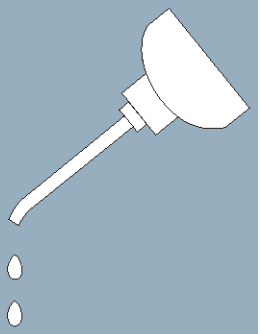
Published Manual Number/ECN: MPPSHUTLCE/2022096A

- **Publishing System: TPAS2**
- **Access date: 02/25/2022**
- **Document ECNs: Latest**

Service

Tractor Drive Shuttles



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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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

BIUUUD19 (Published) Book specs- Dates: 20081231 / 20081231 / 20081231 Lang: ENG01 Applic: UUU

How to Get the Necessary Repair Components

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

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: 504-467-2787
Fax: 504-469-9777
Email: parts@milnor.com

— End of BIUUUD19 —

Trademarks

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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™	RecircONE®
E-P Express®	Hydro-cushion™	MILRAIL™	RinSave®
E-P OneTouch®	Mentor®	Miltrac™	SmoothCoil™
E-P Plus®	Mildata®	PBW™	Staph Guard®
Gear Guardian®	Milnor®		

End of document: BNUUUU02

Safety Information 1

BIUUUS27 (Published) Book specs- Dates: 20051111 / 20051111 / 20060323 Lang: ENG01 Applic: VIP VSR VSL VSE VST VGU

Safety—Shuttle

1. General Safety Requirements—Vital Information for Management Personnel [Document BIUUUS04]

Incorrect installation, neglected preventive maintenance, abuse, and/or improper repairs, or changes to the machine can cause unsafe operation and personal injuries, such as multiple fractures, amputations, or death. The owner or his selected representative (owner/user) is responsible for understanding and ensuring the proper operation and maintenance of the machine. The owner/user must familiarize himself with the contents of all machine instruction manuals. The owner/user should direct any questions about these instructions to a Milnor® dealer or the Milnor® Service department.

Most regulatory authorities (including OSHA in the USA and CE in Europe) hold the owner/user ultimately responsible for maintaining a safe working environment. Therefore, the owner/user must do or ensure the following:

- recognize all foreseeable safety hazards within his facility and take actions to protect his personnel, equipment, and facility;
- work equipment is suitable, properly adapted, can be used without risks to health or safety, and is adequately maintained;
- where specific hazards are likely to be involved, access to the equipment is restricted to those employees given the task of using it;
- only specifically designated workers carry out repairs, modifications, maintenance, or servicing;
- information, instruction, and training is provided;
- workers and/or their representatives are consulted.

Work equipment must comply with the requirements listed below. The owner/user must verify that installation and maintenance of equipment is performed in such a way as to support these requirements:

- control devices must be visible, identifiable, and marked; be located outside dangerous zones; and not give rise to a hazard due to unintentional operation;
- control systems must be safe and breakdown/damage must not result in danger;
- work equipment is to be stabilized;
- protection against rupture or disintegration of work equipment;
- guarding, to prevent access to danger zones or to stop movements of dangerous parts before the danger zones are reached. Guards to be robust; not give rise to any additional hazards; not be easily removed or rendered inoperative; situated at a sufficient distance from the danger zone; not restrict view of operating cycle; allow fitting, replacing, or maintenance by restricting access to relevant area and without removal of guard/protection device;
- suitable lighting for working and maintenance areas;
- maintenance to be possible when work equipment is shut down. If not possible, then protection measures to be carried out outside danger zones;
- work equipment must be appropriate for preventing the risk of fire or overheating; discharges of gas, dust, liquid, vapor, other substances; explosion of the equipment or substances in it.

1.1. **Laundry Facility**—Provide a supporting floor that is strong and rigid enough to support–with a reasonable safety factor and without undue or objectionable deflection–the weight of the fully loaded machine and the forces transmitted by it during operation. Provide sufficient clearance for machine movement. Provide any safety guards, fences, restraints, devices, and verbal and/or posted restrictions necessary to prevent personnel, machines, or other moving machinery from accessing the machine or its path. Provide adequate ventilation to carry away heat and vapors. Ensure service connections to installed machines meet local and national safety standards, especially regarding the electrical disconnect (see the National Electric Code). Prominently post safety information, including signs showing the source of electrical disconnect.

WARNING 1: Collision, Crushing and Pinch Hazards—Serious bodily injury or death can result to personnel in proximity to machinery/systems that traverse, elevate, extend, pivot, and/or tilt. The following mandatory minimum safety requirements must be installed with the machinery system: • Safety fence inclosing machine movement areas, • Lockable electrical interlocks on all gates, properly interfaced as shown on machine schematics, to disable machine movement when any gate is opened, • Signs to alert personnel to these hazards, placed prominently around the fenced area. Local codes may require additional precautions.

1.2. **Personnel**—Inform personnel about hazard avoidance and the importance of care and common sense. Provide personnel with the safety and operating instructions that apply to them. Verify that personnel use proper safety and operating procedures. Verify that personnel understand and abide by the warnings on the machine and precautions in the instruction manuals.

1.3. **Safety Devices**—Ensure that no one eliminates or disables any safety device on the machine or in the facility. Do not allow machine to be used with any missing guard, cover, panel or door. Service any failing or malfunctioning device before operating the machine.

1.4. **Hazard Information**—Important information on hazards is provided on the machine safety placards, in the Safety Guide, and throughout the other machine manuals. **Placards must be kept clean so that the information is not obscured. They must be replaced immediately if lost or damaged. The Safety Guide and other machine manuals must be available at all times to the appropriate personnel.** See the machine service manual for safety placard part numbers. Contact the Milnor Parts department for replacement placards or manuals.

1.5. **Maintenance**—Ensure the machine is inspected and serviced in accordance with the norms of good practice and with the preventive maintenance schedule. Replace belts, pulleys, brake shoes/disks, clutch plates/tires, rollers, seals, alignment guides, etc. before they are severely worn. Immediately investigate any evidence of impending failure and make needed repairs (e.g., cylinder, shell, or frame cracks; drive components such as motors, gear boxes, bearings, etc., whining, grinding, smoking, or becoming abnormally hot; bending or cracking of cylinder, shell, frame, etc.; leaking seals, hoses, valves, etc.) Do not permit service or maintenance by unqualified personnel.

2. Safety Alert Messages—Internal Electrical and Mechanical Hazards [Document BIUUUS11]

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

WARNING 2: 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 3: 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.

3. Safety Alert Messages—External Mechanical Hazards [Document BIUUUS12]

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

CAUTION 4: 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 5: 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 6: 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.

4. Safety Alert Messages—Unsafe Conditions [Document BIUUUS14]

4.1. Damage and Malfunction Hazards

4.1.1. Hazards Resulting from Inoperative Safety Devices

WARNING 7: 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 8: 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 9: 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.

4.1.2. Hazards Resulting from Damaged Mechanical Devices

WARNING 10: 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 11: 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.

4.2. Careless Use Hazards

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

WARNING 12: 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 13: 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 14: 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.

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

WARNING 15: 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 16: 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 17: 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 18: 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 BIUUUS27 —

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

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1. What Safety Supports are Provided and Why

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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

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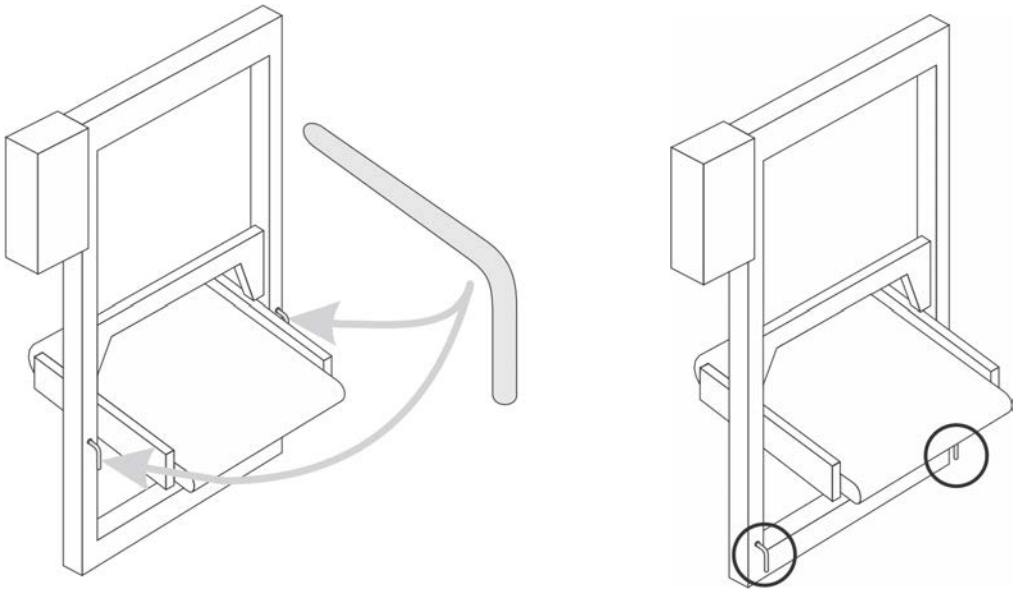
1. Use the Manual mode to raise the bed or bucket carrier only as far as needed to insert the pins at one of the receptacle holes.
2. The illustrations below show the safety pins deployed (at left) and stowed (at right). Install the safety pins into the receptacle holes in the frame.



3. Remove electric power from the machine.

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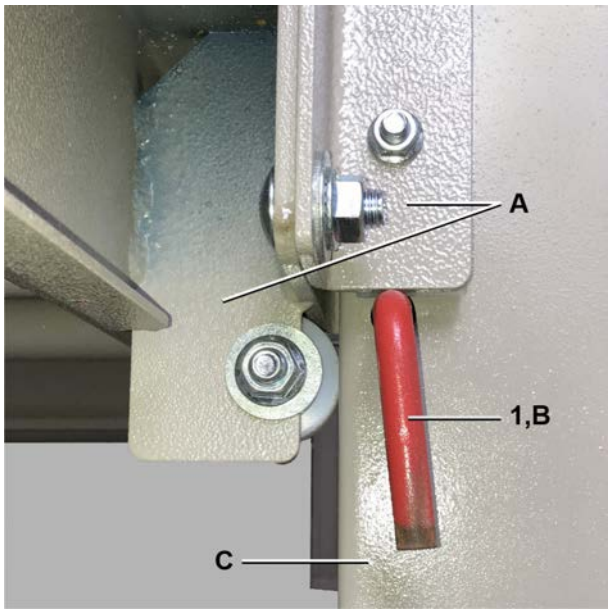
Safety Pin

All Elevating Shuttles and Pivoting Elevators.



Legend

A . . . Side Slider
B . . . Safety Pin, 2 instances, left and right
C . . . Vertical frame member

Table 1. Parts List—Safety Pin

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Components				
all	1	04 21496	SAFETY PIN-COSHA	

Proximity Safeguarding for Automatic Shuttle Conveyors

Proximity safeguarding—a means of preventing personnel from entering the path of a machine, such as an industrial robot, that moves within a large area.

1. Applicability

This document—

applies to Milnor® automated laundering systems with shuttle conveyors that move without operator intervention (automatic operation),

does *not* apply to shuttles that require operator input continually, such as directing all shuttle movements (manual operation).

2. References for Proximity Safeguarding

ANSI Z8.1-2016 “American National Standard for Commercial Laundry and Drycleaning Equipment and Operations - Safety Requirements”

OSHA Standard 29 CFR § 1910.212 “General Requirements for All Machines”

OSHA Directive STD 01-12-002 - Pub 8-1.3 “Guidelines for Robotic Safety”

ANSI/RIA R15.06-2012 “American National Standard for Industrial Robots and Robot Systems- Safety Requirements”

ANSI/ASME B15.1-2000 “Safety Standard for Mechanical Power Transmission Apparatus”

OSHA Publication 3067 “Concepts and Techniques of Machine Safeguarding”

ISO 10472-1 “Safety Requirements for Industrial Laundry Machinery”

3. Hazards To Personnel in Proximity to Shuttle Conveyors

Milnor automated laundering systems use automatic shuttle conveyors to transport goods among the processing machines in the system. Depending on model, an automatic shuttle conveyor may move in any of the following ways, in addition to running its conveyor belt(s):

- It may travel along (traverse) a line of machines (typically dryers).
- Its conveyor bed(s) may ascend and descend (elevate) within the machine frame.
- Its conveyor bed(s) may extend and retract within the machine frame.
- The conveyor bed and frame may pivot.
- Wet goods shuttles have a bucket that elevates and tilts.

These motions pose strike, crush, sever, and entrapment hazards to personnel in proximity to the shuttle. **For the safety of personnel, owner/users must provide proximity safeguarding that protects personnel from the moving shuttle.**

A common method of proximity safeguarding is safety fencing with interlocked gates that disable the shuttle when a gate is opened. When a shuttle is disabled, this will eventually cause other machines in the system to hold (wait for action from another machine), but it will not necessarily cause them to immediately stop moving. In the case of a tunnel system, the press or centrifugal extractor can pose additional hazards to personnel in proximity to the equipment. **Hence, the safeguards must also disable any presses or extractors.** Tunnels and dryers do not pose a significant hazard to personnel merely because they are in proximity to the equipment, and need not be automatically disabled.

WARNING 1: Multiple Hazards—Proximity safeguarding provides only partial protection and only against injury resulting from entering the shuttle path. It is not a substitute for proper

lockout/tagout procedures and good safety practices.

- Always lockout/tagout any individual machine (or follow the published maintenance procedures) when performing maintenance or clearing a fault on that machine.
- Ensure that all personnel understand the safeguards and do not attempt to defeat them.
- Inspect safeguards weekly to ensure that they are not mechanically or electrically circumvented.

4. How Milnor Accommodates Proximity Safeguarding

Milnor provides connection points on shuttles, presses and centrifugal extractors for interfacing with devices such as gate interlock switches. These connection points are tagged for easy identification. When Milnor provides equipment layout drawings for an automated laundering system, it indicates on the drawing, the perimeter of the shuttle movement area that must be guarded. The following hazard statement is displayed on connection point tags as well as equipment layout drawings prepared by Milnor:

WARNING 2: Strike, Crush, Sever, and Entrapment Hazards—Serious bodily injury or death can result to personnel in proximity to machinery/systems that traverse, elevate, extend, pivot, and/or tilt. The following mandatory minimum safety requirements must be installed with the machinery system (local codes may require additional precautions):

- Safety fence enclosing machine movement areas,
- Lockable electrical interlocks on all gates, properly interfaced as shown on machine schematics, to disable machine movement when any gate is opened,
- Signs to alert personnel to these hazards, placed prominently around the fenced area.

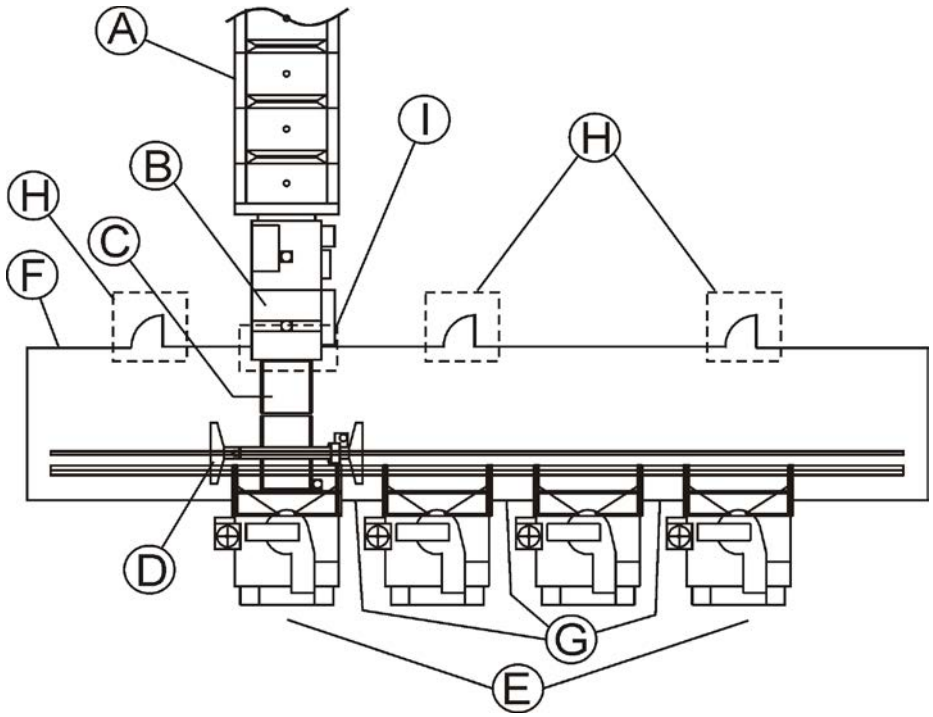
Although the objectives of proximity safeguarding are the same anywhere, design requirements vary with local codes (which occasionally change) and with the plant layout. For this reason, Milnor does not provide detailed designs or materials for proximity safeguarding. If the necessary expertise does not exist within the owner/user's organization, consult appropriate sources such as local engineers or architects specializing in industrial facility design.

5. Examples of Safety Fencing With Interlocked Gates

Fencing with interlocked gates like that depicted in Figure 1 and Figure 2, may be used to meet the proximity safeguarding requirement. Should the owner/user choose this method, the following information may be useful. However, **this information may not satisfy current or local code requirements. The owner/user must determine its suitability for his particular facility.**

Figure 1: Example Fence Layout for Automated Laundering System Where One Tunnel Serves a Bank of Dryers

Plan View of Laundering System

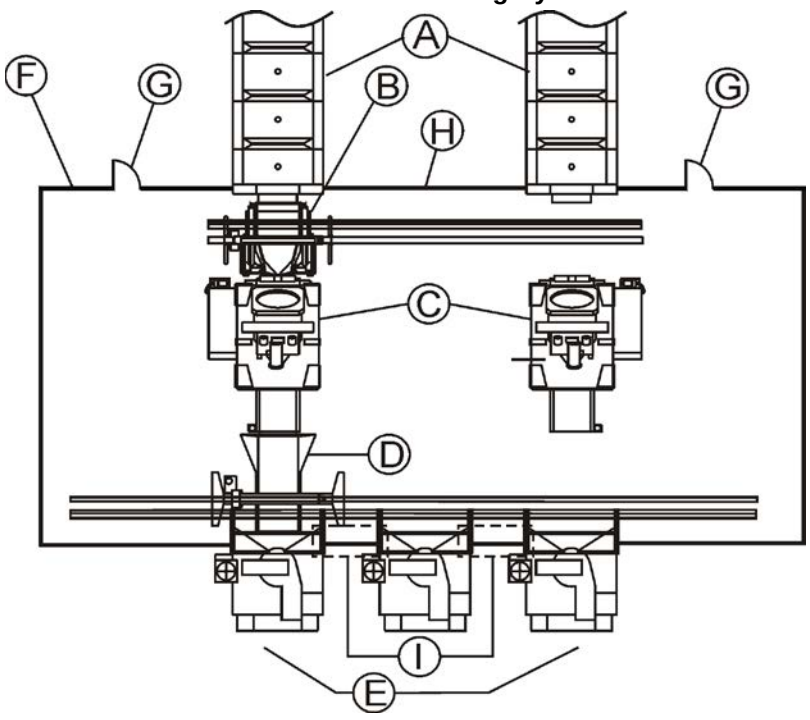


Legend

- **A.** Continuous Batch Washer (tunnel)
- **B.** Press extractor
- **C.** COINC inclined conveyor
- **D.** Traversing and elevating shuttle conveyor for pressed cakes
- **E.** Bank of dryers
- **F.** Fence enclosing path of shuttle
- **G.** Fence segments between dryers
- **H.** Electrically interlocked gates. Gates swing outward at least 90 degrees and swing area is marked on floor. Provide multiple gates for long fence runs.
- **I.** Fence restricts access to unload end of press, but does not obstruct access to press controls.

Figure 2: Example Fence Layout for Automated Laundering System Where Two Tunnels Serve a Bank of Dryers

Plan View of Laundering System



Legend

- **A.** Continuous Batch Washers (tunnels)
- **B.** Traversing and elevating shuttle conveyor for wet goods
- **C.** Centrifugal extractors
- **D.** Traversing and elevating shuttle conveyor for loose goods
- **E.** Bank of dryers
- **F.** Fence enclosing paths of both shuttles and both centrifugal extractors
- **G.** Gates interlocked with both shuttles and both centrifugal extractors.
- **H.** Fence segment between tunnels.
- **I.** Fence segments between dryers.

5.1. Fence Dimensions—The fence must discourage climbing over and prevent crawling under.

5.2. Fence Materials and Setback—The fence must be constructed of materials and located so as to prevent personnel from reaching through gaps in the fence and contacting the enclosed machinery.

5.3. Gates—Personnel gates must be held firmly closed but permit personnel to easily pass through when necessary. Gates must be equipped with a positive latching arrangement to prevent accidental opening. Adequate floor space must be provided to allow the gate to swing at least 90 degrees when fully open. Gates must open outward; that is, away from the fenced perimeter. The floor must be permanently marked to show the gate's swing area, to discourage obstructing its movement.

5.4. Control Circuitry—All gates must be electrically interlocked with any shuttle conveyors within the fenced area and with any presses or centrifugal extractors that the fence either encloses or intersects. Opening any gate must have the following effects:

1. Shuttle(s), press(es), and/or centrifugal extractor(s) stop moving immediately.
2. An audible alarm sounds.
3. Shuttle(s), press(es), and/or centrifugal extractor(s) cannot be restarted merely by closing the gate(s), but must be restarted at the machine control panel once the gate(s) are closed.

Milnor shuttles, presses and centrifugal extractors provide such functionality when properly interfaced with gate interlock switches.

5.5. System Emergency Stop Switches—The laundry must establish rules and procedures that prohibit personnel from remaining within the fenced area with machine(s) enabled, except in accordance with published maintenance procedures. System emergency stop switches (panic buttons) should be provided inside and outside the fenced perimeter. Emergency stop switches should be located so that personnel anywhere inside the fenced perimeter are only a short distance from a switch, and they should be clearly marked as to their locations and function. Connect switches in series with the gate interlocks so that pressing an emergency stop switch performs the same control function as opening a gate.

5.6. Isolating Individual Machine Controls—The interlock circuitry for each machine must be electrically isolated from that of the other machines. Hence, each gate interlock switch must provide as many pairs of dry contacts as there are machines to interface to. A pair of switch contacts must never be shared by two or more machines.

5.7. Recommended Signage—Safety placards should be posted along the fence and at each gate, alerting personnel to the hazards within. At minimum, the size of lettering and distance between placards should be such that anyone contemplating entering the fenced area will likely see and read the placard first. Wording should be provided in each native language spoken by laundry personnel.

— End of BISUUI01 —

Glossary of Tag Illustrations—Shuttle

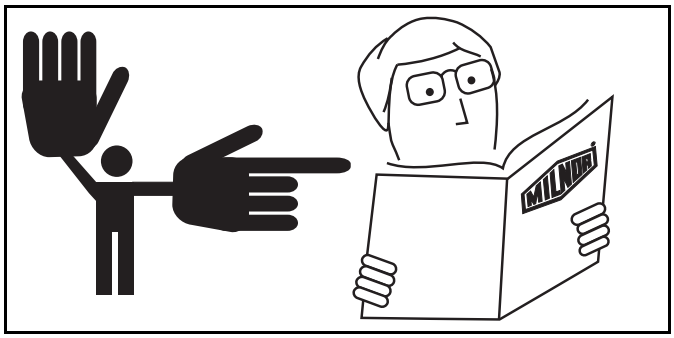
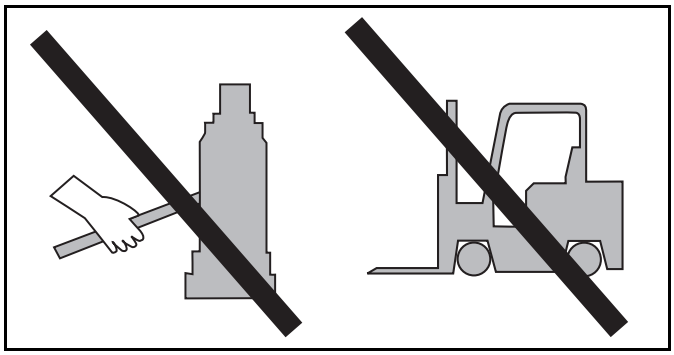
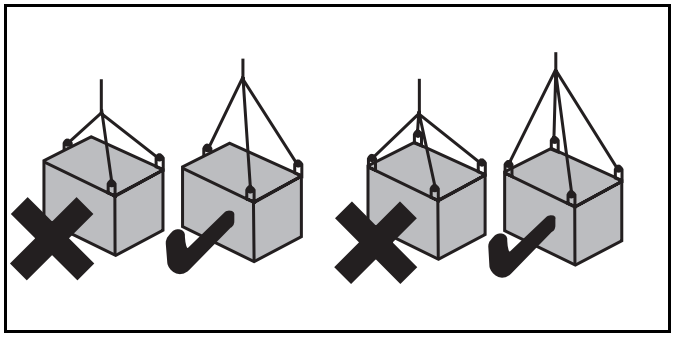
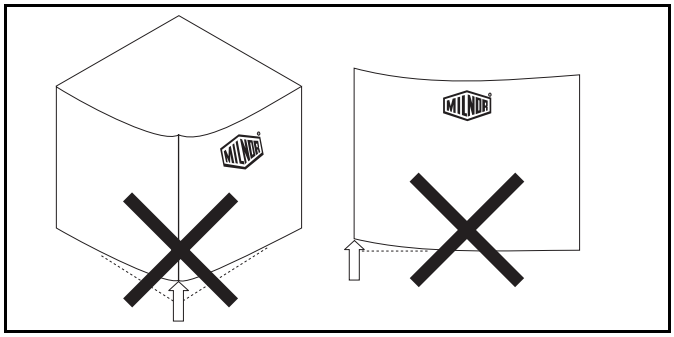
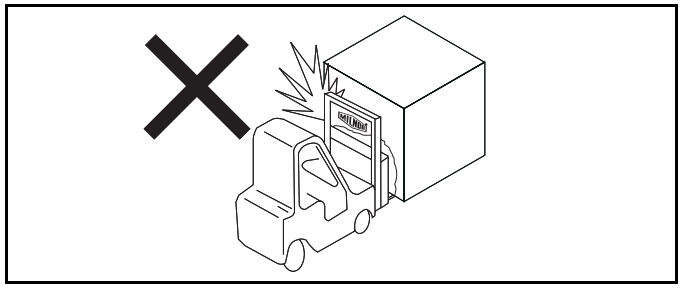
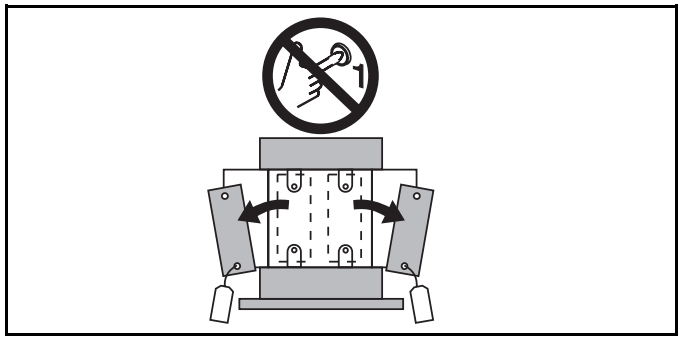
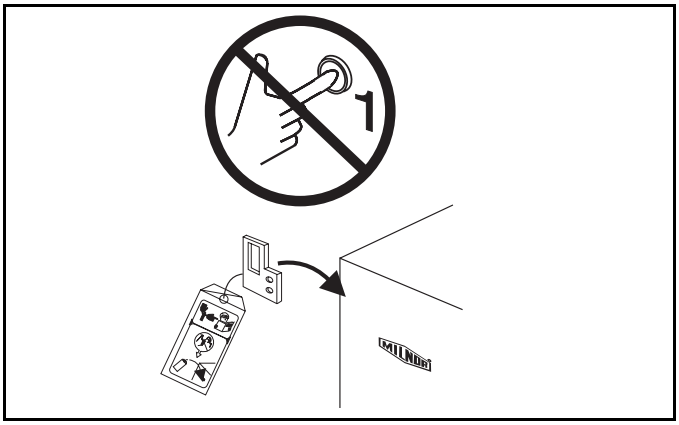
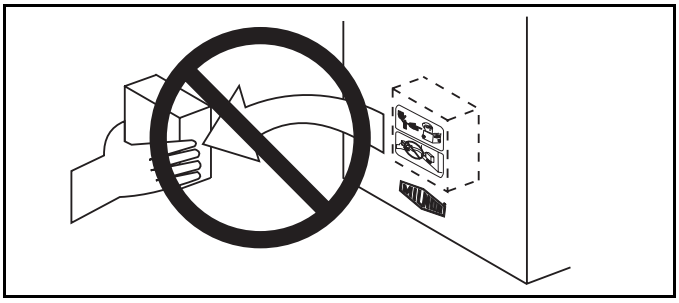
Illustration	Explanation
	Stop! Read the manual first for complete instructions before continuing.
	Do not jack the machine here. Do not lift the machine here.
	Use three point or four point lifting as determined by the lifting eyes furnished. Rig the load using lifting cables of sufficient size and length to ensure cables are not over-stressed.
	Do not lift the machine from one corner or one side edge.

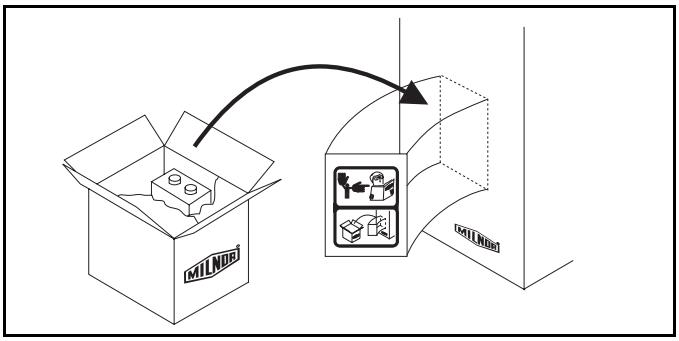
Illustration	Explanation
	Do not strike machine or components during fork lifting.
	Do not start this machine until the packing materials, lifting brackets, etc. with this tag attached or behind this panel are removed. These materials are painted red. Safety stands or brackets (also painted red) may be provided with this machine. Do not discard safety stands or brackets
	Do not step or stand on this machine part.
	This motor or pump should rotate in the direction of the arrow.



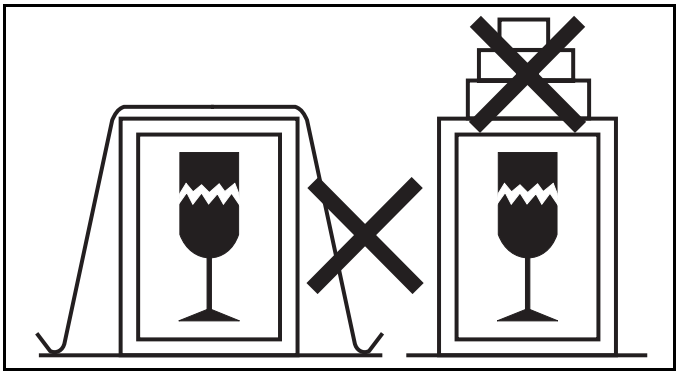
Do not start this machine until the part with this tag is installed on the machine.



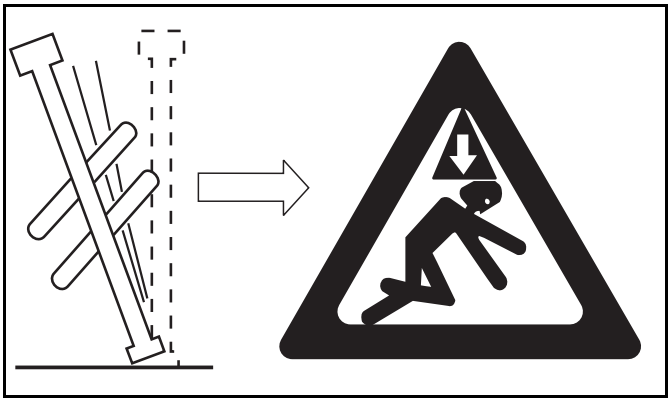
Do not remove this component from the machine.



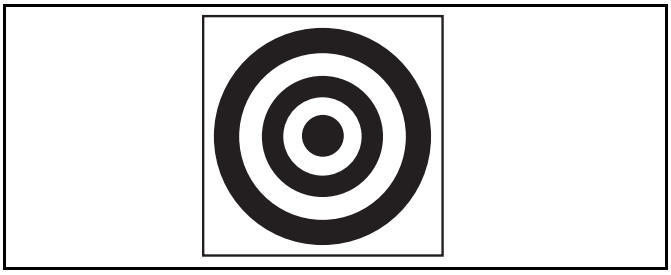
Install the appropriate part here before operating the machine.



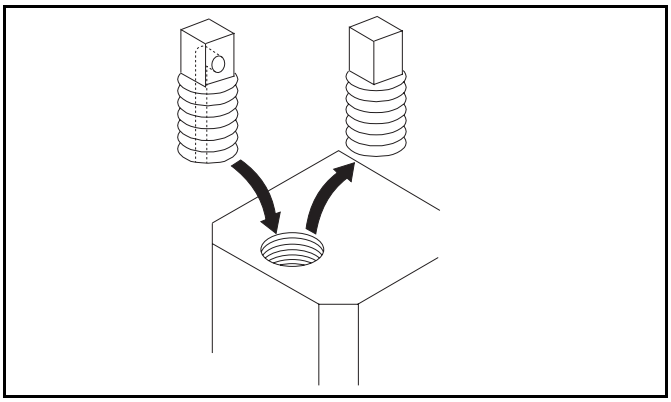
Do not strap or chain over box



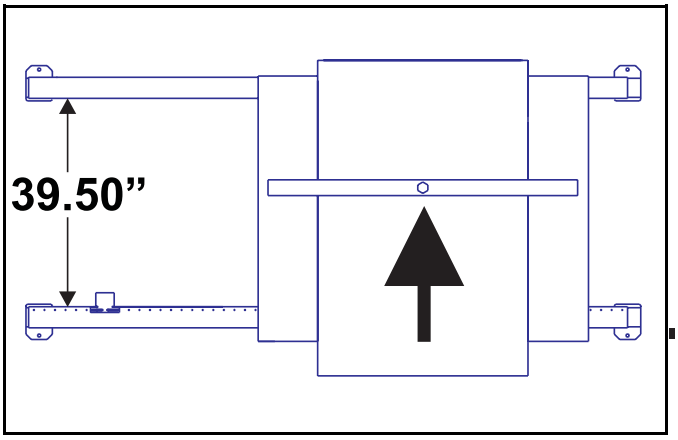
Do not attempt to balance the shuttleon the lower shipping brackets. Always suspend and lift the shuttle from the lifting eyes at the top of the machine.



This is the target that will actuate the shuttle proximity switch with the matching function code.



Replace non-vented plug with vented plug on gear reducer before operating



Rails with holes go on load end.

.

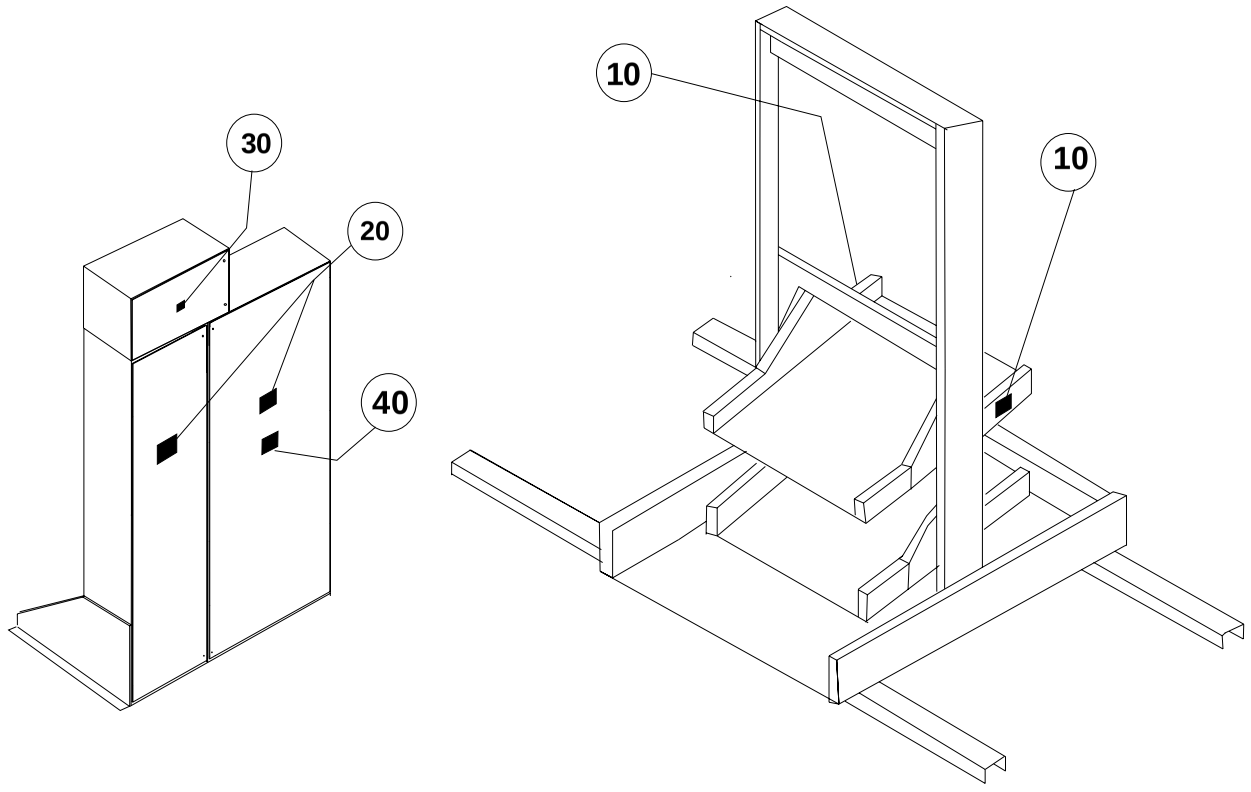
Safety Placard Use and Placement

ALL SHUTTLES

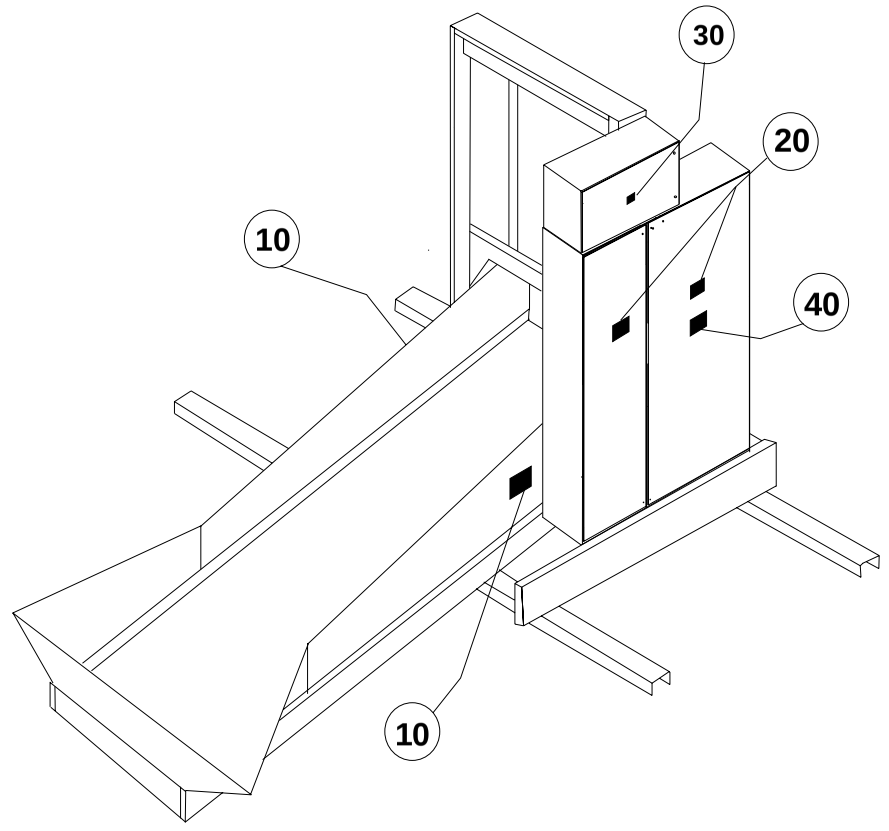
Pellerin Milnor Corporation
P. O. Box 400, Kenner, LA 70063-0400

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.**



TYPICAL CAKE SHUTTLE



TYPICAL LOOSE GOODS SHUTTLE

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 10375B	NPLT:ELEC HAZARD SMALL-TCATA	
all	40	01 10699A	NPLT:SERV HZRD-PLYEST-TCATA	

Safety Placard Use and Placement ISO

ALL SHUTTLES

BMP070017/2007215B
(Sheet 1 of 2)

Pellerin Milnor Corporation
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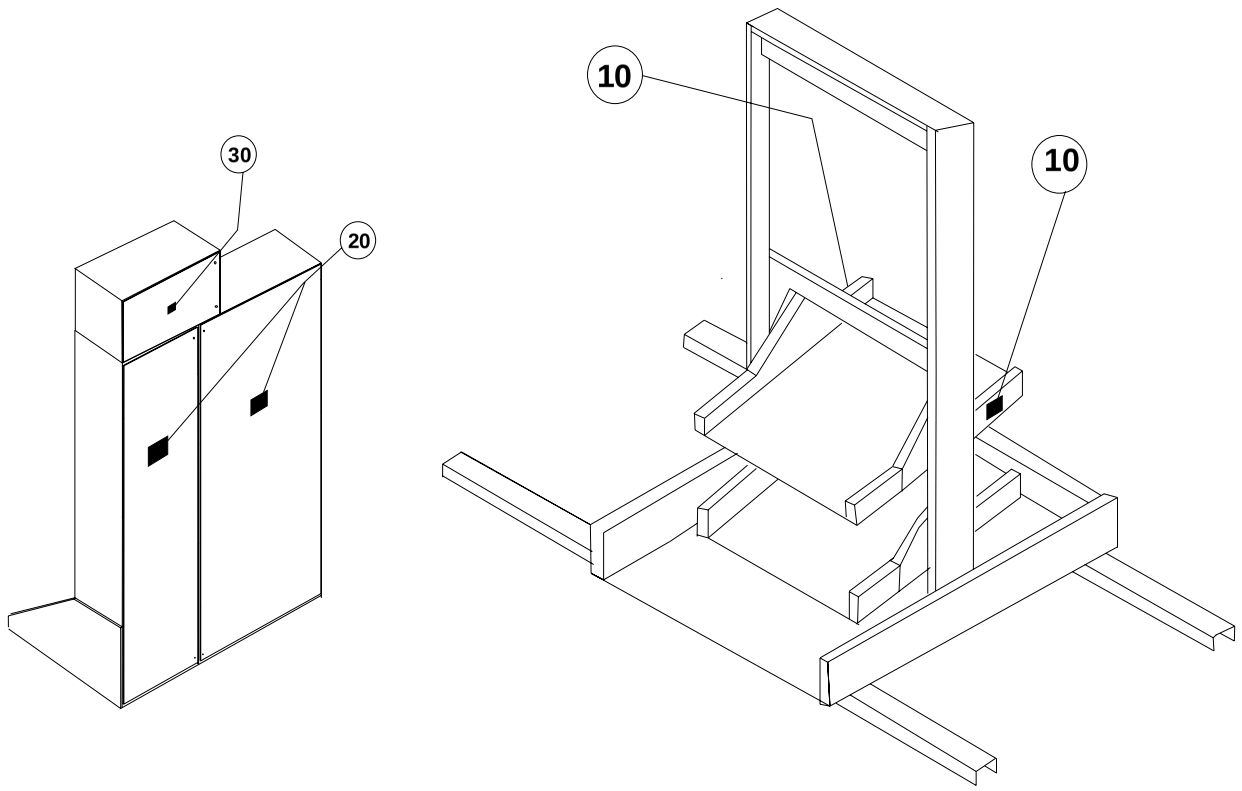
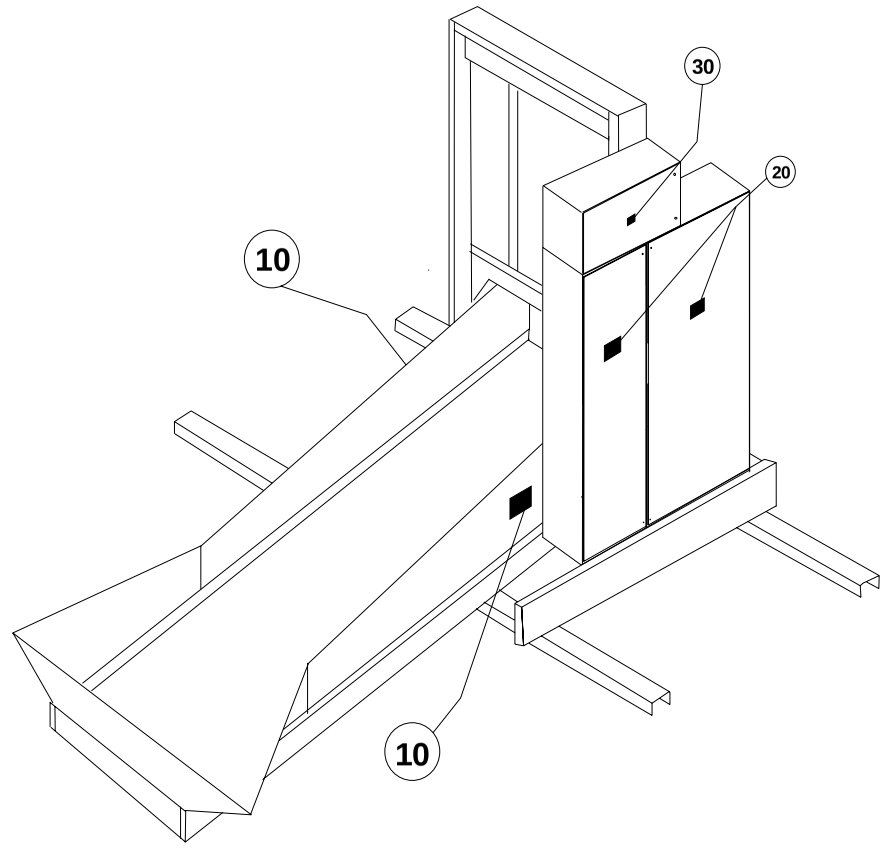
ISO Placards shown on this page

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.**



TYPICAL CAKE SHUTTLE



TYPICAL LOOSE GOODS SHUTTLE

Pellerin Milnor Corporation
P. O. Box 400, Kenner, LA 70063-0400
Litho in U.S.A.

Parts List—Safety Placard Placement

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

Safety Placard Use and Placement

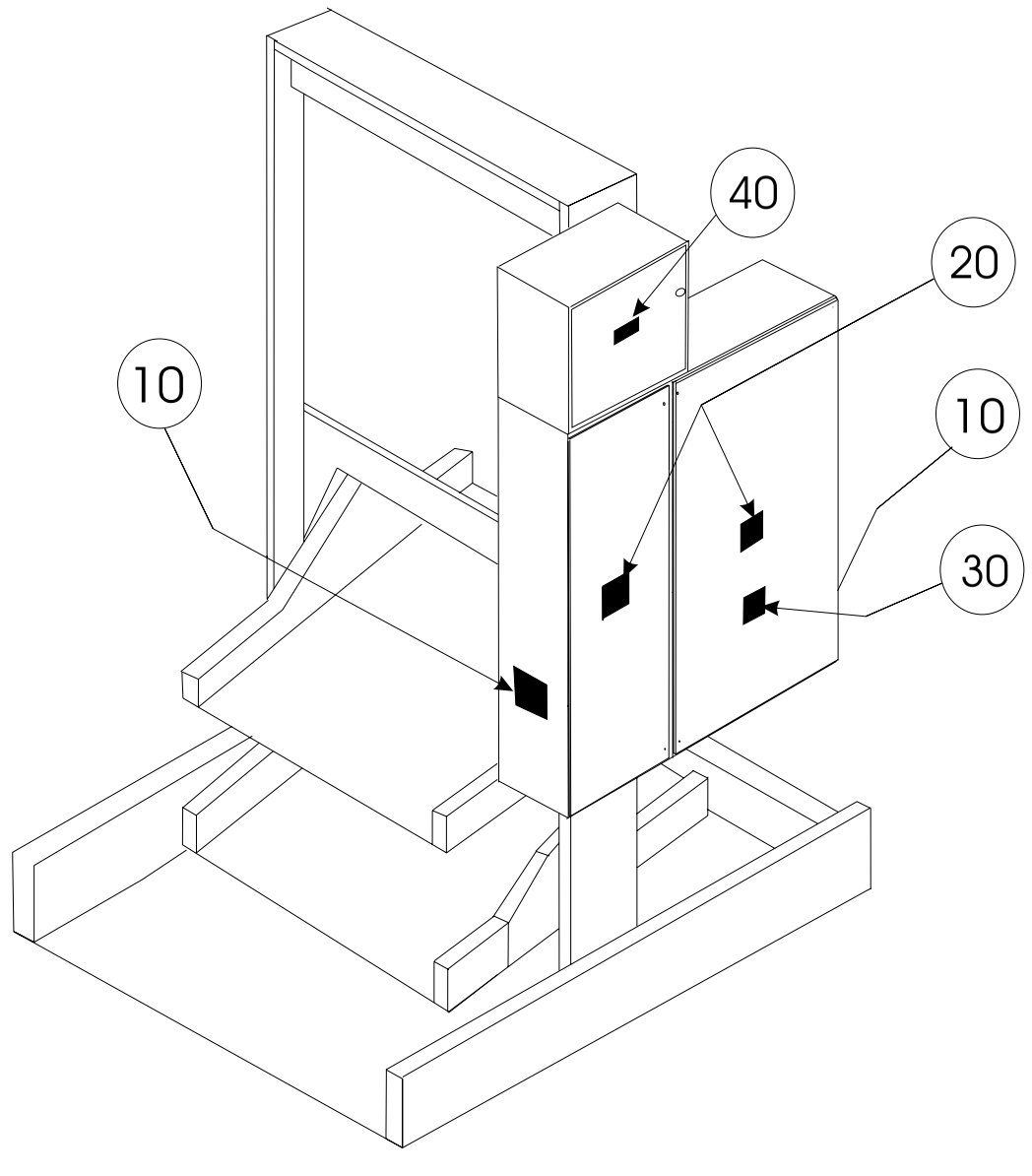
ALL ELEVATING CONVEYORS

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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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

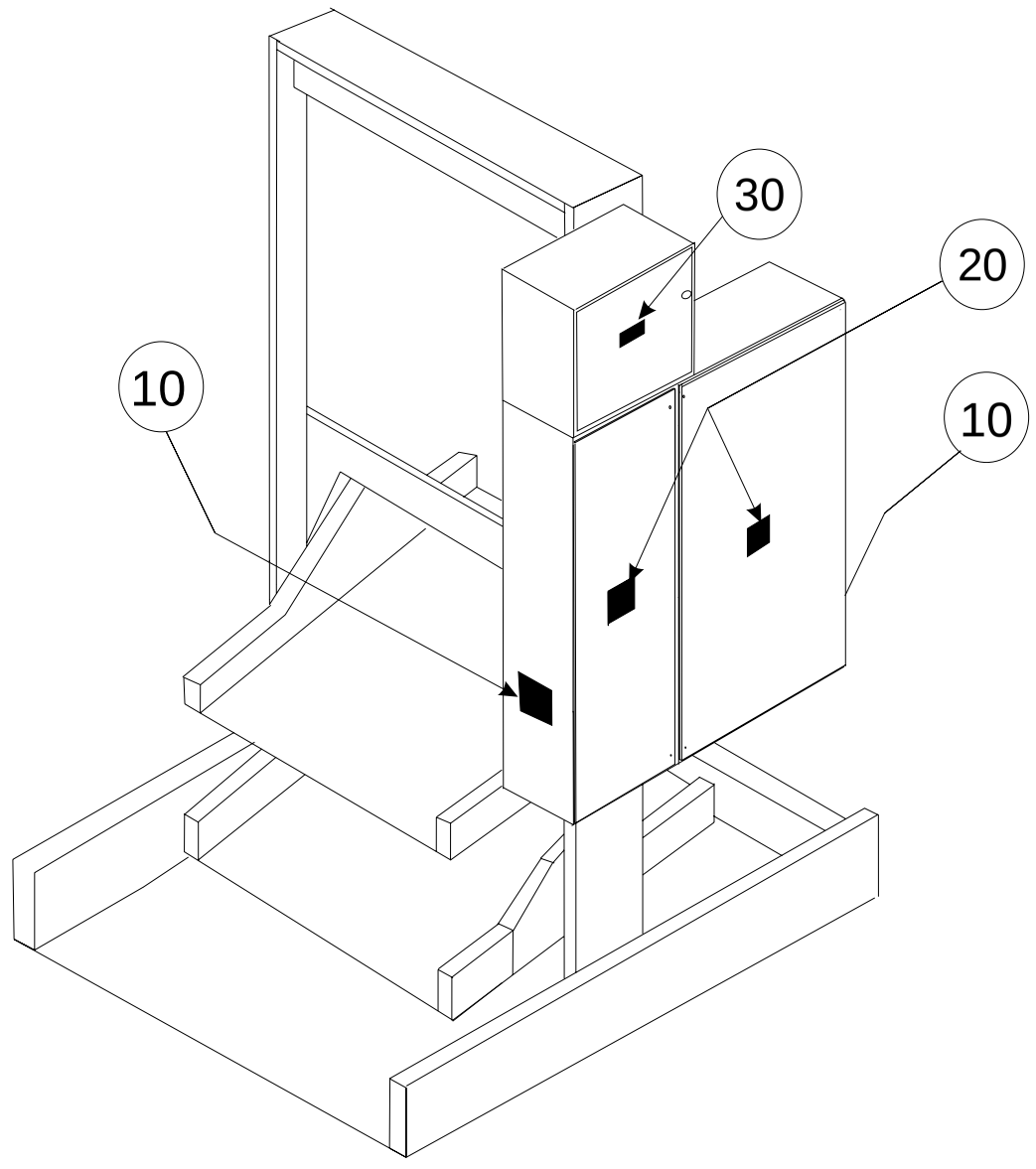
ALL ELEVATING CONVEYORS

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
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 10564X	WARNINGS:SHUTTLE ISO	
all	20	01 10377	NPLT:"WARNING" 4X4	
all	30	01 10375	NPLT:"WARNING" 2X2	

Service and Maintenance 2

REPLACING SHUTTLE LIFT CHAINS

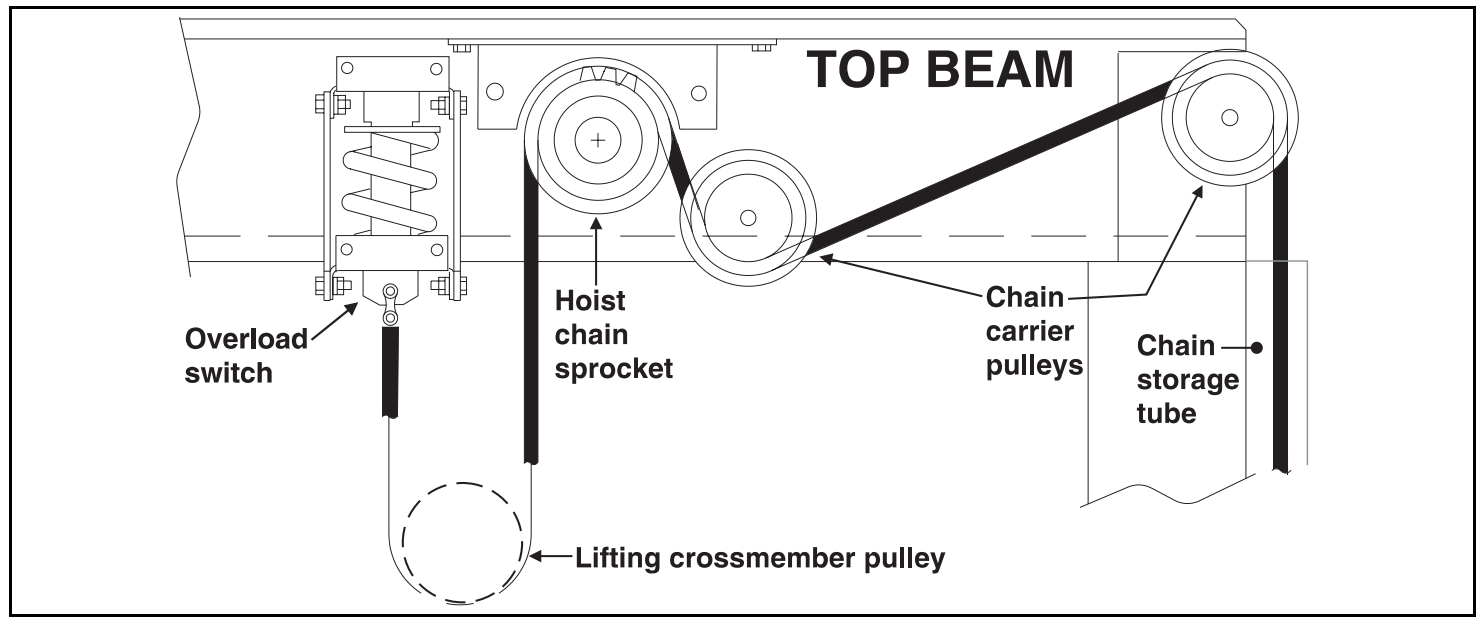


FIGURE 1 (MSSM0943AE)
Typical Chain Path

NOTE 1: Determine the existing chain length before ordering a new chain.

NOTE 2: The overload to chain connection fasteners (FIGURE 3) are made of specially hardened steel. Do not replace with a standard masterlink.

Component	Pounds	Kilograms
Gear Reducer Motor Unit	135	61
Chain	1.8 Pounds per Foot	2.7 Kilograms per Meter

FIGURE 2 (MSSM0943AE)
Component Weights

Special tools required—This procedure requires safety harnesses, two technicians, a forklift, and a chain hoist or other suitable lifting device capable of supporting the weight of the gear reducer and motor (FIGURE 2).

The chain path—The chain attaches at the overload switch, leads down to the lifting crossmember pulley, then up to the hoist chain sprocket. After leaving the sprocket, the chain travels through a series of chain carrier pulleys and stores in the chain storage tube as shown in FIGURE 1 above.

⚠WARNING⚠

ENTANGLE AND CRUSH HAZARD—Chain sprockets and pulleys can entangle and crush fingers.

- **Lock OFF and tag out power at the wall disconnect before servicing.**
- **NEVER attempt to thread chain by manually operating gear reducer motor.**

⚠WARNING⚠

FALL HAZARD—You can lose balance and fall from a shuttle bed.

- **Permit only qualified personnel to perform these procedures.**
- **Wear safety harness while working on shuttle.**
- **Insert factory supplied safety pins into shuttle beds.**
- **Follow procedure carefully.**

Replace the chain as follows:

1. Carefully inspect the overload switch, lifting crossmember, and hoist chain sprocket for excessive wear.
2. Using a forklift, chain hoist, or other hoisting device, lift the shuttle bed(s) as close as possible to the top beam to minimize the amount and weight of chain that must be threaded though the chain path and to provide a stable working area. Install the factory supplied safety pins. Pins must be inserted completely through the side rail as shown in FIGURE 4. Wear a safety harness secured to the top beam or other strong support to prevent serious injury in the event of a fall from the top of the shuttle.

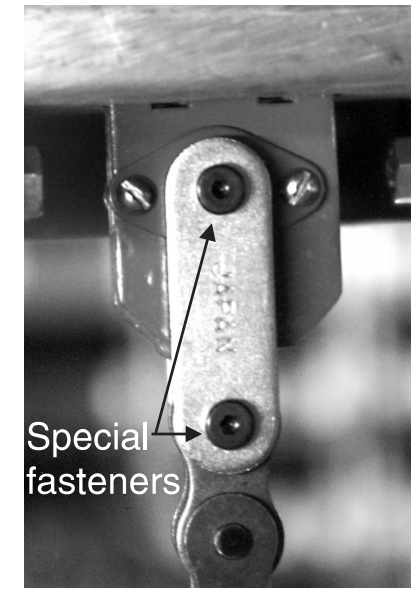


FIGURE 3 (MSSM0943AE)
Overload Switch to Chain Connection Detail

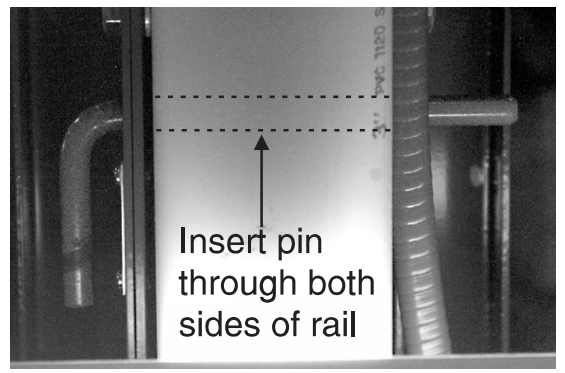


FIGURE 4 (MSSM0943AE)
Correct Safety Pin Insertion

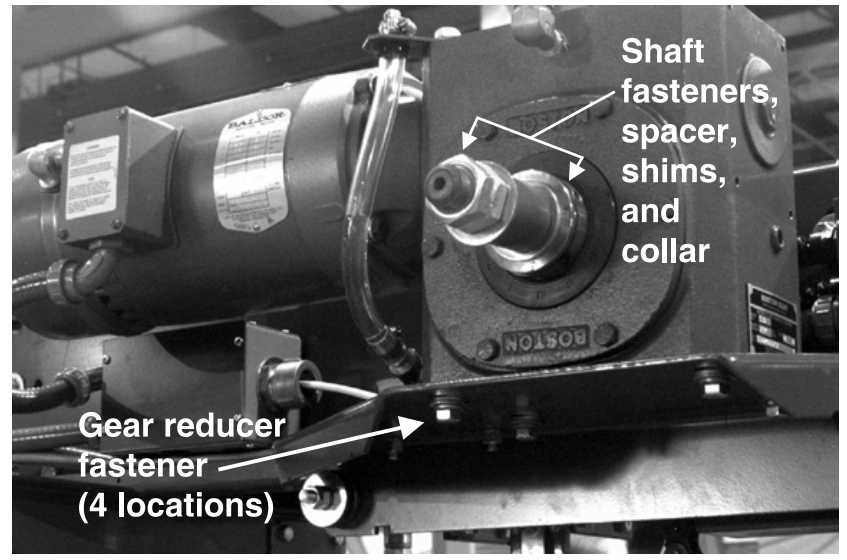


FIGURE 5 (MSSM0943AE)
Gear Reducer and Motor Details

3. Attach one end of a suitably sized rope to the gear reducer and motor unit and run the other end over the top of a beam or other strong structure above the shuttle. This rope is necessary as a safeguard, preventing the gear reducer and motor assembly from falling off the shuttle during this procedure. **The gear reducer and motor assembly do not need to be completely removed from the hoist chain shaft.**
4. Remove the gear reducer fasteners, shaft fasteners, spacer, shims, and collar allen screws (FIGURES 5 and 6). Slowly and carefully slide the gear reducer and motor unit back until the key and keyway appear (FIGURE 7). Remove the key to disconnect the gear reducer from the shaft. Attach two feet of electrical wire to the first chain link. Thread the wire through the sprocket, then pull on wire and turn the shaft by hand to draw chain onto sprocket and through chain path, as shown in FIGURES 8 and 9. Remove the wire after the first chain link is around the last pulley.
5. Carefully feed about two feet (610) of chain down the chain storage tube.

NOTICE

Failure to install key during following step will result in machine malfunction.

6. Apply anti-seize to hoist shaft then re-install key and gear reducer to hold the chain in position.
7. Use the manual controls to take up all the chain slack (see “MANUALLY OPERATING THE MARK III SHUTTLE” in the Reference manual. Remove the safety pins after the chain is tight and resume normal operation.

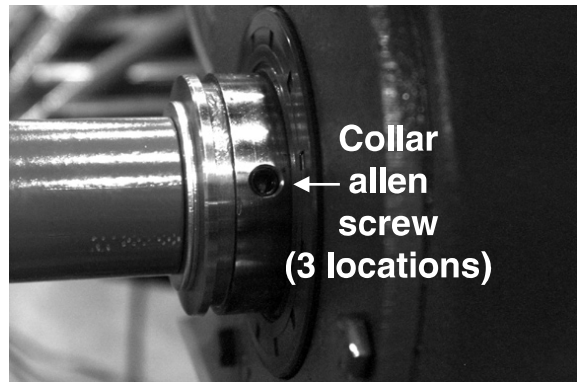


FIGURE 6 (MSSM0943AE)
Gear Reducer Collar Details

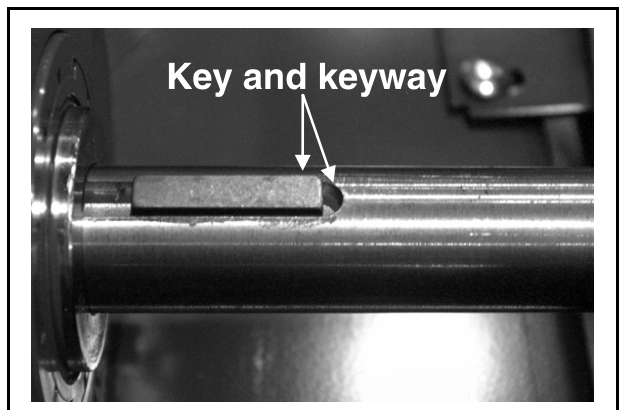


FIGURE 7 (MSSM0943AE)
Hoist Shaft Details

FIGURE 8 (MSSM0943AE)
Hand Threading New Chain

FIGURE 9 (MSSM0943AE)
Using Wire to Thread Chain

SETTING SLACK/TIGHT CHAIN SAFETY SWITCHES

The slack\tight chain safety switches are located on the top beam of the shuttle, opposite from the hoist motor. The upper switch senses when the chain is slack and is also used to set the lowest position of the shuttle. At initialization (when the control is first energized), and each time the shuttle returns to the press, the hoist automatically lowers until the slack chain switch is actuated, then raises again until the switch is released. The lower switch senses when the chain is too tight. Some software versions test the tight chain safety switch during initialization by automatically raising the shuttle to its upper limit to verify that the switch is functioning correctly.

To set the safety switches, loosen the socket-head cap screws on both switches and position the switches away from the actuator so neither switch can come into contact with the actuator as it moves to its maximum upper and lower limits (see FIGURE 1).

NOTE: The following procedures require that the shuttle be raised and lowered manually, using either commands to the keypad on the controller or using the manual switches on the shuttle frame.

Setting the Slack Chain (Upper) Switch

1. Lower the shuttle until the chain is slackened. Be sure to stop the hoist motor after the chain has slackened, otherwise all the chain may be pulled out of the chain box.
2. Position the **upper** switch until it is depressed halfway within its total travel, then tighten the screws which secure it.
3. Raise the shuttle then lower it until chain goes slack. Visually confirm that the slack chain switch is actuated (when in manual mode, the hoist motor will not stop automatically when the chain becomes slack).

Setting the Tight Chain (Lower) Switch

1. Lower shuttle until chain goes slack.
1. Insert safety pins in vertical rails immediately above the shuttle bed to block the bed from moving up.
2. Raise the shuttle until it stops and let the hoist motor stall for almost two seconds. This ensures that the cross member has contacted the safety pins and that the switch actuator mechanism has fully extended.
3. Mark location of the actuator.

⚠ CAUTION ⚠

PROPERTY DAMAGE HAZARD. Do not stall hoist motor for more than two seconds or it may burn out.

4. Position the **lower** switch until it is depressed halfway within its total travel, and the actuator is fully extended. Then tighten the screws which secure it.

5. Lower the shuttle, then lift it again to confirm that the tight chain switch is actuated and the hoist motor stops automatically.

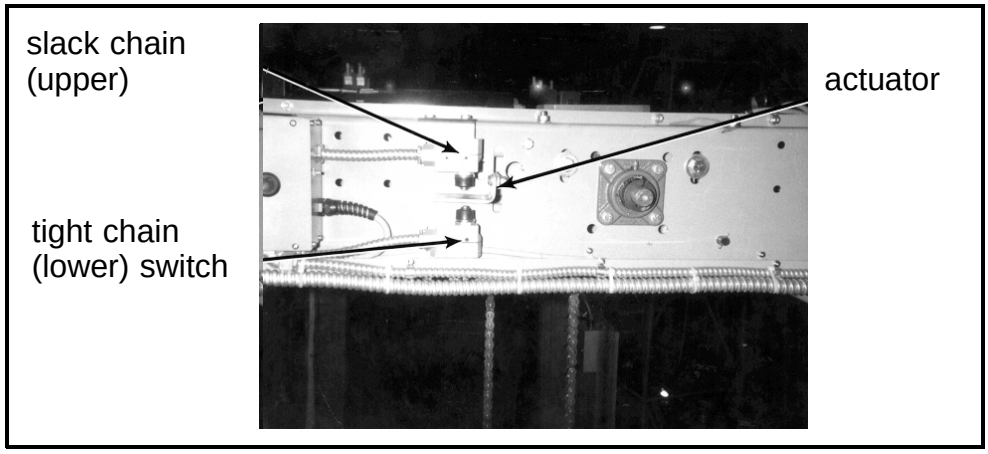


FIGURE 1 (MSSM090AE)
Shuttle Top Beam

6. Check all mounting screws for tightness.

Replacing the Motor and Secondary Brake Assembly on CF40xxxx and CL40xxxx Shuttles

Document BIVSRM01
Spec Date..... 19991110
As-of Date..... 19991110

1. Required tools

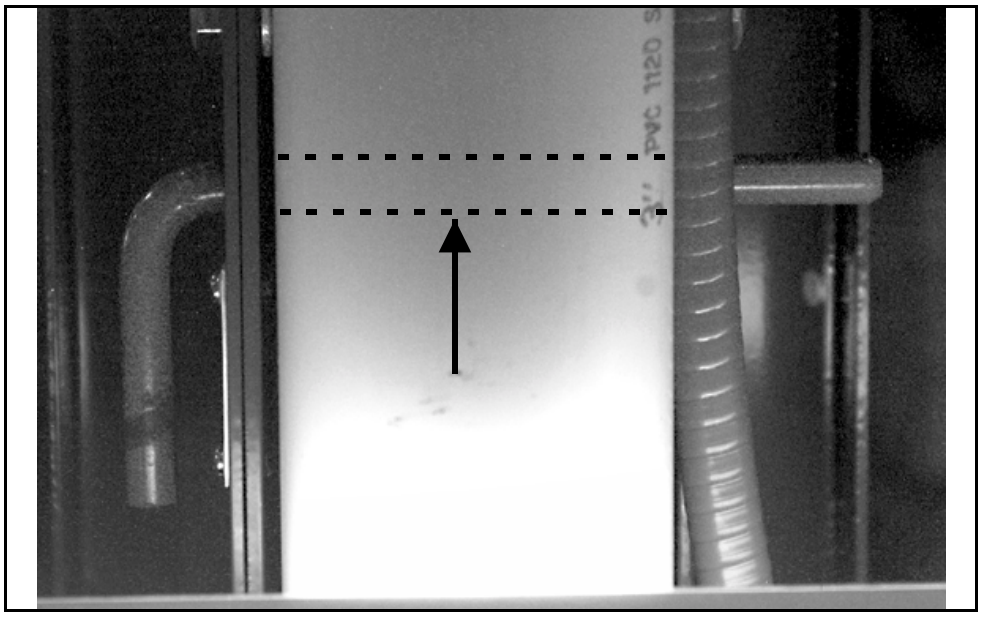
This procedure requires safety harnesses, two technicians, a forklift, and a chain hoist or other suitable lifting device capable of safely supporting the weight of the motor (approximately 65 pounds - 29.5 kilograms).

2. Removing the motor and secondary brake assembly

WARNING 1: Fall Hazard—You can lose balance and fall from a shuttle bed.

- Permit only qualified personnel to perform these procedures.
- Use safety harness while working on shuttle.
- Insert factory supplied safety pins into shuttle beds.
- Follow procedure carefully.

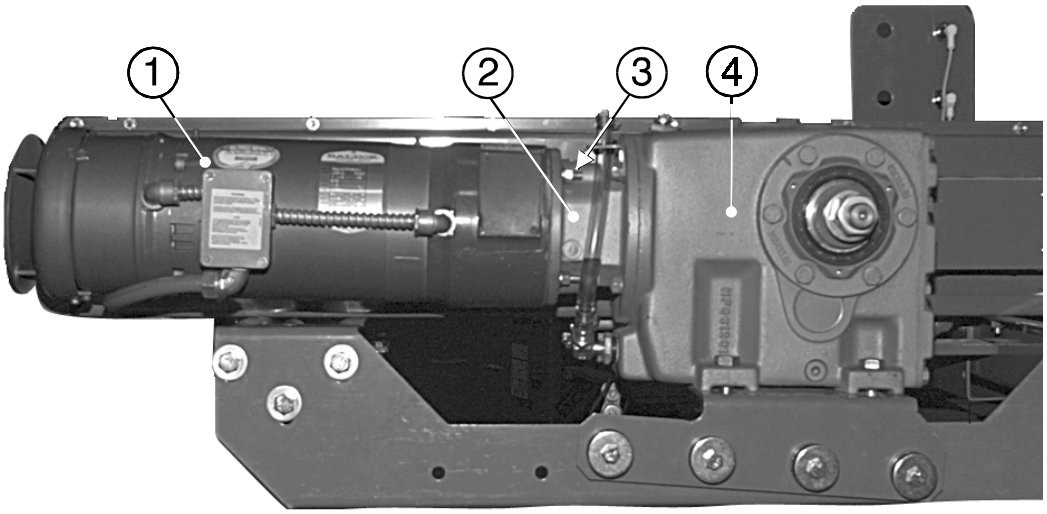
Figure 1: Pin inserted through rail



1. Using a forklift, chain hoist, or other hoisting device, lift the shuttle bed(s) as close as possible to the top beam to minimize the chain weight and provide a stable work area. Install the factory supplied safety pins. Pins must be inserted completely through the side rail as shown in Figure 1. Wear a safety harness secured to the top beam or other strong support to prevent serious injury in the event of a fall from the top of the shuttle.
2. Attach one end of a suitably sized rope to the motor/secondary brake unit and run the other end over the top of a beam or other strong structure above the shuttle. Loosen the locking collar clamp screw and key set screw (Figure 4) holding the secondary brake shaft to the gear reducer. Access these items through the access ports shown in Figure 3. Remove the four motor-to-gear reducer fasteners (Figure 2, item 3). Lower motor to ground.

Figure 2: Shuttle Components

Identifing components

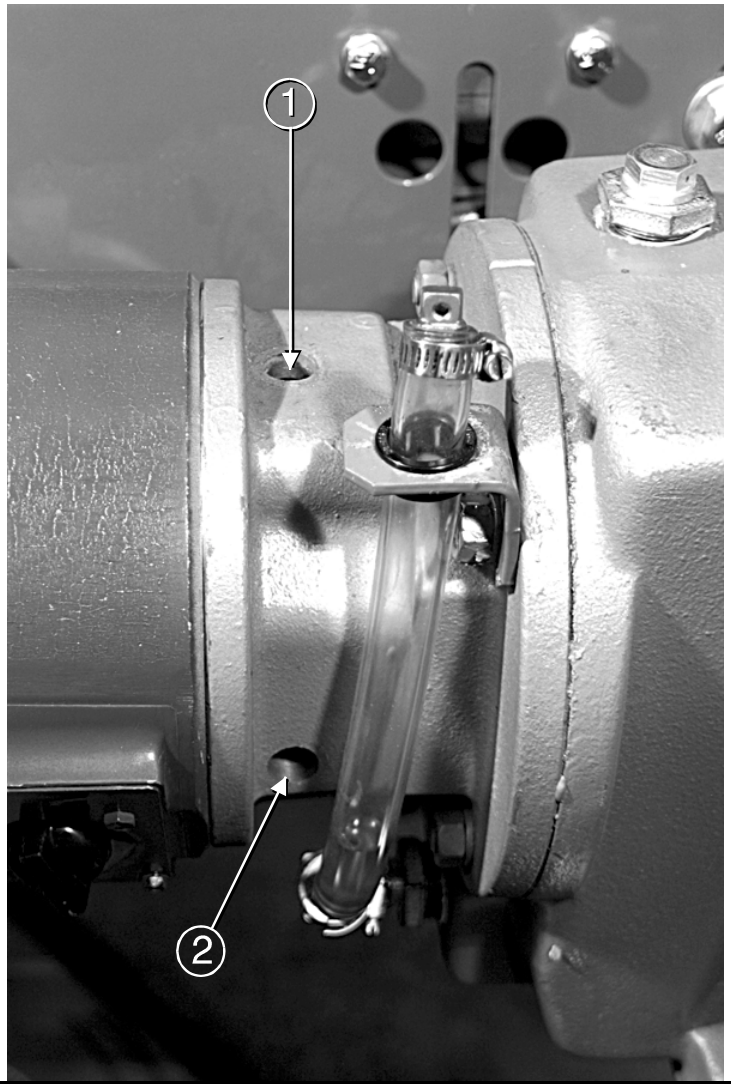


Legend

1. Shuttle hoist motor
2. Secondary brake
3. Motor to gear reducer fasteners (4)
4. Gear reducer

Figure 3: Removing or installing the secondary brake on the gear reducer

Access ports for locking collar



Legend

1. Key set screw access port
2. Clamp screw access port

3. Reinstalling Shuttle Motor/Secondary Brake Assembly

A locking collar (Figure 4) connects the motor and secondary brake assemblies (Figure 2) to the gear reducer. If this locking collar is incorrectly installed, the connection between the secondary brake shaft and the gear reducer will loosen, causing the shuttle bed(s) to not elevate and/or slip.

1. Screw key set screw in until one thread is exposed (as shown in Figure 4).
2. Manually rotate the gear reducer shaft until the keyway slot is vertical (Figure 5). Slide the locking collar on the gear reducer shaft. Check that the collar cannot be rotated on the gear reducer shaft.

Figure 4: Examining the locking collar

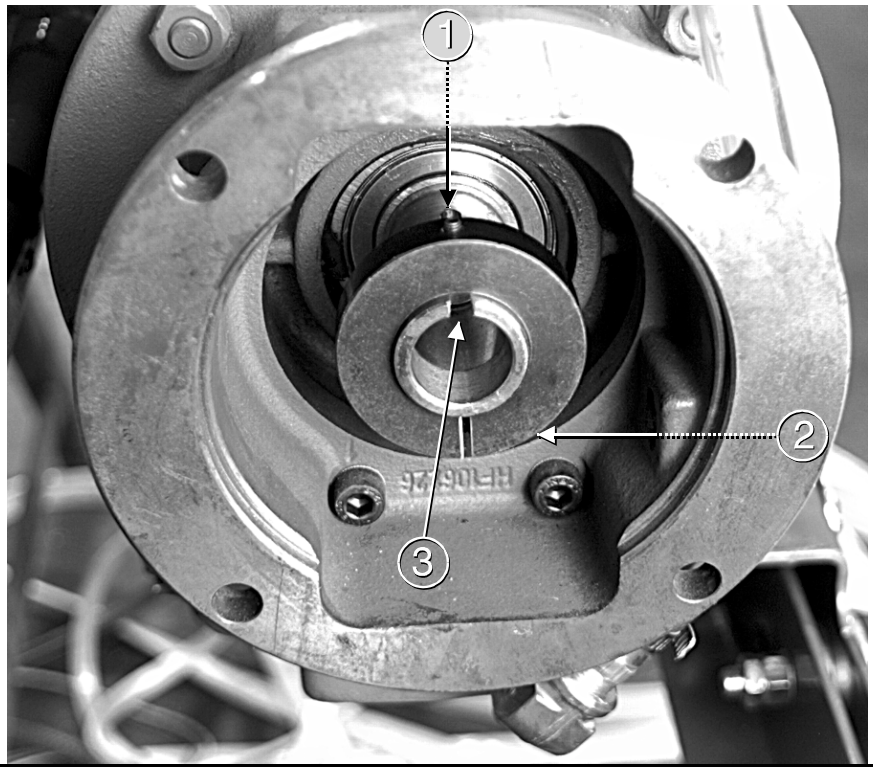
Key set screw and clamp screw

Legend

1. Key set screw
2. Clamp screw

Figure 5: Locking collar in place

Key set screw and clamp screw orientation



Legend

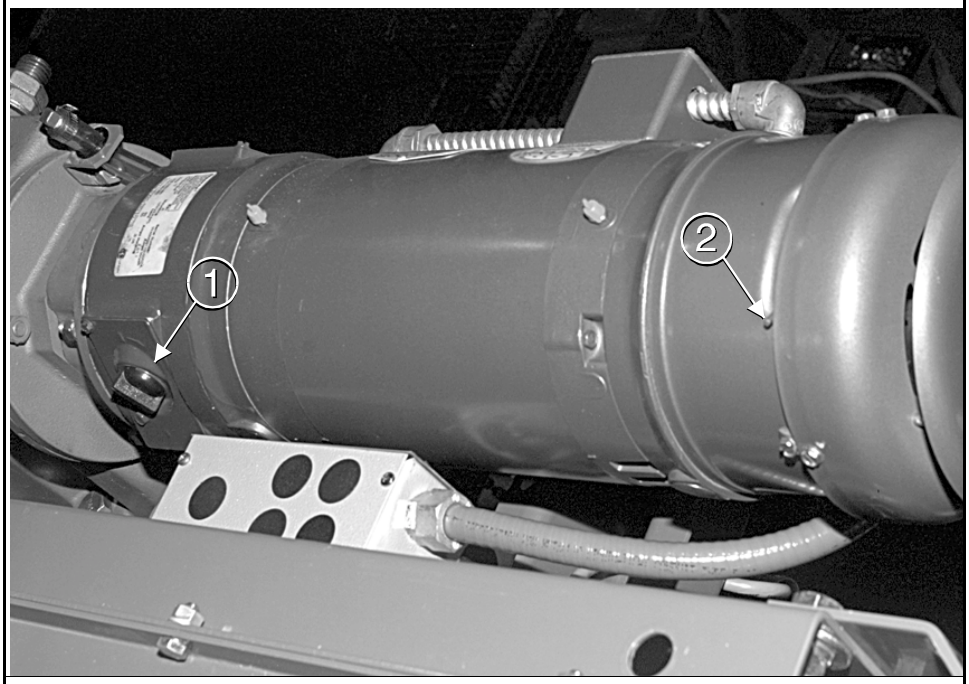
1. Key set screw
2. Clamp screw
3. Keyway slot

Note 1: Motor and secondary brakes lock as soon as control power is restored to machine.

3. Slide the secondary brake onto motor shaft. Release both the motor and secondary brake (Figure 6), if necessary, to rotate the secondary brake shaft to match the gear reducer shaft. Slide the brake shaft into gear reducer shaft (Figure 7). Lock both brakes at this time to prevent the shaft from rotating out of the correct position for tightening the locking collar.
4. Install and tighten the motor-to-gear reducer fasteners.
5. Tighten the clamp screw, then tighten the key set screw through the provided access ports (shown in Figure 3).

Figure 6: Identifing the secondary and motor brake releases

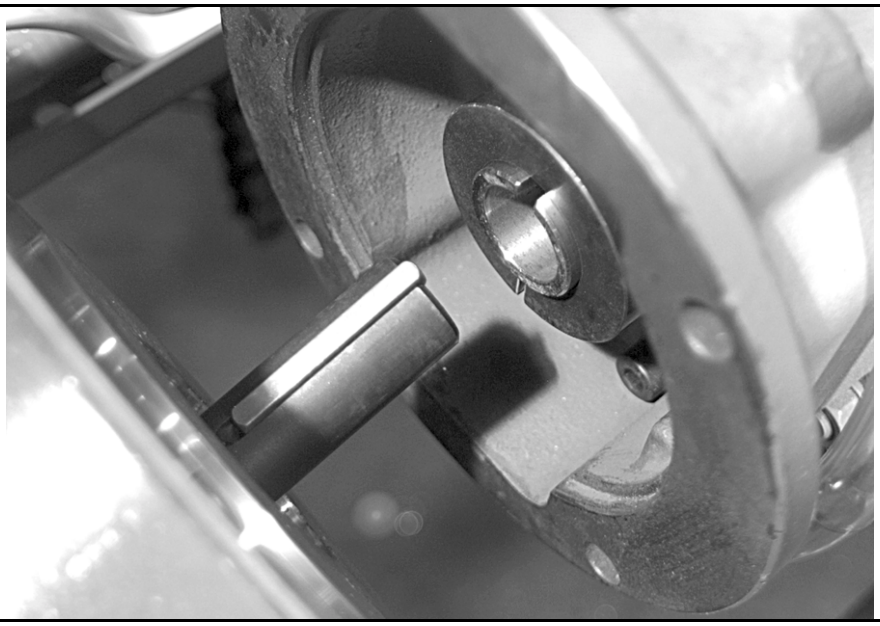
Top view



Legend

1. Secondary brake release
2. Motor brake release

Figure 7: Sliding secondary brake shaft into gear reducer



— End of BIVSRM01 —

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!

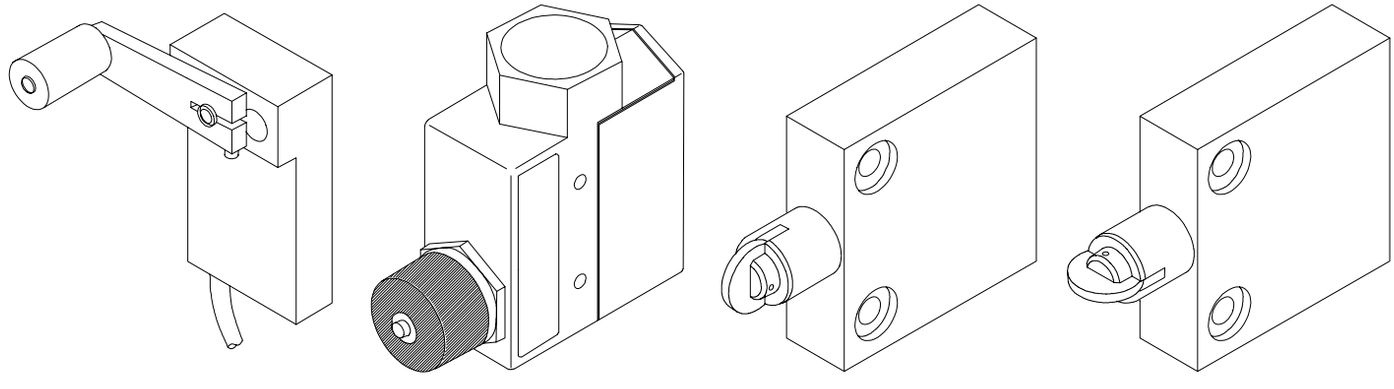


FIGURE 1a
Rotary Lever Switch

FIGURE 1b
Plunger Switch

FIGURE 1c
180° Roller Plunger

FIGURE 1d
90° Roller Plunger Switch

FIGURE 1 (MSSM0116AE)
Limit Switch Types

⚠ 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.

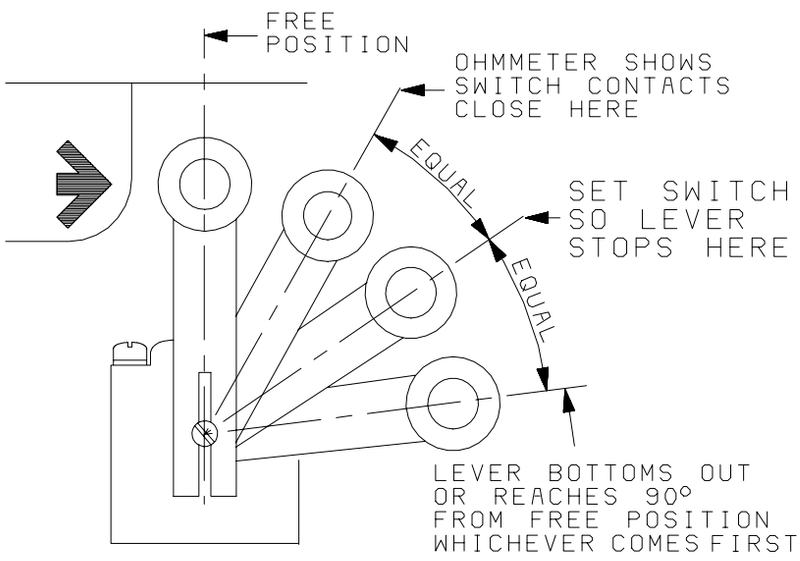


FIGURE 2a
Rotary Lever

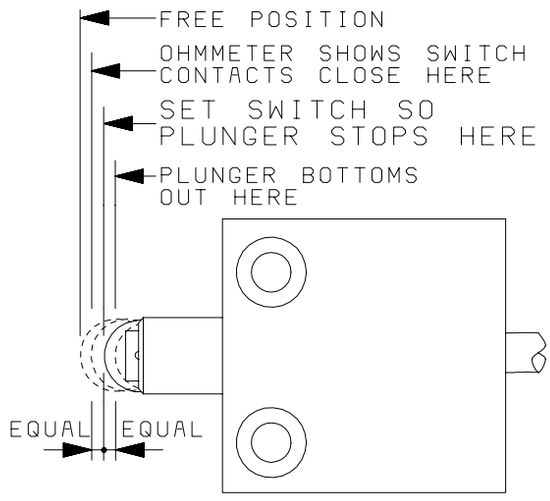


FIGURE 2b
Plunger Switches
(Roller Plunger Switch Shown)

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).

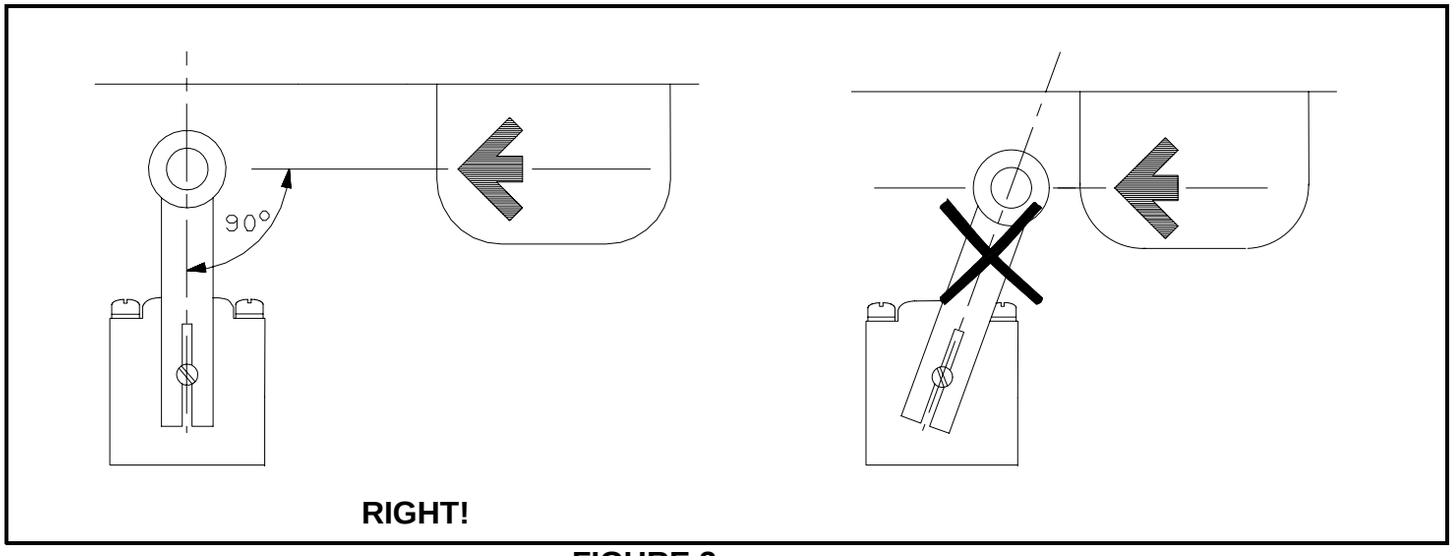


FIGURE 3 (MSSM0116AE)
Free Position of Rotary Lever

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.

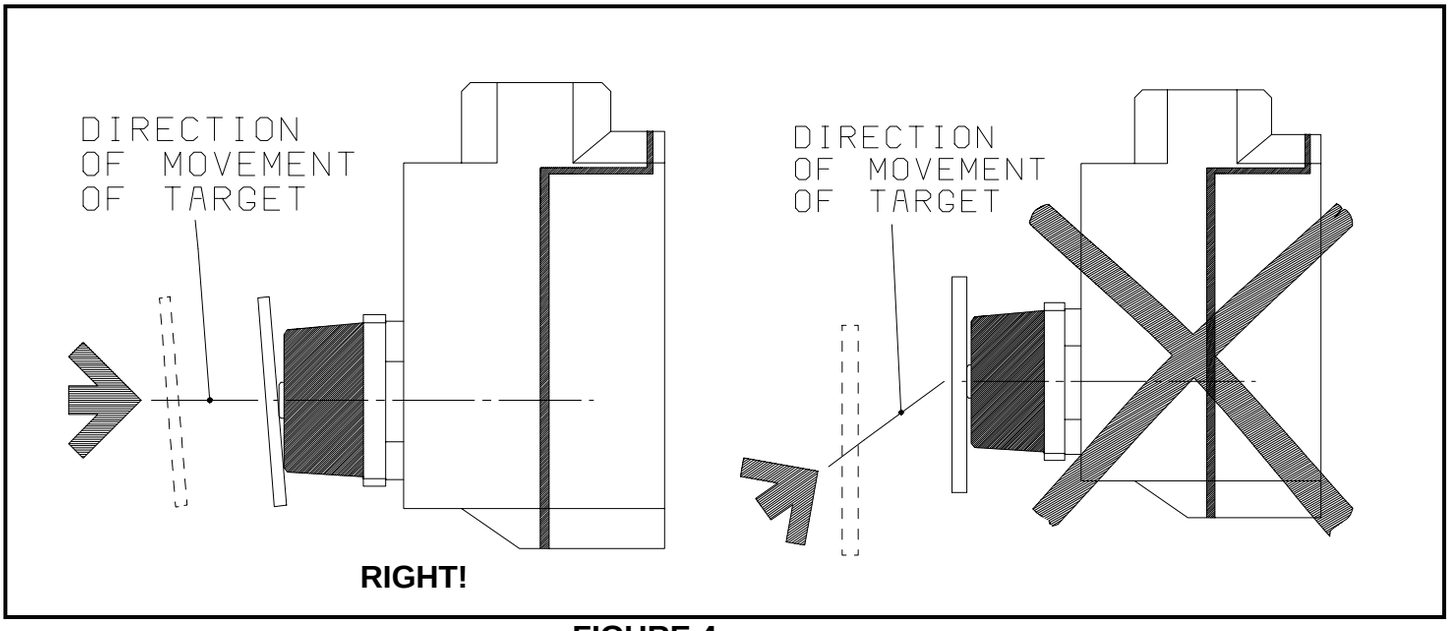


FIGURE 4 (MSSM0116AE)
Plunger Switch Angle

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).

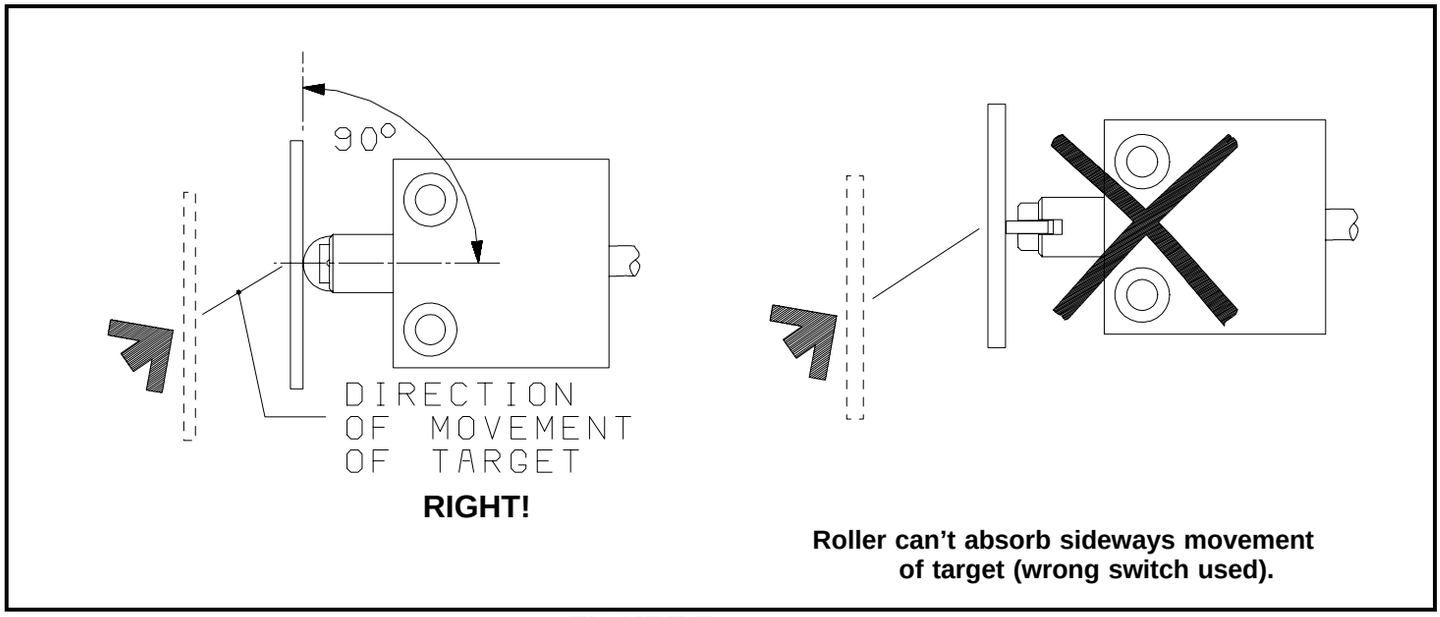


FIGURE 5 (MSSM0116AE)
Roller Plunger Switch Angle

SETTING PHOTOSENSORS

⚠ CAUTION ⚠

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

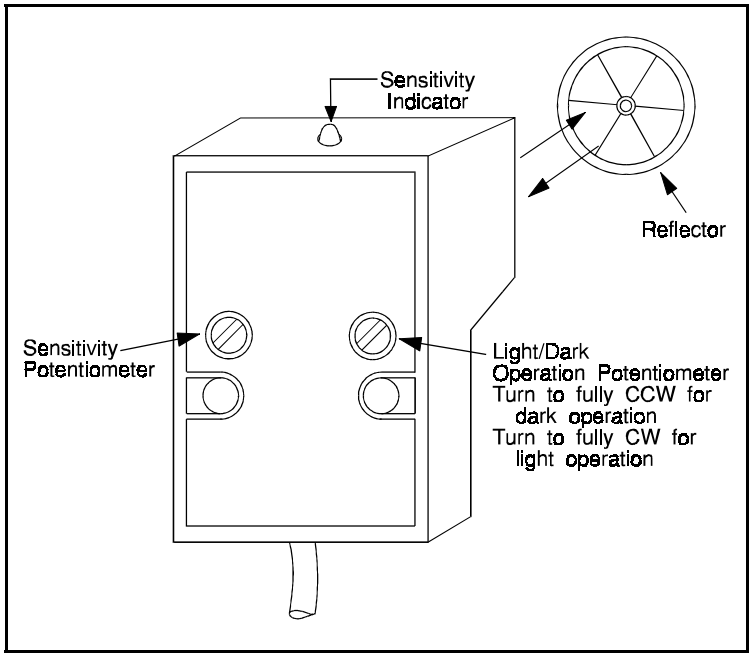


FIGURE 1 (MSSM0122AE)
Retroflective Photosensor (rear)

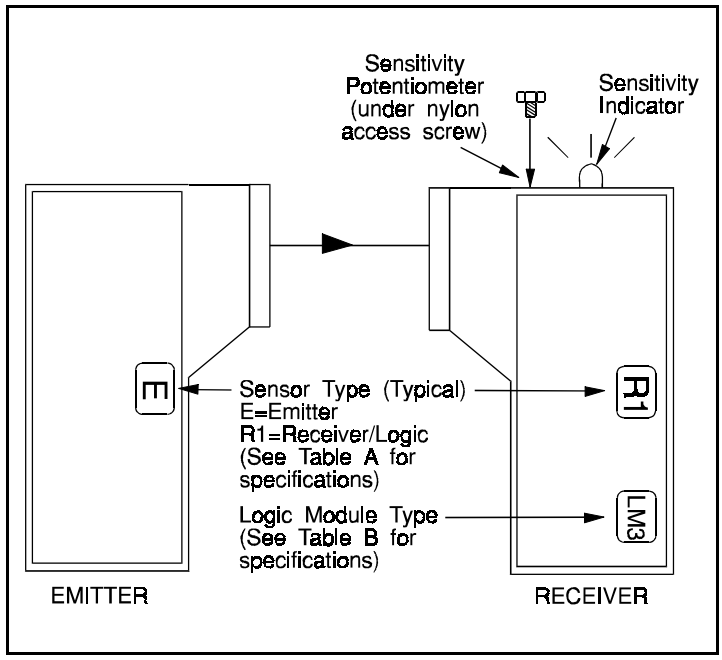


FIGURE 2 (MSSM0122AE)
Opposed-mode Photosensors

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.

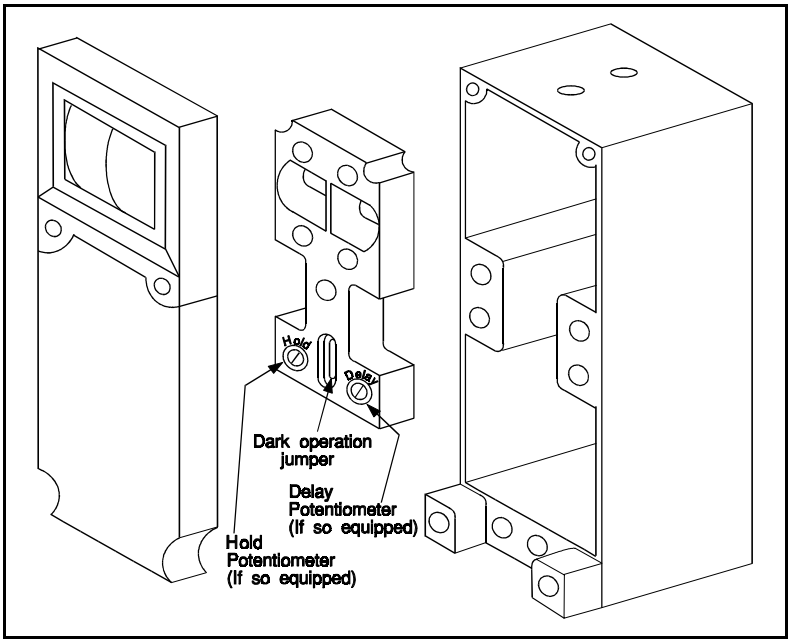


FIGURE 3 (MSSM0122AE)
Exploded View of Opposed-mode Receiver/Logic Module

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.

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

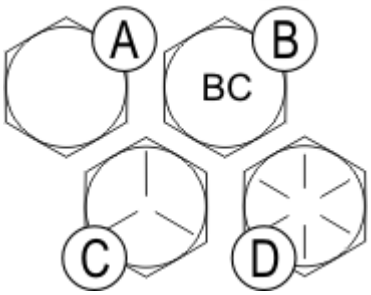
Torque Requirements for Fasteners

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.

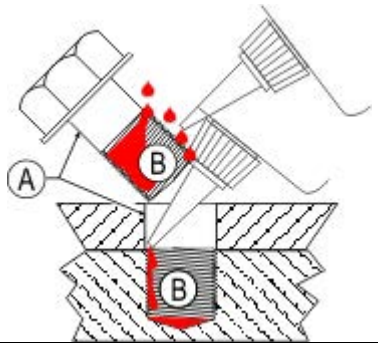
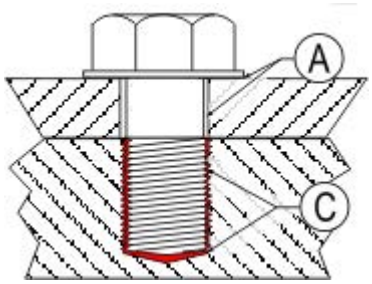
3. How to Apply a Threadlocker

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

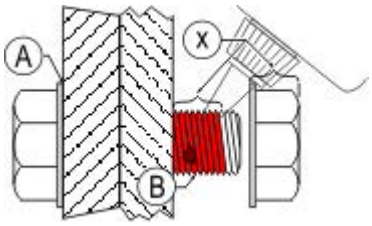
3.1. Blind Holes

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

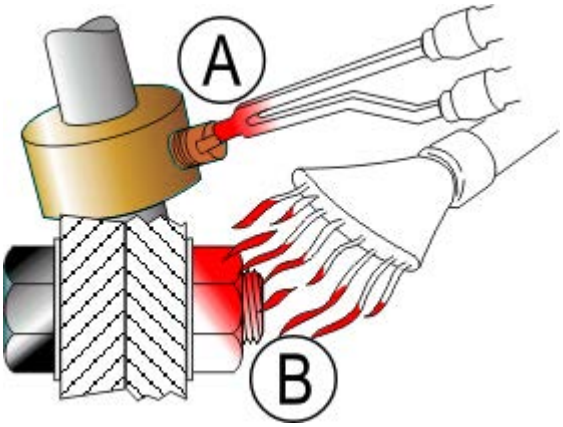
Application	Legend
	**A.** No threadlocker here **B.** Apply the threadlocker to this area **x.** Nut depth

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 —

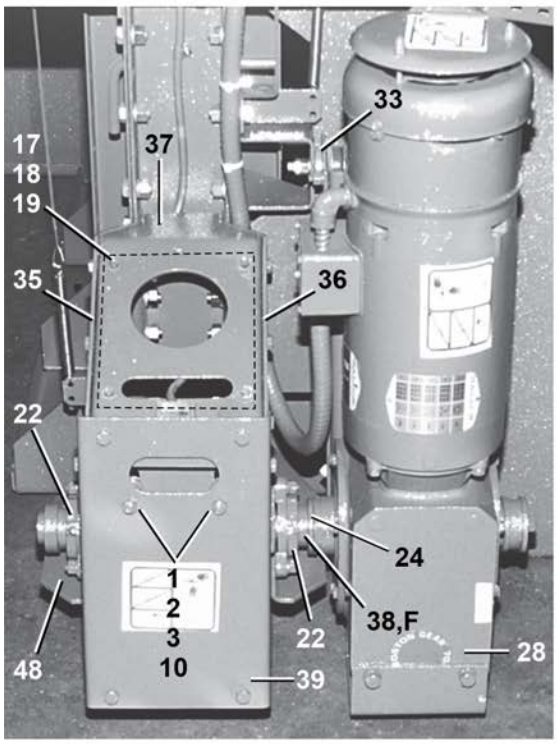
Mechanical Parts 3

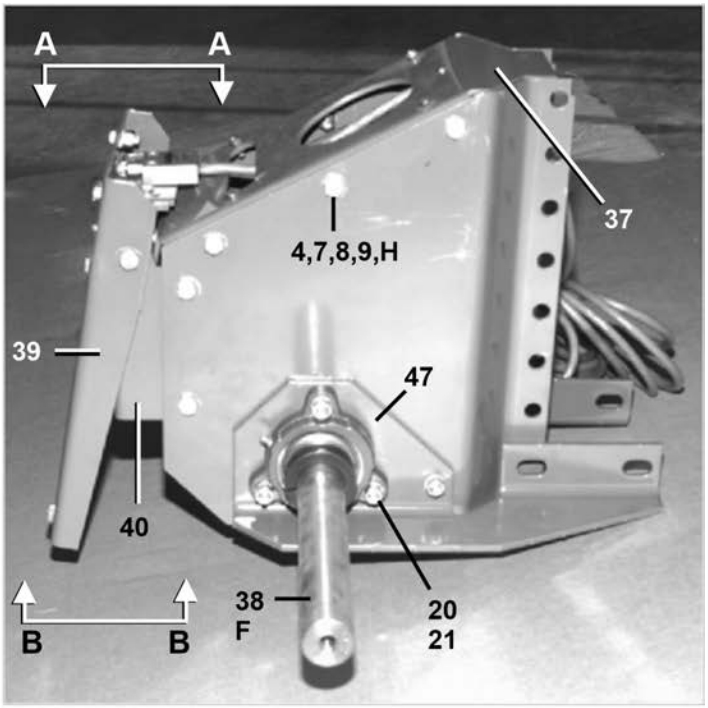
3

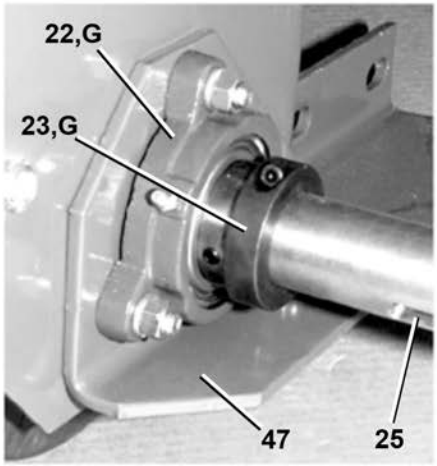
Floor Drive 3.1

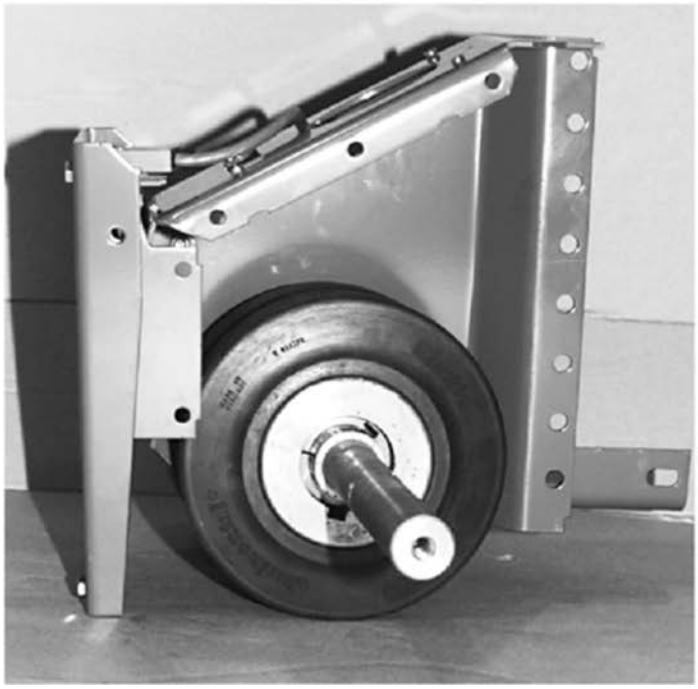
Floor Drive Tractor

COSH(A,J,K,B,X)_, COBUC(E,T), and CL(36,40,48)_







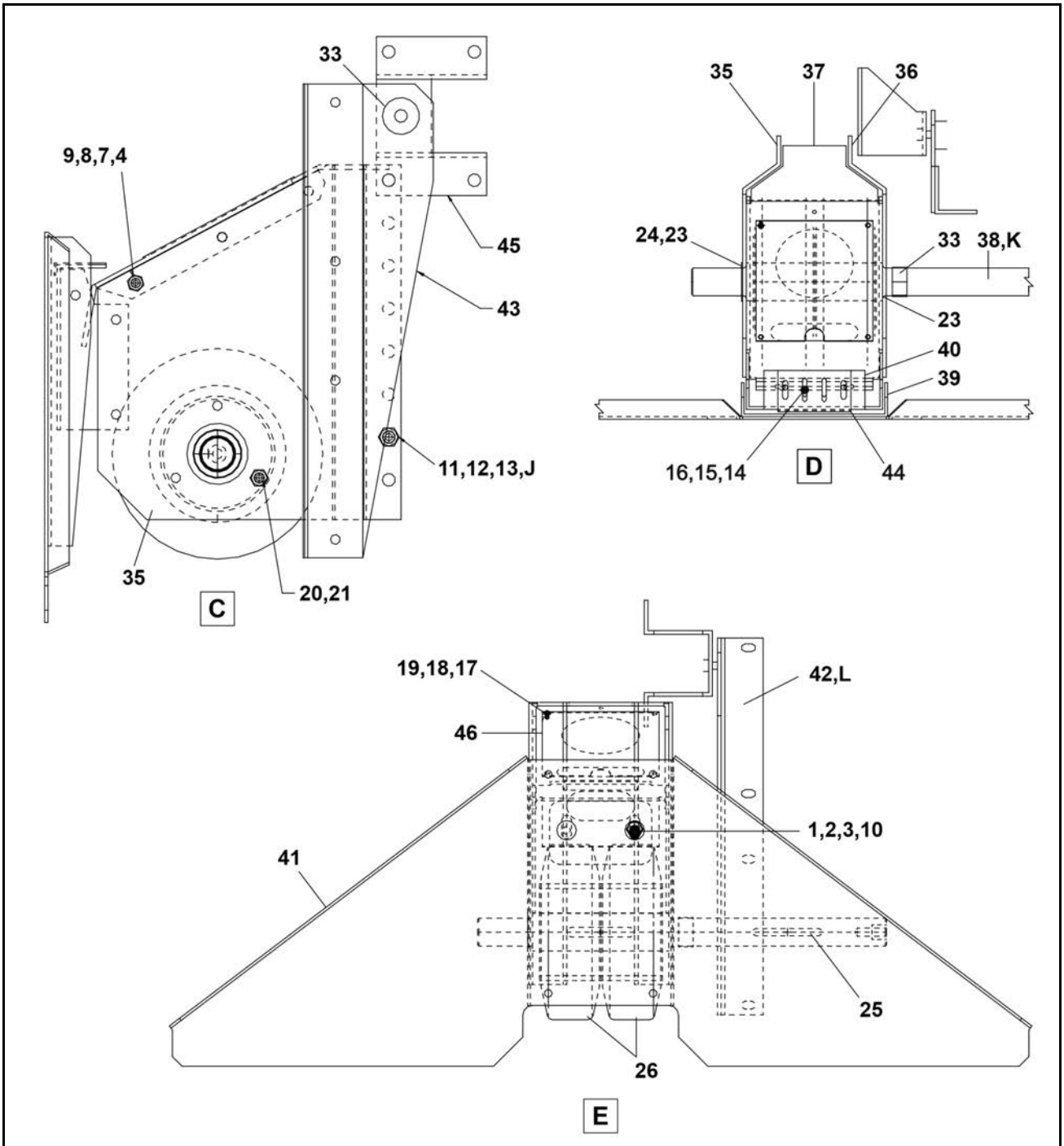


Legend

F . . . Drive shaft
G . . . Used on both sides of gear reducer
H . . . 12 instances

Floor Drive Tractor

COSH(A,J,K,B,X)_, COBUC(E,T), and CL(36,40,48)_



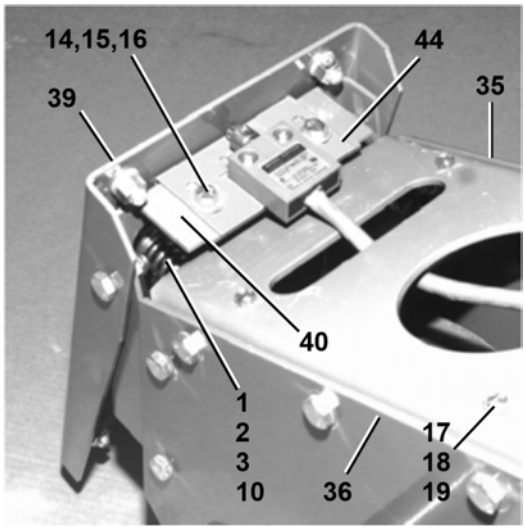
Legend

C . . . Front view
D . . . Top view
E . . . Side view
J . . . Fastens to shuttle side rail
K . . . Drive shaft shown
L . . . Torque arm

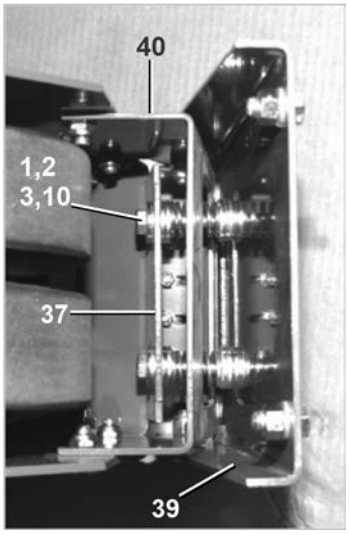
Floor Drive Tractor

COSH(A,J,K,B,X)_, COBUC(E,T), and CL(36,40,48)_

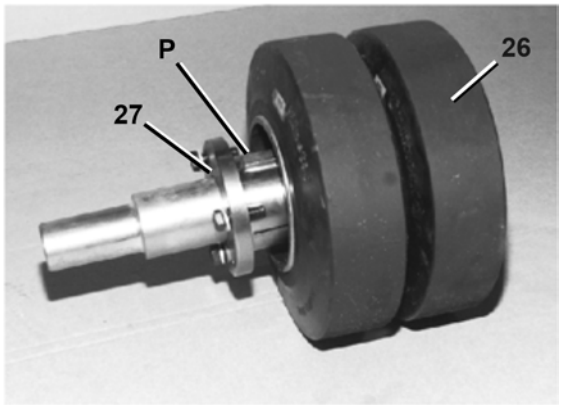
View A-A



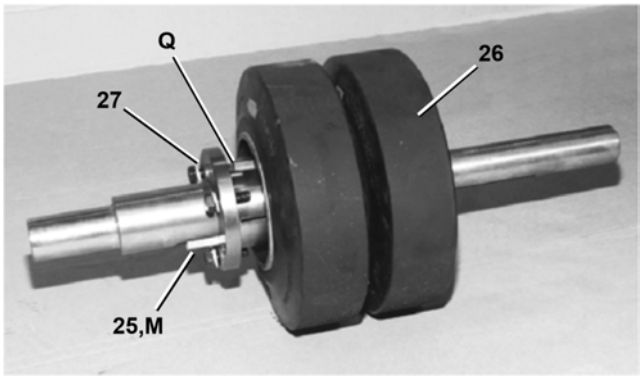
View B-B



Idler Wheels and Idler Shaft



Drive Wheels and Drive Shaft



Legend

M . . . Key
P . . . Wheel key comes with idler shaft
Q . . . Wheel key comes with drive shaft

Table 1. Parts List—Floor Drive Tractor

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Reference Assemblies				
	A	ALC420047A	FLOORDR DRIVE SIDE-9"WHEEL	Drive Side
	B	ALC420048A	FLOORDR IDLER SIDE-9"WHEEL	Idler Side
Components				
all	1	15K136	HEXCAPSCR 3/8-16UNCX3+1/2 GR5	

Floor Drive Tractor

COSH(A,J,K,B,X)_, COBUC(E,T), and CL(36,40,48)_

Parts List—Floor Drive Tractor (cont'd.)

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.

Used In	Item	Part Number	Description/Nomenclature	Comments
all	2	15U266	FLATWASHER 1"0DX7/16"IDX3/16"	
all	3	02 18187	SPRING=OUTER DOOR 60 WEHU	
all	4	15K095	HXCPSCR 3/8-16UNC2AX1 GR5 ZINC	
all	5	15K110	HEXCAPSCR 3/8-16UNC2AX1.5 GR5-	
all	6	15K085	HEXCAPSCR 3/8-16UNC2AX3/4 GR5	
all	7	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL	
all	8	15U240	FLATWASHER(USS STD) 3/8" ZNC P	
all	9	15G205	HXNUT 3/8-16UNC2B ZINC GR2	
all	10	15G218	HXLOKNUT NYL 3/8-16 STL/ZNC	
all	11	15K162	HXCAPSCR 1/2-13UNC2AX1.5 GR5 P	
all	12	15U300	LOKWASHER REGULAR 1/2 ZINC PLT	
all	13	15G230	HXNUT 1/2-13UNC2B SAE ZINC GR2	
all	14	15K039	HXCAPSCR 1/4-20UNC2AX3/4 GR5 Z	
all	15	15U180	LOCKWASHER MEDIUM 1/4 ZINCPL	
all	16	15G165	HXNUT 1/4-20UNC2BSAE ZC GR2	
all	17	15N135	RDMACSCR 10-24UNC2AX5/8 ZINC G	
all	18	15U150	LOCKWASHER MEDIUM #10 ZINCPL	
all	19	15G125	HXMACHSCRNUT 10-24UNC2B ZINC G	
all	20	15K143B	HEXCAPSCR 7/16-14UNCX1"GR5 ZIN	
all	21	15U278	LOCKWASHER MEDIUM 7/16 ZINCPL	
all	22	54AF1437	FLGEBRG.HUBCITY 3-BOLT FB150URX1-7/16	
all	23	54JH11437C	SHAFTCOLLAR 1.4375 CFG #23S	
all	24	15U445	FLATWASH 1.453"X2"OD.X.060THK.	
all	25	15E235	SQMACHKEY 1/2X1/2X2"	
all	26	60C510UT	WHEEL DOUBLE 9"OD URETHANE	
all	27	56Q1TQ3S	1+15/16" SPLIT BUSHING BROWN#Q3	
all	28	54STB33260	REDUCER 60:1 SF732-60T-B7-G	
all	30	15U390P	FLATWASHER(USS STD) 1" ZNC P	
all	33	ALC420063	TORQUE ARM BUSHING ASSEMBLY	
all	35	04 21927B	WHEEL SUPP BKT LF-9"FLOORDR	
all	36	04 21927C	WHEEL SUPP BKT RT-9"FLOORDR	
all	37	04 21928A	COVER-WHEEL SUPP-9"FLOORDR	
A	38	X4 21933A	DRIVE SHAFT SF732-9"FLOORDR	
B	38	X4 21934A	IDLER SHAFT-9"FLOORDR	
all	39	04 21929A	SAFETYSTOP MTG BKT 9"FLOORDR	
all	40	04 21931A	SAFETY STOP SW MTG-9"FLOORDR	
all	41	04 21930B	SAFETY STOP PLATE-9"FLOORDR	
all	42	04 21939E	TORQARM MTG ANGLE=FLOORDR	
all	43	04 21939D	TORQUE ARM PLATE=FLOORDR	
all	44	04 21937G	KICKPL SW STOP BRKT-FLOORDR9	
all	45	04 21940	TORQUE ARM MTG BRKT-FLOORDR	
all	46	04 21928B	FLOOR DOOR-9" COVER	

Floor Drive Tractor

COSH(A,J,K,B,X)_, COBUC(E,T), and CL(36,40,48)_

Parts List—Floor Drive Tractor (cont'd.)

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.

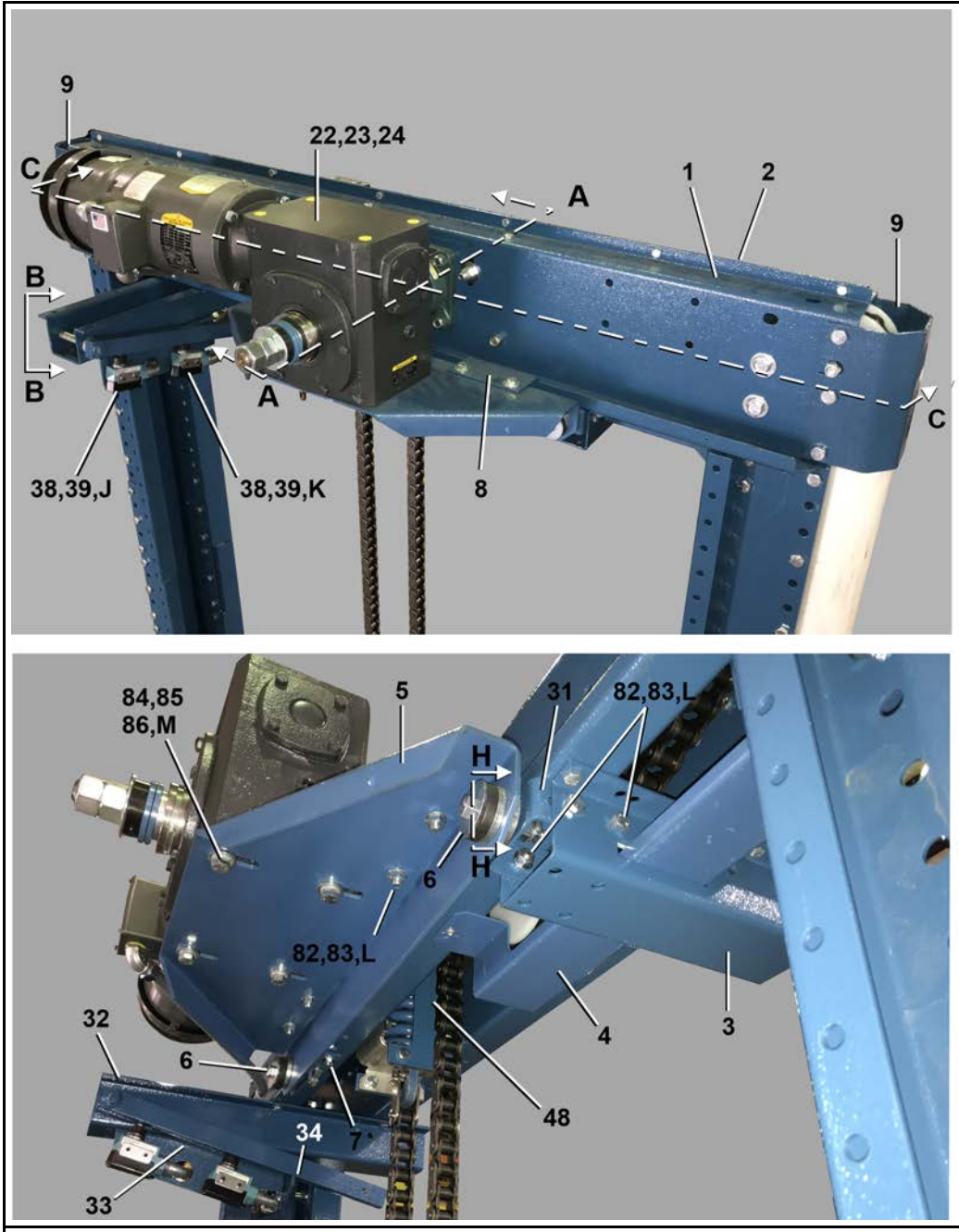
Used In	Item	Part Number	Description/Nomenclature	Comments
all	47	04 21928C	FLOORDR SUPP PL STIFF-RT	
all	48	04 21928D	FLOORDR SUPP PL STIFF-LF	

3

Milnor Hoist 3.2

Milnor Hoist for J-Rail Shuttles

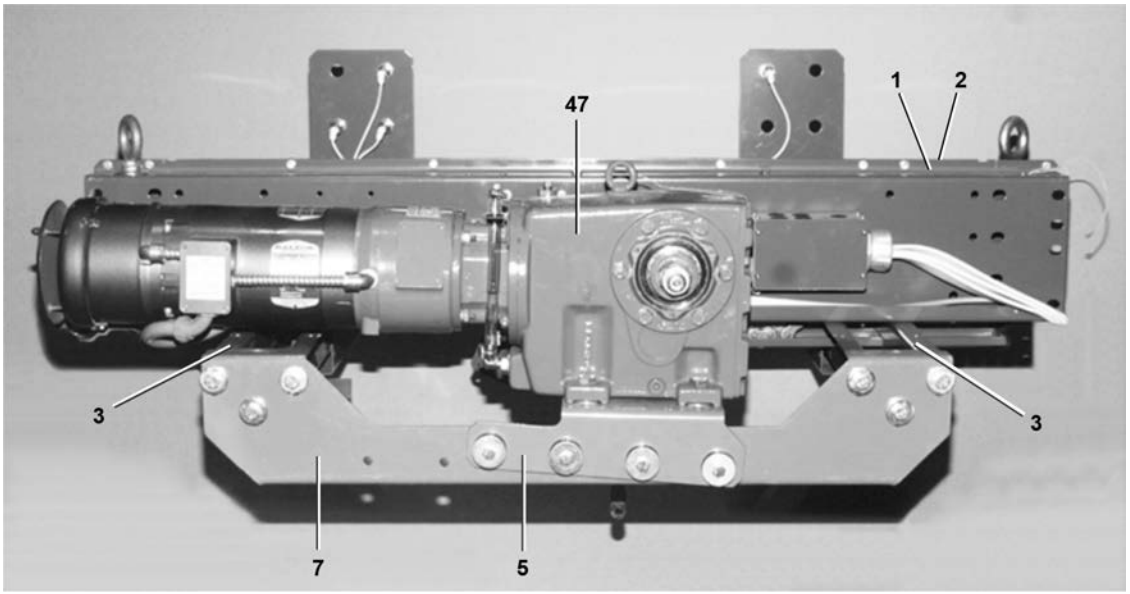
Figure 1. Milnor Hoist with Standard Gear Reducer

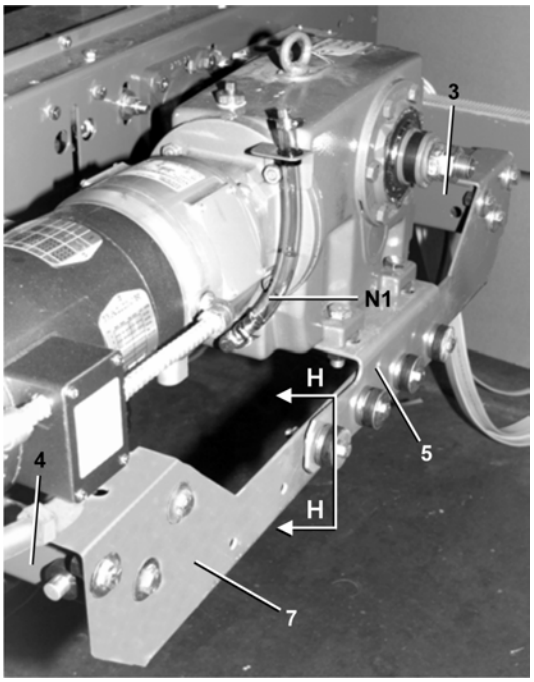


Legend

J . . . Lift Stop Safety Switch, Maximum
K . . . Lift Stop Safety Switch, Up Limit
L . . . Typical
M . . . 4 instances

Figure 2. Milnor Hoist with Helical Gear Reducer for Extra Heavy Loads

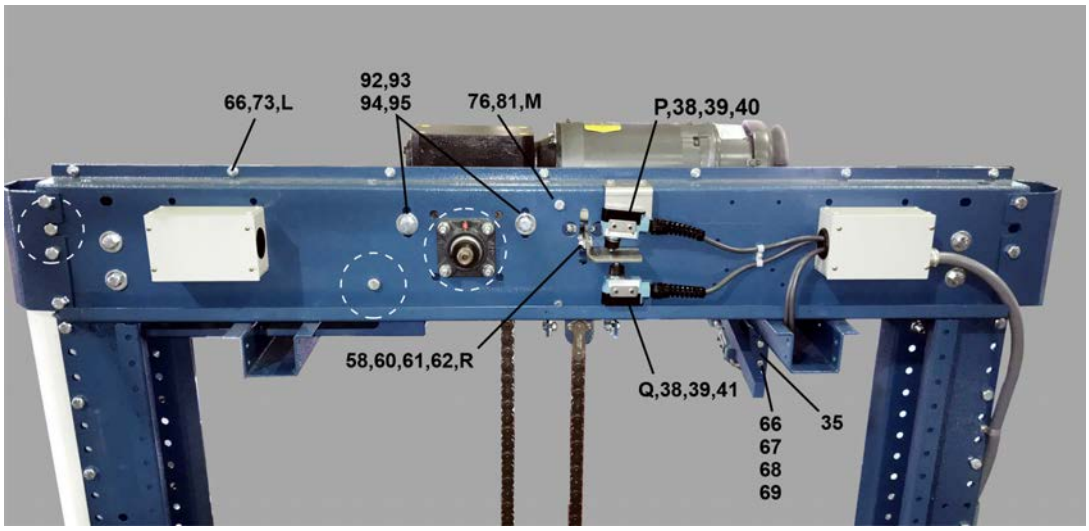


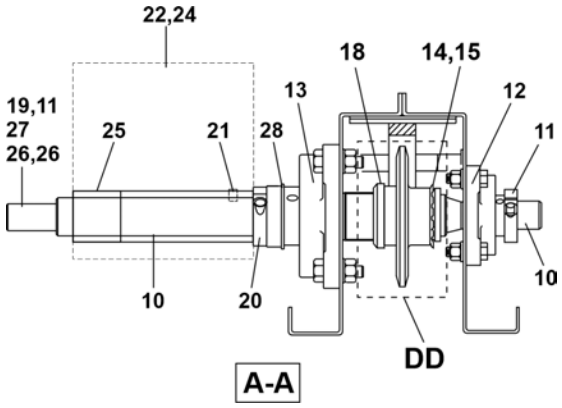


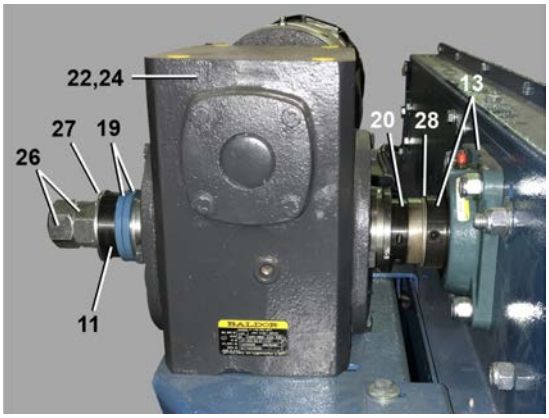
Legend

N1 . . The lubrication line is no longer used. The gear reducer does not require oil.

Milnor Hoist for J-Rail Shuttles

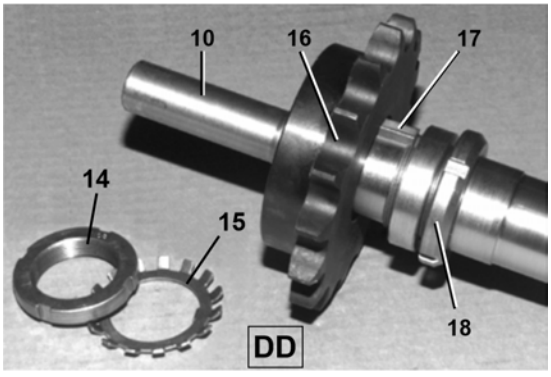




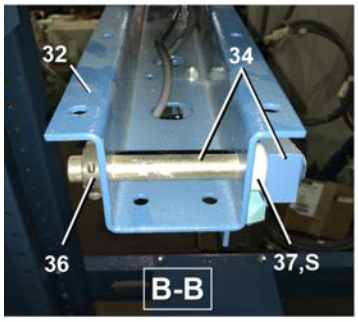


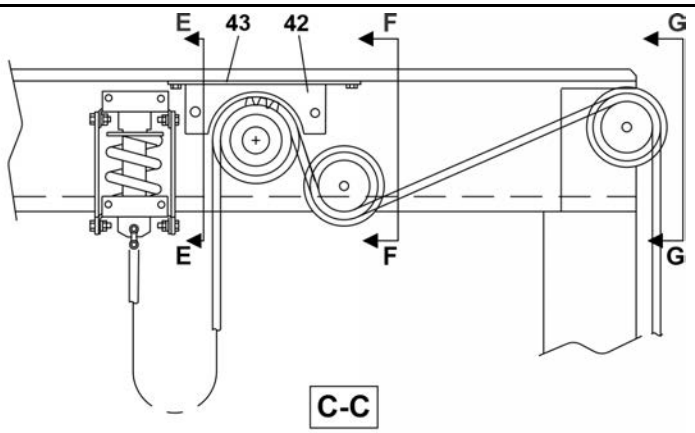
Legend

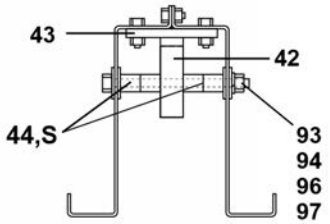
J . . . Lift Stop Safety Switch, Maximum Up
K . . . Lift Stop Safety Switch, Up Limit
L . . . Typical
M . . . 4 instances
P . . . Down limit Switch
Q . . . Taut Chain Limit Switch
R . . . 2 instances

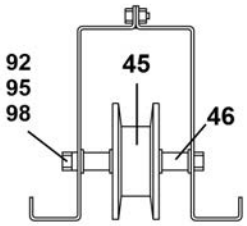


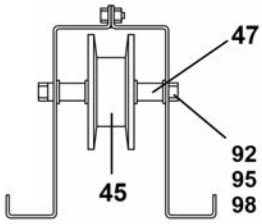
Milnor Hoist for J-Rail Shuttles

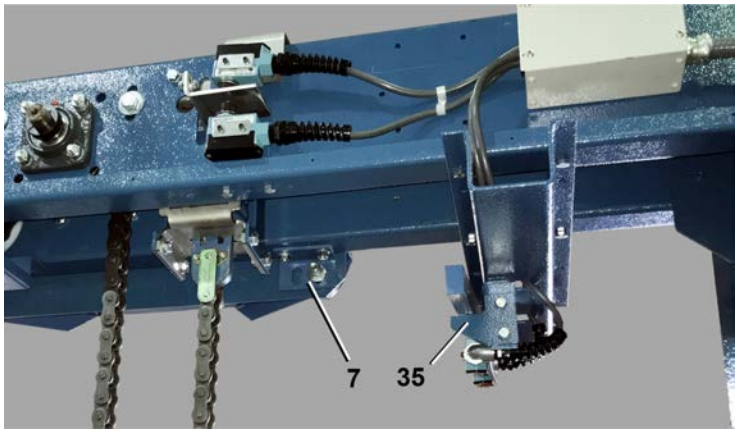






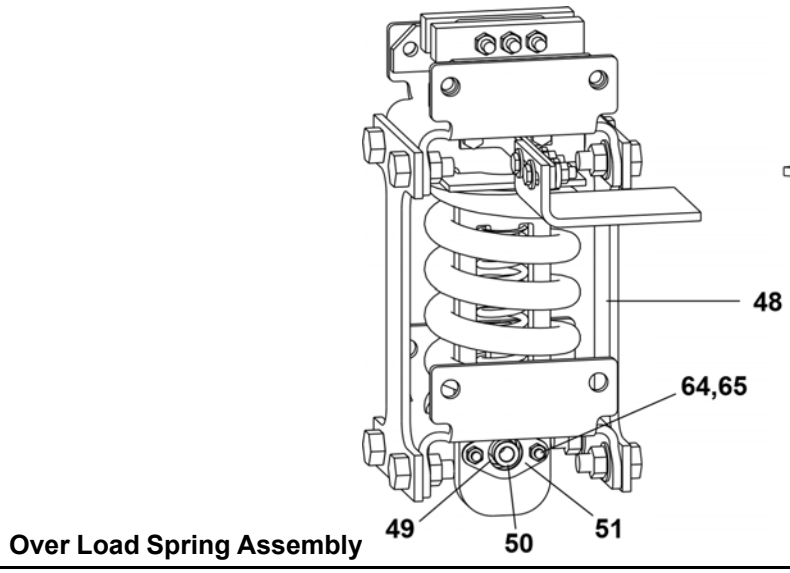






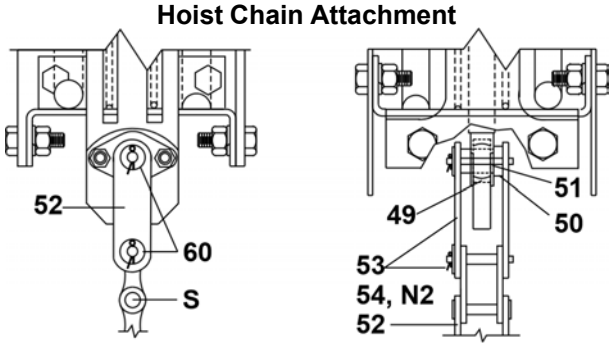
Legend

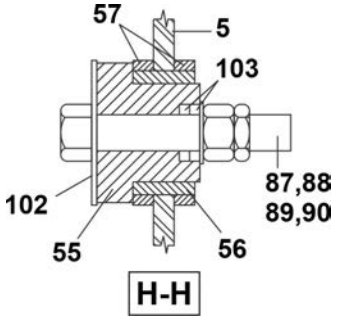
S . . . 8 instances



Over Load Spring Assembly

Hoist Chain Attachment





Legend

N2 . . A new cotter pin must be used if the connecting link is replaced or the cotter pin is removed for any reason.

Table 1. Parts List—

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Assemblies				
	D	ALC420001D	MK2 X-MEMBER+HOIST 40W-73260	36” Beds
	H	ALC420001H	MK2 X-MEMBER+HOIST 48W-73260	48” Beds
	E	ALC420001E	MK2 X-MEMBER+HOIST 40W-KA80K	36” Beds Helical
	F	ALC420001F	MK2 X-MEMBER+HOIST 42W-KA80K	42” Beds Helical
Components				
D,E	1	04 20786R	MK2 TOP BEAM-RT=36W BED	
H	1	04 21730	MK2 TOP BEAM-RT=48W BED	
F	1	04 23017	MK2 TOP BEAM-RT=42W BED	
D,E	2	04 20786L	MK2 TOP BEAM-LF=36W BED	

Parts List— (cont'd.)

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.

Used In	Item	Part Number	Description/Nomenclature	Comments
H	2	04 21730A	MK2 TOP BEAM-LF=48W BED	
F	2	04 23017A	MK2 TOP BEAM-LF=42W BED	
D,E	3	04 21731B	CHANN LIFT STOP 10.88"L	
E,F	3	04 21501C	CHANN LIFT STOP-HELICAL 3.81	
D,E,F	4	04 21006B	DRIP PAN-HOIST	
H	4	04 21006C	DRIP PAN-HOIST=48BED	
D,H	5	04 21419A	MK2 TORQUE ARM SF732-HOIST	
E,F	5	04 21503B	TORQARM-HELICAL GEAR HOIST	
D	6	ALC420063	TORQUE ARM BUSHING ASSEMBLY	
H	7	04 21143	MK2 HOIST TORQ ARM MTG BRKT	
E	7	04 21502	BKT-REDUCER SUPPORT-COLOSLYA	
D,H	8	04 21403A	TORQUE ARM SAFETY BRACKET-LF	
	9	04 21009A	MK2 TRACTOR CONN.BRKT./COSHA	
D,H,E,F	10	04 21418A	SHAFT=HOIST (SF653R)-COLOSLY	
D	11	54JH11000C	SHAFTCOLLAR SPLIT 1" CG#16S	
D,H,E,F	12	54AF10001A	FLG BRG 1"BORE NTN#UCF205-100T (4-BOLT)	
D,H,E,F	13	54AF1687	FLBRG 1.6875 NTN#UCF209-111T	
D,H,E,F	14	56AHN08	N08 BEARING LOCKNUT	
D,H,E,F	15	56AHW108	TW108 BEARING LOCKWASHER	
D,H,E,F	16	54N080B16	SPRKT 16T .492 IN/FT TAPER	
D,H,E,F	17	15E221	SQMACH KEY 3/8X1" C/0/8 NOHEAD	
D,H,E,F	18	56AHN09	N09 BEARING LOCKNUT	
all	19	04 21422	SPACER-SHAFT (SF732 GEAR)	D,H(2 instances); EF(4 instances)
all	20	54JH11437C	SHAFTCOLLAR 1.4375 CFG #23S	
D,H	21	15Q140	SOKSETSCR CUP 3/8-16X1/2 BLK	
D,H	22	54STB33260	REDUCER 60:1 SF732-60T-B7-G	
E,F	22	54STDKA80D	HELI-REDUCR+BUSH ASSY .9/2.0	
H	23	39RB1001AL	BRAKE DOUBLE-143TC 10FT/LB 230	
D	24	15E221	SQMACH KEY 3/8X1" C/0/8 NOHEAD	
H,E,F	24	15E228BAL	MACHKEY .375X.312X2.5 LG	
D,H	25	04 21036B	SPACER-HOIST GEAR REDUCER	
D,H	26	15U390P	FLATWASHER(USS STD) 1" ZNC P	
D,H,E,F	27	15G248C	HXFINJAMNUT 1-8UNC2B ZINC GR2	
E,F	28	15U515S	FLATWASH 2.375X1.703X16GA SS	
D,H	31	04 21668	BRKT-GROMMET MOUNTING	
DH	32	04 21731B	CHANN LIFT STOP 10.88"L	
E,F	32	04 21501C	CHANN LIFT STOP-HELICAL 3.81	
all	33	04 22857	SWITCH MTG BRKT=UPRAIL	
all	34	W4 21735	*LIFT STOP BAR WLMT-HOIST	
all	35	04 22857A	SAFETY BAR SW ADJUSTING-PLT	

Parts List— (cont'd.)

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.

Used In	Item	Part Number	Description/Nomenclature	Comments
all	36	54JH10625C	SHFTCOLLAR 5/8" CLPTYPE CFG10S	
all	37	15U345B	FLTWASH 101NYL 41/64IDX1.125OD	
all	38	09R012	MICSW SPDT PAINTED BZE6-RN 01	
all	39	02 10391	COVER STRIP=MICRO SW #6-8	
all	40	04 20993C	MICRO SW BRKT-LOOSE CHAIN	
all	41	04 20993B	MICRO SW BRKT-TOUGH CHAIN	
all	42	04 20774B	BLOCK #80 CHAIN RETAINER	
all	43	04 207742	1/4"SHIM,CHAIN HOLDER BLOCK	
all	44	27B240	SPCRROLL.5ID.813L.062T STLZNC	
all	45	04 20756	PULLEY CHAIN CARRIER	
all	46	27B2750L0T	SPC RROLL.562ID.937L.048T ZNK	
all	47	27B2400K0N	SPCRROLL.5ID.687L.062T STLZNC	
all	48	ALC420011B	OVERLOAD SPRING ASSY #80CHN	
all	49	54A701	SPHERICAL PLAIN BRG BALL BUSHING 1/2" RBC# B8-L	
all	50	X4 24527	DRILLBUSHING FOR #80 CHAIN	
all	51	04 20777C	BALL BRG RETAINER-SLACKCHAIN	
all	52	54G080C	ROLLCHAIN ANSI 80-1R 1"P (50FT REELS ONLY)	
all	53	54G080DPCN	CLNK DP CL2080HNC HVY NKL COTR	
all	54	15H031	STDCOTTERPIN 3/32X3/4 SS18-8	
all	55	60B065	RUBBER MNT CTR BONDED 40 DURO	
all	56	04 20796	SLEEVE=TORQUE ARM BUSHING	
all	57	02 18571A	PISTON ROD WASHER-.25"TK	
all	58	15K041	HXCAPSCR 1/4-2OUNC2AX1 GR 5 ZI	
all	59	15K046	HXCAPSCR 1/4-20 UNC2A X 2"GR5	
all	60	15U185	FLATWASHER(USS STD) 1/4" ZNC P	
all	61	15U180	LOCKWASHER MEDIUM 1/4 ZINCPL	
all	62	15G165	HXNUT 1/4-20UNC2BSAE ZC GR2	
all	63	15G166A	HXLOKNUT NYL1/4-20 UNC2A STL/Z	
all	64	15N146	RDMACHSCR 10-24UNC2X1 SS18-8	
all	65	15G126	HXLOCKNUT NYLON 10-24 UNC SS N	
all	66	15K065	HEXCAPSCR 5/16-18UNC2AX1 GR5 Z	
all	67	15U200	FLATWASHER(USS STD) 5/16"ZNC P	
all	68	15U210	LOKWASHER MEDIUM 5/16 ZINCPL	
all	69	15G185	HXNUT 5/16-18UNC2B SAE ZINC GR	
all	70	15A009	CARBOLT 5/16-18NC2X3.5 FULTHD	
all	71	15G193	HEXLOKNUT 5/16-18UNC2A NYL STL	
all	72	15K060	HXCAPSCR 5/16-18UNCAX3/4 GR5 Z	
all	73	15K196	HEXCAPSCR 1/2-13UNC2X3 18-8SS	
all	75	15K085	HEXCAPSCR 3/8-16UNC2AX3/4 GR5	
all	76	15K095	HXCPSCR 3/8-16UNC2AX1 GR5 ZINC	
all	77	15K105	HXCAPSCR 3/8-16UNC2A1.25 GR5 P	
all	78	15U240	FLATWASHER(USS STD) 3/8" ZNC P	

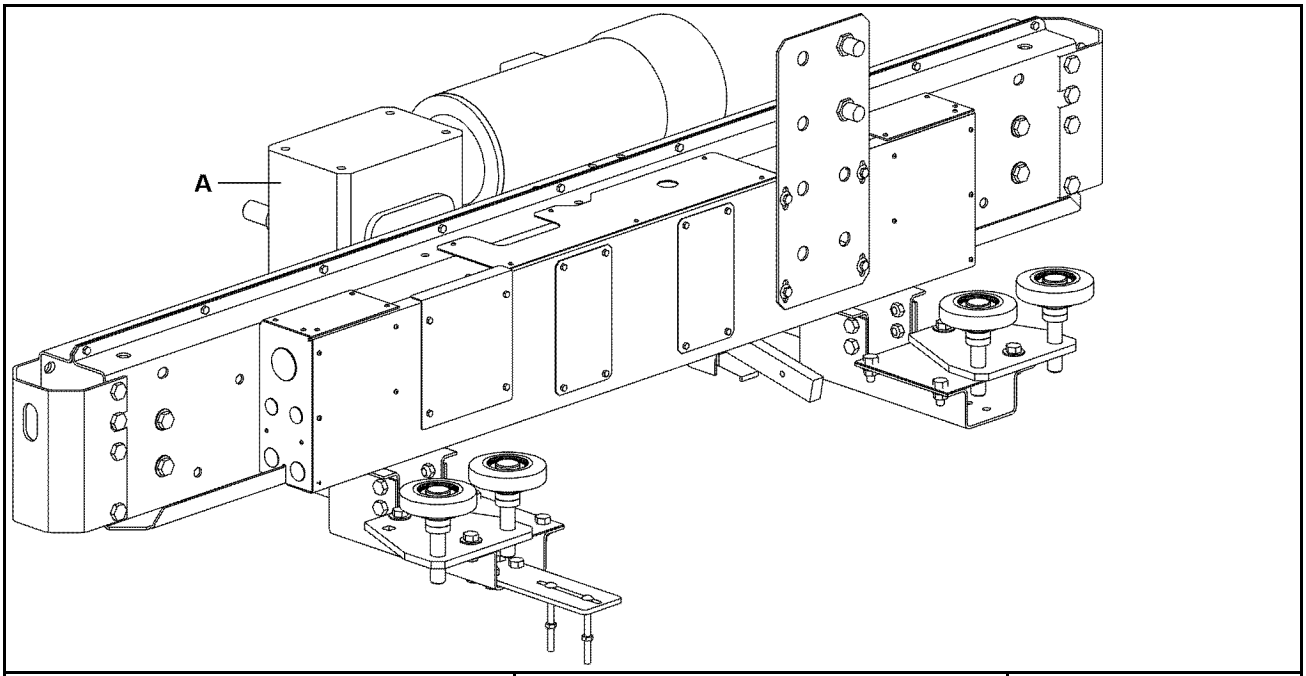
Parts List— (cont'd.)

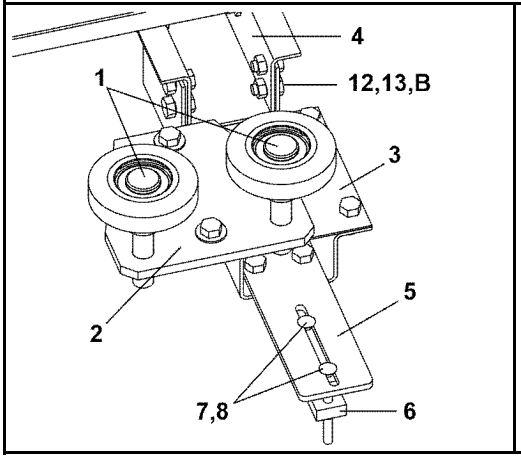
Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.

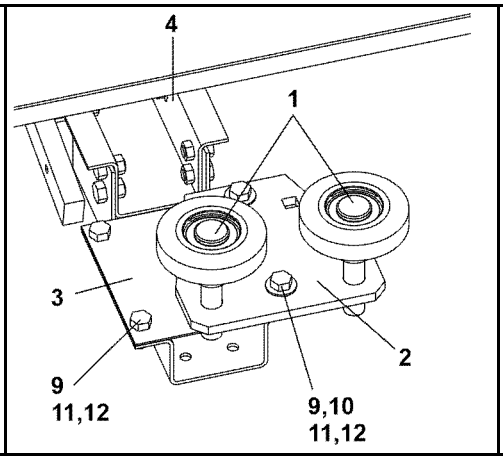
Used In	Item	Part Number	Description/Nomenclature	Comments
all	79	15U266	FLATWASHER 1"0DX7/16"IDX3/16"	
all	80	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL	
all	81	15G205	HXNUT 3/8-16UNC2B ZINC GR2	
all	82	15K092Z	HEXFLGSCR 3/8-16X1 GR5 ZINC	
all	83	15G198	HXFLGNUT 3/8-16 ZINC	
all	84	15K143C	HEXCAPSCR 7/16-14 X 1.5 GR5 ZP	
all	85	15U286	FLATWASHER 2"0DX17/32"IDX1/4"	
all	86	15U278	LOCKWASHER MEDIUM 7/16 ZINCPL	
all	87	15K144C	HEXCAPSCR 7/16-14UNC X 2.5 GR	
all	88	15U271	LOKWASH INTOOTH 7/16ZN	
all	89	15G222	HXFINJAMNUT 7/16-14UNC2B ZINC	
all	90	15G222C	HEXNUT 7/16-14UNC2B ZINC GR2	
all	91	15K162	HXCAPSCR 1/2-13UNC2AX1.5 GR5 P	
all	92	15K203D	HEXCAPSCR 1/2-13X5.5 GR5 ZINC	
all	93	15B177	HXMACBOLT 1/2-13UNC2X6 ZINC GR	
all	94	15U280	FL+WASHER(USS STD)1/2 ZNC PL+D	
all	95	15U312	HARD FWASH 3/4ODX33/64IDX.115	
all	96	15U300	LOKWASHER REGULAR 1/2 ZINC PLT	
all	97	15G230	HXNUT 1/2-13UNC2B SAE ZINC GR2	
all	98	15G234N	HXLOCKNUT NYL 1/2-13UNC2 STL/Z	
all	99	15K128	HEXFLGSCR 1/2-13X1 ZN. GRD. 5	
all	100	15K129	HEXFLGSCR 1/2-13X1-1/4ZN. GR 5	
all	101	15G222B	HEXFLGNUT 1/2-13 ZINC SERRATED	
all	102	15G225H	HEXFLGNUT 1/2-13 SERRATED 18-8	
all	103	15U202	FLATWSHR.50ID1.75OD11GA ZNC	

Guide Wheels

Traversing J-Rail Shuttles







Legend

A . . . Milnor Hoist is shown. Hook Mounted Chain Hoist is used on some models.

B . . . Typical

Table 1. Parts List—

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Assemblies				
	A	ALC420069B	UPPER RAIL 3.8T GUIDE WHEEL	
Components				
all	1	ALC420069C	OUTRIG WHEEL ASSY-3.8T RAIL	
all	2	04 22860	SHUTL GUIDE WHEEL MTG PL	
all	3	04 22853A	OUTRIGGER WHEEL MTG PLATE	
all	4	04 22856	FESTOON MTG CHANNEL EXT.	

Guide Wheels

Traversing J-Rail Shuttles

Parts List— (cont'd.)

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.

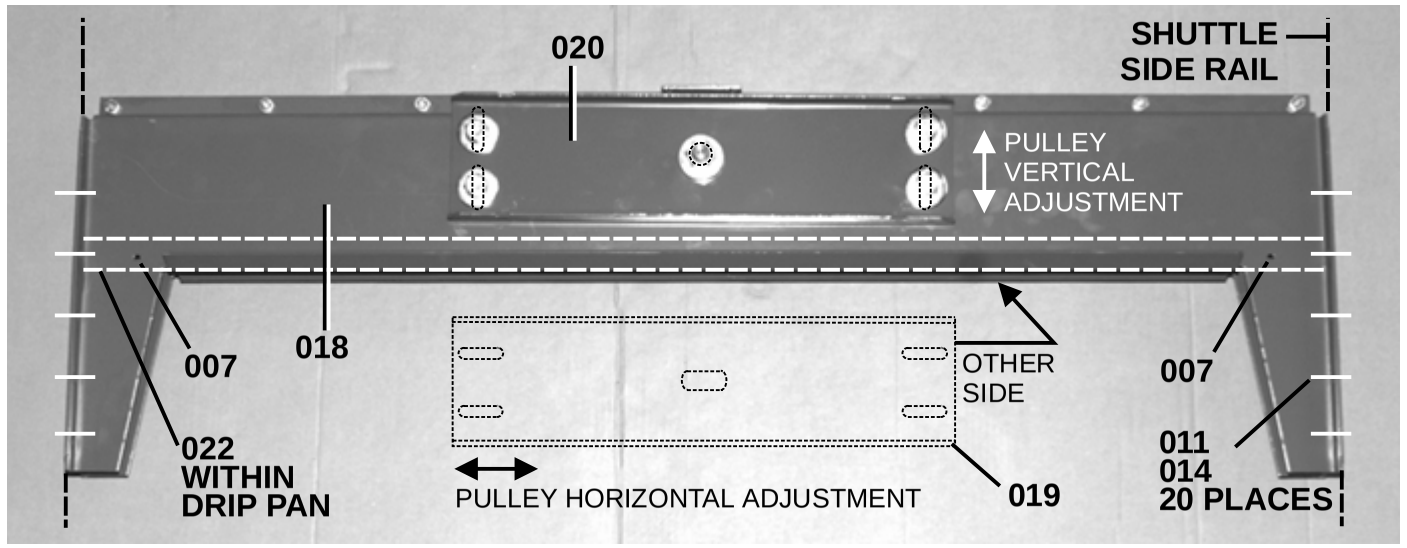
Used In	Item	Part Number	Description/Nomenclature	Comments
all	5	04 24158	FESTOON SUPPORT PLATE	
all	6	04 20750	PAD=FESTOON CABLE CLAMP	
all	7	15A009	CARBOLT 5/16-18NC2X3.5 FULTHD	
all	8	15G193	HEXLOKNUT 5/16-18UNC2A NYL STL	
all	9	15K095	HXCPSCR 3/8-16UNC2AX1 GR5 ZINC	
all	10	15U266	FLATWASHER 1"0DX7/16"IDX3/16"	
all	11	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL	
all	12	15K092Z	HEXFLGSCR 3/8-16X1 GR5 ZINC	

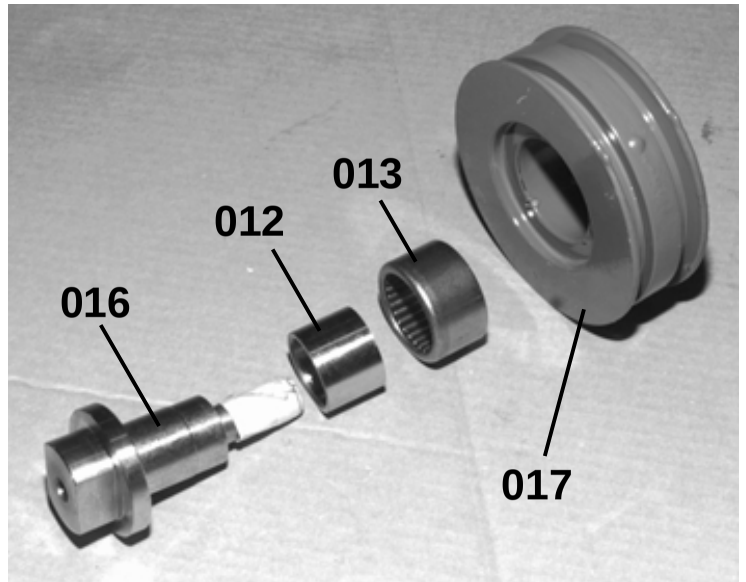
Shuttle Lifting Cross Member

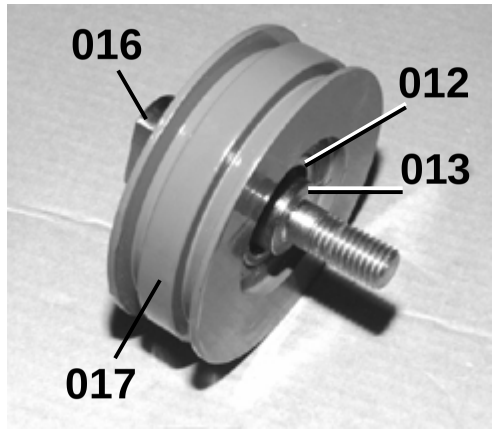
36", 40", & 48" Elevating Bed Shuttles

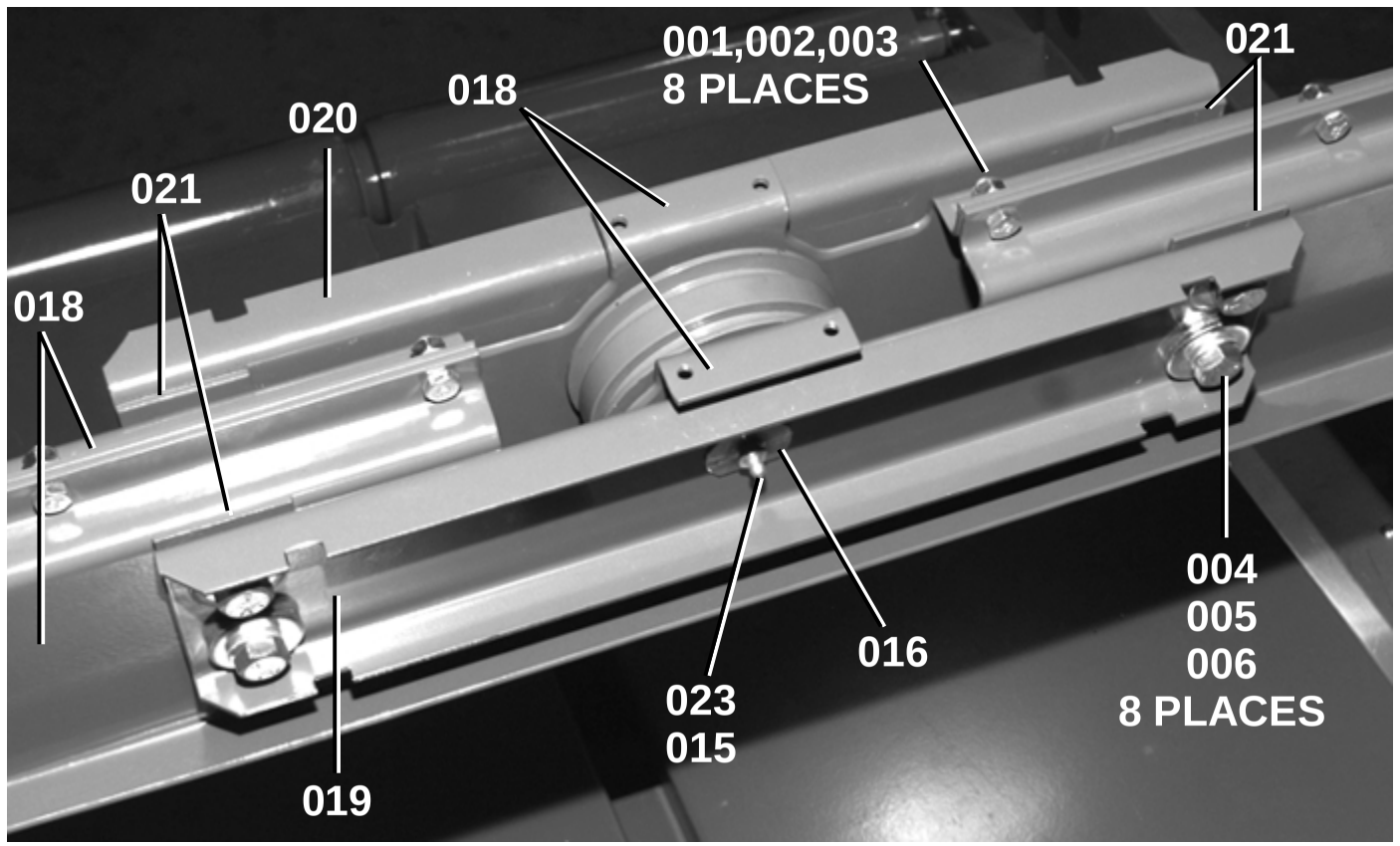
Pellerin Milnor Corporation
P. O. Box 400, Kenner, LA 70063-0400

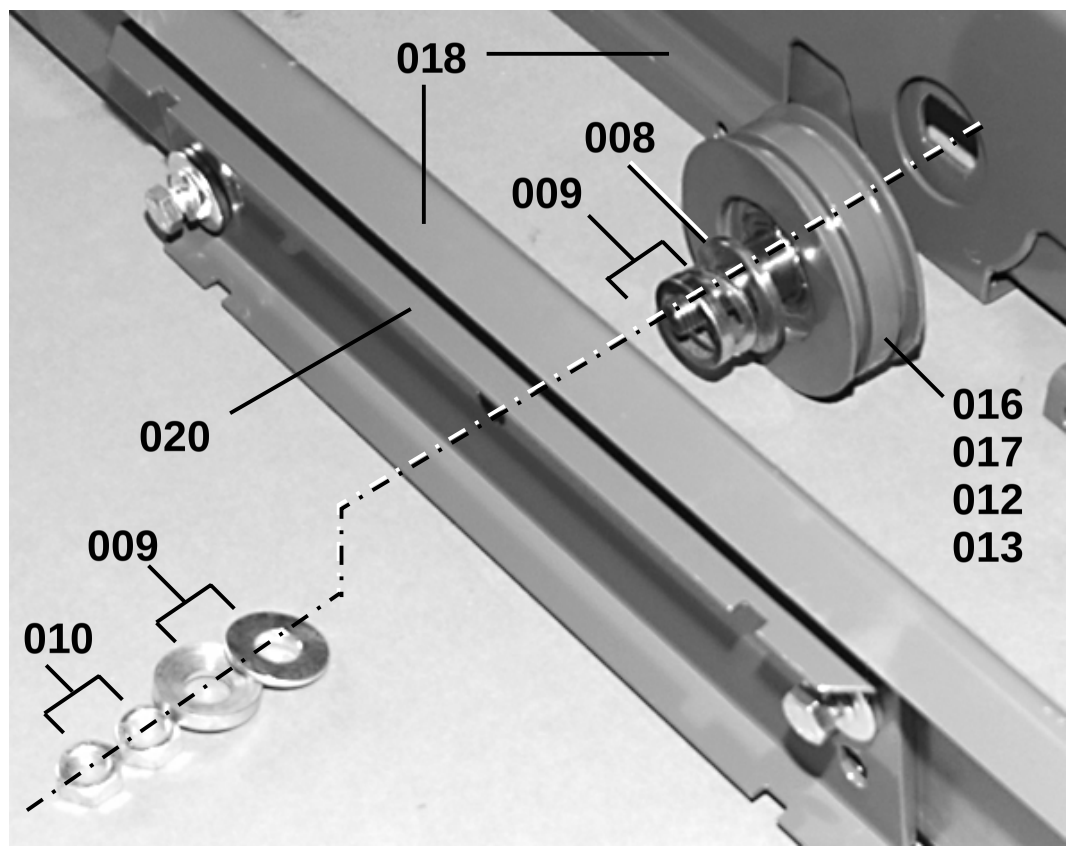
Litho in U.S.A.











PULLEY & CROSS MEMBERS (UPSIDE DOWN)

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

Litho in U.S.A.

Parts List—Shuttle Lifting Cross Member

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	ALC420002D	92633@ LIFTING X-MEMBER ASSY-#80	36" & 40" BEDS
	B	ALC420002H	95452N LIFTING X-MEMBER ASSY-48 BED	48" BEDS
			----------COMPONENTS----------	
all	1	15K085	HEXCAPSCR 3/8-16UNC2AX3/4 GR5 ZINC	
all	2	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL	
all	3	15G205	HXNUT 3/8-16UNC2B ZINC GR2	
all	4	15K162	HXCAPSCR 1/2-13UNC2AX1.5 GR5 PLATED	
all	5	15U300	LOKWASHER REGULAR 1/2 ZINC PLT	
all	6	15U490	FLAWASH 1+1/2X17/32X1/4ZINC	
all	7	15P060	SCREW SELFDRIL & TAP 10-24 X 1" #3	
all	8	15U443	92171B FLWASH 1.25IDX1.50ODX.268T	
all	9	17W050A	91281B SPHERICAL WASH SET 1.23ID	
all	10	15G236C	HXFINJAMNUT 5/8-11UNC2B ZINC GR2	
all	11	15K108	05Z SKCPSC3/8-16X1 BLK GR8 HK	
all	12	54AN02A01A	BRG-INNRACE 1.25BOR TORR#IR182216	
all	13	54AN02A01	BRG=NEEDLE 1.38BORE TORR #BH-2216	
all	14	20C008C	THREADLOCKER-REMOVABLE 250CC#242-41	
all	15	20H012A	SHELL ALVANIA EP-2 LF E= 14 OZ CART	
all	16	04 20762B	93353B SHAFT-1.13DIA X-MEMBER LIFT	
all	17	H4 21404E	93183# IDLER PULLEY #80-HEAT TREAT	
A	18	04 20782C	93503D LIFTING CROSS MEMBER-.844W	
B	18	04 20782D	91206D LIFTING X-MEMBER-48W BED	
all	19	04 20782B	89496C X-MEMBER HORIZONTAL ADJ	
all	20	04 20783B	90042C X-MEMBER VERTICAL ADJ	
all	21	04 20783C	90042B SPACER-X MEMBER ADJ PLATE	
A	22	04 20757	90532B CHANNEL=GREASE RUN-OFF	
B	22	04 20757A	90532# CHAN-GREASE RUNOFF-48 BED	
all	23	54M015	65408A GREASEFIT 60X36/60X44 1610BL	

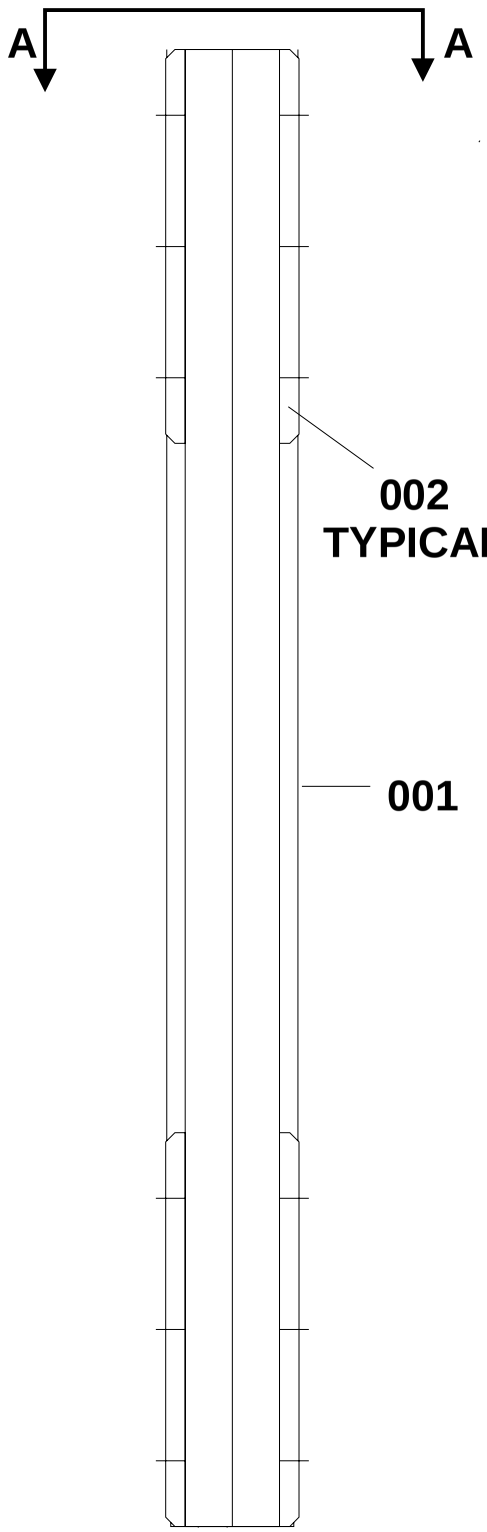
Side Slider Assembly

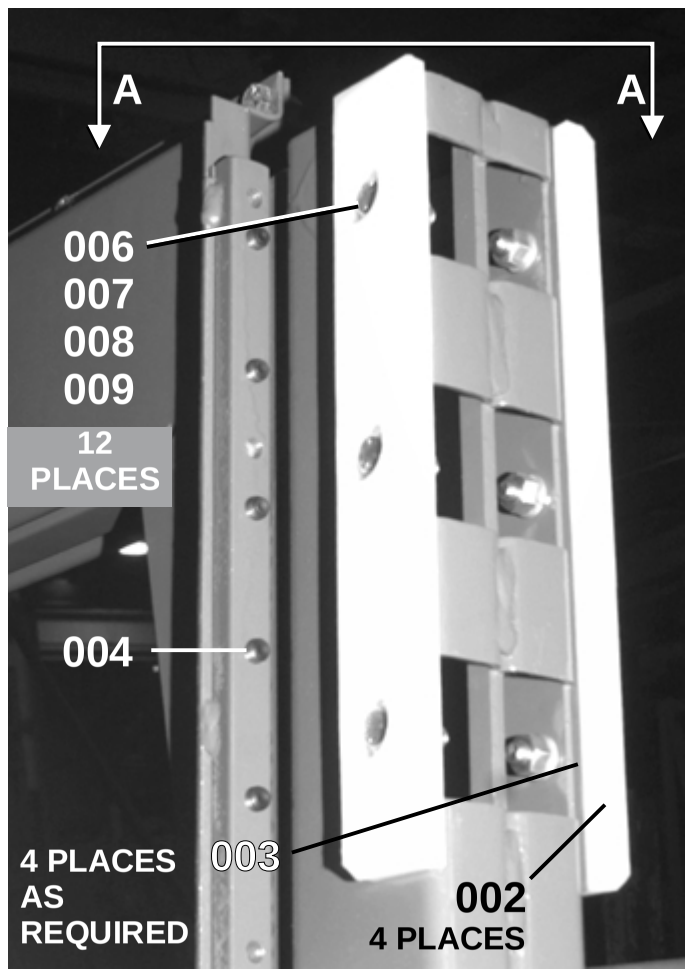
All Elevating Shuttles

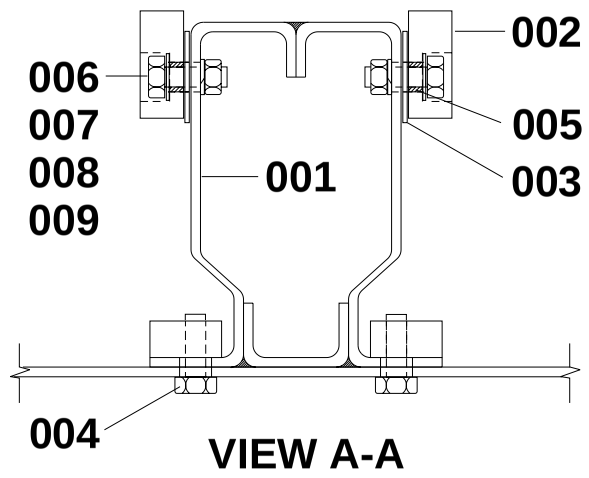
Pellerin Milnor Corporation
P. O. Box 400, Kenner, LA 70063-0400

BMP950037/96203V (1 of 1)

Litho in U.S.A.







Parts List—Side Slider Assembly

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	ALC420012	88432D MK2 SIDE SLIDER COSHA 112	
	B	ALC420012A	88000Z MK2 SIDE SLIDER-COLOSLYA	
	C	ALC420012B	90000Z MK2 SIDE SLIDER COSHA 113	
	D	ALC420012C	90000Z MK2 SIDE SLIDER COSHA 114	
	E	ALC420012E	93000Z COBUC/ELEVATE SLIDER ASSY	
	F	ALC420012F	94000Z MK2 SIDE SLIDER COSHA 122	
	G	ALC420013	88432# MK2 SIDE SLIDER COSHA 111	
			----------COMPONENTS----------	
A	1	W4 20850A	94166D*MK2 COSHA 112 SLIDER WLMT	
B	1	W4 21554	94166#*MK2 COSHA 114 SLIDER WLMT	
C	1	W4 20850B	94166#*MK2 COSHA 113 SLIDER WLMT	
D	1	W4 21554	94166#*MK2 COSHA 114 SLIDER WLMT	
E	1	W4 22520	93347E*SLIDER WELDMENT=COBUC/ELEV	
F	1	W4 20850C	94166#*K2 COSHA 122 SLIDER WLMT	
G	1	W4 21157	94166#*MK2 COSHA 111 SLIDER WLMT	
all	2	04 20850C	89517B MK2 SLIDE PAD COSHA	
all	3	04 20850S	94187B SHIM-SLIDE PAD COSHA	
all	4	15K108	05Z SKCPSC3/8-16X1 BLK GR8 HK	
all	5	27B25002SZ	SPACER ROLL.39ID.125L.048T STL/ZNC	
all	6	15K095	HXCPSCR 3/8-16UNC2AX1 GR5 ZINC/CAD	
all	7	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL	
all	8	15U240	FLATWASHER(USS STD) 3/8" ZNC PLT	
all	9	15G205	HXNUT 3/8-16UNC2B ZINC GR2	

3

Hook Mounted Hoist 3.3

Hook Mounted Chain Hoist

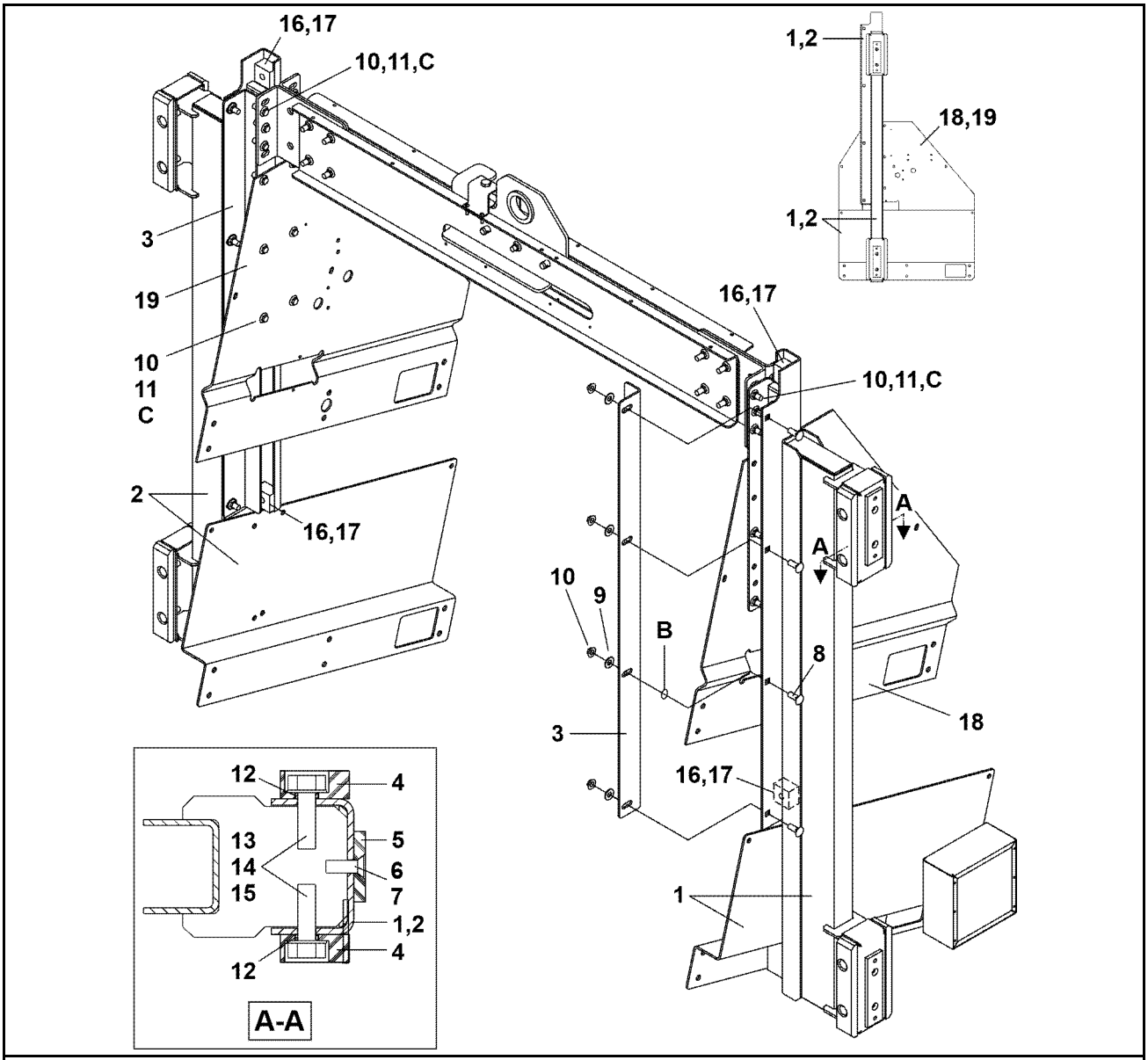
- See the hoist manufacturer's manual shipped with the machine for safe use and care of hoist. See also the Milnor Maintenance Guide for the shuttle or elevator model.
- When ordering a replacement hoist supply the model, serial number, and nameplate data from the hoist.

Table 1. Parts List—Hook Mounted Chain Hoist

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.

Used In	Item	Part Number	Description/Nomenclature	Comments
Assemblies				
none				
Components				
all	1	27KH050A83	DEMAGHOIST 2TON 24FPM 380V60	
all	1	27KH050A89	DEMAGHOIST 1TON48FPM 460V60	
all	1	27KH050A92	DEMAGHOIST 1TON39FPM 380-415V/3/50	
all	1	27KH050A81	DEMAGHOIST 2TON 24FPM 460V	
all	1	27KH04816	HOIST 1TON 48FPM 230V60 COFFING	
all	1	27KNER010A	HARRINGTON HOIST 1TON 28FPM 230/460V	

Side Slider & Two Bed Support for Hook Mount Chain Hoist



Legend

A—A . Cross section view of slider pad and hardware, 4 instances
B . . . 8 instances
C . . . 20 instances

Side Slider & Two Bed Support for Hook Mount Chain Hoist

Table 1. Parts List—Side Slider & Two Bed Support for Hook Mount Chain Hoist

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Assemblies				
	A	ALC50108	LF/RT SIDE SLIDER-COLFJ112	COLFJ112
	B	ALC420012G	LF/RT SIDE SLIDER HORZ BED-COLFJ/K111A	COLFJ112 HORIZONTAL BEDS
	C	ALC50109	LF/RT SIDE SLIDER-COSHJ112	COSHJ112
	D	ALC50109A	LF/RT SIDE SLIDER-COSHJ112A	COSHJ112A HORIZONTAL BEDS
Components				
AC	1	W4 21792	MAIN SLIDER WLMT LF-COSHJ112	
B	1	W4 23797	SIDE SLIDER WLMT LF-COLFJ111A	
D	1	W4 21792F	MAIN SLIDER WLMT LF-COSHJ112A	
AC	2	W4 21792A	MAIN SLIDER WLMT RT-COSHJ112	
BD	2	W4 23797A	SIDE SLIDER WLMT RT-COLFJ111A	
AC	3	04 21791	UPPER BED SLIDER ADJ BRKT	
BD	3	W4 21792G	MAIN SLIDER WLMT RT-COSHJ112A	
all	4	X4 23391	TRACK SLIDER UHMW BAR	
all	5	X4 23326	BED SLIDE UHMW PAD	
all	6	15N173	FLATMACSCR 1/4-20NCX5/8SS18-8	
all	7	15G166A	HXLOKNUT NYL1/4-20 UNC2A STL/Z	
all	8	15A012	CARBOLT 3/8-16UNC2AX1+1/4 ZNC	
all	9	15U240	FLATWASHER(USS STD) 3/8" ZNC P	
all	10	15G198	HXFLGNUT 3/8-16 ZINC	
all	11	15K092	HEXFLGSCR 3/8-16X1 GR8 CS	
all	12	27B25002SZ	SPCRROLL.39ID.125L.048T STLZNC	
all	13	15K105	HXCAPSCR 3/8-16UNC2A1.25 GR5 P	
all	14	15U200	FLATWASHER(USS STD) 5/16"ZNC P	
all	15	15G218	HXLOKNUT NYL 3/8-16 STL/ZNC	
all	16	02 19283	NUT=1/2-13UNCX1+1/2SQ SPEC	
all	17	15K154A	HEXCAPSCR 1/2-13X1.5 G8 ZN	
AC	18	04 23304	TOP BED MTG 15DEG-LF	
BD	18	04 22273	UPPER HORZBED MTG PLATE-LF	
AC	19	04 23304B	TOP BED MTG 15DEG-RT	
BD	19	04 22273A	UPPER HORZBED MTG PLATE-RT	

3 Beds 3.4

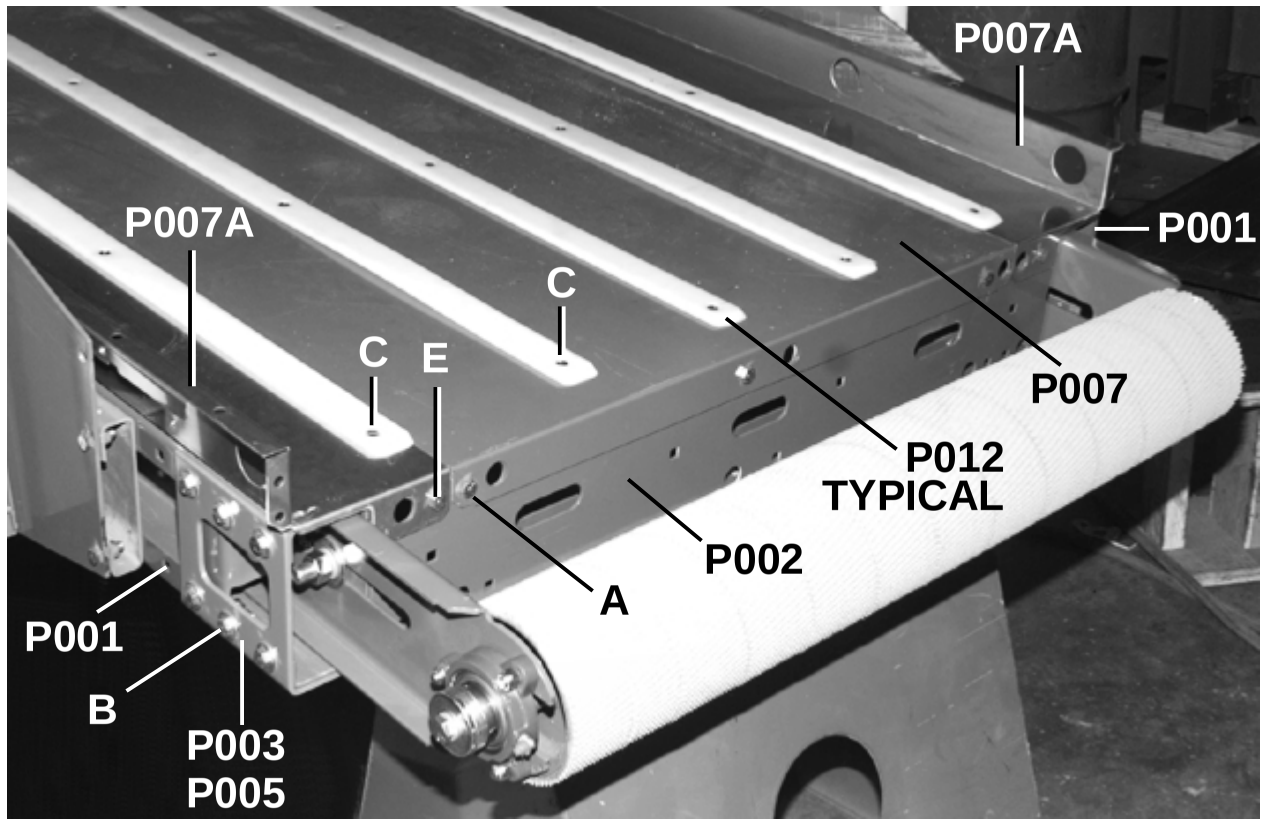
Conveyor Assembly 40 x 108

All 40" Wide Flatbelt & Shuttle Conveyors

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

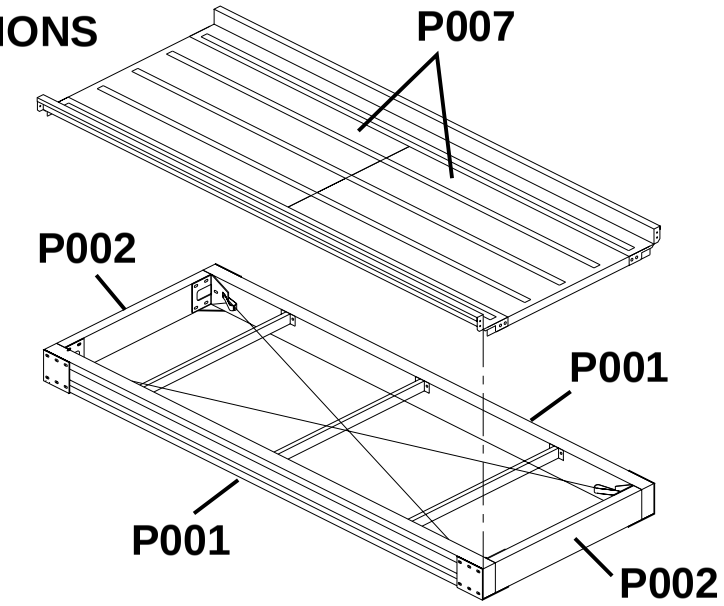
BMP960005/96137V (1 of 2)

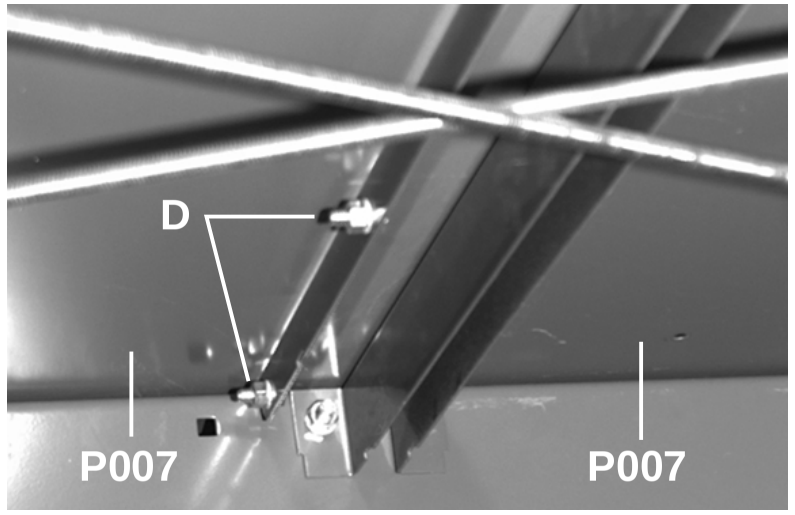
Litho in U.S.A.

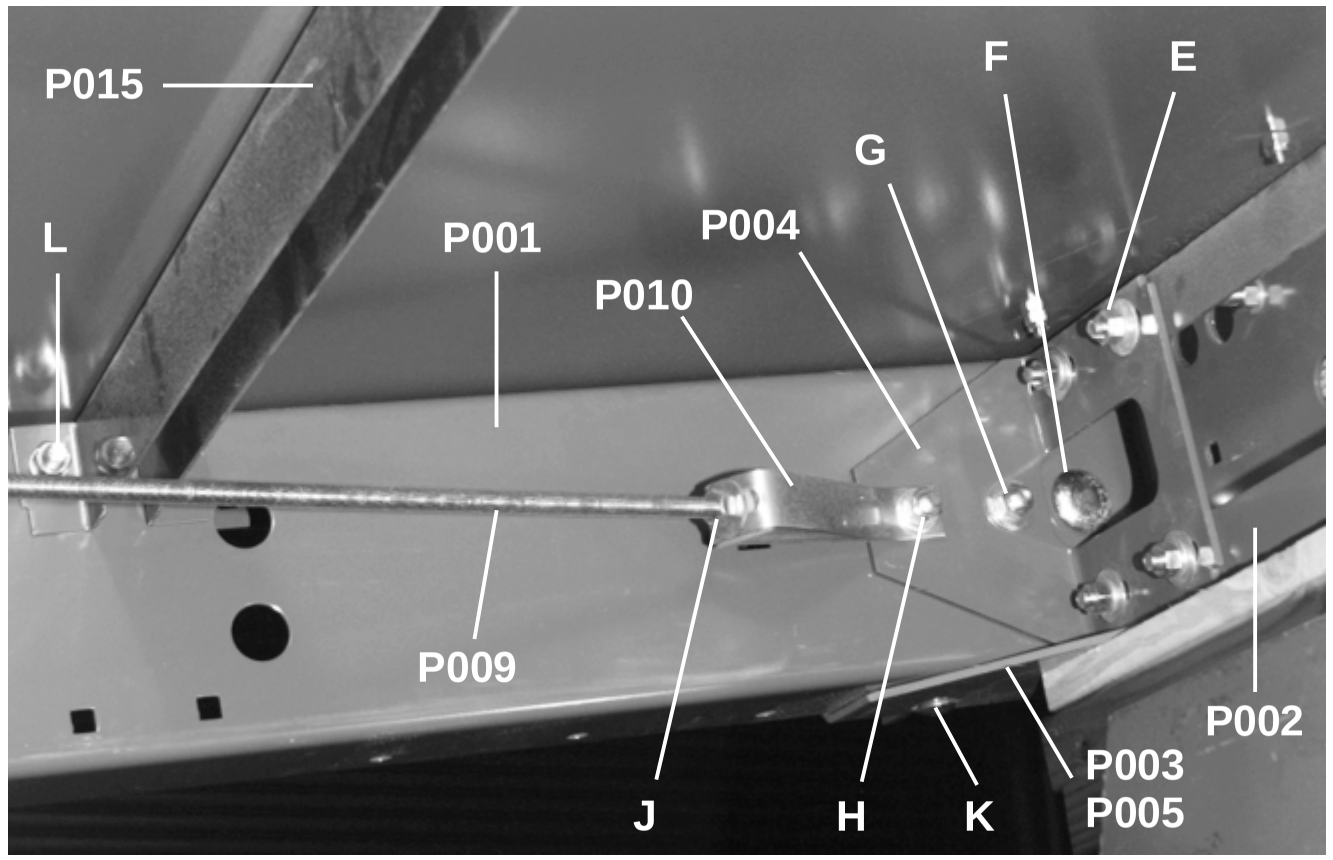


TYPICAL HARDWARE CONNECTIONS

- A- AF01,AF02,AF03
- B- AF04,AF03,AF05,AF02
- C- AF06,AF07
- D- AF08,AF09,AF10
- E- AF11,AF05,AF02,AF03
- F- AF12,AF13,AF14,AF15
- G- AF04,AF03,AF05
- H- AF16,AF03,AF05
- J- AF17







Pellerin Milnor Corporation
P. O. Box 400, Kenner, LA 70063-0400
Litho in U.S.A.

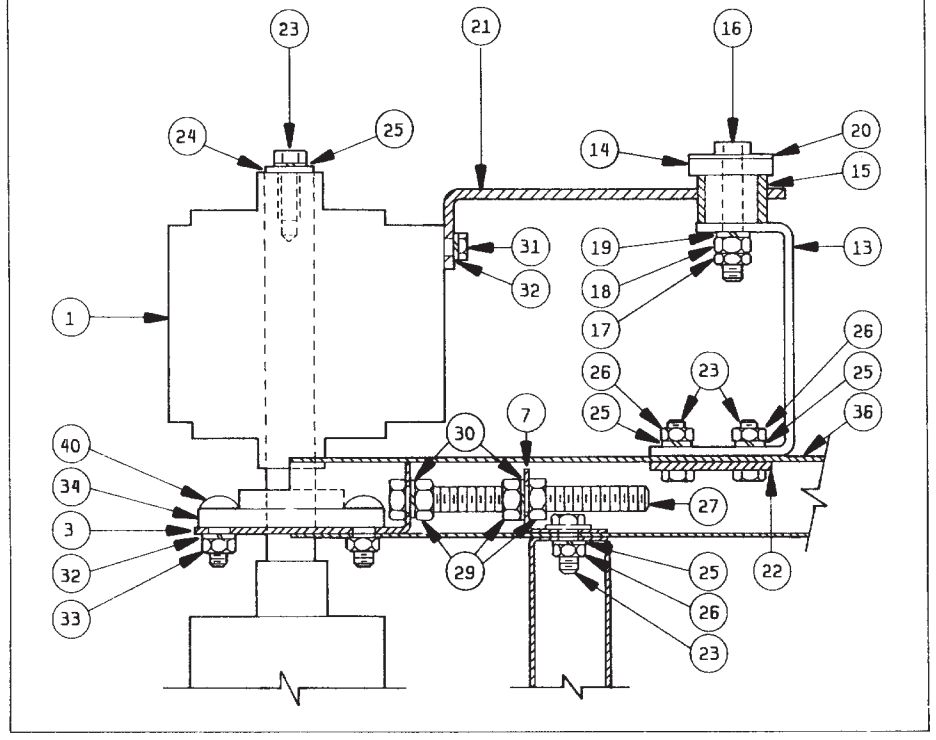
Parts List—Conveyor Assembly 40 x 108

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.

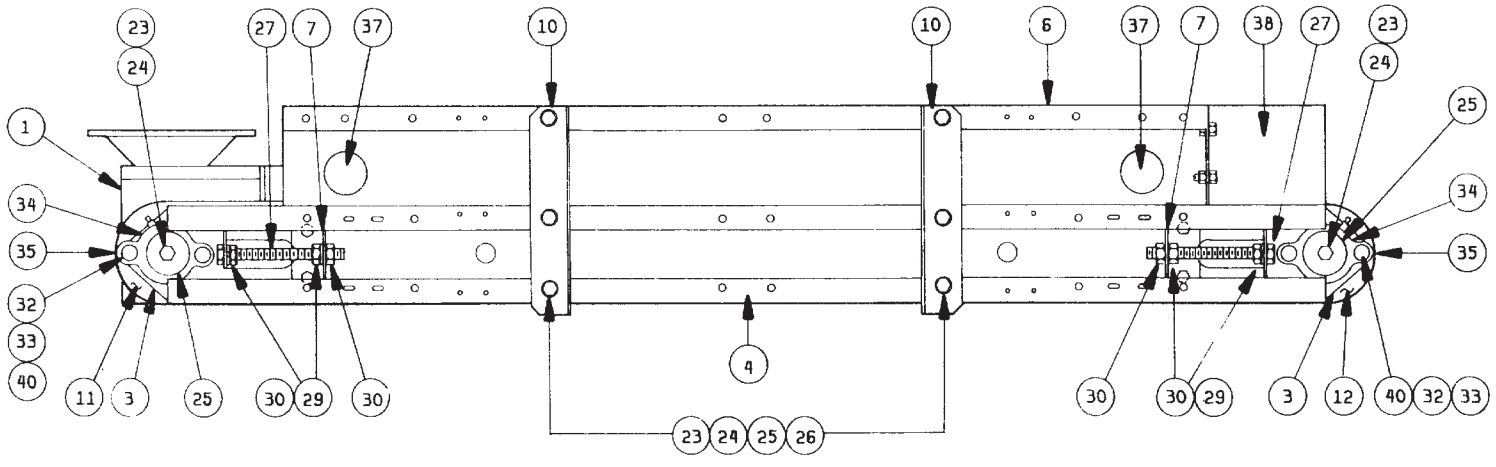
Used In	Item	Part Number	Description	Comments
			----------ASSEMBLIES----------	
all	A	ALC40003	86293@ MCS CONVEY W=40 L=108 ASSY	
			----------COMPONENTS----------	
all	AF01	15K085	HEXCAPSCR 3/8-16UNC2AX3/4 GR5 ZINC	
all	AF02	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL	
all	AF03	15G205	HXNUT 3/8-16UNC2B ZINC GR2	
all	AF04	15K095	HXCPSCR 3/8-16UNC2AX1 GR5 ZINC/CAD	
all	AF05	15U240	FLATWASHER(USS STD) 3/8" ZNC PLT	
all	AF06	15N176	FLATMACSCR 1/4-20NCX3/4SS18-8	
all	AF07	15G166A	01Z HXLOKNUT NYL1/4-20 UNC2A STL/ZC	
all	AF08	15K060	HXCAPSCR 5/16-18UNCAX3/4 GR5 ZN/CD	
all	AF09	15G185	HXNUT 5/16-18UNC2B SAE ZINC GR2	
all	AF10	15U210	LOKWASHER MEDIUM 5/16 ZINCPL	
all	AF11	15A011	CARBOLT 3/8-16UNC2X1 ZINC GR2	
all	AF12	15A075	CARBOLT 5/8-11UNC2X1 3/4 ZINC GR2	
all	AF13	15U314	FLATWASHER(USS STD) 5/8" ZNC PLT	
all	AF14	15U315	LOKWASHER MEDIUM 5/8 ZINCPL	
all	AF15	15G238	HXNUT 5/8-11UNC2B SAE ZINC GR2	
all	AF16	15K105	HXCAPSCR 3/8-16UNC2A1.25 GR5 PLATED	
all	AF17	02 13155A	71197A WASHER=SELF ALIGNING	
all	P001	04 20003	91137# MCS 108"SIDE MEMBER	
all	P002	04 20004A	96152D MCS 40"CROSS MEMBER	
all	P003	04 20023A	88202# MCS MOD CONN BKT RIGHT END	
all	P004	04 20024	89216C MCS CROSS MEMBER CONN BKT	
all	P005	04 20023B	88202# MCS MOD CONN BKT LEFT END	
all	P007	04 23082	95427D CONV BED HALF 40WX54L	
all	P007A	04 23091	95427D CONV SIDE 3.00X1.50X108L	
all	P009	17R021	THRD ROD 3/8-16X12FT ZINC PLTD *	
all	P010	04 20118	90491B TIE ROD STRAP	
all	P012	60F125	UHMW POLYMER STRIP 1+1/2"X1/4" *	
all	P013	04 21429	91516B BKT-UNLOAD END STIFF-COSH121	
all	P014	04 20011D	86532# 40" CONV.BED SPLICE PLATE	
all	P015	04 21687	94413D BED SUPPORT X-MEMBER-40W	

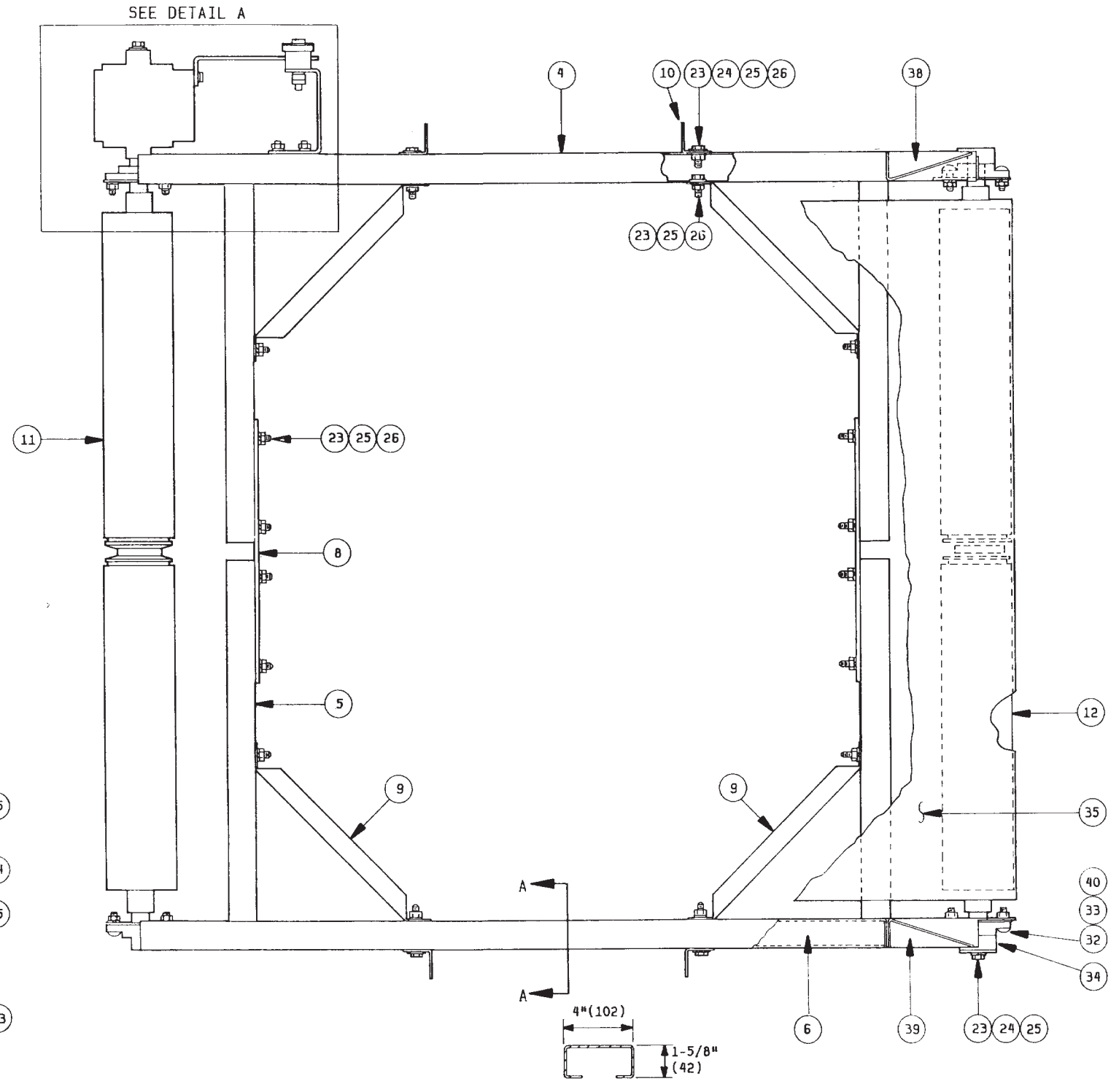
CONVEYOR BED ASSEMBLY 40" X 50"

BMP890004
93041D



DETAIL A





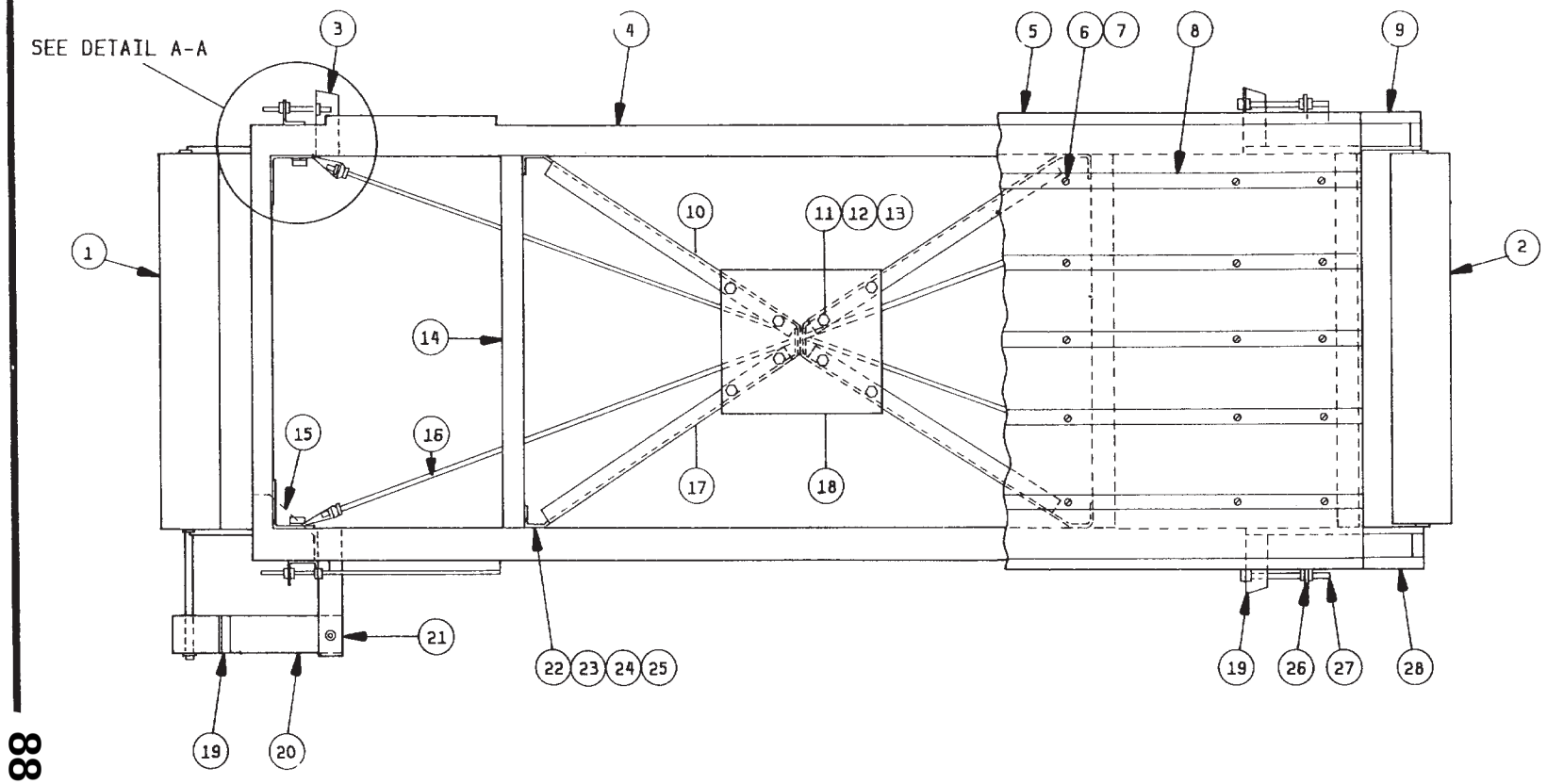
SECTION A-A

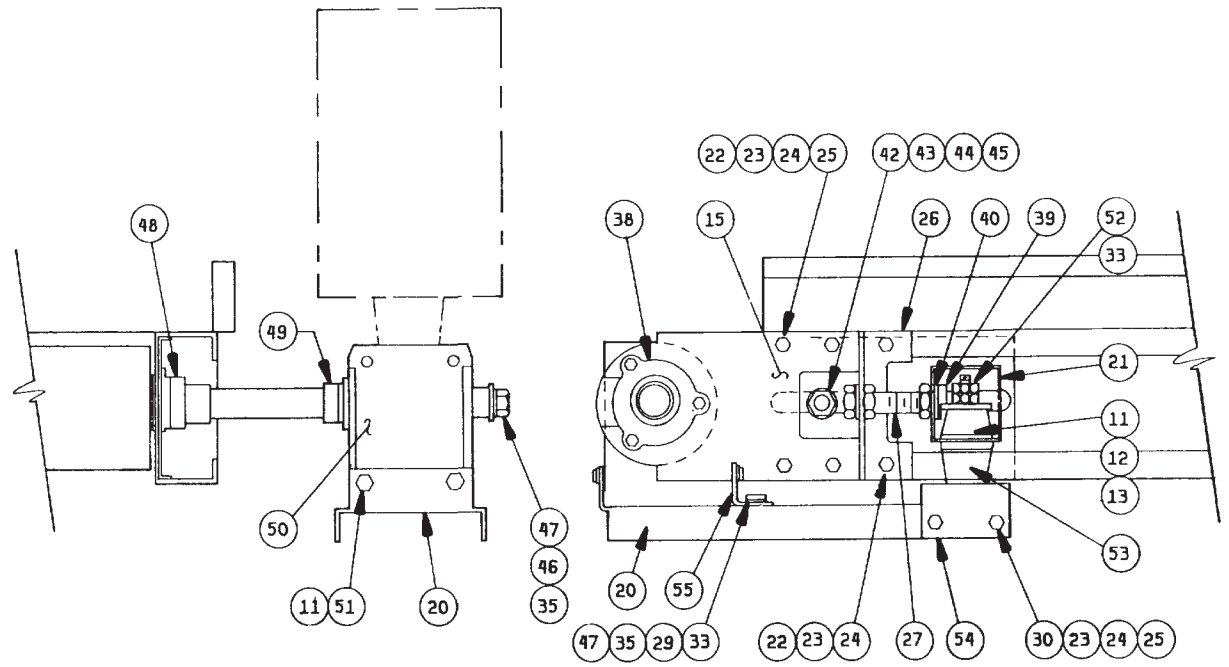
Litho in U.S.A.

ITEM	HOW PART IS USED IN ASSY (ONLY IF PERTINENT)	P/N	DESCRIPTION
000	FOR REFERENCE ONLY	ALC50001A	88017E CONVEYORBED 41X50,NO PHO-EYE
001	SEE DESCRIPTION ------->	54ST831830	REDUCER30:1 B#SF718-30T-B5-G .6/1.0
002	SEE DESCRIPTION ------->	20H213	02Z SYN. LUBE SHC634 (55GAL) E=1GAL
003	SEE DESCRIPTION ------->	04 20801	92302D BRNG SUPPORT CONV
004	SEE DESCRIPTION ------->	04 20802	87091D CONV SIDE RAIL
005	SEE DESCRIPTION ------->	04 20803	87457D CROSS MEMBER SECTION CONV
006	SEE DESCRIPTION ------->	04 20804	91057E CONVEYOR BED CONV
007	SEE DESCRIPTION ------->	04 20808	86117C BRNG ADJ BRKT CONV
008	SEE DESCRIPTION ------->	04 20809	82533C JOINER PLATE CONV
009	SEE DESCRIPTION ------->	04 20810	86266C CORNER BRACE CONV
010	SEE DESCRIPTION ------->	04 20815	92222C ANGLE BRKT CONV
011	SEE DESCRIPTION ------->	Y4 20832	87461D ROLLER 4X40 GROOVED 1"INPUT
012	SEE DESCRIPTION ------->	Y4 20833	92176D ROLLER 4X40 GROOVED 1"IDLER
013	SEE DESCRIPTION ------->	04 20837C	86022C CHAN TORQUE ARM MT 318BOSTON
014	SEE DESCRIPTION ------->	60B065	RUBBER MOUNT CENTER BONDED 40 DURO
015	SEE DESCRIPTION ------->	04 20796	85372B SLEEVE-TORQUE ARM BUSHING
016	SEE DESCRIPTION ------->	15K144C	HEXCAPSCR 7/16-14UNC X 2.5 GR 5 ZNC
017	SEE DESCRIPTION ------->	15G222	HXFINJAMNUT 7/16-14UNC2B ZINC GR2
018	SEE DESCRIPTION ------->	15G222C	HEXNUT 7/16-14UNC2B ZINC GR2
019	SEE DESCRIPTION ------->	15U271	LOKWASH INT 7/16 ZINC S-P# 1222-11
020	SEE DESCRIPTION ------->	15U312	FLAWASHER 3/40DX33/64IDX11GA ZINCPL
021	SEE DESCRIPTION ------->	04 20837B	86022C BRKT -TORQUE ARM 318 BOSTON
022	SEE DESCRIPTION ------->	04 20838	82386B TORQUE ARM SUP CONV REAR
023	SEE DESCRIPTION ------->	15K095	HEXCAPSCR 3/8-16UNC2AX1"GR5 ZNC/CAD
024	SEE DESCRIPTION ------->	15U240	FLATWASHER(USS STD) 3/8" ZNC PLT
025	SEE DESCRIPTION ------->	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL
026	SEE DESCRIPTION ------->	15G205	HXNUT 3/8-16UNC2B ZINC GR2
027	SEE DESCRIPTION ------->	15K203	HXTAPSCR 1/2-13UNC2AX5 GR5 ZINC
028	SEE DESCRIPTION ------->	15U260	01Z FL+WASHER(USS STD)1/2 ZNC PL+D
029	SEE DESCRIPTION ------->	15U300	LOKWASHER MEDIUM 1/2 ZINCPL
030	SEE DESCRIPTION ------->	15G230	HXNUT 1/2-13UNC2B SAE ZINC GR2
031	SEE DESCRIPTION ------->	15K063	HEXCAPSCR 5/16-18UNC2AX1 GR8 ZNC/CD
032	SEE DESCRIPTION ------->	15U210	LOKWASHER MEDIUM 5/16 ZINCPL
033	SEE DESCRIPTION ------->	15G185	HXNUT 5/16-18UNC2B SAE ZINC GR2
034	SEE DESCRIPTION ------->	54AF10001	FLANGE BRG 1"BROWNING#VF2S-116M
035	SEE DESCRIPTION ------->	54C4010000A	83177NBLT SPL 40WSH W"V" +LACING
036	SEE DESCRIPTION ------->	04 20838A	82386B TORQUE ARM SUPPORT SPACER
037	SEE DESCRIPTION ------->	12P11PHP	HOLEPLUG LPE BLK 1-3/4" HEYCO #2773
038	SEE DESCRIPTION ------->	04 21029	87236C GUIDE-CAKE RT COINC CONVBED
039	SEE DESCRIPTION ------->	04 21030	87236# GUIDE-CAKE LH COINC CONVBED
040	SEE DESCRIPTION ------->	15A008C	CARRBOLT 5/16-18NCX1''ZINC GR-2
041	SEE DESCRIPTION ------->	ALC36038B	91357B OIL LEVEL INDICATOR 718/721

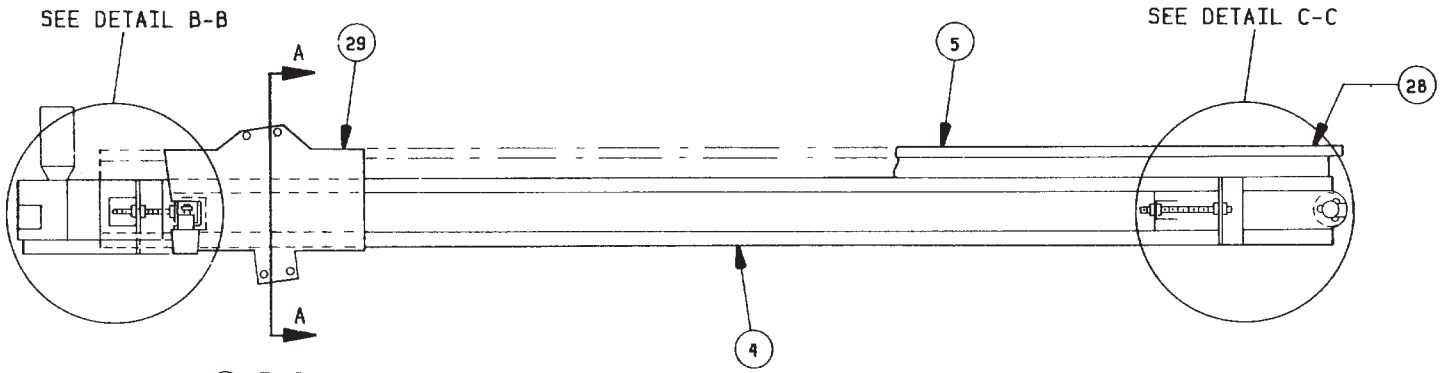
COSHA BED ASSEMBLY 40" X 126"

BMP890024
93041D

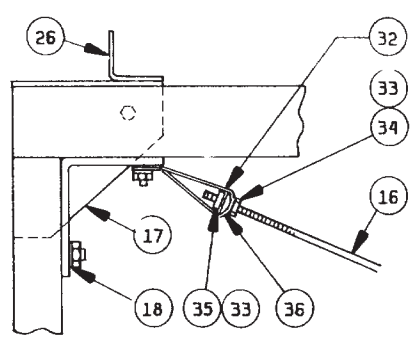




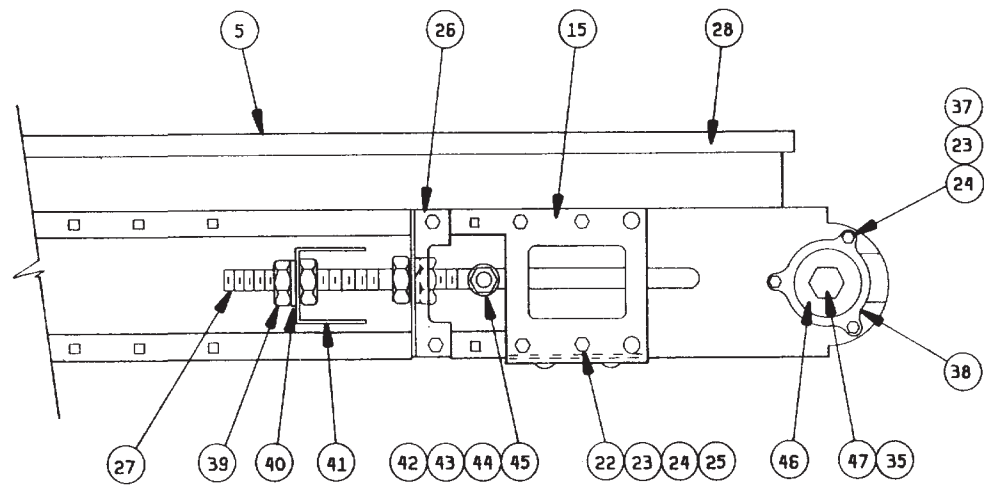
DETAIL B-B



SECTION A-A



DETAIL A-A



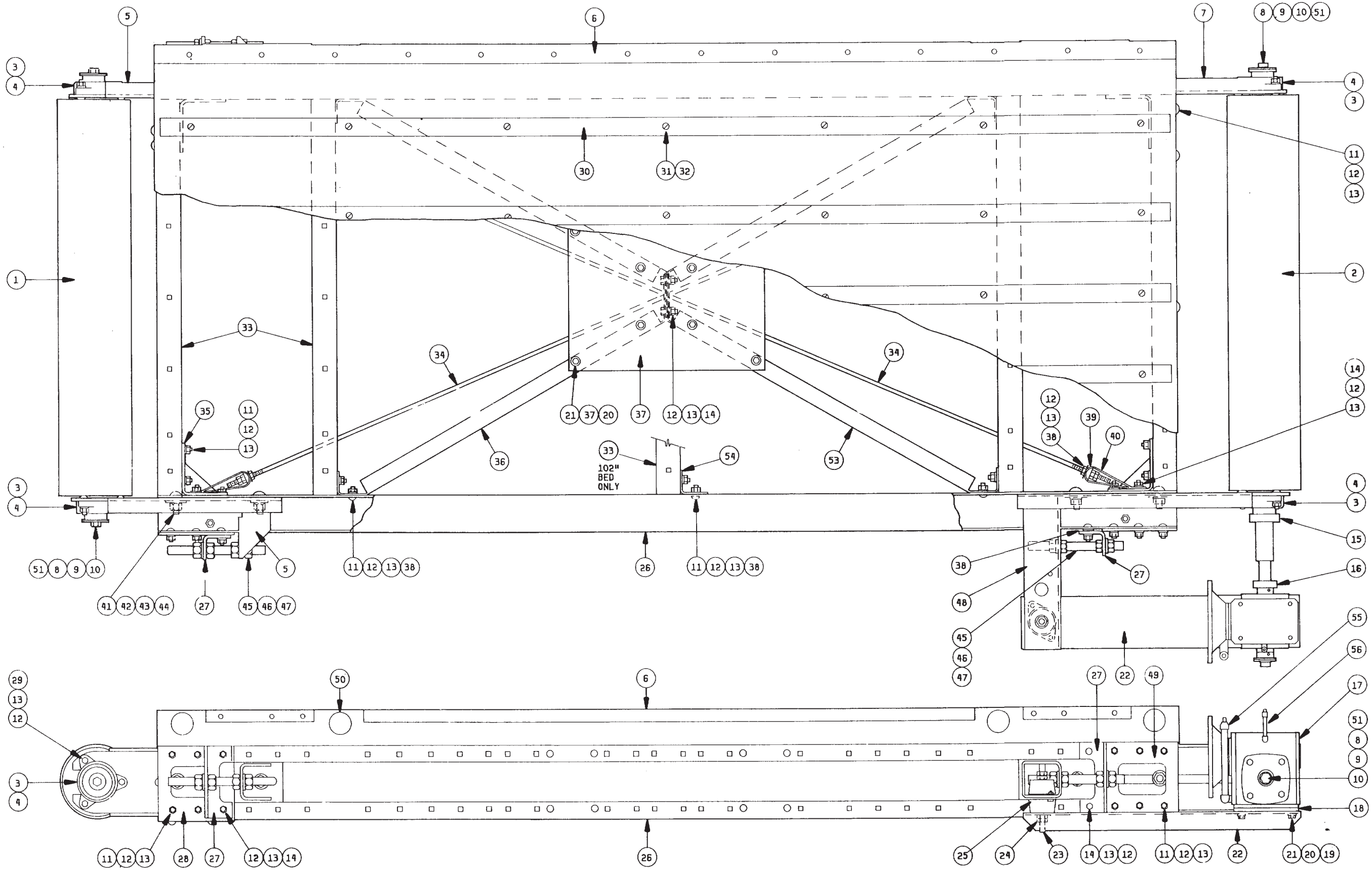
DETAIL C-C

ITEM	HOW PART IS USED IN ASSY (ONLY IF PERTINENT)	P/N	DESCRIPTION
00Z	FOR REFERENCE ONLY	ALC40006	893076 COSHA CONVEYOR BED 40X126
001	SEE DESCRIPTION ------->	APC40002A	86041Z*MCS 40"ONE DRV LAG*1.00INPUT
002	SEE DESCRIPTION ------->	APC40003	86041Z*MCS 40"IDLER LAGGED 1.437
003	SEE DESCRIPTION ------->	W4 21414	88427C*BRGCARR WLMT DR END-COLOOSE
004	SEE DESCRIPTION ------->	04 20003	91137# MCS 108"SIDE MEMBER
005	SEE DESCRIPTION ------->	04 20005D	90021E BED MCS 6ROL 40W 108L CROWN
006	SEE DESCRIPTION ------->	15N176	FLATMACSCR 1/4-20NCX3/4SS18-8
007	SEE DESCRIPTION ------->	15G166A	01Z HXLOKNUT NYL1/4-20 UNC2A STL/ZC
008	SEE DESCRIPTION ------->	60F125	UHMW POLYMER STRIP 1+1/2"X1/4" *
009	SEE DESCRIPTION ------->	04 21425	92703C BED EXT-LF UNLOAD/RT LOAD
010	SEE DESCRIPTION ------->	04 21434	90532D BRACE-BED FRAME LG-COLOOSE
011	SEE DESCRIPTION ------->	15K060	HXCAPSCR 5/16-18UNCAX3/4 GR5 ZN/CD
012	SEE DESCRIPTION ------->	15U210	LOKWASHER MEDIUM 5/16 ZINCPL
013	SEE DESCRIPTION ------->	15G185	HXNUT 5/16-18UNC2B SAE ZINC GR2
014	SEE DESCRIPTION ------->	04 20004A	92461D MCS 40"CROSS MEMBER
015	SEE DESCRIPTION ------->	04 20023B	88202# MCS MOD CONN BKT LEFT END
016	SEE DESCRIPTION ------->	04 20113	87152B MCS 36X108 TIE ROD 96"LG
017	SEE DESCRIPTION ------->	04 20023A	88202# MCS MOD CONN BKT RIGHT END
018	SEE DESCRIPTION ------->	04 21435	90526C BRACE MTG PLATE-COLOOSE BED
019	SEE DESCRIPTION ------->	W4 20029	88503#*MCS BRGCAR 6"ROLL NO TORKARM
020	SEE DESCRIPTION ------->	04 21420	87342D TORQUE ARM 1.000 SHAFT MT DR
021	SEE DESCRIPTION ------->	W4 21413	91273C*BRGCARR WLMT DRSIDE-COLOOSE
022	SEE DESCRIPTION ------->	15A011	CARBOLT 3/8-16UNC2X1 ZINC GR2
023	SEE DESCRIPTION ------->	15G205	HXNUT 3/8-16UNC2B ZINC GR2
024	SEE DESCRIPTION ------->	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL
025	SEE DESCRIPTION ------->	15U240	FLATWASHER(USS STD) 3/8" ZNC PLT
026	SEE DESCRIPTION ------->	04 20026A	90186B MCS BEARING CARRIER ADJ BKT
027	SEE DESCRIPTION ------->	17R026A10A	88052# MCS BEARING CARRIER STUD 10"
028	SEE DESCRIPTION ------->	04 21425A	92703# BED EXT-RT UNLOAD/LF LOAD
029	SEE DESCRIPTION ------->	04 21416	92247D 6"CONV BED TILT-COLOOSE2
030	SEE DESCRIPTION ------->	15K105	HXCAPSCR 3/8-16UNC2A1.25 GR5 PLATED
031	SEE DESCRIPTION ------->	04 21410	90497D SPACER-126"CUSHA BED
032	SEE DESCRIPTION ------->	04 20118	90491B TIE ROD STRAP
033	SEE DESCRIPTION ------->	15G230	HXNUT 1/2-13UNC2B SAE ZINC GR2
034	SEE DESCRIPTION ------->	15U280	01Z FL+WASHER(USS STD)1/2 ZNC PL+D
035	SEE DESCRIPTION ------->	15U300	LOKWASHER MEDIUM 1/2 ZINCPL
036	SEE DESCRIPTION ------->	02 13155A	71197A WASHER-SELF ALIGNING
037	SEE DESCRIPTION ------->	15A021	CARRBOLT 3/8-16 X1.5 ZNC GR 5
038	SEE DESCRIPTION ------->	54AF1437	FLANGE BRG.BROWN#VF3S-123M
039	SEE DESCRIPTION ------->	15G240	HXNUT 3/4-10UNC2B SAE ZINC GR2
040	SEE DESCRIPTION ------->	15U340	LOCKWASH MEDIUM 3/4 ZINCPL
041	SEE DESCRIPTION ------->	17R023A05K	THREADED ROD 1/2-20UNFX5+1/2"LONG
042	SEE DESCRIPTION ------->	15A075	CARBOLT 5/8-11UNC2X1 3/4 ZINC GR2
043	SEE DESCRIPTION ------->	15G238	HXNUT 5/8-11UNC2B SAE ZINC GR2
044	SEE DESCRIPTION ------->	15U314	FLATWASHER(USS STD) 5/8" ZNC PLT
045	SEE DESCRIPTION ------->	15U315	LOKWASHER MEDIUM 5/8 ZINCPL
046	SEE DESCRIPTION ------->	15U490	FLAWASH 1+1/2X17/32X1/4ZINC
047	SEE DESCRIPTION ------->	15K147	HXCAPSCR 1/2-13UNC2X1 GR5 ZINC
048	SEE DESCRIPTION ------->	54JH11437C	SHAFTCOLLAR 1.4375 CFG #23S
049	SEE DESCRIPTION ------->	54JH11000C	SHAFTCOLLAR SPLIT 1" CG#16S

ITEM	HOW PART IS USED IN ASSY (ONLY IF PERTINENT)	P/N	DESCRIPTION
050	SEE DESCRIPTION ------->	54STB31R40	REDUCER40:1 B#SF718-40T-B5-G .6/1.0
051	SEE DESCRIPTION ------->	15U200	FLATWASHER(USS STD) 5/16"ZNC PLT
052	SEE DESCRIPTION ------->	15K162	HXCAPSCR 1/2-13UNC2AX1.5 GR5 PLATED
053	SEE DESCRIPTION ------->	608055	01Z VIBRO ISOLATER REINFORCED 70 D
054	SEE DESCRIPTION ------->	04 20070B	86403C TORQ ARM END BKT 1&1.125SHFT
055	SEE DESCRIPTION ------->	04 20070A	88081B TORQUE ARM BRKT 1.000" SHAFT

COSHA BED ASSEMBLY 36" X 126"

BMP890025
93041D



06

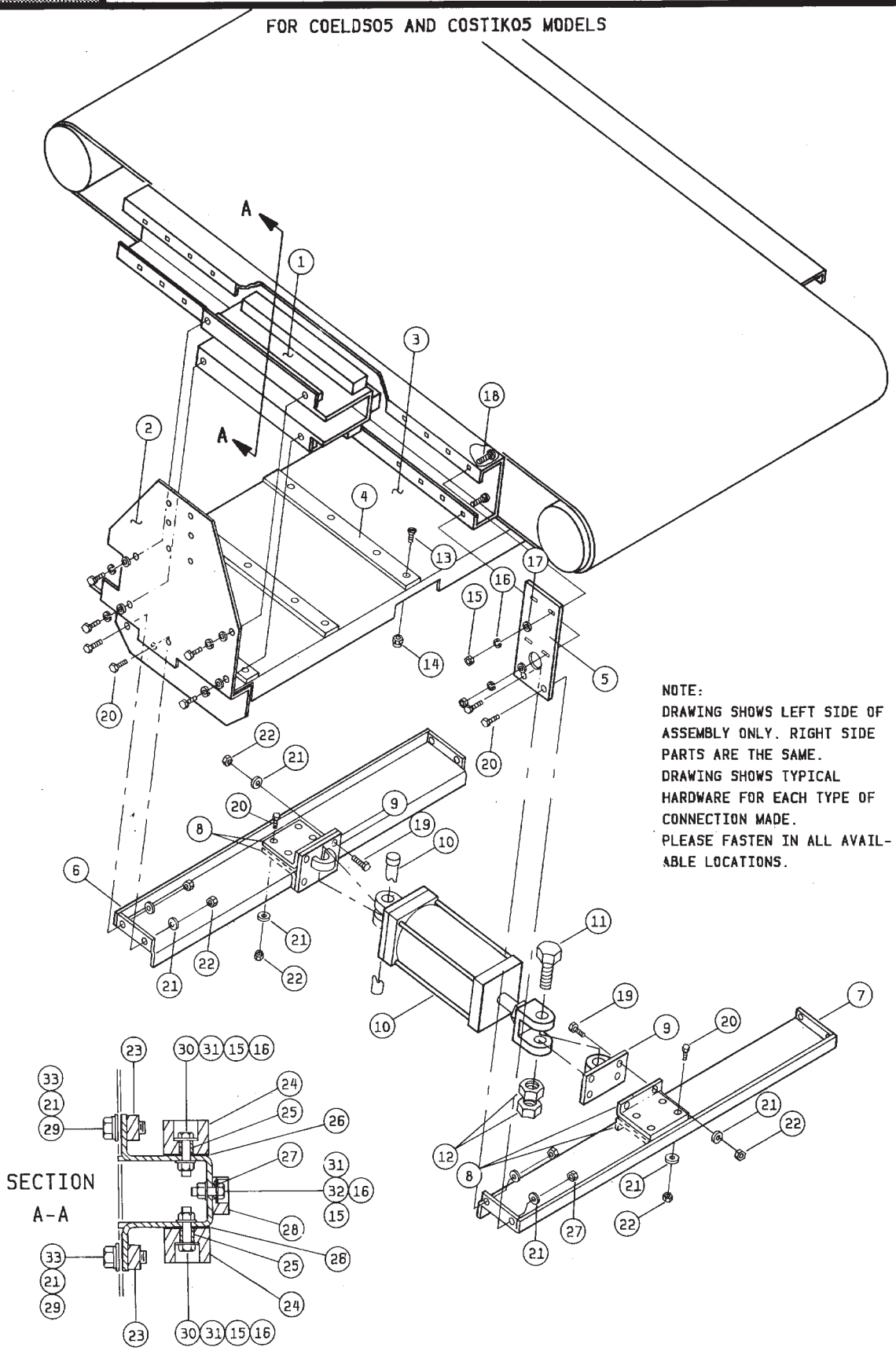
PARTS LIST FOR: BMP890025R/93041A COSHA BED ASSEMBLY-36"X126"

ITEM	HOW PART IS USED IN ASSY (ONLY IF PERTINENT)	P/N	DESCRIPTION
00Y	SEE DESCRIPTION ------->	ALC36048	89297D 36X102" BED ASSY-NO SIDE EXT
002	FOR REFERENCE ONLY	ALC36046	89297# 36X126" BED ASSY-NO SIDE EXT
001	SEE DESCRIPTION ------->	APC36002	86206T 36" IDLER LAGGED PULLEY
002	SEE DESCRIPTION ------->	APC36003	86206@ 36" DRIVE LAGGED 1.000 INPUT
003	SEE DESCRIPTION ------->	54M010	GREASEFIT 1/4-28NF-90 PIVOT#ZERT-29
004	SEE DESCRIPTION ------->	54AF1437	FLANGE BKG.BROWN#VF3S-123M
005	SEE DESCRIPTION ------->	W4 21414	88427C*BKGCARR WLMT DR END-COLOUSE
006A	102" BED ONLY	04 20007	90321# BED MCS 6ROL 36W 84L CROWN
006B	126" BED ONLY	04 20008	90321# BED MCS 6ROL 36W 108L CROWN
007	SEE DESCRIPTION ------->	W4 21414A	88427#*BKGCARR WLMT DR END-COSLIDEB
008	SEE DESCRIPTION ------->	15K147	HXCAPSCR 1/2-13UNC2X1 GR5 ZINC
009	SEE DESCRIPTION ------->	15U490	FLAWASH 1+1/2X17/32X1/4ZINC
010	SEE DESCRIPTION ------->	15U286	FLATWASHER 2"ODX17/32"IDX1/4" ZINC
011	SEE DESCRIPTION ------->	15A011	CARBOLT 3/8-16UNC2X1 ZINC GR2
012	SEE DESCRIPTION ------->	15G205	HXNUT 3/8-16UNC2B ZINC GR2
013	SEE DESCRIPTION ------->	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL
014	SEE DESCRIPTION ------->	15K105	HXCAPSCR 3/8-16UNC2A1.25 GR5 PLATED
015	SEE DESCRIPTION ------->	54JH11437C	SHAFTCOLLAR 1.4375 CFG #23S
016	SEE DESCRIPTION ------->	54JH11000C	SHAFTCOLLAR SPLIT 1" CG#16S
017	SEE DESCRIPTION ------->	54STB31A40	REDUCER40:1 B#SF718-40T-B5-G .6/1.0
018	SEE DESCRIPTION ------->	04 21641A	88427B SHIM-GEAR REDUCER-COSLIDEB
019	SEE DESCRIPTION ------->	15G185	HXNUT 5/16-18UNC2B SAE ZINC GR2
020	SEE DESCRIPTION ------->	15U210	LOKWASHER MEDIUM 5/16 ZINCPL
021	SEE DESCRIPTION ------->	15K060	HXCAPSCR 5/16-18UNCAX3/4 GR5 ZN/CD
022	SEE DESCRIPTION ------->	04 21641	91273C TORQUE ARM-BELT DR-COSLIDEB
023	SEE DESCRIPTION ------->	17R023A05K	THREADED ROD 1/2-20UNFX5+1/2"LONG
024	SEE DESCRIPTION ------->	15G231A	HXFINJAMNUT 1/2-20UNF2B ZINC GR2
025	SEE DESCRIPTION ------->	60B055	01Z VIBRO ISOLATER REINFORCED 70 D
026A	102" BED ONLY	04 20002	91137D MCS 84"SIDE MEMBER
026B	126" BED ONLY	04 20003	91137# MCS 108"SIDE MEMBER
027	SEE DESCRIPTION ------->	04 20026A	90186B MCS BEARING CARRIER ADJ BKT
028	SEE DESCRIPTION ------->	04 20023A	88202# MCS MOD CONN BKT RIGHT END
029	SEE DESCRIPTION ------->	15A021	CARRBOLT 3/8-16 X1.5 ZNC GR 5
030	SEE DESCRIPTION ------->	60F125	UHMW POLYMER STRIP 1+1/2"X1/4" *
031	SEE DESCRIPTION ------->	15N176	FLATMACSCR 1/4-20NCX3/4SS18-8
032	SEE DESCRIPTION ------->	15G166A	01Z HXLOKNUT NYL1/4-20 UNC2A STL/ZC
033	SEE DESCRIPTION ------->	04 20004	92377D MCS 36"CROSS MEMBER
034A	102" BED ONLY	04 20115	87152# MCS 36X84 TIE ROD 73" LG.
034B	126" BED ONLY	04 20113	87152B MCS 36X108 TIE ROD 96"LG
035	SEE DESCRIPTION ------->	04 20024	89216C MCS CROSS MEMBER CONN BKT
036	126" BED ONLY	04 21642A	88471# BRACE-BED FRAME SH-COSLIDEB
037	126" BED ONLY	15U200	FLATWASHER(USS STD) 5/16"ZNC PLT
038	SEE DESCRIPTION ------->	15U240	FLATWASHER(USS STD) 3/8" ZNC PLT
039	SEE DESCRIPTION ------->	02 13155A	71197A WASHER-SELF ALIGNING
040	SEE DESCRIPTION ------->	04 20118	90491B TIE ROD STRAP
041	SEE DESCRIPTION ------->	15A075	CARBOLT 5/8-11UNC2X1 3/4 ZINC GR2
042	SEE DESCRIPTION ------->	15G238	HXNUT 5/8-11UNC2B SAE ZINC GR2
043	SEE DESCRIPTION ------->	15U314	FLATWASHER(USS STD) 5/8" ZNC PLT
044	SEE DESCRIPTION ------->	15U315	LOKWASHER MEDIUM 5/8 ZINCPL
045	SEE DESCRIPTION ------->	17R026A08A	88043N MCS BEARING CARRIER STUD 8"
046	SEE DESCRIPTION ------->	15G240	HXNUT 3/4-10UNC2B SAE ZINC GR2
047	SEE DESCRIPTION ------->	15U340	LOCKWASH MEDIUM 3/4 ZINCPL
048	SEE DESCRIPTION ------->	W4 21413A	91273#*BRGCARR WLMT DRSIDE-COSLIDEB
049	SEE DESCRIPTION ------->	04 20023B	88202# MCS MOD CONN BKT LEFT END
050	SEE DESCRIPTION ------->	12P11PHP	HOLEPLUG LPE BLK 1-3/4" HEYCO #2773
051	SEE DESCRIPTION ------->	15U445	FLATWASH 1.453"X2"OD.X.060THK.ZINPL
053	126" BED ONLY	04 21642	88471D BRACE-BED FRAME LG-COSLIDEB
054	102" BED ONLY	04 20027	87391B MCS CROSS MEMBER BKT
055	SEE DESCRIPTION ------->	ALC36038B	91357B OIL LEVEL INDICATOR 718/721
056	SEE DESCRIPTION ------->	ALC36039B	91357B VENT PIPE-718/721 GEAR
057	126" BED ONLY	04 21643	88436B BRACE MTG PLATE-COSLIDEB

BED SLIDER & MOUNTING ASSEMBLY 5' BEDS

BMP890042
89307C

FOR COELDS05 AND COSTIK05 MODELS



Litho in U.S.A.

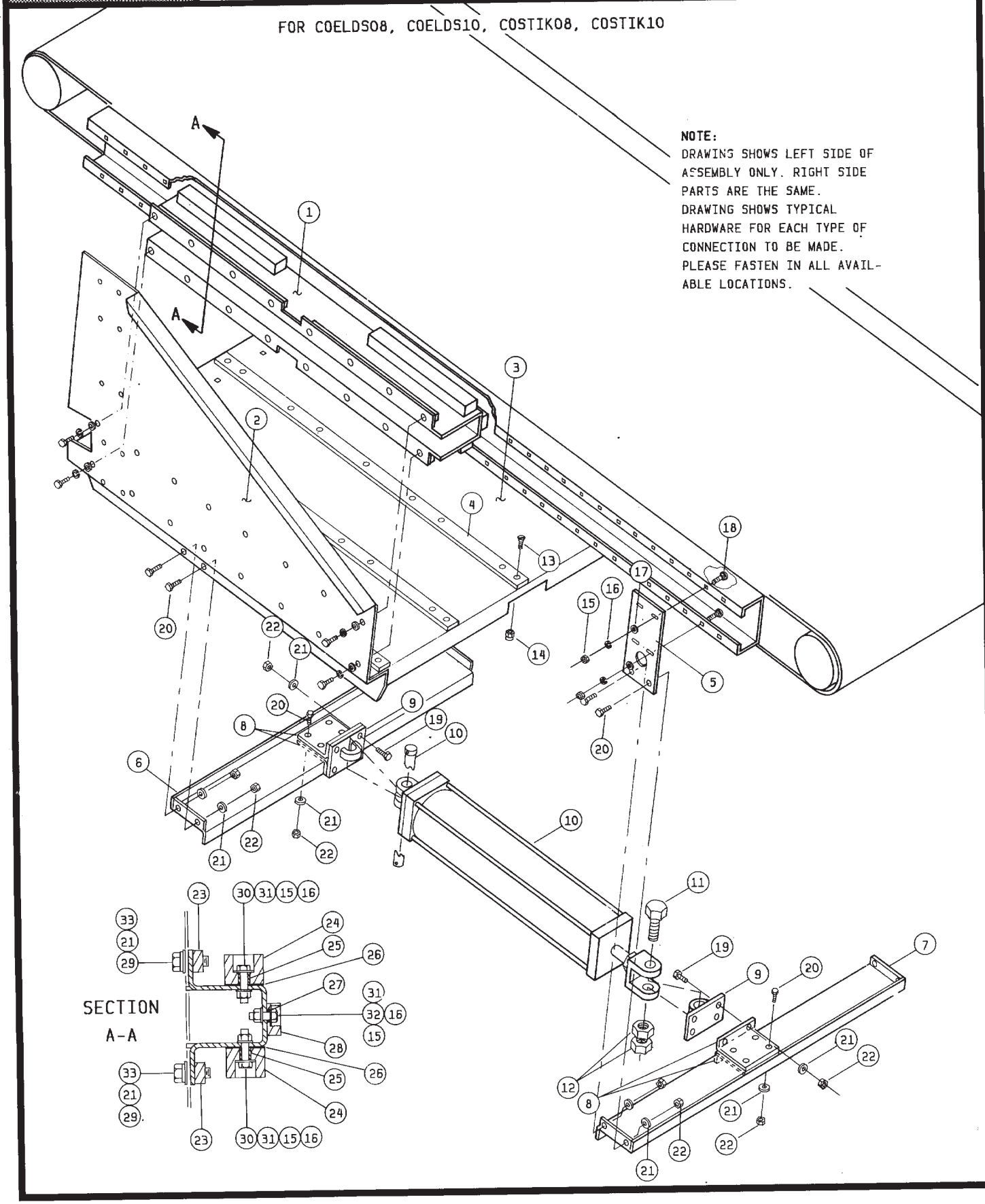
PELLERIN MILNOR CORPORATION

ITEM	HOW PART IS USED IN ASSY (ONLY IF PERTINENT)	P/N	DESCRIPTION
00Y	(REFERENCE)	ALC36044	89081C 36"BED SLIDER ASSY=8"EXT
001	SEE DESCRIPTION ------->	04 21438C	89141D 36"BED SUPPORT CHAN=COELDS05
002A	(LEFT SIDE)	04 21437B	89137D CONV BED MTG-LF=COELDS05
002B	(RIGHT SIDE)	04 21437C	89137# CONV BED MTG-RT=COELDS05
003	SEE DESCRIPTION ------->	04 21452B	89097C CONV SPT BOTTOM=COELDS05
004	SEE DESCRIPTION ------->	04 21446A	89081B SL STRAP=CONV BED BOT 18"L
005	SEE DESCRIPTION ------->	04 21448A	88431C BKT-AIR CYL MTG-REAR-COSLIDE
006	SEE DESCRIPTION ------->	04 21448C	88512C 36"BED AIRCYL MT-REAR
007	SEE DESCRIPTION ------->	04 21448	87392C BKT-AIR CYL MTG-COSLIDE
008	SEE DESCRIPTION ------->	04 21449	87392B AIR CYL ADJUSTING BRACKET
009	SEE DESCRIPTION ------->	W4 21450	87392B*AIR CYL CLEVIS MTG WELDMENT
010	SEE DESCRIPTION ------->	27C408	01Z AIR CYL 4"X8"X1" CLEVIS MT.
011	SEE DESCRIPTION ------->	15K191	HXCAPSCR 1/2-13UNC2AX2.5 GR5 ZNC/CD
012	SEE DESCRIPTION ------->	15G247	HEXTHINNUT 3/4-10UNC2B GR2 ZNC/CAD
013	SEE DESCRIPTION ------->	15N191	FLATMACHSCR 1/4-20X7/8 SS18-8 U/CUT
014	SEE DESCRIPTION ------->	15G166A	HXLOKNUT NYL 1/4-20UNC2A STEEL+ZINC
015	SEE DESCRIPTION ------->	15G205	HEXNUT 3/8-16 UNC2B GR 2 ZNC/CAD
016	SEE DESCRIPTION ------->	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL
017	SEE DESCRIPTION ------->	15U240	FLATWASHER(USS STD) 3/8" ZNC PLT
018	SEE DESCRIPTION ------->	15A021	CARRBOLT 3/8-16 X1.5 ZNC GR 5
019	SEE DESCRIPTION ------->	15K147	HXCAPSCR 1/2-13UNC2X1 6R5 ZINC/CAD
020	SEE DESCRIPTION ------->	15K151	HXCAPSCR 1/2-13UNC24X1.25 GR5 PLATE
021	SEE DESCRIPTION ------->	15U300	LOKWASHER MEDIUM 1/2 ZINCPL
022	SEE DESCRIPTION ------->	15G230	HEXNUT 1/2-13UNC2B SAEGR2 ZINC/CAD
023	SEE DESCRIPTION ------->	04 21441A	89097B THREAD STRIP-SL CHAN 15"L
024	SEE DESCRIPTION ------->	04 21654A	89156B BED SL PAD 1.38THK=COELDS05
025	SEE DESCRIPTION ------->	2782100G0L	SPACER ROLL.39ID .562L.048T STL/ZNC
026	SEE DESCRIPTION ------->	04 21664	89156B SHIM-BED SL PAD=COEL DS05
027	SEE DESCRIPTION ------->	27825002SZ	SPACER ROLL.39ID.125L.048T STL/ZNC
028	SEE DESCRIPTION ------->	04 20850C	87026B MK2 SLIDE PAD COSHA
029	SEE DESCRIPTION ------->	15U280	FLATWASHER(USS STD) 1/2" ZNC PLT
030	SEE DESCRIPTION ------->	15K110	HEXCAPSCR 3/8-16UNC2AX1.5 GR5-PLTD
031	SEE DESCRIPTION ------->	15U200	FLATWASHER(USS STD) 5/16"ZNC PLT
032	SEE DESCRIPTION ------->	15K095	HEXCAPSCR 3/8-16UNC2AX1"GR5 ZNC/CAD
033	SEE DESCRIPTION ------->	15K051	HXCAPSCR 5/16-18UNC2AX1/2 SS18-8

BED SLIDER & MOUNTING ASSEMBLY 8' & 10' BEDS

BMP890026
89296C

FOR COELDS08, COELDS10, COSTIK08, COSTIK10



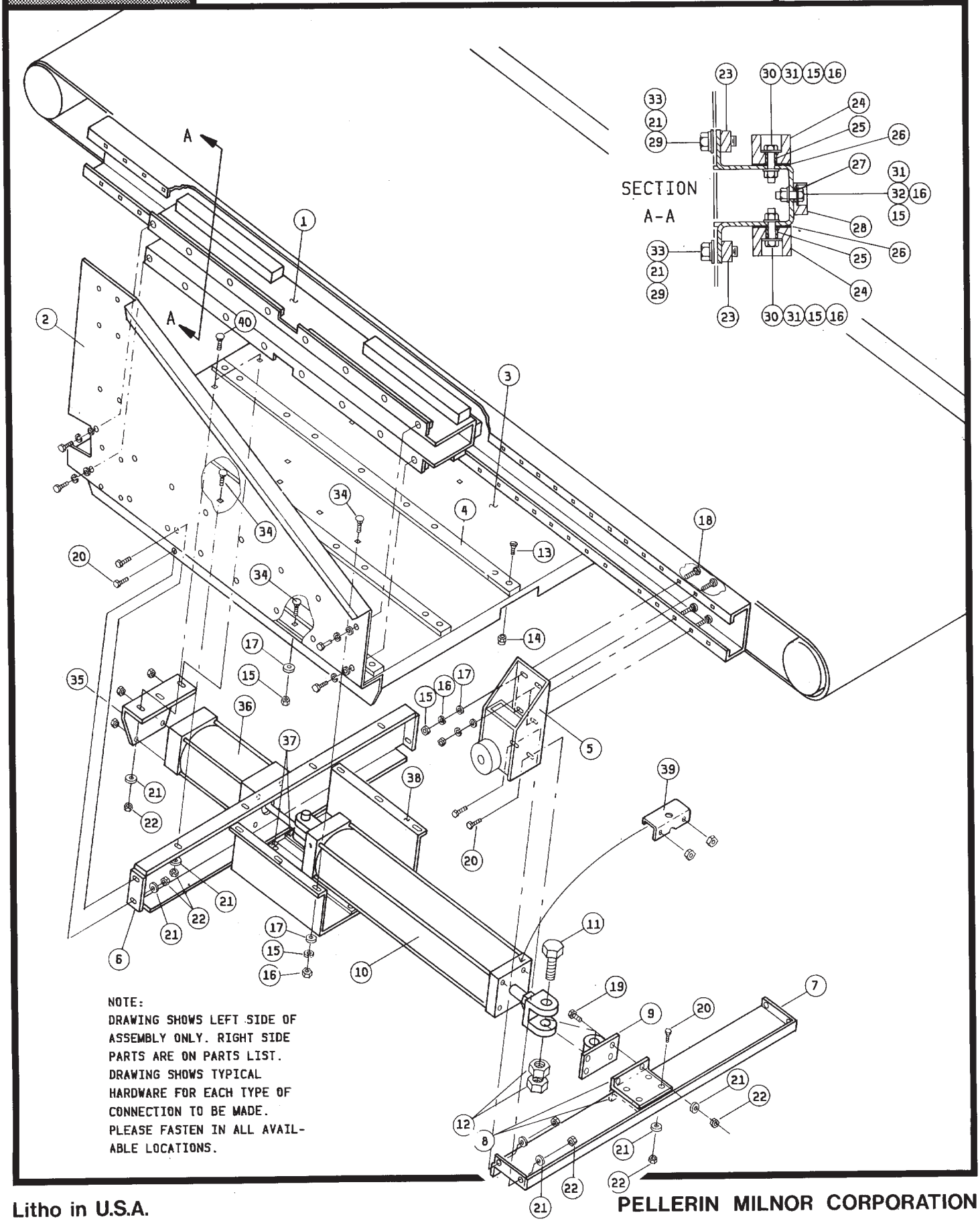
PARTS LIST FOR: BMP890026R/89296A P/L BED SLIDER MTG 8"/10"BDS

ITEM	HOW PART IS USED IN ASSY (ONLY IF PERTINENT)	P/N	DESCRIPTION
00X	(36" BELT SLIDING MODELS)	ALC36045A	89186# 36"BED SLIDER ASSY-COSTIK
00Y	(40" BELT SLIDING MODELS)	ALC40045A	89186D 40"BED SLIDER ASSY-COSLIDE2
001A	(36" BELT SLIDING MODELS)	04 21438E	89172D 36"BED SUPPORT CHAN-COSTIK
0018	(40" BELT SLIDING MODELS)	04 21438D	89172D 40"BED SUPPORT CHAN-COSLIDE2
002A	SEE DESCRIPTION ------->	04 21437	89171D CONVEYOR BED MTG-RT-COSLIDE
0028	SEE DESCRIPTION ------->	04 21437A	89171# CONVEYOR BED MTG-LF-COSLIDE
003	SEE DESCRIPTION ------->	04 21452A	89046D CONV SPT BOTTOM-COSLID38
004	SEE DESCRIPTION ------->	04 21446	89286B SLIDING STRAP-CONV BED BOT
005	SEE DESCRIPTION ------->	04 21448A	88431C BKT-AIR CYL MTG-REAR-COSLIDE
006	SEE DESCRIPTION ------->	04 21448C	88512C 36"BED AIRCYL MT-REAR
007	SEE DESCRIPTION ------->	04 21448	87392C BKT-AIR CYL MTG-COSLIDE
008	SEE DESCRIPTION ------->	04 21449	87392B AIR CYL ADJUSTING BRACKET
009	SEE DESCRIPTION ------->	W4 21450	87392B#AIR CYL CLEVIS MTG WELDMENT
010A	(COSTIK & COELDS05,08,10)	27C408	01Z AIR CYL 4"X8"X1" CLEVIS MT.
0108	(COSLIDE2 ONLY)	27C430	03Z AIR CYL 4"X30"X1" CLEVIS MT.
011	SEE DESCRIPTION ------->	15K191	HXCAPSCR 1/2-13UNC2AX2.5 GR5 ZNC/CD
012	SEE DESCRIPTION ------->	15G247	HEXTHINNUT 3/4-10UNC2B GR2 ZNC/CAD
013	SEE DESCRIPTION ------->	15N191	FLATMACHSCR 1/4-20X7/8 SS18-8 U/CUT
014	SEE DESCRIPTION ------->	15G166A	HXLOKNUT NYL 1/4-20UNC2A STEEL+ZINC
015	SEE DESCRIPTION ------->	15G205	HEXNUT 3/8-16 UNC2B GR 2 ZNC/CAD
016	SEE DESCRIPTION ------->	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL
017	SEE DESCRIPTION ------->	15U240	FLATWASHER(USS STD) 3/8" ZNC PLT
018	SEE DESCRIPTION ------->	15A021	CARRBOLT 3/8-16 X1.5 ZNC GR 5
019	SEE DESCRIPTION ------->	15K147	HXCAPSCR 1/2-13UNC2X1 6R5 ZINC/CAD
020	SEE DESCRIPTION ------->	15K151	HXCAPSCR 1/2-13UNC24X1.25 GR5 PL'
021	SEE DESCRIPTION ------->	15U300	LOKWASHER MEDIUM 1/2 ZINCPL
022	SEE DESCRIPTION ------->	15G230	HEXNUT 1/2-13UNC2B SAEGR2 ZINC/CAD
023	SEE DESCRIPTION ------->	04 21441	87393B THREAD STRIP-SLIDING CHAN
024	SEE DESCRIPTION ------->	04 21654A	89156B BED SL PAD 1.38THK=COELDS05
025	SEE DESCRIPTION ------->	27B2100G0L	SPACER ROLL.39ID .562L.048T STL/ZNC
026	SEE DESCRIPTION ------->	04 21664	89156B SHIM-BED SL PAD=COEL DS05
027	SEE DESCRIPTION ------->	27B25002SZ	SPACER ROLL.39ID.125L.048T STL/ZNC
028	SEE DESCRIPTION ------->	04 20850C	87026B MK2 SLIDE PAD COSHA
029	SEE DESCRIPTION ------->	15U280	FLATWASHER(USS STD) 1/2" ZNC PLT
030	SEE DESCRIPTION ------->	15K110	HEXCAPSCR 3/8-16UNC2AX1.5 GR5-PLTD
031	SEE DESCRIPTION ------->	15U200	FLATWASHER(USS STD) 5/16"ZNC PLT
032	SEE DESCRIPTION ------->	15K095	HEXCAPSCR 3/8-16UNC2AX1"GR5 ZNC/CAD
033A	SEE DESCRIPTION ------->	15K051	HXCAPSCR 5/16-18UNC2AX1/2 SS18-8
0338	SEE DESCRIPTION ------->	15K151	HXCAPSCR 1/2-13UNC24X1.25 GR5 PLATE

PARTS LIST FOR: BMP89C026R/89296A SHEET 1 (END)

BED SLIDER & MOUNTING ASSEMBLY FOR COSL3810 & COSLIDES

BMP890044
89326C



Litho in U.S.A.

PELLERIN MILNOR CORPORATION

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

Litho in U.S.A.

Parts List, cont.—Bed Slider Mounting COSL3810

Used In	Item	Part Number	Description	Comments
.				
----------			----------ASSEMBLIES----------	----------
	Z	ALC36045A	36"BED SLIDER ASSY-COSTIK	
----------			----------COMPONENTS----------	----------
all	1	04 21438E	36"BED SUPPORT CHAN-COSTIK	(RIGHT SIDE)
all	2	04 21437	CONVEYOR BED MTG-RT-COSLIDE	(LEFT SIDE)
all	2	04 21437A	CONVEYOR BED MTG-LF-COSLIDE	
all	3	04 21452A	CONV SUPT BOTTOM-COSLID38	
all	4	04 21446	SLIDING STRAP-CONV BED BOT	
all	5	ALC40009A	*COSLIDE LOAD END SUPT ASSY R	(RIGHT, SEE BMP890046)
all	5	ALC40009B	*COSLIDE LOAD END SUPT ASSY L	(LEFT, SEE BMP890046)
All	7	04 21448C	36"BED AIRCYL MT-REAR	
all	8	04 21449	AIR CYL ADJUSTING BRACKET	
all	9	W4 21450	*AIR CYL CLEVIS MTG WELDMENT	
all	10	27C430	AIR CYL 4"X30"X1" CLEVIS MT.	
all	11	15K191	HXCAPSCR 1/2-13UNC2AX2.5 GR5 Z	
all	12	15G247	HXTHINNUT 3/4-10UNC2B ZINC GR2	
all	13	15N191	FLATMACHSCR 1/4-20X7/8 SS18-8	
all	14	15G166A	HXLOKNUT NYL1/4-20 UNC2A STL/Z	
all	15	15G205	HXNUT 3/8-16UNC2B ZINC GR2	
all	16	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL	
all	17	15U240	FLATWASHER(USS STD) 3/8" ZNC P	
all	18	15A021	CARRBOLT 3/8-16 X1.5 ZNC GR 5	
all	19	15K147	HXCAPSCR 1/2-13UNC2X1 GR5 ZINC	
all	20	15K151	HXCAPSCR 1/2-13UNC24X1.25 GR5	
all	21	15U300	LOKWASHER REGULAR 1/2 ZINC PLT	
all	22	15G230	HXNUT 1/2-13UNC2B SAE ZINC GR2	
all	23	04 21441	THREAD STRIP-SLIDING CHAN	
all	24	04 21654A	BED SL PAD 1.38THK=COELDS05	
all	25	27B2100G0L	SPCRROLL.39ID.562L.048T STLZNC	
all	26	04 21664	SHIM-BED SL PAD=COEL DS05	
all	27	27B25002SZ	SPCRROLL.39ID.125L.048T STLZNC	
all	28	04 20850C	MK2 SLIDE PAD COSHA	
all	29	15U280	FL+WASHER(USS STD)1/2 ZNC PL+D	
all	30	15K110	HEXCAPSCR 3/8-16UNC2AX1.5 GR5-	
all	31	15K095	HXCPSCR 3/8-16UNC2AX1 GR5 ZINC	
all	32	15U200	FLATWASHER(USS STD) 5/16"ZNC P	
all	33	15K051	HXCAPSCR 5/16-18UNC2AX1/2 SS18	
all	34	15A011	CARBOLT 3/8-16UNC2X1 ZINC GR2	
all	35	04 21648	BKT-8"STK AIRCYL MT COSLIDEB	
all	36	27C408	AIR CYL 4"X8"X1" CLEVIS MT.	
all	37	04 21649B	AIRCYL SLIDING STRIP-COSLIDB	
all	38	04 21649	AIR CYL SUPP BKT-COSLIDEB	
all	39	04 21649A	BRKT=AIRCTL 4" BORE COVER	
all	40	15A058	CARRSCR 1/2-13UNC2X 1+1/4 SS	

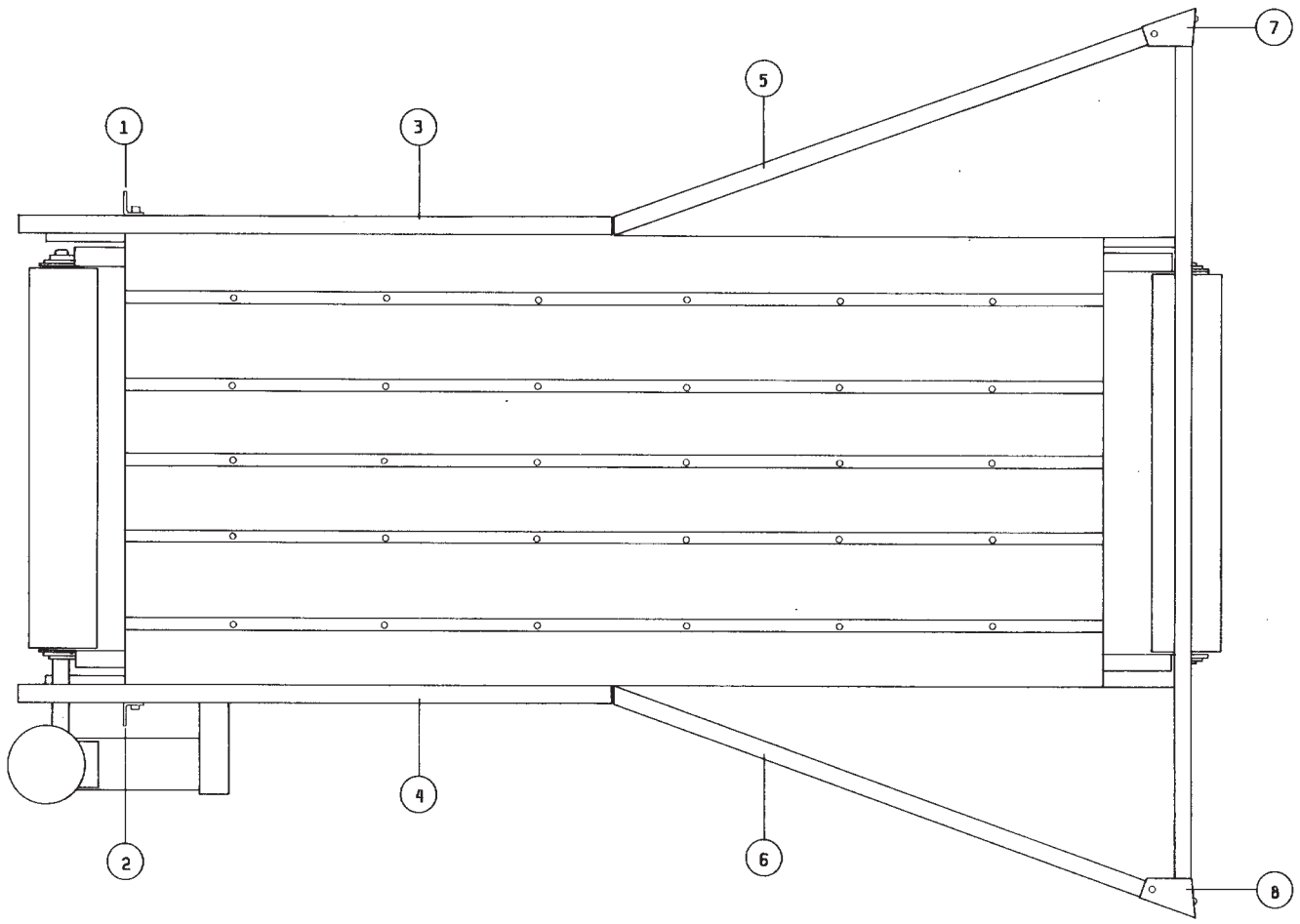
3

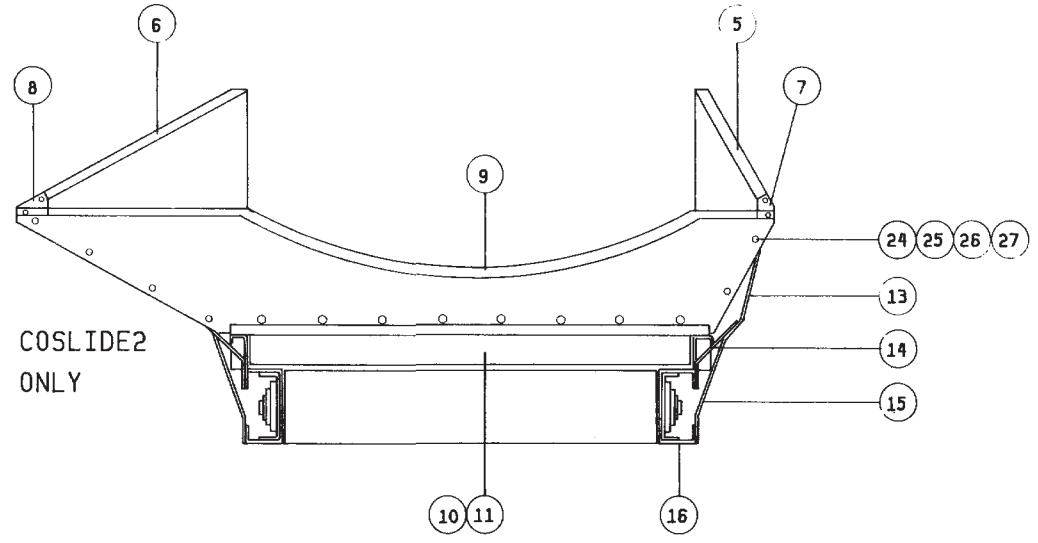
Flairsides 3.5

FLAIRSIDE ASSEMBLY 40" BEDS

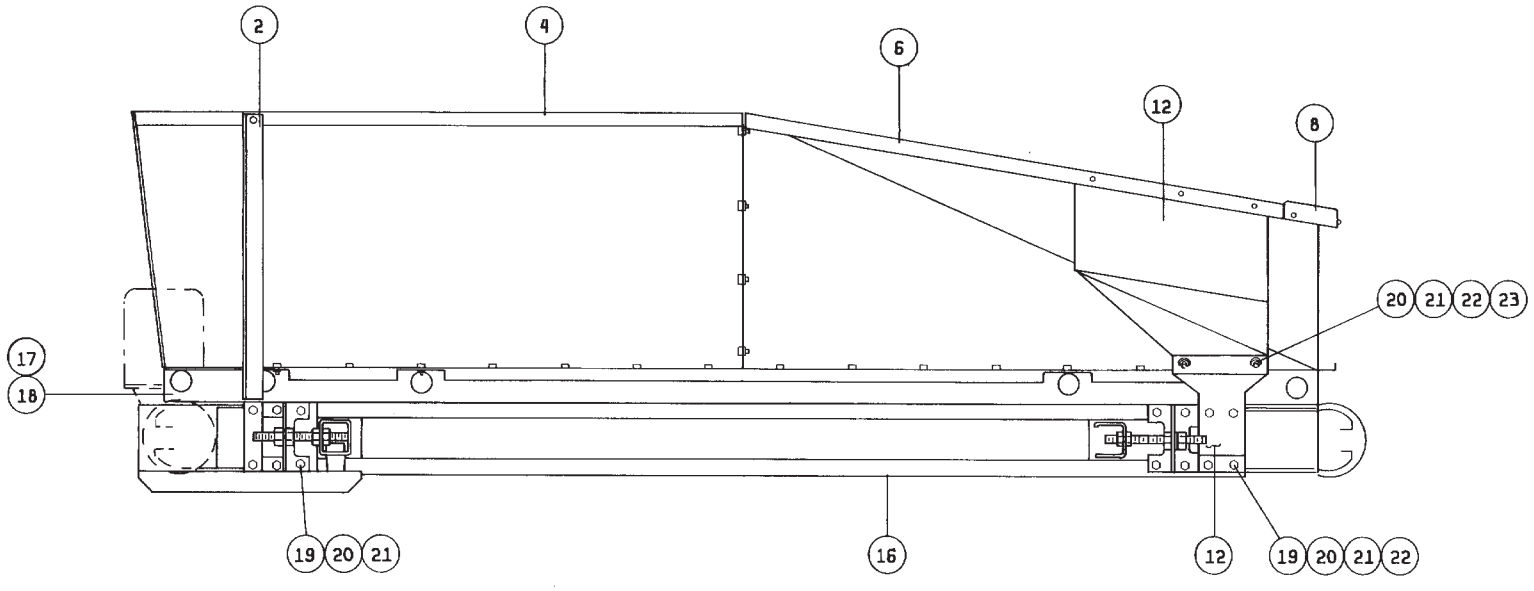
BMP890057
89433D

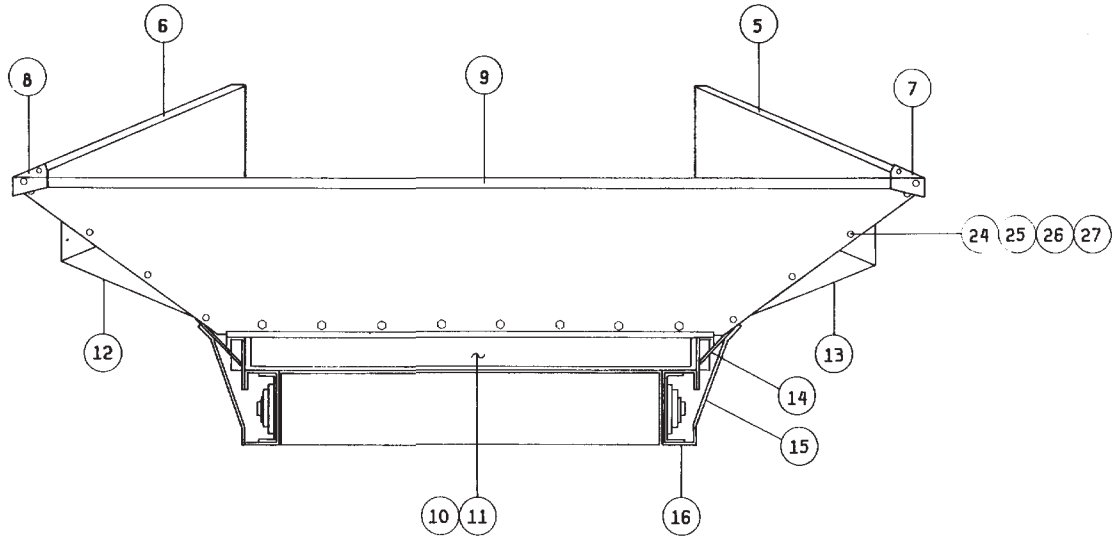
FOR MODELS:
COELF121, COL00SE2, COSLIDE2, COELDE08,
COL00S08, COELDE10, COL00S10





COSLIDE2
ONLY



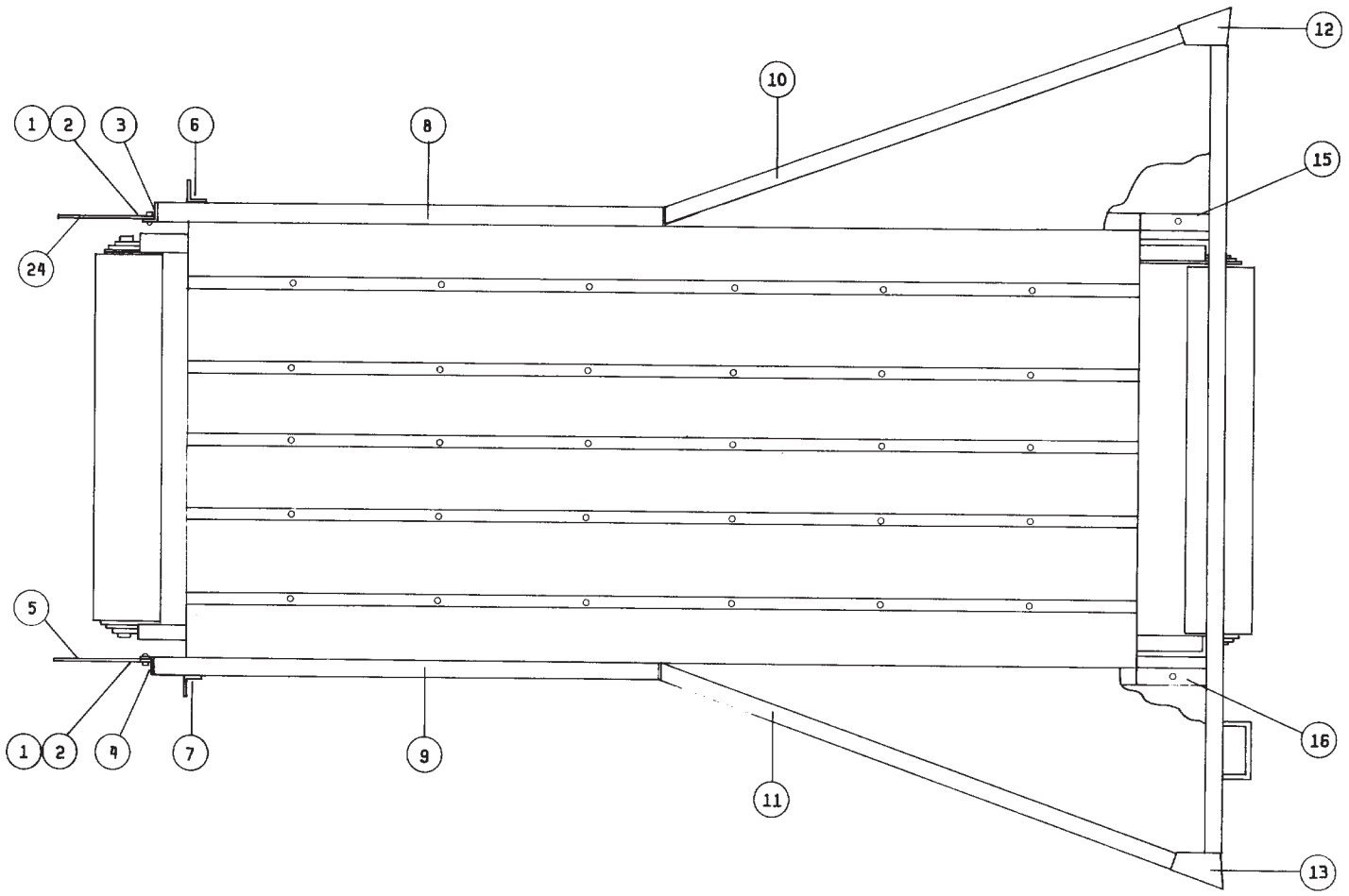


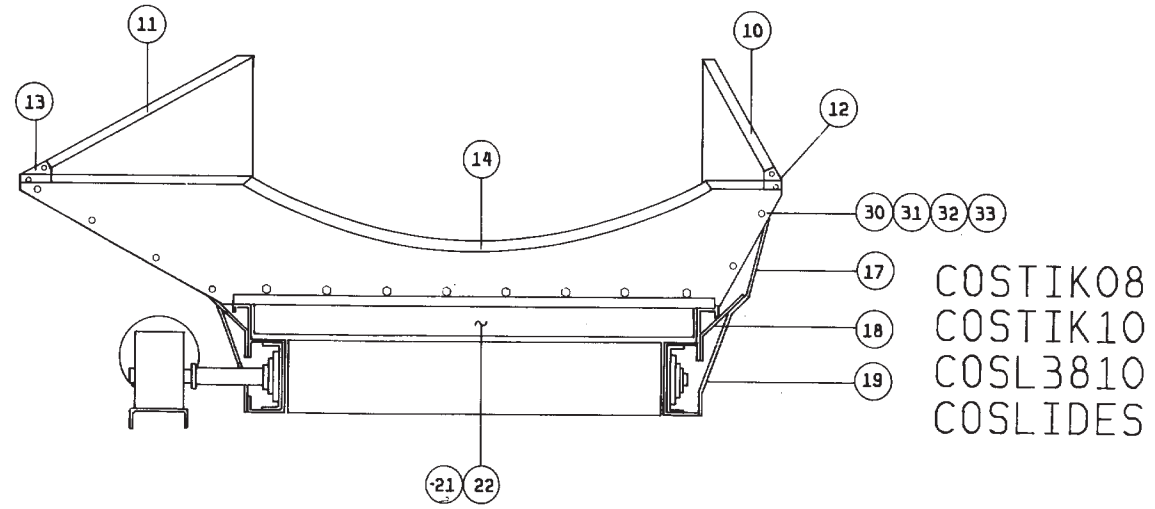
100

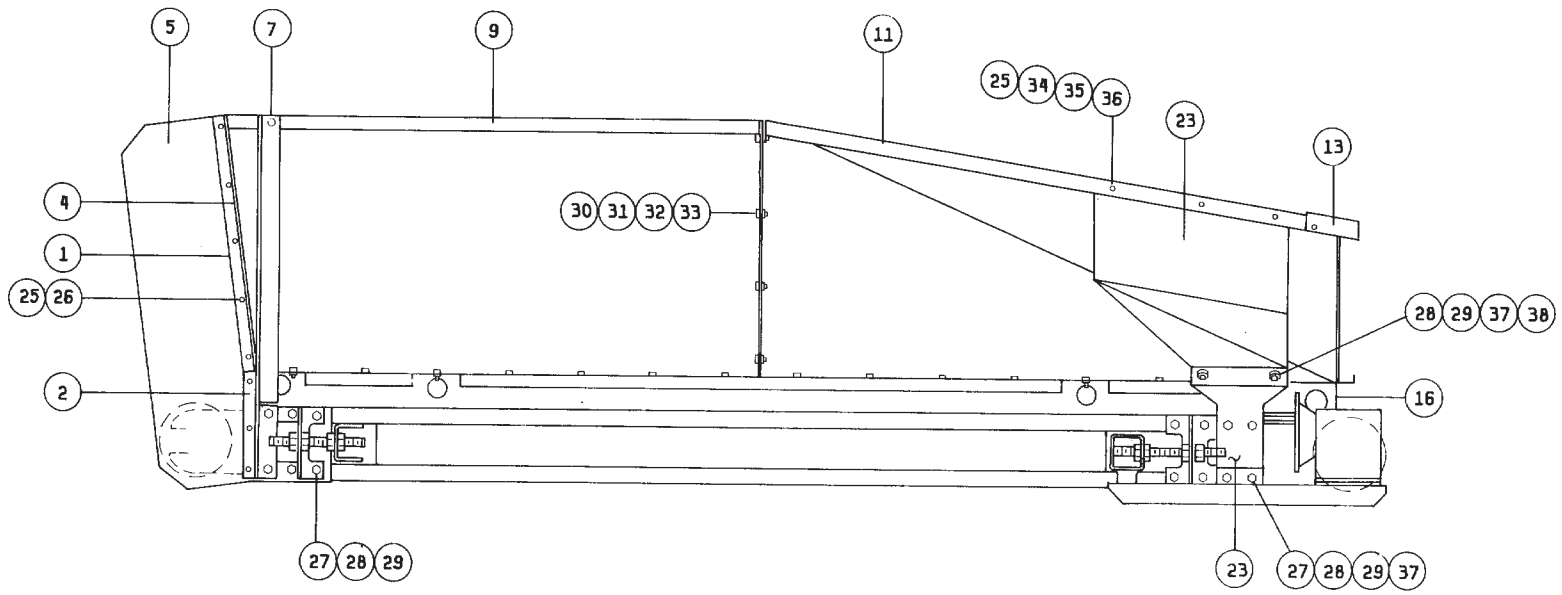
ITEM	HOW PART IS USED IN ASSY (ONLY IF PERTINENT)	P/N	DESCRIPTION
00X	(REFERENCE)	ALC40009	89382# COLOOSE BED ASSEMBLY
00Y	SEE DESCRIPTION ------->	ALC40009C	89382D COSLIDE BED ASSEMBLY
00Z	SEE DESCRIPTION ------->	ALC40009F	89382# COLOOS08 8.5FT40" BED ASS'Y
001	SEE DESCRIPTION ------->	04 21433	87386C BKT-SIDE PANEL MTG-RT FRT
002	SEE DESCRIPTION ------->	04 21433A	87386# BKT-SIDE PANEL MTG-LF FRT
003A	(00X,00Y)	04 21424	89182D CONV BED SIDE RT-COLOOSE
003B	(00Z)	04 21424D	89182# CONV BED SIDE 48"RT-COLOOS08
004A	(00X,00Y)	04 21424A	89182# CONV BED SIDE LF-COLOOSE
004B	(00Z)	04 21424E	89182# CONV BED SIDE 48"LF-COLOOS08
005A	(00X,00Z)	04 21427A	89051# FLAIRSIDE 48L 21H RT-COLOOSE
005B	(00Y)	04 21481	88021D FLAIRSIDE 48LX21H RT COSLIDE
006A	(00X,00Z)	04 21427	89051D FLAIRSIDE 48L 21H LF-COLOOSE
006B	(00Y)	04 21482	88021D FLAIRSIDE 48LX21H LF COSLIDE
007A	(00X,00Z)	W4 21491B	89113#*COVERPLATE WELDMENT RT-COELD
007B	(00Y)	W4 21492	89113#*COVERPLATE WELDMENT RT
008	SEE DESCRIPTION ------->	W4 21491	89113#*COVERPLATE WELDMENT LF
009A	(00X,00Z)	04 21428	89101D ENDGATE 40W-COLOOSE
009B	(00Y)	W4 21483	88436D*40"BED ENDGATE WLMT-COSLIDE2
010	(00X,00Z)	04 21493	88157B ENDGATE BELT STRAP-COSLIDE
011	(00Y)	04 21493A	88157B ENDGATE BELT FLAP-COSLIDE
012A	(00X,00Z)	04 21658	89047D FLAIRSUPP LF-COELDS/COSTIK
012B	(00Y)	04 21646	88436C FLAIRSIDE SUPP-RT-COSLIDEB
013A	(00X,00Z)	04 21659	89047# FLAIRSIDE SUPP-RT-COELDS
013B	(00Y)	04 21647	88436T FLAIRSIDE SUPP-LF-COSLIDEB
014	SEE DESCRIPTION ------->	04 21644	88436L BKT-FLAIRSIDE SUPP-COSLIDEB
015	SEE DESCRIPTION ------->	04 21645	88436B BRACE-FLAIRSIDE-COSLIDEB
016A	(00X, SEE BMP890024)	ALC40006	89307E COSHA CONVEYOR BED 40X126
016B	(00Z)	ALC40006B	89307# COSHA CONVEYOR BED 40X102"
017	SEE DESCRIPTION ------->	04 21425	88027D BED EXT-LF UNLOAD/RT LOAD
018	SEE DESCRIPTION ------->	04 21425A	88027# BED EXT-RT UNLOAD/LF LOAD
019	SEE DESCRIPTION ------->	15A021	CARRBOLT 3/8-16 X1.5 ZNC GR 5
020	SEE DESCRIPTION ------->	15G205	HEXNUT 3/8-16 UNC2B GR 2 ZNC/CAD
021	SEE DESCRIPTION ------->	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL
022	SEE DESCRIPTION ------->	15U240	FLATWASHER(USS STD) 3/8" ZNC PLT
023	SEE DESCRIPTION ------->	15K095	HEXCAPSCR 3/8-16UNC2AX1"GR5 ZNC/CAD
024	SEE DESCRIPTION ------->	15K052	HXCAPSCR 5/16-18UNC2AX3/4 SS18-8
025	SEE DESCRIPTION ------->	15G186	HEXNUT 5/16-18UNC2 SS18-8
026	SEE DESCRIPTION ------->	15U205	LOCKWASHER MEDIUM 5/16" 18-8SS
027	SEE DESCRIPTION ------->	15U201	FLATWASH 7/80DX3/8IDX.062THK SS18-8

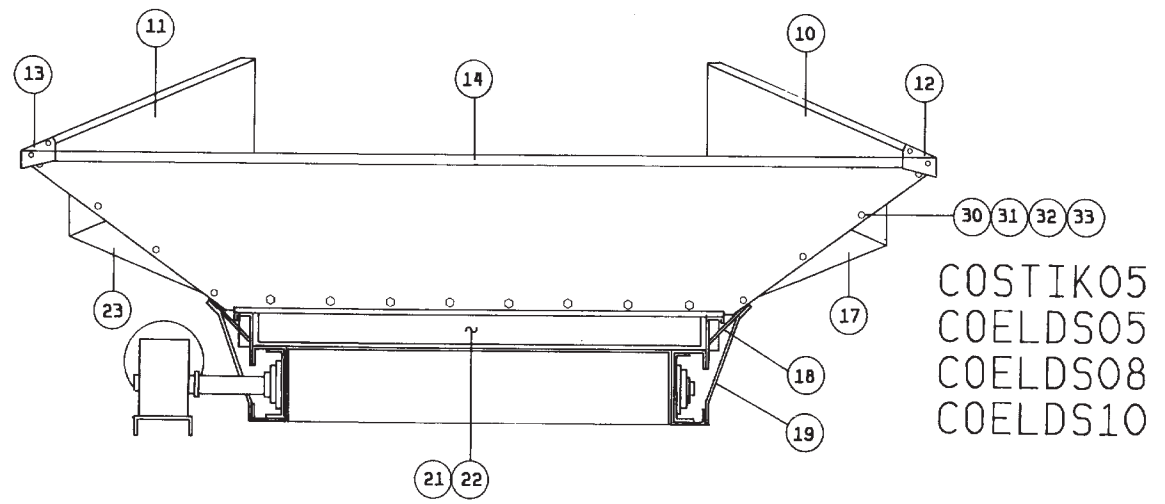
FLAIRSIDE ASSEMBLY 36" BEDS

BMP890058
89427D









102

Litho in U.S.A.

PELLERIN MILNOR CORPORATION

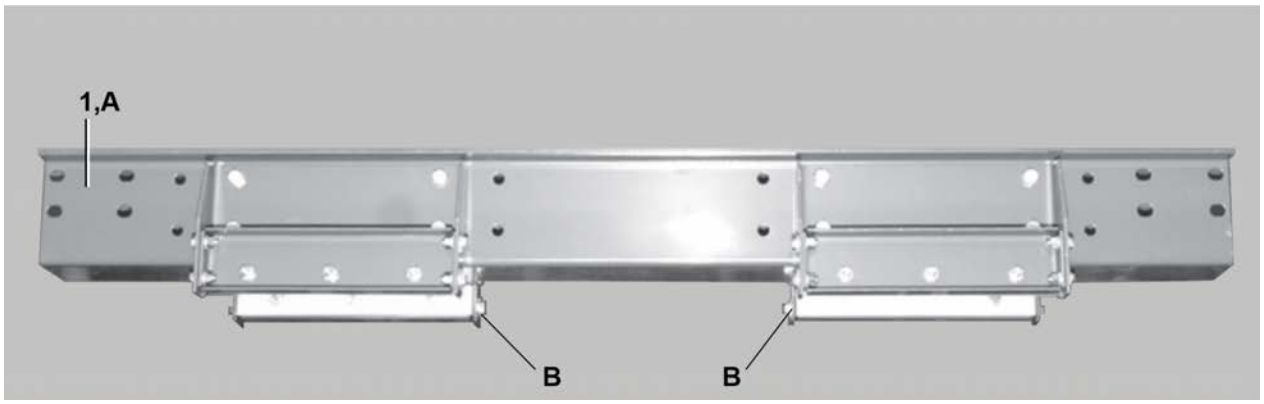
PARTS LIST FOR: BMP890058R/92491A P/L FLAIRSIDE ASSY 36" BEDS

ITEM	HOW PART IS USED IN ASSY (ONLY IF PERTINENT)	P/N	DESCRIPTION
00V	(REFERENCE)	ALC36047	89376Y COSHA CONVEYOR BED 36X126"L
00W	(REFERENCE)	ALC36047A	89376@ COELDS CONVEYOR BED 36X126"L
00X	(REFERENCE)	ALC36049	89376@ COSHA CONVEYOR BED 36X102"L
00Y	(REFERENCE)	ALC36049A	89376@ COELDS CONVEYOR BED 36X102"L
00Z	(REFERENCE)	ALC36051	89376@ COSHA CONVEYOR BED 36X66"L
001	SEE DESCRIPTION ------->	04 21652	88497B FRONT GUARD STRAP-TOP
002	SEE DESCRIPTION ------->	04 21652A	88497B FRONT GUARD STRAP-BOTTOM
003	SEE DESCRIPTION ------->	04 21651A	88512# BKT FRT GUARD MTG RT-COSLIP
004	SEE DESCRIPTION ------->	04 21651	88512C BKT FRT GUARD MTG LF-COSLIP
005	SEE DESCRIPTION ------->	04 21653	91031B FRONT GUARD LF-COSLIP
006	SEE DESCRIPTION ------->	04 21433	87386C BKT-SIDE PANEL MTG-RT FRT
007	SEE DESCRIPTION ------->	04 21433A	87386# BKT-SIDE PANEL MTG-LF FRT
008A	(00V,00W)	04 21424F	91291# CONV BED SIDE 66"RT-COSLIDEB
008B	(00X,00Y)	04 21424B	91291# CONV BED SIDE 42"RT-COSLIP08
008C	(00Z)	04 21424J	91291# CONV BED SIDE 30"RT-COELDS05
009A	(00V,00W)	04 21424G	91291# CONV BED SIDE 66"LF-COSLIDEB
009B	(00X,00Y)	04 21424C	91291# CONV BED SIDE 42"LF-COSLIP08
009C	(00Z)	04 21424K	91291# CONV BED SIDE 30"LF-COELDS05
010A	(00V,00X)	04 21481	92087D FLAIRSIDE 48LX21H CONT.RT-RT
010B	(00W,00Y)	04 21427A	89051# FLAIRSIDE 48L 21H RT-COLOOSE
010C	(00Z)	04 21666A	89127# FLAIRSIDE 24L21H RT-COELDS05
011A	(00V,00X)	04 21482	90152D FLAIRSIDE 48LX21H CONT.RT-LF
011B	(00W,00Y)	04 21427	89051D FLAIRSIDE 48L 21H LF-COLOOSE
011C	(00Z)	04 21666	89127D FLAIRSIDE 24L21H LF-COELDS05
012A	(00V,00X)	W4 21492	91206#*COVERPLATE WELDMENT RT
012B	(00W,00Y)	W4 21491B	89113#*COVERPLATE WELDMENT RT-COELD
012C	(00Z)	W4 21491A	89097#*WELDMENT-COV PL COELDS05 RT
013A	(00V,00W,00X,00Y)	W4 21491	89113#*COVERPLATE WELDMENT LF
013B	(00Z)	W4 21492A	89097#*WELDMENT-COV PL COELDS05 LF
014A	(00V,00X)	W4 21483A	90152#*36"BED ENDGATE CONT.RT WLMT
014B	SEE DESCRIPTION ------->	04 21483B	89101D 36"BED ENDGATE-COELDS
014C	SEE DESCRIPTION ------->	04 21483E	89081D 36X66 BED-ENDGATE-COELDS05
015	SEE DESCRIPTION ------->	04 21425	88027D BED EXT-LF UNLOAD/RT LOAD
016	SEE DESCRIPTION ------->	04 21425A	88027# BED EXT-RT UNLOAD/LF LOAD
017A	(00V,00X)	04 21647	90152C FLAIRSIDE SUPP CONT.RT-LF
017B	(00W,00Y)	04 21659	89047# FLAIRSIDE SUPP-RT-COELDS
017C	(00Z)	04 21667A	91031# FLAIRSIDE SPT -LF-COELDS05
018	SEE DESCRIPTION ------->	04 21644	88436L BKT-FLAIRSIDE SUPP-COSLIDEB
019	SEE DESCRIPTION ------->	04 21645	90526B BRACE-FLAIRSIDE-COSLIDEB
021	SEE DESCRIPTION ------->	04 21493B	89046B 36"BED ENDGATE BELT FLAP
022	SEE DESCRIPTION ------->	04 21493C	89046B 36"BED ENDGATE BELT STRAP
023A	(00V,00X)	04 21646	90152C FLAIRSIDE SUPP CONT.RT-RT
023B	(00W,00Y)	04 21658	89047D FLAIRSUPP LF-COELDS/COSTIK
023C	(00Z)	04 21667	91031C FLAIRSIDE SPT -RT-COELDS05
024	SEE DESCRIPTION ------->	04 21653A	91031# FRONT GUARD RT-COSLIP
025	SEE DESCRIPTION ------->	15N185	RDMACSCR 1/4-20UNC2X3/4SS18-8
026	SEE DESCRIPTION ------->	15G164NE	HEXLOKNUT NYL 1/4-20 UNC2A SS.TY-NE
027	SEE DESCRIPTION ------->	15A021	CARRBOLT 3/8-16 X1.5 ZNC GR 5
028	SEE DESCRIPTION ------->	15G205	HXNUT 3/8-16UNC2B ZINC GR2
029	SEE DESCRIPTION ------->	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL
030	SEE DESCRIPTION ------->	15K052	HXCAPSCR 5/16-18UNC2AX3/4 SS18-8
031	SEE DESCRIPTION ------->	15G186	HEXNUT 5/16-18UNC2 SS18-8
032	SEE DESCRIPTION ------->	15U205	LOCKWASHER MEDIUM 5/16" 18-8SS
033	SEE DESCRIPTION ------->	15U201	FLATWASH 7/80DX3/8IDX.062THK SS18-8
034	SEE DESCRIPTION ------->	15G170	HEXNUT 1/4-20UNC2 SS18-8
035	SEE DESCRIPTION ------->	15U181	LOCKWASHER MEDIUM 1/4 SS18-8
036	SEE DESCRIPTION ------->	15U188	FLATWASH 1/4 STD COMMERCIAL SS18-8
037	SEE DESCRIPTION ------->	15U240	FLATWASHER(USS STD) 3/8" ZNC PLT
038	SEE DESCRIPTION ------->	15K095	HEXCAPSCR 3/8-16UNC2AX1"GR5 ZNC/CAD

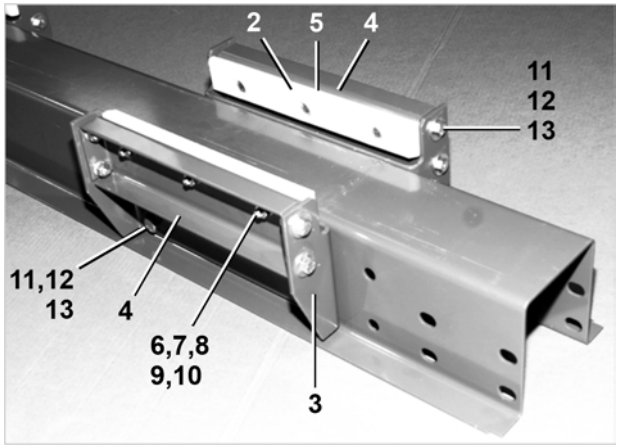
3 Bottom Beam 3.6

Shuttle Low Rail Guides

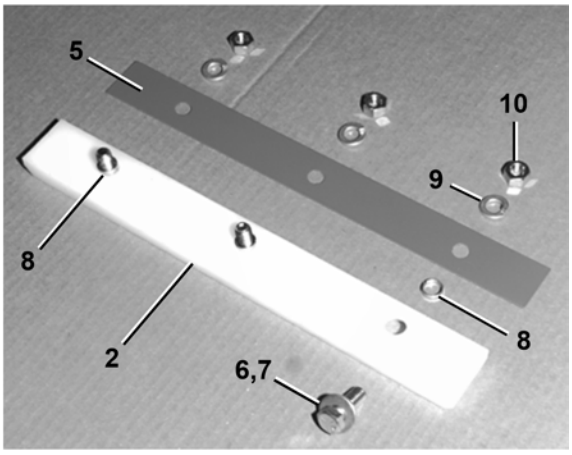
Floor Drive Translating Shuttles



Bottom view



Detail: Slider Pad and Hardware, 4 instances



Legend

A . . . Shuttle bottom beam
B . . . Lower rail guides

Table 1. Parts List—Shuttle Low Rail Guides

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.

Used In	Item	Part Number	Description/Nomenclature	Comments
			Assemblies	
	A	ALC420003D	BOTTOM BEAM 36/40W FLOORDR	
	B	ALC420003E	BOTTOM BEAM 48W FLOORDRIVE	
	C	ALC420049B	FLOODR LOW TRACK GUIDE ASSY	
			Components	
all	1	04 21142	MK2 COSHA BOTTOM BEAM	
all	1	04 21142B	MK2 COSHA BOTTOM BEAM-48 BED	
all	2	04 20850C	MK2 SLIDE PAD COSHA	
all	3	04 21937C	TRACK GUIDE BKT-9"FLOORDR	
all	4	04 21937B	TRACK SLIDE MTG-9"FLOORDR	

Shuttle Low Rail Guides

Floor Drive Translating Shuttles

Parts List—Shuttle Low Rail Guides (cont'd.)

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.

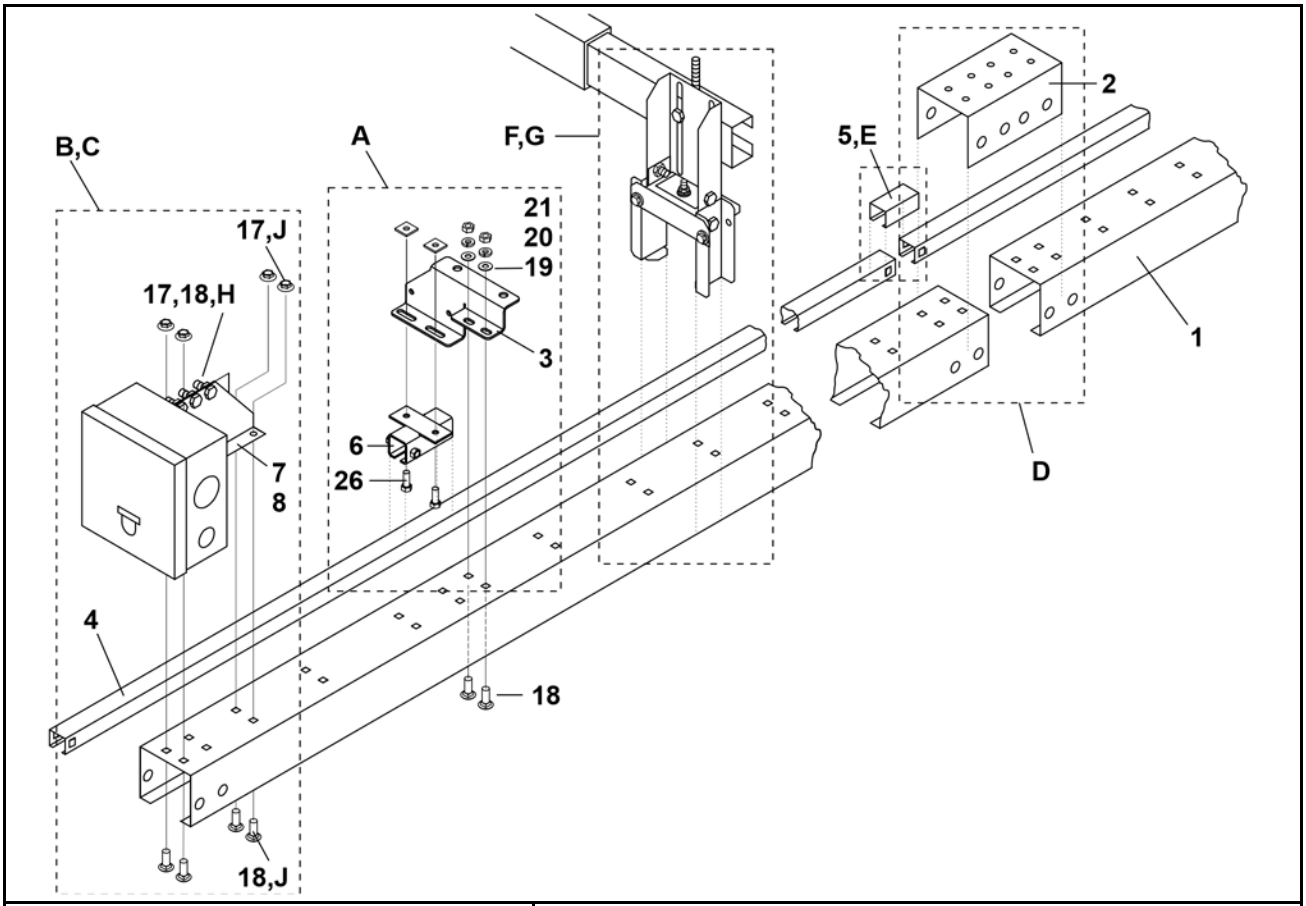
Used In	Item	Part Number	Description/Nomenclature	Comments
all	5	04 20850S	SHIM-SLIDE PAD COSHA	
all	6	15K095	HXCPSCR 3/8-16UNC2AX1 GR5 ZINC	
all	7	15U200	FLATWASHER(USS STD) 5/16"ZNC P	
all	8	27B25002SZ	SPCRROLL.39ID.125L.048T STLZNC	
all	9	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL	
all	10	15G205	HXNUT 3/8-16UNC2B ZINC GR2	
all	11	15K151	HXCAPSCR 1/2-13UNC2AX1.25 GR5	
all	12	15U300	LOKWASHER REGULAR 1/2 ZINC PLT	
all	13	15G230	HXNUT 1/2-13UNC2B SAE ZINC GR2	

3

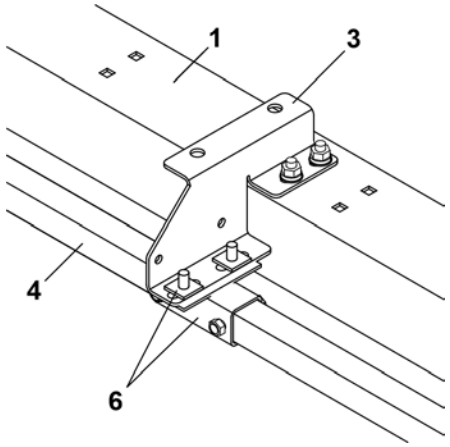
Rail Components 3.7

Upper Rail Components

COSH(A,J,K,B,X)_, CL(36,40,48)_



Detail A: Upper Rail Festoon Hanger



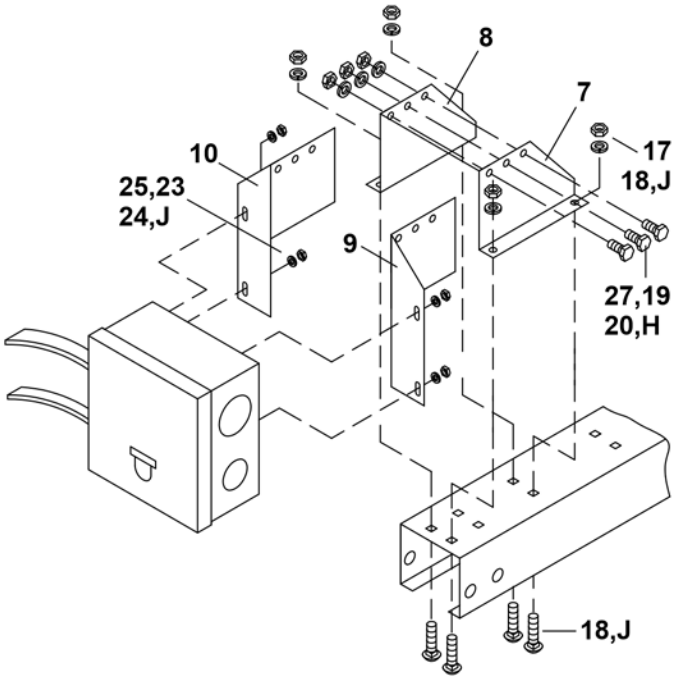
Legend

A . . . Upper Rail Festoon Hanger, see Detail A.
B . . . Rail End Electric Box, see Detail B.
C . . . Festoon Rail Electric Box, see Detail C.
D . . . Upper Rail Connection, see Detail D.
E . . . Festoon Rail Clamp, see Detail E.
F . . . Upper Rail Hanger Assembly, see BPSCAV05.
G . . . Ceiling Mounted Rail Support, see BPSCAV05.
H . . . 3 instances
J . . . 4 instances

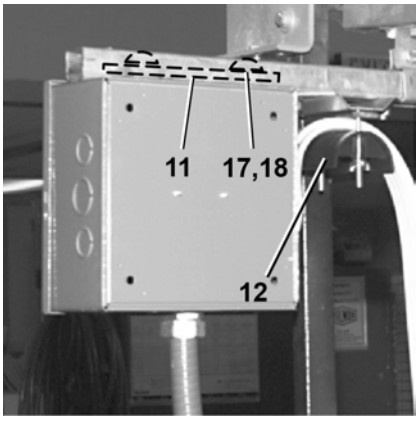
Upper Rail Components

COSH(A,J,K,B,X)_, CL(36,40,48)_

Detail B: Rail End Electric Box



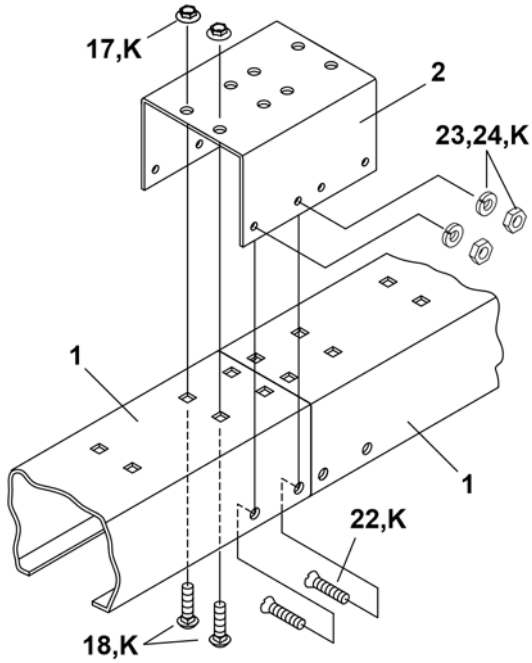
Detail C: Festoon Rail Electric Box



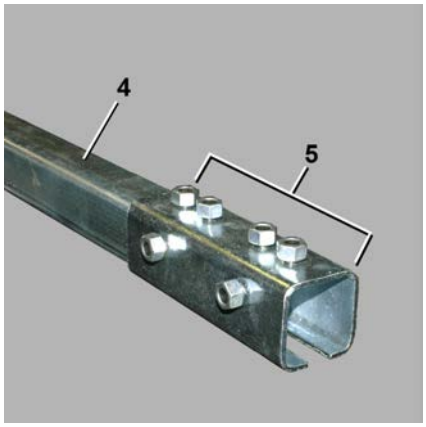
Legend

H . . . 3 instances
J . . . 4 instances
K . . . 8 instances

Detail D: Upper Rail Connection



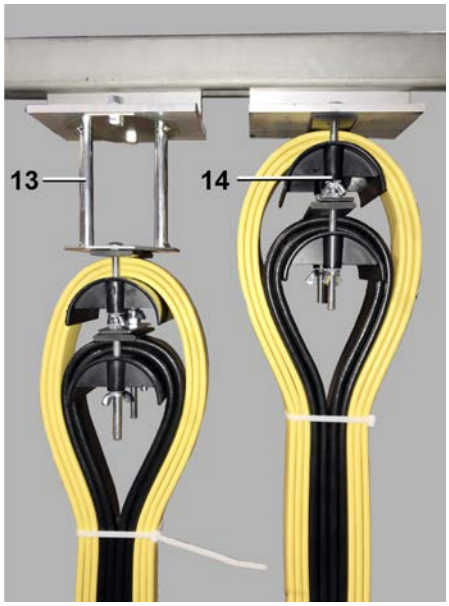
Detail E: Festoon Rail Clamp



Upper Rail Components

COSH(A,J,K,B,X)_, CL(36,40,48)_

Festoon Cars



Festoon Tow Bar

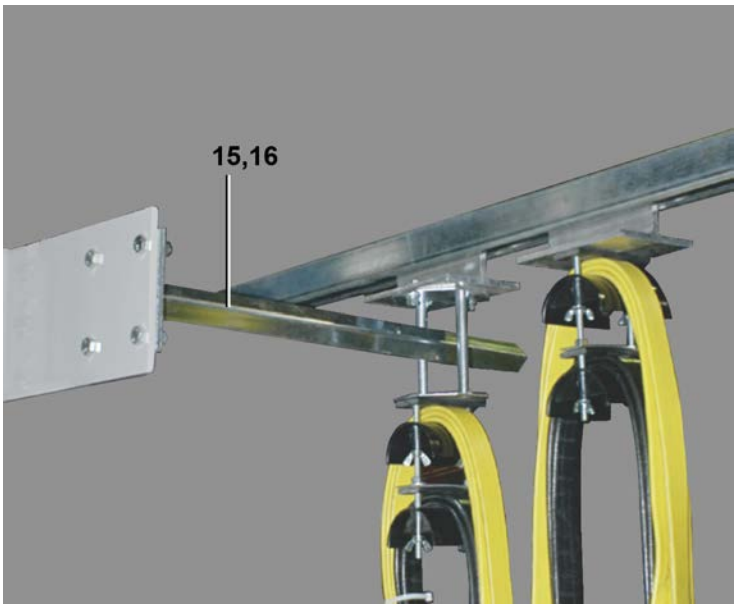


Table 1. Parts List—Upper Rail Components

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.

Used In	Item	Part Number	Description/Nomenclature	Comments
			Assemblies	
	A	ALC420064B	FIRST RAILSET W/12GA FESTRAIL	Reference
	B	ALC420065B	ADD'L RAILSET W/12GA FESTRAIL	Reference
	C	ALC420015A	FESTOON RAIL ELEC BOX ASSY	Reference
			Components	
all	1	04 22850	UP OUTRIG RAIL-SHTL 117.5	
all	2	04 22858	UP OUTRIG RAIL CONN-3.50"	
all	3	04 22847	FESTOON HANGER BKT-ONE RAIL	
all	4	27A765	12GA FESTOON PARA-TRACK	
all	5	27A765A	12GA PARA-TRACK JOINT CLAMP	
all	6	27A765B	TRACK HANGER CLAMP ASSY	
all	7	04 22825	FESTOON ELEC.BOX MTG-RT	
all	8	04 22825A	FESTOON ELEC.BOX MTG-LF	
all	9	04 20903A	BRKT=FEST END ELECT BOX RT	
all	10	04 20903	BRKT=FEST END ELECT BOX LF	
all	11	04 22847B	FIXED FESTOON MTG FLATBAR	
all	12	27A770	END CLAMP WITH 2 SADDLES	
all	13	27A768	12GA FESTOON TOW TROLLEY/2SADDLES	
all	14	27A767	12GA FESTOON TROLLEY/2 SADDLES	
all	15	X4 24297	FESTOON TOW BAR-TAP	
all	16	04 24298	FESTOON TOW BAR EXTENSION	
all	17	15G198	HXFLGNUT 3/8-16 ZINC	

Upper Rail Components

COSH(A,J,K,B,X)_, CL(36,40,48)_

Parts List—Upper Rail Components (cont'd.)

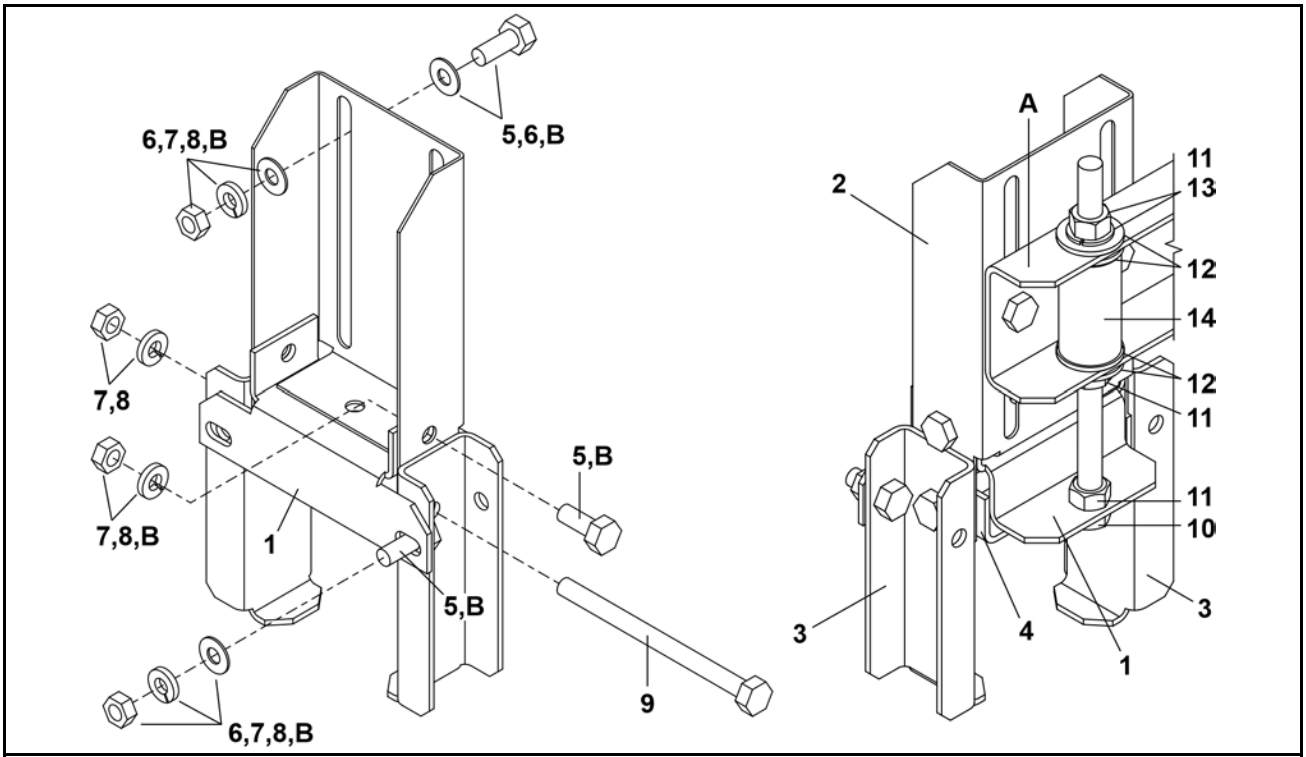
Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.

Used In	Item	Part Number	Description/Nomenclature	Comments
all	18	15A011	CARBOLT 3/8-16UNC2X1 ZINC GR2	
all	19	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL	
all	20	15G205	HXNUT 3/8-16UNC2B ZINC GR2	
all	21	15U240	FLATWASHER(USS STD) 3/8" ZNC P	
all	22	15N173	FLATMACSCR 1/4-20NCX5/8SS18-8	
all	23	15U180	LOCKWASHER MEDIUM 1/4 ZINCPL	
all	24	15G165	HXNUT 1/4-20UNC2BSAE ZC GR2	
all	25	15K039	HXCAPSCR 1/4-20UNC2AX3/4 GR5 Z	
all	26	15P200	TRDCUT-F HXWASHD 3/8-16X3/4NIK	
all	27	15K110	HEXCAPSCR 3/8-16UNC2AX1.5 GR5-	

Upper Rail Hanger & Ceiling Mounted Rail Support

COSH(A,J,K,B,X)_, CL(36,40,48)_

Figure 1. Upper Rail Hanger Assembly



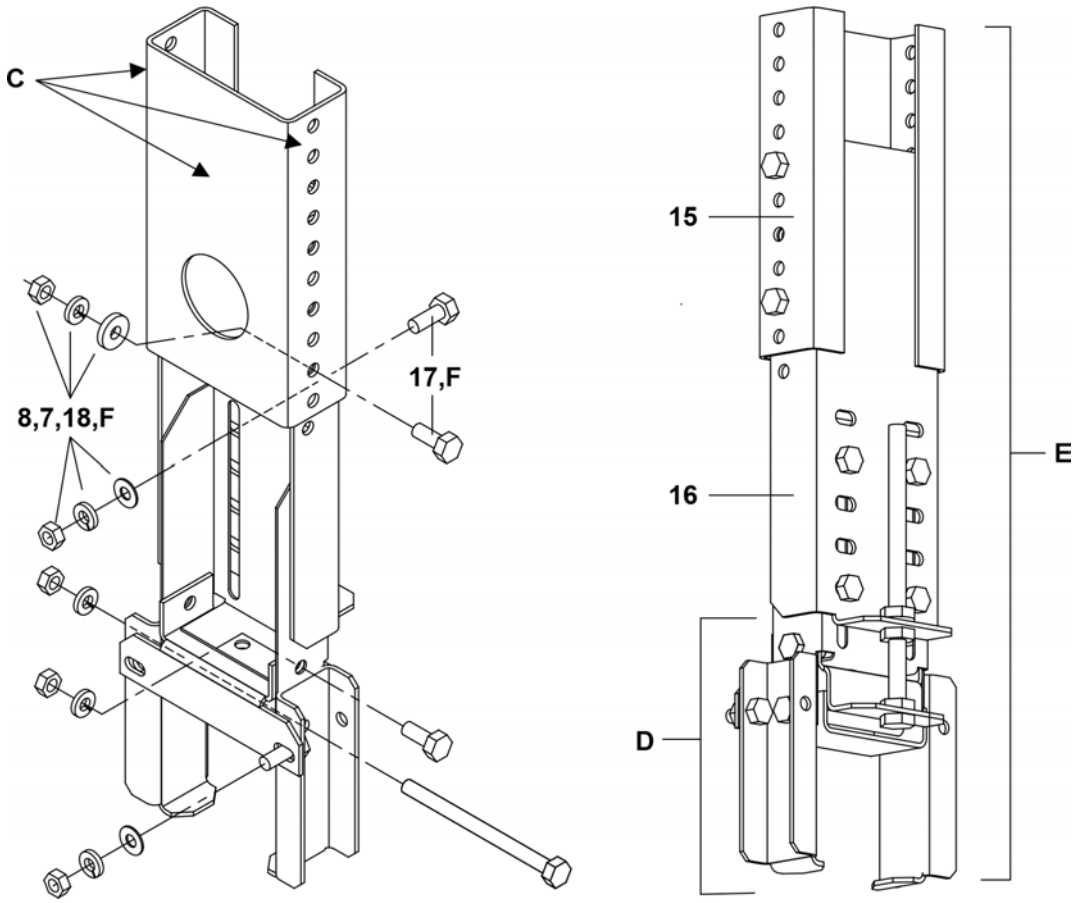
Legend

A . . . Dryer mounted rail support bracket
B . . . 2 instances

Upper Rail Hanger & Ceiling Mounted Rail Support

COSH(A,J,K,B,X)_, CL(36,40,48)_

Figure 2. Ceiling Mounted Rail Support



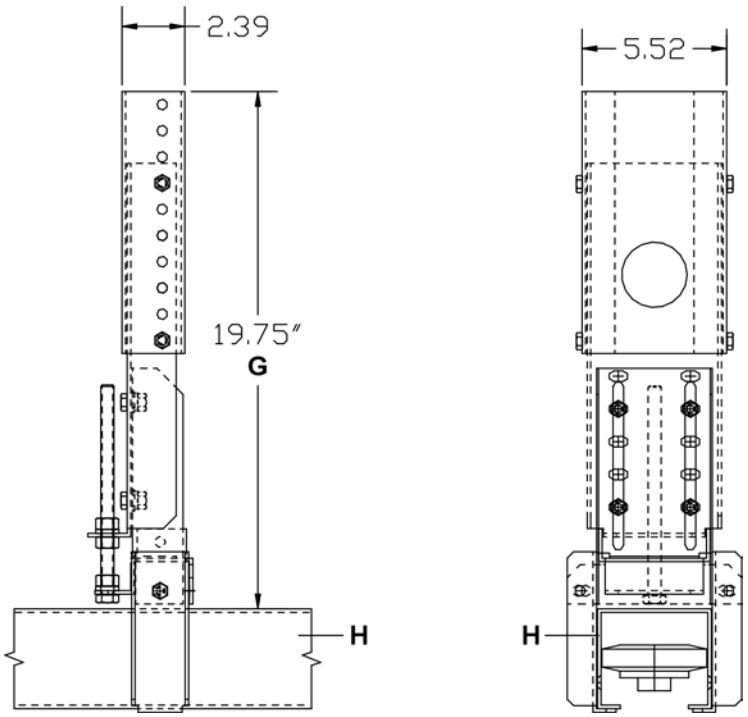
Legend

C . . . Weld to support structure
D . . . Upper rail hanger assembly
E . . . Ceiling mounted rail supports include the upper rail hanger assembly.
F . . . 4 instances

Upper Rail Hanger & Ceiling Mounted Rail Support

COSH(A,J,K,B,X)_, CL(36,40,48)_

Figure 3. Ceiling Mounted Rail Support: Dimensions required for planning



Legend

G . . . Minimum dimension of bracket assembly from top of rail

H . . . Upper rail

Table 1. Parts List—Upper Rail Hanger Ceiling Mounted Rail Support

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.

Used In	Item	Part Number	Description/Nomenclature	Comments
Assemblies				
	A	ALC420070B	UPPER RAIL HANGER ASSY 3.8T	ASSEMBLY
	B	ALC420070C	UPPER RAIL CEILING SUPP-3.8T	ASSEMBLY
Components				
A,B	1	04 22815B	RAIL HANGER BASE	
A,B	2	04 22815C	RAIL HANGER-LIGHT RAIL	
A,B	3	04 22852	RAIL HANGER CLAMP	
A,B	4	04 22815D	RAIL HOLD DOWN BRKT	
A,B	5	15K085	HEXCAPSCR 3/8-16UNC2AX3/4 GR5	
A,B	6	15U240	FLATWASHER(USS STD) 3/8" ZNC P	
A,B	7	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL	
A,B	8	15G205	HXNUT 3/8-16UNC2B ZINC GR2	
A,B	9	15K141A	HEXCAPSCR 3/8-16UNC2A X5.5" GR	
A,B	10	15D122C	HEXTAPSCR 1/2-13UNCK 8.5 FLTHD	

Upper Rail Hanger & Ceiling Mounted Rail Support

COSH(A,J,K,B,X)_, CL(36,40,48)_

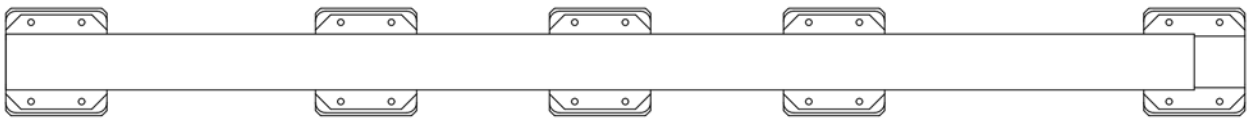
Parts List—Upper Rail Hanger Ceiling Mounted Rail Support (cont'd.)

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.

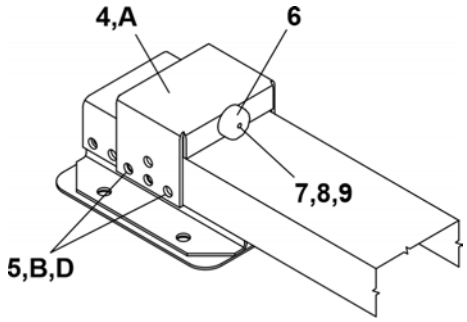
Used In	Item	Part Number	Description/Nomenclature	Comments
A,B	11	15G230	HXNUT 1/2-13UNC2B SAE ZINC GR2	
A,B	12	15U280	FL+WASHER(USS STD)1/2 ZNC PL+D	
A,B	13	15U300	LOKWASHER REGULAR 1/2 ZINC PLT	
A,B	14	04 20989	SLEEVE=TIE ROD BRKT HOLDER	
B	15	04 22852A	CEILING SUPPORT CHANN=10"LG	
B	16	04 22852B	CEILING SUPPORT BRKT	
B	17	15K095	HXCPSCR 3/8-16UNC2AX1 GR5 ZINC	
B	18	15U266	FLATWASHER 1"0DX7/16"IDX3/16"	

Floor Drive Rail

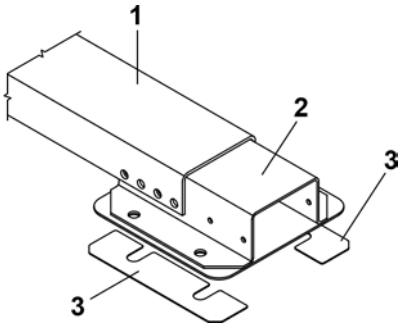
COSH(A,J,K,B,X)_, CL(36,40,48)_



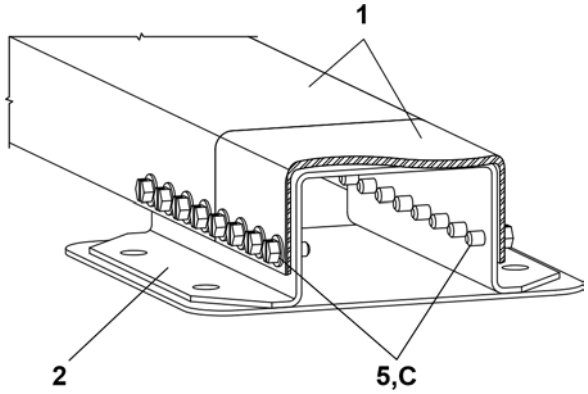
Positive Stop



Rail, Supports, and Shims



Rail to Rail Connections



Legend

A . . . 2 instances
B . . . 8 instances
C . . . 48 instances
D . . . To mount the positive stops to the rail, holes must be located and drilled into the rail with a 5/16” diameter bit.

Table 1. Parts List—Floor Drive Rail

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Assemblies				
	A	ALC420064B	FIRST RAILSET W/12GA FESTRAIL	
	B	ALC420065B	ADD'L RAILSET W/12GA FESTRAIL	
Components				

Floor Drive Rail

COSH(A,J,K,B,X)_, CL(36,40,48)_

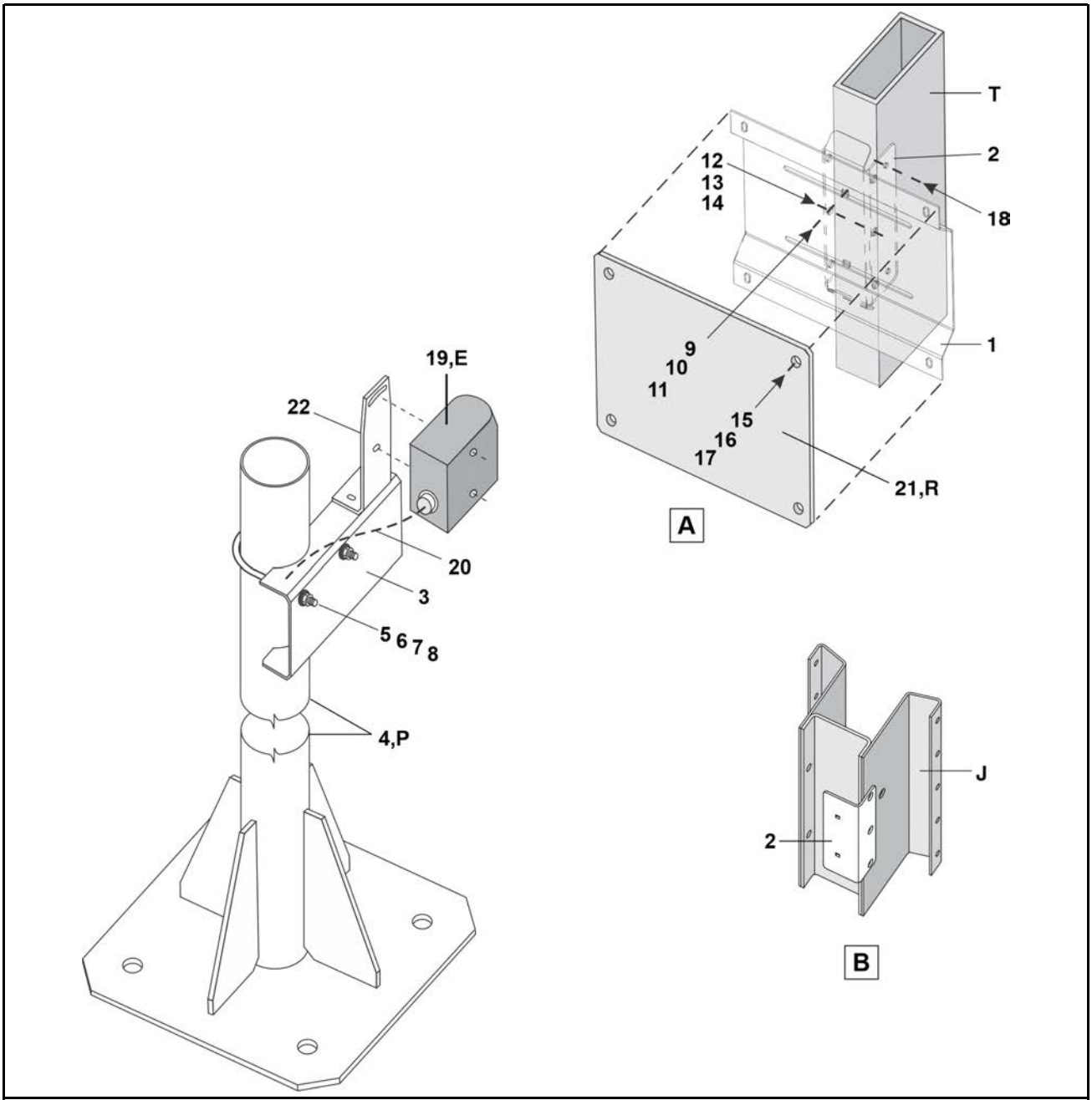
Parts List—Floor Drive Rail (cont'd.)

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.

Used In	Item	Part Number	Description/Nomenclature	Comments
all	1	04 21924D	FLOORDR TRACK CS-5.5WX117.5LG	
all	2	W4 23489	RAIL SUPPORT WLMT-FLOORDR	
all	3	04 21664E	RAIL LEVELING PLATE=7GA	
all	4	04 21924H	COSHA TRACK STOP BRKT	
all	5	15P200	TRDCUT-F HXWASHD 3/8-16X3/4NIK	
all	6	60C001	RUBBER BUMPER-BLKW/WASHER #698	
all	7	15N141	RDMACSCR 10-24NCX3/4 SLOTTED S	
all	8	15U315	LOKWASHER MEDIUM 5/8 ZINCPL	
all	9	15G126	HXLOCKNUT NYLON 10-24 UNC SS N	

Laser Targeting

All Traversing Shuttles



Legend

A . . . Detail A — Typical laser target mounting shown on shuttle tubular frame
B . . . Detail B — Mounting plate for shuttle J-rail frame
E . . . Emitter
J . . . J-rail frame
P . . . Laser mounting post
R . . . Reflector
T . . . Tubular frame

Laser Targeting

All Traversing Shuttles

Table 1. Parts List—Laser Targeting

Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	**Item**	**Part Number**	**Description/Nomenclature**	**Comments**
Assemblies				
	A	ALC420223	SHUTTLE LASER TARGETING ASSY	TUBULAR FRAME
	B	ALC420224	LASER TARGETING ASSY-J RAIL	J-RAIL FRAME
Components				
all	1	04 24176	LASER TARGET FRAME	
all	2	04 24177	LASER TARGET TUBE RAIL MTG	
all	2	04 24178	LASER TARGET J-RAIL MTG	
all	3	04 24146	LASER MTG CHANNEL	
all	4	W4 24180	LASER MOUNTING POST WLMT	
all	5	27A035C	UBOLT 3/8-16X5.36 #0127316	
all	6	15U246	FLATWASHER 1"ODX25/64IDX1/8"30	
all	7	15U255	LOCKWASHER MEDIUM 3/8 ZINCPL	
all	8	15G205	HXNUT 3/8-16UNC2B ZINC GR2	
all	9	15A002A	CARBOLT 1/4-20UNC2X3/4 ZINC GR	
all	10	15U185	FLATWASHER(USS STD) 1/4" ZNC P	
all	11	15G178	1/4"-20 HEXFLANGE NUT ZINC	
all	12	15K046	HXCAPSCR 1/4-20 UNC2A X 2"GR5	
all	13	17N058	HEXRIVNUT 1/4-20 UNC-2B #2520-	
all	14	15U180	LOCKWASHER MEDIUM 1/4 ZINCPL	
all	15	15N130	RDMACSCR 10-24UNC2A X 1/2 SS18	
all	16	15U135S	FLATWASH#10 .5620DX.203IDX.04+	
all	17	15G126	HXLOCKNUT NYLON 10-24 UNC SS N	
all	18	15P011	TRDCUT-F PANHD 10-24X1/2 NIKST	
all	19	09RLE0001	LT7PLVQ L-GAGE LT7 LONG RANGE TIME-OF-FLIGHT LASER SENSOR	
all	20	09RLE0001C	MQDC-1230RA (QUICK DISCONNECT CABLE) 30'	
all	21	09RLE0001R	BRT-250 (50 METER RETRO REFLECTOR)	
all	22	09RLE0001B	SMBLT7 (MOUNTING BRACKET)	