

Acco[®] LOUDEN[®]

**underhung crane and
monorail accessories
product series 200, 300,
400, 500, & 800**

**installation
operation
maintenance
and parts
manual**

SERIAL NUMBER

⚠ WARNING

This equipment should not be installed, operated or maintained by any person who has not read all the contents of these instructions. Failure to read and comply with the instructions or any one of the limitations noted herein can result in serious bodily injury or death, and/or property damage.

There are no other warranties which extend beyond the description on the Order Acknowledgment and as it may apply to the specifications provided in this publication. THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXCLUDED. Acco shall in no event be liable for any special, direct, indirect, incidental or consequential damages to anyone beyond the cost of replacement of the goods sold hereby.

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NOTICE

Manual 69879 covers information in reference to standard models of the LOUDEN® Underhung Cranes and Monorail Track. This manual includes instructions and parts information for a variety of accessories. Therefore, all instructions or parts information may not apply to any one type or size of specific crane, monorail, or accessory. Disregard those portions of the manual that do not apply. Manual 69879 should be used in conjunction with Manual 69878: Installation, Operation, Maintenance, and Parts Manual for LOUDEN® Series 500 Underhung Cranes; and with Manual 69880: Installation, Operation, Maintenance, and Parts Manual for LOUDEN® Series 600 and 700 Monorail Track, Fittings, and Switches. Use of the term MANUAL refers to all of these manuals as applicable. MANUALS FOR SPECIAL ENGINEERED CRANES, MONORAILS, AND ACCESSORIES WILL CONTAIN ADDITIONAL PAGES IN ACCORDANCE WITH PRODUCT SPECIFICATIONS.

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NOTICE

TO ORDER PARTS: Provide part number, part description, quantity required, and Product Number or Serial Number of Crane, Monorail, and Accessory.

IMPORTANT INFORMATION AND WARNINGS

SAFETY ALERT SYMBOL

The Safety Alert Symbol is used in this manual to indicate hazards and to alert the reader to information that should be known, understood, and followed in order to avoid DEATH or SERIOUS INJURY.

Read and understand this manual before using the crane, monorail, or accessory.

Important issues to remember during operation are provided at the crane, monorail, or accessory control stations, at various locations on the crane, monorail, or accessory and in the manuals by DANGER, WARNING, or CAUTION instructions or placards, that alert the personnel to potential hazards, proper operation, load limitations, and more.

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

CAUTION

These general instructions deal with the normal installation, operation, inspection, and maintenance situations encountered with the equipment described herein. The instructions should not be interpreted to anticipate every possible contingency or to anticipate the final system, crane, or configuration that uses this equipment.

This manual includes instructions and parts information for a variety of crane or monorail accessories. Therefore, all instructions and parts information may not apply to any one type or size of specific crane, monorail, or accessory. Disregard those portions of the instructions that do not apply.

Record crane or monorail serial number on the front cover of this manual for identification and future reference to avoid referring to the wrong manual for information or instructions on installation, operation, inspection, maintenance, or parts.

Use only LOUDEN® authorized replacement parts in the service and maintenance of this equipment.

WARNING

Equipment described herein is not designed for and should not be used for lifting, supporting, or transporting humans.

Equipment described herein should not be used in conjunction with other equipment unless necessary and/or required safety devices applicable to the system, crane, or application are installed by the system designer, system manufacturer, crane manufacturer, installer, or user.

Modifications to upgrade, rerate, or otherwise alter this equipment shall be authorized only by the original equipment manufacturer or qualified professional engineer.

Equipment described herein may be used in the design and manufacture of cranes or monorail systems. Additional equipment or devices may be required for the crane or monorail system to comply with applicable crane or monorail design and safety standards. The crane or system designer, crane or system manufacturer, or user is responsible to furnish these additional items for compliance. Refer to ASME B30.11, Safety Standard for Monorails and Underhung Cranes. If a hoist is used with this equipment, refer to ASME B30.16, Safety Standard for Overhead Hoists. If a below-the-hook lifting device or sling is used with this equipment, refer to ASME B30.9, Safety Standard for Slings, or ASME B30.20, Safety Standard for Below-the-Hook Lifting Devices.

Hoists, cranes, and monorails used to handle hot molten material may require additional equipment or devices. Refer to ANSI Z241.2, Safety Requirements for Melting and Pouring of Metals in the Metalcasting Industry.

Electrical equipment described herein is designed and built in compliance with ACCO Chain & Lifting Products interpretation of ANSI/NFPA 70, National Electrical Code. The system designer, system manufacturer, crane designer, crane manufacturer, installer, or user is responsible to assure that the installation and associated wiring of these electrical components is in compliance with ANSI/NFPA 70, and all applicable Federal, State, and Local Codes.

Failure to read and comply with any one of the limitations noted herein can result in serious bodily injury or death, and/or property damage.

IMPORTANT INFORMATION AND WARNINGS

DANGER

HAZARDOUS VOLTAGES ARE PRESENT IN THE CONTROL ENCLOSURE, OTHER ELECTRICAL COMPONENTS, AND CONNECTIONS BETWEEN THESE COMPONENTS.

Before performing ANY mechanical or electrical maintenance on the equipment, de-energize (disconnect) the main switch supplying power to the equipment; and lock and tag the main switch in the de-energized position. Refer to ANSI Z244.1, Personnel Protection — Lockout/Tagout of Energy Sources.

Do not operate the equipment without control enclosure cover or covers in place.

Only trained and competent personnel should inspect and repair this equipment.

NOTICE

It is the responsibility of the owner/user to install, inspect, test, maintain, and operate a crane or monorail in accordance with ASME B30.11, Safety Standard for Monorails and Underhung Cranes, OSHA Regulations, and ANSI/NFPA 70, National Electrical Code. If the crane or monorail is installed as part of a total lifting system, it is also the responsibility of the owner/user to comply with the applicable ASME B30 volume that addresses other types of equipment used in the system.

It is the responsibility of the owner/user to have all personnel that will install, inspect, test, maintain, and operate a crane or monorail read the contents of this manual and applicable portions of ASME B30.11, Safety Standard for Monorails and Underhung Cranes, OSHA Regulations, and ANSI/NFPA 70, National Electrical Code. If the crane or monorail is installed as part of a total lifting system, the applicable ASME B30 volume that addresses other types of equipment used in the system must also be read by all personnel.

Any ANSI Standards referenced in this manual may be obtained from the American National Standards Institute, 1430 Broadway, New York, New York 10018.

This manual contains information for safe operation of an underhung crane or monorail. Taking precedence over any specific rule, however, is the most important rule of all - "USE COMMON SENSE." Operation of an underhung crane or monorail involves more than operating the controls. The operator must consider and anticipate the motions and actions that will occur as a result of operating the controls.

If the crane or monorail owner/user requires additional information, or if any information in the manual is not clear, contact ACCO Chain & Lifting Products, York, Pennsylvania or the distributor of the crane or monorail. Do not install, inspect, test, maintain, or operate this equipment unless this information is fully understood.

When contacting ACCO Chain & Lifting Products or the distributor of the crane or monorail, always make reference to the serial number of the equipment.

A regular schedule of inspection of the crane and monorail in accordance with the requirements of the ASME B30.11 should be established and records maintained.

WARNING

Before installing, removing, inspecting, or performing any maintenance on a hoist, crane, or monorail; the main switch shall be de-energized. Lock and tag the main switch in the de-energized position in accordance with ANSI Z244.1. Follow other maintenance procedures outlined in this manual and applicable ASME B30 volumes.

Additional WARNINGS are listed in various portions of this manual. Personnel shall read and follow these WARNINGS. Failure to read and comply with these WARNINGS as well as other instructions or any limitations noted in this manual and applicable ASME B30 volumes could result in serious bodily injury or death, and/or property damage.

WARNING

IF LOUDEN® CRANES ARE INSTALLED TO OPERATE ON RUNWAYS THAT ARE COMPRISED OF TRACK OTHER THAN LOUDEN® MONORAIL TRACK; OR IF LOUDEN® MONORAIL TRACK IS USED FOR OPERATION OF CRANES OR CARRIERS NOT MANUFACTURED BY LOUDEN®; THE SYSTEM DESIGNER, SYSTEM MANUFACTURER, OR SYSTEM INSTALLER IS RESPONSIBLE TO DETERMINE THE COMPATIBILITY OF THE CRANE AND MONORAIL TRACK; AND THAT THE LOAD RATINGS OF NEITHER THE CRANE OR MONORAIL TRACK WILL BE EXCEEDED.

CRANE AND MONORAIL ACCESSORY TYPES

Various accessories are available for LOUDEN® underhung cranes and monorail track systems. Types of LOUDEN® accessories include:

- Hoist trolleys, Product Series 200.
- Trolleys, Product Series 400.
- Motoveyors and motor-driven trolleys, Product Series 300.
- Latches, blocks, spur track supports, and crossovers, Product Series 500.
- Electrification, Product Series 800.

General descriptions of different LOUDEN® crane and monorail accessories are presented below for information purposes, and to serve as a guide to aid in using the instructions and parts information outlined in this manual. Detailed specifications can be obtained from catalog data or order specifications. If additional information is required, contact Acco Chain & Lifting Products or the distributor of the monorail system, crane, or accessory.

LOUDEN® SERIES 200 Hoist Trolleys:

LOUDEN® Series 200 hoist trolleys include: Series 202 and 203 for manual operation on monorails or single-girder cranes that can be motor driven by use of a motoveyor; Series 210 and 210T for motor driven operation on double-girder cranes; Series 285 for motor driven operation by use of a steel wheel drive on monorails and single-girder cranes; and Series 286 for motor driven operation by use of dual steel wheel drives on double girder cranes.

SERIES 202 AND 203 HOIST TROLLEYS

LOUDEN® Series 202 and 203 hoist trolleys are designed for the specific hoist specified and used. They are designed for manual hand propelled operation, and can be used in motor driven applications by the use of a LOUDEN® motoveyor. Refer to Figures 1, 2, and 3.

The Series 202 hoist trolley will operate on monorails or bridge girders of 602 *SuperTrack*,™ having a 2.0 inch operating flange. Standard models are available in capacities of 500 through 4000 pounds. Trolleys are either 4-wheel or 8-wheel, with 4 inch diameter flanged wheels (flangeless wheels and guide rollers are available).

The Series 203 hoist trolley will operate on monorails or bridge girders of 603 *SuperTrack*,™ 604 *SuperTrack*™ Girder, or 605 *TrojanTrack*™ Girder, having a 3.33 inch operating flange. Standard models are available in capacities of 500 through 15,000 pounds. Trolleys are either 4-wheel or 8-wheel, with 4½ inch diameter flanged wheels (flangeless wheels and guide rollers are available), or 9 inch diameter flangeless wheels and guide rollers.

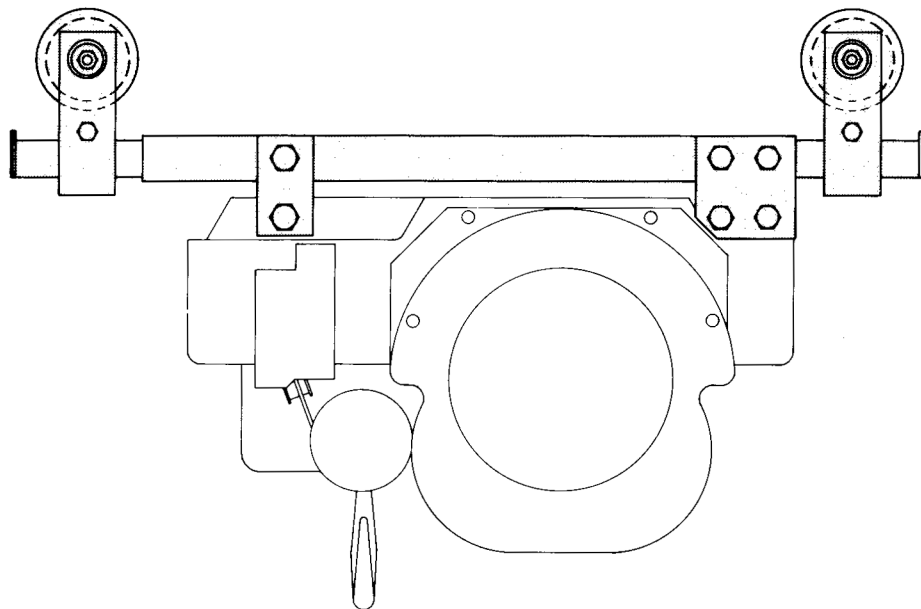


FIGURE 1

CRANE AND MONORAIL ACCESSORY TYPES

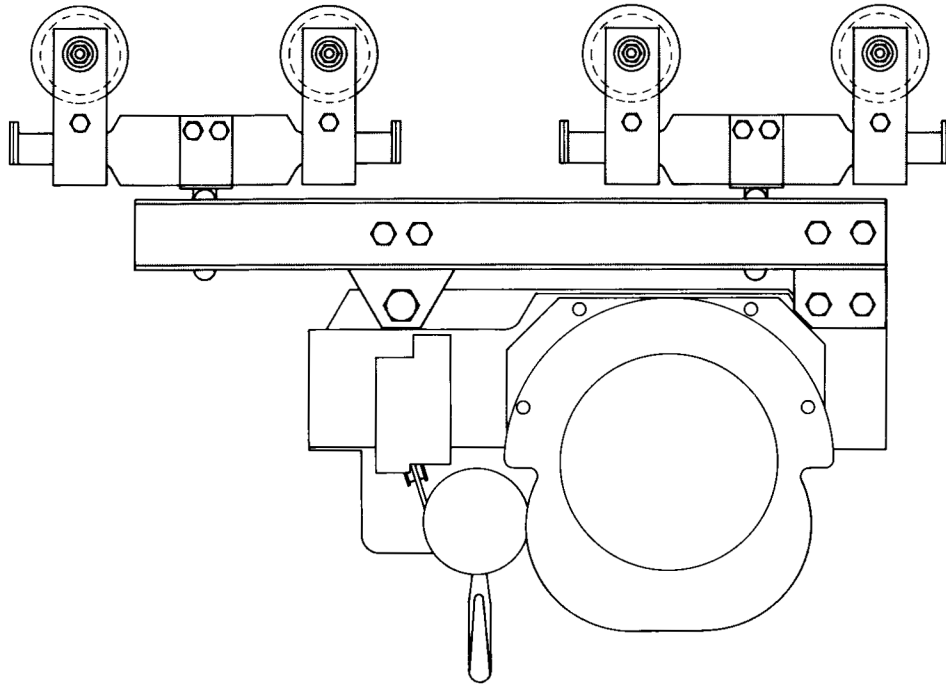


FIGURE 2

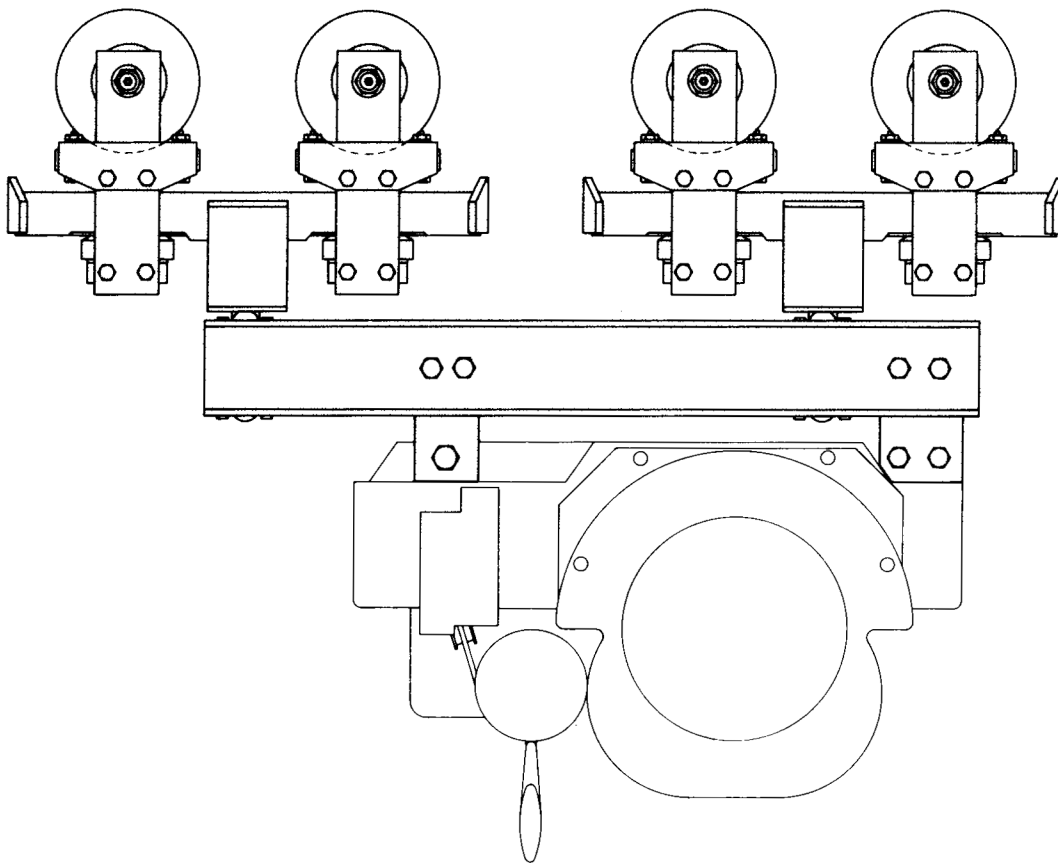


FIGURE 3

CRANE AND MONORAIL ACCESSORY TYPES

SERIES 210 AND 210T HOIST TROLLEYS

LOUDEN® Series 210 and 210T hoist trolleys are designed for the specific hoist specified and used. They are designed for motor driven operation on LOUDEN® Series 517, 517T, and 586 double girder cranes. Refer to Figure 4 as viewed perpendicular to the bridge girders, and Figure 5 as viewed parallel to the bridge girders.

The Series 210 and 210T hoist trolley will operate on bridge girders of 603 *SuperTrack*™, 604 *SuperTrack*™ Girder, or 605 *TrojanTrack*™ Girder, having a 3.33 inch operating flange. Standard models are available in capacities of 1 through 15 tons. Trolley truck units are either 8-wheel or 16-wheel, with 4½ inch diameter flanged wheels (flangeless wheels and guide rollers are available), or 9 inch diameter flangeless wheels and guide rollers.

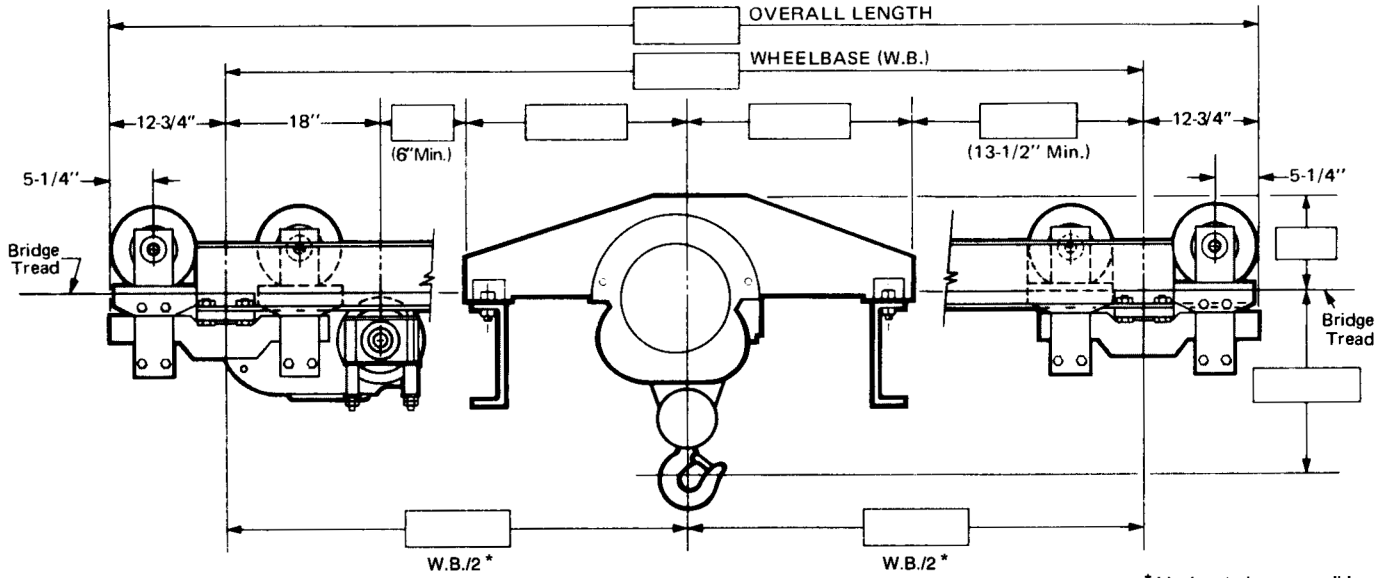


FIGURE 4

* Ideal, not always possible.

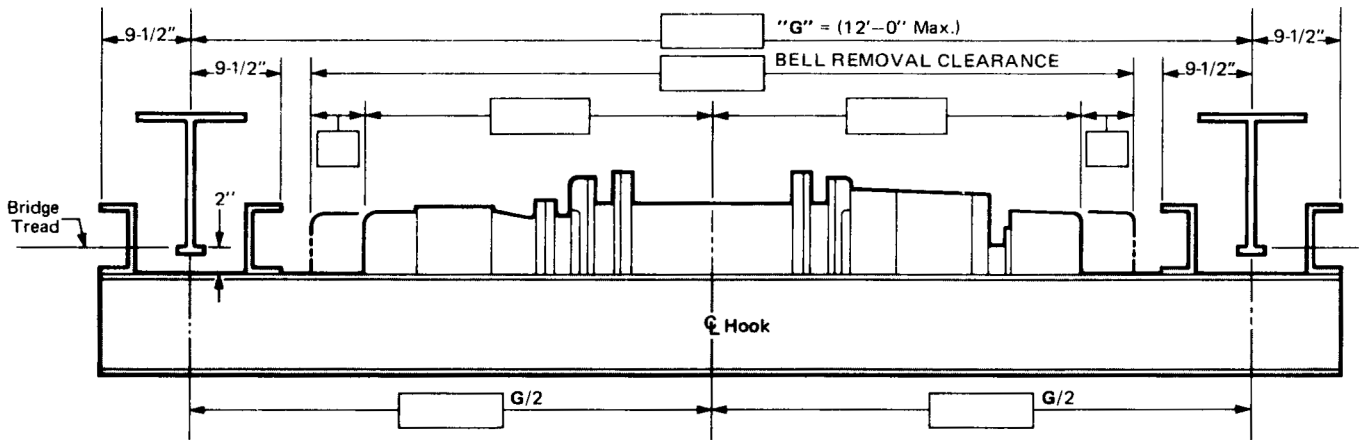


FIGURE 5

CRANE AND MONORAIL ACCESSORY TYPES

SERIES 285 AND SERIES 286 HOIST TROLLEYS

LOUDEN® Series 285 hoist trolleys are designed for the specific hoist specified and used. They are similar to Series 203 hoist trolleys except one of the trolley units is replaced by a LOUDEN® steel-wheel drive trolley for motor driven applications. Refer to Figures 6 and 7.

The Series 285 hoist trolley will operate on monorails or bridge girders of 603 *SuperTrack*®, 604 *SuperTrack™ Girder*, or 605 *TrojanTrack™ Girder*, having a 3.33 inch operating flange. Standard models are available in capacities of 1 through 5 tons. Trolleys are either 4-wheel or 8-wheel, with 4½ inch diameter flanged wheels (flangeless wheels and guide rollers are available on idler trolleys).

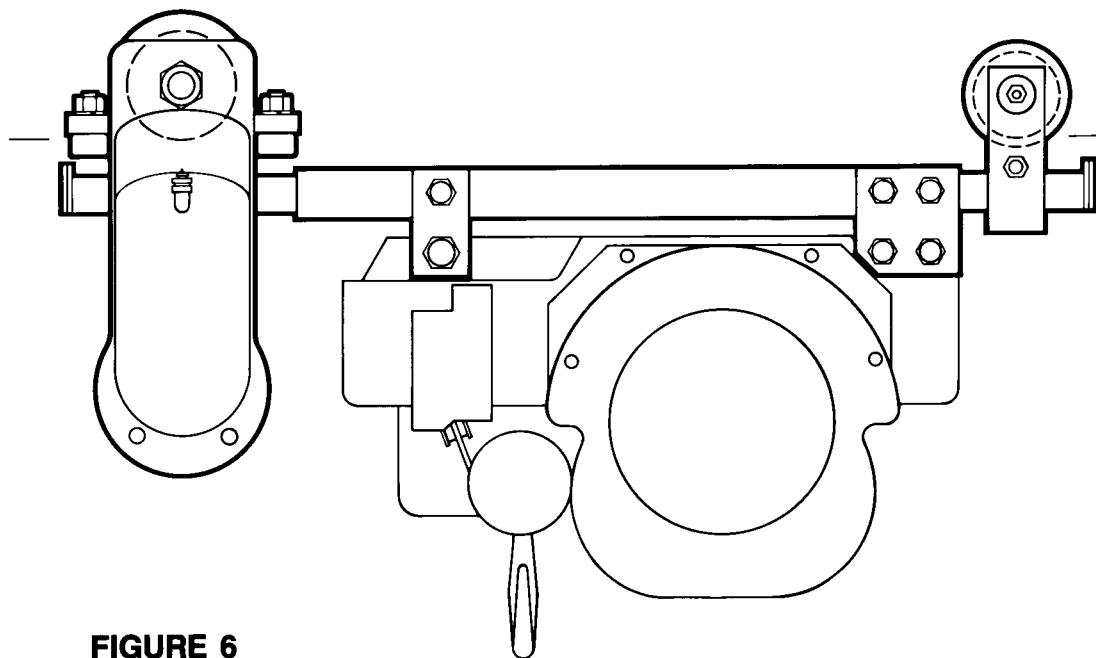


FIGURE 6

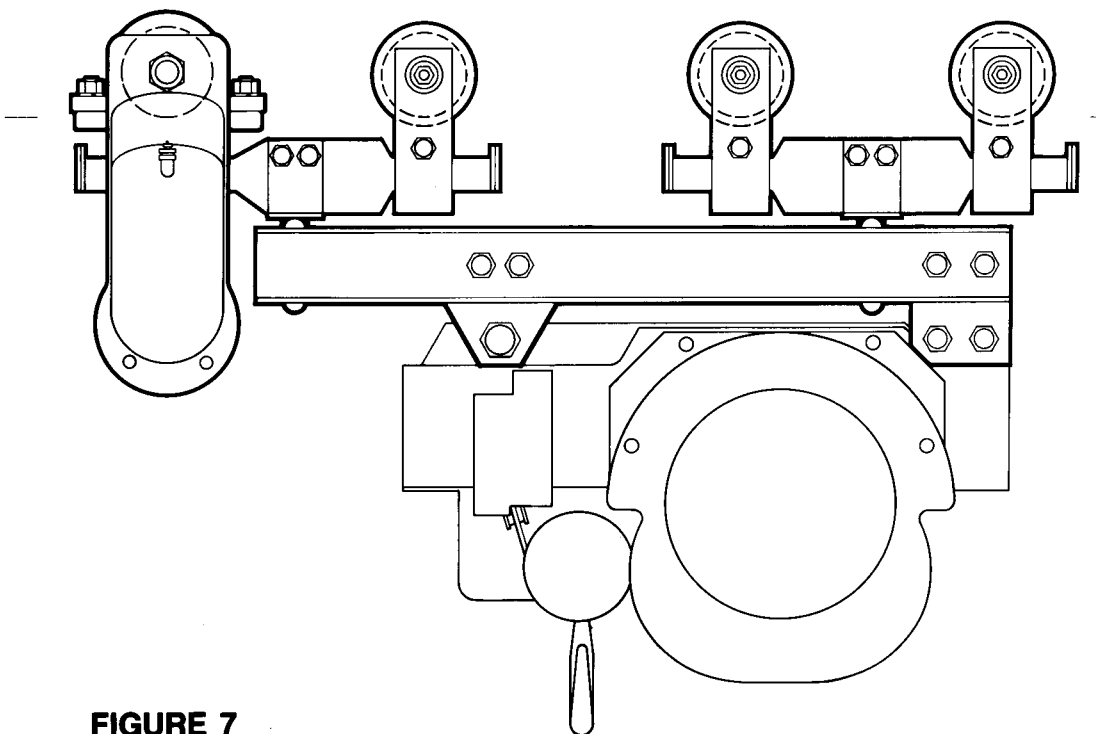


FIGURE 7

CRANE AND MONORAIL ACCESSORY TYPES

LOUDEN® Series 286 double girder hoist trolleys are designed for the specific hoist specified, and will operate on double girder underhung cranes having bridge girders of 603 *SuperTrack™*, 604 *SuperTrack™ Girder*, or 605 *TrojanTrack™ Girder*, having a 3.33 inch operating flange.

LOUDEN® SERIES 400 Trolleys:

The trolley is one of the basic components of monorail and crane equipment. Trolleys are one of the components of crane end trucks shown in Manual 69878: Installation, Operation, Maintenance, and Parts Manual for LOUDEN® Series 500 Underhung Cranes.

LOUDEN® offers a broad range of trolleys for operation on track having both 2.0 inch operating flange or 3.33 inch operating flange. Trolley capacities for track having a 2.0 inch operating flange range from 375 pounds to 6000 pounds. Trolley capacities for track having a 3.33 inch operating flange range from 375 pounds to 20,000 pounds. Some typical LOUDEN® trolleys are shown in Figures 8 through 13.

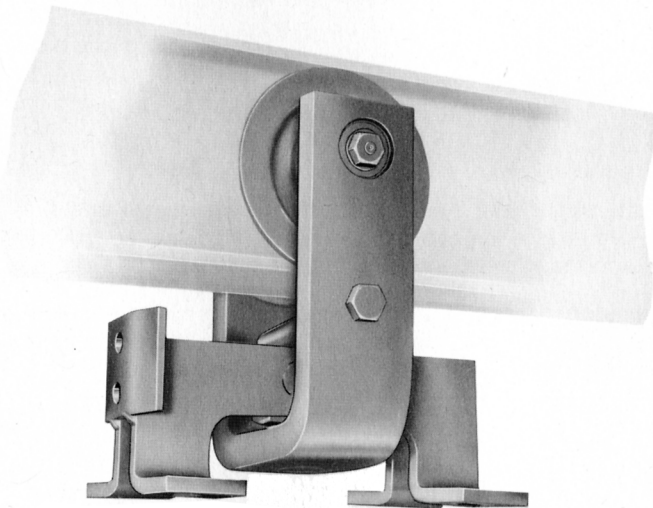


FIGURE 8

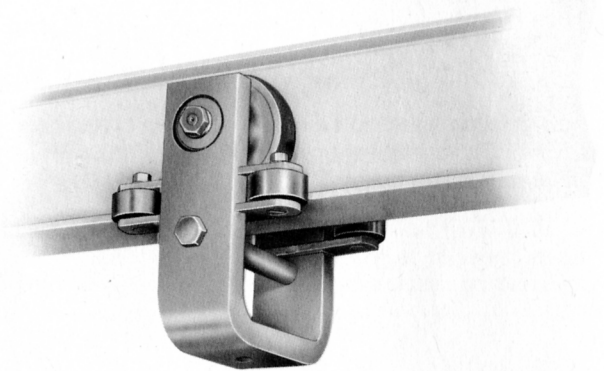


FIGURE 9



FIGURE 10

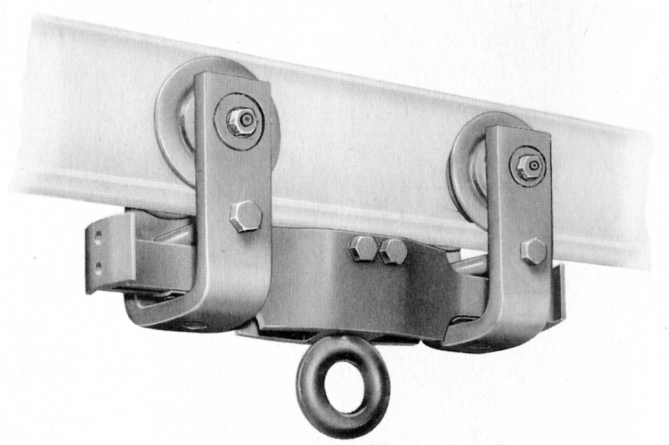


FIGURE 11

CRANE AND MONORAIL ACCESSORY TYPES

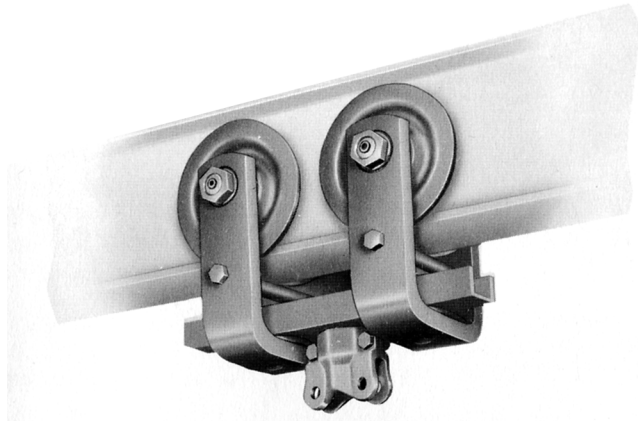


FIGURE 12

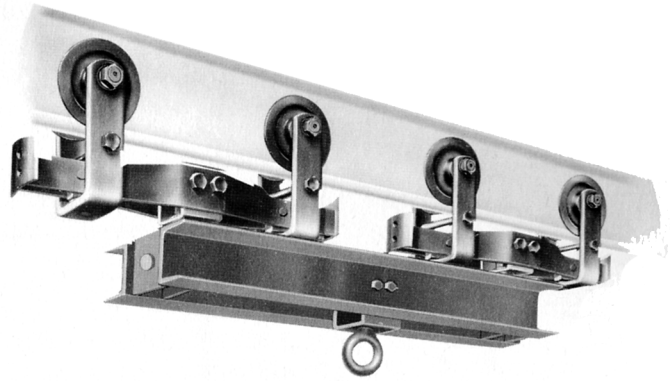


FIGURE 13

Trolleys allow yokes to swivel. This aids in providing alignment of the wheels with the track, especially when traveling through a curve. On four-wheel trolleys, the yokes articulate. This aids in load distribution between all wheels. Bumpers are standard on all four-wheel trolleys to provide spacing and minimize damage to the wheels.

All LOUDEN® trolleys can be equipped with restraining (drop-down) lugs when specified. Restraining lugs can be welded to the trolley yoke as shown in Figure 14 or bolted to the trolley loadbar, where applicable, as shown in Figure 15. When trolleys are used on systems having curves and restraining lugs are specified, only lugs shown in Figure 14 can be used.

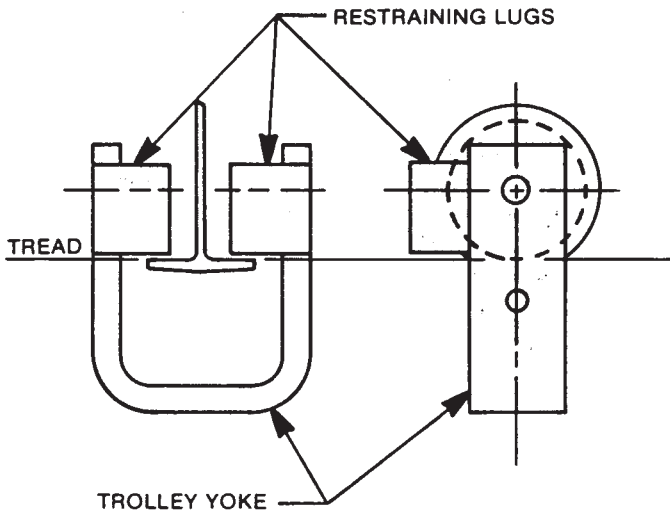


FIGURE 14

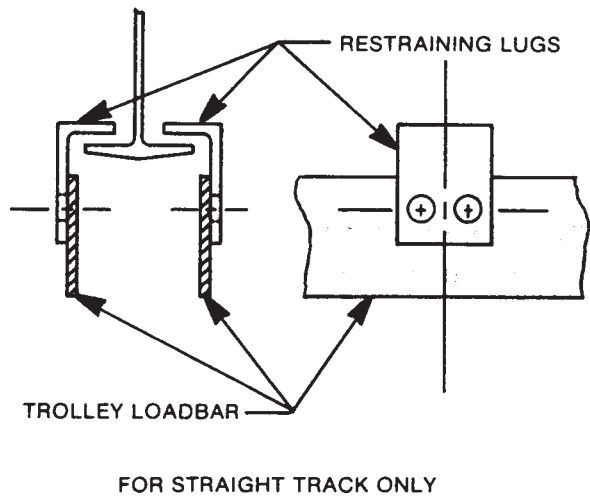


FIGURE 15

CRANE AND MONORAIL ACCESSORY TYPES

Trolleys are designed to operate in ambient temperatures between 0° F and 104° F, and in atmospheres reasonably free from dust, moisture, and corrosive fumes. For operation in applications with unusual conditions; such as high temperatures, low temperatures, high humidity, explosive and corrosive atmospheres, and high dust content, contact Acco Chain & Lifting Products, York, Pennsylvania or the distributor of LOUDEN® products. For applications where explosive atmospheres are present, spark-resistant bronze wheels are available. Also, spark-resistant rubber bumpers are available on four-wheel and eight-wheel trolleys.

Standard catalog trolleys are tabulated in Tables 1 through 4 by type of track they will operate upon. Catalog numbers shown in these tables are basic numbers only. The complete catalog number will have a letter or letters suffix that designates the type of fitting furnished with the trolley. Suffix designations are as follows:

- E = eye
- H = hook
- C = clevis
- SC = swivel clevis
- RF = flush rack
- RC = clevis rack
- TC = clevis rack (*TrojanTrack™* only)
- TF = flush rack (*TrojanTrack™* only)
- LF = less fitting (on trolleys without loadbar spacers)
- WCS = with center spacer (designates 'less fitting' on trolleys with loadbar spacers)

For detailed trolley specifications, refer to LOUDEN® catalog information, or contact Acco Chain & Lifting Products, York, Pennsylvania or the distributor of LOUDEN® products.

**TABLE 1
TROLLEYS FOR LOUDEN® SERIES 602 *SuperTrack™*
2.0 INCH OPERATING FLANGE**

TROLLEY CATALOG NUMBER	NUMBER OF WHEELS	WHEEL PART NUMBER	WHEEL DIAMETER (INCHES)	TROLLEY CAPACITY (POUNDS)	WHEEL TYPE
402.372	2	280682	3.0	375	Flanged
402.754	4	280682	3.0	750	Flanged
402.1502	2	280877	4.0	1,500	Flanged
402.1552	2	280879	4.0	1,500	Flangeless & Guide Rollers
402.3004	4	280877	4.0	3,000	Flanged
402.3024	4	280877	4.0	3,000	Flanged
402.3054	4	280879	4.0	3,000	Flangeless & Guide Rollers
402.6008	8	280877	4.0	6,000	Flanged
402.6058	8	280879	4.0	6,000	Flangeless & Guide Rollers

**TABLE 2
TROLLEYS FOR LOUDEN® SERIES 603 *SuperTrack™* AND 604 *SuperTrack™ Girder*
3.33 INCH OPERATING FLANGE**

TROLLEY CATALOG NUMBER	NUMBER OF WHEELS	WHEEL PART NUMBER	WHEEL DIAMETER (INCHES)	TROLLEY CAPACITY (POUNDS)	WHEEL TYPE
403.372	2	280682	3.0	375	Flanged
403.754	4	280682	3.0	750	Flanged

CRANE AND MONORAIL ACCESSORY TYPES

**TABLE 3
TROLLEYS FOR LOUDEN®
SERIES 603 SuperTrack™, 604 SuperTrack™ Grider AND 605 TrojanTrack™ Girder
3.33 INCH OPERATING FLANGE**

TROLLEY CATALOG NUMBER	NUMBER OF WHEELS	WHEEL PART NUMBER	WHEEL DIAMETER (INCHES)	TROLLEY CAPACITY (POUNDS)	WHEEL TYPE
403.1502	2	280878	4.0	1,500	Flanged
403.2502	2	280882	4.5	2,500	Flanged
403.3004	4	280878	4.0	3,000	Flanged
403.3024	4	280878	4.0	3,000	Flanged
403.5004	4	280882	4.5	5,000	Flanged
403.5002	2	280593	4.5	5,000	Flanged
403.6008	8	280878	4.0	6,000	Flanged
403.10008	8	280882	4.5	10,000	Flanged
403.10004	4	280593	4.5	10,000	Flanged
403.1552	2	280879	4.0	1,500	Flangeless & Guide Rollers
403.2552	2	280660	4.5	2,500	Flangeless & Guide Rollers
403.3054	4	280879	4.0	3,000	Flangeless & Guide Rollers
403.5052	2	280595	4.5	5,000	Flangeless & Guide Rollers
403.5054	4	280660	4.5	5,000	Flangeless & Guide Rollers
403.6058	8	280879	4.0	6,000	Flangeless & Guide Rollers
403.10058	8	280660	4.5	10,000	Flangeless & Guide Rollers
403.10054	4	280595	4.5	10,000	Flangeless & Guide Rollers

**TABLE 4
TROLLEYS FOR LOUDEN® SERIES 605 TrojanTrack™ Girder**

TROLLEY CATALOG NUMBER	NUMBER OF WHEELS	WHEEL PART NUMBER	WHEEL DIAMETER (INCHES)	TROLLEY CAPACITY (POUNDS)	WHEEL TYPE
403.10552	2	280589	9.0	10,000	Flangeless & Guide Rollers
403.20054	4	280589	9.0	20,000	Flangeless & Guide Rollers

LOUDEN® SERIES 300 Motoveyors and Motor-Driven Trolleys:

STEEL-WHEEL DRIVE

The steel-wheel drive unit is an enclosed spur gear reduction unit that replaces an idler trolley on either cranes and trolleys or carriers. Refer to Series 285 hoist trolleys and Figure 16. The final gear reduction is exposed and the pinions drive the loaded wheels that travel on the monorail track. Maximum load capacity that can be placed on the steel-wheel drive unit is 5,000 pounds. Standard catalog travel speeds are 50, 75, 100, 125, and 150 feet per minute. Optional speeds of 200 or 250 feet per minute are available for monorail applications only. An Acceleration Control Module (ACM) is furnished as a standard feature on all units using a three-phase electric motor. The ACM is a solid state device designed to provide reduced starting torque and controlled acceleration of three-phase motors. The ACM offers a soft controlled start that reduces the swinging action of suspended loads caused by uncontrolled abrupt starts. Starting torque and acceleration rate can be adjusted to accommodate differing requirements. Wheels are flanged and have a diameter of 4.5 inches.

CRANE AND MONORAIL ACCESSORY TYPES

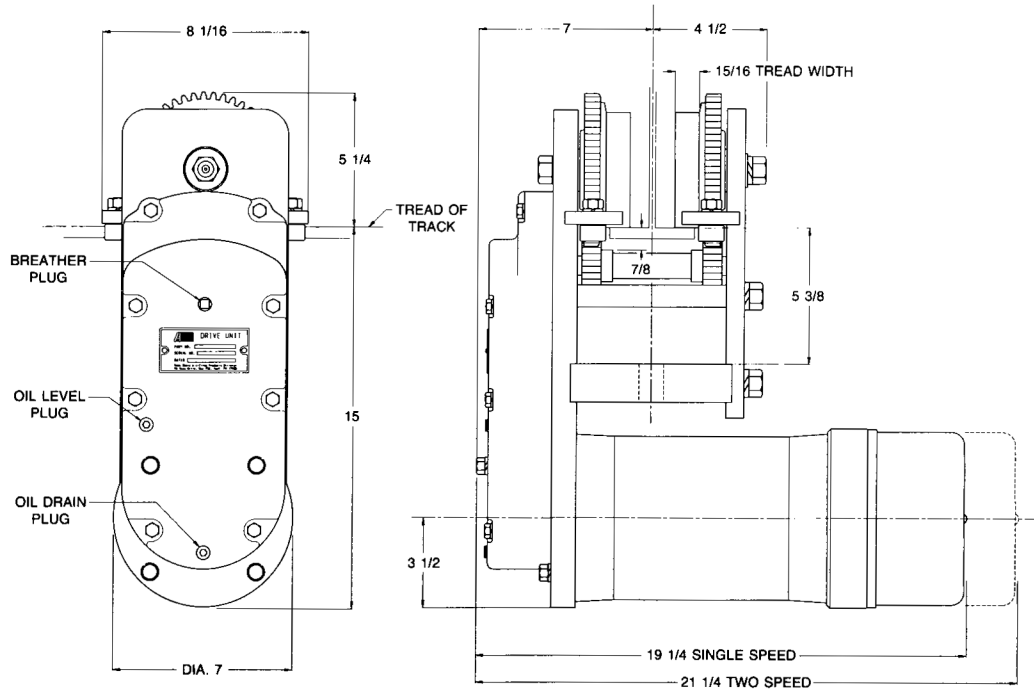


FIGURE 16

MOTOVEYORS

Motoveyor drives are individual units that act as a tractor and pull or push the crane or hoist trolley. The unit is supported on the operating flange by typical monorail trolley wheels. Travel is accomplished by an adjustable spring-loaded drive tire operating against the lower face of the operating flange. Three models of motoveyors are available: M8, M9, and M16. A M9 motoveyor is shown in Figure 17.

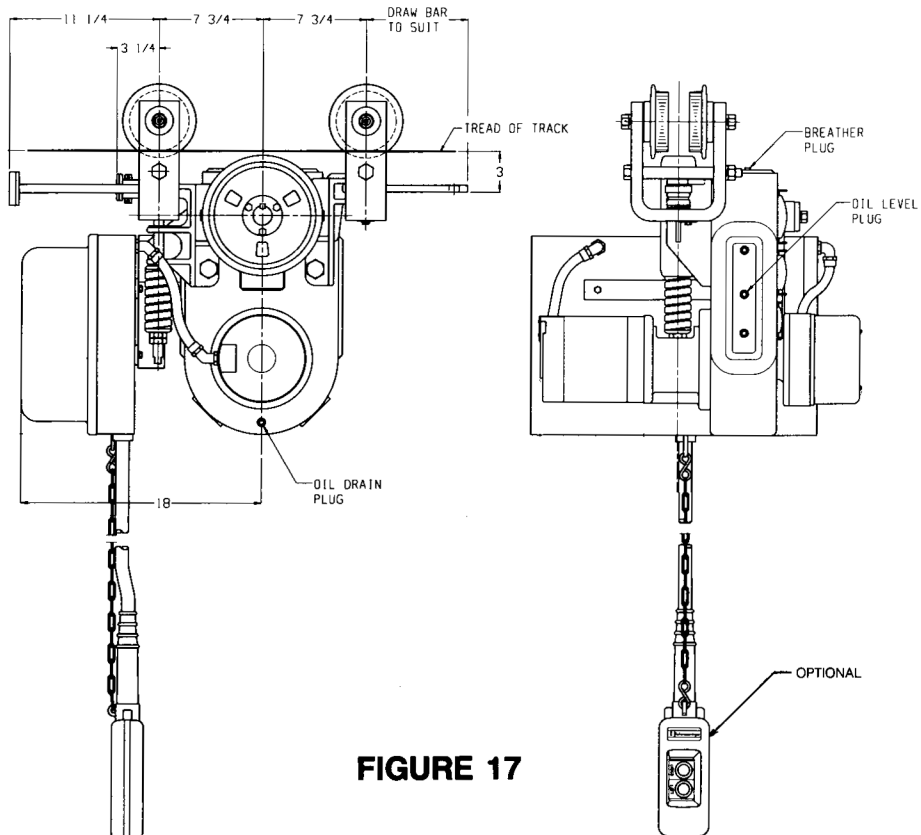


FIGURE 17

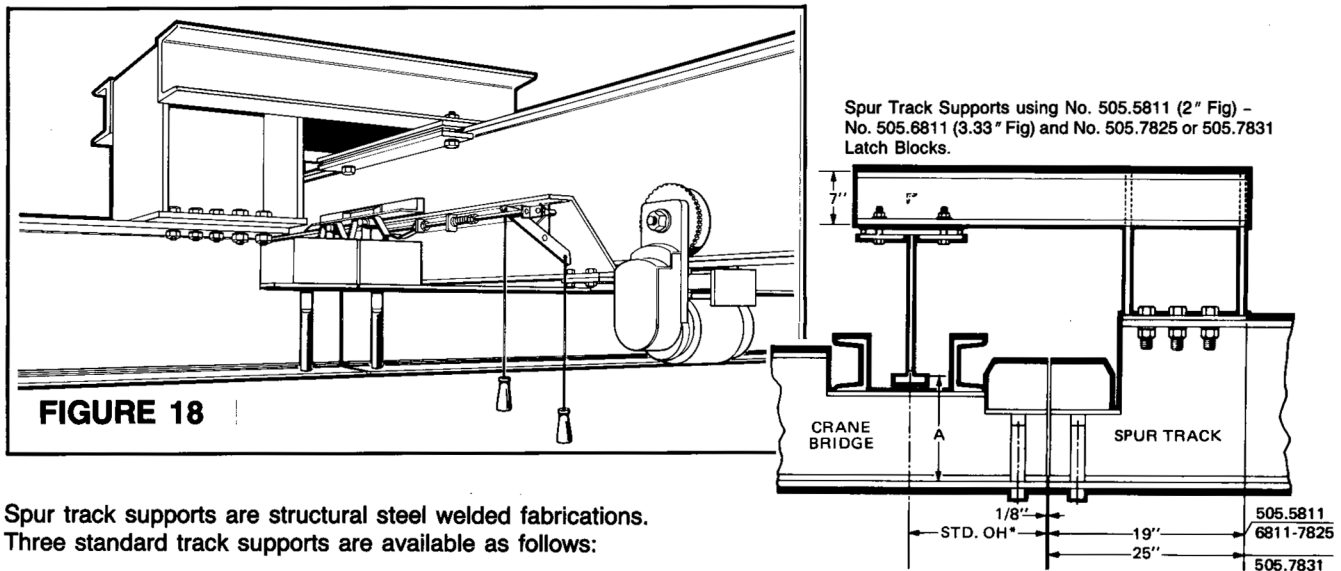
CRANE AND MONORAIL ACCESSORY TYPES

- M8** - The M8 Motoveyor has an 8 inch diameter drive tire and can operate on either a 2.0 inch operating flange or 3.33 inch operating flange. Travel speeds available are 70 and 125 feet per minute. Only single-speed fluid drive is available.
- M9** - The M9 Motoveyor has a 9 inch diameter drive tire for operation on a 3.33 inch operating flange. Standard catalog travel speeds are 75 and 135 feet per minute. Optional speeds of 50, 110, 165, 190, or 255 feet per minute are available. An Acceleration Control Module (ACM) is furnished as a standard feature on all units using a three-phase electric motor. The ACM is a solid state device designed to provide reduced starting torque and controlled acceleration of three-phase motors. The ACM offers a soft controlled start that reduces the swinging action of suspended loads caused by uncontrolled abrupt starts. Starting torque and acceleration rate can be adjusted to accommodate differing requirements.
- M16** - The M16 Motoveyor has a 16 inch diameter drive tire for operation on a 3.33 inch operating flange. M16 units are engineered for each specific application.

For detailed Motoveyor and motor-driven trolley specifications, refer to LOUDEN® catalog information, or contact Acco Chain & Lifting Products, York, Pennsylvania or the distributor of LOUDEN® products.

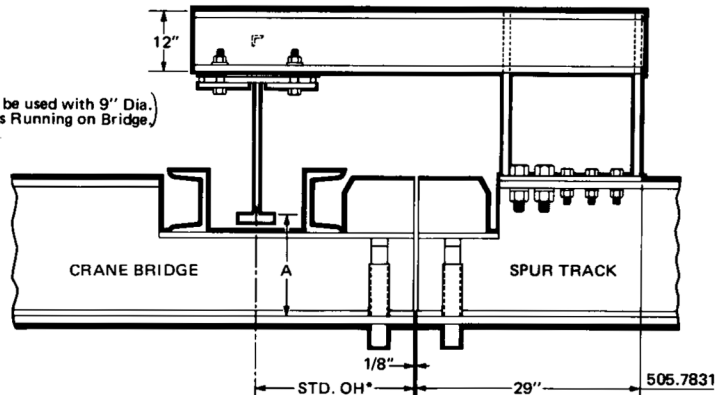
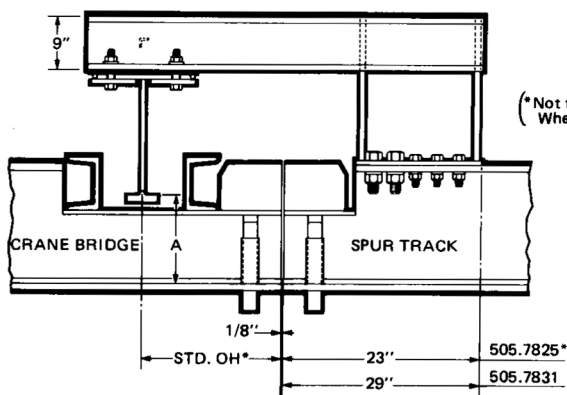
LOUDEN® SERIES 500 Spur Track Supports, Transfer Sections, Latches, and Latch Blocks:

Spur track supports, latches, and latch blocks are used in applications where trolleys are transferred from the bridge girder of underhung cranes to monorail spur tracks and transferred from monorail spur tracks to the bridge girder of underhung cranes. These components are used to align the bridge girder and spur monorail track and allow smooth passage of trolley wheels over the transfer joint. Refer to Figure 18.



Spur track supports are structural steel welded fabrications. Three standard track supports are available as follows:

- 504.3 Maximum capacity 3 tons. Refer to Figure 19.
- 504.12 Maximum capacity 5 tons. Refer to Figure 20.
- 504.15 Maximum capacity 7½ tons. Refer to Figure 21.



(* Not to be used with 9" Dia. Wheels Running on Bridge)

CRANE AND MONORAIL ACCESSORY TYPES

Since the end of the spur track is supported through the spur track support on the crane runway, any deflection at the end of the crane bridge is transferred to the spur track end. This equalization results in vertical alignment of the operating flange of the ends of the bridge girder and spur track. No other support of the monorail spur track should be provided close to the spur track support because such a support would defeat the equalizing effect provided by the spur track support. Where applications require the spur track to curve immediately adjacent to the crane runway, a spur track support is not feasible. However, in such situations, the superstructure supporting the curve should be arranged so that it bears on the crane runway resulting in the same equalizing effect as a spur track support.

Transfer sections, latches, and latch blocks are used in applications where trolleys are transferred from the bridge girder of one underhung crane to the bridge girder of another underhung crane. These components are used to align the ends of the bridge girders and allow smooth passage of trolley wheels over the transfer joint. Refer to Figure 22.

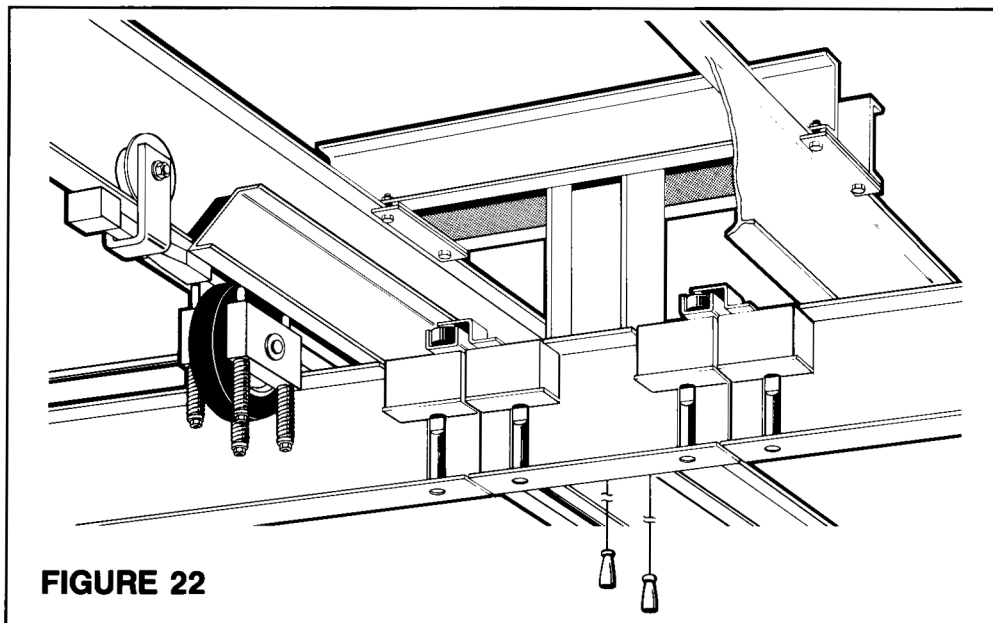
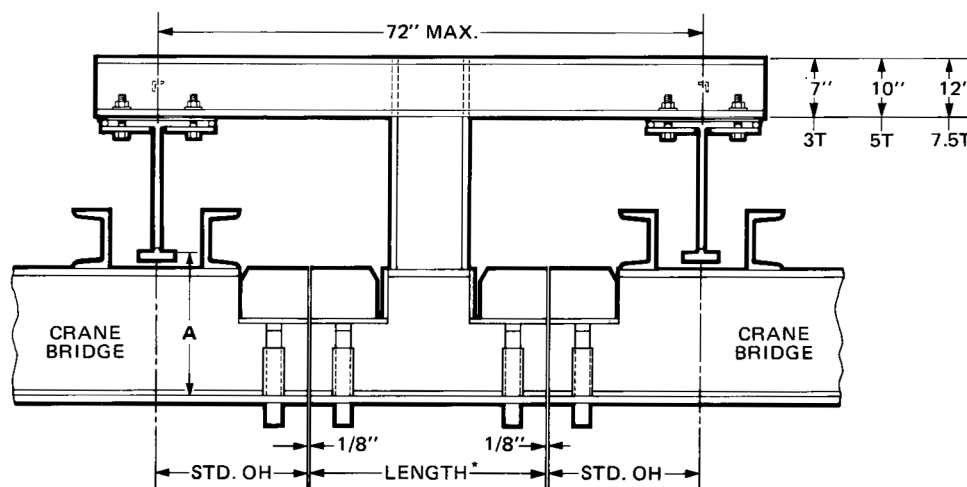


FIGURE 22

Transfer sections are structural steel welded fabrications. Three standard transfer sections, shown in Figure 23, are available as follows:

- 504.5 Maximum capacity 3 tons. Minimum length is 18" with 505.5811 and 505.6811 latch blocks.
- 504.28 Maximum capacity 5 tons. Minimum length is 24" with 505.7825 latch blocks.
- 504.30 Maximum capacity 7½ tons. Minimum length is 18" with 505.7831 latch blocks.



**504.5 - 504.28 - 504.30 TRANSFER SECTIONS
FIGURE 23**

CRANE AND MONORAIL ACCESSORY TYPES

Since the transfer section is supported by the crane runways, any deflection at the end of one crane bridge is transferred to the transfer section and to the end of the other crane bridge. This equalization results in vertical alignment of the operating flange of the ends of the bridge girders and transfer section.

Latches and latch blocks are used in conjunction with spur track supports and transfer sections for horizontal alignment of the bridge girder end, spur track end, and/or transfer section. Latches are mounted on the crane and latch blocks are mounted on the track support or transfer section. Baffles on both the latch and latch block cover the track ends of the bridge girder, spur track, or transfer section to prevent a trolley from traveling off the track end when the latch and latch block are not aligned and engaged. When an operator aligns and engages the latch and latch block, horizontal alignment of the bridge girder end, spur track end, and/or transfer section is completed and the baffles raise to permit passage of trolleys. Typical latches and latch blocks are shown in Figures 24 and 25.

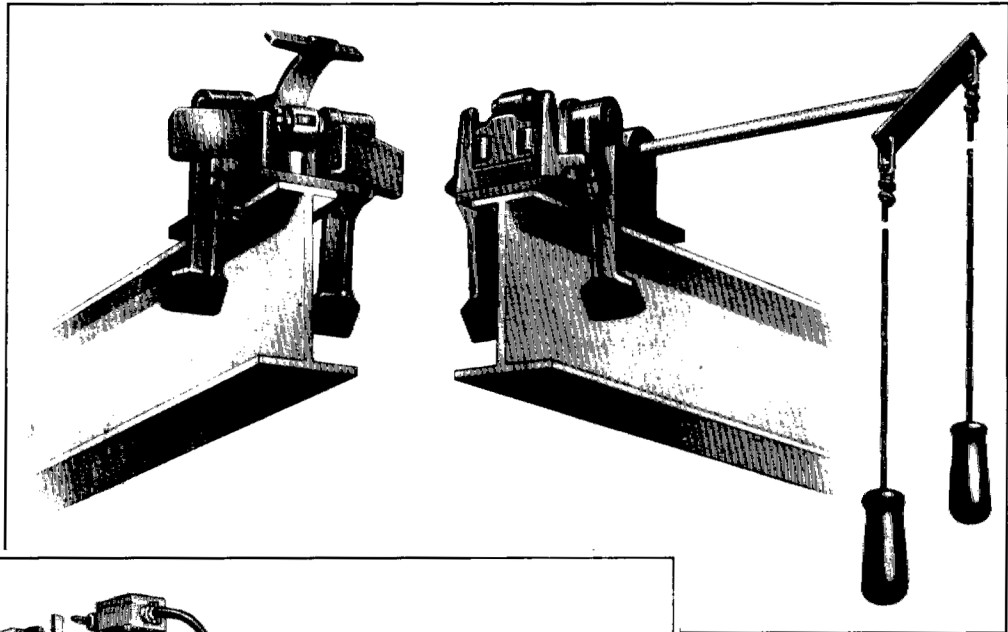


FIGURE 24

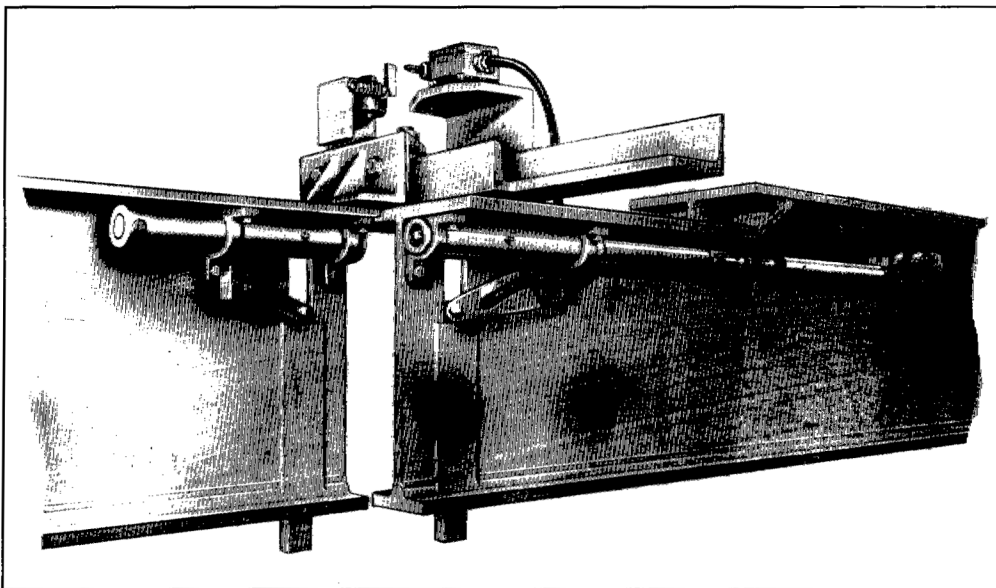


FIGURE 25

Standard latches and latch blocks are as follows:

Manually-operated for cranes without bridge conductors:

- 505.5810 Latch, 2.0 inch operating flange.
- 505.5811 Latch block, 2.0 inch operating flange.
- 505.6810 Latch, 3.33 inch operating flange.
- 505.6811 Latch block, 3.33 inch operating flange.

Manually-operated for cranes with bridge conductors:

- 505.7824 Latch, 3.33 inch operating flange.
- 505.7825 Latch block, 3.33 inch operating flange.

Motor-operated for cranes with bridge conductors:

- 505.7830 Latch, 3.33 inch operating flange.
- 505.7831 Latch block, 3.33 inch operating flange.

CRANE AND MONORAIL ACCESSORY TYPES

Table 5 shows information on tread-to-tread dimensions and overhangs on cranes with latches or latch blocks.

TABLE 5

LATCH NO.	CRANE SERIES	NUMBER OF WHEELS ON TRUCK	TREAD-TO-TREAD DIMENSION "A"	MINIMUM OVERHANG W/LATCH OR LATCH BLOCK	MAXIMUM OVERHANG W/LATCH OR LATCH BLOCK
5810/6810	551 Non-Electrified	4	10"	12"	18"
7824	551 Electrified 604.922 Bridge	4	13¼"	12"	18"
7824	551 Electrified 603.6 Bridge 603.7 Bridge	4	12½"	12"	18"
7824	552 Electrified	4	See Note 2	15"	18"
7824	552 Electrified	8	See Note 2	17"	18"
7824	503	4 8	See Note 2	15" 17"	18"
7824	503-T 5 Ton Cap. Only	8	See Note 2	18"	18"
7824	517	8 16	See Note 2	15" 17"	18"
7824	517-T 5 Ton Cap. Only	8 16	See Note 2	18"	18"
7824	585	4 8	See Note 2	14" 16½"	18"
7824	586	8 16	See Note 2	14" 16½"	18"
7830	503-T & 517-T	8 16	See Note 3	16"	18"

NOTES:

- Standard overhang at latch end of crane is 18" for all models of cranes and latches.
- Tread-to-tread dimensions for bridge girder depths as follows:
 11" for 604.924.
 14" for 604.1231.
 14" for 605.1235.
 16" for 604.1435.
 17" for depths of 15" and greater.
- Tread-to-tread dimensions *SuperTrack™ Girder* or *TrojanTrack™ Girder* as follows:
 14" for 4½" diameter wheels.
 17" for 9" diameter wheels operating on *TrojanTrack™ Girder*.
- For applications requiring overhangs in excess of 18," contact Acco Chain & Lifting Products, York, Pennsylvania or the distributor of LOUDEN® products.
- Under-the-rail bumpers must be furnished on all trolleys.

LOUDEN® SERIES 800 Electrification:

Standard electrification accessories for cranes and monorails include the following:

- Dual conductor bottom-entry electrification.
- Single conductor bottom-entry electrification.
- Conductor bar support brackets.
- Light-duty wire-supported tagline systems for flat cable.
- Light-duty wire-supported tagline systems for round cable.
- Heavy-duty track-supported festoon systems.
- Acceleration Control Module V (ACM V).

CRANE AND MONORAIL ACCESSORY TYPES

Additional electrification accessories may be furnished in accordance with specification requirements. In such cases, refer to the specific application specifications. Manuals for such applications will contain additional pages in accordance with product specifications.

DUAL CONDUCTOR BOTTOM-ENTRY ELECTRIFICATION

LOUDEN® Dual Conductor Bottom-Entry Electrification is designed and manufactured by Acco Chain & Lifting Products to meet the requirements of monorail and crane service. Length of conductor sections is 10 feet, and consist of two roll-formed, zinc-coated steel bars held in position by five spacer insulators to form an inverted U shape with a $\frac{5}{8}$ " slot opening at the bottom to accommodate sliding shoe collectors. This assembly is housed in a neoprene or vinyl insulating cover. A length of conductor section with location of the five spacer insulators is shown in Figure 26. Figure 27 shows a cross-section through the conductor with a support insulator assembly and a sliding shoe collector.

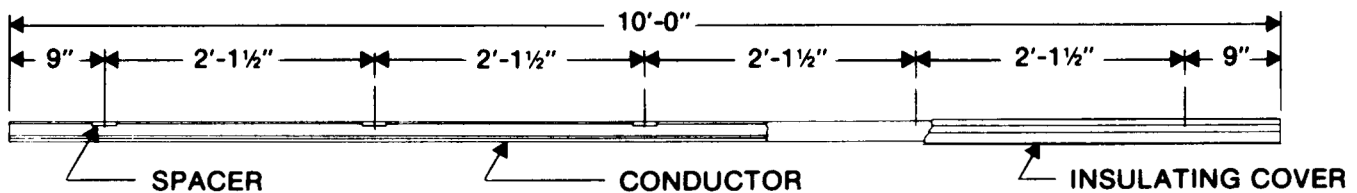


FIGURE 26

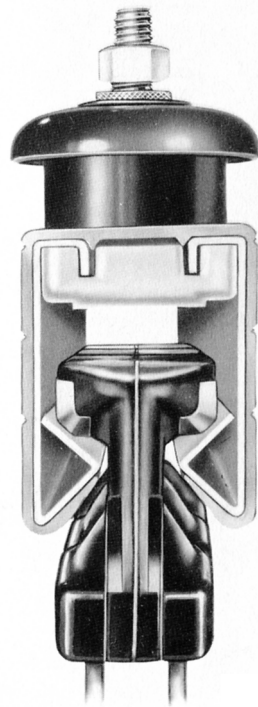


FIGURE 27

Neoprene covers will withstand temperatures up to 400° F, but maximum ambient or operating temperatures are normally limited by other components in the system. Vinyl should not be used where temperatures rise above 140° F. LOUDEN® Dual Conductor Bottom-Entry Electrification is available on special order with stainless steel conductor bars for use in highly corrosive or caustic applications.

Each of the two conductor bars is a separate conductor with a capacity of 100 amperes at 600 volts AC. This capacity can be doubled by electrically tying the two bars together.

LOUDEN® Dual Conductor Bottom-Entry Electrification can be field fitted for curves using bending tools available from Acco Chain & Lifting Products. Straight runs require support on maximum 5' centers. Curves require a minimum of one center support; however, support centers should not exceed 4'.

CRANE AND MONORAIL ACCESSORY TYPES

A feature of LOUDEN® Dual Conductor Bottom-Entry Electrification is the availability of control sections, shown in Figure 28. Control sections are installed into the top of conductor sections, and when used in conjunction with control collectors provide signals to other equipment in automatic systems.

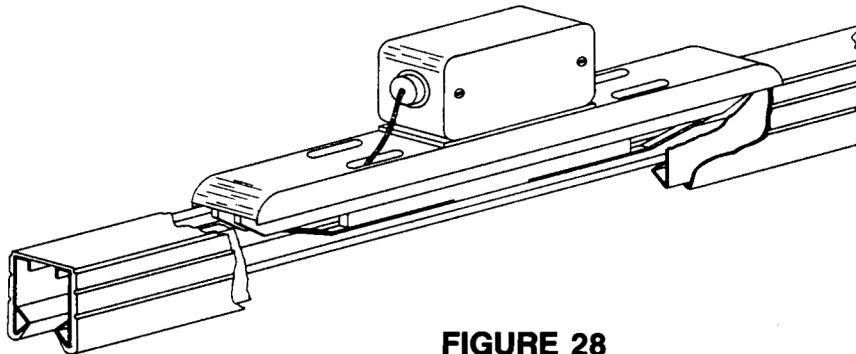


FIGURE 28

A wide range of components are available for LOUDEN® Dual Conductor Bottom-Entry Electrification for runway, crane, and monorail applications. For detailed specifications, refer to LOUDEN® catalog information, or contact Acco Chain & Lifting Products, York, Pennsylvania or the distributor of LOUDEN® products. Components available are as follows:

810.1-N	Conductor section with neoprene cover, 10' length.	810.35	Splice assembly.
810.1-V	Conductor section with vinyl cover, 10' length.	810.37	Powerfeed assembly.
810.5	Bending hickey. For bending curves in the field.	810.38	Control section, single contact.
810.19	Selector section, insulator (28-0586)	810.40	Cleaning shoe.
810.21	Support insulator assembly.	810.41	Control section, short.
810.22	Transfer Insulator.	810.100	Current collector, single pole.
810.26	End closure.	810.101	Current collector, spring loaded.
810.30	Current collector.	810.102	Control collector, spring loaded.
810.32	Control collector.	810.103	Control collector, single pole.
810.33	Control section, double contact.		

SINGLE CONDUCTOR BOTTOM-ENTRY ELECTRIFICATION

LOUDEN® Single Conductor Bottom-Entry Electrification is a commercial conductor bar of a figure 8 configuration covered with a noncombustible insulating material to enclose the conductor bar. A cross-section view of 811.1 conductor bar and 811.10 single hanger clamp is shown in Figure 29.

The conductor has a capacity of 110 amperes at 600 volts AC. Each conductor bar section is 10 feet long and includes a joint cover, and connector pins or joint clamps where applicable.

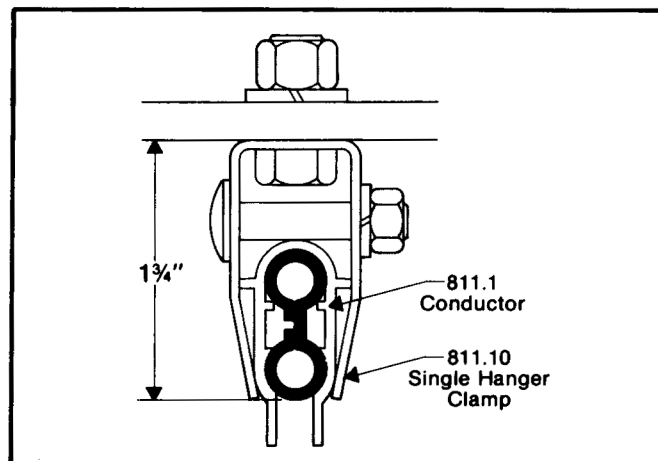


FIGURE 29

CRANE AND MONORAIL ACCESSORY TYPES

LOUDEN® Single Conductor Bottom-Entry Electrification can be field fitted for curves having a minimum radius of 3'-6" without damage to the vinyl cover or conductor bar. Straight runs require support on maximum 5' centers. Curves require a minimum of one center support; however, support centers should not exceed 2'.

A wide range of components are available for LOUDEN® Single Conductor Bottom-Entry Electrification for runway, crane, and monorail applications. For detailed specifications, refer to LOUDEN® catalog information, or contact Acco Chain & Lifting Products, York, Pennsylvania or the distributor of LOUDEN® products. Components available are as follows:

- 811.1 Conductor section, 10' length.
- 811.2 Expansion assembly.
- 811.10 Single hanger clamp assembly.
- 811.11 Twin hanger clamp assembly.
- 811.12 Triple hanger clamp assembly.
- 811.20 Center powerfeed.
- 811.21 Vinyl end cap.
- 811.22 Transfer cap. Specify 45° right hand (281117) or 45° left hand (281118).
- 811.23 Isolation section.
- 811.24 Connector tool.
- 811.30 Current collector, 40 amp./600 volt rating.
- 811.31 Current collector, 100 amp./600 volt rating.
- 811.32 Current collector, 80 amp./600 volt rating, double shoe.

CONDUCTOR BAR SUPPORT BRACKETS

LOUDEN® conductor bar support brackets are designed to mount both LOUDEN® Dual Conductor Bottom-Entry Electrification and LOUDEN® Single Conductor Bottom-Entry Electrification to LOUDEN® monorail and crane girder track at the proper location for optimum performance of the system. Bottom entry electrification types are supported at 8½" above operating flange surface in systems with wheel tread diameters up to and including 4½", and at 12" above operating flange surface in systems with 9" wheel tread diameters. Electrification system types cannot be intermixed.

All bottom-entry electrification systems offered by Acco Chain & Lifting Products require that conductor bar support brackets be provided on maximum 5' centers for straight runs of electrification. Monorail curves require a minimum of one conductor bar support bracket for each 45° of bend; however, support brackets should not exceed 4' for LOUDEN® Dual Conductor Bottom-Entry Electrification, or 2' for LOUDEN® Single Conductor Bottom-Entry Electrification.

Conductor bar support brackets do not include support insulators or hanger clamp assemblies. A wide range of conductor bar support brackets are available as shown in Figures 30 through 42 and as described below. For additional information or detailed specifications, refer to LOUDEN® catalog information, or contact Acco Chain & Lifting Products, York, Pennsylvania or the distributor of LOUDEN® products.

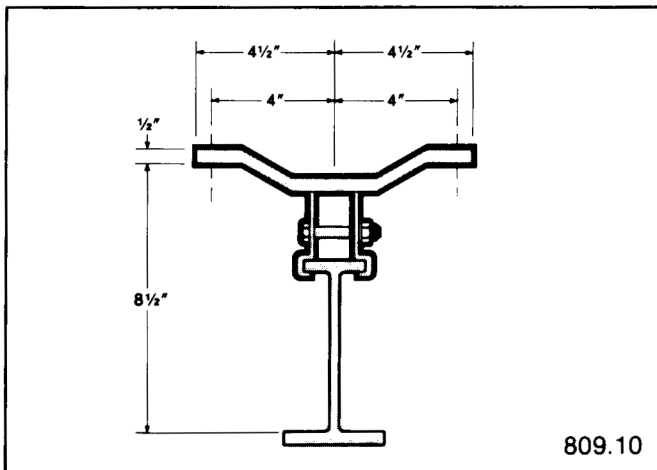


FIGURE 30

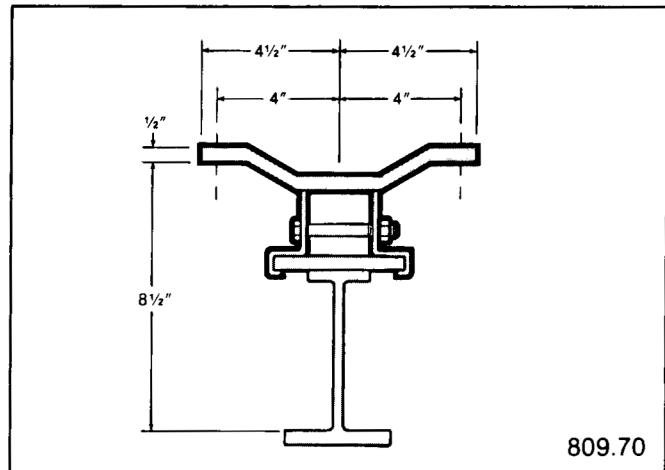


FIGURE 31

CRANE AND MONORAIL ACCESSORY TYPES

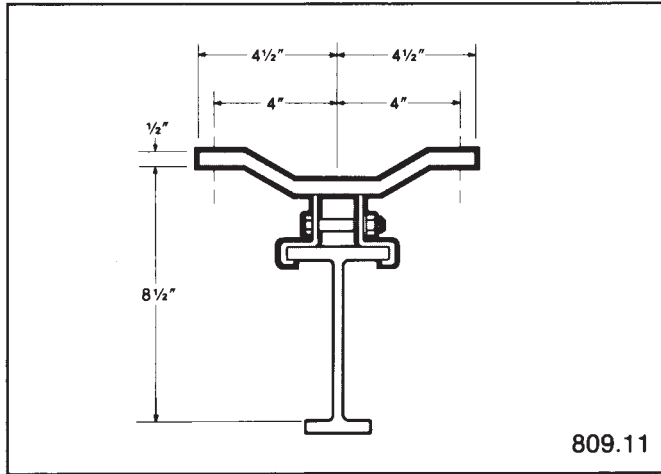


FIGURE 32

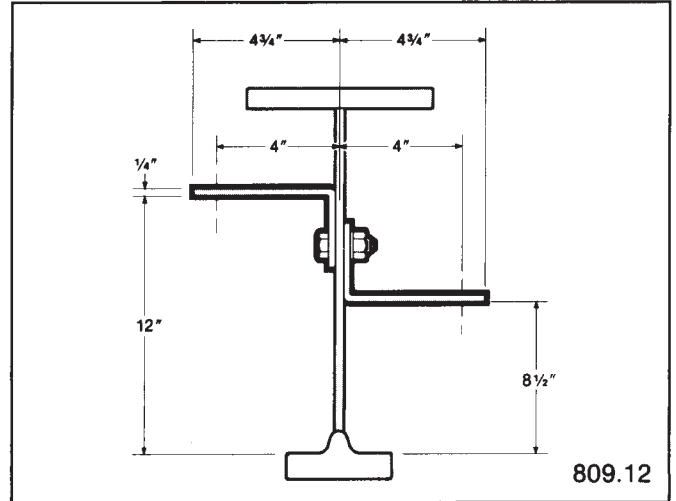


FIGURE 33

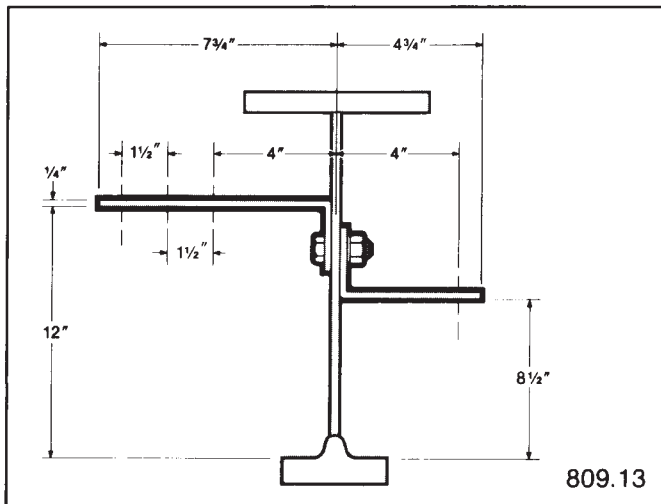


FIGURE 34

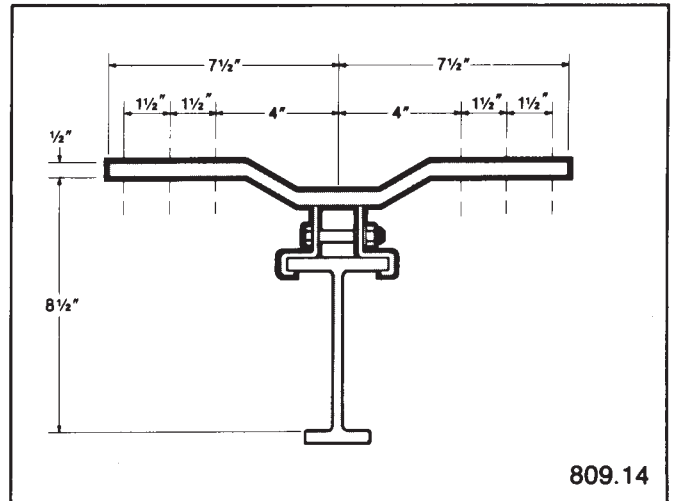


FIGURE 35

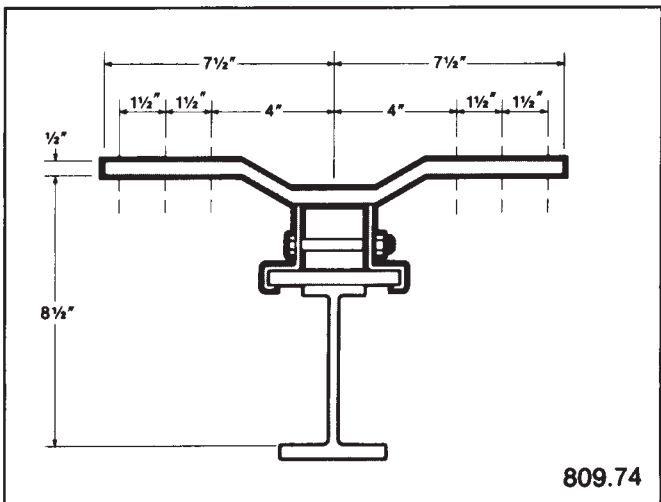


FIGURE 36

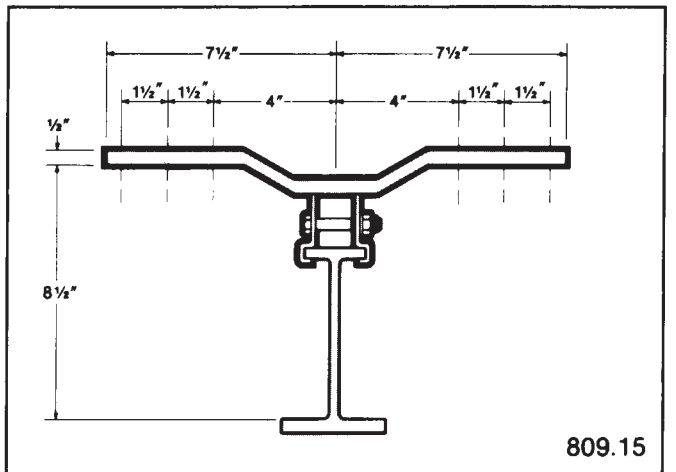


FIGURE 37

CRANE AND MONORAIL ACCESSORY TYPES

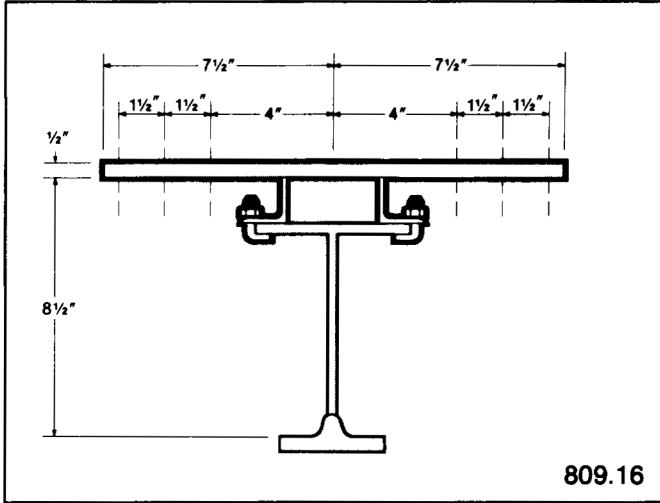


FIGURE 38

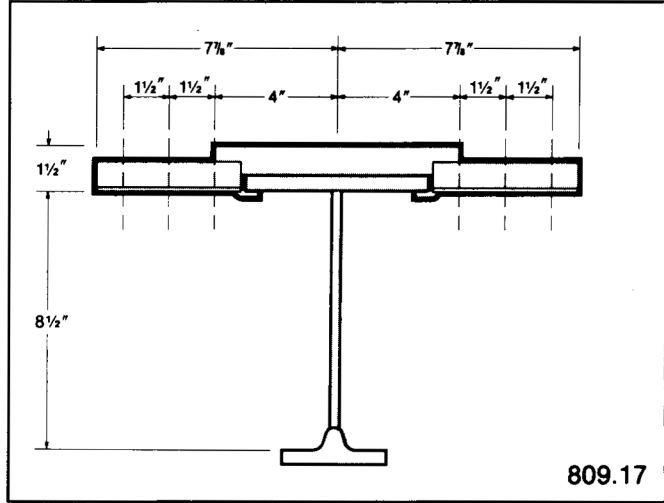


FIGURE 39

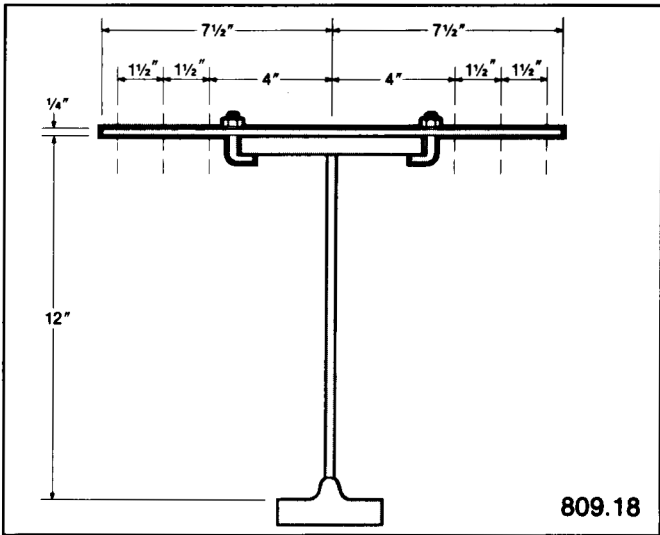


FIGURE 40

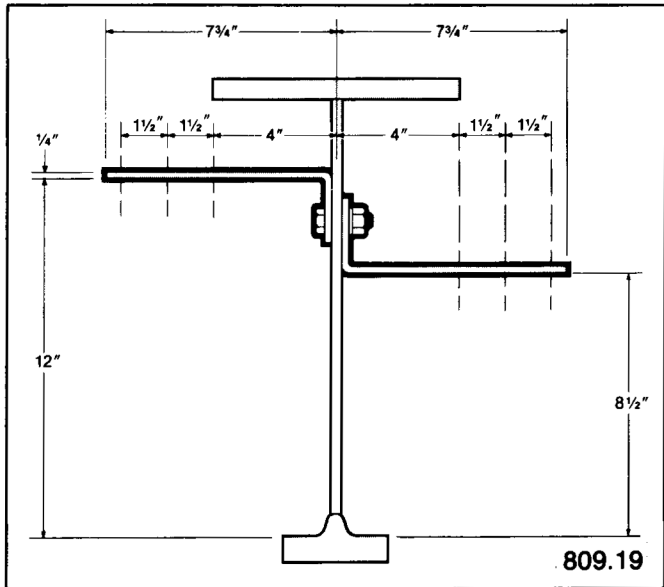


FIGURE 41

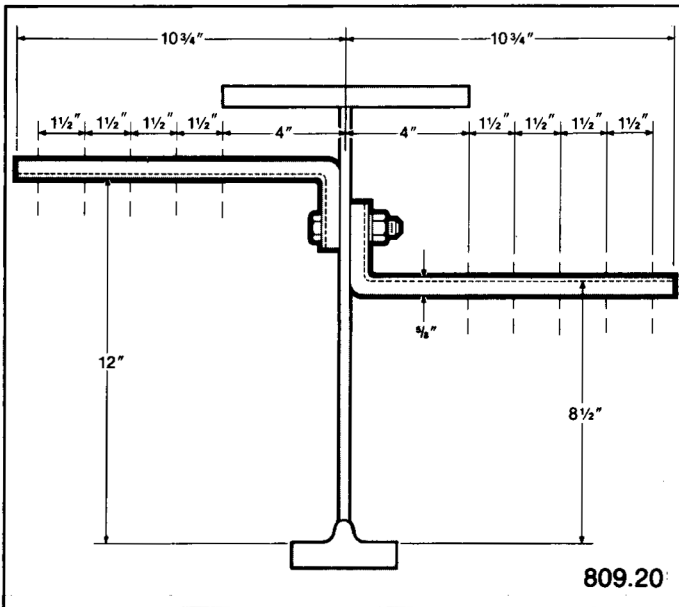


FIGURE 42

CRANE AND MONORAIL ACCESSORY TYPES

Descriptions of conductor bar support brackets as follows:

- 809.10 (Refer to Figure 30): For 4-wire (2-run) dual conductor bottom-entry electrification at 8½" above operating flange surface of 603.6 *SuperTrack™*.
- 809.70 (Refer to Figure 31): For 4-wire (2-run) dual conductor bottom-entry electrification at 8½" above operating flange surface of 603.7 *SuperTrack™*.
- 809.11 (Refer to Figure 32): For 4-wire (2-run) dual conductor bottom-entry electrification at 8½" above operating flange surface of 602.6 *SuperTrack™*.
- 809.12 (Refer to Figure 33): For 4-wire (2-run) dual conductor bottom-entry electrification at 8½" above operating flange surface of 12" depth 604 *SuperTrack™ Girder* or 605 *TrojanTrack™ Girder*. On girder depths of 14" or greater, electrification can be either 8½" or 12" above operating flange surface.
- 809.13 (Refer to Figure 34): For up to 6-wire (3-run) dual conductor bottom-entry electrification or 4-wire single conductor bottom-entry electrification at 8½" above operating flange surface of 12" depth 604 *SuperTrack™ Girder* or 605 *TrojanTrack™ Girder*. On girder depths of 14" or greater, electrification can be either 8½" or 12" above operating flange surface.
- 809.14 (Refer to Figure 35): For up to 8-wire (4-run) dual conductor bottom-entry electrification or 6-wire single conductor bottom-entry electrification at 8½" above operating flange surface of 602.6 *SuperTrack™*.
- 809.74 (Refer to Figure 36): For up to 8-wire (4-run) dual conductor bottom-entry electrification or 6-wire single conductor bottom-entry electrification at 8½" above operating flange surface of 603.7 *SuperTrack™*.
- 809.15 (Refer to Figure 37): For up to 8-wire (4-run) dual conductor bottom-entry electrification or 6-wire single conductor bottom-entry electrification at 8½" above operating flange surface of 603.6 *SuperTrack™*.
- 809.16 (Refer to Figure 38): For up to 8-wire (4-run) dual conductor bottom-entry electrification or 6-wire single conductor bottom-entry electrification at 8½" above operating flange surface of 604.717 *SuperTrack™ Girder*.
- 809.17 (Refer to Figure 39): For up to 8-wire (4-run) dual conductor bottom-entry electrification or 6-wire single conductor bottom-entry electrification at 8½" above operating flange surface of 604.924 *SuperTrack™ Girder*.
- 809.18 (Refer to Figure 40): For up to 8-wire (4-run) dual conductor bottom-entry electrification or 6-wire single conductor bottom-entry electrification at 12" above operating flange surface of 604.1231 *SuperTrack™ Girder* or 605.1235 *TrojanTrack™ Girder*.
- 809.19 (Refer to Figure 41): For up to 8-wire (4-run) dual conductor bottom-entry electrification or 6-wire single conductor bottom-entry electrification at 8½" above operating flange surface of 12" depth 604 *SuperTrack™ Girder* or 605 *TrojanTrack™ Girder*. On girder depths of 14" or greater, electrification can be either 8½" or 12" above operating flange surface.
- 809.20 (Refer to Figure 42): For up to 12-wire (6-run) dual conductor bottom-entry electrification or 10-wire single conductor bottom-entry electrification at 12" above operating flange surface of 14" or greater depths of 604 *SuperTrack™ Girder* or 605 *TrojanTrack™ Girder*.

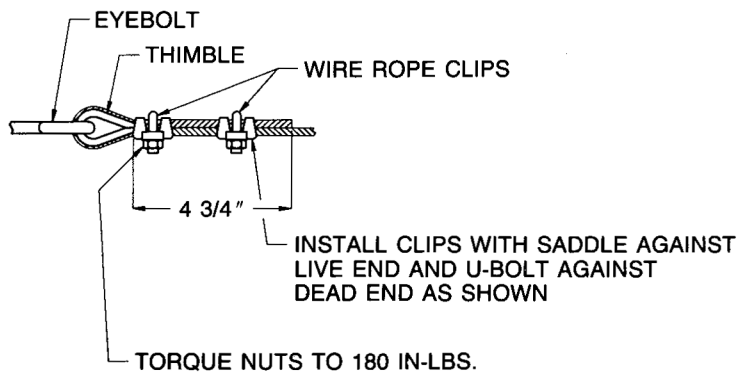
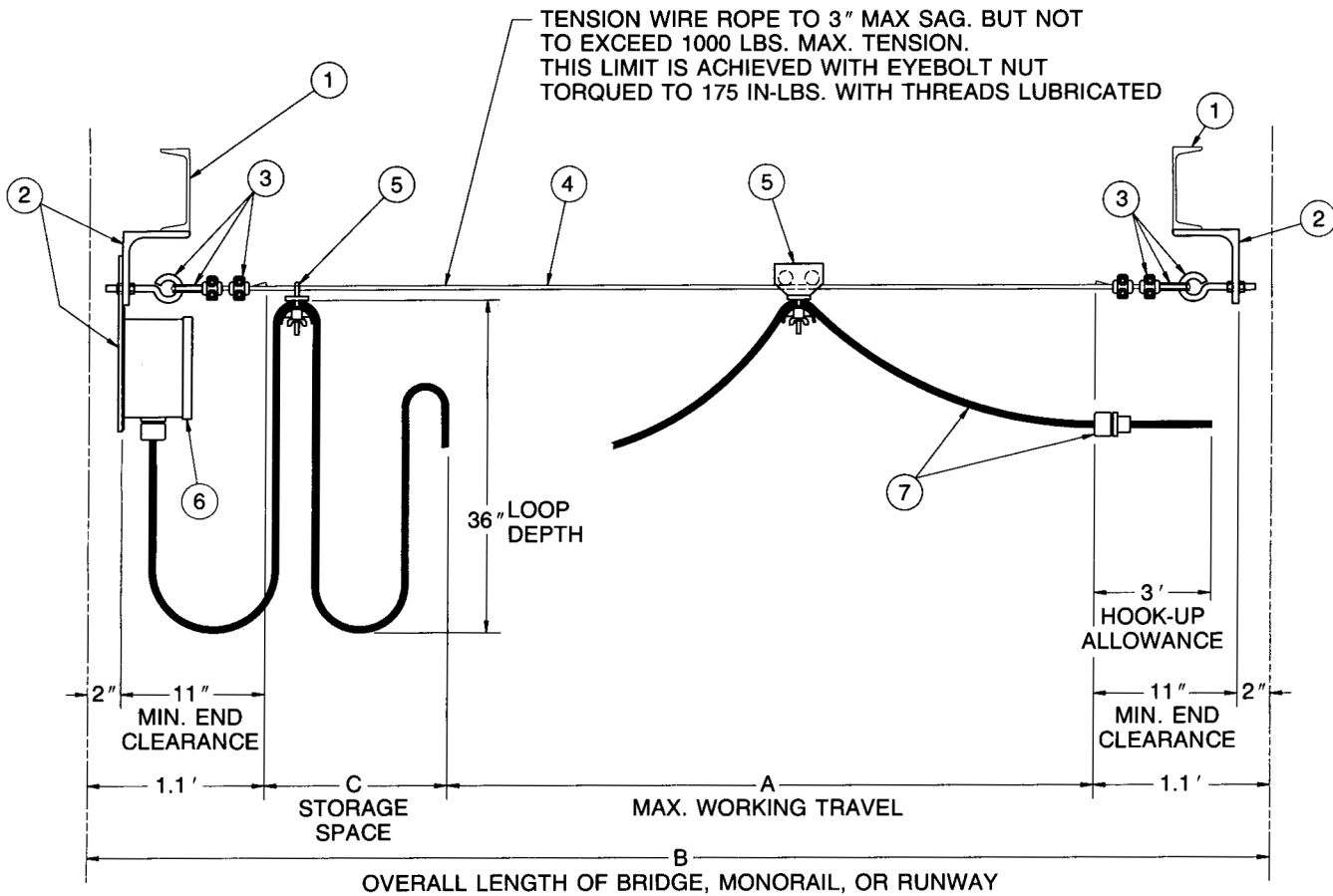
LIGHT-DUTY WIRE-SUPPORTED TAGLINE SYSTEMS

Light-duty, wire-supported tagline systems are used to furnish electrical power and/or control circuits to electrified cranes, crane runways, and straight monorails up to a maximum overall length of 42'-2." Two different systems are available: one for flat electrical cable, and one for round electrical cable. The system for flat electrical cable will accommodate flat electrical cable up to a maximum width of 2½." The system for round electrical cable will accommodate round electrical cable up to a maximum diameter of 0.91." Both systems use nylon electrical cable carrier trolleys that travel on a galvanized wire rope. The system for flat electrical cable is shown in Figure 43. The system for round electrical cable is shown in Figure 44.

CRANE AND MONORAIL ACCESSORY TYPES

⚠ WARNING

LIGHT-DUTY, WIRE-SUPPORTED TAGLINE SYSTEMS ARE DESIGNED AND INTENDED TO SUPPORT ELECTRICAL CABLE ONLY. DO NOT USE LIGHT-DUTY, WIRE-SUPPORTED TAGLINE SYSTEMS TO SUPPORT OTHER ITEMS OR COMPONENTS. A MAXIMUM LOAD OF 9 POUNDS CAN BE SUPPORTED BY THE NYLON ELECTRICAL CABLE CARRIER TROLLEY.



$$\frac{B \text{ (ft.)} - 2.2'}{6} = \text{No. of Trolleys (N)} \text{ (Round off)}$$

$$C \text{ (ft.)} = N \times 0.33'$$

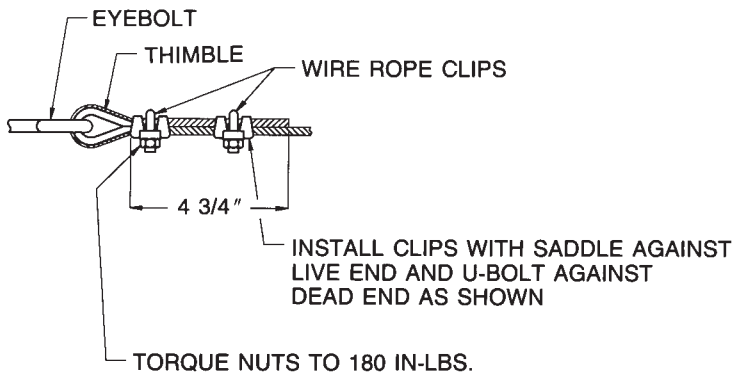
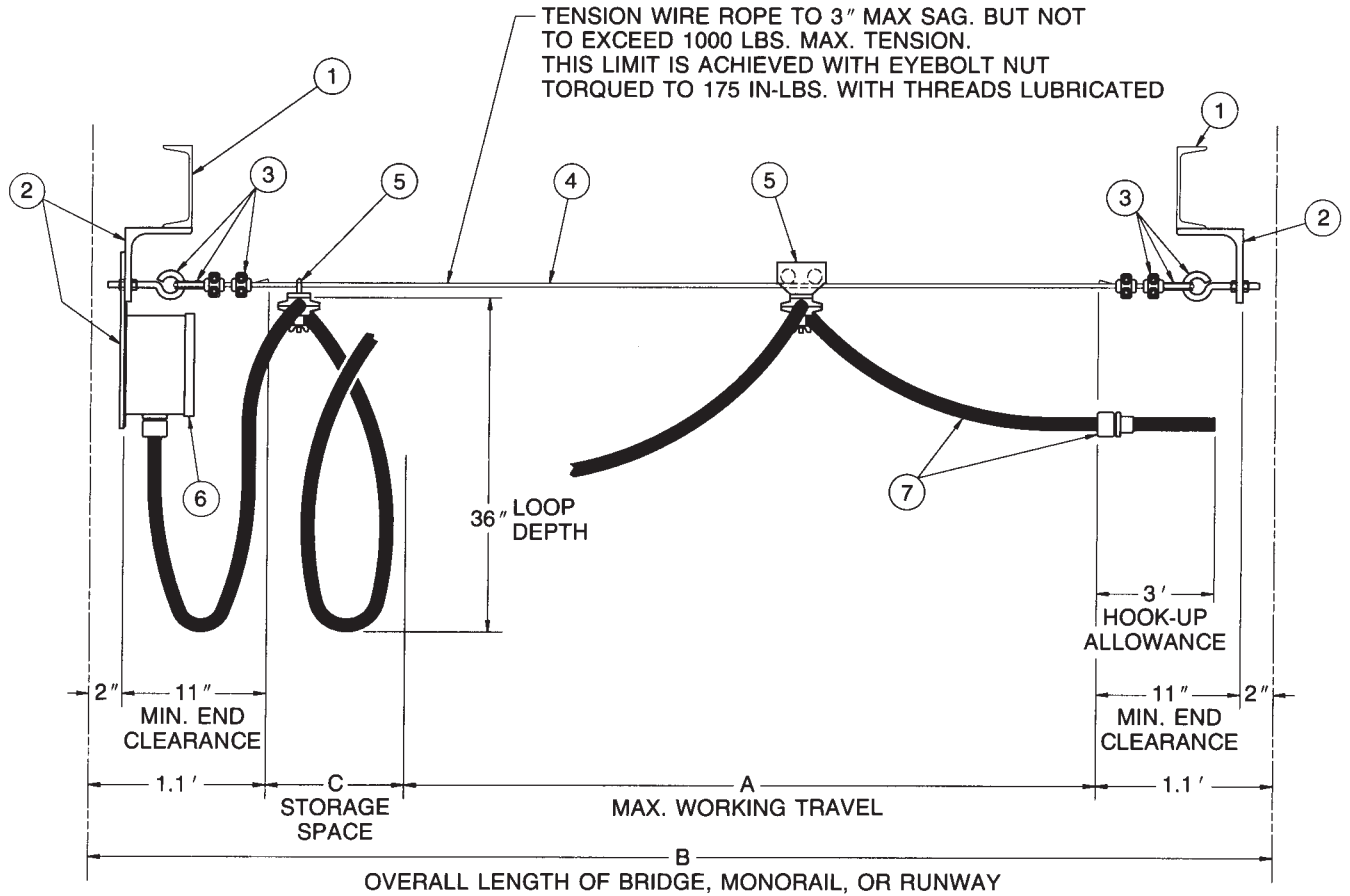
$$A \text{ (ft.)} = B - 2.2 - C$$

$$\text{MAX. CABLE WEIGHT} = 1.44 \text{ LB./FT.}$$

FIGURE 43

Light-duty, wire-supported tagline systems include end supports (item 1); support brackets (item 2); hardware parts consisting of eyebolts, clips, and thimbles (item 3); galvanized wire rope (item 4); intermediate and lead carrier trolleys (item 5); junction box (item 6); and flat cable and connectors (item 7). Maximum spacing of carrier trolleys along electrical cable length is 9 feet intervals.

CRANE AND MONORAIL ACCESSORY TYPES



$$\frac{B \text{ (ft.)} - 2.2'}{6} = \text{No. of Trolleys (N)} \text{ (Round off)}$$

$$C \text{ (ft.)} = N \times 0.33'$$

$$A \text{ (ft.)} = B - 2.2 - C$$

$$\text{MAX. CABLE WEIGHT} = 1.38 \text{ LB./FT.}$$

FIGURE 44

Light-duty, wire-supported tagline systems include end supports (item 1); support brackets (item 2); hardware parts consisting of eyebolts, clips, and thimbles (item 3); galvanized wire rope (item 4); intermediate and lead carrier trolleys (item 5); junction box (item 6); and round cable and connectors (item 7). Maximum spacing of carrier trolleys along electrical cable length is 9 feet intervals.

CRANE AND MONORAIL ACCESSORY TYPES

HEAVY-DUTY TRACK-SUPPORTED FESTOON SYSTEM

Heavy-duty, track-supported festoon systems are used to furnish electrical power and/or control circuits, as well to carry pendant-control units, to electrified cranes, crane runways, and straight monorails. Refer to Figure 45. Festoon systems use electrical cable carrier trolleys having steel wheels with ball bearings that travel on the inside surface of a formed steel track. The carrier trolleys can be loaded to a maximum load of 45 pounds each, and can accommodate up to 5 flat electrical cables up to a maximum width of 2-3/16."

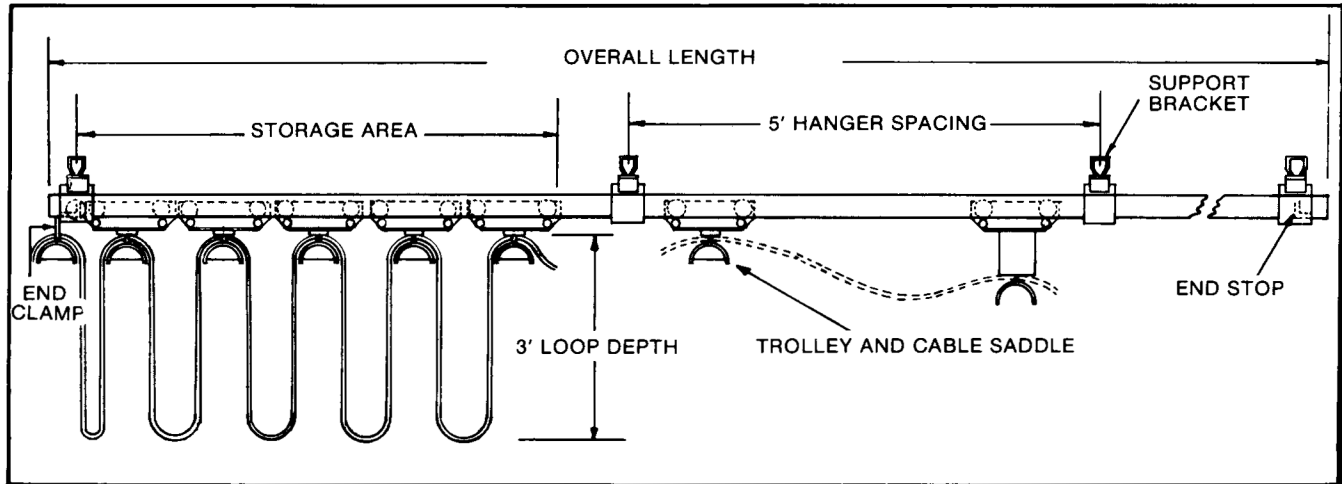


FIGURE 45

Each heavy-duty, track-supported festoon system is custom designed and assembled from various components as follows:

- 821.101 Basic track unit: Consists of one 10' length of track, three track-support assemblies, two end-stop assemblies, and one cable end clamp.
- 821.102 Track extension unit: Consists of one 10' length of track, two track-support assemblies, and one track splice assembly.
- 821.201 Standard trolley: Standard trolley has a length of 5" and consists of a trolley frame with integral bumpers and wheels, cable pad, nylon cable saddle, and hardware. Refer to Figure 46.
- 821.202 Short trolley: Standard trolley has a length of 3" and consists of a trolley frame with integral bumpers and wheels, cable pad, nylon cable saddle, and hardware. Refer to Figure 46. The short trolley is used where minimum storage space is critical.
- 821.203 Pendant support trolley: Consists of two 4-wheel trolleys, loadbar, cable saddle, and a junction box that supports the pendant control unit. Refer to Figure 47.

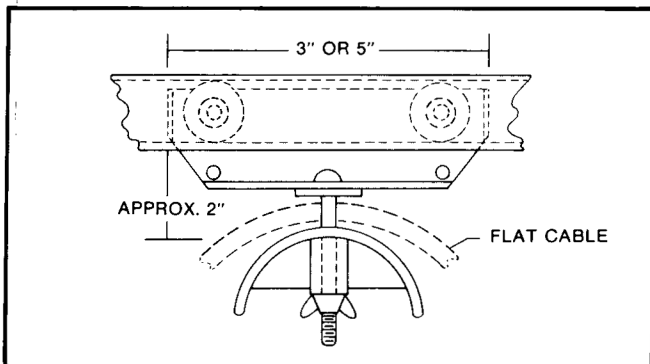


FIGURE 46

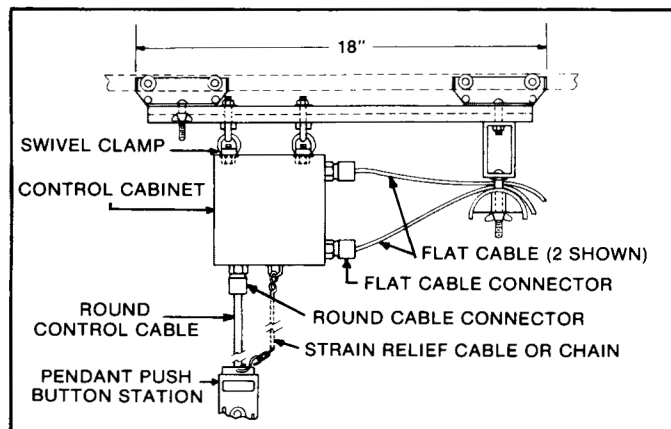


FIGURE 47

CRANE AND MONORAIL ACCESSORY TYPES

WARNING

HEAVY-DUTY, TRACK-SUPPORTED FESTOON SYSTEMS ARE DESIGNED AND INTENDED TO SUPPORT ELECTRICAL CABLE ONLY. DO NOT USE HEAVY-DUTY, TRACK-SUPPORTED FESTOON SYSTEMS TO SUPPORT OTHER ITEMS OR COMPONENTS. A MAXIMUM LOAD OF 45 POUNDS CAN BE SUPPORTED BY THE ELECTRICAL CABLE CARRIER TROLLEY.

For additional information or detailed specifications of heavy-duty track-supported festoon systems, refer to LOUDEN® catalog information, or contact Acco Chain & Lifting Products, York, Pennsylvania or the distributor of LOUDEN® products. Series 821 festoon systems are not designed for use in spark-resistant applications. For spark-resistant festoon systems, contact Acco Chain & Lifting Products, York, Pennsylvania or the distributor of LOUDEN® products.

ACCELERATION CONTROL MODULE V (ACM V)

An Acceleration Control Module V (ACM V) is furnished as a standard feature on all power-driven single-speed and two-speed cranes, steel-wheel drive trolleys, and M9 Motoveyors using a three-phase electric motor. The ACM V is a solid state device designed to provide reduced starting torque and controlled acceleration of three-phase motors. The ACM V offers a soft controlled start that reduces the swinging action of suspended loads caused by uncontrolled abrupt starts. Starting torque and acceleration rate can be adjusted to accommodate differing requirements.

INSTALLATION

PRIOR TO INSTALLING ACCESSORIES WITH CRANE OR MONORAIL:

1. Read and observe the instructions and warnings contained in this manual. Read and observe any instructions and warning tags attached to the equipment.
2. If a LOUDEN® crane is being installed as part of the total installation, read and observe the applicable instructions and warnings contained in Manual 69878, Installation, Operation, Maintenance, and Parts Manual for LOUDEN® Underhung Cranes.
3. If LOUDEN® monorail track is being installed as part of the total installation, read and observe the instructions and warnings contained in Manual 69880, Installation, Operation, Maintenance, and Parts Manual for LOUDEN® Monorail Track and Fittings.
4. If a hoist is to be installed on the crane, trolley or monorail as part of the total installation, read and observe the instructions and warnings contained in the manual furnished with the hoist. Read and observe any instructions and warning tags attached to the hoist.
5. Check for any damage to the equipment during shipment. If any damage has occurred, place a claim with the carrier. DO NOT install damaged equipment.
6. Locate any vent plugs attached to or included with the trolley drives. Remove solid shipping plug or plugs, if provided, and replace with a vent plug. Refer to the LUBRICATION section of this manual.
7. Check lubricant in trolley drive gear housing or housings. Oil level should be even with oil level plug in housing. If additional gear housing lubricant is required, refer to the LUBRICATION section of this manual. Lubricate any exposed gears and pinions on the trolley drives with the open gear lubricant supplied with the trolley.
8. Remove drain plug, if provided, from the lowest position of the trolley drive motor. This will allow moisture to escape so that it does not condense and accumulate inside the motor housing.
9. Check that the monorail, and other supporting structure where the crane or trolley will be installed has a load rating capable to handle loads equal to the rated load capacity of the crane or trolley.

INSTALLATION

10. Check that runway or monorail stops are installed, or install runway or monorail stops, at the open end or ends of the runway or monorail to prevent the crane and trolleys from traveling off the runway or monorail beam. Runway stops that engage crane end truck or trolley wheels are not recommended. Check that runway or monorail stops will prevent overhanging parts of the crane, hoist, or trolley from interfering with other equipment beyond the ends of the runway or monorail.
11. Warning signs and barriers shall be utilized on the floor area beneath the runway where a crane or crane accessories will be installed; and beneath a monorail where trolleys, hoists, and other accessories will be installed.

DANGER

12. THE MAIN SWITCH (DISCONNECT) SUPPLYING POWER TO THE RUNWAY OR MONORAIL SHALL BE DE-ENERGIZED. LOCK AND TAG THE MAIN SWITCH IN THE DE-ENERGIZED POSITION IN ACCORDANCE WITH ANSI Z244.1.

13. If a crane, hoist, trolley, or accessory is to be installed on an existing runway or monorail, and the crane runway or monorail remains energized because of other equipment operating on the same runway or monorail; stops or a signal person(s), located full-time at a visual vantage point for observing the approach of an active crane(s) or trolley(s), shall be provided to prohibit contact by the active crane(s) or trolley(s) with the crane, trolley, or accessory being installed, or crane or trolley where accessories are being installed, and personnel involved in installing the crane, trolley, or other accessories. HOWEVER,

DANGER

AFTER THE CRANE HAS BEEN POSITIONED ON THE RUNWAY, OR TROLLEY POSITIONED ON THE RUNWAY, OR ACCESSORY INSTALLED, AND PRIOR TO CONNECTING THE CRANE, TROLLEY, OR ACCESSORY TO THE RUNWAY OR MONORAIL ELECTRIFICATION, THE MAIN SWITCH (DISCONNECT) SUPPLYING POWER TO THE RUNWAY OR MONORAIL SHALL BE DE-ENERGIZED. LOCK AND TAG THE MAIN SWITCH IN THE DE-ENERGIZED POSITION IN ACCORDANCE WITH ANSI Z244.1.

14. If personnel will be required to work on the crane runway during installation, a guard or barrier shall be installed between adjacent runways for the length of the established work area to prevent contact between persons performing installation and a crane on the adjacent runway.
15. If personnel are required to work at elevations in excess of 6 feet above floor or ground level, a fall prevention policy and procedure shall be developed, documented, and implemented prior to installation being started.
16. Check power supply that will be furnished to the crane, trolleys, or hoist. It must be the same as shown on the crane, trolley, or hoist serial plate.
 - a. Standard trolley drive single-speed motors are reconnectable for 208/230 volt or 460 volt, three-phase, 60 Hz. operation. Such motors and control will be connected at the factory for 460 volt unless otherwise specified.
 - b. All two-speed motors, 200 volt single-speed motors, and 575 volt single-speed motors are single voltage motors, and are not reconnectable.
 - c. If the power supply that will be furnished to the trolley is not the same as shown on the trolley serial plate for two-speed, 200 volt single-speed, and 575 volt single-speed trolleys; DO NOT INSTALL. Contact Acco Chain & Lifting Products or the distributor of the equipment.
 - d. If reconnection of a 230/460 volt motor is required, proceed as follows:
 - (1) If crane, monorail, or trolley is connected to the main power supply, de-energize, lock, and tag the main switch (disconnect) in accordance with step 12 of "PRIOR TO INSTALLING ACCESSORIES WITH CRANE OR MONORAIL" instructions.

INSTALLATION

- (2) Reconnect the control circuit transformer, located inside the control enclosure. Connection instructions are located on the transformer and in the ELECTRICAL COMPONENTS section of this manual.
 - (3) Reconnect the trolley drive motor leads, and trolley drive motor brake leads located inside the trolley motor junction box. Connection instructions are located in the ELECTRICAL COMPONENTS section of this manual.
 - (4) If the trolley is equipped with optional motor circuit fuses or overload relays sized for the original connection voltage, they must be replaced with ones properly sized for the reconnected voltage.
 - (5) If the trolley is equipped with other optional features effected by power supply voltage, reconnect as per instructions included on the component or other sections of the manual.
17. Conductors supplying power to the crane, monorail and associated equipment must be sized to maintain the operating voltage at the crane, monorail, or trolley at plus or minus 10% of the nominal operating voltage at all times. Standard nominal operating voltages are 200, 208, 230, 460, and 575 volts.
 18. Conductors supplying power to the crane, monorail and associated equipment must be protected against short circuit and overcurrent conditions in compliance with ANSI/NFPA 70, National Electrical Code. These requirements are listed in Article 610 and are the responsibility of the owner/user. It is also the responsibility of the owner/user to insure that all protective devices and associated wiring comply with applicable Federal, State, and Local Codes.
 19. Every LOUDEN® trolley is fully assembled at the factory prior to shipment. Some trolleys are disassembled to facilitate shipment, but the original assembly assures that all parts fit and that the trolley is complete. General trolley shipping practices are as follows:
 - a. Motor driven trolleys are normally shipped partially disassembled.
 - b. Trolley drive units for steel-wheel drive trolleys are shipped loose with four-wheel loadbar or end truck packages, or attached to the four-wheel drive trolley assembly with eight-wheel loadbar or end truck packages.
 - c. Idler trolleys are attached to four-wheel loadbar or end truck packages, and shipped loose with eight-wheel loadbar or end truck packages.
 - d. For double-girder trolleys, end trucks are normally attached to the hoist trolley frame unless the overall truck length exceeds eight feet.
 - e. Collector brackets are normally shipped loose.
 20. Check and confirm that all components and items have been received. If any items are missing, contact Acco Chain & Lifting Products or the distributor of the crane or accessory.
 21. Place crane, crane components, trolleys, and accessories in correct position directly below the crane runway or monorail. Verify that crane electrification and runway electrification are properly positioned.
 22. If a crane is being installed, check that runway centers and crane span are correct.
 23. Rotate all end truck and trolley wheels by hand to check for possible damage during shipment. Check for rough bearings, loose bearings, and loose axles. Do not install a damaged crane or trolley. Replace damaged parts and file a claim with the carrier.

INSTALLING SINGLE GIRDER HAND-PROPELLED TROLLEYS:

This installation section covers LOUDEN® Series 400 standard catalog trolleys. These trolleys include two-wheel, four-wheel, and eight-wheel for assembly at the job site with a customer/user provided loadbar, hook-mounted hoist, or other carrier. Trolleys may have standard fittings, or may be supplied less fitting, as per order specifications.

1. For installation of the following trolleys:
For 2.0" flange width *SuperTrack™* with 3" or 4" diameter wheels;
For 3.33" flange width *SuperTrack™* with 3" diameter wheels; and
For 3.33" flange width *SuperTrack™* and *TrojanTrack™* 4" or 4½" diameter wheels.

Remove end stop from monorail or bridge girder and guide the entire trolley onto the track. After installing the trolleys on the monorail or bridge girder, re-install end stop on the monorail or bridge girder.

If an open end of monorail or bridge girder is not available for guiding trolleys onto the rail, remove one wheel and axle assembly from each two-wheel trolley. Place the other wheel or wheels, still assembled to the trolley or trolleys on the rail and replace the wheel and axle assembly or assemblies to the trolley or trolleys.

INSTALLATION

NOTICE

ANY TROLLEYS WITH RESTRAINING LUGS WELDED TO THE TWO-WHEEL TROLLEY YOKE MUST BE INSTALLED BY GUIDING THE TROLLEYS ONTO THE END OF THE RAIL. FOR TROLLEYS WITH RESTRAINING LUGS BOLTED TO THE LOADBAR, THE LUGS MAY BE REMOVED FOR INSTALLATION OF THE TROLLEY ONTO THE RAIL, THEN REPLACED.

If trolleys are two-wheel less fitting, a hardened steel washer and bronze washer are wired to the trolley yoke for shipment. Remove the washers from the yoke, coat the bronze washer with Lubriplate 630-AA or 630-2 and seat the washers on the trolley yoke with the hardened steel washer on top of the bronze washer.

2. For installation of *TrojanTrack*™ trolleys with 9" diameter wheels.

Remove end stop from monorail or bridge girder and guide the entire trolley onto the track. After installing the trolleys on the monorail or bridge girder, re-install end stop on the monorail or bridge girder.

If an open end of monorail or bridge girder is not available for guiding trolleys onto the rail, remove one sideplate from each two-wheel trolley, keeping wheel assemblies intact. Place the trolley sideplate, with wheel assembly intact, on the rail. Replace the sideplate that was originally removed.

INSTALLING SINGLE GIRDER SERIES 200 HOIST TROLLEYS:

Hoists may be shipped direct to job site by the hoist supplier. If so, the owner/user or electrical contractor is responsible to make any necessary connections to related equipment and provide any incidental material. Installation must be in compliance with ANSI/NFPA 70, National Electrical Code. These requirements are listed in Article 610 and are the responsibility of the owner/user or electrical contractor. It is also the responsibility of the owner/user or electrical contractor to insure that all protective devices and associated wiring comply with applicable Federal, State, and Local Codes.

Instructions for installing hoist trolleys are outlined below. Follow step 1 according to the type and style of trolleys specified. Steps 2 through 7 apply to any trolley.

1. Remove trolleys from loadbars. Install trolleys on the monorail in the same relative position that the trolley was oriented on the floor, as follows:

IDLER TROLLEYS - SUPERTRACK HOIST TROLLEYS (4 INCH AND 4½ INCH DIAMETER WHEELS)

- a. Four-wheel hoist trolleys have two-wheel trolleys at each end of the loadbar. Disassemble trolleys from the loadbar by removing the bolt and spacer that passes through the trolley yoke above the loadbar. Remove end stops from the monorail or bridge girder and guide the trolleys onto the monorail or bridge girder. After installing the trolleys on the rail, re-install end stops on the monorail or bridge girder.

If an open end of monorail or bridge girder is not available for guiding the trolleys onto the rail, remove one wheel and axle assembly from the trolley. Place the other wheel, still assembled to the trolley, on the monorail or bridge girder and replace the wheel and axle assembly to the trolley.

NOTICE

ANY TROLLEYS WITH RESTRAINING LUGS WELDED TO THE TWO-WHEEL TROLLEY YOKE MUST BE INSTALLED BY GUIDING THE TROLLEYS ONTO THE END OF THE RAIL. FOR TROLLEYS WITH RESTRAINING LUGS BOLTED TO THE LOADBAR, THE LUGS MAY BE REMOVED FOR INSTALLATION OF THE TROLLEY ONTO THE RAIL, THEN REPLACED.

Bronze washers are to be coated with Lubriplate 630-AA or 630-2 and seated on the trolley yoke with the hardened steel washer on top of the bronze washer. Trolleys can be reassembled to the loadbar when the hoist and loadbar assembly are lifted into position at final assembly.

INSTALLATION

- b. Eight-wheel hoist trolleys have four-wheel trolleys with eye fittings at each end of the loadbar. Trolleys are shipped loose. Remove end stops from the monorail or bridge girder and guide the trolleys onto the monorail or bridge girder. After installing the trolleys on the rail, re-install end stops on the monorail or bridge girder.

If an open end of monorail or bridge girder is not available for guiding the trolleys onto the rail, remove one wheel and axle assembly from the trolley. Place the other wheel or wheels, still assembled to the trolley or trolleys, on the monorail or bridge girder and replace the wheel and axle assembly or assemblies to the trolley or trolleys.

Trolleys can be reassembled to the loadbar when the hoist and loadbar assembly are lifted into position at final assembly.

IDLER TROLLEYS - TROJANTRACK HOIST TROLLEYS (9 INCH DIAMETER WHEELS)

Eight-wheel hoist trolleys have four-wheel trolleys with eye fittings at each end of the loadbar. Trolleys are shipped loose. Remove end stops from the monorail or bridge girder and guide the trolleys onto the monorail or bridge girder. After installing the trolleys on the rail, re-install end stops on the monorail or bridge girder.

If an open end of runway monorail is not available for guiding the trolleys onto the monorail or bridge girder, remove one trolley sideplate with the wheel assembly intact. Place the other trolley sideplate, with wheel assembly intact, on the monorail or bridge girder and replace the trolley sideplate that was originally disassembled.

Trolleys can be assembled to the loadbar when the hoist and loadbar are lifted into position at final assembly.

STEEL-WHEEL DRIVE UNIT TROLLEYS (4½ INCH DIAMETER WHEELS ONLY)

- a. Steel-wheel trolley drive units are shipped loose with four-wheel load-bar packages. Remove end stops from the monorail or bridge girder and guide the steel-wheel trolley drive assembly onto the monorail or bridge girder. After installing the steel-wheel trolley drive on the monorail or bridge girder, re-install end stops on the monorail or bridge girder.

If an open end of monorail or bridge girder is not available for guiding the steel-wheel trolley drive onto the rail, remove the plain sideplate with the geared wheel assembly intact. Place the drive side of the unit on the rail and replace the plain sideplate, without replacing the two 5/8 inch bolts and spacers. These bolts and spacers are to be replaced at final assembly of hoist trolley.

NOTICE

ANY IDLER TROLLEYS WITH RESTRAINING LUGS WELDED TO THE TWO-WHEEL TROLLEY YOKE MUST BE INSTALLED BY GUIDING THE TROLLEYS ONTO THE END OF THE RAIL. FOR TROLLEYS WITH RESTRAINING LUGS BOLTED TO THE LOADBAR, THE LUGS MAY BE REMOVED FOR INSTALLATION OF THE TROLLEY ONTO THE RAIL, THEN REPLACED.

Bronze washers are to be coated with Lubriplate 630-AA or 630-2 and seated on the trolley yoke with the hardened steel washer on top of the bronze washer.

Steel-wheel trolley drive unit and idler trolleys can be reassembled to the loadbar when the hoist and loadbar assembly are lifted into position at final assembly.

- b. Steel-wheel trolley drive units are attached to the four-wheel drive trolley assembly with an eye fitting with eight-wheel loadbar packages. Trolleys are shipped loose. Remove end stops from the monorail or bridge girder and guide the assembly onto the monorail or bridge girder. After installing the trolleys on the monorail or bridge girder, re-install end stops on the monorail or bridge girder.

If an open end of monorail or bridge girder is not available for guiding the trolleys onto the rail, remove the plain sideplate with the geared wheel assembly intact from the steel-wheel drive unit, and one wheel and axle assembly from the idler trolley, on the same side as the plain sideplate of the steel-wheel drive trolley. Place the drive side wheels of the unit on the rail and replace the wheel and axle assembly to the idler trolley, and plain sideplate to the steel-wheel drive unit, without replacing the two 5/8 inch bolts and spacers. These bolts and spacers are to be replaced at final assembly of hoist trolley.

INSTALLATION

NOTICE

ANY IDLER TROLLEYS WITH RESTRAINING LUGS WELDED TO THE TWO-WHEEL TROLLEY YOKE MUST BE INSTALLED BY GUIDING THE TROLLEYS ONTO THE END OF THE RAIL. FOR TROLLEYS WITH RESTRAINING LUGS BOLTED TO THE LOADBAR, THE LUGS MAY BE REMOVED FOR INSTALLATION OF THE TROLLEY ONTO THE RAIL, THEN REPLACED.

Trolleys can be reassembled to the loadbar when the hoist and loadbar assembly are lifted into position at final assembly.

2. Assemble the hoist to the loadbar if not already assembled. Use mounting pins, cotter pins, bolts, etc. provided with the loadbar package.
3. Lift the hoist and loadbar assembly into position and attach to trolley yokes or eye fittings, as follows:
 - a. For four-wheel hoist trolleys:
Lift hoist and loadbar assembly as close to rail as possible;
Move idler trolleys and/or steel-wheel drive unit in under loadbar from each end. Lower loadbar down onto trolleys;
Secure trolleys in place with previously removed bolts and spacers.
 - b. For eight-wheel hoist trolleys:
Locate four-wheel trolleys on rail so that eye fittings are directly over pin mounting holes in the loadbar;
Lift hoist and loadbar assembly up to the trolleys, aligning pin mounting holes with eye fittings;
Secure the loadbar to trolleys with mounting pins provided with the loadbar package.
4. Make sure all hoist and loadbar assembly bolts are in place and are tight. Make sure all mounting pins and cotter pins are installed properly.
5. If a power-operated hoist is used on the monorail, and rail electrification is provided through collectors, check that collectors are positioned for proper contact with conductors.

SPRING LOADED COLLECTORS - Set midway between free state and collapsed state.

TOW TYPE COLLECTORS - Make sure they are properly seated and towing harness is not fouled.

6. If trolley bumpers are provided, check that they meet stops on monorail or bridge girder, and reposition stops if necessary.
7. Check that end stops are installed on all open ends of the monorail or bridge girder.

INSTALLING DOUBLE GIRDER SERIES 200 HOIST TROLLEYS:

Hoists may be shipped direct to job site by the hoist supplier. If so, the owner/user or electrical contractor is responsible to make any necessary connections to related equipment and provide any incidental material. Installation must be in compliance with ANSI/NFPA 70, National Electrical Code. These requirements are listed in Article 610 and are the responsibility of the owner/user or electrical contractor. It is also the responsibility of the owner/user or electrical contractor to insure that all protective devices and associated wiring comply with applicable Federal, State, and Local Codes.

Some double-girder hoist trolleys may be disassembled for shipment. Drive components and various subassemblies may be shipped loose, but are match-marked for re-assembly. Refer to the LOUDEN® match-mark print for re-assembly at the job site.

Instructions for installing double-girder hoist trolleys are outlined below. Follow step 1 according to the type and style of end truck trolley specified. Steps 2 through 9 apply to any trolley.

1. Remove trolleys from end trucks. Install trolleys on the bridge girders in the same relative position that the trolley was oriented on the floor, as follows:

IDLER TROLLEYS - SUPERTRACK TRUCKS (4½ INCH DIAMETER WHEELS)

INSTALLATION

- a. Four-wheel end trucks have two-wheel trolleys at each end of the truck. Disassemble trolleys from the truck loadbar by removing the bolt and spacer that passes through the trolley yoke above the loadbar. Remove end stops from the bridge girders and guide the trolleys onto the bridge girder. After installing the trolleys on the girders, re-install end stops on the bridge girder.

If open ends of bridge girders are not available for guiding the trolleys onto the girders, remove one wheel and axle assembly from the trolley. Place the other wheel, still assembled to the trolley, on the girders and replace the wheel and axle assembly to the trolley.

Bronze washers are to be coated with Lubriplate 630-AA or 630-2 and seated on the trolley yoke with the hardened steel washer on top of the bronze washer. Trolleys can be reassembled to the truck loadbar when the hoist trolley frame and end trucks are lifted into position at final assembly.

- b. Eight-wheel end trucks have four-wheel trolleys at each end of the truck. Trolleys are shipped loose, and saddle plates are bolted to the end truck channels. Saddle plates rest on top of the four-wheel trolley loadbars. Disassemble saddle plate from end truck channels. Check bronze washers. Bronze washers are to be coated with Lubriplate 630-AA or 630-2 and seated on the trolley loadbar. Place saddle plate on loadbar. Remove end stops from the bridge girders and guide the trolleys onto the girders. After installing the trolleys on the girders, re-install end stops on bridge girders.

If open ends of bridge girders are not available for guiding the trolleys onto the girders, remove one wheel and axle assembly from each trolley. Place the other wheels, still assembled to the trolleys, on the girders and replace the wheel and axle assemblies to the trolleys.

Trolleys and saddle plates can be reassembled to the end truck when the hoist trolley frame and end trucks are lifted into position at final assembly.

IDLER TROLLEYS - TROJANTRACK END TRUCKS (9 INCH DIAMETER WHEELS)

- a. Four-wheel end trucks have two-wheel trolleys at each end of the truck. Each trolley has a grounding cable that is attached to an end truck channel. Disassemble trolley and adapter assemblies from the end truck channels. Remove end stops from the bridge girders and guide the trolleys onto girders. After installing the trolley and adapter assemblies on the girders, re-install end stops on the bridge girders.

If open ends of bridge girders are not available for guiding the trolleys onto the girders, remove one trolley sideplate with the wheel assembly intact. Place the other trolley sideplate, with wheel assembly intact, on the girder and replace the trolley sideplate that was originally disassembled.

Trolleys and adapters can be reassembled to the end truck when the hoist trolley frame and end trucks are lifted into position at final assembly.

- b. Eight-wheel end trucks have four-wheel trolleys at each end of the truck. Trolleys are shipped loose, and saddle plates are bolted to the end truck channels. Saddle plates rest on top of the four-wheel trolley loadbars. Disassemble saddle plate from end truck channels. Check bronze washers. Bronze washers are to be coated with Lubriplate 630-AA or 630-2 and seated on the trolley loadbar. Place saddle plate on loadbar. Remove end stops from the bridge girders and guide the trolleys onto the girders. After installing the trolleys on the girders, re-install end stops on bridge girders.

If open ends of bridge girders are not available for guiding the trolleys onto the girders, remove one trolley sideplate with the wheel assembly intact. Place the other trolley sideplate, with wheel assembly intact, on the girder and replace the trolley sideplate that was originally disassembled.

Trolleys and saddle plates can be reassembled to the end truck when the hoist trolley frame and end trucks are lifted into position at final assembly.

STEEL-WHEEL DRIVE UNIT TROLLEYS (4½ INCH DIAMETER WHEELS ONLY)

- a. Steel-wheel trolley drive units are shipped loose with four-wheel end truck packages. Remove end stops from the bridge girders and guide the steel-wheel trolley drive assembly onto the girders. After installing the steel-wheel trolley drive on the girders, re-install end stops on the bridge girder.

If open ends of bridge girders are not available for guiding the steel-wheel trolley drive onto the girders, remove the plain sideplate with the geared wheel assembly intact. Place the drive side of the unit on the girders and replace the plain sideplate, without replacing the two 5/8 inch bolts and spacers. These bolts and spacers are to be replaced at final assembly of hoist trolley.

INSTALLATION

Bronze washers are to be coated with Lubriplate 630-AA or 630-2 and seated on the trolley yoke with the hardened steel washer on top of the bronze washer.

Steel-wheel trolley drive unit and idler trolleys can be reassembled to the end truck when the hoist trolley frame and end trucks are lifted into position at final assembly.

- b. Steel-wheel trolley drive units are attached to the four-wheel drive trolley assembly with eight-wheel end truck packages. Trolleys are shipped loose and saddle plates are bolted to the end truck channels. Saddle plates rest on top of the four-wheel trolley loadbars. Disassemble saddle plate from end truck channels. Check bronze washers. Bronze washers are to be coated with Lubriplate 630-AA or 630-2 and seated on the trolley loadbar. Place saddle plate on loadbar. Remove end stops from the bridge girders and guide the assembled trolleys and saddle plates onto the girders. After installing the trolleys and saddle plates on the girders, re-install end stops on bridge girders.

If open ends of bridge girders are not available for guiding the trolleys and saddle plates onto the girders, remove the plain sideplate with the geared wheel assembly intact from the steel-wheel drive unit, and one wheel and axle assembly from the idler trolley, on the same side as the plain sideplate of the steel-wheel drive trolley. Place the drive side wheels of the unit on the girder and replace the wheel and axle assembly to the idler trolley, and plain sideplate to the steel-wheel drive unit, without replacing the two 5/8 inch bolts and spacers. These bolts and spacers are to be replaced at final assembly of hoist trolley.

Trolleys and saddle plates can be reassembled to the end truck when the hoist trolley frame and end trucks are lifted into position at final assembly.

2. Assemble the end trucks to the hoist trolley frame if not already assembled.
3. Mount hoist to trolley frame if not already mounted.
4. Lift the hoist trolley assembly and end trucks into position and attach to trolley yokes or saddle plates, as follows:
 - a. Disassemble restraining lugs from end trucks.
 - b. For trolleys with rubber tire drives, lower the drive tires to a point where the top surface of the tire will be approximately 2 inches below bridge girder (approximately level with the bottom of the end truck channel).
 - c. Lift entire hoist trolley assembly as close to bridge girder rails as possible. Move idler trolleys and/or steel-wheel drive unit in under end trucks from each end. Lower trolley assembly down onto trolleys or loadbars.
 - d. Secure trolleys in place with previously removed bolts.
 - e. Reinstall restraining lugs.
5. Make sure all hoist trolley assembly bolts are in place and are tight.
6. For hoist trolley with drive tires only:
 - a. Raise drive tires to bottom surface of bridge girders. Make sure that tires have equal pressure against bottom surface of girders.
 - b. Adjust drive tires against bottom surface of bridge girders. Adjust just enough so that tire will not slip when operating at full load. Tire slippage will accelerate tire wear; however, excessive tightening will place excessive loads on motors, shafts, bearings, and wheels.
 - c. Check that drive shaft couplings are tight and that keys are in place.
7. If a power-operated hoist is used on the trolley, and bridge electrification is provided through collectors, check that collectors are positioned for proper contact with conductors.

SPRING LOADED COLLECTORS - Set midway between free state and collapsed state.

TOW TYPE COLLECTORS - Make sure they are properly seated and towing harness is not fouled.

8. If end truck bumpers are provided, check that they meet stops on bridge girders, and reposition stops if necessary.
9. Check that end stops are installed on all open ends of the bridge girders.

INSTALLATION

INSTALLING SERIES 300 HOIST MOTOVEYORS:

1. Check Motoveyor assembly with respect to related equipment, making sure the Motoveyor is oriented in the proper direction.
2. Lower the drive tire to a point where the top surface of the tire will be approximately 2 inches below monorail or bridge girder.

Remove end stops from the monorail or bridge girder and guide the Motoveyor assembly onto the girders. After installing the Motoveyor on the rail, re-install end stops on the monorail or bridge girder.

If open ends of monorail are not available for guiding the Motoveyor onto the monorail, a track section of the monorail can be removed, the Motoveyor guided onto the track section, and the track section located back in place in the monorail system.

If open ends of monorail or bridge girder are not available for guiding the Motoveyor onto the rail, or a track section of the monorail cannot be removed for guiding the Motoveyor onto the rail; remove one wheel assembly, yoke spacer, and bolt from each yoke. Raise the Motoveyor to the track and sit the wheel flanges on the rail operating flange. Replace the wheel assemblies and lower the Motoveyor onto the rail. Replace the yoke spacers and bolts.

3. Check that bronze thrust bearing, if furnished, seats on the trolley yoke with the special washer on top of bronze thrust bearing.
4. Check motor and tire rotation before the tire is adjusted against the bottom of the track rail.

To check Motoveyor motion direction or Motoveyor drive motor phasing:

MOMENTARILY activate one button or lever of the Motoveyor control device and observe the direction of Motoveyor tire motion. If direction of travel agrees with the direction marking of the Motoveyor control device activated (i.e., Motoveyor direction is EAST when the Motoveyor EAST control device is activated), Motoveyor motor is properly phased. If the direction of Motoveyor travel does not agree with the direction marking of the Motoveyor control device activated (i.e., Motoveyor direction is WEST when the Motoveyor EAST control device is activated), Motoveyor motor is improperly phased and must be corrected. DO NOT USE MOTOVEYOR until motor phasing is corrected.

WARNING

DO NOT OPERATE MOTOVEYOR IF DIRECTION OF MOTOVEYOR MOTION DOES NOT AGREE WITH THE DIRECTION MARKING ON THE MOTOVEYOR CONTROL DEVICE ACTIVATED.

WARNING

DO NOT ATTEMPT TO CORRECT AN IMPROPERLY PHASED MOTOVEYOR BY CHANGING ANY WIRING IN THE MOTOVEYOR CONTROL DEVICE OR AT THE MOTOVEYOR CONTACTORS; OR BY CHANGING THE MARKINGS ON THE MOTOVEYOR CONTROL DEVICE.

To correct Motoveyor motor phasing:

DANGER

a. DISCONNECT POWER AND LOCKOUT DISCONNECTING MEANS BEFORE RECONNECTING (REVERSING) POWER LINES TO MOTOVEYOR.

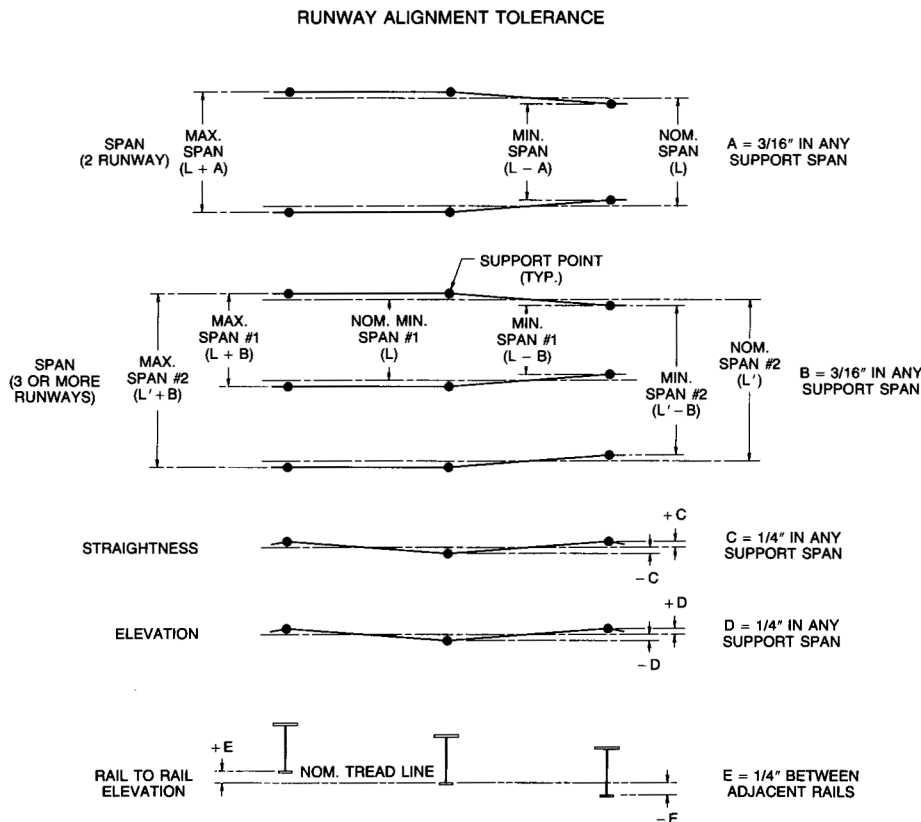
b. Only a qualified electrician should reconnect the power lines to the Motoveyor.

INSTALLATION

- c. Interchange any two lines supplying power to the Motoveyor motor only. DO NOT reverse main power leads to the crane or monorail system as this will also effect the phasing of other motors in the system (i.e. hoist motors).
 - d. Re-energize power supply to the Motoveyor.
 - e. Re-check Motoveyor travel for correct Motoveyor motion. If direction of Motoveyor travel agrees with the direction marking of the Motoveyor control device activated (i.e., Motoveyor direction is EAST when the Motoveyor EAST control device is activated), Motoveyor motor is properly phased. If the direction of Motoveyor travel does not agree with the direction marking of the Motoveyor control device activated (i.e., Motoveyor direction is WEST when the Motoveyor EAST control device is activated), Motoveyor motor is improperly phased and must be corrected by repeating steps a through e.
5. Check oil level in gear housing. Oil must be level with the oil level plug hole. Refer to Figure 17. Refer to LUBRICATION section of this manual.
 6. Check the split-taper bushing, if furnished, for tightness. Tighten the three bolts, tap bushing solidly with a hammer, and re-tighten bolts.
 7. Connect drawbar to hoist or trolley frame. Lubricate connections for initial start-up with Lubriplate 630-AA or 630-2.
 8.
 - a. Raise drive tire to bottom surface of monorail or bridge girder.
 - b. Adjust drive tire against bottom surface of monorail or bridge girder. Adjust just enough so that tire will not slip when operating at full load. Tire slippage will accelerate tire wear; however, excessive tightening will place excessive loads on motors, shafts, bearings, and wheels. Also, a tire with excessive tightening will prevent proper cornering on curves, and will cause excessive kick-up forces at switches and lift sections.
 9. Check operation of ACM V, if furnished, and adjust as required. Refer to ACCELERATION CONTROL MODULE V section of this manual.

INSTALLING SERIES 500 SPUR TRACK SUPPORTS, TRANSFER SECTIONS, AND LATCHES:

1. Install spur track supports and transfer sections in accordance with job specifications. Refer to Figures 18 through 23.



INSTALLATION

2. A maximum clearance of 1/4 inch between the operating flange of adjacent crane bridge girder ends should be provided between two cranes on parallel runways that are designed for interlocking and transfer of the trolley or carrier.
3. Track straightness and elevation shall not exceed the tolerances shown in Figure 48.
4. Runway track straightness and elevation, and runway span center-to-center distance shall not exceed the tolerances shown in Figure 48.
5. The maximum gap between the operating flange of adjacent track ends for transfer and interlocking cranes, spur tracks, and fixed transfer sections should not exceed 1/4 inch.
6. Interlock mechanisms should limit misalignment at joints between the operating flange of adjacent track ends to a maximum of 1/8 inch.

NOTICE

ALL CLEARANCES AND TOLERANCES APPLY TO MONORAIL TRACK THAT HAS BEEN COMPLETELY INSTALLED AND ADJUSTED. FOR ADDITIONAL INFORMATION ON CLEARANCES AND TOLERANCES, REFER TO MANUAL 69880, INSTALLATION, OPERATION, MAINTENANCE, AND PARTS MANUAL FOR LOUDEN® MONORAIL TRACK AND FITTINGS.

MOTOR-OPERATED LATCH AND BLOCK ADJUSTMENT

1. Refer to Figure 49.

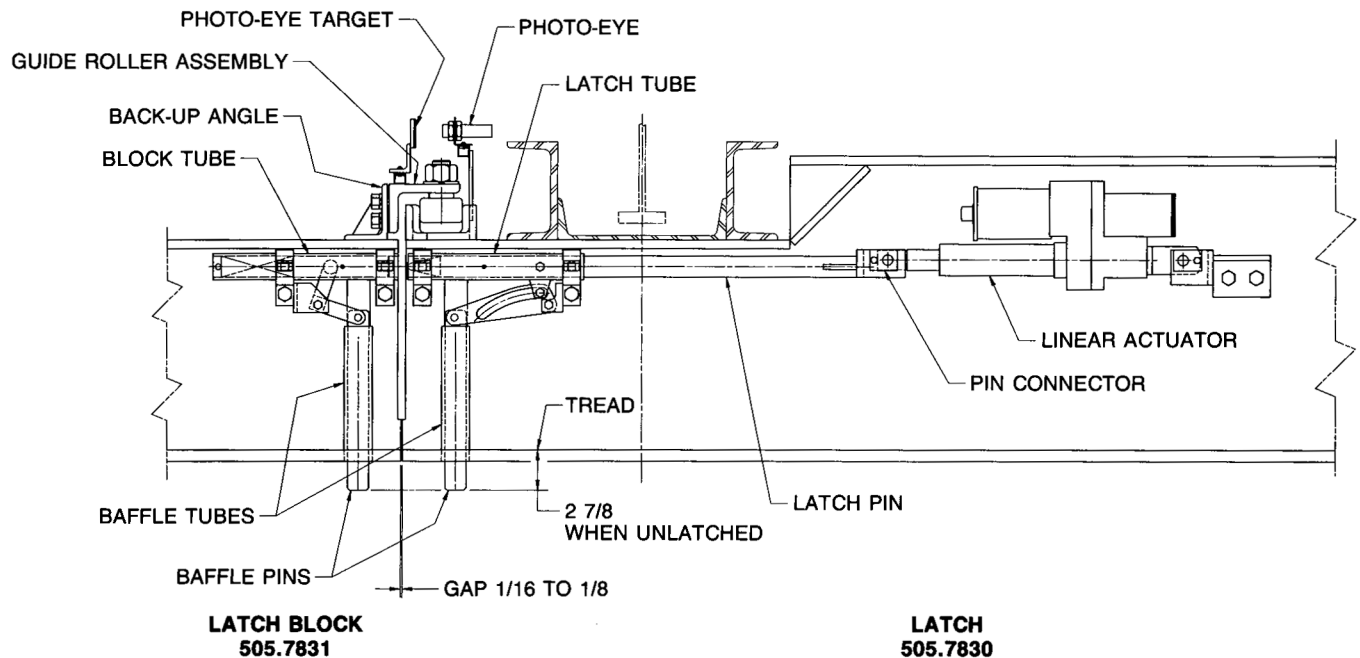


FIGURE 49

2. Move the crane into latching position with the spur track or adjacent latching crane. Check that rail treads are laterally aligned. If necessary, correct lateral alignment as required. Check vertical alignment of rail treads. If necessary, shim runway connection and/or bridge girder to end truck connection, until both rails are level.
3. Disconnect the latch pin from the linear actuator by removing the pin connector. Attempt to slide (throw) the latch pin by hand into the block tube. If the latch pin binds in the block tube, correct the vertical or lateral misalignment by adding or removing shims between the latch tube or latch block and the track web and/or underside of the top flange. Applying grease to the latch pin will also decrease the required latching force.

INSTALLATION

Lubriplate 630-AA or 630-2 or equivalent is recommended. When the latch pin can be thrown into and removed from the latch tube with minimal force, and treads are vertically and laterally aligned, this step is completed.

4. Check the horizontal gap between adjacent rails at tread level. The gap should be 1/16" to 1/8". If the gap requires adjustment, add or remove shims from between the guide roller assembly and the back-up angle. In most conditions, shims will have to be removed.
5. With the latch pin thrown, check the vertical and lateral alignment of the bridge conductors. If vertical misalignment exceeds 1/16", shim for proper alignment. For LOUDEN® conductors, the horizontal gap between transfer insulators should be 3/8" to 1/2". For other conductors, refer to applicable instructions.
6. Reconnect the latch pin to the linear actuator.
7. The linear actuator portion of the latch assembly has internal limit switches to limit travel in both the latched and unlatched positions. Before adjusting linear actuator limit switches, verify that electrical power is removed and:

⚠ DANGER

THE MAIN SWITCH (DISCONNECT) SUPPLYING POWER TO THE RUNWAY, CRANE, OR RAIL SHALL BE DE-ENERGIZED. LOCK AND TAG THE MAIN SWITCH IN THE DE-ENERGIZED POSITION IN ACCORDANCE WITH ANSI Z244.1.

8. With the latch in the LATCHED position (linear actuator extended), and both baffle pins completely retracted, refer to Figure 50 and adjust the LATCH limit switch by removing nut restrainer A and rotating nut actuator C until it actuates the LATCH limit switch. When the limit switch actuates, it will emit an audible "click"; or an ohmmeter or continuity tester can be used to determine when the limit switch actuates. Replace nut restrainer A.

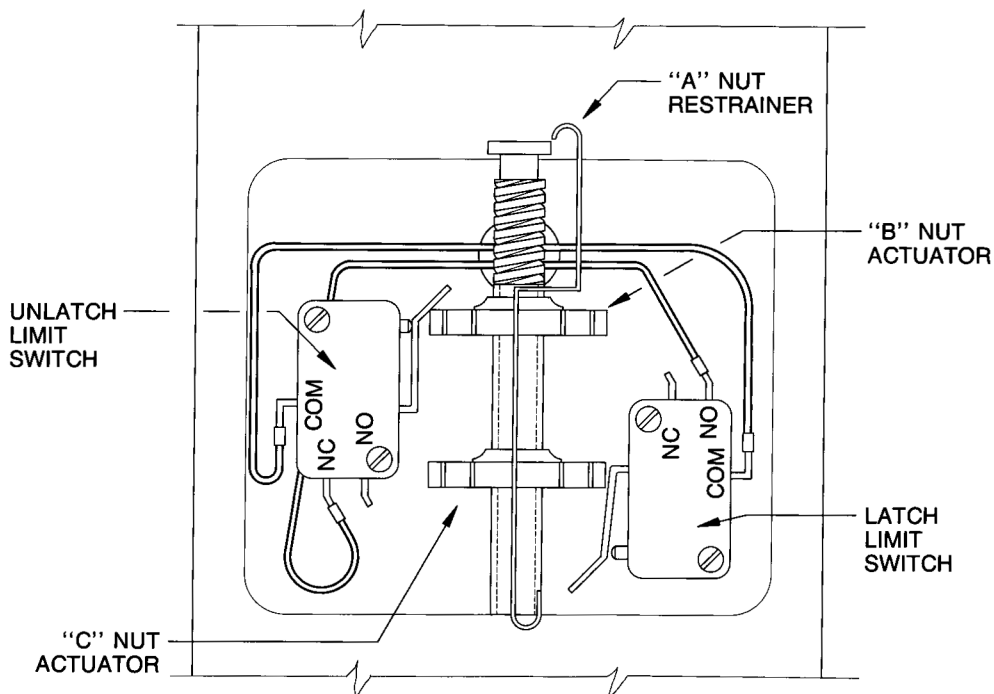


FIGURE 50

9. With the latch in the UNLATCHED position (linear actuator retracted), both baffle pins should extend downward approximately 2-7/8" below the rail tread. When this mechanical relationship is established, refer to Figure 50 and adjust the UNLATCH limit switch by removing nut restrainer A and rotating nut actuator B until it actuates the UNLATCH limit switch. When the limit switch actuates, it will emit an audible "click"; or an ohmmeter or continuity tester can be used to determine when the limit switch actuates. Replace nut restrainer A.

INSTALLATION

NOTICE

WHEN ADJUSTING NUT ACTUATOR B, BE CAREFUL NOT TO DISTURB THE SETTING OF NUT ACTUATOR C, ADJUSTED IN STEP 8.

10. Restore electrical power and electrically operate the motorized latch to verify proper operation. If additional adjustments are necessary, repeat steps 7, 8, and 9.
11. After completing linear actuator limit switch adjustment, a preliminary alignment should be performed on the photo-eye and reflective target assemblies. The photo-eye and reflector (target) assembly work in conjunction to confirm that the correct mechanical alignment between the crane latch and latch block has been achieved before permitting the latching process to occur. The photo-eye emits a modulated (pulsed) light beam that, when reflected from the reflective tape of the target, will bounce back and be sensed by the photo-eye receptor. When this condition occurs, the photo-eye allows the latch mechanism to operate. The receptor part of the photo-eye only recognizes the modulated light that is emitted by the photo-eye. Any ambient or stray light that shines on the receptor will not cause the photo-eye to operate.
12. Before operational adjustment of the photo-eye is attempted, check that the photo-eye and its reflector are properly aligned. As illustrated in Figure 51, the centerline of the photo-eye and reflector assembly must be aligned with each other. The front surface of the photo-eye must be parallel to the reflective surface of the reflector (target) assembly in both the horizontal and vertical planes. This assures proper light reflection back to the photo-eye receptor. If this alignment is not checked first, adjustment of the photo-eye is very difficult. The photo-eye and/or target assemblies can be re-positioned by loosening the respective bracket retaining screws and sliding the photo-eye or reflective target on its unistrut mounting to the desired location. After the assemblies are located in the desired position, re-tighten the bracket retaining screws.

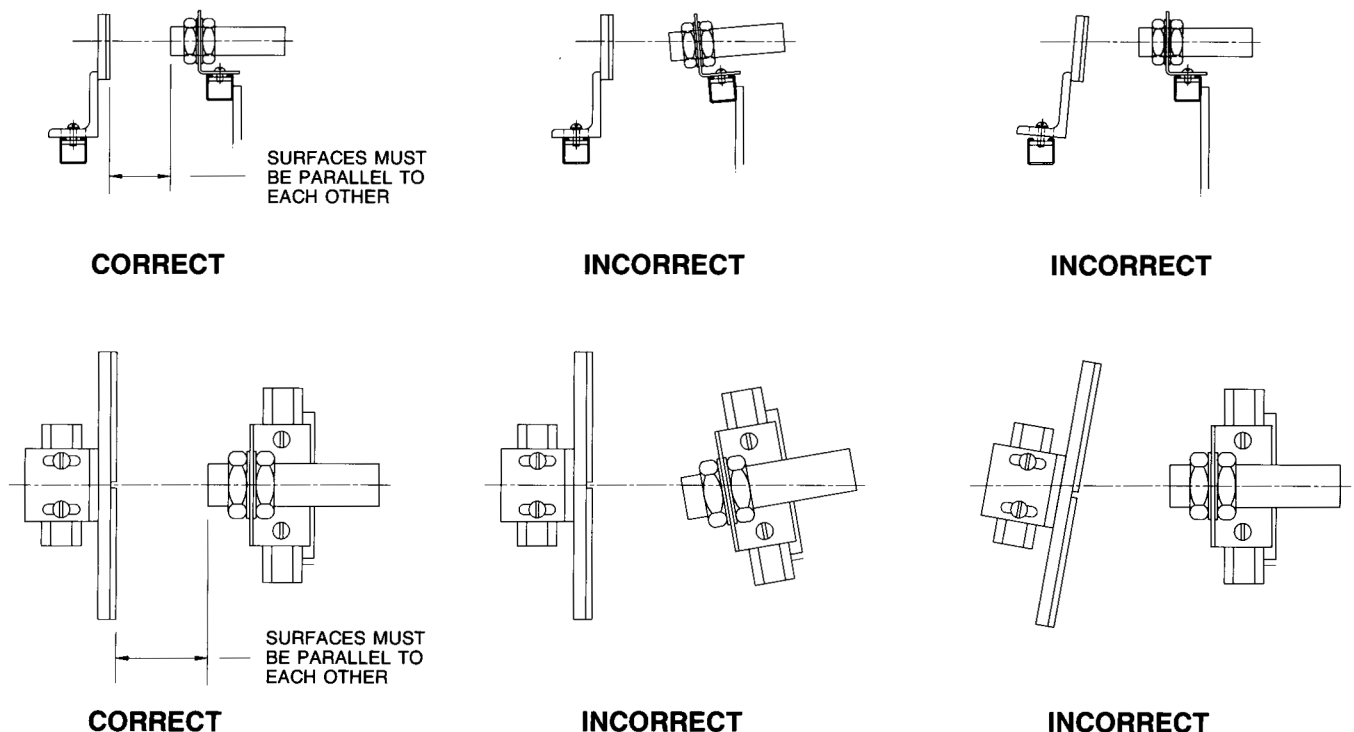


FIGURE 51

13. Check that the aperture, or opening, that exposes the reflective tape on the target assembly is adjusted to expose a section of reflective tape approximately 1/8" to 1/4" wide. By exposing the reflective tape that actuates the photo-eye, the aperture determines the accuracy of the latch/latch block alignment. This adjustment is factory set; however, should additional adjustment be required, loosen the aperture plate retaining screws and slide the aperture plates until they expose the desired amount of reflective tape. Re-tighten aperture plate retaining screws.

INSTALLATION

14. With the crane latch and latch block mechanically aligned and latched, adjust the photo-eye and reflective target assemblies so that the light beam emitted from the photo-eye is aimed at the reflective tape exposed by the aperture, while maintaining the parallel relationship between the photo-eye and target assemblies. The photo-eye and/or target assemblies can be re-positioned by loosening the photo-eye bracket retaining screws and sliding the photo-eye on its unistrut mounting to the desired location. Re-tighten the photo-eye retaining screws.

⚠ DANGER

HAZARDOUS VOLTAGES ARE PRESENT WHEN POWER IS APPLIED. THIS WORK SHOULD ONLY BE PERFORMED BY TRAINED, QUALIFIED, AND AUTHORIZED PERSONNEL.

15. Adjust the sensing distance between the photo-eye and the reflective target. Sensing range is between 1-1/2" and 6". Experience indicates that approximately 2" is ideal. With the photo-eye aimed at the reflective tape exposed through the aperture, and power applied, the red LED on the back of the photo-eye should illuminate. If it does not, check that the reflective target assembly and photo-eye assembly are properly aligned as referenced in Figure 51. If the reflective target assembly and photo-eye assembly are properly aligned, adjust the sensing distance until the red LED on the back of the photo-eye illuminates. To adjust the sensing distance, temporarily loosen the adjusting jam nuts that hold the photo-eye to the photo-eye bracket, and move the photo-eye in or out until the sensing distance is in the optimum range. When a distance is achieved that allows the red LED to illuminate, re-tighten the photo-eye adjusting jam nuts. Refer to Figure 52. Check that the position of the photo-eye does not interfere with any crane components or the building structure that may exist along the entire length of the crane runway. Failure to check for interference could result in damage to the photo-eye if it would impact objects during crane operation.

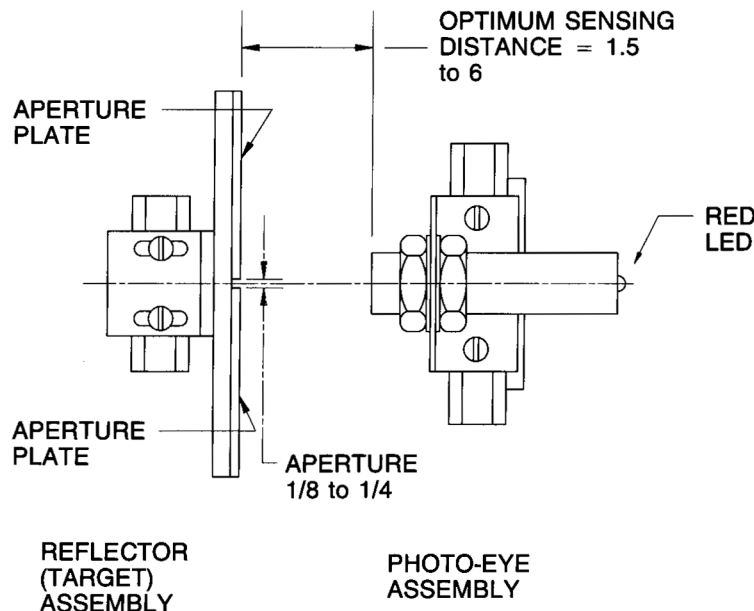


PHOTO-EYE ADJUSTMENT

FIGURE 52

16. If a latch crane has multiple latch points (cranes, transfer sections, or monorail spurs), the following photo-eye adjustment procedure is recommended and should be followed:
 - a. Align the crane with the first latch point and follow the photo-eye adjustment procedures of steps 12 through 15.
 - b. With the crane properly latching at the first latch point, move the crane to each successive latch point and repeat the photo-eye adjustment procedure; HOWEVER, on successive latch points, ONLY adjust the reflective target. After adjusting the first latch point, do not disturb the photo-eye alignment location. This is required so that when the crane is moved back to the first latch point, it will retain its initial alignment.

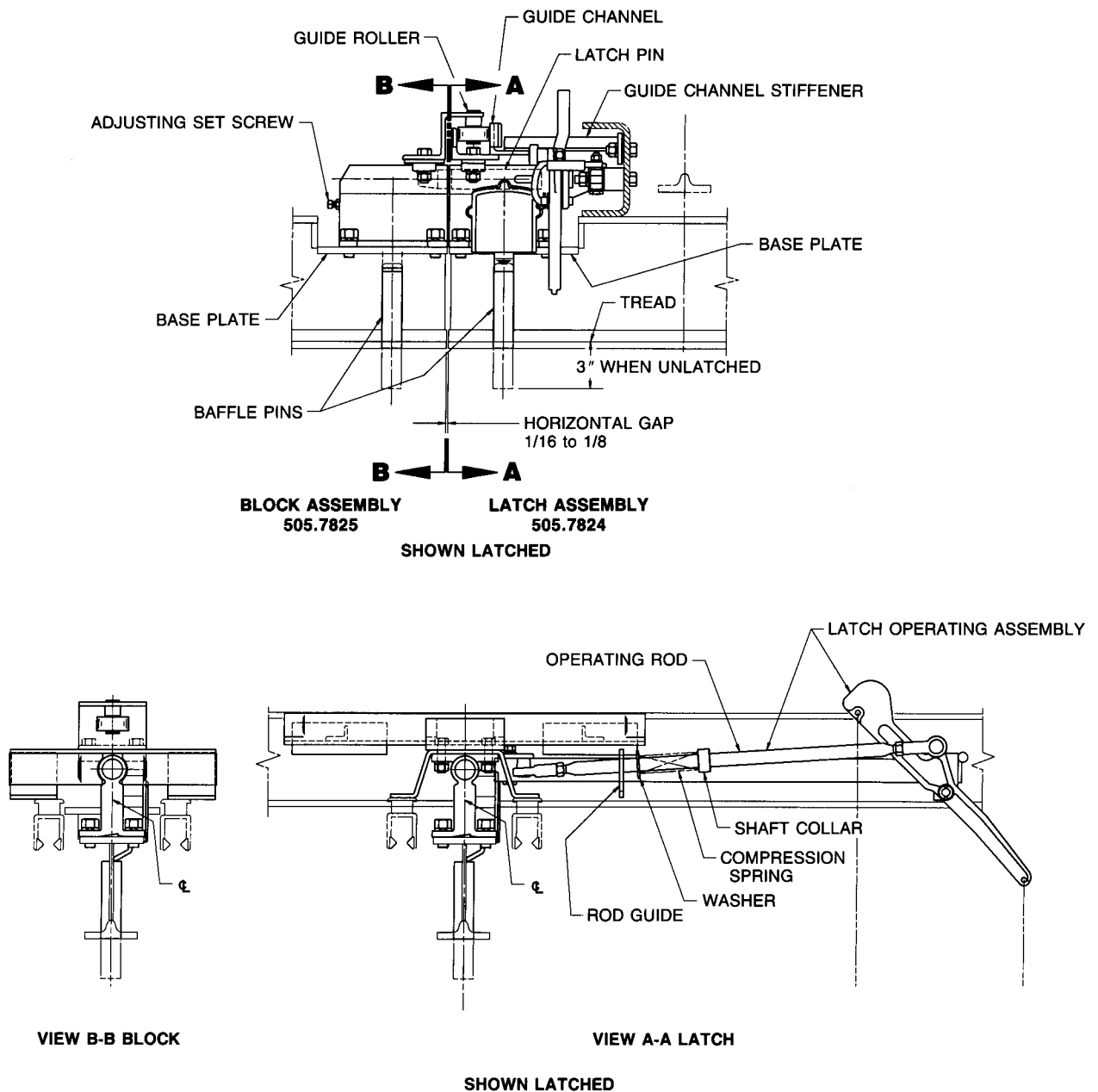
INSTALLATION

NOTICE

CHECK BAFFLE PINS, ESPECIALLY THE LATCH BLOCK BAFFLE PIN, FOR FREE OPERATION. CHECK THAT THE BAFFLE PIN IS NOT DAMAGED, AND THAT THERE IS NO FOREIGN MATTER IN THE BAFFLE TUBE THAT WILL INHIBIT PIN MOVEMENT.

MANUALLY-OPERATED LATCH AND BLOCK MOUNTING AND ADJUSTMENT

Refer to Figure 53. Manually-operated latches and blocks are usually factory mounted to a bridge or spur track, and set for operation. Some field adjustment is required. However, latches and blocks may be shipped loose for field mounting, if so specified on the job order.



INSTALLATION

Note that the latch pin is free to travel to the fully extended position, without affecting the position of the internal mechanism, when the latch is not aligned with a block. This feature is to prevent the baffle pins from raising unless the crane is in alignment and interlocked with the transfer rail or adjacent latching crane.

Steps 1 and 2 below apply only if the latch and/or block are to be field mounted. If the latch and/or block have been factory mounted, begin with step 3.

1. Verify that base plate is level with tread of track and is centered on the rail. Mount latch/block to base plate, making certain that latch/block is centered on the rail.
2. The latch operating assembly is usually mounted on the crane end truck adjacent to the latch. When mounting, be sure that the pin on the bell crank fits into the slot on the end of the latch pin. The only adjustment required on this assembly is the positioning of the shaft collar on the operating rod. Pull the actuating rope to partially throw the latch until the latch pin extends about one inch beyond the face of the housing. Position the compression spring and washer against the rod guide and locate the shaft collar to contact the spring without applying a load on the spring. The shaft collar is to be fastened to the operating rod by drilling through the collar and rod, and installing the included 7/32" diameter spring pin.
3. Move the crane into latching position with the spur track or adjacent latching crane. Check vertical alignment of rail operating treads. If vertical alignment is required, shim runway connection and/or bridge-to-truck connection until both rail treads are level.
4. Throw the latch and recheck vertical alignment of rail operating treads. If additional vertical alignment is required, add shims between the latch/block housing and the base plate; on the member having the higher tread elevation to bring the higher tread down to the lower tread.
5. Check lateral alignment of the operating tread flanges. Lateral misalignment should not exceed 1/16". If lateral alignment is required, add shims under only one side of the latch or block housing. This step will slightly tilt the housing, moving the latch pin to the side, and bring the tread flange into lateral alignment. After this step is completed, it may be necessary to realign the treads vertically.
6. Check horizontal (longitudinal) gap between the rails at operating tread level. The gap should be between 1/16" to 1/8". If adjustment of the gap is required, add or remove shims between the guide channel brackets and end truck channel or support member.
7. Check vertical and lateral alignment of bridge conductors. If vertical misalignment exceeds 1/16", shim for proper alignment. For Louden® Series 811 conductors, the horizontal gap between transfer insulators should be between 3/8" to 1/2". For other conductors, refer to applicable instructions.
8. At this point, when the latch is thrown into the "latched" position, both baffle pins should be retracted into the rails, with the bottoms of the pins flush with or slightly recessed into the bottom surface of the rails. If this is not the case, either the horizontal gap between rails is too large (not allowing enough latch pin travel to properly actuate internal mechanisms), or the internal racks and pinions of latch or block require adjustment. For internal adjustment, refer to step 9. In the "unlatched" position, the pins should extend approximately 3" below the rail treads.
9. Refer to Figures 54, 55, 56, and 57 that show the relationship of internal parts.

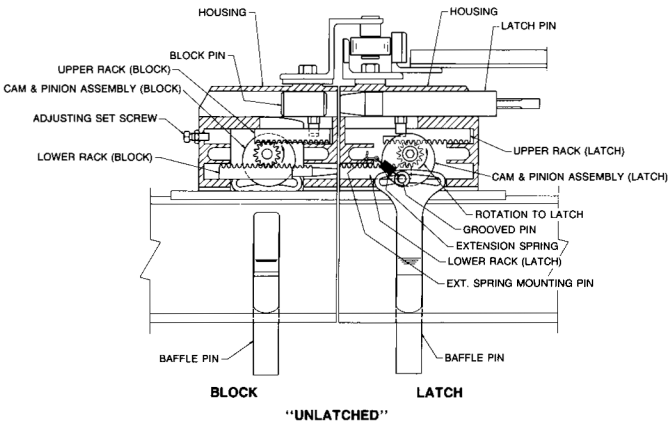


FIGURE 54

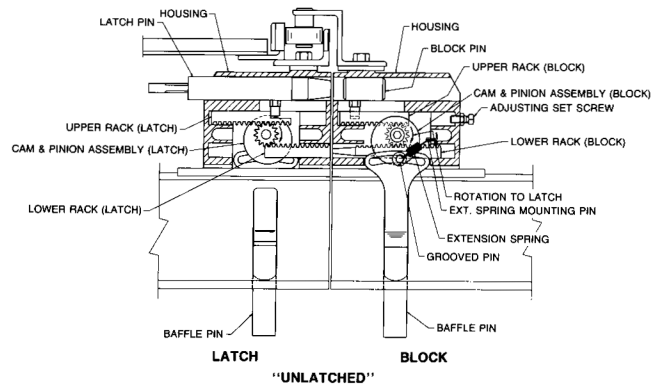


FIGURE 55

INSTALLATION

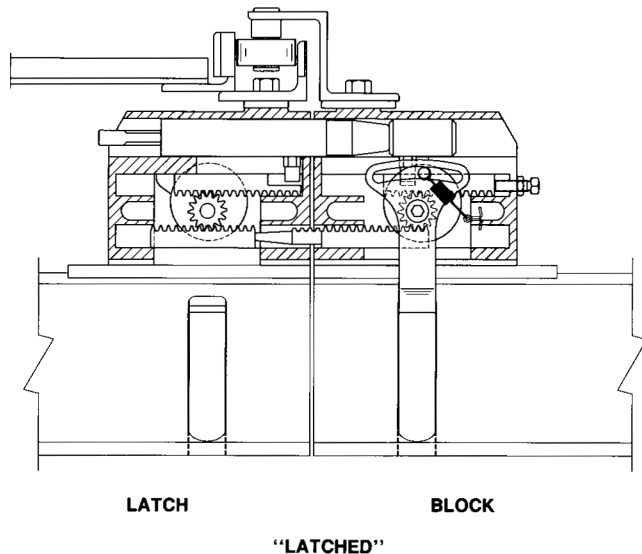


FIGURE 56

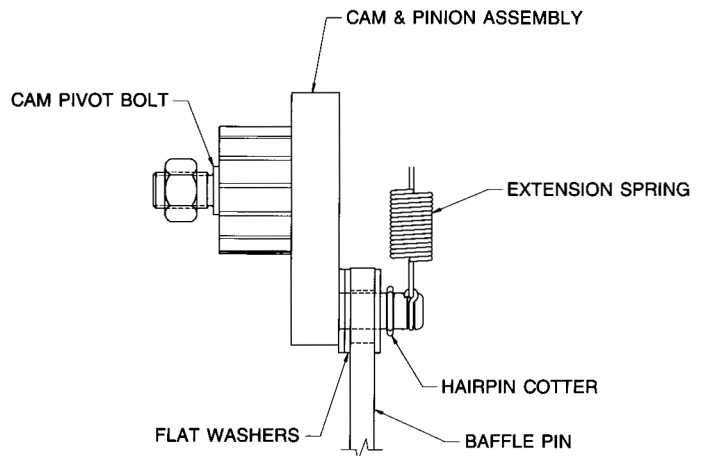


FIGURE 57

If for any reason, it becomes necessary to disassemble the latch and block, use the following procedure:

1. With the latch operating assembly in “unlatch” position, assemble the latch pin and block pin, and upper and lower racks as shown in Figures 54 and 55. In the latch assembly, the latch pin and lower rack should be flush with the front surface of the housing, and the block pin and upper rack should be moved forward to the extreme position. When the pins and racks are properly positioned, insert the cam and pinion assembly to mesh with the upper and lower racks while the grooved pin in the cam is in the low position. Note that the grooved pin should be slightly past center towards the mounting pin of the extension spring, as shown in Figures 54 and 55.
2. Assembly of the baffle pin on the cam is accomplished by rotating the cam about 1/4 turn, bringing the grooved pin about on a line horizontally with the cam pivot. Refer to Figure 57 for proper assembly of the baffle pin and extension spring on the cam. Assemble baffle pin to cam as shown.
3. Refer to Figure 56 showing the mechanisms in “latched” position. Note that the grooved pin in the cam is in the upper position and slightly past center in the direction of rotation. The rotation of the cam is slightly over 180 degrees.
4. With the parts in “latched” position, adjust the set screw in the block so that it contacts the upper rack at the extreme end of travel as shown in Figure 56.

INSTALLING SERIES 800 CONDUCTOR BAR SUPPORT BRACKETS:

LOUDEN® conductor bar support brackets are designed to mount both LOUDEN® Dual Conductor Bottom-Entry Electrification and LOUDEN® Single Conductor Bottom-Entry Electrification to LOUDEN® monorail and crane girder track. Bottom entry electrification types are supported at 8-1/2" above operating flange surface in systems with wheel tread diameters up to and including 4-1/2", and at 12" above operating flange surface in systems with 9" wheel tread diameters.

NOTICE

ELECTRIFICATION SYSTEM TYPES CANNOT BE INTERMIXED.

All bottom-entry electrification systems offered by Acco Chain & Lifting Products require that conductor bar support brackets be provided on maximum 5' centers for straight runs of electrification. Monorail curves require a minimum of one conductor bar support bracket for each 45° of bend; however, support brackets should not exceed 4' for LOUDEN® Dual Conductor Bottom-Entry Electrification, or 2' for LOUDEN® Single Conductor Bottom-Entry Electrification.

Install conductor bar support brackets as outlined in job layout specifications and as shown in Figures 30 through 42.

INSTALLATION

INSTALLING SERIES 811 SINGLE CONDUCTOR BOTTOM-ENTRY ELECTRIFICATION:

LOUDEN® Series 811 Single Conductor Bottom-Entry Electrification is a commercial conductor bar of a figure 8 configuration covered with a noncombustible insulating material to enclose the conductor bar, and is commercially labeled Duct-O-Bar. Standard catalog conductor bar is FE-908-2 with a continuous rating of 110 amps for operation in temperatures below 160°F. Duct-O-Bar electrification can be field fitted for curves having a minimum radius of 3'-6" without damage to the vinyl cover or conductor bar. Straight runs require support on maximum 5' centers. Curves require a minimum of one center support; however, support centers should not exceed 2'. For applications requiring conductor bar rating higher than 110 amps, contact Acco Chain & Lifting Products, York, Pennsylvania or the distributor of LOUDEN® products.

AMPERE LOAD

- Determine type of current, voltage, phase, etc. of the power that will feed the conductor bar.
- Determine the horsepower of the motors that are to be operated simultaneously and supplied by the conductor bar. Convert the horsepowers to amperes and add amperes to obtain total amperes to be handled by the conductor bar. Ampere ratings of motors vary somewhat depending on the type of motor. Rating data should be used as shown on the motor nameplate. If motor nameplate data is not available, the data tabulated in Table 8 can be considered average for 1800 RPM motors. For slower speed motors, the ampere ratings may be 10% to 50% higher. For high-torque, squirrel-cage motors, the rating should be increased at least 10% above the tabulated figures. For 200-volt motors, the rating should be increased 10% above the corresponding 230-volt ratings tabulated. *Note: Table numbers 6 and 7 have been intentionally omitted.*
- Adjust the ampere rating figure determined by step 2 as follows:
 For CLASS B DUTY, use 60% of the total amperes determined by step 2;
 For CLASS C DUTY, use 90% of the total amperes determined by step 2;
 For CLASS D DUTY, use 120% of the total amperes determined by step 2.
- The ampere rating determined by step 3 should be adjusted based on the ambient temperature where the conductor bars are located as follows:
 Where ambient temperature is up to 100°F, use 95% of the ampere rating determined by step 3;
 Where ambient temperature is above 100°F and up to 120°F, use 74% of the ampere rating determined by step 3;
 Where ambient temperature is above 120°F and up to 140°F, use 33% of the ampere rating determined by step 3;
- Required ampere rating determined by step 4 cannot exceed 110 amps. For applications requiring conductor bar rating higher than 110 amps, contact Acco Chain & Lifting Products, York, Pennsylvania or the distributor of LOUDEN® products.

**TABLE 8
HORSEPOWER/AMPERE CONVERSIONS
AVERAGE VALUES**

TOTAL H.P.	1-PHASE AC - 60 115 VOLTS AMPERES	1-PHASE AC - 60 230 VOLTS AMPERES	3-PHASE AC - 60 230 VOLTS AMPERES	3-PHASE AC - 60 460 VOLTS AMPERES	3-PHASE AC - 60 575 VOLTS AMPERES	DIRECT CURRENT 115 VOLTS AMPERES	DIRECT CURRENT 230 VOLTS AMPERES
1	16	8	3.5	1.8	1.4	9.6	4.8
1½	20	10	5	2.5	2	13.2	6.6
2	24	24	6.5	3.3	2.6	17	8.5
3	34	17	9	4.5	4	25	12.5
5	56	28	15	7.5	6	40	20
7½	80	40	22	11	9	58	29
10	100	50	27	14	11	78	38
15	N/A	N/A	40	20	16	112	56
20	N/A	N/A	52	26	21	148	74

INSTALLATION

VOLTAGE DROP AND POWER FEED LOCATION

To determine the required number of power feed connections, the voltage drop for a given system must be calculated. The maximum allowable voltage drop for a properly designed and installed system should be limited to a maximum of 3% of the power supply voltage feeding the conductor bar. Calculate voltage drop using one of the following formulae:

For three-phase, 60-hertz, A.C. system:

$$\text{Voltage drop} = L \times I \times Z \times 1.73$$

For single-phase, 60-hertz, A.C. system:

$$\text{Voltage drop} = L \times I \times Z \times 2$$

For three-phase, 60-hertz, A.C. system:

$$\text{Voltage drop} = L \times I \times R \times 2$$

Where:

L = Length in feet of conductor bar, from power feed to end of conductor.

I = Load current in amperes.

Z = A.C. impedance of conductor bar = 0.0008 for FE-908-2.

R = D.C. resistance of conductor bar = 0.0005 for FE-908-2.

TYPICAL INSTALLATIONS AND DIMENSIONS

Typical conductor bar installation is shown in Figures 58 and 59. For monorail applications as shown in Figure 59, two conductors are often installed on one side of the monorail, and one conductor on the opposite side to balance the collector spring forces. Installation dimensions for conductor assemblies and collectors are shown in Figures 60 and 61.

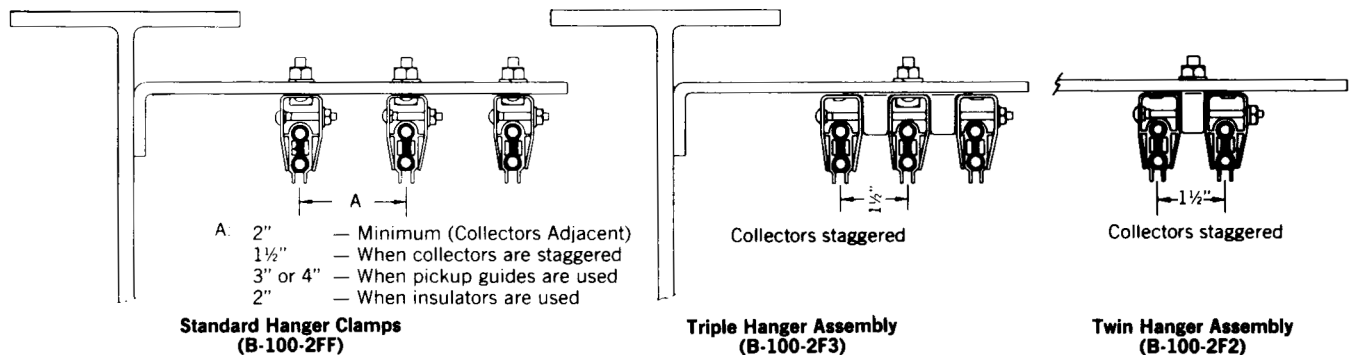


FIGURE 58

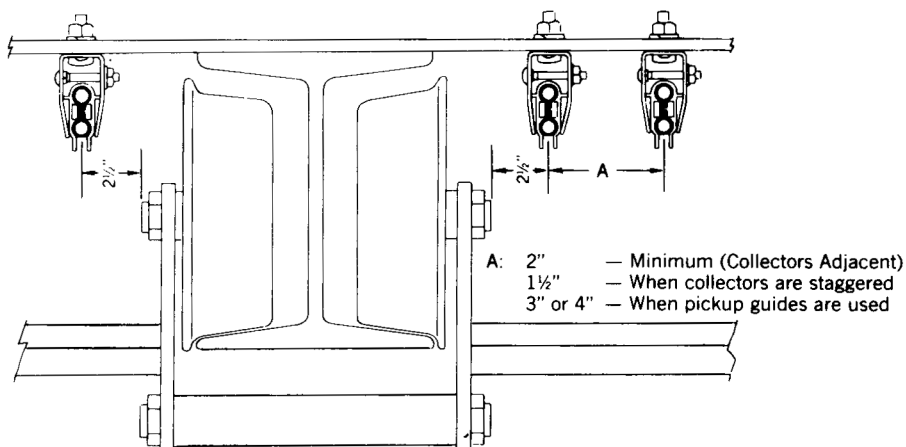


FIGURE 59

INSTALLATION

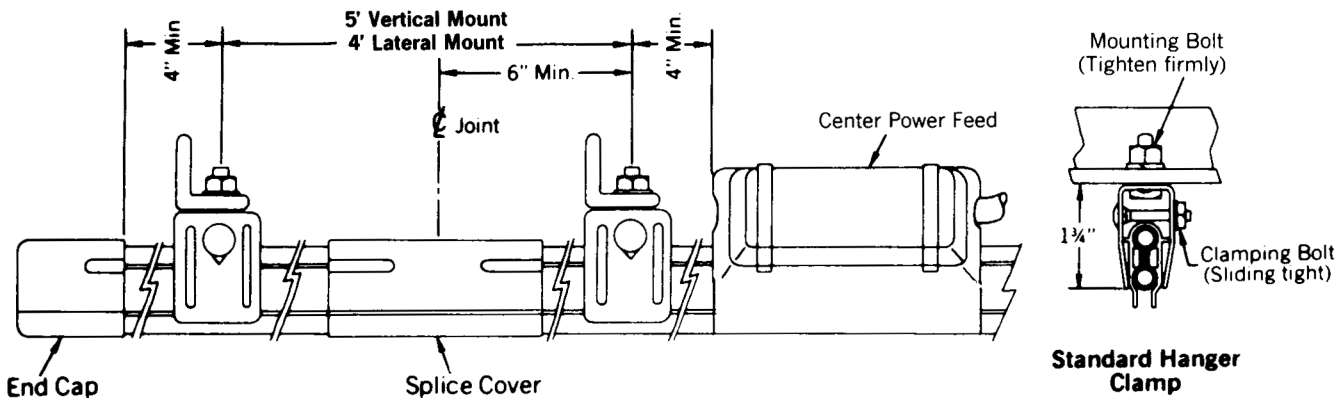


FIGURE 60

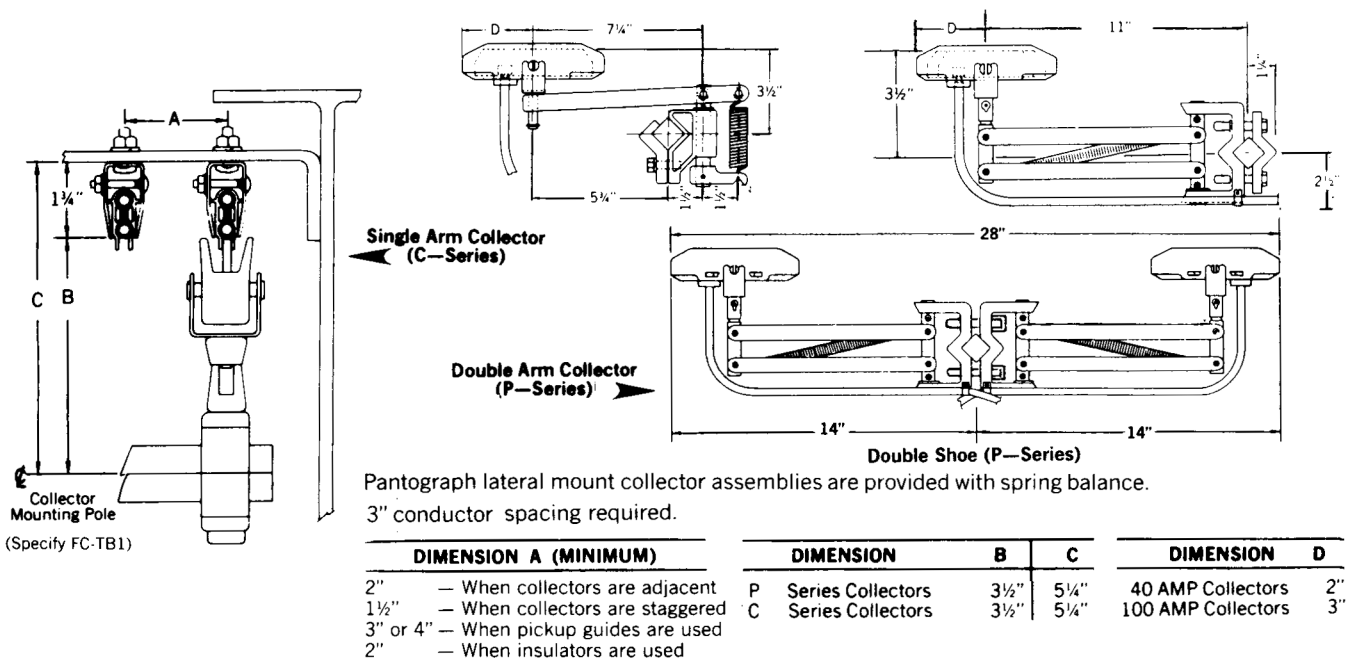


FIGURE 61

EXPANSION GAP AND ANCHORING REQUIREMENTS

Expansion gaps should be placed at intervals determined by the temperature rise of the specific conductor bar material used. FE-908-2 conductor bar has steel conductors. If the estimated temperature rise for a steel conductor bar system is 100°F, provisions should be made for expansion gaps at midspan for systems 300 ft. to 600 ft. in length. For systems over 600 ft. in length, expansion gaps should be placed every 300 ft. of straight run of conductor. If the building has expansion joints, an expansion gap should be placed at each building expansion joint. If the estimated temperature rise for a steel conductor bar system is greater than 100°F, or conductor bar material other than steel is used, contact Acco Chain & Lifting Products, York, Pennsylvania or the distributor of LOUDEN® products.

Anchor clamps are required at midpoint on all systems without expansion gaps. Systems with expansion gaps require an anchor point midspan between expansion gap and each end of the runway. When two or more expansion gaps are used, anchor points must also be placed midpoint between gaps. The use of an anchor clamp set permits controlled expansion toward the expansion gap and the end of the conductor run.

A 10 ft. expansion gap assembly is installed in the same manner as other 10 ft. sections of conductor bar. The expansion gap must be mounted as shown in Figure 62 to secure the assembly and allow the bar to expand as designed. The gap has been completely closed for shipping purposes and must be adjusted in accordance with gap settings shown in Table 9 for the ambient temperature at the time of installation.

INSTALLATION

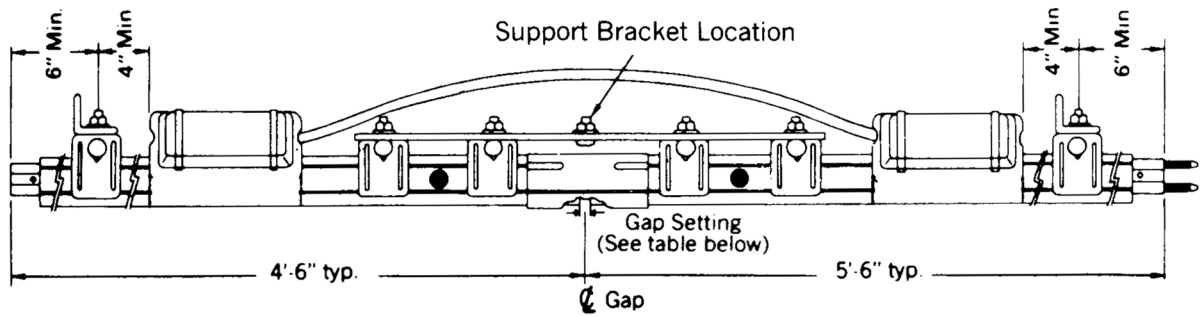


FIGURE 62

TABLE 9

MIN. OPERATING TEMPERATURE	MAX. OPERATING TEMPERATURE	INSTALLATION AMBIENT TEMPERATURE	GAP SETTING (IN.)
0 °F	100 °F	25 °F	1.5
		50 °F	1.0
		75 °F	0.5
25 °F	125 °F	50 °F	1.5
		75 °F	1.0
		100 °F	0.5
50 °F	150 °F	75 °F	1.5
		100 °F	1.0
		125 °F	0.5

INTERLOCKS, SWITCHES, OR FIXED GAPS

For fixed gaps occurring at interlocks, etc., the maximum gap is 1 inch. Refer to Figure 63. The use of transfer caps will allow the collector brushes to transfer evenly and smoothly. Round both ends of contact brushes to permit a smooth transfer. Install pickup guide assembly in order that self-centering type collectors may engage or disengage the conductor bar. Anchor mounting of the guide to the hanger bracket is required. To ensure proper elevation of conductor bar, the support point for the pickup guide must be located 3/4" above the remaining support brackets.

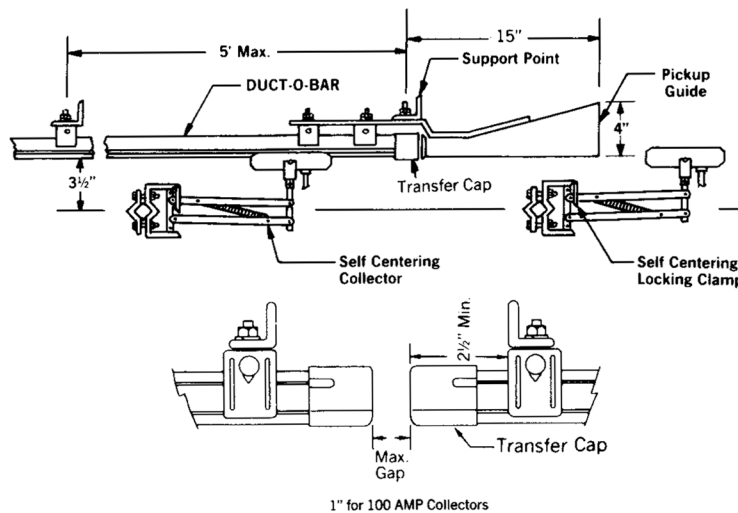


FIGURE 63

INSTALLATION

INSTALLATION PROCEDURE

1. Fasten the hanger clamps on the hanger brackets and leave the mounting and clamping bolts loose. Refer to Figure 64.
2. Slide the conductor bar into the hanger clamps. Refer to Figure 65. Start the conductor bar so that the first mounting bracket is 6" from the end.
3. Draw adjacent conductor bars together with the connector tool as shown in Figure 66. Proceed to next joint.
4. Tighten mounting bolts to 8 foot-pounds after aligning the conductor bar in the hanger brackets. Tighten the clamping bolts to 6 foot-pounds. Refer to Figure 67. The conductor should be able to slide freely through the hangers and held securely in place.
5. Install center power feed. Refer to Figure 68. Locate power feed at conductor joint or cut the conductor insulating cover to accept the connector clamp. Install the connector clamp (2) and the power feed-in cable (3). Place the power feed insulating case halves (4) around the connector clamp and secure with two spring clips (5).
6. Install end caps over exposed ends of all conductor runs. A transfer cap is installed in lieu of end caps at all switches, interlocks, and discontinuous circuits with pickup guides. All bar ends must be drilled with 19/64" drill to accept transfer cap stud.

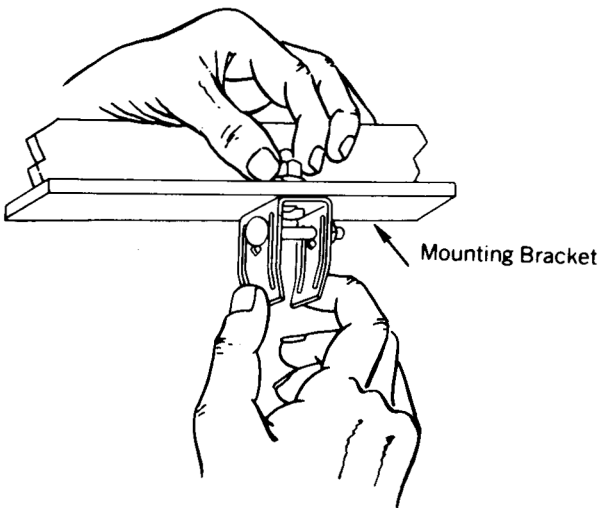


FIGURE 64

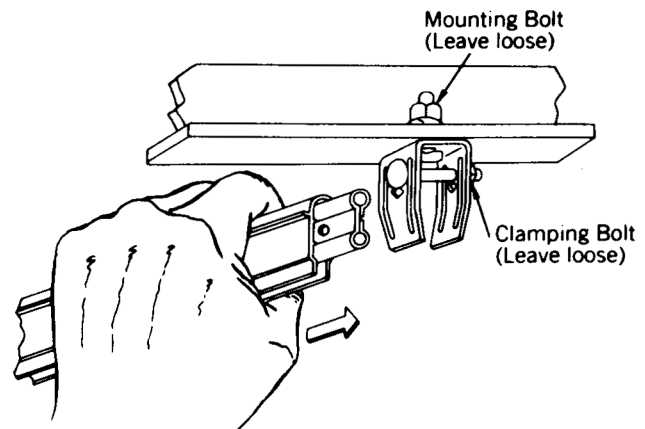


FIGURE 65

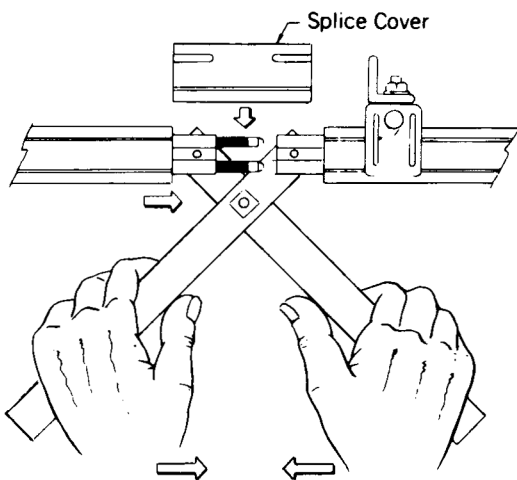
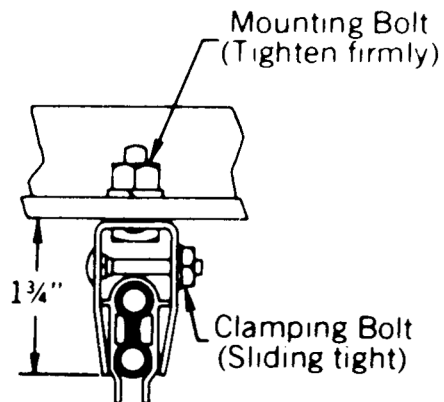


FIGURE 66



Standard Hanger
Clamp

FIGURE 67

INSTALLATION

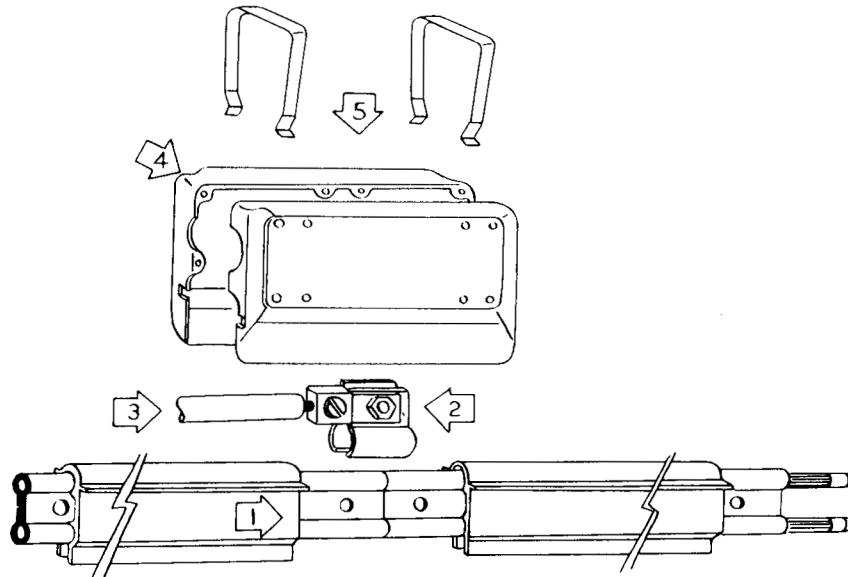


FIGURE 68

NOTICE

ALL SPRAY PAINTING OF AREAS SURROUNDING THE CONDUCTOR BAR SYSTEM SHOULD BE DONE PRIOR TO INSTALLING THE CONDUCTOR BAR SYSTEM. IF SPRAY PAINTING IS REQUIRED AFTER INSTALLATION OF THE CONDUCTOR BAR SYSTEM HAS BEEN COMPLETED, EXTREME CARE MUST BE TAKEN, BY THE USE OF MASKS, TAPE, OR SIMILAR METHODS, TO PROTECT THE CONTACT SURFACES OF THE CONDUCTOR BAR SYSTEM. PAINT ON CONTACT SURFACES WILL CAUSE SERIOUS OPERATING DIFFICULTIES.

CAUTION

DO NOT OVERTIGHTEN HANGERS. CONDUCTOR BAR MUST BE ABLE TO SLIDE FREELY DURING TEMPERATURE VARIATIONS TO ALLOW FOR EXPANSION AND CONTRACTION OF BAR AND COVER.

INSTALLING SERIES 810 DUAL CONDUCTOR BOTTOM-ENTRY ELECTRIFICATION:

VOLTAGE DROP AND POWER FEED LOCATION

To determine the required number of power feed connections, the voltage drop for a given system must be calculated. The maximum allowable voltage drop for a properly designed and installed system should be limited to a maximum of 3% of the power supply voltage feeding the conductor bar. Calculate voltage drop using one of the following formulae:

For three-phase, 60-hertz, A.C. system:

$$\text{Voltage drop} = L \times I \times Z \times 1.73$$

For single-phase, 60-hertz, A.C. system:

$$\text{Voltage drop} = L \times I \times Z \times 2$$

For three-phase, 60-hertz, A.C. system:

$$\text{Voltage drop} = L \times I \times R \times 2$$

Where:

L = Length in feet of conductor bar, from power feed to end of conductor.

I = Load current in amperes.

Z = A.C. impedance of conductor bar = 0.0010 for Series 810.

R = D.C. resistance of conductor bar = 0.0006 for Series 810.

INSTALLATION

INSTALLATION

LOUDEN® Series 810 Dual Conductor Bottom-Entry Electrification should be installed using standard conductor bar support brackets, pre-drilled to accept 810.21 support insulator assemblies, as shown in Figures 30 through 42. Conductor bar support brackets must be provided on maximum 5' centers for straight runs of electrification. Monorail curves require a minimum of one conductor bar support bracket for each 45° of bend; however, support brackets should not exceed 4' for LOUDEN® Dual Conductor Bottom-Entry Electrification. Conductor bar is supported at 8-1/2" above operating flange surface in systems with wheel tread diameters up to and including 4-1/2", and at 12" above operating flange surface in systems with 9" wheel tread diameters. Spacing of conductor bar from rail centerline should not be less than 4". Spacing of parallel runs of conductor bar should not be less than 3". Refer to Figure 69.

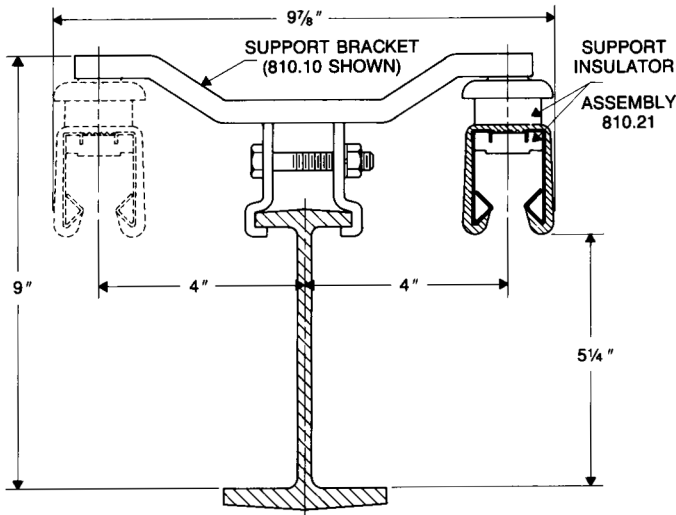


FIGURE 69

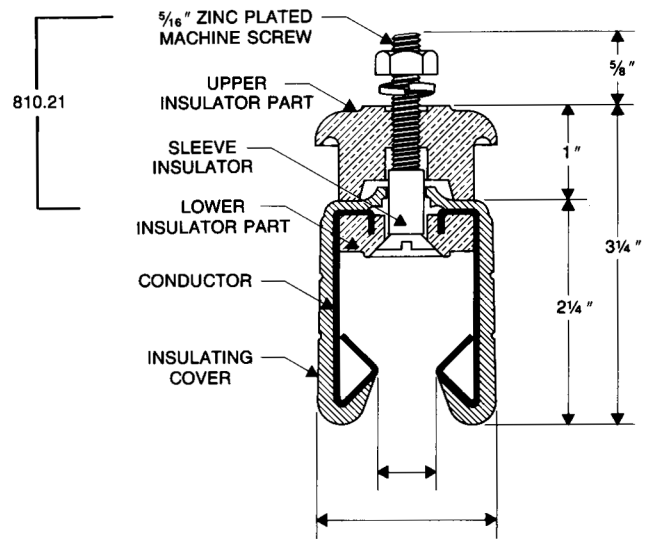


FIGURE 70

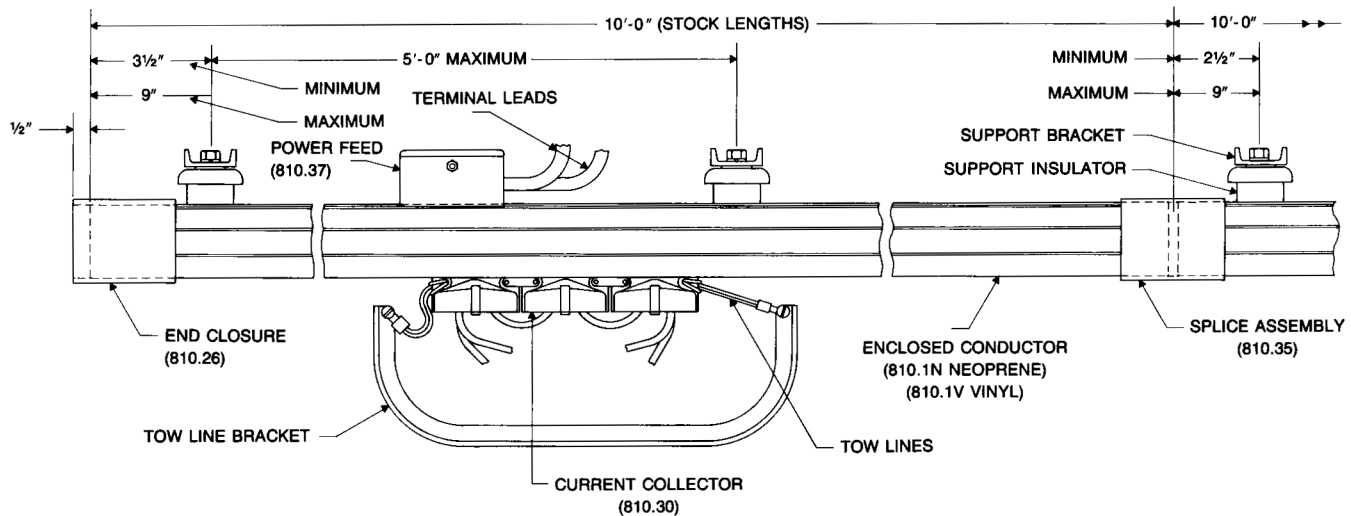


FIGURE 71

1. Attach 810.21 support insulator assemblies to conductor bar sections. Additional 810.21 support insulator assemblies can be added by poking a hole in the top of the insulating cover of conductor bar at the point of required support, and inserting the lower insulator and bolt between the bars and pushing up until the insulator is seated, as shown in Figure 70, then screwing the upper insulator on the bolt from the top. If conductor bar sections are to be formed into curves, bending and cutting, if required, should be completed before attaching support insulator assemblies.

INSTALLATION

2. A bending hickey should be used to form curves. Refer to Figure 72. Use the floor or a work table to prepare a layout of curves required. Figure 73 shows an example for a standard 3'-4" radius track curve. Follow the 2'-11" radius scribed line for an inside curve and the 3'-7" radius scribed line for the outside curve. Use the near edge of the conductor bar section in lining up the conductor bar section with the scribed line. Lay conductor bar section on the layout with the open side up. Start bending at the center of the curve with the bending hickies about 6" apart, as shown in Figure 72. Form a short segment of curve. Make short bends progressively both ways from center, checking against guide line. Care must be exercised not to kink or spread the conductor bar. Where spacer insulators occur, shift hickey to miss spacer. After curve is formed, square off and cut ends. Assemble splice dowels and support insulators. When squaring and cutting ends of curved sections or fitting short pieces at the end of a run, use a hand saw.

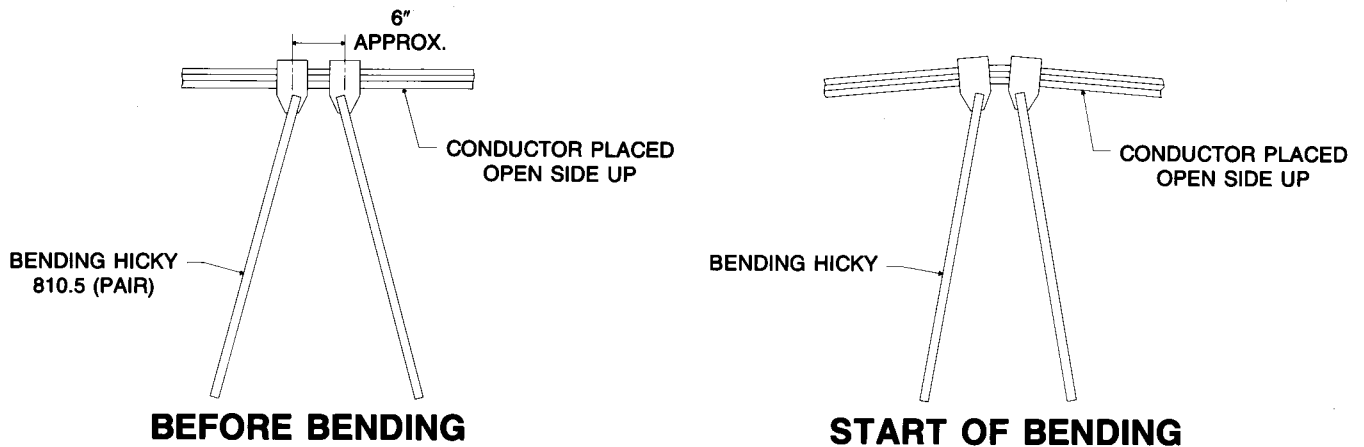


FIGURE 72

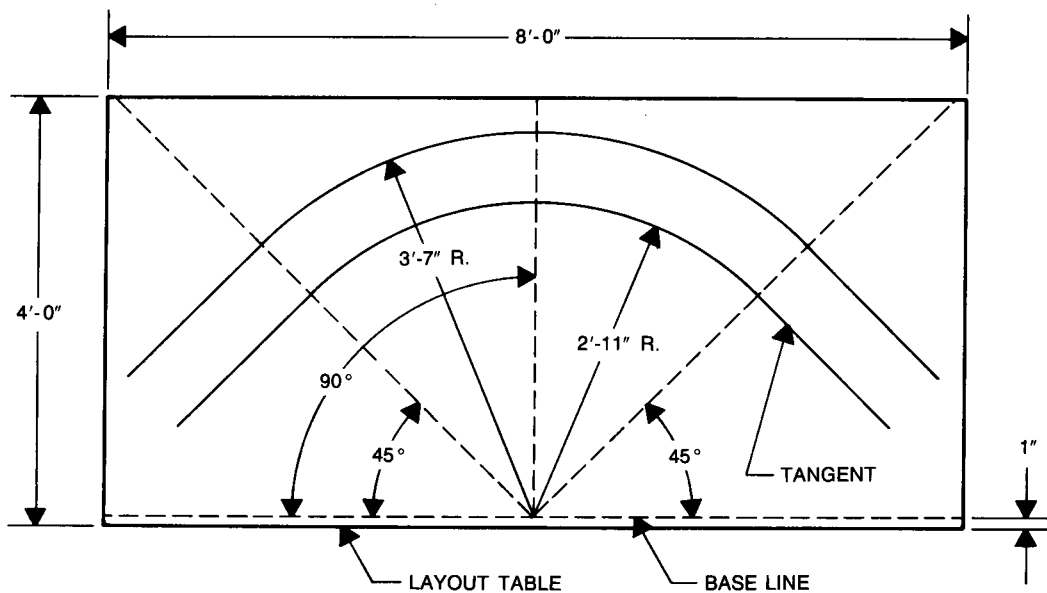


FIGURE 73

3. At each junction where conductor bar is joined or spliced, splice kit 810.35 is required. This kit includes two special dowel pins, one splice cover, and two tapped splice bars with screws. The longest end of each dowel pin is driven into the triangular opening at the bottom of each conductor of the bar, and the conductors of the conductor bar piece to be joined is driven onto the short end of the dowel pins. The splice bars are then secured at the top of each conductor of the bar using the screws provided and the pre-drilled holes in the bar as shown in Figure 74. To install splice bars, peel back insulating cover about 2" on each side of the joint. Place splice bars on the conductor section to be erected, insert and fasten screws finger tight. Raise section into position engaging the dowel pins and splice bars with the previously erected section. Insert additional screws and tighten all screws securely. Re-install the conductor and install splice cover. To install splice cover, hook lip of cover on one side of bar and with hand pressure snap the other lip into position. If a section has been cut, holes must be drilled in the top of each conductor bar to secure the splice bars.

INSTALLATION

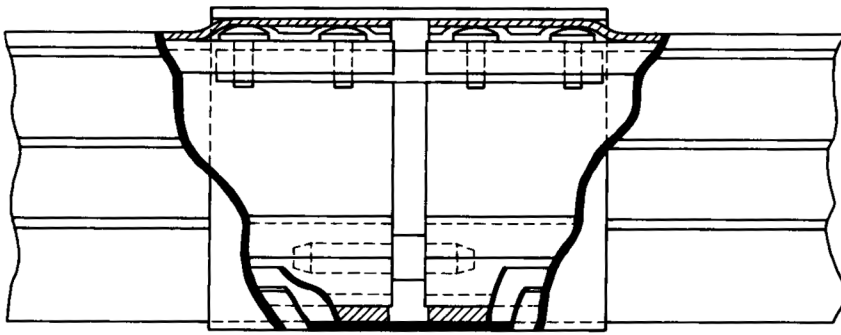


FIGURE 74

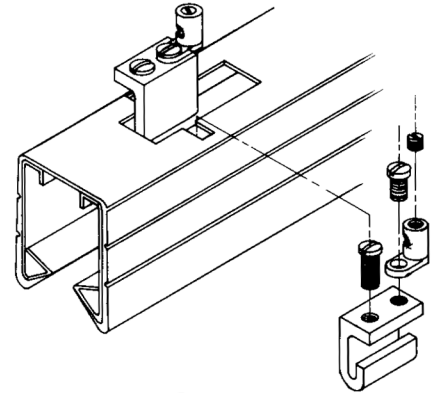
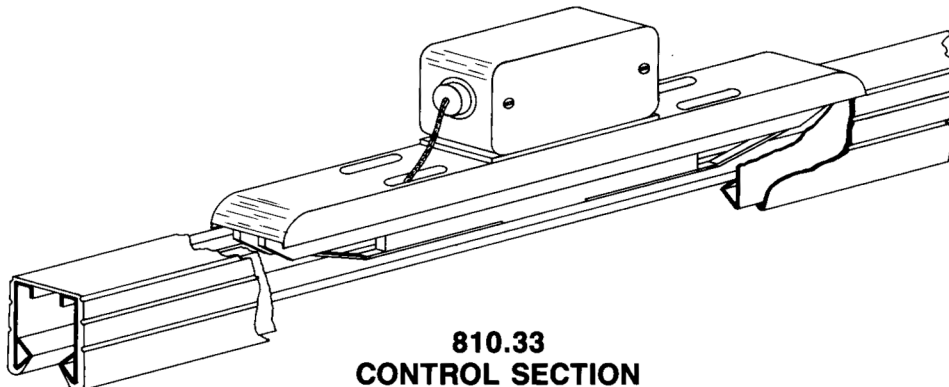


FIGURE 75

4. Start installing conductor bar sections at one end of the conductor bar system. Attach conductor bar section with support insulator assemblies to support brackets as shown in Figure 71. Dimension from end of conductor bar section to first support bracket shall be minimum 3-1/2" to maximum 9".
5. Install adjacent conductor bar sections following the instructions for installing splice assemblies. Refer to Figure 71 and notice that dimension from end of conductor bar section at splice to first support bracket of each bar shall be minimum 2-1/2" to maximum 9".
6. After installing system, align conductor bar and tighten all mounting nuts until lock washers are fully flat.
7. Install powerfeed 810.37. Refer to Figure 75. To install powerfeed, cut a rectangular slot in the top of the insulating cover as shown in Figure 70. The slot should be approximately 2" long and the same width as the inside dimension between the lips of the steel conductors. Cut two notches about 3/8" wide and about 1/4" off the transverse center line of the slot to accommodate the clamping screws. Insert terminal lugs and securely tighten clamping screws. Attach terminal connectors to lugs and connect power feed-in conductors. Place center insulator section between the two terminal lugs. Break out the thin plastic sections at one end of the side insulators and clamp the housing together with the screw provided.
8. Install end closures 810.26 over exposed ends of all conductor runs. Check that splice covers are installed at all conductor bar joints.

CONTROL SECTION

Specific instructions, or signals, may be imparted to a carrier by a centrally located track control panel through the use of control sections. The 810.33 control section is mounted in a single run of electrification and consists of two spring-loaded tabs that fit between the parallel conductor bars as shown in Figure 76. The tabs are isolated and insulated from the parallel conductors as well as from each other. In operation, a contact is made with tabs located on top of the 810.32 current collector as it passes beneath the control section. This contact may be from one or both of the tabs, and may be used to transmit a signal from the track controls to the carrier or vice-versa. Typical applications include signals to de-energize a section of conductor bar causing the carrier to stop in a designated area; the lowering and/or lifting of a hoist at a specific point on the monorail; and decrease or increase carrier speed.



**810.33
CONTROL SECTION
FIGURE 76**

INSTALLATION

The 810.33 control section is installed by cutting out 13-1/2" of the center of the dividing outer cover between the two conductors of a single run of electrification. Insert the control section between the conductor bars and mark the four holes on the conductor bars through the control section. Drill the conductor bars and secure the control section to the bars with four self-tapping screws. The control section can be connected to any of the power conductors by inserting a stakon lug under one of the control section mounting screws. If a control section must be located directly at a splice point, the splice must be moved by the addition of a short section of conductor bar and one additional splice.

Special 810.41 half-length control sections and long 810.38 single-contact control sections are available for installation in curved sections of electrification or when a signal of longer duration is required.

TRAVEL BAR ISOLATION

Travel bar isolation is achieved at any desired point in the electrification conductor bar as follows:

1. Refer to Figure 77.
2. Peel back the insulating cover and cut out a 1/2" section of the single conductor bar to be isolated.
3. Drive two 28-0586 selector section insulators into the triangle at each cut end of the conductor bar.
4. Before snapping the insulating cover back in place, a notch must be cut in the bottom lip of the cover at the point where the conductor bar was cut. This cut in the cover is necessary to allow foreign particles to drop out and avoid an electrical connection between supposedly isolated conductors.
5. An 810.21 support insulator must be inserted at the cut and tightened securely to provide rigidity. It is not necessary to provide support brackets at the cut, only support insulators.
6. Another cut must be provided at the other end of the desired isolation section in the same manner as described in steps 2 through 5.
7. If a separate power source is to be provided to this isolated section, an 810.37 powerfeed must be installed.

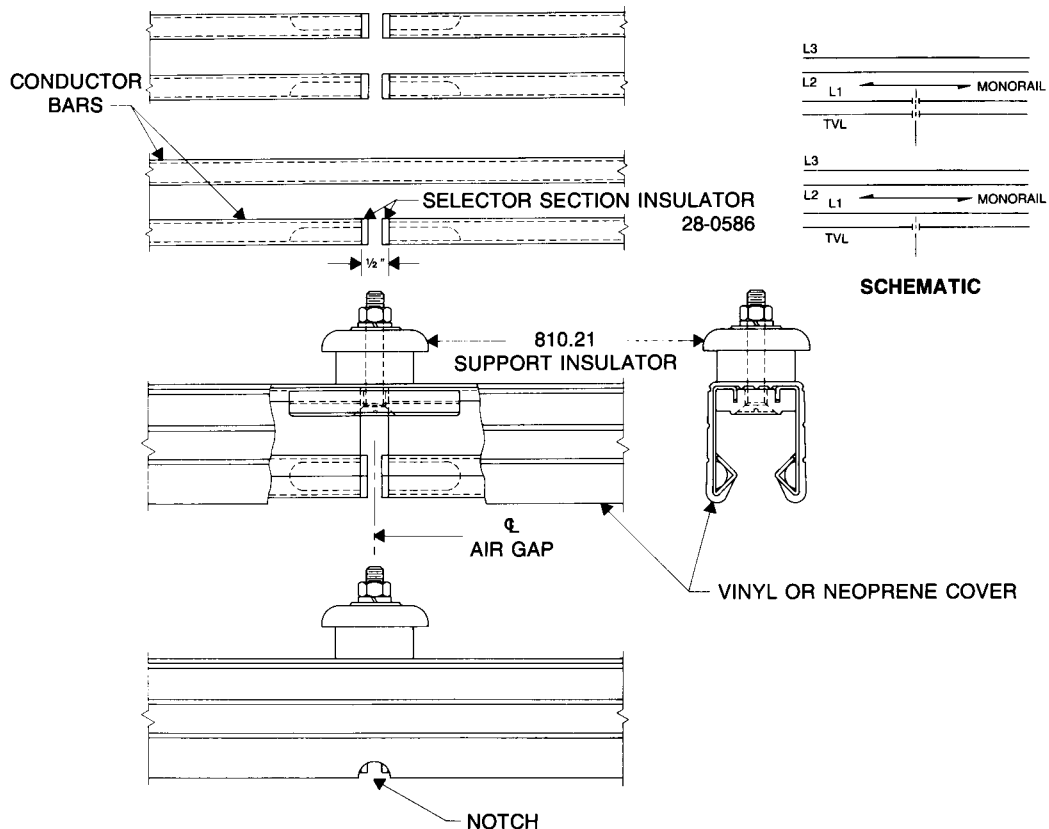


FIGURE 77

INSTALLATION

TRANSFER SECTIONS

When preparing conductor bar electrification ends at transfers and switches, 810.22 transfer insulators are required. $3/8$ " is considered a minimum spacing between ends of two opposing transfer insulators at a transfer while $1/2$ " is acceptable. This provides that the conductor bars at transfer are between $1-7/8$ " to 2 " apart. The conductor cover should extend $5/8$ " beyond the conductor bar, covering all but the exposed tip of each transfer insulator. Figure 78 shows the proper preparation of angle cut required at *SuperTrack*™ switch curves. For *TrojanTrack*™ switch curves, the angle of cut is 60° . Straight transfers are prepared in the same manner with the cut made at 90° to the conductor bar.

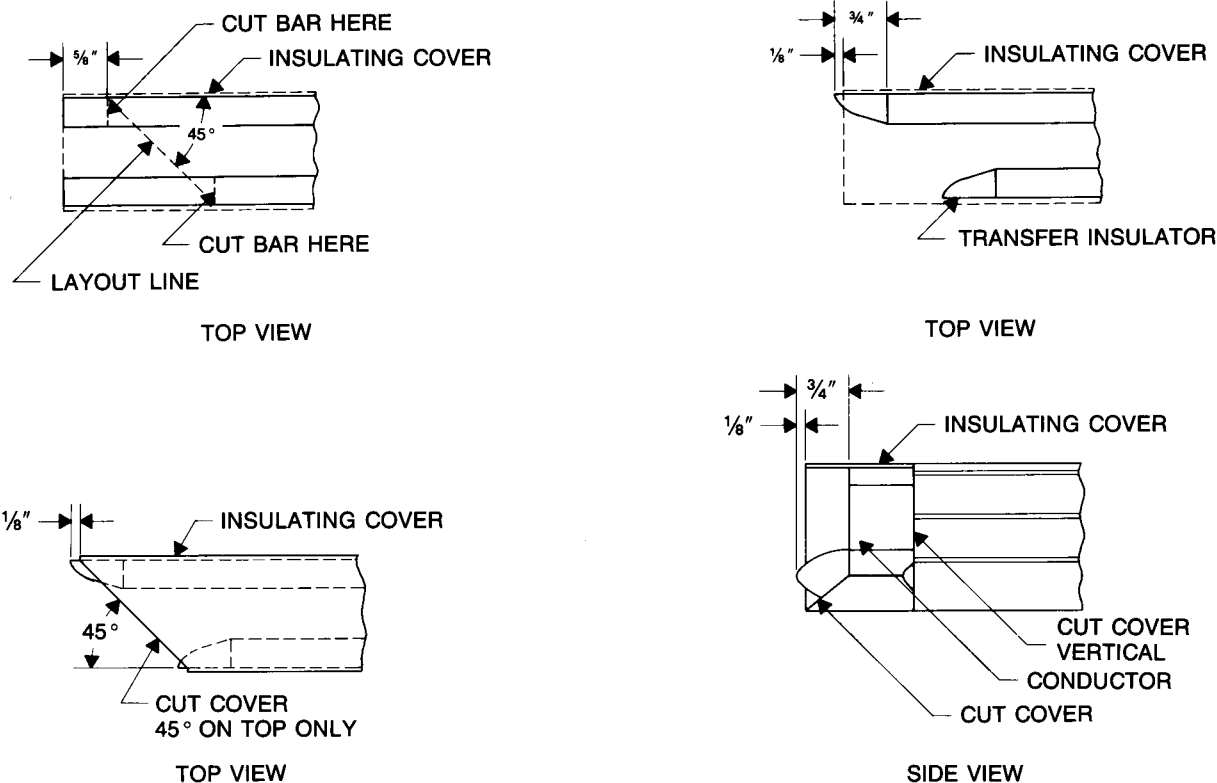


FIGURE 78

CURRENT COLLECTOR INSULATION

Insert current collectors into conductor bars by removing an end enclosure at end of electrification run or at transfer points. They may also be inserted in the system by springing apart lower lips of conductor bars midway between spacer insulators. Current collector mounting brackets are designed to tow collectors from either end as shown in Figure 71.

When mounting tow line connecting links to collector bracket, the machine screw and elastic stop nut assembly should be left slightly loose to permit the connecting link to pivot freely about the screw. If brackets are fabricated in the field, tow leads should be attached at points below center line of conductor section $3/4$ " to 1 " below bottom of conductor. For smooth operation, some slack should be left in the tow leads. In systems with curves, check required amount of slack by placing unit in most critical curve.

Terminal leads from collectors must be extra flexible such as those furnished with the assembly. In making connection to central unit, sufficient slack must be provided in the lead wires to permit flexing as collector moves in either direction. Bring the wires straight down from the collector and either tape or use wire tie around the wires and the collector bracket. Do not tape or tie snug to the bracket; leave loose so that movement of the wires is not restricted. Check that tow bracket is directly under the transverse center line of the electrification. Correct as required by springing the bracket.

INSTALLING LIGHT-DUTY WIRE-SUPPORTED TAGLINE SYSTEMS:

1. Determine components required and detail dimensional information from Figure 43 for flat electrical cable systems; or Figure 44 for round electrical cable systems.

INSTALLATION

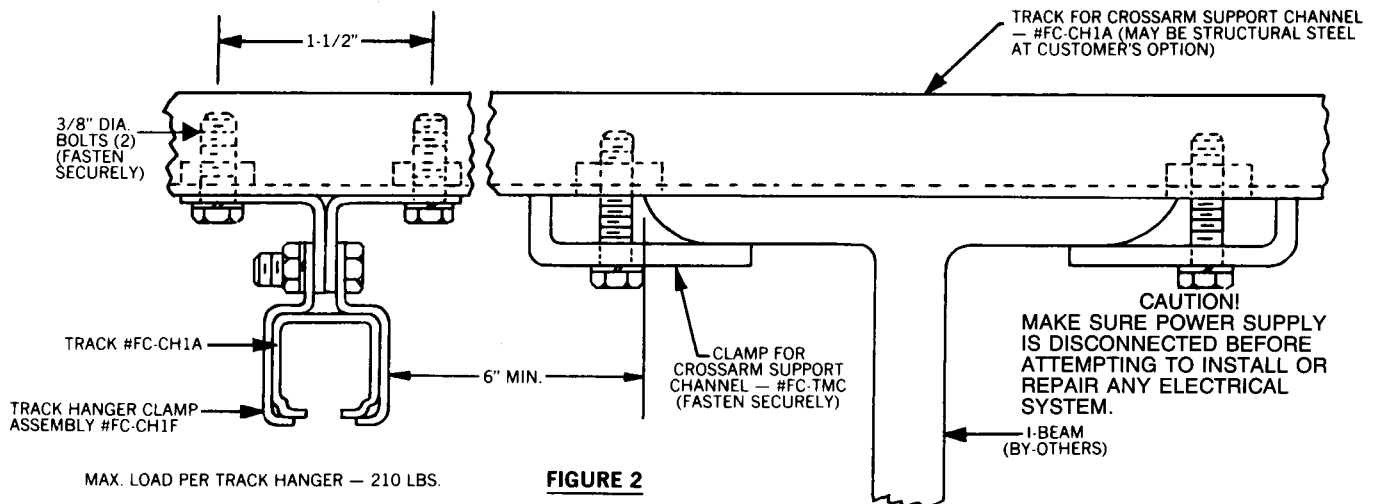
2. Refer to Figures 43 or 44 for reference.
3. Assemble eyebolts (item 3) used to support wire rope to wire rope end support brackets (item 2).
4. Secure one end of wire rope (item 4) to one eyebolt with hardware (item 3).
5. Slide intermediate and lead carrier trolleys (item 5) onto wire rope.
6. Secure other end of wire rope to one eyebolt with hardware (item 3).
7. Adjust wire rope tension with eyebolt nuts. After obtaining required wire rope tension, secure locknuts against eyebolt nuts.
8. Secure electrical cable to carrier trolleys, end clamp assembly, junction box (item 6), and hoist or trolley junction box.
9. Make electrical connections as required.

⚠ WARNING

LIGHT-DUTY, WIRE-SUPPORTED TAGLINE SYSTEMS ARE DESIGNED AND INTENDED TO SUPPORT ELECTRICAL CABLE ONLY. DO NOT USE LIGHT-DUTY, WIRE-SUPPORTED TAGLINE SYSTEMS TO SUPPORT OTHER ITEMS OR COMPONENTS. A MAXIMUM LOAD OF 9 POUNDS CAN BE SUPPORTED BY THE NYLON ELECTRICAL CABLE CARRIER TROLLEY.

INSTALLING HEAVY-DUTY TRACK-SUPPORTED FESTOON SYSTEMS:

1. Refer to Figure 45 and determine loop length, track length, quantity of carrier trolleys required, and quantity of hangers required. The carrier trolleys can be loaded to a maximum load of 45 pounds each, and can accommodate up to 5 flat electrical cables up to a maximum width of 2-3/16".
2. Install crossarm support brackets as shown in Figure 79.
3. Install track hangers on crossarms as shown in Figure 79.
4. Slide track sections into track hanger clamps as shown in Figure 79.



Crossarms may be clamped to beam as shown or welded to beam at customers option.

FIGURE 79

INSTALLATION

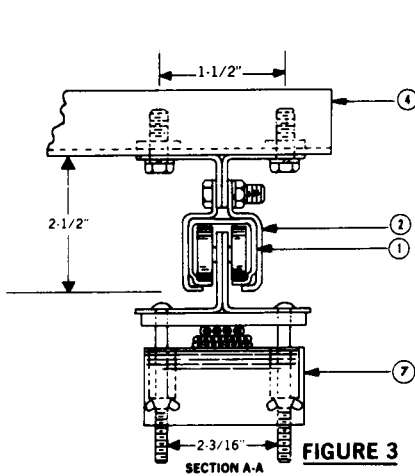


FIGURE 80

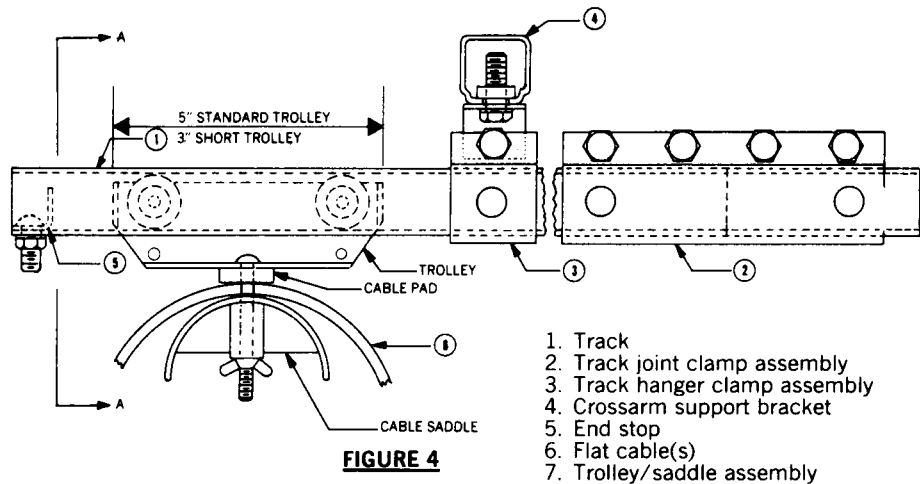


FIGURE 81

5. Butt track sections together and secure with track joint clamps as shown in Figure 81.
6. Install end clamp assembly in cable storage end of track and anchor that end of the track. Refer to Figure 82.

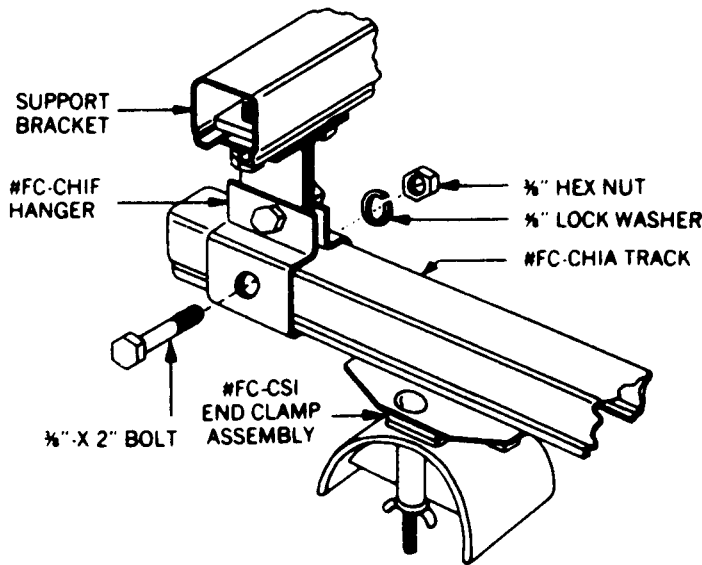


FIGURE 82

7. Insert trolley/saddle assemblies into the track. Refer to Figure 80. All trolleys should be manually operated through the entire length of track to verify that trolleys do not bind or hang up. Align track as required; or replace any trolleys that do not operate freely within the track.
8. Insert and secure the end stop in track end farthest from cable feed point. Refer to Figure 81.
9. Feed the flat cables into trolleys between the plastic clamp pad and the saddle as shown in Figures 80 and 81. Firmly finger tighten the wing nuts.
10. Install cable connectors on approved junction boxes and insert cables through the rubber bushings. Firmly tighten connector nut.
11. Install tow bar on equipment to be electrified in order that the tow bar will be centered within the tow trolley. Refer to Figure 83. This is not required when cable is fed to a control trolley. Instead, install junction box on control trolley. Refer to Figure 84.

INSTALLATION

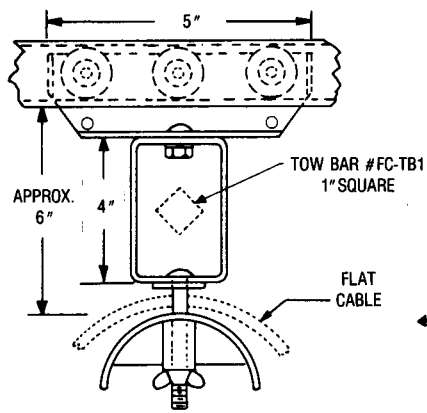


FIGURE 83

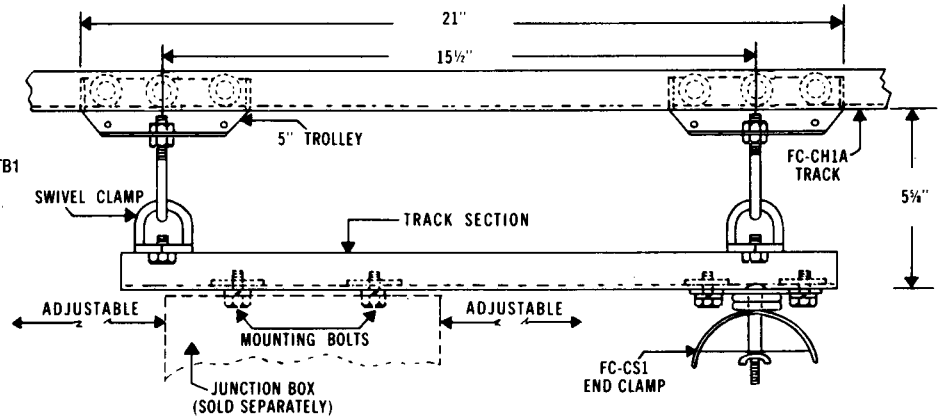


FIGURE 84

12. Operate entire system several times over full track length to verify operation. Flat cables should extend in a straight line if cables are fastened properly on trolleys.

⚠ CAUTION

CHECK THAT END STOP (ITEM 5 OF FIGURE 81) IS SECURELY FASTENED.

⚠ WARNING

HEAVY-DUTY, TRACK-SUPPORTED FESTOON SYSTEMS ARE DESIGNED AND INTENDED TO SUPPORT ELECTRICAL CABLE ONLY. DO NOT USE HEAVY-DUTY, TRACK-SUPPORTED FESTOON SYSTEMS TO SUPPORT OTHER ITEMS OR COMPONENTS. A MAXIMUM LOAD OF 45 POUNDS CAN BE SUPPORTED BY THE ELECTRICAL CABLE CARRIER TROLLEY.

CONNECTING POWER SUPPLY TO CRANE OR MONORAIL SYSTEM:

⚠ WARNING

BEFORE CONNECTING POWER TO CRANE, MONORAIL SYSTEM, OR ACCESSORIES; REFER TO THIS SUBJECT IN THE INSTALLATION SECTION OF LOUDEN® MANUAL 69878, INSTALLATION, OPERATION, MAINTENANCE, AND PARTS MANUAL FOR LOUDEN® UNDERHUNG CRANES; OR LOUDEN® MANUAL 69880, INSTALLATION, OPERATION, MAINTENANCE, AND PARTS MANUAL FOR LOUDEN® MONORAIL TRACK AND FITTINGS.

INSTALLATION

BEFORE OPERATING CRANE OR MONORAIL SYSTEM:

⚠ WARNING

BEFORE OPERATING CRANE, MONORAIL SYSTEM, OR ACCESSORIES; REFER TO THIS SUBJECT IN THE INSTALLATION SECTION OF LOUDEN® MANUAL 69878, INSTALLATION, OPERATION, MAINTENANCE, AND PARTS MANUAL FOR LOUDEN® UNDERHUNG CRANES; OR LOUDEN® MANUAL 69880, INSTALLATION, OPERATION, MAINTENANCE, AND PARTS MANUAL FOR LOUDEN® MONORAIL TRACK AND FITTINGS.

CRANE OR MONORAIL SYSTEM LOAD TEST:

⚠ WARNING

TO LOAD TEST CRANE, MONORAIL SYSTEM, OR ACCESSORIES; REFER TO THIS SUBJECT IN THE INSTALLATION SECTION OF LOUDEN® MANUAL 69878, INSTALLATION, OPERATION, MAINTENANCE, AND PARTS MANUAL FOR LOUDEN® UNDERHUNG CRANES; OR LOUDEN® MANUAL 69880, INSTALLATION, OPERATION, MAINTENANCE, AND PARTS MANUAL FOR LOUDEN® MONORAIL TRACK AND FITTINGS.

OPERATION

Operation of a monorail system or crane accessory usually includes the operation of an underhung crane, trolley, and/or an overhead hoist. The operation section of the manuals furnished with the monorail track, crane and/or hoist must be reviewed for specific operation procedures that apply to the monorail system, crane and/or hoist.

Operation of an overhead hoist, trolley and crane involves more than activating the buttons or levers of the hoist, trolley and crane control devices. It is emphasized in the ASME B30 Standards that the use of overhead hoists and cranes are subject to certain hazards that cannot be met by mechanical means, but only by the exercise of intelligence, care, common sense, and experience in anticipating the motions that will occur as a result of activating the hoist, trolley or crane controls. Certain precautions are necessary before moving the load and this includes the proper rigging of loads to the hoist hook.

⚠ WARNING

CRANE, HOIST, AND MONORAIL OPERATORS SHALL BE REQUIRED TO READ THE OPERATION SECTION OF THIS MANUAL, THE WARNINGS CONTAINED IN THIS MANUAL, THE OPERATION SECTION AND WARNINGS CONTAINED IN THE MANUAL FURNISHED WITH THE CRANE, INSTRUCTION AND WARNING LABELS ON THE CRANE, THE OPERATION SECTION AND WARNINGS CONTAINED IN THE MANUAL FURNISHED WITH THE HOIST, INSTRUCTION AND WARNING LABELS ON THE HOIST, AND THE OPERATION SECTIONS OF ASME B30.11 AND ASME B30.16; AND TO BE FAMILIAR WITH THE CRANE, HOIST, AND MONORAIL; AND CRANE, HOIST, AND MONORAIL CONTROLS BEFORE BEING AUTHORIZED TO OPERATE THE CRANE, HOIST, AND MONORAIL OR LIFTING SYSTEM.

OPERATION

⚠ WARNING

CRANE, HOIST, AND MONORAIL OPERATORS SHOULD BE TRAINED IN PROPER RIGGING PROCEDURES TO BE FOLLOWED IN THE ATTACHMENT OF LOADS TO THE HOIST HOOK.

CRANE, HOIST, AND MONORAIL OPERATORS SHOULD BE TRAINED TO BE AWARE OF POTENTIAL MALFUNCTIONS OF THE EQUIPMENT THAT REQUIRE ADJUSTMENT OR REPAIR, AND TO BE INSTRUCTED TO STOP OPERATION IF SUCH MALFUNCTIONS OCCUR, AND TO IMMEDIATELY ADVISE THEIR SUPERVISOR SO CORRECTIVE ACTION CAN BE TAKEN.

CRANE, HOIST, AND MONORAIL OPERATORS SHOULD HAVE NORMAL DEPTH PERCEPTION, FIELD OF VISION, REACTION TIME, MANUAL DEXTERITY, AND COORDINATION.

CRANE, HOIST, AND MONORAIL OPERATORS SHOULD NOT BE SUBJECT TO SEIZURES, LOSS OF PHYSICAL CONTROL, PHYSICAL DEFECTS, OR EMOTIONAL INSTABILITY THAT COULD RESULT IN ACTIONS OF THE OPERATOR BEING A HAZARD TO THE OPERATOR OR OTHERS.

CRANE, HOIST, AND MONORAIL OPERATORS SHOULD NOT OPERATE A CRANE, HOIST, MONORAIL, OR LIFTING SYSTEM WHEN UNDER THE INFLUENCE OF ALCOHOL, DRUGS, OR MEDICATION.

MONORAILS, CRANES AND OVERHEAD HOISTS ARE INTENDED ONLY FOR VERTICAL LIFTING SERVICE OF FREELY SUSPENDED UNGUIDED LOADS. DO NOT USE MONORAIL, CRANE OR HOIST FOR LOADS THAT ARE NOT LIFTED VERTICALLY, LOADS THAT ARE NOT FREELY-SUSPENDED, OR LOADS THAT ARE GUIDED. IF SUCH CONDITIONS EXIST, CONTACT ACCO CHAIN & LIFTING PRODUCTS.

REFER TO THE OPERATION SECTION OF LOUDEN® MANUALS:
69878, INSTALLATION, OPERATION, MAINTENANCE, AND PARTS MANUAL FOR LOUDEN® UNDERHUNG CRANES, PRODUCT SERIES 500; AND
69880, INSTALLATION, OPERATION, MAINTENANCE, AND PARTS MANUAL FOR LOUDEN® MONORAIL TRACK, FITTINGS, AND SWITCHES, PRODUCT SERIES 600 & 700.

MOTOR OVERLOAD FEATURES

Complete motorized trolleys are furnished with a motor overload feature. This feature de-energizes the trolley drive motor or the trolley drive control circuit for the purpose of stopping operation of the trolley when a condition arises that makes it unwise, or even hazardous, for continued operation. Therefore, if the trolley should stop during operation, or if the trolley should fail to move a load, first consider and investigate any motor overload features. Standard features, unless otherwise specified, on complete trolleys include:

- Motor Thermostats

MOTOR THERMOSTATS:

A bi-metallic, automatic thermostat is built into the motor windings. This thermostat will cause the motor control to be de-energized when the temperature of the motor winding exceeds a predetermined temperature limit. It provides full running protection against motor overheating. The motor control will continue to be de-energized until the temperature of the winding is reduced below the temperature cutoff point and then the crane may be operated as before.

OPTIONAL ITEMS:

Other motor overload features may be furnished on the trolley as specified; furnished by others as part of a trolley, crane, monorail, or lifting system; or installed as part of the system or building by the installer or owner/user of the equipment as required by ANSI/NFPA 70, National Electrical Code, or applicable Federal, State, or Local Codes. Such items could include thermal overload relays, branch circuit fuses, or main line fuses. Refer to the wiring diagram enclosed in the trolley or crane control enclosure to determine if any additional motor overload features are furnished with the trolley or crane. If the trolley or crane is installed in a lifting system designed and manufactured by others, refer to the wiring diagram for the trolley, crane, or lifting system to determine if any additional motor overload features are furnished as part of the crane or lifting system.

MAINTENANCE AND INSPECTION PROCEDURES

Cranes, trolleys, track systems, and accessories shall be maintained, inspected, and tested in accordance with the MAINTENANCE AND REPAIR, INSPECTION, and TEST sections of this manual; the MAINTENANCE AND REPAIR, INSPECTION, and TEST sections of LOUDEN® manual 69878, Installation, Operation, Maintenance, and Parts Manual for LOUDEN® Underhung Cranes, Product Series 500; the MAINTENANCE AND REPAIR, INSPECTION, and TEST sections of LOUDEN® manual 69880, Installation, Operation, Maintenance, and Parts Manual for LOUDEN® Monorail Track, Fittings, and Switches, Product Series 600 & 700; and in accordance with the intervals and requirements of ASME B30.11. Hoists shall be maintained, inspected, and tested in accordance with the manual furnished by the hoist manufacturer and in accordance with the intervals and requirements of ASME B30.16.

Before maintenance or inspections are performed on a hoist, trolley, crane, crane runway, crane runway or monorail support, or crane runway or monorail conductors, the following precautions shall be taken as applicable.

1. The hoist, trolley, or crane to be inspected, tested, or repaired shall be run to a location where it will cause the least interference with other hoists, cranes, and operations in the area.
2. If a load is attached to the crane, trolley, or hoist it shall be landed.
3. All controllers shall be placed in the off position.
4. If a trolley hoist is installed on the crane or runway, the trolley shall be blocked to prevent trolley movement.
5. The crane shall be blocked to prevent crane movement.

DANGER

6. HAZARDOUS VOLTAGES ARE PRESENT IN THE CONTROL BOX, OTHER ELECTRICAL COMPONENTS, AND CONNECTIONS BETWEEN THESE COMPONENTS.

The main switch (disconnect) of the hoist, crane, monorail, or lifting system shall be de-energized. Lock and tag the main switch in the de-energized position in accordance with ANSI Z244.1.

7. Warning signs and barriers shall be utilized on the floor beneath the hoist, crane, monorail, or lifting system where overhead maintenance, repair, or inspection work creates a hazardous area on the floor beneath the hoist, crane, monorail, or lifting system.
8. If the crane runway or monorail remains energized because of other equipment operating on the same runway or monorail; rail stops or a signal person(s), located full-time at a visual vantage point for observing the approach of an active crane(s) or trolley(s) shall be provided to prohibit contact by the active crane(s) or trolley(s) with the idle crane or trolley; with persons performing maintenance, repair, or inspection; and with equipment used in performing the maintenance, repair, or inspection.
9. A guard or barrier shall be installed between adjacent runways for the length of the established work area to prevent contact between persons performing maintenance, repair, or inspection and a crane on the adjacent runway.
10. Safe access to the hoist, crane, or lifting system, such as scaffolding, work platforms, etc., shall be provided for personnel that will perform maintenance, repair, or inspection. If personnel are required to work at elevations in excess of 6 feet above floor or ground level, a fall prevention policy and procedure shall be developed, documented, and implemented by the owner/user.
11. After maintenance, repair, or inspection work is completed, and before the hoist, trolley, crane, or lifting system is returned to normal operation:
 - a. Any guards on the hoist, trolley, crane, or lifting system that were removed to perform maintenance, repair, or inspection work shall be reinstalled.
 - b. Any safety devices on the hoist, trolley, crane, or lifting system that were deactivated to perform maintenance, repair, or inspection work shall be reactivated.

MAINTENANCE AND INSPECTION PROCEDURES

- c. Any parts that were replaced and other loose material shall be removed.
 - d. All equipment used in the maintenance, repair, or inspection work shall be removed.
12. Warning signs, barriers, and guards shall be removed only by authorized personnel.
13. Lock and tag on the main switch (disconnect) of the hoist, crane, or lifting device shall be removed only by the person that locked and tagged the main switch originally, or an authorized person.
14. If the extent of the maintenance or repair work requires any testing as outlined in the TEST section of this manual; the TEST section of LOUDEN® manual 69878, Installation, Operation, Maintenance, and Parts Manual for LOUDEN® Underhung Cranes, Product Series 500; the TEST section of LOUDEN® manual 69880, Installation, Operation, Maintenance, and Parts Manual for LOUDEN® Monorail Track, Fittings, and Switches, Product Series 600 & 700; the manual furnished by the hoist manufacturer; or as required by, as applicable, the provisions of ASME B30.16, or ASME B30.11; such tests shall be conducted before the hoist, trolley, crane, or lifting system is returned to normal operation.

INSPECTION

Inspection procedure for cranes and monorails in regular service is divided into two general classifications as outlined in ASME B30.11. These two general classifications are based upon the intervals at which inspections should be performed. The intervals are dependent upon the nature of the critical components of the crane, monorail and accessories; and the degree of exposure of crane, monorail, and accessory components and parts to wear and deterioration. The degree of exposure is dependent upon equipment activity, severity of equipment service, and the environment of equipment location. These two general classifications of inspection are designated as *frequent* and *periodic*. In addition, daily inspections are required to be performed by the operator at the start of each shift, or at the time the equipment is first used during each shift.

WARNING

REFER TO THE INSPECTION SECTION OF LOUDEN® MANUALS:
69878, INSTALLATION, OPERATION, MAINTENANCE, AND PARTS MANUAL FOR LOUDEN® UNDERHUNG
CRANES, PRODUCT SERIES 500; AND
69880, INSTALLATION, OPERATION, MAINTENANCE, AND PARTS MANUAL FOR LOUDEN® MONORAIL TRACK,
FITTINGS, AND SWITCHES, PRODUCT SERIES 600 & 700.

TEST

After installation, it is the responsibility of the owner/user to test the monorail, crane, and accessory in accordance with ASME B30.11. If a crane is installed on the crane runway, it is the responsibility of the owner/user to test the crane in accordance with ASME B30.11, and instructions in the manual furnished with the crane. If a hoist is installed on the monorail or crane, it is the responsibility of the owner/user to test the hoist in accordance with ASME B30.16, and instructions in the manual furnished with the hoist.

Testing of monorail, crane, or accessory after original installation is required when the monorail, crane, or accessory has been altered, reinstalled, modified, or repaired; has been idle for a period of 12 months or longer; or in accordance with specific testing requirements established by the owner/user. General testing requirements are outlined in ASME B30.11 and should be followed.

TEST

WARNING

REFER TO THE TEST SECTION OF LOUDEN® MANUALS:
69878, INSTALLATION, OPERATION, MAINTENANCE, AND PARTS MANUAL FOR LOUDEN® UNDERHUNG
CRANES, PRODUCT SERIES 500; AND
69880, INSTALLATION, OPERATION, MAINTENANCE, AND PARTS MANUAL FOR LOUDEN® MONORAIL TRACK,
FITTINGS, AND SWITCHES, PRODUCT SERIES 600 & 700.

MAINTENANCE AND REPAIR

If maintenance, adjustment, replacement of parts, or repair of the equipment is required because of any damage or malfunctions noted during the daily, frequent, or periodic inspections outlined in the INSPECTION section of manuals 69878 and 69880; because of conditions found during a test as outlined in the TEST section of manuals 69878 and 69880; or based upon specific instructions outlined in other sections of this manual or manuals 69878 and 69880; the equipment shall be taken out of service, and maintenance performed as required.

WARNING

BEFORE PERFORMING ANY MAINTENANCE OR ADJUSTMENTS ON THE EQUIPMENT, REFER TO THE
MAINTENANCE AND INSPECTION PROCEDURES SECTION OF THIS MANUAL.

DANGER

HAZARDOUS VOLTAGES ARE PRESENT IN THE CONTROL BOX, OTHER ELECTRICAL COMPONENTS, AND
CONNECTIONS BETWEEN THESE COMPONENTS.

The main switch (disconnect) of the equipment shall be de-energized. Lock and tag the main switch in the de-energized position in accordance with ANSI Z244.1.

Follow the instructions outlined in various sections of this manual or manuals 69878 and 69880 for specific components or portions of the equipment where maintenance or adjustment is required. Refer to the parts identification pages for the specific portion of the equipment where maintenance or adjustment is being performed and to identify any part numbers requiring replacement.

If any instructions are not clear; or if any additional information is required in reference to adjustment, maintenance, or identification of parts; contact Acco Chain & Lifting Products or the distributor of the equipment.

LUBRICATION

All moving parts of the equipment for which lubrication is specified should be inspected, checked, and lubricated on a regular basis. The method used to deliver lubricant should be checked for proper delivery of the lubricant. This section applies to LOUDEN® cranes and trolleys or carriers only. If a hoist is installed as part of a crane or lifting system, lubrication instructions covered in the manual furnished with the hoist should be followed.

Trolley drive unit gear housings are enclosed and provide a liberal oil reservoir from which gears and bearings inside the housing are splash-lubricated. Check oil level in gear housings periodically, with intervals determined by use and operating conditions. Refer to INSPECTION section of this manual.

Equipment shall be stationary when inspecting, checking, adding or changing lubricants. The main switch (disconnect) of the equipment, shall be de-energized. Lock and tag the main switch in the de-energized position in accordance with ANSI Z244.1.

⚠ WARNING

BEFORE INSPECTING, CHECKING, ADDING, OR CHANGING LUBRICANTS OF THE EQUIPMENT, REFER TO THE MAINTENANCE AND INSPECTION PROCEDURES SECTION OF THIS MANUAL.

⚠ CAUTION

DO NOT USE LUBRICANTS THAT DO NOT MEET THE SPECIFICATIONS OF THE RECOMMENDED LUBRICANTS.

⚠ WARNING

ALL LUBRICANTS:
MAY CAUSE MILD EYE IRRITATION - AVOID CONTACT WITH EYES.
MAY CAUSE MODERATE SKIN IRRITATION - AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. WASH THOROUGHLY AFTER HANDLING.
ARE SLIGHTLY COMBUSTIBLE - KEEP AWAY FROM EXTREME HEAT AND OPEN FLAME.

MODEL M9 MOTOVEYOR® :

Refer to Figure 17 to determine the location of breather and oil fill plug, oil level plug, and drain plug.

When the model M9 is shipped from the factory, the breather plug hole is closed by use of a solid plug. During installation, this solid plug is to be removed and replaced with a breather plug furnished loose. When installing the breather plug, the breather hole on the outside of the plug must be directed upward. During inspection, clean the breather plug and check that the breather hole in the plug is not closed because of foreign matter or dirt. If the breather hole is closed, either clean the plug to open the breather hole or replace with a new breather plug.

The level of the oil in the housing should be level with the bottom of the oil level hole. If the level of the oil in the housing is below this point, add oil. Add oil through the oil fill hole at the breather plug until oil level in the housing is level with the bottom of the oil level hole. Refer to Table 10 for recommended lubricants. AGMA stands for American Gear Manufacturers Association. Table 11 lists lubricants of some lubricant manufacturers in accordance with AGMA lubricant numbers.

LUBRICATION

**TABLE 10
GEAR HOUSING LUBRICANTS
MODEL M9 MOTOVEYOR®
STEEL-WHEEL TROLLEY DRIVE UNIT**

AMBIENT TEMPERATURE	AGMA LUBRICANT
Below 15° F (-9° C)	Contact Acco
15° to 60° F (-9° to 16° C)	AGMA No. 4 EP
50° to 125° F (10° to 52° C)	AGMA No. 6 EP
Above 100° F (38° C)	Contact Acco

For normal service, replace gear housing oil after 300 operational hours or 6 months, whichever comes first. Replace oil more frequently for heavy duty service or as required. Select lubricant from Table 10. The drive is shipped from the factory with AGMA No. 6 EP oil. Remove oil from housing through the drain hole and replace plug. Add oil through the oil fill hole until oil level in the housing is level with the bottom of the oil level hole. Make sure all plugs have been replaced before operating crane.

**TABLE 11
AGMA LUBRICANTS BY MANUFACTURER**

MANUFACTURER	AGMA 4EP	AGMA 6EP	AGMA 7 COMP.	AGMA 8 COMP.
Amoco Oil Co.	Perma Gear EP 150	Perma Gear EP 320	Worm Gear Oil	Cylinder Oil 680
ARCO	Pennant NL Oil 150	Pennant NL Oil 320	Modoc 175	Modoc 175
Chevron USA, Inc.	Gear Compound EP Grade 150	Gear Compound EP Grade 320	Cylinder Oil 460X	Cylinder Oil 680X
Conoco	Gear Oil Grade 150	Gear Oil Grade 320	none	none
Exxon Co. USA	Spartan EP Grade 150	Spartan EP Grade 320	Cylestic TK-460	Cylestic TK-680
Gulf Oil Co.	EP Lubricant HD 150	EP Lubricant HD 320	Senate 460	Senate 680D
Mobil Oil Corp.	Mobilgear 629	Mobilgear 632	600W Super	Extra Hecla Super
Shell Oil Co.	Omala 150	Omala 320	Valvata Oil J460	Valvata Oil J680
Sun Oil Co.	Sun EP 1060	Sun EP 1090	Gear Oil 7C	Gear Oil 8C
Texaco	Meropa 150	Meropa 320	Honor Cylinder Oil 460	650T Cylinder Oil
ISO Viscosity Grade	150	320	460	680
Ambient Temperature	15° to 60° F -9° to 16° C	50° to 125° F 10° to 52°	C15° to 60° F -9° to 16° C	50° to 125° F 10° to 52° C

STEEL-WHEEL TROLLEY DRIVE:

Refer to Figure 16 to determine the location of breather and oil fill plug, oil level plug, and drain plug for the steel-wheel crane drive unit.

When the steel-wheel drive is shipped from the factory, the breather plug hole is closed by use of a solid plug. During installation, this solid plug is to be removed and replaced with a breather plug furnished loose. When installing the breather plug, the breather hole on the outside of the plug must be directed upward. During inspection, clean the breather plug and check that the breather hole in the plug is not closed because of foreign matter or dirt. If the breather hole is closed, either clean the plug to open the breather hole or replace with a new breather plug.

LUBRICATION

The level of the oil in the housing should be level with the bottom of the oil level hole. If the level of the oil in the housing is below this point, add oil. Add oil through the oil fill hole at the breather plug until oil level in the housing is level with the bottom of the oil level hole. Refer to Table 10 for recommended lubricants. AGMA stands for American Gear Manufacturers Association. Table 11 lists lubricants of some lubricant manufacturers in accordance with AGMA lubricant numbers.

For normal service, replace gear housing oil after 300 operational hours or 6 months, whichever comes first. Replace oil more frequently for heavy duty service or as required. Select lubricant from Table 10. The drive is shipped from the factory with AGMA No. 6 EP oil. Remove oil from housing through the drain hole and replace plug. Add oil through the oil fill hole until oil level in the housing is level with the bottom of the oil level hole. Make sure all plugs have been replaced before operating crane.

BEARINGS:

Bearings not located inside gear housing and motor are pre-lubricated and provided with shields or seals, unless provided with lube fittings, for operation in ambient temperatures between 0°F and 104°F, and in environments reasonably free from dust, moisture, and corrosive fumes. No additional lubricant is required for bearings with shields or seals. If bearings are provided with lube fittings, check and add NLGI No. 2 grease every 6 months. For other operating conditions, contact Acco Chain & Lifting Products or the distributor of the crane.

WHEEL BEARINGS:

Unless provided with lube fittings, wheel bearings are pre-lubricated and provided with shields or seals for operation in ambient temperatures between 0°F and 104°F, and in environments reasonably free from dust, moisture, and corrosive fumes. No additional lubricant is required for wheel bearings with shields or seals. If wheel bearings are provided with lube fittings, check and add NLGI No. 2 grease every 6 months. For other operating conditions, contact Acco Chain & Lifting Products or the distributor of the crane.

BRONZE THRUST WASHERS:

Inspect and check bronze thrust washers every 6 months. Clean the old lubricant off the bronze thrust washer. If washer shows signs of cracks or excessive wear (washer thickness worn to 75% of original thickness), replace bronze thrust washer. Bronze washers are to be coated with Lubriplate 630-AA or 630-2 before re-installing.

EXPOSED OR OPEN GEARS AND PINIONS:

Exposed gears and pinions on steel-wheel drives are shipped from the factory without lubricant. Lyondell® EP Moly D Grease, packaged in a 4-ounce squeeze bottle container, is furnished with all steel-wheel drives. During installation, the Lyondell® EP Moly D Grease should be applied to all exposed gears and pinions so that a coating of lubricant is on all pinion and gear teeth.

For normal service, apply Lyondell® EP Moly D Grease or equivalent to all exposed gears and pinions every 3 months to maintain a coating of lubricant on all pinion and gear teeth. Apply grease more frequently for heavy duty service or as required.

In applications where foreign matter or dirt combines with the grease on exposed gears and pinions, the dirty grease should be cleaned off the teeth prior to applying new grease.

Additional containers of Lyondell® EP Moly D Grease, packaged in a 4-ounce squeeze bottle, can be obtained by ordering Acco® part no. 69807.

WARNING

NEVER APPLY ANY LUBRICANTS TO PARTS OF THE TROLLEY DRIVE MOTOR BRAKE.

TROLLEY DRIVE BRAKE

Motor brakes are standard on motor-driven trolley drive units.

The brake coil on reconnectable 230/460 volt single-speed motors may be connected for 230 volts or 460 volts. The brake coil must be reconnected as shown in Figure 85 if the motor voltage is reconnected.

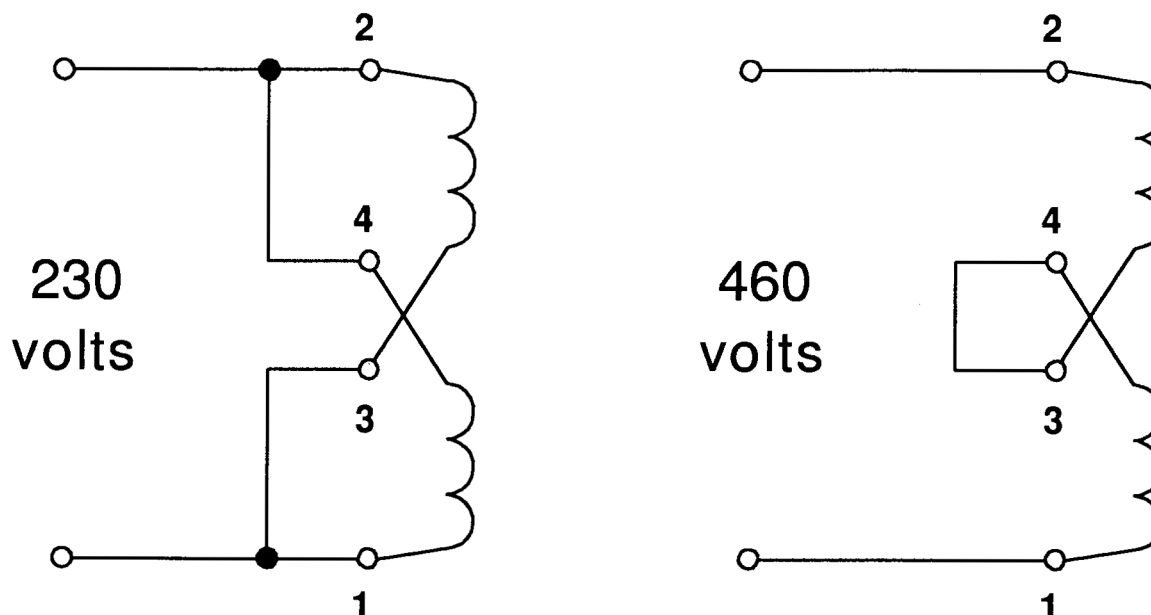


FIGURE 85

Trolley drive brake on trolleys in regular service should be checked without load on the trolley by the operator at the start of each shift, or the first time the trolley is to be operated during each shift. The trolley drive brake should be checked during scheduled frequent and periodic inspections.

During daily, frequent, or periodic inspections, the trolley drive brake should be checked as follows:

1. Operate trolley in both travel directions, without load on the hook, and stop motion to check operation of the trolley drive brake. The drift of the trolley should not exceed a distance equal to 10% of the trolley travel speed in either direction. If trolley drift exceeds this distance, the trolley drive brake normally requires adjustment or lining replacement.
2. After completing trolley drive brake adjustment or lining replacement, operate trolley in both travel directions, without load on the hook, and stop motion to check operation of the trolley drive brake. If trolley drift is still excessive, replace the brake assembly.

⚠ DANGER

DISCONNECT POWER AND LOCKOUT DISCONNECTING MEANS BEFORE ADJUSTING TROLLEY DRIVE BRAKE.

Only qualified personnel should adjust brakes.

TROLLEY DRIVE BRAKE

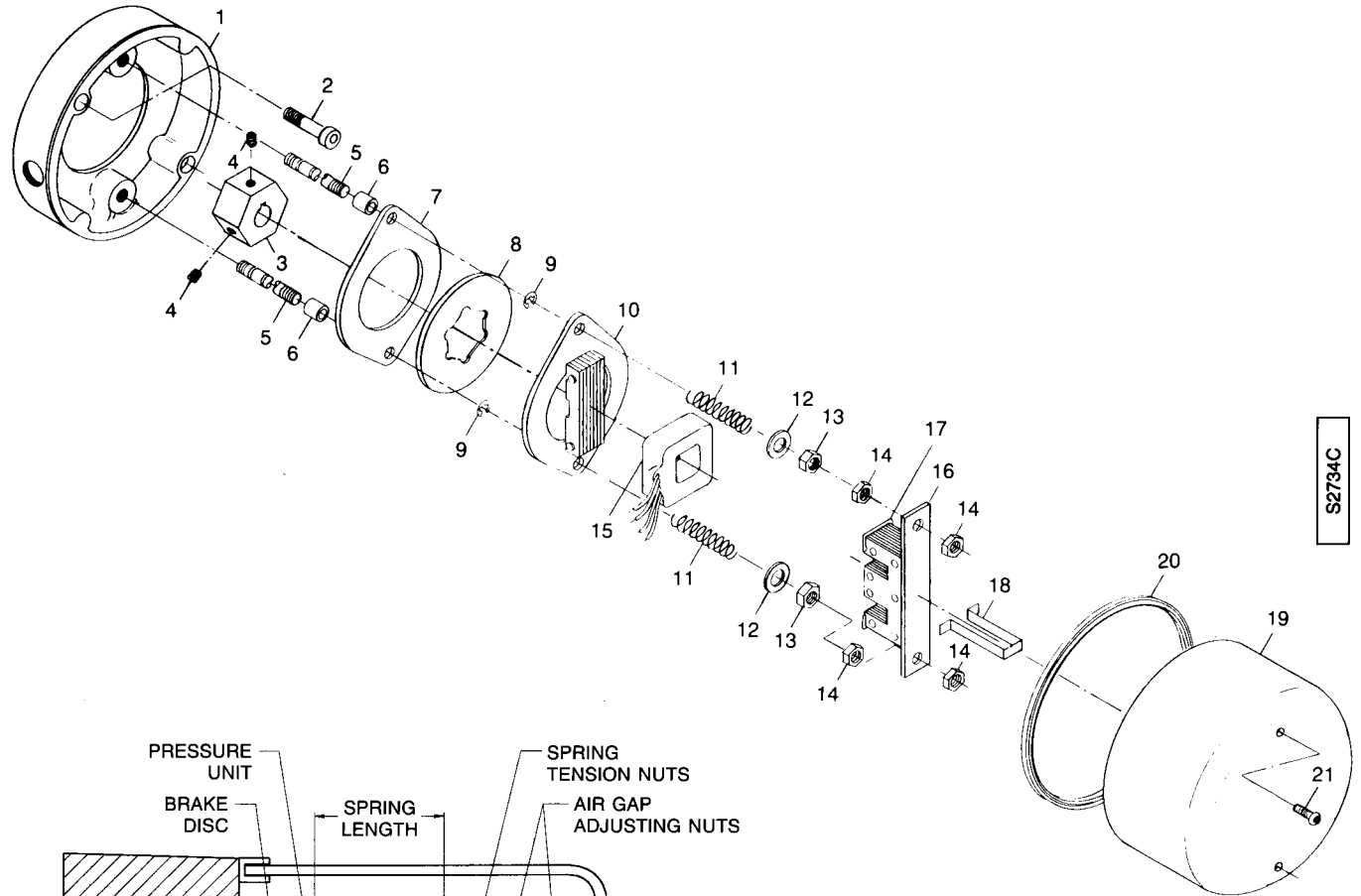


FIGURE 86

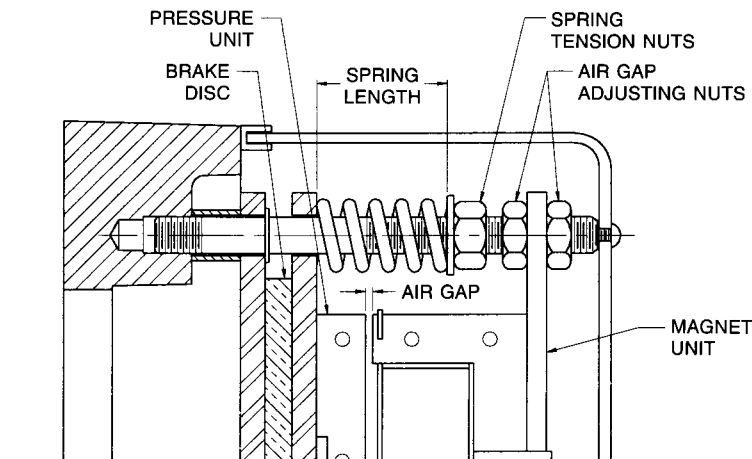


FIGURE 87

TROLLEY DRIVE BRAKE INSPECTION:

The trolley drive brake and parts are shown in Figures 86 and 87. Trolley drive motor brake should be inspected every three months, and during scheduled frequent and periodic inspections, as follows:

1. Follow the procedures and instructions listed in the MAINTENANCE AND INSPECTION PROCEDURES section of this manual.
2. Loosen and remove bolts (21) securing brake cover (19).
3. Remove brake cover (19).
4. Use air or brush to remove any lining dust that has accumulated on brake parts. Specific attention should be directed to removal of dust from the air gap between magnet (17) and armature plate (10).

TROLLEY DRIVE BRAKE

⚠ WARNING

USE PROPER EYE AND BREATHING PROTECTION EQUIPMENT DURING DUST REMOVAL.

5. Check brake coil (15) for proper fit and retention in magnet (17). Adjust coil strap (18) to tighten.
6. Check for loose electrical connections or broken wires. Repair or replace as required.
7. Check thickness of brake disc (8). Replace disc if worn to a thickness of 3/32 inch (2.4 mm) or less.
8. Check air gap and adjust if required. Minimum air gap - 0.020 inch (0.5 mm) Maximum air gap - 0.045 inch (1.1 mm) Adjust in accordance with "TO ADJUST AIR GAP" instructions of this section.
9. Replace brake cover (19) and secure with bolts (21). Bolts (21) are self-locking type with locking insert. Do not reuse bolts with damaged locking insert or that do not tighten properly. When replacing the brake cover, the ends of the rubber gasket should face downward to prevent water or foreign substances from getting inside the brake cover.

TO ADJUST AIR GAP:

Adjust trolley drive brake air gap as follows:

1. Loosen the air gap adjusting nuts (14) to allow the magnet unit (16) to move toward the pressure unit (10). Using a feeler gage, set the air gap to 0.020 inches. Tighten air gap adjusting nuts (14) to lock the position on the magnet unit (16). Check air gap at several points to verify uniform setting.
2. As brake disc wear occurs, the compressed length of spring (11) will increase. Select the recommended compressed spring length from Table 12, based on trolley motor horsepower. Adjust both spring lengths in accordance with Table 12. If trolley stopping performance is not satisfactory, increase compressed spring length for less brake torque or decrease compressed spring length for more brake torque.

**TABLE 12
COMPRESSED LENGTH OF SPRING
TROLLEY DRIVE MOTOR BRAKE**

MOTOR HORSEPOWER 1800 RPM	BRAKE TORQUE (LB FT)	COMPRESSED LENGTH SPRING (IN)
1/2	3/4	1-5/8
3/4	1-1/8	1-9/16
1	1-1/2	1-1/2
1-1/2	2-1/4	1-3/8
2	3	1-1/4
3	4-1/2	1-1/2
5	7-1/2	1-5/16
MOTOR HORSEPOWER 1200 RPM	BRAKE TORQUE (LB FT)	COMPRESSED LENGTH SPRING (IN)
1/2	1-1/8	1-9/16
3/4	1-3/4	1-7/16
1	2-1/4	1-3/8

TROLLEY AND TROLLEY WHEELS

TROLLEY AND WHEEL INSPECTION:

Trolleys and wheels should be inspected every three months, and during scheduled frequent and periodic inspections, as follows:

1. Follow the procedures and instructions listed in the MAINTENANCE AND INSPECTION PROCEDURES section of this manual.
2. Inspect trolley wheel bearings for wear by manually rotating and rocking wheels. If excessive bearing play is present, replace bearings.
3. Inspect for wear, flat spots, or damage to wheel tread; and cracked or broken wheel flanges. Replace wheels as required. When wheel replacement is required, all the wheels of a trolley should be replaced.
4. Inspect gear teeth of geared wheels and pinion for wear, cracks, or damage. Replace geared wheels or pinion as required. Geared wheels should always be replaced in pairs.
5. Inspect and tighten or replace as required all bolts, nuts, and locking devices on the trolley.
6. Inspect and tighten or replace as required all bolts, nuts, and locking devices connecting loadbars, and other structural members to the trolley.
7. Inspect bronze thrust washers for cracks and excessive wear. Refer to LUBRICATION section of this manual.
8. Check lubrication in accordance with the LUBRICATION section of this manual.
9. For trolleys with drive tires, check adjustment of drive tire against bottom surface of monorail or girder. Adjust so that tire will not slip when operating at full load. Tire slippage will accelerate tire wear; however, excessive tightening will place excessive loads on motors, shafts, bearings, and wheels.
10. For trolleys with collectors, check that collectors are positioned for proper contact with conductors.

ELECTRICAL COMPONENTS



HAZARDOUS VOLTAGES PRESENT.

DISCONNECT POWER AND LOCKOUT DISCONNECTING MEANS BEFORE INSPECTING OR SERVICING.

Only qualified electricians should inspect, service, repair, or replace electrical components.

ELECTRICAL COMPONENTS INSPECTION:

Electrical components should be inspected every three months, and during scheduled frequent and periodic inspections, as follows:

1. Follow the procedures and instructions listed in the MAINTENANCE AND INSPECTION PROCEDURES section of this manual.
2. Components to examine:
 - a. Magnetic contactors.

ELECTRICAL COMPONENTS

- b. If provided, travel limit switches, and locking devices.
 - c. Control devices.
 - d. Wiring and connections.
3. Damage to look for:
- a. Pitting.
 - b. Corrosion.
 - c. Broken parts.
 - d. Damage and deterioration of any kind.
 - e. Damaged or frayed wire.
 - f. Loose terminal connections.
4. Corrective action required:
- a. Tighten any loose connections.
 - b. Replace any damaged or frayed wires.
 - c. Replace any pitted, burned, or corroded contacts or the entire contactor. Replace contacts in sets only. NEVER attempt to smooth contacts by filing or other means.
 - d. Replace damaged components.
 - e. Lubricate controller parts only if recommended by the controller manufacturer.

RECONNECTABLE MOTORS:

Standard trolley drive single-speed motors are reconnectable for 208/230 volt or 460 volt, three-phase, 60 Hz. operation. Such motors and control will be connected at the factory for 460 volt unless otherwise specified. All two-speed motors, 200 volt single-speed motors, and 575 volt single-speed motors are single voltage motors, and are not reconnectable.

If reconnection of a 230/460 volt motor is required, proceed as follows:

1. If trolley is connected to the main power supply, de-energize, lock, and tag the main switch (disconnect).
2. Reconnect the control circuit transformer, located inside the control enclosure. Connection instructions are located on the transformer. Refer to Table 15 and Figure 91.
3. Reconnect the trolley drive motor leads inside the motor junction box. Refer to Table 13 and Figures 88 and 89.
4. Reconnect the trolley drive motor brake leads inside the motor junction box. Refer to Table 16 and Figure 92. Refer to the TROLLEY DRIVE BRAKE section of this manual for additional crane drive brake information.
5. If the trolley is equipped with optional motor circuit fuses or overload relays sized for the original connection voltage, they must be replaced with ones properly sized for the reconnected voltage.

CAUTION

WHEN RECONNECTING FOR A DIFFERENT VOLTAGE, MOTOR CIRCUIT FUSES AND THERMAL OVERLOADS (IF ANY) MUST BE REPLACED WITH UNITS THAT COMPLY WITH THE NEW VOLTAGE AND CURRENT RATINGS.

WARNING

WHENEVER ANY CHANGES HAVE BEEN MADE, DO NOT OPERATE TROLLEY, CRANE, OR HOIST UNTIL ALL SAFETY DEVICES HAVE BEEN RECHECKED IN THE SAME MANNER AS DURING ORIGINAL INSTALLATION. REFER TO INSTALLATION SECTION OF THIS MANUAL.

Refer to Table 14 and Figure 90 for two-speed motor connections.

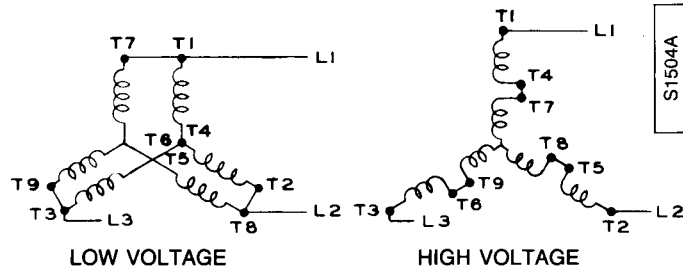


FIGURE 88

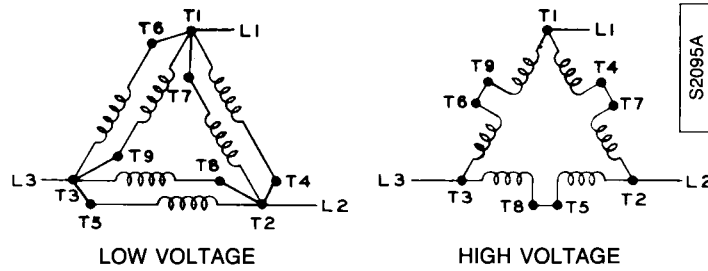


FIGURE 89

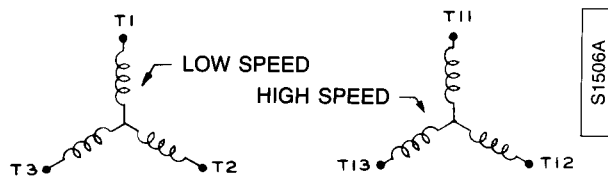


FIGURE 90

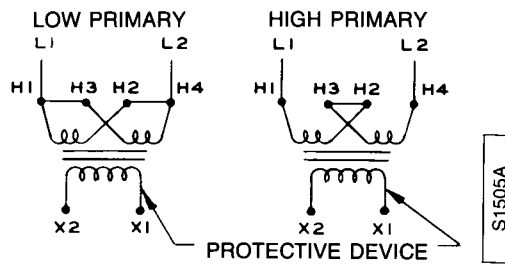


FIGURE 91

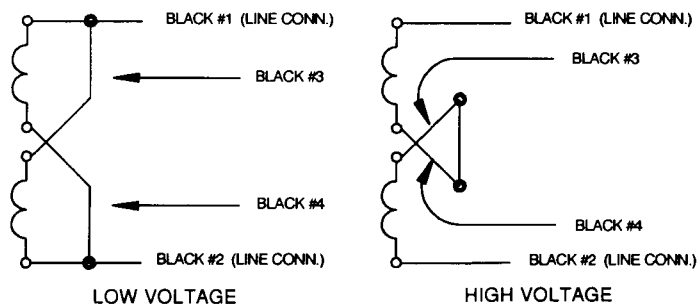


FIGURE 92

ELECTRICAL COMPONENTS

TABLE 13
MOTOR CONNECTIONS
Y-CONNECTED (Figure 88) DELTA-CONNECTED (Figure 89)

LOW VOLTAGE	HIGH VOLTAGE	LOW VOLTAGE	HIGH VOLTAGE
L1,T1,T7	L1,T1	L1,T1,T6,T7	L1,T1
L2,T2,T8	L2,T2	L2,T2,T4,T8	L2,T2
L3,T3,T9	L3,T3	L3,T3,T5,T9	L3,T3
	T4,T7		T4,T7
T4,T5,T6	T5,T8		T5,T8
	T6,T9		T6,T9

TABLE 14
TWO-SPEED MOTOR CONNECTIONS
(Figure 90)

LOW SPEED	HIGH SPEED
L1,T1	L1,T11
L2,T2	L2,T12
L3,T3	L3,T13
INSULATE SEPARATELY	INSULATE SEPARATELY
T11-T12-T13	T1-T2-T3

TABLE 15
TRANSFORMER CONNECTIONS
(Figure 91)

LOW VOLTAGE	HIGH VOLTAGE
H1,H3-L1	H1-L1
H2,H4-L2	H4-L2
	H2-H3

TABLE 16
CRANE DRIVE MOTOR BRAKE COIL CONNECTIONS

VOLTAGE	BRAKE COIL PART NO. 39783-3
230 VAC	Figure 92, Low voltage
380 VAC	Figure 92, High voltage
480 VAC	Figure 92, High voltage

ELECTRICAL COMPONENTS

NOTICE

When a trolley hoist is installed on a crane system that requires a common control voltage between the crane and hoist controls, the following must be adhered to:

1. Primary phasing to the control transformer in both the hoist and crane must be identical.
2. X1 must be connected between the hoist and crane controls.
3. The X2 secondary leads **MUST NOT** be connected together or to ground.

FAILURE TO FOLLOW THESE GUIDELINES WILL RESULT IN MISMATCHED VOLTAGES AND BLOWN CONTROL TRANSFORMER FUSES.

On installations where a grounded X2 secondary is required, SEPARATE X1 leads must be used for:

1. the mainline contactor (on the crane) and crane motion, and
2. the trolley/hoist motion controls or push buttons.

The X1 of transformers with grounded X2 secondaries **MUST NOT** be tied together.

If additional information is required, contact Acco Chain & Lifting Products or the distributor of the trolley hoist.

ACCELERATION CONTROL MODULE V

An Acceleration Control Module V (ACM V) is furnished as a standard feature on all power-driven M9 motoveyors and steel wheel drives using a three-phase electric motor. The ACM V is a solid state device designed to provide reduced starting torque and controlled acceleration of three-phase motors. The ACM V offers a soft controlled start that reduces the swinging action of suspended loads caused by uncontrolled abrupt starts. Starting torque and acceleration rate can be adjusted to accommodate differing requirements.

DANGER

HAZARDOUS VOLTAGES ARE PRESENT IN THE CONTROL BOX, OTHER ELECTRICAL COMPONENTS, AND CONNECTIONS BETWEEN THESE COMPONENTS.

The main switch (disconnect) of the trolley hoist, crane, or lifting system shall be de-energized. Lock and tag the main switch in the de-energized position in accordance with ANSI Z244.1.

Only qualified electricians should inspect, adjust, service, repair, or replace electrical components.

All adjustments of ACM V must be made with the main switch locked and tagged in the de-energized position. After adjustments are made, re-energize power supply and test operation of ACM V. If additional adjustment is required, repeat this procedure.

NOTICE

Multi-Voltage Controls must be set for correct voltage before operating.

ACCELERATION CONTROL MODULE V

ACM V SINGLE SPEED ADJUSTMENT:

1. Set the TIME adjustment at the maximum point and the INITIAL TORQUE adjustment at the minimum point. (This initial setting provides the softest start, but the initial torque may be too small to start the motor for the first few cycles.)
2. Set the INITIAL TORQUE adjustment first; usually $\frac{1}{4}$ to $\frac{1}{2}$ of a turn from the minimum torque setting is adequate.
3. Decrease the TIME adjustment if the starting is too soft under a half load condition. Strive for a smooth even transition from zero to maximum speed with a minimal INITIAL TORQUE setting.

ACM V TWO SPEED ADJUSTMENT:

1. Set the TIME adjustment at the maximum point and the ACCELERATION and DECELERATION INITIAL TORQUE adjustments at the minimum points. (This setting provides the softest start, but the initial torque may be too small to start the motor for the first few cycles.)
2. Set the ACCELERATION TORQUE adjustment first; usually $\frac{1}{4}$ to $\frac{1}{2}$ of a turn from the minimum torque setting is adequate.
3. Next set the DECELERATION TORQUE adjustment by turning it to the minimum torque setting. If the transition from high to low speed is too soft, increase the setting until an appropriate transition is obtained. Usually setting the DECELERATION TORQUE adjustment to minimum proves to be the best setting.

DANGER

SERVICE CHECKS OF THE ACM V REQUIRE THAT THE ELECTRICAL POWER SUPPLY BE ENERGIZED.

THEREFORE, only electricians qualified and certified to work on energized circuits and equipment should perform this service.

NOTICE

All readings should be taken with a standard analog type VOM (volt-ohm-meter)

ACM V SINGLE SPEED SERVICE:

1. Disconnect motor from T1, T2, and T3.
2. Set INITIAL TORQUE adjustment to minimum and the TIME adjustment to maximum.
3. Energize the contactor. For proper operation the following readings should be taken (example is for a 460 VAC, three-phase system with 115 VAC control voltage):
 - a. TL1 to TL2, TL2 to TL3, and TL1 to TL3 – 460 VAC.

ACCELERATION CONTROL MODULE V

- b. Control signal point A and B terminals – 115 VAC. It is important that this reading be taken **across the A and B terminal screws on the ACM unit**. If no voltage can be read across these two points, first check for misplacement of an electrical interlock from the reversing or two-speed contactor. The “common” side of the control signal is sensed through the coil which is not *energized*, so do not interlock the common wire out of the circuit. Simply checking for 115 VAC from one screw terminal and the “common” wire is NOT sufficient. Without a proper signal to the A and B terminals (and the HI, LO, and COMMON on two-speed models), the output of the ACM at T1, T2, and T3 will remain zero (0) VAC. A and B must only be connected to the contactor coils, **NEVER THE CONTROL TRANSFORMER**.
- c. After six seconds, take readings at T1, T2, and T3 (with the motor disconnected).
 - (1) From T1 to T2, T2 to T3, and T1 to T3, the voltage is approximately 80-95% of line voltage. For the 460 VAC ACM, the reading is approximately 405 VAC.
 - (2) A zero (0) VAC output will occur if the proper control signal is not being received (See b above and a, b, and c listed under two-speed service).
- d. With the TORQUE adjustment at minimum and the TIME adjustment at maximum, take a meter reading across terminals T1, T2, and T3 (as in c(1) above), from the instant the contactor is closed. The meter should move slowly during the first five seconds, then quickly for the last second. The total time to reach 88% of the line voltage should be approximately six to nine seconds. Each phase to phase test should be similar in voltage profile, no matter where the TIME and TORQUE adjustments are set. Due to the dampening factor in volt-ohm-meters, it is difficult to detect the exact voltage level at a particular torque setting. However, the varying of the TORQUE and TIME settings can be readily identified on the meter. **THE IMPORTANT POINT IS THAT ALL THREE VOLTAGE PROFILES ARE THE SAME.**

ACM V TWO SPEED SERVICE:

Steps 1, 2, and 3 are the same as for single-speed control. The difference lies with the control signal circuitry. For proper operation, check the following control signals across the screws on the ACM. See 3b of single-speed service for general testing procedure.

- a. When the contactor is energized for low speed operation, the meter will read:
 - (1) Between HI and COMMON 0 VAC
 - (2) Between LO and COMMON 115 VAC
 - (3) Between LO and HI 115 VAC
 - (4) Between A and B 115 VAC
- b. When the contactor is energized for high speed operation, the meter will read:
 - (1) Between HI and COMMON 115 VAC
 - (2) Between LO and COMMON 0 VAC
 - (3) Between LO and HI 115 VAC
 - (4) Between A and B 115 VAC
- c. If another control voltage is used, it will appear instead of the 115 VAC listed above.

TROUBLESHOOTING

If monorail system, crane runway, crane, or accessory operates erratically, or not at all, the equipment should be taken out of service. Any problem should be diagnosed and corrected before the equipment is returned to regular service. Refer to the TROUBLESHOOTING sections of LOUDEN® MANUALS: 69878, Installation, Operation, Maintenance, and Parts Manual for LOUDEN® Underhung Cranes, Product Series 500; and 69880, Installation, Operation, Maintenance, and Parts Manual for LOUDEN® Monorail Track, Fittings, and Switches, Product Series 600 & 700 for some problem areas to consider and investigate.

TROUBLESHOOTING

DANGER

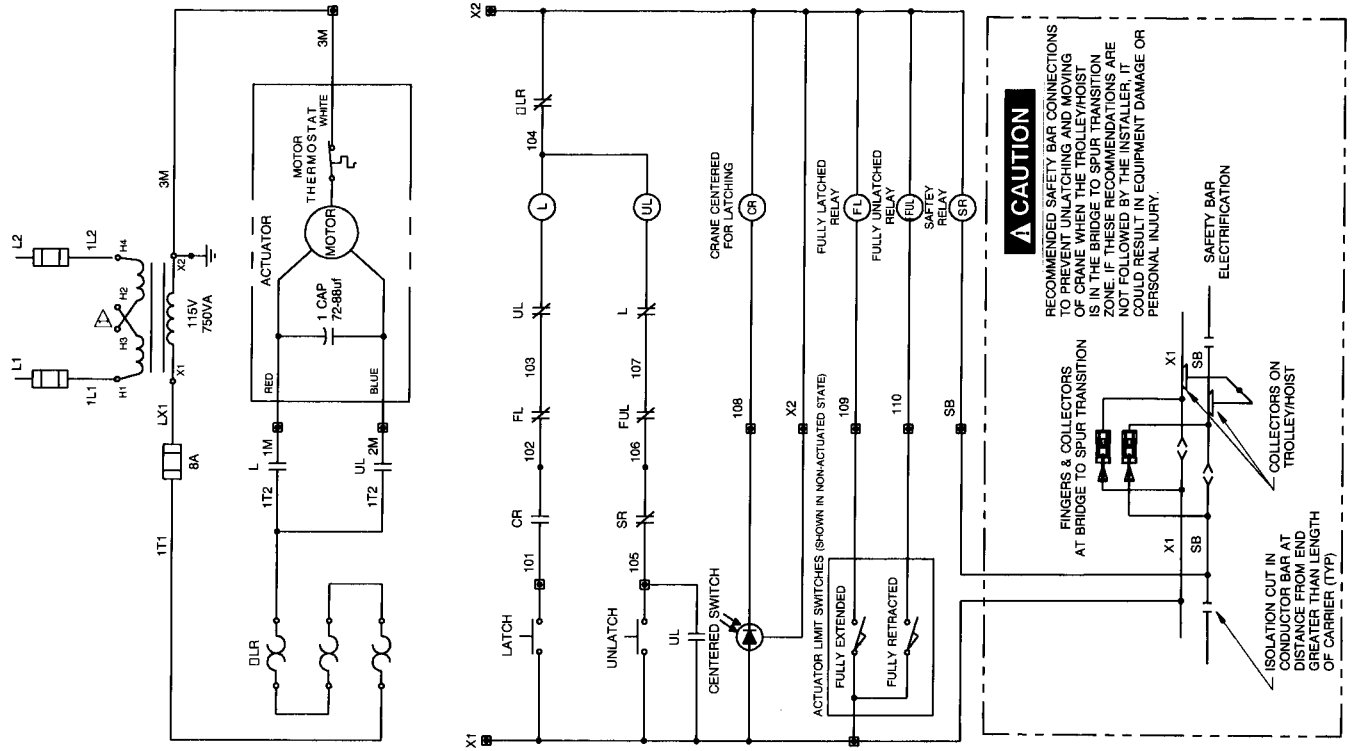
DISCONNECT POWER AND LOCKOUT DISCONNECTING MEANS BEFORE PERFORMING SERVICE TO ELECTRICAL PARTS OF THIS EQUIPMENT.

Only a qualified electrician should perform service to electrical parts of this equipment.

WARNING

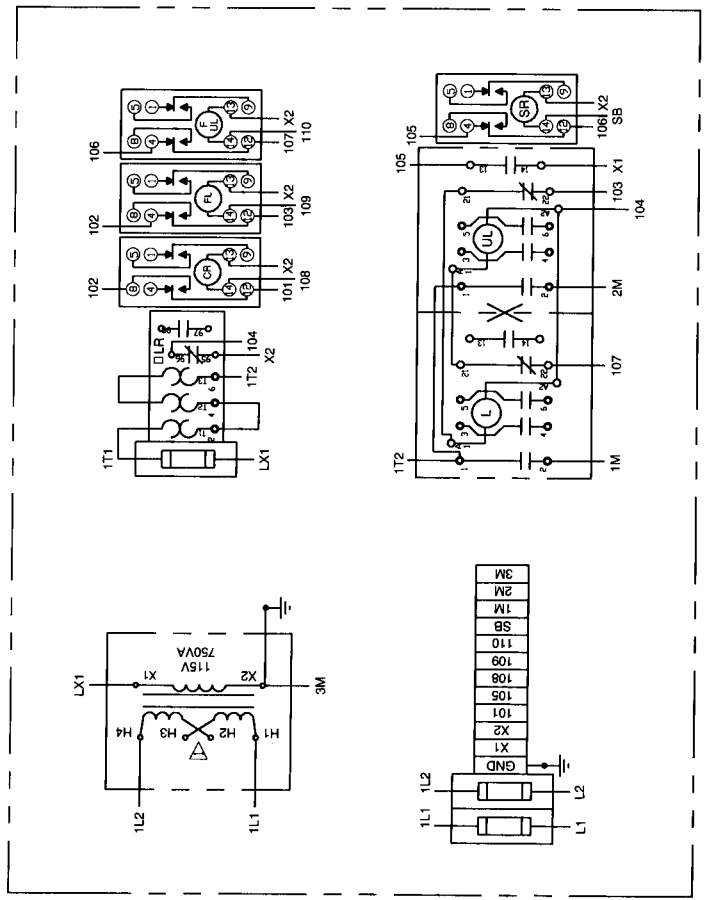
REFER TO THE TROUBLESHOOTING SECTION OF LOUDEN® MANUALS:
69878, INSTALLATION, OPERATION, MAINTENANCE, AND PARTS MANUAL FOR LOUDEN® UNDERHUNG CRANES, PRODUCT SERIES 500; and
69880, INSTALLATION, OPERATION, MAINTENANCE, AND PARTS MANUAL FOR LOUDEN® MONORAIL TRACK, FITTINGS, AND SWITCHES, PRODUCT SERIES 600 & 700.

TYPICAL LATCH CONTROL WIRING DIAGRAM



CAUTION
 RECOMMENDED SAFETY BAR CONNECTIONS TO PREVENT UNLATCHING AND MOVING OF CRANE WHEN THE TROLLEY/HOIST IS IN THE BRIDGE TO SPUR TRANSITION ZONE. IF THESE RECOMMENDATIONS ARE NOT FOLLOWED BY THE INSTALLER, IT COULD RESULT IN EQUIPMENT DAMAGE OR PERSONAL INJURY.

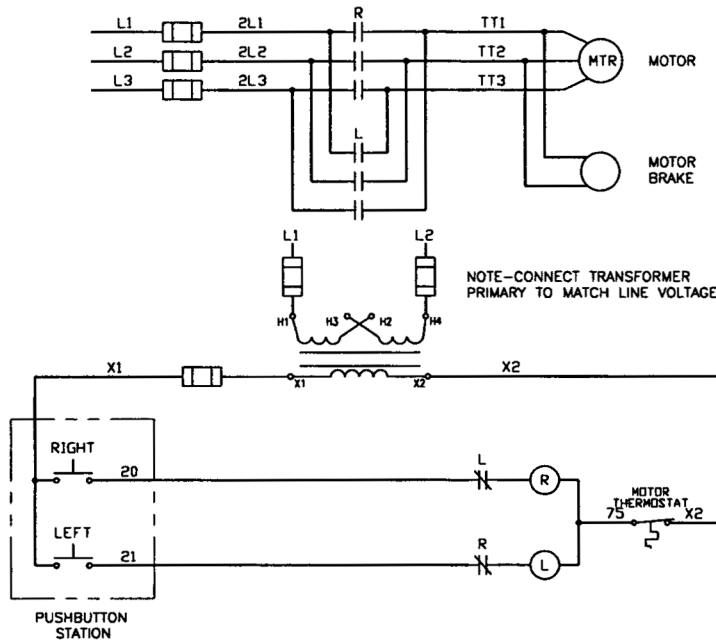
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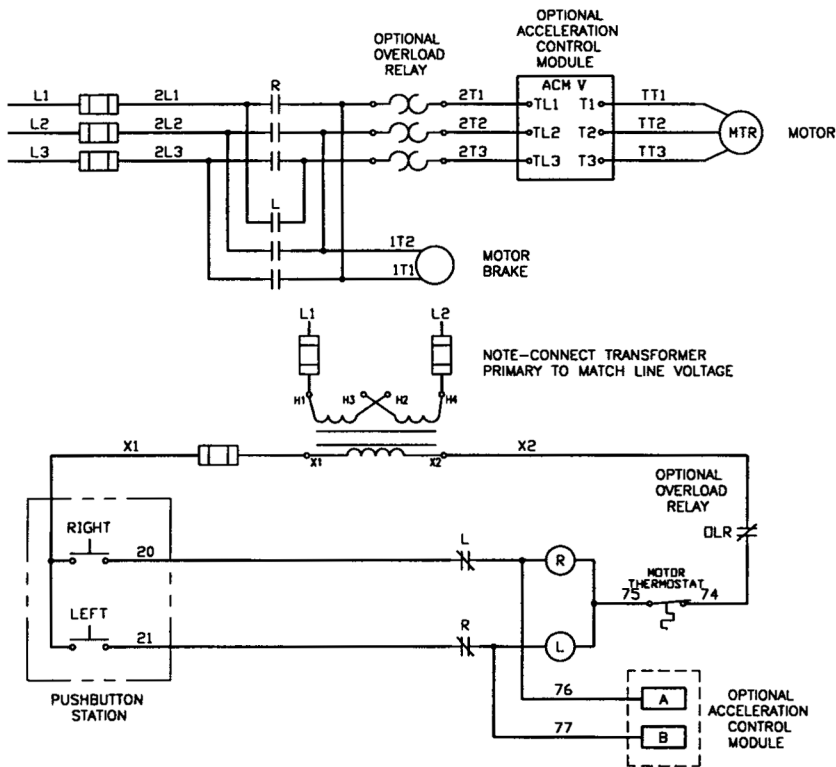
▷ MULTIPLE VOLTAGE COMPONENTS MUST BE CONNECTED AS PER NAMEPLATE DATA, TO MATCH SUPPLY VOLTAGE.

TYPICAL STEEL WHEEL DRIVE AND MOTOVEYOR WIRING DIAGRAMS

SINGLE SPEED



SINGLE SPEED WITH OPTIONAL ACM AND OPTIONAL OVERLOAD RELAYS



⚡ DANGER

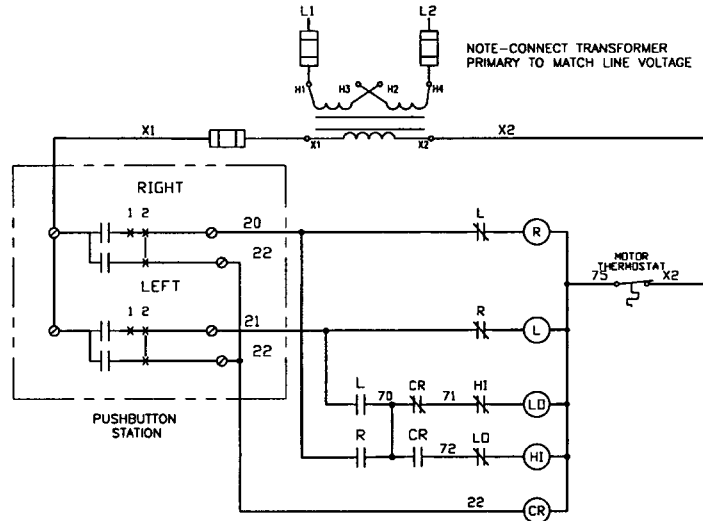
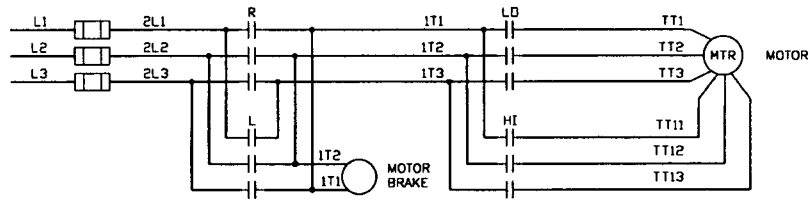
DISCONNECT POWER AND LOCKOUT DISCONNECTING MEANS BEFORE REMOVING COVER OR SERVICING THIS EQUIPMENT. SERVICE SHOULD BE PERFORMED ONLY BY A QUALIFIED ELECTRICIAN.

⚠ CAUTION

WIRING DIAGRAMS SHOWN ARE "TYPICAL" AND MAY NOT INCLUDE ALL DEVICES SUPPLIED WITH A PARTICULAR HOIST OR TROLLEY. ALWAYS REFER TO THE WIRING DIAGRAM SUPPLIED INSIDE OF THE CONTROL ENCLOSURE COVER OF A SPECIFIC PIECE OF EQUIPMENT, BEFORE PERFORMING ANY SERVICE.

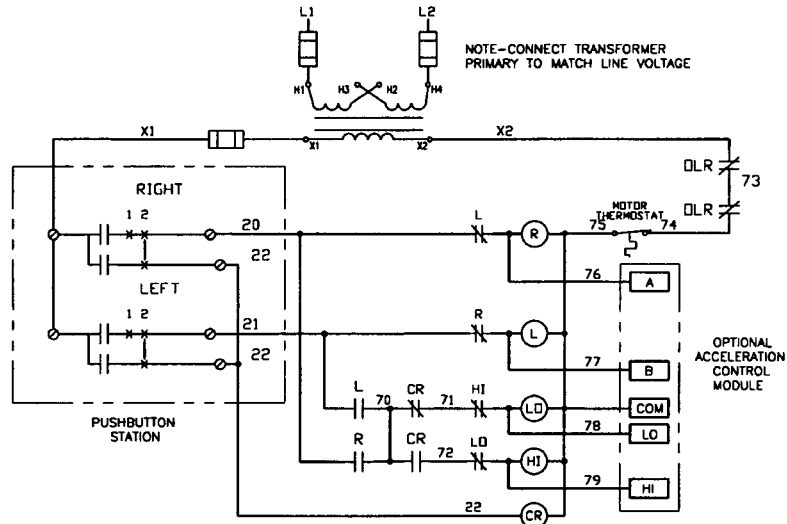
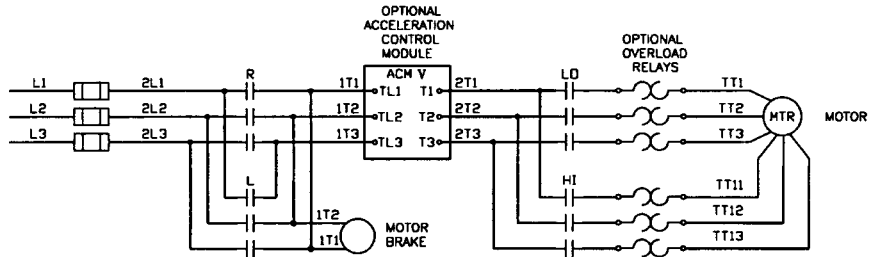
TYPICAL STEEL WHEEL DRIVE AND MOTOVEYOR WIRING DIAGRAMS

TWO SPEED



S2744B

TWO SPEED WITH OPTIONAL ACM AND OPTIONAL OVERLOAD RELAYS

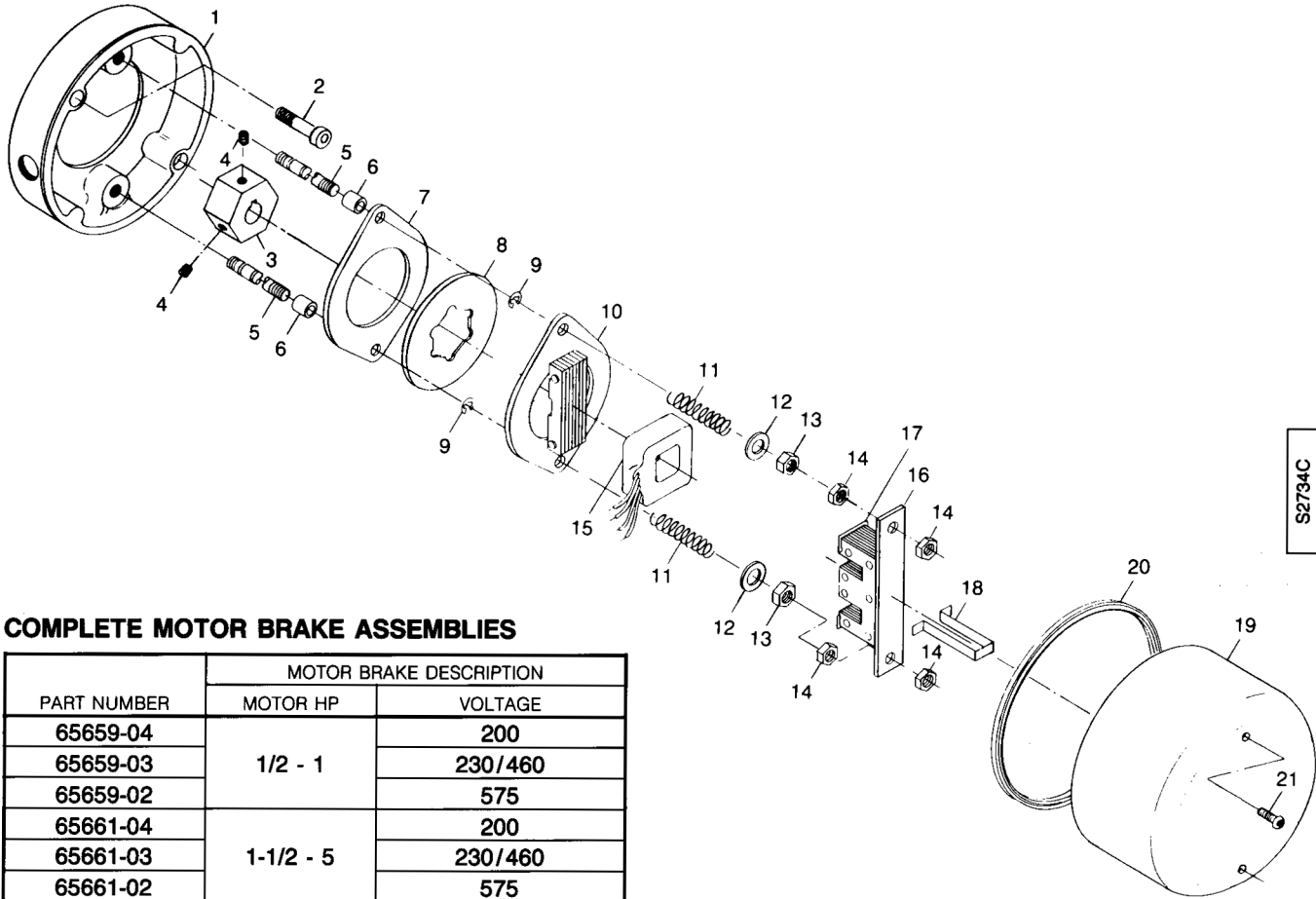


⚠ DANGER
DISCONNECT POWER AND LOCKOUT DISCONNECTING MEANS BEFORE REMOVING COVER OR SERVICING THIS EQUIPMENT. SERVICE SHOULD BE PERFORMED ONLY BY A QUALIFIED ELECTRICIAN.

⚠ CAUTION
WIRING DIAGRAMS SHOWN ARE "TYPICAL" AND MAY NOT INCLUDE ALL DEVICES SUPPLIED WITH A PARTICULAR HOIST OR TROLLEY. ALWAYS REFER TO THE WIRING DIAGRAM SUPPLIED INSIDE OF THE CONTROL ENCLOSURE COVER OF A SPECIFIC PIECE OF EQUIPMENT, BEFORE PERFORMING ANY SERVICE.

PARTS LIST - TROLLEY DRIVE MOTOR BRAKE

TROLLEY DRIVE MOTOR BRAKE ASSEMBLY



COMPLETE MOTOR BRAKE ASSEMBLIES

PART NUMBER	MOTOR BRAKE DESCRIPTION	
	MOTOR HP	VOLTAGE
65659-04	1/2 - 1	200
65659-03		230/460
65659-02		575
65661-04	1-1/2 - 5	200
65661-03		230/460
65661-02		575

TROLLEY DRIVE MOTOR BRAKE PARTS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY/ ASSY
1	65653	Adapter	1
2	1-6-24	Bolt, 3/8-16 x 1-1/2 lg	2
3	65654	Hub	1
4	12-4-6	Set Screw	2
5	65655	Stud	2

ITEM NO.	PART NUMBER	MOTOR HP	DESCRIPTION	QTY/ ASSY
6	61459	1/2 - 1	Spacer	2
		1-1/2 - 5		0
7	39794	1/2 - 1	Brake Plate	1
		1-1/2 - 5		2
8▲	39649	1/2 - 1	Brake Lining	1
		1-1/2 - 5		2
9	PA5623	Retaining Ring	2	

ITEM NO.	PART NUMBER	DESCRIPTION	QTY/ ASSY
10	39781	Pressure Unit	1
11	PA5823	Spring	2
12	15-6-1	Flat Washer	2
13	PA2377	Locknut, 3/8	2
14	24-6	Jam Nut, 3/8	4
15▲	39783-6	Coil, 200 Volts	1
	39783-3	Coil, 230/460 Volts	
	39783-2	Coil, 575 Volts	
16	39780	Magnet Unit	1
17	39784	Shading Coil (a)	2
18	39877	Coil Strap	1
19	69161	Brake Cover	1
20	PA7110	Gasket	1.77 ft
21▲	PA7323	Screw, LOC-WEL, #10-24 (b)	2

▲ Recommended Spare Parts

- (a) Shading Coil is furnished with Magnet Unit, but also available as a spare.
- (b) Screw with self-locking feature must be utilized. Substitutes are not permissible.

PARTS LIST – TROLLEY DRIVE MOTOR

TROLLEY DRIVE MOTOR

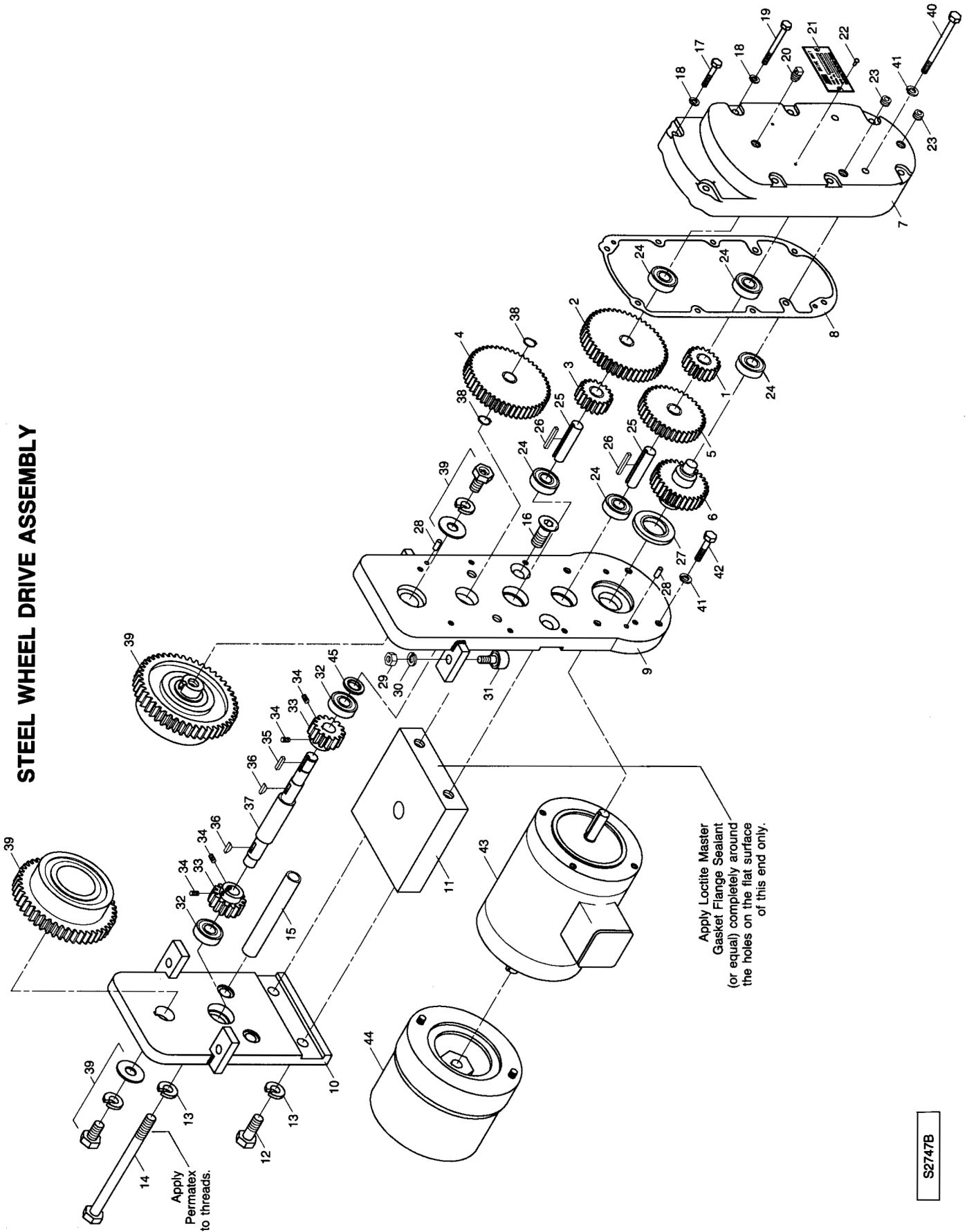
Trolley drive motors for M9 drive units have one shaft extension and the trolley drive motor brake mounts on the opposite side of the drive. Trolley drive motors for steel-wheel drive units have two shaft extensions and the trolley drive motor brake mounts on one end of the motor. Select motor as specified from the following:

PART NO. MOTOR WITH ONE SHAFT EXT.	PART NO. MOTOR WITH TWO SHAFT EXT.	VOLTAGE	HP	RPM	SPEED	FRAME	
61010-34 61010-35 61010-36	65818-19 65818-20 65818-21	200 208/230/460 575	1/2	1200	SINGLE	56C	
61010-37 61010-38 61010-39	65818-22 65818-23 65818-24	200 208/230/460 575	3/4				
61010-31 61010-32 61010-33	65818-25 65818-26 65818-27	200 208/230/460 575	1				
61010-01 61010-02 61010-03	65818-04 65818-05 65818-06	200 208/230/460 575	1/2	1800			
61010-25 61010-26 61010-27	65818-07 65818-08 65818-09	200 208/230/460 575	3/4				
61010-04 61010-05 61010-06	65818-10 65818-11 65818-12	200 208/230/460 575	1				
61010-07 61010-08 61010-09	65818-13 65818-14 65818-15	200 208/230/460 575	1 1/2	2			
61010-10 61010-11 61010-12	65818-16 65818-17 65818-18	200 208/230/460 575	2				
69180-01 69180-02 69180-03	N/A N/A N/A	200 208/230/460 575	3				182TC
69180-04 69180-05 69180-06	N/A N/A N/A	200 208/230/460 575	5				184TC
N/A N/A N/A N/A	65819-21 65819-22 65819-23 65819-24	200 230 460 575	1/2 / 1/4	1200/600	TWO	56C	
N/A N/A N/A N/A	65819-25 65819-26 65819-27 65819-28	200 230 460 575	3/4 / 3/8				
N/A N/A N/A N/A	65819-29 65819-30 65819-31 65819-32	200 230 460 575	1 / 1/2				
61012-01 61012-02 61012-03 61012-04	65819-01 65819-02 65819-03 65819-04	200 230 460 575	1/2 / 1/6	1800/600			
61012-13 61012-14 61012-15 61012-16	65819-05 65819-06 65819-07 65819-08	200 230 460 575	3/4 / 1/4				
61012-05 61012-06 61012-07 61012-08	65819-09 65819-10 65819-11 65819-12	200 230 460 575	1 / 1/3				
61012-17 61012-18 61012-19 61012-20	65819-33 65819-34 65819-35 65819-36	200 230 460 575	1 1/2 / 1/2	2 / 2/3			184C
61012-21 61012-22 61012-23 61012-24	65819-17 65819-18 65819-19 65819-20	200 230 460 575	2 / 2/3				
69181-01 69181-02 69181-03 69181-04	N/A N/A N/A N/A	200 230 460 575	3 / 1				
69181-05 69181-06 69181-07 69181-08	N/A N/A N/A N/A	200 230 460 575	5 / 1 2/3				213TC

For other specified special motors, refer to additional information pages supplied with manual.

PARTS LIST - STEEL WHEEL DRIVE ASSEMBLY

STEEL WHEEL DRIVE ASSEMBLY



PARTS LIST – STEEL WHEEL DRIVE ASSEMBLY

STEEL WHEEL DRIVE ASSEMBLIES

NOMINAL SPEED	ASSEMBLY PART NUMBER	MOTOR (RPM)
50 FPM	69500-01	1200
75 FPM	69500-01	1800
100 FPM	69500-02	1800
125 FPM	69500-03	1800
150 FPM	69500-04	1800

NOMINAL SPEED	ASSEMBLY PART NUMBER	MOTOR (RPM)
50/25 FPM	69500-01	1200/600
75/25 FPM	69500-01	1800/600
100/33 FPM	69500-02	1800/600
125/42 FPM	69500-03	1800/600
150/50 FPM	69500-04	1800/600

STEEL WHEEL DRIVE PARTS

ITEM NO.	DESCRIPTION	ASSEMBLY NO. 69500-01	ASSEMBLY NO. 69500-02	ASSEMBLY NO. 69500-03	ASSEMBLY NO. 69500-04
1	Reduction Gear	67378 (18 teeth)	67378 (18 teeth)	67379 (22 teeth)	69514 (30 teeth)
2	Reduction Gear	67388 (48 teeth)	67388 (48 teeth)	67387 (44 teeth)	67384 (36 teeth)
3	Reduction Gear	67378 (18 teeth)	67379 (22 teeth)	67379 (22 teeth)	67378 (18 teeth)
4	Reduction Gear	67388 (48 teeth)	67387 (44 teeth)	67387 (44 teeth)	67388 (48 teeth)

ITEM NO.	PART NUMBER	DESCRIPTION	QTY/ ASSY
5	67384	Reduction Gear (36 teeth)	1
6	69513	Input Gear (30 teeth)	1
7	69509	Gear Cover	1
8▲	69515	Gasket	1
9	69516	Geared Sideplate	1
10	69093	Plain Sideplate	1
11	69133	Crosshead	1
12	35-10-24	Bolt, 5/8-11 x 1-1/2"	2
13	17-10	Lockwasher, 5/8"	4
14	PA7184	Bolt, 5/8-11 x 7-1/2"	2
15	67394	Yoke Spacer	2
16	PA5465	Flat Head Hex Socket Screw	2
17	35-5-24	Bolt, 5/16-18 x 1-1/2"	2
18	17-5C	Lockwasher, 5/16"	8
19	35-5-44	Bolt, 5/16-18 x 2-3/4"	6
20	PA7350	Breather Plug	1
21	69106	Nameplate	1
22	PA897	Drive Screw	2
23	PA786	Pipe Plug	2
24	PA2464	Bearing	5

ITEM NO.	PART NUMBER	DESCRIPTION	QTY/ ASSY
25	67376	Intermediate Shaft	2
26	67414	Key	1
27▲	PA6622	Oil Seal	1
28	PA5439	Dowel Pin	2
29	23-7	Nut, 7/16-20	4
30	17-7C	Lockwasher, 7/16"	4
31	PA7317	Cam Follower	4
32	PA1796	Bearing	2
33	62214	Spur Pinion	2
34	12-4-4C	Set Screw, 1/4 x 1/4"	4
35	67413	Key	1
36	PA1357	Woodruff Key	2
37	69134	Pinion Shaft	1
38	PA2470	Retaining Ring	2
39	280594	Geared Wheel Assembly	2
40	35-6-64	Bolt, 3/8-16 x 4"	2
41	17-6C	Lockwasher, 3/8"	4
42	35-6-24	Bolt, 3/8-16 x 1-1/2"	2
43▲	(a)	Motor	1
44	(b)	Motor Brake	1
45▲	PA7395	Oil Seal	1
46▲	(c)	Grease (Not Shown)	

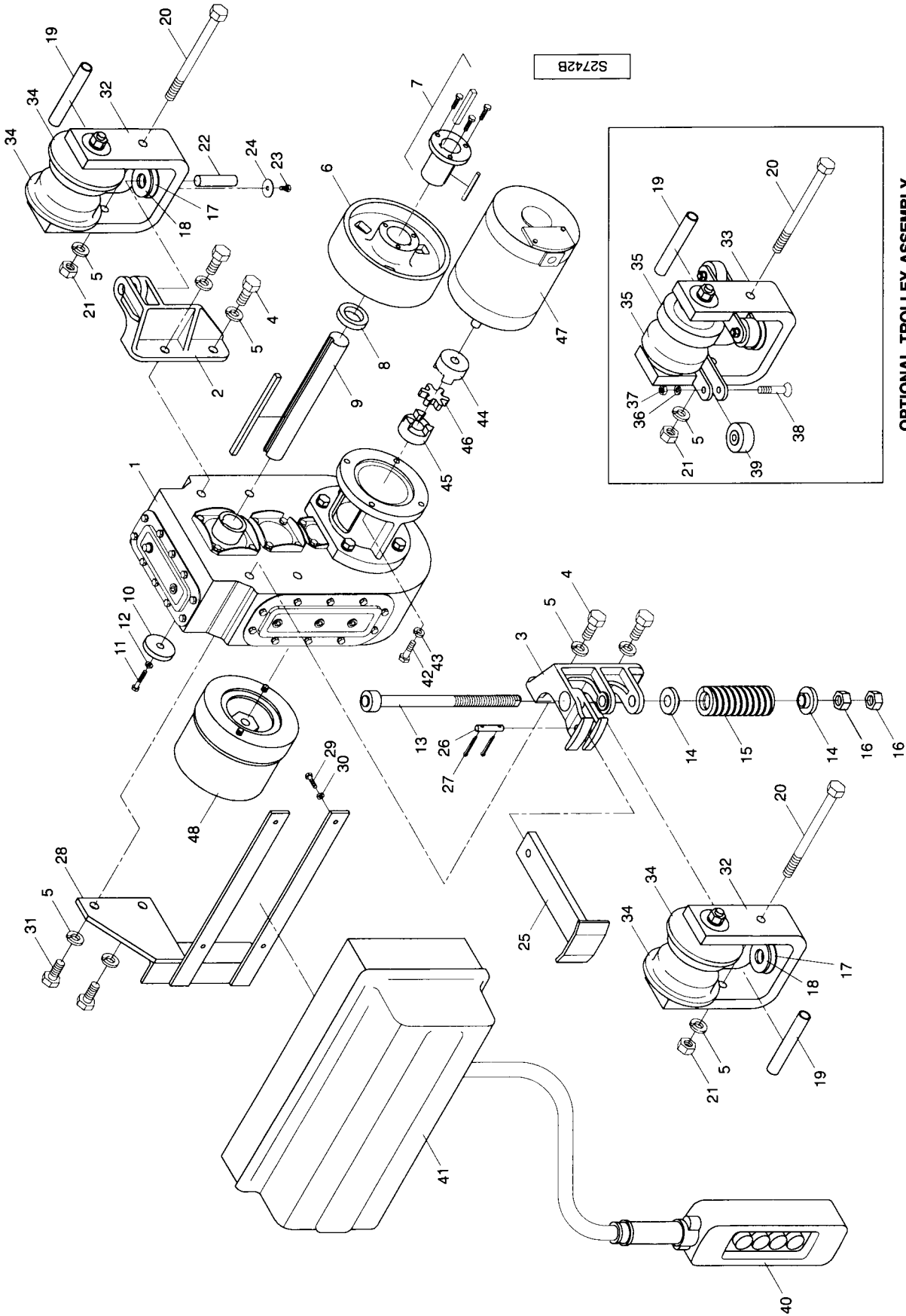
▲ Recommended Spare Parts

NOTES:

- For part numbers of motors, refer to page 81.
- For part numbers of motor brake assemblies and motor brake parts, refer to page 80.
- Exposed gears and pinions on steel-wheel drive unit are shipped from the factory without lubricant. Lyondell® EP Moly D Grease, packaged in a 4-ounce squeeze bottle container, is furnished with all steel-wheel drive units. Refer to the LUBRICATION section of this manual. Additional containers or Lyondell® EP Moly D Grease, packaged in a 4-ounce squeeze bottle, can be obtained by ordering ACCO® part no. 69807.

PARTS LIST - M9 LOUDEN MOTOVEYOR® DRIVE ASSEMBLY

M9 LOUDEN MOTOVEYOR® DRIVE ASSEMBLY



OPTIONAL TROLLEY ASSEMBLY
WITH FLANGELESS WHEELS & GUIDE ROLLERS

PARTS LIST - M9 LOUDEN MOTOVEYOR® DRIVE ASSEMBLY

M9 LOUDEN MOTOVEYOR® DRIVE PARTS

ITEM NO.	PART NUMBER	GEAR REDUCER DESCRIPTION		QTY/ ASSY
		SPEED	MOTOR HP	
1	222750	50 & 75 FPM	1/2 - 2	1
	222751	110 FPM	1/2 - 2	
	222756		3	
	222752	135 FPM	1/2 - 2	
	222757		3	
	222753	165 FPM	1/2 - 2	
	222758		3 - 5	

ITEM	PART NO.	RUNWAY TYPE	DESCRIPTION	QTY.
2	200265	<i>SuperTrack</i>	Rear Support	1
	200266	<i>TrojanTrack</i>	Bracket	
3	200264	<i>SuperTrack</i>	Front Support	1
	200263	<i>TrojanTrack</i>	Bracket	

ITEM NO.	PART NUMBER	DESCRIPTION	QTY/ ASSY
4	210995	Bolt, 5/8-11 x 1-1/4" Gr. 5	4
5	210410	Lockwasher, 5/8"	8
6▲	260536	9" Drive Tire	1
7	213534	Split Taper Bushing Kit	1
8	262017	Spacer	1
9	260650	Drive Shaft	1
10	260438	End Plate	1
11	210927	Bolt, 1/2-13 x 1-1/2"	1
12	210409	Lockwasher, 1/2"	1
13	260515	Tire Adjustment Stud	1
14	200236	Spring Retaining Washer	2
15	214282	Spring	1
16	211716	Jam Nut, 3/4-16	2
17▲	213608	<i>Ollite</i> Thrust Bearing	2
18▲	260444	Special Washer	2
19	260132	Yoke Spacer	2
20	211014	Bolt, 5/8-11 x 8" Gr. 5	2
21	211661	Heavy Nut, 5/8-11	2
22	265165	Drawbar Pin	1

▲ Recommended Spare Parts

- (a) To order replacement Push Button Station or Electrical Controls, furnish *Motoveyor* Serial Number.
- (b) For part numbers of motors, refer to page 81.
- (c) For part numbers of motor brake assemblies and motor brake parts, refer to page 80.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY/ ASSY
23	210757	Bolt, 1/4-20 x 1/2"	1
24	210232	Special Washer	1
25	260946	Bumper Extension	1
26	260446	Bumper Pin	1
27	210474	Cotter Pin, 3/16 x 1-1/4"	2
28	260057	Control Mounting Bracket	1
29	210745	Bolt, 1/4-20 x 3/4"	4
30	210405	Lockwasher, 1/4"	4
31	210994	Bolt, 5/8-11 x 1" Gr. 5	2
32	262002	Yoke Assembly	2
33	262001	Yoke Assembly	2
34▲	280593	Flanged Wheel Assembly	4
35▲	260530	Flangeless Wheel Assembly	4
36	210407	Lockwasher, 3/8"	8
37	211547	Nut, 3/8-16	8
38	212547	Axle	8
39▲	213674	Guide Rollers	8
40	(a)	Push Button Station	1
41	(a)	Electrical Controls	1

ITEM NO.	PART NUMBER	MOTOR HP	DESCRIPTION	QTY/ ASSY
42	210865	1/2 - 2	Bolt	4
	210926	3 - 5		
43	210409	1/2 - 2	Lockwasher	4
	210407	3 - 5		
44	222601	1/2 - 2	Motor Coupling Half	1
	222604	3		
	222604	5 Single Speed		
	222605	5 Two Speed		
45	222602	1/2 - 2	Reducer Coupling Half	1
	222603	3 - 5		
46▲	222606	1/2 - 2	Spider	1
	222607	3 - 5		
47▲	(b)		Motor	1
48	(c)		Motor Brake	1

PARTS LIST – STEEL WHEEL DRIVE AND MOTOVEYOR CONTROL

Determine size of controls from the charts below.

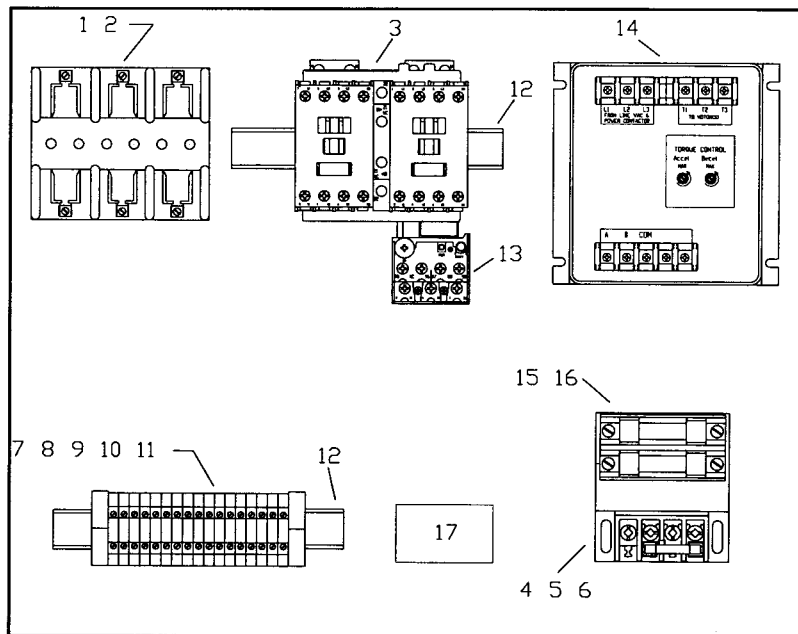
CONTROL PANEL FOR SINGLE SPEED STEEL WHEEL DRIVE AND MOTOVEYOR

CONTROL WITHOUT ACM

VOLTAGE	MAXIMUM MOTOR SIZE	CONTROL SIZE
200 - 230 Volts	2 HP	Size B
	5 HP	Size C
460 - 575 Volts	5 HP	Size B

CONTROL WITH ACM

VOLTAGE	MAXIMUM MOTOR SIZE	CONTROL SIZE
200 - 230 Volts	1 HP	Size B
	2 HP	Size C
460 - 575 Volts	2 HP	Size B
	5 HP	Size C



S2745B

SINGLE SPEED PARTS

ITEM NO.	PART NUMBER	DESCRIPTION
1	PA7341	Fuse Block, Motor Circuit
2▲	86709-XXX	Fuse, Motor Circuit <i>(When ordering, provide motor nameplate data.)</i>
3	86727-01	Reversing Contactor, Size B
	86729-01	Reversing Contactor, Size C
4	52429-04	Transformer, 200V. - 115V.
	52429-16	Transformer, 230/460V. - 115V.
	52429-39	Transformer, 575V. - 115V.
5	52429-80	Transformer Fuse Clip
6▲	PA7329	Transformer Fuse, 2 Amp
7	86710-01	Terminals, Control
8	86710-02	Terminals, Power
9	86710-04	Terminal, Grounding
10	86710-06	Terminal End Barrier
11	86710-05	Terminal End Anchor
12	PA7231	Din Rail <i>(When ordering, specify length in feet.)</i>
13	86736-XX	Overload Relay <i>(When ordering, provide motor nameplate data.)</i>
14	86715-101	ACM V, Single Speed, 200-230V. - 1 HP max. or 460V. - 2 HP max.
	86715-102	ACM V, Single Speed, 575V. - 2 HP max.
	86715-103	ACM V, Single Speed, 200-230V. - 2½ HP max. or 460V. - 5 HP max.
	86715-104	ACM V, Single Speed, 575V. - 5 HP max.
15	52429-81	Fuse Block, Transformer Primary
16▲	86724-012	Fuse, Primary, 200V.
	86724-010	Fuse, Primary, 230V.
	86724-005	Fuse, Primary, 460 and 575V.
17	69505-02	Label, Danger, Electrical

▲ Recommended Spare Parts

PARTS LIST – STEEL WHEEL DRIVE AND MOTOVEYOR CONTROL

Determine size of controls from the charts below.

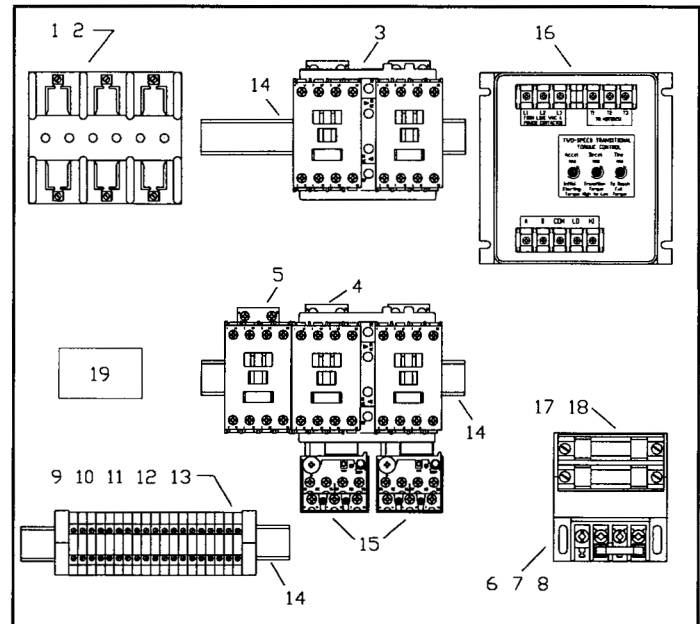
CONTROL PANEL FOR TWO SPEED STEEL WHEEL DRIVE AND MOTOVEYOR

CONTROL WITHOUT ACM

VOLTAGE	MAXIMUM MOTOR SIZE	CONTROL SIZE
200 - 230 Volts	2 HP	Size B
	5 HP	Size C
460 - 575 Volts	5 HP	Size B

CONTROL WITH ACM

VOLTAGE	MAXIMUM MOTOR SIZE	CONTROL SIZE
200 - 230 Volts	1 HP	Size B
	2 HP	Size C
460 - 575 Volts	2 HP	Size B
	5 HP	Size C



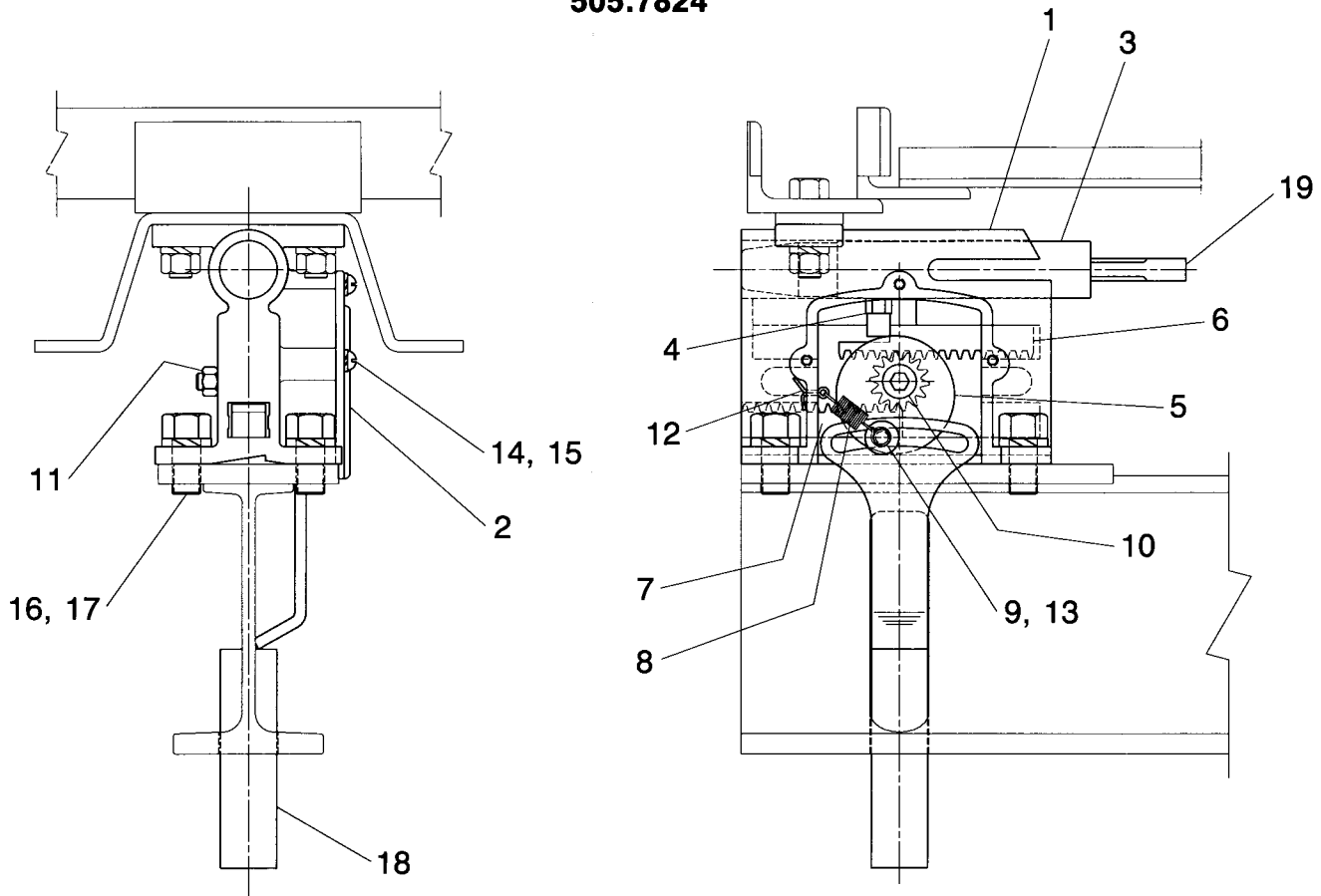
S2746B

TWO SPEED PARTS

ITEM NO.	PART NUMBER	DESCRIPTION
1	PA7341	Fuse Block, Motor Circuit
2▲	86709-XXX	Fuse, Motor Circuit (<i>When ordering, provide motor nameplate data.</i>)
3	86727-01	Reversing Contactor, Size B
	86729-01	Reversing Contactor, Size C
4	86727-01	Two Speed Contactor, Size B
	86729-01	Two Speed Contactor, Size C
		<i>Two Speed Contactors are shipped as Reversing Contactors. Remove the three (3) black power wires on the load side of the contactor.</i>
5	86737-03	Control Relay
6	52429-04	Transformer, 200V. - 115V.
	52429-16	Transformer, 230/460V. - 115V.
	52429-39	Transformer, 575V. - 115V.
7	52429-80	Transformer Fuse Clip
8▲	PA7329	Transformer Fuse, 2 Amp
9	86710-01	Terminals, Control
10	86710-02	Terminals, Power
11	86710-04	Terminal, Grounding
12	86710-06	Terminal End Barrier
13	86710-05	Terminal End Anchor
14	PA7231	Din Rail (<i>When ordering, specify length in feet.</i>)
15	86736-XX	Overload Relay (<i>When ordering, provide motor nameplate data.</i>)
16	86715-105	ACM V, Two Speed, 200-230V. - 1 HP max. or 460V. - 2 HP max.
	86715-106	ACM V, Two Speed, 575V. - 2 HP max.
	86715-107	ACM V, Two Speed, 200-230V. - 2½ HP max. or 460V. - 5 HP max.
	86715-108	ACM V, Two Speed, 575V. - 5 HP max.
17	52429-81	Fuse Block, Transformer Primary
18▲	86724-012	Fuse, Primary, 200V.
	86724-010	Fuse, Primary, 230V.
	86724-005	Fuse, Primary, 460 and 575V.
19	69505-02	Label, Danger, Electrical

PARTS LIST – MANUAL LATCH ASSEMBLY

MANUAL LATCH ASSEMBLY 505.7824



LATCH COVER AND FASTENERS
(ITEMS 2, 14, & 15) NOT SHOWN
IN THIS VIEW

BASIC LATCH ASSEMBLY

Part No. 265029: End-Operated Latch.

Part No. 301225: Side-Operated Latch.

BASIC LATCH ASSEMBLY PARTS (Consisting of items 1 through 15)

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	200229	Housing	1
2	200037	Cover	1
3	260165 260533	Latch Pin End-Operated Latch Side-Operated Latch	1
4	260166	Throw Pin	1
5	260169	Cam and Pinion Assembly	1
6	260170	Upper Rack	1
7	260171	Lower Rack	1
8	214276	Cam Extension Spring	1

No Recommended Spare Parts

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
9	210466	Hairpin Cotter	1
10	21275†	Shoulder Screw	1
11	211548	Lock Nut	1
12	210467	Cotter Pin	1
13	210290	Washer	3
14	212272	Machine Screw	3
15	210405	Lockwasher	3
16	212808	Screw	4
17	210410	Lockwasher	4
18	(a)	Baffle Pin	1
19	(b)	Latch Pin Extension	1

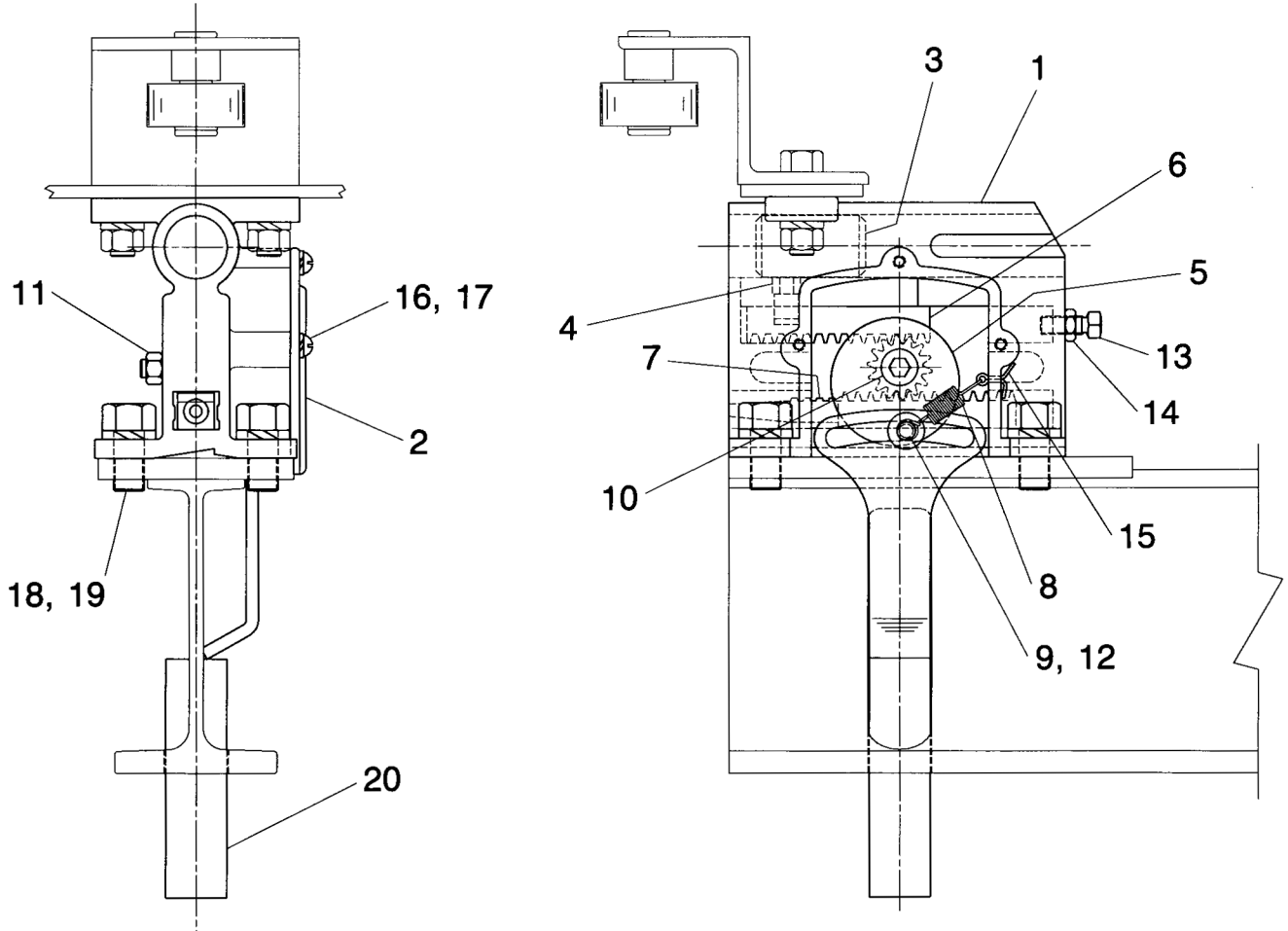
NOTES:

(a) For standard 10" tread-to-tread dimension, part number is 260204. For other tread-to-tread dimensions, pin is special; contact Acco Chain & Lifting Products or the distributor of the latch.

(b) For end-operated latch only. Length is based upon specific application, and welds to item number 3. Contact Acco Chain & Lifting Products or the distributor of the latch.

PARTS LIST – MANUAL BLOCK ASSEMBLY

BLOCK ASSEMBLY FOR MANUAL LATCH 505.7825



LATCH COVER AND FASTENERS
(ITEMS 2, 16 & 17) NOT SHOWN
IN THIS VIEW

BASIC BLOCK ASSEMBLY

Part No. 265031: End-Operated Latch and Side-Operated Latch.

BASIC BLOCK ASSEMBLY PARTS (Consisting of items 1 through 17)

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	200229	Housing	1
2	200037	Cover	1
3	260172	Block Pin	1
4	260166	Throw Pin	1
5	260169	Cam and Pinion Assembly	1
6	260173	Upper Rack	1
7	260174	Lower Rack	1
8	214276	Cam Extension Spring	1
9	210466	Hairpin Cotter	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
10	212751	Shoulder Screw	1
11	211548	Lock Nut	1
12	210290	Washer	3
13	212702	Set Screw	1
14	211549	Jam Nut	1
15	210467	Cotter Pin	1
16	212272	Machine Screw	3
17	210405	Lockwasher	3
18	212808	Screw	4
19	210410	Lockwasher	4
20	(a)	Baffle Pin	1

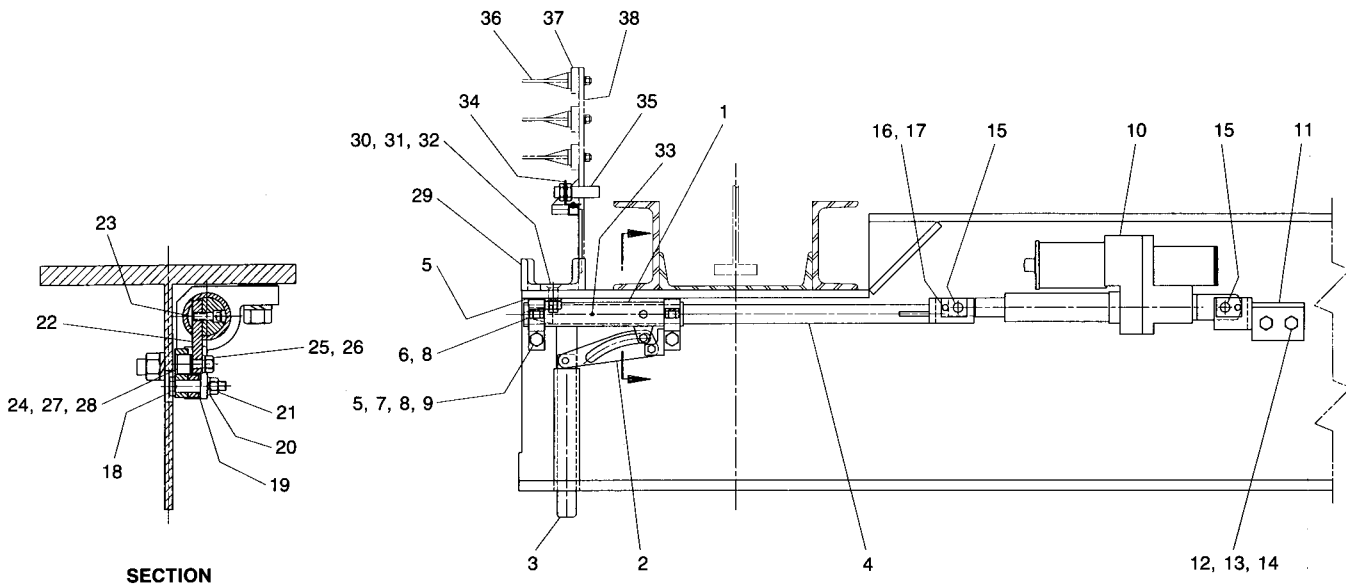
No Recommended Spare Parts

NOTE:

(a) For standard 10" tread-to-tread dimension, part number is 260204. For other tread-to-tread dimensions, pin is special; contact Acco Chain & Lifting Products or the distributor of the latch.

PARTS LIST – MOTOR-OPERATED LATCH

MOTOR-OPERATED LATCH ASSEMBLY 505.7830



LATCH ASSEMBLY PARTS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY. SINGLE GIRDER	QTY. DOUBLE GIRDER	ITEM NO.	PART NUMBER	DESCRIPTION	QTY. SINGLE GIRDER	QTY. DOUBLE GIRDER
1	260547	Latch Tube	1	2	20	210407	Lockwasher	1	2
2	260545	Baffle Cam	1	2	21	211547	Hex Nut	1	2
3	(d)	Baffle Pin	1	2	22	260552	Cam Bracket	1	2
4	(d)	Latch Pin	1	2	23	212730	Cap Screw	1	2
5	260551	Shim	(a)	(b)	24	213675	Cam Follower	1	2
6	210996	Screw	2	4	25	210407	Lockwasher	1	2
7	211000	Screw	2	4	26	211553	Hex Nut	1	2
8	210410	Lockwasher	4	8	27	214084	Lube Fitting	1	2
9	211661	Hex Nut	2	4	28	210217	Washer	1	2
10	222001	Linear Actuator	1	2	29	(d)	Guide Channel	1	1
11	(d)	Anchor Bracket	1	2	30	212864	Flat Head Screw	2	4
12	210998	Screw	2	4	31	210411	Lockwasher	2	4
13	210410	Lockwasher	2	4	32	211720	Hex Nut	2	4
14	211661	Hex Nut	2	4	33	214088	Lube Fitting	1	2
15	(d)	Pin Connector	2	4	34	260962	Mounting Bracket	1	1
16	210745	Screw	2	4	35	222002	Photoswitch	1	1
17	210405	Lockwasher	2	4	36	200016	Interlock Finger	(c)	(c)
18	212752	Shoulder Screw	1	2	37	(d)	Insulating Spacer	(c)	(c)
19	213607	Thrust Bearing	1	2	38	(d)	Bracket	(c)	(c)

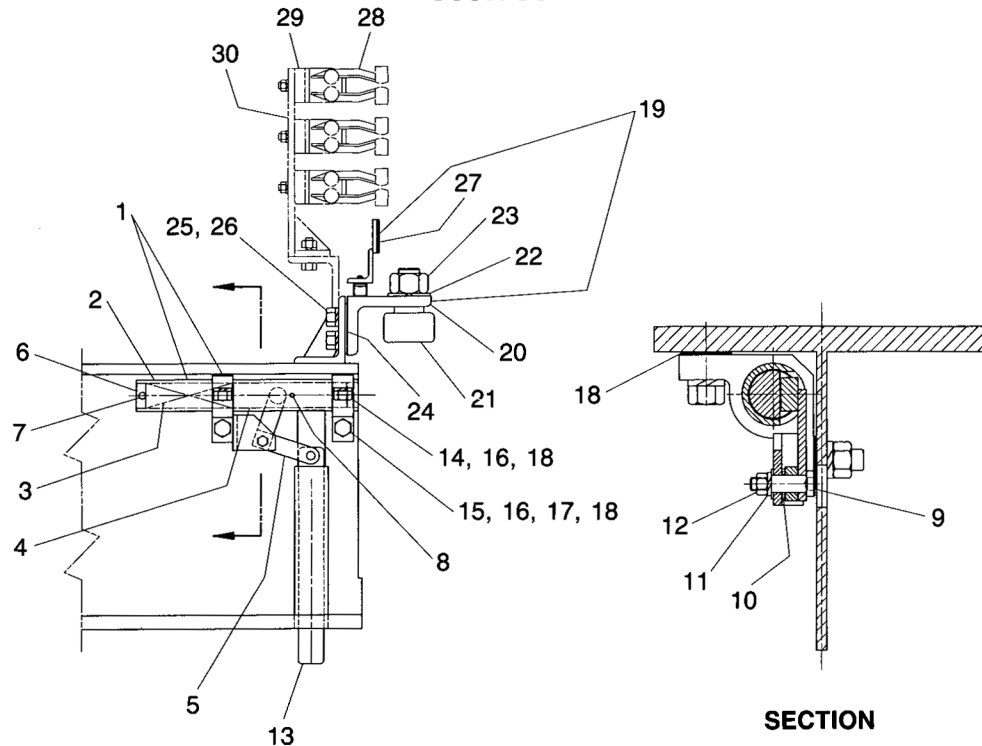
No Recommended Spare Parts

NOTES:

- (a) Quantity of 10 required with 5/16" thick web. Quantity of 8 required with 7/16" thick web.
- (b) Quantity of 20 required with 5/16" thick web. Quantity of 16 required with 7/16" thick web.
- (c) Optional; as required.
- (d) Contact Acco Chain & Lifting Products.

PARTS LIST – MOTOR-OPERATED BLOCK

BLOCK ASSEMBLY FOR MOTOR-OPERATED LATCH 505.7831



BLOCK ASSEMBLY PARTS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY. SINGLE GIRDER	QTY. DOUBLE GIRDER
1	260689	Pin and Tub Assembly	1	2
2	260548	Tube Assembly (a)	1	2
3	214273	Compression Spring (a)	1	2
4	260271	Pin (a)	1	2
5	260549	Crank Arm (a)	1	2
6	260272	Plug (a)	1	2
7	210861	Cap Screw (a)	1	2
8	214088	Lube Fitting (a)	1	2
9	212752	Pivot Bolt (a)	1	2
10	213607	Thrust Washer (a)	1	2
11	210407	Lockwasher (a)	1	2
12	211547	Hex Nut (a)	1	2
13	(f)	Baffle Pin	1	2
14	210996	Screw	2	4
15	211000	Screw	2	4

ITEM NO.	PART NUMBER	DESCRIPTION	QTY. SINGLE GIRDER	QTY. DOUBLE GIRDER
16	210410	Lockwasher	4	8
17	211661	Hex Nut	2	4
18	260551	Shim	(c)	(d)
19	(f)	Guide Roller Assembly	1	2
20	260556	Roller Bracket (b)	1	2
21	213678	Roller (b)	1	2
22	210415	Lockwasher (b)	1	2
23	211937	Hex Jam Nut (b)	1	2
24	(f)	Shim (b)	3	6
25	210410	Lockwasher (b)	3	6
26	210995	Screw (b)	3	6
27	(f)	Photoswitch Target Assembly (b)	1	1
28	260106	Interlock Collector	(e)	(e)
29	(f)	Insulating Spacer	(e)	(e)
30	(f)	Bracket	(e)	(e)

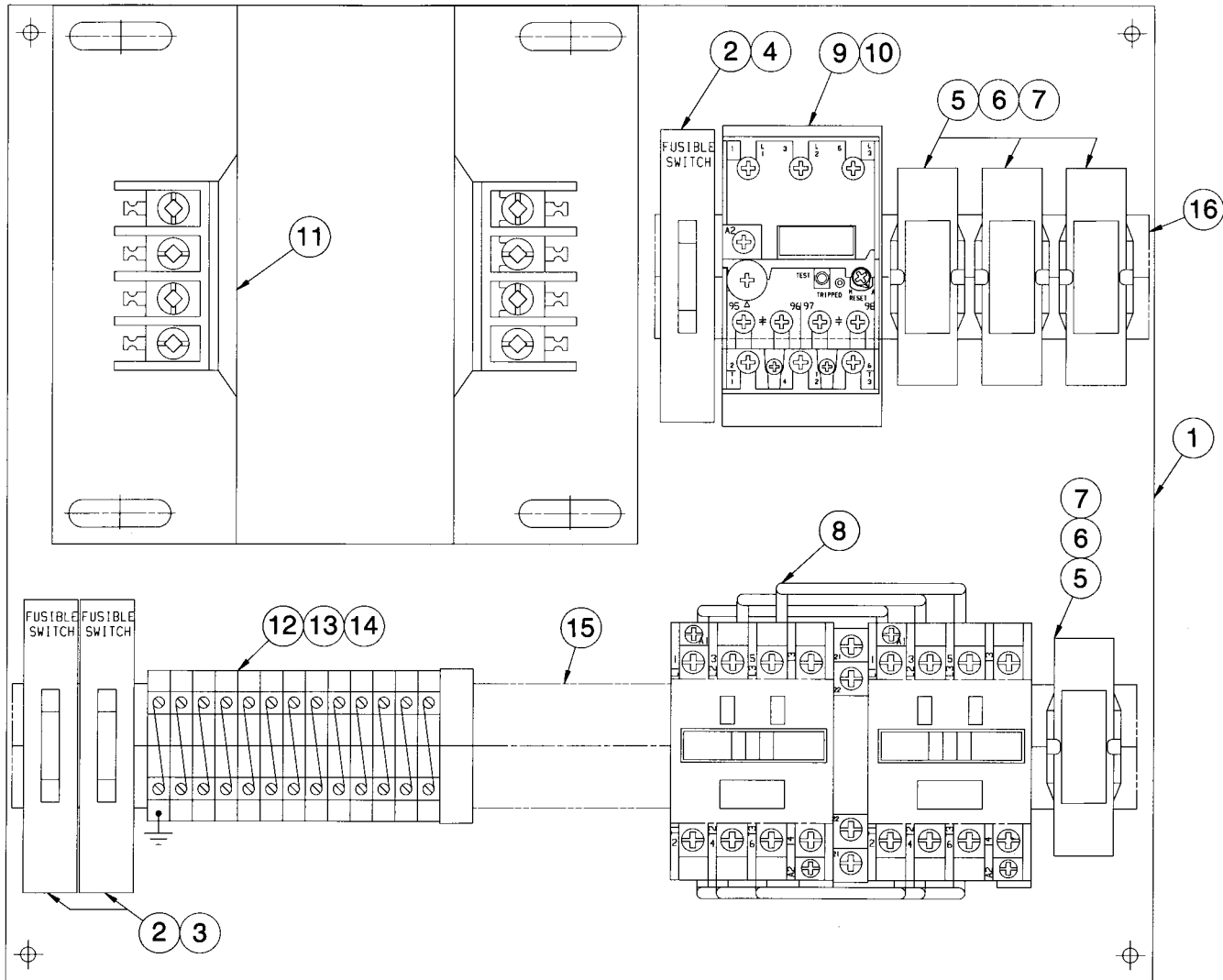
No Recommended Spare Parts

NOTES:

- (a) Included with item no. 1, but also available as a spare.
- (b) Included with item no. 19, but also available as a spare.
- (c) Quantity of 10 required with 5/16" thick web. Quantity of 8 required with 7/16" thick web.
- (d) Quantity of 20 required with 5/16" thick web. Quantity of 16 required with 7/16" thick web.
- (e) Optional; as required.
- (f) Contact Acco Chain & Lifting Products.

PARTS LIST – LATCH CONTROL

CONTROL PANEL FOR MOTOR-OPERATED LATCH



CONTROL PANEL PARTS

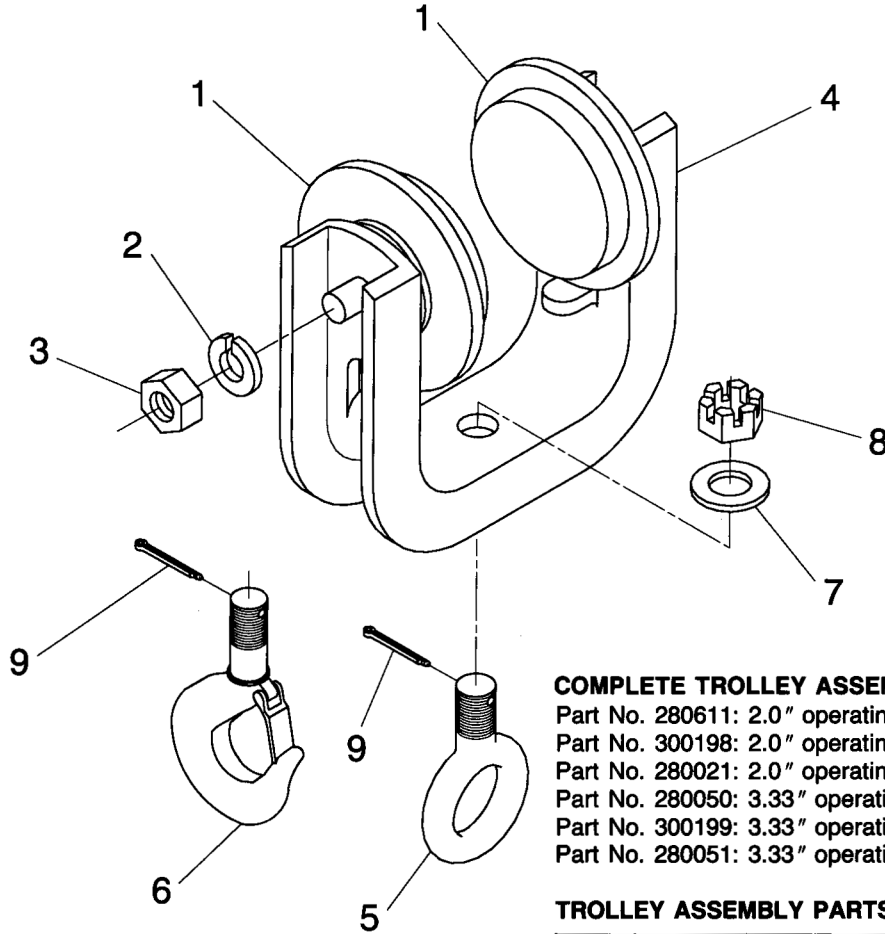
ITEM NO.	PART NUMBER	DESCRIPTION
1	86820	Panel, Drilled
2	PA7359	Fusible Switch
3▲	PA7361	Fuse, 7A, for 200 V Supply
	PA7362	Fuse, 6A, for 230 V Supply
	PA7363	Fuse, 3A, for 460 V Supply
	PA7363	Fuse, 3A, for 575 V Supply
4▲	PA7360	Fuse, 8A, Transformer
5▲	PA7382	Relay, DPDT. 115 V
6	PA7385	Relay Socket
7	PA7385	Relay Retaining Clip

▲ Recommended Spare Parts

ITEM NO.	PART NUMBER	DESCRIPTION
8▲	86727-01	Contactor, Reversing
9	86736-09	Overload Relay
10	86736-50	O'Load Relay Mtg. Adapter
11	52429-11	Transformer, 200 V
	52429-23	Transformer, 230/460 V
	52429-46	Transformer, 575 V
12	86710-01	Terminal Block
13	86710-04	Terminal Block, Grounding
14	86710-05	Terminal End Anchor
15	PA7231	Din Rail, 12.5" L.
16	PA7231	Din Rail, 5.5" L.

PARTS LIST – TROLLEY ASSEMBLY

2-WHEEL MONORAIL TROLLEY ASSEMBLY 3" DIA. FLANGED WHEELS 375# TROLLEY CAPACITY 2.0" AND 3.33" SUPERTRACK™ OPERATING FLANGE



COMPLETE TROLLEY ASSEMBLY:

- Part No. 280611: 2.0" operating flange with eye fitting (402.372E).
- Part No. 300198: 2.0" operating flange with hook fitting (402.372H).
- Part No. 280021: 2.0" operating flange less fitting (402.372LF).
- Part No. 280050: 3.33" operating flange with eye fitting (403.372E).
- Part No. 300199: 3.33" operating flange with hook fitting (403.372H).
- Part No. 280051: 3.33" operating flange with less fitting (403.372LF).

TROLLEY ASSEMBLY PARTS (b)

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1▲	260831	Wheel Assembly	2
2	210409	Lockwasher (a)	2
3	211606	Hex Nut (a)	2
4		Yoke	1
	260078	2.0" Operating Flange	
	260107	3.33" Operating Flange	
5▲	260435	Eye Fitting	1
6▲	260436	Hook	1
7▲	210220	Washer	1
8▲	211611	Slotted Hex Nut	1
9▲	210472	Cotter Pin	1

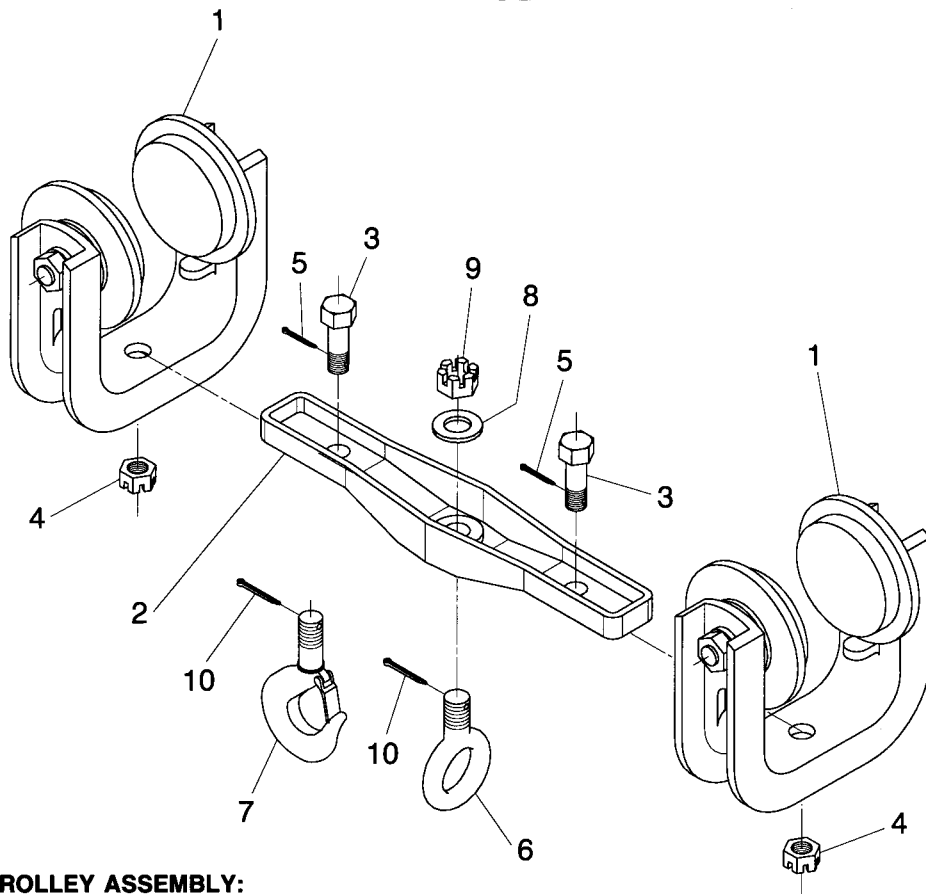
▲ Recommended Spare Parts

NOTES:

- (a) Included with item no. 1, but also available as a spare.
- (b) For trolley with eye fitting, use items 1 through 5, 7, 8, and 9.
For trolley with hook fitting, use items 1 through 4, and 6 through 9.
For trolley less fitting, use items 1 through 4.

PARTS LIST – TROLLEY ASSEMBLY

4-WHEEL MONORAIL TROLLEY ASSEMBLY 3" DIA. FLANGED WHEELS 750# TROLLEY CAPACITY 2.0" AND 3.33" SUPERTRACK™ OPERATING FLANGE



COMPLETE TROLLEY ASSEMBLY:

- Part No. 280024: 2.0" operating flange with eye fitting (402.754E).
- Part No. 280616: 2.0" operating flange with hook fitting (402.754H).
- Part No. 280473: 2.0" operating flange less fitting (402.754LF).
- Part No. 280054: 3.33" operating flange with eye fitting (403.754E).
- Part No. 280479: 3.33" operating flange with hook fitting (403.754H).
- Part No. 280644: 3.33" operating flange with less fitting (403.754LF).

TROLLEY ASSEMBLY PARTS (a)

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1▲	280021 280051	2-Wheel Trolley 2.0" Operating Flange 3.33" Operating Flange	2
2	200147	Loadbar	1
3	260249	Pivot Screw	2
4	211608	Slotted Hex Nut	2
5	210469	Cotter Pin	2
6▲	260435	Eye Fitting	1
7▲	260436	Hook	1
8▲	210220	Washer	1
9▲	211611	Slotted Hex Nut	1
10▲	210472	Cotter Pin	1

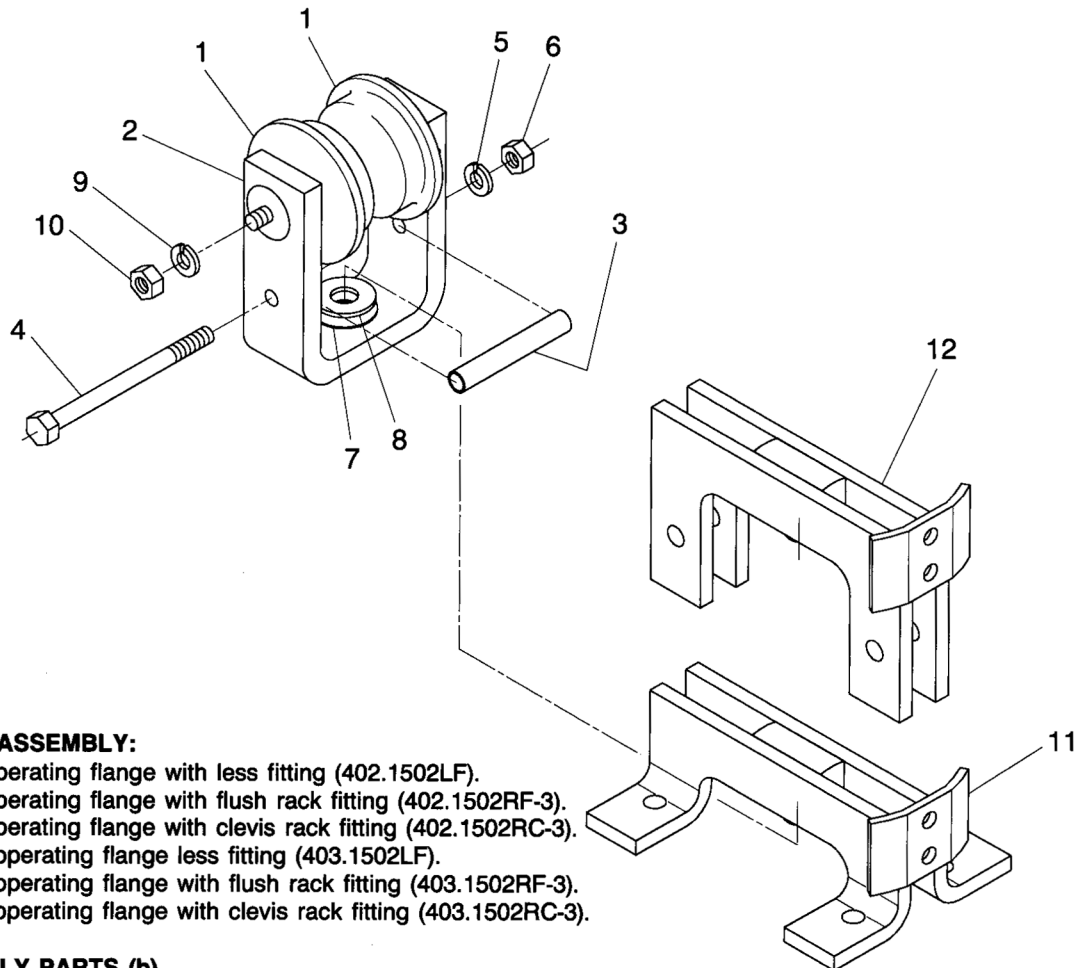
▲ Recommended Spare Parts

NOTE:

- (a) For trolley with eye fitting, use items 1 through 6, 8, 9, and 10.
- For trolley with hook fitting, use items 1 through 5, and 7 through 10.
- For trolley less fitting, use items 1 through 5.

PARTS LIST – TROLLEY ASSEMBLY

2-WHEEL MONORAIL TROLLEY ASSEMBLY 4" DIA. FLANGED WHEELS 1500# TROLLEY CAPACITY 2.0" AND 3.33" SUPERTRACK™ OPERATING FLANGE 3.33" TROJANTRACK™ OPERATING FLANGE



COMPLETE TROLLEY ASSEMBLY:

- Part No. 280027: 2.0" operating flange with less fitting (402.1502LF).
- Part No. 280028: 2.0" operating flange with flush rack fitting (402.1502RF-3).
- Part No. 280029: 2.0" operating flange with clevis rack fitting (402.1502RC-3).
- Part No. 280056: 3.33" operating flange less fitting (403.1502LF).
- Part No. 280058: 3.33" operating flange with flush rack fitting (403.1502RF-3).
- Part No. 280057: 3.33" operating flange with clevis rack fitting (403.1502RC-3).

TROLLEY ASSEMBLY PARTS (b)

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1▲	280877 280878	Wheel Assembly 2.0" Operating Flange 3.33" Operating Flange	2
2	260120 260195	Trolley Yoke 2.0" Operating Flange 3.33" Operating Flange	1
3	260121 260206	Yoke Spacer 2.0" Operating Flange 3.33" Operating Flange	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
4	210938 210939	Yoke Spacer Bolt 2.0" Operating Flange 3.33" Operating Flange	1
5	210409	Lockwasher	1
6	211609	Hex Nut	1
7▲	213612	Thrust Bearing	1
8▲	260194	Steel Bearing Washer	1
9	210411	Lockwasher (a)	2
10	211716	Hex Nut (a)	2
11	260124	Flush Rack Fitting	1
12	260123	Clevis Rack Fitting	1

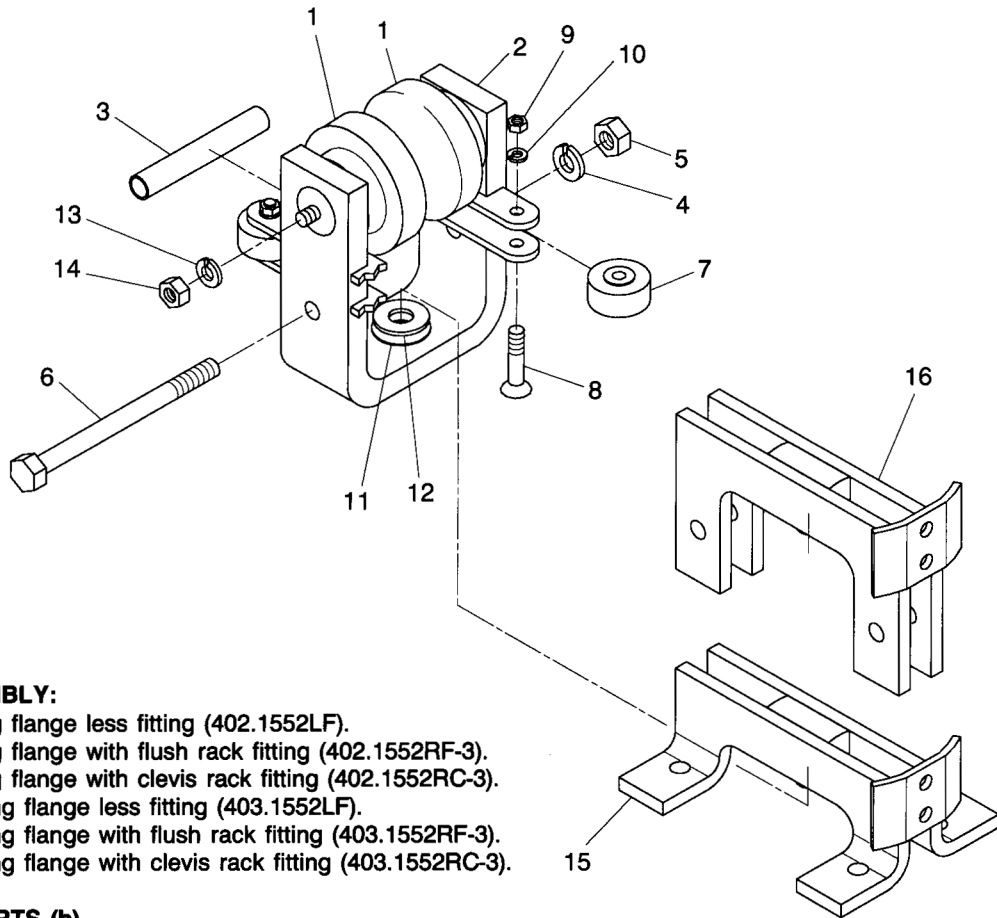
▲ Recommended Spare Parts

NOTES:

- (a) Included with item no. 1, but also available as a spare.
- (b) For trolley less fitting, use items 1 through 10.
For trolley with flush rack fitting, use items 1 through 11.
For trolley with clevis rack fitting, use items 1 through 10 and 12.

PARTS LIST – TROLLEY ASSEMBLY

2-WHEEL MONORAIL TROLLEY ASSEMBLY 4" DIA. FLANGELESS WHEELS 1500# TROLLEY CAPACITY 2.0" AND 3.33" SUPERTRACK™ OPERATING FLANGE 3.33" TROJANTRACK™ OPERATING FLANGE



COMPLETE TROLLEY ASSEMBLY:

- Part No. 280474: 2.0" operating flange less fitting (402.1552LF).
- Part No. 300455: 2.0" operating flange with flush rack fitting (402.1552RF-3).
- Part No. 300457: 2.0" operating flange with clevis rack fitting (402.1552RC-3).
- Part No. 280480: 3.33" operating flange less fitting (403.1552LF).
- Part No. 300415: 3.33" operating flange with flush rack fitting (403.1552RF-3).
- Part No. 300416: 3.33" operating flange with clevis rack fitting (403.1552RC-3).

TROLLEY ASSEMBLY PARTS (b)

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1▲	280879	Wheel Assembly	2
2	265002	2.0" Operating Flange	1
	265003	3.33" Operating Flange	
3	260121	Yoke Spacer	1
	260206	2.0" Operating Flange	
4	210409	Lockwasher	1
5	211609	Hex Nut	1
6	210939	Yoke Spacer Bolt	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
7▲	213674	Guide Roller	4
8	212547	Flat Head Machine Screw	4
9	211547	Hex Nut	4
10	210407	Lockwasher	4
11▲	213612	Thrust Bearing	1
12▲	260194	Steel Bearing Washer	1
13	210411	Lockwasher (a)	2
14	211716	Hex Nut (a)	2
15	260124	Flush Rack Fitting	1
16	260123	Clevis Rack Fitting	1

▲ Recommended Spare Parts

NOTES:

- (a) Included with item no. 1, but also available as a spare.
- (b) For trolley less fitting, use items 1 through 14.
For trolley with flush rack fitting, use items 1 through 15.
For trolley with clevis rack fitting, use items 1 through 14 and 16.

PARTS LIST - TROLLEY ASSEMBLY

4-WHEEL MONORAIL TROLLEY ASSEMBLY 4" DIA. FLANGED AND FLANGELESS WHEELS 3000# TROLLEY CAPACITY 2.0" AND 3.33" SUPERTRACK™ OPERATING FLANGE 3.33" TROJANTRACK™ OPERATING FLANGE

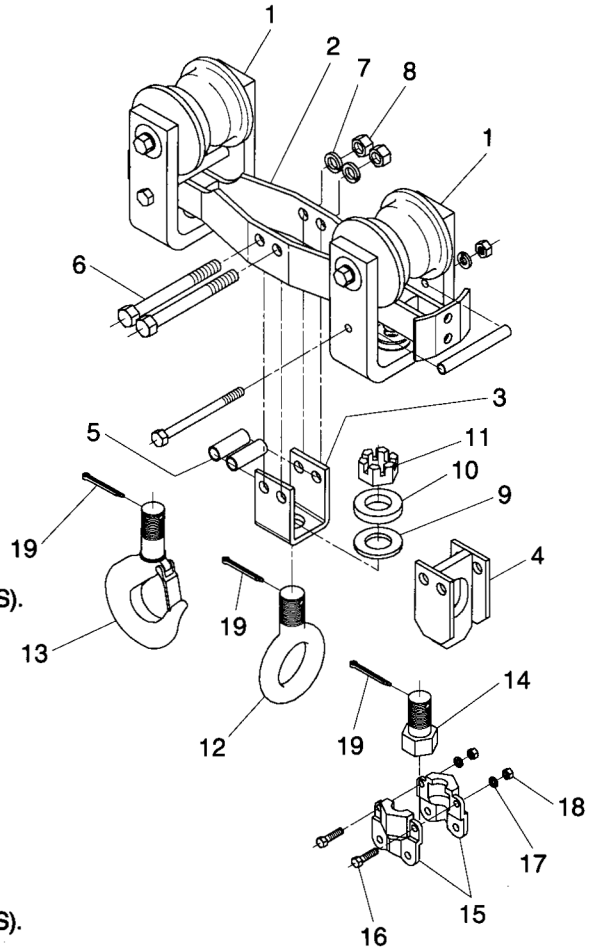
COMPLETE TROLLEY ASSEMBLY:

2.0" OPERATING FLANGE

- Part No. 280037: flanged wheels, with eye fitting (402.3004E).
- Part No. 280476: flanged wheels, with hook fitting (402.3004H).
- Part No. 280477: flanged wheels, with clevis fitting (402.3004C).
- Part No. 280039: flanged wheels, with swivel clevis (402.3004SC).
- Part No. 280475: flanged wheels, with center spacer (402.3004WCS).
- Part No. 300461: flangeless wheels, with eye fitting (402.3054E).
- Part No. 300463: flangeless wheels, with hook fitting (402.3054H).
- Part No. 300465: flangeless wheels, with clevis fitting (402.3054C).
- Part No. 300468: flangeless wheels, with swivel clevis (402.3054SC).
- Part No. 300459: flangeless wheels, with center spacer (402.3054WCS).

3.33" OPERATING FLANGE

- Part No. 280062: flanged wheels, with eye fitting (403.3004E).
- Part No. 280483: flanged wheels, with hook fitting (403.3004H).
- Part No. 280484: flanged wheels, with clevis fitting (403.3004C).
- Part No. 280065: flanged wheels, with swivel clevis (403.3004SC).
- Part No. 280482: flanged wheels, with center spacer (403.3004WCS).
- Part No. 300311: flangeless wheels, with eye fitting (403.3054E).
- Part No. 300316: flangeless wheels, with hook fitting (403.3054H).
- Part No. 300321: flangeless wheels, with clevis fitting (403.3054C).
- Part No. 300326: flangeless wheels, with swival clevis (403.3054SC).
- Part No. 300306: flangeless wheels, with center spacer (403.3054WCS).



TROLLEY ASSEMBLY PARTS (a)

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1▲	280027	2-Wheel Trolley 2.0" Operating Flange, Flanged Wheels	2
	280474	2.0" Operating Flange, Flangeless Wheels	
	280056	3.33" Operating Flange, Flanged Wheels	
	280480	3.33" Operating Flange, Flangeless Wheels	
2	260126	Loadbar	1
3	260128 (b)	Center Fitting	1
4	300432 (c)	Clevis	1
5	260262 (b)	Spacer	2
6	211025	Bolt	2

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
7	210410	Lockwasher	2
8	211661	Hex Nut	2
9▲	213611 (d)	Thrust Bearing	1
10▲	260316 (d)	Bearing Washer	1
11▲	211774 (d)	Slotted Hex Nut	1
12▲	260255	Eye Fitting	1
13▲	260256	Hook	1
14	260687	Swivel Bolt	1
15	200267	Clevis Half	2
16	210804	Screw	2
17	210406	Lockwasher	2
18	211490	Lock Nut	2
19▲	210475	Cotter Pin	1

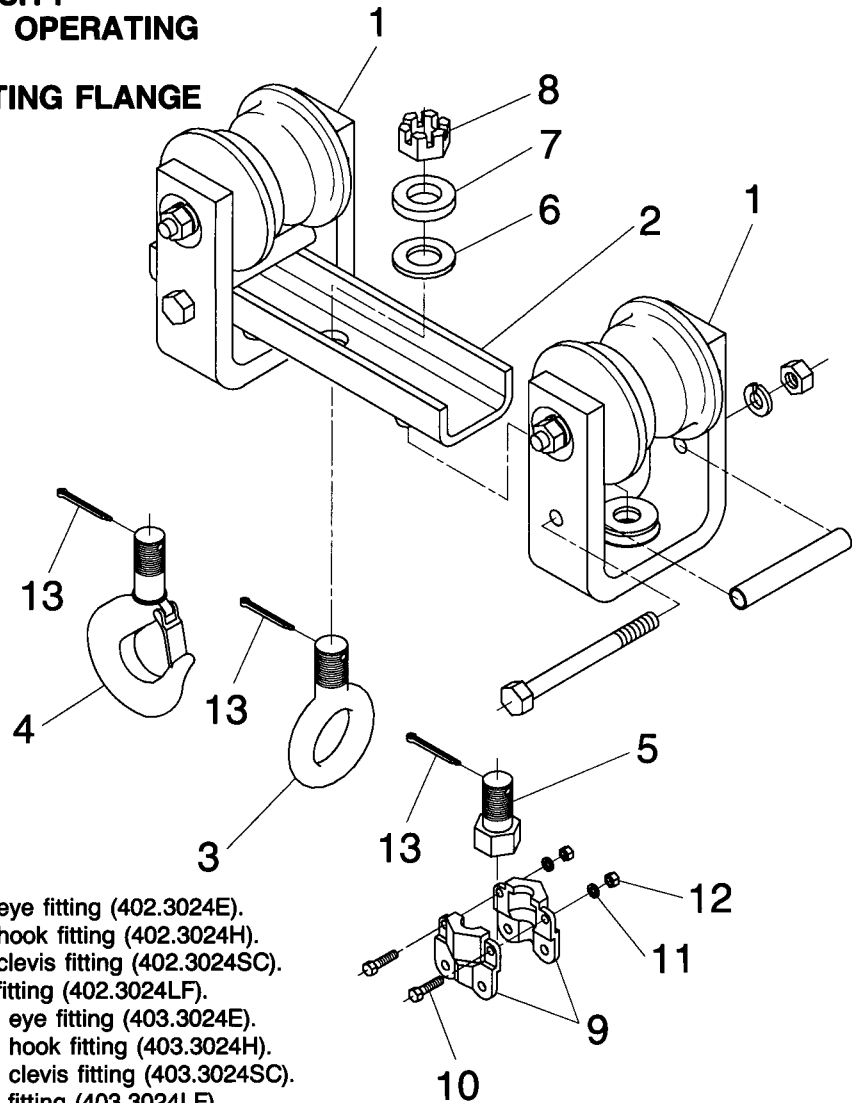
▲ Recommended Spare Parts

NOTES:

- (a) For trolley with eye fitting, use items 1, 2, 3, 5 through 12, and 19.
For trolley with hook fitting, use items 1, 2, 3, 5 through 11, 13, and 19.
For trolley with clevis fitting, use items 1, 2, 4, 6, 7, and 8.
For trolley with swivel clevis, use items 1, 2, 3, 5 through 11, and 14 through 19.
For trolley with center spacer, use items 1, 2, 3, 5, 6, 7, and 8.
- (b) For E, H, SC, and WCS trolleys only.
- (c) For C trolley only.
- (d) For E, H, and SC trolleys only.

PARTS LIST – TROLLEY ASSEMBLY

4-WHEEL MONORAIL TROLLEY ASSEMBLY
4" DIA. FLANGED WHEELS
3000# TROLLEY CAPACITY
2.0" AND 3.33" SUPERTRACK™ OPERATING
FLANGE
3.33" TROJANTRACK™ OPERATING FLANGE



COMPLETE TROLLEY ASSEMBLY:

- Part No. 280040: 2.0" operating flange with eye fitting (402.3024E).
- Part No. 280042: 2.0" operating flange with hook fitting (402.3024H).
- Part No. 280043: 2.0" operating flange with clevis fitting (402.3024SC).
- Part No. 280478: 2.0" operating flange less fitting (402.3024LF).
- Part No. 280066: 3.33" operating flange with eye fitting (403.3024E).
- Part No. 280485: 3.33" operating flange with hook fitting (403.3024H).
- Part No. 280071: 3.33" operating flange with clevis fitting (403.3024SC).
- Part No. 280486: 3.33" operating flange less fitting (403.3024LF).

TROLLEY ASSEMBLY PARTS (a)

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1▲	280027 280056	2-Wheel Trolley 2.0" Operating Flange 3.33" Operating Flange	2
2	260686	Loadbar	1
3▲	260255	Eye Fitting	1
4▲	260256	Hook	1
5	260687	Swivel Bolt	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
6▲	213611	Thrust Bearing	1
7▲	260316	Bearing Washer	1
8▲	211774	Slotted Hex Nut	1
9	200267	Clevis Half	2
10	210804	Screw	2
11	210406	Lockwasher	2
12	211490	Lock Nut	2
13▲	210475	Cotter Pin	1

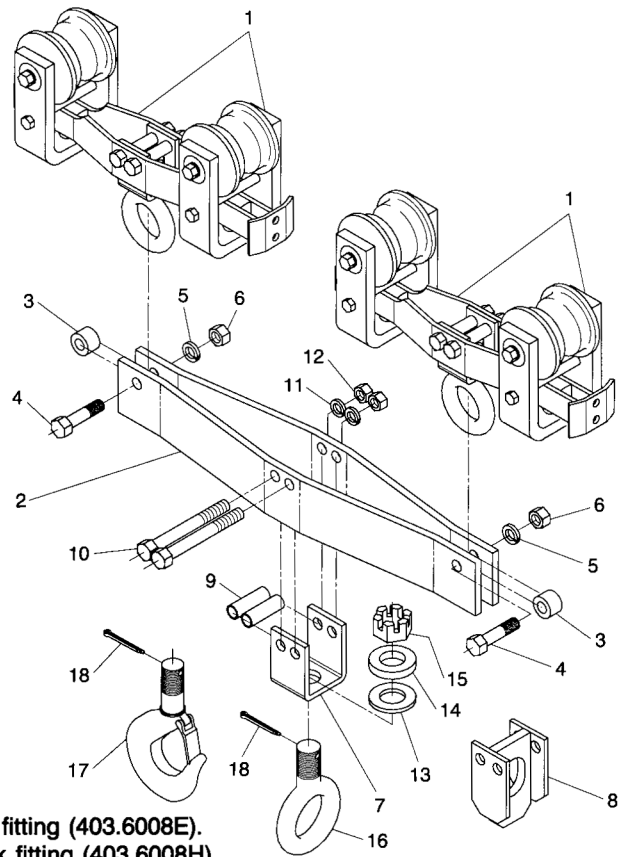
▲ Recommended Spare Parts

NOTE:

- (a) For trolley with eye fitting, use items 1, 2, 3, 6, 7, 8, and 13.
- For trolley with hook fitting, use items 1, 2, 4, 6, 7, 8, and 13.
- For trolley with clevis fitting, use items 1, 2, and 5 through 13.
- For trolley less fitting, use items 1 and 2.

PARTS LIST – TROLLEY ASSEMBLY

8-WHEEL MONORAIL TROLLEY ASSEMBLY 4" DIA. FLANGED AND FLANGELESS WHEELS 6000# TROLLEY CAPACITY 2.0" AND 3.33" SUPERTRACK™ OPERATING FLANGE 3.33" TROJANTRACK™ OPERATING FLANGE



COMPLETE TROLLEY ASSEMBLY:

2.0" OPERATING FLANGE

- Part No. 280041: flanged wheels, with eye fitting (402.6008E).
- Part No. 280471: flanged wheels, with hook fitting (402.6008H).
- Part No. 280472: flanged wheels, with clevis fitting (402.6008C).
- Part No. 300470: flangeless wheels, with eye fitting (402.6058E).
- Part No. 300472: flangeless wheels, with hook fitting (402.6058H).
- Part No. 300474: flangeless wheels, with clevis fitting (402.6058C).

3.33" OPERATING FLANGE

- Part No. 280072: 3.33" operating flange, flanged wheels, with eye fitting (403.6008E).
- Part No. 280492: 3.33" operating flange, flanged wheels, with hook fitting (403.6008H).
- Part No. 280493: 3.33" operating flange, flanged wheels, with clevis fitting (403.6008C).
- Part No. 300366: 3.33" operating flange, flangeless wheels, with eye fitting (403.6058E).
- Part No. 300371: 3.33" operating flange, flangeless wheels, with hook fitting (403.6058H).
- Part No. 300376: 3.33" operating flange, flangeless wheels, with clevis fitting (403.6058C).

TROLLEY ASSEMBLY PARTS (a)

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1▲	280037	4-Wheel Trolley 2.0" Operating Flange, Flanged Wheels	2
	300461	2.0" Operating Flange, Flangeless Wheels	
	280062	3.33" Operating Flange, Flanged Wheels	
	300311	3.33" Operating Flange, Flangeless Wheels	
2	280648	Loadbar	1
3	260149	Adapter Spool (b)	2
4	211077	Bolt (b)	2
5	210411	Lockwasher (b)	2
6	211720	Hex Nut (b)	2

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
7	260248 (c)	Center Fitting	1
8	300433	Clevis	1
9	260261 (c)	Spacer	2
10	211084	Bolt	2
11	210411	Lockwasher	2
12	211720	Hex Nut	2
13▲	213613 (c)	Thrust Bearing	1
14▲	260317 (c)	Bearing Washer	1
15▲	211939 (c)	Slotted Hex Nut	1
16▲	260257	Eye Fitting	1
17▲	260258	Hook	1
18▲	210482	Cotter Pin	1

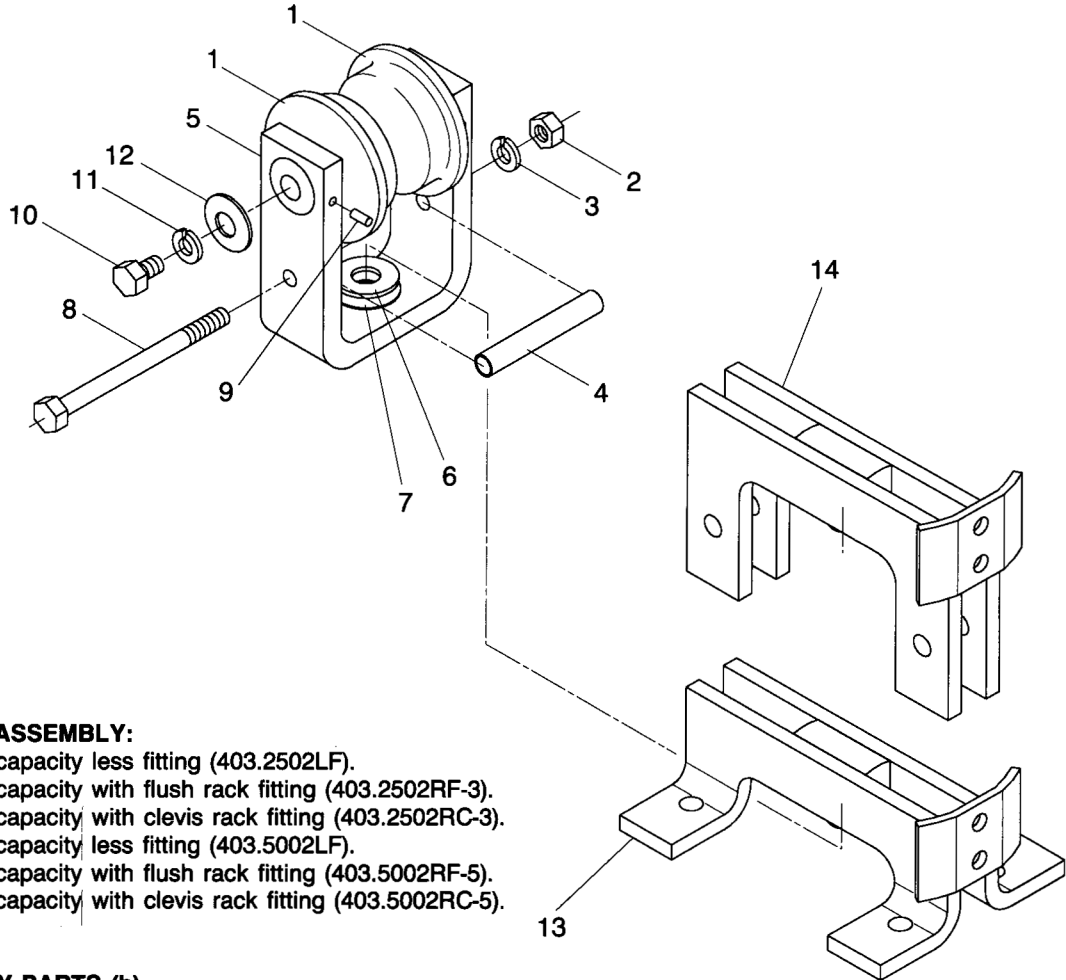
▲ Recommended Spare Parts

NOTES:

- (a) For trolley with eye fitting, use items 1 through 7, 9 through 16, and 18.
For trolley with hook fitting, use items 1 through 7, 9 through 15, 17, and 18.
For trolley with clevis fitting, use items 1 through 6, 8, 10, 11, and 12.
- (b) Included with item 2.
- (c) For E and H trolleys only.

PARTS LIST – TROLLEY ASSEMBLY

2-WHEEL MONORAIL TROLLEY ASSEMBLY 4½" DIA. FLANGED WHEELS 2500# AND 5000# TROLLEY CAPACITY 3.33" SUPERTRACK™ OPERATING FLANGE 3.33" TROJANTRACK™ OPERATING FLANGE



COMPLETE TROLLEY ASSEMBLY:

- Part No. 280059: 2500# capacity less fitting (403.2502LF).
- Part No. 280060: 2500# capacity with flush rack fitting (403.2502RF-3).
- Part No. 280061: 2500# capacity with clevis rack fitting (403.2502RC-3).
- Part No. 280067: 5000# capacity less fitting (403.5002LF).
- Part No. 280068: 5000# capacity with flush rack fitting (403.5002RF-5).
- Part No. 280069: 5000# capacity with clevis rack fitting (403.5002RC-5).

TROLLEY ASSEMBLY PARTS (b)

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1▲	280652 280593	Wheel Assembly 2500# Trolley Capacity 5000# Trolley Capacity	2
2	211661	Hex Nut	1
3	210410	Lockwasher	1
4	260132	Yoke Spacer	1
5	260131	Trolley Yoke	1
6▲	260194	Steel Bearing Washer	1
7▲	213612	Thrust Bearing	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
8	211014	Spacer Bolt	1
9	213482	Roll Pin	2
10	260049	Screw Assembly (a)	2
11	210410	Lockwasher (a)	2
12	260434	Washer (a)	1
13	260124 260143	Flush Rack Fitting 2500# Trolley Capacity 5000# Trolley Capacity	1
14	260123 260141	Clevis Rack Fitting 2500# Trolley Capacity 5000# Trolley Capacity	1

▲ Recommended Spare Parts

NOTES:

- (a) Included with item no. 1, but also available as a spare.
- (b) For trolley less fitting, use items 1 through 12.
 For trolley with flush rack fitting, use items 1 through 13.
 For trolley with clevis rack fitting, use items 1 through 12 and 14.

PARTS LIST – TROLLEY ASSEMBLY

4-WHEEL MONORAIL TROLLEY ASSEMBLY 4½" DIA. FLANGED AND FLANGELESS WHEELS 5000# AND 10000# TROLLEY CAPACITY 3.33" SUPERTRACK™ OPERATING FLANGE 3.33" TROJANTRACK™ OPERATING FLANGE

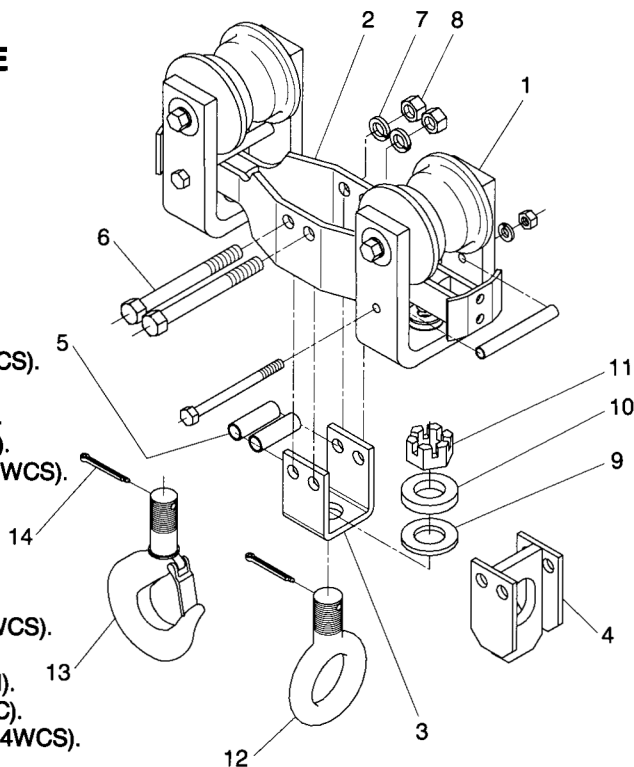
COMPLETE TROLLEY ASSEMBLY:

5000# CAPACITY

- Part No. 280070: flanged wheels, with eye fitting (403.5004E).
- Part No. 280489: flanged wheels, with hook fitting (403.5004H).
- Part No. 280490: flanged wheels, with clevis fitting (403.5004C).
- Part No. 280488: flanged wheels, with center spacer (403.5004WCS).
- Part No. 300348: flangeless wheels, with eye fitting (403.5054E).
- Part No. 300353: flangeless wheels, with hook fitting (403.5054H).
- Part No. 300358: flangeless wheels, with clevis fitting (403.5054C).
- Part No. 300343: flangeless wheels, with center spacer (403.5054WCS).

10000# CAPACITY

- Part No. 280074: flanged wheels, with eye fitting (403.10004E).
- Part No. 280499: flanged wheels, with hook fitting (403.10004H).
- Part No. 280500: flanged wheels, with clevis fitting (403.10004C).
- Part No. 280498: flanged wheels, with center spacer (403.10004WCS).
- Part No. 300402: flangeless wheels, with eye fitting (403.10054E).
- Part No. 300404: flangeless wheels, with hook fitting (403.10054H).
- Part No. 300406: flangeless wheels, with clevis fitting (403.10054C).
- Part No. 300400: flangeless wheels, with center spacer (403.10054WCS).



TROLLEY ASSEMBLY PARTS (a)

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1▲	280059 280481 280067 280491	2-Wheel Trolley 5000# Flanged Wheels 5000# Flangeless Wheels 10000# Flanged Wheels 10000# Flangeless Wheels	2
2	260263	Loadbar	1
3	260248 (b) 265000 (b)	Center Fitting 5000# Capacity 10000# Capacity	1
4	300433 (c) 300438 (c)	Clevis 5000# Capacity 10000# Capacity	1
5	260261 (b)	Spacer	2
6	211084	Bolt	2
7	210411	Lockwasher	2
8	211720	Hex Nut	2

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
9▲	213613 (d) 213614 (d)	Thrust Bearing 5000# Capacity 10000# Capacity	1
10▲	260317 (d) 260315 (d)	Bearing Washer 5000# Capacity 10000# Capacity	1
11▲	211939 (d) 211991 (d)	Slotted Hex Nut 5000# Capacity 10000# Capacity	1
12▲	260257 260259	Eye Fitting 5000# Capacity 10000# Capacity	1
13▲	260258 260260	Hook 5000# Capacity 10000# Capacity	1
14▲	210482	Cotter Pin	1

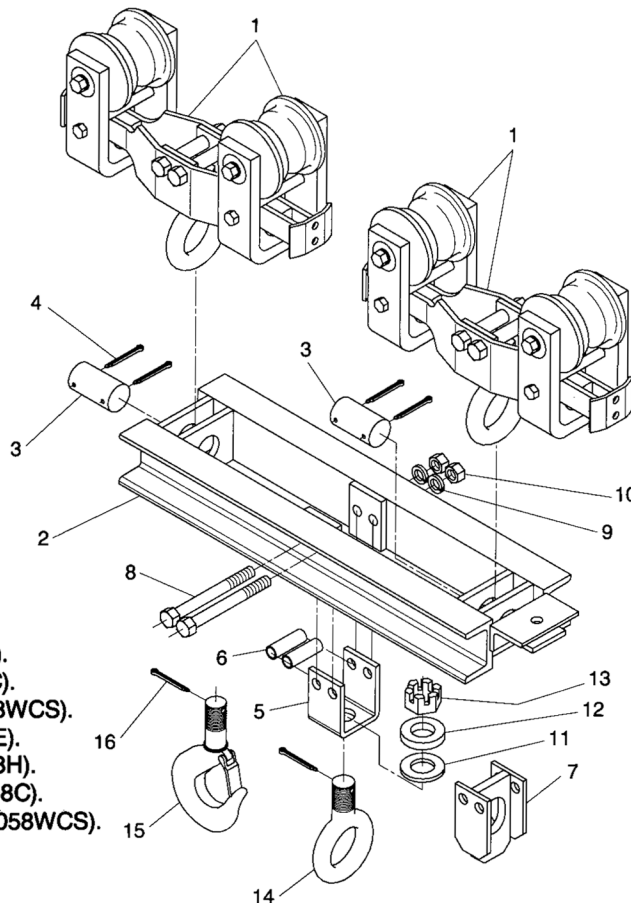
▲ Recommended Spare Parts

NOTES:

- (a) For trolley with eye fitting, use items 1, 2, 3, 5 through 12, and 14.
For trolley with hook fitting, use items 1, 2, 3, 5 through 11, 13, and 14.
For trolley with clevis fitting, use items 1, 2, 4, 6, 7, and 8.
For trolley with center spacer, use items 1, 2, 3, 5, 6, 7, and 8.
- (b) For E, H, and WCS trolleys only.
- (c) For C trolleys only.
- (d) For E and H trolleys only.

PARTS LIST – TROLLEY ASSEMBLY

8-WHEEL MONORAIL TROLLEY ASSEMBLY 4½" DIA. FLANGED AND FLANGELESS WHEELS 10000# TROLLEY CAPACITY 3.33" SUPERTRACK™ OPERATING FLANGE 3.33" TROJANTRACK™ OPERATING FLANGE



COMPLETE TROLLEY ASSEMBLY:

- Part No. 300001: Flanged wheels, with eye fitting (403.10008E).
- Part No. 300002: Flanged wheels, with hook fitting (403.10008H).
- Part No. 300003: Flanged wheels, with clevis fitting (403.10008C).
- Part No. 300174: Flanged wheels, with center spacer (403.10008WCS).
- Part No. 300386: Flangeless wheels, with eye fitting (403.10058E).
- Part No. 300391: Flangeless wheels, with hook fitting (403.10058H).
- Part No. 300396: Flangeless wheels, with clevis fitting (403.10058C).
- Part No. 300381: Flangeless wheels, with center spacer (403.10058WCS).

TROLLEY ASSEMBLY PARTS (a)

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1▲	280070 300438	4-Wheel Trolley Flanged Wheels Flangeless Wheels	2
2	300740	Loadbar	1
3	300739	Loadbar Pin	2
4	210480	Cotter Pin	4
5	265000 (b)	Center Fitting	1
6	260261 (b)	Spacer	1
7	280044 (c)	Clevis	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
8	211089	Bolt	2
9	210411	Lockwasher	2
10	211720	Hex Nut	2
11▲	213614 (d)	Thrust Bearing	1
12▲	260315 (d)	Bearing Washer	1
13▲	211991 (d)	Slotted Hex Nut	1
14▲	260259	Eye Fitting	1
15▲	260260	Hook	1
16▲	210482 (d)	Cotter Pin	1

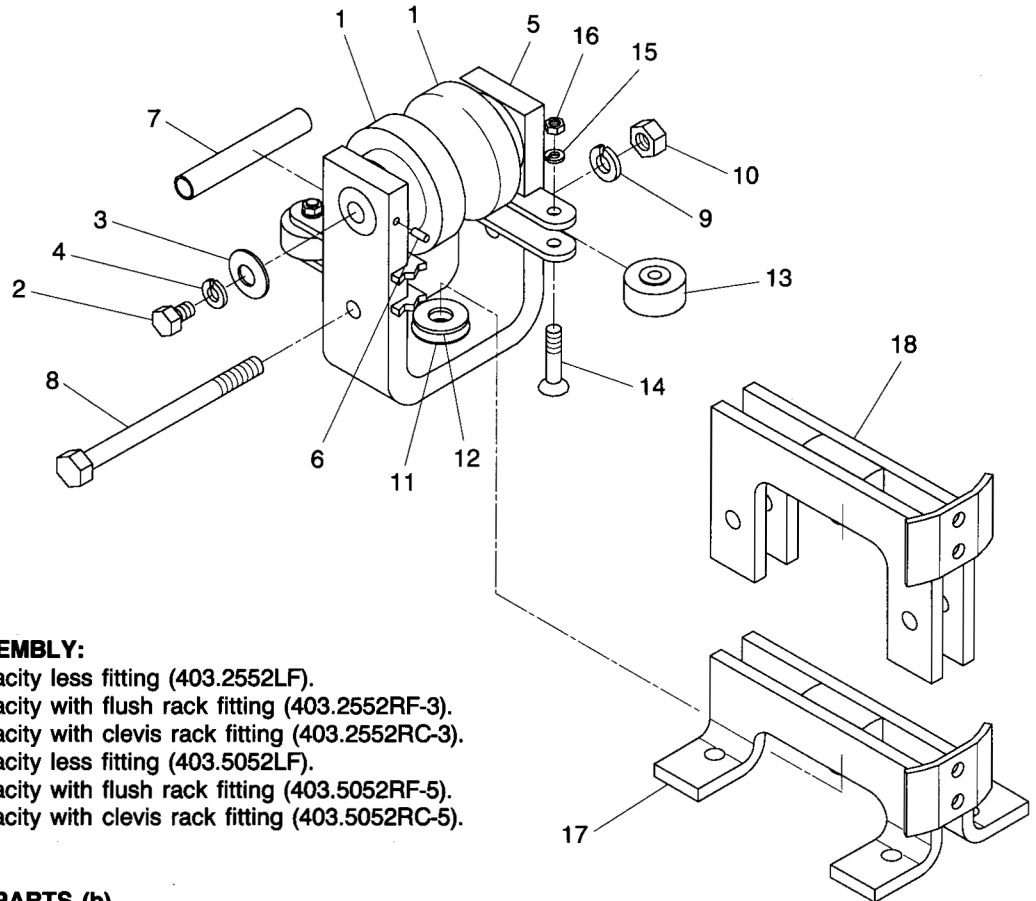
▲ Recommended Spare Parts

NOTES:

- (a) For trolley with eye fitting, use items 1 through 6, 8 through 14, and 16.
For trolley with hook fitting, use items 1 through 6, 8 through 13, 15, and 16.
For trolley with clevis fitting, use items 1 through 4, and 7 through 10.
For trolley with center spacer, use items 1 through 6, 8, 9, and 10.
- (b) For E, H, and WCS trolleys only.
- (c) For C trolleys only.
- (d) For E and H trolleys only.

PARTS LIST – TROLLEY ASSEMBLY

2-WHEEL MONORAIL TROLLEY ASSEMBLY 4½" DIA. FLANGELESS WHEELS 2500# AND 5000# TROLLEY CAPACITY 3.33" SUPERTRACK™ OPERATING FLANGE 3.33" TROJANTRACK™ OPERATING FLANGE



COMPLETE TROLLEY ASSEMBLY:

- Part No. 280481: 2500# capacity less fitting (403.2552LF).
- Part No. 300417: 2500# capacity with flush rack fitting (403.2552RF-3).
- Part No. 300418: 2500# capacity with clevis rack fitting (403.2552RC-3).
- Part No. 280491: 5000# capacity less fitting (403.5052LF).
- Part No. 300413: 5000# capacity with flush rack fitting (403.5052RF-5).
- Part No. 300414: 5000# capacity with clevis rack fitting (403.5052RC-5).

TROLLEY ASSEMBLY PARTS (b)

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1▲	280660 280595	Wheel Assembly 2500# Trolley Capacity 5000# Trolley Capacity	2
2	260049	Screw Assembly (a)	2
3	260434	Washer (a)	2
4	210410	Lockwasher (a)	2
5	260519	Trolley Yoke	1
6	213482	Roll Pin	2
7	260132	Yoke Spacer	1
8	211014	Spacer Bolt	1
9	210410	Lockwasher	1
10	211661	Hex Nut	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
11▲	213612	Thrust Bearing	1
12▲	260194	Steel Bearing Washer	1
13▲	213674	Guide Roller	4
14▲	212547	Flat Head Machine Screw	4
15▲	210407	Lockwasher	4
16▲	211547	Hex Nut	4
17▲	260124 260143	Flush Rack Fitting 2500# Trolley Capacity 5000# Trolley Capacity	1
18▲	260123 260141	Clevis Rack Fitting 2500# Trolley Capacity 5000# Trolley Capacity	1

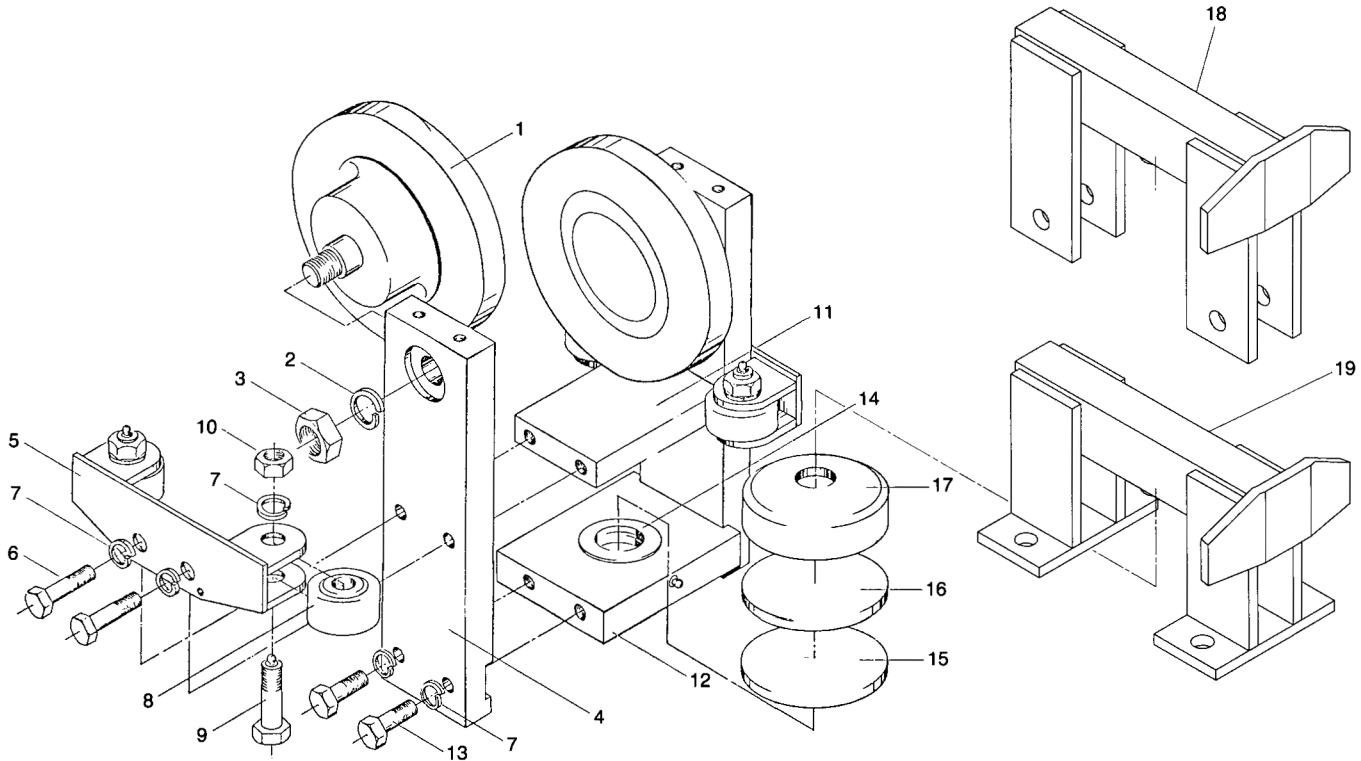
▲ Recommended Spare Parts

NOTES:

- (a) Included with item no. 1, but also available as a spare.
- (b) For trolley less fitting, use items 1 through 16.
For trolley with flush rack fitting, use items 1 through 17.
For trolley with clevis rack fitting, use items 1 through 16 and 18.

PARTS LIST – TROLLEY ASSEMBLY

2-WHEEL MONORAIL TROLLEY ASSEMBLY 9" DIA. FLANGELESS WHEELS 10000# TROLLEY CAPACITY 3.33" TROJANTRACK™ OPERATING FLANGE



COMPLETE TROLLEY ASSEMBLY:

Part No. 280494: Trolley less fitting.

Part No. 280495: Trolley with clevis rack fitting.

Part No. 280496: Trolley with flush rack fitting.

TROLLEY ASSEMBLY PARTS (b)

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1▲	280589	Wheel Assembly	2
2	210414	Lockwasher (a)	2
3	211882	Hex Jam Nut (a)	2
4	260314	Trolley Side Bar	2
5	260313	Guide Roller Bracket	2
6	211001	Hex Head Bolt	4
7	210410	Lockwasher	12
8▲	213689	Guide Roller	4
9▲	260307	Guide Roller Axle	4

▲ Recommended Spare Parts

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
10	211664	Hex Nut	4
11	260312	Upper Cross Bar	1
12	260311	Lower Cross Bar	1
13	210998	Hex Head Bolt	4
14▲	213531	Thrust Bearing	1
15	260309	Thrust Bearing Plate	1
16▲	213151	Rubber Absorber	1
17	260310	Shock Absorber Housing	1
18	300811	Clevis Rack Fitting	1
19	260694	Flush Rack Fitting	1

NOTES:

(a) Included with item no. 1, but also available as a spare.

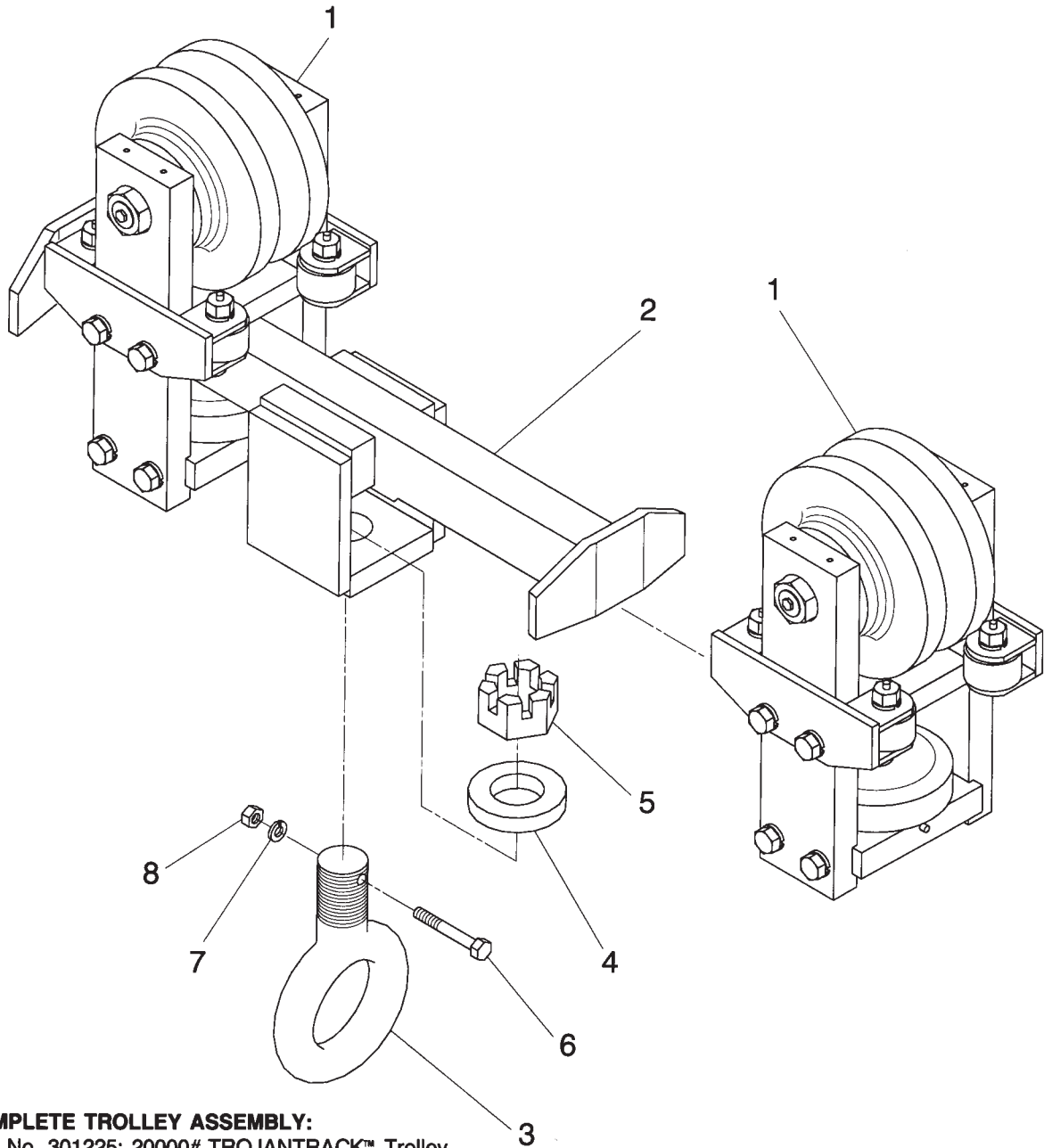
(b) For trolley less fitting, use items 1 through 17.

For trolley with clevis rack fitting, use items 1 through 18.

For trolley with flush rack fitting, use items 1 through 17 and 19.

PARTS LIST – TROLLEY ASSEMBLY

4-WHEEL MONORAIL TROLLEY ASSEMBLY 9" DIA. FLANGELESS WHEELS 20000# TROLLEY CAPACITY 3.33" TROJANTRACK™ OPERATING FLANGE



COMPLETE TROLLEY ASSEMBLY:
Part No. 301225: 20000# TROJANTRACK™ Trolley.

TROLLEY ASSEMBLY PARTS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1▲	280494	2-Wheel Trolley	2
2	265164	Loadbar	1
3▲	300498	Eye Fitting	1
4▲	213532	Thrust Bearing	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
5▲	211994	Slotted Hex Nut	1
6	210873	Screw	1
7	210407	Lockwasher	1
8	211547	Hex Nut	1

▲ Recommended Spare Parts

GENERAL CONDITIONS OF WARRANTY

WARRANTIES: The Seller warrants to the original using Buyer thereof that the goods sold under this Agreement are free from defects in workmanship and materials for a period of one year from the date of shipment to the original using Buyer. No other express warranties are given and no affirmation of Seller or Seller's agents, by word or action, shall constitute a warranty. No warranty is made for components and accessories made by others when such items are warranted by their respective manufacturers.

Installation or operation of the equipment in any manner other than as recommended by Seller, shall void the warranty.

Any variations in details between the goods furnished herein and those covered in Buyer's specifications are due to standards of manufacture not to be construed as exceptions to the specifications.

DISCLAIMER OF IMPLIED WARRANTIES:

- (a) SELLER MAKES NO WARRANTY OF MERCHANTABILITY IN RESPECT TO THE GOODS SOLD UNDER THIS AGREEMENT.
- (b) This sale is made WITHOUT ANY WARRANTY BY SELLER THAT THE GOODS ARE SUITABLE FOR ANY PARTICULAR PURPOSE.
- (c) Buyer hereby waives all other warranties, guarantees, obligations, liabilities, rights, and remedies arising by law or otherwise including any obligation or liability of the Seller arising from tort, and Buyer shall indemnify Seller from any liability, loss, damage, or claim arising from Buyer's tortious use of the goods sold hereby.

REMEDIES:

- (a) Under no conditions shall any goods be returned to Seller without its prior written consent.
- (b) The Buyer's sole and exclusive remedy for breach of any warranty is limited to Seller furnishing, at its expense, duplicate or repaired parts F.O.B. Seller's plant with installation at Buyer's expense if discovery of a claimed defect occurs during the allowable warranty period, and if Seller's inspection determines a defect exists.
- (c) The quantity of material shown by invoice shall in all cases govern settlement for shortages, unless notice of shortage, appropriately documented, is given to the carrier and the Seller upon delivery by the Carrier.
- (d) Claims for errors, deficiencies or imperfections shall be deemed waived by the Buyer unless Seller is notified in writing of the basis of such claims within 10 days after discovery of claimed defect and such discovery occurs within the warranted period.
- (e) Neither Buyer nor User shall be entitled under this Agreement to recover from Seller any incidental or consequential damages of any nature including but not limited to the cost of any labor expended by others in connection with the goods sold hereby by reason of any alleged nonconformity or breach of warranty on the part of the Seller, nor costs of material or account thereof, nor any lost profits whether determinable or speculative.



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product series 200, 300,
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**installation
operation
maintenance
and parts
manual**

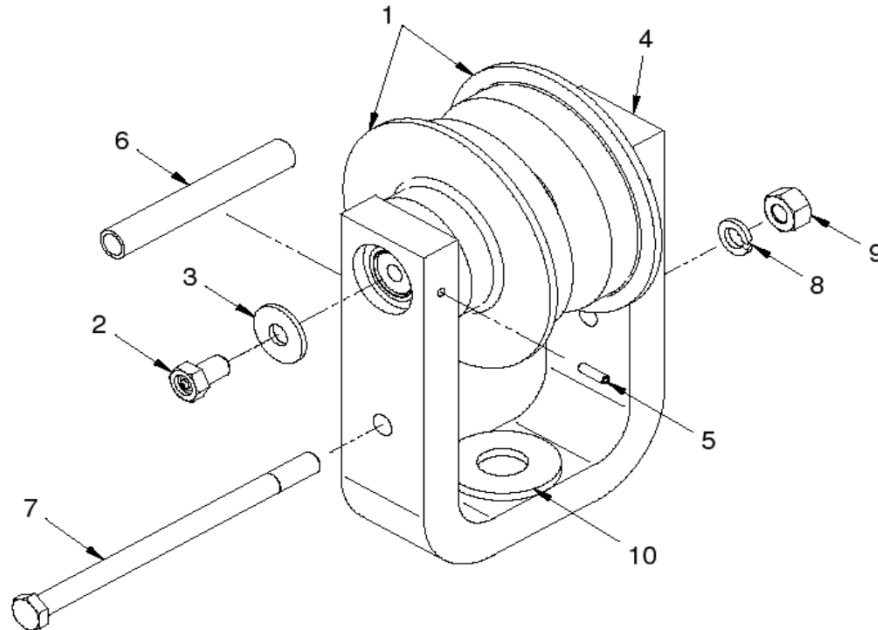
**supplemental instruction and parts manual pages
for 6-1/2 inch diameter wheel trolleys**

**These pages are to be used in conjunction with the pages in manual
69879.**

All warnings in the above listed manual apply to this supplement.

PARTS LIST - TROLLEY ASSEMBLY

**2-WHEEL TROLLEY ASSEMBLY
6 1/2" FLANGED WHEELS
7,500 # TROLLEY CAPACITY
3.25" AND 3.33" OPERATING FLANGE WIDTH**



COMPLETE TROLLEY ASSEMBLY:
Part No. 280314: 7,500 # trolley capacity

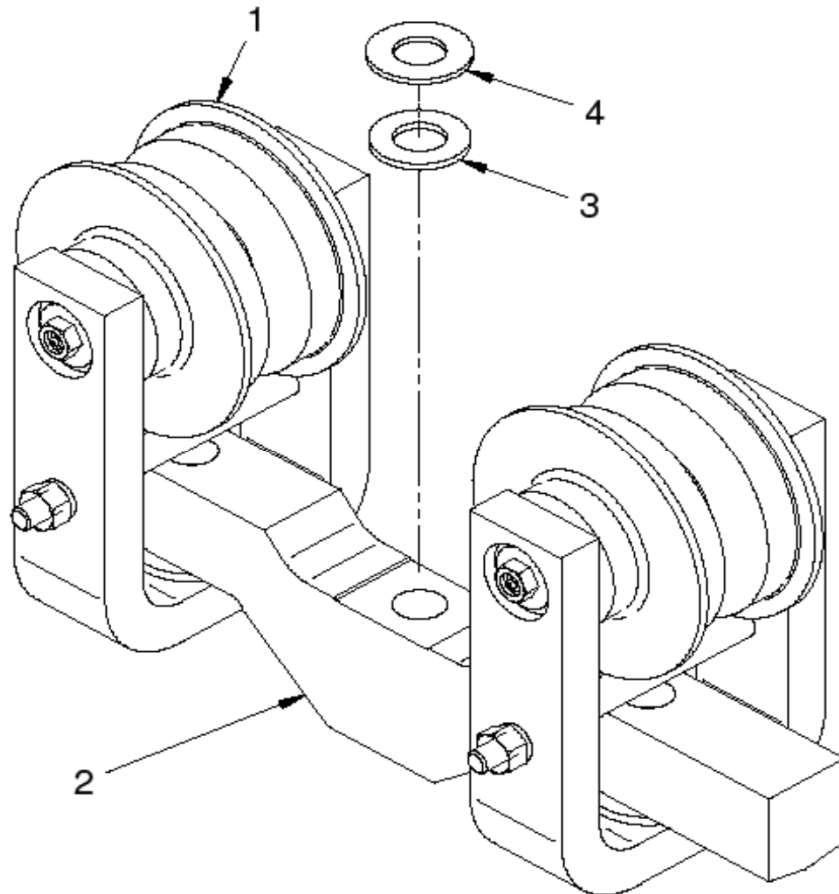
TROLLEY ASSEMBLY PARTS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1 ▲	280866	Wheel Assembly, 6 1/2" Dia. FLGD for 7,500 LB. Cap. Trolley	2
2 •	260049	Screw Lube Assembly	2
3 •	260434	Washer	2
4	260790	Yoke, Trolley	1
5	210021	Pin, Roll	2
6	260225	Spacer, Yoke	1
7	210907	Bolt, Spacer	1
8	210410	Lockwasher	1
9	211661	Nut, Hex	1
10 ▲	260801	Bearing, Thrust	1

NOTE: ▲ Recommended spare parts
 • Included with item no. 1 but also available as a spare part.

PARTS LIST - TROLLEY ASSEMBLY

**4-WHEEL CRANE TROLLEY ASSEMBLY
6 1/2" FLANGELED WHEELS
15,000 # TROLLEY CAPACITY
3.25" AND 3.33" OPERATING FLANGE WIDTH**



COMPLETE TROLLEY ASSEMBLY:
Part No. 265178: 15,000 # trolley capacity

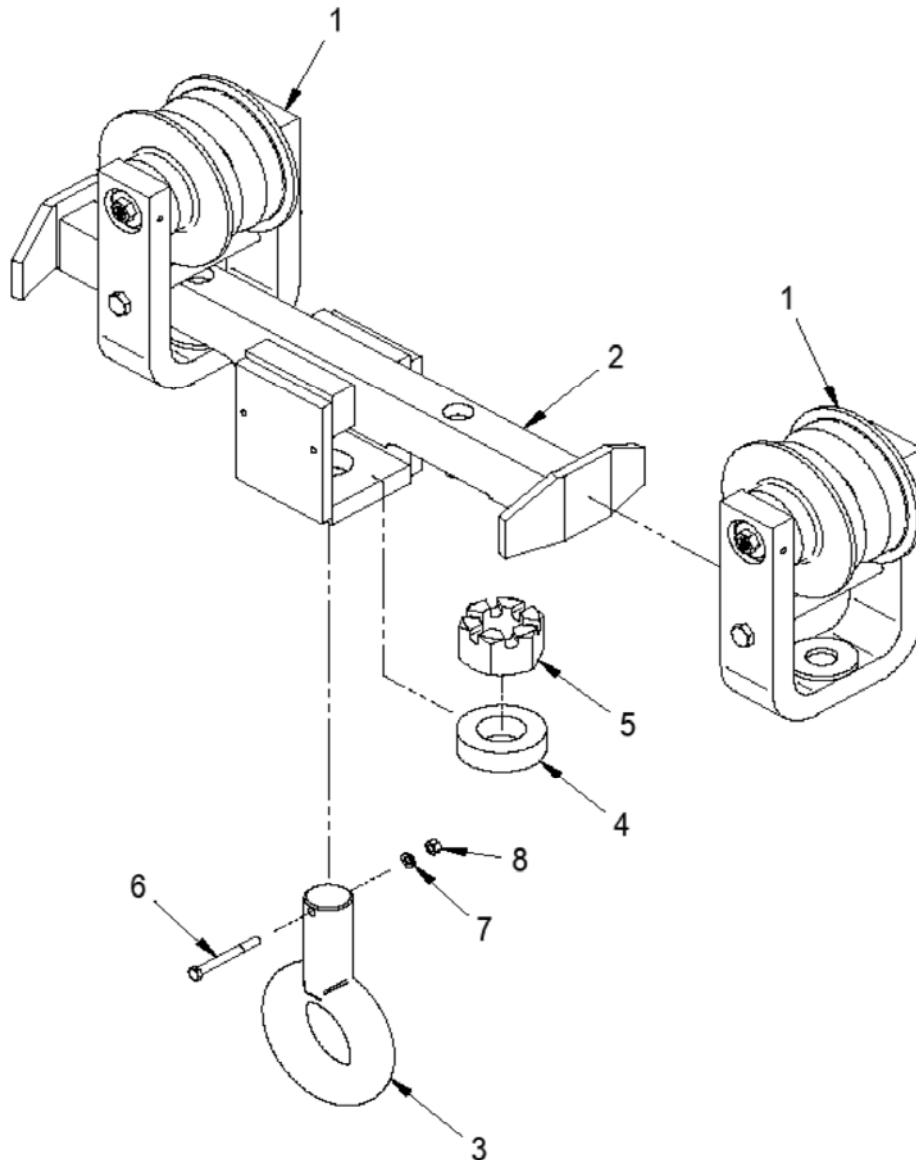
TROLLEY ASSEMBLY PARTS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1 ▲	280314	Wheel Assembly, 6 1/2" diameter	2
2	260238	Loadbar	1
3 ▲	213613	Bearing, Thrust T-2304	1
4 ▲	210238	Washer	1

NOTE: ▲ Recommended spare parts

PARTS LIST - TROLLEY ASSEMBLY

**4-WHEEL MONORAIL TROLLEY ASSEMBLY
6 1/2" FLANGED WHEELS
15,000 # TROLLEY CAPACITY
3.25" AND 3.33" OPERATING FLANGE WIDTH**



COMPLETE TROLLEY ASSEMBLY:
Part No. 301755: 15,000 # trolley capacity

TROLLEY ASSEMBLY PARTS

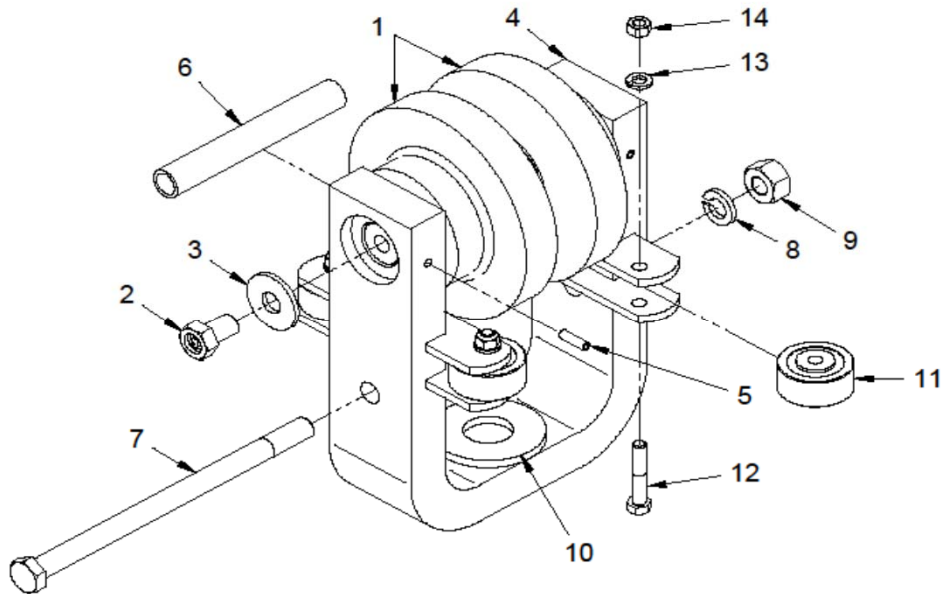
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1 ▲	280314	2-Wheel Trolley	2
2	260337	Loadbar	1
3 ▲	300498	Eye Fitting	1
4 ▲	213532	Thrust Bearing	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
5 ▲	211994	Slotted Hex Nut	1
6	210873	Screw	1
7	210407	Lockwasher	1
8	211547	Hex Nut	1

▲ Recommended spare parts

PARTS LIST - TROLLEY ASSEMBLY

**2-WHEEL TRAMBEAM™ HEAVY RAIL TROLLEY ASSEMBLY
6 1/2" FLANGELESS WHEELS AND SIDE GUIDE ROLLERS
7,500 # TROLLEY CAPACITY
3.25" OPERATING FLANGE WIDTH**



COMPLETE TROLLEY ASSEMBLY:
Part No. 280312: 7,500 # trolley capacity

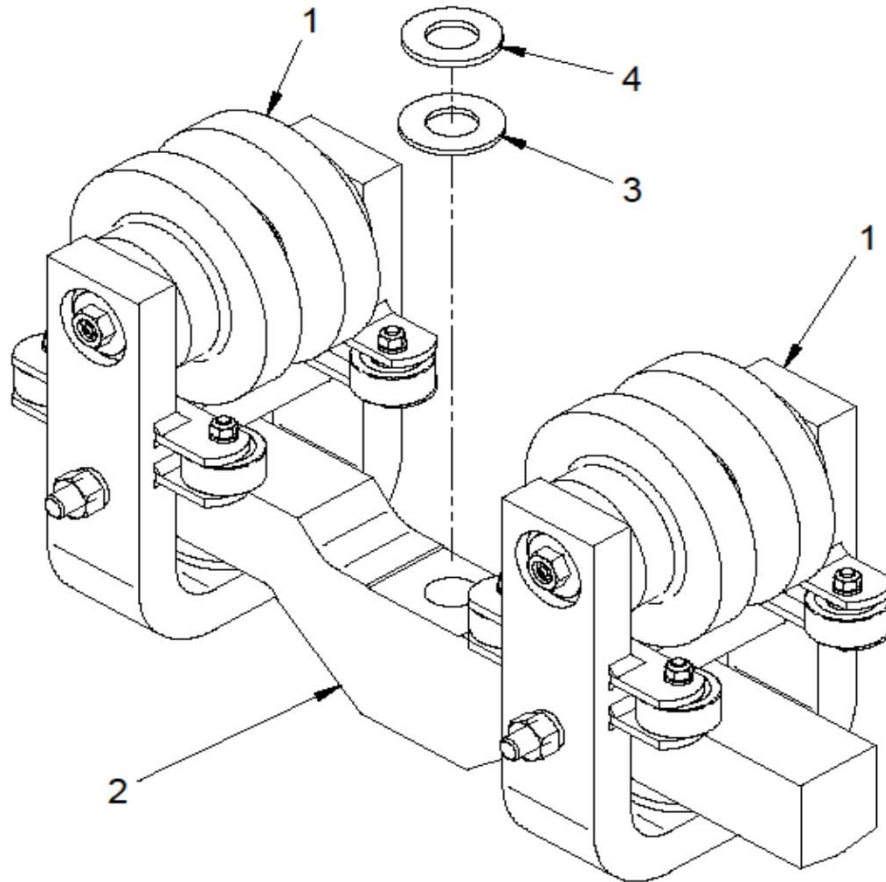
TROLLEY ASSEMBLY PARTS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1 ▲	280359	Wheel Assembly, 6 1/2" Dia. FLSS for 7,500 LB. Cap. Trolley	2
2 •	260049	Screw Lube Assembly	2
3 •	260434	Washer	2
4	260837	Yoke, Trolley	1
5	210021	Pin, Roll	2
6	260225	Spacer, Yoke	1
7	210907	Bolt, Spacer	1
8	210410	Lockwasher	1
9	211661	Nut, Hex	1
10 ▲	260801	Bearing, Thrust	1
11 ▲	210050	Guide Roller	4
12	210868	Screw, Hex Head	4
13	210407	Lockwasher	4
14	211547	Nut, Hex	4

NOTE: ▲ Recommended spare parts
 • Included with item no. 1 but also available as a spare part.

PARTS LIST - TROLLEY ASSEMBLY

WHEEL TRAMBEAM™ HEAVY RAIL CRANE TROLLEY ASSEMBLY
 6 1/2" FLANGELESS WHEELS AND SIDE GUIDE ROLLERS
 15,000 # TROLLEY CAPACITY
 3.25" OPERATING FLANGE WIDTH



COMPLETE TROLLEY ASSEMBLY:
 Part No. 265177: 15,000 # trolley capacity

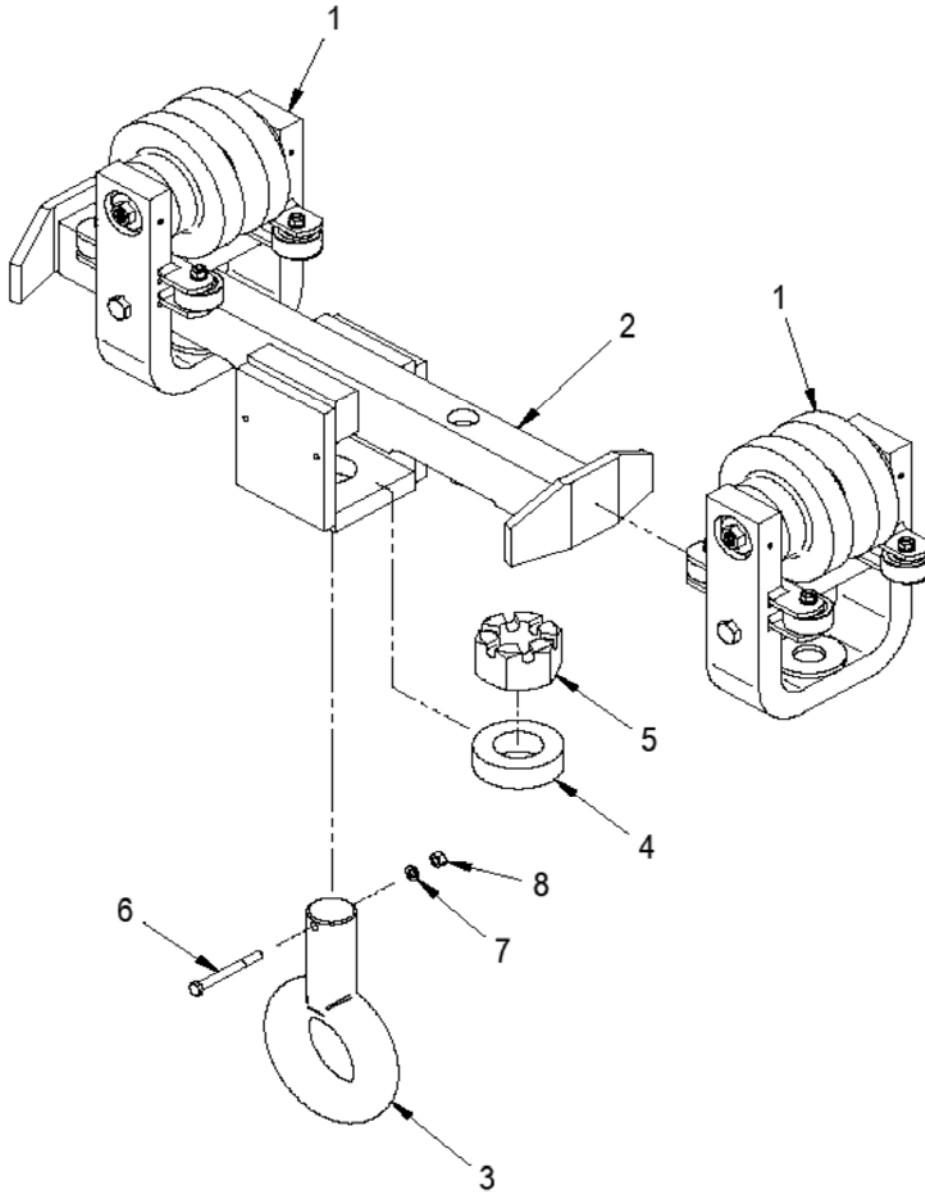
TROLLEY ASSEMBLY PARTS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1 ▲	280312	Wheel Assembly, 6 1/2" diameter	2
2	260238	Loadbar	1
3 ▲	213613	Bearing, Thrust T-2304	1
4 ▲	210238	Washer	1

NOTE: ▲ Recommended spare parts

PARTS LIST - TROLLEY ASSEMBLY

**4-WHEEL TRAMBEAM™ HEAVY RAIL MONORAIL TROLLEY ASSEMBLY
6 1/2" FLANGELESS WHEELS AND SIDE GUIDE ROLLERS
15,000 # TROLLEY CAPACITY
3.25" OPERATING FLANGE WIDTH**



COMPLETE TROLLEY ASSEMBLY:
Part No. 301754: 15,000 # trolley capacity

TROLLEY ASSEMBLY PARTS

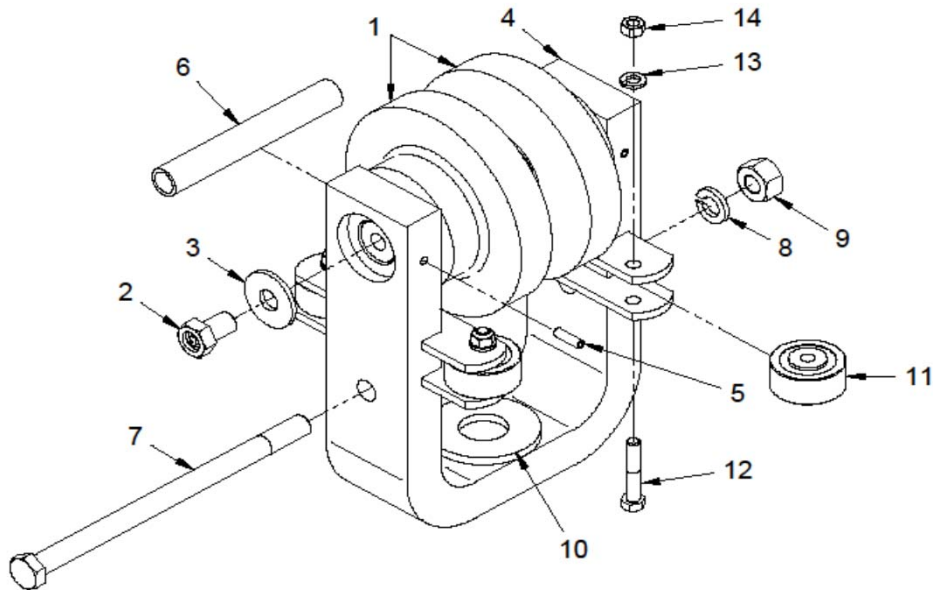
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1 ▲	280312	2-Wheel Trolley	2
2	260337	Loadbar	1
3 ▲	300498	Eye Fitting	1
4 ▲	213532	Thrust Bearing	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
5 ▲	211994	Slotted Hex Nut	1
6	210873	Screw	1
7	210407	Lockwasher	1
8	211547	Hex Nut	1

▲ Recommended spare parts

PARTS LIST - TROLLEY ASSEMBLY

2-WHEEL TROJANTRACK™ TROLLEY ASSEMBLY 6 1/2" FLANGELESS WHEELS AND SIDE GUIDE ROLLERS 7,500 # TROLLEY CAPACITY 3.33" OPERATING FLANGE WIDTH



COMPLETE TROLLEY ASSEMBLY:
Part No. 280310: 7,500 # trolley capacity

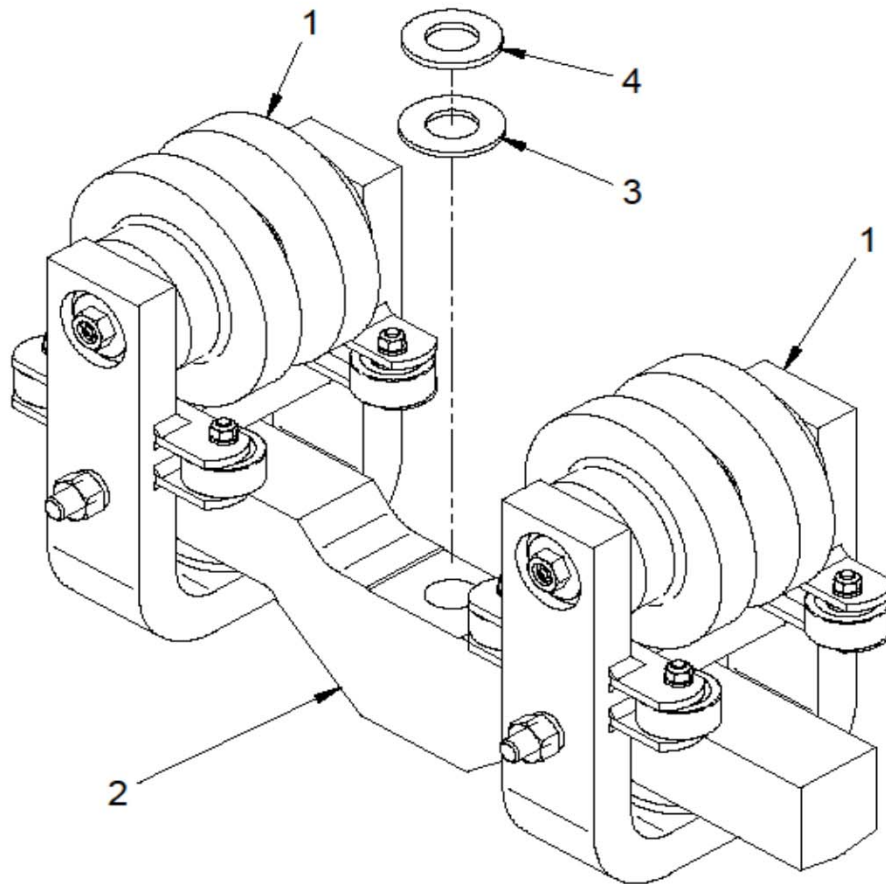
TROLLEY ASSEMBLY PARTS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1 ▲	280359	Wheel Assembly, 6 1/2" Dia. FLSS for 7,500 LB. Cap. Trolley	2
2 •	260049	Screw Lube Assembly	2
3 •	260434	Washer	2
4	260837	Yoke, Trolley	1
5	210021	Pin, Roll	2
6	260225	Spacer, Yoke	1
7	210907	Bolt, Spacer	1
8	210410	Lockwasher	1
9	211661	Nut, Hex	1
10 ▲	260801	Bearing, Thrust	1
11 ▲	213674	Guide Roller	4
12	210868	Screw, Hex Head	4
13	210407	Lockwasher	4
14	211547	Nut, Hex	4

NOTE: ▲ Recommended spare parts
• Included with item no. 1 but also available as a spare part.

PARTS LIST - TROLLEY ASSEMBLY

4-WHEEL TROJANTRACK™ CRANE TROLLEY ASSEMBLY
6 1/2" FLANGELESS WHEELS AND SIDE GUIDE ROLLERS
15,000 # TROLLEY CAPACITY
3.33" OPERATING FLANGE WIDTH



COMPLETE TROLLEY ASSEMBLY:
 Part No. 265176: 15,000 # trolley capacity

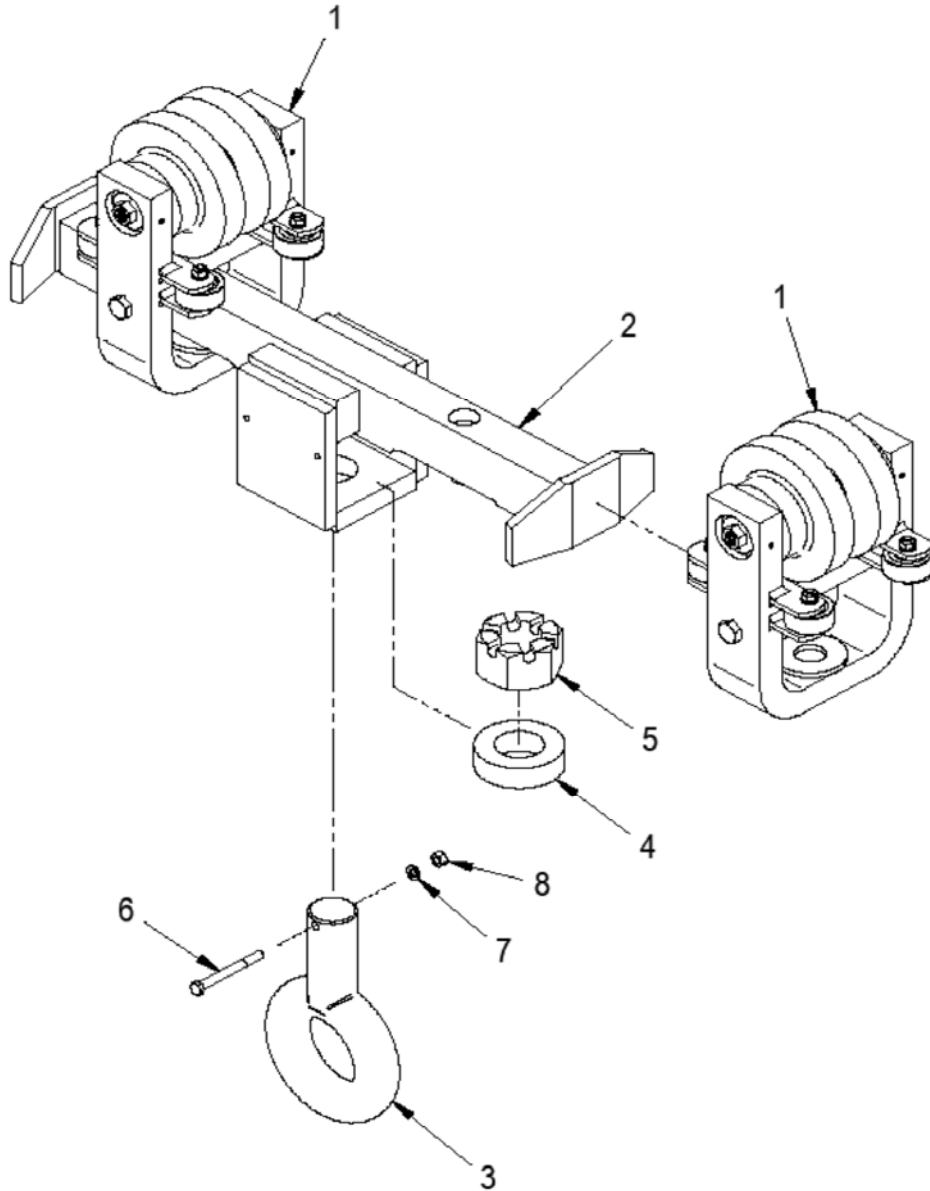
TROLLEY ASSEMBLY PARTS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1 ▲	280310	Wheel Assembly, 6 1/2" diameter	2
2	260238	Loadbar	1
3 ▲	213613	Bearing, Thrust T-2304	1
4 ▲	210238	Washer	1

NOTE: ▲ Recommended spare parts

PARTS LIST - TROLLEY ASSEMBLY

**4-WHEEL TROJANTRACK™ MONORAIL TROLLEY ASSEMBLY
6 1/2" FLANGELESS WHEELS AND SIDE GUIDE ROLLERS
15,000 # TROLLEY CAPACITY
3.33" OPERATING FLANGE WIDTH**



COMPLETE TROLLEY ASSEMBLY:
Part No. 301753: 15,000 # trolley capacity

TROLLEY ASSEMBLY PARTS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1 ▲	280310	2-Wheel Trolley	2
2	260337	Loadbar	1
3 ▲	300498	Eye Fitting	1
4 ▲	213532	Thrust Bearing	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
5 ▲	211994	Slotted Hex Nut	1
6	210873	Screw	1
7	210407	Lockwasher	1
8	211547	Hex Nut	1

▲ Recommended spare parts



M9C Motoveyor®

supplemental parts manual

**These pages are to be used in conjunction with the pages in manual 69879.
All warnings in the above listed manual apply to this suppliment.**

SERIAL NUMBER

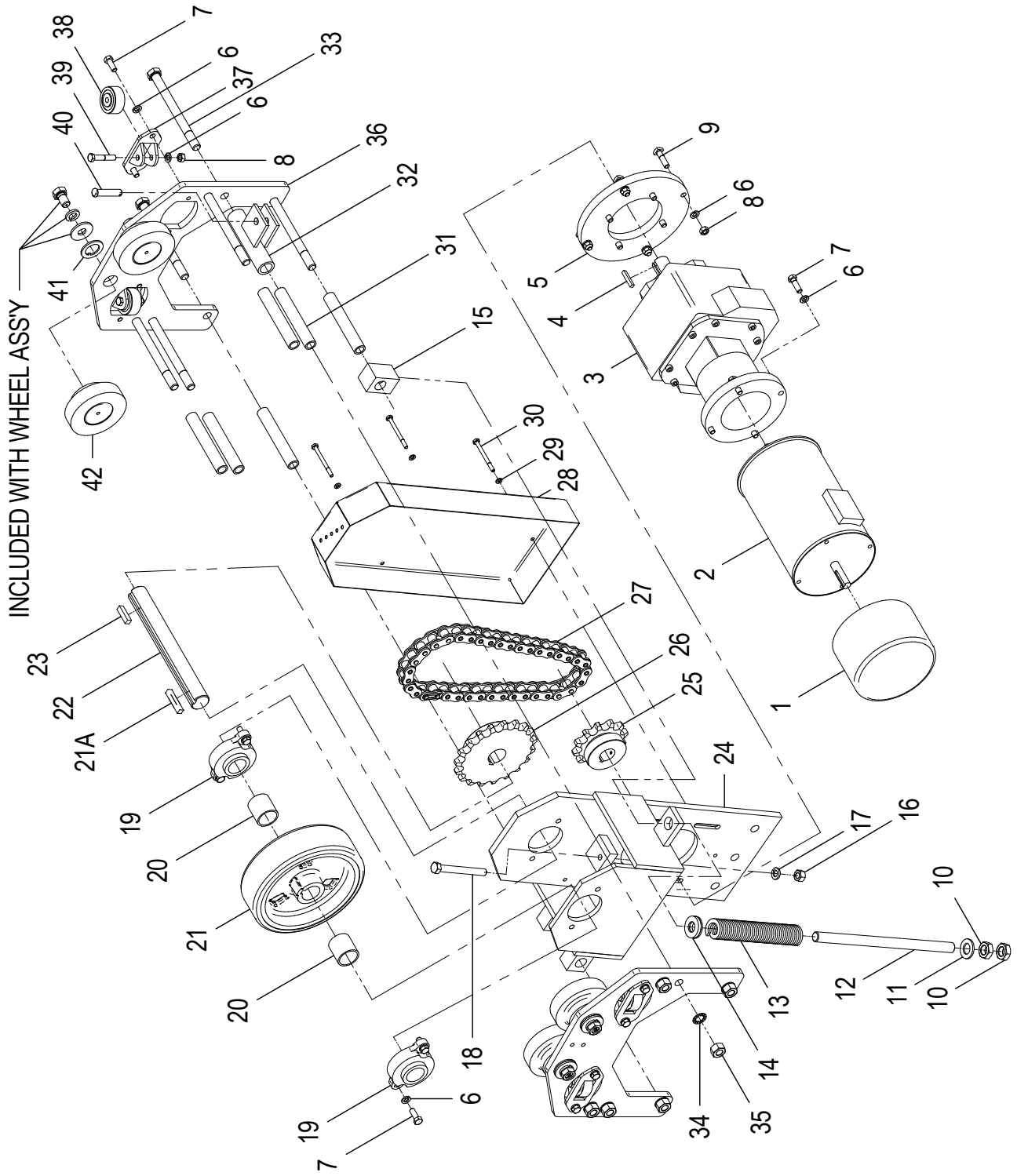
 **WARNING**

This equipment should not be installed, operated or maintained by any person who has not read all the contents of these instructions. Failure to read and comply with the instructions or any one of the limitations noted herein can result in serious bodily injury or death, and/or property damage.

There are no other warranties which extend beyond the description on the Order Acknowledgment and as it may apply to the specifications provided in this publication. THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXCLUDED. Acco shall in no event be liable for any special, direct, indirect, incidental or consequential damages to anyone beyond the cost of replacement of the goods sold hereby.

PARTS LIST - M9C LOUDEN MOTOVEYOR® DRIVE ASSEMBLY

M9C LOUDEN MOTOVEYOR® DRIVE ASSEMBLY



PARTS LIST - M9C LOUDEN MOTOVEYOR® DRIVE ASSEMBLY

M9C LOUDEN MOTOVEYOR® DRIVE ASSEMBLY

ITEM NO.	PART NUMBER	DRIVE COMPONENTS	QTY/ ASS'Y
1	71816	BRAKE - SEE SPEEDS CHART	1
2▲	71777	MOTOR - SEE SPEEDS CHART	1
	71778		
	71779		
	71780		
	71867		
	71868		
	71869		
3	260374	REDUCER - SEE SPEEDS CHART	1

ITEM NO.	PART NUMBER	CHAIN COMPONENTS	QTY/ ASS'Y
25	260830	SPROCKET, DRIVE - SEE SPEEDS ...	1
26	260835	SPROCKET, DRIVEN - 19T	1
27	260998	CHAIN, ASS'Y - SEE SPEEDS CHART	1

ITEM	PART NO.	DESCRIPTION	QTY
4	T480031	KEY, 1/4 x 1/4 x 1	1
5	T2801111	FLANGE	1
6	17-6P	LOCKWASHER 3/8	24
7	35-6-16	BOLT, HEX 3/8-16 x 1	16
8	22-6P	NUT, HEX 3/8-16	8
9	38-X6-24	BOLT, SQR 3/8-16 x 1 1/2	4
10	T480102	NUT, HEX 3/4-10 JAM	2
11	T480093	WASHER, FLAT 3/4	1
12	T2401115	ADJUSTING STUD	1
13	T480004	SPRING	1
14	T2401159	SPHERICAL WASHER SET	1
15	T2401111	ROD EYE	1
16	22-8	NUT, HEX 1/2-13	1
17	17-8P	LOCKWASHER 1/2	1
18	35-8-72	BOLT, HEX 1/2-13 x 4 1/2	1
19	213670	FLANGE BEARING	2
20	260989	SPACER	2
21▲	260536	DRIVE WHEEL ASS'Y, 9"	1
21A	70054	KEY, 3/8 x 3/8 x 2-1/8	1
22	261786	SHAFT	1
23	T480131	KEY, 3/8 x 3/8 x 1	1
24	261656	LEFT HAND	FRAME WELD. 1
	261657	RIGHT HAND	

ITEM	PART NO.	DESCRIPTION	QTY
28	263756	COVER, CHAIN	1
29	17-4C	LOCKWASHER 1/4	3
30	35-4-48	BOLT, HEX 1/4-20 x 3	3
31	260810	SPACER	6
32	260391	TOW LUG	1
33	211024	BOLT, HEX 5/8-11 x 7 1/2	6
34	17-10	LOCKWASHER 5/8	6
35	211661	NUT, HEX 5/8-11	6
36	261756	SIDE PLATE, CARRIER	2
37	200005	BRACKET, S.G.R.	4
38▲	213674	GUIDE ROLLER	3.33 TRACK
	210050		3.25 TRACK
39	35-6-32	BOLT, HEX 3/8-16 x 2	4
40	T2401123	YOKE PIN ASS'Y W/COTTER PIN	1
41	260406	KEYED WASHER	4
42▲	260530	WHEEL ASS'Y - 4-1/2", 2,500#	4

▲ Recommended Spare Parts

(a) For brake, motor, reducer, drive sprocket, and chain part numbers; "SPEEDS CHART", above, refer to the chart labeled "M9C CATALOG SPEEDS - HP, REDUCER, MOTOR, & BRAKE SPECIFICATIONS".

(B) Lubricate by dripping oil through holes in cover onto chain as needed. See LUBRICATION sheet for recommended oils.

LUBRICATION

Chain and sprocket lubrication can be achieved by dripping oil through the various holes included in the top of the chain guard.

For normal service, apply new SAE 30 motor oil (without additives) to the entire chain every three months.

In applications where foreign matter or dirt have accumulated on the chain, clean off all dirt and grit prior to re-oiling. Disconnect power to the tractor prior to the removal of the chain guard. Do not reconnect power until all maintenance is complete and the chain guard is back in place.

M9C CATALOG SPEEDS - HP, REDUCER, MOTOR, & BRAKE SPECIFICATIONS

NOMINAL SPEED (FPM)	HORSE POWER (HP)	MAX. LOAD (LBS)	MOTOR SPEED (RPM)	DRIVE PARTS OPTIONS								
				FRAME SIZE	REDUCER RATIO	REDUCER ASS'Y PART NO.	SINGLE SPEED SINGLE SHAFT	TWO SPEED SINGLE SHAFT	SINGLE SPEED DOUBLE SHAFT	TWO SPEED DOUBLE SHAFT	DRIVE SPROCKET & CHAIN	OPTIONAL BRAKE CHOICES
50	1/2	20,000	1800 SINGLE SPEED OR 1800/600 TWO SPEED	143TC	37.06:1	260374-01	71777	71778	71779	71780	260830-9 260998-036	71816-01, -05, -08, -12
50	3/4	30,000										
50	1	40,000										
75	1/2	13,333										
75	3/4	20,000										
75	1	26,666										
75	1 1/2	40,000										
100	1/2	10,000										
100	3/4	15,000										
100	1	20,000										
100	1 1/2	30,000										
100	2	40,000										
150	3/4	10,000										
150	1	13,333										
150	1 1/2	20,000										
150	2	26,666										
150	3	40,000										
200	1	10,000										
200	1 1/2	15,000										
200	2	20,000										
200	3	30,000										
250	1 1/2	12,000										
250	2	16,000										
250	3	24,000										
250	5 *	40,000										
300	1 1/2	10,000										
300	2	13,333										
300	3	20,000										
300	5 *	33,333										
				143TC	37.06:1	260374-01	71777	71778	71779	71780	260830-13 260998-038	71816-01, -05, -08, -12
				143TC	37.06:1	260374-01	71777	71778	71779	71780	260830-18 260998-040	71816-01, -05, -08, -12
				143TC	12.25:1	260374-02	71777	71778	71779	71780	260830-9 260998-036	71816-01, -05, -08, -12
				182TC	12.25:1	260374-03	71867	71868	71869	71870	260830-12 260998-038	71816-02, -06, -09, -13
				143TC	12.25:1	260374-02	71777	71778	71779	71780	260830-15 260998-038	71816-02, -06, -09, -13
				182TC	12.25:1	260374-03	71867	71868	71869	71870 71870 *	260830-17 260998-040	71816-03, -07, -10, -14
				143TC	12.25:1	260374-02	71777	71778	71779	71780	260830-17 260998-040	71816-02, -06, -09, -13
				182TC	12.25:1	260374-03	71867	71868	71869	71870 71870 *	260830-17 260998-040	71816-03, -07, -10, -14

* 71870 (5Hp Only) - IS A MODIFIED 213TC FRAME WITH A 182TC STYLE MOUNT.

PARTS LIST - M9C TRACTOR DRIVE MOTOR & BRAKE

TRACTOR DRIVE MOTOR & BRAKE CHARTS

Tractor drive motors for M9C drive units can be ordered with one shaft extension or two shaft extensions if used in conjunction with a brake module. Select the motor from the chart below and the brake from the bottom chart.

PART NUMBER MOTOR WITH ONE SHAFT EXT.	PART NUMBER MOTOR WITH TWO SHAFT EXT.	VOLTAGE	HP	RPM	SPEED	FRAME			
71777-01	71779-01	200	1/2	1800	SINGLE	143TC			
71777-11	71779-11	208/230/460							
71777-21	71779-21	575							
71777-02	71779-02	200	3/4						
71777-12	71779-12	208/230/460							
71777-22	71779-22	575							
71777-03	71779-03	200	1						
71777-13	71779-13	208/230/460							
71777-23	71779-23	575							
71777-04	71779-04	200	1 1/2						
71777-14	71779-14	208/230/460							
71777-24	71779-24	575							
71777-05	71779-05	200	2						
71777-15	71779-15	208/230/460							
71777-25	71779-25	575							
71867-01	71869-01	200	3	1800/600	TWO	143TC			
71867-11	71869-11	208/230/460							
71867-21	71869-21	575							
71867-02	71869-02	200	5						
71867-12	71869-12	208/230/460							
71867-22	71869-22	575							
71778-01	71780-01	200	1/2 - 1/6 HP				1800/600	TWO	143TC
71778-11	71780-11	230							
71778-21	71780-21	460							
71778-31	71780-31	575	3/4 - 1/4 HP						
71778-02	71780-02	200							
71778-12	71780-12	230							
71778-22	71780-22	460							
71778-32	71780-32	575	1 - 1/3 HP						
71778-03	71780-03	200							
71778-13	71780-13	230							
71778-23	71780-23	460							
71778-33	71780-33	575	1 1/2 - 1/2 HP						
71778-04	71780-04	200							
71778-14	71780-14	230							
71778-24	71780-24	460							
71778-34	71780-34	575	2 - 2/3 HP						
71778-05	71780-05	200							
71778-15	71780-15	230							
71778-25	71780-25	460							
71778-35	71780-35	575	3 - 1 HP						
71868-01	71870-01	200							
71868-11	71870-11	230							
71868-21	71870-21	460							
71868-31	71870-31	575	5 - 1 2/3 HP						
71868-02	71870-02	200							
71868-12	71870-12	230							
71868-22	71870-22	460							
71868-32	71870-32	575				182TC			

ACCO BRAKE P/N	FRAME SIZE	RATED TORQ. (FT-LB)	NEMA /IP-	FOR USE ON
71816-01	143TC	1.5	2/23	1/2 - 1 Hp TRACTOR
71816-02	143TC	3.0	2/23	1 1/2 - 2 Hp TRACTOR
71816-03	182TC	6.0	2/23	3 Hp TRACTOR
71816-04	182TC	10.0	2/23	5 Hp TRACTOR
71816-05	143TC	1.5	4/54	1/2 - 1 Hp TRACTOR
71816-06	143TC	3.0	4/54	1 1/2 - 2 Hp TRACTOR
71816-07	182TC	10.0	4/54	3 - 5 Hp TRACTOR
71816-08	143TC	1.5	2/23	1/2 - 1 Hp TRACTOR
71816-09	143TC	3.0	2/23	1 1/2 - 2 Hp TRACTOR
71816-10	182TC	6.0	2/23	3 Hp TRACTOR
71816-11	182TC	10.0	2/23	5 Hp TRACTOR
71816-12	143TC	1.5	4/54	1/2 - 1 Hp TRACTOR
71816-13	143TC	3.0	4/54	1 1/2 - 2 Hp TRACTOR
71816-14	182TC	10.0	4/54	3 - 5 Hp TRACTOR

GENERAL CONDITIONS OF WARRANTY

WARRANTIES: The Seller warrants to the original using Buyer thereof that the goods sold under this Agreement are free from defects in workmanship and materials for a period of two years from the date of shipment to the original using Buyer. No other express warranties are given and no affirmation of Seller or Seller's agents, by word or action, shall constitute a warranty. No warranty is made for components and accessories made by others when such items are warranted by their respective manufacturers.

Installation or operation of the equipment in any manner other than as recommended by Seller, shall void the warranty.

Any variations in details between the goods furnished herein and those covered in Buyer's specifications are due to standards of manufacture not to be construed as exceptions to the specifications.

DISCLAIMER OF IMPLIED WARRANTIES:

- (a) SELLER MAKES NO WARRANTY OF MERCHANTABILITY IN RESPECT TO THE GOODS SOLD UNDER THIS AGREEMENT.
- (b) This sale is made WITHOUT ANY WARRANTY BY SELLER THAT THE GOODS ARE SUITABLE FOR ANY PARTICULAR PURPOSE.
- (c) Buyer hereby waives all other warranties, guarantees, obligations, liabilities, rights, and remedies arising by law or otherwise including any obligation Of liability of the Seller arising from tort, and Buyer shall indemnify Seller from any liability, loss, damage, or claim arising from Buyer's tortious use of the goods sold hereby.

REMEDIES:

- (a) Under no conditions shall any goods be returned to Seller without its prior written consent.
- (b) The Buyer's sole and exclusive remedy for breach of any warranty is limited to Seller furnishing, at its expense, duplicate or repaired parts F.O.B. Seller's plant with installation at Buyer's expense if discovery of a claimed defect occurs during the allowable warranty period, and if Seller's inspection determines a defect exists.
- (c) The quantity of material shown by invoice shall in all cases govern settlement for shortages, unless notice of shortage, appropriately documented, is given to the carrier and the Seller upon delivery by the Carrier.
- (d) Claims for errors, deficiencies or imperfections shall be deemed waived by the Buyer unless Seller is notified in writing of the basis of such claims within 10 days after discovery of claimed defect and such discovery occurs within the warranted period.
- (e) Neither Buyer nor User shall be entitled under this Agreement to recover from Seller any incidental or consequential damages of any nature including but not limited to the cost of any labor expended by others in connection with the goods sold hereby by reason of any alleged nonconformity or breach of warranty on the part of the Seller, nor costs of material or account thereof, nor any lost profits whether determinable or speculative.



Acco Material Handling Solutions

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e-mail: info@accomhs.com
www.accomhs.com

DODGE® QUANTIS® IN-LINE HELICAL REDUCER

Gearmotors C-Face Reducers Separates Sizes 38 thru 168

These instructions should be read thoroughly before installation or operation.

DANGER: High voltage and rotating parts can cause serious or fatal injury and property damage. The use of electrical machinery, like all other utilization of concentrated power and rotating equipment, can be hazardous. Installation, operation and maintenance should be performed only by qualified electrical and mechanical maintenance personnel familiar with NEMA safety standards, the National Electrical Code and sound local practices. The manual is to be studied thoroughly by personnel responsible for the installation and maintenance of this equipment before installation is begun. Personnel must be familiar with the potential hazards involved. If this warning is not observed, personal injury and/or property damage may result. Keep this document for future reference.

GENERAL:

Please read these instructions carefully. They contain vital information on proper installation, operation, maintenance and service for the DODGE QUANTIS ILH gear reducer.

Each DODGE gear reducer is thoroughly inspected and tested at the factory prior to shipment. Care is taken in packing of each gear reducer. However, each gear reducer should be thoroughly inspected before it is accepted from the transportation company. If any of the goods called for in the bill of lading are damaged or missing, do not accept the shipment until the freight agent makes appropriate notation on your freight bill. If any loss or damage is discovered later, notify the agent at once and request an inspection. Though DODGE will be happy to assist you with claims for loss or damage in shipment, the transportation company is responsible for reimbursing you for such claims. Claims for loss or damage in shipment must not be deducted from the DODGE invoice, nor should payment of the DODGE invoice be withheld awaiting claims adjustment. The carrier, not DODGE, guarantees safe delivery. If considerable damage or shortage has occurred and the situation is urgent, contact the nearest BALDOR-DODGE Sales Office.

WARRANTY:

NOTE: SERVICE AND REPAIR UNDER WARRANTY SHOULD BE PERFORMED ONLY BY A DODGE AUTHORIZED SERVICE SHOP. CALL CUSTOMER SOLUTIONS CENTER AT 864-284-5777 FOR ASSISTANCE.

WARNING: Because of the possible danger to person(s) or property from accidents which may result from the improper use of products, it is important that correct procedures be followed. Products must be used in accordance with the engineering information specified in the catalog. Proper installation, maintenance and operation procedures must be observed. The instructions in the instruction manuals must be followed. Inspections should be made as necessary to assure safe operation under prevailing conditions. Proper guards and other suitable safety devices or procedures as may be desirable or as may be specified in safety codes should be provided, and are neither provided by Baldor Electric Company nor are the responsibility of Baldor Electric Company. This unit and its associated equipment must be installed, adjusted and maintained by qualified personnel who are familiar with the construction and operation of all equipment in the system and the potential hazards involved. When risk to persons or property may be involved, a holding device must be an integral part of the driven equipment beyond the speed reducer output shaft.

The DODGE QUANTIS ILH is warranted under the DODGE "Standard Terms and Conditions of Sale". Warranty claims must be submitted to DODGE within one year from the date of installation or within three years from the date of manufacture, whichever comes first. The warranty does not extend to failures induced by misuse, improper storage or handling, abuse, or misapplication.

LUBRICATION:

The DODGE QUANTIS ILH Gear Reducer is factory filled with ISO 220 EP type mineral oil to the correct oil level for the specified mounting position. **Changes in the mounting position will require relocation of the oil level and vent plugs.** Oil may have to be added or drained to get to the correct oil level in the new mounting position. See the Mounting Position Diagrams on Pages 2 and 3 for the correct plug locations for various mounting positions of the QUANTIS ILH unit. The oil level should be checked before startup and frequently thereafter, preferably with the unit at operating temperature.

The DODGE QUANTIS ILH gearbox is factory filled with lubricant. The factory fill lubricant is suitable for use at all output speeds and in ambient temperatures from +10°F to +105°F (-12°C to +41°C). No initial oil change after break in is needed. The initial factory oil fill is good for up to 10000 hours or 3 years of service, whichever comes first, in normal industrial environments.

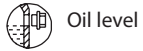
Normal operating conditions are defined as steady loads not exceeding normal ratings and running conditions as defined in the DODGE QUANTIS ILH catalog. Oil quantity and levels should be checked at frequent intervals, depending on usage. Oil changes are required after 10000 operating hours, or three years whichever comes first. The period can be extended to 20000 operating hours, or six years, if a synthetic lubricant is used. The lubricant should be changed more frequently if the unit is operating in a hostile environment. For extremely hot, wet, or dirty conditions consult Application Engineering at 864-284-5700. In those mountings that require grease lubrication for specific bearings, relubricate the affected bearings every year, or every 2000 operating hours whichever comes first. Use a grease with a lithium complex thickener and ISO 220 viscosity mineral oil base lubricant. Use 15 pumps of grease for the first re-greasing and 5 pumps of grease for subsequent re-greasing.

DODGE QUANTIS ILH Reducers are shipped with filling, oil level and drain plugs in place. A separate breather is included with the unit. Before putting the unit into service the filling plug must be replaced with the breather. HB38 and HF38 (1, 2 and 3 stage gear units) have one oil plug, ventilation is not necessary.

Approximate oil volumes for each QUANTIS ILH unit are listed on page 3 in pints and liters. The oil volumes are approximate and should not be used to determine correct oil level. The correct oil level is defined as the bottom of the appropriate oil level hole.



These mounting arrangements are for all output configurations and output shaft types. When ordering, please specify mounting position for correct oil quantity. In cases of mounting position other than shown here with regard to the oil quantity, please reference the Incline Mounting page in the QUANTIS catalog and contact Application Engineering.



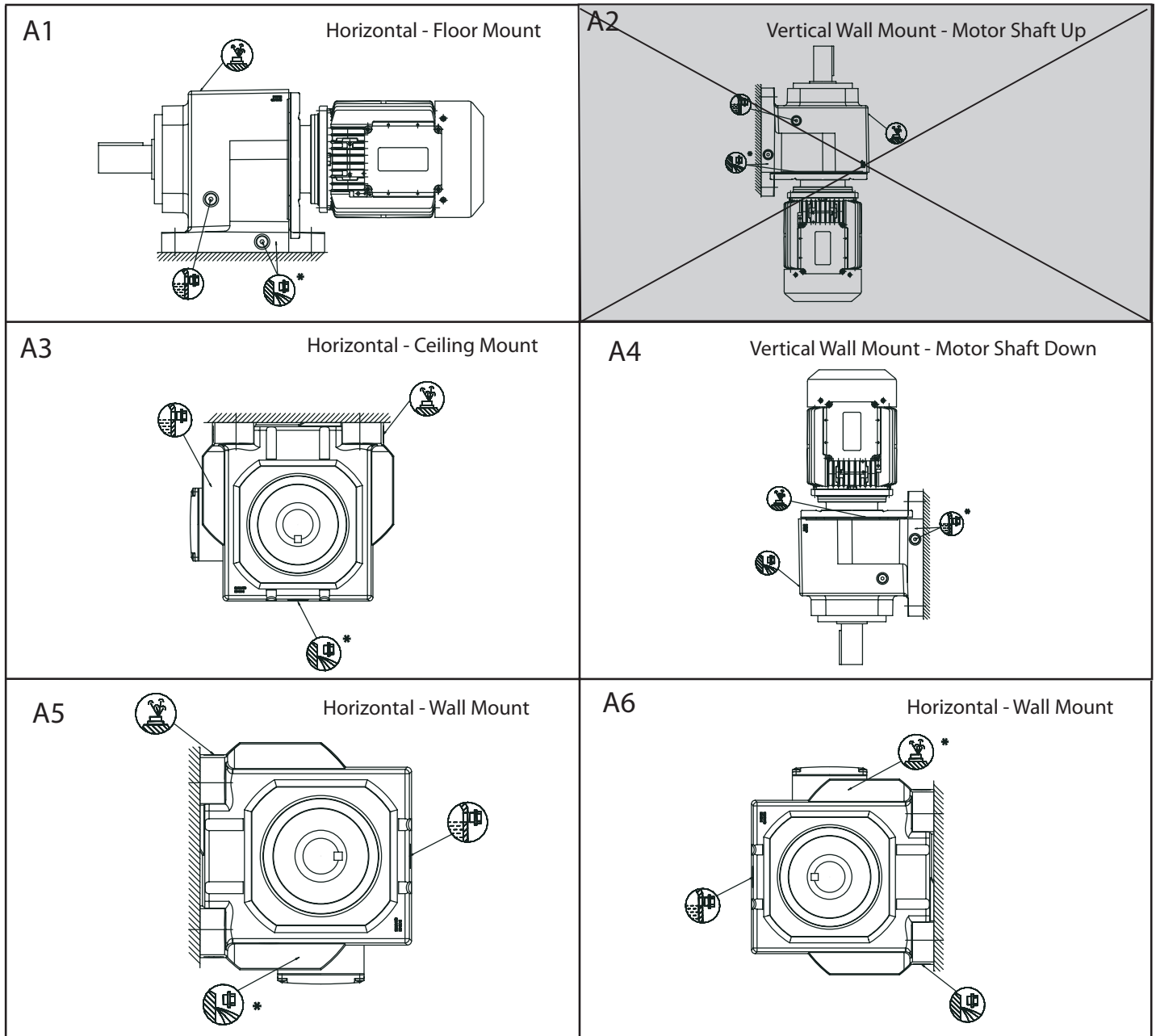
Oil level



Ventilation



Oil drain






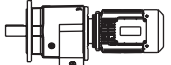

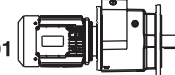
* On opposite side







HB38 and HF38 units are sealed and furnished with only one plug for the purpose of filling and draining.

Shaded mounting position not recommended. Use of product in positions not recommended negates the time-in-use warranty.

Figure 1 - Mounting Positions

OLD VS. NEW MOUNTING POSITIONS

	A1	A2	A3
ILH (HB)	B3 	V6 	B8 
ILH (HF)	B5 	V3 	B8-01 

	A4	A5	A6
ILH (HB)	V5 	B6 	B7 
ILH (HF)	V1 		

Shaded A2 mounting is not a recommended mounting position due to the weight of oil on the high speed input seal.

Figure 2 - Old vs. New Mounting Position Nomenclature

Table 1 - Approximate Lubricant Amount

Type	Red. Stage	Mounting Position											
		A1		A2		A3		A4		A5		A6	
		Pints	Liters	Pints	Liters	Pints	Liters	Pints	Liters	Pints	Liters	Pints	Liters
H_38	1	0.3	0.2	1.2	0.6	0.8	0.4	1.0	0.5	0.5	0.3	0.5	0.3
	2	1.1	0.5	2.5	1.2	1.3	0.6	1.5	0.7	1.3	0.6	1.3	0.6
	3	1.1	0.5	2.3	1.1	1.3	0.6	1.9	0.9	1.3	0.6	1.9	0.9
H_48	1	0.5	0.3	2.2	1.1	1.5	0.7	1.5	0.7	1.2	0.6	1.0	0.5
	2	2.3	1.1	5.1	2.4	3.2	1.5	3.8	1.8	3.4	1.6	2.7	1.3
	3	2.3	1.1	5.1	2.4	3.2	1.5	4.9	2.3	3.2	1.5	3.0	1.4
H_68	1	1.1	0.5	3.9	1.9	3.1	1.5	3.7	1.8	2.1	1.0	2.2	1.1
	2	3.8	1.8	8.7	4.1	5.3	2.5	6.8	3.2	5.7	2.7	4.9	2.3
	3	3.6	1.7	8.5	4.0	5.5	2.6	8.5	4.0	5.5	2.6	5.1	2.4
H_88	1	1.6	0.8	8.0	3.8	5.3	2.5	4.9	2.3	3.3	1.6	3.4	1.6
	2	8.7	4.1	18.6	8.8	12.0	5.7	15.9	7.5	12.9	6.1	11.2	5.3
	3	8.5	4.0	18.8	8.9	12.5	5.9	19.7	9.3	12.5	5.9	11.4	5.4
H_108	2	14.2	6.7	29.6	14.0	18.2	8.6	27.9	13.2	22.2	10.5	19.7	9.3
	3	13.7	6.5	30.0	14.2	19.0	9.0	33.0	15.6	21.8	10.3	20.1	9.5
H_128	2	19.0	9.0	44.2	20.9	27.9	13.2	42.1	19.9	33.8	16.0	29.8	14.1
	3	18.4	8.7	45.8	21.5	29.8	14.1	51.6	24.4	33.4	15.8	31.3	14.8
H_148	2	25.8	12.2	58.5	27.7	50.5	23.9	54.3	25.7	44.0	20.8	38.7	18.3
	3	24.7	11.7	59.6	28.2	49.5	23.4	68.1	32.2	43.1	20.4	40.4	19.1
H_168	2	39.7	18.8	88.1	41.7	67.8	32.1	96.6	45.7	73.5	34.8	63.6	30.1
	3	38.3	18.1	92.4	43.7	71.4	33.8	115.0	54.4	72.1	34.1	65.9	31.2

NOTE: Do not mix oils from different manufacturers. If a change to another type or brand of oil is made, the existing lubricant should be drained and the gearcase flushed with a small quantity of the new lubricant before refilling with the new lubricant. This is necessary to avoid possible incompatibility problems between the two lubricants. The list below gives approved alternative lubricants. This is not an exclusive list. Equivalent lubricants from other manufacturers may be used.

All reducers are factory filled according to the mounting position indicated on the order. **If the mounting position is changed from the ordered mounting the position, the oil level must be changed.** The oil volumes shown in the mounting position charts are approximate. The correct oil level is determined by the oil level hole in the housing except for size 38 reducers. If the reducer is ordered with the standard mineral oil and the oil is later changed to synthetic oil, it is recommended the shaft seals be changed to Viton (FKM) material.

ILH is furnished with oil level, drain, and fill plugs except for the size 38, which only has a fill plug. Before starting operation, the breather must be located in the correct location.

Continued operation in cold ambient conditions requires special modifications. Contact DODGE Gearing Application Engineering, Greenville, SC for application assistance (864-284-5700).

The density of the standard factory fill oil is 0.93 lbs/pint (1.98 lbs/liter).

The list below shows lubricants that are available as factory fill in QUANTIS reducers. The standard factory fill lubricant is Mobilgear 600 XP 220, which is a high performance mineral oil lubricant with special additives for use in industrial gear products.

Table 2 - Lubricant Selection Table

Ambient Temperature*	Oil Type	ISO Viscosity Grade	Available Oils	Available Food Grade Oils (NSF H1)
10°F to 105°F (-12°C to 41°C)	Mineral Oil	220	Mobilgear 600 XP 220 (standard factory fill **)	-
-20°F to 50°F (-29°C to 13°C)	Synthetic Oil	68	Mobil SHC 626	-
-10°F to 115°F (-23°C to 46°C)	Synthetic Oil	220	Mobil SHC 630	-
30°F to 140°F (-0° C to 60° C)	Synthetic Oil	460	Mobil SHC 634	-
<hr/>				
25°F to 75°F (-4°C to 29°C)	Mineral Oil	220	-	Chevron FM 220
45°F to 105°F (7°C to 41°C)	Mineral Oil	460	-	Chevron FM 460

* Ambient temperatures listed are for lubricant only and do not indicate a particular gear unit's suitability to run in that ambient.

** Previous factory fill oil was Mobilgear 630 - Mobilgear 600 XP 220 and Mobilgear 630 are compatible with each other and do not require a flush.

Recommendations will be made based on specific application details.

LONG TERM STORAGE:

NOTE: Unless an extended warranty has been negotiated prior to sale, time in storage is considered time in service for warranty purposes.

If the drive is not installed immediately, it should be stored in a clean, dry, protected area. During periods of long term storage (six months or longer) special procedures must be followed. The unit should be filled to the highest oil level hole with an approved lubricant blended with 2%, by volume, of "Daubert Chemical Co. Nox-Rust VCI-105" oil. Apply a thick coating of rust preventative on all unpainted surfaces including threads, bores, keyways, and shafts. Apply a thick coating of chassis-type grease to all exposed shaft seals. If the unit is to be stored outdoors or in a damp, unheated area indoors, cover the entire exterior with a rust preventative. Seal the unit in a moisture proof container or wrapping with a desiccant inside. Shade the enclosure from direct sunlight. Rotate the input shaft at least 60 revolutions once a month to redistribute the lubricant and prevent brinnelling of bearings and drying of seals.

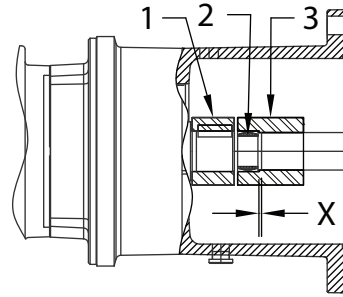
Upon removal from storage, remove all protective coatings applied for protection during storage. Check all hardware for proper tightness. Drain and refill the gear reducer with a recommended lubricant. If the gear reducer has been stored for more than three years or in an area with high ambient temperatures, replace the oil seals.

INSTALLATION AND OPERATION:

DODGE QUANTIS ILH Reducers are shipped with filling, oil level and drain plugs in place. A separate breather is included with the unit. Before putting the unit into service the filling plug must be replaced with the breather. Install the oil level plug and breather plug in the correct location for the appropriate mounting position using the mounting position diagrams shown on pages 2 and 3. Add or drain oil to get to the correct oil level for the mounting position used.

Review the dataplates on the reducer and drive motor to verify that the drive is correct for the intended loads, speeds and power supply. The gear reducer should be installed in a location that meets the following requirements:

- Ambient temperatures below 105°F (41°C).
- Free flow of air around the motor.
- Good access to gear reducer and motor for maintenance.
- A flat, level, rigid steel mounting surface.
- All four feet of the foot-mounted unit must be evenly supported.
- The flange mounted unit must have even support at the flange face.
- Units supported by both flange and feet must be shimmed to avoid housing stress.
- Good alignment to both input and output devices.



- 1 Reducer Coupling Hub
 2 Coupling Element
 3 Motor Coupling Hub
 X = Distance from motor shaft end to end face of coupling half (the length of the coupling jaws is not included in dimension X).

Figure 3 - Three-Piece Coupling Assembly

INSTALLATION OF COMPONENTS ON GEAR REDUCER SHAFTS:

Use care when installing couplings, sprockets and sheaves (pulleys) on the DODGE QUANTIS ILH input and output shafts. Such components should not be hammered into place. Damage to shafts and bearings may result. If parts do not slip into place easily, check for dirt or burrs that may be binding the assembly. Very tightly fitted parts may need to be heated to get them onto the shafts. Keys should be located for maximum engagement between the shaft and the associated part. Sprockets and sheaves should be mounted as close to the gearcase as possible to minimize overhung loads. Retaining hardware (setscrews, etc.) for couplings, sprockets and sheaves should be tightened as recommended by the component manufacturer. Chain and belt drives must be aligned to run true. Tighten chains and belts according to the chain or belt manufacturer's instructions. Excessive tension results in rapid chain and belt wear and reduces the bearing life of the DODGE QUANTIS ILH unit.

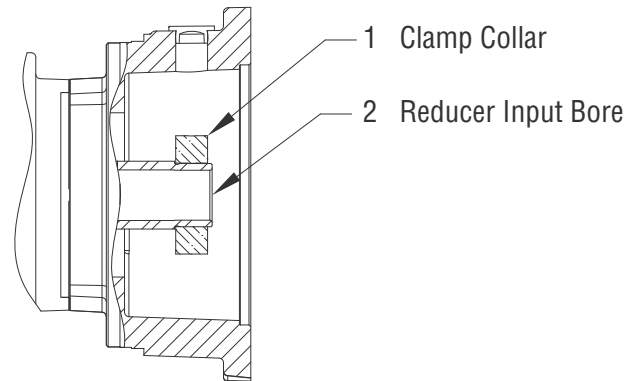


Figure 4 - Clamp Collar Assembly



Figure 5 - Clamp Collar Motor Key Fit

Table 3 - MOUNTING MOTORS TO C-FACE REDUCERS

FOR 3-PIECE COUPLED INPUT REDUCERS (Reference Figure 3)	FOR CLAMP COLLAR INPUT REDUCERS (Reference Figure 4)
Prepare the motor by checking the motor shaft extension for dirt or damage. Remove any anti-rust coating that may be on the shaft. Apply a thin even coating of anti-seize compound to the entire motor shaft.	Prepare the motor by checking the motor shaft extension for dirt or damage. Use solvent to remove all traces of anti-rust coating that may be on the shaft.
Insert the coupling key into the motor shaft keyway. Slip the motor coupling half onto the motor shaft and locate it a distance “x” from the motor shaft end. Refer to Figure 3 for definition of distance “x”. Refer to the table on page 7 for values of “X” for each motor.	Check the input bore for dirt or damage. Clean the bore with solvent to remove all traces of oil or anti-rust coating.
Tighten the motor coupling half setscrew to the correct torque value listed below.	<p>For NEMA motors ONLY: A special long, tall motor key is provided with the QUANTIS unit.</p> <ol style="list-style-type: none"> 1. Discard the motor key and replace it with the special key provided. DO NOT USE THE MOTOR KEY. 2. If the special key does not fit snugly in the motor shaft keyway, prepare the key for assembly by nicking its bottom in a couple of spots. A chisel may be used to accomplish this. This must be done on a work surface away from the QUANTIS unit and the motor. This nicking should widen the key bottom and cause it to fit snugly in the motor keyway. Refer to Figure 5 for definition of key bottom. 3. Install the key in the motor shaft keyway by lightly tapping it in place with a rubber mallet. 4. Locate the key so that it sits flat in the motor shaft keyway. The key will probably extend beyond the end of the motor shaft. This is OK. The key MUST NOT sit tilted in the keyway. A tilted key can occur when a motor shaft has a sled runner keyway, Refer to Figure 5. 5. Mark the clamp collar with a fine tipped marker on both sides of the setscrew to indicate where the center of the set screw is located. Run a line down both sides of the clamp collar that line up with the line previously created. 6. Remove the socket head screw and set screw from the clamp collar and apply Loctite 243 thread locker. Reinstall the screws into the clamp collar. Install the clamp collar onto the reducer input shaft and line up the mark previously made on the clamp collar with the center of the keyway in the shaft. If the clamp collar rotates freely, tighten the clamping screw slightly to keep it from rotating during assembly. Make sure the marked line is pointing to the center of the keyway.
Check that the reducer coupling half, with its key in place, is mounted on the reducer input shaft inside the C-face adapter. Make sure this coupling half is mounted on the reducer shaft such that the shaft extends the complete length of the coupling bore. Insert the coupling spider properly into the coupling jaws.	
The DODGE QUANTIS ILH C-Face reducer should be firmly anchored to prevent sliding as the motor is mounted. The motor should be rotated on its axis so the motor flange holes line up with the C-Face adapter holes. Check to be sure the motor conduit box, grease fittings and condensations drains (where fitted) will be oriented as needed by the reducer mounting position.	The DODGE QUANTIS ILH C-Face reducer should be firmly anchored to prevent sliding as the motor is mounted. The motor should be rotated on its axis so the motor flange holes line up with the C-Face adapter holes. Check to be sure the motor conduit box, grease fittings and condensate drains (where fitted) will be oriented as needed by the reducer mounting position.
Hoist motor level and in line with reducer input shaft.	Hoist motor level and in line with reducer input shaft.
Align the motor coupling half such that its jaws are aligned with the gaps between the spider and the reducer coupling half jaws. Push the motor into place. Motor flange to C-face adapter clearances are tight and good alignment is essential.	Align the motor shaft with the gear reducer input bore making sure that the motor shaft keyway is in line with the input bore key. Push the motor into place. Motor shaft to input bore clearances are tight and good alignment is essential.
Insert and tighten the motor retaining bolts Tighten to the correct torque value listed below.	Insert and tighten the motor retaining bolts. Tighten to the correct torque value listed below.

FOR 3-PIECE COUPLED INPUT REDUCERS (Reference Figure 3)			FOR CLAMP COLLAR INPUT REDUCERS (Reference Figure 4)		
NEMA Motor Frame	Motor Bolt	Bolt Tightening Torque	NEMA Motor Frame	Motor Bolt	Bolt Tightening Torque
56-140	3/8—16	276 lb-in (31 Nm)	56-140	3/8—16	276 lb-in (31 Nm)
180	1/2—13	660 lb-in (75 Nm)	180	1/2—13	660 lb-in (75 Nm)
210	1/2—13	660 lb-in (75 Nm)	210	1/2—13	660 lb-in (75 Nm)
250	1/2—13	660 lb-in (75 Nm)	250	1/2—13	660 lb-in (75 Nm)
280	1/2—13	660 lb-in (75 Nm)	280	1/2—13	660 lb-in (75 Nm)
320	5/8—11	1320 lb-in (150 Nm)	320	5/8—11	1320 lb-in (150 Nm)
360	5/8—11	1320 lb-in (150 Nm)	360	5/8—11	1320 lb-in (150 Nm)
IEC Motor Frame	Motor Bolt	Bolt Tightening Torque	IEC Motor Frame	Motor Bolt	Bolt Tightening Torque
71	M8	220 lb-in (25 Nm)	71	M8	220 lb-in (25 Nm)
80	M10	440 lb-in (50 Nm)	80	M10	440 lb-in (50 Nm)
90	M10	440 lb-in (50 Nm)	90	M10	440 lb-in (50 Nm)
100	M12	800 lb-in (90 Nm)	100	M12	800 lb-in (90 Nm)
112	M12	800 lb-in (90 Nm)	112	M12	800 lb-in (90 Nm)
132	M12	800 lb-in (90 Nm)	132	M12	800 lb-in (90 Nm)
160	M16	1860 lb-in (210 Nm)	160	M16	1860 lb-in (210 Nm)
180	M16	1860 lb-in (210 Nm)	180	M16	1860 lb-in (210 Nm)
200	M16	1860 lb-in (210 Nm)	200	M16	1860 lb-in (210 Nm)
225	M16	1860 lb-in (210 Nm)			
250	M16	1860 lb-in (210 Nm)			

FOR 3-PIECE COUPLED INPUT REDUCERS (Reference Figure 3)	FOR CLAMP COLLAR INPUT REDUCERS (Reference Figure 4)
View the coupling assembly through the access hole in the C-face adapter. 1. Make sure the couplings jaws fully engage the spider. If they do not, loosen the setscrew in the reducer coupling half and slide it forward until full jaw engagement is achieved. However, make sure the jaws on one coupling half do not contact the hub of the other coupling half. 2. Reaching through the access hole in the C-face adapter with a hex key, tighten the coupling setscrew on the reducer coupling half to the recommended torque given below.	View the clamp collar through the access holes in the C-face adapter. 1. Rotate the clamp collar to locate the setscrew over the key, if necessary. 2. Tighten the setscrew to the torque referenced below. 3. Reach through the access hole in the C-face adapter with a hex socket and tighten the clamp collar clamping bolt to the torque value given below.
Replace the access hole plugs in the C-face adapter.	Replace the access hole plugs in the C-face adapter.
NOTE: A TEE handle hex key wrench is not stiff enough to properly tighten the coupling setscrews. A large diameter socket wrench extension with a short hex key insert must be used in conjunction with a torque wrench. Failure to tighten the setcrews to the proper torque may result in movement between shafts and coupling components and cause premature wear on the shafts, coupling and keys.	NOTE: A TEE handle hex key wrench is not stiff enough to properly tighten the clamp collar bolt. A socket wrench extension with a hex insert must be used in conjunction with a torque wrench. Failure to tighten the clamp collar to the proper torque may result in movement between motor and reducer shafts and cause premature wear on the shafts and keys.

FOR 3-PIECE COUPLED INPUT REDUCERS Reference Figure 3					FOR CLAMP COLLAR INPUT REDUCERS Reference Figure 4				
NEMA Motor Frame	Coupling Size	Setscrew Size	Setscrew Tightening Torque	Motor Coupling Half Position Dimension "X"	NEMA Motor Frame	Clamp Bolt	Clamp Bolt Tightening Torque	Setscrew Size	Set Screw Tightening Torque
56	19	M5	18 lb-in (2 Nm)	0	56	M6	132 lb-in (15 Nm)	M4	27 lb-in (3 Nm)
140	19/24	M5	18 lb-in (2 Nm)	0	140	M6	132 lb-in (15 Nm)	M4	27 lb-in (3 Nm)
180	24/28	M5	18 lb-in (2 Nm)	0	180	M8	312 lb-in (35 Nm)	M6	90 lb-in (10 Nm)
210	28/38	M6	42 lb-in (4.8 Nm)	0	210	M10	600 lb-in (68 Nm)	M8	220 lb-in (25 Nm)
250	38/45	M8	90 lb-in (10 Nm)	0	250	M8	312 lb-in (35 Nm)	M6	90 lb-in (10 Nm)
280	42/55	M8	90 lb-in (10 Nm)	0	280	M8	312 lb-in (35 Nm)	M6	90 lb-in (10 Nm)
320	48/60	M8	90 lb-in (10 Nm)	0	320	M10	600 lb-in (68 Nm)	M8	220 lb-in (25 Nm)
360	55/70	M10	150 lb-in (17 Nm)	0	360	M10	600 lb-in (68 Nm)	M8	220 lb-in (25 Nm)

IEC Motor Frame	Coupling Size	Setscrew Size	Setscrew Tightening Torque	Motor Coupling Half Position Dimension "X"	IEC Motor Frame	Clamp Bolt	Clamp Bolt Tightening Torque	Setscrew Size	Set Screw Tightening Torque
71	19	M5	18 lb-in (2 Nm)	0	71	M6	132 lb-in (15 Nm)	M4	27 lb-in (3 Nm)
80	19/24	M5	18 lb-in (2 Nm)	0	80	M6	132 lb-in (15 Nm)	M4	27 lb-in (3 Nm)
90	19/24	M5	18 lb-in (2 Nm)	0	90	M8	312 lb-in (35 Nm)	M6	90 lb-in (10 Nm)
100	24/28	M5	18 lb-in (2 Nm)	0	100	M8	312 lb-in (35 Nm)	M6	90 lb-in (10 Nm)
112	24/28	M5	18 lb-in (2 Nm)	0	112	M8	312 lb-in (35 Nm)	M6	90 lb-in (10 Nm)
132	28/38	M6	42 lb-in (4.8 Nm)	0	132	M10	600 lb-in (68 Nm)	M8	220 lb-in (25 Nm)
160	38/45	M8	90 lb-in (10 Nm)	0	160	M8	312 lb-in (35 Nm)	M6	90 lb-in (10 Nm)
180	42/55	M8	90 lb-in (10 Nm)	0	180	M8	312 lb-in (35 Nm)	M6	90 lb-in (10 Nm)
200	42/55	M8	90 lb-in (10 Nm)	0	200	M10	600 lb-in (68 Nm)	M8	220 lb-in (25 Nm)
225	48/60	M8	90 lb-in (10 Nm)	0.040 in (6.0 mm)					
250	55/70	M10	150 lb-in (17 Nm)	0					

WARNING: The DODGE QUANTIS ILH and its connected equipment and accessories must be guarded. Rotating parts such as couplings, pulleys, fans and unused shaft extensions must be permanently guarded by the user against accidental contact with personnel and their clothing. The surface temperature of the DODGE QUANTIS ILH enclosure may reach temperatures which can cause discomfort or injury to personnel accidentally coming into contact with hot surfaces. The user should provide guards to prevent accidental contact with hot surfaces. Guards must be sufficiently rigid to maintain adequate guarding in normal service.

WARNING: Threaded hardware used to mount the DODGE QUANTIS ILH Unit must be SAE Grade 5 or Metric Class 8.8 or better. DO NOT USE HARDWARE OF A LOWER GRADE.

MAINTENANCE

Check oil levels and oil quality regularly. Change oil at the intervals specified in the Lubricants section of this document. Check alignments of drive components regularly. Check chain and belt tensions and hardware tightness periodically too.

Bolts to be used on Mounting Feet and B5 Output Flanges

In addition to the bolts below, it is recommended that a lockwasher or other anti-loosening device be used.

Table 4 - Bolts to be used on Mounting Feet

Unit Size	Red. Stage	Grade 5 Inch	Grade 8.8 Metric
38	1	3/8-16 UNC	M10 x 1.5
	2, 3	5/16-18 UNC	M8 x 1.25
48	1	1/2-13 UNC	M12 x 1.75
	2, 3	1/2-13 UNC	M12 x 1.75
68	1	5/8-11 UNC	M16 x 2
	2, 3	5/8-11 UNC	M16 x 2
88	1	5/8-11 UNC	M16 x 2
	2, 3	5/8-11 UNC	M16 x 2
108	2, 3	3/4-10 UNC	M20 x 2.5
128	2, 3	7/8-9 UNC	M24 x 3
148	2, 3	1-1/4-7 UNC	M30 x 3.5
168	2, 3	1-1/2-6 UNC	M36 x 4

Table 5 - Bolts and Tightening Torque for B5 and NEMA Output Flanges (Output flange to gearcase)

Unit Size	Red. Stage	Grade 8.8 Metric	Tightening Torque (Nm)	Tightening Torque (ft-lb)
38	1	M8	25	18
	2, 3	M8	25	18
48	1	M8	25	18
	2, 3	M10	50	37
68	1	M10	50	37
	2, 3	M12	90	66
88	1	M12	90	66
	2, 3	M16	210	155
108	2, 3	M16	210	155
128	2, 3	M16	210	155
148	2, 3	M16	210	155
168	2, 3	M20	400	295

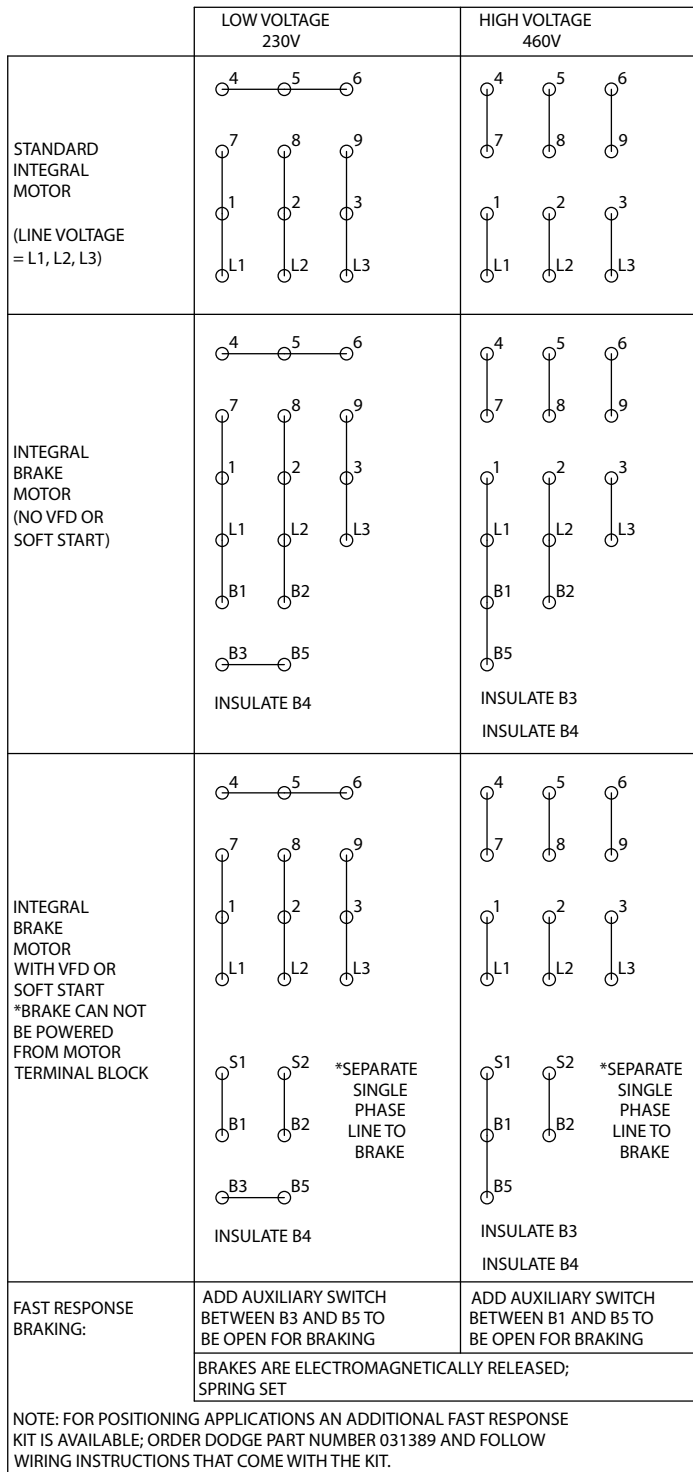


Figure 6 - Wiring Diagram for Dual Voltage/ Single Speed Integral Motor

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60 Series End-Mount Brake Instructions Standard Housing

Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.



DESCRIPTION

These magnetic disc brakes mount directly onto NEMA 56C, 143TC, and 145TC frame motors, on the end opposite the drive shaft. The brake is direct acting, electro-magnetically released, and spring set. It uses rotating friction and stationary disc contact to supply positive braking action. It retains quick release and setting capabilities at all times.

WARNING: Do not install or use these brakes in an explosive atmosphere.

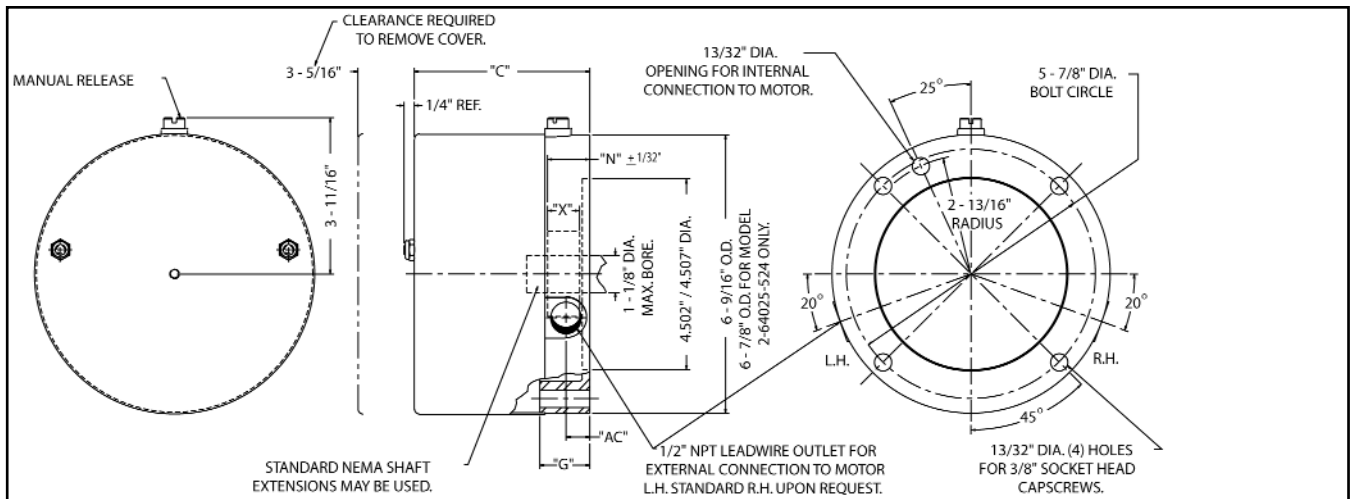


Figure 1

G060871-001

Model Number	Number of Rotating Discs	Torque Lb-ft	*Thermal Capacity HPS/MIN.	Inertia of Rotating Parts Lb. Ft. ²	Dimensions				
					X	G	AC	C	N ± 1/32
2-61001-524	1	1.5	6	.006	.875	1.19	.585	4.13	1.125
2-61003-524	1	3	6	.006	.875	1.19	.585	4.13	1.125
2-62006-524	2	6	6	.010	.875	1.19	.585	4.13	1.125
2-62010-524	2	10	6	.010	.875	1.19	.585	4.13	1.125
2-63015-524	3	15	6	.015	1.187	1.56	.873	4.50	1.437
2-63020-524	3	20	6	.015	1.187	1.56	.873	4.50	1.437
2-64025-524	4	25	6	.020	1.344	2.25	1.562	5.19	2.000

*Thermal capacity (HPS/MIN.) was determined under the following test conditions: a) Room temperature 72°F. b) Stopping time of one second or less. c) Brake mounted in a horizontal position. d) Equal on and off times. e) 1800 RPM f) Coil energized with 110% of rated voltage.

WARNING:

Brake performance and features must be carefully matched to the requirements of the application.

Consideration must be given to torque requirements, especially where an overhauling condition exists, as well as thermal capacity, ambient temperature, atmospheric explosion hazards, type of enclosure and any other unusual conditions.

Improper selection and installation of a brake and/or lack of maintenance may cause brake failure which could result in damage to property and/or injury to personnel.

If injury to personnel could be caused by brake failure, additional means must be provided to insure safety of personnel.

UNPACKING

When unpacking the brake, inspect it carefully for damage that may have occurred during transit.

GENERAL SAFETY INFORMATION

NOTE: These brakes are not intended for accurate positioning applications. They are designed for applications that require rapid stopping and holding power, such as on conveyors, door openers, etc.

1. For applications with high inertia-type loads or rapid cycling, the thermal capacity of the brake must be considered.
2. Observe all local electrical and safety codes, as well as the National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA).
3. Brake motors and brake gearmotors must be securely and adequately grounded. This can be accomplished by wiring with a grounded metal-clad raceway system, by using a separate ground wire connected to the bare metal of the motor frame, or other suitable means. Refer to NEC Article 250 (Grounding) for additional information. All wiring should be done by a qualified electrician.
4. Always disconnect power before working on or near a brake motor, a brake gearmotor, or its connected load. If the power disconnect point is out of sight, lock it in the open position and tag it to prevent unexpected application of power.
5. When working on the brake, be sure the load is completely removed, secured or blocked to prevent injury or property damage.
6. Provide guarding for all moving parts.
7. Be careful when touching the exterior of an operating motor, gearmotor or brake. It may be hot enough to cause injury or to be painful. This condition is normal for modern motors, which operate at higher temperatures when running at rated load and voltage.
8. Protect all electrical lead wires and power cables against contact with sharp objects or moving parts.
9. Do not kink electrical lead wires and power cables, and never allow them to touch oil, grease, hot surfaces, or chemicals.

INSTALLATION

CAUTION: To preserve pre-alignment of rotating discs for ease of installation, do not operate manual release or energize brake coil before installation.

NOTE: The brakes are designed for horizontal mounting. Modification is required for vertical mounting. Brakes that are modified will have a prefix on the model number of VO (Vertical Over) or VU (Vertical Under).

Numbers in parentheses refer to parts illustrated in Figs. 3, 5, 6 and 9.

Mounting Hub on Motor Shaft

1. Remove hub (1) from brake and position it on motor shaft with key as shown in Fig. 1. Stamped part number on hub should face away from motor. Tighten hub setscrews with 8 to 10 lb. ft. torque.

Placing Brake on Motor Shaft

1. Remove two cover locknuts (22) and cover (20). Position brake over hub on shaft, aligning hub splines with rotating disc splines.
2. Bolt brake to motor flange with four 3/8 - 16 socket head capscrews.
NOTE: Dimension "G" (Fig. 1) is the length of the mounting hole through brake bracket.
3. Place coil lead wires around mounting bracket (15C) to the same side as the desired wire outlet position. Connect lead wires per "Connection of Coil Leads" and Fig. 2.
4. Replace cover (20) and cover locknuts (22). Tighten just enough to hold the cover in place.

Wiring Diagrams

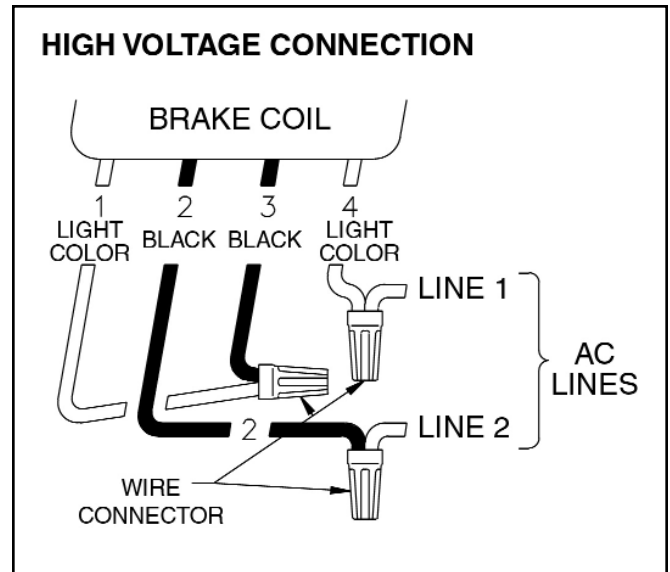
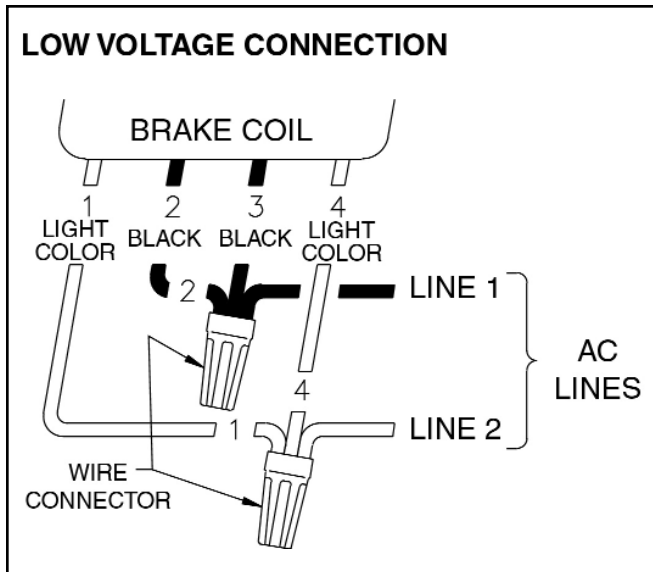


Figure 2

Connection of Coil Leads

After securing the brake to the motor, connect coil leads for proper voltage per wiring diagram (Fig. 2 shows dual voltage coil). Incorrect connection can result in brake failure.

CAUTION: The voltage supplied to the coil must match the voltage that the coils are connected for, or the coils will burn out.

Single voltage coil:

Connect brake coil leads to any two line leads (single or three phase) of same voltage and frequency as brake.

Dual voltage coil:

Connect leads 2 and 4 to any two motor line leads (single or three phase) of same voltage as brake. Connect leads 1 and 3 as shown for voltage desired. Brake must be energized with motor.

OPERATION

These brakes are spring set devices with an electrical (magnet) release. They contain a rotating friction disc which is driven by a hub mounted on the motor shaft. When energized, the magnet compresses the torque springs, removing the force pressing the stationary disc and friction disc together. This permits free rotation of the shaft.

WARNING: Observe proper safety precautions in applications where a brake failure would allow the load to move in such a manner as to injure personnel. KEEP PERSONNEL AWAY FROM LOAD AREAS.

If brake torque rating is higher than motor full-load torque rating, use brake rating rather than motor rating when selecting other drive components.

Take the following precautions when operating the brake:

1. Do not operate the brake at higher than normal static torque capacity.
2. For applications with high inertia-type loads or rapid cycling, the thermal capacity of the brake must be considered.
3. High start-stop rates may damage motor. Consult motor manufacturer if high cycling rates are expected.
4. Be sure power supply conforms to electrical rating of brake.

Manual Release

The brake is equipped with a manual release. Turn the release knob (3) clockwise to stop position to release the brake. The brake will remain released until the release knob is turned counterclockwise (approx. 65°) or until the brake coil is energized, automatically resetting the brake.

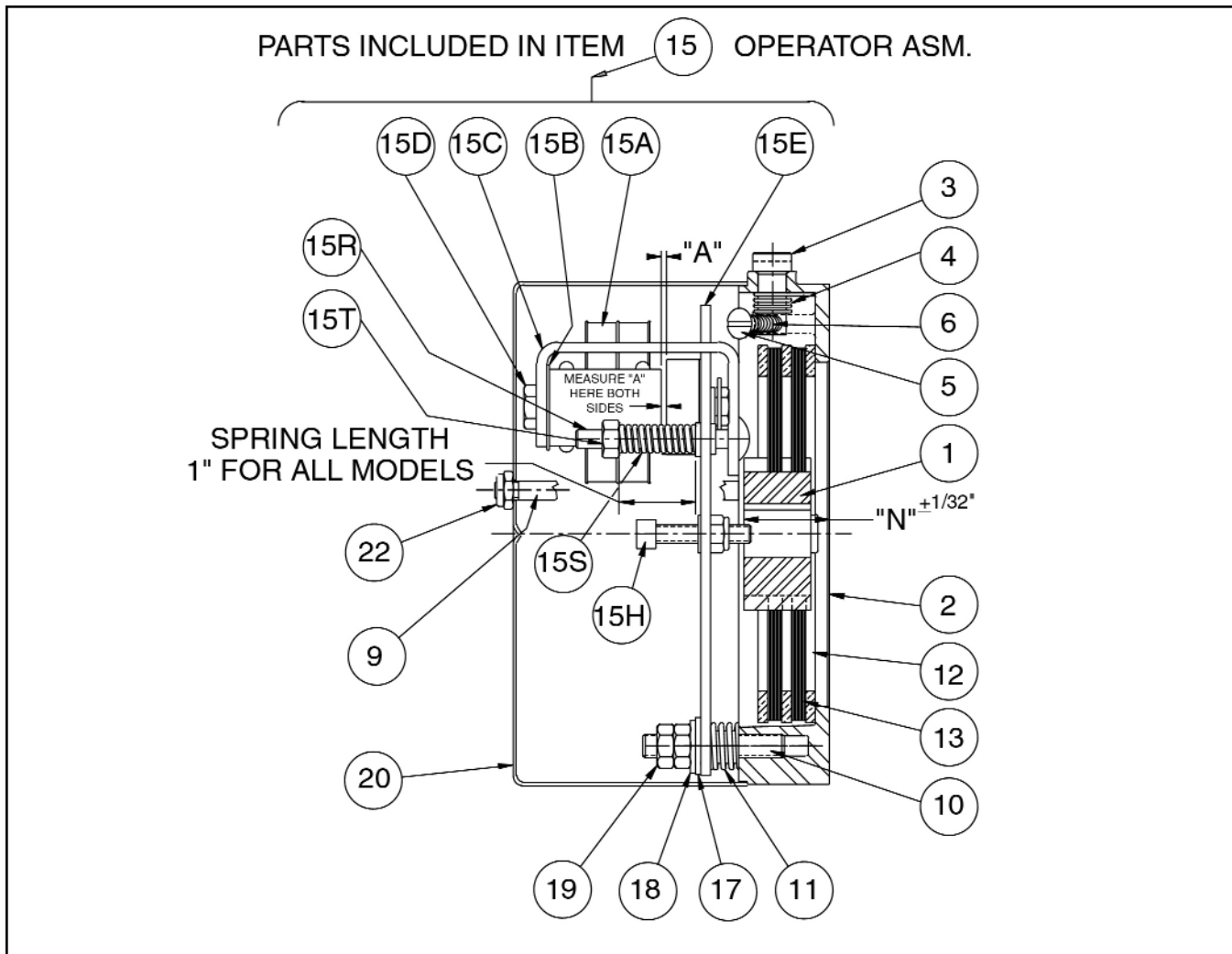


Figure 3

MAINTENANCE

CAUTION: Before attempting to service or remove any components, make certain that the power is disconnected and that the load is completely removed, secured or blocked to prevent injury or property damage.

Wear Adjustment

CAUTION: Load to be removed or blocked. Brake may be inoperative during this procedure.

Before air gap "A" reaches .100", adjustment is required. Any delay in adjusting the magnet air gap will result in eventual loss of torque. Refer to Fig. 3.

1. To adjust, remove cover locknuts (22) and cover (20) to expose square head wear adjusting screws (15H) and expose magnet air gap "A".

2. Measure air gap "A" using 3/8" to 1/2" wide feeler gauge. (Measure at center of magnet.)
3. Turn two square head adjusting screws (15H) until air gap "A" measures:
 - .045/.050 for 1 disc models
 - .050/.055 for 2 disc models
 - .060/.065 for 3 disc models
 - .060/.065 for 4 disc models
 Air gap should be the same on both sides.

Torque Adjustment

Caution: Load to be removed or blocked. Brake may be inoperative during this procedure.

The magnetic disc brake is factory set for rated static torque. The brake can be adjusted to reduce torque which increases stopping time. Do not attempt to adjust brake for higher torque, as this will cause premature coil burnout. (Refer to Fig. 3)

1. To adjust, remove cover locknuts (22) and cover (20) to expose torque locknuts (15T), which are above torque springs (15S).
2. To increase stopping time and reduce torque, turn two locknuts (15T) counterclockwise, increasing spring length. Each full turn reduces torque 7% to 10% depending upon the model.

Friction Disc Replacement

Caution: Load to be removed or blocked. Brake will be inoperative during this procedure.

If brake model number has a prefix VO or VU, see page 8.

When total wear on a rotating friction disc (13) reaches 1/16", replace disc:

1. **Removing operator assembly**

Disconnect power.

2. Remove cover locknuts (22) and cover (20).
3. Remove operator assembly (15) by removing screws (16), pivot stud (10), washer (18), bushing (17), and spring (11).

NOTE: Item (10) has a hex socket in end of stud for removal. Do not loosen nuts (19) on pivot stud (10), or "Pivot Stud Adjustment" (on page 6) to quiet the magnet will have to be made.

4. **Replacing the friction disc**

Remove worn rotating discs (13) and stationary discs (12). Replace worn discs and install new discs in the same order. Install stabilizer clip (14), if furnished, on rotating discs prior to installing.

5. **Re-assembly of operator assembly (15)**

Refer to Figs. 3 and 9. (Capscrew (16) is shown in Fig. 9 and not Fig. 3)

Turn two screws (15H) counterclockwise five turns. Place operator assembly onto brake bracket (2) and install two screws (16). Replace compression spring (11), bushing (17), washer (18), and pivot stud (10) which has the two nuts (19) in place. Tighten firmly.

6. Readjust magnet air gap "A" as described under "Wear Adjustment" on page 4.
7. Check manual release operation before completing installation. Adjust per "Manual Release Adjustment" on page 7 if required.

8. **Completing installation**

Replace cover (20) and cover locknuts (22). Tighten just enough to hold the cover in place. Reconnect power.

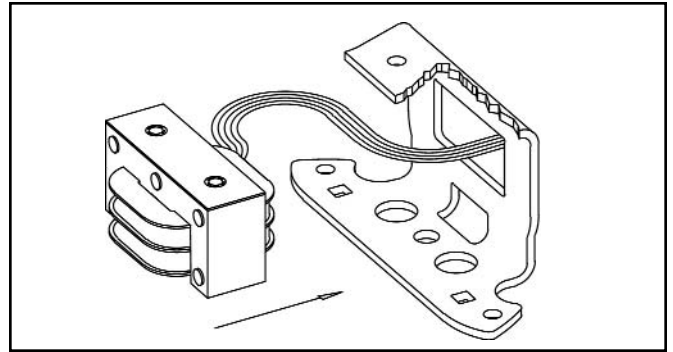


Figure 4

Magnet Assembly Replacement

Caution: Load to be removed or blocked. Brake will be inoperative during this procedure.

1. Disconnect power supply.
2. Remove cover locknuts (22) and cover (20).
3. Remove two capscrews (15D), magnet assembly (15A) and shock mount (15B).
4. Replace with new magnet assembly (15A), making sure shock mount (15B) is in place. Feed coil lead wires through hole in back of bracket (15C) as shown in Fig. 4. Tighten mounting screws (15D) with 55-60 lb. in. torque.
5. Place coil lead wires around mounting bracket (15C) to the same side as the wire outlet position. Connect coil lead wires per "Connection of Coil Leads" and Fig. 2.
6. Set air gap "A" as described under "Wear Adjustment" on page 4.
7. Energize coil. Magnet should be quiet; if not, refer to "Pivot Stud Adjustment" on page 6.
8. Check manual release. If it does not operate properly, adjust as outlined under "Manual Release Adjustment" on page 7.
9. Replace cover (20) and cover locknuts (22). Tighten just enough to hold the cover in place. Reconnect power.

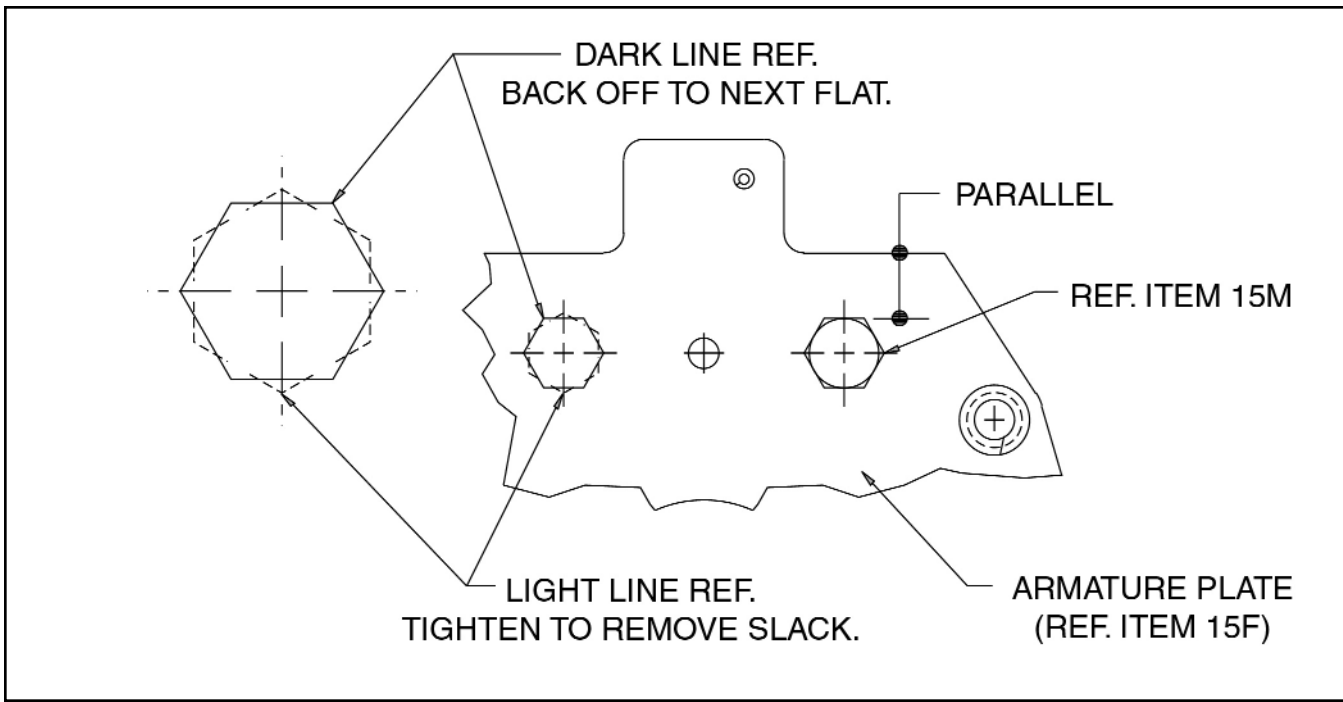


Figure 5

Armature Replacement

CAUTION: Load to be removed or blocked. Brake will be inoperative during this procedure.

If you replace the magnet assembly, it may be necessary to replace the armature (15J). If it is badly deformed, it will be difficult to make the magnet quiet.

1. To replace, remove operator assembly (15) from brake. See "Friction Disc Replacement Steps 1-3" on page 5.
Remove nuts (15T), springs (15S) and carriage bolts (15R). This will allow the armature plate assembly to be removed from magnet bracket.
2. Remove screw (15Q), lockwasher (15P), locking plate (15N), two screws (15M), spacers (15L), and armature (15J). Inspect these parts and shock mount (15K). If worn, replace them also.
3. Put armature in place (ground side up) and install spacers (15L) and screws (15M).

NOTE: See Fig. 5 Screws (15M) should be tightened to remove slack only. Then back off, counterclockwise on screw so that the next flat on screw is parallel with edge of the armature plate (15F).

Install locking plate (15N), screw (15Q), and lockwasher (15P). Tighten screw with 30 lb. in. torque.

4. Reassemble to magnet bracket (15C) using items (15R), (15S) and (15T). Reassemble operator assembly to brake bracket. Set magnet air gap "A" and set torque springs (15S) to 1" as shown in Fig. 3.

Pivot Stud Adjustment

CAUTION: Load to be removed or blocked. Brake will be inoperative during this procedure.

This adjustment is made at the factory and may be required when replacing the magnet assembly (15A) or the armature (15J).

The purpose is to regulate the height of the armature plate (15F) so that when the magnet (15A) is energized, the armature (15J) is parallel with it. This is required so that the magnet will be quiet.

NOTE: Cover (20) must be removed to make this adjustment.

1. To adjust: Hold nut (19) which is adjacent to washer (18) and loosen the other nut (19) and remove it from the stud.
2. Energize the magnet and turn remaining nut (19) counterclockwise slowly until the magnet becomes noisy. Turn magnet on and off several times until you find the position where the magnet first becomes quiet.
At this point, turn nut (19) 1/3 turn (two flats) in a clockwise position. Hold nut in this position and turn magnet on and off to make sure the magnet does not become noisy.
3. Holding this nut in place, screw on other nut and tighten it against the nut you are holding. Tighten firmly.
4. Operate the manual release. If the release does not operate properly, see "Manual Release Adjustment" on next page.

Manual Release Adjustment

CAUTION: Load to be removed or blocked. Brake will be inoperative during this procedure.

The manual release (3) may require adjustment after replacing the operator assembly (15), magnet (15A0, or armature (15J). It also may be required if adjustments are made on the pivot stud nuts (19).

The release is working properly if:

- a) you turn release knob (3) clockwise to stop and the brake is released;
- b) the release knob returns to its normal position automatically when power is applied to the magnet.

NOTE: Cover (20) must be removed to make this adjustment.

1. To adjust: Set air gap "A" as described under "Wear Adjustment" on page 4.
2. If the brake does not release, turn adjusting screw (5) counterclockwise 1/4 turn and try again.
3. If the release knob (3) does not return to its normal position automatically, turn screw (5) clockwise 1/4 turn and try again.

NOTE: You may have to repeat Steps 2 or 3 to get the release to operate properly.

It is important that the release knob returns to its normal position automatically when power is applied to the magnet.

Manual Release Assembly

Refer to Fig. 6

1. Place shaft of release knob (3) through hole in bracket (2).
2. Slide return spring (4) over shaft; straight leg of spring should enter shaft first with leg in the position shown.
3. Slip spring (6) over screw (5) and install in tapped hole in release shaft. Screw in until it stops.
Make sure spring (4) is not caught under spring (6).
4. Engage bent end of spring (4) over spring (6) as shown. Pull it over with a needle-nose pliers or screwdriver.
5. Adjust release. See "Manual Release Adjustment" on the left.

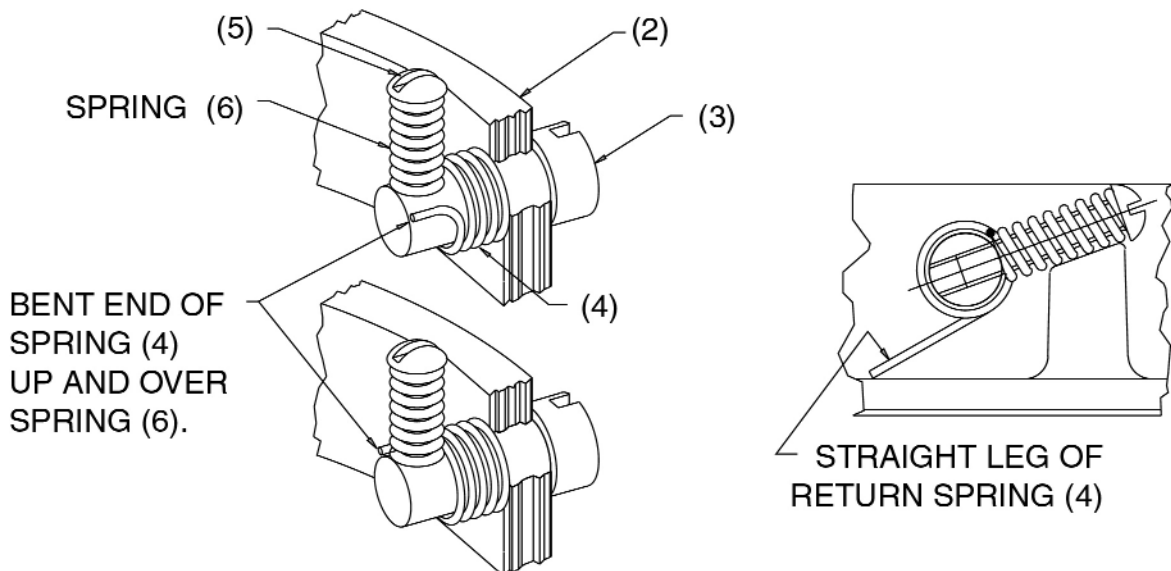


Figure 6

VERTICAL MOUNTING

Installation and adjustment of the vertically mounted brake is the same as on the standard model.

Friction Disc Replacement

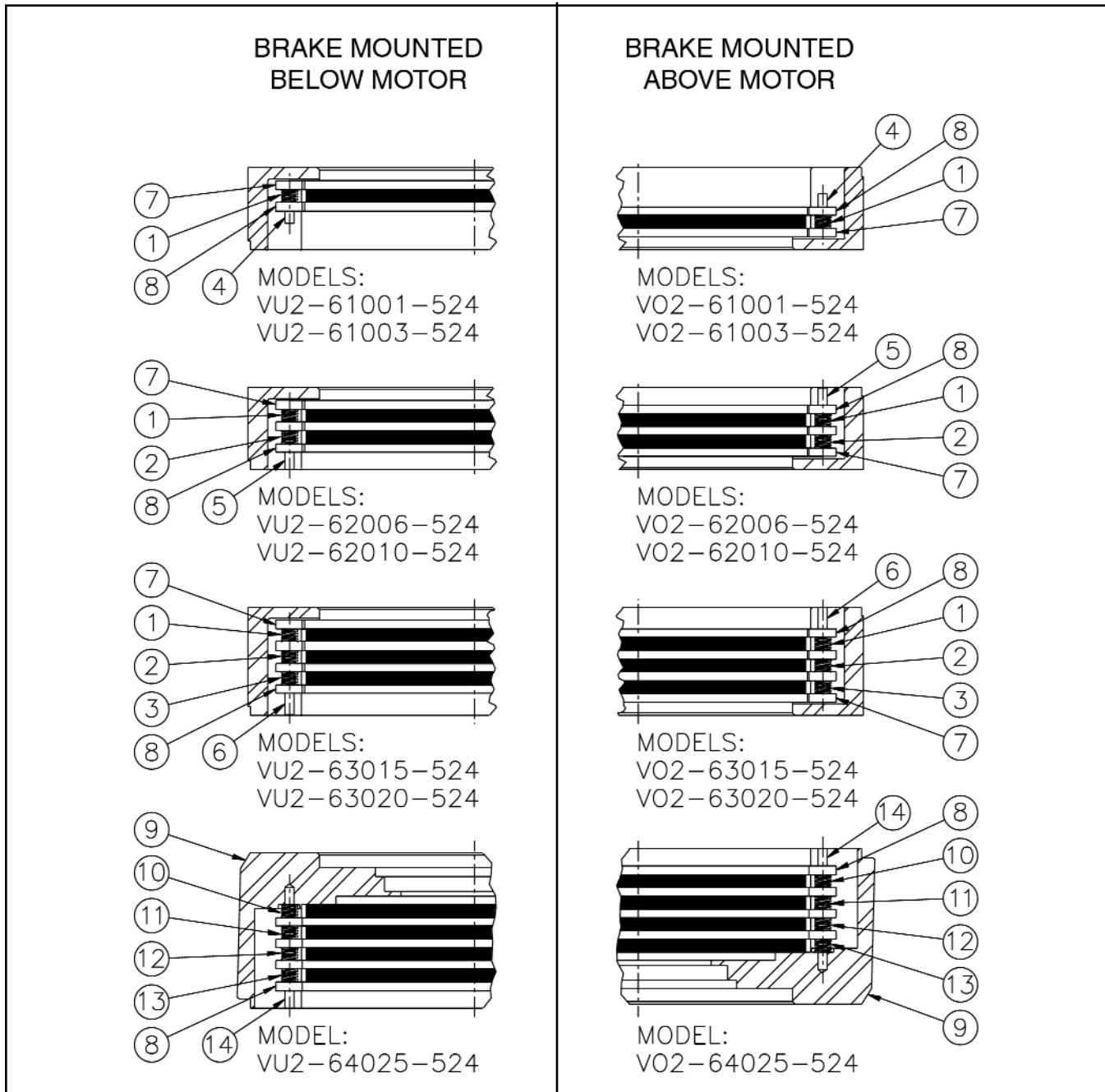
When replacing friction discs, follow procedure outlined on page 5 with this addition:

Care must be taken to insure proper insertion of disc separating springs. Springs are color coded for easy identification, and reference is made to spring color (see Figs. 7 and 8). Since the installation order of the disc springs is dependent on brake mounting position (above or below motor), it is important to consult the correct diagram for spring location.

Figure 8

Item No.	Description	Part No.	Qty. of Parts (determined by no. of rotating discs)			
			1	2	3	4
1	Spring (silver)	G060350-001	2	2	2	-
2	Spring (black)	G060350-002	-	2	2	-
3	Spring (bronze)	G060350-003	-	-	2	-
4	Roll pin-1/8" x 5/8"	W005003-071	2	-	-	-
5	Roll pin-1/8" x 1"	W005003-077	-	2	-	-
6	Roll pin-1/8" x 1 3/8"	W005003-080	-	-	2	-
7	Stationary disc	H060203-003	1	1	1	-
8	Stationary disc	H060203-004	1	2	3	4
9	Cast iron bracket (ref.)	-	-	-	-	1
10	Flotation spring (silver)	G060736-001	-	-	-	2
11	Flotation spring (black)	G060736-002	-	-	-	2
12	Flotation spring (bronze)	G060736-003	-	-	-	2
13	Flotation spring (red)	G060736-004	-	-	-	2
14	Roll pin-1/8" x 1 3/4"	W005003-083	-	-	-	2

Figure 7 Parts for Vertical Mounting



TROUBLESHOOTING CHART

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Brake does not release	<ol style="list-style-type: none"> 1. Broken or damaged parts 2. Wrong voltage 3. Burned out coil 4. Incorrect wiring connections or broken wires 	<ol style="list-style-type: none"> 1. Replace. 2. Check for correct voltage. Voltage must correspond to that listed on brake nameplate. If the voltage is more than 10% below the nameplate voltage, the magnet may not pull in. 3. Replace magnet assembly (15A). 4. Find the connection or wiring fault. Correct or repair as required.
Brake does not stop properly	<ol style="list-style-type: none"> 1. Broken or damaged parts 2. Worn friction disc 3. Hub positioned incorrectly 4. Brake is manually released 	<ol style="list-style-type: none"> 1. Replace. 2. Replace disc if worn to 1/8" thickness. If disc replacement is not required, adjust air gap. (Refer to "Wear Adjustment" section.) 3. Relocate hub (1) and key, if required. (Refer to "Installation" section.) 4. Determine if manual release is in normal position.
Brake chatters or hums	<ol style="list-style-type: none"> 1. Dirty magnet faces 2. Magnet faces are not parallel in closed position 3. Loose or broken shading coil 4. Wrong voltage supply 	<ol style="list-style-type: none"> 1. To remove dirt, insert a clean sheet of paper between faces and energize brake. Move paper around between faces to dislodge dirt, then remove paper. 2. See "Pivot Stud Adjustment" section. 3. Replace magnet assembly (15A). 4. Check for low voltage.
Manual release does not work	<ol style="list-style-type: none"> 1. Broken or damaged parts 2. Improper setting 	<ol style="list-style-type: none"> 1. Replace. 2. See "Manual Release Adjustment" section.

REPLACEMENT PARTS ILLUSTRATION

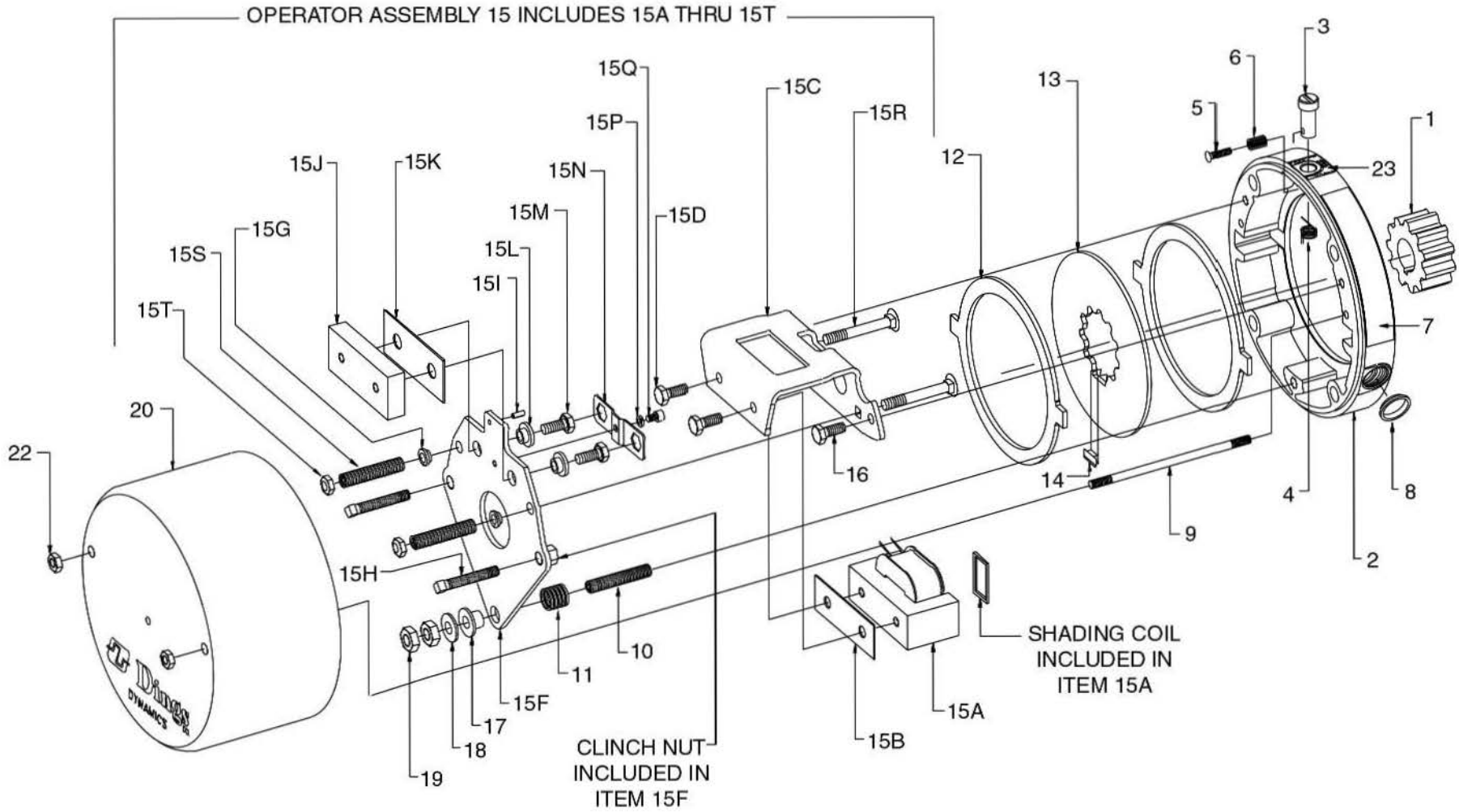


Figure 9

REPLACEMENT PARTS LIST

Item No.	Description	Part Number	Qty.
1	Splined hub	K060107-**	1
2	Bracket 1 & 2 disc models (aluminum)	L060258-001	1
2	Bracket 3 disc model (aluminum)	L060259-001	1
2	Bracket 4 disc model (cast iron)	L060285-001	1
3	Release knob	G060785-001	1
4	Release return spring	G060797-001	1
5	Release adjustment screw	W001002-056C	1
6	Release adjustment lock spring	G060795-001	1
7	Nameplate	K060407-001	1
8	Cap plug	W008003-001	1
9	Cover stud	G060822-001	2
10	Pivot stud	W002005-303A	1
11	Compression spring (all except 20 & 25 lb. ft.)	G060821-001	1
11	Compression spring (20 & 25 lb. ft.)	G060852-001	1
12	Stationary disc	H060147-001	*
13	Splined rotating friction disc	H060157-003	*
14	Stabilizer clip, rotating friction disc (when used)	H060466-001	*
15	Operator assembly: includes "A" through "T" (not shown as an assembly)	K060476-**	1
15A	Magnet assembly	**	1
15B	Magnet shock mount	G060813-001	1
15C	Magnet mounting bracket	H060544-001	1
15D	Hex hd. capscrew 1/4-20 x 1/2 lg.	W001008-001E	2
15E	Armature plate assembly: includes "F" through "Q" (not shown as an assembly)	H060541-**	1

Item No.	Description	Part Number	Qty.
15F	Armature plate	H060545-003	1
15G	Nyliner bushing	W013005-001	2
15H	Wear adjustment screw, sq. hd. 1/4-20 x 1-1/2" lg.	W002003-001	2
15I	Roll pin 5/32" dia. x 3/8" lg.	W005003-098	1
15J	Armature lamination assembly	G060788-001	1
15K	Armature shock mount	G060808-003	1
15L	Armature spacer	G060798-002	2
15M	Hex hd. capscrew 1/4-20 x 5/8" lg. Grade 5	W001007-002E	2
15N	Locking plate	G060812-001	1
15P	Split spring lockwasher #8	W004006-003	1
15Q	Soc. hd. capscrew #8-32 x 1/4" lg.	W001013-201	1
15R	Carriage bolt 1/4-20	G060803-001	2
15S	Torque spring (blue) 1.5 lb. ft.	G060791-001	2
15S	Torque spring (silver) 3 & 6 lb. ft.	G060792-001	2
15S	Torque spring (bronze) 10 & 15 lb. ft.	G060793-001	2
15S	Torque spring (green) 20 & 25 lb. ft.	G060794-001	2
15T	Locknut 1/4-20	W003013-001	2
16	Hex hd. capscrew 1/4-20 x 1/2 lg.	W001008-001E	2
17	Nylon bushing	G060820-001	1
18	Plain brass washer	W004003-024	1
19	Hex nut 5/16-18	W003002-002E	2
20	Cover	L060261-002	1
21	Instruction label (not shown)	K060496-001	1
22	Locknut 1/4-20	W003001-013	2
23	Release label	G060859-001	1

* Number of rotating discs is shown in the brake model number. Example - 2-62006-524 has two rotating discs. The number of stationary discs is one more than the number of rotating discs, with the exception of model 2-64025-524 which has the same number of stationary discs as rotating discs.

**Part number is determined by one or more of the following: model number, voltage, motor shaft diameter and keyway size.

SPECIFICATIONS

Torque: 1-1/2 through 25 lb. ft.

NEMA Motor Frame Sizes: 56C, 143TC and 145TC.

Enclosure: Aluminum, with steel cover (through 20 lb. ft.) Cast iron, with steel cover (25 lb. ft. only)

Voltage: All NEMA single phase voltages and frequencies are standard. Others optional.

Duty: Rated for continuous duty.

Mounting: Direct to NEMA C face. Horizontal or vertical position with slight modifications.

Maximum Ambient Temperature: 40°C

Maximum Input Speed: 3600 rpm

Certified CSA Enclosure 2

ORDERING INFORMATION

Replacement parts can be purchased from your local distributor or from Dings Co. at the address and phone number shown below. Call the Dings Co. for the location of the nearest stocking distributor.

For replacement parts, please furnish this data with your order:

- ♦ Brake model number
- ♦ Part number and description (refer to parts list)
- ♦ If ordering a hub, specify bore diameter and key dimensions
- ♦ If ordering electrical parts, specify voltage and frequency

For a replacement brake, please furnish this data with your order:

- ♦ Brake model number
- ♦ Voltage and frequency
- ♦ Hub bore and keyway dimensions
- ♦ Mounting - horizontal or vertical. If vertical, specify whether above or below motor. If brake includes foot mounting bracket or adapter, specify.

WARRANTY

Seller warrants products manufactured by it and supplied hereunder to be free from defects in materials and workmanship under normal use and proper maintenance for a period of twelve months from date of shipment. If within such period any such products shall be proved to Seller's reasonable satisfaction to be defective, such products shall be repaired or replaced at Seller's option. Seller's obligation and Buyer's exclusive remedy hereunder shall be limited to such repair and replacement and shall be conditioned upon Seller's receiving written notice of any alleged defect no later than 10 days after its discovery within the warranty period and, at Seller's option, the return of such products to Seller, f.o.b. its factory, when such return is feasible. Seller reserves the right to satisfy its warranty obligation in full by reimbursing Buyer for all payments it makes hereunder, and Buyer shall thereupon return the products to Seller. Seller shall have the right to remedy such defects. Seller makes no warranty with respect to wear or use items, such as belts, chains, sprockets, discs and coils, all of which are sold strictly AS IS.

The foregoing warranties are exclusive and in lieu of all other express and implied warranties (except of title) including but not limited to implied warranties of merchantability, fitness for a particular purpose, performance or otherwise, and in no event shall the Seller be liable for claims (based upon breach of express or implied warranty, negligence, product liability, or otherwise) for any other damages, whether direct, immediate, incidental, foreseeable, consequential, or special.

