OWNER'S MANUAL

MODEL 84

GRAIN FLOW

Calc-U-Dri Controls

DAVID MANUFACTURING CO.

1600 12th Street N.E., Mason City, Iowa USA 50401 641-424-7010

WARRANTY
for
Grain Flow Model 84

The guarantee is for one year from date of installation to be free of defects in material or workmanship when properly installed and operated in accordance with instructions in this booklet. Warranted parts will be exchanged F.O.B. Mason City, Iowa without charge to the user. Damage resulting from negligence voids the warranty. Warranty does not include labor, installation or delivery of replacement parts.

Electric motors are covered by the warranties of the respective manufacturers. Electric service centers are located in all regions. Consult your dealer.

The Warranty and liability of David Manufacturing Company, its distributors, dealers and agents is limited to replacement, without charge, of defective parts, as outlined above. DMC makes no other warranties, express or implied except as stated herein, and disclaims all obligations and liabilities other than specified.

The Manufacturer reserves the right to make changes in specifications or prices without incurring obligation on previously produced merchandise.

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***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.

CAUTION

SAFETY INFORMATION PLEASE READ

WATCH FOR THIS SYMBOL!
IT POINTS OUT IMPORTANT SAFETY PRECAUTIONS.
IT MEANS ATTENTION -- "BECOME ALERT! YOUR SAFETY IS INVOLVED!"

It is recommended that you review the entire contents of this manual, paying particular attention to items preceded by this symbol.

FAILURE TO HEED THESE INSTRUCTIONS CAN RESULT IN PERSONAL INJURY!

Operator Qualifications

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

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

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

3. Unqualified persons are to stay out of the work area. The "Work Area" is defined as any area within the grain drying and storage complex where this equipment is installed.

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

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

⚠ CAUTION ⚠

1. Read and understand the Owner's Manual.
2. Attach all safety decals as required.
3. Keep all safety shields in place.
4. Do not wear loose-fitting clothes while working with equipment in operation.
5. Keep hands and feet away from moving parts. Be sure all people are clear of the equipment before start-up.
6. Disconnect all electrical power before servicing or opening control box, adjusting, or lubricating the equipment.
7. All electrical hook-ups should be in accordance with the National Electrical Code.
8. An automatic shut-off of the Calc-U-Dri and burner for grain depths less than two feet is recommended.
9. GROUND all electrical equipment as well as the BIN ITSELF.
10. Only knowledgeable and trained personnel should operate this equipment.
11. NEVER ENTER BIN WITH POWER "ON" AND CONTROLS IN "AUTO"... Floor augers travel around at a rapid speed...AUTOMATIC CONTROLS START AUGERS WITHOUT WARNING!!
12. **SHOULD ENTRY TO GRAIN-FILLED BIN BE NECESSARY, AVOID POSSIBLE INJURY BY:**

    A. Disengaging floor augers.

    B. Using a safety rope when using center sump.

    C. Having another person outside bin capable of stopping unit during clean out.

    D. STAY CLEAR OF OPERATING FLOOR AUGERS. THEY CAN INJURE OR KILL YOU.

FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY OR PROPERTY DAMAGE.

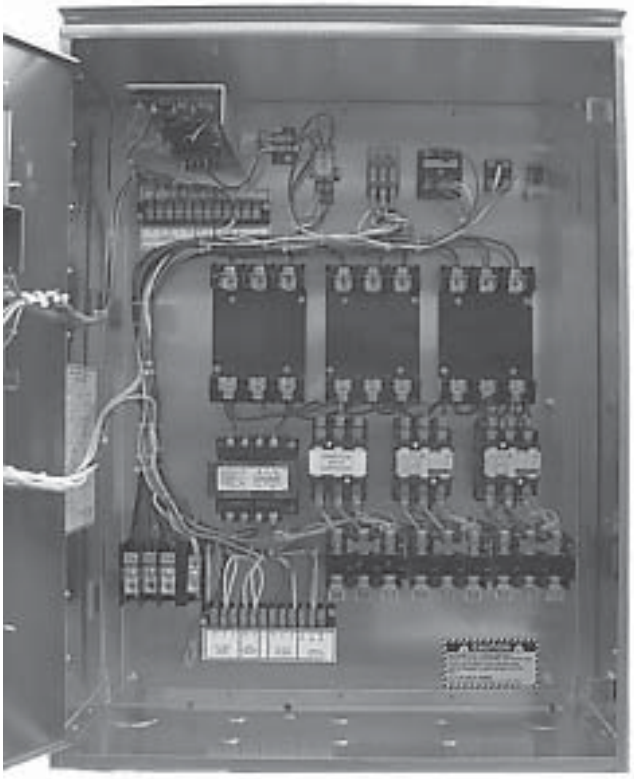
THE DECALS SHOWN ON THESE PAGES MUST BE DISPLAYED AS SHOWN

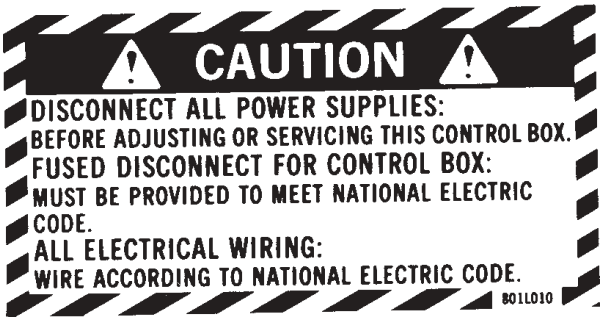
REPLACEMENTS ARE AVAILABLE UPON REQUEST

Write to: DMC
1004 East Illinois St.
Assumption, IL 62510
Phone: 217-226-4421

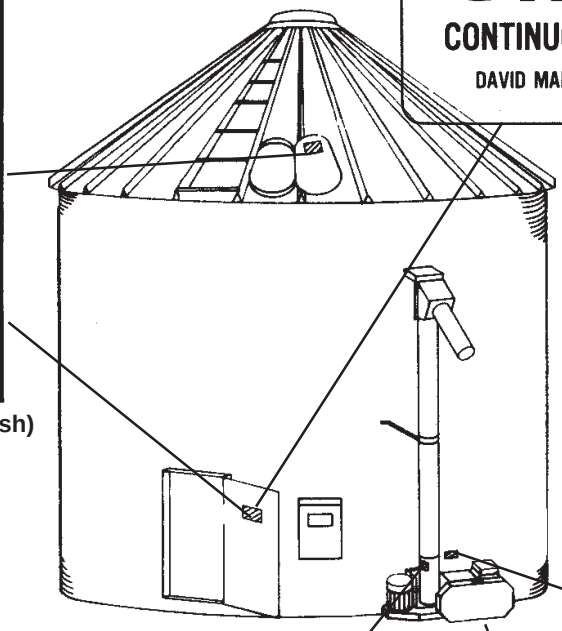
Please note:

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.





THE DECALS SHOWN ON THESE PAGES MUST BE DISPLAYED AS SHOWN



THIS DRYING BIN EQUIPPED WITH

DMC

GRAIN-FLOW

CONTINUOUS DRY / FLOW SYSTEM.

DAVID MANUFACTURING CO. MASON CITY, IOWA

601L0024
Decal on outside of door

⚠ DANGER

Rotating flighting can kill or dismember. | Flowing material can trap and suffocate. | Crusted material can collapse and suffocate.

Keep clear of all augers.
DO NOT ENTER this bin!

If you must enter this bin:

1. Shut off and lock out all power.
2. Use safety harness and safety line.
3. Station another person outside the bin.
4. Avoid the center of the bin.
5. Wear proper breathing equipment or respirator.

Failure to heed these warnings will result in serious injury or death

DC-552

DC-552(English) & DC606 (Spanish)
Decal on inside of door

FLOOR AUGER DRIVE

NOTICE

SHUT OFF MAIN POWER SWITCH TO ENGAGE OR TO DISENGAGE

601L0016

601L0016

⚠ CAUTION ⚠

AVOID POSSIBLE INJURY

- KEEP HANDS, FEET AND LOOSE CLOTHING AWAY FROM MOVING PARTS.
- KEEP ALL SAFETY SHIELDS IN PLACE DURING OPERATION
- DISCONNECT POWER BEFORE SERVICING OR ADJUSTING
- READ AND UNDERSTAND OWNERS MANUAL BEFORE OPERATING.

205L0004

205L0004

⚠ CAUTION ⚠

DISCONNECT POWER
BEFORE
SERVICING OR ADJUSTING
SEE OWNERS MANUAL

104L0014

104L0014

INTRODUCTION

The DMC Grain Flow turns your bin into the most accurate, efficient and profitable continuous flow drying system available.

Your new Grain Flow Continuous In-bin Dry-Flow system is a quality machine, and with proper maintenance, it will serve you for years to come.

Before operating, familiarize yourself with the machine. It will help you to operate your Grain Flow more efficiently, resulting in better quality returns to you.

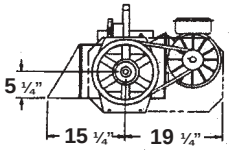
Limit the amount of grain above the Grain Flow to a maximum depth of 16 feet.

Having your fan and heater properly sized and operating correctly is necessary to get the capacities specified in the Drying Chart (shown on page 33).

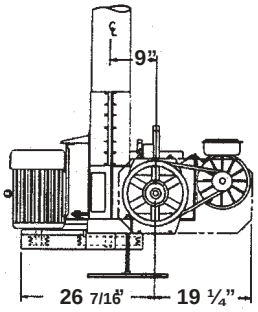
See your dealer for the details on a complete line of available optional equipment to match your drying needs.

PATENT NOTICE: The Calc-u-Dri Control Box is patent pending.

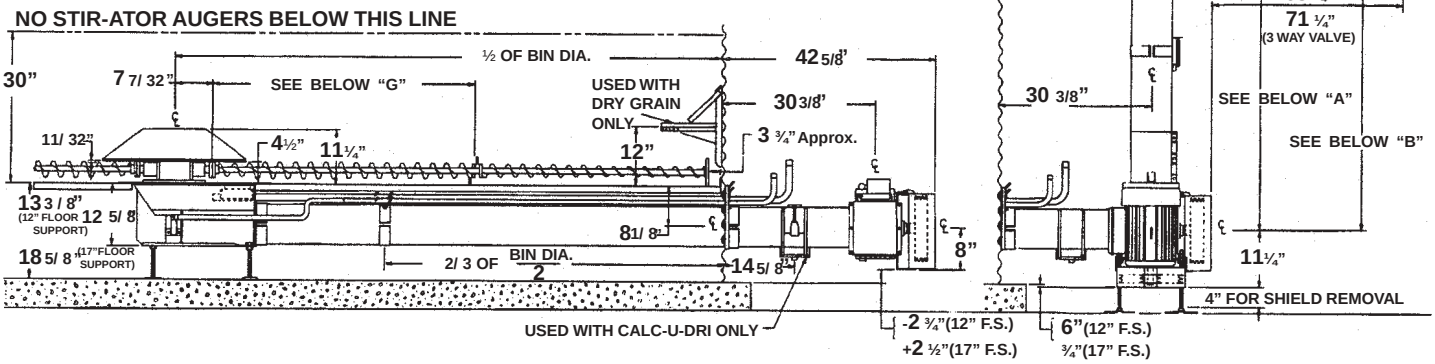
GRAIN FLOW OVERALL DIMENSIONS



FRONT VIEW



FRONT VIEW
WITH VERTICAL AUGER



	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 602C042	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 Dimn. "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"

	Two-Way Valve "A"	Three-Way Valve Upper "A"	Three-Way Valve Lower "A"	Two-Way Valve "B"	Three-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 Diagram E.)

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 small holes in the wall plate. One is for the shift rod with the other two 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. [Eight (8) inch Grain Flow only - See Diagram A].

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 inch floor heights.

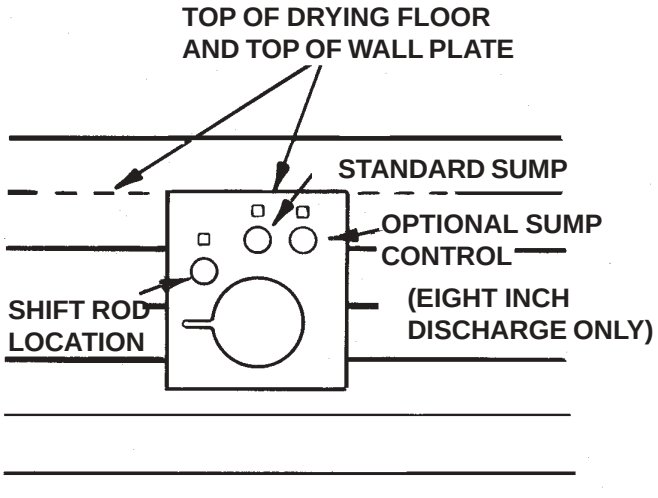


DIAGRAM A

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 four (4) inch 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 Photos 1 & 2 on the next page.)

GRAIN FLOW INSTALLATION INSTRUCTIONS (continued)

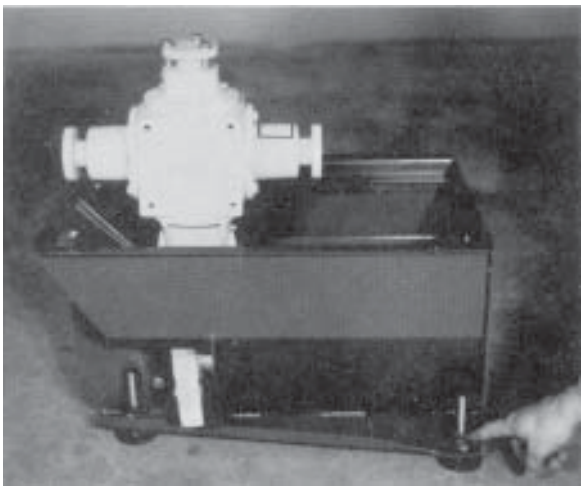


PHOTO 1

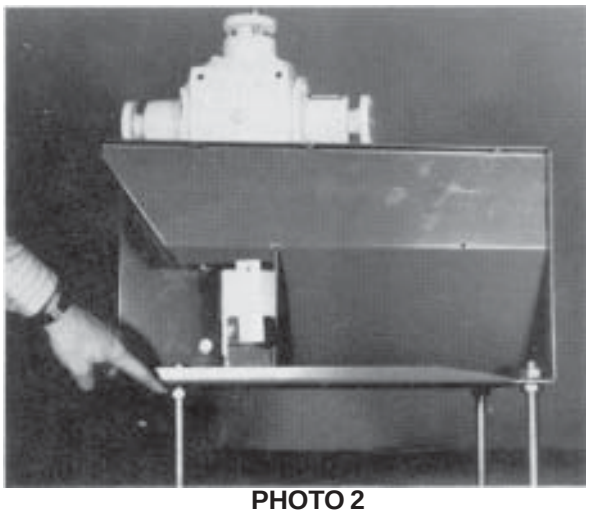


PHOTO 2

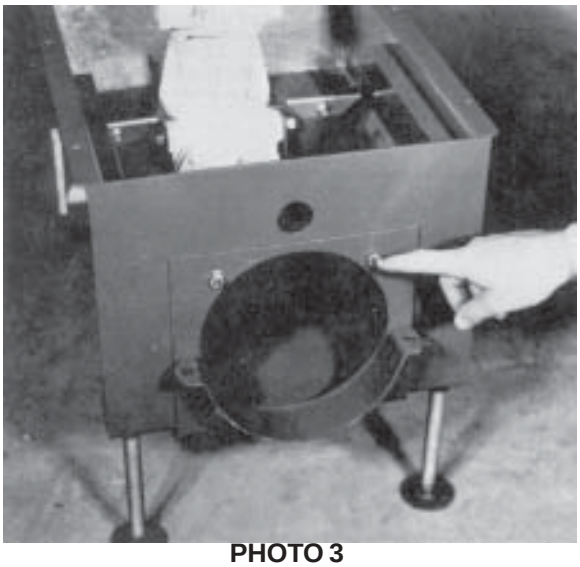


PHOTO 3

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

7. Bolt the offset shift tube to the shift lever assembly on the gearbox using one (1) 5/16" x 1" grade 5 bolt and locknut. Put the bolt through the hole in the shift tube, then thread the locknut 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 locknut against the shift lever. Be sure the shift tube and shift lever can move freely. See Photo 4.

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 gear boxes. See Photo 5.

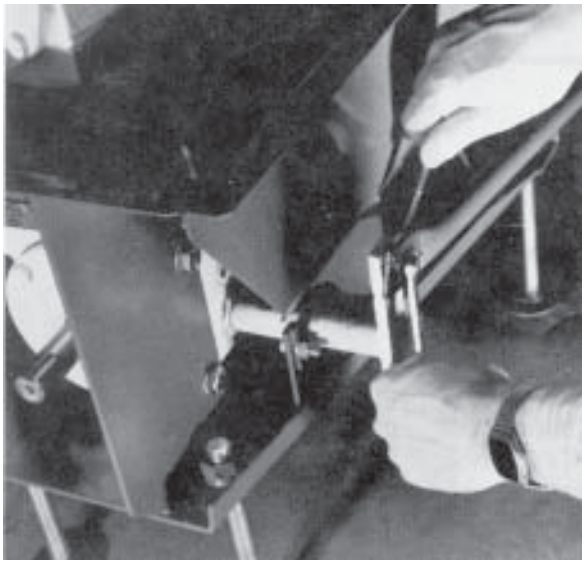


PHOTO 4

PHOTO 5

GRAIN FLOW INSTALLATION INSTRUCTIONS (continued)

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 Diagram B.

CHECK TO MAKE SURE THAT THE GEARBOX AND SUMP IS LEVEL. See Diagram C.

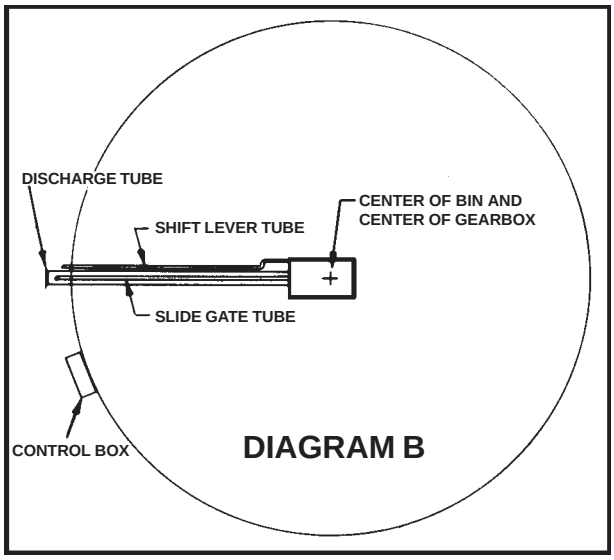


DIAGRAM B

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. See Diagram C, Photos 6 & 7.

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

ATTACH A BAR TO THE TOP OF THE GEARBOX AND MEASURE THIS DISTANCE SEVERAL PLACES AROUND THE FLOOR. ADJUST THE SUMP LEGS UNTIL THE DIFFERENCE BETWEEN THE MAXIMUM AND MINIMUM MEASUREMENTS IS LESS THAN 1/2".

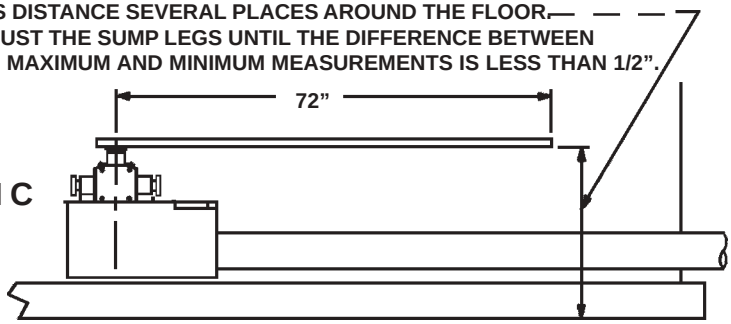


DIAGRAM C

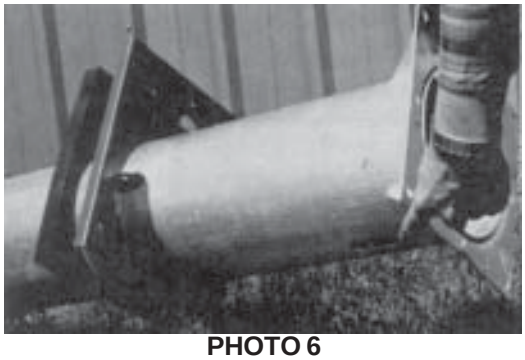


PHOTO 6

PHOTO 7

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 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 Photos 8 & 9 on the next page.

GRAIN FLOW INSTALLATION INSTRUCTIONS (continued)

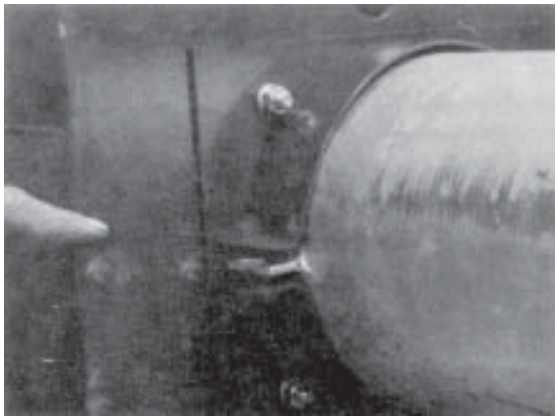


PHOTO 8

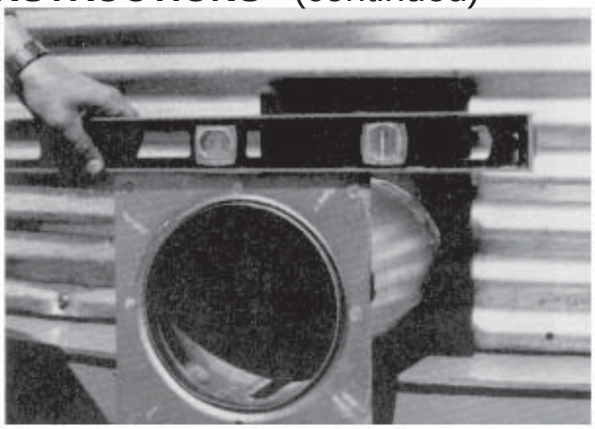


PHOTO 9

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 counter- clockwise rotation direction. See Diagram D, Photo 10.

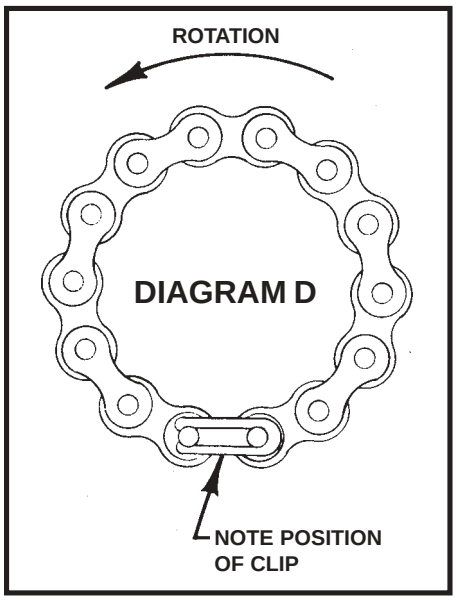


Diagram D viewed with the clip on the gearbox side away from the flighting.

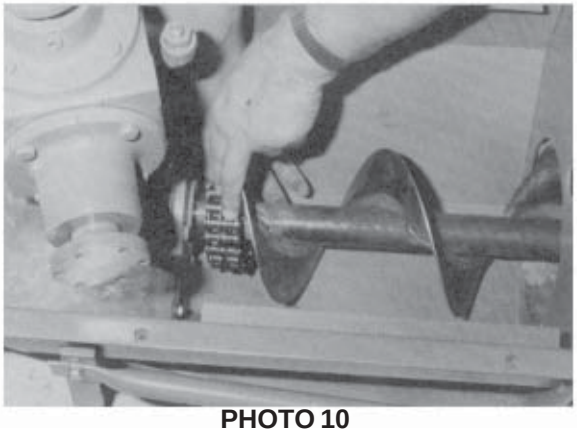


PHOTO 10

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 Photo 11.

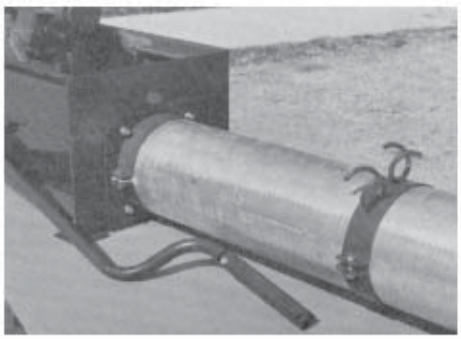


PHOTO 11

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 Diagram G on page 13.

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" hexbolts and locknuts. Connect the shift lever tube to the offset shift tube with the connecting sleeve using one (1) 5/16" x 1-1/2" grade 5 bolt and locknut. See Photos 12, 13 and 14.

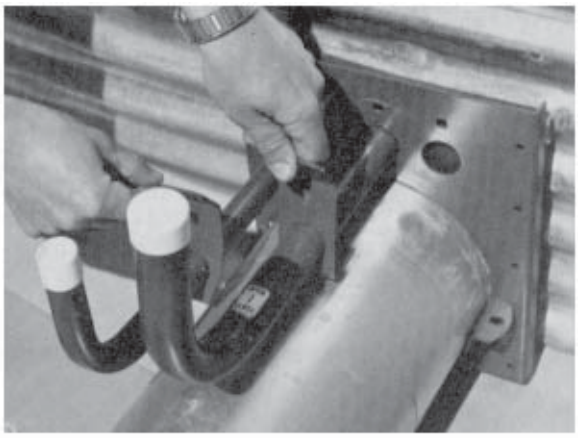


PHOTO 12

PHOTO 13

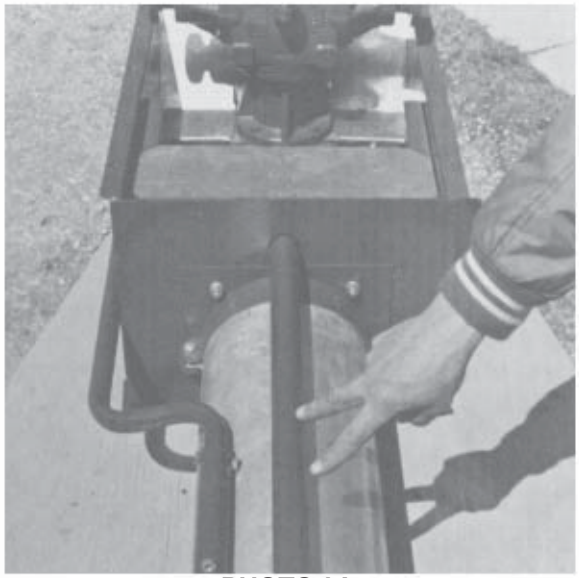


PHOTO 14

On 18' to 24' diameter bins, the intermediate slide gate handle will have to be cut off and the holes redrilled to get the proper length. Leave 12"-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 connecting bands and hardware. Attach the latching hardware as stated for shift lever and center sump slide gate.

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 Photos 15 & 16 on the next page.

GRAIN FLOW INSTALLATION INSTRUCTIONS (continued)

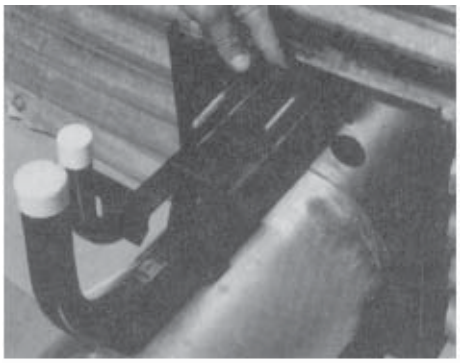


PHOTO 15

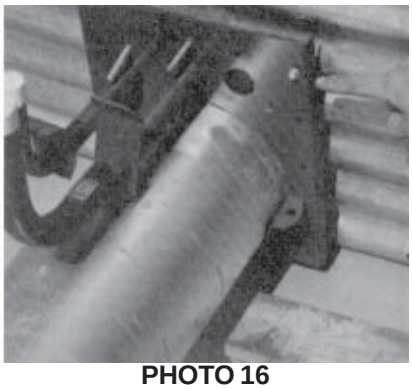


PHOTO 16

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

16. Secure tube to the wall plate with a clamp band and two (2) 3/8” x 1-1/4” bolts and nuts. See Photo 17.

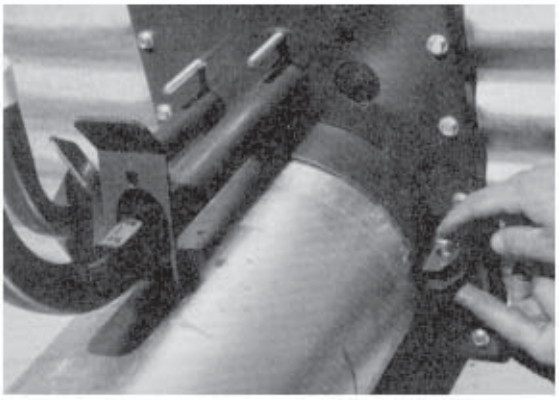


PHOTO 17

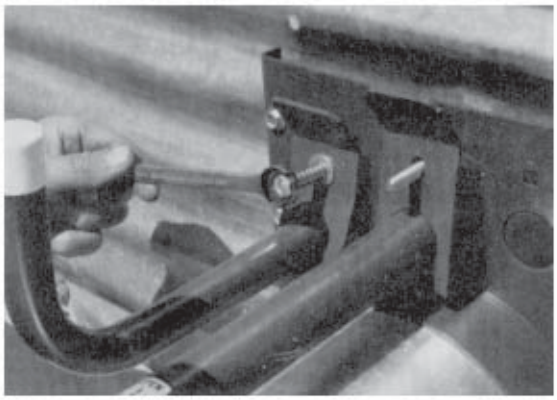


PHOTO 18

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 locknuts. See Photo 18.

18. Install the drying floor. An area 14 feet 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 Diagram E on the next page.

For existing bins, replace the drying floor taken out. Follow Step 18 instructions. See Diagram E on the next page.

GRAIN FLOW INSTALLATION INSTRUCTIONS (continued)

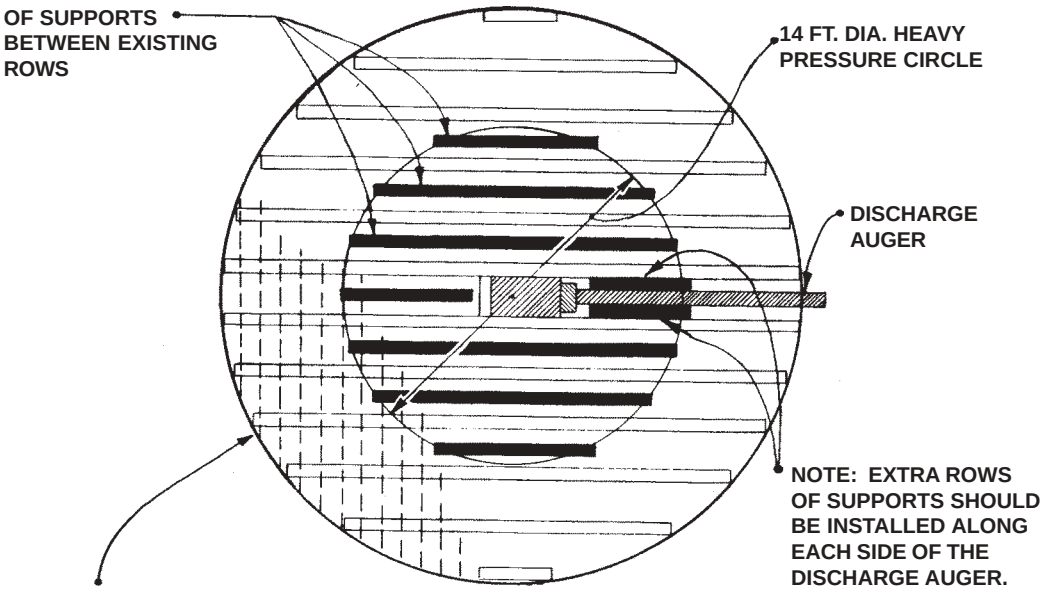


DIAGRAM E

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 Drawing II, Items 8 and 9, page 48.

20. Bolt one floor auger to the gearbox hub using 5/16" x 1-1/2" grade 5 hex bolts and locknuts. For grade 5 identification, See Diagram F.

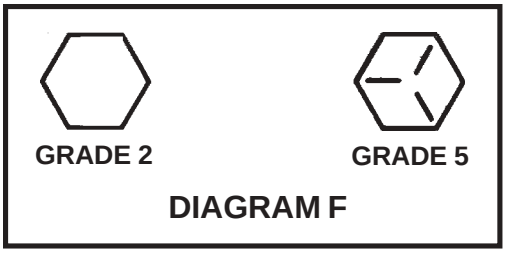


DIAGRAM F

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 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 Diagrams G and H.

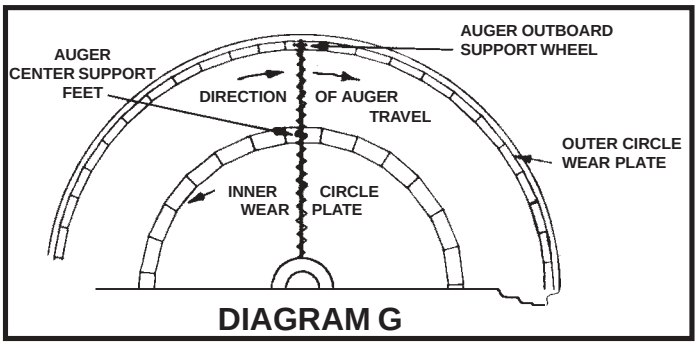


DIAGRAM G

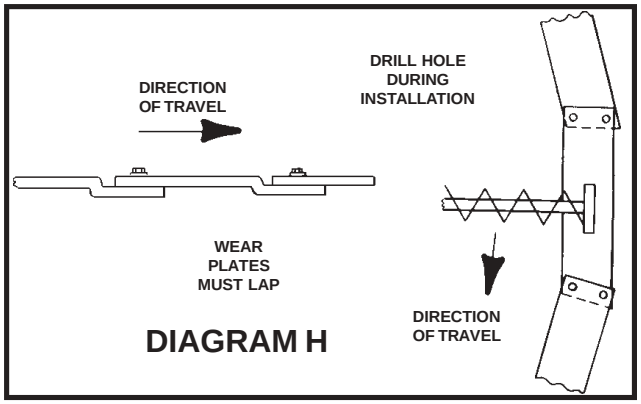


DIAGRAM H

GRAIN FLOW INSTALLATION INSTRUCTIONS (continued)

22. Attach second floor auger. Same as Step 20.

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 Gd 5 bolts with lockwashers.)

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 insure that it turns freely.

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 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 Photo 19.

To fasten the sampler to the discharge tube, use two (2) #10 x 1" hex flange head, self-tapping screws, and two 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 more 5/32" holes into the discharge auger tube. Finish the installation by using two 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 Photos 20, 21, 22 and 23.

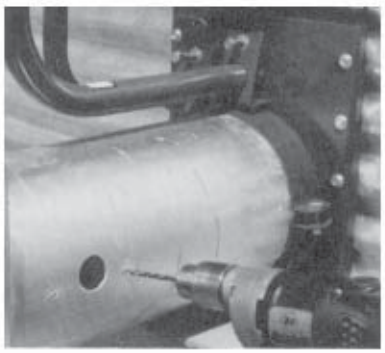


PHOTO 19

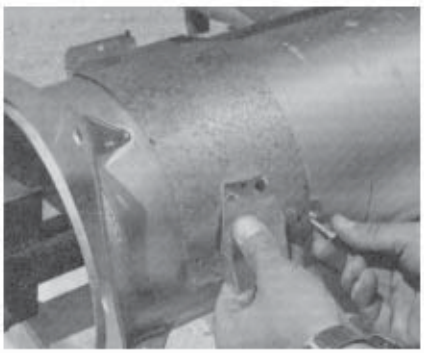


PHOTO 20

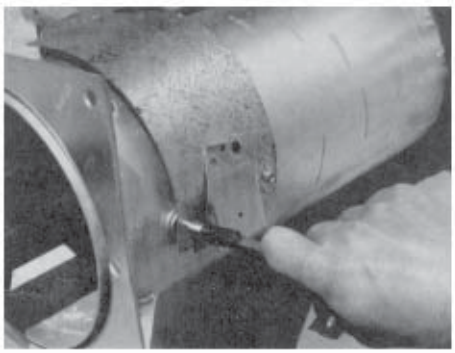


PHOTO 21

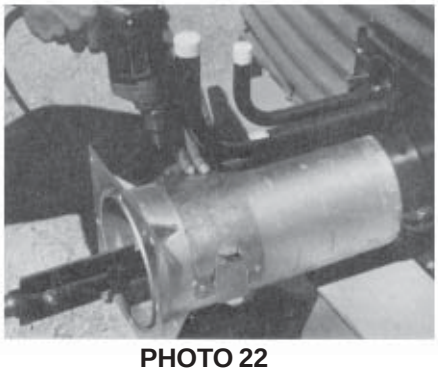


PHOTO 22

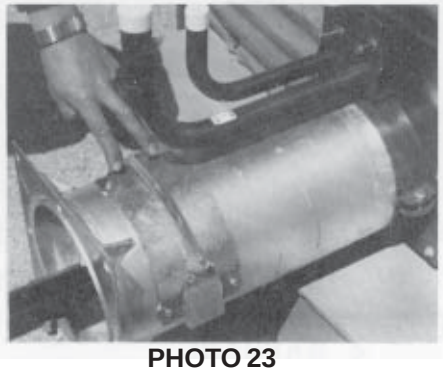


PHOTO 23

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 Photos 24 and 25.

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 Photo 26.

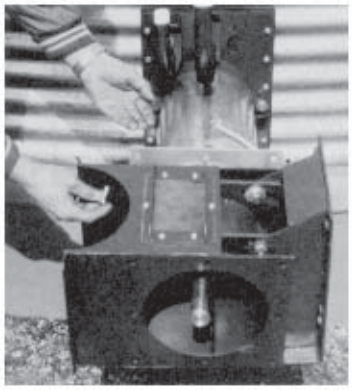


PHOTO 24

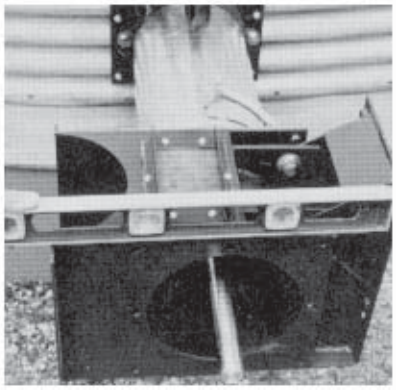


PHOTO 25

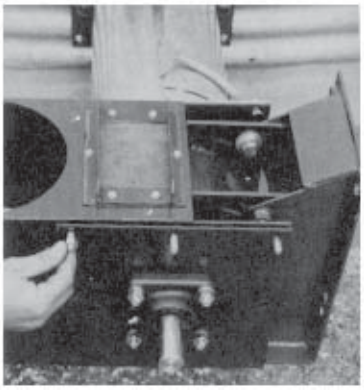


PHOTO 26

28. Place the top and bottom shield mounting brackets onto the six (6) 3/8" x 1-1/4" capscrews protruding through the bearing plate. Secure by using six (6) more 3/8" lock washers and nuts. See Photo 27 or Drawing I on page 46.

For Installation of optional GIMBAL or STRAIGHT SWIVEL discharge boot, go to pages 19 or 20.

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 Photo 28.

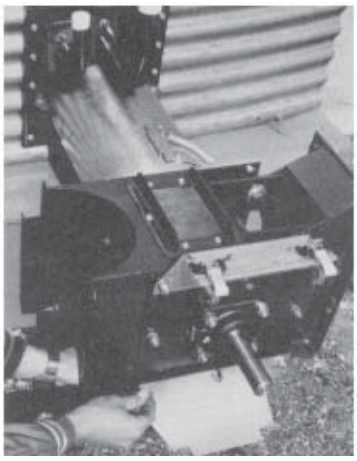


PHOTO 27

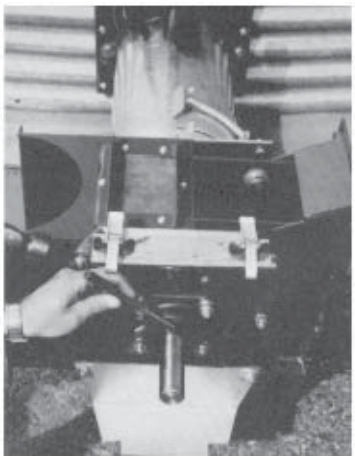


PHOTO 28

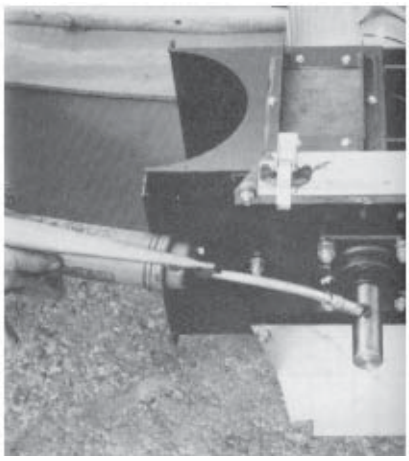


PHOTO 29

30. Coat the surface of the auger stub shaft with grease. See Photo 29.

GRAIN FLOW INSTALLATION INSTRUCTIONS (continued)

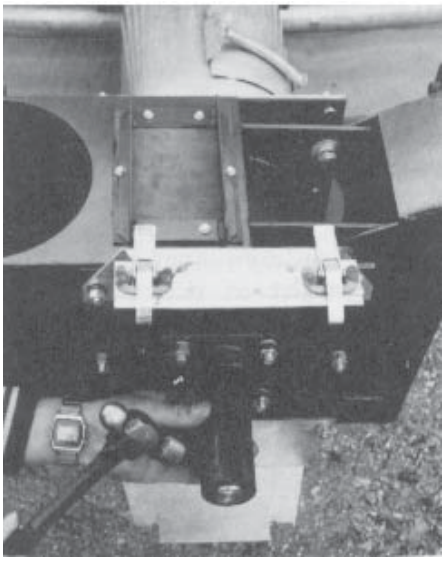


PHOTO 30

31. Slide the 2” OD 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 Photo 30.

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 Photo 31 and 32 and Diagram J or Drawing I on page 46.

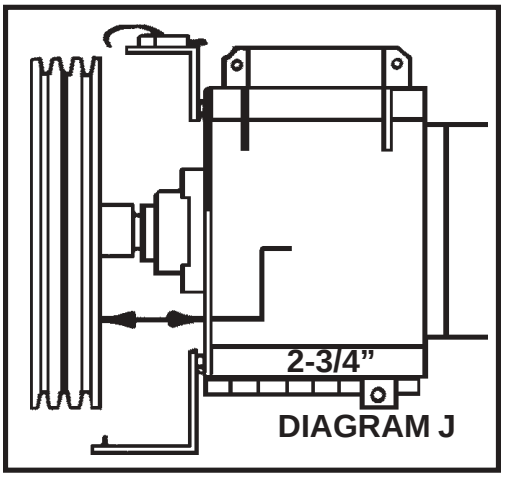


DIAGRAM J

PHOTO 31

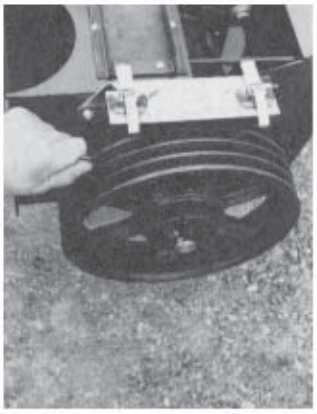


PHOTO 32

33. Mount the motor onto the base with four (4) 3/8” x 1-1/4” hex flange bolts. See Photo 33.

34. Install the 4” OD 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 Diagram K.

PHOTO 33

NOTE: For eight (8) inch units, a 3-1/2” OD pulley is used.

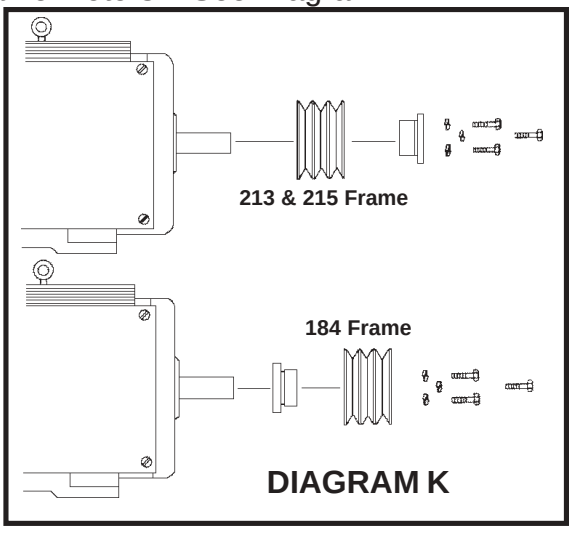


DIAGRAM K

GRAIN FLOW INSTALLATION INSTRUCTIONS (continued)

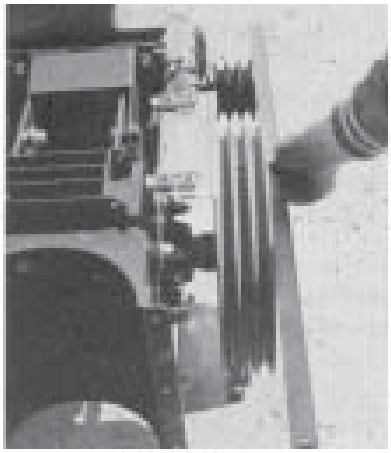


PHOTO 34

35. Use a straight edge to align the pulleys and then tighten the bushing on the motor. See Photo 34.

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. Retighten the three (3) 3/8” x 1” carriage bolts. See Photos 35 and 36.

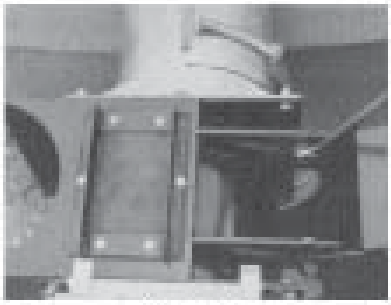


PHOTO 35

37. Tighten the drive belts to 3/16” deflection at 10-15 lb. pivoting the motor down and retightening the two (2) 1/2” bolts loosened in Step 36. See Photo 37.

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.

PHOTO 36

39. The auger overload switch assembly is installed so that it opens away from the bin wall. Attach to the top of the power unit using a 1/4” x 4-1/4” bolt inserted through two (2) nylon bushings. Secure with a locknut. The cover must pivot freely - DO NOT OVERTIGHTEN THE LOCKNUT. See Photo 38.

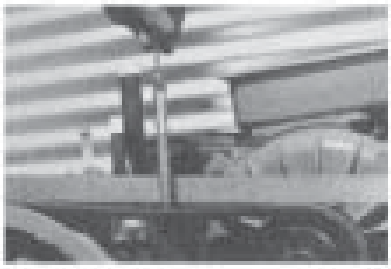


PHOTO 37

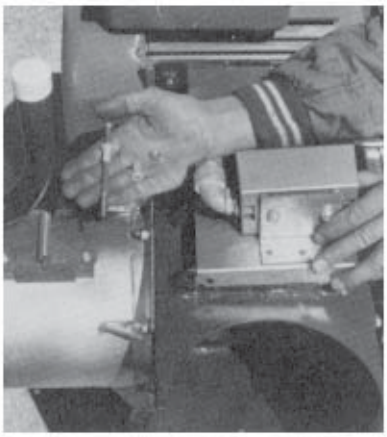


PHOTO 38

GRAIN FLOW INSTALLATION INSTRUCTIONS (continued)

40. 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 Photo 39.

PHOTO 39

41. Put decals in place as follows:
    1) Place “This Bin Equipped With DMC GrainFlow” decal on the outside of the grain bin walk-in door.

    2) Place “DANGER” decal on the underside of the man-hole 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 Photo 40.

2. Use the bearing plate as a guide and cut off the mounting flanges as shown in Photos 40, 41 and 42.

3. 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. See Photo 43 on the next page.

4. Start the two lower 3/8” x 1-1/4” flange head bolts into the swivel support base. See Photo 43 on the next page.

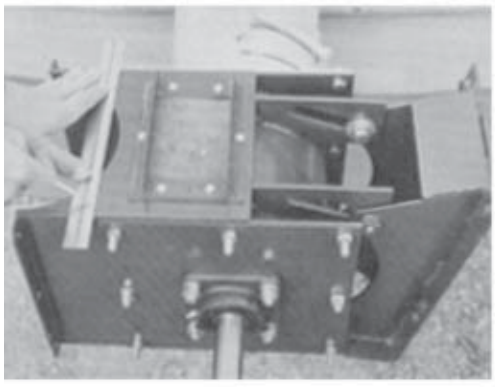


PHOTO 40

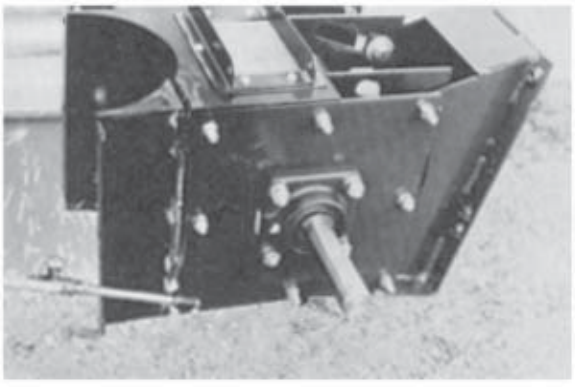


PHOTO 41

PHOTO 42

STRAIGHT OUT SWIVEL BOOT INSTALLATION (continued)

5. Install the swivel boot onto your take-away auger. Secure by tightening the bolts on the connecting band. See Photo 44.

6. Set the take-away auger swivel boot onto the two (2) 3/8" bolts installed in Step 4. Hold in position by adding the top two (2) 3/8" x 1-1/14" flange head bolts. Finish by tightening all four bolts. See Photos 45 and 46.

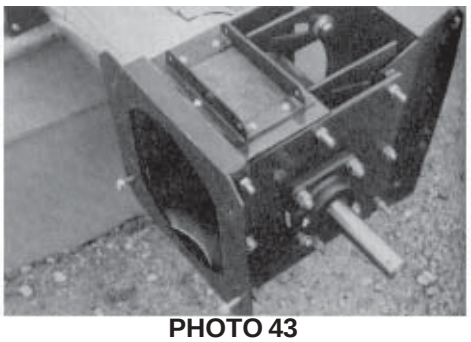


PHOTO 43

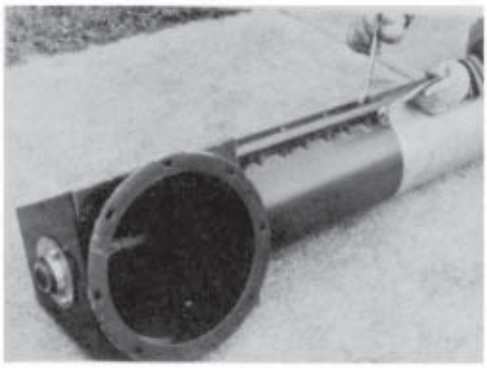


PHOTO 44

PHOTO 45

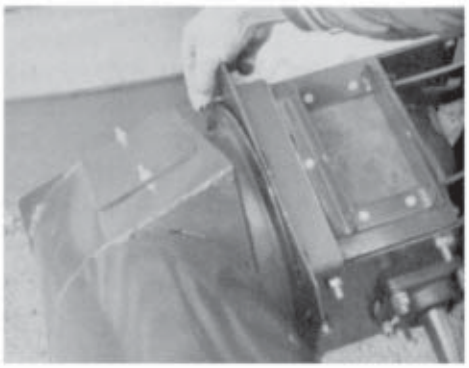


PHOTO 46

GIMBAL SWIVEL BOOT INSTALLATION

1. Use a straight edge to mark cutline. See Photo 40 on the previous page.

2. Use a bearing plate as a guide and cut off the mounting flanges as shown in Photos 40, 41 and 42 on the previous page.

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 Photos 47 and 48.

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 Photo 49.

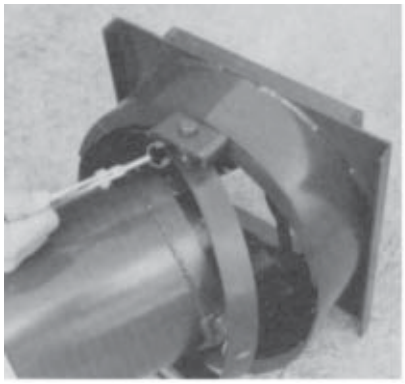


PHOTO 47

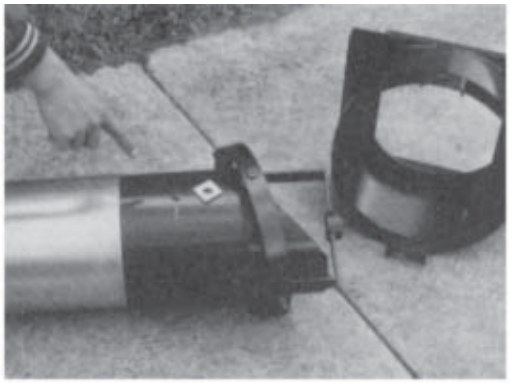


PHOTO 48

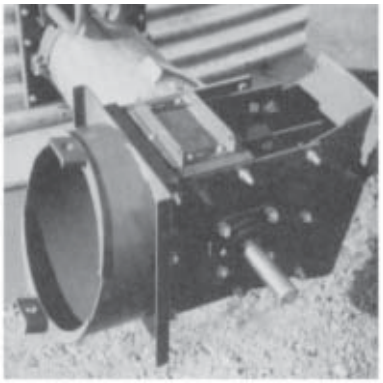


PHOTO 49

GIMBAL SWIVEL BOOT INSTALLATION (continued)

5. Remove the tail cage from your auger and measure the exposed flighting. **NOTE:** If your 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 your auger tube so the exposed flighting on your auger is the same length as the gimbal tube including the gimbal bottom bearing, after removing the connecting band from the gimbal boot. See Photo 50.

7. Slide the connecting band onto your 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 Photo 51.

DON'T TIGHTEN THE CONNECTING BAND UNTIL THE AUGER AND GIMBAL BASE ARE ALIGNED.

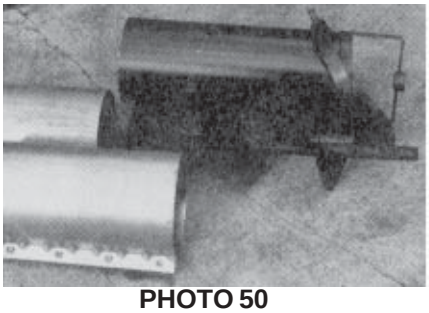


PHOTO 50

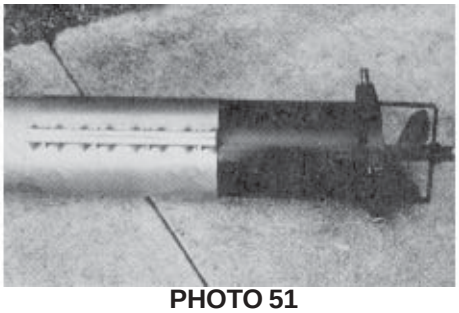


PHOTO 51

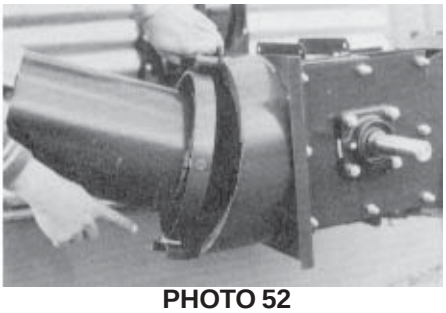


PHOTO 52

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 Photo 52.

9. Tighten the connecting band left loose in Step 7, 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 Photo 53.

PHOTO 53

The gimbal swivel boot installation is now complete.

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) 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 Photo 54.

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 Photo 55. Install and tighten the locking collar by tapping it clockwise (viewed from shaft end). Tighten the collar set screw.

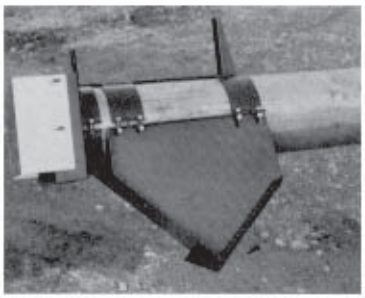


PHOTO 54

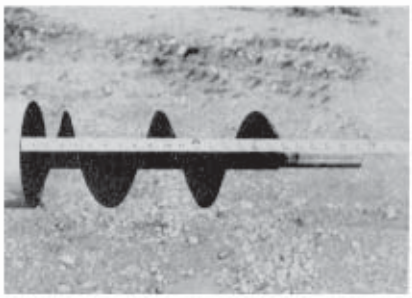


PHOTO 55

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 four (4) 3/8” x 1-1/2” clamp bolts. See Photo 56.

6. Check to make sure the bearing holder bolts are tight, then install the bearing locking collar by tapping it counter clockwise (as viewed from shaft end). Tighten the collar set screw. See Photo 57.

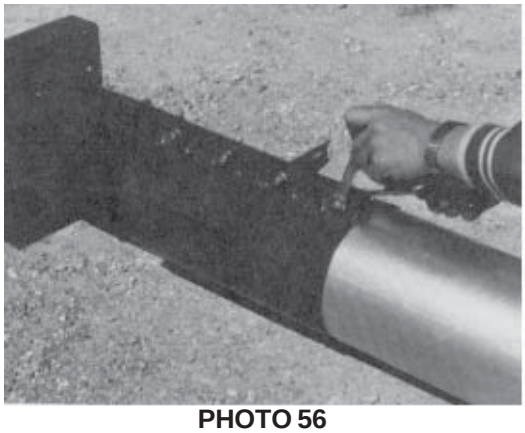


PHOTO 56

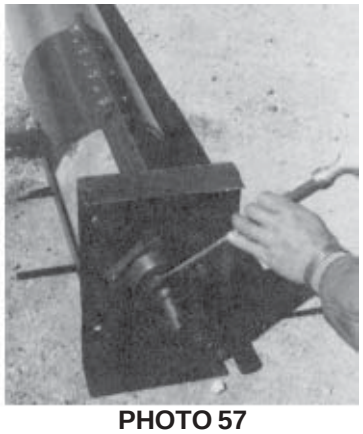


PHOTO 57

INSTALLATION OF GRAIN FLOW VERTICAL AUGER (continued)

7. Attach the 45 degree 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.

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 Photos 58 and 59.

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 Photo 60.

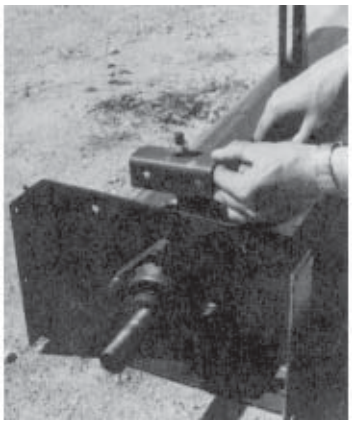


PHOTO 58

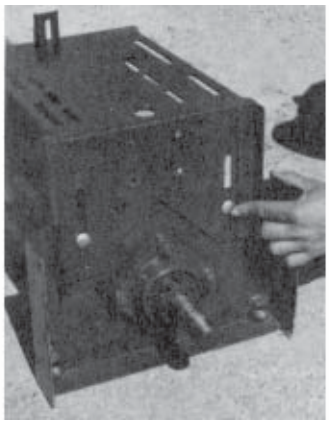


PHOTO 59

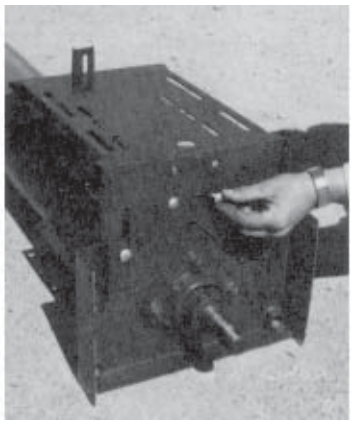


PHOTO 60

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 Photo 61.

11. Install 12” OD two (2) groove pulley with tapered bushing and 1/4” square key onto auger stub shaft and tighten. See Drawing IX on page 52 .

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 Photo 62.

13. Thread the two (2) support legs into the welded nuts on the base of the vertical auger boot. See Photo 63.

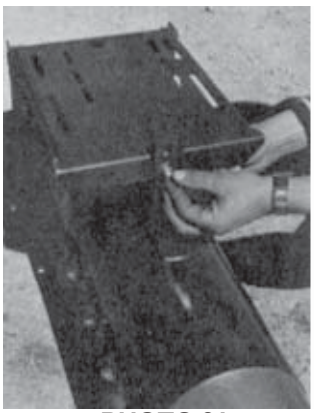


PHOTO 61

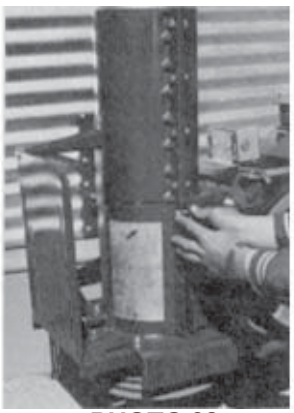


PHOTO 62

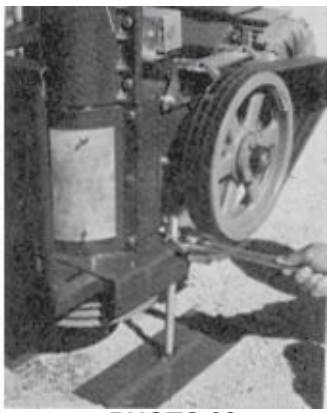


PHOTO 63

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. Retighten 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 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 Drawing IX, page 52.
17. Put the 4" OD 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 lb. 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, retighten 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 Photo 64. For top drive units, install rain cover at the same time as the belt shield.
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 Photo 65.

PHOTO 64

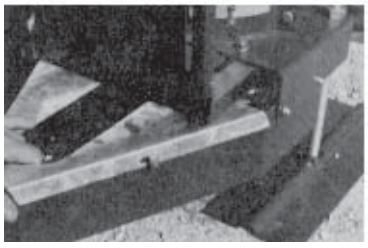


PHOTO 65

22. Cut a 1-1/4" diameter hole into the vertical tube at a location convenient for taking grain samples. See Photo 66.

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 Photos 66 and 67.

NOTE:
Motor NOT installed for photo purposes.

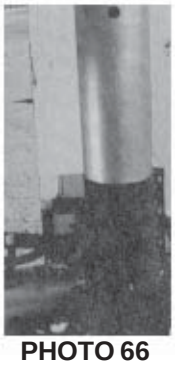


PHOTO 66

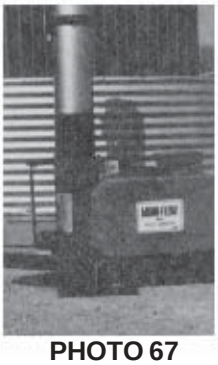


PHOTO 67

GRAIN FLOW VERTICAL AUGER OPTIONAL EQUIPMENT

See page 54 - Drawing X

Items B & H are two-way or three-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 four foot loading spout which can be used on the vertical auger without any additional equipment, or can be bolted onto a two-way or three-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 six inch 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 five feet 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

See page 56 - Drawing XI

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 cutout for the grain to flow through into the bin. It also has a longer shaft to accommodate the one (1) inch bore by 12” OD “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 Diagram L.

PROPER WAY TO CONNECT 6” INCLINE AUGER FLIGHTING

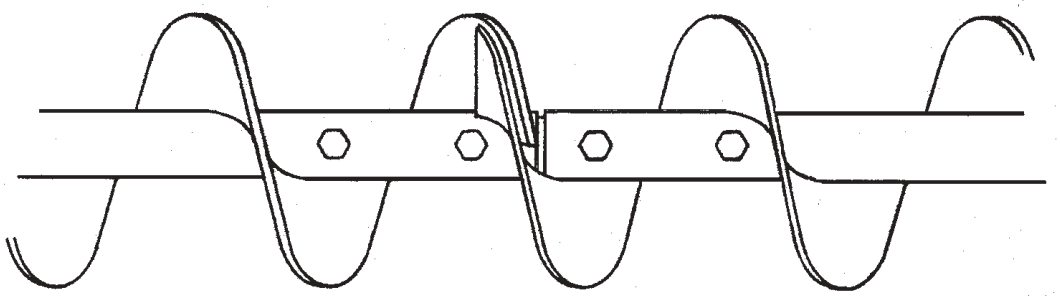


DIAGRAM L

PROPER OVERLAP

If six (6) inch 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 Drawing I on page 46.

2. INSTALLING THE AUGER OVERLOAD SWITCH

Measure the distance from the electrical outlet box (F.S.) that houses the auger overload switch which is on top of the power unit discharge chute. String the 1/2" liquidtite along the top of the discharge auger tube to the main control box as shown in Drawing I, page 46. Cut the 1/2" liquidtite conduit to the length measured, plus allowing enough liquidtite conduit to permit the overload switch cover to open and close easily. Feed 18-3 rubber covered wire through the flexible conduit and connect the liquidtite conduit to the connector on the electrical outlet box (F.S.). Use wire nuts provided to connect the black and white wires to the 18-3 wire to the mercury switch wire with green going to ground. BE SURE TO CONNECT THE GREEN WIRE TO THE GROUND ON THE MAIN CONTROL PANEL, HOOK THE BLACK WIRE ON THE 18-3 TO TERMINAL #4, AND THE WHITE WIRE TO TERMINAL #5. Clamp the liquidtite conduit to the bin wall using 13/16" nylon clamp and #10 x 1" self-tapping screws. The mercury switch is preadjusted so that when the overload door is raised, the Grain Flow will shut down. This angle may be adjusted by loosening the two 1/4" nuts and turning the mercury switch inside the electrical outlet box(F.S.).

NOTE: IF THE MERCURY SWITCH IS NOT INSTALLED CORRECTLY, THE GRAIN FLOW WILL NOT OPERATE.

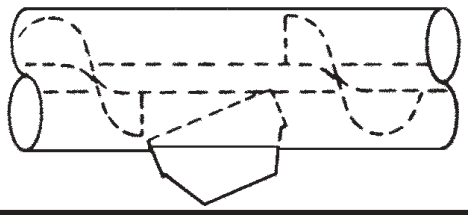
IT OVER-RIDES ALL OTHER CONTROLS. TO ADJUST, MOVE CLOCKWISE FOR QUICKER SHUT-OFF.

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 cutout 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 gage provided into the sensor slot as shown in Diagram O.

DISCONNECT POWER!!!

HOW TO INSERT GAGE



GAGE AND FLIGHTING PROPERLY INSTALLED

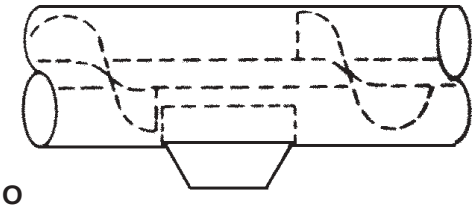


DIAGRAM O

CALC-U-DRI CONTROL BOX INSTALLATION (continued)

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

Measure the amount of 1/2" liquidtite 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 D.C.
NEVER HOOK A.C. 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 A.C. 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.

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 name plate 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 name plate 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.

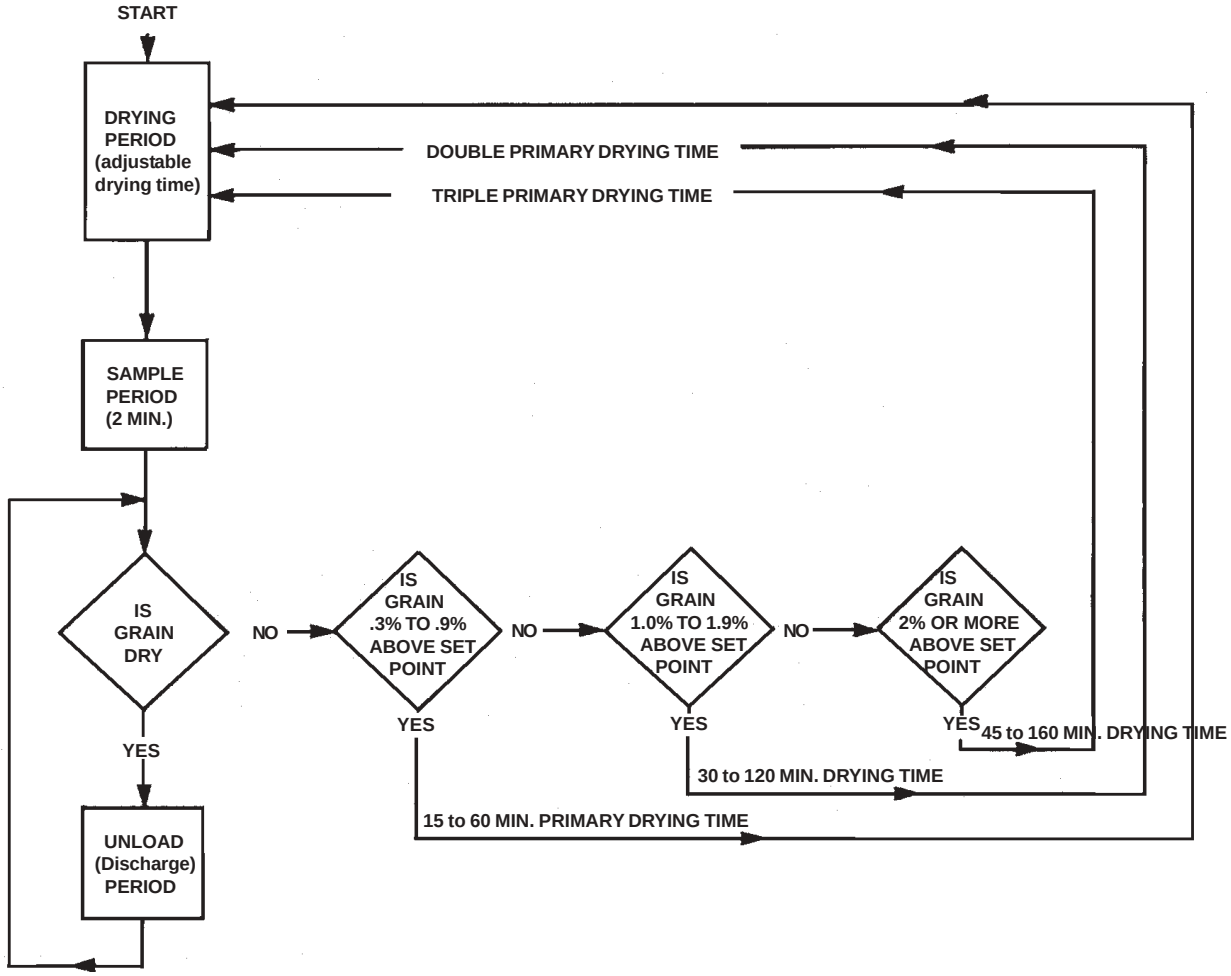
5. MAIN POWER LINE TO THE CONTROL PANEL
   Hook up in the main control box as in the Wiring Diagrams on pages 65-67.

   All wiring should 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 SHOULD MEET CODE STANDARDS TO AVOID POSSIBLE BODILY INJURY OR DEATH.

GRAIN BINS WITH ELECTRICAL EQUIPMENT IN OPERATION MUST BE GROUNDED.

CALC-U-DRI
OPERATIONS FLOW CHART



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 two minutes. If the grain is not dry at the end of the two minute 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 three to six feet of wet grain in your bin, the following step should be taken:

1. Start the fan and heater and select the desired drying temperature by setting your 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.

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 gear box.

   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). Thirty 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 88.

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 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.		

GRAIN FLOW WITH CALC-U-DRI START-UP (continued)

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 don’t have power to the control box.

7. Push the “start button”. The unit will not run, but the digital meter will read 000.

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, pages 35-36.

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 .3% wetter than the set point value.
    B. If the grain is .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 .3% to .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 two minute 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 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 Item 23 on page 29 under “Operating Suggestions” for information on how to use the Calc-U-Dri for grains other than corn.

CALC-U-DRI OPERATING SUGGESTIONS

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. Your 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 degree grain cooled to 40 degrees ambient may dry as much as 1.5 % to 2% during cooling. However, the same 120 degree grain cooled to 90 degrees ambient may only dry .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:
   1. 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.
   2. 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 89 for a sample chart of this procedure).
   3. 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).
   4. 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.
   5. 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 insure that the electronic equipment is functioning correctly. Use a quality moisture tester that will provide repeatable accuracy.

Use the Following Guidelines for Safe & Reliable Sampling:

!!CAUTION!!

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 your 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 second “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.

CALC-U-DRI OPERATING SUGGESTIONS (continued)

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 gear box 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 five (5') feet 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 six (6") inch tube and 620 bushels per hour with an eight (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 four (4) to (6) feet. MAXIMUM EFFICIENCY at all depths when stirring is used. See pages 77-78.

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 your 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 effect on the amount of drying done in cooling.

CALC-U-DRI OPERATING SUGGESTIONS (continued)

17. The Grain Flow control box has three contactors with individual automatic/manual selector switches to provide power to three different take-away augers. Maximum amps per auger is 40 AMP - single phase and 30 AMP - three 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 35-36.

18. If more than three 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 33.

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 feet 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 72 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 30. 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.

DANGER

WHEN EMPTYING YOUR 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.

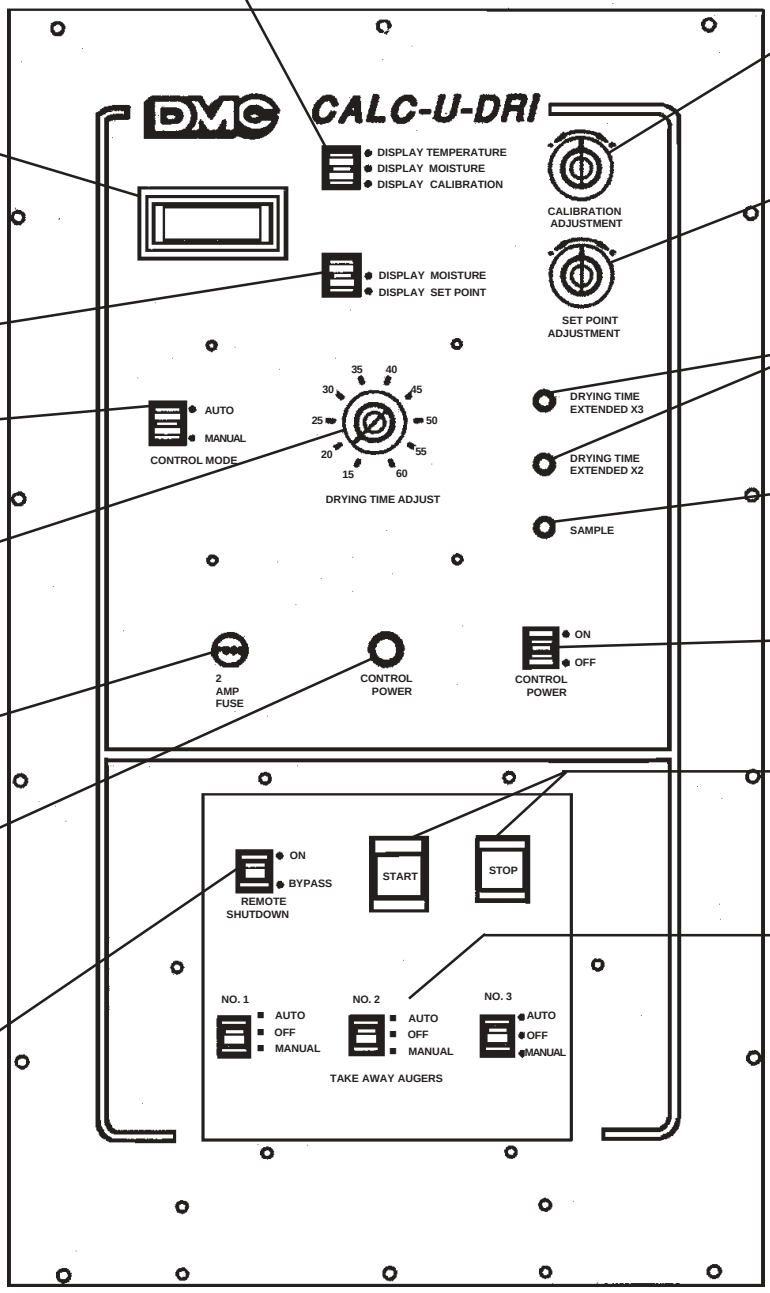
GRAIN FLOW DRYING GUIDE & CHART

The chart is a guide to base your fan and heater size on. It gives the approximate drying capacities that can be expected from the various combinations of bin diameter, heat rise, and fan and heater size. The chart is based on atmospheric air of 50 degree F and 60% relative humidity, starting grain temperatures at 50 degrees F, and 8-foot 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 your grain. When grain depths of over eight feet 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
33'	10	1.8	na	13800	.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	.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	.7	950	1920	2930	3980	5060	6170
	12 1/2	1.8	na	15900	.8	1080	2200	3360	4550	5780	7060
	10 C	1.9	na	13600	.7	930	1880	2870	3890	4950	6040
	15 C	1.8	na	16600	.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	.4	950	1940	2950	4010	5090	6220
	12 1/2	1.9	2.6	16200	.6	1100	2240	3420	4630	5890	7190
	15 C	1.9	2.7	16900	.6	1150	2340	3570	4840	6150	7500
	20 C	1.9	2.6	20100	.8	1370	2780	4240	5750	7310	8920
	30 C	1.9	2.6	23500	.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	.3	960	1950	2980	4030	5130	6260
	12 1/2	1.9	2.7	16400	.5	1120	2270	3460	4690	5960	7280
	15 C	1.9	2.8	17100	.4	1160	2370	3610	4890	6220	7590
	20 C	1.9	2.8	20300	.5	1380	2810	4280	5810	7380	9010
	30 C	1.9	2.7	23700	.6	1610	3280	5000	6780	8620	10520
	40 C	2.0	2.8	27100	.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 your DMC distributor.
All multiple fans are in parallel. Multiply Drying Rate x .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



1. Switch-Display Temperature
   Display Moisture
   Display Calibration
2. Digital Display Panel Meter
3. Switch-Display Moisture Set Point
4. Auto/Manual Switch
5. Drying Time Adjustment
6. 2 Amp Fuse
7. Power Indicator Light
8. Remote Shutdown Switch
9. Calibration Adjustment
10. Set Point Adjustment
11. Drying Time Indicator Lights
12. Sample Indicator Light
13. Power Switch
14. Start/Stop Switches
15. Take-Away Auger Switches

CALC-U-DRI GRAIN FLOW CONTROL FUNCTIONS

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: 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: a) a drying period, (b) a sample period, (c) an unloading period if the grain has dried to the desired moisture content.

   (a) 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 setpoint is checked, after which, 0.0 will be displayed for the remainder of the drying period.

   (b) 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 setpoint, it will start the unloading period; if the grain is 0.3% or more wetter than the setpoint, then it will stop discharging grain after the 2 minute period and return to the drying period.

   (c) The unloading period is when the unit is discharging grain that has dried below the setpoint moisture. It will continue until the Calc-U-Dri senses grain that is 0.3% or more wetter than the setpoint. The unit will then switch to the drying period.

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.

5. Drying Time Adjustments: 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".

NOTE: It is possible to adjust the circuit board to provide different sample and drying period times. See Appendix A on page 88.

CALC-U-DRI GRAIN FLOW CONTROL FUNCTIONS (continued)

6. Two 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 Shutdown 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, page 68).

9. Calibration Adjustment: 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.

NOTE: The calibration will change when this knob is turned even if the value is not being displayed.

10. Set Point Adjustment: 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.

NOTE: The set point value will change when this knob is turned, even if the value is not being displayed.

11. Drying Time Indicator Lights: These lights indicate the length of the drying period before the next sample is taken. (See #5. Drying Time Adjustment)

12. Sample Indicator Light: This light is “ON” when the unit is in the “Sample Period”.

NOTE: The length of the sample period can be changed by adjusting the circuit board. See Appendix A on page 88.

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.

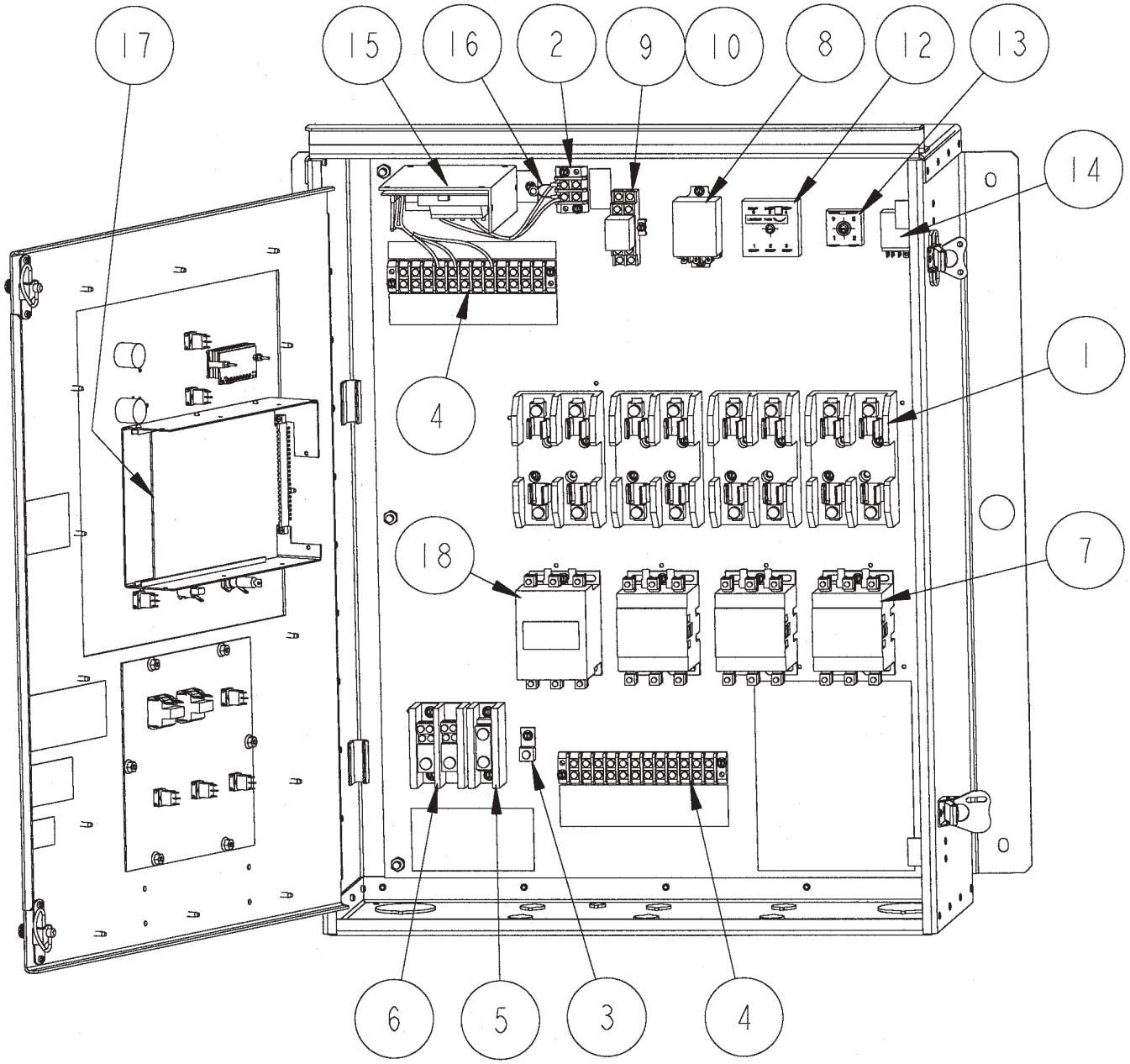
15. Take-Away Auger Switches: These switches control auxiliary augers used to take grain away from the Grain Flow discharge auger. The power switch must be “ON” to activate these switches. They will immediately start any auger when switched to **MANUAL** position. In **AUTO**, the equipment will start 3 seconds before the Grain Flow discharge auger starts, and will continue to run for 20 seconds after it has stopped.

NOTE: These switches must be in the **AUTO** position during any automatic operation.

GRAIN FLOW MOTOR ONLY
FUSES & 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 PH	10 HP, 230V, 3 PH	10 HP, 440V, 3 PH	10 HP, 575V, 3 PH
8 AMP, FRS FUSE IEL0745			3													
12 AMP, FRS FUSE IEL0742							3									
17-1/2 AMP, FRS FUSE IEL0743											3					3
20 AMP, FRS FUSE IEL0741															3	
15 AMP, FRN FUSE IEL0728		3														
20 AMP, FRN FUSE IEL0729	2					3										
35 AMP, FRN FUSE IEL0731										3						
40 AMP, FRN FUSE IEL0732					2									3		
60 AMP, FRN FUSE IEL0735									2				2			
#B 6.90 THERMAL UNIT IEL0769			3													
#B 9.10 THERMAL UNIT IEL0767							3									
#B 14 THERMAL UNIT IEL0761		3														
#B 15.5 THERMAL UNIT IEL0764											3					3
#B 22 THERMAL UNIT IEL0783						3									3	
#B 32 THERMAL UNIT IEL0865										3						
#B 40 THERMAL UNIT IEL0785														3		
FUSE REDUCER IEL0718	4	6				6										

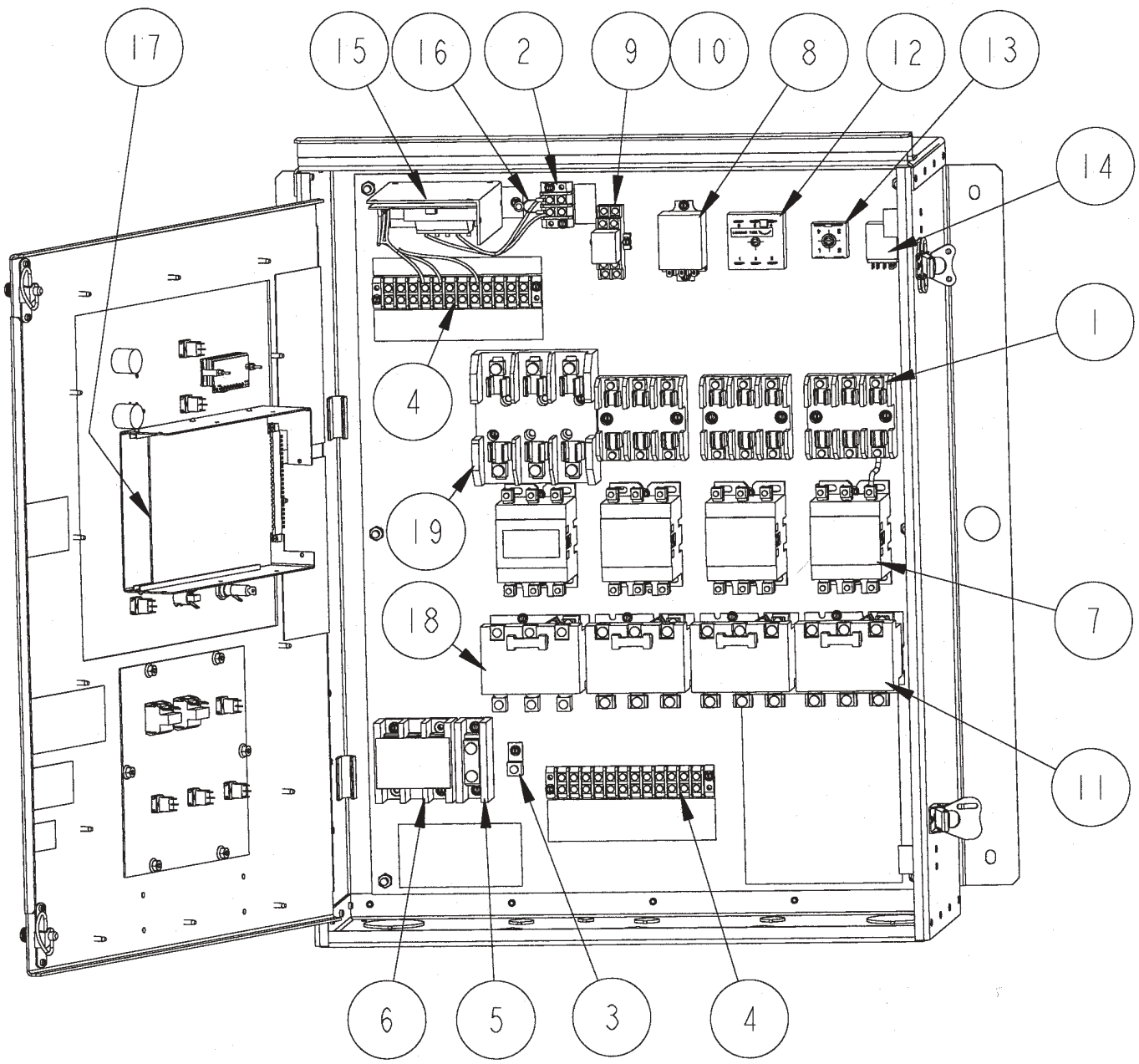
GRAIN FLOW CONTROL BOX
230V, 1 PH



GRAIN FLOW CONTROL BOX
230V, 1 PH

INDEX	PART	DESCRIPTION	QTY
1	1EL0830	FUSEHOLDER- BLOCK, (CSA) 2 POLE, 60 AMP, 250 V,	4
2	1EL0879	TERMINAL BLOCK- DBL(CSA) 2 TERM, 30 AMP, 250 V,	1
3	1EL0891	LUG- GROUND, #TA-2(CSA) 600 VOLT, #2-14 WIRE,	1
4	1EL0900	TERMINAL BLOCK- DBL(CSA) 12 TERM, 30 AMP, 250 V,	2
5	1EL0909	POWER DIST. BLOCK (CSA) ONE CIRCUIT, 600 VOLT,	1
6	1EL0910	POWER DIST. BLOCK- (CSA) TWO CIRCUIT, 600 VOLT	1
7	2EL0243	CONTACTOR- MAGNETIC(CSA) 40 AMP, 120V COIL,	3
8	2EL0273	RELAY- GEN. PURPOSE(CSA) 3PDT, 5A, 120V (DELTROL)	1
9	2EL0274	RELAY- GEN. PURPOSE(CSA) MODEL LY, DPDT, 12 VDC	1
10	2EL0275	RELAY- SOCKET, (CSA) (IDEC #SH2B-02 ONLY)	1
12	602E047	TIMER- OFF DELAY, 20 SEC ASSEMBLY, (ADJUSTABLE)	1
13	602E048	TIMER- ON DELAY, 3 SEC ASSEMBLY(NONADJUSTABLE)	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	2EL0247	CONTACTOR- MAGNETIC 50 AMP, 120V COIL,	1
20	FUSES (NOT SHOWN)	SEE FUSE & THERMAL UNIT CHART FOR REQUIRED SIZES	A/R

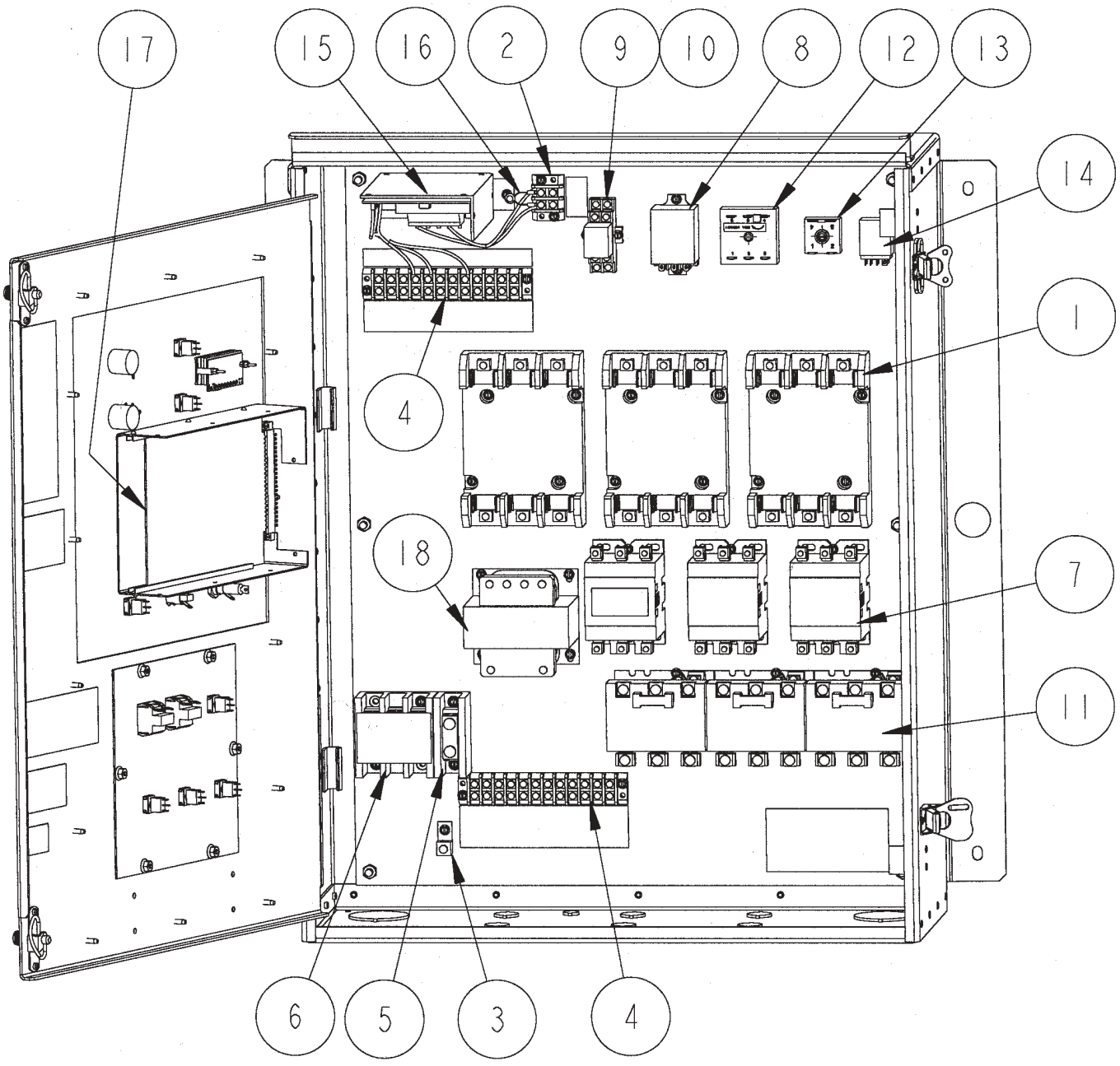
GRAIN FLOW CONTROL BOX
230V, 3 PH



GRAIN FLOW CONTROL BOX
230V, 3 PH

INDEX	PART	DESCRIPTION	QTY
1	1EL0836	FUSEHOLDER- BLOCK, (CSA) 3 POLE, 30 AMP, 250 VOLT	3
2	1EL0879	TERMINAL BLOCK- DBL(CSA) 2 TERM, 30 AMP, 250 V,	1
3	1EL0891	LUG- GROUND, #TA-2(CSA) 600 VOLT, #2-14 WIRE,	1
4	1EL0900	TERMINAL BLOCK- DBL(CSA) 12 TERM, 30 AMP, 250 V,	2
5	1EL0909	POWER DIST. BLOCK (CSA) ONE CIRCUIT, 600 VOLT,	1
6	1EL0911	POWER DIST. BLOCK- (CSA) THREE CIRCUIT, 600 VOLT,	1
7	2EL0243	CONTACTOR- MAGNETIC(CSA) 40 AMP, 120V COIL,	4
8	2EL0273	RELAY- GEN. PURPOSE(CSA) 3PDT, 5A, 120V (DELTROL)	1
9	2EL0274	RELAY- GEN. PURPOSE(CSA) MODEL LY, DPDT, 12 VDC	1
10	2EL0275	RELAY- SOCKET, (CSA) (IDEC #SH2B-02 ONLY)	1
11	2EL0281	RELAY- THRML OVERLD(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(NONADJUSTABLE)	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	FUSEHOLDER- BLOCK, 3 POLE, 60 AMP, 250 VOLT	1
20	FUSES/THERMAL UNITS (NOT SHOWN)	SEE FUSE & THERMAL UNIT CHART FOR REQUIRED SIZES	A/R

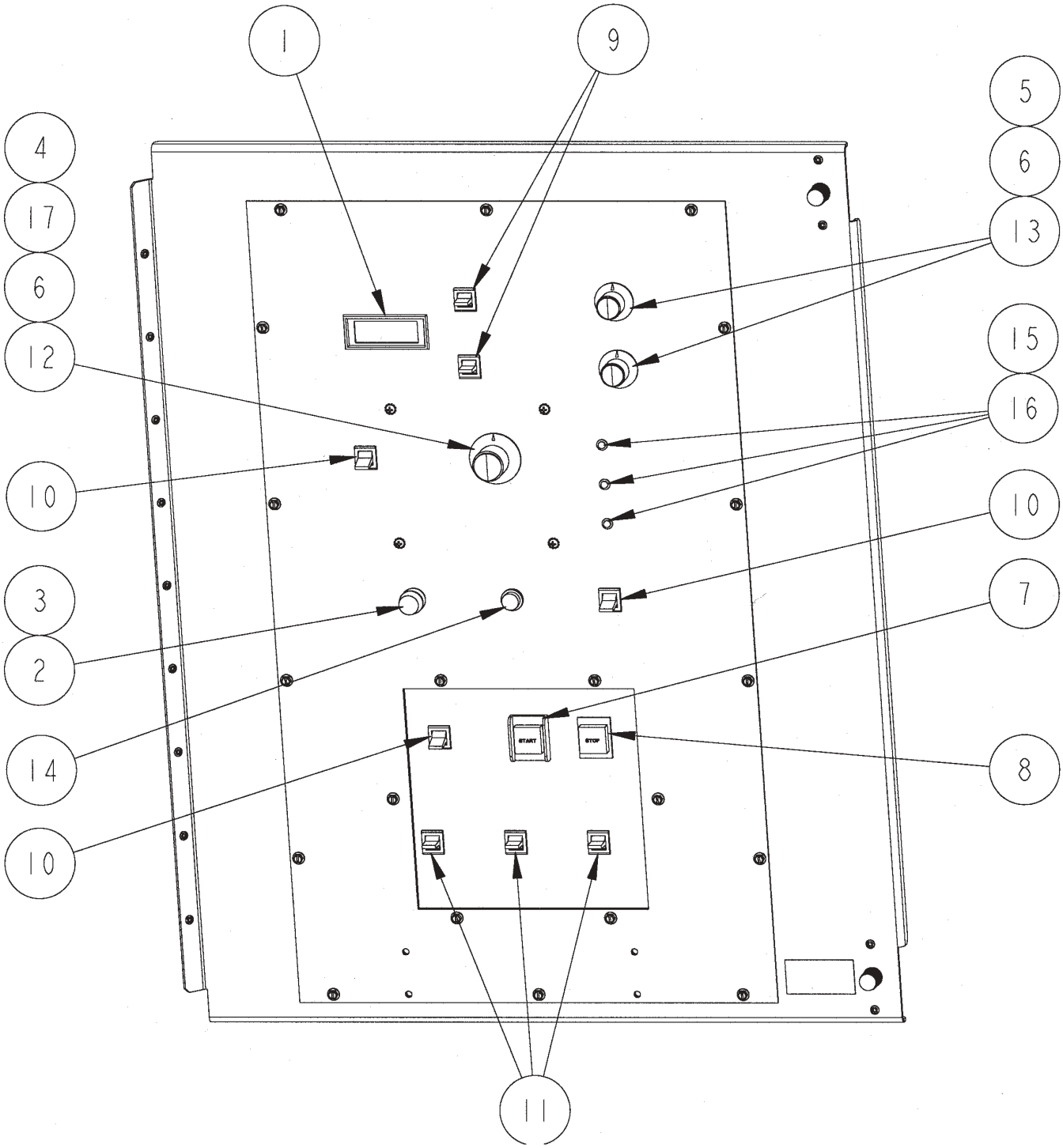
GRAIN FLOW CONTROL BOX
440V, 3 PH



GRAIN FLOW CONTROL BOX
440V, 3 PH

INDEX	PART	DESCRIPTION	QTY
1	1EL0837	FUSEHOLDER- BLOCK, (CSA) 3 POLE, 30 AMP, 600 VOLT	3
2	1EL0879	TERMINAL BLOCK- DBL(CSA) 2 TERM, 30 AMP, 250 V,	1
3	1EL0891	LUG- GROUND, #TA-2(CSA) 600 VOLT, #2-14 WIRE,	1
4	1EL0900	TERMINAL BLOCK- DBL(CSA) 12 TERM, 30 AMP, 250 V,	2
5	1EL0909	POWER DIST. BLOCK (CSA) ONE CIRCUIT, 600 VOLT,	1
6	1EL0911	POWER DIST. BLOCK- (CSA) THREE CIRCUIT, 600 VOLT,	1
7	2EL0243	CONTACTOR- MAGNETIC(CSA) 40 AMP, 120V COIL,	3
8	2EL0273	RELAY- GEN. PURPOSE(CSA) 3PDT, 5A, 120V (DELTROL)	1
9	2EL0274	RELAY- GEN. PURPOSE(CSA) MODEL LY, DPDT, 12 VDC	1
10	2EL0275	RELAY- SOCKET, (CSA) (IDEC #SH2B-02 ONLY)	1
11	2EL0281	RELAY- THRML OVERLD(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(NONADJUSTABLE)	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
20	FUSES/THERMAL UNITS (NOT SHOWN)	SEE FUSE & THERMAL UNIT CHART FOR REQUIRED SIZES	A/R

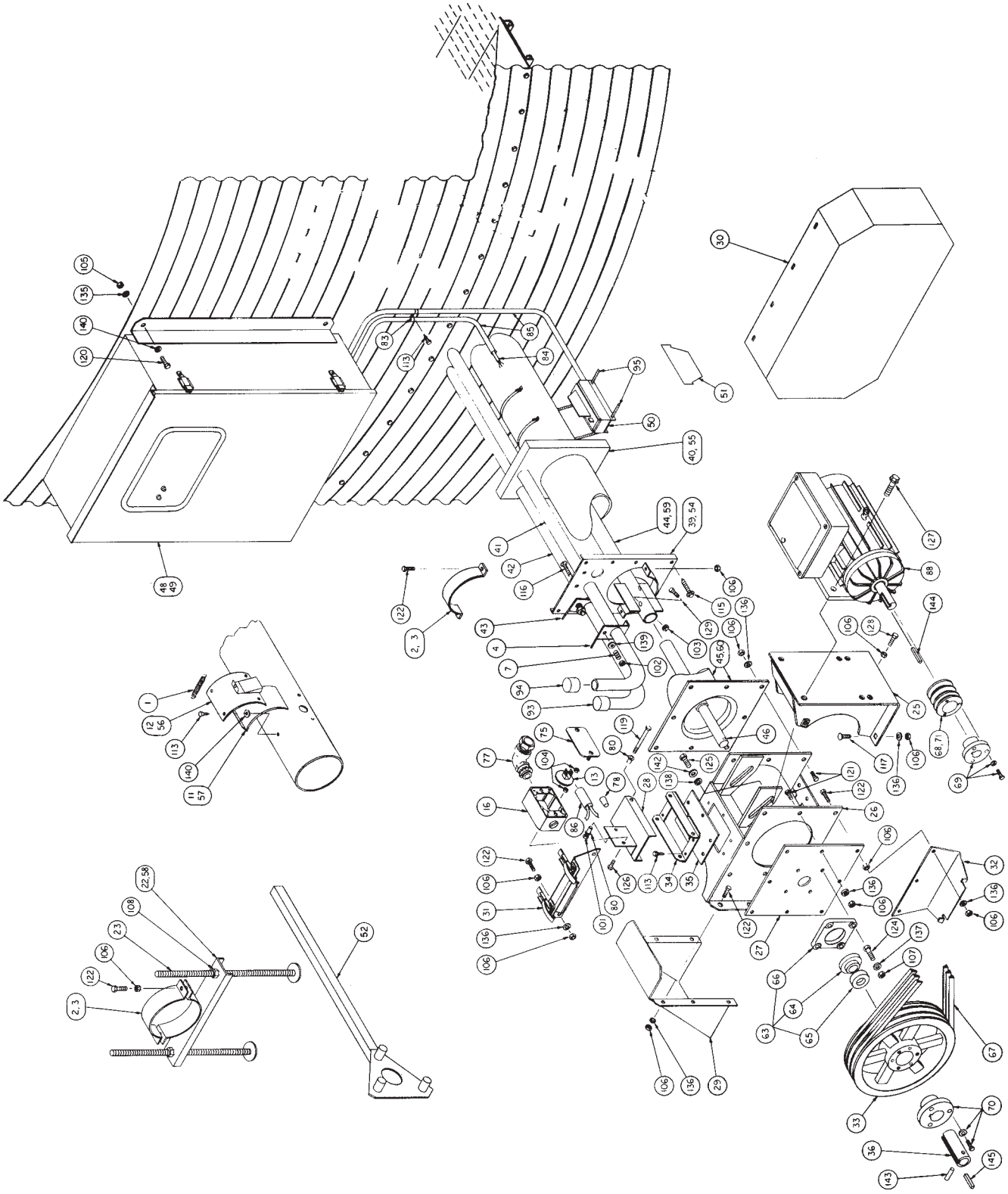
GRAIN FLOW
CONTROL MODULE



GRAIN FLOW
CONTROL MODULE

INDEX	PART	DESCRIPTION	QTY
1	5041198	DIGITAL PANEL METER- SUBASSEMBLY (2EL0692)	1
2	1EL0719	FUSE- AGC,CARTRIDGE(CSA) 2 AMP, 250 VOLT	1
3	1EL0826	FUSEHOLDER- PAN MNT(CSA) 30 AMP, 250 VOLT, (HKP)	1
4	1EL0852	KNOB- CONTROL, BLACK 1 DIA, FOR 1/4 SHAFT	1
5	1EL0921	KNOB- CONTROL, BLACK .72 DIA, FOR 1/4 SHAFT	2
6	1EL2042	GROMMET- RUBBER, .62 OD X .38 ID X .15 T	3
7	2EL0618	SWITCH- PUSHB, SPST(CSA) MOM, NORM, OPEN, GREEN	1
8	2EL0619	SWITCH- PUSHB, SPST(CSA) MOM, NORM, CLOSED, RED	1
9	2EL0658	SW-LVR,SPDT,(ON)-OFF-(ON) #ULI3L5S5ZQEJ4J90-22/CSA	2
10	2EL0659	SW-LVR,SPDT, ON-NONE-ON #ULIIL5S5ZQEJ4J90-22/CSA	3
11	2EL0668	SW-LVR,SPDT, ON-OFF-ON #ULI2L5S5ZQEJ4J90-22/CSA	3
12	2EL0671	POTENTIOMETER- 2.5M OHM, CLAROSTAT #RV4NAYSD255B	1
13	2EL0672	POTENTIOMETER- 10K OHM SPECTROL #534-10K	2
14	2ELI161	LIGHT- INDICATOR,RED(CSA) (IDI #1050QC1)	1
15	2ELI163	LIGHT- LED, RED (CHICAGO #HLMP-3750)	3
16	2ELI164	LIGHT- LED CLIP & RING (CHICAGO #CMP52)	3
17	3FH0963	WASHER- FLAT, STEEL/PLTD .500 OD X .283 ID X .062	1

DISCHARGE & POWER UNIT



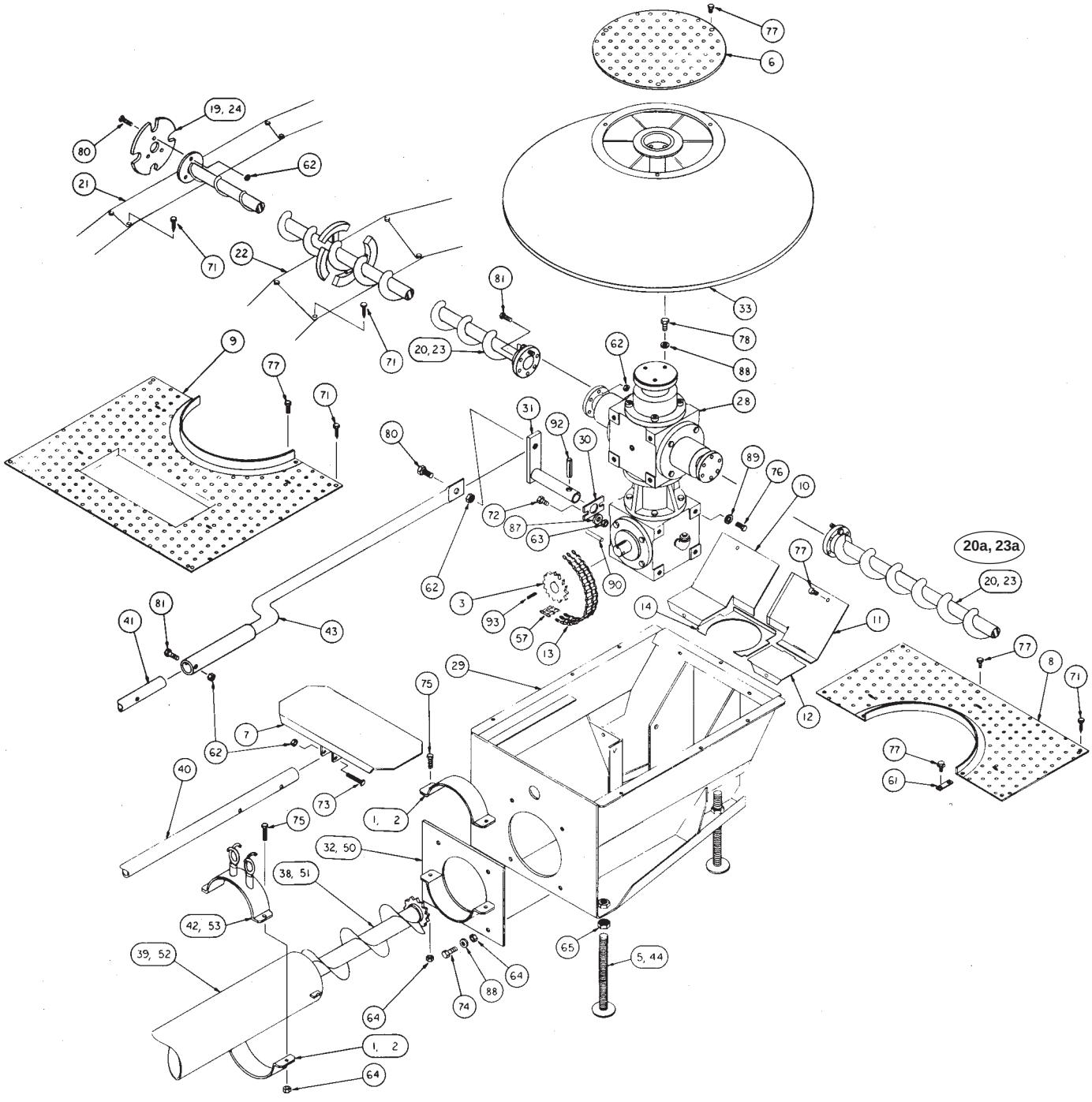
DRAWING I

DISCHARGE & POWER UNIT

REF. NO.	PART NUMBER	NO. REQ'D. 6"	8"	DESCRIPTION
1	104B2056	1	1	Extension spring
2	205C0002	0	1	Clamping band, 8"
3	601B0003	1	0	Clamping band, 6"
4	601C0021	1	1	Slide gate latch
7	601C0052	2	2	Compression spring
11	601C0081	1	0	Slide gate grain sampler, 6"
12	601C0082	1	0	Retaining cover sample slide gate, 6"
13	601C0103	1	1	Switch holder
16	601E0044	2	2	Outlet box (2" x 4")
22	601C0070	1	0	Tube end support-6" (optional)
23	601C0072	2	2	Adjustable leg-18" (optional)
25	602A002	1	1	Power unit motor mount
26	602A003	1	1	Power unit discharge chute
27	602A020	1	1	Bearing plate
28	602A040	1	1	Auger overload cover
29	602A025	1	1	Discharge chute shield
30	602A026	1	1	Power unit shield
31	602A029	1	1	Shield support latch (top)
32	602A032	1	1	Shield support (bottom)
33	602A033	1	1	Pulley, 12.8, 3B (requires taper lock bushing)
34	602A036	1	1	Overload switch frame
35	602A039	1	1	Overload switch rubber diaphragm
36	602C009	1	1	Drive hub-discharge auger
39	602C016	1	0	Wall plate-6" discharge
40	602C018	1	0	Wall seal-6" discharge tube
41	602C019	1	1	Slide gate tube (specify bin diameter)
42	602C021	1	1	Shift lever tube (specify bin diameter)
43	602C025	1	1	Shift lever tube latch
44	**6023064**	1	0	Discharge auger, 5" (specify bin diameter)
45	602C035	1	0	Discharge tube, 6" (specify bin diameter)
46	602C037	1	1	Stub shaft-discharge auger
49	**5041143**	1	1	Calc-U-Dri control box assembly, 1Ø, 230V
	5041144	1	1	Calc-U-Dri control box assembly, 3Ø, 230V
	5041145	1	1	Calc-U-Dri control box assembly, 3Ø, 440V
50	602E020	1	1	Calc-U-Dri sensor assembly ("Calc-U-Dri" only)
51	602E091	1	1	Sensor clearance gage ("Calc-U-Dri" only)
52	602M001	1	1	Breaker bar
54	603C006	0	1	Wall plate-8" discharge tube
55	603C008	0	1	Wall seal-8" discharge tube
56	603C010	0	1	Retaining cover grain sampler, 8"
57	603C012	0	1	Slide gate grain sampler, 8"
58	603C013	0	1	Tube end support, 8" (optional)
59	**6033022**	0	1	Discharge auger, 7" (specify bin diameter)
60	603C019	0	1	Discharge tube, 8" (specify bin diameter)
63	**PT0144**	1	1	Complete precision bearing, eccentric lock, 1-1/4"
64	**PT0212**	1	1	Bearing, 1-1/4" with eccentric locking collar
65	**PT0403**	1	1	Eccentric locking collar, 1-1/4"
66	**PT0419**	1	1	4-bolt cast bearing housing
67	**PT0531**	3	3	V-belt, BX-51 (matched)
68	**PT0639**	1	0	Pulley, 4"-3B (requires taper lock bushing) 6"
69	PT0771	1	0	Taper lock bushing, 1-1/8" w/hardware (6", 18'-36')
	PT0790	1	0	Taper lock bushing, 1-3/8" w/hardware (6", 36'1"-42')
70	PT0783	1	1	Taper lock bushing, 2" w/hardware
71	PT0587	0	1	Pulley, 3-1/2" x 1-1/8"-3B (18'-36') 8"
	PT0588	0	1	Pulley, 3-1/2" x 1-3/8"-3B (36'1"-42') 8"

REF. NO.	PART NUMBER	NO. REQ'D. 6"	8"	DESCRIPTION
75	1EL0324	2	2	Cover-outlet box
76	1EL0441	1	1	Liquidtite straight connector, 1/2" ("Dry Grain" only)
77	1EL0442	1	1	Liquidtite 90° conduit connector, 1/2"
78	1EL0553	4	4	Wire twist connector, gray
80	1EL2003	2	2	Nylon bushing-.513 OD x .260 ID x 13/16"
81	1EL2116	1	1	Wire clip ("Dry Grain" only)
82	1EL2081	7	7	Cable clamp-nylon, 1/4" ("Dry Grain" only)
83	1EL2084	14	14	Cable clamp-nylon, 13/16"
84	1EL3017	25'	25'	18/3 SJ wire
85	1EL3045	49'	49'	Liquidtite conduit, 1/2"
86	2EL0605	1	1	Mercury switch, 16°
87	2EL0636	1	1	Switch burner shut-off w/activator & mtg. bolts ("Dry Grain" only)
88	3EL5104	1	1	3HP motor-3 phase (18' bins)
	3EL5112	1	1	3HP motor-1 phase (18' bins)
	3EL5114	1	1	5HP motor-1 phase (21'-24' bins)
	3EL5120	1	1	5HP motor-3 phase (21'-24' bins)
	3EL5116	1	1	7-1/2HP motor-1 phase (27'-36' bins)
	3EL5117	1	1	7-1/2HP motor-3 phase (27'-36' bins)
	3EL5118	0	1	10HP motor-1 phase (42' bins)
	3EL5119	0	1	10HP motor-3 phase (42' bins)
93	MS0019	1	1	Plastic caps, 1"
94	MS0083	1	1	Plastic caps, 1-5/16"
95	MS0359	2	2	Worm gear clamp, 32" long ("Calc-U-Dri" only)
100	1FH0725	1	1	Hex lock nut, #8-32 ("Dry Grain" only)
101	1FH0734	1	1	Hex lock nut, 1/4"
102	1FH0735	2	2	Hex lock nut, 5/16"
103	1FH0738	2	2	Hex lock nut, 1/2"
104	1FH0763	4	4	Hex nut, 1/4"
105	1FH0764	4	4	Hex nut, 5/16"
106	1FH0765	30	30	Hex nut, 3/8"
107	1FH0766	4	4	Hex nut, 7/16"
108	1FH0770	4	4	Hex nut, 3/4" (optional)
113	2FH0486	A/R	A/R	Self-drilling hex washer head screw, #10 x 3/4#
115	2FH0491	8	8	Hex washer head screw-self-drilling, 1/4" x 1-1/2""
116	2FH0650	2	2	Carriage bolt, 5/16" x 2"
117	2FH0660	3	3	Carriage bolt, 3/8" x 1"
118	2FH0800	1	1	Machine screw-truss head, #8-32 x 2-1/2" ("Dry Grain" only)
119	2FH0818	1	1	Hex bolt, 1/4" x 4-1/2"
120	2FH0832	4	4	Hex bolt, 5/16" x 1-1/2"
121	2FH0855	10	10	Hex bolt, 3/8" x 1"
122	2FH0856	14	14	Hex bolt, 3/8" x 1-1/4"
123	2FH0857	2	2	Hex bolt, 3/8" x 1-1/2" ("Dry Grain" only)
124	2FH0882	4	4	Hex bolt, 7/16" x 1-1/2"
125	2FH0904	2	2	Hex bolt, 1/2" x 1-1/4"
126	2FH0982	2	2	Hex flange whiz lock screw, 1/4" x 7/8"
127	2FH0984	4	4	Hex flange whiz lock screw, 3/8" x 1-1/4"
128	2FH1034	1	1	Hex bolt, 3/8" x 2", full thread
129	2FH5339	2	2	Hex bolt, 1/2" x 2-1/2", grade 5
135	3FH0790	4	4	Lock washer, 5/16"
136	3FH0791	27	27	Lock washer, 3/8"
137	3FH0792	4	4	Lock washer, 7/16"
138	3FH0793	2	2	Lock washer, 1/2"
139	3FH0863	2	2	Flat washer, 1/4"
140	3FH0864	8	8	Flat washer, 5/16"
141	3FH0865	2	2	Flat washer, 3/8" ("Dry Grain" only)
142	3FH0867	2	2	Flat washer, 1/2"
143	3FH0894	1	1	Spring pin, 3/8" x 2"
144	3FH1030	1	1	Square key, 1/4" x 2"
145	3FH1041	1	1	Square key, 1/2" x 2"

CENTER SUMP AND GEAR BOX ASSEMBLY

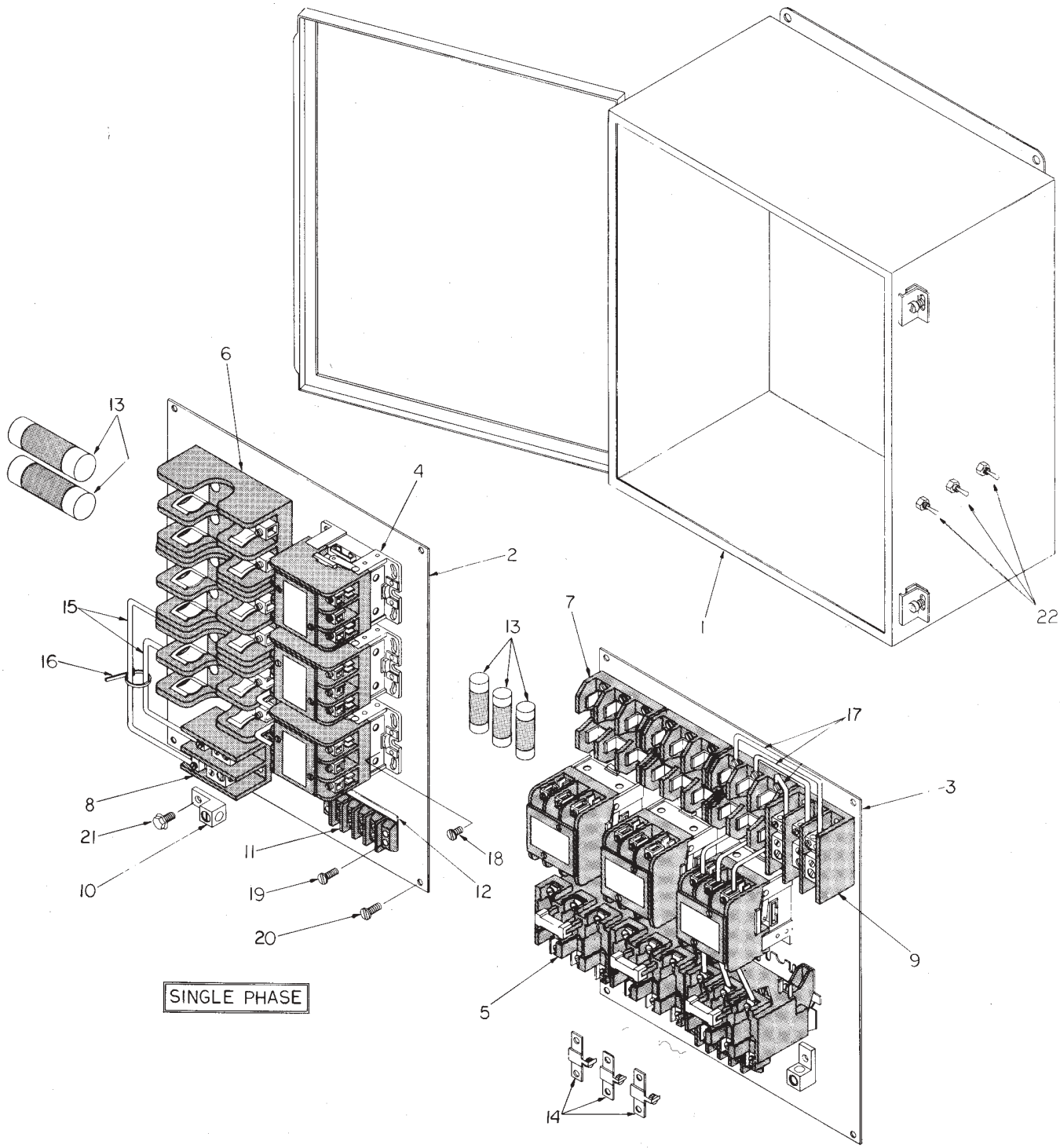


DRAWING II

CENTER SUMP AND GEAR BOX ASSEMBLY

REF. NO.	PART NUMBER	NO. REQ'D. 6"	NO. REQ'D. 8"	DESCRIPTION
1.	205C0002	0	2	Clamping Band, 8"
2.	601B0003	2	0	Clamping Band, 6"
3.	601B0005	1	1	Roller Chain Sprocket, 14T.
5.	601B0015	4	4	Adjustable Leg - 8" long
6.	601B0016	1	1	Perforated Hood Cover
7.	601B0038	1	1	Slide Gate
8.	601B0042	1	1	Perforated Cover Plate (Small Section)
9.	601B0043	1	1	Perforated Cover Plate (Large Section)
10.	601B0044	1	1	Gearbox Cover - Left Upper Section
11.	601B0045	1	1	Gearbox Cover - Right Upper Section
12.	601B0046	1	1	Gearbox Cover - Right Lower Section
13.	601B0049	1	1	Roller Chain, #50 Double Strand
14.	601B0091	1	1	Gearbox Center Seal Ring
19.	602C050	2	2	Auger Wheel - Plain (For 1¼ dia. shaft)
20.	602C042	2	2	Floor Auger (Specify Bin Diameter) - Plain (1¼ dia. shaft)
20a	6023069			1450 BU/HR Floor Auger
21.	601C0108	A/R	A/R	Floor Wear Plate - Outside (Specify Bin Diameter)
22.	601C0109	A/R	A/R	Floor Wear Plate - Inside (Specify Bin Diameter)
23.	602C051	1	1	Floor Auger - Hardsurfaced (Specify Bin Diameter) (1¼ dia. shaft)
23a	6023075			1450 BU/HR Hardsurfaced Floor Auger
24.	602C054	2	2	Auger Wheel - Hardsurfaced (For 1¼ dia. shaft)
28.	602B001	1	1	Gearbox (Painted White)
29.	602B012	1	1	Sump
30.	602B014	1	1	Shift Lever Support Plate
31.	602B015	1	1	White Shift Lever
32.	602B018	1	0	Sump Clamp Plate, 6"
33.	602B020	1	1	Center Hood
38.	6023064	1	0	Discharge Auger, 6" (Specify Bin Diameter)
39.	602C035	1	0	Discharge Tube, 6" (Specify Bin Diameter)
40.	602C019	1	1	Slide Gate Tube (Specify Bin Diameter)
41.	602C021	1	1	Shift Lever Tube (Specify Bin Diameter)
42.	602C026	1	0	Support Clamp-Extension Tube, 6"
43.	602C028	1	1	Shift Lever Offset Tube
44.	602B024	4	4	Adjustable Leg, 4" long
50.	603B001	0	1	Sump Clamp Plate, 8"
51.	6033022	0	1	Discharge Auger, 8" (Specify Bin Diameter)
52.	603C019	0	1	Discharge Tube, 8" (Specify Bin Diameter)
53.	603C009	0	1	Support Clamp-Extension Tube, 8"
57.	PT1050	1	1	Connecting Link, #50 Double Strand
61.	1FH0610	2	2	Threaded Strap, 1/4"
62.	1FH0735	22	22	Hex Lock Nut, 5/16"
63.	1FH0764	1	1	Hex Nut, 5/16"
64.	1FH0765	8	8	Hex Nut, 3/8"
65.	1FH0770	4	4	Hex Nut, 3/4"
71.	2FH0491	A/R	A/R	Hex Flange Head Screw, Self-Drilling, 1/4" x 1-1/2"
	3FH0535	A/R	A/R	Rivet, Steel Body & Mandrell, 1/4" .626-.750 Grip Range
72.	2FH0830	1	1	Hex Bolt, 5/16" x 1"
73.	2FH0834	2	2	Hex Bolt, 5/16" x 2"
74.	2FH0855	4	4	Hex Bolt, 3/8" x 1"
75.	2FH0856	4	4	Hex Bolt, 3/8" x 1-1/4"
76.	2FH0903	8	8	Hex Bolt, 1/2" x 1"
77.	2FH0980	18	18	Hex Flange Head Whiz Lock Screw, 1/4" x 1/2"
78.	2FH5293	3	3	Hex Bolt, 3/8" x 1-1/4", Grade 5
80.	2FH5269	7	7	Hex Bolt, 5/16" x 1", Grade 5
81.	2FH5271	11	11	Hex Bolt, 5/16" x 1-1/2", Grade 5
87.	3FH0790	1	1	Lock Washer, 5/16"
88.	3FH0791	7	7	Lock Washer, 3/8"
89.	3FH0793	8	8	Lock Washer, 1/2"
90.	3FH0896	1	1	Spring Pin, 5/16" x 2"
92.	3FH0936	1	1	Spring Pin, 7/32" x 1"
93.	3FH1026	1	1	Square Key, 1/4" x 1"

TAKE-AWAY AUGER CONTROL BOX



DRAWING III

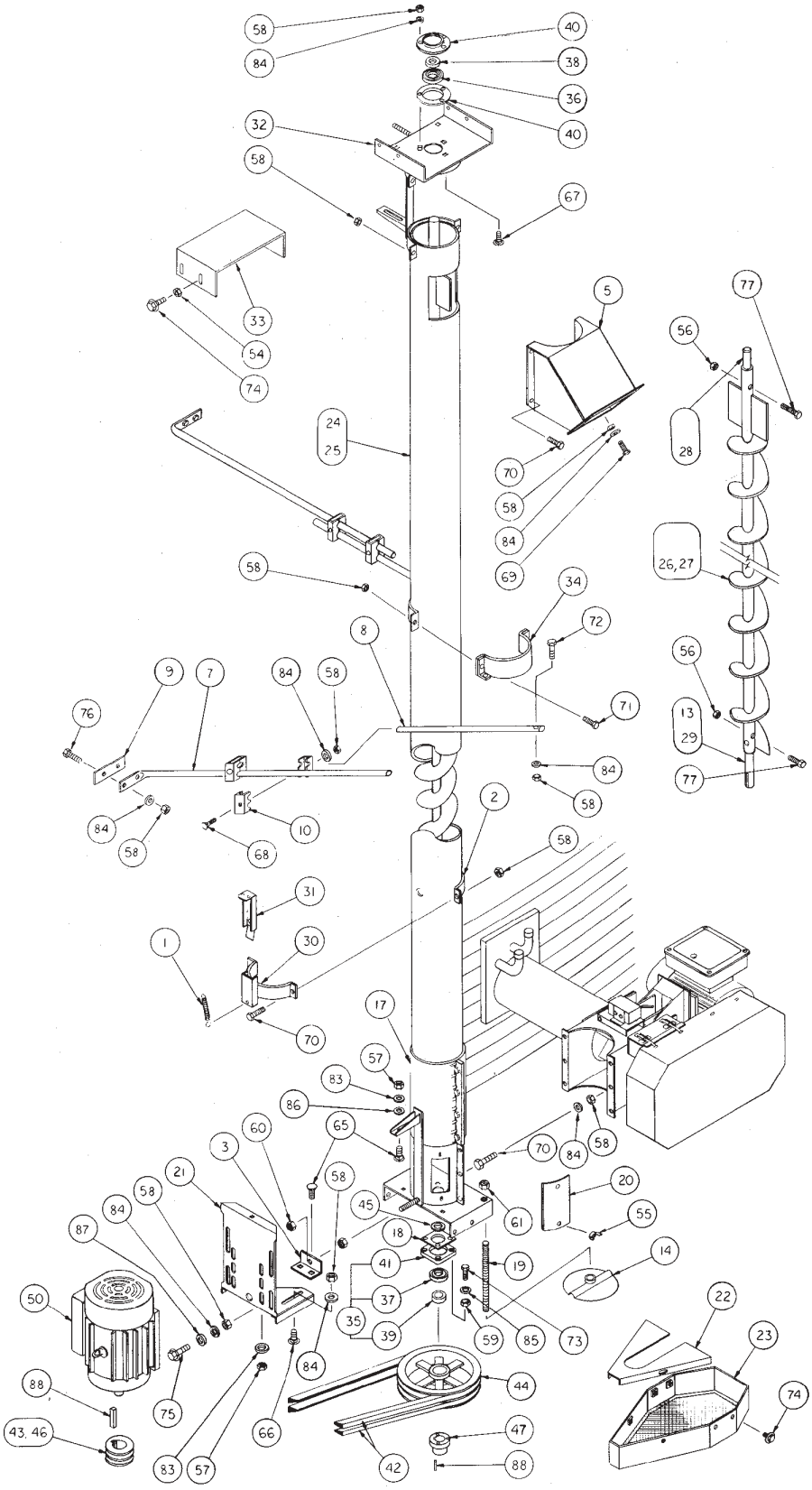
TAKE-AWAY AUGER CONTROL BOX

REF. NO.	PART NUMBER	NO. REQ'D.	DESCRIPTION
1.	601E0049	1	Control Box - Electrical
2.	601E0032	1	Inside Mounting Panel - 1 Phase Unit
3.	601E0033	1	Inside Mounting Panel - 3 Phase Unit
4.	2EL0243	A/R 1-3	Magnetic Contactor - 3 Pole
5.	2EL0281	A/R 1-3	Thermal Overload Relay - 3 Phase
6.	1EL0830	A/R 1-3	Fuse Holder Block - 1 Phase, 35-60 Amp.
7.	1EL0836	A/R 1-3	Fuse Holder Block - 3 Phase, 30 Amp.
8.	1EL0910	1	Power Distribution Block - 1 Phase Unit
9.	1EL0911	1	Power Distribution Block - 3 Phase Unit
10.	1EL0891	1	Grounding Terminal Lug
11.	1EL0882	1	Terminal Block
12.	1EL0896	1	Terminal Block No. Strip
*13.	1EL0728**	A/R	Fuse, 15A, 1½HP, 230V, 1PH
	1EL0729**	A/R	Fuse, 20A, 2HP, 230V, 1PH
	1EL0731	A/R	Fuse, 35A, 3HP, 230V, 1PH
	1EL0732	A/R	Fuse, 40A, 5HP, 230V, 1PH
	1EL0735	A/R	Fuse, 60A, 7½HP, 230V, 1PH
	1EL0736	A/R	Fuse, 10A, 1½HP, 230V, 3PH
	1EL0736	A/R	Fuse, 10A, 2HP, 230V, 3PH
	1EL0728	A/R	Fuse, 15A, 3HP, 230V, 3PH
	1EL0729	A/R	Fuse, 20A, 5HP, 230V, 3PH
	1EL0730	A/R	Fuse, 30A, 7½HP, 230V, 3PH
	1EL0737	A/R	Fuse, 5A, 1½HP, 440V, 3PH
	1EL0737	A/R	Fuse, 5A, 2HP, 440V, 3PH
	1EL0745	A/R	Fuse, 8A, 3HP, 440V, 3PH
	1EL0742	A/R	Fuse, 12A, 5HP, 440V, 3PH
	1EL0743	A/R	Fuse, 17.5A, 7½HP, 440V, 3PH
	1EL0741	A/R	Fuse, 20A, 10HP, 600V, 3PH
*14			Thermal unit
	1EL0767	A/R	(B9.10) 1½HP, 230V, 3PH
	1EL0782	A/R	(B10.2) 2HP, 230V, 3PH
	1EL0761	A/R	(B14) 3HP, 230V, 3PH
	1EL0759	A/R	(B25) 5HP, 230V, 3PH
	1EL0760	A/R	(B36) 7½HP, 230V, 3PH
	1EL0859	A/R	(B4.15) 1½HP, 440V, 3PH
	1EL0778	A/R	(B4.85) 2HP, 440V, 3PH
	1EL0762	A/R	(B7.70) 3HP, 440V, 3PH
	1EL0763	A/R	(B11.5) 5HP, 440V, 3PH
	1EL0776	A/R	(B17.5) 7½HP, 440V, 3PH
	1EL0783	A/R	(B22) 10HP, 440V, 3PH
15.	1EL3002	(State Length Req.)	Wire #8
16.	1EL2112	A/R	Nylon Wire Tie
17.	1EL3001	(State Length Req.)	Wire #10
18.	2FH0466	A/R	Machine Screw - Self-Tapping, Pan Hd. #8-32 x 1/2"
		6-14	1 Phase Unit
		8-20	3 Phase Unit
19.	2FH0468	2	Machine Screw - Self-Tapping, Pan Hd. #8-32 x 3/4"
20.	2FH0787	4	Machine Screw - Pan Hd. #10-24 x 1/2"
21.	2FH0980	1	Hex Flange Whiz Lock Screw, 1/4" x 1/2"
22.	2EL0627	3	Toggle Switch (3 Position)

*Not sent with original box, must be ordered separately.

** 1EL0718 - fuse reducer required (2 per fuse)

VERTICAL AUGER

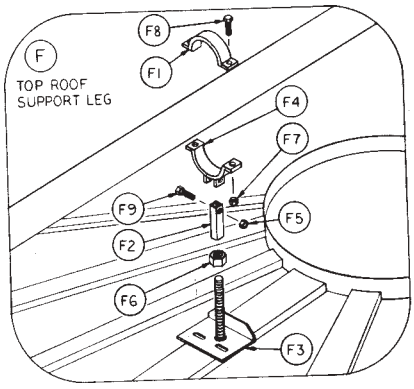


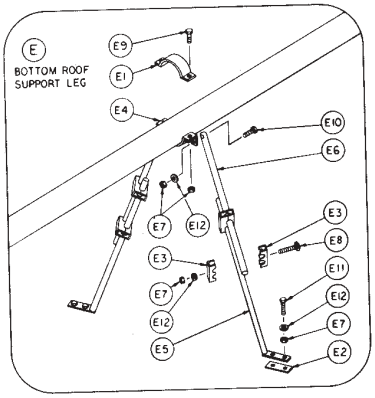
DRAWING IX

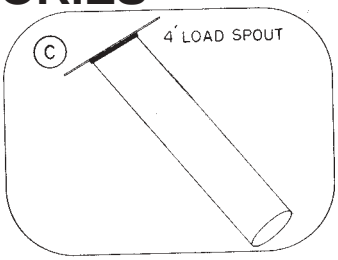
VERTICAL AUGER

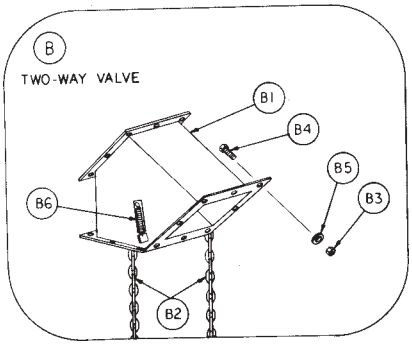
REF. NO.	PART NO.	NO. REQ'D	DESCRIPTION
1.	104B2056	1	Extension Spring
2.	205C0002	2	Clamping Band, 8" x 2"
3.	205C0003	1	Motor Mount Angle
5.	601D0060	1	Vertical Discharge Spout 45 degree
7.	601D0062	2	Bin Wall Tube (2 hole)
8.	601D0063	2	Adjustment Tube (1 hole)
9.	601D0064	2	Backing Plate (Bin Wall)
10.	601D0065	8	Clamping Channel
14.	601D0082	2	Support Pad
17.	602D002	1	Auger Boot
18.	602D010	1	Boot Seal Plate
19.	602D011	2	Boot Adjustable Leg
20.	602D012	1	Boot Clean-Out Cover
21.	602D013	1	Boot Motor Mount
22.	602D015	1	Boot Belt Shield - Top
23.	602D016	1	Boot Belt Shield - Bottom
24.	602D024	1	Auger Tube, 15'
25.	602D025	1	Auger Tube, 18
26.	602D026	1	Screw Weldment, 15' (1-3/8" ID No Stub Shafts
27.	602D027	1	Screw Weldment, 18' (1-3/8" ID) No Stub Shafts
28.	602D032	1	Stub Shaft, 6" long, 1-3/8" stepped to 1/4" Dia.
29.	602D033	1	Stub Shaft (Keyed) 10-1/4" long, 1-3/8" stepped to 1-1/4" Diameter
30.	602D036	1	Vertical Auger Sampler
31.	602D037	1	Vertical Auger Sampler Slide Gate
32.	602D041	1	Vertical Auger Head
33.	602D044	1	Rain Shield
34.	602D045	1	8" Clamping Band W/Angle Bracket
35.	PT0116	1	Heavy Bearing 1-1/4" W/Locking Collar & 4 Bolt Hsg.
36.	PT0218	1	Bearing, 1-1/4" W/Eccentric Locking Collar
37.	PT0232	1	Heavy Bearing, 1-1/4" W/Eccentric Locking Collar
38.	PT0403	1	Eccentric Locking Collar 1-1/4"
39.	PT0405	1	Heavy Eccentric Locking Collar, 1-1/4"
40.	PT0425	2	3-Hole Stamped Flangette
41.	PT0429	1	4 Bolt Cast Housing (Heavy)
42.	PT0531	2	V-Belt, BX51 (Matched)
43.	PT0642	1	Pulley, 4" OD x 1-1/8" - 2B (8" Discharge Only)
44.	PT0677	1	Pulley, 11.35 OD x 2B, QD
45.	PT0824	1	Seal, 1-7/8" OD x 1-1/4" x 1/4"
46.	PT0567	1	Pulley, 3-1/2" OD X 1-1/8" 2B(6" Discharge Only)
47.	PT0789	1	Bushing, 1-1/4" SK hub, QD
50.	3EL5114	1	5 HP TEFC, 1 Phase
	3EL5120	1	5 HP 3 Phase
	3EL5116	1	7-1/2 HP TEFC, 1 Phase
	3EL5117	1	7-1/2 HP, 3 Phase
54.	1FH0763	4	Hex Nut, 1/4"
55.	1FH0579	2	Wing Nut, 1/4"
56.	1FH0738	3	Hex Lock Nut, 1/2"
57.	1FH0764	3	Hex Nut, 5/16"
58.	1FH0765	43	Hex Nut, 3/8"
59.	1FH0766	4	Hex Nut, 7/16"
60.	1FH0767	2	Hex Nut, 1/2"
61.	1FH0770	2	Hex Nut, 3/4"
65.	2FH0645	3	Carriage Bolt, 5/16" x 3/4"
66.	2FH0659	2	Carriage Bolt, 3/8" x 3/4"
67.	2FH0660	3	Carriage Bolt, 3/8" x 1"
68.	2FH0679	4	Carriage Bolt, 3/8" x 3", Full Thread
69.	2FH0855	8	Hex Bolt, 3/8" x 1"
70.	2FH0856	14	Hex Bolt, 3/8" x 1-1/4"
71.	2FH0857	2	Hex Bolt, 3/8" x 1-1/2"
72	2FH0859	2	Hex Bolt, 3/8" x 2"
73.	2FH0882	4	Hex Bolt, 7/16" x 1-1/2"
74.	2FH0980	10	Hex Flange Whiz Lock Screw, 1/4" x 1/2"
75.	2FH0984	4	Hex Flange Whiz Lock Screw, 3/8" x 1-1/4"
76.	2FH1034	4	Hex Bolt, 3/8" x 2", Full Thread
77.	2FH5339	3	Hex Bolt, 1/2" x 2-1/2", Grade 5
83.	3FH0790	3	Lock Washer, 5/16"
84.	3FH0791	33	Lock Washer, 3/8"
85.	3FH0792	4	Lock Washer, 7/16"
86.	3FH0864	1	Flat Washer, 5/16"
87.	3FH0865	4	Flat Washer, 3/8"
88.	3FH1030	2	Square Key, 1/4" x 2"

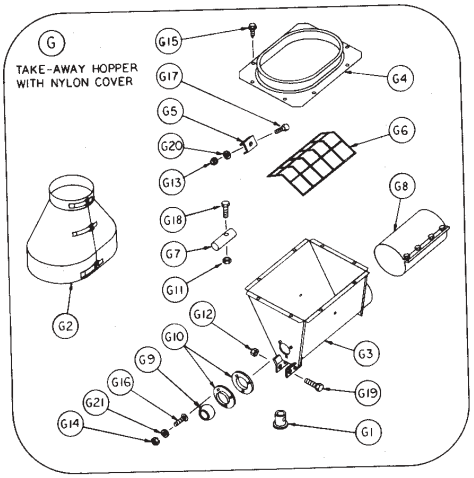
VERTICAL AUGER ACCESSORIES

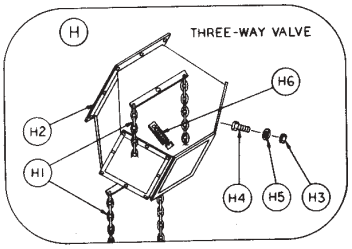


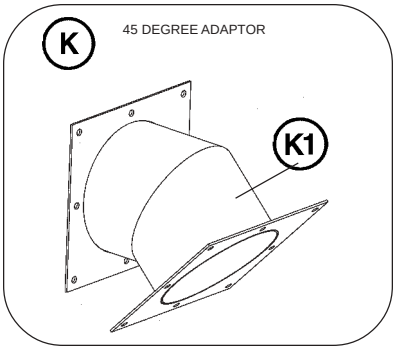


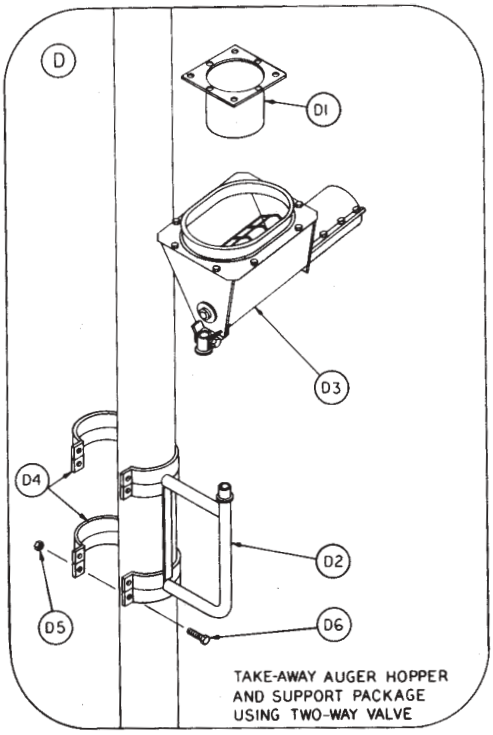


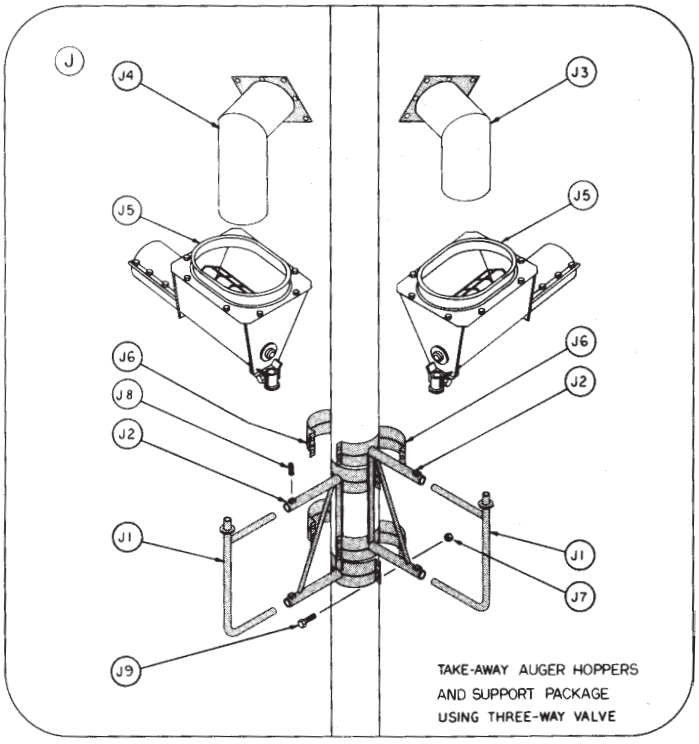










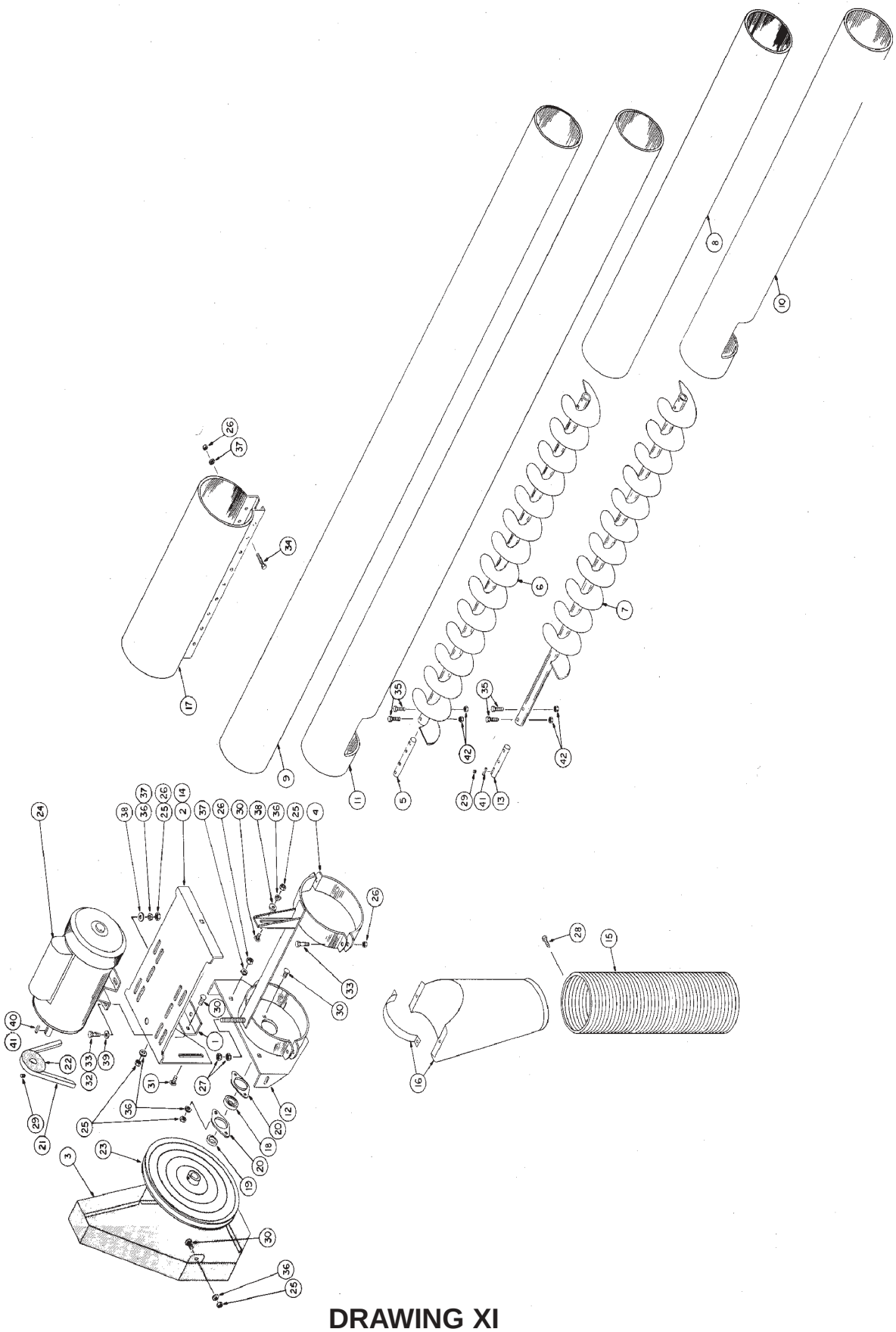


DRAWING X

VERTICAL AUGER ACCESSORIES

REF. NO.	PART NUMBER	NO. REQ'D.	DESCRIPTION
B.	601D0036	1	Two-Way Valve W/Control Chain & Hardware
B1.	601D0034	1	Two-Way Valve Weldment
B2.	601D0035	1	Control Chain W/"S" Hooks
B3.	1FH0765	14	Hex Nut, 3/8"
B4.	2FH0855	16	Hex Bolt, 3/8" x 1"
B5.	3FH0791	16	Lock Washer, 3/8"
B6.	103C0025	1	Extension Spring, 5/8" x 4 1/4"
C.	601D0005	1	8" x 4' Loading Spout
D.	601N0057	1	Take-Away Hopper & Support Package (Using Two-Way Valve)
D1.	601D0003	1	8" OD x 8" Transition Down Spout
D2.	601D0014	1	Support for 6" Hopper Base
D3.	602D120	1	Take-Away Hopper Assembly W/Nylon Cover
D4.	205C0002	4	8" x 2" Clamping Band
D5.	1FH0765	8	Hex Nut, 3/8"
D6.	2FH0856	8	Hex Bolt, 3/8" x 1 1/4"
E.	602N026	1	Bottom Roof Support Leg Package
E1.	601B0003	1	6" x 2" Clamping Band
E2.	601D0064	2	Bin Wall Tube Backing Plate
E3.	601D0065	8	Clamping Channel
E4.	602D080	1	6" Clamping Band W/Angle Bracket
E5.	602D081	2	Support Leg (1" x 38" - 2 Holes)
E6.	602D082	2	Adjustment Leg (1" x 40")
E7.	1FH0765	12	Hex Nut, 3/8"
E8.	2FH0679	4	Carriage Bolt, 3/8" x 3" Full Thread
E9.	2FH0857	2	Hex Bolt, 3/8" x 1 1/2"
E10.	2FH0859	2	Hex Bolt, 3/8" x 2"
E11.	2FH1034	4	Hex Bolt, 3/8" x 2" Full Thread
E12.	3FH0791	10	Lock Washer, 3/8"
F.	602N027	1	Top Roof Support Leg Bag
F1.	601B0003	1	6" Clamping Band
F2.	601D0015	1	Adjustable Pivot Tube
F3.	601D0019	1	Roof Support Base W/Adjustable Rod
F4.	601D0020	1	6" Clamping Band W/Pivot Bracket
F5.	1FH0738	1	Hex Lock Nut, 1/2"
F6.	1FH0757	2	Hex Jam Nut, 1"
F7.	1FH0765	2	Hex Nut, 3/8"
F8.	2FH0856	2	Hex Bolt, 3/8" x 1 1/4"
F9.	2FH0909	1	Hex Bolt, 1/2" x 2 1/2"
G.	602D120	1	Take-Away Hopper Assembly W/Nylon Cover
G1.	601D0013	1	Hopper Pivot Tube
G2.	602D118	1	Nylon Cover
G3.	602D121	1	Take-Away Hopper Weldment
G4.	602D122	1	Take-Away Hopper Top Flange Plate
G5.	602D123	2	Take-Away Hopper Screen Clamp
G6.	602D124	1	Take-Away Hopper Screen
G7.	602D134	1	Take-Away Hopper Stub Shaft
G8.	6815P	1	6" Connecting Band
G9.	PT0220	1	Wood Bearing, 1"
G10.	PT0421	2	3 Hole Flangette
G11.	1FH0736	1	Hex Lock Nut, 3/8"
G12.	1FH0738	1	Hex Lock Nut, 1/2"
G13.	1FH0763	2	Hex Nut, 1/4"
G14.	1FH0764	3	Hex Nut, 5/16"
G15.	2FH0479	8	Hex Washer Head Self-Tapping Screw Type AB, 1/4" x 3/4"
G16.	2FH0645	3	Carriage Bolt, 5/16" x 3/4"
G17.	2FH0805	2	Hex Bolt, 1/4" x 1"
G18.	2FH0857	1	Hex Bolt, 3/8" x 1 1/2"
G19.	2FH0911	1	Hex Bolt, 1/2" x 3"
G20.	3FH0789	2	Lock Washer, 1/4"
G21.	3FH0790	3	Lock Washer, 5/16"
H.	601D0106	1	Three-Way Valve W/Control Chain & Hardware
H1.	601D0035	1	Control Chain W/"S" Hooks
H2.	601D0105	1	Three-Way Valve Weldment
H3.	1FH0765	20	Hex Nut, 3/8"
H4.	2FH0855	24	Hex Bolt, 3/8" x 1"
H5.	3FH0791	24	Lock Washer, 3/8"
H6.	103C0025	1	Extension Spring, 5/8" x 4 1/4"
J.	601N0058	1	Take-Away Hopper & Support Package (Using Three-Way Valve)
J1.	601D0095	2	Hopper Support Frame
J2.	601D0096	2	Hopper Support Frame Extension
J3.	601D0100	1	8" OD Angled Transition Down Spout (Short)
J4.	601D0101	1	8" OD Angled Transition Down Spout (Long)
J5.	602D120	2	Take-Away Hopper Assembly W/Nylong Cover
J6.	205C0002	8	8" x 2" Clamping Band
J7.	1FH0765	16	Hex Nut, 3/8"
J8.	2FH0617	4	Square Head Set Screw, 3/8" x 1"
J9.	2FH0856	16	Hex Bolt, 3/8" x 1 1/4"
K1.	6024164	1	45 degree Adaptor - Use with 3-way valve

INCLINED AUGER

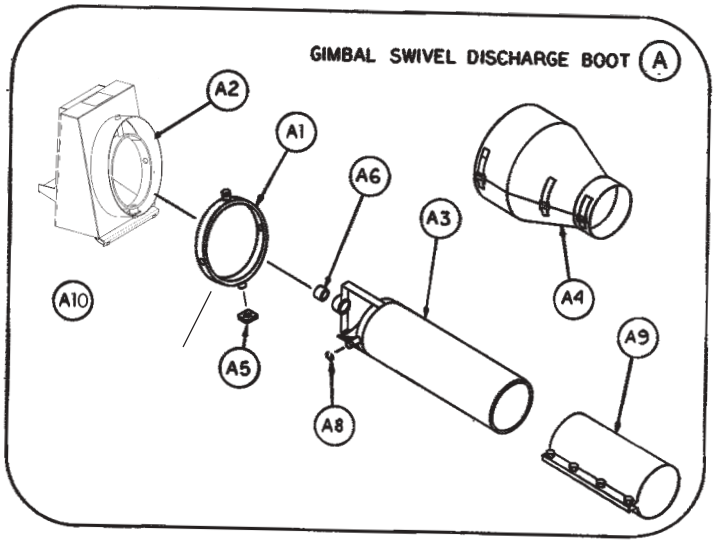


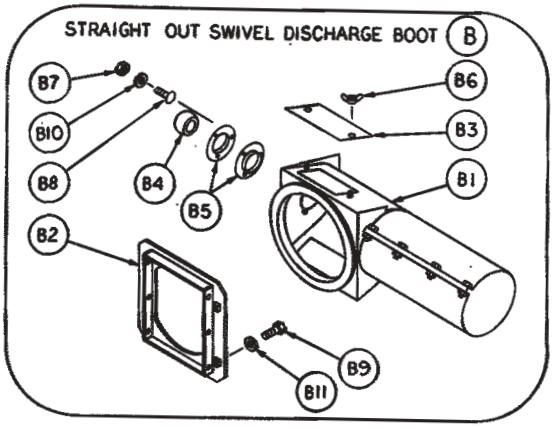
DRAWING XI

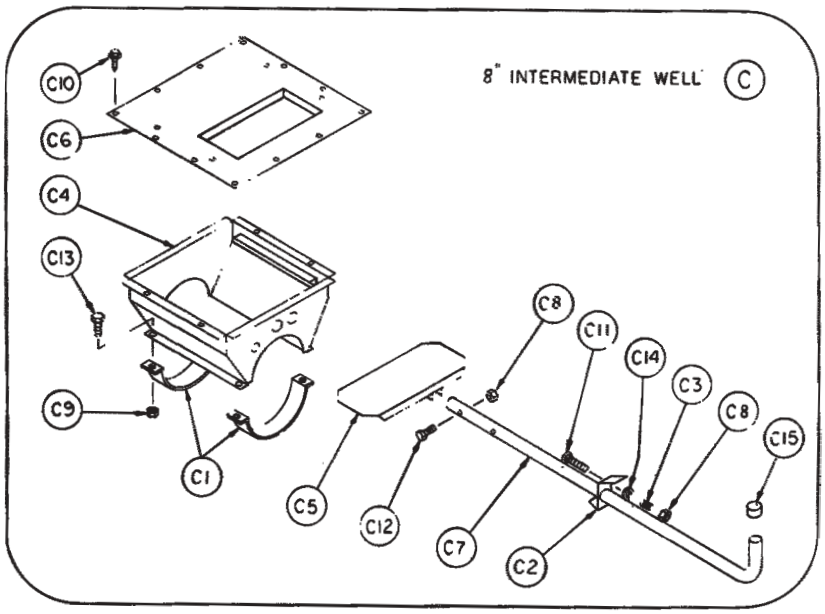
INCLINED AUGER

REF. NO.	PART NO.	NO. REQ'D	DESCRIPTION
1.	205C0003	1	Motor mount angle
2.	205C0005	1	Motor mount base plate (47' & under)
3.	205C0012	1	Belt shield
4.	601B0003	1	Tube clamp, 6"
5.	601D0109	A/R	Splice shaft
6.	601D0113	A/R	Extension auger
7.	601D0114	A/R	Extension auger-head section
8.	601D0115	A/R	Extension tube-10'
9.	601D0116	A/R	Extension tube-20'
10.	601D0117	1	Extension tube-head section-10'
11.	601D0118	1	Extension tube-head section-20'
12.	601D0120	1	Auger head
13.	601D0130	1	Stub shaft
14.	602D013	1	Boot motor mount (over 47')
15.	MS0260	A/R	6" discharge sput extension (per foot)
16.	H1607A	1	6" discharge spout
17.	N6309A	1	6" connecting tube splice
18.	PT0203	1	1" bearing with eccentric locking collar
19.	PT0401	1	1" eccentric locking collar
20.	PT0420	2	2 hole bearing flange
21.	PT0490	1	V-belt, B-48 (47' & under)
	PT0490	2	V-belt, B-48 (matched) (over 47')
22.	PT0640	1	Pulley, 4" x 5/8-1B, 1-1/2HP motors
	PT0641	1	Pulley, 4" x 7/8-1B, 2HP motors
	PT0644	1	Pulley, 4" x 1-1/8-1B, 3HP, 5HP, 7-1/2HP motors (47 & under)
	PT0642	1	Pulley, 4" x 1-1/8-2B, 5HP, 7-1/2HP motors (over 47')
23.	PT0681	1	Pulley, 12" x 1"-1B (47' & under)
	PT0684	1	Pulley, 12" x 1"-2B (over 47')
24.	3EL5097	1	Motor, 1-1/2HP, 1PH
	3EL5108	1	Motor, 2HP, 1PH
	3EL5109	1	Motor, 2HP, 3PH
	3EL5112	1	Motor, 3HP, 1PH
	3EL5104	1	Motor, 3HP, 3PH
	3EL5114	1	Motor, 5HP, 1PH
	3EL5120	1	Motor, 5HP, 3PH
	3EL5116	1	Motor, 7-1/2HP, 1PH
	3EL5117	1	Motor, 7-1/2HP, 3PH
25.	1FH0764	11	Hex nut, 5/16" (1-1/2HP)
	1FH0764	7	Hex nut, 5/16" (2HP & larger)
26.	1FH0765	A/R	Hex nut, 3/8"
27.	1FH0767	2	Hex nut, 1/2"
28.	2FH0478	3	Self-tapping screw, #10 x 1"
29.	2FH0512	3	Socket head set screw, 5/16" x 5/16"
30.	2FH0645	7	Carriage bolt, 5/16 x 3/4
31.	2FH0659	2	Carriage bolt, 3/8 x 3/4
32.	2FH0830	4	Hex bolt, 5/16 x 1 (1-1/2HP only)
33.	2FH0856	4	Hex bolt, 3/8 x 1-1/4 (1-1/2HP)
	2FH0856	8	Hex bolt, 3/8 x 1-1/4 (2HP & larger)
34.	2FH0857	A/R	Hex bolt, 3/8 x 1-1/2
35.	**2FH5295**	A/R	Hex bolt, 3/8 x 1-3/4
36.	3FH0790	11	Lockwasher, 5/16 (1-1/2HP)
	3FH0790	7	Lockwasher, 5/16 (2HP & larger)
37.	3FH0791	A/R	Lockwasher, 3/8
38.	3FH0864	5	Flat washer, 5/16" (1-1/2HP)
	3FH0864	1	Flat washer, 5/16" (2HP & larger)
39.	3FH0865	4	Flat washer, 3/8" (2HP & larger)
40.	3FH1015	1	Square key, 3/16" x 1" (under 47')
41.	3FH1030	2	Square key, 1/4" x 2" (over 47')
42.	1FH0736	A/R	Hex lock nut, 3/8"

GRAIN FLOW OPTIONAL EQUIPMENT







DRAWING XII

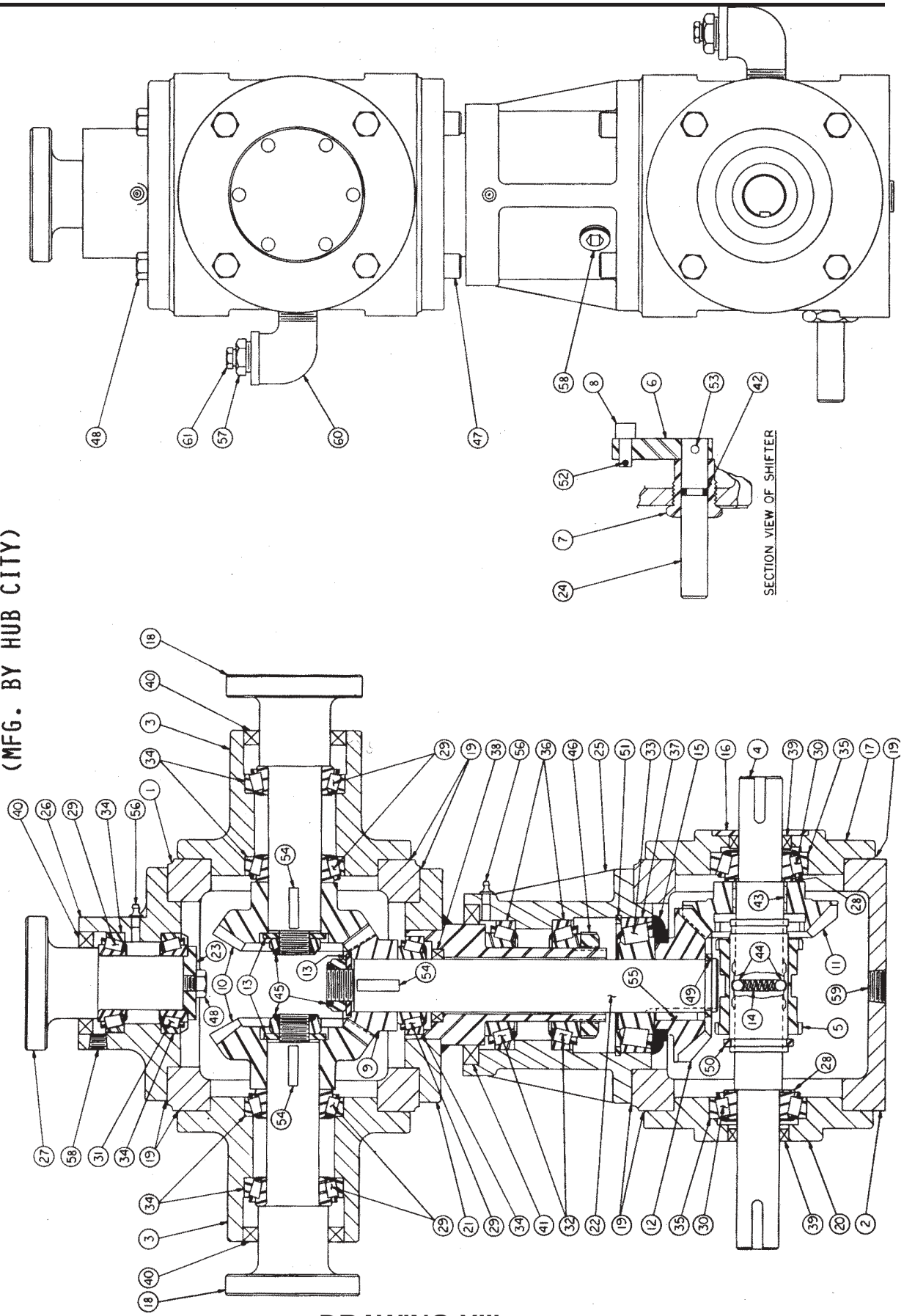
GRAIN FLOW OPTIONAL EQUIPMENT

REF. NO.	6" DISCHARGE	8" DISCHARGE	NO. REQ'D	DESCRIPTION
A.	602D100	603D001	10	Gimbal Swivel Discharge Boot
A1.	602D101	603D002	1	Gimbal Swivel Yoke
A2.	6024151	6024151	1	Gimbal Swivel Boot with Slide Gate
A3.	602D104	603D005	1	Gimbal Swivel Tube
A4.	602D118	602D118	1	Nylon Cover
A5.	602D119	602D119	1	Gimbal Swivel Square Washer
A6.	PTO887	PTO887	1	Bronze Bushing, 1 1/4" ID x 1 1/2" OD x 1"
A8.	3FH0578	3FH0578	3	External Retaining Ring, 5/8"
A9.	6309A	8309A	1	Connecting Band
A10.	6024153	6024153	1	Slide Gate
B.	602D086	602D086	1	Straight Out Swivel Discharge Boot
B1.	602D087	602D087	1	Straight Out Boot
B2.	602D088	602D088	1	Straight Out Boot Mounting Plate
B3.	602D089	602D089	2	Straight Out Boot Clean Out Cover
B4.	PTO219	PTO219	1	Wood Bearing, 1 1/4"
B5.	PTO424	PTO424	2	3-Hole Center Flange
B6.	1FH0579	1FH0579	4	Wingnut, 1/4"
B7.	1FH0765	1FH0765	3	Hex Nut, 3/8"
B8.	2FH0659	2FH0659	3	Carriage Bolt, 3/8" x 3/4"
B9.	2FH0855	2FH0855	4	Hex Bolt, 3/8" x 1"
B10.	3FH0791	3FH0791	3	Lock Washer, 3/8"
B11.	3FH0865	3FH0865	4	Flat Washer, 3/8"
B12.	3FH0866	3FH0866	4	Flat Washer, 7/16" (Not Shown)
B13.	1FH0736	1FH0736	4	Locknut, 3/8" (Not Shown)
B14.	106B110	106B110	4	Spacer (Not Shown)
C.	602N231	603N010	1	8" Intermediate Well
C1.	601B0003	205C0002	2	8" x 2" Clamping Band
C2.	601C0021	601C0021	1	Latch-Slide Gate Tube
C3.	601C0051	601C0052	1	Compression Spring .420 x 1 1/4
C4.	602B031	603B003	1	Intermediate Well Weldment
C5.	603B004	603B004	1	Intermediate Well Slide Gate
C6.	603B009	603B009	1	Intermediate Well Cover
C7.	6022039	603B012	1	Intermediate Well Slide Gate Tube
C8.	1FH0735	1FH0735	3	Hex Locknut, 5/16"
C9.	1FH0765	1FH0765	4	Hex Nut, 3/8"
C10.	2FH0491	2FH0491	16	Hex Washer Head, Self-Tapping Screw 1/4" x 1 3/4", No. 3 TEKS
C11.	2FH0650	2FH0650	1	Carriage Bolt, 5/16" x 2"
C12.	2FH0834	2FH0834	2	Hex Bolt, 5/16" x 2"
C13.	2FH0856	2FH0856	4	Hex Bolt, 3/8" x 1 1/4"
C14.	3FH0863	3FH0863	1	Flat Washer, 1/4"
C15.	MS0083	MS0083	1	Plastic End Cap, 1 1/4"

DUAL CENTER GEAR BOX

DMC #602B001 (Painted Red)

(MFG. BY HUB CITY)



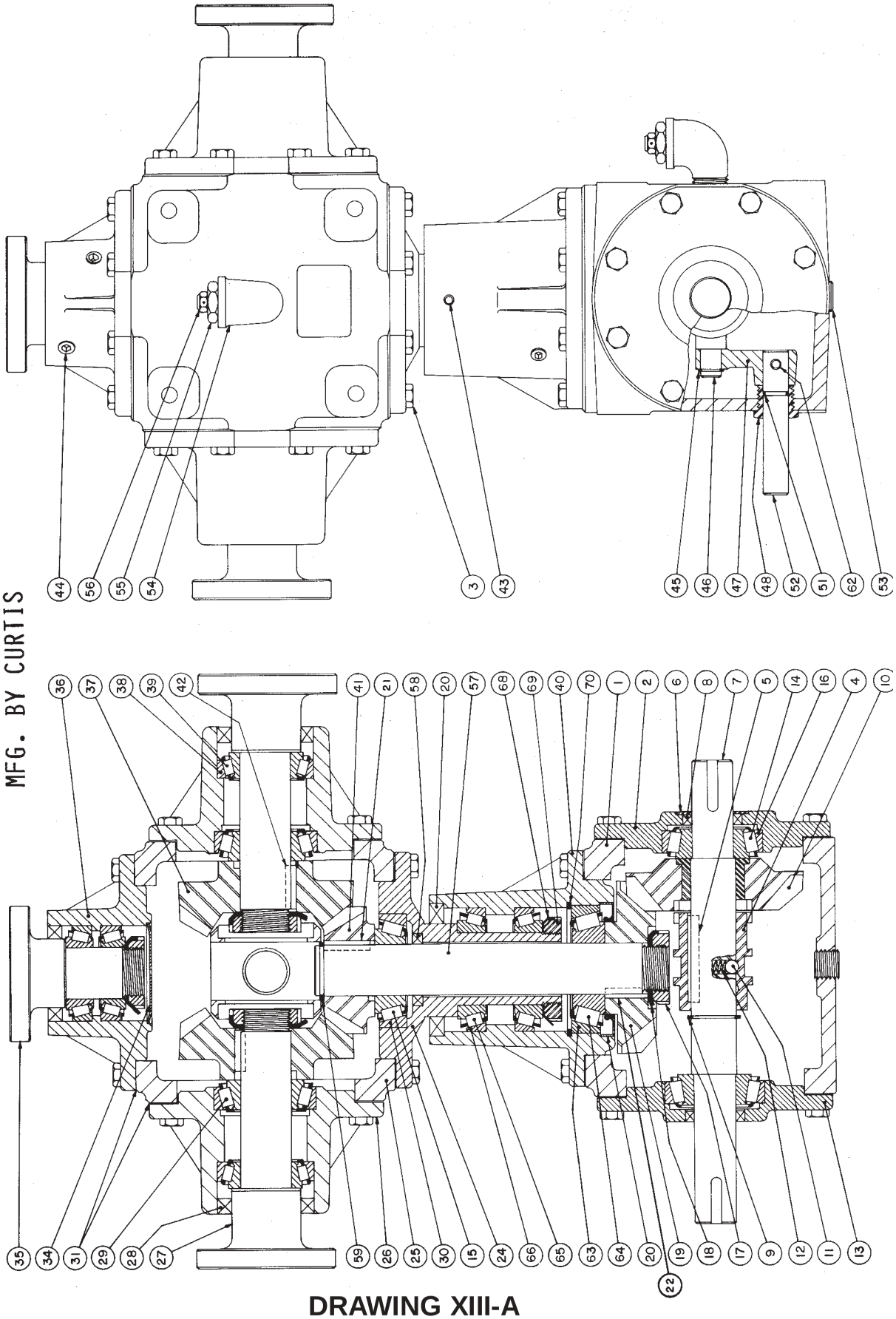
DRAWING XIII

DUAL CENTER GEAR BOX

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

REF. NO.	PART NO.	NO. REQ'D	DESCRIPTION
1.	601B0051	1	Upper Gear Case
2.	601B0052	1	Lower Gear Case
3.	601B0055	2	Pinion Extension Housing
4.	601B0059	1	Lower Horizontal Drive Shaft
5.	601B0061	1	Sliding Clutch
6.	601B0063	1	Shifting Arm
7.	601B0064	1	Threaded Bushing
8.	601B0066	1	Shifting Block
9.	601B0077	1	Bevel Gear, 16T.
10.	601B0078	2	Bevel Gear, 24T.
11.	601B0079	1	Bevel Gear, 21T.
12.	601B0080	1	Bevel Gear, 21T.
13.	601B0082	3	Pinion Washer, 3/4"ID x 1-1/2" OD x 1/8"
14.	601B0084	1	Spring, .240 x .038 x 1-1/8"
15.	601B0085	1	Excluder-Inner
16.	601B0086	1	Seal Protector
17.	601B0087	1	Open End Cap (For Seal Protector)
18.	601B0093	2	Upper Pinion Shaft
19	601B0114	A/R	Aluminum Shim, .003
	601B0115	A/R	Aluminum Shim, .005
20.	602B002	1	Open End Cap
21.	602B003	1	Open Cap Weldment
22.	602B004	1	Connecting Shaft
23.	602B005	1	Pinion Washer
24.	602B006	1	Shift Lever Connecting Shaft
25.	602B007	1	Connecting Housing
26.	602B008	1	Top Bearing Support
27.	602B009	1	Top Bearing Shaft
28.	PT0306	2	Thrust Race
29.	PT0322	6	Tapered Bearing, 1-1/4"
30.	PT0323	2	Tapered Bearing, 1"
31.	PT0328	1	Tapered Bearing, 1-1/4"
32.	PT0329	2	Tapered Bearing, 1-3/4"
33.	PT0330	1	Tapered Bearing, 1-1/4"
34.	PT0442	7	Tapered Bearing Cup
35.	PT0443	2	Tapered Bearing Cup
36.	PT0448	2	Tapered Bearing Cup
37.	PT0449	1	Tapered Bearing Cup
38.	PT0803	1	Oil Seal, 1989
39.	PT0811	2	Oil Seal
40.	PT0812	3	Oil Seal
41.	PT0823	1	Oil Seal
42.	PT0851	1	"O" Ring
43.	PT0885	1	Bronze Bushing
44.	MS0025	2	Steel Ball, 1/4" Diameter
45.	1FH0732	3	Hex Jam Nut, Self-Locking, 3/4" UNF
46.	1FH0841	1	Shaft Lock Nut, 1-3/4"
47.	2FH0446	8	Socket Head Cap Screw, 3/8" x 1"
48.	2FH0855	21	Hex Bolt, 3/8" x 1"
49.	3FH0571	1	External Retaining Ring, 1-1/4"
50.	3FH0576	1	Heavy External Retaining Ring 1-3/8"
51.	3FH0593	1	Internal Retaining Ring, 3-1/2"
52.	3FH0701	1	Cotter Pin, 1-1/16" x 1/2"
53.	3FH0890	1	Shear Proof Pin, 3/16" x 7/8"
54.	3FH0993	3	Woodruff Key, 1/4" x 1"
55.	3FH1026	1	Square Key, 1/4" x 1"
56.	4FH0202	2	Grease Fitting, 3/16"
57.	4FH0404	2	Pipe Bushing, 1/2" x 1/8" NPT
58.	4FH0822	2	Socket Head Pipe Plug, 1/4" NPT
59.	4FH0824	3	Socket Head Pipe Plug, 1/2"NPT
60.	4FH0444	2	Street Elbow, 90 degree, 1/2" NPT
61.	4FH0841	2	Pressure Relief Fitting, 1/'

DUAL CENTER GEAR BOX
DMC No. 602B001 (Painted Red)
MFG. BY CURTIS



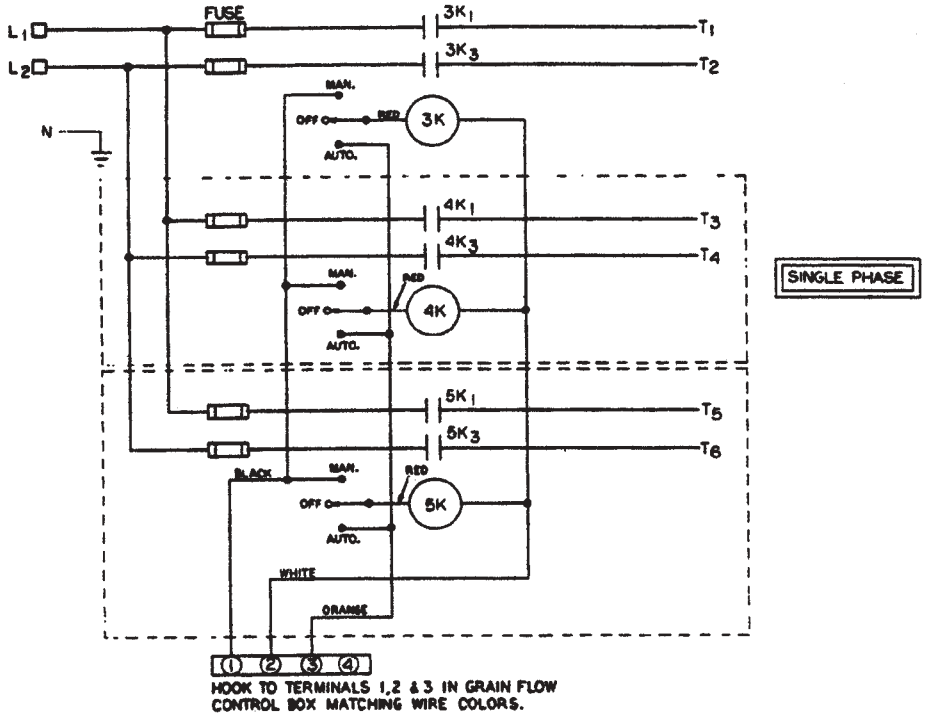
DRAWING XIII-A

DUAL CENTER GEAR BOX

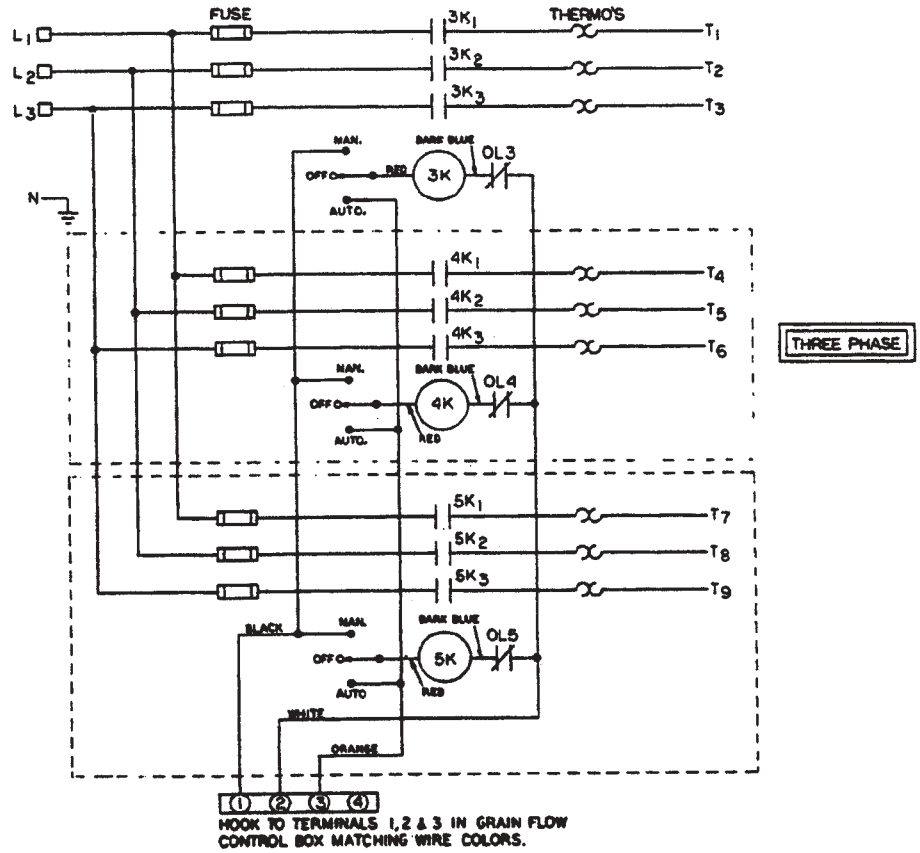
DMC #602B001 (Painted Red) - (Mfg. by Curtis)

REF. NO.	PART NO.	NO. REQ'D	DESCRIPTION
1.	002659	1	Lower Housing
2.	054189	1	Lower Cap (For Seal Protector)
3.	410167	56	Sems Cap Screw, 5/16 x 1
4.	802777	1	Shifter Dog
5.	601328	1	Key, 1/4 x 1/4 x 2
6.	413641	1	Seal Protector
7.	217445	1	Lower Horizontal Drive Shaft
8.	301317	2	Seal, (CR # 9879)
9.	620328	1	Retaining Ring (Ind. # 3100-112)
10.	882142	1	Gear Sub Assembly 21 T.
11.	801498	2	Ball
12.	802819	1	Spring
13.	054171	1	Lower Cap
14.	PT0327	2	Bearing Cone (# 15101)
15.	150185	1	Bearing Cone, (# 14124)
16.	PT0447	4	Bearing Cup (# 15245)
17.	410225	4	Lock Nut, (# N06)
18.	410233	4	Lock Washer, (# W06)
19.	104919	1	Gear - 21 T.
20.	301325	2	Seal (National # 472636V)
21.	601310	1	Key, 1/4 x 1/4 x 1-1/8" Tapered
22.	600023	1	Key, 1/4 x 1/4 x 7/8"
24.	054205	1	Botton Cap
25.	000869	1	Upper Housing
26.	054700	2	Upper End Housing
27.	217489	2	Upper Pinion Shaft
28.	301333	3	Seal (CR # 16817)
29.	150151	2	Bearing Cone (# 15126)
30.	150177	1	Bearing Cup (# 14276)
31.	390021	A/R	Gasket (.015 THK.)
	390039	A/R	Gasket (.005 THK.)
	390195	A/R	Gasket (.003 THK.)
34.	640029	1	Soft Plug
35.	217497	1	Top Vertical Shaft
36.	054213	1	Top End Housing
37.	100818	2	Gear - 30 T.
38.	PT0322	4	Bearing Cone (LM # 67048)
39.	PT0442	4	Bearing Cone (LM # 67010)
40.	054197	1	Connecting Housing
41.	100826	1	Gear - 20 T.
42.	3FH1027	2	Key, 1/4 x 1/4 x 1-1/8" Tapered
43.	410290	1	Zerk, (Lincoln #5033)
44.	410795	3	Pipe Plug - Solid (1/8 - 27 Pipe Plug Zink)
45.	3FH0560	1	Retaining Ring, (Tru-Arc # 5100-50)
46.	802785	1	Shifting Block
47.	802793	1	Arm
48.	413658	1	Shifter Pivot
51.	650473	1	O-Ring (Circle # 014)
52.	217448	1	Shift Lever Connecting Shaft
53.	410027	3	Pipe Plug - Solid (1/2 - 14 Pipe)
54.	411538	2	Streel L
55.	410654	2	Reducer Bushing (1/2-14-1/8-27)
56.	410696	2	Relief Valve (Alemite # SW 47200)
57.	217463	1	Connecting Shaft
58.	301341	1	Seal (CR # 12343)
59.	620088	1	Retaining Ring, (Eaton # 336-2)
62.	350496	1	Roll Pin (1/4 x 1)
63.	153353	1	Bearing Cup (# 332)
64.	PT0330	1	Bearing Cone (# 346)
65.	PT0329	2	Bearing Cone (# 12175)
66.	150201	2	Bearing Cup (#12303)
68.	413609	1	Lock Washer (# W08)
69.	413617	1	Lock Nut (# N08)
70.	620377	1	Retaining Ring (Tru-Arc # N 5000-315)

TAKE-AWAY AUGER CONTROL BOX WIRING DIAGRAM

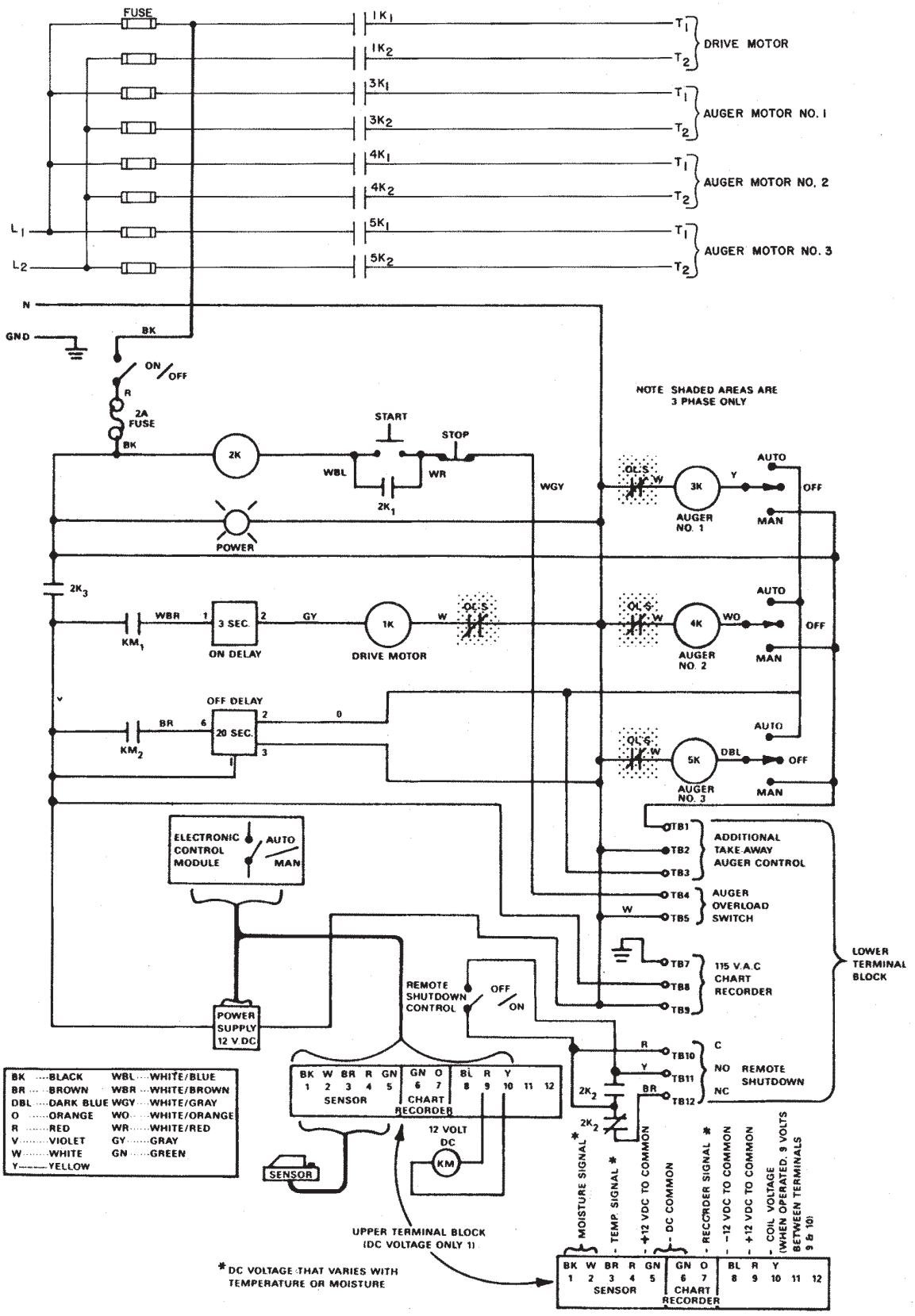


HOOK TO TERMINALS 1,2 & 3 IN GRAIN FLOW CONTROL BOX MATCHING WIRE COLORS.

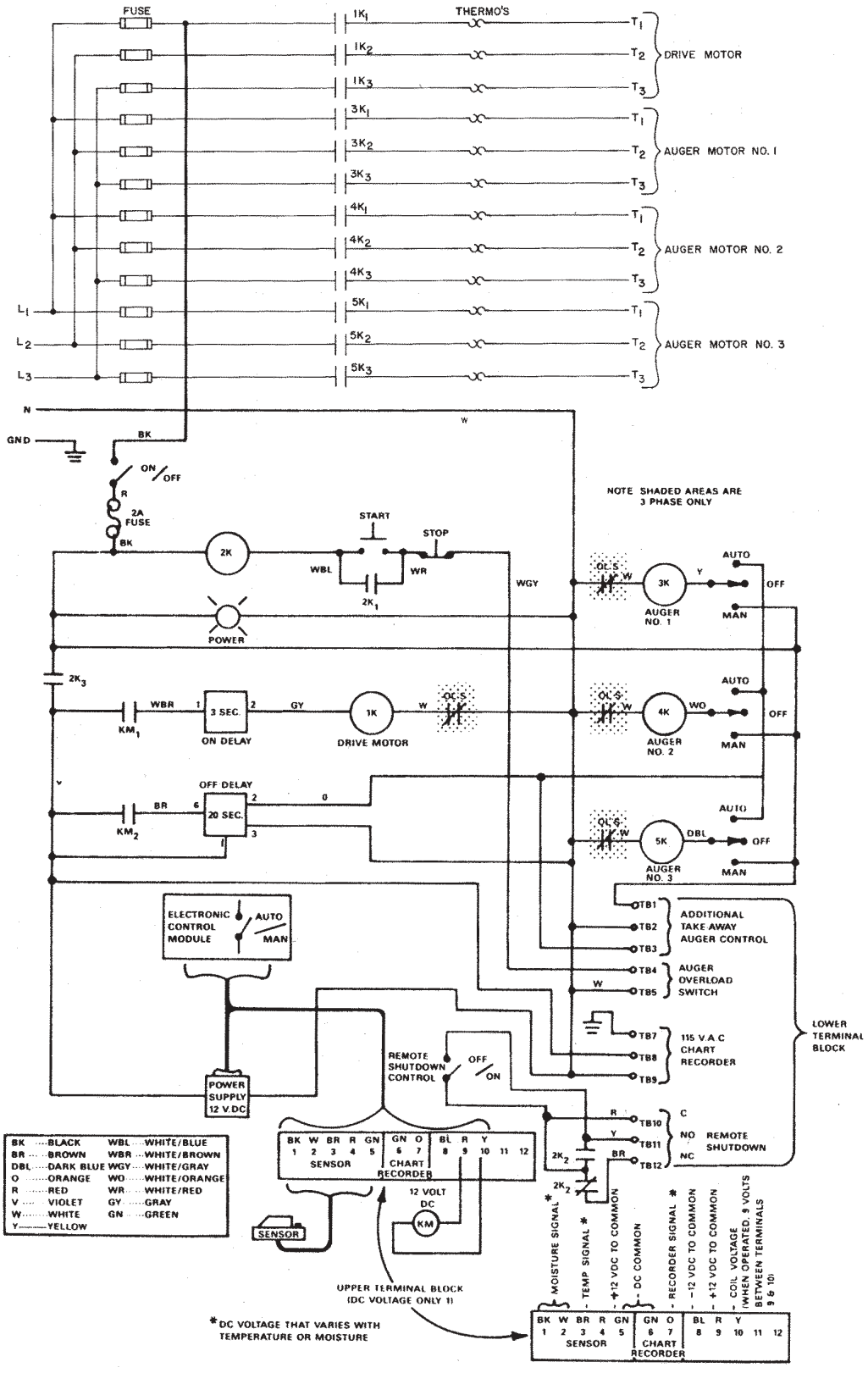


HOOK TO TERMINALS 1,2 & 3 IN GRAIN FLOW CONTROL BOX MATCHING WIRE COLORS.

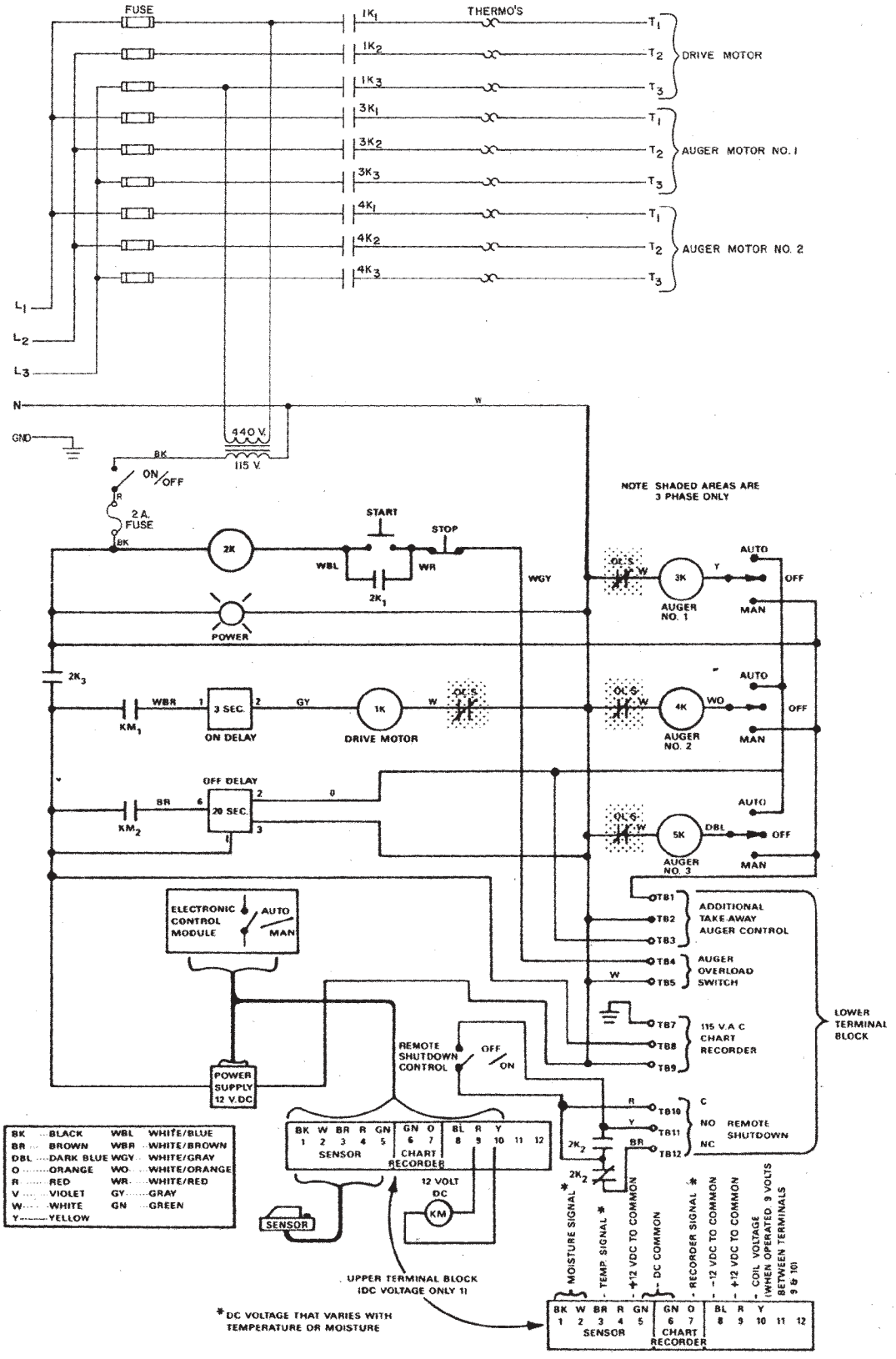
CALC-U-DRI WIRING DIAGRAM
230V, 1PH



CALC-U-DRI WIRING DIAGRAM
230V, 3 PH



CALC-U-DRI WIRING DIAGRAM
440V, 3 PH



OPERATION OF THE REMOTE SHUTDOWN SWITCH USED WITH THE FAN & HEATER

1. The remote shutdown switch was added to the front control panel of the Calc-u-Dri to provide the ability to bypass a shutdown signal.

2. Switch the Remote Shutdown Switch to the 'BYPASS" position to omit a shutdown signal. This will allow equipment such as fan and/or burner to be started without the Grain Flow running.

3. Switch the "Remote Shutdown Switch" to the "ON" position to allow a shutdown 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 Single Fan and Burner to be Controlled by the Grain Flow Operation

1. Locate the Remote Shutdown terminals #10 and #11 on the terminal strip at the bottom of the Grain Flow back panel. Connect these 2 terminals in series with the fan and burner control circuit. See Drawing 1 on page 70.

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 & 7, #5 & 8, and #6 & 9 in series with each of the fan and burner control circuits. See Drawing 2 on page 71.

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 Drawing 3 on page 72.

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 terminals to each side of the magnetic contactor in the Grain Flow box. See Drawing 4 on page 73.

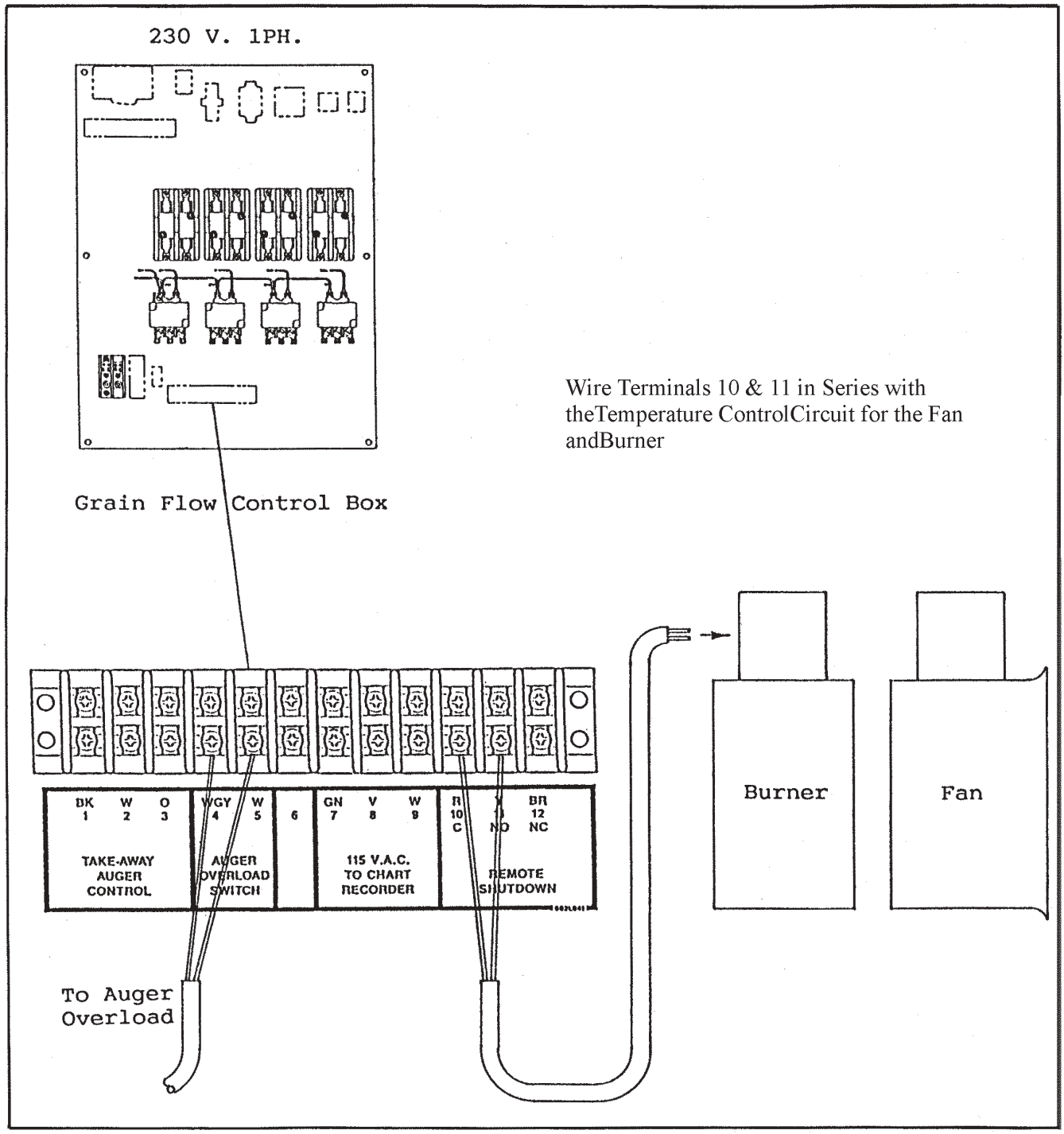
Electrical Hook-Up: Level Monitor to Control the Stir-Ator Above a Grain Flow

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.

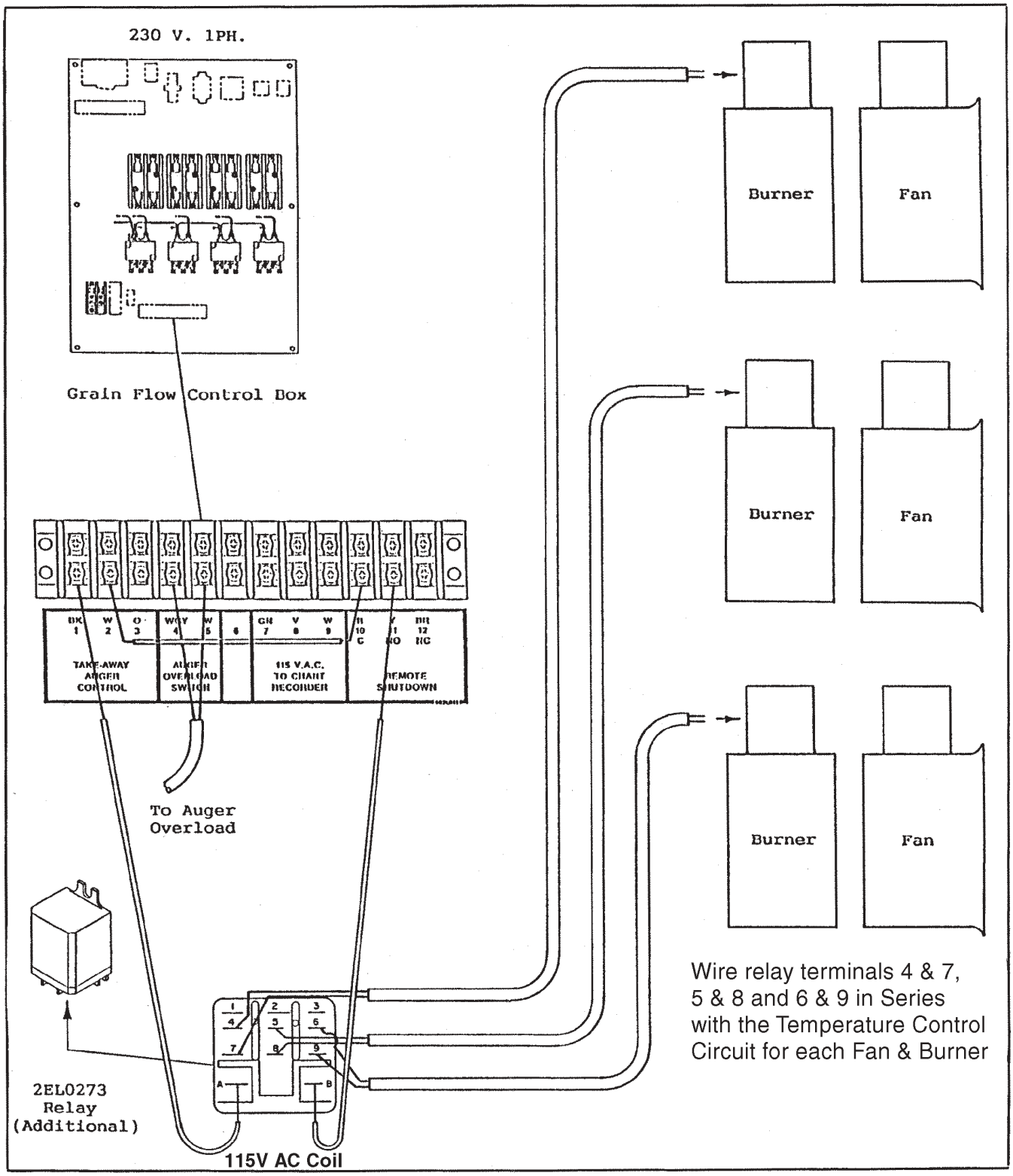
2. Remove the orange wire from the bottom of the third take-away auger switch and insulate. From this switch terminal run a wire to the “C” on the Level Monitor. Put a jumper from the NO to L1 on the terminal strip in the Level Monitor. See Drawing 5 on page 74. OPERATION: When the third toggle switch 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 SHUTDOWN FOR THE FAN AND BURNER



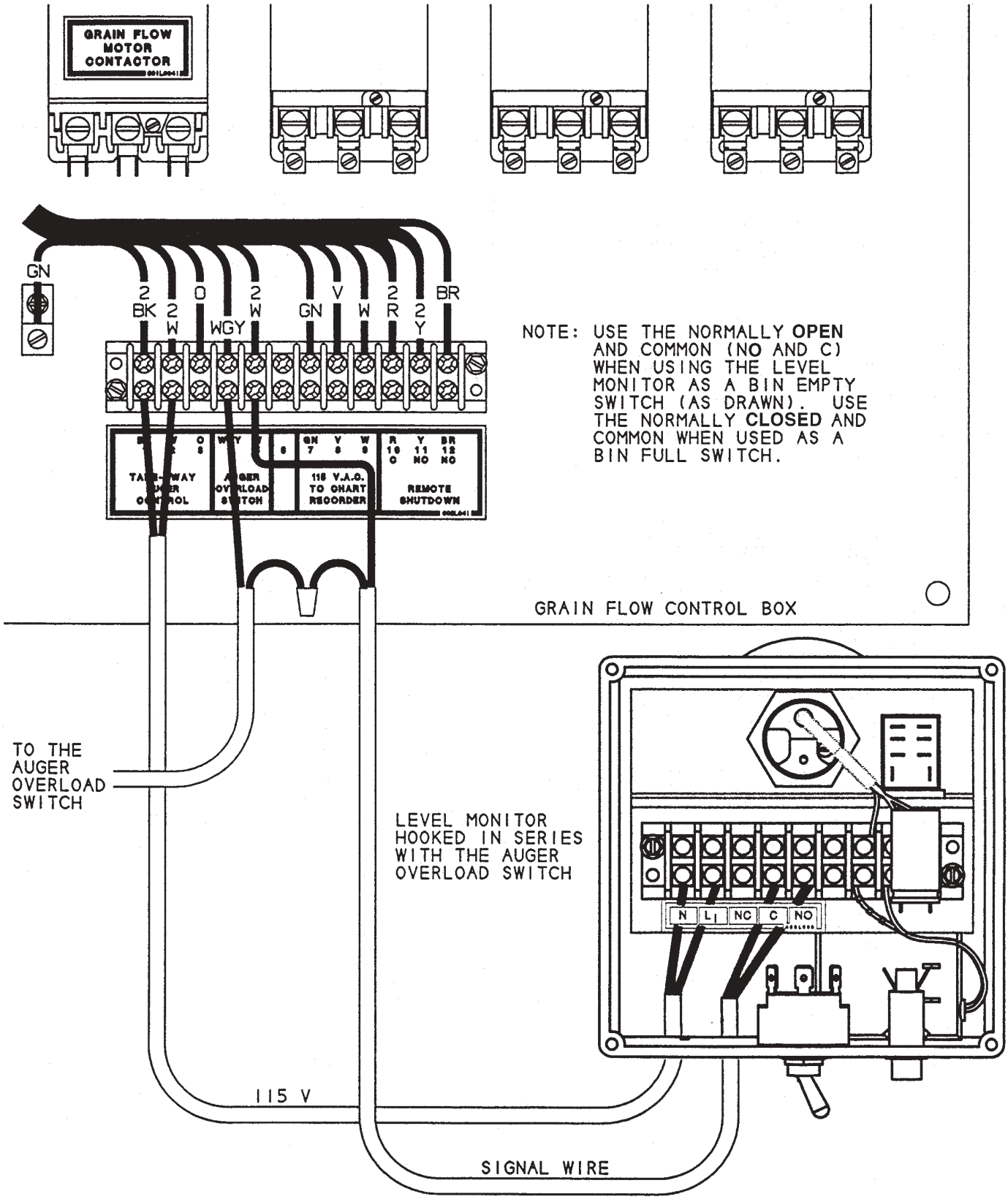
DRAWING 1

ELECTRICAL HOOK-UP FOR GRAIN FLOW REMOTE SHUTDOWN FOR UP TO 3 FANS AND BURNERS



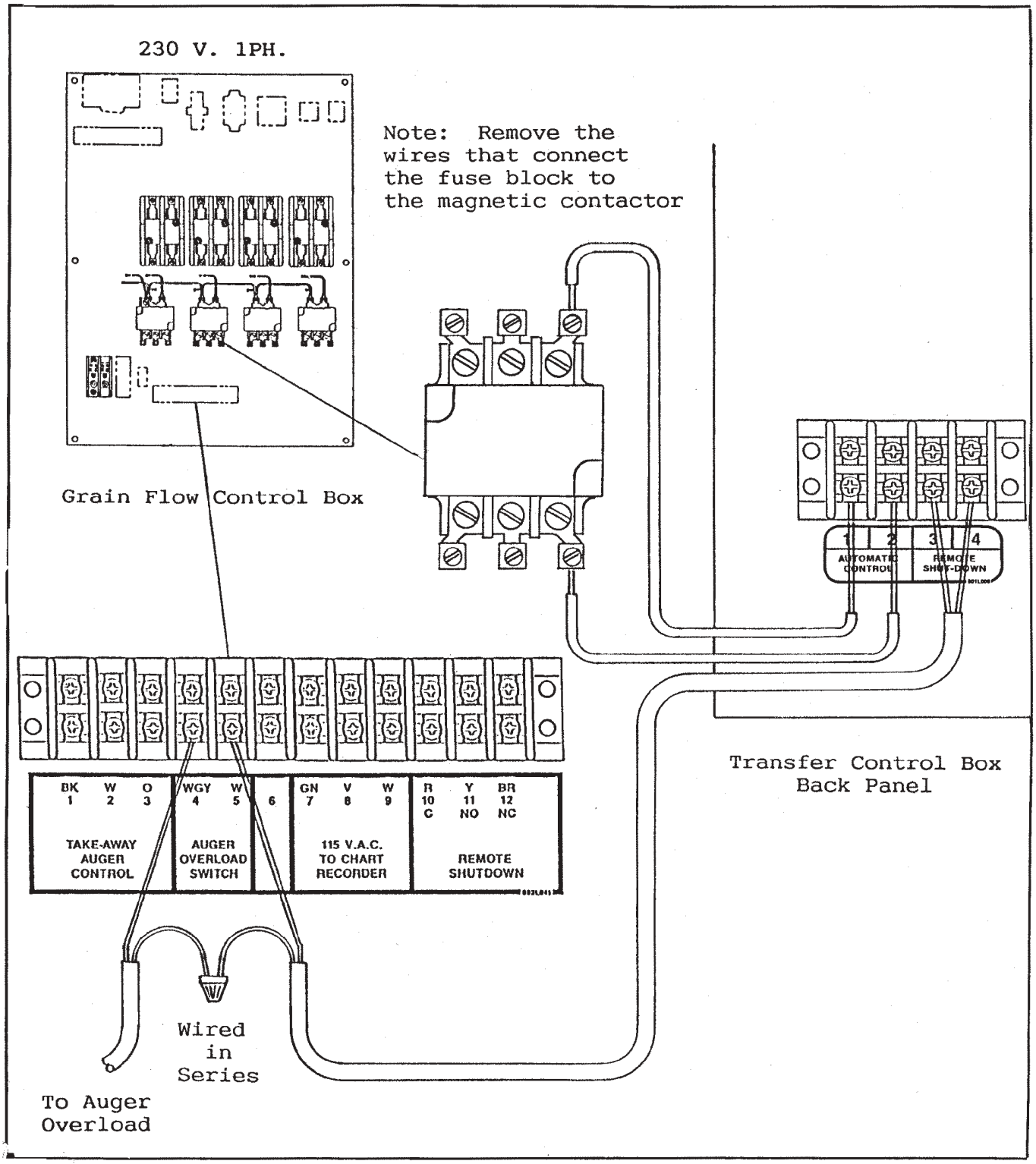
DRAWING 2

ELECTRICAL HOOK-UP FOR LEVEL MONITOR TO GRAIN FLOW



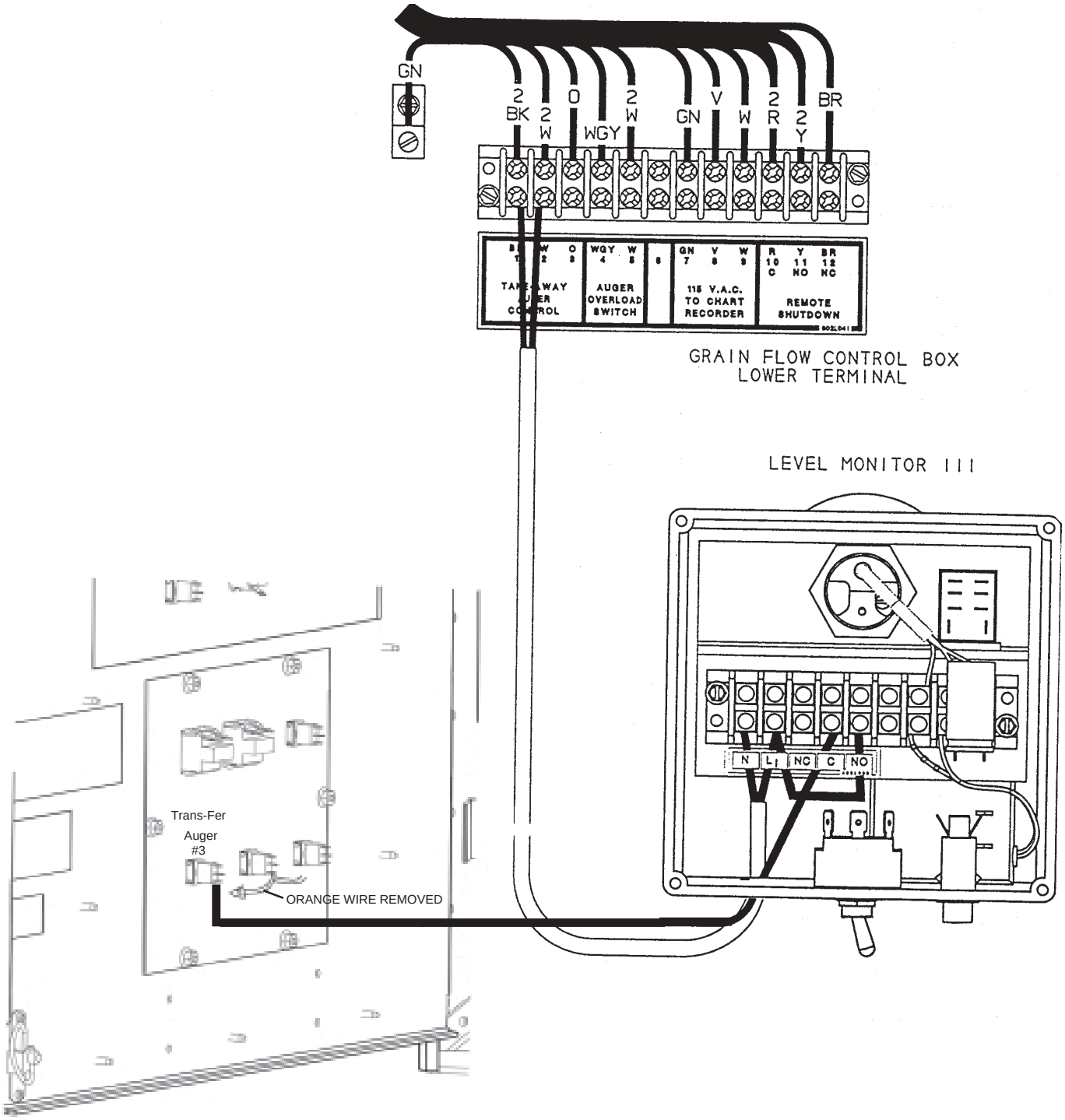
DRAWING 3

ELECTRICAL HOOK-UP FOR A TRANSFER TO A GRAIN FLOW



DRAWING 4

ELECTRICAL HOOK-UP FOR LEVEL MONITOR AND A STIR-ATOR ABOVE A GRAIN FLOW



DRAWING 5

GRAIN FLOW
ANNUAL START-UP CHECK LIST

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.

CALC-U-DRI SERVICE

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 your replacement circuit board in.

4. Set the dip switches for application. Reference page 88.

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.

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:

!!CAUTION!!

1. DISCONNECT ALL POWER TO THE CONTROL BOX!
2. Pull out the small 12VDC 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.

GRAIN FLOW WITH STIRRING EQUIPMENT

A Grain Flow drying bin equipped with an optional Stir-Ator will increase the drying capacity as grain depths increase. Do NOT exceed 16 feet 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 ft. diameter bins, double auger units for 27-33 ft. diameter bins and triple auger units for 36 ft. diameter bins are recommended.

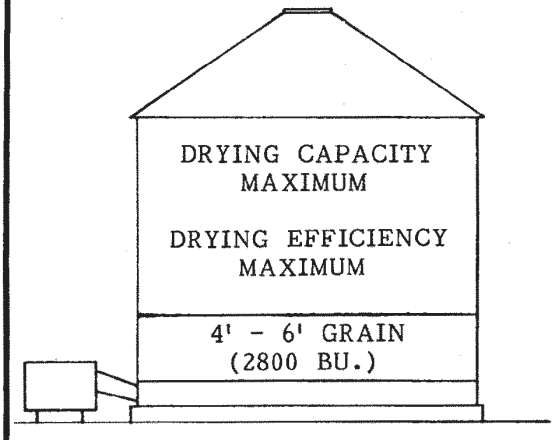
Grain Level Monitors are available that will automatically start and stop the stirring equipment at the desired grain depth. When drying shelled corn, five feet depth is usually when stirring should be started and continued until the grain depth is below five feet. However, this depth may differ for 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 Illustration on the next page.

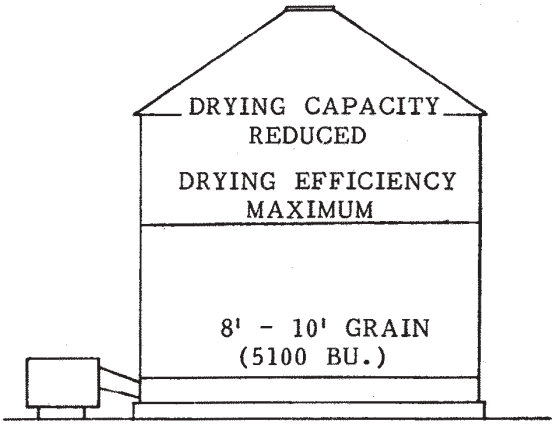
WHY STIRRING IS PART OF YOUR CONTINUOUS IN-BIN SYSTEM

* 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 EXAMPLE BELOW)
* MAXIMUM DRYING EFFICIENCY

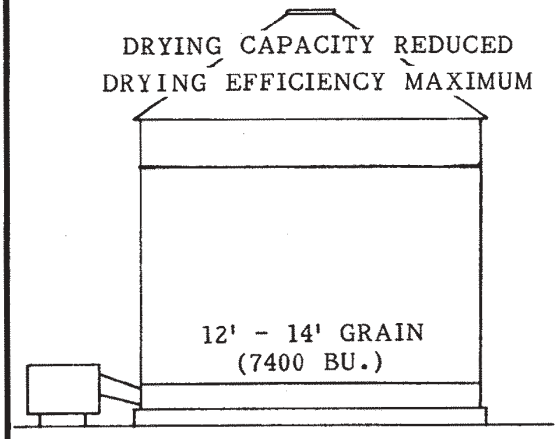
30' BIN EQUIPPED WITH 2 - 20 HP. CENTRIFICAL FANS
DRYING 24 HOURS A DAY 300 B.P.H. RATE
COMBINING 10 HOURS A DAY 720 B.P.H. RATE



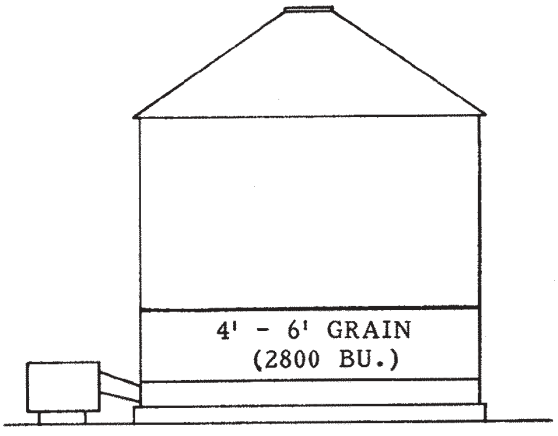
7:00 A.M.



NOON



5:00 P.M.



7:00 A.M. NEXT DAY

RECOMMENDED STIRATOR FOR GRAIN FLOW SYSTEMS
24' - DESIGN III S.A.
30' - DESIGN III D.A.
36' - DESIGN III T.A.
42' - DESIGN III T.A.

CALC-U-DRI TROUBLE SHOOTING

NOTE:

1. Extreme caution must be used when trouble shooting problems. Have a qualified electrician do all electrical trouble shooting.

2. Never unplug or plug in the circuit board with power on. See Service Instructions.

3. Do not make field adjustments on the circuit board. This is a factory adjustment only.

4. Contact your dealer or DMC if you have any questions on the operation or service of your 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. Gear box trouble.	1. Floor augers not in gear. 2. Adjust tension. 3. Pin sheared or key sheared. 4. Repair. 5. Replace gear box.
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.

CALC-U-DRI TROUBLE SHOOTING (continued)

PROBLEM	PROBABLE CAUSE	SOLUTION
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.
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 & 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 okay. Never stops augering out grain.	1. Circuit board trouble. 1. Switch is in manual mode. 2. Moisture set point too high. 3. Circuit board trouble.	1. Replace circuit board. 1. Switch to automatic. 2. Adjust moisture set point. 3. Replace circuit board.

CALC-U-DRI TROUBLE SHOOTING (continued)

PROBLEM	PROBABLE CAUSE	SOLUTION
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 or not hooked to the terminal. 2. Sensor trouble.	1. Tighten terminal screws. Wire insulations should not be under terminal screw. 2. Replace sensor.
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 doesn't auger out grain in automatic.	1. Dip switches 1, 2 & 3 are all "open",OR 2. Dip switches 1, 2 & 3 are all "on."	1. Reference correct dip switch setting on page 88.
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 88.
Grain samples are early or late.	1. Dip switches on control card are set wrong.	1. Reference correct dip switch setting on page 88.
In the drying cycle the moisture changes.	1. Dip Switches 9 or 10 set wrong.	1. Reference Dip Switch setting page 88.

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

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

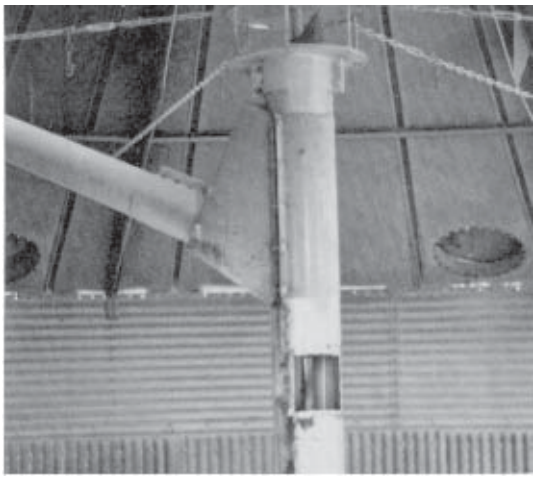
Before operating the Calc-u-Dri and other equipment, familiarize yourself with both the mechanical and electrical aspects of the unit by carefully reading the owner's manuals.

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 27, followed by operating suggestions, box definitions and parts breakdown.

CALC-U-DRI STANDARD CONTROL BOX AND SENSOR INSTALLATION INSTRUCTIONS

I. Sensor Cutout 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 Diagram P. 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 Photo 70 and Diagram P.



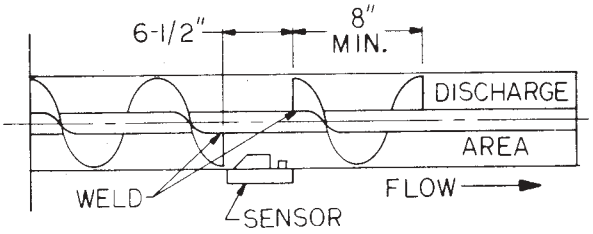


DIAGRAM P

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 Diagram P. After the flight is welded at these points, cut out 6-1/2” of the flighting from the discharge auger.

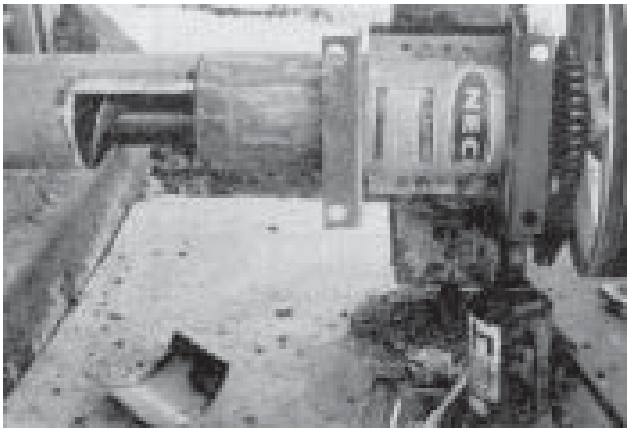


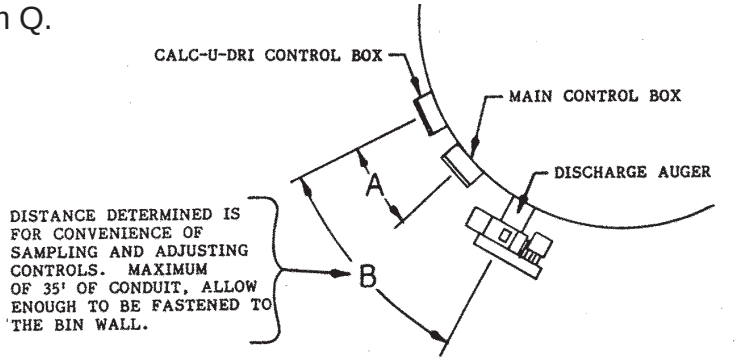
PHOTO 71

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 5/16" x 1-1/2" bolts, lock washers, and nuts. See Diagram Q.

DIAGRAM Q



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 cutout 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 Diagram R.

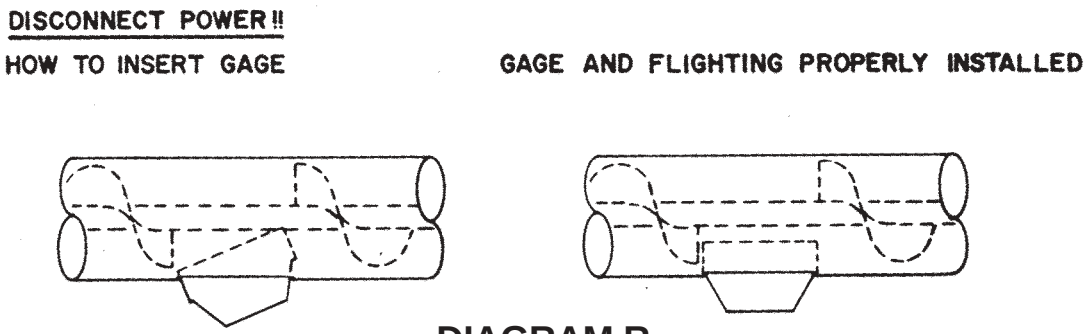


DIAGRAM R

!!CAUTION!!

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

CENTER VERTICAL AUGER UNITS, Continue to step #6 & HORIZONTAL DISCHARGE AUGER UNITS, go to step #13

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" liquidtite 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 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 degree 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 Diagram S and Photo 72. 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.

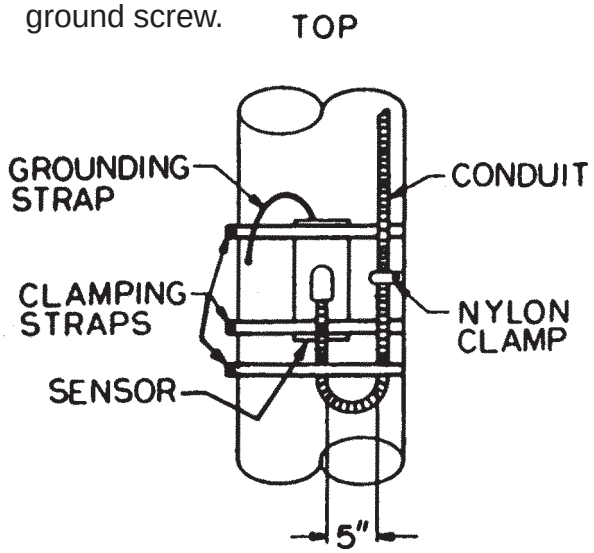


DIAGRAM S

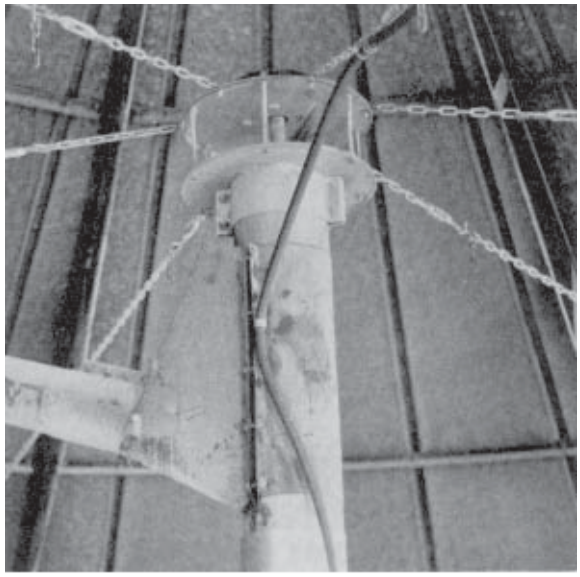


PHOTO 72

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 liquidtite 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 self-drilling screws so both liquidtite conduit lines can be attached on the bottom of the box. See Diagram T. Be sure to leave a drip loop in the conduit. Attach the liquidtite conduit to the junction box with a connector. Secure the liquidtite conduit to the bin wall with the nylon clamps and #10 screws.

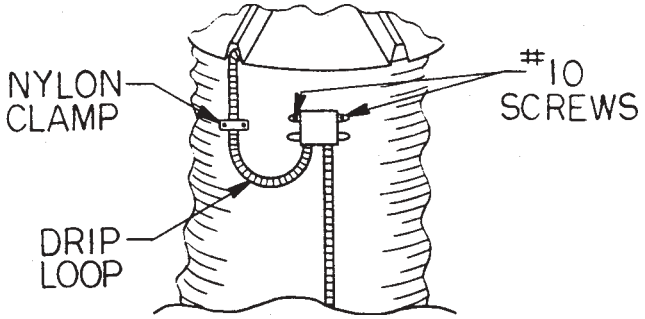


DIAGRAM T

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 liquidtite to the two 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 Photo 73. 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.

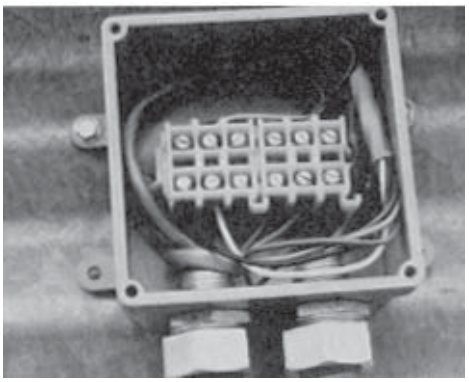


PHOTO 73

NOTE: New production uses a different style terminal block.

13. HORIZONTAL UNITS: Measure and connect the 1/2” liquidtite 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 liquidtite 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 Diagram.

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

!!CAUTION!!

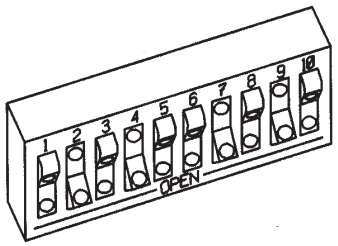
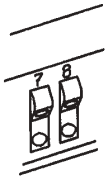
Wiring should be done by a qualified electrician, and should meet code standards to AVOID BODILY INJURY or DEATH. Grain bins with electrical equipment operation must be grounded.

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.

APPENDIX A

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 FOUR MINUTES (TWO 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 FOUR TO 3.75 THROUGH 15 MINUTES		1 - CLOSED 2 - OPEN 3 - OPEN
MULTIPLY DRYING TIME RANGE BY TWO FOR 30 THROUGH 120 MINUTES		1 - OPEN 2 - OPEN 3 - CLOSED

APPENDIX B

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 a.m.	**112°**	**14.4**	**109°**	**14.7**	
9:36 a.m.	**112°**	**14.4**	**111°**	**14.4**	
9:38 a.m.	**108°**	**16.0**	**107°**	**17.5**	
9:40 a.m.	**110°**	**14.6**	**109°**	**14.7**	
9:43 a.m.	**108°**	**15.9**	**104°**	**17.3**	
9:50 a.m.	**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, +.3 or +.6?*
Answer: *Most would want to set it to +.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 & Control Box Installed:_____

Date of Initial Start-Up & Check Out:_____

Date of First Use:_____

Dates of Annual Check Ups:

_____ _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

Important Information:_____

_____

_____

_____

_____

MODEL 84
GRAIN FLOW
With Dry Grain
Or Calc-U-Dri Controls

DMC markets across the U.S. and around the world.

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