CONVEYING SYSTEMS

INSTALLATION AND SERVICE MANUAL

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WARRANTY

INTRACO, INC. warrants its CABLEVEY Feed Conveying System components, when installed within its recommended limitations, to be free from defects in material and workmanship under normal use and service for which intended, for a period of one year from date of purchase.

Any parts, which are proven defective, and the company's inspection and examination shall disclose to have been thus defective will be replaced or repaired free of charge, f.o.b. Oskaloosa, Iowa. Any defective part must be returned to INTRACO prepaid for examination and inspection. INTRACO's responsibility covers cost of replacement parts only and does not include repair or replacement caused by misuse, abuse or normal wear and tear.

No claim of any kind, whether as to goods delivered or for non-delivery of goods shall be greater in amount than the purchase price of the goods in respect of which such damages are claimed; and failure to give notice of claim within (30) days from date of delivery or the date fixed for delivery, as the case may be, shall constitute a waiver by Buyer of all claims in respect of such goods. The remedy hereby provided shall be the exclusive and sole reedy of the Buyer and any right of the Buyer to consequential and incidental damages is excluded.

INTRACO, INC. will use all reasonable means to deliver the property sold hereunder within the terms and the time specified, but will not be liable for any loss, damage, detention or delay caused by accident, strike, walkout, fire, explosion, theft, lightning, windstorm, earthquake, flood, riot, civil commotion, malicious mischief, act of God or any other cause beyond its reasonable control, whether or not the same is herein specified and in any event, INTRACO, INC. SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL OR INDIRECT DAMAGE ARISING FROM ANY DELAY.

This guarantee is made expressly in place of all other guarantees or warranties, expressed or implied, with respect to quality, merchantability of fitness for a particular purpose.

MAXIMUM RECOMMENDATIONS

Maximum recommendations vary with the configuration of the system, cable speed, and the material being transported. As noted below, the number of corners influences the maximum recommended length of the system. In most cases, the lower the bulk density of the material, the farther it can be moved.

Figures are given based on 40 pounds per cubic foot (641 kgs/cu meter) material and cable speed of 82 feet (25m) per minute.

Maximum length suggestions @ 82 ft. per minute with Large Drive Unit (1 HP):

	Ground (mash) Maximum		Pellets Maximum	
1 ½" (38) System	**Up to 900' (275m)**	**8 Corners**	**Up to 900' (275m)**	**4 Corners**
	Up to 800' (245m)	**12 Corners**	**Up to 800' (245m)**	**8 Corners**
	Up to 600' (185m)	**14 Corners**	**Up to 600' (185m)**	**12 Corners**
2" (50) System	**Up to 900' (275m)**	**4 Corners**	**Up to 900' (275m)**	**4 Corners**
	Up to 800' (245m)	**10 Corners**	**Up to 800' (245m)**	**8 Corners**
	Up to 500' (150m)	**12 Corners**	**Up to 500' (150m)**	**10 Corners**
	Up to 300' (90m)	**14 Corners**	**Up to 300' (90m)**	**12 Corners**

No circuit should exceed maximum lengths as shown above.
All lengths are based on total circuit lengths.
We recommend that all applications (excluding poultry) should use the 2" (50) System.
All inclines and declines in heights should be 45° or less.

1 ½" (38) System rated at 20 pounds per minute at 40 pounds per cubic foot.
2" (50) System rated at 35 pounds per minute at 40 pounds per cubic foot.

Air Trippers can open maximum 200 drops. Hand Trippers can open maximum 100 drops.

MATERIAL RECOMMENDATIONS

The CABLEVEY system will handle a variety of materials. Limitations of the system in transporting materials depend upon many factors, such as moisture content, friction qualities and size. Examples of these are cohesive materials such as molasses, large particles such as sow cubes, or high friction materials such as sand. Any material about which there is a question should be sent to us in an adequate amount for testing. MSDS sheets must be provided for materials to be tested.

DO NOT EXPERIMENT ON YOUR OWN. YOU MAY DAMAGE THE EQUIPMENT!

CAPACITIES

The capacity of a CABLEVEY system varies with the speed of the cable and the density of the material being transported. Figures given are based on 40 pounds per cubic foot (641 kgs/cu meter) material and cable speed of 82 feet (25m) per minute.

1½" (38) System 1200 pounds (540kg) per hour
2" (50) System 2100 pounds (950kg) per hour

With certain materials, it may be necessary to use a lower cable speed to reduce carryover of material past the intended drop. The cable speed is altered by changing the ratio of the belt drive on the drive unit. The capacity will vary with type and moisture content of materials being transported.

PROPER V-BELT TENSION

Push on belt between the sheaves. The force required to deflect the belt 1/8th inch (3mm) should be between 4 (1.81kg) and 8 lbs. (3.62kg).

A new belt should be tensioned to require near 8 lbs. (3.62kg), force for 1/8th inch (3mm) deflection. A 4 lb. (1.81kg) force is adequate for a belt that has operated over 50 hours.

OVERTENSIONING CAN CAUSE GEAR REDUCER BEARING DAMAGE.

CABLE SPEED

BASED ON 1 HP 60 Hz MOTOR SPEED OF 1725 R.P.M.

CABLE SPEED		MOTOR PULLEY	BELT
Ft/Min	**Mt/Min**		
63	**19.2**	**01291C (AK27)**	**01259 (4L280)**
69	**21**	**01292C (AK30)**	**01259 (4L280)**
82	**25**	**01293C (AK34)**	**01259 (4L280)**
88	**26.8**	**01294C (AK39)**	**01260 (4L290)**
101	**30.8**	**01295C (AK44)**	**01260 (4L290)**

THE NEW CABLEVEY FEEDING AND CONVEYING SYSTEMS

CABLEVEY is the registered trademark of a feeding and conveying system produced and marketed by INTRACO, INC. of Oskaloosa, Iowa U.S.A.

The NEW CABLEVEY system uses a simple principle. Material is moved through a tube with an aircraft cable that has plastic discs molded to the cable at regular intervals. The cable moves at high speed in a continuous circuit carrying the material with it at the same speed, this reduces the grinding action and separation.

The flexibility of the cable enables it to be installed in almost any configuration, with the use of corner assemblies having an idler to reduce friction, wear and pull requirements.

The material is introduced into the system by means of a hopper which helps keep the material flowing.

The cable is pulled through the circuit by a drive unit having an automatic cable tensioning device.

The material can be discharged from the circuit at any desired location by placing a hole in the bottom of the tube. Any of a variety of styles of drops can be installed on the tube under the hole -- the style used will depend on the function to be performed. The drop styles and functions are described later in this manual.

NOTE: All electrical connections are to be made by a qualified electrician, in compliance with all local, state and national codes.

Revised 4/14/00

DESIGNING and INSTALLING OF A CABLEVEY SYSTEM

INSTALLATION AND PREPLANNING:

A well-designed and properly installed system will help insure quality and long life of the CABLEVEY feeding system.

1. Conference with customer before installation. Visually inspect the CABLEVEY installation site, gathering the following information:

    a) Identify any obstructions.
    b) Check for hanger supports, advise if necessary to recess ceilings.
    c) Determine height at which tubing will be installed.
    d) Location of bulk bin and/or feed container source or fill auger system.
    e) Determine direction of feed flow.
    f) Select Drive Unit location -- Preferably install on return line after last drop -- and allow for adequate support of the Drive Unit.

2. Sketch proposed system. Several rough sketches will help establish the best system layout. If not using fill auger, set the bulk tank at different locations and rotate the hopper 90 degrees at each of these locations. Keep the incoming feed line angle as gradual as possible (maximum 45 degrees). The number of corners should be kept to a minimum to increase the cable life.

    Consider weather protection, serviceability, electrical hookup and recycling of feed in locating the Drive Unit. Place Drive Unit directly after the last drop, if possible.

INSTALLATION OF THE SYSTEM:

1. Lay out open tubing end-to-end in aisles or over pens. Locate and punch at desired locations. Note location of holes for AccuDial drops are different than for volumetric drops. Support tube on both ends to prevent burred and jagged edges surrounding the hole from catching cable. File all tubes -- make sure there are no burrs or rough edges.

2. Hang the tubing:

    a) Locate the cup hooks for attaching the tube hangers -- every 8’ for all systems.
    b) Support tubing close to either side of the tube joint and each corner to keep lines level.
    c) Level the tubing.
    d) Open tube feed lines, from hopper into building, should not exceed 45 degrees from horizontal.

3. Install 90 Degree Corners and Connect System. Place supports close to either side of Corner so Corner does not sag.

4. Large Drive Unit - Installation Instructions:

   a) Determine Location: This drive Unit can be located almost anywhere in the circuit, but if possible, it should be located inside the building on the return line of the system. Consider ease of service when locating it, remembering that the cable travels from left to right and the sprocket turns counterclockwise.
   b) Install Port: Mount port to outlet on right end of drive frame. Install breather in Gear Reducer by replacing top plug.
   c) Mount Drive Unit: Unit can be suspended from chains by using eyebolts attached to mounting angle.
   d) Install Motor: Attach motor to motor base and secure pulley to motor shaft. Thread adjusting bolt through motor base and into nut. Attach this assembly to Drive unit with pivot rod and cotter pins.
   e) Install Belt: Align belt by moving motor pulley. Check pulleys, make sure they are tight. Adjust belt tension by moving the adjusting bolt.
   f) Install Belt Guard: Position belt guard in place between the guard clip and the drive unit frame. Snap into place, insert two #10 X 3/8" sheet metal screws into belt guard through drive unit frame.
   g) Electrical Connection: Have qualified electrician wire power supply to drive safety switch and motor. Check direction of motor, sprocket must turn counterclockwise.
   h) Attach Cover: Slip cover into place behind spring-covers.
   i) Provide good, secure support for unit - either suspend from ceiling or place on floor or drive unit stand.

5. Proximity Recycler Feed Sensor: Never install on return side of drive unit

6. Installation of Hopper:

   a) Determine the direction in which the feed cable will be traveling.
   b) Position hopper so the cable enters the hopper into the recycler unit and exits the hopper through the restrictor port under the motor. Make sure the feed line going through hopper is level and the holddowns are on each side of the hopper.
   c) The slide gate under the hopper must be opened to let feed flow out. Open slowly until feed tube is 2/3 to 3/4 full.
   d) VERY IMPORTANT: The ports and the trough bottom MUST line up evenly so they will not cause the cable to catch or slip.
   e) Run feed in the CABLEVEY system. Watch feed level in the tube and the rotor on the hopper. When the tube comes back at 2/3 to 3/4 full, the recycler switch should shut the hopper rotor off. If it does not shut off, switch adjustment may need to be reset, to do this turn thumbscrew ½ turn down or till hopper rotor stops. When rotor stops turn screw up till rotor starts to turn, then screw ½ turn more and stop.

7. Install Cable:

   a) Block Idler Wheel on tension take-up assembly in Large Drive unit forward a few inches with a short piece of open tube.
   b) Feed cable under Idler Wheel and push around system with 01602hw cable pushing tool. Lift micro switch in the recycle unit to allow cable to pass through hopper. Stay near the front end of cable while pushing, DO NOT force or kink cable.
   c) Prestretch cable using 01604HW cable lock tool.
   d) Connect cable, using C38208 cable connector kit, 01275 cable cutters and instructions on Page 20-21 of Installation and Service Manual.
   e) Adjust Cable Tension: After cable has been installed, turn the drive unit by hand with the "V" belt, observing the disc leaving the tube just before it enters the sprocket. The disc should be approximately 1/16" off the tube bottom. If it contacts the tube bottom it can "snap" off the end of the tube, causing wear and excessive drag. If it is too high, feed can accumulate on the tube bottom. If adjustment is required, slightly loosen the bolts holding the mount bracket to the frame, adjust as necessary and retighten.

8. Install Drops:

   a) Mount the drops in proper position over holes.

b) Be sure drops and closure mechanisms are oriented on the tube in the proper direction with feed flow.

* AccuDial Drops: See Diagram for punching holes 1 1/2" off center. Snap drop in place. Fasten to tube with cover.

9. Positive Close Installation

a) Start channel 12" from wall opposite end of building away from the tripper -- attach all drop door wires to the channel. If holes do not line up with wires on doors, move forward (toward tripper) to the next closest hole.
b) Attach flared end of channel to narrow end of next piece of channel. If attachment comes up on wire for door, shorten the narrow end of channel enough to get the attachment before the wire on the door.
c) Continue to attach wires from drop doors until line is complete to the end of the row.
d) Spring at end of channel should not have tension on it until drop doors begin to open. After the spring is attached, cut channel at proper length and attach.
e) If drops are more than 4' apart, install channel support J-Brackets.

10. Tripping System Installation

a) Mount Air Trip Cylinder in proper location on the open tube. Cylinder must pull on the channel to open drop doors. Tube Mount Tripper will bolt directly to open tube over tube cover. Support frame with "S" hooks & chains. Bolt rod to channel with cylinder rod extended.
b) Hand Trip: Handle to be mounted to the wall and cabled to the channel through pulleys.

11. Connect Power

Control Panels are available for most applications. Wiring diagrams are available for systems not using control panels. Have qualified electrician connect power in compliance with all Local, State and National Codes.
New CABLEVEY Conveying Panel and Dispensing Panel.

12. Observe System in Operation

a) Operate system to check performance.
b) Introduce feed into system and adjust feed flow to proper level by viewing feed flow through Inspection Section.
c) Set Recycle Unit.

13. Cleanup - Installation crew is to leave installation site free of all boxes, packing materials, etc. brought by the installer.

14. Review CABLEVEY Feeding System operating procedure with the customer or his representative. Include these items:

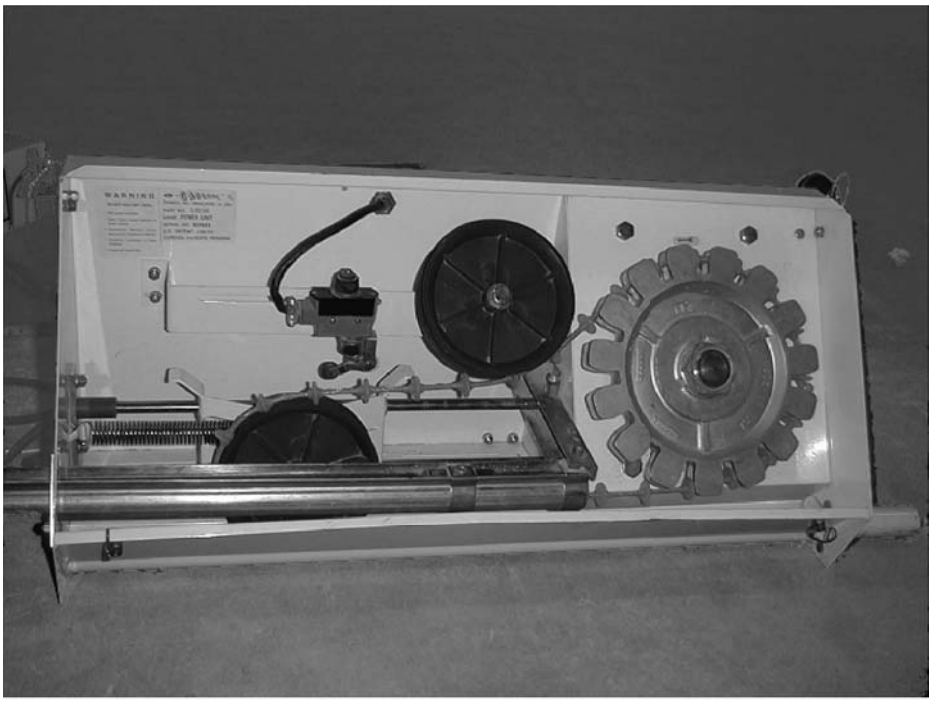
a) How to connect the cable.
b) Cable Connectors' position on sprocket.
c) Review maintenance schedule.
d) Adjusting recycle switch.
e) Scan the Installation and Service Manual, identifying sections relevant to customer's CABLEVEY system.
f) Help the customer complete his CABLEVEY information card to be mailed to the factory.

EXPLANATION OF FUNCTION - LARGE DRIVE UNIT

The drive unit is the mechanism which pulls the cable through the system. The cable is pulled through the drive unit by a sprocket driven by a one horsepower electric motor and gear reducer.

The cable enters the left end of the drive unit, travels around the sprocket and is picked up by two idler wheels, which guide it to the outlet on the right end of the drive unit. The outgoing cable travels under the incoming cable, allowing material brought into the drive unit to drop onto the outgoing cable and be carried out returning it to the system.

One of the two idler wheels is spring-loaded to act as an automatic tensioning device, removing slack from the cable. If the slack becomes excessive, or if the tension becomes too high, a Drive Unit Safety (Roller) Switch will shut off the drive unit.



LARGE DRIVE UNIT - INSTALLATION INSTRUCTIONS

(Illustration and Parts Identification Numbers on following pages)

1. **DETERMINE LOCATION:** This Drive Unit can be located almost anywhere in the circuit, **but if possible, it should be located inside the building on the return line of the system.** Consider ease of service when locating it, remembering that the cable travels from left to right and the sprocket turns **counterclockwise.**

2. **INSTALL PORT:** Mount port (Item 28) to outlet on right end of drive frame. Install breather in Gear Reducer by replacing top plug.

3. **MOUNT DRIVE UNIT:** Unit can be suspended from chains by using eyebolts attached to mounting angle (Item 22).

4. **INSTALL MOTOR:** Attach motor to motor base (Item 19) and secure pulley to motor shaft. Thread adjusting bolt (Item 49) through motor base and into nut (Item 39). Attach this assembly to Drive Unit with pivot rod (Item 20) and cotter pins (included in bag kit). (See Figure A)

5. **INSTALL BELT:** Align belt by moving motor pulley. Check pulleys, make sure they are tight. Adjust belt tension (see page 4 for proper tension) by moving the adjusting bolt (Item 49).

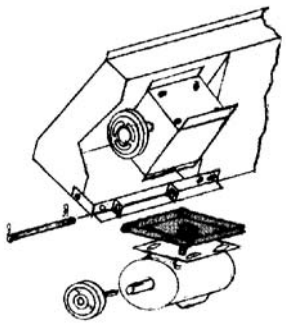
6. **INSTALL BELT GUARD:** Position belt guard (Item 12) in place between the guard clip (Item 13) and the drive unit frame. Snap into place, insert two #10 X 3/8" sheet metal screws (provided in bag kit) into belt guard through drive unit frame.

7. **ELECTRICAL CONNECTION:** Have **qualified electrician** wire power supply to Drive Unit Safety Switch (Roller) (Item 57) and motor. Check direction of motor, sprocket must turn **counterclockwise.**

8. **ATTACH COVER:** Slip cover (Item 9) into place behind spring-covers (Item 21).

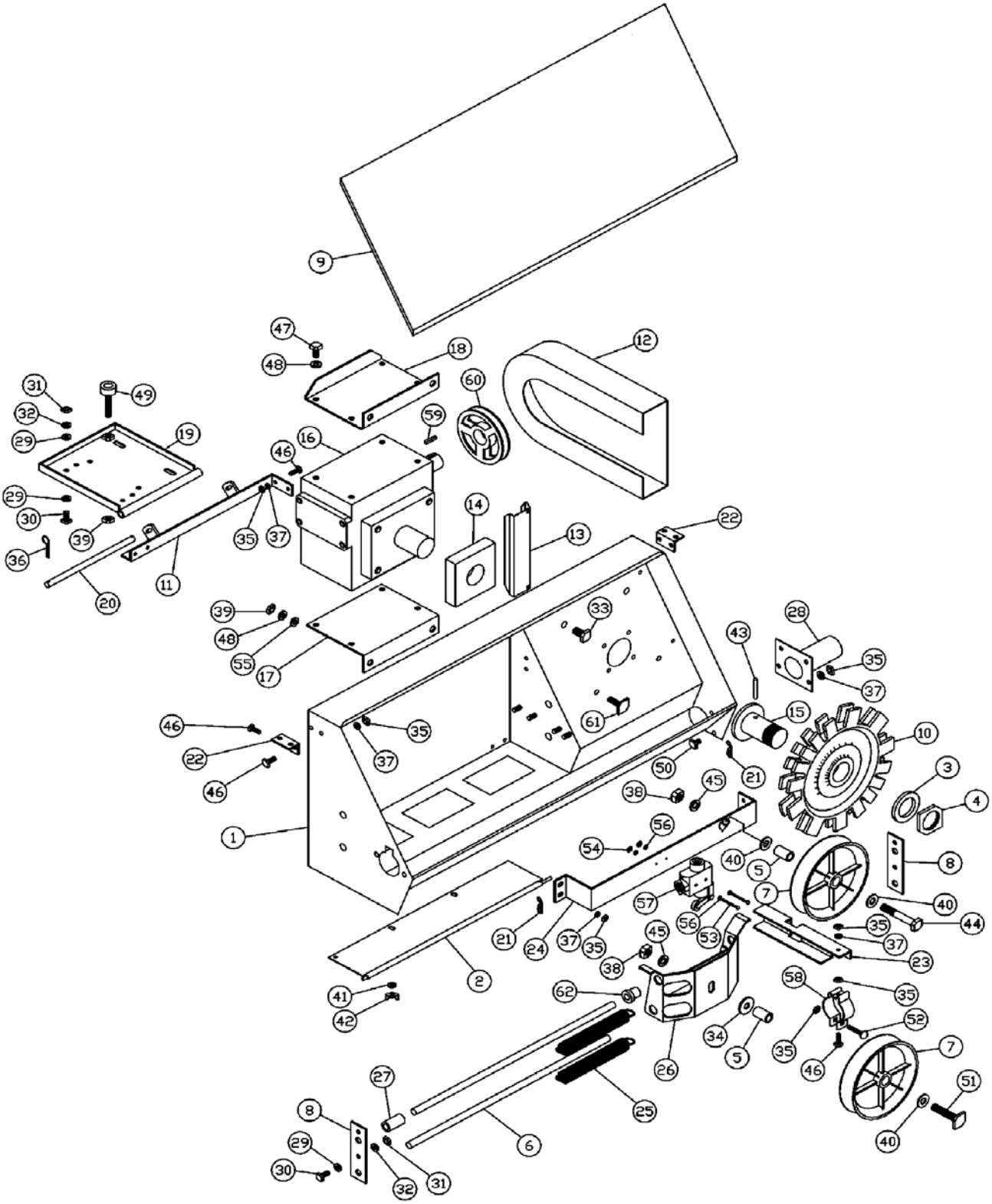
SPECIAL NOTE: ADJUST CABLE TENSION

After cable has been installed, turn the drive unit by hand with the "V" belt, observing the disc leaving the tube just before it enters the sprocket. The disc should be approximately 1/16" off the tube bottom. If it contacts the tube bottom it can "snap" off the end of the tube, causing wear and excessive drag. If it is too high, feed can accumulate on the tube bottom. If adjustment is required, slightly loosen the bolts holding the mount bracket (Item 23) to the frame, adjust as necessary and retighten.



Drive Units

C50100T 2” (“50” SYSTEM) 1HP With PLASTIC COVER
C50100TM 2” (“50” SYSTEM) 1HP With METAL COVER
C50100TMK 2” (“50” SYSTEM) 1HP With METAL COVER & LIGHT KIT



DRIVE UNITS- PARTS IDENTIFICATION NUMBERS

	PART NO.	DESCRIPTION	QTY		ITEM	PART NO.	DESCRIPTION	QTY
1	100001P	DRIVE FRAME	1		32	01004	5/16 LOCKWASHER	8
2	100002P	CLEAN OUT COVER	1		33	01006	HEX HEAD SCREW	2
3	100005	WASHER, ADAPTOR	1		34	*01007	1/2” FLAT WASHER	1
4	100006	NUT, ADAPTOR	1		35	01011S	1/4-20 HEX NUT S.S.	37
5	*100007	AXLE, IDLER	2		36	01013	3/32 X 1 COTTER KEY	2
6	*100015	GUIDE ROD	2		37	01018	1/4 LOCKWASHER	25
7	*100017A	IDLER WHEEL	2		38	01019	1/2-13 HEX NUT	4
8	100019	MOUNTING BLOCK	2		39	01020	3/8-16 HEX NUT	3
9	100023	CLEAR COVER	1		40	*01021	1/2” SAE WASHER	3
9	100023MP	METAL COVER	1		41	01023	1/4” SAE WASHER	6
10	100026	SPROCKET	1		42	01024	1/4-20 WING NUT	2
11	100027P	MOTOR MOUNT	1		43	01025	SHEAR PIN	1
12	100035	BELT GUARD	1		44	*01026L	1/2-13 X 3/4 HEX HEAD SCREW	1
13	100036	GUARD CLIP	1		45	01027	1/2 LOCKWASHER	4
14	100003	FOAM SEAL	1		46	01028S	1/4-20 X 3/4 HEX CAP SCR SS	11
15	100004	SPROCKET ADAPTOR	1		47	01033	3/8-16 X 3/4 HEX HEAD SCREW	8
16	100050	GEAR REDUCER	1		48	01034	3/8 LOCKWASHER	10
17	100051P	LOWER MT GEARBOX	1		49	01035	TENSION BOLT FB-3348	1
18	100052P	UPPER MT GEARBOX	1		50	01037S	1/4-20X 1/2 HEX HEAD SCREW	12
19	100021P	MOTOR BASE	1		51	01038	LEVELER 1/2-13 X 2-1/2	1
20	100022	PIVOT ROD	1		52	01039	1/4-20X 1 1/4 CARRIAGE BOLT	1
21	100069	SPRING COVER	2		53	01044	#6-32 X01 1/2 RD HD SCREW	2
22	100070	MOUNTING ANGLE	2		54	01049	#6-32 HEX NUT	2
23	100108	MT BRKT TUBE SUPPORT	1		55	01086	3/8 SAE GAUGE WASHER	2
24	*100111P	BAFI IDLER BRACKET	1		56	01094	#8 LOCKWASHER	6
25	*100112	DRIVE SPRING	2		57	01101R	ROLLER SWITCH FOR DRIVE	1
26	*100113P	IDLER/SHUT OFF FRAME	1		58	01142	2” CONDUIT HANGER	1
27	*100114	DRIVE STOP SLEEVE	1		59	01112	3/16 SQ. KEY X 1”	1
28	100502P	2” DRIVE PORT	1		60	01297C	SHEAVE AK46-3/4	1
29	01001	5/16 FLAT WASHER	12		61	01029	LEG LEVELER SCREW	2
30	01002	HEX HEAD SCREW	8		62	100016	BEARING SMALL	4
31	01003	HEX NUT, YELLOW	8					

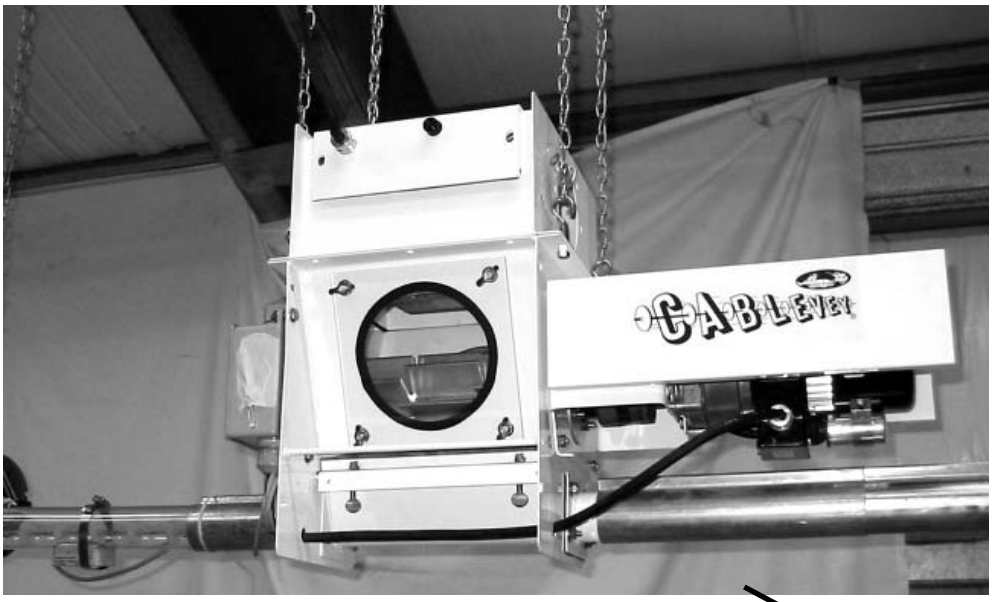
*** Included in CABLEVEY Tension Take Up Assembly Rework Kit (Item No. 100107)**

DRIVE UNITS- TROUBLE SHOOTING

1. Unit will not start:
   Check Electrical Supply
   Reset Drive Unit Roller Switch (Item 57)
   Check Control Switch
   Check Motor Reset
2. Unit tries to start but can't:
   System overloaded and tension incorrect
   Motor defective
   Gear Reducer defective (Item 16)
   Reset Drive Unit Roller Switch (Item 57)
3. Motor Runs, Sprocket does not turn:
   Check Belt
   Check Shear Pin (Item 43)
   Sprocket Loose (Item 10)
   Gear Reducer defective (Item 16)
4. Unit Shuts off::
   System overfull
   Cable tension incorrect
   Foreign object in hopper
   Foreign object in corner
   Foreign object in drop opening
   Cable broken
   Control device malfunction
5. Cable comes off sprocket:
   Check cable connector positioning
   Sprocket worn - flip sprocket over or replace (Item 10)
   Broken buttons
   System doesn't shut off from excess slack
   Feed build up behind tensioner
6. Unit runs Jerkily:
   Foreign object in corner
   Obstruction in system
   Tubing not straight
   Circuit too long
   Misaligned Corner
   Feed build up in drive unit
   Burrs on end of tube or tube not filed
   Idler (Item 7) in wrong bracket (Item 26) Hole.
   Top Hole for 2" System (1 1/2" disc)
   Middle Hole for 2" System (1 1/4" disc)
   Bottom Hole for 1 1/2" System (1" Disc)
7. Worn Idlers:
   Cable too short
   Cable threaded over top stationary idler, should be threaded under it.

NOTE: Disconnect power before Servicing. Keep cover in place when unit is operating. Keep hands and loose clothing away from moving parts. Be sure belt guard is in place before operating unit.

MOTORIZED HOPPER WITH PROXIMITY RECYCLER FEED SENSOR



Direction of Cable Travel

INSTALLATION

1st Determine the direction in which the feed cable will be traveling.

2nd Position hopper so the cable enters the hopper into the recycler switch and exits the hopper through the restrictor port under the motor (see photo above). Make sure the feed line going through hopper is level and the holddowns are on each side of the hopper.

NOTE: The slide gate under the hopper must be opened to let feed flow out. Open slowly until feed tube is 2/3 to 3/4 full.

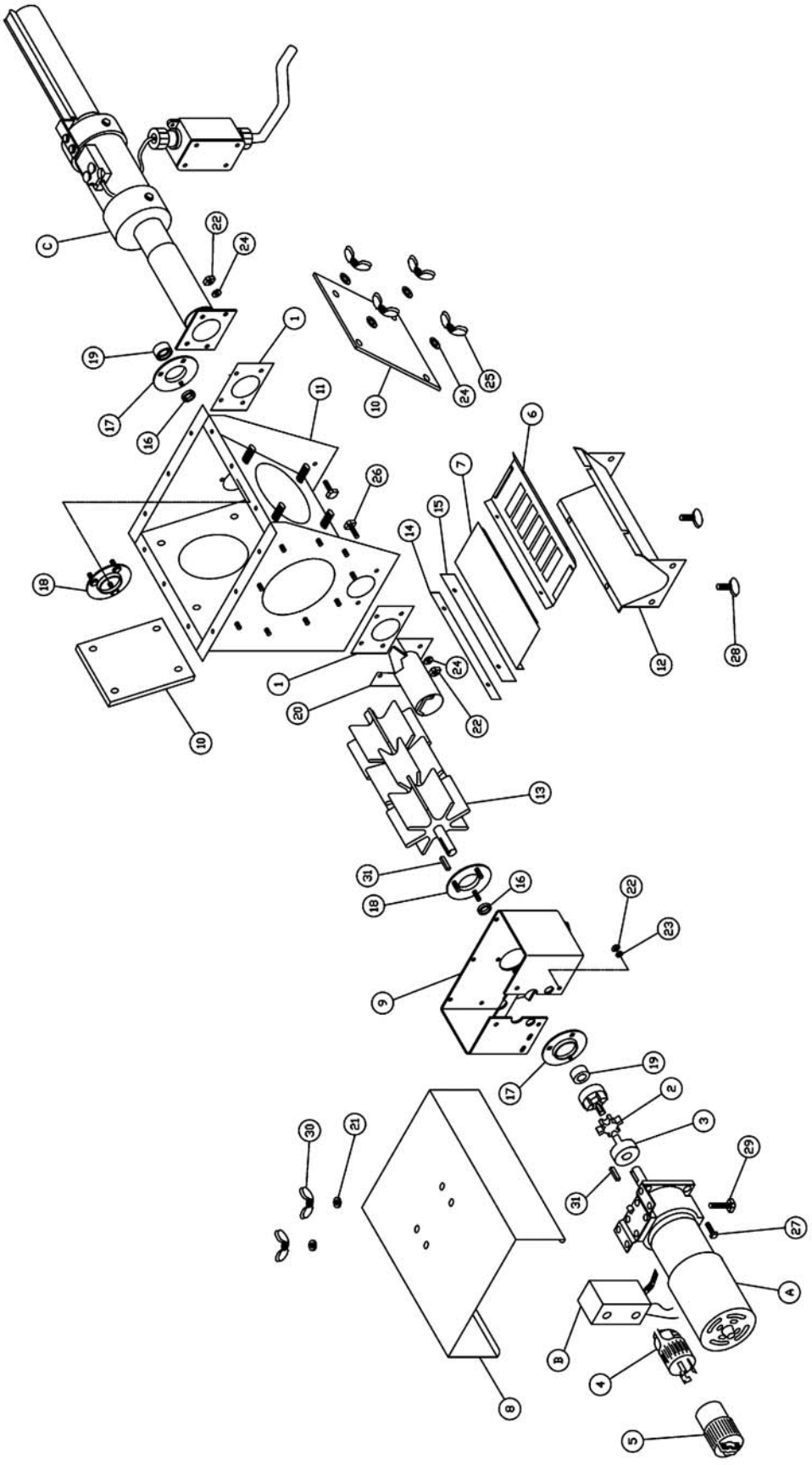
CABLE TRAVEL →

CAUTION - Never operate system with space between discs more than 2/3 to 3/4 full

VERY IMPORTANT: The ports and the trough bottom MUST line up evenly so they will not cause the cable to catch or slip.

Run feed in the CABLEVEY system. Watch feed level in the tube and the rotor on the hopper. When the tube comes back at 2/3 to 3/4 full, the recycler switch should shut the hopper rotor off. If it does not shut off or if it shuts off too soon the sensitivity of the proximity recycler may need to be adjusted (see Proximity Recycler for these instructions).

**** Hopper Auger Control Cap Included in photograph ****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MOTORIZED HOPPERS
WITH PROXIMITY RECYCLER FEED SENSOR

2" (50) SYSTEM

C50108HWPR	POWER HOPPER 110 W/PROX RECYCLER
C50108HWPRK	POWER HOPPER 110 W/PROX RECYCLER KLAUBER
C501082HWPR	POWER HOPPER 220 W/PROX RECYCLER
C501082HWPRK	POWER HOPPER 220 W/PROX RECYCLER KLAUBER

ITEM	PART NO.	DESCRIPTION	QTY
1	107382	GASKET 1/16(.046-.076)40+DURO	2
2	108014	SPIDER 2X814	1
3	108015	COUPLING BODY 4X182 5/8 BORE	2
4	108016**	MALE PLUG 4721 ** AVAILABLE SEPARATELY	
5	108017**	CONNECT FEMALE 4731 **AVAILABLE SEPARATELY	
6	108020P	PAINTED GRATE ¾	1
7	108021P	PAINTED SLIDE GATE	1
8	108023P	PAINTED MOTOR COVER	1
9	108024P	PAINTED MOTOR BEARING MT	1
10	108026	WINDOW	2
11	108027P	PAINTED HOPPER FRAME	1
12	108029P	2IN TROUGH BOTTOM	1
13	108047	3 SEGMENT ROTOR ASSEMBLY	1
14	108037P	PAINTED RUBBER RET STRAP	1
15	108038	RUBBER SEAL FOR HOPPER	1
16	108391	BALL BEARING 5/8IN	2
17	108392	BEARING FLANGETTE HW	2
18	108392A	FLANGETTE BEARING & BOLT	2
19	108393	BEARING LOCKING COLLAR 5/8IN	2
20	800160HWP	PAINTED 2IN REST PORT	1
21	01001	5/16 FLAT WASHER	2
22	01011S	1/4 -20 HEX NUT STAINLESS	20
23	01018	1/4 LOCK WASHER	4
24	01023	1/4 SAE WASHER	16
25	01024	1/4-20 WING NUT, YELLOW CHROM.	8
26	01028S	1/4-20 X 3/4 HEX CAP BOLT S.S.	8
27	01041	1/4-20 X 1 HEX HEAD BOLT (USE 01028S WITH KLAUBER)	4
28	01083	1/4-20 X 3/4 THUMBSCREW BOLT	2
29	01936	5/16 SELF THREADING BOLT	2
30	01937	5/16 WING NUT	2
31	01112	3/16 SQ. KEY X ¾	1

C50108HWPR & C50108HWPRK (110 VOLT)

Item	Part No.	Description	Qty
A	108011	1/40 6 RPM GEARMOTOR 9CPH8 (HWPR)	1
A	108011KL	KLAUBER GEAR MOTOR 8 RPM 1/40 (HWPRK)	1
B	01173 2	59247 SCEPTER BOX FSC15 PLASTI	1
B	01174	BLANK COVER F.S. BOX (E980C)	1
C	C50120	2 IN PROXIMITY RECYCLER 110/120 V	1

C501082HWPR & C501082HWPRK (220 VOLT)

Item	Part No.	Description	Qty
A	108012B	MOTOR ASSEMBLY 50/60 1/15HP 15 RPM (HWPR)	1
A	108011KL	KLAUBER GEAR MOTOR 8 RPM 1/40 (HWPRK)	1
B	01173 2	59247 SCEPTER BOX FSC15 PLASTI	1
B	01174	BLANK COVER F.S. BOX (E980C)	1
C	C50120 220	2 IN PROXIMITY RECYCLER 220/240 V	1

2 " Proximity Recycler Feed Sensor

C50120 - 110 Volt C50120 220 - 220 Volt
C50120 220 (CANADA) - 220 Volt

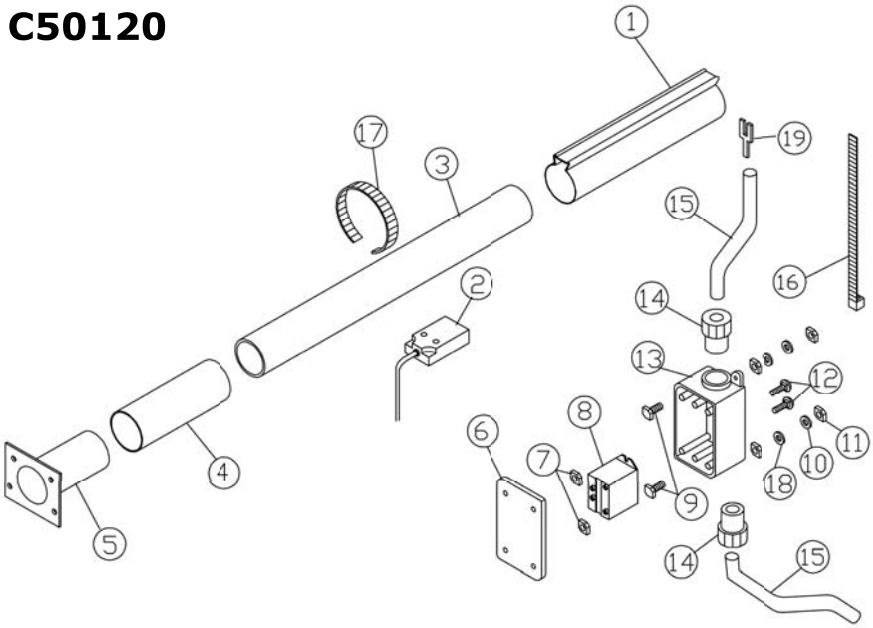
- ○ +

CABLEVEY P.N. 01647
20...250 VAC 5...500 mA
s: 2...20 mm

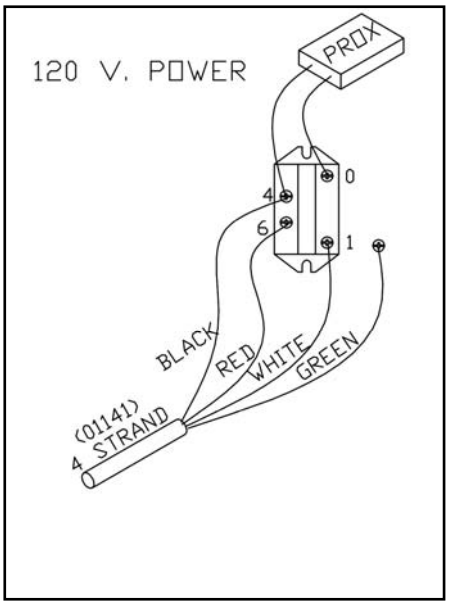
To adjust sensitivity on switch use precision screwdriver to turn screw (between the - and + slightly to the right or left. If you are getting too much feed in the line, turn 1/4 turn toward the + to increase sensitivity. If you are getting too little feed in the line turn 1/4 turn toward the - to decrease sensitivity.

Item	Part No.	Description	C50120 Qty	C50120 220 Qty
1	C50204	OPEN TUBE CONNECTOR 6 IN	1	1
2	01647	FLATPACK PROX SENSOR 20-250VAC,N.C.	1	1
3	120003	2 OD X 1 3/4 ID X 18 POLYCARB TUBE	1	1
4	C50203	CLOSED TUBE CONNECTOR	1	1
5	107501P	PAINTED 2IN HOPPER PORT	1	1
6	01174	BLANK COVER F.S. BOX (E980C)	1	1
7	01015	#10-24 HEX HUT	2	2
8	01650	RELAY 120V 1 POLE NORMALLY OPEN	1	
8	01649	RELAY 240V 2 POLE NORMALLY OPEN		1
9	01041	1/4-20 X 1 HEX HEAD BOLT	2	2
10	01018	1/4 LOCK WASHER	4	4
11	01011	1/4-20 HEX NUT	4	4
12	01012	#10-24 X 1/2 SLT RD HD BOLT	2	2
13	01173 2	59247 SCEPTER BOX FSC15 PLASTI	1	1
14	01175	STRAIN RELIEF CONNECTOR (H978E	2	2
15	01141	14/4 SJ CORD	3 ft.	
15	01172	SDT CONTROL CABLE V 144 SDT		3 ft.
16	01197L	11 IN WIRE TIE	1	
16	01139	TERMINAL 14RB-8F		2
17	01925	SS HOSE CLAMP 2 9/16”-3 ½”	1	
17	01197L	11 IN WIRE TIE		1
18	01023	¼ SAE WASHER	2	
18	01925	SS HOSE CLAMP 2 9/16”-3 ½”		1
19	01139	TERMINAL 14RB-8F	2	
19	01023	¼ SAE WASHER		2

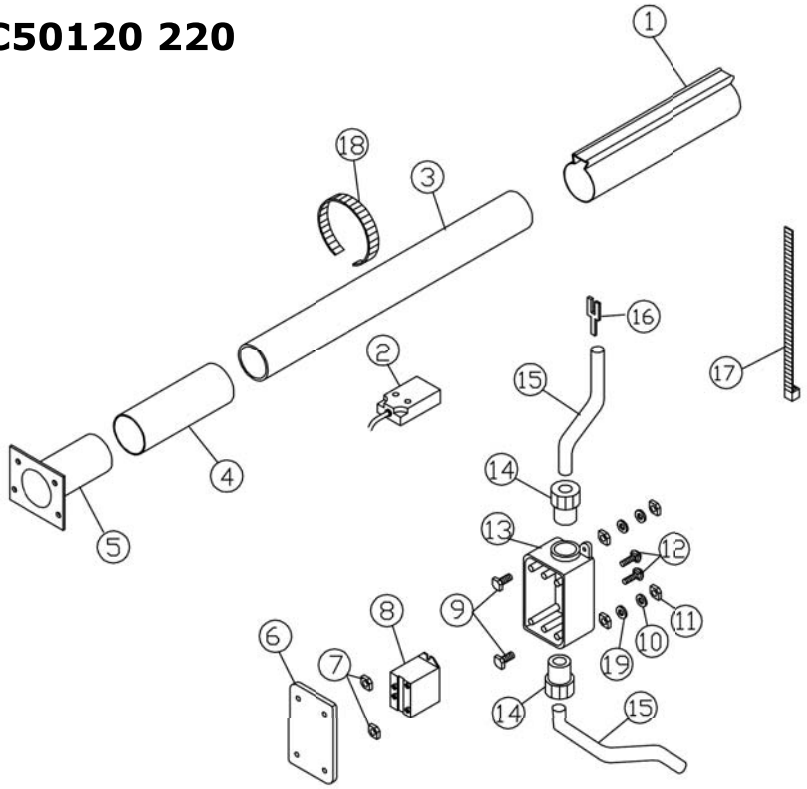
C50120

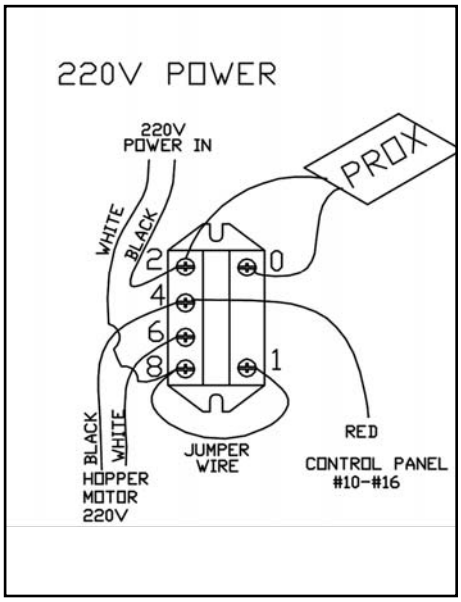


Wiring Diagrams



C50120 220

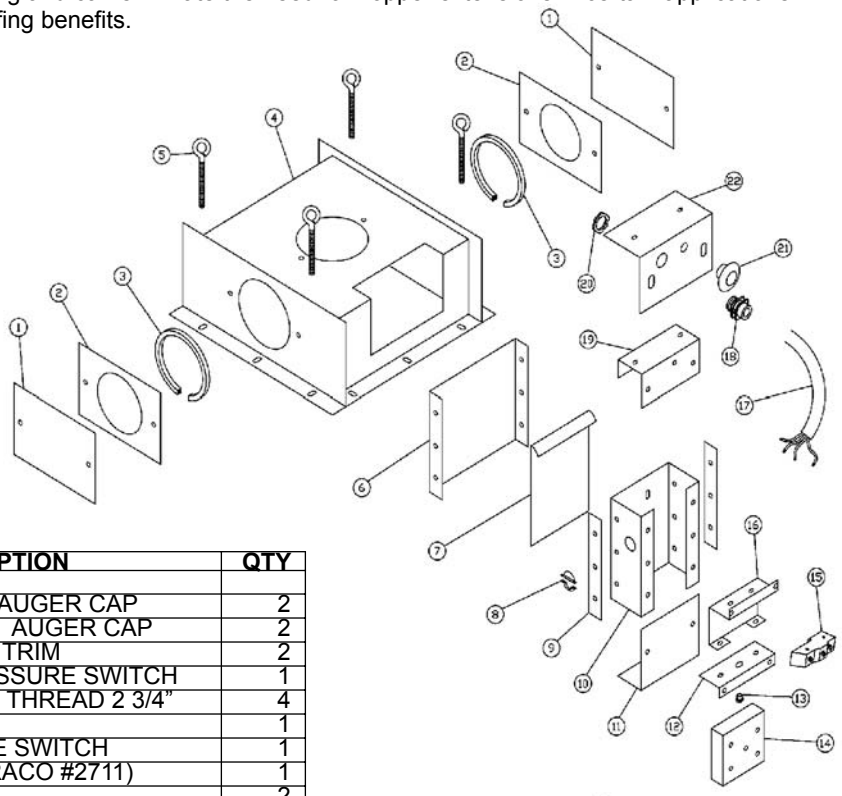




EXPLANATION OF FUNCTION
CONTROL HOPPER / AUGER CAP

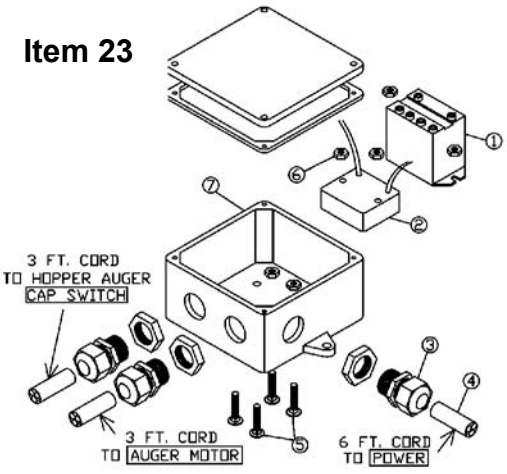
C00161

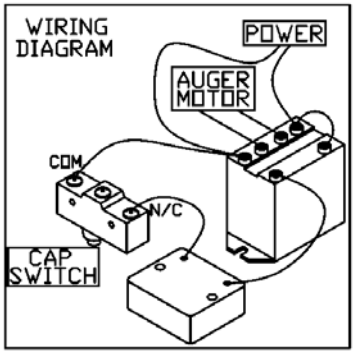
The Control Hopper/Auger Cap mounts on top of the CABLEVEY Hoppers to receive materials from alternative fill systems. It allows hoppers to be mounted closer to the ceiling and can eliminate the need for hopper extensions in certain applications. The Control Hopper/Auger Cap increases waterproofing benefits.



ITEM	PART NO.	DESCRIPTION	QTY
1.	108396P	COVER PLATE FOR AUGER CAP	2
2.	108395P	3" HOLE PLATE FOR AUGER CAP	2
3.	01944	PROTECTIVE EDGE TRIM	2
4.	108398P	HOPPER CAP / PRESSURE SWITCH	1
5.	01078L	EYEBOLT 1/4 X 20 3" THREAD 2 3/4"	4
6.	708008	GASKET, SWITCH	1
7.	708003	PADDLE, PRESSURE SWITCH	1
8.	01113	1/2" CONNECTOR (RACO #2711)	1
9.	708007	STRAP, GASKET	2
10.	708001	FRAME, PRESSURE SWITCH	1
11.	108405	LOWER COVER PRESSURE SWITCH	1
12.	108404	FRAME MOUNT / HOPPER CAP	1
13.	01953	5/8 ID X 1 1/8 RUBBER GROMMET	1
**14.	01952	3-10 SEC. TIME DELAY 110 VOLT	1
**14.	01952 220	3-10 SEC. TIME DELAY 220 VOLT	1
15.	01138	MICRO SWITCH (BE-2RB)	1
16.	708005	SWITCH MOUNT BRACKET	1
17.	01141	14/4 SJ CORD	1
18.	01113-2	CONNECTOR RSR-1007	1
19.	108403	COVER SWITCH/HOPPER CAP	1
20.	01414	½" ELECT. LOCKNUT	1
21.	01954	HOPPER CAP POLY PLUG	1
22.	108402P	PAINTED HOP/AUGER CAP SW	1
23.	C00161 1	220 V ELECT CONTROL BOX	1
**		REPAIR ITEMS ONLY – REPLACED BY ITEM 23	

Item 23





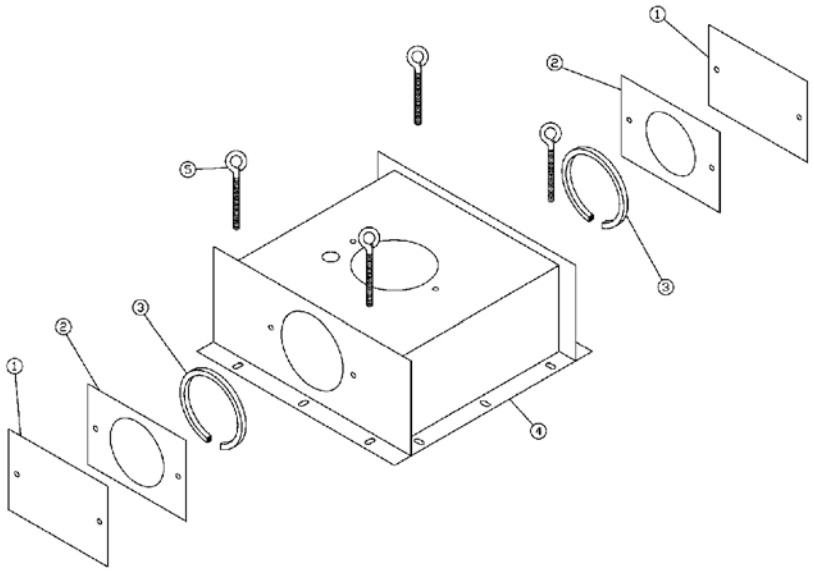
C00161 1 220V Electric Control Box
Hopper Auger Control Cap

Item	Part No	Description	Qty
1	01649	RELAY 240V 2 POLE NORMALLY OPEN	1
2	108408	120/240 VOLT 10 SEC TIMER	1
3	01113 2	CONNECTOR RSR-1007	3
4	01143	COPPER 14/3 SJ CORD	12 ft
5	01036	#10-24 X 1 CARRIAGE BOLT, PLTD	4
6	01015	#10-24 HEX HUT	6
7	108407	4 X 4 X 2 PVC JUNCTION BOX	1

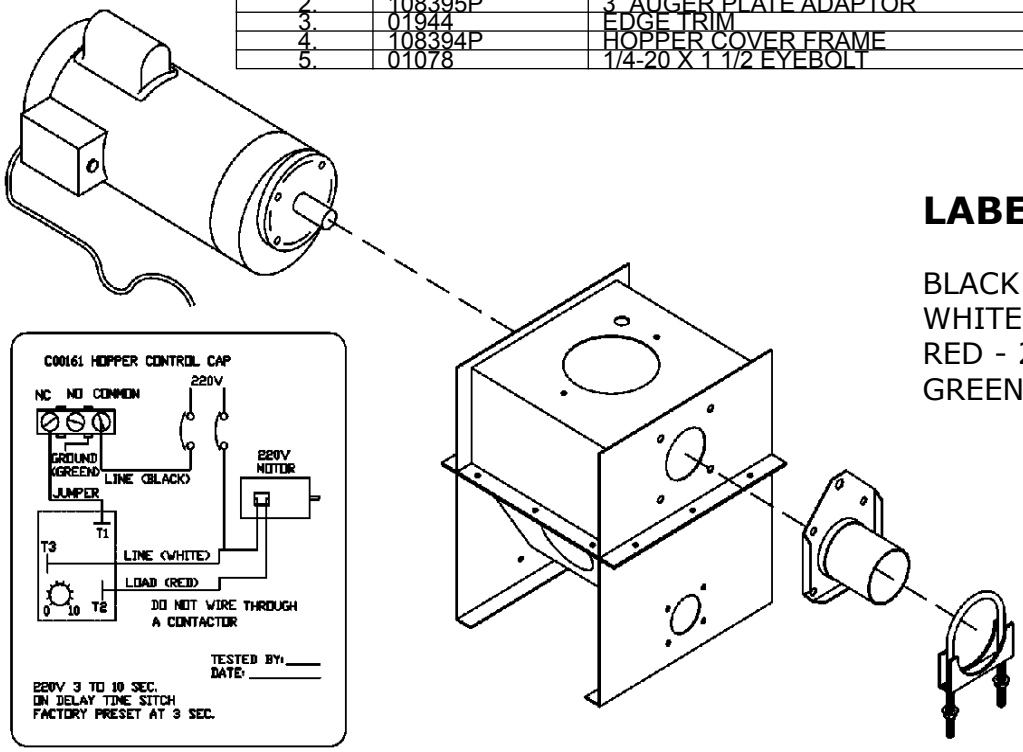
EXPLANATION OF FUNCTION
HOPPER / AUGER CAP ASSEMBLY

C00155

The Hopper/Auger Cap Assembly is used as a supplemental component with the Control Hopper Auger Cap.



ITEM	PART NO.	DESCRIPTION	QTY
1.	108396P	COVER PLATE	2
2.	108395P	3" AUGER PLATE ADAPTOR	2
3.	01944	EDGE TRIM	2
4.	108394P	HOPPER COVER FRAME	1
5.	01078	1/4-20 X 1 1/2 EYEBOLT	4



LABELING CORDS

BLACK - 110 VOLT LINE
WHITE - 110 VOLT LINE
RED - 220 VOLT LOAD
GREEN - GROUND

WIRING FOR C00161 220 CONTROL HOPPER/AUGER CAP

BLACK JUMPER TO NORMALLY CLOSED AND TO T1, ON TIME DELAY BLACK WIRE FROM CORD TO COMMON, AND RED FROM CORD TO T2 TIME DELAY, GREEN GROUNDS UNDER SCREW HOLDING SWITCH. SET TIME DELAY SWITCH TO TEN SECONDS.

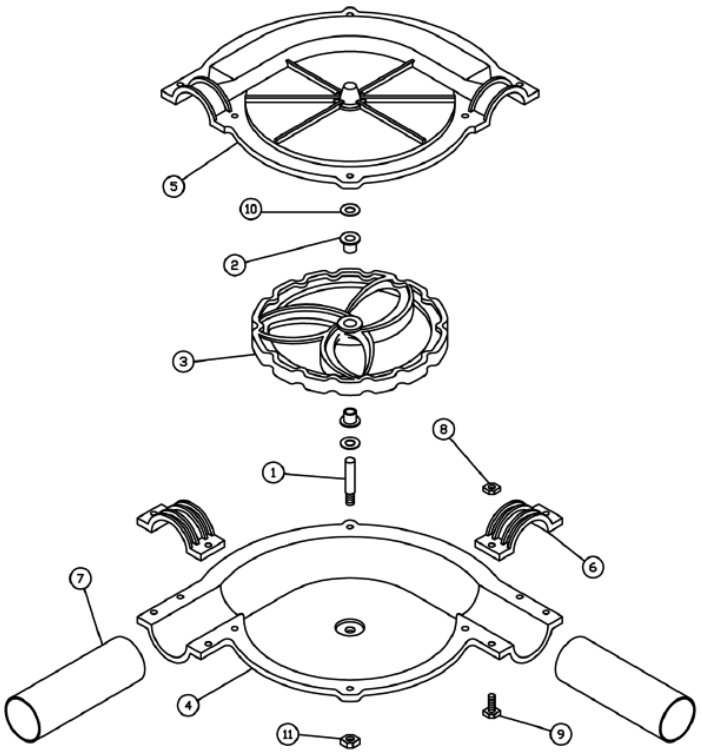
EXPLANATION OF FUNCTION
CORNERS

C50300TWPS

The corners are used to change the direction of cable travel. The corners are specially designed to transfer the conveyed material from one tube to the other and reduce drag on the system. This is accomplished by means of an idler wheel mounted on bronze bushings inside an aluminum enclosure.

The idler wheel is formed to reduce buildup of material inside the aluminum housing by forcing it to the outside as the idler turns, allowing the cable to carry it away.

The aluminum housing is structured so that it can be waterproofed and so that it will hold the tubes rigidly in line with itself.
All corners for the 2” (50) system are now weatherproofed.



	ITEM	PART NO.	DESCRIPTION	QTY
	1.	300005H **	HARDENED AXLE FOR CORNER IDLER	1
	2.	300006B * **	BRONZE CORNER BUSHING	2
	3.	300384A *	CORNER IDLER 38 BIDIRECTION W/HOLE	1
	4.	300501 1	BOTTOM PLATE 2IN CORNER	1
	5.	300502 1	TOP PLATE 2IN CORNER	1
	6.	300503 1	CLAMP 90 CORNER 2IN	2
	7.	C50211	2IN CORNER TUBE	2
	8.	01011S	1/4 -20 HEX NUT STAINLESS	10
	9.	01028S	1/4-20 X 3/4 HEX CAP BOLT S.S.	10
	10.	01084	54233-2 SPACER THIN.	2
	11.	01087	8MM METRIC NUT, PLATED	1

REPLACEMENT PARTS AVAILABLE:

* 300385A CORNER IDLER 38 BIDIRECTION WITH BRONZE BUSHINGS INSTALLED

** 300005HK INNER CORNER REPLACEMENT KIT (1 HARDENED AXLE & 2 BRONZE BUSHINGS

300007 CORNER WEATHERPROOF KIT.

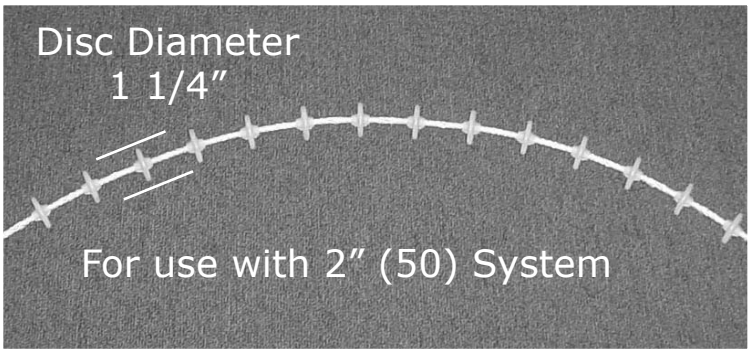
Always be sure corner is well supported.
Never place corner vertically if material is to pass through it.

EXPLANATION OF FUNCTION - CABLE

C38201

The cable is the heart of the CABLEVEY systems. As the cable is pulled through the circuit, it carries the conveyed material with it.

The cable is an aircraft quality steel cable with specially designed plastic discs spaced at regular intervals. The discs are sized to transfer the highest quantity of material with the least friction.



01275 Cable Cutter

Installation Instructions

Mount spool of cable on an axle and thread end over lower idler and out right end port of large drive unit (see photo A) Push cable from one corner to the next through tube. As soon as the cable has passed a corner fasten the cover in place.

When both ends of cable are in drive unit hook 3 or 4 discs of one end in sprocket and pull slack from system by hand, pulling the opposite end. Place discs in sprocket to hold cable in this position.

Cut cable using 01275 Cable Cutter and attach connector according to cable connector installation instructions.

Shortening Cable

With no product being conveyed in the system, stop the cable when the conntector is in the drive unit. Turn off electrical power to the unit. To shorten the cable, follow steps 1 - 8 on pages 21 - 22. Be certain to remove discs from both ends of the cable. This wil reposition both ends of the connector

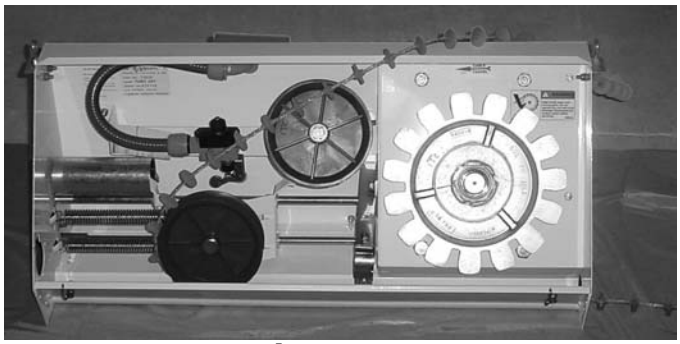
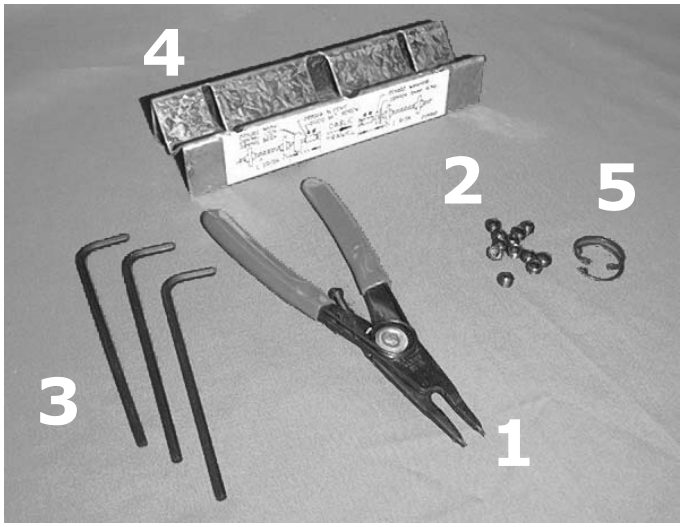


Photo A



C38208 Cable Connector Kit

Item	Part No.	Description	Qty
1	01105	Snap Ring Pliers	1
2	01022	Socket Set Screws	12
3	01104L	Long Allen Key	3
4	C38219	Cable Connector Template	1
5	209004	Snap Ring Connector	2

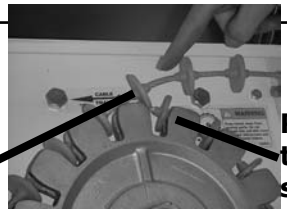
EXPLANATION OF FUNCTION
CABLE CONNECTOR - C38209

The **CABLE CONNECTOR** attaches the two ends of the cable together to complete the loop. The two-piece metal connector is joined together with an internal snap ring, which allows any rotational twist in the cable to be self-correcting.

Installation

1. With cable meshed in sprocket after removing slack, mark discs to be replaced by connector.

NOTE: NINE INCHES BETWEEN THE IDLER SHUT OFF FRAME AND LEFT END OF DRIVE UNIT FRAME (PG 20, NO. 5).



2. Remove cable from sprocket. Hold disc to be removed with vise grips and cut with hacksaw. Cut ***TO*** cable; ***do not cut into cable***. Turn cable over and make another cut 180° from last cut. Pull disc halves from cable. Repeat for other disc to be removed.

3. Place cable coming from right side of sprocket (with disc removed) in cable connector gauge. Be sure arrow on gauge is pointing in same direction as cable travel arrow on the drive unit. Cut cable with cable cutters 1/16 in. (1.5 mm) off the center of the large slot toward the disc in the gauge. (If the cable is cut directly at the center of the large slot, cable wires may extend beyond the cable sleeve end causing interference.)

4. Slide **BODY** of connector over end of cable (cable cut in step 3). Thread **SLEEVE** onto cable, turning counterclockwise until end of cable is flush with end of **SLEEVE**. Slide **BODY** to outer end of **SLEEVE** and insert two **SET SCREWS**. Care must be taken to avoid cross threading. Do not completely tighten set screws yet.

5. Place cable coming from the left side of the sprocket (with disc removed) in cable connector gauge with empty spot over center slot in gauge. Again, be sure arrow on gauge is pointing in same direction as cable travel arrow on the drive unit. Cut cable with cable cutters 1/16 in. (1.5 mm) off the center of the large slot toward the disc in the gauge. (If the cable is cut directly at the center of the large slot, cable wires may extend beyond the cable sleeve end causing interference.

6. Slide washer onto cable (cable cut in step 5) with beveled edge toward end of cable. Thread sleeve on cable until flush. Slide washer to end of sleeve and insert set screws. Care must be taken to avoid cross threading. Do not completely tighten set screws yet.

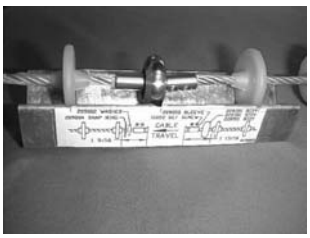
(Continued on following page)

Cable Connector Installation (continued)

7.

Fit two ends of connector together and insert snap ring into groove of body. Rotate the snap ring in the groove to be certain that it is seated.

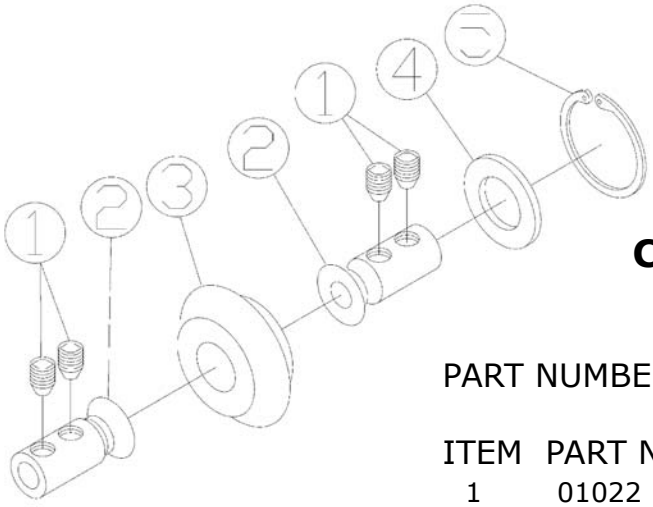
NOTE: Snap ring must be inserted with sharp edge out.



8. Place connected cable in gauge under slight tension with connector in center slot. If it goes into place easily, connector spacing is correct and the set screws can now be tightened. If connector is not centered on the slot, loosen the four set screws and move the connector. Now, tighten the set screws to 50-60 inch lbs. of torque which is a 15 lb. pull on the end of the 4 in. Long Allen Key (Item 3 , pg 66).

Note: Do not reuse set screws after they have been tightened.

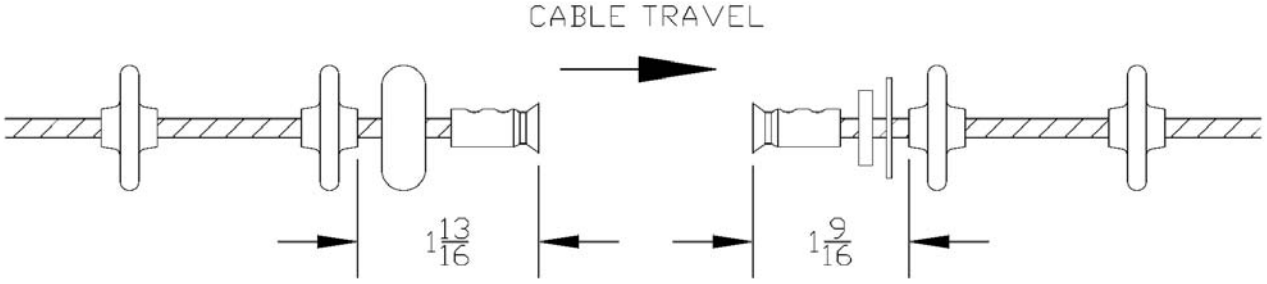
Used set screws will not sufficiently clamp to the cable.



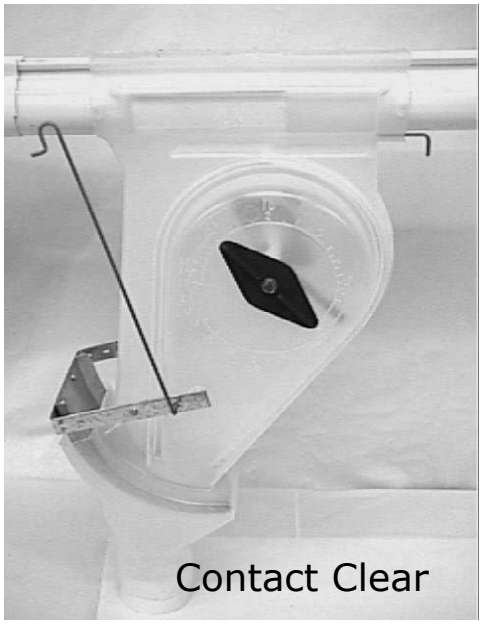
C38209 Cable Connector

PART NUMBER IDENTIFICATION

ITEM	PART NO.	DESCRIPTION	QTY
1	01022	1/4-28X5/32 Socket Set Screw	10
2	209003	Connector Clamp Sleeve	2
3	209381	Body - 50 Connector	1
4	209002	Connector Washer Plated	1
5	209004	Connector Snap Ring	2



EXPLANATION OF FUNCTION
AccuDial Feed Drop
C50605PCL or C50606PCL

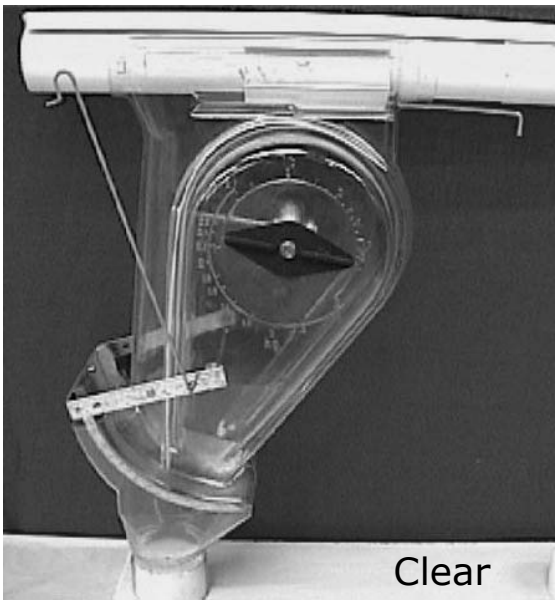

Contact Clear

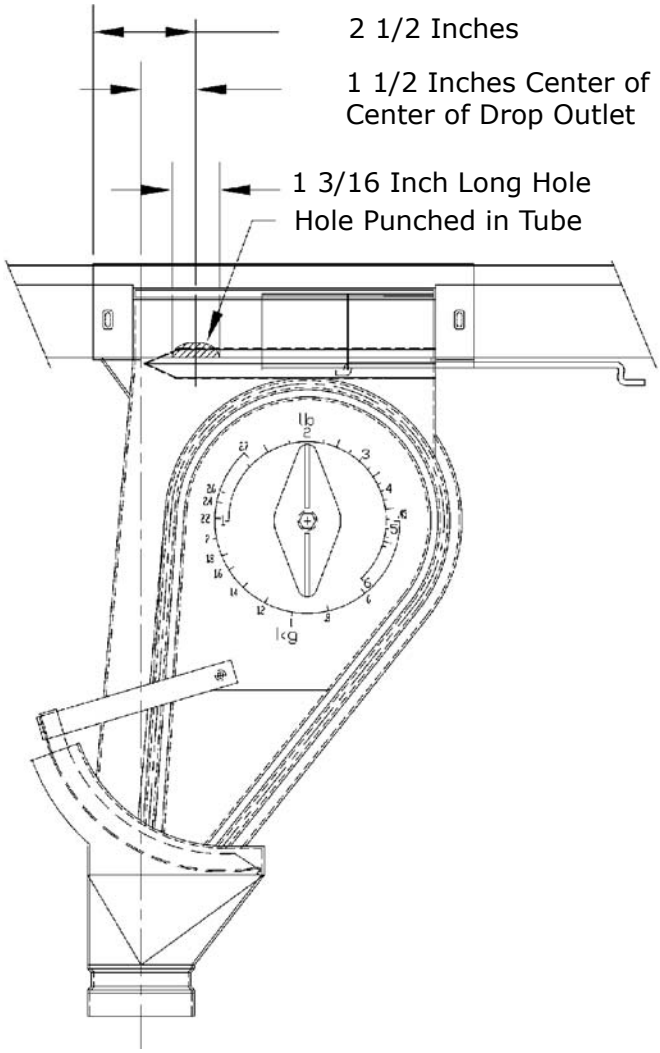
Simply dial in your desired feed setting for each drop in either pounds or kilograms.

Markings visible from both sides of drop.

Easy to adjust closure.

Patented Positive Close Feed Dispenser guards against feed spills and insures accurate feedings.

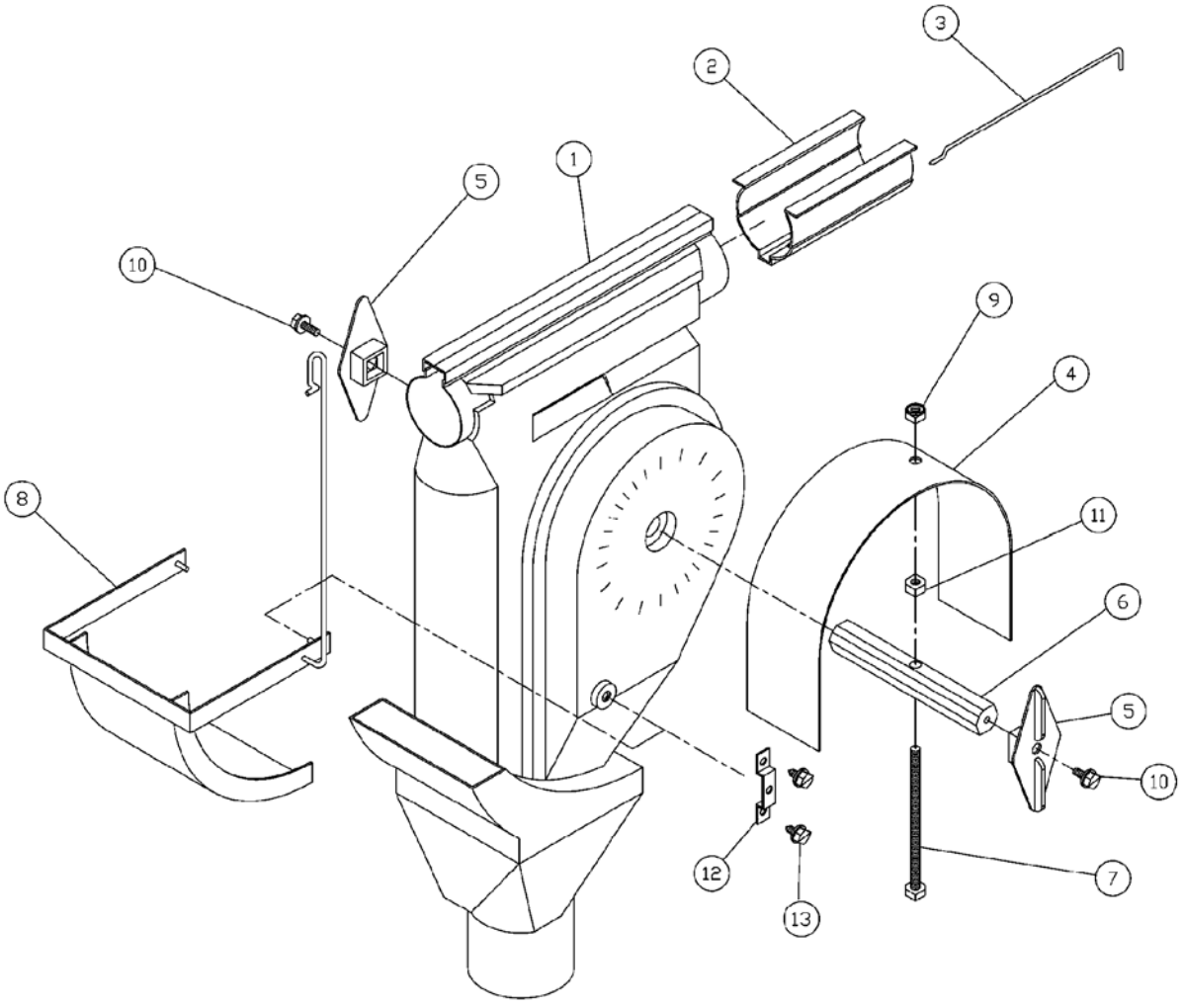

Clear



AccuDial Feed Drop
C50605PCL or C50606PCL
(Continued)

Item	Part No.	Description	Qty
1	606009	AccuDial Drop Body Clear	1
1	605009	AccuDial Drop Body Contact Clear	1
2	602011	2 In. Slide Closure for AccuDial	1
3	602012	Closer Rod for AccuDial	1
4	602013	Slide Strip for AccuDial	1
5	602014	Knob for AccuDial	2
6	602010	Pivot Rod for AccuDial	1
7	602016	5/16-18 X 4 Tap Bolt for AccuDial	1
8	602017	Long Wire Door for AccuDial	1
9	01960	5/16-18 Nylon Insert Jam Nut	1
10	01072	#14 X 1/2 Hx Hd Sht Mtll Screw	2
11	01003	5/16-18 Hex Nut, Yellow Chrom.	1
*12	105008	Hopper Locking Strap	1
*13	01966	#10 X 1/4 HWH Screw Plated	2

* Drop Pivot Boss Repair - Not in Bill of Materials



Control Panel Instructions

1. Clock for Conveying
2. Manual Start Switch
3. Manual Stop Switch
4. Green Light
5. Clock for Dispensing
6. Manual Dispensing Switch
7. Manual Cleanout Switch

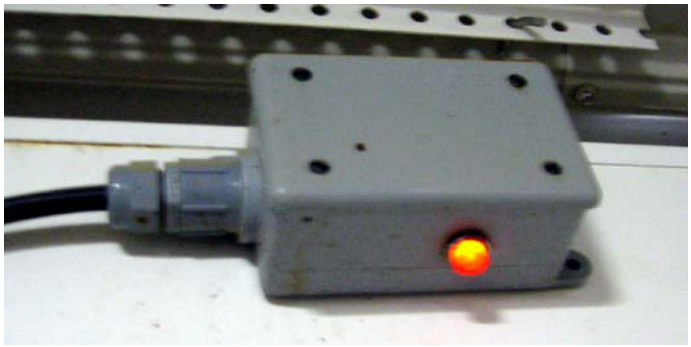


Photo #1 - Red Light on Drive Unit

Photo #2 - Control Drop

Photo #3 - Safety Switch (Roller Switch for Drive)

Photo #4 - Safety Switch (Roller Switch for Drive)

Photo #5 - Air Valve

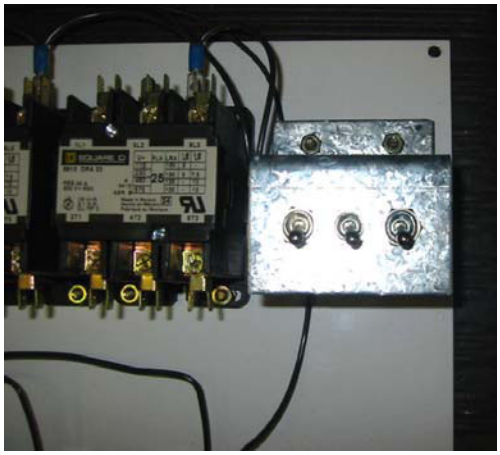


Photo #6 - Manual Bypass Switches

1. **Clock for Conveying** (Item 1)

   A. If the Clock (Item 1) will not start the systems, but the Manual Start Switch (Item 2) will start the systems, the Clock (Part No. 01467TC) will need to be replaced.

   B. If the systems will not run and the Green Light (Item 4) is off:

      1st. Check all Safety Switches (Roller Switches) in Drive Units and reset as necessary. Once the Safety Switches are reset, it will reset the Control Panel and turn the Green Light (Item 4) on. The Red Light on the back of the Drive Unit which needs to be reset will be on (See Photo #1)

      2nd. If none of the Safety Switches (Roller Switches) need to be reset, you will need to check the Control Drop (See Photo #2) to be sure the door is completely closed. The system will not run if the door is open.

      3rd. If resetting the Drive Units and closing the door on the Control Drop do not resolve the problem, you will need to check electrical power to the Control Panel.

      4th. If there is power to the Control Panel, you will need to check the Manual Stop Switch (Item 3). If this is on a qualified electrician will need to open the panel box and place a "jumper wire" from #4 to #5 on the terminal block at the bottom of the Control Panel (see Wiring Diagram included). If the green light does not come on, there is no power to the Control Panel and you must contact a qualified electrician to restore power to the panel. If the green light comes on, then it is one of the Drive Unit Safety Switches (Roller Switches). **The "jumper wire" must be removed before running the system.** The Safety Switch should look like Photo #3. If you can reset the Safety Switch and the system stops again, and it is the same Drive Unit this indicates the cable needs to be shortened. If the Safety Switch looks like Photo #4 it means that the cable needs to be shortened or the system is plugged. To shorten the cable, you will need to remove 3 buttons. See instructions for shortening cable on Page 19 of Installation and Service Manual.

2. **Clock for Dispensing** (Item 5)

   A. If the Clock for Dispensing (Item 5)will not dispense feed, but the Manual Switch (Item 6) will, then the Clock (Part No. 01467TC) will need to be replaced.

   B. If the Manual Switch (Item 6) and the Clock (Item 5) will not open the doors on the drops, you will need to press the small red button on the Air Valve (Photo 5). This should open all the doors. They should stay open as long as the button is depressed and should close when the button is released. If this happens, the air valve is plugged or bad and will need to be cleaned or replaced as necessary (Part No. AS01021K).

   C. Check the Air Compressor and be sure the water is drained out of it.

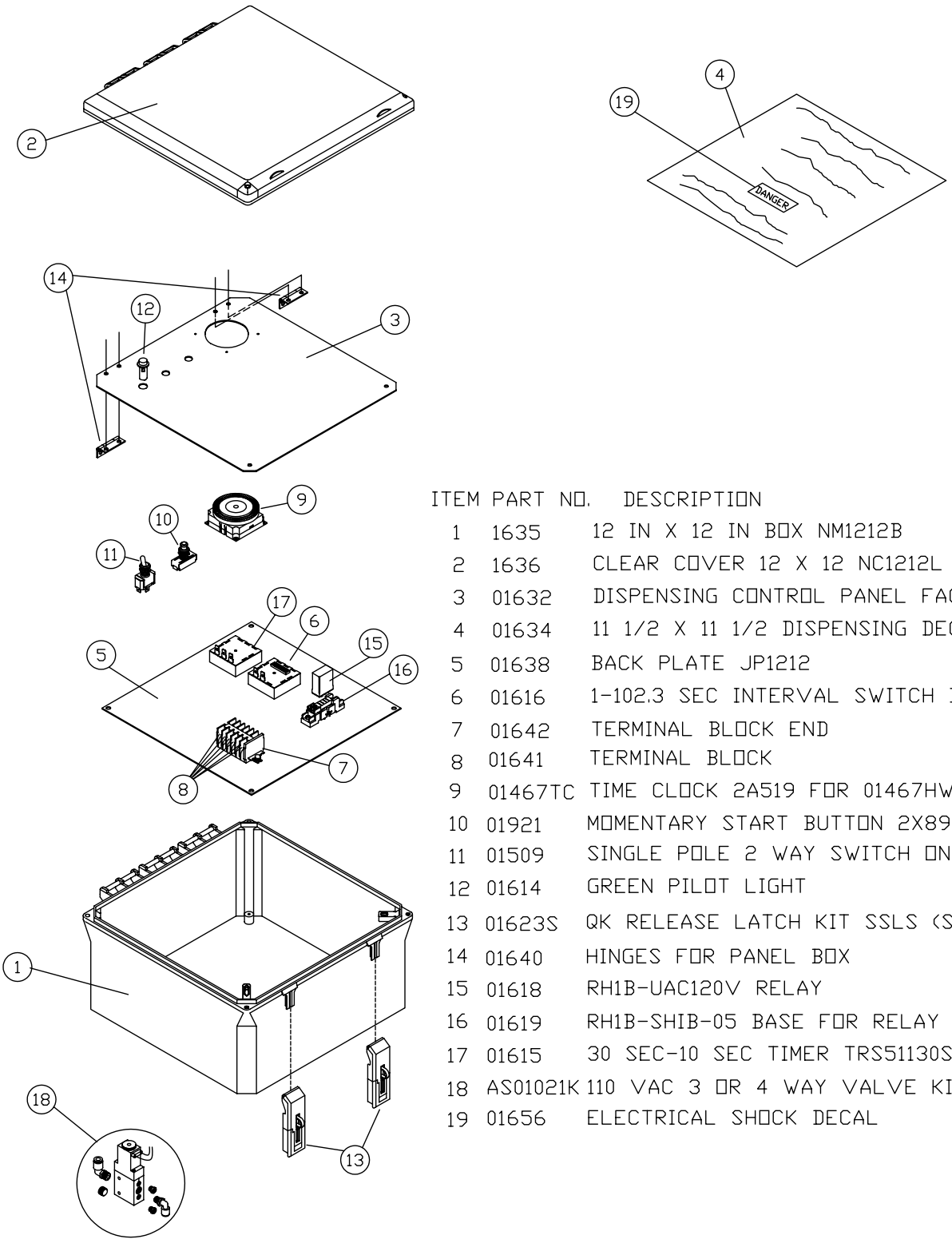
3. **Manual Bypass Switches**

   A. The switches, located inside the control box, are to be used **ONLY** if the controller in the panel is not functioning. These manual switches must be turned on and off manually. You MUST turn the switch off if it is ever switched to on.

CONTROL PANELS (Dispensing)

01580
DISPENSING PANEL
8/6/02

P.H.

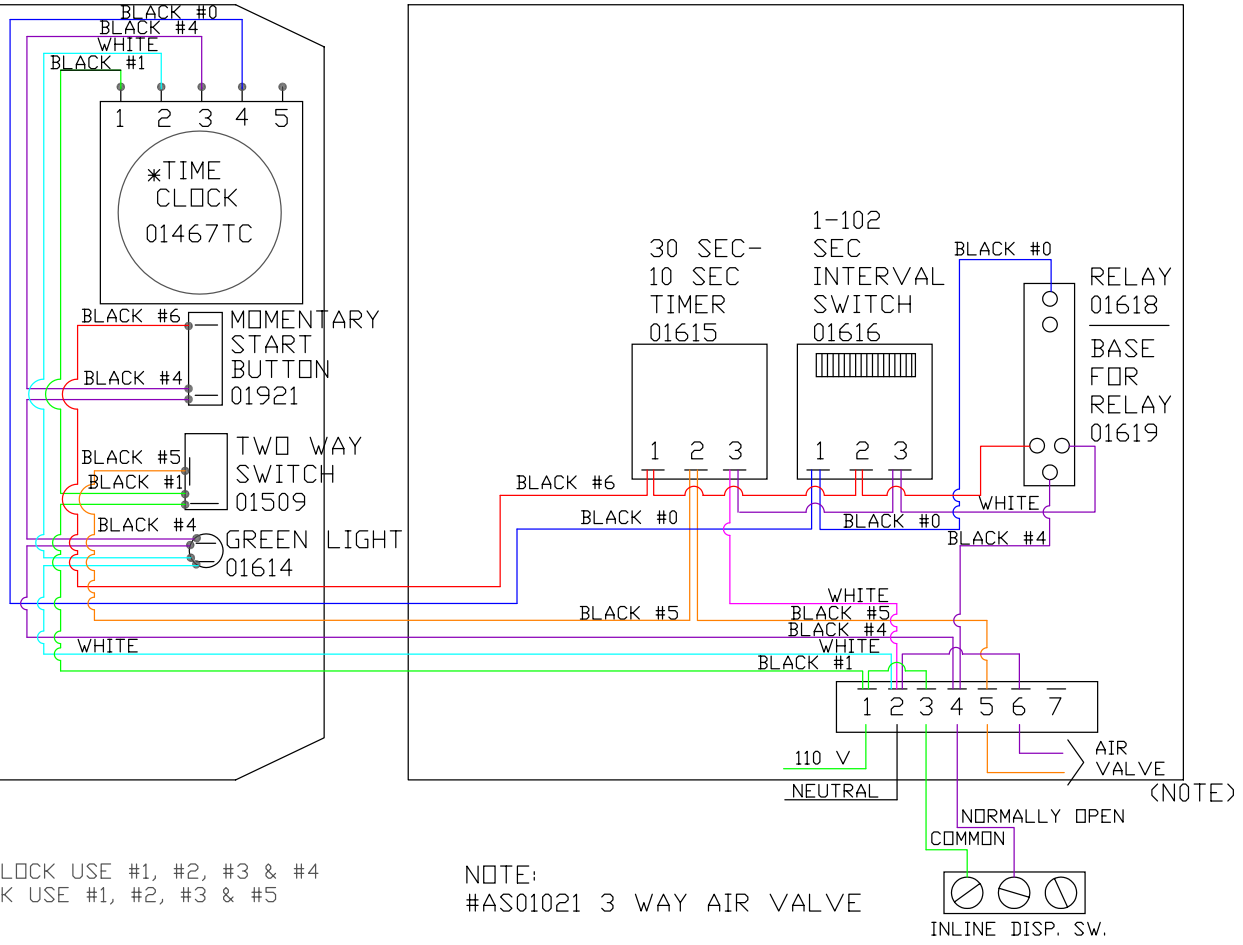


ITEM	PART NO.	DESCRIPTION	QTY.
1	1635	12 IN X 12 IN BOX NM1212B	1
2	1636	CLEAR COVER 12 X 12 NC1212L	1
3	01632	DISPENSING CONTROL PANEL FACE	1
4	01634	11 1/2 X 11 1/2 DISPENSING DEC	1
5	01638	BACK PLATE JP1212	1
6	01616	1-102.3 SEC INTERVAL SWITCH BI	1
7	01642	TERMINAL BLOCK END	1
8	01641	TERMINAL BLOCK	6
9	01467TC	TIME CLOCK 2A519 FOR 01467HW	1
10	01921	MOMENTARY START BUTTON 2X894	1
11	01509	SINGLE POLE 2 WAY SWITCH ON/OFF	1
12	01614	GREEN PILOT LIGHT	1
13	01623S	QK RELEASE LATCH KIT SSLS (STAINLESS)	2
14	01640	HINGES FOR PANEL BOX	2
15	01618	RH1B-UAC120V RELAY	1
16	01619	RH1B-SHIB-05 BASE FOR RELAY	1
17	01615	30 SEC-10 SEC TIMER TRS51130S1	1
18	AS01021K	110 VAC 3 OR 4 WAY VALVE KIT	1
19	01656	ELECTRICAL SHOCK DECAL	1

R/M	R/A	NEXT ASSY	MODEL

Note: Set clock. When light is on, system is ready to dispense. Dispensers will open, drop feed, then open and close twice more. (Manual start button will also start dispensing sequence.)

Open/close switch will open dispensers and will stay open until switch is returned to the close position.



*GRASSLIN TIME CLOCK USE #1, #2, #3 & #4
*DIEHL TIME CLOCK USE #1, #2, #3 & #5

NOTE:
#AS01021 3 WAY AIR VALVE

3RD ANGLE PROJECTION

LET.	CHANGE DESCRIPTION	DATE

UNLESS OTHERWISE SPEC.:
DIMNS. IN INCHES. ANSI Y14.5M-1982.
STD. TOLERANCES:
X.X ± .060
X.XX ± .030
X.XXX ± .010
FRAC.DIM. ± 1/32
DEG. ± 1°

DESIGN BY: DATE:
DRAFT BY: J.Z. DATE: 6/30/98
DRAFTING APPROVAL: DESIGN APPROVAL:

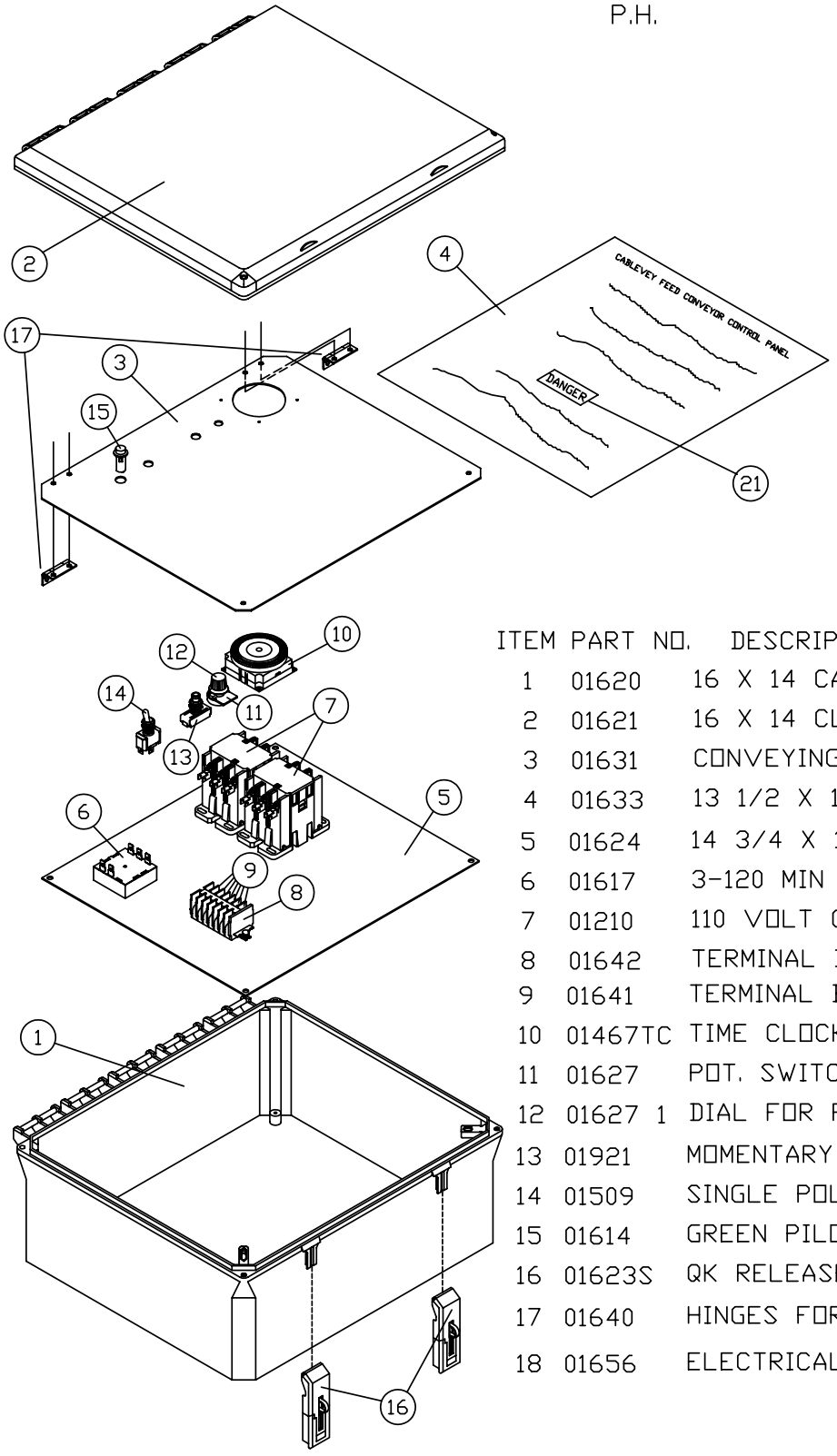
TITLE CABLEVEY DISPENSING PANEL
DRAWING NUMBER: 01580 CODE

ENG. NUMBER: E3350
SIZE A
DO NOT SCALE
SHEET 1 OF 1

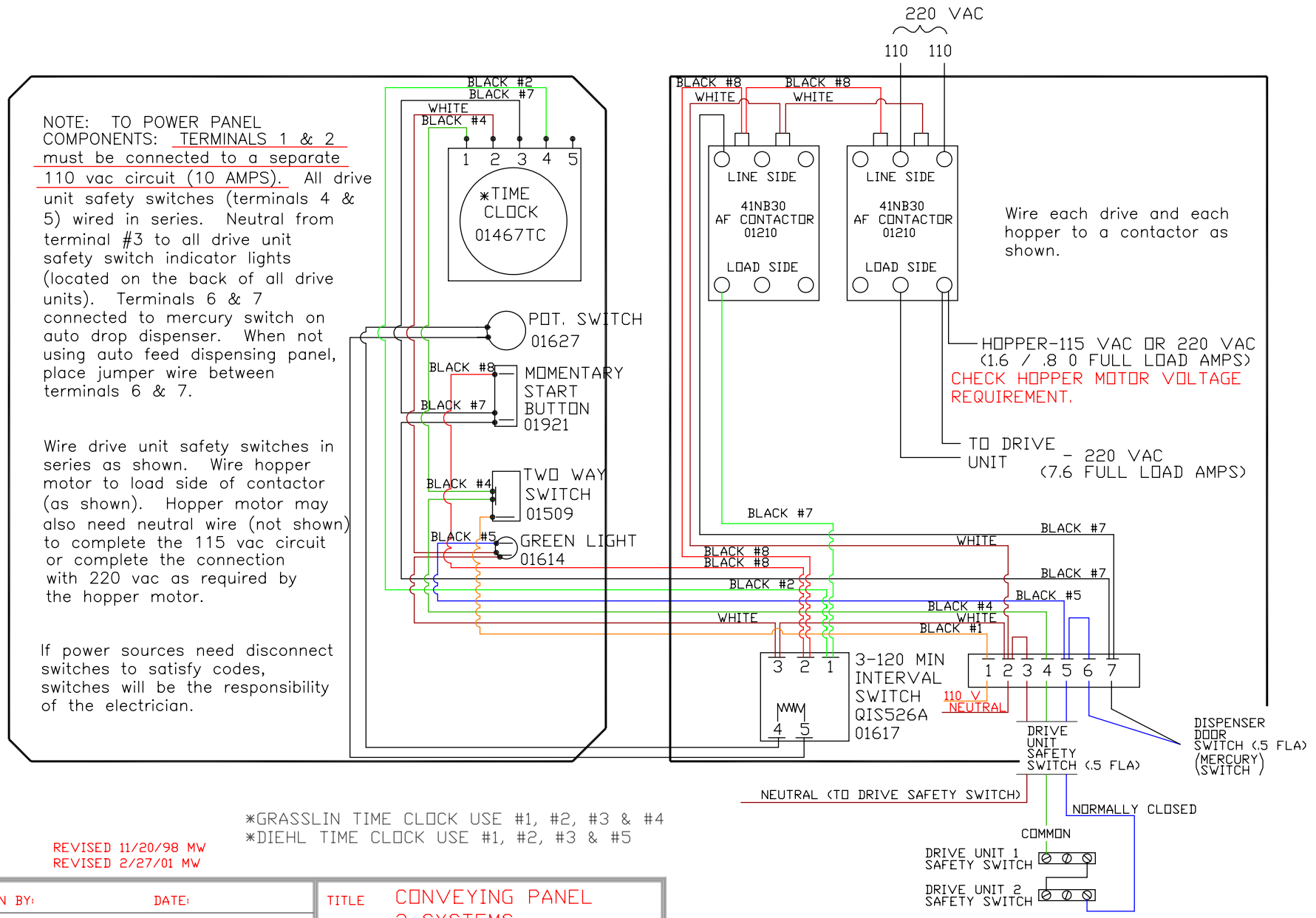
INTRACO, INC.
OSKALOOSA, IOWA

CONTROL PANELS (Conveying 1-2 Systems)

01582
CONVEYING PANEL
8/6/02
P.H.



ITEM	PART NO.	DESCRIPTION	QTY.
1	01620	16 X 14 CARLON BOX NM1614B	1
2	01621	16 X 14 CLEAR COVER NC1614L	1
3	01631	CONVEYING CONTROL PANEL FACE P	1
4	01633	13 1/2 X 15 CONVEYING DECAL	1
5	01624	14 3/4 X 12 7/8 BACK PLATE	1
6	01617	3-120 MIN INTERVAL SWITCH QUIS5	1
7	01210	110 VOLT CONTACTOR	2
8	01642	TERMINAL BLOCK END	1
9	01641	TERMINAL BLOCK	7
10	01467TC	TIME CLOCK 2A519 FOR 01467HW	1
11	01627	POT. SWITCH	1
12	01627 1	DIAL FOR POT. SWITCH	1
13	01921	MOMENTARY START BUTTON 2X894	1
14	01509	SINGLE POLE 2 WAY SWITCH ON/OFF	1
15	01614	GREEN PILOT LIGHT	1
16	01623S	QK RELEASE LATCH KIT SSLS (STAINLESS)	2
17	01640	HINGES FOR PANEL BOX	2
18	01656	ELECTRICAL SHOCK DECAL	1

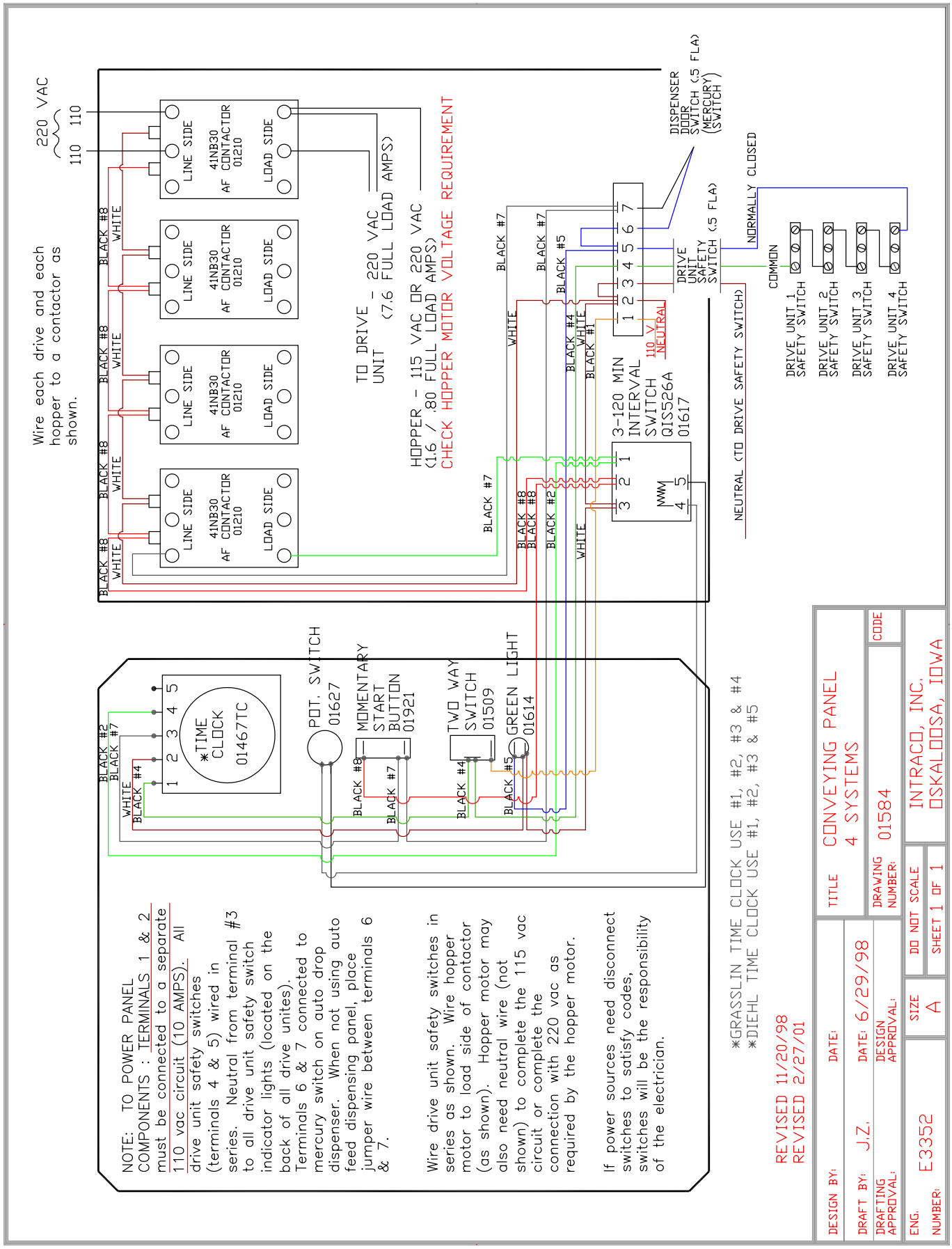


*GRASSLIN TIME CLOCK USE #1, #2, #3 & #4
*DIEHL TIME CLOCK USE #1, #2, #3 & #5

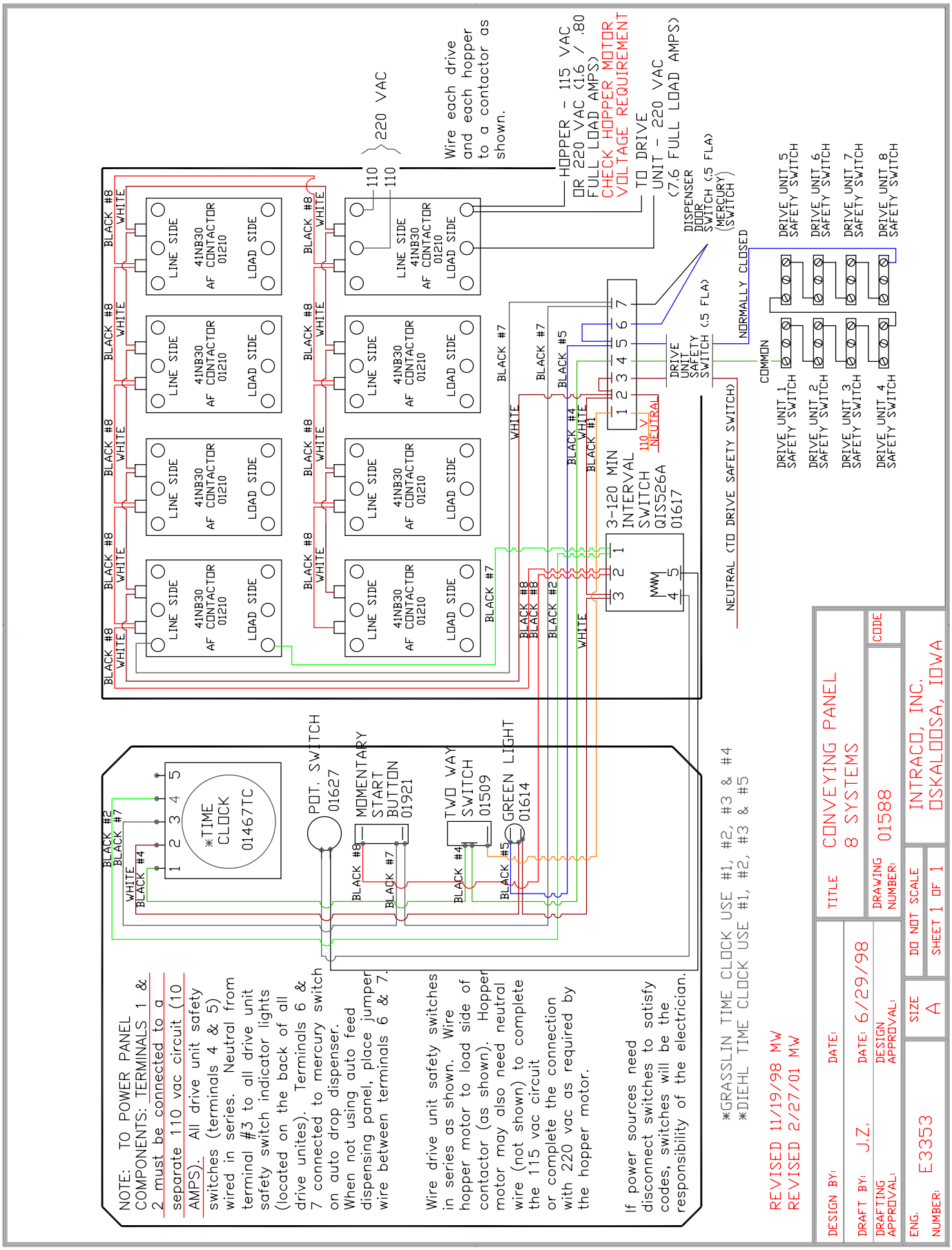
REVISED 11/20/98 MW
REVISED 2/27/01 MW

DESIGN BY:	DATE:	TITLE	CONVEYING PANEL 2 SYSTEMS
DRAFT BY: J.Z.	DATE: 6/29/98		
DRAFTING APPROVAL:	DESIGN APPROVAL:	DRAWING NUMBER: 01582	CODE
ENG. NUMBER: E3351	SIZE A	DO NOT SCALE	INTRACO, INC. OSKALOOSA, IOWA
		SHEET 1 OF 1	

CONTROL PANELS (Dispensing 3-4 Systems)



CONTROL PANELS (Dispensing 5-8 Systems)



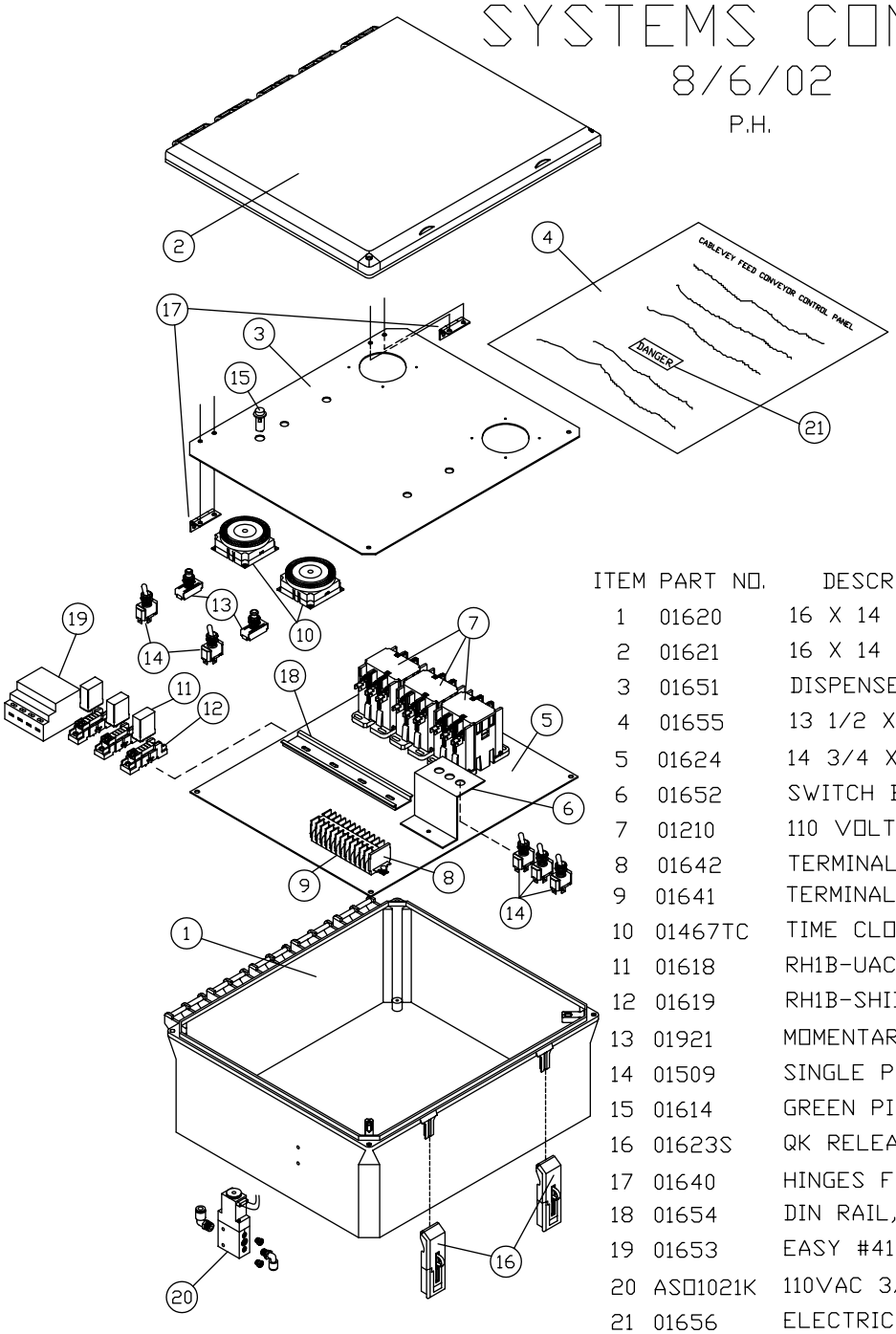
CONTROL PANELS (Conveying& Dispensing)

01581

CONVEY/DISPENSE, THREE SYSTEMS CONTROL PANEL

8/6/02

P.H.



ITEM	PART NO.	DESCRIPTION	QTY.
1	01620	16 X 14 CARLON BOX NM1614B	1
2	01621	16 X 14 CLEAR COVER NC1614L	1
3	01651	DISPENSE/CONVEY PANEL FACE PLATE	1
4	01655	13 1/2 X 15 CONVEYING DECAL	1
5	01624	14 3/4 X 12 7/8 BACK PLATE	1
6	01652	SWITCH BRKT, DISPENSE/CONVEY PANEL	1
7	01210	110 VOLT CONTACTOR	3
8	01642	TERMINAL BLOCK END	1
9	01641	TERMINAL BLOCK	12
10	01467TC	TIME CLOCK 2A519 FOR 01467HW	2
11	01618	RH1B-UAC120V RELAY	3
12	01619	RH1B-SHIB-05 BASE FOR RELAY	3
13	01921	MOMENTARY START BUTTON 2X894	2
14	01509	SINGLE POLE 2 WAY SWITCH ON/OFF	2
15	01614	GREEN PILOT LIGHT	1
16	01623S	QK RELEASE LATCH KIT SSLS (STAINLESS)	2
17	01640	HINGES FOR PANEL BOX	2
18	01654	DIN RAIL, DISPENSE/CONVEY PANEL	1
19	01653	EASY #412 RELAY	1
20	ASO1021K	110VAC 3/4 WAY AIR VALVE KIT	1
21	01656	ELECTRICAL SHOCK DECAL	1

R/M	R/A	NEXT ASSY	MODEL

NOTE: TO POWER PANEL COMPONENTS: TERMINALS 1 & 2 must be connected to a separate 110 vac circuit (10 AMPS). All drive unit safety switches (terminals 4 & 5) wired in series. Neutral from terminal #3 to all drive unit safety switch indicator lights (located on the back of all drive units). Terminals 8 & 9 connected to mercury switch on auto drop dispenser.

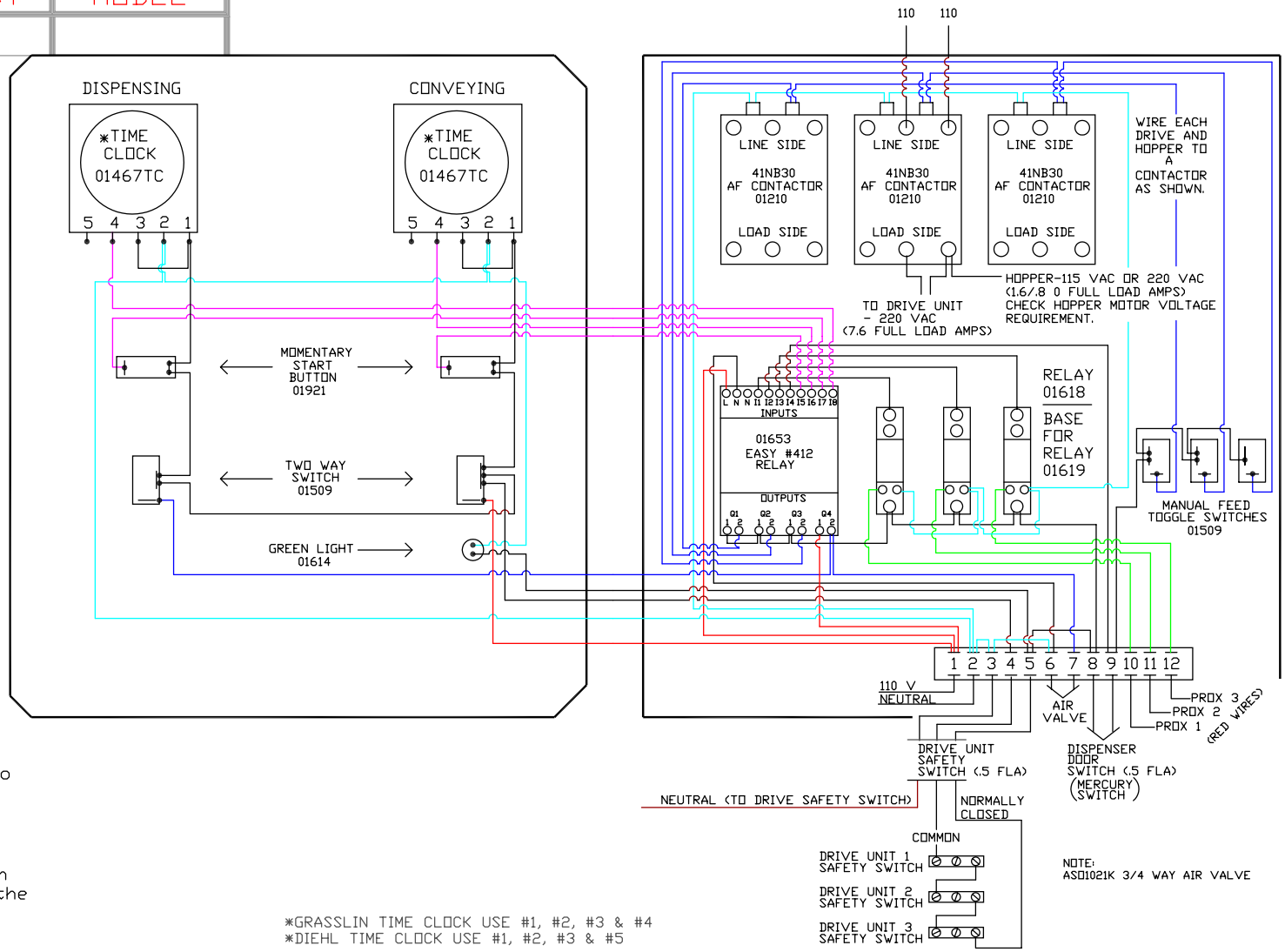
Wire drive unit safety switches in series as shown. Wire hopper motor to load side of contactor (as shown). Hopper motor may also need neutral wire (not shown) to complete the 115 vac circuit or complete the connection with 220 vac as required by the hopper motor.

Wire in disconnect switches (not provided) for drive unit and hopper motors.

If power sources need disconnect switches to satisfy codes, switches will be the responsibility of the electrician.

Note: Set clock. Dispensers will open, drop feed, then open and close once more. (Manual start button will also start dispensing sequence.)

Open/close switch will open dispensers and will stay open until switch is returned to the close position.



*GRASSLIN TIME CLOCK USE #1, #2, #3 & #4
*DIEHL TIME CLOCK USE #1, #2, #3 & #5

3RD ANGLE PROJECTION	REQD /DASH NO	ITEM NUMBER	MATERIAL DESCRIPTION	SYM

LET.	CHANGE DESCRIPTION	DATE

UNLESS OTHERWISE SPEC.:
DIMNS. IN INCHES. ANSI Y14.5M-1982. STD. TOLERANCES:
X.X ± .060
X.XX ± .030
X.XXX ± .010
FRAC.DIM. ± 1/32
DEG. ± 1°

DESIGN BY: DATE:
DRAFT BY: P.H. DATE: 7/8/02
DRAFTING APPROVAL: DESIGN APPROVAL:

TITLE CONVEY/DISPENSE, 3 SYSTEMS CONTROL PANEL

DRAWING NUMBER: 01581 CODE

ENG. NUMBER: SIZE A DO NOT SCALE SHEET OF

INTRACO, INC. OSKALOOSA, IOWA

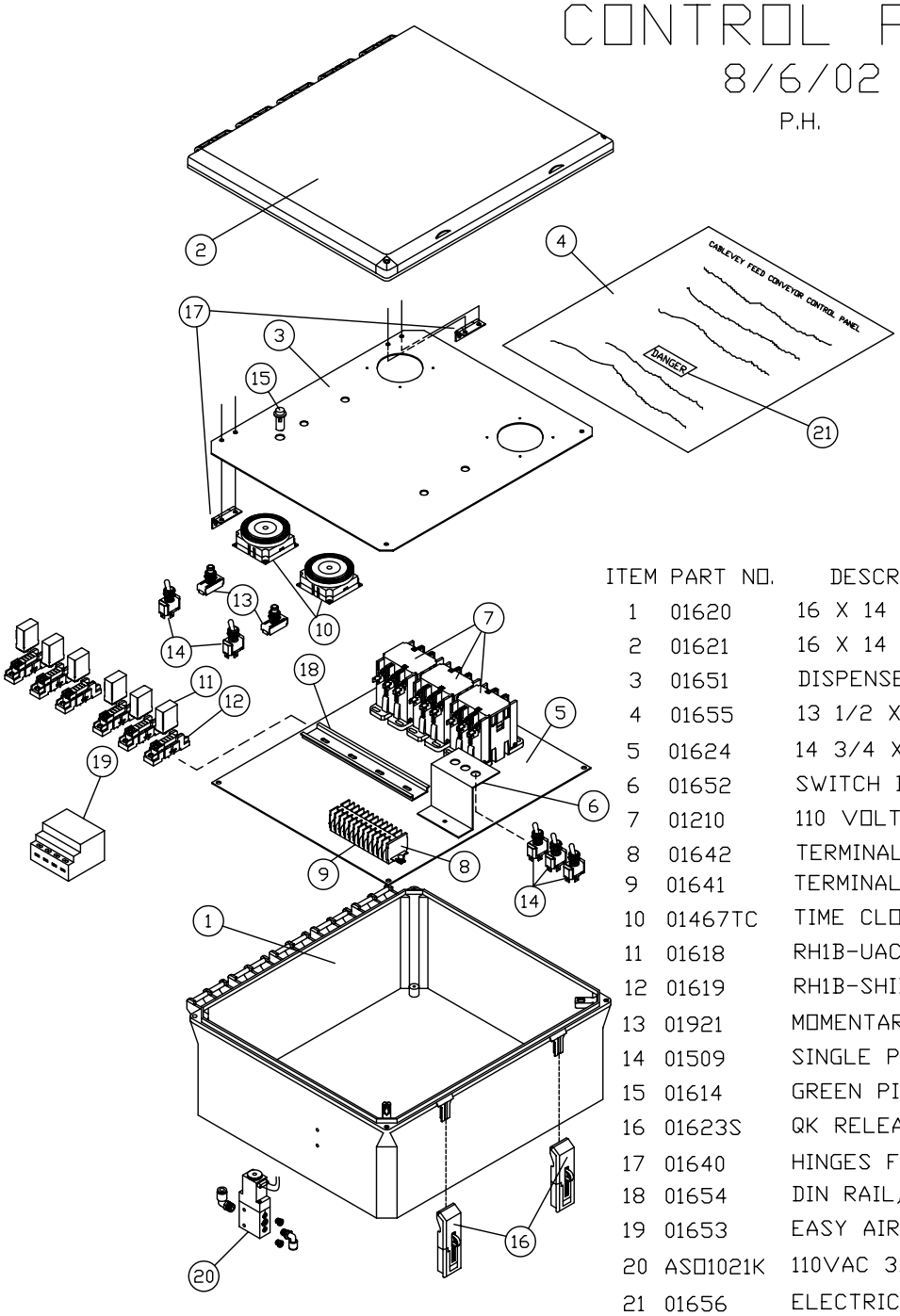
CONTROL PANELS (Conveying& Dispensing)

01583

CONVEY/DISPENSE, 6 SYSTEM CONTROL PANEL

8/6/02

P.H.



ITEM	PART NO.	DESCRIPTION	QTY.
1	01620	16 X 14 CARLON BOX NM1614B	1
2	01621	16 X 14 CLEAR COVER NC1614L	1
3	01651	DISPENSE/CONVEY PANEL FACE PLATE	1
4	01655	13 1/2 X 15 CONVEYING DECAL	1
5	01624	14 3/4 X 12 7/8 BACK PLATE	1
6	01652	SWITCH BRKT, DISPENSE/CONVEY PANEL	1
7	01210	110 VOLT CONTACTOR	3
8	01642	TERMINAL BLOCK END	1
9	01641	TERMINAL BLOCK	15
10	01467TC	TIME CLOCK 2A519 FOR 01467HW	2
11	01618	RH1B-UAC120V RELAY	6
12	01619	RH1B-SHIB-05 BASE FOR RELAY	6
13	01921	MOMENTARY START BUTTON 2X894	2
14	01509	SINGLE POLE 2 WAY SWITCH ON/OFF	3
15	01614	GREEN PILOT LIGHT	1
16	01623S	QK RELEASE LATCH KIT SSLS (STAINLESS)	2
17	01640	HINGES FOR PANEL BOX	2
18	01654	DIN RAIL, DISPENSE/CONVEY PANEL	1
19	01653	EASY AIR RELAY	1
20	AS01021K	110VAC 3/4 WAY AIR VALVE KIT	1
21	01656	ELECTRICAL SHOCK DECAL	1

R/M	R/A	NEXT ASSY	MODEL

NOTE: TO POWER PANEL COMPONENTS: TERMINALS 1 & 2 must be connected to a separate 110 vac circuit (10 AMPS). All drive unit safety switches (terminals 4 & 5) wired in series. Neutral from terminal #3 to all drive unit safety switch indicator lights (located on the back of all drive units). Terminals 8 & 9 connected to mercury switch on auto drop dispenser.

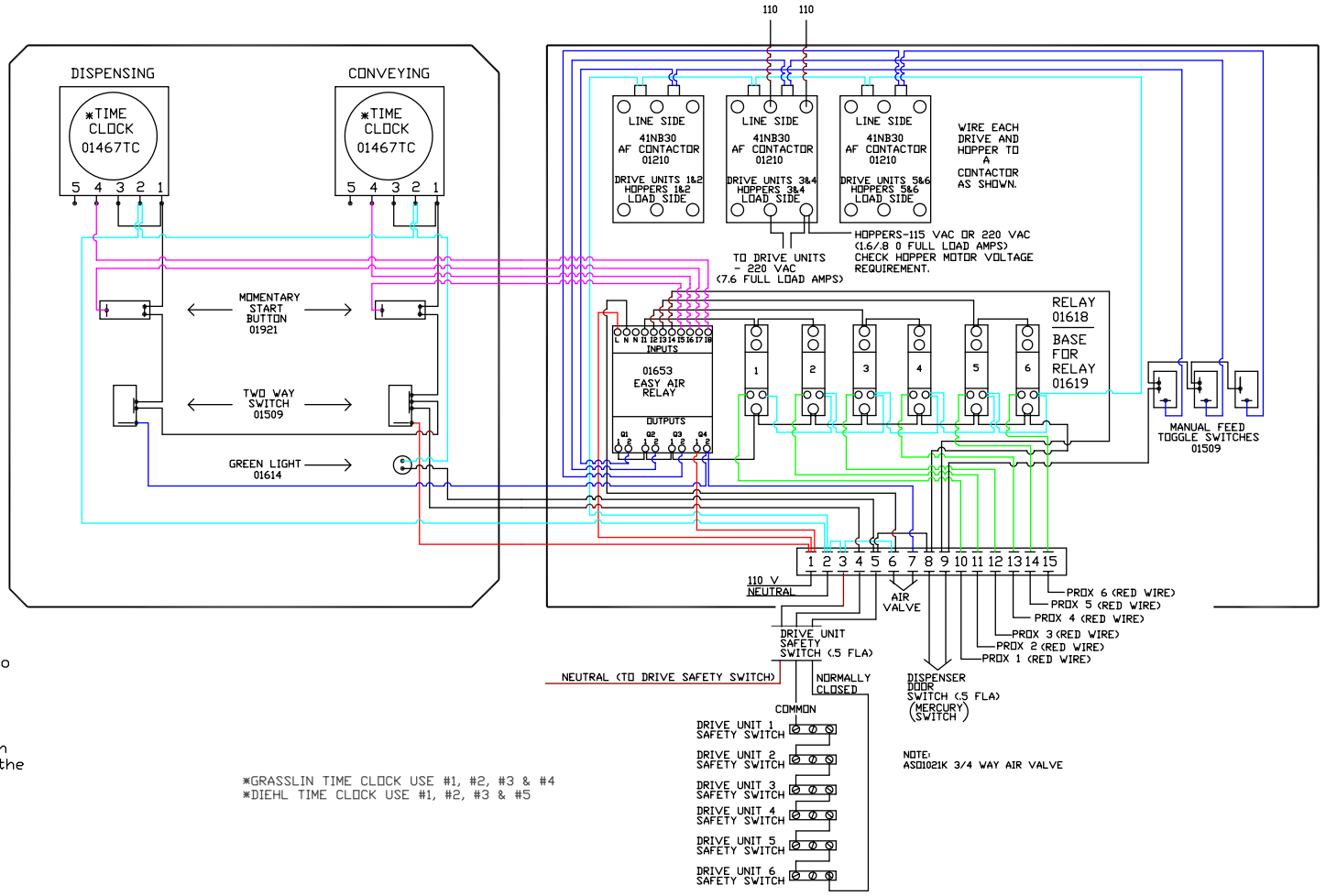
Wire drive unit safety switches in series as shown. Wire hopper motor to load side of contactor (as shown). Hopper motor may also need neutral wire (not shown) to complete the 115 vac circuit or complete the connection with 220 vac as required by the hopper motor.

Wire in disconnect switches (not provided) for drive unit and hopper motors.

If power sources need disconnect switches to satisfy codes, switches will be the responsibility of the electrician.

Note: Set clock. Dispensers will open, drop feed, then open and close once more. (Manual start button will also start dispensing sequence.)

Open/close switch will open dispensers and will stay open until switch is returned to the close position.



*GRASSLIN TIME CLOCK USE #1, #2, #3 & #4
*DIEHL TIME CLOCK USE #1, #2, #3 & #5

			3RD ANGLE PROJECTION	REQD /DASH NO	ITEM NUMBER	MATERIAL DESCRIPTION / SYM
LET.	CHANGE DESCRIPTION	DATE	UNLESS OTHERWISE SPEC.: DIMNS. IN INCHES, ANSI Y14.5M-1982, STD. TOLERANCES: X.X ± .060 X.XX ± .030 X.XXX ± .010 FRAC.DIM. ± 1/32 DEG. ± 1°	DESIGN BY:	DATE:	TITLE CONVEY/DISPENSE, 6 SYSTEMS, CONTROL PANEL
				DRAFT BY: P.H.	DATE: 7/8/02	
				DRAFTING APPROVAL:	DESIGN APPROVAL:	DRAWING NUMBER: 01583 / CODE
				ENG. NUMBER:	SIZE A	DO NOT SCALE / SHEET OF
						INTRACO, INC. OSKALOOSA, IOWA

TRIPPING SYSTEM (Components)

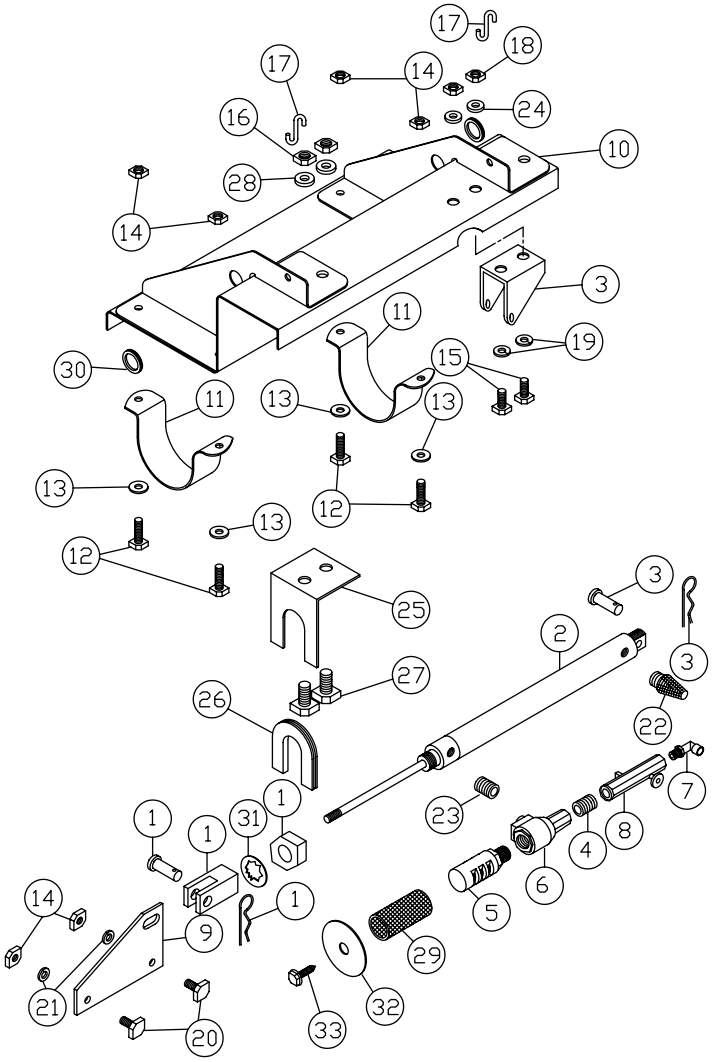
C00612-13

AIR TRIP TUBE MT 3/4 CYL

1/8/02

P.H.

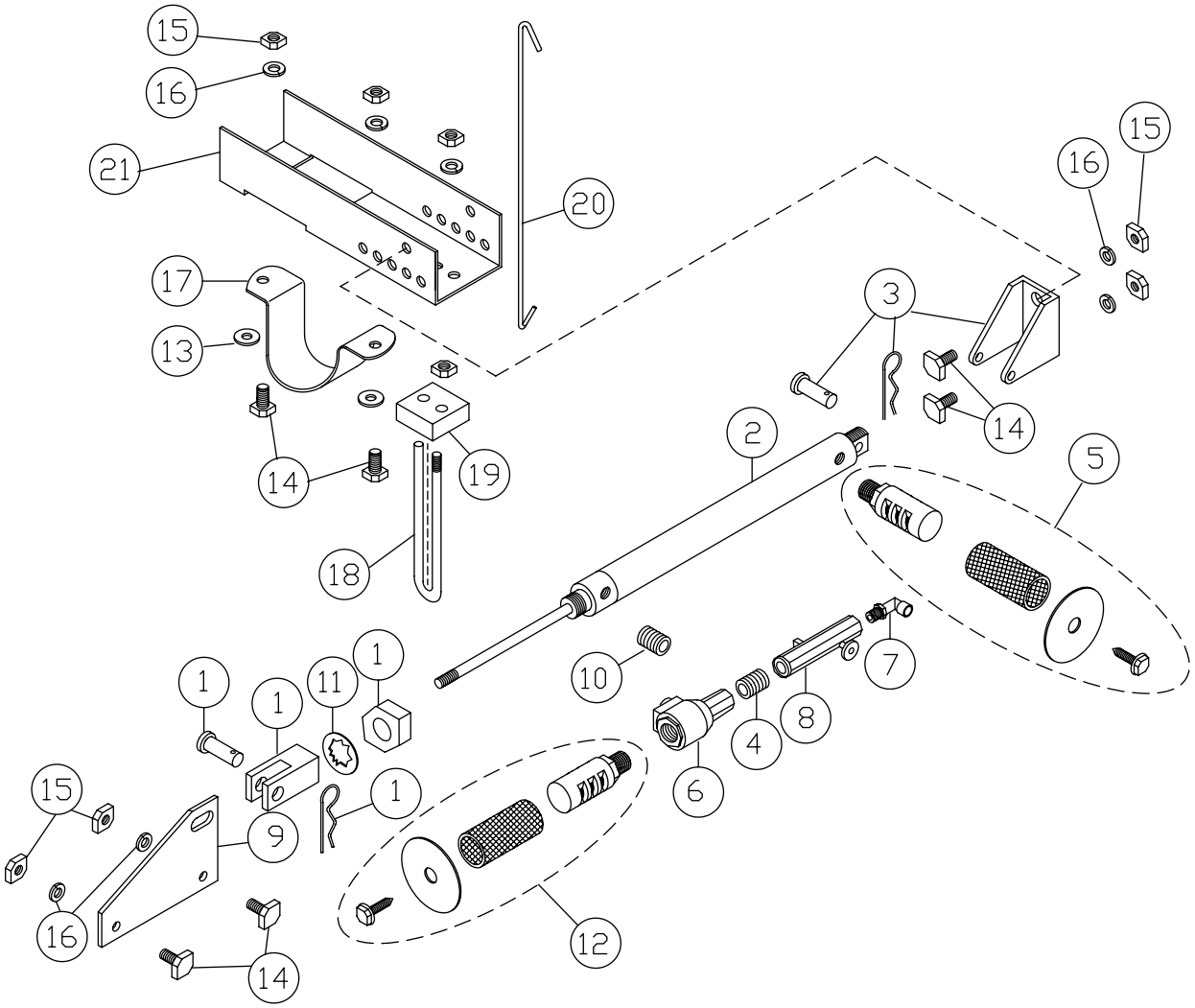
ITEM	PART NO.	DESCRIPTION	QTY.
1	AS01012	CLEVIS AIR CYLINDER	1
2	AS01059	9" AIR CYLINDER, 3/4	1
3	AS01013	PIVOT BRKT. FOR 9" AIR CYLINDER	1
4	AS01945	1/4" PIPE NIPPLE	1
5	AS01041S	STAINLESS MUFFLER 1/4" NPT	1
6	AS01038	QUICK EXHAUST VALVE	1
7	AF01036	90 MALE 3/8" (1/AIR COMPRESSOR)	1
8	AS01046	FLOW REGULATOR	1
9	612034A	PAINTED AIR TRIP BRACKET	1
10	612036P	POS AIRTRIP LONGWIRE PAINTED FRAME	1
11	600026	SPRING ATTACHMENT CONDUIT CLAMP	2
12	01009	1/4-20 X 1 1/4 HEX HEAD SCREW	4
13	01970	9/32 ID X 1 OD X .125 TK FLATWASHER	4
14	01011	1/4-20 HEX NUT	6
15	01028S	1/4-20 X 3/4 HEX HEAD CAP SCR. S.S.	2
16	01020	3/8-16 HEX NUT	2
17	01137	#8 MED. S. HOOK ZINC(79008-35)	2
18	01011S	1/4-20 HEX NUT STAINLESS	2
19	01018	1/4 LOCK WASHER	2
20	01028	1/4-20 X 3/4 HEX HEAD SCREW	2
21	01018	1/4 LOCKWASHER	2
22	AS01035	1/8" MUFFLER	1
OR 22	AS01066S	STAINLESS MUFFLER 1/8 NPT	1
23	AS01050	1/8" TO 1/4" PIPE NIPPLE	1
24	01023	1/4" SAE WASHER	2
25	612037	TRIPPER 3/4 CYL. GUIDE	1
26	01944	EDGE TRIM	1
27	01033	3/8-16 X 3/4 HEX HEAD SCREW	2
28	01034	3/8 LOCKWASHER	2
29	01929MO	MESH SLEEVE	2
30	01953	5/8 ID X 1 1/8 OD RUBBER GROMMET	2
31	02022	1/4 S.S. INTERNAL TOOTH WASHER	1
32	02024	S.S. WASHER 13/64 X 1 X .047	1
33	01971	#8 X 1/2 SELF TAPPING SCREW	1



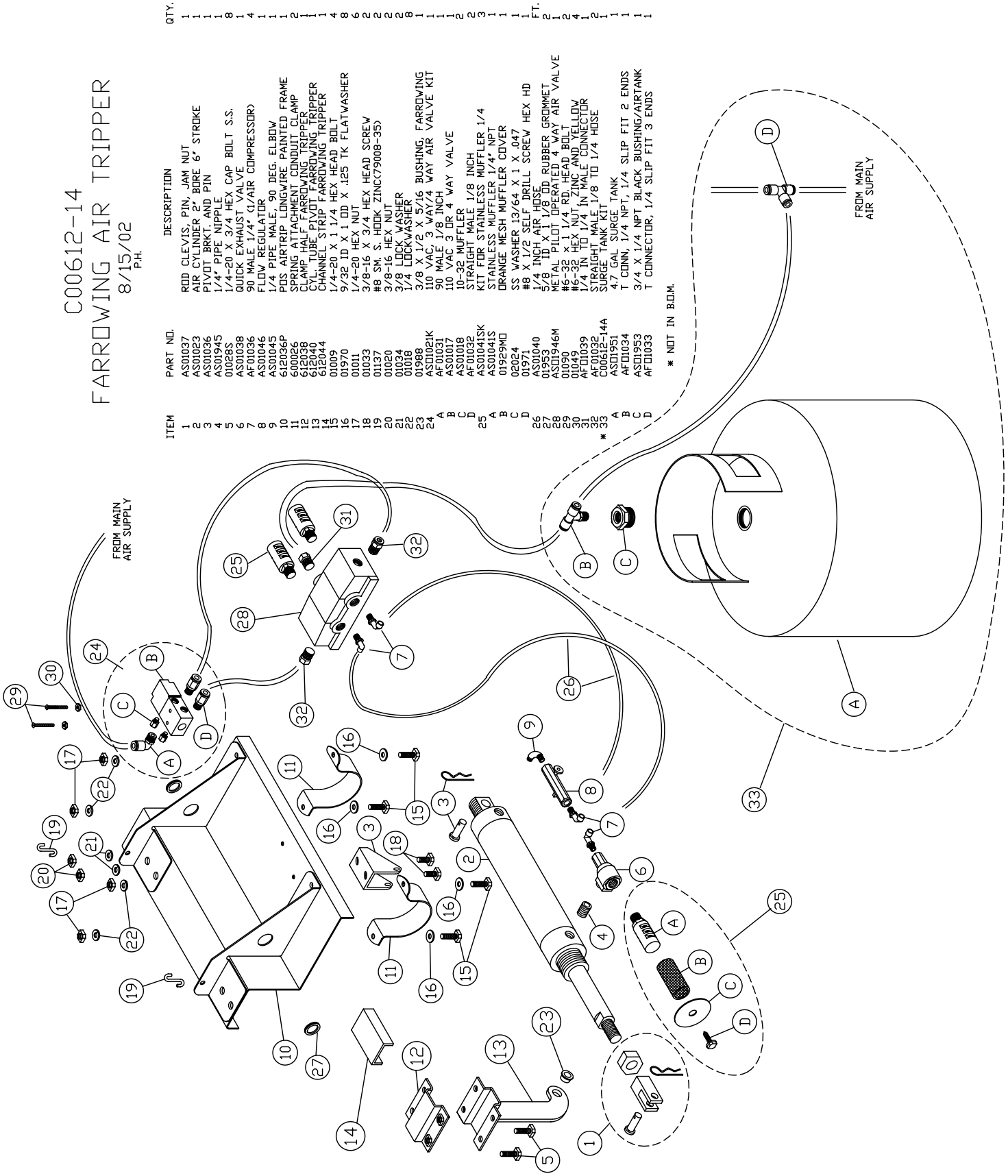
TRIPPING SYSTEM (Components)

C00612-13A
AIR TRIP TUBE MT 3/4 CYL
7/16/02
P.H.

ITEM	PART NO.	DESCRIPTION	QTY.
1	AS01012	CLEVIS AIR CYLINDER	1
2	AS01059	9" AIR CYLINDER, 3/4	1
3	AS01013	PIVOT BRKT. FOR 9" AIR CYLINDER	1
4	AS01945	1/4" PIPE NIPPLE	1
5	AS01066SK	KIT FOR STAINLESS MUFFLER 1/8" NPT	1
6	AS01038	QUICK EXHAUST VALVE	1
7	AF01036	90 MALE 1/4" (1/AIR COMPRESSOR)	1
8	AS01046	FLOW REGULATOR	1
9	612034A	PAINTED AIR TRIP BRACKET	1
10	AS01047	1/8" TO 1/4" PIPE NIPPLE	1
11	02022	1/4 S.S. INTERNAL TOOTH WASHER	1
12	AS01041SK	KIT FOR STAINLESS MUFFLER 1/4" NPT	1
13	01970	9/32 ID X 1 OD X .125 TK FLATWASHER	2
14	01028S	1/4-20 X 3/4 HEX HEAD CAP SCR. S.S.	6
15	01011S	1/4-20 HEX NUT STAINLESS	8
16	01018	1/4 LOCK WASHER	7
17	600026	SPRING ATTACHMENT CONDUIT CLAMP	1
18	600043	4 1/4 U BOLT TRIPPER CHANNEL	1
19	612054	PLASTIC CHANNEL GUIDE BLOCK	1
20	600044	SUPPORT BRKT., DROP LEVELING WIRE	1
21	612057	SUPPORT/CYLINDER BRKT, TRIPPER CHANNEL	1



TRIPPING SYSTEM (Components)



ITEM	PART NO.	DESCRIPTION	QTY.
1	AS01037	ROD CLEVIS, PIN, JAM NUT	1
2	AS01023	AIR CYLINDER 2" BORE 6" STROKE	1
3	AS01036	PIVOT BRKT. AND PIN	1
4	AS01945	1/4" PIPE NIPPLE	1
5	01028S	1/4-20 X 3/4 HEX CAP BOLT S.S.	8
6	AS01038	QUICK EXHAUST VALVE	1
7	AF01036	90 MALE 1/4" (1/AIR COMPRESSOR)	4
8	AS01046	FLOW REGULATOR	1
9	AS01045	1/4 PIPE MALE, 90 DEG. ELBOW	1
10	612036P	POS AIRTRIP LONGWIRE PAINTED FRAME	1
11	600026	SPRING ATTACHMENT CONDUIT CLAMP	2
12	612038	CLAMP HALF FARROWING TRIPPER	1
13	612040	CYL. TUBE PIVOT FARROWING TRIPPER	1
14	612044	CHANNEL STRIP FARROWING TRIPPER	1
15	01009	1/4-20 X 1 1/4 HEX HEAD BOLT	4
16	01970	9/32 ID X 1 OD X .125 TK FLATWASHER	8
17	01011	1/4-20 HEX NUT	6
18	01033	3/8-16 X 3/4 HEX HEAD SCREW	2
19	01137	#8 SM. S. HOOK ZINC(79008-35)	2
20	01020	3/8-16 HEX NUT	2
21	01034	3/8 LOCK WASHER	2
22	01018	1/4 LOCKWASHER	8
23	01988	3/8 X 1/2 X 5/16 BUSHING, FARROWING	1
24	ASD1021K	110 VAC, 3 WAY/4 WAY AIR VALVE KIT	1
A	AF01031	90 MALE 1/8 INCH	1
B	AS01017	110 VAC 3 OR 4 WAY VALVE	1
C	AS01018	10-32 MUFFLER	2
D	AF01032	STRAIGHT MALE 1/8 INCH	2
25	AS01041SK	KIT FOR STAINLESS MUFFLER 1/4	3
A	AS01041S	STAINLESS MUFFLER 1/4" NPT	1
B	01929MD	ORANGE MESH MUFFLER COVER	1
C	02024	SS WASHER 13/64 X 1 X .047	1
D	01971	#8 X 1/2 SELF DRILL SCREW HEX HD	1
26	AS01040	1/4 INCH AIR HOSE	FT.
27	01953	5/8 ID X 1 1/8 OD RUBBER GROMMET	2
28	ASD1946M	METAL PILOT OPERATED 4 WAY AIR VALVE	1
29	01090	#6-32 x 1 1/4 RD. HEAD BOLT	2
30	01049	#6-32 HEX NUT ZINC AND YELLOW	4
31	AFD1039	1/4 IN TO 1/4 IN MALE CONNECTOR	1
32	AF01032	STRAIGHT MALE 1/8 TO 1/4 HOSE	2
33	C00612-14A	SURGE TANK KIT	1
*	ASD1951	4.7 GAL SURGE TANK	1
A	AFD1034	T CONN, 1/4 NPT, 1/4 SLIP FIT 2 ENDS	1
B	ASD1953	3/4 X 1/4 NPT BLACK BUSHING/AIRTANK	1
C	AFD1033	T CONNECTOR, 1/4 SLIP FIT 3 ENDS	1
D			

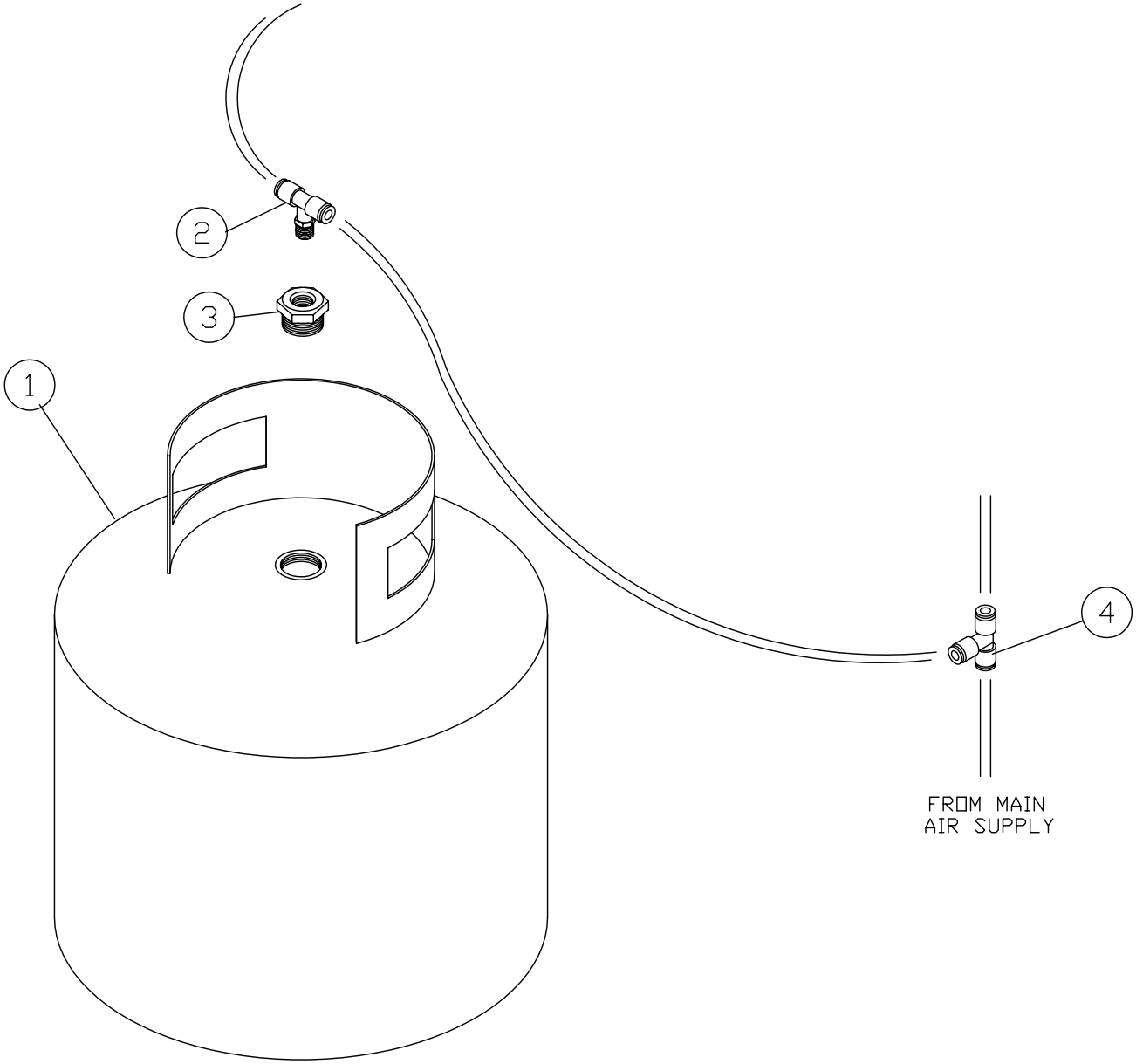
* NOT IN B.O.M.

TRIPPING SYSTEM (Components)

C00612-14A
SURGE TANK KIT

8/15/02
P.H.

ITEM	PART NO.	DESCRIPTION	QTY.
1	AS□1951	4.7 GAL SURGE TANK	1
2	AF□1034	T CONN, 1/4 NPT, 1/4 SLIP FIT 2 ENDS	1
3	AS□1953	3/4 X 1/4 NPT BLACK BUSHING/AIRTANK	1
4	AF□1033	T CONNECTOR, 1/4 SLIP FIT 3 ENDS	1



TRIPPING SYSTEM (Components)

C00612-15

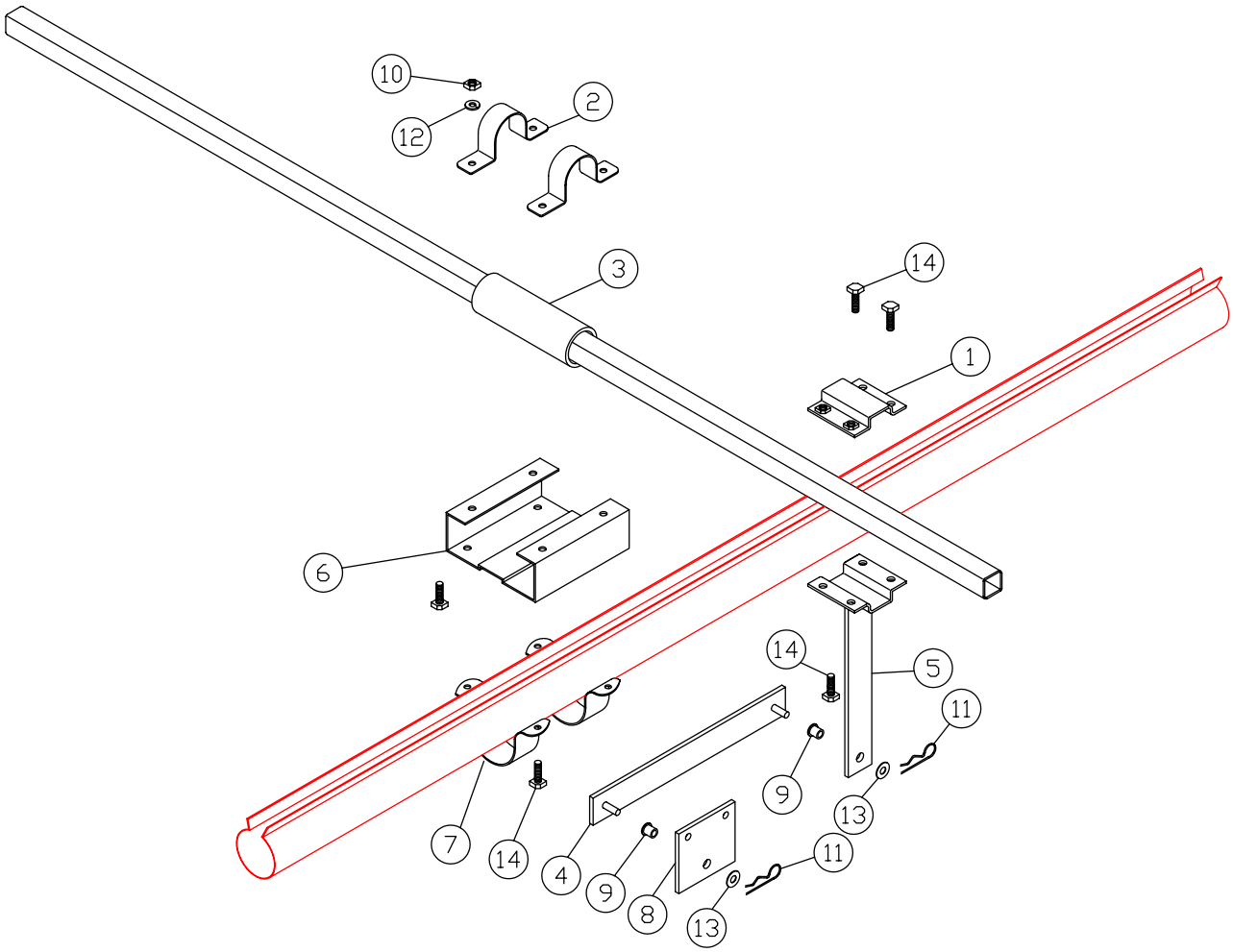
(FILE NO. 3D109)

FARROWING TRIPPER PIVOT KIT

5/13/99

M.W.

ITEM	PART NO.	DESCRIPTION	QTY.
1	612038	CLAMP HALF FARROWING TRIPPER	1
2	01985	1 1/4 RIGID PIPE STRAP FARROWING TRIPPER	2
3	612046	TUBE BUSHING FARROWING TRIPPER	1
4	612041	LINKAGE FARROWING TRIPPER	1
5	612039	CHANNEL GUIDE FARROWING TRIPPER	1
6	612042	TUBE BUSHING BRKT. FARROWING TRIPPER	1
7	600026	SPRING ATTACHMENT CONDUIT CLAMP	2
8	612043	CHANNEL PIVOT BRKT. FARROWING TRIPPER	1
9	01987	1/4 X 3/8 X 3/8 BUSHING, FARROWING	2
10	01011S	1/4-20 HEX NUT SS	8
11	01013	3/32 X 1 COTTER KEY	2
12	01018	1/4 LOCKWASHER	8
13	01023	1/4 SAE WASHER	2
14	01028S	1/4-20 X 3/4 HEX CAP SCREW SS	12



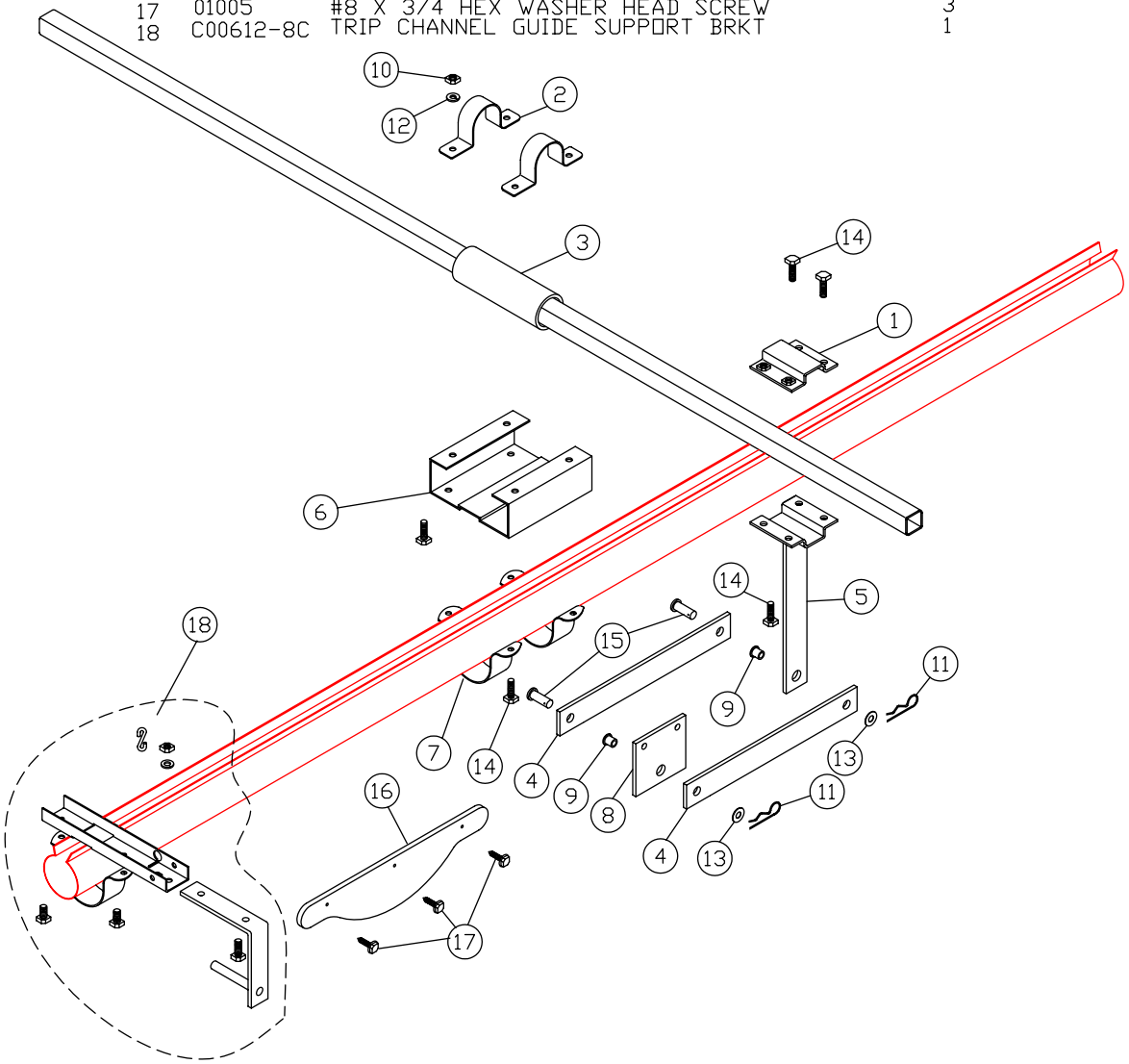
TRIPPING SYSTEM (Components)

C00612-15A

FARROWING TRIPPER PIVOT KIT

8/7/02
M.W.

ITEM	PART NO.	DESCRIPTION	QTY.
1	612038	CLAMP HALF FARROWING TRIPPER	1
2	01985	1 1/4 PIPE STRAP FARR. TRIPPER	2
3	612046	TUBE BUSHING FARROWING TRIPPER	1
4	612055	LINKAGE BAR FARROWING TRIPPER	2
5	612039A	CHANNEL GUIDE FARROWING TRIPPER	1
6	612042	TUBE BUSHING BRKT. FARROWING TRIPPER	1
7	600026	SPRING ATTACHMENT CONDUIT CLAMP	2
8	612043A	CHANNEL PIVOT BRKT. FARROWING TRIPPER	1
9	01988	3/8 X 1/2 X 5/16 BUSHING, FARROWING	2
10	01011S	1/4-20 HEX NUT STAINLESS	12
11	01993	1/8 X 1 COTTER PIN	2
12	01018	1/4 LOCKWASHER	12
13	01086	3/8 SAE GUAGE WASHER	4
14	01028S	1/4-20 X 3/4 HEX CAP BOLT S.S.	17
15	01989	3/8 X 1.0 CLEVIS PIN	2
16	612052	PLASTIC CHANNEL GUIDE	1
17	01005	#8 X 3/4 HEX WASHER HEAD SCREW	3
18	C00612-8C	TRIP CHANNEL GUIDE SUPPORT BRKT	1



TRIPPING SYSTEM (Components)

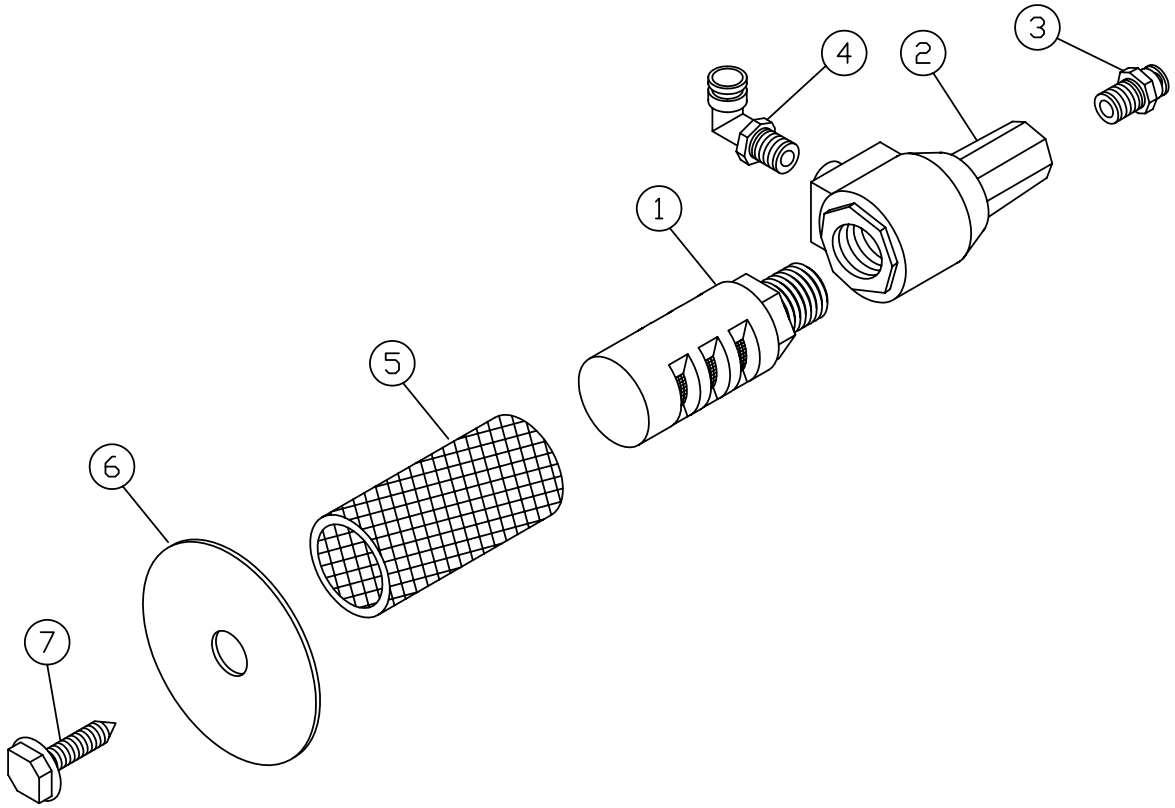
C00612-5

INLINE QUICK EXHAUST

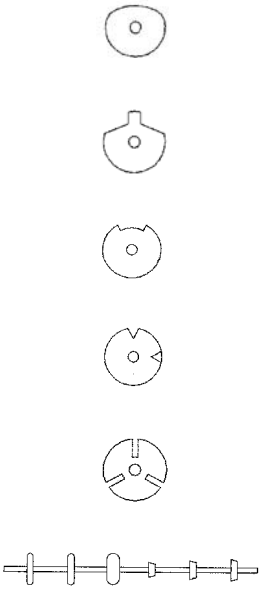
1/8/02

P.H.

ITEM	PART NO.	DESCIPTION	QTY.
1	AS01041S	STAINLESS MUFFLER 1/4" NPT	1
2	AS01038	QUICK EXHAUST VALVE	1
3	AF01039	MALE 3/8"	1
4	AF01036	90 MALE 3/8"	1
5	01929M	MESH SLEEVE	1
6	02024	S.S. WASHER 13/64 X 1 X .047	1
7	01971	#8 X 1/2 SELF TAPPING SCREW	1



Troubleshooting

Problem:	Questions to Ask / Solution:
Buttons wearing 	**Button wear patterns give clues about system problems:** √ **Oval shaped buttons** - The cable is sliding over the feed and the buttons are pushing up against the inside of the closed tube. Install open tube with holddowns every 4 feet in place of the closed tube. √ **Two "V" notches** - The cable is being pushed up against the inside of the open tube. Add holddowns every 4 feet. √ **A wide "V" notch** - Idlers are seized. Check corner idlers for rotation. Clean out foreign material and grease spindle. If idler plugs with feed consistently, replace idler with corner slide (2" system only). √ **A narrow "V" notch or several narrow "V" notches** - Corners and tubes are sagging causing cable to ride up or down in the corner. Support corners and tubes. √ **Cuts into buttons** - Old style hopper (C00107) cams worn away completely and metal cutting into buttons. Install new cams. The drop has slipped on the tube letting the metal closer inside of the cleanout slot. √ **Buttons tapered after cable connector** - This wear occurs each pass over a corner idler wheel if: √ The cable connector spacing is incorrect. Check spacing with gauge. √ System pulls hard with old style corner idlers. Replace idlers with new beveled timed-notched idlers. √ **Sudden reduction in button size for no apparent reason** - Generally starts with a broken button. Feed rolls past the broken button and bunches especially at inclines, thus, pushing the cable against the top of the tube. Also, the cable is forced to ride up inside the corners, which wears on the corner covers and edges of the idler wheels.
Buttons Broken 	√ **Are the buttons in the hopper and is it a new installation?** The motor is wired backwards. √ **Are the corners sagging?** Support corners and tube, they must be level. √ **Are there foreign objects in the system?** Check for foreign objects (rodents, hardware, etc.) in the system. √ **Is there excessive feed buildup through small drive unit?** Clean out the feed buildup. √ **Is there open tube to closed tube with no holddowns at tube connector?** Install open tube with holddowns every 4 feet in place of closed tube. Make sure there are holddowns in the system at drive unit, hopper and corner connections. √ **Are the tubes in and out of the hopper straight?** Realign the tubes in/out of the hopper. √ **Are there rough edges on tubing?** File off burrs.
Cable	√ **Where in the system will the cable most likely separate?** Near or on the heaviest loaded corner. Start checking at the corner just before the drive unit. √ **Where is the cable most likely to pull apart?** At the connector. The snap ring may pop out due to improper installation and set screws may not be tightly imbedded. Do not reuse the snap ring, sleeve or set screws when this happens. √ **Where is the cable most likely to break first?** It is most likely to first break where the connector sleeve touches the cable (metal to metal). Simply reposition the cable connector. √ **Where is the cable most likely to break next?** Next, the cable will break below the button shoulder after its useful life. By removing a button and checking for broken cable strands below the button shoulder, one may determine if a new cable is required. Cable life in years is determined by a combination of system length, the number of corners, cable speed, system pull, type of feed and moisture content, feed additives, and system operating time per day. Double corners drastically reduce cable life. If possible keep adjacent corners at least 3 feet apart (corner idler axle to corner idler axle).

Cable connector breaking	√ **Did the cable connector break or pull apart?** If the set screws are not set deep enough into the cable, they will pull apart. Do not reuse the set screws, snap rings or sleeves when putting on a new connector. New set screws with a deeper hex and a longer allen wrench are now available. Tighten the set screw as deeply as you can (50-60 lb. torque inch) using the longer allen wrench. √ **Is the cable connector body touching either side of the drive sprocket teeth?** The connector body should be centered between the drive sprocket teeth when passing around the drive sprocket. √ **Are cable connectors placed too close together in the system?** Cable connectors should be at least 2 feet apart. √ **Was the cable connector gauge used when connectors were installed?** Always use the gauge to put connector together. √ **If it ever breaks, you must change out - sleeve, snap ring and set screws.** New improved set screws with a deeper hex and longer allen wrenches are now available. √ **Is there too much drag/strain on the system?** See "System Plugs" sections for possible causes of drag/strain. √ **Are there more corners in the system than the maximum recommendations?** Too many corners will cause excessive pull on the system. See Maximum Length Recommendations on Page 4. √ **Is the system longer than the maximum recommendations?** Systems which are longer than the maximum recommended length create excessive pull on the system. See Maximum Length Recommendations on Page 4. √ **What type of feed are they feeding?** Pellets put too much of a strain on a 1 ½" system. Consider switching to a 2" system.
Cable jerks and pulls extremely hard	√ **Is the corner idler wheel turning?** Check for foreign object in idler wheel and proper direction of rotation of idler wheel. Remove object. Place idler in correctly. Replace idler wheel with corner slide (2" system only) if feed continues to plug in idler. √ **Are there rough edges on tubing?** File off burrs. √ **Is tubing seated properly in the corners?** Loosen corner clamp and reseat. √ **All reasons given for "System Plugs" can cause the cable to jerk and pull hard.** See "System Plugs" section.
Corners	√ **Which corner idler bushing is most likely to wear out first?** The corner just before the drive unit. The heaviest loaded corner is the one that the cable passes through just before entering the drive. The lightest loaded corner is the one just after the drive unit. √ **Which corner idlers are most likely to plug with feed?** The lightest loaded corners (corners just after the drive unit) at the top of inclines. Usually the second corner after the hopper at the top of an incline will plug before any other corner. (This corner idler is lightly loaded and feed naturally falls back into the idler.)
Drop doors sticking open	√ **Are drop doors sticking open and causing feed spills?** Pull the trip handle more than once (2 or 3 times) - or - change over to the new positive close system.
Drops/Fill Baffle bending when adjusting	√ **Are you attempting to close the drop with feed in it?** You can open the drop with feed in it but you can't close with feed in it. Adjust only when the drop is empty.
Feed clogging due to moisture	√ **Where is it clogging in the system? (Line or Hopper)** √ **Hopper** - Hopper adapter should be completely sealed. Silicone sealant should be used on all seams and metal joints √ **Line** - Not sealed correctly. Check tube cover and all connections. √ **See also -- "System Plugs"**

Feed not moving fast enough	√ **What size system is installed (1½" or 2")?** If a 1½" system, convert to 2" system. Refer to Maximum Length Recommendations on page 4. √ **What size motor pulley and belt are being used?** Check alternative sizes and cable speeds on Maximum Length Recommendations on page 4.
Holddowns	√ **Are holddowns placed properly throughout the system?** Holddowns should be installed every 4 feet/level, every 2 feet/incline and before and after corners, hoppers recyclers and drives.
Hoppers	√ **Are hoppers leaking?** Are they hooked up to the double boot extension? If so, replace it with the new 17" Double Boot Ext. Wldm. C38113W or caulk it until it stops leaking. Use silicone sealant on any seams or metal joints.
Prox. Switch not working - system won't shut off	√ **Is there a control drop?** If proximity switch is on the control drop it should shut off immediately. You can adjust the sensitivity. √ **Is the proximity switch on an inline switch?** The timer may be set wrong if the prox. switch is on an inline switch (this has to be set by length of system and speed of cable).
Prox. Switch trips too fast	√ **Does the proximity switch trip too fast?** Adjust the switch (adjustment screw is by the light).
Recycle Switch	√ **Is there a load on the switch?** Needs FMS time delay (delay to keep it from putting load on switch). √ **Is the paddle hitting the switch?** Put holddown before the recycler to keep the cable from jumping up and down causing the paddle to hit the switch.
Rusting (Feed tube)	√ **Is tubing rusting?** Put a couple of feet of stainless steel or powder coated feed tube on each side of wall coming into and going out of the building (powder coated is a less costly method than stainless steel).
Slack in cable & disc	√ **How many times have you removed stretch?** You shouldn't have to remove stretch more than three times. You get ¼ of 1 percent of stretch for the life of the cable. Most of the construction stretch should be taken out in the first year. √ **Was the cable pre-stretched during installation?** Cable should always be pre-stretched during installations. √ **Was the tube in the tube connectors butted against each other during initial installation?** The tube in the connectors must be butted together when installed or they will work their way together while running and cause slack in the cable due to decreased length of the total circuit.

System Plugs	√ **Is too much feed flowing from the hopper?** Reduce the flow level. The proper level is 2/3 to 3/4 full tubes for most feeds - 1/2 full for high-moisture materials. √ **How steep is the incline of incoming feed tube?** If the incline is too steep, this will cause system plugs. Reduce tube angle and/or add holddowns to open tube to give even flow. √ **Is tube cover properly installed.** Check all tube cover inside and outside to be sure it is securely attached to the tube. √ **Is water getting into the system at hopper, tube connectors or corners?** Keep doors on hoppers. Be sure slide gate is not partially inserted. Tape ends of tube connectors. Seal corners with weatherproofing kits. √ **Is there a foreign object in the system?** (Example: rodents and hardware) They are usually wedged in the corner - remove. √ **Bunching of feed?** Feed roll-by in tube causes bunching of feed. Replace closed tube with open tube and holddowns or add holddowns to existing open tube every 4 feet. √ **Is moisture freezing in tubing in extremely cold climates?** In humid buildings, in extremely cold climates, moisture may freeze in return tubes out of the building. Attach heat tape and insulation around tube. √ **Do tube and/or corners sag?** This allows feed to roll by, thus, causing bunching of feed. Add supports to corners and tubes. √ **Is the control drop working properly?** If the control drop malfunctions and feed cycles through the system, tubes will overload. Fix or replace the control drop. √ **Is there a buildup of fines in the closed tube return feed lines?** High moisture feeds and molasses feeds can close return tubes so that only the cable buttons can squeeze through the tube, causing excessive pull. Replace the closed tube with open tube and holddowns.
Tripping System	√ **If Doors will not open** A. Go to Dispensing and use the Manual Open switch to open all doors. B. If some doors open and some do not, leave the switch and check the line for air leaks C. If none of the doors open, push the red button on the air valve on the bottom of the dispensing panel. D. The air valve on the air cylinders control air flow to open doors. The more air allowed into the line, the faster the door will open. Turn the value to adjust the air flow. √ **If Doors do not close** (The doors close with the release of air through the mufflers and the inline exhaust.) A. Check the springs on the tripping channel to be sure they are attached. B. Check the mufflers on the air cylinders to be sure they are not plugged. C. Check the Inline Exhaust to see if it is plugged.