

# **BEST™**

## **Diversified Products, Inc. Best/Flex Power Expandable Conveyor With Accumulation**

- Leg Mount Accumulation**
- Read-Between-Roller Accumulation**

# **Manual**

Factory Order Number: \_\_\_\_\_

Serial Number: \_\_\_\_\_

Ship Date: \_\_\_\_\_

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**99042**

**July, 2003**



**E230497**

**Please read entire manual before operating conveyor.**

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## Thank You

Congratulations on your purchase of the **BEST/FLEX POWER CONVEYOR with ACCUMULATION**. This conveyor has been designed to increase your material handling productivity while preventing damage to your packages through zero pressure accumulation. Please take the time to read through this manual and familiarize yourself with your new conveyor and its handling, maintenance and safety procedures.

# General Operation

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The BEST/FLEX POWER CONVEYOR is a flexible, expandable powered conveyor that operates from a standard 115VAC grounded outlet.

The accumulation option allows zero pressure accumulation of packages in individual zones along the conveyor. Packages are detected by photoelectric sensors located at the end of each zone. When no packages are on the conveyor, all zones will run. The first package placed on the conveyor will travel to the last zone on the discharge end of the conveyor and stop when it breaks that zone's photoeye beam. The remaining zones continue to run. The next package placed on the conveyor will stop at the next-to-last zone. Packages will continue to accumulate the length of the conveyor. This allows full utilization of the conveyor without letting packages become damaged from over crowding or "bunching up" on the conveyor.

When the package in the discharge end zone is removed from the conveyor, all zones will start and the packages will again "accumulate" toward the discharge end of the conveyor.

The accumulation conveyor comes with photoelectric sensors set in two configurations. Note that the configuration is customer-determined at the time of the order.

One configuration is with the photo-eyes mounted on the leg above and outside the conveyor bed. This configuration is known as *Leg Mount Optics*.

The second configuration is with the photo-eyes mounted slightly below and in the conveyor bed, at the leg locations. This configuration is known as *Read Between Roller Optics*.

## **Host System Interface:**

Two sets of dry contacts, one normally open and one normally closed, are provided to give an interface signal from the BEST/FLEX conveyor to a host control system. The normally open contacts will be closed anytime one or more zones of the BEST/FLEX Accumulation conveyor are running. A terminal block for these contacts is provided on the power supply board located in the larger enclosure at the end of the conveyor. (Refer to the POWER SUPPLY CONNECTION DIAGRAM.) This terminal block is labeled "EXTRA CONTACTS". The individual terminals are labeled "NO" (normally open), "COM" (common), "NC" (normally closed) and "GRD" (ground). These contacts are rated up to 10A/250VAC or 10A/30VDC.

**CAUTION:** *Always unplug the 115VAC power cord before working on the unit or opening any electrical enclosures. Never operate the conveyor with the enclosures open.*

# Installation

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- 1) Unpack the BEST/FLEX POWER CONVEYOR and inspect for damage incurred in shipping. Pay particular attention to the wiring to ensure no wires are pulled loose or damaged in any way. If damage is found, contact the factory before applying power to the conveyor.
- 2) Make sure all START/STOP switches (there will be one switch at each end of the conveyor) are in the STOP position.
- 3) Roll unit into position. If applicable, use the connect hooks to attach the BEST/FLEX to a rigid conveyor.
- 4) Plug the power cord into a 115VAC grounded receptacle.
- 5) Release **all** Emergency Stop pushbuttons. (Any one Emergency Stop pushbutton that is depressed will prevent the conveyor from running.) There is an on/off switch on the control box located near the middle of the conveyor.
- 6) Adjust the speed of the conveyor with the potentiometer on the side of the enclosure mounted near the power cord.
- 7) Begin placing packages on the conveyor. They will travel to the last available zone and stop until packages are removed from the discharge end.

# Safety Information

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- 1) Avoid wearing excessively loose clothing when working with moving machinery.
- 2) Keep long hair pulled up to prevent it from becoming caught in moving parts.
- 3) Move conveyor only by grasping the handles. Keep hands, clothing and other items away from sidebars while moving conveyor.
- 4) BEST/FLEX conveyors and their electrical systems must only be serviced by properly trained and qualified technicians.
- 5) Conveyor's power cord must be connected to a grounded receptacle that is protected by an over current device rated at no larger than 15 Amps unless otherwise specified.
- 6) Never service conveyor with power applied. Always disconnect power cord before servicing equipment.
- 7) Never operate conveyor with any electrical enclosure open.



## **Underwriter's Laboratories Certification Statement**

Best conveyors have been thoroughly tested by Underwriter's Laboratories, and have been found to meet their strict standards for Factory Automation Equipment. Our conveyors are certified to UL508 Standards when shipped from our plant. Our UL file number is E230497. All standards can be found on-line at [www.ul.com](http://www.ul.com).

**ANY MODIFICATION FROM ORIGINAL FACTORY CONDITION OR REPAIRS NOT PERFORMED BY BEST DIVERSIFIED PRODUCTS' TECHNICIANS OR CERTIFIED CONTRACTORS MAY VOID UL CERTIFICATION.**

For specific assistance regarding any UL issues, please contact your Best Diversified Products, Inc. sales representative at 1-800-327-9209.

# Maintenance Schedule

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The BEST/FLEX Power Conveyor is virtually maintenance free. However, we do recommend the following:

- 1) Keep the conveyor clean and free of debris, dirt and grease accumulation.
- 2) Periodically lubricate all slotted components with a lightweight lubricant to ensure smooth and easy operation.
- 3) Inspect wires and cables for damage. If damage to wires or cables is found, disconnect the power cord immediately and do not operate unit until proper repairs are made.
- 4) Inspect belts for wear. Replace excessively worn belts.
- 5) Inspect side bar nuts and bolts for looseness or missing parts. Tighten or replace as needed.
- 6) Make sure reflectors and photoeyes are clean, unobstructed and properly aligned.
- 7) Verify START/E-STOP/STOP switches operate properly.

**All of the above maintenance inspections should be conducted daily.**

# Accumulation Trouble Shooting Guide

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To use this guide, find the heading that best fits your conveyor's condition and check the numbered items in the order they appear. *It is important to proceed in the order given since it is assumed at each item that all preceding items under that heading have passed inspection.*

**CAUTION:** *Electrical systems should only be serviced by qualified personnel. Refer to and observe all local codes and OSHA guidelines for LOCKOUT/TAGOUT procedures. Make sure all power has been disconnected before opening any enclosure. Keep hands and tools away from electrical circuits when power is applied. 115VAC is present even when the conveyor is stopped by the STOP switch. The only way to guard against electrical shock is to unplug the conveyor from its AC power source before servicing.*

## Diagnostic LEDs

To aid in troubleshooting, there are a number of LEDs mounted on the power supply printed circuit board (PCB) in the larger enclosure on the first leg of the system and on each accumulation PCB in the smaller enclosures located at each motor. These LEDs are shown on the system wire connection diagrams and their meanings are listed here.

### Power Supply Board's LEDs and Neon Lamp:

<b>RED</b>	On when STOP button is pushed and RELAY1 is off.
<b>GREEN</b>	On when 17VDC is present through the DC fuse.
<b>LARGE AMBER</b>	On when the photoeye connected to the power supply is blocked.
<b>SMALL AMBER</b>	On when RELAY2 is energized.
<b>NEON LAMP</b>	On when RELAY1 is energized and AC power is supplied to the DC controller.

### Accumulation Board's LEDs:

<b>RED</b>	On when that zone is stopped and stopped signal is sent to adjacent zones.
<b>AMBER</b>	On when the photoeye used for forward accumulation is blocked.
<b>GREEN</b>	On when the photoeye used for reverse accumulation is blocked.

## NO ZONE RUNS:

### 1) Check AC power coming into conveyor.

- Make sure the unit is plugged into a hot 115VAC outlet.
- Check the circuit breaker mounted in the side of the power supply enclosure. If button is out an overload has occurred. The fault causing this condition must be cleared before continuing.
- If AC power is present, at least one LED on top of each photoeye will be on since the DC voltage supplying the photoeyes is derived from the AC power.
- AC power can be verified with an appropriate voltage meter across the L1 and L2 terminals on the power supply board.



# Accumulation Trouble Shooting Guide (Cont.)

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## 2) Check DC control voltage.

- A) Check that the Green LED on the power supply is on. If LED is off and AC voltage is present, check the  $\frac{3}{4}$  amp and 2 amp fuses on the power supply board. If a fuse is blown, repair any electrical shorts or overload conditions before continuing. If fuses are not blown and the GREEN LED is not on, the power supply board has failed.
- B) If the GREEN LED is on, check for DC voltage at accumulation zones. If DC power is present, LEDs on photoeyes should be lit. The AMBER LED on the accumulation board should also be lit when that zone's photoeye is blocked. If these LEDs are not on, make sure all communication cables are plugged in. Check the communication cable between power supply board and first zone accumulation board.

## 3) Check for AC power coming into the DC motor controller.

- A) The neon lamp on the power supply board should be on whenever AC power is supplied to the DC controller. If this lamp is off and the RED LED on the power supply board is also off, check the 15 amp fuse on the power supply board that powers the DC controller. If this fuse is good, the relay on the power supply board has failed.
- B) If the RED LED is on, check to be sure all E-STOP pushbuttons have been released.
- C) Check the AC fuse on the DC motor controller.
- C) AC power can be verified with a volt meter at the DC controller.

## NO ZONE RUNS:

## 4) Check for DC power on the output side of the DC motor controller.

- A) Check the DC fuse on the DC controller. If the DC fuse is good, the plug-in resistor is in place and no DC voltage is present at the output of the DC motor controller, the controller has failed. If the fuse is blown, the cause could be either a shorted coiled motor cord or a motor drawing excessive current.

## 5) Check for DC power at the first zone.

- A) Unplug the coiled motor cord at the first zone. Test for DC voltage between the two female receptacles of the cord attached to the DC controller. If voltage was present at the output of the controller and none is present at the connector, the cord is defective.

# **Accumulation Trouble Shooting Guide (Cont.)**

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## **ONE OR MORE ZONES WILL NOT RUN:**

- 1) If zone is an end zone, check that zone's photoeye for alignment and proper functioning.
  - A) The photo eye's GREEN LED will be on if its beam is blocked or the eye is not aligned with reflector. If the GREEN LED does not come on when the beam is broken, the photoeye is defective.
- 2) Check accumulation board for control voltage.
  - A) Observe photo eye's LEDs. They are powered from the accumulation's control voltage. If none are on, the photoeye may not have power. Control voltage is supplied to each accumulation board by the communication cable connected to the PREVIOUS modular connector. Check cable for broken wires or defective connectors.
  - B) Block that zone's photoeye. The AMBER LED on the accumulation board should come on when the photoeye's beam is broken.
- 3) Check for DC voltage at the motor cable's connector on the accumulation board.
  - A) If no voltage is present, check fuse. If the fuse is blown check for shorts in the motor cable and in the motor.
  - B) If no voltage is present, check for voltage at connector for coiled motor cord's pigtail. Cable could be defective if there is no voltage here and other zones will run.
  - C) If voltage is present at the motor cable's connector, the motor or its cable is defective.

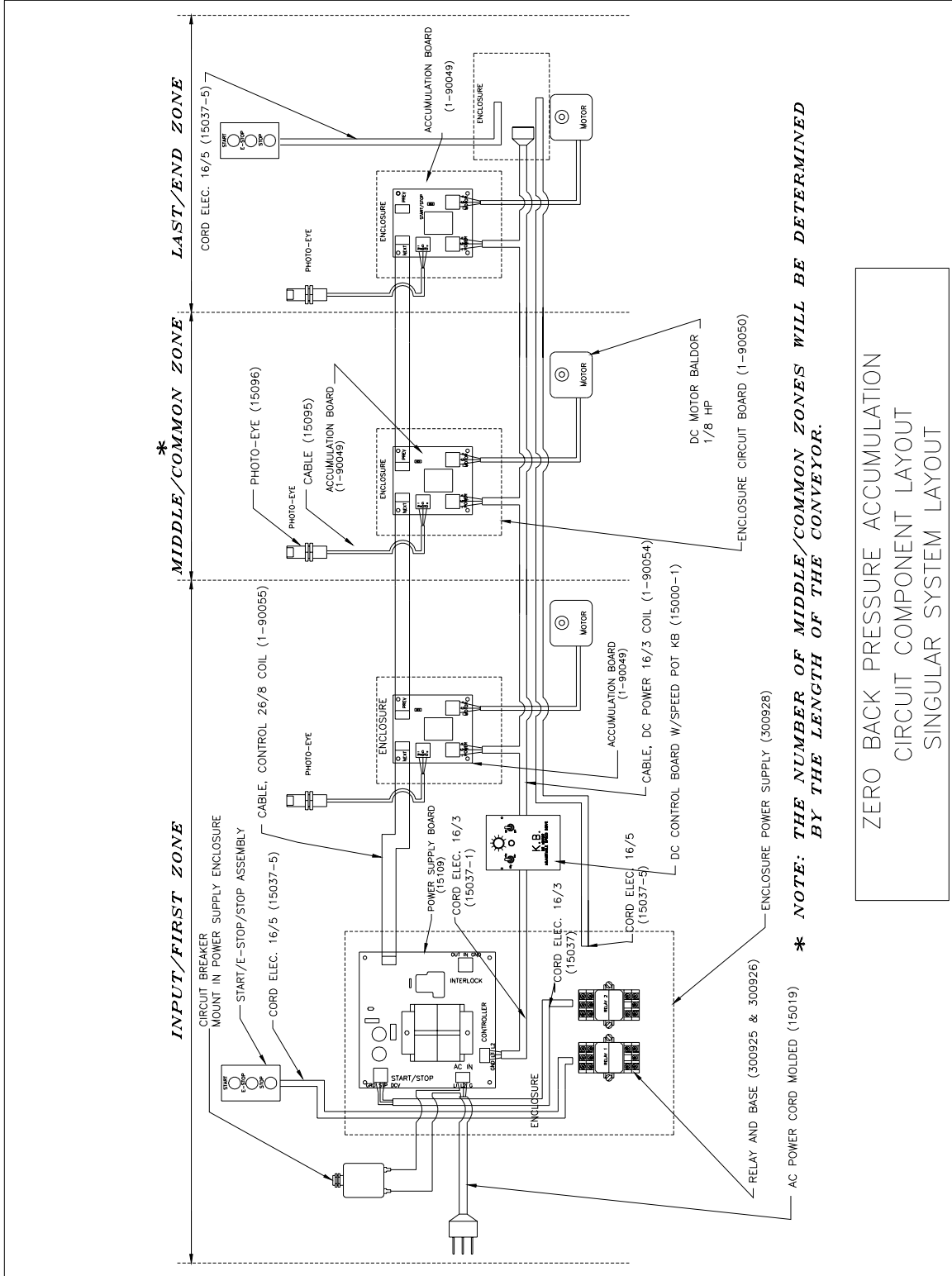
## **ONE PHOTOEYE STOPS TWO OR MORE ZONES**

- 1) Check alignment of photoeyes in zones that stop when the next zone's photoeye is blocked.
  - A) If a zone's photoeye is not properly aligned and the next zone's eye is blocked, both zones will operate as one. The GREEN LED on the top of the photoeye should only be lit when the photoeye is blocked. It will not be on when the photoeye is properly lined up with its reflector. When a photo eye's beam is not being reflected back to the photoeye the accumulation board's AMBER LED will be lit.

## **ZONE WILL NOT SHUT OFF WHEN PHOTOEYE IS BLOCKED AND NEXT ZONE IS OFF**

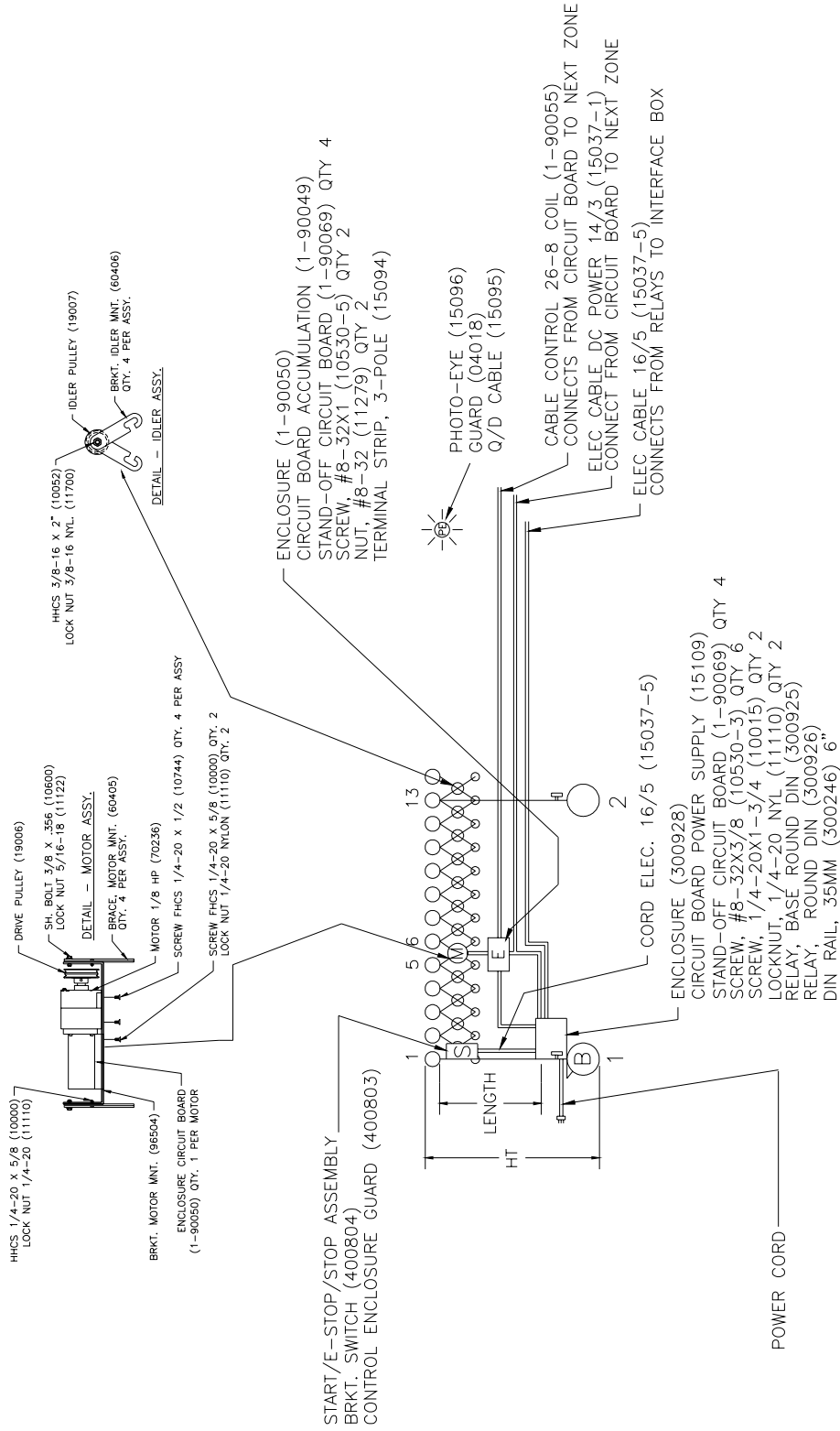
- 1) Check photoeye for proper function.
  - A) Make sure the accumulation's AMBER LED is on when the photoeye is blocked. If it does not come on, check the connections from the photoeye cable at the board's connector. The photoeye could also be defective.

# Circuit Component Layout



ZERO BACK PRESSURE ACCUMULATION  
CIRCUIT COMPONENT LAYOUT  
SINGULAR SYSTEM LAYOUT

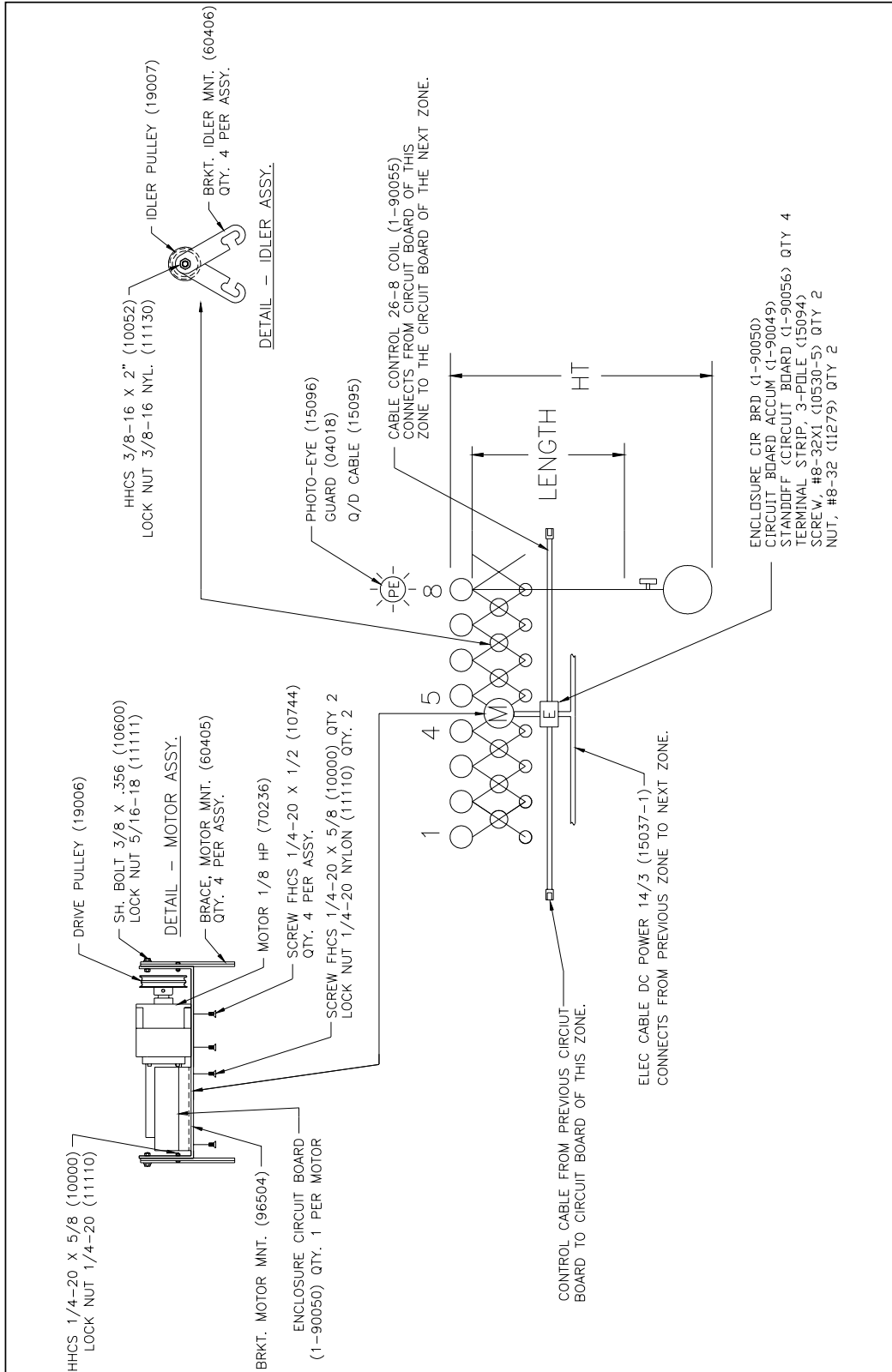
# Input Zone Layout, Leg Mount Accumulation



## Input Zone Parts List, Leg Mount Accumulation

1-90049	1	CIRCUIT BOARD 2-WAY ACCUM	11111	ASREQD	LOCKNUT NYL 5/16
15109	1	CIRCUIT BOARD POWER SUPP	12185	ASREQD	SPACER 3/4 OD X 13/32 ID X 0.20
1-90056	4	STAND OFF PLASTIC	12187	ASREQD	WASHER NYL 1" OD
1-90069	4	SPACER 1/4 HEX X 3/4 LG	60081-PR	ASREQD	LEG MNT BRKT, 5" or
15037-1	6 FT	CORD ELEC 14/3 SI 300V	60379-PR	ASREQD	LEG MNT BRKT, 4" or
1-90055	1	CABLE CONTROL 26/8	60375	ASREQD	LEG MNT BRKT, 3-1/2" or
1-90050	1	ENCLOSURE ASSY CIRC BOARD	60295-PR	ASREQD	LEG MNT BRKT, 3"
300928	1	ENCLOSURE POWER SUPPLY	60463-5	ASREQD	ROLLER MNT BRKT, 5" or
15000-1	1	CONTROL BOARD W/SPEED POT	60463-4	ASREQD	ROLLER MNT BRKT, 4" or
			60463-35	ASREQD	ROLLER MNT BRKT, 3-1/2" or
1-90067	1	CIRCUIT BREAKER, 15 AMP SERVICE or	60463-3	ASREQD	ROLLER MNT BRKT, 3"
1-90076	1	CIRCUIT BREAKER, 20 AMP SERVICE or	50098-ZZ	ASREQD	ROLLER 1.5 x ZZ (ZZ=18,24, or 30) or
1-90068	1	CIRCUIT BREAKER, 30 AMP SERVICE	50099-ZZ	ASREQD	ROLLER 1.9 x ZZ (ZZ=18,24, or 30)
10530-2	4	RHMS#10-24 X 3/4	95037-ZZ	ASREQD	AXLE 12 MM x ZZ LENGTH, 5/16 THD
11999	4	WASHER FLAT 3/16	10024	ASREQD	SCREW, HHC 5/16-18 X 1/2
12120	4	WASHER LOCK 3/16	70236	1	MOTOR, DC 1/8 HP (0-160 FPM) or
11279-1	4	NUT HEX #10-32	70236-3	1	MOTOR, DC 1/8 HP (0-200 FPM)
15096	1	PHOTO-EYE SENSOR AB NPN	96504	1	BRKT MOTOR MNT
15095	1	CABLE Q/D BRAD HARRISON	60405	4	BRACE MOTOR MNT
1-90027	2	REFLECTOR	10744	4	SCREW, 1/4-20 X 5/8 HHC
4018	2	PHOTOEYE MT BRKT W/GUARD	10000	2	SCREW HHC 1/4-20X5/8
60900	2	BRKT PHOTO-EYE MT AB	11110	2	LOCKNUT 1/4-20 NYLON
1-90019	3	STRAIN RELIEF .250 CABLE	10052	6	SCREW, 3/8-16 X 2 HHC
12000	4	WASHER FLAT 1/4"	11130	6	LOCKNUT, 3/8-16 NYLON
11110	6	LOCKNUT NYL 1/4	19006	1	PULLEY DRIVE DBL GROOVE
			19007	ASREQD	PULLEY IDLER DBL GROOVE
15037-11	3 FT	ELEC CORD 18/2	60406	ASREQD	IDLER MNT BRKT
15019	1	PLUG/CORD M 12/3 300V 3' or	12466	2	DRIVE BELT
15024-30	1	MALE PWR PLUG 30 AMP <i>plus</i>	12467	ASREQD	IDLER BELT
15037-7	3 FT	ELEC CORD 10/3	1-90049-S	1	ACCUMULATION SCHEMATIC
1-90070	1	STRAIN RELIEF 7P2	10015	2	SCREW HHC 1/4-20X1 3/4
1-90071	3	STRAIN RELIEF #MP30-1	10534	4	SCREW HHC 1/4-20X 1/2"
1-90072	2	STRAIN RELIEF MP4K1	15025	25	CABLE TIE 7 3/8L, 3/16W
15012-1	3	STRAIN RELIEF 16/3 WIRE	15030-3	8	SCREW #8-32X3/8 RHM
15015	7	TERM FORK#10STUD 16-14GAB	15045-15	1	FUSE 15AMP 250VOLT CERMIC
60492	AS REQD	SIDEBAR, BFP 15 or	15097	4	1/2" CABLE CLAMP HANGER
60507	AS REQD	SIDEBAR, BFP 19	15098	8	NYLON AXLE CLAMP
10600	AS REQD	SIDEBAR BOLT, 3/8 X 3/8, 5/16 THD	15109-S	1	POWER SUPPLY SCHEMATIC
10620	AS REQD	SIDEBAR BOLT, 3/8 X 0.70, 5/16 THD	60440	1	STRAP, ENCLOSURE SUPPORT
10624	AS REQD	SIDEBAR BOLT, 3/8 X 1.10, 5/16 THD	15030-5	2	SCREW, #8-32 X 1
15094	1	TERM STRIP, 3-POLE	11279	2	NUT, #8-32

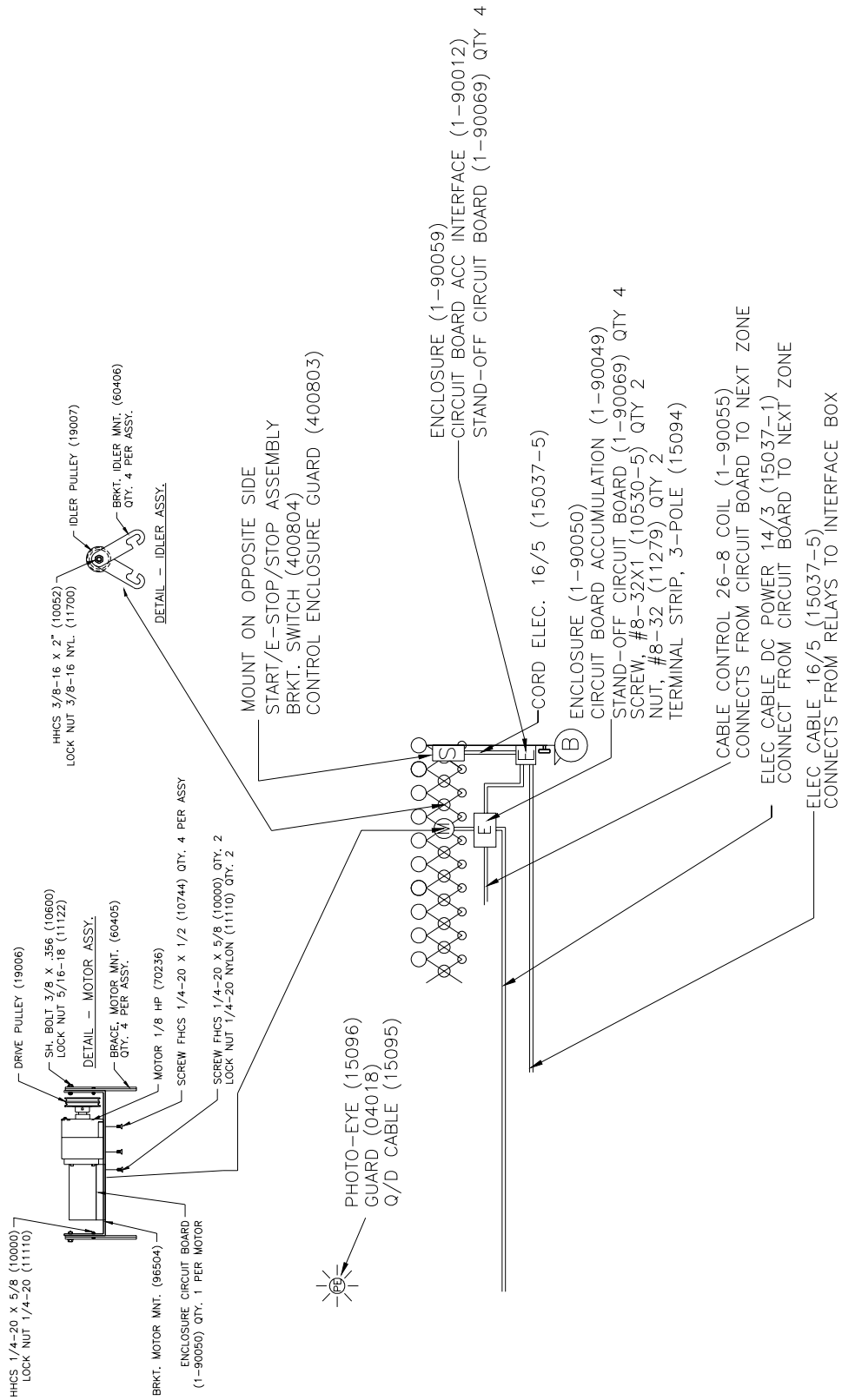
# Middle Zone Layout, Leg Mount Accumulation



## Middle Zone Parts List, Leg Mount Accumulation

1-90049	1	CIRCUIT BOARD 2-WAY ACCUM	15094	1	TERM STRIP, 3-POLE
1-90056	4	STAND OFF PLASTIC	60463-5	AS REQD	ROLLER MNT BRKT, 5" or
15037-1	6 FT	CORD ELEC 14/3 SJ 300V	60463-4	AS REQD	ROLLER MNT BRKT, 4" or
1-90055	1	CABLE CONTROL 26/8	60463-35	AS REQD	ROLLER MNT BRKT, 3-1/2" or
1-90050	1	ENCLOSURE ASSY CIRC BOARD	60463-3	AS REQD	ROLLER MNT BRKT, 3"
1-90081	1	ENCLOSURE COVER	50098-ZZ	AS REQD	ROLLER 1.5 x ZZ (ZZ=18,24, or 30) or
1-90152	1	THUMB SCREW, #8-32	50099-ZZ	AS REQD	ROLLER 1.9 x ZZ (ZZ=18,24, or 30)
1-90153	1	NUT, U-CLIP, #8-32	95037-ZZ	AS REQD	AXLE 12 MM x ZZ LENGTH, 5/16 THD
15096	1	PHOTO-EYE SENSOR AB NPN	10024	AS REQD	SCREW, HHC 5/16-18 X 1/2
15095	1	CABLE Q/D BRAD HARRISON	70236	1	MOTOR, DC 1/8 HP (0-160 FPM) or
1-90027	2	REFLECTOR	70236-3	1	MOTOR, DC 1/8 HP (0-200 FPM)
4018	2	PHOTOEYE MT BRKT W/GUARD	96504	1	BRKT MOTOR MNT
60900	2	BRKT PHOTO-EYE MT AB	60405	4	BRACE MOTOR MNT
12000	2	WASHER FLAT 1/4"	10744	4	SCREW, 1/4-20 X 5/8 HHC
11110	2	LOCKNUT NYL 1/4	10000	2	SCREW HHC 1/4-20X5/8
1-90070	1	STRAIN RELIEF 7P2	11110	2	LOCKNUT 1/4-20 NYLON
1-90071	3	STRAIN RELIEF #MP30-1	10052	6	SCREW, 3/8-16 X 2 HHC
1-90072	2	STRAIN RELIEF MP4K1	11130	6	LOCKNUT, 3/8-16 NYLON
15012-1	3	STRAIN RELIEF 16/3 WIRE	19006	1	PULLEY DRIVE DBL GROOVE
15015	7	TERM FORK#10STUD 16-14GAB	19007	AS REQD	PULLEY IDLER DBL GROOVE
60492	AS REQD	SIDEBAR, BFP15 or	60406	AS REQD	IDLER MNT BRKT
60507	AS REQD	SIDEBAR, BFP19	12466	2	DRIVE BELT
10600	AS REQD	SIDEBAR BOLT, 3/8 X 3/8, 5/16 THD	12467	AS REQD	IDLER BELT
10620	AS REQD	SIDEBAR BOLT, 3/8 X 0.70, 5/16 THD	1-90049-S	1	ACCUMULATION SCHEMATIC
10624	AS REQD	SIDEBAR BOLT, 3/8 X 1.10, 5/16 THD	10015	2	SCREW HHC 1/4-20X1 3/4
11111	AS REQD	LOCKNUT NYL 5/16	10534	4	SCREW HHC 1/4-20X 1/2"
12185	AS REQD	SPACER 3/4 OD X 13/32 ID X 0.20	15025	25	CABLE TIE 7 3/8L, 3/16W
12187	AS REQD	WASHER NYL 1" OD	15030-3	8	SCREW #8-32X3/8 RHM
60081-PR	AS REQD	LEG MNT BRKT, 5" or	15097	4	1/2" CABLE CLAMP HANGER
60379-PR	AS REQD	LEG MNT BRKT, 4" or	15098	8	NYLON AXLE CLAMP
60375	AS REQD	LEG MNT BRKT, 3-1/2" or	15030-5	2	SCREW, #8-32 X 1
60295-PR	AS REQD	LEG MNT BRKT, 3"	11279	2	NUT, #8-32

# Last Zone Layout, Leg Mnt Accumulation

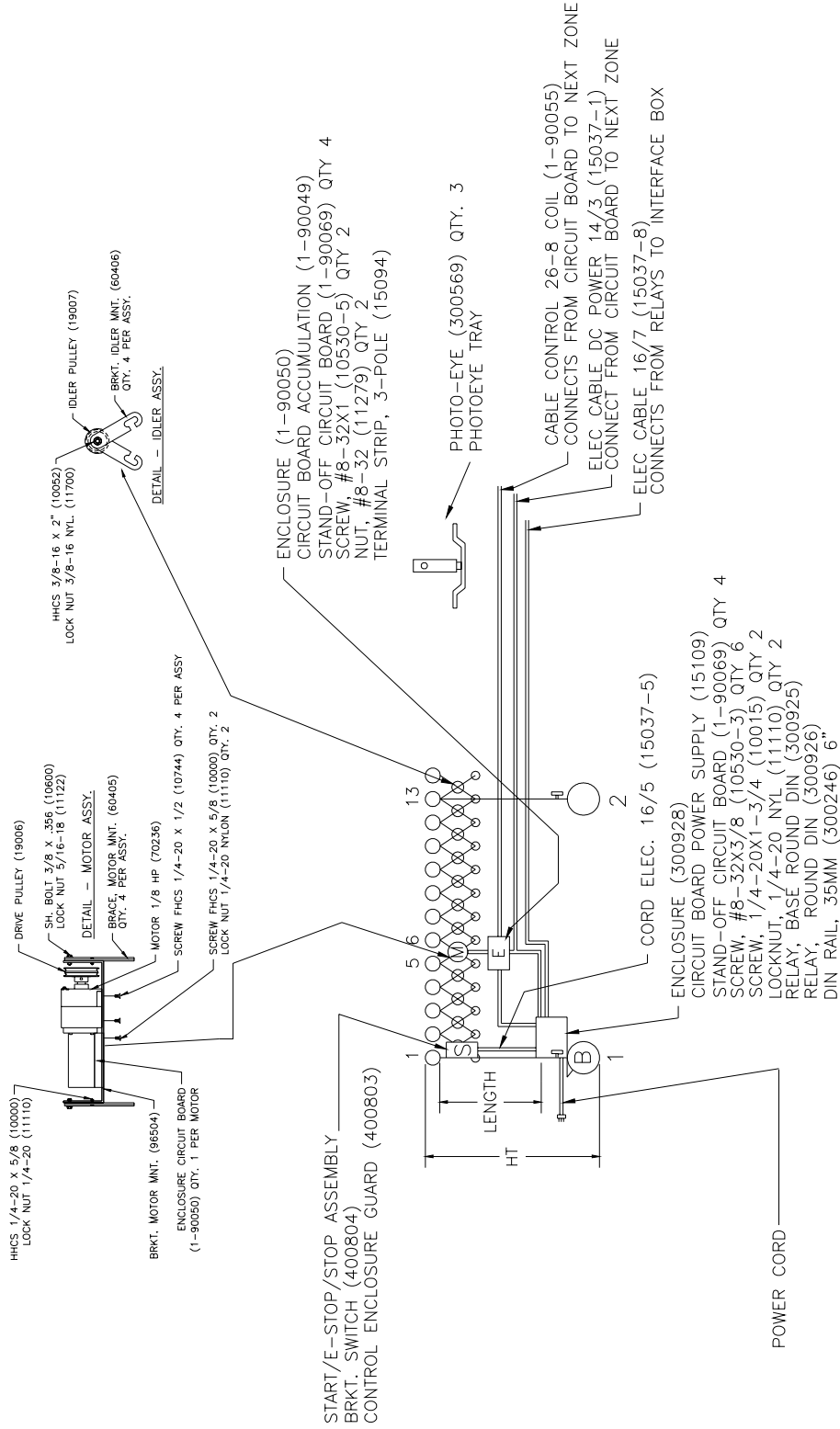




## Last Zone Parts List, Leg Mnt Accumulation

1-90049	1	CIRCUIT BOARD 2-WAY ACCUM	60081-PR	ASREQD	LEG MNT BRKT, 5" or
1-90012	1	INTERFACE BOARD	60379-PR	ASREQD	LEG MNT BRKT, 4" or
1-90069	4	SPACER 1/4 HEX X 3/4 LEG	60375	ASREQD	LEG MNT BRKT, 3-1/2" or
15037-1	6 FT	CORD ELEC 14/3 SJ 300V	60295-PR	ASREQD	LEG MNT BRKT, 3"
1-90055	1	CABLE CONTROL 26/8	60463-5	ASREQD	ROLLER MNT BRKT, 5" or
1-90059	1	ENCLOSURE	60463-4	ASREQD	ROLLER MNT BRKT, 4" or
1-90056	4	ST AND OFF PLASTIC	60463-35	ASREQD	ROLLER MNT BRKT, 3-1/2" or
1-90050	1	ENCLOSURE ASSY CIRC BOARD	60463-3	ASREQD	ROLLER MNT BRKT, 3"
15096	1	PHOTO-EYE SENSOR AB NPN	50098-ZZ	ASREQD	ROLLER 1.5 x ZZ (ZZ=18,24, or 30) or
15095	1	CABLE Q/D BRAD HARRISON	50099-ZZ	ASREQD	ROLLER 1.9 x ZZ (ZZ=18,24, or 30)
1-90027	2	REFLECTOR	95037-ZZ	ASREQD	AXLE 12 MM x ZZ LENGTH, 5/16 THD
4018	2	PHOTOEYE MT BRKT W/GUARD	10024	ASREQD	SCREW, HHC 5/16-18 X 1/2
60900	2	BRKT PHOTO-EYE MT AB	70236	1	MOTOR, DC 1/8 HP (0-160 FPM) or
1-90019	3	STRAIN RELIEF .250 CABLE	70236-3	1	MOTOR, DC 1/8 HP (0-200 FPM)
12000	4	WASHER FLAT 1/4"	96504	1	BRKT MOTOR MNT
11110	6	LOCKNUT NYL 1/4	60405	4	BRACE MOTOR MNT
			10744	4	SCREW, 1/4-20 X 5/8 HHC
15037-11	3 FT	ELEC CORD 18/2	10000	2	SCREW HHC 1/4-20X5/8
1-90070	1	STRAIN RELIEF 7P2	11110	2	LOCKNUT 1/4-20 NYLON
1-90071	3	STRAIN RELIEF #MP30-1	10052	6	SCREW, 3/8-16 X 2 HHC
1-90072	2	STRAIN RELIEF MP4K1	11130	6	LOCKNUT, 3/8-16 NYLON
15012-1	3	STRAIN RELIEF 16/3 WIRE	19006	1	PULLEY DRIVE DBL GROOVE
15015	7	TERM FORK#10STUD 16-14GAB	19007	ASREQD	PULLEY IDLER DBL GROOVE
60492	ASREQD	SIDEBAR, BFP15 or	60406	ASREQD	IDLER MNT BRKT
60507	ASREQD	SIDEBAR, BFP19	12466	2	DRIVE BELT
10600	ASREQD	SIDEBAR BOLT, 3/8 X 3/8, 5/16 THD	12467	ASREQD	IDLER BELT
10620	ASREQD	SIDEBAR BOLT, 3/8 X 0.70, 5/16 THD	1-90049-S	1	ACCUMULATION SCHEMATIC
10624	ASREQD	SIDEBAR BOLT, 3/8 X 1.10, 5/16 THD	10015	2	SCREW HHC 1/4-20X1 3/4
11111	ASREQD	LOCKNUT NYL 5/16	10534	4	SCREW HHC 1/4-20X 1/2"
12185	ASREQD	SPACER 3/4 OD X 13/32 ID X 0.20	15025	25	CABLE TIE 7 3/8L, 3/16W
12187	ASREQD	WASHER NYL 1" OD	15030-3	8	SCREW #8-32X3/8 RHM
15094	1	TERM STRIP, 3-POLE	15097	4	1/2" CABLE CLAMP HANGER
15030-5	2	SCREW, #8-32 X 1	15098	8	NYLON AXLE CLAMP
11279	2	NUT, #8-32			

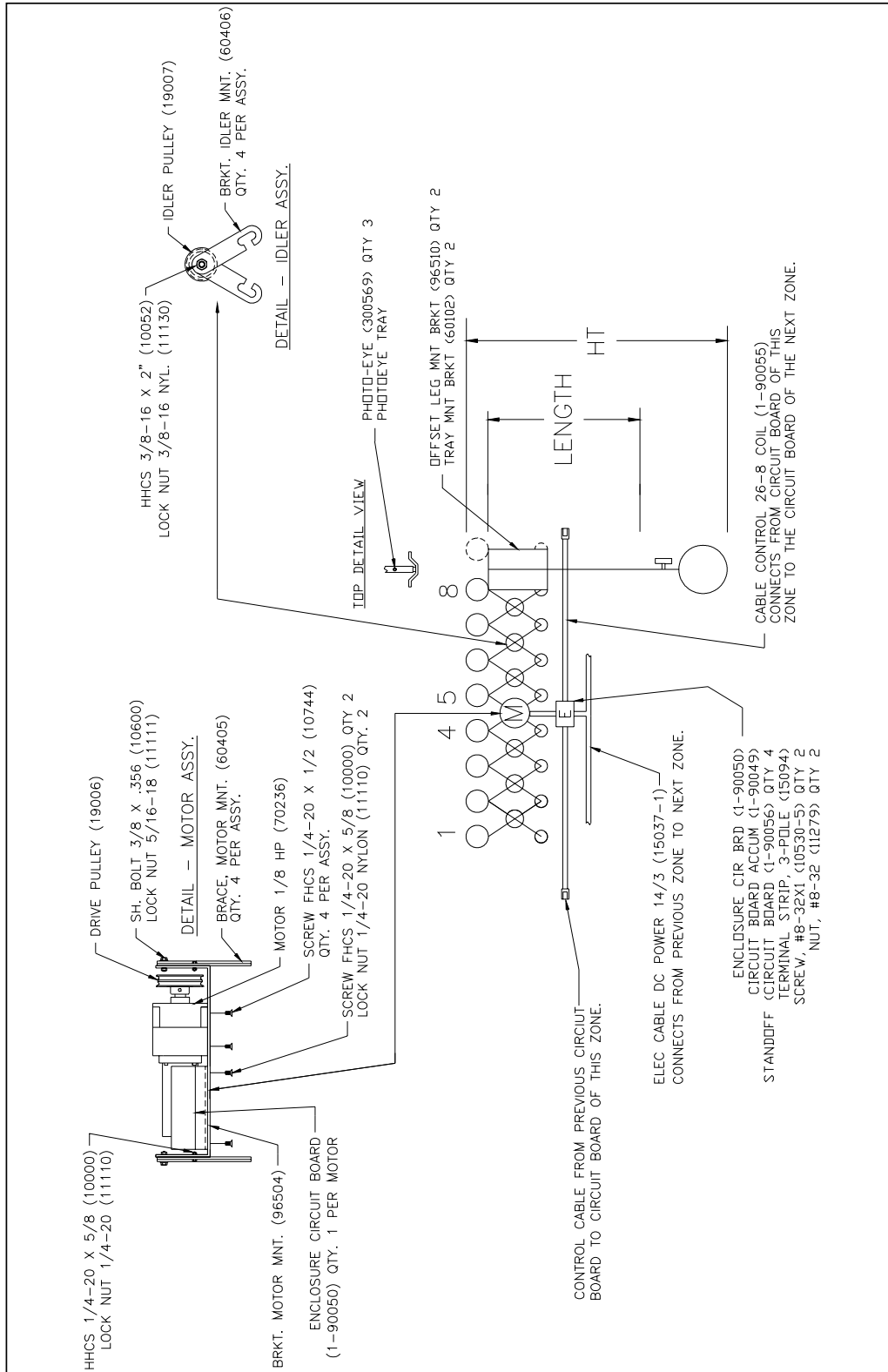
# Input Zone Layout, Read-Between-Roller Accumulation



## Input Zone Parts List, Read-Between-Roller Accumulation

1-90049	1	CIRCUIT BOARD 2-WAY ACCUM	11111	AS REQD	LOCKNUT NYL 5/16
15109	1	CIRCUIT BOARD POWER SUPP	12185	AS REQD	SPACER 3/4 OD X 13/32 ID X 0.20
1-90056	4	STAND OFF PLASTIC	12187	AS REQD	WASHER NYL 1" OD
1-90069	4	SPACER 1/4 HEX X 3/4 LG	60081-PR	AS REQD	LEG MNT BRKT, 5" or
15037-1	6 FT	CORD ELEC 14/3 SJ 300V	60379-PR	AS REQD	LEG MNT BRKT, 4" or
1-90055	1	CABLE CONTROL 26/8	60375	AS REQD	LEG MNT BRKT, 3-1/2" or
1-90050	1	ENCLOSURE ASSY CIRG BOARD	60295-PR	AS REQD	LEG MNT BRKT, 3"
300928	1	ENCLOSURE POWER SUPPLY	60463-5	AS REQD	ROLLER MNT BRKT, 5" or
1500-1	1	CONTR OL BOARD W/SPEED POT	60463-4	AS REQD	ROLLER MNT BRKT, 4" or
			60463-35	AS REQD	ROLLER MNT BRKT, 3-1/2" or
1-90067	1	CIRCUIT BREAKER, 15 AMP SERVICE or	60463-3	AS REQD	ROLLER MNT BRKT, 3"
1-90076	1	CIRCUIT BREAKER, 20 AMP SERVICE or	50098-ZZ	AS REQD	ROLLER 1.5 x ZZ (ZZ=18,24, or 30) or
1-90068	1	CIRCUIT BREAKER, 30 AMP SERVICE	50099-ZZ	AS REQD	ROLLER 1.9 x ZZ (ZZ=18,24, or 30)
10530-2	4	RHMS #10-24 X 3/4	95037-ZZ	AS REQD	AXLE 12 MM x ZZ LENGTH, 5/16 THD
11999	4	WASHER FLAT 3/16	10024	AS REQD	SCREW, HHC 5/16-18 X 1/2
12120	4	WASHER LOCK 3/16	70236	1	MOTOR, DC 1/8 HP (0-160 FPM) or
11279-1	4	NUT HEX #10-32	70236-3	1	MOTOR, DC 1/8 HP (0-200 FPM)
300569	3	PHOTO-EYE SENSOR DIFFUSE	96504	1	BRKT MOTOR MNT
60102	2	TRAY MNT BRKT	60405	4	BRACE MOTOR MNT
96510	2	OFFSET LEG MNT BRKT	10744	4	SCREW, 1/4-20 X 5/8 HHC
60101	1	PHOTO EYE MNT TRAY, 24" or	10000	2	SCREW HHC 1/4-20X5/8
60101-30	1	PHOTO EYE MNT TRAY, 30"	11110	2	LOCKNUT 1/4-20 NYLON
1-90019	3	STRAIN RELIEF .250 CABLE	10052	6	SCREW, 3/8-16 X 2 HHC
12000	4	WASHER FLAT 1/4"	11130	6	LOCKNUT, 3/8-16 NYLON
11110	6	LOCKNUT NYL 1/4	19006	1	PULLEY DRIVE DBL GROOVE
			19007	AS REQD	PULLEY IDLER DBL GROOVE
15037-11	3 FT	ELEC CORD 18/2	60406	AS REQD	IDLER MNT BRKT
15019	1	PLUG/CORD M 12/3 300V 3' or	12466	2	DRIVE BELT
15024-30	1	MALE PWR PLUG 30 AMP <i>plus</i>	12467	AS REQD	IDLER BELT
15037-7	3 FT	ELEC CORD 10/3	1-90049-S	1	ACCUMULATION SCHEMATIC
1-90070	1	STRAIN RELIEF 7P2	10015	2	SCREW HHC 1/4-20X1 3/4
1-90071	3	STRAIN RELIEF #MP30-1	10534	4	SCREW HHC 1/4-20X 1/2"
1-90072	2	STRAIN RELIEF MP4K1	15025	25	CABLE TIE 7 3/8L, 3/16W
15012-1	3	STRAIN RELIEF 16/3 WIRE	15030-3	8	SCREW #8-32X3/8 RHM
15015	7	TERM FORK#10ST UD 16-14GAB	15045-15	1	FUSE 15AMP 250VOLT CERMIC
60492	AS REQD	SIDEBAR, BFP 15 or	15097	4	1/2" CABLE CLAMP HANGER
60507	AS REQD	SIDEBAR, BFP19	15098	8	NYLON AXLE CLAMP
10600	AS REQD	SIDEBAR BOLT, 3/8 X 3/8, 5/16 THD	15109-S	1	POWER SUPPLY SCHEMATIC
10620	AS REQD	SIDEBAR BOLT, 3/8 X 0.70, 5/16 THD	60440	1	STRAP, ENCLOSURE SUPPORT
10624	AS REQD	SIDEBAR BOLT, 3/8 X 1.10, 5/16 THD	15030-5	2	SCREW, #8-32 X 1
15094	1	TERM STRIP, 3-POLE	11279	2	NUT, #8-32

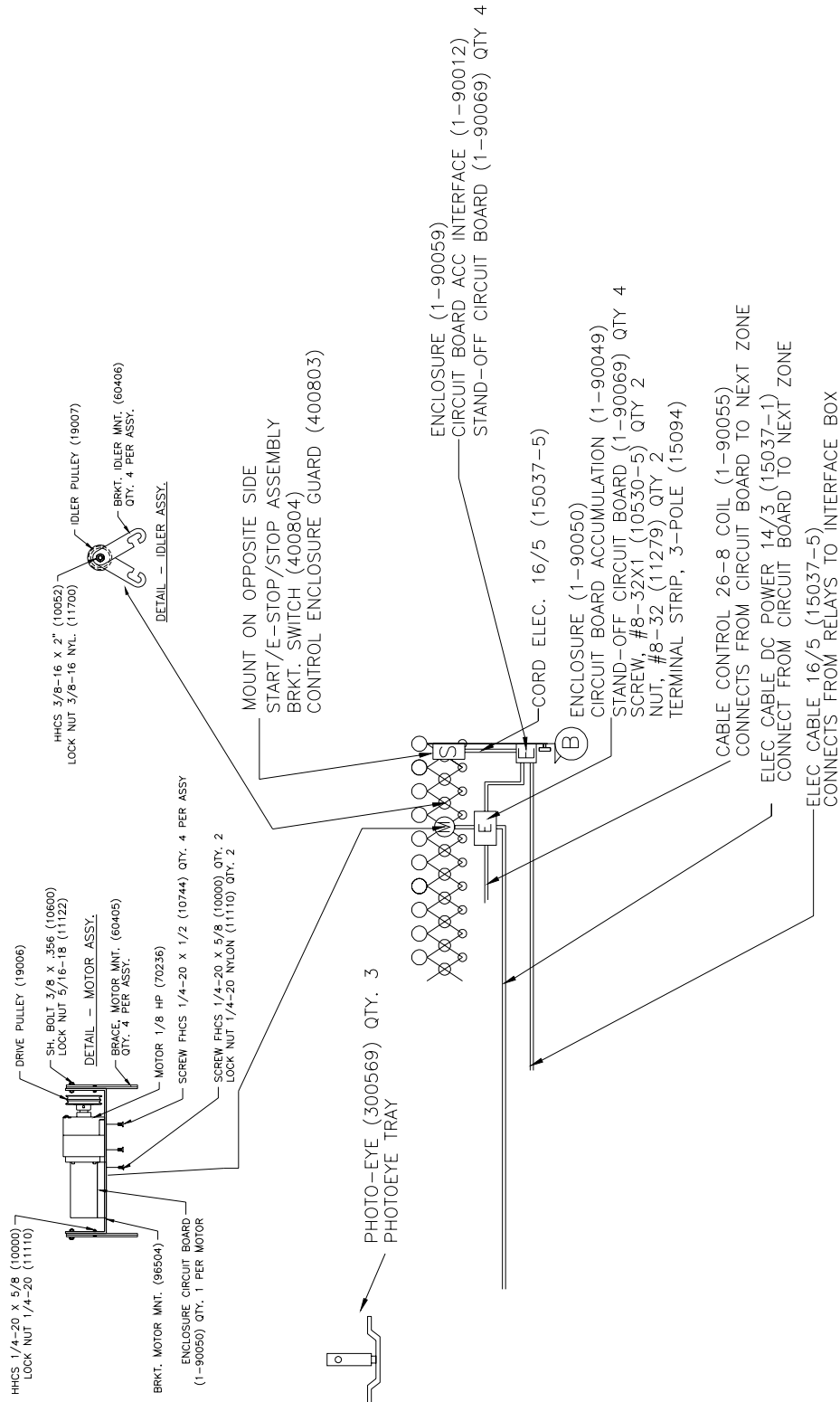
# Middle Zone Layout, Read-Between-Roller Accumulation



## Middle Zone Parts List, Read-Between-Roller Accumulation

1-90049	1	CIRCUIT BOARD 2-WAY ACCUM	15094	1	TERM STRIP, 3-POLE
1-90056	4	ST AND OFF PLASTIC	60463-5	AS REQD	ROLLER MNT BRKT, 5" or
15037-1	6 FT	CORD ELEC 14/3 SJ 300V	60463-4	AS REQD	ROLLER MNT BRKT, 4" or
1-90055	1	CABLE CONTROL 26/8	60463-35	AS REQD	ROLLER MNT BRKT, 3-1/2" or
1-90050	1	ENCLOSURE ASSY CIRC BOARD	60463-3	AS REQD	ROLLER MNT BRKT, 3"
1-90081	1	ENCLOSURE COVER	50098-ZZ	AS REQD	ROLLER 1.5 x ZZ (ZZ=18,24, or 30) or
1-90152	1	THUMB SCREW, #8-32	50099-ZZ	AS REQD	ROLLER 1.9 x ZZ (ZZ=18,24, or 30)
1-90153	1	NUT, U-CLIP, #8-32	95037-ZZ	AS REQD	AXLE 12 MM x ZZ LENGTH, 5/16 THD
300569	3	PHOTO-EYE SENSOR DIFFUSE	10024	AS REQD	SCREW, HHC 5/16-18 X 1/2
60102	2	TRAY MNT BRKT	70236	1	MOTOR, DC 1/8 HP (0-160 FPM) or
96510	2	OFFSET LEG MNT BRKT	70236-3	1	MOTOR, DC 1/8 HP (0-200 FPM)
60101	1	PHOTO EYE MNT TRAY, 24" or	96504	1	BRKT MOTOR MNT
60101-30	1	PHOTO EYE MNT TRAY, 30"	60405	4	BRACE MOTOR MNT
12000	2	WASHER FLAT 1/4"	10744	4	SCREW, 1/4-20 X 5/8 HHC
11110	2	LOCKNUT NYL 1/4	10000	2	SCREW HHC 1/4-20X5/8
1-90070	1	STRAIN RELIEF 7P2	11110	2	LOCKNUT 1/4-20 NYLON
1-90071	3	STRAIN RELIEF #MP30-1	10052	6	SCREW, 3/8-16 X 2 HHC
1-90072	2	STRAIN RELIEF MP4K1	11130	6	LOCKNUT, 3/8-16 NYLON
15012-1	3	STRAIN RELIEF 16/3 WIRE	19006	1	PULLEY DRIVE DBL GROOVE
15015	7	TERM FORK#10STUD 16-14GAB	19007	AS REQD	PULLEY IDLER DBL GROOVE
60492	AS REQD	SIDEBAR, BFP15 or	60406	AS REQD	IDLER MNT BRKT
60507	AS REQD	SIDEBAR, BFP19	12466	2	DRIVE BELT
10600	AS REQD	SIDEBAR BOLT, 3/8 X 3/8, 5/16 THD	12467	AS REQD	IDLER BELT
10620	AS REQD	SIDEBAR BOLT, 3/8 X 0.70, 5/16 THD	1-90049-S	1	ACCUMULATION SCHEMATIC
10624	AS REQD	SIDEBAR BOLT, 3/8 X 1.10, 5/16 THD	10015	2	SCREW HHC 1/4-20X1 3/4
11111	AS REQD	LOCKNUT NYL 5/16	10534	4	SCREW HHC 1/4-20X 1/2"
12185	AS REQD	SPACER 3/4 OD X 13/32 ID X 0.20	15025	25	CABLE TIE 7 3/8L, 3/16W
12187	AS REQD	WASHER NYL 1" OD	15030-3	8	SCREW #8-32X3/8 RHM
60081-PR	AS REQD	LEG MNT BRKT, 5" or	15097	4	1/2" CABLE CLAMP HANGER
60379-PR	AS REQD	LEG MNT BRKT, 4" or	15098	8	NYLON AXLE CLAMP
60375	AS REQD	LEG MNT BRKT, 3-1/2" or	15030-5	2	SCREW, #8-32 X 1
60295-PR	AS REQD	LEG MNT BRKT, 3"	11279	2	NUT, #8-32

# Last Zone Layout, Read-Between-Roller Accumulation



### Last Zone Parts Lists, Read-Between-Roller Accumulation

1-90049	1	CIRCUIT BOARD 2-WAY ACCUM	60081-PR	AS REQD	LEG MNT BRKT, 5" or
1-90012	1	INTERFACE BOARD	60379-PR	AS REQD	LEG MNT BRKT, 4" or
1-90069	4	SPACER 1/4 HEX X 3/4 LEG	60375	AS REQD	LEG MNT BRKT, 3-1/2" or
15037-1	6 FT	CORD ELEC 14/3 SJ 300V	60295-PR	AS REQD	LEG MNT BRKT, 3"
1-90055	1	CABLE CONTROL 26/8	60463-5	AS REQD	ROLLER MNT BRKT, 5" or
1-90059	1	ENCLOSURE	60463-4	AS REQD	ROLLER MNT BRKT, 4" or
1-90056	4	ST AND OFF PLASTIC	60463-35	AS REQD	ROLLER MNT BRKT, 3-1/2" or
1-90050	1	ENCLOSURE ASSY CIRC BOARD	60463-3	AS REQD	ROLLER MNT BRKT, 3"
300569	3	PHOTO-EYE SENSOR DIFFUSE	50098-ZZ	AS REQD	ROLLER 1.5 x ZZ (ZZ=18,24, or 30) or
60102	2	TRAY MNT BRKT	50099-ZZ	AS REQD	ROLLER 1.9 x ZZ (ZZ=18,24, or 30)
96510	2	OFFSET LEG MNT BRKT	95037-ZZ	AS REQD	AXLE 12 MM x ZZ LENGTH, 5/16 THD
60101	1	PHOTO EYE MNT TRAY, 24" or	10024	AS REQD	SCREW, HHC 5/16-18 X 1/2
60101-30	1	PHOTO EYE MNT TRAY, 30"	70236	1	MOTOR, DC 1/8 HP (0-160 FPM) or
1-90019	3	STRAIN RELIEF .250 CABLE	70236-3	1	MOTOR, DC 1/8 HP (0-200 FPM)
12000	4	WASHER FLAT 1/4"	96504	1	BRKT MOTOR MNT
11110	6	LOCKNUT NYL 1/4	60405	4	BRACE MOTOR MNT
15037-11	3 FT	ELEC CORD 18/2	10744	4	SCREW, 1/4-20 X 5/8 HHC
1-90070	1	STRAIN RELIEF 7P2	10000	2	SCREW HHC 1/4-20X5/8
1-90071	3	STRAIN RELIEF #MP30-1	11110	2	LOCKNUT 1/4-20 NYLON
1-90072	2	STRAIN RELIEF MP4K1	10052	6	SCREW, 3/8-16 X 2 HHC
15012-1	3	STRAIN RELIEF 16/3 WIRE	11130	6	LOCKNUT, 3/8-16 NYLON
15015	7	TERM FORK#10STUD 16-14GAB	19006	1	PULLEY DRIVE DBL GROOVE
60492	AS REQD	SIDEBAR, BFP 15 or	19007	AS REQD	PULLEY IDLER DBL GROOVE
60507	AS REQD	SIDEBAR, BFP 19	60406	AS REQD	IDLER MNT BRKT
10600	AS REQD	SIDEBAR BOLT, 3/8 X 3/8, 5/16 THD	12466	2	DRIVE BELT
10620	AS REQD	SIDEBAR BOLT, 3/8 X 0.70, 5/16 THD	12467	AS REQD	IDLER BELT
10624	AS REQD	SIDEBAR BOLT, 3/8 X 1.10, 5/16 THD	1-90049-S	1	ACCUMULATION SCHEMATIC
11111	AS REQD	LOCKNUT NYL 5/16	10015	2	SCREW HHC 1/4-20X1 3/4
12185	AS REQD	SPACER 3/4 OD X 13/32 ID X 0.20	10534	4	SCREW HHC 1/4-20X 1/2"
12187	AS REQD	WASHER NYL 1" OD	15025	25	CABLE TIE 7 3/8L, 3/16W
15094	1	TERM STRIP, 3-POLE	15030-3	8	SCREW #8-32X3/8 RHM
15030-5	2	SCREW, #8-32 X 1	15097	4	1/2" CABLE CLAMP HANGER
11279	2	NUT, #8-32	15098	8	NYLON AXLE CLAMP

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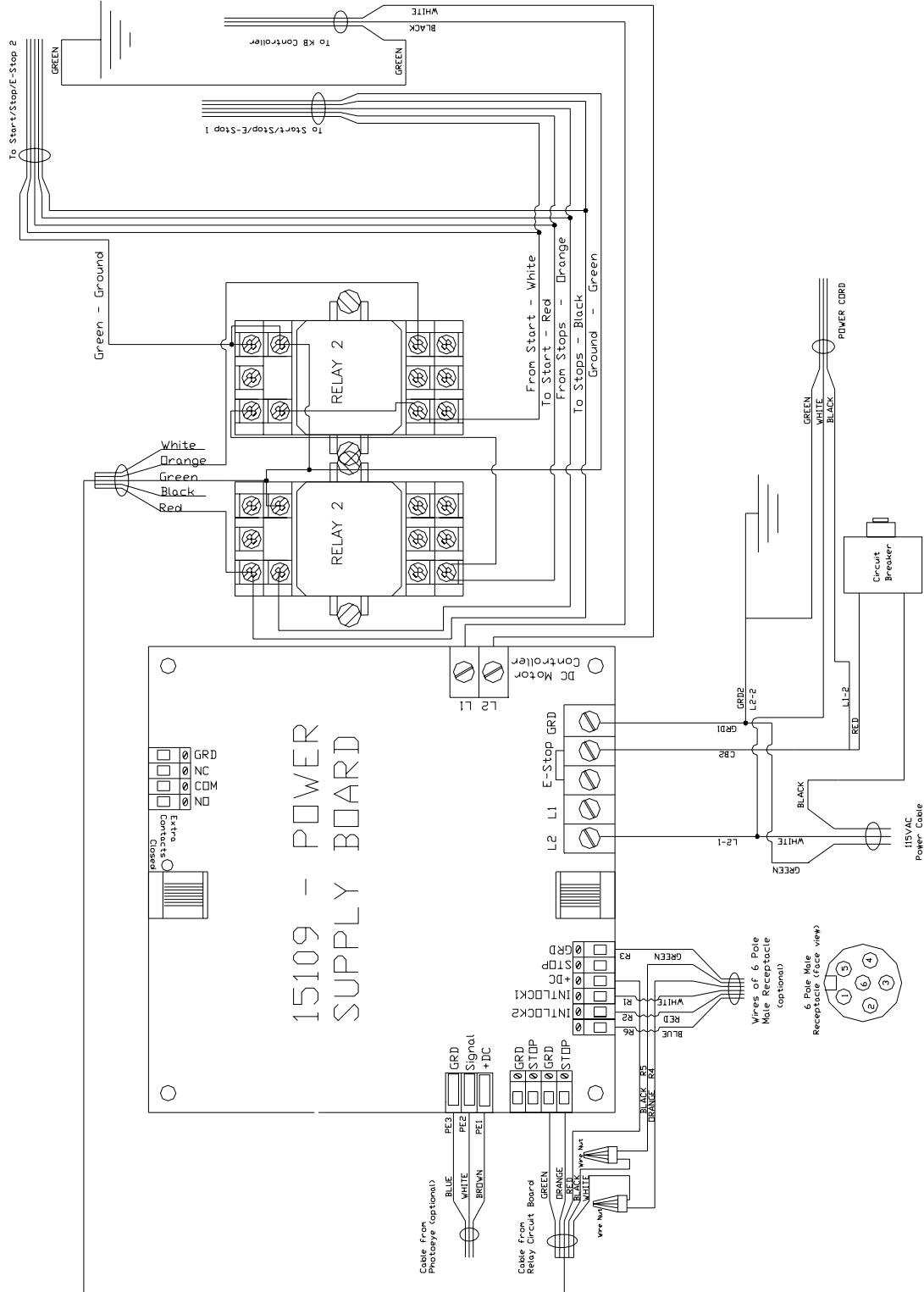


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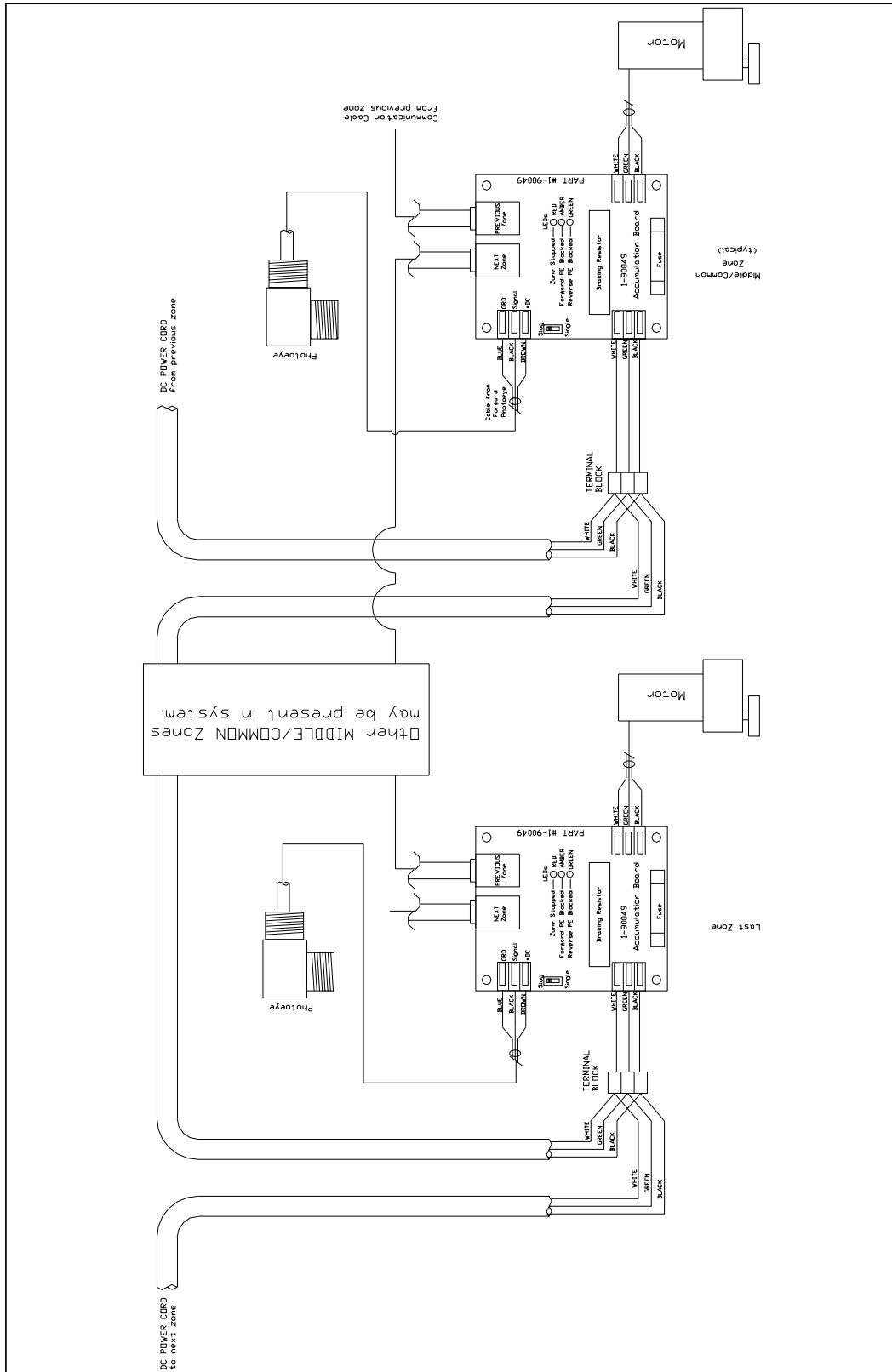
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# **Generalized Electrical Connection Diagrams**

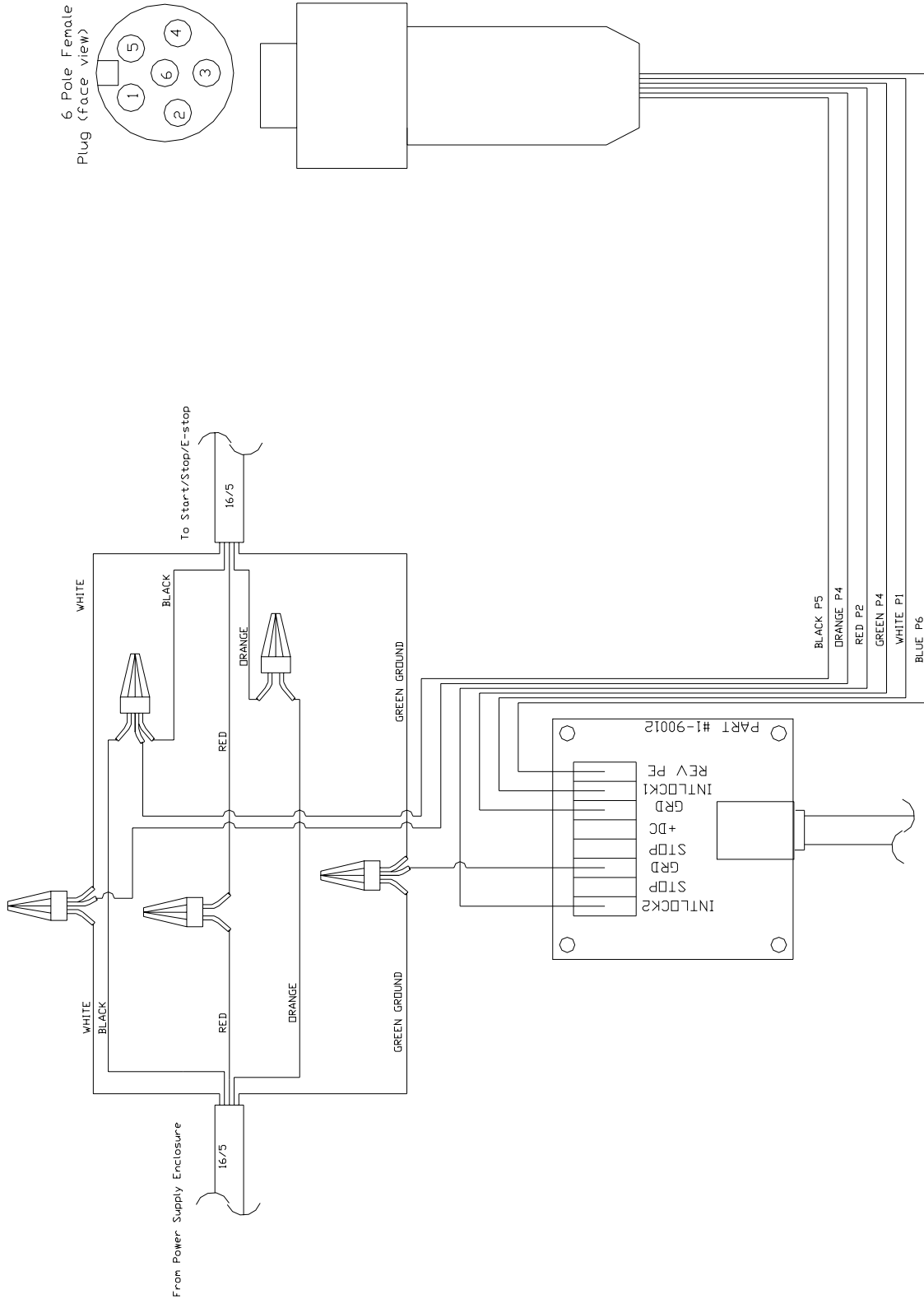
# Power Supply Connection Diagram



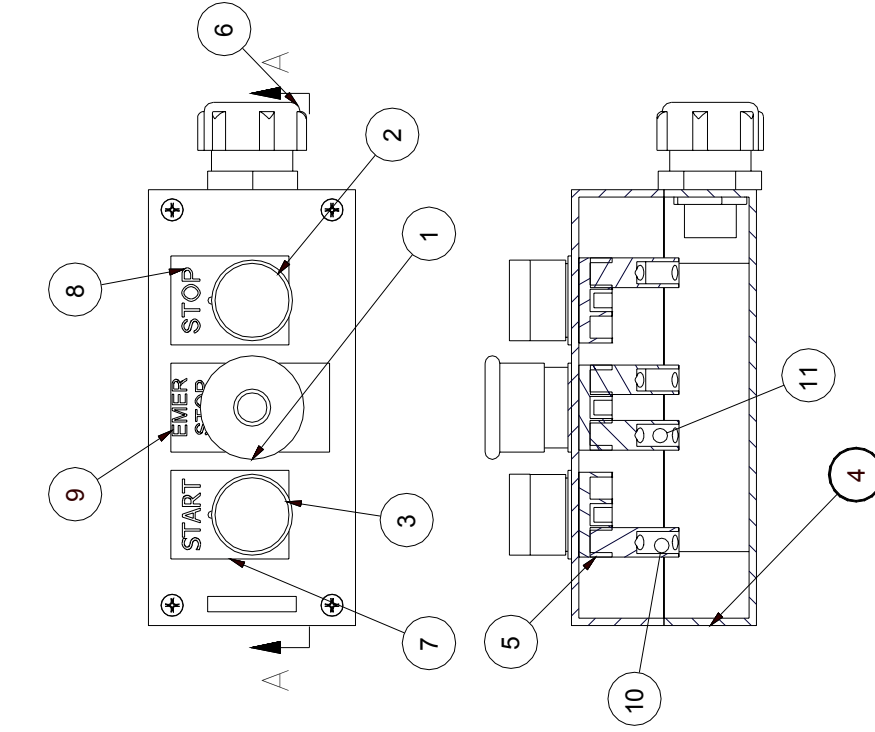
# Zone Connection Diagram



# Interface Connection Diagram



# Control Assembly



ITEM	QTY	PART NUMBER	DESCRIPTION
11	1	300901	CONTACT, NORMALLY CLOSED 22mm
10	3	300902	Contact, Normally Open 22mm
9	1	300910	Nameplate, 22mm E-Stop
8	1	300908	Nameplate, 22mm Stop
7	1	300909	Nameplate, 22mm Start
6	1	300213	Strain Relief
5	3	300904	Pushbutton, Base 22mm
4	1	300903	3 Hole Enclosure
3	1	300906	Pushbutton, 22mm Green
2	1	300905	Pushbutton, 22mm Red
1	1	300907	Pushbutton, 22mm E-Stop
ITEM	QTY	PART NUMBER	DESCRIPTION
Parts List			

# Notes

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