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Manufacturer:

Accufill

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Model:

Speedster

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Serial No:

N/A

4

Category:

Auger Filler

4

Description:

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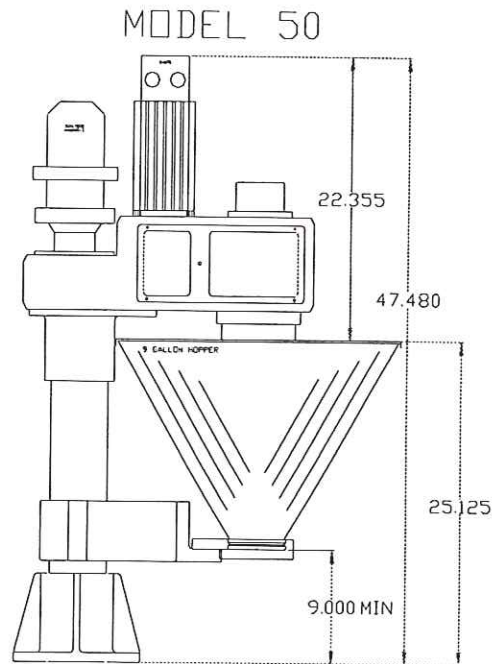
Used- Klockner Bartelt IM9-14 Horizontal Form Fill & Seal Pouch Machine. Capable of speeds of up to 70 CPM. Has a 9" centers for a pouch size range: (Length) 3" - 7-3/4" (Height) 3" - 9-1/2". Has dual ASE Automation Supply and Engineering model 76 servo auger fillers with agitated hoppers. Vacuum openers. Maximum Gusset Thickness of 2". Left to Right product flow with vacuum pickoff discharge. Has top seal clean station. Last running pouches of rice. Has relay logic controls.

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Bartelt

ACCUFILL SPEEDSTER 50, 75, &100
Servo controlled
AUGER FILLING MACHINES



Installation, Documentation and Operations Manual

AUTOMATION SUPPLY AND ENGINEERING, INC.
8307 CREEKSTONE CIRCLE
HOUSTON, TEXAS 77055-6713
FAX PHONE (713) 465-8080

AUTOMATION SUPPLY AND ENGINEERING, INC
HOUSTON, TEXAS (713) 465-8080
MODEL: AccuFill Speedster, MODEL 75
SERIAL #1422, #1423 FEB 19, 1998
CUSTOMER: RIVIANA FOODS, HOUSTON TX

UTILITY REQUIREMENTS
VOLTAGE: 240 VAC, 3 PHASE
CURRENT: 20 AMP CIRCUIT

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Project Summary Sheet

Date: Feb 12, 1998

Serial Number: SN#1422, SN#1423

Customer: Riviana Foods
Contact: Ralph Sorenson (713) 942-1152
Shipping Address: 1502 Sawyer
Houston, Texas 77007
Billing Address: Riviana Foods, Inc Attn: Accts Payable
1702 Taylor St.
Houston, Texas 77007

Customer PO #: Verbal, Ralph Sorensen
Product to be run: various spices
Delivery Date: February 23, 1998

PRODUCT TO BE PROVIDED

AS&E Model: Model 75S Series Filler
Hopper Size: 22" dia, plain cone
Tooling Provided: #14 NFF tooling, 13.125 AOL auger, 5-5/8 OAL funnel
Controls: PDM30 and A/B motor starters
Operator Interfacel: Existing thumbwheel switches
Servo Motor: ElectroCraft H4075 with 56C flange
Servo Amplifier: ElectroCraft PDM30
Control Program: RIVBART.pdm
Agitator Motor: Standard Sumitoma 3/4HP, 60.3 RPM
Column Height: see attached drawing
Agitator Blade: single, Stainless Steel
Impeller Blade: None

IMPORTANT SAFETY INFORMATION
READ THIS MANUAL CAREFULLY
BEFORE
INSTALLING OR OPERATING THIS EQUIPMENT

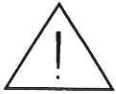
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Chapter 1: Danger, Warning, and Caution Notices

Basic safety recommendation:

All products, given enough time, can be expected to fail. Since the failure of automatic machinery or processes can create hazardous conditions, operate this and all machinery in such a manner that when a failure occurs, personnel and/or property will not be harmed directly or indirectly. Some specific recommendations about safety follow.

Recognize Safety Information:



This symbol brings attention to Danger, Warning, and Caution notices in this manual. When you see this symbol, be alert to the potential for personal injury or damage to the machine.

The careful and safe operation of any machinery depends on everyone who operates, maintains, adjusts, or works near it. Please read and understand these Danger, Warning, and Caution notices. Be sure you understand the following signal words which will be seen throughout this manual:

- **DANGER:** "Danger" is used to indicate a hazardous situation which has a high probability of death or severe injury.
- **WARNING:** "Warning" is used to indicate a hazardous condition which has some probability of death or serious injury.
- **CAUTION:** "Caution" is used to indicate a hazardous situation which may result in minor or moderated injury.
- **NOTICE:** "Notice" is used to indicate a statement of policy as the message relates directly or indirectly to the safety of personnel or protection of property. Notice is not associated directly with a hazard or hazardous situation and is not used in place of danger, warning or caution.

Installation

Handling, moving, and installation should be done only by machinery movers using appropriate equipment. Never install, operate, or maintain this machine unless you are qualified and trained properly.

When you lift or move this machine, use adequate equipment. The bill of lading gives the machine weight. Prevent anyone from walking, crawling, or reaching under equipment while it is supported by a lifting device.

Keep hands and feet clear of machine, platform or skid, and wheels of lifting equipment. Watch for overhead lines, low clearances, and other obstructions.

Guards

Guards are supplied and must be in place before operation. The guarding on all AS&E machines is designed to protect personnel who operate or work on or around the machine. Guards shield you from moving parts. Reaching over, under, or through a guard, blocking it open, or tampering with a guard interlock is extremely hazardous and must never be attempted. Guard interlocks and fixed barrier guards are there to protect you. Do not alter them.

Work with special care when guards are removed for lubrication, adjustment, and part replacement.

Opening an inspection hatch, guard, or equipment door does not disconnect electrical power in the control cabinet. To disconnect control power padlock the main disconnect in the OFF position.

Padlock disconnect in OFF position before you service pneumatic filters (if applicable on your machine).

Nip and Pinch Points

Be extremely careful when you work near nip points and pinch points. Keep yourself, your hair, necktie, clothing, or tools away from these hazards to prevent serious injury or death. Do not wear jewelry such as rings, watches, and chains around the machine.

While power is on, **never** put hands into the product hopper. If you must make adjustments inside the hopper, remove power from the machine and padlock the electrical disconnect. Never leave any foreign object inside the hopper after adjustments are completed.

While power is on, never attempt to adjust or inspect the auger tooling. Power is concentrated at the auger tooling and serious injury to personnel and equipment may result.

Electrical

A qualified person must install and repair electrical equipment and verify electrical ground to avoid shock, injury, or death to anyone using the machine. All electrical interlocks must work.

Always LOCK OUT- TAG OUT with a padlock the electrical disconnect in the OFF position before you adjust, clean, lubricate, or maintain the machine.

Without approval from AS&E, do not make revisions, modifications, or additions to the program in the servo controller or operational parameters in the VFD on the machine. This can impair the operation of the machine.

Never use jumper wires to bypass electrical circuits. This could activate a part which could cut, crush, or seriously injure persons in the immediate area of the machine.

Electrical modifications and additions are prohibited. Any modifications or additions to the electrical system or contents of this machine's electrical enclosure may impair the proper functioning of this machine and create a safety hazard. Any changes not authorized by AS&E will void your warranty.

The servo positioner, VFD and electronic controls on this machine requires an electrically clean environment. AS&E has taken care to reduce electrical noise and to lessen its potential to cause malfunctions. No modifications or additions, other than specifically described interface wiring, should be made to the electrical system. If there is any question, or unforeseen need for modifications, contact AS&E before proceeding.

The servo positioner and other electronic components require a solid earth ground for proper operation and noise reduction. Further, any electronic component connected to the RS232C port on the servo positioner must be earth grounded. Failure to properly ground all electrical components may result in damage to the machine and/or connected peripherals.

Parts Replacement

**NEVER REMOVE OR REPLACE ANY PART WITH POWER APPLIED.
WAIT 10 MINUTES BEFORE TOUCHING COMPONENTS:**

Personnel hazard: Be sure the machine is turned OFF before replacing any part. Wait at least 10 minutes after turning power off before touching the servo controller or VFD. Energy is stored in these devices which can cause high voltage electrical shocks resulting in serious injury or death.

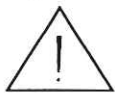
Machine hazard: You may damage machine parts if you replace any with the power on. The machine is not operating normally when any part is removed, and this is dangerous.

Electronic component hazard: The servo controller, VFD, and solid state components used in this machine can be damaged if replaced or disassembled with the power on.

RS232C programming port: Make sure the earth ground is securely attached to the electrical enclosure before attaching any programming device to the servo positioner. If you are unsure of the quality of the ground in the AC service outlet used to power the programming device, use a battery powered laptop computer for equipment safety.

AS&E's warranty covers operation using original parts and electronic programs. Substitution of third party parts void the factory warranty.

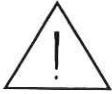
Specific Caution Notices



- **Caution:** Do not attach or place paper, cardboard, photos, signs, string, tape, wire, tinsel, tools, hardware, or other equipment on your machine. This could cause personal injury or machine damage.
- **Caution:** If you repaint your machine, cover all notices and identification plates with masking tape before painting. All warning labels must be clearly visible.
- **Caution:** All notices and plates must be in place and legible. If they are damaged, defaced or missing they must be replaced immediately. Refer to your parts manual for part numbers and descriptions.

- **Caution:** Sales are subject to prevailing terms and conditions of sale. Specifications and illustrations may be changed without notice. All dimensions and specifications are approximate and drawings are not to scale. Machines are shown without guards for illustration purposes only.

Specific DANGER notices



• **DANGER:** Only qualified personnel familiar with the construction and operation of this equipment and its hazards should install, adjust, operate, or service this equipment. Read and understand this manual in its entirety before proceeding. Failure to observe this precaution could result in severe bodily injury or loss of life.

- **DANGER:** Dangerous voltages are used to power the motors in the machinery. Mount the servo amplifier and agitator controls inside a suitable enclosure where electrical connections can not be touched inadvertently. Do not operate the equipment with the door of the enclosure opened. Dangerous voltages may exist after power is removed! **DO NOT ASSUME SAFETY** because power is removed. Make sure all electrical power is disconnected and locked in the OFF position before attempting to service any part of the machine.
- **DANGER:** The auger and agitator drive systems can cause extensive damage and injury to personnel and to the machine if operated imprudently. To limit hazard, do not operate the machine with the protective covers removed. Use prudent maintenance procedures in performing maintenance on the machine to insure safety.
- **DANGER:** Do not locate your machine in a combustible environment or near any combustible material or explosive substance.
- **DANGER:** **GROUND** the machine. Failure to ground machine could result in electrical shock to personnel. Use the ground lugs provided within the electrical box, on the machine frame, or on other items. Run the grounding conductors directly to a permanent earth ground.
- **DANGER:** When you lift or move this machine use equipment of adequate capacity. Prevent everyone from walking, crawling, or reaching under the machine while it is supported by a hoist or other device. Keep hands and feet clear of machine, platform or skid, and wheels of lifting equipment. Watch overhead utility lines, low clearances, and other obstructions. Handling, moving and installation should be done only by competent machinery movers using appropriate equipment. Everyone must be alert and extremely careful to avoid injuries or machine damage. Be sure to follow all Danger and Caution notices.
- **DANGER:** Inspect the machine before operating. Be sure all fasteners are secure and tightened. Check fasteners on drive pulleys and idlers.
- **DANGER:** Never operate this machine unless you have been instructed on its intended use. Never maintain or adjust machinery unless all power to the machine is OFF DO NOT operate machinery without guards. DO NOT remove guards, clean, or ore repair machinery while machine is in motion.

- **DANGER:** Disconnect the electrical and pneumatic power to the machine prior to adjusting or repairing the machine,
- **DANGER:** Remove or restrain loose clothing, necktie, jewelry, or loose hair around any machinery. Keep hands away from moving machinery and from pinch points such as pulleys and belts and auger tooling. Failure to do so is likely to result in serious injury or death.

Warranty:

AS&E, Inc. warrants each item of its manufacture to be free from defects for 90 days from start up or 180 days from shipment, whichever comes first. Within this time period, all equipment within this warranty will be repaired free of charge and returned to the point of original sale provided that 1) prior approval is obtained from AS&E, 2) the defective equipment is returned freight pre-paid, 3) the equipment has not been damaged by misuse, neglect, improper operation, accident, or alteration, as determined by AS&E.

AS&E's warranty covers operation using original parts and electronic programs. Substitution of third party parts or programs or program modifications without written authorization by AS&E voids the factory warranty.

PRODUCT LIABILITY:

Because of the many and varied uses that this machine can be employed, the owners of this equipment and those responsible for its operation and maintenance must satisfy themselves that the machine is used in a manner applicable to its function and is installed and operated in a safe manner. IN NO EVENT will AS&E, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this machine.

Chapter 2: Basic Product Information

The AS&E AccuFill servo series auger filling machine is a high performance, servo driven auger filler intended to be incorporated by the OEM or the end user (customer) into an integrated automated packaging system. Since the filler is only one component of an integrated packaging machine, AS&E designed the mechanical assemblies around defacto standards for mounting and tooling accessories. In addition, the electrical interface between the filler and the customer's machine allows for several interconnection methods...from simple contact closures to more sophisticated multi-axis communications networks. Several interconnect schemes are included in this manual as examples of tried and proven techniques. However, please feel free to contact AS&E engineering staff if you have questions about how best to interconnect the filler to your machinery.

Features:

You have purchased one of the highest performance, if not the highest performance, auger filler system available anywhere in the world. Some of the features you will enjoy are...

Repeat Accuracy:

The servo controlled auger can be accurately positioned to ± 2 encoder counts regardless of voltage variations, temperature, head pressure, product density, etc. Encoder resolution is 16,000 counts per auger revolution. For a typical 3 revolution index, the auger will be positioned repeatable to within 0.004% of target value. Weight deviations due to non-repeatability of the auger drive system are all but over with the AccuFill filler.

Cycle rates:

The auger drive assembly is optimized by using low inertia designs to provide extremely high index rates - for example, 120 CPM @ 3.000 Rev/Index @ 50% duty cycle. Up to 180 cycles per minute have been achieved with smaller index distances (using larger diameter auger to achieve the fill weight). Note-accuracy does not degrade with cycle rates. The same accuracy is obtained at 10 CPM as at 120 CPM.

Auger acceleration and deceleration rates:

Auger acceleration and deceleration rates are set electronically for either a *SoftFill* or a *HardFill*. In both instances, the resulting trapezoidal motion profile lessens the jerk and shock on drive components. Mechanical fatigue and failure of drive components are all but eliminated.

Low maintenance:

The Model 50S auger filler was designed from its inception for an exceptionally long MTBF. There are no clutch-brakes to fail or slowly change performance. The brushless servo design has no brushes to burn out. In addition, the MTBR (mean time to repair) is measured in minutes, not hours or days. Finally, we expect the system to require little, if any, periodic maintenance.

Product History:

AS&E started retrofitting clutch-brake auger fillers with brushless servo assemblies in 1988 to its local customer base in the Southwest USA. From that base, we expanded our product offering by pioneering and developing all servo based auger fillers. Today, we manufacture three models of servo based fillers-our AccuFill Models 50S, 75S and 100. These units cover the broad range of weighments from fractional

ounce to multi-pound packages. We did not forget our origins, however, as we still provide retrofit kits for the more popular fillers, such as All-Fill, AMS, Bartlett, and Mateer-Burt

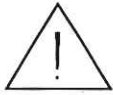
Technology comparison:

While servo technology has been widely accepted in the high speed packaging, converting, and machine tool industries, the technology is not readily known to the auger fill industry. A general understanding of the technology will aid you in getting the most benefit from your purchase.

- **A servo driven auger system** is a combination of components (positioner, amplifier, motor, and feedback device) all working together to automatically control the auger's torque, velocity, and/or position. The feedback device (usually mounted on the motor), continually reports the rotor position which is compared to the commanded position. Any difference (following error) between the desired command and feedback is automatically reduced to zero by the closed loop servo system. Thus, the repeat accuracy of the auger filler is independent of external forces. If the torque on the auger shaft is within the torque limits set in the amplifier, the auger will precisely repeat to the same index distance each time, both short and long term and with exactly the same motion profile. Excessive loading results in a following error which is immediately detected and the index halted
- **A clutch-brake indexer**, in contrast, uses a mechanical mechanism to couple a continuously rotating motor to the driven shaft. When the driven shaft turns, its movement is measured by a feedback device (typically an encoder). When the actual count equals or exceeds the preset count, the clutch is disengaged and the brake applied. The distance traveled from the time the brake is applied until the actual stop point is called the drift or coast amount and is an uncontrollable amount. The coast amount is a function of the index speed, the loading of the auger shaft, the repeatability of the clutch-brake, etc. In addition, there is no ability to set the acceleration or deceleration ramp of the auger tooling. The amount of jerk applied to the auger and product is also uncontrollable and the severity increases with the driven speed of the auger.

Chapter 3: Start Up Procedures

Mechanical Set Up:



- **CAUTION: INITIAL INSPECTION:** All fasteners used to secure the machine to the vertical mounting column should be inspected before removing the machine from its shipping crate. Check to be sure that the locking screws on the filler head, round base, and hopper support are firmly tightened against the vertical support column.
- **CAUTION: TOP HEAVY EQUIPMENT:** The filler will tip over and fall if not properly secured to a mounting base. Damage will result both to the machine and anything it falls on. Use multiple slings to support the machine and to prevent it from tipping over when hoisting. Personnel should be safely out of harms way while the filler is being hoisted onto the OEM's machine. Do not release the slings until the filler is securely fastened to the packaging machine.
- **CAUTION: HEAVY EQUIPMENT:** Do not attempt to man-handle or manually lift the filler. Hoist the filling machine using a forklift or other power assisted equipment only. Refer to attached drawings for guidance in aligning hopper and hopper coupling, and installing auger tooling.
- **CAUTION: DELICATE ELECTRONICS ON SERVO MOTOR:** Use care when handling the servo motor. The servo motor contains a precision encoder. Excessive shock to the motor can result in permanent damage to the encoder- a very expensive repair at the least. Do not subject any part of the motor to shock or excessive force. Under no circumstances expose the rotor to shock. Do not attempt to remove the motor drive pulley with anything other than a gear puller.
- **CAUTION: PRECISION MACHINERY: DO NOT FORCE COMPONENTS:** If the filler is disassembled for any reason, take care in its reassemble. If force is required to reassemble a component, then something is wrong. Factory machining tolerances on critical components allow reassemble in the field without special tools or alignment procedures. Take time. All components fit together in the factory without force. They will also in the field if sufficient care is taken.

Electrical Set Up:



- **DANGER:** Dangerous voltages are used to power the motors in the machinery. Mount the servo amplifier and agitator controls inside a suitable enclosure where electrical connections can not be touched inadvertently. Do not operate the equipment with the door of the enclosure opened. Dangerous voltages may exist after power is removed! The servo amplifier retains a capacitor charge when power is turned off. Make sure all indicator lights are extinguished before working on unit. **DO NOT ASSUME SAFETY** because power is removed. Make sure all electrical power is disconnected and locked in the OFF position before attempting to service any part of the machine.

Chapter 4: Integration with other OEM machinery

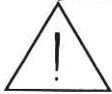
AS&E has provided its fillers both to end-users and to end users (customers). We have learned from this experience that all customers have different operational preferences and budgets. Based on these experiences, we designed the AccuFill servo fillers to be easily configured for most customer's requirements. Several wiring diagrams and programs are available showing possible ways to perform the integration. Contact AS&E engineering for details and assistance in integration with the OEM machinery.

OEM Configuration:

Basics: In the OEM configuration, the electrical control components are furnished loose-lot for mounting by the customer in the customer's packaging machine. The filler has two electrical components to connect - the agitator motor and the auger motor.

Agitator motor:

The agitator drive is a 3/4HP, 230 @ 2.6 amps FLA, 460VAC @ 1.3 amps FLA, 3 phase gearmotor, with final agitator shaft speed of 44 RPM. Possible control modes are continuous run, pulsed (SS contactor, full voltage), and pulsed (SCR soft-start or VFD). The OEM's responsibility is to select and furnish the control mode and protection circuits for the application. No control components are provided by AS&E for the agitator motor.



- **Warning:** The agitator motor is a high efficiency gear motor with sufficient torque to mix even the heaviest components. It is also powerful enough to seriously harm personnel or damage the drive components if a mechanical jam occurs. If a mechanical jam occurs, the control system must sense the overload and remove power from the motor. The overload sensors should be set less than or equal to the motor's FLA. Once an overload is sensed, the control circuit should remove power from the motor and signal a fault condition to the base machine.

Auger Motor:

The auger is driven by an ElectroCraft H-series brushless servo motor. The servo motor (ElectroCraft series H4075) is mounted to the filler head and is coupled to the auger drive spindle with high performance HTD belt and low inertia 2:1 pulleys. An ElectroCraft PDM30 amplifier is furnished "loose lot" for mounting in the OEM's control cabinet. Motor and encoder cables are furnished 10 foot lengths standard. Refer to drawing M02-002, "Power wiring and interconnect diagrams for Model 50S-OEM Auger Filler" as the minimal wiring standard for the servo amplifier. Other source information is the ElectroCraft manuals ([IQ2000 Positioning Drive Modules and Installation Manual](#) and [IQ Master Instruction Manual](#)) provided with the equipment. These manuals are excellent reference materials and provide detailed yet generic wiring diagrams and specifications relevant to the PDM30 and H4075 motor. You should read and become familiar with the IQ-2000 product before integrating the filler into your control package.

The ElectroCraft IQ series system is an excellent product for the OEM filler as it tightly integrates programmable motion, general purpose I/O, and communications functions into one package. The majority of our customer's requirements have been met by this one product alone by using its programmable features. Index distance can be entered through a simple and inexpensive thumbwheel switch, or more tightly integrated into the OEM controls via a RS232/RS422 communications channel. Several sample auger filler programs are included on diskette for your use. For more detailed information,

refer to IQ Master Instructions Manual. AS&E engineering is available, if required, to assist in your application.

- **Drive ratio and torque:** The servo motor is coupled to the auger drive spindle with a 2:1 ratio of high performance HTD timing belts and low inertia pulleys. The timing belt and pulley material require no lubrication and virtually no maintenance. By using the 2:1 drive ratio, we trade-off the higher speed of the servo motor (3000 RPM) to gain a 2 fold increase in torque. Continuous torque available to the auger shaft is 180 Lb.-In; peak torque, 360 Lb.-In.
- **Index Distance and Speed:** See the AS&E sample programs to enter a 2:1 scale factor for index distance and velocity. By so doing, the OEM control circuit can directly enter index distance and speed in engineering units referenced to the auger shaft (instead of the servo motor shaft).
- **Limiting Index Distance and Speed:** See the AS&E sample programs to provide software limits on index distance and speed. Typical index distance on auger fillers seldom exceeds 20 revolutions. Index speed is firmware limited to 1500 RPM. Set software limits to prevent the operator from entered values beyond reasonable limits.
- **Rotation Direction:** The agitator turns in the clockwise (CW) direction; the auger (servo motor) turns CCW. Unlike typical three phase motors, the servo direction cannot be reversed by swapping motor leads. Motor rotation can only be changed under program control. Refer to the drawing M02-002 attached for correct motor lead connection. Refer to AS&E sample programs for setting motor direction. Servo motor phase wiring **must** be connected as shown in the electrical schematic for proper operation of the motor.
- **Minimum Connections:** Refer to AS&E drawing M02-003- Logic Interconnections between Model 50S-OEM and User's PLC Controls. A minimum of signals are required between the PDM30 amplifier and the OEM controls. Signals for Jog Forward, Jog Reverse, and Index are required. Status signals from the filler are drive ready and drive enabled. Note: the PDM30 accepts only 24VDC control signals. Failure to follow the wiring specifications shown in the wiring diagrams attached can and will result in damage to the servo drive. Follow the instructions implicitly. Signals are required to be "dry contacts" or NPN transistors (sinking signals) as shown.
- **Concerning auger speed.** One of the advantages of the *AccuFill* servo controlled auger is the ease in setting auger speed to achieve consistent fill weights while achieving the fastest fill times. The servo control drive system allows the auger to be run at peak speed of 1500 RPM with no degradation of repeatable index lengths. Production rates can be significantly increased on those products capable of being run at the faster speeds. Experiment with different settings until you achieve the best production rates while maintaining good weighments. Realize that the system is fully capable of running 365 days, 24 hours/day at maximum speed and acceleration. Do not limit your production speed in an attempt to be less demanding of the servo drive system.
- **Concerning acceleration rates:** Typical acceleration rates range from 100 to 1000 Revs per second². Collect samples and weigh them. If the weights are repeatable, increase index speed and/or Accel rates. If other variables are held constant (head pressure, product density, etc.), non-repeatability typically results from the product not flowing uniformly into the auger funnel. Increase agitator speed, or slow down the index speed until repeatability is again achieved. Remember, the

repeatability of the auger index is no longer an issue in the repeatability of the weighment. Product handling is now the major source of weight deviations. Experiment with various ramp rates, agitator, and index speeds. Choose the range which yields the best results while not sacrificing production speed.

- **Head height as a source of non-repeatability:** Remember that the auger filler is merely a method of dispensing a unit volume of product. If the product density changes, the weight dispensed for the same revolutions will reflect the density change. Height of product in the hopper causes the product to be compressed which results in an increase in product. Keep the level of product in the hopper constant.

Chapter 5: AS&E controls package with operator interface

For customers who wish to purchase the AccuFill product as a “turn-key” product, we provide the mechanical and electrical components above in a ready to install, integrated assembly. All that is required to place into production from electrical standpoint is to connect power and a “dump” signal from the associated packaging machine. An operator console is provided which allows the operator to set the index length, velocity, acceleration profile, agitator speeds, and agitator off-delays. The electrical controls, servo positioner, power supply, agitator VFD and associated wiring, are provided in a heavy duty NEMA 12 enclosure.

The electrical components are described in Chapter 4. Refer to this chapter for information on wiring, capabilities, etc. Chapter 5 describes how to use the Operator’s Terminal and Console and the Thumbwheel Switch Console.

Thumbwheel Switch Console

The thumbwheel switch console, the least expensive method of setting auger index distance, is well suited for large production line operation where the one or two products are to be run year round. Where multiple products are to be run with frequent change over of products, the Operator Terminal and Console described below may be more suitable.

The thumbwheel switch console includes a four digit decimal switch in a 6”x6” enclosure suitable for mounting up to 25 feet away from the filler. Auger revolutions are entered with a range of 0.000 to 9.999 revolutions or 00.00 to 99.99 revolutions. Jumper options, inside the control cabinet, select auger speed (800, 1000, 1200, 1500 RPM) and thumbwheel scaling- x.xxx or xx.xx revolutions.

Operator Terminal and Console

The operator’s terminal is a 4 line x 20 character VF display with 8 function keys and 10-key numeric keypad. Function keys and their operation follow.

Product Memories: X1 Key

Ten products can be store for recall at a later date. Product numbers are 0 to 9. All parameters for a product are stored and any changes made to the current product are automatically stored in product memory for subsequent recall.

Setting Index Length : X2 Key

Direct setting of index length:

Press the **X2** Key to directly enter the index distance. The index distance is the number of revolutions made by the auger each time a "dump" command is issued from the bagger. Index distance is entered directly in revolutions. Once the key has been pressed, the flashing cursor will appear next to the display line showing the index length. You may abort entering new value by merely pressing the **ENTER** key.

Enter the desired index distance, scaled in revolutions of the auger by entering the number with decimal point using the 10-key pad. Press the **ENTER** key to register the value. If a wrong number is entered, use the back arrow key to remove the number entered. To remove the entire entry, use the Clear Key. Index distance is restricted to 99.99 revolutions. A number outside this range will cause an error message to appear on the screen. In this case, press **ENTER** to clear the error message, and continue by entering a value within the 0.01 to 99.00 revolution range.

Minor changes to index length with F1, F2, F3, F4 keys & Remote Inputs

Minor adjustment: Pressing the **F1**, **F2**, **F3** and **F4** keys causes the current index length to be raised or lowered by 0.01 or 0.1 revolutions each keystroke. The remote increment and decrement switch inputs adjust the index distance by 0.01 revolutions. These keys are useful in trimming the bag weight during production. Normally, the index revolution only needs to be adjusted up or down a small amount to get bag weight closer to the target weight. Use these keys to fine tune weights once the base setting has been determined.

Setting Speed and Ramp Rates: X3 Key:

Once the **X3** key has been pressed, the flashing cursor will appear next to the display line showing the index speed. Enter the desired speed, scaled in percent speed of the auger shaft, from 10 to 100% and press the **ENTER** key. After entering speed, the ramp rate (acceleration & deceleration rates) of the index is entered. The ramp rate determines how fast the auger reaches the index speed. The ramp rate is scaled in percentage units with an acceptable range of 10 to 100%. Accept the current value by pressing the **ENTER** key. Next, enter the desired agitator speed, in RPM, ranging from 10 to 100%. Accept the current value by pressing the **ENTER** key.

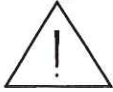
Additional Operator Display Diagnostics Functions

STATUS key: Pressing the **STATUS** key on the bottom right of the operator's console will cause the display to scroll through multiple factory configured screens providing monitoring and trouble shooting information. Examples: Program Status, I/O status, Position, Velocity, etc. These screens are applicable for trouble shooting the internal operation of the servo system. An operator, during normal production, will have little need for the status displays. If the status key is pressed, return to the main program displays by pressing the **CLEAR** key.

Chapter 6: Mechanical Adjustments

Hopper removal and alignment

The manufacturing tolerances of the filler prevent gross misalignment to occur. However, small amounts of alignment may be necessary to achieve peak performance.



DANGER: Disconnect all electrical power from the filler and lock in the OFF position before attempting to remove the hopper.

Hopper removal:

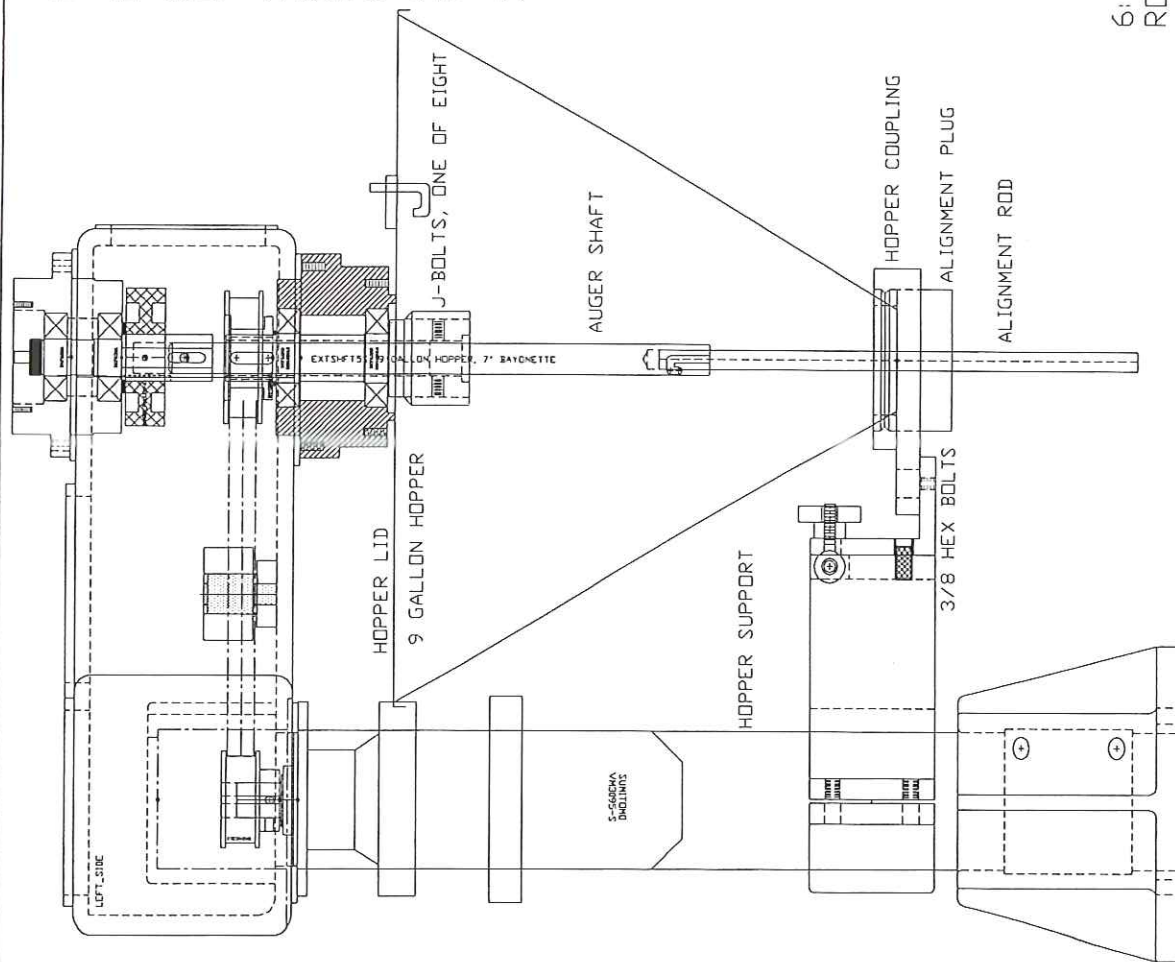
Refer to the attached drawing for additional information.

1. Disconnect power from the filler- both to the servo and agitator motors.
2. Remove the auger funnel from the hopper support by loosening the three lower knurled hand screws.
3. Remove the auger tooling if installed. The auger tooling connects to the auger drive shaft using a bayonet coupling and pressure spring. Push up and rotate CCW until the auger disengages and can be lowered out of the hopper. You may need to hold the auger drive stationary. If a shaft collar is used, loosen the collar until it frees the auger shaft. Store the auger in a safe, out of the way location to prevent damage or injury.
4. Loosen the hopper cover J bolt clamps and turn to allow the hopper to drop free of the bolts.
5. While supporting the hopper, loosen the hand knob on the hopper support casting and rotate it out of the way. Remove the hopper and coupling together as a unit. To prevent unnecessary realignment of the hopper, do not loosen or remove the two hex head bolts on the hopper coupling.

Hopper alignment:

Refer to the attached drawings for more information.

1. The hopper was aligned at the factory before shipping. However, the hopper will need to be aligned from time to time to achieve peak performance. Misalignment may result in excessive wear of the auger tooling and agitator blades and/or hopper. During normal operation, very little noise will be heard from the filler. Any scrapping noises or vibrations are an indication of hopper misalignment.
2. Disconnect all electrical power to the agitator and servo motors. Remove any product in the hopper and remove any auger tooling.
3. Insert the alignment plug into the bottom of the hopper and hand tighten the three lower coupling screws to secure in place.
4. Insert the alignment rod through the alignment plug until it enters the opening in the auger drive shaft. If the alignment rod easily enters the auger drive shaft, the hopper is aligned and no further alignment is necessary. If not, proceed with the following steps.
5. If the hopper support casting is not aligned vertically with the head casting, loosen the four ½" bolts securing the hopper support casting to the column. Rotate the hopper support casting so that it is aligned with the head casting.
6. Loosen but do not remove the two 3/8" hex bolts holding the hopper coupling to the hopper support casting. Reposition the hopper support casting horizontally so that it is aligned horizontally with the head casting.
7. In both steps 5 and 6 above, use the alignment rod to assist in the alignment of the hopper support and coupling.



HOPPER COUPLING AND HOPPER ALIGNMENT PROCEDURE

- 1: TURN OFF POWER TO MACHINE
- 2: INSERT ALIGNMENT PLUG INTO HOPPER COUPLING AND HAND TIGHTEN COUPLING SCREWS.
- 3: INSERT ALIGNMENT ROD THROUGH PLUG AND INTO AUGER SHAFT. IF ROD CAN BE EASILY INSERTED AND REMOVED FROM AUGER SHAFT, HOPPER AND HOPPER COUPLING ARE ALIGNED. NO FURTHER ACTION IS NEEDED.
- 4: IF ROD CANNOT BE EASILY INSERTED AND REMOVED, THEN PROCEED AS FOLLOWS.
- 5: ALIGNMENT PROCEDURE...
 - A: LOOSEN BUT DO NOT REMOVE THE J-BOLTS
 - B: LOOSEN BUT DO NOT REMOVE THE TWO 3/8" HEX BOLTS HOLDING THE HOPPER COUPLING TO THE HOPPER SUPPORT.
 - C: FIRST, REPOSITION THE HOPPER COUPLING SO THAT ROD CAN BE EASILY INSERTED AND REMOVED FROM THE AUGER SHAFT. THE ROD SHOULD ROTATE, ALTHOUGH SOME FIRM FORCE WILL BE REQUIRED.
 - 1: ONCE ALIGNED, SNUG THE 3/8 HEX BOLTS. MAKE SURE THE ROD CONTINUES TO SLIP EASILY INTO THE AUGER SHAFT.
 - D: SECOND, SNUG THE J-BOLTS SECURING THE HOPPER TO THE LID. SNUG OPPOSED J-BOLTS TO BE SURE HOPPER IS NOT PULLED ONE SIDE OR THE OTHER BY THE TIGHTENING OF THE J-BOLTS.
- 6: RECHECK ROD ALIGNMENT. IF ALIGNED, REMOVE ALIGNMENT ROD AND PLUG. IF NOT ALIGNED, REPEAT STEP 5.
- 7: INSERT TOOLING AND PROCEED TO RUN PRODUCTION.

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AUTOMATION SUPPLY AND ENGINEERING, INC
HOUSTON, TEXAS

DATE: JAN 1996

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HOPPER ALIGNMENT PROCEDURE

8. When the vertical and horizontal alignments are completed, the alignment tool should easily enter the auger drive shaft. Repeat steps 5 and 6 as many times as needed to achieve proper alignment.

Auger Height Adjustment:

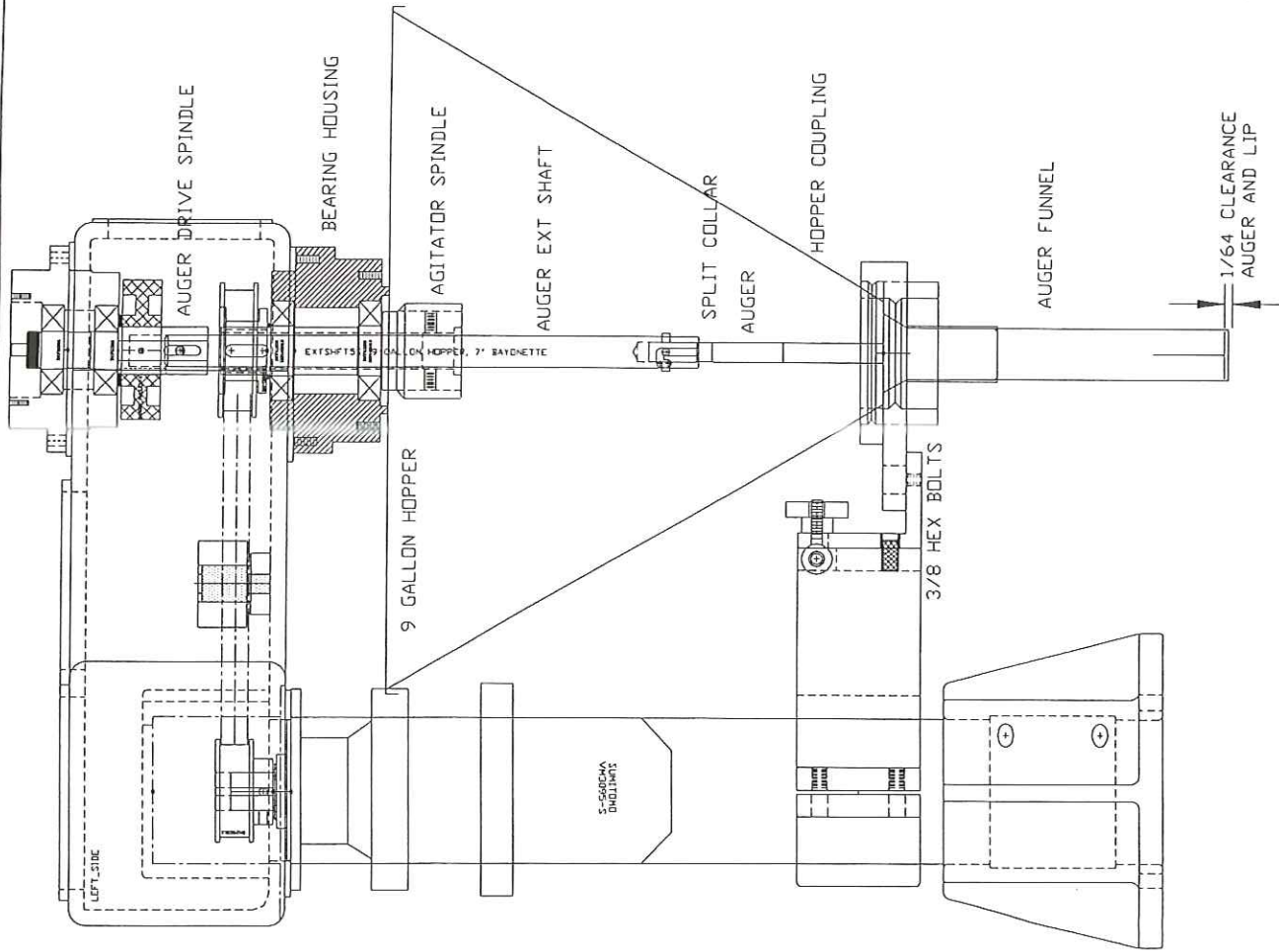
Refer to the attached drawings for more information. The auger height is critical for proper operation. Set the clearance between the bottom the auger and the lip of the funnel to 1/32". The height adjustment bolt is accessible through the maintenance panel in the top of the head casting. **NOTE:** The height adjustment bolt is shipped from the factory in the highest position to prevent the customer from inadvertently starting the filler with the auger height set too low. Consequently, you must adjust the auger height in the field before starting production.

Self Feeding Tooling with Drip Washers:

For products that drip or fail to pack in the auger tooling, drip washers can be used to lessen the dripping. Note: The drip washers should only be installed after the product has been run and tested on the tooling. Too large a drip washer will cause the product to tightly compress in the auger tooling and jam the machine. If this happens, merely jog the tooling the reverse direction to clear the jam. Turn off power to the machine and replace the drip washer with a smaller diameter piece. Turn power back on and jog in the forward direction. Repeat the procedure until the appropriate sized drip washer is determined.

Free Flowing products: using spinner plate and collector funnel:

For products that are free flowing (they do not pack in the auger tooling), a combination of a spinner plate and collector funnel is used to dispense the product. The gap between the bottom of the auger tube and the spinner plate should be set so that product does not spill off the plate. The distance should be as large as possible without product spillage. Too close a gap will cause the product to tightly compress in the auger tooling and jam the machine. If this happens, merely jog the tooling the reverse direction to clear the jam. Turn off power to the machine and increase the gap. Turn power back on and jog in the forward direction. Repeat the procedure until the appropriate sized gap is determined.



AUGER ALIGNMENT AND INSTALLATION

- 1: TURN OFF POWER TO MACHINE
- 2: HOPPER AND HOPPER COUPLING SHOULD HAVE BEEN PREVIOUSLY ALIGNED.
- 3: INSERT AUGER EXTENSION SHAFT PARTIALLY INTO HOPPER. LEAVE ABOUT 3 TO 4 INCHES BELOW BOTTOM OF HOPPER COUPLING.
- 4: COUPLE AUGER BAYONETTE INTO AUG EXTENSION SHAFT BY ROTATING BAYONETTE INTO THE J-SLOT.
- 5: MOVE SLIT COLLAR UNTIL FLUSH WITH BOTTOM OF AUGER EXTENSION SHAFT. TIGHTEN SCREWS.
- 6: RAISE COMBINED AUGER AND AUGER EXT SHAFT ASSEMBLY UNTIL EXT SHAFT INSERTS INTO AUGER SPINDLE.
- 7: SNUG 3/8" BOLT TO HOLD THE AUGER ASSEMBLY AT THE TOP OF THE ADJUSTMENT SLOT.
- 8: SLIDE AUGER FUNNEL INTO PLACE. USE THE THUMB SCREWS TO SECURE THE FUNNEL TO THE HOPPER COUPLING.
- 9: LOOSEN THE LOCK NUT AND ALLOW THE AUGER ASSEMBLY TO LOWER INTO THE AUGER FUNNEL. SET CLEARANCE BETWEEN BOTTOM OF AUGER AND LIP OF FUNNEL TO 1/64".
- 10: FIRMLY TIGHTEN LOCKING NUT.
- 11: PUT PROTECTIVE COVERS ON MACHINE. CONNECT AIR LINES AND PROX SWITCH CABLE USED ON FLAPPER TOOLING. TURN POWER ON, AND JOG REV (SLOWLY) THE AUGER.
- 12: WHEN JOGGING, LISTEN FOR ANY SCRAPPING OR RUBBING SOUNDS. A LITTLE IS NORMAL. EXCESSIVE AMOUNT INDICATES HOPPER AND COUPLING MISALIGNMENT.

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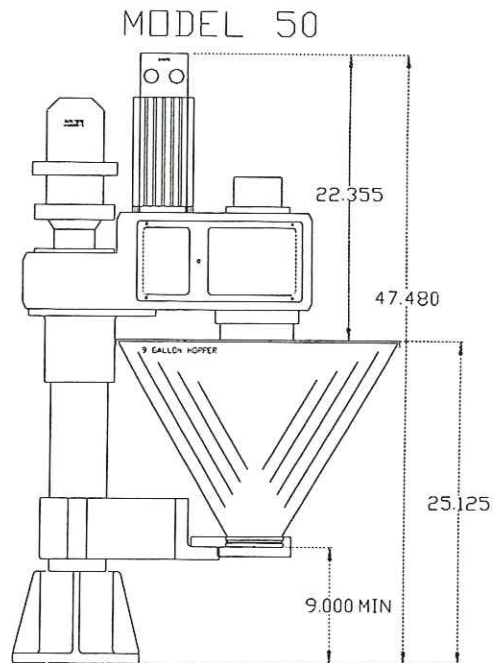
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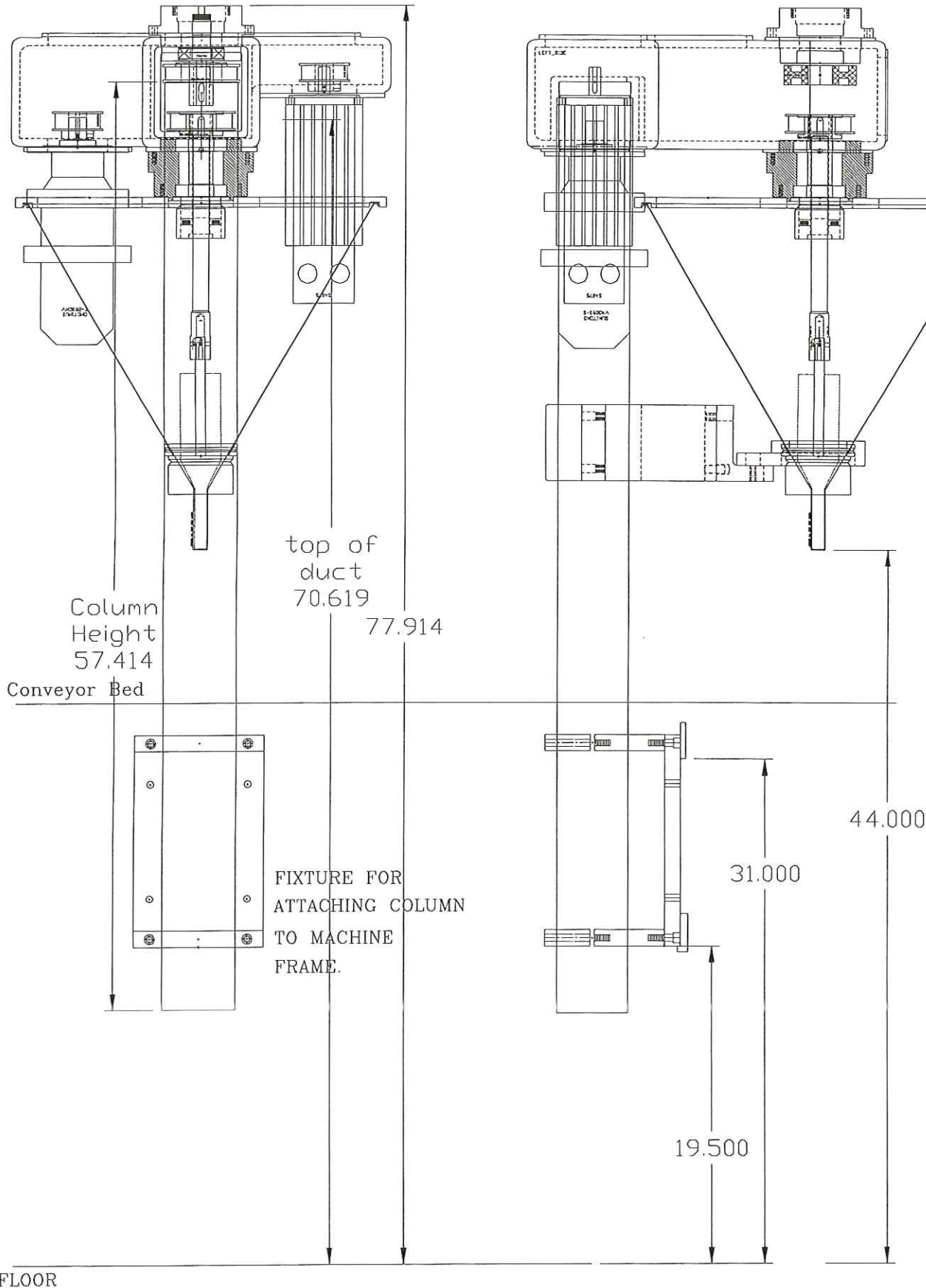
MECHANICAL DOCUMENTATION

ACCUFILL SPEEDSTER 50, 75, &100 Servo controlled AUGER FILLING MACHINES



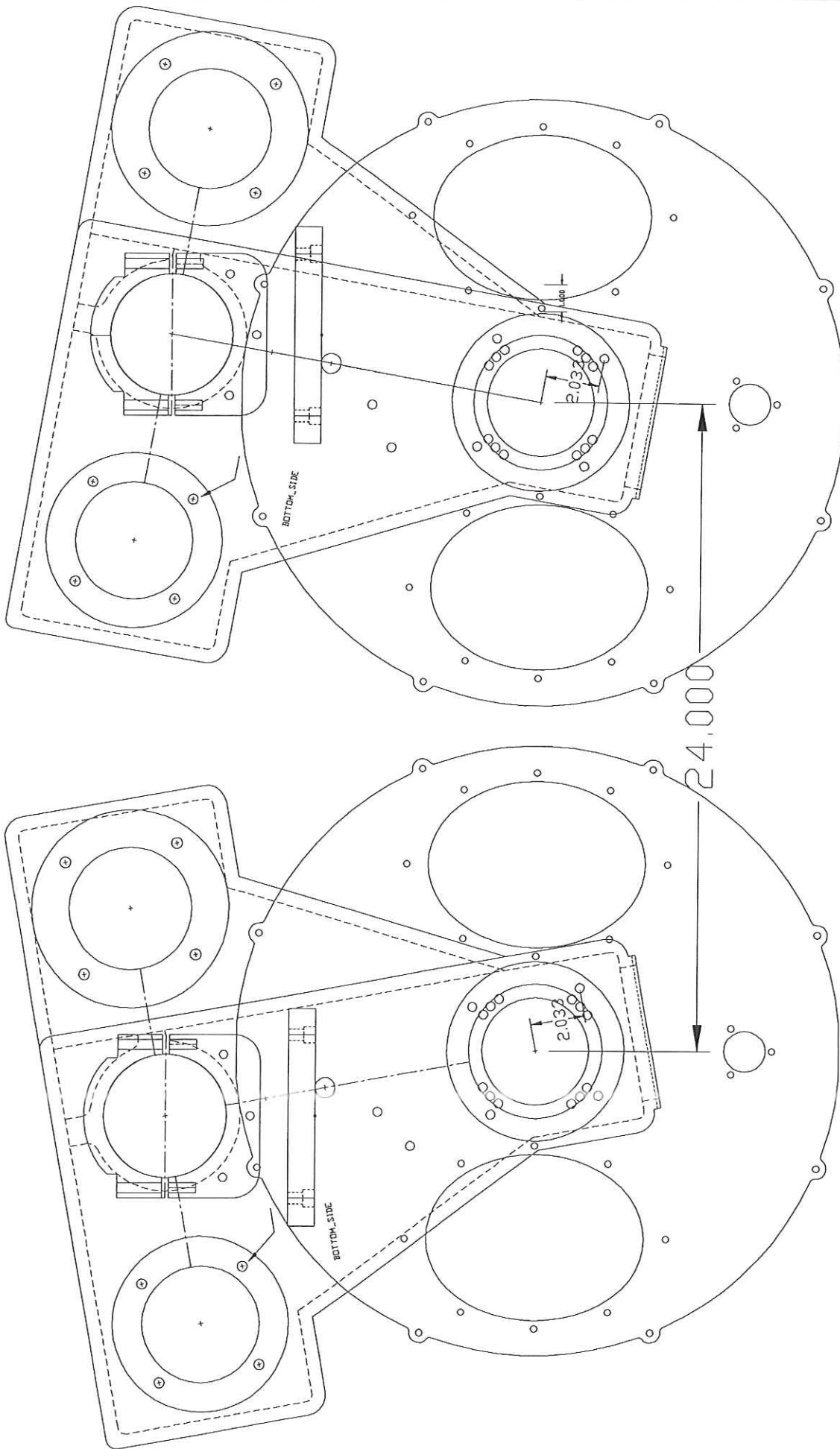
Installation, Documentation and Operations Manual

AUTOMATION SUPPLY AND ENGINEERING, INC.
8307 CREEKSTONE CIRCLE
HOUSTON, TEXAS 77055-6713
FAX PHONE (713) 465-8080



CHECK PRINT FOR DIMENSIONS AS SHOWN.
 MODEL 75 FILLERS TO BE MOUNTED TO EXISTING MACHINE FRAMEWORK.

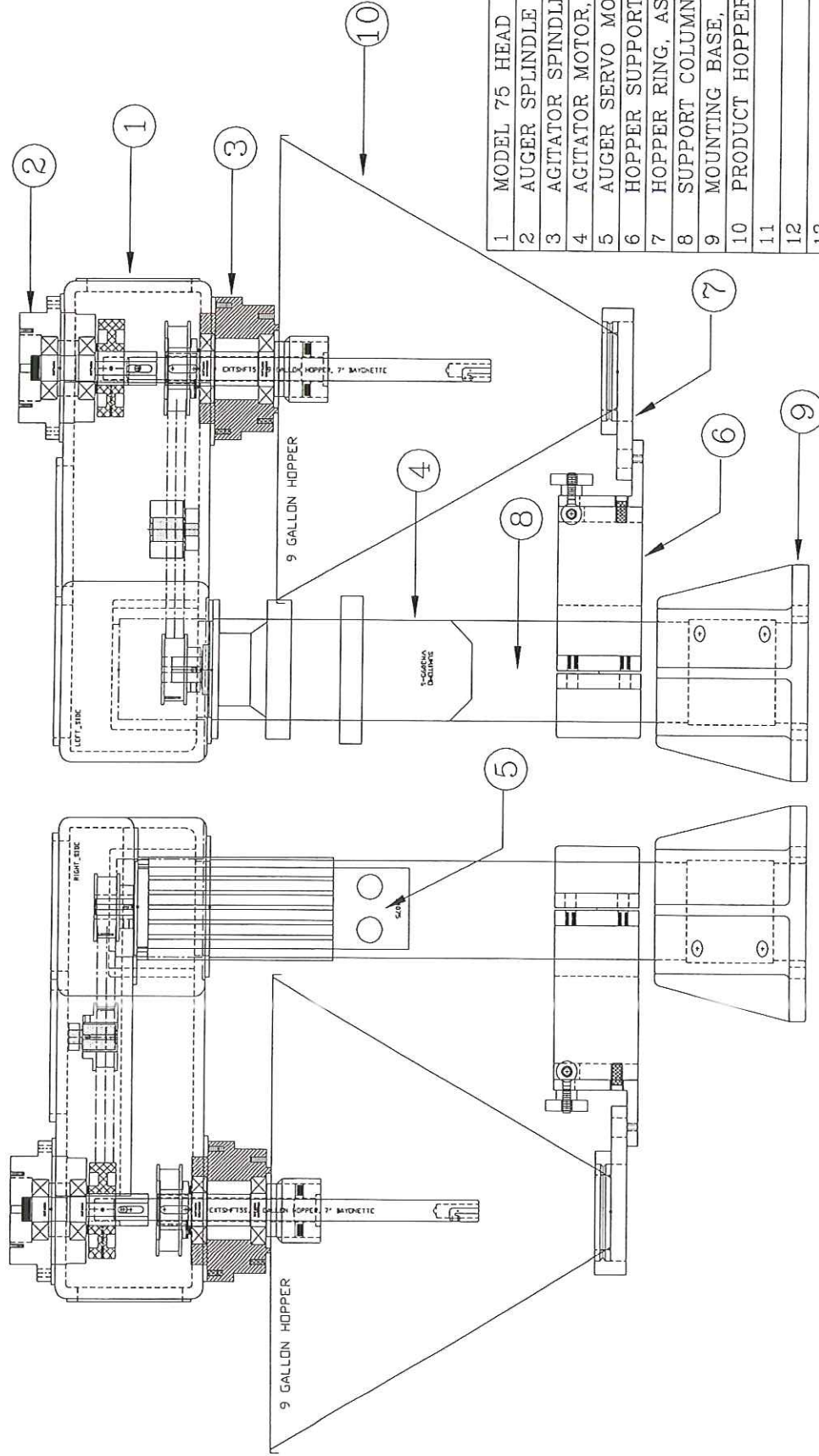
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<div>SCALE:</div>	<div>AUTOMATION SUPPLY AND ENGINEERING, INC</div> <div>HOUSTON, TEXAS</div> <div>Rivana Foods, Bartelt Line</div>
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------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------	----------------------------------------------------------------------------	----------------------------------------------------------------------------------

LEFT SIDE

RIGHT SIDE



1	MODEL 75 HEAD CASTING, ASE
2	AUGER SPLINDLE ASSEMBLY, ASE
3	AGITATOR SPINDLE ASSEMBLY, ASE
4	AGITATOR MOTOR, SUMITOMA
5	AUGER SERVO MOTOR, ELECTROCRRAFT
6	HOPPER SUPPORT, ASE
7	HOPPER RING, ASE
8	SUPPORT COLUMN, ASE
9	MOUNTING BASE, ASE
10	PRODUCT HOPPER, 9 OR 16 GAL, ASE
11	
12	
13	
14	
15	

DRAWING NUMBER

AUTOMATION SUPPLY AND ENGINEERING, INC
HOUSTON, TEXAS

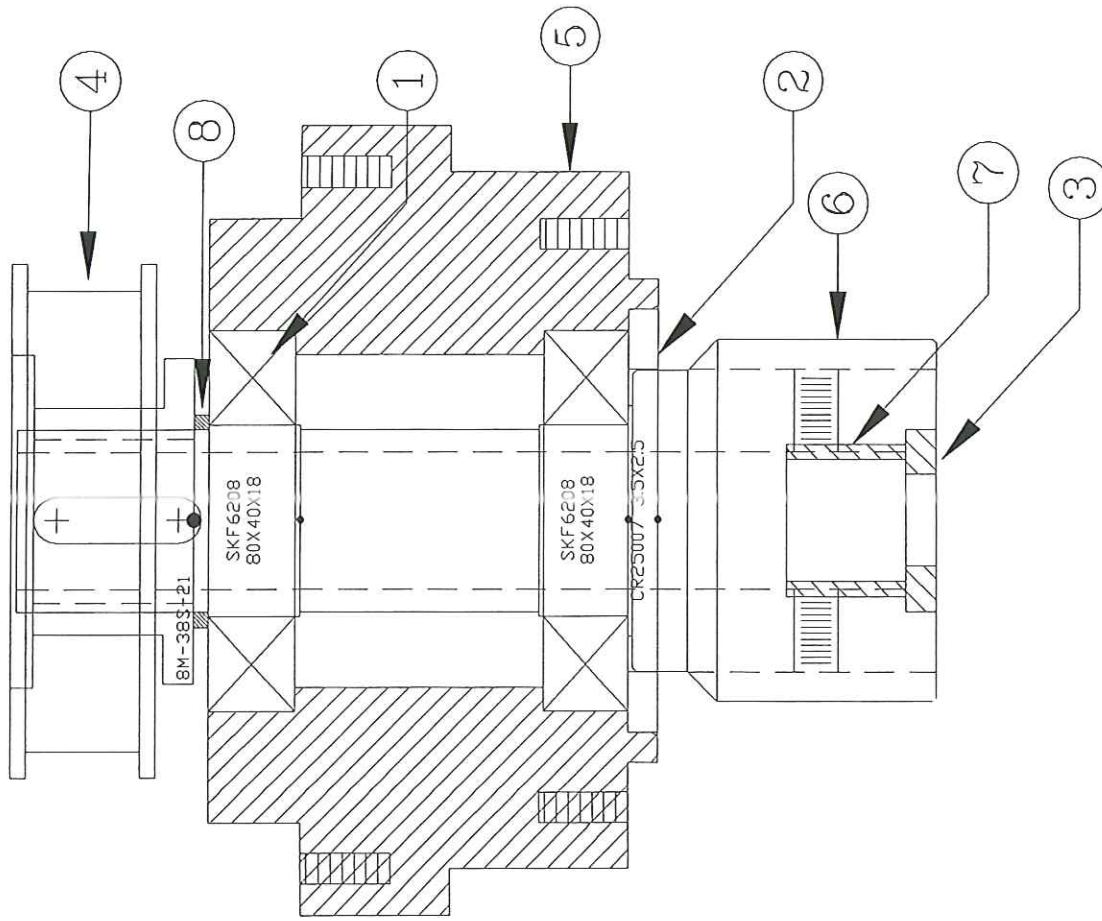
DATE: JAN 1996

SCALE:

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MODEL 75 POWER TRANSMISSION OVERVIEW



1	BEARING, SKF8208-2RS1
2	SEAL, CR25007
3	SEAL, CR7571
4	PULLY, 8M-38S-21, POLYCHAIN
5	BEARING HOUSING, ASE
6	AGITATOR SPINDLE, ASE
7	BUSHING, ASE
8	SPACER, NYLON, ASE
9	
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TOLERANCES UNLESS OTHERWISE SPECIFIED

FRACTIONS DECIMAL
 $\pm \frac{1}{64}$.X \pm .05
 ANGLES .XX \pm .005
 \pm .1 DEG .XXX \pm .001
 FILLETS .005-.010 RADIUS
 CHAMFERS .020-.040 X 45 DEG

DRAWING NUMBER

M75-AGIT_SPINDLE

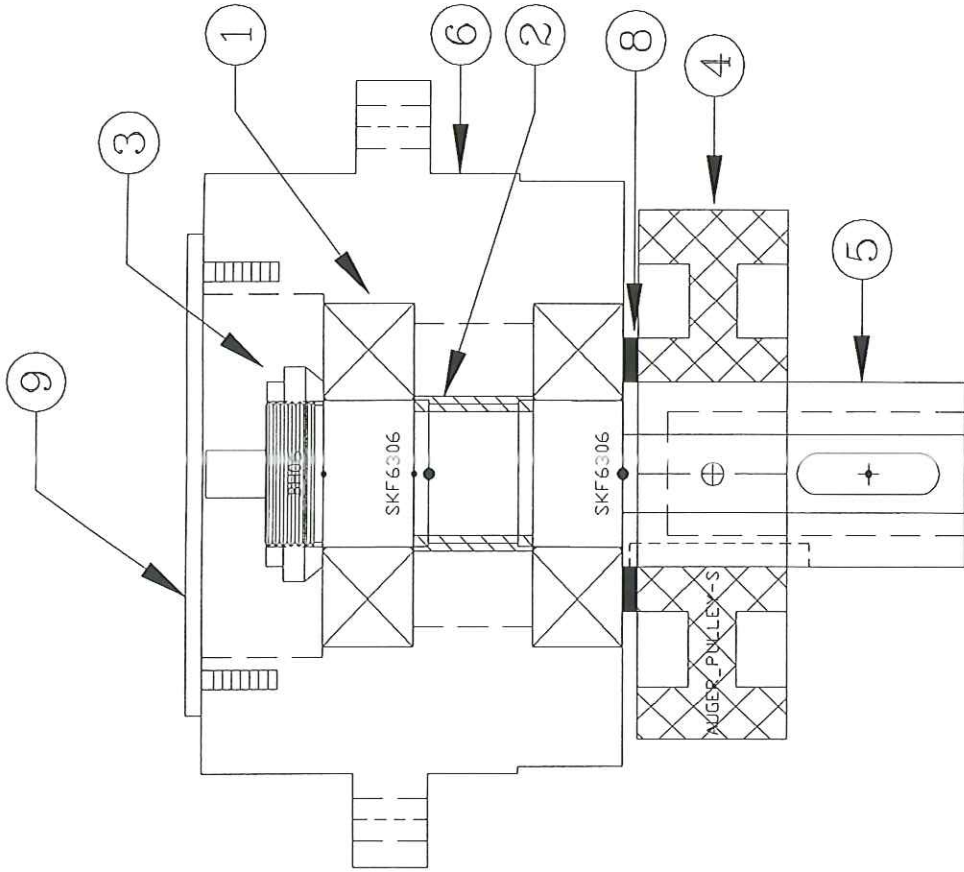
DATE: JANUARY 1997

SCALE:

AUTOMATION SUPPLY AND ENGINEERING, INC

HOUSTON, TEXAS

MODEL 75 SPEEDSTER LP
 AGITATOR SPINDLE ASSEMBLY



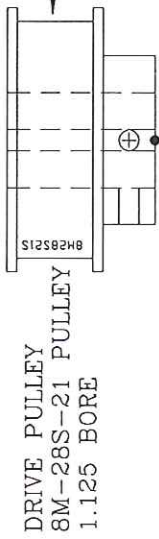
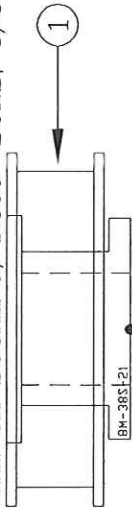
1	BEARING, SKF6306-2RS1
2	BUSHING, THRUST, ASE
3	LOCK NUT, W/H BH06
4	PULLEY, HTD, 44T-8M-PS, ASE
5	AUGER DRIVE SPINDLE, ASE
6	BEARING HOUSING, ASE
7	BUSHING, ASE
8	SPACER, NYLON, ASE
9	SPINDLE, TOP COVER, ASE
10	
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	<p>DATE: JANUARY 1997</p>	<p>MODEL 75 SPEEDSTER LP</p> <p>AUGER SPINDEL ASSEMBLY</p>	
	<p>SCALE:</p>		

POLYCHAIN PULLEY

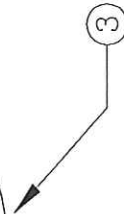
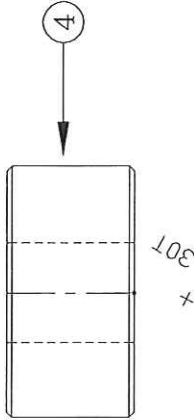
S8-M-38S-21 PULLEY

WITH SH BUSHING, 1.500" BORE, 3/8" KEYWAY



GATES POLYCHAIN BELT, 8M-1120-21, 8mm PITCH, 125 TEETH

FABRICATED 8M-20S-21 ALUM PULLEY, ASE



1	AGIT PULLEY, 8M-38S-21 WITH SH BUSHING, 1.5 DIA, 3/8 KEY
2	8M-28S-21 PULLEY, 1-1/8 DIA
3	POLYCHAIN BELT, 1120-8M-21
4	IDLER PULLEY, 30T, 8mm
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TOLERANCES UNLESS OTHERWISE SPECIFIED

FRACTIONS DECIMAL
 +/- 1/64 X +/- .05
 ANGLES XX +/- .005
 +/- .1 DEG XXX +/- .001
 FILLETS .005-.010 RADIUS
 CHAMFERS .020-.040 X 45 DEG

DRAWING NUMBER

AGITATOR DRIVE SYSTEM

DATE: JAN 1997

SCALE:

AUTOMATION SUPPLY AND ENGINEERING, INC

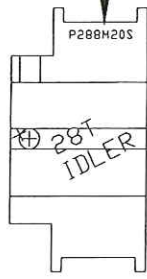
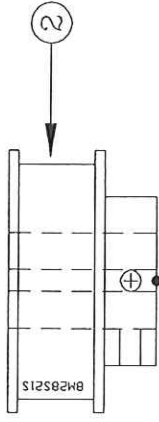
HOUSTON, TEXAS

MODEL 75 AUGER FILLER
 AGITATOR DRIVE SYSTEM

HTD DRIVE PULLEY
FABRICATED WITH 8M-44-20 PULLEY STOCK
CUSTOM BORE AND KEYWAYS



DRIVE PULLEY
8M-22T-20 HTD
5/8" BORE



IDLER PULLEY
8M-28T-20 HTD
CUSTOM BORE AND BEARING

+ 22T

+ 22T



1	PULLEY, 8M-44S-20PS WITH FABRICATED BORE AND KEYWAY
2	8M-28S-21 PULLEY, 1-1/8 DIA
3	HTD BELT, 8M-1120-20
4	HTD PULLEY, P28-8M-20-DF
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TOLERANCES UNLESS OTHERWISE SPECIFIED

FRACTIONS	DECIMAL
+/- 1/64	.X +/- .05
ANGLES	.XXX +/- .001
FILLET: .005-.010 RADIUS	.XXX +/- .005
CHAMFERS: .020-.040 X 45 DEG	

DRAWING NUMBER

AUGER DRIVE SYSTEM

DATE: JAN 1997

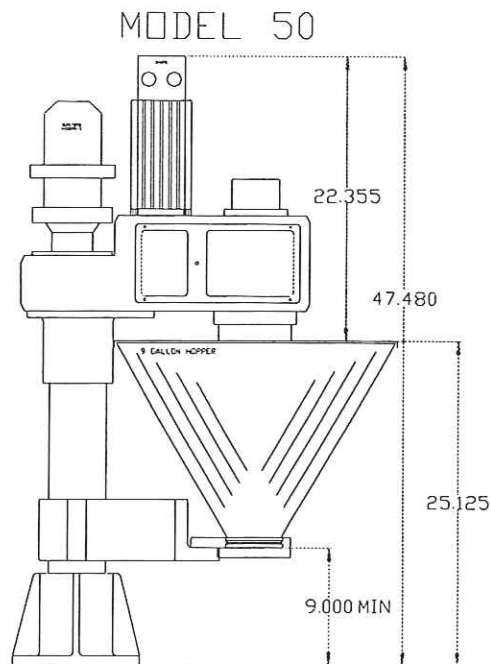
SCALE:

AUTOMATION SUPPLY AND ENGINEERING, INC
HOUSTON, TEXAS

MODEL 75 AUGER FILLER
AUGER DRIVE SYSTEM

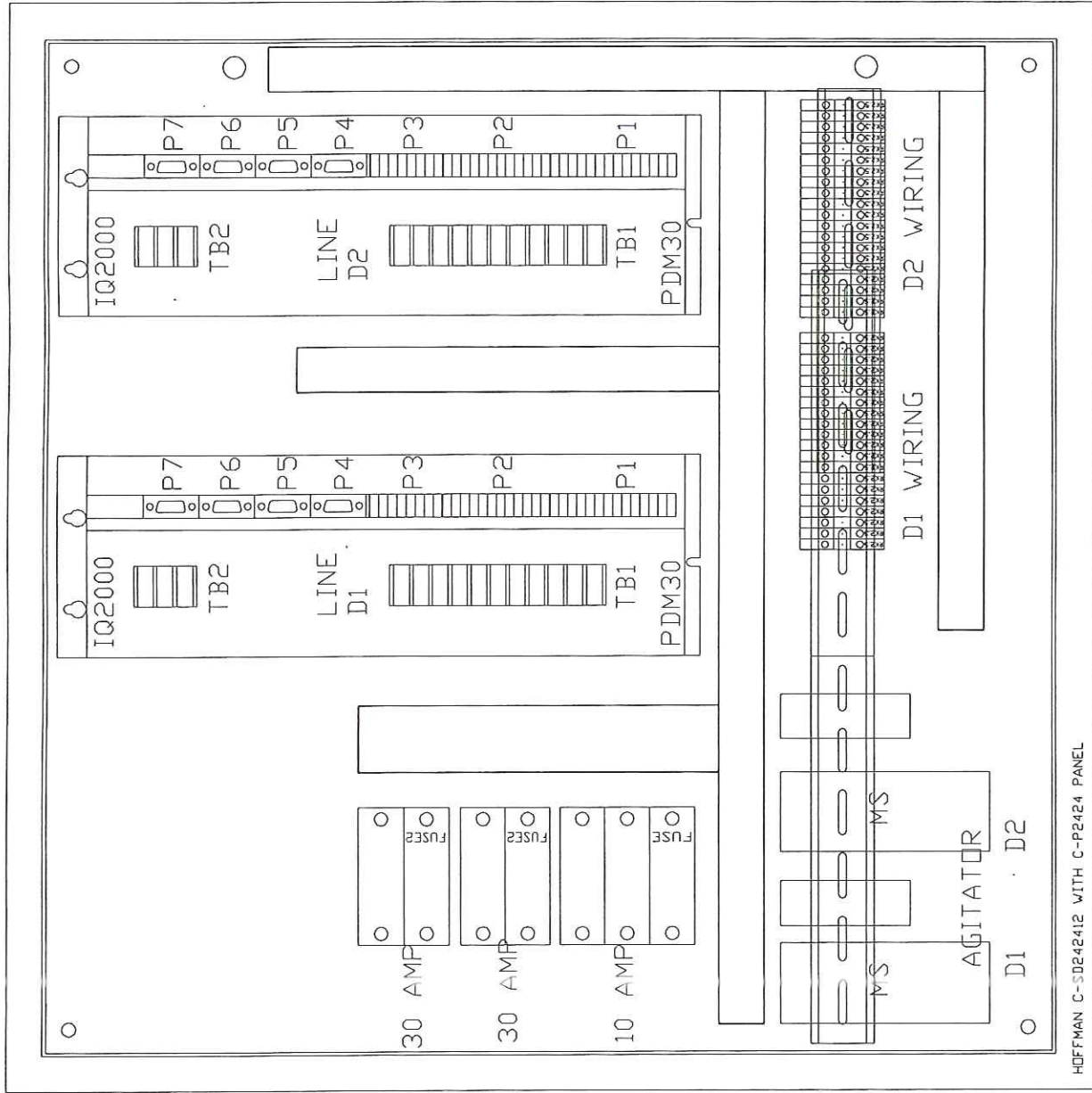
ELECTRICAL DOCUMENTATION

ACCUFILL SPEEDSTER 50, 75, &100 Servo controlled AUGER FILLING MACHINES



Installation, Documentation and Operations Manual

AUTOMATION SUPPLY AND ENGINEERING, INC.
8307 CREEKSTONE CIRCLE
HOUSTON, TEXAS 77055-6713
FAX PHONE (713) 465-8080



HOFFMAN C-30242412 WITH C-P2424 PANEL

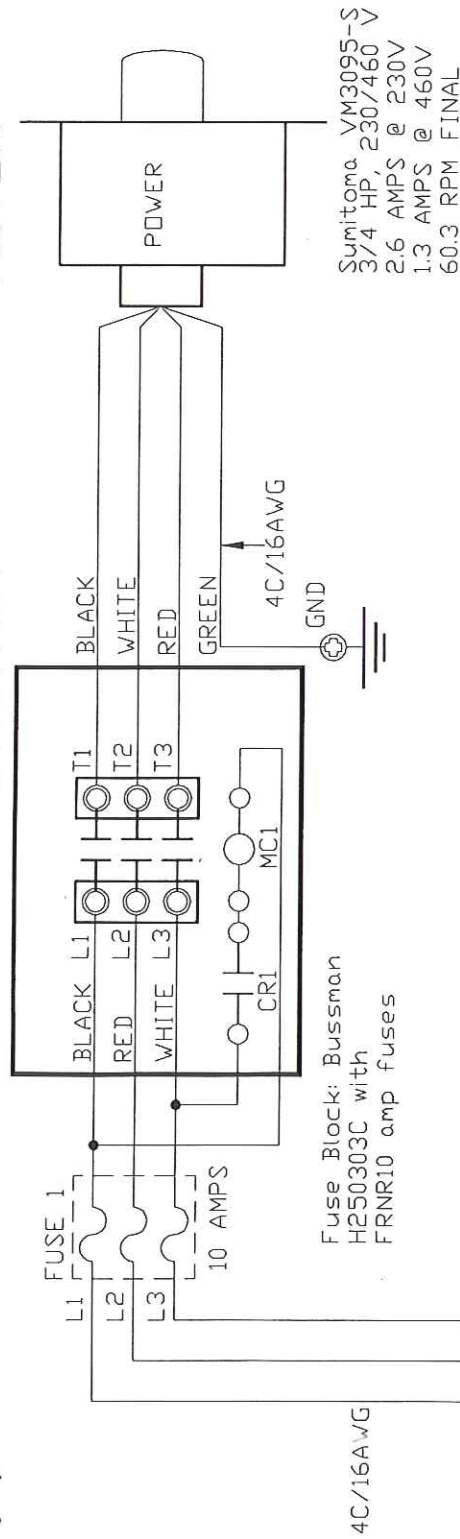
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-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

***** DANGER*****

Only qualified electrical personnel should install, adjust, operate, or service this equipment. Failure to observe this precaution could result in severe bodily injury or loss of life.

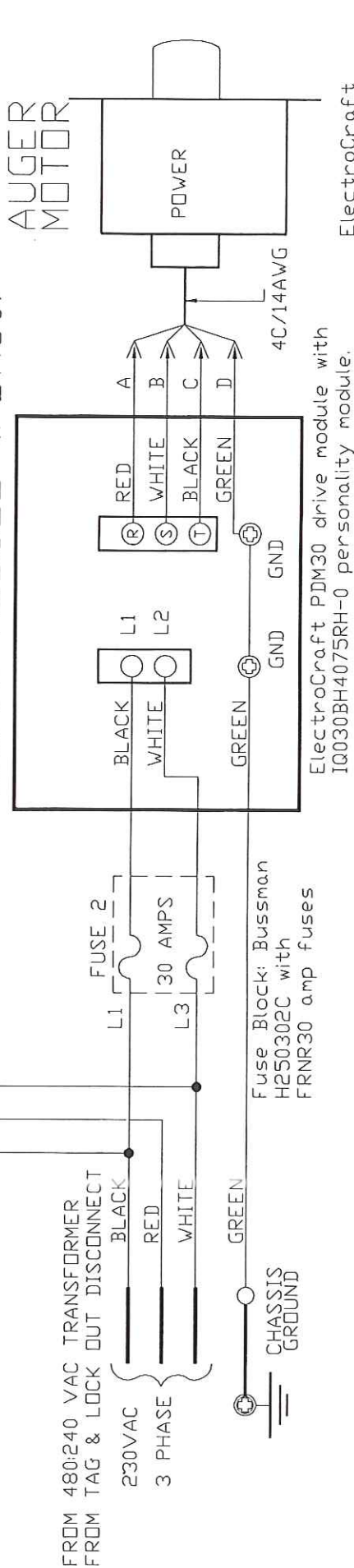
AGITATOR MOTOR

AGITATOR MOTOR STARTER



AUGER MOTOR

ELECTROCRAFT IQ2000 DRIVE MODULE (PDM30)



CUSTOMER: RIVIANA FOODS
FEBRUARY 1998, BARTELT LINE CONVERSION

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TOLERANCES UNLESS OTHERWISE SPECIFIED
FRACTIONS DECIMAL
+/- 1/64 .XX +/- .05
ANGLES .XXX +/- .001
+/- 1 DEG .XXXX +/- .0005
FILLET: .005-.010 RADIUS
CHAMFERS: .020-.040 X 45 DEG

DRAWING NUMBER

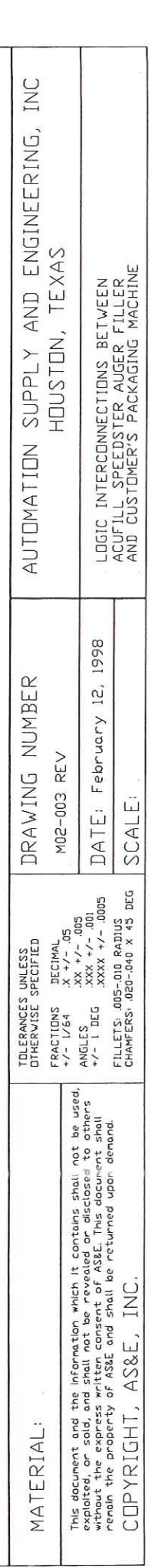
DATE: FEBRUARY 1998

SCALE:

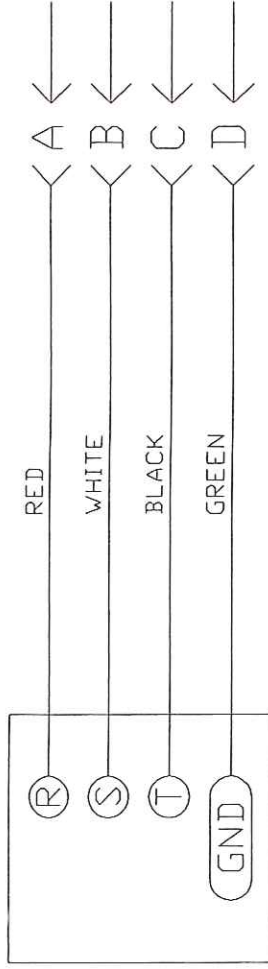
AUTOMATION SUPPLY AND ENGINEERING, INC
HOUSTON, TEXAS

POWER DISTRIBUTION WIRING FOR
MODEL 75 AccuFill Speedster

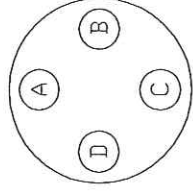
PACKAGING MACHINE CONTROL CABINET



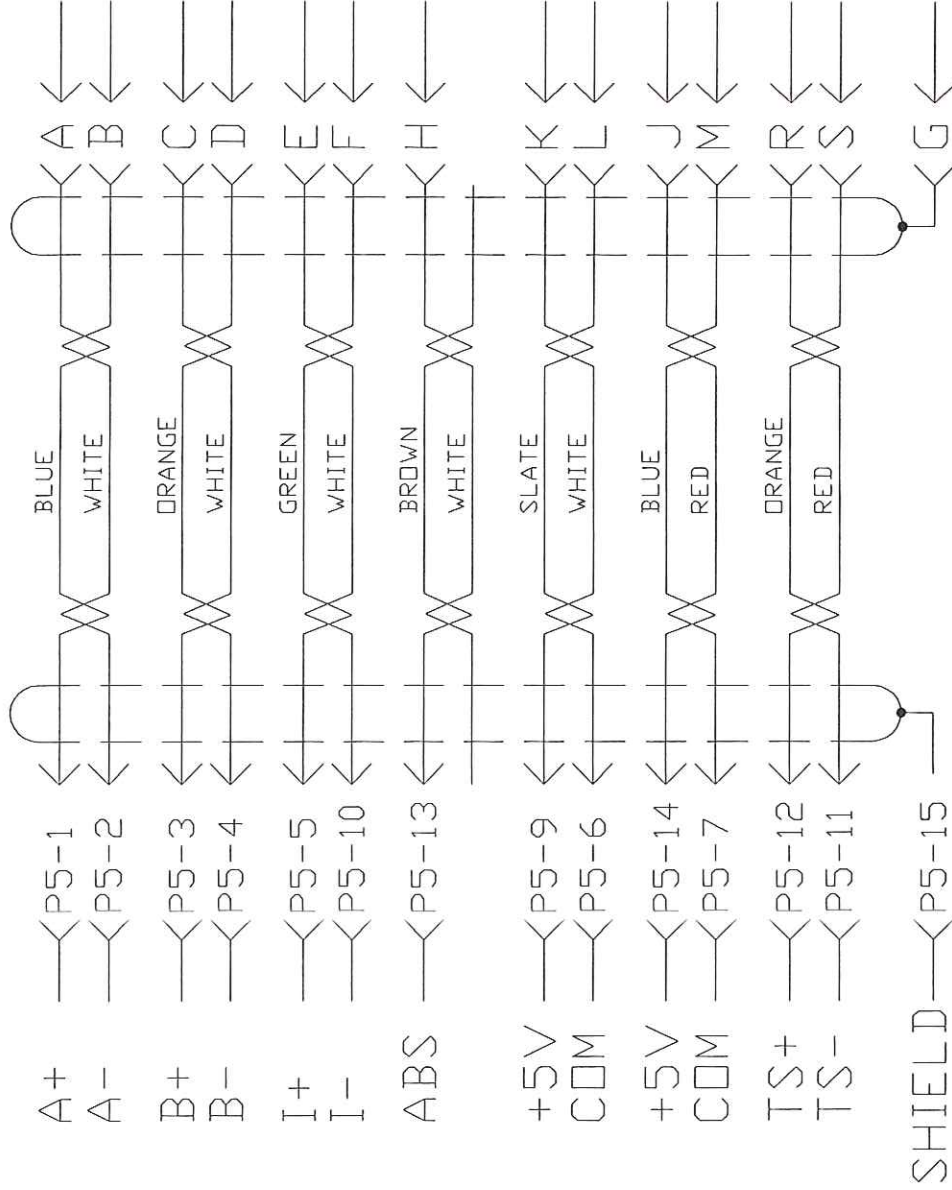
DRIVE MODULE CONNECTIONS



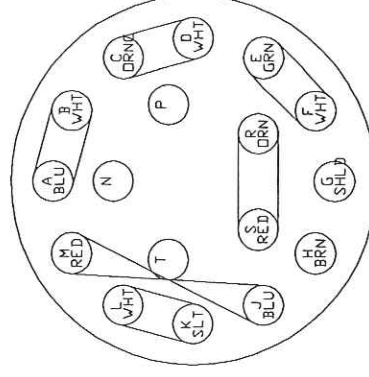
CABLE: SD TYPE #14 AWG FOR H4075 MOTORS
CABLE: SD TYPE #8 AWG FOR H6200 MOTORS



MOTOR POWER CONNECTOR
MS3106F208-4S, 4000 SERIES MOTORS
MS3106F24-22S, 6000 SERIES MOTORS



CONNECTOR: MS3106F20-29S
CABLE: BELDEN 8337, COLOR CODE #4
AMP CONNECTOR: 15-PIN MINI-D



(SOLDER PINS SHOWN)

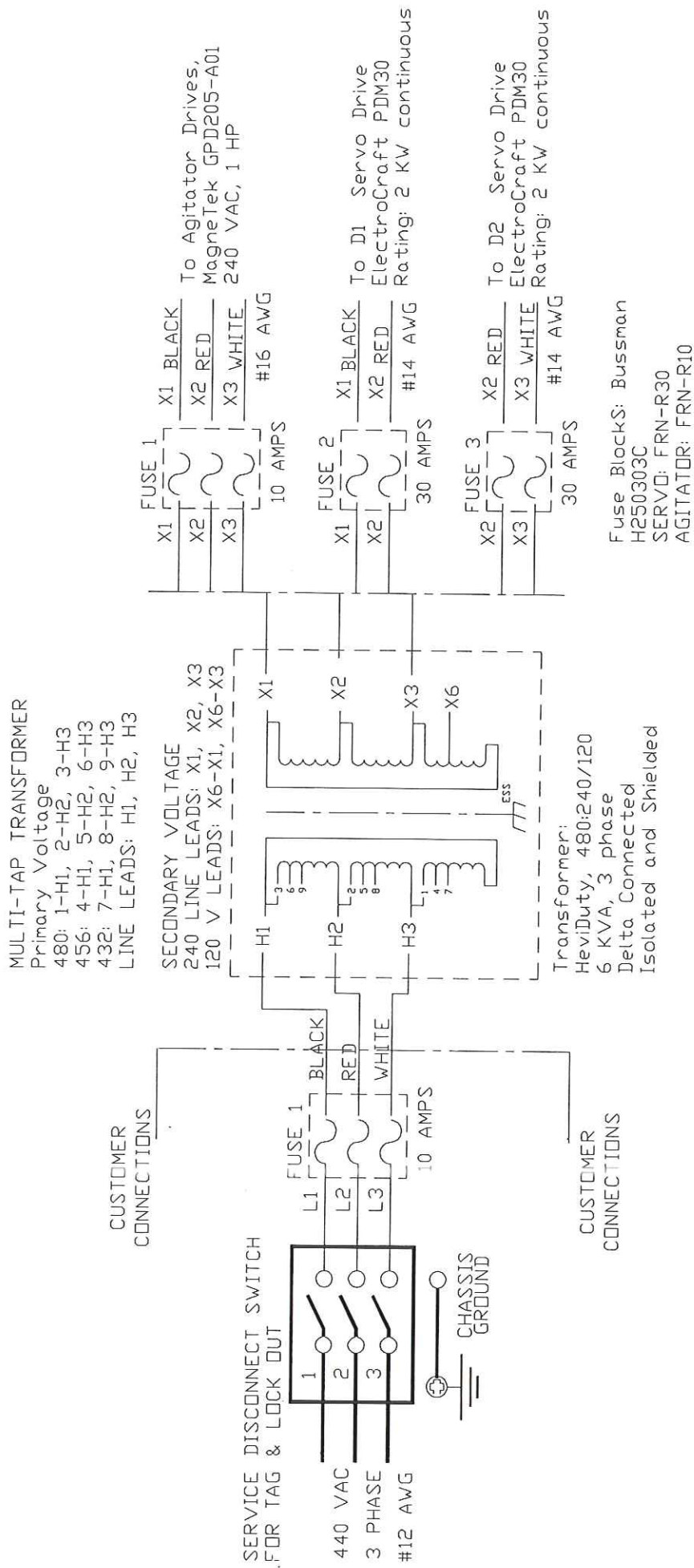


ENCODER CASE

MATERIAL:		TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONS .X +/- 1/64 DECIMAL .XX +/- .005 ANGLES .XXX +/- .001 FILLET .XXXX +/- .0005 CHAMFERS .020-.040 X 45 DEG		DRAWING NUMBER		AUTOMATION SUPPLY AND ENGINEERING, INC HOUSTON, TEXAS	
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		SCALE:					

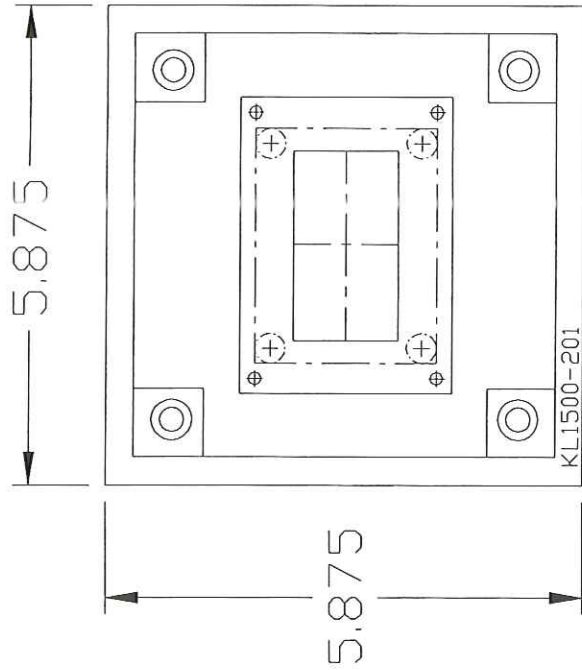
***** DANGER*****

Only qualified electrical personnel should install, adjust, operate, or service this equipment. Failure to observe this precaution could result in severe bodily injury or loss of life.



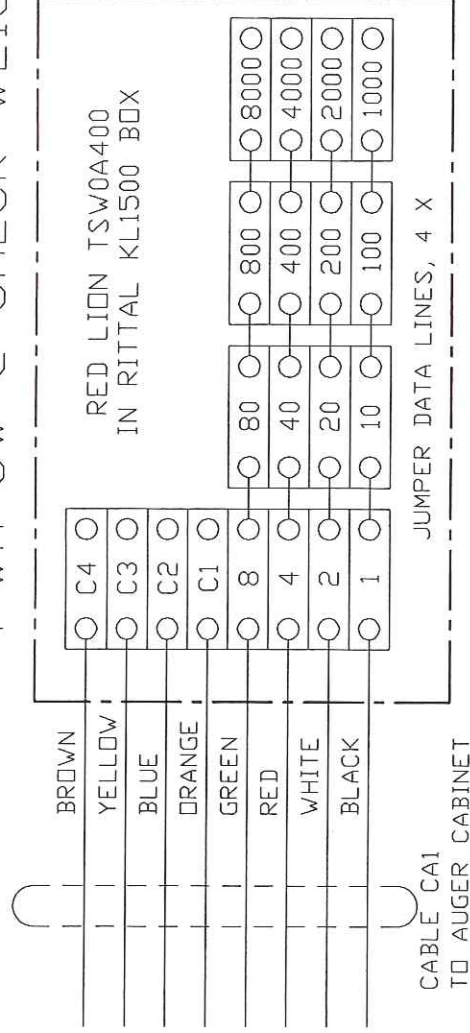
CUSTOMER: KRAFT SAN LEANDRO
PO # 30-0052726-PXL, JUNE 1997

MATERIAL:	TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONS DECIMAL +/- 1/64 X +/- .05 X +/- .005 ANGLES XXX +/- .001 +/- 1 DEG XXXX +/- .0005 FILLETS: .005-.010 RADIUS CHAMFERS: .020-.040 X 45 DEG	DRAWING NUMBER	AUTOMATION SUPPLY AND ENGINEERING, INC HOUSTON, TEXAS
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SCALE:			



T'SWITCH ENCLOSURE

T'WH SW @ CHECK WEIGHER



INTERNAL WIRING

Red Lion TSW0A400 T'wheel Switch
4 Digits, BCD, logic "0" true
Jumpered for multiplexed operation
4 strobe lines, 4 data lines

MATERIAL:

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DRAWING NUMBER

DATE: June 1997

SCALE:

TOLERANCES UNLESS OTHERWISE SPECIFIED

FRACTIONS: DECIMAL
+/- 1/64 X +/- .05
ANGLES: XX +/- .005
+/- 1 DEG XXX +/- .001
FILLET: .005-.010 RADIUS
CHAMFERS: .020-.040 X 45 DEG

AUTOMATION SUPPLY AND ENGINEERING, INC
HOUSTON, TEXAS

THUMBWHEEL SWITCH MODULE
MODEL 75 AccuFill Speedster

Automation Supply and Engineering, Inc.
12601 Overcup Drive, Houston, Texas 77024-4941
Fax Phone (713) 465-8080

November 11, 2002

Riviana Foods
Attn: Accts Payable
Box 2636
Houston Texas 77252-2636

Ship to: Riviana Foods
502 Sawyer
Houston, Texas 77007
Attn: Martin Pozdra

Re: Proposal for spare auger and agitator spindle assemblies for Model 75 auger fillers
PO Number 233124-MP

Dear Martin,

We have a suggestion that will make life easier for the Riviana technicians. Since you have four Model 75 servo auger fillers, you might be interested in complete auger and agitator bearing assemblies, instead of the raw components making up the assemblies.

We sell the assemblies as complete units (as opposed to the individual piece parts). When they leave our factory, we know the assemblies are correctly assembled with the correct preload on the bearings. Machine downtime is minimized as the spare assembly can be easily installed and the old assembly sent back to us for refurbishment.

If you prefer, we will be happy to provide the raw bushings, pulleys, and seals. However, without the proper fixtures and hydraulic presses (the bearings are press fit into the bearing housings), you might destroy the bearings trying to disassemble the spindles. We have the tools and a fixture to do the retrofit without damaging the spindle assemblies.

When you get the spare spindles back, you will then have spare parts for the Box line (SN1412) as well as the three fillers in the Bartelt room.

Model 75 Auger Spindle	\$875 ←
Model 75 Agitator Spindle	\$925
Model 75 Auger drive shaft	\$165

Refurbish existing spindles assemblies - with new bearings, bushings, double lip seals, and pulleys - ½ price of new spindles as above.

What do you want to do?

Delivery is 2 weeks.

Best regards;

Kenneth L. Kunze, PE
Automation Supply and Engineering, Inc

Ken Kunze @ PPO.Net