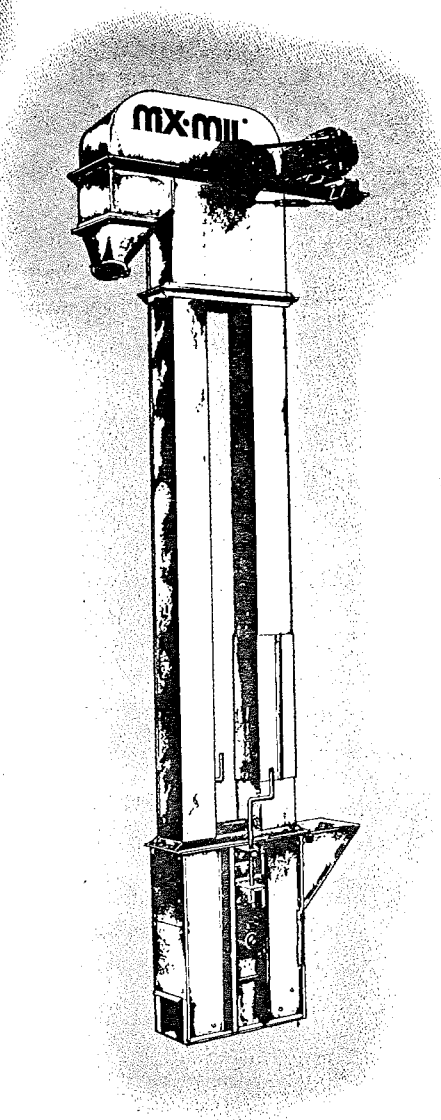
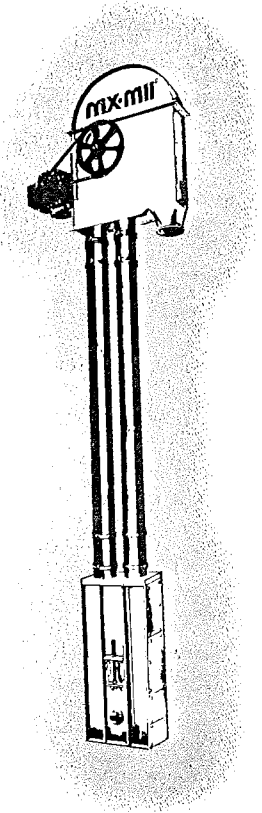


3000 BPH BUCKET ELEVATOR



1500 BPH BUCKET ELEVATOR



800 BPH BUCKET ELEVATOR

# **BE A SAFE OPERATOR**

## **AVOID ACCIDENTS**

Most accidents, whether they occur in industry, on the farm, at home, or on the highway, are caused by the failure of some individual to follow simple and fundamental safety rules or precautions. For this reason most accidents can be prevented by recognizing the real cause and doing something about it before the accident occurs.

Regardless of the care used in the design and construction of any type of equipment, there are many conditions that can not be completely safe guarded against without interfering with reasonable accessibility and efficient operation.

**A CAREFUL OPERATOR IS THE BEST INSURANCE AGAINST AN ACCIDENT.**

**THE COMPLETE OBSERVANCE OF ONE SIMPLE RULE WOULD PREVENT MANY THOUSAND SERIOUS INJURIES EACH YEAR. THAT RULE IS:**

**NEVER ATTEMPT TO CLEAN, OIL, OR ADJUST A MACHINE WHILE IT IS IN MOTION!**

**"NATIONAL SAFETY COUNCIL"**

MIX-MILL<sup>®</sup>, INC. has made every effort to provide safe equipment, however, the following precautions should be carefully observed!

1. Disconnect main service switch before removing any housing covers or electrical boxes or switches.
2. Ground the mill frame to a ground rod driven eight (8) feet into moist soil.
3. Ground any augers to feeders where livestock might contact either augers or feeders.
4. Keep all shields and covers in place.

## SECTION I

This manual is divided into two parts; Section I dealing with square tube elevator — 1500 BPH and 3000 BPH; Section II dealing with round tube elevator — 800 BPH.



MIX-MILL, INC., Bluffton, Indiana 46714

automatic feed processing systems

telephone 219/824-3400

Dear Mix-Mill Owner/Operator:

Thank you for purchasing a Mix-Mill Bucket Elevator. More than twenty (20) years experience in the manufacturing of feed milling and grain handling equipment has made Mix-Mill the leader in the field of electric-powered on-the-farm feed making systems and grain storage.

The manual will aid in erecting a bucket elevator in a manner consistent with sound, safe erection procedures.

Some of the features of the Mix-Mill elevator include galvanized construction, lock-seamed leg sections, larger diameter head and boot pulleys, backstop included in drive kit, and many other features for economy and safety.

Other quality products from Mix-Mill, along with this elevator, will produce a complete system to move and store grain, and process, move, and store finished feed. These products can be incorporated into an existing system to further diversify and expand at a planned future date.

For further information on products and usage, please contact your Mix-Mill distributor. He can help you obtain information on this and other Mix-Mill equipment and parts.

Sincerely,

MIX-MILL, INC.

## WARRANTY CERTIFICATE

Mix-Mill<sup>®</sup> Inc., warrants each new product of its manufacture when purchased from an authorized representative for a period of one year from the date of delivery to the Purchaser-User or 1500 hours of operation, whichever ever occurs first. This warranty shall apply to all parts and workmanship (except products or components not manufactured by Mix-Mill<sup>®</sup>) which shall appear to Mix-Mill<sup>®</sup> to have been defective in manufacture. Mix-Mill<sup>®</sup>'s sole and entire obligation under such warranty shall be satisfied by shipment to the Purchaser-User without charge, (except for transportation costs which shall be paid by Purchaser-User) of the part or parts, returned for inspection and parts intended to replace those acknowledged by Mix-Mill<sup>®</sup> to be defective. This warranty shall not apply and shall be void under the following conditions:

- (1) IF THE PRODUCT IS TRANSPORTED FROM ORIGINAL INSTALLATION SITE.
- (2) IF THE PRODUCT IS INSTALLED OR ASSEMBLED BY OTHER THAN FACTORY TRAINED AUTHORIZED DISTRIBUTOR SERVICE PERSONNEL.
- (3) IF ANY PART OF THE PRODUCT HAS BEEN ALTERED, MODIFIED OR CHANGED EXCEPT AT MIX-MILL'S FACTORY OR IS AUTHORIZED BY IT IN WRITING.
- (4) IF ATTACHMENTS OR DEVICES UNSUITABLE TO THE PRODUCT HAVE BEEN USED ON OR IN CONJUNCTION WITH THE PRODUCT.
- (5) IF THE PRODUCT HAS NOT BEEN INSTALLED, USED, OPERATED, HANDLED OR SERVICED IN ACCORDANCE WITH THE APPROPRIATE INSTRUCTION MANUAL.

Mix-Mill reserves the right to make changes in design or improvements in its products without any obligation whatsoever to prior Purchaser-User of such products.

Mix-Mill will pass on to a Purchaser-User only such warranty as it shall receive on products or components not of its manufacture from the manufacturer or supplier thereof.

This warranty is expressly in lieu of any other express or implied warranties, including any implied warranty of merchantability of fitness, and of any other obligation on the part of Mix-Mill, and may not be altered, modified or changed in any way except by a writing signed by an officer of Mix-Mill.

Mix-Mill shall not be liable for any loss or damage, directly or indirectly arising from the use of its products or otherwise, or for any special or consequential damages of any nature.

## GENERAL

Any piece of equipment, no matter how well constructed, cannot be expected to offer the performance and usefulness intended, if it is improperly installed. The customer and/or the firm responsible for erecting an elevator leg should make it a prime concern to properly erect the leg. Mix-Mill, Inc. can not assume any liability, either express or implied, for the installation, and offer the suggestions and information contained in this manual only as a convenience.

Careful consideration must be given to the location in reference to depth of pit, discharge and loading facilities, obstructions, anchoring, etc. These and other points are important to consider in avoiding bottlenecks in grain flow.

A solid foundation must be installed compatible with the type of filling system used. The footing must be sufficiently strong to carry the load imposed. When a pit is used, a means of keeping it free of water **must** be provided.

A basic layout for a concrete pit is shown in Figures 2 and 3 on pages I-8 and I-9. The dimensions are suggestions only and may be easily modified to suit any particular application necessary.

A shipping or packing list is included with the freight bills when your elevator is shipped from the Mix-Mill plant. This list should be used to identify all parts and components and to insure that all parts have been received.

Any shortage or damage should be so noted on the freight bill and a claim filed with the truck line.

Small parts such as bolts, keys, washers, etc., are important to any installation. Do not dispose of any container before making sure all parts are located.

In case of the necessity of having to store an elevator for a period of time, the parts should be stored so as to be easily located and identified.

Each elevator consists of the following components when purchased:

|                 |      |
|-----------------|------|
| Head Section    | (1)  |
| Boot Section    | (1)  |
| Leg Sections    | (AR) |
| Inspection Door | (1)  |
| Belt            | (AR) |
| Cups            | (AR) |
| Hdw. Package    | (1)  |

Each elevator must have the following components as determined by the size of the elevator:

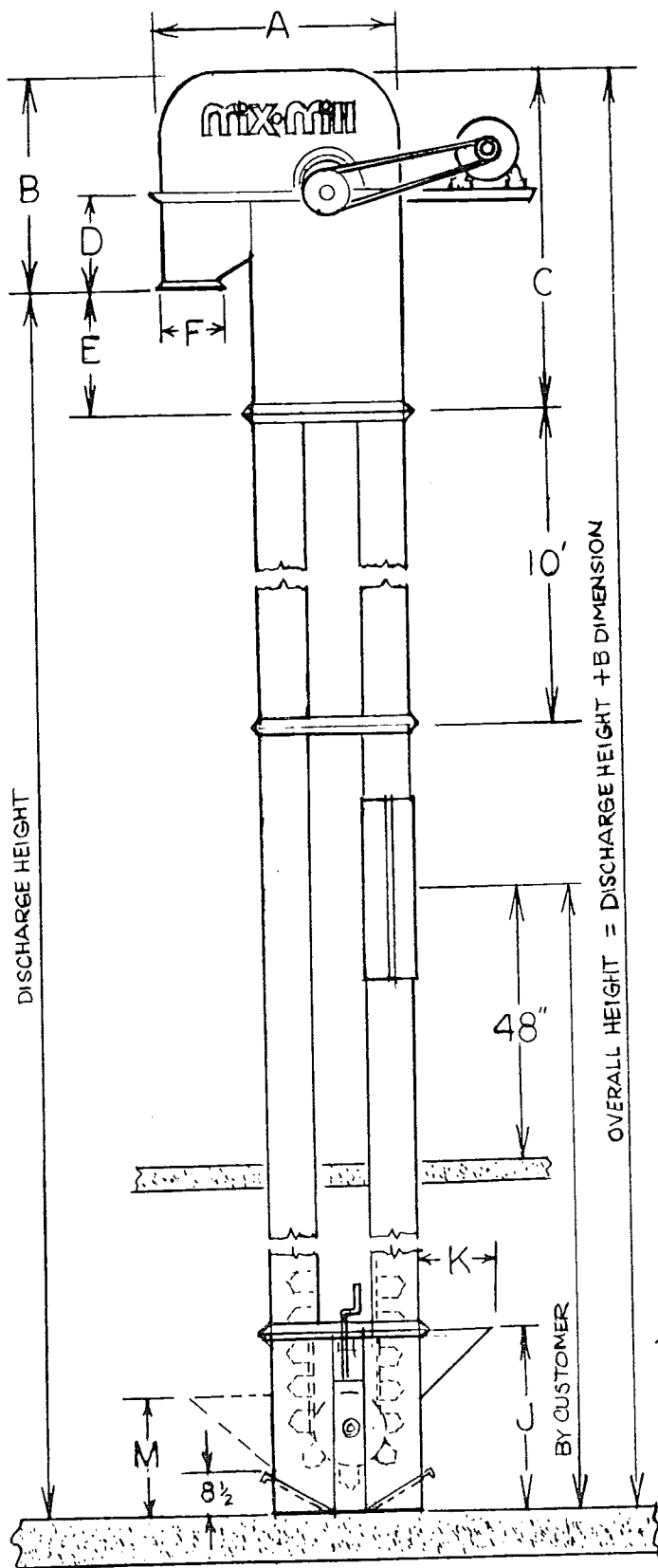
|                  |      |
|------------------|------|
| Motor            | (1)  |
| Drive Package    | (1)  |
| Transition       | (1)  |
| Discharge Tubing | (AR) |

Selection may be made from the following components to make a complete system. Check with your Mix-Mill distributor for further information on:

- Distributor Heads
- Wye Valves
- Deadheads
- Truss Supports
- Elbows
- Head Vents
- Drive Covers
- Drive Hoppers
- Cable and Related Parts
- Auger and U-Trough Adaptors
- Spouting Couplings
- Spouting Supports

## BUCKET ELEVATOR SPECIFICATIONS

|   | 1500<br>SERIES | 3000<br>SERIES |
|---|----------------|----------------|
| <b>CAPACITY:</b>                                  |                |                |
| Bushels per hour                                  | 1500           | 3000           |
| Cubic ft. per hour                                | 1867           | 3750           |
| <b>HEAD SECTION:</b>                              |                |                |
| Material — gauge galvanized                       | 12 / 16        | 12 / 16        |
| Crowned Lagged Pulley                             | 14" Dia.       | 18" Dia.       |
| Pulley speed R.P.M.                               | 96             | 96             |
| Water and dust tight head cover                   | Yes            | Yes            |
| Replaceable discharge liner — gauge galv.         | 12             | 12             |
| Sealed inspection door                            | Yes            | Yes            |
| Sealed, self-aligning ball bearings               | Yes            | Yes            |
| Adjustable heavy duty motor mount                 | Yes            | Yes            |
| Shaft mounted speed reducer with back stop        | Yes            | Yes            |
| Head Shaft size                                   | 1 7/16"        | 1 15/16"       |
| <b>BELT:</b>                                      |                |                |
| Width   | 7"             | 10"            |
| Speed — Feet per min.                             | 352            | 450            |
| Type  | PVC            | PVC            |
| <b>CUPS:</b>                                      |                |                |
| Size — width and depth                            | 6x5            | 9x5            |
| Spacing on belt                                   | 6"             | 6"             |
| Bolts — No. per cup                               | 2              | 3              |
| High speed vented cups                            | Yes            | Yes            |
| <b>TRUNKING:</b>                                  |                |                |
| Material — gauge galvanized                       | 16             | 16             |
| Dual type trunk, self-supporting                  | Yes            | Yes            |
| Reinforced trunk section for heights above 95 ft. | Yes            | Yes            |
| <b>BOOT:</b>                                      |                |                |
| Material — gauge galvanized                       | 12             | 12             |
| Crowned pulley                                    | 14" dia.       | 18" dia.       |
| Self-aligning cartridge flange ball bearings      | Yes            | Yes            |
| Flanged boot hopper                               | Yes            | Yes            |
| Clean out slides on both sides                    | Yes            | Yes            |
| Boot shaft size                                   | 1"             | 1 3/8"         |



| DIM. | 1500 SERIES | 3000 SERIES |
|------|-------------|-------------|
| A    | 44"         | 54"         |
| B    | 40"         | 44½"        |
| C    | 66"         | 63"         |
| D    | 20"         | 20"         |
| E    | 26"         | 18"         |
| F    | 10"         | 12"         |
| G    | 8"          | 9"          |
| H    | 12"         | 16"         |
| I    | 28"         | 34"         |
| J    | 32"         | 42"         |
| K    | 12"         | 16½"        |
| L    | 22"         | 30"         |
| M    | 20"         | 25½"        |

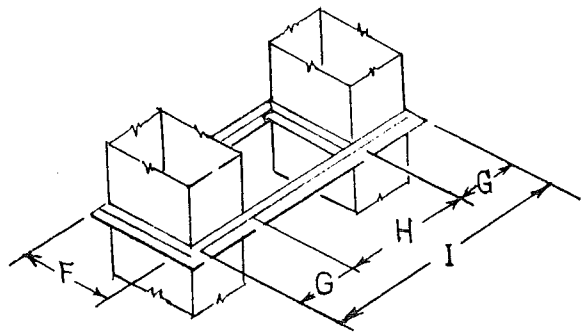
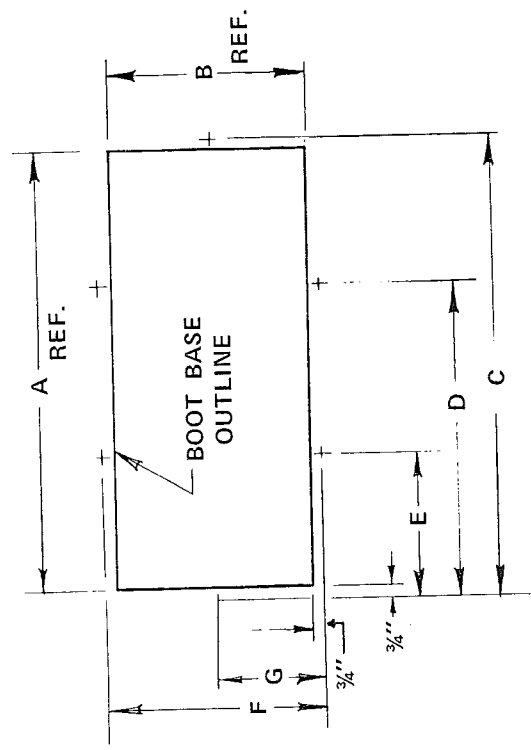
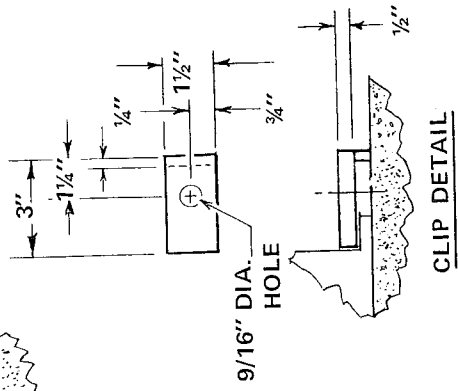
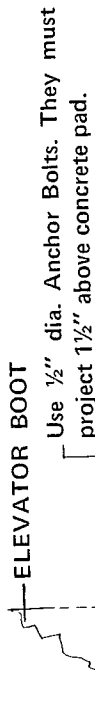


FIGURE 1





|          | A    | B    | C    | D    | E    | F    | G   |
|----------|------|------|------|------|------|------|-----|
| 800 BPH  | 20½" | 9½"  | NR   | 17¼" | 4¾"  | 11"  | NR  |
| 1500 BPH | 28"  | 12½" | 29½" | 20¼" | 9¼"  | 14"  | 7"  |
| 3000 BPH | 34"  | 15"  | 35½" | 24¼" | 11¼" | 16½" | 8¼" |



ANCHOR BOLT LAYOUT  
FIGURE 3

## SETTING BOOT

The boot should be installed, leveled and securely anchored to a firm level foundation before other parts of the elevator are assembled. As the plumbing of the elevator is strongly affected by the boot, the importance of this cannot be over-emphasized.

A one-half inch layer of an Ironite type construction grout is highly recommended to support the elevator. An alternate method would be to provide a small indentation in the concrete for the base bolt heads. DO NOT leave the elevator sit on the bolt heads.

Bolts set in the concrete and plates overlapping the boot base flange are recommended for anchoring. Recheck, after tightening, to be sure the boot is level.

After the boot has been located and secured, the filling hoppers can be located and attached at any time desired.

When a force feed U-trough is used to fill the elevator, an adapter plate is available to bolt the U-trough directly to the boot. This should be on the down side of the leg at the bottom of the boot.

## HEAD ASSEMBLY

Two ways of erecting the head and legging will be discussed later. In either case the head and related components should be assembled in the following manner.

Block the head high enough to allow the motor support angles to clear the ground by 8 to 10 inches.

Apply a bead of caulking around the inside of the bolt holes on one end flange of a leg section. Align the leg section with the head and bolt together with the bolts provided in the hardware package.

Determine on which side of the elevator the ladder is to be mounted and bolt a ladder bracket and ladder section to the top side of the joint. See Figure 12 for a typical ladder, bracket, and cage installation.

## MOTOR AND DRIVE PACKAGE INSTALLATION

Refer to Figure 4 on page I-11. Check the head shaft for nicks and scratches. Clean and smooth with fine grit emory cloth. A good lubricant such as Never-Seez is recommended to be used on the head shaft.

The smaller gearboxes may not use a bushing in the hollow out-put shaft. In this case, slide the gearbox directly onto the shaft. Where a bushing is used, slide it into the hollow shaft first, then slide the gearbox onto the shaft. Use care in assembling and avoid pounding onto the shaft.

For best results, mount as close to the bearing as possible.

Assemble the QD bushing and large sheave to the gearbox. Attach the torque arm to the gearbox and motor mount channel, following the instructions in the gearbox package.

Mount the motor to the brackets using standard bolts (not furnished). Assemble the bushing and sheave to the motor.

Slip the belt or belts (depending on size of unit) onto the two sheaves. Align the belt by adjusting the moveable motor mount and adjusting the sheaves if necessary. Tighten motor down and take tension in the belts by adjusting the torque arm. The belts should be able to be depressed about 3/4" at a point midway between the two pulleys.

**CAUTION:**

1. Be sure to put oil in the gearbox before operating.
2. Check rotation of the motor before operating. The wrong rotation can damage the gearbox.

**DRIVE COVER**

Refer to Figure 5 for 1500 BPH elevator and Figure 6 for 3000 BPH elevator.

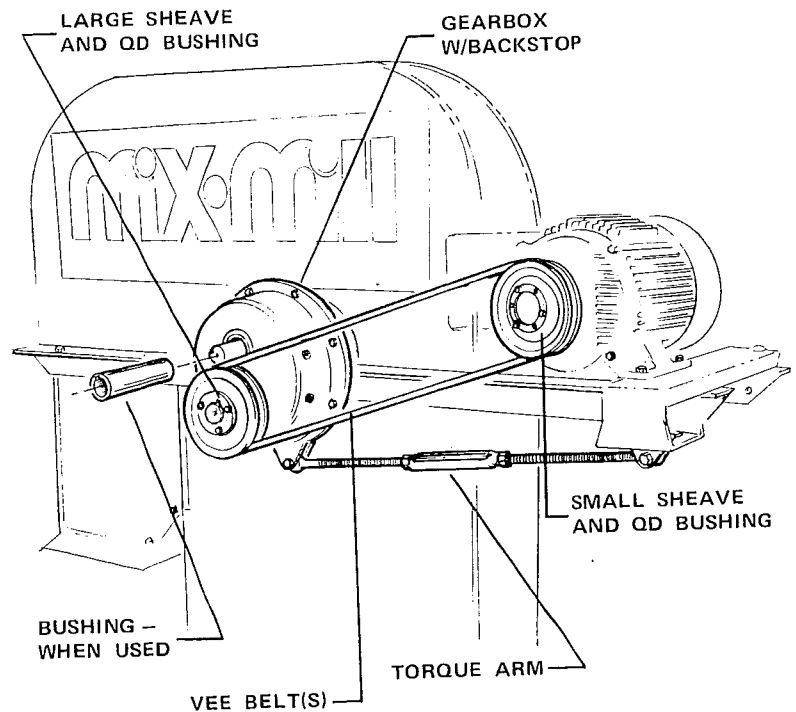


FIGURE 4

**DRIVE COVER PARTS LIST**

| <u>1500 BPH</u> |                 | <u>DESCRIPTION</u>        | <u>QUANTITY</u> |
|-----------------|-----------------|---------------------------|-----------------|
| <u>ITEM</u>     | <u>PART NO.</u> |                           |                 |
| 1               | 1119-9120       | Wrapper • Support Bracket | 1               |
| 2               | 1119-9170       | Belt Guard Mtg. Angle     | 1               |
| 3               | 9000-0234       | Belt Guard Bracket        | 1               |
| 4               | 1119-9110       | Belt Cover – Side Rear    | 1               |
| 5               | 9000-0233       | Belt Guard Wrapper        | 1               |
|                 | 9200-0323       | Drive Cover Package       |                 |

| <u>3000 BPH</u> |                 | <u>DESCRIPTION</u>            | <u>QUANTITY</u> |
|-----------------|-----------------|-------------------------------|-----------------|
| <u>ITEM</u>     | <u>PART NO.</u> |                               |                 |
| 1               | 1120-0270       | Drive Cover Bracket           | 1               |
| 2               | 1120-0310       | Drive Cover Backplate Support | 1               |
| 3               | 1120-0320       | Drive Cover Backplate         | 1               |
| 4               | 1120-0300       | Drive Cover Support           | 1               |
| 5               | 9000-0253       | Drive Cover – Welded          | 1               |
|                 | 9200-0360       | Drive Cover Package           |                 |

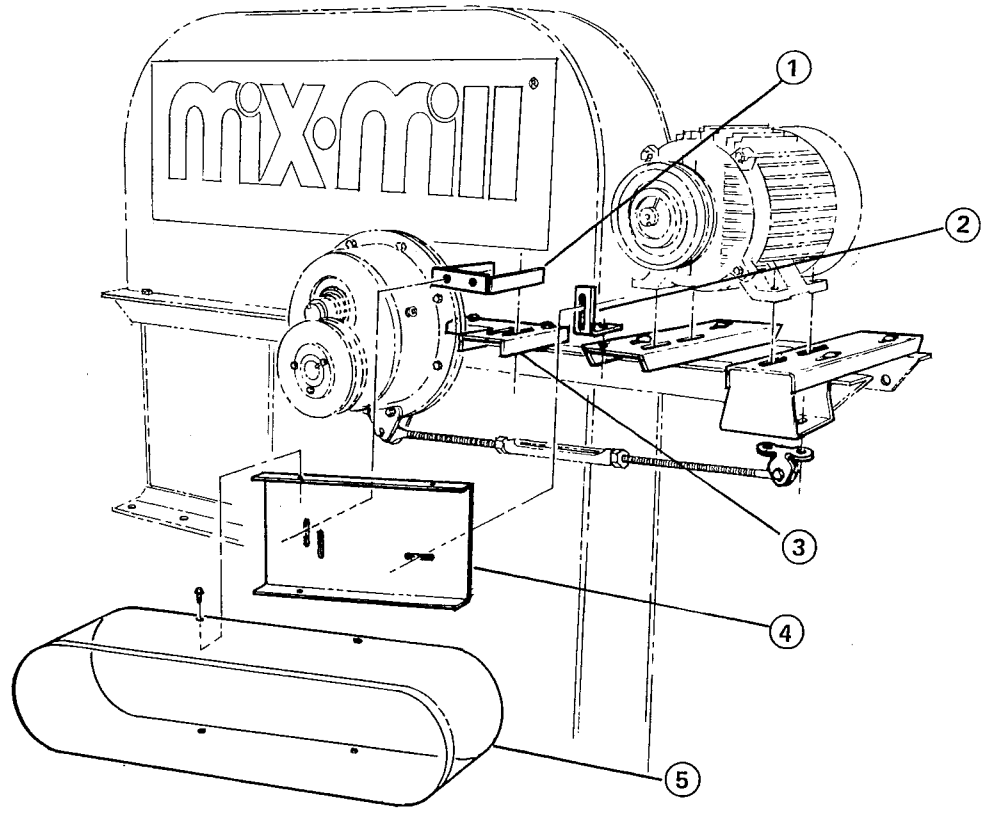


FIGURE 5 1500 BPH

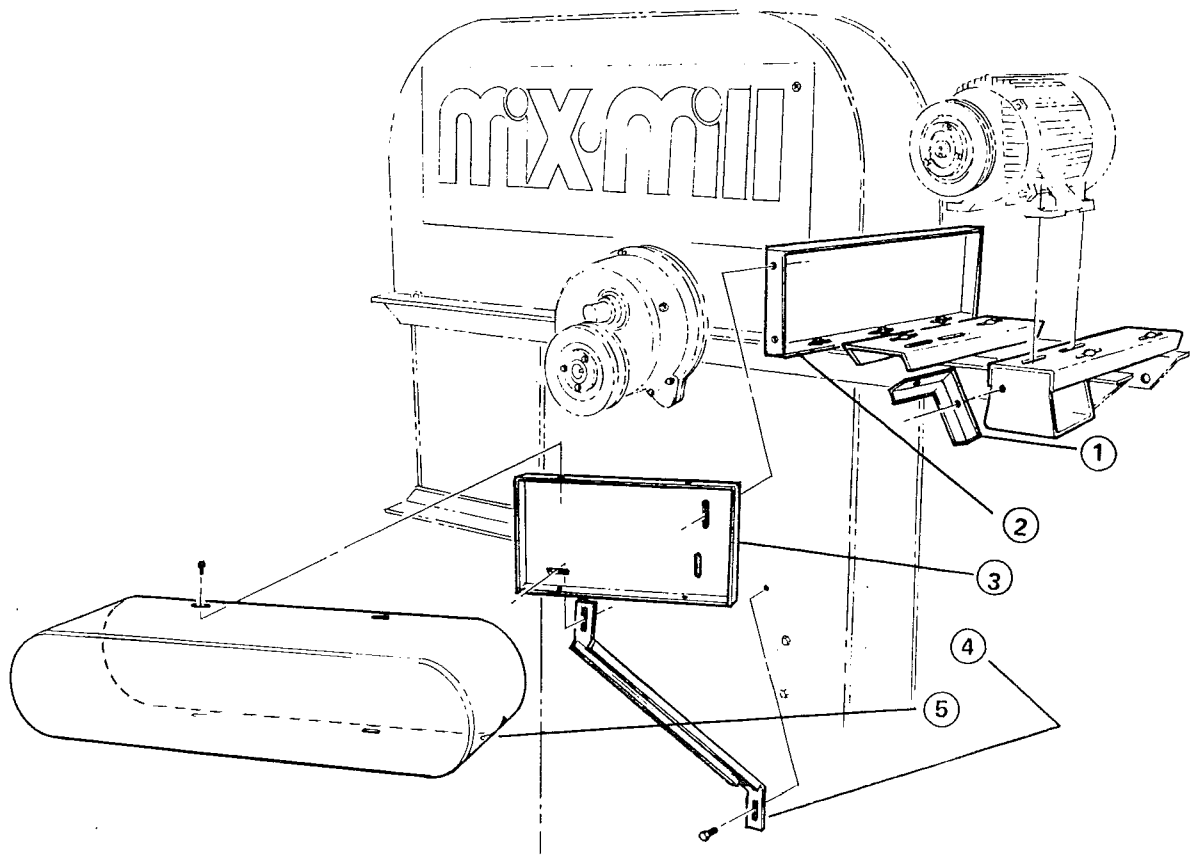


FIGURE 6 3000 BPH

## LEGGING ERECTION

The preferred method of erecting the legging requires most of the work to be accomplished near the ground.

The head cover should be removed before lifting to prevent damage by the cables or chains.

In this manner, the head and previously assembled parts will be raised high enough to allow a ten foot section of legging to be set under the assembly.

**NOTE:** When raising the assembled parts, use eye bolts and cables heavy enough to carry the entire weight. The bottom end must not be dragged across the ground, as this can damage the flanges. (See Figure 7)

Caulk around the flange and inside the bolt holes of a leg section. Position it under the suspended leg section, align the holes, and bolt together. Assemble a ladder bracket and section of ladder. The safety cage should be started from directly below the platform.

Continue raising and assembling legging sections, ladder and cage sections, and guy brackets (see Figure 7) until the complete height of the elevator has been attained.

**NOTE:** Where an elevator of sufficient height to require use of reinforced leg sections is being erected, these sections must be the bottom section installed.

Raise the complete assembly into position on the boot. Caulk around flange inside the bolt holes, uppers and lowers. Align the holes and bolt together securely.

Fasten the guy cables to the anchors. See Figures 13 and 14 for typical anchoring points.

Leave the crane attached, but slacken the cable to relieve the tension.

To plumb the elevator, drop a plumb bob or weighted string through the head and down one leg of the elevator. Use a block of wood so the string will not move. Measure from the sides of the opening to the string. Measure from the sides of the leg at the bottom to the string. (See Figure 20, Page I-32)

Determine which way the leg needs to be pulled to bring the bottom measurements to match those at the top. Tighten the turn-buckle as required on the individual cables to align the sections of the leg.

At this point the crane is ready to be disconnected and removed.

The second method consists of assembling 30 or 40 foot sections complete with ladder, cage, and guy brackets on the ground. These sections would then be raised into position, plumbed, and secured as previously described.

**NOTE:** When assembling and raising legging in this manner, always lift so the weight is supported through the narrower, stronger dimension. The bottom end must not be dragged over the ground.

The head and previously assembled parts will then be lifted into place.

This method requires more aerial work and someone with the ability to work at the heights required.

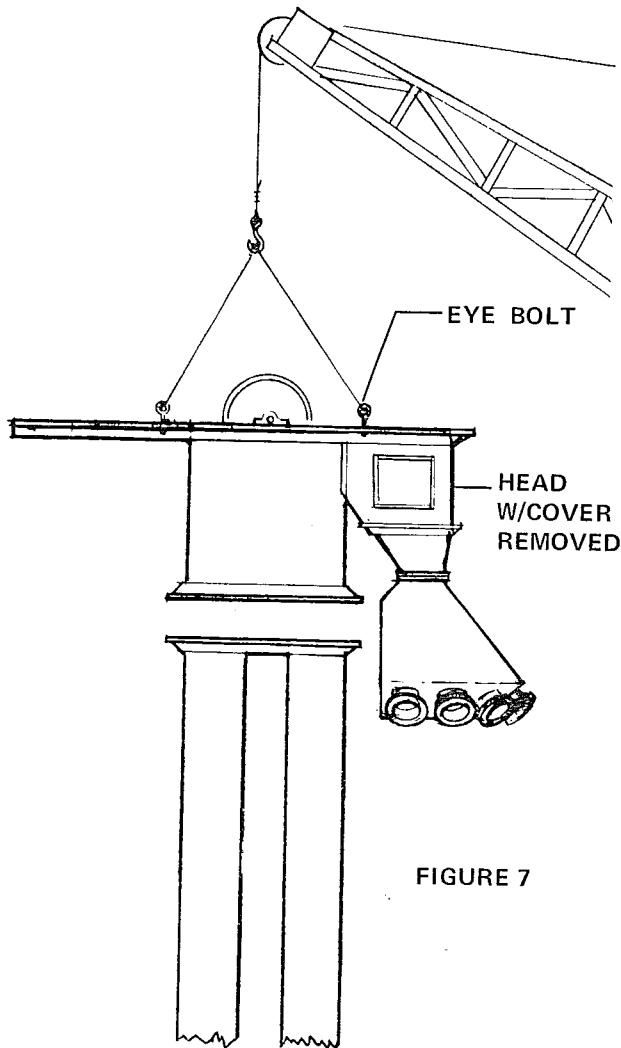


FIGURE 7

#### DISTRIBUTOR

See page I-28 and I-29.

Assemble the transition to the discharge opening. Place a bead of caulking inside the bolt holes on the square end of the transition. Bolt the transition to the discharge opening with the sloped side of the transition nearest the head.

Next, attach the stabilizer bracket (item 18) to the distributor head as shown in the drawing. Place a bead of caulking around the inside edge of the bolt holes on the flange ring of the distributor head and fasten the distributor head to the transition with bolts. **DO NOT** tighten the nuts at this time. Position the flat back of the distributor parallel to the trunking.

Install two support clamps (item 17) around the legging and attach to the stabilizer bracket of the distributor head. At this time, all nuts should be tightened.

An alternate method to attach the distributor head to the transition would be to utilize the Mix-Mill clamp ring assembly instead of using nuts, bolts, and washers.

#### SERVICE PLATFORM

Refer to Figure 18 on page I-30.

All bolts should be installed with the heads to the inside of the platform.

Attach the two base channels (1) to the leg section with four leg braces (2) and brace plates (3).

The top edge of both channels should be six inches below the joint of the head sections and leg section.

Next attach the four support channels (4) to the base channels. For ease of assembly, do not tighten any bolts at this point.

The four corner legs (5) and six center legs (6) are ready to be installed. Attach the two long toeboards (7) and the two short toeboards (8) to the legs.

Lay the long walk board (9) in place with the edges over the bottom toeboard flanges. The short walk board (10) fits over the edge of the long walk board and the toeboard.

Following the outline in Figure 18, install the long (11), medium (12) and short (13) upper rails.

These upper rails are bolted to the inside of the legs with the flange to the outside.

Install the long (14), medium (15), and short (16), lower rails, again with the flanges out. Tighten any and all nuts that have not previously been tightened.

Bolt the trap door channels (17) into the flanges of the trap door (18). Attach the trap door to the platform by inserting the pivot rod (19) through the guideholes and pinning with the cotter pins provided.

The platform is produced with matching holes so it may be used on either side of the elevator for service of the drive or distributor head.

For ease of distributor service, mount a platform approximately five to six feet below the distributor bottom.

#### **TURN PIPE**

Refer to Figure 8.

The next step in the installation procedure is to install the turn pipe onto the spinner spout in the distributor head. A pipe coupling is required for this connection. After this assembly is tightened, it will be necessary to either drill and bolt or weld the coupling to prevent unscrewing of the assembly during operation.

Pipe guides are furnished with the Mix-Mill "Pipe and Guide Assemblies", when these systems have been purchased as optional equipment. One of these pipe guides should now be assembled to the elevator trunking where two trunk sections are joined together. This first guide should be bolted to the flanges of the trunking section about twenty feet below the bottom of the distributor head. As additional trunking is added, extra lengths of pipe and pipe guides should be installed until the correct above ground height is reached. The last section of pipe should be cut to desired length to obtain this desired height. All couplings should be drilled and bolted or welded as described above for the spinner spout connection.

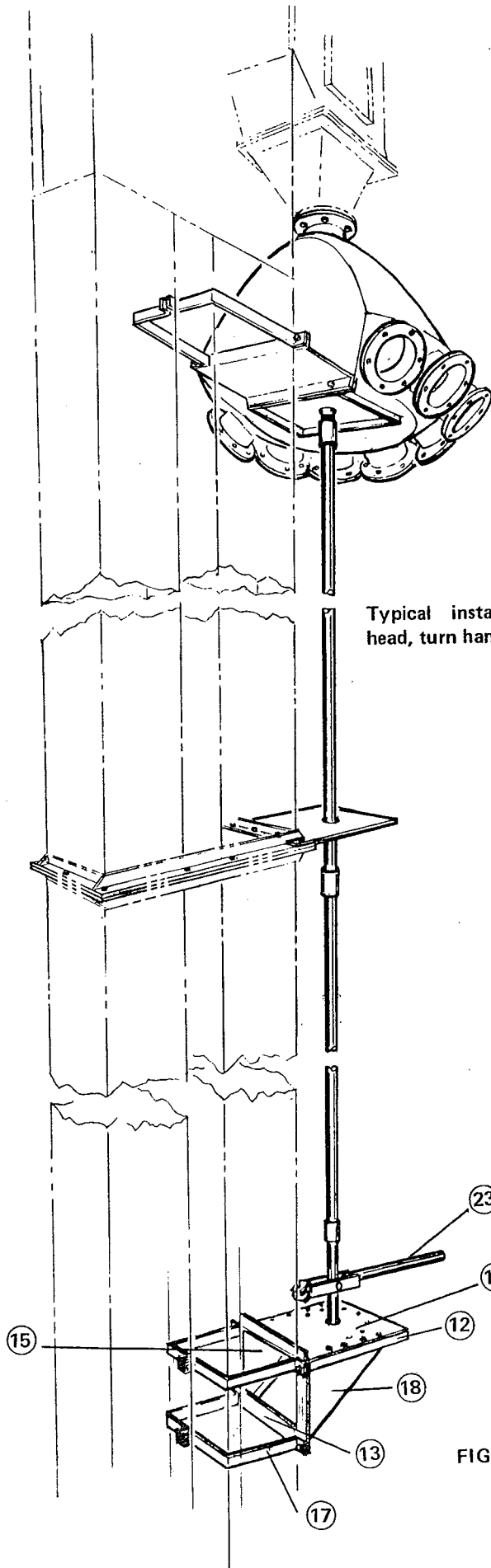
#### **TURN HANDLE ASSEMBLY**

The turn handle control for a distributor head is part of the distributor head package.

Refer to Figures 8 and 17 for a typical installation. The height for installation should be determined by the customer.

Preassemble the following parts before fastening to the elevator trunking. Assemble the tie strap (item 13) to the support brace left (item 16) and then assemble the support brace right (item 15) to the other end. Place the locator plate (item 14) over the support plate (item 12) and then fasten these two items to the support braces. These five parts make up the basic sub assembly for the turn handle assembly support.





Typical installation of a distributor head, turn handle, pipe and guides.

FIGURE 8

Hold this assembly against the trunking section and fasten to the trunking with the remaining four (4) support clamps. Item 17 and the 5/16-18 hardware furnished. This assembly will be fastened in a low position temporarily.

Place the turn handle assembly (item 23) into the locator plate 1 3/8" diameter hole. Slide the support brace assembly up until the pipe is seated fully into the top of the turn handle assembly. Drill thru the pipe and turn handle and assemble the bolt and nut furnished with the turn handle. Tighten all nuts and bolts.

#### **GUY BRACKETS AND CABLES**

See Figures 13, 14 and 19.

The top four guy cables should be attached to the head during the assembly of the related parts. Four 9/16" holes are provided in the main support angles of the head.

Attach the proper sized guy cables to the head using a thimble and three cable clamps at each attachment location.

The guy brackets should be located on the top side of joints spaces 20 ft. apart. The top bracket will be 20 ft. below the discharge. The bottom bracket will be 30 or 40 ft. from the ground depending on the elevator's overall height.

#### **CABLE ANCHORS**

See Figures 13 and 14 for some arrangements and locations.

The cables should have at least 14 ft. of ground clearance to allow trucks and other equipment to pass under the cables. Where clearance is not required, the cables can run directly to the deadman anchor.

Use an I-beam railroad rail or other suitable beam to provide the clearance where it is required.

An elevator can be braced to a building, silo, or feed factory if that building is strong enough to accept the extra stress.

#### **INSPECTION DOOR INSTALLATION**

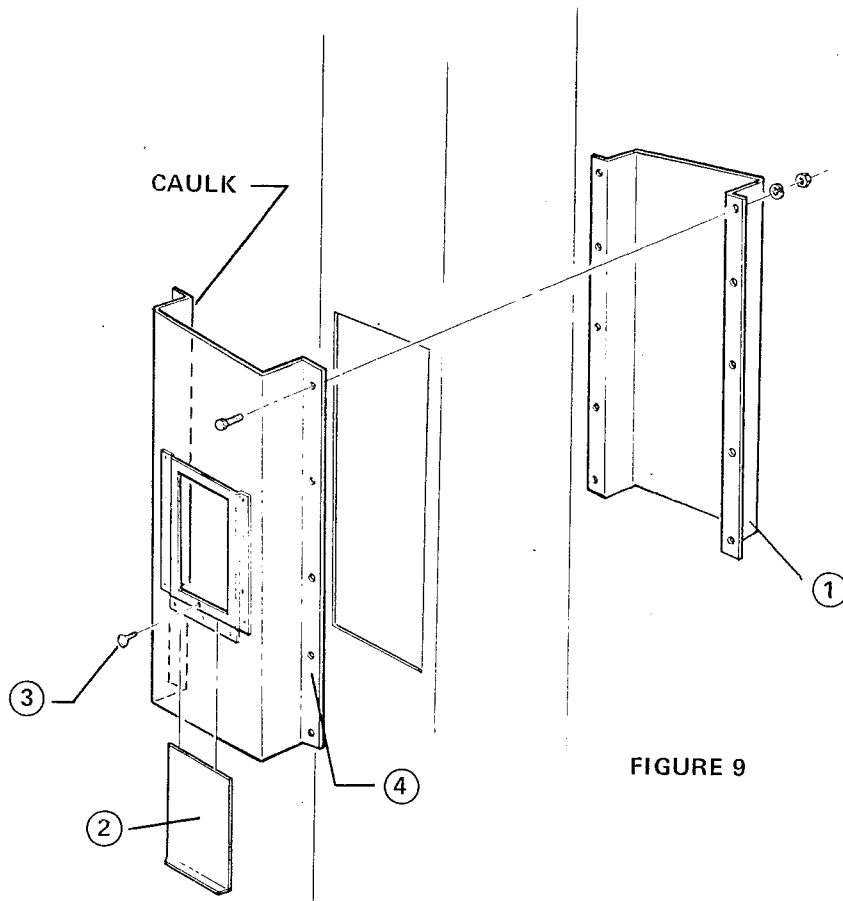
The inspection door may be installed in either the up leg or the down leg of the lower trunking section. It should be installed at a height convenient to the new operator. It would normally be installed in the up leg.

Place the weldment around the trunking in the desired location and scribe a line at each end of the weldment. Lay the weldment aside and mark a line approximately one inch inside each of the lines and from the corners of the leg section. Cut out the opening in the trunking and remove any rough edges with a file. Place a bead of caulking around the inside of the top end of the weldment.

Install the inspection door as shown in the drawing with the inspection slide down towards the boot section. Use standard hardware for installation.

## PARTS LIST

| <u>ITEM</u> | <u>1500 BU PART NO.</u> | <u>3000 BU PART NO.</u> | <u>DESCRIPTION</u>             | <u>QUANTITY</u> |
|-------------|-------------------------|-------------------------|--------------------------------|-----------------|
| 1           | 1119-8271               | 1119-9770               | Inspection Door Back Plate     | 1               |
| 2           | 1119-8310               | 1119-8310               | Inspection Door Slide          | 1               |
| 3           | 6682-3312               | 6682-3312               | Thumb Screw ¼" - 20 UNC X ½"   | 1               |
| 4           | 9000-0172               | 9000-0242               | Inspection Door Weldment       | 1               |
|             | 9200-0310               | 9200-0357               | Inspection Door Complete Ass'y | 1               |



## BELT AND BUCKET INSTALLATION

The belt may be installed with or without buckets attached.

To install the belt with buckets attached, a crane should be used. Pick up the belt at the center, using a block of wood to keep the belt from doubling against itself. Swing into position over the open head section. Feed the ends down each leg. Make sure the buckets are in proper legs.

To install belt without buckets, proceed as follows:

1. Drop a heavy rope down the up-leg of the elevator. Attach belt to the end of the rope in the down-leg side. A piece of angle iron with holes in one side to match the holes in belt and a large hole in the other side make a good attachment.
2. Pull the belt to the top of the elevator, dropping the free end of the rope down the down-leg.
3. Pull the rope around the boot pulley till the belt is around far enough to splice. See Figure 10.
4. Run the boot pulley to the highest position.
5. Lap the lead end of the belt over the trailing end of the belt. Align four rows of holes.
6. Use the long elevator bolts for splicing and fastening buckets in place. Tighten nuts enough to set heads in belt.
7. Finish attaching buckets. For best results, it would be best to attach 1 or 2 buckets at 10 to 12 foot intervals for one revolution. On the second revolution, install the buckets midway between those previously installed. Continue in this manner until all buckets are installed.

8. Lower the boot pulley till belt is tightened.

9. Turn elevator on. Adjust boot pulley until belt is tracking in center of legging.

Check and tighten all bucket bolts after the first week of operation.

Check the head shaft to make sure it has not been altered in shipping.

If one side is low, install shims under the pillow block bearing on the low side. The belt will not track properly and could wear the head, legging, or boot, if the head shaft is not level.

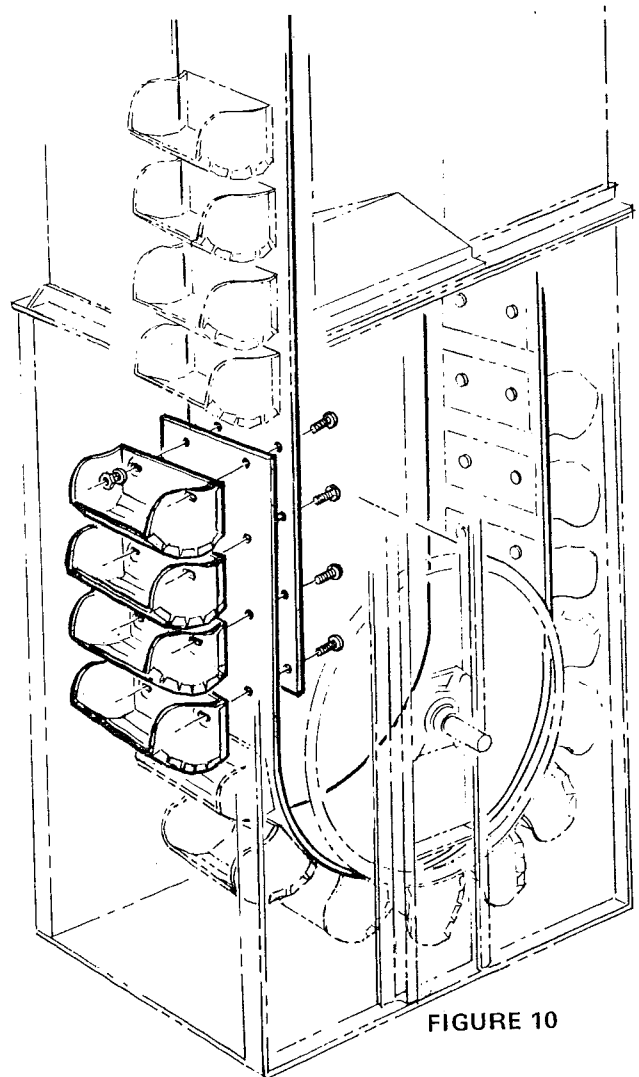


FIGURE 10

## SPOUTING

Down-spouting should be assembled on the ground and lifted into position with a crane.

Weld flange ring to ends of down-spouts. Use compression couplings together to join lengths of tubing. Clean and paint all welded areas to give protection from rust.

Make all runs as straight as possible for best flow of grain. Use deadheads on the runs of tubing to reduce wear.

Caulk all flanges to make water tight joints.

On all runs over 40 feet, a truss support should be installed. These should be installed with the end clamps one foot from the ends of the tube and the spider or cross arms centered. The clamps should be tack-welded to the tube after installation.

See figure 11 for a view of a truss support.

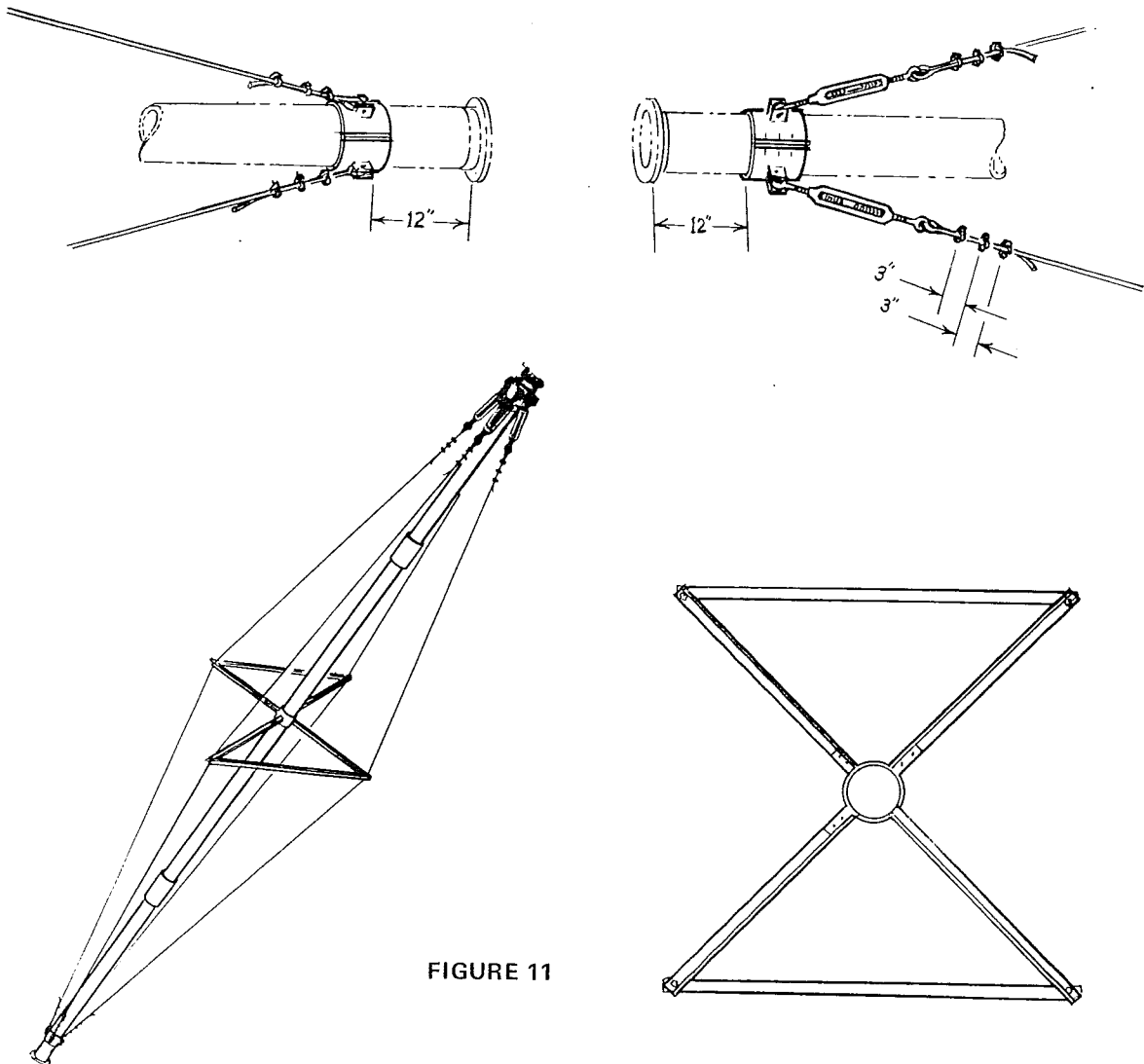


FIGURE 11

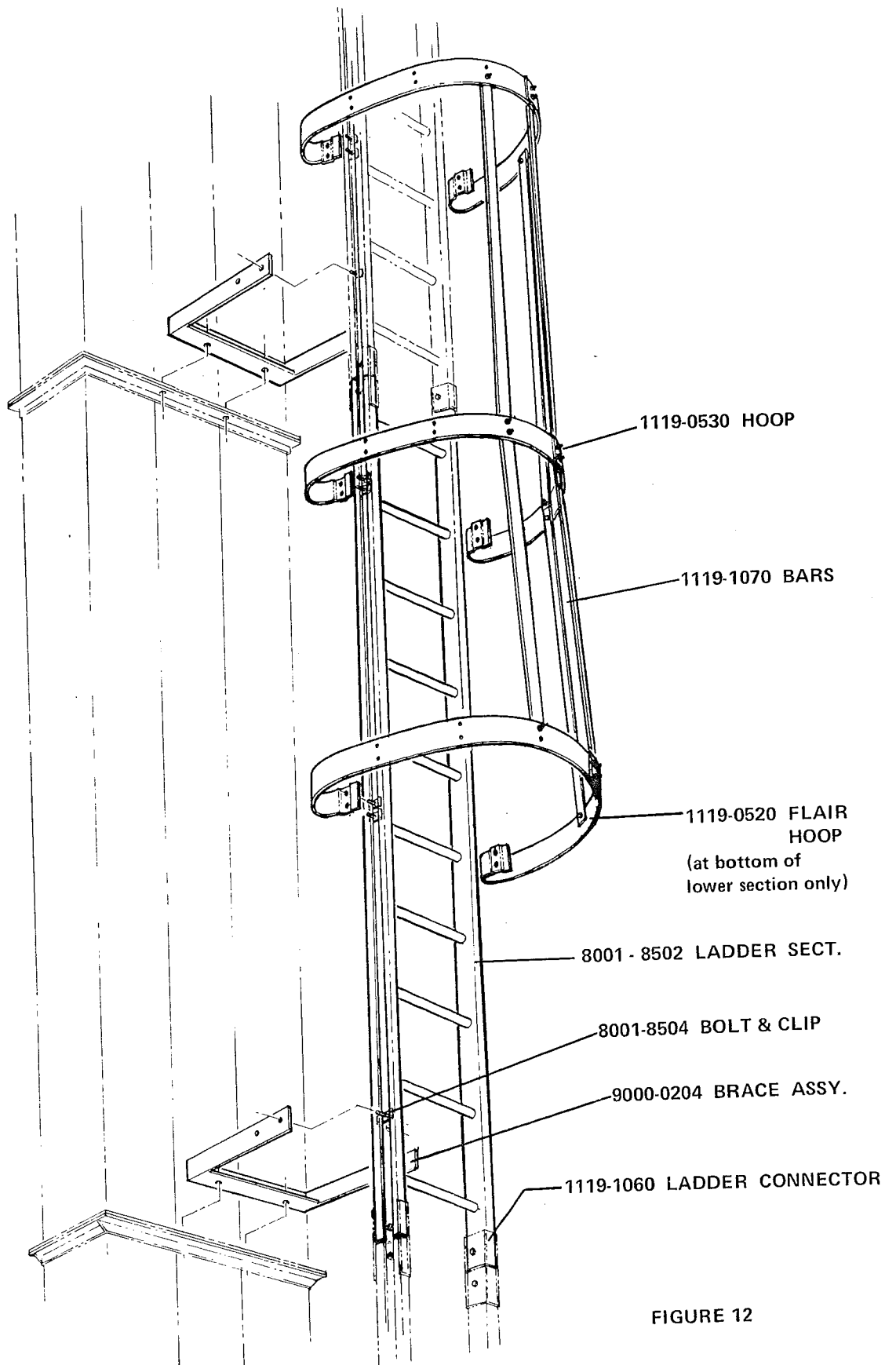


FIGURE 12

TYPICAL LADDER AND SAFETY CAGE

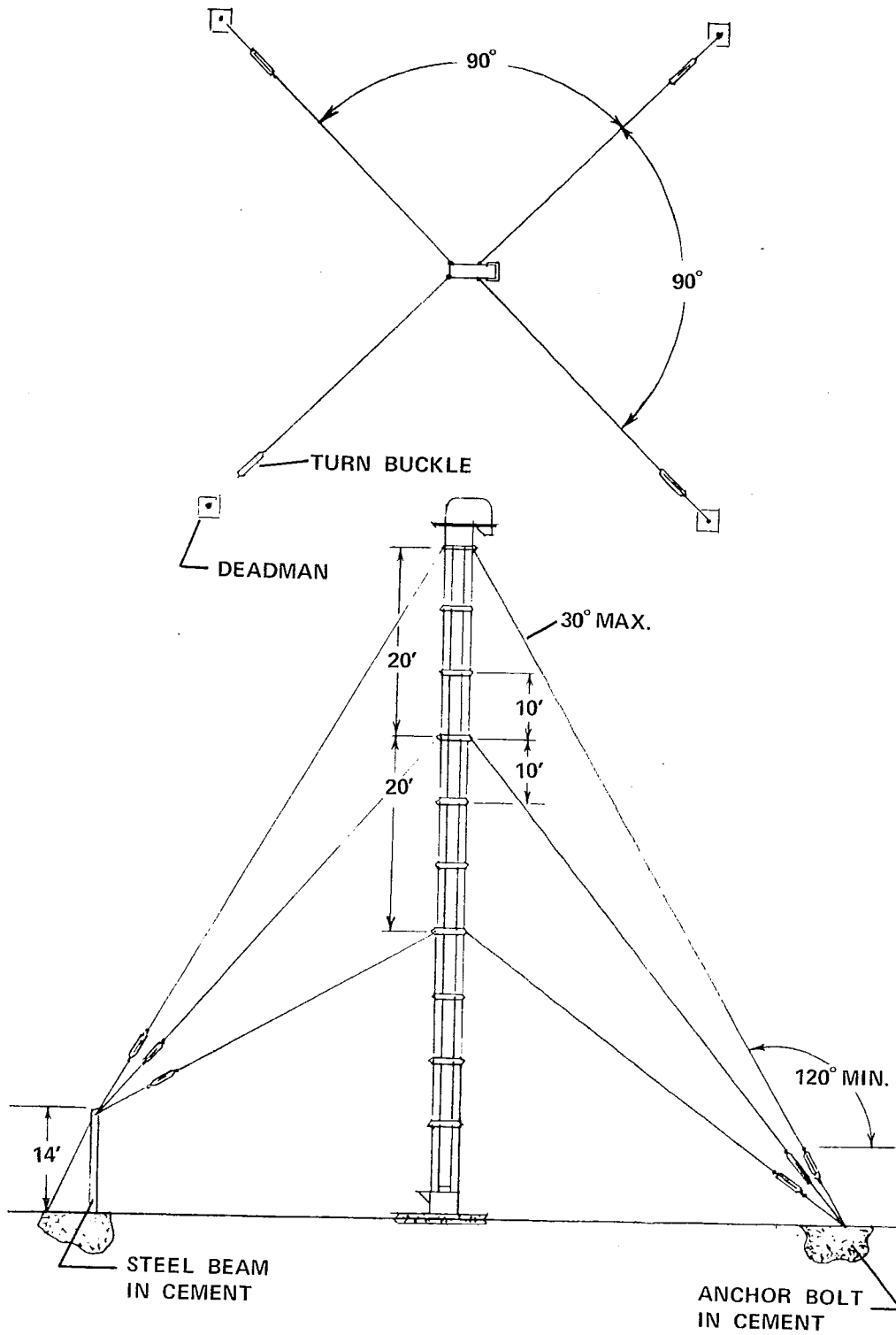


FIGURE 13

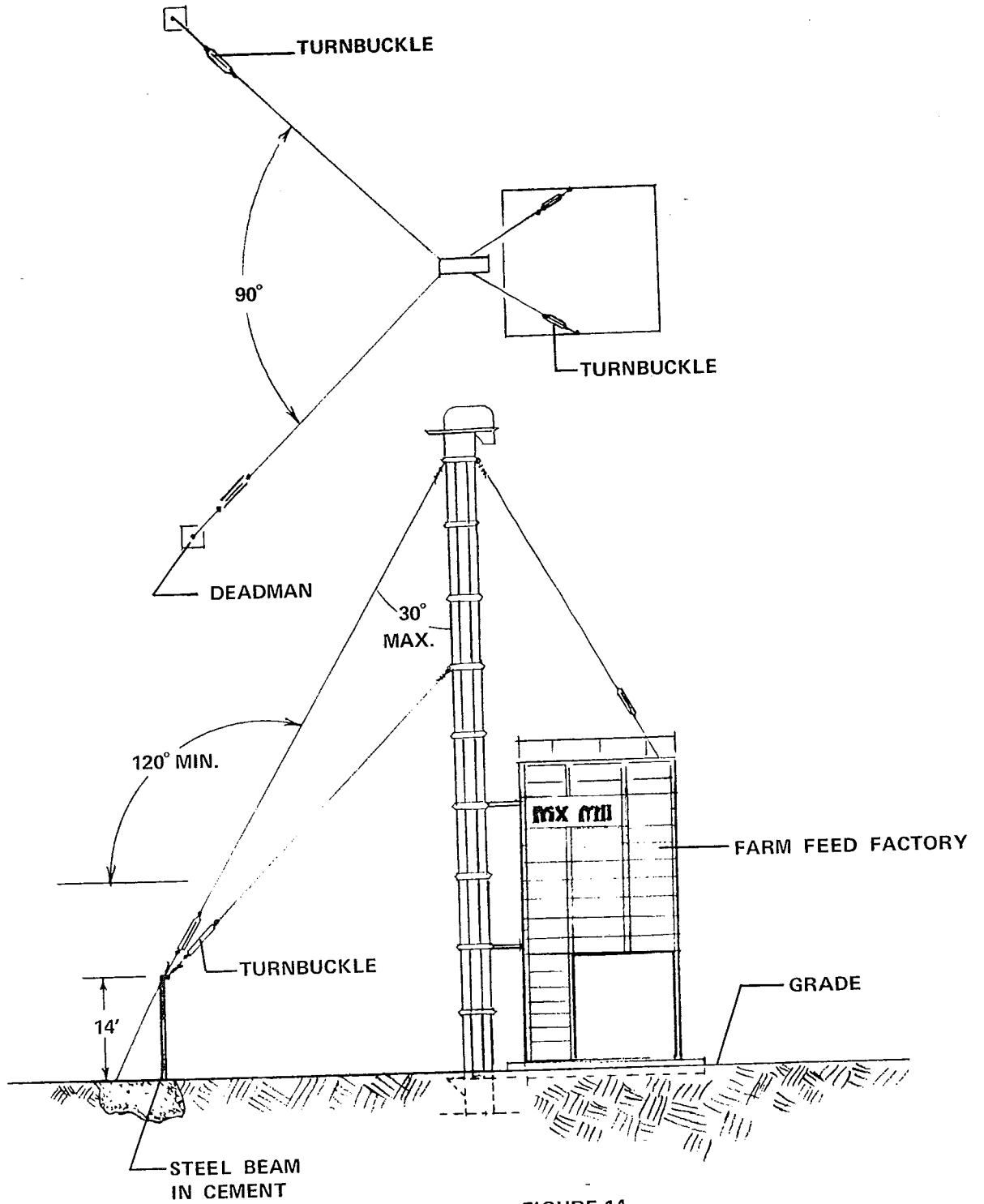


FIGURE 14



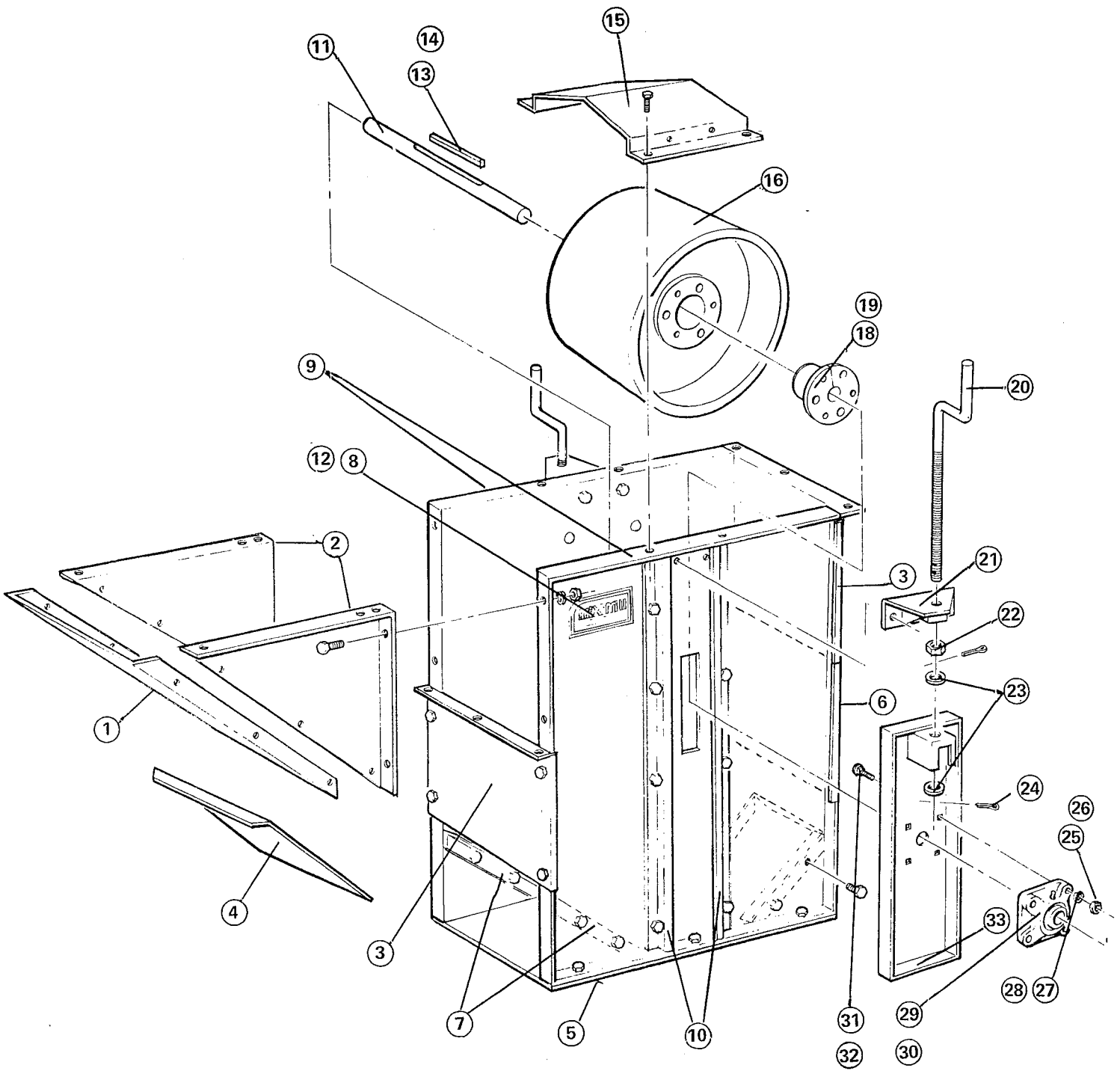


FIGURE 15

## BOOT SECTION

| ITEM | 1500 BU PART NO. | 3000 BU PART NO. | DESCRIPTION                           | QUANTITY |
|------|------------------|------------------|---------------------------------------|----------|
| 1    | 1119-8350        | 1119-9250        | Boot Hopper Bottom                    | 1        |
| 2    | 1119-8360        | 1119-9260        | Boot Hopper Side                      | 2        |
| 3    | 1119-8380        | 1119-9270        | Boot End Plate, Upper                 | 2        |
| 4    | 1119-8400        | 1119-9220        | Boot Slide                            | 1        |
| 5    | 1119-8390        | 1119-9210        | Boot Base                             | 1        |
| 6    | 1119-8370        | 1119-9230        | Boot End Plate, Lower                 | 1        |
| 7    | 1119-8410        | 1119-9200        | Boot Slide, Guides                    | 4        |
| 8    | 8000-3502        | -                | Mix-Mill Decal                        | 2        |
| 9    | 1119-8420        | 1119-9300        | Boot Side                             | 2        |
| 10   | 1119-8440        | 1119-9280        | Bearing Plate Guide                   | 4        |
| 11   | 1119-8450        | 1119-9240        | Boot Pulley Shaft                     | 1        |
| 12   | -                | 8000-3514        | Decal, Feed Processing System         | 2        |
| 13   | 4900-0648        | -                | Key, 1/4" x 1/4" x 3" Long            | 1        |
| 14   | -                | 4900-0748        | Key, 5/16" x 5/16" x 3" Long          | 1        |
| 15   | 1119-8990        | 1119-9290        | Boot Cover                            | 1        |
| 16   | 8001-6005        | -                | Pulley, 14" O.D. x 8" Wide            | 1        |
| 17   | -                | 8001-6007        | Pulley, 18" O.D. x 11" Wide           | 1        |
| 18   | 4401-0910        | -                | Bushing, O.D. 1" Bore                 | 1        |
| 19   | -                | 4401-1216        | Bushing, O.D. 1 3/8" Bore             | 1        |
| 20   | 1119-8460        | 1119-8460        | Belt Tightener Rod                    | 2        |
| 21   | 9000-0173        | 9000-0173        | Belt Tightener Weldment               | 2        |
| 22   | 6608-5800        | 6608-5800        | Hex Nut 5/8-11 U.N.C.                 | 2        |
| 23   | 6640-5800        | 6640-5800        | Flat Washer 5/8"                      | 4        |
| 24   | 7000-2003        | 7000-2003        | Cotter Pin                            | 4        |
| 25   | 6608-4400        | -                | Hex Nut, 3/8"-16 U.N.C.               | 60       |
| 26   | -                | 6608-5200        | Hex Nut, 1/2"-13 U.N.C.               | 12       |
| 27   | 6644-4400        | -                | Lock Washer, 3/8"                     | 60       |
| 28   | -                | 6644-5200        | Lock Washer, 1/2"                     | 12       |
| 29   | 1119-9190        | -                | Cartridge Flange Bearing - 1"         | 2        |
| 30   | -                | 1120-0090        | Cartridge Flange Bearing - 1 3/8"     | 2        |
| 31   | 6186-4428        | -                | Flat Head Mach. Screw 3/8"-16X 1 1/2" | 8        |
| 32   | -                | 6186-5228        | Flat Head Mach. Screw 1/2"-13X 1 1/2" | 8        |
| 33   | 9000-0176        | 9000-0235        | Bearing Plate Welded Ass'y            | 1        |
|      | 9200-0311        | 9200-0351        | Complete Boot Ass'y                   |          |

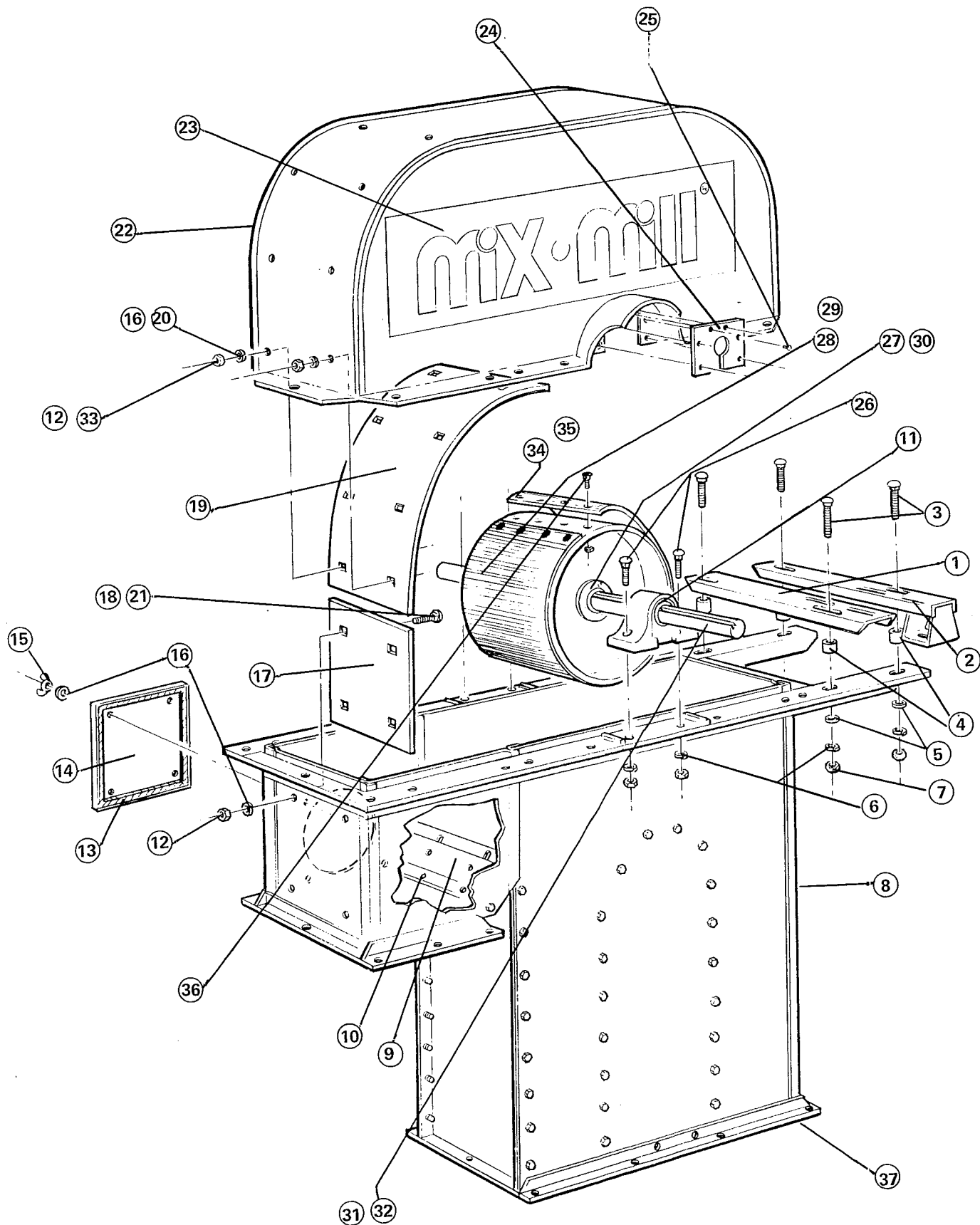


FIGURE 16

## HEAD SECTION ASSEMBLY

| <u>ITEM</u> | <u>1500 BU PART NO.</u> | <u>3000 BU PART NO.</u> | <u>DESCRIPTION</u>                  | <u>QUANTITY</u> |
|-------------|-------------------------|-------------------------|-------------------------------------|-----------------|
| 1           | 1119-8870               | 1119-9530               | Motor Mounting Bracket              | 1               |
| 2           | 9000-0178               | 9000-0240               | Motor Mounting Channel              | 1               |
| 3           | 6028-5237               | 6028-5237               | Carriage Bolt-1/2"-13 N.C. x 2 1/2" | 4               |
| 4           | 8001-5001               | 8001-5001               | Spacers                             | 4               |
| 5           | 6640-5200               | 6640-5200               | Flat Washers - 1/2"                 | 8               |
| 6           | 6644-5200               | 6644-5200               | Lock Washers - 1/2"                 | 8               |
| 7           | 6608-5200               | 6608-5200               | Hex Nut - 1/2" 13 N.C.              | 4               |
| 8           | 9000-0177               | 9000-0238               | Head Section Welded Ass'y           | 1               |
| 9           | 1119-8950               | 1119-9570               | Adjustment Plate                    | 1               |
| 10          | 1119-8940               | 1119-9560               | Belt, Adjustment                    | 1               |
| 11          | 4000-0020               | 4000-0023               | Pillow Block Bearing                | 2               |
| 12          | 6608-3300               | -                       | Hex Nut - 1/4" 2 U.N.C.             | 12              |
| 13          | 8001-4003               | 8001-4003               | Gasket, Sponge Rubber               | 32"             |
| 14          | 1119-8960               | 1119-8960               | Clean Out Door                      | 1               |
| 15          | 6636-3300               | 6636-3300               | Wing Nut 1/4" - 20 U.N.C.           | 4               |
| 16          | 6644-3300               | 6644-3300               | Lock Washer 1/4"                    | 16              |
| 17          | 1119-8920               | 1119-9540               | Head Liner                          | 1               |
| 18          | 6028-3317               | -                       | Carriage Bolt-1/4"-20 x 3/4"        | 12              |
| 19          | 1119-8930               | 1119-9550               | Cover Liner                         | 1               |
| 20          | -                       | 6644-3800               | Lock Washer - 1/16"                 | 12              |
| 21          | -                       | 6028-3817               | Carriage Bolt-5/16"-18 x 3/4"       | 12              |
| 22          | 9000-0179               | 9000-0239               | Head Cover Welded Ass'y             | 1               |
| 23          | 8000-3520               | 8000-3520               | Mix-Mill Decal                      | 2               |
| 24          | 1119-9180               | 1120-0070               | Head Shaft Sealer                   | 2               |
| 25          | 7000-7001               | 7000-7001               | Pop Rivet                           | 12              |
| 26          | 6258-5228               | -                       | Cap Screws-1/2"-13 U.N.C. x 1 1/2"  | 4               |
| 27          | 4401-0917               | -                       | Q.D. Bushing-SK-1 7/16" Bore        | 1               |
| 28          | 8001-6005               | -                       | 14" Pulley                          | 1               |
| 29          | -                       | 8001-6007               | 18" Pulley                          | 1               |
| 30          | -                       | 4401-1225               | Q.D. Bushing S.F.R. 1 15/16" Bore   | 1               |
| 31          | 1119-9010               | -                       | Head Pulley Shaft 1 7/16" Dia.      | 1               |
| 32          | -                       | 1119-9580               | Head Pulley Shaft 1 15/16" Dia.     | 1               |
| 33          | -                       | 6608-3800               | Hex Nut 5/16" 18 U.N.C.             | 12              |
| 34          | 1119-9000               | -                       | Lagging for 14" Dia. Pulley         | 1               |
| 35          | -                       | 1119-9720               | Lagging for 18" Dia. Pulley         | 1               |
| 36          | 8001-6003               | 8001-6003               | Elevator Bolt 1/4-20 Thread         | 8               |
|             | 9200-0320               | 9200-0355               | Head Section-Complete Ass'y         |                 |

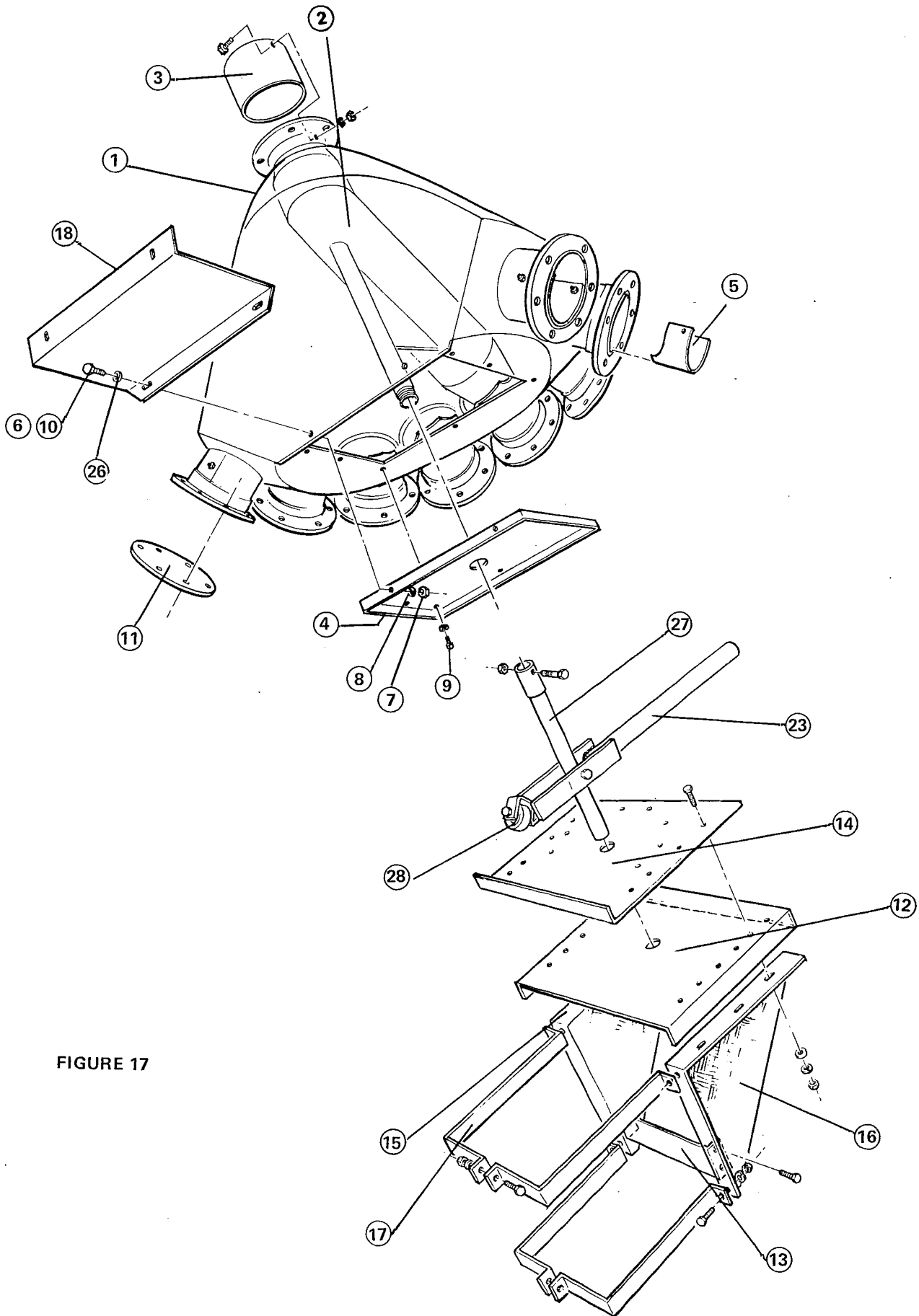


FIGURE 17

### 8 WAY FLAT BACK DISTRIBUTOR HEAD

| <u>ITEM</u> | <u>1500 BU PART NO.</u> | <u>3000 BU PART NO.</u> | <u>DESCRIPTION</u>                     | <u>QUANTITY</u> |
|-------------|-------------------------|-------------------------|--|-----------------|
| 1           | 9309-0820               | 9000-0245               | Distributor Head Welded Ass'y          | 1               |
| 2           | 9310-0840               | 9000-0244               | Spinner Spout Ass'y                    | 1               |
| 3           | 1090-9600               | 1119-9930               | Sleeve, Inlet                          | 1               |
| 4           | 1100-7800               | 1119-9940               | Clean Out Door                         | 1               |
| 5           | 1090-7900               | 1119-9950               | Wear Plate, Discharge Outlet           | 8               |
| 6           | -                       | 6258-3322               | Cap Screw 1/4"-20 U.N.C. x 1" Hex Hd.  | 19              |
| 7           | 6608-3300               | 6608-3300               | Nut 1/4"-20 U.N.C.                     | 21              |
| 8           | 6644-3300               | 6644-3300               | Washer 1/4" lock                       | 21              |
| 9           | 6548-3312               | 6548-3312               | Mach. Screw 1/4"-20 x 1/2" thread cut  | 8               |
| 10          | 6258-3317               | -                       | Hex Cap Screw 1/4"-20 x 3/4"           | 21              |
| 11          | 1078-1900               | 1120-0140 ✓             | Plug Outlet                            | 4               |
| 12          | 1085-2800               | 1120-0200 ✓             | Support Plate, Turn Handle             | 1               |
| 13          | 1085-3500               | 1120-0160 ✓             | Tie Strap                              | 1               |
| 14          | 1090-8300               | 1120-0210               | Locator Plate                          | 1               |
| 15          | 1119-8750               | 1120-0150 ✓             | Support Brace-Turn Handle, right       | 1               |
| 16          | 1119-8751               | 1120-0151 ✓             | Support Brace-Turn Handle, left        | 1               |
| 17          | 1119-8760               | 1120-0190 ✓             | Support Clamp-Turn Handle              | 6               |
| 18          | 1119-8980               | 1120-0170 ✓             | Stabilizing Bracket                    | 1               |
| 19          | 6258-3822               | 6258-3822               | Hex Cap Screw 5/16"-18 U.N.C. x 1"     | 40              |
| 20          | 6258-3828               | 6258-3828               | Hex Cap Screw 5/16"-18 U.N.C. x 1 1/2" | 6               |
| 21          | 6608-3800               | 6608-3800               | Hex Nut 5/16"-18 U.N.C.                | 46              |
| 22          | 6644-3800               | 6644-3800               | Lock Washer 5/16"                      | 46              |
| 23          | 9309-1020               | 9309-1020               | Turn Handle                            | 1               |
| 24          | 9200-0322               | 9200-0362               | Complete Ass'y with Parts Pkg.         | 1               |
| 25          | 6640-3300               | -                       | Flat Washer 1/4"                       | 2               |
| 26          | 9200-0321               | 9200-0384               | Parts Pkg. Only (items 11-25)          | 1               |
| 27          | 9309-1050               | 9309-1050               | Pivot Tube                             | 1               |
| 28          | 8001-7002               | 8001-7002               | Skate Wheel                            | 1               |

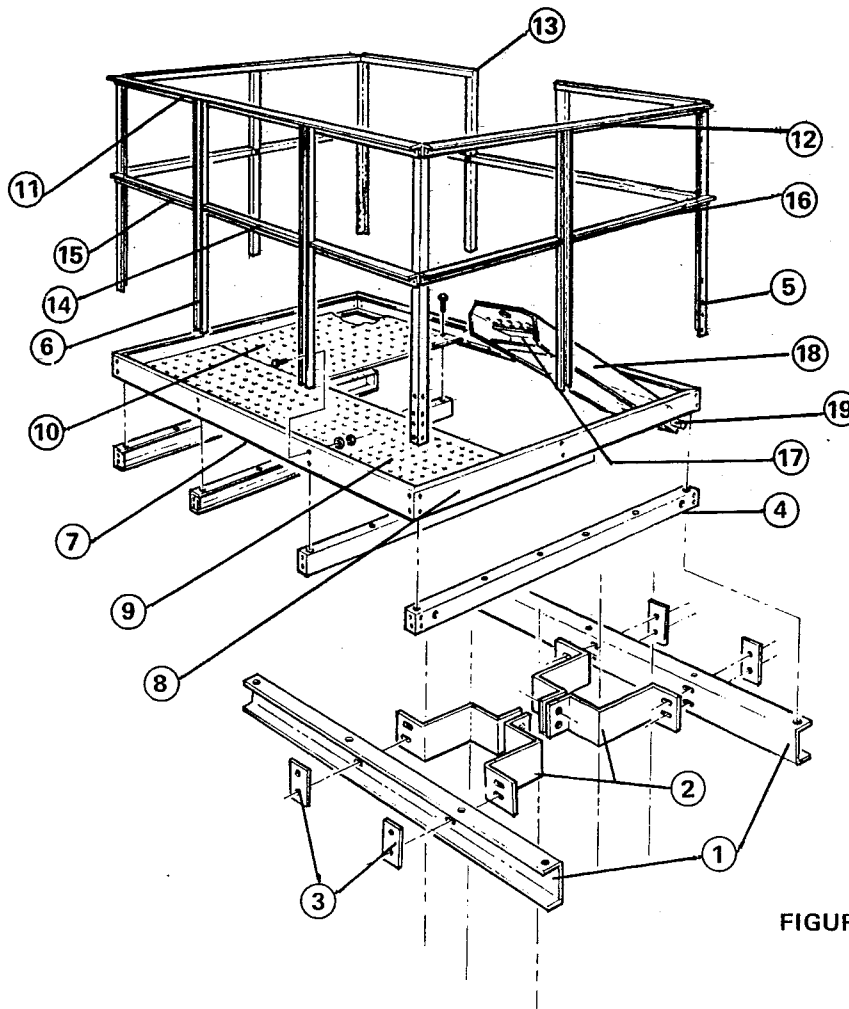


FIGURE 18

**PLATFORM PARTS LIST**

| <u>ITEM</u> | <u>1500 BU PART NO.</u> | <u>3000 BU PART NO.</u> | <u>DESCRIPTION</u>                             | <u>QUANTITY</u> |
|-------------|-------------------------|-------------------------|--|-----------------|
| 1           | 1119-8630               | 1119-9460               | Channel, Base                                  | 2               |
| 2           | 1119-8540               | 1119-9380               | Brace, leg                                     | 4               |
| 3           | 1119-8530               | 1119-8530               | Plate, brace                                   | 4               |
| 4           | 1119-8670               | 1119-9470               | Channel, Floor Support                         | 4               |
| 5           | 1119-8590               | 1119-8590               | Leg, Platform Corner                           | 4               |
| 6           | 1119-8580               | 1119-8580               | Leg, Platform Center                           | 6               |
| 7           | 1119-8610               | 1119-9490               | Toeboard, Side - <i>SHORT</i>                  | 2               |
| 8           | 1119-8600               | 1119-9480               | Toeboard, End - <i>LONG</i>                    | 2               |
| 9           | 1119-8630               | 1119-9510               | Base-plate, Long                               | 1               |
| 10          | 1119-8640               | 1119-9500               | Base-plate, Short                              | 1               |
| 11          | 1119-8570               | 1119-9450               | Rail, Upper Long                               | 1               |
| 12          | 1119-8560               | 1119-9440               | Rail, Upper Medium                             | 2               |
| 13          | 1119-8550               | 1119-9410               | Rail, Upper Short                              | 2               |
| 14          | 1119-8551               | 1119-9411               | Rail, Lower Long                               | 4               |
| 15          | 1119-8690               | 1119-9430               | Rail, Lower Medium                             | 4               |
| 16          | 1119-8700               | 1119-9420               | Rail, Lower Short                              | 2               |
| 17          | 1119-8720               | 1119-9390               | Channel Trap Door                              | 2               |
| 18          | 1119-8710               | 1119-9520               | Trap Door                                      | 1               |
| 19          | 1119-8730               | 1119-9400               | Rod, Pivot                                     | 1               |
| 20          | 9200-0313               | 9200-0313               | Hardware Pkg. (includes all bolts, nuts, etc.) | 1               |
|             | 9200-0314               | 9200-0354               | Service Platform - Complete                    |                 |

### GUY BRACKET ASSEMBLY

| <u>ITEM</u> | <u>1500 BU PART NO.</u> | <u>3000 BU PART NO.</u> | <u>DESCRIPTION</u>                    | <u>QUANTITY</u> |
|-------------|-------------------------|-------------------------|---------------------------------------|-----------------|
| 1           | 1069-1403               | 1069-1407               | 1/2" - 13 Threaded Rod (12") (15")    | 2               |
| 2           | 1119-8670               | 1119-9320               | Guy Bracket-End                       | 2               |
| 3           | 1119-8680               | 1119-9330               | Guy Bracket-Side                      | 2               |
| 4           | 6258-4422               | 6258-4422               | Cap Screw-3/8"-16 U.N.C. x 1" Hex Hd. | 4               |
| 5           | 6644-4400               | 6644-4400               | Lock Washer 3/8"                      | 4               |
| 6           | 6608-4400               | 6608-4400               | Hex Nut - 3/8"-16 U.N.C.              | 4               |
| 7           | 6644-5200               | 6644-5200               | Lock Washer - 1/2"                    | 4               |
| 8           | 6608-5200               | 6608-5200               | Hex Nut-1/2"-13 U.N.C.                | 4               |
|             | 9200-0317               | 9200-0352               | Guy Bracket Ass'y, Complete           |                 |

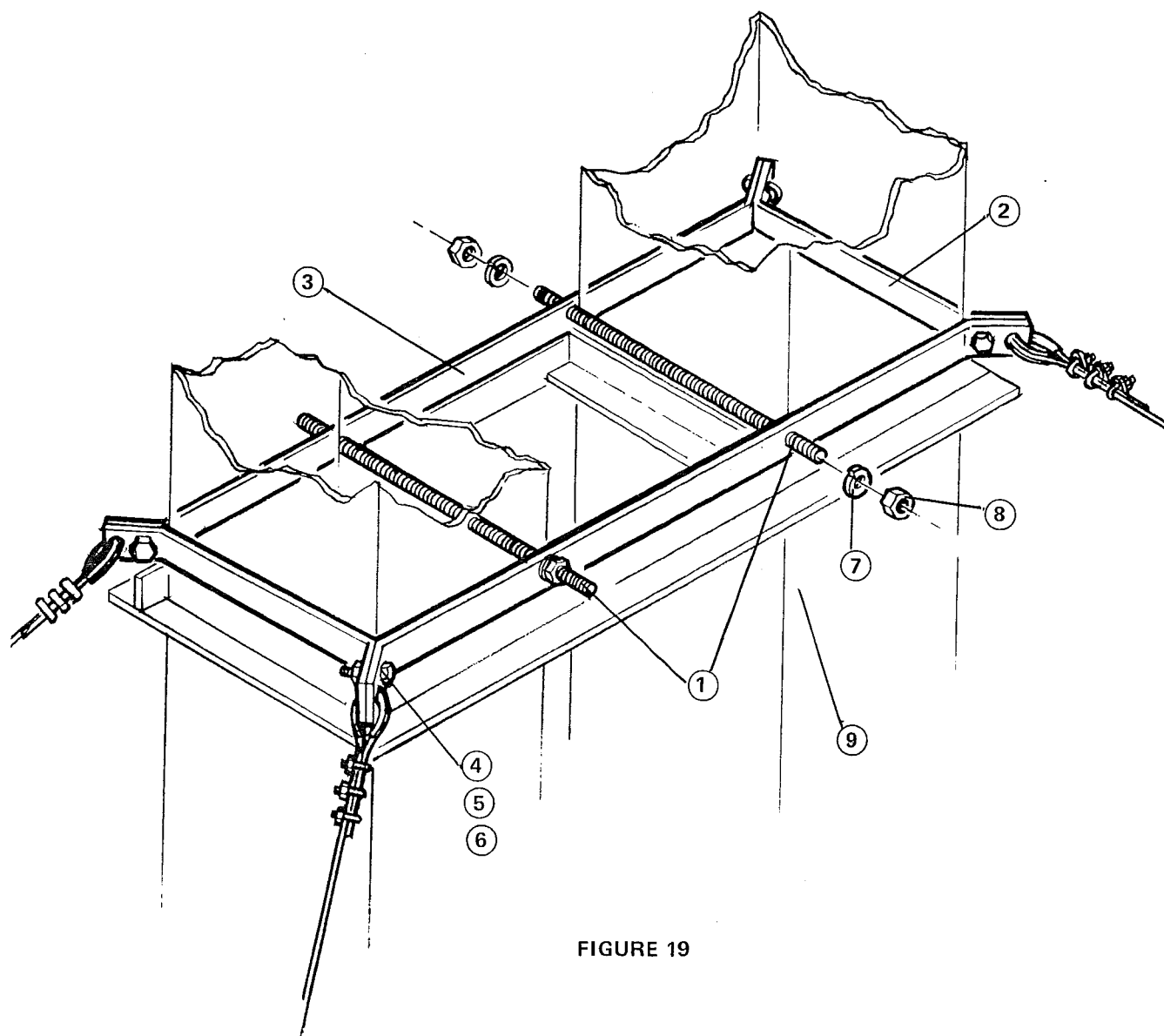


FIGURE 19



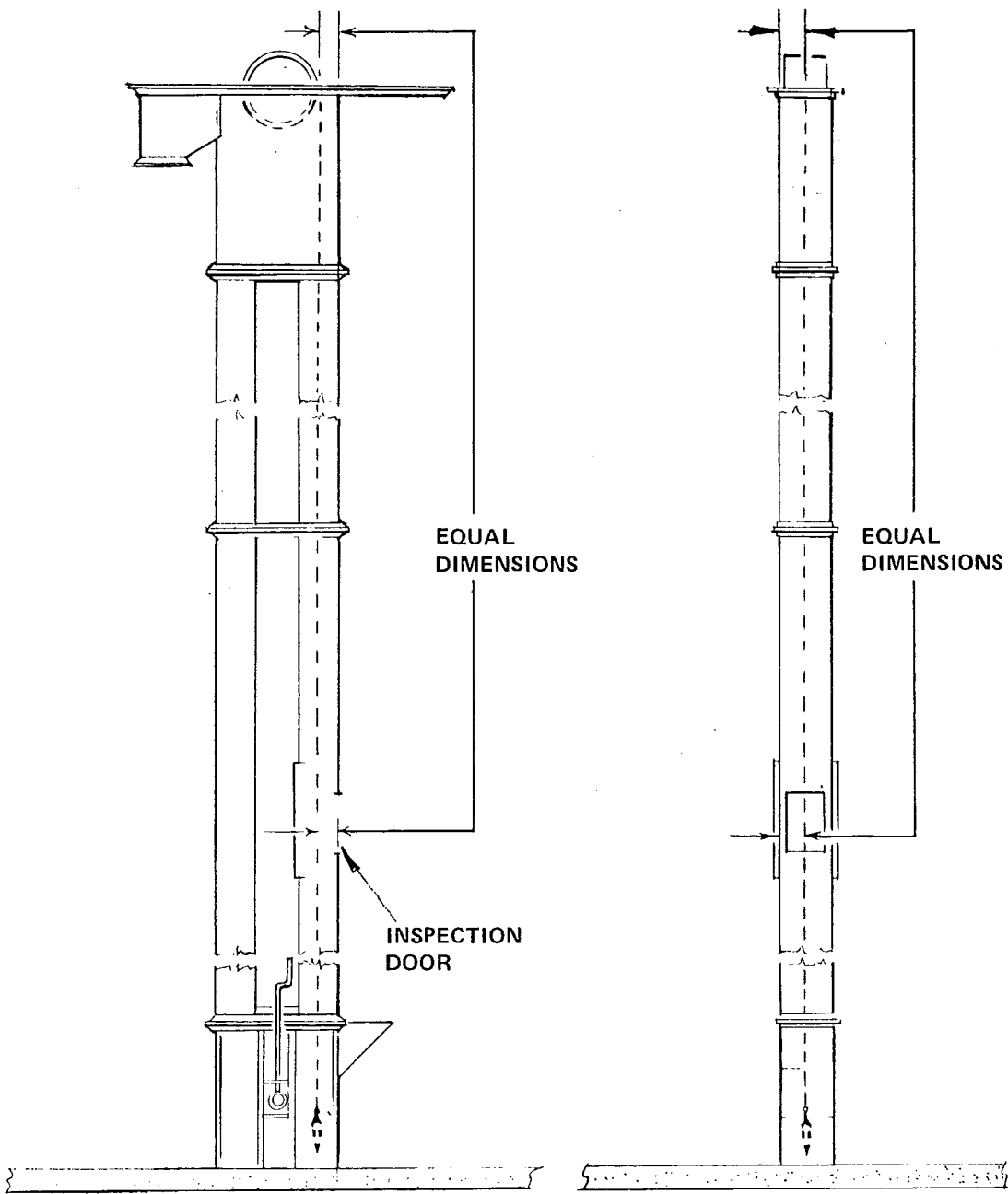


FIGURE 20

**SECTION II**  
**800 BPH TUBE ELEVATOR**



MIX MILL, INC., Bluffton, Indiana 46714

automatic feed processing systems

telephone 219/824-3400

Dear Mix-Mill Owner/Operator:

Thank you for purchasing a Mix-Mill Bucket Elevator. More than twenty (20) years experience in the manufacturing of feed-milling and feed handling equipment has made Mix-Mill the leader in the field of electric powered on-the-farm feed making systems and grain storage.

The manual will aid in erecting a bucket elevator in a manner consistent with sound, safe erection procedures.

Some of the features of the Mix-Mill elevator include galvanized construction, custom constructed head and boot pulleys, double belt drive and many other features for safety and economy.

Other quality products from Mix-Mill, along with this elevator, will produce a complete system to move and store grain and process, move, and store finished feed. These products can be incorporated into an existing system to further diversify and expand at a planned future date.

For further information on products and usage, please contact your Mix-Mill distributor. He can help you obtain information on this and other Mix-Mill equipment and parts.

Sincerely,

MIX-MILL, INC.

## WARRANTY CERTIFICATE

Mix-Mill<sup>®</sup> Inc., warrants each new product of its manufacture when purchased from an authorized representative for a period of one year from the date of delivery to the Purchaser-User or 1500 hours of operation, whichever ever occurs first. This warranty shall apply to all parts and workmanship (except products or components not manufactured by Mix-Mill<sup>®</sup>) which shall appear to Mix-Mill<sup>®</sup> to have been defective in manufacture. Mix-Mill<sup>®</sup>'s sole and entire obligation under such warranty shall be satisfied by shipment to the Purchaser-User without charge, (except for transportation costs which shall be paid by Purchaser-User) of the part or parts, returned for inspection and parts intended to replace those acknowledged by Mix-Mill<sup>®</sup> to be defective. This warranty shall not apply and shall be void under the following conditions:

- (1) IF THE PRODUCT IS TRANSPORTED FROM ORIGINAL INSTALLATION SITE.
- (2) IF THE PRODUCT IS INSTALLED OR ASSEMBLED BY OTHER THAN FACTORY TRAINED AUTHORIZED DISTRIBUTOR SERVICE PERSONNEL.
- (3) IF ANY PART OF THE PRODUCT HAS BEEN ALTERED, MODIFIED OR CHANGED, EXCEPT AT MIX-MILL'S FACTORY OR IS AUTHORIZED BY IT IN WRITING.
- (4) IF ATTACHMENTS OR DEVICES UNSUITABLE TO THE PRODUCT HAVE BEEN USED ON OR IN CONJUNCTION WITH THE PRODUCT.
- (5) IF THE PRODUCT HAS NOT BEEN INSTALLED, USED, OPERATED, HANDLED OR SERVICED IN ACCORDANCE WITH THE APPROPRIATE INSTRUCTION MANUAL.

Mix-Mill reserves the right to make changes in design or improvements in its products without any obligation whatsoever to prior Purchaser-User of such products.

Mix-Mill will pass on to a Purchaser-User only such warranty as it shall receive on products or components not of its manufacture from the manufacturer or supplier thereof.

This warranty is expressly in lieu of any other express or implied warranties, including any implied warranty of merchantability of fitness, and of any other obligation on the part of Mix-Mill, and may not be altered, modified or changed in any way except by a writing signed by an officer of Mix-Mill.

Mix-Mill shall not be liable for any loss or damage, directly or indirectly arising from the use of its products or otherwise, or for any special or consequential damages of any nature.

## GENERAL

Any piece of equipment, no matter how well constructed, cannot be expected to offer the performance and usefulness intended, if it is improperly installed. The customer and/or the firm responsible for erecting an elevator leg should make it a prime concern to properly erect the leg. Mix-Mill, Inc., cannot assume any liability, either express or implied, for the installation, and offer the suggestions and information contained in this manual only as a convenience.

Careful consideration must be given to the location in reference to depth of pit, discharge and loading facilities, obstructions, anchoring, etc. These and other points are important to consider in avoiding bottlenecks in grain flow.

A solid foundation must be installed compatible with the type of filling system used. The footing must be sufficiently strong to carry the load imposed. When the pit is used, a means of keeping it free of water **must** be provided.

A basic layout for a concrete pit is shown in Figures 2 & 3 on pages 1-8 & 1-9 of the first section of this manual. The dimensions are suggestions only and may be easily modified to suit any particular application necessary.

A shipping or packing list is included with the freight bills when your elevator is shipped from the Mix-Mill plant. This list should be used to identify all parts and components and to insure that all parts have been received.

Any shortage or damage should be so noted on the freight bill and a claim filed with the truck line.

Small parts such as bolts, keys, washers, etc., are important to any installation. DO NOT dispose of any container before making sure all parts are located.

In case of the necessity of having to store an elevator for a period of time, the parts should be stored so as to be easily located and identified.

Each elevator consists of the following components when purchased:

|                                |      |
|--------------------------------|------|
| Head Section .....             | (1)  |
| Boot Section .....             | (1)  |
| Leg Sections (6" tubing) ..... | (AR) |
| Joint Assembly .....           | (AR) |
| Belt .....                     | (AR) |
| Cups .....                     | (AR) |
| Hardware Package .....         | (1)  |

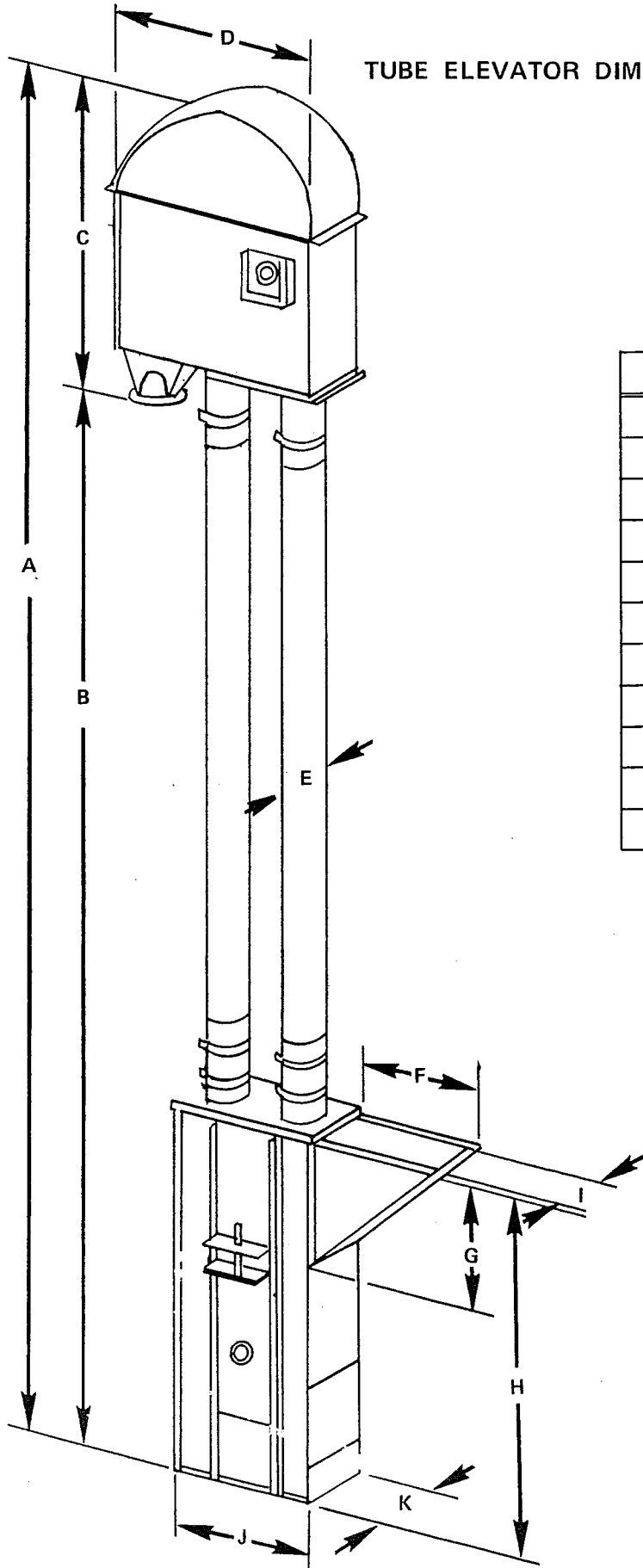
Each elevator must have the following components as determined by the size of the elevator:

|                        |      |
|------------------------|------|
| Motor .....            | (1)  |
| Drive Kit .....        | (1)  |
| Discharge tubing ..... | (AR) |

Selection may be made from the following components to make a complete system. Check with your Mix-Mill distributor for further information on:

- Distributor Heads
- Wye Valves
- Deadheads
- Truss Supports
- Elbows
- Drive Covers
- Drive Hoppers
- Cable and Related Parts
- Auger and U-trough Adaptors
- Spouting Couplings
- Spouting Supports

### TUBE ELEVATOR DIMENSIONAL OUTLINE



| DIMENSION | 800 BU. |
|-----------|---------|
| A         | *       |
| B         | **      |
| C         | 45¼"    |
| D         | 33¼"    |
| E         | 6"      |
| F         | 17"     |
| G         | 17"     |
| H         | 54"     |
| I         | 6"      |
| J         | 20½"    |
| K         | 9"      |

\* OVERALL HEIGHT IS DISCHARGE HEIGHT PLUS 45¼"

\*\* DISCHARGE HEIGHT

## TUBE ELEVATOR SPECIFICATIONS

|   |             |
|---|-------------|
| <b>CAPACITY</b>   |             |
| Bushels Per Hour - Cups 90% Full .....  | 800         |
| Cubic Ft. Per Hour - Cups 90% Full .....  | 996         |
| <b>HEAD</b>   |             |
| Material - gauge galvanized .....   | 12          |
| Pulley — Diameter and Face .....  | 6-5/8" x 5" |
| Pulley - Rubber Faced .....   | Yes         |
| Shaft Diameter .....  | 1"          |
| Bearings - Flange Mounted Ball .....  | Yes         |
| Speed - RPM at Maximum Capacity .....   | 384         |
| Discharge Opening .....   | 6" Dia.     |
| Space Required For Head, Motor, & Drive .....                                     | 60" x 16"   |
| <b>BELT</b>   |             |
| Width .....   | 4"          |
| Number of Plys .....  | 1           |
| Rubber Faced Both Sides .....   | Yes         |
| Speed - Ft. Per Min. at Max. Capacity .....                                       | 720         |
| Type Splice .....   | Overlap     |
| <b>CUPS</b>   |             |
| Size - Width x Depth .....  | 3" x 2¼"    |
| Spacing on Belt .....   | 3½"         |
| Bolts - No. Per Cup .....   | 2           |
| Cubic In. ....  | 15          |
| Perforations Required For Small Grain & Feed Handling .....                       | No          |
| <b>LEGGING</b>  |             |
| Material - Gauge Galvanized .....   | 16          |
| Cross Section .....   | 6" Dia.     |
| Inspection Plates on Boot Section .....   | 54"         |
| Space Required .....  | 20½" x 9½"  |
| <b>BOOT</b>   |             |
| Material - Gauge Galvanized .....   | 12          |
| Pulley - Diameter and Face .....  | 6-5/8" x 5" |
| Pulley Type .....   | Slatted     |
| Shaft Diameter .....  | 1"          |
| Bearings - Flange Mounted Ball .....  | Yes         |
| Pulley Takeup Distance .....  | 8"          |
| <b>DRIVE</b>  |             |
| Motor - Totally Enclosed Fan Cooled Ball Bearing with Manual Reset Overload ..... | Yes         |
| Motor RPM (2-5HP) .....   | 1750        |
| Pulleys .....   | Cast Iron   |
| Motor Pulley O.D. ....  | 3.95        |
| Elevator Pulley O.D. ....   | 16.35       |
| Type Belt .....   | B Section   |
| Number of Belts .....   | 2           |
| <b>MISC.</b>  |             |
| Maximum Height .....  | 64 ft.      |
| Size Discharge Pipe .....   | 6"          |

There are two (2) methods of erecting the tube elevator. The preferred method consists of setting the boot, assembling the head section, complete with one section of tubing, platform, and accessories. Then starting from the bottom, with the aid of a crane or boom, add the leg tubing and joint assemblies, support brackets, ladders and cages, guy wires and head section assembly.

The second method consists of assembling the complete unit on the ground and lifting the entire unit into place with a crane. This method is suggested only on models up to 44 feet in height, but extreme care must be exercised that the joint assembly does not bend or buckle.

Below, the preferred method of assembly will be discussed fully.

#### **SETTING THE BOOT**

The boot should be installed, leveled, and securely anchored to a firm foundation before other parts of the elevator are assembled. As the plumbing of the elevator is strongly affected by the boot, the importance of this cannot be over-emphasized.

A one-half inch layer of an Ironite type construction grout is highly recommended to support the elevator.

Bolts set in the concrete and plates overlapping the boot base flange are recommended for anchoring. Recheck after tightening, to be sure the boot is level.

After the boot has been located and secured, the filling hopper(s) can be located and attached at any time desired.

When a force feed U-trough is used to fill the elevator, an adapter plate is available to bolt the U-trough directly to the boot. This should be on the down side of the leg at the bottom of the boot.

#### **HEAD SECTION ASSEMBLY**

Block the head high enough to allow clearance for any outlet, distributor head, service platform, or 16 to 18 inches, whichever is greater.

Assemble two equal lengths of 6" tubing — 10' for 34 and 54 foot models; 20' for 24, 44 and 64 foot models — in head section sleeves. Attach the top portion of joint assemblies to the bottoms of the tubing just assembled in head sleeves (This makes a section of legging). Caulk around the tubes and down the vertical seams of the joint assembly.

Measure the distance from joint assembly plate to the bottom of head section on both sides. Make the dimensions equal to insure a plumb assembly.

#### **LEGGING ERECTION**

Remove the top half of joint assembly from the boot. Assemble this top half of joint assembly with a bottom half of another joint assembly and two twenty (20) foot lengths of 6" tubing to make a legging section.

Caulk around top of sleeves and overlap seam of joint assemblies to make water tight. See Figure 1.

Before tightening clamp rings, measure both sides of joint assembly to insure a straight legging section. See Figure 2.

Assemble any additional tubing sections and joint assemblies as required per above instructions.

Starting at the boot caulk around the top flanges of the boot inside the bolt holes and lift a legging section atop the boot and bolt in place.



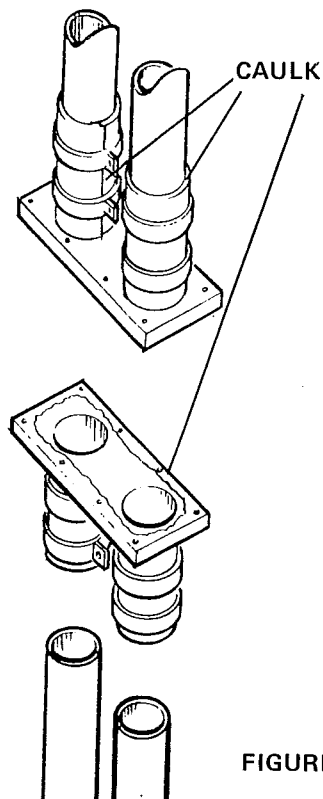


FIGURE 1

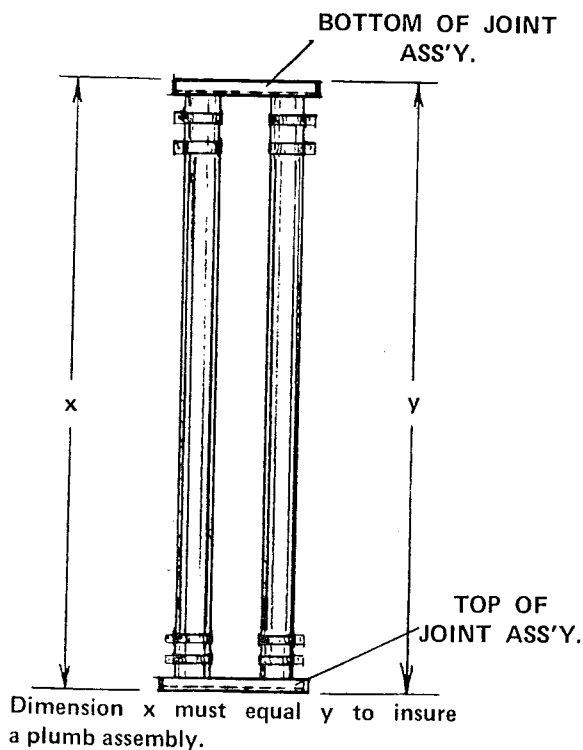


FIGURE 2

Proceed by caulking the top area of joint assembly of the legging section just erected. Raise next legging section or head assembly and bolt in place.

It should be noted that when the legging sections are joined, the guy brackets are also assembled. (See section on Guy brackets and Cables.)

To plumb the elevator, drop a plumb bob or weighted string through the head down one leg of the elevator. Use a block of wood so the string will not move. Measure from the sides of the opening to the string. Measure from the sides of the leg, at the bottom, to the string.

Determine which way the leg needs to be pulled to bring the bottom measurements to match those at the top. Tighten the turnbuckle as required on the individual cables to align the sections of the leg.

#### MOTOR AND DRIVE ASSEMBLY

Check the head shaft for nicks and scratches. Clean and smooth with fine grit emery cloth. A good lubricant such as Never-Seez is recommended for the head shaft and motor shaft.

Attach the QD bushing and large sheave to the head shaft using the 1/4" sq. X 2" key provided.

Assemble motor to motor mounting plate. Mounting plate attaches to head with the hinge pin 5/8" dia. X 13-1/2". A 5/8" washer and 3/16" dia. cotter pin secure hinge pin at each end.

Attach the QD bushing and small sheave to motor.

Slip two (2) 69" belts over pulleys and adjust tension with adjusting screw and nut.

## SERVICE PLATFORM

Refer to Figure 11 on page II-20.

All bolts should be installed with the heads to the inside of the platform.

Attach the four (4) support brackets (1) to the tube legs 38" below the head section assembly. Assemble two short support channels (2) to support brackets (1). Next attach two long support channels (3) to the short channels.

On top of the long channels, assemble the four floor support channels (4). For ease of assembly, do not tighten any bolts at this time.

The four corner legs (5) and six center legs (6) are ready to be installed. Attach the two long toeboards (7) and the two short toeboards (8) to the legs.

Lay the long walk board (9) in place with the edges over the bottom toeboard flanges. The short walkboard (10) fits over the edge of the long walk board and the toeboard flange.

Following the outline in Figure 11, install the long (11), medium (12), and short (13) top rails.

The upper rails are bolted to the inside of the legs with the flange to the outside.

Install the long (14), medium (15), and short (16) bottom rails on the inside of the legs with the flange to the outside. Tighten all nuts.

The trap door (17) rests between the long walk board and the long toeboard.

The platform is produced with matching holes so it may be used on either side of the elevator for service of the head and drive or distributor head.

For ease of distributor service, mount a platform approximately five to six feet below the distributor bottom.

## DISTRIBUTOR

Attach the stabilizer bracket (item 7) to the distributor head as shown in Figure 12 page II-21. Place a bead of caulking around the inside edge of the bolt holes on the inside edge of the distributor head and fasten the distributor head to the transition with bolts. DO NOT tighten at this time. Position the flat side of the distributor perpendicular to the trunking.

Install half clamp (item 8) around the legging and attach to the stabilizer bracket of the distributor head. At this time, all nuts should be tightened.

An alternate method to attach the distributor head to the transition would be to utilize the Mix-Mill clamp ring assembly instead of using nuts, bolts and washers.

## LADDER AND SAFETY CAGE

See Figure 3 page II-10.

Assemble two support brackets 9000-0210 to tube legs as shown, just below the service platform. Then two more every ten feet until the top of boot is reached.

Attach ladder brace assemblies to the support brackets. Assemble ladder to brace and hoops of safety cage to ladder with bolt and clip assemblies provided.

Ladder connector channels are required over each joint in ladder. Note: These are also provided with ladder assembly.

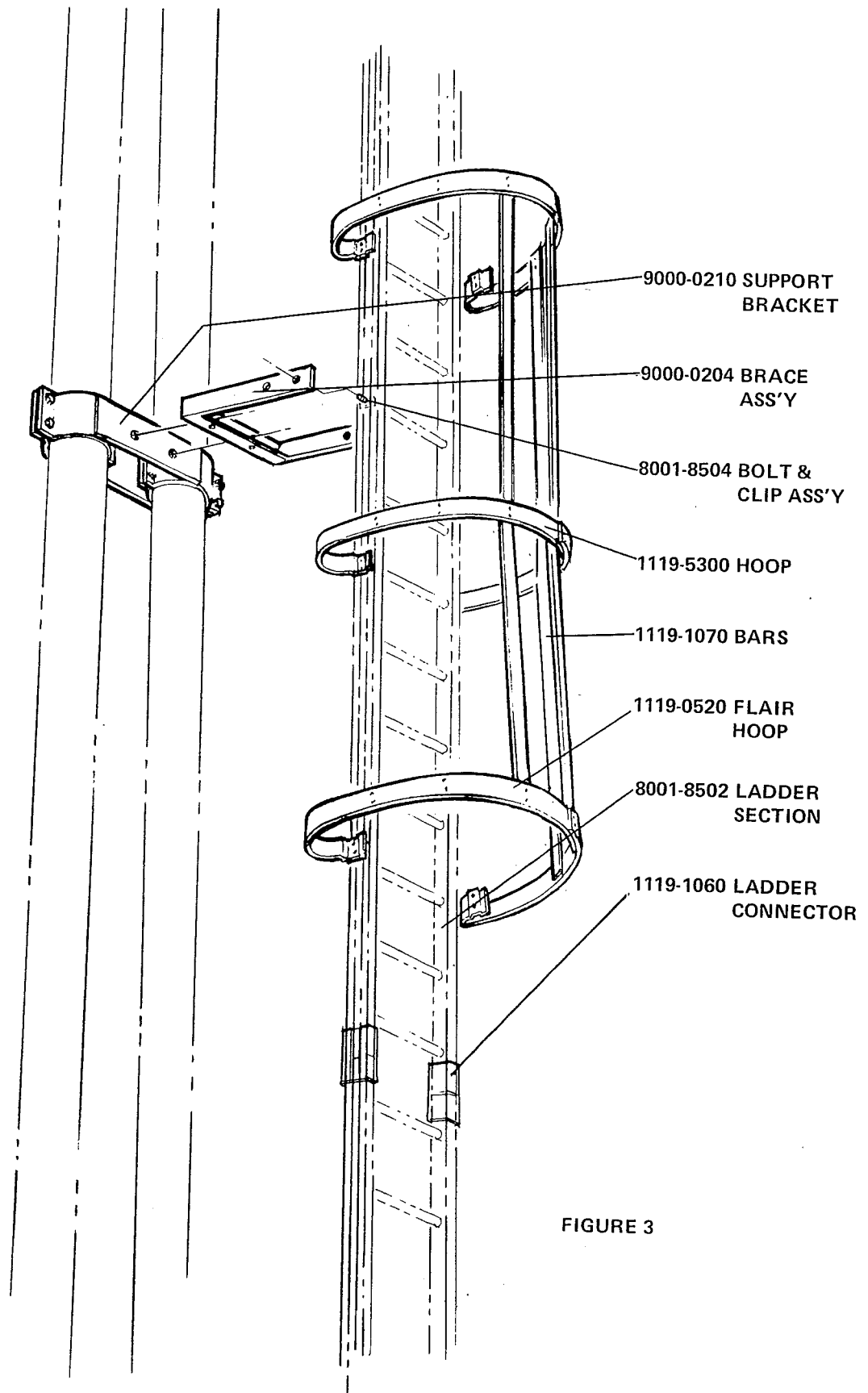


FIGURE 3

TYPICAL LADDER AND SAFETY CAGE

The safety cage should be installed directly below service platform.

When installing the safety cage, the large flair hoop for the starter kit is assembled at the bottom of the ladder at a height of your discretion.

The smaller hoops are assembled above the starter kit. The vertical bars will space the hoops.

#### **TURN PIPE**

Refer to Figure 12 page II-21.

The next step in the installation procedure is to install the turn pipe onto the spinner spout in the distributor head. A pipe coupling is required for this connection. After this assembly is tightened it will be necessary to either drill and bolt or weld the coupling to prevent unscrewing of the assembly during operation.

Pipe guides are furnished with Mix-Mill "Pipe and Guide Assemblies". When these systems have been purchased as optional equipment. One of these pipe guides should now be assembled to the joint assembly near the distributor head. As additional legging is added, extra lengths of pipe and pipe guides should be installed until the correct height above ground is reached. The last section of pipe should be cut to desired height. All couplings should be drilled and bolted or welded as described above for the spinner spout connection.

#### **TURN HANDLE ASSEMBLY**

The turn handle control for a distributor head is a part of the distributor head package.

Refer to Figure 12 for a typical installation. The height for installation should be determined by the customer.

Assemble turn handle support (9) to leg with half clamp (8) and hardware furnished. This assembly will be fastened in a low position, temporarily.

Place the turn handle assembly (12) into the support plate's 1-3/8" diameter hole. Slide the support assembly up until the turn pipe is seated fully into the top of the turn handle assembly. Make sure that the spinner spout in distributor head and the turn handle assembly are both relative to each other in position (i.e., spinner in outside outlet and turn handle pointing to corresponding hole in locater plate.)

Drill thru the pipe and turn handle and assemble the bolt and nut furnished with the turn handle.

Tighten all nuts and bolts.

#### **GUY BRACKETS AND CABLES**

See Figures 4 and 5.

The top four guy cables should be attached to the head during the assembly of the related parts.

Attach the proper sized guy cables to the head using three cable clamps at each attachment location.

The guy brackets should be located on the top side of joint assemblies. The bottom brackets will be 20 feet from the ground.

## **CABLE ANCHORS**

See Figures 4 and 5 for some arrangements and locations.

The cables should have at least 14 feet of ground clearance to allow trucks and other equipment to pass under the cables. Where clearance is not required, the cables can run directly to the dead-man anchor.

Use an I-beam, railroad rail, or other suitable beam to provide the clearance where it is required.

An elevator can be braced to a building, silo, or feed factory, if that building is strong enough to accept the additional stress.

## **SPOUTING**

The downspouting should be assembled on the ground and lifted into position with a crane.

Weld flange rings to the ends of downspouts. Use compression couplings to weld lengths of tubing for a downspout. Clean and paint all welded areas to give protection from rust.

Make all runs as straight as possible for the best flow of grain. Use deadheads on the runs of tubing to reduce wear.

Caulk all flanges to make watertight joints.

On all runs over 40 feet a truss support should be installed. These should be installed with the end clamps one foot from the ends of the tube and the spider or cross-arms centered on runs. The clamps should be tack welded to the tube after installation.

See Figure 11 page I-20 for a view of a truss support.

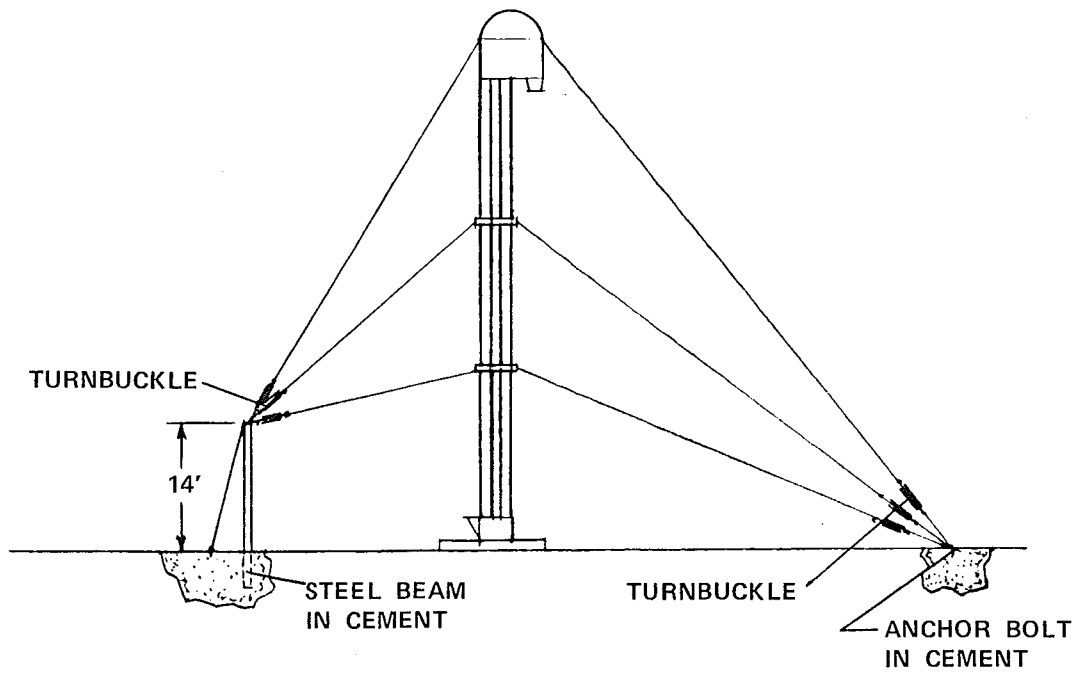
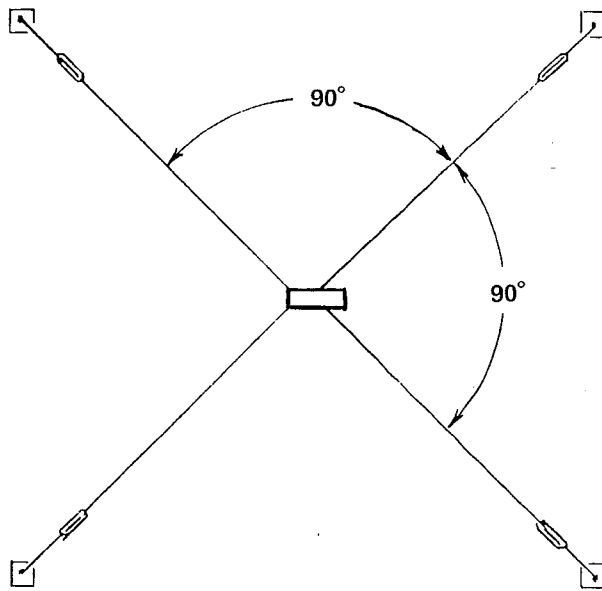


FIGURE 4

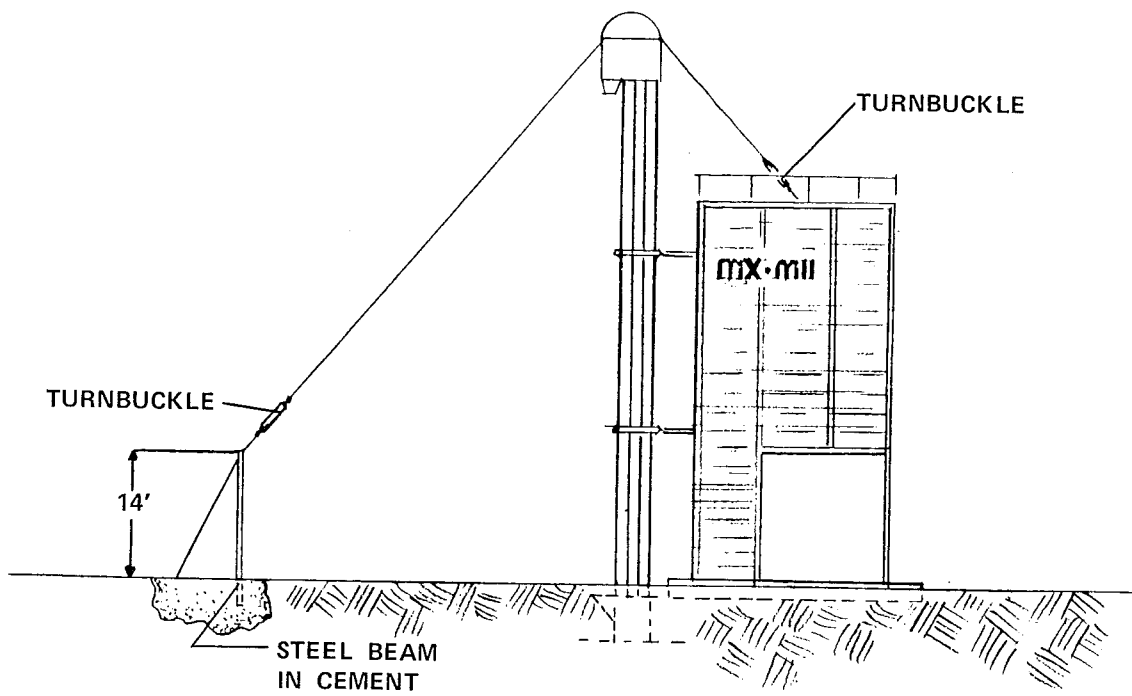
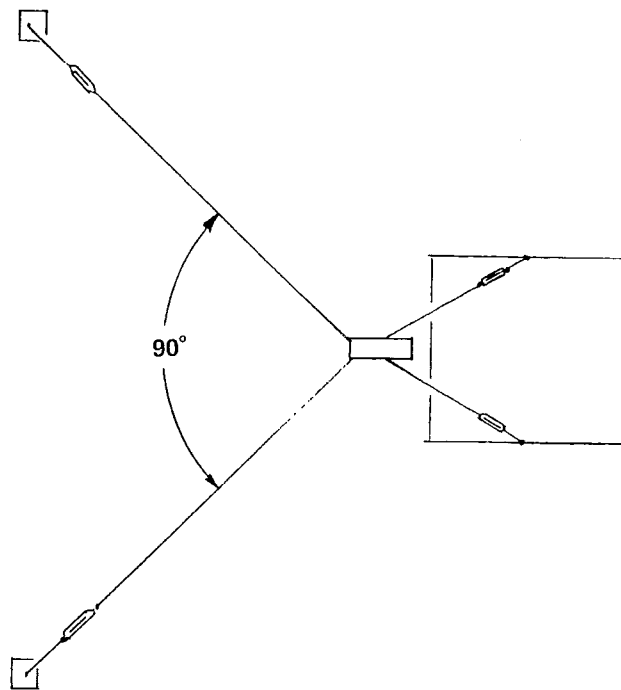


FIGURE 5

## BELT AND BUCKET INSTALLATION

Remove top cover of head assembly to provide access to head pulley and legging. Also remove all cover plates on one side of the boot assembly.

The belt may be installed with or without buckets attached.

To install the belt with buckets attached, a crane should be used. Pick up the belt at the center using a block of wood to keep the belt from doubling against itself. Swing into position over the open head section. Feed the ends down each leg. Make sure the buckets are in proper legs.

To install belt without buckets, proceed as follows:

1. Drop a heavy rope down the up-leg of the elevator. Attach belt to the end of the rope in the up-leg side with the belt stretcher plate provided.

2. Pull the belt to the top of the elevator, dropping the free end of the rope down the down-leg.

3. Pull the rope around the boot pulley until the belt is around far enough to splice, see Figure 6.

4. Raise the boot pulley to the highest position.

5. Lower head pulley to the lowest position.

6. Attach the other belt stretcher plate to the other end of the belt. With the aid of a block and tackle, pretension the belt to provide an overlap of four set of holes in the belt.

7. Lap the lead end of the belt over the trailing end of the belt. Align four rows of holes.

8. Use the long elevator bolts for splicing and fastening buckets in place. Tighten nuts enough to set heads in belt.

9. Finish attaching buckets. For best results, it would be best to attach 1 or 2 buckets at 10 to 12 foot intervals for one revolution. On the second revolution, install the buckets midway between those previously installed. Continue in this manner until all buckets are installed.

10. Lower the boot pulley until belt is tightened.

11. Turn elevator on. Adjust boot pulley until belt is tracking in the center of legging. Note: Head pulley may also need some adjustment.

12. Make sure rotation is correct.

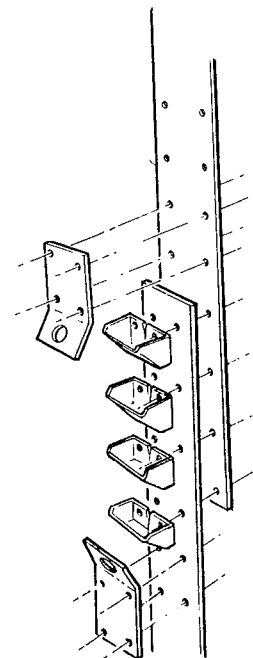


FIGURE 6



Refer to Figure 8 on page II-17 for a view of head section grain deflector. At this point adjust it so that passing buckets have a minimum of 1/4" clearance.

Caulk around the top of head assembly inside of bolt holes and re-install top cover.

### WEATHER COVER

Refer to Figure 7.

Assemble the support for motor cover support (1) and support for belt cover (2) with hardware provided for the head top cover.

Using 1/4-20 self-threading screws and lock-washers, assemble motor cover (3), belt cover (4), and end cover (5).

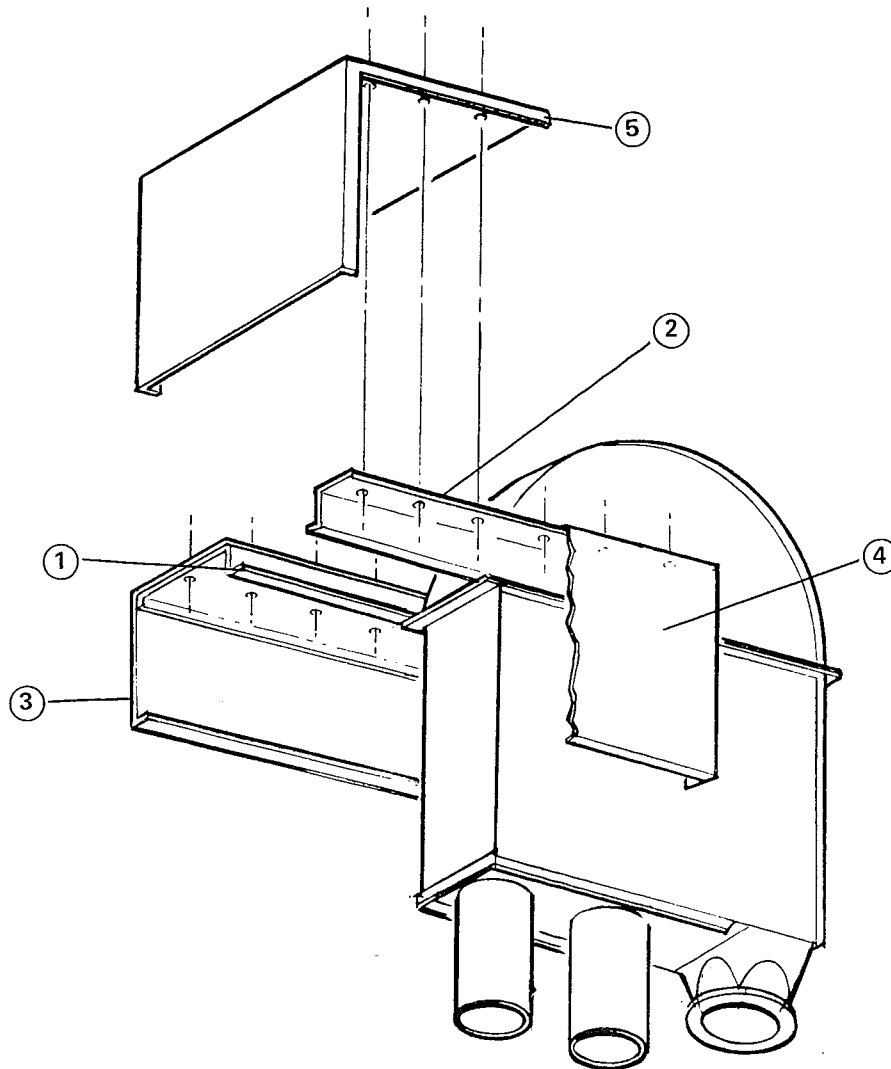


FIGURE 7

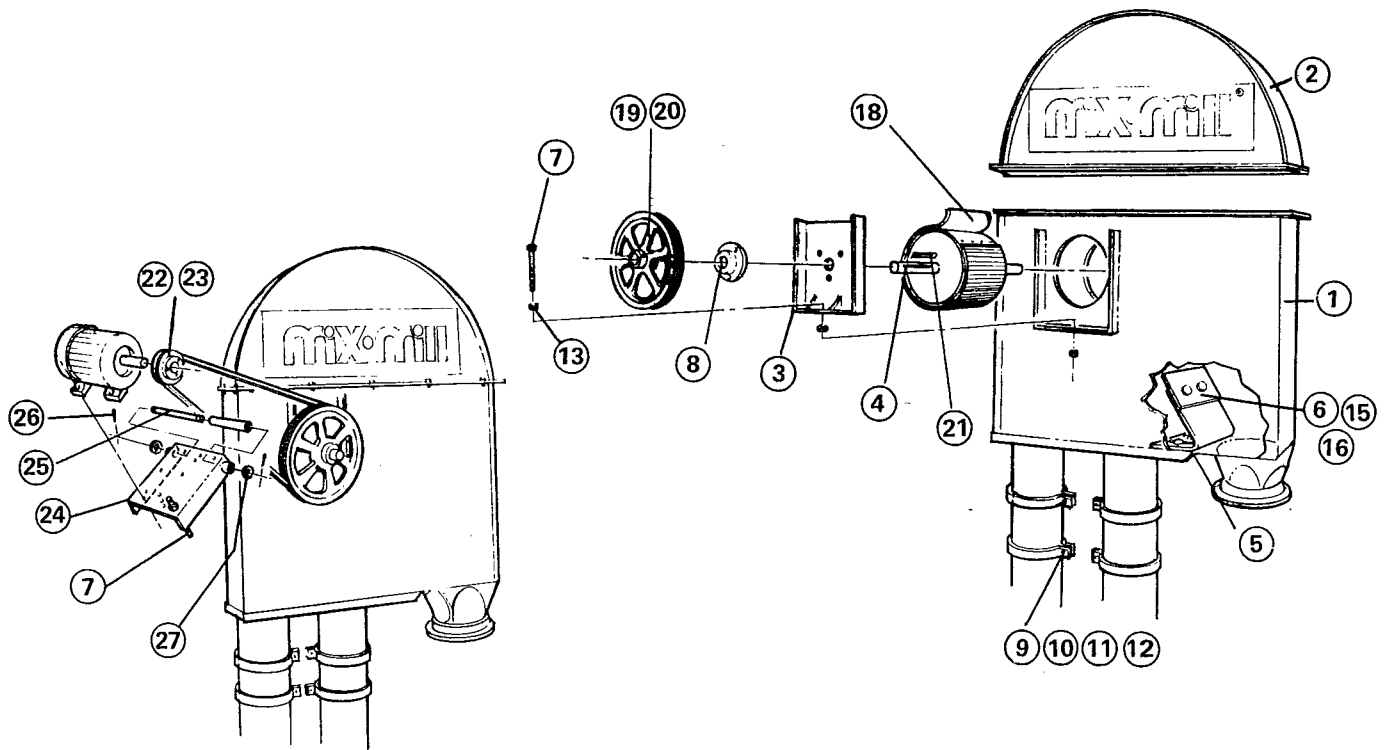


FIGURE 8

**HEAD SECTION REPLACEMENT PARTS**

| <u>ITEM</u> | <u>PART NO.</u> | <u>DESCRIPTION</u>                   | <u>QUANTITY</u> |
|-------------|-----------------|--------------------------------------|-----------------|
| 1           | 9309-2471       | Lower Head Ass'y - Welded            | 1               |
| 2           | 9309-2540       | Top Assembly                         | 1               |
| 3           | 9309-2580       | Bearing Plate Assembly               | 2               |
| 4           | 9309-2791       | Pulley Assembly - Head               | 1               |
| 5           | 1092-5500       | Discharge Baffle                     | 1               |
| 6           | 1092-5600       | Belt - Grain Deflector               | 1               |
| 7           | 9307-4814       | Rod Ass'y - Belt Tightener           | 3               |
| 8           | 9307-8500       | Flangette Bearing                    | 2               |
| 9           | 1032-2905       | Clamp Ring                           | 4               |
| 10          | 6690-3830       | Bolt - Hex. Hd. (5/16-18 X 1-3/4")   | 4               |
| 11          | 6608-3800       | Nut - Hex. (5/16 - 18)               | 24              |
| 12          | 6644-3800       | Lockwasher (5/16")                   | 32              |
| 13          | 6608-5200       | Nut - Hex. (1/2 - 13)                | 6               |
| 14          | 6258-3817       | Bolt - Hex. Hd. (5/16-18 X 3/4")     | 24              |
| 15          | 8001-6003       | Elevator Bolt (1/4-20 X 3/4")        | 6               |
| 16          | 6644-3300       | Nut - Hex. (1/4 - 20)                | 2               |
| 17          | 7001-1505       | Flat Washer (5/16")                  | 2               |
| 18          | 1093-3200       | Lagging - Head Pulley                | 1               |
| 19          | 4312-0327       | Sheave - 16.35" O.D. - Double Groove | 1               |
| 20          | 4401-0910       | QD SK Bushing - 1" bore              | 1               |
| 21          | 4900-0632       | Key (1/4" sq. X 2")                  | 1               |
| 22          | 4312-0079       | Sheave - 3.95" O.D. - Double Groove  | 1               |
| 23          | 4401-0308       | QD SH Bushing - 7/8" bore            | 1               |
| 23          | 4401-0312       | QD SH Bushing - 1 1/8" bore          | 1               |
| 24          | 9309-2200       | Motor Mounting Plate                 | 1               |
| 25          | 1092-7000       | Hinge Pin                            | 1               |
| 26          | 7000-2004       | Cotter Pin                           | 2               |
| 27          | 6640-5600       | Flat Washer (5/8")                   | 2               |
| 28          | 6258-3828       | Bolt - Hex. Hd. (5/16-18 X 1 1/2")   | 4               |
| 29          | 4500-2069       | V-Belt - 69" O.D.                    | 2               |

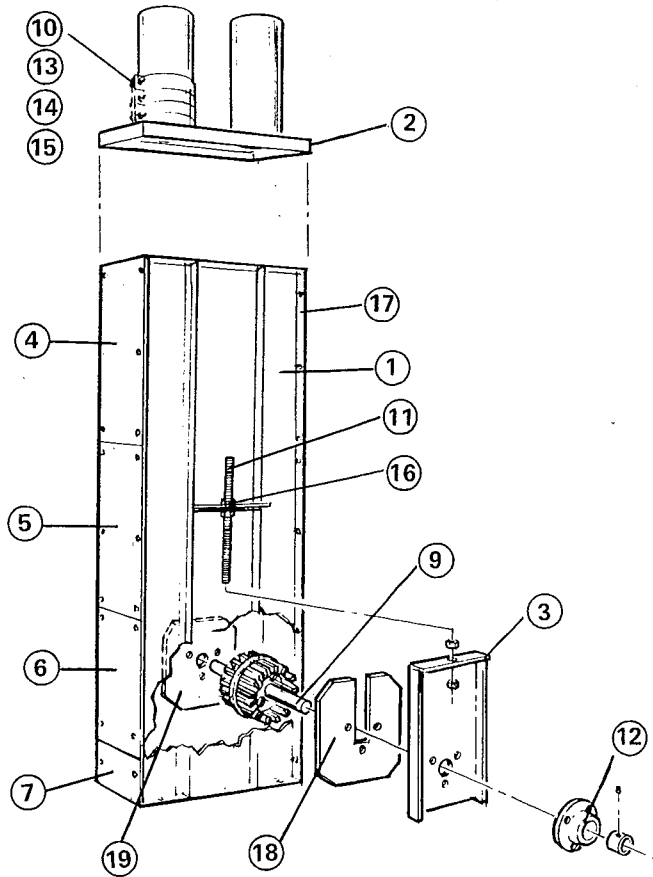


FIGURE 9

**BOOT ASSEMBLY – REPLACEMENT PARTS**

| <u>ITEM</u> | <u>PART NO.</u> | <u>DESCRIPTION</u>                 | <u>QUANTITY</u> |
|-------------|-----------------|------------------------------------|-----------------|
| 1           | 9309-2250       | Boot Assembly – Welded             | 1               |
| 2           | 9309-2240       | Adapter Plate Assembly             | 1               |
| 3           | 9309-2300       | Bearing Plate Assembly             | 2               |
| 4           | 1092-8500       | Plate – Top End                    | 1               |
| 5           | 1092-8400       | Plate – Center End                 | 2               |
| 6           | 1092-8300       | Plate – Lower End                  | 2               |
| 7           | 1092-8200       | Plate – Clean Out                  | 2               |
| 8           | 9309-3201       | Boot Hopper Assembly (not shown)   | Optional        |
| 9           | 9309-2600       | Pulley Assembly – Boot             | 1               |
| 10          | 1032-2905       | Clamp Ring                         | 4               |
| 11          | 9307-4813       | Rod Ass’y – Belt Tightener         | 2               |
| 12          | 9307-8500       | Flangette Bearing                  | 2               |
| 13          | 6690-3830       | Bolt – Hex. Hd. (5/16-18 X 1-3/4") | 4               |
| 14          | 6608-3800       | Nut – Hex. (5/16 - 18)             | 52              |
| 15          | 6644-3800       | Lock Washer (5/16")                | 58              |
| 16          | 6608-5200       | Nut – Hex. (1/2 - 13)              | 6               |
| 17          | 6258-3817       | Bolt – Hex. Hd. (5/16-18 X 3/4")   | 54              |
| 18          | 9309-8741       | Bucket Shield with slot            | 1               |
| 19          | 9309-8742       | Bucket Shield                      | 1               |
|             | 9309-3291       | Boot Ass’y – Complete              | 1               |

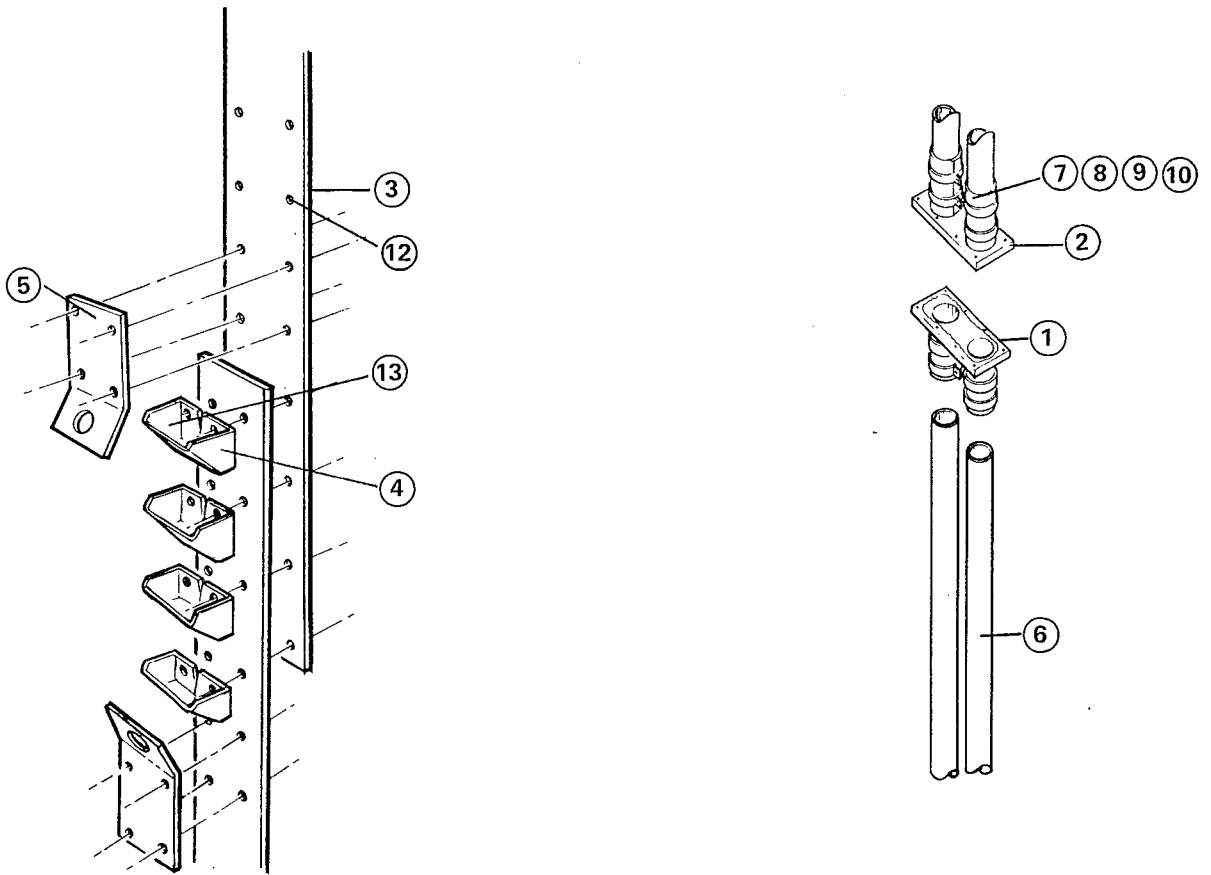


FIGURE 10

ELEVATOR LEGGING REPLACEMENT PARTS

| ITEM | PART NO.  | DESCRIPTION                        | QUANTITY     |
|------|-----------|------------------------------------|--------------|
| 1    | 9309-2230 | Adapter Plate Ass'y (Lower)        | AR           |
| 2    | 9309-2240 | Adapter Plate Ass'y (Upper)        | AR           |
| 3    | 1093-2500 | Belt - Pierced                     | State Length |
| 4    | 1093-3700 | Bucket                             | AR           |
| 5    | 1092-8100 | Belt Stretcher Plate               | 2            |
| 6    | 1119-2172 | Tubing (10')                       | AR           |
| 6    | 2629-0134 | Tubing (20')                       | AR           |
| 7    | 1032-2905 | Clamp Ring                         | AR           |
| 8    | 6690-3830 | Bolt - Hex. Hd. (5/16-18 X 1-3/4") | AR           |
| 9    | 6608-3800 | Nut - Hex. (5/16-18)               | AR           |
| 10   | 6644-3800 | Lock Washer 5/16"                  | AR           |
| 11   | 6258-3822 | Bolt - Hex. Hd. (5/16-18 X 1")     | AR           |
| 12   | 8001-6003 | Elevator Bolt (1/4-20 X 3/4")      | AR           |
| 13   | 8001-6004 | Elevator Bolt (1/4-20 X 1")        | 12           |

AR - As Required

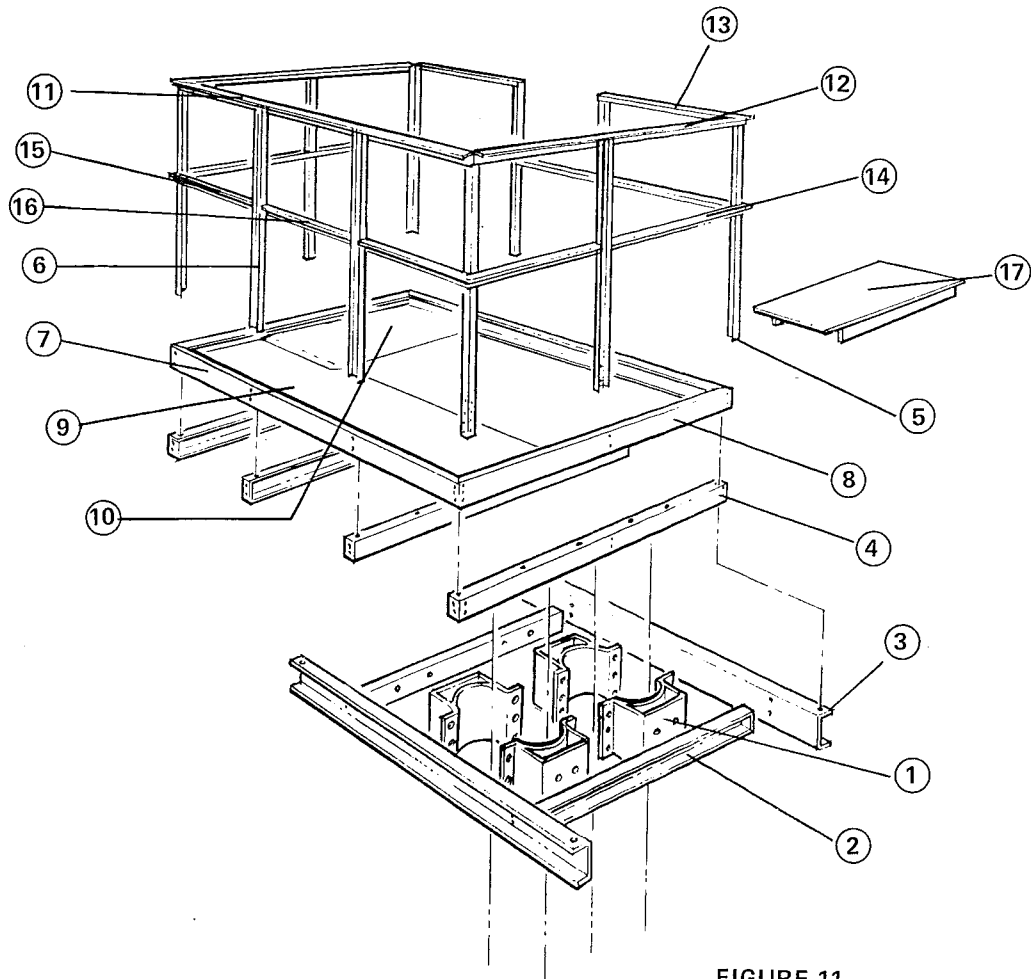


FIGURE 11

### SERVICE PLATFORM REPLACEMENT PARTS

| ITEM | PART NO.  | DESCRIPTION              | QUANTITY |
|------|-----------|--------------------------|----------|
| 1    | 9309-3010 | Support Bracket — Welded | 4        |
| 2    | 1092-9900 | Support Channel — Short  | 2        |
| 3    | 1092-9800 | Support Channel — Long   | 2        |
| 4    | 1120-0340 | Support Channel — Floor  | 4        |
| 5    | 1119-8590 | Leg — Corner             | 4        |
| 6    | 1119-9858 | Leg — Center             | 6        |
| 7    | 1120-0370 | Toeboard — Long          | 2        |
| 8    | 1120-0380 | Toeboard — Short         | 2        |
| 9    | 1120-0350 | Walk Base — Long         | 1        |
| 10   | 1120-0360 | Walk Base — Short        | 1        |
| 11   | 1120-0430 | Top Rail — Long          | 4        |
| 12   | 1120-0420 | Top Rail — Medium        | 2        |
| 13   | 1120-0410 | Top Rail — Short         | 2        |
| 14   | 1120-0540 | Bottom Rail — Long       | 4        |
| 15   | 1120-0390 | Bottom Rail — Medium     | 4        |
| 16   | 1120-0400 | Bottom Rail — Short      | 2        |
| 17   | 1120-0550 | Trap Door                | 1        |
|      | 9200-0392 | Platform — Complete      | 1        |

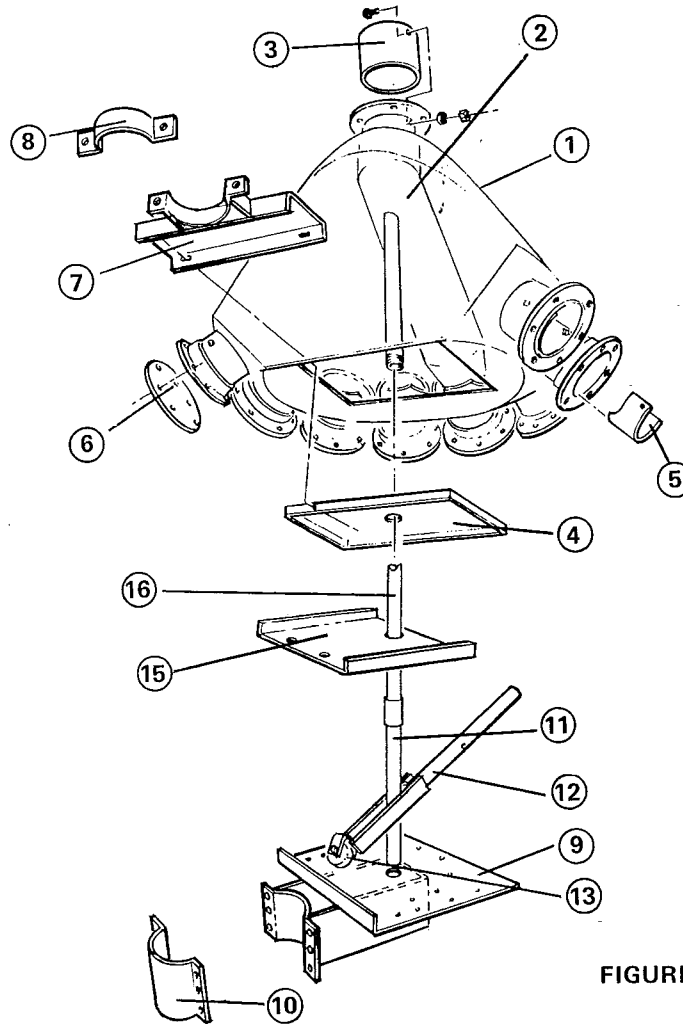


FIGURE 12

6" - 8 WAY DISTRIBUTOR HEAD

| ITEM | PART NO.  | DESCRIPTION                                       | QUANTITY |
|------|-----------|---|----------|
| 1    | 9309-0820 | Distributor Head - Welded Ass'y                   | 1        |
| 2    | 9310-0840 | Spinner Spout Ass'y                               | 1        |
| 3    | 1090-9600 | Sleeve, Inlet                                     | 1        |
| 4    | 1100-7800 | Clean Out Door                                    | 1        |
| 5    | 1090-7900 | Wear Plate, Discharge Outlet                      | 8        |
| 6    | 1119-4880 | Plug - Outlet                                     | 4        |
| 7    | 9309-3090 | Stabilizing Bracket                               | 1        |
| 8    | 1033-9001 | Half Clamp - 6"                                   | 1        |
| 9    | 9309-3051 | Support Bracket, Turn Handle                      | 1        |
| 10   | 1082-3902 | Half Clamp (Long)                                 | 1        |
| 11   | 9309-1050 | Pivot Tube  | 1        |
| 12   | 9309-1020 | Turn Handle                                       | 1        |
| 13   | 8001-7002 | Skate Wheel                                       | 1        |
| 14   | 9309-1102 | Complete Assembly - Distributor Head (items 1-13) | 1        |
| 15   | 1093-2600 | Pipe Guide  | AR       |
| 16   | 5003-2724 | Pipe and Coupling (21')                           | AR       |