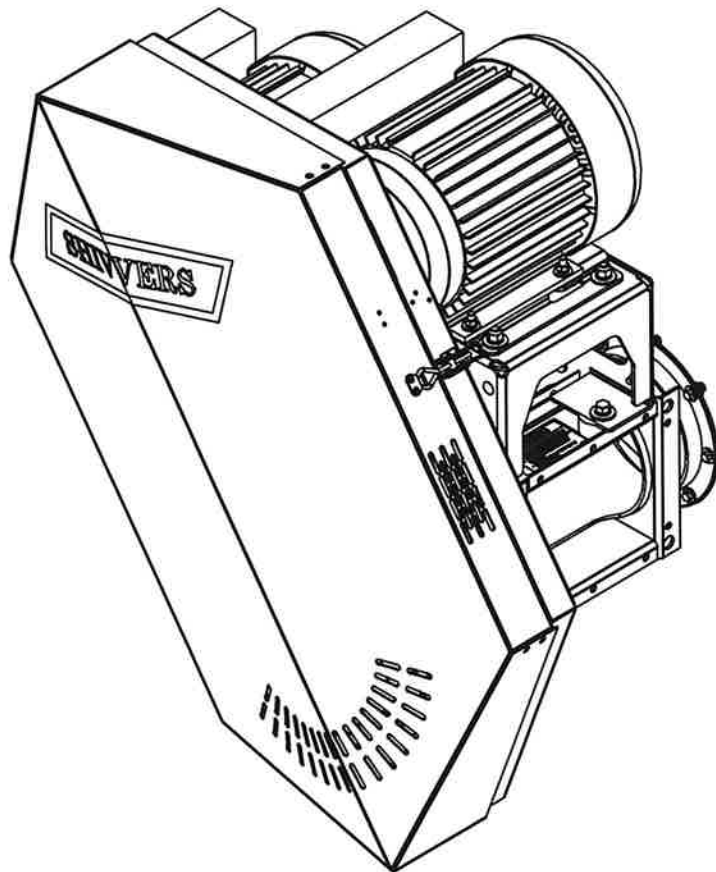


INSTALLATION MANUAL for SHIVERS HIGH TORQUE DRIVE SYSTEM



Shivers Manufacturing, Inc.
614 W. English St.
Corydon, IA 50060
Ph. (641) 872-1005 ** Fax (641) 872-1593
www.shivers.com

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TABLE OF CONTENTS

SECTION	PAGE
Attention _____	1
Warranty _____	1
Introduction _____	2
Safety _____	2-4
Location of Safety Decals _____	4
Important _____	5
Site Preparation _____	6
Bin Layout _____	7-18
Installing Horizontal Unloader and Gear Basket _____	19-28
Installing Dual Motor Drive _____	29-37
Installing Flooring _____	38
Installing Tapered Sweeps and Track _____	39-42
Installing Center Vertical _____	43-47

ATTENTION

The Shivers Circu-Lator will set up flow patterns of grain which exert extra stress on the walls and floor of the drying bin. Additional floor supports are normally required for the drying floor. Bin sidewall stiffeners are often required. Consult bin and floor manufacturers for their recommendations before installing and using Shivers Circu-Lator. Shivers will not be responsible for structural failure of the drying floor or bin, or for any loss, damage, or injury relating to use of the Circu-Lator.

Large amounts of water are removed during the drying process. A way to remove this water from inside the drying bin is required. This is usually accomplished by installing roof vents. We strongly recommend having the bin roof raised about 3/4" above the bin side wall. This is especially important while drying when outside temperatures are below freezing. Having the roof raised will keep a lot of the condensation from running down the inside of the bin wall.

WARRANTY

PRO RATED TWO SEASON WARRANTY

Shivers Circu-Lator is guaranteed for the first season of harvest operation, regardless of purchase date, provided it is installed and operated as directed by instructions and manuals. Under this warranty, SHIVERS will repair or replace such parts that are returned to us, freight prepaid, and found to be defective by the factory.

During the second season of harvest operation, SHIVERS will repair or replace at 50% of retail price, such parts that are returned to us freight prepaid and found defective by the factory.

Vee-Belts are not covered by this warranty. Electric motors (including spreader motors) are covered under warranty by the motor manufacturers and are not covered by the SHIVERS warranty.

SHIVERS makes no warranty of any kind, expressed or implied, except as stated herein and buyer assumes all risk and liability resulting from the use of products manufactured by SHIVERS, whether used singly or in combination with other products.

For purposes of this warranty, "Season of Harvest" is defined as the period of time between June 1st and December 31st of a calendar year.

INTRODUCTION

Read this manual carefully.

The information contained within this manual will instruct you on how to properly install and operate your equipment. Improper installation or operation could result in personal injury and/or equipment damage.

The Shivvers' High Torque Drive System is designed to remove large quantities of dried grain from the bottom of the drying bin and transport it, via the horizontal unloader or center vertical auger, to a desired destination. The removal of the grain is precisely metered so as to allow an even layer to be removed, without excessive center coning, which maintains optimum drying conditions. The more consistent the grain level, the more efficient the drying process will be.

Note: It is recommended that if the unit has set for some time without running, that the grain should be heated before startup.

The output capacities will vary according to the size of the motor pulley, depth of grain, and moisture content of the grain. The amount of grain dried will depend on size of the bin, number & size of the burner/fans in use, depth of grain, moisture content of the grain, plenum temperature, as well as other factors.

If you are unsure of the correct configuration that would best suit your application, contact your SHIVVERS dealer for more information.

SAFETY

The operator of this machinery must assume the responsibility for their own safety, and that of those who are working with them. They must also make sure the equipment was installed properly. Factors that contribute to the overall safety of operation are: proper use, maintenance, and frequent inspection of the equipment. All of these are the operator's responsibility.

If any items covered in this manual are not completely understood, or there is a concern with the safety of the product, contact Shivvers Manufacturing, Inc. at the address shown on the front page.

Read and understand the Operator's Safety Manual (P-10001), and all applicable operator's manuals, before working on Shivvers equipment.

SHIVVERS is genuinely interested in providing the safest practical equipment to our customers. If you have a suggestion which you believe will enhance the safety of this product, please contact us.

SAFETY (cont'd)



TAKE NOTE ANYTIME THIS SAFETY ALERT SYMBOL APPEARS. YOUR SAFETY, AND THAT OF THE PERSONS AROUND YOU IS AT STAKE.

The safety alert symbol will be accompanied by one of three signal words whose definitions are given as:

DANGER: Red and white. Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations, typically for machine components that, for functional purposes, cannot be guarded.

WARNING: Orange and black. Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

CAUTION: Yellow and black. Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

Besides these, you will find:

IMPORTANT: Black on white. This is not a safety decal. It is for important details pertaining to the maintenance, operation, or setup of the equipment to keep it running smoothly and/or efficiently.

Anytime you are working with your drying unit, be sure to observe these common sense rules:

- 1.) All units must be equipped with the main power disconnect switch. This disconnect switch must shut power off to the complete drying system. It must have the capability of being locked into the OFF or OUT position. Disconnect and LOCK OUT this main power disconnect switch before conducting any inspection, maintenance, repair, adjustment, or cleaning of the drying system. When you must have the electrical power on to troubleshoot equipment, do it from a safe distance, and always from outside the bin.
- 2.) Keep the bin entrances locked at all times. To unlock the bin, first lower the Level-Dry (if so equipped), then shut the main power disconnect off. Take the safety lock off the bin entrance and place it on the main power disconnect before opening the bin entrance. Never enter the drying bin unless the Level-Dry (if so equipped), is completely lowered, and all power is disconnected and locked out.

SAFETY (cont'd)

- 3.) Always keep all shields and guards in place. If shields or guards must be removed for inspection or maintenance, replace them before unlocking and turning power back on.
- 4.) Be sure everyone is clear of all the drying and transferring equipment, and outside of all bins before unlocking and turning power on. Some equipment may run upon re-application of power.
- 5.) Make sure that all decals are in place and are easy to read. Do not operate the equipment with missing or illegible decals. If replacements are needed, contact Shivers Manufacturing, Inc. or your dealer.
- 6.) Prior to use, inspect all equipment to insure that it is in good operating condition. Do not operate with missing, damaged, or worn parts. Use only SHIVERS approved replacement parts.
- 7.) Metal edges can be sharp. Wear protective clothing and handle equipment and parts with care.
- 8.) Keep children and bystanders away from drying and transferring equipment at all times.
- 9.) If going up the bin ladder and/or performing maintenance on the top of the bin, take precautions to prevent accidental falls. When on top of the bin, wear a safety harness or other safety device.
- 10.) At least annually, review all operating and safety manuals with any personnel working with this equipment. Always train new employees before they operate the drying equipment. Insist that they read and understand the operating and safety manuals.

LOCATION OF SAFETY DECALS

For complete instructions as to where to find safety decals and where to place field installed safety decals, consult your Operator's Safety Manual (P-10001).

IMPORTANT

Floor Supports: Floor Layout

SHIVERS Floor and Floor Supports for Circu-Lator use are warranted for use with SHIVERS circulating equipment. (If other brands are used, SHIVERS will not be responsible for the drying floor or support system should it happen to fail).

Bin Stiffeners:

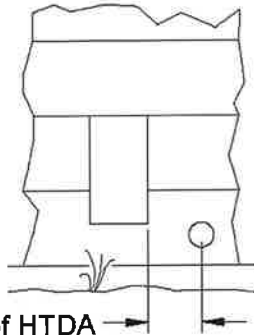
Bin stiffeners are required. Follow bin manufacturer's specific recommendations or use SHIVERS Stiffeners. NOTE: Some bin manufacturers warrant heavy duty bins for recirculation devices, but these are not warranted by SHIVERS.

Doors:

Remove the Withdrawal Auger Cover Plate which is usually fastened to one of the door panels and extends into the bin. This and any other internal protrusion of substantial size (extra bulky ladders, etc.) should be removed as they would be pulled down by the flowing grain during Circu-Lator operation. All Doors must be of sound construction, and all original equipment door braces must be bolted in place during Circu-Lator operation.

SITE PREPARATION

Follow the bin manufacturer's specific recommendations for a re-circulating bin.

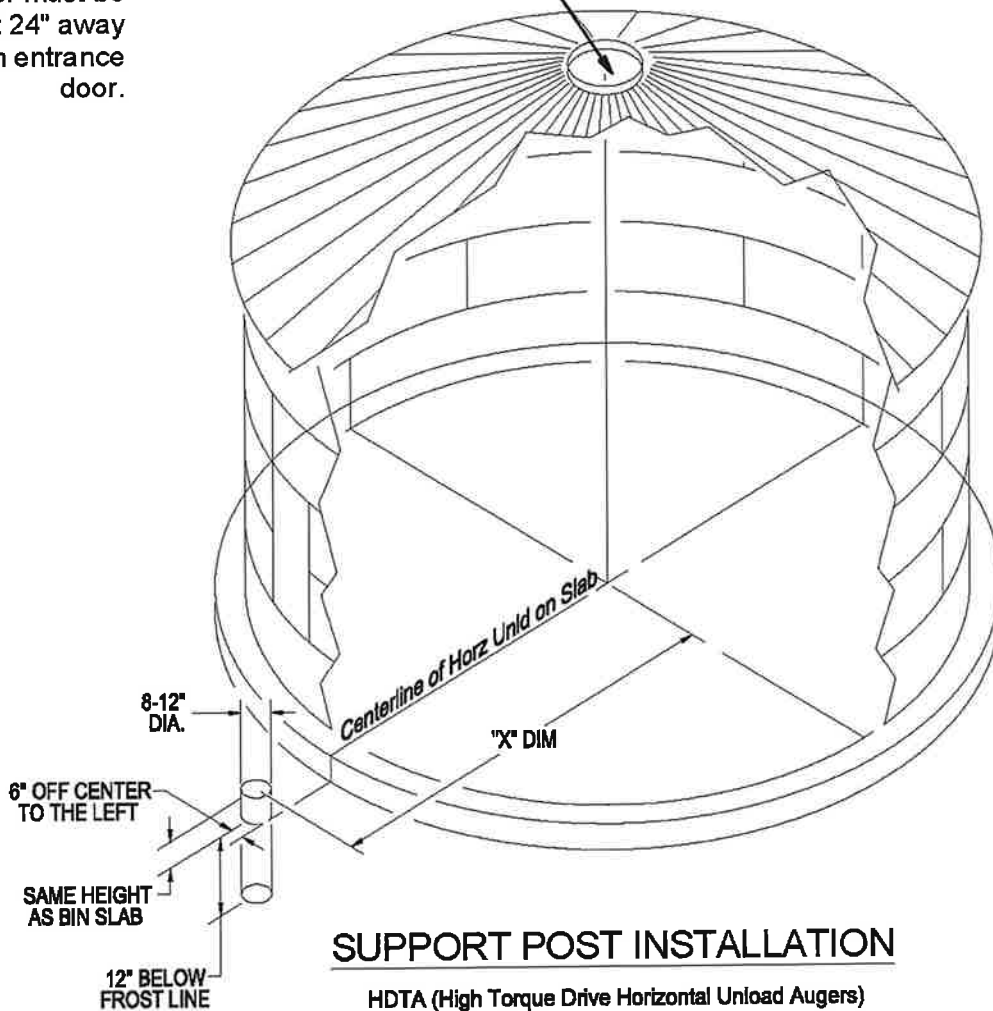


Exit point of HTDA Unloader must be at least 24" away from entrance door.

Are you installing a large grain spreader?

You may want to consider mounting it:

- 1.) During bin construction while the roof is near to the ground.
- 2.) Before the Center Vertical Auger and its supporting chains are installed, since these are very much in the way.



SUPPORT POST INSTALLATION

HDTA (High Torque Drive Horizontal Unload Augers)

Bin Dia.	Horz Unld	"X" DIM
36FT	656G-001A	21FT- 5"
39FT	656H-001A	22FT-10"
42FT	656I-001A	24FT- 8"
48FT	656J-001A	27FT- 3"

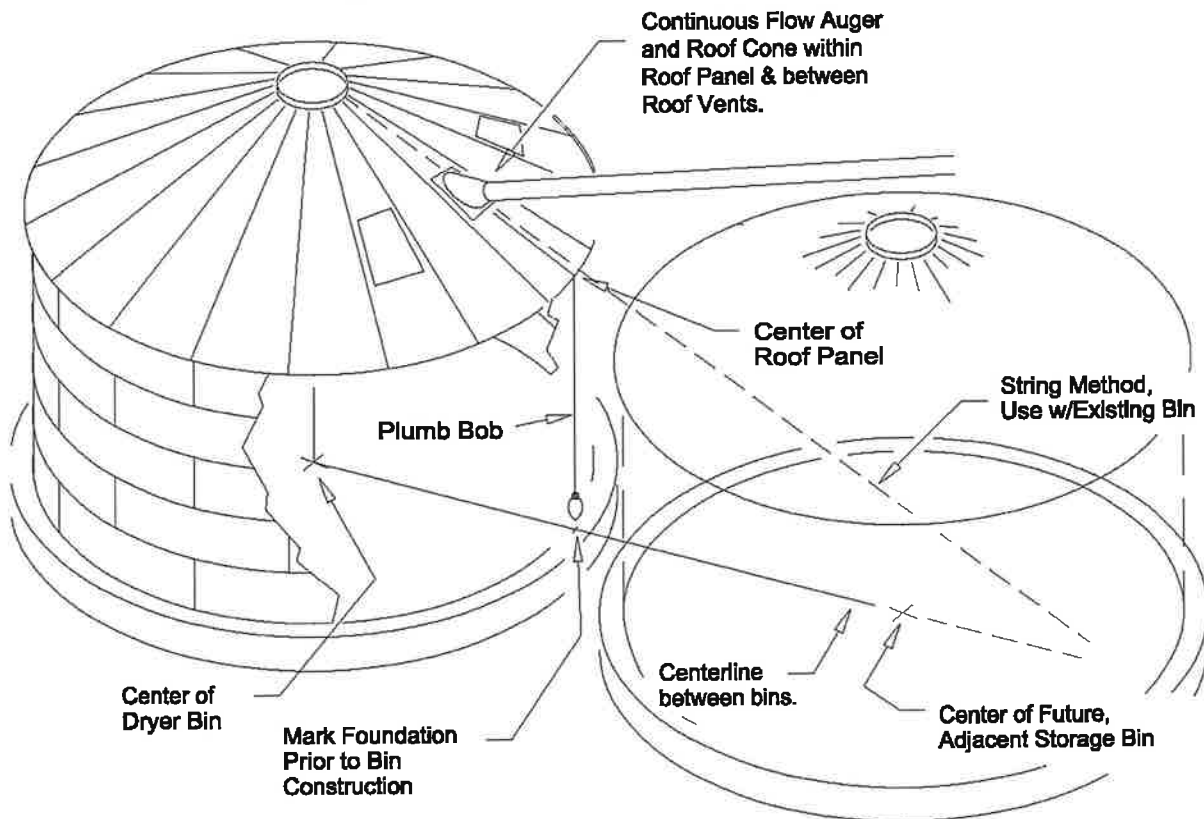
Don't forget to Offset 6" to the Left!!

BIN LAYOUT

On new installations, mark where the centerline between the bins crosses the outer edge of the dryer bin foundation. Line up the centerline of a roof panel to the mark on the foundation, using a plumb bob if necessary.

When a storage bin is being added to an existing drying bin installation, the centerline can be determined by tying a string to the center of the roof panel near the opening at the top of the bin, then stretching it outwardly from the bin and in alignment with the center of the roof panel, as shown. In most cases, the position of the storage bin can be adjusted to line up with the center of the roof panel.

Dryer & Storage Bin Orientation



BIN LAYOUT

The concrete pad for the drying bin should be as close to flat and level as possible. Make sure it is thick enough and has enough reinforcement so it will not crack and move. Consult the bin manufacturer for more information. A good, solid, flat and level foundation is required for the Circu-Lator to work properly.

See fan and burner installation manuals for instructions on concrete pads for them. See suggested layouts in this manual for orientation of fans, horizontal unloader, and control boxes. The suggested layouts show pad sizes for SHIVVERS dryers. They also show a CompuDry Command Center for the control box. Your installation may have something different, but the orientation should be similar. Try to align the bin sheets so the fan/burner entrance collar(s) do not have to be cut through a seam.

The Horizontal Unloader must come out near the main entrance door of the bin.

The control box must be within line of sight of the bin's main entrance door.

There must be a main electrical disconnect switch. This switch must shut off all electrical power to the drying system. It must have the capability of being locked in the OFF position. It must be located near the bin's main entrance and within line of sight of the control box.

A lockable disconnect switch for each Machine (Circu-Lator) motor is required near the bin entrance. These disconnect switches are **NOT** supplied by SHIVVERS, but can be obtained locally.

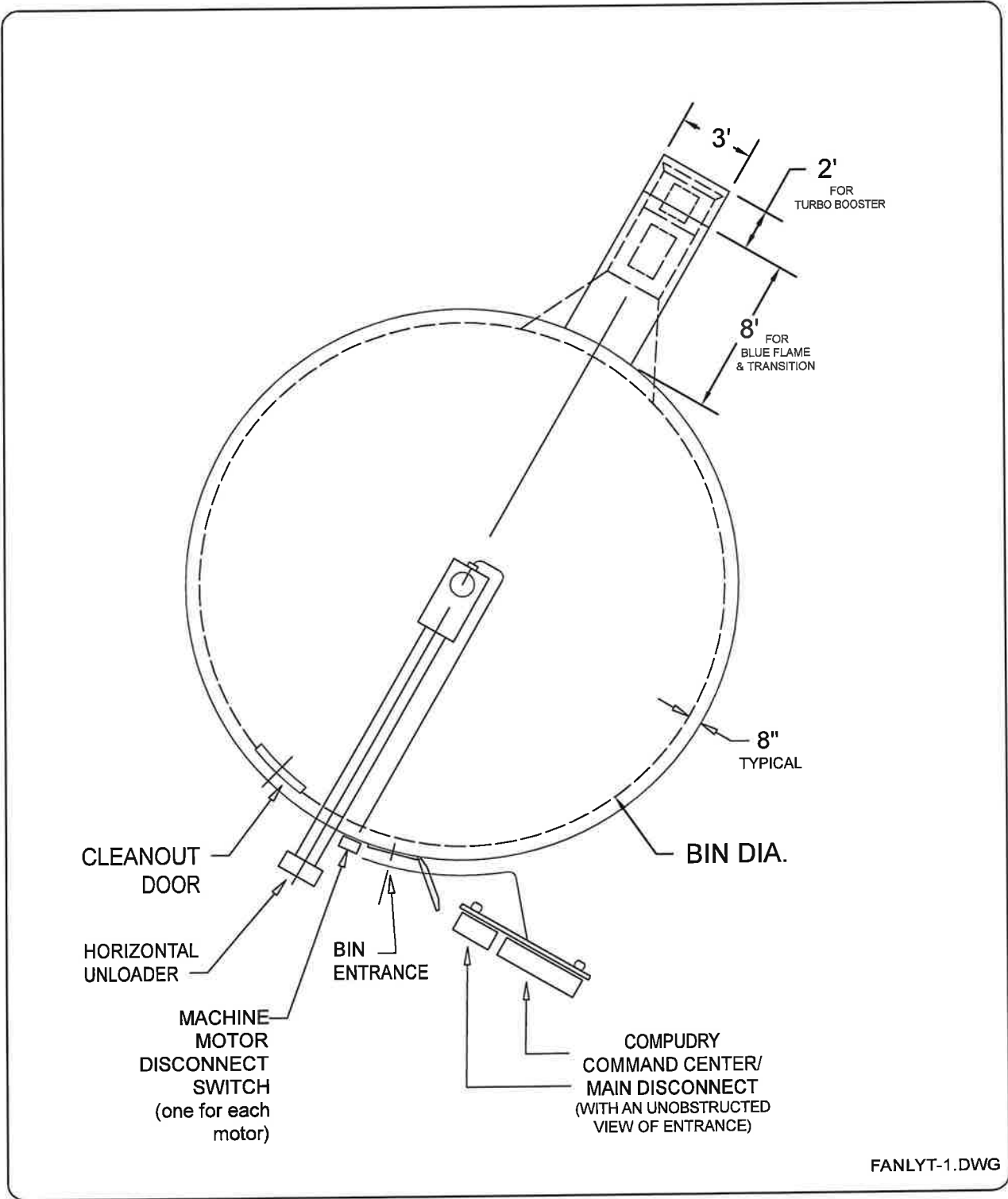
Since the SHIVVERS drying system can operate at temperatures up to 200~F, all sealants in the plenum area must be able to withstand this temperature. Ordinary plastic roofing cement or tar will soften and should not be used. Possible materials to use are:

- 1.) Black Jack #1010, Neoprene Flashing Cement, by Gibson-Homans
- 2.) Regular 100% Silicone Caulking
- 3.) Stretch-a-Seal ^(TM), Bin and Elevator Sealant, by Farm Products Direct
(Follow manufacturer's instructions) Ph (800) 669-9314
- 4.) Rubberflex Binseal Ph (800-817-2986) www.binseal.com

All air leaks in the bin must be sealed off. The sealant should be applied from the inside of the plenum area, if at all possible. If it is applied from the outside, plenum pressure will probably blow it out.

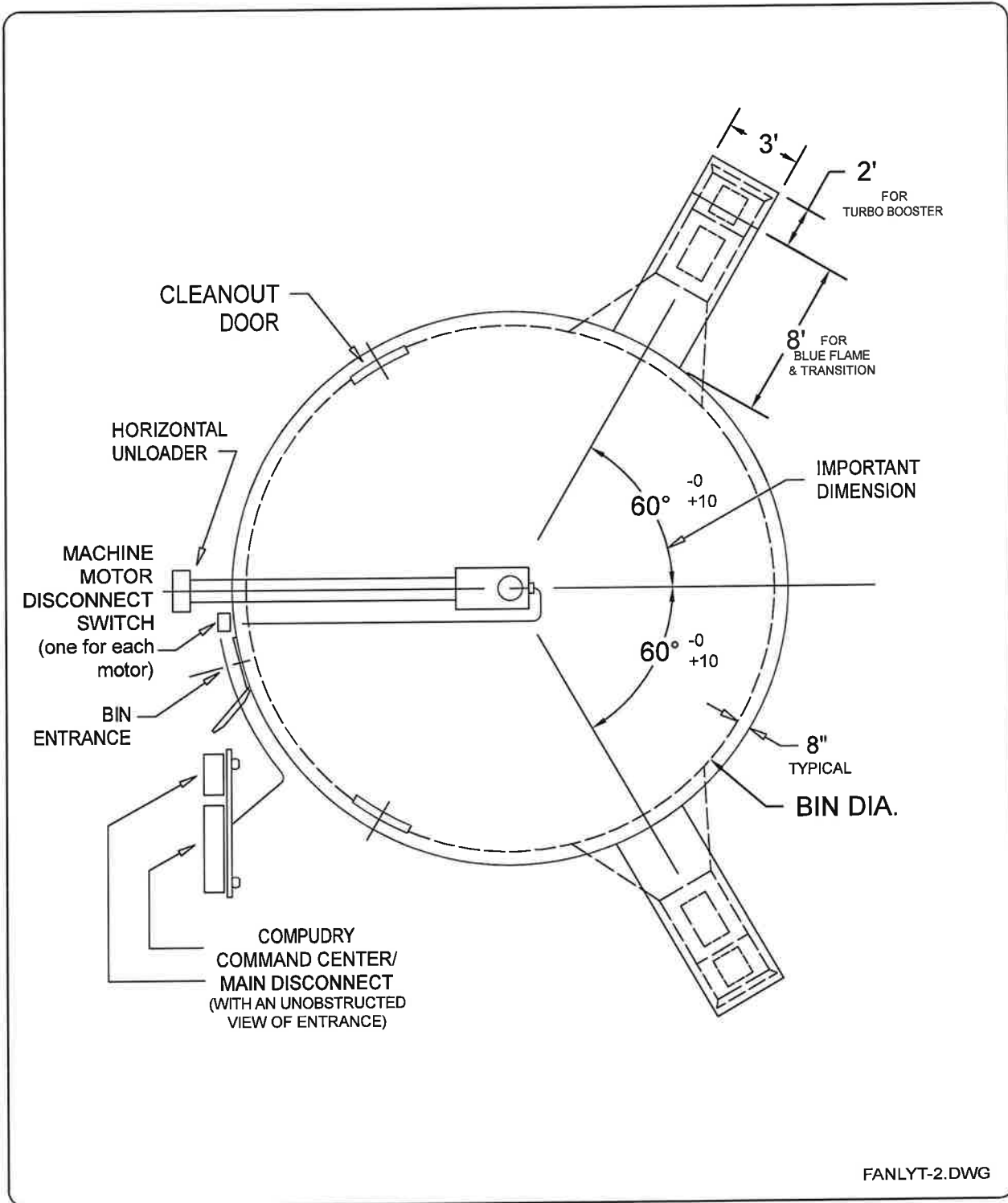
BIN LAYOUT (cont'd)

BLUE FLAME Shivvers Circulator 2 1-Fan Layout



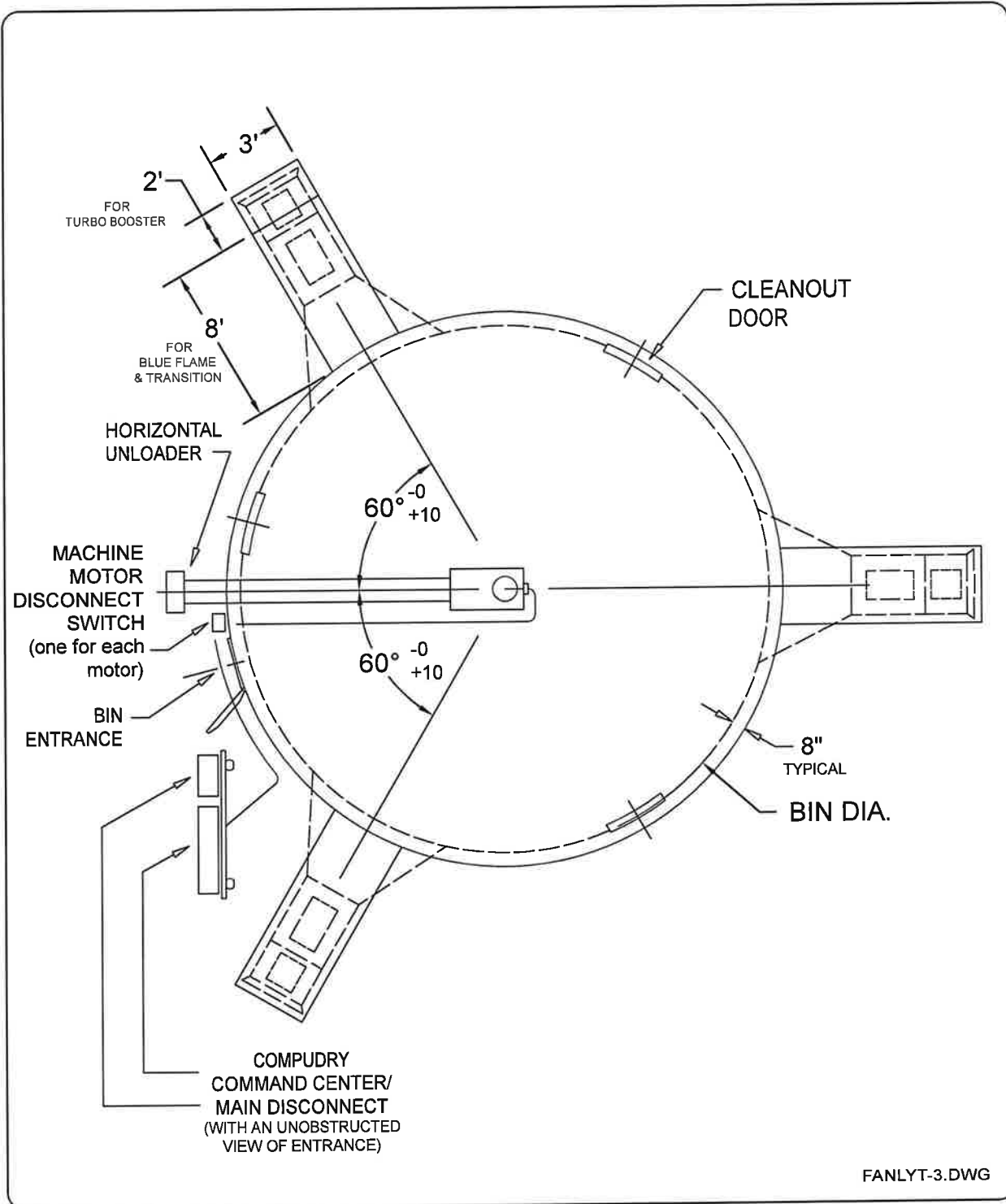
BIN LAYOUT (cont'd)

BLUE FLAME Shivvers Circulator 2 2-Fan Layout

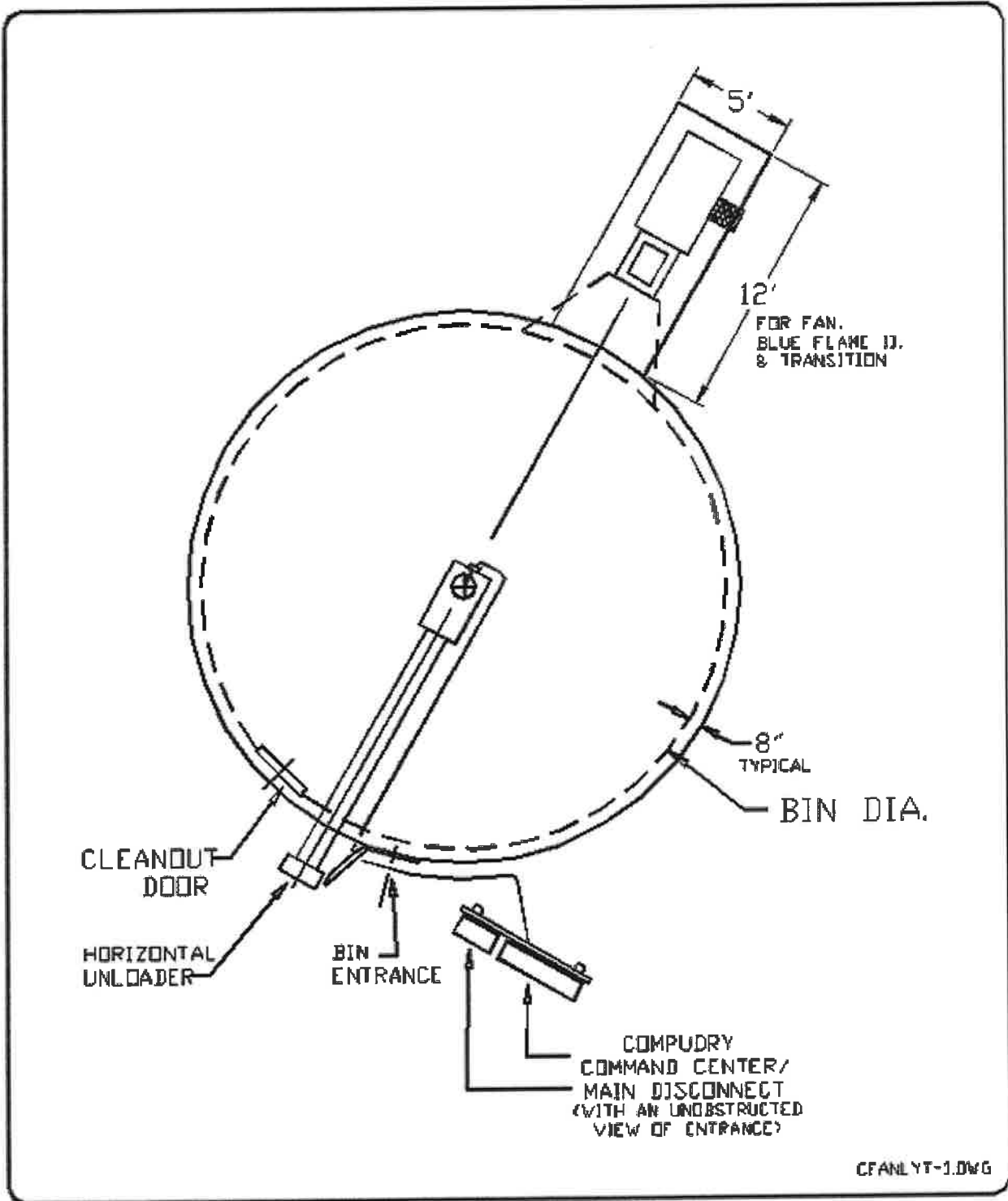


BIN LAYOUT (cont'd)

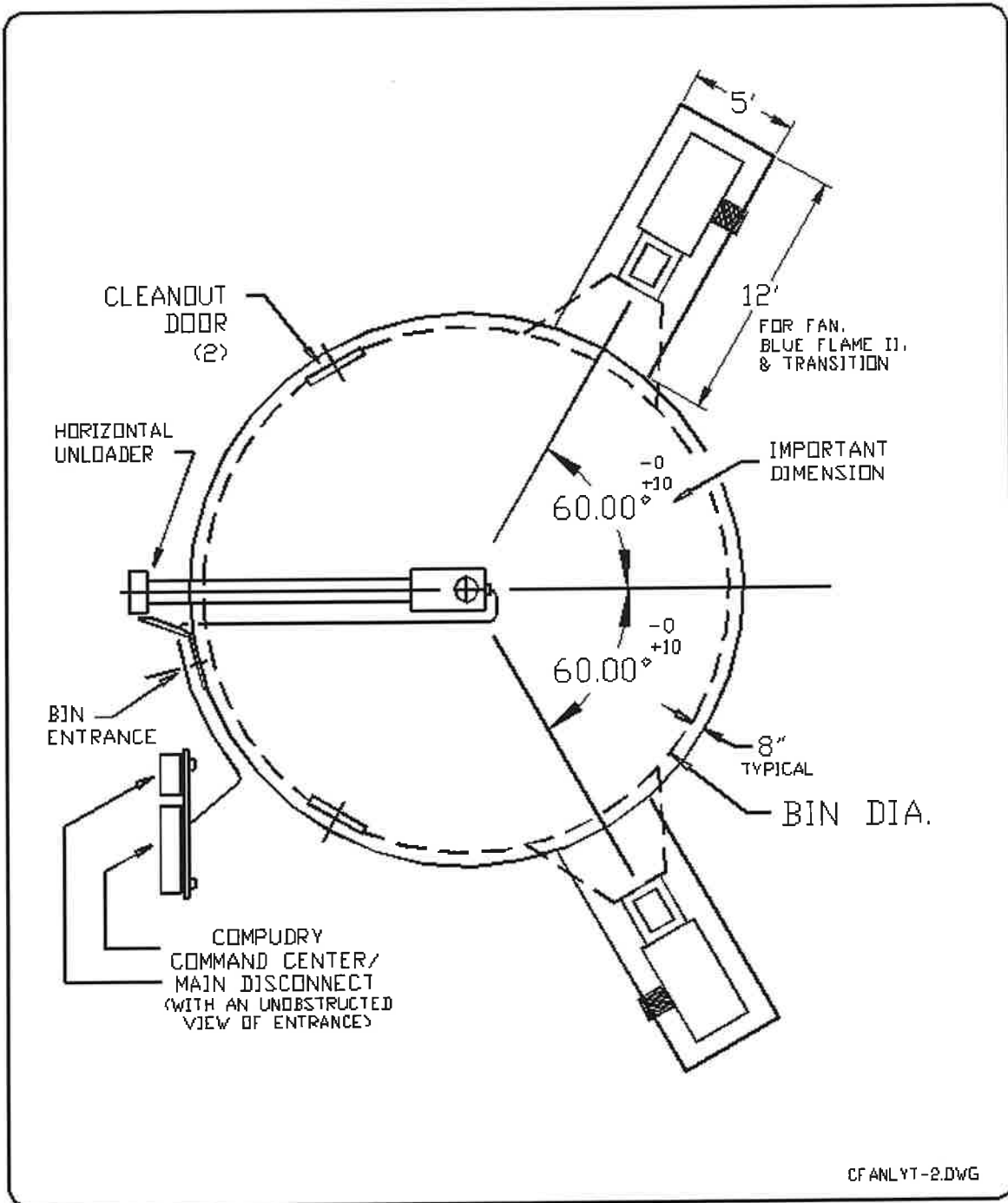
BLUE FLAME Shivvers Circulator 2 3-Fan Layout



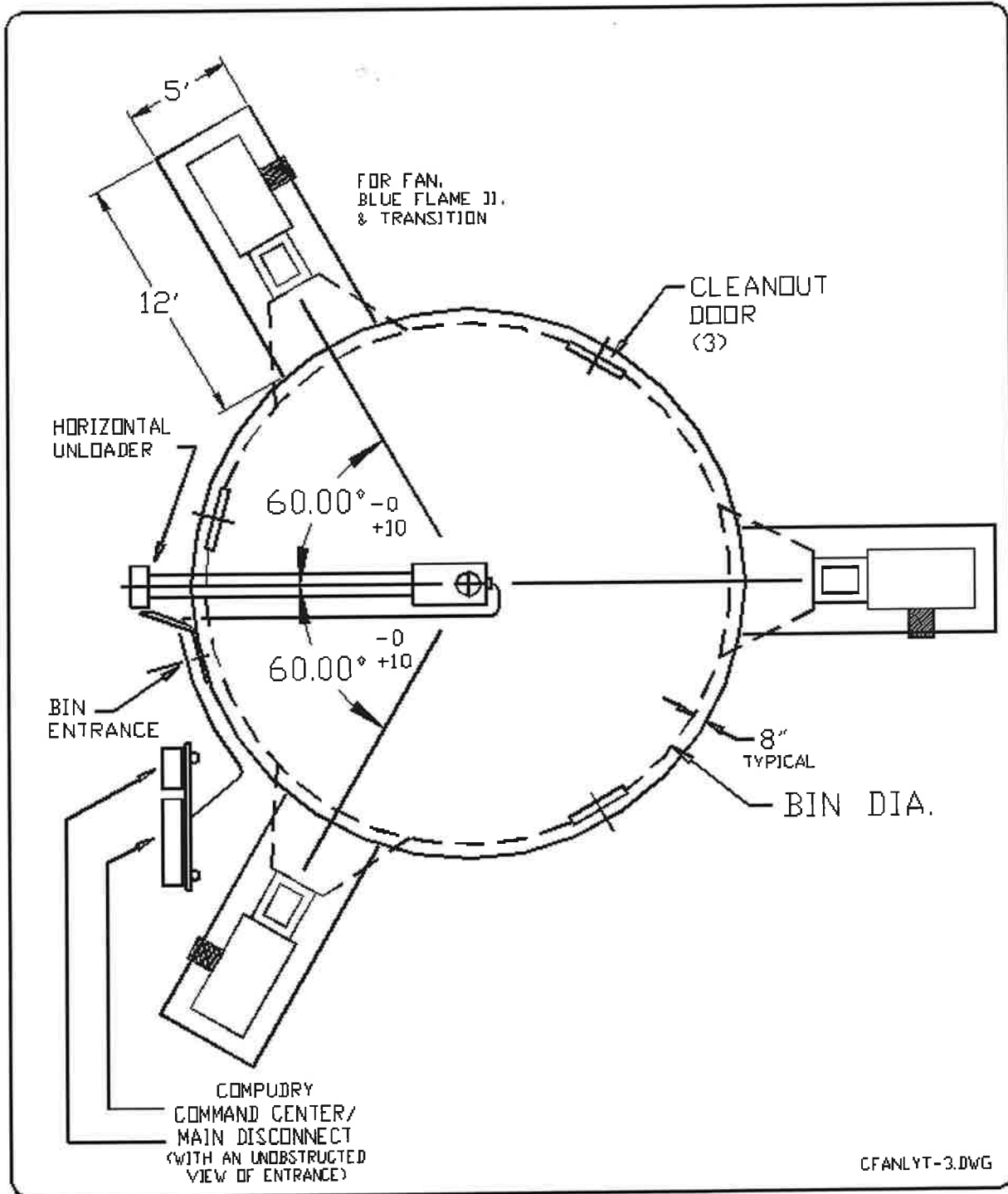
BLUE FLAME II
Shivvers Circulator 2
1-Fan Layout



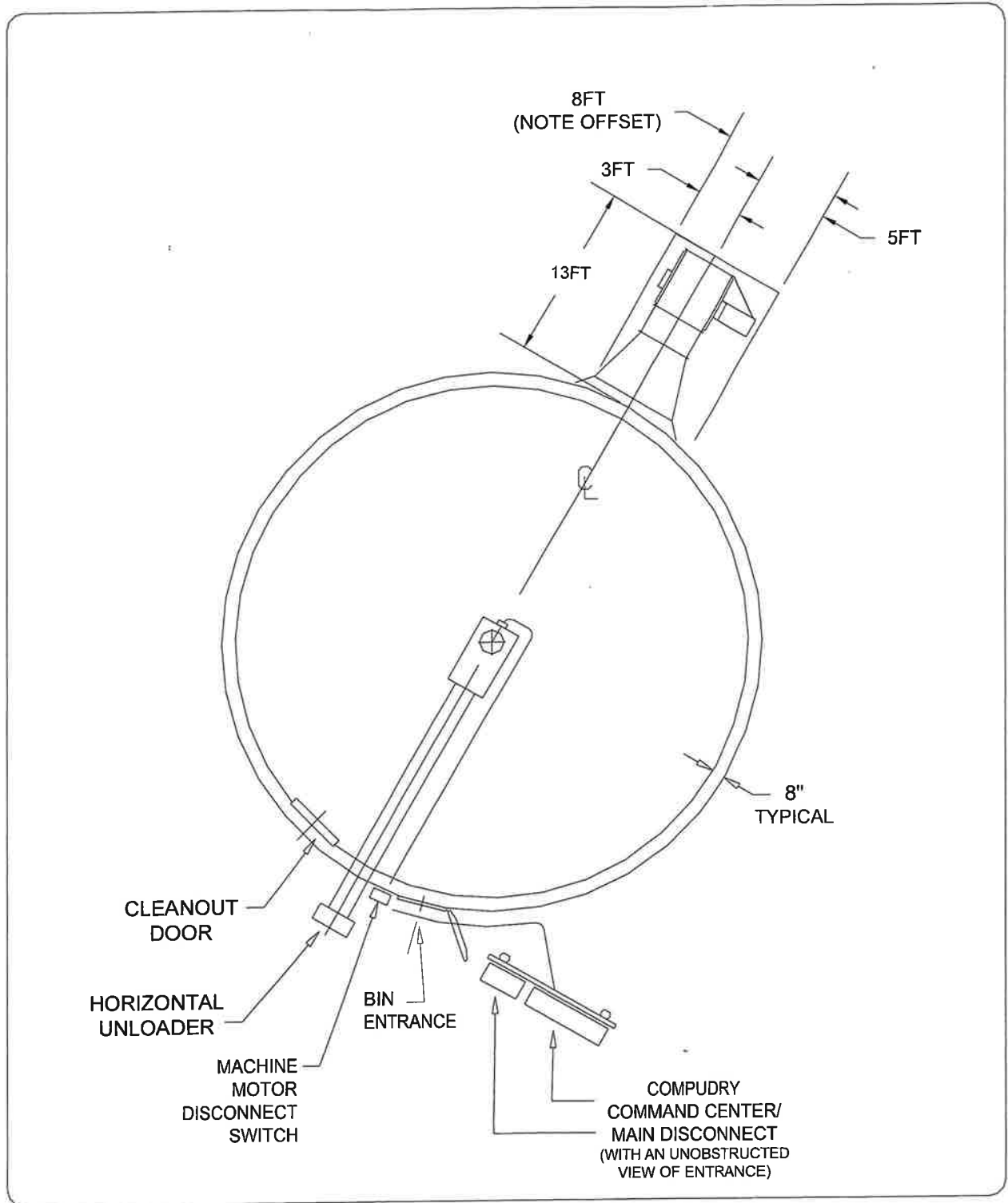
BLUE FLAME II
Shivvers Circulator 2
2-Fan Layout



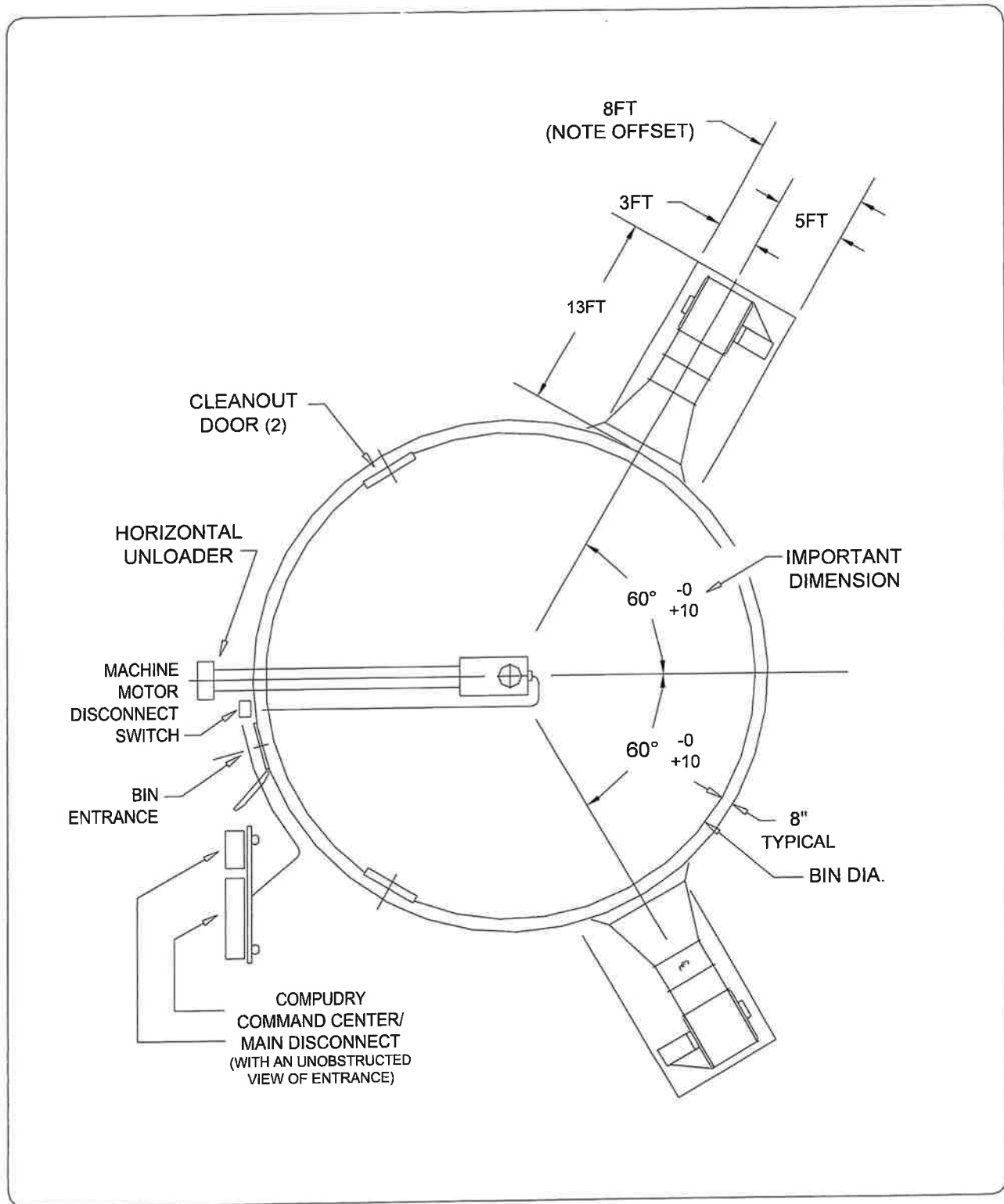
BLUE FLAME II Shivvers Circulator 2 3-Fan Layout



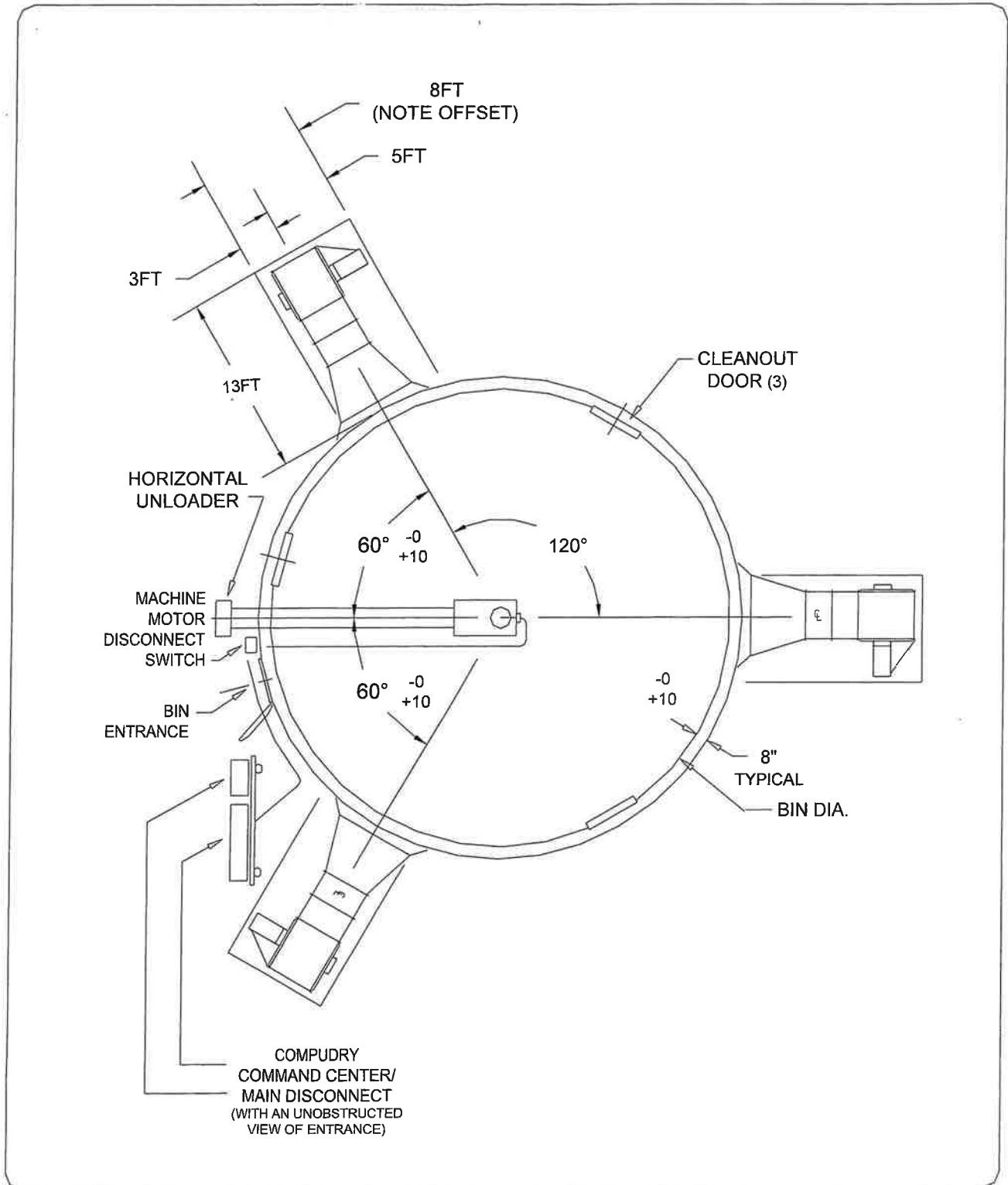
DUAL FAN INLET Shivvers Circulator 2 1-Fan Layout



DUAL FAN INLET Shivvers Circulator 2 2-Fan Layout



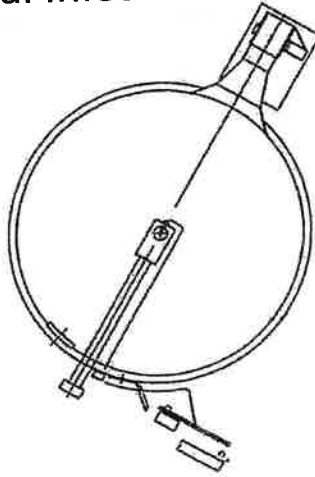
DUAL FAN INLET Shivvers Circulator 2 3-Fan Layout



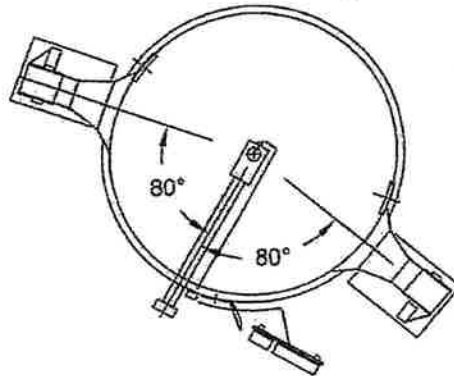
MECHANICAL INSTALLATION
Recommended Fan Lay-outs for 3-Sweeps Systems
(For New Installations)

Dual Inlet Fans

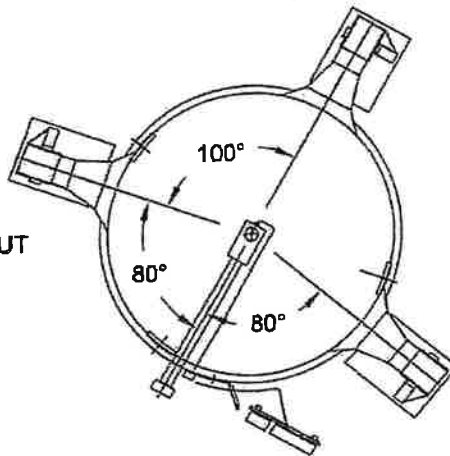
1-FAN LAYOUT



2-FAN LAYOUT



3-FAN LAYOUT



8

INSTALLING HORIZONTAL UNLOADER AND GEAR BASKET

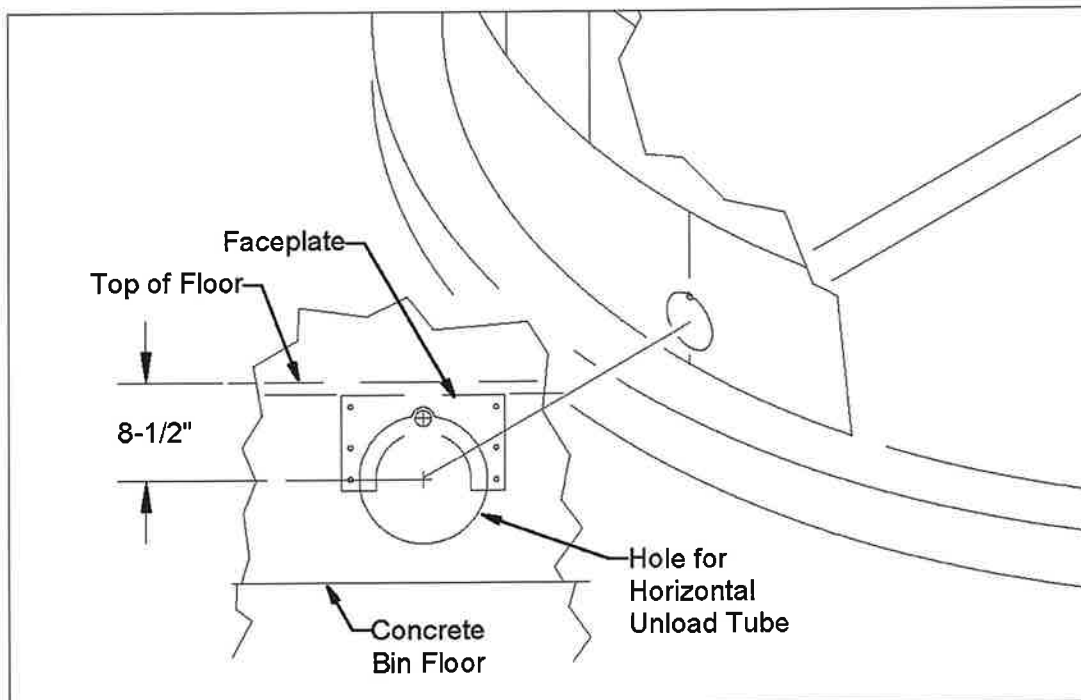
Step 1:

For installations in existing bins, it is recommended that the floor be removed. If the old floor is going back in, number the individual floor pieces for convenience of re-installation. The entire concrete bin floor should be cleaned.

Step 2:

Determine the location where the horizontal unload tube will project through the bin sidewall. It should be within sight of the bin entrance and the dryer controller. At this location, measure down 8-1/2" from where the top of the floor will be. This will be the center of the horizontal unload tube.

Hold the faceplate against the bin wall, with the control rod hole on top, and mark all holes on the bin wall. Cut a keyhole shape in the bin wall for the unload tube and control rod. Hanger bearing unloaders will require a larger hole. Make sure the faceplate will cover the hole that is cut.

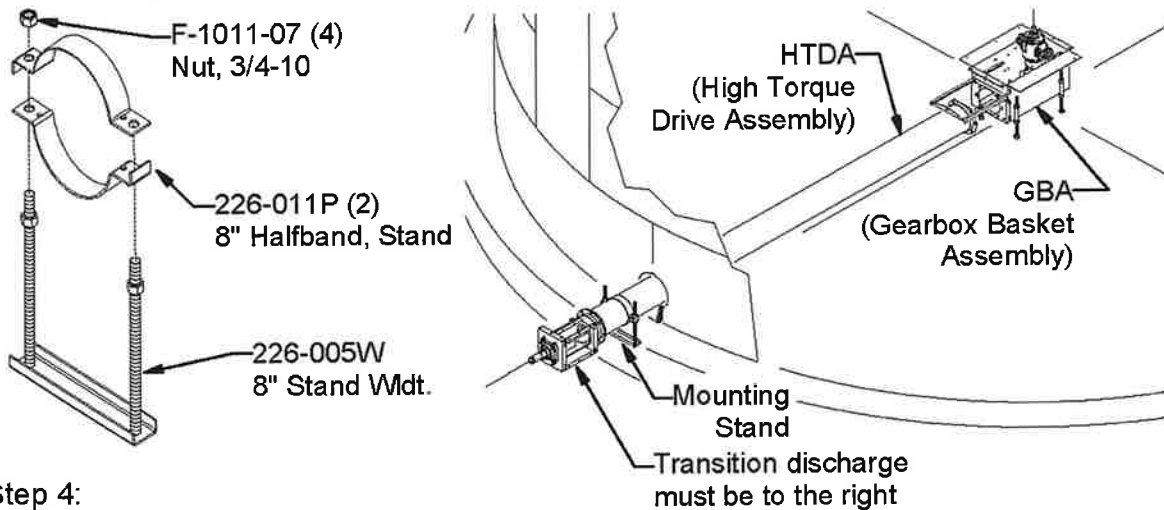


INSTALLING HORIZONTAL UNLOADER AND GEAR BASKET (cont'd)

Step 3: Rough Locate HTDA.

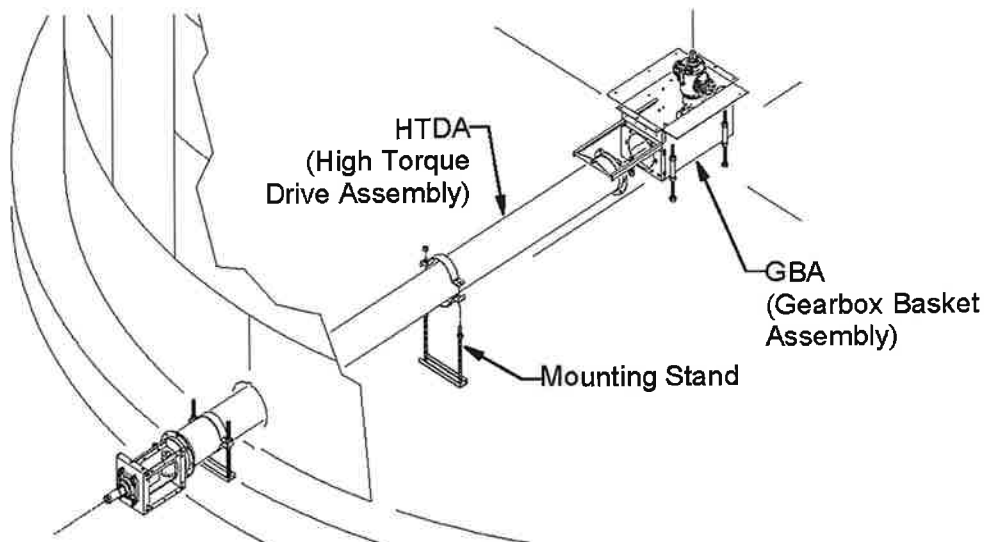
Place a folded towel across the bottom edge of the opening in the bin wall to protect the HTDA during installation. Be careful not to drop the unit at any time to avoid denting the tube. Put the open end of the HTDA through the bin wall and set it on the floor near the GBA.

Outside the bin, assemble and install the Mounting Stand onto the HTDA. This should be clamped onto the tube 5" away from the bin wall, leaving room for the 2-piece Face Plate to be installed later. This stand is to support the HTDA during installation, leveling, as well as for the life of the machine.



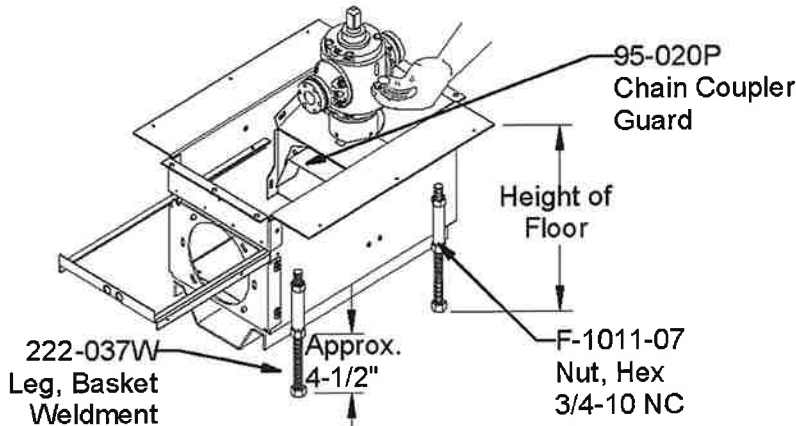
Step 4:

Assemble and install a second mounting stand onto the HTDA. This should be clamped to the tube at about halfway between the GBA and the bin wall. Make sure the location will not interfere with any intermediate wells. This stand is to support the HTDA during installation, leveling, as well as for the life of the machine.



INSTALLING HORIZONTAL UNLOADER AND GEAR BASKET (cont'd)

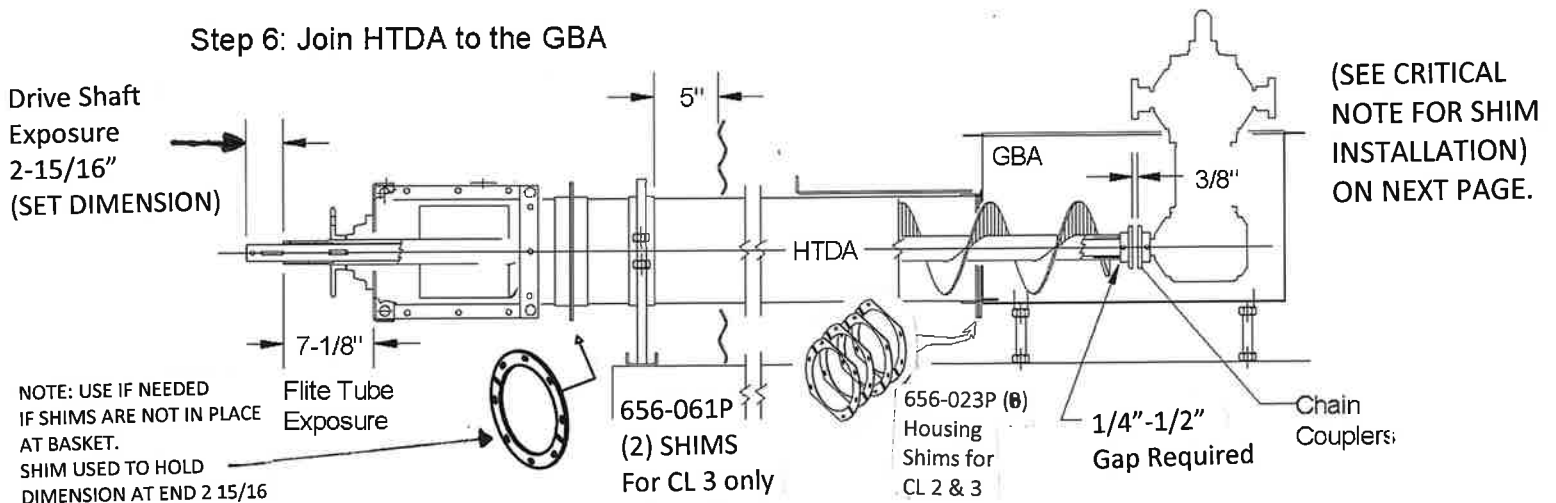
Step 5: Prepare gearbox and basket for installation



Check the gearbox to insure it is lubricated. Remove the shipping wire that holds the top gearbox to the bottom gearbox. Screw jam nuts, from 222-085A Basket Hardware Sack, on the 3/4" X 12" support legs approximately 9". Screw the support legs, with the jam nuts, into the basket until the top of the basket will be about the same height as the drying bin floor.

Remove the Chain Coupler Guard and keep it for later re-installation.

Step 6: Join HTDA to the GBA



(SEE CRITICAL NOTE FOR SHIM INSTALLATION) ON NEXT PAGE.

Positioning of the HTDA housing is critical to prevent binding and misalignment. Pre-assembly is necessary to determine the number of housing shims required.

Fasten the HTDA to the GBA using all the shims but only four bolts and tighten snugly. The HTDA should now be supported by the mounting stand outside the bin and the GBA at the center of the bin.

Outside the bin, measure the flite tube exposed from the front of the HTDA Transition, this should be: 7-1/8" ±1/32". If not, loosen set screws of the bearing, adjust as needed, and re-tighten setscrews. Measure the drive shaft exposed from the flite tube, this should be: 2-15/16" ±1/32". If not, pull or push gently to adjust.

INSTALLING HORIZONTAL UNLOADER AND GEAR BASKET (cont'd)

Step 6: Join HTDA to the GBA (cont'd)

Inside the bin, measure the space between the chain couplers (this should be: $3/8'' \pm 1/32''$). If not, determine the number of shims to be removed (approximately 1 shim for each $1/8''$).

Using all six bolts, re-attach the HTDA Housing to the GBA and tighten snugly. Remeasure the exposed drive shaft and chain coupler distance. Adjust until drive shaft is exposed $2-15/16''$ (this dimension needs to be held) and the distance between the chain couplers (sprockets) needs to be $3/8''$.

Important: There must also be a $1/4''-1/2''$ gap between the flite tube and the chain coupler sprocket to avoid undue friction during operation, which could start a bin fire.

The units are shipped with an "O" ring to help maintain this spacing during installation. It is not necessary that it remains in place, but it is also OK to leave it there.

Critical Note for shim installation:

For CL II-

After positioning the Horizontal with the stand. Pull parts 656-023P and 656-061P Shims from parts box (654Z-001A). Use shims (3) 656-023P between front of basket and horizontal tube with flat part of shim on top, and put hardware in. Before tightening install chain coupler. Check shims if they are snug. Then tighten.

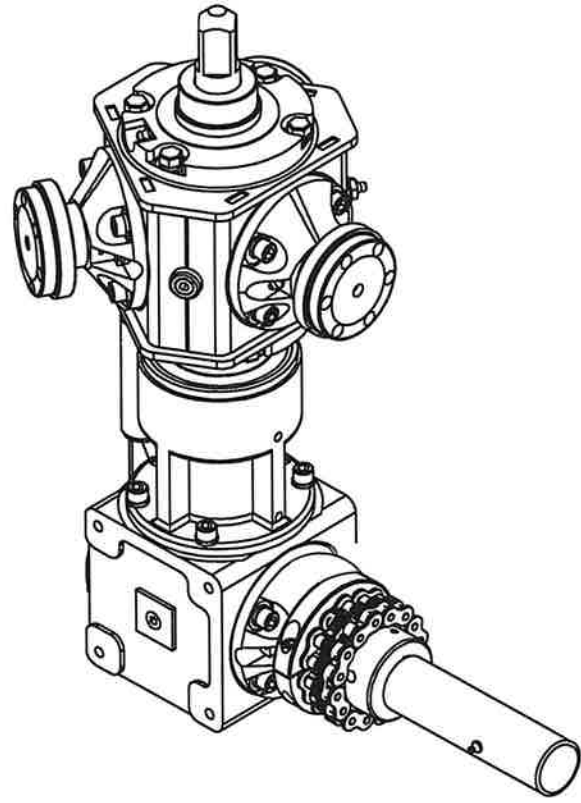
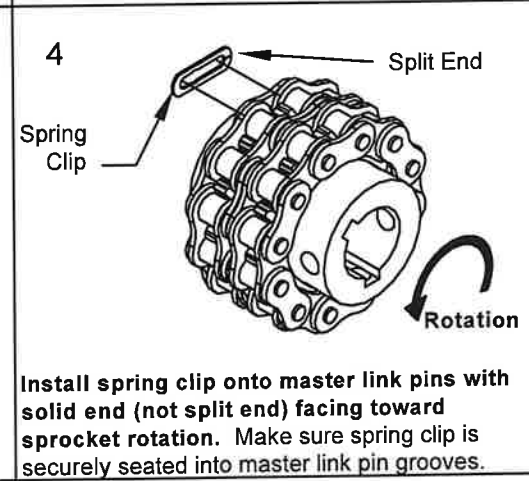
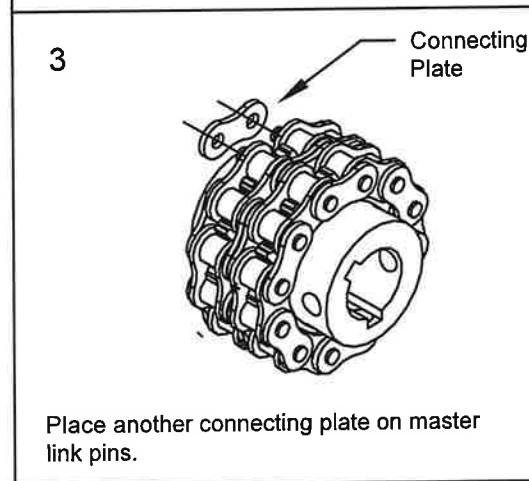
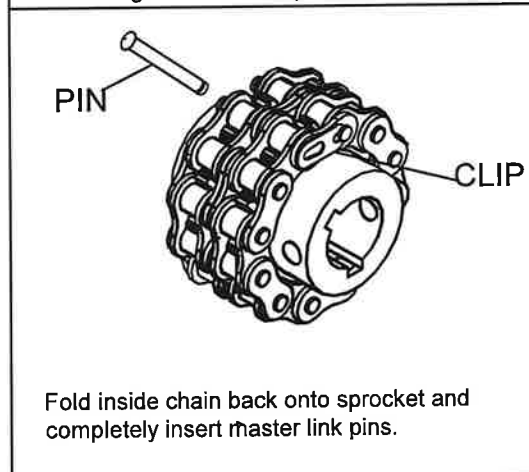
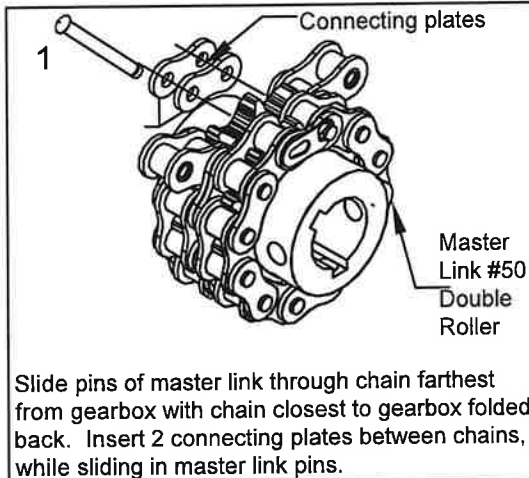
Note; (All shims are of 2 halves).

For CL 3-

Add (2) 656-061P shims along with the (3) 656-023P shims. Follow same procedure as above.

Installing Horizontal Unloader and Gearbox Basket (cont'd)

Step 7: Using the 656-017A hardware Sack, connect the drive shaft of the horizontal unloader to the gearbox input shaft.



Installing Horizontal Unloader and Gearbox Basket (cont'd)

Step 8: Setup of HTDF/HU/GBA Joined Unit

Re-measure to confirm that the square shaft on top of the gearbox is centered in the bin. Adjust as needed. This centering should be checked at least every 90 degrees around the bin.

Level the Gearbox Basket Assembly (GBA):

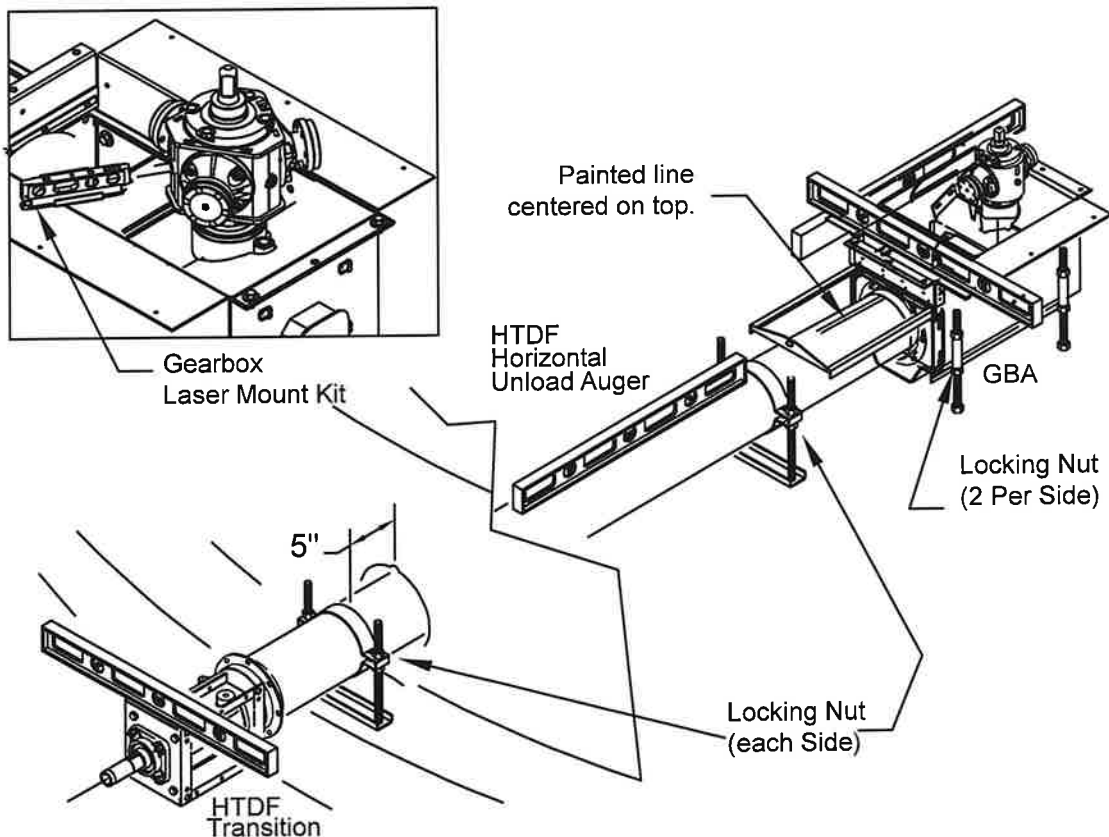
Adjust the support legs of the GBA until the top of it is level and all four support legs are in contact with the slab. Weight must be carried by all four support legs of the GBA. This would be a good time to check that the gearbox is square to the floor using the 423-351-001A Gearbox Laser Mount Kit.

Level the HTDF/HU Transition:

The top of the HTDF/HU transition should be level. If not, loosen the HTDF/HU housing from the front of the GBA and loosen the top clamp of the mounting stands. Rotate the HTDF/HU until the front of the transition is level. Re-tighten the bolts that fasten the HTDF/HU to the GBA. Both 2 & 3 Sweeps.

Level the HTDF Horizontal Unload Auger:

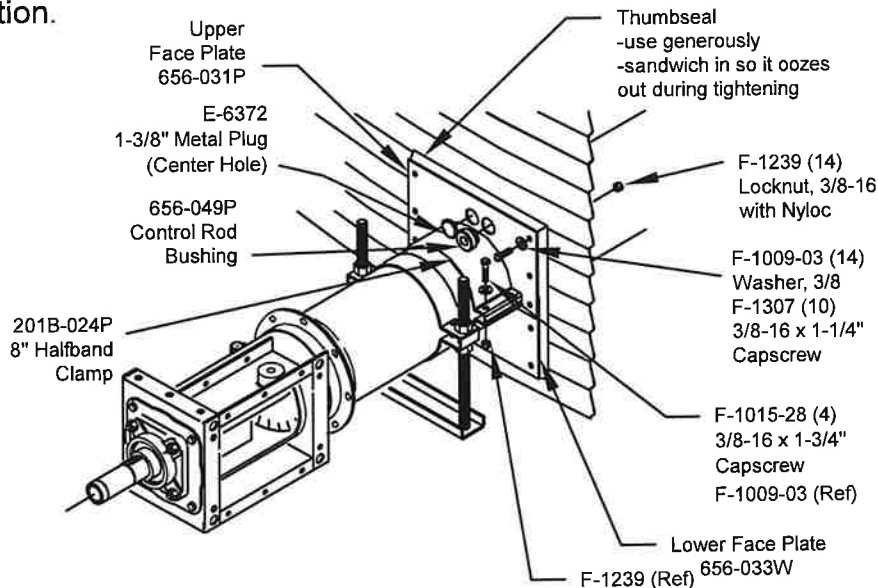
Adjust the outside and inside mounting stand height as needed, then make sure the 5" space has been maintained on the outside stand and tighten both stands securely.



Installing Horizontal Unloader and Gearbox Basket (cont'd)

Step 9:

Assemble the lower face plate weldment and half band onto the HTDF/HU between the mounting stand and the bin wall with minimal clamping force. Using two bolts, fasten the upper face plate to the lower face plate weldment and slide it up against the bin wall, leveling as needed. Using the face plate as a template, drill all bolt holes in the bin wall. Using a marker, draw around the faceplate to show where thumb-seal will be needed. Remove the face plate and apply a generous bead of thumb-seal just inside the face plate mark on the bin wall. Re-install the face plate assembly, making sure it is completely sealed against the bin wall. Once GBA, HTDF, and the horizontal transition are level, be sure to tighten the face plate into position.



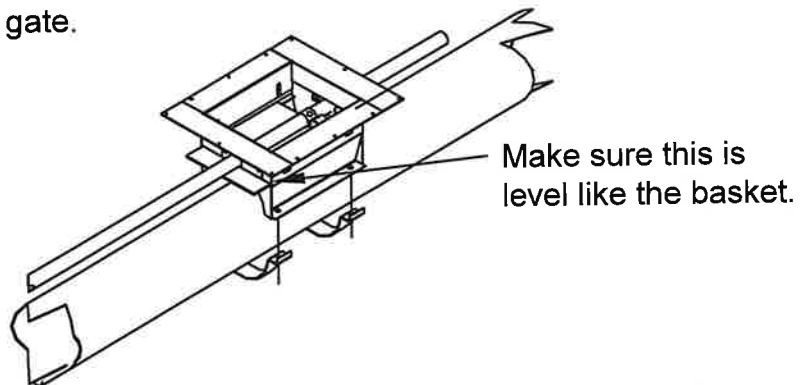
Step 10:

Re-install the Chain Coupler Guard removed earlier.

Installing Horizontal Unloader and Gearbox Basket (cont'd)

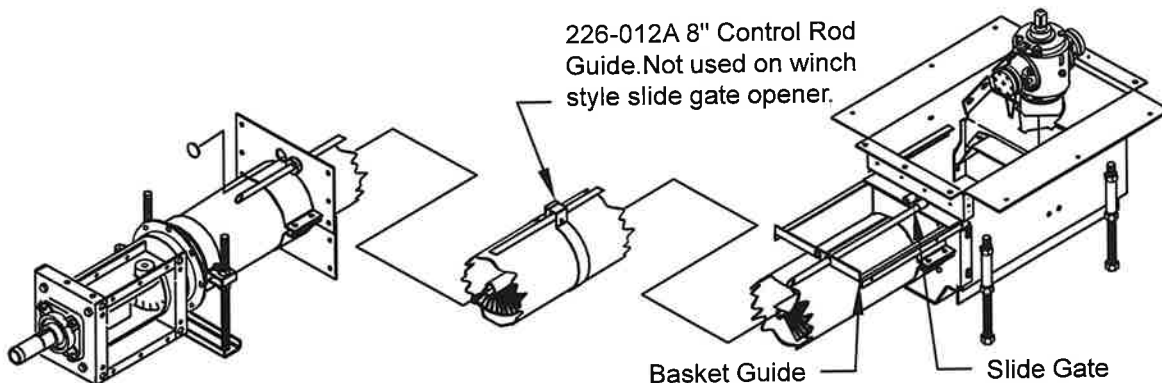
Step 11: Optional Intermediate Well (For more details see Intermediate Well Instructions, P-11584)

If an intermediate well is to be installed, attach it to the horizontal unloader now. Make sure the well is not placed where the tapered sweep auger track will be. Track location will depend on the type of sweep auger. For bins over 33' diameter, the inset wheel track will either be 142" or 145" from the gearbox base. Measure the sweeps to double check the inset wheel location. Once the intermediate well is installed, attach a 1" pipe control rod 423-419-001A to allow independent operation of the intermediate well slide gate.



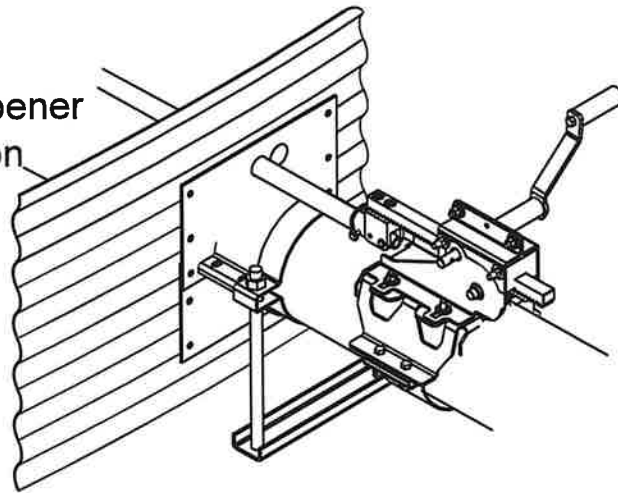
Step 12:

Install the slide gate into the basket as shown. Off center the control rod guide on the unloader tube (guide may not be required if intermediate well is used). Bins over 34' in diameter may require two control rod guides. One is located in the parts box and one is located in the chain and pop rivets parts box. If an intermediate well is not used and a 2-piece face plate is used, install the 656-049P, control rod bushing, into the offset hole in the face plate. Install an E-6372, 1-3/8" metal plug, into the centered unused face plate hole. Slide the control rod through the face plate, intermediate well (if used), control rod guide, and basket guide. Screw the control rod into the slide gate and check operation. Attach a slide gate opener (Step 11).



Installing Horizontal Unloader and Gearbox Basket (cont'd)

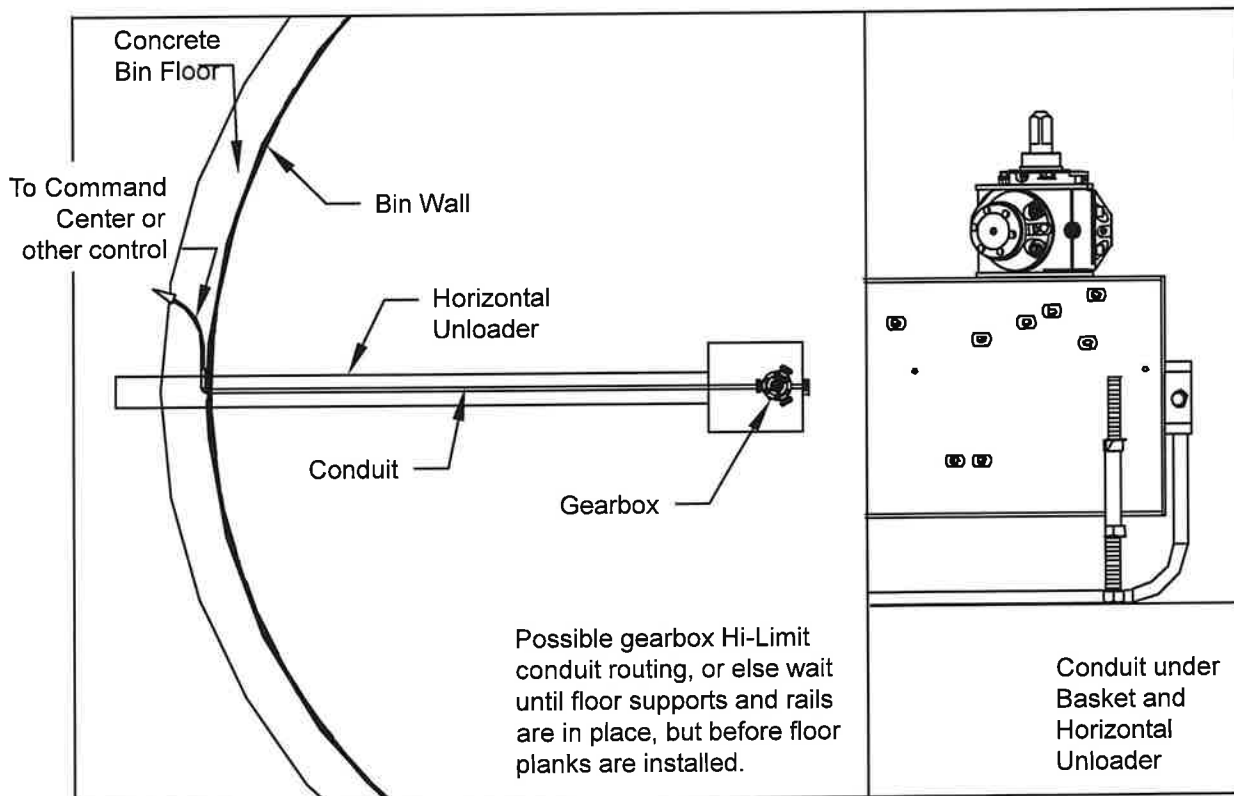
91C-001A (8")
Winch Style Slide Gate Opener
See P-13189 for Installation
Instructions.



Installing Horizontal Unloader and Gearbox Basket (cont'd)

Step 12: Install conduit for gearbox Hi-Limit.

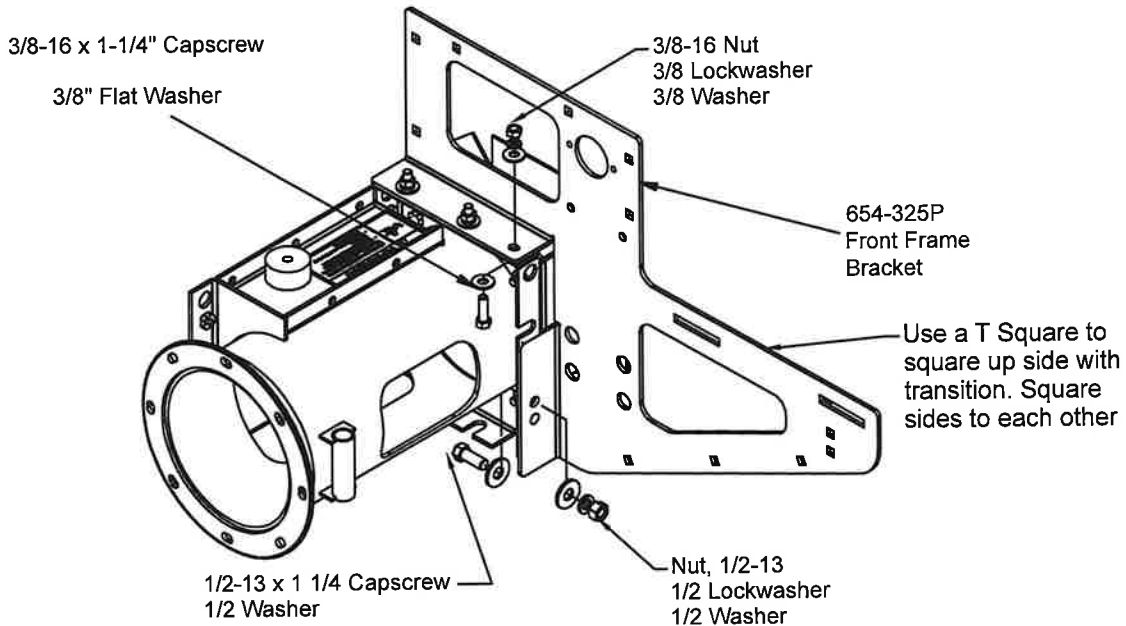
The gearbox Hi-limit will shut off the drying fan(s) if it gets above 240° F. What the gearbox Hi-limit will wire to depends on the type of control and how many fans are used in the installation. If a Compudry Command Center is used, the gearbox Hi-Limit will always wire to it. If 2 or more fans are used, the gearbox Hi-Limit will wire to either the dryer control box or a Grain Hi-limit Control box. Only if a control other than a Compudry Command Center is used, and there is only one fan on the bin, will the gearbox Hi-limit go directly to the fan. The important thing is to get the conduit installed before the bin floor is in place. The wire can always be routed wherever it needs to go once it is on the outside of the bin. If the conduit is not going to be in-line with the horizontal unloader, it may be better to wait until the floor supports and rails are in place to route the conduit so it doesn't interfere with floor support placement. Use the high temperature wire (641-046A) supplied for under the floor. Once outside the bin, any appropriate electrical control wire can be used. Pull 2 of the high temperature wires through the conduit. Connect each wire to a gearbox Hi-limit wire in the junction box on the back of the basket. Use regular wire nuts to make the connection. Refer to installation manual for dryer control used on where to connect the other end of the gearbox Hi-limit wires.



INSTALLING DUAL MOTOR DRIVE

Step 1:

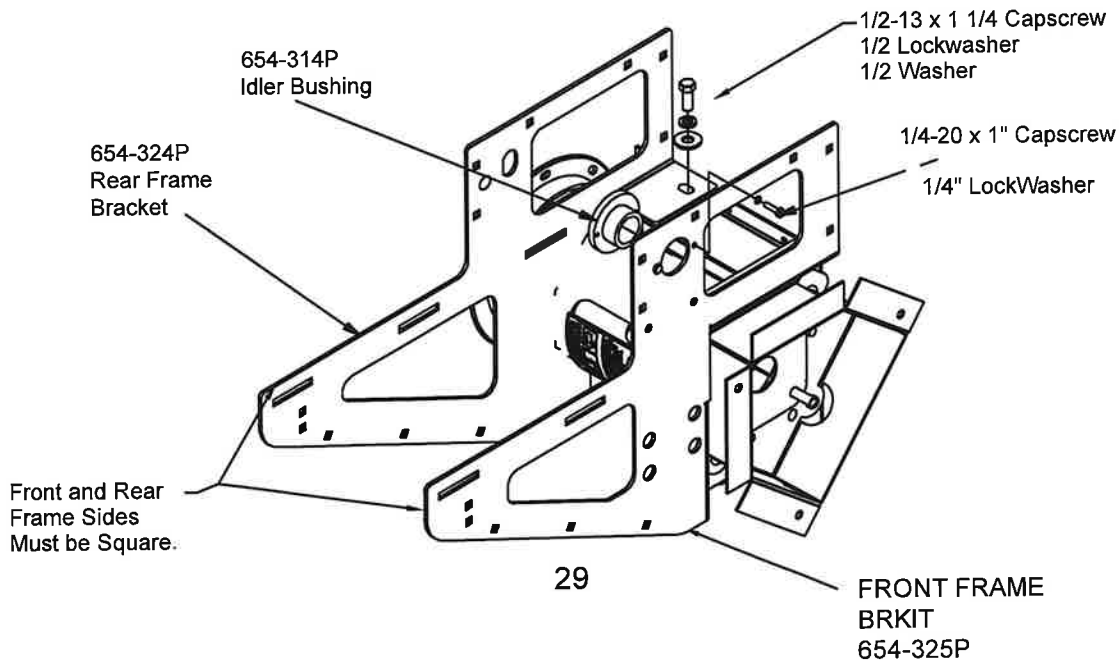
Remove all contents from shipping box. Use hardware, as shown, from sack (654-330A) to secure the Front Frame Bracket (654-325P) to the 8" horizontal unloader transition. DO NOT tighten bolts completely at this time.



Step 2:

Use hardware, as shown, from sack (654-330A) to position the Rear Frame Bracket (654-324P) to the horizontal unloader transition. Do not tighten 1/2" bolt into transition.

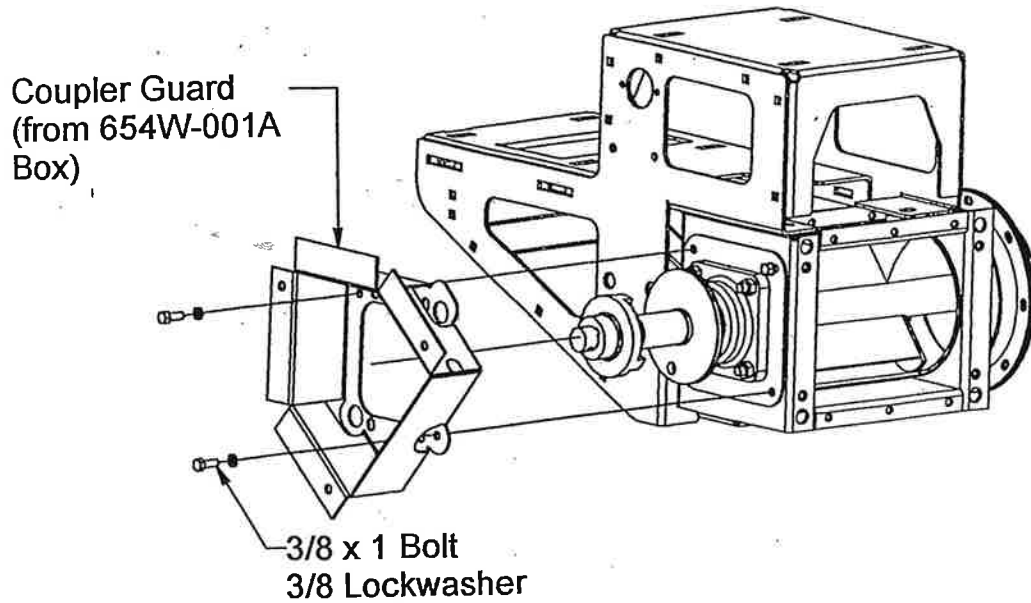
Place the Idler Bushing (654-314P) into hole in the Front Frame Bracket (654-325P). Secure with hardware, as shown, from sack (654-330A).



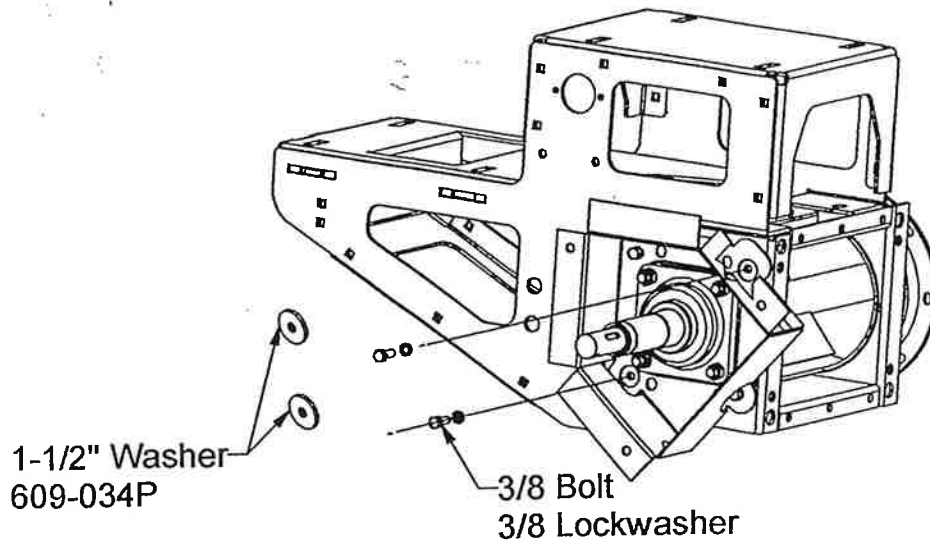
INSTALLATION INSTRUCTIONS

FOR COUPLER GUARD ON TRANSITION WITH REMOVABLE BEARING PLATE

STEP 1: Remove 2 bolts and lockwashers in opposite corners corresponding with small bolt holes in coupler guard. Fasten coupler guard to transition by replacing these two bolts and lockwashers.



STEP 2: Remove two bolts and lockwashers in opposite large clearance holes.



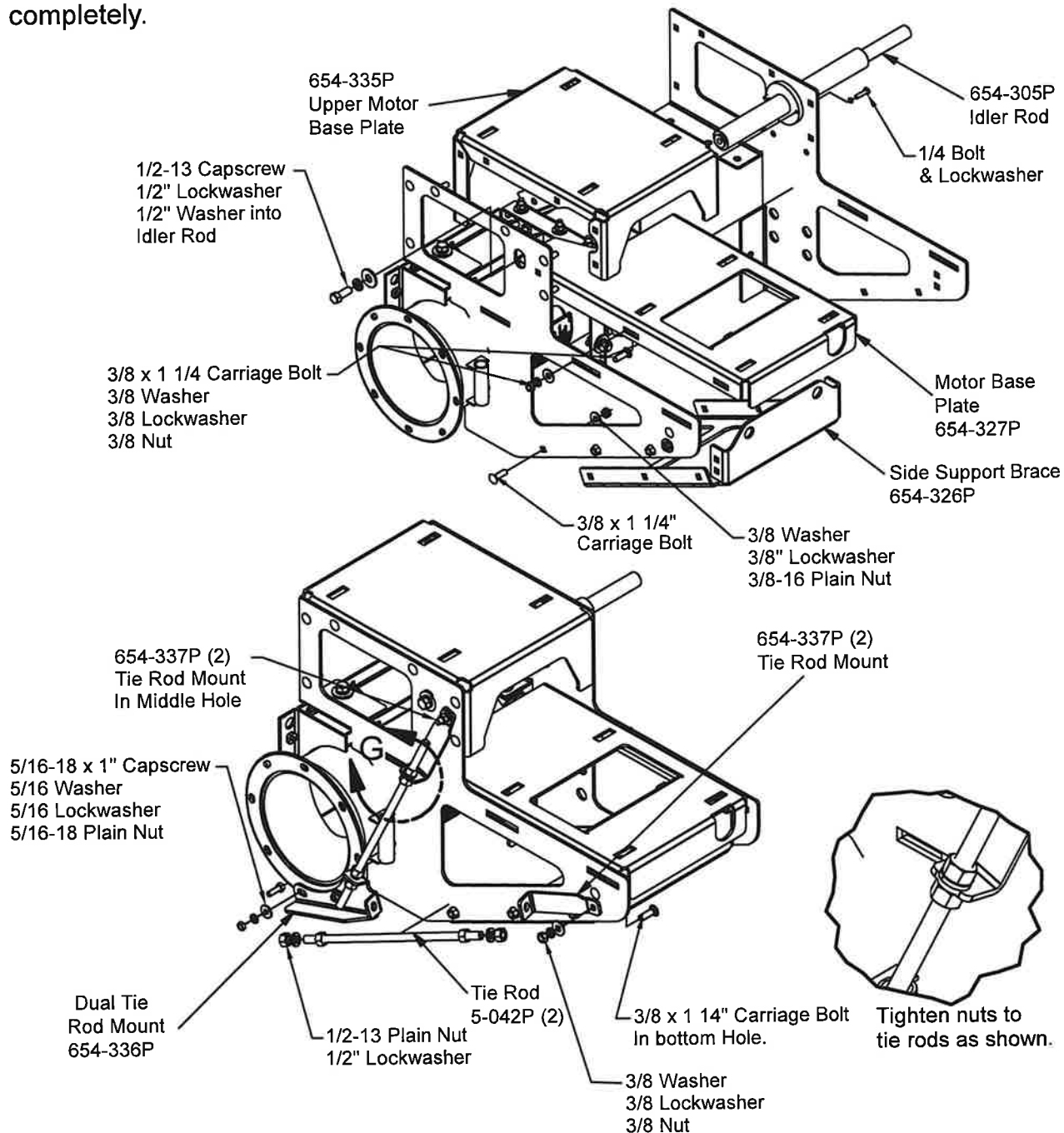
STEP 3: Fasten back on top of Coupler Guard with the 1-1/2" Washer, 609-034P. These large Washers can be found in the 654-332A Small Parts Box.

INSTALLING DUAL MOTOR DRIVE (cont'd)

Step 3:

Use hardware, as shown, from sack (654-330A) to secure the following parts to the front and rear frame brackets: Upper Motor Base Plate (654-335P), Side Support Brace (654-326P) and Motor Base Plate (654-327P). All bolts can be tightened at this time except the (5) bolts that go into the long slots on the frame sides. Hardware can be placed in the direction that is most convenient for the installer. Attach Tie Rods Mounts and Tie Rods as shown below

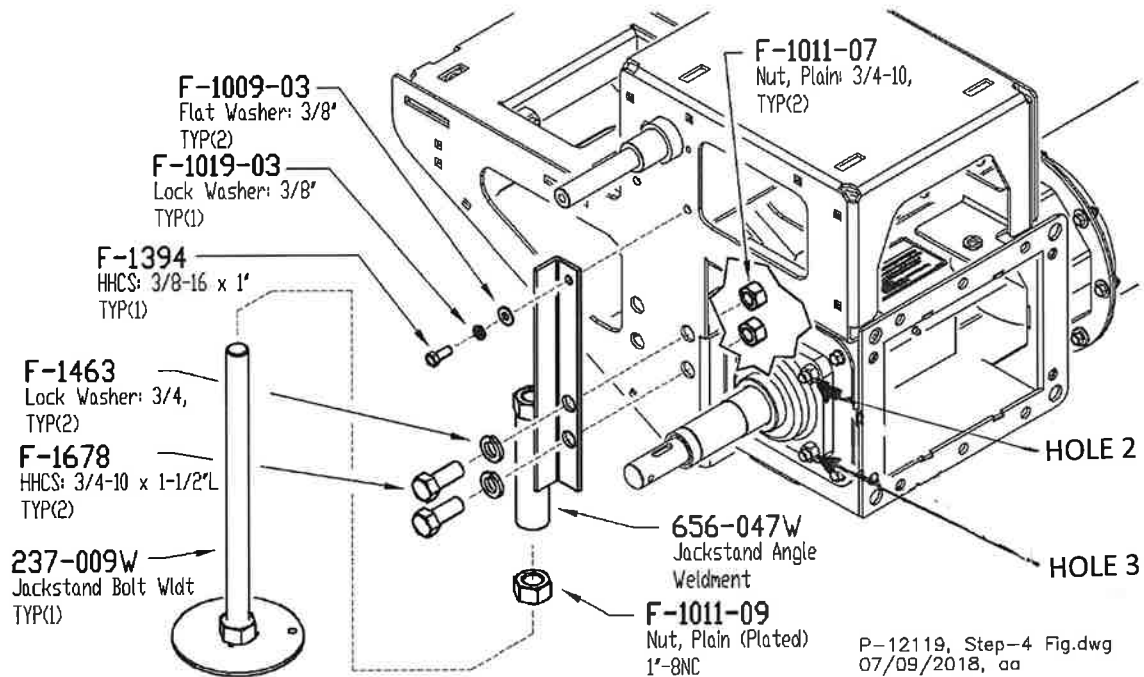
Slide Idler Rod (654-305P) through Idler Bushing. Take care to apply an anti-siezing compound to the rod where it will rest inside of the bushing. Lock in place using hardware, as shown, from sack (654-332A). Tighten these 1/4" bolts completely.



INSTALLING DUAL MOTOR DRIVE (cont'd)

Step 4: Install Jackstand:

Using hardware from sack in 654-332A, Install F-1011-09 (1"-8 Plain Nut) onto the Jackstand Bolt Wldt (237-009W) leaving about 1" from Nut on Jackstand Bolt. Now Thread the Jackstand Bolt into the Jackstand Angle Weldment (656-047W) until it contacts the nut you just put on. Using the set of holes best for your site, attach the Jackstand to the Drive Frame and tighten securely.



(See diagram on next page for steps 5 & 6).

Step 5a: Install Tensioning Bolt (654-309W) Through the Notch in the Lower Motor Mount Base Plate (654-327P). ...thread it in 4-6 turns, it will be adjusted later.

Step 5b: Install Chain Guard. It uses the same bolts that hold the Front Bearing Plate. We will systematically be replacing the 3/8" x 1" Bolts with 3/8" x 1-1/4", so follow instructions carefully.

The goal is to mount the Chain Guard without having to remove/readjust the Bearing. (We will not be removing the 1/2" Nuts holding the Bearing).

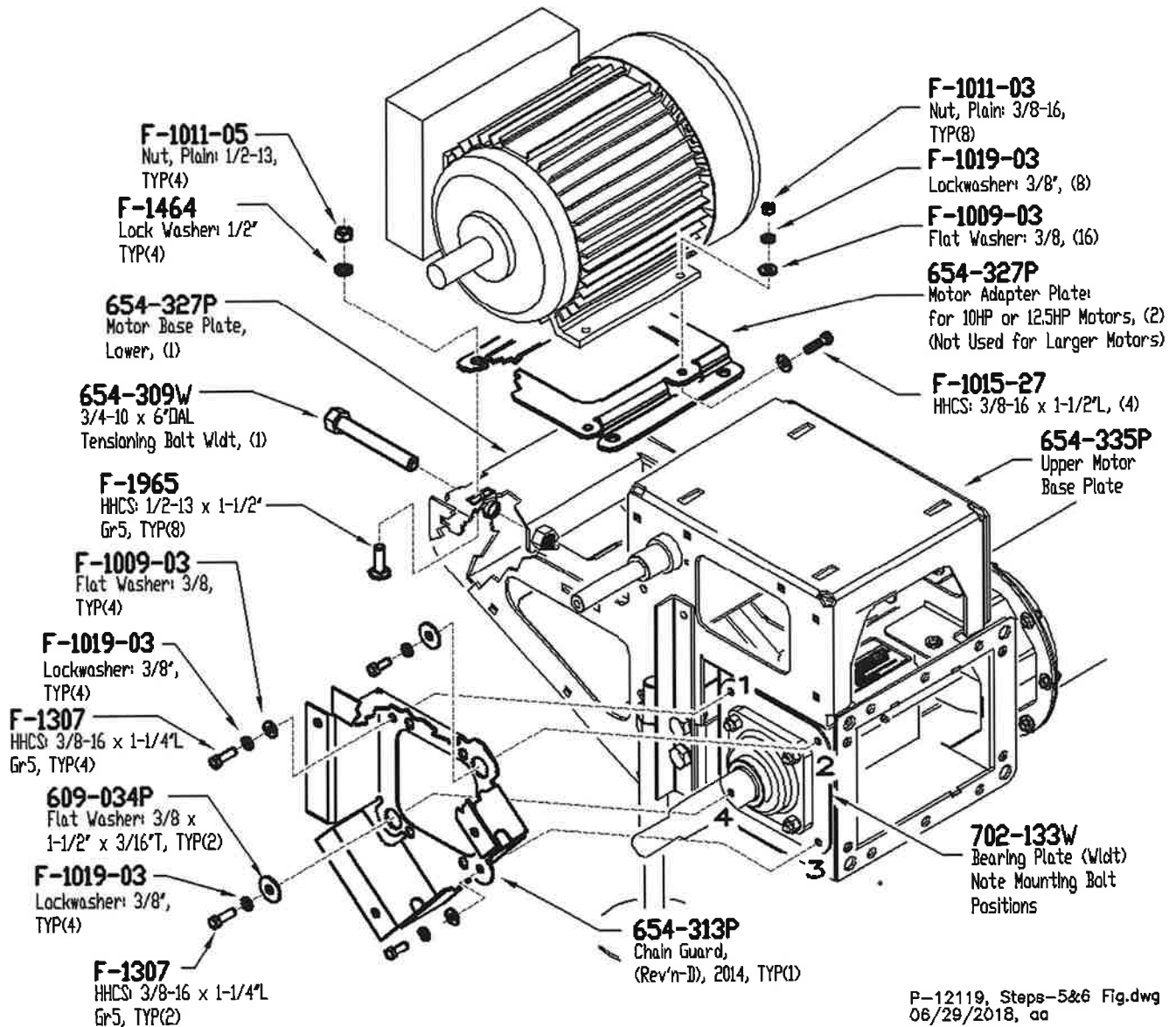
- Remove the 3/8" bolts at the #1 and #3 positions.
- Place the Chain Guard 654-313P against the Bearing Plate, it should fit over the remaining bolts.
- Using the 3/8 x 1-1/4" L Bolt (F-1307), 3/8" Lockwasher (F-1019-03), 3/8" Flatwasher (F-1009-03) at positions 1 & 3, fasten the Chain Guard securely at those corners, (28-31 Ft/Lb).
- Remove the 3/8" bolts at the #2 and #4 positions.
- Using the 3/8 x 1-1/4" L Bolt (F-1307), 3/8" Lockwasher (F-1019-03), 3/8" x 1-1/2" Large Flatwasher (609-034P) at positions 2 & 4, fasten the Chain Guard securely at those corners, (28-31 Ft/Lb).

Step 6a: Prepare Motors for Installation.

If you are installing two 10HP Motors, mount each one to a Motor Adapter Plate (654-327P) using the 3/8" hardware from sack (654-331A) as shown. If you are installing two 12.5HP Motors, mount each one to a Motor Adapter Plate (654-327P) using the 3/8" hardware from sack (654-331A) as shown. If you are installing two 15HP Motors, they will mount directly to the Powerhead Frame, so the 654-327P Motor Mount Plates will not be needed.

INSTALLING DUAL MOTOR DRIVE (cont'd)

Step 6b: Installing the Motors to the Powerhead Frame. Using the 1/2" hardware from the 654-331A Hardware Sack, Mount the Motors, One to the 654-335P Upper Motor Base Plate and the other to the 654-327P Motor Base Plate. Positioning later.

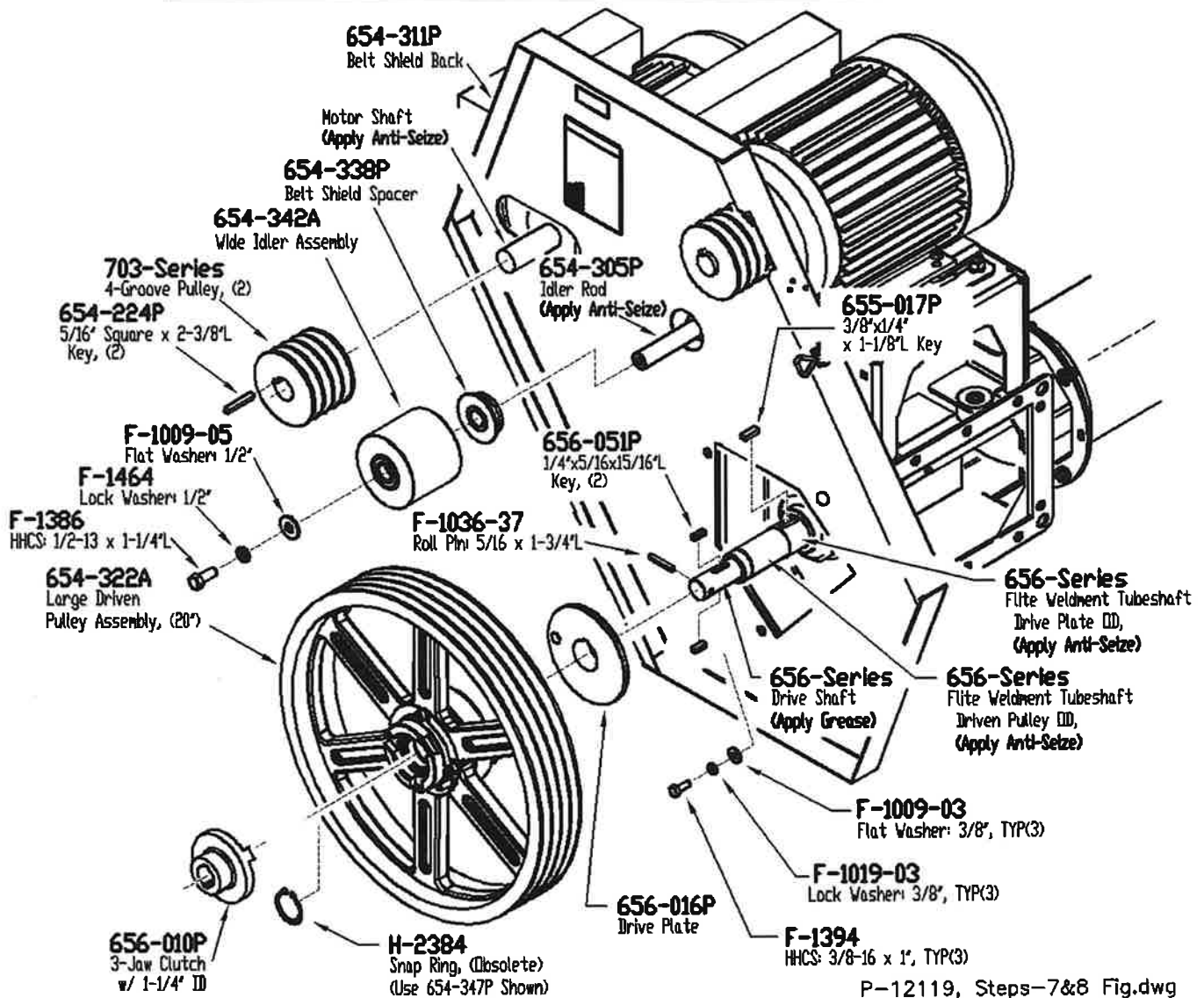


(See diagram on next page for steps 7 & 8).

Step 7a: Installing the Belt Shield Back, Wide Idler & Motor Pulleys: Using hardware from sack in 654-332A, secure Belt Shield Back (654-311P) to Chain guard. Install Belt Shield Spacer (654-338P) over Idler Rod and into hole in Belt Shield Back as shown. Install Wide Idler Assy (654-342A) over Idler Rod, secure with hardware as shown.

Step 7b: Install 703-Series 4-Groove Motor Pulleys: Back off all setscrews to allow clearance for Motor Shaft(s). Install Key(s) (654-224P) into Motor Shaft(s), Install Motor Pulley(s) onto Motor Shaft(s), (Tighten Setscrews during alignment).

INSTALLING DUAL MOTOR DRIVE (cont'd)



Step 8: Place Rectangular Key (655-017P) into Tubeshaft of the (656- Series Flite Weldment). Install Drive Plate (656-016P), hub side first, onto Tubeshaft and over key until it contacts Bearing Hub, then using a 5/32" hex key socket, tighten (2) setscrews to secure Drive plate in place. Install Large Driven Pulley (654-322A [20.35" or 654-334A [18.75]], (3-Jaws outward), onto 2nd OD of Tubeshaft until it stops against Drive Plate. Install Driveshaft Keys (654-051P(s) into Driveshaft and apply grease. Install 3-jaw Clutch (656-010P) and make sure it slides back and forth freely. Install F-1036-37 into Driveshaft to keep Clutch from sliding off. Check 3-Jaw Clutch for proper engagement and dis-engagement.

Step 9: before installing belts, wire the motors and check direction to ensure both rotate in the same direction. (Counter-Clockwise looking at the Pulleys).



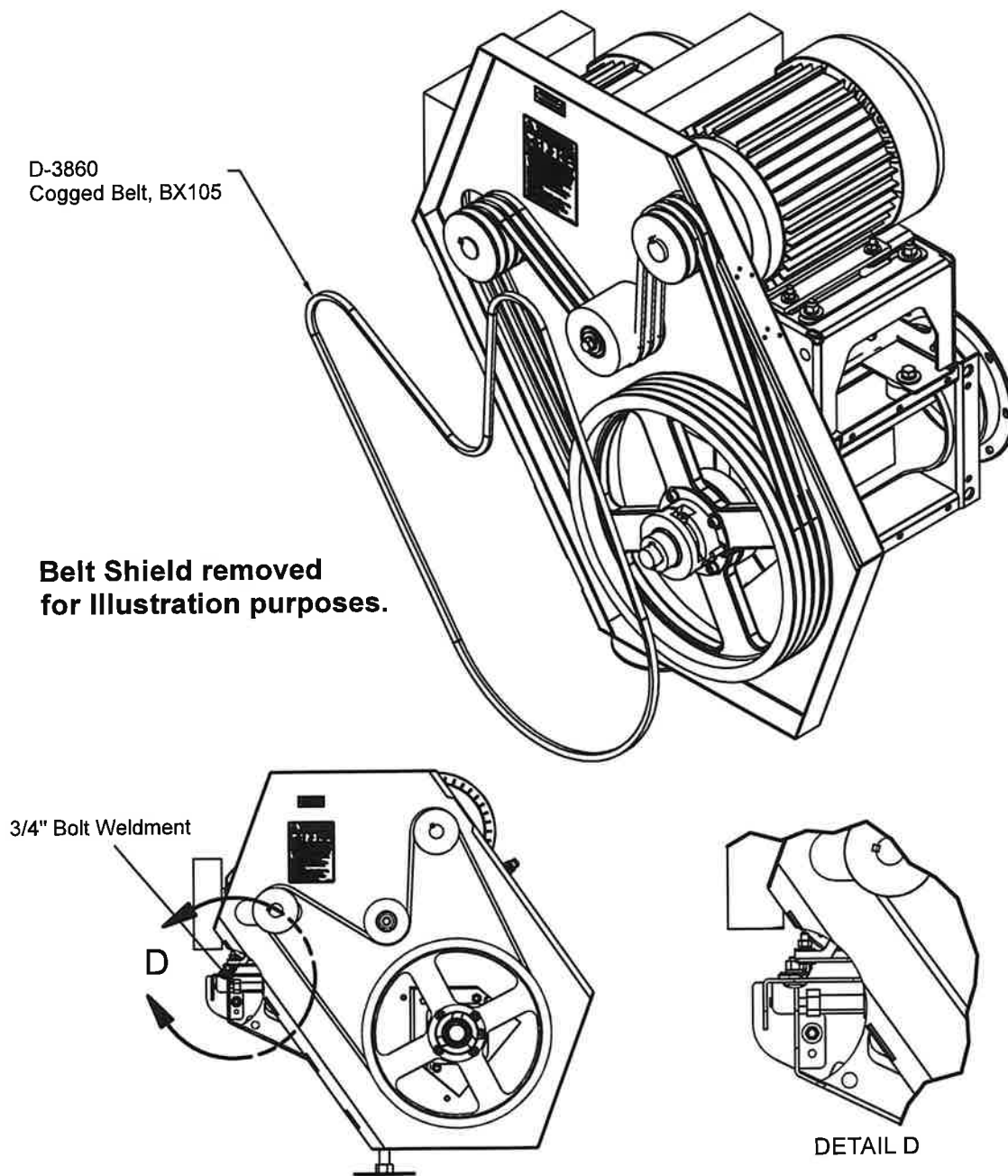
Shut and lock off power after motors have been wired and checked.

INSTALLING DUAL MOTOR DRIVE (cont'd)

Step 10:

Using a long straight edge, align the large pulley with the two small pulleys. Install four belts as shown. Tighten the belts by adjusting the bolt weldment (654-309W) underneath the lower motor (Detail D).

Test belts to make sure they will stay aligned properly. After belts are installed and aligned, tighten all four set screws holding the small pulleys on the motors. Tighten (5) 3/8 Carriage Bolts in Slots on Lower Motor Plate. (See Page 23)

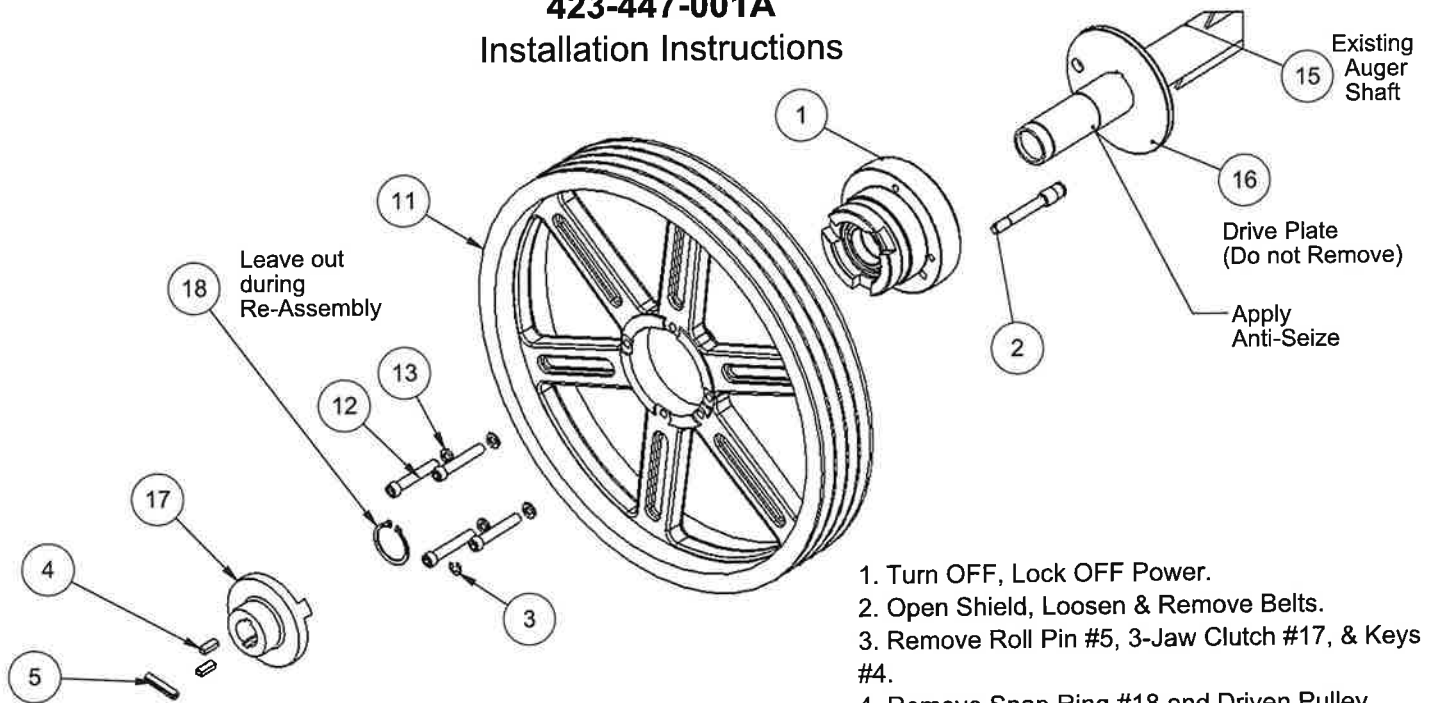


SHIVERS

High-Torque 4-Bearing Pulley Hub Retainer Kit

423-447-001A

Installation Instructions



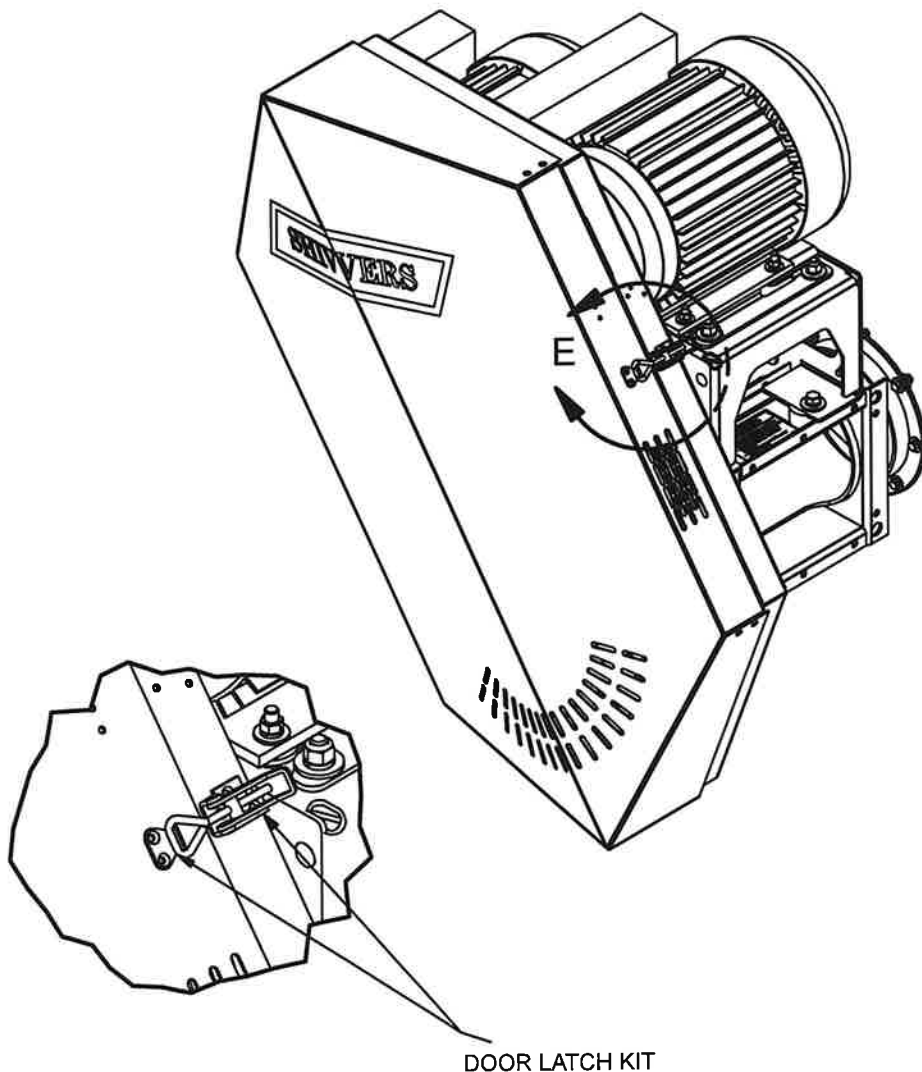
1. Turn OFF, Lock OFF Power.
2. Open Shield, Loosen & Remove Belts.
3. Remove Roll Pin #5, 3-Jaw Clutch #17, & Keys #4.
4. Remove Snap Ring #18 and Driven Pulley Assembly #11 from Existing Auger Shaft #15.
5. Remove E-Ring #3 and Clutch Pin #2
6. Remove existing Hub Assembly from Driven Pulley #11.
8. Install new Hub Assembly #1.
9. Install Driven Pulley Assembly #11 (now with new Hub Assembly #1) onto Auger Shaft #15. Reinstall snap ring,(Apply Anti-Seize).
10. Install both Keys #5 and 3-Jaw Clutch #17.
11. Install Roll Pin #5.
12. Install Belts and tension accordingly. (Make sure all 5 motor mount bolts are tight after tensioning belts).
13. Unlock Power and test:
 Test-1: Belt Alignment (readjust if necessary).
 Test-2: 3-Jaw Clutch #17 and new Hub Assembly #1 (under power if possible)
 Test-3: Clutch Pin #2 and existing Drive Plate #16 (under power if possible)..
14. Close and secure Shield.

BOM Table				
ITEM	PART NO.		DESCRIPTION	QTY.
1	654-348A	Incd	HTDK: PULLEY HUB ASSY (4-BRG STYLE)	1
2	654-318P	Incd	CLUTCH PIN	(1)
3	F-1812	Incd	RING,RETAINING 3/8"	(1)
4	656-051P	Incd	KEY, RECTANGULAR: 1/4"X5/16 X .938"L	(2)
5	F-1036-37	Incd	ROLL PIN, 5/16 DIA X 1.750	(1)
6				
10				
11	654-065P	Reuse	PULLEY, 20" 4AB-GRUV	1
12	F-1670	Reuse	SHCS: 3/8-16 X 2-1/2 GRD 8	4
13	F-1019-03	Reuse	LOCKWASHER, HVY, 3/8, YZ	4
14				
15	656A-002W	Reuse	FLITE WELDMENT	1
16	656-016P	Reuse	HTDA AUGER: HU DRIVE PLATE	1
17	656-010P	Reuse	HTDA AUGER 3-JAW CLUTCH W/1.25 ID	1
18	H-2384	Omit	SNAP RING	1

INSTALLING DUAL MOTOR DRIVE (cont'd)

Step 11:

Install latch from the door latch kit (H-2412) in lower bolt holes on belt shield back (654-311P) and door striker from the door latch kit (H-2412) onto the belt shield cover (654-310W). Use the hardware provided in the door latch kit (H-2412). Install the belt shield cover (654-310W) onto the belt shield back. Align the tabs on the cover with the slots of the belt shield back. Insert and let the weight of the cover lock hinges in position. Adjust the latch to keep the cover securely in place.



Installing Flooring

Step 1:

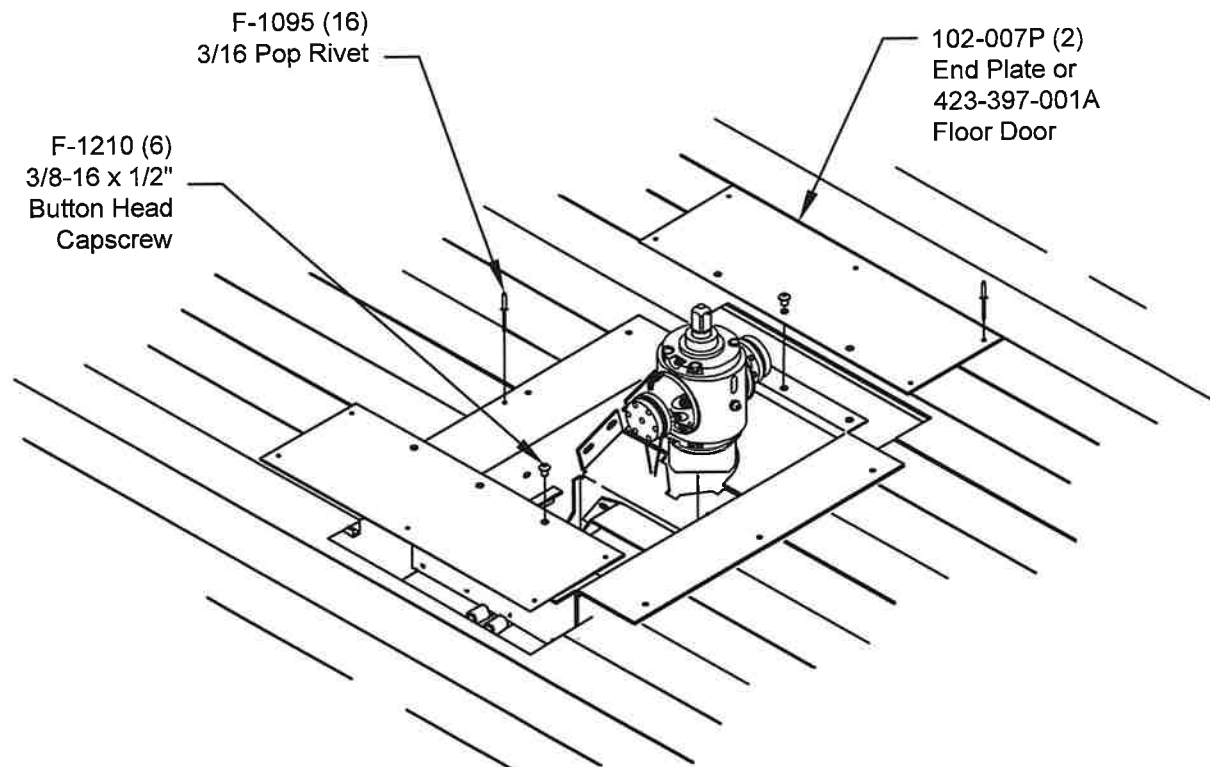
Follow the instructions provided with the floor and supports to install the perforated drying floor.

Step 2:

Make sure enough of the floor planks are cut out to provide access to the gearbox hi-limit junction box and basket support legs. This would be a good time to check that the gearbox is square to the floor using the gearbox laser mount kit (423-351-001A).

Bolt the two end plates (102-007P) to the basket with 3/8" hex socket button head capscrews (F-1210)* from the basket sack (222-085A). Drill required holes to pop rivet the end plates (102-007P) and basket sides to the floor planks. Do **NOT** use self-drilling screws.

* NOTE: 3/8" hex socket button head capscrews must be used for sweep auger clearance. Circulator 2 basket assembly shown.



Tapered Sweep and Wear Track Installation

Step 1:

- a. Remove caplugs from tapered sweep's coupler. Remove all debris from the tapered sweep's coupler and outside surfaces of the gearbox base and flange.
- b. Pack the inside of the tapered sweep's coupler and coat the outside of the gearbox's base and flange with our recommended high temperature-rated grease, HIGH TEMP Synthetic Grease EP or equivalent. (Shivvers # C-6188 (14oz Tube)). CAUTION: USE ONLY THIS GREASE. (Note: Step B does not apply to 712 sweeps.)

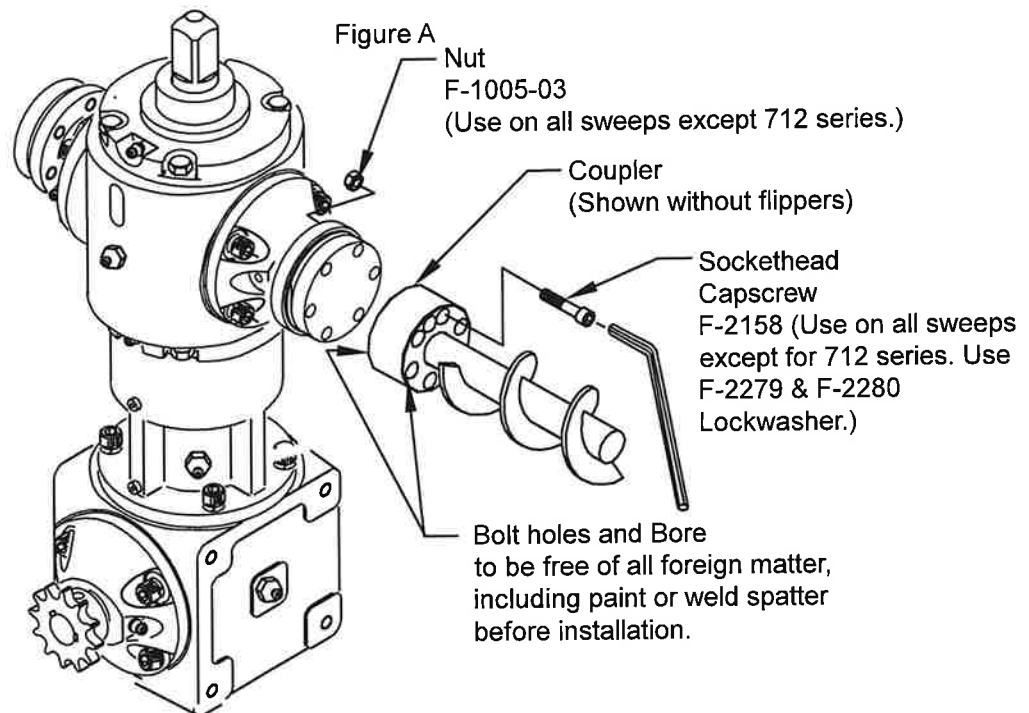
Step 2:

Note: For all sweeps except 712 series.

Bolt the tapered sweep auger(s) to the gearbox as follows: See Figure A

- a. 3/8-16 sockethead capscrew (F-2158) & locknuts (F-1005-03), are provided in the decal package. This bolt and nut must be used.
- b. Position the sweep's coupler onto the output shaft.
- c. Insert bolts into sweep's coupler, through the output shaft, and start the threads into the flange, then start a nut onto the end of each bolt.
- d. Tighten the bolts down to 35 ft/lbs for 3/8" bolts. Tighten bolts down to 60 ft/lbs for 712 series with 7/16" screws.
- e. With a hex wrench on the head of the bolt, tighten the nut, in effect double-nutting it with the flange. The bolt should have threads seen on the outside of the nut.
- f. Repeat the above process to install all tapered sweeps as required.

Check levelness of Gear Box using Laser level.



Installing Tapered Sweep and Track (cont'd)

It is recommended that these bolts and nuts not be re-used. See your dealer or Shivers for replacement of hardware sack #635-014A for 3/8 hardware or #712-010A for 7/16 hardware.

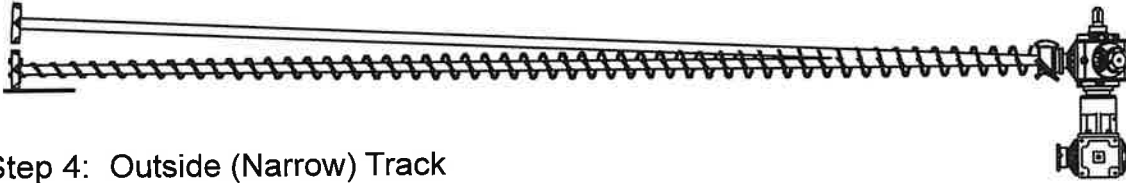
NOTE: For CL2 and CL3

Sweeps will use 7/16 HDW- no lock nut. Found in sack. 712-018A

Installing Tapered Sweep and Track (cont'd)

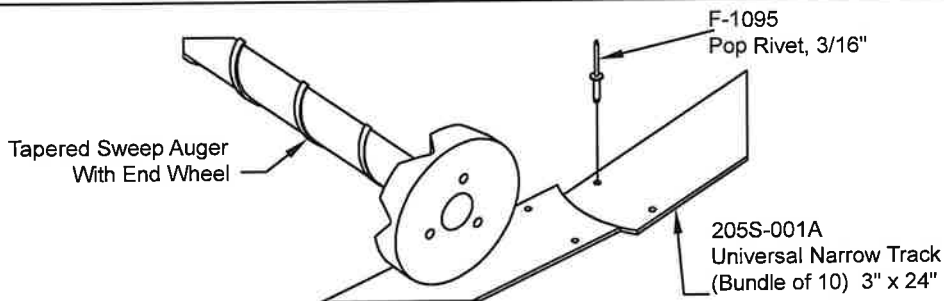
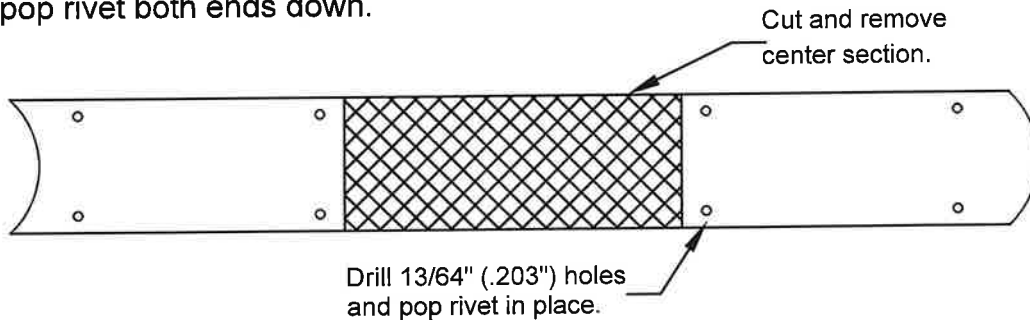
Step 3:

There should be flex in the coupling after the sweep auger is bolted to the gearbox. Check to make sure the sweep can be lifted a minimum of 6" at the outer end of the bin without bending the sweep auger shaft. Check this in at least 4 places around the bin, especially in-line with and perpendicular to the horizontal unloader. If the amount of flex is not uniform around the bin, the basket legs will have to be adjusted, or gearbox adjusted.



Step 4: Outside (Narrow) Track



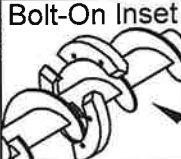

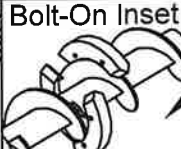
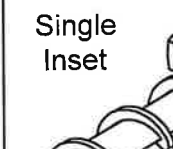
The 3-Sweep Gearbox has been created for larger bins which will have an outside track. **Lay the track sections so that ends butt against each other (no cracks between sections), flush and smooth (one end no higher than another), with sweep auger wheel riding the center of each bend and the center of each end.** As each section is laid in place, move the tapered sweep along the track to insure that curvature and location are correct, then fasten securely with 3/16 pop rivets. Drill additional holes and pop rivet track down, as necessary, to insure a firm, smooth track. Do not use self drilling screws. They will loosen with time. **Do not allow the wheel to run over a pop rivet head.** The last section of track must be trimmed to size. To trim, remove a straight section out of the center of the track, as shown below. Drill 13/64" (.203) holes and pop rivet both ends down.



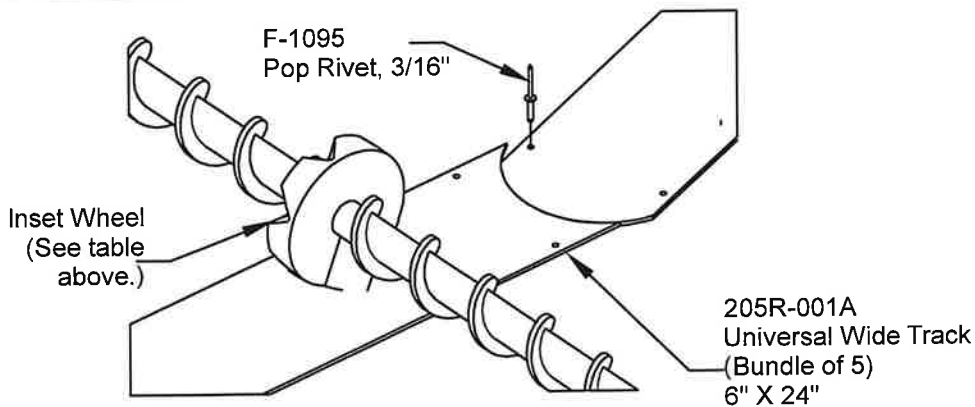
Installing Tapered Sweep and Track (cont'd)

Step 5: Inset Track

The tapered sweep auger for bins 29' diameter and over have an inset wheel that moves along a wide wear track mounted on the bin floor. These straight track sections must be laid so as to form a smooth, firm path along the bin floor on which the tapered sweep auger can move. **Lay track sections so that ends butt up against each other (no cracks between sections), flush and smooth (one end no higher than another), with inset wheel riding the center of each end.** As each section of track is placed on the floor, move the tapered sweep along the track section to insure that the inset wheel will be centered as it runs along the track. After checking the location, mount the track with 3/16" pop rivets. Drill additional holes and pop rivet track down, as necessary, to insure a firm, smooth track. Do not use self drilling screws. They can loosen with time. **Do not allow the wheel to run over a pop rivet head.** The last section of track must usually be trimmed to size. See Illustration on page 21.

Track Bundle Part #	Track Style & Dimensions	Inset Wheel Location From	Inset Wheel Style	
			Double Inset	Bolt-On Inset
205R -001A 5 Pieces Per Bundle (205-014P) (individual)	 6" x 24"	Gearbox Base 9'-7"		
		11'-10"		
		12'-7/8"		

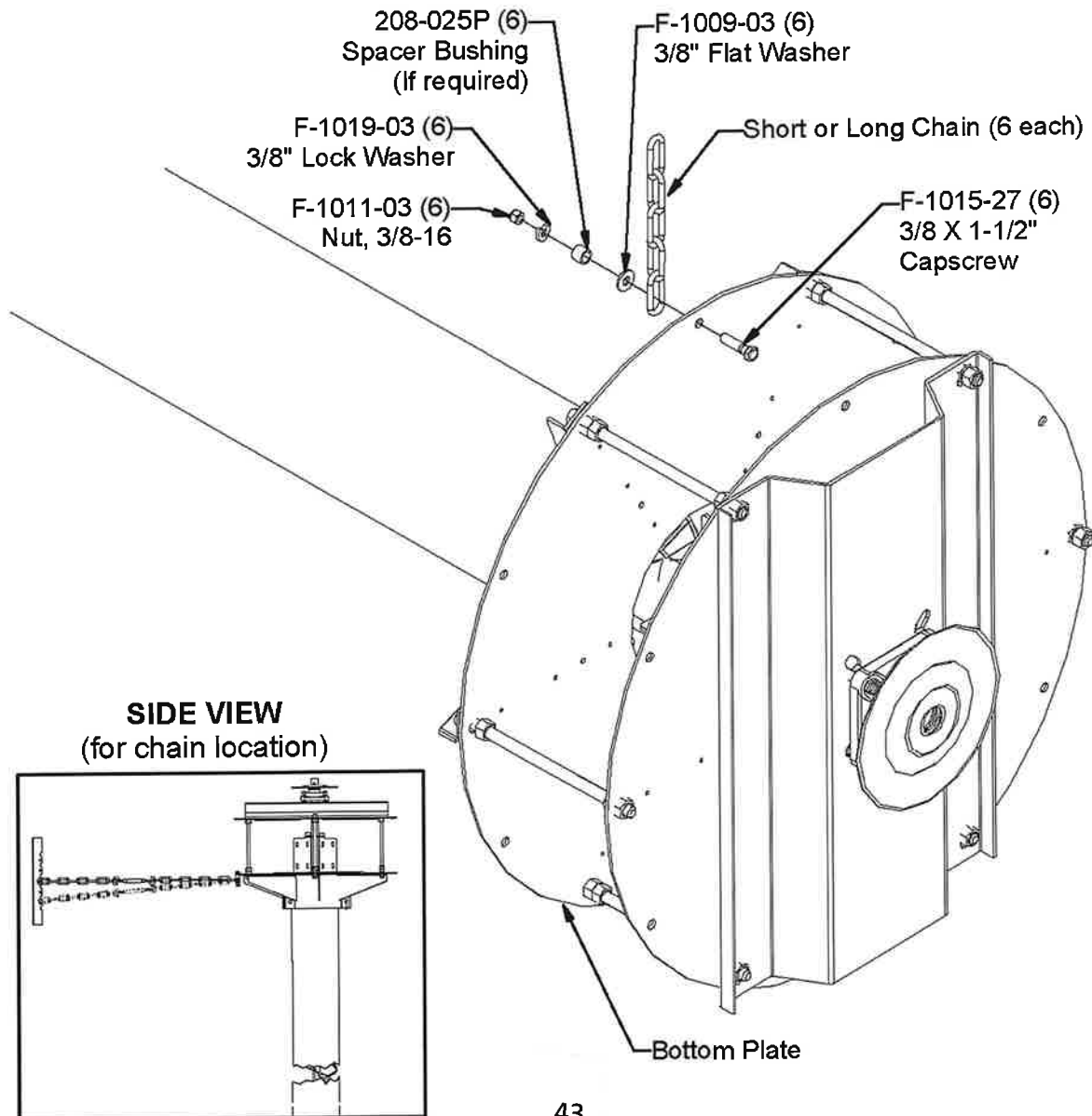
These are the only styles used on High Torque



INSTALLING CENTER VERTICAL

Step 1:

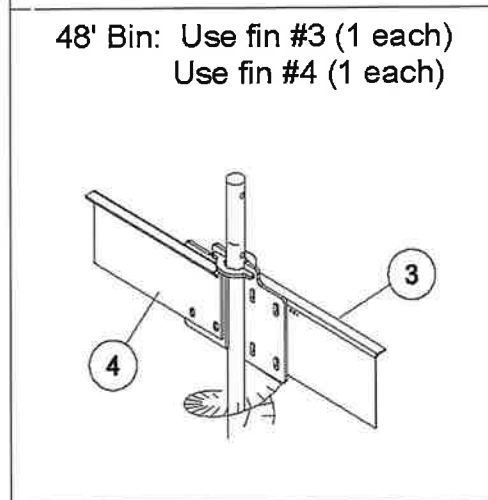
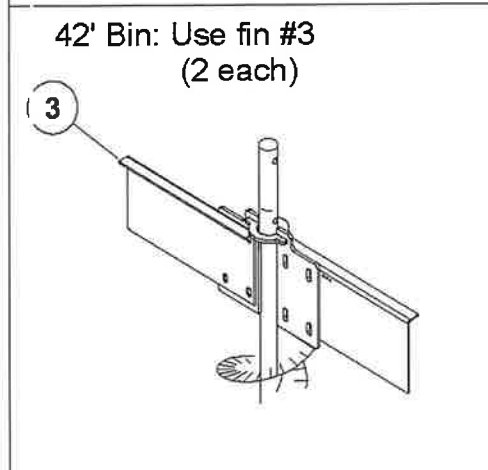
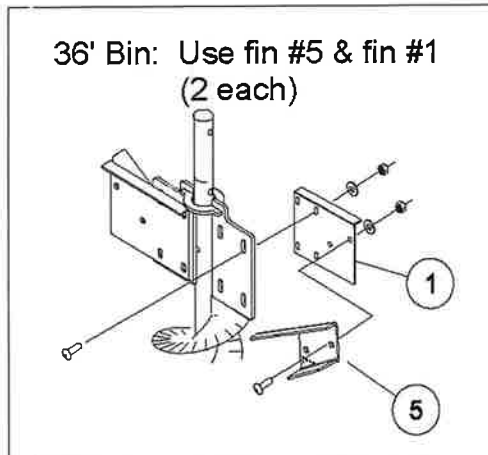
Measure along the bin wall to the height of your center vertical tube when installed on gearbox (18'5" or 20'3"). The chains should either go straight across from the bottom plate of the center vertical or down slightly. They should never be higher than the center vertical. Fasten either the long or short chains from the chain and pop rivets parts box to a mounting bracket on the bin sidewall or roof (as shown in P-12053 instructions sheet). Hardware for attaching chains to bin sidewall is provided in the chain and pop rivets box. Place another chain directly across the bin at the same height. Then space two more equidistant between these on each side of the bin, for a total of six chains. Connect six long or short chains to the bottom plate of the center vertical with bolts, nuts, and washers from the chain and pop rivets parts box.



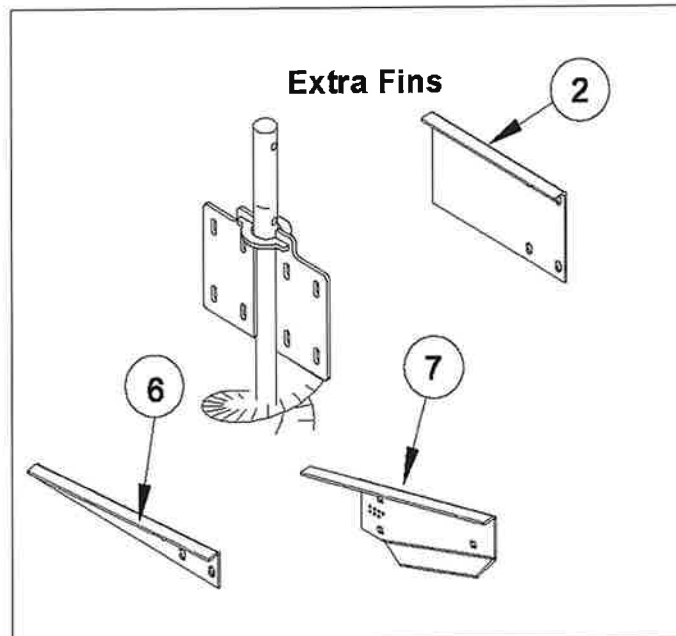
INSTALLING CENTER VERTICAL (cont'd)

Step 2:

Bolt the spreader fins on the spreader wheel of the center vertical tube as recommended for your bin diameter. Fins should be 1/2" above the center vertical bottom plate.



FIN SACK			
ITEM	DESCRIPTION	QTY	PART #
1	WSCV: FIN #1 -6"	2	658-021P
2	WSCV: FIN #2 -8"	1	658-022P
3	WSCV: FIN #3 -9.5"	2	658-023P
4	WSCV: FIN #4 -11"	1	658-024P
5	WSCV: FIN #5 -LIFT SMALL	2	658-025P
6	WSCV: FIN #6 -ANG FLAT	1	658-026P
7	WSCV: FIN #7 -LIFT LARGE	1	658-027P
8	CARRIAGE BOLT, 1/4 X 3/4"	12	F-1823
9	1/4" FLAT WASHER	12	F-1009-01
10	1/4-20 LOCK NUT	12	F-1005-01



If your Center Vertical has four Fin Plates, you should cut two off opposite each other so your new configuration is as shown above.

Bolt the Fins on the Fin Plates of the Center Vertical Flite as recommended for your bin diameter. Fins should be 1/2" above the Center Vertical Bottom Plate,

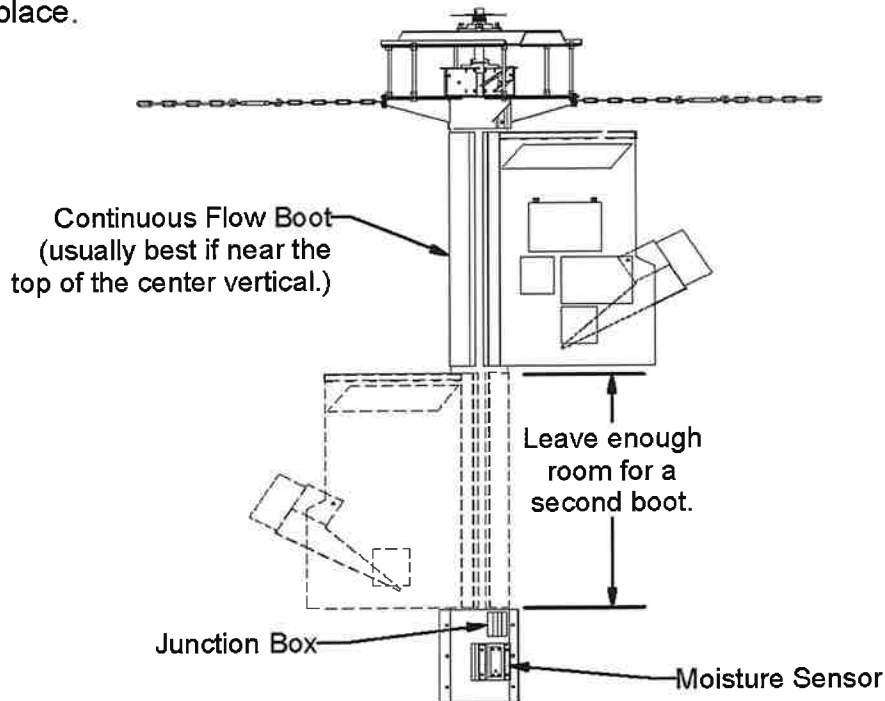
* Save the extra fins. It may be necessary to use them to adjust for more optimum spread. They may be used in any combination.

INSTALLING CENTER VERTICAL (cont'd)

Step 3: (Optional) Continuous flow boot and moisture sensor can be mounted now or after the center vertical is in place.

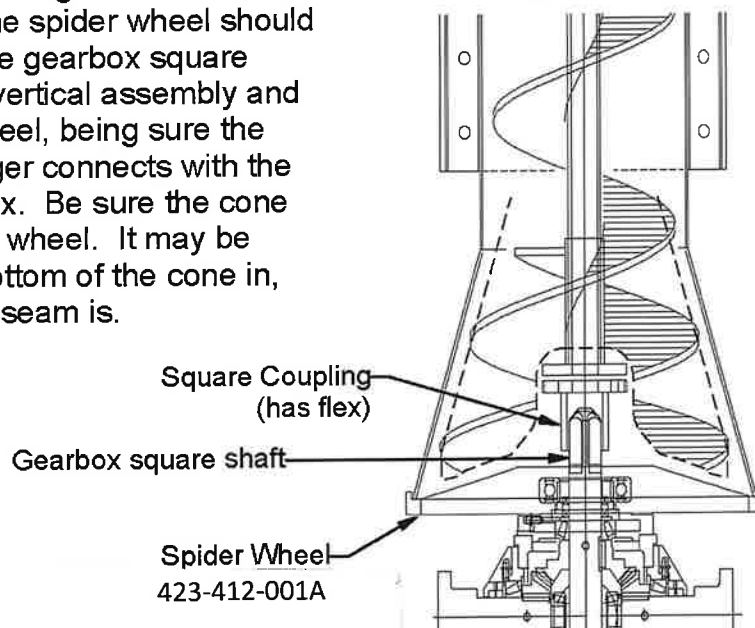
Cut a hole in the center vertical tube for the continuous flow boot(s), following the instructions (P-8969-P) included with the boot or on Decal P-11617 for the high angle boot.

Wide Spread Center Verticals are pre-cut for the moisture sensor. It is still necessary to check for moisture sensor clearance once the sensor mounting band is fastened in place.



Step 4:

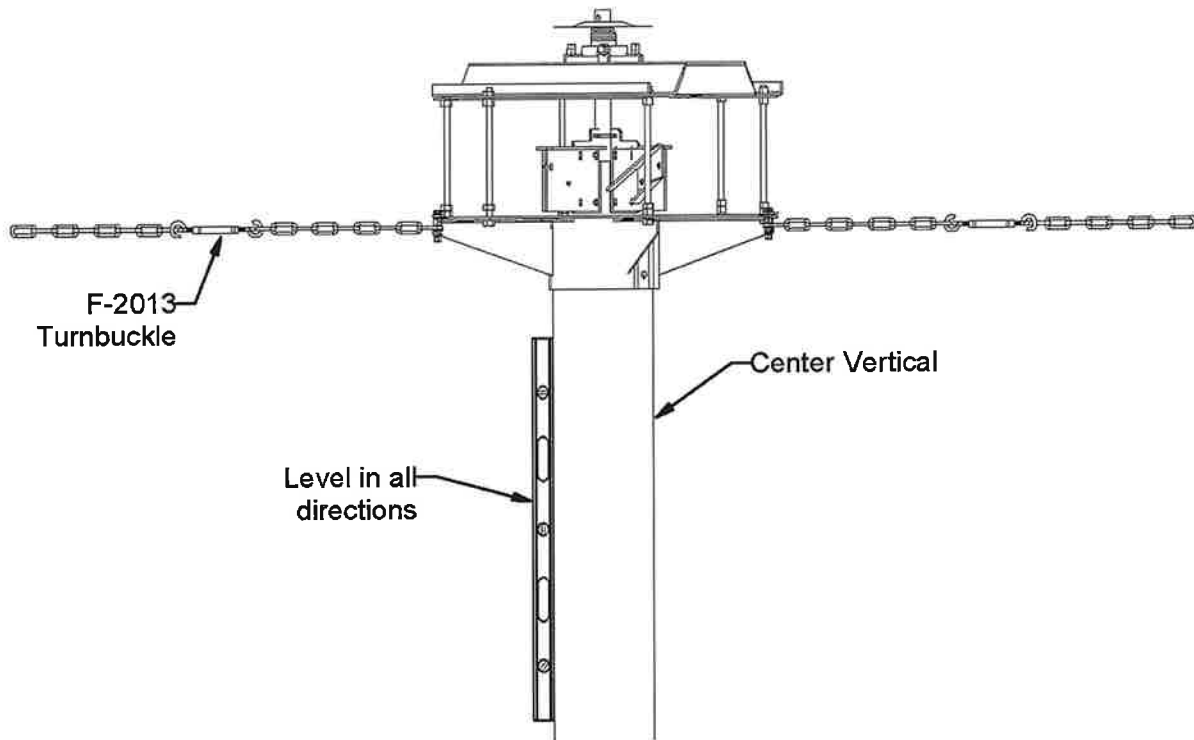
Place the spider wheel on the gearbox. Make sure it is seated all the way down on the gearbox. The top of the spider wheel should be flush with the flats of the gearbox square shaft. Elevate the center vertical assembly and lower it onto the spider wheel, being sure the square coupling of the auger connects with the square shaft of the gearbox. Be sure the cone bottom rests on the spider wheel. It may be necessary to pound the bottom of the cone in, especially where the weld seam is.



INSTALLING CENTER VERTICAL (cont'd)

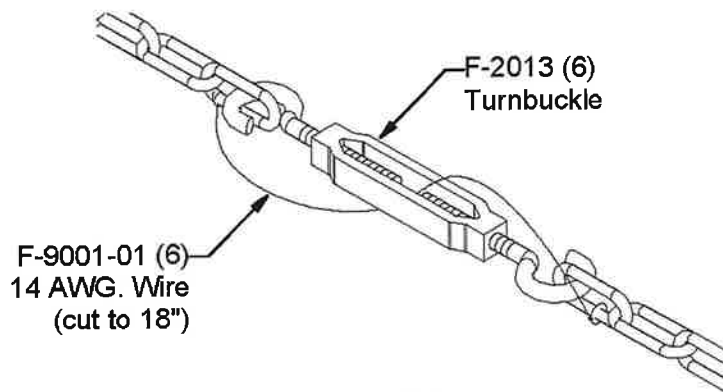
Step 5:

Connect the long chains to the short chains with the turnbuckles. Using a good level, plumb the center vertical tube vertically in all directions by adjusting turnbuckles.



Step 6.

Wire the turnbuckles to the chains by running wire through the turnbuckle and the chains, to prevent loosening from vibration.



INSTALLING CENTER VERTICAL (cont'd)

Step 7:

Check the tolerances on the center vertical auger.

1. All dimensions must be checked with center vertical auger in the vertical position and resting squarely on the spider wheel.

