



Universal Industries



P2800 Series Manual

Safety, Installation, Maintenance,
Operation & Parts

Model: _____

S.N.: _____

Date: _____

P/N 45829

For Parts or Service Contact:

Universal Industries, Inc.

5800 Nordic Drive • P.O. Box 308 • Cedar Falls, IA 50613-0019
Phone: (319) 277-7501 • Fax: (319) 277-2318

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TERMS AND CONDITIONS OF SALE

1. **TERMS OF PAYMENT:** Buyer agrees to pay the purchase price shown on the acknowledged Sales Order in accordance with the terms of payment stated on the Sales Order. Amounts not paid when due shall accrue interest at the rate of 1.5% per month from the due date. For all sales on open account, the full purchase price shall be due 30 days from the date of the Invoice. However, Seller reserves the right to require down payment and/or progress payments, which shall be specified on the Sales Order. Unless otherwise specified, all sales are exclusive of freight, taxes, and other amounts due third parties. Discounts for early payment shall be as stated on the Invoice. Discounts shall not apply to the amount of any freight, taxes of other sums due any third party. Terms begin on the date of the Invoice. Seller shall establish the credit terms available to Buyer based on a current credit application and any other information available to Seller. At any time, Seller may limit or cancel the amount or time of credit extended to Buyer, in the sole opinion of Seller. Buyer shall pay in cash before delivery (C.O.D) for any order or part of an order in excess of the approved credit terms of Buyer. In the event Buyer fails to pay in advance any amount demanded by Seller, Seller shall have the right, in addition to any other remedies available, to cancel the contract or sell all or any part of the undelivered goods without notice at public or private sale, holding Buyer responsible for any deficiency.

2. **SECURITY INTEREST:** Seller reserves and Buyer hereby grants to Seller a security interest in the goods shipped under this agreement and the proceeds derived from their sale of whatever nature, whether in cash, note or account. This security interest shall continue until the full purchase price and any related expenses and/or charges due in connection with the Sales Order are paid in full. Notes shall not be considered as payment buy merely as evidence of indebtedness. Seller shall be entitled to all the rights of a secured party under Iowa law. Buyer agrees to execute any documents required to perfect or confirm this security interest.

3. **TITLE/RISK OF LOSS:** Title to all goods priced at shipping point shall pass to Buyer upon delivery at such shipping point. All risk of loss shall be Buyer's from the time of shipment. Seller's responsibility for any loss or damage to the goods ceases at the time delivery is made to the carrier. Buyer shall be solely responsible for making any claim(s) against the carrier for any loss or damage.

4. **EXPORT ORDERS:** Prices for export-crating charges can be obtained by contacting the Sales Department for quotations and orders.

5. **PRICE CHANGES:** The prices listed may be changed by Seller without notice in order to reflect Seller's prices at time of shipment and any increase in transportation, labor or other costs. If a delivered price has been quoted, any charges at destination for spotting, switching, handling, storage, and other accessorial services and demurrage shall be borne by Buyer. Seller reserves the right to correct any obvious errors or mistakes in specifications or prices.

6. **WHEN ORDERING:** Please specify name of item, catalog part number, as well as other information when this is applicable to insure prompt handling of the order.

7. **MINIMUM BILLING:** \$50.00 Net, exclusive of transportation charges.

8. **DELIVERIES:** Any delivery schedule indicated is based on Seller's present estimate of the time required to ship after receipt of Buyer's order. In the event of any delay in Seller's performance due in whole or in part to any cause beyond Seller's reasonable control, Seller shall have such additional time for its performance as may be reasonably necessary under the circumstance.

9. **MANUALS:** Seller will furnish one combined safety, installation, operation, maintenance, and parts manual. Extra manuals will be sent on request.

10. **SHIPMENT:** Shipment may be by carrier or other means selected by Seller. All units are shipped-knocked down. If shipment is delayed by Buyer, date of readiness for shipment shall be deemed to be date of shipment for payment purposes. If manufacture is delayed by Buyer, a payment shall be made based on purchase price and percentage of completion, balance payable in accordance with the terms as stated. Equipment held for Buyer shall be at the risk and expense of Buyer.

11. **LIMITED WARRANTY:** Seller warrants that the components and parts that it manufactures for its machines and equipment will be free from defects in material or workmanship for a period of one (1) year from the date of shipment by Seller. Seller does not warrant any component or part not manufactured by Seller. If, during the one year warranty period, Buyer discovers a defect in material or workmanship of a covered component, Buyer shall promptly (and in no event later than thirteen (13) months after the date of shipment by Seller) notify Seller in writing of such defect. Within a reasonable time of receiving such notification, Seller will furnish a replacement component or part. Buyer shall be responsible for all expenses attendant to the shipment and installation of the replacement component or part. Buyer also shall be responsible for returning the defective component or part to Seller if request by Seller to do so. **THE FOREGOING WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, SELLER DISCLAIMS THE IMPLIED WARRANTY OR MERCHANTABILITY AND ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.**

SELLER SPECIFICALLY DOES NOT WARRANT PARTS AND COMPONENTS PURCHASED BY SELLER FROM THIRD PARTY SUPPLIERS, INCLUDING, BUT NOT LIMITED TO, SUCH PARTS AND COMPONENTS AS MOTORS, BEARINGS, REDUCERS, AND SWITCHES. BUYER SHALL BE LIMITED IN RECOURSE FOR SUCH COMPONENTS AND PARTS TO THE TERMS OF THE WARRANTY OF THAT PARTICULAR MANUFACTURER.

12. **LIMITATION OF REMEDIES AND DAMAGES:** Buyer's primary remedy for breach of warranty is the provision of a replacement component or part, as stated above. If Seller is unable to provide a replacement component or part, Buyer's alternate remedy shall be refund of Buyer's purchase price. These remedies are Buyer's sole and exclusive remedies for breach of warranty. In no event shall Seller be liable under any theory of liability for (i) damages in excess of Buyer's purchase price or (ii) any special, incidental or consequential damages.

13. **TIME TO BRING SUIT:** Buyer shall bring any action relating to the goods sold by Seller pursuant to his Sales Order or Invoice, including any action for breach of contract or breach of warranty, not later than two (2) years after the date of shipment by Seller. Buyer agrees that any action brought after such date shall be barred as being untimely.

14. **PLACE OF BRINGING SUIT:** Any action relating to the goods sold by Seller pursuant to this Sales Order or Invoice shall be brought in the Iowa District Court in and for Black Hawk County, Iowa.

15. **TOLERANCES AND VARIATIONS:** All goods shall be subject to tolerances and variations consistent with usual trade practices regarding dimension, straightness, section, composition and mechanical properties and normal variations in surface and internal conditions and quality and shall also be subject to deviations from tolerances and variations consistent with practical testing and inspection methods.

16. **RETURNS:** Returns are not accepted unless Seller is first notified of the reason for the return, and has granted permission for the return to be made. A return authorization tag will be issued on agreed-to returns. Credit for permitted returns will not exceed the price charged when shipment was made, or the market price at the time the return was received. 20% handling charge will be made on all returned goods. In case of damaged goods, the charge will rise accordingly. When the cause for return is due to incorrect shipment by Seller, there will be no restocking or freight charge. Any merchandise that is to be returned must be received with a return authorization tag attached and freight charges-Prepaid. Any returns authorized by Seller are conditioned upon the goods being returned in condition for resale.

17. **COPYRIGHT:** No reproduction either in whole or in part may be made from Seller's catalog, drawings, sketched, etc., without written permission from Seller's Sales Department.

18. **BACK ORDERS:** Seller will attempt to ship all orders complete; however, in the event of back orders, the orders will be shipped with freight charges, collect or prepaid, at Seller's option only.

19. **SHORTAGES:** Claims for shipping shortages concealed or otherwise, will not be allowed by Seller, unless reported within 15 days after date of shipment by Seller.

20. **PRODUCT CHANGES:** Seller reserves the right to change, without notice, the design or any modular, "standardized" components represented in Seller's catalog.

21. **TOOLS, DIES AND FIXTURES:** Unless otherwise expressly provided herein, any tools, dies, or fixtures which may be developed for Seller in the production of the goods covered hereby shall be owned by Seller, as Seller may elect, even though Buyer is charged in whole or in part for the cost of such tools, dies and fixtures.

22. **PATENT INFRINGEMENT:** If any of the goods are to be furnished to Buyer's specification, Buyer agrees to indemnify Seller and Seller's successors and assigns, against all liabilities and expenses resulting from any claim of infringement of any patent in connection with the production of such goods.

23. **SPECIAL DRAWING OR DATE REQUIREMENTS:** Seller will provide, upon request, an 8 ½ x 11 copy of any line drawing shown in the catalog without charge. Seller reserves the right to reject any request and/or assess a charge for any other drawing.

24. **CANCELLATION:** Except as otherwise provided in Paragraph 1, order may be cancelled or modified only by written agreement between the parties. On specially ordered or fabricated equipment, no cancellation will be allowed. Buyer's insistence upon cancelling or suspending fabrication or shipment, or Buyer's failure to furnish specifications when required, may be treated by Seller as a breach of contract by Buyer, and Seller may cancel any unshipped balance without prejudice to any other remedies Seller may have.

25. **TAXES:** All applicable federal, state or local sales, use, occupational or excise taxes are the responsibility of the Buyer and shall be in addition to the price or prices stated unless otherwise specifically stated. Seller shall have the right to Invoice separately any such tax as may be imposed at a later time. Applicable tax exemption certificates must accompany any order to which the same applies.

26. **MODIFICATIONS OF ALTERATIONS TO EQUIPMENT:** Seller shall not be liable for any product that is modified or altered by Buyer or it's assignee or successor regardless of whether Seller knows or is aware of such modification or alteration.

27. **EQUIPMENT OPERATION:** Buyer agrees to require its employees to read and be familiar with the safety instructions and the operation and maintenance portion of the manual before operating this equipment. Buyer agrees to require its employees to use all safety devices and guards on the equipment and to use safe operating procedures. Buyer agrees to not remove or modify any such equipment, switch, device, guard or warning sign. If Buyer, or its employees, fail to strictly observe all of these obligations, Buyer agrees to indemnify and save Seller harmless from any liability or obligation incurred by Seller to persons injured directly or indirectly by the operation of the equipment.

28. **RESALE, TRANSFER, OR LEASE OF EQUIPMENT TO OTHERS:** Buyer agrees to the continuing obligation to notify Seller of the resale, transfer or lease of the equipment to third parties, stating the name and address of the new owner or transferee and the location of the equipment.

29. **REPORTING PERSONAL INJURIES OR PROPERTY DAMAGE:** The Buyer or user agrees to notify Seller within 30 days of any accident or occurrence involving Seller's machinery or equipment resulting in personal injury or property damage, and shall cooperate fully with Seller in investigating and determining the cause of such accident or occurrence. In the event that the Buyer or user fails to give such notice to Seller and so cooperate, the Buyer or user agrees to indemnify and save Seller harmless from all loss or damage arising from such accident or occurrence.

30. **ASSIGNABILITY:** Any contract for sale and purchase of machinery and equipment cannot be assigned except with the written consent of Seller.

31. **SUCCESSOR OWNERS AND USERS:** The terms and conditions hereof are binding on successor owners and users, who take by purchase, assignment, lease, or otherwise, the right to own, use or operate the equipment sold to the original Buyer, and said terms and conditions shall transfer with the equipment itself as an integral obligation of any successor to the original Buyer. The successor owner and user obligations and liabilities stated herein shall also apply if the original Buyer was a dealer and purchased the equipment from Seller for purposes of resale and transfer to third parties.

32. **ENTIRE AGREEMENT:** These Terms and Conditions of Sale constitute the entire agreement between the parties concerning any machinery or equipment sold and purchased. It shall not be modified or cancelled except by mutual agreement in writing signed by all parties.

33. **APPLICABLE LAW:** The laws of the state of Iowa shall govern and control the rights, duties, remedies, and obligations of Seller, Buyer, successors, user, and owner and Iowa law shall be used to interpret and construe all of the terms and conditions hereof.

PRODUCT SAFETY STATEMENT

UNIVERSAL INDUSTRIES, INC. PRODUCT SAFETY STATEMENT

To: Customers, Dealers, Owners, and Users

Universal Industries, Inc. strives to make its products safe. However, because of the wide variety of applications for its products, often Universal does not know how the equipment is being used and installed. Consequently, Universal cannot directly control the installation of its product to assure compliance with applicable safety codes and practices. Nevertheless, Universal has listed various safety codes, standards, and regulations in its Manuals to assist the owner-user in providing a safe installation.

Universal will continue its best efforts to design, build, and market a safe product, and will continue to advocate and urge a safe installation of that product.

Universal requests your written suggestions as to how its product could be manufactured to improve its safety, convenience of use, function, repair, and maintenance. Written suggestions should be dated, signed, and mailed to:

Product Safety and Planning
Universal Industries, Inc.
P.O. Box 308
Cedar Falls, Iowa 50613



SAFETY ALERT SYMBOLS

This is a **safety alert symbol** and is used in this manual and on signs placed on the machine to call attention to specific safety precautions.

The following words are **signal words**. Signal words have specific meaning when used with this symbol.

CAUTION

Denotes a general reminder of good safety practices or to direct attention to unsafe practices which, could result in personal injury if proper precautions are not taken.

WARNING

Denotes specific potential hazard, which can result in injury or death if proper precautions are not taken.

DANGER

Denotes the most serious specific potential hazard, which would result in high probability of death or irreparable injury if proper precautions are not taken.

All machines have inherent hazards such as moving parts, energy (electrical, mechanical or hydraulic), sharp edges and fumes or dust. Personnel must keep clear of moving machinery. Only authorized and trained persons are to be involved in the operation of this machine. **Any disregard for instructions and safety precautions can cause serious injury or death.**

Guards, disconnects, lock-outs and other features are provided or are available to improve operator safety.

This machine must not be altered in any manner or operated with any damage, missing, or malfunctioning parts. If modification is deemed necessary to accomplish the user's requirements, write or FAX a description including a sketch or drawing to the Company with identification, condition and any previous modifications. The company may be able to help the customer avoid creating a hazardous situation. Careful attention must be given to adjacent machinery and accessible space for cleaning and inspection. Other factors should be planned for such as: product spillage, dust pollution, personnel space, interfacing of machines, automatic startup, and handling of hot materials.

THE FREQUENT USAGE OF ELEVATORS AND CONVEYORS TOGETHER WITH THE NECESSARY CONNECTION BETWEEN THEM MAKES IT ADVISABLE TO ADDRESS THE SAFETY CONSIDERATIONS OF BOTH UNITS EVEN THOUGH THE READER MIGHT BE DEALING ONLY WITH AN ELEVATOR OR ONLY A CONVEYOR.

WARNING

INSTRUCTIONS AND WARNING FOR USE OF COVER OR GRATE ON OPEN SYSTEM ELEVATORS

The company recommends that for safety reasons its elevator and/or hopper be closed or covered during the time it is in operation.

The company cannot know all the applications of its elevators by its customers, but recognizes that there may be some applications where the material being elevated or conveyed requires that there be an *open system*. (Open system is when the hopper is exposed and open to view and to bodily parts during operation).

The purchaser and/or user is instructed and warned that the handling of certain materials may call for the use of an open system. Thus requiring the use of certain grates or guards to prevent persons from using or operating the unit and coming in contact with the moving parts, thereby sustaining serious bodily injuries or death.

When such an open system is to be operated, the purchaser or user is referred to ANSI or OSHA Regulations on the inside of the back cover of this manual which may be applicable to the improved safety for the operator.

WARNING

FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SEVERE INJURY OR DEATH

CONSTRUCTION OF WALKWAY OVER CONVEYOR AND/OR ELEVATOR INLET

The Company presumes that personnel or the operator will not step on, across, or over the conveyor or elevator inlet while it is stopped or running. The Company also places a **Warning Sign** on the conveyor and elevator inlet to warn against such acts.

The user, however, may have a unique and particular usage that requires the operator of the conveyor or elevator to cross over the unit. Whether the conveyor or elevator is running or stopped, if such a usage is anticipated or necessary to accomplish the users' purpose, a permanent guarded walkway should first be constructed over and across the conveyor or elevator inlet in accordance with OSHA and other appropriate standards and regulations. Conveyors and elevator inlets should be crossed only at these designated points.

RECEIVING

Plan for and provide adequate lifting and moving equipment for safe unloading of heavy, bulky machine subassemblies.

Allow enough time for personnel to safely unload the machinery. Do not allow inclement weather or the pressure of installation schedules to unduly hurry the unloading and check-in process.

Immediately check goods received against the bill of lading and pack list, making note of those items that may have been back ordered.

Inspect boxes, crates and machinery for damage. Notify freight carrier immediately of missing pieces or damage claims. Open boxes and examine contents for completeness of order and/or damage. The buyer must handle claims for loss or damage in transit with the carrier. (See Terms and Condition of Sale)

Have an experienced machine assembler or millwright look over the goods to assess possible damage, missing parts and to estimate the kind of equipment and methods required for assembly.

Find the manual holder on the unit and remove the manual. If necessary, order from Universal more copies for other departments or users of this machine. Refer to inside back cover for various Safety Standards and Codes. The back cover also lists addresses where this manual may be obtained.



WARNING

READ THE SAFETY SECTION! FAILURE TO FOLLOW SAFETY MESSAGES COULD RESULT IN SEVERE INJURY OR DEATH.

INSTALLATION - GENERAL

Read the entire manual, especially the safety instructions. Study the drawings and specifications to gain an understanding as to how the parts go together. Most Universal machines are shipped partially assembled and require further assembly with the aid of cranes, hoists, "come-alongs", drift punches for bolt hole alignment, clamps, welding equipment, and experienced assembly supervision.



WARNING

Do not attempt to assemble, hoist into place, or hook up Universal machines with untrained personnel or inadequate tools and equipment. To do so invites wasted time, causes unnecessary repairs and jeopardizes the safety of all persons associated with the project. Use experienced millwrights or riggers!

It is often necessary to connect the electrical supply to the motor in a temporary manner to check the direction of motor shaft rotation. Upon completion, if needed, reconnect, and recheck the rotational direction before making permanent connections.

DO SO WITH MOTOR DISCONNECTED FROM THE DRIVE AND THE REST OF THE MACHINE IF AT ALL POSSIBLE.

To check direction of motor rotation:

1. Warn all personnel working in the area and on electrically connected machines (possibly out of the area) that a test is pending.
2. Post observer(s) or provide for fail-safe communications between the motor location and the electrical switch.
3. If motor is disconnected from drive, take care to restrain the motor from rolling at the start due to inertial reaction. Take special care with the C-face type motor which has no mounting foot and almost a round casing. While this reaction may not be violent, if the C-face motor was insecurely resting on a ledge or support, it could roll off, creating a falling hazard.
4. If motor cannot be disconnected from the drive or the drive disconnected from the machine, be sure the machine is clear of tools, parts, and bolts and that all personnel are cleared away at a safe distance from the machine.

All guards, covers, safety signs, overload devices are to be in place and functional before starting initial run-in (empty operation) or before placing unit in service.



WARNING

FAILURE TO HEED ABOVE SAFE PRACTICES COULD RESULT IN SEVERE INJURY OR DEATH.

INSTALLATION - ELECTRICAL

REQUIREMENTS

National and local Electrical Codes have had as their main goal, the SAFE OPERATION OF EQUIPMENT. They can help you eliminate the risk of injury or equipment damage, but only if you follow them under the guidance of your local electrical inspector or qualified journeyman electrician.

There are four main areas of Electrical Safety:

1. Safeguarding the operator from physical injury by the equipment itself.
2. Safeguarding the operator from electrical shock injuries.
3. Safeguarding the wires and equipment from major current damage due to short circuits.
4. Safeguarding the operator from slightly excessive electrical current levels that can still cause fires and equipment damage.

All four areas are important and require careful planning before installation is begun.

First Area of Safety-Operator Injury

Requires the physical guarding of all moving parts of the equipment.

Electrical disconnect switches should be padlocked in the off position before work is started. Emergency stop switches should always be installed near open areas to minimize injuries from accidental contact with moving material or equipment parts. Most importantly, thorough training of all workers should be done to eliminate the accidents before they happen. Training and guarding is required by OSHA. Refer to inside back manual cover for various regulations that may cover the specific safety concern.

Second Area of Safety-Electrical Shock Hazards

Requires the installation of properly sized and protected wiring and electrical equipment. Code requirements for grounding should be followed completely, and the entire installation should be reinspected periodically to detect any deterioration in your overall exposure to these and other risks.

Third Area of Safety-Protection from Short Circuits

Requires the use of properly sized fuses or circuit breakers in each section of the electrical distribution system at the site, from the main disconnect to the motor. At each point, fusing cuts off power to prevent fires, personal injuries, and further damage to equipment.

Fourth Area of Safety-Slight Current Excesses

This area is important because the conditions that cause expensive damage are difficult to detect or prevent with either fuses or circuit breakers. Only magnetic starters with correctly sized heaters are sensitive enough to limit current in many situations. Anything else will allow a motor or its wiring to burn out at slight overloads or low voltage situations. Fuses are just not available in enough different sizes to protect the motor against these smaller overloads. Magnetic starters also can be remotely controlled with switches, including low-speed switches, emergency stop switches, and remote or automatic controls. Besides being REQUIRED BY THE ELECTRICAL CODE, magnetic controls also protect anyone working on the equipment after a power failure as it greatly lessens the chance of an unexpected start when power is restored.



DO NOT INSTALL THIS UNIT WITHOUT A LOCKABLE ELECTRICAL DISCONNECT SWITCH

Unit Application, location and specifications determine the type, quantity and/or placement of electrical safety or other safety controls required. Whether another supplier or the Company supplies these controls, all OSHA and health standards, the National Electric Code and the Local Codes should be considered.

INSTRUCTIONS FOR PURCHASERS, INSTALLERS, AND DESIGNERS FOR USE OF EMERGENCY SHUT-OFF SWITCHES FOR UNITS

The Company cannot know all the uses and applications of its units, but recommends the installation and use of one or more emergency shut-off switches on each installation. The emergency shut-off switches improve the safety for the user, the operator, and other people in the area of the unit. The installer and/or designer will have to analyze the installation of each unit, and determine the placement of, location of, and number of emergency switches necessary for each application and usage.

ELEVATOR INSTALLATION

1. Determine the exact location of the elevator boot. Establish the up-leg and down leg sides. Consider how the boot will be cleaned out and serviced when necessary. Establish the location of the lockable disconnect switch for the person who will be cleaning or maintaining the machine. Refer to OSHA Regulation 1910.147 requiring employer to use a lockable disconnect switch.
2. Establish whether the elevator is to be fed on the down leg side or the up-leg side or both. Preferred side is the up-leg side. Experience has shown that fewer feeding problems and less product damage occurs when feeding on the up-leg side. However, lightweight (fluffy) materials load well at low positions on the down-leg side. The low position on the up-leg side is to be used as a last resort and only with free-flowing materials.



CAUTION

Positioning the hopper (inlet) high on the down leg side or low on the up-leg side may result in buckets not filling to capacity. Feeding on the down-leg side may cause the elevator to consume more power, to damage fragile products, and to be more susceptible to choking.

3. Before starting assembly, determine the height at which the access section and the platforms (if any) will be placed. Plan for the location of safety lockout switches and/or emergency stop switches for operating, cleaning, and service personnel.
4. Assemble the elevator and erect according to the three methods listed below. As noted in Section 4, INSTALLATION-GENERAL section of the manual use experienced assembly, millwright or rigger personnel to minimize mistakes and to make the installation as safe as possible.

METHOD A

Assemble the elevator completely at ground level (horizontal). Hoist the assembly into position (vertical), using legging reinforcements, two lift points to distribute the load. If equipped with a ladder, weld the ladder ends together to stiffen the elevator.

METHOD B

Assemble the elevator upward, starting with the boot section. Place access section and different legging lengths as desired. Run a cable or rope over the head pulley (top), attach the cable to the chain or chain and bucket assembly and pull the belt into the elevator by pulling down over the head pulley.

METHOD C

Bolt the head assembly and one or two sections of legging together as a subassembly. Pull the belt around the head pulley. As the unit is lifted with a crane, slip sections of legging over belt ends and bolt into position from underneath.

Be sure buckets are installed for operation in the correct direction!



WARNING

Guy or brace the standing sections of the elevator to prevent swaying or collapse during erection. Attach guys to leg, not ladders or platforms! Use two or three cable clamps per end of guy. Guard against sharp anchor holes cutting the cable by using any practical means including the use of cable thimbles. Failure of the guy system may cause serious injury or death.

ELEVATOR INSTALLATION

FOR ALL METHODS:

Brace the head section permanently when erection is complete. Guy or brace the elevators at 20 to 30 foot intervals below the head section, using 5/16 inch or 7/16 inch diameter galvanized wire rope. The top guys should make an angle of at least 30 degrees or more with the trunking and be guyed in four equally spread directions. Align the outer edges of the trunk coupling to assure that the buckets will not catch on interior projections. Install bolts (grade 5 or better furnished) in all holes provided in coupling. Grade 5 bolts have superior strength and can be identified by the industry standard three (3) marks on their head.

If required, weather or dust sealant is available from Universal Industries. If the sealant was previously ordered, it would have shipped with the unit. Prior to attaching the next coupling, apply a 1/8" diameter bead of sealant to the trunking coupling face.

Use a transit instrument from in two different directions (side and front or back) or a plumb bob. To check the plumb and straightness of the finished installation. **IT IS IMPORTANT THAT THE ELEVATOR IS PLUMB AND STRAIGHT!** A plumb, straight elevator will be more durable, quieter, and less expensive to operate because the contact of the bucket/belt assembly with trunking will be minimized.

INSTALLER CHECKLIST:

- All guards and covers are in place?
- Are all warning signs visible-not painted over or badly scratched? If not, order and install new safety warning signs.
- Are the set screws tight? (See Section 4).
- Is the motor wired for correct rotation? (See Section 4)
- Is the reducer backstop installed to allow correct rotation? (if a backstop is necessary or provided)
- Does reducer have the correct kind and amount of oil? (See reducer manufacturer's recommendations)
- Are all of the tools, excess nuts and bolts, and spent welding electrodes, etc., cleared out of the elevator?
- Are inlet(s) guarded per safety standards, codes and good practice?
- Deliver this manual to the person responsible for the operation and maintenance of the elevator. Get additional copies made or order them from Universal Industries. If the installer is a third party, good business practice suggests that a written statement be signed by the installer stating that this manual exists and was read for installation information and turned over to the permanent owner/operator of the elevator.

Before running the unit, operate unit empty for several hours. While doing this, recheck the tightness of bucket bolts, bearing and reducer setscrews, pulley fasteners, drive component temperatures and signs of normal grease leakage from around bearing seals (a small bead of visible grease is desirable).



WARNING

LOCK POWER OFF BEFORE CHECKING ABOVE ITEMS. Replace all covers and guards before putting elevator into service. Failure to do so may cause serious injury or death.



WARNING

FAILURE TO INSTALL EMERGENCY SHUTOFF SWITCHES MAY CAUSE SERIOUS INJURY OR DEATH.

Emergency Stop Switches must be used on all systems.

Universal ships an Emergency Shutoff Switch as standard equipment on **open systems**.

CHAIN & BUCKET INSTALLATION

One method of new chain installation is to fasten the buckets to the chain at ground level someplace near the elevator and pull the assembled chain and buckets up into the elevator. Another method of bucket installation is to pull the chain up, into the elevator, install the chain connecting link(s) and bolt the buckets onto the chain, working through the elevator access section opening. This second method is similar to a maintenance operation where buckets, bolts, and chain are inspected and/or parts replaced.



DANGER

LOCK POWER OFF IF ASSEMBLING BUCKETS AND PADS TO A BELT ALREADY INSTALLED IN THE ELEVATOR.

Elevators that do not have power connected can also be dangerous due to unbalanced chain assemblies running away when not sufficiently anchored. Assemble only a few buckets at a time, leaving many spaces or gaps, filling in these empty spaces as they present themselves on succeeding revolutions. Failure to do so may cause serious injury or death due to uneven distribution of weight.

Most P models have buckets installed on each set of chain attachments. Consult the specifications page in Section 11 on this model for the bucket spacing. Be sure buckets are installed to discharge over the down-leg side!

After the chain is installed, check to see that it is correctly aligned on the head and boot sprockets. Buckets should be parallel to the ground. The chain should be under tension around the boot sprocket. Slackness in the chain due to the chain stretch should be removed by adjusting the take-up system in the elevator head, initially placing the take-up sprockets in a fully retracted position before installation is complete. The chain tension spring should be slightly compressed (not completely compressed) to compensate for future chain stretching.



WARNING

NEVER MAKE THE INITIAL CHECK OF THE CHAIN ALIGNMENT IN THE ELEVATOR AT FULL SPEED OR LOADED WITH PRODUCT.

The following procedures are recommended to insure a safe start-up of the elevator;

1. Warn all personnel in the area to stay clear, including any near the machines that may be electrically connected with the elevator.
2. Use only experienced and trained personnel to conduct observations and adjustments
3. Use extreme caution and keep at a safe distance from the elevator.
4. Often, both top and bottom ends of the elevator may be out of sight or hearing from the starting equipment. It is absolutely necessary to establish a fail-safe communication arrangement whether it be hand signals or a radio/telephone system.
5. Lock out power during adjustments, then repeat #1 (above) when rechecking chain tracking by jogging.

FAILURE TO FOLLOW THESE AND OTHER SAFE PRACTICES DURING THE ALIGNMENT/ADJUSTMENT COULD RESULT IN SERIOUS INJURY OR DEATH. ONLY TRAINED PERSONS USING EXTREME CAUTION ARE TO ATTEMPT THIS PRACTICE.

Observing and correcting chain tracking while the elevator is in operation requires that one or more covers be removed. Remove the cover at the head (top) and the boot (bottom) of the elevator. Position observers that will alert personnel to the potential hazard.

We recommend the elevator run unloaded for a day or more to check the chain tension and bucket bolt tightness before putting the unit into service.



WARNING

ALL COVERS AND GUARDS MUST BE IN PLACE WHILE PERFORMING EMPTY RUNNING AND ALSO BEFORE PUTTING THE UNIT INTO SERVICE. FAILURE TO DO SO MAY CAUSE SERIOUS INJURY OR DEATH.

CHAIN & BUCKET INSTALLATION

Start-up and empty run-in period:

The start-up or installation period is not to be confused with an empty run in period.

The start-up or installation adjustment period is the period when only skilled installers, using safe practices apply electrical energy to the machine to observe direction of rotation and chain tracking in order to make adjustments. This is quite often and necessarily done with covers and guards removed for visual inspection.



WARNING

ONLY TRAINED PERSONNEL USING SAFE PRACTICES SHOULD BE ALLOWED TO PERFORM START-UP ACTIVITIES!

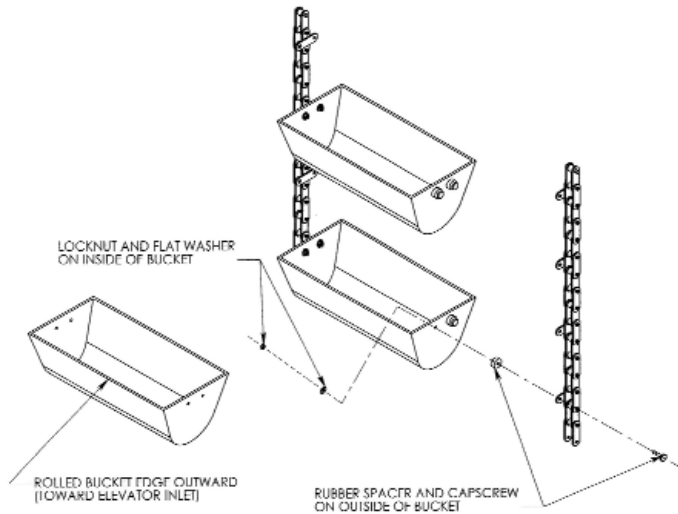
The empty run-in period is that phase of installation after the initial installation adjustment activity when all guards and covers are placed into position and the unit is run without carrying product. The purpose is to allow a few hours of break-in to reveal whether further adjustments are required before putting the unit into service. Care must be taken that all personnel working nearby are instructed that the machine is operating and that safeguards be taken to prevent exposure to the machine through connecting chutes. Typically, the trained personnel keep the machine under observation. This period is when loose fasteners, overheating and unusual sounds are discovered. A valuable and early chance to correct problems before production start-up.



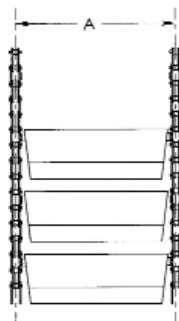
WARNING

ALL COVERS AND GUARDS MUST BE IN PLACE WHILE PERFORMING EMPTY RUN-IN AND ALSO BEFORE PUTTING THE UNIT INTO SERVICE. FAILURE TO DO SO MAY CAUSE SERIOUS INJURY OR DEATH!

BUCKET AND CHAIN ATTACHMENTS



TIGHTEN FASTENERS ALTERNATING FROM SIDE TO SIDE UNTIL CHAIN CENTER (DIM. A) IS OBTAINED. ONE TO TWO THREADS OF THE CAPSCREW CAN BE SEEN PROTRUDING THROUGH THE LOCKNUT.



CHAIN CENTERS	
MODEL	DIM "A"
P1000	10"
P1300	13"
P2800	20 3/8"

OPERATION & MAINTENANCE

GENERAL

WARNING

LOCK POWER OFF before performing inspections and maintenance. When it is necessary to observe the elevator while running, use utmost care in keeping clear of the machine. Keep other personnel away from the area and be sure that other electrically connected equipment is also isolated from harming personnel. Never service this machine while it is in use. Use a buddy system with another experienced person who also can lock out the disconnect with his/her personal padlock. Use failsafe methods of communication, whether it be visual, radio or shouted messages. Restore all covers and guards before returning unit to operation. Replace missing, damaged or painted over safety signs with new ones from the Universal Industries.

FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS INJURY OR DEATH.

Good belt alignment in a properly erected and plumb elevator is necessary for optimum operation of the machine. The bolts on the bar-clamp splice will probably need to be re-tightened after about 10 hours of operation.

The belt can be expected to stretch from about 1 to 1.5%, mostly during the first few weeks of operation. Check the belt frequently at first and use the take-up bolts to eliminate slack.

WARNING

FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS INJURY OR DEATH.

Never allow belt to hang below the boot pulley. If allowed, a slack belt may fold in the boot causing buckets to jam and stall the elevator. This may cause a belt failure at head (top) pulley, dropping the belt assembly into the elevator trunking.

When the take-up bolts will not tighten enough, shorten the belt accordingly. When shortening the belt, always trim the excess at both ends of the belt.

PERIODIC INSPECTION

Periodically inspect the drive system for worn, misaligned or loose belts and/or chains. Examine the unit for loose nuts and bolts. Make sure that the electrical wiring, contacts, switches, etc., are in good operating condition. Worn chains will ruin sprockets quickly. Consult manufacturers' instructions on gear reducer drives regarding oil levels, oil changes, and, if equipped, backstops.

BACKSTOPS

WARNING

On elevators equipped with a backstop (anti-backwards running device), check at each lubrication or inspection interval to see if the backstop is working. Lock power off and remove drive guard. Try to run elevator backwards by pulling on the v-belts, using extreme caution not to pinch fingers. If any backward motion is allowed, service the backstop. The backstop device is usually enclosed in the Shaft Mounted Speed Reducer and is accessible through a cover on the backside of the gear reducer on the opposite end of the input shaft. On very small elevators that employ a second (counter) shaft and pulleys for speed reduction, the backstop is a device mounted on the outer end of the elevator main (head) shaft on the side opposite the input sprocket or pulley. This device is restrained from turning backwards by a link and arm arrangement. Inspect the condition of the arm and the link.

The purpose of the backstop is to restrain the elevator from idling backwards in the event of a power failure while the unit is handling product. On very tall or heavily loaded units, the loaded buckets would move downward, discharging their contents in the boot. There would be no place for the material to go. If larger forces are present, the boot, buckets and belt may be badly damaged. If the boot would suffer structural damage, the elevator could collapse. Do not restore the elevator to service after inspection or repair until all covers and guards are in place.

OPERATION & MAINTENANCE

WARNING

FAILURE TO FOLLOW THESE PRECAUTIONS COULD RESULT IN SERIOUS INJURY OR DEATH.

Periodically check the elevator for vertical position. Inspect guys and braces, looking for corrosion, abrasion, cuts and tightness. Occasionally, check the condition of the belt and see that it is centered on the head and boot pulleys. Straighten or replace damaged buckets.

OPERATING SUGGESTIONS

When a sluggish material is going to be elevated, install a shut-off slide at the top end of any chute leading to the hopper. This will allow the material to gain some speed before it enters the elevator, and thus reduce any tendency it has to stall in the chute.

Rapid flowing heavy materials can push the belt over against the boot casing side if the stream goes in at a sideways angle to the bucket path. Try to arrange for the material to enter straight into the buckets. This will result in better bucket filling and less material going down into the bottom of the boot to be scooped up again.

To check whether the elevator is operating at or near capacity, open the slide on the inspection section. If there appears to be a good deal of spillage, then the buckets are at or near capacity. The lower the inspection section is located, the more spillage can be expected out of the inspection opening. Spillage out of the inspection opening does not necessarily mean that the buckets are full or reaching a choked condition. The only actual way to accurately determine the volume being elevated is by making a timed run on a known volume of material.

BEARING LUBRICATION

Most equipment is furnished with bearings that can be relubricated. The bearings will have grease fittings installed. If the bearing does not have grease fitting, it is a lubricated-for-life bearing and requires no further service except setscrew tightness check.

If the bearing is exposed to wet or dust conditions or to corrosive vapors, extra protection is necessary. Add grease until it shows at the seals. If possible, rotate the bearing to distribute the grease. Provide a removable cover for the bearing if dust, sand or moisture tends to wick away lubricants or attack the seals. The cover should be easily removed so the greasing process can be observed at the seals.

Most products operate at moderate to low shaft speeds and under normal dust conditions. This means that the bearing should be as full of grease as possible. The bearings are shipped from the factory greased and ready to run. When establishing a relubrication schedule, note that a small amount of grease at frequent intervals is preferable to a large amount at infrequent intervals. The Bearing Lubrication Table on page 8-3 is a general guide for relubrication. However, certain conditions such as high surrounding temperatures, excessive dust or wet conditions, may call for different lubrication schedules or different lubricants. If premature bearing failure is experienced, consult Universal Industries or an experienced bearing distributor.

OPERATION & MAINTENANCE

BOLT AND SETSCREW TORQUE VALUES

SETSCREWS				BOLTS-GENERAL	
Key Hex Recommended					
Across Torque (in-lbs.)				Wrench Torque	
<u>Size</u>	<u>Flats</u>	<u>Min</u>	<u>Max</u>	<u>Size</u>	<u>Inch-lbs.</u>
No. 10	3/32	28	33	3/8-16	240
1/4	1/8	66	80	1/2-13	600
5/16	5/32	126	156	5/8-11	1200
3/8	3/16	228	275	3/4-10	2100

Also at this time, check the tightness of bolts securing pulley and sprocket hubs.

It is a good idea to operate the machine for several hours with **all guards and covers in place**, but with no product being conveyed. This should be done without other noisy machinery turned on. Installation personnel should be close by to be watchful for malfunctions. Unexplained machine noises, excessive lubricant leakage, belt mistracking, motor overheating and other problems can often be detected and corrected inexpensively before putting the unit in service.

AIR CLEANOUT OPERATION

Follow the prescribed AVC assembly instructions, referring to the exploded parts drawing for the correct assembly of plumbing components. The boot shaft should be adjusted so that there is at least one full elevator bucket spaced below the inlet opening in the elevator boot. Lengthening the chain may be required to achieve the necessary boot shaft position.

CAUTION

The AVC can only be installed on the "down leg" elevator side of the boot for it to function properly. Installations of the AVC on the "upleg" elevator side of the boot will cause the boot to not clean out properly and may cause damage to the elevator.

CAUTION

Over tensioning the elevator chain may cause excessive loads on elevators shafts and bearings, which may cause premature failure of these components.

Power requirements:

AIR	95-120 psi ½" diameter air line (minimum)
Electrical	24vdc or 120vac

Using the air regulator supplied with the AVC Kit and the solenoids energized, adjust the air pressure according to Table 1. Air pressure and volume depend upon product density, shape and size. Table 1 will provide a guideline from which to determine the appropriate regulator setting for your AVC application.

WARNING

Never make the initial check of the elevator loaded with product. Use eye protection to avoid serious injury during assembly and operation on any machinery.

CAUTION

Too much pressure will suspend the remaining product up into the elevator inlet, causing cleanout failure.

AIR CYCLING AVC OPERATION:

This operation is performed after stopping the flow of material into the elevator and the elevator buckets are unable to pick up the remains of material left in the boot.

Energize the air solenoid valve and allow the air to sweep the material up toward the elevator inlet where the buckets will lift the remaining material away to the discharge. We recommend cycling periods of "air on" and "air off", beginning with a 15 second "air on" period, followed by a 15 second "air off" period. elevator capacity and discharge height effects the on/off cycling duration. Larger capacity elevators will accumulate more material in the boot and may require a longer "air on" cycle duration. Taller elevators require more time for the last buckets of the "air on" cycle to reach the elevator discharge, adding to the "air off" cycle duration. For example, some applications may require an "air on" cycle for 15-20 seconds, while the "air off" cycle may be as long as 30 seconds, or more. The number of cycle periods may also vary. Three or four cycle periods will usually achieve the desired cleanout effects. Operator experimentation with air pressure and with the "air on" and "air off" cycling periods may be necessary to achieve the desired cleanout effects.

WARNING

LOCK POWER OFF BEFORE REMOVING COVERS OR OPENING THE BOOT DOOR TO INSPECT THE ELEVATOR.

To verify that the boot is clear of material, open the boot door, lower the cleanout strap attached to the boot.

AIR CLEANOUT OPERATION

MODEL (ELEVATOR)	PRESSURE (PSI)	VOLUME (CFM)
P1000	15-25	15-30
P1300	20-40	20-40
P2800	25-45	20-45
P3500		
P4700		

Table 1

VACUUM CLEANOUT OPERATION:

AVC kits are supplied with a 2.5" vacuum port tube stub, to vacuum out the fine debris that accumulates below the AVC strap. The larger elevators (C6 and larger) have a secondary air manifold which assists the vacuum cleanout. This secondary manifold is connected to a solenoid, which is connected to the same air plumbing used for the primary AVC manifold.

WARNING

ENERGIZING THE SECONDARY AIR MANIFOLD SOLENOID WILL PRESSURIZE THE AREA BELOW THE AVC STRAP. A CAP OR HOSE TO VENT THE AIR AWAY TO A SAFE AREA, MUST BE IN PLACE ON TOP OF THE VACUUM PORT TUBE STUB. IN NOT, MATERIAL CAN BE PROJECTED FROM THIS TUBE STUB, WHICH MAY CAUSE INJURY OR DEATH.

Periodic vacuum cleaning below the AVC strap is recommended to insure the best operation of the bucket elevator.

Vacuum cleaning can be preformed manually with a "shop-vac" or setup for automatic cleaning with the central vacuum system or dust collection system, installed in your plant.

Automatic vacuum cleanout requires some synchronization of the vacuum system with the secondary air manifold solenoid (models with air-assist). Vacuum cleanout can be scheduled during the main AVC cleanout cycling periods. However, vacuum cleanout could be scheduled once or twice a week, depending on the amount of material run through the elevator over a given period of time. This cleanout period may last several seconds to a minute or more, depending on the frequency of cleaning and the amount of material collected in the elevator boot. The operation should a steady continuous vacuum and blast of regulated air (models with air-assist) until the area beneath the AVC strap is satisfactorily cleaned of debris. The regulated air pressure setting for the secondary air manifold is to be adjusted to the same pressure setting as the primary air manifold.

BOOT ADJUSTMENTS:

WARNING

BEFORE INSTALLATION OF THE AIR/VACUUM CLEAN-OUT KIT BE SURE THAT THE ELEVATOR IS COMPLETELY EMPTY OF PRODUCT.

WHENEVER WORKING WITH ELECTRICITY, EXTREME CAUTION SHOULD BE USED. POSSIBILITY OF ELECTRICAL SHOCK IS ALWAYS EVIDENT.

DISCONNECT, LOCKOUT AND TAG OUT ELECTRICAL POWER BEFORE SERVICING. FAILURE TO DO SO MAY CAUSE SERIOUS INJURY OR DEATH.

AIR CLEANOUT OPERATION



CAUTION

WEAR APPROPRIATE SAFETY GEAR.



CAUTION

METAL FILINGS AND DUST WILL BE AIR BORN.

REMOVING OF EXISTING PARTS:

Remove the boot cover of the elevator. See Illustration 1A on Page 9-6 for help in identifying this panel.

MODIFICATION TO THE EXISTING BOOT:

A stiffener strip attached to the lower boot flange needs to be cut out to make room for the down leg wedge slide and the vacuum wedge.



CAUTION

NATIONAL AND LOCAL ELECTRICAL CODES HAVE HAD AS THEIR MAIN GOAL THE SAFE OPERATION OF EQUIPMENT. THEY CAN HELP YOU ELIMINATE THE RISK OF INJURY OR EQUIPMENT DAMAGE, BUT ONLY IF YOU FOLLOW THEM UNDER THE GUIDANCE OF YOUR LOCAL ELECTRICAL INSPECTOR OR QUALIFIED JOURNEYMAN ELECTRICIAN. TO ASSURE PROPER INSTALLATION, A QUALIFIED PNEUMATIC TECHNICIAN SHOULD BE ON HAND TO SETUP THE PIPING AND CONNECT THE AIR PRESSURE.

ATTACHING/ASSEMBLING OF THE AIR/VACUUM CLEAN-OUT EQUIPMENT:

The exploded parts drawing labeled Illustration 1A on Page 9-6 and a parts list labeled 2B on page 9-7 will help in identifying parts for assembling the AVC kit. Teflon tape over the pipe threads will help in sealing the plumbing of possible air leaks.

1. Raise Cover by using second set of slots on the Boot Casing.
2. Drill four 3/8" in diameter holes in the Cover and lower Boot Flange using item #12 as a template.
3. Then connect all parts as illustrated in Illustration 1A on page 9-6.
4. Then attach the completed AVC Kit to the Boot Casing by aligning the previously drilled holes and screw together.
5. Reattach Cover.
6. Connect the wires for the solenoids.
7. Connect air line hose to the system.



WARNING

ELECTRICAL SHOCK. A QUALIFIED ELECTRICIAN SHOULD CONNECT WIRING FOR THE SOLENOIDS.

AIR CLEANOUT DIAGRAM

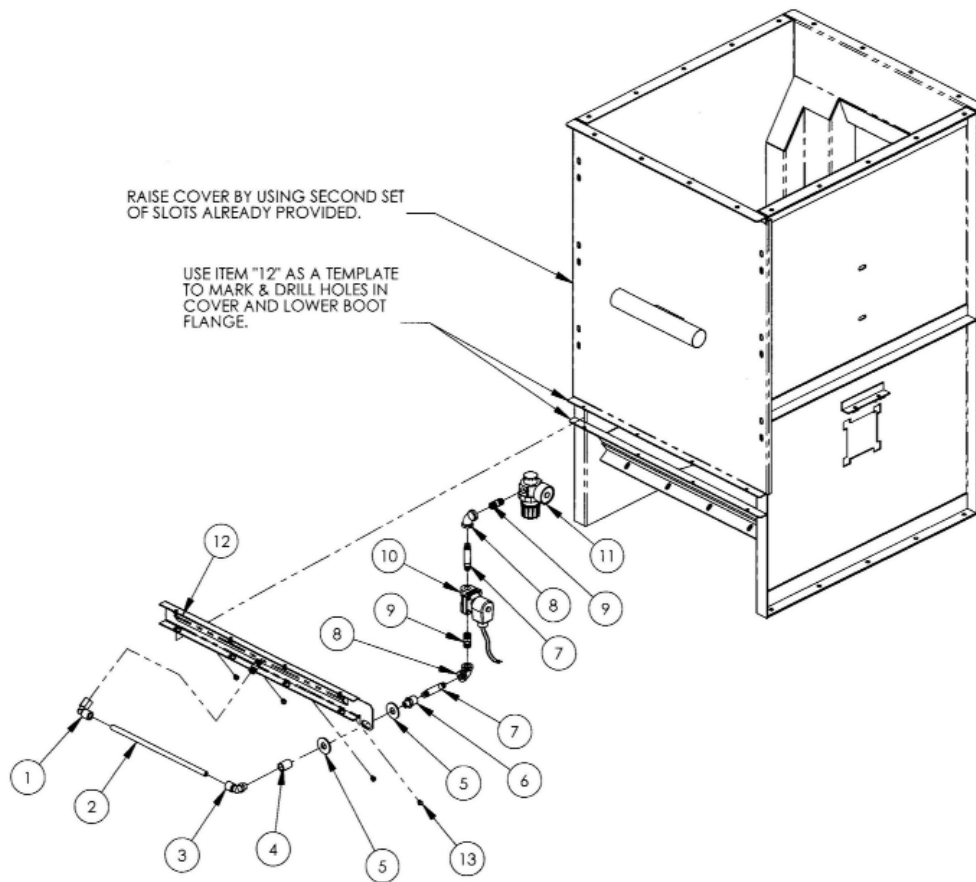


ILLUSTRATION 1A

INDEX NO.	PART NO.	DESCRIPTION	QTY.
	48615	CLEANOUT KIT, AVC, P2800, AC (INCLUDES ITEMS 1-9, 10A, 11-13)	1
	48954	CLEANOUT KIT, AVC, P2800, DC (INCLUDES ITEMS 1-9, 10B, 11-13)	1
1	35775	FITTING, 0.500 OD X 0.375 NPT, FEMALE ELBOW, LEGRIS	1
2	35778	TUBING, 0.500 OD SEMI-RIGID, NYLON (2870.50)	1.5 FT
3	35777	FITTING, 0.500 OD X 0.375 NPT, MALE ELBOW, LEGRIS (2870.40)	1
4	35773	FITTING, COUPLING, GALVANIZED (2701.100)	1
5	30414	WASHER, FLAT, 0.625 (2865.1)	2
6	35776	FITTING, 0.500 OD X 0.375 NPT, STRAIGHT, LEGRIS (2870.30)	1
7	35771	FITTING, NIPPLE, 0.375 x 1.00, GALVANIZED (2701.310)	2
8	35772	FITTING, ELBOW, 0.375, GALVANIZED (2701.200)	2
9	35770	FITTING, NIPPLE, 0.375" x 4.00, GALVANIZED	2
10A	35900	SOLENOID, 0.375 120V AC (3116.121)	1
10B	35902	SOLENOID, 0.375 24V DC (3116.241)	1
11	35804	REGULATOR, AIR, 0.375"	1
12		MANIFOLD WELDMENT	1
13	30030	NOZZLE	4

PARTS LIST 2B

PROBLEM DIAGNOSIS

TROUBLE	PROBABLE CAUSE	SUGGESTED REMEDY
Not Operating at Rated Capacity	1. Hopper or feed inlet not installed correctly.	1. Arrange to have material enter boot high on the up-leg side or low on the down-leg side.
	2. Material bridges and will not flow into bucket path fast enough.	2. Arrange feeding method to allow material to drop into the hopper at elevator capacity avoiding overfilling and consequent bridging.
	3. Headshaft RPM incorrect.	3. Check capacity table for correct RPM; change sheaves or sprockets as necessary.
	4. Buckets caked up.	4. Clean out buckets and if condition persists substitute stainless steel or plastic buckets.
	5. Air coming up the spout from the bind forces down legging of light material.	5. Vent the bin or the spout.
Elevator stalls or plugs up.	1. Belt slack not taken out; bucket jam in the boot.	1. Shorten belt; adjust take-up bolts.
	2. Not enough power or incorrect heater coils in the starter; motor wired incorrectly.	2. Check power requirements; have competent electrician check circuits & heaters.
	3. Elevator discharge or spouting plugged up.	3. Check for foreign material lodged in discharge chute, valves or spouting. Check spouting for bad turns which may hold up flow of material.
	4. Bins get overfilled.	4. Install an overflow box, or bin level indicator.
Noisy operation; buckets rattle in leg casing and boot	1. Elevator out of plumb.	1. Set elevator straight & plumb. Use steel cables for guying in place of wire, which will stretch & loosen. Arrange elevator braces so they are not forced out of alignment when attached to structures or bins which may shift as they are loaded & unloaded.
	2. Belt too loose or not centered on pulleys	2. Shorten belt, adjust take-up bolts, shim under head shaft bearings. See Sect. 7.
	3. Loose or deformed buckets	3. Repair or replace buckets.

SPECIFICATIONS

P2800 BUCKET ELEVATOR

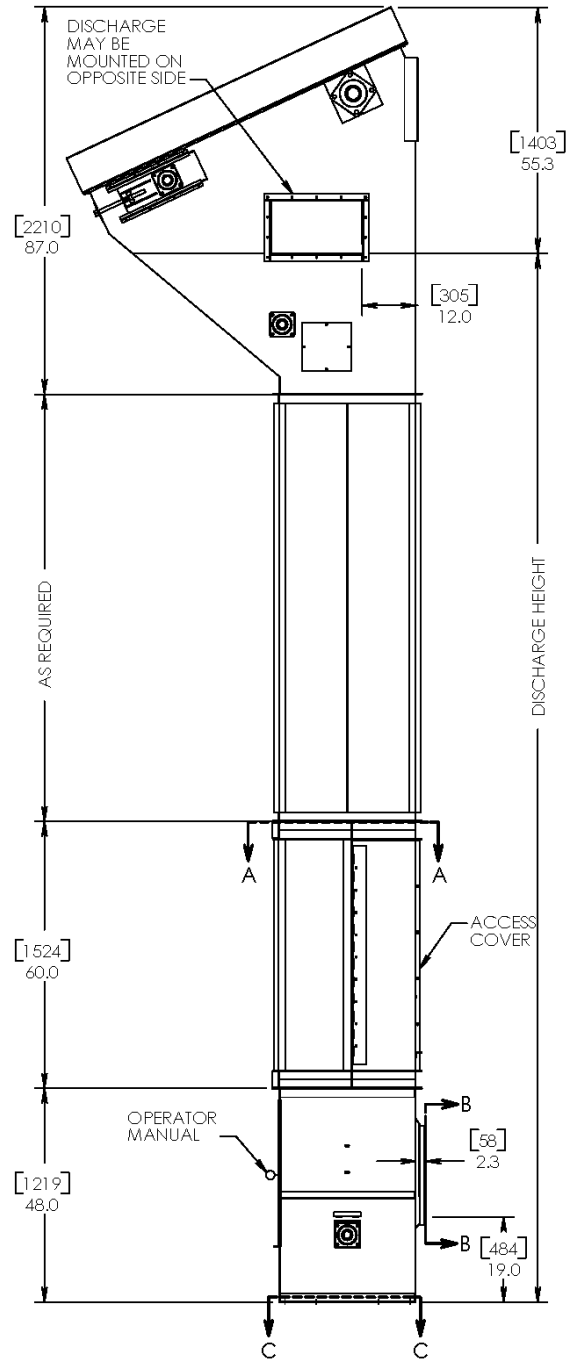
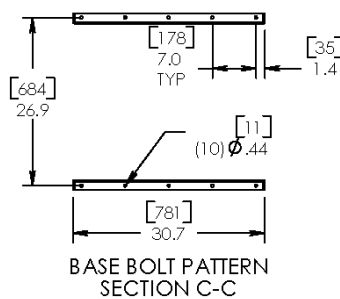
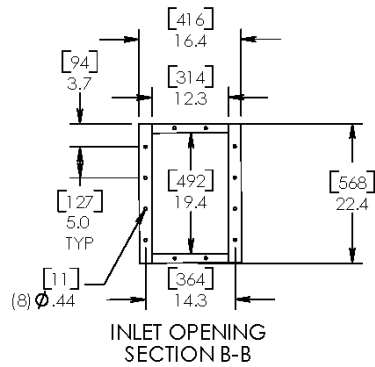
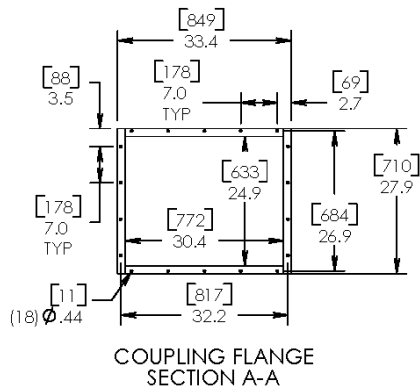
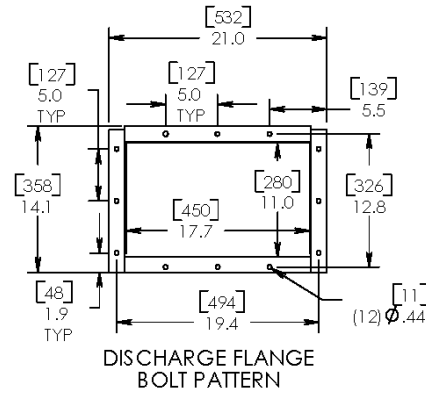
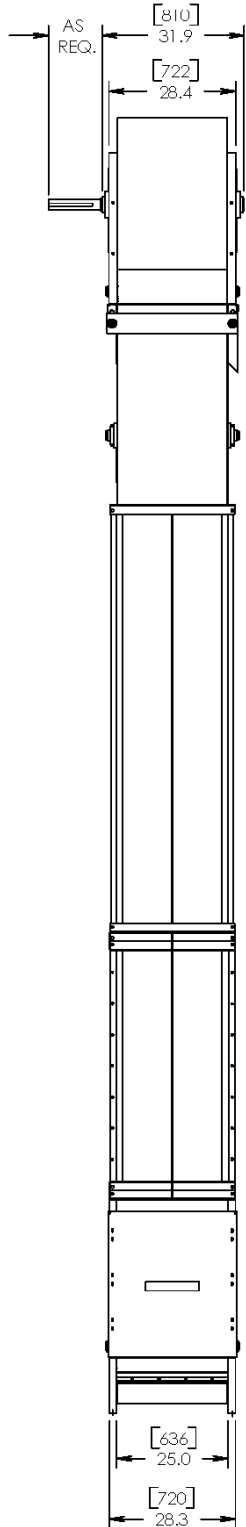
Up to 2,879 CFH (81.5 CMH)

MODEL	P2800-60	P2800-90
Capacity - Free Flowing Material @ 75% Bucket Fill	1,55 BPH 1,936 ft ³ /h 54.8m ³ /h	2,313 BPH 2,879 ft ³ /h 84.5 m ³ /h
Short TPH @ 50 lbs/ft ³	48.4 TPH	72 TPH
Short TPH @ 75 lbs/ft ³	72.6 TPH	81.5 TPH
Chain Speed	60 FPM	90 FPM
Headshaft RPM	14.7 RPM	21.8 RPM
Bucket Spacing	8"	
Head Casing	11 gauge	
Headshaft Diameter	Determined by Discharge Height-Consult Factory	
Buckets	18" x 8" HDPE	
Chain	C2080H	
Trunking	12 gauge single trunk	
Boot Casing	11 gauge	
Bootshaft	1 15/16" diameter	
Bootshaft Bearing	Ball bearing, four bolt flange	
Construction	Carbon, galvanized or 304 stainless steel	
Drive Package	Optional	
Motor	Optional	

DIMENSION DRAWING

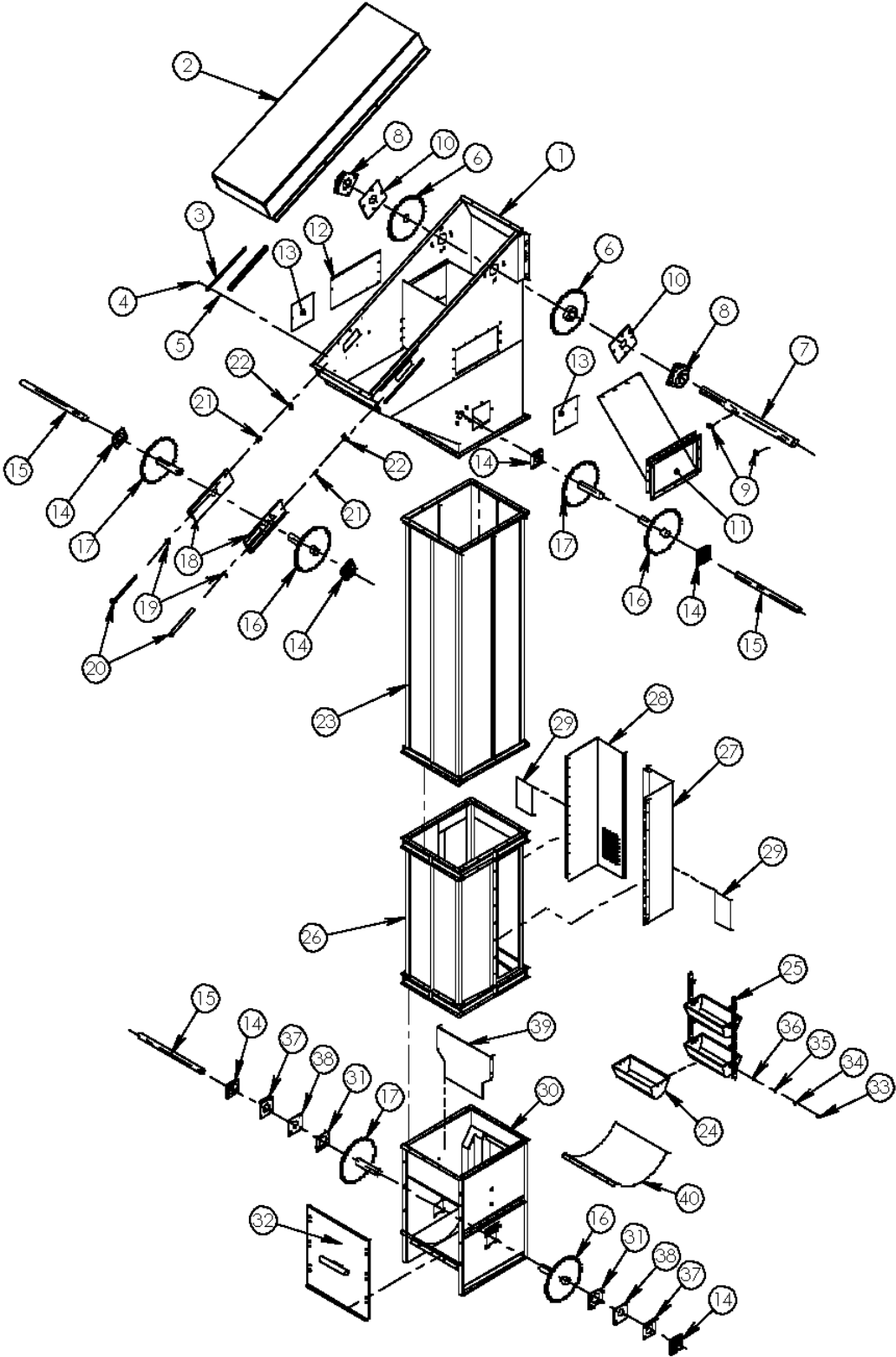
P2800 BUCKET ELEVATOR

Up to 2,879 CFH (81.5 CMH)



PARTS DIAGRAM

MODEL P2800 EXPLODED PARTS



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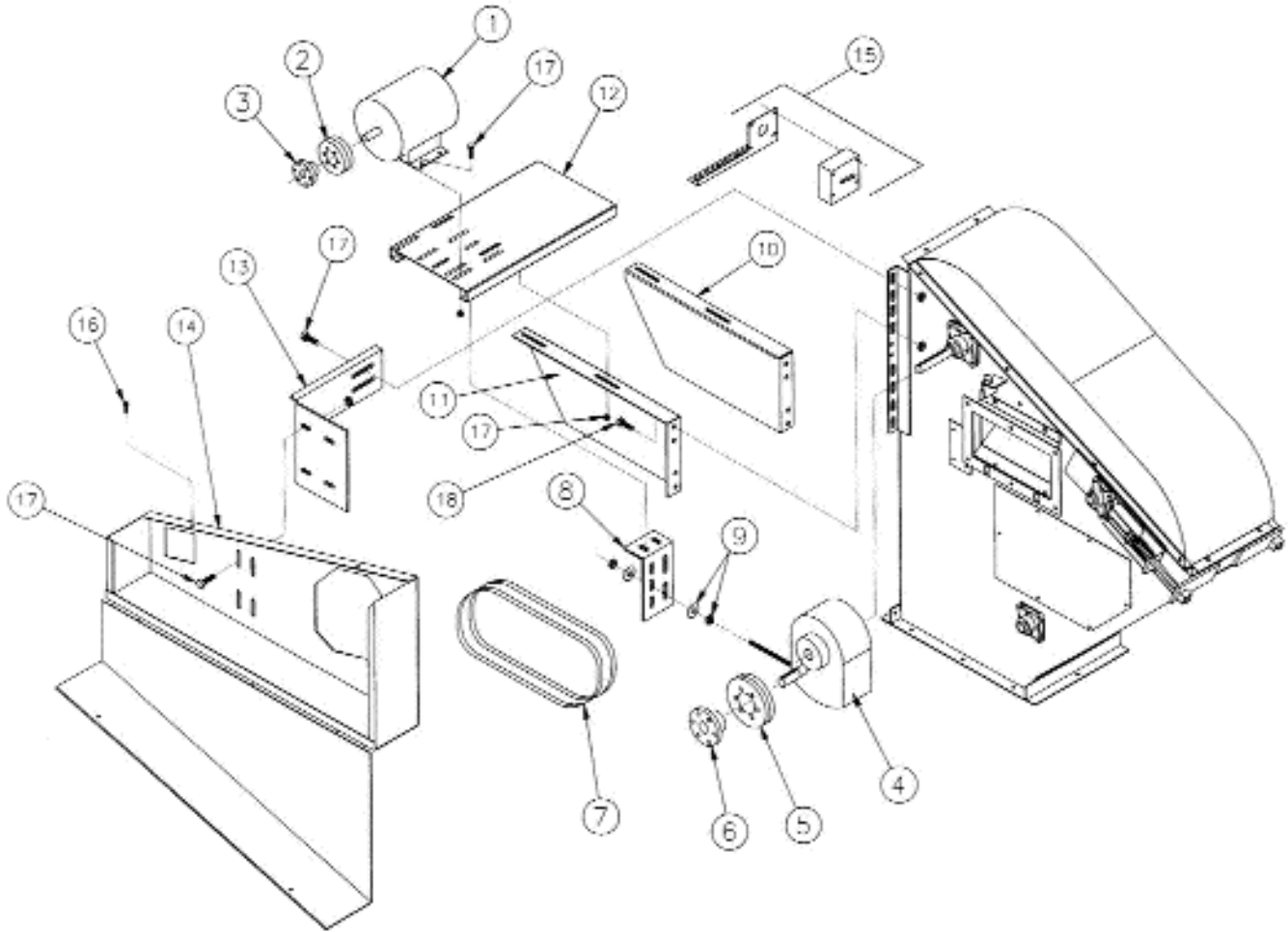
PARTS LIST

INDEX NO.	PART NO.	DESCRIPTION	QTY.
1	48373	CASING,HEAD,P2800,CS	1
2	48394	COVER,ASSY,HEAD,P2800,CS	1
3	48393	GUIDE,TAKEUP,P2800,GS	4
4	43399	NUT,HEX,0.250-20,ZP	16
5	30428	BOLT,CB,0.250X0.50	16
6.1	44926	SPROCKET,B,80B51H,2.938"BORE	AR
6.2	44927	SPROCKET,B,80B51H,3.438"BORE	AR
6.3	44928	SPROCKET,B,80B51H,3.938"BORE	AR
7.1	45037	SHAFT,HEAD,P2800,#2,2.94=>2.44	AR
7.2	44487	SHAFT,HEAD,P2800,#2,2.94=>2.19	AR
7.3	45038	SHAFT,HEAD,P2800,#2,3.44=>2.94	AR
7.4	45039	SHAFT,HEAD,P2800,#2,3.94=>3.44	AR
8.1	35067	BRG,2.937,4BFL,SCM	AR
8.2	35070	BRG,3.437,4BFL	AR
8.3	35072	BRG,3.937,4BFL,TYPE-E	AR
9	44906	KEY,SQ,0.75X2.00	2
10.1	45274	SEAL,HEADSHAFT,PELEV,2.94,UHMW	AR
10.2	47134	SEAL,HEADSHAFT,PELEV,3.44,UHMW	AR
10.3	43647	SEAL,HEADSHAFT,PELEV,3.94,UHMW	AR
11	48385	DISCHARGE,HEAD,P2800,CS	1
12	48397	COVER,HEAD,DISCHARGE,HEAD,P2800,CS	1
13	43320	COVER,HEAD,INSPECTION,PELEV,CS	2
14	35056	BRG,1.937,4BFL	6
15	44326	SHAFT,IDLER,P2800,1.938X29.938,CS	3
16	44320	SPROCKET&SLEEVE,ASSY,P2800,CS,W/O SET SCREWS	3
17	45282	SPROCKET&SLEEVE,ASSY,P2800,CS,W/ SET SCREWS	3
18	48391	SLIDE,TAKEUP,P2800,CS	2
19	30416	WASHER,FLAT,0.750,ZP	2
20	35465	BOLT,TAKEUP,0.75-6ACMEX12.38,HH,CS	2
21	35744	SPRING,DIE,1.50-ODX0.750-IDX	2
22	37098	NUT,ASSY,HEAD,PELEV,CS	2
23.1	45015	TRUNK,12.00",P2800,CS	AR
23.2	45016	TRUNK,24.00",P2800,CS	AR
23.3	45017	TRUNK,36.00",P2800,CS	AR
23.4	45018	TRUNK,48.00",P2800,CS	AR
23.5	45019	TRUNK,60.00",P2800,CS	AR
23.6	45020	TRUNK,72.00",P2800,CS	AR
23.7	45021	TRUNK,84.00",P2800,CS	AR
23.8	44300	TRUNK,96.00",P2800,CS	AR
24	30441	BKT,HDPE,18.00X8.00,STYLE-SS	AR
25	45035	CHAIN,W/ATTACHMENTS,P2800,CS	AR
26A	47081	ACCESS,COMP,W/COVER,P2800,CS	1
26	44306	CASING,ACCESS,ASSY,P2800,CS	1
27	44294	COVER,ASSY,ACCESS,P2800,LH,CS	1
28	44304	COVER,ASSY,ACCESS,P2800,RH,CS	1
29	44297	COVER,INSPECTION,ACCESS,P2800,CS	2
30	44318	CASING,BOOT,ASSY,P2800,CS	1
31	44313	RETAINER,BOOT,P2800,CS	2
32	44857	COVER,ASSY,BOOT,P2800,CS	1
33	45308	SCREW,HHCS,0.25-20X1.25,ZP	AR
34	45309	WASHER,BUCKET-SPACER,1.00DX0.28IDX0.5THX	AR
35	30411	WASHER,FLAT,0.250	AR
36	30642	NUT,HEXNYLOCK,0.250-20,ZP	AR
37	44329	PLATE,BRG,ADJUSTMENT,P2800,GS	2
38	44327	GASKET, RETAINER,BOOT,P2800	2
39	44322	PANEL,DEFLECTOR,P2800,CS	1
40	45275	COVER,ASSY,BOOT,BTTM,P2800,CS	1
	39816	SWITCH,DISCONNECT&SHUTOFF,CS	1

LEGEND:

CS = CARBON STEEL	GS = GALVANIZED STEEL	DL = DOWN-LEG	UL = UP-LEG	BRG = BEARING
2BPB = 2 BOLT PILLOW BLOCK	CI = CAST IRON	ZP = ZINC PLATED	TU = TAKE-UP	GR = GRADE
OD = OUTSIDE DIAMETER	ID = INSIDE DIAMETER	2BFL = 2 BOLT FLANGE	BKT = BUCKET	HDPE = PLASTIC
VNT = VENTED	SS = STAINLESS STEEL	EB = ELEVATOR BOLT	UHMW = ULTRA HIGH MOLECULAR WEIGHT	
HHCS = HEX HEAD CAP SCREW	GA = GAUGE	BLK = BLACK	HD = HEAD DIAMETER	PKG = PACKAGE

#2 DRIVE PARTS LIST



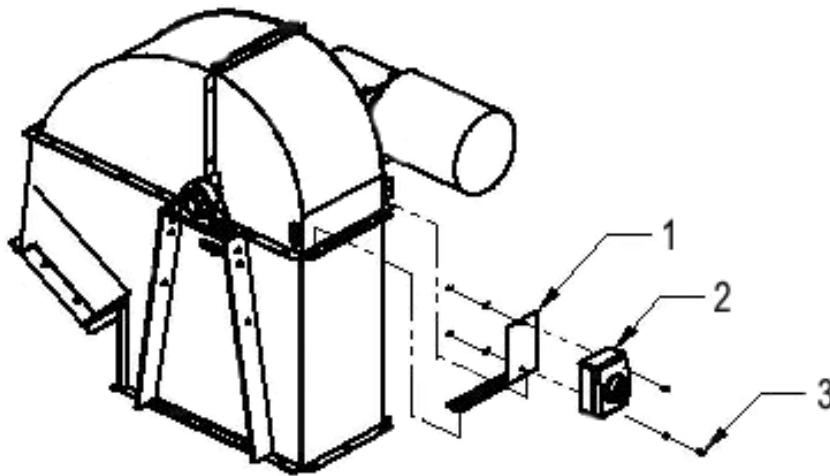
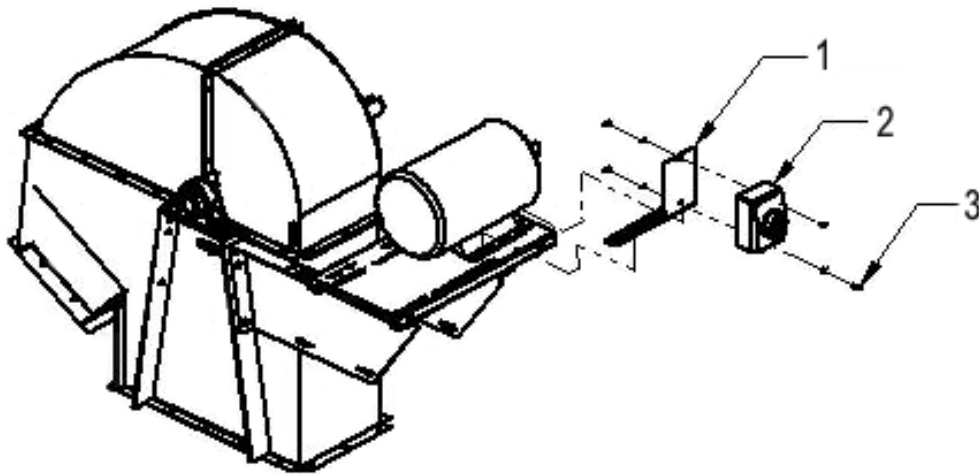
INDEX NO.	PART NO.	DESCRIPTION	QTY.
1	-----	MOTOR	1
2	-----	SHEAVE (Motor) **	1
3	-----	BUSHING,MOTOR SHEAVE	1
4	-----	REDUCER **	1
5	-----	SHEAVE (Reducer) **	1
6	-----	BUSHING, REDUCER SHEAVE	1
7	-----	V-BELT(S) **	AR
8	37323	BRKT,TORQUE,P,#2,CS	1
9.1	-----	NUT, TORQUE ARM**	2
9.2	-----	WASHER, TORQUE ARM**	2
10	37325	PLATE,MOTORMOUNT,P,LH,CS	1
11	37324	PLATE,MOTORMOUNT,P,RH,CS	1
12.1	37326	PLATE,MOTOR,#2,P1200,CS	1
12.2	37327	PLATE,MOTOR,#2,P880,CS	1
13	43080	PANEL,BENT,10X9.00X18.00,LH,CS	1
14	43076	GUARD,DRIVE,P2,LH,CS	2
15	39816	SWITCH,DISCONNECT&SHUTOFF (ELEVATOR SAFETY SWITCH PKG)	1

**CONSULT FACTORY WITH MODEL OF ELEVATOR

LEGEND:

BRG = BEARING	2BPB = 2 BOLT PILLOW BLOCK	CS = CARBON STEEL	BRKT = BRACKET
LH = LEFT HAND	RH = RIGHT HAND	GS = GALVANIZED STEEL	PKG = PACKAGE

LOCKABLE DISCONNECT SWITCH



Item #	Description	Part #	Quantity
1	Bracket	30348	30348
2	Lockable Disconnect Switch	47700	47700
3	Machine Screw, #8-32 x 3/4	30406	30406
	Flatwasher	30417	30417
	Hex Nut	30424	30424

DECAL DIAGRAM

SAFETY INSTRUCTIONS


THE OPERATOR IS RESPONSIBLE TO READ AND UNDERSTAND THE SAFETY INSTRUCTIONS OF THIS MACHINE. RESTRICTED MUST RECEIVE:

1. READ ALL SYMBOLS IN PLACE
2. KEEP GUARDMEASURES PROPERLY ADJUSTED TO SAFE PROBLEMS
3. DO NOT CLEAN OR SERVICE WHILE RUNNING AND NEVER TO BE CLEAN BY HANDS
4. LOCK POWER OFF BEFORE CLEANING OR SERVICING THIS MACHINE

PLEASE TO HAVE REGISTRATION INFO. THIS DECAL IS NOT TO BE REMOVED OR ALTERED.

A. 30139

WARNING



DO NOT STEP ON OR CROSS OVER THIS CONVEYOR WHEN UNIT IS RUNNING OR STOPPED. CROSSING AT WALKWAYS PROVIDED. FAILURE TO FOLLOW THIS WARNING MAY CAUSE SERIOUS INJURY OR DEATH.

B. 30137

DANGER

LOCK POWER OFF. SERIOUS INJURY OR DEATH MAY OCCUR WHEN THIS COVER IS OPENED. SERVICING MUST BE DONE WITH POWER LOCKED OFF. MAKE SURE ALL PERSONS ARE AWAY FROM THE COVER. COVER MUST BE CLOSED AND OFF. REPLACE ALL COVERS AND GUARDS BEFORE RETURNING MACHINE TO OPERATING STATUS.

C. 30140

DANGER

PINCH POINT

BE VERY CAREFUL WITH HANDS WHEN MACHINE IS RUNNING. LOCK OFF POWER WHEN CLEANING OR SERVICING MACHINE. FAILURE TO FOLLOW THIS WARNING MAY CAUSE SERIOUS INJURY OR DEATH.



E. 30128

WARNING

ADJUSTABLE OVERLOAD CLUTCH UNDER THIS COVER.

MAY HAVE HOT SURFACES. LOCKOUT POWER BEFORE SERVICING OR ADJUSTING.

THIS UNIT - LOADED OR EMPTY - EVEN WITH POWER OFF - COULD RUN FORWARD OR BACKWARD IF CLUTCH IS LOOSENED. ALWAYS KEEP OTHER PERSONS AWAY FROM ENTIRE MACHINE WHEN SERVICING THE CLUTCH. FAILURE TO DO SO COULD CAUSE SEVERE INJURY OR DEATH.

D. 30141

SAFETY INSTRUCTION

PULL CORD TO STOP CONVEYOR

DO NOT REMOVE OR COVER THIS CORD.



F. 41809

WARNING

THIS UNIT WILL START AUTOMATICALLY WITHOUT WARNING. DISCONNECT AND LOCK OFF POWER BEFORE CLEANING OR SERVICING.

G. 30132

WARNING



LOCK POWER OFF BEFORE CLEANING OR SERVICING THIS MACHINE. FAILURE TO DO SO MAY RESULT IN SEVERE INJURY OR DEATH.

H. 30131

WARNING



DO NOT STEP ON OR CROSS OVER THIS CONVEYOR WHEN UNIT IS RUNNING OR STOPPED. CROSSING AT WALKWAYS PROVIDED. FAILURE TO FOLLOW THIS WARNING MAY CAUSE SERIOUS INJURY OR DEATH.

J. 30143

Universal Industries

1000 W. 10th St. - Lubbock, TX 79401
Phone: (806) 791-1111 - Fax: (806) 791-1112
www.universalind.com

G. 30132

WARNING



BE SERVICED OR REPAIRED THIS COVER WILL EXPOSE MACHINE PARTS THAT CAN CAUSE SERIOUS INJURY OR DEATH. LOCK POWER OFF. ONLY TRAINED PERSONS USING EXTREME CAUTION SHOULD EVER CLEAN, REPAIR OR ADJUST THIS MACHINE WITH COVERS REMOVED. REPLACE COVERS AND GUARDS BEFORE USING THIS MACHINE.

K. 30129

WARNING

KEEP OFF

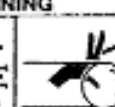
THIS IS NOT A STEP. COVER IS TO PREVENT ACCIDENTAL CONTACT WITH ELEVATOR CUPS. REPLACE COVER AFTER EACH USE.



L. 30144

WARNING

BE SERVICED OR REPAIRED THIS COVER WILL EXPOSE MACHINE PARTS THAT CAN CAUSE SERIOUS INJURY OR DEATH. LOCK POWER OFF. ONLY TRAINED PERSONS USING EXTREME CAUTION SHOULD EVER CLEAN, REPAIR OR ADJUST THIS MACHINE WITH COVERS REMOVED. REPLACE COVERS AND GUARDS BEFORE USING THIS MACHINE.



S. 30146

SAFETY, INSTALLATION, AND MAINTENANCE MANUAL

DO NOT USE, OPERATE, CLEAN OR REPAIR THIS MACHINE UNTIL THE ENCLOSED MANUAL HAS BEEN READ AND UNDERSTOOD. FAILURE TO DO SO MAY RESULT IN SEVERE INJURY OR DEATH. IF MANUAL IS MISSING, CONTACT UNIVERSAL INDUSTRIES, 1000 W. 10TH ST. LUBBOCK, TEXAS 79401 (806) 791-1111.

P. 30134

PLEASE CHECK!

A WARNING SYMBOL MUST BE VISIBLE AT ALL TIMES. CHECK THE TABLE OF SET SCREWS BY INCLUDING TOOL AND PART NUMBER. MAKE SURE ALL SCREWS ARE TIGHT. ALWAYS WEAR SAFETY GLASSES WHEN OPERATING OR MAINTAINING THIS MACHINE.



T. 30130

UNIVERSAL

M. 30133

UNIVERSAL

N. 30145

DECAL PARTS LIST

DRAWING SYMBOL	PART NUMBER	DESCRIPTION	QTY.
A	30139	Decal,Safety Instruction	1
B	30137	Decal,Hopper Warning Sign	2
C	30140	Decal,Danger Sign	1
D	30141	Decal,Adjustable Clutch Sign	0
E	30128	Decal,Pinch Point Sign	1
F	41809	Decal,Safety,Instruction,Conv	0
G	30132	Decal,Auto Start Warning	0
H	30131	Decal,Disconnect/Lockout Sign	1
J	30143	Decal,Crossover	0
K	30129	Decal,Access&CVR Warning Sign	2
L	30144	Decal,Hopper Cover Warning Sign	1
M	30133	Decal,Vertical Universal Sign	2
N	30145	Decal,Horizontal,3.00X14.50 (Universal)	0
P	30134	Decal,Installation Maintenance (Manual Holder Sign)	1
R	30135	Decal,Identification Sign	1
S	30146	Decal,Drive Guard Warning	1
T	30130	Decal, Please Check Setscrew	2

SOURCES OF STANDARDS AND CODES

The Company expects the customer/owner of supplied equipment to comply with all applicable safety code standards, and good practices. Below is a list of organizations that publish various standards that may apply to your machine. This list is included for your convenience, does not necessarily contain all codes and standards, and is to be periodically updated by you.

Universal recommends that owners and operators make an effort to keep themselves informed on the topic of safety. Standards are constantly evolving and it requires vigilance to remain fully informed.

Here is a list of some of the various standards that are categorized by subject of concern:

Safety Concern	Organization and Publication Section
Altering Safety Characteristics	ANSI B20.1 paragraph 5-12.7
Backstops, Brakes	ANSI B20.1 paragraph 5.05
Cages (for ladders)	OSHA 1910.24d, 2, 5
Drive Guards	OSHA 1910.219m; 217c2b
Electrical	NEC; OSHA 1910.300
Emergency Stop Switches	ANSI B20.1 paragraph 5-11.2c
Ladders	OSHA 1910.24b
Lock Out Hazardous Energy Sources	OSHA 1910.147
Platforms	OSHA 1910.23c3; 23e; 24b
Point of Operation	OSHA 1910.212a3; 217c2b; ANSI B20.1 paragraph 5.09.1.1
Guards and Covers	
Shafting, shaft ends, couplings, guards	OSHA 1910.219; .219c4; .219l
Inlet Grates	OSHA 1910.272j
Interfacing Machines	ANSI B20.1 paragraph 5-11c

For additional copies: write Universal Industries, Inc. • PO Box 308 • Cedar Falls, IA 50613

Addresses of some of the various societies publishing rules, regulations and recommended practices:

American Society of Agricultural Engineers (ASAE)
2950 Niles Road
St. Joseph, MI 10018

American National Standards Institute (ANSI)
25 West 43rd Street, 4th Floor
New York, NY 10036
Phone: (212) 642-4900

National Fire Protection Association (NFPA)
(Publisher of the National Electrical Code)(NEC)
P.O. Box 9101
Quincy, Massachusetts 02269-9101
Phone: (800) 344-3555

American Society of Mechanical Engineers (ASME)
345 East 47th Street
New York, NY 10017

U.S. Department of Agriculture (USDA)
14th Street and Independence Avenue, S.W.
Washington, DC 20250

Factory Mutual Engr. Corp. (FM)
P. O. Box 9102
Norwood, MA 02062
Phone: (781) 440-8000

Society of Automotive Engineers (SAE)
400 Commonwealth Drive
Warrenberg, PA 15096

Underwriters Laboratories (UL)
207 East Ohio Street
Chicago, IL 60611

American Society for Testing and Materials (ASTM)
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959
Phone: (610) 832-9585

OSHA, Office of Mechanical Engineering Safety Standards, Room N
3621 OSHA Dept. of Labor
200 Constitution N.W.
Washington, DC 20210

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