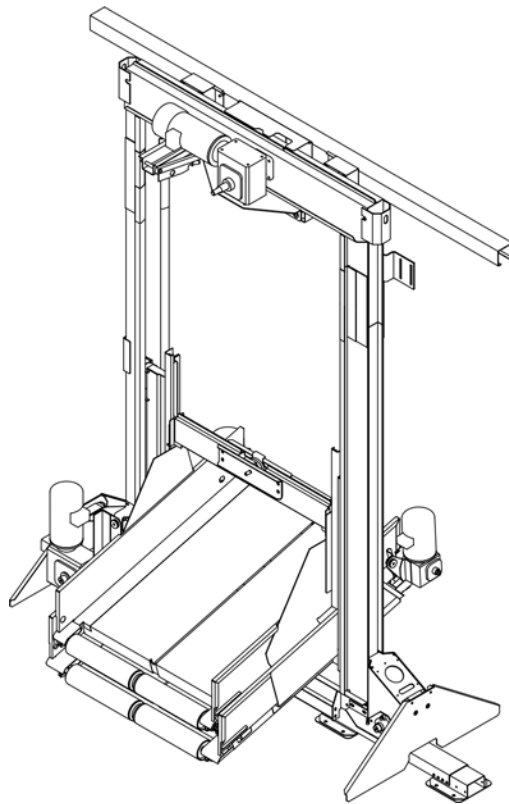




Manual Number: MCSCAM01  
Edition (ECN): 2021415A

# Mechanical Parts and Service

## COSHJ111\_, COSHJ112\_ (Milnor Hoist)





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# 1 General Service Information

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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, NEGLIGENCE, 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.

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## How to Get the Necessary Repair Components

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

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

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

To write to the Milnor® factory:

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

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

## 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®		



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# Torque Requirements for Fasteners

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

## Torque Values

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



**NOTE:** Data from the Pellerin Milnor® Corporation “Bolt Torque Specification” (bolt\_torque\_milnor.xls/2002096).

## Fasteners Made of Carbon Steel

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### Without a Threadlocker

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Table 2. Torque Values for Standard Fasteners with Maximum 5/16-inch Diameters and No Lubricant

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	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 3. Torque Values for Standard Fasteners Larger Than 5/16-inch Diameters and No Lubricant

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
3/8 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

**Table 3 Torque Values for Standard Fasteners Larger Than 5/16-inch Diameters and No Lubricant (cont'd.)**

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
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
3/4 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 4. Torque Values for Plated Fasteners with Maximum 5/16-inch Diameters and No Lubricant**

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	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 5. Torque Values for Plated Fasteners Larger Than 5/16-inch Diameters and No Lubricant**

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
3/8 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
3/4 x 16	144	192	223	297	315	420	–	–

**Table 5 Torque Values for Plated Fasteners Larger Than 5/16-inch Diameters and No Lubricant (cont'd.)**

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
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	–	–

**With a Threadlocker**

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**Table 6. Threadlocker by the Diameter of the Bolt (see below Note )**

LocTite Product	Dimension			
	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:** 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 7. 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 8. 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

**Table 8 Torque Values if You Apply LocTite 242 (cont'd.)**

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
3/8 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 9. 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 10. Torque Values if You Apply LocTite 272 (High-Temperature)**

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
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 11. Torque Values if You Apply LocTite 277**

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
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	–	–

**Table 11 Torque Values if You Apply LocTite 277 (cont'd.)**

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
1-1/2 x 6	1130	1532	2534	3436	4110	5572	3597	4877
1-1/2 x 12	1271	1723	2852	3867	4624	6269	–	–

## Stainless Steel Fasteners

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**Table 12. Torque Values for Stainless Steel Fasteners 5/16-inch and Smaller**

Dimension	316 Stainless		18-8 Stainless		18-8 Stainless with Loctite 767	
	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 13. Torque Values for Stainless Steel Fasteners Larger Than 5/16-inch**

Dimension	316 Stainless		18-8 Stainless		18-8 Stainless with Loctite 767	
	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

## Preparation

BNUUUN02.T01 0000222511 E.2 B.3 A.3 1/2/20 2:14 PM Released



**WARNING: 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:** 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.

## How to Apply a Threadlocker

BNUUUN02.T02 0000222508 E.2 B.3 A.3 11/26/19 2:48 PM Released



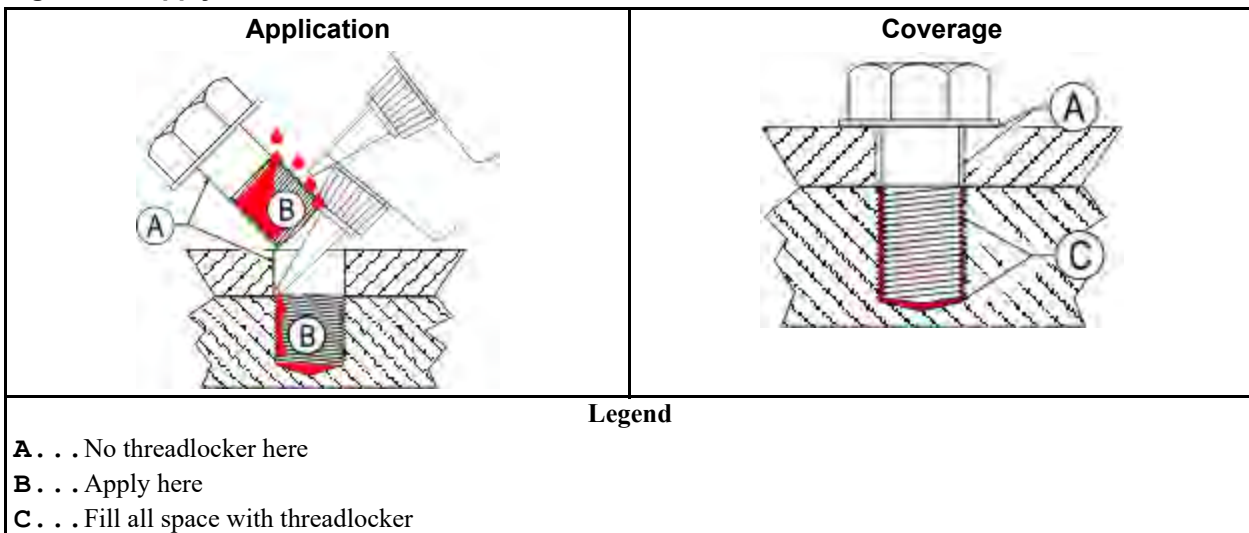
**CAUTION: Malfunction Hazard** — Heat, vibration, or mechanical shocks can let the fasteners loosen if you do not apply the threadlocker correctly. Loose fasteners can cause malfunctions of the equipment.



- ▶ 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. Apply Threadlocker in a Blind Hole**



## Blind Holes

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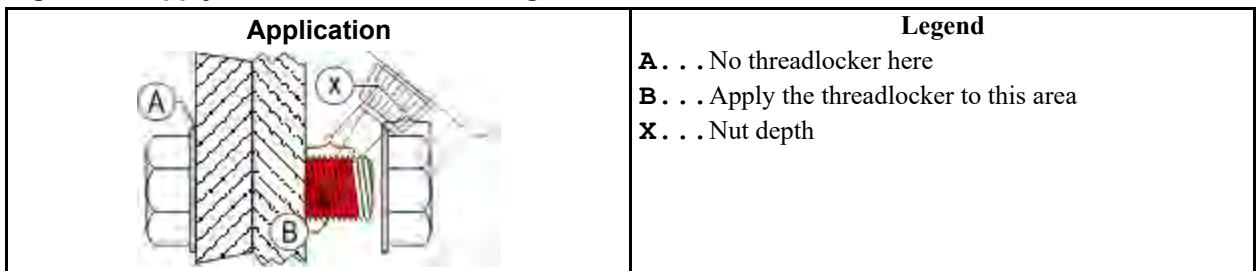
1. Apply the threadlocker down the threads to the bottom of the hole.
2. Apply the threadlocker to the bolt.
3. Tighten the bolt to the value shown in the correct table ([Table 6: Threadlocker by the Diameter of the Bolt \(see below Note \), page 9](#) to [Table 12: Torque Values for Stainless Steel Fasteners 5/16-inch and Smaller, page 11](#) ).

## Through Holes

BNUUUN02.T04 0000222506 E.2 B.3 A.3 11/26/19 2:51 PM Released

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 6: Threadlocker by the Diameter of the Bolt \(see below Note \), page 9](#) to [Table 12: Torque Values for Stainless Steel Fasteners 5/16-inch and Smaller, page 11](#) ).

**Figure 3. Apply Threadlocker in a Through Hole**



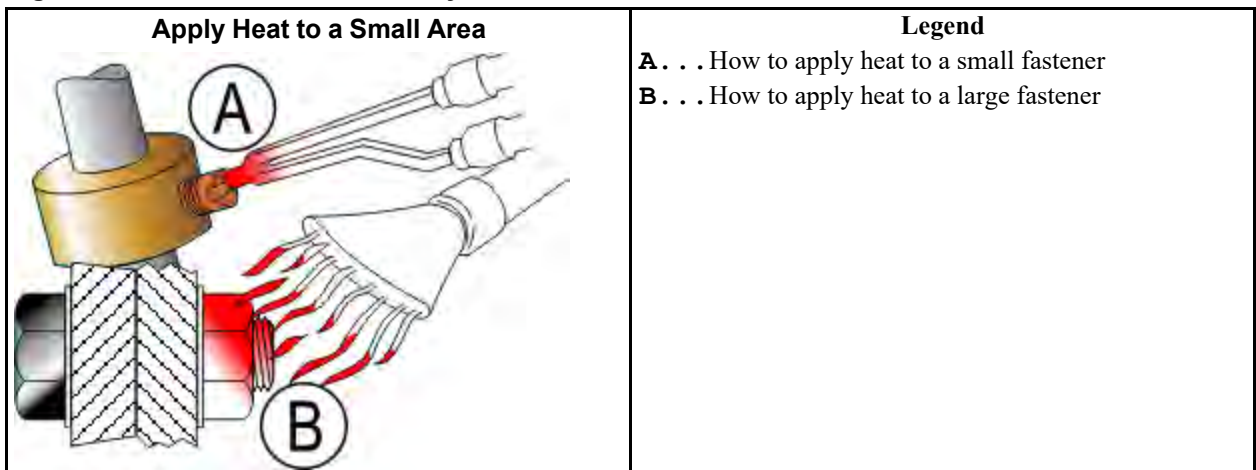
## Disassembly

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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. Use heat for disassembly of fasteners with threadlocker.**



# 2 Safety Related Components and Assemblies

BNSUUS06 / 2020074

BNSUUS06 0000275642 B.2 2/19/20 12:19 PM Released

## Safety — Shuttle Conveyors

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

### Safety Alert Messages—Internal Electrical and Mechanical Hazards

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

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



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



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



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



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

### Safety Alert Messages—External Mechanical Hazards

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

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





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



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



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



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



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



- ▶ Keep yourself and others off of machine.

## Safety Alert Messages—Unsafe Conditions

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

### Damage and Malfunction Hazards

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

### Hazards Resulting from Inoperative Safety Devices

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



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

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



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



- ▶ Do not unlock or open electric box doors.



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



- ▶ Do not remove guards, covers, or panels.

### Hazards Resulting from Damaged Mechanical Devices

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



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

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



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

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

### Careless Use Hazards

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

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

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



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

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



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

- ▶ Understand the consequences of entering cake data.



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



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

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

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



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



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



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



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



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



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



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



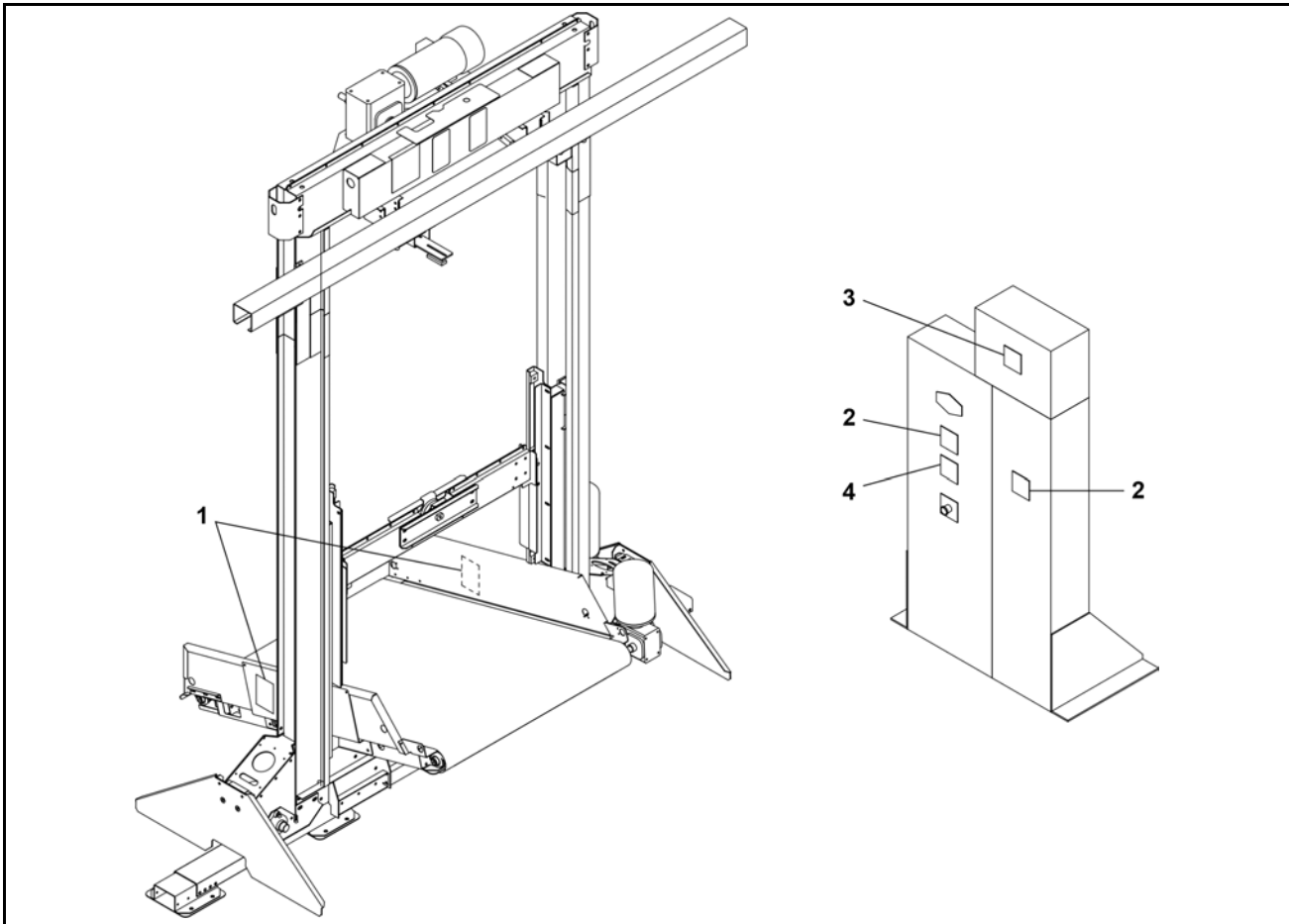
- ▶ Lock out and tag out power to the traveling machine at the main machine disconnect if you must work in the path of the traveling machine.

# Safety Placard Use and Placement

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



**NOTICE:** Replace placard immediately, if removed or unreadable. Approximate locations of placards are shown. If aluminum, placard mounting holes are provided on machine. Use #8 self-tapping screws.



**Table 14. Parts List—Safety Placard Use and Placement**

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	01 10564A	NPLT: COSHA HAZARDS-TCATA	
all	2	01 10377A	NPLT: ELEC HAZARD LG-TCATA	
all	3	01 10375B	NPLT: ELEC HAZARD SMALL-TCATA	
all	4	01 10699A	NPLT: SERV HZRD-PLYEST-TCATA	

BPSCAM02 / 2020163

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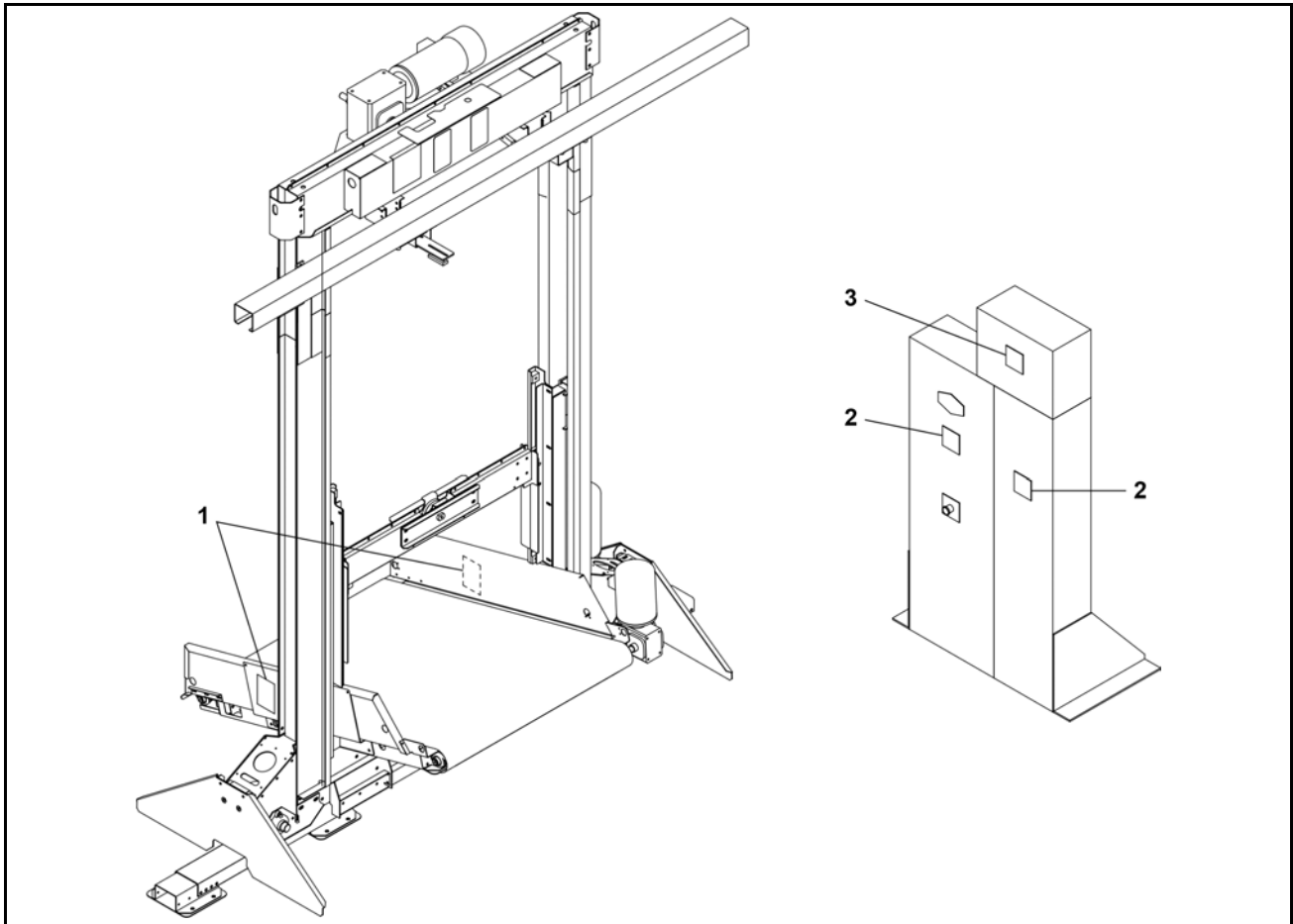
# Safety Placard Use and Placement ISO

1 Sheet

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



**NOTICE:** Replace placard immediately, if removed or unreadable. Approximate locations of placards are shown. If aluminum placard, mounting holes are provided on machine. Use #8 self-tapping screws.



**Table 15. Parts List—Safety Placard Use and Placement ISO**

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	01 10564X	WARNINGS:SHUTTLE ISO	
all	2	01 10377	NPLTE:"WARNING" 4X4	
all	3	01 10375	NPLTE:"WARNING" 2X2	

BNSUUH01 / 2021344

BNSUUH01 0000374280 A.7 8/19/21 10:11 AM Released

## Use the Red Safety Supports for Maintenance — CA\_, CG\_, COEL\_, COLF\_, COSH\_

BNSUUH01.C01 0000374279 E.2 A.7 A.4 8/18/21 8:51 AM Released

### 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

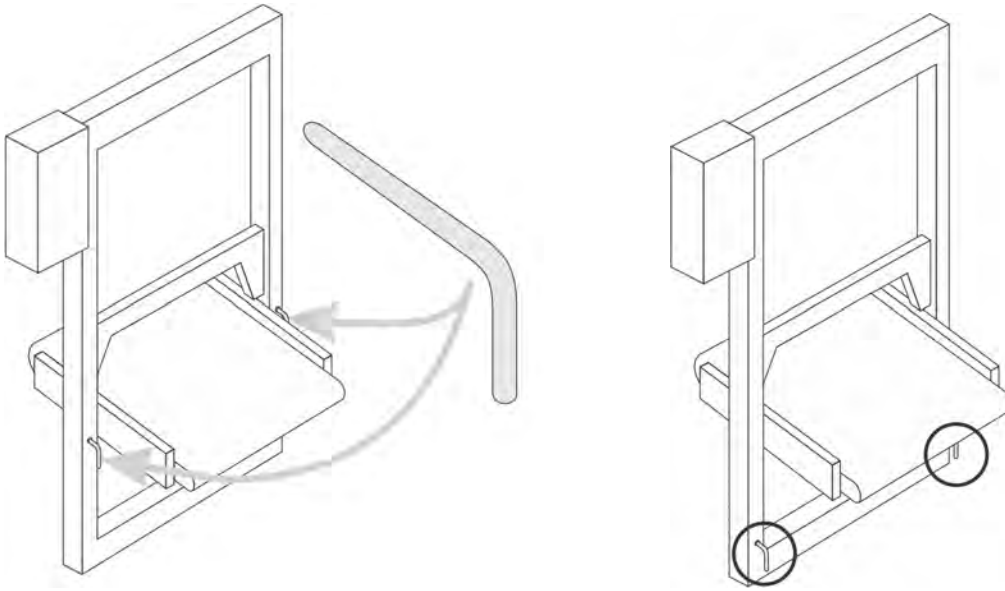
deployed.

- ▶ 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.

## How to Deploy the Safety Pins

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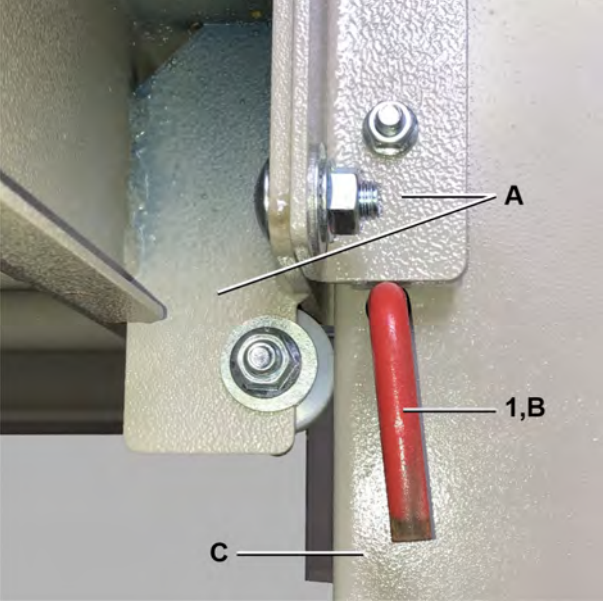
1. Use the Manual mode to raise the bed or bucket carrier only as far as needed to insert the pins at one of the receptacle holes.
2. The illustrations below show the safety pins deployed (at left) and stowed (at right). Install the safety pins into the receptacle holes in the frame.



3. Remove electric power from the machine.

# Safety Pin

All Elevating Shuttles and Pivoting Elevators.

	<p style="text-align: center;"><b>Legend</b></p> <p><b>A</b> . . . Side Slider</p> <p><b>B</b> . . . Safety Pin, 2 instances, left and right</p> <p><b>C</b> . . . Vertical frame member</p>
---	--

**Table 16. 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	

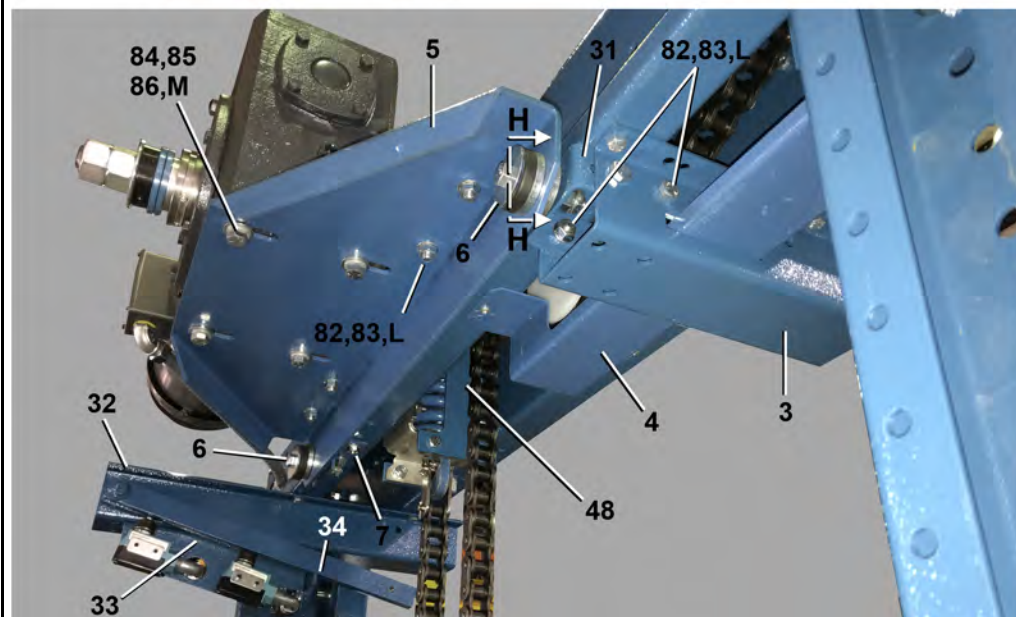
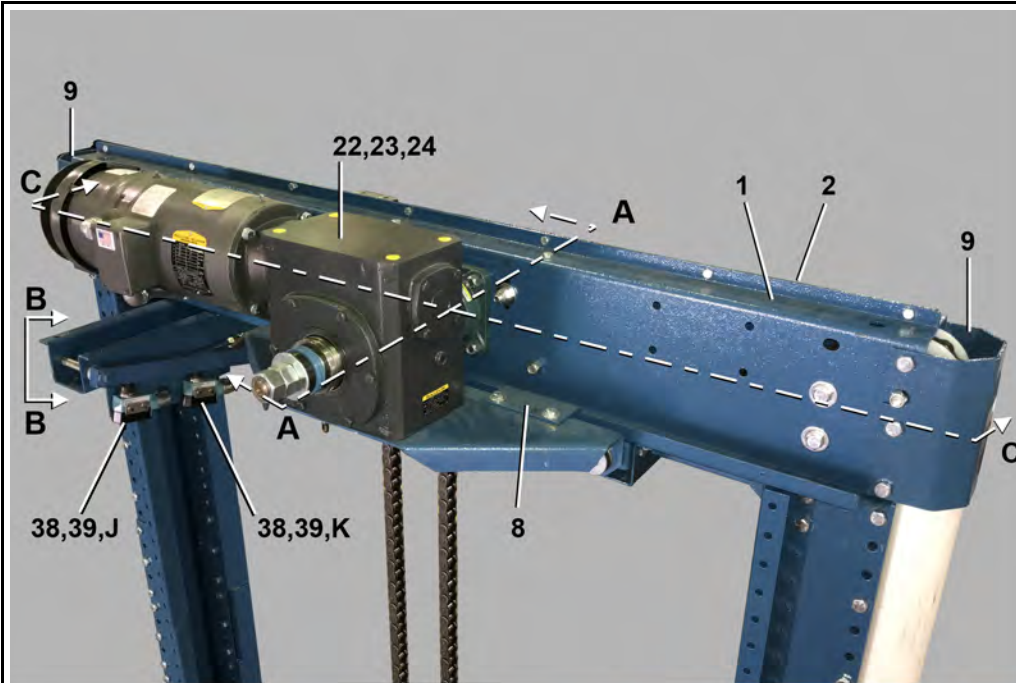


# 3 Mechanical Components

# Milnor Hoist for J-Rail Shuttles

All Elevating Shuttles and Pivoting Elevators.

Figure 5. Milnor Hoist with Standard Gear Reducer



**Legend**

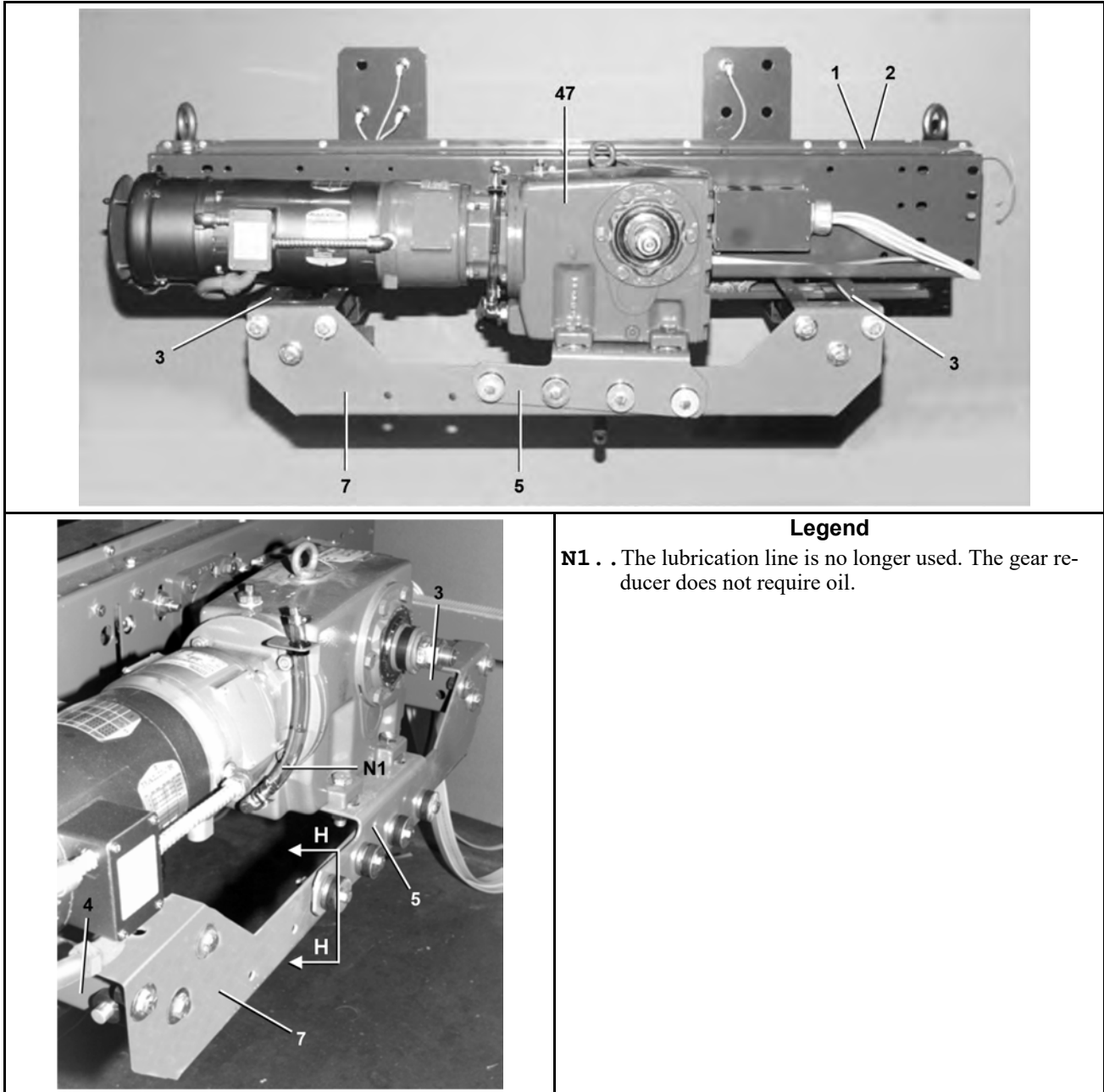
- J . . . Lift Stop Safety Switch, Maximum
- K . . . Lift Stop Safety Switch, Up Limit
- L . . . Typical
- M . . . 4 instances

# Milnor Hoist for J-Rail Shuttles

1 Sheet

All Elevating Shuttles and Pivoting Elevators.

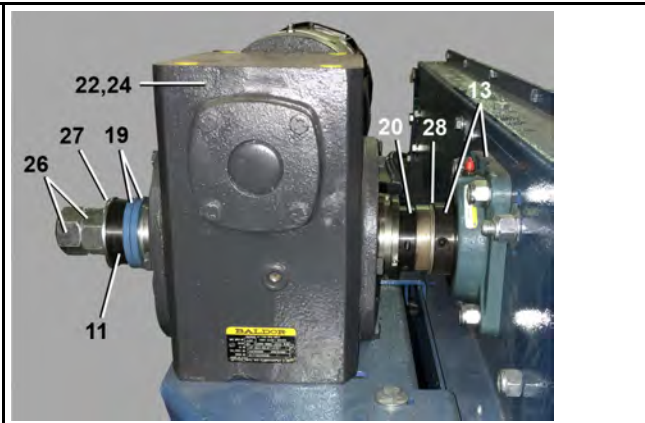
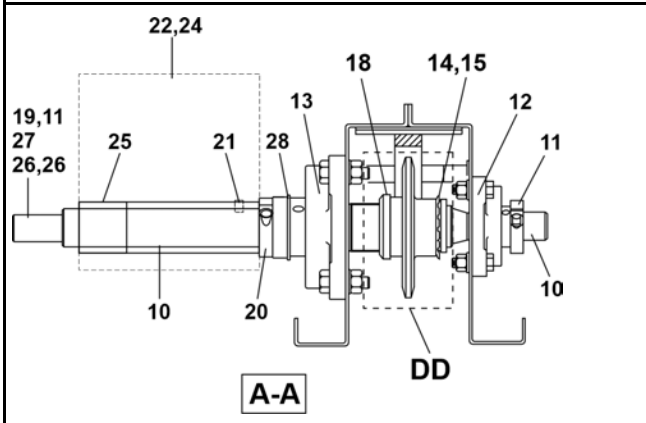
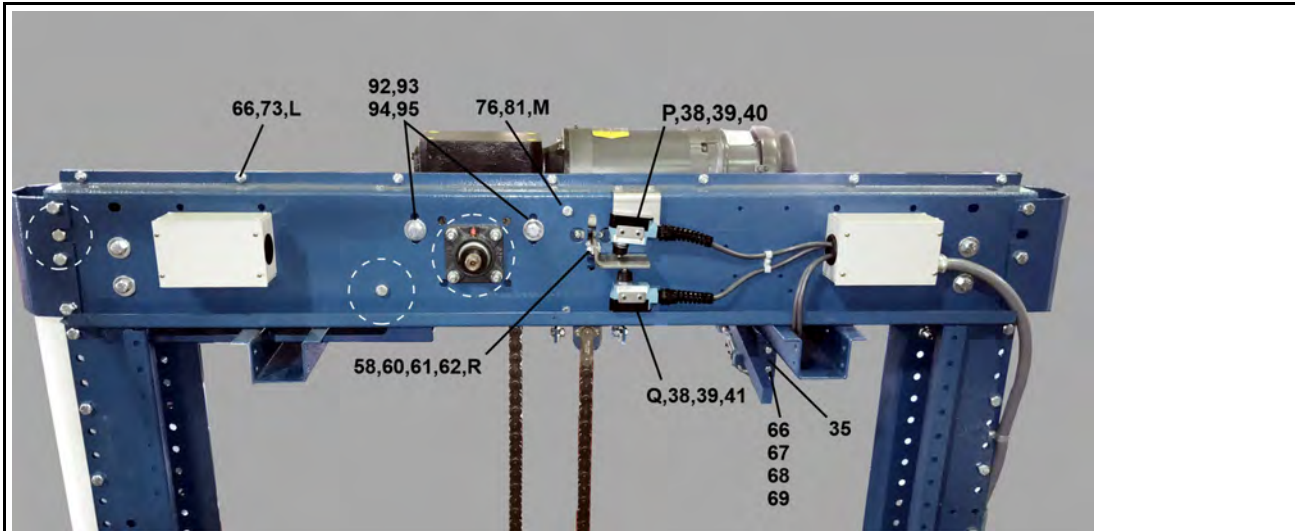
Figure 6. Milnor Hoist with Helical Gear Reducer for Extra Heavy Loads



# Milnor Hoist for J-Rail Shuttles

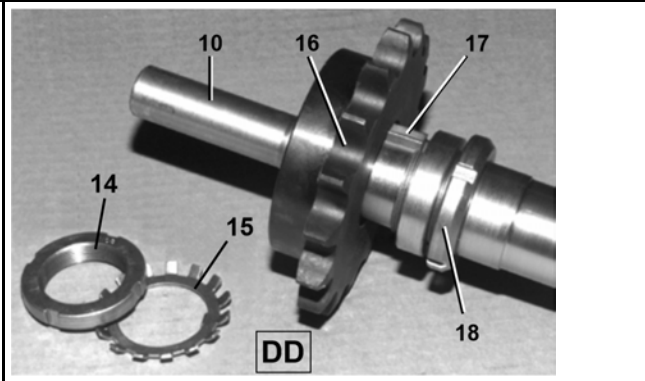
1 Sheet

All Elevating Shuttles and Pivoting Elevators.



**Legend**

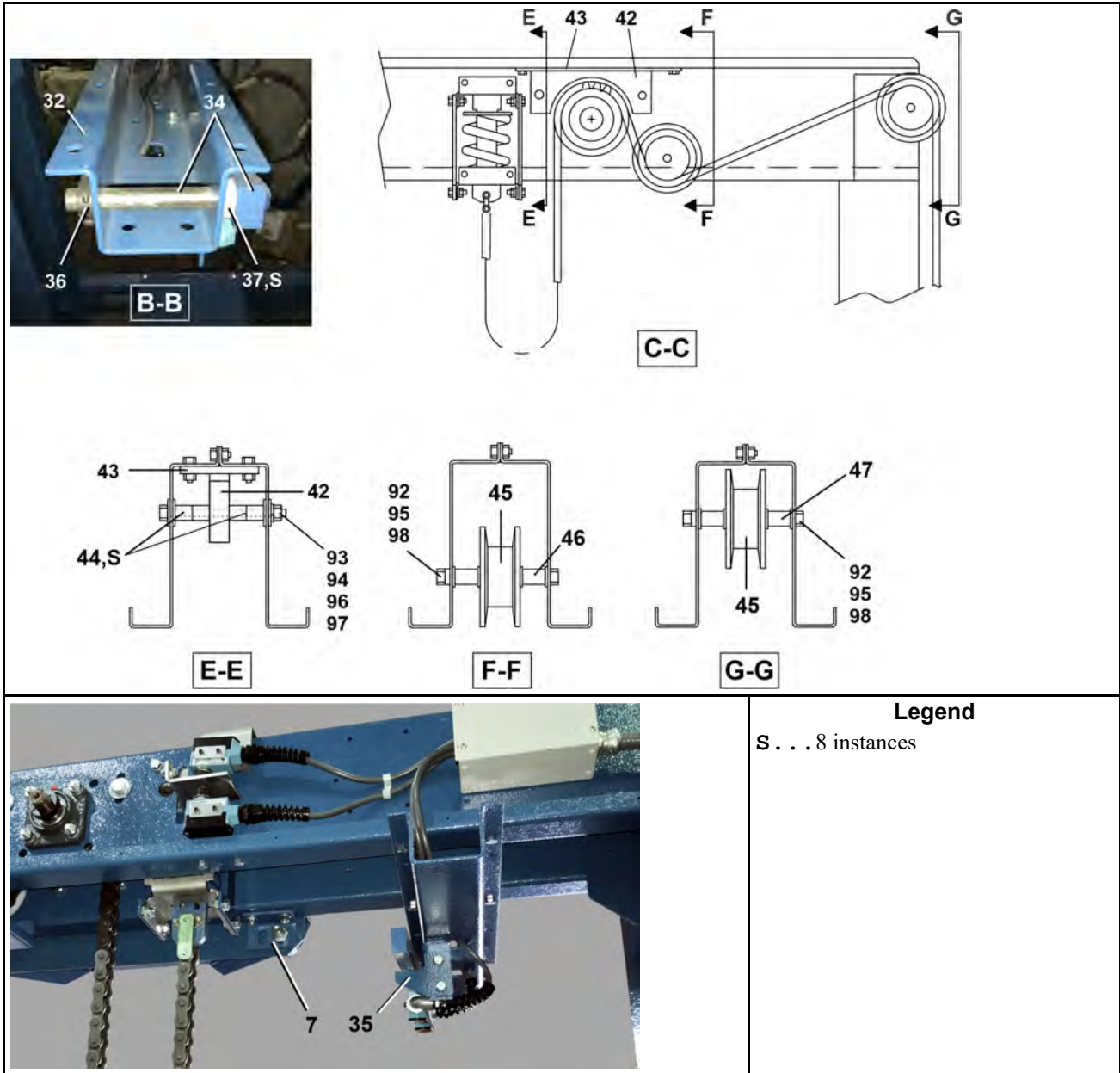
**J** . . . Lift Stop Safety Switch, Maximum Up  
**K** . . . Lift Stop Safety Switch, Up Limit  
**L** . . . Typical  
**M** . . . 4 instances  
**P** . . . Down limit Switch  
**Q** . . . Taut Chain Limit Switch  
**R** . . . 2 instances



# Milnor Hoist for J-Rail Shuttles

1 Sheet

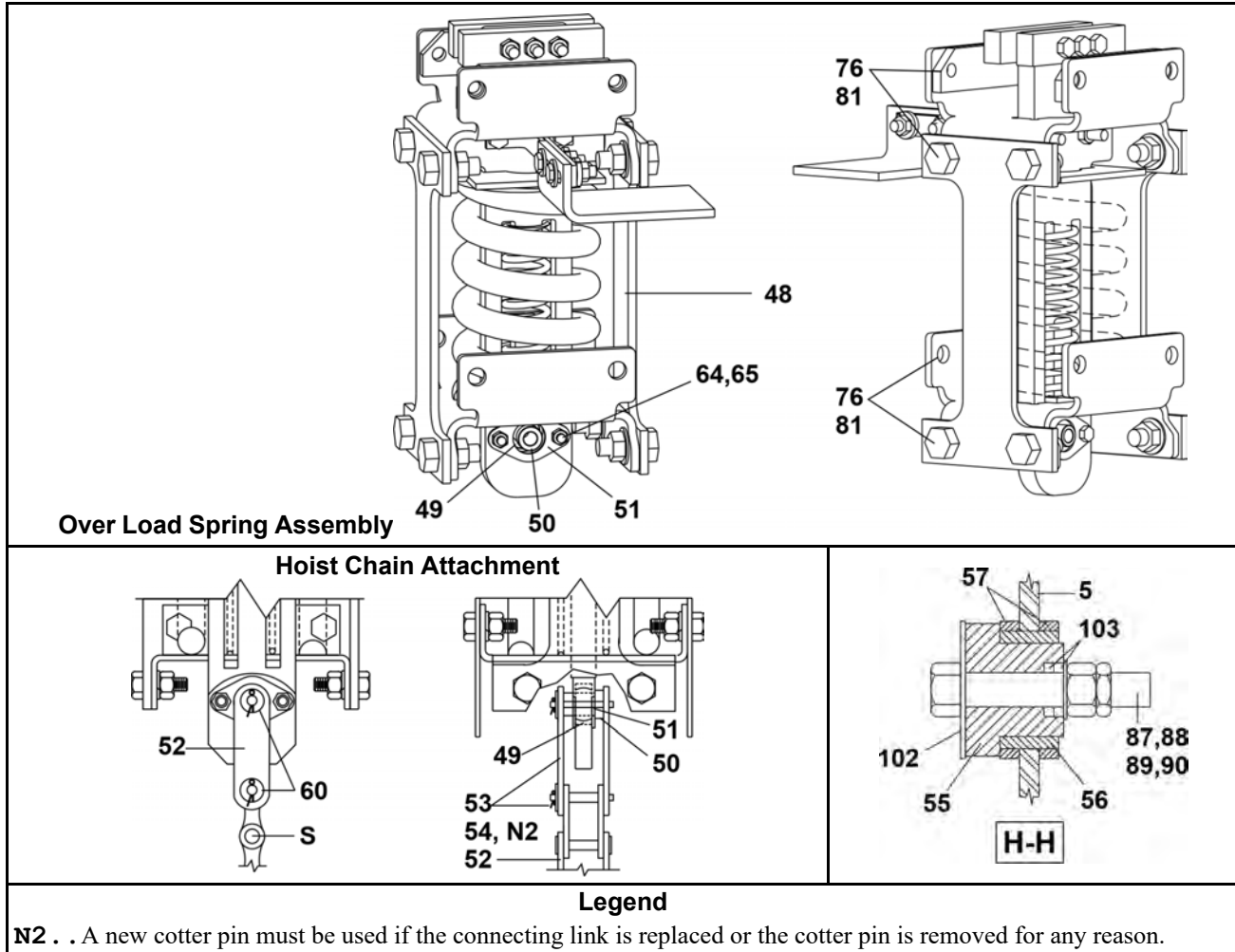
All Elevating Shuttles and Pivoting Elevators.



# Milnor Hoist for J-Rail Shuttles

1 Sheet

All Elevating Shuttles and Pivoting Elevators.



### 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 17. 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
Reference 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	

# Milnor Hoist for J-Rail Shuttles

1 Sheet

All Elevating Shuttles and Pivoting Elevators.

Table 17 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	

# Milnor Hoist for J-Rail Shuttles

All Elevating Shuttles and Pivoting Elevators.

**Table 17 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	HXCPCSCR 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	



# Milnor Hoist for J-Rail Shuttles

1 Sheet

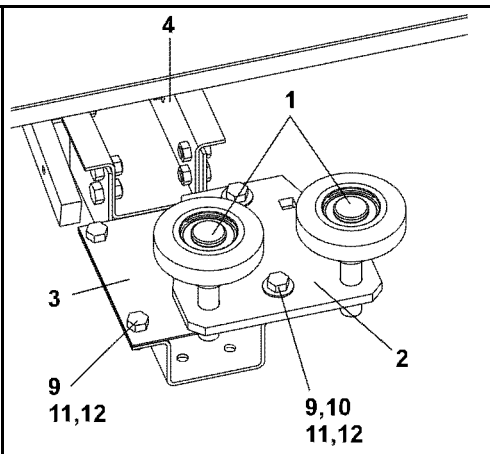
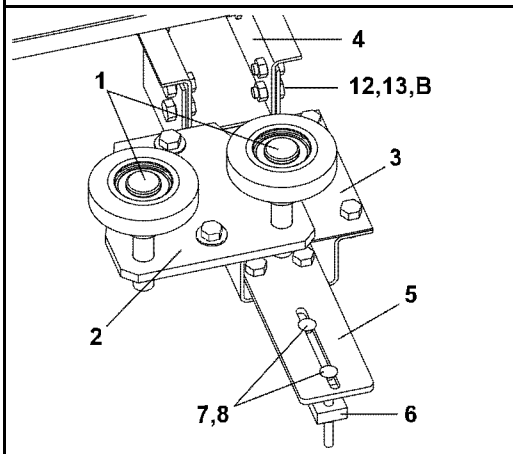
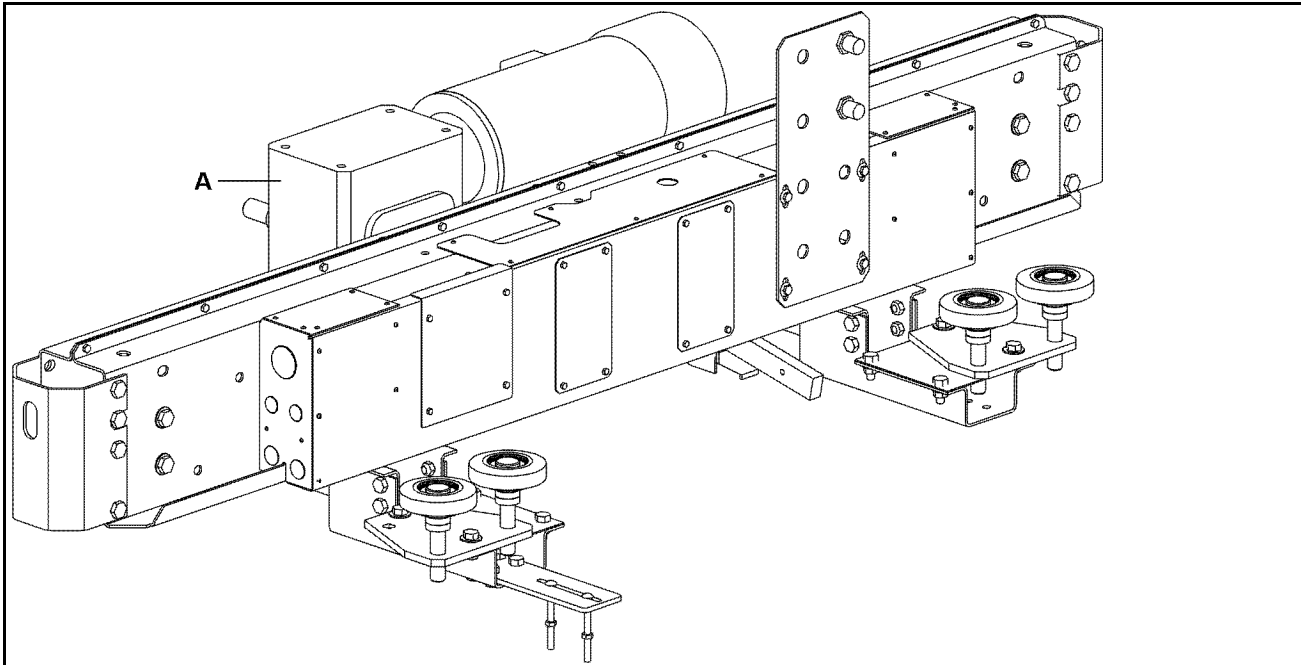
All Elevating Shuttles and Pivoting Elevators.

Table 17 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 18. 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
Reference 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

1 Sheet

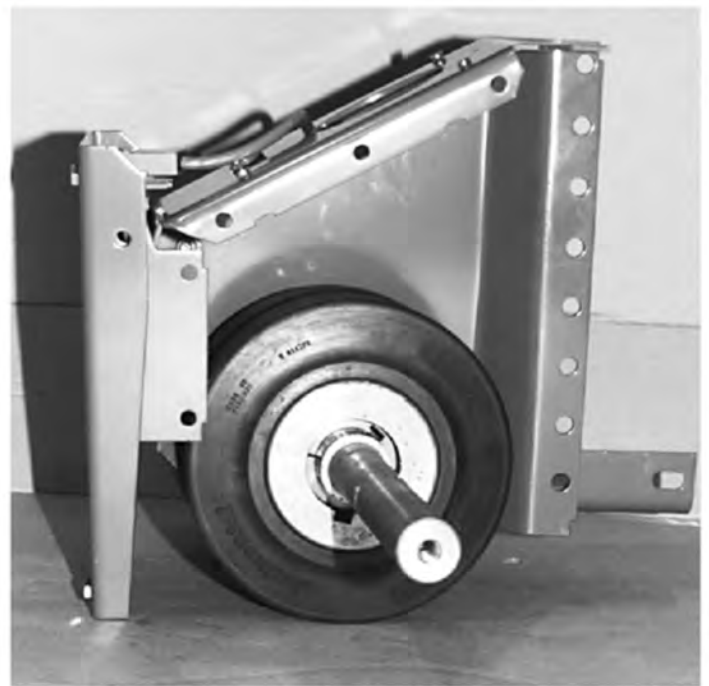
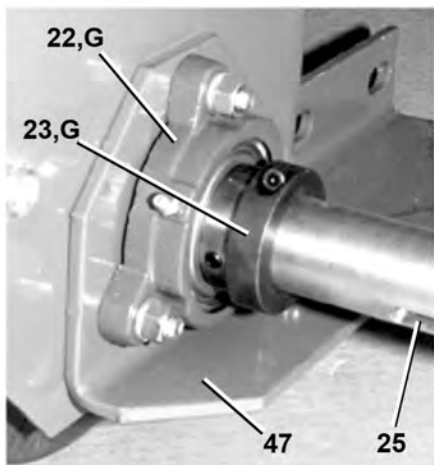
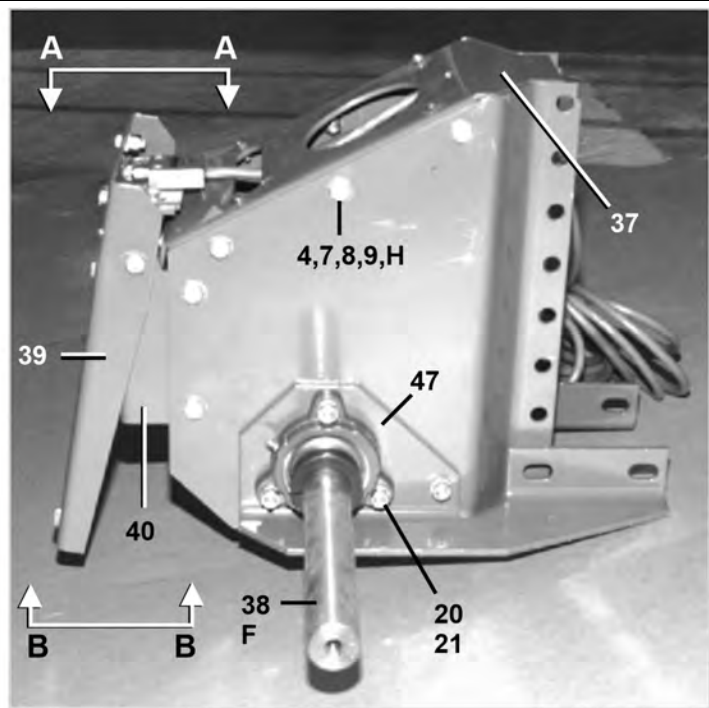
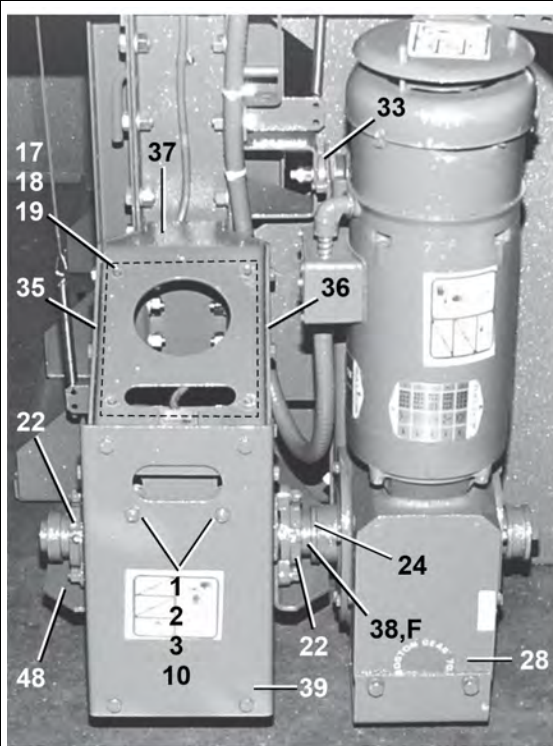
### Traversing J-Rail Shuttles

**Table 18 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	HXCPSR 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	

**Floor Drive Tractor**

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



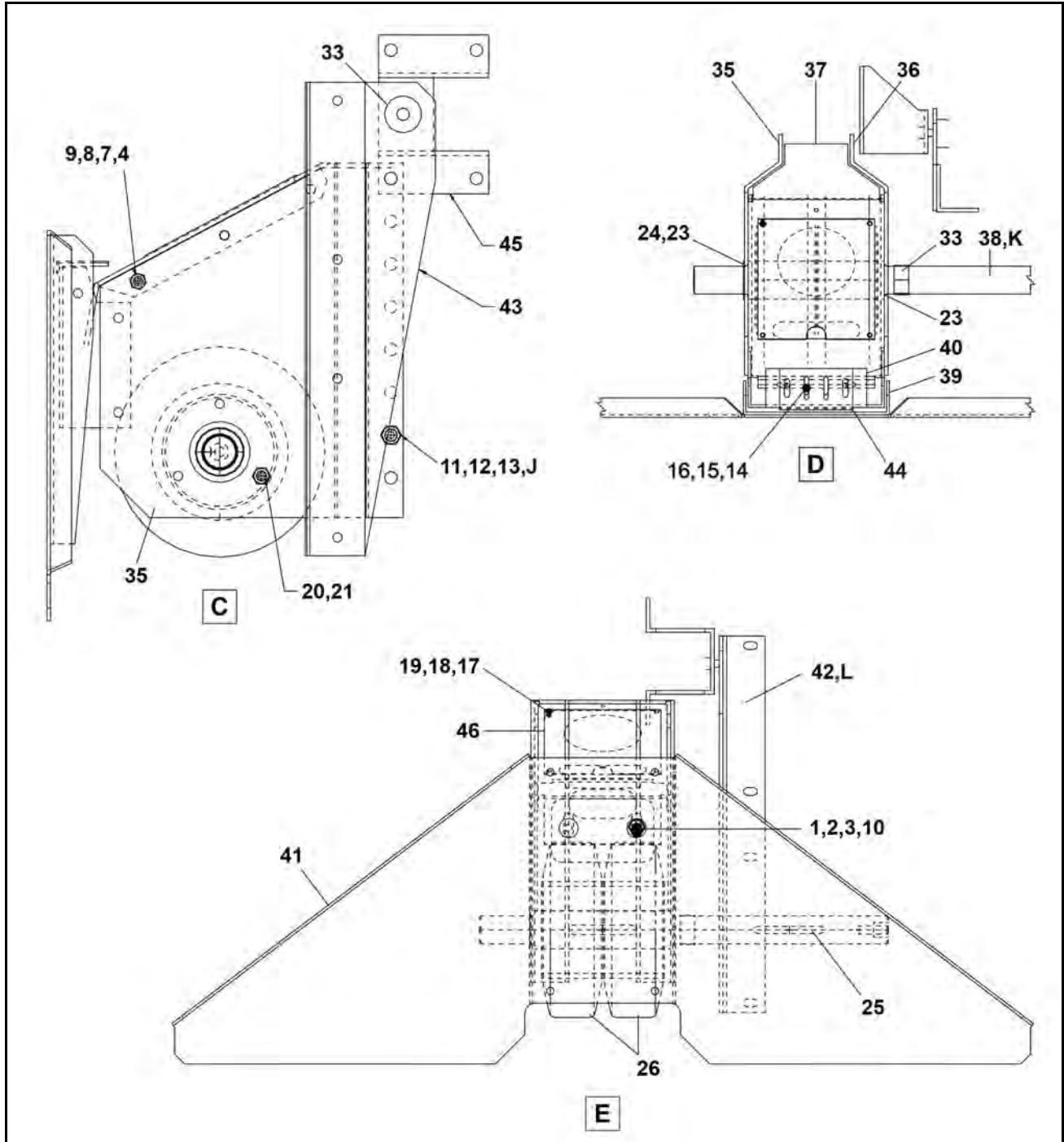
**Legend**

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

# Floor Drive Tractor

5 Sheet

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

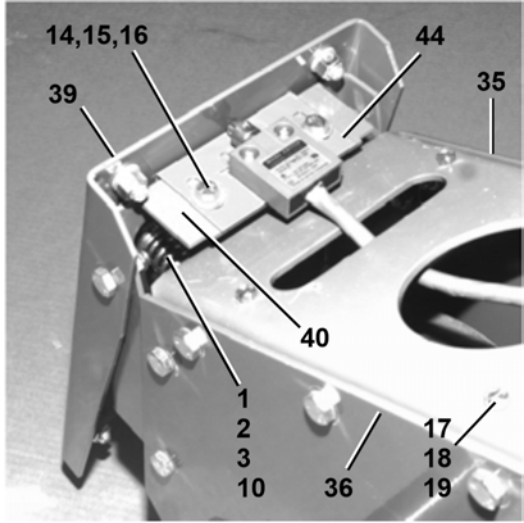
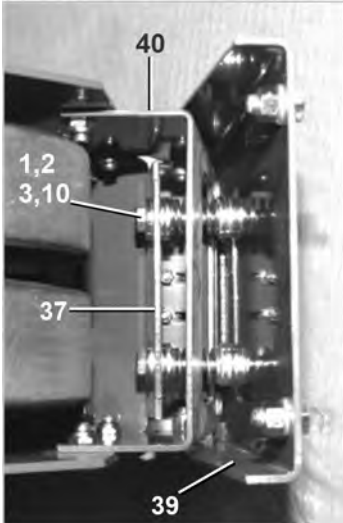
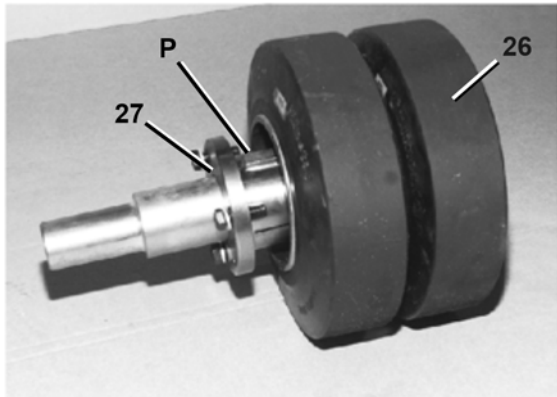
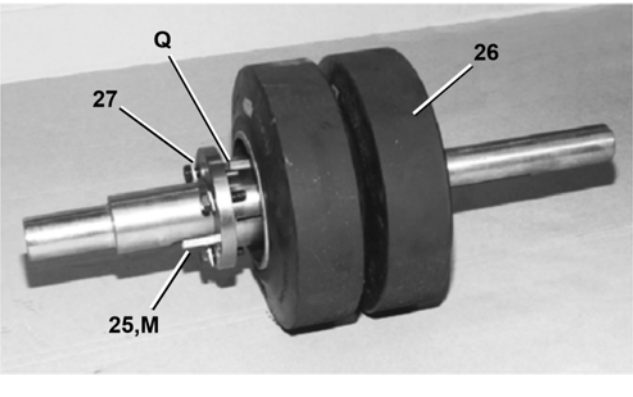


### Legend

- 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)\_ and CL(36,40,48)\_

<p><b>View A-A</b></p> 	<p><b>View B-B</b></p> 
<p><b>Idler Wheels and Idler Shaft</b></p> 	<p><b>Drive Wheels and Drive Shaft</b></p> 
<p><b>Legend</b></p> <p><b>M</b> . . . Key  <b>P</b> . . . Wheel key comes with idler shaft  <b>Q</b> . . . Wheel key comes with drive shaft</p>	

**Table 19. 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

5 Sheet

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

Table 19 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

5 Sheet

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

**Table 19 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	



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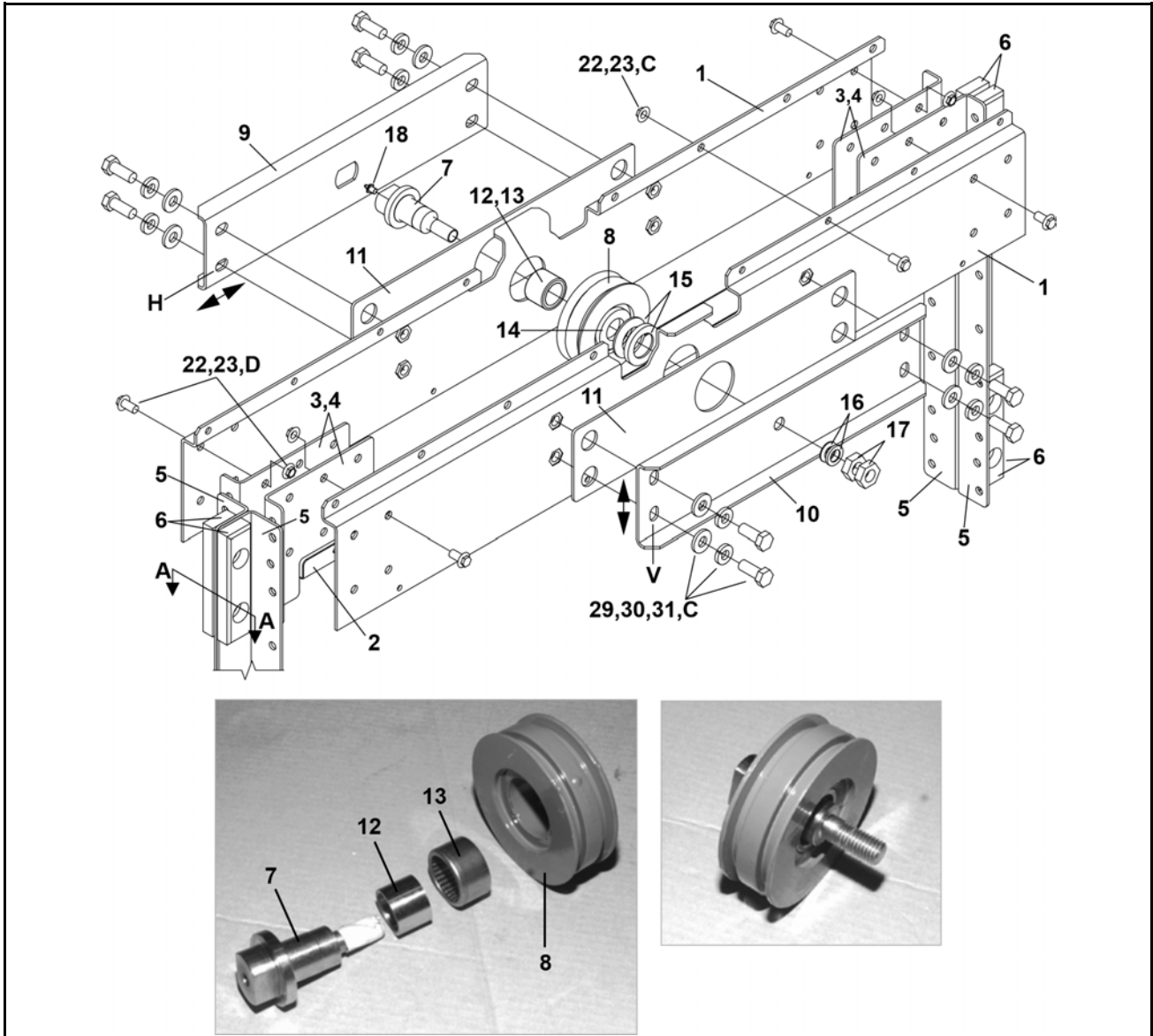
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# Lifting Cross Member for Milnor Hoist

3 Sheet

COSHJ111/112, COLF112/112A. COSHK112

Figure 7. Exploded View of Lifting Cross Member with Roller Chain Pulley



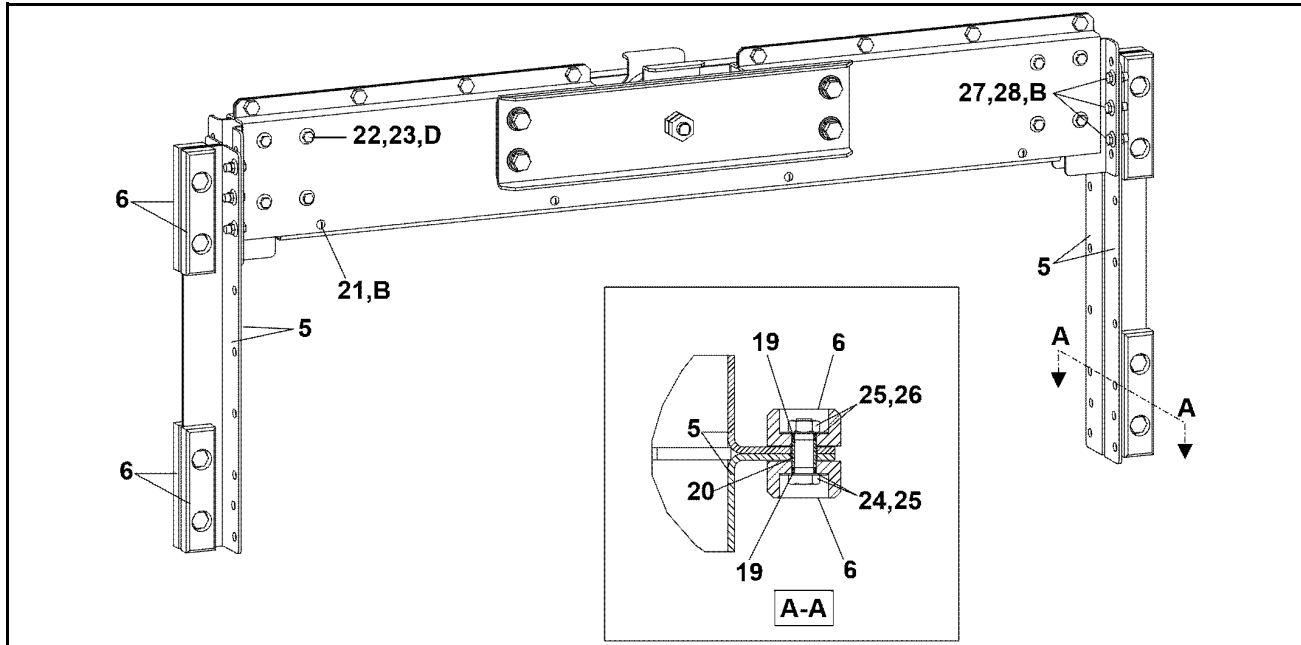
### Legend

- C . . . 8 instances
- D . . . 16 instances
- H . . . Slotted for horizontal adjustment of pulley
- V . . . Slotted for vertical adjustment of pulley

# Lifting Cross Member for Milnor Hoist

COSHJ111/112, COLF112/112A. COSHK112

Figure 8. Lifting Cross Member with Detail of Side Sliders



**Legend**

- A—A . . Cross section view of side slider pads and hardware
- B . . . Typical
- D . . . 16 instances

**Table 20. 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
Reference Assemblies				
	A	ALC420002L	LIFT X-MEMBER PULLEY ASSY-COSHJ111/112	REFERENCE
	B	ALC420245	ROLLER CHAIN PULLEY ASSEMBLY	REFERENCE
Components				
all	1	04 21795	LIFTING X-MEMBER-COSHJ112	
all	2	04 21796	LIFT X-MEMBER GREASE CHANNEL	
all	3	04 21798	X-MEMBER ADAPTER BRKT-RT	
all	4	04 21798A	X-MEMBER ADAPTER BRKT-LF	
all	5	04 21794	VERTSLIDER ANGLE-COSHJ112	
all	6	04 23322	UPPER BED SLIDER PAD	
all	7	04 20762B	SHAFT-1.13DIA X-MEMBER LIFT	
all	8	04 21404E	IDLER PULLEY X-MEMBER-#80CHN	
all	9	04 20782B	X-MEMBER HORIZONTAL ADJ	
all	10	04 20783B	X-MEMBER VERTICAL ADJ	
all	11	04 20873C	SPACER X-MEMBER ADJ PLATE	
all	12	54AN02A01	BEARING=NEEDLE 1.38"BORE TORRINGTON#BH-2216	

# Lifting Cross Member for Milnor Hoist

3 Sheet

COSHJ111/112, COLF112/112A. COSHK112

Table 20 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	13	54AN02A01A	BEARING INRACE 1.25" TORRINGTON #IR182216	
all	14	15U443	FLWASH 1.110 IDX2"ODX.26THK 304SS	
all	15	17W050A	SPHERICAL WASH SET 1.23ID	
all	16	17W030	SPHERICAL WASHER SET 5/8 M/F	
all	17	15G236C	HXFJNUT 5/8-11UNC2B ZINC G	
all	18	54M015	GREASEFIT 60X36/60X44 1610BL	
all	19	27B25002SZ	SPCRROLL.39ID.125L.048T STLZNC	
all	20	27B2100G0L	SPCRROLL.39ID.562L.048T STLZNC	
all	21	15P149	1/4-14X3/4 SCRSELDRL+TAP ZC	
all	22	15K091H	HEXFLGSCR 3/8-16X3/4 ZN GRD.5	
all	23	15G198	HXFLGNUT 3/8-16 ZINC	
all	24	15K105	HXCAPSCR 3/8-16UNC2A1.25 GR5 P	
all	25	15U200	FLATWASHER(USS STD) 5/16"ZNC P	
all	26	15G218	HXLOKNUT NYL 3/8-16 STL/ZNC	
all	27	15K147	HXCAPSCR 1/2-13UNC2X1 GR5 ZINC	
all	28	15G222B	HEXFLGNUT 1/2-13 ZINC SERRATED	
all	29	15K162	HXCAPSCR 1/2-13UNC2AX1.5 GR5 P	
all	30	15U490	FLTWASH 1+1/2X17/32X1/4 ZINC	
all	31	15U300	LOKWASHER REGULAR 1/2 ZINC PLT	

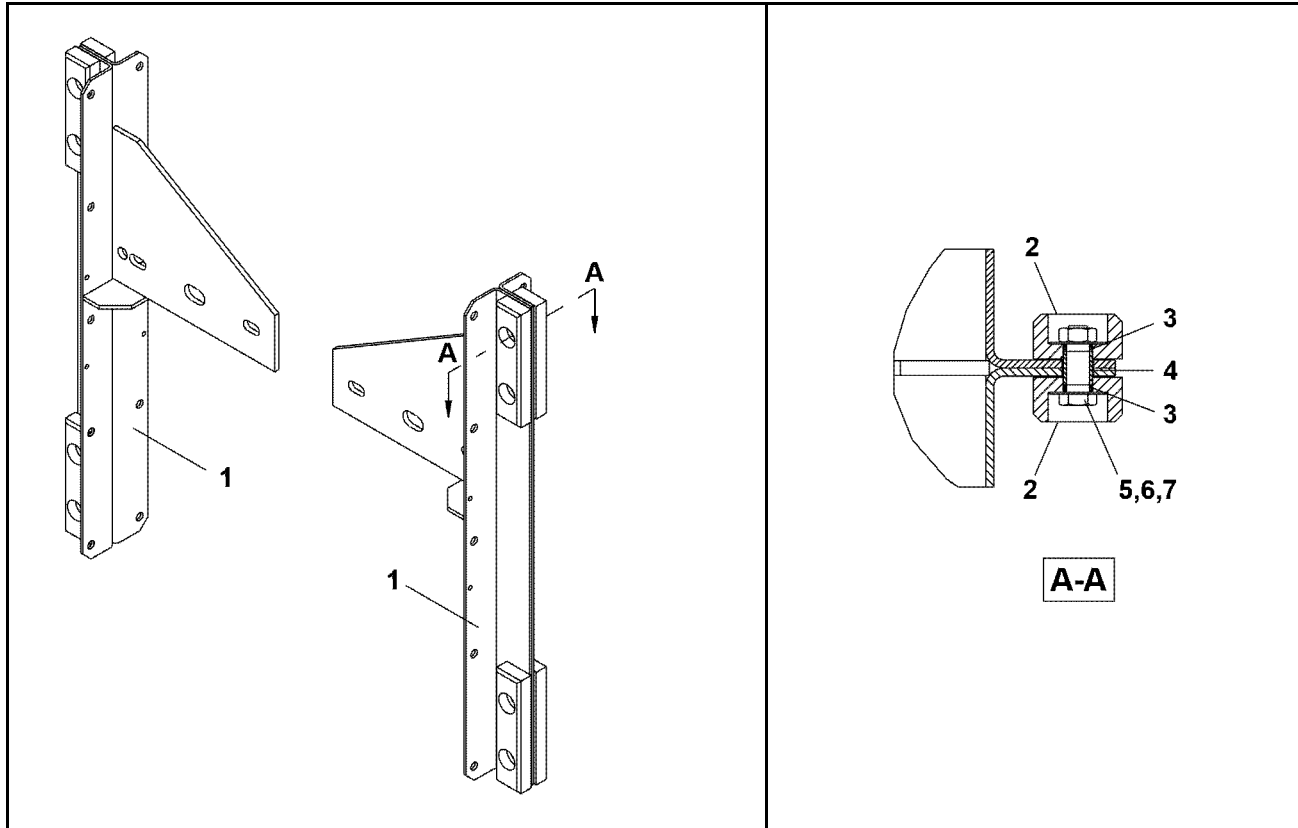
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# Upper Bed Sliding Pads

1 Sheet

COSHJ111/112, COLF112/112A. COSHK112



### Legend

A—A . . Cross section view of sliding pads, 4 instances

**Table 21. Parts List—Upper Bed Sliding Pads**

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	ALC50077	UPPERBED SLIDING PAD ASSY	
Components				
all	1	W4 23308	UPPER BED SLIDER WLMT (COLOR=AZURE BLUE)	
all	2	04 23322	UPPER BED SLIDER PAD	
all	3	27B2100G0L	SPCRROLL.39ID.562L.048T STLZNC	
all	4	27B25002SZ	SPCRROLL.39ID.125L.048T STLZNC	
all	5	15K105	HXCAPSCR 3/8-16UNC2A1.25 GR5 P	
all	6	15G218	HXLOKNUT NYL 3/8-16 STL/ZNC	
all	7	15U200	FLATWASHER(USS STD) 5/16" ZNC P	

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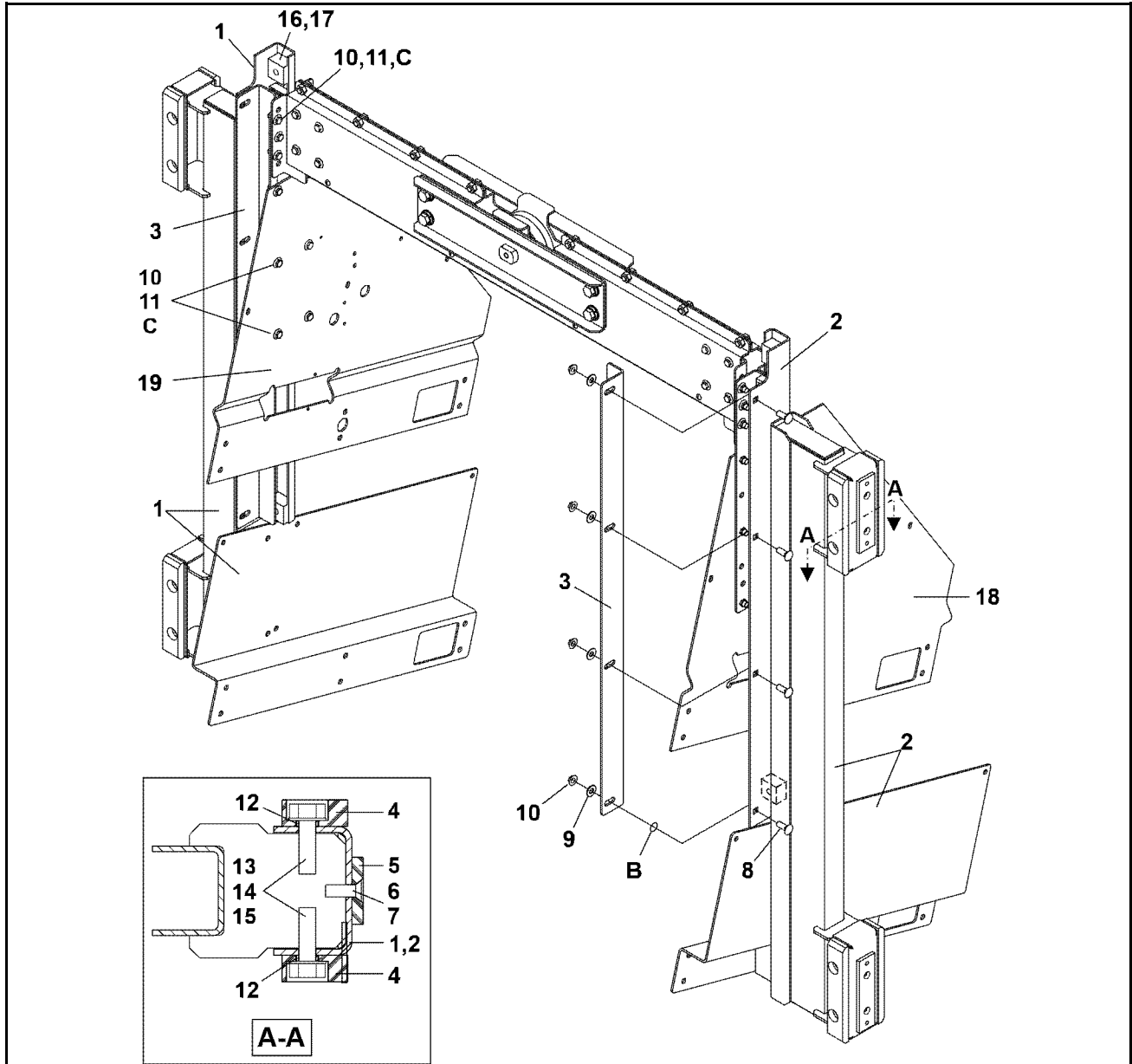
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# Side Slider 2 Bed Supt COLFJ COSHJ Milnor Hoist

3 Sheet

COSHJ111/112, COLFJ112/112A, COSHK112

Figure 9. Inclined Bed Supports



**Legend**

A—A . . . Cross section view of side slider pads and hardware

B . . . 8 instances

C . . . Typical

# Side Slider & Two Bed Support Milnor Hoist

3 Sheet

COSJ111/112, COLFJ112/112A, COSHK112

Figure 10. Horizontal Bed Supports

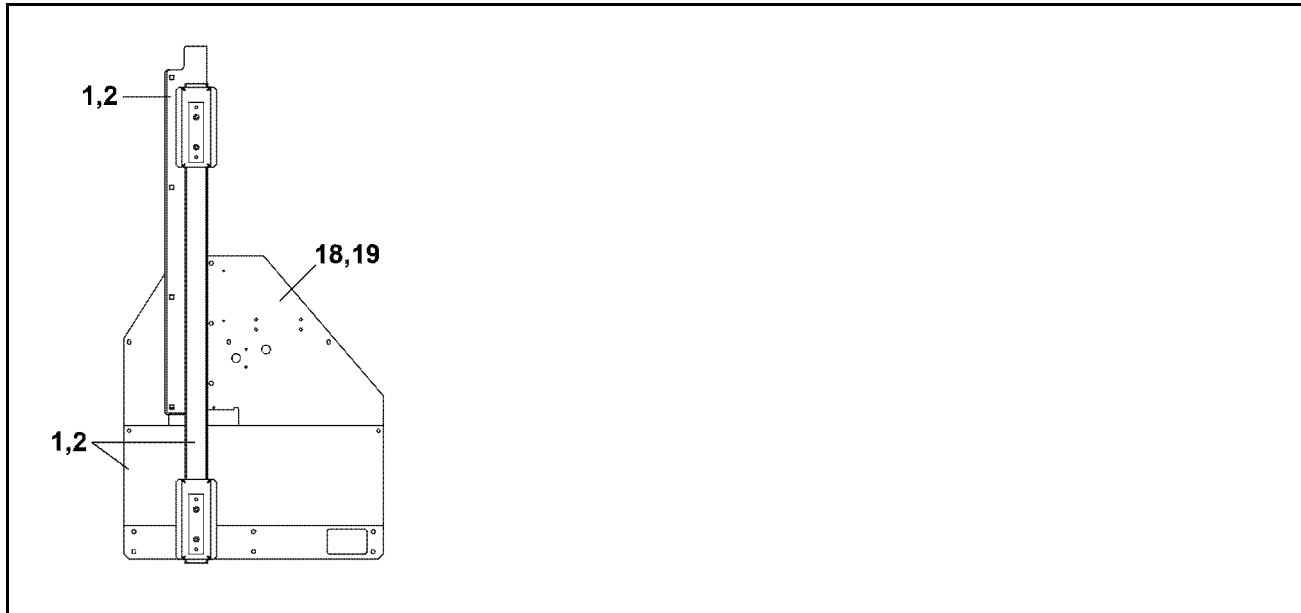


Table 22. Parts List— Side Slider & Two Bed Support Milnor Hoist

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
Reference Assemblies				
	A	ALC50109	LF/RT SIDE SLIDER-COSJ112	INCLINED
	B	ALC50109A	LF/RT SIDE SLIDER-COSJ112A	HORIZONTAL
Components				
all	1	W4 21792	MAIN SLIDER WLMT LF-COSJ112	
all	2	W4 21792A	MAIN SLIDER WLMT RT-COSJ112	
all	3	04 21791	UPPER BED SLIDER ADJ BRKT	
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	HXLKKNUT 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	HXLKKNUT 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	

## Side Slider & Two Bed Support Milnor Hoist

3 Sheet

COSHJ111/112, COLFJ112/112A, COSHK112

**Table 22 Parts List— Side Slider & Two Bed Support Milnor Hoist (cont'd.)**

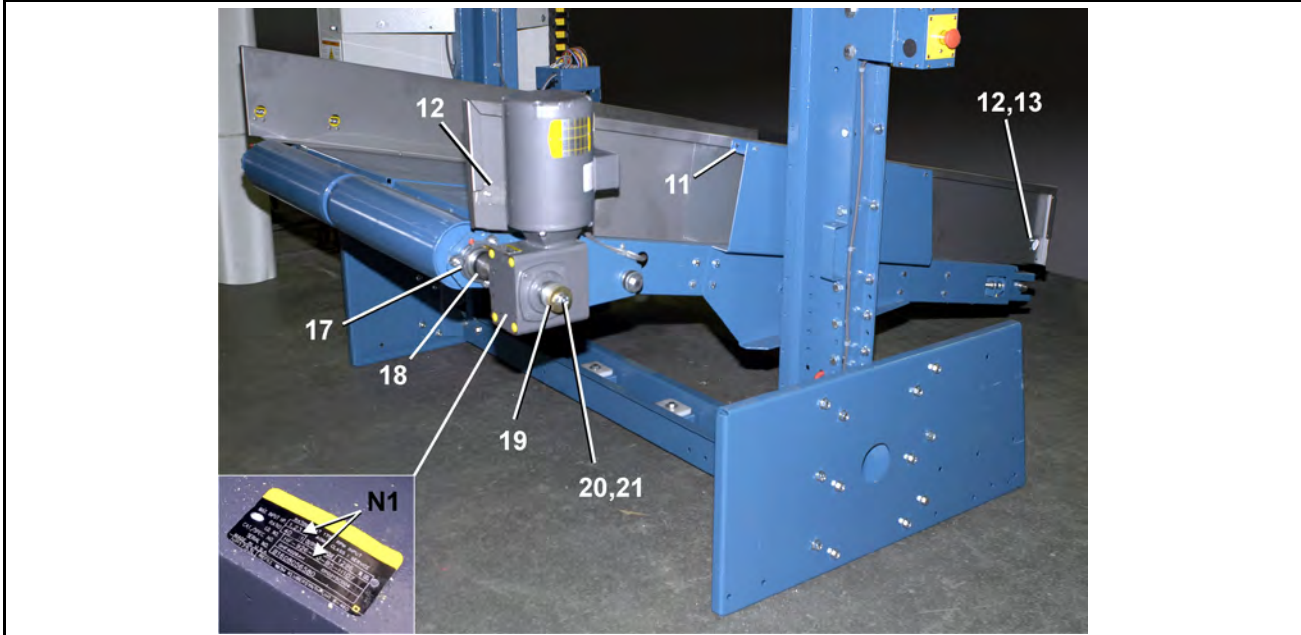
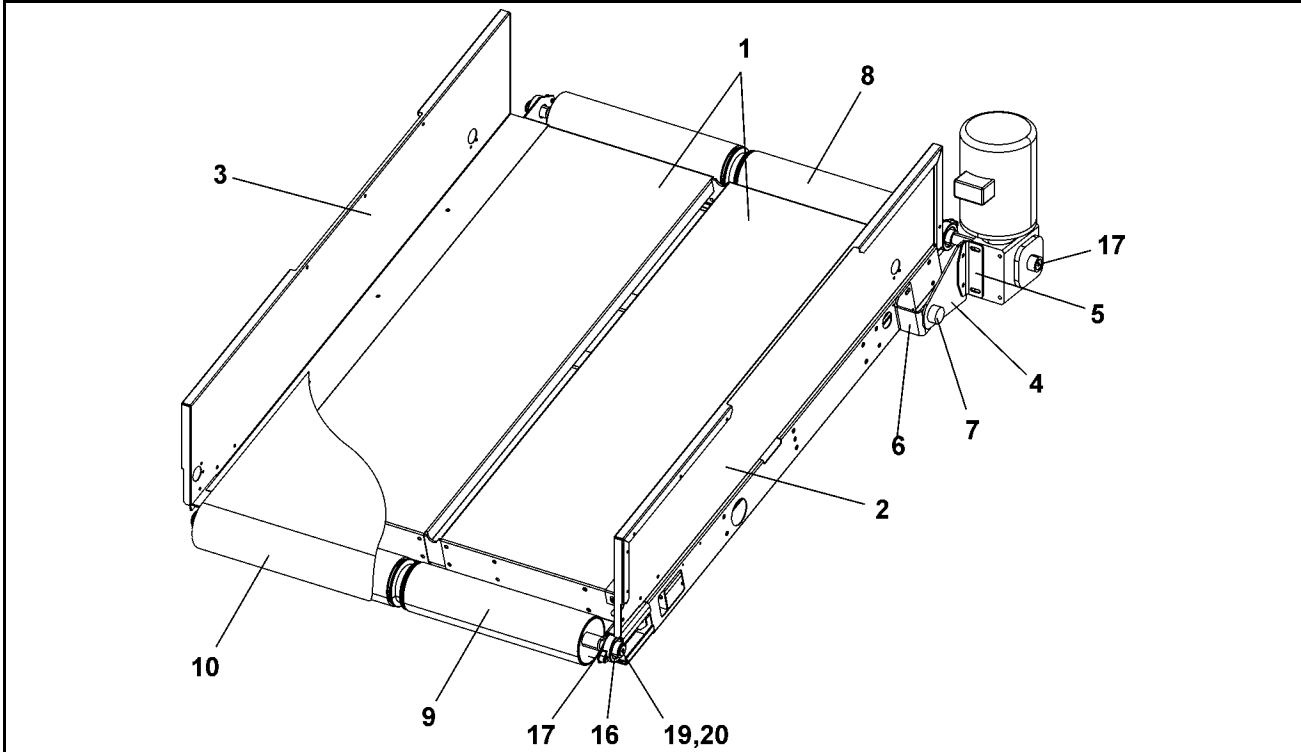
Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	Item	Part Number	Description/Nomenclature	Comments
A	18	04 23304	TOP BED MTG 15DEG-LF	
B	18	04 22273	UPPER HORZBED MTG PLATE-LF	
A	19	04 23304B	TOP BED MTG 15DEG-RT	
B	19	04 22273A	UPPER HORZBED MTG PLATE-RT	

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**COLFJKL COSHJKL Beds**  
 COSHJ/K/L 111/112 & COLFJ/K/L 111/112

1 Sheet



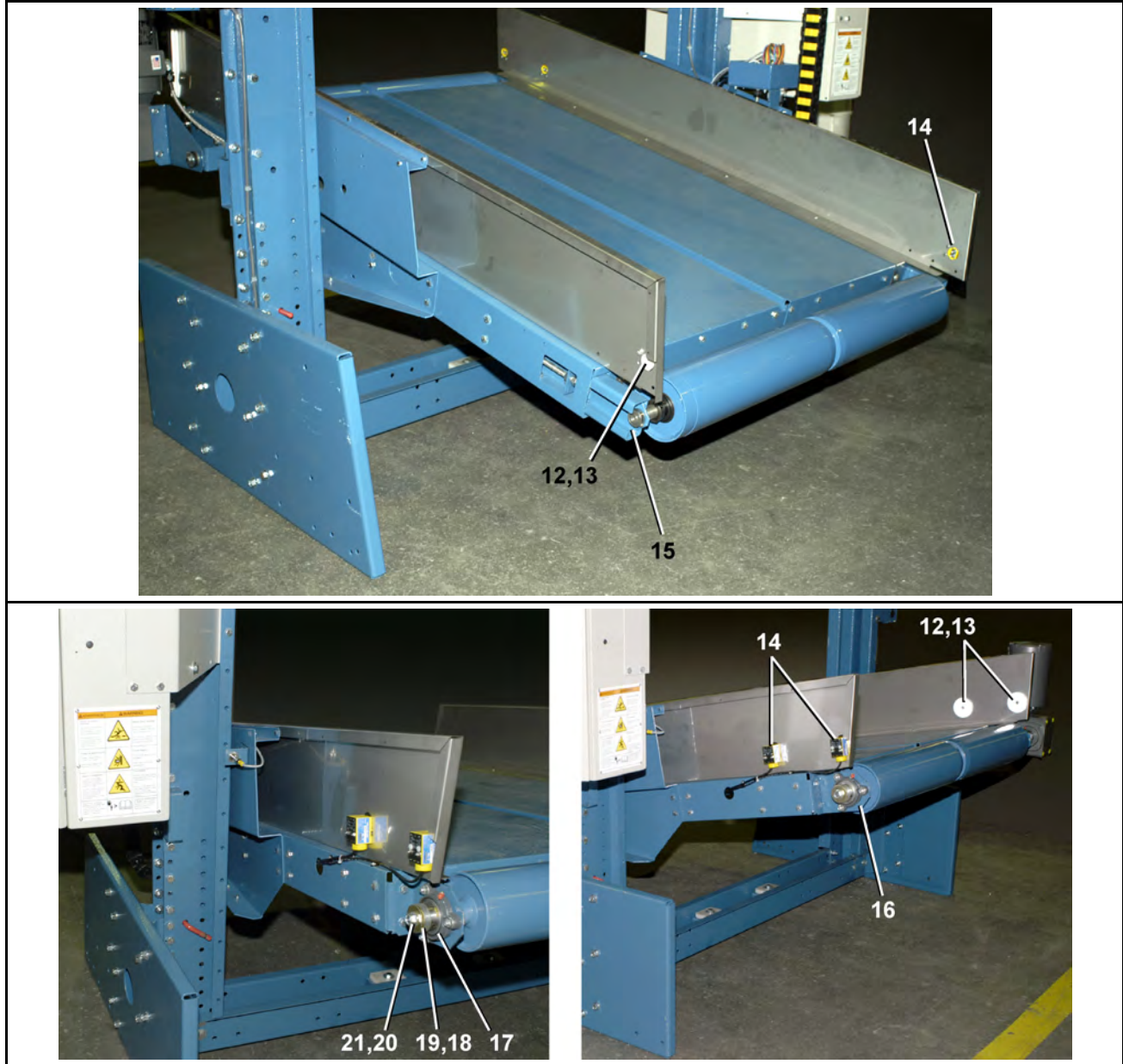
**N1** To order gear reducers, supply the parts department with your gear reducer's serial number and gear ratio. An example is shown here.



# Bed Assemblies

1 Sheet

COSHJ/K/L 111/112 & COLFJ/K/L 111/112



**Table 23. 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				
all	A	ALC50075	BED ASSY 44WX62L-COSH111	COSHJ111, COLFJ111
all	B	ALC50066	BED ASSY 44WX62LG-COSH112	COSHJ112, COLF112

# Bed Assemblies

COSHJ/K/L 111/112 & COLFJ/K/L 111/112

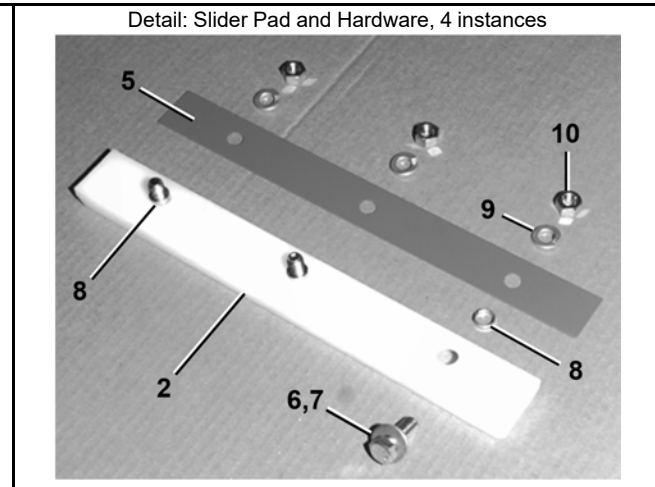
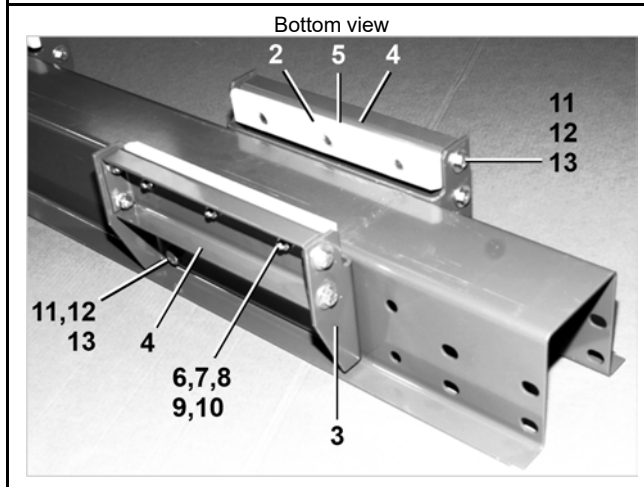
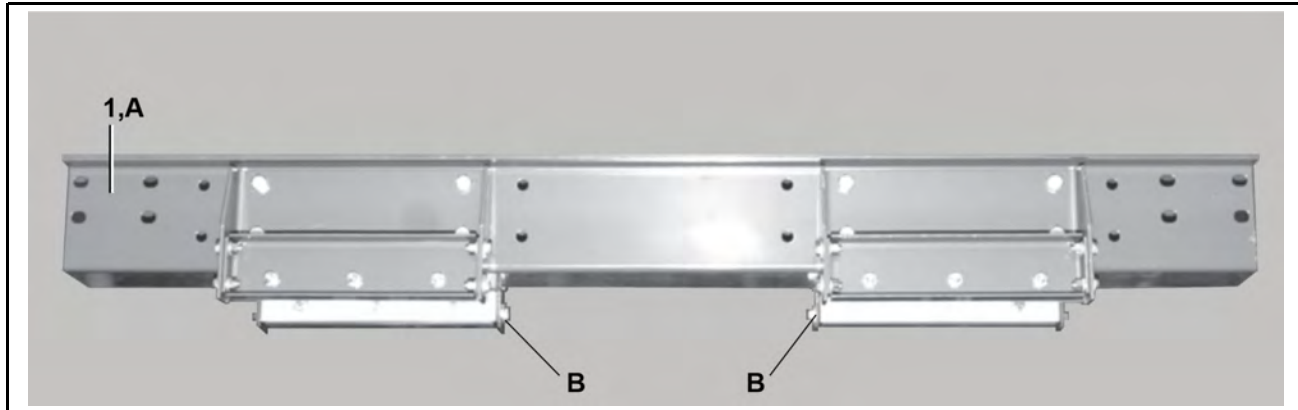
**Table 23 Parts List— (cont'd.)**

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	C	ALC50084	BED ASSY 44WX77LG-COSHQ111	COLFK111
all	D	ALC50085	BED ASSY 44WX77LG-COSHQ112	COLFK112
all	E	ALC50130	BED ASSY 52WX84LG COINC11R	COLFL111
Components				
AB	1	ALC50081	BED FRAME 44WX62LG ASSEMBLY	
CD	1	ALC50081A	BED FRAME 44WX77LG ASSEMBLY	
E	1	ALC50081C	BED FRAME 50WX84LG ASSEMBLY	
AB	2	04 22256	SIDE UPPER 62L BED-RT	
CD	2	04 22254	SIDE UPPER 77L BED-RT	
E	2	04 22864	SIDE UPPER 84L BED-RT	
AB	3	04 22256A	SIDE UPPER 62L BED-LF	
CD	3	04 22254A	SIDE UPPER 77L BED-LF	
E	3	04 22264A	BED HALF 40WX50LG-LF SIDE	
AC	4	04 22260	TORQARM-12DEG LOWER BED	
BD	4	04 22258	TORQARM-12DEG UPPER BED-RT	
E	4	04 20716	TORQARM COSHR LOWER BED-LF	
ABCD	5	04 22260B	TORQARM ADP ANGLE-SF718	
ACE	6A	04 22233	TORQUE ARM GROMET MTG BRKT	
B	6BA	04 22259	TORQARM BRKT UPPER BED-RT	
B	6BB	04 22259A	TORQARM BRKT UPPER BED-LF	
all	7	ALC420063	TORQUE ARM BUSHING ASSEMBLY	
ABCD	8	Y4 20832E	DRVROLLER 4.50D X 53" OAL	
E	8	Y4 20832K	DRVROLLER 5.75D X 63.75" OAL	
ABCD	9	Y4 20832G	IDLER ROLLER 4.50D X 44.5" OAL	
E	9	ALC50131	IDLER 50W ROLLER ASSEMBLY	
AB	10	ALC50164	BELT+LACING FOR 'M' BED	
CD	10	ALC50166	BELT+LACING FOR 'Q' BED	
E	10	ALC50167	BELT+LACING FOR 'R' BED	
AC	11	04 23421	BED SIDE MTG CHAN-COSHM111	
all	12	03 BF2X4W	MOUNT PLT=PHOTO REFLECTOR	
all	13	09RPE001A	REFLECTOR 3"DIA CLEAR	
all	14	09RPE011	PHOTOEYE VALU-BEAM 10-30DC	
ABCD	15	04 22220	BRNGCARR 3.5H FRAME-LOADEND	
E	15	04 22868	BRNGCARR 84LG BED LOADEND RT	
ABCD	16	04 22221	BRNGCARR 3.5H FR-UNLOAD END	
E	16	04 22869	BRNGCARR 84LG BED-UNLOAD END	
all	17	54AF10001	FLG BRG 1" BROWN#VF2S-116M (2BOLT FLG)	
all	18	54JH11000A	SHAFTCOLLAR 1" CLPTYPE CFG#16A	
all	19	15U241MB	FLAT WASHER-1.50D 1+1/32ID 10G	
all	20	15K091H	HEXFLGSCR 3/8-16X3/4 ZN GRD.5	
all	21	15U245A	FLTWASH 25/64IDX1.25ODX3/32 S/	

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# Shuttle Low Rail Guides

## Floor Drive Translating Shuttles



**Legend**

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

**Table 24. 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
Reference Assemblies				
	A	ALC420003D	BOTTOM BEAM 36/40W FLOORDR	
	B	ALC420003E	BOTTOM BEAM 48W FLOORDRIVE	
	C	ALC420049B	FLOORDR LOW TRACK GUIDE ASSY	
Components				
A	1	04 21142	MK2 COSHA BOTTOM BEAM	
B	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

2 Sheet

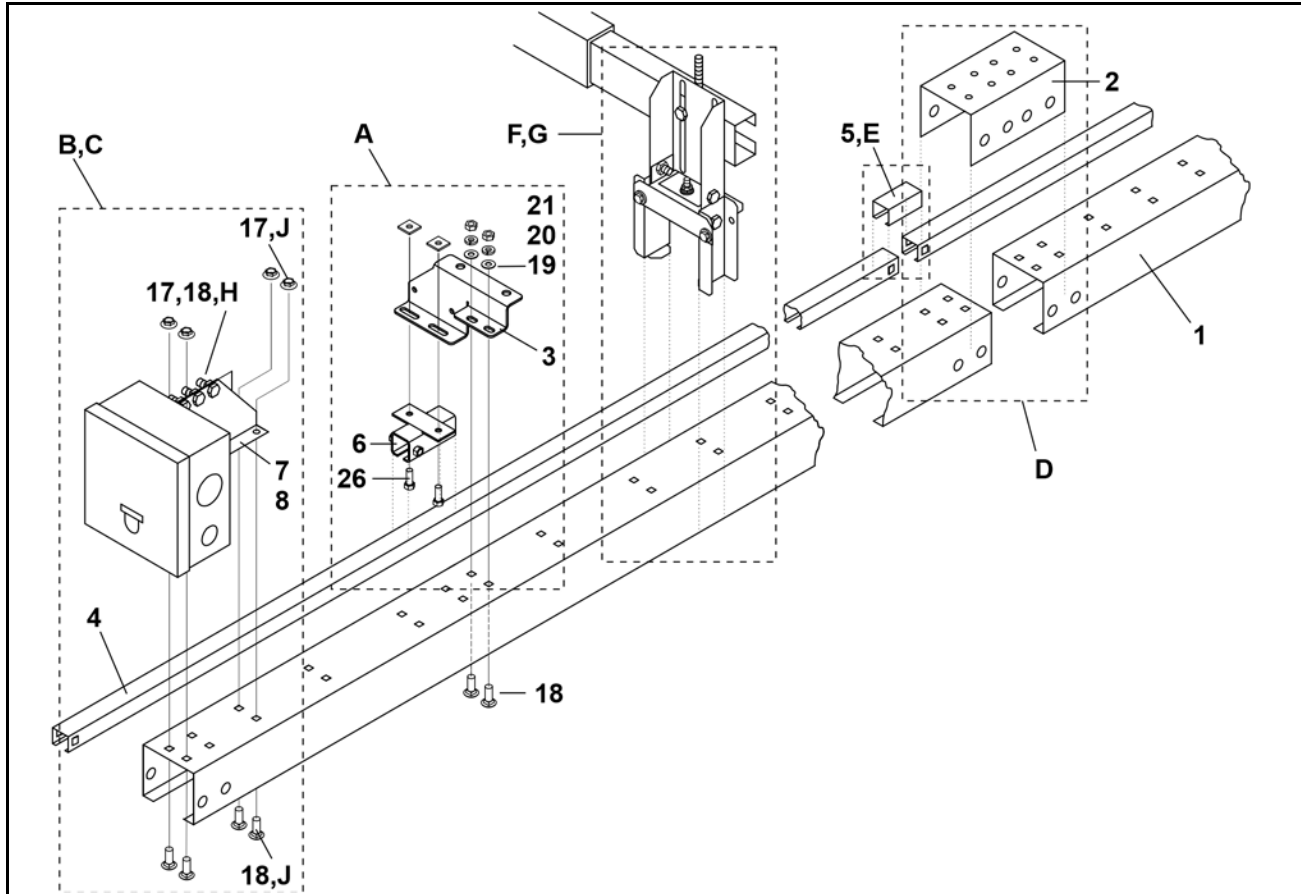
### Floor Drive Translating Shuttles

**Table 24 Parts List—Shuttle Low Rail Guides (cont'd.)**

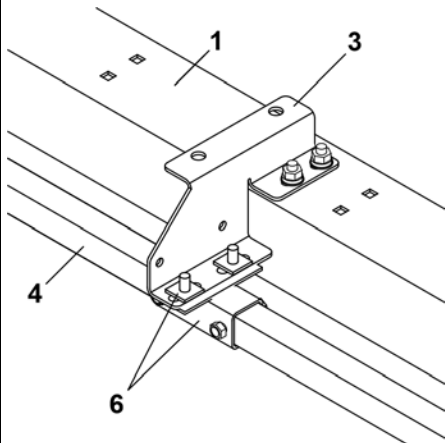
Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	Item	Part Number	Description/Nomenclature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

# Upper Rail Components

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



**Detail A: Upper Rail Festoon Hanger**



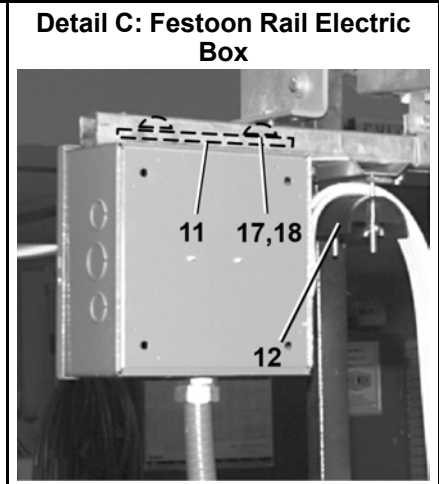
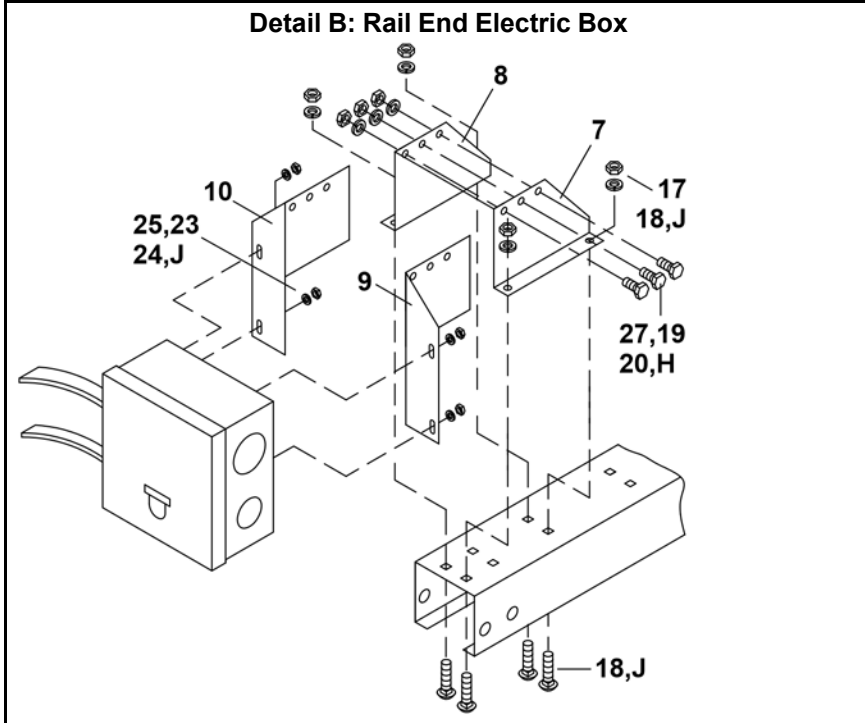
**Legend**

- 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

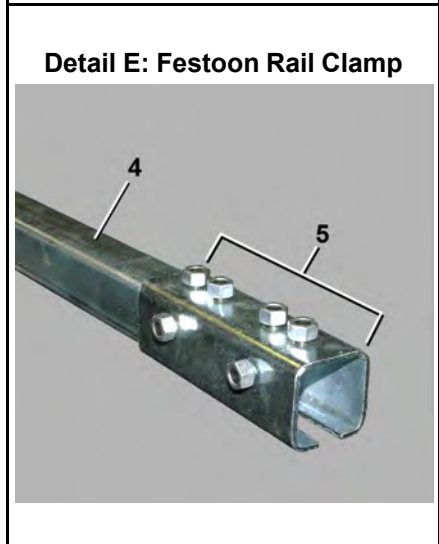
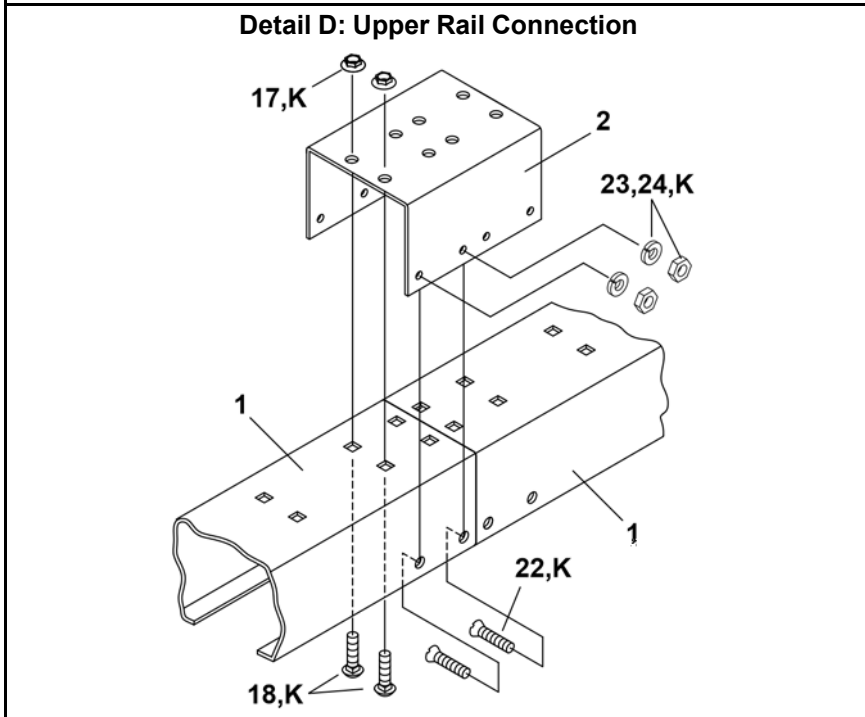
4 Sheet

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



**Legend**

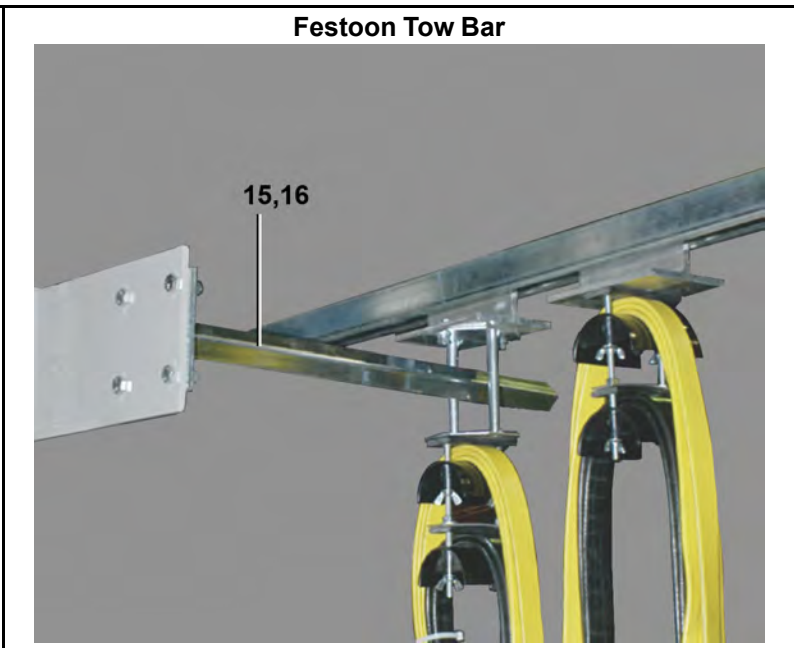
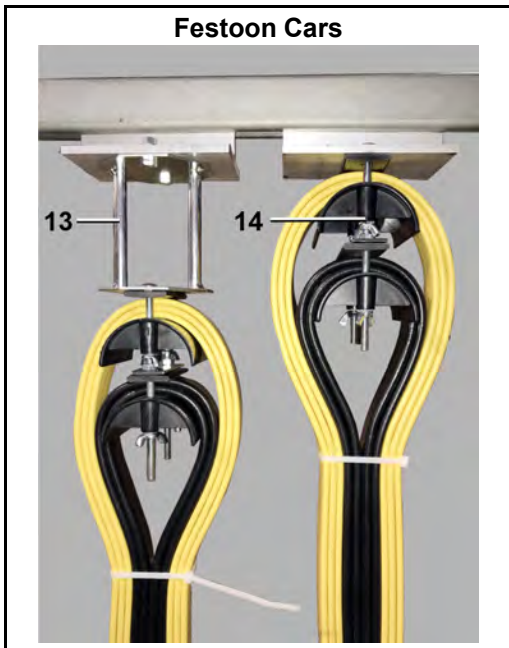
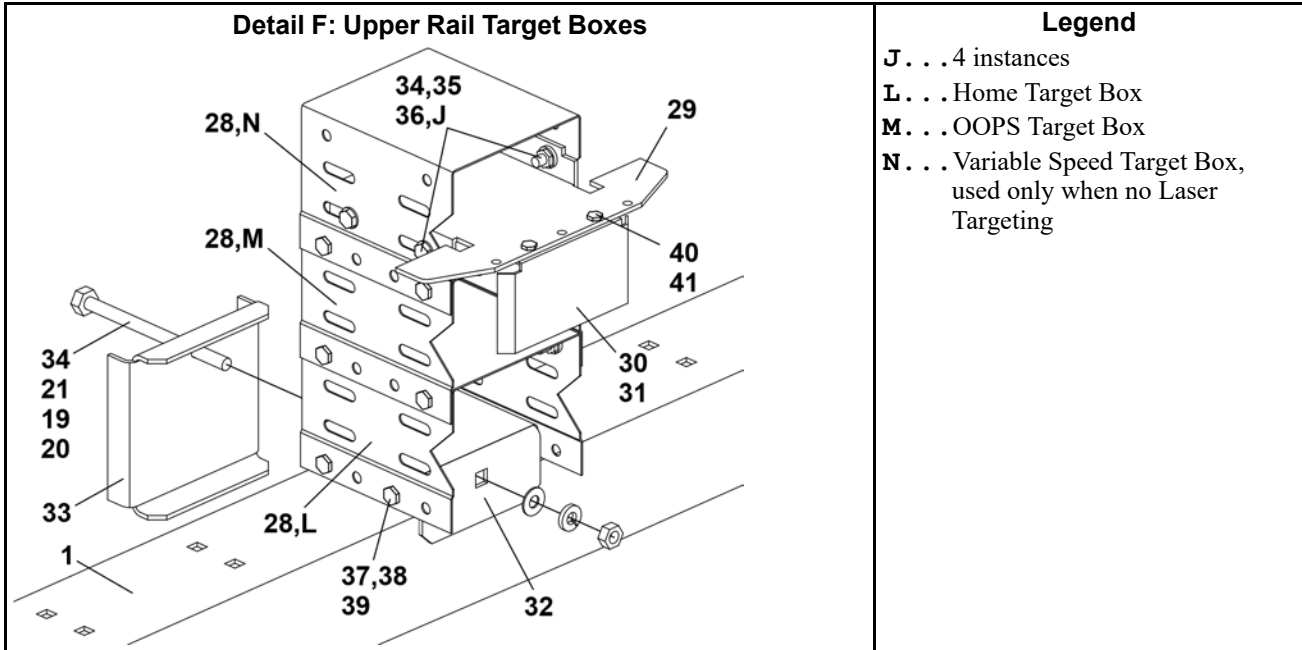
H . . . 3 instances  
 J . . . 4 instances  
 K . . . 8 instances



# Upper Rail Components

4 Sheet

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





## Upper Rail Components

4 Sheet

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

Table 25. 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
Reference 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
	D	ALC420230	SHUTL HOME TARGET ASSEMBLY	Home Target
	E	ALC420231	SHUTL OOPS TARGET ASSEMBLY	OOPS Target
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	
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 1/4-20UNC2B SAE 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-	
all	28	04 22855	TARGET MOUNTING BKT=STACK	
all	29	04 20976	TARGET FIXED EXTENDED POSIT	
D	30	03 BL1X6W	BRKT: RAIL PROX TRGT-4.5"L	4.5"
E	31	03 BL1X8W	BRKT:RAIL PROX TRGT (45 DEG)	11"
all	32	04 22819	SHTL STOP TARGET RAIL MTG	
all	33	04 22851	SHTL STOP TARGET CLAMP	
all	34	15K065	HEXCAPSCR 5/16-18UNC2AX1 GR5 Z	
all	35	15U200	FLATWASHER(USS STD) 5/16"ZNC P	

## Upper Rail Components

4 Sheet

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

**Table 25 Parts List—Upper Rail Components (cont'd.)**

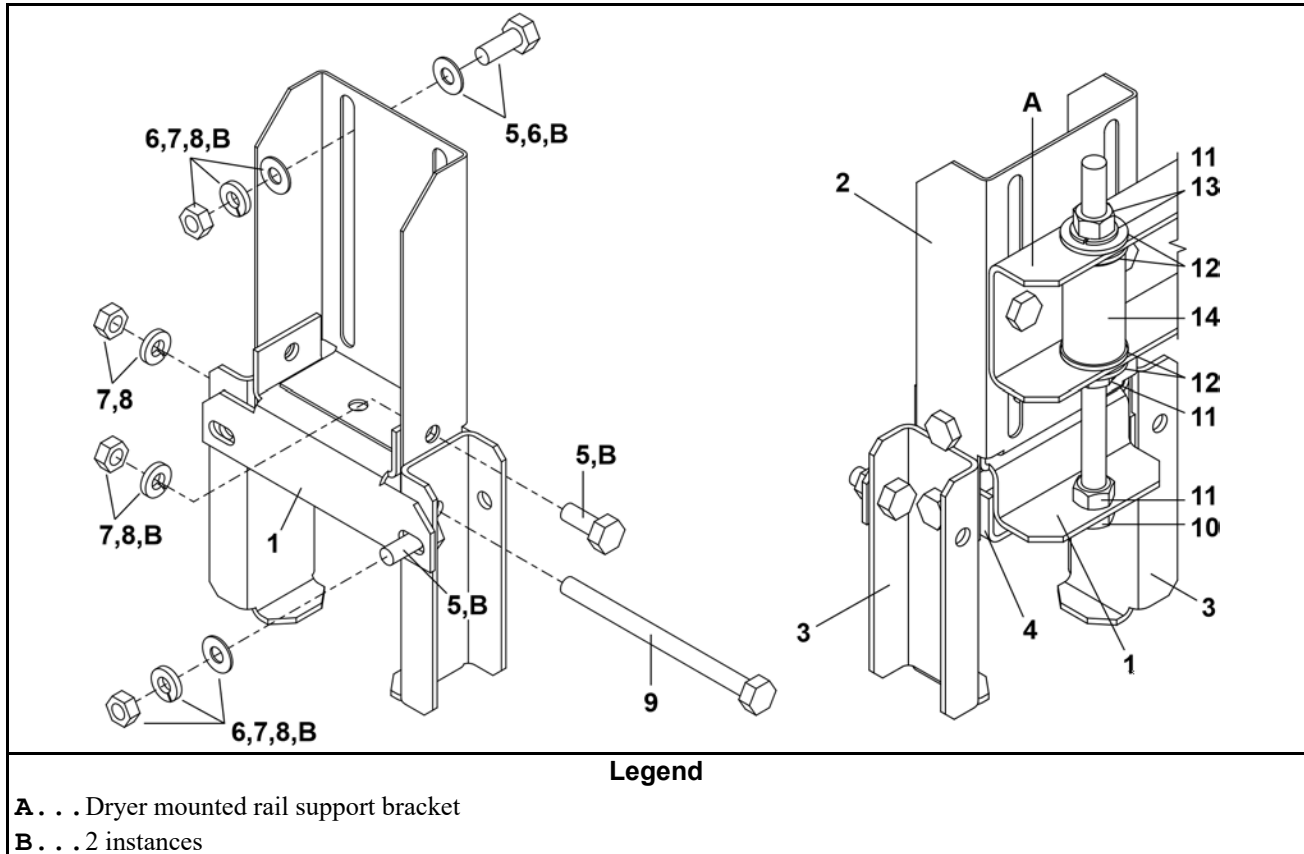
Find the assembly for your machine and the letter shown in the "Item" column. The components for your machine will show this letter or the word "all" in the "Used In" column. The numbers shown in the "Item" column are those shown in the illustrations.				
Used In	Item	Part Number	Description/Nomenclature	Comments
all	36	15G196	HXFLGNUT 5/16-18 ZINC	
all	37	15K060	HXCAPSCR 5/16-18UNCAX3/4 GR5 Z	
all	38	15U210	LOKWASHER MEDIUM 5/16 ZINCPL	
all	39	15G185	HXNUT 5/16-18UNC2B SAE ZINC GR	
all	40	15K095	HXCPSCR 3/8-16UNC2AX1 GR5 ZINC	
all	41	15G164	HX THIN LOCKNUT NYL1/4-20 SS	

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# Upper Rail Hanger & Ceiling Mounted Rail Support

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

Figure 11. Upper Rail Hanger Assembly

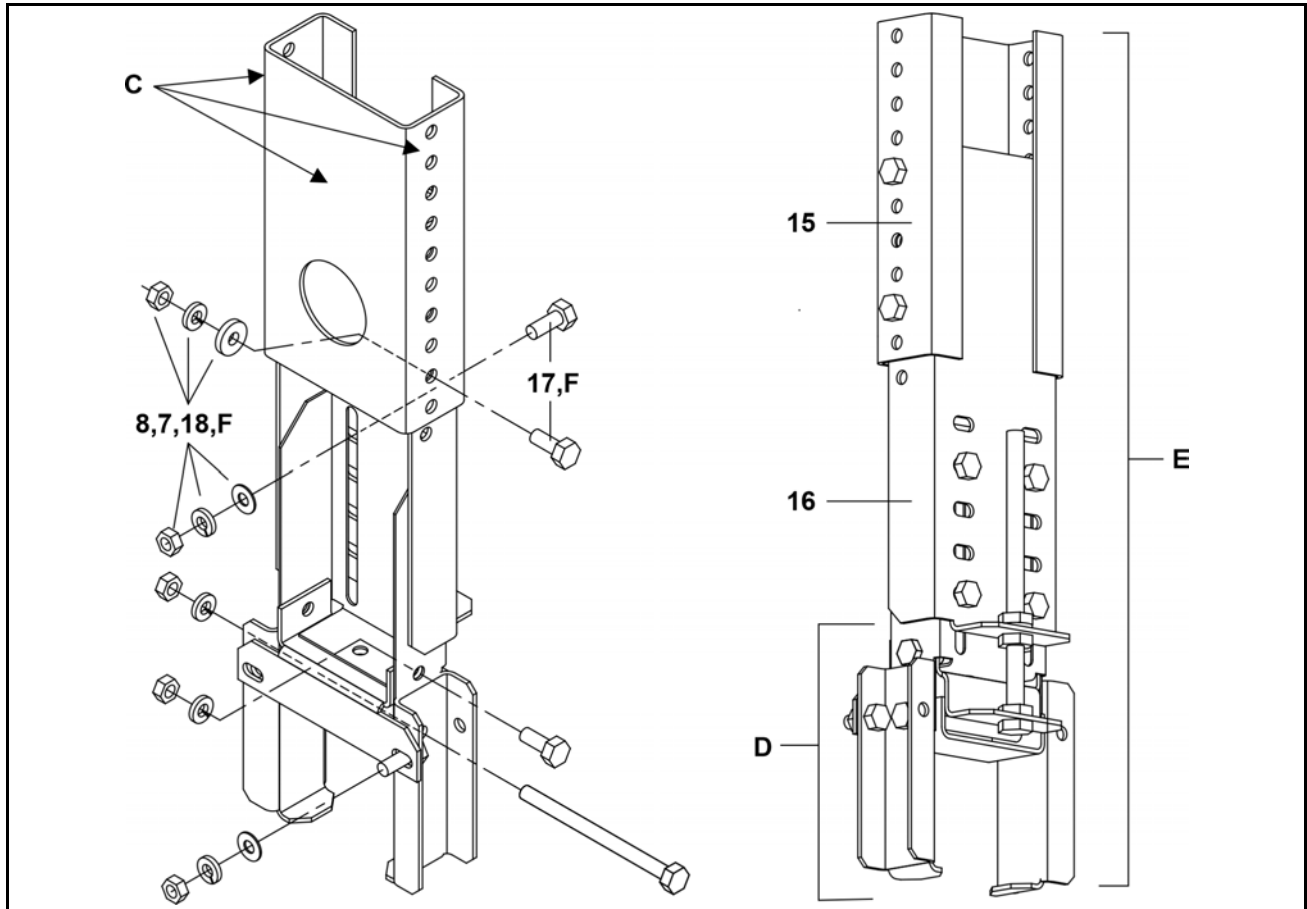


# Upper Rail Hanger & Ceiling Mounted Rail Support

4 Sheet

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

Figure 12. 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 13. Ceiling Mounted Rail Support: Dimensions required for planning

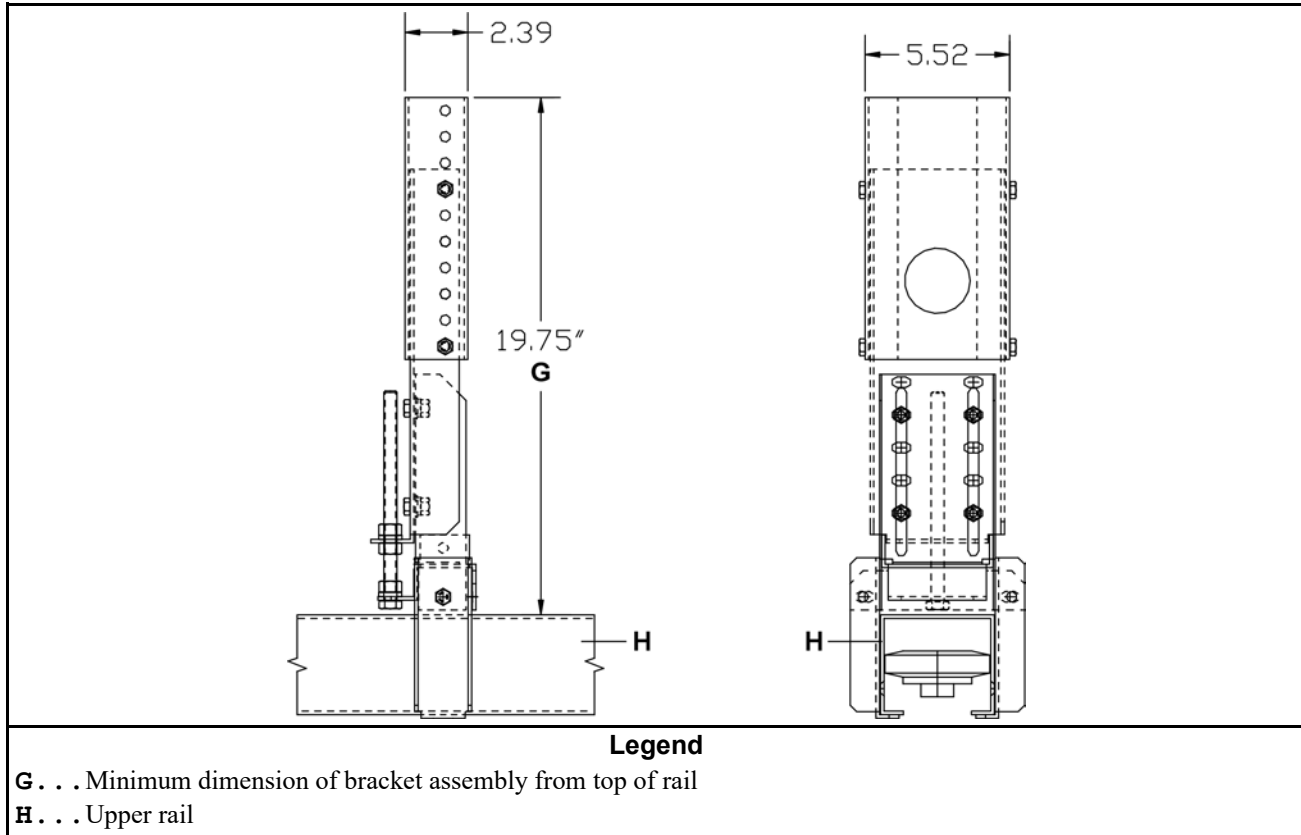


Table 26. Parts List—Upper Rail Hanger Ceiling Mounted Rail Support

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
Reference 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

4 Sheet

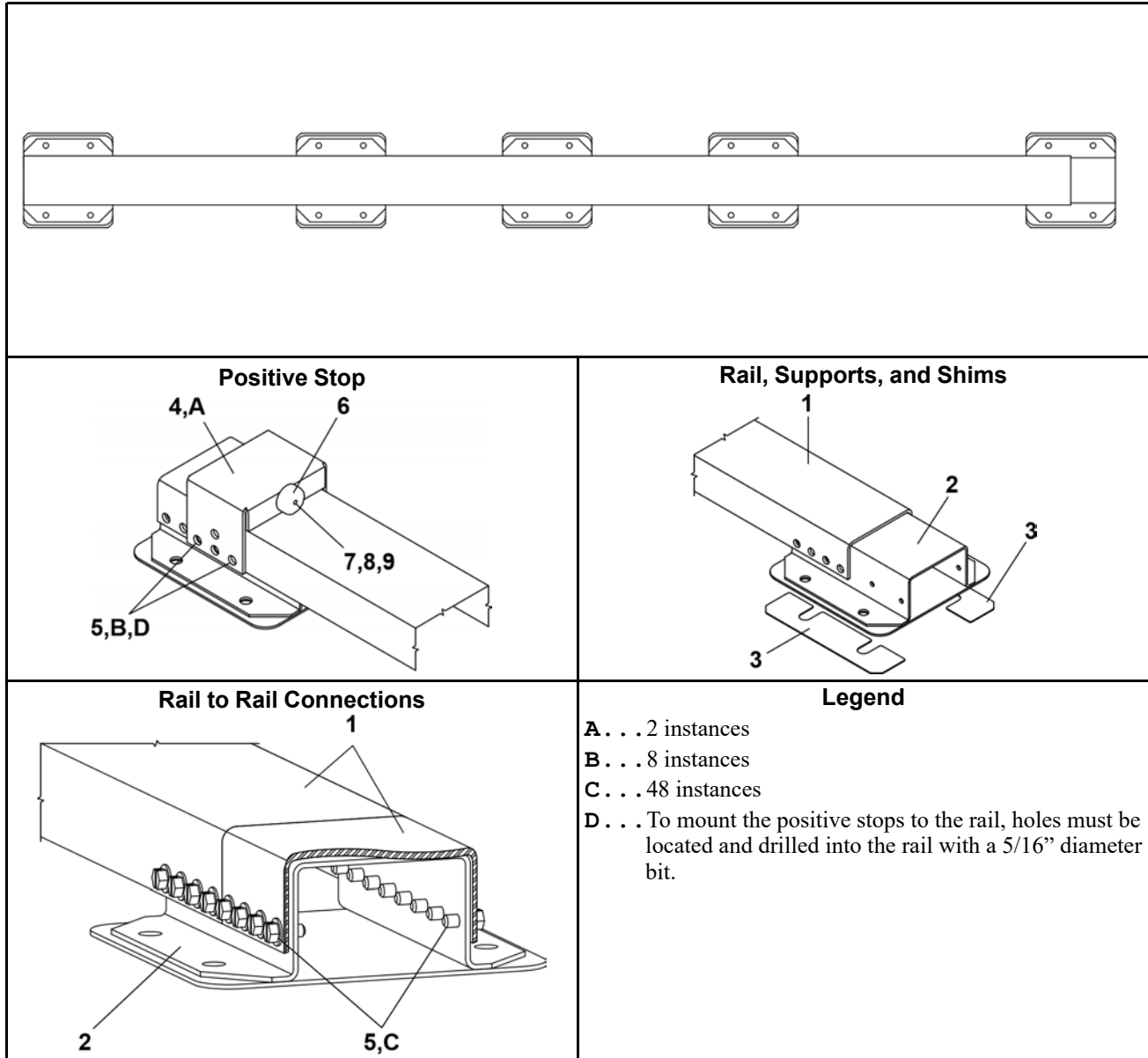
COSH(A,J,K,B,X)\_, CL(36,40,48)\_

**Table 26 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)\_



**Table 27. 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
Reference Assemblies				
	A	ALC420064B	FIRST RAILSET W/12GA FESTRAIL	
	B	ALC420065B	ADD'L RAILSET W/12GA FESTRAIL	
Components				



## Floor Drive Rail

2 Sheet

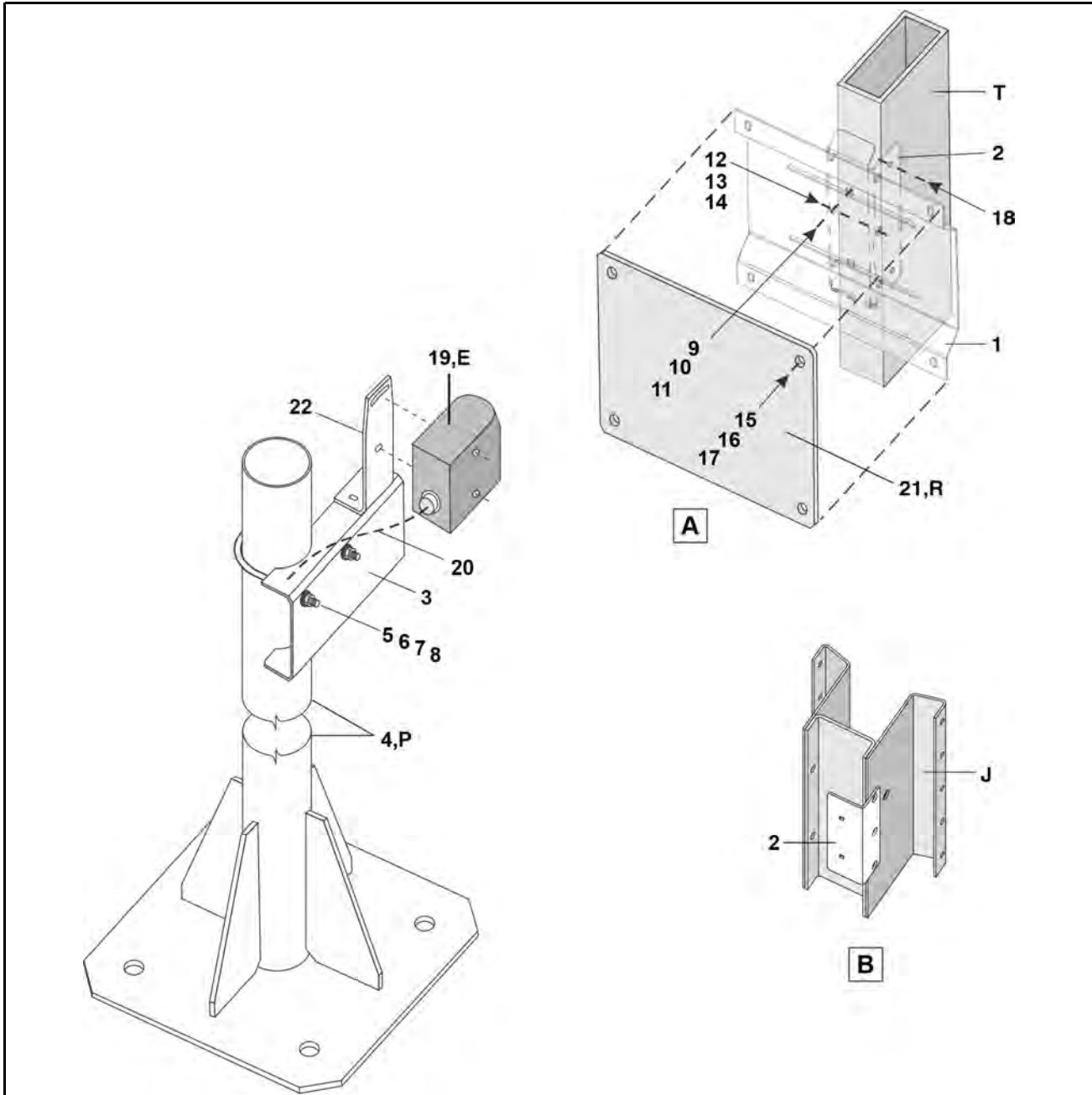
COSH(A,J,K,B,X)\_, CL(36,40,48)\_

Table 27 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 Target

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

## General Service Information

2 Sheet

### All Traversing Shuttles

**Table 28. 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
Reference 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)	