

**OPERATING,
MAINTENANCE &
PARTS MANUAL**

**MOTOR DRIVEN
TROLLEY**



RAILSTAR[®]

Motor Driven Trolley

Before installing hoist, fill in the information below.

Serial No.

Purchase Date

Voltage

Rated Load

Rated Loads:
1/8 - 2 Tons and 3 Tons
(250 - 2000 Kg. and 3000 Kg.)

Follow all instructions and warnings for inspecting, maintaining and operating this hoist.

The use of any hoist presents some risk of personal injury or property damage. That risk is greatly increased if proper instructions and warnings are not followed. Before using this hoist, each operator should become thoroughly familiar with all warnings, instructions and recommendations in this manual. **Retain this manual for future reference and use.**

Forward this manual to operator. Failure to operate equipment as directed in manual may cause injury.

**CM HOIST AND TROLLEY PARTS AND SERVICES ARE AVAILABLE
IN THE UNITED STATES AND IN CANADA**

As a CM Hoist and Trolley user, you are assured of reliable repair and parts services through a network of Master Parts Depots and Service Centers that are strategically located in the United States and Canada. These facilities have been selected on the basis of their demonstrated ability to handle all parts and repair requirements promptly and efficiently. To quickly obtain the name of the Master Parts Depot or Service Center located nearest you, call (800) 888-0985. Fax: (716) 689-5644.

ORDERING INSTRUCTIONS

The following information must accompany all correspondence or repair parts orders:

- 1) Serial Number - This is stamped on the nameplate.
- 2) Voltage, Phase, Hertz - These are also on the nameplate.

For parts orders also specify:

- | | |
|-----------------------|------------------------|
| 1) Quantity desired | 4) Part name |
| 2) Key number of part | 5) Capacity of trolley |
| 3) Part Number | |

When ordering replacement parts, consideration should be given to the need to replace other items: (bearings, contacts, fasteners, etc.) that may be damaged or lost during disassembly or just unfit for future use because of deterioration from age or service.

Parts should be ordered from CM's Master Parts Deposits conveniently located throughout the United States and Canada. Refer to the list on the inside of the front cover of this manual to locate the Master Parts Depot nearest you.

WARNING

Using "commercial" or other manufacturer's parts to repair the Railstar Trolley may cause load loss.

TO AVOID INJURY:
Order all replacement parts from CM. Some parts may look alike but often CM parts are made of specific materials or processed to achieve specific properties.

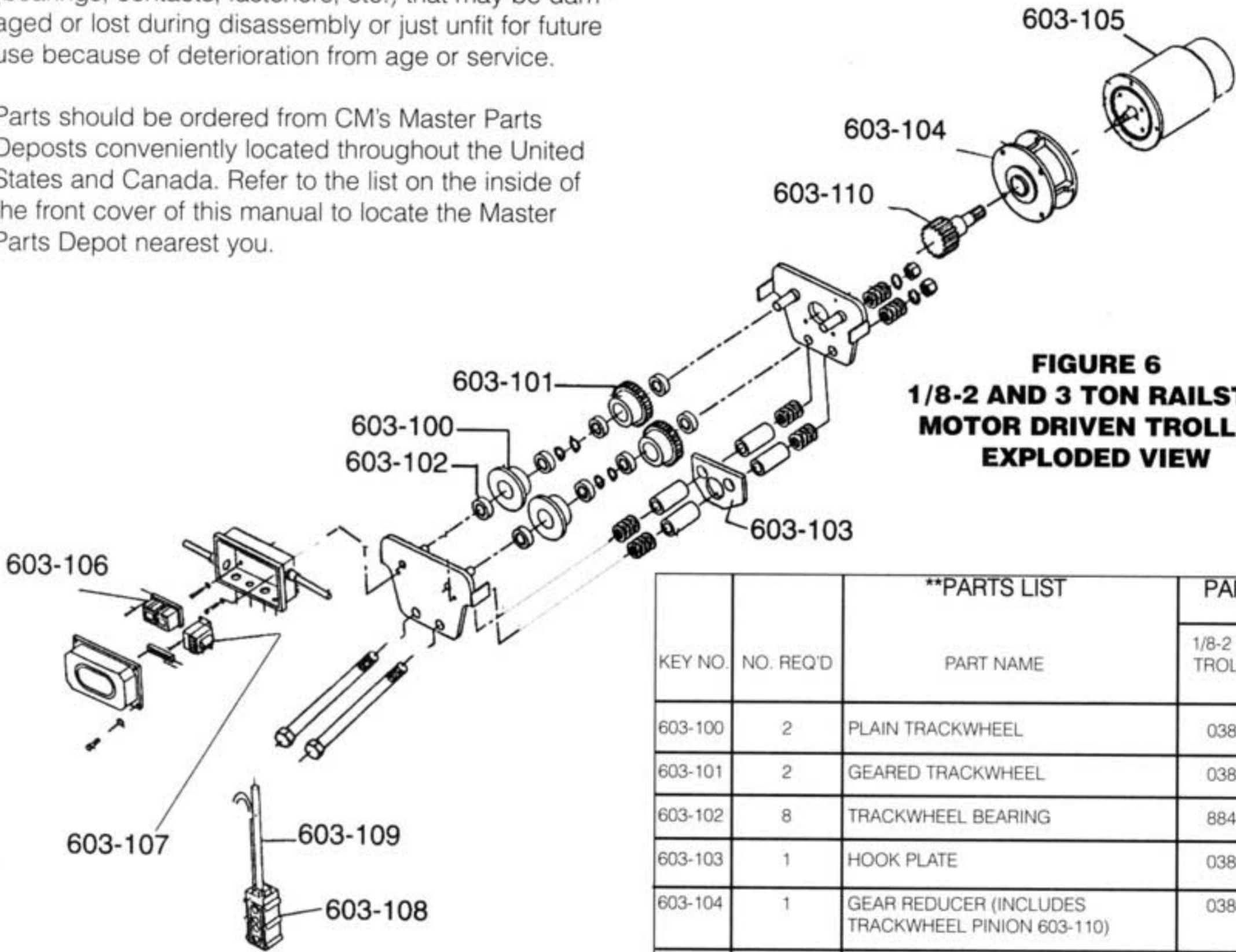


FIGURE 6
1/8-2 AND 3 TON RAILSTAR
MOTOR DRIVEN TROLLEY
EXPLODED VIEW

		**PARTS LIST		PART NUMBER	
KEY NO.	NO. REQ'D	PART NAME	1/8-2 TON TROLLEY	3 TON TROLLEY	
603-100	2	PLAIN TRACKWHEEL	03800	03801	
603-101	2	GEARED TRACKWHEEL	03802	03803	
603-102	8	TRACKWHEEL BEARING	88429	83670	
603-103	1	HOOK PLATE	03804	03805	
603-104	1	GEAR REDUCER (INCLUDES TRACKWHEEL PINION 603-110)	03806	03807	
603-105	1	MOTOR (115-1-60) MOTOR (3 PHASE)	03808 03810	03809 03811	
603-106	1	TROLLEY CONTACTOR (48 VOLT COILS) TROLLEY CONTACTOR (115 VOLT COILS)	03812	03813	
603-107	1	TRANSFORMER (FOR 3 PHASE ONLY) 48 VOLT SECONDARY	03814		
603-108	1	CONTROL STATION	58219		
603-109	-	CONTROL CABLE - SPECIFY LENGTH REQUIRED	03815		
603-110	1	TRACKWHEEL PINION	03816	03817	

- Touch-up Paints for CM Railstar Motor Driven Trolleys:
1. **Hoist.** Order *(1) case (12-12 oz. Aerosol Cans) of Orange Touch-up paint Part Number 84190.
 2. **Trolley.** Order *(1) case (12-12 oz. Aerosol Cans) of Black Touch-up paint Part Number 84189.

*Touch-up paints are only available in case quantities.

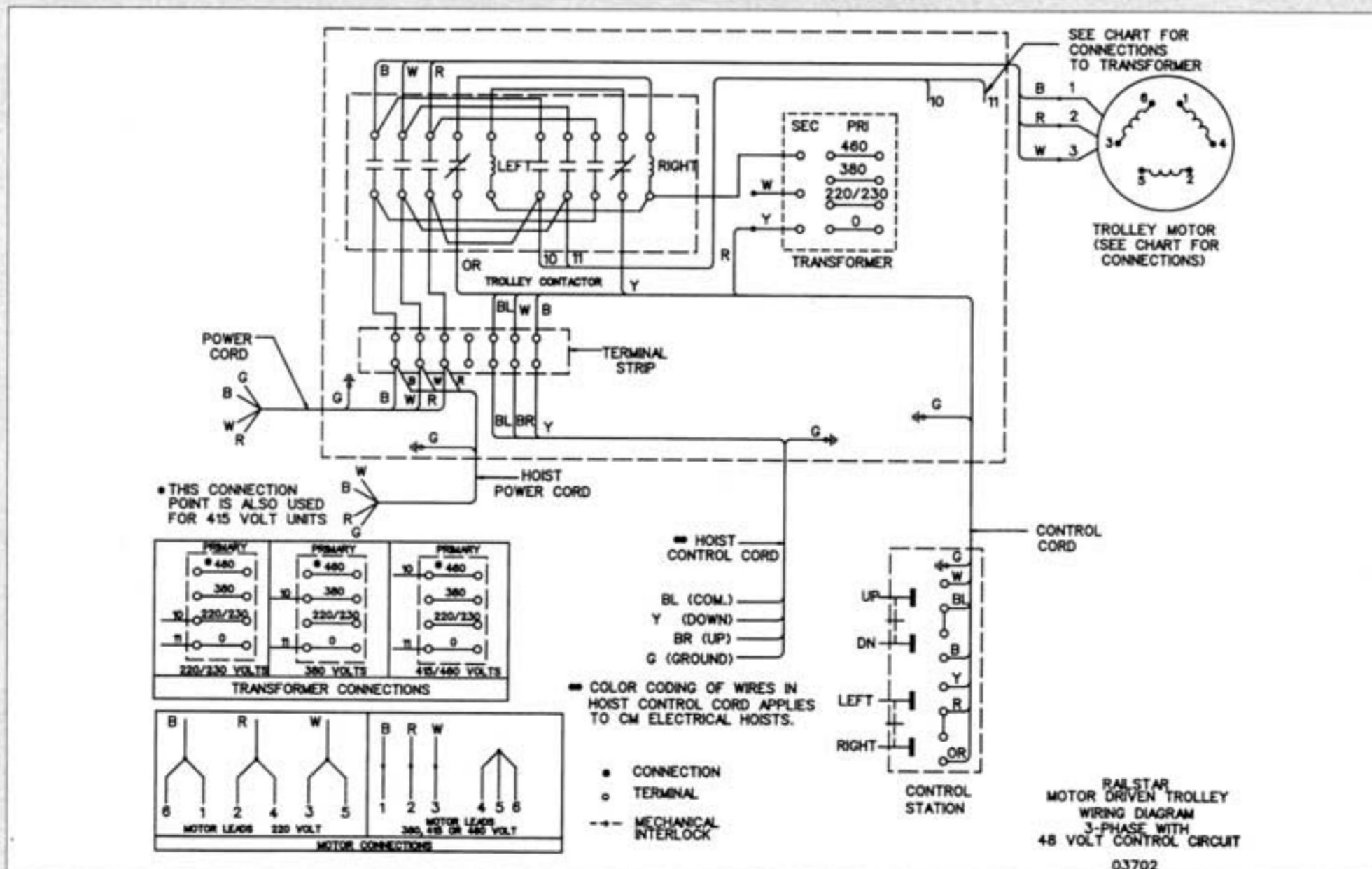
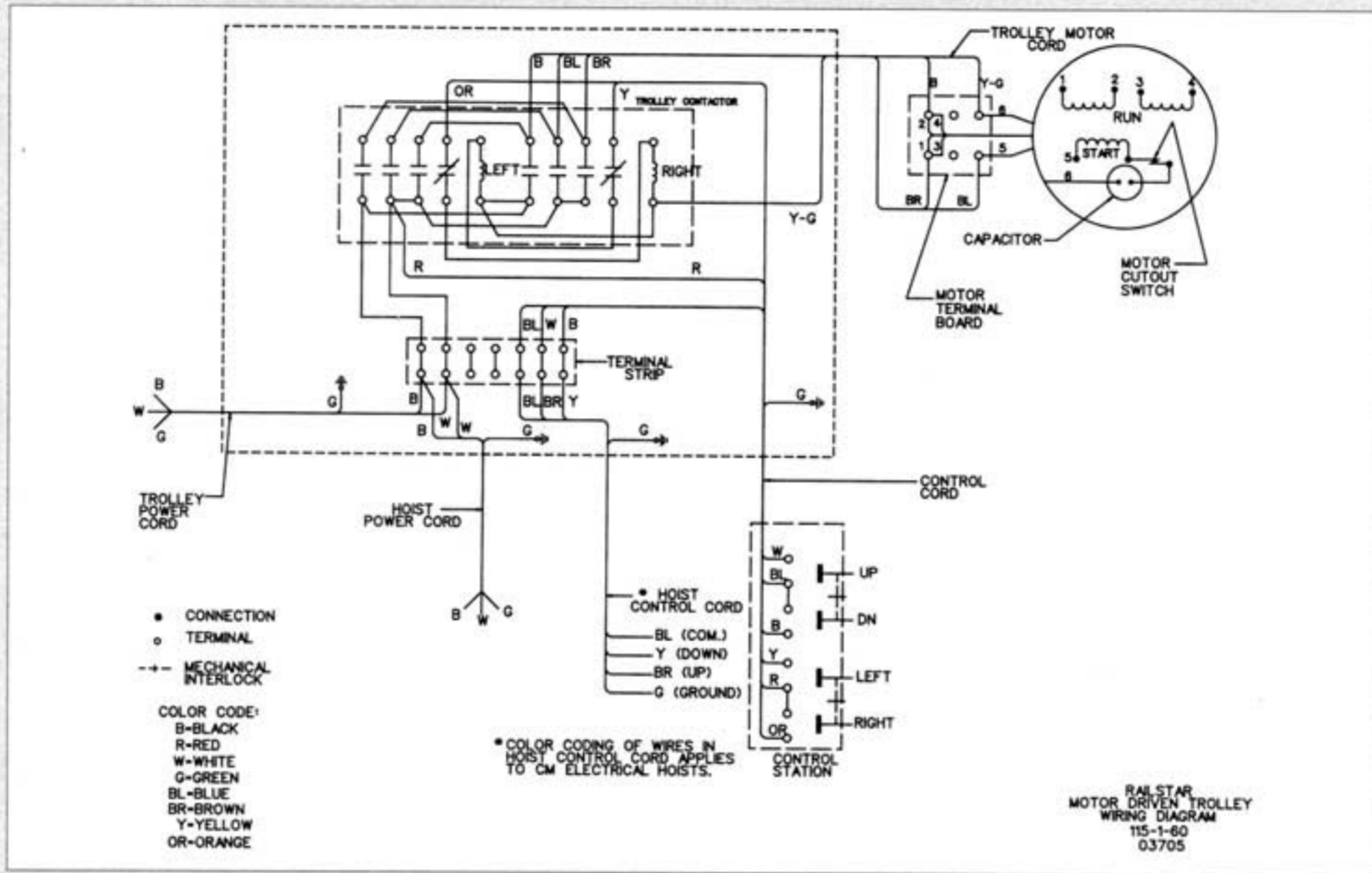
NOTE: When painting Hoists or Trolleys, also order warning labels, identification labels, etc. that may be coated during painting.

*THESE ARE THE ONLY PARTS AVAILABLE FOR THE REPAIR OF THE RAILSTAR MOTOR DRIVEN TROLLEYS.

TABLE 4. TROUBLESHOOTING AND REMEDIAL ACTION

IF	CAUSE MAY BE	REMEDY														
1. Trolley does not operate in either direction	<p>a) No voltage at trolley</p> <p>b) Phase failure (Single phasing)</p> <p>c) Open control circuit</p> <p>d) Wrong voltage or frequency</p> <p>e) Low voltage</p> <p>f) Excessive load</p>	<p>Mainline or branch circuit switch open; branch line fuse blown or circuit breaker tripped. Close, replace or re-set. Check for grounded or open connections in supply lines or current collectors.</p> <p>Open circuit, grounded or open connections in one line of supply system, collectors, trolley wiring, reversing contactor, motor leads or windings. Check for electrical continuity.</p> <p>Open or shorted windings in transformer or reversing contactor, control station switch contacts not making contact. Check continuity and repair or replace defective parts.</p> <p>The voltage and frequency must be the same as shown on trolley control box.</p> <p>Voltage at the terminal board must be above the following minimums with the trolley in question:</p> <table border="1" data-bbox="1284 1322 1935 1579"> <thead> <tr> <th>POWER SUPPLY</th> <th>MINIMUM VOLTAGE</th> </tr> </thead> <tbody> <tr> <td>115-1-60</td> <td>98</td> </tr> <tr> <td>220/240-3-60</td> <td>198</td> </tr> <tr> <td>440/480-3-60</td> <td>396</td> </tr> <tr> <td>220-3-50</td> <td>198</td> </tr> <tr> <td>380-3-50</td> <td>352</td> </tr> <tr> <td>415-3-50</td> <td>374</td> </tr> </tbody> </table> <p>Reduce loading to the capacity limit of trolley.</p>	POWER SUPPLY	MINIMUM VOLTAGE	115-1-60	98	220/240-3-60	198	440/480-3-60	396	220-3-50	198	380-3-50	352	415-3-50	374
POWER SUPPLY	MINIMUM VOLTAGE															
115-1-60	98															
220/240-3-60	198															
440/480-3-60	396															
220-3-50	198															
380-3-50	352															
415-3-50	374															
2. Trolley operates in one direction only.	a) Open control circuit	See item 1c.														
3. Trolley operates sluggishly	<p>a) Excessive load</p> <p>b) Low voltage</p> <p>c) Worn or dirty rails</p>	<p>See item 1f.</p> <p>See item 1e.</p> <p>Clean rails, inspect for worn spots.</p>														
4. Motor overheats	<p>a) Excessive load</p> <p>b) Low voltage</p> <p>c) Extreme external heating</p> <p>d) Frequent starting or reversing</p> <p>e) Phase failure</p>	<p>See item 1f.</p> <p>See item 1e.</p> <p>Above an ambient temperature of 104°F., the frequency of trolley operation must be limited to avoid overheating of motor. Special provision should be made to ventilate the space or shield the trolley from heat radiation.</p> <p>Excessive inching, jogging or plugging should be avoided since this type of operation will drastically shorten the life of motor and contactor.</p> <p>See item 1b.</p>														

FIGURE 6.
TYPICAL WIRING DIAGRAMS (WIRING DIAGRAMS SHOWN ARE REPRESENTATIVE. CONSULT
DIAGRAM IN TROLLEY OR FURNISHED WITH THE UNIT).



TROUBLESHOOTING

ELECTRICAL DATA

To detect open and short circuits in electrical components use the following procedure.

Open circuits in the coils of electrical components may be detected by isolating the coil and checking for continuity with an ohmmeter or with the component in series with a light or bell circuit.

Shorted turns are indicated by a current draw substantially above normal (connect ammeter in series with suspected element and impose normal voltage) or D.C. resistance substantially below normal. The current method is recommended for coils with very low D.C. resistance.

Motor current should be measured with the motor running under full load with rated voltage applied. Contactor coil current should be measured with the contactor armature (contacts) closed and full voltage on the coil.

TABLE 3. ELECTRICAL DATA FOR TROLLEY COMPONENTS

TRANSFORMER - 48 VOLT SECONDARY	
TERMINALS OR LEADS	*DC RESISTANCE (OHMS)
0-220	45.5
0-380	97.2
0-460	108.7
WHITE TO YELLOW	2.0
BLACK TO WHITE	1.4
BLACK TO YELLOW	3.4

CONTACTOR COIL		
VOLTAGE-HERTZ	CURRENT (AMPS)	*D.C. RESISTANCE (OHMS)
48-50/60	.20	22
115-60	.12	110

MOTORS				
VOLTAGE-PHASE-HERTZ	H.P. (KW)	FULL LOAD CURRENTS (AMPS)	MOTOR LEADS	*D.C. RESISTANCE (OHMS)
115-1-60	1/3 (.25 KW)	4.5	5 to ** 1 to 2 3 to 4	4.1 1.9 1.9
115-1-60	3/4 (.60 KW)	7	5 to ** 1 to 2 3 to 4	3.2 1.9 1.9
230/460-3-60	1/3 (.25 KW)	1.5/.7	1 to 4	42.5
220/380-3-50		2/.7	2 to 5	42.5
220/415-3-50		2/.7	3 to 6	42.5
230/460-3-60	3/4 (.60 KW)	2.8/1.4	1 to 4	17.3
220/380-3-50		3/1.5	2 to 5	17.3
220/415-3-50		3/1.5	3 to 6	17.3

*Resistance values listed are nominal and they may vary slightly from motor to motor or component to component.

**To measure the resistance of the start winding, connect one lead of ohmmeter to motor lead 5 and the other lead of the ohmmeter to the terminal of the motor cut-out switch to which the gray colored wire is attached.

LUBRICATION



WARNING

The lubricants used in and recommended for the Railstar Motor Driven Trolley may contain hazardous materials that mandate specific handling and disposal procedures.

To Avoid Contact and Contamination: Handle and dispose of lubricants only as directed in applicable material safety data sheets and in accordance with applicable local, state and federal regulations.

Once a month lubricate trackwheel gear and pinion with Texaco Novatex #2 or an equivalent heavy cup grease or graphite grease.

The gear box of the trolley is packed with grease and it is not necessary to change the grease unless the gearing is disassembled for inspection. If the gear box is disassembled, wipe the grease from the various parts and from the inside of the housing. During reassembly, coat the gears and pack the inside of the housing with Mobil grease AA3, Exxon Estan 3, Shell Unedo 3 or equal grease. Use 6 oz. of grease in the 1/8-2 ton (250-2000 Kg.) trolley gear box and 20 oz. of grease in the 3 ton (3000 Kg.) trolley gear box.

NOTE: The above lubricants are not available from CM.

All other trolley parts are lubricated for life at the factory.

IMPORTANT: Refer to manual packed with the hoist for the inspection and maintenance of the hoist.

EXTERIOR FINISH

The exterior finish of the CM Railstar Motor Driven Trolley is a lacquer paint and it should periodically be cleaned by wiping with a cloth. However, if the finish is damaged, compatible touch-up paint can be purchased from CM (see page 14) for ordering instructions.

PREVENTATIVE MAINTENANCE

In addition to the above inspection procedure, a preventative maintenance program should be established to prolong the useful life of the motor driven trolley and maintain its reliability and continued safe use. The program should include the above inspection procedure with particular attention being paid to the lubrication of the various components using the lubricants recommended above.

RECOMMENDED SPARE PARTS

To insure continued service of the Railstar Trolley, the following is a list of parts that are recommended to be kept on hand at all times to replace parts that have worn or failed:

KEY NO.	PART NAME	QTY FOR EACH TROLLEY IN SERVICE
603-106	TROLLEY CONTACTOR	1
603-107	TRANSFORMER (3 PHASE UNITS ONLY)	1
603-108	CONTROL STATION	1

TESTING

Before using, all altered, repaired or used hoists and trolleys that have not been operated for the previous 12 months shall be tested by the user for proper operation. First, test the unit without a load and then with a light load of 50 pounds times the number of load supporting parts of load chain to be sure that the hoist operates properly and that the brake holds the load when the control is released. Next test with a load of *125% of rated capacity. In addition, hoists in which load sustaining parts have been replaced should be tested with *125% of rated capacity by or under the direction of an appointed person and a written report prepared for record purposes. After testing the hoist, operate the trolley with capacity load over the entire length of the runway to be sure that all adjustments and operations are satisfactory.

NOTE: For additional information on inspection and testing, refer to Code B30.11 "Monorail Systems and Underhung Cranes" obtainable from ASME Order Department, 22 Law Drive, Box 2300, Fairfield, NJ 07007-2300, U.S.A.

*If the hoist overload device prevents lifting of a load of 125% of rated capacity, reduce load to rated capacity.

8. Do not load trolley beyond the rated capacity. Overload can cause immediate failure of load carrying parts or cause damage resulting in future failure at less than rated load.
 9. Do not use this or any other overhead materials handling equipment for lifting or transporting people.
 10. Stand clear of all loads and avoid moving a load over the heads of other people. Warn people of your intention to move a load in their area.
 11. Do not leave the load suspended in the air unattended.
 12. Do not wrap the load chain around the load and hook onto itself as a choker chain. Doing this will result in the following:
 - (a) Operation of the upper limit switch is bypassed and the load could hit the hoist.
 - (b) The loss of the swivel effect of the hook which could mean twisted chain and a jammed liftwheel.
 - (c) The chain could be damaged at the hook.
 13. Permit only qualified personnel to operate unit.
 14. Never operate the hoist or trolley when flammable materials or vapors are present. Electrical devices produce arcs or sparks that can cause a fire or explosion.
 15. STAY ALERT! Watch what you are doing and use common sense. Do not use the hoist or trolley when you are tired, distracted or under the influence of drugs, alcohol or medication causing diminished control.
 16. On single phase units, it is necessary to allow the trolley to come to a stop before changing direction. Therefore, when moving a load along the beam, it is necessary to release the push button and allow the trolley to coast to a stop, before depressing the other push button to reverse direction. If this is not done, the trolley will continue to travel in the original direction when the push button to reverse direction is depressed. As a result, on the single phase units, direction of travel must not be reversed quickly (plug reversed).
1. Tightness of all fasteners including suspension bolt nuts.
 2. Contactor and control station for burnt or pitted contacts and loose or corroded terminals.
 3. Cables and leads for broken wires, loose or corroded terminals and damaged insulation.
 4. Trackwheels for wear of tread, flange and bearings (as indicated by excessive looseness of wheel on stud).
 5. Gear portion of trackwheel and pinion for wear.
 6. Hook plate and upper hook for excessive wear where the hook bears on the hook plate hole. If hook has worn away more than 1/4" of the hook plate, the hook plate should be replaced.
 7. Collector or power supply system for damage, wear corrosion and proper operation.

CAUTION: ANY DEFICIENCIES ARE TO BE CORRECTED BEFORE THE TROLLEY IS RETURNED TO SERVICE. ALSO, THE EXTERNAL CONDITIONS MAY SHOW THE NEED FOR DISASSEMBLY TO PERMIT A MORE DETAILED INSPECTION, WHICH, IN TURN, MAY REQUIRE THE USE OF NON-DESTRUCTIVE TYPE TESTING.

MAINTENANCE

INSPECTION

To maintain continuous and satisfactory operation, a regular, periodic inspection procedure must be initiated so that worn or damaged parts can be replaced before they become unsafe. The frequency of inspection must be determined by the individual application.

The following list gives an inspection procedure for normal usage under normal conditions. When the unit is subjected to heavy usage or dusty, gritty, moist or other adverse conditions, shorter time periods must be assigned. Inspection must be made of all parts for unusual wear, corrosion or damage in addition to those specifically mentioned in the list below.

It is suggested that the unit be inspected monthly for wear, damage and corrosion effects to all parts with particular attention to the following:

HOIST CONTROL CORD

The hoist control cord must be shortened and run into the trolley control box so that the hoist can be controlled from the four button control station suspended from the trolley. To do this, form a loop in the hoist control cord as shown in Figure 2. Allowing 5 to 6 inches (127.0 to 152.4 mm) for making connections inside the control box, cut-off the hoist control cord. The hoist control station and excess cord can be discarded. Strip 5" to 6" (127.0 to 152.4 mm) of the outer jacket from the cord to expose the individual wires. Run the cord through the box connector and firmly tighten the outer nut of the connector to secure the cord. Strip $\frac{3}{8}$ " (9.5 mm) of insulation from the individual wires.

*Connect the brown, yellow and blue wires to the terminal board as shown in Figure 4. Loosen one of the screws used to attach the terminal board or transformer to the control box. Firmly crimp a spade type terminal (from the wiring kit) to the end of the green wire and slide the terminal under the head of the screw. Firmly tighten screw to insure proper ground.

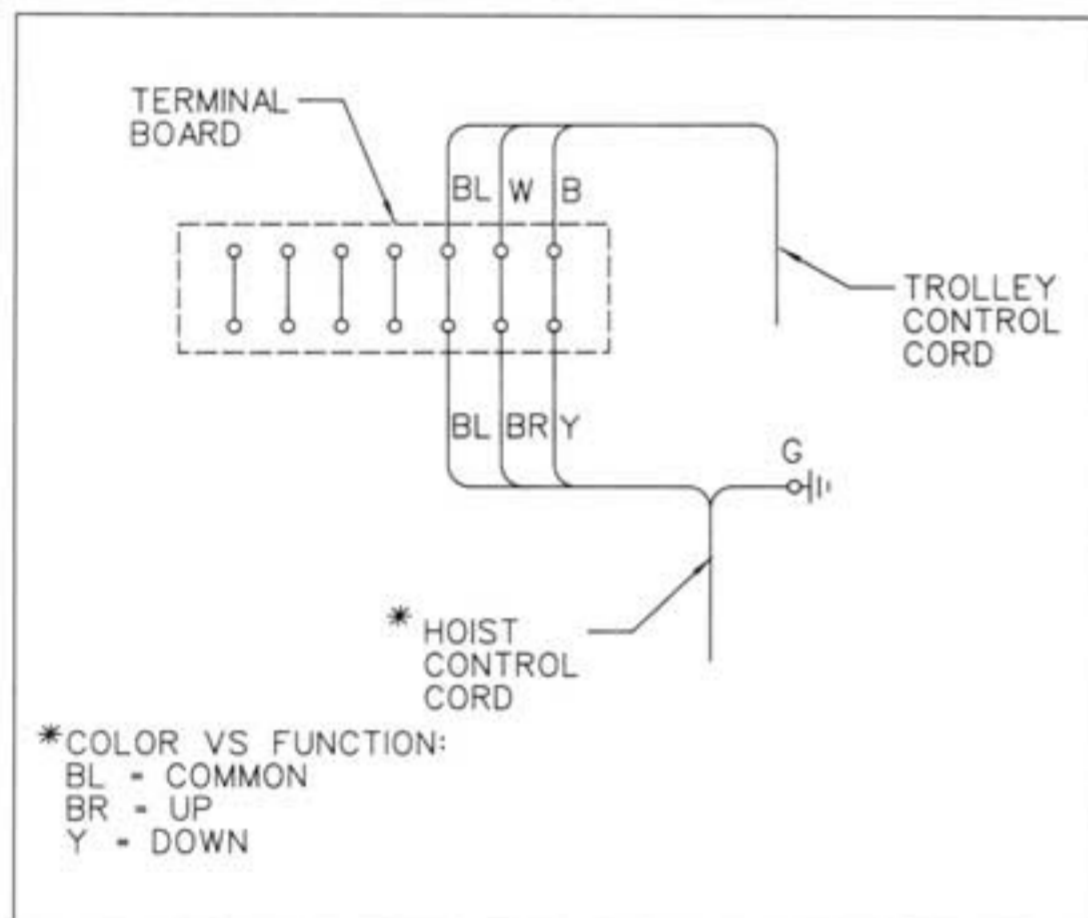


FIGURE 4. HOIST CONTROL CORD CONNECTIONS

(OTHER WIRING IS NOT SHOWN FOR CLARITY)

*Color coding of wires may vary. Refer to wiring diagram supplied with hoist for color coding of up, down and common wires.

THREE-PHASE UNITS

A three phase motor can rotate in either direction depending on its connection to the power supply. Therefore, the direction of trolley and hook travel relative to the selected indicated direction must be checked before the trolley is put into service. If the hoist power cord is not properly connected to the terminal board inside the trolley control box, serious damage could result and the hoist limit switches are ineffective. The trolley should be checked first and then the hoist.

Energize the power supply system. Depress the trolley control button. If the movement of the trolley does not agree with the direction arrows on the control station, de-energize the power supply system. Remove trolley control box cover and interchange the red and black wires as shown in Figure 5.

Now, depress the "up" button. If the hoist hook lowers, de-energize the power supply system and interchange the red and black wires of the hoist power cord at the terminal board as shown in Figure 5.

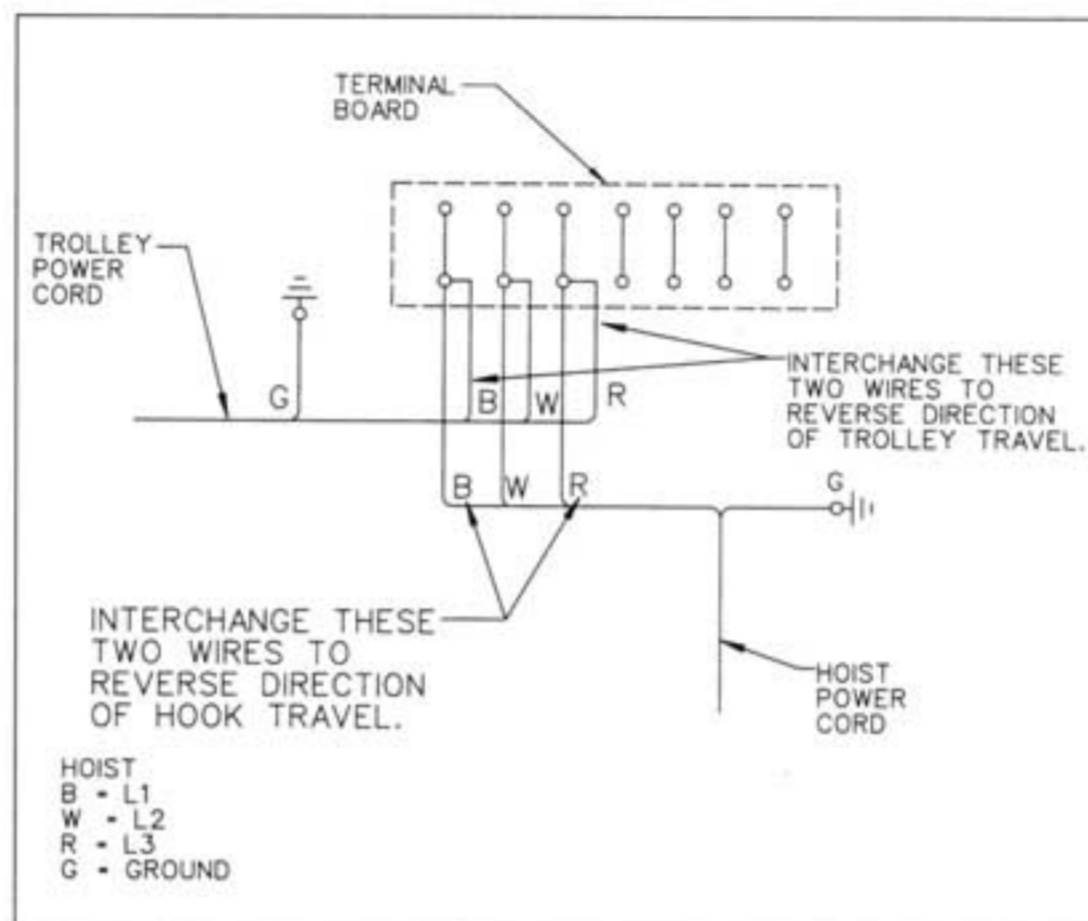


FIGURE 5. CONNECTIONS FOR PROPER TROLLEY AND HOOK TRAVEL

(OTHER WIRING IS NOT SHOWN FOR CLARITY)

OPERATING INSTRUCTIONS

1. Immediately after installation, operate trolley with a capacity load over the entire length of runway or monorail system to be sure that all adjustments and operations are satisfactory.
2. When preparing to lift a load, be sure that the attachments to the hook are firmly seated in hook saddle. Avoid off center loading of any kind, especially loading on the point of the hook.
3. When lifting, raise the load only enough to clear the floor or support and check to be sure that the attachments to hook and load are firmly seated. Continue lift only after you are assured the load is free of all obstructions.
4. When applying a load, it should be directly under the trolley. Avoid off center loading of any kind.
5. Take up a slack load chain carefully and start lifting load slowly to avoid shock and jerking of hoist load chain. If there is any evidence of overloading, immediately lower the load and remove the excess load.
6. Do not allow the load to swing or twist while hoisting.
7. Anticipate the stopping point and allow trolley to coast to a smooth stop. Reversing or "plugging" to stop trolley causes overheating of motor and swaying of load.

The following wiring diagrams show connections to be made within trolley control box. For special units, see wiring diagram supplied with unit. NOTE: Trolley power cord must be replaced (if necessary), hoist power cord must be connected to the trolley power circuit, hoist control cord must be connected to the trolley and wired to the trolley control cord and the control cord must be shortened (if necessary) before the system supplying power to the trolley is energized.

CONTROL STATION

The standard trolleys are supplied with a four button control station. The hoist control buttons are the single speed type that can be used to control a single speed hoist that is equipped with a reversing contactor. The trolley control buttons are also the single speed type.

Unless ordered special, the control station is suspended from the trolley control box by a cord that is approximately 16'-3" (4.95 M) long. If this is too long for your application, the cord should be shortened so that the control station is approximately four feet above the operating floor.

! WARNING

Typing knots or loops to shorten the drop of the control station will make the strain relief ineffective and the internal conductors of the cord may break.

**TO AVOID INJURY:
Shorten the control cord per the following instructions.**

To shorten the cord, measure the distance the control station is to be raised. Remove the cover from the control station and disconnect the wires from the various terminals. Using wire cutters, cut the external wire rope strain relief just above the fitting used to form the loop. Measuring from the end of the longest wire, cut-off the cord the distance the station is to be raised. Using the cut-off piece of cord as an example, remove the outer jacket and prepare the individual wires of the shortened cord accordingly.

Slide the prepared cord through the grommet on top of the control station. Clamp the cord to the top of the control station and, using the wiring diagram supplied with the trolley, connect the wires to the various terminals. Now, remove the insulation from the wire rope strain relief. Slide the clamp sleeve (from the wiring kit) up on the wire rope and feed the rope around the pin at the top of the station. Feed the end of the wire rope through the other side of the clamp sleeve. Pull on the end of the wire rope until it supports the control station. Slide the clamp sleeve down to form a tight loop and then squeeze the clamp sleeve using a vise or very large pliers to secure the loop. Reattach the cover to the control station.

TROLLEY POWER CORD

The short power cord furnished is for use with a collector and bus system. It should be discarded if a cable is to supply power to the trolley. Connect the "new" power cord to the terminal board as shown in Figure 3. The box connector must be made tight on the cable, and if necessary, a separate strain relief should be provided to prevent any stress on the wires of the power cord.

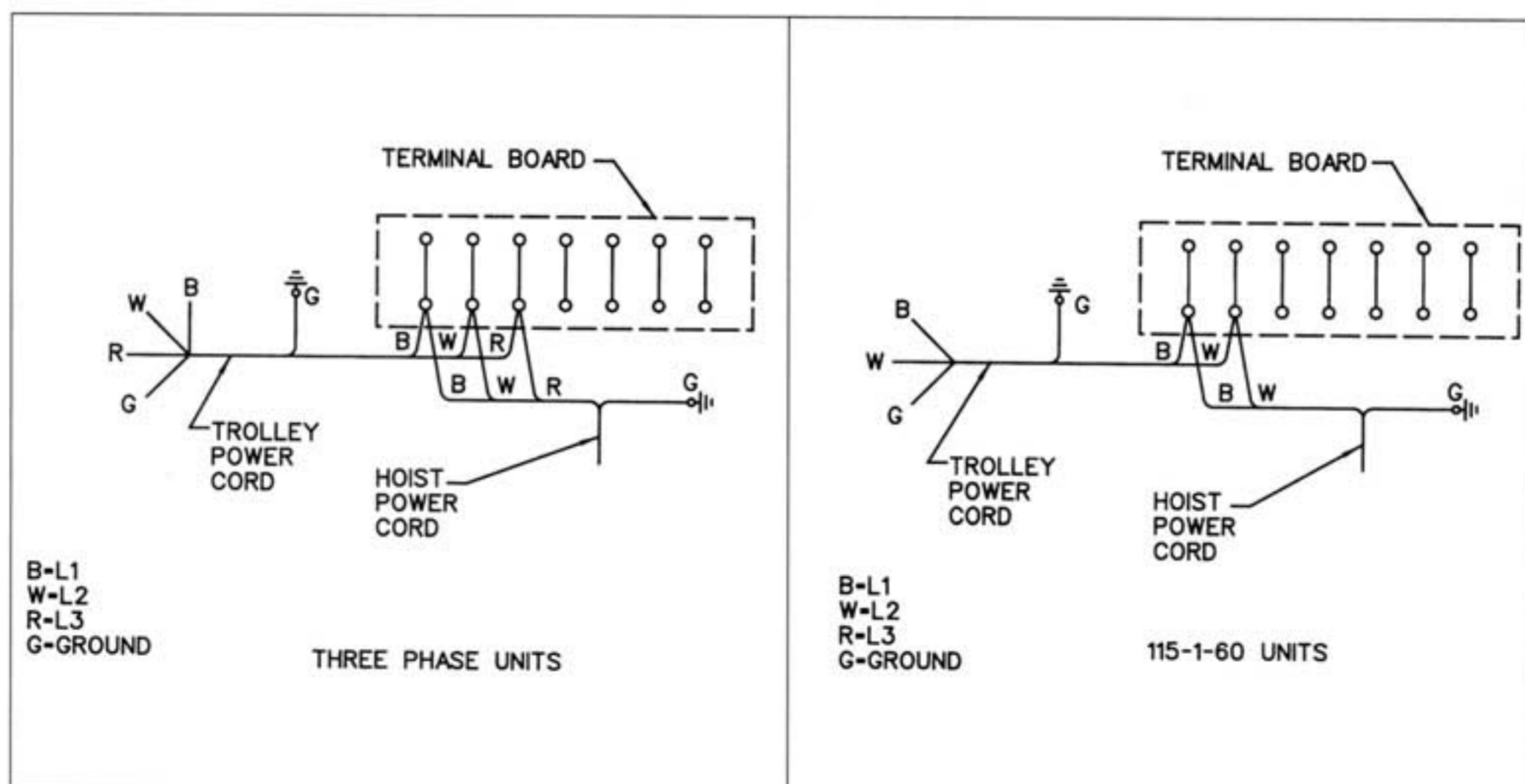
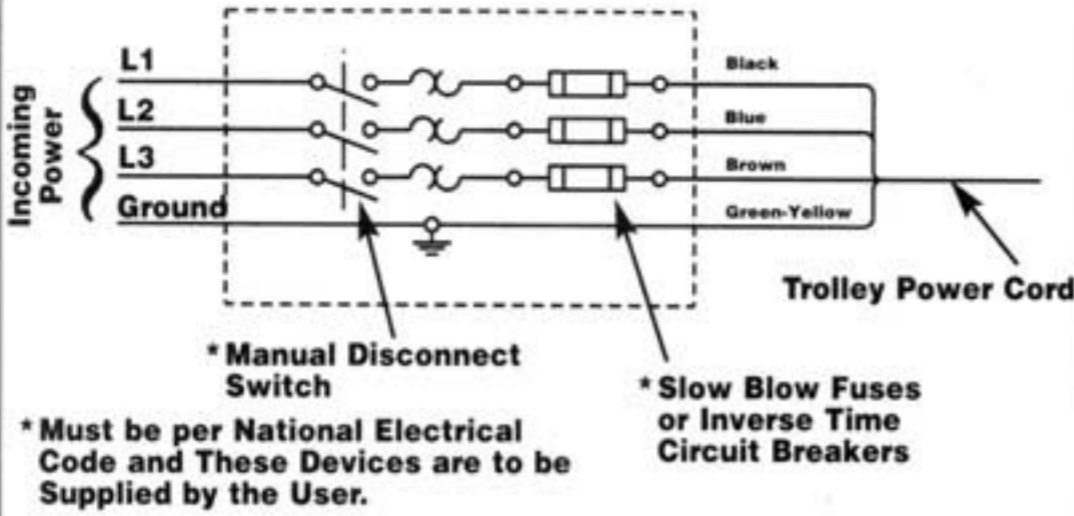


FIGURE 3. HOIST POWER CORD CONNECTIONS

(OTHER WIRING IS NOT SHOWN FOR CLARITY)

Three Phase Systems



TYPICAL POWER SUPPLY SYSTEM

If grounding is to be through the metal to metal contact between trackwheels and the operating flange of the beam, make sure that:

1. No paint or other insulating material is applied to the operating flange of the beam.
2. No paint or other insulating material is applied to the trackwheel treads.

WARNING

Failure to properly ground the trolley presents the danger of electric shock.

TO AVOID INJURY:
Permanently ground the hoist and trolley as instructed in this manual.

3. The trolley beam is permanently grounded to the building ground system.
4. The hoist power cord, trolley power cord, hoist control cord, and the trolley control cord are grounded to the control box (see figures 3 and 4).

LENGTH OF EXTENSION CORD	SINGLE PHASE	THREE PHASE
	MINIMUM WIRE SIZE	MINIMUM WIRE SIZE
UP TO 50 FEET (15.2 M)	#14 AWG	#16 AWG
80 FEET (24.4 M)	#12 AWG	#16 AWG
120 FEET (36.6 M)	#10 AWG	#14 AWG

Low voltage can also be caused by using an under-size extension cord to supply power to the trolley. The following chart should be used to determine the size wires in the extension cord in order to minimize the voltage drop between the power source and the trolley control box.

WARNING

Failure to provide a proper power supply system for the trolley may cause trolley and hoist damage and offers the potential for a fire.

TO AVOID INJURY:
Provide the trolley with a 20 amp, minimum, overcurrent protected power supply system per the National Electrical Code and applicable local codes as instructed in this manual.

Remember, operation with low voltage can void the CM repair/replacement policy. When in doubt about any of the electrical requirements, consult a qualified electrician.

Always disconnect the power from the power supply system and lockout/tagout disconnecting means before servicing the trolley or hoist.

WARNING

Working in or near exposed energized electrical equipment presents the danger of electric shock.

TO AVOID INJURY:
DISCONNECT POWER AND LOCKOUT/TAGOUT DISCONNECTING MEANS BEFORE REMOVING COVER OR SERVICING THIS EQUIPMENT.

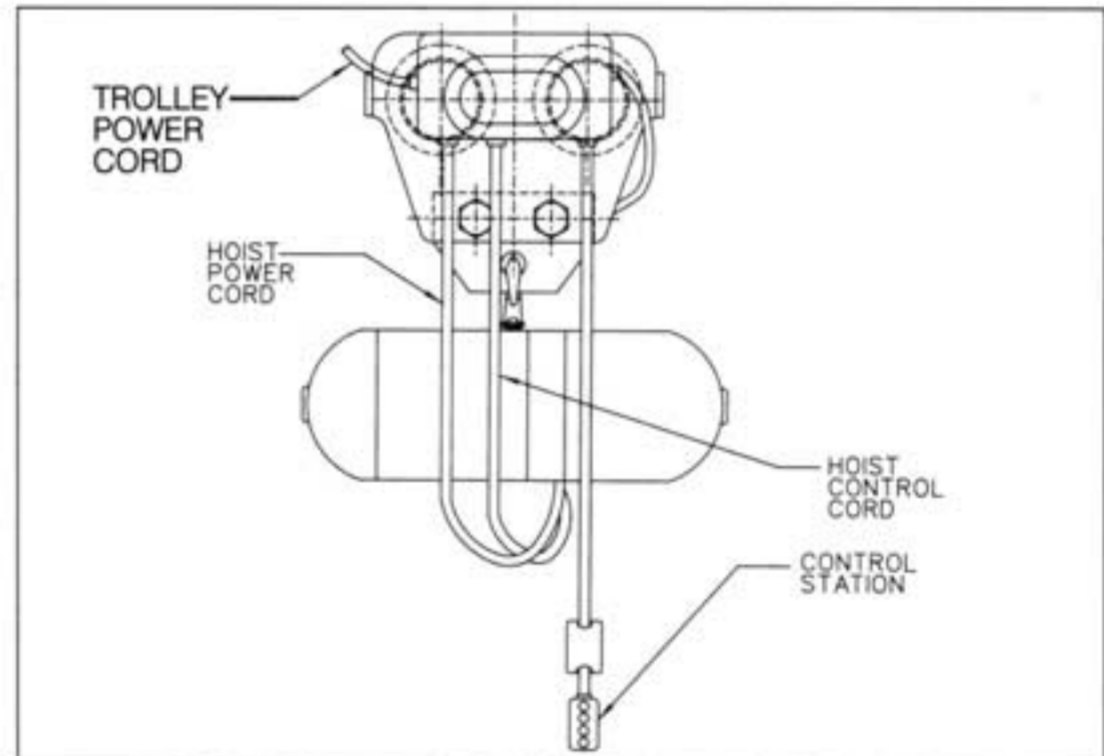


FIGURE 2. HOIST AND TROLLEY GENERAL ARRANGEMENT

In addition, as shipped from CM, the three phase trolleys are connected to operate on 380-415 Volts, 3 Phase, 50 Hertz or 440-480 Volts, 3 Phase, 60 Hertz. These units can be converted to operate on 220 Volts, 3 Phase, 50 Hertz or 230 Volts, 3 Phase, 60 Hertz. To do this, reconnect the motor leads to the motor cord and move lead #10 at the transformer terminal board to the "220" position as shown on the wiring diagram supplied with the trolley or wiring diagram 03702 on page 12 of this manual. Be sure to re-mark, using tape or some other suitable material, the trolley identification plate to indicate that the unit is suitable for operation on 220-3-50 or 230-3-60.

TABLE 1

CHART A: 1/8 THRU 2 TON RAILSTAR TROLLEY WASHER SPACING

FLANGE WIDTH		NUMBER OF SPACER WASHERS			
IN.	MM	A	B	C	D
3 1/4	82.5	22	0	0	0
3 3/8	85.7	21	1	0	0
3 5/8	92.1	19	2	1	0
4	101.6	16	3	3	0
4 1/8	104.8	15	4	3	0
4 5/8	117.5	11	6	5	0
5	127.0	8	7	7	0
5 1/8	130.2	7	8	7	0
5 1/4	133.3	6	8	8	0
5 1/2	139.7	4	9	9	0
5 5/8	142.9	3	10	9	0
6	152.4	0	11	11	0

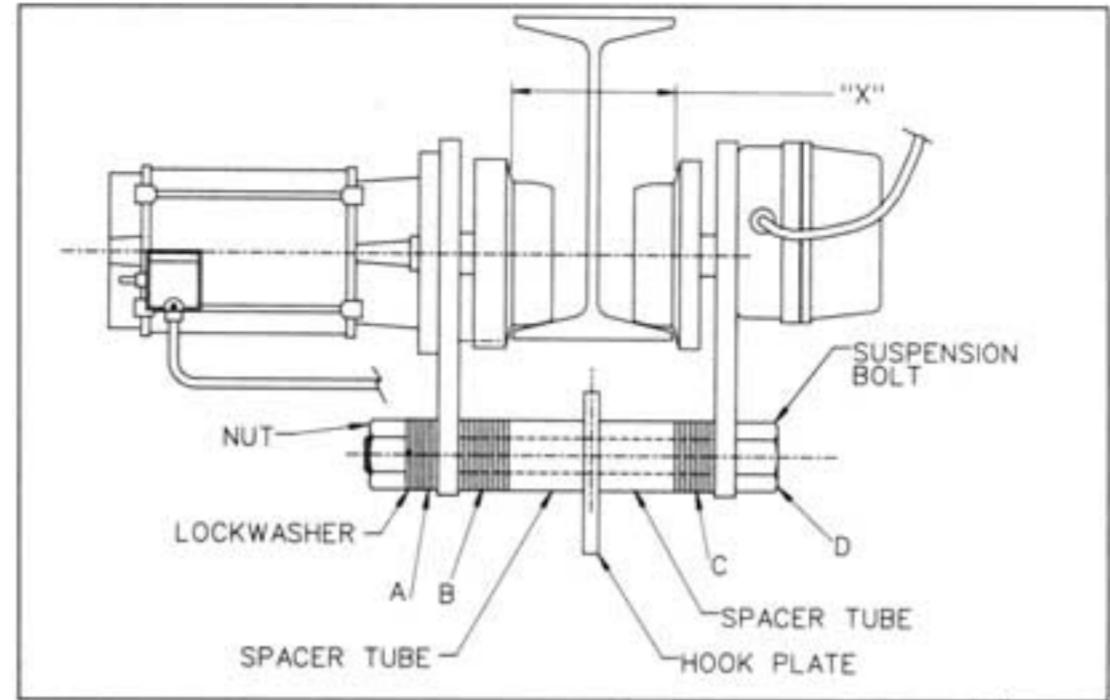


FIGURE 1. TROLLEY TO BEAM INSTALLATION

Electrical Connections

The trolley electrical connections must be completed as shown in Figure 2 (see page 6). The hoist and trolley must be supplied with adequate electrical power in order to operate properly. For proper operation, the voltage, (measured at the trolley terminal board with the hoist operating in the ↑ up direction with full load) must be as indicated in the table below.

NOMINAL CURRENT	MINIMUM RUNNING VOLTAGE	MINIMUM STARTING VOLTAGE
115-1-60	104	98
230-3-60	198	198
460-3-60	396	396
220-3-50	198	198
380-3-50	352	352
415-3-50	374	374

TABLE 2

CHART B: 3 TON (3000 Kg)

FLANGE WIDTH		NUMBER OF SPACER WASHERS			
IN.	MM	A	B	C	D
4	101.6	24	0	0	0
4 1/8	104.8	23	1	0	0
4 5/8	117.5	19	3	2	0
5	127.0	16	4	4	0
5 1/8	130.2	15	5	4	0
5 1/4	133.3	14	5	5	0
5 1/2	139.7	12	6	6	0
5 5/8	142.9	11	7	6	0
6	152.4	8	8	8	0
6 1/4	158.7	6	9	9	0
6 3/8	161.9	5	10	9	0
7	177.8	0	12	12	0

Signs of inadequate electrical power (Low Voltage) are:

- Noisy hoist or trolley operations due to brake and/or contactor chattering.
- Dimming of lights or slowing of motors connected to the same circuit.
- Heating of the hoist and/or trolley motors and other internal components as well as heating of the wires and connectors in the circuit feeding the unit.
- Failure of the hoist to lift the load due to motor stalling.
- Blowing of fuses or tripping of circuit breakers.

To avoid these low voltage problems, the trolley must be connected to an electrical power supply system that complies with the National Electrical Code and applicable local codes. This system must also be rated for a minimum of 20 amps and it must have #14 AWG or larger wiring, a disconnecting means, over-current protection (slow blow fuses or inverse-time type circuit breakers) and provisions for grounding.

INSTALLATION

UNPACKING INFORMATION

After removing the trolley from the shipping carton, carefully inspect the external condition of the cords, control box, gear reducer and motor for damage that may have occurred during shipment and handling. Check to make sure all parts (trolley side frame assembly with control box, trolley side frame with gear reducer and motor, hook plate, suspension bolts, spacer washer, spacer tubes, lockwashers and nuts) are furnished. Also, before attempting to install the trolley, make sure that the power supply indicated on the nameplate is the same as the power supply on which the unit is to operate. If there is damage, refer to packing slip envelope for claim procedure.

INSTALLATION

The hoist, trolley and hook suspension for suspending the hoist from the trolley may be packed separately. If necessary, assemble the hook suspension to the hoist according to the instruction furnished with the suspension and/or the instruction in the manual furnished with the hoist.

The CM Railstar Motor Driven Trolley is designed for operation at ambient temperatures of 0° to 100°F (-17° to 38°C).

WARNING

Operating the trolley on a beam that has no rail stops may allow the trolley to fall off the end of the beam.

TO AVOID INJURY:
Install rail stops at each end of the beam on which the trolley is to operate.

The stops must be positioned so as to not exert impact force on the hoist frame or trolley wheels. They must contact the ends of the trolley side frames.

TROLLEY TO BEAM

It is recommended that the trolley be mounted on the beam prior to suspending the hoist from the trolley. Before attempting to mount the trolley on the beam, measure the actual width of the beam flange on which the trolley is to operate. Using this measurement determine the arrangement of the spacer washers using Figure 1 and Table 2. Chart A of Table 2 shows the washer arrangement for the 1/8-2 ton (250-2000 kg.) trolley, while Chart B provides data for the 3 ton (3000 kg.) trolley. Loosely assemble the side frames, hook plate, spacer washers, spacer tubes, lockwashers and nuts on the suspension bolts as shown in Figure 1.

WARNING

If CM's washer spacing recommendations are not followed, trolley may fall from beam.

TO AVOID INJURY:
Measure the actual beam flange on which the trolley is to operate and use Table 2 to determine the arrangement of the spacer washers for that flange width.

Due to the variations in beam flange widths, it is suggested that the beam flange width be measured to determine the exact distribution of spacer washers. The distance between trackwheel flanges (dimension "X") should be 1/8 to 3/16 inch (3.2 to 4.8 mm) greater than the beam flange width for straight runway beams, and 3/16 to 1/4 inch (4.8 to 6.3 mm) greater than the beam flange width if runway system includes sharp curves. The use of other than CM supplied washers may result in trackwheel to beam flange variations and thus Table 2 will not apply.

Now install the trolley on the beam by sliding one side frame out far enough to allow the trackwheels to clear the beam flange. Lift the trolley up so that the trackwheels are riding on the beam. Draw the side frames together and tighten the nuts snugly to compress the lockwashers. Suspend the hoist from the trolley hook plate so that the hoist power and control cords are on the control box side of the trolley.

GENERAL INFORMATION

SPECIFICATIONS

The Railstar Motor Driven Trolleys are designed for use with *any hook suspended electric hoist. The trolleys are available in two capacities: 1/8 Through 2 Ton and 3 Ton (250 through 2000 Kg. and 3000 Kg.) These trolleys are similar except for the sizes of the load carrying members.

The trolleys have rugged steel side plates, hardened steel axles, steel suspension bolts, steel hook plate from which the hoist is suspended and hardened cast iron wheels that are suitable for operation on sloped or flat flanged beams. Hardened gears are machined into the flanges of two trackwheels and driven by a hardened steel pinion. The pinion is driven by a planetary gear reducer.

The control box contains a trolley reversing contactor, terminal board for ease of connecting the hoist to the power and control circuits and a transformer (as required). A four button control station is suspended from the control box.

Table 1 provides the general specifications for the motor driven trolleys.

***NOTE: The Railstar Motor Driven Trolleys are only to be used with single speed hoists that are equipped with a reversing contactor.**

CM REPAIR/REPLACEMENT POLICY

If any properly maintained part, within 1 year of shipment, proves to have been originally defective in materials or workmanship, and is returned to CM, transportation prepaid, we will replace or repair the part, no charge, f.o.b. our factory.

We reserve the right to change materials or design if, in our opinion, such changes will improve our product. Abuse, repair by an unauthorized person, or use of non-CM replacement parts voids the guarantee and could lead to dangerous operation. For full Terms of Sales, see Sales Order Acknowledgement. Also, refer to the back cover of this manual for Limitation of Warranties, Remedies and Damages, and Indemnification and Safe Operations.

TABLE 1. TROLLEY SPECIFICATIONS

CM CODE NO.	CAPACITY (TONS)	POWER SUPPLY (VOLTS-PH-HZ)	TRAVEL SPEED (FPM)	MOTOR H.P.	RANGE OF ADJUSTMENT FOR STD. S-BEAMS		MIN RADIUS CURVE	NET WEIGHT (LBS)
					DEPTH (IN)	WIDE FLANGE (IN)		
0300	1/8 THRU 2 TONS	220-3-50 380-3-50 415-3-50 230-3-60 460-3-60	**78 FPM	1/3	6X 12.5 THRU 18X 54.7	3-1/4 THRU 6 IN. (82.5 THRU 152.4 MM)	52 IN. (1.32 M)	102 lbs. (46.3 kg.)
0301		(250 THRU 2000 Kg.)						115-1-60
0302	3 TON (3000 kg.)	220-3-50 380-3-50 415-3-50 230-3-60 460-3-60	**78 FPM	3/4	8X 18.4 THRU 20X 66.0	4 THRU 7 IN. (101.6 THRU 177.8 MM)	71 IN. (1.8 M)	160 lbs. (72.6 kg.)
0303		115-1-60						**23.8 MPM

**TRAVEL SPEED IS FOR 60 HZ. OPERATION. WHEN OPERATING ON 50 HZ, THE TRAVEL SPEED IS 65 F.P.M. F.P.M. (19.8 MPM)

SAFETY PRECAUTIONS

Each CM Railstar Motor Driven Trolley is manufactured in accordance with our interpretation of the applicable sections of the American National Standard Institute Code *B30.11 Monorail Systems and Underhung Cranes, the National Electric Code (ANSI/NFPA No. 70) and the Occupational Safety and Health Act. Since OSHA states that the National Electrical Code applies to all electrical installations and utilization equipment, installers are required to provide current overload protection and grounding in accordance with the code. Users should check each installation for compliance with the application, operation and maintenance requirements of this act.

After you have completely familiarized yourself with the contents of this manual, we recommend that you carefully file it for future reference.

*Copies of these standards may be obtained from ASME Order Department, 22 Law Drive, Box 2300, Fairfield, NJ 07007-2300.



THIS SYMBOL POINTS OUT IMPORTANT SAFETY INSTRUCTIONS WHICH IF NOT FOLLOWED COULD ENDANGER THE PERSONAL SAFETY AND/OR PROPERTY OF YOURSELF AND OTHERS. READ AND FOLLOW ALL INSTRUCTIONS IN THIS MANUAL AND ANY PROVIDED WITH THE EQUIPMENT BEFORE ATTEMPTING TO OPERATE YOUR CM RAILSTAR MOTOR DRIVEN TROLLEY.



WARNING

Improper operation of a hoist can create a potentially hazardous situation which, if not avoided, could result in death or serious injury. To avoid such a potentially hazardous situation, the operator shall:

1. **NOT** operate a damaged, malfunctioning or unusually performing hoist.
2. **NOT** operate the hoist until you have thoroughly read and understood this Operating, Maintenance and Parts Manual.
3. **NOT** operate a hoist which has been modified.
4. **NOT** lift more than rated load for the hoist.
5. **NOT** use hoist with twisted, kinked, damaged, or worn load chain.
6. **NOT** use the hoist to lift, support, or transport people.
7. **NOT** lift loads over people.
8. **NOT** operate a hoist unless all persons are and remain clear of the supported load.
9. **NOT** operate unless load is centered under hoist.
10. **NOT** attempt to lengthen the load chain or repair damaged load chain.
11. Protect the hoist's load chain from weld splatter or other damaging contaminant's.
12. **NOT** operate hoist when it is restricted from forming a straight line from hook to hook in the direction of loading.
13. **NOT** use load chain as a sling, or wrap chain around load.
14. **NOT** apply the load to the tip of the hook or to the hook latch.
15. **NOT** apply the load unless load chain is properly seated in the chain wheel(s) or sprocket(s).
16. **NOT** apply load if bearing prevents equal loading on all load supporting chains.
17. **NOT** operate beyond the limits of the load chain travel.
18. **NOT** leave load supported by the hoist unattended unless specific precautions have been taken.
19. **NOT** allow the load chain or hook to be used as an electrical or welding ground.
20. **NOT** allow the load chain or hook to be touched by a live welding electrode.
21. **NOT** remove or obscure the warnings on the hoist.
22. **NOT** operate a hoist on which the safety placards or decal's are missing or illegible.

23. **NOT** operate a hoist unless it has been securely attached to a suitable support.
24. **NOT** operate a hoist unless load slings or other approved single attachments are properly sized and seated in the hook saddle.
25. Take up slack carefully - make sure load is balanced and load holding action is secure before continuing.
26. Shut down a hoist that malfunctions or performs unusually and report such malfunction.
27. Make sure hoist limit devices function properly.
28. Warn personnel of an approaching load.



CAUTION

Improper operation of a hoist can create a potentially hazardous situation which, if not avoided, could result in death or serious injury. To avoid such a potentially hazardous situation, the operator shall:

1. Maintain a firm footing or be otherwise secured when operating the hoist.
2. Check brake function by tensioning the hoist prior to each lift operation.
3. Use hook latches. Latches are to retain slings, chains, etc. under slack conditions only.
4. Make sure the hook latches are closed and not supporting any parts of the load.
5. Make sure the load is free to move and will clear all obstructions.
6. Avoid swinging the load or hook.
7. Make sure hook travel is in the same direction as shown on the controls.
8. Inspect the hoist regularly, replace damaged or worn parts, and keep appropriate records of maintenance.
9. Use CM parts when repairing the unit.
10. Lubricate load chain per instructions in this manual.
11. **NOT** use the hoist load limiting or warning device to measure load.
12. **NOT** use limit devices as routine operating stops unless allowed by manufacturer. They are emergency devices only.
13. **NOT** allow your attention to be diverted from operating the hoist.
14. **NOT** allow the hoist to be subjected to sharp contact with other hoists, structures, or objects through misuse.
15. **NOT** adjust or repair the hoist unless qualified to perform such adjustments or repairs.

Note: When ordering parts, always furnish trolley model and serial number, motor horsepower, voltage, phase, frequency and rated capacity of trolley on which the parts are to be used.

For the location of the nearest CM Master Parts Depot, see the list located on the inside front cover.

LIMITATION OF WARRANTIES, REMEDIES AND DAMAGES

THE WARRANTY STATED BELOW IS GIVEN IN PLACE OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE, NO PROMISE OR AFFIRMATION OF FACT MADE BY ANY AGENT OR REPRESENTATIVE OF SELLER SHALL CONSTITUTE A WARRANTY BY SELLER OR GIVE RISE TO ANY LIABILITY OR OBLIGATION.

Seller warrants that on the date of delivery to carrier the goods are free from defects in workmanship and materials.

SELLER'S SOLE OBLIGATION IN THE EVENT OF BREACH OF WARRANTY OR CONTRACT OR FOR NEGLIGENCE OR OTHERWISE WITH RESPECT TO GOODS SOLD SHALL BE EXCLUSIVELY LIMITED TO REPAIR OR REPLACEMENT, F.O.B. SELLER'S POINT OF SHIPMENT, OF ANY PARTS WHICH SELLER DETERMINES TO HAVE BEEN DEFECTIVE or if Seller determines that such repair or replacement is not feasible, to a refund of the purchase price upon return of the goods to Seller.

Any action against Seller for breach of warranty, negligence or otherwise, must be commenced within one year after such cause of action accrues.

NO CLAIM AGAINST SELLER FOR ANY DEFECT IN THE GOODS SHALL BE VALID OR ENFORCEABLE UNLESS BUYER'S WRITTEN NOTICE THEREOF IS RECEIVED BY SELLER WITHIN ONE YEAR FROM THE DATE OF SHIPMENT. Seller shall not be liable for any damage, injury or loss arising out of the use of the goods if, prior to such damage, injury or loss, such goods are (1) damaged or misused following Seller's delivery to carrier; (2) not maintained, inspected, or used in compliance with applicable law and Seller's written instructions and recommendations; or (3) installed, repaired, altered or modified

without compliance with such law, instructions or recommendations.

UNDER NO CIRCUMSTANCES SHALL SELLER BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES AS THOSE TERMS ARE DEFINED IN SECTION 2-715 OF THE UNIFORM COMMERCIAL CODE.

INDEMNIFICATION AND SAFE OPERATION

Buyer shall comply with and require its employees to comply with directions set forth in instructions and manuals furnished by Seller and shall use and require its employees to follow such instructions and manuals and to use reasonable care in the use and maintenance of the goods. Buyer shall not remove or permit anyone to remove any warning or instruction signs on the goods. In the event of personal injury or damage to property or business arising from the use of the goods, Buyer shall within 48 hours thereafter give Seller written notice of such injury or damage. Buyer shall cooperate with Seller in investigating any such injury or damage and in the defense of any claims arising therefrom.

If Buyer fails to comply with this section or if any injury or damage is caused, in whole or in part, by Buyer's failure to comply with applicable federal or state safety requirements, Buyer shall indemnify and hold Seller harmless against any claims, loss or expense for injury or damage arising from the use of the goods.

WARNING

Alterations or modifications of equipment and use of non-factory repair parts can lead to dangerous operation and injury.

TO AVOID INJURY:

- Do not alter or modify equipment.
- Do use only factory replacement parts.



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