Grain Flow Calc-U-Dri Controls

Model 84

Owner's Manual

PNEG-1148

Date: 07-19-10

GSI GROUP

IMPORTANT:** ***It is very important for the dealer and/or the person(s) installing the Grain Flow (with dry grain control for the Calc-U-Dri) to go through the start-up checklist procedure. Failure to do so will invalidate warranty.

Contents

Table of Contents

READ THIS MANUAL carefully to learn how to properly use and install equipment. Failure to do so could result in personal injury or equipment damage.

Limit the amount of grain above the Grain Flow to a maximum depth of 16'.

GSI recommends using 18 gauge cor-lok round hole floor with a Grain Flow.

Having the fan/heater properly sized and operating correctly is necessary to get the capacities specified in the drying chart on *Page 62*.

INSPECT the shipment immediately upon arrival. The customer is responsible for ensuring that all quantities are correct. The customer should report and note any damage or shortage on the bill of lading to justify their claim to the transport company.

THIS MANUAL SHOULD BE CONSIDERED a permanent part of your equipment and should be easily accessible when needed.

This warranty provides you the assurance that the company will back its products when defects appear within the warranty period. In some circumstances, the company also provides field improvements, often without charge to the customer, even if the product is out of warranty. Should the equipment be abused, or modified to change its performance beyond the factory specifications, the warranty will become void and field improvements may be denied.

PATENT NOTICE: The Calc-U-Dri control box is patent pending.

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.

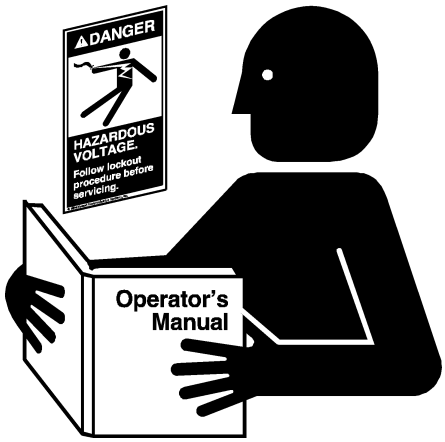
Follow Safety Instructions

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

Stay Clear of Rotating Parts

Entanglement in rotating augers will cause serious injury or death.

Keep all shields and covers in place at all times.

Wear close fitting clothing. Stop and lock out power source before making adjustments, cleaning, or maintaining equipment.

Rotating Auger

Practice Safe Maintenance

Understand service procedures before doing work. Keep area clean and dry.

Never lubricate, service, or adjust machine while it is in operation. Keep hands, feet and clothing away from rotating parts.

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any built up grease oil and debris.

Maintain Equipment and Work Area

Operate Motor Properly

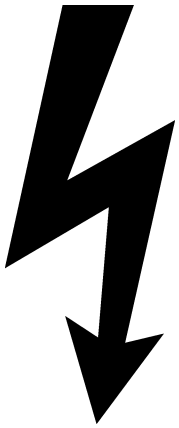
To avoid serious injury or death, stay away from unit and make sure everyone is clear of the equipment before starting or operating the unit.

All electrical connections should be made in accordance with the National Electric Code. Be sure equipment and bins are properly grounded.

Do not operate electric motor equipped units until motors are properly grounded.

Disconnect power on electrical driven units before resetting motor overloads.

Do not repetitively stop and start the drive in order to free a plugged condition. Jogging the drive in this manner can damage the equipment and/or drive components.



Electric Shock Hazard

Stay Clear of Hoisted Equipment

Always use proper lifting/hoisting equipment when assembling or disassembling equipment.

Do not walk or stand under hoisted equipment.

Always use sturdy and stable supports when needed for installation.

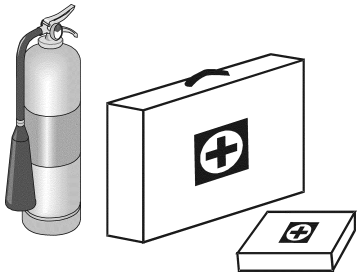
Crush Hazard

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.

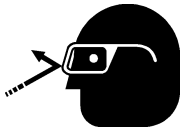
Wear steel toe boots to help protect your feet from falling debris. Tuck in any loose or dangling shoe strings.

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

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.

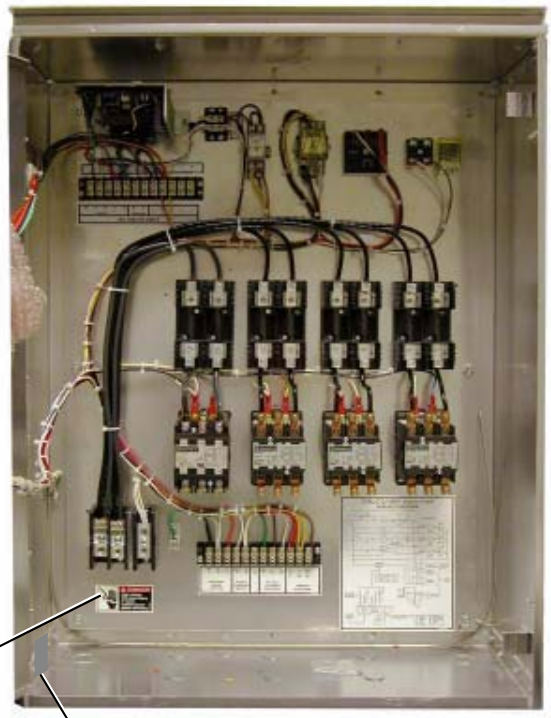
Date	***Employee Name***	***Supervisor Name***

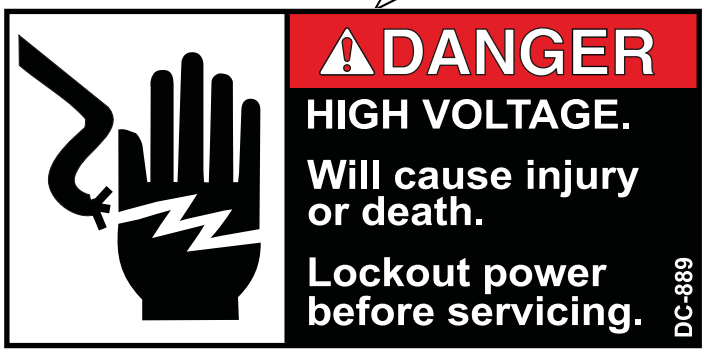
Replacements are available upon request.

GSI Decals
1004 E. Illinois St.
Assumption, IL. 62510
Phone: 1-217-226-4421

Please note:

1. The decals on these pages are not actual size.
2. Keep all decals wiped clean at all times.
3. All decals must be replaced if they are destroyed, missing, painted over, or can no longer be read.

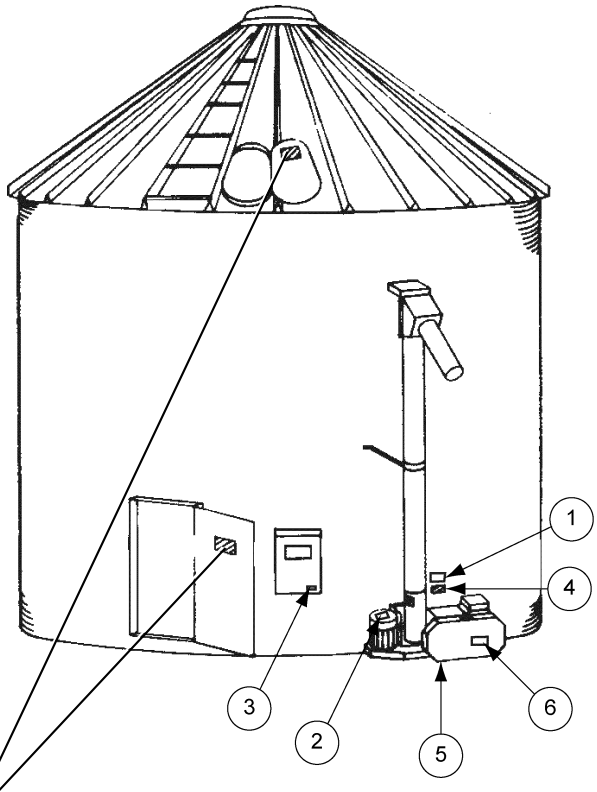




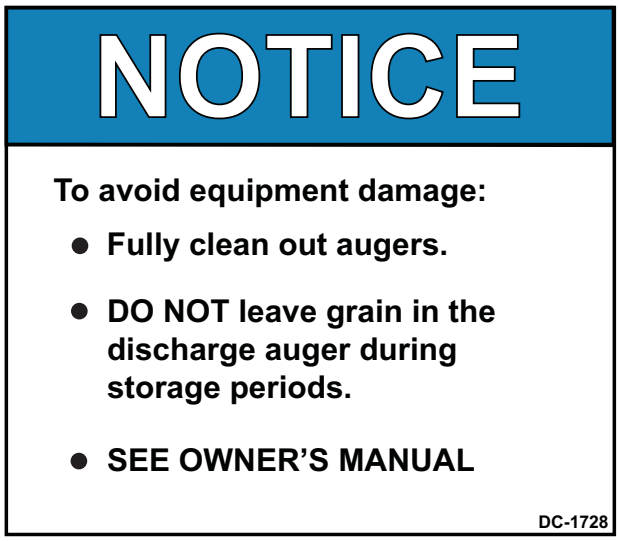
DC-889
Located inside control box.

DC-1729
Located inside on door of control box.

The decals shown on *Page 13* must be displayed as shown.



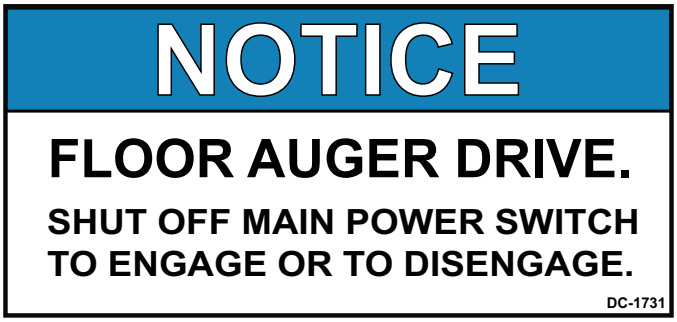
DC-GBC-1A (English) and DC-GBC-1S (Spanish) Decal on inside of doors.



1 **DC-1728**
Located on outside of bin.

2 **DC-1730**
Located on outside of bin.

3 **DC-1732**
Located inside on door of control box.



4 **DC-1731**
Located on outside of bin.

5 **DC-994**
Located next to belt drive.

6 **DC-995**
Located on belt guard cover.

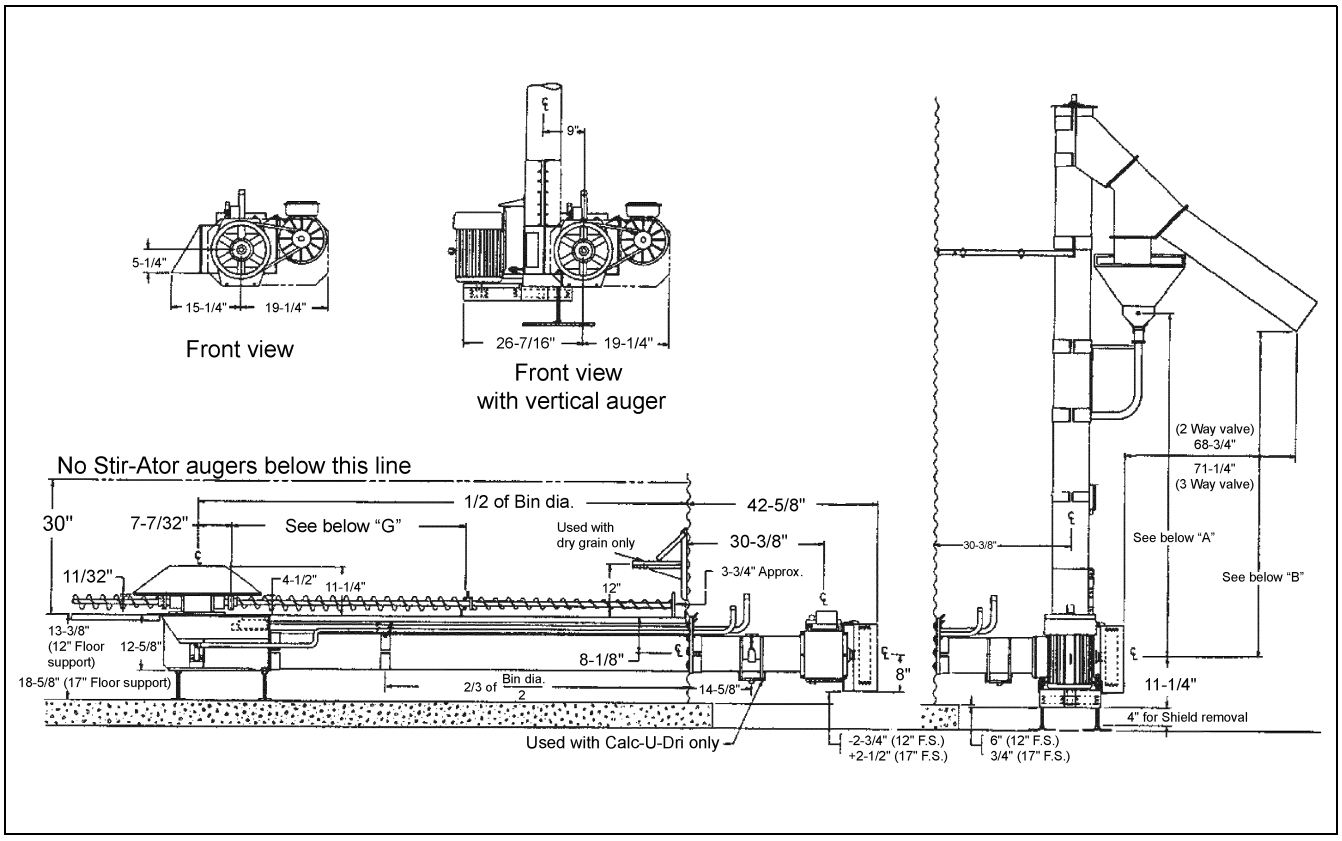


Figure 4A

	18'	21'	24'	27'	30'	33'	36'	42'
Slide Gate Tube 602C019	114-11/16"	132-11/16"	150-11/16"	168-11/16"	186-11/16"	204-11/16"	222-11/16"	258-11/16"
Shift Lever Tube 602C021	85"	103"	121"	139"	157"	175"	193"	229"
Discharge Auger 6023064 or 6033022	136-3/4"	154-3/4"	172-3/4"	190-3/4"	208-3/4"	226-3/4"	244-3/4"	280-3/4"
Discharge Tube 602C035 or 603C019	118"	136"	154"	172"	190"	208"	226"	262"
Floor Auger Pair 602P042-XXXX	97-1/16"	115-1/16"	133-1/16"	151-1/16"	169-1/16"	187-1/16"	205-1/16"	241-1/16"
Floor Auger Dimension "G"	52-1/16"	62-1/6"	73-1/6"	83-1/16"	94-1/16"	105-1/16"	113-1/16"	#1G 82" #2G 163"

	2 Way Valve "A"	3 Way Valve Upper "A"	3 Way Valve Lower "A"	2 Way Valve "B"	3 Way Valve "B"
Vertical Auger 15'	10' 1"	10' 6"	10' 2"	9' 5"	9' 2"
Vertical Auger 18'	13' 1"	13' 6"	13' 2"	12' 5"	12' 2"

Grain Flow Installation Instructions

When installing a Grain Flow in an existing bin, the drying floor will not have to be totally removed providing the Grain Flow discharge auger is going to be located perpendicular with the drying floor. *(See Step 18 and Figure 5V on Page 26.)*

NOTE: *GSI recommends using 18 gauge cor-lok round hole floor with a Grain Flow.*

1. Locate bin center, then check the bin for roundness. The floor augers will hit the bin wall if the bin is too far out of round.

2. The concrete under the drying floor should be nearly level. If excessive variation exists, corrective action must be taken by chipping away some of the concrete at the center to level the Grain Flow sump.

3. Determine the discharge auger position. BE SURE to consider all take-away equipment in this decision. Remember the Grain Flow position of left or right hand discharge when determining auger position.

4. Measure drying floor height. (Correct measurement is from concrete to top of drying floor.)

   To get proper placement of the discharge auger hole, use wall plate for guide. For proper position, place the top edge of the wall plate at the same height as the top of the drying floor.

   There are three (3) small holes in the wall plate. One is for the shift rod with the other two (2) being for the slide gate control rods. One sump control rod is standard equipment with the second being used only if the optional intermediate sump is installed. (8" Grain Flow only - *See Figure 5A*.)

   NOTE: *The sump uses the 4-1/4" legs for floor heights of less than 15" and the 8-1/4" legs for over 15" floor heights.*

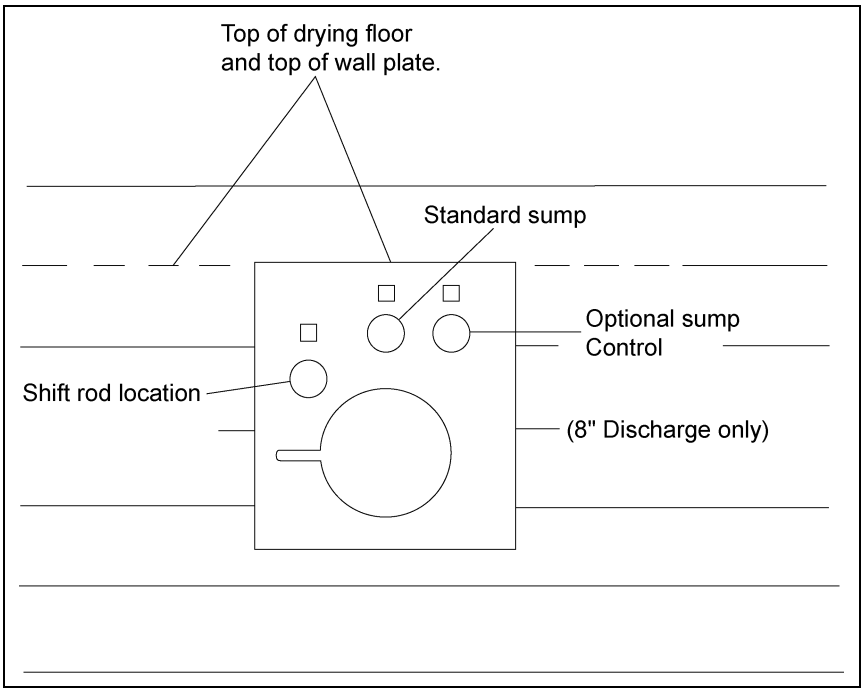


Figure 5A

Grain Flow Installation Instructions (Continued)

5. Turn the four (4) threaded sump legs into the welded nuts on the Grain Flow sump. If floor height is 12" or less, thread the 4" legs into the welded nuts on the Grain Flow sump and put locking jam nuts on top of the welded sump nut.

   If floor height is greater than 12", thread the four (4) 3/4" jam nuts onto the threaded sump legs, then finish by threading the legs into the welded nuts on the Grain Flow sump. *(See Figure 5B and Figure 5C.)*

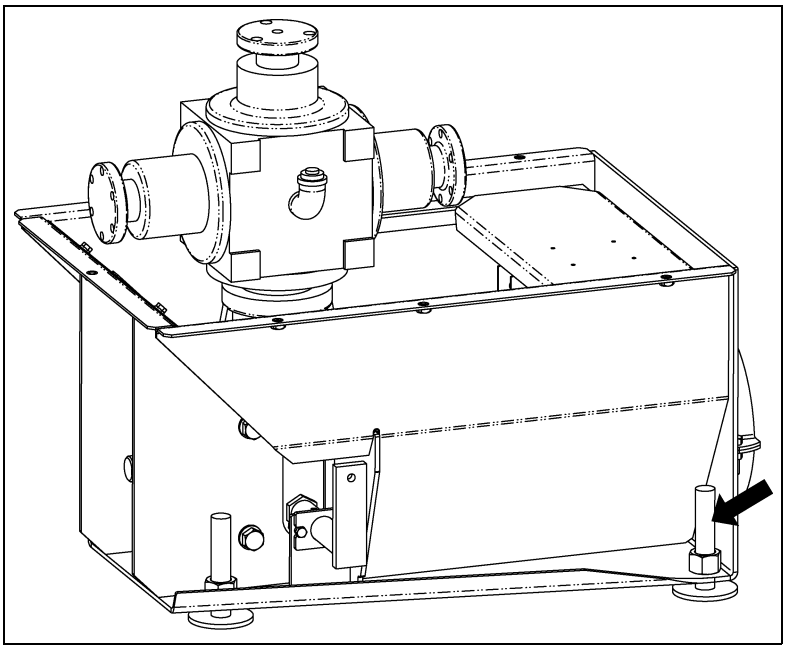


Figure 5B

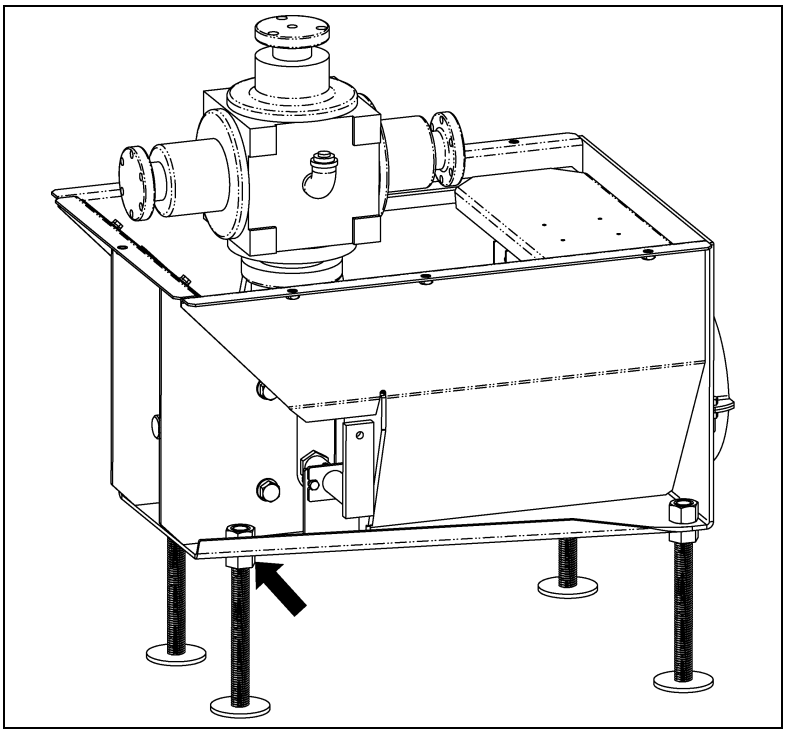


Figure 5C

Grain Flow Installation Instructions (Continued)

6. Assemble the sump face plate to the Grain Flow sump using four (4) 3/8" x 1" bolts, lock washers and nuts. *(See Figure 5D.)*

7. Bolt the offset shift tube to the shift lever assembly on the gearbox using one 5/16" x 1" grade 5 bolt and lock nut. Put the bolt through the hole in the shift tube, then thread the lock nut onto the bolt. Next, turn the bolt into the shift lever assembly on the gearbox; thread the bolt into the shift lever until the bolt is holding the shift tube snug. Then back the bolt out 1/2 turn. Lock the bolt in place by tightening the lock nut against the shift lever. Be sure the shift tube and shift lever can move freely. *(See Figure 5E.)*

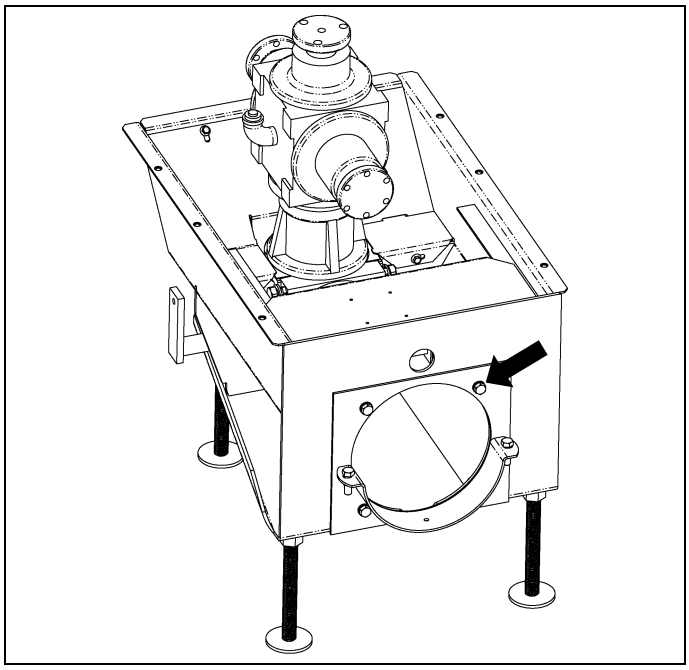


Figure 5D

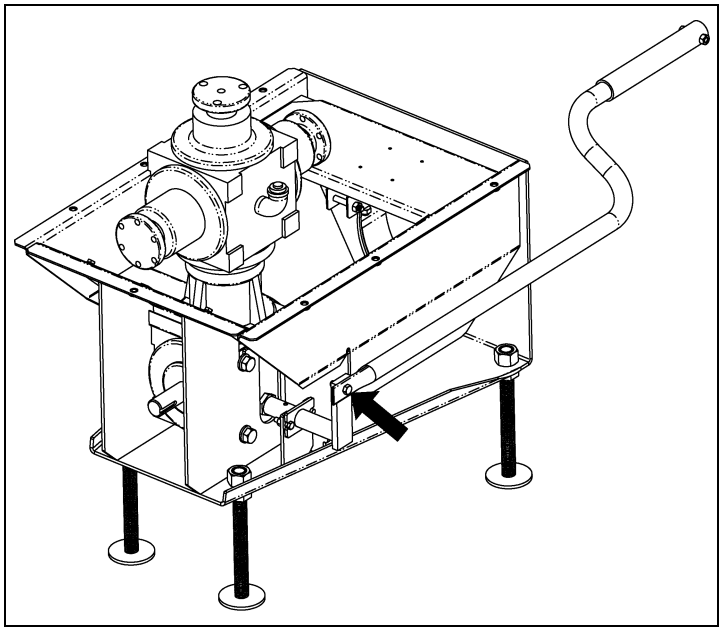


Figure 5E

Grain Flow Installation Instructions (Continued)

8. Check the gearbox lubricant level by removing the inspection plate and the oil level plug. If lube is needed, add 90 weight gear lube to the level of the check plugs. Be sure to check upper and lower gearboxes. *(See Figure 5F.)*

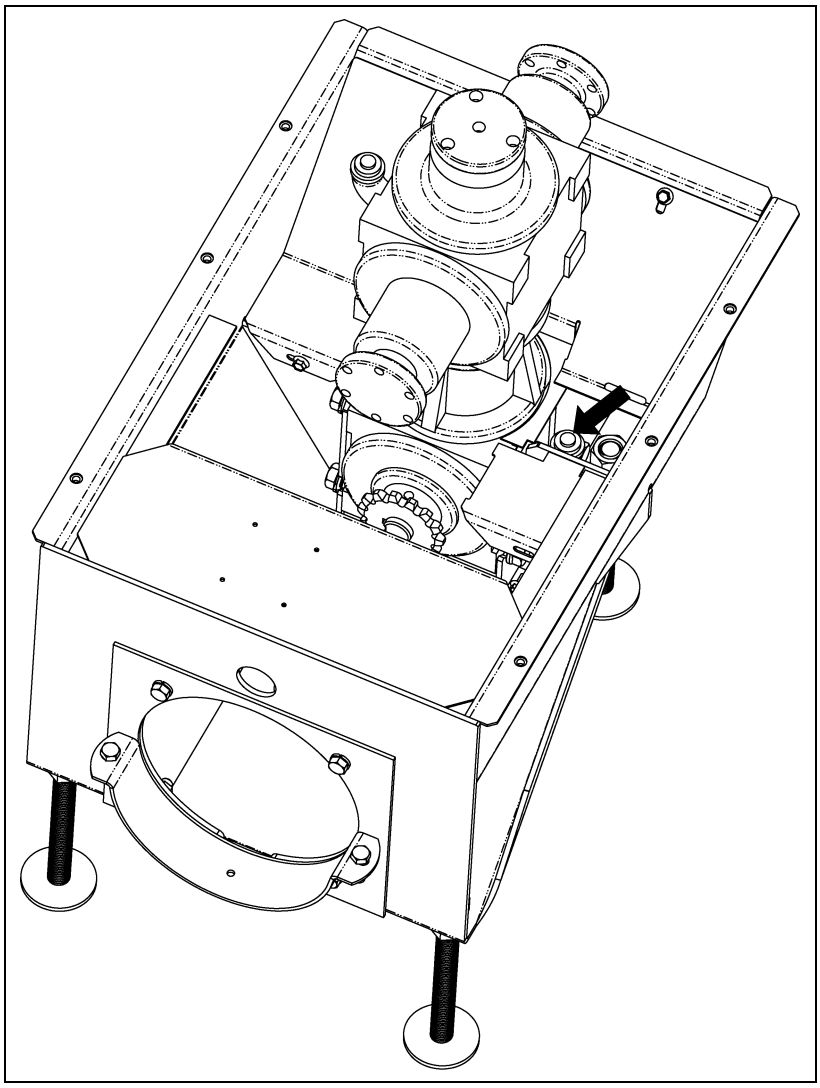


Figure 5F

9. Set the Grain Flow sump in the center of the bin with the discharge opening pointed in the proper direction. Adjust the legs to the correct height and level to the drying floor. Finish by tightening the jam nuts on the leveling legs. BE SURE the sump is centered in the bin to avoid the floor augers hitting the wall. *(See Figure 5G on Page 19.)*

   Check to make sure that the gearbox and sump is level. *(See Figure 5H on Page 19.)*

10. Slip the face plate and face seal onto the discharge auger tube. Next, insert the auger tube through the hole cut into the bin in *Step 4 on Page 15*. *(See Figure 5H and Figure 5I on Page 19.)*

    NOTE: *With the Calc-U-Dri unit, BE SURE the rectangular hole in the auger tube is LOCATED ON THE BOTTOM.*

Grain Flow Installation Instructions (Continued)

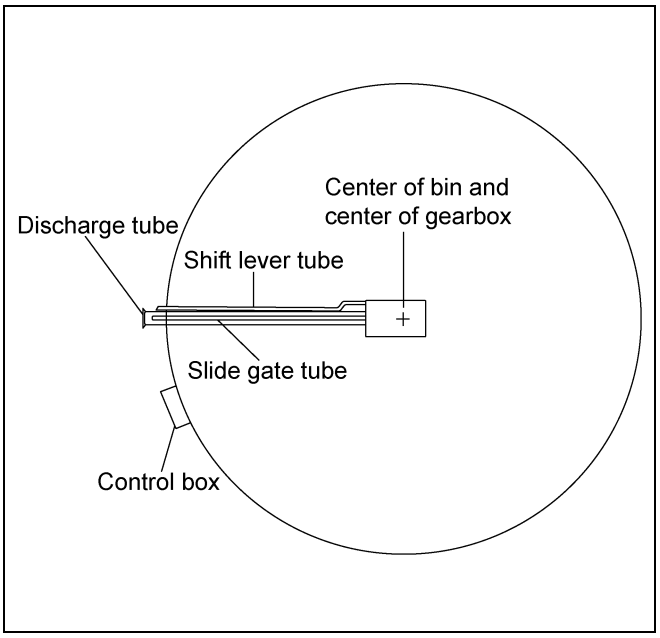


Figure 5G

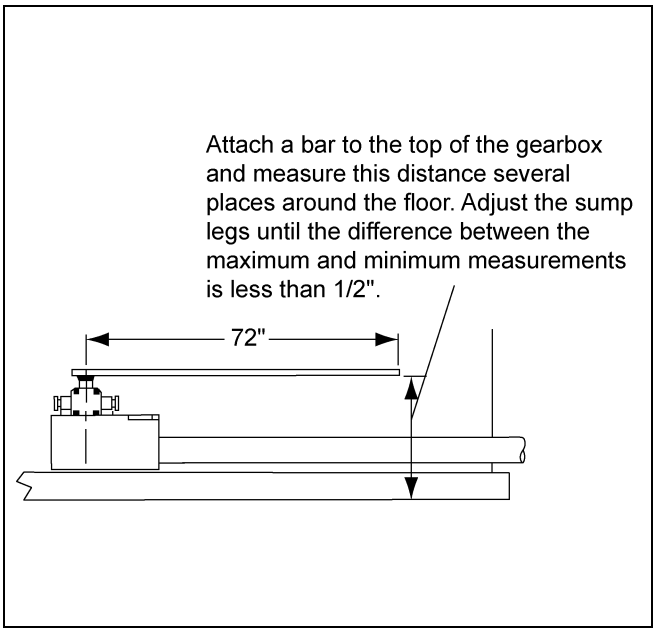


Figure 5H

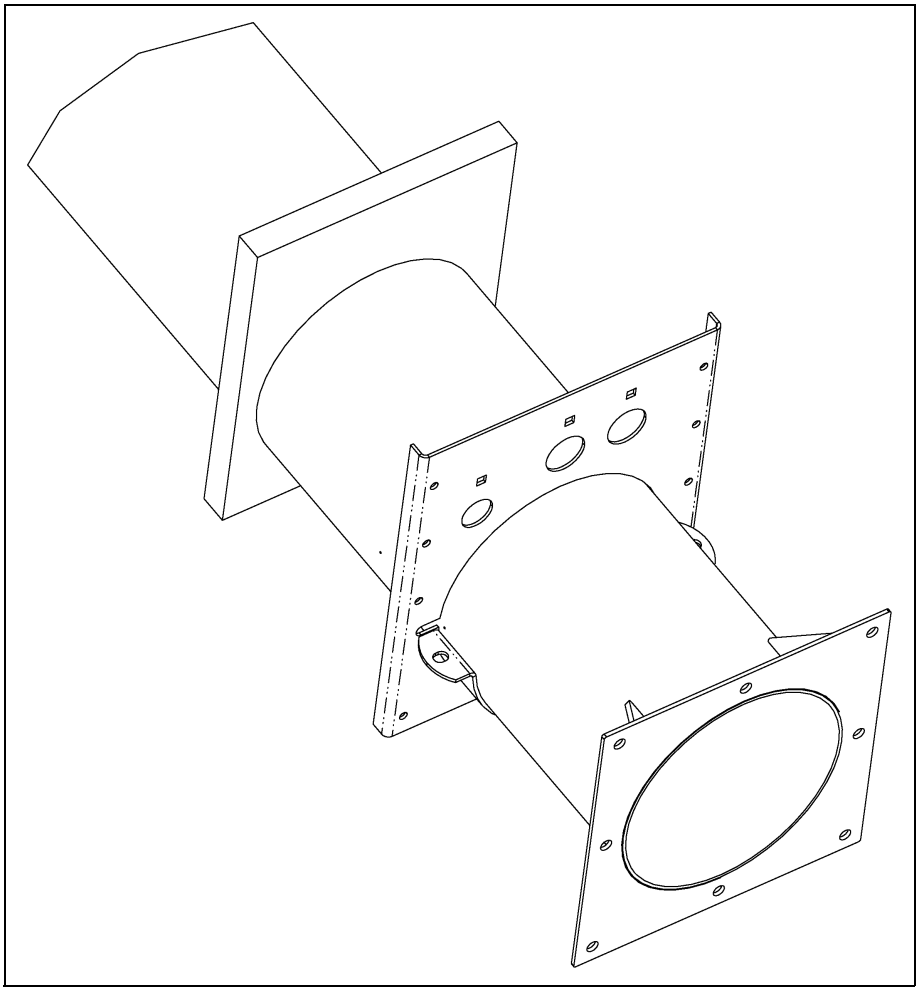


Figure 5I

Grain Flow Installation Instructions (Continued)

11. Connect the discharge auger tube to the Grain Flow sump. Be sure that the locator tabs welded on the auger tube are in position between the clamp bands. At this time, check the square flange welded onto the opposite end of the auger tube making sure it is level. Finish by tightening the two (2) 3/8" x 1-1/4" bolts and nuts holding the two (2) clamps together. The square flange on the auger tube must be level to ensure the power unit or vertical augers, if utilized, will be level and plumb. *(See Figure 5J and Figure 5K.)*

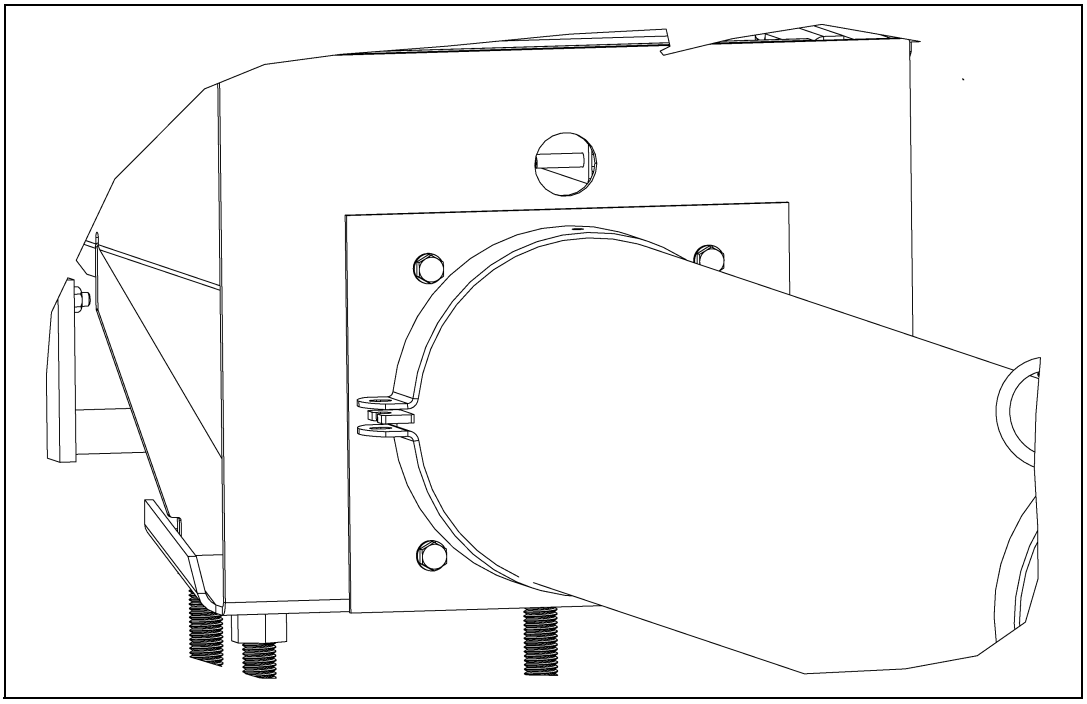


Figure 5J

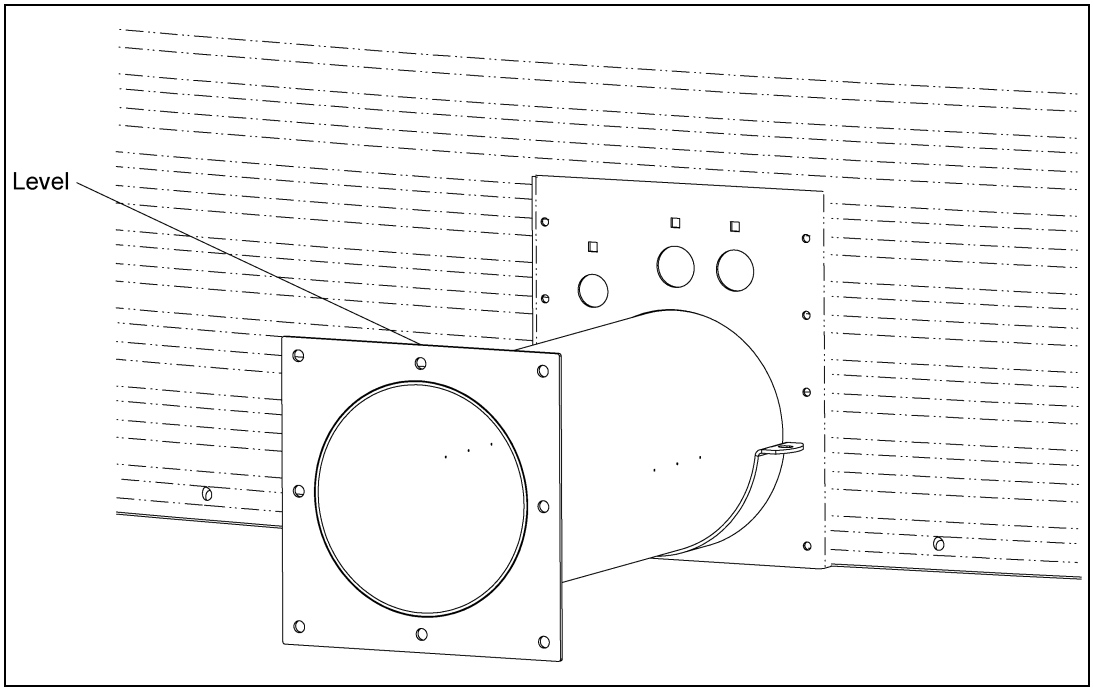


Figure 5K

Grain Flow Installation Instructions (Continued)

12. Slide the discharge auger flighting into the auger tube and connect to the gearbox drive sprocket with a #50 roller chain coupling. Be sure to install the chain retaining clip in the counterclockwise rotation direction. *(See Figure 5L and Figure 5M.)*

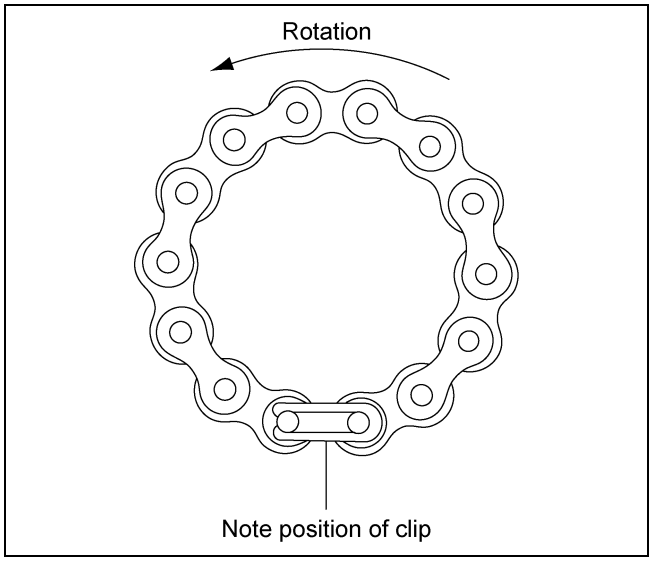


Figure 5L *Viewed with the clip on the gearbox side away from the flighting.*

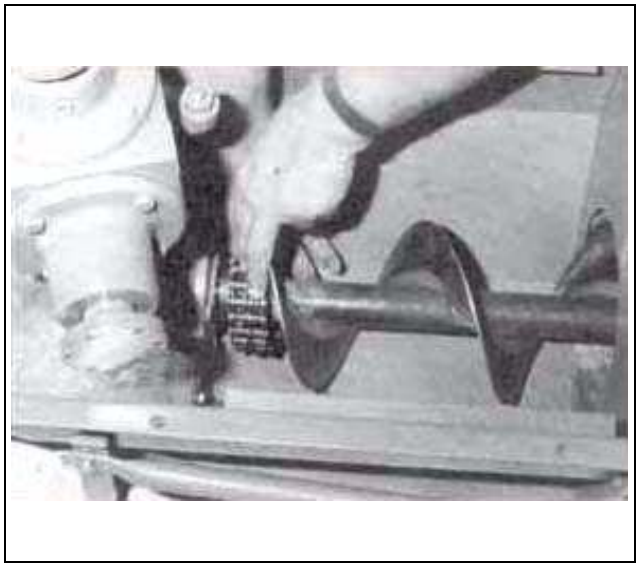


Figure 5M

13. Mount the control tube support clamps to the auger tube 2/3 of the way from the bin wall to the Grain Flow sump using a clamp band and two (2) 3/8" x 1-1/4" bolts and nuts. If optional intermediate sump is used, it replaces the control the gearbox side away from the flighting tube support bracket. *(See Figure 5N.)*

    For intermediate sump, place the sump on the discharge tube so the slide gate is pushed toward the center of the bin to open it. Install the sump with 52" between the bin wall and the intermediate sump. For 18' to 24' diameter bins, the intermediate sump will have to be installed closer to the bin wall so it will not interfere with the auger wear plates. Use the floor augers as guides to determine the position of the wear plates. *(See Figure 5X on Page 27.)*

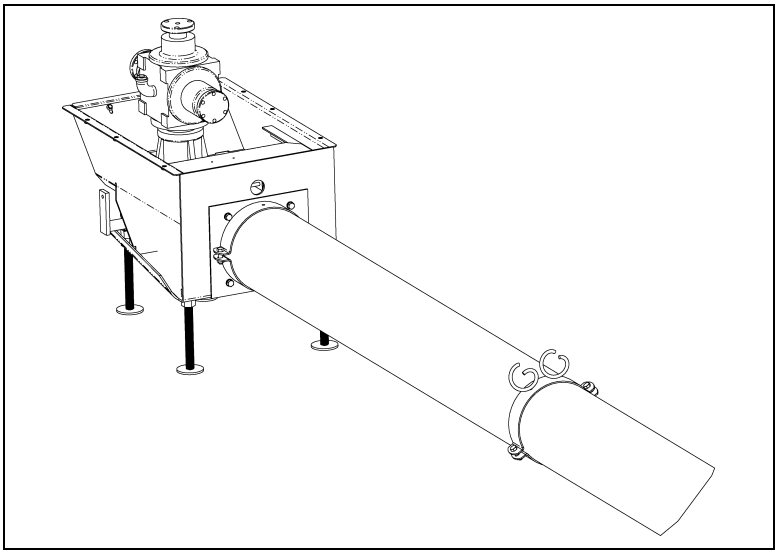


Figure 5N

Grain Flow Installation Instructions (Continued)

14. Place the latches onto the slide gate, intermediate sump (if used) and shift lever tubes. Then insert the tubes into the bin wall plate holes, through the support rings on the auger tube. Next, put the slide gate tube through the end of the sump and attach to the slide gate using two (2) 5/16" x 2" hex bolts and lock nuts. Connect the shift lever tube to the offset shift tube with the connecting sleeve using one 5/16" x 1-1/2" grade 5 bolt and lock nut. *(See Figure 5O, Figure 5P below and Figure 5Q on Page 23.)*

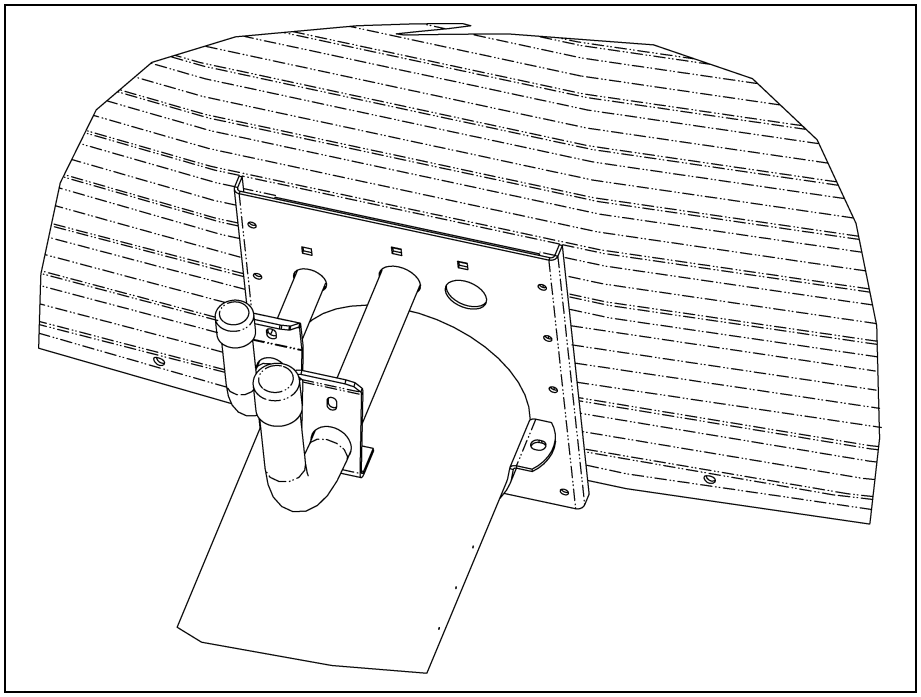


Figure 5O

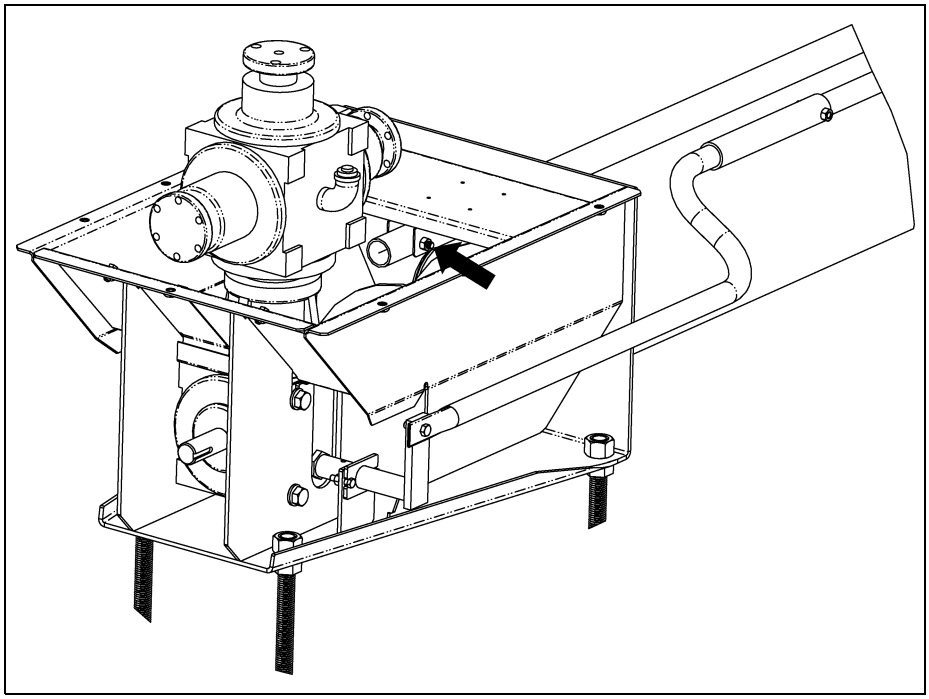


Figure 5P

Grain Flow Installation Instructions (Continued)

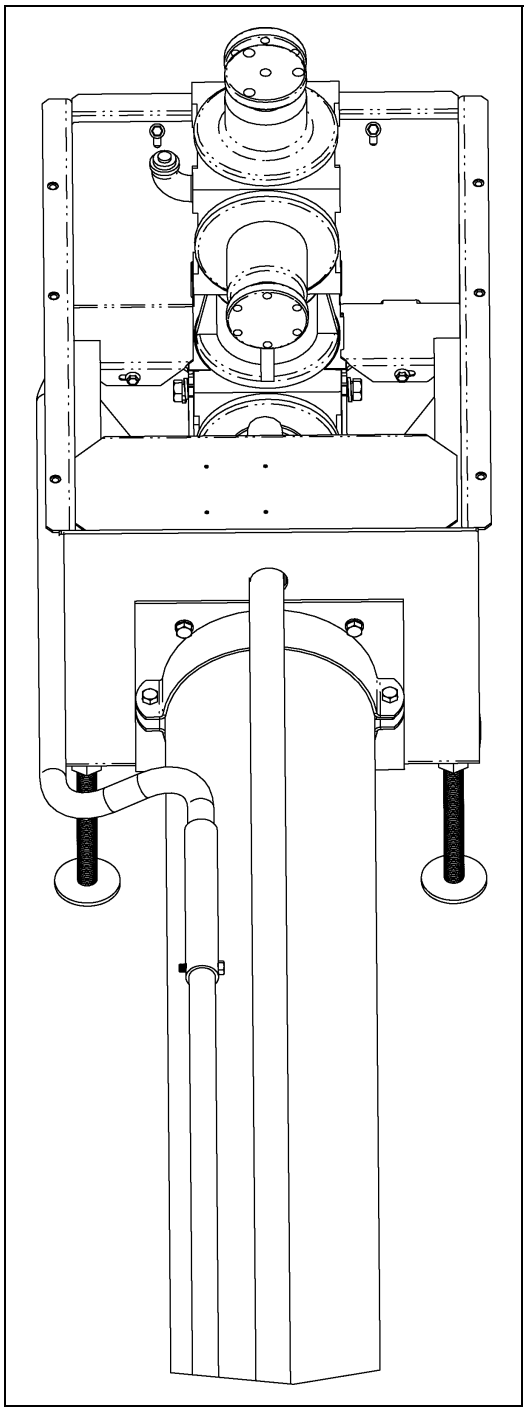


Figure 5Q

On 18' to 24' diameter bins, the intermediate slide gate handle will have to be cut off and the holes re-drilled to get the proper length. Leave 12" to 14" off tube outside the bin wall. Next, close the slide gate and mark the discharge tube along the inside of the intermediate sump. Slide the sump away from the marked area and carefully cut the opening in the discharge tube.

Place the sump over the cut-out opening and secure it to the tube with the two (2) connecting bands and hardware. Attach the latching hardware as stated for shift lever and center sump slide gate.

Grain Flow Installation Instructions (Continued)

15. Block up the outside end of the discharge tube so that the tube does not rest on the bin wall sheet. Next, insert two (2) 5/16" x 2" carriage bolts which hold the control tube latches onto the face plate, then attach the wall plate and wall seal to the bin wall using eight (8) 1/4" x 1-3/4" self-drilling screws. **NOTE:** *Discharge tube cannot rest on bin wall sheet.* *(See Figure 5R and Figure 5S.)*

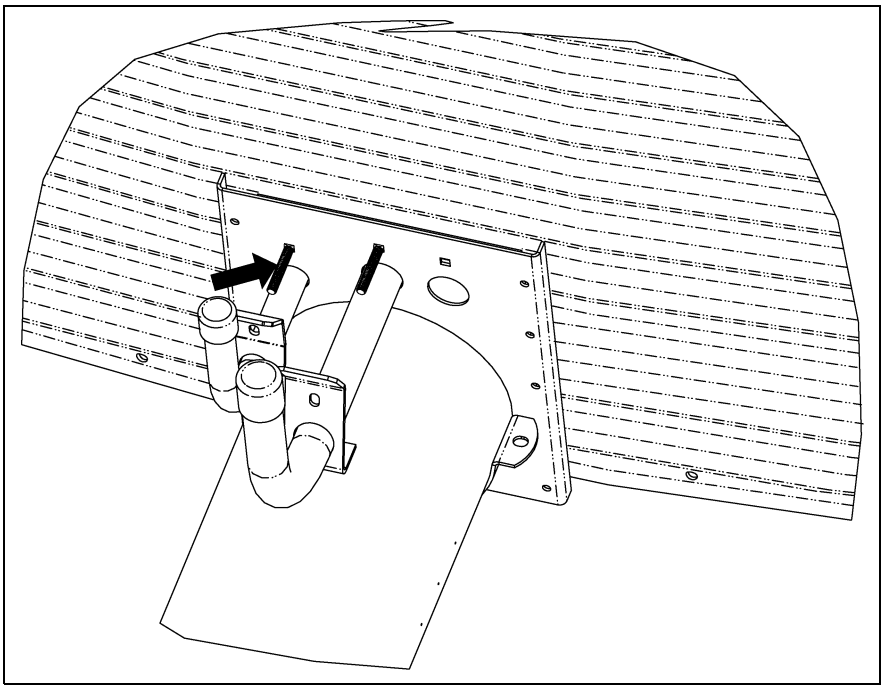


Figure 5R

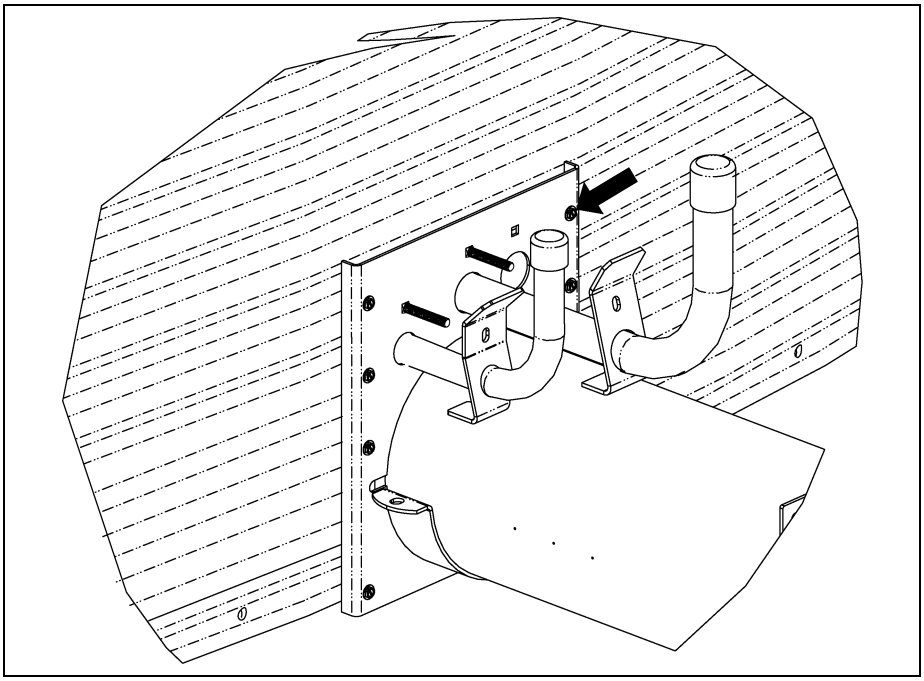


Figure 5S

BE SURE THE SUMP IS CENTERED AND AT THE RIGHT HEIGHT IN THE BIN BEFORE PROCEEDING.

Grain Flow Installation Instructions (Continued)

16. Secure tube to the wall plate with a clamp band and two (2) 3/8" x 1-1/4" bolts and nuts. *(See Figure 5T.)*

17. Place the slide gate and shift lever tube latches onto the 5/16" x 2" carriage bolts. Continue by placing a 1/4" flat washer and the compression spring onto the 5/16" bolt. Secure the lock nuts. *(See Figure 5U.)*

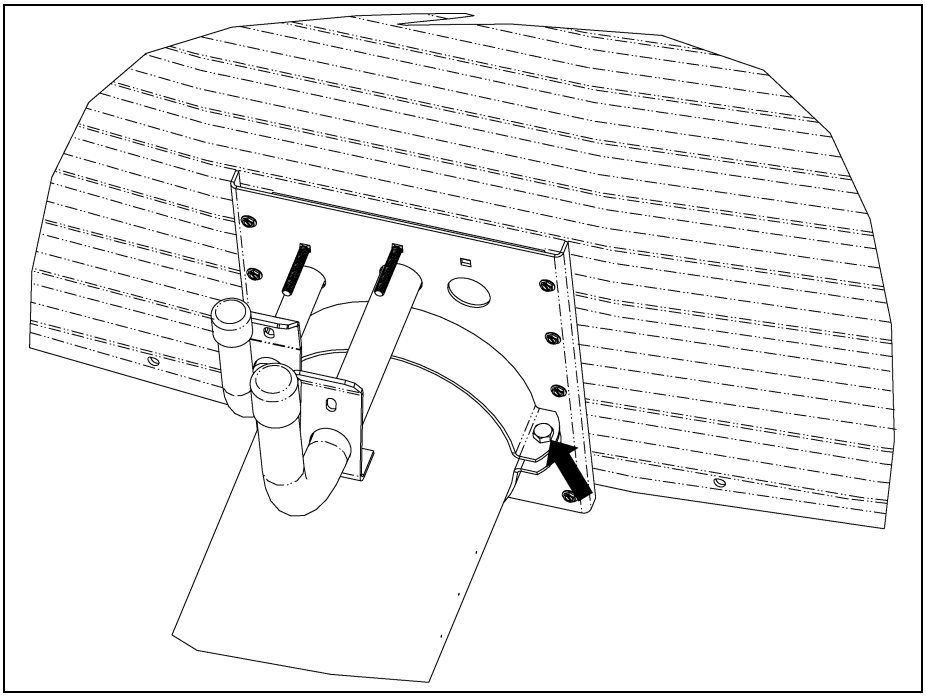


Figure 5T

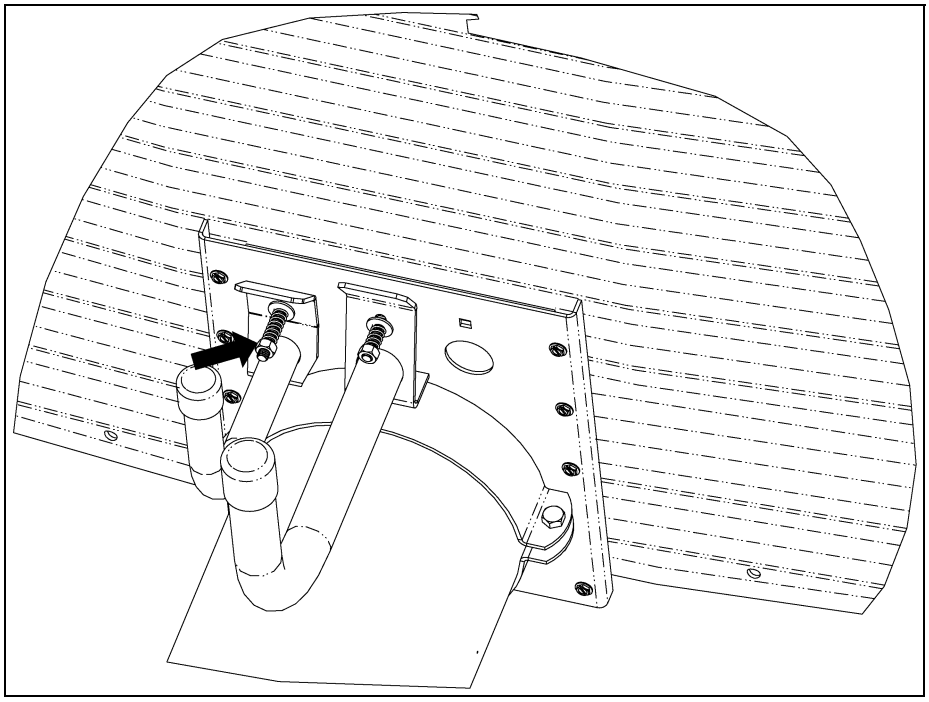


Figure 5U

Grain Flow Installation Instructions (Continued)

18. Install the drying floor. An area 14' in diameter in the center of the bin MUST have extra floor supports to hold the extra down pressure that occurs during the operation of the Grain Flow. Install the floor perpendicular to the discharge auger starting on the opposite side of the bin from the auger. *(See Figure 5V.)*

For existing bins, replace the drying floor taken out. Follow *Step 18* instructions. *(See Figure 5V.)*

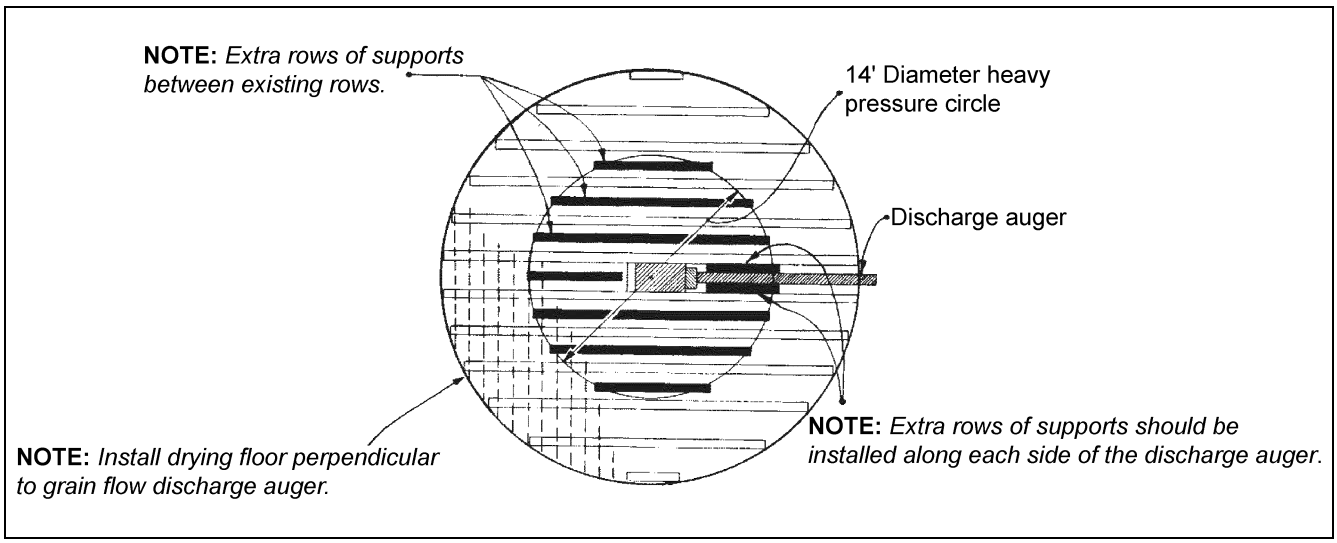


Figure 5V

19. After the drying floor has been installed, attach both halves of the perforated cover plate to the sump using nine (9) 1/4" x 1/2" hex flange head screws. Secure to the drying floor with twenty (20) 1/4" x 3/4" self-drilling screws. Make sure the angle ring on the perforated cover is sticking up. See center sump and gearbox assembly on *Page 80*, *Ref #8* and *Ref #9 on Page 81*.

20. Bolt one floor auger to the gearbox hub using 5/16" x 1-1/2" grade 5 hex bolts and lock nuts. For grade 5 identification, *See Figure 5W*.

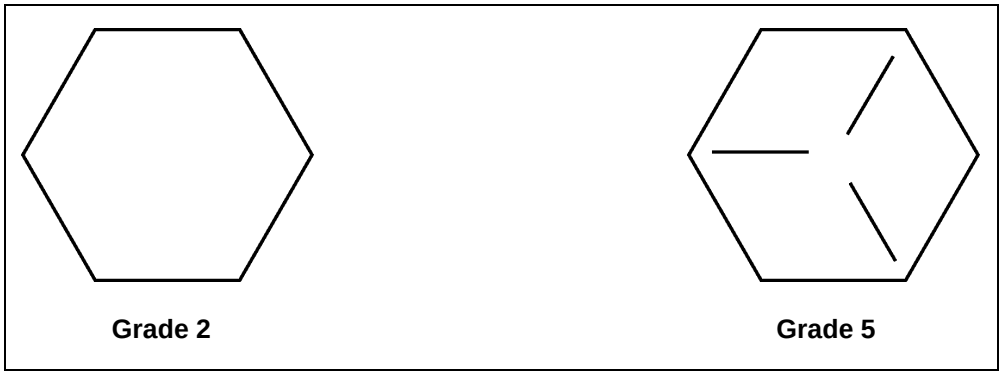


Figure 5W

Grain Flow Installation Instructions (Continued)

21. Use the floor auger to position the wear plates locating them so the drive wheel and center support feet will not hit the anchoring screws or rivets. Bin sizes 36' 1" and larger will use two (2) sets of inner wear plates. The wear plates are to be overlapped so the drive wheels can move over them without tearing them loose from the floor. Secure the plates to the floor with either 3/16" aluminum rivets. *(See Figure 5X and Figure 5Y.)*

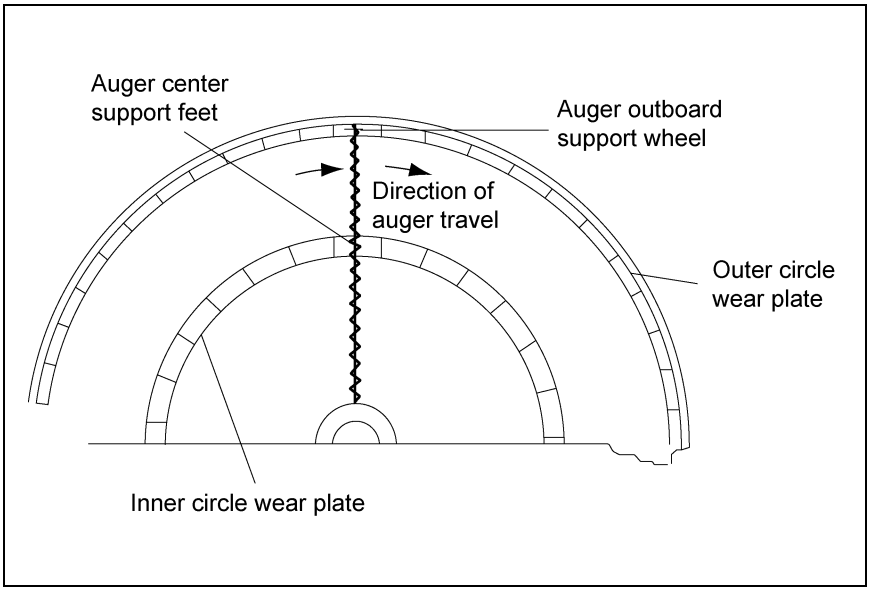


Figure 5X

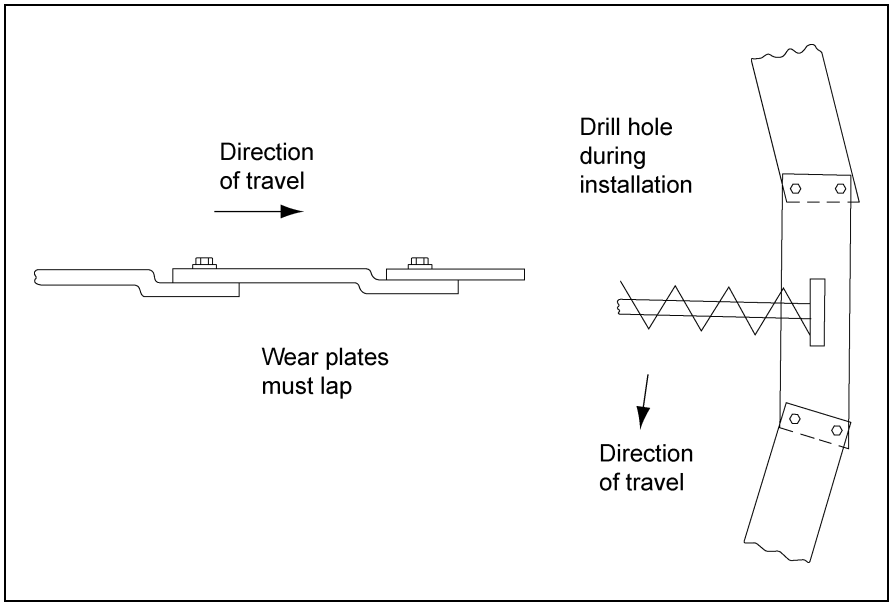


Figure 5Y

22. Attach second floor auger. Same as *Step 20 on Page 26*.
23. Attach the center hood to the top of the gearbox using the hardware that is in the top of the gearbox. (3/8"-16" x 1-1/4" Grade 5 bolts with lock washers.)
24. Place the small perforated cover over the hood and secure it with three (3) 1/4" x 1/2" hex flange head screws. Rotate the hood by hand to ensure that it turns freely.

Grain Flow Installation Instructions (Continued)

Installation of the Grain Sampler

25. The sampler may be installed on either side of the discharge tube. If a vertical auger is being attached, a separate sampler is provided for use with the vertical auger. Locate the three (3) small pilot holes on the side of the discharge tube. Drill the outside holes to 5/32" diameter and the center hole to 1-1/4" diameter. *(See Figure 5Z.)*

    To fasten the sampler to the discharge tube, use two (2) #10 x 1" hex flange head, self-tapping screws, and two (2) 5/16" flat washers, place the two (2) flat washers between the grain sampler unit and the discharge auger tube. Tighten the two (2) #10 x 1/2" self-tapping screws. Using the grain sampler as a template, drill two (2) more 5/32" holes into the discharge auger tube. Finish the installation by using two (2) more 5/16" flat washers between the sampler and the discharge auger tube. Secure with #10 x 1/2" hex flange head self-drilling screws.

    Hook the extension spring into the holes in the slide gate and sampler cover. *(See Figure 5AA, Figure 5AB on Page 29, Figure 5AC and Figure 5AD on Page 30.)*

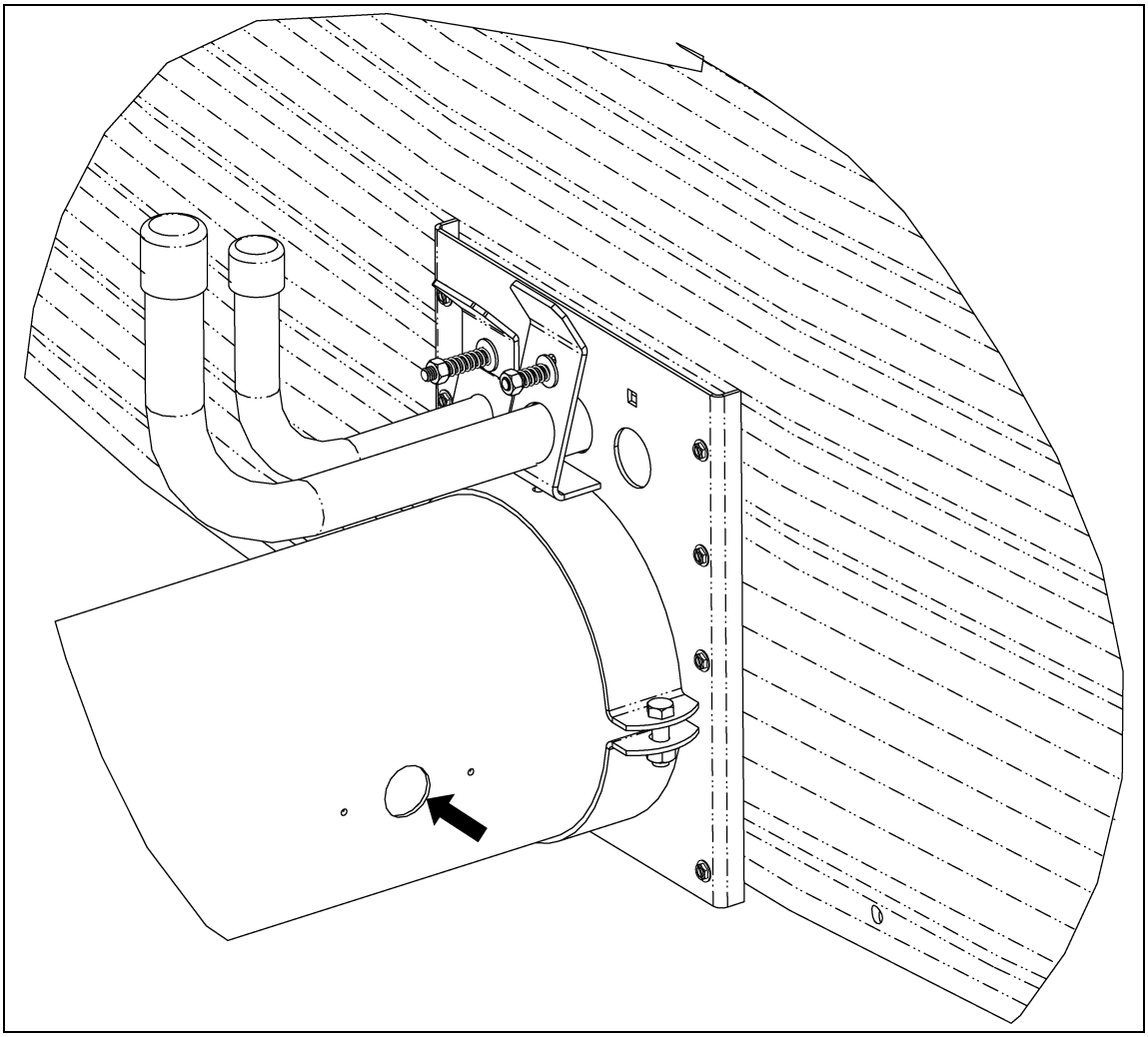


Figure 5Z

Grain Flow Installation Instructions (Continued)

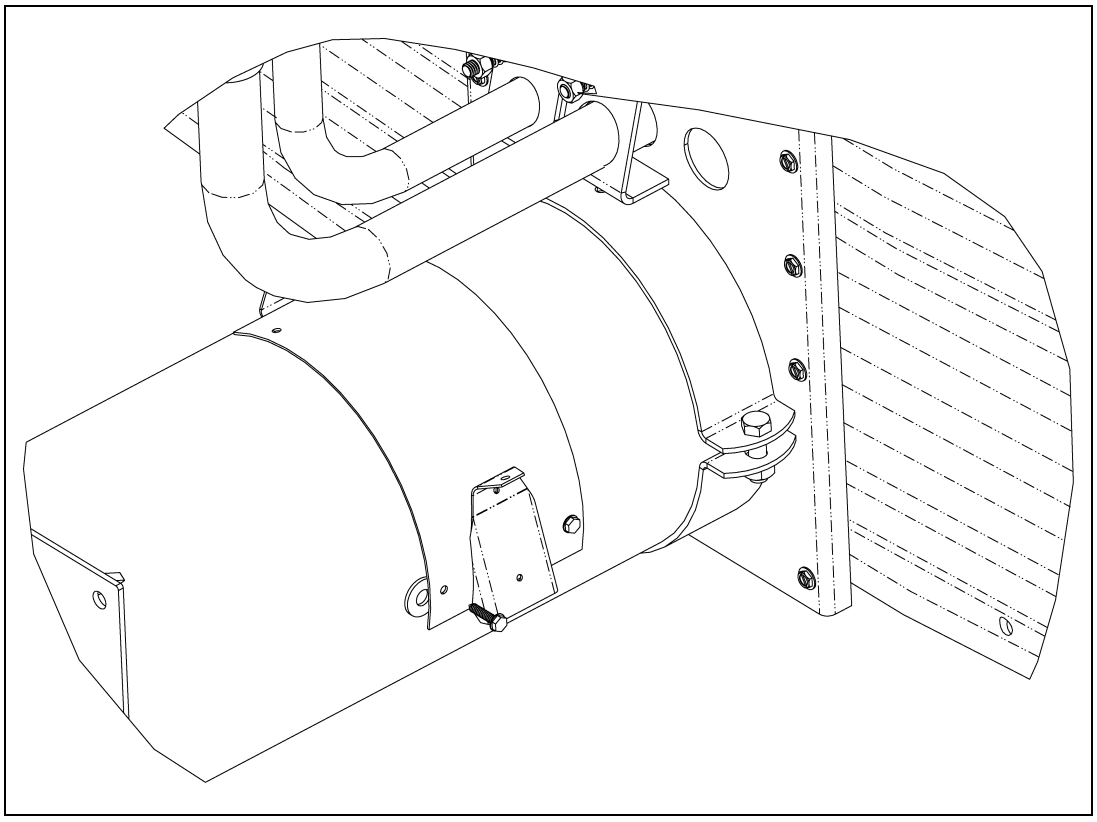


Figure 5AA

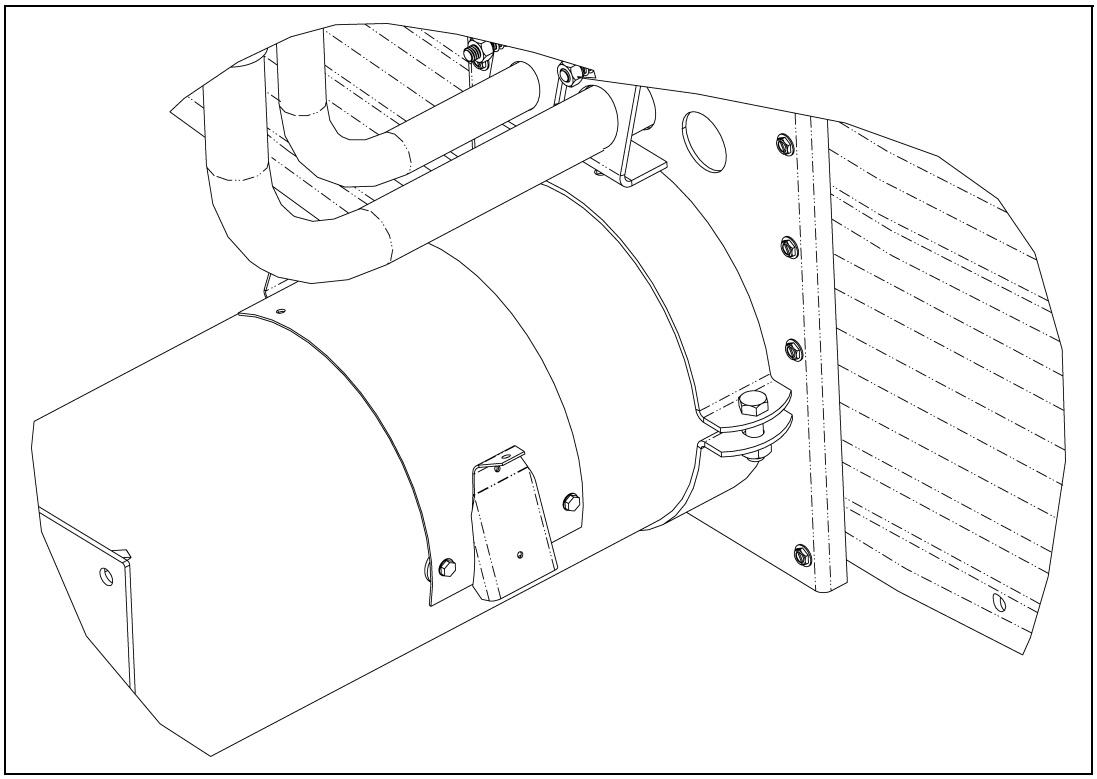


Figure 5AB

Grain Flow Installation Instructions (Continued)

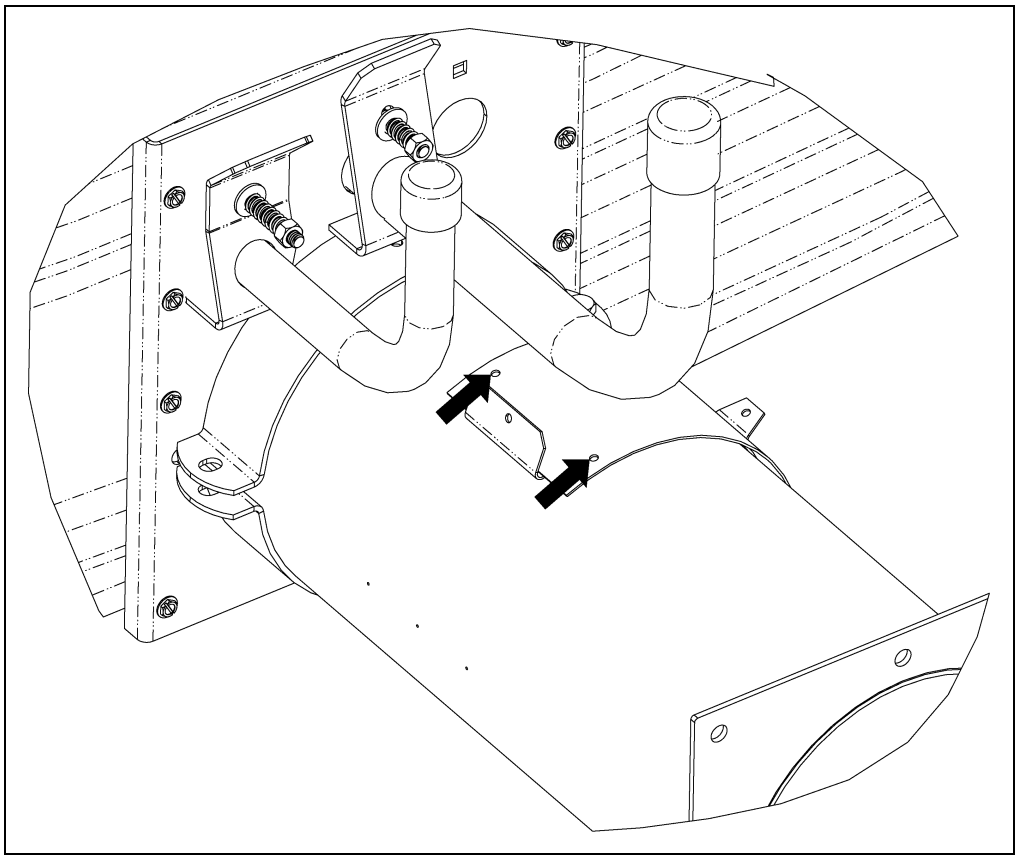


Figure 5AC

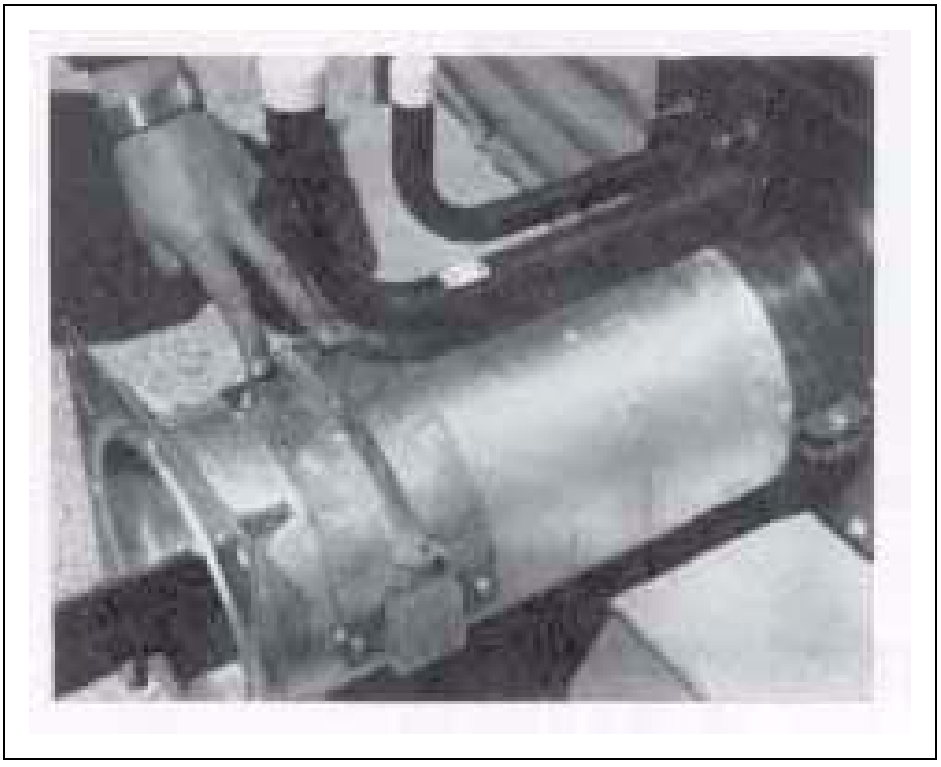


Figure 5AD

Grain Flow Installation Instructions (Continued)

26. Bolt the power unit to the flange on the discharge auger tube using eight (8) 3/8" x 1" hex bolts, lock washers and nuts. Note that the power unit is symmetrical and can be assembled to discharge grain to the left or to the right; however, the preferred assembly is to mount the motor on the right side (as viewed from outside). Before tightening, check level of the assembly. *(See Figure 5AE below and Figure 5AF on Page 32.)*

27. Install the 1-1/4" bearing and bearing plate assembly onto the auger stub shaft and fasten to the power unit using the six (6) 3/8" x 1-1/4" hex bolts and nuts. Place these six (6) bolts across the top and bottom of the bearing plate. Put two (2) 3/8" x 1" hex bolts, lock washers and nuts in the two (2) side holes. Position the bearing so that the grease fitting is pointed away from the motor. *(See Figure 5AG on Page 32.)*

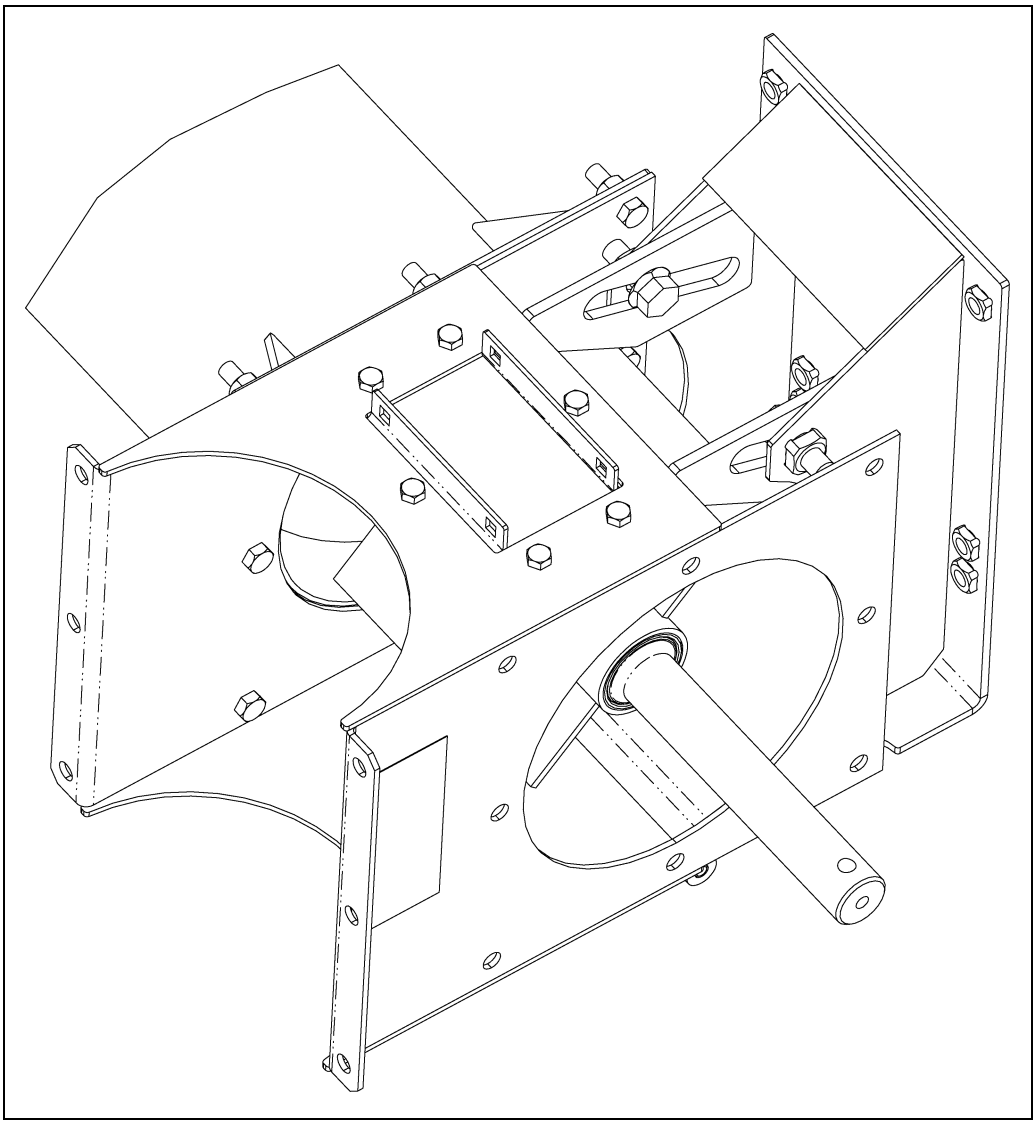


Figure 5AE

Grain Flow Installation Instructions (Continued)

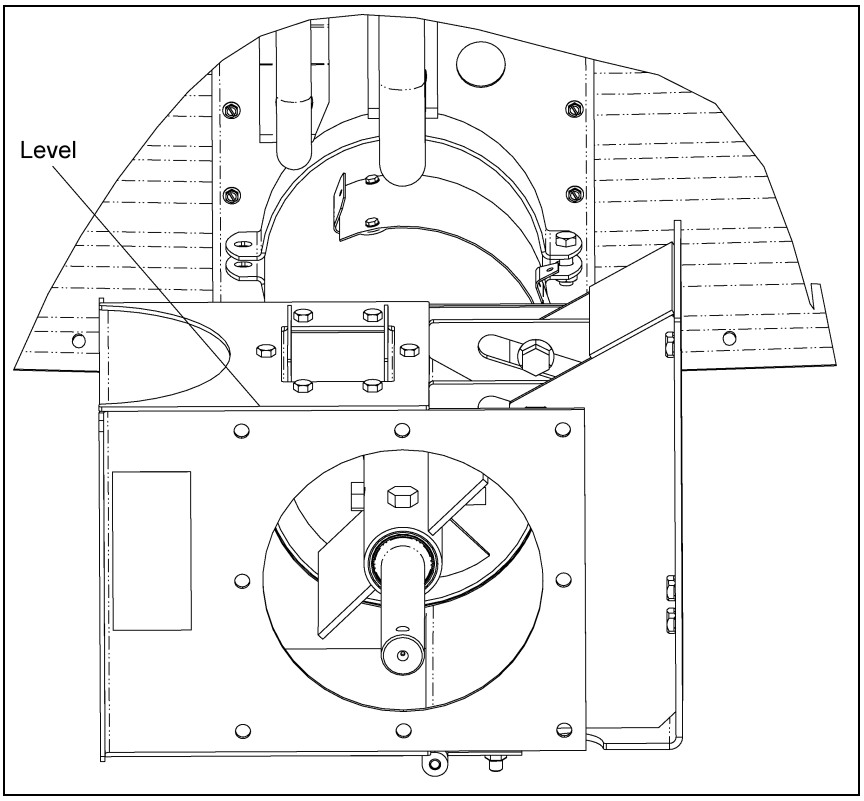


Figure 5AF

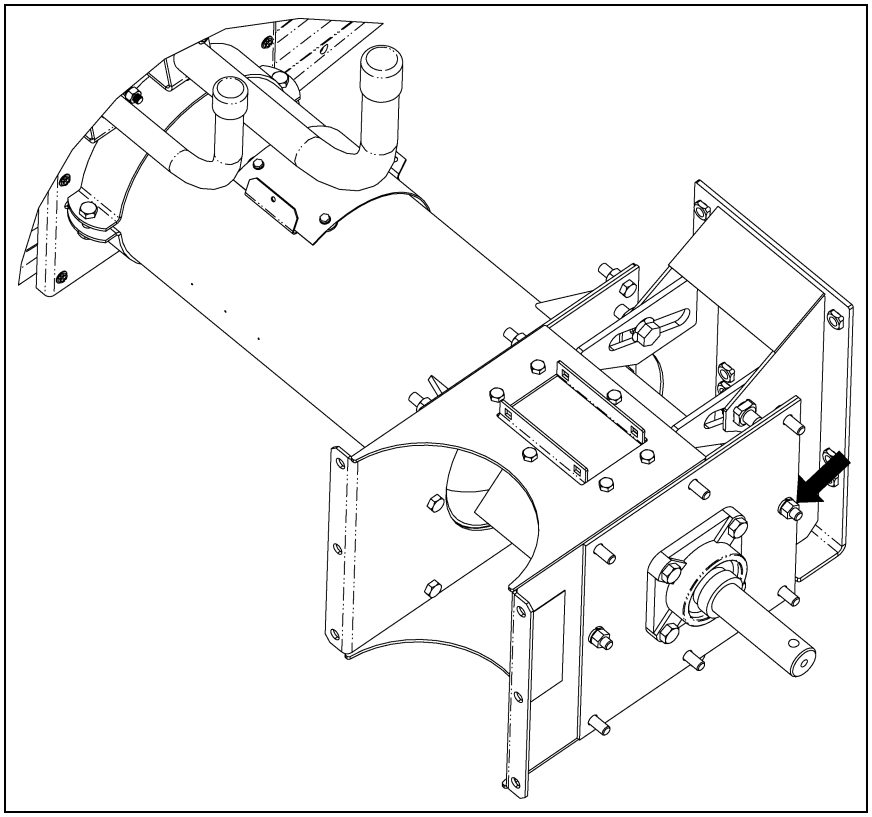


Figure 5AG

Grain Flow Installation Instructions (Continued)

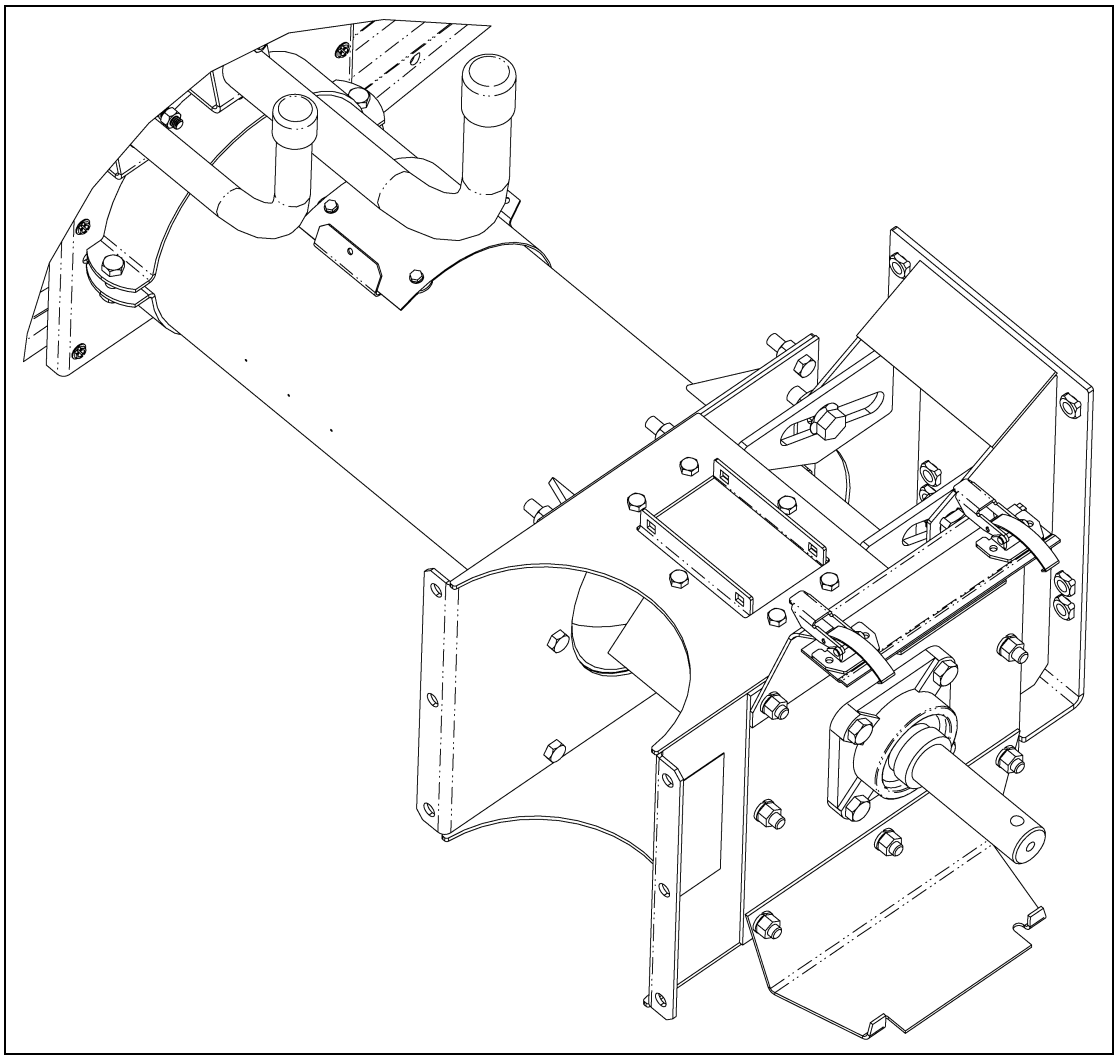


Figure 5AH

28. Place the top and bottom shield mounting brackets onto the six (6) 3/8" x 1-1/4" cap screws protruding through the bearing plate. Secure by using six (6) 3/8" lock washers and nuts. *(See Figure 5AH* or discharge and power unit on *Page 76.)*

    See *Pages 41-45* for installation of optional GIMBAL or STRAIGHT SWIVEL discharge boot.

Grain Flow Installation Instructions (Continued)

29. Install the bearing locking collar on the 1-1/4" bearing. Lock the collar by tapping in a clockwise direction (as viewed from the shaft end) and tightening the locking collar set screw. *(See Figure 5AI.)*
30. Coat the surface of the auger stub shaft with grease. *(See Figure 5AJ.)*

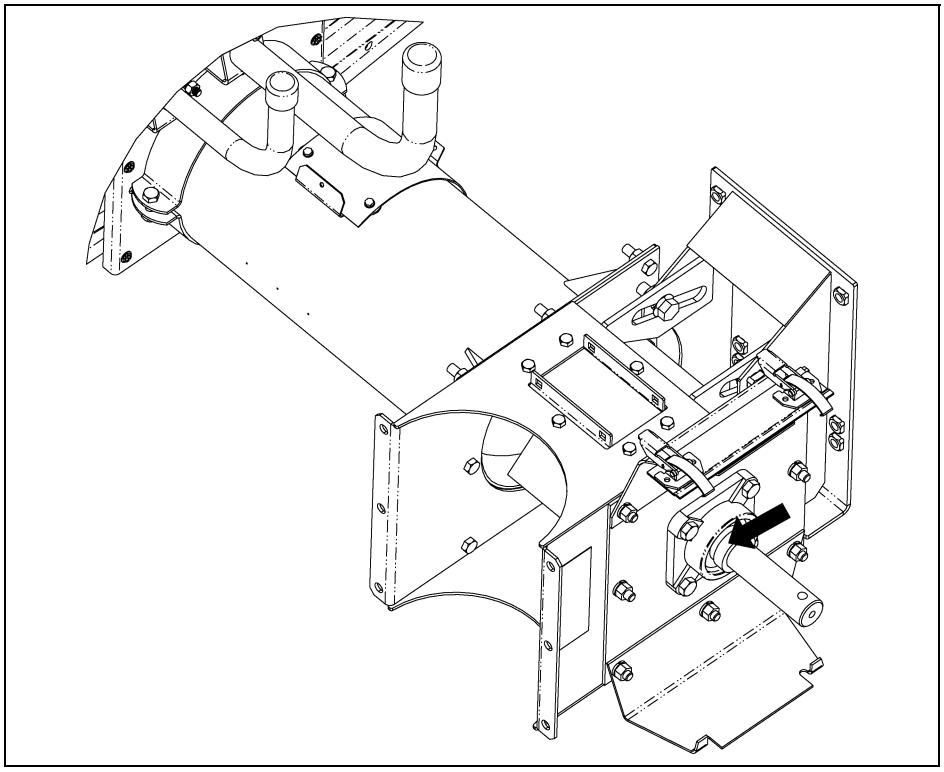


Figure 5AI

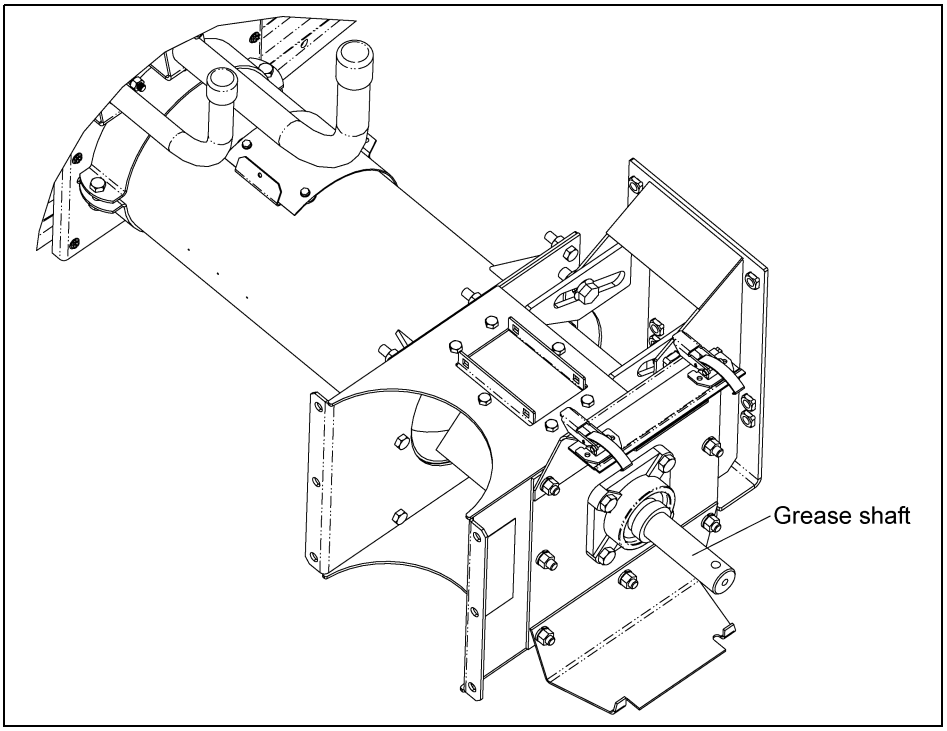


Figure 5AJ

Grain Flow Installation Instructions (Continued)

31. Slide the 2" O.D. keyed drive hub over the stub shaft until the 3/8" holes in the hub and auger shaft are in line, then drive the 3/8" x 2" roll pin through both shaft and drive hub. *(See Figure 5AK.)*

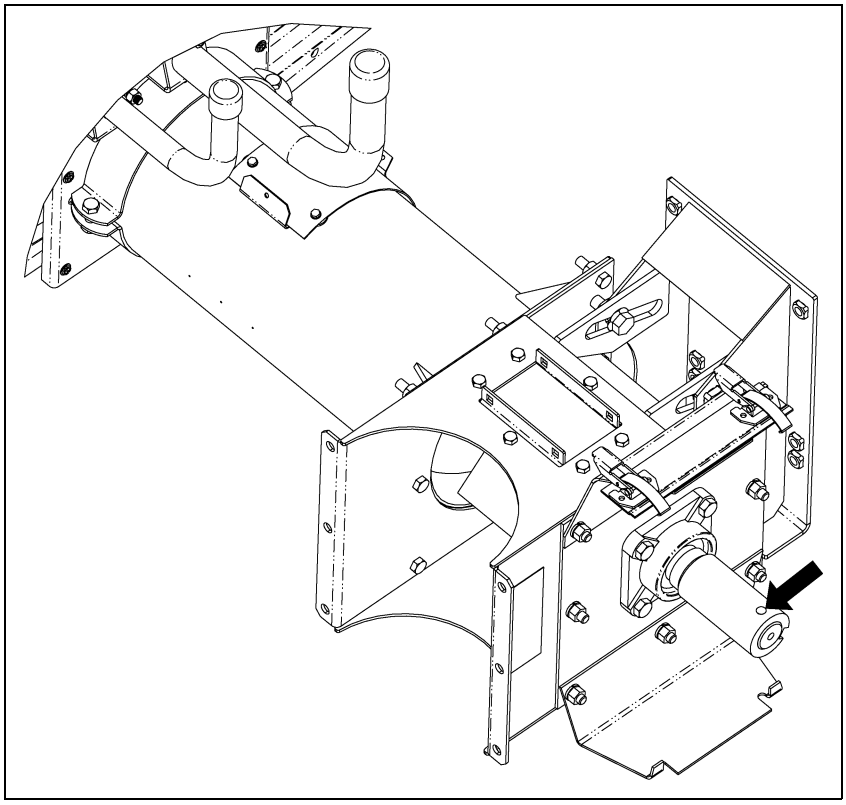


Figure 5AK

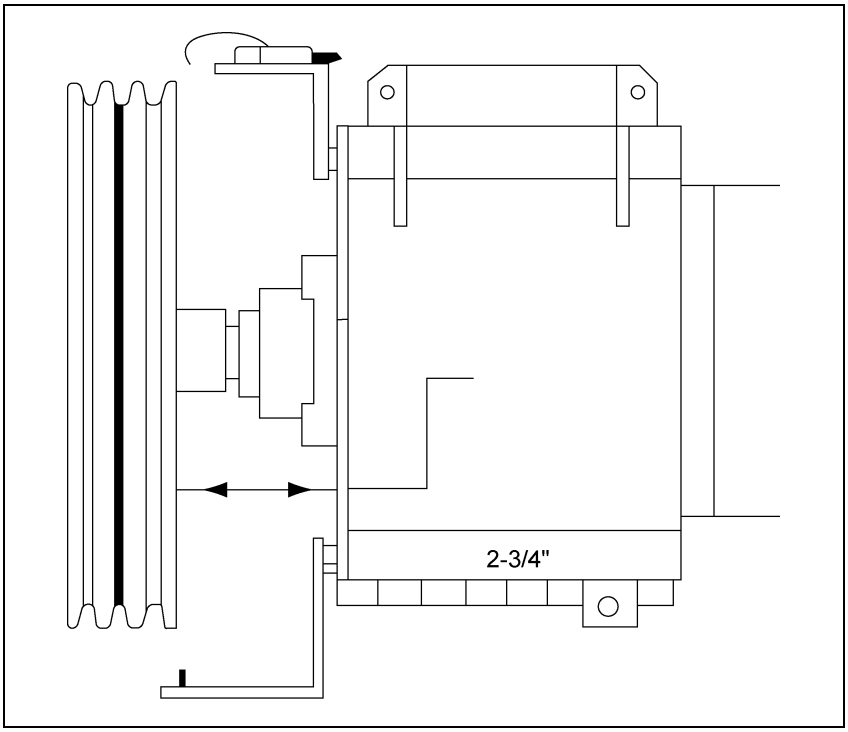


Figure 5AL

Grain Flow Installation Instructions (Continued)

32. Install the 1/2" x 2" square key into the keyway of the drive hub. Slide the 12-3/4" diameter drive pulley, with pulley hub pointing outward, onto the shaft. Position the pulley so the inside flange is 2-3/4" from the bearing plate and tighten. *(See Figure 5AL on Page 35, Figure 5AM and Figure 5AN below* or discharge and power unit on *Page 76.)*

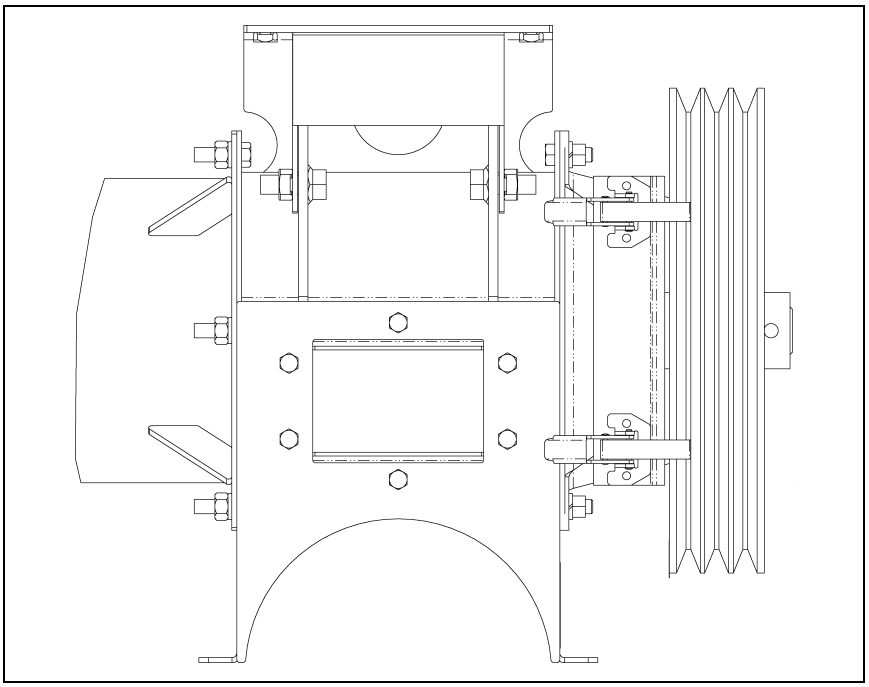


Figure 5AM

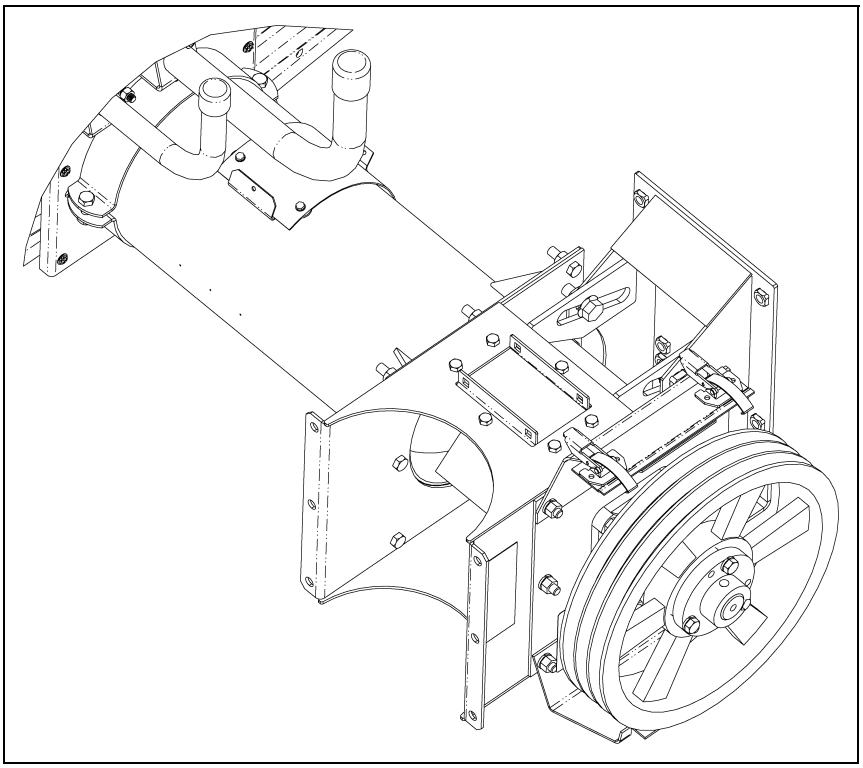


Figure 5AN

Grain Flow Installation Instructions (Continued)

33. Mount the motor onto the base with four (4) 3/8" x 1-1/4" hex flange bolts. *(See Figure 5AO.)*

34. Install the 4" O.D. three (3) groove pulley on the motor shaft using a taper lock bushing. The bushing should be assembled between the motor and pulley for #184 frame motors and on the outside of the pulley for #213 and #215 frame motors. *(See Figure 5AP.)*

    NOTE: *For 8" units, a 3-1/2" O.D. pulley is used.*

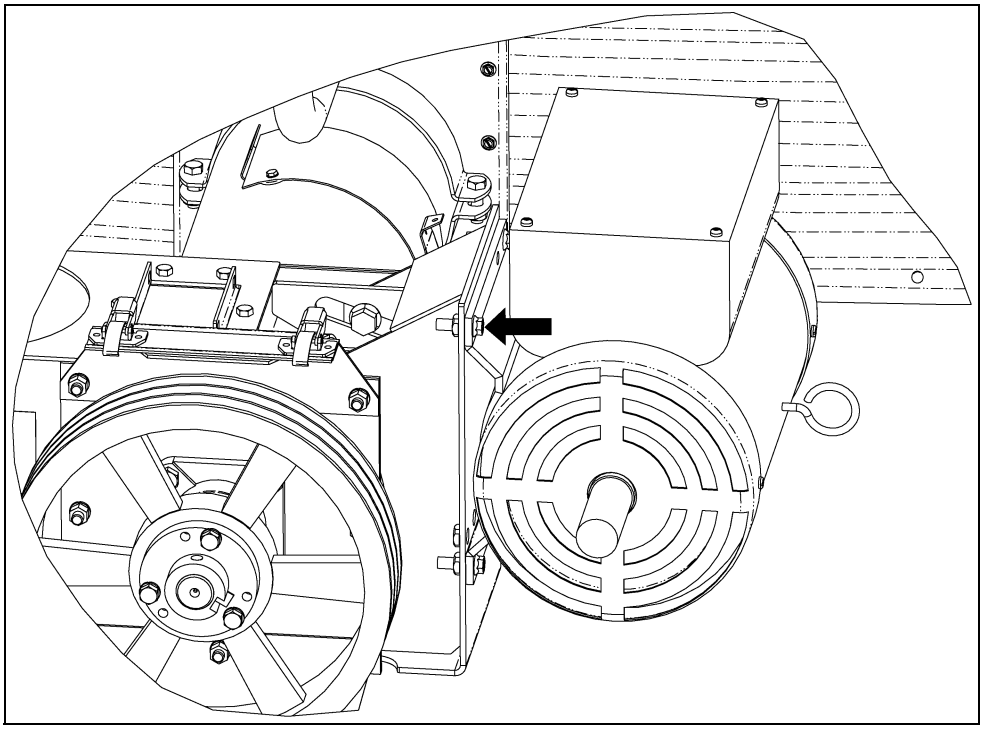


Figure 5AO

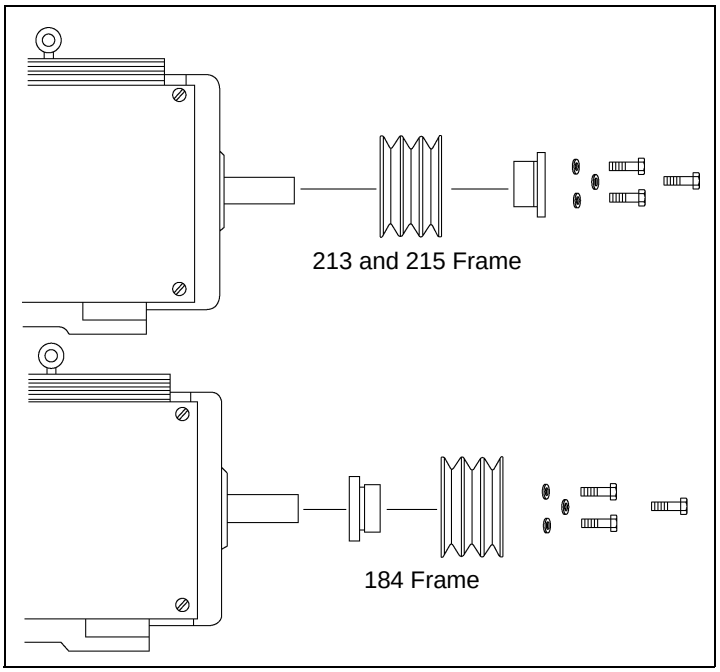


Figure 5AP

Grain Flow Installation Instructions (Continued)

35. Use a straight edge to align the pulleys and then tighten the bushing on the motor. *(See Figure 5AQ.)*

36. Loosen the two (2) 1/2" bolts on the motor mount allowing it to pivot freely. Next, install three (3) BX-51 V-belts. Check to see that the pulleys are parallel with just the weight of the motor tensioning the belts. If the pulleys are not parallel due to play in the power unit hinge, straighten by loosening the three (3) 3/8" x 1" carriage bolts on the underside of the motor mount. Turn the 3/8" adjusting bolt until the pulleys are parallel to one another. Re-tighten the three (3) 3/8" x 1" carriage bolts. *(See Figure 5AR below and Figure 5AS on Page 39.)*

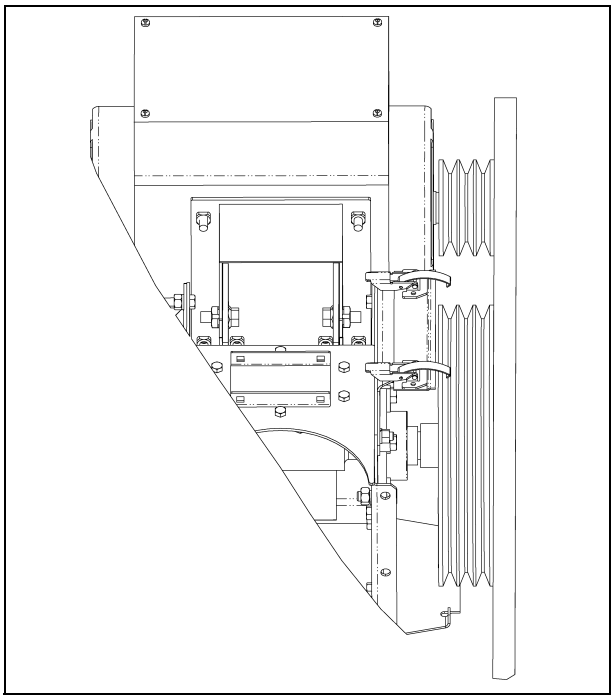


Figure 5AQ

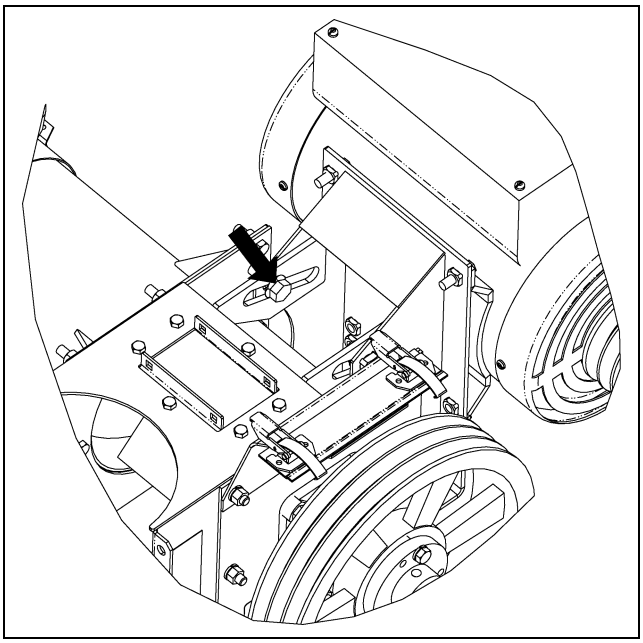


Figure 5AR

Grain Flow Installation Instructions (Continued)

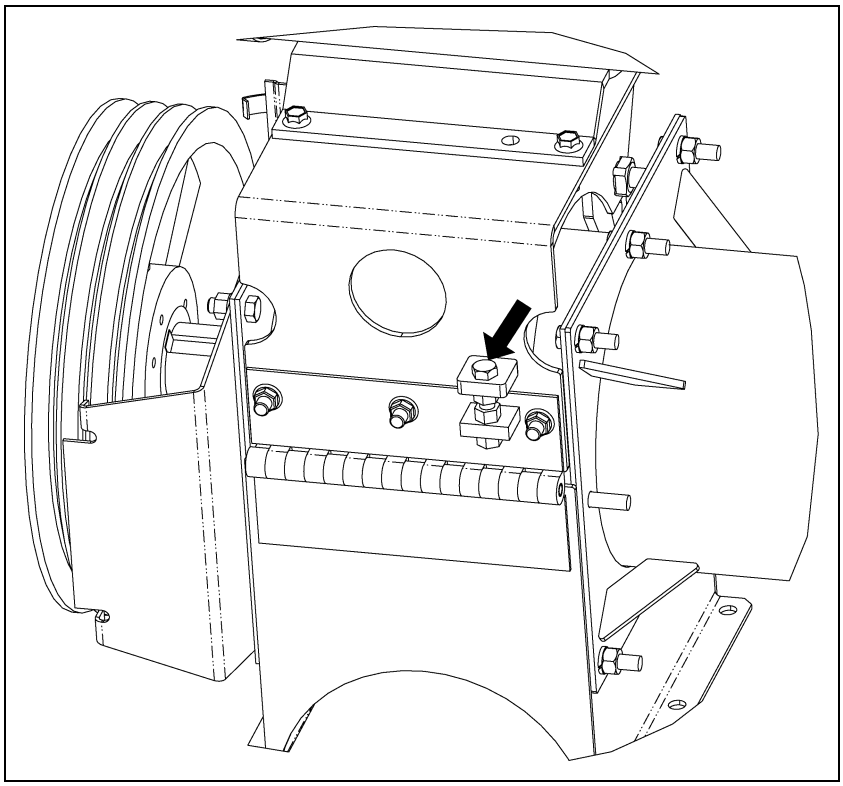


Figure 5AS

37. Tighten the drive belts to 3/16" deflection at 10-15 lbs. pivoting the motor down and re-tightening the two (2) 1/2" bolts loosened in *Step 36 on Page 38. (See Figure 5AT.)*
38. Attach the drive pulley shield by setting the shield over the tabs on the bottom support, pivot up and latch to the top support with over-center clamps.

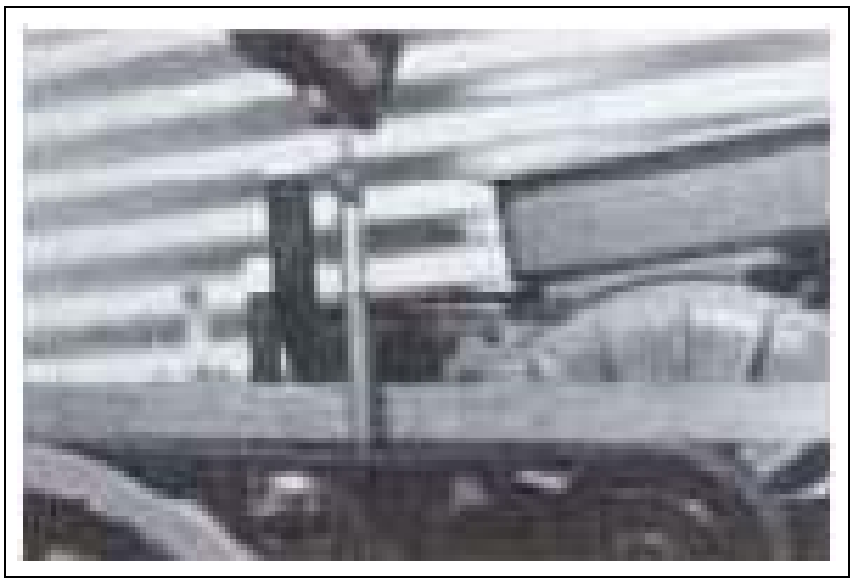


Figure 5AT

Grain Flow Installation Instructions (Continued)

39. Bolt the discharge chute shield to the power unit with six (6) 3/8" x 1-1/4" hex bolts, lock washers and nuts. Leave the discharge chute shield off if vertical auger is to be installed. *(See Figure 5AU.)*

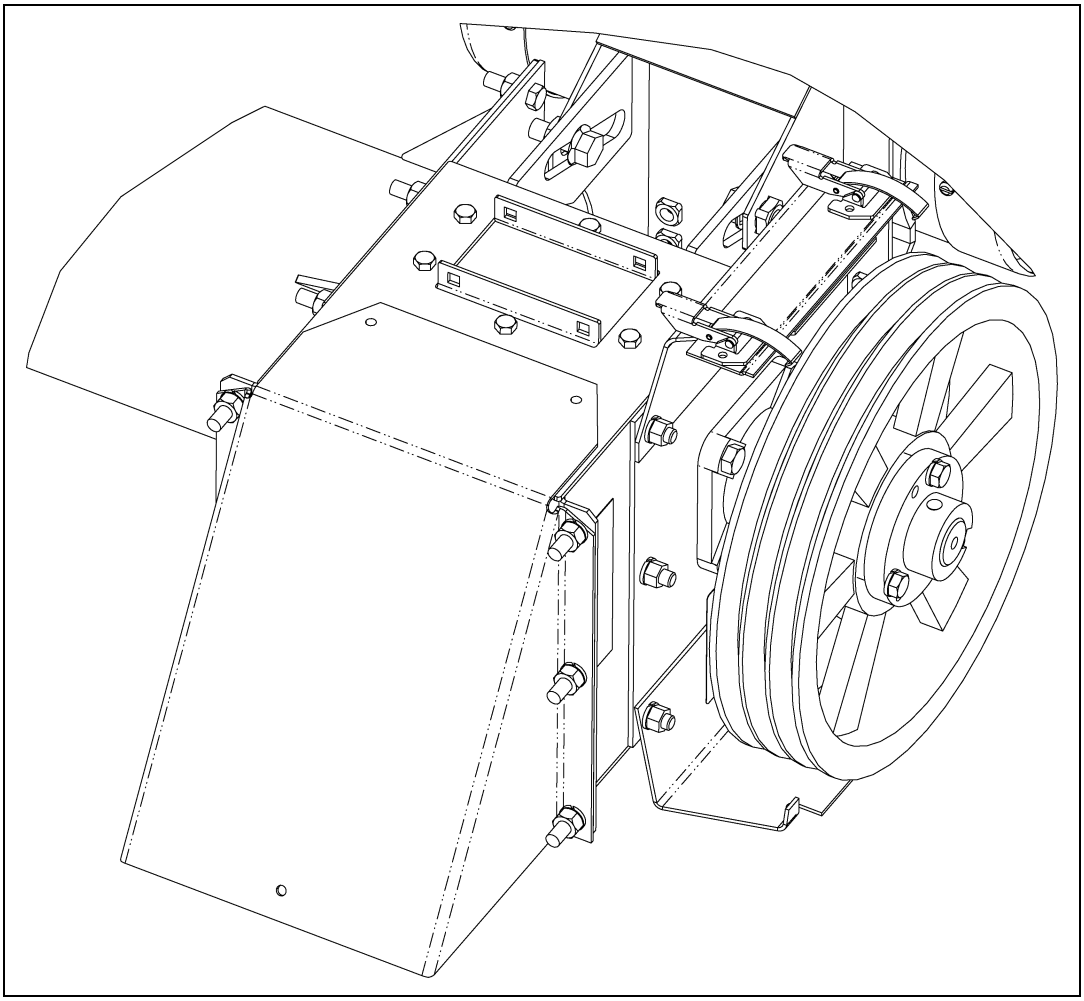


Figure 5AU

40. Put decals in place as follows:

    1. Place “This bin equipped with DMC Grain Flow” decal on the outside of the grain bin walk-in door.
    2. Place “DANGER” decal on the underside of the manhole cover and on the inside of the walk-in door.
    3. Place the “Slide gate” decal on bin wall above the slide gate control tube.
    4. Place the “Floor auger drive notice” decal directly above the shift rod.

Straight Out Swivel Boot Installation

1. Use a straight edge to mark the cutline. *(See Figure 5AV.)*
2. Use the bearing plate as a guide and cut off the mounting flanges as shown in *Figure 5AV, Figure 5AW and Figure 5AX*.
3. Install the swivel boot onto the take-away auger. Secure by tightening the bolts on the connecting band. *(See Figure 5AY on Page 42.)*

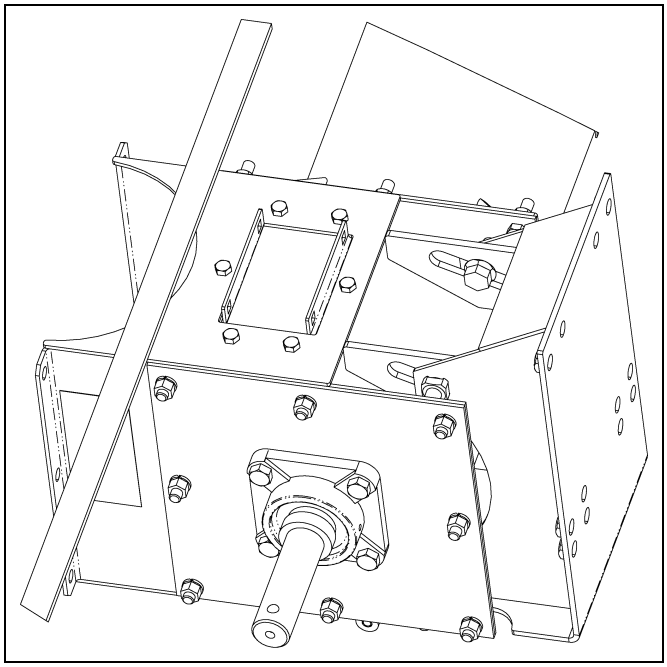


Figure 5AV

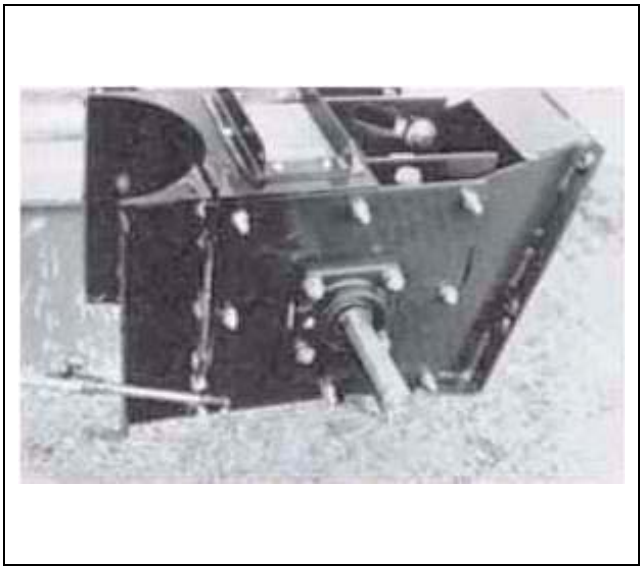


Figure 5AW

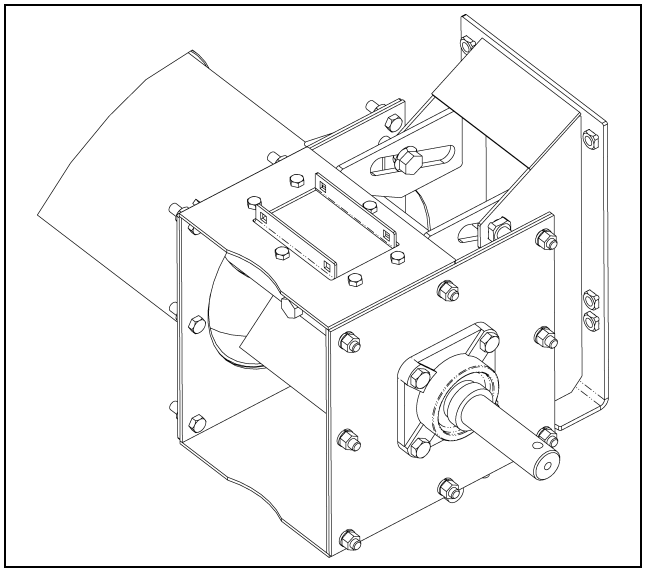


Figure 5AX

Straight Out Swivel Boot Installation (Continued)

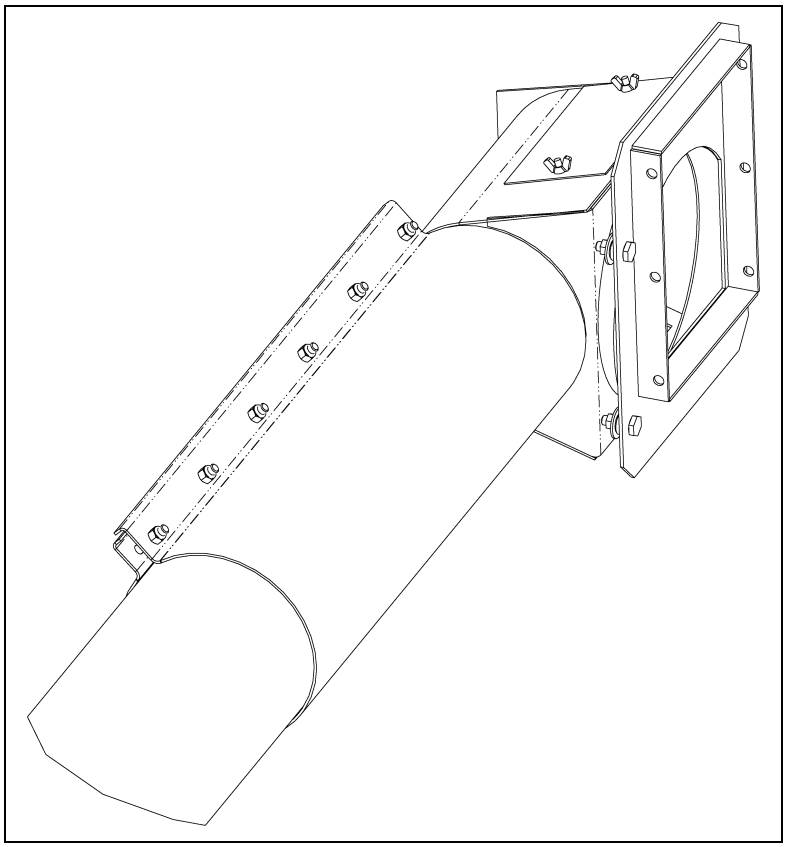


Figure 5AY

4. Remove the six (6) 3/8" x 1-1/4" hardware, and bolt the swivel support base onto the Grain Flow discharge chute using the 3/8" hardware just removed.

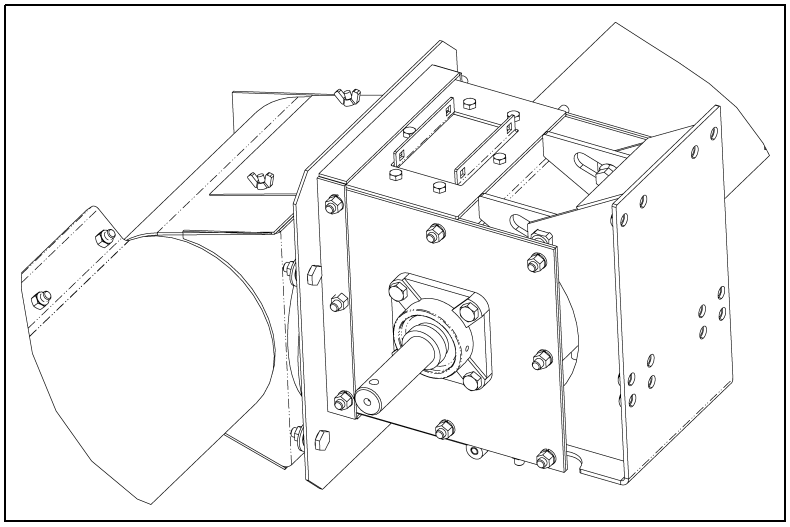


Figure 5AZ

Gimbal Swivel Boot Installation

1. Use a straight edge to mark cutline. *(See Figure 5AV on Page 41.)*
2. Use a bearing plate as a guide and cut off the mounting flanges as shown in *Figure 5AV, Figure 5AW and Figure 5AX on Page 41*.
3. To remove the gimbal from the gimbal base, remove the snap ring on the upper stud of the large gimbal ring. Slide the tube and ring assembly up and pull the bottom stud out first. Do not lose the plastic thrust washer or snap ring. *(See Figure 5BA and Figure 5BB.)*

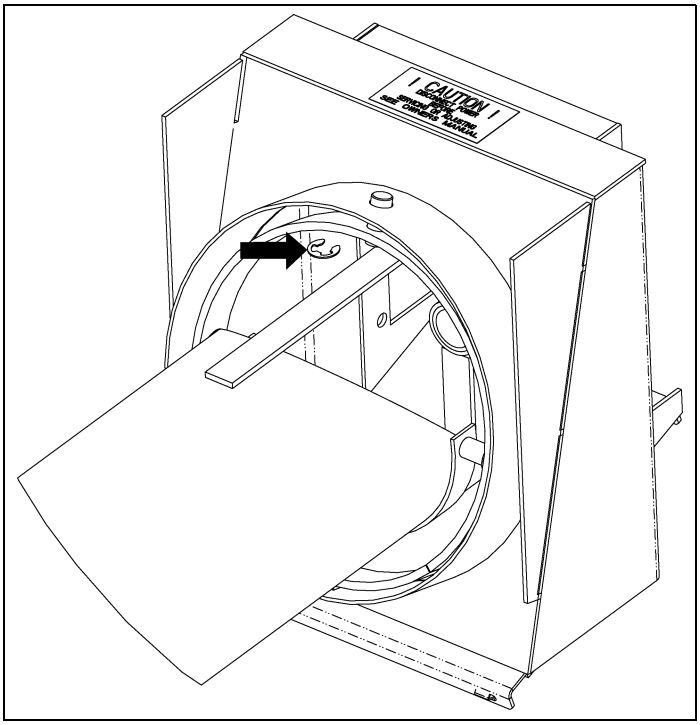


Figure 5BA

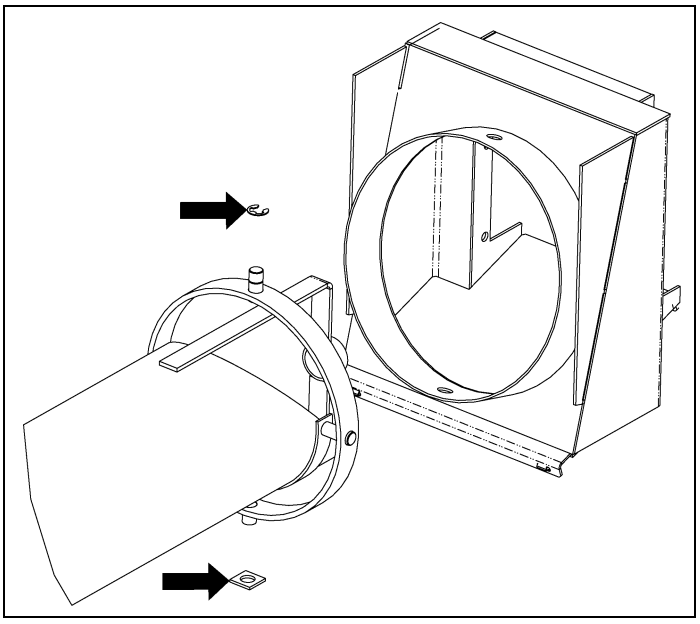


Figure 5BB

Gimbal Swivel Boot Installation (Continued)

4. Remove the six (6) 3/8" bolts next to the cut off edge of the discharge chute. Bolt the gimbal base onto the discharge chute with the wide part of the hoop to the bottom, and secure with the removed 3/8" hardware. *(See Figure 5BC.)*

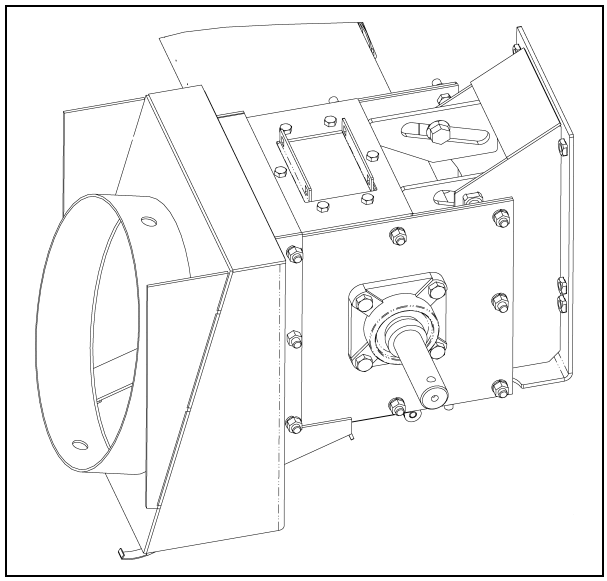


Figure 5BC

5. Remove the tail cage from the auger and measure the exposed flighting. **NOTE:** *If the auger stub shaft is not 1-1/4" diameter, the bushing in the gimbal boot will have to be changed prior to assembly.*
6. Cut the auger tube so the exposed flighting on the auger is the same length as the gimbal tube including the gimbal bottom bearing, after removing the connecting band from the gimbal boot. *(See Figure 5BD.)*
7. Slide the connecting band onto the auger tube. Install the gimbal boot over the auger with the auger stub shaft fitting into the gimbal bushing. The auger flighting must be as close to the bottom gimbal bearing as possible but should not strike on the gimbal. You may have to cut the extra auger shaft off. *(See Figure 5BE on Page 45.)*

   DO NOT TIGHTEN THE CONNECTING BAND UNTIL THE AUGER AND GIMBAL BASE ARE ALIGNED.

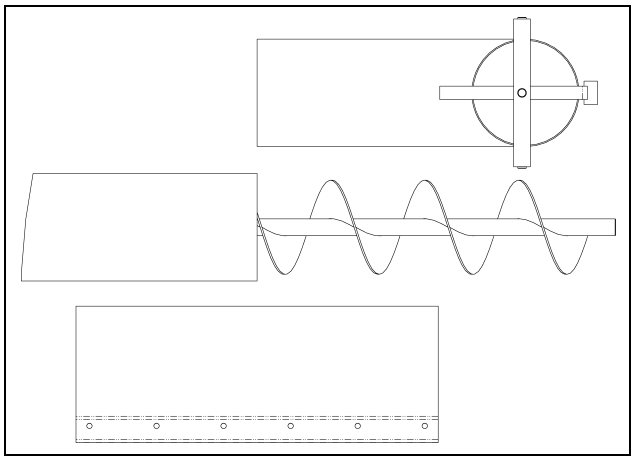


Figure 5BD

Gimbal Swivel Boot Installation (Continued)

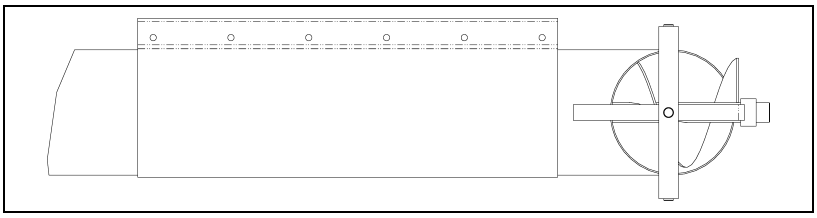


Figure 5BE

8. Install the auger gimbal boot and ring to the discharge chute and gimbal mount. Be sure the plastic thrust washer is positioned between the large ring and the lower support pad. Complete by installing the snap ring to the top ring stud. *(See Figure 5BF.)*
9. Tighten the connecting band left loose in *Step 7 on Page 44*, being sure the auger flighting will clear and turns freely after the auger is in operating position.
10. Wrap the weather cover around the gimbal assembly so water cannot seep through the seam. Keep in place with the fastener straps. *(See Figure 5BG.)*

    The gimbal swivel boot installation is now complete.

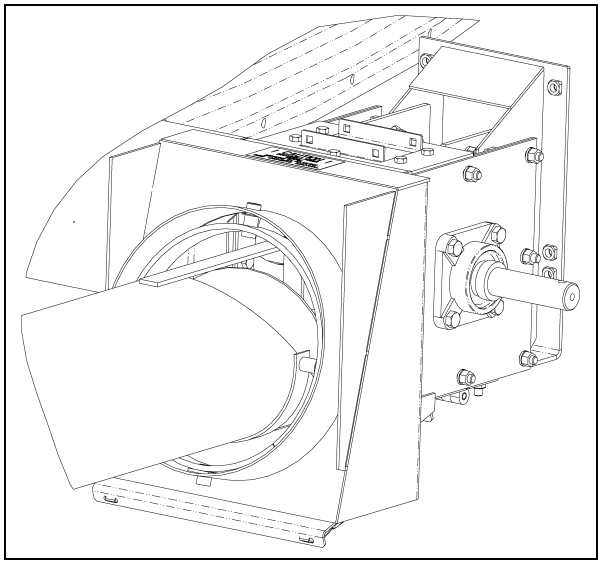


Figure 5BF

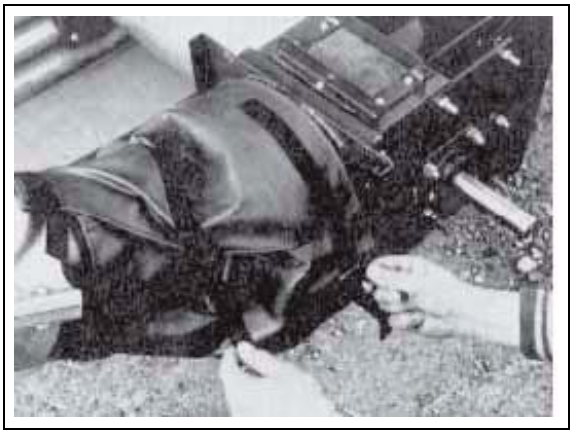


Figure 5BG

Installation of Grain Flow Vertical Auger

Determine if the drive motor is to be mounted at the bottom or the top of the vertical auger.

1. Install the keyed stub shaft into the auger screw on the driven end, and secure with two (2) 1/2" x 2-1/2" grade 5 hex head bolts and lock nuts.
2. Install the plain stub shaft in the opposite end of the auger screw and secure with one 1/2" x 2-1/2" grade 5 hex head bolt and lock nut.
3. Slide the upper head assembly onto the top of the auger tube. Align it with the auger tube discharge hole and secure it with two (2) 3/8" x 1-1/4" hex bolts and hex nuts. *(See Figure 5BH.)*
4. Slide the auger screw stub shaft through the top 1-1/4" bearing until there is 17-3/4" exposed flighting at the bottom end of the auger tube. *(See Figure 5BI.)* Install and tighten the locking collar by tapping it clockwise (viewed from shaft end). Tighten the collar set screw.

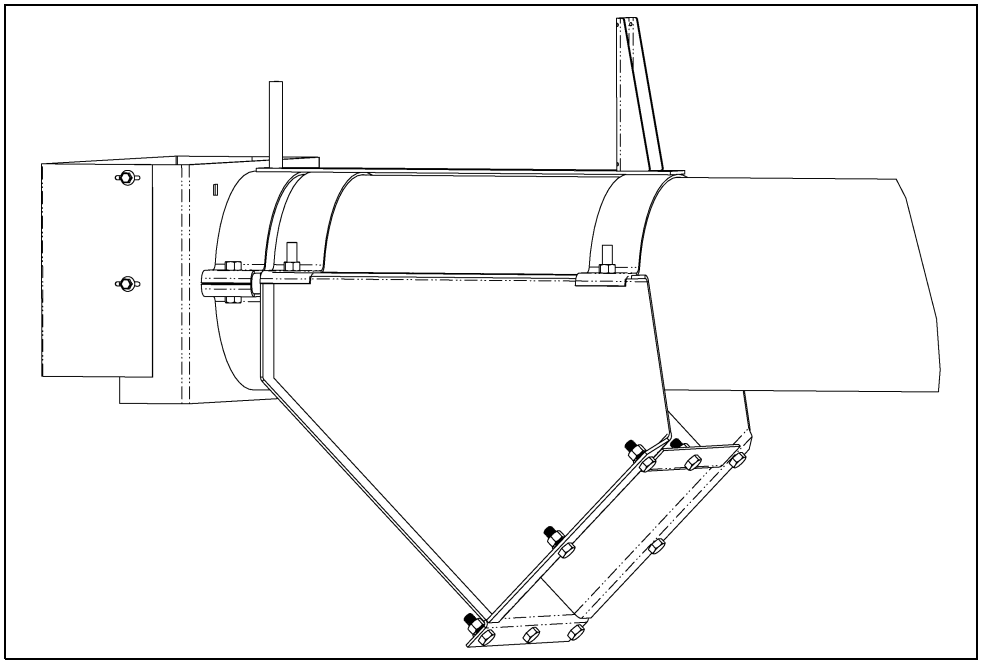


Figure 5BH

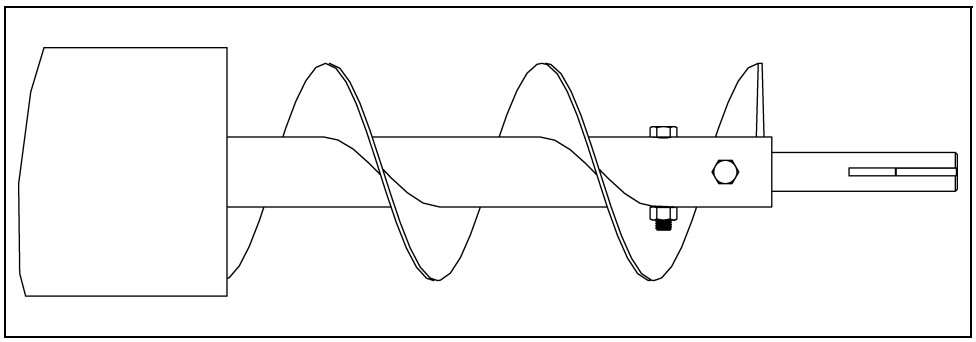


Figure 5BI

Installation of Grain Flow Vertical Auger (Continued)

5. Loosen the four (4) bolts holding the bearing and seal plate onto the auger tube. Apply grease to the auger stub shaft and slip the vertical auger boot over the auger and tube assembly until the tubes butt together. Be careful not to damage the bearing protective seal in the bottom of the boot. Tighten the three (3) 3/8" x 1-1/2" clamp bolts. *(See Figure 5BJ.)*
6. Check to make sure the bearing holder bolts are tight, then install the bearing locking collar by tapping it counterclockwise (as viewed from shaft end). Tighten the collar set screw. *(See Figure 5BK.)*

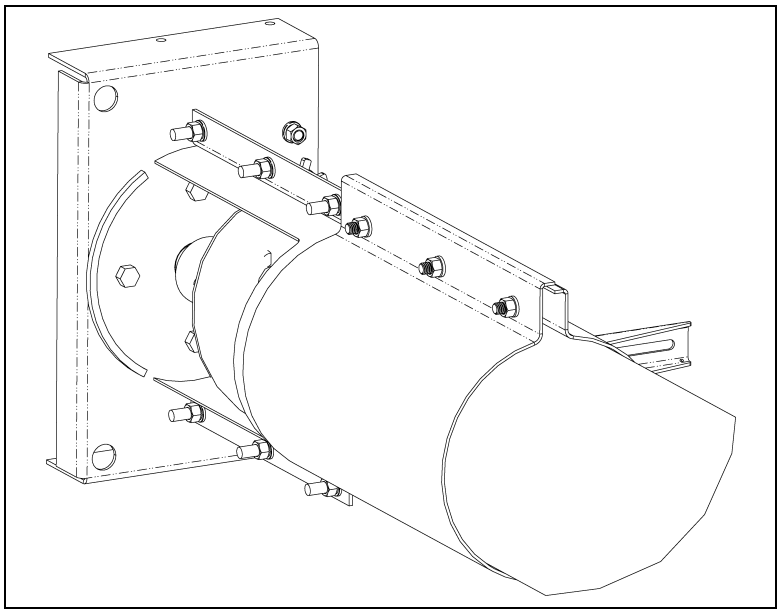


Figure 5BJ

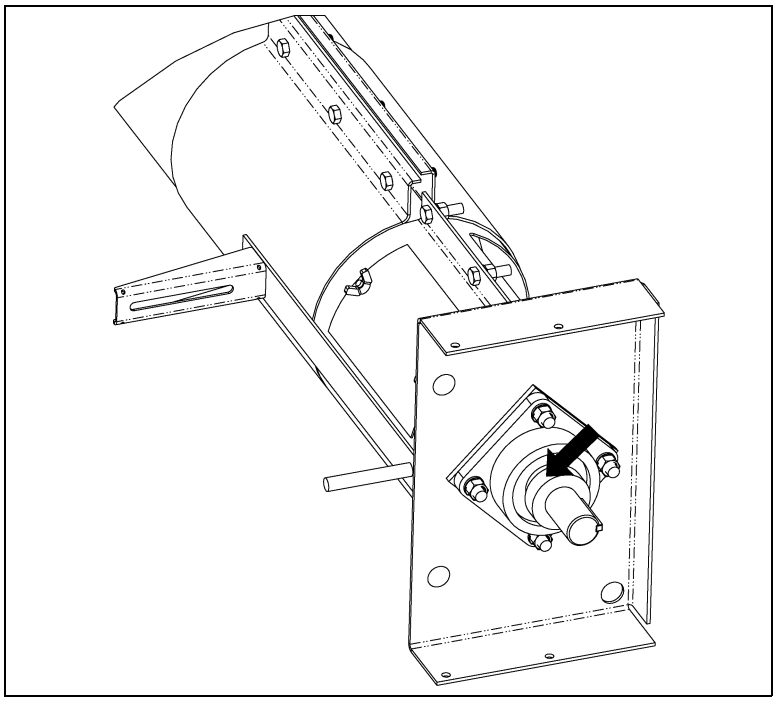


Figure 5BK

7. Attach the 45° vertical discharge spout to the upper end of the tube over the cut-out hole, attach with four (4) 3/8" x 1-1/2" hex head bolts, lock washers and nuts.

Installation of Grain Flow Vertical Auger (Continued)

8. Thread a 1/2" nut onto the stud bolt of the motor mount utilized, slide the motor mount angle over the stud bolt and secure with another 1/2" nut. Next, bolt the motor mount base plate assembly to the mount assembly being utilized using two (2) 3/8" x 3/4" carriage bolts, lock washers and nuts. *(See Figure 5BL and Figure 5BM.)*

9. Attach the motor base plate assembly to the motor angle using two (2) 5/16" x 3/4" carriage bolts, lock washers and nuts. *(See Figure 5BN.)*

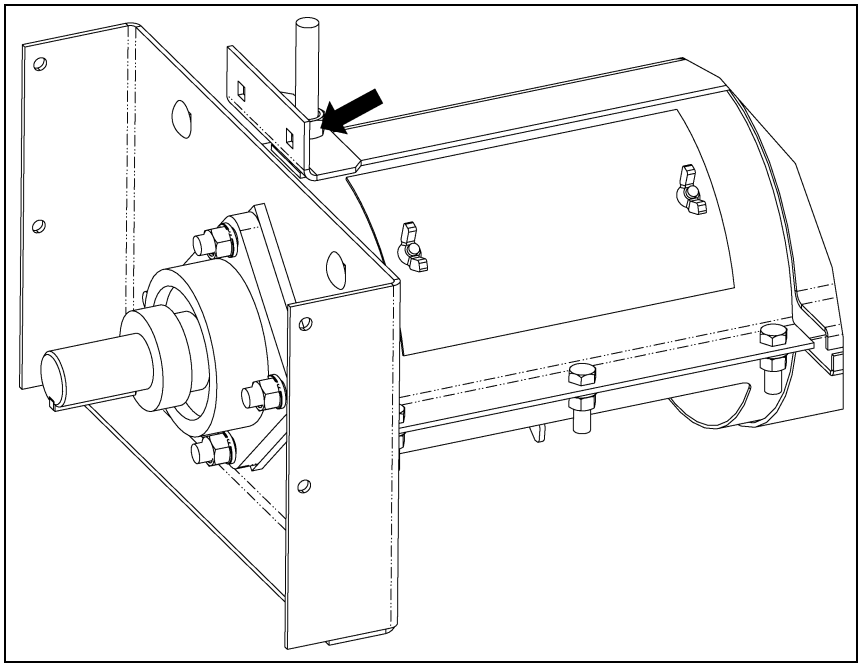


Figure 5BL

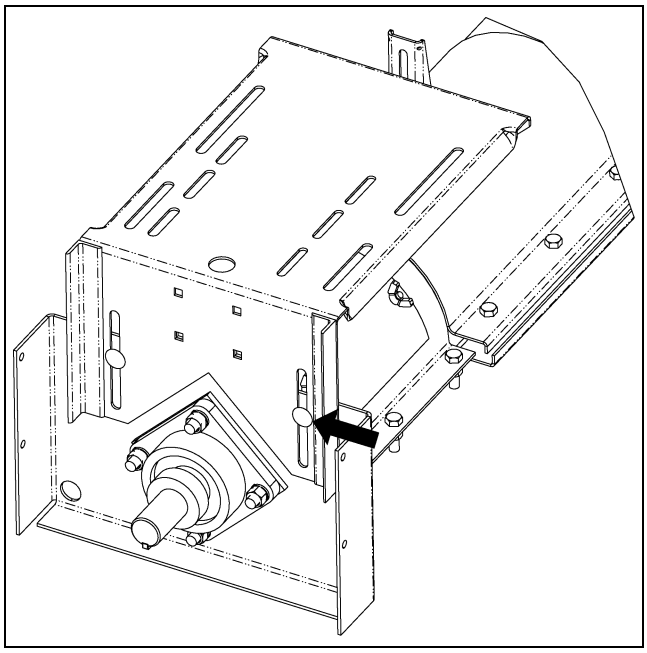


Figure 5BM

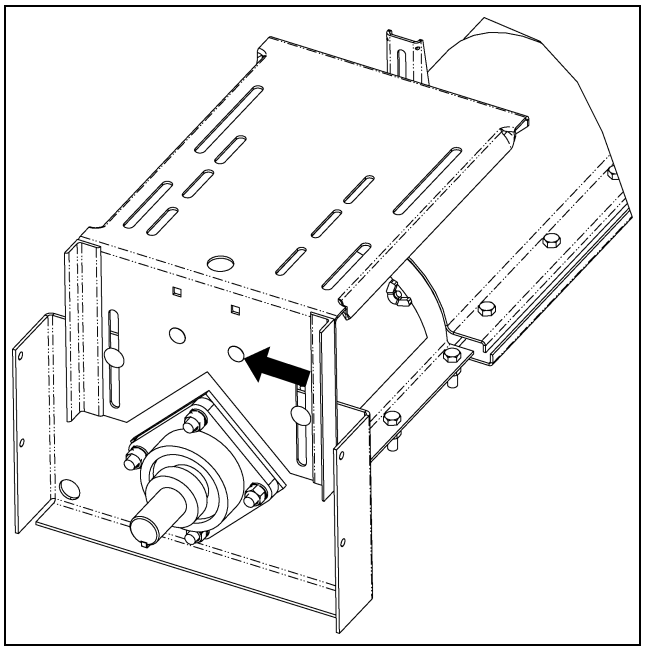


Figure 5BN

Installation of Grain Flow Vertical Auger (Continued)

10. Bolt the back of the base plate to the auger boot stem with a 5/16" x 3/4" carriage bolt, flat washer, lock washer and nut. *(See Figure 5BO.)*
11. Install 12" O.D. two (2) groove pulley with tapered bushing and 1/4" square key onto auger stub shaft and tighten. See vertical auger on *Page 84*.
12. Set the vertical auger assembly into a vertical position and bolt the flanges of the auger boot to the Grain Flow power unit using six (6) 3/8" x 1-1/4" hex bolts, lock washers and nuts. *(See Figure 5BP.)*
13. Thread the two (2) support legs into the welded nuts on the base of the vertical auger boot. *(See Figure 5BQ.)*

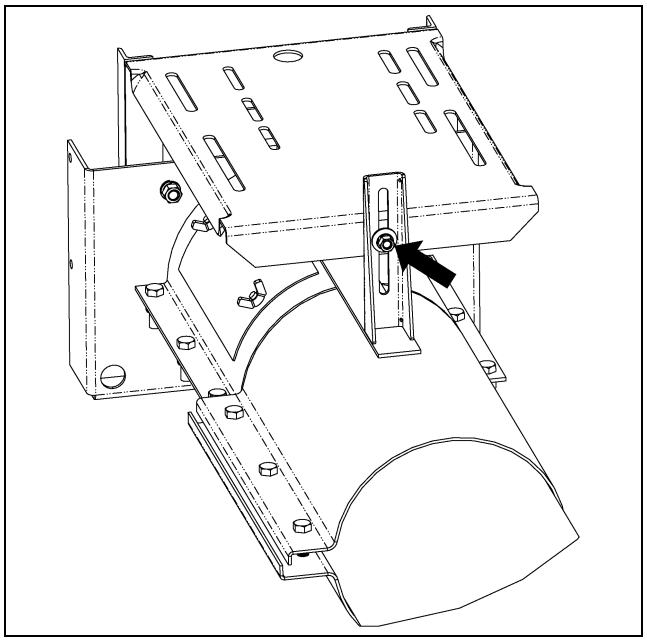


Figure 5BO

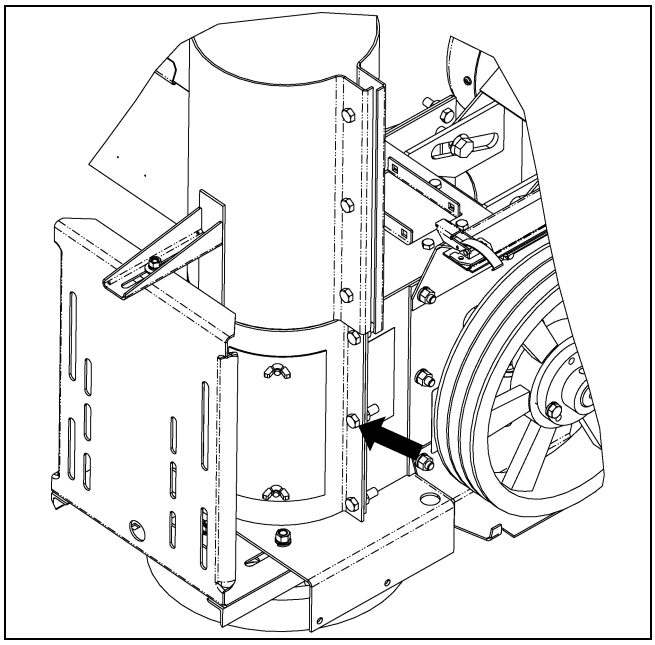


Figure 5BP

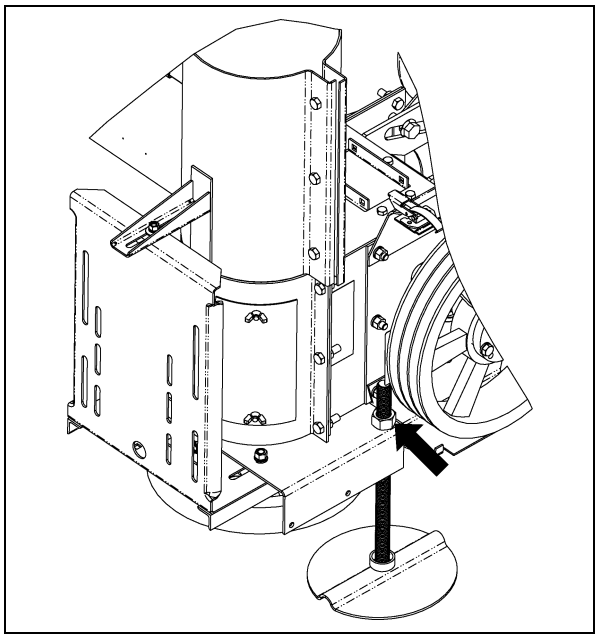


Figure 5BQ

Installation of Grain Flow Vertical Auger (Continued)

14. Adjust the legs down into the support pads until they support the weight of the auger assembly. Finish by locking the support leg in place with another 3/4" nut tightened against the base plate.

    NOTE: *Annual adjustment may be needed to keep support legs carrying auger weight.*

15. Loosen the four (4) clamp bolts on the auger boot and turn the vertical auger tube to the proper position. Re-tighten the clamp bolts.

16. Anchor the vertical auger tube to the bin wall by assembling the adjustable brackets to the tube and bin. The 15' vertical auger uses one set of braces and the 18' uses two (2) sets. Fasten the angle brackets to the clamping bands with 3/8" x 2" full threaded hex bolts, lock washers and nuts. Fasten the 26" long adjustable tubes to the angle brackets with 3/8" x 2" hex bolts, lock washers and nuts. Assemble the adjustable tubes to the bin wall tubes with clamping channels, 3/8" x 3" carriage bolts, lock washers and nuts. Anchor the adjustable bin wall tubes to the bin by using the backing plates on the inside of the bin and fasten with 3/8" x 1-1/2" hex bolts, lock washers and nuts. See vertical auger on *Page 84*.

17. Put the 4" O.D. x 2B groove pulley on the motor shaft. (A 6" discharge uses a 3-1/2" pulley.) Complete by attaching the motor to the base plate with four (4) 3/8" x 1-1/4" hex flange bolts, flat washers, lock washers and nuts.

18. Put two (2) BX-51 V-belts on the motor and auger pulleys. Adjust the pulleys until the belt alignment is proper.

19. Tighten the belt to 3/16" deflection at 10-15 lbs. by loosening the 5/16" carriage bolt on the back of mounted plate. Loosen the two (2) 3/8" carriage bolts in front of the base plate and turn the 1/2" nuts on the stud to move the motor out. After proper tension is obtained, re-tighten all nuts and bolts.

20. For bottom drive, raise the belt shield assembly and attach to the vertical boot using four (4) 1/4" x 1/2" hex flanged head bolts. Install the rain cover on the top of the vertical. *(See Figure 5BR.)* For top drive units, install rain cover at the same time as the belt shield.

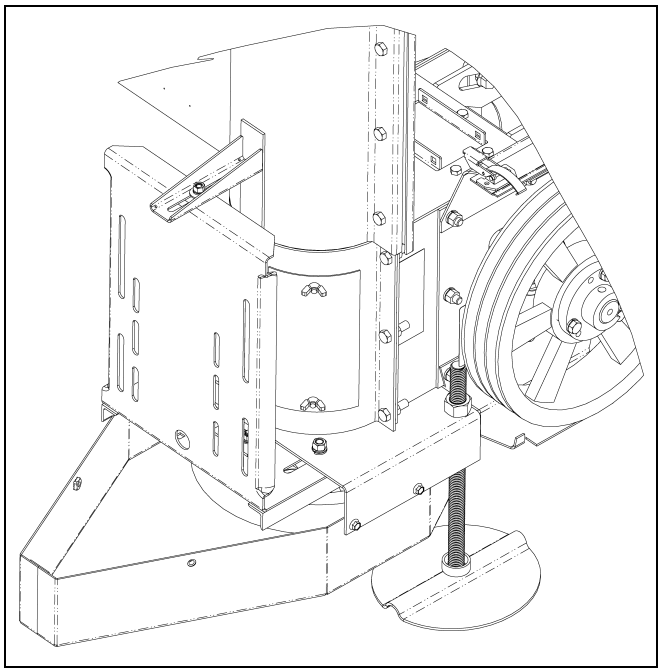


Figure 5BR

Installation of Grain Flow Vertical Auger (Continued)

21. Slide top half of belt shield in over the motor pulley and attach to the lower shield with two (2) 1/4" x 1/2" hex flange head bolts. *(See Figure 5BS.)*

22. Cut a 1-1/4" diameter hole into the vertical tube at a location convenient for taking grain samples. *(See Figure 5BT.)*

23. Clamp the sampler assembly over the 1-1/4" hole with a half band and two (2) 3/8" x 1-1/2" hex washers and nuts. *(See Figure 5BT and Figure 5BU.)*

    NOTE: *Motor NOT installed for photo purposes*.

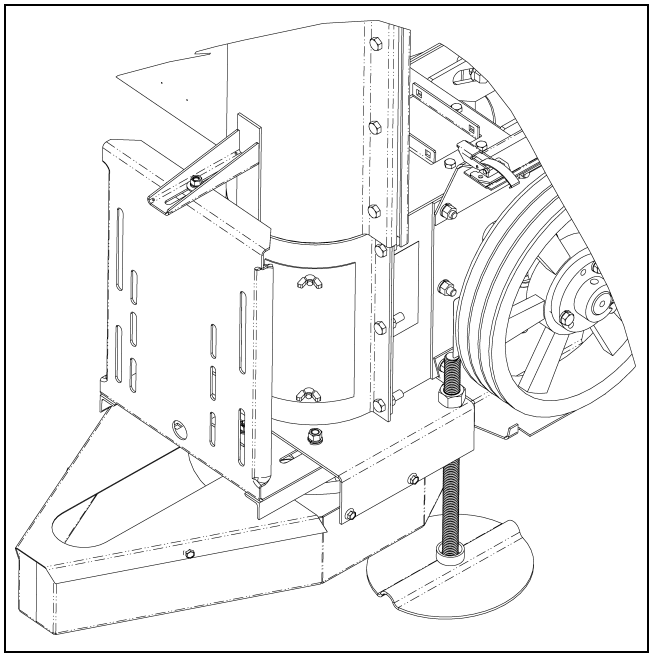


Figure 5BS

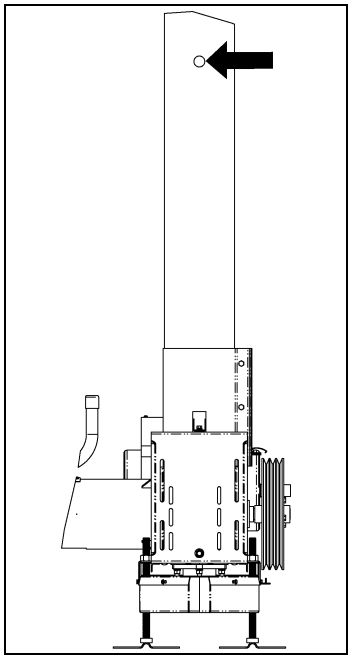


Figure 5BT

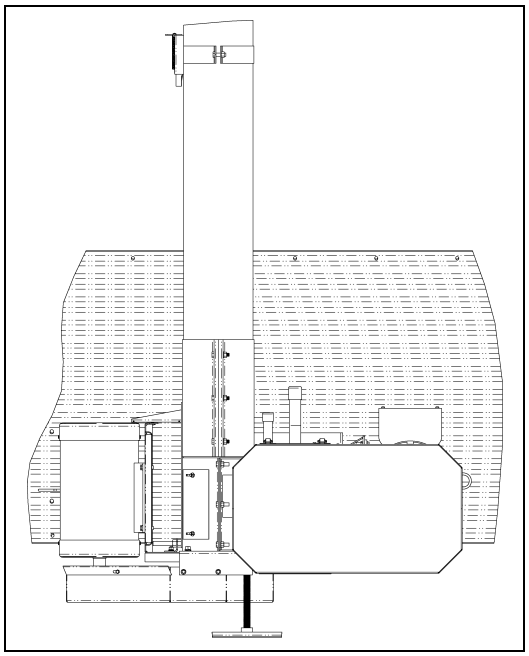


Figure 5BU

Grain Flow Vertical Auger Optional Equipment

See vertical auger accessories on *Page 86*.

Items B and H are 2 way or 3 way valve packages which bolt onto the vertical auger, making possible loading grain out of a drying bin as well as spouting grain into take-away auger hopper.

Item C is a 4' loading spout which can be used on the vertical auger without any additional equipment, or can be bolted onto a 2 way or 3 way valve to facilitate truck loading.

Items D and J are transfer auger hopper packages which are bolted directly onto the vertical auger and can be adjusted in any position to facilitate easy take-away auger installation.

Items E and F are supports for 6" take-away augers.

Installation Instructions for Take-away Auger Control Boxes

The take-away auger control box should be located near the take-away transfer auger motor power source. This location should be approximately 5' above the ground. The control power signal is provided by the Grain Flow main control box. Connect by running 18-3 or larger wires from terminals 1, 2 and 3 in the Grain Flow main control box to terminals 1, 2 and 3 in the take-away auger box.

Inclined Auger

Inclined augers come in either 10' or 20' lengths. The various lengths can be bolted together to form any length of auger needed to transfer grain from the Grain Flow vertical auger to the storage bin. If inclined augers need to be longer than 40', cable trusses need to be used to support the inclined augers. When ordering auger extensions, there is a plain extension or a head section in either 10' or 20' lengths. The difference being the head section has a cut-out for the grain to flow through into the bin. It also has a longer shaft to accommodate the 1" bore by 12" O.D. “B” section pulley. Along with the motor mount and other accessories, the inclined augers are easy to assemble and can be custom fit for any installation. *(See Figure 5BV.)*

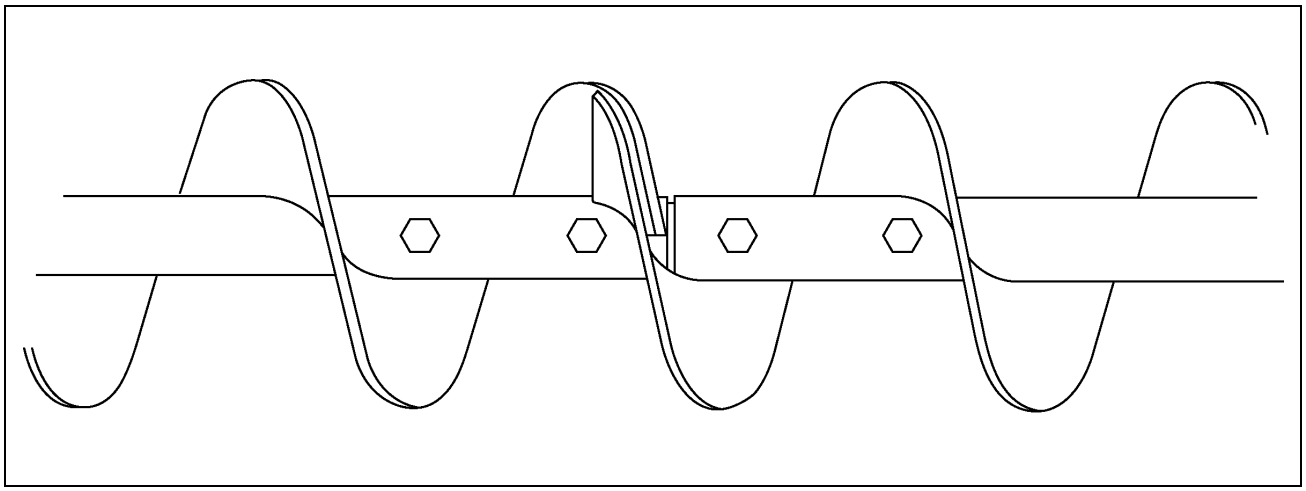


Figure 5BV *Proper Way to Connect 6" Incline Auger Flighting*

Proper Overlap

If 6" standard utility or distributing auger equipment is used, see the operation’s manual packed separate with the augers.

Main Control Box Installation Instructions for DMC'S Calc-U-Dri

1. MOUNTING THE MAIN CONTROL BOX

Locate the control box near the Grain Flow discharge auger and sampler so that it is easily accessible and convenient for you to use. Mount the control box to the bin wall, using four (4) 5/16" x 1-1/2" hex head bolts, flat washer, lock washer and hex nuts. Mount it at a convenient level. See discharge and power unit on *Page 76*.

2. OVERLOAD SWITCH INSTALLATION INSTRUCTIONS

a. Disconnect and lock out the power supply.

b. Remove the mercury switch assembly and the old rubber diaphragm.

c. Replace the diaphragm with the new one supplied in the kit and anchor it in place using the diaphragm frame and screws.

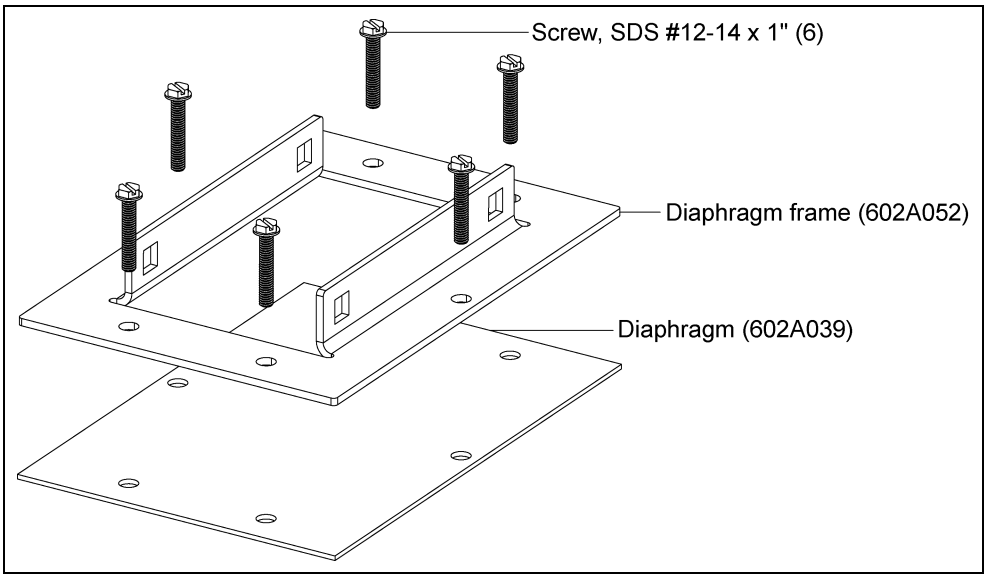


Figure 5BW

d. Assemble the overload switch box assembly to the diaphragm frame using the 5/16" carriage bolts and nuts.

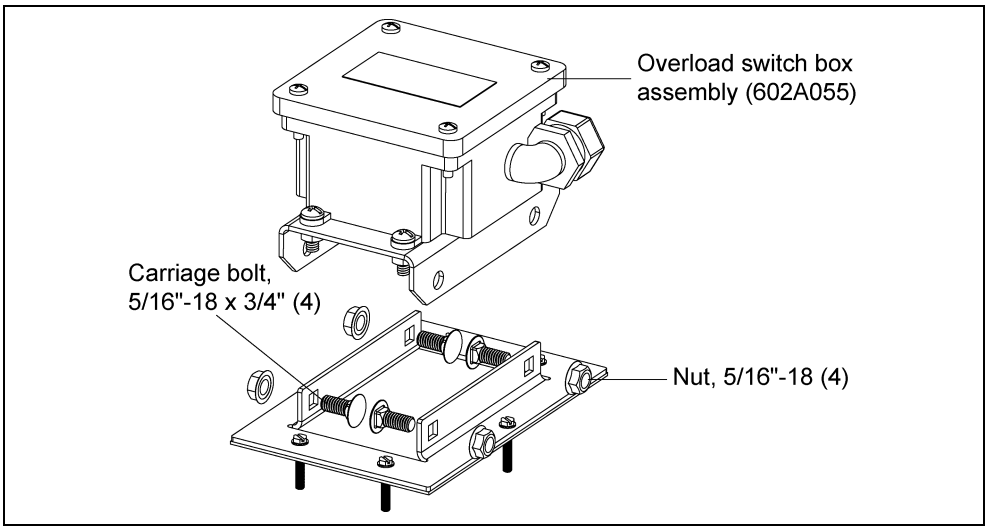


Figure 5BX

Main Control Box Installation Instructions for DMC's Calc-U-Dri (Continued)

e. Remove the box lid and connect the wires to the N/C contact inside the box.

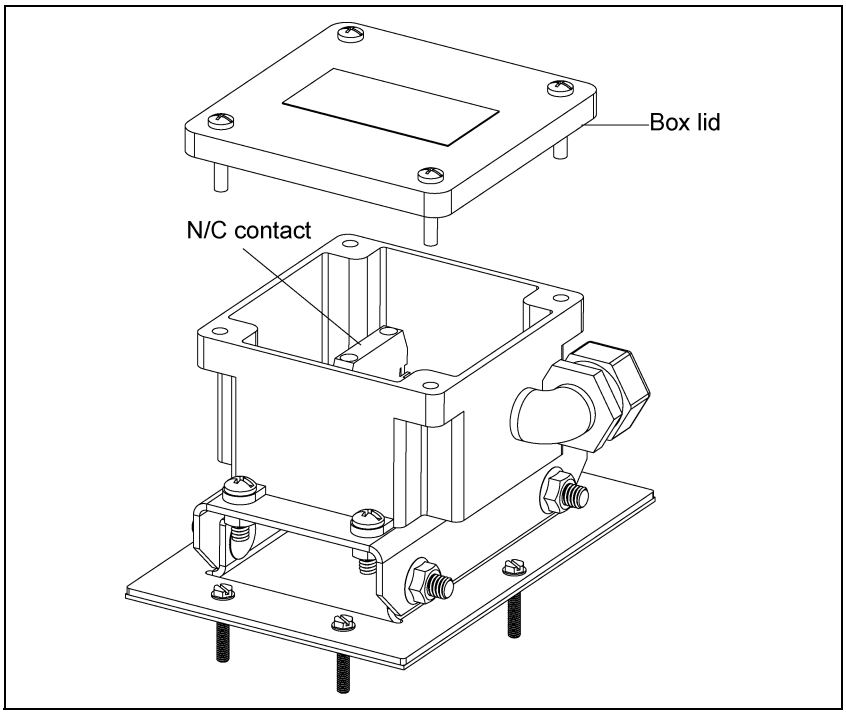


Figure 5BY

f. Reattach the box lid and test the overload switch. When the overload switch is actuated, the system should shut down.

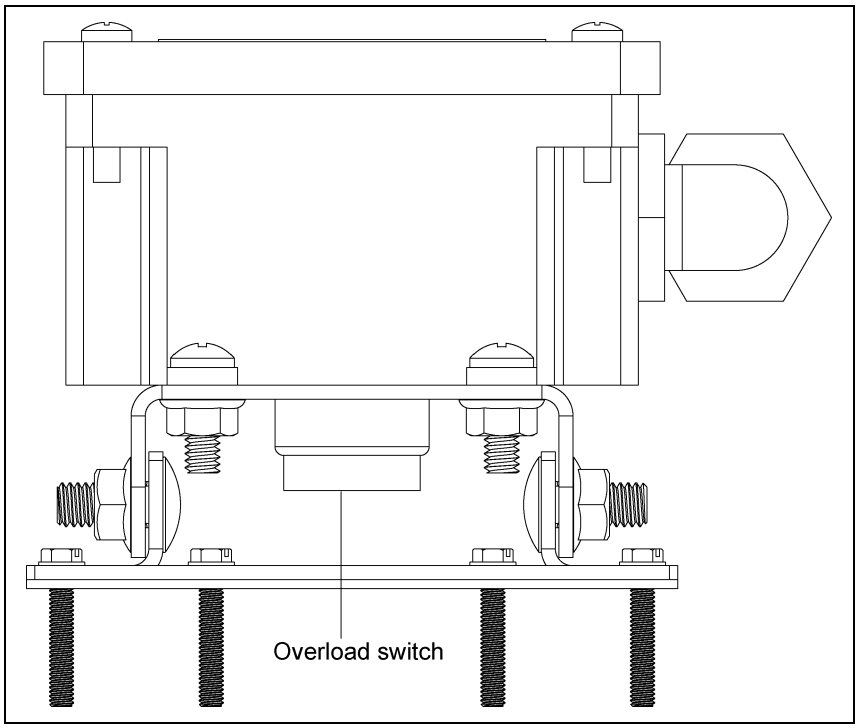


Figure 5BZ

Main Control Box Installation Instructions for DMC's Calc-U-Dri (Continued)

NOTE: *If the mercury switch is not installed correctly, the Grain Flow will not operate.*

It over-rides all other controls. To adjust, move clockwise for quicker shut off.

3. INSTALLING THE CALC-U-DRI SENSOR

The discharge auger flighting is designed to provide clearance for the sensor. Before the actual installation of the sensor, check very thoroughly through the slot in the discharge tube to see that the cut-out flighting on the discharge auger is positioned so it is centered with the slot in the discharge tube and will not catch the sensor. To check this, insert the clearance gauge provided into the sensor slot as shown in *Figure 5CA.*

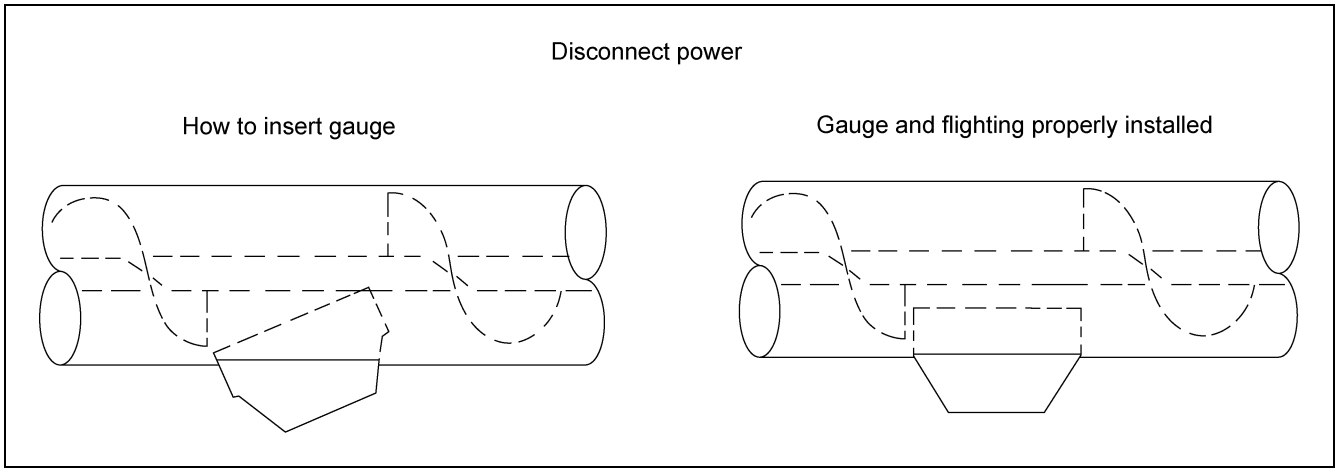


Figure 5CA

CAUTION

Slowly rotate the discharge auger BY HAND one complete revolution. The flighting should miss the gauge completely. If it does not, correct it now.

Measure the amount of 1/2" liquid tite conduit needed to reach from the sensor to the control box, allowing enough to run along the bin wall. Feed the sensor control wire through the conduit, then attach the conduit to the sensor connector. Connect the conduit and then hook-up the sensor wires to the terminal strip in the upper left corner marked "sensor".

NOTE: *The top terminal strip is low voltage DC never hook AC power to this terminal strip.*

Excess sensor wire can be cut off. The wires are color coded and MUST be connected correctly to properly operate and prevent electronic damage. After tightening, tug on each lead to be sure it is secure in the terminal. Run the sensor leads along the left side of the control box separate from the AC voltage lines to avoid any induced voltages in the signal lines. Hook the sensor wire in the "J" hooks along the left side of the control box.

Attach the conduit to the bin wall with 13/16" nylon clamps and #10 x 1" screws. Mount the sensor in the discharge tube by positioning the stainless flag toward the bin wall and the copper flag toward the discharge. The flow of the grain should follow the arrows on the sensor decal. Be sure the sensor block seats fully into the rectangular hole in the discharge tube. Fasten to the tube with the strap bands. Fasten the grounding strap from the sensor to the discharge tube by removing a self-tapping screw from the sampler and running the screw through the connector on the ground strap and back into the discharge tube.

Main Control Box Installation Instructions for DMC's Calc-U-Dri (Continued)

4. INSTALLING THE FUSES AND THERMAL UNITS

a. The fuse and thermal unit bag has the correct fuse and thermal unit for the Grain Flow motor. The thermal units are installed correctly when you can read the size.

b. Guidelines for sizing the fuses for the transfer augers: Read the motor nameplate amps and multiply by one-point-five (1.5). Be sure that the fuse is a dual-element time delay type.

c. Thermal unit sizing: Read the full load nameplate amps off of the motor. The square D overload chart on the inside of the control box will give you the correct thermal unit size according to the motor amps.

5. MAIN POWER LINE TO THE CONTROL PANEL

Hook-up in the main control box as in the wiring diagrams on *Pages 94-97*.

All wiring must be done in accordance with National Electrical Code. Power feeding the main control box requires fuse disconnects or the equivalent.

Wiring should be done by a qualified electrician and must meet code standards to avoid possible bodily injury or death.

Grain bins with electrical equipment in operation must be grounded.

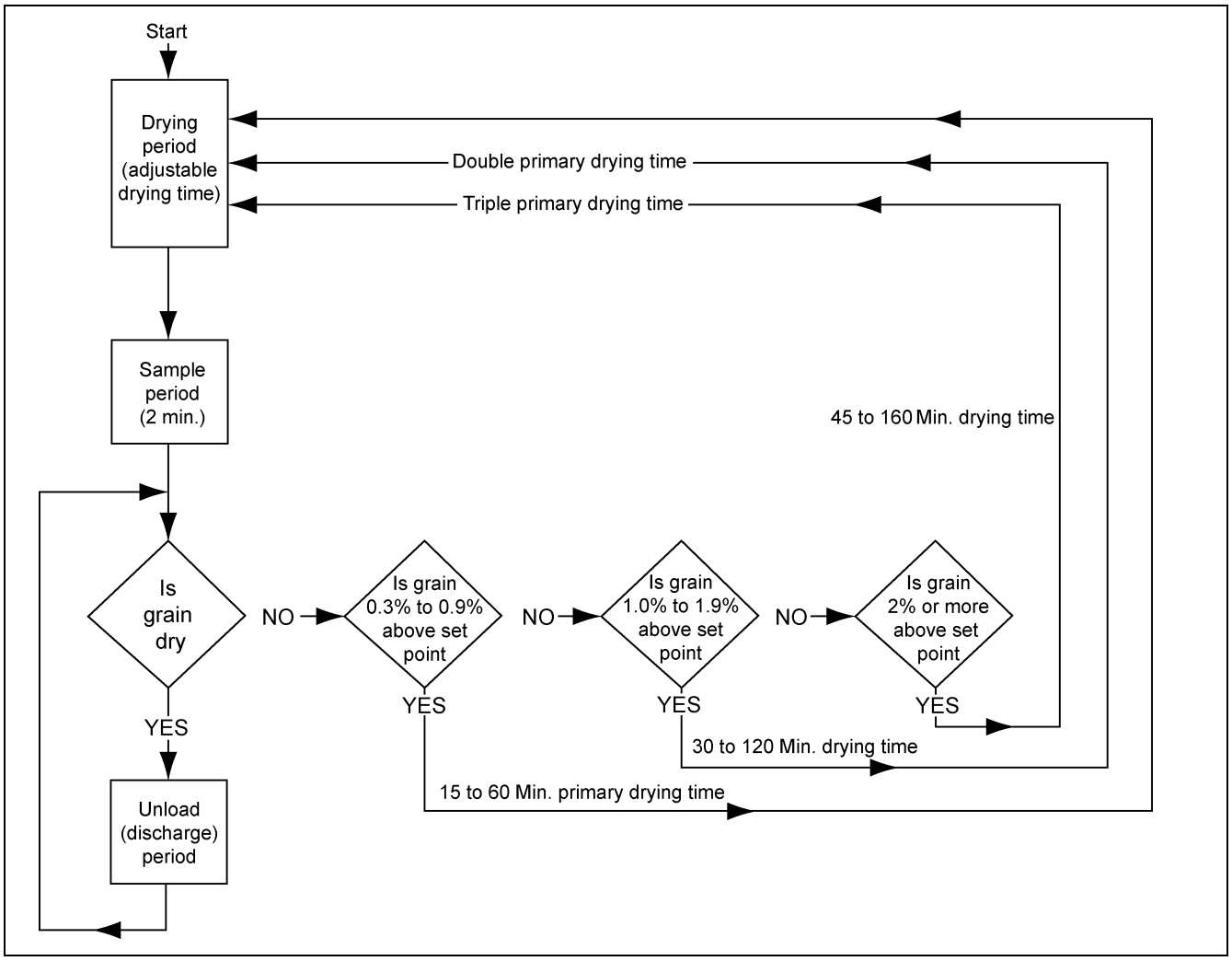


Figure 6A

In the **drying period**, grain is dried to the desired moisture. This time is manually adjustable.

In the **sample period**, the unit will auger out grain for 2 minutes. If the grain is not dry at the end of the 2 minutes sample, the Calc-U-Dri selects a drying time based on the grain moisture of the sample.

If the grain is drier than the moisture set point, the Calc-U-Dri will go to the **unload period** and auger out grain until wet grain is sensed. At this time, it goes back to the drying period.

Grain Flow with Calc-U-Dri Start-up

Be sure center slide gate is closed. (PULL out on the handle to close.)

After having put 3' to 6' of wet grain in the bin, the following step should be taken:

1. Start the fan/heater and select the desired drying temperature by setting the heater control. Plenum temperatures may be changed anytime during the drying process without changing the control settings. The moisture read-out is automatically temperature corrected, however, changes in plenum temperature will change the amount of moisture removed in the cooling process.

> **CAUTION** ***Be sure the power switch is "OFF".***

2. Break loose the floor augers anytime during the initial drying period. Augers will break loose easier if the grain around them has dried down some. To break floor augers loose, remove the drive belt shield and engage the floor augers by pulling on the shift rod while slowly turning the auger pulley by hand. DO NOT USE EXCESSIVE FORCE to engage the floor auger gearbox.

   Break the floor augers loose by turning the auger pulley CLOCKWISE with the breaker bar. Floor augers can be difficult to break loose and a rocking motion on the breaker bar will help.

3. In the Calc-U-Dri control box, set the "drying time adjustment" from 15 to 60 minutes, depending upon fan size, plenum temperature, and moisture to be removed. (see *Chart below*.) 30 Minutes is recommended as initial setting.

   For drying time periods shorter or longer than the normal 15 and 60 minutes, please see appendix A on *Page 118*.

Drying Time - Manual Adjustment

Less Drying Time	No Change Needed	More Drying Time
1. First sample is extremely over dried.	The Calc-U-Dri goes to the unload period after the first or second samples have been taken.	1. Three (3) or more sample periods before an unload period takes place.
2. Sunflowers or light grain.		2. High moisture grain being harvested.
3. Low moisture grain being harvested.		3. Low drying capacity (low temperature and/or air flow).
4. High drying capacity (high temperature and/or air flow).		4. Deep grain depths.
5. Shallow grain depths.		

4. Put "Take-away auger" switches to be used in "AUTO" mode.
5. Put Calc-U-Dri Mode switch in "AUTO" mode.
6. Flip "Control Power" switch ON. "Control power indicator" light should come ON. If not, you do not have power to the control box.
7. Push the "Start button". The unit will not run, but the digital meter will read 000.

Grain Flow with Calc-U-Dri Start-up (Continued)

8. Set moisture calibration to zero. This is done by holding the Calibration Display switch down while turning the calibration adjustment knob either right or left until 0.00 is showing on the digital display. See definition section on *Pages 64-69*.
9. Hold the Set Point Display switch down and at the same time dial the set point adjustment knob to the desired grain moisture content.
10. Flip the Mode switch to the “MANUAL” position and the unit will discharge grain. The grain moisture is displayed at this time.
11. After a few minutes, flip the Mode switch to “AUTO” and one of the following will happen:

    A. The grain will continue to discharge until the grain is 0.3% wetter than the set point value.

    B. If the grain is 0.3% or more wetter than the set point value, the unit will shut off and lock the last moisture reading on the digital meter. Then the Calc-U-Dri will automatically take one of the following steps:

        1. If this last reading is 0.3% to 0.9% higher than the set point, the drying period time will be determined by the pointer on the “Drying time adjustment knob”.
        2. If this last reading is 1% to 1.9% higher than the set point, the drying period time will be twice that shown on the drying time dial. (Drying time X2 light will be ON.)
        3. If this last reading is 2% or higher than the set point, drying time will be 3 times the time shown on the drying time dial. (Drying time X3 light will be ON.)

    C. After the drying period is complete, the unit will go into a 2 minutes sample period with the “sample indicator” light ON. At the end of the sample period, the Calc-U-Dri will once again take either *Step A* or *Step B*.

12. If a chart recorder is being used, you may want to mark the date and time on the paper. It is pressure sensitive paper so any pointed object can be used to write with.
13. The temperature of the grain can be read at any time by pushing the Temperature Display switch. This will help you determine how much additional moisture will be lost in the cooling process.

See *Step 23 on Page 61* under “operating suggestions” for information on how to use the Calc-U-Dri for grains other than corn.

1. The grain moisture readings are temperature compensated. This means that whatever temperature the corn is discharged at, the Calc-U-Dri is reading the corrected moisture content. Under normal conditions when the grain cools, it gives up moisture. The holding bins should have cooling fans to remove the moisture. The hotter the grain being transferred, the more moisture it will give up as it is cooled.

   Example: 120° Grain cooled to 40° ambient may dry as much as 1.5% to 2% during cooling. However, the same 120° grain cooled to 90° ambient may only dry 0.5% during cooling.

2. The Calc-U-Dri needs to be calibrated so that it will display the moisture content of grain the same as a local elevator or a trusted moisture tester. This calibration is accomplished by:
   a. Hold down the Display Calibration switch and observe the calibration value on the panel meter. Turn the calibration adjustment knob until the offset value is zero.
   b. Compare the moisture value display on the panel meter with the moisture content determined by a reliable tester. Average several samples. (See appendix B on *Page 119* for a sample chart of this procedure.)
   c. Subtract the average of the displayed moisture readings from the average of the tested samples. This is the calibration value needed for the Calc-U-Dri to match the actual grain moisture content. (**NOTE:** *The calibration value may be either a positive or negative number*.)
   d. Hold the Display Calibration switch down and turn the calibration adjustment knob until the value on the panel meter matches the calibration value determined in *Step 3*.
   e. This completes the calibration. Record the calibration value in the back of this manual for future reference.

   Grain samples should be taken on a daily basis to ensure that the electronic equipment is functioning correctly. Use a quality moisture tester that will provide repeatable accuracy.

Use the Following Guidelines for Safe and Reliable Sampling

Use a safe sample procedure. Do not sample from a hopper with an unguarded auger. Keep hands, feet and clothing away from rotating parts.

   a. Take several samples from the discharge auger sample gate, not from a storage bin. If you do not have a sample gate on the discharge tube, contact the dealer to have one installed.
   b. Take the samples when the displayed moisture is not changing rapidly.
   c. Take several samples and record the moisture being displayed when each sample was taken; as well as tested moisture content of each sample.

3. Take-away augers will start 3 seconds before the Grain Flow motor. This is to reduce the in-rush current on start-ups. The augers will run 20 seconds after the Grain Flow motor stops. This is to clean out the augers on shut down. The 20 seconds “off-delay” is adjustable from 1 to 100 seconds.
4. Make sure the Grain Flow floor augers rotate freely and that there are no obstructions in the bin before filling with wet grain.
5. The slide gate must be CLOSED during automatic Grain Flow operation. The slide gate is closed by PULLING OUT on the control rod and opened by pushing in on the control rod.
6. Drive belts should be checked for proper tension after 10 hours of operation.
7. Cleaning the grain before it is put into the drying bin can increase the capacity and efficiency of the drying system. DMC grain cleaners are recommended.
8. The use of a good grain spreader is highly recommended. DMC grain spreaders are recommended.
9. If the grain is not feeding down evenly, you should find the problem and correct it, because this is a compounding problem. This can be caused by one of several things: The grain spreader may not be set correctly, the heat and air mix in the plenum might not be even or the gearbox hood is not installed correctly.

10. The use of stirring equipment in the drying bin will increase the capacity of the Grain Flow system as the grain depths increase. The bottom of the stirring augers should be 30" above the drying floor so that they will not disturb the drying zone. When the grain depth is 5' or less, it is not necessary to run the stirring device.
11. The capacity of a drying bin equipped with a Grain Flow is dependent on the cubic feet per minute (CFM) of air and the BTU's of heat applied to the grain. The rate of discharge when the Grain Flow is running is approximately 700 bushels per hour with a 6" tube and 620 bushels per hour with an 8" tube. The drying rate affects the length of time and the frequency that the Grain Flow operates, but will not change the discharge rate.
12. A Grain Flow drying system operates at maximum capacity in grain depths of 4' to 6'. MAXIMUM EFFICIENCY at all depths when stirring is used. See on *Page 108*.
13. The Grain Flow is equipped with a Discharge Auger Overload switch. The switch must be closed for the Grain Flow to operate. The Grain Flow must be restarted if this is momentarily opened.
14. When a Stir-Ator is used in conjunction with the Grain Flow, it provides more flexibility while increasing the versatility of the drying system.
15. DO NOT LEAVE GRAIN IN THE DISCHARGE AUGER. Grain left in the discharge tube during the off season can cause damage to the sensor, auger, and bearings. To clean this out, disengage the floor augers and run the system until the discharge tube is clean. Stop the system and turn OFF the power. Then remove the sensor and let the grain fall out. Replace the sensor.
16. If the burner temperature is increased by a large amount, the "drying time" may have to be reduced to prevent over-drying. A large change in burner temperature will have an affect on the amount of drying done in cooling.
17. The Grain Flow control box has three (3) contactors with individual automatic/manual selector switches to provide power to three (3) different take-away augers. Maximum amps per auger is 40 amp - 1 phase and 30 amp - 3 phase. When the power switch is "ON", each take-away auger can be started in "manual" for testing. The take-away augers in "automatic" will be stopped and started by the main control. All augers that are in "automatic" can be started by switching the Mode switch on the control to "manual". Refer to the control box functions on pages *Pages 64-66*.
18. If more than three (3) take-away augers are needed, purchase the optional take-away auger control box with the needed contactors. The control signal for this box is on terminals 1, 2, and 3 in the main control box.
19. Drying time - manual adjustment - set at 30 minutes to start and then adjust according to the drying time chart on *Page 62*.
20. If the unit is shut down due to any condition such as power failure, thermal overload, discharge auger overload, or manual shut down, restart the unit by pushing the Start button. No recalibration is required.
21. Avoid touching the control card. NEVER unplug or plug in with power ON.
22. An automatic shut off of the Calc-U-Dri and the burner, for when grain depths are below 2' is recommended. This avoids the extra cost of lost heat when the grain bin is nearly empty, and prevents operation of the Grain Flow and Calc-U-Dri with very little grain in the bin. Refer to *Page 102* for wiring diagram of the DMC level monitor.
23. To use the Calc-U-Dri for grains other than corn, take several moisture samples as described in *Step 2 on Page 60*. Compare the Calc-U-Dri readings to the grain being dried. Use the calibration adjustment to read the correct moisture of the grain being dried. It is best to do the sampling when the grain is close to the moisture desired.

When emptying the drying bin, stay clear of operating floor augers. They can injure or kill you. Clean all but a small amount of grain out, then disengage floor augers to finish cleaning out the bin.

Grain Flow Drying Guide and Chart

The chart is a guide to base the fan/heater size on. It gives the approximate drying capacities that can be expected from the various combinations of bin diameter, heat rise, and fan/heater size. The chart is based on atmospheric air of 50°F and 60% relative humidity, starting grain temperatures at 50°F, and 8' grain depth. The capacities are based on removing 7.5 points of moisture from 24% to 16.5%. Cooling can remove 1% to 2% moisture from the grain. When grain depths of over 8' are being dried, a grain Stir-Ator used in conjunction with a Grain Flow can increase drying efficiency.

Bin Size	Fan HP	Drying Rate Multipliers for more Fans		CFM	Static Pressure	Drying Capacity (BU/24 Hrs) Heat Rise above Ambient Temperature					
		2 Fans	3 Fans			25	50	75	100	125	150
18'	5	1.2	NA	8700	2.7	590	1200	1840	2490	3160	3860
	7-1/2	1.2	NA	9800	3.2	670	1360	2070	2800	3560	4350
21'	5	1.4	NA	10000	2.1	680	1380	2110	2860	3640	4440
	7-1/2	1.4	NA	10800	2.3	740	1500	2280	3090	3930	4790
	10	1.3	NA	12000	2.7	820	1660	2530	3430	4360	5330
	12-1/2	1.4	NA	12900	3.0	880	1790	2720	3690	4690	5730
24'	7-1/2	1.6	NA	11400	1.7	780	1580	2410	3260	4150	5060
	10	1.5	NA	13000	2.0	890	1800	2740	3720	4730	5770
	12-1/2	1.5	NA	14000	2.3	950	1940	2950	4010	5090	6220
	10 C	1.7	NA	12500	1.9	850	1730	2640	3580	4550	5550
	15 C	1.6	NA	14900	2.5	1010	2060	3140	4260	5420	6610
	20 C	1.6	NA	17700	3.3	1210	2450	3740	5060	6440	7860
27'	7-1/2	1.7	NA	11900	1.2	810	1650	2510	3400	4330	5280
	10	1.6	NA	13300	1.5	910	1840	2810	3810	4840	5900
	12-1/2	1.6	NA	14800	1.7	1010	2050	3120	4230	5380	6570
	10 C	1.8	NA	12900	1.4	880	1790	2720	3690	4690	5730
	15 C	1.7	NA	15600	1.9	1060	2160	3290	4460	5670	6930
	20 C	1.7	NA	18500	2.4	1260	2560	3900	5290	6730	8210
	30 C	1.6	NA	21400	3.1	1460	2960	4520	6120	7780	9500
30'	7-1/2	1.8	NA	12200	1.0	830	1690	2570	3490	4440	5420
	10	1.8	NA	13700	1.1	930	1900	2890	3920	4980	6080
	12-1/2	1.7	NA	15300	1.3	1040	2120	3230	4380	5560	6790
	10 C	1.8	NA	13200	1.1	900	1830	2790	3780	4800	5860
	15 C	1.7	NA	16100	1.4	1100	2230	3400	4610	5860	7150
	20 C	1.7	NA	19100	1.9	1300	2640	4030	5460	6950	8480
	30 C	1.7	NA	22100	2.3	1510	3060	4660	6320	8040	9810

Grain Flow Drying Guide and Chart (Continued)

Bin Size	Fan HP	Drying Rate Multipliers for more Fans		CFM	Static Pressure	Drying Capacity (BU/24 Hrs) Heat Rise above Ambient Temperature					
		2 Fans	3 Fans			25	50	75	100	125	150
33'	10	1.8	NA	13800	0.9	940	1910	2910	3950	5020	6130
	12-1/2	1.8	NA	15600	1.0	1060	2160	3290	4460	5670	6930
	10 C	1.8	NA	13400	0.8	910	1860	2830	3830	4870	5950
	15 C	1.8	NA	16400	1.1	1120	2270	3460	4690	5960	7280
	20 C	1.8	NA	19500	1.4	1330	2700	4120	5580	7090	8660
	30 C	1.8	NA	22600	1.8	1540	3130	4770	6470	8220	10030
36'	10	1.9	NA	13900	0.7	950	1920	2930	3980	5060	6170
	12-1/2	1.8	NA	15900	0.8	1080	2200	3360	4550	5780	7060
	10 C	1.9	NA	13600	0.7	930	1880	2870	3890	4950	6040
	15 C	1.8	NA	16600	0.9	1130	2300	3500	4750	6040	7370
	20 C	1.8	NA	19800	1.1	1350	2740	4180	5660	7200	8790
	30 C	1.8	NA	23000	1.4	1570	3180	4850	6580	8360	10210
42'	10	2.0	2.8	14000	0.4	950	1940	2950	4010	5090	6220
	12-1/2	1.9	2.6	16200	0.6	1100	2240	3420	4630	5890	7190
	15 C	1.9	2.7	16900	0.6	1150	2340	3570	4840	6150	7500
	20 C	1.9	2.6	20100	0.8	1370	2780	4240	5750	7310	8920
	30 C	1.9	2.6	23500	0.9	1600	3250	4960	6720	8550	10430
	40 C	2.2	2.7	27000	1.1	1840	3740	5700	7720	9820	11990
48'	10	2.0	2.9	14100	0.3	960	1950	2980	4030	5130	6260
	12-1/2	1.9	2.7	16400	0.5	1120	2270	3460	4690	5960	7280
	15 C	1.9	2.8	17100	0.4	1160	2370	3610	4890	6220	7590
	20 C	1.9	2.8	20300	0.5	1380	2810	4280	5810	7380	9010
	30 C	1.9	2.7	23700	0.6	1610	3280	5000	6780	8620	10520
	40 C	2.0	2.8	27100	0.8	1850	3750	5720	7750	9860	12030
	50 C	1.9	2.7	32500	1.0	2210	4500	6860	9300	11820	14430

Capacities given are for shelled corn. Information on drying other grains is available from the DMC distributor.
All multiple fans are in parallel. Multiply drying rate x 0.77 for 10 pt. removal. Multiply drying rate x 1.35 for 5 pt. removal.
All multiple fan static pressures (where multipliers are shown) fall within acceptable performance guidelines.

Calc-U-Dri Grain Flow Control Functions

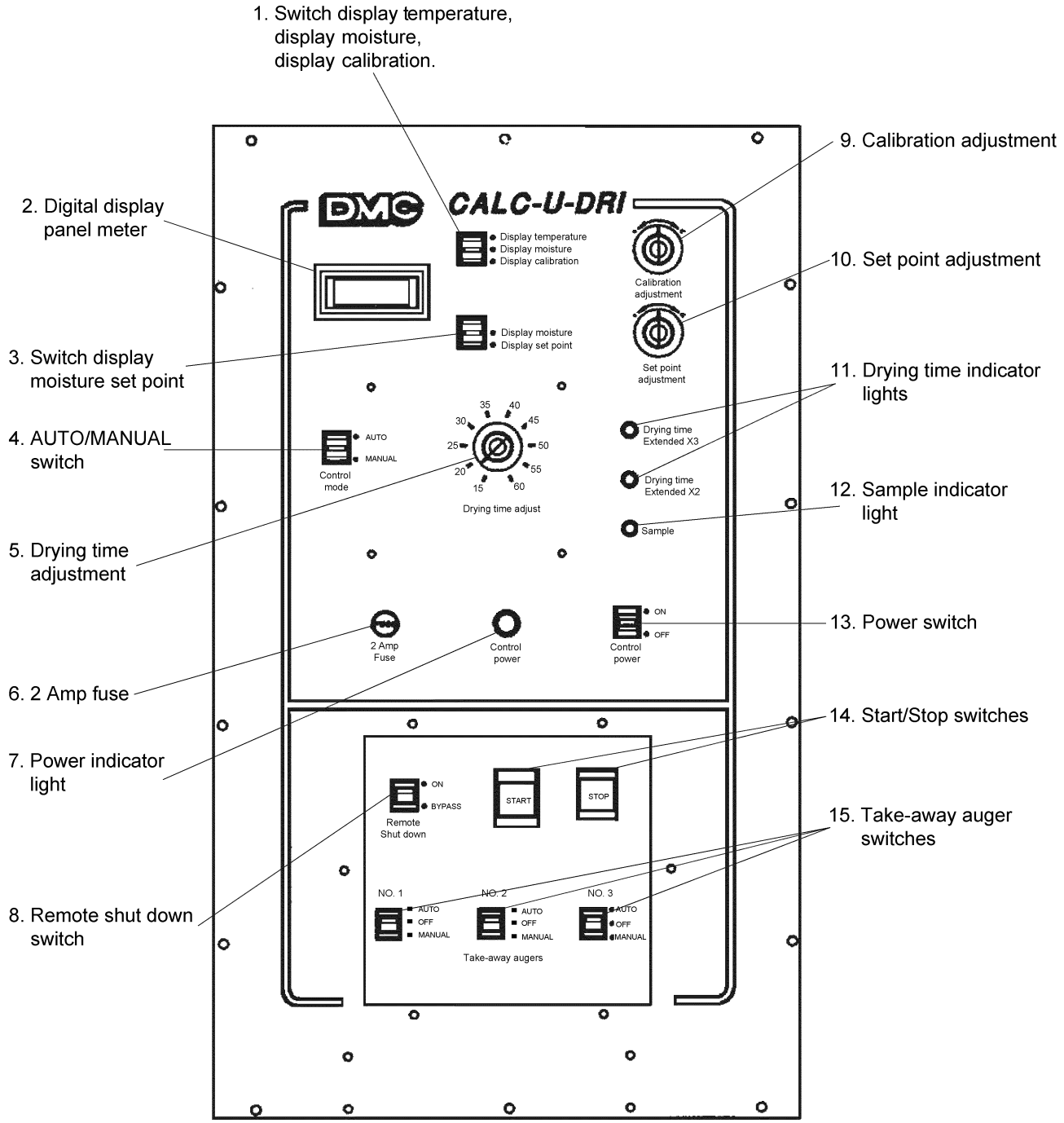


Figure 8A

Calc-U-Dri Grain Flow Control Functions (Continued)

1. Temperature, moisture or calibration switch.	This switch is spring-loaded to display grain moisture unless pushed up for grain temperature or down for the calibration value.
2. Digital display panel meter.	The digital panel meter is used to display the calibration value, the set point, the grain temperature, or the moisture content of the grain.
3. Moisture or set point display.	This switch is spring loaded to display moisture content unless pushed down to display the set point value.
4. AUTO/MANUAL switch. **NOTE:** *The moisture value on the digital display will not change for the first 20 seconds of the sample period in order to make sure that fresh grain has been moved over the sensor.*	When the switch is in "**MANUAL**" the Grain Flow will discharge grain regardless of the moisture content and the grain moisture will be displayed on the panel meter. When the switch is in "**AUTO**" the unit will cycle automatically through: 1. a drying period, 2. a sample period, 3. an unloading period if the grain has dried to the desired moisture content. 1. The drying period is the length of time that has been dialed in with the drying adjustment knob. During this period the panel meter will display the moisture content of the last grain discharged. This value will remain on the display unless the grain temperature or set point is checked, after which, 0.0 will be displayed for the remainder of the drying period. 2. The sample period is the 2 minutes that the unit will discharge grain after the drying period has expired. (The sample indicator light will be "ON" during this period.) If the grain moisture is drier than the moisture set point, it will start the unloading period; if the grain is 0.3% or more wetter than the set point, then it will stop discharging grain after the 2 minutes period and return to the drying period. 3. The unloading period is when the unit is discharging grain that has dried below the set point moisture. It will continue until the Calc-U-Dri senses grain that is 0.3% or more wetter than the set point. The unit will then switch to the drying period.
5. Drying time adjustments. **NOTE:** *It is possible to adjust the circuit board to provide different sample and drying period times. See appendix A on Page 118.*	The drying period is set by turning this knob to the desired time interval. The drying period should be set long enough so that the unit does not go through more than 2 drying and sampling cycles without an unloading period. If the moisture content is between 0.3% and 0.9% above the set point after a sample period, then the next drying period will be the same as the set value. If the moisture content is between 1.0% and 1.9% above the set point after a sample period, then the next drying period will be extended by 2 times the set value and the "2X drying time" light will be "ON". If the moisture content is more than 2.0% above the set point after a sample period, then the next drying period will be extended by 3 times the set value and the "3X drying time" light will be "ON".
6. 2 Amp fuse.	Use only AGC 2A fuses. DO NOT OVERSIZE.
7. Power ON indicator.	This lamp will be "ON" whenever the Power switch is "ON" and there is 115 volts AC present.
8. Remote shut down switch.	This switch, in "BYPASS", allows a fan and/or burner to run even though the Grain Flow has been shut down. When this switch is "ON" the fan and/or burner will be shut down when the Grain Flow is shut down. (See shut down switch operation on *Page 98*.)

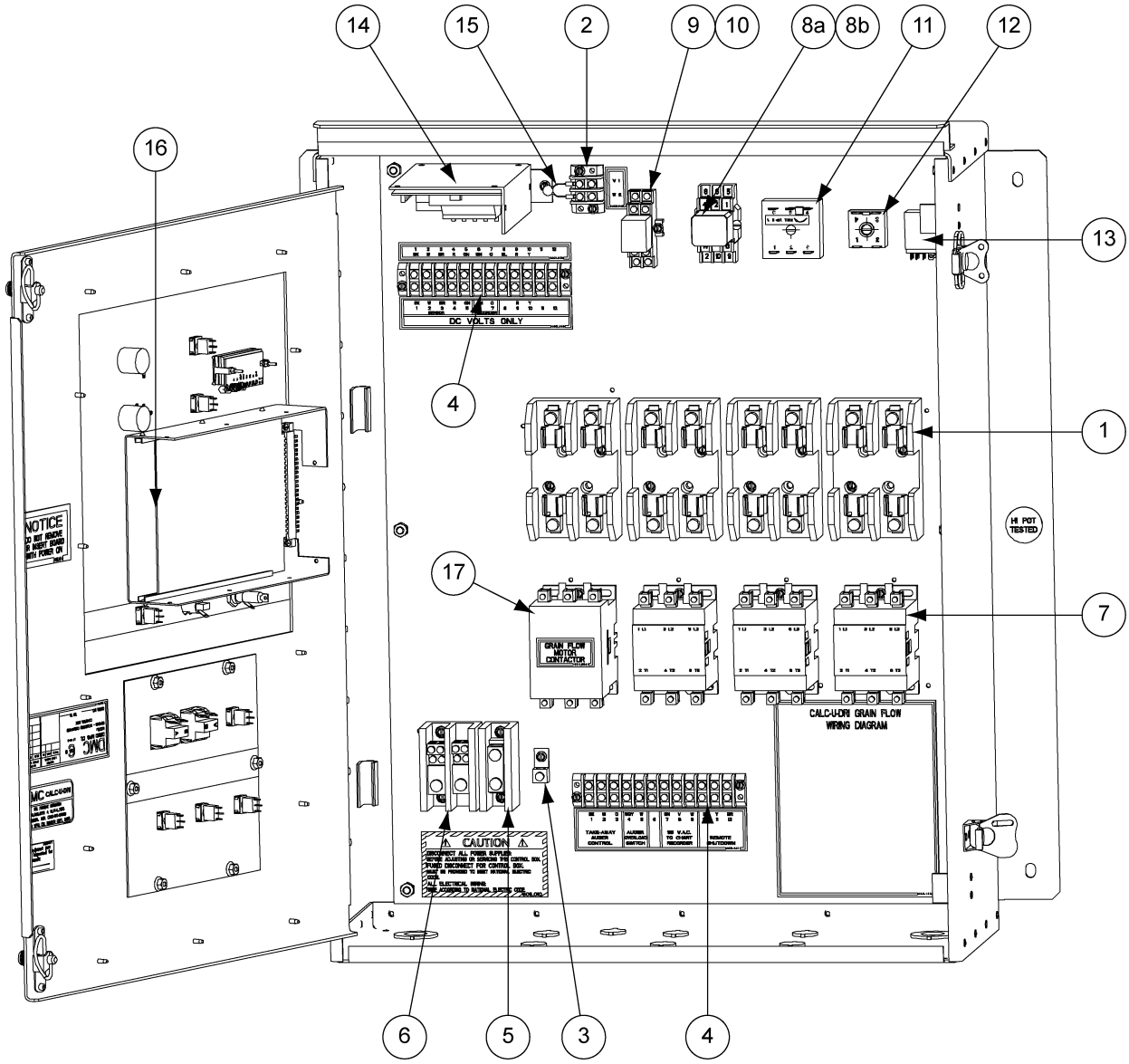
Calc-U-Dri Grain Flow Control Functions (Continued)

9. Calibration adjustment. **NOTE:** *The calibration will change when this knob is turned even if the value is not being displayed.*	The calibration value is displayed by holding the calibration switch down; turning this knob clockwise will increase the calibration value and turning it counterclockwise will decrease the value. The calibration value can be set from -10.0% to +10.0% and is automatically added to the moisture content.
10. Set point adjustment. **NOTE:** *The set point value will change when this knob is turned, even if the value is not being displayed.*	The set point value is displayed by holding the set point switch down. This knob is used to adjust the set point, which is the desired moisture content of the dry grain being discharged.
11. Drying time indicator lights.	These lights indicate the length of the drying period before the next sample is taken. (See *Step 5 on Page 65* drying time adjustment.)
12. Sample indicator light. **NOTE:** *The length of the sample period can be changed by adjusting the circuit board. See appendix A on Page 118.*	This light is “ON” when the unit is in the “sample period”.
13. Power switch.	This switch controls the 115 volt AC power that is required for the Calc-U-Dri controls and digital display.
14. Start/Stop switches.	The **START** button will start the Grain Flow in either the **AUTO** or **MANUAL** mode if the power switch is “ON”. The unit must be restarted after any safety or remote equipment, such as the auger overload switch or level monitor, has caused a shut down. The **STOP** button will immediately stop the Grain Flow and all connected equipment.
15. Take-away auger switches. **NOTE:** *These switches must be in the **AUTO** position during any automatic operation.*	These switches control auxiliary augers used to take grain away from the Grain Flow discharge auger. The power switch must be “ON” to activate these switches. They will immediately start any auger when switched to **MANUAL** position. In **AUTO**, the equipment will start 3 seconds before the Grain Flow discharge auger starts, and will continue to run for 20 seconds after it has stopped.

Grain Flow Motor Only Fuses and Thermal Unit Chart

	3 HP, 230V, 1 PH	3 HP, 230V, 3 PH	3 HP, 440V, 3 PH		5 HP, 230V, 1 PH	5 HP, 230V, 3 PH	5 HP, 440V, 3 PH		7-1/2 HP, 230V, 1 PH	7-1/2 HP, 230V, 3 PH	7-1/2 HP, 440V, 3 PH		10 HP, 230V, 1 HP	10 HP, 230V, 3 HP	10 HP, 440V, 3 HP	10 HP, 575V, 3 HP
8 Amp, FRS Fuse 1EL0745			3													
12 Amp, FRS Fuse 1EL0742							3									
17-1/2 Amp, FRS Fuse 1EL0743											3					3
20 Amp, FRS Fuse 1EL0741															3	
15 Amp, FRN Fuse 1EL0728		3														
20 Amp, FRN Fuse 1EL0729	2					3										
35 Amp, FRN Fuse 1EL0731										3						
40 Amp, FRN Fuse 1EL0732					2									3		
60 Amp, FRN Fuse 1EL0735									2				2			
#B 6.90 Thermal Unit 1EL0769			3													
#B 9.10 Thermal Unit 1EL0767							3									
#B 14 Thermal Unit 1EL0761		3														
#B 15.5 Thermal Unit 1EL0764											3					3
#B 22 Thermal Unit 1EL0783						3									3	
#B 32 Thermal Unit 1EL0865										3						
#B 40 Thermal Unit 1EL0785														3		
Fuse Reducer 1EL0718	4	6				6										

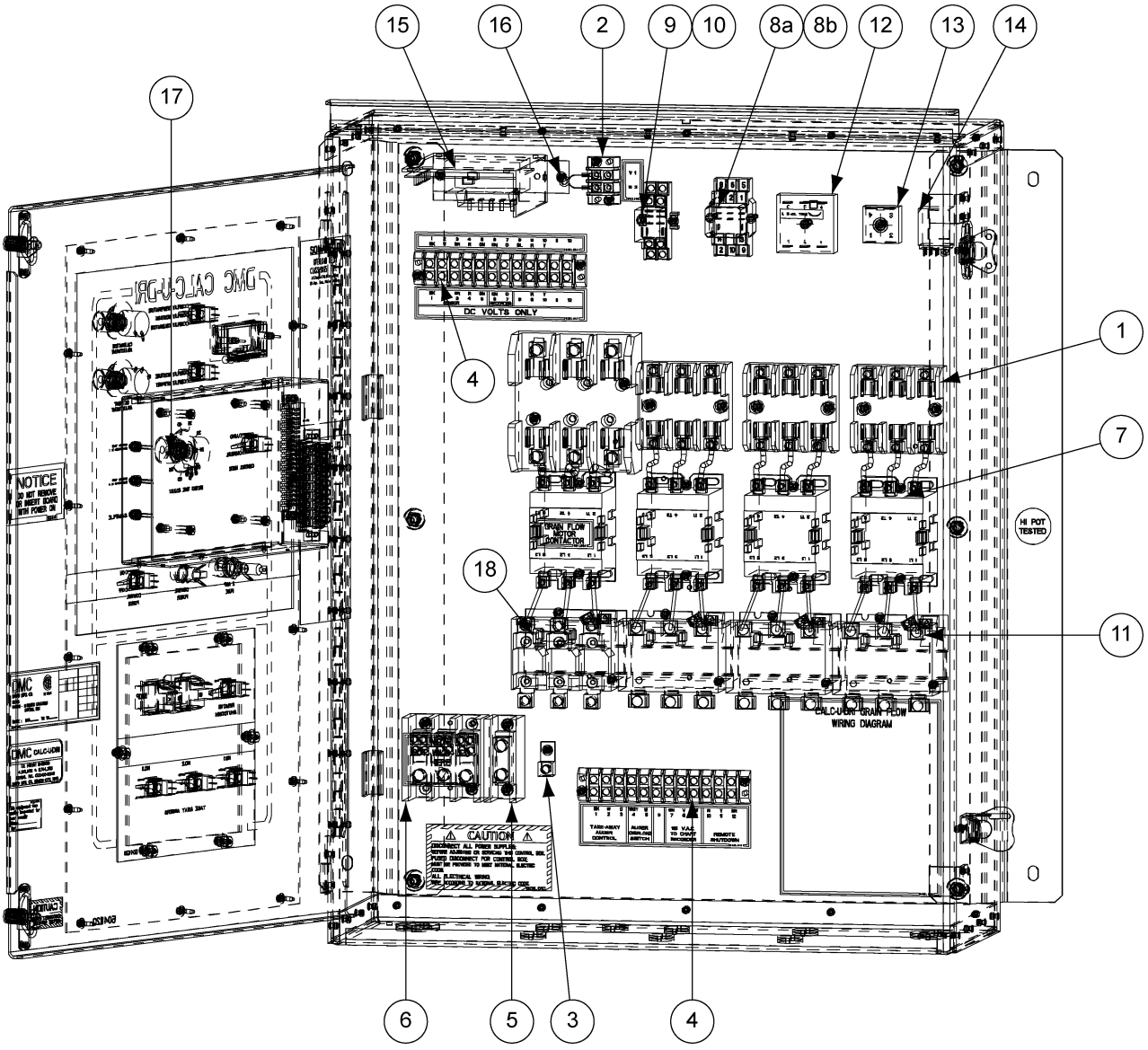
Grain Flow Control Box 230V, 1 PH



Grain Flow Control Box 230V, 1 PH Parts List

Ref #	Part #	Description	Qty
1	1EL0830	Fuse Holder - Block, (CSA) 2 Pole, 60 Amp, 250V	4
2	1EL0879	Terminal Block - DBL (CSA) 2 Terminal, 30 Amp, 250V	1
3	1EL0891	Ground Lug #TA-2 (CSA) 600 Volt, #2-14 Wire	1
4	1EL0900	Terminal Block - DBL (CSA) 12 Terminal, 30 Amp, 250V	2
5	1EL0909	Power Distribution Block (CSA) 1 Circuit, 600 Volt	1
6	1EL0910	Power Distribution Block (CSA) 2 Circuit, 600 Volt	1
7	2EL0243	Contactor - Magnetic (CSA) 40 Amp, 120V Coil	3
8a	07097555	Relay - Base (CSA)	1
8b	HF-7203	Relay 3PDT, 120 VAC Coil	1
9	2EL0274	Relay - General Purpose (CSA) Modelly, DPDT, 12 VDC	1
10	2EL0275	Relay - Socket, (CSA) (IDEC #SH2B-02 Only)	1
11	602E047	Timer - Off Delay, 20 Sec Assembly (Adjustable)	1
12	602E048	Timer - On Delay, 3 Sec Assembly (Non-adjustable)	1
13	602E098	Shorting Block - KM Assembly	1
14	602E340	Power Supply - Main Assembly, (Field Replacement)	1
15	602E430	Surge Absorbor - Assembly with Terminals	1
16	602E458	Circuit Board - DMC 12 (Final DMC Assembly)	1
17	2EL0247	Contactor - Magnetic 50 Amp, 120V Coil	1
18	Fuses (N/S)	See Fuse and Thermal Unit Chart for Required Sizes *on Page 67*	A/R

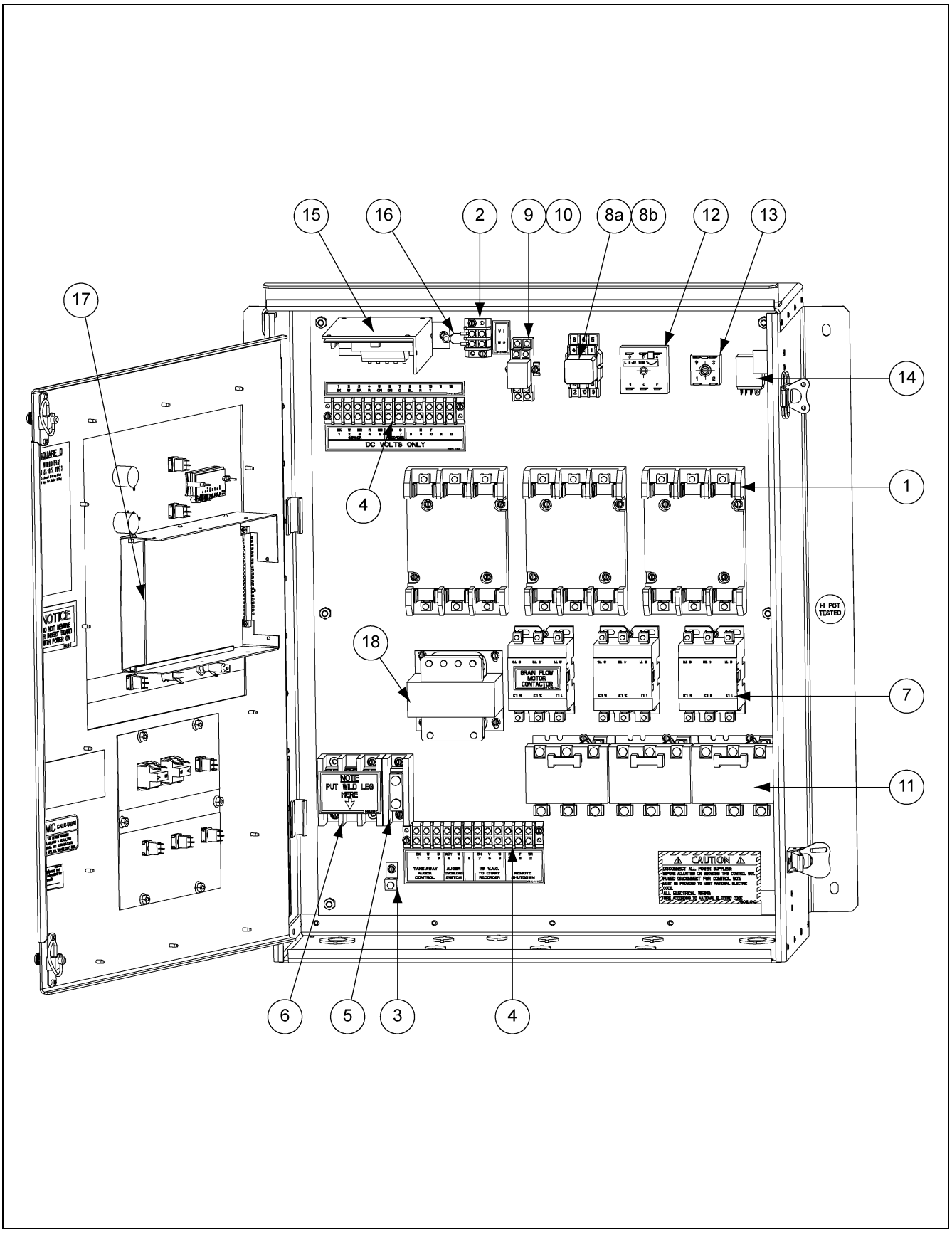
Grain Flow Control Box 230V, 3 PH



Grain Flow Control Box 230V, 3 PH Parts List

Ref #	Part #	Description	Qty
1	1EL0836	Fuse Holder - Block, (CSA) 3 Pole, 30 Amp, 250V	4
2	1EL0879	Terminal Block - DBL (CSA) 2 Terminal, 30 Amp, 250V	1
3	1EL0891	Ground Lug #TA-2 (CSA) 600 Volt, #2-14 Wire	1
4	1EL0900	Terminal Block - DBL (CSA) 12 Terminal, 30 Amp, 250V	2
5	1EL0909	Power Distribution Block (CSA) 1 Circuit, 600 Volt	1
6	1EL0911	Power Distribution Block (CSA) 3 Circuit, 600 Volt	1
7	2EL0243	Contactor - Magnetic (CSA) 40 Amp, 120V Coil	4
8a	07097555	Relay - Base (CSA)	1
8b	HF-7203	Relay 3PDT, 120 VAC Coil	1
9	2EL0274	Relay - General Purpose (CSA) Modelly, DPDT, 12 VDC	1
10	2EL0275	Relay - Socket, (CSA) (IDEC #SH2B-02 Only)	1
11	2EL0281	Relay - Thermal Overload (CSA) Size 1, 26 Amp, SEO-5	3
12	602E047	Timer - Off Delay, 20 Sec Assembly (Adjustable)	1
13	602E048	Timer - On Delay, 3 Sec Assembly (Non-adjustable)	1
14	602E098	Shorting Block - KM Assembly	1
15	602E340	Power Supply - Main Assembly, (Field Replacement)	1
16	602E430	Surge Absorbor - Assembly with Terminals	1
17	602E458	Circuit Board - DMC 12 (Final DMC Assembly)	1
18	2EL0283	Relay - Thermal Overload Size 2, 45 Amp, SEO-8	1
19	1EL0838	Fuse Holder - Block 3 Pole, 60 Amp, 250 Volt	1
20	Fuses (N/S)	See Fuse and Thermal Unit Chart for Required Sizes *on Page 67*	A/R

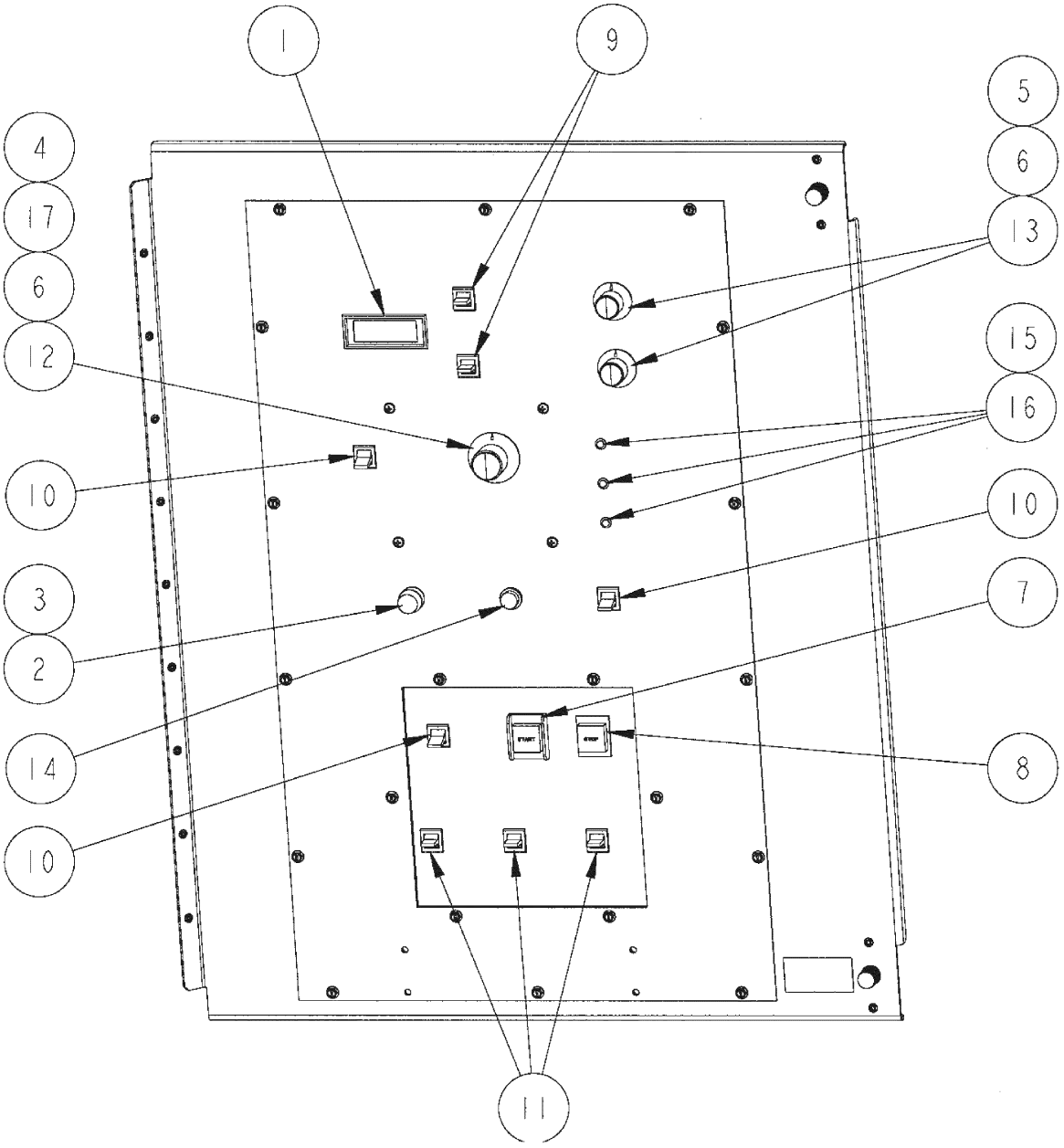
Grain Flow Control Box 440V, 3 PH



Grain Flow Control Box 440V, 3 PH Parts List

Ref #	Part #	Description	Qty
1	1EL0837	Fuse Holder - Block, (CSA) 3 Pole, 30 Amp, 600 Volt	3
2	1EL0879	Terminal Block - DBL (CSA) 2 Terminal, 30 Amp, 250V	1
3	1EL0891	Ground Lug #TA-2 (CSA) 600 Volt, #2-14 Wire	1
4	1EL0900	Terminal Block - DBL (CSA) 12 Terminal, 30 Amp, 250V	2
5	1EL0909	Power Distribution Block (CSA) 1 Circuit, 600 Volt	1
6	1EL0911	Power Distribution Block (CSA) 3 Circuit, 600 Volt	1
7	2EL0243	Contactor - Magnetic (CSA) 40 Amp, 120V Coil	3
8a	07097555	Relay - Base (CSA)	1
8b	HF-7203	Relay 3PDT, 120 VAC Coil	1
9	2EL0274	Relay - General Purpose (CSA) Modelly, DPDT, 12 VDC	1
10	2EL0275	Relay - Socket, (CSA) (IDEC #SH2B-02 Only)	1
11	2EL0281	Relay - Thermal Overload (CSA) Size 1, 26 Amp, SEO-5	3
12	602E047	Timer - Off Delay, 20 Sec Assembly (Adjustable)	1
13	602E048	Timer - On Delay, 3 Sec Assembly (Non-adjustable)	1
14	602E098	Shorting Block - KM Assembly	1
15	602E340	Power Supply - Main Assembly, (Field Replacement)	1
16	602E430	Surge Absorbor - Assembly with Terminals	1
17	602E458	Circuit Board - DMC 12 (Final DMC Assembly)	1
18	2EL0308	Transformer - 9070 (CSA) 240/480-120V, K150,100VA	1
19	Fuses/Thermal Units (N/S)	See Fuse and Thermal Unit Chart for Required Sizes *on Page 67*	A/R

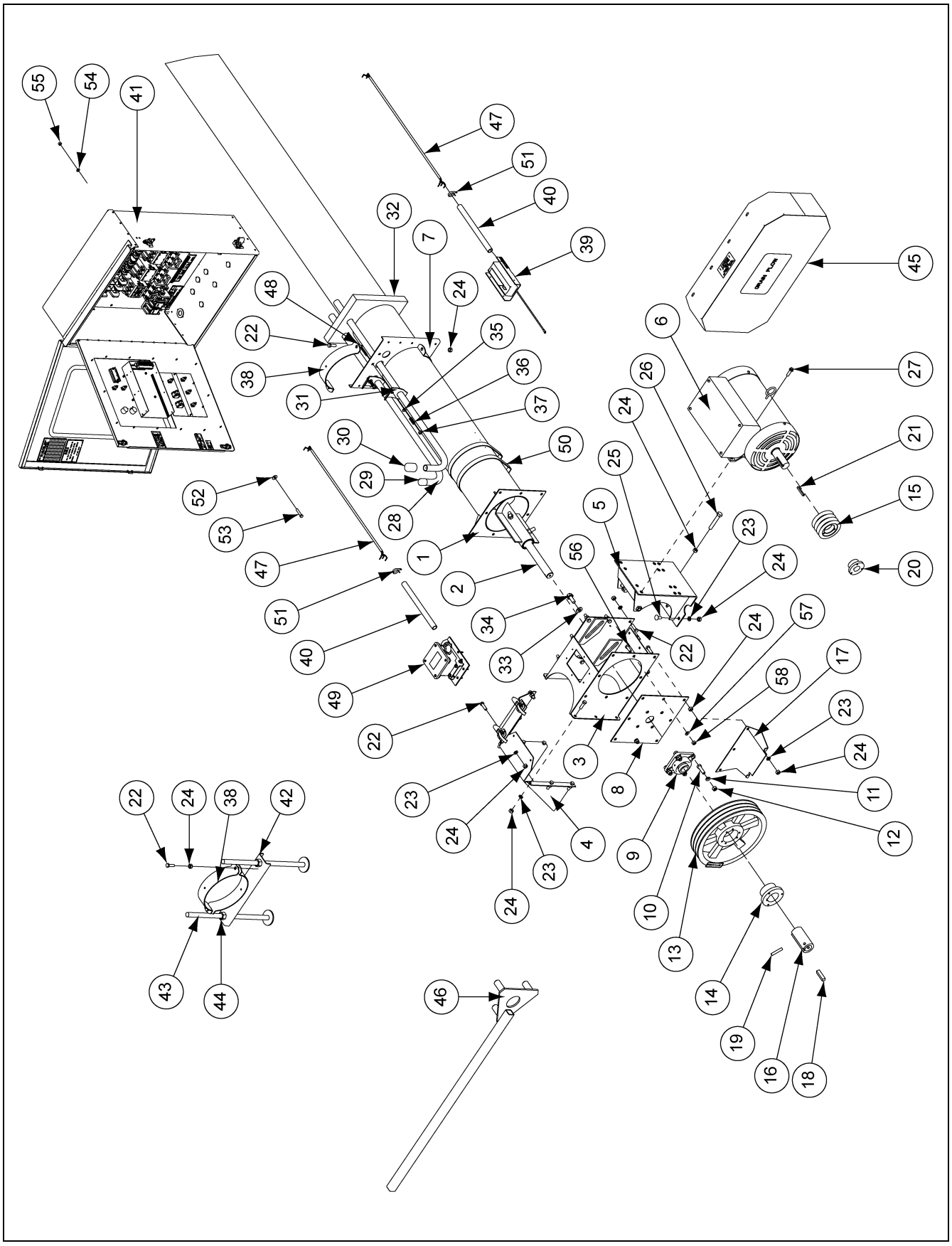
Grain Flow Control Module



Grain Flow Control Module Parts List

Ref #	Part #	Description	Qty
1	5041198	Digital Panel Meter - Subassembly (2EL0692)	1
2	1EL0719	Fuse - AGC, Cartridge (CSA) 2 Amp, 250 Volt	1
3	1EL0826	Fuse Holder - Pan Mount (CSA) 30 Amp, 250 Volt (HKP)	1
4	1EL0852	Knob - Control, Black 1 Diameter for 1/4" Shaft	1
5	1EL0921	Knob - Control, Black 0.72 Diameter for 1/4" Shaft	2
6	1EL2042	Grommet - Rubber, 0.62" O.D. x 0.38" I.D. x 0.15 T	3
7	2EL0618	Switch - Push Button, SPST (CSA) Mom, Norm, Open, Green	1
8	2EL0619	Switch - Push Button, SPST (CSA) Mom, Norm, Closed, Red	1
9	2EL0658	SW-LVR, SPDT, ON-OFF-ON #UL13L5S5ZQEJ4J90-22/CSA	2
10	2EL0659	SW-LVR, SPDT, ON-NONE-ON #UL11L5S5ZQEJ4J90-22/CSA	3
11	2EL0668	SW-LVR, SPDT, ON-OFF-ON #UL12L5S5ZQEJ4J90-22/CSA	3
12	2EL0671	Potentiometer - 2.5M Ohm, Clarostat #RV4NAYSD255B	1
13	2EL0672	Potentiometer - 10K Ohm, Spectrol #534-10K	2
14	2EL1161	Light - Indicator, Red (CSA) (IDI #1050QC1)	1
15	2EL1163	Light - Led, Red (Chicago #HLMP-3750)	3
16	2EL1164	Light - Led, Clip and Ring (Chicago #CMP52)	3
17	3FH0963	Flat Washer Steel/Plated 0.500" O.D. x 0.283" I.D. x 0.062"	1

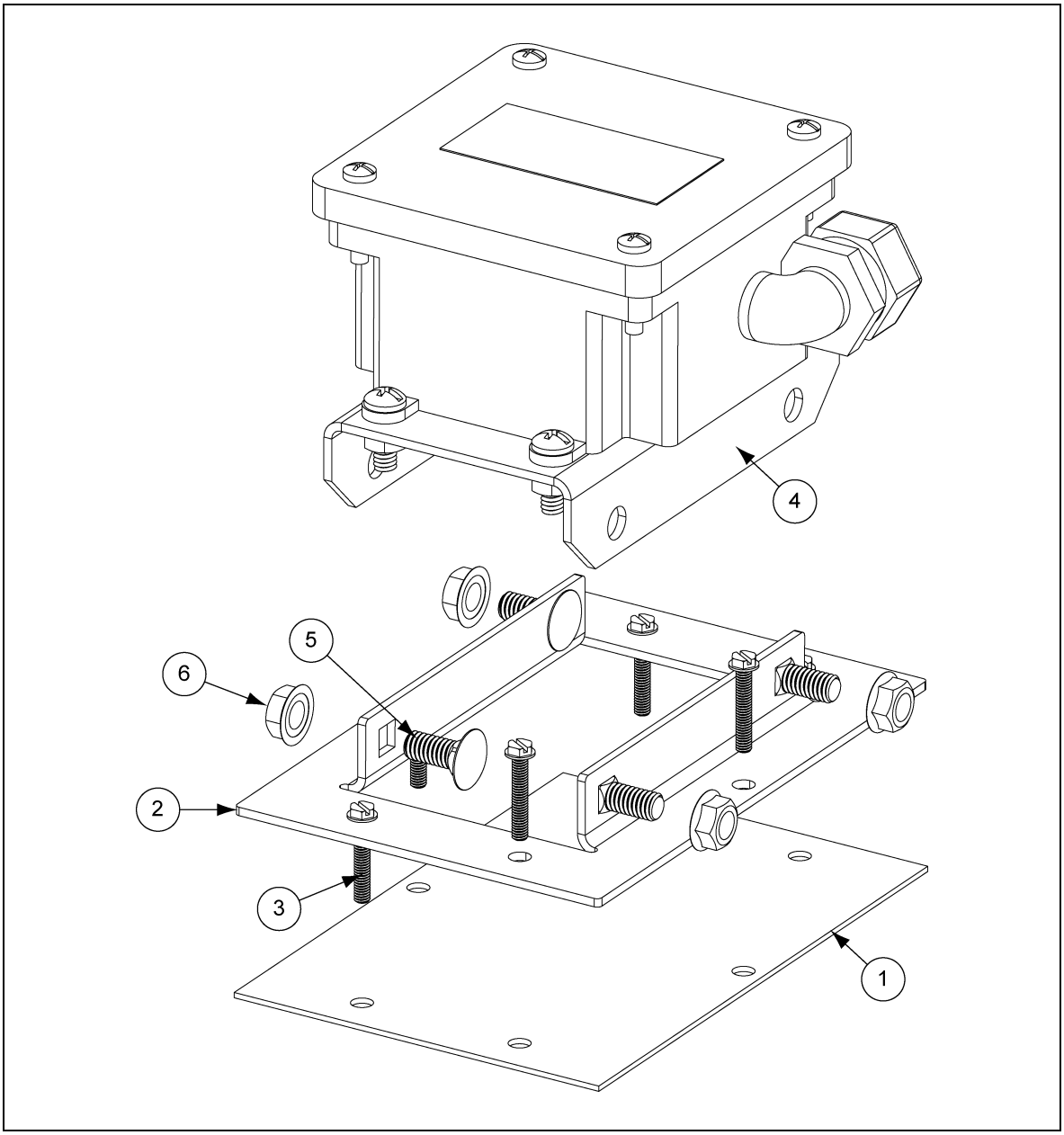
Discharge and Power Unit



Discharge and Power Unit Parts List

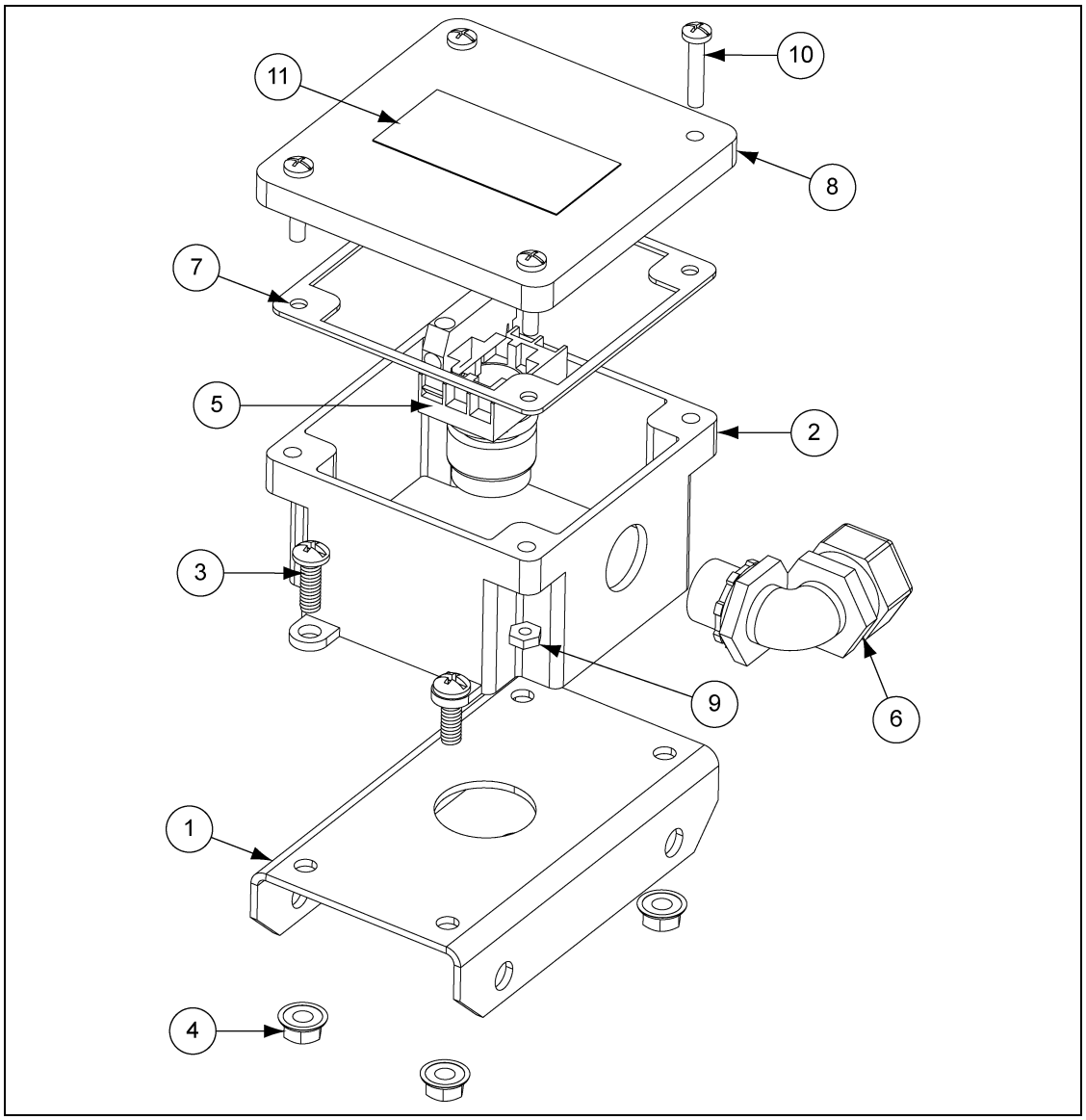
Ref #	Part #	Description
1	603C019	Weldment Tube Discharge 8" (Specify Bin Diameter)
2	6023064	SP Flight - Discharge, 6" (Specify Bin Diameter)
3	602A003	Power Unit Discharge Chute
4	602A025	Shield - Discharge Chute
5	602A002	Power Unit Motor Mount
6	1000-1	Motor 10 HP 1 PH 1800 RPM
7	603C006	Wall Plate - 8" Tube
8	602A020	Bearing Plate-Discharge Chute
9	PT0114	Bearing-w/ Housing 1-1/4" 206-20G
10	S-7837	Bolt HHCS 7/16"-14 x 1-1/2" ZN Grade 5
11	S-7014	7/16" Lock Washer
12	S-860	Hex Nut 7/16"-14 ZN Grade 2
13	602A033	Pulley - 12-3/4" O.D. x 3B 6 Spoke
14	PT0783	Taper Lock Bushing, 2" w/ Hardware
15	PT0639	Pulley, 4"-3B
16	602C009	Discharge Auger Drive Hub
17	602A032	Support - Shield
18	S-9166	Square Key 1/2" x 2" Long
19	S-9339	Spring Pin, 3/8" x 2"
20	PT0771	Taper Lock Bushing, 1-1/8" w/ Hardware
21	S-4513	1/4" x 2" Square Key
22	S-7767	Bolt HHCS 3/8"-16 x 1-1/4" ZN Grade 2
23	S-1054	Lock Washer, 3/8"
24	1FH0765	Hex Nut 3/8"-16 Finished, Plated, Grade 2
25	S-3585	Carriage Bolt 3/8"-16 x 1" ZN Grade 5
26	S-7722	Bolt HHCS 1/2"-13 x 3" ZN Grade 5
27	2FH0984	Screw, 5/16"-18 Whiz Lock
28	602C021	Shift Lever Tube (Specify Bin Diameter)
29	MS0019	Plastic Caps, 1"
30	MS0083	Plastic Caps, 1-5/16"
31	602C025	Latch - Shift Lever Tube
32	603C008	Wall Seal-8" Discharge Tube
33	S-2120	Flat Washer 1/2" SAE ZN
34	S-9062	Flange Bolt 1/2"-13 x 1-1/4" ZN Grade 5
35	S-1430	Flat Washer 1/4" USS ZN Grade 2
36	601C0052	Compression Spring
37	S-5220	Nut, 5/16" Nylock Grade 5 Zinc
38	205C0002	Clamp - Band, 8"
39	602E020	Calc-U-Dri Control Box Assembly, 10, 230V
40	1EL3045	Liquid Tite Conduit - 1/2"
41	5041143	Calc-U-Dri Control Box Assembly, 10, 230V
41	5041144	Calc-U-Dri Control Box Assembly, 30, 230V
41	5041145	Calc-U-Dri Control Box Assembly, 30, 440V
42	603C013	Support End 8" Tube
43	601C0072	Leg - Adjustable, 18-1/4"
44	S-234	Hex Nut 3/4"-10 ZN Grade 5
45	602A026	Power Unit Shield
46	602M001	Breaker Bar
47	WR-18-3SJ	Wire, 18/3 Sjeoow Black Wire Cord, per Ft.
48	2FH0650	Generic Carriage Bolt
49	602A056	Grain Flow Overload Switch Service Bop
50	MS0309	Worm Gear Clamp, 32" Long
51	1EL2084	Cable Clamp-Nylon, 13/16"
52	S-845	Flat Washer 5/16" USS SAE YDP Grade 2
53	S-2741	Bolt HHCS 5/16"-18 x 1-1/2" ZN Grade 5
54	S-1147	Split Lock Washer 5/16" ZN
55	S-396	Hex Nut 5/16"-18 ZN YDP Grade 2
56	S-7520	Bolt HHCS 3/8"-16 x 1" ZN Grade 2
57	S-1054	Split Lock Washer 3/8" ZN
58	S-456	Hex Nut 3/8"-16 ZN YDP Grade 5

Grain Flow Overload Switch Service Kit (602A056)



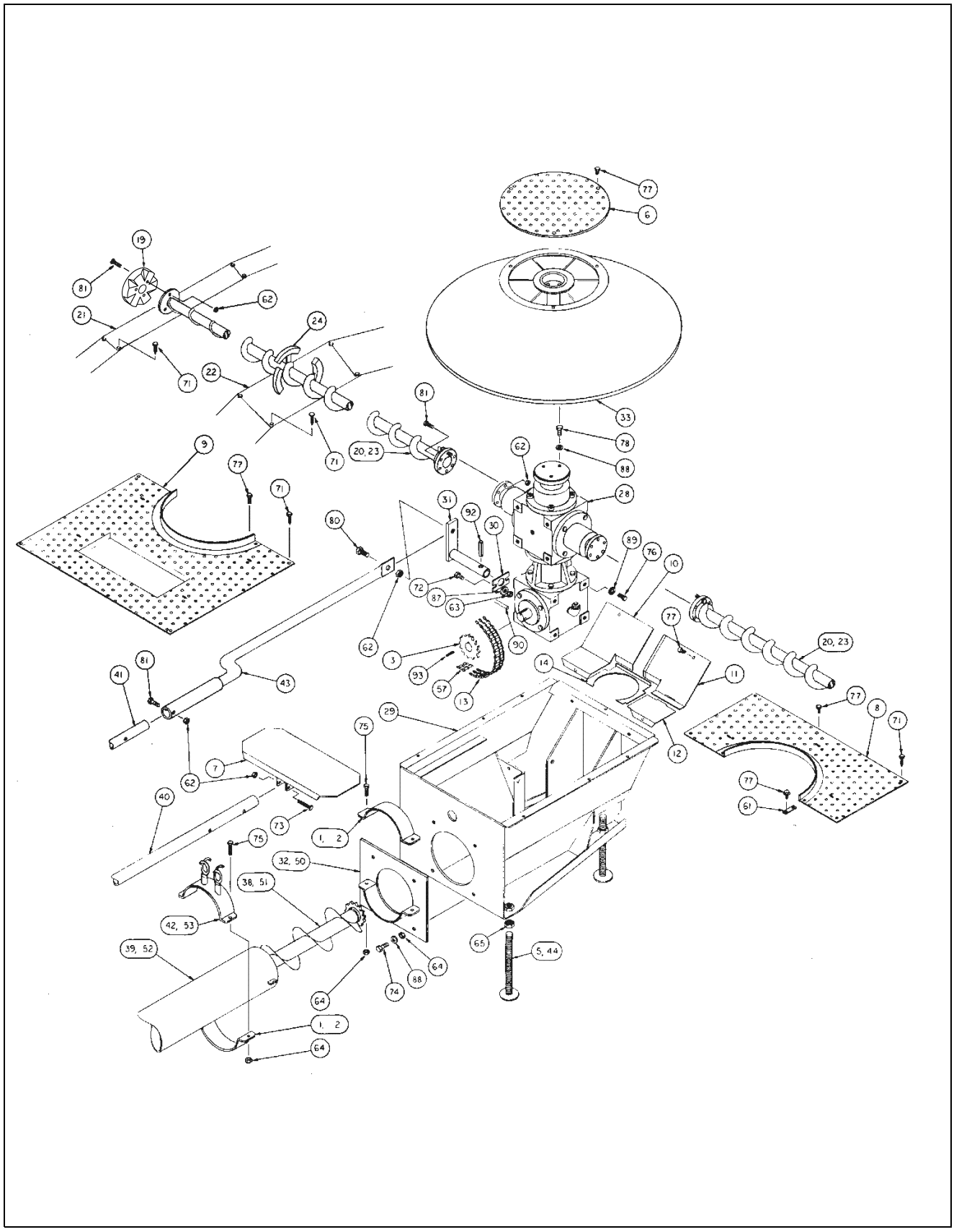
Ref #	Part #	Description	Qty
1	602A039	Rubber Diaphragm Overload Switch	1
2	602A052	Overload Diaphragm Frame	1
3	S-7581	Screw, TCS23 #12-14 x 1" HWH ZN	6
4	602A055	Grain Flow Overload Switch Box Assembly	1
5	S-6076	Carriage Bolt, 5/16"-18 x 3/4" ZN Grade 2	4
6	S-3611	Flange Nut 5/16"-18 YDP Grade 2	4

Grain Flow Overload Switch Box Assembly (602A055)



Ref #	Part #	Description	Qty
1	602A053	Overload Switch Mount	1
2	602A054	Overload Switch Box	1
3	S-8789	Screw, MS 1/4"-20 x 3/4" RHP ZN	4
4	S-7215	Flange Nuts 1/4"-20 ZN	4
5	C-8052	Switch, P.B. Red Ext.	1
6	1EL0442	Connector - Liquid Tite	1
7	FLX-2690	Gasket, Electrical Box 4" x 4"	1
8	FLX-2689	Electrical Box Cover	1
9	S-849	Hex Nut 10"-24" ZN Grade 2	4
10	S-7377	Screw, MS #10-24 x 1" RHP ZN Grade 2	4
11	DC-889	Decal, Danger High Voltage	1

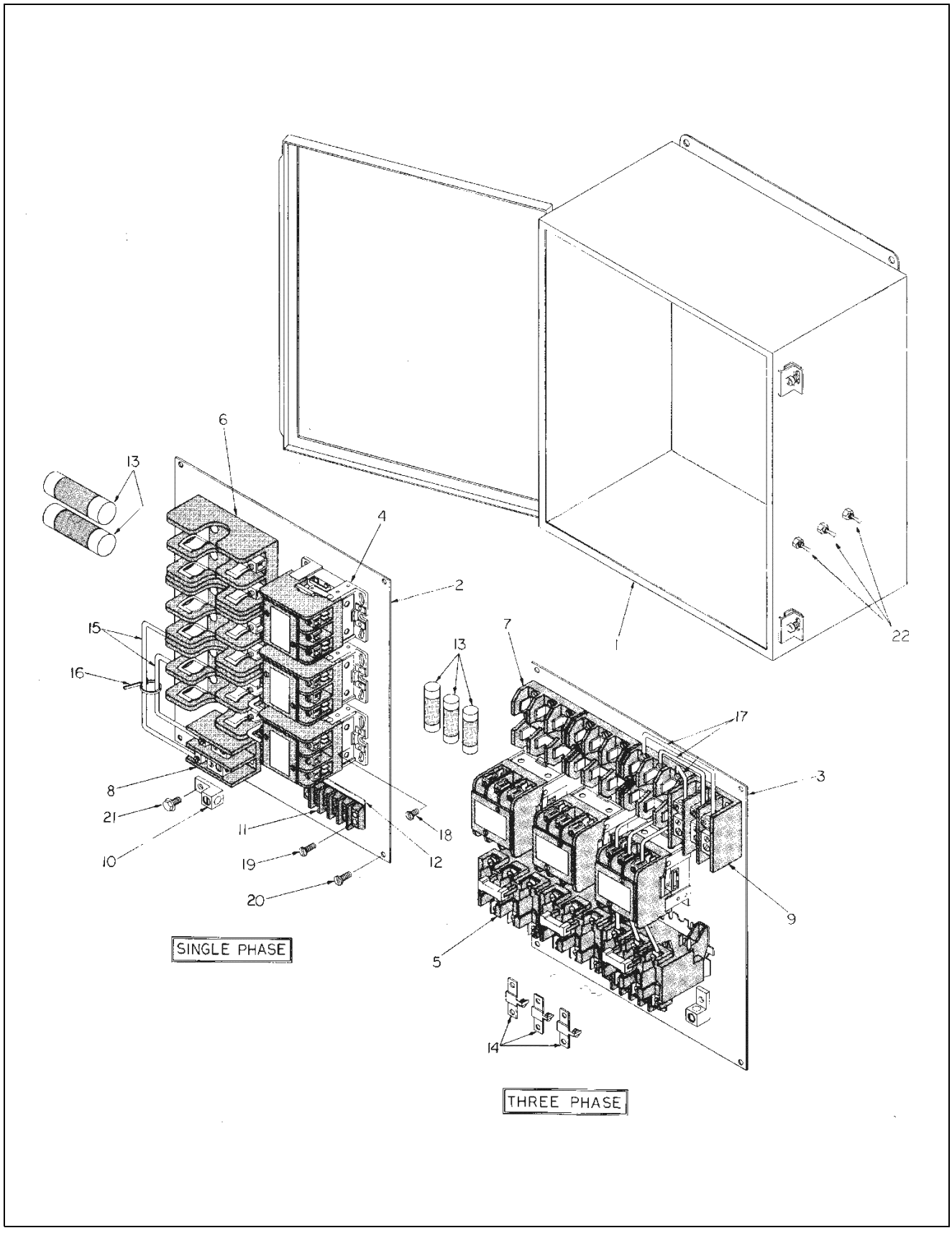
Center Sump and Gearbox Assembly



Center Sump and Gearbox Assembly Parts List

Ref #	Part #	Description	Qty	
			6"	8"
1	205C0002	Clamping Band, 8"	0	2
2	601B0003	Clamping Band, 6"	2	0
3	601B0005	Roller Chain Sprocket, 14T	1	1
5	601B0015	Adjustable Leg - 8" Long	4	4
6	601B0016	Perforated Hood Cover	1	1
7	601B0038	Slide Gate	1	1
8	601B0042	Perforated Cover Plate (Small Section)	1	1
9	601B0043	Perforated Cover Plate (Large Section)	1	1
10	601B0044	Gearbox Cover - Left Upper Section	1	1
11	601B0045	Gearbox Cover - Right Upper Section	1	1
12	601B0046	Gearbox Cover - Right Lower Section	1	1
13	601B0049	Roller Chain, #50 Double Strand	1	1
14	601B0091	Gearbox Center Seal Ring	1	1
19	602T050	Auger Wheel (for 1-1/4" Diameter Shaft)	2	2
20	602P042-XXXX	Floor Auger Pair - Plain (Specify Bin Diameter) - (1-1/4" Diameter Shaft)	1	1
21	601C0108	Floor Wear Plate - Outside (Specify Bin Diameter)	A/R	A/R
22	601C0109	Floor Wear Plate - Inside (Specify Bin Diameter)	A/R	A/R
23	602P051-XXXX	Floor Auger Pair - Hardsurfaced (Specify Bin Diameter) (1-1/4" Diameter Shaft)	1	1
24	602T0030	Auger Wheel Section	A/R	A/R
28	602B001	Gearbox (Painted White)	1	1
29	602B012	Sump	1	1
30	602B014	Shift Lever Support Plate	1	1
31	602B015	White Shift lever	1	1
32	602B018	Sump Clamp Plate, 6"	1	0
33	602B020-W	Center Hood	1	1
38	6023064	Discharge Auger, 6" (Specify Bin Diameter)	1	0
39	602C035	Discharge Tube, 6" (Specify Bin Diameter)	1	0
40	602C019	Slide Gate Tube (Specify Bin Diameter)	1	1
41	602C021	Shift Lever Tube (Specify Bin Diameter)	1	1
42	602C026	Support Clamp - Extension Tube, 6"	1	0
43	602C028	Shift Lever Offset Tube	1	1
44	602B024	Adjustable Leg, 4" Long	4	4
50	603B001	Sump Clamp Plate, 8"	0	1
51	6033022	Discharge Auger, 8" (Specify Bin Diameter)	0	1
52	603C019	Discharge Tube, 8" (Specify Bin Diameter)	0	1
53	603C009	Support Clamp - Extension Tube, 8"	0	1
57	PT1050	Connecting Link, #50 Double Strand	1	1
61	1FH0610	Threaded Strap, 1/4"	2	2
62	S-5220	Hex Lock Nut, 5/16"	22	22
63	S-1102	Hex Nut, 1/4"	1	1
64	S-456	Hex Nut, 3/8"	8	8
65	S-234	Hex Nut, 3/4"	4	4
71	2FH0491	Hex Flange Head Screw, Self-drilling, 1/4" x 1-1/2"	A/R	A/R
71	3FH0535	Pop Rivet, 1/4" Steel SD812BS	A/R	A/R
71	3FH0536	Rivet, Aluminum Body and Mandrell, 1.4" 0.626-0.750 Grip Range	A/R	A/R
72	S-7576	Hex Bolt, 1/4" x 1"	1	1
73	S-7329	Hex Bolt, 5/16" x 2"	2	2
74	S-7520	Hex Bolt, 3/8" x 1"	4	4
75	S-2071	Hex Bolt, 3/8" x 1-1/4"	4	4
76	S-7527	Hex Bolt, 1/2" x 1"	8	8
77	S-8857	Hex Flange Head Whiz Lock Screw, 1/4" x 1/2"	18	18
78	S-2071	Hex Bolt, 3/8" x 1-1/4", Grade 5	3	3
80	S-1196	Hex Bolt, 5/16" x 1", Grade 5	7	7
81	S-2741	Hex Bolt, 5/16" x 1-1/2" Grade 5	11	11
87	S-2041	Lock Washer, 1/4"	1	1
88	S-1054	Lock Washer, 3/8"	7	7
89	S-236	Lock Washer, 1/2"	8	8
90	S-4377	Spring Pin, 5/16" x 2"	1	1
92	3FH0936	Spring Pin, 7/32" x 1"	1	1
93	S-9168	Square Key, 1/4" x 1"	1	1

Take-away Auger Control Box

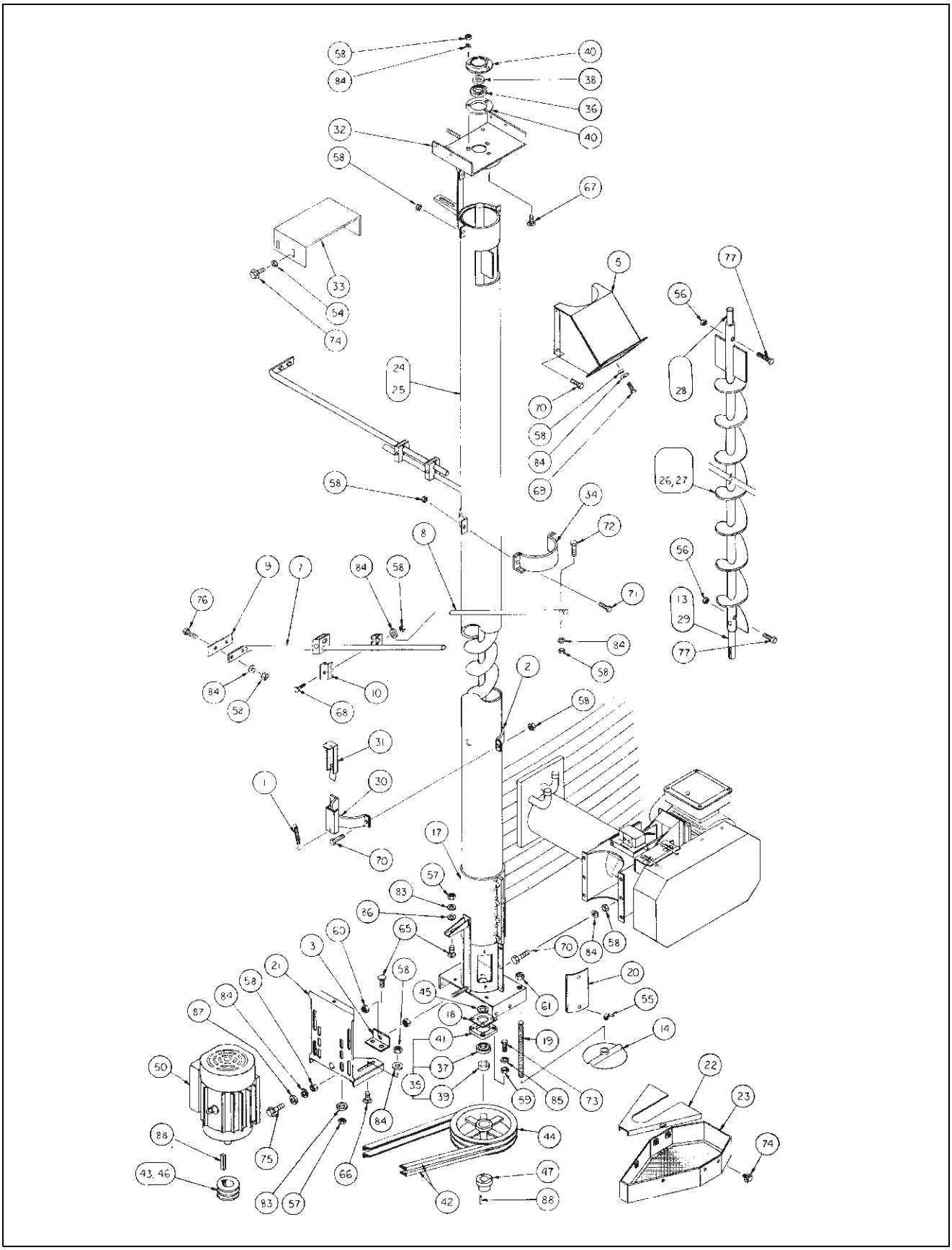


Take-away Auger Control Box Parts List

Ref #	Part #	Description	Qty
1	601E0049	Control Box - Electrical	1
2	601E0032	Inside Mounting Panel - 1 Phase Unit	1
3	601E0033	Inside Mounting Panel - 3 Phase Unit	1
4	2EL0243	Magnetic Contactor - 3 Pole	A/R 1-3
5	2EL0281	Thermal Overload Relay - 3 Phase	A/R 1-3
6	1EL0830	Fuse Holder Block - 1 Phase, 35-60 Amp	A/R 1-3
7	1EL0836	Fuse Holder Block - 3 Phase, 30 Amp	A/R 1-3
8	1EL0910	Power Distribution Block - 1 Phase Unit	1
9	1EL0911	Power Distribution Block - 3 Phase Unit	1
10	1EL0891	Grounding Terminal Lug	1
11	1EL0882	Terminal Block	1
12	1EL0896	Terminal Block No. Strip	1
*13	1EL0728**	Fuse, 15A, 1-1/2 HP, 230V, 1 PH	A/R
	1EL0729**	Fuse, 20A, 2 HP, 230V, 1 PH	A/R
	1EL0731	Fuse, 35A, 3 HP, 230V, 1 PH	A/R
	1EL0732	Fuse, 40A, 5 HP, 230V, 1 PH	A/R
	1EL0735	Fuse, 60A, 7-1/2 HP, 230V, 1 PH	A/R
	1EL0736	Fuse, 10A, 1-1/2 HP, 230V, 3 PH	A/R
	1EL0736	Fuse, 10A, 2 HP, 230V, 3 PH	A/R
	1EL0728	Fuse, 15A, 3 HP, 230V, 3 PH	A/R
	1EL0729	Fuse, 20A, 5 HP, 230V, 3 PH	A/R
	1EL0730	Fuse, 30A, 7-1/2 HP, 230V, 3 PH	A/R
	1EL0737	Fuse, 5A, 1-1/2 HP, 440V, 3 PH	A/R
	1EL0737	Fuse, 5A, 2 HP, 440V, 3 PH	A/R
	1EL0745	Fuse, 8A, 3 HP, 440V, 3 PH	A/R
	1EL0742	Fuse, 12A, 5 HP, 440V, 3 PH	A/R
	1EL0743	Fuse, 17-1/2A, 7-1/2 HP, 440V, 3 PH	A/R
	1EL0741	Fuse, 20A, 10 HP, 600V, 3 PH	A/R
*14	Thermal Unit		
	1EL0767	(B9.10) 1-1/2 HP, 230V, 3 PH	A/R
	1EL0782	(B10.2) 2 HP, 230V, 3 PH	A/R
	1EL0761	(B14) 3 HP, 230V, 3 PH	A/R
	1EL0759	(B25) 5 HP, 230V, 3 PH	A/R
	1EL0760	(B36) 7-1/2 HP, 230V, 3 PH	A/R
	1EL0859	(B4.15) 1-1/2 HP, 440V, 3 PH	A/R
	1EL0778	(B4.85) 2 HP, 440V, 3 PH	A/R
	1EL0762	(B7.70) 3 HP, 440V, 3 PH	A/R
	1EL0763	(B11.5) 5 HP, 440V, 3 PH	A/R
	1EL0776	(B17.5) 7-1/2 HP, 440V, 3 PH	A/R
	1EL0783	(B22) 10 HP, 440V, 3 PH	A/R
15	1EL3002	Wire #8	(State Length Required)
16	1EL2112	Nylon Wire Tie	A/R
17	1EL3001	Wire #10	(State Length Required)
18	S-1158	Machine Screw - Self-Tapping, Pan Head #8-32 x 1/2"	A/R
		1 Phase Unit	6-14
		3 Phase Unit	8-20
19	S-6557	Machine Screw - Self-Tapping, Pan Head #8-32 x 3/4"	2
20	S-848	Machine Screw - Pan Head #10-24 x 1/2"	4
21	S-8857	Hex Flange Whiz Lock Screw, 1/4" x 1/2"	1
22	2EL0627	Toggle Switch (3 Position)	3

* Not sent with original box, must be ordered separately.
** 1EL0718 - Fuse reducer required (2 per fuse).

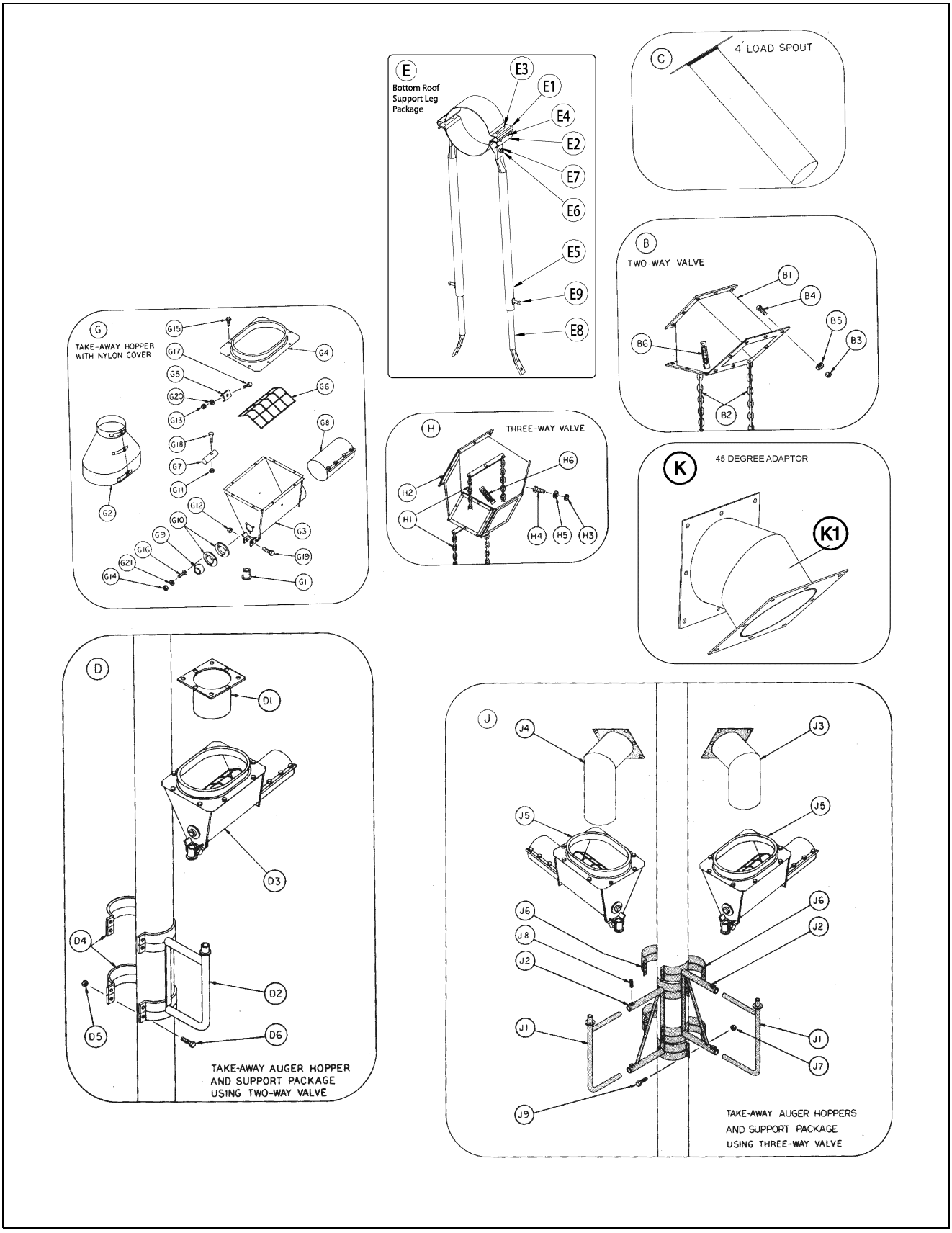
Vertical Auger



Vertical Auger Parts List

Ref #	Part #	Description	Qty
1	104B2056	Extension Spring	1
2	205C0002	Clamping Band, 8" x 2"	2
3	205C0003	Motor Mount Angle	1
5	601D0060	Vertical Discharge Spout 45°	1
7	601D0062	Bin Wall Tube (2 Hole)	2
8	601D0063	Adjustment Tube (1 Hole)	2
9	601D0064	Backing Plate (Bin Wall)	2
10	601D0065	Clamping Channel	8
14	601D0082	Support Pad	2
17	602D002	Auger Boot	1
18	602D010	Boot Seal Plate	1
19	602D011	Boot Adjustable Leg	2
20	602D012	Boot Clean Out Cover	1
21	602D013	Boot Motor Mount	1
22	602D015	Boot Belt Shield - Top	1
23	602D016	Boot Belt Shield - Bottom	1
24	602D024	Auger Tube, 15'	1
25	602D025	Auger Tube, 18'	1
26	602D026	Screw Weldment, 15' (1-3/8" I.D.) No Stub Shafts	1
27	602D027	Screw Weldment, 18' (1-3/8" I.D.) No Stub Shafts	1
28	602D032	Stub Shaft, 6" Long, 1-3/8" Stepped to 1/4" Diameter	1
29	602D033	Stub Shaft (Keyed) 10-1/4" Long, 1-3/8" Stepped to 1-1/4" Diameter	1
30	602D036	Vertical Auger Sampler	1
31	602D037	Vertical Auger Sampler Slide Gate	1
32	602D041	Vertical Auger Head	1
33	602D044	Rain Shield	1
34	602D045	8" Clamping Band w/ Angle Bracket	1
35	PT0116	Heavy Bearing 1-1/4" w/ Locking Collar and 4 Bolt HSG.	1
36	PT0218	Bearing, 1-1/4" w/ Eccentric Locking Collar	1
37	PT0232	Heavy Bearing 1-1/4" w/ Eccentric Locking Collar	1
38	PT0403	Eccentric Locking Collar 1-1/4"	1
39	PT0405	Heavy Eccentric Locking Collar, 1-1/4"	1
40	PT0425	3 Hole Stamped Flangette	2
41	PT0429	4 Bolt Cast Housing (Heavy)	1
42	GC06337	V-Belt, BX51 (Matched)	2
43	PT0642	Pulley, 4" O.D. x 1-1/8" - 2B (8" Discharge Only)	1
44	PT0677	Pulley, 11.35" O.D. x 2B, QD	1
45	PT0824	Seal, 1-7/8" O.D. x 1-1/4" x 1/4"	1
46	3418-2	Pulley, 3-1/2" O.D. x 1-1/8" 2B (6" Discharge Only)	1
47	GC07674	Bushing, SK 1-1/4" Bore	1
50	500-1	5 HP TEFC 1 Phase	1
50	3EL5120	5 HP 3 Phase	1
50	712-1	7-1/2 HP TEFC, 1 Phase	1
50	3EL5117	7-1/2 HP, 3 Phase	1
54	S-1102	Hex Nut, 1/4"	4
55	S-4198	Wing Nut, 1/4"	2
56	S-6493	Hex Lock Nut, 1/2"	3
57	S-396	Hex Nut, 5/16"	3
58	S-456	Hex Nut, 3/8"	43
59	S-860	Hex Nut, 7/16"	4
60	S-7510	Hex Nut, 1/2"	2
61	S-234	Hex Nut, 3/4"	2
65	S-6076	Carriage Bolt, 5/16" x 3/4"	3
66	S-7391	Carriage Bolt, 3/8" x 3/4"	2
67	S-3585	Carriage Bolt, 3/8" x 1"	3
68	S-8055	Carriage Bolt, 3/8" x 3", Full Thread	4
69	S-7520	Hex Bolt, 3/8" x 1"	8
70	S-7767	Hex Bolt, 3/8" x 1-1/4"	14
71	S-7521	Hex Bolt, 3/8" x 1-1/2"	2
72	S-7522	Hex Bolt, 3/8" x 2"	2
73	S-7879	Hex Bolt, 7/16" x 1-1/2"	4
74	S-8857	Hex Flange Whiz Lock Screw, 1/4" x 1/2"	10
75	2FH0984	Hex Flange Whiz Lock Screw, 3/8" x 1-1/4"	4
76	S-9147	Hex Bolt, 3/8" x 2" Full Thread	4
77	S-7722	Hex Bolt, 1/2" x 3" Grade 5	3
83	S-1147	Lock Washer, 5/16"	3
84	S-1054	Lock Washer, 3/8"	33
85	S-7014	Lock Washer, 7/16"	4
86	S-845	Flat Washer, 5/16"	1
87	S-248	Flat Washer, 3/8"	4
88	S-4513	Square Key, 1/4" x 2"	2

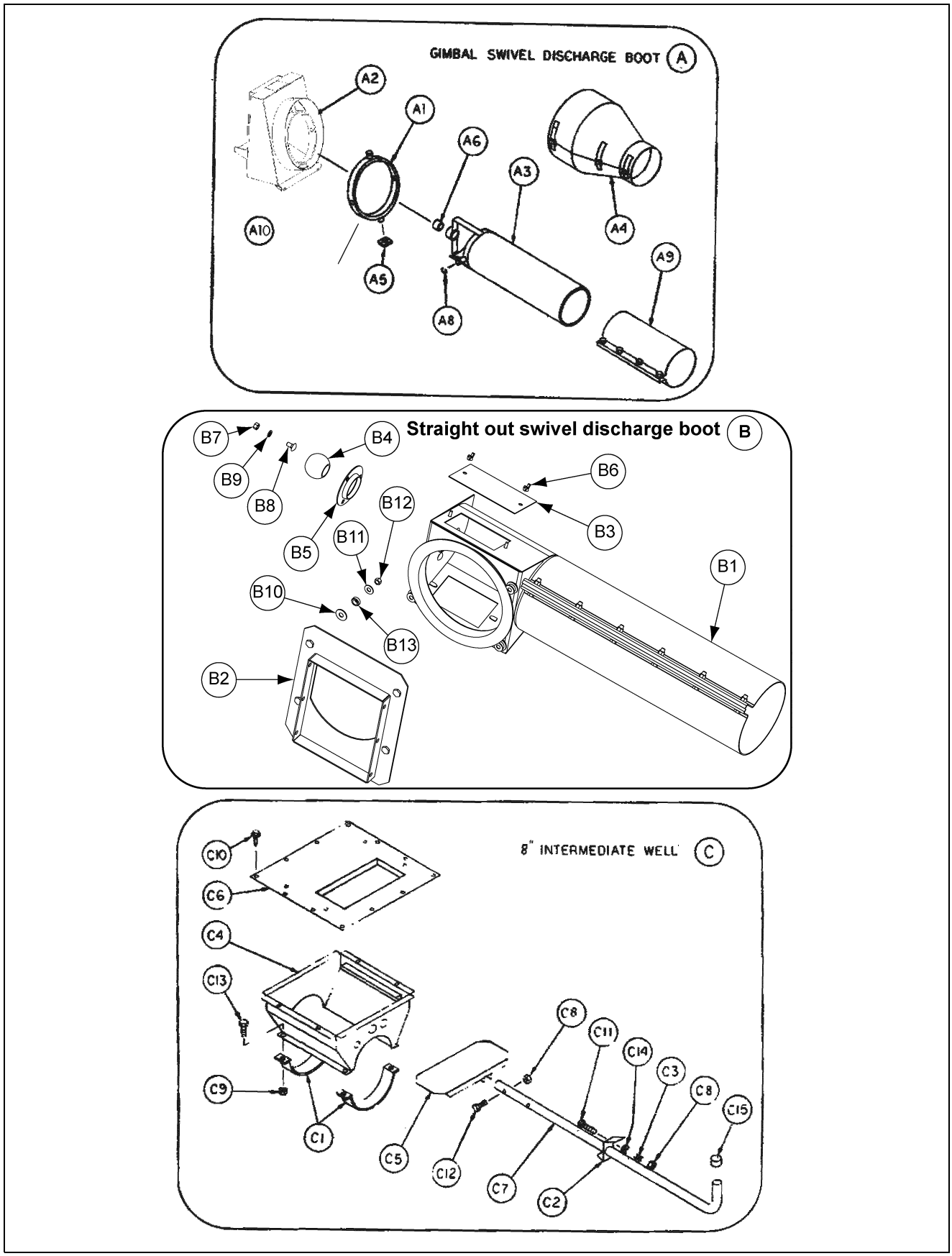
Vertical Auger Accessories



Vertical Auger Accessories Parts List

Ref #	Part #	Description	Qty
B	601D0036	2 Way Valve w/ Control Chain and Hardware	1
B1	601D0034	2 Way Valve Weldment	1
B2	601D0035	Control Chain w/ “S” Hooks	1
B3	S-456	Hex Nut, 3/8"	14
B4	S-7520	Hex Bolt, 3/8" x 1"	16
B5	S-1054	Lock Washer, 3/8"	16
B6	103C0025	Extension Spring, 5/8" x 4-1/4"	1
C	601D005	8" x 4" Loading Spout	1
D	601N0057	Take-away Hopper and Support Package (Using 2 Way Valve)	1
D1	601D0003	8" O.D. x 8" Transition Down Spout	1
D2	601D0014	Support for 6" Hopper Base	1
D3	602D120	Take-away Hopper Assembly w/ Nylon Cover	1
D4	205C0002	8" x 2" Clamping Band	4
D5	S-456	Hex Nut, 3/8"	8
D6	S-7767	Hex Bolt, 3/8" x 1-1/4"	8
E	GK4807	Support Legs - Bottom	1
E1	GK1122	Band, Half 6" x 4"	2
E2	GK1034	Ears, Mounting, Adjustable	2
E3	S-7079	U-Bolt 5/16"-18 x 1-3/4" Inside Width	2
E4	S-396	Hex Nut, 5/16"-18 SAE Grade 2 ZN Plated	2
E5	GK1892	Tube, Telescoping Outer Leg 36"	2
E6	S-7469	Bolt HHCS 3/8"-16 x 1 Grade 5	2
E7	S-7383	Nylon Lock Nut 3/8"-16 Grade 5 ZN Plated	2
E8	GK4896	Extension Leg for Mounting Bracket	2
E9	S-8084	Set Screw 3/8"-14 x 1-1/4" Square Head	2
G	602D120	Take-away Hopper Assembly w/ Nylon Cover	1
G1	601D0013	Hopper Pivot Tube	1
G2	602D118	Nylon Cover	1
G3	602D121	Take-away Hopper Weldment	1
G4	602D122	Take-away Hopper Top Flange Plate	1
G5	602D123	Take-away Hopper Screen Clamp	2
G6	602D124	Take-away Hopper Screen	1
G7	602D134	Take-away Hopper Stub Shaft	1
G8	G151624	6" Connecting Band	1
G9	PT0220	Wood Bearing, 1"	1
G10	PT0421	3 Hole Flangette	2
G11	S-8315	Lock Nut 1/2"-13 ZN GRC Prevailing Torque	1
G12	S-6493	Hex Lock Nut, 1/2"	1
G13	S-1102	Hex Nut, 1/4"	2
G14	S-396	Hex Nut, 5/16"	3
G15	2FH0479	Hex Washer Head Self-Tapping Screw Type AB, 1/4" x 3/4"	8
G16	S-6076	Carriage Bolt, 5/16" x 3/4"	3
G17	S-7576	Hex Bolt, 1/4" x 1"	2
G18	S-7521	Hex Bolt, 3/8" x 1-1/2"	1
G19	S-7719	Hex Bolt, 1/2" x 3"	1
G20	S-2041	Lock Washer, 1/4"	2
G21	S-1147	Lock Washer, 5/16"	3
H	601D0106	3 Way Valve w/ Control Chain and Hardware	1
H1	601D0035	Control Chain w/ “S” Hooks	1
H2	601D0105	3 Way Valve Weldment	1
H3	S-456	Hex Nut, 3/8"	20
H4	S-7520	Hex Bolt, 3/8" x 1"	24
H5	S-1054	Lock Washer, 3/8"	24
H6	103C0025	Extension Springs, 5/8" x 4-1/4"	1
J	601N0058	Take-away Hopper and Support Package (Using 3 Way Valve)	2
J1	601D0095	Hopper Support Frame	2
J2	601D0096	Hopper Support Frame Extension	1
J3	601D0100	8" O.D. Angled Transition Down Spout (Short)	1
J4	601D0101	8" O.D. Angled Transition Down Spout (Long)	1
J5	602D120	Take-away Hopper Assembly w/ Nylon Cover	2
J6	205C0002	8" x 2" Clamping Band	8
J7	S-456	Hex Nut, 3/8"	16
J8	2FH0617	Square Head Set Screw, 3/8" x 1"	4
J9	S-7767	Hex Bolt, 3/8" x 1-1/4"	16
K1	6024164	45° Adaptor- Use with 3 Way Valve	1

Grain Flow Optional Equipment

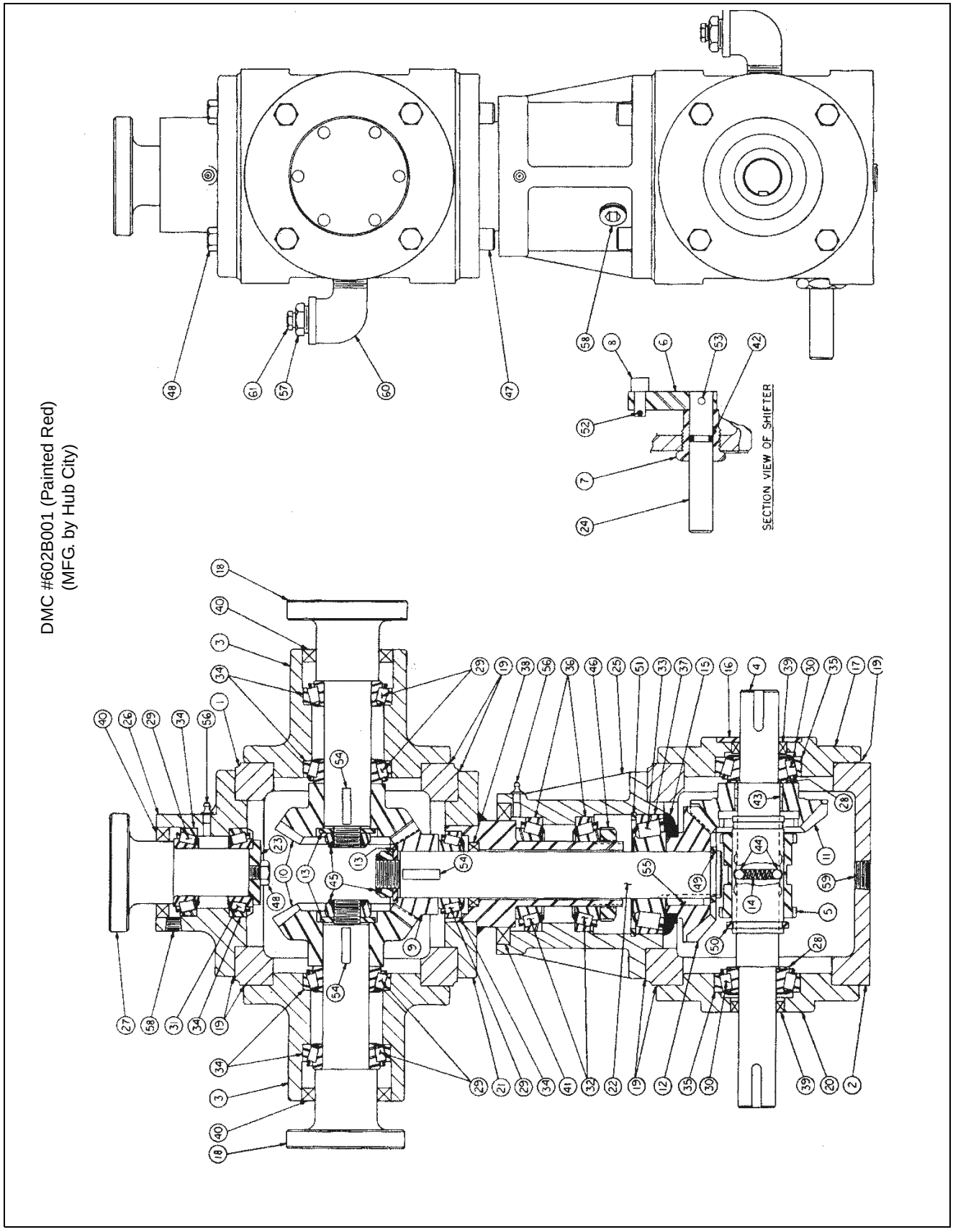


Grain Flow Optional Equipment Parts List

Ref #	Part #		Description	Qty
	6" Discharge	8" Discharge		
A	602D100	603D001	Gimbal Swivel Discharge Boot	10
A1	602D101	603D002	Gimbal Swivel Yoke	1
A2	6024152	6024153	Gimbal Swivel Boot w/ Slide Gate	1
A3	602D104	603D005	Gimbal Swivel Tube	1
A4	602D118	602D118	Nylon Cover	1
A5	602D119	602D119	Gimbal Swivel Square Washer	1
A6	PT0887	PT0887	Bronze Bushing, 1-1/4" I.D. x 1-1/2" O.D. x 1"	1
A8	3FH0578	3FH0578	External Retaining Ring, 5/8"	3
A9	GK3827	GK3827	Connecting Band	1
A10	6024153	6024153	Slide Gate	1
B	602D086	602D086	Straight Out Swivel Discharge Boot	1
B1	602D087	602D087	Straight Out Boot	1
B2	602D088	602D088	Straight Out Boot Mounting Plate	1
B3	602D089	602D089	Straight Out Boot Clean Out Cover	2
B4	PT0219	PT0219	Wood Bearing, 1-1/4"	1
B5	PT0424	PT0424	3 Hole Center Flange	2
B6	S-4198	S-4198	Wing Nut, 1/4"	4
B7	S-456	S-456	Hex Nut, 3/8"	3
B8	S-7391	S-7391	Carriage Bolt, 3/8" x 3/4"	3
B9	S-1054	S-1054	Lock Washer, 3/8"	3
B10	S-248	S-248	Flat Washer, 3/8"	4
B11	S-8320	S-8320	Flat Washer, 7/16"	4
B12	S-4663	S-4663	Lock Nut, 3/8"	4
B13	106B110	106B110	Bushing	4
C	602N231	602N010	8" Intermediate Well	1
C1	601B003	205C0002	8" x 2" Clamping Band	2
C2	601C0021	601C0021	Latch-Slide Gate Tube	1
C3	601C0052	601C0052	Compression Spring 0.420 x 1-1/4"	1
C4	602B031	603B003	Intermediate Well Weldment	1
C5	603B004	603B004	Intermediate Well Slide Gate	1
C6	603B009	603B009	Intermediate Well Cover	1
C7	6022039	603B012	Intermediate Slide Gate Tube	1
C8	S-5220	S-5220	Hex Lock Nut, 5/16"	3
C9	S-456	S-456	Hex Nut, 3/8"	4
C10	2FH0491	2FH0491	Hex Washer Head, Self-Tapping Screw (1/4" x 1-3/4", No. 3 Teks)	16
C11	2FH0650	2FH0650	Carriage Bolt, 5/16" x 2"	1
C12	S-7329	S-7329	Hex Bolt, 5/16" x 2"	2
C13	S-7767	S-7767	Hex Bolt, 3/8" x 1-1/4"	4
C14	S-1430	S-1430	Flat Washer, 1/4"	1
C15	MS0083	MS0084	Plastic End Cap, 1-1/4"	1

Dual Center Gearbox

DMC #602B001 (Painted Red)
(MFG. by Hub City)



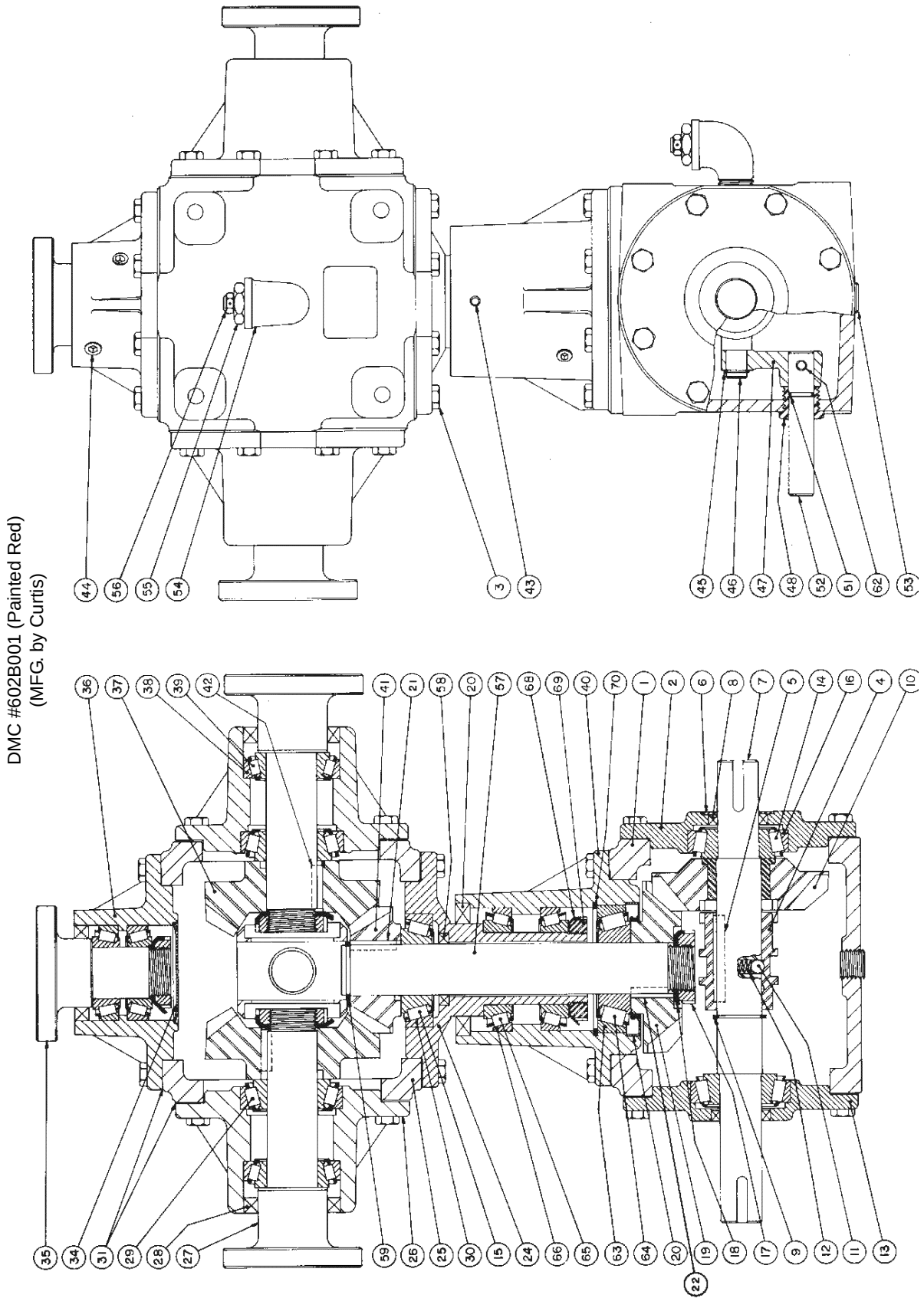
Dual Center Gearbox DMC #602B001 (Painted Red) - (MFG. by Hub City) Parts List

Ref #	Part #	Description	Qty
1	601B0051	Upper Gear Case	1
2	601B0052	Lower Gear Case	1
3	601B0055	Pinion Extension Housing	2
4	601B0059	Lower Horizontal Drive Shaft	1
5	601B0061	Sliding Clutch	1
6	601B0063	Shifting Arm	1
7	601B0064	Threaded Bushing	1
8	601B0066	Shifting Block	1
9	601B0077	Bevel Gear, 16T.	1
10	601B0078	Bevel Gear, 24T.	2
11	601B0079	Bevel Gear, 21T.	1
12	601B0080	Bevel Gear, 21T.	1
13	601B0082	Pinion Washer, 3/4" I.D. x 1-1/2" O.D. x 1/8"	3
14	601B0084	Spring, 0.240" x 0.038" x 1-1/8"	1
15	601B0085	Excluder-Inner	1
16	601B0086	Seal Protector	1
17	601B0087	Open End Cap (for Seal Protector)	1
18	601B0093	Upper Pinion Shaft	2
19	601B0114	Aluminum Shim, 0.003	A/R
19	601B0115	Aluminum Shim, 0.005	A/R
20	602B002	Open End Cap	1
21	602B003	Open Cap Weldment	1
22	602B004	Connecting Shaft	1
23	602B005	Pinion Washer	1
24	602B006	Shift Lever Connecting Shaft	1
25	602B007	Connecting Housing	1
26	602B008	Top Bearing Support	1
27	602B009	Top Bearing Shaft	1
28	PT0306	Thrust Race	2
29	PT0322	Tapered Bearing, 1-1/4"	6
30	PT0323	Tapered Bearing, 1"	2

Ref #	Part #	Description	Qty
31	PT0328	Tapered Bearing, 1-1/4"	1
32	PT0329	Tapered Bearing, 1-3/4"	2
33	PT0330	Tapered Bearing, 1-1/4"	1
34	PT0442	Tapered Bearing Cup	7
35	PT0443	Tapered Bearing Cup	2
36	PT0448	Tapered Bearing Cup	2
37	PT0449	Tapered Bearing Cup	1
38	PT0803	Oil Seal, 1989	1
39	PT0811	Oil Seal	2
40	PT0812	Oil Seal	3
41	PT0823	Oil Seal	1
42	PT0851	O-Ring	1
43	PT0885	Bronze Bushing	1
44	MS0025	Steel Ball, 1/4" Diameter	2
45	1FH0732	Hex Jam Nut, Self-Locking, 3/4" UNF	3
46	1FH0841	Shaft Lock Nut, 1-3/4"	1
47	2FH0446	Socket Head Cap Screw, 3/8" x 1"	8
48	S-7520	Hex Bolt, 3/8" x 1"	21
49	3FH0571	External Retaining Ring, 1-1/4"	1
50	3FH0576	Heavy External Retaining Ring, 1-3/8"	1
51	3FH0593	Internal Retaining Ring, 3-1/2"	1
52	3FH0701	Cotter Pin, 1-1/16" x 1/2"	1
53	3FH0890	Shear Proof Pin, 3/16" x 7/8"	1
54	S-8106	Woodruff Key, 1/4" x 1"	3
55	S-9168	Square Key, 1/4" x 1"	1
56	4FH0202	Grease Fitting, 3/16"	2
57	4FH0404	Pipe Bushing, 1/2" x 1/8" NPT	2
58	4FH0822	Socket Head Pipe Plug, 1/4" NPT	2
59	4FH0824	Socket Head Pipe Plug, 1/2" NPT	3
60	4FH0444	Street Elbow, 90°, 1/2" NPT	2
61	4FH0841	Fit-Plug, Pipe (Sq.) 1/8 Vented	2

Dual Center Gearbox (Continued)

DMC #602B001 (Painted Red)
(MFG. by Curtis)

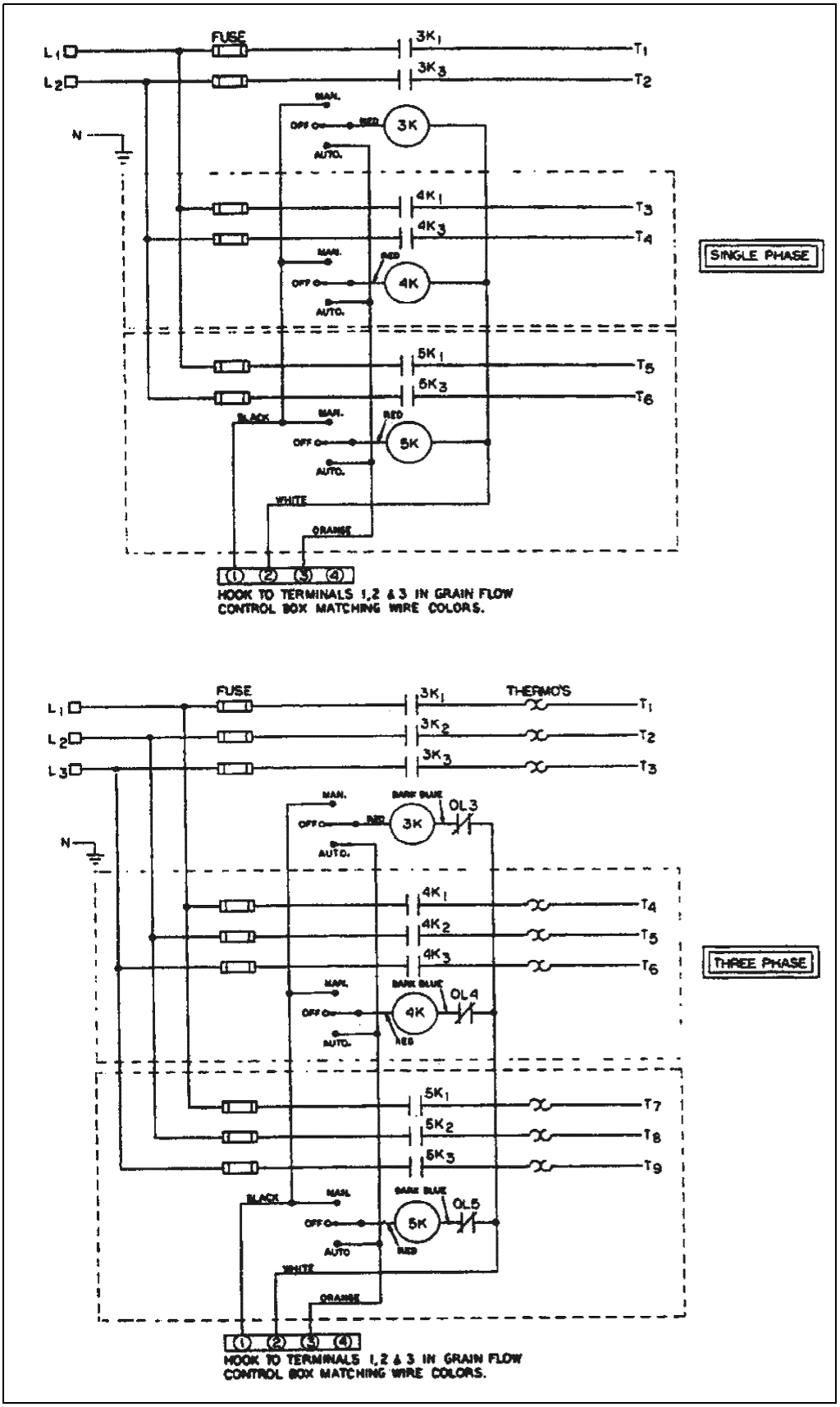


Dual Center Gearbox DMC #602B001 (Painted Red) - (MFG. By Curtis) Parts List

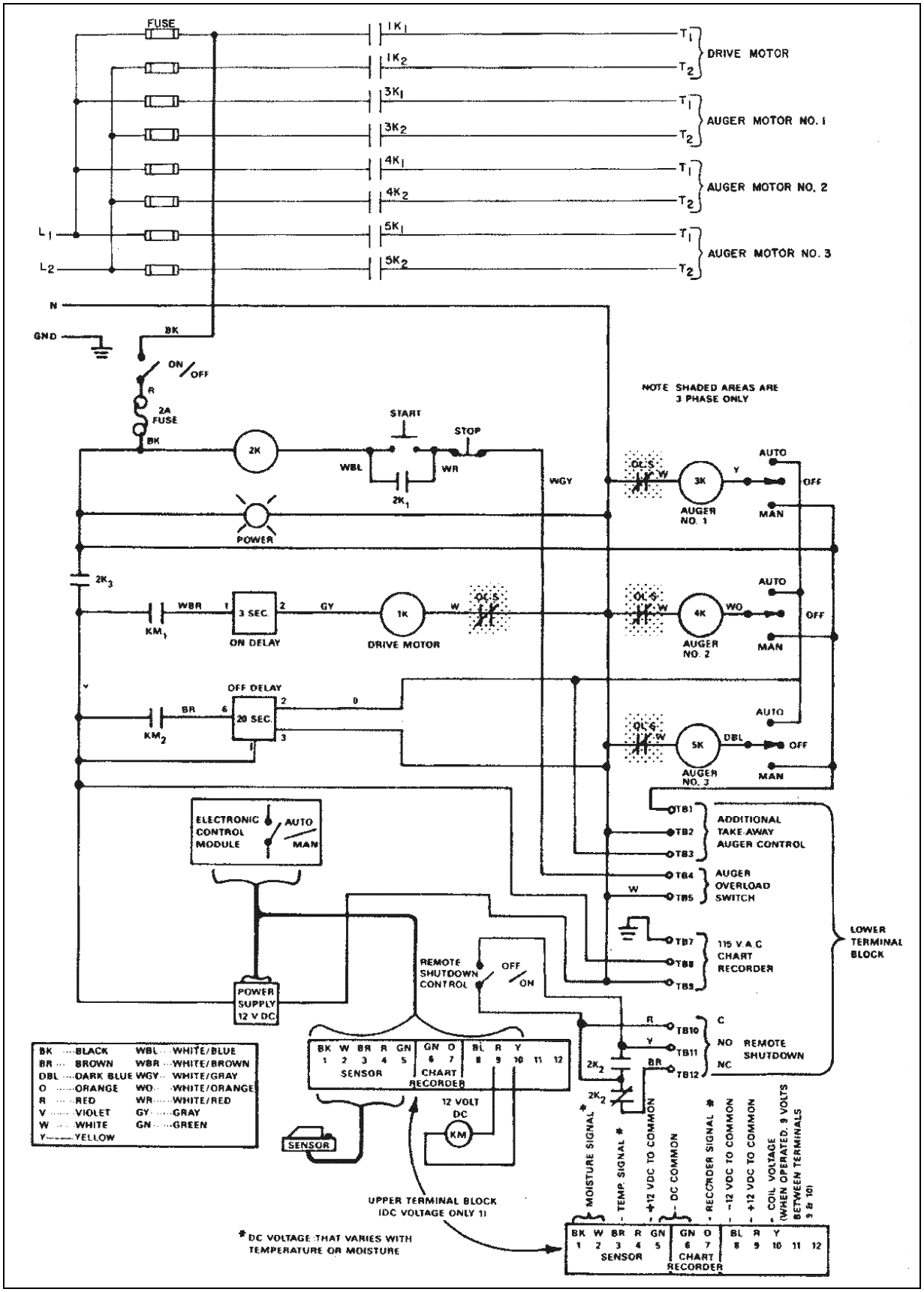
Ref #	Part #	Description	Qty
1	002659	Lower Housing	1
2	054189	Lower Cap (for Seal Protector)	1
3	410167	Sems Cap Screw, 5/16" x 1"	56
4	802777	Shifter Dog	1
5	601328	Key, 1/4" x 1/4" x 2"	1
6	413641	Seal Protector	1
7	217455	Lower Horizontal Drive Shaft	1
8	301317	Seal, (CR #9879)	2
9	620328	Retaining Ring (Ind. #3100-112)	1
10	882142	Gear, Sub Assembly 21T.	1
11	801498	Ball	2
12	802819	Spring	1
13	054171	Lower Cap	1
14	PT0327	Bearing Cone (#15101)	2
15	150185	Bearing Cone (#14124)	1
16	PT0447	Bearing Cup (#15245)	4
17	410225	Lock Nut (# N06)	4
18	S-8753	Lock Washer (#W06)	4
19	104919	Gear 21T.	1
20	301325	Seal (National # 472636V)	2
21	601310	Key, 1/4" x 1/4" x 1-1/8" Tapered	1
22	S-9172	Key, 1/4" x 1/4" x 7/8"	1
24	054205	Bottom Cap	1
25	000869	Upper Housing	1
26	054700	Upper End Housing	2
27	217489	Upper Pinion Shaft	2
28	301333	Seal, (CR #16817)	3
29	150151	Bearing Cone (#15126)	2
30	150177	Bearing Cup (#14276)	1
31	390021	Gasket (0.015 THK.)	A/R
31	390039	Gasket (0.005 THK.)	A/R
31	390195	Gasket (0.003 THK.)	A/R

Ref #	Part #	Description	Qty
34	640029	Soft Plug	1
35	217497	Top vertical Shaft	1
36	054213	Top End Housing	1
37	100818	Gear 30T.	2
38	PT0322	Bearing Cone (LM #67048)	4
39	PT0442	Bearing Cone (LM #67010)	4
40	054197	Connecting Housing	1
41	100826	Gear 20T.	1
42	3FH1027	Key, 1/4" x 1/4" x 1-1/8" Tapered	2
43	410290	Zerk, (Lincoln #5033)	1
44	410795	Pipe Plug - Solid (1/8"-27 Pipe Plug ZN)	3
45	3FH0560	Retaining Ring, (Tru-Arc #5100-50)	1
46	802785	Shifting Block	1
47	802793	Arm	1
48	413658	Shifter Pivot	1
51	650473	O-Ring (Circle #014)	1
52	217448	Shift Lever Connecting Shaft	1
53	410027	Pipe Plug - Solid (1/2"-14 Pipe)	3
54	411538	Street L	2
55	410654	Reducer Bushing (1/2-14-1/8-27)	2
56	410696	Relief Valve (Alemite #SW 47200)	2
57	217463	Connecting Shaft	1
58	301341	Seal (CR #12343)	1
59	620088	Retaining Ring, (Eaton #336-2)	1
62	S-6079	Roll Pin, 1/4" x 1"	1
63	153353	Bearing Cup (#332)	1
64	PT0330	Bearing Cone (#346)	1
65	PT0329	Bearing Cone (#12175)	2
66	150201	Bearing Cup (#12303)	2
68	413609	Lock Washer (#W08)	1
69	413617	Lock Nut (#N08)	1
70	620377	Retaining Ring (Tru-Arc #N500-315)	1

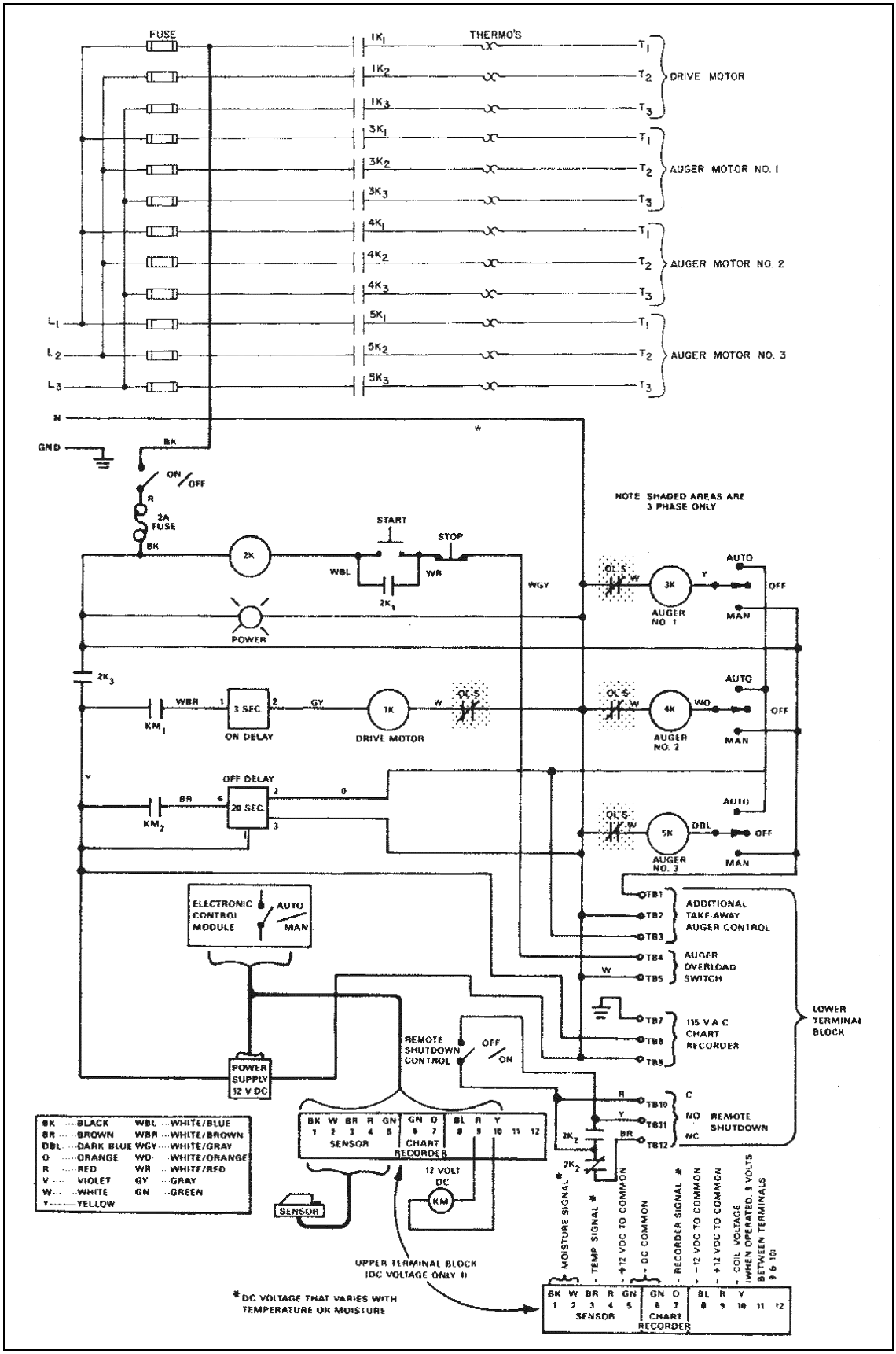
Take-away Auger Control Box Wiring Diagram



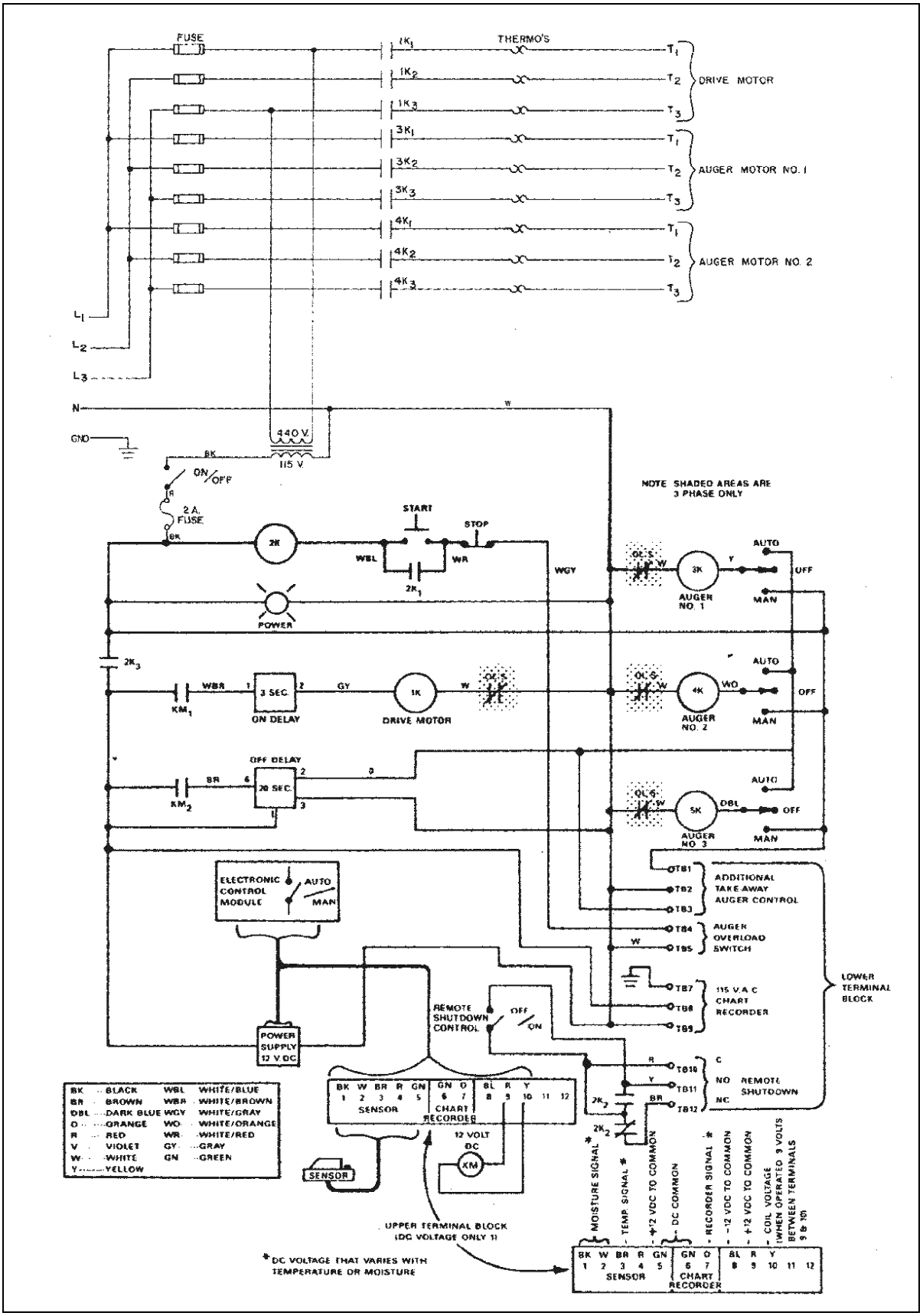
Calc-U-Dri Wiring Diagram 230V, 1 PH



Calc-U-Dri Wiring Diagram 230V, 3 PH



Calc-U-Dri Wiring Diagram 440V, 3 PH



Operation of the Remote Shut Down Switch Used with the Fan/Heater

1. The remote shut down switch was added to the front control panel of the Calc-U-Dri to provide the ability to bypass a shut down signal.
2. Switch the remote shut down switch to the “BYPASS” position to omit a shut down signal. This will allow equipment such as fan and/or burner to be started without the Grain Flow running.
3. Switch the “Remote Shut Down Switch” to the “ON” position to allow a shut down signal. For example, in the “ON” position the fan and/or burner will shut off when a level monitor signals the Grain Flow to turn OFF.

Electrical Hook-up of a 1 Fan and Burner to be Controlled by the Grain Flow Operation

1. Locate the remote shut down terminals #10 and #11 on the terminal strip at the bottom of the Grain Flow back panel. Connect these two (2) terminals in series with the fan and burner control circuit. *(See Figure 11A on Page 100.)*

Electrical Hook-up of up to 3 Fans and Burners to be Controlled by the Grain Flow Operation

1. An additional 2EL0273 relay is required to complete this hook-up.
2. Connect a jumper wire between terminals #2 and #10 on the terminal strip at the bottom of the Grain Flow back panel.
3. Connect terminal #1 to coil terminal A on the relay (2EL0273). Connect coil terminal B to terminal #11 on the terminal strip.
4. Connect relay terminals #4 and #7, #5 and #8, and #6 and #9 in series with each of the fan and burner control circuits. *(See Figure 11B on Page 101.)*

Electrical Hook-up of a Level Monitor to a Grain Flow

1. Locate the auger overload switch terminals #4 and #5 on the terminal strip at the bottom of the Grain Flow back panel. Connect the level monitor in series with the auger overload by removing the auger overload wire from terminal #5. Use a wire nut to connect the wire from the auger overload switch to the wire attached to the “NO” terminal in the level monitor. Attach one end of another wire to the “C” terminal in the level monitor and the other end to terminal #5 in the Grain Flow. Other shut down equipment used to control the Grain Flow should be wired in series with this circuit in a similar way. *(See Figure 11C on Page 102.)*

Electrical Hook-up of a Trans-fer System to be Controlled by the Grain Flow Operation

1. Locate the auger overload switch terminals #4 and #5 on the back panel of the Grain Flow and the remote shut down terminals #3 and #4 on the back panel of the trans-fer control box. Connect the remote shut down terminals #3 and #4 in series with the auger overload terminals #4 and #5.
2. Locate a magnetic contactor that is not being used in the Grain Flow box. Remove the wires connecting this contactor with the fuse block.
3. Locate automatic control terminals #1 and #2 on the back panel of the trans-fer box. Connect these two (2) terminals to each side of the magnetic contactor in the Grain Flow box. *(See Figure 11D on Page 103.)*

Electrical Hook-up: Level Monitor to Control the Stir-Ator above a Grain Flow

You must have an unused contactor in the Grain Flow control box to use as a power source for the Stir-Ator.

1. Connect the power wires from the Stir-Ator switch box to the unused contactor on the far right.
2. Remove the orange wire from the bottom of the third take-away auger switch and insulate. From this switch terminal run a wire to the “C” on the level monitor. Put a jumper from the N.O. to L1 on the terminal strip in the level monitor. *(See Figure 11E on Page 104.)*
   OPERATION: When the third toggle switch is in “AUTOMATIC” position, the Stir-Ator will run when the grain is covering the Level Monitor Proximity switch. The Stir-Ator will be OFF when the grain is lower than the level monitor. When the third switch is in “MANUAL” position, the Stir-Ator will run continuously. In the “OFF” position, the Stir-Ator will not run.

Electrical Hook-up for Grain Flow Remote Shut Down for the Fan and Burner

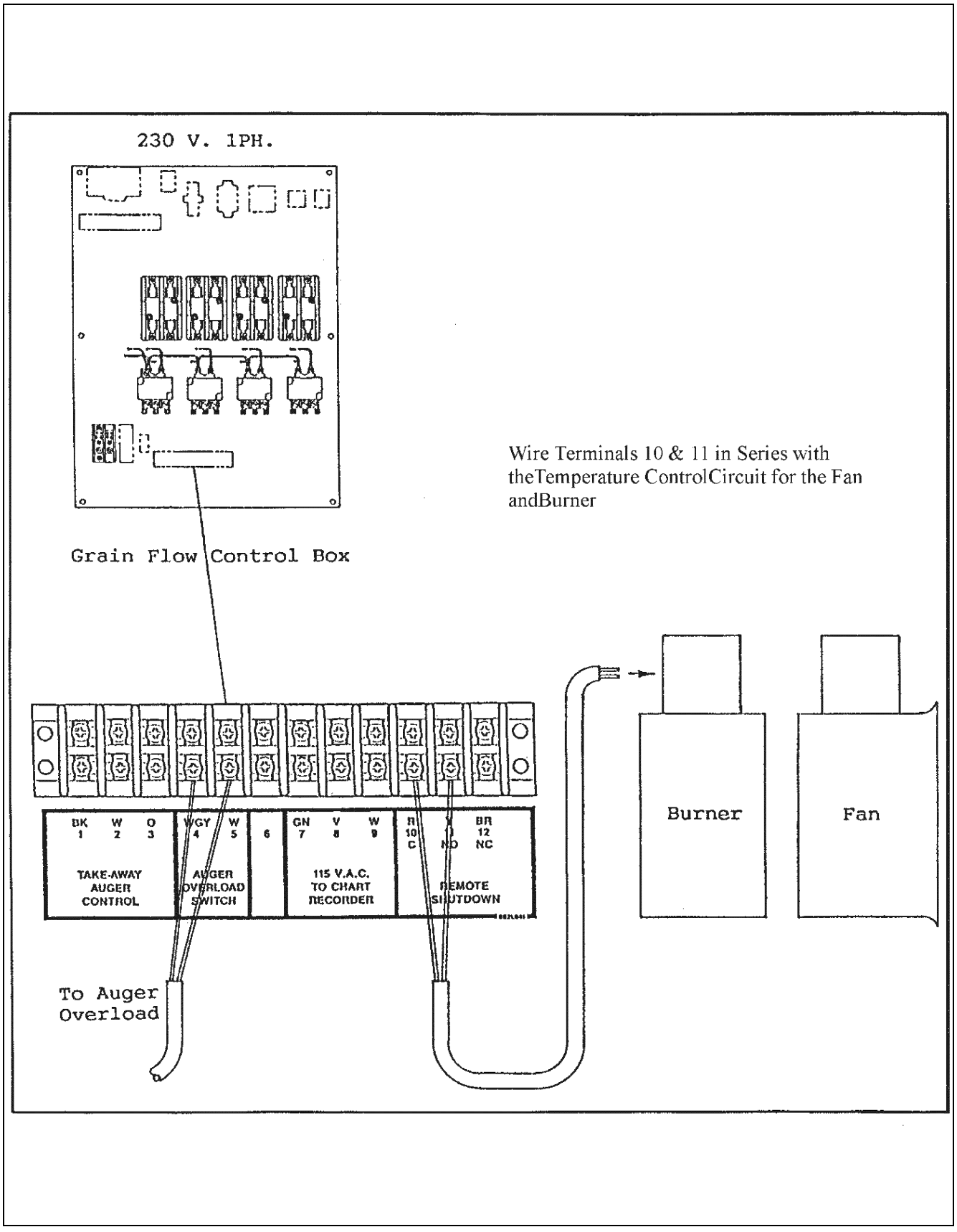


Figure 11A

Electrical Hook-up for Grain Flow Remote Shut Down for up to 3 Fans and Burners

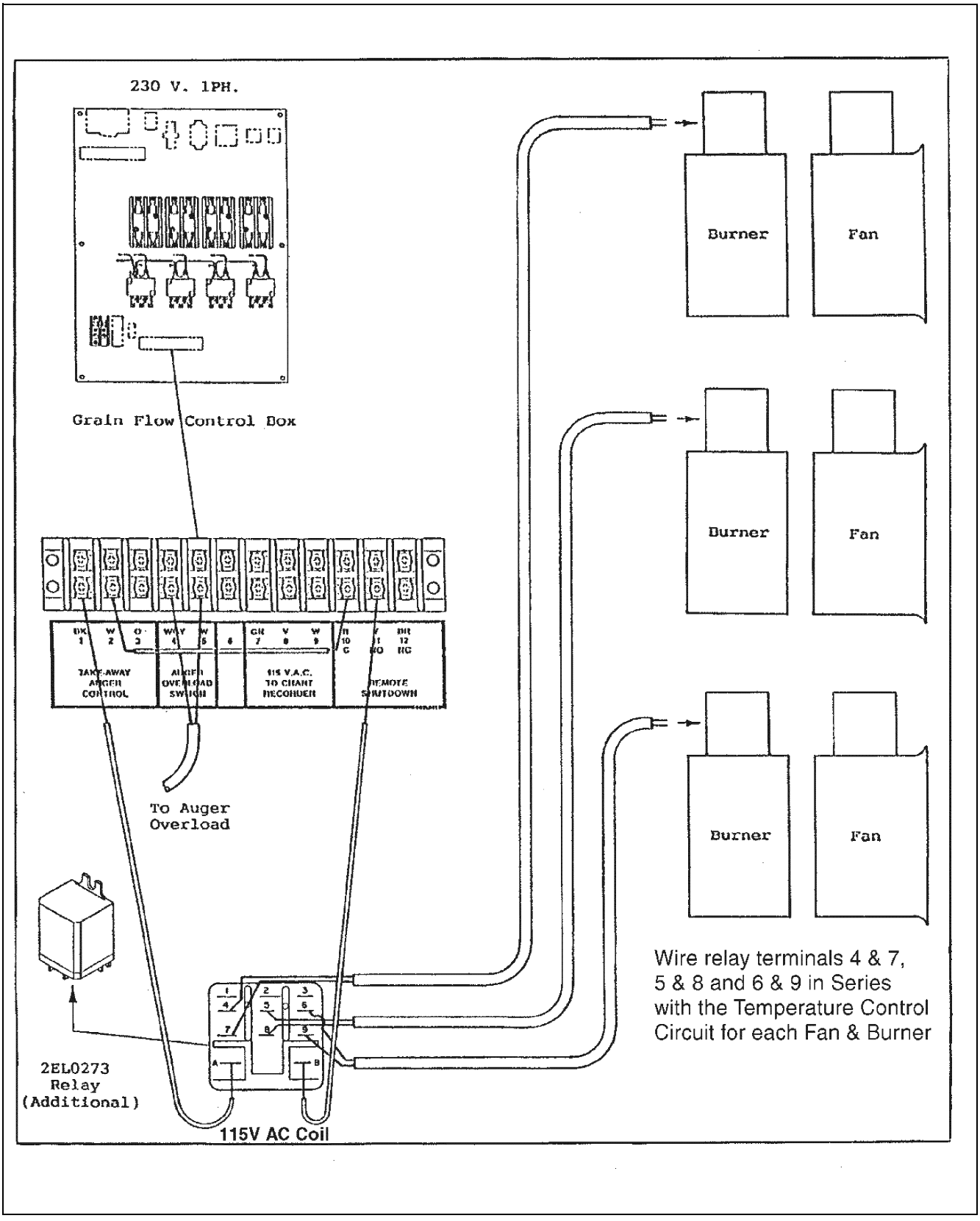


Figure 11B

Electrical Hook-up for Level Monitor to Grain Flow

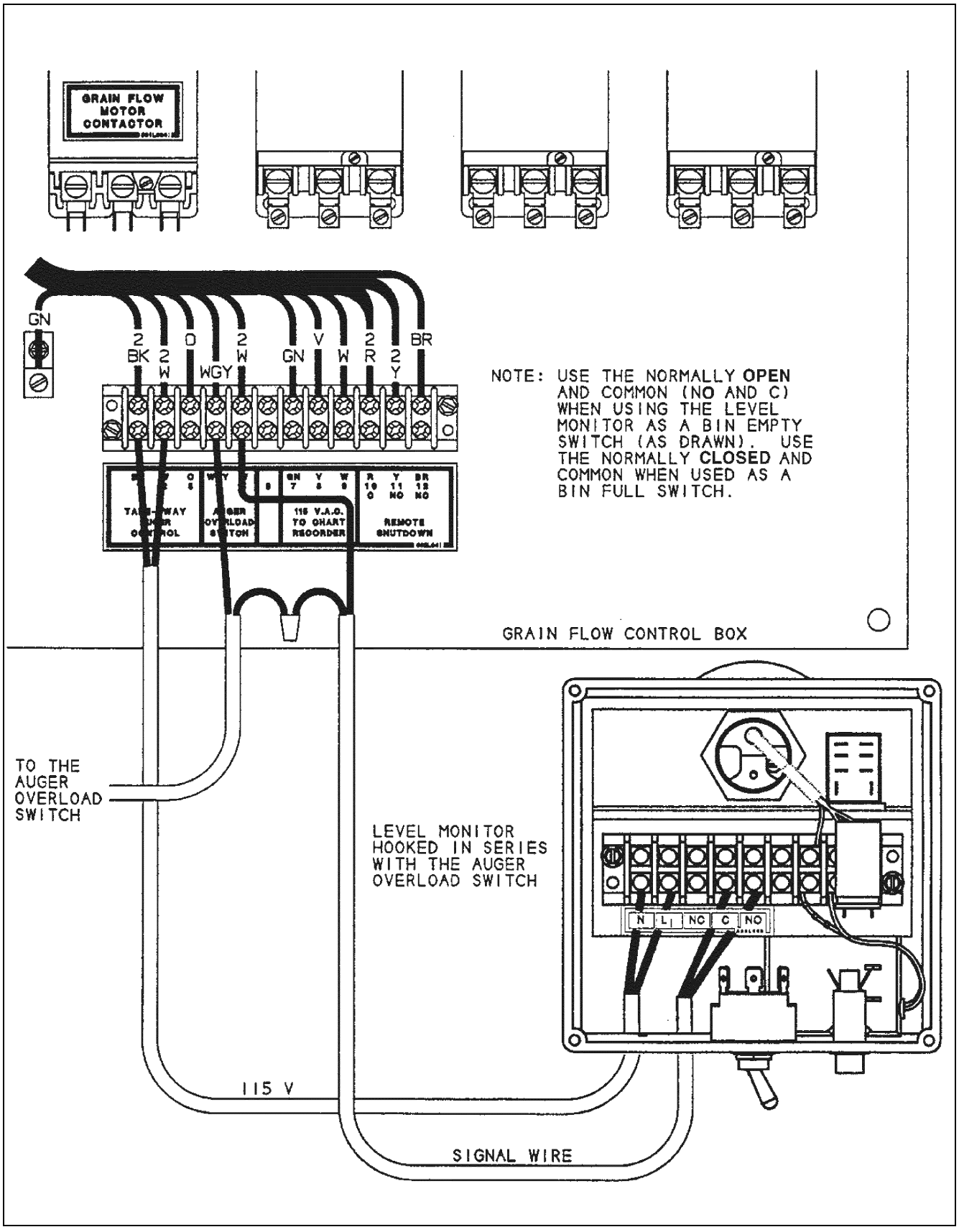


Figure 11C

Electrical Hook-up for a Trans-fer to a Grain Flow

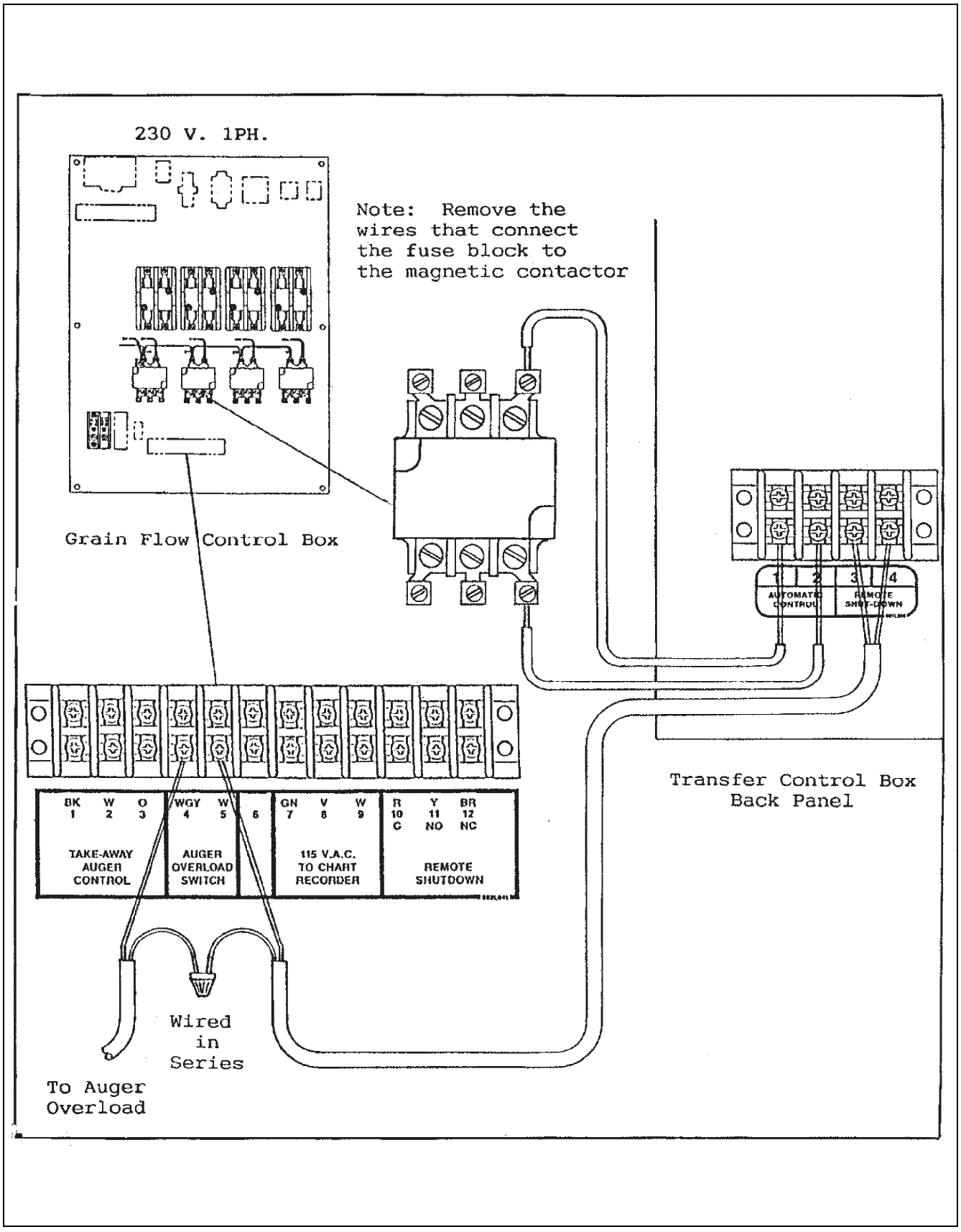


Figure 11D

Electrical Hook-up for Level Monitor and a Stir-Ator above a Grain Flow

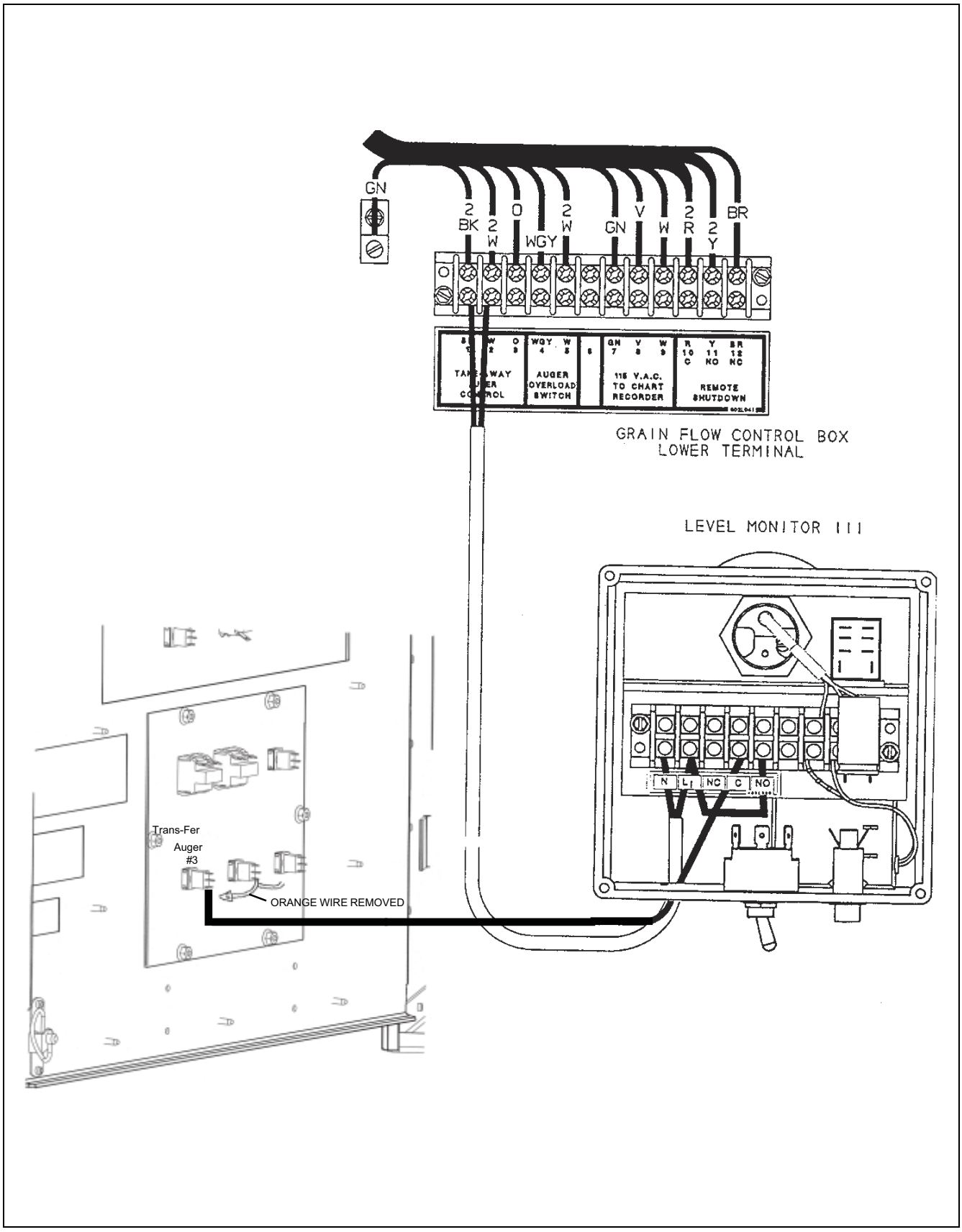


Figure 11E

A. Inspect the center gearbox each drying season to make sure that the hood and top gearbox will rotate freely.

B. Remove the hood and the inspection plate in the sump to check to level of lubricant in both the TOP and BOTTOM GEARBOXES. Fill with 90 weight gear lube to the lubricant level up to the inspection hole. Grease the top and center zerks.

C. Grease the bearings located behind the drive pulleys of the discharge and vertical augers. Do not over grease or the bearing seals could be damaged.

D. Inspect the sensor flag located in the discharge tube for wear, being bent, or other damage.

E. Shift the floor augers in and out of gear to see if linkage functions correctly.

F. Clean the drying floor, removing any “fines” that can impede air flow.

G. Check the floor auger wear plates to make sure they are not loose and are in good condition.

H. Inspect the floor augers for wear and damage.

I. Inspect all drive belts on the Grain Flow and take-away augering equipment.

J. Check and clean the auger overload switch to make sure that it is adjusted correctly.

K. Inspect control box for loose or worn wires. Rodents sometimes chew electrical components and ruin them. Disengage floor augers, turn power ON, and operate all motors.

Be careful not to have hands or clothing where entanglement is possible.

L. Check all optional equipment installed in the bin (such as Level Monitor, Stir-Ator, and Amp-Alarm) to be sure all are functioning properly.

If removal of the circuit board is necessary, follow these steps:

1. Disconnect AC power to the control box.
2. Carefully pull the circuit board straight out of the guides. This sometimes requires a little extra force. DO NOT use a pliers or other tool to pull or pry this circuit board.
3. If the circuit board is to be replaced, return it in the packaging you received the replacement circuit board in.
4. Set the dip switches for application. Refer *Page 112*.
5. Install the circuit board with the component side away from the door. Slide into guides and push firmly until it is seated in the circuit board jack.
6. Make sure that the board is completely seated. Only 1/8" of the gold card connector should be seen.
7. Apply power to unit and start. If digital panel is blank, it is possible the circuit board is not seated properly. Disconnect power and repeat *Step 4*.

   NOTE: *Never unplug or plug in the circuit board with power ON.*

CAUTION

If an electronic component fails, which prevents the Calc-U-Dri from being run in manual, such as the power supply or control board, the unit has an emergency shorting relay. To use the emergency short relay, read the following steps:

1. ***Disconnect all power to the control box.***
2. ***Pull out the small 12 VDC relay with the clear cover (2EL0274) from its socket. It is found at top center on the control box back panel.***
3. ***Replace it with the small relay plug found in the upper right of the back panel with this plug installed.***
4. ***MANUAL unloading is controlled by the START and STOP buttons only.***
5. ***Remove the shorting relay plug once the components are replaced and install the regular relay to resume normal operations.***

A Grain Flow drying bin equipped with an optional Stir-Ator will increase the drying capacity as grain depths increase. DO NOT exceed 16' of depth. The ends of the stirring augers should be 30" above the floor to avoid disturbing the drying zone.

BE SURE TO RE-WELD BOTTOM FLIGHTING OF STIR-ATOR AUGER AFTER CUTTING OFF.

Constant stirring above the drying zone loosens the grain and allows more air to move through the grain mass, which increases the drying rate. It also allows more grain to be put into the drying bin without fear of bridging or spoiling. With stirring, no side wall stiffeners are required for the drying bin. The number of down augers on the stirring equipment varies with the size of the drying bin. Single auger machines for up to 27' diameter bins, double auger units for 27' to 33' diameter bins and triple auger units for 36' diameter bins are recommended.

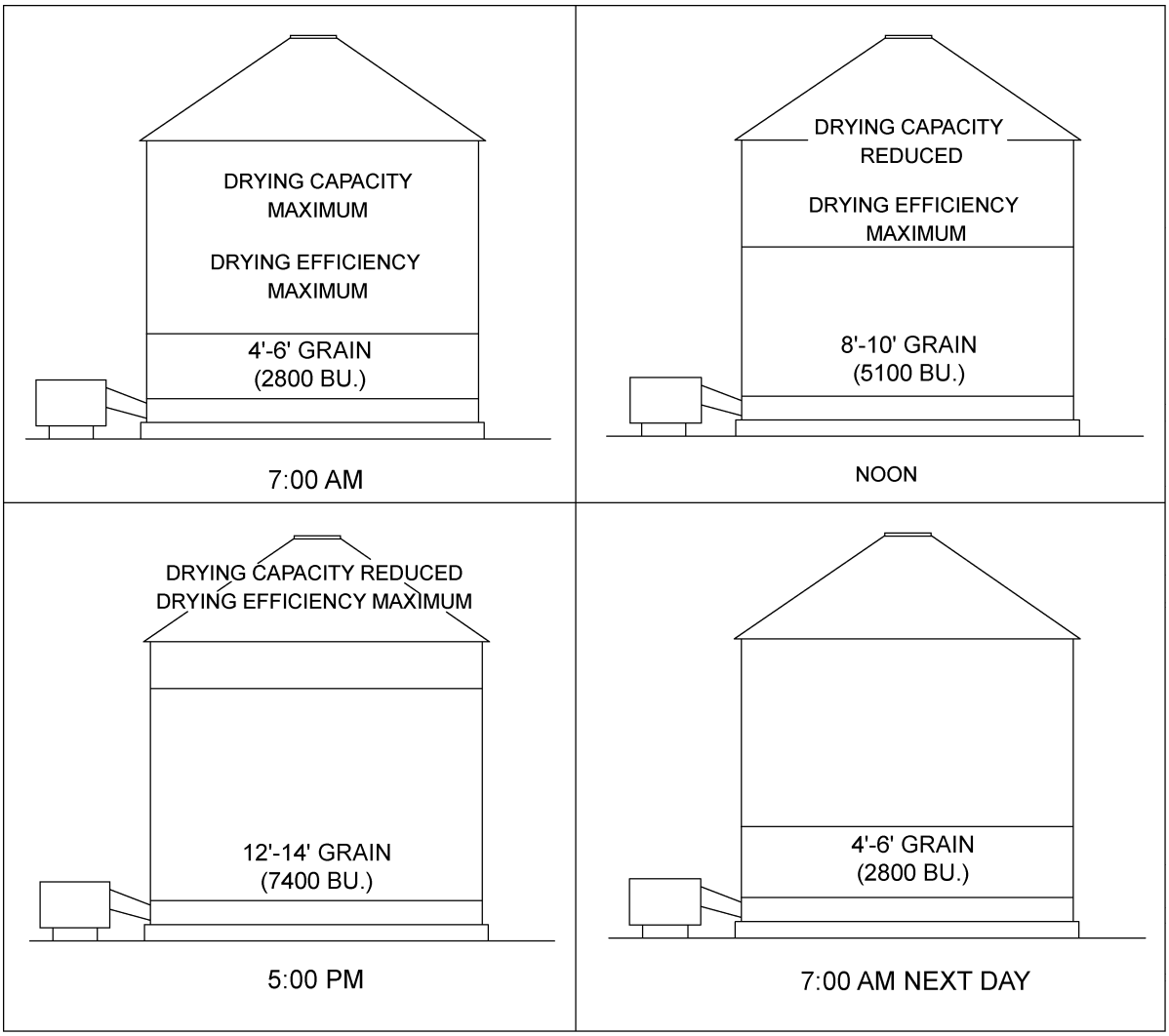
Grain level monitors are available that will automatically start and stop the stirring equipment at the desired grain depth. When drying shelled corn, 5' depth is usually when stirring should be started and continued until the grain depth is below 5'. However, this depth may differ for other grains.

In an emergency, stirring equipment above a Grain Flow allows the grain in the drying bin to be stir-dried if the Grain Flow becomes inoperative and also provides a useful tool to keep the grain in condition during storage. *(See Figure 14A on Page 108.)*

Why Stirring is Part of the Continuous In-Bin System

- Wet holding, drying and storage in one bin.
- Eliminates need for wall stiffeners.
- Stir-dry last fill for storage without spoilage.
- Mechanical problems with Grain Flow. (Stir-dry and transfer dry grain.)
- Realities of harvesting. *(See Figure 14A on Page 108.)*
- Maximum drying efficiency.

30' Bin equipped with 2-20 HP. Centrifugal fans drying 24 hours a day 300 BPH rate combining 10 hours a day 720 BPH rate.



Recommended Stir-Ator for Grain Flow systems.
24' - Design III S.A.
30' - Design III D.A.
36' - Design III T.A.
42' - Design III T.A.

Figure 14A

Calc-U-Dri Troubleshooting

NOTE:

1. *Extreme caution must be used when troubleshooting problems. Have a qualified electrician do all electrical troubleshooting.*
2. *Never unplug or plug in the circuit board with power ON. See service instructions on Page 106.*
3. *Do not make field adjustments on the circuit board. This is a factory adjustment only.*
4. *Contact the dealer or DMC if you have any questions on the operation or service of the Calc-U-Dri.*

Problem	Probable Cause	Solution
Contactors operate motor(s) does not run.	1. One line has an open fuse. 2. Motor overload tripped (on the motor).	1. Replace the bad fuse. 2. Reset thermal overload.
Motor hums and will not start.	1. One fuse is open. (3 Phase only.) 2. Augers stuck.	1. Replace fuse. 2. Break loose by following start-up procedures.
Grain Flow motor operating but no grain is coming out.	1. Floor augers not turning. 2. Belts slipping. 3. Pulley not secured to the auger shaft. 4. Chain coupling unhooked. 5. Gearbox trouble.	1. Floor augers not in gear. 2. Adjust tension. 3. Pin sheared or key sheared. 4. Repair. 5. Replace gearbox.
Take-away augers fail to start.	1. Control switch “OFF”. 2. Loss of AC power. 3. Thermal overload tripped. 4. If contactors do not operate in auto.	1. Switch to AUTO or MANUAL. 2. Replace fuse. 3. Reset overload. 4. Replace off delay module.
Take-away augers fail to stop.	1. Auger control switch in MANUAL position. 2. If in AUTO position, the off-delay module is bad.	1. Switch to AUTO. 2. Replace the off-delay module.
Blowing motor fuses.	1. Fuse is not sized correctly. 2. Motor overload. 3. Loose connections. 4. Low voltage. 5. High voltage.	1. Replace with correct size. 2. Clear the overload. 3. Tighten loose screws and wire connections. 4. Power company must correct or the wire size too small. 5. Power company must correct.

Calc-U-Dri Troubleshooting (Continued)

Problem	Probable Cause	Solution
Grain is not pulling down level.	1. Heat and air mix is poor. 2. If the center is low, the slide gate or hood are probably causes. 3. If the grain is V'ed, the floor augers are not traveling around the bin.	1. Have heat and air mix corrected by fan manufacturer. 2. Slide gate not closed or hood not installed correctly. 3. Remove the obstruction(s).
Digital readout dead. No power indicator.	1. Main AC power not ON. 2. Main fuse(s) blown. 3. Control fuse (2 amp).	1. Turn ON. 2. Replace fuse(s). 3. Replace.
Unit will not run in MANUAL or AUTO. Power indicator ON. Digital panel meter not lit. Take-away auger runs in manual.	1. Circuit board not plugged in. 2. Bad circuit board. 3. Power supply not working. 4. Auger overload switch.	1. Push in. 2. Replace circuit board. 3. Put in a new power supply. 4. Auger overload door held open or out of adjustment.
Will not work in AUTO or MANUAL. Digital display is working, normal readings. Take-away auger will run in manual.	1. Small ice cube relay not plugged in. 2. Small ice cube relay not operating. 3. Circuit board trouble or poor connection. 4. "On delay" module defective.	1. Push relay in. 2. Bad relay - replace. 3. A) Reseat circuit board. B) Replace circuit board. 4. Replace the "on delay" module.
Digital read-out is not lit but unit will work in automatic and manual.	1. Digital panel meter (DPM) is bad. 2. Open wire feeding the digital panel meter. 3. Circuit board trouble.	1. Replace the DPM. 2. Repair. 3. Replace circuit board.
Will not auger out grain in automatic, but manual works ok.	1. Circuit board trouble.	1. Replace circuit board.
Never stops augering out grain.	1. Switch is in MANUAL mode. 2. Moisture set point too high. 3. Circuit board trouble.	1. Switch to automatic. 2. Adjust moisture set point. 3. Replace circuit board.
Moisture readings are very high - grain checks dry.	1. Moisture on sensor blade. 2. Foreign object jammed on sensor. 3. Water in circuit board jack. 4. Calibration set too high. 5. Sensor not grounded to the tube. 6. Bad circuit board. 7. Bad sensor.	1. Dry off the sensor. 2. Remove. 3. Dry off. 4. Adjust. 5. Secure ground strap. 6. Replace circuit board. 7. Replace sensor.
Moisture readings are high and do not change, temperature readings are high negative.	1. Sensor leads are broken or not hooked to the terminal. 2. Sensor trouble.	1. Tighten terminal screws. Wire insulations should not be under terminal screw. 2. Replace sensor.

Calc-U-Dri Troubleshooting (Continued)

Problem	Probable Cause	Solution
High moisture and temperature readings.	1. Digital panel meter (to test - adjust moisture set point to minimum - meter = 000).	1. Replace if DPM does not read 00.0.
Moisture readings are intermittently high then low.	1. Check for the sensor ground strap not hooked up. 2. Sensor cable leads broken. 3. Loose terminal leads where sensor is hooked.	1. Hook-up strap. 2. Replace sensor. 3. Tighten screws.
Moisture readings are consistently high or low.	1. Correct by calibration adjustment, refer to control box definitions.	1. Adjust.
Blowing control fuses.	1. Check for loose or shorted leads. 2. Any component that is bad can cause this-check by isolating.	1. Isolate and correct. 2. Replace bad component. one component at a time.
Grain temperature reading does not follow the corn temperature.	1. Bad temperature sensor. 2. Circuit board trouble.	1. Replace sensor. 2. Replace the control board.
Sample light stays ON but the unit does not auger out grain in automatic.	1. Dip switches 1, 2 and 3 are all “open”, OR 2. Dip switches 1, 2 and 3 are all “ON.”	1. Reference correct dip switch setting on *Page 118*.
No grain samples are taken by the unit.	1. Dip switches on control card are set wrong.	1. Reference correct dip are set switch setting on *Page 118*.
Grain samples are early or late.	1. Dip switches on control card are set wrong.	1. Reference correct dip switch setting on *Page 118*.
In the drying cycle the moisture changes.	1. Dip switches 9 or 10 set wrong.	1. Reference correct dip switch setting on *Page 118*.

CALC-U-DRI
OWNER'S MANUAL

Supplement For:

NECO - Super Flow
Commercial Flow
Circu-Flow

Shivvers- Dri-Flow I & II
Circulator I & II
Stir-A-Matic Super

Introduction

The new Calc-U-Dri control box turns the bin into the most accurate, efficient, profitable continuous-flow drying system available.

Before operating the Calc-U-Dri and other equipment, familiarize yourself with both the mechanical and electrical aspects of the unit by carefully reading the owner's manuals.

Installation of the mechanical unit will follow as prescribed in the manual for that unit. This DMC Grain Flow supplement will be used for installation of the control box and sensor. Read the main DMC Grain Flow owner's manual for cautions and safe operating procedures. The Calc-U-Dri start-up instructions begin on *Page 58*, followed by operating suggestions, box definitions and parts breakdown.

Calc-U-Dri Standard Control Box and Sensor Installation Instructions

Sensor cut-out for 6" and 8" horizontal or vertical units other than DMC Grain Flows.

1. Look at the discharge tube and determine where the sensor can be best located. *(See Figure 16B.)* There must be at least 8" of flighting left on the discharge auger after the sensor to move the grain away. On center vertical unloading systems, the sensor is mounted near the top but NOT directly below the attaching incline auger. Use the same dimensions as described for the horizontal. *(See Figure 16A and Figure 16B.)*

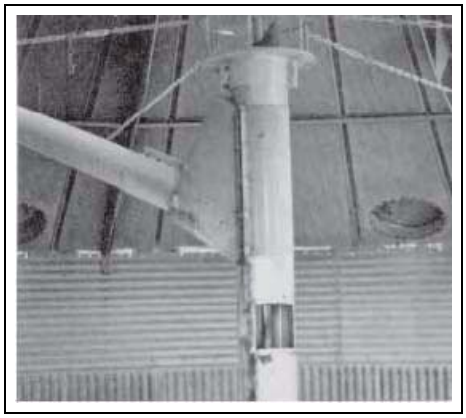


Figure 16A

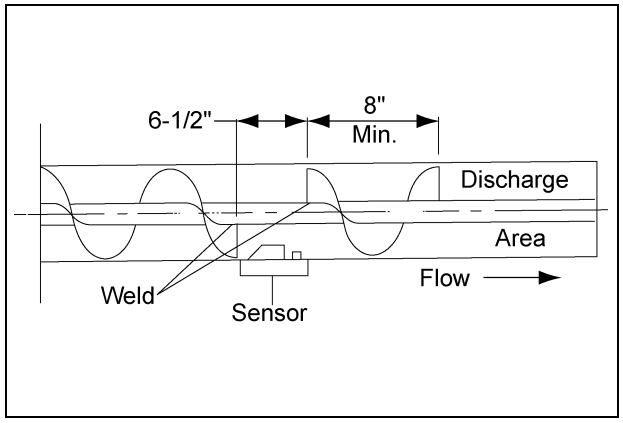


Figure 16B

NOTE: *If the unit has a connecting band, determine if it can be removed and replaced with a 12" long connecting band provided. If it is a structural support connecting band, additional support during removal of the connecting band may be needed.*

2. After positioning the sensor connecting band properly on the discharge tube, mark the outline of the rectangular hole and the edges of the band on the discharge auger tube. Cut a hole in the discharge tube 6-1/2" long so the outline of the rectangular hole is removed (stay inside the total overall length marks of the band). Cut up the one side of the discharge tube about 1/3 of the way around the tube. This extra room is for ease of removing flighting in the next step.
3. Weld the discharge auger flighting to the shaft at each end of the 6-1/2" opening as shown in *Figure 16B*. After the flight is welded at these points, cut-out 6-1/2" of the flighting from the discharge auger.

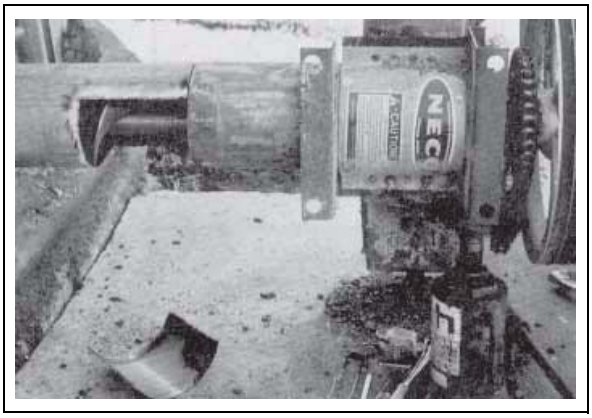


Figure 16C

4. Smooth out all of the rough edges from the cut area and position the sensor hole centered over the 6-1/2" area, tighten the connecting band.

Calc-U-Dri Standard Control Box and Sensor Installation Instructions (Continued)

5. Locate the Calc-U-Dri control box near the unit's main control box, discharge auger, and sampler so that it is easily accessible and convenient height for you to observe and use. Mount the control box to the bin wall, using four (4) 5/16" x 1-1/2" bolts, lock washers, and nuts. *(See Figure 16D.)*

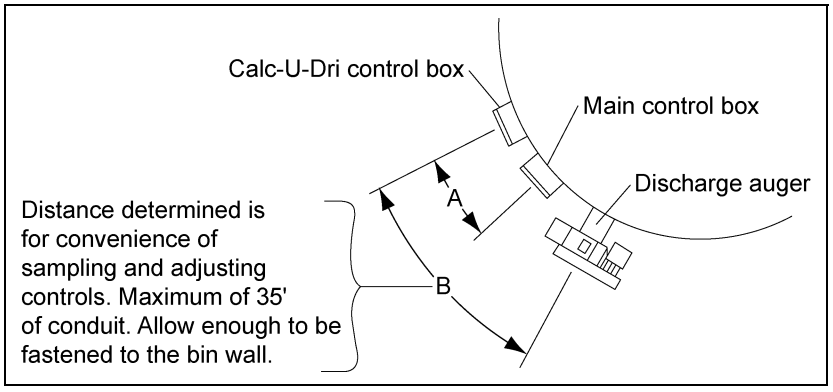


Figure 16D

NOTE: *The discharge auger flighting was cut-out to provide clearance for the sensor. Before the actual installation of the sensor, check very thoroughly through the slot in the discharge tube to see that the cut-out flighting on the discharge auger is positioned so it is centered with the slot in the discharge auger tube and will not catch the sensor. To check this, insert the clearance gauge provided into the sensor slot as shown in Figure 16E.*

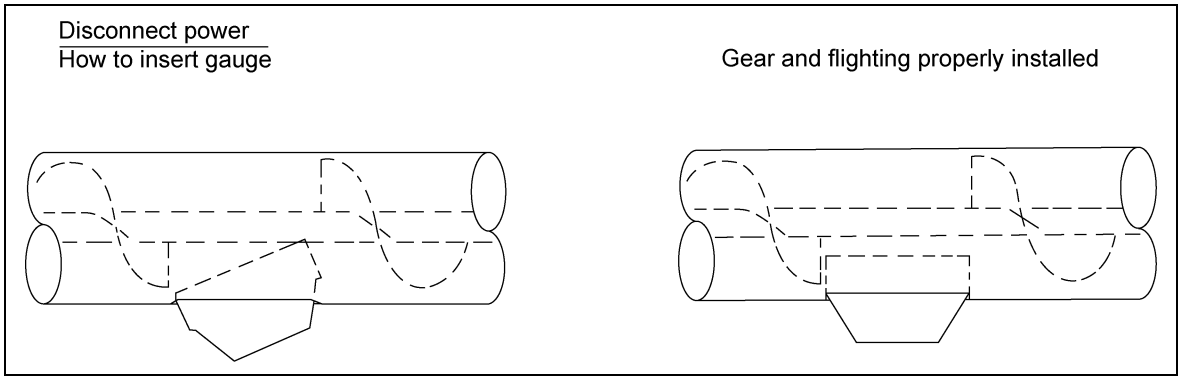


Figure 16E

CAUTION

Slowly rotate the discharge auger by hand one complete revolution. The flighting must miss the gauge completely. If it does not, correct it by going back and redoing the cut-out procedures.

Center Vertical Auger Units, Continue to *Step 6* **and**
Horizontal Discharge Auger Units, go to *Step 13 on Page 116*.

6. Because of the extra distance to the Calc-U-Dri sensor, a 4 x 4 junction box is provided for the Calc-U-Dri sensor wire to be spliced in. Determine the shortest distance from the sensor to the control box. The Calc-U-Dri sensor wire will be attached to the vertical support chains to get to the outside of the bin. Measure 27' of 1/2" liquid tite conduit, feed the sensor wire through the conduit and attach the conduit to the Calc-U-Dri sensor using the connector provided. The sensor wire should be 6" longer than the conduit.

Calc-U-Dri Standard Control Box and Sensor Installation Instructions (Continued)

7. Mount the Calc-U-Dri sensor in the vertical tube, secure it with the two (2) clamping straps, excess clamp material can be cut off. The flow of grain must follow the arrows on the sensor decal. Be sure the sensor block seats fully into the opening of the tube, the 90° conduit connector will be pointed down. Bend the conduit in a tight loop (do not kink it) of about 5" diameter. Secure it to the discharge tube with a nylon cable clamp and screw in the area where the flighting is cut-out. Also, secure the drip loop, below the sensor, to the vertical tube with a clamp strap. *(See Figure 16F and Figure 16G.)* Fasten the grounding strap from the Calc-U-Dri sensor to the discharge tube with a self-tapping screw through the connector on the ground strap and into the tube where the flighting has been removed. Leave at least 2" between the sensor block and the ground screw.

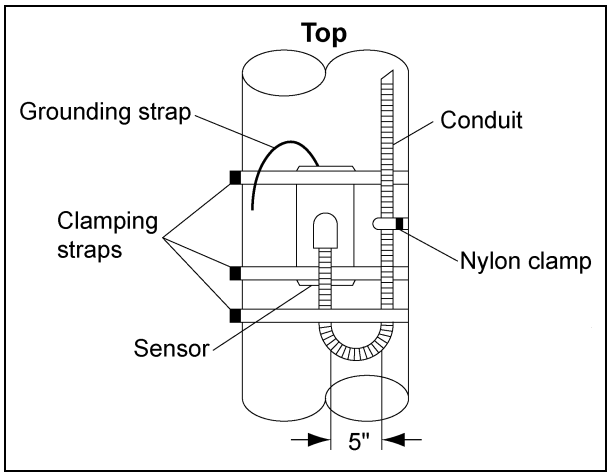


Figure 16F

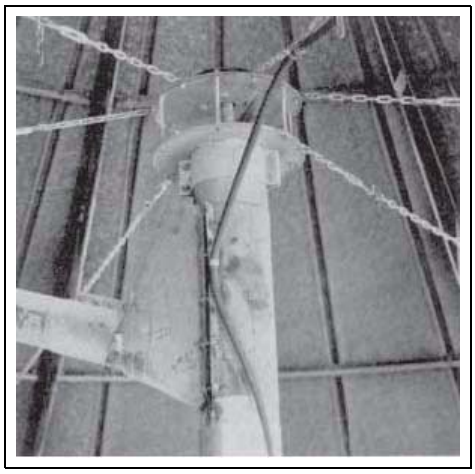


Figure 16G

8. Continue to run the conduit up the vertical discharge auger. Attach it to the flange of the incline boot with a nylon cable clamp about 1' below the distributing head. (Be sure the screw does not enter an area of the vertical auger where flighting will catch it.)

9. Attach the liquid tite conduit to a vertical auger support chain, which goes to the bin wall closest to the control box, with metal conduit hangers every 2'. (Be sure it clears the rotary distributing head.) Run the Calc-U-Dri sensor wire and conduit out of the bin and down the sidewall.

10. Attach the 4 x 4 junction box on the bin sidewall as low as possible with the two (2) self-drilling screws so both liquid tite conduit lines can be attached on the bottom of the box. *(See Figure 16H.)* Be sure to leave a drip loop in the conduit. Attach the liquid tite conduit to the junction box with a connector. Secure the liquid tite conduit to the bin wall with the nylon clamps and #10 screws.

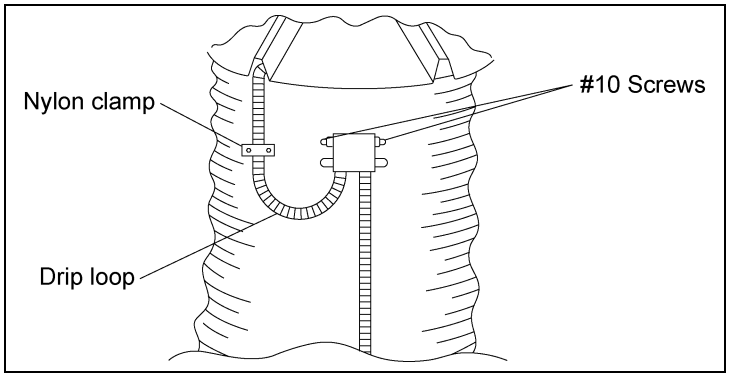


Figure 16H

Calc-U-Dri Standard Control Box and Sensor Installation Instructions (Continued)

11. Measure and cut the 1/2" conduit needed to reach from the 4 x 4 junction box to the Calc-U-Dri control box, leaving enough for a drip loop under the box. Cut the five-strand sensor wire about 3' LONGER than the conduit. Feed the sensor wire through the conduit and connect the liquid tite to the two (2) boxes using the connectors provided.

12. Connect the Calc-U-Dri sensor wires in the 4 x 4 junction box to the top of the terminal strip. The leads from the sensor flag go to the top of the terminal block. BE CAREFUL to match the color coded wires to each other, red to red, etc. *(See Figure 16I.)* Then attach the junction box lid. This completes the Calc-U-Dri sensor mounting for units with vertical discharge auger tubes. Go to *Step 14*.

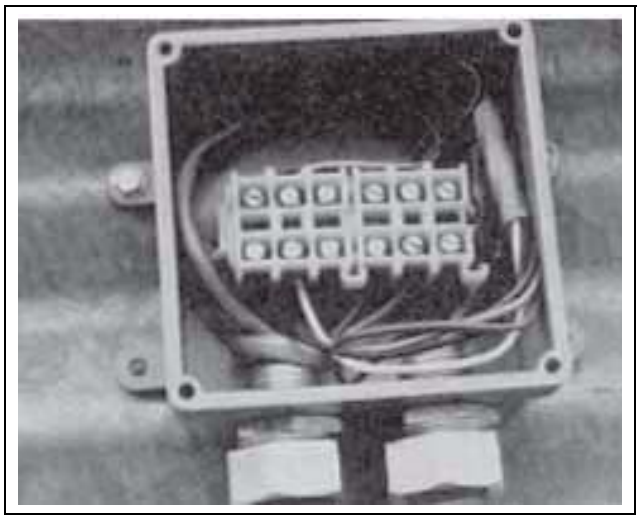


Figure 16I

NOTE: *New production uses different style terminal block.*

13. HORIZONTAL UNITS: Measure and connect the 1/2" liquid tite conduit needed to reach from the Calc-U-Dri sensor location to the control box, allowing enough to run along the bin wall. Feed the sensor control wire through the conduit, then attach the conduit to the Calc-U-Dri sensor and the Calc-U-Dri control box using the connectors provided. Secure the liquid tite to the bin wall using nylon cable clamps and #10 screws.

14. Secure the Calc-U-Dri sensor wire in the plastic “J” clip(s) along the left side of the Calc-U-Dri control box and connect the wires to the terminal strip in the upper left corner marked “sensor”. Excess sensor wire can be cut off. Be sure the sensor wire is clamped and not the insulation.

    NOTE: *The top terminal strip is low voltage DC. Never hook AC power to this terminal strip.*

15. HORIZONTAL DISCHARGE ONLY: Mount the Calc-U-Dri sensor in the discharge tube by positioning the stainless flag toward the bin wall and the copper flag toward the discharge end. The flow of grain must follow the arrows on the sensor decal. Be sure the sensor block seats fully into the rectangular hole in the discharge auger tube by drilling a self-tapping screw through the connector on the ground strap and back into the discharge tube in the area where the flighting has been removed. Leave at least 2" between the sensor block and the grounding screw.

Control Box Wiring Instructions

Hook-up in the main control panel as shown in wiring diagrams on *Pages 100-104*.

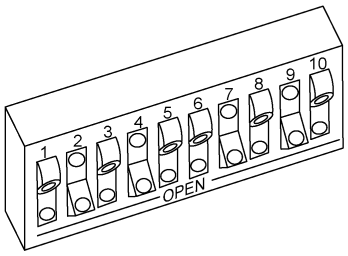
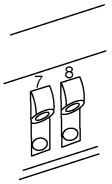
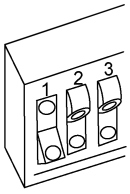
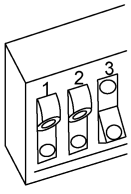
All wiring must be done in accordance with National Electrical Code. Power feeding the main control box requires fuse disconnects or the equivalent.

CAUTION

Wiring should be done by a qualified electrician, and must meet code standards to AVOID BODILY INJURY or DEATH. Grain bins with electrical equipment operation must be grounded.

NOTE: *If you use a bin full, bin empty and auger overload or any combination, they must be hooked in series. For the Grain Flow to run, the circuit must be closed between TB4 and TB5. These terminals (TB4 and TB5) will require a jumper if none of the safety features are used. The remote "shut down" feature for the burner is recommended. The "shut down" feature is used to turn OFF the burner when the Grain Flow is stopped for plugged augers, bin full or bin empty. The terminals TB10, TB11 and TB12 are for this feature. The normal hook-up is to hook the thermostat in series with terminals TB10 and TB11.*

DIP SWITCH SETTING FOR DMC 12 CIRCUIT BOARD IN GRAIN FLOW OR N-S CONTROL BOX

THIS WOULD BE HOW A STANDARD BOARD WOULD BE SET WITH OR WITHOUT A CHART RECORDER		1 - OPEN 2 - CLOSED 3 - OPEN 4 - CLOSED 5 - OPEN 6 - OPEN 7 - CLOSED 8 - OPEN 9 - CLOSED 10 - OPEN
WITH PRINTER		7 - OPEN 8 - OPEN
DOUBLE SAMPLE TIME TO APPROXIMATELY 4 MINUTES (2 MINUTES WHEN CLOSED)		4 - OPEN
ELIMINATE TIMES THREE (X3) DRYING TIME		5 - CLOSED
ELIMINATE TIMES TWO (X2) DRYING TIME		6 - CLOSED
DIVIDE DRYING TIME RANGE BY 4 TO 3.75 THROUGH 15 MINUTES		1 - CLOSED 2 - OPEN 3 - OPEN
MULTIPLY DRYING TIME RANGE BY 2 FOR 30 THROUGH 120 MINUTES		1 - OPEN 2 - OPEN 3 - CLOSED

The chart shows grain moisture readings (from a real situation) as they should be taken to obtain a realistic sample.

Calc-U-Dri Sampling

	Calc		Dole		Elev.
9:33 AM	112°	14.4	109°	14.7	
9:36 AM	112°	14.4	111°	14.4	
9:38 AM	108°	16.0	107°	17.5	
9:40 AM	110°	14.6	109°	14.7	
9:43 AM	108°	15.9	104°	17.3	
9:50 AM	111°_	14.5	107°_	15.0	-
Total		89.8		93.6	
Average		15.0		15.6	15.3

Question: *Where would you set the moisture offset, +0.3 or +0.6?*

Answer: *Most would want to set it to +0.3 which would make it match the point of sale's moisture reading.*

Important Records

Serial number of Calc-U-Dri Control Box: _____

Serial number of Dry Grain Control Box: _____

Date Grain Flow and Control Box Installed: _____

Date of Initial Start-up and Check Out: _____

Date of First Use: _____

Dates of Annual Check Ups:

_____

_____

_____

Important Information: _____

_____

_____

_____

_____

NOTES

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
	All Fiberglass Housings	Lifetime
	All Fiberglass Propellers	Lifetime
Cumberland Feeding/Watering Systems	Feeder System Pan Assemblies	5 Years **
	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
Grain Systems Farm Fans Zimmerman	Portable and Tower Dryers	2 Years
	Portable and Tower Dryer Frames and Internal Infrastructure †	5 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%

** Warranty prorated from list price:
0 to 3 years - no cost to end-user
3 to 5 years - end-user pays 50%

† Motors, burner components and moving parts not included. Portable dryer screens included. Tower dryer screens not included.

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 (12^{th}) month from the date of purchase and continuing until the sixtieth (60^{th}) 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.

9101239_1_CR_rev7.DOC (revised July 2009)

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.

GSI GROUP

GSI Group
1004 E. Illinois St.
Assumption, IL 62510-0020
Phone: 1-217-226-4421
Fax: 1-217-226-4420
www.gsiag.com