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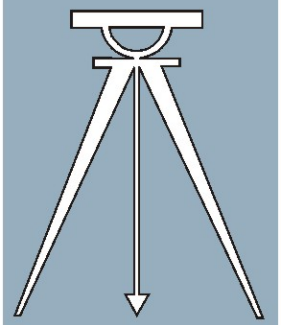
Installation

J-Rail Elevators

COELF, COELD, COLFB, COSTB



Read the separate safety manual before installing, operating, or servicing

PELLERIN MILNOR CORPORATION POST OFFICE BOX 400, KENNER, LOUISIANA 70063-0400, U.S.A.

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MAICOELXXAE/24383A

PELLERIN MILNOR CORPORATION
LIMITED STANDARD WARRANTY

We warrant to the original purchaser that MILNOR machines including electronic hardware/software (hereafter referred to as "equipment"), will be free from defects in material and workmanship for a period of one year from the date of shipment (unless the time period is specifically extended for certain parts pursuant to a specific MILNOR published extended warranty) from our factory with no operating hour limitation. This warranty is contingent upon the equipment being installed, operated and serviced as specified in the operating manual supplied with the equipment, and operated under normal conditions by competent operators.

Providing we receive written notification of a warranted defect within 30 days of its discovery, we will—at our option—repair or replace the defective part or parts, EX Factory (labor and freight specifically NOT included). We retain the right to require inspection of the parts claimed defective in our factory prior to repairing or replacing same. We will not be responsible, or in any way liable, for unauthorized repairs or service to our equipment, and this warranty shall be void if the equipment is tampered with, modified, or abused, used for purposes not intended in the design and construction of the machine, or is repaired or altered in any way without MILNOR's written consent.

Parts damaged by exposure to weather, to aggressive water, or to chemical attack are not covered by this warranty. For parts which require routine replacement due to normal wear—such as gaskets, contact points, brake and clutch linings, belts, hoses, and similar parts—the warranty time period is 90 days.

We reserve the right to make changes in the design and/or construction of our equipment (including purchased components) without obligation to change any equipment previously supplied.

ANY SALE OR FURNISHING OF ANY EQUIPMENT BY MILNOR IS MADE ONLY UPON THE EXPRESS UNDERSTANDING THAT MILNOR MAKES NO EXPRESSED OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR USE OR PURPOSE OR ANY OTHER WARRANTY IMPLIED BY LAW INCLUDING BUT NOT LIMITED TO REDHIBITION. MILNOR WILL NOT BE RESPONSIBLE FOR ANY COSTS OR DAMAGES ACTUALLY INCURRED OR REQUIRED AS A RESULT OF: THE FAILURE OF ANY OTHER PERSON OR ENTITY TO PERFORM ITS RESPONSIBILITIES, FIRE OR OTHER HAZARD, ACCIDENT, IMPROPER STORAGE, MIS-USE, NEGLECT, POWER OR ENVIRONMENTAL CONTROL MALFUNCTIONS, DAMAGE FROM LIQUIDS, OR ANY OTHER CAUSE BEYOND THE NORMAL RANGE OF USE. REGARDLESS OF HOW CAUSED, IN NO EVENT SHALL MILNOR BE LIABLE FOR SPECIAL, INDIRECT, PUNITIVE, LIQUIDATED, OR CONSEQUENTIAL COSTS OR DAMAGES, OR ANY COSTS OR DAMAGES WHATSOEVER WHICH EXCEED THE PRICE PAID TO MILNOR FOR THE EQUIPMENT IT SELLS OR FURNISHES.

THE PROVISIONS ON THIS PAGE REPRESENT THE ONLY WARRANTY FROM MILNOR AND NO OTHER WARRANTY OR CONDITIONS, STATUTORY OR OTHERWISE, SHALL BE IMPLIED.

WE NEITHER ASSUME, NOR AUTHORIZE ANY EMPLOYEE OR OTHER PERSON TO ASSUME FOR US, ANY OTHER RESPONSIBILITY AND/OR LIABILITY IN CONNECTION WITH THE SALE OR FURNISHING OF OUR EQUIPMENT TO ANY BUYER.

BMP720097/19036

How to Get the Necessary Repair Components

BNUUUM01.C01 0000250120 A.3 A.2 8/16/19 4:43 PM Released

You can get components to repair your machine from the approved supplier where you got this machine. Your supplier will usually have the necessary components in stock. You can also get components from the Milnor® factory.

Tell the supplier the machine model and serial number and this data for each necessary component:

- The component number from this manual
- The component name if known
- The necessary quantity
- The necessary transportation requirements
- If the component is an electrical component, give the schematic number if known.
- If the component is a motor or an electrical control, give the nameplate data from the used component.

To write to the Milnor® factory:

Pellerin Milnor Corporation
Post Office Box 400
Kenner, LA 70063-0400
UNITED STATES

Telephone: 504-712-7775
Fax: 504-469-9777
Email: parts@milnor.com

End of document: BNUUUM01

Trademarks

BNUUUU02.R01 0000158093 F.2 E.2 3/3/21, 9:47 AM Released

These words are trademarks of Pellerin Milnor® Corporation and other entities:

Table 1. Trademarks

AutoSpot™	GreenFlex™	MilMetrix®	PulseFlow®
CBW®	GearTrace™	MilTouch™	RAM Command™
Drynet™	GreenTurn™	MilTouch-EX™	Recirc*ONE*®
E-P Express®	Hydro-cushion™	MilRAIL®	RinSave®
E-P OneTouch®	Mentor®	Miltrac™	SmoothCoil™
E-P Plus®	Mildata®	MilVision™	Staph Guard®
Gear Guardian®	Milnor®	PBW™	

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Safety 1

Safety — Shuttle Conveyors

BNSUUS06.C01 0000275641 A.2 B.2 2/12/20, 4:13 PM Released

1. Safety Alert Messages—Internal Electrical and Mechanical Hazards

BNSUUS01.C03 0000240137 A.3 B.2 1/2/20, 2:04 PM Released

The following are instructions about hazards inside the machine and in electrical enclosures.

WARNING: **Electrocution and Electrical Burn Hazards** — Contact with electric power can kill or seriously injure you. Electric power is present inside the cabinetry unless the main machine power disconnect is off.

- Do not unlock or open electric box doors.
- Do not remove guards, covers, or panels.
- Do not reach into the machine housing or frame.
- Keep yourself and others off of machine.
- Know the location of the main machine disconnect and use it in an emergency to remove all electric power from the machine.

WARNING: **Entangle and Crush Hazards** — Contact with moving components normally isolated by guards, covers, and panels, can entangle and crush your limbs. These components move automatically.

- Do not remove guards, covers, or panels.
- Do not reach into the machine housing or frame.
- Keep yourself and others off of machine.
- Know the location of all emergency stop switches, pull cords, and/or kick plates and use them in an emergency to stop machine motion.

2. Safety Alert Messages—External Mechanical Hazards

BNSUUS02.C03 0000240134 A.3 B.2 1/2/20, 2:04 PM Released

The following are instructions about hazards around the front, sides, rear or top of the machine.

CAUTION: **Strike and Crush Hazards** — A traveling machine such as a shuttle can strike, crush, or entrap you if you ride on it or enter its path. Traveling machines or their components can move automatically in any direction. Placing a system machine on line by energizing the machine control may immediately summon a shuttle or other traveling machine.

- Keep yourself and others off of machine.
- Keep yourself and others clear of movement areas and paths.
- Understand the consequences of placing a system machine on line.
- Know the location of all emergency stop switches, pull cords, and/or kick plates and use them in an emergency to stop machine motion.
- Know the location of the main machine disconnect and use it in an emergency to remove all electric power from the machine.

CAUTION: **Crush and Entrap Hazards —** A traveling machine such as a shuttle can crush or entrap you if the bed or bucket descends while you are under it. The bed or bucket can descend with power off or on.

- Keep yourself and others clear of movement areas and paths.

WARNING: **Fall, Entangle, and Strike Hazards —** Machine motion can cause you to fall or become entangled in or struck by nearby objects if you stand, walk, or ride on the machine. Shuttles and conveyor belts move automatically.

- Keep yourself and others off of machine.

3. Safety Alert Messages—Unsafe Conditions

BNSUUS03.C01 0000240133 A.3 B.2 1/2/20, 2:04 PM Released

3.1. Damage and Malfunction Hazards

BNSUUS03.C02 0000240132 A.2 B.2 1/2/20, 2:04 PM Released

3.1.1. Hazards Resulting from Inoperative Safety Devices

BNSUUS03.C03 0000240131 B.2 A.4 1/2/20, 2:04 PM Released

WARNING: **Multiple Hazards —** Operating the machine with an inoperative safety device can kill or injure personnel, damage or destroy the machine, damage property, and/or void the warranty.

- Do not tamper with or disable any safety device or operate the machine with a malfunctioning safety device. Request authorized service.

WARNING: **Electrocution and Electrical Burn Hazards —** Electric box doors—Operating the machine with any electric box door unlocked can expose high voltage conductors inside the box.

- Do not unlock or open electric box doors.

WARNING: **Entangle and Crush Hazards —** Guards, covers, and panels—Operating the machine with any guard, cover, or panel removed exposes moving components.

- Do not remove guards, covers, or panels.

3.1.2. Hazards Resulting from Damaged Mechanical Devices

BNSUUS03.C04 0000240130 A.3 B.2 1/2/20, 2:04 PM Released

WARNING: **Multiple Hazards —** Operating a damaged machine can kill or injure personnel, further damage or destroy the machine, damage property, and/or void the warranty.

- Do not operate a damaged or malfunctioning machine. Request authorized service.

WARNING: **Crush Hazards** — Chain and hoist—A broken chain or a malfunctioning hoist can permit the belt/bucket assembly to fall or descend.

- Do not operate the machine with any evidence of damage or malfunction.

3.2. Careless Use Hazards

BNSUUS03.C05 0000240156 A.2 B.2 1/2/20, 2:04 PM Released

3.2.1. Careless Operation Hazards—Vital Information for Operator Personnel (see also operator hazards throughout manual)

BNSUUS03.C06 0000240155 A.2 B.2 1/2/20, 2:04 PM Released

WARNING: **Multiple Hazards** — Careless operator actions can kill or injure personnel, damage or destroy the machine, damage property, and/or void the warranty.

- Do not tamper with or disable any safety device or operate the machine with a malfunctioning safety device. Request authorized service.
- Do not operate a damaged or malfunctioning machine. Request authorized service.
- Do not attempt unauthorized servicing, repairs, or modification.
- Do not use the machine in any manner contrary to the factory instructions.
- Use the machine only for its customary and intended purpose.
- Understand the consequences of operating manually.

CAUTION: **Goods Damage and Wasted Resources** — Entering incorrect cake data causes improper processing, routing, and accounting of batches.

- Understand the consequences of entering cake data.

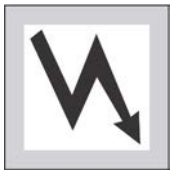
WARNING: **Strike and Crush Hazards** — Carelessly moving the machine with manual controls can cause it to strike, crush, entrap, or entangle personnel. You have total control of machine movement immediately after setting the Manual/Automatic switch to manual.

- Keep yourself and others clear of movement areas and paths.
- Understand the consequences of operating manually.

3.2.2. Careless Servicing Hazards—Vital Information for Service Personnel (see also service hazards throughout manuals)

BNSUUS03.C07 0000240154 A.3 B.2 1/2/20, 2:04 PM Released

WARNING: **Electrocution and Electrical Burn Hazards** — Contact with electric power can kill or seriously injure you. Electric power is present inside the cabinetry unless the main machine power disconnect is off.



- Do not service the machine unless qualified and authorized. You must clearly understand the hazards and how to avoid them.
- Abide by the current OSHA lockout/tagout standard when lockout/tagout is called for in the service instructions. Outside the USA, abide by the OSHA standard in the absence of any other overriding standard.

WARNING: **Entangle and Crush Hazards —** Contact with moving components normally isolated by guards, covers, and panels, can entangle and crush your limbs. These components move automatically.

- Do not service the machine unless qualified and authorized. You must clearly understand the hazards and how to avoid them.
- Abide by the current OSHA lockout/tagout standard when lockout/tagout is called for in the service instructions. Outside the USA, abide by the OSHA standard in the absence of any other overriding standard.

WARNING: **Crush and Entrap Hazards —** A traveling machine such as a shuttle can crush or entrap you if the bed or bucket descends while you are under it. The bed or bucket can descend with power off or on.

- Secure both red safety pins in accordance with the instructions furnished, then lock out and tag out power at the main machine disconnect before working under bed or bucket.

WARNING: **Strike and Crush Hazards —** A traveling machine such as a shuttle can strike, crush, or entrap you if you ride on it or enter its path. Traveling machines or their components can move automatically in any direction. Placing a system machine on line by energizing the machine control may immediately summon a shuttle or other traveling machine.

- Lock out and tag out power to the traveling machine at the main machine disconnect if you must work in the path of the traveling machine.

End of document: BNSUUS06

Safety Placard Use and Placement

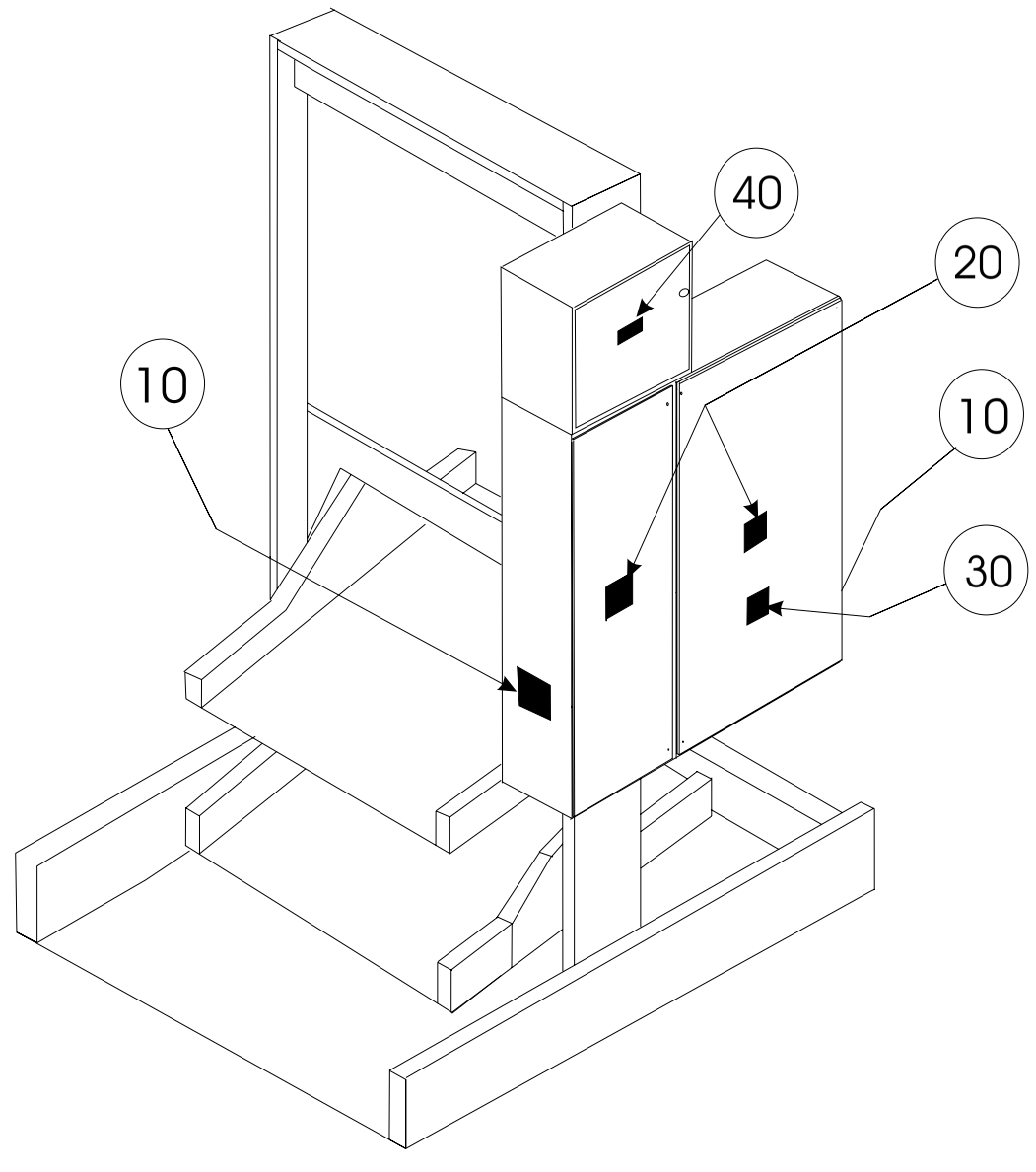
ALL ELEVATING CONVEYORS

Pellerin Milnor Corporation
P. O. Box 400, Kenner, LA 70063-0400

Litho in U.S.A.

Notes:

1. **Replace placard immediately, if removed or unreadable.**
2. **Approximate locations of placards are shown. Mounting holes are provided on machine. Use #8 self-tapping screws.**



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Pellerin Milnor Corporation
P. O. Box 400, Kenner, LA 70063-0400

Litho in U.S.A.

Parts List—Safety Placard Placement

Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.

Used In	Item	Part Number	Description	Comments
.				
			----------ASSEMBLIES----------	
			none	
			----------COMPONENTS----------	
all	10	01 10564A	NPLT:COSHA HAZARDS-TCATA	
all	20	01 10377A	NPLT:ELEC HAZARD LG-TCATA	
all	30	01 10699A	NPLT:SERV HZRD-PLYEST-TCATA	
all	40	01 10375B	NPLT:ELEC HAZARD SMALL-TCATA	

Safety Placard Use and Placement ISO

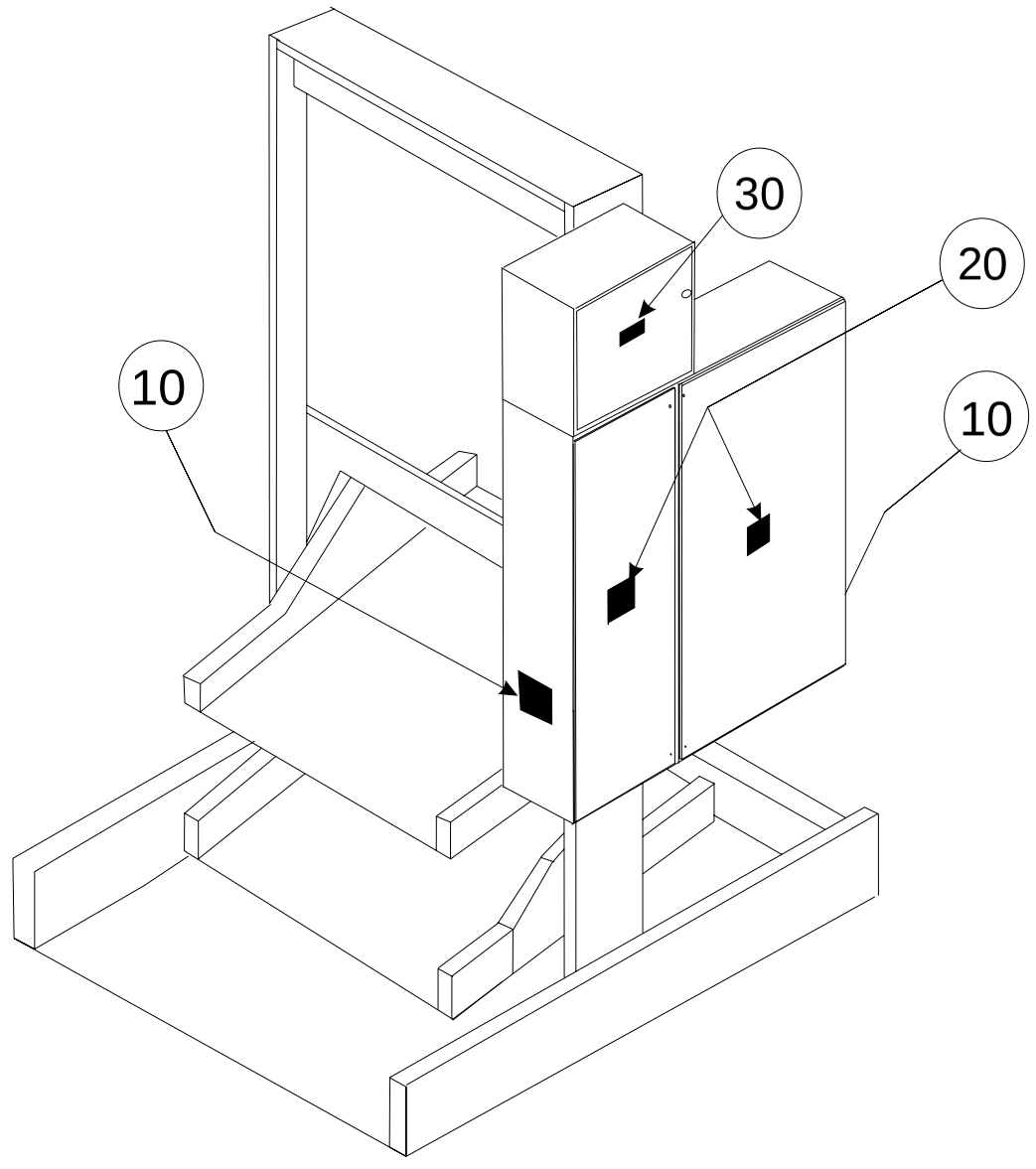
ALL ELEVATING CONVEYORS

Pellerin Milnor Corporation
P. O. Box 400, Kenner, LA 70063-0400

Litho in U.S.A.

ISO Placards
shown on this page

Notes:
1. **Replace placard immediately, if removed or unreadable.**
2. **Approximate locations of placards are shown. Mounting holes are provided on machine. Use #8 self-tapping screws.**



Pellerin Milnor Corporation
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Parts List—Safety Placard Placement

Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.

Used In	Item	Part Number	Description	Comments
.				
----------ASSEMBLIES----------				
			none	
----------COMPONENTS----------				
all	10	01 10564X	WARNINGS:SHUTTLE ISO	
all	20	01 10377	NPLT:"WARNING" 4X4	
all	30	01 10375	NPLT:"WARNING" 2X2	

Use the Red Safety Supports for Maintenance — CA_, CG_, COEL_, COLF_, COSH_

BNSUUH01.C01 0000374279 A.7 A.4 8/18/21 8:51 AM Released

1. What Safety Supports are Provided and Why

BNSUUH01.C02 0000374278 A.7 8/19/21 9:52 AM Released

These machines are provided with two safety pins. After the bed is raised, the pins are inserted in holes in both sides of the frame. The safety pins provide protection against the unpowered descent of the bed during maintenance. A mechanical problem such as a broken chain can cause the bed to fall. Use the safety support(s) whenever the maintenance to be performed requires you to place any part of your body in or near the path of the vertically moving portion of the machine.

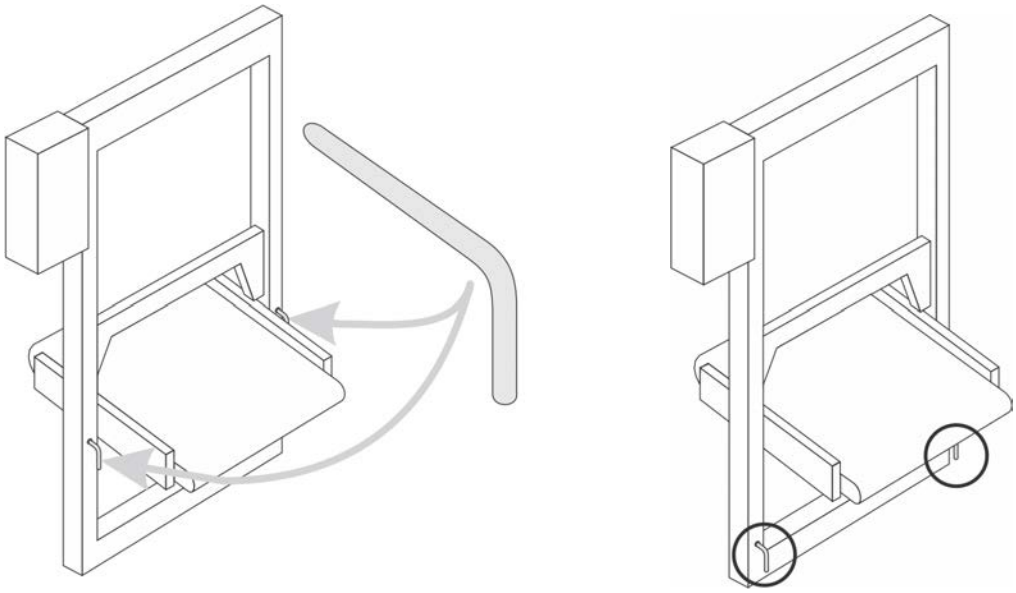
WARNING: **Incorrect use of the safety supports** — can cause the machine to descend and crush you.

- Never work near the path of the vertically moving portion of the machine unless the safety supports are deployed and power is removed from the machine.
- Do not use power to close a small gap between the machine and the safety supports. Use care not to lower the machine with the safety supports deployed.
- Where a pair of safety supports is provided, always use both supports.
- Maintain the safety support(s) in good condition.
- When not in use, stow the safety support(s) in the location(s) provided on the machine or in a convenient, designated location.

2. How to Deploy the Safety Pins

BNSUUH01.T01 0000374277 A.7 A.6 8/19/21 10:04 AM Released

1. Use the Manual mode to raise the bed or bucket carrier only as far as needed to insert the pins at one of the receptacle holes.
2. The illustrations below show the safety pins deployed (at left) and stowed (at right). Install the safety pins into the receptacle holes in the frame.



3. Remove electric power from the machine.

End of document: BNSUUH01

Installation Tag Guidelines

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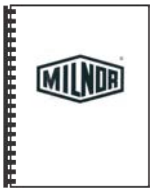
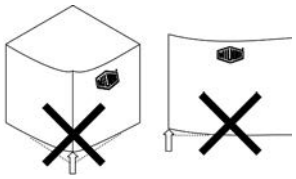
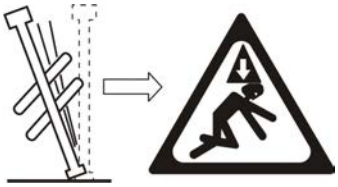
Cake Shuttles Loose Goods Shuttles

NOTICE: This information may apply to models in addition to those listed above. It applies to paper tags. It does not apply to the vinyl or metal safety placards, which must remain permanently affixed to the machine and replaced if no longer readable.

Paper tags on the machine provide installation guidelines and precautions. The tags can be tie-on or adhesive. You can remove tie-on tags and white, adhesive tags after installation. Yellow adhesive tags must remain on the machine.

The following entries explain the installation tags. Each entry includes: 1) the tag illustration, 2) the tag part number at the bottom of the tag, and 3) the meaning of the tag.

Display or Action	Explanation
	Read the manuals before proceeding. This symbol appears on most tags. The machine ships with safety, operator, and routine maintenance guides for customer use. Milnor dealer manuals for installing, commissioning, and servicing the machine are also available from the Milnor Parts department.
	B2TAG88005: This carefully built product was tested and inspected to meet Milnor performance and quality standards by (identification mark of tester).
	B2TAG94078: Do not forklift here; do not jack here; do not step here—whichever applies.
	B2TAG94084: Do not lift from one corner of the machine, as this can cause the frame to rack, damaging it.
	B2TAG94089: Do not attempt to balance the shuttle on the lower shipping brackets. Always suspend and lift the shuttle from the lifting eyes at the top of the machine.

B2T2002013: Do not start the machine until shipping restraints are removed. This tag will appear on the outside of the machine to alert you to the presence of internal shipping restraints. A tag will also appear on the restraint to help identify it. Most, but not all shipping restraints display the color red. Some shipping restraints are also safety stands. Do not discard these.

B2T2007003: Install the shuttle rail in accordance with this instruction and the installation manual.

B2T2010001: Mount festoon tow bar this way. (Used only on COSHM, COSHP, COSHQ & COSHR models.)

End of document: BNSCAI01

External Fuse/Breaker, Wiring, and Disconnect Requirements

BNUUUF01.C01 0000109242 D.2 A.4 1/2/20, 2:14 PM Released

An external fuse **or** circuit breaker and a disconnect switch must be provided in the facility for (and dedicated to) the machine. These may be in the same or separate, **permanently mounted** electric boxes. Electric power and ground connections will be made between the incoming power junction box on the machine and this external box (or one of the boxes).

1. Fuse or Circuit Breaker Size

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Refer to the “External Fuse and Wire Sizes...” document for your machine model. This document will be found in the machine's installation manual, available from the parts department. Choose the fuse or circuit breaker from the appropriate column of the table provided, as follows:

If a fuse is used — Match the fuse listed in the “Fuse” column for your machine's voltage. The specified fuse sizes are consistent with the USA National Electric Code (NEC), section 430-52, exception No. 2, Part B, which states: “The rating of a time-delay (dual-element) fuse shall be permitted to be increased, but shall in no case exceed 225 percent of the full-load current.”

If a standard circuit breaker is used — Match the amperage rating listed in the “Breaker” column for your machine's voltage.

If an inverse time circuit breaker is used — Match the characteristics (amperage rating) of the fuse listed in the “Fuse” column for your machine's voltage. When applied to an inverse time circuit breaker, the specified fuse sizes are consistent with the USA National Electric Code (NEC), section 430-52, exception No. 2, Part C, which states: “The rating of an inverse time circuit breaker shall be permitted to be increased, but shall in no case exceed 400 percent for full-load currents of 100 amperes or less.”

2. Wire Size

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Use wiring no smaller than that listed for your machine's voltage in the “Wire size... ”column in the “External Fuse and Wire Sizes...” document. The table value applies to runs up to 50 feet (15 meters). Use the next larger size for runs 50 to 100 feet (15 to 30 meters). Use wire two sizes larger for runs greater than 100 feet (30 meters). If an inverse time circuit breaker is used and local codes require a larger wire size than that specified by Milnor, abide by the local code.

NOTICE: The specified wire size may appear too small for the fuse or circuit breaker shown. However, it is consistent with both the load imposed and with the USA National Electric Code.

3. Ground

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The ground wire and connections must ensure a reliable earth ground (zero potential). Use wiring of at least as large a gauge as that required for incoming power. Do not rely on conduit, machine anchorage, etc. Use the ground lug provided in the incoming power junction box on the machine.

4. Disconnect Switch for Lockout/Tagout

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The disconnect switch must permit personnel to disconnect and lockout/tagout electric power from the machine. In the USA, refer to OSHA standard 1910.147 “The control of hazardous energy (lockout/tagout)”. Refer to the USA National Electric Code for requirements on locating the switch. In other locales, abide by these standards if no other local codes apply.

5. Using GFCI (Ground Fault Circuit Interrupter) Device

BNUUUF01.R05 0000571262 D.2 A.2 4/26/23, 10:44 AM Released

The AC Drive will most likely cause the GFCI protection device to trip. The reason the AC Drive will cause this tripping of the GFCI is the Common Mode Current or Common Mode Noise (CM Noise) that the VFD is producing.

Use a GFCI with a higher trip level.

NOTE: Choose a GFCI designed specifically for an AC drive. The operation time should be at least 0.1 s with sensitivity amperage of at least 200 mA per drive. The output waveform of the drive may cause an increase in leakage current. This may in turn cause the leakage breaker to malfunction. Increase the sensitivity amperage or lower the carrier frequency to correct the problem.

Use a type B GFCI according to IEC/EN 60755.

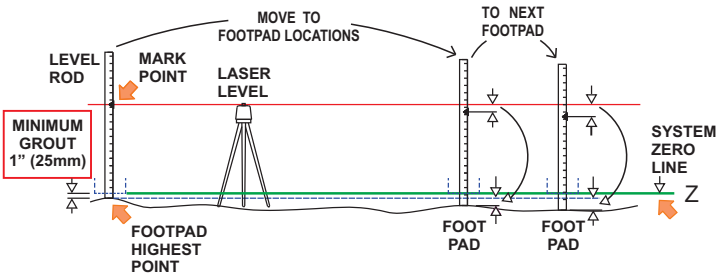
End of document: BNUUUF01

Installation 2

ATTENTION INSTALLERS!

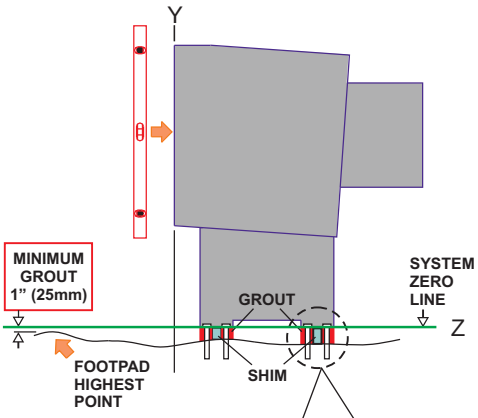
FLOOR IS UNEVEN

- Establish System Zero Line or Z.
- Find highest point in factory floor where footpads will be located.
- System Zero Line or Z is 1" above highest point.



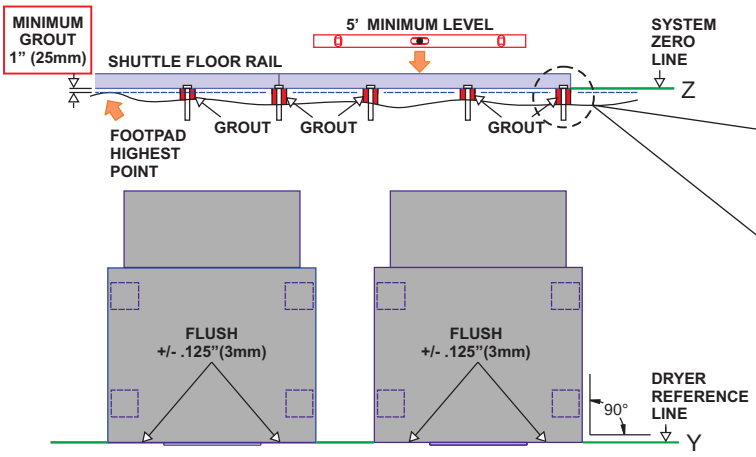
DRYER FEET MUST BE GROUTED

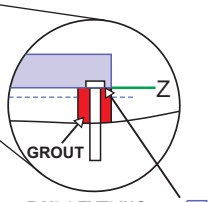
- Shim & level to System Zero Line or Z.
- Grout & anchor all brackets.

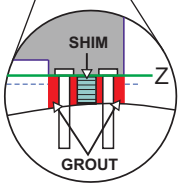


SHUTTLE RAIL BRACKETS MUST BE GROUTED TO Z

- Shim & level to System Zero Line or Z.
- Grout & anchor all brackets.

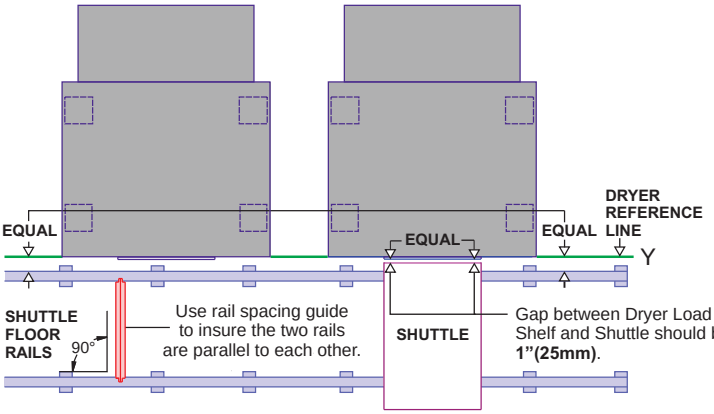


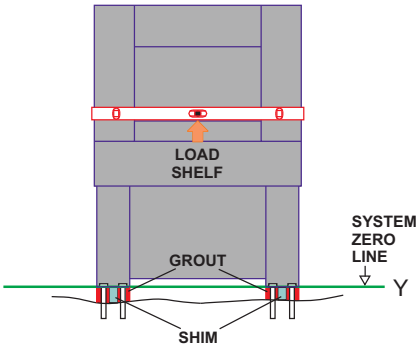




RAIL LEVELING PLATES ARE ALSO PROVIDED FOR FINE ADJUSTMENT OF RAIL.

DRYER FACES MUST BE FLUSH





DRYER MUST BE LEVEL

SHUTTLE RAILS MUST BE PERFECTLY PARALLEL TO DRYER FACES

- Floor rails must be parallel, level, and square along entire length of rail.

B2T2007003/2019193A

BIUUUM04 (Published) Book specs- Dates: 20180109 / 20180109 / 20180109 Lang: ENG01 Applic: UUU

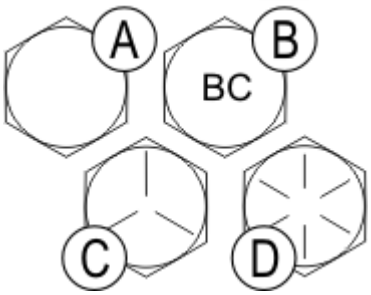
Torque Requirements for Fasteners

This document uses Simplified Technical English. Learn more at http://www.asd-ste100.org.

The document about the assembly gives the torque requirements for other fasteners. **If fastener torque specifications or threadlocker requirements in an assembly document are different from this document, use the assembly document.**

Figure 1: The Bolts in Milnor® Equipment

The Marks on Bolt Heads



Legend

A. SAE Grades 1 and 2, ASTM A307, and stainless steel
B. Grade BC, ASTM A354
C. SAE Grade 5, ASTM A449
D. SAE Grade 8 and ASTM A354 BD

1. Torque Values

These tables give the standard dimension, grade, threadlocker, and torque requirements for fasteners frequently used on Milnor® equipment.

Note 1: Data from the Pellerin Milnor® Corporation "Bolt Torque Specification" (bolt_torque_milnor.xls/2002096).

1.1. Fasteners Made of Carbon Steel

1.1.1. Without a Threadlocker

Table 1: Torque Values for Standard Fasteners with Maximum 5/16-inch Diameters and No Lubricant

	The Grade of the Bolt							
	Grade 2		Grade 5		Grade 8		Grade BC	
Dimension	Pound-Inches	N-m	Pound-Inches	N-m	Pound-Inches	N-m	Pound-Inches	N-m
1/4 x 20	66	7	101	11	143	16	126	14
1/4 x 28	76	9	116	13	163	18	--	--
5/16 x 18	136	15	209	24	295	33	258	29
5/16 x 24	150	17	232	26	325	37	--	--

Table 2: Torque Values for Standard Fasteners Larger Than 5/16-inch Diameters and No Lubricant

	The Grade of the Bolt							
	Grade 2		Grade 5		Grade 8		Grade BC	
Dimension	Pound-feet	N-m	Pound-feet	N-m	Pound-feet	N-m	Pound-feet	N-m
3/8 x 16	20	27	31	42	44	59	38	52
3/8 x 24	23	31	35	47	50	68	--	--
7/16 x 14	32	43	49	66	70	95	61	83
7/16 x 20	36	49	55	75	78	105	--	--
1/2 x 13	49	66	75	102	107	145	93	126
1/2 x 20	55	75	85	115	120	163	--	--
9/16 x 12	70	95	109	148	154	209	134	182
9/16 x 18	78	106	121	164	171	232	--	--
5/8 x 11	97	131	150	203	212	287	186	252
5/8 x 18	110	149	170	231	240	325	--	--
3/4 x 10	172	233	266	361	376	510	329	446
3/14 x 16	192	261	297	403	420	569	--	--
7/8 x 9	167	226	429	582	606	821	531	719
7/8 x 14	184	249	473	641	668	906	--	--
1 x 8	250	339	644	873	909	1232	796	1079
1 x 12	274	371	704	954	994	1348	--	--
1 x 14	281	381	723	980	1020	1383	--	--
1 1/8 x 7	354	480	794	1077	1287	1745	1126	1527
1 1/8 x 12	397	538	891	1208	1444	1958	--	--
1 1/4 x 7	500	678	1120	1519	1817	2464	1590	2155
1 1/4 x 12	553	750	1241	1682	2012	2728	--	--
1 3/8 x 6	655	888	1469	1992	2382	3230	2085	2827
1 3/8 x 12	746	1011	1672	2267	2712	3677	--	--
1 1/2 x 6	869	1178	1949	2642	3161	4286	2767	3751
1 1/2 x 12	979	1327	2194	2974	3557	4822	--	--

Table 3: Torque Values for Plated Fasteners with Maximum 5/16-inch Diameters and No Lubricant

	The Grade of the Bolt							
	Grade 2		Grade 5		Grade 8		Grade BC	
Dimension	Pound-Inches	N-m	Pound-Inches	N-m	Pound-Inches	N-m	Pound-Inches	N-m
1/4 x 20	49	6	76	9	107	12	95	11
1/4 x 28	56	6	88	10	122	14	--	--
5/16 x 18	102	12	156	18	222	25	193	22
5/16 x 24	113	13	174	20	245	28	--	--

Table 4: Torque Values for Plated Fasteners Larger Than 5/16-inch Diameters and No Lubricant

	The Grade of the Bolt							
	Grade 2		Grade 5		Grade 8		Grade BC	
Dimension	Pound-feet	N-m	Pound-feet	N-m	Pound-feet	N-m	Pound-feet	N-m
3/8 x 16	15	20	23	31	33	44	29	38
3/8 x 24	17	23	26	35	37	49	--	--
7/16 x 14	24	32	37	50	52	71	46	61
7/16 x 20	27	36	41	55	58	78	--	--
1/2 x 13	37	49	56	76	80	106	70	93
1/2 x 20	41	55	64	85	90	120	--	--
9/16 x 12	53	70	81	110	115	153	101	134
9/16 x 18	59	79	91	122	128	174	--	--
5/8 x 11	73	97	113	150	159	212	139	186
5/8 x 18	83	110	127	172	180	240	--	--
3/4 x 10	129	173	200	266	282	376	246	329
3/14 x 16	144	192	223	297	315	420	--	--
7/8 x 9	125	166	322	430	455	606	398	531
7/8 x 14	138	184	355	474	501	668	--	--
1 x 8	188	250	483	644	682	909	597	796
1 x 12	205	274	528	716	746	995	--	--
1 x 14	210	280	542	735	765	1037	--	--
1 1/8 x 7	266	354	595	807	966	1288	845	1126
1 1/8 x 12	298	404	668	890	1083	1444	--	--
1 1/4 x 7	375	500	840	1120	1363	1817	1192	1590
1 1/4 x 12	415	553	930	1261	1509	2013	--	--
1 3/8 x 6	491	655	1102	1470	1787	2382	1564	2085
1 3/8 x 12	559	758	1254	1672	2034	2712	--	--
1 1/2 x 6	652	870	1462	1982	2371	3161	2075	2767
1 1/2 x 12	733	994	1645	2194	2668	3557	--	--

1.1.2. With a Threadlocker

Table 5: Threadlocker by the Diameter of the Bolt (see Note 2)

	Dimension			
LocTite Product	1/4-inch	1/4- to 5/8-inch	5/8- to 7/8-inch	1-inch +
LocTite 222	OK			
LocTite 242		OK		
LocTite 262			OK	
LocTite 272			High temperature	
LocTite 277				OK

Note 2: The acceptable bolt size ranges for various LocTite® threadlocking products is the LocTite manufacturer's **general** recommendation. Specific applications sometime require that a LocTite product is applied to a bolt size outside the ranges shown here. For example, Milnor specifies LocTite 242 for use on certain 1" bolt applications and has confirmed this usage with the LocTite manufacturer. You may see variances such as this in the documentation for specific machine assemblies.

Table 6: Torque Values if You Apply LocTite 222

Dimension	The Grade of the Bolt							
	Grade 2		Grade 5		Grade 8		Grade BC	
	Pound-inches	N-m	Pound-inches	N-m	Pound-inches	N-m	Pound-inches	N-m
1/4 x 20	60	7	96	11	132	15	108	12
1/4 x 28	72	8	108	12	144	16	--	--

Table 7: Torque Values if You Apply LocTite 242

Dimension	The Grade of the Bolt							
	Grade 2		Grade 5		Grade 8		Grade BC	
	Pound-feet	N-m	Pound-feet	N-m	Pound-feet	N-m	Pound-feet	N-m
5/16 x 18	11	15	17	23	25	34	22	30
5/16 x 24	13	18	19	26	27	37	27	37
3/8 x 16	20	27	31	42	44	60	38	52
3/8 x 24	23	31	35	47	50	68	--	--
7/16 x 14	32	43	49	66	70	95	61	83
7/16 x 20	36	49	55	75	78	106	--	--
1/2 x 13	49	66	75	102	107	145	93	126
1/2 x 20	55	75	85	115	120	163	--	--
9/16 x 12	70	95	109	148	154	209	134	182
9/16 x 18	78	106	121	164	171	232	--	--
5/8 x 11	97	132	150	203	212	287	186	252
5/8 x 18	110	149	170	230	240	325	--	--

Table 8: Torque Values if You Apply LocTite 262

Dimension	The Grade of the Bolt							
	Grade 2		Grade 5		Grade 8		Grade BC	
	Pound-feet	N-m	Pound-feet	N-m	Pound-feet	N-m	Pound-feet	N-m
3/4 x 10	155	210	240	325	338	458	296	401
3/4 x 16	173	235	267	362	378	512	--	--
7/8 x 9	150	203	386	523	546	740	477	647
7/8 x 14	165	224	426	578	601	815	--	--

Table 9: Torque Values if You Apply LocTite 272 (High-Temperature)

	The Grade of the Bolt							
	Grade 2		Grade 5		Grade 8		Grade BC	
Dimension	Pound-feet	N-m	Pound-feet	N-m	Pound-feet	N-m	Pound-feet	N-m
1 x 8	350	475	901	1222	1272	1725	1114	1510
1 x 12	383	519	986	1337	1392	1887	--	--
1 x 14	393	533	1012	1372	1428	1936	--	--
1-1/8 x 7	496	672	1111	1506	1802	2443	1577	2138
1-1/8 x 12	556	754	1247	1691	2022	2741	--	--
1-1/4 x 7	700	949	1568	2126	2544	3449	2226	3018
1-1/4 x 12	774	1049	1737	2355	2816	3818	--	--
1-3/8 x 6	917	1243	2056	2788	3335	4522	2919	3958
1-3/8 x 12	1044	1415	2341	3174	3797	5148	--	--
1-1/2 x 6	1217	1650	2729	3700	4426	6001	3873	5251
1-1/2 x 12	1369	1856	3071	4164	4980	6752	--	--

Table 10: Torque Values if You Apply LocTite 277

	The Grade of the Bolt							
	Grade 2		Grade 5		Grade 8		Grade BC	
Dimension	Pound-feet	N-m	Pound-feet	N-m	Pound-feet	N-m	Pound-feet	N-m
1 x 8	325	441	837	1135	1181	1601	1034	1402
1 x 12	356	483	916	1242	1293	1753	--	--
1 x 14	365	495	939	1273	1326	1798	--	--
1-1/8 x 7	461	625	1032	1399	1674	2270	1464	1985
1-1/8 x 12	516	700	1158	1570	1877	2545	--	--
1-1/4 x 7	650	881	1456	1974	2362	3202	2067	2802
1-1/4 x 12	719	975	1613	2187	2615	3545	--	--
1-3/8 x 6	851	1154	1909	2588	3097	4199	2710	3674
1-3/8 x 12	970	1315	2174	2948	3526	4781	--	--
1-1/2 x 6	1130	1532	2534	3436	4110	5572	3597	4877
1-1/2 x 12	1271	1723	2852	3867	4624	6269	--	--

1.2. Stainless Steel Fasteners

Table 11: Torque Values for Stainless Steel Fasteners 5/16-inch and Smaller

	316 Stainless		18-8 Stainless		18-8 Stainless with Loctite 767	
Dimension	Pound-Inches	N-m	Pound-Inches	N-m	Pound-Inches	N-m
1/4 x 20	79	9	76	9	45	5
1/4 x 28	100	11	94	11	56	6
5/16 x 18	138	16	132	15	79	9
5/16 x 24	148	17	142	16	85	10

Table 12: Torque Values for Stainless Steel Fasteners Larger Than 5/16-inch

	316 Stainless		18-8 Stainless		18-8 Stainless with Loctite 767	
Dimension	**Pound-feet**	**N-m**	**Pound-feet**	**N-m**	**Pound-feet**	**N-m**
3/8 x 16	21	28	20	27	12	16
3/8 x 24	23	31	22	29	13	18
7/16 x 14	33	44	31	42	19	25
7/16 x 20	35	47	33	45	20	27
1/2 x 13	45	61	43	58	26	35
1/2 x 20	47	64	45	61	27	37
9/16 x 12	59	81	57	77	34	46
9/16 x 18	66	89	63	85	38	51
5/8 x 11	97	131	93	125	56	75
5/8 x 18	108	150	104	141	62	84
3/4 x 10	132	179	128	173	77	104
3/4 x 16	130	176	124	168	75	101
7/8 x 9	203	275	194	263	116	158
7/8 x 14	202	273	193	262	116	157
1 x 8	300	406	287	389	172	233
1 x 14	271	367	259	351	156	211
1-1/8 x 7	432	586	413	560	248	336
1-1/8 x 12	408	553	390	529	234	317
1-1/4 x 7	546	740	523	709	314	425
1-1/4 x 12	504	683	480	651	288	390
1-1/2 x 6	930	1261	888	1204	533	722
1-1/2 x 12	732	992	703	953	422	572

2. Preparation

WARNING 2: Fire Hazard—Some solvents and primers are flammable.

- Use threadlocker and primers with sufficient airflow.
- Do not use flammable material near ignition sources.

1. Clean all threads with a wire brush or a different tool.
2. Remove the grease from the fasteners and the mating threads with solvent. Make the parts dry.

   Note 3: LocTite 7649 Primer™ or standard solvents will remove grease from parts.

3. Apply a spray of LocTite 7649 Primer™ or equal on the fasteners and the mating threads. Let the primer dry for one minute minimum.

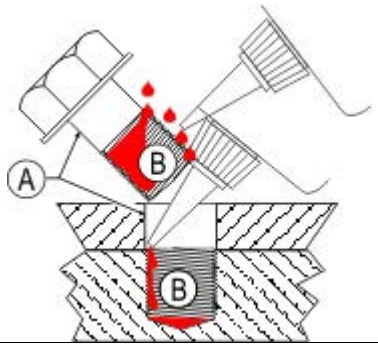
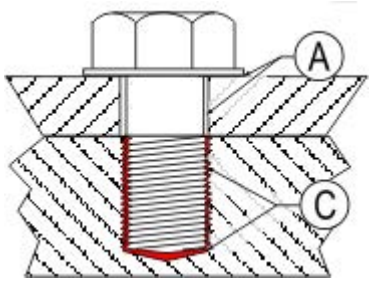
3. How to Apply a Threadlocker

CAUTION 3: Malfunction Hazard—Heat, vibration, or mechanical shocks can let the fasteners loosen if you do not apply the threadlocker correctly. Loose fasteners can cause malfunctions of the equipment.

- Read the threadlocker manufacturer's instructions and warnings. Obey these instructions.

Apply the threadlocker only to the areas where the fastener threads and the mating threads engage.

Figure 2: Blind Hole

Application	Coverage
	

Legend

A. No threadlocker here
B. Apply here
C. Fill all space with threadlocker

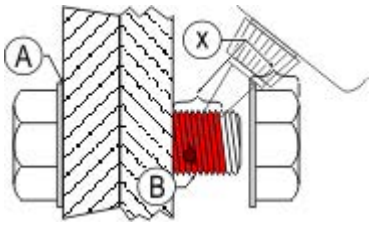
3.1. Blind Holes

1. Apply the threadlocker down the threads to the bottom of the hole.
2. Apply the threadlocker to the bolt.
3. Tighten the bolt to the value shown in the correct table (Table 5 to Table 11).

3.2. Through Holes

1. Put the bolt through the assembly.
2. Apply the threadlocker only to the bolt thread area that will engage the nut.
3. Tighten the bolt to the value shown in the correct table (Table 5 to Table 11).

Figure 3: Through Hole

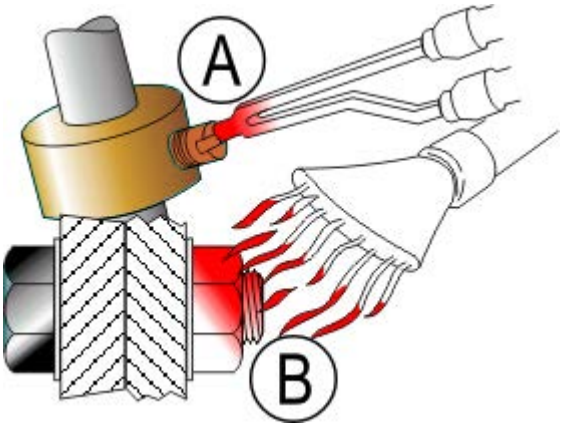
Application	Legend
	**A.** No threadlocker here **B.** Apply the threadlocker to this area **x.** Nut depth

3.3. Disassembly—For high-strength threadlocker, apply heat for five minutes. Disassemble with hand tools while the parts are hot.

For low-strength and moderate-strength threadlocker, disassemble with hand tools.

Figure 4: Disassembly

Apply Heat to a Small Area



Legend

A. How to apply heat to a small fastener
B. How to apply heat to a large fastener

— End of BIUUUM04 —

ON-SITE ASSEMBLY—SHUTTLE AND CONVEYOR DEVICES

Guidelines for Lifting and Supporting

Do not try to balance the shuttle on the lower shipping brackets (FIGURE 1) before installation. These brackets protect the wheels during shipping and are not intended to support the shuttle.

Handle the device only by the lift points provided near the top of the machine (FIGURE 3).

Do not lift, jack, or stand on the shuttle bed or other components (FIGURE 2). These actions may cause personal injury and equipment damage.

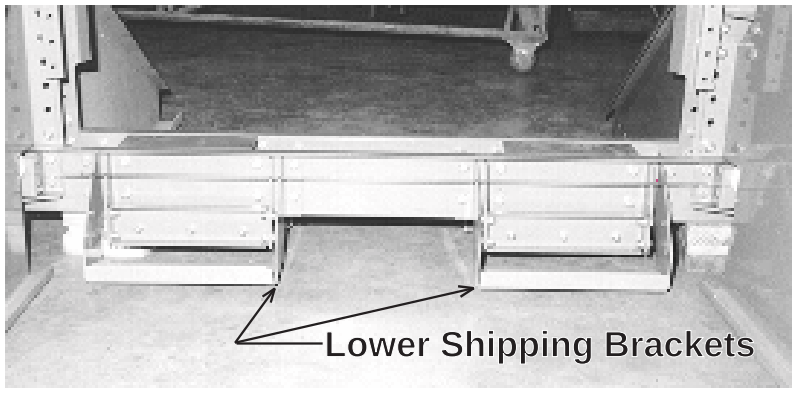


FIGURE 1 (MSIND429AE)
Shuttle Lower Shipping Brackets

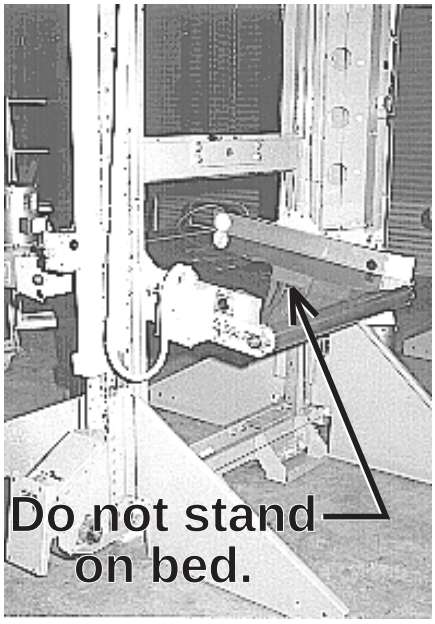


FIGURE 2 (MSIND429AE)
Shuttle (Typical)

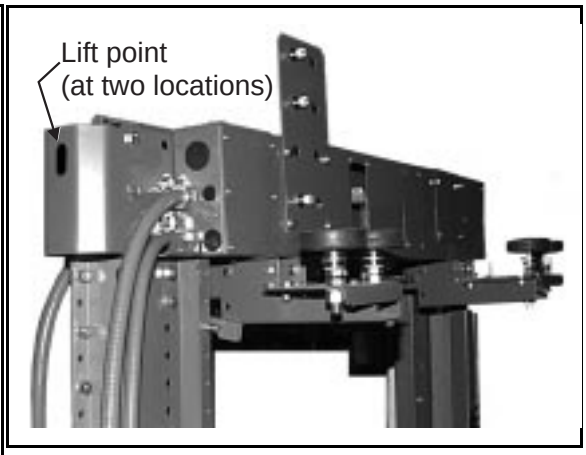


FIGURE 3 (MSIND429AE)
Lift Points at Top of Shuttle

Installing Emergency Stop Cable

The emergency stop cable was removed prior to shipment. Reinstall this cable before operating the device.

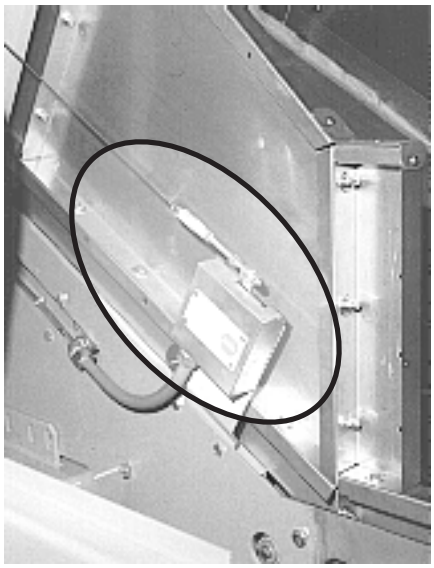


FIGURE 4(MSIND429AE)
Emergency Stop Cable (Typical)

Installing Kickplates

Traversing shuttle models will not operate without the emergency stop kickplates installed. Install the kickplates according to FIGURE 5.

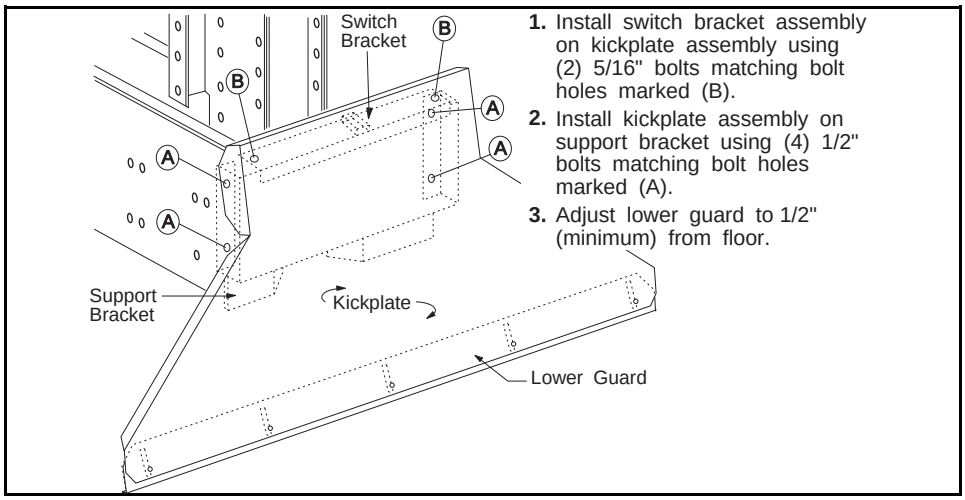


FIGURE 5 (MSSMD429AE)
Kickplate Installation—Traversing Shuttle Models

Installing Adjustable Hoist Down Stop

The adjustable hoist down stop (FIGURE 6) prevents the shuttle bed from descending any further than necessary. Set this stop at the highest position which does not interfere with shuttle operation.

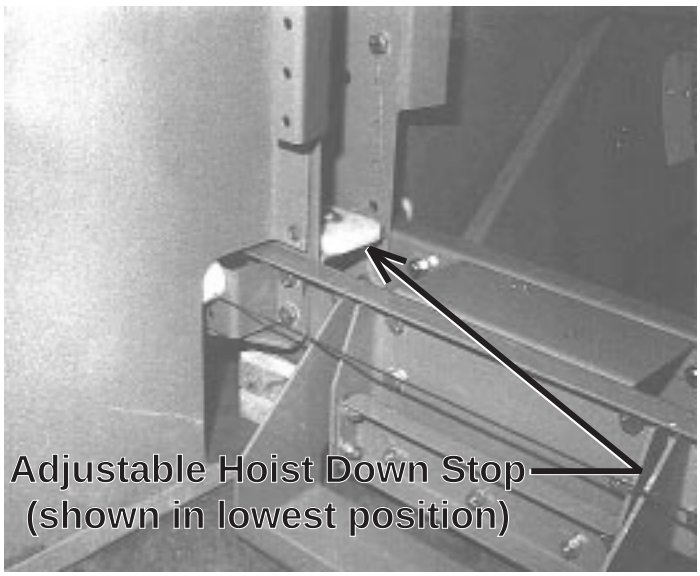


FIGURE 6 (MSIND429AE)
Hoist Down Stop

Installing Safety Stop Bracket

Install the safety stop brackets (FIGURE 7) on each end of the lower track. Use 3/8" self-tapping screws to secure the bracket to the track if the holes do not align.

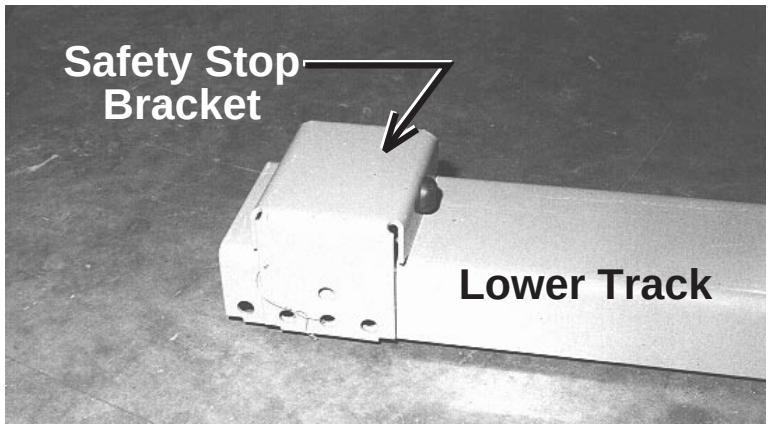


FIGURE 7 (MSIND429AE)
Lower Safety Stop Bracket Location

Installing Leg Plates on CONLO/CONWA Models

Install plate 04-20623 (FIGURE 8) at all leg positions of CONLO and CONWA models except the LOAD end of CONLO/CONWA 304 and 305, or when the conveyor is to be installed horizontally.

Install plate 04-20623B (FIGURE 9) on the LOAD end of CONLO/CONWA 304 and 305 conveyors except when the conveyor is to be installed horizontally.

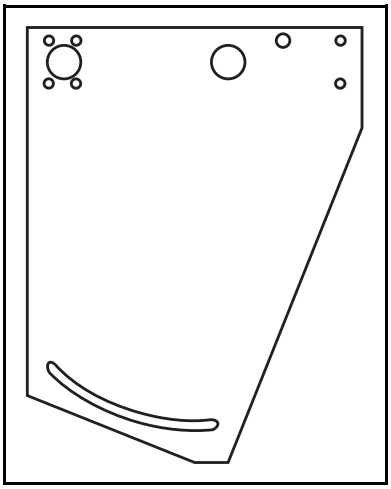


FIGURE 8 (MSIND429AE)
Plate 04-20623

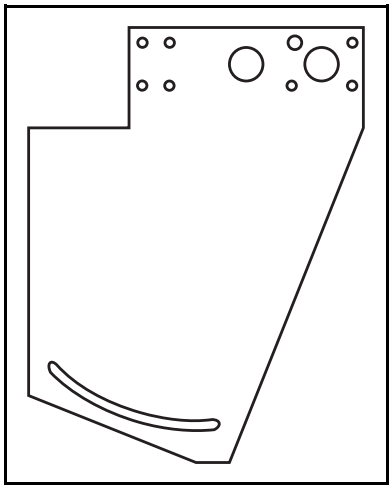


FIGURE 9 (MSIND429AE)
Plate 04-20623B

Service Connections and Adjustments

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The service connections required for shuttles are as follows: 1) electric power, 2) control signals, and 3) serial link. The power, control signals, and serial link are routed to the shuttle via festoon cables supplied separately by the Milnor® factory. The fixed end of the festoon cable terminates in a junction box supplied by the Milnor® factory. This junction box may be mounted to the support rail. Power and control connections must be made at both festoon ends. See dimensional drawings for information on locating and hanging the festoon cable. See BISCUI01 “On-Site Control Connections for Shuttles. . .” in the electrical schematic manual.

NOTE: Shuttles intended for manual operation do not have serial link connections.

1. Electric Power Connections

BNSUUI03.C02 0000296991 A.2 7/6/20, 9:36 AM Released

The customer must furnish a remotely mounted disconnect switch with lag-type fuses and wiring between this box and the motor contactor box on the machine. The sizes of these fuses and wires, along with the motor fuses supplied with your machinery, depend on the machine voltage. For your machine specifications, see the following documents:

Table 1. Electric Connections

Specification	Document	Document Location
Machine voltage	Machine nameplate	Affixed to machine frame
External fuse and wire sizes	External fuse and wire document for your machine	Request from Service Department
Motor fuses	Motor fuse name plate	Affixed to door of motor contactor box.
Phasing motors	“Electric Power Connections” tag	Inside motor contactor box

2. Electric Control Connections

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Unlike stand-alone machines, all CBW® system components require power and control cabling between the machine and their external, remotely located controllers. Refer to BICSUI01 “On-Site Control Connections for Shuttle. . .” in the electrical schematic manual.

End of document: BNSUUI03

B SETTING LIMIT SWITCHES

Limit Switches—Including Microswitches—Will Be Damaged If Over-actuated!

Any limit switch will be damaged if it bottoms out forcefully. This can bend the rotary shaft or damage internal components and may cause the switch to stick in one position either permanently or intermittently. Be aware that an intermittently sticking switch can be mistaken for a malfunctioning microprocessor!

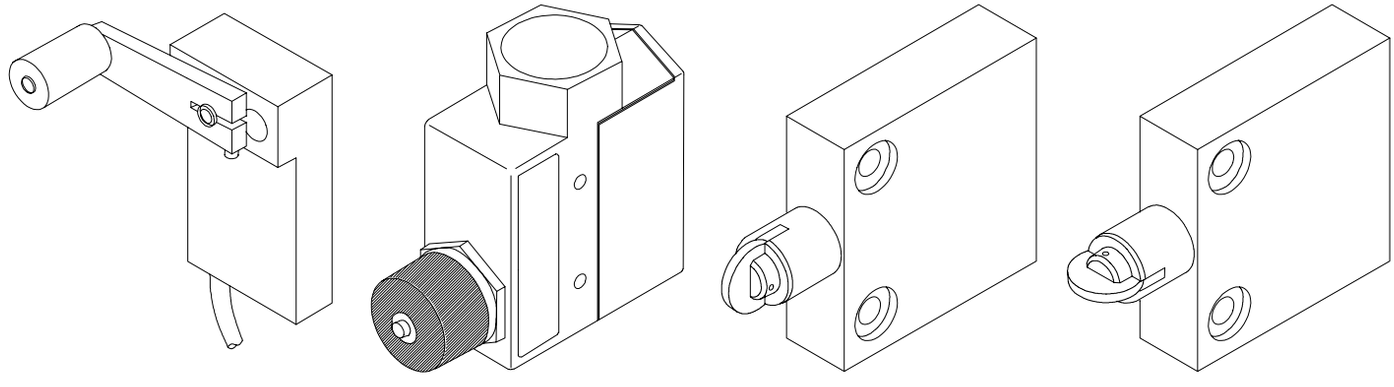


FIGURE 1a
Rotary Lever Switch

FIGURE 1b
Plunger Switch

FIGURE 1c
180° Roller Plunger

FIGURE 1d
90° Roller Plunger Switch

FIGURE 1 (MSSM0116AE)
Limit Switch Types

B

⚠ WARNING ⚠

Limit switches must function properly to ensure the safe operation of the machine.

- ☞ **Inspect switches regularly.**
- ☞ **Never operate a machine with a malfunctioning limit switch.**

Setting Switches

B

Travel of Rotary Lever or Plunger—Set switch and target so that after the switch contacts close (as determined by an ohmmeter), the lever or plunger will then move approximately half of its additional available travel (see FIGURE 2).

NOTE: It is impossible to determine by feel, sound, or experience at what point the switch contacts make. The only reliable method is to use an ohmmeter. Switches may also be bench-tested, and the plunger or rotary shaft scribed to mark this point.

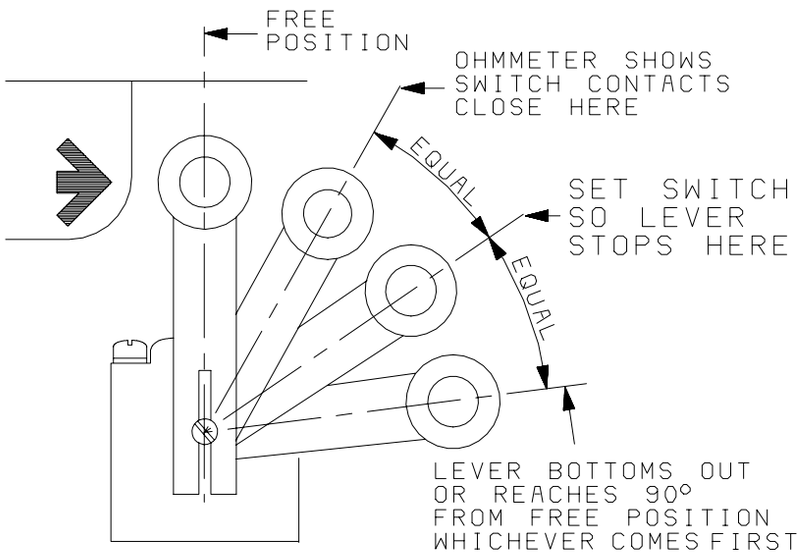


FIGURE 2a
Rotary Lever

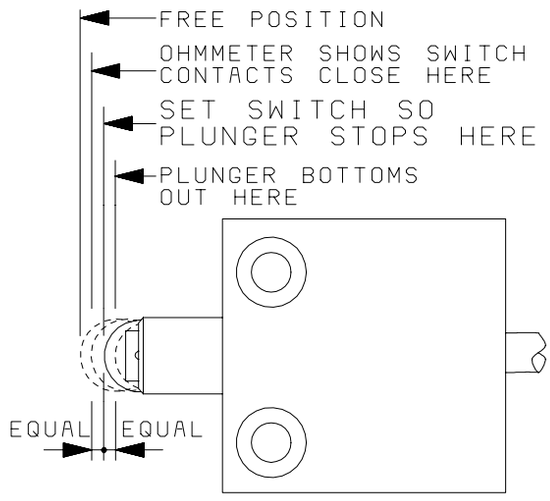


FIGURE 2b
Plunger Switches
(Roller Plunger Switch Shown)

FIGURE 2 (MSSM0116AE)
Where Lever or Plunger Should Stop

Free Position of Rotary Lever—Attach the rotary lever to the shaft so that, in the free position, the lever is at a right angle to the direction of relative movement between the switch and target (see FIGURE 3).

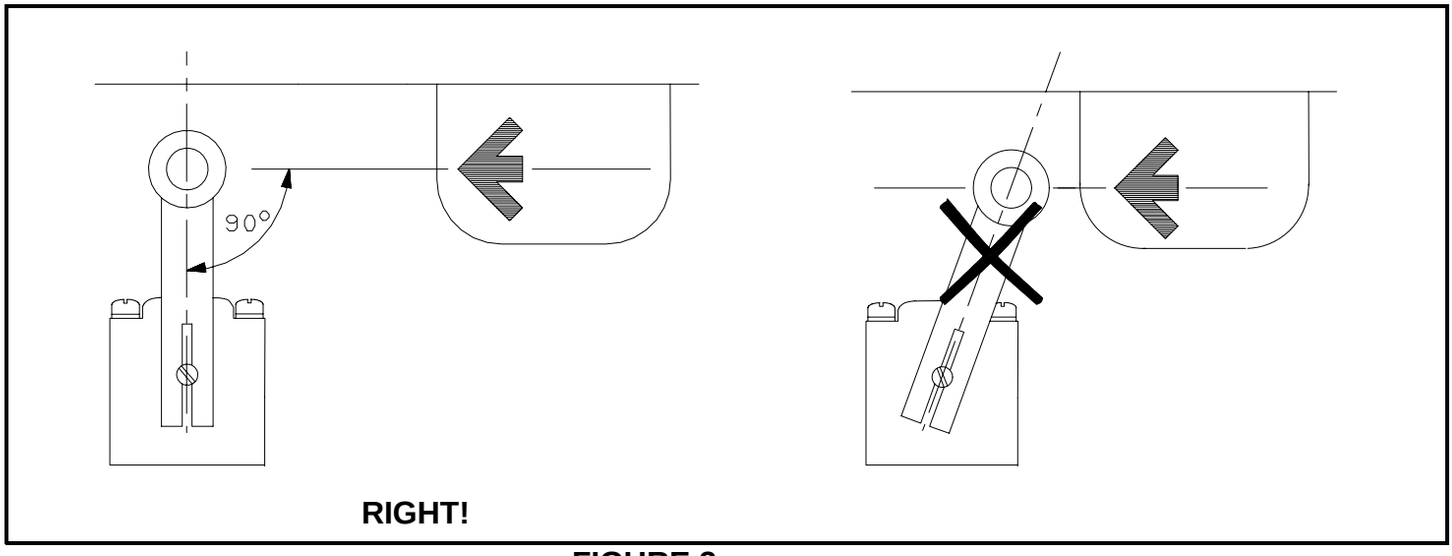


FIGURE 3 (MSSM0116AE)
Free Position of Rotary Lever

Angle of Switch—Set a plunger switch so that the target and plunger move parallel to each other. It will be approximately correct when properly installed on its mounting bracket, but may require fine adjustment.

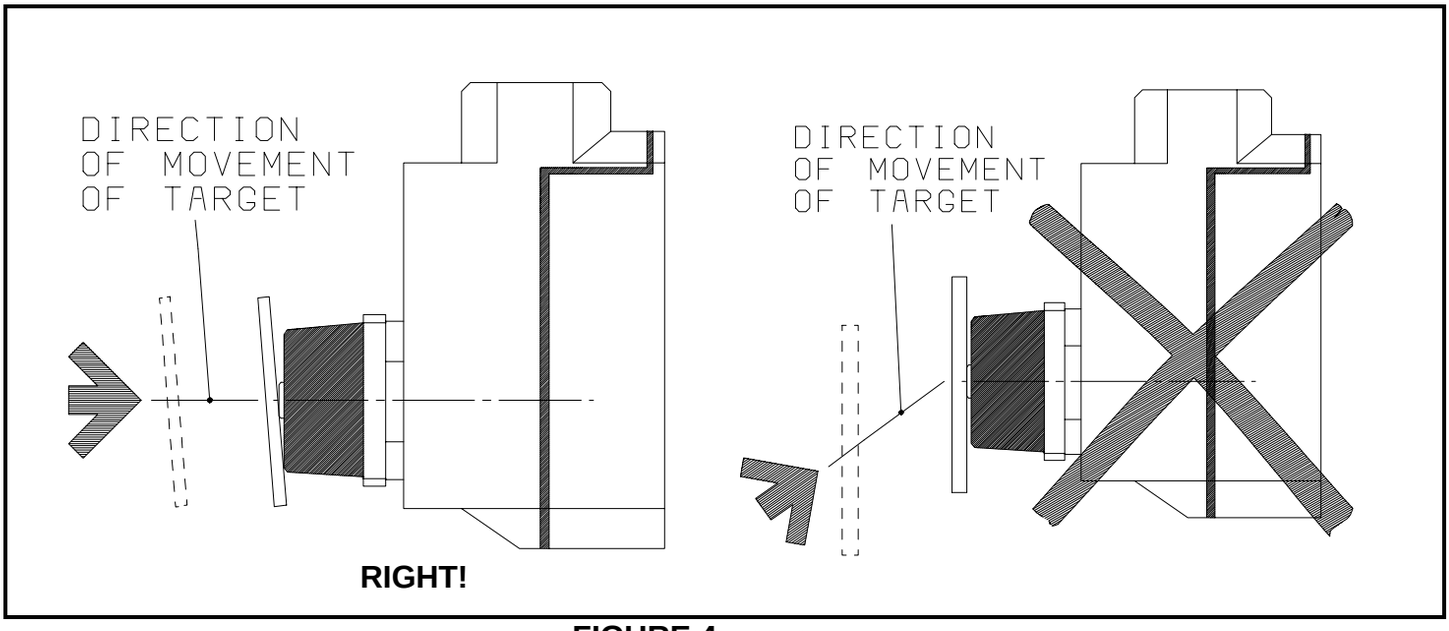


FIGURE 4 (MSSM0116AE)
Plunger Switch Angle

With a roller plunger switch, make sure that the roller rotates in the direction that will accommodate the movement of the target (not at a right angle to the target movement). Also, be sure that a replacement switch has the roller oriented the same way as the switch it replaces (see FIGURE 5).

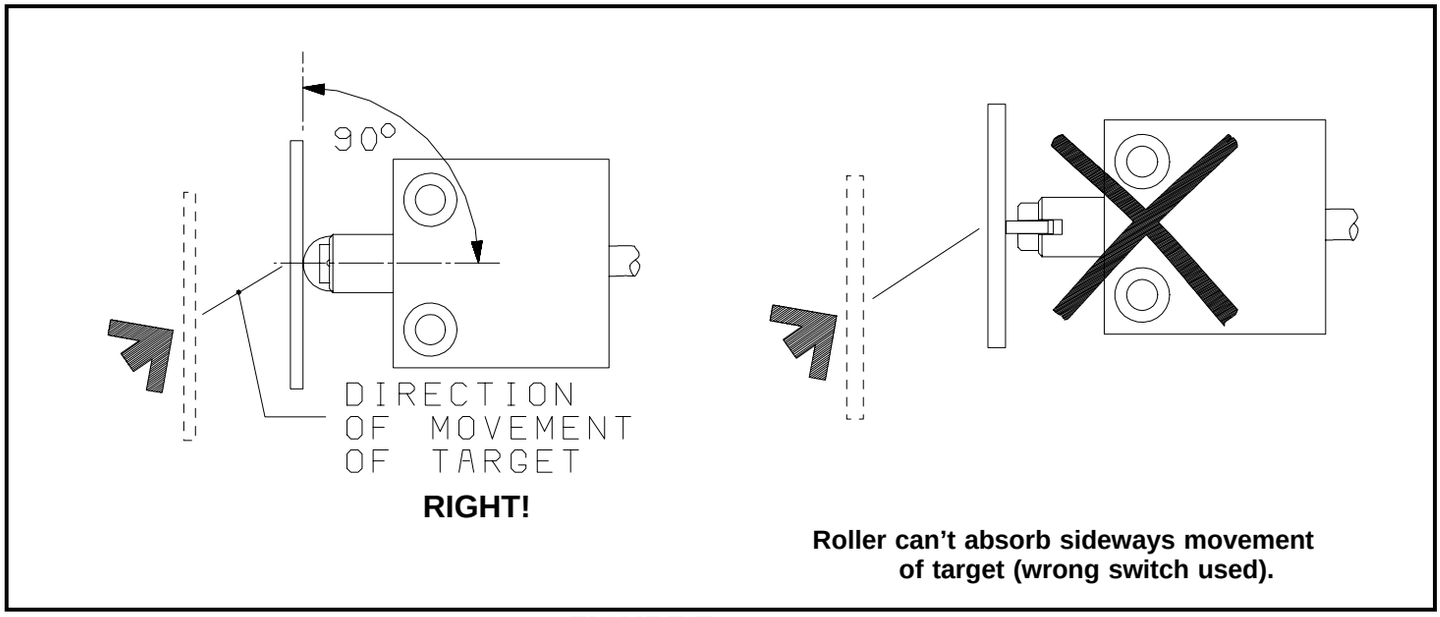


FIGURE 5 (MSSM0116AE)
Roller Plunger Switch Angle

SETTING PHOTOSENSORS

⚠ CAUTION ⚠

Excessive torque when turning potentiometers to their limits will damage them.

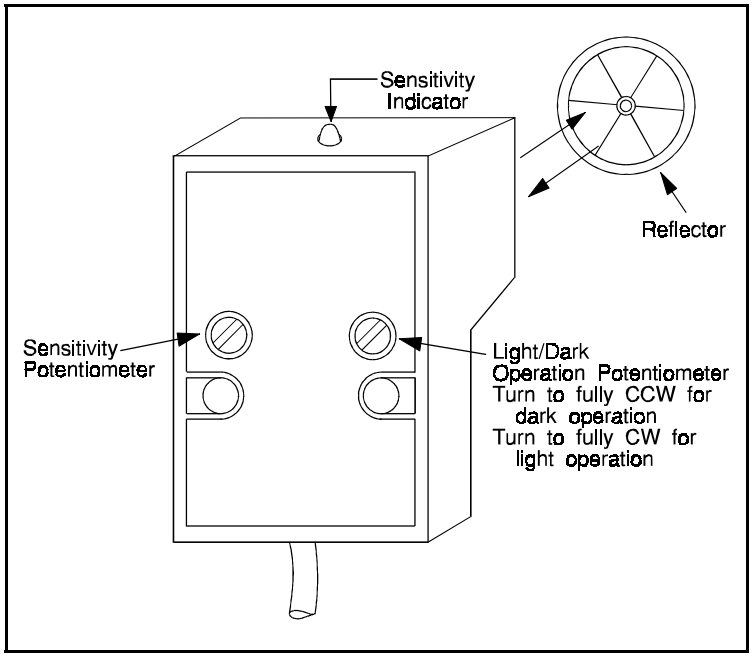


FIGURE 1 (MSSM0122AE)
Retroflective Photosensor (rear)

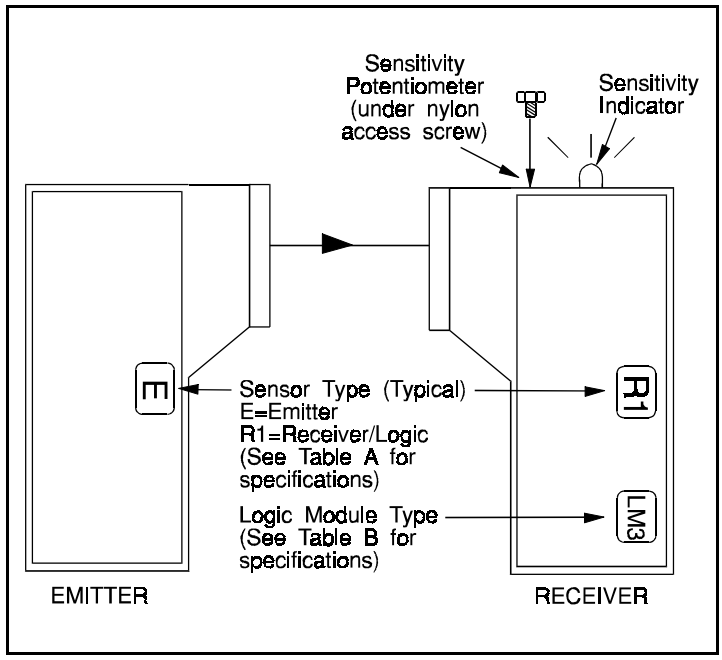


FIGURE 2 (MSSM0122AE)
Opposed-mode Photosensors

As of this writing, Milnor® uses two types of photosensors: the Banner VALU-BEAM SM-800 Retroflective and the Banner LM3 Opposed-mode models (see FIGURES 1 and 2). Both types must be properly adjusted for light or dark operation and for sensitivity. In addition, for some functions, opposed-mode photosensors have adjust-able time delays. While these devices are set at the Milnor® factory, photosensors supplied as original equipment may require adjustment to suit local conditions, and replacement units must be set initially.

NOTE: When set for dark operation, the photosensor provides an input to the Milnor® microprocessor when the beam is blocked by an object. When set for light operation, the photosensor provides an input to the microprocessor when the object normally blocking the beam is removed.

Setting Retroflective Photosensors

Retroflective photosensors use a combined receiver/emitter and separate reflector to sense when an object blocks the focused light beam. These sensors have a top-mounted sensitivity indicator that flashes faster as sensitivity is increased. Sensitivity and light/dark operation settings are made via potentiometers (see FIGURE 1). **Most Milnor® applications require dark operation.**

1. **Light/Dark Operation Potentiometer**—Adjust this single-turn potentiometer fully counterclockwise if the application calls for dark operation, or fully clockwise if it calls for light operation. When turning the potentiometer, avoid excessive torque to prevent damage.

2. **Sensitivity Potentiometer**—If this potentio-meter is turned clockwise, sensitivity increases and the sensitivity indicator flashes more rapidly. When the potentiometer is fully clockwise, the sensor is most sensitive. Adjust the sensitivity by turning the potentiometer clockwise until the indicator flashes very rapidly.

Setting Opposed-mode Photosensors

⚠ DANGER ⚠

SHOCK HAZARD—Electrical power can cause death or severe injury. Lock OFF and tag out power to the machine main bus before opening photosensor.

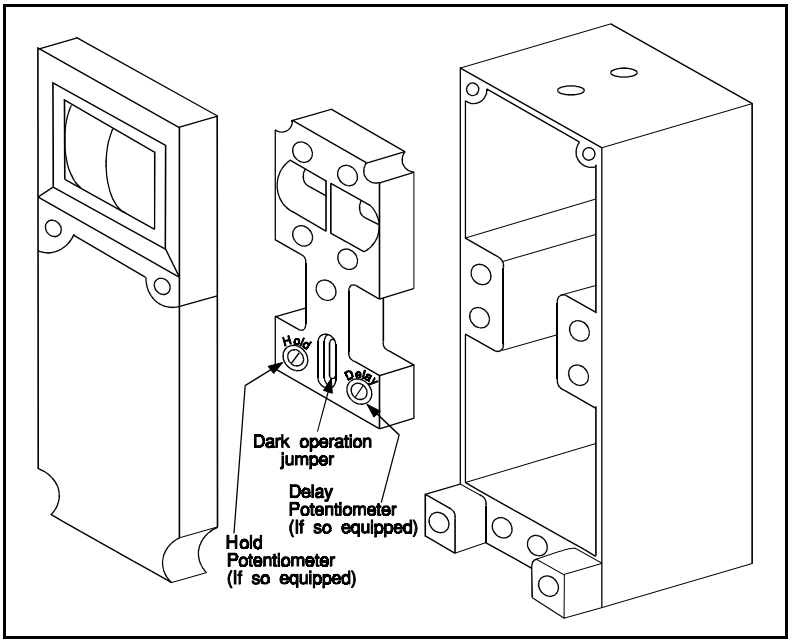


FIGURE 3 (MSSM0122AE)
Exploded View of Opposed-mode Receiver/Logic Module

Opposed-mode sensors use two units: an emitter to produce an infrared beam and a receiver/logic module to sense when objects block the beam (see FIGURE 2). The emitter-type determines the beam type and range (see Table A). The receiver/logic type determines whether the receiver reads light or dark and when it provides an input to the MILNOR microprocessor (see Table B). Receiver/logic modules are equipped with a dark operation jumper for dark operation (FIGURE 3). Removing this jumper changes the sensor to light operation. Depending on the function, the receiver/logic module may also have potentiometers for **On/Off-delay** and **Hold.** An **On-delay** potentiometer sets the amount of time the light (or dark) beam must be seen by the receiver/logic module before the input (to the MILNOR® microprocessor) makes. An **Off-delay** potentiometer sets how long the input lasts even if the beam has ceased. A **Hold** potentiometer sets the time the input will last.

Receiver/logic modules are provided with a sensitivity potentiometer (see FIGURE 2). If the potentiometer is turned fully counter-clockwise, the sensor is least sensitive, and the sensitivity indicator is extinguished. As the potentiometer is turned clockwise, sensitivity increases, and the indicator flashes more rapidly. When the potentiometer is fully clockwise, the sensor is most sensitive, and the indicator flashes so rapidly it appears steadily **ON**. Adjust the sensitivity by turning the potentiometer clockwise until the indicator begins flashing very rapidly.

Table A: Opposed-mode Sensor Types and Characteristics

Emitter/Logic Module Types	Beam	Range
E/R1	Infrared beam	150 feet (45 meters)
ED/RD1	Infrared beam	10 feet (3 meters)
EXD/RXD1	Infrared beam	30 feet (9 meters)
EV/RX1	Visible red beam	100 feet (30 meters)
EX/RX1	Infrared beam	700 feet (200 meters)

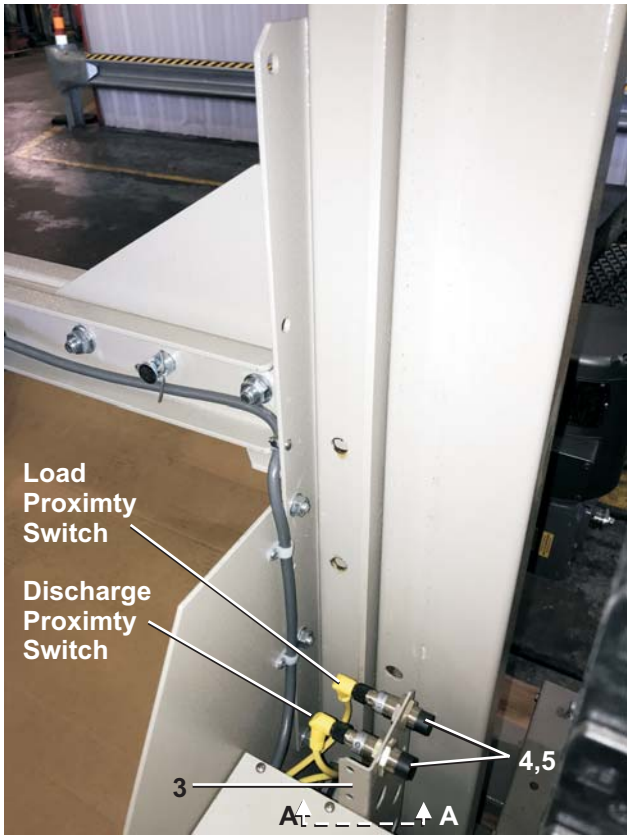
Table B: Opposed-mode Receiver/Logic Module Types and Characteristics

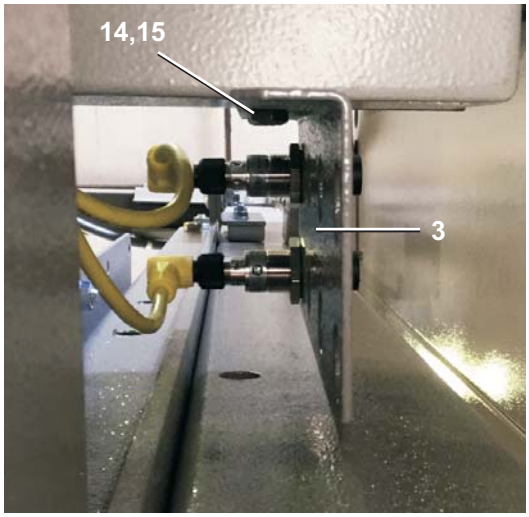
NOTE1: On-delay is the time delay before an input (to the MILNOR® microprocessor) is made.
NOTE 2: Hold is the length of time the input (to the MILNOR® microprocessor) is made.

Receiver/Logic Module type	The logic module provides an input to the MILNOR® microprocessor when it sees any of the following:
LM1	a light.
LM2	a change from light to dark. The input continues until the next light-to-dark change.
LM3	dark (if dark operation jumper installed) or light (if dark operation jumper removed).
LM4-2	a change from light to dark (if dark operation jumper installed) or a change from dark to light (if dark operation jumper removed).
LM4-2NR	same as LM4-2 above, but the input (to the Milnor® microprocessor) will **hold** (continue) for an adjustable time before the logic module will see the next change.
LM5	a steady light (or dark) for an adjustable **on-delay** time.
LM5R	the same as LM5 above, but the input (to the Milnor® microprocessor) will **hold** for an adjustable time.
LM5-14	a light (or dark) that lasts more than the adjustable **on-delay** time. The input (to the Milnor® microprocessor) will also **hold** for an adjustable time even if the light (or dark) ceases.
LM5T	a light (or dark). The input (to the Milnor® microprocessor) will **hold** for an adjustable time then end, even if the light (or dark) continues.
LM6-1	a light (or dark). The interval between lights (or darks) is calculated and compared to an adjustable reference time. The input (to the Milnor® microprocessor) ends if the reference time is exceeded. Alternately, the module can be adjusted so that the input ends if the interval between light (or dark) drops below the reference time.
LM8	a light (or dark) past an adjustable **on-delay** time. If the light (or dark) continues past the **on-delay** time, the input (to the Milnor® microprocessor) makes for an adjustable **hold** time. If the light (or dark) still remains at the end of the **hold** time, the input (to the Milnor® microprocessor) ends, and the **on-delay** time starts over.
LM8-1	light (or dark) past an adjustable **on-delay** time. The input to the Milnor® microprocessor makes for an adjustable **hold** time then ends.
LM8A	light (or dark) past an adjustable **on-delay** time.
LM10	five dark to light transitions. The input (to the Milnor® microprocessor) remains made for five additional light to dark transitions, then ends.

Bed Stop Targets and Switches

COLFM111/112, COLFP111/112, COLFQ111/112
COSHM111/112, COSHP111/112, COSHQ111/112





View A-A: (Bottom View)

Bed Stop Targets and Switches

COLFM111/112, COLFP111/112, COLFQ111/112
COSHM111/112, COSHP111/112, COSHQ111/112

Parts List

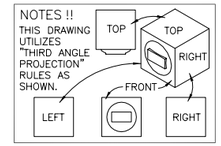
Find the correct assembly first, then find the needed components. The item letters (A, B, C, etc.) assigned to assemblies are referred to in the "Used In" column to identify which components belong to an assembly. The item numbers (1, 2, 3, etc.) assigned to components relate the parts list to the illustration.

Used In	Item	Part Number	Description	Comments
			----------ASSEMBLIES----------	
	A	ALC50079	LOAD TARGET ASSY-COSHM	REFERENCE
	B	ALC50080	DISCHARGE TARGET ASSY-COSHM	REFERENCE
	C	ES112PXA	FEST/PROX/COUNTER ASSY	REFERENCE
			----------COMPONENTS----------	
all	1	04 23344	BED STOP TARGET-LOAD	
all	2	04 23344A	BED STOP TARGET-DISC	
all	3	04 23360	BED STOP SW MTG	
all	4	09RPM18ADU	PRXSW QD CONN 18M NO-DC UNSHLD	
all	5	09RPMCD902	CONN.90-DEG FEMLE DC 3A300V 2M	
all	6	09RPMCD905	CONN 90-DEG FEMLE DC 3A300V 5M	
all	7	15K047	HXCAPSCR 1/4-20UNCX2+1/2 ZINC	
all	8	15U180	LOCKWASHER MEDIUM 1/4 ZINCPL	
all	9	15U185	FLATWASHER(USS STD) 1/4" ZNC P	
all	10	17N058	HEXRIVNUT 1/4-20 UNC-2B #2520-	
all	11	17M010	#8-32X3/8" FPHMSUC ZINC	
all	12	15U210	LOKWASHER MEDIUM 5/16 ZINCPL	
all	13	15G100	HXMACHSCRNUT 8-32UNC2B ZINC GR	
all	14	15K038C	1/4-20X 3/4 HEXFLANGE SCRW SS	
all	15	15G178	1/4"-20 HEXFLANGE NUT ZINC	

Dimensional Drawings 3

WHEN THIS DRYER PEDESTAL EXTENDER IS USED WITH DRYER 7272TG1/TS1		WHEN THIS DRYER PEDESTAL EXTENDER IS USED WITH DRYER 6458TG1/TS1		WHEN THIS DRYER PEDESTAL EXTENDER IS USED WITH DRYER 58080TG1/TS1		WHEN THIS DRYER PEDESTAL EXTENDER IS USED WITH DRYER 58058TG2/TS1		WHEN THIS DRYER PEDESTAL EXTENDER IS USED WITH DRYER 58040TG2/TS1		WHEN THIS DRYER PEDESTAL EXTENDER IS USED WITH DRYER 50040TS1		USE THIS COELD/F SIDE RAIL EXTENDERS FOR COELD/F 111, 11X, 112		COELD/COELF 111,11X,112 DIMENSIONS						DIMENSION "D" 580XX DRYERS LOAD HEIGHT		DIMENSION "D" 6458 DRYERS LOAD HEIGHT		DIMENSION "D" 7272 DRYERS LOAD HEIGHT	
														DIMENSION "A"		DIMENSION "B"		DIMENSION "C"					
INCHES	mm	INCHES	mm	INCHES	mm	INCHES	mm	INCHES	mm	INCHES	mm	INCHES	mm	INCHES	mm	INCHES	mm	INCHES	mm	INCHES	mm	INCHES	mm
–	–	10 1/2	–267	–	–	–	–	0	0	0	0	3 1/2	89	115 1/2	2845	118 1/2	2921	56	1422	57	1448	57 1/2	1460	57 1/2	1460
–	–	–7	–178	–	–	–	–	3 1/2	267	3 1/2	267	7	178	119	3112	122	3188	59 1/2	1511	60 1/2	1537	61	1638	61	1638
–7	–178	0	0	–	–	–	–	10 1/2	267	10 1/2	267	14	356	126	3200	129	3277	66 1/2	1689	67 1/2	1715	68	1727	68	1727
–3 1/2	–89	3 1/2	89	–	–	0	0	14	356	14	356	17 1/2	445	129 1/2	3289	132 1/2	3366	70	1778	71	1803	71 1/2	1816	71 1/2	1816
0	0	7	178	–	–	3 1/2	89	17 1/2	445	17 1/2	445	21	533	133	3378	136	3454	73 1/2	1867	74 1/2	1892	75	1905	75	1905
3 1/2	89	10 1/2	267	0	0	7	178	21	533	21	533	24 1/2	622	136 1/2	3454	139 1/2	3543	77	1956	78	1981	78 1/2	1994	78 1/2	1994
7	178	14	356	3 1/2	89	10 1/2	267	24 1/2	622	24 1/2	622	28	711	140	3556	143	3632	80 1/2	2045	81 1/2	2070	82	2083	82	2083
14	356	21	533	10 1/2	267	17 1/2	445	31 1/2	800	31 1/2	800	35	889	147	3734	150	3810	87 1/2	2223	88 1/2	2248	89	2261	89	2261
21	533	28	711	17 1/2	445	24 1/2	622	38 1/2	978	38 1/2	978	42	1067	154	3912	157	3988	94 1/2	2400	95 1/2	2426	96	2438	96	2438
28	711	35	889	24 1/2	622	31 1/2	800	45 1/2	1156	45 1/2	1156	49	1245	161	4089	164	4166	101 1/2	2578	102 1/2	2604	103	2616	103	2616
35	889	42	1067	31 1/2	800	38 1/2	978	52 1/2	1334	52 1/2	1334	56	1422	168	4267	171	4343	108 1/2	2756	109 1/2	2781	110	2794	110	2794
42	1067	49	1245	38 1/2	978	45 1/2	1156	59 1/2	1511	59 1/2	1511	63	1600	175	4445	178	4521	115 1/2	2934	116 1/2	2959	117	2972	117	2972
49	1245	56	1422	45 1/2	1156	52 1/2	1334	66 1/2	1689	66 1/2	1689	CONSULT FACTORY		182	4623	185	4700	122 1/2	3112	123 1/2	3137	124	3150	124	3150
56	1422	63	1600	52 1/2	1334	66 1/2	1689	CONSULT FACTORY		CONSULT FACTORY		CONSULT FACTORY		189	4801	192	4877	129 1/2	3289	130 1/2	3315	131	3327	131	3327

NOTES !!
THIS DRAWING UTILIZES "THIRD ANGLE PROJECTION" RULES AS SHOWN.

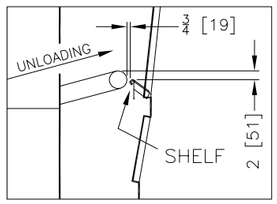


N1	STANDARD SIDE BASE. NOT SHOWN IN LEFT VIEW FOR CLARITY.
M3	BELT MOTOR. ALTERNATES LEFT/RIGHT PER LEVEL.
*M2	HOIST MOTOR IN ALTERNATE "AWAY FROM PRESS" LOCATION.
*M1	HOIST MOTOR IN "FACING PRESS" LOCATION.
F1	FOUR, ANCHOR BRACKETS. USE 1 [25] DIAMETER ANCHOR BOLTS (NOT SUPPLIED BY PMC). BOLTS MUST PROTRUDE 6 [152] MINIMUM ABOVE BASELINE Z.
E4	EMERGENCY STOP BUTTONS. SEE NOTE 15.
*E3	LOW VOLTAGE CONTROL BOX IN RIGHT HAND POSITION. (LEFT HAND POSITION "DASHED").
*E2	HIGH VOLTAGE CONTROL BOX IN RIGHT HAND POSITION. (LEFT HAND POSITION "DASHED").
*E1	ELECTRICAL CONNECTION
C2	POSITION OF MILNOR DRYER ROLLER TO SHOW PROPER INTERFACE. SEE NOTE 7.
C1	OPTIONAL, HORIZONTAL BED, MINIMUM LOAD HEIGHT "F" IS 12 [305]
ITEM	LEGEND

DIMENSION "F" VARIES WITH DISCHARGE HEIGHT OF ADJACENT MACHINE. SEE NOTE 7 AND 14.

ADJACENT MACHINE	DISCHARGE HEIGHT		DIM "F" COELF/ COELD LOADING HEIGHT	
	INCHES	mm	INCHES	mm
MILNOR PRESS 50K	13 3/16	335	11	279
MILNOR PRESS 60K SEE NOTE BELOW	16 9/16	335	14 3/8	365
ALLIED PRESS	32 3/16	818	30 1/4	769
ALLIED PRESS	6 5/8	168	6 1/2	165

NOTE: THE MILNOR 60K PRESS CAN ONLY TO THE COELD/COELF 11X

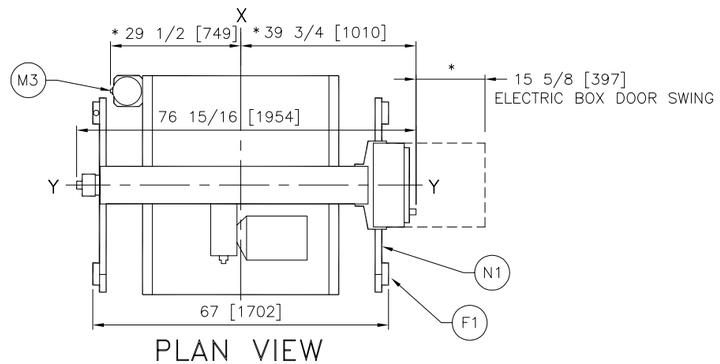


DETAIL: 6458 & 7272 SHELF LOADING ONLY

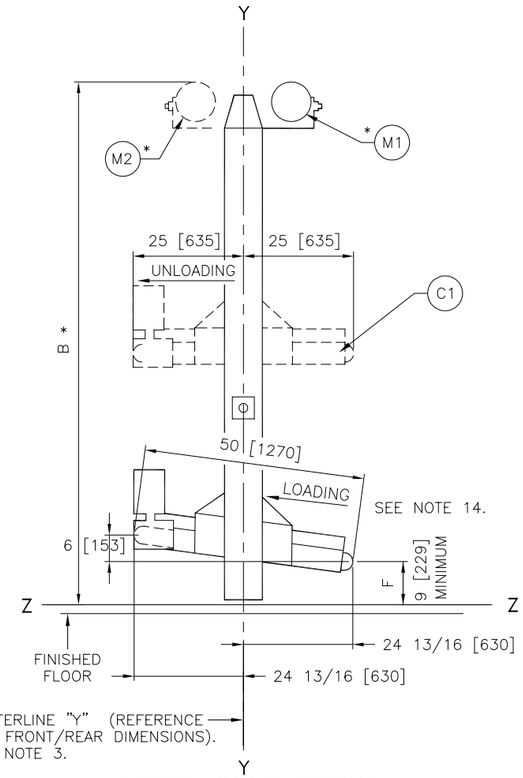
DIMENSION "G" VARIES WITH MACHINE MODEL: SEE NOTE 10

COELF/ COELD MODEL	NUMBER OF BATCHES	DIMENSION "G"	
		INCHES	mm
111	1	14 3/4	375
11X	1 HICAKE	34 3/4	883
112	1	14 3/4	375

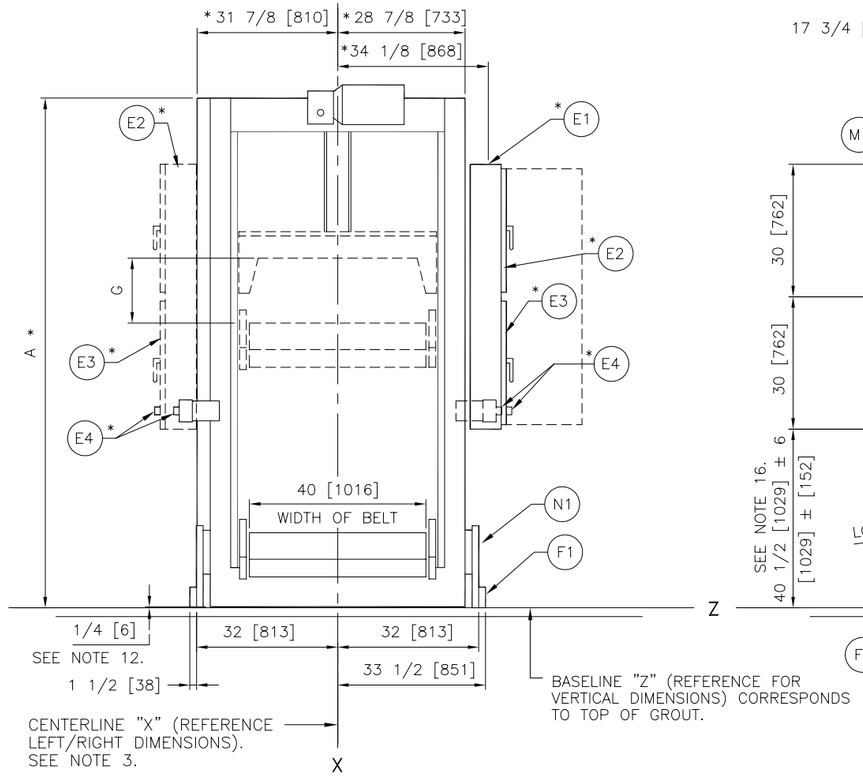
DRYER MODEL NO.	DIMENSION "H"	
	INCHES	mm
50040	31	787
58040	27	686
58058	27	686
58080	27 1/2	698
6458	26	660
7272	26	660



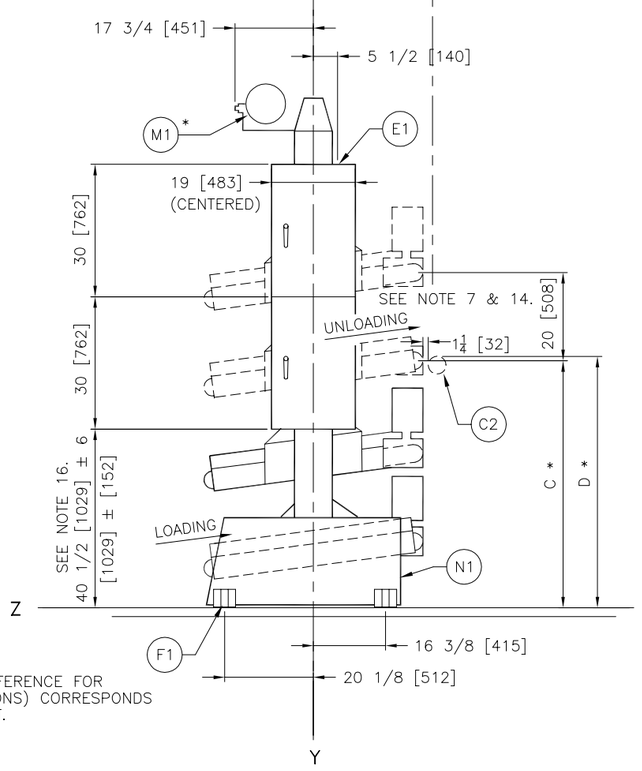
PLAN VIEW



LEFT SIDE VIEW



FRONT (LOAD END) VIEW



RIGHT SIDE VIEW

NOTES

17 DIMENSION "H" IS FROM "Y" OF THE SHUTTLE TO "Y" OF THE DRYER. SEE DRYER DIMENSIONAL DRAWING

16 DIMENSION VARIES WITH HEIGHT OF EXTENDERS WHEN ADDED.

15 EMERGENCY STOPS ARE REQUIRED ON BOTH LEFT AND RIGHT SIDES OF THE CONVEYOR. ONE OF THE TWO EMERGENCY STOPS IS INSTALLED INTO THE DOOR OF THE CONTROL BOX. THE SECOND EMERGENCY STOP IS MOUNTED TO THE SIDE RAIL MEMBER OPPOSITE THE CONTROL BOX.

14 WHEN COELF/COELD IS LOADED DIRECTLY FROM PRESS, THE EDGE OF THE CONVEYOR MUST BE 2 1/4 [57] MINIMUM FROM REAR FACE OF PRESS. THIS ALLOWS FOR CLEARANCE OF WATER CATCHER AND PRESS SLED WHEN EXTENDED, SEE BD5031MPAE.

13 CAUTION – BELT END ROLLER MUST BE 1 [25] ABOVE DRYER ROLLER AS SHOWN WHEN CAKE IS DISCHARGED INTO THE DRYER. IF BELT IS SET TOO LOW, THE DRYER ROLLER WILL LIFT THE CAKE, CAUSING IT TO BREAK UP AND SOME PIECES MAY DROP ON FLOOR.

12 A MINIMUM 1/4 [6] AIRSPACE MUST BE MAINTAINED BETWEEN THE CROSSMEMBER OF COELF/COELD AND TOP OF GROUT OR OTHER FLOOR MATERIAL OR OBSTRUCTION.

11 THE HEIGHT EXTENDERS SHOWN IN THE TABLE ARE STANDARD EXTENTIONS AND THOSE THAT SATISFY MOST FACILITY REQUIREMENTS. HOWEVER, THE COELF/COELD MAY BE SPECIAL ORDERED IN OTHER HEIGHTS IF REQUIRED. CONSULT THE MILNOR FACTORY.

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COELD/COELF 111, 11X, 112

DM 0 0.5M 1M
INCHES 0 12 24 36

DWG# BDCOEL11BE 2006255D

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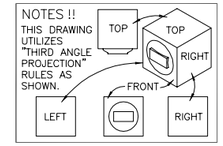
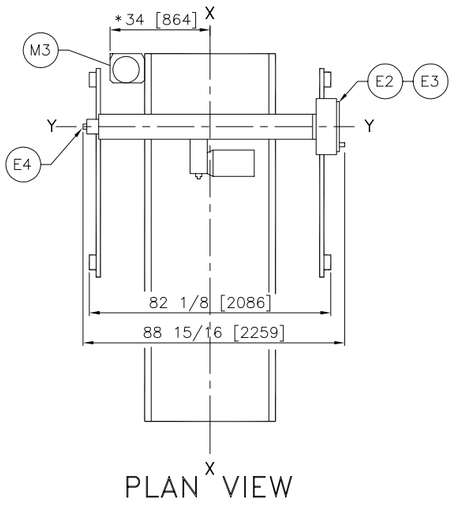
P.O. Box 400 Kenner, LA 70063, USA, Phone 504/467-9591, FAX 504/469-1849, Telex ITT 460124/PELM UI, Cable PELMILNOR

WHEN THIS DRYER PEDESTAL EXTENDER IS USED WITH DRYER 7272TG1/TS1		WHEN THIS DRYER PEDESTAL EXTENDER IS USED WITH DRYER 6458TG1/TS1		WHEN THIS DRYER PEDESTAL EXTENDER IS USED WITH DRYER 58080TG1/TS1		WHEN THIS DRYER PEDESTAL EXTENDER IS USED WITH DRYER 58058TG2/TS1		WHEN THIS DRYER PEDESTAL EXTENDER IS USED WITH DRYER 58040TG2/TS1		WHEN THIS DRYER PEDESTAL EXTENDER IS USED WITH DRYER 50040TS1		USE THIS COELD/F SIDE RAIL EXTENDERS FOR COELD/F 111, 11X, 112		COELD/COELF 121 DIMENSIONS						DIMENSION "D" 580XX DRYERS ROLLER LOAD HEIGHT		DIMENSION "D" 6458 DRYERS LOAD HEIGHT		DIMENSION "D" 7272 DRYERS LOAD HEIGHT	
														DIMENSION "A"		DIMENSION "B"		DIMENSION "C"							
INCHES	mm	INCHES	mm	INCHES	mm	INCHES	mm	INCHES	mm	INCHES	mm	INCHES	mm	INCHES	mm	INCHES	mm	INCHES	mm	INCHES	mm	INCHES	mm	INCHES	mm
–	–	−10 1/2	−267	–	–	–	–	0	0	0	0	3 1/2	89	115 1/2	2845	118 1/2	2921	56	1422	57	1448	57 1/2	1460	57 1/2	1460
–	–	−7	−178	–	–	–	–	3 1/2	267	3 1/2	267	7	178	119	3112	122	3188	59 1/2	1511	60 1/2	1537	61	1549	61	1549
−7	−178	0	0	–	–	–	–	10 1/2	267	10 1/2	267	14	356	126	3200	129	3277	66 1/2	1689	67 1/2	1715	68	1727	68	1727
−3 1/2	−89	3 1/2	89	–	–	0	0	14	356	14	356	17 1/2	445	129 1/2	3289	132 1/2	3366	70	1778	71	1803	71 1/2	1816	71 1/2	1816
0	0	7	178	–	–	3 1/2	89	17 1/2	445	17 1/2	445	21	533	133	3378	136	3454	73 1/2	1867	74 1/2	1892	75	1905	75	1905
3 1/2	89	10 1/2	267	0	0	7	178	21	533	21	533	24 1/2	622	136 1/2	3454	139 1/2	3543	77	1956	78	1981	78 1/2	1994	78 1/2	1994
7	178	14	356	3 1/2	89	10 1/2	267	24 1/2	622	24 1/2	622	28	711	140	3556	143	3632	80 1/2	2045	81 1/2	2070	82	2083	82	2083
14	356	21	533	10 1/2	267	17 1/2	445	31 1/2	800	31 1/2	800	35	889	147	3734	150	3810	87 1/2	2223	88 1/2	2248	89	2261	89	2261
21	533	28	711	17 1/2	445	24 1/2	622	38 1/2	978	38 1/2	978	42	1067	154	3912	157	3988	94 1/2	2400	95 1/2	2426	96	2438	96	2438
28	711	35	889	24 1/2	622	31 1/2	800	45 1/2	1156	45 1/2	1156	49	1245	161	4089	164	4166	101 1/2	2578	102 1/2	2604	103	2616	103	2616
35	889	42	1067	31 1/2	800	38 1/2	978	52 1/2	1334	52 1/2	1334	56	1422	168	4267	171	4343	108 1/2	2756	109 1/2	2781	110	2794	110	2794
42	1067	49	1245	38 1/2	978	45 1/2	1156	59 1/2	1511	59 1/2	1511	63	1600	175	4445	178	4521	115 1/2	2934	116 1/2	2959	117	2972	117	2972
49	1245	56	1422	45 1/2	1156	52 1/2	1334	66 1/2	1689	66 1/2	1689	CONSULT FACTORY		182	4623	185	4700	122 1/2	3112	123 1/2	3137	124	3150	124	3150
56	1422	63	1600	52 1/2	1334	66 1/2	1689	CONSULT FACTORY		CONSULT FACTORY		CONSULT FACTORY		189	4801	192	4877	129 1/2	3289	130 1/2	3315	131	3327	131	3327

NOTES !!
THIS DRAWING UTILIZES "THIRD ANGLE PROJECTION" RULES AS SHOWN.



ITEM	LEGEND
N1	STANDARD SIDE BASE. NOT SHOWN IN LEFT VIEW FOR CLARITY.
M3	BELT MOTOR.
*M2	HOIST MOTOR IN ALTERNATE "AWAY FROM PRESS" LOCATION.
*M1	HOIST MOTOR IN "FACING PRESS" LOCATION.
F1	FOUR, ANCHOR BRACKETS. USE 1 [25] DIAMETER ANCHOR BOLTS (NOT SUPPLIED BY PMC). BOLTS MUST PROTRUDE 6 [152] MINIMUM ABOVE BASELINE Z.
E4	EMERGENCY STOP BUTTONS. SEE NOTE 15.
*E3	LOW VOLTAGE CONTROL BOX IN RIGHT HAND POSITION. (LEFT HAND POSITION "DASHED").
*E2	HIGH VOLTAGE CONTROL BOX IN RIGHT HAND POSITION. (LEFT HAND POSITION "DASHED").
*E1	ELECTRICAL CONNECTION
C2	POSITION OF MILNOR DRYER ROLLER TO SHOW PROPER INTERFACE. SEE NOTE 7.
C1	OPTIONAL, HORIZONTAL BED, MINIMUM LOAD HEIGHT "F" IS 14 [356]



PLAN VIEW

DRYER MODEL NO.	DIMENSION "H" INCHES	mm
50040	31	787
58040	27	686
58058	27	686
58080	27 1/2	698
6458	26	660
7272	26	660

DIMENSION "F" VARIES WITH DISCHARGE HEIGHT OF LOAD END OF ADJACENT MACHINE SEE NOTE 7 & 14.

ADJACENT MACHINE	DISCHARGE HEIGHT INCHES	mm	DIM "F" COELD/COELF LOADING HEIGHT FROM ℄ ROLLER TO "Z" INCHES	mm
MILNOR PRESS 50K	13 3/16	335	10	254
MILNOR PRESS 60K	16 9/16	421	13 3/8	340
ALLIED PRESS	32 3/16	818	29 1/4	743
MILNOR COINC	31	787	29	737

DETAIL: 6458 & 7272 SHELF LOADING ONLY

LEFT SIDE VIEW

FRONT (LOAD END) VIEW

RIGHT SIDE VIEW

NOTES

17 DIMENSION "H" IS FROM "Y" OF THE SHUTTLE TO "Y" OF THE DRYER. SEE DRYER DIMENSIONAL DRAWING

16 DIMENSION VARIES WITH HEIGHT OF EXTENDERS WHEN ADDED.

15 EMERGENCY STOPS ARE REQUIRED ON BOTH LEFT AND RIGHT SIDES OF THE CONVEYOR. ONE OF THE TWO EMERGENCY STOPS IS INSTALLED INTO THE DOOR OF THE CONTROL BOX. THE SECOND EMERGENCY STOP IS MOUNTED TO THE SIDE RAIL MEMBER OPPOSITE THE CONTROL BOX.

14 WHEN COELF/COELD IS LOADED DIRECTLY FROM PRESS, THE EDGE OF THE CONVEYOR MUST BE 2 1/4 [57] MINIMUM FROM REAR FACE OF PRESS. THIS ALLOWS FOR CLEARANCE OF WATER CATCHER AND PRESS SLED WHEN EXTENDED, SEE BD5031MPAE.

13 CAUTION – BELT END ROLLER MUST BE 1 [25] ABOVE DRYER ROLLER AS SHOWN WHEN CAKE IS DISCHARGED INTO THE DRYER. IF BELT IS SET TOO LOW, THE DRYER ROLLER WILL LIFT THE CAKE, CAUSING IT TO BREAK UP AND SOME PIECES MAY DROP ON FLOOR.

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COELD/COELF 121

DM 0 0.5M 1M
INCHES 0 12 24 36

DWG# BDCOEL21BE 2006255D

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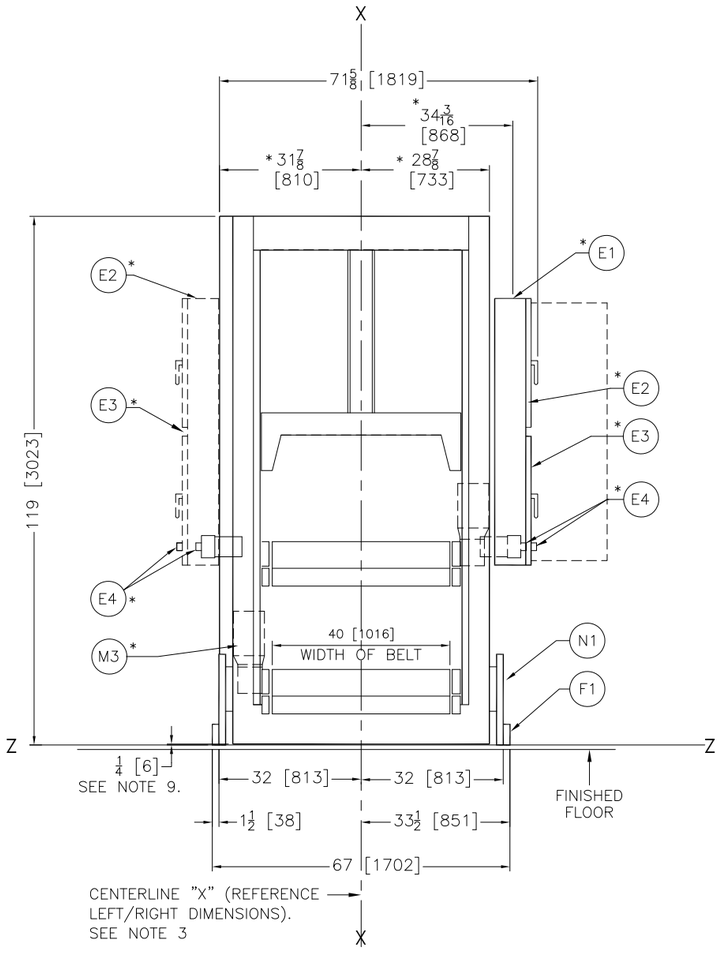
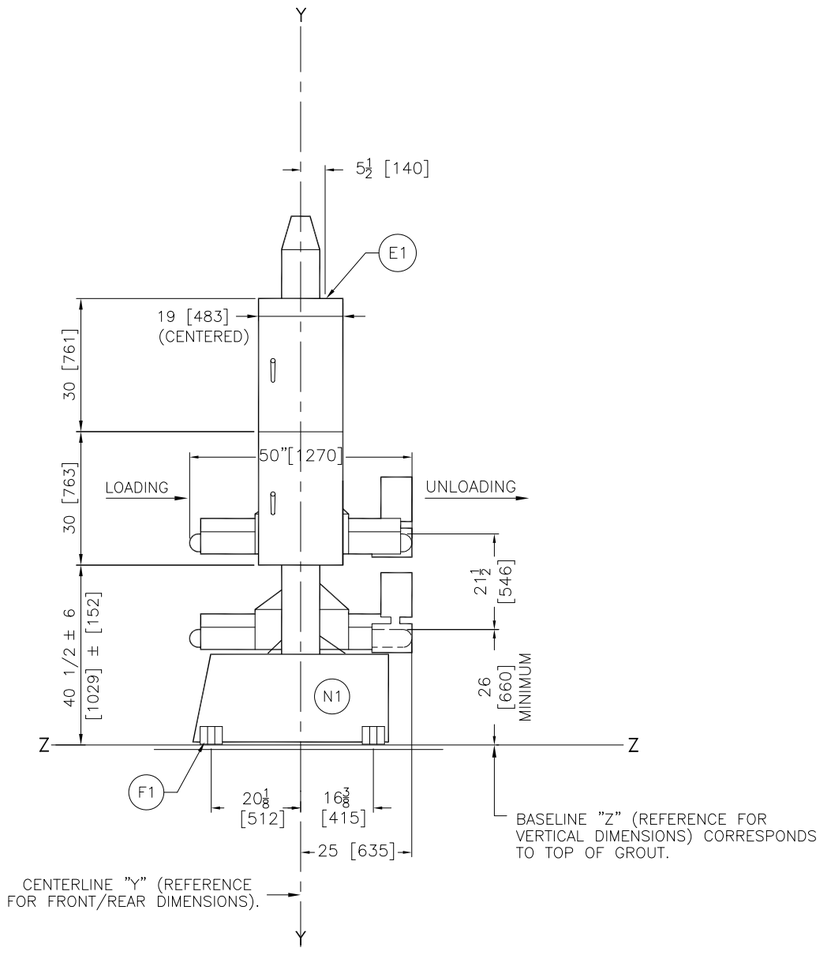
FAX 504/469-1849, Telex ITT 460124/PELM UI, Cable PELMILNOR



FRONT (LOAD END) VIEW



RIGHT SIDE VIEW

ITEM	LEGEND
*E1	ELECTRICAL CONNECTION
*E2	HIGH VOLTAGE CONTROL BOX IN RIGHT HAND POSITION. (LEFT HAND POSITION "DASHED").
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E4	EMERGENCY STOP BUTTONS.
F1	FOUR, ANCHOR BRACKETS. USE 1 [25] DIAMETER ANCHOR BOLTS (NOT SUPPLIED BY PMC). BOLTS MUST PROTRUDE 6 [152] MINIMUM ABOVE BASELINE Z.
*M3	BELT MOTOR. ALTERNATES LEFT/RIGHT PER LEVEL.
N1	STANDARD SIDE BASE. NOT SHOWN IN LEFT VIEW FOR CLARITY.

NOTES

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COSTB112 (50K CAKES)

DM 0 0.25M
INCHES 0 12

DWG# BDCOSTB112AE
2018196D

PELLERIN MILNOR CORPORATION
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