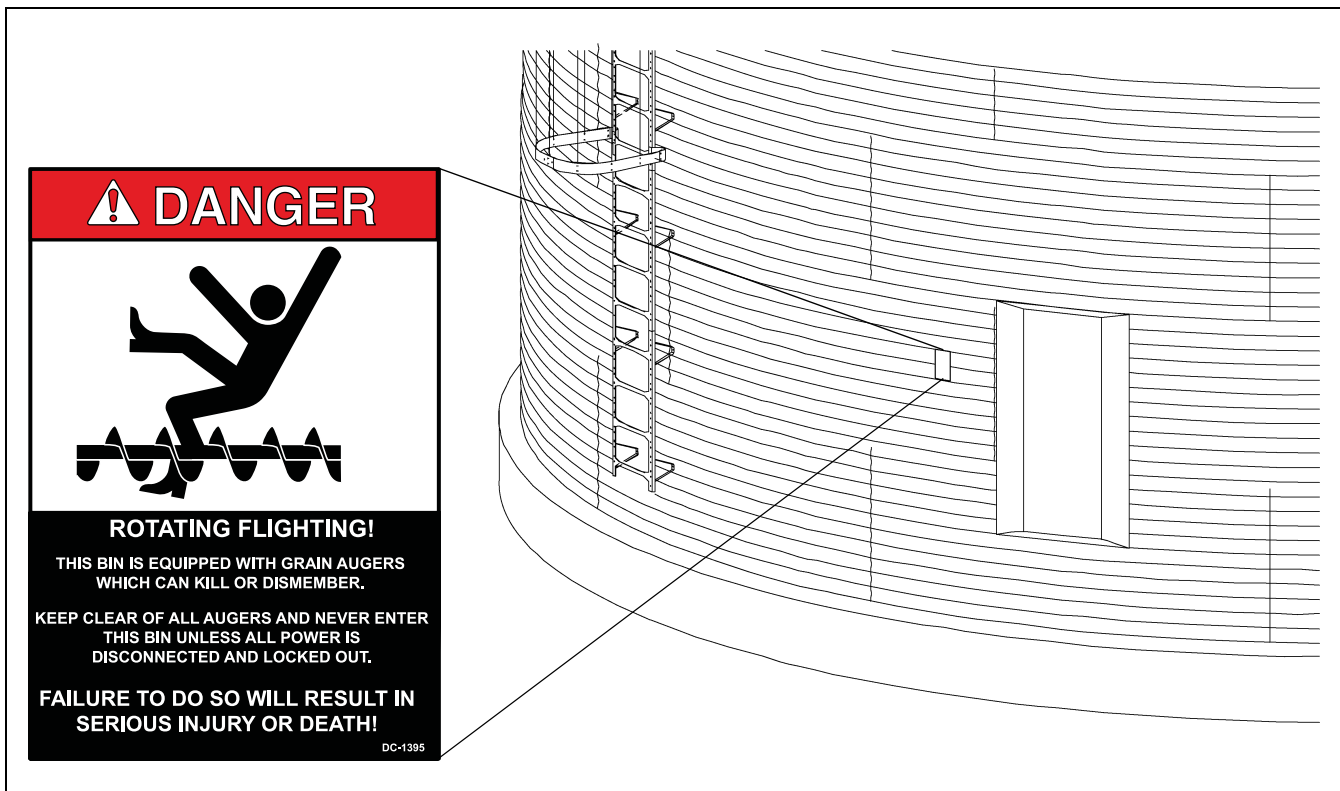
The below *Figure* show the location of the decals and safety signs which should appear on the Series II Sweep hopper with collector ring.



NOTE: Please remember safety signs provide important safety information for people working near bin unloading equipment that is in operation. Any safety signs that are worn, missing, painted over or otherwise illegible should be replaced immediately. Obtain **FREE** replacements by contacting GSI.

- A. DANGER Sign No. DC-1395 was supplied with your bin unloading equipment. This safety sign should be applied to the side of the bin near the bin opening, so it will be viewed by people entering into the bin storage building. Do not cover any safety signs or any other signs that are already there.
- B. If the safety sign location suggested is not in full view because of equipment modifications, other equipment in the area or any reason, then locate the safety sign in a more suitable location.
- C. Be certain the surface is clean, dry and free of dirt and oil. Peel paper backing from decals and stick into place. The adhesive backing will bond on contact.

NOTE: Please remember, safety signs provide important safety information for people working near bin unloading equipment that is in operation.



NOTE: If the Safety Sign cannot be easily read for any reason or has been painted over, replace it immediately. Additional Safety Signs may be obtained free of charge from your dealer, distributor or ordered from the factory.

Order SAFETY SIGN NO. DC-1395

4. Assembly

1. Assemble the slip ring shield onto the cross brace assembly using four (4) 1/4" x 1" hex bolts and nuts. Assemble one nut and bolt to each side of the collector ring shield. Do not tighten these at this point. (See Figure 4A.)

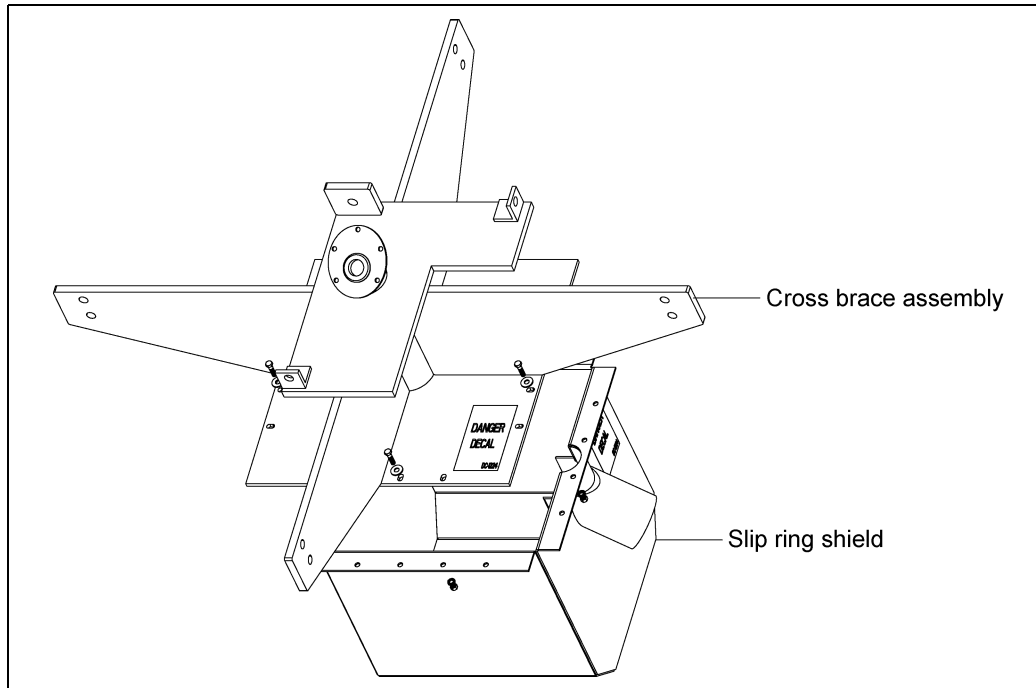


Figure 4A

2. As the sump should be installed into the floor, place the cross brace and slip ring shield into the sump so that the lower conduit shroud exits on the side that is intended to accept the slip ring wiring. As the assembly is placed into the sump, slide the lower shroud assembly onto the conduit shroud tube of the slip ring shield. (See Figure 4B.)

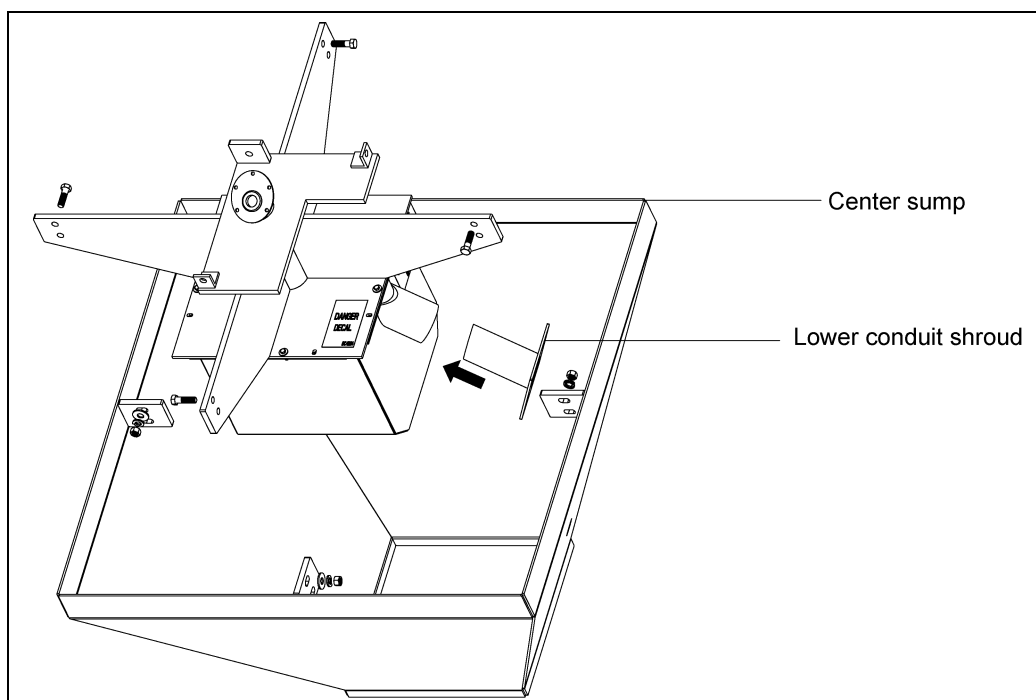


Figure 4B

3. Once the assembly is aligned properly, attach the cross brace to the sump with four (4) 1/2" x 1-3/4" hex bolts and nuts. Do not tighten these at this point.
4. Using the lower shroud assembly, mark the center lines of the plate onto the sump wall. These marks will be used to create the conduit exit hole through the sump wall.
5. Once the marks have been double checked on the wall, unbolt the cross assembly from the sump and remove the slip ring shield from the cross brace assembly.
6. Drill up to a 2" hole at the marked location on the sump wall. Remove any burrs created in the drilling process from the conduit exit hole in the sump wall.
7. Assemble the 1" x 9-3/8" conduit to the 1" chase nipple using one 1" conduit coupling.
8. Feed the nine (9) stranded wires from the slip ring through the conduit assembly and fasten it to the slip ring. *(See Figure 4C.)*

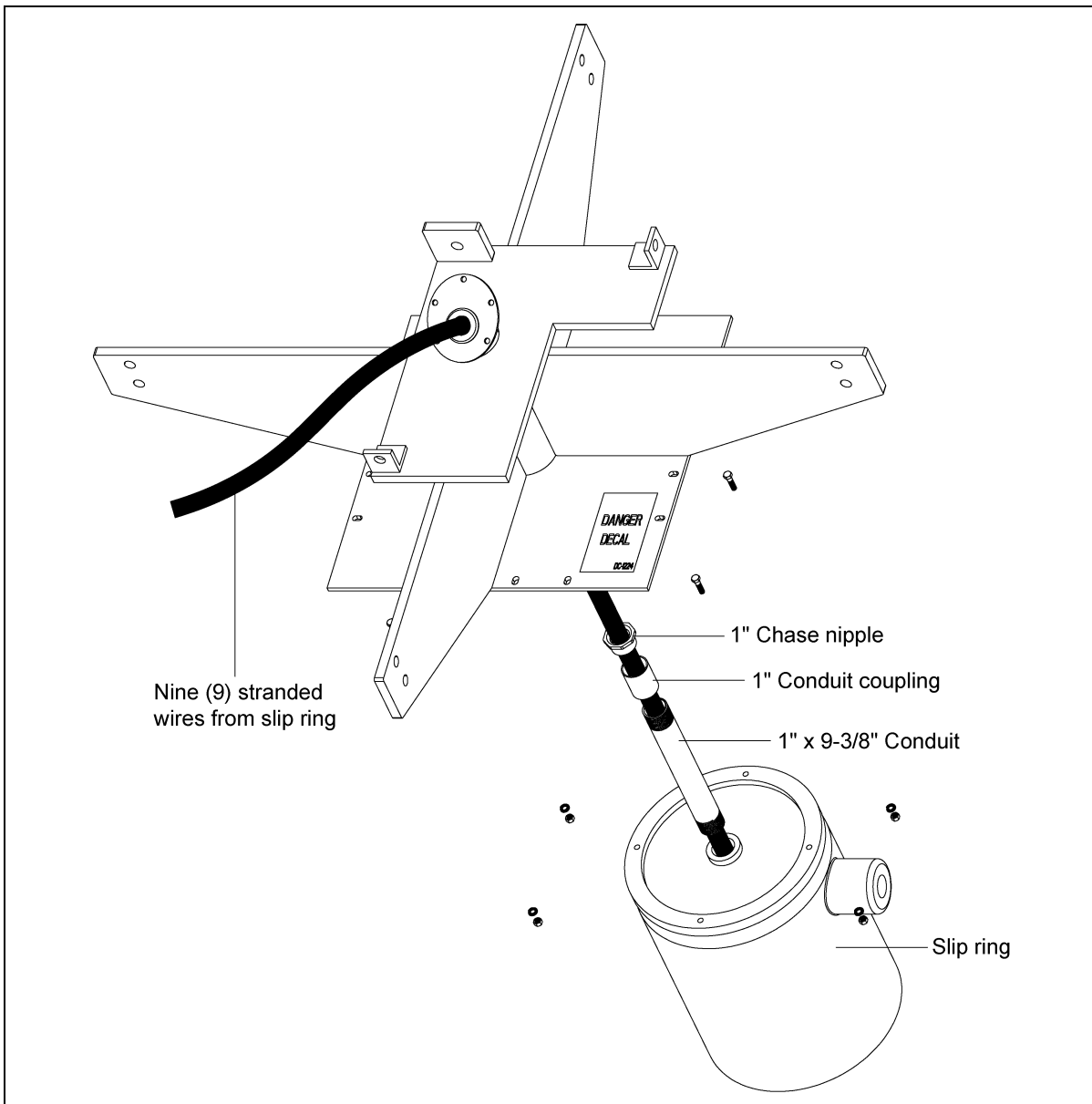


Figure 4C

4. Assembly

9. Feed the nine (9) stranded wires from the slip ring through the vertical pivot tube rubber grommet and bolt the slip ring to the cross brace assembly using four (4) 1/4" x 1" hex bolts, lock washers and hex nuts. It is important that the rubber grommet remains stationary and intact. Failure to do so can result in severed wires during operation.

Electrical controls and wiring should be installed by a qualified electrician. The motor disconnect switches and conductor cables should comply with the National Electrical Code and any local codes which apply. Reset and motor starting stations should be located so that the operator can see that all personnel are clear of the equipment.

NOTE: *The liquid-tight flex conduit may need to be trimmed to length.*

10. Attach the 1" liquid-tight flex conduit coupling to one end of the 1" x 16" liquid-tight flex conduit.
11. Attach the 1" x 45° liquid-tight flex conduit coupling to the other end of the 1" x 16" liquid-tight flex conduit.
12. Remove the protective housing from the slip ring.
13. Feed the multi-conductor cord through the conduit assembly and the 1" conduit hub on the slip ring.
14. Attach the 1" x 45° liquid-tight flex conduit coupling to the 1" conduit hub on the slip ring. Be sure to turn the conduit assembly down. (See Figure 4D.)

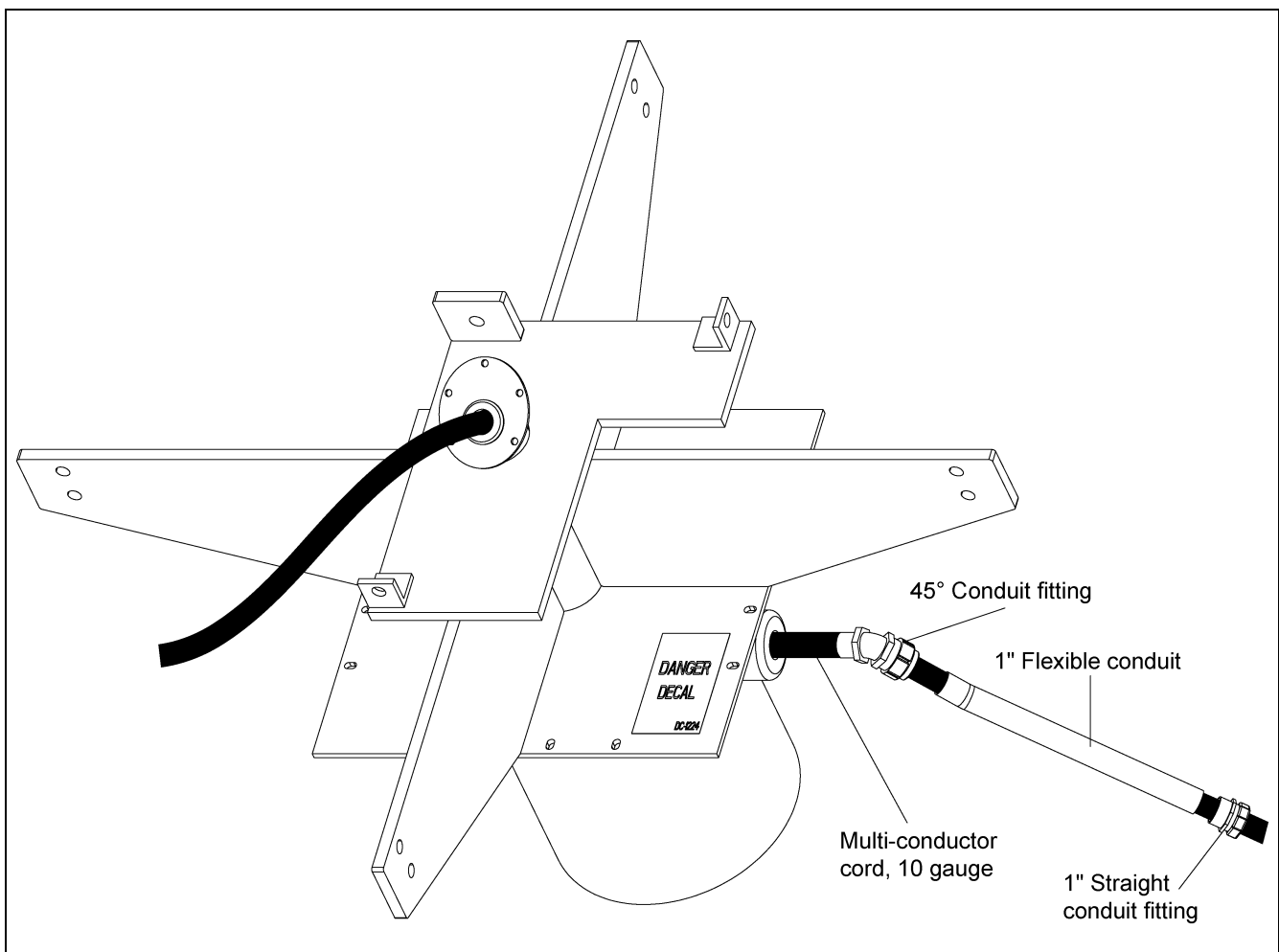


Figure 4D

15. Wire the multi-conductor cord to the slip ring using the fork terminals provided in the following manner.
 1. Thermal protection leads
 - a. Wire the "P1" lead from the control panel to ring "1".
 - b. Wire the "P2" lead from the control panel to ring "2".
 2. Drive motor leads
 - a. Wire the three (3) power leads to rings "3", "4" and "5".
 - b. Wire the ground lead to ring "9".
 3. Auger motor leads
 - a. Wire the three (3) power leads to rings "6", "7" and "8".
 - b. Wire the ground lead to ring "9".
16. Replace the protective housing onto the slip ring.
17. Feed the multi-conductor cord through the slip ring shield and attach the slip ring shield to the cross brace assembly using sixteen (16) 1/4" x 1" hex bolts, flat washers, lock washers and nuts.
18. Feed the multi-conductor cord through the lower shroud assembly and through the drilled conduit exit hole in the sump wall.
19. Slide the lower shroud assembly into the slip ring shield. *(See Figure 4E.)*

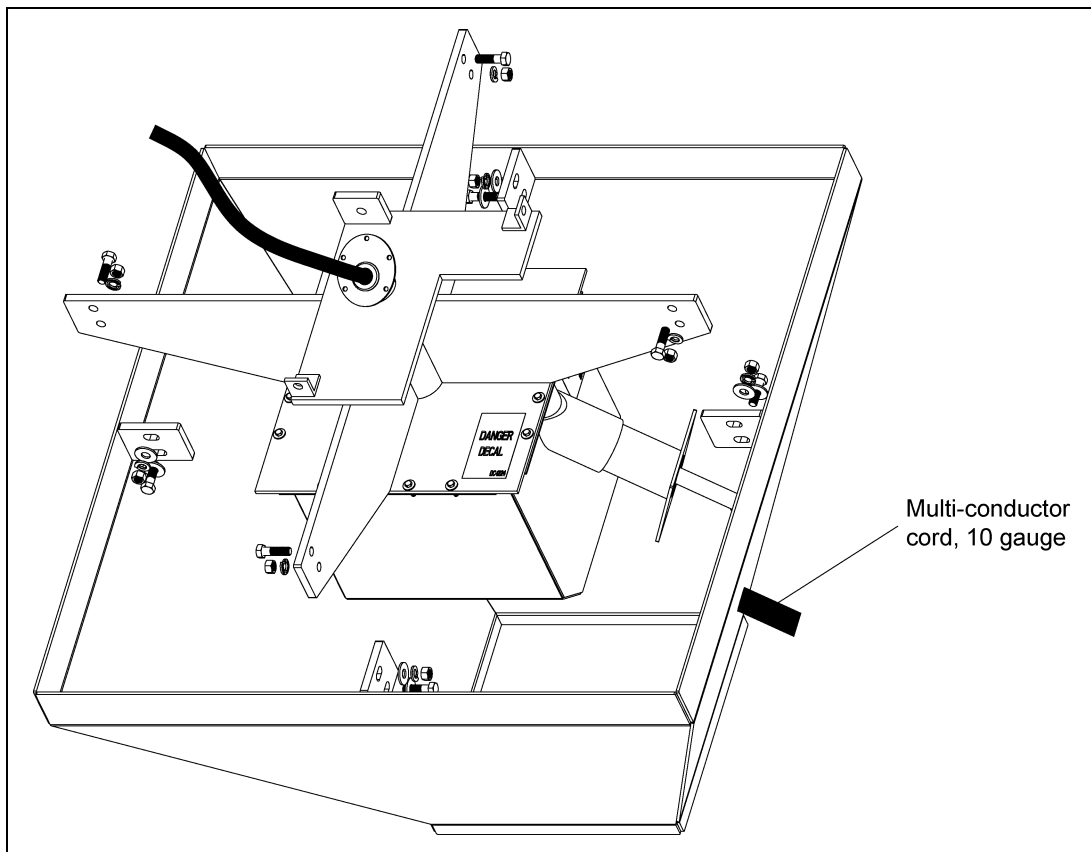


Figure 4E

4. Assembly

20. Make sure that the lower shroud assembly and the drilled conduit exit hole in the sump wall hole are aligned. Bolt the cross brace assembly to the sump using eight (8) 1/2" x 1-3/4" hex bolts, flat washers, lock washers and hex nuts.
21. Slide the lower shroud assembly into position against the sump wall. Tack weld the lower shroud assembly to the sump wall.
22. Without damaging the slip ring stranded wires, connect the L-shaped pivot plate to the head section back shield using two (2) 1/2" x 1-3/4" hex bolts, flat washers, lock washers and hex nuts.
23. Without damaging the slip ring stranded wires, fasten the vertical brace rod to the head section back shield and L-shaped pivot plate using two (2) 1/2" x 2" hex bolts, lock washers and hex nuts.
(See Figure 4F.)

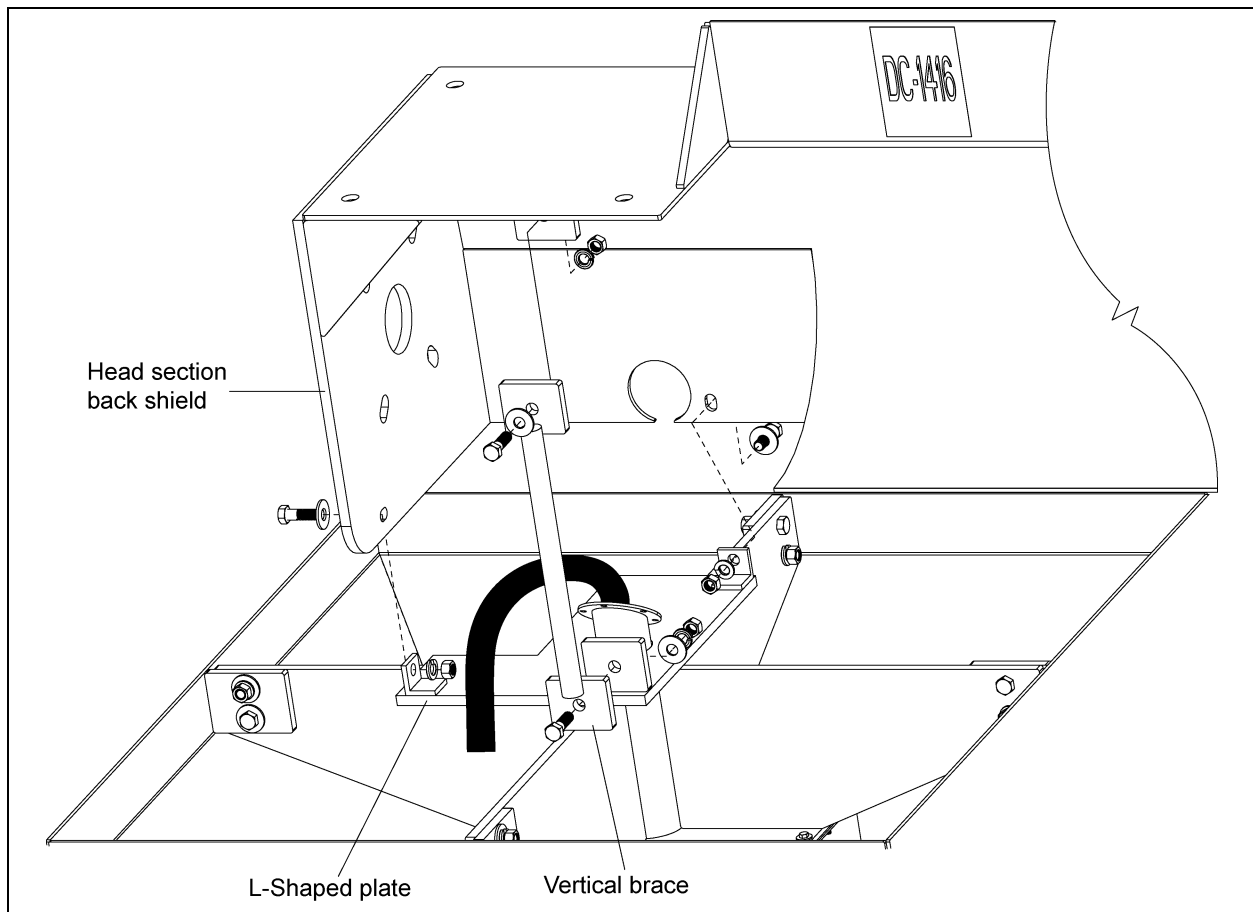
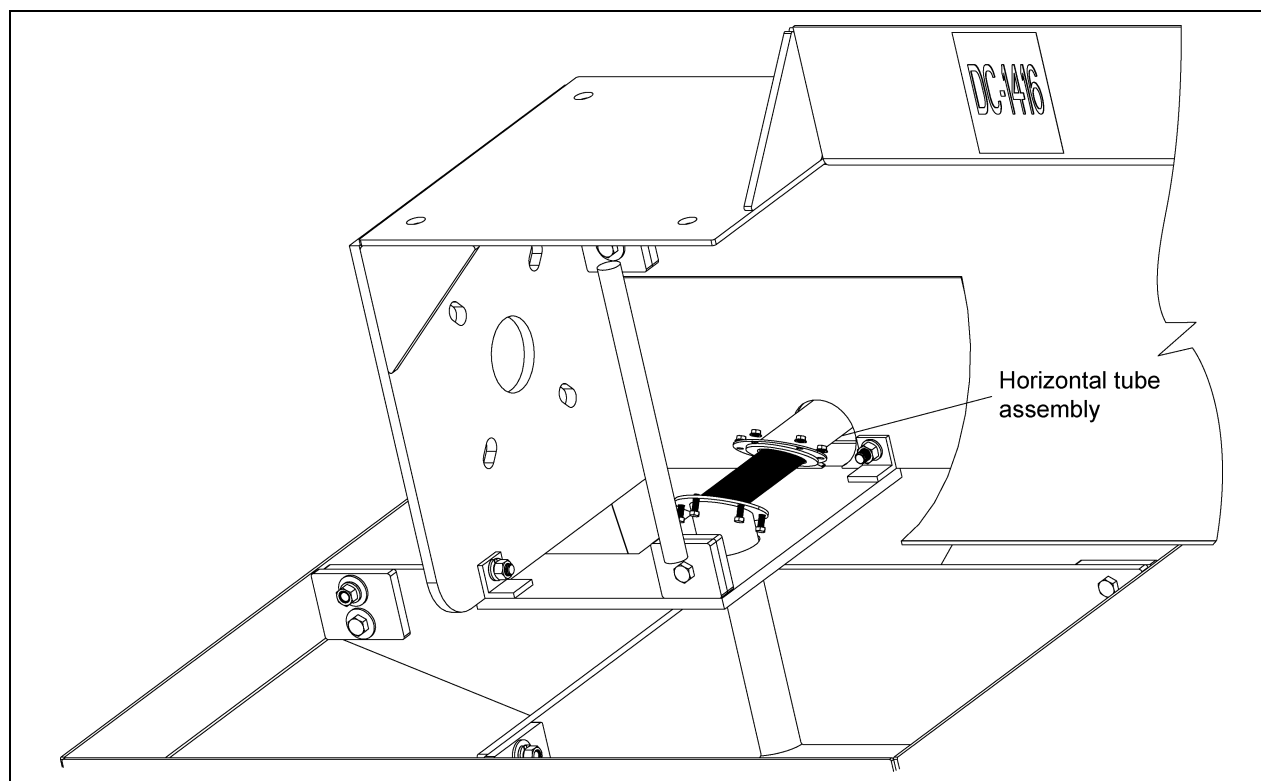
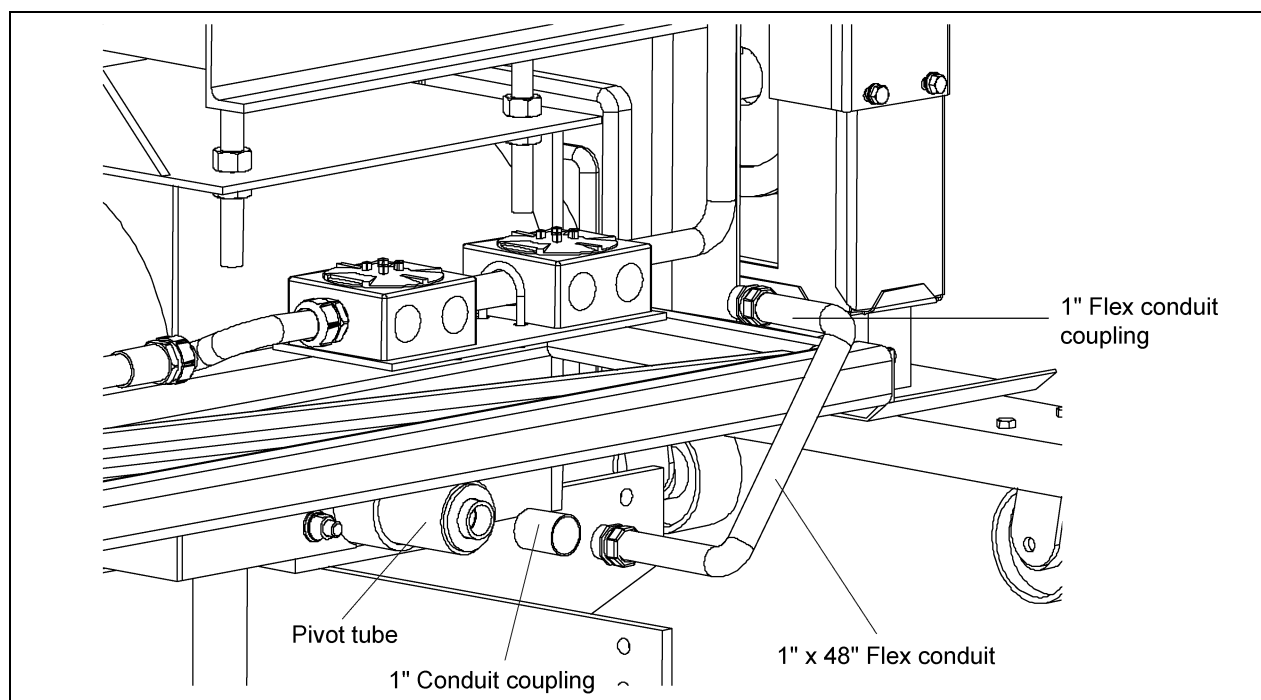


Figure 4F

24. Feed the nine (9) stranded wires from the slip ring through the horizontal tube assembly. Take care to ensure that none of the wires becomes stripped or damaged in this process.
25. Feed the horizontal tube assembly and nine (9) stranded wires from the slip ring through the hole in the head section back shield.
26. Attach the horizontal pivot tube and vertical pivot tube together using five (5) 1/4" x 1" hex bolts and serrated flange nuts. It is critical that the two (2) flanges are seated and create a proper seal so that contaminants do not enter the space around the stranded wires. (See Figure 4G on Page 19.)

**Figure 4G**

27. Attach one 1" liquid-tight flex conduit coupling to each end of the 1" x 48" liquid-tight flex conduit.
28. Feed the nine (9) stranded wires from the slip ring through the 1" conduit coupling and 1" x 48" liquid-tight flex conduit assembly.
29. Attach the 1" x 48" liquid-tight flex conduit assembly to the pivot tube using the 1" conduit coupling.
(See Figure 4H.)

**Figure 4H**

4. Assembly

30. Feed the nine (9) stranded wires from the slip ring through one of the holes in the right junction box.
31. Connect the 1" x 48" liquid-tight flex conduit assembly to the junction box using the 1" liquid-tight flex conduit coupling.
32. Wire the nine (9) stranded wires to the junction boxes in the following manner.
 1. Thermal protection leads
 - a. Wire the "P1" lead from the both motors to "1".
 - b. Wire the "P2" lead from the both motors to "2".
 2. Drive motor leads
 - a. Wire the three (3) power leads to "3", "4" and "5".
 - b. Wire the ground lead to "9".
 3. Auger motor leads
 - a. Wire the three (3) power leads to "6", "7" and "8".
 - b. Wire the ground lead to "9".

Preform Pre-start Checks



To ensure that the drive is not unexpectedly started, turn OFF and lock out or tag out the power source before proceeding. Failure to observe these precautions could result in bodily injury.



*Failure to perform any or all of these pre-start checks may cause damage to the equipment and/or cause **SERIOUS INJURY** or **DEATH** to those in the work area.*

Failure to perform any or all of these pre-start checks may also be a misuse of the equipment. Any misuse of the equipment may void the warranty.

1. Make sure ALL shields are in place.



***ALWAYS** keep ALL guards and shields in place, until all the power is disconnected and locked out.*

2. Inspect the collector ring for any problems or potential problems.
3. Be aware of any emergency shut down procedures. Two (2) people must always be in a position where the operation of the equipment can be monitored.
4. Before starting the auger for the first time, make sure that all parts are assembled correctly according to the instructions in this manual.



*Make certain **ONLY** trained operators are in the work area before operating or moving the machine. Two (2) people must always be in a position where the operation of the equipment can be monitored.*

Maintain the Hopper



ALWAYS shut down and disconnect the power supply before adjusting, servicing or cleaning the equipment.

1. Use caution when repairing or replacing equipment parts.
2. Make sure ALL decals are legible and tightly attached to the hopper. If necessary, replace them **FREE OF CHARGE** by contacting GSI at:

GSI
P.O. Box 20
1004 E. Illinois St.
Assumption, IL 62510
Phone: 1-217-226-4421

3. Make sure ALL electrical wiring is not damaged and that it meets proper wiring codes.
4. Make sure ALL components are in good working condition before use.
5. Grease the center pivot tube at least two (2) times each season.

Slip Ring Maintenance

Lubrication

All bearings are lubricated for life at the factory. Additional lubrication should not be required.



Do not apply any lubricants or solvent cleaning agents to any part of the slip ring.

Brush Holders

Make the first inspection shortly after installation and before operation. Make continuing inspections on a regular basis after every 200-400 hours of operation under normal conditions.

Brush Holders

1. Inspect brush holders for proper alignment. Locate brush holders so that the entire brush contact surface rides squarely on the ring with the brush moving freely in the brush holder. Position brush holders so that the brush makes contact with the middle of the conductor and is not offset.
2. Check brush holder clamps for tightness. Set clamp bolts at 10 in-lbs. maximum.
3. Inspect brush terminations at the holder to assure that no external force is imposed on the holder. We recommend flexible or soft wire leads for these terminations. Use external clamps to support the entire weight of the leads.

Brushes

1. Inspect for wear. If the distance from the top of the insulator to the lower part of the brush spring is 0.093" or less, replace the brush.

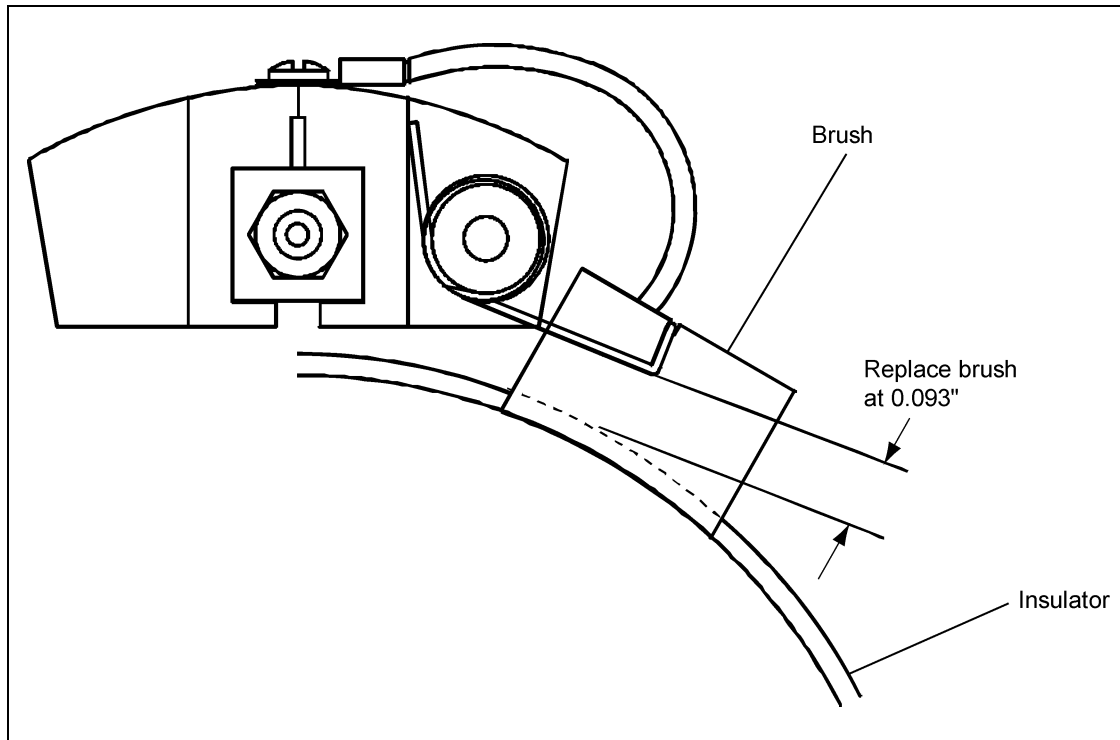


Figure 6A

2. Inspect brush contact surface by removing the brush. Remove surface dirt, oxidation, pitting or other contaminants (with a wire brush).
3. To remove and replace the brush:
 - a. Remove the clamp screw from the brush holder.
 - b. Remove the screw from the brush lead.
 - c. Remove the brush holder.
 - d. Replace the brush.
 - e. Re-assemble.

Brush Fit Inspection

1. Brushes must run at $90^\circ \pm 3^\circ$ square on the rings. If brush is not square, adjust position of brush holder on brush post.
2. Brushes need not run on the center of the rings, but there should be no forceful friction against the insulators.
3. The brush spring cross-bar must be seated in the brush slot.

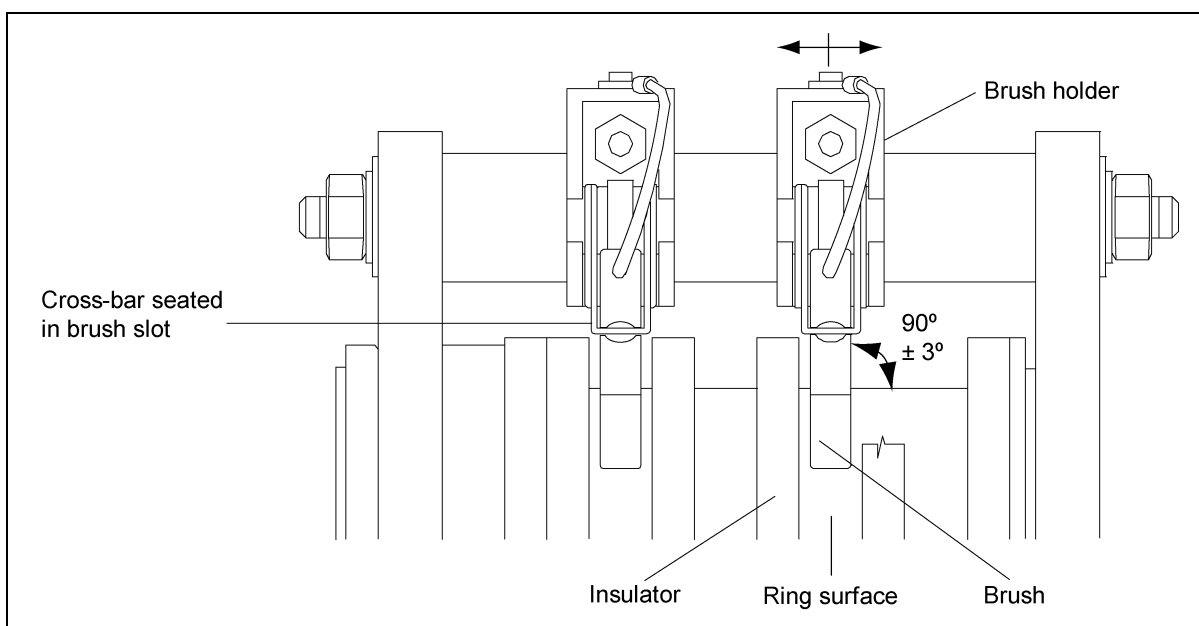


Figure 6B

Brush Springs

1. Inspect and test brush springs to assure uniform brush pressure. If brush springs fall below recommended pressure, replace entire brush holder.

Brush Spring Tension

Brush Amperage	Spring Pressure
15	1.0 lb. min
35	1.5 lbs. min
75	3.0 lbs. min

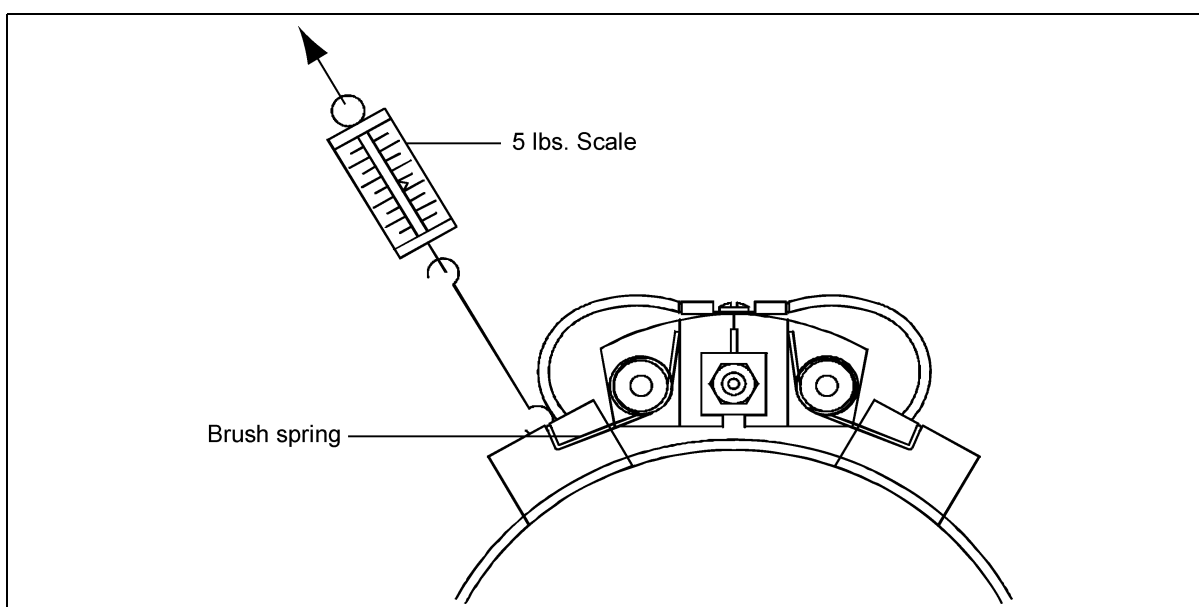


Figure 6C

Rings

1. Inspect the ring surface for dirt, oxidation or other contaminants. A properly operating ring will have a film that appears burnished in color with a darker surrounding color where the brushes track. If the ring requires cleaning, order slip ring polishing kit #41286.

Electrical Connections

1. Inspect all electrical connections for corrosion and tightness. Clean corroded parts with a wire brush and/or muriatic acid. Loose and/or corroded terminations will cause a concentration of excessive heat.

Brush Rigging

1. Brush posts are supported between two (2) outboard bearings. The brush posts extend to the outboard bearings and are secured by a notch in the outboard.
2. Spacing between the outboard bearings is critical to assure the free rotation of the brush rigging. The brush posts are cut to an exact length in order to provide the proper spacing. Locate the outboard bearings against the insulator and have a 0.20" clearance without deformation of the material.



Do not over-tighten the outboard brush post jam nuts. Make a final check to assure there is no binding of the outboard brush rigging or binding of brushes with insulator barriers.

Enclosure Inspection

1. Moisture is a major cause of slip ring deterioration. Water will corrode parts and breakdown insulation. Dust and dirt present within the enclosure will effect the proper operation of the assembly. Most dusts cause excessive brush and slip ring wear and conductive dust, if allowed to accumulate, will form a path for short circuiting.
2. A properly designed NEMA 4 enclosure will be dust tight and watertight. However, NEMA 4 enclosures do not eliminate internal condensation. Condensation can be eliminated with the addition of a breather, drain and a thermostatically controlled heater.
3. Periodically perform an inspection by removing the enclosure and checking for condensation, water and dust collection. If contaminants are found, wipe the enclosure and the assembly with a lint free cloth. If the problem persists, take steps to remedy the leakage or condensation problem.

Slip Ring Storage

1. When storing the slip ring, keep it at room temperature in a clean, dry, protective place. Place self-contained or bagged absorbent material in the collector ring enclosure during extended periods of storage. Remove absorbent material before putting collector ring into operation.

Serial Number

1. Make the following information available when ordering replacement parts or discussing the slip ring with the factory by recording the information in the spaces provided here. This information is located on the packing slip, factory invoice and serial number tag.

Catalog No. Slip Ring: _____

Serial No.: _____

Date of Purchase: _____

7. Troubleshooting

Problem	Possible Cause	Solution
Sweep will not run.	1. Power cords may be unplugged.	1. Plug in the power cords.
	2. Foot switch may not be actuated.	2. Make sure the foot switch is depressed and the switch is operating properly.
	3. Overloads may be tripped.	3. Reset the overloads.
	4. The collector ring may not be making good connections.	4a. Check the collector ring terminals for proper contact.
		4b. Make sure the springs have correct tension according to the owner's manual.
Intermittent signal or loss of signal.	1. Brush wear.	1. Verify brush wear per section.
	2. Spring pressure.	2. Check spring pressure per section.
	3. Dirty contact surface.	3. Check contact surfaces for cleanness. (Ring polishing kit available.)
	4. Bad springs.	4. Visually check for spring fit and function. Adjust or replace as necessary.
	5. Short in wire.	5. Check core wiring for short circuit.

NOTES



Components Parts List

System	Ref #	Part #	Description
ALL	1	GC04615	Standard 15K Sump
12"	2	GK80042	Protector Cord Slip Ring Cross Brace, 12" System
16"	2	GK80041	Protector Cord Slip Ring Cross Brace, 16" System
ALL	3	GC11833	Slip Ring Shield
ALL	4	GC04624	Lower Conduit Shroud
ALL	5	GC04547	Slip Ring, XPFC, 9 Ring, CA12707
ALL	6	GC04653	1" IMC Conduit, 9-3/8", 1" NPT Both Ends
ALL	7	S-8519	1" Conduit Coupling, Galvanized
ALL	8	S-2122	1" Conduit Fitting, Steel Chase Nipple
ALL	9	S-6998	1/4"-20 x 1" HHCS Bolt Zinc Grade 5
ALL	10	S-2041	1/4" Lock Washer Zinc
ALL	11	S-1102	1/4" Hex Nut Zinc Grade 2
ALL	12	GC04654	1" Conduit Fitting, 45°, Rigid Flex
ALL	13	GC07881	1" Flexible Conduit, 16"
ALL	N/S	GC07602	10 Gauge Power Cord, 9 Strand, 12'
ALL	14	S-8518	1" Conduit Fitting, Straight, Rigid Flex
ALL	15	S-1430	1/4" Flat Washer Zinc Grade 2
ALL	16	S-2121	1/2" Flat Washer Zinc
ALL	17	S-3883	1/2"-13 x 1-3/4" HHCS Bolt YDP Grade 8
ALL	18	S-236	1/2" Lock Washer Zinc
ALL	19	S-3729	1/2"-13 Hex Nut YDP Grade 5
ALL	20	GK80038	Horizontal Protector Cord Slip Ring Tube Assembly
ALL	21	S-8244	1/4"-20 x 3/4" HHCS Bolt Zinc Grade 5
ALL	22	S-7215	1/4"-20 Serrated Flange Nut Zinc
12"	23	GC06716	Vertical Brace Rod Weldment, 12" System
16"	23	GC06717	Vertical Brace Rod Weldment, 16" System
ALL	24	GC07575	1" Flexible Conduit, 48"

Slip Ring Replacement Parts

Parts Descriptions

(Blank) = No special configuration
 X = Explosion proof enclosure
 W = Explosion proof enclosure
 w/ 1" air passage
 T = Ball bearings on brush carriage
 (Standard is brass sleeve bearing);
 N = Non-self-contained
 (Kit ring, no enclosure)

(Blank) = No enclosure
 R = Revolving unit (RU)
 S = Swivel unit (SU)
 U = Wrap around cover

----- Required
 Optional

(BLANK) = Single brush
 (Ring profile section) D = All circuits double brushed
 (Amperage profile section) D = This amperage double brushed

Number of conductors

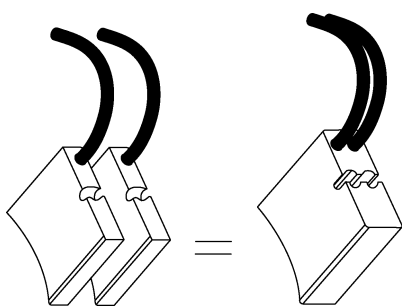
R A X R D - D A 03 - SPEC *

Ring profile section

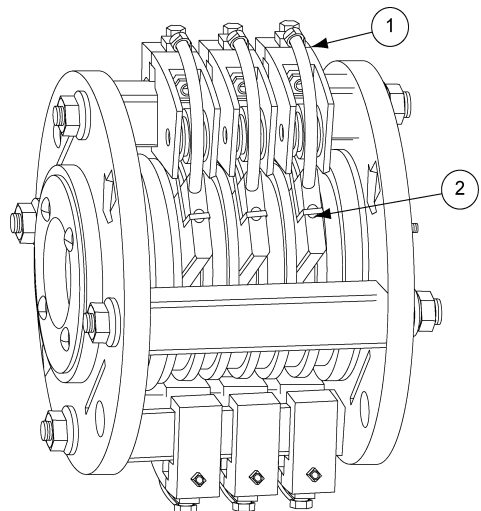
Amperage profile section
 Multiple sections possible

Slip Ring Bore Size					Brush Holders		
Z	A	B, C, D	E, F, G, H	J, K			
Special Bore	1.50	2.5, 3.0, 3.5	4.0, 4.5, 5.0, 6.0	8.0, 10.0	<div>①</div> <div>Single Double</div>		
	30067A	30067B	30067C	30067D			
	30066A	30066B	30066C	30066D			
	30068A	30068B	30068C	30068D			
	30068A	30068B	30068C	30068D			
Brushes	30069A	30069B	30069C	30069D	E =	75 Amp/600V	02802 02809
	02840	02845	02850	02855	F =	110 Amp/600V	02803 02810
	02841	02846	02851	02856	G =	150 Amp/600V	02804 02811
	02842	02847	02852	02857	H =	225 Amp/600V	02805 02805 (x2)
	02843	02848	02853	02858	J =	300 Amp/600V	02806 02806 (x2)
	N/A	DRA3-20A-2500	DRA3-20A-4000	DRA3-20A-8000	K =	200 Amp/600V	Brushes and holders sold as a unit in this Amp/Volt range
	N/A	03309	03247	03247	L =	400 Amp/600V	
	N/A	03248	03248	03248	M =	600 Amp/600V	

* Consult the factory for custom application configurations.



**Two (2) 35 Amp brushes
 Replace one 75 Amp brush**



GSI Group, LLC Limited Warranty

The GSI Group, LLC ("GSI") warrants products which it manufactures to be free of defects in materials and workmanship under normal usage and conditions for a period of 12 months after sale to the original end-user or if a foreign sale, 14 months from arrival at port of discharge, whichever is earlier. The end-user's sole remedy (and GSI's only obligation) is to repair or replace, at GSI's option and expense, products that in GSI's judgment, contain a material defect in materials or workmanship. Expenses incurred by or on behalf of the end-user without prior written authorization from the GSI Warranty Group shall be the sole responsibility of the end-user.

Warranty Extensions:

The Limited Warranty period is extended for the following products:

	Product	Warranty Period	
AP Fans and Flooring	Performer Series Direct Drive Fan Motor	3 Years	* Warranty prorated from list price: 0 to 3 years - no cost to end-user 3 to 5 years - end-user pays 25% 5 to 7 years - end-user pays 50% 7 to 10 years - end-user pays 75%
	All Fiberglass Housings	Lifetime	
	All Fiberglass Propellers	Lifetime	
Cumberland Feeding/Watering Systems	Feeder System Pan Assemblies	5 Years **	** Warranty prorated from list price: 0 to 3 years - no cost to end-user 3 to 5 years - end-user pays 50%
	Feed Tubes (1-3/4" and 2.00")	10 Years *	
	Centerless Augers	10 Years *	
	Watering Nipples	10 Years *	
Grain Systems	Grain Bin Structural Design	5 Years	† Motors, burner components and moving parts not included. Portable dryer screens included. Tower dryer screens not included.
Grain Systems Farm Fans Zimmerman	Portable and Tower Dryers	2 Years	
	Portable and Tower Dryer Frames and Internal Infrastructure †	5 Years	

GSI further warrants that the portable and tower dryer frame and basket, excluding all auger and auger drive components, shall be free from defects in materials for a period of time beginning on the twelfth (12th) month from the date of purchase and continuing until the sixtieth (60th) month from the date of purchase (extended warranty period). During the extended warranty period, GSI will replace the frame or basket components that prove to be defective under normal conditions of use without charge, excluding the labor, transportation, and/or shipping costs incurred in the performance of this extended warranty.

Conditions and Limitations:

THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE LIMITED WARRANTY DESCRIPTION SET FORTH ABOVE. SPECIFICALLY, GSI MAKES NO FURTHER WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE IN CONNECTION WITH: (I) PRODUCT MANUFACTURED OR SOLD BY GSI OR (II) ANY ADVICE, INSTRUCTION, RECOMMENDATION OR SUGGESTION PROVIDED BY AN AGENT, REPRESENTATIVE OR EMPLOYEE OF GSI REGARDING OR RELATED TO THE CONFIGURATION, INSTALLATION, LAYOUT, SUITABILITY FOR A PARTICULAR PURPOSE, OR DESIGN OF SUCH PRODUCTS.

GSI shall not be liable for any direct, indirect, incidental or consequential damages, including, without limitation, loss of anticipated profits or benefits. The sole and exclusive remedy is set forth in the Limited Warranty, which shall not exceed the amount paid for the product purchased. This warranty is not transferable and applies only to the original end-user. GSI shall have no obligation or responsibility for any representations or warranties made by or on behalf of any dealer, agent or distributor.

GSI assumes no responsibility for claims resulting from construction defects or unauthorized modifications to products which it manufactured. Modifications to products not specifically delineated in the manual accompanying the equipment at initial sale will void the Limited Warranty.

This Limited Warranty shall not extend to products or parts which have been damaged by negligent use, misuse, alteration, accident or which have been improperly/inadequately maintained. This Limited Warranty extends solely to products manufactured by GSI.

Prior to installation, the end-user has the responsibility to comply with federal, state and local codes which apply to the location and installation of products manufactured or sold by GSI.

This equipment shall be installed in accordance with the current installation codes and applicable regulations which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made.

G S I G R O U P



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