



MULTIFLO®

Installation and Operators Manual



Chore-Time Warranty

Chore-Time Poultry Production Systems, a division of CTB, Inc., (“Chore-Time”), warrants each new CHORE-TIME® product manufactured by it to be free from defects in material or workmanship for one-year from and after the date of initial installation by or for the original purchaser. If such a defect is found by Chore-Time to exist within the one-year period, Chore-Time will, at its option, (a) repair or replace such product free of charge, F.O.B. the factory of manufacture, or (b) refund to the original purchaser the original purchase price, in lieu of such repair or replacement. Labor costs associated with the replacement or repair of the product are not covered by the Manufacturer.

Additional extended warranties for the equipment and/or systems listed below are provided to the original purchaser as follows (for all other CHORE-TIME® products purchased, the one-year warranty period shall apply):

1. TURBO® and RLX™ fans, less motors - 3 years
2. TURBO® fan fiberglass housings, polyethylene cones, and cast aluminum blades - for the life of the product
3. TURBO® fan motors and bearings - 2 years
4. TURBO® fan components (including plastic shutters) - 3 years
5. Poultry feeder pans that become unusable within five years from the date of installation - Warranty prorated after three years usage
6. Rotating centerless augers, excluding applications involving high moisture feed stuffs (exceeding 18%), for ten years from the date of installation. Note: MULTIFLO® and applications involving high moisture feed stuffs are subject to a one-year warranty
7. Chore-Time manufactured roll-formed steel auger tubes for ten years from the date of installation
8. ULTRAFLO® Breeder Feeding System auger and feed trough are warranted for a period of five years from the date of original installation against repeated breakage of the auger or wear-through of the feed trough caused solely by the auger
9. ULTRAPAN® Feeding System augers are warranted for a period of five years from the date of installation

CONDITIONS AND LIMITATIONS

1. The product must be installed by and operated in accordance with the instructions published by the Manufacturer or Warranty will be void.
2. Warranty is void if all components of the system are not original equipment supplied by the Manufacturer.
3. This product must be purchased from and installed by an authorized distributor or certified representative thereof or the Warranty will be void.
4. Malfunctions or failure resulting from misuse, abuse, negligence, alteration, accident, or lack of proper maintenance shall not be considered defects under the Warranty.
5. This Warranty applies only to systems for the care of poultry and livestock. Other applications in industry or commerce are not covered by this Warranty.

Chore-Time shall not be liable for any consequential or special damage which any purchaser may suffer or claim to suffer as a result of any defect in the product. "Consequential" or special damages" as used herein include, but are not limited to, lost or damaged products or goods, costs of transportation, lost sales, lost orders, lost income, increased overhead, labor and incidental costs and operational inefficiencies.

THIS WARRANTY CONSTITUTES THE MANUFACTURER'S ENTIRE AND SOLE WARRANTY AND THIS MANUFACTURER DISCLAIMS ANY AND ALL OTHER WARRANTIES, INCLUDING, BUT NOT LIMITED TO, EXPRESS AND IMPLIED WARRANTIES AS TO MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSES SOLD AND DESCRIPTION OR QUALITY OF THE PRODUCT FURNISHED HEREUNDER.

Chore-Time Distributors are not authorized to modify or extend the terms and conditions of this Warranty in any manner or to offer or grant any other warranties for Chore-Time products in addition to those terms expressly stated above.

An officer of CTB, Inc. must authorize any exceptions to this Warranty in writing. Chore-Time reserves the right to change models and specifications at any time without notice or obligation to improve previous models.

Effective: **July 2004**

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Thank You

The employees of Chore-Time would like to thank your for your recent Chore-Time purchase. If a problem should arise, your Chore-Time distributor can supply the necessary information to help you.

***Chore-Time Poultry Feeder Pan Pro Rata Schedule**

Year from date of installation during which pan becomes unusable	Charge to be paid by the purchaser for replacement.
0 - 1 years	NO CHARGE
1 - 2 years	NO CHARGE
2 - 3 years	NO CHARGE
3 - 4 years	4/10 of then current list price
4 - 5 years	5/10 of then current list price

Contents

Topic	Page
Chore-Time Warranty	2
CONDITIONS AND LIMITATIONS	3
About This Manual	6
Safety Information	6
Safety Instructions	7
Follow Safety Instructions	7
Decal Descriptions	7
DANGER: Moving Auger	7
DANGER: Electrical Hazard	7
CAUTION:	7
General	7
Support Information	7
MULTIFLO® SPECIFICATIONS	8
Auger Information	8
Auger Specifications	8
MULTIFLO® Effective Length Calculation	9
Example with 90° Elbow:	9
Example with 180° Elbow:	9
MULTIFLO® Components	10
Tubes, Elbows	10
Welding Bridge	10
Service Section	10
Side Draw Boots	10
Driver Assembly/Power Unit	11
Sleeve Switch Control	11
Auger	11
Planning the MULTIFLO® System	12
MULTIFLO® Boot Placement	12
Determine Where to Install Power Units	12
Outlet Drop Size and Placement	12
Examples of MULTIFLO® System Layout	13
MULTIFLO® Installation	15
Adapter Plate and MULTIFLO® Boot	15
Auger Tubes and Nylon Elbows	16
Cementing the Auger Tubes	16
Power Unit and Driver Assembly Installation	17
Install the Welding Bridge	17
Install Hand Crank Assembly	18
Installing the Auger	19
Auger Connector Installation	20
Brazing the Auger	22
Install the Service Section Cover	22
Install the Hand Crank Closure	23
Install the Boot Clean-Out Cover	23
Install the Gear Drive and Hub	24
Wiring the System	25
Notes for Wiring Diagrams	25
MULTIFLO Motor Wiring (Motor Part No. 14750) GE 1/2 hp	25

Contents - continued

Topic	Page
Hi-Speed MULTIFLO Motor Wiring (Motor Part No. 5051) GE 3/4 hp	25
FLEX-AUGER® Fill System Supplying a single MULTIFLO® loop	26
FLEX-AUGER® Fill System Supplying a single Hi-Speed MULTIFLO® loop	27
FLEX-AUGER® Fill System Supplying two MULTIFLO® loops w/boot switch	28
FLEX-AUGER® Fill System Supplying two Hi-Speed MULTIFLO® loops w/boot switch	29
FLEX-AUGER® Fill System Supplying three MULTIFLO® loops w/boot switch	30
Parts Listing	31
Power Unit and Driver Assembly	31
Complete Power Unit and Driver Assemblies	31
Control And Intermediate Boot Assemblies	32
Proximity Sleeve Switch Part No. 40508	33
Installation Tools	34
Service Section Part No. 8710	34
Line Components	35
Trouble Shooting Guide	36

About This Manual

The intent of this manual is to help you in two ways. One is to follow step-by-step in the order of assembly of your product. The other way is for easy reference if you have questions in a particular area.

Important: **Read ALL instructions carefully before starting construction.**

Important: **Pay particular attention to all SAFETY information.**

- *Metric measurements are shown in millimeters and in brackets, unless otherwise specified. " " equals inches and " ' " equals feet in English measurements.*

Examples:

1" [25.4]

4' [1 219]

- Optional equipment contains necessary instructions for assembly or operation.
- Very small numbers near an illustration (*i.e.*, 1257-48) are identification of the graphic, not a part number.

Note: The original, authoritative version of this manual is the English version produced by CTB, Inc. or any of its subsidiaries or divisions, (hereafter collectively referred to as "CTB"). Subsequent changes to any manual made by any third party have not been reviewed nor authenticated by CTB. Such changes may include, but are not limited to, translation into languages other than English, and additions to or deletions from the original content. CTB disclaims responsibility for any and all damages, injuries, warranty claims and/or any other claims associated with such changes, inasmuch as such changes result in content that is different from the authoritative CTB-published English version of the manual. For current product installation and operation information, please contact the customer service and/or technical service departments of the appropriate CTB subsidiary or division. Should you observe any questionable content in any manual, please notify CTB immediately in writing to: CTB Legal Department, P.O. Box 2000, Milford, IN 46542-2000 USA.

Safety Information

Caution, Warning and Danger Decals have been placed on the equipment to warn of potentially dangerous situations. Care should be taken to keep this information intact and easy to read at all times. Replace missing or damaged safety decals immediately.

Using the equipment for purposes other than specified in this manual may cause personal injury and/or damage to the equipment.

Safety–Alert Symbol



This is a safety–alert symbol. When you see this symbol on your equipment, be alert to the potential for personal injury. This equipment is designed to be installed and operated as safely as possible...however, hazards do exist.

Understanding Signal Words

Signal words are used in conjunction with the safety–alert symbol to identify the severity of the warning.



DANGER indicates an imminently hazardous situation which, if not avoided, **WILL** result in death or serious injury.



WARNING indicates a potentially hazardous situation which, if not avoided, **COULD** result in death or serious injury.



CAUTION indicates a hazardous situation which, if not avoided, **MAY** result in minor or moderate injury.

Safety Instructions

Follow Safety Instructions

Carefully read all safety messages in this manual and on your equipment safety signs. Follow recommended precautions and safe operating practices.

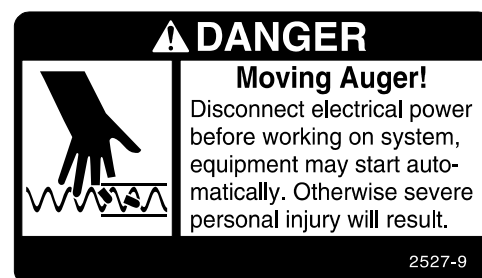
Keep safety signs in good condition. Replace missing or damaged safety signs.

Decal Descriptions

DANGER: Moving Auger

This decal is placed on the Panel Weldment.

Severe personal injury will result, if the electrical power is not disconnected, prior to servicing the equipment.



DANGER: Electrical Hazard

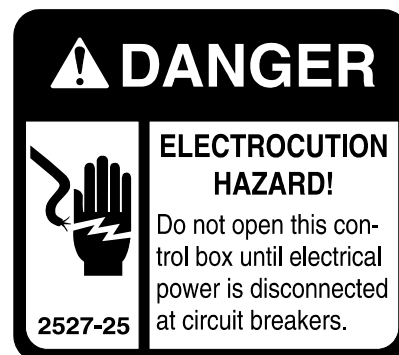
Disconnect electrical power before inspecting or servicing equipment unless maintenance instructions specifically state otherwise.

Ground all electrical equipment for safety.

All electrical wiring must be done by a qualified electrician in accordance with local and national electric codes.

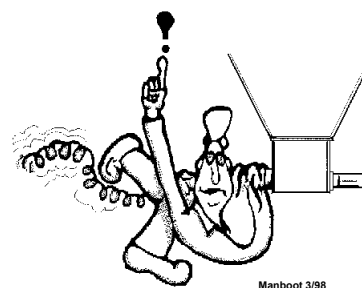
Ground all non-current carrying metal parts to guard against electrical shock.

With the exception of motor overload protection, electrical disconnects and over current protection are not supplied with the equipment.



CAUTION:

Use caution when working with the Auger—springing Auger may cause personal injury.



General

Support Information

Using this equipment for any other purpose or in a way not within the operating recommendations specified in this manual will void the warranty and may cause personal injury.

This manual is designed to provide comprehensive planning and installation information. The Table of Contents provides a convenient overview of the information in this manual.

MULTIFLO® SPECIFICATIONS

The MULTIFLO® Feed Delivery System is a closed “loop” system which pulls the auger through the tube. The system is used primarily in nurseries, gestation, and dairy houses. **It is recommended for systems with running times of less than 2 hours per day and no high moisture corn.**

Read all instructions carefully and familiarize yourself with the components before beginning to install the MULTIFLO® system. Determine approximate layout of the system where each component will be placed, how much space it will require, how it will be suspended, and so forth. be careful to plan the system so it does not interfere with ventilation, watering systems, or other equipment in the building. “Examples of MULTIFLO® System Layout” on page 13 shows some possible MULTIFLO® “layouts”. These are to be used as examples only.

Auger Information

7961MF Auger is specifically designed for use in MULTIFLO® Systems. It differs from standard 7961 Auger used with Model 55 Feeding Systems, the 7961MF Auger contains no factory brazes. MULTIFLO® Auger should be connected using an Auger Connector when it is necessary to join sections of the 7961MF Auger. However, the welding or brazing technique is acceptable. Remember, brazing MULTIFLO® auger is considerable different than for other Chore-Time auger systems (see page 9).

Auger Specifications

Auger Tube: 55 mm PVC Tube

Elbows: 90 degree, 2" (51 mm) I.D. two piece nylon elbow w/24" (610 mm) center line radius. **The maximum number of 90 degree elbows allowed for each MULTIFLO® loop is 4.**

180 degree, 2.12" (54 mm) O.D. x 2" I.D. Hardened Steel Elbow w/39" (990 mm) center to center turn.

The maximum number of 180 degree elbows allowed for each MULTIFLO® loop is 2.

Auger: 7961MF for systems 400' (122 m) or shorter, auger should be one piece. Maximum length auger for shipment is 400' (122 m). It is important to specify length of the system when ordering auger. Auger for longer systems will be sent in most desirable section lengths. Example: for a 450' (137 m) MULTIFLO® System, it would be better to use two 225' (69 m) sections of auger than one 400' (122 m) section and one 50' (15 m) section. Specify system length and Chore-Time will supply the best available combination of auger. Handle auger carefully. Store flat if it is to be stored for a period of time prior to installation.

Auger Drive: Helical Gear.

Power Unit: Standard 1/2 HP, 62 RPM Direct Drive, 230 V, 60 Hz; 220 V, 50 Hz, Single Phase; 380 V, 50 Hz, 3 Phase

Hi-Speed 3/4 HP, 95 RPM Direct Drive, 230 V, 60 Hz, Single Phase

Power Unit Capacity: 400' (122 m) Effective Length. Effective Length is based on feed with 40 lb/cu.ft (64 kg/cu. meter) density.

System Capacity: 1200' (366 m) Effective Length (with three Power Units-maximum)

Delivery Capacity:

Standard: 15 lb/min (6.8 kg/min) with Model 55 FLEX AUGER® Fill System

Standard: 18 lb/min (8.1 kg/min) with Model 75 or HMC FLEX AUGER® Fill System @ 129 RPM

Hi-Speed: 50 lb/min (22.6 kg/min) with Model 75 or HMC FLEX AUGER® Fill System @ 348 RPM

Feed Types: Ground feeds, crumbles, and pellets up to/including 3/16" dia. x 1/2" long (4.7 x 12.7 mm), not to exceed 18% moisture. **The MULTIFLO® system is not recommended for high moisture feed.**

MULTIFLO® Effective Length Calculation

The Effective Length if a MULTIFLO System is calculated an shown. Before beginning to install the system, determine the Effective Length of the system.

Important: You must know the Effective Length before placing the power units, service section area, and other system components.

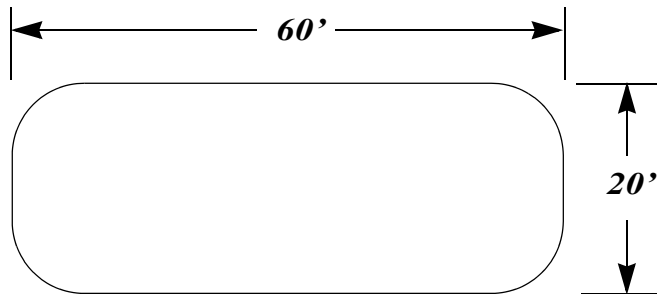
**Effective Length = Total Feet (meters) of Straight Lengths
PLUS**

Number of 90° Elbows x 30' (9.1 m)

or

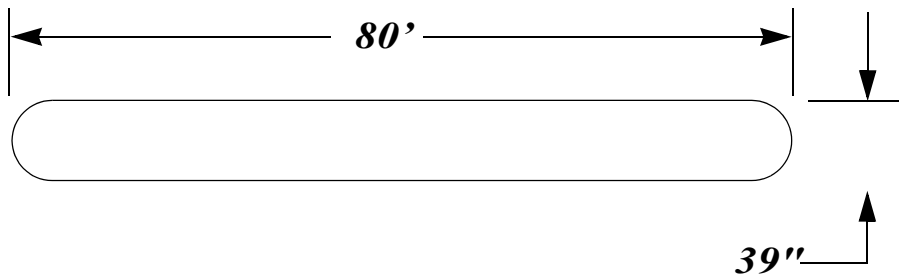
Number of 180° Elbows x 60' 18.2 m)

Example with 90° Elbow:



60' x 2 = 120', 20' x 2 = 40': given straight line length of 160'
 4 (90 degree elbows) x 30' = 120': given elbow length of 120'
 Straight line length (160') + elbow length (120') = Effective Length (280')

Example with 180° Elbow:

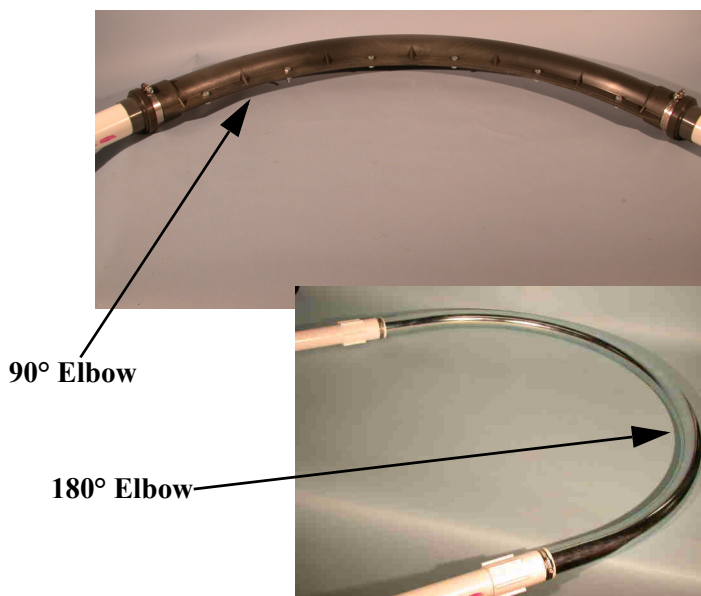


80' x 2 = 160': given straight line length of 160'
 2 (180 degree elbows) x 60' = 120': given elbow length of 120'
 Straight line length (160') + elbow length (120') = Effective Length (280')

MULTIFLO® Components

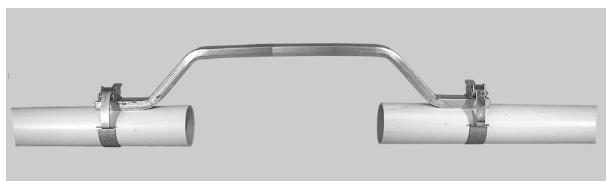
Tubes, Elbows

PVC Tubes are used to form the main portion of the delivery system. Tube is supplied in 10' (3 m) sections with an expanded end designed to fit over the end of the next tube for easy installation. PVC couplers are available for fitting tubes together without an expanded end. Nylon Elbows are 90 degree units with a compact, 24" (610 mm) Center-line radius or 180 degree with 39" (990 mm) center to center turn and have special PVC adapter to cement to tubes and clamp to elbows. Installation combinations for layout of the system are infinite, the layout charts "Examples of MULTIFLO® System Layout" on page 13 give examples of possible MULTIFLO® system designs. **These are examples only.** Many other component combinations are possible.



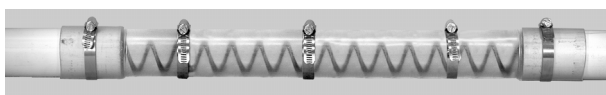
Welding Bridge

The Welding Bridge is used to hold the tubes in place when the Service Section is removed for auger brazing or servicing. It is recommended that the auger Welding Bridge be left in place after installation.



Service Section

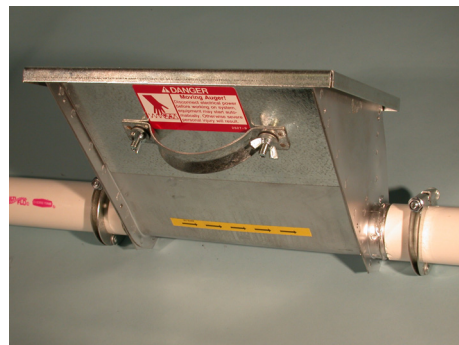
To allow access to the auger, a 17" (432 mm) section of auger tube should be removed and replaced with a clear plastic service access cover. During installation, this 17" (432 mm) opening is used to install the auger, in conjunction with a welding bridge and welding clamp both of which are MULTIFLO® installation tools. After installation is completed, this service section will allow maintenance and repair to the auger. Additionally, the service sections can be used as a visual aid to the system's operation.



Side Draw Boots

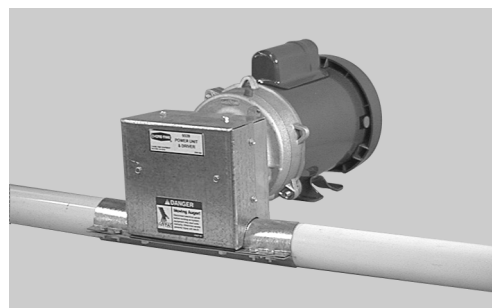
The Side Draw Boots fit beneath the FLEX-AUGER® Control Unit to receive the feed from the FLEX-AUGER® Feed Delivery System. The Side Draw feature controls the amount of feed entering the system supplying a smooth, steady feed supply to the MULTIFLO® line. The Side Draw Boots are single directional and should be installed according to the direction of auger travel.

For standard speed systems, use the standard Side Draw Boot.
For hi-speed systems use the Hi-Speed Side Draw Boot.



Driver Assembly/Power Unit

The MULTIFLO® Power Units are available in three voltages; 230V-60Hz-1PH, 220V-50Hz-1PH, and 220/380V-50Hz-3PH as direct drive power units. They are rated at 1/2 HP, 62 RPM and 3/4 HP, 95 RPM (Hi-Speed). They drive the helical gear driver assembly which powers the auger. Each power unit has a maximum capacity of 400' (122 m) effective length See "MULTIFLO® Effective Length Calculation" on page 9. with the MULTIFLO® system.

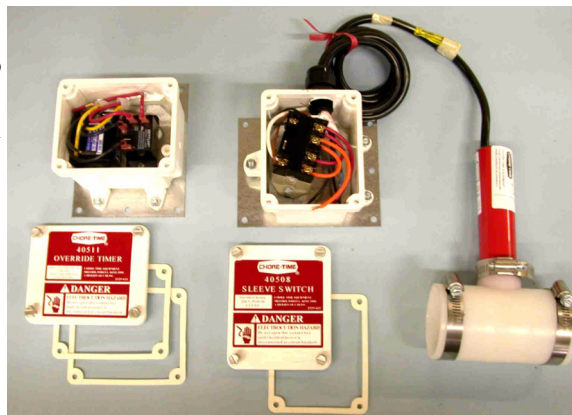


Sleeve Switch Control

The Sleeve feature of this switch allows the proximity switch to be located at the source of the feed. It will sense the level of feed passing in the auger. The Sleeve Switch is supplied with an override timer to allow start-up and purging of the MULTIFLO® System.

Auger

MULTIFLO® Auger circulates around the system delivering feed. Unlike other Chore-Time augers it is not turned by the power unit but is driven with a helical gear. Therefore, it has some different capabilities and requirements. It is recommended the auger be connected using an Auger



Connector, See the Auger Connector installation section in this manual. An alternate way of connecting the auger is brazing. See the Auger Brazing section in this manual.

MULTIFLO® Auger is shipped in lengths up to 400' (122 m). Specify length of the system when ordering auger. The MULTIFLO Auger has no brazes as shipped from the factory. Therefore, for systems shorter than 400' (122 m) the auger can be one-piece with only a connector or braze where the ends are joined following installations. For longer systems it will be necessary to join sections of auger together but these should be kept to a minimum and it is very important to follow the connecting recommendations in this manual!

Planning the MULTIFLO® System

Planning for the MULTIFLO® installation should be coordinated with planning for the FLEX-AUGER® feed delivery system installation so the advantages of each system can be used effectively. The diagram in Example 4 on page 13 shows how a FLEX-AUGER and MULTIFLO loop can work together to fill three rows of feeders. See the FLEX-AUGER operator's manual for information regarding the FLEX-AUGER feed delivery system.

Chains, “S” Hooks, and screw hooks are provided to suspend the system at least every 5' (1.5 m). The elbows should be supported in at least 2 places.

Important: Keep the system as straight and level as possible.

MULTIFLO® Boot Placement

The MULTIFLO Side Draw Boot placement is determined by where the FLEX-AUGER feed delivery system is terminated. Installation of the FLEX-AUGER feed delivery system should be planned with this in mind. The MULTIFLO Side Draw Boot is directional.

Important: It is not recommended to place the MULTIFLO Boot directly adjoining an elbow. Try to locate the boot a few feet prior to or after an elbow in the system.

Determine Where to Install Power Units

Note placement of the power units See “Examples of MULTIFLO® System Layout” on page 13..

See “MULTIFLO® Effective Length Calculation” on page 9. to determine the Effective Length of the system.

The “Effective Length” between Power Units must not exceed 400' (122 m) regardless of the number or position of elbows

Power Units should be placed evenly around the system keeping:

- Single Power Units opposite the boot
- Boot approximately centered between two power units in multiple power unit systems (See “Examples of MULTIFLO® System Layout” on page 13. **Examples 2-4**)
- The “Effective Length” per power unit should be kept as equal (even) as possible.

If possible, install the Power Units in a straight section of tube and not adjacent to an elbow. See Example 1 on page 13.

Outlet Drop Size and Placement

A 1-1/2" (38 mm) hole is required at each outlet drop or drop feeder location. The last drop feeder before the control unit should not be more than 3' (1 m) from the control unit.

DO NOT install outlet drops on elbows, feed is required to cushion the auger here. The maximum angle of the outlet drop is 30 degrees.

Examples of MULTIFLO® System Layout

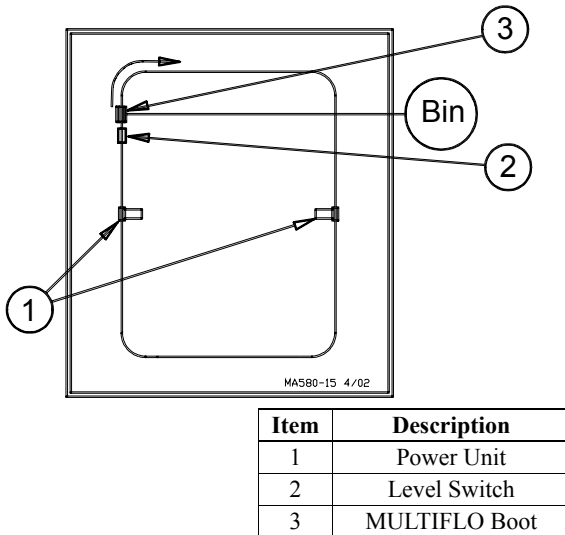
Example 1 shows a typical MULTIFLO® installation. Feed is brought into the building with a FLEX-AUGER® Delivery System to the MULTIFLO boot. Notice how the motor is spaced opposite the boot around the MULTIFLO system.

Example 2 shows a FLEX-AUGER system supplying four different MULTIFLO loops. This system could be used to feed rooms in a sow farrowing operation. Notice the use of 180 degree elbows to accommodate the narrow aisles in a farrowing room. Also notice the Intermediate Boots are located under the Outlet Assemblies in the first three rooms.

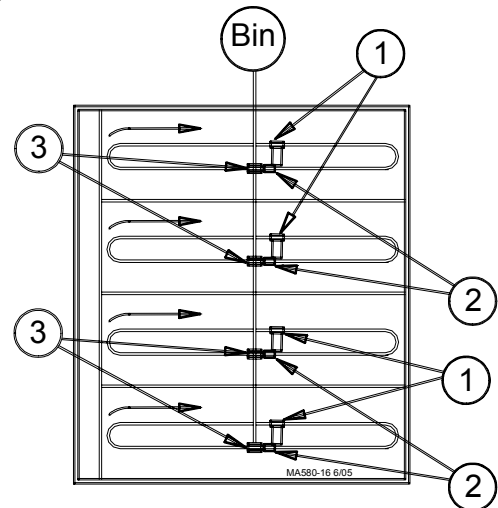
Example 3 shows a FLEX-AUGER Feed Delivery System with a twin boot supplying two similar sized MULTIFLO loops. As with all FLEX-AUGER to MULTIFLO systems adapter plates were installed on the FLEX-AUGER control units to attach the control units to the MULTIFLO boots. The Adapter Plates are supplied with the MULTIFLO boots.

Example 4 shows a FLEX-AUGER Feed Delivery System filling multiple MULTIFLO loops. This configuration requires outlet assemblies on the fill system to fill loops 1 and 2 and the fill system control unit would be over loop 3.

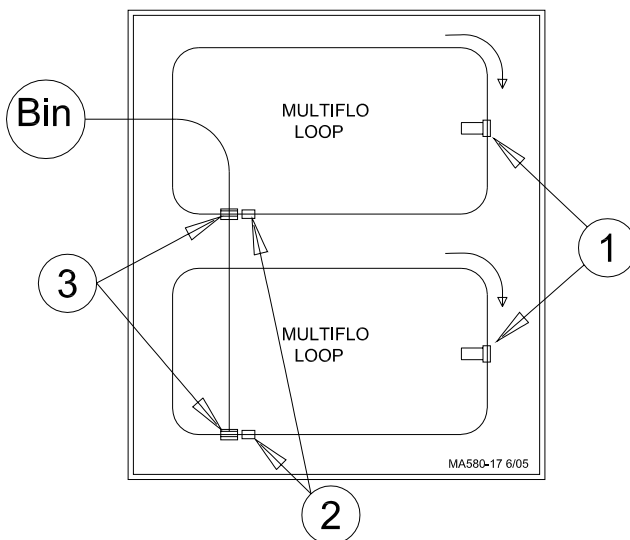
Example 1



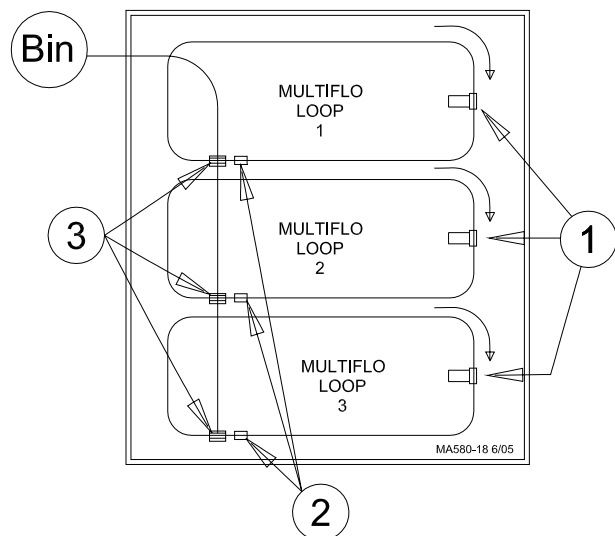
Example 2



Example 3

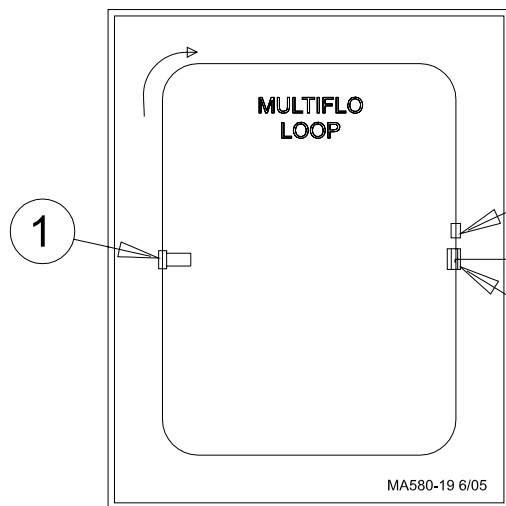


Example 4

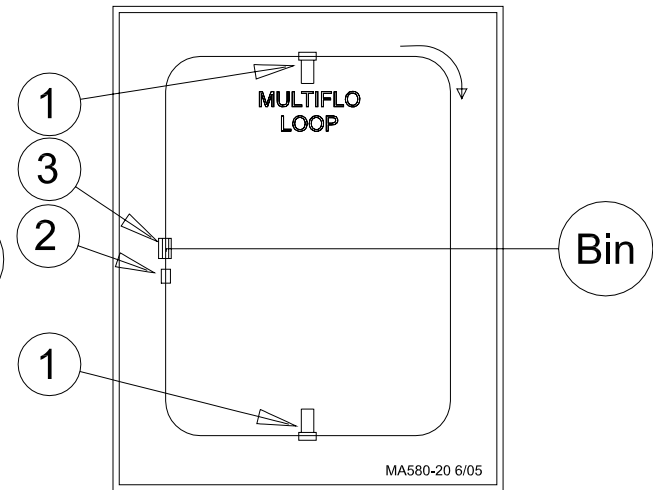


Diagrams below show possible power unit locations in relation to the FLEX-AUGER fill system.

Example 5 One Motor System

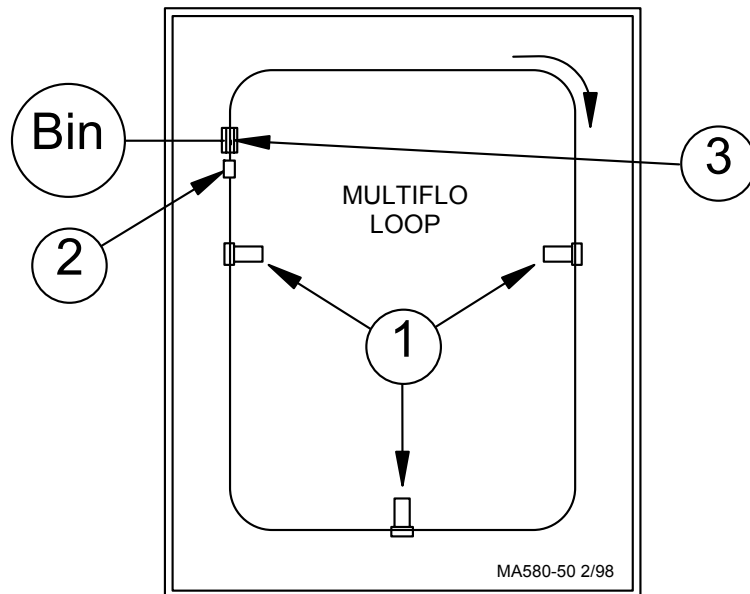


Example 6 Two Motor System



Example 7 Three Motor System

Item	Description
1	Power Unit
2	Level Switch
3	MULTIFLO Boot



Remember, these are examples only. The MULTIFLO System's versatility will provide almost unlimited combinations of delivery system designs. **Follow these guidelines for placement of components.**

MULTIFLO® Installation

Adapter Plate and MULTIFLO® Boot

1. Discard the plastic funnel packed with the FLEX-AUGER® Control Unit.
2. Attach the Adapter Plate to the bottom of the control unit. **See Figure 1 & 2.**
The Adapter Plate can be installed so the MULTIFLO® auger tubes can run either in line, or at right angles with the FLEX-AUGER auger tubes.

3. Attach the MULTIFLO boot to the adapter plate with (4) 1/4-20 bolts and nuts.

Note: The arrows on the boot point in the direction the auger must travel so the notch in the feed adjustment gate will be at the outgoing end of the boot. The auger should travel left to right, when viewing through the Clean-Out Cover hole.

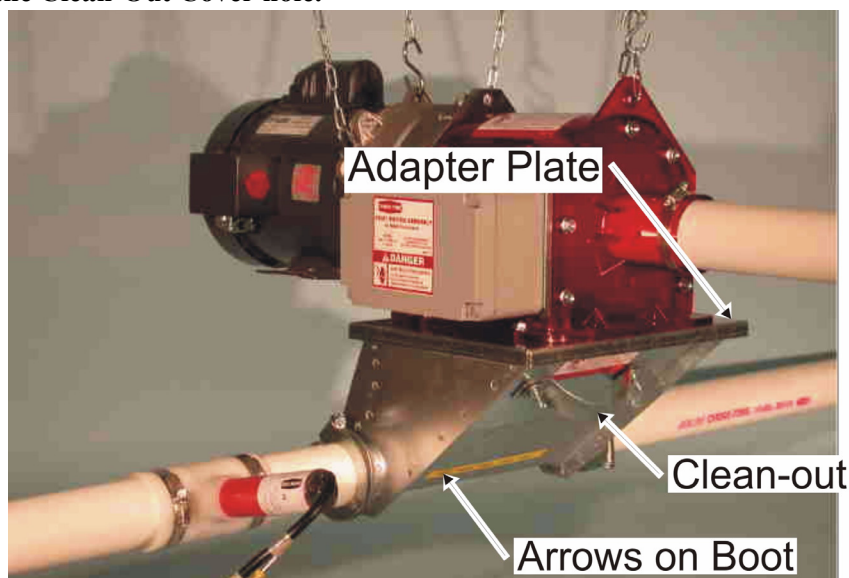


Figure 1. Auger Tubes run at a right angle.

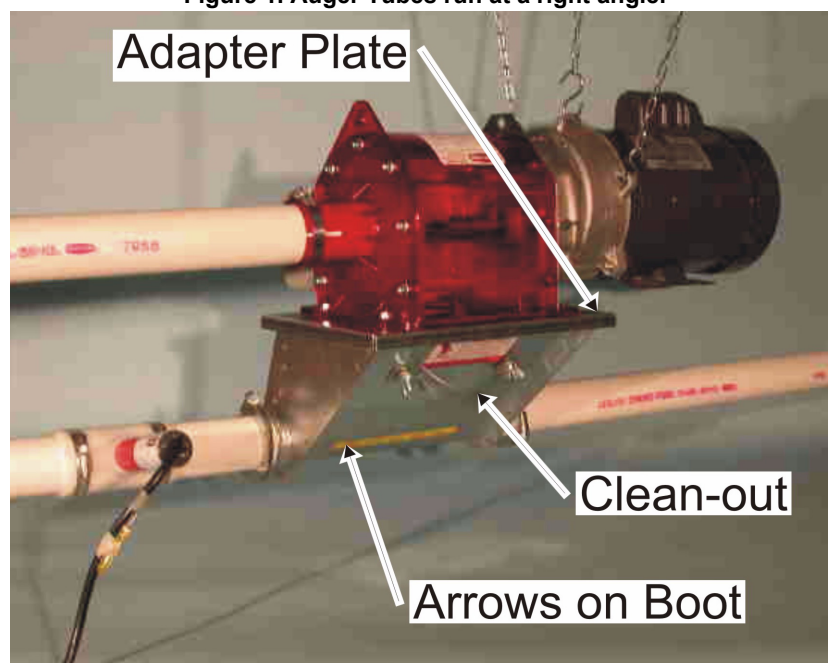


Figure 2. Auger Tubes run in-line

For FLEX-AUGER Feed Delivery System Installation

Refer to Chore-Time Instruction:

MA1702 Model 55, 75, 90 & HMC FLEX-AUGER Feed Delivery Operators Manual.

Auger Tubes and Nylon Elbows

Beginning at the MULTIFLO boot, layout the auger tubes and elbows in the approximate location of the system. The elbows should be assembled with adapters inserted and adjustable hose clamps tightened.

Important: The tubes belled end should be the inlet end for the auger travel.

Cut the outlet holes prior to installation of the tubes. Dry-fit all tubes and elbows before cementing them together to set up the system.

1. Assemble all elbows with molded adapters inserted into the tracks. The tracks are located on the inside surface of the elbows at both ends. Use (12) bolts and nuts provided to assemble the elbow halves. Use the adjustable hose clamps to secure the adapters at both ends of the elbows.
2. Use chain, "S" hooks, and screw hooks supplied to suspend the system. Support the auger tubes a minimum of every 5' (1.5 m). Elbows should be supported at least 2 places. Keep the lines as level and straight as possible.
3. Cement the auger tubes using PVC cement. Follow directions on the container for safe handling of cement.
4. Cement elbow adapters to PVC tube. If an elbow must be placed near the MULTIFLO boot, cut a short section of auger tube to fit over the boot outlet tube and the elbow.



Figure 3. Elbow connected to auger tube

Cementing the Auger Tubes

1. Be sure the tube is cut squarely. Remove all burrs from the outside and inside edges of the tubes.
2. During dry-fitting, the tube must enter the expanded end of the next tube when light pressure is applied. **DO NOT FORCE THE TUBES.**
3. Surfaces to be joined must be clean and free of dirt and grease.
4. Apply cement generously to both the inside of the expanded end of one tube and the outside end of the other tube to be joined. Be sure the cement covers all of the joined areas so there are no bare spots.
5. Quickly join the tubes giving them a twist to bring them into alignment as they are joined. Pay special attention to align the outlet holes. Keep the tubes level.
6. Keep pressure on the joint until the cement sets.
7. All joints which are not cemented and are exposed to moisture and weather should be calked and sealed.

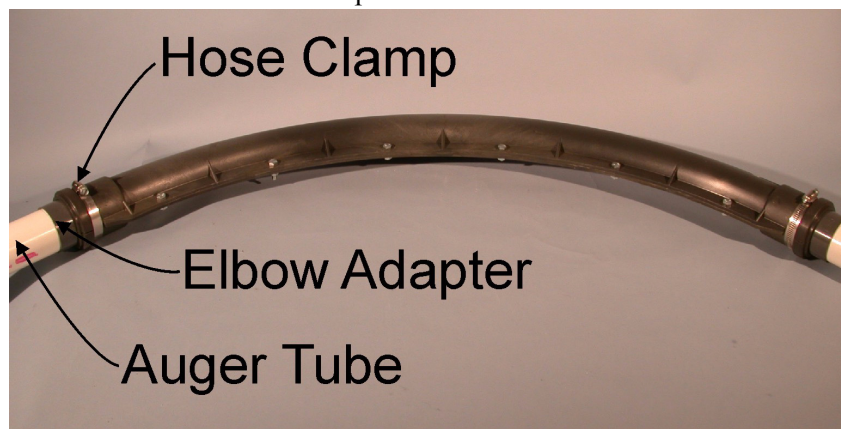


Figure 4. Elbow and Adapters

Power Unit and Driver Assembly Installation

See “Examples of MULTIFLO® System Layout” on page 13. of this manual for information on placement of the power unit/driver assembly in the MULTIFLO® system.

All Power Unit/Driver Assemblies are factory wired to run clockwise when facing the Drive Sprocket with cover removed. This places the motor on the inside of the MULTIFLO® loop-as pictured in prior examples. The Motor/Sprocket rotation is reversible (if desired) to accommodate special installation needs. See motor nameplate for proper wiring to reverse rotation. **Note** pipe may need to be reversed if rotation of the motor is changed. The tubes belled end should be the inlet end for the auger.

1. Suspend the Power Unit/Driver Assembly/ Support the unit with chain and “S” hooks/
2. Measure and cut the tube at the required location of the power unit/driver assembly. Insert the tube as far as possible into the driver assembly housing to provide a sturdy, well-sealed fit. Tighten the screws to hold the tube in place. **THESE SCREWS MUST BE TIGHT!** See Figure 5.
3. Wire the power unit according to wiring connection diagrams in this manual. All electrical wiring should be done by a qualified electrician and must meet local and national electrical codes.
4. Remove the Driver Assembly cover, Gear, and Hub Assembly. Be careful not to lose the Dowel Pin or Socket Head Screws. These will be used to reinstall the Gear and Hub assembly AFTER the auger installation is complete.

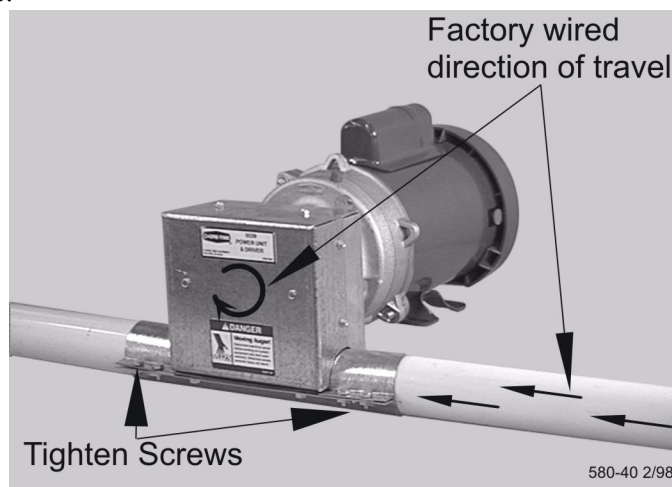


Figure 5. Power Unit and Driver Assembly

Install the Welding Bridge

Cut a 17" (432 mm) section of the tube and install the Welding Bridge at the location where the auger will be pushed into the tube.

Select a point in the system where this will be convenient. It is recommended this be;

- in a straight run.
- in a place where it will be convenient to position the auger on the floor about six feet (1.8 m) from the welding bridge so it can be fed into the tube easily. (An aisle, or area away from the livestock is ideal if it is available.)
- in a visually convenient location to observe system operation once clear service section is installed.
- (if the system permits) just ahead of the sleeve switch and boot, and just after the last feeder or drop to aid in knowing when the system is full or satisfied. **Figure 6** shows a possible placement of the Welding Bridge in a typical installation. The Welding Bridge attaches to the PVC Tubes with the over-center clamps. **IT MUST BE SECURELY ATTACHED BEFORE THE AUGER IS INSTALLED!**

Figure 7 shows the Welding Bridge attached to a tube.

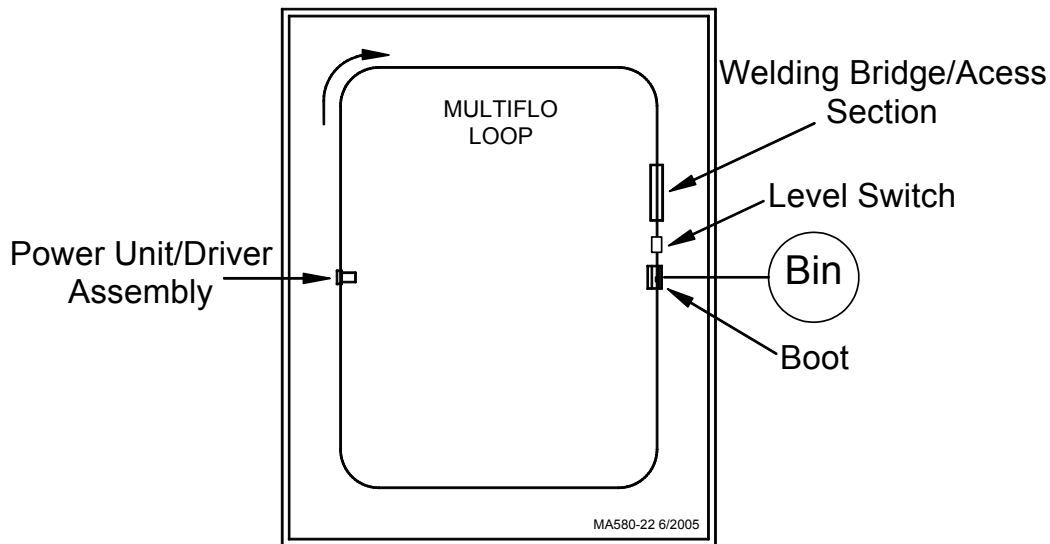


Figure 6. Placement of the Welding Bridge

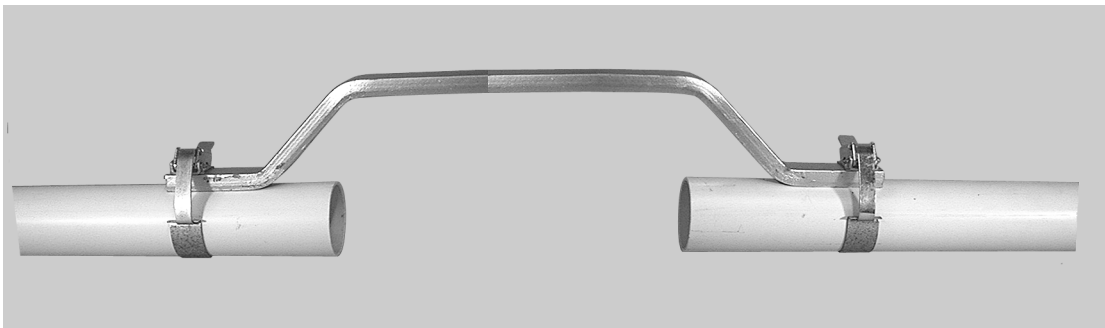


Figure 7. Welding Bridge attached to Tube

Install Hand Crank Assembly

It is possible to push the auger into the tube for short distances and short runs. For longer systems one or more hand cranks should be installed to crank the auger around the length of the MULTIFLO® system. A hand crank will put about 250 feet or 76 meters (Effective Length) of auger into the system. For systems over 250 feet (76m), it may be necessary to use an additional hand crank. **Figure 8** shows proposed installation of the hand crank(s) in relation to the welding bridge installation.

Important: You must calculate the Effective length between the Crank and the Welding Bridge as shown in Figure 8 with points A-D. If this total Effective Length exceeds 250' an additional Hank Crank may be needed.

Effective length of a system is determined by the formula on page 9.

Use a sabre saw or hand-held grinder to cut a 1/2" x 5" (13 mm x 125 mm) opening in the middle of the top of the tube where the hand crank will be placed, see figure 9. The gear wheel should be installed in the opening and two over-center clamps on the bracket hold the crank in place. **See Figure 9.** The gear wheel should be installed in the opening and the two over-center clamps on the bracket hold the crank in place.

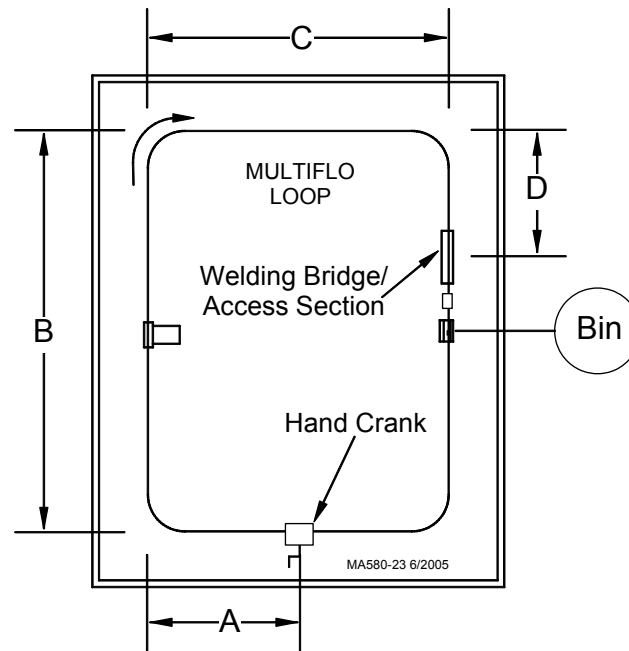


Figure 8. Hand crank installation.

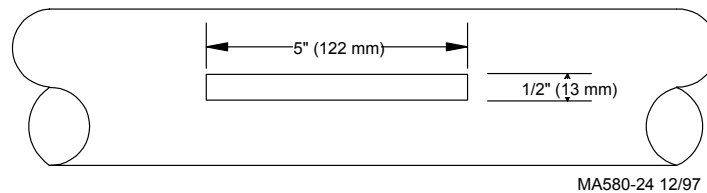
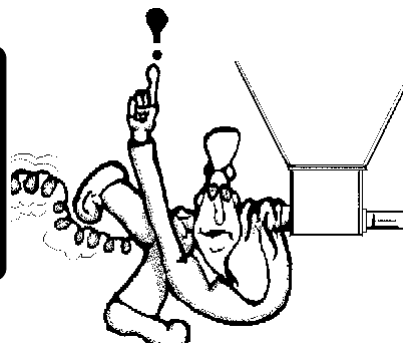
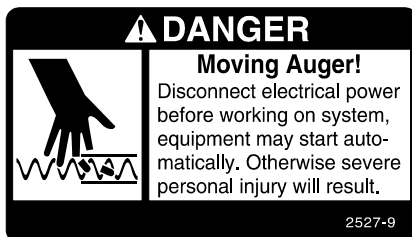


Figure 9. Cut a opening for the hand crank

Installing the Auger

Note: Use extreme caution when working with the auger. The auger is under tension and may spring causing personal injury. Wear protective clothing, gloves, and safety glasses when working with the auger.



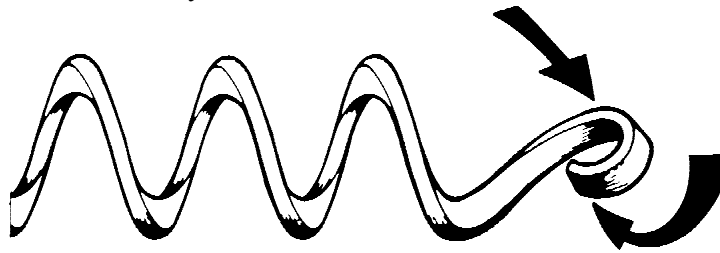
BE CAREFUL WHEN WORKING WITH AUGER!

Handle the Auger carefully. Store the auger flat if it is to set for a period of time prior to installation. Do not install an auger that has a kink in it. A kink will cause tube wear and may cause problems at the driver assembly.

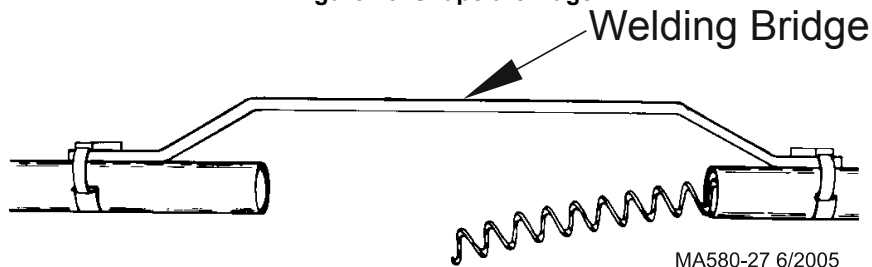
1. Prior to installation, position the coil of auger about 6 feet (1.8 m) from the Welding Bridge in the feed line. This will allow adequate room for someone to uncoil and “feed” the auger into the tube.
2. Remove all tags and wires from the coil of auger.
3. It is not necessary, but it may be desirable to cut approximately a 15 degree elbow and clamp it to the end of the tube where the auger is to be installed.
4. Use a hammer to pound and flatten the end of the auger prior to installation. The auger should be reshaped so

it will ride down the middle of the tube, with no sharp edges exposed to catch on outlet holes, elbows, or joints in the system. **See Figure 10.**

5. Push the auger into the tube using short strokes to prevent distortion of the auger. If the welding bridge is installed at the beginning of a long, straight run it should be possible to push this portion of the auger into the system. **See Figure 11.**
6. Use the hand crank as soon as the auger has been pushed to its installed location in the system. Crank the auger through the remainder of the system.



MA580-26 12/97
Figure 10. Shape the Auger



MA580-27 6/2005
Figure 11. Auger Installation

It may be desirable to have assistance during installation of the auger to follow the progress of the auger around the system. Even with the end of the auger bent to ride through the center of the tubes, the auger may catch at tube openings such as the driver assembly, boot and outlet holes. With the covers off, it is possible to guide the auger through the boot and driver assemblies.

If it is necessary to lengthen the auger, join sections of auger during installation. This can be done easily. With the first section of auger nearly completely installed in the tube, position the next coil of auger, cut tags and prepare to connect the auger with an auger connector or braze/weld the auger as shown in "Brazing the Auger" on page 22 of this manual. If there is any noticeable layover in auger flighting, match ends of auger so they lay flat against each other. Allow the joint to cool and continue installation until the auger makes a complete circuit and the "leading" end is back at the Service Area/Welding Bridge site.

7. When the auger has been installed throughout the system, use bolt cutters to cut off any excess auger at the inlet opening. Also, the **END OF THE AUGER WHICH WAS POUNDED AND SHAPED PRIOR TO INSTALLATION MUST BE REMOVED!** Cut any damaged auger at this end, leaving a good representative end of auger for brazing or welding.
8. Stretch the auger 2" per 50' (50 mm per 15.2 m). For example: if the system has an ACTUAL length of 300' (91.4 m) of auger, stretch the auger approximately 1' (305 mm) and cut at that point.
9. Position the auger as shown in "Brazing the Auger" on page 22 and join the ends of the auger together.

Auger Connector Installation

The Auger Connector is designed to fasten the ends of the auger together without welding.

Note: The Auger Connector is not to be used with rotating auger.

MULTIFLO® and ULTRAFLO® (cage) Auger connectors may be ordered in lots of (2) under part no. 24961-2.

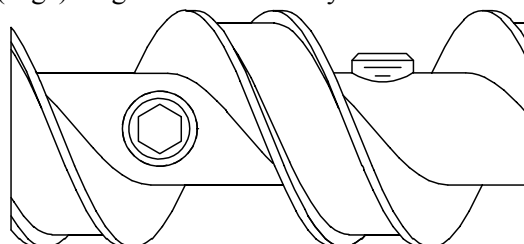
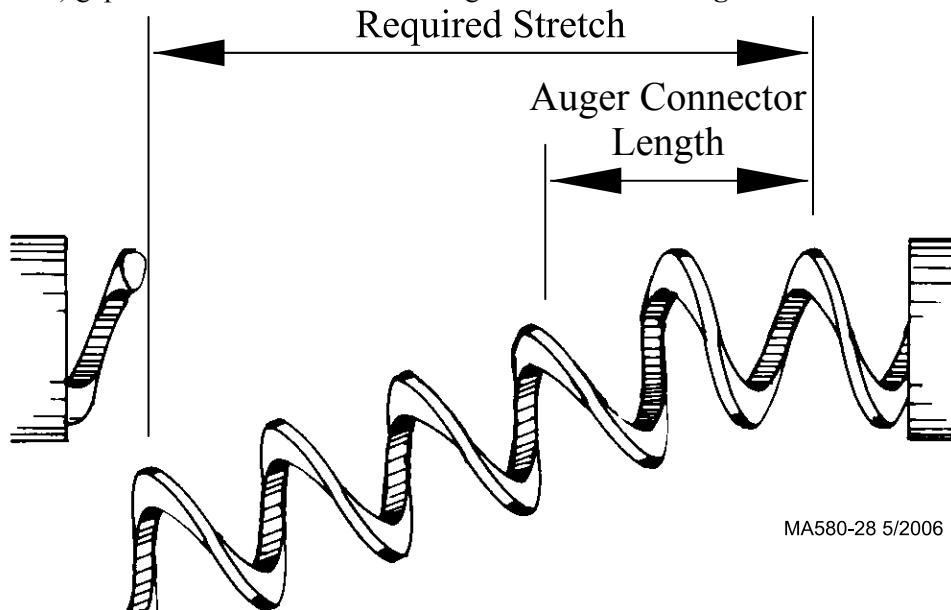


Figure 12. Auger Connector.

1. Before stretching, allow the auger to relax to its free length. This can be achieved by pulling each end of the auger out of the auger tube 1' or 2' (300 to 600 mm), then allowing it to gradually pull back into the tube without springing.
2. Determine the amount of stretch required and subtract 2" (50 mm).
The amount of stretch required is 2" per 50' (50 mm per 15.2 m) of actual auger length.
The Auger Connector requires 2-14" (57 mm) of auger overlap. This overlap is used as auger stretch and **MUST BE SUBTRACTED BEFORE CUTTING THE AUGER.**

For Example:

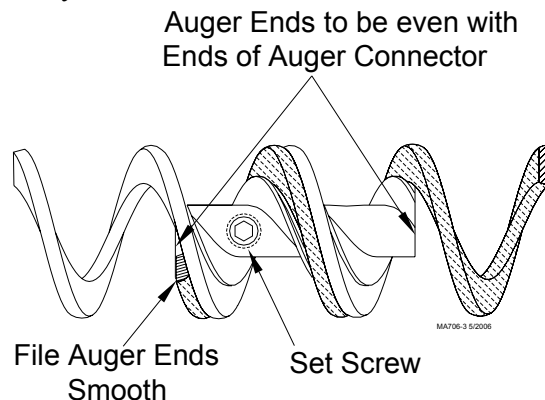
If the system has an ACTUAL length of 300' (91.4 m) of auger, the required auger stretch is 12" (305 mm). Subtract 2-1/4" (57 mm) due to the overlap of the auger. Therefore the auger must be cut with a 9-3/4" (247 mm) gap between the ends with the auger is relaxed. **See Figure 13.**



MA580-28 5/2006

Figure 13. Shape the Auger

3. Cut the auger. File the end of the auger smooth so there are no sharp edges.
4. Screw the Auger Connector into one end of the auger. Remember: If there is any noticeable layover in the auger flighting, match the ends of the auger so they lay flat against each other.
5. Untwist the end of the other auger 1-1/2 turns so when it is threaded onto the auger connector it will return to its relaxed position. The auger ends must be overlapped--NOT butted, when threaded onto the track of the Auger Connector.
6. The end of each auger should be even with one end of the Auger Connector (center the Auger Connector in the joint), as shown.
7. Tighten each set screw until it touches the auger, then tighten an additional 3/4 turn **MAXIMUM**. **BE CAREFUL NOT TO OVER TIGHTEN THE SETSCREWS AND DEFORM THE AUGER. OVER TIGHTENING THE SETSCREWS MAY CAUSE THE AUGER TO JAM UP IN THE POWER UNITS.**
8. File both ends of the auger so they are the same diameter as the rest of the auger. **See Figure 14.**



MA706-3 5/2006

Figure 14. File the ends of the Auger.

Brazing the Auger



Caution: Do Not Braze Auger Without Eye Protection.

Important: CHORE-TIME recommends using an Auger Connector, but brazing is also acceptable.

The braze is critical to the MULTIFLO system, since this portion of the auger must pass through the helical gear and move freely through the tubes and elbows. FOLLOW THE INSTRUCTIONS CAREFULLY!

1. Thread the ends of the augers to be joined approximately 3/4 turn, or 270 degrees overlap. Make sure the auger flighting, from the two augers, are leaning in the same direction.

Important: Auger ends must be overlapped--NOT butted, when threaded together.

2. Install the Brazing Clamp at the spot to be joined. See Figure 15.

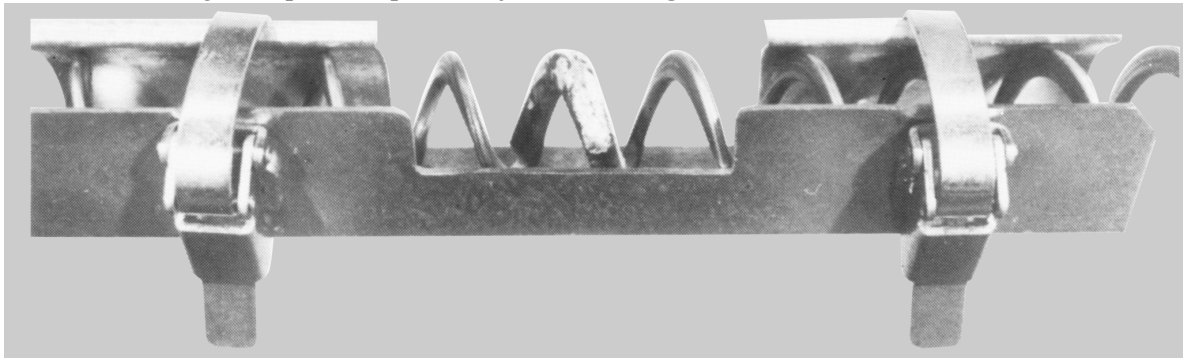


Figure 15. Clamping Auger in place using a Brazing Clamp.

3. Braze the inside of the joint, joining the surfaces to within 1/8" to 1/4" (3 mm to 6 mm) of each end. **THIS IS CRITICAL!** See Figure 16.

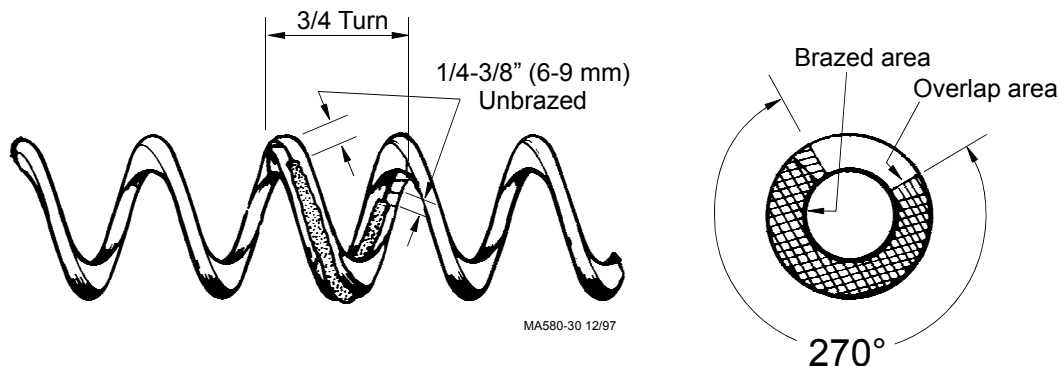


Figure 16. Auger Brazing information.

4. Allow the joint to air cool. Then rotate the clamp to expose the outside of the augers.
5. Join the outside surface. Again, leaving 1/8" to 1/4" (3 mm to 6 mm) at each end of the auger joint.
6. After cooling, file the outside of the joint down to match the outside diameter of the auger. The joined section **MUST NOT BE ANY BIGGER IN DIAMETER THAN THE AUGER ITSELF!** Remove all slag or sharp spots on the joint.
7. File the ends of the auger smooth so they will not gouge the tube. Radius the outside corner of each end to allow the auger to move around elbows without snagging.

Install the Service Section Cover

Allow the joint to cool. Remove the brazing clamp and install the Service Section Cover over the opening. See **Figure 17.**

After the cover kit is installed and the clamps are tightened, remove the welding bridge. However, CHORE-TIME

recommends the Welding Bridge to be left in place for convenience in servicing the auger.

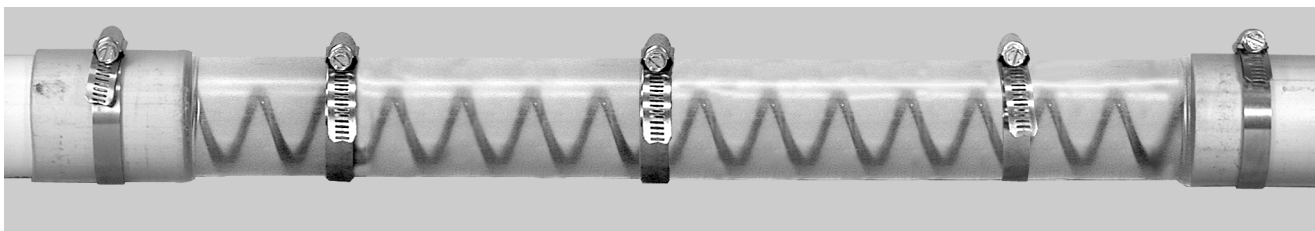


Figure 17. Service Section Cover.

Install the Hand Crank Closure

Remove the Hand Crank Assembly (remove all of them if more than one was used) and install the Cover Closure over the tube opening.

Note: The Closure and two Clamps are packed with the Hand Crank Assembly. See Figure 18.

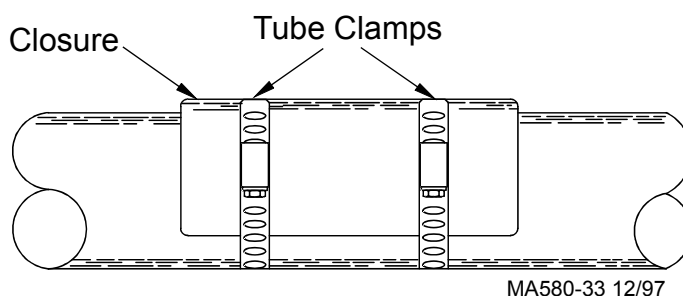


Figure 18. Closure Installed on Tube.

Install the Boot Clean-Out Cover

After the auger has been installed, place the cannonball in the boot. The cannonball must rest in the notch in the Feed Adjustment Gate.

Set the Adjustment Slide Gate all the way up and tighten wing nuts to secure it in place.

Install the clean-out cover to as shown in **Figure 19** to the lower boot.

1. Loosen the wing nuts to the ends of studs.
2. Start the lower side of clean-out cover over bottom of opening.
3. Slide cover upward as far as possible.
4. Hold cover in this position (be sure cover is flat against the outside of the boot) and tighten wing nuts finger tight.

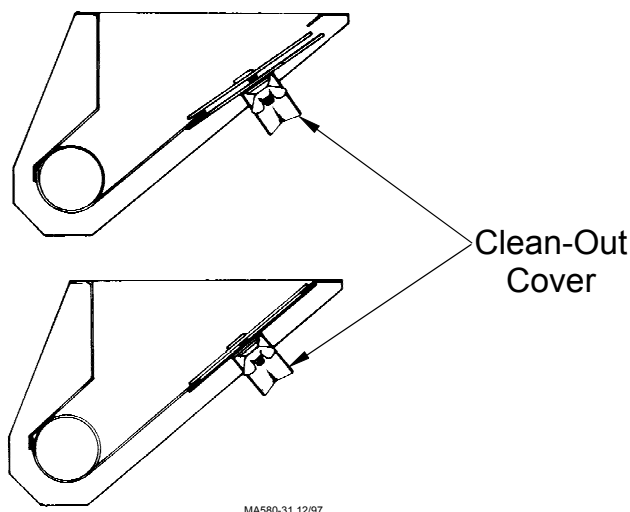


Figure 19. Clean-Out Cover Installation.

Install the Gear Drive and Hub

At the driver assembly, install the hub and pin on the shaft. It is preferable to have the pin in a horizontal position (otherwise it will fall out on the floor and you will have to start over.) Bolt the sprocket in place over the pin. The socket head screws must be tight. **See Figure 20.** Install the cover over the driver assembly unit. Repeat the procedure for the second power unit if more than one is used.

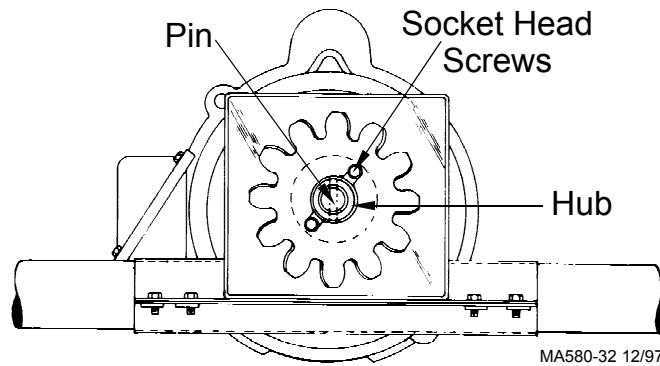


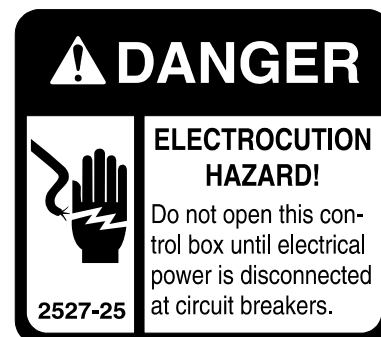
Figure 20. Clean-Out Cover Installation.

Wiring the System

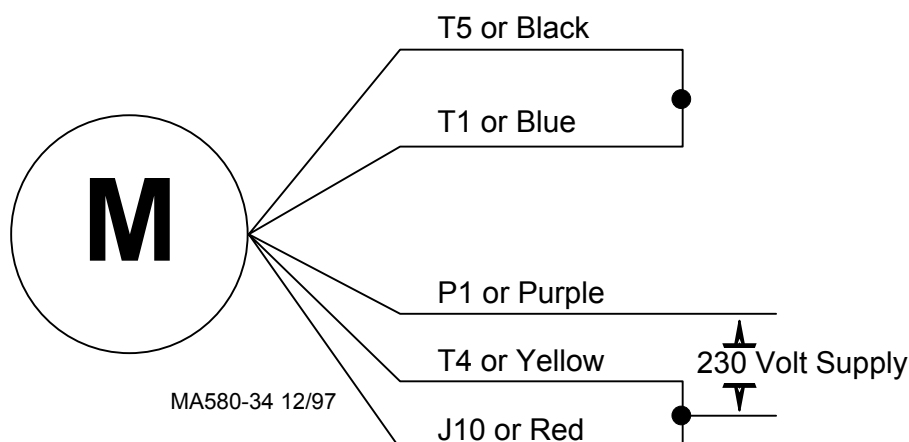
Notes for Wiring Diagrams

1. Ground all electrical equipment for safety.
2. All wiring should be done by a qualified electrician in accordance with local and national electrical codes.
3. Wire color coding is shown for pre-wired equipment.
B-Black; W-White; R-Red.
4. To prevent electrical feedback; use contactor(s) or relay(s) - not supplied:
 - for twin or quad boot installations when FLEX-AUGER is used with MULTIFLO system.
 - contactor is required for 1-1/2 hp Power Unit.

Important: More than one source of electrical power enters the MULTIFLO systems shown in the manual. Disconnect all power before servicing any part of the system.

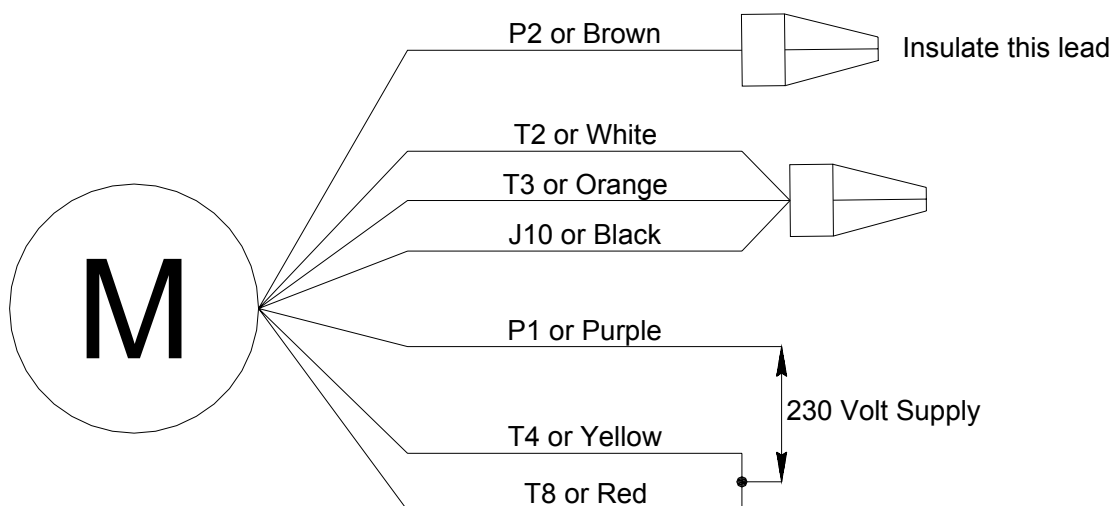


MULTIFLO Motor Wiring (Motor Part No. 14750) GE 1/2 hp



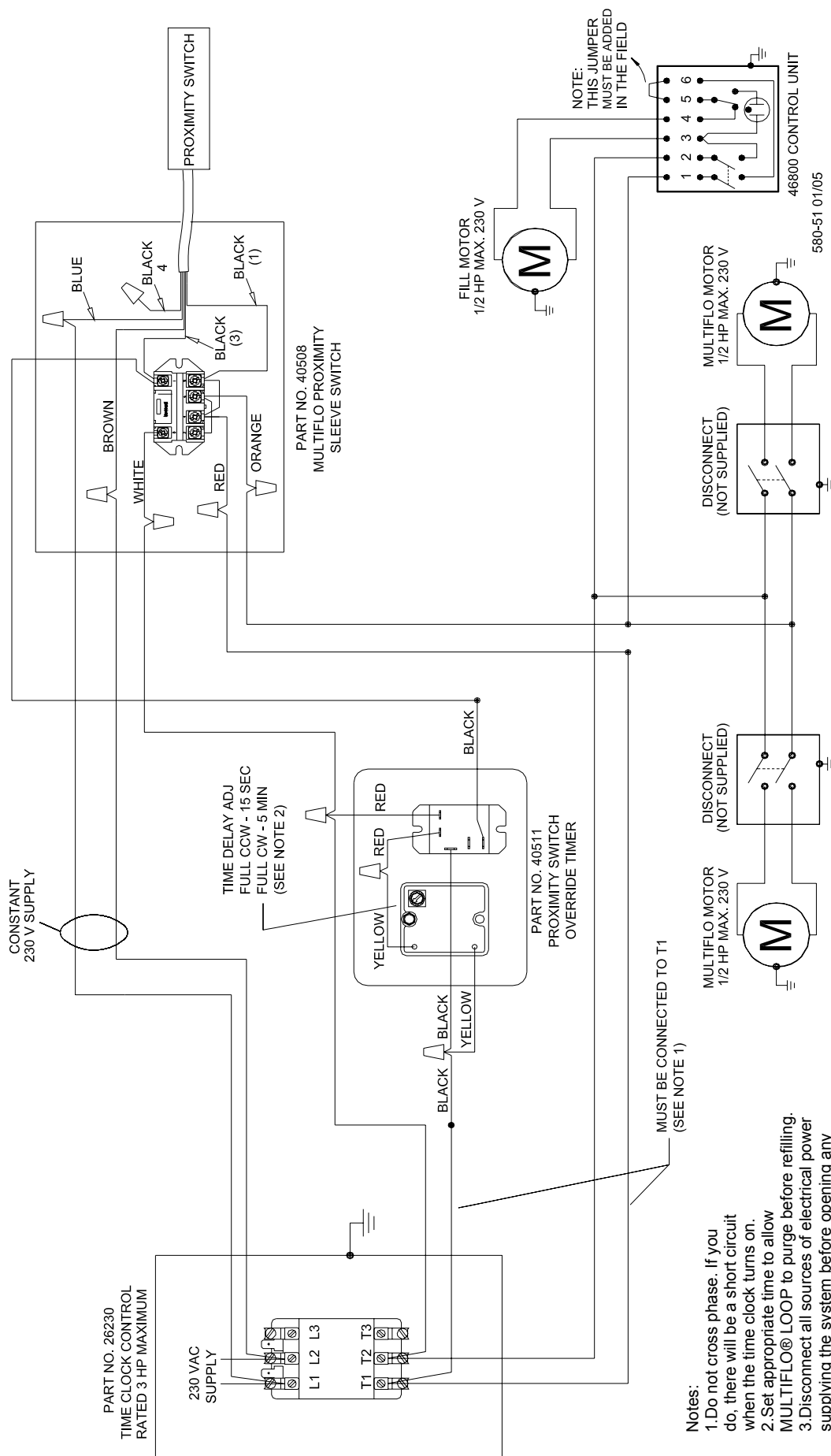
Note: To reverse rotation, refer to motor plate.

Hi-Speed MULTIFLO Motor Wiring (Motor Part No. 5051) GE 3/4 hp



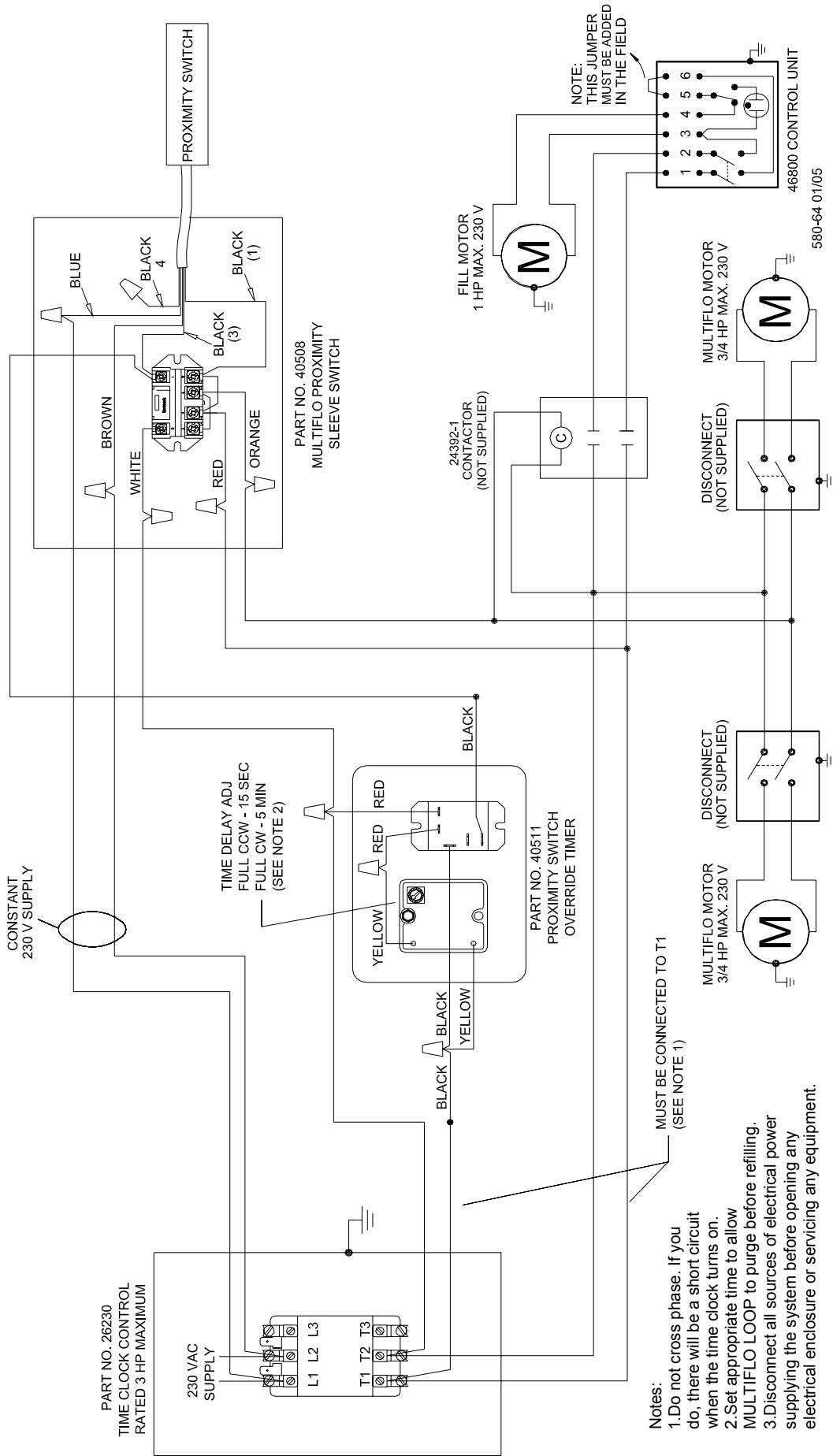
FLEX-AUGER® Fill System Supplying a single MULTIFLO® loop

Use this diagram if the combined horsepower ratings of all the motors in the system is 1 hp or less.



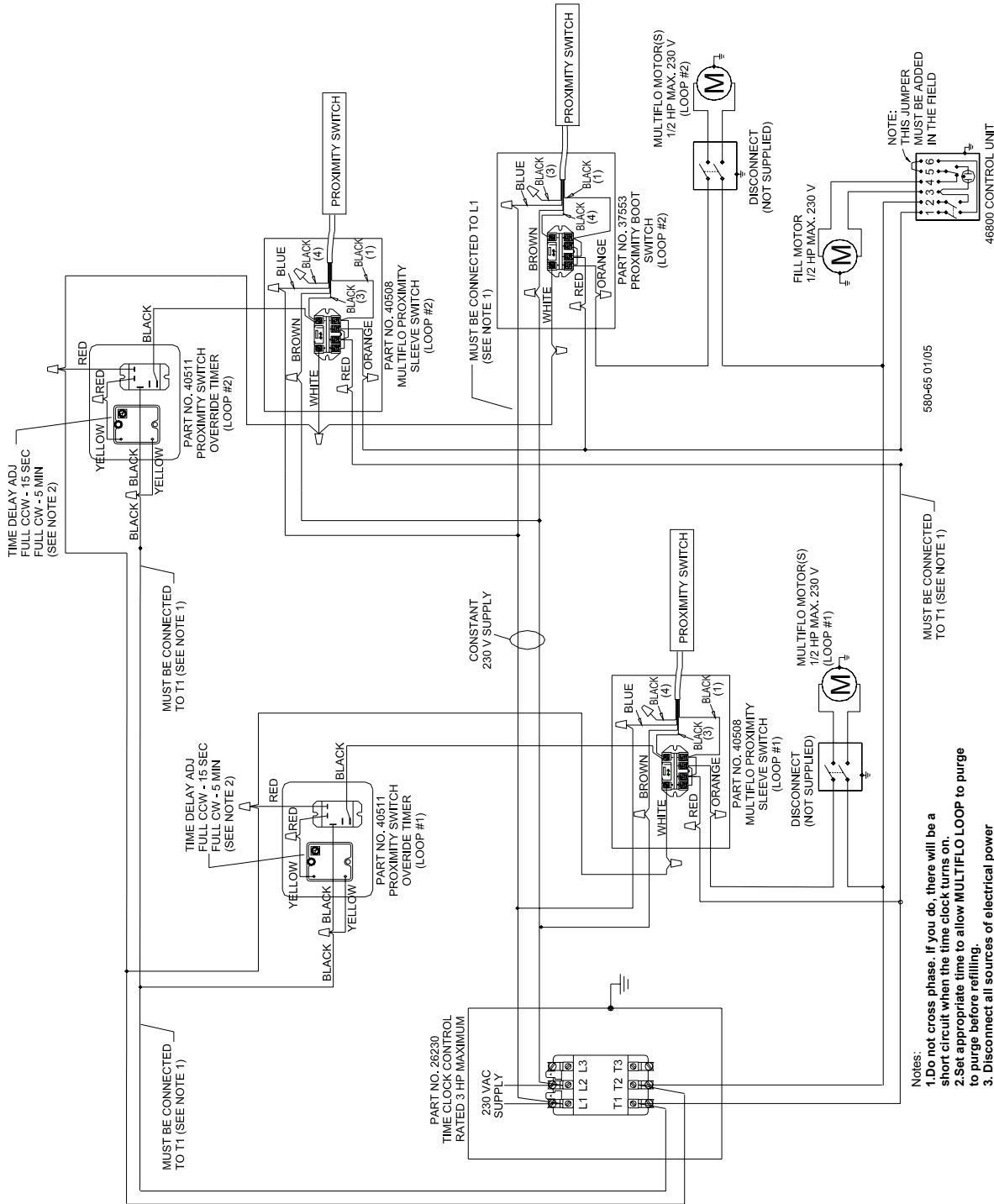
FLEX-AUGER® Fill System Supplying a single Hi-Speed MULTIFLO® loop

Add contactor(s) if the combined horsepower ratings of all the motors in the system exceed 3 hp.



FLEX-AUGER® Fill System Supplying two MULTIFLO® loops w/boot switch

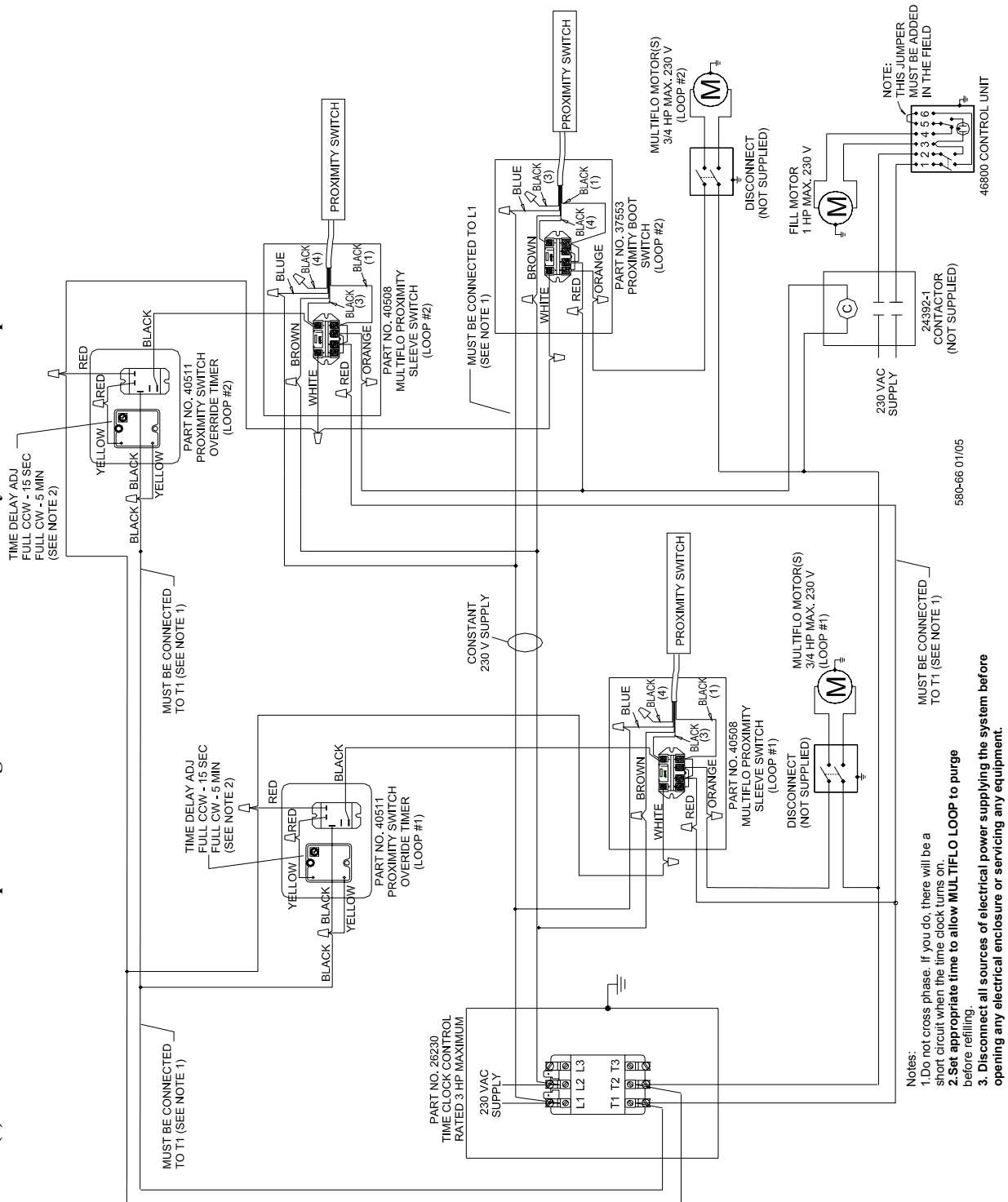
Add contactor(s) if the combined horsepower ratings of all the motors in the system exceed 3 hp.



- Notes:
- 1. Do not cross phase. If you do, there will be a short circuit when the time clock turns on.
 - 2. Set appropriate time to allow MULTIFLO LOOP to purge to purge before refilling.
 - 3. Disconnect all sources of electrical power supplying the system before opening any electrical enclosure or servicing any equipment.

FLEX-AUGER® Fill System Supplying two Hi-Speed MULTIFLO® loops w/boot switch

Add contactor(s) if the combined horsepower ratings of all the motors in the system exceed 3 hp.

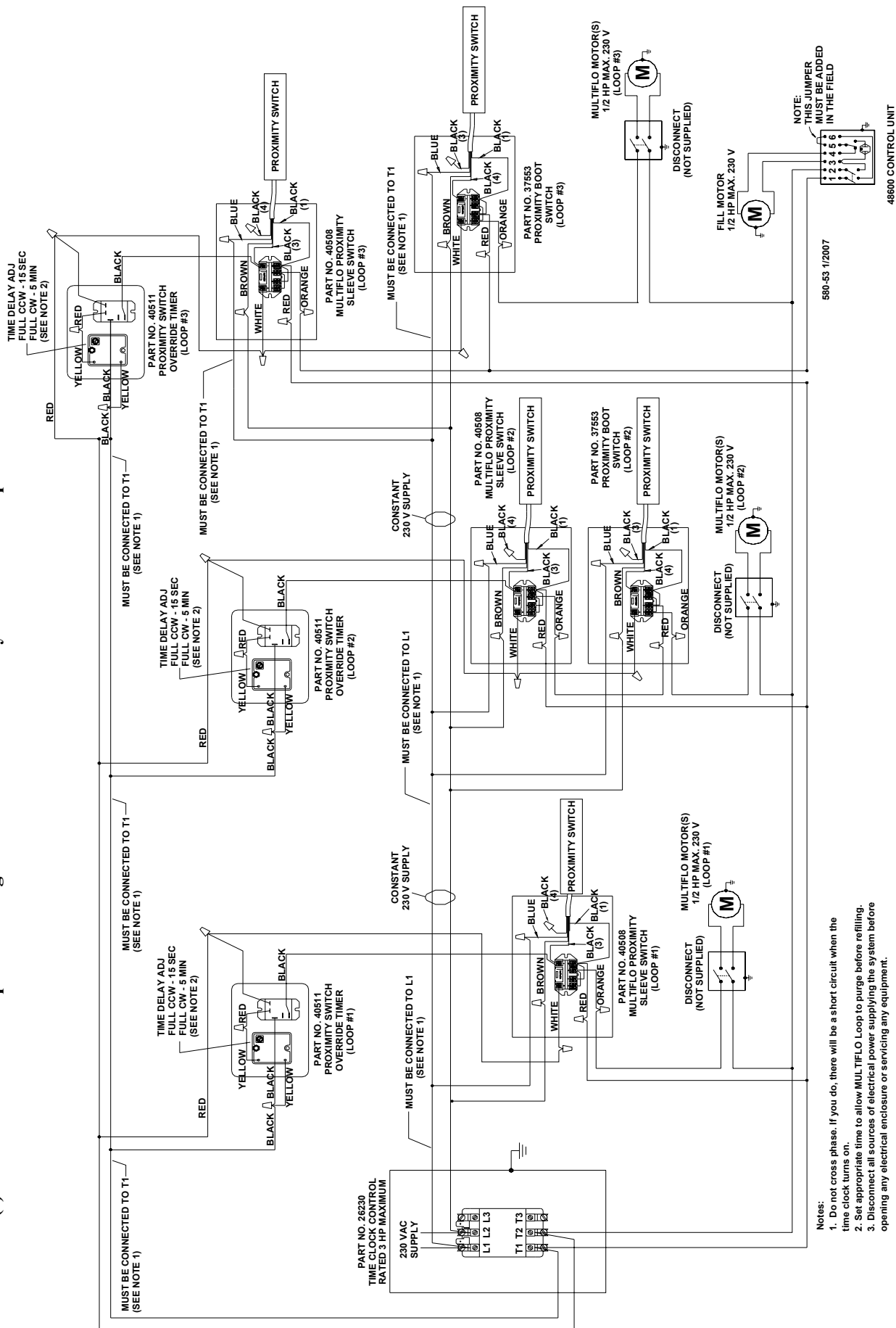


Notes:

1. Do not cross phase. If you do, there will be a short circuit when the time clock turns on.
2. Set appropriate time to allow **MULTIFLO LOOP** to purge before refilling.
3. Disconnect all sources of electrical power supplying the system before opening any electrical enclosure or servicing any equipment.

FLEX-AUGER® Fill System Supplying three MULTIFLO® loops w/boot switch

Add contactor(s) if the combined horsepower ratings of all the motors in the system exceed 3 hp.



Notes:

1. Do not cross phase. If you do, there will be a short circuit when the time clock turns on.
2. Set appropriate time to allow MULTIFLO Loop to purge before refilling.
3. Disconnect all sources of electrical power supplying the system before opening any electrical enclosure or servicing any equipment.

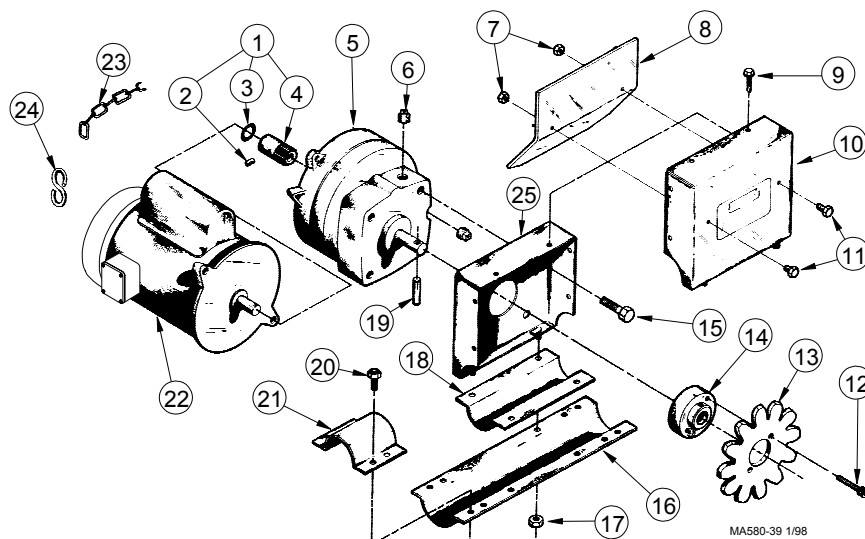
Parts Listing

Power Unit and Driver Assembly

Item	Description	Part No	Part No	Part No	Part No
--	Complete Power Unit and Driver Assembly	41013	46311	41014	28830
1	Pinion Assembly	3249	25836	25836	25836
2	1/4-28 Setscrew	5929	5362	5362	5362
3	“O” Ring	3209	3209	3209	3209
4	Pinion	3245	25835	25835	25835
5	Gearhead Assembly	3261-9	3261-14	3261-12	3261-12
6	Pipe Plug	3516	3516	3516	3516
7	10-24 Lock Nut	1560	1560	1560	1560
8	Auger Brace	24674	24674	24674	24674
9	#10 x 1/2” Self Drilling Screw	3037	3037	3037	3037
10	Drive Unit Cover	8208	8208	8208	8208
11	10-24 x 1/2” Hex Head Screw	4416-3	4416-3	4416-3	4416-3
12	5/16-18 x 7/8” Socket Head Cap Screw	6850-1	6850-1	6850-1	6850-1
13	Drive Gear	8463	8463	8463	8463
14	Drive Gear Hub	8213	8213	8213	8213
15	5/16 -18 x 3/4” Hex Head Fastener	2046	2046	2046	2046
	5/16 Lock Washer	547	547	547	547
16	Base Connector	8249	8249	8249	8249
17	1/4-20 Lock Nut	1269	1269	1269	1269
18	Wear Shoe	8210	8210	8210	8210
19	Dowel Pin	8699	8699	8699	8699
20	1/4-20 x 1/2” Hex Head Fastener	1487	1487	1487	1487
21	End Connector	8211	8211	8211	8211
22	Motor	14750	5051	14750	28031EUR
23	Chain	1302	1302	1302	1302
24	“S” Hook	723	723	723	723
25	Drive Unit Base	8207	8207	8207	8207

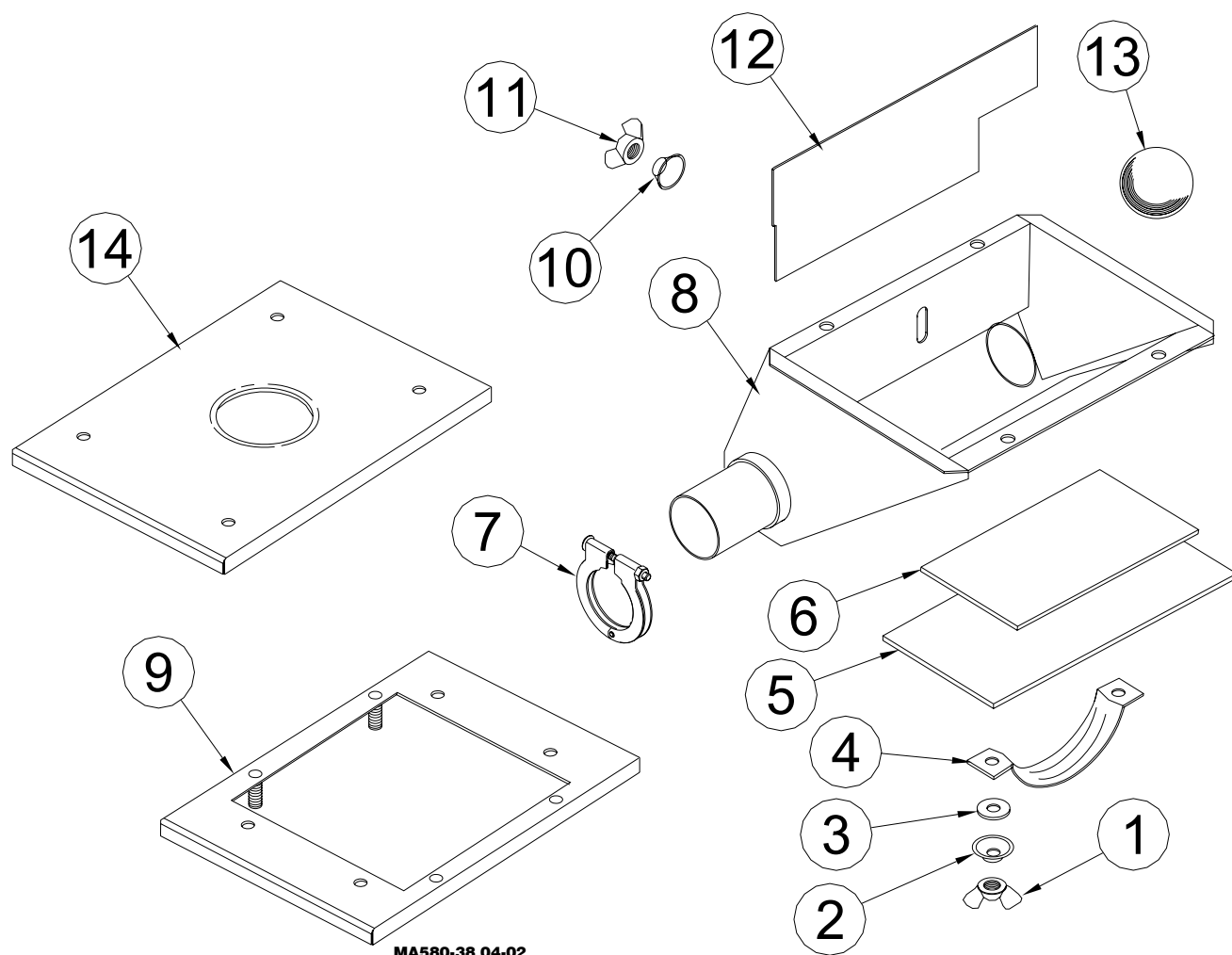
Complete Power Unit and Driver Assemblies

Complete Power Unit and Driver Assembly Part No	Power Unit Assembly	Gearhead and Driver Assembly	hp	rpm	Phase	Hz	Voltage
41013	3259-141	40256	1/2	62	1	60	230
46311	3259-146	45606	3/4	95	1	60	230
41014	3259-113	40260	.4	62	1	50	220
28830	3259-111	40260	1/2	62	3	50	220/380



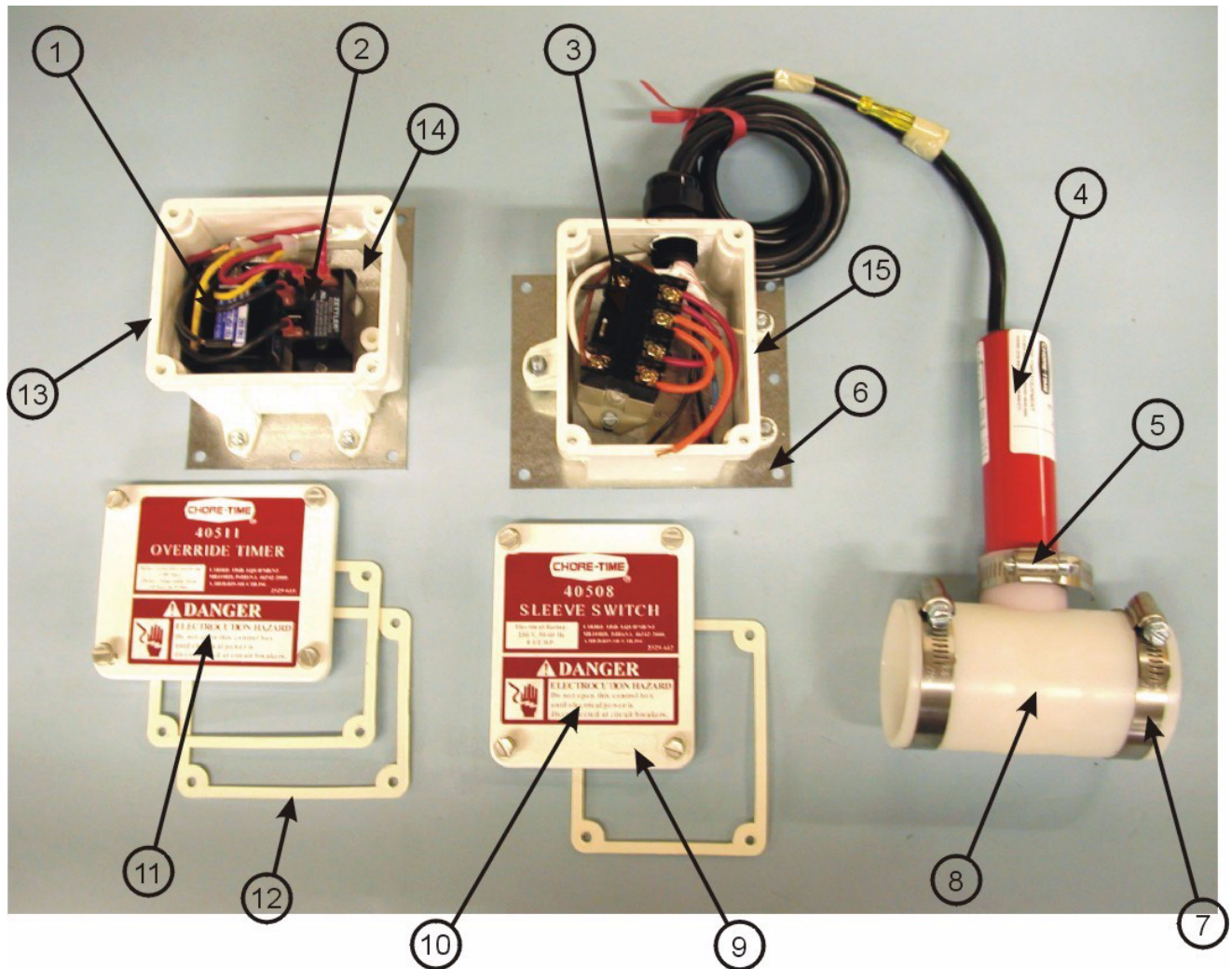
Control And Intermediate Boot Assemblies

Item	Description	Control Boot Part No	Intermediate Boot Part No	Hi-Speed Control Boot Part No	Hi-Speed Intermediate Boot Part No
1	5/16 Wing Nut	2146	2146	2146	2146
2	5/16-18 Cupped Washer	6192	6192	6192	6192
3	5/16-18 Rubber Washer	6152	6152	6152	6152
4	Handle-Included w/ 6301	---	---	---	---
5	Clean-Out Cover	6301	6301	6301	6301
6	Back Plate	6298	6298	6298	6298
7	Tube Clamp	29515-1	29515-1	29515-1	29515-1
8	Boot Body Weldment	8220	8220	8220	8220
9	Adapter Plate	45970	---	45970	---
10	5/16-18 Sealing Washer	39-20155	39-20155	39-20155	39-20155
11	5/16-18 Wing Nut	2146	2146	2146	2146
12	Feed Adjustment Gate	8302	8302	46317	46317
13	Cannonball	3621	3621	3621	3621
14	Transfer Cover	---	29872	---	29872
--	Complete Boot Assembly	14411	---	46325	---
--	Complete Intermediate Boot Assembly	---	47581	---	47582



Proximity Sleeve Switch Part No. 40508

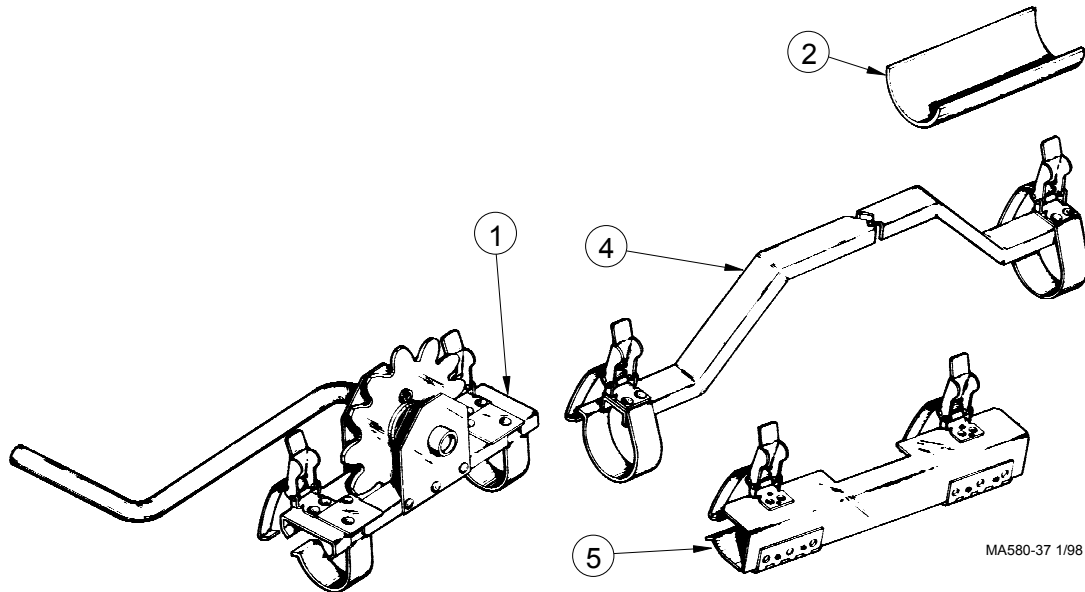
Item	Description	Part No
1	On Delay Timer	24209
2	Relay	34702
3	DPST Relay	34654
4	Proximity Switch	36867
5	1-7/8" Clamp	3527
6	Relay Mount Plate	28701
7	2-3/4" Clamp	8643
8	Proximity Sleeve Switch	39157
9	Cover	6776
10	Danger Decal	2529-612
11	Danger Decal	2526-611
12	Switch Box Gasket	6777
13	Switch Box	7841
14	Box Plate	24321



Installation Tools

Item	Description	Part No
1	Crank Assembly	8697
2*	Closure	8716
3*	Cover Clamp	8643
4	Welding Bridge	8227
5	Welding Clamp	8264

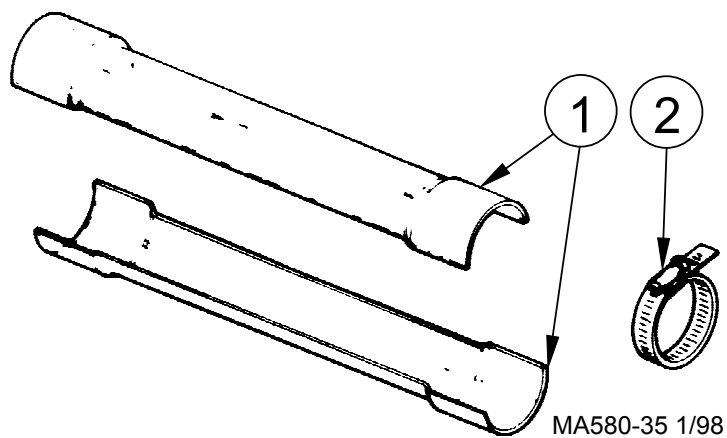
* The Closure and Clamps are installed over the tube after the auger installation, and the crank is removed. They are not installation tools but are shown here because they are shipped with the Crank Assembly.



Service Section Part No. 8710

Item	Description	Part No
1	Pair of clear Tube Halves	8711
2	Clamp - 5 used	8643

The 8710 Kit includes 8711 (pair halves) and one 8727 Parts Package (5 Clamps).

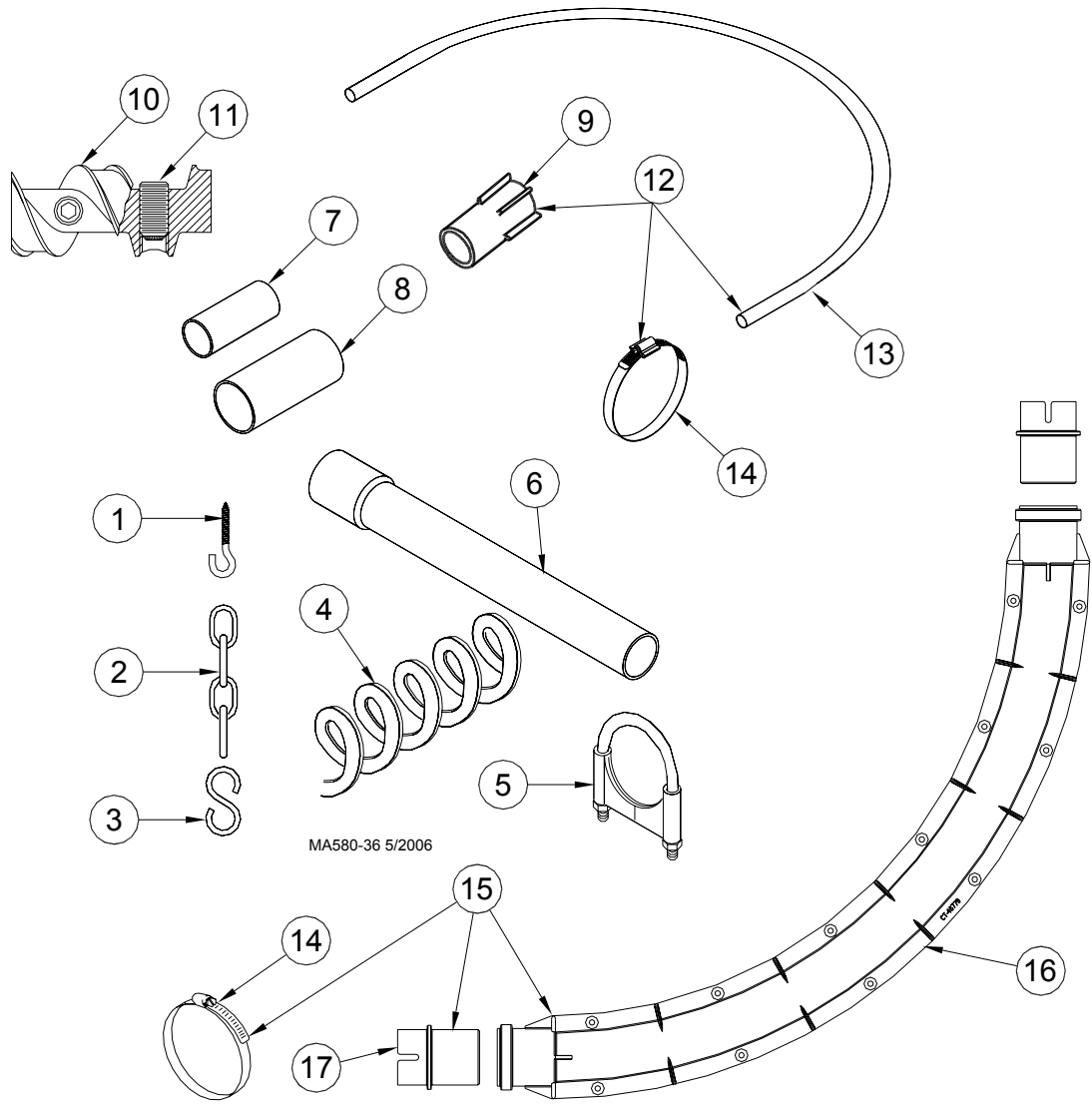


Line Components

Item	Description	Part No
*1	Screw Hook	1214
*2	Chain	*2128-0
*3	“S” Hook	723
4	Auger	7961MF
5	Tube Clamp	7976
6	10' PVC Tube	7955
7	Boot Outlet Coupler	8555
8	Tube Connector	8029
9	PVC Elbow Coupler	39200
**10	Auger Connector	24724

Item	Description	Part No
**11	5/16-18 x 5/8” Set Screw (2 used)	24979
12	180° Hardened Steel Elbow with Clamp and Coupler	46720
13	180° Hardened Steel Elbow	46719
14	Adjustable Clamp	8643
15	90° Nylon Elbow Kit	47950
16	Nylon Elbow Half	46779
17	Elbow Adapter	46778

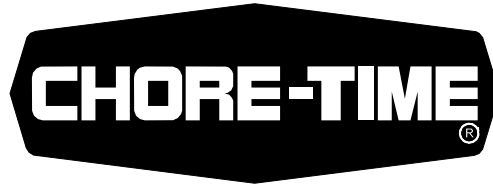
***Components of 6372 Suspension Kit. Part No. 2128-0 can be ordered in lengths of 100' (2128-100) or 250' (2128-250)**
**** (2) Auger Connectors and (4) Setscrews may be ordered under Part No 24961-2.**



Trouble Shooting Guide

Problem	Possible Cause	Corrective Action
System will not run	No power to the system	Check circuits, fuses, and on-off switches on equipment.
	Motor overloaded and stopped	Check for foreign material in line, push reset button.
	System not calling for feed.	Examine Control Unit Switch and Hopper Level Control.
		Remove feed if plugged.
	Defective motor	Replace Motor
Motor overloads after running briefly	Motor too small	Use recommended size motor for line length.
	Low voltage (motor runs slow and overheats)	Check line voltage at motor, use adequate size wire in circuits.
	Foreign object in auger (motor runs, stalls, no feed conveyed)	Check auger line, pull auger to remove object
	System overcharged, plugged	Clean-out system
	Wet feed being conveyed or allowed to stand in tubes	Clean auger and tube, avoid conveying wet feed or empty line after each feeding.
	Motor defective (overheats without load)	Replace motor.
Motor runs, but auger does not run	Sheared pin in sprocket	Replace damaged or lost pin.
	Broken power unit pinion	Examine pinion on motor shaft.
		Replace BOTH gearhead and pinion of pinion is damaged.
Auger wears holes in straight tubes	Auger kinked or poorly brazed	See Auger Brazing section.
	Excessive operating time empty	Do not allow system to operate empty.
Elbows wear out	Auger is over stretched	Lengthen auger.
	Auger ran dry	Do not allow system to operate empty.
	Line not level	Level lines.
Auger runs erratically	Auger too loose	Shorten auger.
	Auger kinked or poorly brazed	See Auger Brazing section.
	Equipment not installed within the capabilities of system	Refer to this manual for approved system installations.
Excessive Auger vibration and noise	System operated too often without feed (auger tubes have been scored by auger)	Do not allow the system to run empty.
		Replace tubes.
	Tube inadequately supported	Be sure auger is correct length. Support Tubes every 5' (1.5 m) or closer.
Fill system short cycles	Check for correct rpm of gearhead on fill system	Install correct rpm of gearhead.
	Switch failure causing system to circulate	repair or replace malfunctioning switch.
Motor Stalls or oscillates	System overcharged, plugged	Clean-out system.

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