

LODESTAR[®]

Electric Chain

Operating, Maintenance & Parts Manual
Rated Loads 1/8 To 3 Tonnes
125 Kg To 3000 Kg



Follow all instructions and warning 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 the hoist operator.
Failure to operate the equipment as directed in the manual may cause injury.

Before using the hoist, fill in the information below.
Refer to the hoist identification plate.

Model Number _____

Serial Number _____

Purchase Date _____

Voltage _____

Rated Load _____

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

PARTS FOR YOUR HOIST ARE AVAILABLE FROM YOUR LOCAL AUTHORIZED REPAIR STATION. FOR THE NAME OF THE NEAREST PARTS OR SERVICE CENTER, VISIT OUR WEB SITE **WWW.CMWORKS.COM** OR CALL OUR CUSTOMER SERVICE DEPARTMENT.

SAFETY PRECAUTIONS

Each Lodestar Electric Hoist is built in accordance with the specifications contained herein and at the time of manufacture complied with our interpretation of applicable sections of the "American Society of Mechanical Engineers Code B30.16 "Overhead Hoists," the National Electrical Code (ANSI/NFPA 70) and the Occupational Safety and Health Act. Since OSHA states the National Electrical Code applies to all electric hoists, installers are required to provide current overload protection and grounding [on the branch circuit section] in keeping with the code. Check each installation for compliance with the application, operation and maintenance sections of these articles.

The safety laws for elevators, lifting of people and for dumbwaiters specify construction details that are not incorporated into the hoists. For such applications, refer to the requirements of applicable state and local codes, and the American National Safety Code for elevators, dumbwaiters, escalators and moving walks (ASME A17.1). Columbus McKinnon Corporation cannot be responsible for applications other than those for which CM equipment is intended.

*Copies of this standard can be obtained from ASME Order Department, 22 Law Drive, Box 2300, Fairfield, NJ 07007-2300, U.S.A.



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 LODESTAR HOIST.



WARNING

Usage of hoists that do not involve lifting of the load on the lower hook or using hoists in the inverted position without special precaution may cause an accident resulting in injury and/or property damage.

TO AVOID INJURY:

Consult Columbus McKinnon for information concerning using hoists in these applications.



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 contaminants.
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 load 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 decals 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 switches 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 minor or moderate 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 the hoist manufacturer's recommended parts when repairing the unit.
10. Lubricate load chain per hoist manufacturer's recommendations.
11. **NOT** use the hoist load limiting or warning device to measure load.
12. **NOT** use limit switches 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.

HOIST SAFETY IS UP TO YOU...

! WARNING – DO NOT LIFT MORE THAN RATED LOAD.

1 CHOOSE THE RIGHT HOIST FOR THE JOB...

Choose a hoist with a capacity for the job. Know the capacities of your hoists and the weight of your loads. Then match them. The application, the size and type of load,

the attachments to be used and the period of use must also be taken into consideration in selecting the right hoist for the job. Remember the hoist was designed to ease

our burden and carelessness not only endangers the operator, but in many cases, a valuable load.



! WARNING – DO NOT OPERATE DAMAGED OR MALFUNCTIONING HOIST. – DO NOT OPERATE WITH TWISTED, KINKED OR DAMAGED CHAIN.

2 INSPECT

All hoists should be visually inspected before use, in addition to regular, periodic maintenance inspections.

Inspect hoists for operational warning notices and legibility.

Deficiencies should be noted and brought to the attention of supervisors. Be sure defective hoists are tagged and taken out of



service until repairs are made.

Under no circumstances should you operate a malfunctioning hoist.

Check chain for gouged, twisted, distorted links and foreign material. Do not operate hoists with twisted, kinked or damaged chain.

Load chain should be properly lubricated. Hooks that are bent, worn or whose open-

ings are enlarged beyond normal throat opening should not be used. If latch does not engage throat opening of hook, hoist should be taken out of service.

Check for misphasing – hook travel should correspond to control direction.



! WARNING – DO NOT PULL AT AN ANGLE. BE SURE HOIST AND LOAD ARE IN A STRAIGHT LINE. – DO NOT USE LOAD CHAIN AS A SLING.

3 USE HOIST PROPERLY



Be sure hoist is solidly held in the uppermost part of the support hook arc.



Be sure hoist and load are in a straight line. Do not pull at an angle.



Be sure load is hooked securely. Do not tip load the hook. Do not load hook latch. Hook latch is to prevent detachment of load under slack chain conditions only.



Do not use load chain as a sling. Such usage damages the chain and lower hook.

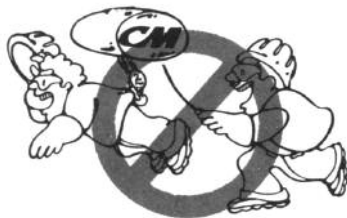


Do not operate with hoist head resting against any object. Lift the load gently. Do not jerk it.

! WARNING – DO NOT LIFT PEOPLE OR LOADS OVER PEOPLE.

4 LIFT PROPERLY

Do not lift co-workers with a hoist. Make sure everyone is clear of the load when you lift. Do not remove or obscure operational warning notices.



5 MAINTAIN PROPERLY

CLEANING: Hoists should be kept clean and free of dust, dirt, moisture, etc., which will in any way affect the operation or safety of the equipment.

LUBRICATION: Chain should be properly lubricated.

AFTER REPAIRS: Carefully operate the hoist before returning it to full service.



VIOLATION OF ANY OF THESE WARNINGS LISTED MAY RESULT IN SERIOUS PERSONAL INJURY TO THE OPERATOR OR NEARBY PERSONNEL BY RELEASED LOAD OR BROKEN HOIST COMPONENTS.

FOREWORD

This manual contains important information to help you properly install, operate and maintain your hoist for maximum performance, economy and safety.

Please study its contents thoroughly before putting your hoist into operation. By practicing correct operating procedures and by carrying out the recommended preventive maintenance suggestions, you will experience long, dependable and safe service.

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

The information herein is directed to the proper use, care and maintenance of the hoist and does not comprise a handbook on the broad subject of rigging.

Rigging can be defined as the process of lifting and moving heavy loads using hoists and other mechanical equipment. Skill acquired through specialized experience and study is essential to safe rigging operations. For rigging information, we recommend consulting a standard textbook on the subject.

TABLE OF CONTENTS

Safety Precautions	3-4
Foreword	5
General Information	
Specifications	6-8
CM Repair/Replacement policy	(Back Page)
Accessories	
Hook Suspensions	9
Lug Suspension	9
Series 635 Low Headroom Trolley	9
Series 635 Motor Driven Trolley	9
Latchlok Hooks	9
Chain Container	9
Installation	
Unpacking Information	10
Installing Suspension	10-11
Recommended Torques	11
Attaching Load Chain	12
Installing Series 635 Low Headroom Trolley	12-13
Power Supply and Electrical Connections	14
Operating Instructions	
General	16
Operating Instruction-Hoist	16-17
Safety Procedures	17
Inspection	
Inspection	18
Frequent Inspections	18-19
Periodic Inspections	18-19
Preventative Maintenance	18
Hook Inspection	18
Load Chain	20
Maintenance	
Load-limiter	21
Hoist Lubrication	21
Trolley Lubrication	21
Adjustments	
Electric Brake	22
Limit Switches	23-24
Troubleshooting	25-27
Electrical Data	28-29
Typical Wiring Diagrams	30-72
Assembly Instructions	
Hook or Lug Suspensions	73
Lower Hook Block Pin	73
Removal and Installation of Load Chain	73-74
Cutting Chain	75
Testing	75

Ordering Instructions	75
Parts List	76-137
Lubricants	138
Recommended Spare Parts	138
Notes	139

LIST OF TABLES

Table	Title	Page
1	Lodestar Electric Chain Hoist Specs.	6-8
2	Recommended Torques	11
3	Series 635 Trolley Side Frame Spacing	13
4	Minimum Frequent Inspections	19
5	Minimum Periodic Inspections	19
6	Limit Switches	22
7	Troubleshooting	25-27
8	Electrical Data	28-29

LIST OF ILLUSTRATIONS

Figure	Table	Page
1	Hook Suspensions	9
2	Lug Suspensions	9
3	Series 635 Low Headroom Trolley	9
4	Series 635 Motor Driven Trolley	9
5	Upper or Lower Latchlok Hook	9
6	Chain Container	9
7	Attaching Load Chain	11
8	Contact Block	12
9	Series 635 Low Headroom Trolley	12
10	1/8 to 2 Ton Hoist to Trolley Assembly	13
11	3 Ton Hoist to Trolley Assembly	13
12	Voltage Change Board	14
13	Locations of Components	14
14	Hook Inspection	18
15	Chain Wear areas	20
16	Gaging Load Chain Wear	20
17	Chain Inspection	20
18	Limit Switches Models, V1 Models	23
18A	Rotatable Limit Switches, V1 Models	23
19	Limit Switches, V2 Models	23
19A	Rotatable Limit Switch, V2 Models	23
20	Typical Wiring Diagrams	30-72
21	Swivel Hook Suspensions	73
22	Chain Embossing	73
23A	Cutting Chain By Nicking	75
23B	Cutting Chain With A Bolt Cutter	75

GENERAL INFORMATION

SPECIFICATIONS

The Lodestar Electric Chain Hoist is a highly versatile materials handling device that can be used to lift loads that are within rated capacity. The mechanical features of these hoists include an alloy steel lift wheel, Load Limiter, hardened steel chain guides, hardened steel gear train, life-time lubrication, forged steel hooks and lightweight aluminum frame. The electrical features include hoist-duty motor, rugged hoist brake, magnetic reversing contactor and voltage conversion board (dual voltage units). The hoist is available with hook or lug suspensions that are supplied separately. Table 1 summarizes the Lodestar Electric Chain Hoist models and the Series 635 Trolleys available. It should be noted that standard single speed hoists are available with 10 (3M), 15 (4.6M) and 20 (6.1M) foot lifts and the standard lift for two speeds hoists is 10 feet. However, hoists with longer lifts are available on a special, per order basis.

CM REPAIR/REPLACEMENT POLICY

All Columbus McKinnon (CM®) Lodestar Electric Chain Hoists are inspected and performance tested prior to shipment. If any properly maintained hoist develops a performance problem due to a material or workmanship defect, as verified by CM®, repair or replacement of the unit will be made to the original purchaser without charge. This repair/replacement policy applies only to Lodestar Hoists installed, maintained and operated as outlined in this manual, and specifically excludes parts subject to normal wear, abuse, improper installation, improper or inadequate maintenance, hostile environmental effects and unauthorized repairs/modifications.

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 Sale, see Sales Order Acknowledgement. Also, refer to the back cover for Limitations of Warranties, Remedies and Damages, and Indemnification and Safe Operation.

Table 1.a. Specifications

Lodestar Electric Chain Hoists Single Speed 115-1-60											
Model	Load Capacity		Lifting Speed 60Hz units		Lifting Speed 50Hz units		Chain Falls	Chain Size		Chain Weight per length of lift	
	Tonne	kg	ft/min	m/min	ft/min	m/min		in x in	mm x mm	lb/ft	kg/m
A	1/8	125	32	9.8	26.7	8.1	1	.250 x .7445	6.35 x 18.9	0.585	0.87
AA	1/8	125	60	18.3	50.0	15.2	1	.250 x .7445	6.35 x 18.9	0.585	0.87
B	1/4	250	16	4.9	13.3	4.1	1	.250 x .7445	6.35 x 18.9	0.585	0.87
C	1/4	250	32	9.8	26.7	8.1	1	.250 x .7445	6.35 x 18.9	0.585	0.87
E	1/2	500	8	2.4	6.7	2.0	2	.250 x .7445	6.35 x 18.9	1.17	1.74
F	1/2	500	16	4.9	13.3	4.1	1	.250 x .7445	6.35 x 18.9	0.585	0.87
J	1/2	500	32	9.8	26.7	8.1	1	.312 x .8583	7.92 x 21.8	0.585	0.87
H	1	1000	8	2.4	6.7	2.0	2	.250 x .7445	6.35 x 18.9	1.17	1.74
L	1	1000	16	4.9	13.3	4.1	1	.312 x .8583	7.92 x 21.8	0.94	1.40
R	2	2000	8	2.4	6.7	2.0	2	.312 x .8583	7.92 x 21.8	1.88	2.80
RT	3	3000	5.3	1.6	4.4	1.4	3	.312 x .8583	7.92 x 21.8	2.82	4.20

Lodestar Electric Chain Hoists Single Speed 115-1-60									
Model	Shortest Distance Between Hooks		Motor Power 60Hz		Motor Power 50Hz		IP Rating	Net Weight 10' lift less upper suspension	
	in	mm	HP	kW	HP	kW		lb	kg
A	16.9	429	0.25	0.19	0.21	0.16	54	72	32.8
AA	19.9	505	0.50	0.37	0.42	0.31	54	76	34.3
B	16.9	429	0.25	0.19	0.21	0.16	54	73	33.1
C	16.9	429	0.50	0.37	0.42	0.31	54	75	34.2
E	21.6	549	0.25	0.19	0.21	0.16	54	78	31.8
F	16.9	429	0.50	0.37	0.42	0.31	54	76	34.5
J	18.1	460	1.00	0.75	0.83	0.62	54	127	57.5
H	21.6	549	0.50	0.37	0.42	0.31	54	81	36.7
L	18.1	460	1.00	0.75	0.83	0.62	54	125	56.7
R	25.8	655	1.00	0.75	0.83	0.62	54	148	67.1
RT	32.1	815	1.00	0.75	0.83	0.62	54	166	75.4

Table 1.b.Specifications, cont'd

Lodestar Electric Chain Hoists											
Single Speed 230/460-3-60 or 220/380-3-50 or 220/415-3-50											
Model	Load Capacity		Lifting Speed 60 Hz units		Lifting Speed 50Hz units		Chain Falls	Chain Size		Chain Weight per length of lift	
	Tonne	kg	ft/min	m/min	ft/min	m/min		in x in	mm x mm	lb/ft	kg/m
A	1/8	125	32	9.8	26.7	8.1	1	.250 x .7445	6.35 x 18.9	0.585	0.87
AA	1/8	125	60	18.3	50.0	15.2	1	.250 x .7445	6.35 x 18.9	0.585	0.87
B	1/4	250	16	4.9	13.3	4.1	1	.250 x .7445	6.35 x 18.9	0.585	0.87
C	1/4	250	32	9.8	26.7	8.1	1	.250 x .7445	6.35 x 18.9	0.585	0.87
E	1/2	500	8	2.4	6.7	2.0	2	.250 x .7445	6.35 x 18.9	1.17	1.74
F	1/2	500	16	4.9	13.3	4.1	1	.250 x .7445	6.35 x 18.9	0.585	0.87
J	1/2	500	32	9.8	26.7	8.1	1	.312 x .8583	7.92 x 21.8	0.585	0.87
JJ	1/2	500	64	19.5	53.3	16.3	1	.312 x .8583	7.92 x 21.8	0.94	1.40
H	1	1000	8	2.4	6.7	2.0	2	.250 x .7445	6.35 x 18.9	1.17	1.74
L	1	1000	16	4.9	13.3	4.1	1	.312 x .8583	7.92 x 21.8	0.94	1.40
LL	1	1000	32	9.8	26.7	8.1	1	.312 x .8583	7.92 x 21.8	0.94	1.40
R	2	2000	8	2.4	6.7	2.0	2	.312 x .8583	7.92 x 21.8	1.88	2.80
RR	2	2000	16	4.9	13.3	4.1	2	.312 x .8583	7.92 x 21.8	1.88	2.80
RT	3	3000	5.3	1.6	4.4	1.4	3	.312 x .8583	7.92 x 21.8	2.82	4.20
RRT	3	3000	10.7	3.3	8.9	2.7	3	.312 x .8583	7.92 x 21.8	1.88	2.80

Lodestar Electric Chain Hoists									
Single Speed 230/460-3-60 or 220/380-3-50 or 220/415-3-50									
Model	Shortest Distance Between Hooks		Motor Power 60Hz		Motor Power 50Hz		IP Rating	Net Weight 10' lift less upper suspension	
	in	mm	HP	kW	HP	kW		lb	kg
A	16.9	429	0.25	0.19	0.21	0.16	54	70	31.9
AA	19.9	505	0.50	0.37	0.42	0.31	54	73	32.9
B	16.9	429	0.25	0.19	0.21	0.16	54	71	32.2
C	16.9	429	0.50	0.37	0.42	0.31	54	72	32.8
E	21.6	549	0.25	0.19	0.21	0.16	54	76	30.9
F	16.9	429	0.50	0.37	0.42	0.31	54	73	33.1
J	18.1	460	1.00	0.75	0.83	0.62	54	121	54.7
JJ	18.1	460	2.00	1.49	1.67	1.24	54	127	57.5
H	21.6	549	0.50	0.37	0.42	0.31	54	78	35.4
L	18.1	460	1.00	0.75	0.83	0.62	54	119	53.9
LL	18.1	460	2.00	1.49	1.67	1.24	54	127	57.6
R	25.8	655	1.00	0.75	0.83	0.62	54	142	64.4
RR	25.8	655	2.00	1.49	1.67	1.24	54	150	68.0
RT	32.1	815	1.00	0.75	0.83	0.62	54	160	72.7
RRT	32.1	815	2.00	1.49	1.67	1.24	54	173	78.4

Table 1.c. Specifications, cont'd

Lodestar Electric Chain Hoists											
Two Speed 230-3-60 or 460-3-60 or 575-3-60 or 220-3-50 or 380-3-50 or 415-3-50 or 550-3-50											
Model	Load Capacity		Lifting Speed 60Hz units		Lifting Speed 50Hz units		Chain Falls	Chain Size		Chain Weight per length of lift	
	Tonne	kg	ft/min	m/min	ft/min	m/min		in x in	mm x mm	lb/ft	kg/m
A-2	1/8	125	10.7/32	3.3/9.8	8.9/26.7	2.7/8.1	1	.250 x .7445	6.35 x 18.9	0.585	0.87
AA-2	1/8	125	20/60	6.1/18.3	16.7/50	5.1/15.2	1	.250 x .7445	6.35 x 18.9	0.585	0.87
B-2	1/4	250	5.3/16	1.6/4.9	4.4/13.3	1.4/4.1	1	.250 x .7445	6.35 x 18.9	0.585	0.87
C-2	1/4	250	10.7/32	3.3/9.8	8.9/26.7	2.7/8.1	1	.250 x .7445	6.35 x 18.9	0.585	0.87
E-2	1/2	500	2.7/8	0.8/2.4	2.2/6.7	0.7/2	2	.250 x .7445	6.35 x 18.9	1.17	1.74
F-2	1/2	500	5.3/16	1.6/4.9	4.4/13.3	1.4/4.1	1	.250 x .7445	6.35 x 18.9	0.585	0.87
J-2	1/2	500	10.7/32	3.3/9.8	8.9/26.7	2.7/8.1	1	.312 x .8583	7.92 x 21.8	0.585	0.87
JJ-2	1/2	500	21.3/64	6.5/19.5	17.8/53.3	5.4/16.3	1	.312 x .8583	7.92 x 21.8	0.94	1.40
H-2	1	1000	2.7/8	0.8/2.4	2.2/6.7	0.7/2	2	.250 x .7445	6.35 x 18.9	1.17	1.74
L-2	1	1000	5.3/16	1.6/4.9	4.4/13.3	1.4/4.1	1	.312 x .8583	7.92 x 21.8	0.94	1.40
LL-2	1	1000	10.7/32	3.3/9.8	8.9/26.7	2.7/8.1	1	.312 x .8583	7.92 x 21.8	0.94	1.40
R-2	2	2000	2.7/8	0.8/2.4	2.2/6.7	0.7/2	2	.312 x .8583	7.92 x 21.8	1.88	2.80
RR-2	2	2000	5.3/16	1.6/4.9	4.4/13.3	1.4/4.1	2	.312 x .8583	7.92 x 21.8	1.88	2.80
RT-2	3	3000	1.8/5.3	0.5/1.6	1.5/4.4	0.5/1.4	3	.312 x .8583	7.92 x 21.8	2.82	4.20
RRT-2	3	3000	3.6/10.7	1.1/3.3	3/8.9	0.9/2.7	3	.312 x .8583	7.92 x 21.8	1.88	2.80

Lodestar Electric Chain Hoists									
Two Speed 230-3-60 or 460-3-60 or 575-3-60 or 220-3-50 or 380-3-50 or 415-3-50 or 550-3-50									
Model	Shortest Distance Between Hooks		Motor Power 60Hz		Motor Power 50Hz		IP Rating	Net Weight 10' lift less upper suspension	
	in	mm	HP	kW	HP	kW		lb	kg
A-2	16.9	429	0.25	0.19	0.21	0.16	54	76	34.6
AA-2	19.9	505	0.50	0.37	0.42	0.31	54	78	35.2
B-2	16.9	429	0.25	0.19	0.21	0.16	54	77	34.9
C-2	16.9	429	0.50	0.37	0.42	0.31	54	77	35.1
E-2	21.6	549	0.25	0.19	0.21	0.16	54	82	33.6
F-2	16.9	429	0.50	0.37	0.42	0.31	54	78	35.4
J-2	18.1	460	1.00	0.75	0.83	0.62	54	133	60.2
JJ-2	18.1	460	2.00	1.49	1.67	1.24	54	135	61.1
H-2	21.6	549	0.50	0.37	0.42	0.31	54	83	37.6
L-2	18.1	460	1.00	0.75	0.83	0.62	54	131	59.4
LL-2	18.1	460	2.00	1.49	1.67	1.24	54	135	57.6
R-2	25.8	655	1.00	0.75	0.83	0.62	54	154	61.2
RR-2	25.8	655	2.00	1.49	1.67	1.24	54	158	69.8
RT-2	32.1	815	1.00	0.75	0.83	0.62	54	172	71.6
RRT-2	32.1	815	2.00	1.49	1.67	1.24	54	181	82.1

Table 1.d. Specifications, cont'd

Table 1.e. Specifications, cont'd

Series 635 Low Headroom Trolleys				
Capacity Tons (kg)	For Use With Models	Adj. For STD S-Beams Depth In. (mm)	Tread Dia. of Wheels In. (mm)	Min. Rad. Curve In. (mm)
1/8 to 1 (125 to 2000)	A thru LL-2	4 - 15 (102 - 381)	3 3/8 (79.4)	24 (610)
	R thru RR-2	6 - 18 (152 - 457)	4 3/4 (120.6)	24 (610)
3 (3000)	RT thru RRT-2	8 - 15 (203 - 381)	4 (101.6)	30 (762)

Series 635 Motor Driven Trolleys					
Capacity Tons (kg)	For Use With Models	*Travel Speed FPM (MPM)	Motor H.P. (kW)	Adj. For STD S-Beams Depth In.(mm)	Min. Rad. Curve In.(mm)
1/8 to 2 (125 to 2000)	A thru RR-2	75 (23)	1/4 (.19)	6 - 15 (152 - 381)	30 (762)
	RT thru RRT-2	75 (23)	1/4 (.19)	6 - 15 (152 - 381)	30 (762)

ACCESSORIES

Hook Suspensions

Swivel and rigid type hook suspensions (see Figure 1) are available for all Lodestar Electric Hoists. However, rigid type hook suspensions are normally recommended for most application. The hook suspensions are intended for suspending the hoist from a trolley which has a single load bar (such as CM's® Series 632 and 633 Trolleys) or for suspending the hoist from a fixed structure.

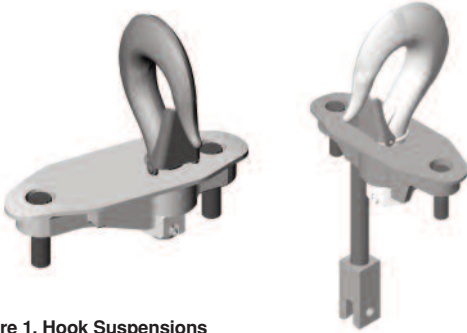


Figure 1. Hook Suspensions

Lug Suspension

Lug suspensions (see Figure 2) are available for all Lodestar Electric Hoists. These are rigid type suspensions wherein the lug shown replaces the hook (Figure 1) in the suspension adapter. The Lug suspensions are required for suspending the hoist from the Series 635 Low Headroom and Motor Driven Trolleys described next.



Figure 2. Lug Suspensions

Series 635 Low Headroom Trolley

These are manual push type trolleys (see Figure 3) designed for use with the Lodestar Electric Chain Hoists. A rigid lug suspension (see Figure 2) is required to suspend the hoist from the trolley. The trolley is adjustable for operation on a range of American Standard "S" beams as indicated in Table 1, and it will also operate on flat flanged beams.



Figure 3. Series 635 Low Headroom Trolley



Figure 4. Series 635 Motor Driven Trolley

Series 635 Motor Driven Trolley

The motor driven trolleys (see Figure 4) are self-contained and supplied complete with independent controls and wiring, including a four directional control station. A rigid lug suspension (see Figure 2) is required to suspend the hoist from the Motor Driven Trolley. The hoist and trolley are joined electrically by connecting the hoist control and power cords (supplied) into the hoist or trolley. The trolley is adjustable for operation on a range of American Standard "S" beams as indicated in Table 1 and it will also operate on flat flanged beams.

Latchlok® Hooks

CM's Latchlok hooks (see Figure 5) are available to replace the standard upper and lower hooks used on the Lodestar Electric Hoists.



Figure 5. Latchlok® Hook

Chain Container

This accessory (see Figure 6) is used to hold slack chain and it is supplied complete with mounting hardware and instructions. The chain container is recommended for those applications where the slack chain would interfere with the load or drag on the floor as may be the case with double or triple reeved units. Chain containers can be furnished for units already in use.



Figure 6. Chain Container

INSTALLATION

UNPACKING INFORMATION

When received, the hoist should be carefully inspected for damage which may have occurred during shipment or handling. Check the hoist frame for dents or cracks, the external cords for damaged or cut insulation, the control station for cut or damaged enclosure, and inspect the load chain for nicks and gouges. If shipping damage has occurred, refer to the packing list envelope on the carton for claim procedure.

Before installing the hoist, make sure that the power supply to which it will be connected is the same as that shown on the nameplate located on the side of the hoist.

NOTE: See Electrical Installation instructions

INSTALLING THE SUSPENSION

A. Single Reeved Units:

Remove the hook suspension and (2) suspension screws from the packaging. Place the suspension assembly into the recess on top of the hoist so that the adaptor body follows the contour of the hoist. Insert the suspension screws through the holes in the adaptor and hand thread these into the self-locking nuts enclosed in the hoist. .



CAUTION

USE OF IMPACT TOOLS (ELECTRIC OR PNEUMATIC) MAY CAUSE PREMATURE FAILURE OF ATTACHING HARDWARE.

Securely tighten the screws to the recommended seating torque (see Table 2) using a 12 point socket: 3/8" for Models A, B, C, & F and 1/2 " for Models J-LL.

B. Double Reeved Units:

Remove the hook suspension,(2) suspension screws, (1) dead end pin, (1) washer, and (1) cotter pin from the packaging. It should be noted that the suspension includes a dead end bolt and block for supporting the dead end of the load chain as shown in Figure 7.

Place the suspension assembly into the recess on top of the hoist. The dead end block should project through the bottom of the hoist with the pin hole and slot aligned to the underside of the hoist as shown in Figure 7. If these are not aligned as shown, lift the head of the bolt from the hex recess in the adaptor and turn the bolt and block assembly and reseal the bolt head to obtain the proper alignment. **Do not** change the position of the dead end block on the bolt to attain this alignment.

Check the position of the pin hole in the dead end block to make sure it has not been disturbed from its factory setting. The distance from the top of the pin hole to the bottom of the hoist should not exceed 1/4" (6.35mm) for Models E,E-2, H, H-2 and 7/16" (11.11mm) for Models R, R-2, RR, RR-2. If the distance is not correct, adjust the position of the dead end block to obtain the proper distance (see fig. 21, p 73.)

Now, insert the suspension screws through the holes in the adaptor and hand thread these into the self-locking nuts

enclosed in the hoist frame. Securely tighten the screws to the recommended seating torque (see Table 2) using a 12 point socket: 3/8" for Models E & H and 1/2" for Models R & RR.

The dead end of the load chain is temporarily positioned (a few links from the end) by a wire tie. **Do not remove this tie before attaching the chain to the dead end block.** (See Fig. 7)

C. Triple Reeved Units:

These hoists have a sheave hanger which is loosely connected to the top of the frame by a thin metal plate for shipping purposes. To attach the suspension, support the sheave hanger from the underside of the hoist and remove the nut and seat from the sheave stud. Remove and discard the shipping plate and retain the sheave stud nut and seat since they will be reused later.

Remove the suspension assembly from the carton and the two suspension screws. Place the suspension assembly over the sheave stud and into the recess on top of the hoist.

Insert the suspension screws through the holes in the suspension adapter and hand thread these into the self-locking nut enclosed in the hoist. Securely tighten the screws to the recommended seating torque (see Table 2) using a 12 point, 1/2" socket.

After the suspension assembly is installed, secure the sheave stud to the suspension adapter using the round slotted nut and seat that were formerly used to attach the shipping plate to top of the hoist frame. Place the seat over the stud with the flat side down and then rotate the seat so that there is clearance between the seat and the suspension lug or hook. Assemble the nut to the stud and turn the nut by hand until the nut seats in the seat and the sheave hanger is snug in the frame. Then back off the nut until the hole in the stud is in line with one of the slots in the nut. Using a hammer, drive the retaining pin (packed with the suspension assembly) into the hole in the sheave stud until the end of the pin is flush with the edge of the nut.



WARNING

Using other than CM supplied high strength suspension screws to attach the suspension adapter to the hoist may cause the screws to break and allow the hoist and load to fall.

TO AVOID INJURY:

Use only the CM supplied suspension screws to attach the suspension to the hoist and hand torque these screws to the recommended seating torque as specified in tables 2a and 2b. DO NOT apply any type of lubricant to the threads of these screws. Lubricating the threads will reduce the effort to seat the screws and as a result, tightening the screws to the above recommended torque may break the screw,damage the suspension adapter, strip the nuts and/or damage the hoist frame.

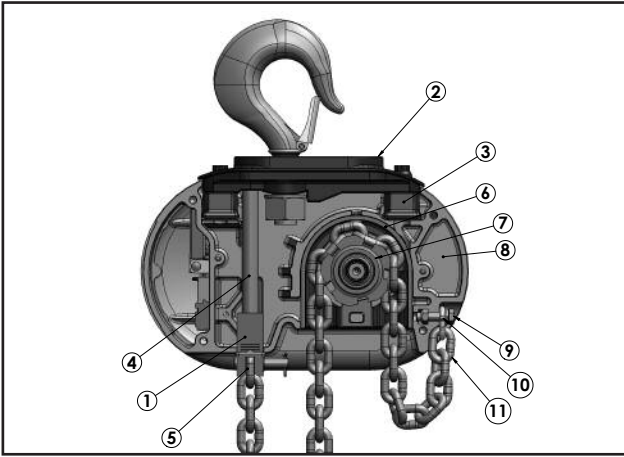


Figure 7. Attaching Load Chain Double Reeved Models

- | | |
|--------------------------------|--------------------|
| 1. Dead end block | 7. Lift-wheel |
| 2. Suspension assembly | 8. Motor housing |
| 3. Suspension self-locking nut | 9. Loose end screw |
| 4. Dead end bolt | 10. Loose end link |
| 5. Dead end link | 11. Loose end |
| 6. Chain guide | |
- (Do not order parts by these numbers. See parts list)

Table 2.a. Recommended Torques: V1 Models A-H

Fastener	Fastener Description	Tool Required	*Recommended Seating Torque	
			ft-lbf	N-m
Brake End cover	1/4-20 Slotted Fillister Head Screw	Slotted Blade Screw Driver	4.0 - 5.0	5.4 - 6.8
Motor End cover	1/4-20 Slotted Fillister Head Screw	Slotted Blade Screw Driver	4.0 - 5.0	5.4 - 6.8
Brake Attaching Screws	1/4-20 Slotted Fillister Head Screw	Slotted Blade Screw Driver	4.2 - 5.0	5.6 - 6.8
Power Cord Strain Relief Nut	1/4-20 Hex Nut	7/16" - 6 or 12 Point Socket	1.7 - 2.0	2.3 - 2.7
Motor Housing/ Gear Housing/ Back Frame	1/4"-20 Socket Head Cap Screw	3/16" Hex Driver	7.9 - 8.3	10.7 - 11.3
Lower Hook Block Screws - Doubled Reeved	1/4"-20 Socket Head Cap Screw	3/16" Hex Driver	5.0 - 5.8	6.8 - 7.9
Suspension Adapter Screws	3/8"-16-12 Point Cap Screw	3/8" 12 Point Socket	35.0 - 45.0	47.5 - 61.0
Lift-Wheel Locking Nut	1"-12 Hex Nut	1-1/2" - 6 or 12 Point Socket	55.0 - 60.0	74.6 - 81.3
Reversing Contactor Connecting Screws-1ø	Terminal Clamp Screw	Phillips No.2 or 3/16" Slotted Head Screw Driver	0.6 - 1.0	0.8 - 1.3
Reversing Contactor Connecting Screws-3ø	Terminal Clamp Screw	Phillips No.2 or 3/16" Slotted Head Screw Driver	0.6 - 1.0	0.8 - 1.3

Table 2.b. Recommended Torques: V2 Models J-RRT

Fastener	Fastener Description	Tool Required	*Recommended Seating Torque	
			ft-lbf	N-m
Brake End cover	1/4-20 Slotted Fillister Head Screw	Slotted Blade Screw Driver	4.0 - 5.0	5.4 - 6.8
Motor End cover	1/4-20 Slotted Fillister Head Screw	Slotted Blade Screw Driver	4.0 - 5.0	5.4 - 6.8
Brake Attaching Screws	1/4-20 Slotted Fillister Head Screw	Slotted Blade Screw Driver	4.2 - 5.0	5.6 - 6.8
Brake Hex Stud	1/2" Hex w/ 5/16 -18 Threaded End	1/2" Open-End Wrench	4.2 - 5.0	5.6 - 6.8
Power Cord Strain Relief Nut	1/4-20 Slotted Rd. Head Screw	Slotted Blade Screw Driver	1.7 - 2.0	2.3 - 2.7
Motor Housing/ Gear Housing/ Back Frame	5/16"-18 Socket Head Cap Screw	1/4" Hex Driver	14.2 - 15.0	19.2 - 20.3
Lower Hook Block Screws - Doubled Reeved	5/16"-18 Socket Head Cap Screw	1/4" Hex Driver	10.0 - 11.3	13.6 - 15.3
Suspension Adapter Screws	1/2"-20-12 Point Cap Screw	1/2" 12 Point Socket	70.0 - 80.0	94.9-108.5
Lift-Wheel Locking Nut	1-1/8"-12 Hex Nut	1-11/16" - 6 or 12 Point Socket	85.0 - 90.0	115.2-122.0
Reversing Contactor Connecting Screws-1ø	Terminal Clamp Screw	Phillips No.2	1.3	1.7
Reversing Contactor Connecting Screws-3ø	Terminal Clamp Screw	Phillips No.2 or 3/16" Slotted Head Screw Driver	0.6 - 1.0	0.8 - 1.3
Stator Mounting Screws	1/4"- 20 Hex Cap Screw	7/16" - 6 or 12 Point Socket	4.2 - 5.0	5.8 - 6.8

* All torque values are for clean, dry fasteners. DO NOT apply oil or any other lubricant to the fastner threads.

ATTACHING LOAD CHAIN

To attach the chain to the dead end block on Models E, E-2, H, H-2, R, R-2 and RR-2, proceed as follows:

1. Suspend the hoist from an adequate support.
2. On Models E, E-2, H and H-2, insert the last link of the load chain into the dead end block (2) and secure it with the dead end pin, washer and cotter pin furnished with the suspension. Ensure there are no twists in the chain.
3. On Models R, R-2, RR and RR-2, slide the contact block up the chain until it is against the bottom of the hoist and the dead end block is projecting through the square opening in the bottom of the block. Insert the last link of the load chain, making sure there are no twists between the hook block and the dead end block, into the dead end block. Push the contact block up slightly and secure the load chain to the dead end block using the dead end pin, washer and cotter pin furnished with the suspension. The dead end pin also supports the contact block (See Figure 8)

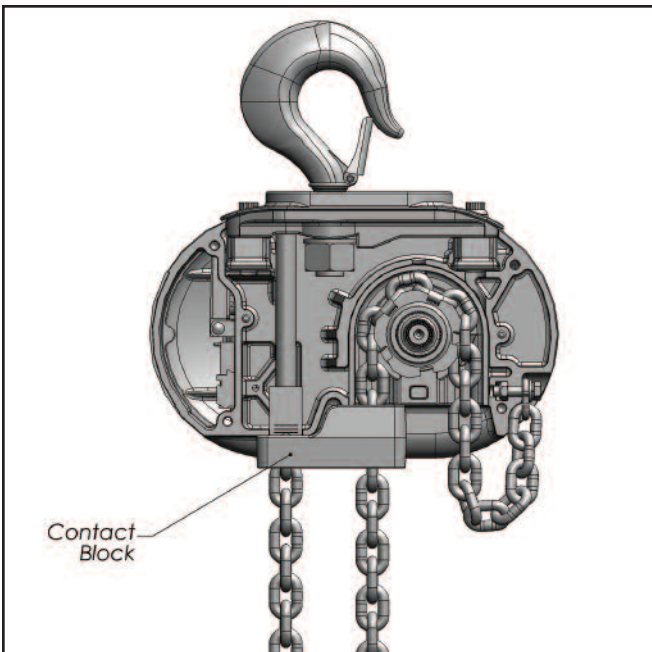


Figure 8. Contact Block Used on Models R, R-2, RR and RR-2

4. Do not remove the plastic ties from the load chain at this time.

After the suspension is installed, hoists with a hook suspension can be suspended from its permanent support and then connected to the power supply system (refer to page 14). For hoists with a lug suspension that are to be suspended from a Series 635 Low Headroom Trolley, attach the hoist to the trolley per the following instructions.

INSTALLING THE SERIES 635 LOW HEADROOM TROLLEY (See Figure 9)



WARNING

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

TO AVOID INJURY:

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

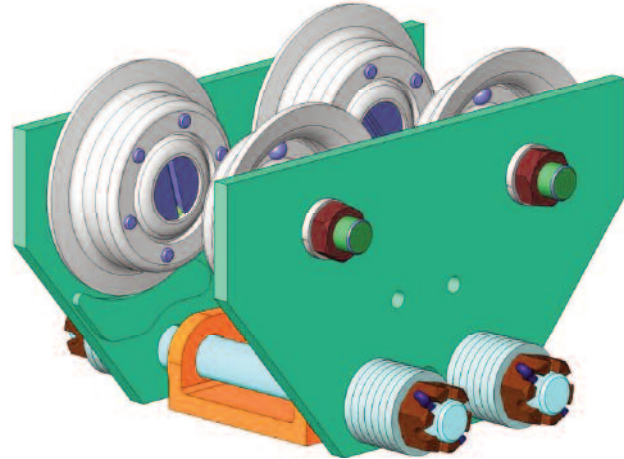


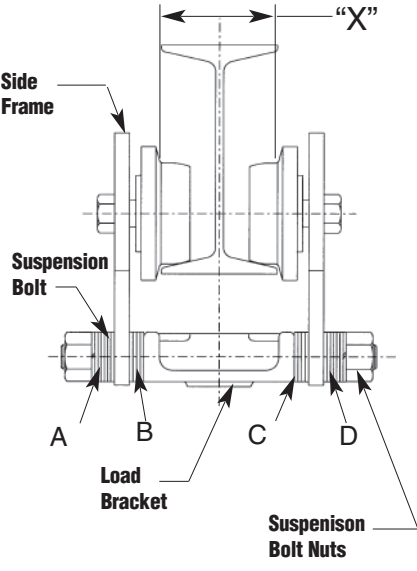
Figure 9. Series 635 Low Headroom Trolley: 1 and 2 Ton (1000 and 2000 kg) Trolley Shown - 3 Ton (3000 kg) Similar.

For hoists with a lug suspension that are to be suspended from a Series 635 Motor Driven Trolley, attach the hoist to the trolley, wire the hoist and trolley together and connect the trolley to the power supply system per the instructions supplied with the trolley.

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.

It is recommended that the trolley be mounted on the beam prior to attaching the hoist to 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 the measurement and Table 3, determine the arrangement of the spacer washers. Loosely assemble the side frames, load bracket, spacer washers and nuts on the suspension bolts as shown in Table 3.

Table 3. Series 635 Low Headroom Trolley Side Frame Spacing



Standard Load Bracket 3 7/16" Wide 1 Ton Capacity				
Flange Width	No. of Spacers			
	A	B	C	D
2 5/8	10	0	0	10
3	9	1	1	9
3 3/8	8	2	2	8
3 5/8	7	3	3	7
4	6	4	4	6
4 5/8	4	6	6	4
5	3	7	7	3
5 1/4	2	8	8	2
5 5/8	1	9	9	1

Standard Load Bracket 5 7/16" Wide 1 Ton Capacity				
Flange Width	No. of Spacers			
	A	B	C	D
6	6	5	5	5
6 1/4	5	6	6	4
7	2	9	9	1


Standard Load Bracket 4 3/16" Wide 2 Ton Capacity				
Flange Width	No. of Spacers			
	A	B	C	D
3 3/8	8	0	0	8
3 5/8	7	1	1	7
4	6	2	2	6
4 5/8	4	4	4	4
5	3	5	5	3
5 1/4	3	5	6	2
5 5/8	2	6	7	1
6	0	8	8	0

Standard Load Bracket 6 11/16" Wide 2 Ton Capacity				
Flange Width	No. of Spacers			
	A	B	C	D
6 1/4	8	2	1	8
7	5	5	4	5
7 1/8	5	5	5	4
7 1/4	4	6	5	5
7 7/8	2	8	8	1
8	1	9	8	1

Standard Load Bracket 4 13/16" Wide 3 Ton Capacity				
Flange Width	No. of Spacers			
	A	B	C	D
4	6	1	1	7
4 5/8	5	3	3	4
5	4	4	4	3
5 1/4	3	5	5	2
5 5/8	3	5	6	1

Standard Load Bracket 3 7/16" Wide 1 Ton Capacity				
Flange Width	No. of Spacers			
	A	B	C	D
6	7	2	2	6
6 1/4	6	3	2	6
7	4	5	5	3
7 1/8	3	6	5	3

*Dimension applies to minimum S-Beam and will vary with larger S-Beams..



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 3 to determine the arrangement of the spacer washers for that flange width.

Note: 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 (3.18 to 4.77 mm) greater than the beam flange width for straight runway beams, and 3/16 to 1/4 inch (4.77 to 6.35 mm) greater than the beam flange width if runway system includes sharp curves. Also, the use of other than CM supplied washers may result in trackwheel to beam flange variations and thus Table 3 will not apply.

On the 1/8 to 2-ton (125 to 2000 kg) trolleys, assemble the suspension lug on hoist to the trolley on beam as shown in Figure 10. The lug is inserted in the trolley load bracket and retained by the vertical load bar pin. A socket head cap screw and lockwasher are used to keep it in place.

For the 3-ton (3000 kg) trolley, a shackle and pin assembly consisting of a pin retained in a central position by retainers is packed loose with the suspension. Insert this assembly into the opening in the top of the load bracket with the legs of the shackle down. Position the shackle pin in the groove provided for the same in the load bracket making sure it is centered between the suspension bolts.

Now install the trolley on the beam by sliding one side frame out far enough to allow all 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. Insert the cotter pins through the slotted nuts and holes in the suspension bolts and spread the legs of the cotter pins to secure.

On the 3 ton (3000 kg) trolley (refer to Figure 11), drive one retaining pin into the hole on one end of the lug pin. Raise the hoist into position so that the lug is between the legs of the shackle. Align the holes in the shackle and lug. Insert the lug pin in the aligned holes and secure the lug pin by driving the remaining retaining pin into the hole in the lug pin. Make certain that the shackle pin is properly seating in the load bracket by manipulating the hoist and checking for freedom of movement (swinging) in both planes and all four directions.

Note that the shackle pin should be retained and centered in the shackle by the retainers.

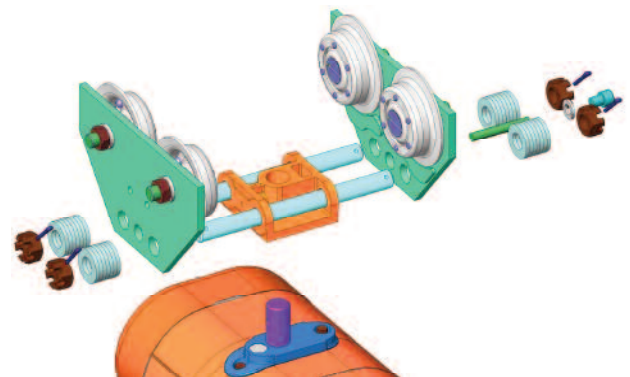


Figure 10. 1/8 to 2 Ton (125 to 2000 kg) Hoist to Trolley Assembly

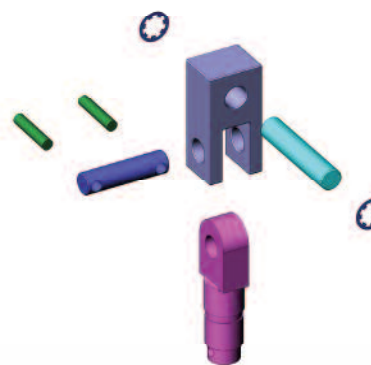


Figure 11. 3 Ton (3000 kg) Hoist to Trolley Assembly

POWER SUPPLY AND ELECTRICAL CONNECTIONS

The hoist should be connected to a branch circuit which complies with the requirements of the National Electrical Code and applicable local codes.

It is recommended, especially for a single phase hoist with a (1) horsepower motor (.75 Kilowatts), that a line with adequate capacity be run directly from the power supply to the hoist to prevent problems with low voltage and circuit overloads.

For grounding of the hoist, the power cord includes a grounding conductor (green yellow, G-Y). Before connecting the hoist to the power supply, check that the power to be used agrees with the position of voltage change plug on the voltage change board. The nominal hoist voltage rating corresponding to the voltage range given on hoist identification plate is:

SINGLE SPEED UNITS		TWO SPEED UNITS	
Range	Nominal	Range	Nominal
110-120	115	--	--
208-240	230	208-240	230
440-480	460	440-480	460
550-575	575	550-575	575

THREE PHASE HOIST

Unless ordered on a special basis, all single speed/dual voltage (230/460-3-60, 220/380-3-50 and 220/415-3-50) hoists are factory arranged to operate on 460-3-60 (or 380-3-50 or 415-3-50). However, a voltage change board is provided to easily and quickly change from 460 to 230 (or 380 to 220 or 415 to 220) volt operation. The voltage change board shown in Figure 12 is located in the hoist as shown in Figure 13.

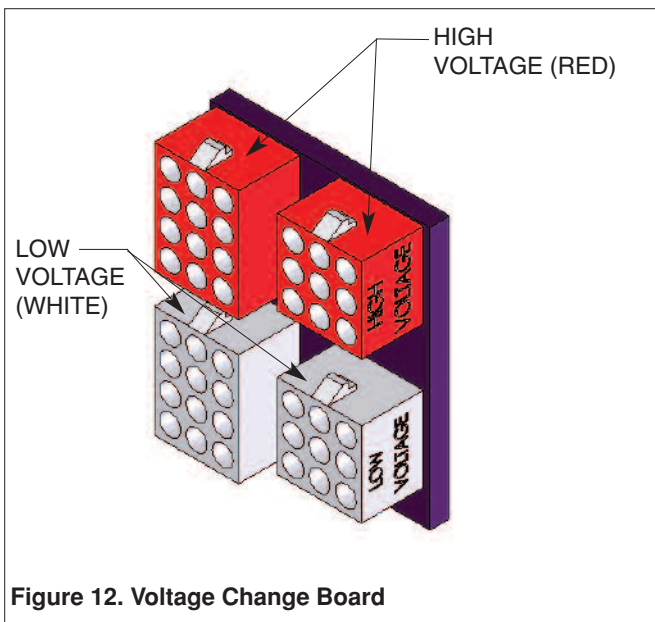


Figure 12. Voltage Change Board

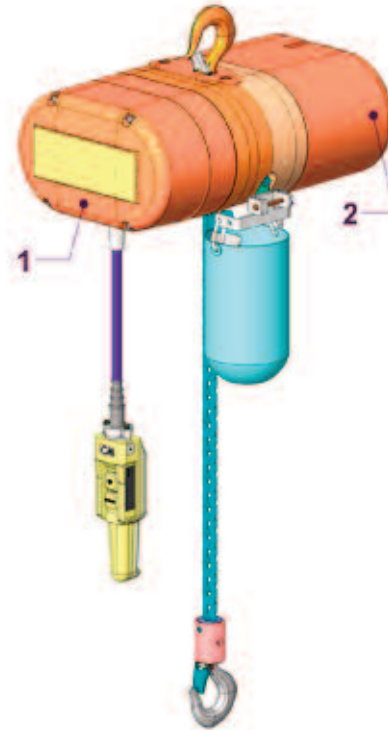


Figure 13. Location of Components

Voltage conversion board is located under back frame cover (1) for Models A-H and under motor housing cover (2) for Models J-RRT.

The voltage change board is color coded to indicate high and low voltage connections. Connecting the 9 and 12 pin plugs into the "Red" voltage change board receptacles will connect the hoist for high voltage (380-3-50, 415-3-50 or 460-3-60). To change the hoist voltage to low voltage (208-3-60, 220-3-50 or 230-3-60) simply remove the 9 and 12 pin plugs from the "Red" receptacles and insert same into the "White" receptacles located on the voltage change board. Be sure to make a notation of the new hoist voltage on the tag attached to the power cord.

POWER PHASING

Since the motor in a three phase hoist can rotate in either direction, depending on the manner in which it is connected to the power supply, the direction of hook movement must be checked prior to each usage.

NOTE: Serious damage can result if the hook is run to the upper or lower limit of travel with the hook operating in a direction opposite to that indicated by the control station. Therefore, proceed as follows:

1. Make temporary connections at the power supply.
2. Operate ▲(UP) control momentarily. If hook raises, connections are correct and can be made permanent.
3. If hook lowers, it is necessary to change direction by inter-changing the Grey lead and the Black lead of hoist power supply. Under no circumstances should the internal wiring of the control device or hoist be changed to reverse hook direction. The wiring is inspected and tested before leaving the factory.

Do not force the Lodestar Load-limiter to compensate for improperly adjusted limit switches or reverse voltage phasing.



WARNING

Allowing the hook block to run into the bottom of the hoist when raising a load or allowing the chain to become taut between the loose end screw and the frame when lowering a load may break the chain and allow the load to drop.

TO AVOID INJURY:

Do not allow the hook block to contact the bottom of the hoist or the loose end chain to become taut.

CHECKING FOR TWIST IN LOAD CHAIN


Models E,H, E-2, H-2,R, RR, R-2, RR-2

The best way to check for this condition is to run the lower hook, without a load, up to within about 2 feet (.61 meters) of hoist. If the dead end of the chain has been properly installed, a twist can occur only if the lower hook block has been capsized between the strands of chain. Reverse capsize to remove twist.

Models RT, RT-2, RRT and RRT-2

On these models, the load chain is dead ended on top of the lower hook block. If the chain has been properly installed, the only way a twist can occur is if the lower hook block has been capsized between the strands of chain. If this has occurred, two strands of chain will be wrapped around each other and to remove this, reverse the capsize.

CHECKING FOR ADEQUATE VOLTAGE AT HOIST

The hoist must be supplied with adequate electrical power in order to operate properly. For proper operation, the voltage, (measured at the hoist end of the standard power cord with the hoist operating in the , up direction with full load) must be as indicated in the table below.

NOMINAL VOLTAGE	MINIMUM RUNNING VOLTAGE	MINIMUM STARTING VOLTAGE
115-1-60	104	98
230-1-60	207	196
230-3-60	187	-
460-3-60	396	-
575-3-60	495	-
220-3-50	198	-
380-3-50	365	-
415-3-50	399	-
550-3-50	495	-

SIGNS OF INADEQUATE ELECTRICAL POWER (LOW VOLTAGE) ARE:

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



WARNING

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

TO AVOID INJURY:

Permanently ground the hoist as instructed in this manual.

To avoid these low voltage problems, the hoist must be connected to an electrical power supply system that complies with the National Electrical Code and applicable local codes. This system must also provide (slow blow fuses or inverse-time type circuit breakers) and provisions for grounding the hoist.

Low voltage may also be caused by using an undersized cord and/or connectors to supply power to the hoist. 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 hoist.

LENGTH OF EXTENSION CORD	SINGLE PHASE HOISTS	THREE PHASE HOIST
	MINIMUM WIRE SIZE	MINIMUM WIRE SIZE
UP TO 50 FEET	#14 AWG	#16 AWG
80 FEET (24.4 M)	#12 AWG	#16 AWG
120 FEET (36.7 M)	#10 AWG	#14 AWG
200 FEET (61.0 M)	Contact Factory	#14 AWG
For runs beyond 200 Feet contact factory.		



WARNING

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

TO AVOID INJURY:

Provide each hoist 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.



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.

CHECKING LIMIT SWITCH OPERATION IF HOIST IS EQUIPPED

With hoists that are equipped with an adjustable screw limit switch, the limit switch will automatically stop the hook at any predetermined point when either hoisting or lowering.



WARNING

Allowing the hook block to run into the bottom of the hoist when raising a load or allowing the chain to become taut between the loose end screw and the frame when lowering a load may break the chain and allow the load to drop.

TO AVOID INJURY:

Do not allow the hook block to contact the bottom of the hoist or the loose end chain to become taut.

Operate hoist over the entire length of its rated lift, checking upper and lower limit switches for correct operation as follows:

1. Press ▲ (UP) control and raise the lower hook until top of hook block is about one foot (305 mm) below the hoist.
2. Cautiously continue raising the hook until the upper limit switch stops the upward motion. The upper limit switch is set at the factory to stop the hook block 3 inches (76.2 mm) from bottom of the hoist on all units with standard 10 foot (3m) lift except Models AA and AA-2. Factory setting is 6 inches (152.4 mm) for these models and for all other models equipped with chain for lifts longer than 10 feet (3m).
3. If adjustment is necessary, see page 23.
4. Press ▼ (DOWN) control and cautiously lower hook until lower limit switch stops the downward motion. From 7 to 11 chain links (depending on hoist model) should be between the loose end link and the hoist entry. See Figures 7 and 8.
5. If adjustment is necessary, see page 23.

NOTE: If the hoist is equipped with a chain container/bag, reset the upper and lower limit switches as indicated on page 23.

Under no condition should the hook block or load be permitted to come in contact with the chain container/bag. If contact is made, the function of the chain container can be interfered with and its fasteners imperiled.

NOTE: When chain bag is filled to capacity the bag must be no more than 75% filled.

CONTROL CORD

Unless ordered on a special basis, the hoist is supplied with a control cord that will position the control station approximately 4 feet above the lower hook when it is at the lower limit of the lift. If this places the control station too close to the floor, a "control cord alteration kit" (Part Number 28642) can be obtained from CM for shortening the length of the control cord.



WARNING

Tying 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 using the control cord alteration kit and the instructions provided with the kit.

OPERATING INSTRUCTIONS

GENERAL

1. The Load-limiter is designed to slip on an excessive overload. An overload is indicated when the hoist will not raise the load. Also, some clutching noise may be heard if the hoist is loaded beyond rated capacity. Should this occur, immediately release the ▲ (UP) control to stop the operation of the hoist. At this point, the load should be reduced to the rated hoist capacity or the hoist should be replaced with one of the proper capacity. When the excessive load is removed, normal hoist operation is automatically restored.

CAUTION: The Load-limiter is susceptible to overheating and wear when slipped for extended periods. Under no circumstance should the clutch be allowed to slip for more than a few seconds.

Due to the above, a hoist equipped with a Load-limiter is not recommended for use in any application where there is a possibility of adding to an already suspended load to the point of overload. This includes dumbwaiter (*see below) installations, containers that are loaded in mid-air, etc.

(* Refer to limitations on Page 3 concerning dumbwaiter applications.

2. All hoists are equipped with an adjustable screw limit switch, which automatically stops the hook at any predetermined point when either hoisting or lowering.
3. The control station used on two speed hoists is similar to single speed unit, except that either of two definite speeds may be selected by the operator in both hoisting and lowering. Each control when partially depressed provide SLOW speed and when fully depressed gives FAST speed. Partial release of control returns hoist to slow speed, while complete release allows hoist to stop. Rated lifting speeds are shown on hoist identification plate. SLOW speed is intended as a means of carefully controlling or "spotting" the load, although the hoist may be operated solely at this speed if desired. It is not necessary to operate in the SLOW speed position as the hoist will pick up a capacity load at FAST speed from a standing start. In other words, it is not necessary to hesitate at the slow position when moving control from STOP to FAST position or vice versa.
4. If material being handled must be immersed in water, pickling baths, any liquid, dusty or loose solids, use a sling chain of ample length so that the hook is always above the surface. Bearings in the hook block are shielded only against ordinary atmospheric conditions.

HOIST

1. Before picking up a load, check to see that the hoist is directly overhead.
2. **WHEN APPLYING A LOAD, IT SHOULD BE DIRECTLY UNDER HOIST OR TROLLEY. AVOID OFF CENTER LOADING OF ANY KIND.**
3. Take up a slack load chain carefully and start load easily 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.
4. **DO NOT** allow the load to swing or twist while hoisting.
5. **DO NOT** allow the load to bear against the hook latch.

HOIST WITH LOW HEADROOM TROLLEY

This unit should be moved by pushing on the suspended load or by pulling the empty hook. However, the unit can also be moved by pulling on the control station since an internal steel cable extends the length of the control cord and is anchored to the hoist and to the control station.


HOIST WITH MOTOR DRIVEN TROLLEY

This unit should be moved by operating the controls marked **▶** (Forward) and **◀** (Reverse) in control station. Unless altered by the erector, depressing **▶** (Forward) control will move the hoist toward motor housing end. 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.

SAFE OPERATING INSTRUCTIONS AND PROCEDURES

For safety precautions and a list of Do's and Do Not's for safe operation of hoists, refer to page 3.

1. Permit only competent personnel to operate unit.
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 hook.
3. **DO NOT** allow the load to bear against the hook latch. The latch is to help maintain the hook in position while the chain is slack before taking up slack chain.

 WARNING
Allowing the load to bear against the hook latch and/or hook tip can result in loss of load.
TO AVOID INJURY:
Do not allow the load and/or attachments to bear against the hook latch and/or hook tip. Apply load to hook bowl or saddle only.

4. **DO NOT** wrap the load chain around the load and hook onto itself as a choker chain.
Doing this will result in:
 - a. The loss of the swivel effect of the hook which could result in twisted chain and a jammed lift wheel.
 - b. The upper limit switch, if so equipped, is by-passed and the load could hit the hoist.
 - c. The chain could be damaged at the hook.
5. Before lifting load, check for twists in the load chain. On double and triple reeved units, a twist can occur if the lower hook block has been capsized between the strands of chain. Reverse the capsize to remove twist.
6. Stand clear of all loads and avoid moving a load over the heads of other personnel. Warn personnel of your intentions to move a load in their area.
7. **DO NOT** leave the load suspended in the air unattended.
8. **DO NOT** use this or any other overhead materials handling equipment for lifting persons.
9. **DO NOT** load hoist beyond the rated capacity shown on ID plate. When in doubt, use the next larger capacity CM Lodestar Hoist.
10. Warn personnel of your intention to lift a load in the area. Tie off the load with auxiliary chains or cables before access to the area beneath the load is permitted.

11. Take up a slack load chain carefully and start load easily 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.
12. When lifting, raise the load only enough to clear the floor or support and check to be sure that the attachments to the hook and load are firmly seated. Continue lift only after you are assured the load is free of all obstructions.
13. **DO NOT** allow the load to swing or twist while hoisting.
14. Never operate the hoist 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 when you are tired, distracted or under the influence of drugs, alcohol or medication causing diminished control.

INSPECTION

To maintain continuous and satisfactory operation, a regular inspection procedure must be initiated to replace worn or damaged parts before they become unsafe. Inspection intervals must be determined by the individual application and are based on the type of service to which the hoist will be subjected.

The type of service to which the hoist is subjected can be classified as "Normal", "Heavy", or "Severe".

Normal Service: Involves operation with randomly distributed loads within the rated load limit, or uniform loads less than 65 percent of rated load for not more than 25 percent of the time.

Heavy Service: Involves operating the hoist within the rated load limit which exceeds normal service.

Severe Service: Normal or heavy service with abnormal operating conditions or constant exposure to the elements of nature.

Two classes of inspection - frequent and periodic - must be performed.

Frequent Inspections: These inspections are visual examinations by the operator or other designated personnel. Records of such inspections are not required. The frequent inspections are to be performed monthly for normal service, weekly to monthly for heavy service, and daily to weekly for severe service, and they should include those items listed in Table 4.

Periodic Inspections: These inspections are visual inspections of external conditions by an appointed person. Records of periodic inspections are to be kept for continuing evaluation of the condition of the hoist.

Periodic inspections are to be performed yearly for normal service, semi-annually for heavy service and quarterly for severe service, and they are to include those items listed in Table 5.

CAUTION: Any deficiencies found during inspections are to be corrected before the hoist 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 nondestructive type testing

PREVENTATIVE MAINTENANCE

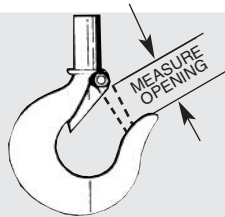
In addition to the above inspection procedure, a preventive maintenance program should be established to prolong the useful life of the hoist and maintain its reliability and continued safe use. The program should include the periodic and frequent inspections with particular attention being paid to the lubrication of the various components using the recommended lubricants (see page 127).

HOOK INSPECTION

Hooks damaged from chemicals, deformations or cracks, or that have more than a 10° twist from the hook's unbent plane, excessive opening or seat wear must be replaced. Also, hooks that are opened and allow the latch to not engage the tip must be replaced. Any hook that is twisted or has excessive throat opening indicates abuse or over-loading of the unit. Inspect other load sustaining parts, hook block screws, load pins and hook block bodies for damage.

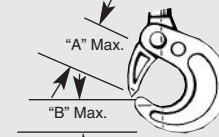
On latch type hooks, check to make sure that the latch is not damaged or bent and that it operates properly with sufficient spring pressure to keep the latch tightly against the tip of the hook and allow the latch to spring back to the tip when released. If the latch does not operate properly, it should be replaced. See Figure 14 to determine when the hook must be replaced.

LATCH TYPE HOOK
(Upper and Lower)
TO MEASURE OPENING,
DEPRESS LATCH AGAINST
HOOK BODY AS SHOWN.



Models	Replace Hooks When Opening is Greater Than
A, A-2, AA, AA-2, B, B-2, C, C-2, F AND F-2	1 3/16 (30.2 mm)
E, E-2, H, H-2, J, J-2, JJ, JJ-2, L, L-2, LL AND LL-2	1 5/16 (33.3mm)
R, R-2, RR AND RR-2, RT, RT-2, RRT AND RRT-2	1 1/2 (38.1 mm)

Figure 14. Hook Inspection



LATCHLOK® HOOK
(Upper and Lower)

Models	Replace Hook When Opening or Seat are:	
	"A" Max.	"B" Min.
A, A-2, AA, AA-2, B, B-2, C, C-2, E, E-2, F, F-2, H, H-2, J, J-2, JJ, JJ-2, L, L-2, LL, LL-2	1 31/64 in. (37.7mm)	21/32 in. (16.7mm)
R, R-2, RR, RR-2	1 59/64 in. (48.8mm)	27/32 in. (21.4mm)
RT, RT-2, RRT AND RRT-2	2 1/2 in (63.5mm)	1 1/8 in (28.6mm)

Table 4. Minimum Frequent Inspections


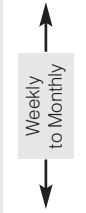

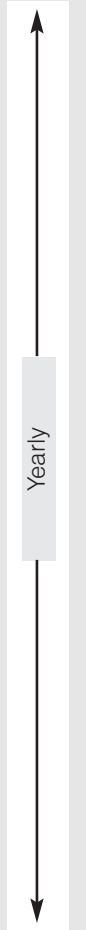
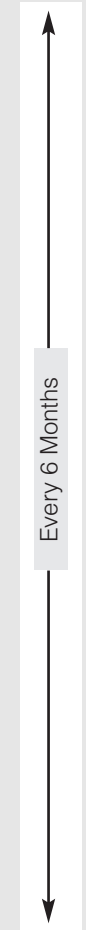
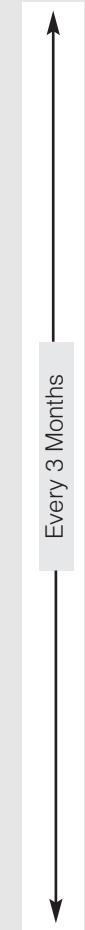
TYPE OF SERVICE			ITEM
Normal	Heavy	Severe	
			<ul style="list-style-type: none"> a) Brake for evidence of slippage. b) Control functions for proper operation. c) Hooks for damage, cracks, twists, excessive throat opening, latch engagement and latch operation - see page 18. d) Load chain for adequate lubrication, as well as for signs of wear, damaged links or foreign matter - see page 20. e) Load chain for proper reeving and twists.

Table 5. Minimum Periodic Inspections

TYPE OF SERVICE			ITEM
Normal	Heavy	Severe	
			<ul style="list-style-type: none"> a) All items listed in Table 4 for frequent inspections. b) External evidence of loose screws, bolts or nuts. c) External evidence of worn, corroded, cracked or distorted hook block, suspension screws, gears, bearings and dead end block and chain pin. d) External evidence of damage to hook retaining nut and pin. Also check the upper suspension adapter making sure it is fully seated in the hoist frame and that both screws are tight. e) External evidence of damage or excessive wear of the liftwheel and hook block sheave chain pockets. Widening and deepening of the pockets may cause the chain to lift-up in the pocket and result in binding between liftwheel and chain guides or between the sheave and hook block. Also, check the chain guide for wear or burring where the chain enters the hoist. Severely worn or damaged parts should be replaced. f) External evidence of excessive wear of brake parts, and AC brake adjustment - see page 22. g) External evidence of pitting or any deterioration of contactor contacts. Check the operation of the control station making sure the buttons operate freely and do not stick in either position. h) Inspect the electrical cords and cables and control station enclosure for damaged insulation. i) Inspect trolley trackwheels for external wear on tread and flange and for wear on internal bearing surfaces as evidenced by a looseness on the stud. Suspension components for damage, cracks, wear and operation. Also check suspension adapter screws for proper tightness - see page 11. j) Inspect the loose end link, loose end screw and dead end block on double reeved units. Replace worn or distorted parts. k) Inspect the suspension lug or hook for excess free play or rotation. Replace worn parts as evidenced by excess free play or rotation. l) Inspect for signs of lubricant leaks at the gasket between the gear housing and back frame. Tighten screws holding back frame to gear housing. If leak persists, repack housing and gears with grease and install a new gasket. m) On the Models RT, RT-2, RRT and RRT-2: <ul style="list-style-type: none"> 1. Inspect shackle and lug pins for wear. Replace if worn. 2. Check dead end screw in lower hook block for wear and tightness*. 3. Check shackle pin for proper seating in groove of load bracket. 4. Inspect cloverleaf plate on bottom of sheave hanger for wear or burring. Replace if worn. 5. Inspect sheave stud nut and seat for wear. Replace if worn or damaged.

*When tightening the special, dead end socket head screw, it should be held firmly in place and torqued from the nut end only to avoid damage to the screw and/or dead end chain link (Refer to step J on page 45).

LOAD CHAIN

Chain should feed smoothly into and away from the hoist or hook block. If chain binds, jumps or is noisy, first clean and lubricate it (see below). If trouble persists, inspect chain and mating parts for wear, distortion or other damage.

Chain Inspection

First Clean chain with a non-caustic/non-acid type solvent and make a link by link inspection for nicks, gouges, twisted links, weld splatter, corrosion pits, striations (minute parallel lines), cracks in weld areas, wear and stretching. Chain with any one of these defects must be replaced.

Slack the portion of the chain that normally passes over the lift-wheel. Examine the interlink area for the point of maximum wear (polishing, see Figure 15). Measure and record the stock diameter at this point of the link. Then measure stock diameter in the same area on a link that does not pass over the liftwheel (use the link adjacent to the loose end link for this purpose). Compare these two measurements. If the stock diameter of the worn link is 0.010 inches (0.254 mm), or more, less than the stock diameter of the unworn link, the chain must be replaced.

On double reeved units, repeat this examination of the chain that passes through the hook block.

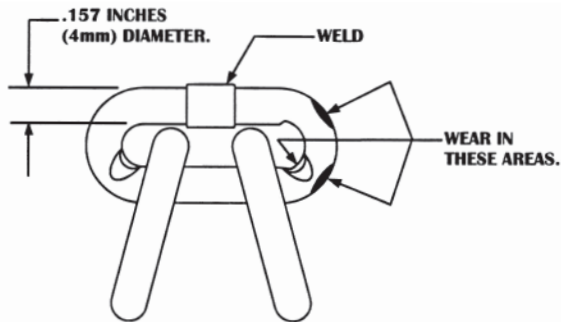


Figure 15. Chain Wear Areas

Gaging Load Chain Wear

To determine if load chain should be continued in service, check gage lengths as indicated in Figure 16. Chain worn beyond length indicated, nicked, gouged or twisted should be replaced before returning hoist to service. Chain should be clean, free of twists and pulled taut before measuring.

Note that worn chain can be an indication of worn hoist components. For this reason, the hoist's chain guides, hook blocks and liftwheel should be examined for wear and replaced as necessary when replacing worn chain.

Also, these chains are specially heat treated and hardened and should never be repaired.

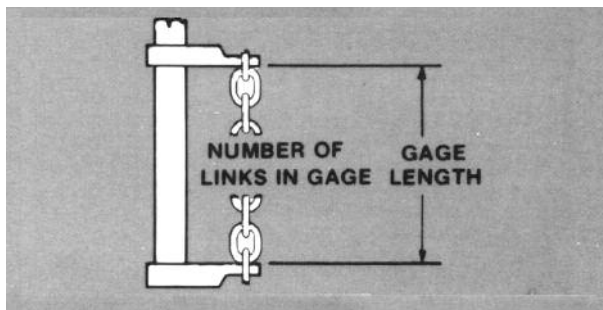


Figure 16. Gaging Load Chain Wear

Models	Dia. of Chain Stock	No. of Links to Gage	Max. Gage Length Allowable Used Chain
A thru H A-2 thru H-2	0.250" (6.35mm)	19	14 13/16" (376 mm)
J thru RRT J-2 thru RRT-2	0.312" (7.9mm)	21	18 7/8" (479 mm)

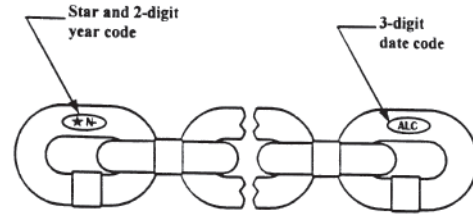


Figure 17. Chain Embossing

Use only Star (*) grade load chain and original replacement parts. Use of other chain and parts may be dangerous and voids factory warranty.

IMPORTANT: Do not use replaced chain for other purposes such as lifting or pulling. Load chain may break suddenly without visual deformation. For this reason, cut replaced chain into short lengths to prevent use after disposal.



WARNING

USE OF COMMERCIAL OR OTHER MANUFACTURER'S CHAIN AND PARTS TO REPAIR CM HOISTS MAY CAUSE LOAD LOSS.

TO AVOID INJURY:

Use only CM supplied replacement load chain and parts. Chain and parts may look alike, but CM chain and parts are made of specific material or processed to achieve specific properties.

MAINTENANCE

LOAD-LIMITER

The Load-limiter should operate for the normal life of the hoist without service. The device has been calibrated at the factory for a specific model of hoist. For proper overload protection, be sure before installing a Load-limiter that it is correct for the unit.

Models	Load-Limiter Part Number	Load-Limiter ID (marked on Load-limiter)
A,A-2,B,B-2, E, E-2	00000240	240
AA,AA-2, C, C-2, F, F-2, H, H-2	00000241	241
J, J-2, L, L-2, R, R-2, RT, RT-2	00000242	242
JJ, JJ-2, LL, LL-2, RR, RR-2, RRT, RRT-2	00000243	243



WARNING

The lubricants used in and recommended for the Lodestar Hoist 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.

HOIST LUBRICATION

GEARS

NOTE: To assure extra long life and top performance, be sure to lubricate the various parts of the Lodestar Hoist using the lubricants specified on page 85. If desired, these lubricants may be purchased from CM. Refer to page 85 for information on ordering the lubricants.

The gearbox is packed at assembly with grease and should not need to be renewed unless the gears have been removed from the housing and degreased.

If the gears are removed from the housing, wipe the excess grease off with a soft cloth and degrease the gears and housings. Upon reassembly, add grease (see page 85) to gears and housing.

V1 hoists require 8 fl. oz. of grease. V2 hoists require 15 fl. oz. of grease.

Also, coat the spline on the end of the drive shaft with a Molydisulphide lubricant such as "Super Herculon".

- The limit switch gears are of molded nylon and require no lubrication.
- Apply a light film of machine oil to the limit switch shaft threads at least once a year.

BEARINGS

- All bearings and bushings, except the lower hook thrust bearing, are pre-lubricated and require no lubrication. The lower hook thrust bearing should be lubricated at least once a month.

CHAIN GUIDES, LIFTWHEEL AND LOWER SHEAVE WHEEL

- When the hoist is disassembled for inspection and/or repair, the chain guides, lower sheave wheel (on double chain units) and liftwheel must be lubricated with Lubriplate Bar and Chain Oil 10-R (Fiske Bros. Refining Co. or equivalent) prior to reassembly. The lubricant must be applied in sufficient quantity to obtain natural runoff and full coverage of these parts.

LOAD CHAIN

A small amount of lubricant will greatly increase the life of load chain. Do not allow the chain to run dry.

Keep it clean and lubricate at regular intervals with Lubriplate Bar and Chain Oil 10-4 (Fiske Bros. Refining Co.) or equal lubricant. Normally, weekly lubrication and cleaning is satisfactory, but under hot and dirty conditions, it may be necessary to clean the chain at least once a day and lubricate it several times between cleanings.

When lubricating the chain, apply sufficient lubricant to obtain natural run-off and full coverage, especially in the interlink area.



WARNING

Used motor oils contain known carcinogenic materials.

TO AVOID HEALTH PROBLEMS:

Never use used motor oils as a chain lubricant. Only use Lubriplate Bar and Chain Oil 10-R as a lubricant for the load chain.

TROLLEY LUBRICATION

Low Headroom Trolley

- CM trackwheel bearings are pre-lubricated and require no lubrication.

EXTERIOR FINISH

The exterior surfaces of the hoist and trolleys have a durable, scratch resistant baked powder coating. Normally, the exterior surfaces can be cleaned by wiping with a cloth. However, if the finish is damaged, compatible touch-up paint can be purchased from CM. Refer to page 138 for information on ordering the paint.

SOLID STATE REVERSE SWITCH

(115-1-60/230-1-60 Units Only)

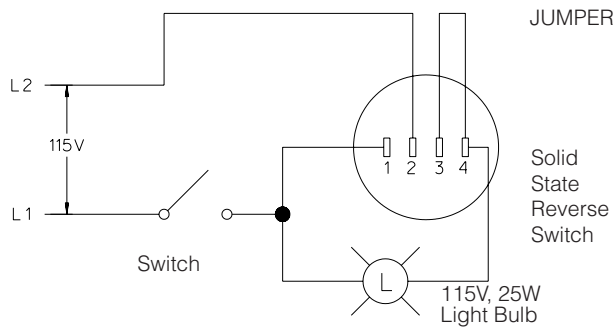
Above an ambient temperature of 104°F. (40° C.), the frequency of hoist operation should be limited to avoid overheating the solid state reverse switch. Even at temperatures less than 104° F. (40° C.), high duty cycle, frequent starting or reversing, excessive inching, jogging or plugging may overheat the solid state reverse switch. Overheating the switch will cause it to malfunction, and this in turn will overheat the motor and/or damage the solid state reverse switch.

If allowed to cool, the solid state switch will return to normal operation. However, before returning the hoist to service, the following procedure should be used to determine if the switch has been damaged.

1. De-energize the power system supplying the hoist and remove the solid state reverse switch.

2. Connect the solid state reverse switch to a 115-1-60/230-1-60 light circuit as shown below.
3. Close the switch to energize the 115-1-60/230-1-60 power supply. The light bulb will illuminate if the solid state reverse switch is not damaged. If the bulb fails to illuminate, the switch is damaged and must be replaced.
4. Turn the 115-1-60/230-1-60 power off and remove the solid state reverse switch from the test circuit.

Reinstall the solid state reverse switch in the hoist and re-connect it using the wiring diagram supplied with the hoist. Re-energize the power system supplying the hoist and test for proper operation. Also, ventilate the space around the hoist and/or reduce duty cycle, excessive starting, excessive plugging to reduce future malfunctions of the solid state reverse due to overheating.



BRAKE ADJUSTMENTS

DC ELECTRIC BRAKE ASSEMBLY

The correct air gap between field and armature is .008-.018 in (0.2-0.45 mm) for models A through H and .008-.020 in (0.2-0.5 mm) for models J through RRT. The DC brake is not adjustable. As the friction material wears, the brake gap increases. If the maximum air gap is reached, a new friction disc/rotor should be installed.

AC ELECTRIC BRAKE ASSEMBLY

The correct air gap between armature and field, when brake is not energized, is 0.025 inch (.635mm) and need not be adjusted until the gap reaches 0.045 inch (1.143mm). When checking brake gap, always reset to .025 inch (.635 mm).

To adjust the brake, proceed as follows:

1. Disconnect hoist from power supply.
2. Remove back frame cover, see figure 13
3. Before adjusting the gap: a) back off the stud nuts and examine friction linings and friction surfaces for excessive wear (min. thickness .188 inch, 4.78mm), scoring or scoring or warpage. b) Check shading coils to be sure they are in place and not broken. A missing or broken shading coil will cause the brake to be noisy when hoist is operated. Any of these symptoms indicate the need for replacement parts.
4. Turn adjusting nuts clockwise gaging the air gap at both ends.
5. Replace cover, reconnect the power and check operation.

Table 6a. Limit Switches

Model	Hook Travel w/44TPI Shaft (Standard)				A		B
	Max Length of Lift		Hook Travel, per Notch		mm	in	Links
	m	ft	mm	in			
A, A-2, C, C-2	63.1	207	53.1	2.09	38.1	1.50	6
AA, AA-2	118.3	388	99.6	3.92	50.8	2.00	6
B, B-2, F, F-2	32.1	105	27.0	1.06	38.1	1.50	6
E, E-2, H, H-2	16.0	53	13.5	0.53	44.5	1.75	6
L, L-2	38.8	127	30.4	1.20	38.1	1.50	8
JJ, JJ-2	149.0	489	116.8	4.60	63.5	2.50	8
J, J-2, LL, LL-2	75.9	249	59.5	2.34	38.1	1.50	8
R, R-2	19.4	64	15.2	0.60	63.5	2.50	8
RR, RR-2	37.9	124	29.7	1.17	63.5	2.50	8
RT, RT-2	12.9	42	10.1	0.40	63.5	2.50	8
RRT, RRT-2	25.3	83	19.8	0.78	63.5	2.50	8

Table 6b. Extended Lift Limit Switches

Model	Hook Travel w/56TPI Shaft				Hook Travel w/64TPI Shaft			
	Max Length of Lift		Hook Travel, per Notch		Max Length of Lift		Hook Travel, per Notch	
	m	ft	mm	in	m	ft	mm	in
A, A-2, C, C-2	80.3	263	41.7	1.64	91.8	301	36.6	1.44
AA, AA-2	150.6	494	78.2	3.08	172.1	565	68.5	2.70
B, B-2, F, F-2	40.8	134	21.2	0.84	46.6	153	18.6	0.73
E, E-2, H, H-2	20.4	67	10.6	0.42	23.3	77	9.3	0.37
L, L-2	49.4	162	23.9	0.94	56.4	185	20.9	0.82
JJ, JJ-2	189.7	622	91.8	3.61	216.8	711	80.3	3.16
J, J-2, LL, LL-2	96.6	317	46.7	1.84	110.4	362	40.9	1.61
R, R-2	24.7	81	11.9	0.47	28.2	93	10.4	0.41
RR, RR-2	48.3	158	23.4	0.92	55.2	181	20.4	0.80
RT, RT-2	16.5	54	8.0	0.31	18.8	62	7.0	0.27
RRT, RRT-2	32.2	106	15.6	0.61	36.8	121	13.6	0.54

LIMIT SWITCH ADJUSTMENTS

If limit switch operation has been checked as described on page 16 and is not operating correctly or is not automatically stopping the hook at a desired position, proceed as follows:

1. Disconnect hoist from power supply.
2. Remove back frame cover, see Figure 13.
3. The identification of upper and lower limit switches are indicated on the fiber insulator.
4. Loosen the 2 screws or spring back the rotatable guide to disengage the travel nut

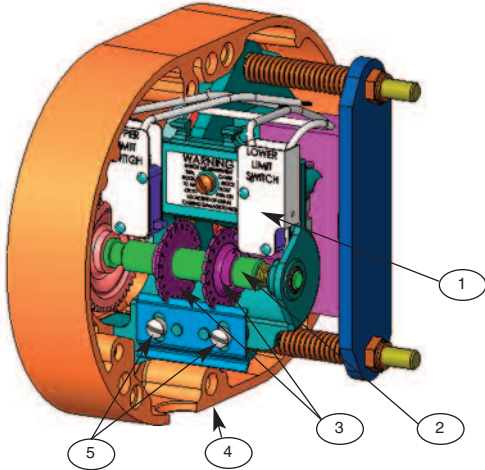


Figure 18. Limit Switches, V1 Models

- | | |
|--------------------------|----------------|
| 1. Limit switch sub-assy | 4. Guide plate |
| 2. Limit switch shaft | 5. Screws |
| 3. Travelling nuts | |

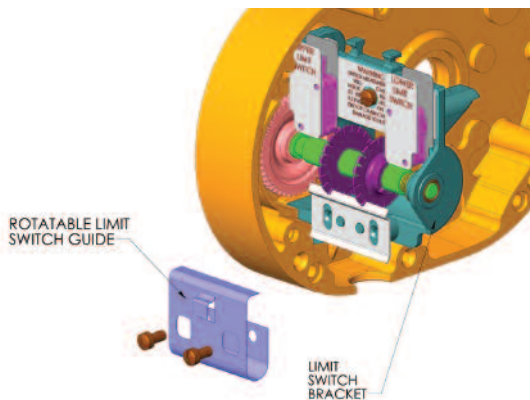


Figure 18A. Rotatable Limit Switches, V1 Models

SETTING UPPER LIMIT SWITCH

After completing steps 1 thru 4

5. Refer to table 6 -The "A" Dimensions given are the minimum distance that should be set between the top at hook block and the bottom of the hoist.

CAUTION: THE "A" DIMENSIONS SHOWN IN TABLE 6 ARE THE MINIMUM ALLOWED FOR SAFE OPERATION AND SHOULD NOT BE REDUCED.

6. Reconnect hoist to power supply.
7. Run hook to the desired upper position, cautiously operating the hoist without a load.
8. Disconnect hoist from power supply.
9. Moving one travel nut toward the other increases hook travel and away from the other decreases the travel. Now, turn the nut nearest the switch indicated as the "UPPER LIMIT SWITCH" until it just breaks the limit switch contacts, cautious not to allow the movement of the other travel nut, if previously set. An audible click will be heard as the switch opens. Continue to rotate the nut toward the switch an additional one full tooth.

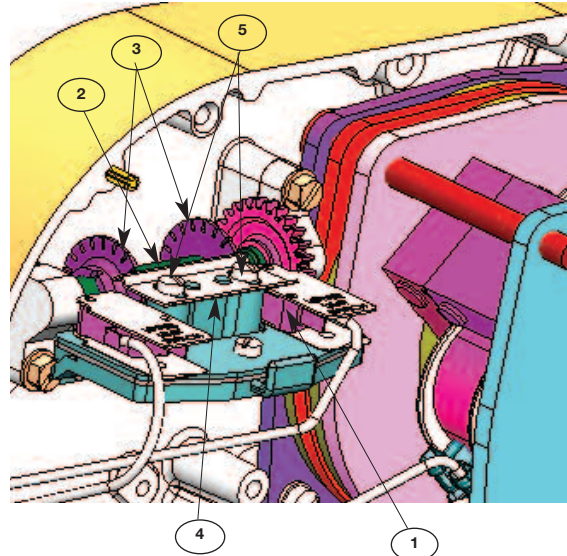


Figure 19. Limit Switches, V2 Models

- | | |
|--------------------------|----------------|
| 1. Limit switch sub-assy | 4. Guide plate |
| 2. Limit switch shaft | 5. Screws |
| 3. Traveling nuts | |

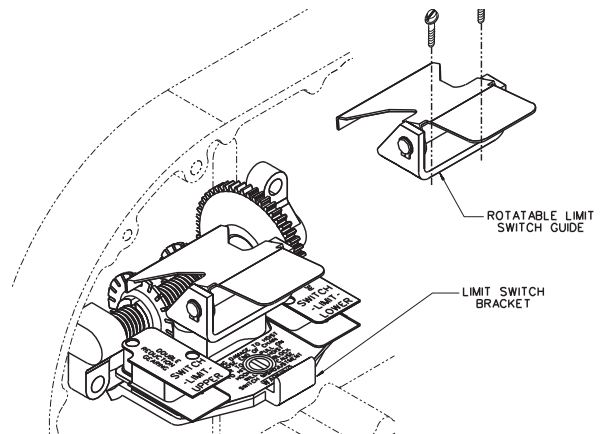


Figure 19A. Rotatable Limit Switches, V2 Models

10. Securely reposition the guide plate in the slot

11. Reconnect hoist to power supply and check the stopping point of hook by first lowering the hook about 2 feet (61 cm), then raise the hook by jogging cautiously until the upper limit switch stops upward motion. The stopping point of hook should be the desired upper position. If not, repeat the above instructions.

12. Double check setting by lowering the hook about 2 feet (61 cm) and then run the hook into the upper limit with ▲(UP) control held depressed.
13. Fine adjustment of the upper limit setting may be obtained by inverting the stationary guide plate in Step 10. (Not available with the rotatable guide plate.) The offset on the plate gives adjustments equivalent to 1/2 notch, see Table 6 for the "Hook Travel Per Notch of Limit Switch Nut". When inverting the plate, it may be necessary to use the notch adjacent to the one used in the preliminary setting.

SETTING LOWER LIMIT SWITCH

After completing steps 1 thru 4

5. Refer to Table 6 -The "B" dimensions given are the minimum length of loose end chain left on the load side of the lift wheel when the hook is positioned at the lowest allowable hook position.

CAUTION: THE "B" DIMENSIONS SHOWN IN TABLE 6 ARE THE MINIMUM ALLOWED FOR SAFE OPERATIONS AND SHOULD NOT BE REDUCED.

6. Reconnect hoist to power supply.
7. Run hook to the desired lower position, cautiously operating the hoist without a load.
8. Disconnect hoist from power supply.
9. Moving one travel nut toward the other increases hook travel and away from the other decreases hook travel. Now, turn the nut nearest the switch indicated as the "LOWER LIMIT SWITCH" until it just breaks the limit switch contacts, cautious not to allow the movement of the other travel nut if previously set. An audible click will be heard as the switch opens.

Continue to rotate the nut toward the switch an additional one full tooth.

10. Securely reposition the guide plate in the slot.
11. Reconnect hoist to power supply and check the stopping point of hook by first raising the hook about 2 feet (61cm) then lower the hook by jogging cautiously until the lower limit switch stops downward motion. The stopping point of the hook should be the desired lower position, if not repeat the above instructions.
12. Double check setting by raising the hook about 2 feet (61 cm) and then run the hook into the lower limit with ▼(DOWN) control held depressed.
13. Fine adjustment of the lower limit setting may be obtained by inverting the stationary guide plate in Step 10. (Not available with the rotatable guide plate). The plate offset on the plate gives adjustments equivalent to 1/2 notch, see Table 6 for the "Hook Travel per Notch of Limit Switch Nut". When inverting the plate, it may be necessary to use the notch adjacent to the one used in the preliminary setting.

CONVERTING LIMIT SWITCH GUIDES

1. Disconnect the hoist from the power supply system.
2. Refer to the exploded views and remove the back frame cover from the hoist.
3. Remove and discard the limit switch guide plate - retaining the 2 screws.
4. Refer to Figure 18A and 19A and assemble the limit switch guide plate to the limit switch bracket. Secure using the 2 screws.

**TROUBLE SHOOTING
All Hoists**

Table 7.

TROUBLE	PROBABLE CAUSE	CHECK AND REMEDY
1. Hook does not respond to the control station or control device	A.) No voltage at hoist-main line or branch circuit switch open; branch line fuse blown or circuit breaker tripped.	A.) Close switch, replace fuse or reset breaker.
	B.) Phase failure (single phasing, three phase unit only)-open circuit, grounded or faulty connection in one line of supply system, hoist wiring, reversing contactor, motor leads or windings.	B.) Check for electrical continuity and repair or replace defective part.
	C.) Upper or lower limit switch has opened the control circuit.	C.) Press the "other" control and the hook should respond. Adjust limit switches as described on page 23.
	D.) Open control circuit-open or shorted winding in transformer, reversing contactor coil or loose connection or broken wire in circuit;mechanical binding in contactor control station contacts not closing or opening.	D.) Check electrical continuity and repair or replace defective part.
	E.) Wrong voltage or frequency.	E.) Use the voltage and frequency indicated on hoist identification plate. For three phase dual voltage unit, make sure the connections at the voltage change board are the proper voltage as described on page 14.
	F.) Low Voltage.	F.) Correct low voltage condition as described on page 14.
	G.) Brake not releasing-open or shorted coil winding; armature binding.	G.) Check electrical continuity and connections. Check that correct coil has been installed. The coil for three phase dual voltage unit operates at 230 volts when the hoist is connected for either 230 volt or 460 volt operation. Check brake adjustment as described on page 22.
	H.) Excessive load.	H.) Reduce loading to the capacity limit of hoist as indicated on the identification plate.
2.) Hook moves in wrong direction.	A.) Wiring connections reversed at either the control station or terminal board (single phase unit only).	A.) Check connections with the wiring diagram.
	B.) Failure of the motor reversing switch to effect dynamic braking at time of reversal (single phase unit only).	B.) Check connections to switch. Replace a damaged or faulty capacitor
	C.) Phase reversal (three phase unit only).	C.) Refer to installation instructions on page 14
3.) Hook lowers but will not raise.	A.) Excessive load.	A.) See item 1H.
	B.) Open hoisting circuit-open or shorted winding in reversing contactor coil loose connection or broken wire in circuit; control station contacts not making; upper limit switch contacts open.	B.) Check electrical continuity and repair or replace defective part. Check operation of limit switch as described on page 16.
	C.) Phase failure (three phase unit only).	C.) See item 1B.

Table 7 (cont.)

TROUBLE	PROBABLE CAUSE	CHECK AND REMEDY
4.) Hook raises but will not lower.	A.) Open lowering circuit-open or shorted winding in reversing contactor coil, loose connection or broken wire in circuit; control station contacts not making; lower limit switch contacts open.	A.) Check electrical continuity and repair or replace defective part. Check operation of limit switch as described on page 15-16.
	B.) Motor reversing switch not operating (single phase unit only).	B.) See items 2B and 3C.
5.) Hook lowers when hoisting control is operated.	A.) Phase failure (three phase unit only).	A.) See item 1B.
	IB.) Phase reversal (three phase unit only).	B.) Refer to installation instruction on page 14.
6.) Hook does not stop promptly.	A.) Brake slipping.	A.) Check brake adjustment as described on page 22.
	B.) Excessive load.	B.) See item 1H.
7.) Hoist operates sluggishly.	A.) Excessive load.	A.) See item 1H.
	B.) Low voltage.	B.) Correct low voltage condition as described on page 15.
	C.) Phase failure or unbalanced current in the phases (three phase unit only).	C.) See item 1B.
	D.) Brake dragging.	D.) Check brake adjustment as described on page 22.
8.) Motor overheats.	A.) Low voltage.	A.) Correct low voltage condition as described on page 15.
	B.) Excessive load.	B.) See item 1H.
	C.) Extreme external heating.	C.) Above an ambient temperature of 40°C. (104°F.), the frequency of hoist operation must be limited to avoid overheating of motor. Special provisions should be made to ventilate the space or shield the hoist from radiation.
	D.) Frequent starting or reversing.	D.) Avoid excessive inching, jogging or plugging. This type of operation drastically shortens the motor and contactor life and causes excessive brake wear.
	E.) Phase failure or unbalanced current in the phase (three phase unit only).	E.) See item 1B.
	F.) Brake dragging.	F.) Check brake adjustment as described on page 22.
	G.) 115-1-60 Units: Solid state reverse switch exposed to excessive temperature or the switch is damaged.	G.) See page 21.
9.) Hook fails to stop at either or both ends of travel.	A.) Limit switches not opening circuits.	A.) Check switch connections, electrical continuity and mechanical operation. Check the switch adjustment as described on page 15-16.
	B.) Limit Switch Shaft not rotating.	B.) Check for damaged Limit Switch gears.
	C.) Traveling nuts not moving along shaft-guide plate loose; shaft or nut threads damaged.	C.) Tighten guide plate screws. Replace damaged part.
10.) Hook stopping point varies.	A.) Limit switch not holding adjustment.	A.) See item 9.
	B.) Brake not holding.	B.) Check the brake adjustment as described on page 22.
	C.) Binding of Limit Switch Shaft.	C.) Check Limit Switch Bearing for proper seating.

Table 7 (cont.)		
Two Speed Hoist		
TROUBLE	PROBABLE CAUSE	CHECK AND REMEDY
11.) Hoist will not operate at slow speed in either direction.	A.) Open Circuit.	A.) Open or shorted motor winding, loose or broken wire in circuit, speed selecting contactor stuck in opposite speed mode. Replace motor, repair wire and/or replace speed selecting contactor.
	B.) Phase Failure.	B.) See item 1B.
12.) Hoist will not operate at fast speed in either direction.	A.) Open Circuit.	A.) See Item 11A.
	B.) Open speed selecting circuit.	B.) Open or shorted winding in speed selecting contactor coil. Loose connection or broken wire in circuit. Mechanical binding in contactor. Control station contacts not making or opening. Replace speed selector; repair connection, replace contactor or control station.
	C.) Phase Failure.	C.) See Item 1B.
13.) Hook will not raise at slow speed.	A.) Excessive load.	A.) See item 1H.
	B.) Phase Failure.	B.) See Item 1B.
	C.) Open Circuit.	C.) See item 11A.
	D.) Brake not releasing.	D.) See Item 1G.
14.) Hook will not lower at slow speed.	A.) Phase Failure.	A.) See item 1B.
	B.) Open Circuit.	B.) See item 11A.
	C.) Brake not releasing.	C.) See Item 1G.
15.) Hook will not raise at fast speed.	A.) Excessive load.	A.) See item 1H.
	B.) Phase Failure.	B.) See Item 1B.
	C.) Brake not releasing.	C.) See Item 1G.
16.) Hook will not lower at fast speed.	A.) Phase Failure.	A.) See Item 1B.
	B.) Brake not releasing.	B.) See Item 1G.
17.) Hook moves in proper direction at one speed-wrong direction at other speed.	A.) Phase reversal.	A.) Wiring reconnected improperly. Interchange two leads of motor winding that is out of phase at the speed selecting relay.

ELECTRICAL DATA

TO DETECT OPEN AND SHORT CIRCUITS IN ELECTRICAL COMPONENTS

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 unit 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 recommend for coils with very low D.C. resistance.

Motor current draw in the stator should be measured with the rotor in place and running. Brake, relay and contactor coil current should be measured with the core iron in operating position.

Table 8. Electrical Data for Hoist Components

TRANSFORMER VOLTAGE	LEADS	*D.C. RESISTANCE (OHMS)
230/460 to 115	X2 to X1	27.9
	H2 to H1	99.0
	H3 to H4	111.8
230/380 to 48	X2 to X1	5.2
	H2 to H1	99.0
	H3 to H4	112.6
220/415 to 24	X2 to X1	1.3
	H2 to H1	100.4
	H3 to H4	114.9
575 to 115	X2 to X1	28.4
	H4 to H1	329.1

MODELS	CONTACTOR OR SPEED SELECTOR COIL VOLTAGE	NOMINAL CURRENT (AMPS)	*D.C. RESISTANCE (OHMS)
A thru H-2	115	0.04	297.5
	48	0.09	56.3
	24	0.19	14.9
JJ thru RRT-2	115	0.07	126.6
	48	0.17	25.1
	24	0.33	6.4

MODELS	AC BRAKE COIL VOLTAGE	NOMINAL CURRENT (AMPS)	*D.C. RESISTANCE (OHMS)
A, AA, B, C, E F and H	115	.51	5.8
A thru H-2	**230	.17	23.1
A-2 thru H-2	460	.20	92.3
A, A-2, AA, AA-2, B, B-2, C, C-2, E, E-2, F, F-2, H, H-2	575	.14	140.0
J, L, R, RT	115	1.25	1.1
J, J-2, L, L-2, LL-2, R, R-2, RT, RT-2	**230	.46	4.6
JJ, JJ-2, LL, LL-2, RR, RR-2, RRT, RRT-2	**230	1.7	2.2
J-2, L-2, R-2, RT-2	460	.25	18.7
JJ-2, LL-2, RR-2, RRT-2	460	1.5	8.9
J, J-2, L, L-2, LL-2, R, R-2, RT, RT-2	575	.50	38.5
JJ, JJ-2, LL, LL-2, RR, RR-2, RRT, RRT-2	575	1.70	14.2

MODELS	DC BRAKE COIL VOLTAGE	NOMINAL CURRENT (AMPS)	*D.C. RESISTANCE (OHMS)
A, AA, B, C, E F and H	103	0.243	424.4
A thru H-2	205	0.122	1681
A-2 thru H-2	255	0.098	2601
J, JJ, L, LL, R, RR, RT, RRT	103	0.311	331.5
J thru RRT-2	205	0.161	1273
J thru RRT-2	255	0.118	2167

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

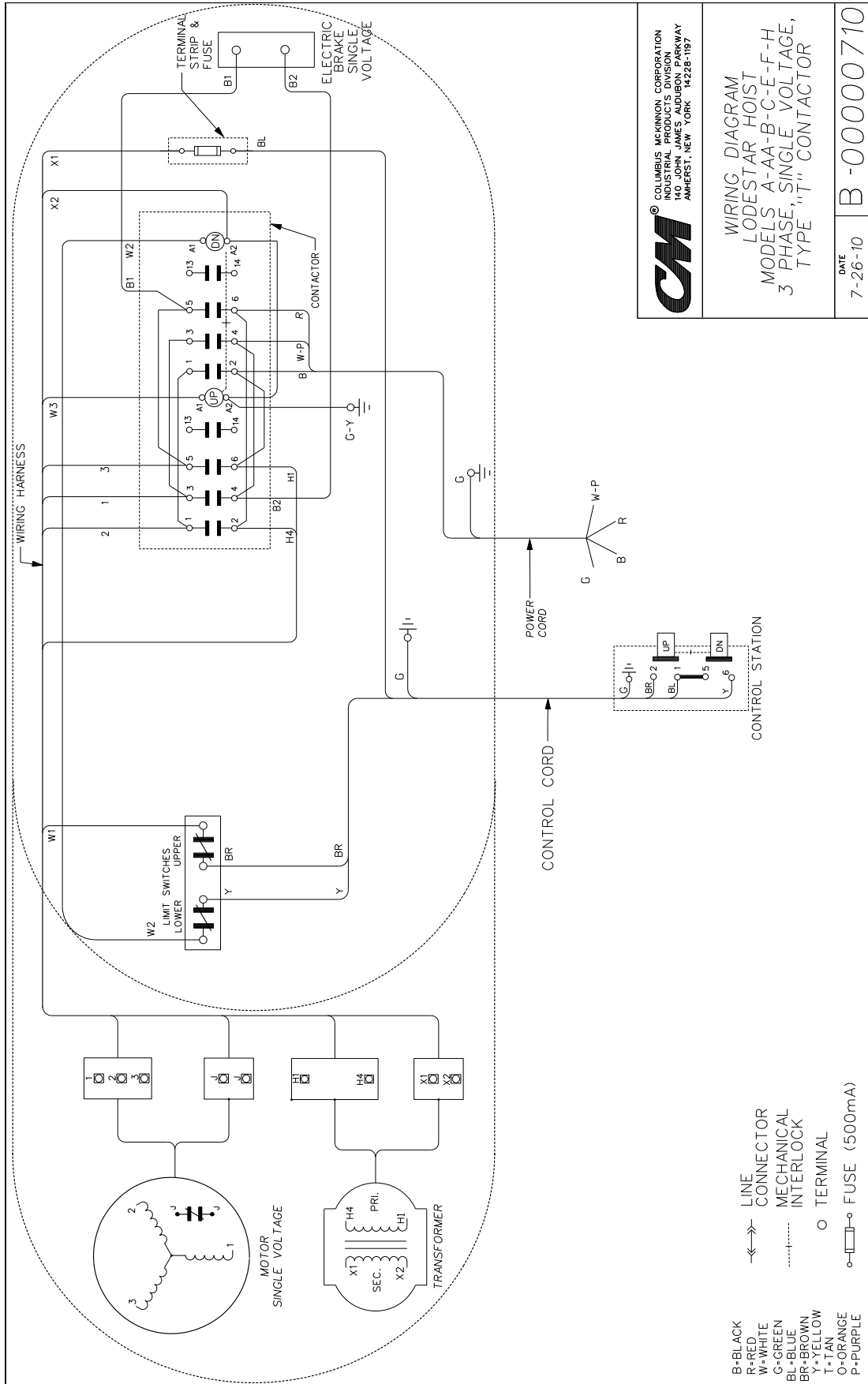
**On dual voltage units (230/460-3-60, 220/380-3-50 and 220/415-3-50), brake coils operate on 230 (220) volts.

Table 8. (cont.)

Models	Volts-Phase Hertz	H.P. (kW)	Full Load Current (Amps)	Leads	*D.C. Resistance (Ohms)
A,B,E	110-1-50	1/4 (.19)	3.2	1-2	7.2
				3-4	7.2
				5-8	5.8
A,B,E	115-1-60	1/4 (.19)	4.6	1-2	4.3
				3-4	4.3
				5-8	4.9
A,B,E	220-1-50	1/4 (.19)	1.6	1-2	7.2
				3-4	7.2
				5-8	5.8
A,B,E	230-1-60	1/4 (.19)	2.3	1-2	4.3
				3-4	4.3
				5-8	4.9
AA,C,F,H	110-1-50	1/2 (.37)	6.4	1-2	2.7
				3-4	2.7
				5-8	3.5
AA,C,F,H	115-1-60	1/2 (.37)	7.2	1-2	1.9
				3-4	1.9
				5-8	3.6
A,B,E	220-1-50	1/2 (.37)	3.2	1-2	2.7
				3-4	2.7
				5-8	3.5
A,B,E	230-1-60	1/2 (.37)	3.6	1-2	1.9
				3-4	1.9
				5-8	3.6
A,B,E	230/460-3-60	1/4 (.19)	1.4/0.7	3-6	14.8
				2-5	14.8
	220/380-3-50		1.4/0.7	1-4	14.8
				8-9	29.5
	220/415-3-50		1.4/0.7	8-7	29.5
				9-7	29.5
575-3-60	0.5	1-2			
550-3-50	0.6	2-3	98.2		
				1-3	
AA,C,F,H	230/460-3-60	1/2 (.37)	1.8/0.9	3-6	7.8
				2-5	7.8
	220/380-3-50		2.1/1.0	1-4	7.8
				8-9	15.6
	220/415-3-50		2.1/1.0	8-7	15.6
9-7		15.6			
575-3-60	0.8	1-2			
550-3-50	0.9	2-3	48.3		
				1-3	
A-2, B-2, E-2	230-3-60	.08/.25 (.06/.19)	1.6/1.6	12-3	17.5
				11-3	17.5
220-3-50	1.9/2.1	11-12	17.5		
		1-2	42.5		
				1-3	42.5
				2-3	42.5
A-2, AA-2, B-2, C-2, E-2, F-2, H-2	230-3-60	.15/.5 (.12/.37)	1.8/2.0	12-3	13.5
				11-3	13.5
	220-3-50		2.1/2.4	11-12	13.5
				1-2	25.0
	460-3-60		1.0/1.0	1-3	25.0
				2-3	25.0
	380-3-50		1.2/1.2	12-3	63.0
				11-3	63.0
415-3-50	1.2/1.2	11-12	63.0		
		1-2	104.0		
				1-3	104.0
				2-3	104.0
575-3-60	.8/.85	12-3	99.1		
		11-3	99.1		
550-3-50	.8/.85	11-12	99.1		
		1-2	156.0		
				1-3	156.0
				2-3	156.0

Models	Volts-Phase Hertz	H.P. (kW)	Full Load Current (Amps)	Leads	*D.C. Resistance (Ohms)
J,L,R,RT	110-1-50	1 (.75)	11.6	1-2	1.1
	115-1-60		9.8	3-4	1.1
				5-8	1.3
J,L,R,RT	220-1-50	1 (.75)	5.8	1-2	1.1
	230-1-60		4.9	3-4	1.1
				5-8	1.3
J,L,R,RT	230/460-3-60	1 (.75)	3.0/1.5	3-6	4.7
				2-5	4.7
	220/380-3-50		3.6/1.8	1-4	4.7
				8-9	9.4
	220/415-3-50		3.6/1.8	8-7	9.4
9-7		9.4			
575-3-60	1.5	1-2			
550-3-50	1.8	2-3	29.6		
				1-3	
JJ,LL,RR, RRT	230/460-3-60	2 (1.5)	5.8/2.9	3-6	2.2
				2-5	2.2
	220/380-3-50		6.4/3.3	1-4	2.2
				8-9	9.4
	220/415-3-50		6.4/3.3	8-7	9.4
9-7		9.4			
575-3-60	3.2	1-2			
550-3-50	3.5	2-3	14.8		
				1-3	
J-2,L-2,R-2, RT-2	230-3-60	.33/1 (.25/.75)	3.4/5.0	12-3	7.7
				11-3	7.7
	220-3-50		3.2/4.7	11-12	7.7
				1-2	19.4
	460-3-60		1.5/2.4	1-3	19.4
				2-3	19.4
	380-3-50		1.6/2.4	12-3	29.9
				11-3	29.4
415-3-50	1.6/2.4	11-12	29.0		
		1-2	80.2		
575-3-60	1.1/1.9	1-3	80.1		
		2-3	82.2		
				12-3	42.9
				11-3	40.1
				11-12	53.2
				1-2	125.7
				1-3	125.8
				2-3	125.2
J-2,L-2,R-2, RT-2	230-3-60	.67/2 (.50/1.5)	5.8/8.8	12-3	3.2
				11-3	3.1
	220-3-50		6.6/9.5	11-12	3.3
				1-2	14.1
	460-3-60		3.3/5.1	1-3	14.1
				2-3	14.0
	380-3-50		3.0/5.0	12-3	11.4
				11-3	11.3
415-3-60	3.0/5.0	11-12	11.3		
		1-2	55.2		
575-3-60	2.3/3.5	1-3	55.4		
		2-3	55.3		
550-3-50	2.5/3.7	12-3	17.0		
		11-3	17.1		
		11-12	17.2		
		1-2	84.1		
		1-3	84.0		
		2-3	83.6		

REFERENCE WIRING DIAGRAMS



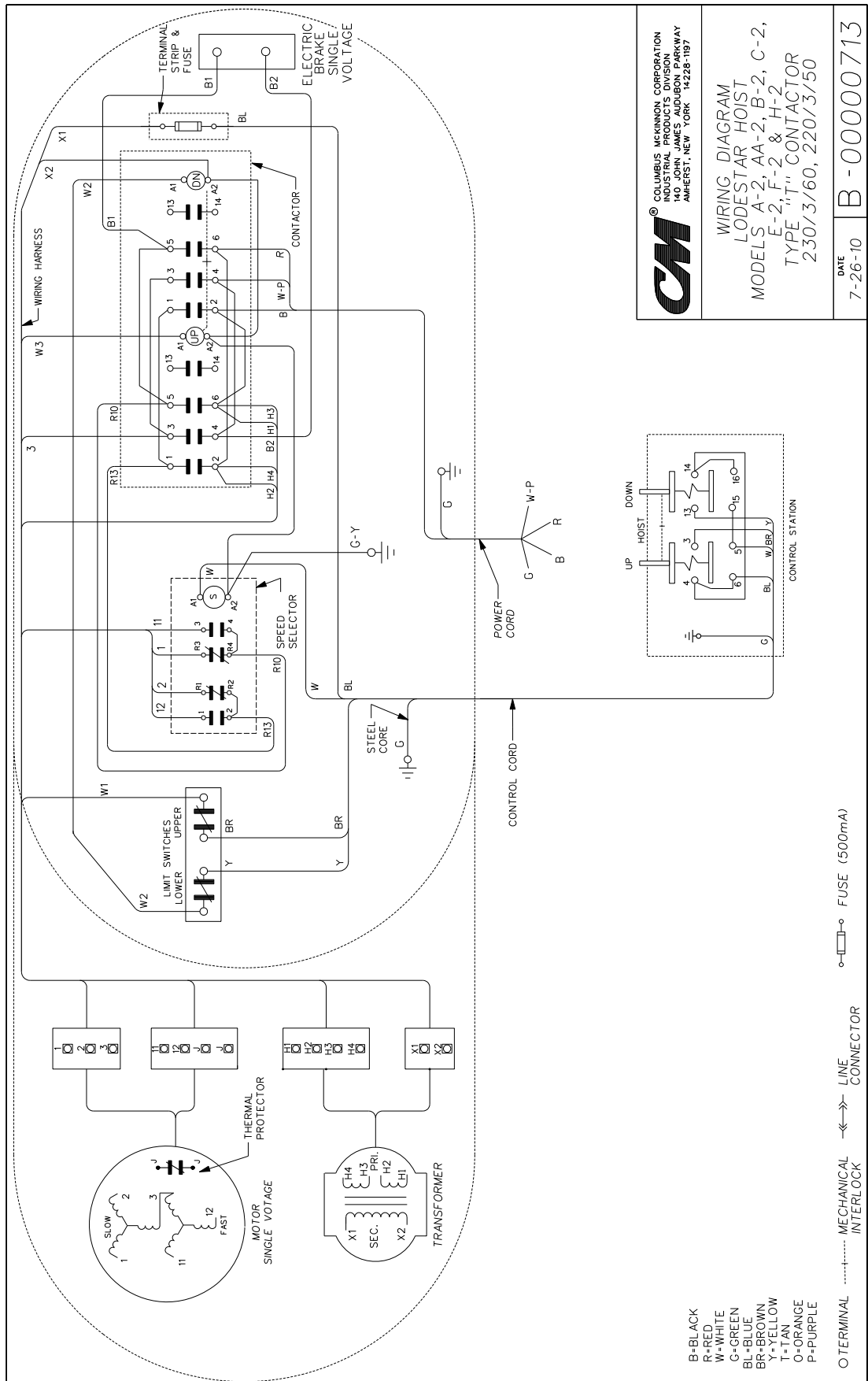
CM COLUMBUS MCKINNON CORPORATION
 INDUSTRIAL PRODUCTS DIVISION
 1450 WEST 10TH AVENUE
 AMHERST, NEW YORK 14228-1197

WIRING DIAGRAM
 LODESTAR HOIST
 MODELS A-AA-B-C-E-F-H
 3 PHASE, SINGLE VOLTAGE,
 TYPE "T" CONTACTOR

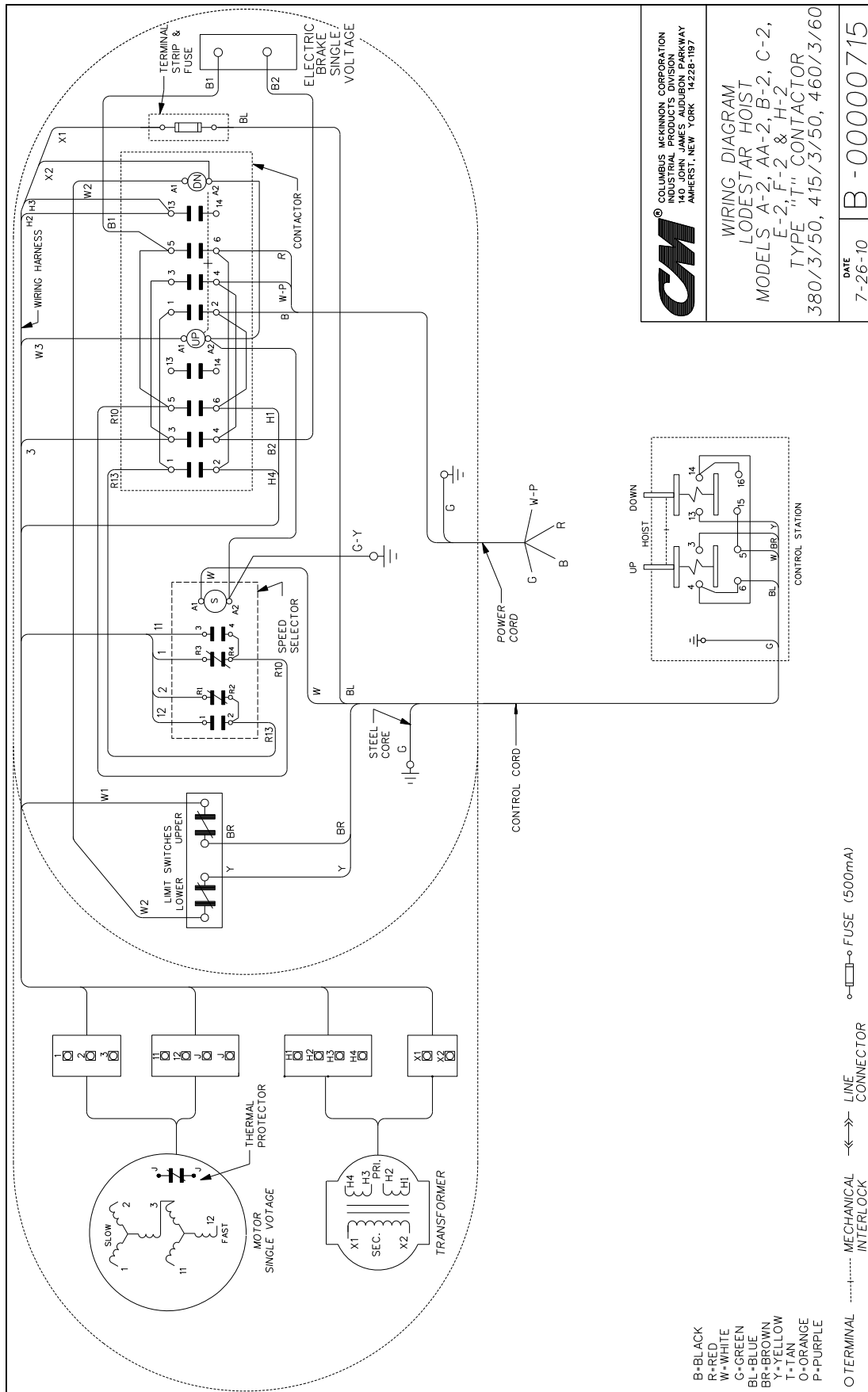
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- B=BLACK
 - R=RED
 - W=WHITE
 - C=GREEN
 - BL=BLUE
 - BR=GREEN
 - T=TEAL
 - O=ORANGE
 - P=PURPLE
- >—>—> LINE CONNECTOR
 - MECHANICAL INTERLOCK
 - TERMINAL
 - FUSE (500mA)

REFERENCE WIRING DIAGRAMS



REFERENCE WIRING DIAGRAMS



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 1000 CENTRAL PARKWAY
 AMHERST, NEW YORK 14228-1197

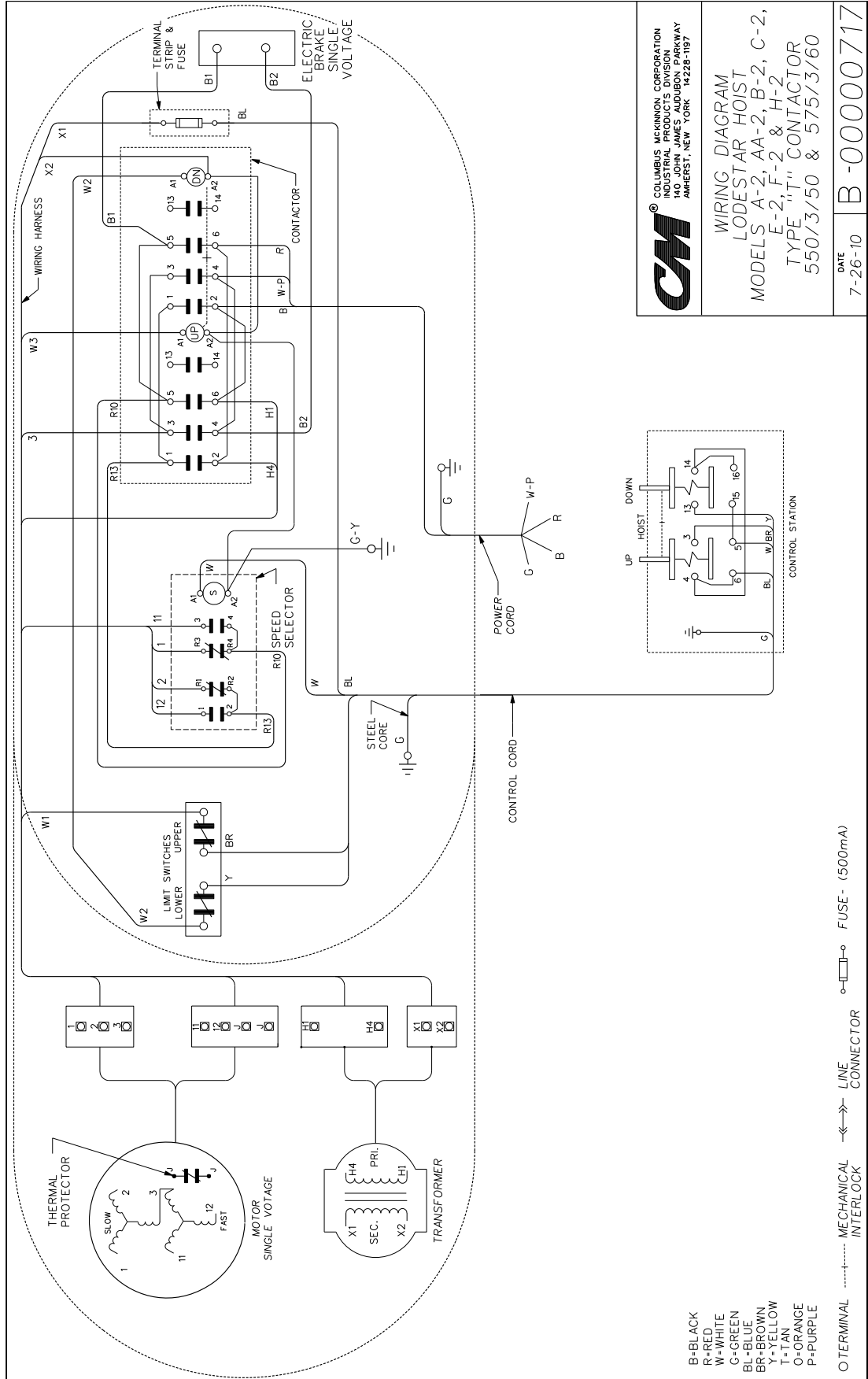
WIRING DIAGRAM
 LODESTAR HOIST
 MODELS A-2, AA-2, B-2, C-2,
 E-2, F-2 & H-2
 TYPE "T" CONTACTOR
 380/3/50, 415/3/50, 460/3/60

DATE 7-26-10
 B-00000715

- B-BLACK
- R-RED
- W-WHITE
- G-GREEN
- BL-BLUE
- BR-BROWN
- Y-YELLOW
- T-TAN
- O-ORANGE
- P-PURPLE

MECHANICAL INTERLOCK
 LINE
 CONNECTOR
 FUSE (500mA)

REFERENCE WIRING DIAGRAMS



CM
 COLUMBUS MCKINNON CORPORATION
 INDUSTRIAL PRODUCTS DIVISION
 140 JOHN JAMES AUDUBON PARKWAY
 AMHERST, N.H. 03817-1928

WIRING DIAGRAM
 LODESTAR HOIST
 MODELS A-2, AA-2, B-2, C-2,
 E-2, F-2 & H-2
 TYPE "I" CONTACTOR
 550/3/50 & 575/3/60

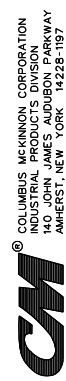
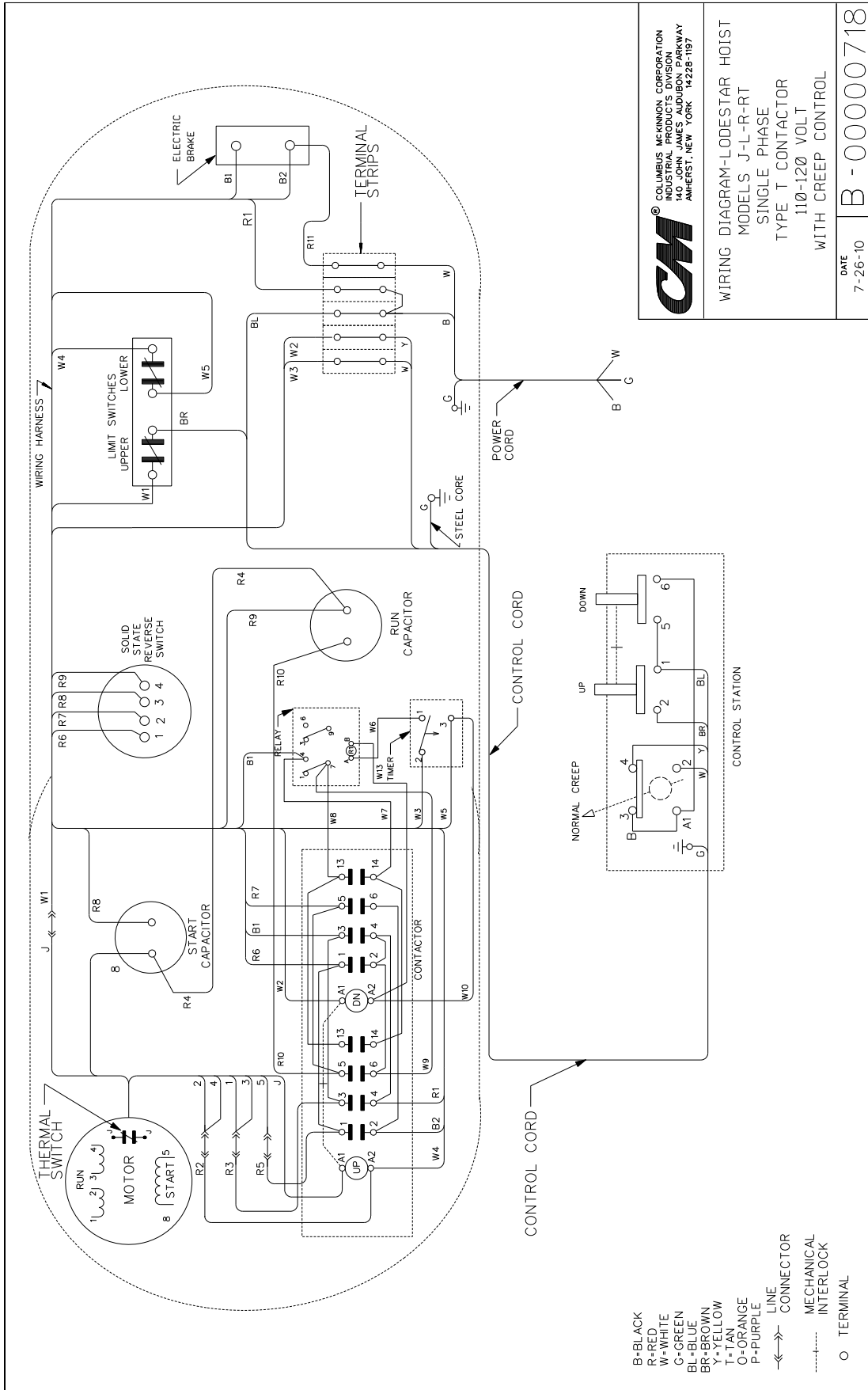
DATE
 7-26-10

B-00000717

- B-BLACK
- R-RED
- W-WHITE
- G-GREEN
- BL-BLUE
- BR-BROWN
- Y-YELLOW
- T-TAN
- O-ORANGE
- P-PURPLE

- TERMINAL
- MECHANICAL INTERLOCK
- LINE CONNECTOR
- FUSE - (500mA)

REFERENCE WIRING DIAGRAMS

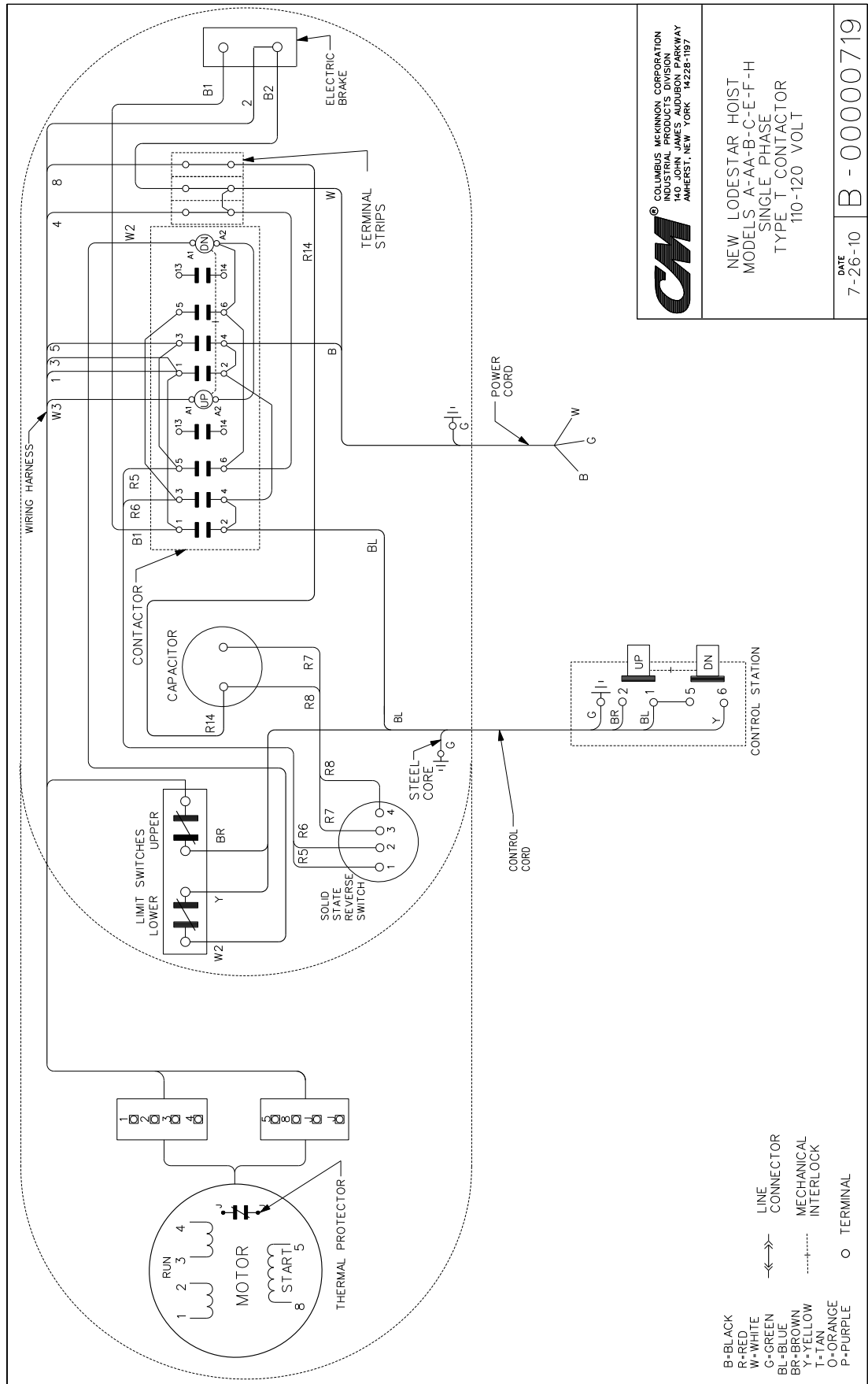


COLUMBUS MCKINNEY CORPORATION
 INDUSTRIAL PRODUCTS DIVISION
 140 JOHN JAMES AUDUBON PARKWAY
 AMHERST, NEW YORK 14228-1197

WIRING DIAGRAM-LODESTAR HOIST
 MODELS J-L-R-RT
 SINGLE PHASE
 TYPE T CONTACTOR
 110-120 VOLT
 WITH CREEP CONTROL

DATE 7-26-10
 B - 00000718

REFERENCE WIRING DIAGRAMS



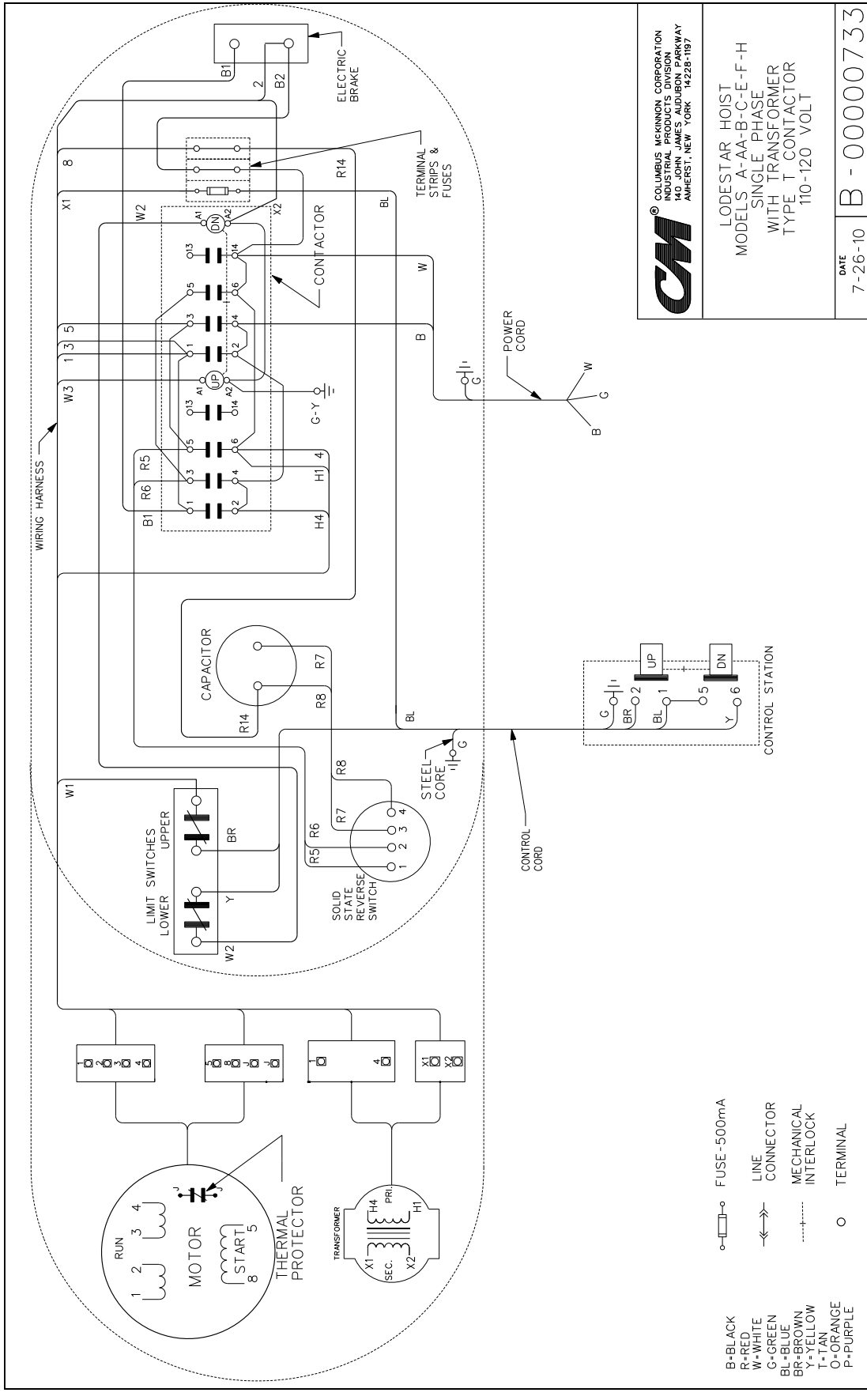
COLUMBUS MCKINNON CORPORATION
INDUSTRIAL PRODUCTS DIVISION
140 JOHN JAMES AUDUBON PARKWAY
AMHERST, NEW YORK 14226-7157

NEW LODESTAR HOIST
MODELS A-AA-B-C-E-F-H
SINGLE PHASE
TYPE T CONTACTOR
110-120 VOLT

DATE
7-26-10

B - 00000719

REFERENCE WIRING DIAGRAMS



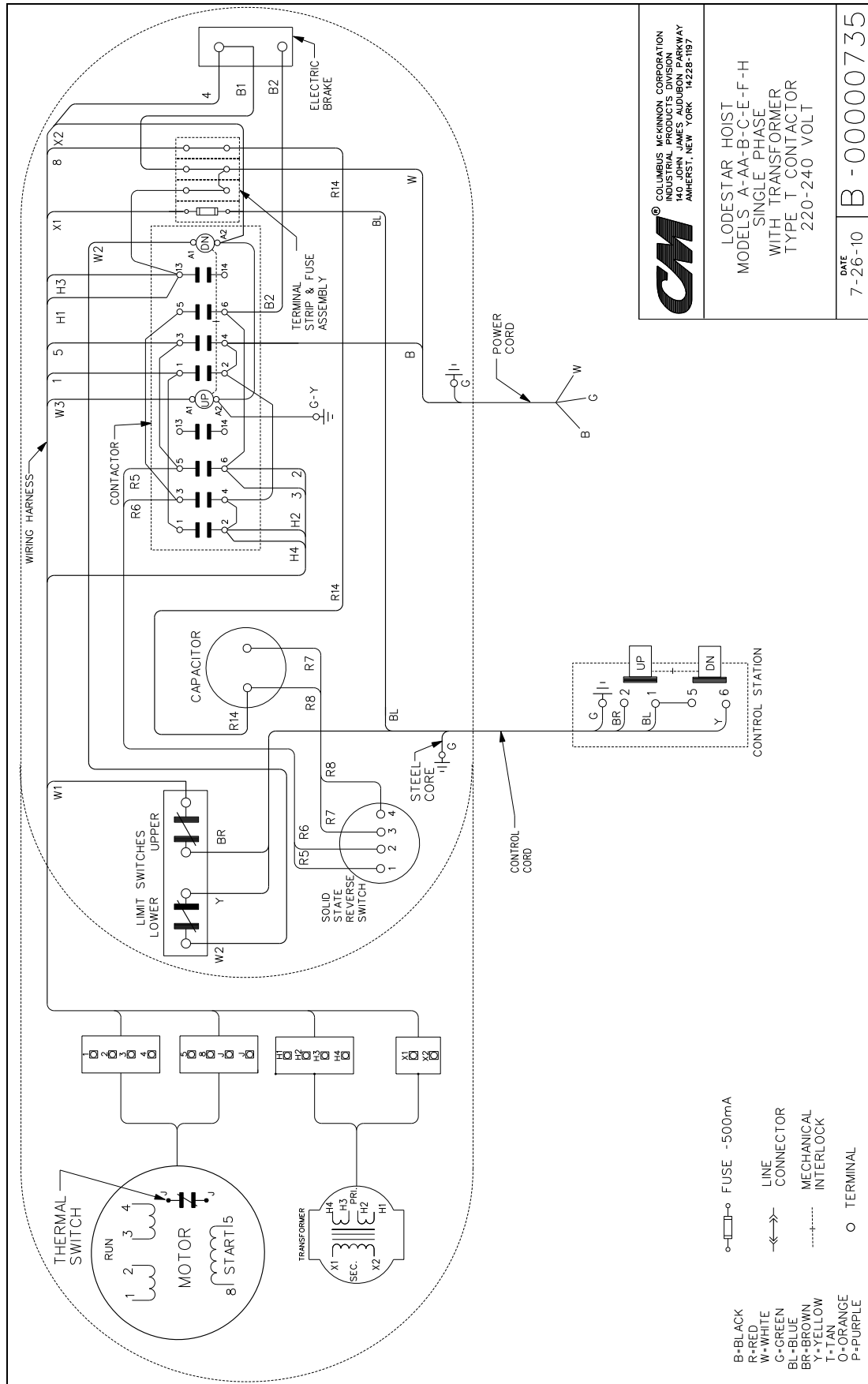
- B=BLACK
 - R=RED
 - W=WHITE
 - G=GREEN
 - BL=BLUE
 - BR=BROWN
 - Y=YELLOW
 - T=TAN
 - O=ORANGE
 - P=PURPLE
- FUSE-500mA
 - ↔ LINE CONNECTOR
 - ⋯ MECHANICAL INTERLOCK
 - TERMINAL

CM COLUMBUS MCKINNON CORPORATION
 INDUSTRIAL PRODUCTS DIVISION
 140 JOHN JAMES AUDUBON PARKWAY
 AMHERST, NEW YORK 14226-187

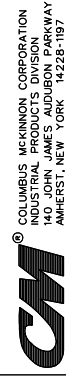
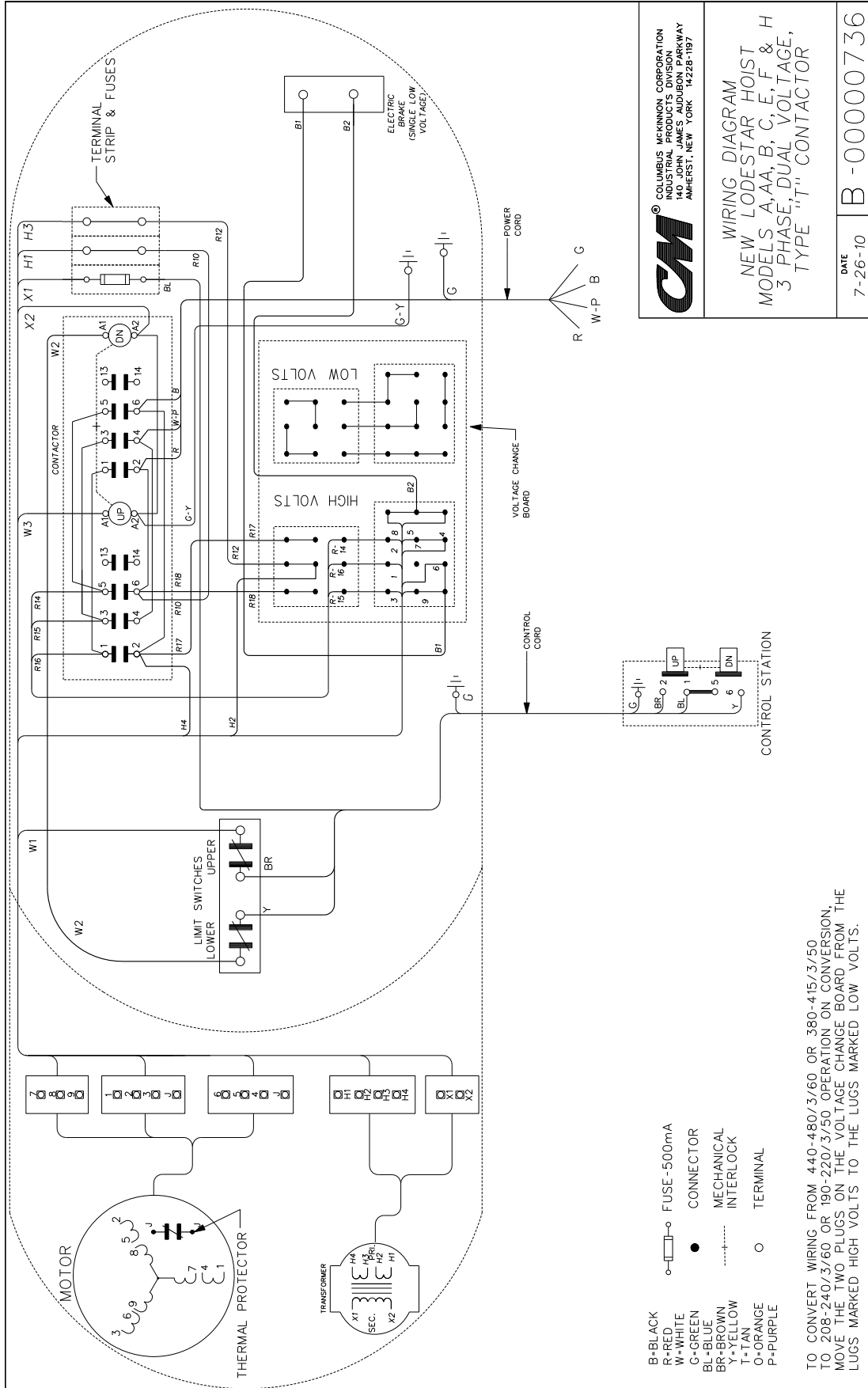
LODESTAR HOIST
 MODELS A-AA-B-C-E-F-H
 SINGLE PHASE
 WITH TRANSFORMER
 TYPE T CONTACTOR
 110-120 VOLT

DATE 7-26-10 B-00000733

REFERENCE WIRING DIAGRAMS



REFERENCE WIRING DIAGRAMS



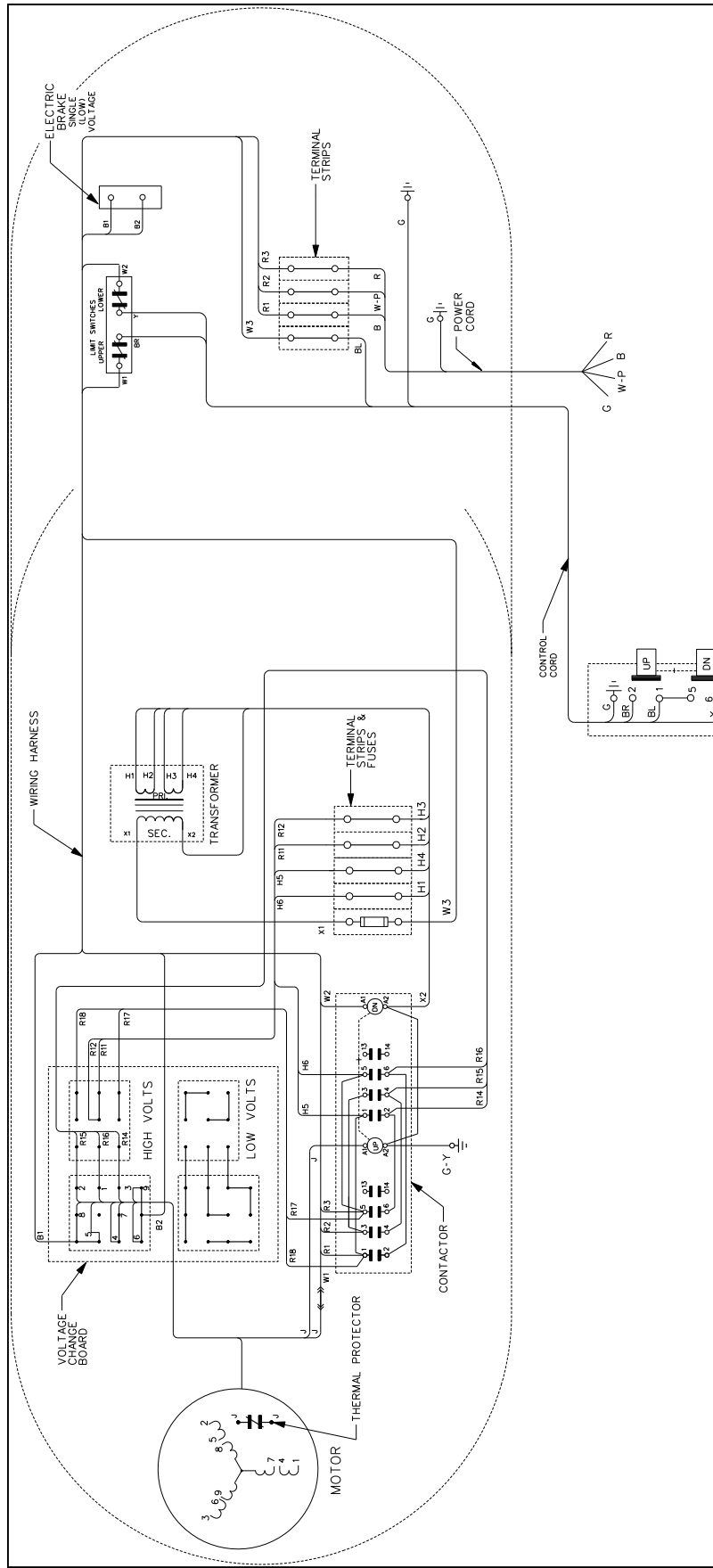
COLUMBUS MCKINNON CORPORATION
 INDUSTRIAL PRODUCTS DIVISION
 140 JOHN JAMES AUDUBON PARKWAY
 AMHERST, NEW YORK 14228-1197

WIRING DIAGRAM
 NEW LODESTAR HOIST
 MODELS A, AA, B, C, E, F & H
 3 PHASE, DUAL VOLTAGE,
 TYPE "I" CONTACTOR

DATE 7-26-10

B-00000736

REFERENCE WIRING DIAGRAMS



- → FUSE - 500mA
- ↔ LINE CONNECTOR
- CONNECTOR
- MECHANICAL INTERLOCK
- TERMINAL
- B-BLACK
- R-RED
- W-WHITE
- G-GREEN
- BL-BLUE
- BR-BROWN
- Y-YELLOW
- T-TAN
- O-ORANGE
- P-PURPLE

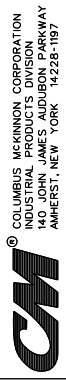
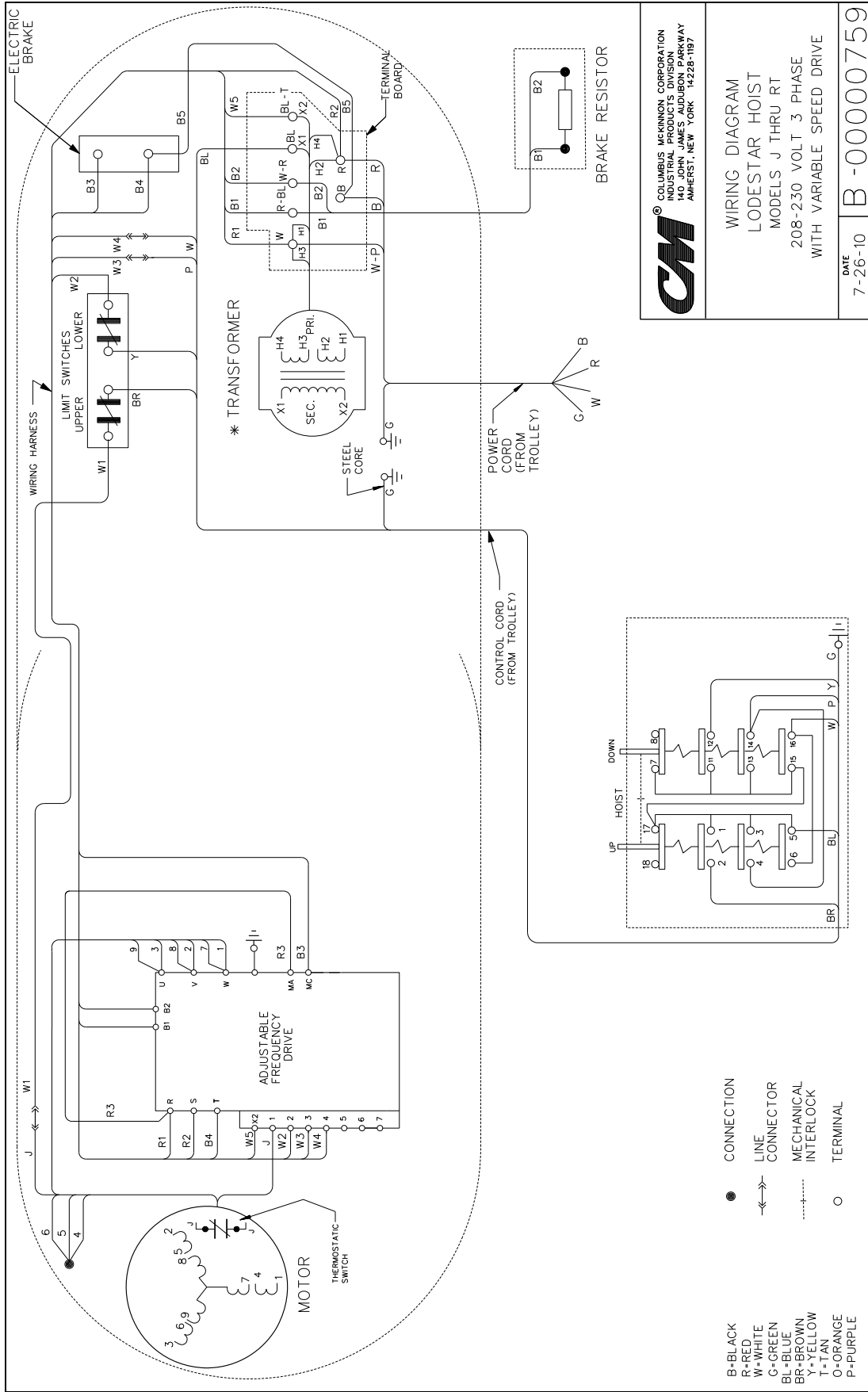
TO CONVERT WIRING FROM 440-480/3/60 OR 380-415/3/50 TO 208-240/3/60 OR 190-220/3/50 OPERATION, MOVE THE TWO PLUGS ON THE VOLTAGE CHANGE BOARD FROM THE LUGS MARKED HIGH VOLTS TO THE LUGS MARKED LOW VOLTS.

COLUMBUS MCKINNON CORPORATION
INDUSTRIAL PRODUCTS DIVISION
40 JOHN JAMES AUDUBON PARKWAY
AMHERST, NEW YORK 14226-1871

WIRING DIAGRAM
LODESTAR HOIST
MODELS J, JJ, L, LL, R & RR
RT & RR^T
DUAL VOLTAGE
TYPE T CONTACTOR

DATE **B - 00000738**
7-26-10

REFERENCE WIRING DIAGRAMS



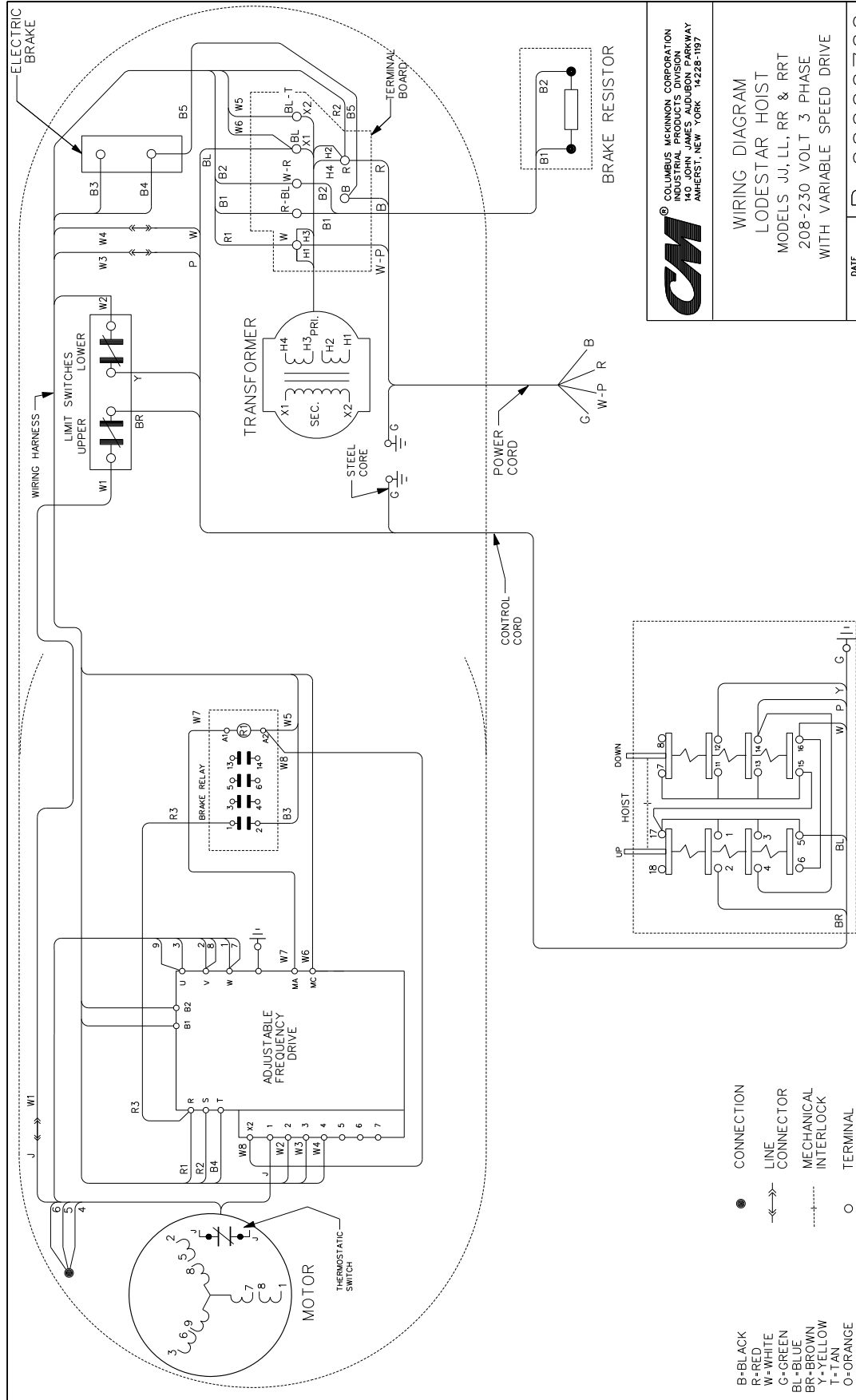
COLUMBUS MCKINNON CORPORATION
INDUSTRIAL PRODUCTS DIVISION
 140 JOHN JAMES AUDUBON PARKWAY
 AMHERST, NEW YORK 14228-1197

WIRING DIAGRAM
LODESTAR HOIST
 MODELS J THRU RT
 208-230 VOLT 3 PHASE
 WITH VARIABLE SPEED DRIVE

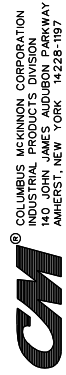
DATE
 7-26-10 **B-00000759**

- B-BLACK
 - R-RED
 - W-WHITE
 - G-GREEN
 - BL-BLUE
 - BR-BROWN
 - Y-YELLOW
 - T-TAN
 - O-ORANGE
 - P-PURPLE
- CONNECTION
 - ←→ LINE CONNECTOR
 - MECHANICAL INTERLOCK
 - TERMINAL

REFERENCE WIRING DIAGRAMS



- B-BLACK
 - R-RED
 - W-WHITE
 - G-GREEN
 - BL-BLUE
 - BR-BROWN
 - Y-YELLOW
 - T-TAN
 - O-ORANGE
 - P-PURPLE
- CONNECTION
 - ←→ LINE CONNECTOR
 - · - · - MECHANICAL INTERLOCK
 - TERMINAL

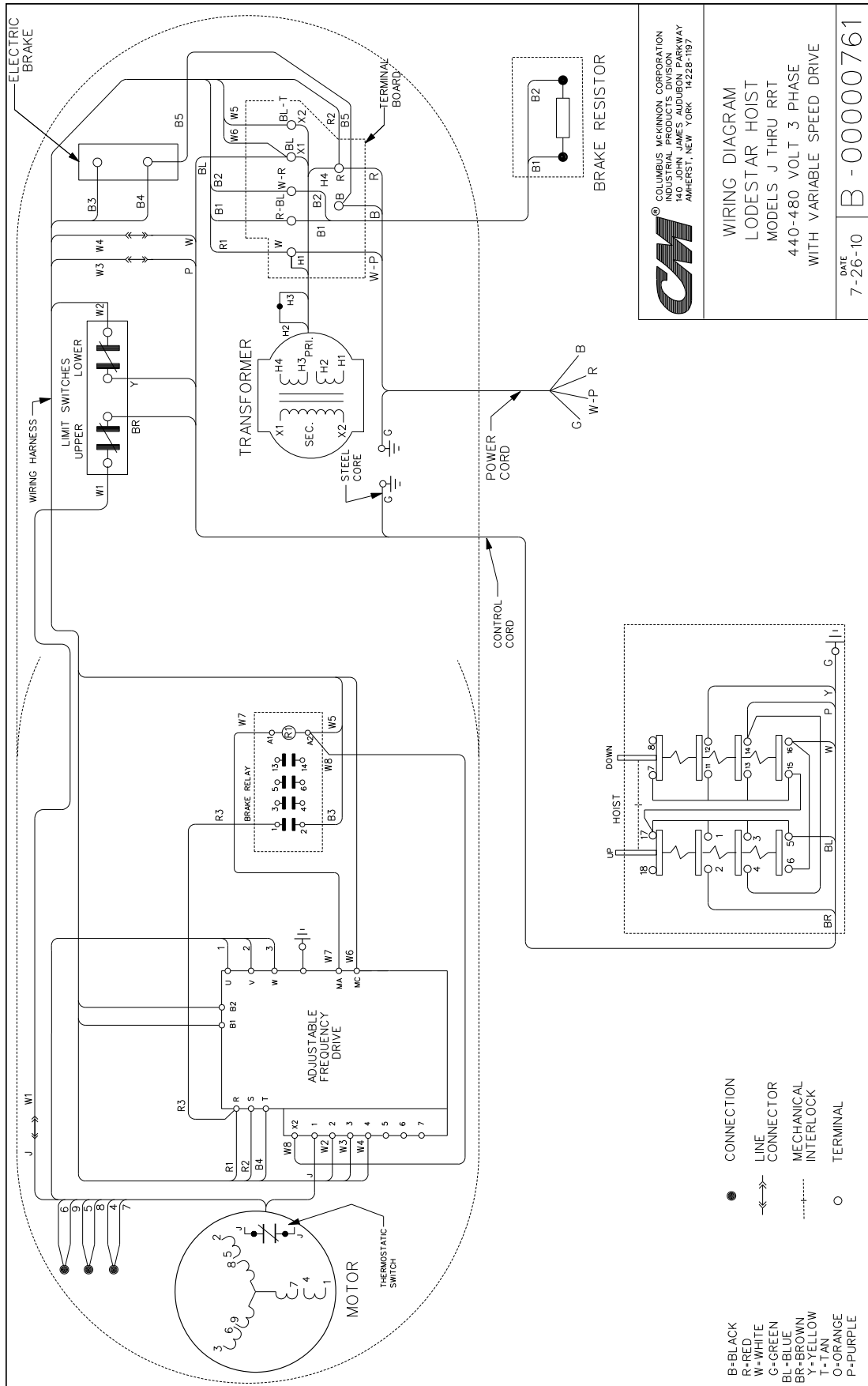


COLUMBIA MCWIKIN CORPORATION
INDUSTRIAL PRODUCTS DIVISION
140 JOHN JAMES AUDUBON PARKWAY
AMHERST, NEW YORK 14228-1197

WIRING DIAGRAM
LODESTAR HOIST
MODELS JJ, LL, RR & RRT
208-230 VOLT 3 PHASE
WITH VARIABLE SPEED DRIVE

DATE 7-26-10
B-00000760

REFERENCE WIRING DIAGRAMS

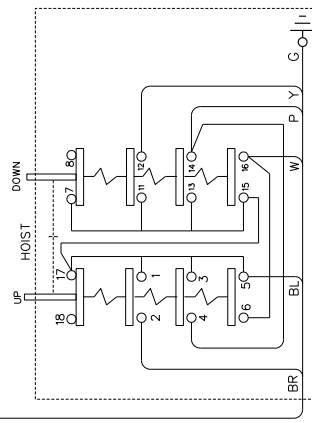


CM COLUMBUS MCKINNON CORPORATION
 INDUSTRIAL PRODUCTS DIVISION
 140 JOHN JAMES AUDUBON PARKWAY
 AMHERST, NEW YORK 14226-1197

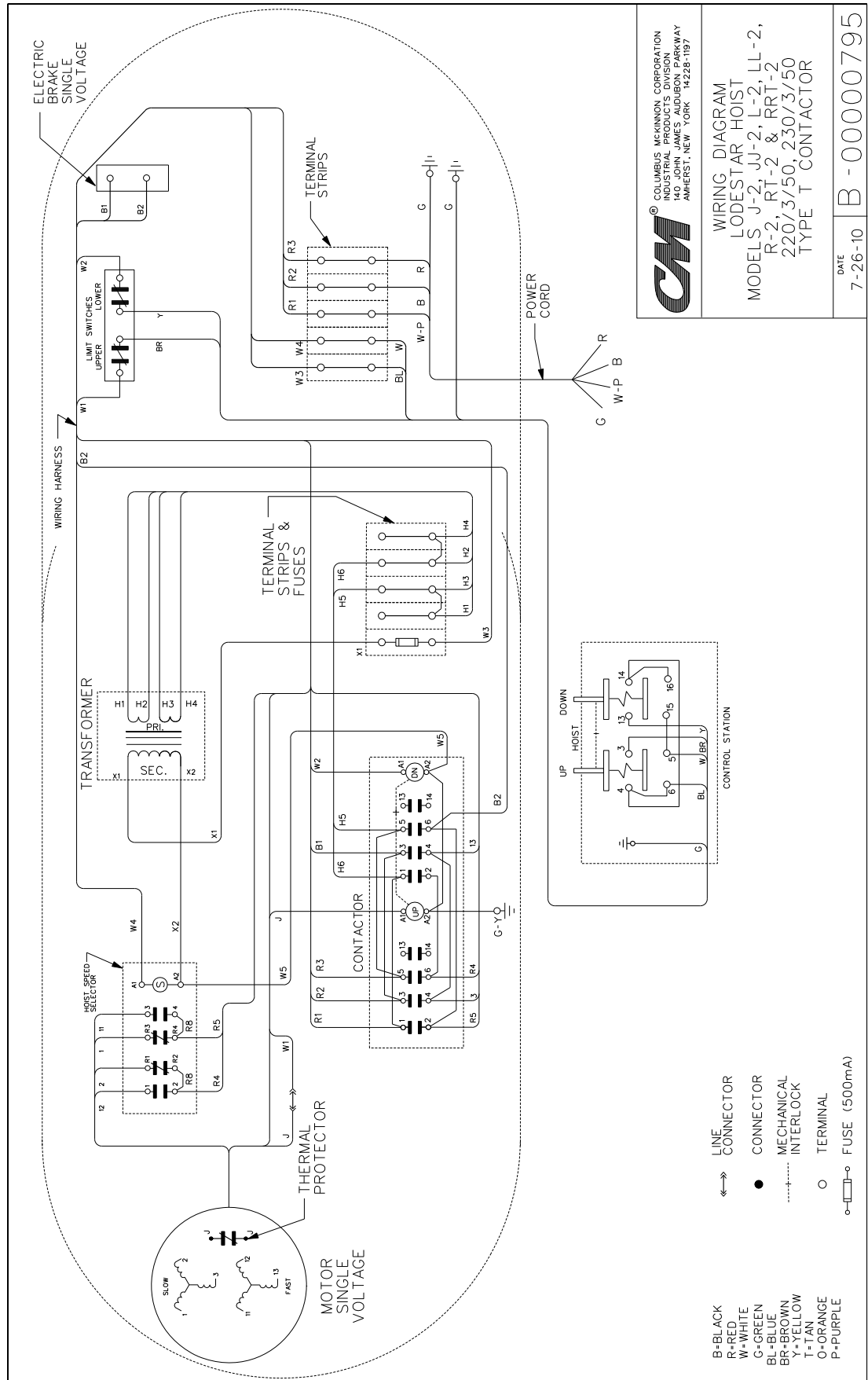
WIRING DIAGRAM
 LODESTAR HOIST
 MODELS J THRU RT
 440-480 VOLT 3 PHASE
 WITH VARIABLE SPEED DRIVE

DATE 7-26-10 B - 00000761

- B-BLACK
 - R-RED
 - W-WHITE
 - G-GREEN
 - BL-BLUE
 - BR-BROWN
 - Y-YELLOW
 - T-TAN
 - O-ORANGE
 - P-PURPLE
- CONNECTION
 - ↔ LINE CONNECTOR
 - ⋯ MECHANICAL INTERLOCK
 - TERMINAL



REFERENCE WIRING DIAGRAMS



COLUMBIE MCINNION CORPORATION
INDUSTRIAL PRODUCTS DIVISION
 140 JOHN JAMES AUDUBON PARKWAY
 AMHERST, NEW YORK 14228-1197

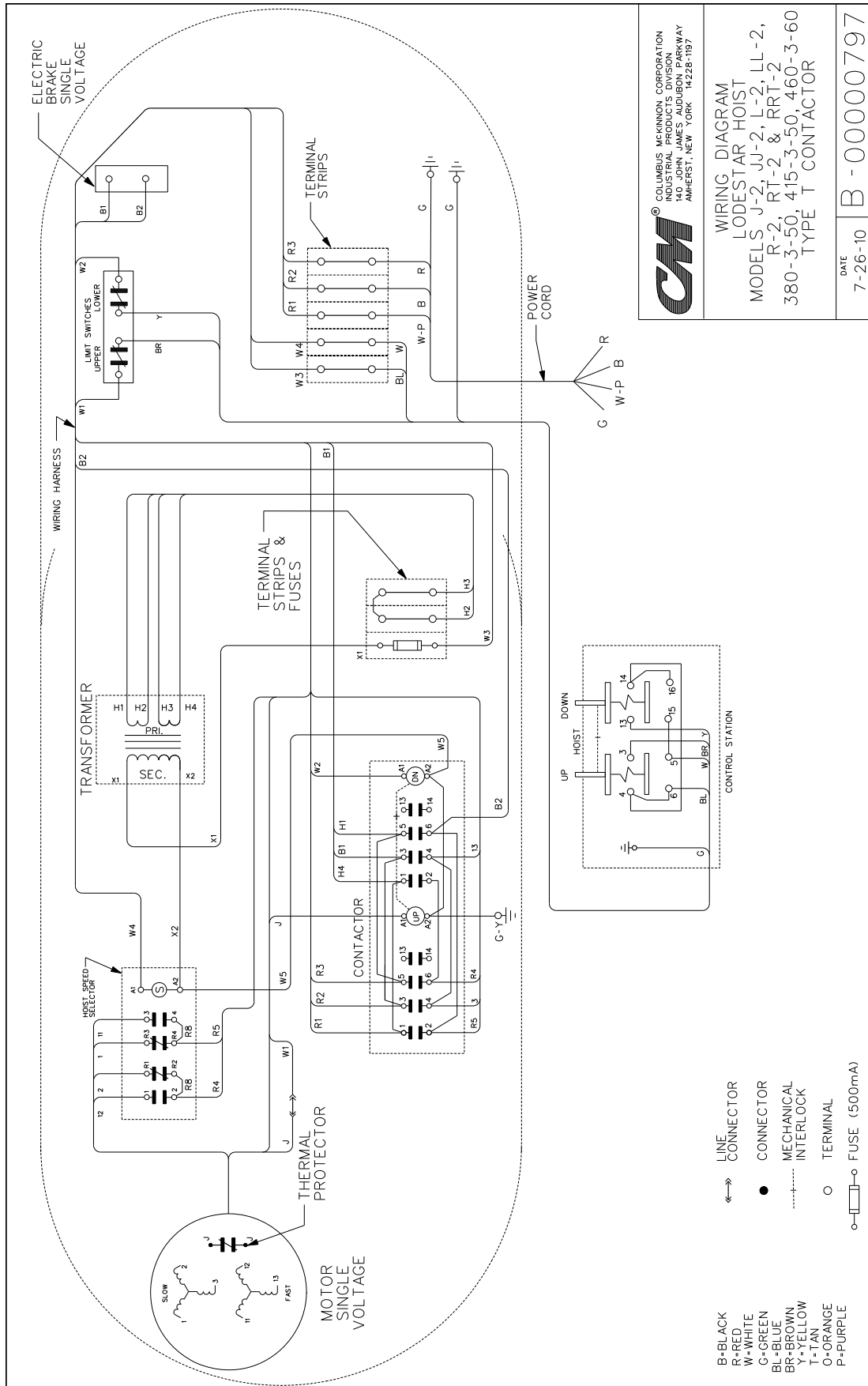
WIRING DIAGRAM
LODESTAR HOIST
 MODELS J-2, JJ-2, L-2, LL-2,
 R-2, RT-2 & RRT-2
 220/3/50, 230/3/50
 TYPE T CONTACTOR

DATE
7-26-10

B - 00000795

- B=BLACK
 - R=RED
 - W=WHITE
 - G=GREEN
 - BL=BLUE
 - BR=BROWN
 - Y=YELLOW
 - T=TAN
 - O=ORANGE
 - P=PURPLE
-
- ←→ LINE CONNECTOR
 - CONNECTOR
 - ⋯ MECHANICAL INTERLOCK
 - TERMINAL
 - FUSE (500mA)

REFERENCE WIRING DIAGRAMS



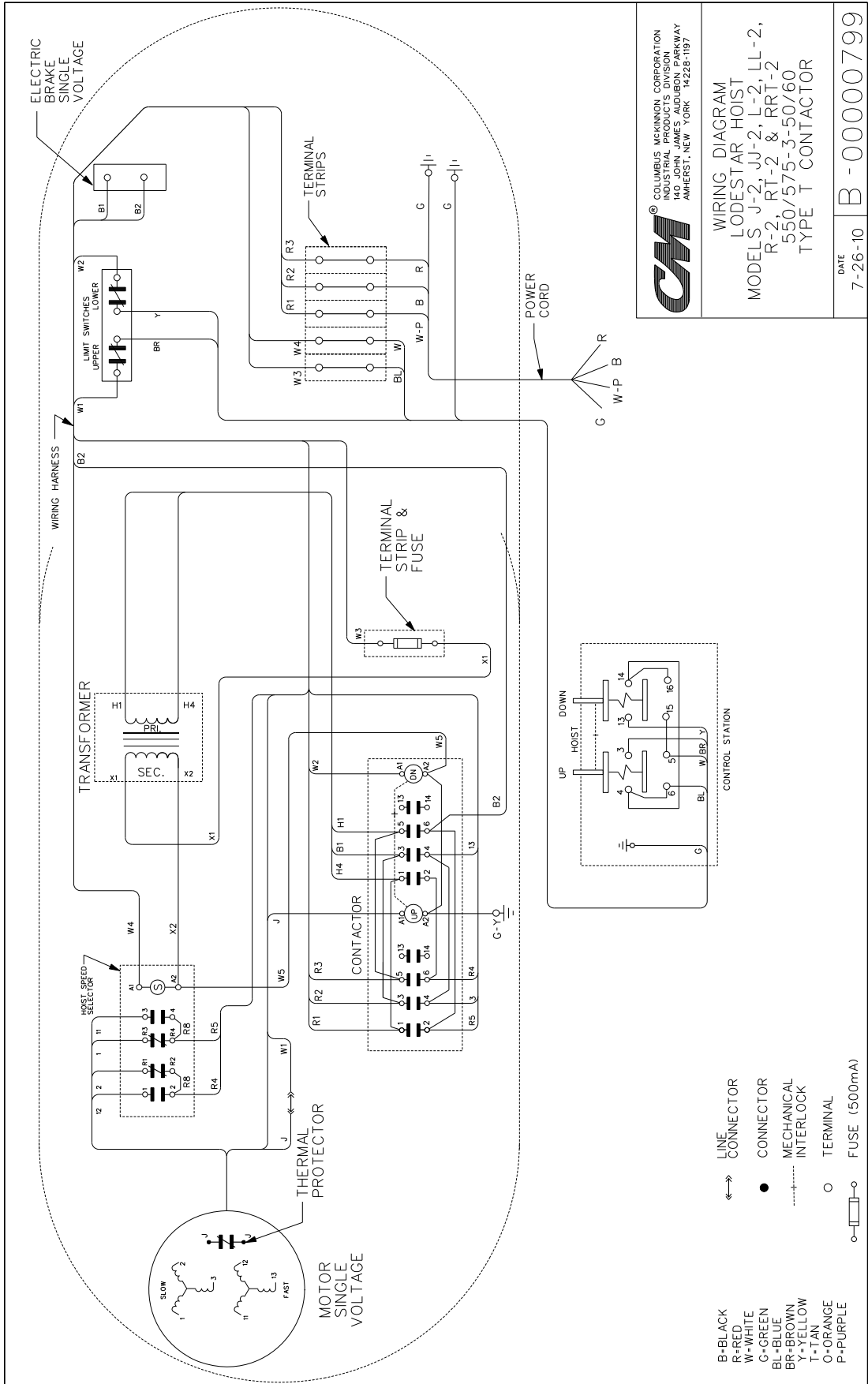
CM COLUMBUS MCKINNON CORPORATION
 INDUSTRIAL PRODUCTS DIVISION
 140 JOHN JAMES AUDUBON PARKWAY
 AMHERST, NEW YORK 14226-1197

WIRING DIAGRAM
 LODESTAR HOIST
 MODELS J-2, JJ-2, L-2, LL-2,
 R-2, RT-2 & RRT-2
 380-3-50, 415-3-50, 460-3-60
 TYPE T CONTACTOR

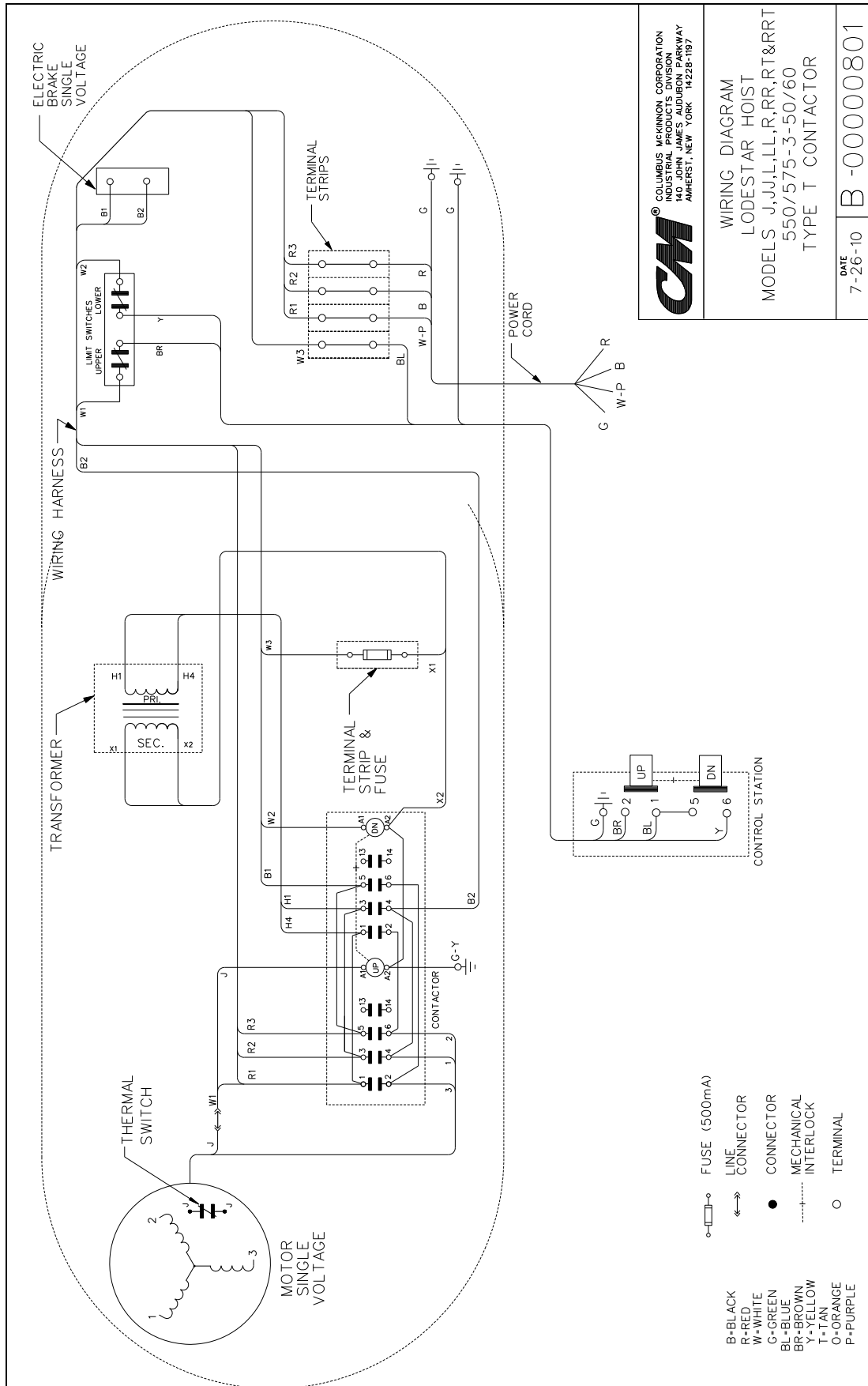
DATE 7-26-10 B-00000797

- B-BLACK
 - R-RED
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 - BL-BLUE
 - BR-BROWN
 - Y-YELLOW
 - T-TAN
 - O-ORANGE
 - P-PURPLE
- ◀→ LINE CONNECTOR
 - CONNECTOR
 - ⋯ MECHANICAL INTERLOCK
 - TERMINAL
 - FUSE (500mA)

REFERENCE WIRING DIAGRAMS



REFERENCE WIRING DIAGRAMS

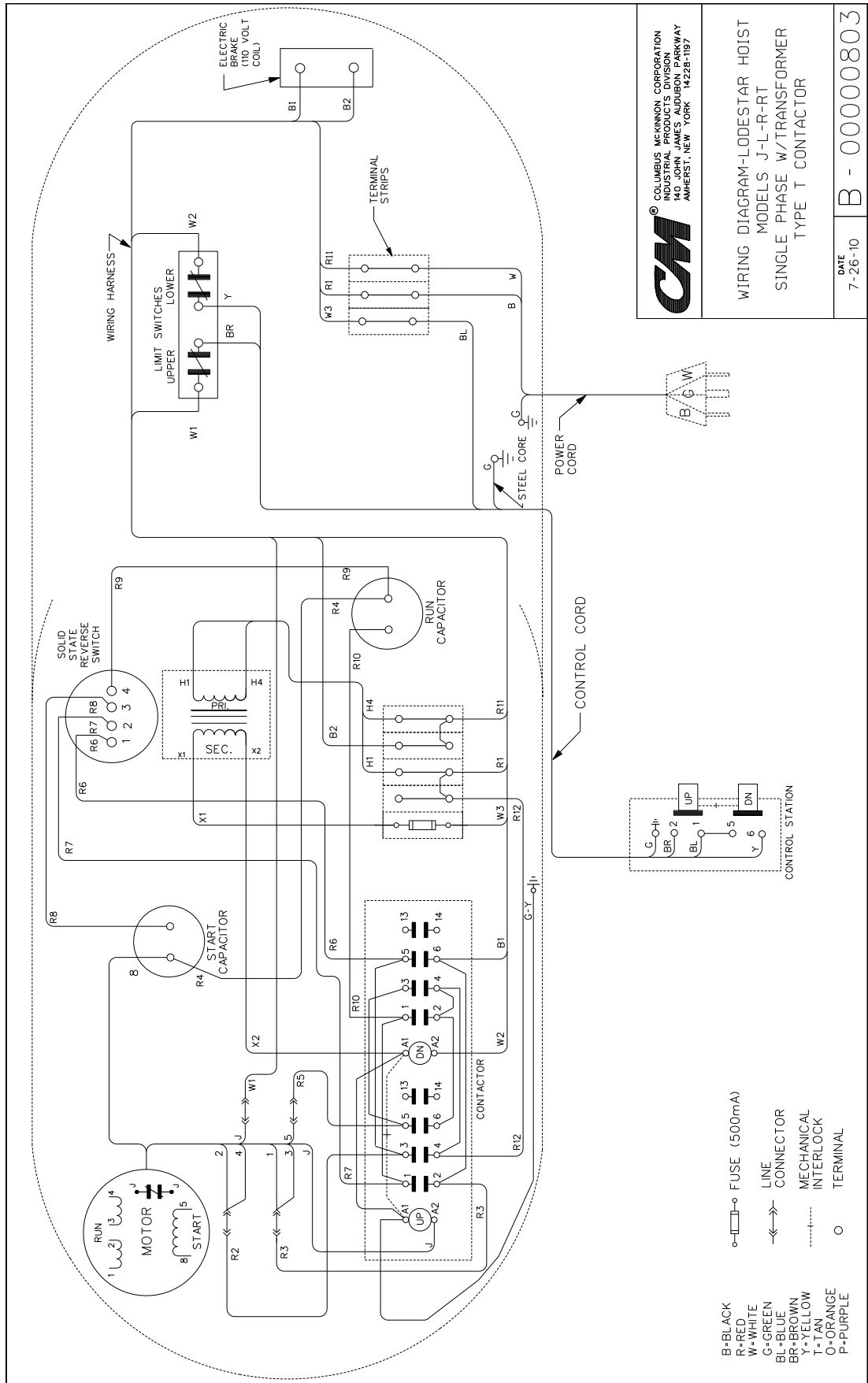


CM COLUMBUS MCKINNON CORPORATION
 INDUSTRIAL PRODUCTS DIVISION
 140 JOHN JAMES AUDUBON PARKWAY
 AMHERST, NEW YORK 14226-1157

WIRING DIAGRAM
 LODESTAR HOIST
 MODELS J,JJ,L,LL,R,RR,RT&RRT
 550/575-3-50/60
 TYPE T CONTACTOR

DATE 7-26-10 B-00000801

REFERENCE WIRING DIAGRAMS

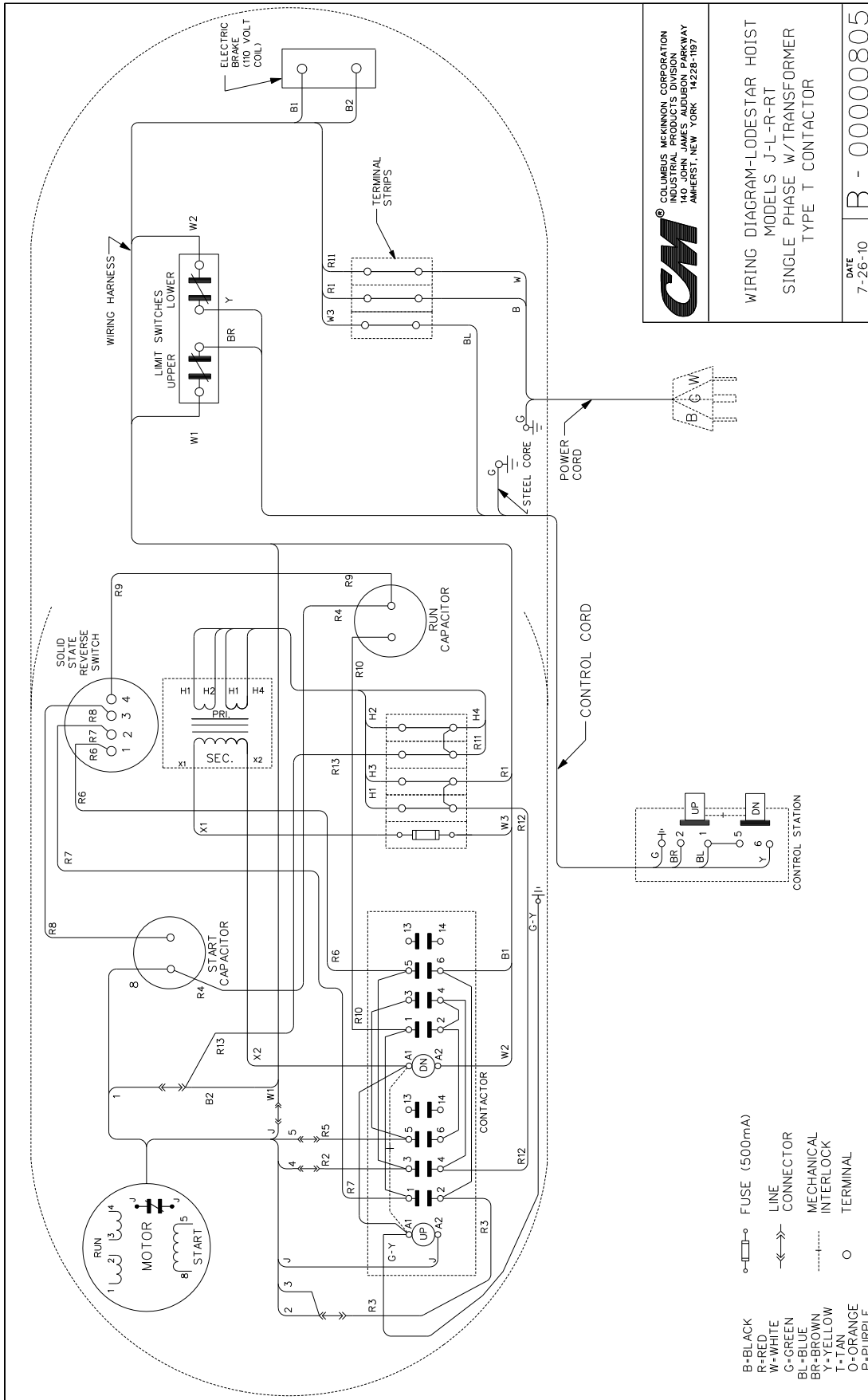


CM COLUMBUS MCKINNON CORPORATION
 INDUSTRIAL PRODUCTS DIVISION
 140 JOHN JAMES AUDUBON PARKWAY
 AMHERST, NEW YORK 14228-1157

WIRING DIAGRAM-LODESTAR HOIST
 MODELS J-L-R-RT
 SINGLE PHASE W/TRANSFORMER
 TYPE T CONTACTOR

DATE 7-26-10 B - 0000803

REFERENCE WIRING DIAGRAMS

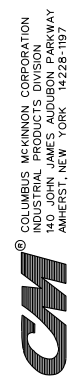
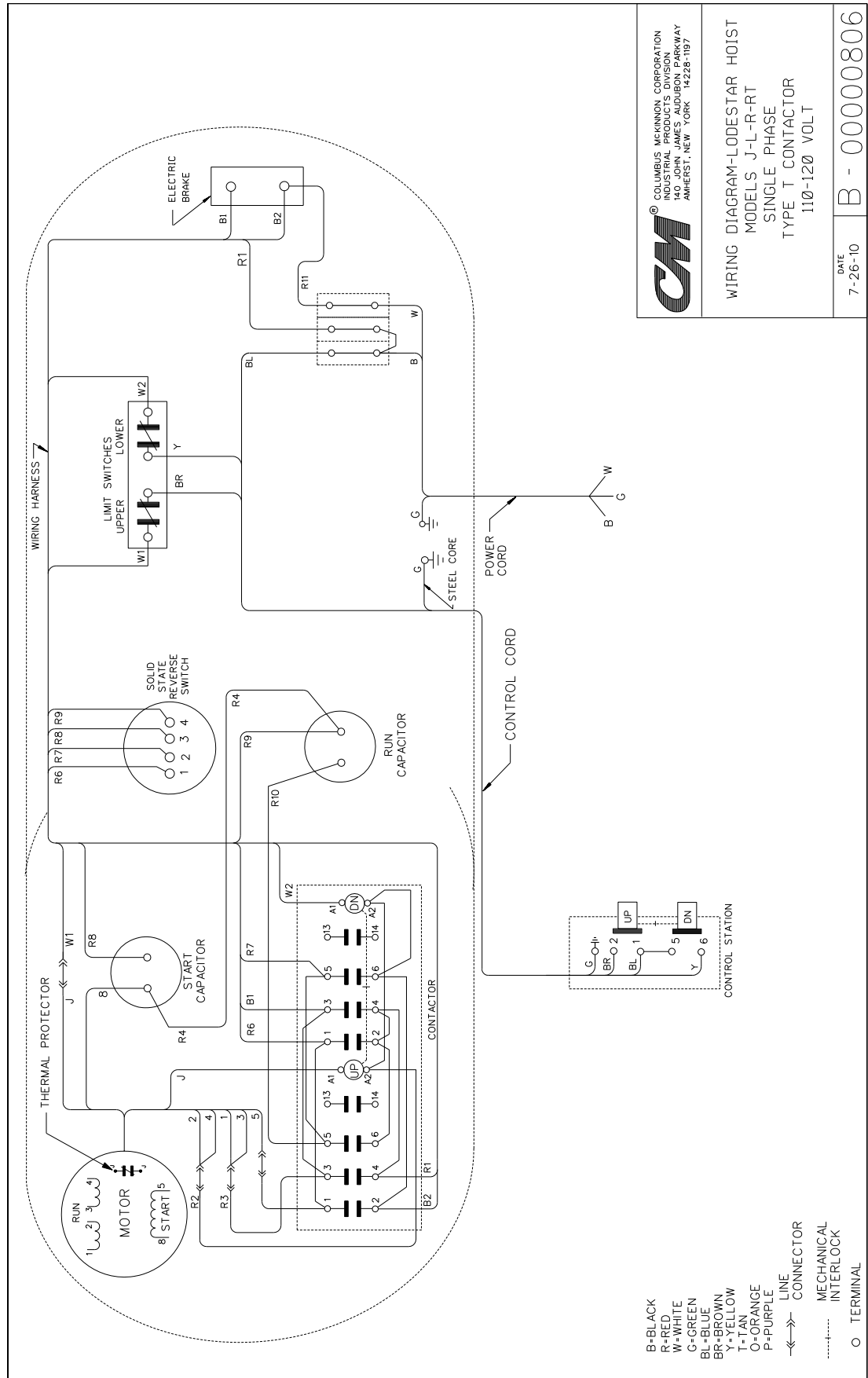


CM COLUMBUS MCKINNON CORPORATION
INDUSTRIAL PRODUCTS DIVISION
140 JOHN JAMES AUDUBON PARKWAY
AMHERST, NEW YORK 14226-1157

WIRING DIAGRAM-LODESTAR HOIST
MODELS J-L-R-RT
SINGLE PHASE W/TRANSFORMER
TYPE T CONTACTOR

DATE 7-26-10
B - 0000805

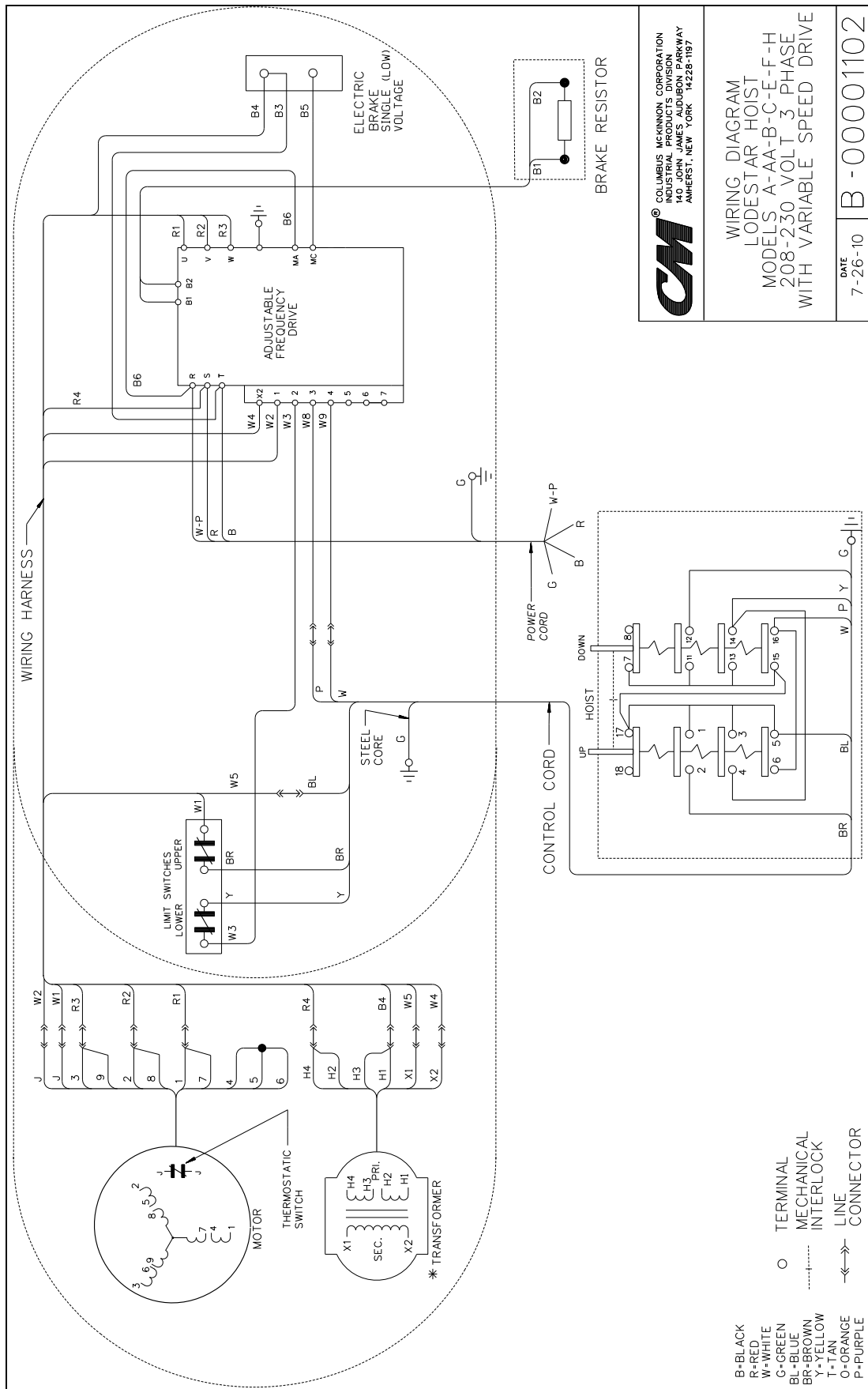
REFERENCE WIRING DIAGRAMS



WIRING DIAGRAM-LODESTAR HOIST
MODELS J-L-R-RT
SINGLE PHASE
TYPE T CONTACTOR
110-120 VOLT

DATE 7-26-10
B - 0000806

REFERENCE WIRING DIAGRAMS



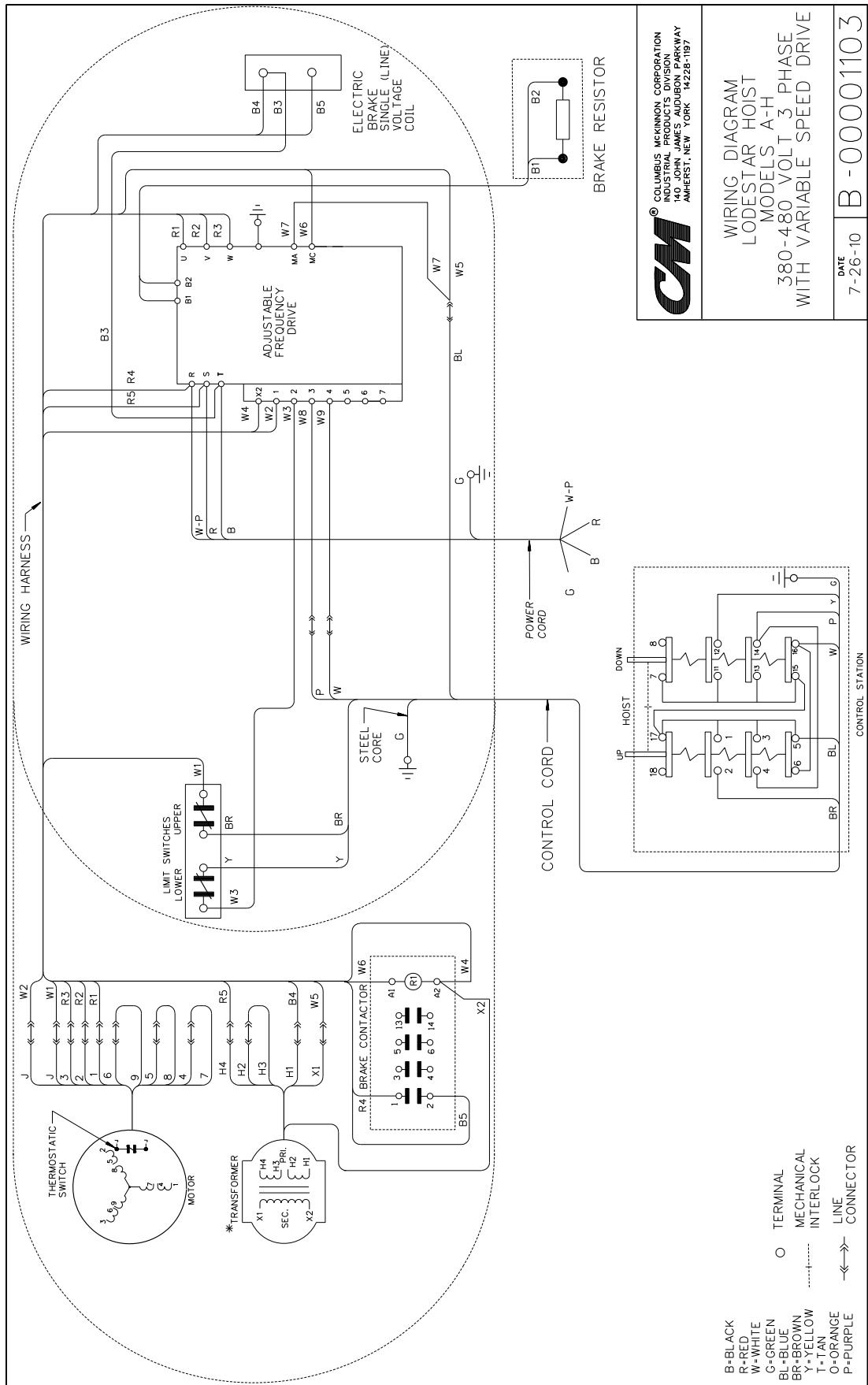
CM COLUMBUS MCKINNON CORPORATION
INDUSTRIAL PRODUCTS DIVISION
140 JOHN JAMES AUDUBON PARKWAY
AMHERST, NEW YORK 14228-1197

WIRING DIAGRAM
LODESTAR HOIST
MODELS A-AA-B-C-E-F-H
208-230 VOLT 3 PHASE
WITH VARIABLE SPEED DRIVE

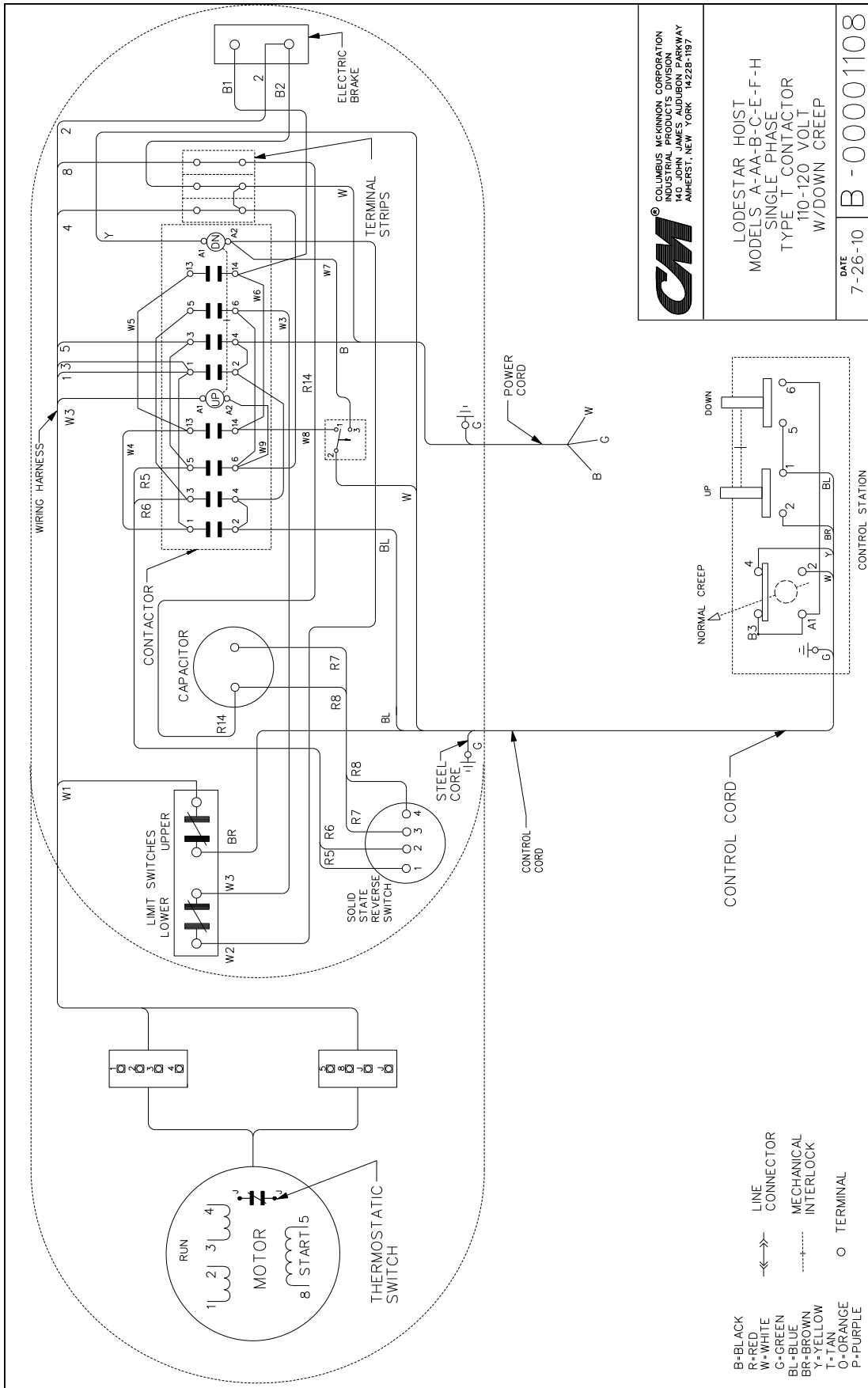
DATE 7-26-10
B-00001102

- B-BLACK
 - R-RED
 - W-WHITE
 - G-GREEN
 - BL-BLUE
 - BR-BROWN
 - Y-YELLOW
 - T-TAN
 - O-ORANGE
 - P-PURPLE
- TERMINAL
 - MECHANICAL INTERLOCK
 - LINE CONNECTOR

REFERENCE WIRING DIAGRAMS



REFERENCE WIRING DIAGRAMS



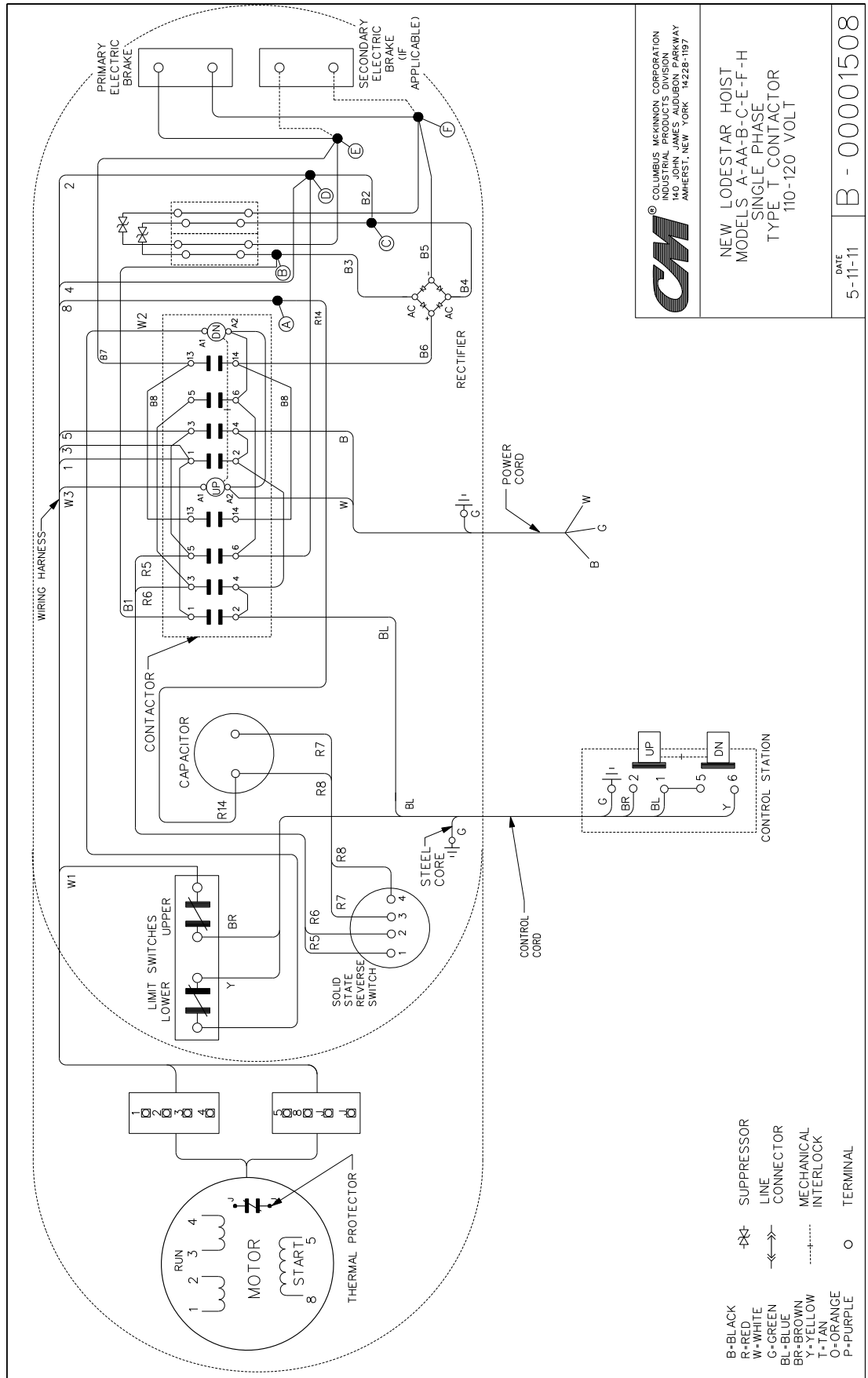
CM COLUMBIUS MCKINNON CORPORATION
 INDUSTRIAL PRODUCTS DIVISION
 140 JOHN JAMES AUDUBON PARKWAY
 AMHERST, NEW YORK 14226-1157

LODESTAR HOIST
 MODELS A-AA-B-C-E-F-H
 SINGLE PHASE
 TYPE T CONTACTOR
 110-120 VOLT
 W/DOWN CREEP

DATE 7-26-10 B-00001108

- B-BLACK
 - R-RED
 - W-WHITE
 - G-GREEN
 - BL-BLUE
 - BR-BROWN
 - Y-YELLOW
 - T-TAN
 - O-ORANGE
 - P-PURPLE
- >— LINE CONNECTOR
 - +— MECHANICAL INTERLOCK
 - TERMINAL

REFERENCE WIRING DIAGRAMS



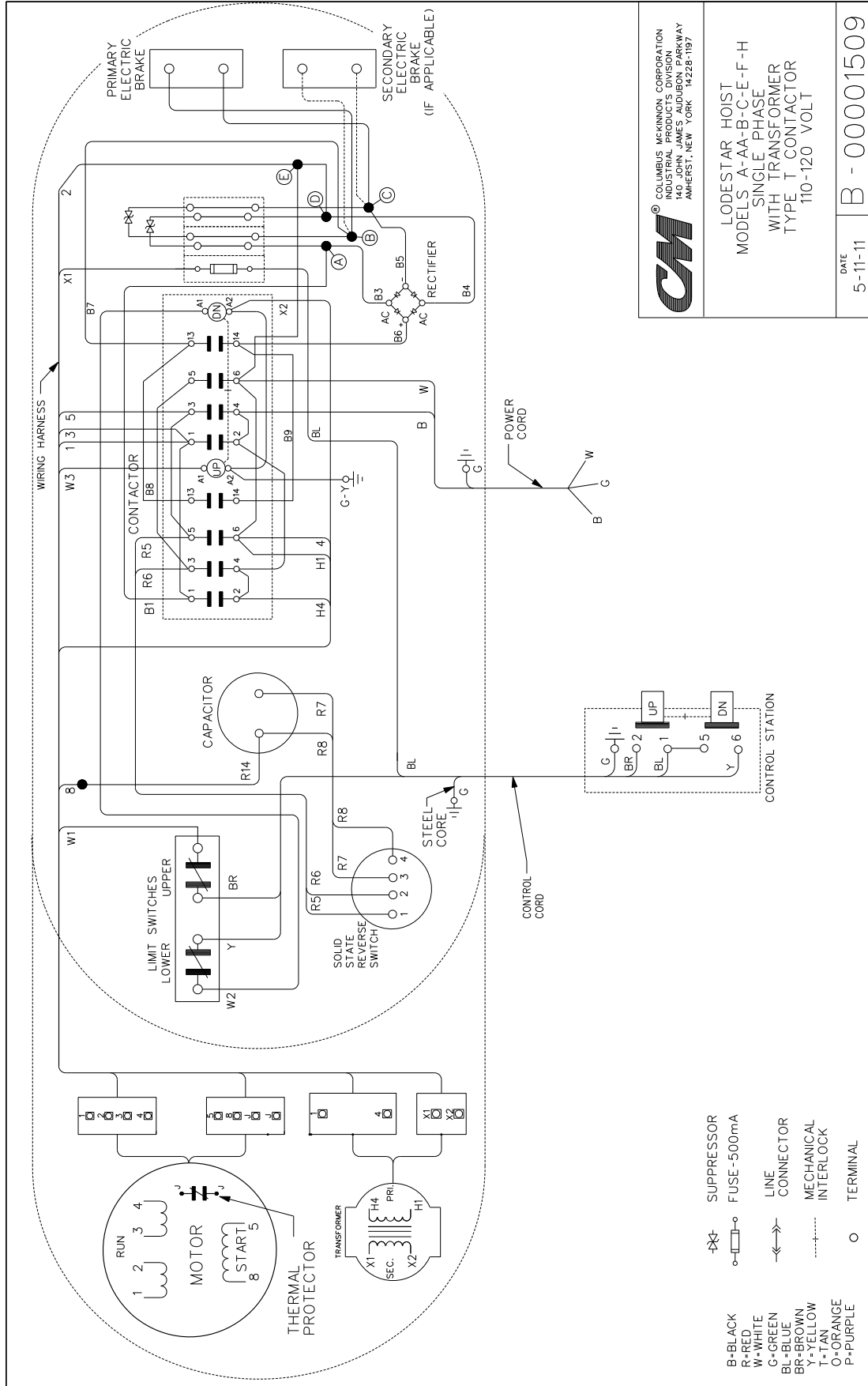
CM COLUMBIUS MCKINNON CORPORATION
INDUSTRIAL PRODUCTS DIVISION
140 JOHN JAMES AUDUBON PARKWAY
AMHERST, NEW YORK 14228-1197

NEW LODESTAR HOIST
MODELS A-AA-B-C-E-F-H
SINGLE PHASE
TYPE T CONTACTOR
110-120 VOLT

DATE 5-11-11 B - 00001508

- B-BLACK
- R-RED
- W-WHITE
- G-GREEN
- BL-BLUE
- BR-BROWN
- Y-YELLOW
- T-TAN
- O-ORANGE
- P-PURPLE
- TERMINAL
- ⊗ SUPPRESSOR
- ⊚ LINE CONNECTOR
- ⊚ MECHANICAL INTERLOCK

REFERENCE WIRING DIAGRAMS



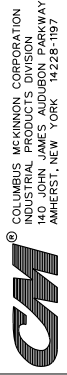
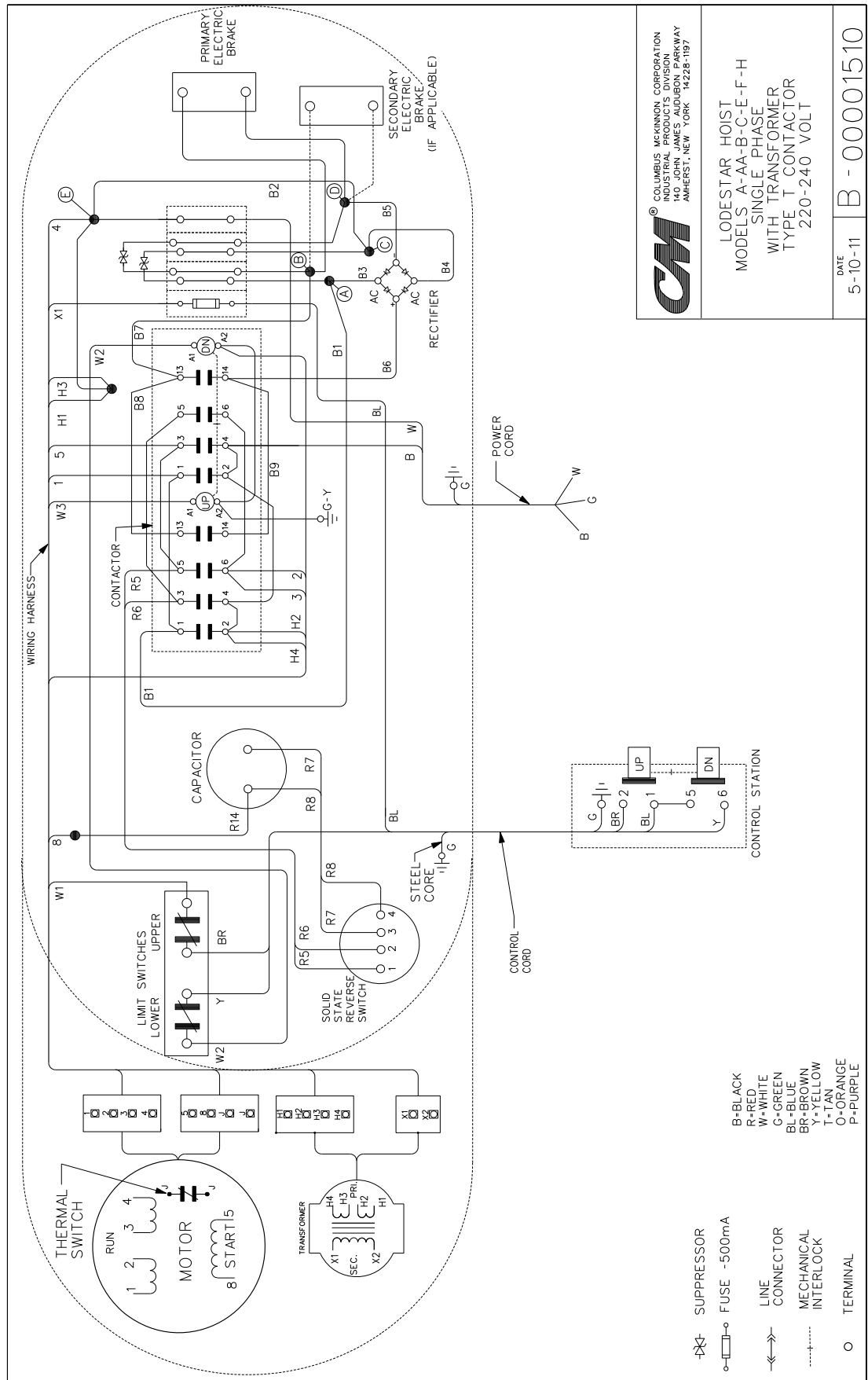
CM COLUMBUS MCKINNON CORPORATION
 INDUSTRIAL PRODUCTS DIVISION
 140 JOHN JAMES AUDUBON PARKWAY
 AMHERST, NEW YORK 14226-1157

LODESTAR HOIST
 MODELS A-AA-B-C-E-F-H
 SINGLE PHASE
 WITH TRANSFORMER
 TYPE T CONTACTOR
 110-120 VOLT

DATE 5-11-11 B - 00001509

- B-BLACK
 - R-RED
 - W-WHITE
 - G-GREEN
 - BL-BLUE
 - BR-BROWN
 - Y-YELLOW
 - T-TAN
 - O-ORANGE
 - P-PURPLE
- |— SUPPRESSOR
 - |— FUSE -500mA
 - |— LINE CONNECTOR
 - |— MECHANICAL INTERLOCK
 - TERMINAL

REFERENCE WIRING DIAGRAMS

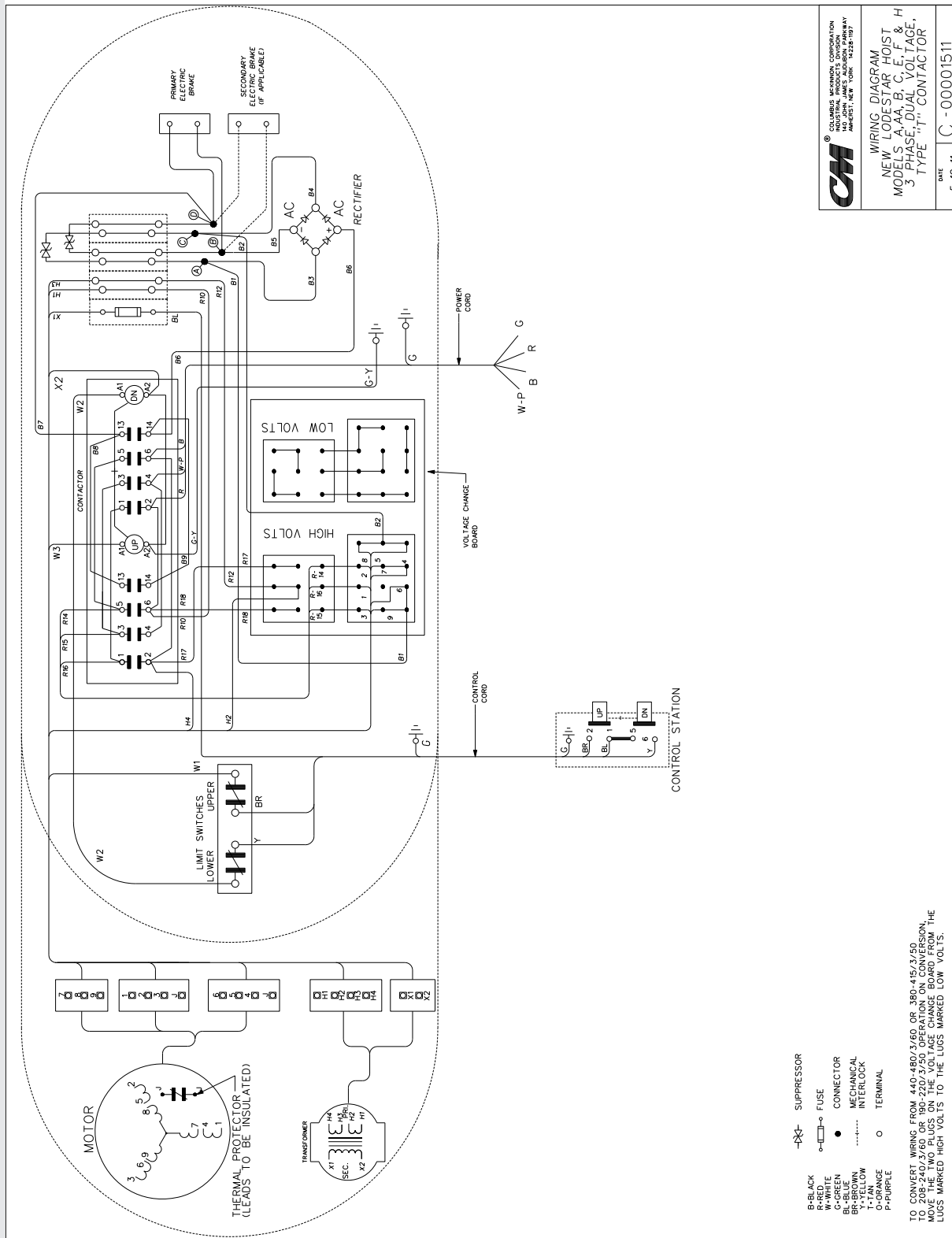


COLUMBIUS MCKINNON CORPORATION
INDUSTRIAL PRODUCTS DIVISION
140 JOHN JAMES AUDUBON PARKWAY
AMHERST, NEW YORK 14228-1197

LODESTAR HOIST
MODELS A-AA-B-C-E-F-H
SINGLE PHASE
WITH TRANSFORMER
TYPE T CONTACTOR
220-240 VOLT

DATE 5-10-11 B - 00001510

REFERENCE WIRING DIAGRAMS

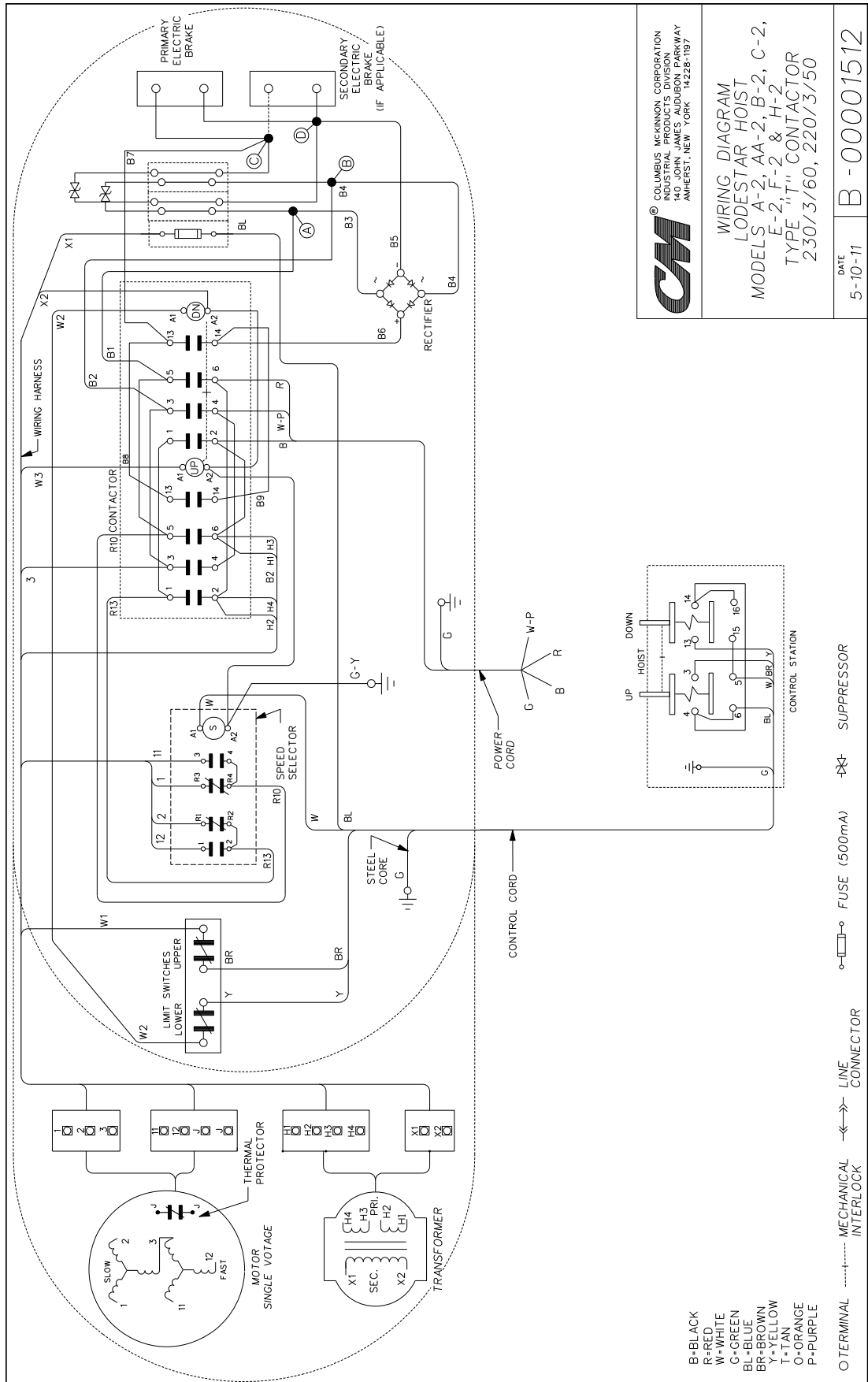


CM
 COLUMBUS MCKINNON CORPORATION
 100 SOUTH PARKWAY
 AMHERST, NEW YORK 14228-1197

WIRING DIAGRAM
 NEW LODESTAR FOIST
 MODELS F, A, B, C, T, & H
 3 PHASE, 415 VOLTAGE,
 TYPE "I" CONTACTOR

DATE: 5-10-11 C-00001511

REFERENCE WIRING DIAGRAMS

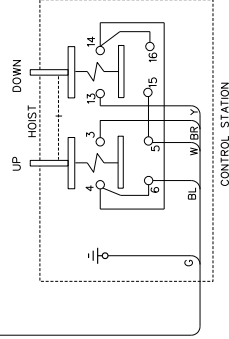


WIRING DIAGRAM
LODESTAR HOIST
MODELS A-2, AA-2, B-2, C-2,
E-2, F-2 & H-2,
TYPE "T" CONTACTOR
230/3/60, 220/3/50

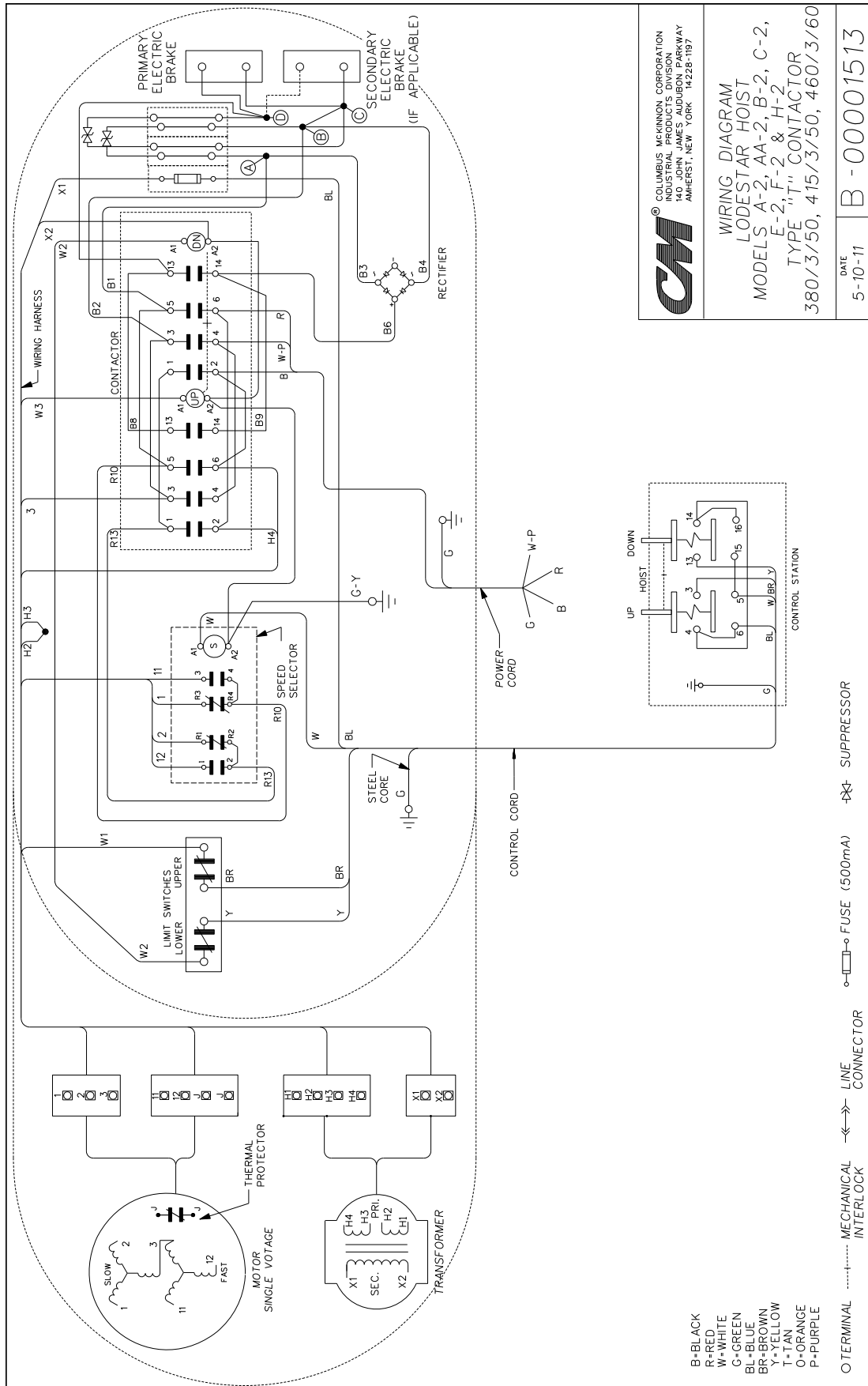
DATE: 5-10-11
 B - 00001512

- B=BLACK
- R=RED
- W=WHITE
- G=GREEN
- BL=BLUE
- BR=BROWN
- Y=YELLOW
- T=TAN
- O=ORANGE
- P=PURPLE

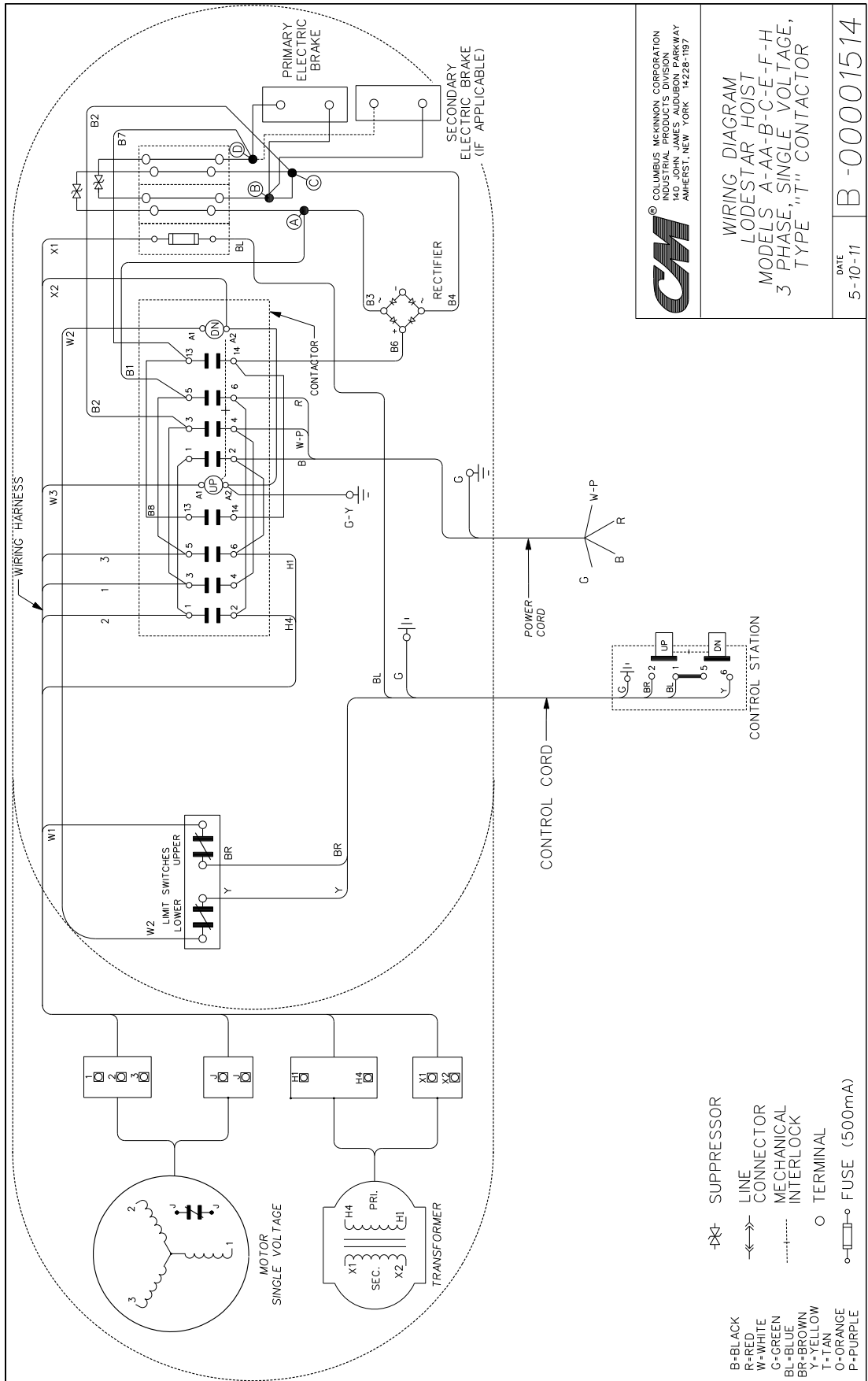
- TERMINAL
- +----- MECHANICAL INTERLOCK
- >--- LINE CONNECTOR
- FUSE (500mA)
- ⊗ SUPPRESSOR



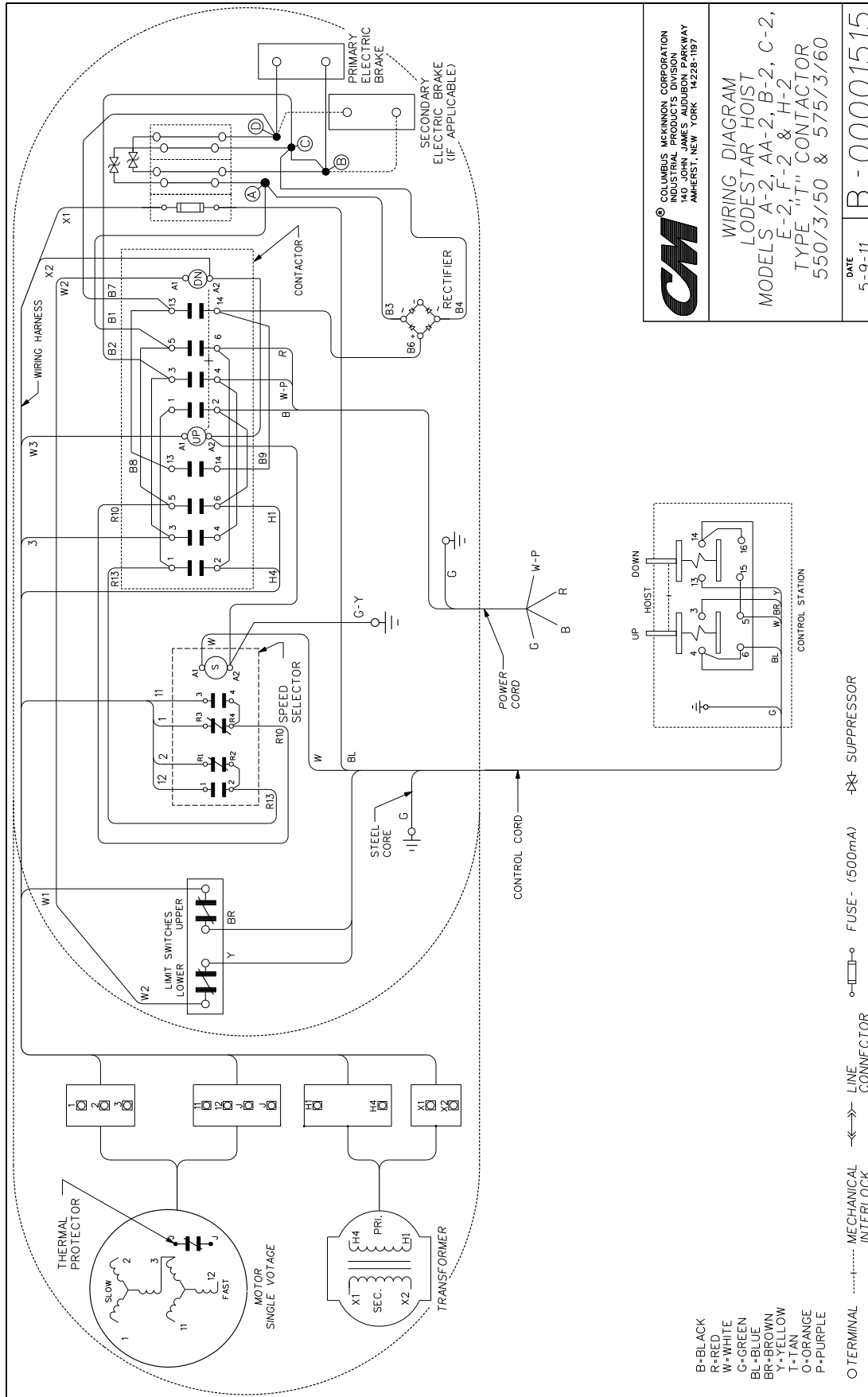
REFERENCE WIRING DIAGRAMS



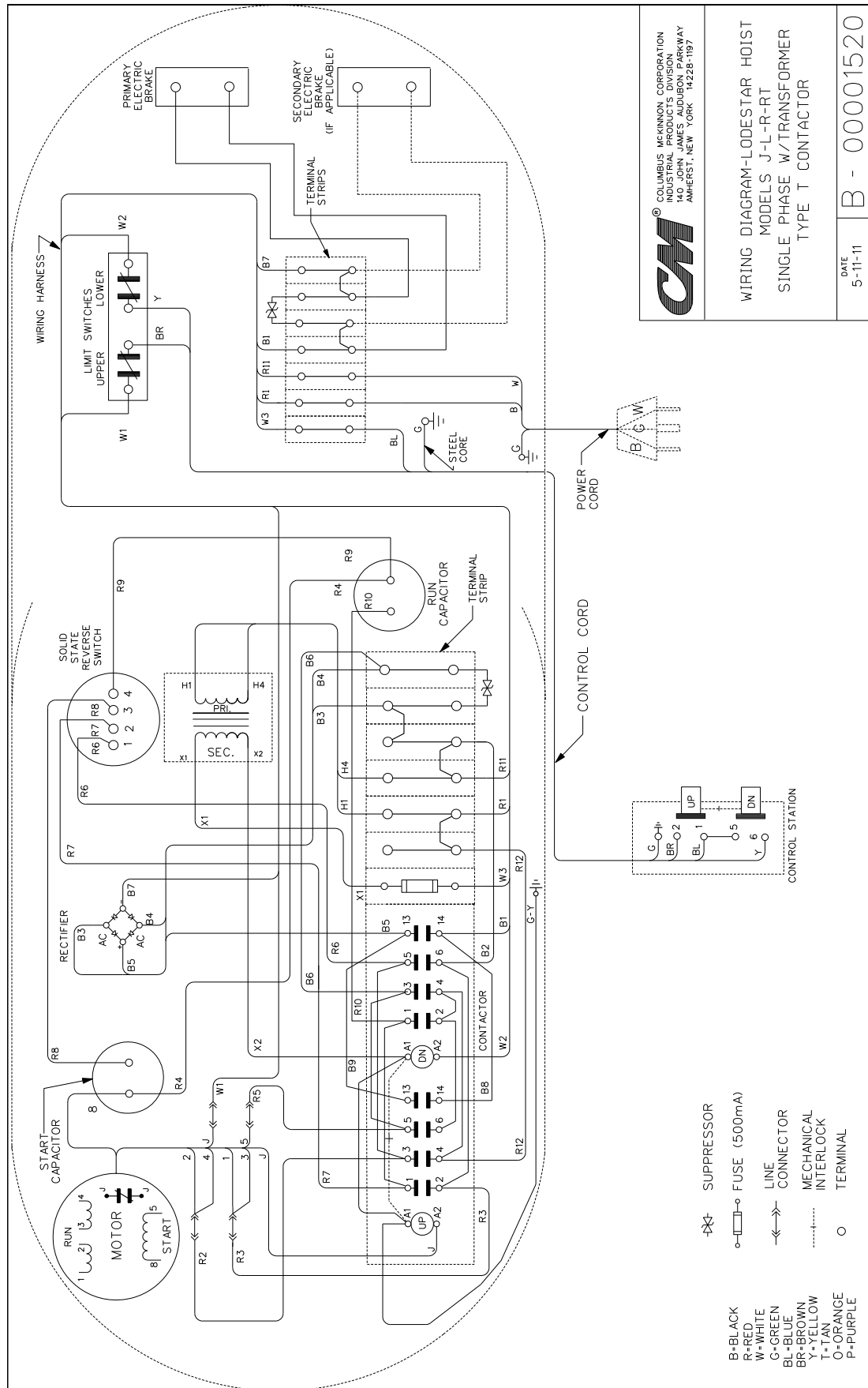
REFERENCE WIRING DIAGRAMS



REFERENCE WIRING DIAGRAMS



REFERENCE WIRING DIAGRAMS

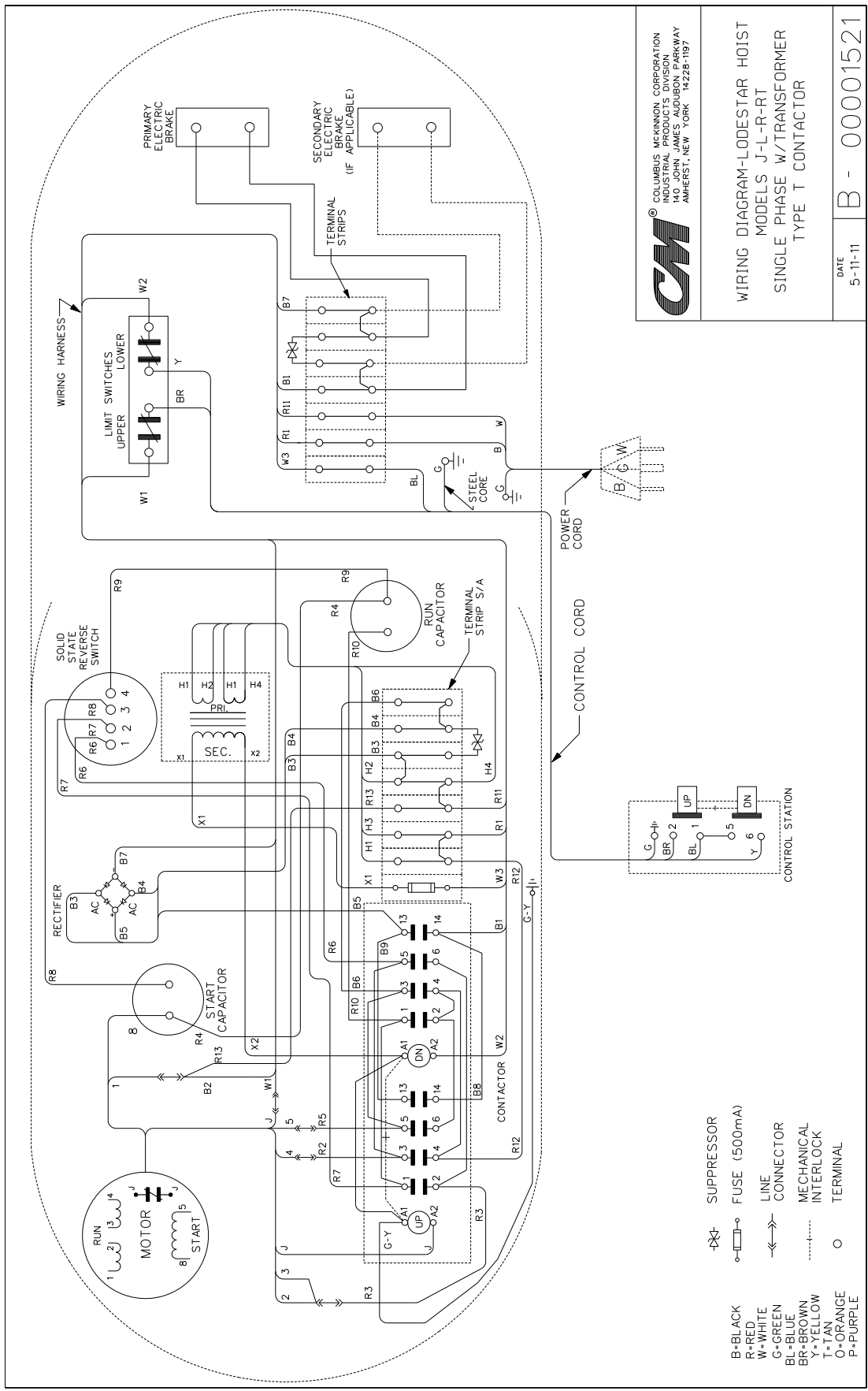



CM COLUMBIUS MCKINNON CORPORATION
 INDUSTRIAL PRODUCTS DIVISION
 140 JOHN JAMES AUDUBON PARKWAY
 AMHERST, NEW YORK 14228-1197

WIRING DIAGRAM-LODESTAR HOIST
 MODELS J-L-R-RT
 SINGLE PHASE W/TRANSFORMER
 TYPE T CONTACTOR

DATE 5-11-11
 B - 00001520

REFERENCE WIRING DIAGRAMS





COLUMBIUS MCKINNON CORPORATION
INDUSTRIAL PRODUCTS DIVISION
140 JOHN JAMES AUDUBON PARKWAY
AMHERST, NEW YORK 14228-1197

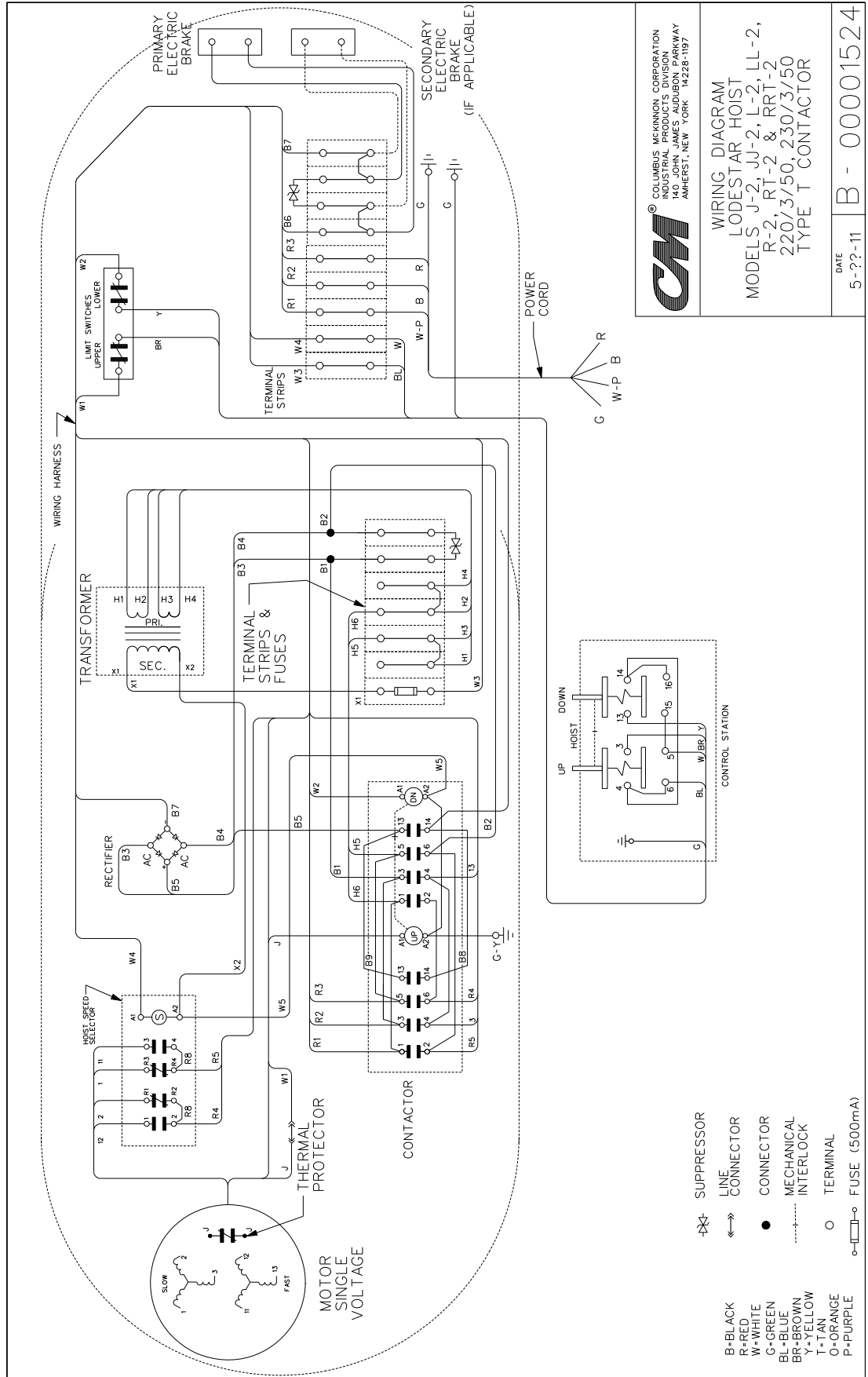
WIRING DIAGRAM-LODESTAR HOIST
MODELS J-L-R-RT
SINGLE PHASE W/TRANSFORMER
TYPE T CONTACTOR

DATE
5-11-11

B - 00001521

- B+BLACK
 - R+RED
 - W+WHITE
 - G+GREEN
 - BL+BLUE
 - BR+BROWN
 - Y+YELLOW
 - T+TAN
 - O+ORANGE
 - P+PURPLE
- /— SUPPRESSOR
 - /— FUSE (500mA)
 - /— LINE CONNECTOR
 - /— MECHANICAL INTERLOCK
 - TERMINAL

REFERENCE WIRING DIAGRAMS



COLUMBIUS MCKINNON CORPORATION
INDUSTRIAL PRODUCTS DIVISION
140 JOHN JAMES AUDUBON PARKWAY
AMHERST, NEW YORK 14226-1197

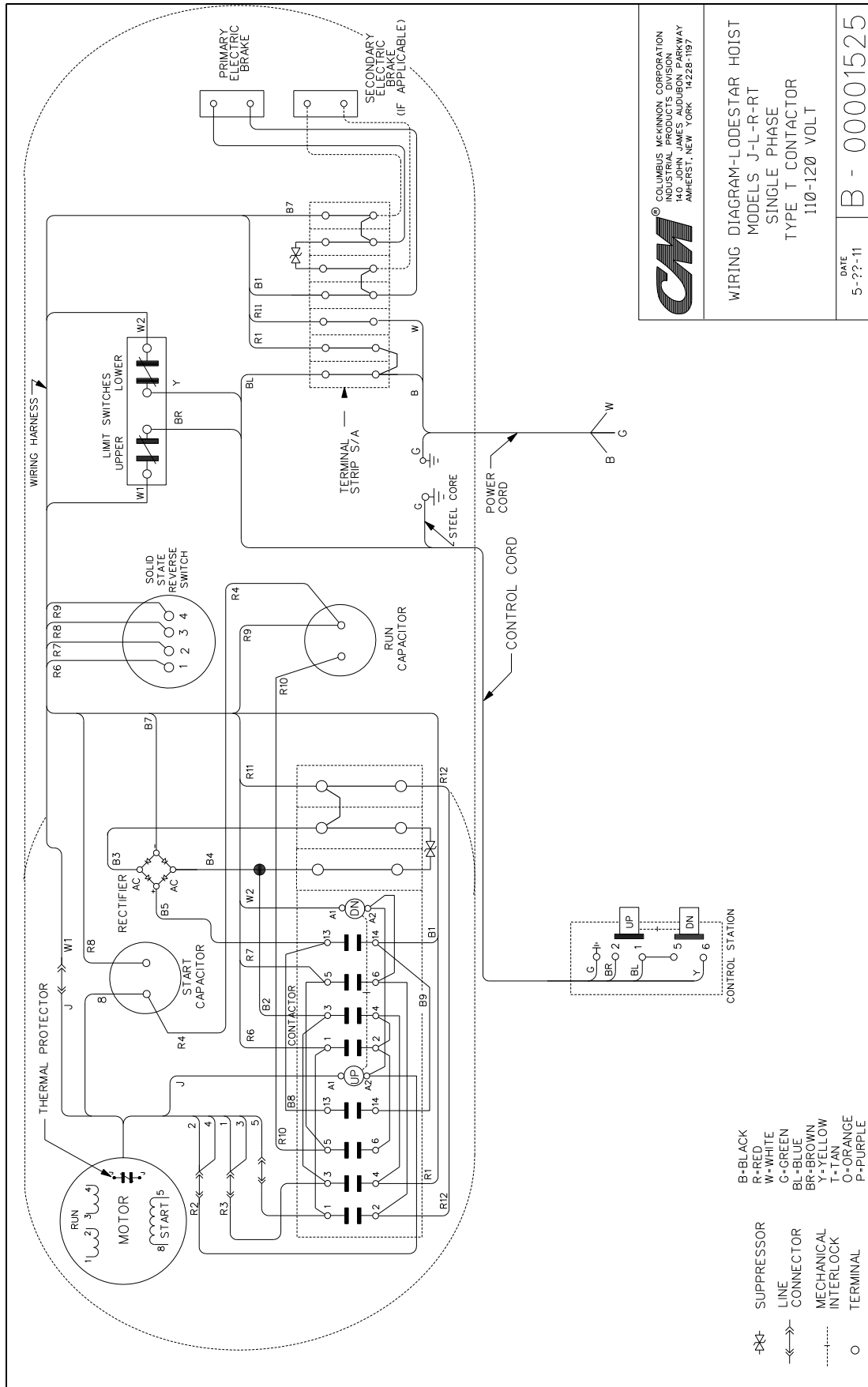
WIRING DIAGRAM
LODESTAR HOIST
MODELS J-2, JJ-2, L-2, LL-2,
R-2, RT-2 & RRT-2
220/3/50, 230/3/50
TYPE T CONTACTOR


DATE
5-??-11

B - 00001524

- ⊗ SUPPRESSOR
 - ↔ LINE CONNECTOR
 - CONNECTOR
 - ⋯ MECHANICAL INTERLOCK
 - TERMINAL
 - FUSE (500mA)
-
- B-BLACK
 - R-RED
 - W-WHITE
 - G-GREEN
 - BL-BLUE
 - BR-BROWN
 - Y-YELLOW
 - T-TAN
 - O-ORANGE
 - P-PURPLE

REFERENCE WIRING DIAGRAMS





COLUMBIUS MCKINNON CORPORATION
INDUSTRIAL PRODUCTS DIVISION
140 JOHN JAMES AUDUBON PARKWAY
AMHERST, NEW YORK 14228-1197

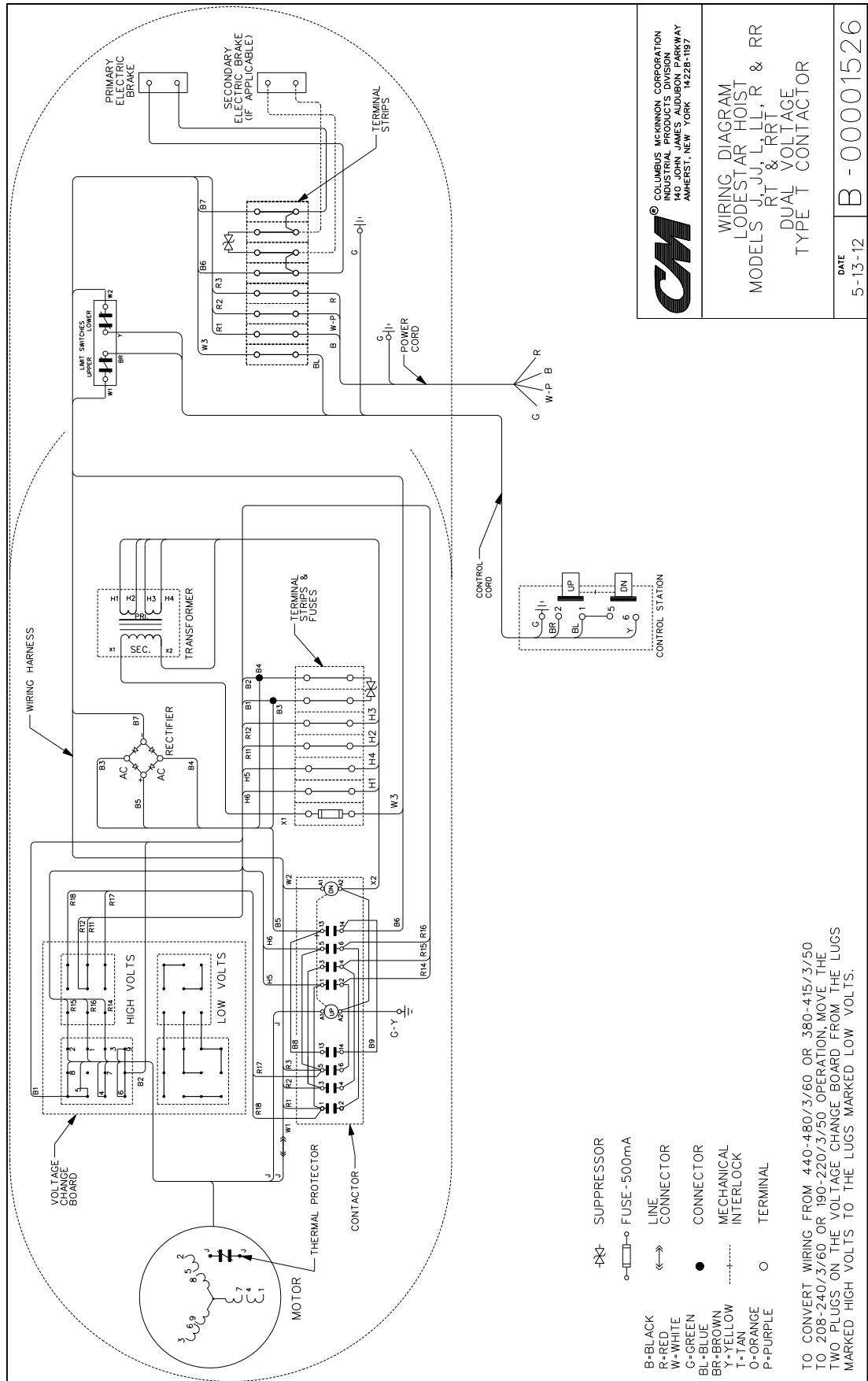
WIRING DIAGRAM-LODESTAR HOIST
MODELS J-L-R-RT
SINGLE PHASE
TYPE T CONTACTOR
110-120 VOLT

DATE
5-??-11

B - 00001525

- B-BLACK
 - R-RED
 - W-WHITE
 - G-GREEN
 - BL-BLUE
 - BR-BROWN
 - Y-YELLOW
 - T-TAN
 - O-ORANGE
 - P-PURPLE
-
- X— SUPPRESSOR
 - <— LINE
 - CONNECTOR
 - MECHANICAL INTERLOCK
 - TERMINAL

REFERENCE WIRING DIAGRAMS



CM COLUMBUS MCKINNON CORPORATION
 INDUSTRIAL PRODUCTS DIVISION
 140 JOHN JAMES AUDUBON PARKWAY
 AMHERST, NEW YORK 14228-1157

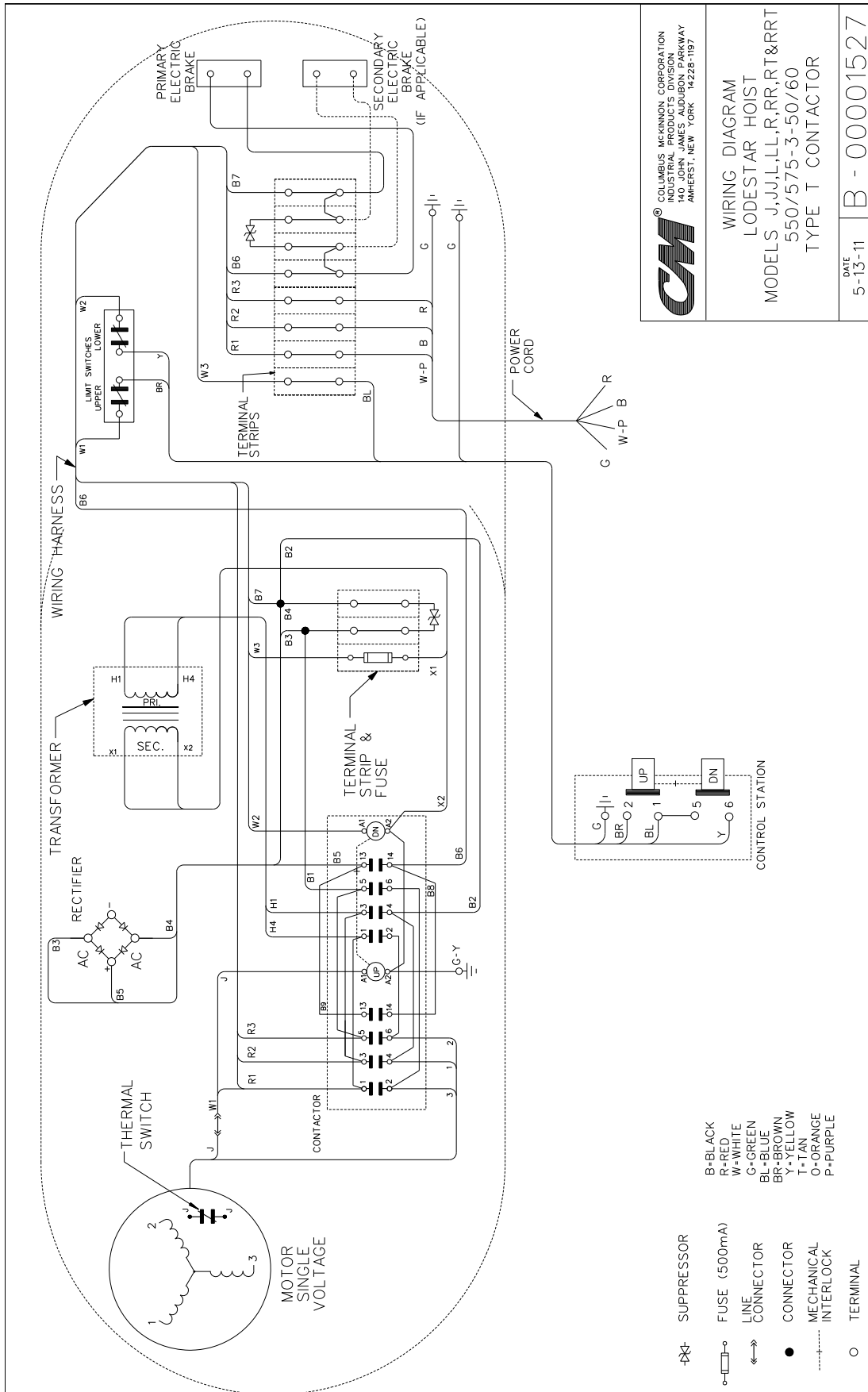
WIRING DIAGRAM
 LODESTAR HOIST
 MODELS J, JJ, L, LL, R & RR
 RT & RRT
 DUAL VOLTAGE
 TYPE T CONTACTOR

DATE 5-13-12
 B - 00001526

- B-BLACK
 - R-RED
 - W-WHITE
 - G-GREEN
 - BL-BLUE
 - BR-BROWN
 - Y-YELLOW
 - T-TAN
 - O-ORANGE
 - P-PURPLE
- ⊗ SUPPRESSOR
 - FUSE - 500mA
 - ↔ LINE CONNECTOR
 - CONNECTOR
 - ⋯ MECHANICAL INTERLOCK
 - TERMINAL

TO CONVERT WIRING FROM 440-480/3/60 OR 380-415/3/50 TO 208-240/3/60 OR 190-220/3/50 OPERATION, MOVE THE TWO PLUGS ON THE VOLTAGE CHANGE BOARD FROM THE LUGS MARKED HIGH VOLTS TO THE LUGS MARKED LOW VOLTS.

REFERENCE WIRING DIAGRAMS

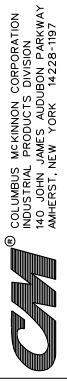
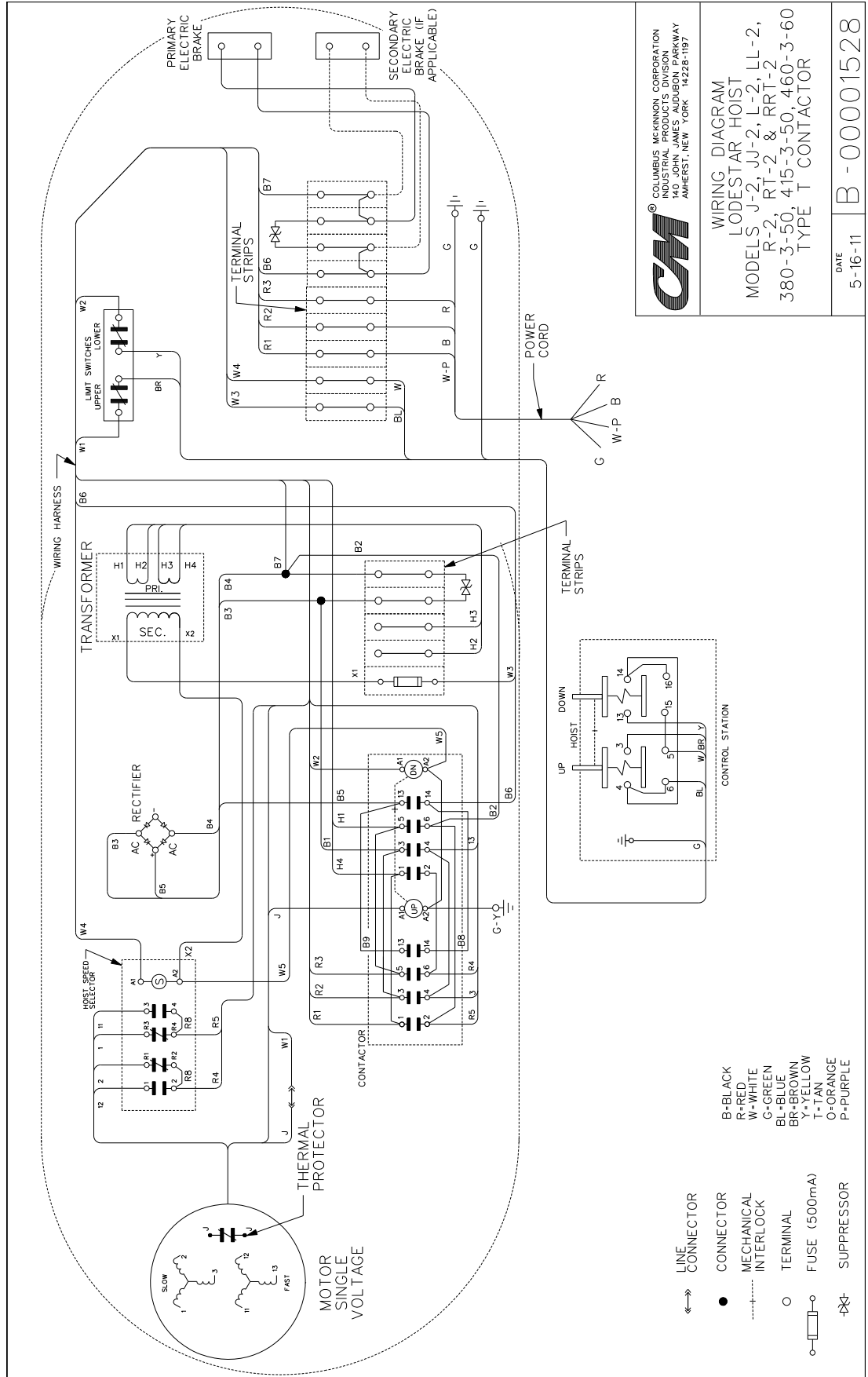


CM COLUMBIUS MCKINNON CORPORATION
 INDUSTRIAL PRODUCTS DIVISION
 140 JOHN JAMES AUDUBON PARKWAY
 AMHERST, NEW YORK 14228-1197

WIRING DIAGRAM
 LODESTAR HOIST
 MODELS J,JJ,L,L,R,RR,RT&RRT
 550/575-3-50/60
 TYPE T CONTACTOR

DATE 5-13-11 B - 00001527

REFERENCE WIRING DIAGRAMS

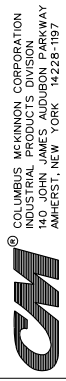
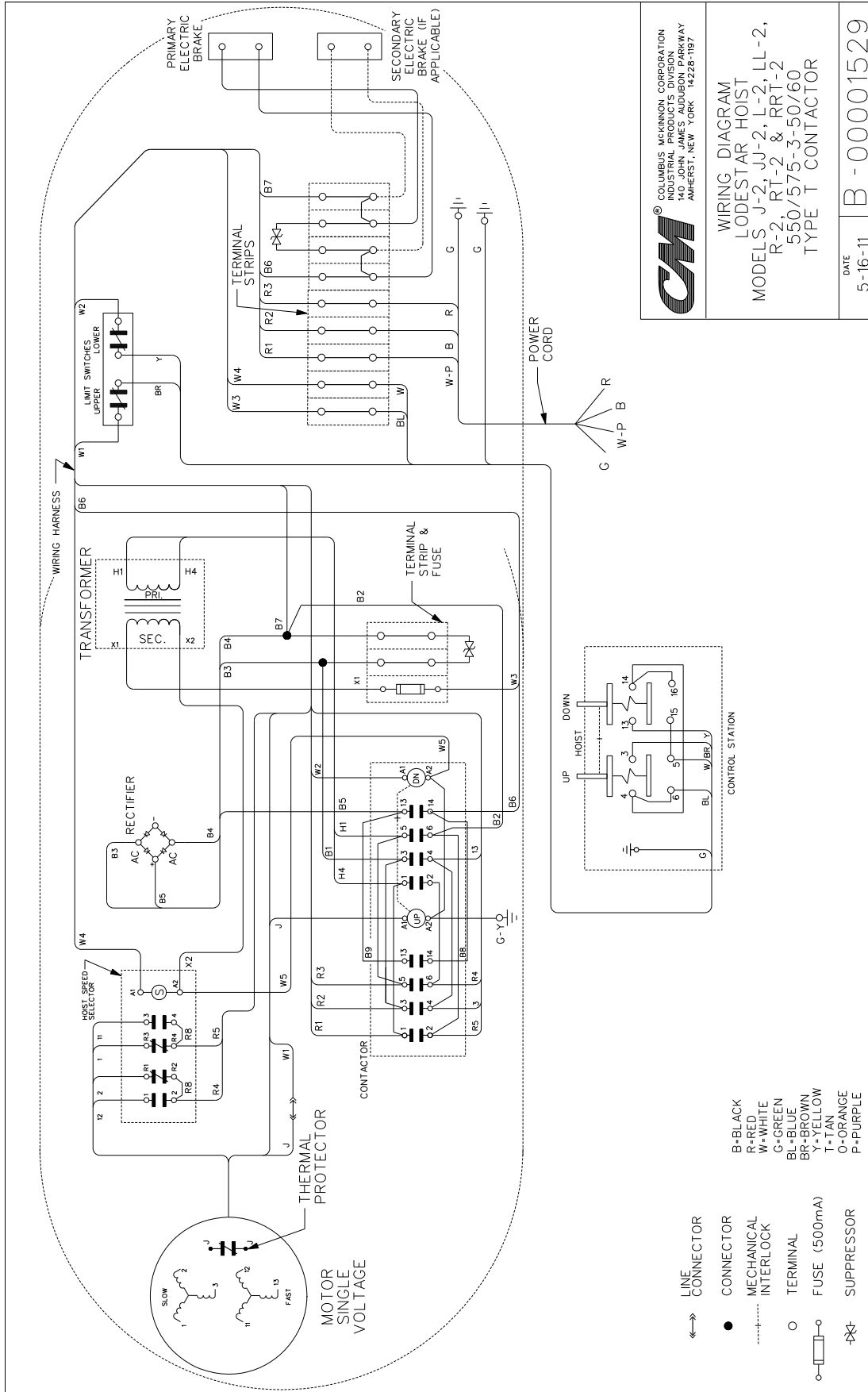


WIRING DIAGRAM
 LODESTAR HOIST
 MODELS J-2, JJ-2, L-2, LL-2,
 R-2, RT-2 & RRT-2
 380-3-50, 415-3-50, 460-3-60
 TYPE T CONTACTOR

DATE
 5-16-11
 B - 00001528

- ←→ LINE CONNECTOR
 - CONNECTOR
 - MECHANICAL INTERLOCK
 - TERMINAL
 - FUSE (500mA)
 - ⊗ SUPPRESSOR
- B-BLACK
 - R-RED
 - W-WHITE
 - G-GREEN
 - BL-BLUE
 - BR-BROWN
 - Y-YELLOW
 - T-TAN
 - O-ORANGE
 - P-PURPLE

REFERENCE WIRING DIAGRAMS

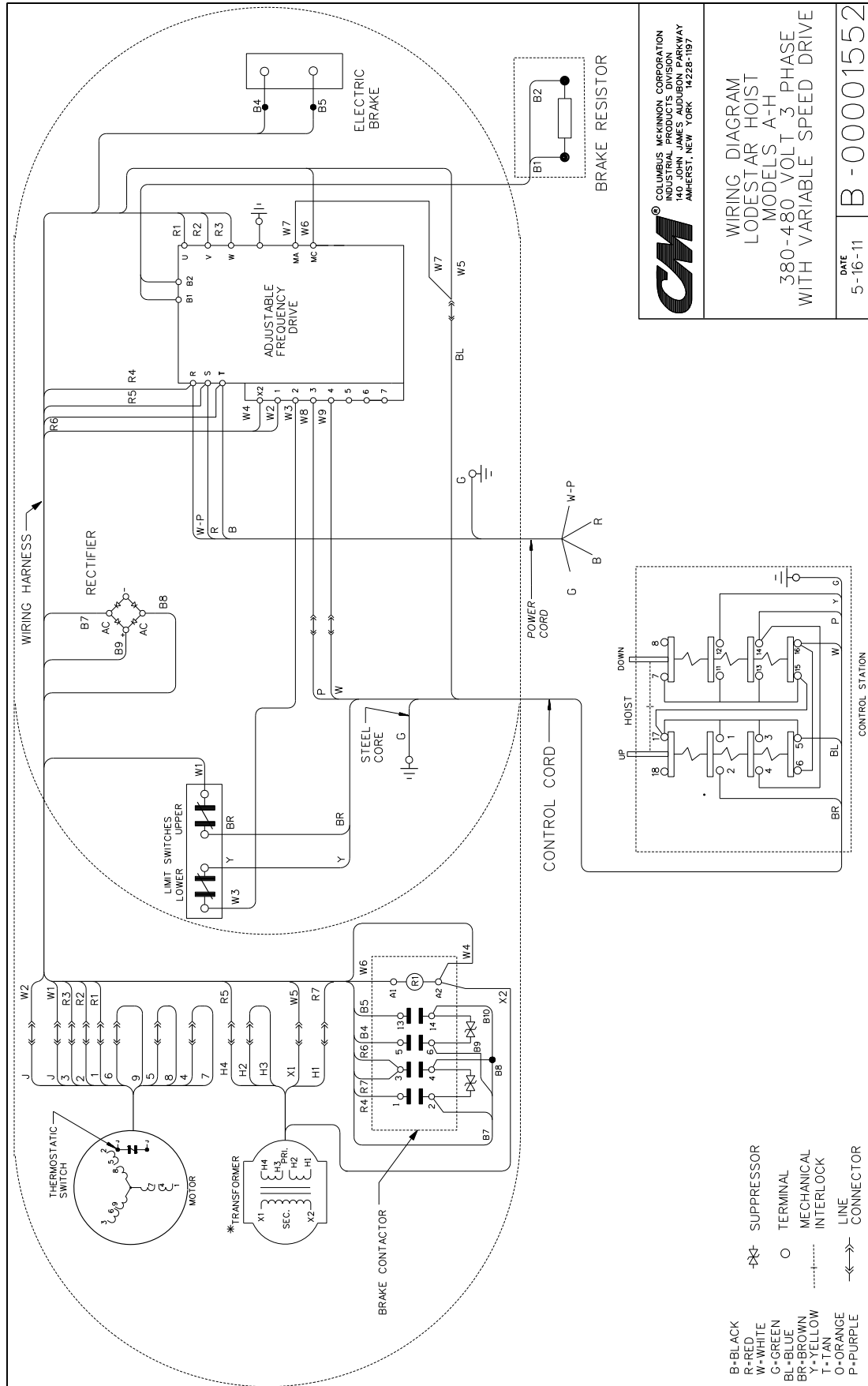



COLUMBIUS MCKINNON CORPORATION
 INDUSTRIAL PRODUCTS DIVISION
 140 JOHN JAMES AUDUBON PARKWAY
 AMHERST, NEW YORK 14228-1197

WIRING DIAGRAM
LODESTAR HOIST
 MODELS J-2, JJ-2, L-2, LL-2,
 R-2, RT-2 & RRT-2
 550/575-3-50/60
 TYPE T CONTACTOR

DATE 5-16-11 B-00001529

REFERENCE WIRING DIAGRAMS





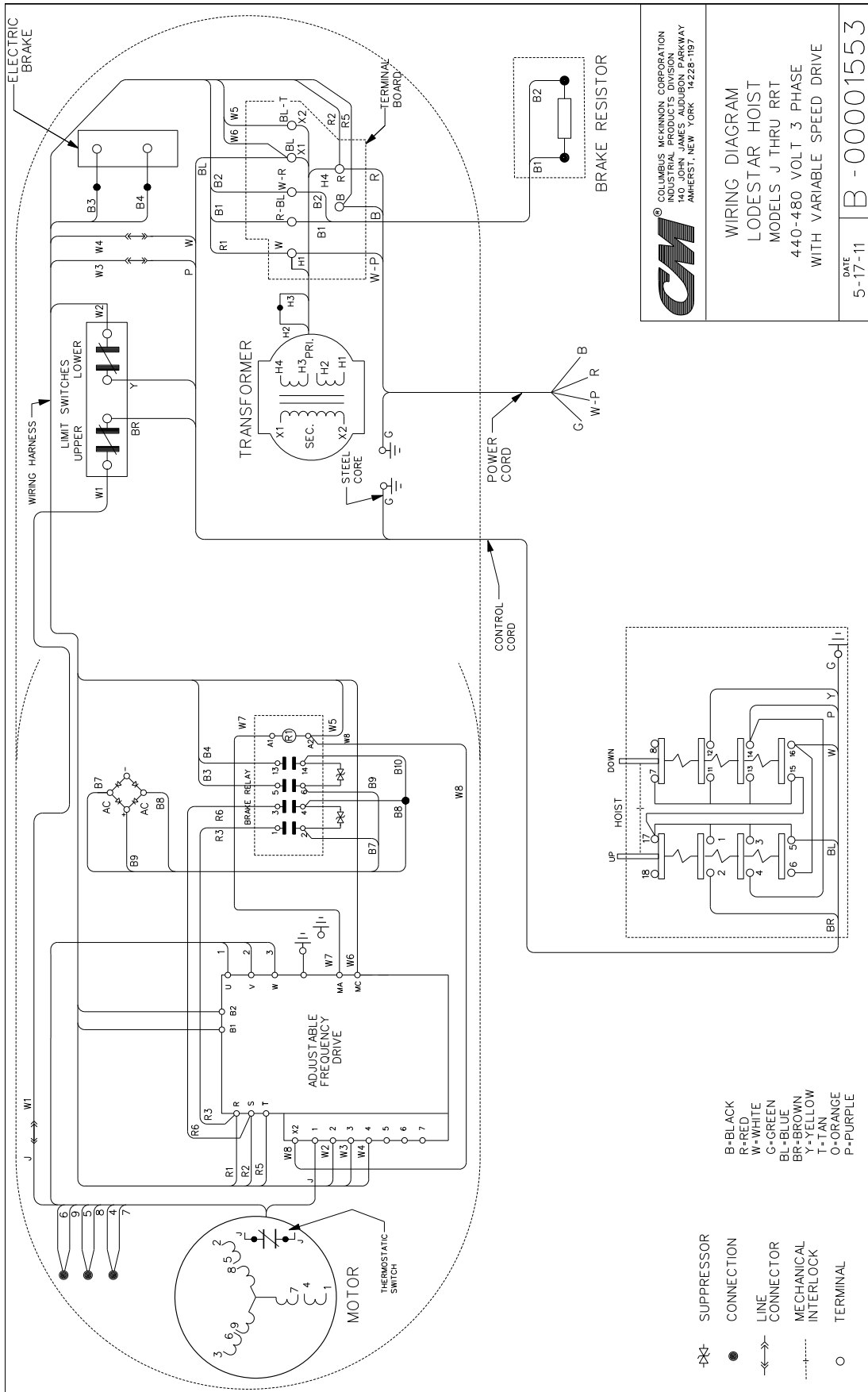

COLUMBUS MCKINNON CORPORATION
INDUSTRIAL PRODUCTS DIVISION
140 JOHN JAMES AUDUBON PARKWAY
AMHERST, NEW YORK 14228-1197

WIRING DIAGRAM
LODESTAR HOIST
MODELS A-H
380-480 VOLT 3 PHASE
WITH VARIABLE SPEED DRIVE

DATE
5-16-11

B-00001552

REFERENCE WIRING DIAGRAMS

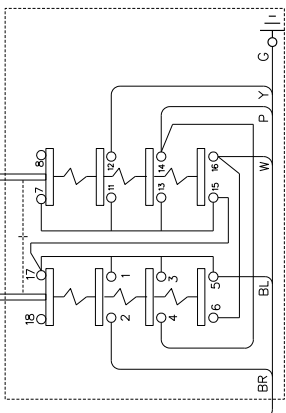



COLUMBIUS MCKINNON CORPORATION
INDUSTRIAL PRODUCTS DIVISION
140 JOHN JAMES AUDUBON PARKWAY
AMHERST, NEW YORK 14228-1197

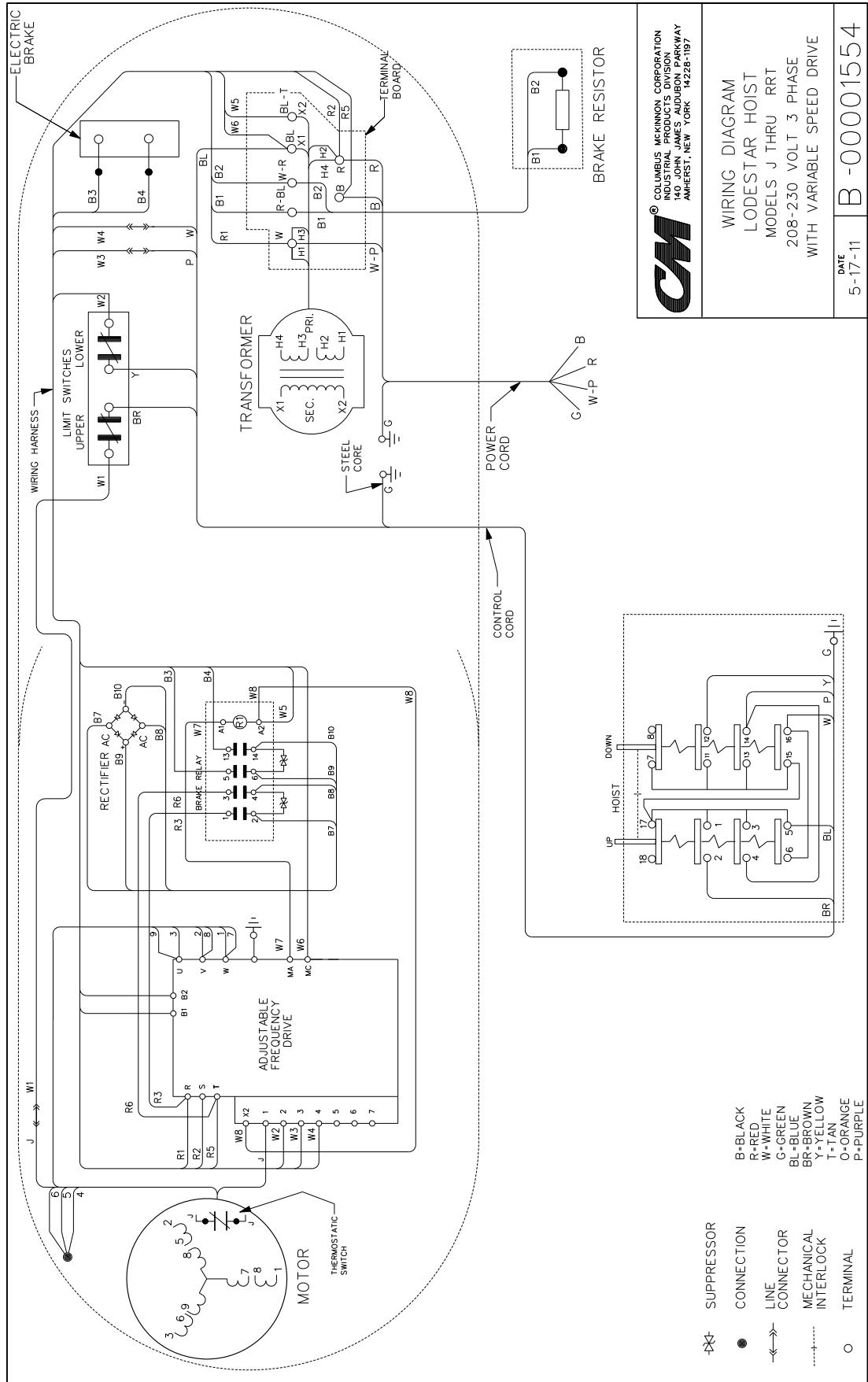
WIRING DIAGRAM
LODESTAR HOIST
MODELS J THRU RRT
440-480 VOLT 3 PHASE
WITH VARIABLE SPEED DRIVE

DATE 5-17-11
B - 00001553

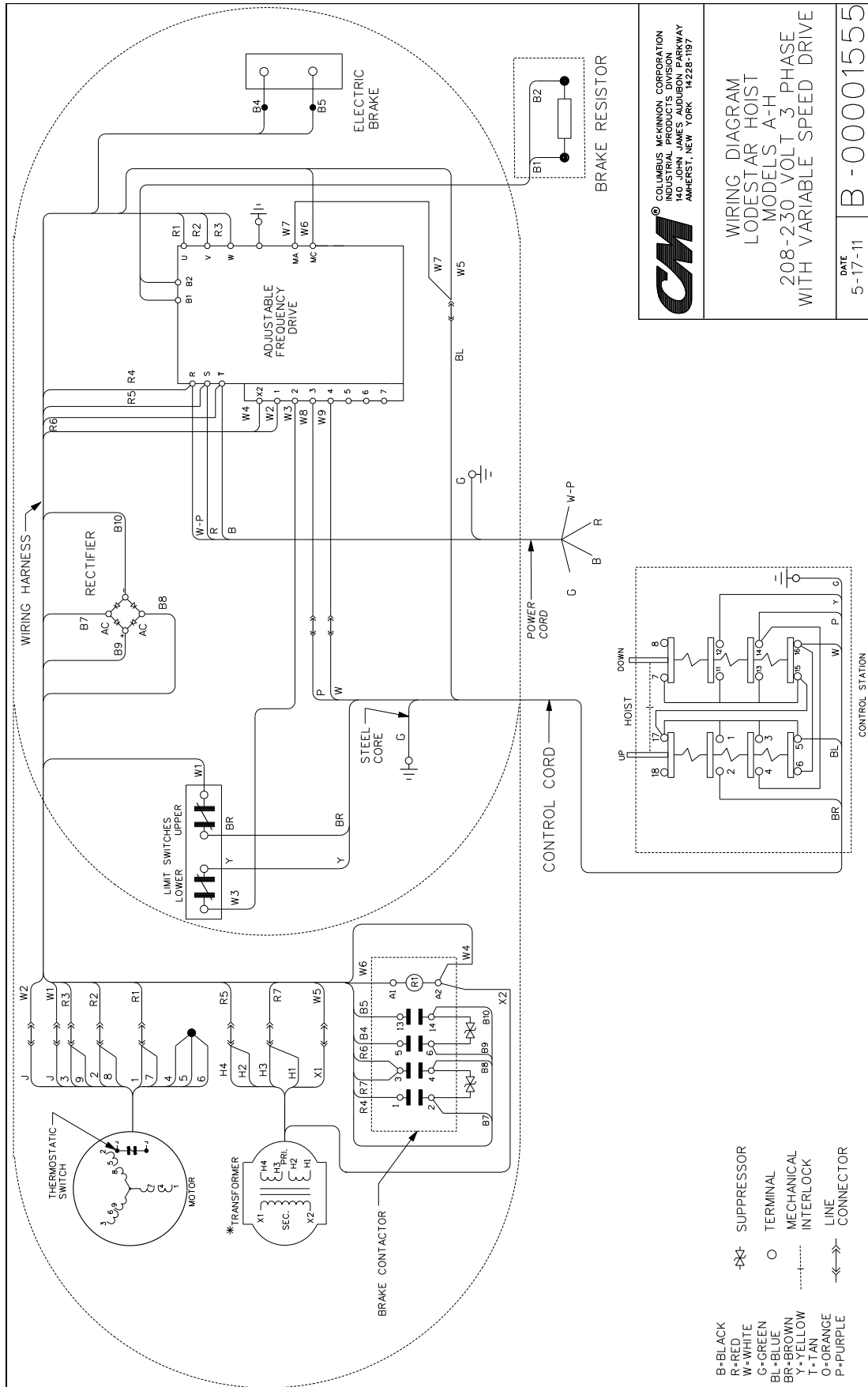
BRAKE RESISTOR




REFERENCE WIRING DIAGRAMS



REFERENCE WIRING DIAGRAMS





CM
 COLUMBUS MCKINNON CORPORATION
 INDUSTRIAL PRODUCTS DIVISION
 140 JOHN JAMES AUDUBON PARKWAY
 AMHERST, NEW YORK 14228-1197

WIRING DIAGRAM
LODESTAR HOIST
MODELS A-H
208-230 VOLT 3 PHASE
WITH VARIABLE SPEED DRIVE

DATE	5-17-11	B-00001555
------	---------	------------

- B-BLACK
 - R-RED
 - W-WHITE
 - G-GREEN
 - BL-BLUE
 - BR-BROWN
 - Y-YELLOW
 - T-TAN
 - O-ORANGE
 - P-PURPLE
- ⊗ SUPPRESSOR
 - TERMINAL
 - ⋯ MECHANICAL INTERLOCK
 - ⎯ LINE
 - ↔ CONNECTOR

ASSEMBLY INSTRUCTIONS

SWIVEL HOOK OR LUG SUSPENSION

Models R, R-2, RR, RR-2

Assemble the dead end bolt and block through the suspension adapter as shown in Figure 21.

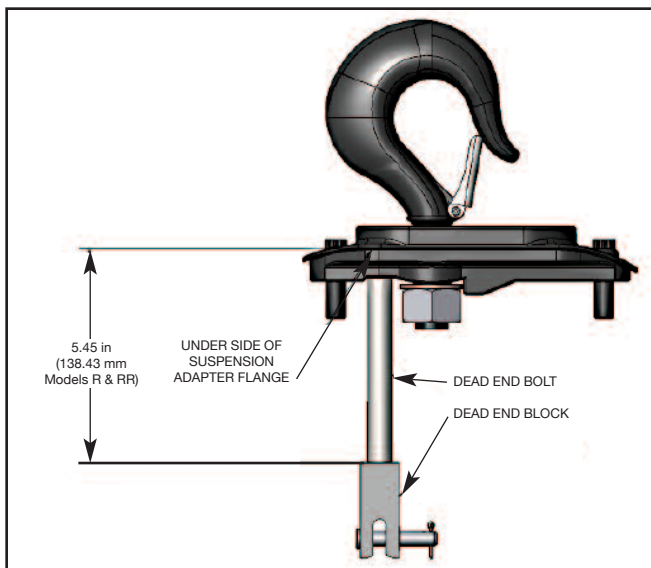


Figure 21. Hook Suspension

FASTENERS

See tables 2a and 2b for recommended torque values.

LOWER HOOK BLOCK PIN

When removing or installing the lower hook pin, care must be taken so as to prevent damaging the pin and/or hook block. These pins are tapered groove pins and as a result, they can only be removed in one direction. To remove the pin, a V-Block, drift and hammer (or slow acting press) are required. The drift should be the same diameter as the pin (5/16" diameter (7.94mm) for Models A, A-2, AA, AA-2, B, B-2, C, C-2, F, F-2 and 3/8" (9.52mm) diameter for Models J, J-2, L, L-2, LL, LL-2 and it should be placed on the small end of the pin. The small end of the pin is the end opposite the end on which the 3 grooves are visible. Place the hook block in the V-Block and drive the pin out using the drift and a hammer or slow acting press.

To re-install the pin, the parts must be arranged the same as they were when the pin was removed. To do this, use the small end of the pin as a gage. First check the holes in the hook block body and determine which hole is the largest. Place the hook body in the V-Block with the larger hole on top. Next, check each end of the hole in the lower hook chain block and determine which end is the largest. Place the chain in the slot of the chain block and insert the chain block, with the large hole on top, into the hook block body. Align the holes in the hook block body with the hole in the chain block and insert the small end of the pin in the hole. Push the pin in by hand until it stops and then use a hammer or slow acting press to drive the pin into position so that the end of the pin is flush with the outside surface of the hook block body.



WARNING

Use of improper lower hook chain block pin as well as improper installation of this pin can cause the pin to break and allow the load to fall.

TO AVOID INJURY:

Use only CM supplied, special high strength lower hook chain block pin to attach the chain to the lower hook block and install the pin as directed above.

REMOVAL AND INSTALLATION OF LOAD CHAIN



WARNING

Improper installation (reeving) of the load chain can result in a dropped load.

TO AVOID INJURY/DAMAGE:

- Verify use of proper size and type of hoist load chain for specific hoist.
- Install load chain properly as indicated below.

USE ONLY CM STAR (★) GRADE LOAD CHAIN AND CM REPLACEMENT PARTS. USE OF OTHER CHAIN AND PARTS MAY BE DANGEROUS AND VOIDS FACTORY WARRANTY.

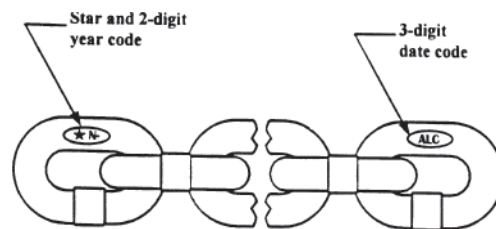


Figure 22. Chain Embossing

NOTE: When installing load chain in Models E, H, R, RR, E-2, H-2, R-2 and RR-2 by either of the "starter chain" methods, two loose end connecting links (627-743) must be used.

Hoist load chain can be installed by any one of several methods.



WARNING

USE OF COMMERCIAL OR OTHER MANUFACTURER'S CHAIN AND PARTS TO REPAIR CM HOISTS MAY CAUSE LOAD LOSS.

TO AVOID INJURY:

Use only CM supplied replacement load chain and parts. Chain and parts may look alike, but CM chain and parts are made of specific material or processed to achieve specific properties.

The first method is recommended when replacing severely worn load chain and requires disassembling the hoist. Method 2 does not require hoist disassembly, where as Method 3 requires only partial disassembly.

Method #1

- Disconnect hoist from power supply.
- Remove back frame cover and disengage the limit switch guide plate from the traveling nuts, see page 23.
- Detach loose end of load chain from hoist frame, see Figure 7. Also, on single reeved models, detach the

lower hook block from the load chain (see pg. 44). On double reeved models R & RR unfasten the dead end side of load chain. On triple reeved Models RT, RRT, RT-2 and RRT-2, detach the load chain from the lower hook block.

- d) Continue to disassemble the hoist and inspect the liftwheel, chain guides, motor housing and gear housing which if worn or damaged may cause premature failure of the new chain. Parts can be easily identified by referring to pages 76 thru 161.
- e) If the liftwheel pockets, in particular the ends, are worn or scored, replace liftwheel. If chain guides and housing are worn, cracked or damaged these parts should also be replaced.
- f) Reassemble hoist with the new load chain inserted over the liftwheel. Position chain with the weld on up standing links away from liftwheel and leave only one foot of chain hanging free on loose end side. Make sure the last chain link is an upstanding link. On double reeved models, make sure that the new load chain has an even number of links. On triple reeved models, make sure that the new chain has an odd number of links. This will prevent twist in chain.
To simplify handling when reassembling the hoist, a short undamaged piece of the old chain may be used as a "starter chain". Position this piece of chain in exactly the same manner as explained above for the "new chain", and complete the reassembly of the hoist.
- g) Attach the loose end link to chain and connect it to the hoist frame with the loose end screw, washer and lockwasher, see Figure 7.

BE CERTAIN THERE IS NO TWIST.

CAUTION: For double reeved models, be sure to disconnect one of the loose end links from the load chain before attaching it to the hoist.

- h) For single reeved models, attach the hook block to load chain (see Page 73) and proceed to step K.
- i) For double reeved models, run the hoist ▲(UP) until only 3 feet (.9 m) in chain remains on dead end side. This will minimize the chance of introducing a twist between hook block and hoist.
Allow the chain to hang free to remove twists.
Using a wire as a starter, insert the chain, flat link first, into lower hook block (upstanding links will have weld toward sheave) and pull through. Insert last link into slot in dead end block making sure that no twist exists in the reeving at any point.
Assemble dead end pin, washer and cotter pin as shown in Figure 7.
- j) Using a wire as a starter, insert the chain, flat link first, into lower hook block (upstanding links will have weld toward sheave) and pull through. Insert last link into slot in dead end block making certain that no twist exists in the reeving at any point.
Assemble dead end pin, washer and cotter pin as shown in Figure 7.
- k) Adjust limit switches as described in Table 6, page 22. If the new chain is longer than the old, check to be sure limit switch will allow for new length of lift. In the event maximum adjustment does not allow entire length of lift, check with CM® for modification if necessary.
- l) For triple reeved models, run the hoist ▲(UP) until only 4 feet (1.2 m) of chain remains on the dead end side. This will minimize the chance of introducing a twist between the hook block and hoist. Allow the chain to hang free to remove twists. Using a wire as a starter, insert the chain, upstanding link first, into lower

hook block (upstanding links will have welds toward sheave) and pull through. Using a wire as a starter, insert the chain, upstanding link first, into the outboard cloverleaf of the hanger. Make sure there are no twists between the hook block and then pull the chain through. In the sheave hanger, the up standing links will have the welds toward the sheaves. Run the chain down to the hook block and making sure there are no twists between the sheave hanger and the hook block, insert the end of the chain into the recess in the top of the hook block. Slide the deadend screw, with flat sides vertical, through the hole in the top of the hook block. Place the lockwasher and nut on the threaded end of the dead end screw. Use an Allen wrench to hold the head of the dead end screw stationary and rotate the nut to tighten. To properly tighten the nut, apply a torque of 45 (61N•m) to 55 pound feet (74.6 N•m) while holding the head of the dead end screw stationary. Also, when tightening this dead end screw, it should be held firmly in position and torqued from the nut end to avoid damaging the screw and/or chain.



WARNING

Do not allow hook block to hit hoist or allow load chain to become taut between loose end screw and frame or else serious damage will result. If hook block should inadvertently hit the hoist-the hoist frames, load chain and hook block should be inspected for damage before further use.

Method #2

Treat the old load chain in hoist as a "starter chain" and proceed with steps from Method #1, a, b, c and h thru k. If a starter chain is used, the loose end link (two links required for double reeved models) can serve as a temporary coupling link to connect together the starter chain in the hoist and the new load chain to be installed. Then, under power, reeve the new load chain through the liftwheel area, replacing the starter chain in unit. Run enough chain through to attach loose end link to hoist frame.

Method #3

- a) First proceed with Steps 1a, b & c from Method #1.
- b) Then, carefully run the load chain out of the hoist.
- c) Disconnect hoist from power supply.
- d) Remove the electric brake assembly.
- e) Rotate the brake hub by hand, at the same time feeding the load chain into and through liftwheel area with hoist upside down or using a wire to pull the load chain up onto the liftwheel as explained in Method #1 step 1f.
- f) Refer to Method #1 steps g thru j above to complete the installation.

CUTTING CHAIN

CM® Load chain is hardened and it is difficult to cut. The following methods are recommended when cutting a length of new chain from stock or cutting off worn chain.

1. Use a grinder and nick the link on both sides (Figure 22), then secure the link in a vise and break off with a hammer.
2. Use a 177.8 mm (7 inches) minimum diameter by 3.175 mm (1/8 inch) thick abrasive wheel (or type recommended by wheel supplier) that will clear adjacent links.
3. Use a bolt cutter (Figure 23) similar to the H.K. Porter No. 0590MTC with special cutter jaws for cutting hardened chain (25.4mm-1 inch) long cutting edge.

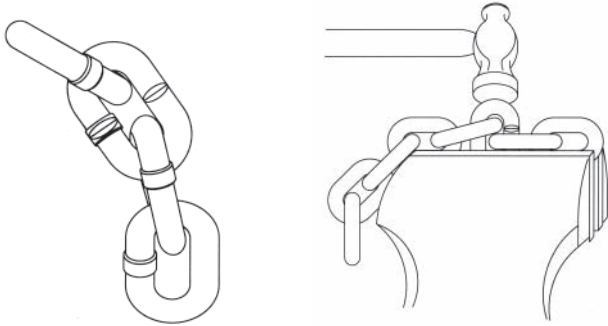


Figure 23A. Cutting Chain by Nicking

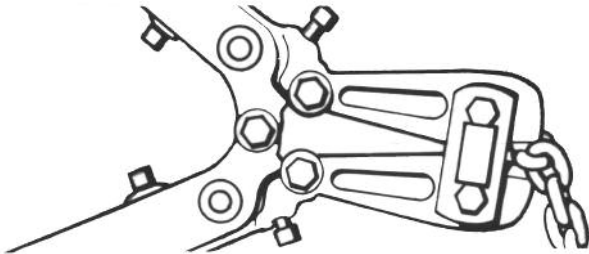




Figure 23B. Cutting Chain with a Bolt Cutter

 <h2 style="margin: 0;">WARNING</h2>
<p>Cutting Chain Can Produce Flying Particles.</p>
<p>TO AVOID INJURY:</p>
<ul style="list-style-type: none"> • Wear Eye Protection. • Provide A shield Over Chain to Prevent Flying Particles.

 <h2 style="margin: 0;">WARNING</h2>
<p>Using “Commercial” or other manufacturer’s parts to repair the CM Lodestar Hoists may cause load loss.</p>
<p>TO AVOID INJURY:</p>
<p>Use only CM supplied replacement parts. Parts may look alike but CM parts are made of specific materials or processed to achieve specific properties.</p>



WARNING

TESTING

Before using, all altered, repaired or used hoists 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 22.7 kg. (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 written report prepared for record purposes. After this test, check that the Load-limiter functions.

***If Load-limiter prevents lifting of a load of 125% of rated capacity, reduce load to rated capacity and continue test.**

NOTE: For additional information on inspection and testing, refer to Code B30.16 “Overhead Hoists” obtainable from ASME Order Department, 22 Law Drive, Box 2300, Fairfield, NJ 07007-2300, U.S.A.

ORDERING INSTRUCTIONS

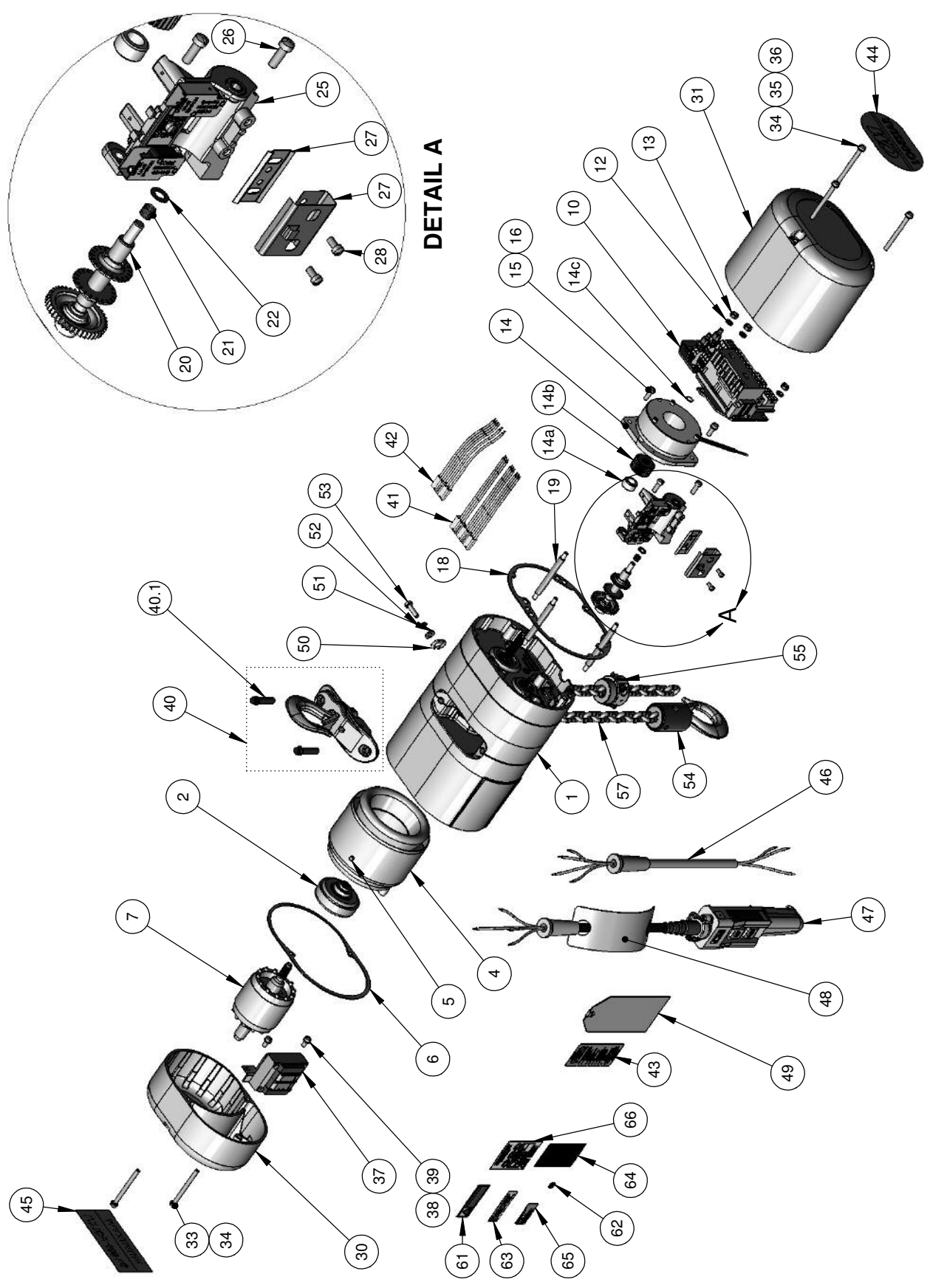
The following information must accompany all correspondence orders for replacement parts:

1. Hoist Model Number from identification plate.
2. Serial number of the hoist stamped below identification plate.
3. Voltage, phase, Hertz from the identification plate.
4. Length of lift.
5. Part number of part from parts list.
6. Number of parts required.
7. Part name from parts list.

If trolley replacement parts are ordered, also include the type and capacity of trolley.

NOTE: When ordering replacement parts, it is recommended that consideration be given to the need for also ordering such items as gaskets, fasteners, insulators, etc. These items may be damaged or lost during disassembly or just unfit for future use because of deterioration from age or service

V1-SMALL FRAME
MODELS A, A-2, AA, AA-2, B, B-2, C, C-2, E, E-2, F, F-2, H & H-2



ITEM NO.	DESCRIPTION	MODELS A & A-2	MODELS AA & AA-2	MODELS B & B-2	MODELS C & C-2	MODELS E & E-2	MODELS F & F-2	MODELS H & H-2	QTY.
1	GEAR BOX SUB-ASSY - DC TYPE BRAKE SEE PAGES 84-85	00000830C	00000831C	00000832C	00000833C	00000832C	00000832C	00000834C	1
	CLEAN ROOM GEAR BOX SUB-ASSY - DC TYPE BRAKE SEE PAGES 84-85	00000835W	00000836W	00000837W	00000838W	00000837W	00000837W	00000839W	
	GEAR BOX SUB-ASSY - AC TYPE BRAKE SEE PAGES 84-85	00000166C	00000130C	00000165C	00000131C	00000165C	00000165C	00000129C	
2	CLEAN ROOM GEAR BOX SUB-ASSY - AC TYPE BRAKE SEE PAGES 84-85	00000817W	00000814W	00000816W	00000815W	00000816W	00000816W	00000813W	1
	CLUTCH ASSEMBLY	00000240	00000241	00000240	00000241	00000240	00000240	00000241	
3	-EMPTY-								-
4	STATOR - 115/230V-50HZ-1Ø	00000473	00000472	00000473	00000472	00000473	00000473	00000472	1
	STATOR - 115/230V-60HZ-1Ø	00000467	00000462	00000467	00000462	00000467	00000467	00000462	
	STATOR - 230/460V-3Ø	00000466	00000461	00000466	00000461	00000466	00000466	00000461	
	STATOR - 575V-3Ø	00000469	00000465	00000469	00000465	00000469	00000469	00000465	
	STATOR-230V-2 SPEED	00000471	00000463	00000471	00000463	00000471	00000471	00000463	
	STATOR-460V-2 SPEED	00000464	00000464	00000464	00000464	00000464	00000464	00000464	
5	STATOR-575V-2 SPEED	00000470	00000470	00000470	00000470	00000470	00000470	00000470	1
	STATOR PIN		983541						
6	MOTOR COVER GASKET				27847				1
	ROTOR ASSEMBLY 50HZ-1Ø	00000266	00000261	00000266	00000261	00000266	00000266	00000261	
	ROTOR ASSEMBLY 60HZ-1Ø	00000265	00000261	00000265	00000261	00000265	00000265	00000261	
	ROTOR ASSEMBLY 3Ø	00000264	00000260	00000264	00000260	00000264	00000264	00000260	
	ROTOR ASSEMBLY - 2 SPEED	00000262	00000263	00000262	00000263	00000262	00000262	00000263	
8-9	-EMPTY-								-
10	CONTACTOR PLATE ASSEMBLY								1
11	-EMPTY-								-
12	LOCKWASHER				982226				3
13	CONTACTOR PLATE MOUNTING NUT				982514				3
14	BRAKE ASSEMBLY								1
14a	BRAKE HUB SPACER					SEE PAGES 92 & 94			0-1
14b	BRAKE HUB					SEE PAGES 92 & 94			0-2
14c	BRAKE HUB SNAP RING					SEE PAGES 92 & 94			1
15	LOCKWASHER				982226				2
16	BRAKE MOUNTING SCREW				982708				2
17	-EMPTY-								-
18	BACK FRAME COVER GASKET				27848				1
19	CONTACTOR PLATE MOUNTING STUD				27836				3
20	LIMIT SWITCH SHAFT S/A - 44 TPI				00000521				1
	LIMIT SWITCH SHAFT S/A - 56 TPI				00000522				
	LIMIT SWITCH SHAFT S/A - 64 TPI				00000523				
21	LIMIT SWITCH SHAFT SPRING				28712				1
22	WASHER				987878				1

V1-SMALL FRAME
MODELS A, A-2, AA, AA-2, B, B-2, C, C-2, E, E-2, F, F-2, H & H-2

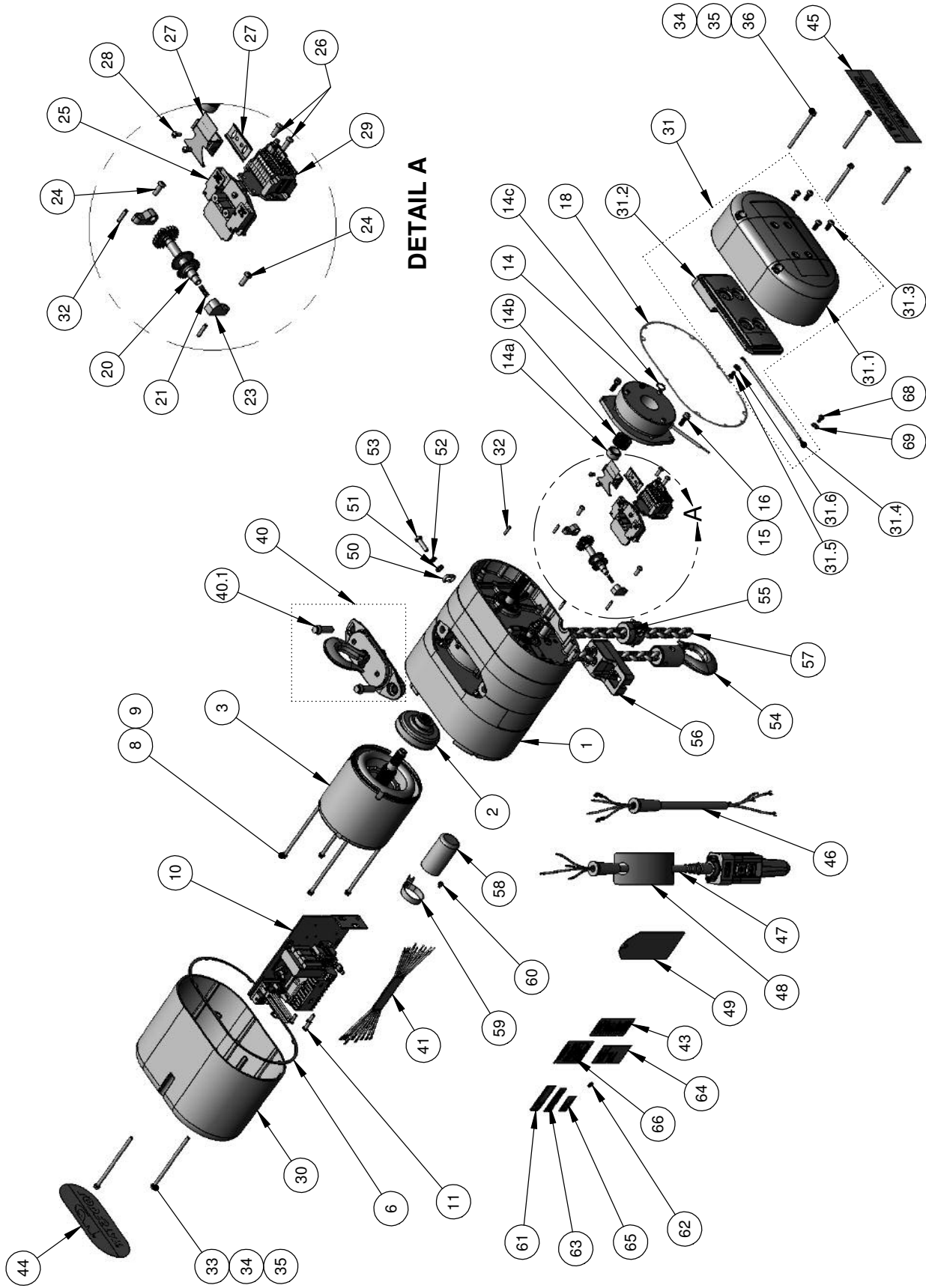
ITEM NO.	DESCRIPTION	MODELS A & A-2	MODELS AA & AA-2	MODELS B & B-2	MODELS C & C-2	MODELS E & E-2	MODELS F & F-2	MODELS H & H-2	QTY.
23-24	-EMPTY-								-
25	LIMIT SWITCH BRACKET S/A - 1ø		0000532						1
	LIMIT SWITCH BRACKET S/A - 3ø		0000531						
26	LIMIT SWITCH BRACKET SCREWS		982708						2
27	LIMIT SWITCH SPRING GUIDE		52737						1
	LIMIT SWITCH GUIDE PLATE		28714						
28	LIMIT SWITCH GUIDE MOUNTING SCREW		983614						2
29	-EMPTY-								-
30	MOTOR COVER		27058						1
	MOTOR COVER - CLEAN ROOM		27034						
	BACK FRAME COVER		28009C						
31	BACK FRAME COVER - CLEAN ROOM		28009W						1
32	-EMPTY-								-
33	MOTOR COVER SCREW		987397						2
34	WASHER		982251						5
35	SCREW RETAINER		00001747						3
36	BACK FRAME COVER SCREW		87325						3
	TRANSFORMER 24V SECONDARY		0000586						
37	TRANSFORMER 48V SECONDARY		0000587						1
	TRANSFORMER 120V SECONDARY		0000588						
38	LOCKWASHER		982226						2
39	TRANSFORMER MOUNTING SCREW		982688						2
40	UPPER SUSPENSION ASSEMBLY		SEE PAGES 88-89						1
40.1	SUSPENSION BOLT		987554						2
	HARNES-110/115V-1-50/60, 110/115V CONTROL		00001516 (FOR DC BRAKE) / 00000762 (FOR AC BRAKE)						
	HARNES-110/115V-1-50/60, 24/48V CONTROL		00001517 (FOR DC BRAKE) / 00000572 (FOR AC BRAKE)						
	HARNES-220/230/380/415/460V-3-50/60		00001522 (FOR DC BRAKE) / 00000571 (FOR AC BRAKE)						
	HARNES-220/230/380/415/460V-3-50/60		00001518 (FOR DC BRAKE) / 00000763 (FOR AC BRAKE)						
41	HARNES-550/575V-3-50/60		0000807 (FOR AC OR DC BRAKE)						1
	HARNES-220/230V-1-50/60, 2 SPEED		0000764 (FOR AC OR DC BRAKE)						
	HARNES-380/415/460V-1-50/60, 2 SPEED		00001519 (FOR DC BRAKE) / 00000765 (FOR AC BRAKE)						
	HARNES-550/575V-1-50/60, 2 SPEED		0000769 (FOR AC OR DC BRAKE)						
	HARNES-230-3-60, VFD		00001558 (FOR DC BRAKE) / 00001104 (FOR AC BRAKE)						
	HARNES-460-3-60, VFD		00001559 (FOR DC BRAKE) / 00001105 (FOR AC BRAKE)						
	HARNES-110/115V-1-50/60, CREEP CONTROL		00000762 (FOR AC BRAKE ONLY)						
42	HARNES-V1 (3Ø ONLY)		00000749						1
43	WARNING LABEL		00000779						1
44	SERIES LABEL		00000780						1
45	CAPACITY LABEL		00000581		00000772		00000773	00000778	1

V1-SMALL FRAME
MODELS A, A-2, AA, AA-2, B, B-2, C, C-2, E, E-2, F, F-2, H & H-2

ITEM NO.	DESCRIPTION	MODELS A & A-2	MODELS AA & AA-2	MODELS B & B-2	MODELS C & C-2	MODELS E & E-2	MODELS F & F-2	MODELS H & H-2	QTY.
46	POWER CORD-110/115V-1-50/60		29924						
	POWER CORD-220/230V-1-50/60		29925						
	POWER CORD-3Ø (1 & 2 SPEED)		27589						1
	POWER CORD-VFD		27756						
47	POWER CORD-CREEP CONTROL		29924						
	CONTROL CORD		SEE PAGES 96-98						1
48	WARNING TAG		68209						1
49	INSTRUCTION TAG		29271						1
50	LOOSE END LINK		27351						1
51	WASHER		954802						1
52	LOCK WASHER		982226						1
53	LOOSE END SCREW		927764						1
54	LOWER HOOK BLOCK ASSEMBLY		SEE PAGES 90-91						1
55	CHAIN STOP KIT		24015K						1
56	-EMPTY-		-						-
57	LOAD CHAIN		85944 (ZINC PLATED)						
			85889 (BURNISHED AND OILED)						
			85965 (ZINC PHOSPHATE PLATED)						
			85915 (NICKEL PLATED)						AS REQ'D
58-60	-EMPTY-								
61	ELECTRICAL WARNING LABEL		24842						2
62	ROHS LABEL		00000782						1
63	ELECTRICAL INFORMATION LABEL		24846						1
64	BILINGUAL WARNING LABEL		27248						1
65	MANUFACTURE LABEL		927236						1
66	CHAIN LABEL		928894						1
67	HOIST IDENTIFICATION PLATE/LABEL		CONTACT FACTORY						1

V1-SMALL FRAME
MODELS A, A-2, AA, AA-2, B, B-2, C, C-2, E, E-2, F, F-2, H & H-2

MODELS J, J-2, JJ, JJ-2, L, L-2, LL, LL-2, R, R-2, RR, RR-2, RT, RT-2, RRT, & RRT-2
V2-LARGE FRAME



ITEM NO.	DESCRIPTION	MODELS J & J-2	MODELS JJ & JJ-2	MODEL L MODEL L-2	MODELS LL & LL-2	MODELS R & R-2	MODELS RR & RR-2	MODELS RT & RT-2	MODELS RRT & RRT-2	QTY.
1	GEAR BOX SUB-ASSY - DC TYPE BRAKE SEE PAGES 86-87	00000845C	00000846C	00000847C	00000845C	00000847C	00000845C	00000848C	00000849C	1
	GEAR BOX SUB-ASSY - AC TYPE BRAKE SEE PAGES 86-87	00000133C	00000134C	00000132C	00000133C	00000132C	00000133C	00000135C	00000136C	
2	CLUTCH ASSEMBLY	00000242	00000243	00000242	00000243	00000242	00000243	00000242	00000243	1
	3/4 MOTOR - 115V-1Ø	00000401	-	00000401	-	00000401	-	00000401	-	
	3/4 MOTOR - 230V-1Ø	00000428	-	00000428	-	00000428	-	00000428	-	
	3/4 MOTOR - 230/460V-3Ø	00000440	00000450	00000440	00000450	00000440	00000450	00000440	00000450	
	3/4 MOTOR - 575V-3Ø	00000433	00000439	00000433	00000439	00000433	00000439	00000433	00000439	
	3/4 MOTOR - 230V-2 SPEED	00000414	00000420	00000414	00000420	00000414	00000420	00000414	00000420	
3	3/4 MOTOR - 460V-2 SPEED	00000415	00000421	00000415	00000421	00000415	00000421	00000415	00000421	1
	3/4 MOTOR - 575V-2 SPEED	00000418	00000422	00000418	00000422	00000418	00000422	00000418	00000422	
4	-EMPTY-	-	-	-	-	-	-	-	-	-
5	-EMPTY-	-	-	-	-	-	-	-	-	-
6	MOTOR COVER GASKET	-	-	-	35845	-	-	-	-	1
7	ROTOR ASSEMBLY	-	-	-	-	-	-	-	-	-
8	LOCKWASHER	-	-	-	982226	-	-	-	-	4
	MOTOR MOUNTING SCREW - 1Ø	-	-	-	87377	-	-	-	-	
9	MOTOR MOUNTING SCREW - 230/460V-3-60 OR 575V-3-60	87377	87336	87377	87336	87377	87336	87377	87336	4
	MOTOR MOUNTING SCREW - 2 SPEED	-	-	-	87336	-	-	-	-	
10	CONTACTOR PLATE ASSEMBLY	-	-	-	SEE PAGES 107-119, 127-135	-	-	-	-	1
11	CONTACTOR PLATE MOUNTING SCREW	-	-	-	983656	-	-	-	-	3
12	-EMPTY-	-	-	-	-	-	-	-	-	-
13	-EMPTY-	-	-	-	-	-	-	-	-	-
14	BRAKE ASSEMBLY	-	-	-	SEE PAGES 93 & 95	-	-	-	-	1
14a	BRAKE HUB SPACER	-	-	-	SEE PAGES 93 & 95	-	-	-	-	0-2
14b	BRAKE HUB	-	-	-	SEE PAGES 93 & 95	-	-	-	-	0-2
14c	BRAKE HUB SNAP RING	-	-	-	35766	-	-	-	-	1
15	LOCKWASHER	-	-	-	945851	-	-	-	-	2
16	BRAKE MOUNTING SCREW	-	-	-	SEE PAGES 93 & 95	-	-	-	-	1-2
17	BRAKE MOUNTING STUD - AC TYPE BRAKE ONLY - NOT SHOWN	-	-	-	SEE PAGES 93 & 95	-	-	-	-	0-1
18	BACK FRAME COVER GASKET	-	-	-	00000236	-	-	-	-	1
19	-EMPTY-	-	-	-	-	-	-	-	-	-
20	LIMIT SWITCH SHAFT S/A - 44 TPI	00000525	00000525	00000524	00000525	00000524	00000525	00000524	00000525	1
	LIMIT SWITCH SHAFT S/A - 56 TPI	00000527	00000527	00000526	00000527	00000526	00000527	00000526	00000527	
	LIMIT SWITCH SHAFT S/A - 64 TPI	00000529	00000529	00000528	00000529	00000528	00000529	00000528	00000529	
21	LIMIT SWITCH SHAFT SPRING	-	-	-	35703	-	-	-	-	1
22	-EMPTY-	-	-	-	-	-	-	-	-	-
23	LIMIT SWITCH BEARING	-	-	-	35751	-	-	-	-	2
24	LIMIT SWITCH BEARING SCREWS	-	-	-	983656	-	-	-	-	2
	LIMIT SWITCH BRACKET S/A	-	-	-	36827	-	-	-	-	
25	LIMIT SWITCH BRACKET S/A	-	-	-	-	-	-	-	-	1

**V2-LARGE FRAME
MODELS J, J-2, JJ, JJ-2, L, L-2, LL, LL-2, R, R-2, RR, RR-2, RT, RT-2, RRT, & RRT-2**

ITEM NO.	DESCRIPTION	MODELS J & J-2	MODELS JJ & JJ-2	MODELS L & L-2	MODELS LL & LL-2	MODELS R & R-2	MODELS RR & RR-2	MODELS RRT & RRT-2	QTY.
26	LIMIT SWITCH BRACKET SCREWS				983656				2
27	LIMIT SWITCH GUIDE PLATE			28714					1
	LIMIT SWITCH GUIDE PLATE-ROTATABLE			52500					
28	LIMIT SWITCH GUIDE MOUNTING SCREW			983614					2
	TERMINAL STRIP S/A (115V-1Ø)			00001739 (FOR DC BRAKE) / 24848 (FOR AC BRAKE)					
	TERMINAL STRIP S/A (230V-1Ø)	00001738 (FOR DC BRAKE) / CONTACT FACTORY FOR AC BRAKE APPLICATIONS							
	TERMINAL STRIP S/A (230/460V-3Ø)	00001734 (FOR DC BRAKE) / 24847 (FOR AC BRAKE)							
29	TERMINAL STRIP S/A (575V-1Ø)	00001735 (FOR DC BRAKE) / 24847 (FOR AC BRAKE)							1
	TERMINAL STRIP S/A (230V-2 SPEED)	00001736 (FOR DC BRAKE) / 24849 (FOR AC BRAKE)							
	TERMINAL STRIP S/A (460/575V-2 SPEED)	00001746 (FOR DC BRAKE) / 24849 (FOR AC BRAKE)							
	TERMINAL STRIP S/A (CREEP CONTROL)	27444 (FOR AC BRAKE ONLY)							
30	MOTOR COVER			36205C					1
31	BACK FRAME COVER ASSEMBLY			00000578C					1
31.1	BACK FRAME COVER			36008C					1
31.2	COUNTER WEIGHT			00000565					1
31.3	COUNTER WEIGHT SCREW			00000576					4
31.4	TETHER			00000575					1
31.5	SCREW			00000577					1
31.6	WASHER			00000554					1
32	BACKFRAME COVER PINS			983784					4
33	MOTOR COVER SCREW			987553					2
34	WASHER			982251					6
35	SCREW RETAINER			00001747					6
36	BACK FRAME COVER SCREW			968752					4
37-39	-EMPTY-			-					-
40	UPPER SUSPENSION ASSEMBLY			SEE PAGES 88-89					1
40.1	SUSPENSION BOLT			36849					2
	HARNES-110/115V-1-50/60, 110/115V CONTROL			00001530 (FOR DC BRAKE) / 00000569 (FOR AC BRAKE)					
	HARNES-110/115V-1-50/60, 24/48V CONTROL			00001523 (FOR DC BRAKE) / 00000570 (FOR AC BRAKE)					
	HARNES-220/230V-1-50/60			00001523 (FOR DC BRAKE) / 00000568 (FOR AC BRAKE)					
	HARNES-220/230/380/415/460V-3-50/60			00001531 (FOR DC BRAKE) / 00000808 (FOR AC BRAKE)					
	HARNES-550/575V-3-50/60			00001534 (FOR DC BRAKE) / 00000567 (FOR AC BRAKE)					
	HARNES-220/230V-1-50/60, 2 SPEED			00001532 (FOR DC BRAKE) / 00000566 (FOR AC BRAKE)					
	HARNES-380/415/460V-1-50/60, 2 SPEED			00001533 (FOR DC BRAKE) / 00000566 (FOR AC BRAKE)					
41	HARNES-550/575V-1-50/60, 2 SPEED			00001533 (FOR DC BRAKE) / 00000566 (FOR AC BRAKE)					1
				000001556 (FOR DC BRAKE)					
	HARNES-230-3-60, VFD	000001106 (FOR AC BRAKE)	000001107 (FOR AC BRAKE)	000001106 (FOR AC BRAKE)	000001107 (FOR AC BRAKE)	000001106 (FOR AC BRAKE)	000001107 (FOR AC BRAKE)	000001106 (FOR AC BRAKE)	000001107 (FOR AC BRAKE)
	HARNES-460-3-60, VFD	00001556 (FOR DC BRAKE)	00001109 (FOR AC BRAKE ONLY)						
	HARNES-110/115V-1-50/60, CREEP CONTROL			00001109 (FOR AC BRAKE ONLY)					

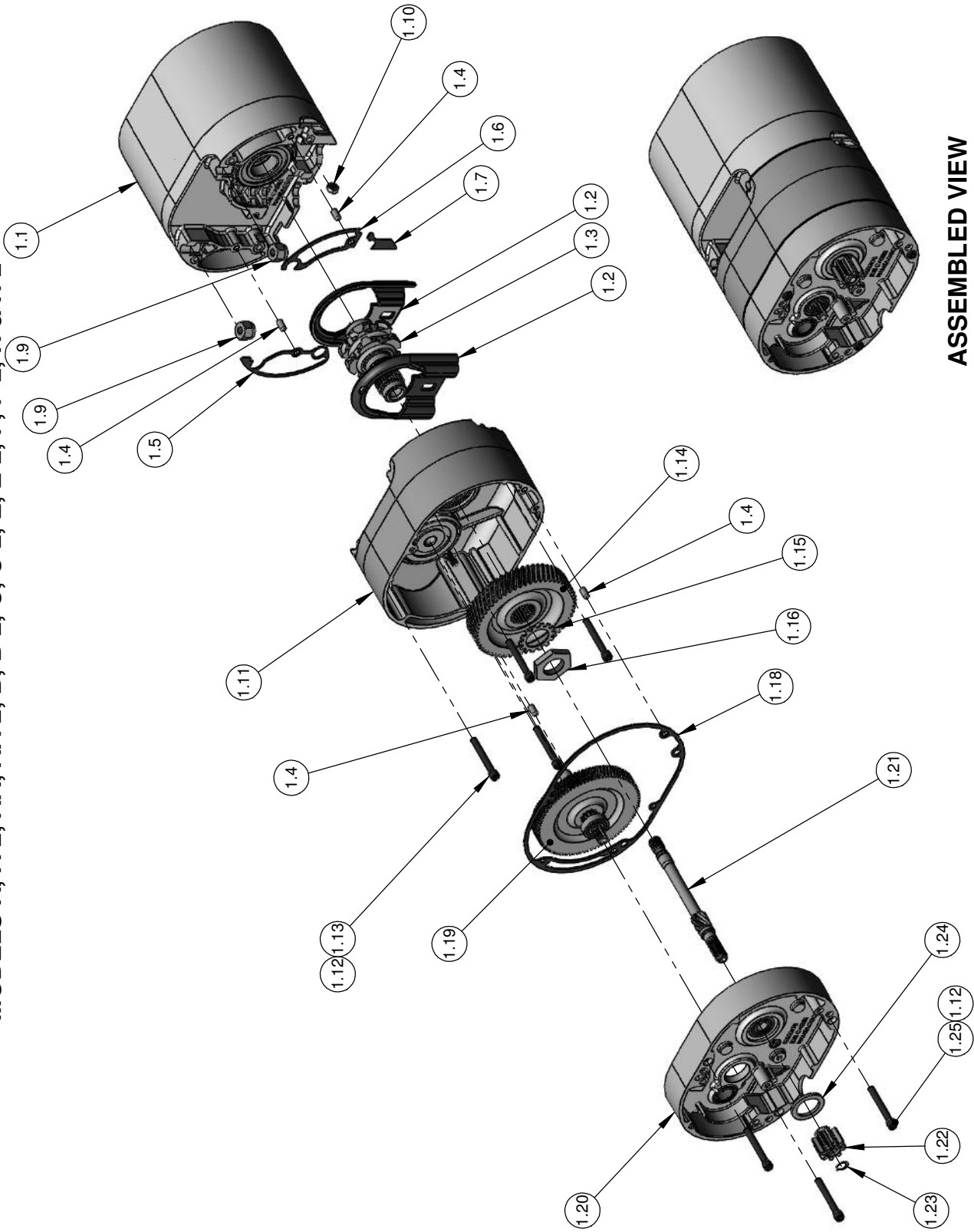
**V2-LARGE FRAME
MODELS J, J-2, JJ, JJ-2, L, L-2, LL, LL-2, R, R-2, RR, RR-2, RT, RT-2, RRT, & RRT-2**

ITEM NO.	DESCRIPTION	MODELS J & J-2	MODELS JJ & JJ-2	MODELS L & L-2	MODELS LL & LL-2	MODELS R & R-2	MODELS RR & RR-2	MODELS RRT & RRT-2	MODELS RRT & RRT-2	QTY.
42	-EMPTY-									-
43	WARNING LABEL				00000779					1
44	SERIES LABEL				00000781					1
45	CAPACITY LABEL	00000774		00000775		00000776		00000777		1
46	POWER CORD-110/115V-1-50/60				29042					1
	POWER CORD-220/230V-1-50/60				29042					
	POWER CORD-3Ø (1 & 2 SPEED)				29430					
	POWER CORD-VFD				27757					
47	POWER CORD-CREEP CONTROL (AC BRAKE ONLY)				29042					1
	CONTROL STATION AND CORD				SEE PAGES 96-98					
48	WARNING TAG				68209					1
49	INSTRUCTION TAG				29271					1
50	LOOSE END LINK				35367					1
51	WASHER				954807					1
52	LOCK WASHER				945851					1
53	LOOSE END SCREW				987210					1
54	LOWER HOOK BLOCK ASSEMBLY				SEE PAGES 90-91					1
55	CHAIN STOP KIT				24016K					1
56	CONTACT BLOCK					00000224C				1
57	LOAD CHAIN				85949 (ZINC PLATED)					AS REQ'D
					85979 (BURNISHED AND OILED)					
					85966 (ZINC PHOSPHATE PLATED)					
					85916 (NICKEL PLATED)					
58	SOLID STATE REVERSE SWITCH				35499				1*	
59	SOLID STATE REVERSE SWITCH MTG. CLAMP				27275				1*	
60	SOLID STATE REVERSE SWITCH MTG. CLAMP SCREW				982873				1*	
61	ELECTRICAL WARNING LABEL				24842					2
62	ROHS LABEL				00000782					1
63	ELECTRICAL INFORMATION LABEL				24846					1
64	BILINGUAL WARNING LABEL				27248					1
65	MANUFACTURE LABEL				927236					1
66	CHAIN LABEL				928894					1
67	HOIST IDENTIFICATION PLATE/LABEL (NOT SHOWN)				Contact Factory					1
68	SCREW				00000577					1
69	WASHER				00000554					1

*Single phase hoists only

**V2-LARGE FRAME
MODELS J, J-2, JJ, JJ-2, L, L-2, LL, LL-2, R, R-2, RR, RR-2, RT, RT-2, RRT, & RRT-2**

V1 - GEARBOX ASSEMBLY
MODELS A, A-2, AA, AA-2, B, B-2, C, C-2, E, E-2, F, F-2, H & H-2



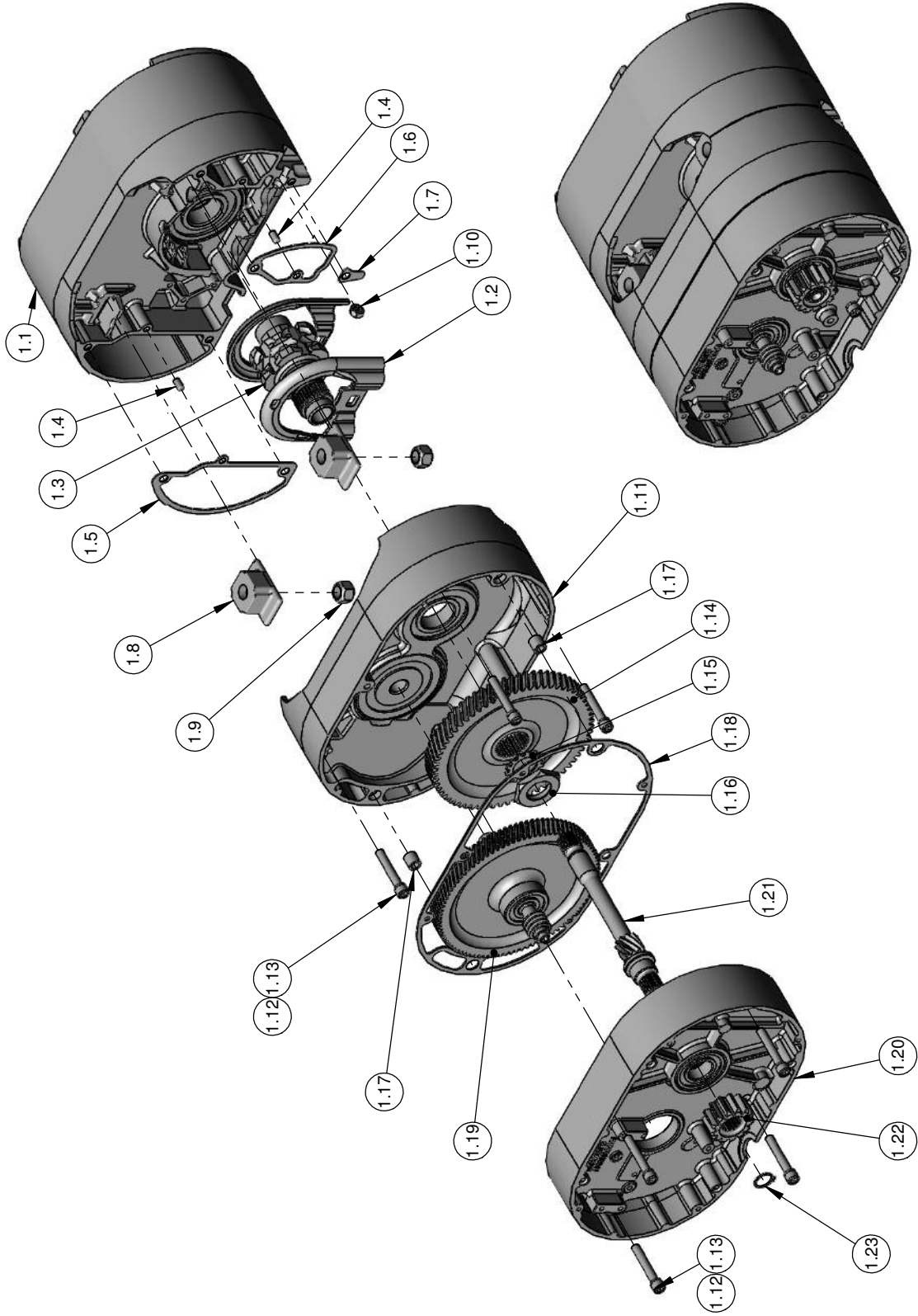
ASSEMBLED VIEW

ITEM NO.	DESCRIPTION	DC TYPE BRAKE						AC TYPE BRAKE						QTY.
		MODEL A	MODEL AA	MODELS B/E	MODEL C	MODELS F/H	MODEL A	MODEL AA	MODELS B/E	MODEL C	MODELS F/H			
1	GEARBOX SUB-ASSEMBLY CLEAN ROOM GEAR BOX SUB-ASSEMBLY	00000830C	00000831C	00000832C	00000833C	00000834C	00000166C	00000130C	00000165C	00000131C	00000129C	1		
		00000835W	00000836W	00000837W	00000838W	00000839W	00000817W	00000814W	00000816W	00000815W	00000813W			
1.1	MOTOR HOUSING SUB-ASSY CLEAN ROOM MOTOR HOUSING SUB-ASSY		00000504C					00000504C				1		
			00000504W					00000504W						
1.2	CHAIN GUIDE CLEAN ROOM CHAIN GUIDE		00000232					00000232				2		
			00000811					00000811						
1.3	LIFTWHEEL CLEAN ROOM LIFTWHEEL		00000500					00000500				1		
			00000818					00000818						
1.4	DOWEL PIN GASKET-MOTOR HOUSING WIREWAY		82354					82354				4		
1.5	GASKET-MOTOR HOUSING WIREWAY		00000189					00000189				1		
1.6	GASKET MOTOR HOUSING		00000190					00000190				1		
1.7	GASKET MOTOR HOUSING		00000191					00000191				1		
1.8	-EMPTY-		-					-				-		
1.9	SUSPENSION NUT		927755					927755				2		
1.10	LOOSE END NUT		82638					82638				1		
	GEAR HOUSING SUB-ASSY	00000503C	00000503C	00000502C	00000503C	00000502C	00000503C	00000503C	00000502C	00000503C	00000502C			
1.11	CLEAN ROOM GEAR HOUSING SUB-ASSY	00000503W	00000503W	00000502W	00000503W	00000502W	00000503W	00000503W	00000502W	00000503W	00000502W	1		
1.12	LOCKWASHER		940802					940802				7		
1.13	GEAR HOUSING SCREW		28830					28830				4		
1.14	LIFTWHEEL GEAR	00000160 (45TEETH)	00000159 (36TEETH)	00000161 (59TEETH)	00000160 (45TEETH)	00000161 (59TEETH)	00000160 (45TEETH)	00000159 (36TEETH)	00000161 (59TEETH)	00000160 (45TEETH)	00000161 (59TEETH)	1		
1.15	LOCK WASHER		00000199					00000199				1		
1.16	LIFTWHEEL NUT		00000198					00000198				1		
1.17	-EMPTY-		-					-				-		
1.18	GEAR HOUSING GASKET		00000188					00000188				1		
1.19	INTERMEDIATE SHAFT SUB-ASSY	00000156 (88TEETH/ 12TEETH)	00000157 (88TEETH/ 18TEETH)	00000155 (88TEETH/ 8TEETH)	00000156 (88TEETH/ 12TEETH)	00000155 (88TEETH/ 8TEETH)	00000156 (88TEETH/ 12TEETH)	00000157 (88TEETH/ 18TEETH)	00000155 (88TEETH/ 8TEETH)	00000156 (88TEETH/ 12TEETH)	00000155 (88TEETH/ 8TEETH)	1		
1.20	BACKFRAME SUB-ASSY CLEAN ROOM BACKFRAME SUB-ASSY		00000505C*					00000505C*				1		
			00000505W*					00000505W*						
1.21	DRIVE SHAFT		00000819 (10 TEETH)				00000141 (10 TEETH)	00000143 (10 TEETH)	00000141 (10 TEETH)	00000143 (10 TEETH)	00000143 (10 TEETH)	1		
1.22	BRAKE HUB		SEE BRAKE DETAIL, PAGE 92				27851	27852	27851	27852	27852	1		
1.23	RETAINING RING		SEE BRAKE DETAIL, PAGE 92					27766				1		
1.24	SPACER		SEE BRAKE DETAIL, PAGE 92					27710				1		
1.25	BACKFRAME SCREW		982699					982699				3		

*For VFD units, use backframe sub-assembly 00000269C

V1 - GEARBOX ASSEMBLY
MODELS A, A-2, AA, AA-2, B, B-2, C, C-2, E, E-2, F, F-2, H & H-2

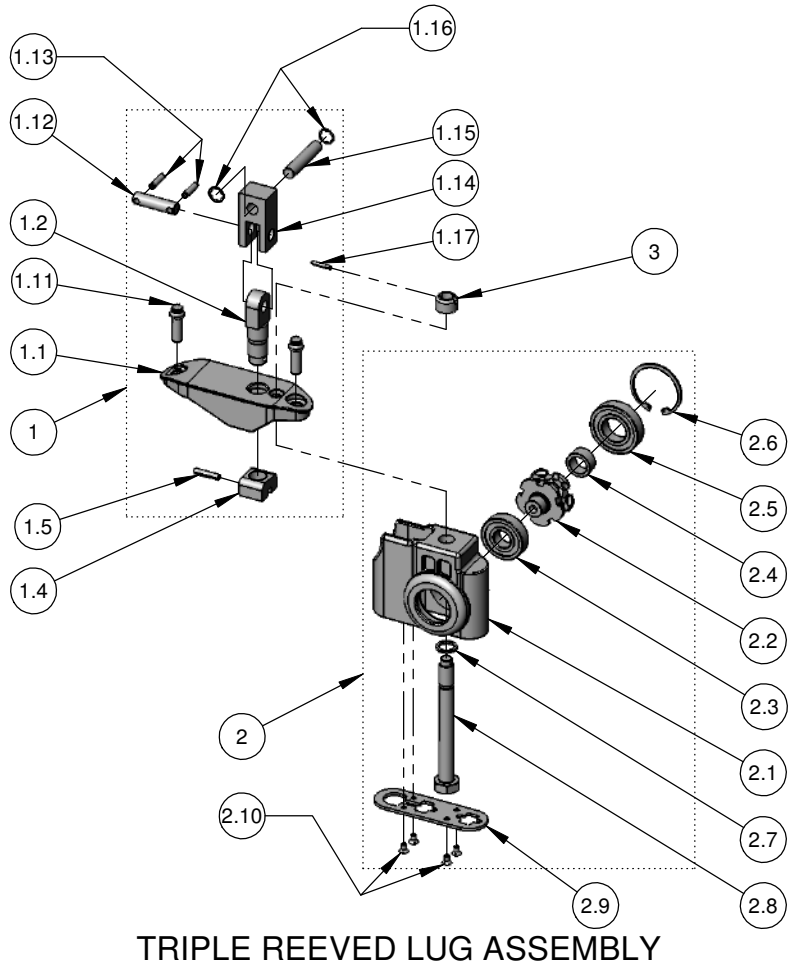
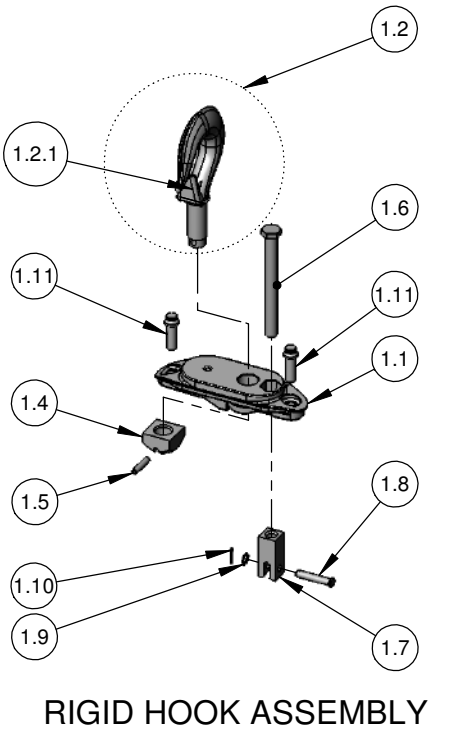
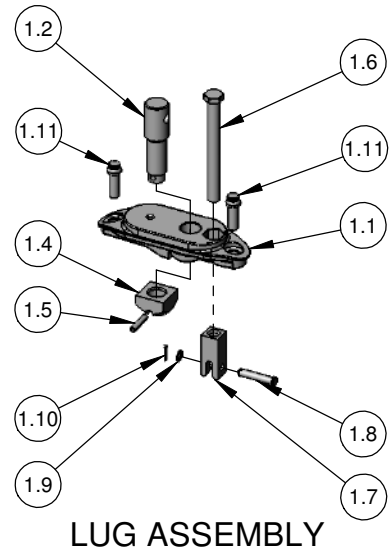
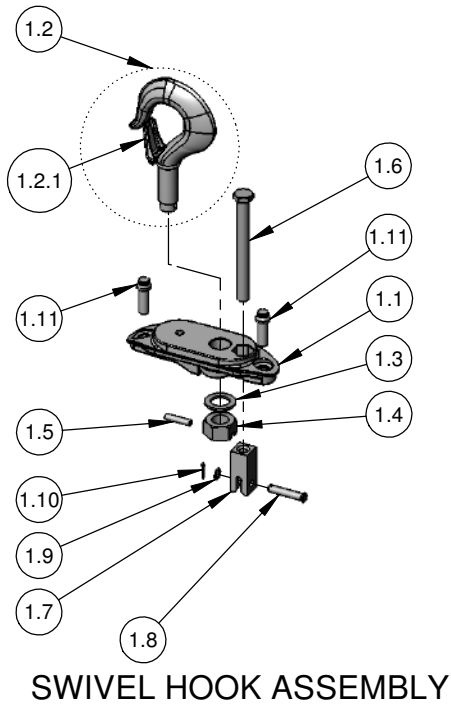
V2 - GEARBOX ASSEMBLY
J, J-2, JJ, JJ-2, L, L-2, LL, LL-2, R, R-2, RR, RR-2, RT, RT-2, RRT, & RRT-2



ASSEMBLED VIEW

ITEM NO.	DESCRIPTION	DC TYPE BRAKE						AC TYPE BRAKE						QTY.
		MODELS J/LL/RR	MODEL JJ	MODELS L/R	MODEL RT	MODEL RRT	MODELS J/LL/RR	MODEL JJ	MODELS L/R	MODEL RT	MODEL RRT			
1	GEARBOX SUB-ASSEMBLY	00000845C	00000846C	00000847C	00000848C	00000849C	00000133C	00000134C	00000132C	00000135C	00000136C	1		
1.1	MOTOR HOUSING SUB-ASSY	00000509C	00000509C	00000509C	00000513C	00000513C	00000509C	00000509C	00000509C	00000513C	00000513C	1		
1.2	CHAIN GUIDE			00000235					00000235			2		
1.3	LIFT-WHEEL			00000501					00000501			1		
1.4	DOWEL PIN			82354					82354			2		
1.5	GASKET-MOTOR HOUSING WIREWAY			00000193					00000193			1		
1.6	GASKET MOTOR HOUSING			00000194					00000194			1		
1.7	GASKET MOTOR HOUSING			00000549					00000549			1		
1.8	SUSPENSION ANCHOR			35066					35066			2		
1.9	SUSPENSION NUT			935791					935791			2		
1.10	LOOSE END NUT			82639					82639			1		
1.11	GEAR HOUSING SUB-ASSY	00000507C	00000508C	00000507C	00000512C	00000512C	00000507C	00000508C	00000507C	00000512C	00000512C	1		
1.12	LOCKWASHER			940830					940830			8		
1.13	GEAR HOUSING SCREW			982682					982682			8		
1.14	LIFEWHEEL GEAR	00000163 (66 TEETH)	00000162 (42 TEETH)	00000163 (66 TEETH)	00000163 (66 TEETH)	00000163 (66 TEETH)	00000163 (66 TEETH)	00000162 (42 TEETH)	00000163 (66 TEETH)	00000163 (66 TEETH)	00000163 (66 TEETH)	1		
1.15	LOCKWASHER			986276					986276			1		
1.16	LIFTWHEEL NUT			35773					35773			1		
1.17	ALIGNMENT BUSHING			35768					35768			2		
1.18	GEAR HOUSING GASKET			00000192					00000192			1		
1.19	INTERMEDIATE SHAFT SUB-ASSY	00000146 (47 TEETH/ 8 TEETH)	00000170 (47 TEETH/ 10 TEETH)	00000171 (92 TEETH/ 8 TEETH)	00000171 (92 TEETH/ 8 TEETH)	00000146 (47 TEETH/ 8 TEETH)	00000146 (47 TEETH/ 8 TEETH)	00000170 (47 TEETH/ 10 TEETH)	00000171 (92 TEETH/ 8 TEETH)	00000171 (92 TEETH/ 8 TEETH)	00000146 (47 TEETH/ 8 TEETH)	1		
1.2	BACKFRAME SUB-ASSY			00000510C					00000510C			1		
1.21	DRIVE SHAFT	00000821 (10 TEETH)	00000821 (10 TEETH)	00000820 (10 TEETH)	00000820 (10 TEETH)	00000821 (10 TEETH)	00000144 (10 TEETH)	00000144 (10 TEETH)	00000145 (10 TEETH)	00000145 (10 TEETH)	00000144 (10 TEETH)	1		
1.22	BRAKE HUB			SEE BRAKE DETAIL, PAGE 93					35744			1		
1.23	RETAINING RING			SEE BRAKE DETAIL, PAGE 93					35766			1		

V2 - GEARBOX ASSEMBLY
J, J-2, JJ, JJ-2, L, L-2, LL, LL-2, R, R-2, RR, RR-2, RT, RT-2, RRT, & RRT-2



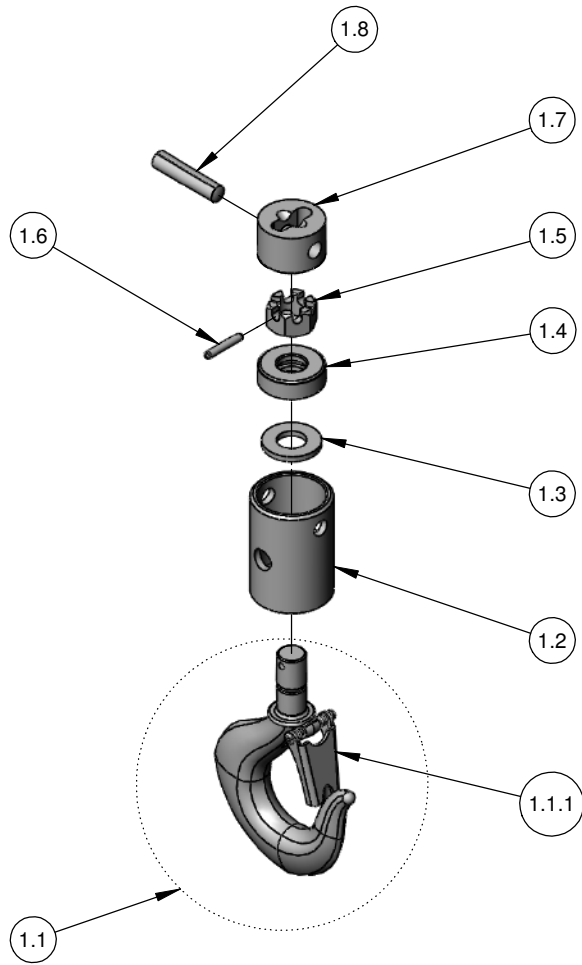
UPPER SUSPENSIONS

ITEM NO.	DESCRIPTION	V1-SMALL FRAME PART NUMBERS		V2-LARGE FRAME PART NUMBERS			QTY.
		MODELS A, A-2, AA, AA-2, B, B-2, C, C-2, F, F-2	MODELS E, E-2, H, H-2	MODELS J, J-2, L, L-2, LL, LL-2	MODELS R, R-2, RR, RR-2	MODELS RT, RT-2, RRT, RRT-2	
1	SWIVEL SUSPENSION ASSEMBLY - W/ LATCH TYPE HOOK	2792NH	2793NH	3661NH	3660NH	9557NH	1
	SWIVEL SUSPENSION ASSEMBLY - W/ LATCHLOK TYPE HOOK	2796NH	-*	3662NH	3663NH	-*	
	RIGID SUSPENSION ASSEMBLY - W/ LATCH TYPE HOOK	2788NH	2789NH	3651NH	3658NH	9559NH	
	RIGID SUSPENSION ASSEMBLY - W/ LATCHLOK TYPE HOOK	2790NH	-*	3652NH	-*	-*	
	LUG SUSPENSION FOR MOTOR DRIVEN TROLLEY	2992NH	2993NH	3679NH	3668NH	9561NH	
	LUG SUSPENSION FOR LOW HEADROOM TROLLEY	2778NH	2779NH	3677NH			
1.1	SUSPENSION ADAPTER	00000218B	00000223B	00000220B	00000221B	00000222B	1
1.2	UPPER HOOK SUB-ASSEMBLY - LATCH TYPE	28689B	28697B	35617B	35616B	36613B	1
	UPPER HOOK SUB-ASSEMBLY - LATCHLOK TYPE	28643	-*	36678	36680	-*	
	SUSPENSION LUG FOR MOTOR DRIVEN TROLLEY	27454	27455	35459	35457	36356	
	SUSPENSION LUG FOR LOW HEADROOM TROLLEY	27450	27452	35456			
1.2.1	LATCH KIT	45661	45661	45662	45663	45663	**
1.3	THRUST WASHER (FOR SWIVEL SUSPENSIONS ONLY)	27786	45930	45930	45918	-	1
1.4	UPPER HOOK COLLAR FOR SWIVEL SUSPENSIONS	27350	45385	35042	35041	36352	1
	UPPER HOOK COLLAR FOR RIGID HOOK AND LUG SUSPENSIONS	27372	27373	35458	35426	36360	
1.5	SPRING PIN	27805	45941	983764	983762	983762	1
1.6	DEAD END BOLT	-	89508	-	35957	-	1
1.7	DEAD END BLOCK	-	27397	-	35418	-	1
1.8	DEAD END PIN	-	82320	-	82314	-	1
1.9	WASHER	-	987878	-	987877	-	1
1.10	COTTER PIN	-	988330	-	988330	-	1
1.11	SUSPENSION SCREW	987554	987554	36849	36849	36849	2
1.12	SUSPENSION LUG SUPPORT PIN	-	-	-	-	36366	1
1.13	PIN RETAINER	-	-	-	-	983760	2
1.14	SHACKLE	-	-	-	-	36357	1
1.15	SHACKLE SUPPORT PIN	-	-	-	-	36363	1
1.16	RING RETAINER	-	-	-	-	36867	2
1.17	SHEAVE STUD PIN	-	-	-	-	983791	1
2	UPPER SHEAVE HANGER S/A	-	-	-	-	00000285C	1
2.1	UPPER SHEAVE HANGER	-	-	-	-	00000281C	1
2.2	SHEAVE	-	-	-	-	00000274	1
2.3	BEARING 6305ZZ	-	-	-	-	83674	1
2.4	PILOT BUSHING	-	-	-	-	00000284	1
2.5	BEARING 6207ZZ	-	-	-	-	83669	1
2.6	RETAINING RING	-	-	-	-	46800	1
2.7	WASHER	-	-	-	-	36370	1
2.8	SHEAVE STUD	-	-	-	-	36372	1
2.9	CLOVER LEAF PLATE	-	-	-	-	00000282B	1
2.10	SCREW	-	-	-	-	936823	4
3	SHEAVE STUD NUT	-	-	-	-	00000289	1

*Contact factory for Latchlok hooks and assemblies

** Latch Type hooks assemblies come with latches installed

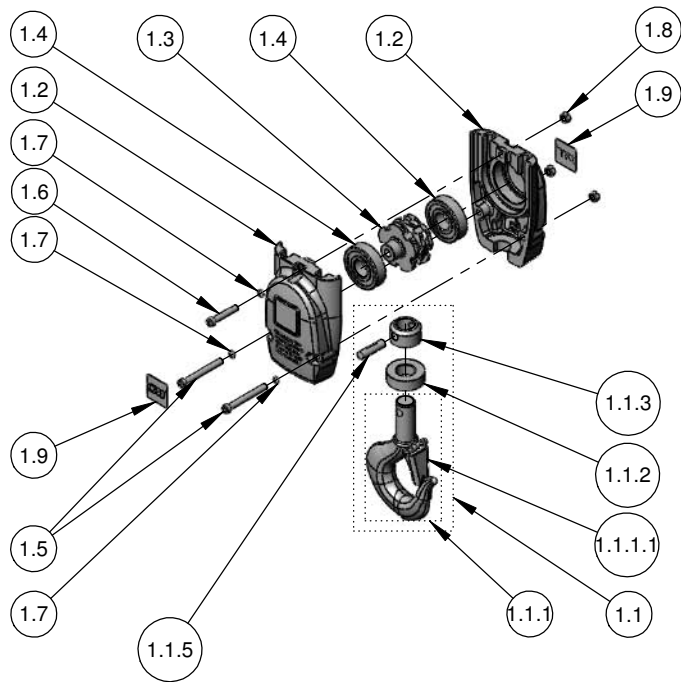
UPPER SUSPENSIONS



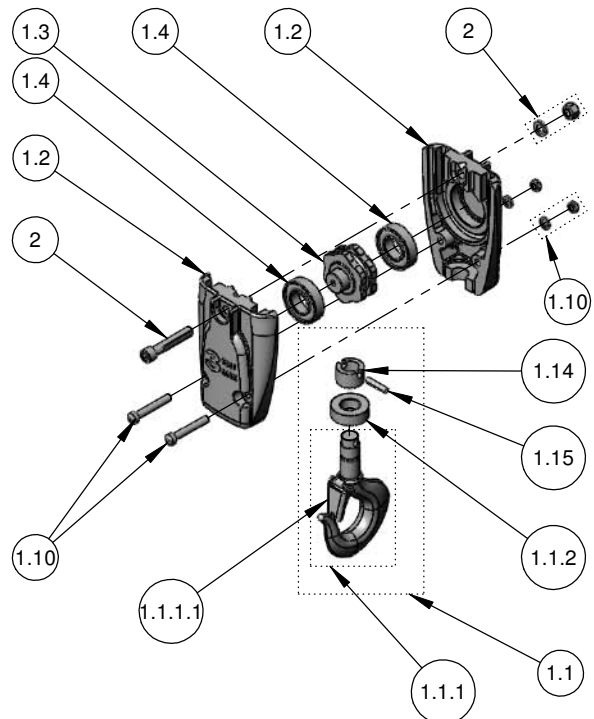
ITEM NO.	DESCRIPTION	SINGLE-REEVED MODELS		QTY.
		A, A-2, AA, AA-2, B, B-2, C, C-2, F, F-2	J, J-2, L, L-2, LL, LL-2	
1	LOWER HOOK BLOCK ASSEMBLY-COMplete WITH LATCH TYPE HOOK	*28683	*35651	1
1.1	LOWER HOOK WITH LATCH	28686	35611	1
	LATCHLOK TYPE HOOK	28604	28604	
1.1.1	LATCH KIT	45661	45662	1
1.2	LOWER HOOK BODY	45401B	35370	1
1.3	LOWER HOOK WASHER	945921	945921	1
1.4	LOWER HOOK THRUST BEARING	88485	88485	1
1.5	LOWER HOOK NUT	982526	982526	1
1.6	LOWER HOOK NUT PIN	983772	983772	1
1.7	LOWER HOOK CHAIN BLOCK	28007	35026	1
1.8	LOWER HOOK CHAIN BLOCK PIN	45943	35790	1

* Contact CM for LatchLok part numbers

LOWER HOOK BLOCKS SINGLE REEVED



DOUBLE-REEVED

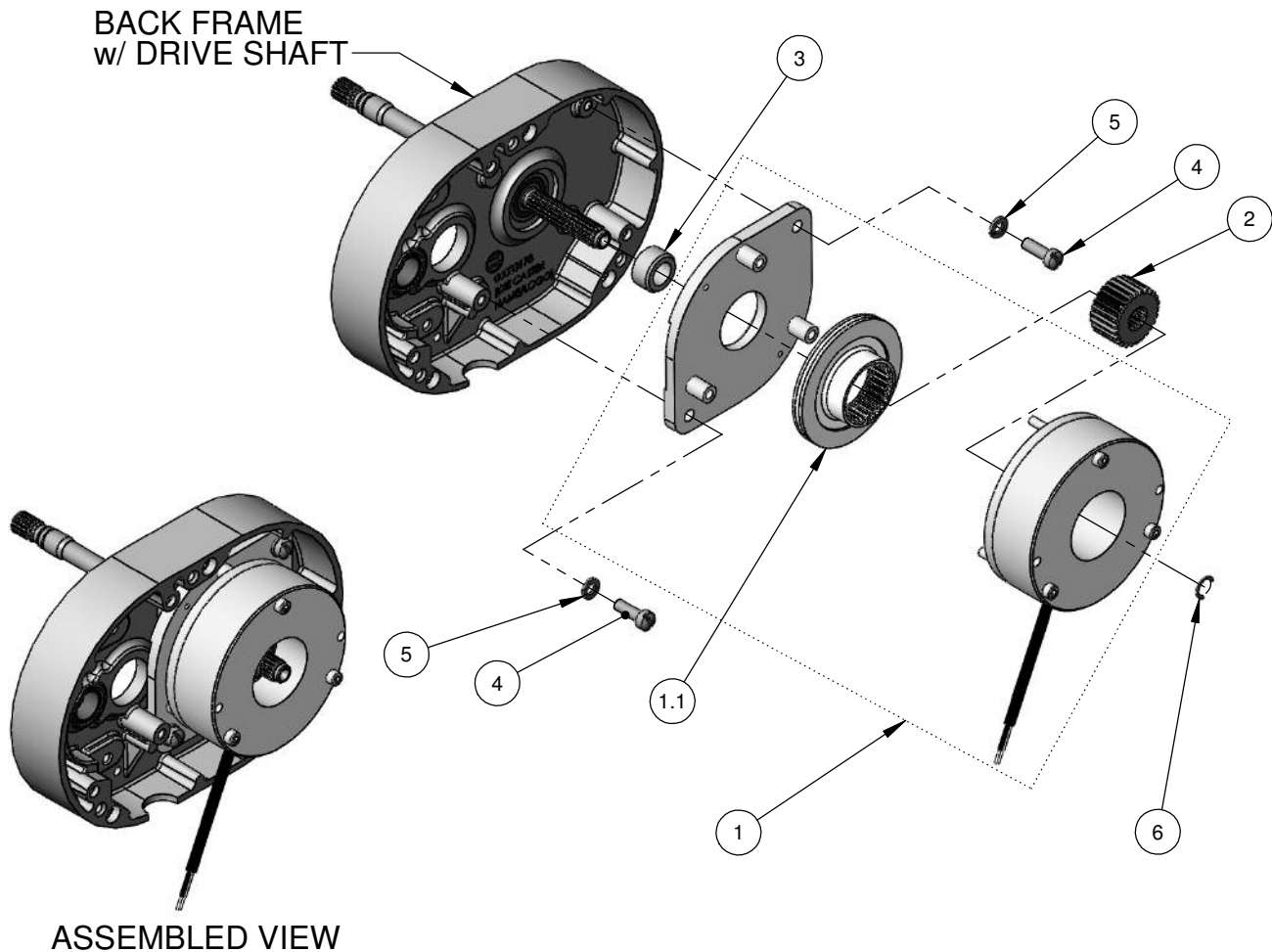


TRIPLE-REEVED

ITEM NO.	DESCRIPTION	DOUBLE REEVED MODELS		TRIPLE REEVED MODELS	QTY.
		E, E-2, H, H-2	R, R-2, RR, RR-2	RT, RT-2, RRT, RRT-2	
1	LOWER HOOK BLOCK ASSEMBLY-COMLETE WITH LATCH TYPE HOOK	*00000272B	*00000277B	*36607	1
1.1	LOWER HOOK ASSEMBLY WITH LATCH AND BRG	28665	35645	36606	1
	LATCHLOK TYPE HOOK ASSEMBLY WITH BRG	-	-	-	
1.1.1	LOWER HOOK WITH LATCH	28687B	35612B	36353B	1
	LATCHLOK TYPE HOOK	28603	36681	*	
1.1.1.1	LATCH KIT	45662	45663	45663	1
1.1.2	LOWER HOOK THRUST BEARING	88478	88505	88505	1
1.1.3	LOWER HOOK COLLAR	45385	35369	-	1
1.1.4	LOWER HOOK NUT	-	-	36352	1
1.1.5	LOWER HOOK PIN	45941	45946	983762	1
1.2	HOOK BLOCK (ORDER IN PAIRS)	00000271B	00000276B	36010B	2
1.3	HOOK BLOCK SHEAVE	00000273	00000274	36351	1
1.4	HOOK BLOCK SHEAVE BEARING	88429	83674	83670	2
1.5	HOOK BLOCK SCREW-LONG	982066	982374	-	2
1.6	HOOK BLOCK SCREW-SHORT	986191	982370	-	1
1.7	HOOK BLOCK LOCKWASHER	940802	940830	-	3
1.8	HOOK BLOCK NUT	982514	982445	-	3
1.9	HOOK BLOCK LABEL	00000766	00000766	-	2
1.10	HOOK BLOCK SCREWS WITH NUTS AND LOCKWASHERS (2 EACH)	-	-	C245	1
2	DEAD END SCREW WITH NUT AND LOCKWASHER	-	-	C249	1

* Contact CM for LatchLok part numbers

LOWER HOOK BLOCKS DOUBLE & TRIPLE REEVED

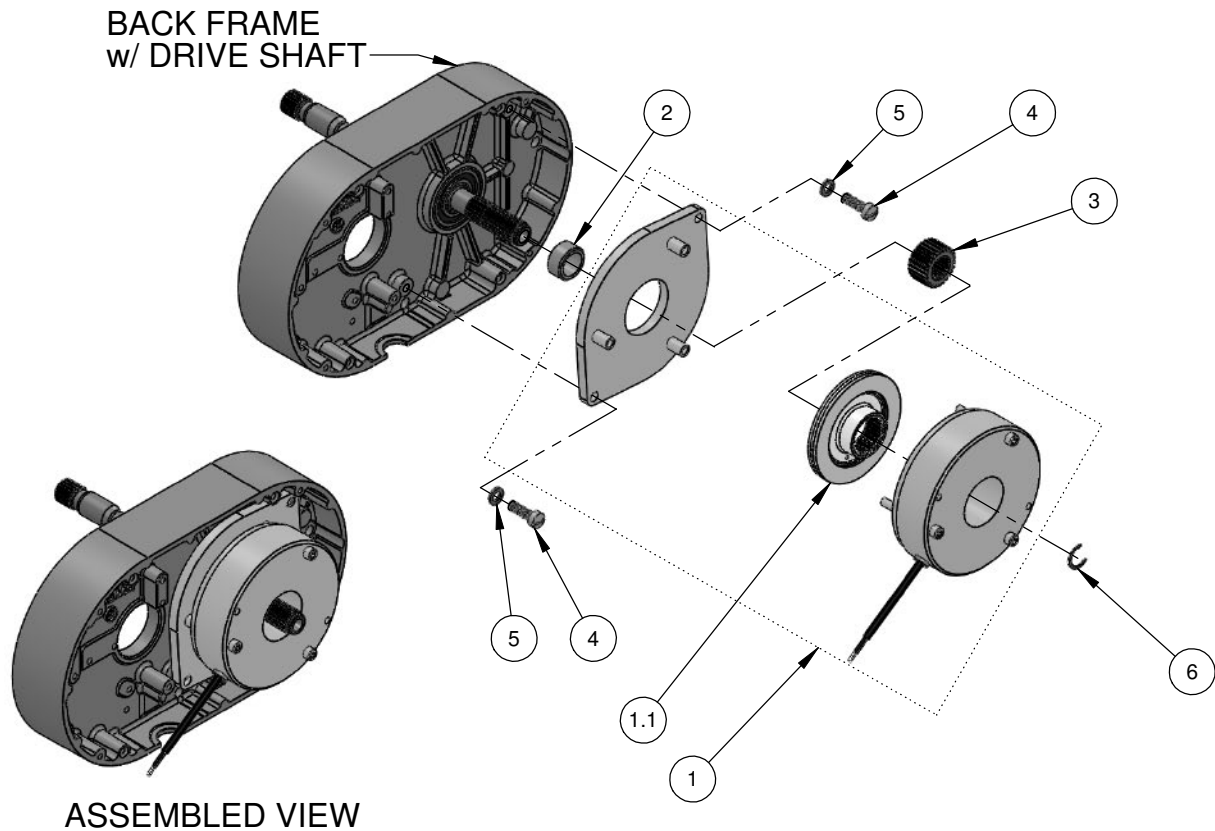


ASSEMBLED VIEW

BRAKE ASSEMBLY ITEM 1	HOIST MOTOR	BRAKE COIL VOLTAGE
00001400	110/115-1-50/60	103VDC
00001401	220/230-1-50/60 220/230-3-50/60 380/415/480-3-50/60	205VDC
00001402	550/575-3-50/60	255VDC

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	V1 LODESTAR SIZE 8	1
1.1	00001427	V1 LODESTAR, SIZE 8 ROTOR	1
2	00001430	V1 LODESTAR, SIZE 8 HUB	1
3	00001432	HUB SPACER V1 DC BRAKE	1
4	982708	SCREW 1/4-20 X .75" SL FIL HD	2
5	982226	LOCKWASHER 1/4 X .109 X .062"	2
6	10409710	ROTOR CLIP RETAINING RING	1

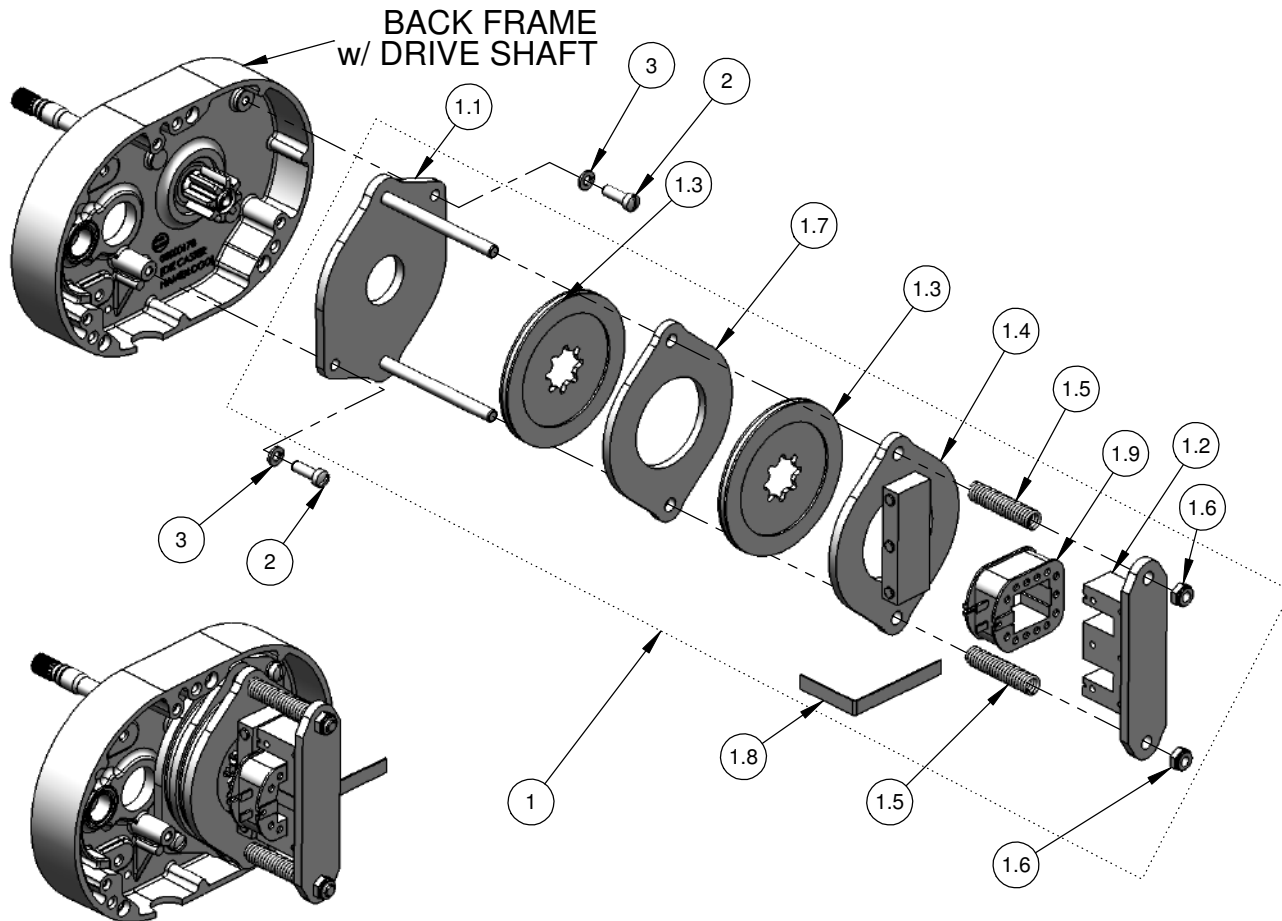
V1 LODESTAR
DC BRAKE - SINGLE
MODELS A, A-2, AA, AA-2, B, B-2, C, C-2, E, E-2, F, F-2, H & H-2



HOIST MODEL	BRAKE ASSEMBLY ITEM1	ROTOR ITEM 1.1	HOIST MOTOR	BRAKE COIL VOLTAGE
J, J-2, L, L-2, R, R-2, RT, RT-2	00001406	00001428	110/115-1-50/60	103VDC
	00001407	00001428	220/230-1-50/60 220/230-3-50/60 380/415/480-3-50/60	205VDC
	00001408	00001428	550/575-3-50/60	255VDC
JJ, JJ-2, LL, LL-2, RR, RR-2, RRT, & RRT-2	00001413	00001429	220/230-3-50/60 380/415/480-3-50/60	205VDC
	00001414	00001429	550/575-3-50/60	255VDC

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	V2 LODESTAR SIZE 10	1
1.1	SEE TABLE	V2 LODESTAR, SIZE 10 ROTOR	1
2	00001433	HUB SPACER V2 DC INTORQ BRAKE	1
3	00001431	V2 LODESTAR, SIZE 10 HUB	1
4	982709	SCREW 5/16-18 UNC-2A X 1"	2
5	945851	LOCKWASHER 5/16 X .125 X .078"	2
6	10409711	ROTOR CLIP RETAINING RING	1

**V2 LODESTAR
DC BRAKE - SINGLE**
MODELS J, J-2, JJ, JJ-2, L, L-2, LL, LL-2, R, R-2, RR, RR-2, RT, RT-2, RRT & RRT-2

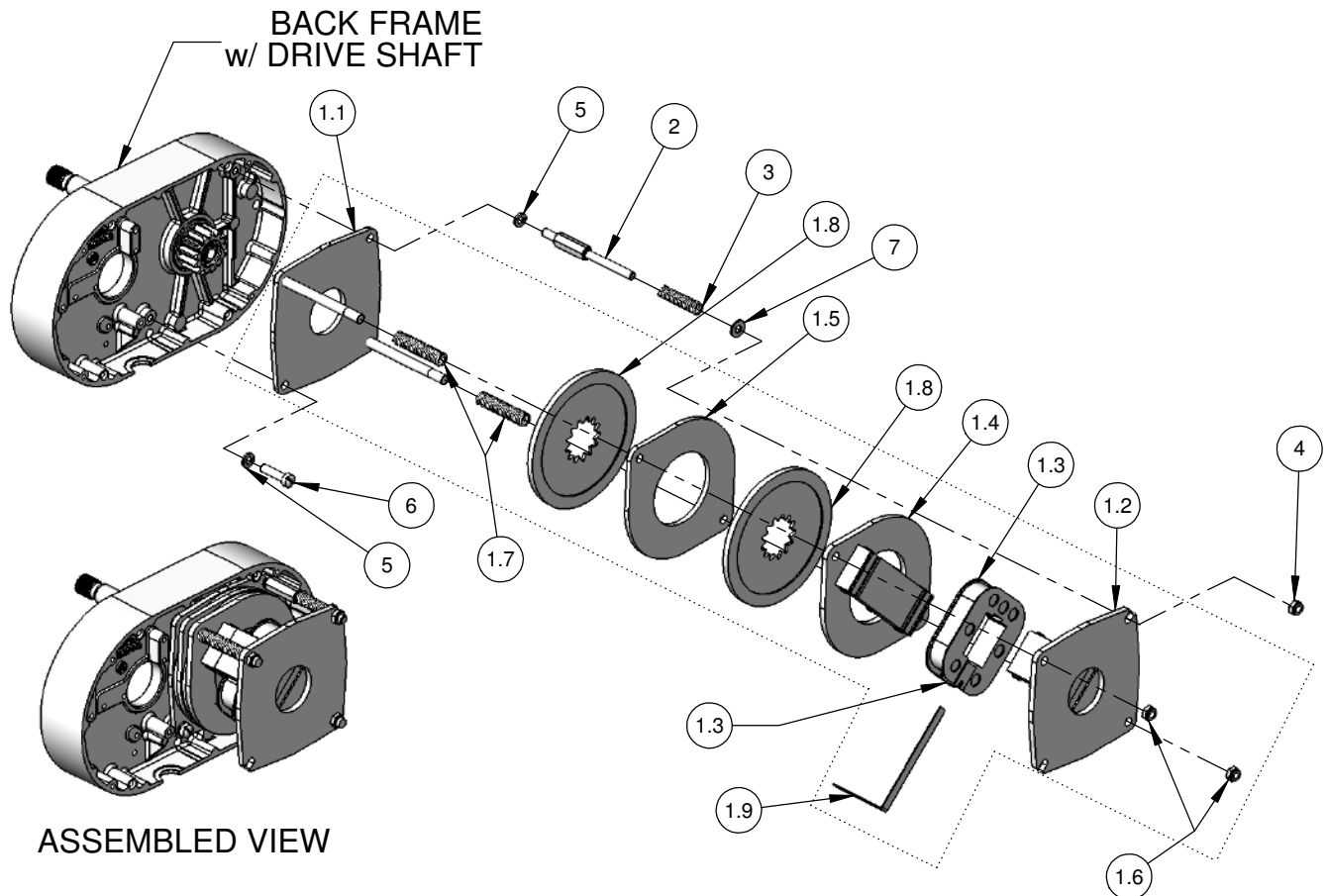


ASSEMBLED VIEW

HOIST MODEL	BRAKE ASSEMBLY ITEM 1				FRICTION DISC ITEM 1.3	INTERMEDIATE PLATE ITEM 1.7	BRAKE COIL ITEM 1.9			
	115V COIL	230V COIL	460V COIL	575V COIL			115V	230V	460V	575V
A, A-2, B, B-2, E, E-2	27656	27659	28655	27658	27677 (x1)	NOT REQ'D	51517	51518	51519	51520
AA, AA-2, C, C-2, F, F-2, H, H-2	27681	27684	28656	27683	27677 (x2)	27090 (x1)	51517	51518	51519	51520

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	BRAKE ELECTRIC	1
1.1	28668	PLATE BASE W/STUDS	1
1.2	28677	BRAKE FIELD	1
1.3	SEE TABLE	DISC FRICTION	SEE TABLE
1.4	28678	BRAKE ARMATURE	1
1.5	27751	SPRING BRAKE	2
1.6	945840	NUT 5/16-18 UNC-3B	2
1.7	27090	BRAKE INTERMEDIATE PLATE	SEE TABLE
1.8	57753	STRAP COIL RETAINER	1
1.9	SEE TABLE	COIL BRAKE	1
2	982708	SCREW 1/4-20 X .75" SL FIL HD	2
3	982226	LOCKWASHER 1/4 X .109 X .062"	2

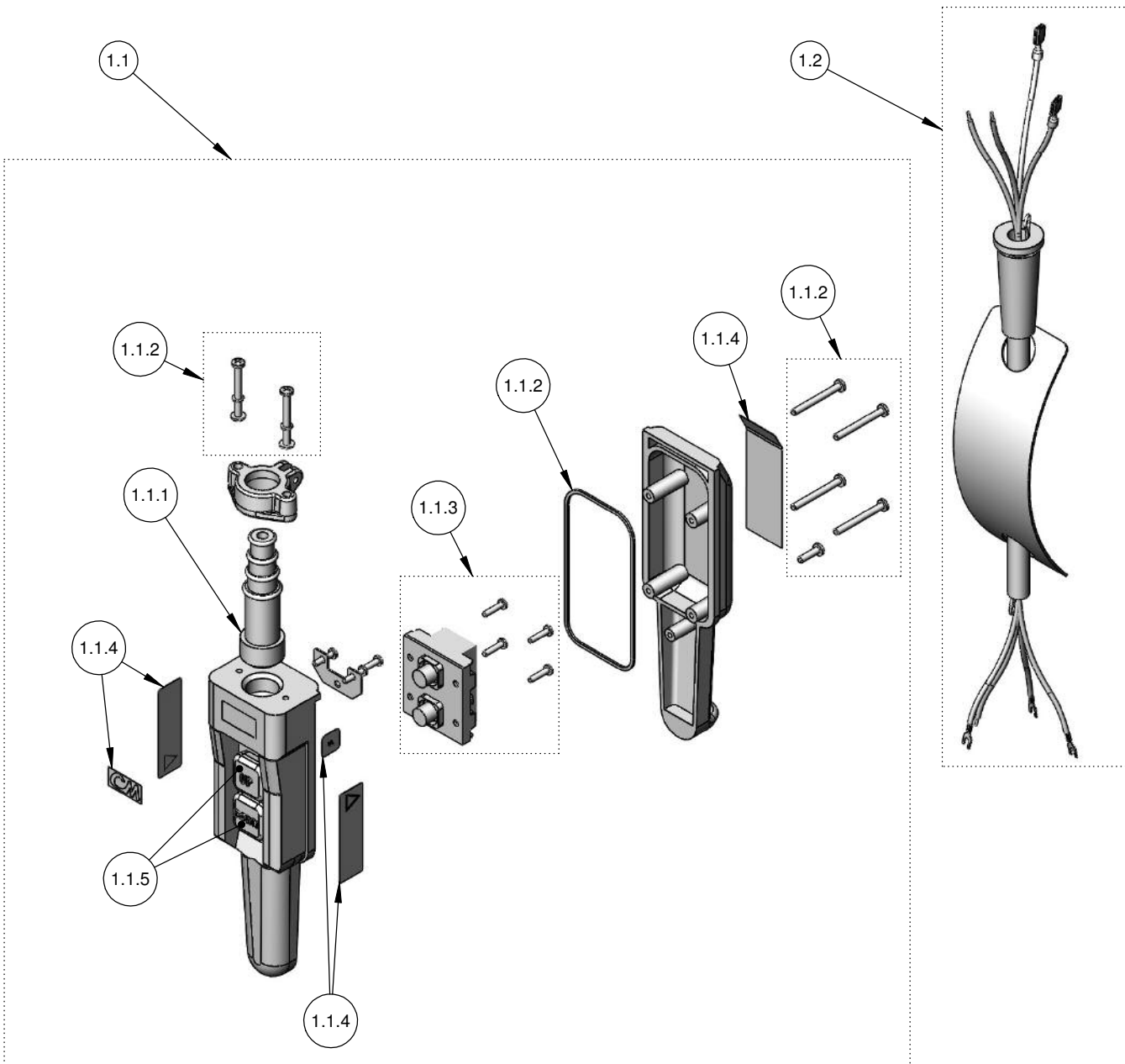
**V1 LODESTAR
AC BRAKE ASSEMBLY
MODELS A, A-2, AA, AA-2, B, B-2, C, C-2, E, E-2, F, F-2, H & H-2**



HOIST MODEL	BRAKE ASSEMBLY ITEM 1				BRAKE COIL ITEM 1.3				SPRING ITEM 1.7
	115V COIL	230V COIL	460V COIL	575V COIL	115V	230V	460V	575V	
J, J-2, L, L-2, R, R-2, RT, RT-2	35646	35647	35622	35649	51510	51511	51513	51515	35716
JJ, JJ-2, LL, LL-2, RR, RR-2, RRT, RRT-2	-	35648	35623	36688	-	51512	51514	51516	35717

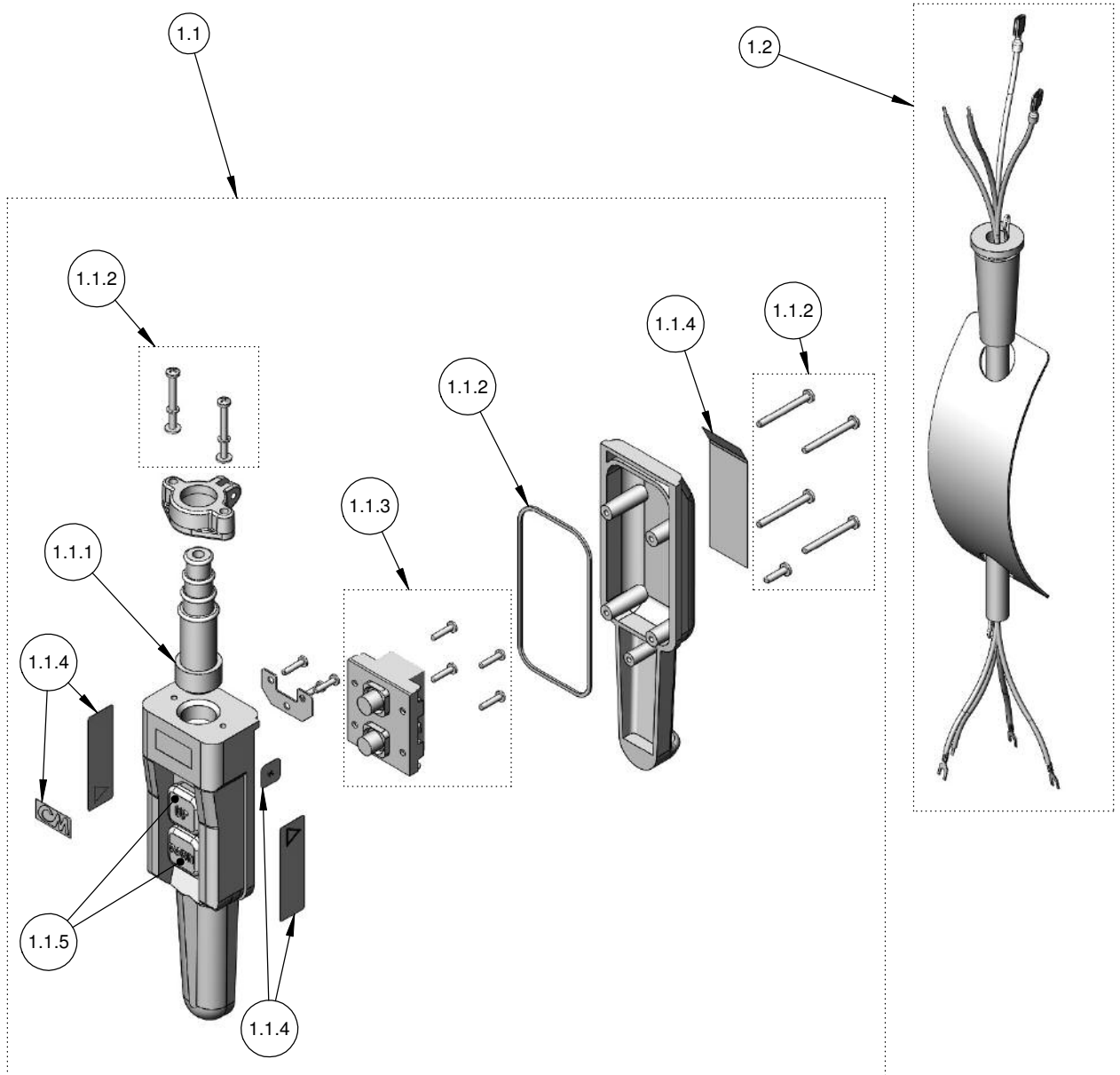
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	BRAKE ELECTRIC ASSM	1
1.1	35643	PLATE BRAKE BASE	1
1.2	35629	FIELD BRAKE	1
1.3	SEE TABLE	BRAKE COIL	1
1.4	35600	ARMATURE BRAKE	1
1.5	35069	PLATE BRAKE INTERMEDIATE	1
1.6	945840	NUT 5/16-18 UNC-3B	2
1.7	SEE TABLE	SPRING BRAKE	2
1.8	35632	BRAKE FRICTION DISC	2
1.9	35704	STRAP COIL RETAINER	1
2	36674	HEX BRAKE STUD	1
3	35831	BRAKE SPRING	1
4	945840	NUT 5/16-18 UNC-3B	1
5	945851	LOCKWASHER 5/16 X .125 X .078"	2
6	982709	SCREW 5/16-18 X 1.0" SL FIL HD	1
7	954807	WASHER .312" X .688" X .065"	1

**V2 LODESTAR
AC BRAKE ASSEMBLY**
MODELS J, J-2, JJ, JJ-2, L, L-2, LL, LL-2, R, R-2, RR, RR-2, RT, RT-2, RRT & RRT-2



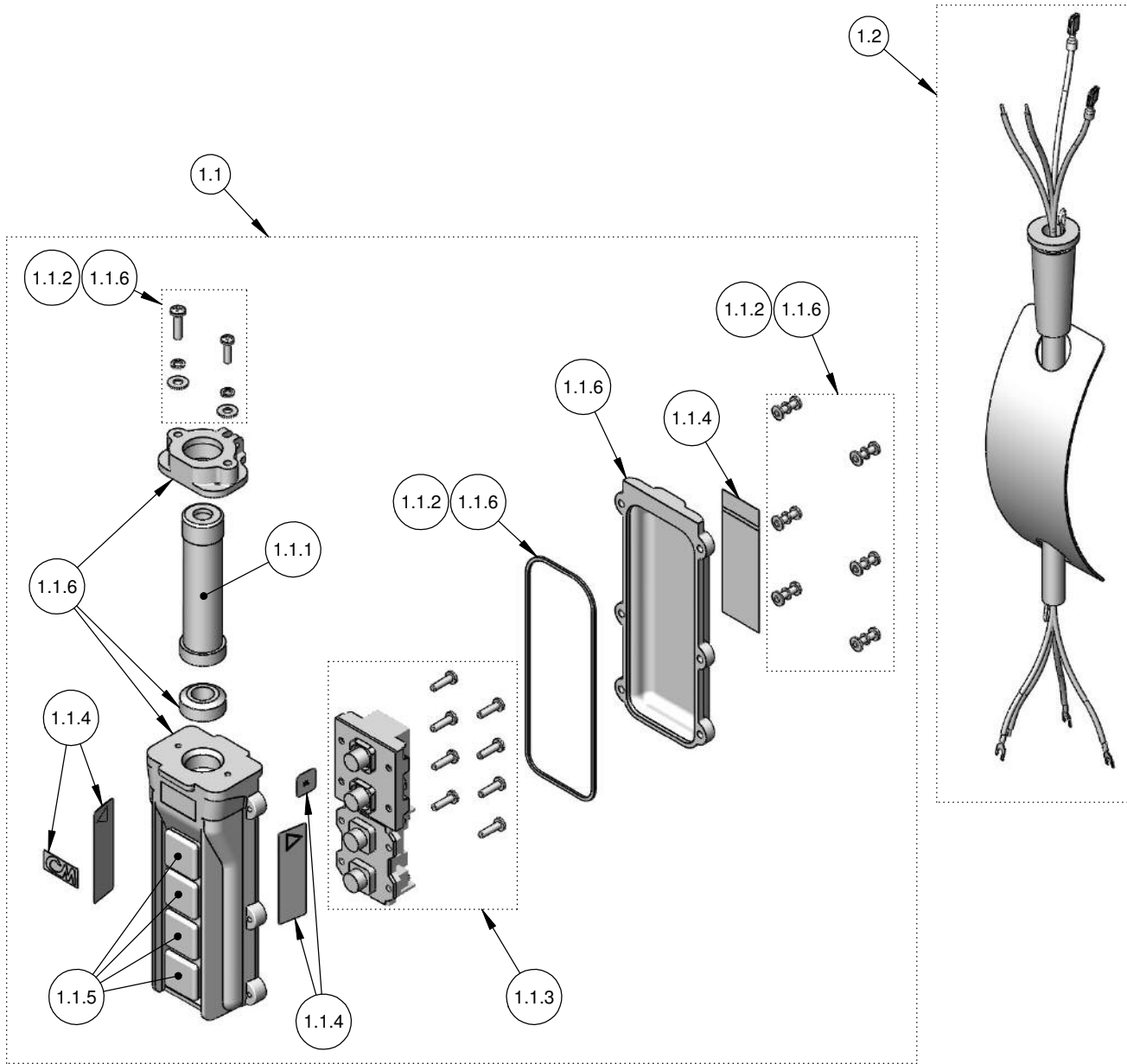
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	29336	STATION ASSEMBLY AND CONTROL CORD FOR 10 FOOT LIFT	1
	29336-15	STATION ASSEMBLY AND CONTROL CORD FOR 15 FOOT LIFT	
	29336-20	STATION ASSEMBLY AND CONTROL CORD FOR 20 FOOT LIFT	
1.1	58272	2 BUTTON CONTROL STATION	1
1.1.1	58278	GROMMET	1
1.1.2	58275	HARDWARE KIT	1
1.1.3	58255	1-SPEED INSERT	1
1.1.4	58276	WARNING LABEL KIT	1
1.1.5	58277	BUTTON LABEL KIT	1
1.2	29353	CONTROL CORD - 10 FOOT LIFT	1
	29353-15	CONTROL CORD - 15 FOOT LIFT	
	29353-20	CONTROL CORD - 20 FOOT LIFT	

**COMPLETE CONTROL CORD AND STATION ASSEMBLY
SINGLE SPEED HOIST CONTROL STATION**



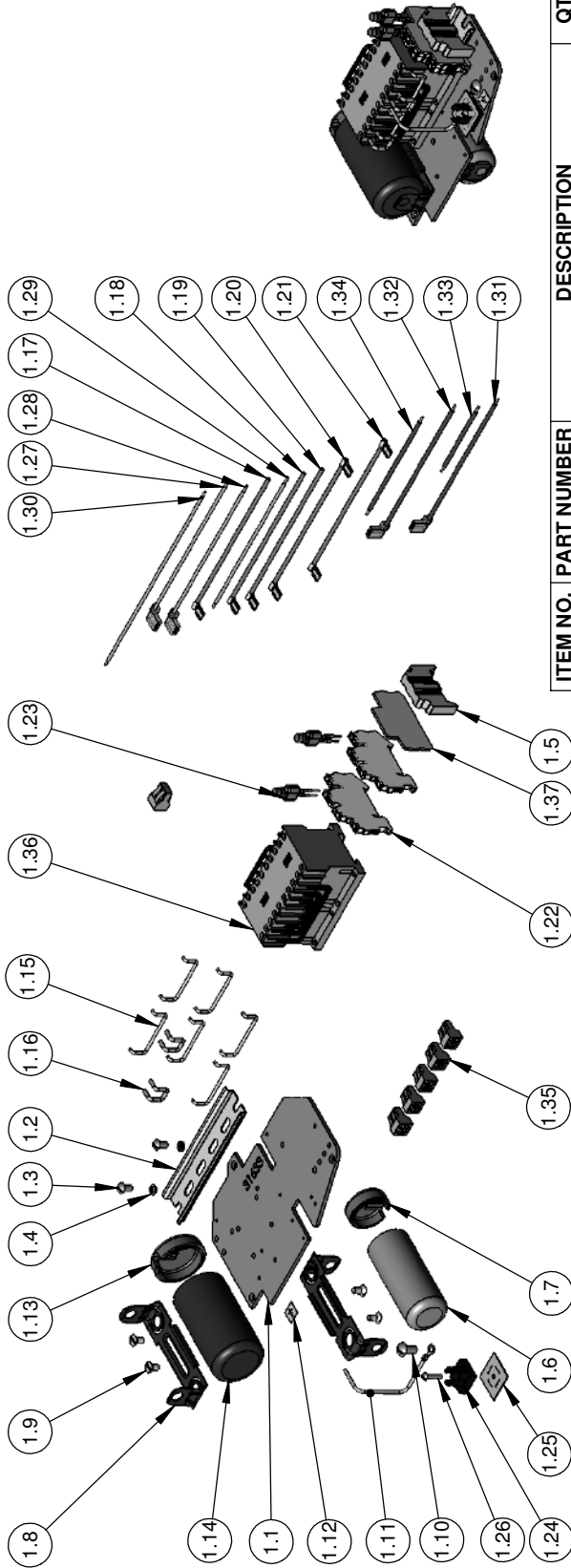
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	29348	STATION ASSEMBLY AND CONTROL CORD FOR 10 FOOT LIFT	1
	29348-15	STATION ASSEMBLY AND CONTROL CORD FOR 15 FOOT LIFT	
	29348-20	STATION ASSEMBLY AND CONTROL CORD FOR 20 FOOT LIFT	
1.1	58273	2 BUTTON CONTROL STATION	1
1.1.1	58278	GROMMET	1
1.1.2	58275	HARDWARE KIT	1
1.1.3	58256	2 - SPEED INSERT	1
1.1.4	58276	WARNING LABEL KIT	1
1.1.5	58277	BUTTON LABEL KIT	1
1.2	29349	CONTROL CORD - 10 FOOT LIFT	1
	29349-15	CONTROL CORD - 15 FOOT LIFT	
	29349-20	CONTROL CORD - 20 FOOT LIFT	

**COMPLETE CONTROL CORD AND STATION ASSEMBLY
TWO SPEED HOIST CONTROL STATION**



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	51750	STATION ASSEMBLY AND CONTROL CORD FOR 20 FOOT LIFT	1
1.1	58220CM	4 BUTTON CONTROL STATION	1
1.1.1	58278	GROMMET	1
1.1.2	58279	HARDWARE KIT	1
1.1.3	58255	1-SPEED INSERT	AS REQ'D
	58256	2-SPEED INSERT	
1.1.4	58276	WARNING LABEL KIT	1
1.1.5	58277	BUTTON LABEL KIT	1
1.1.6	58288	HOUSING KIT (INCLUDES HOUSING, BOOTS, COLLAR, GASKET & HARDWARE)	1
1.2	51708	CONTROL CORD - 20 FOOT LIFT	1

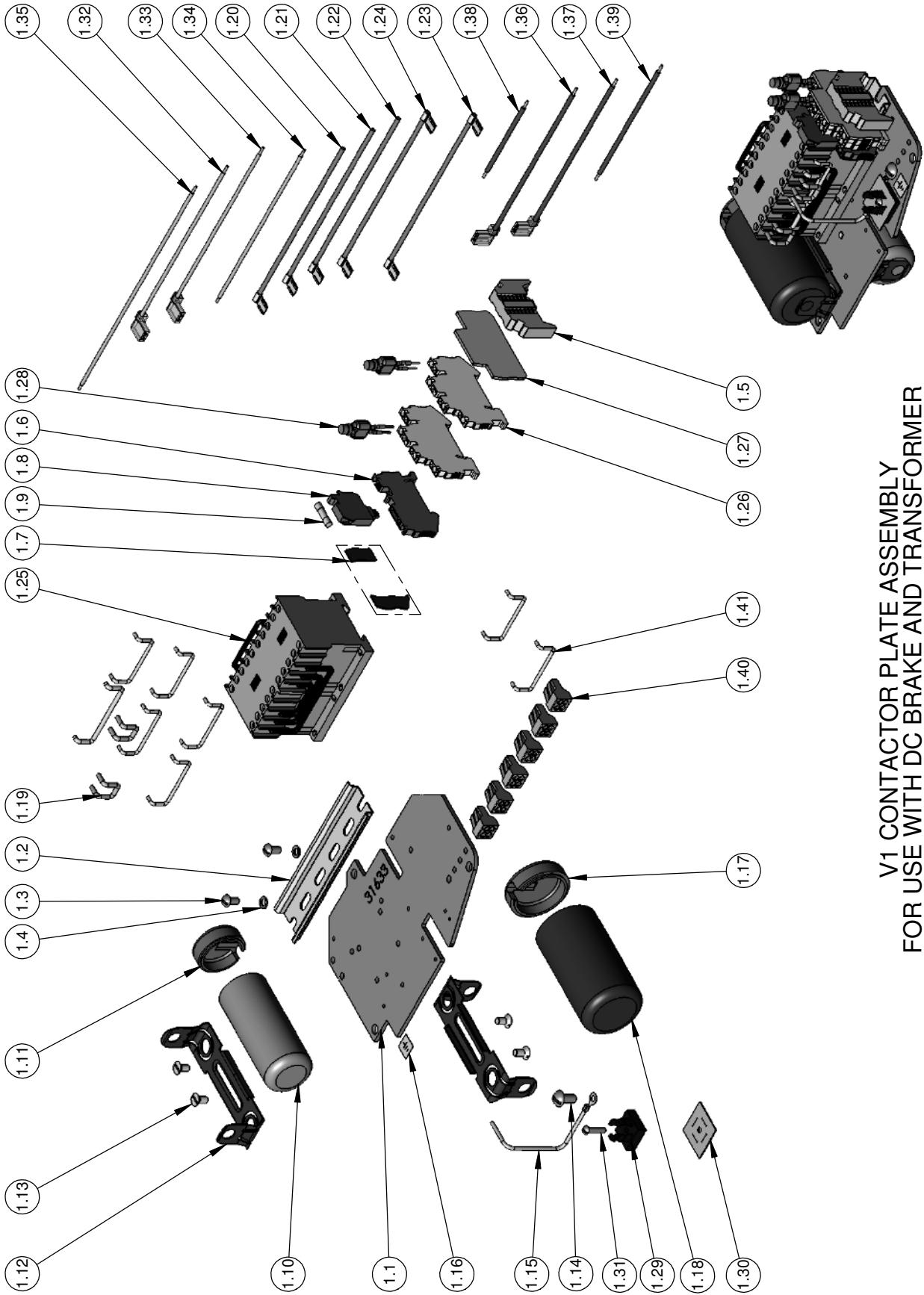
**COMPLETE CONTROL CORD AND STATION ASSEMBLY
FOUR DIRECTIONAL HOIST/TROLLEY CONTROL STATION**



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	00001674	CONTACTOR PLATE S/A	1
1.1	31633	CONTACTOR PLATE	1
1.2	29312	DIN-RAIL 5.00" LONG	1
1.3	982686	SCREW #10-32 UNF-2A X 3/8" SL	2
1.4	987873	LOCKWASHER #10 ASA MEDIUM	2
1.5	29015	TERMINAL STRIP END CLAMP	1
1.6	27716	CAPACITOR	1
1.7	29910	CAPACITOR CAP	1
1.8	27910	CAPACITOR MOUNTING BRACKET	2
1.9	982696	SCREW 10-32 UNF-2A X 3/8 LG	4
1.10	987827	SCREW 1/4-20 UNC-2A X 1/2"	1
1.11	27189	JUMPER-GY-#16 AWG	1
1.12	20940	GROUND LABEL	1
1.13	27925	SOLID STATE SWITCH CAP	1
1.14	27257	REVERSE SWITCH	1
1.15	51847	JUMPER	6
1.16	51845	JUMPER	2
1.17	27156	JUMPER R14	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1.18	29911	JUMPER R5	1
1.19	29912	JUMPER R6	1
1.20	29913	JUMPER R7	1
1.21	29914	JUMPER R8	1
1.22	00001506	TERMINAL STRIP	2
1.23	00000535	SURGE SUPPRESSOR	2
1.24	70246	RECTIFIER	1
1.25	70274	RECTIFIER INSULATOR	1
1.26	957854	ROUND HEAD MACHINE SCREW	1
1.27	00001500	B3-JUMPER	1
1.28	00001501	B4-JUMPER	1
1.29	00001504	JUMPER-B7	1
1.30	00001502	JUMPER-B1	1
1.31	00000376	B5 JUMPER	1
1.32	00000205	B6 JUMPER	1
1.33	00000537	B8 JUMPER	1
1.34	00000538	B9 JUMPER	1
1.35	11782704	CONNECTOR PUSHWIRE ORANGE	6
1.36	24799	REVERSING CONTACTOR 110V	1
1.37	00001507	TERMINAL STRIP PARTITION	1

V1 CONTACTOR PLATE ASSEMBLY
 FOR USE WITH DC BRAKE
 SINGLE PHASE
 110/115-1-50/60
 MODELS A, AA, B, C, E & H



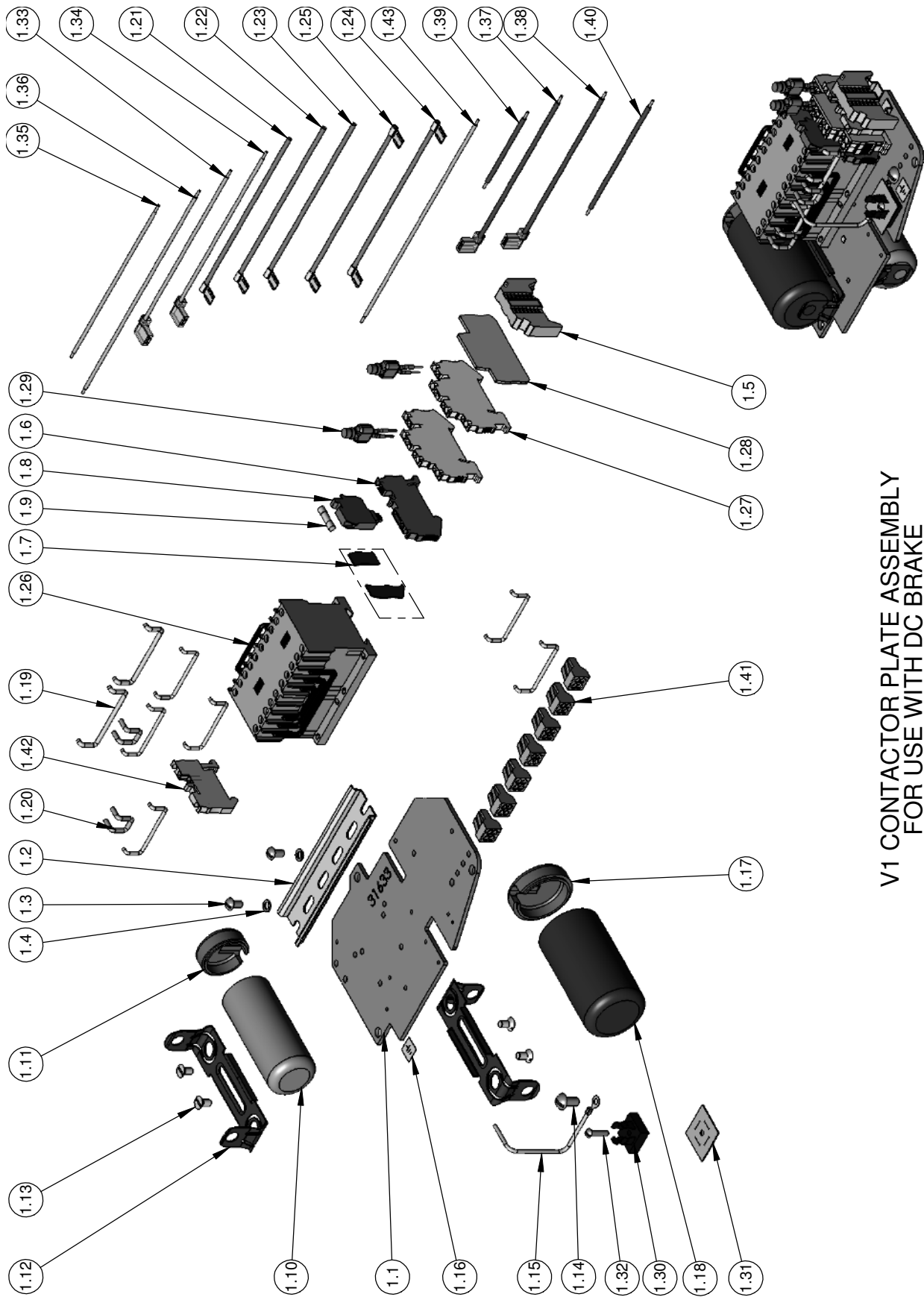
V1 CONTACTOR PLATE ASSEMBLY
 FOR USE WITH DC BRAKE AND TRANSFORMER
 110/115-1-50/60
 MODELS A, AA, B, C, E, F & H

CONTACTOR BKT S/A	REVERSING CONTACTOR	SECONDARY VOLTAGE
00001675	28860	24 V
00001676	24797	48 V

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	CONTACTOR PLATE S/A	1
1.1	31633	CONTACTOR PLATE	1
1.2	29312	DIN-RAIL 5.00" LONG	1
1.3	982686	SCREW #10-32 UNF-2A X 3/8" SL	2
1.4	987873	LOCKWASHER #10 ASA MEDIUM	2
1.5	29015	TERMINAL STRIP END CLAMP	1
1.6	29018	FUSIBLE TERMINAL STRIP	1
1.7	00000398	TERMINAL STRIP COVER SEGMENT	1
1.8	29019	TERMINAL STRIP CARTRIDGE	1
1.9	00000393	FUSE-5MM X 20MM-500MA	1
1.10	27716	CAPACITOR	1
1.11	29910	CAPACITOR CAP	1
1.12	27910	CAPACITOR MOUNTING BRACKET	2
1.13	982696	SCREW 10-32 UNF-2A X 3/8 LG	4
1.14	987827	SCREW 1/4-20 UNC-2A X 1/2"	1
1.15	27189	JUMPER-GY-#16 AWG	1
1.16	20940	GROUND LABEL	1
1.17	27925	SOLID STATE SWITCH CAP	1
1.18	27257	REVERSE SWITCH	1
1.19	51845	JUMPER	2
1.20	27156	JUMPER R14	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1.21	29911	JUMPER R5	1
1.22	29912	JUMPER R6	1
1.23	29913	JUMPER R7	1
1.24	29914	JUMPER R8	1
1.25	SEE TABLE	REVERSING CONTACTOR	1
1.26	00001506	TERMINAL STRIP	2
1.27	00001507	TERMINAL STRIP PARTITION	1
1.28	00000535	SURGE SUPPRESSOR	2
1.29	70246	RECTIFIER	1
1.30	70274	RECTIFIER INSULATOR	1
1.31	957854	ROUND HEAD MACHINE SCREW	1
1.32	00001500	B3-JUMPER	1
1.33	00001501	B4-JUMPER	1
1.34	00001504	JUMPER-B7	1
1.35	00001502	JUMPER-B1	1
1.36	00000376	B5 JUMPER	1
1.37	00000205	B6 JUMPER	1
1.38	00000537	B8 JUMPER	1
1.39	00000538	B9 JUMPER	1
1.40	11782704	CONNECTOR PUSHWIRE ORANGE	6
1.41	51847	JUMPER	8

V1 CONTACTOR PLATE ASSEMBLY
FOR USE WITH DC BRAKE AND TRANSFORMER
110/115-1-50/60
MODELS A, AA, B, C, E, F & H



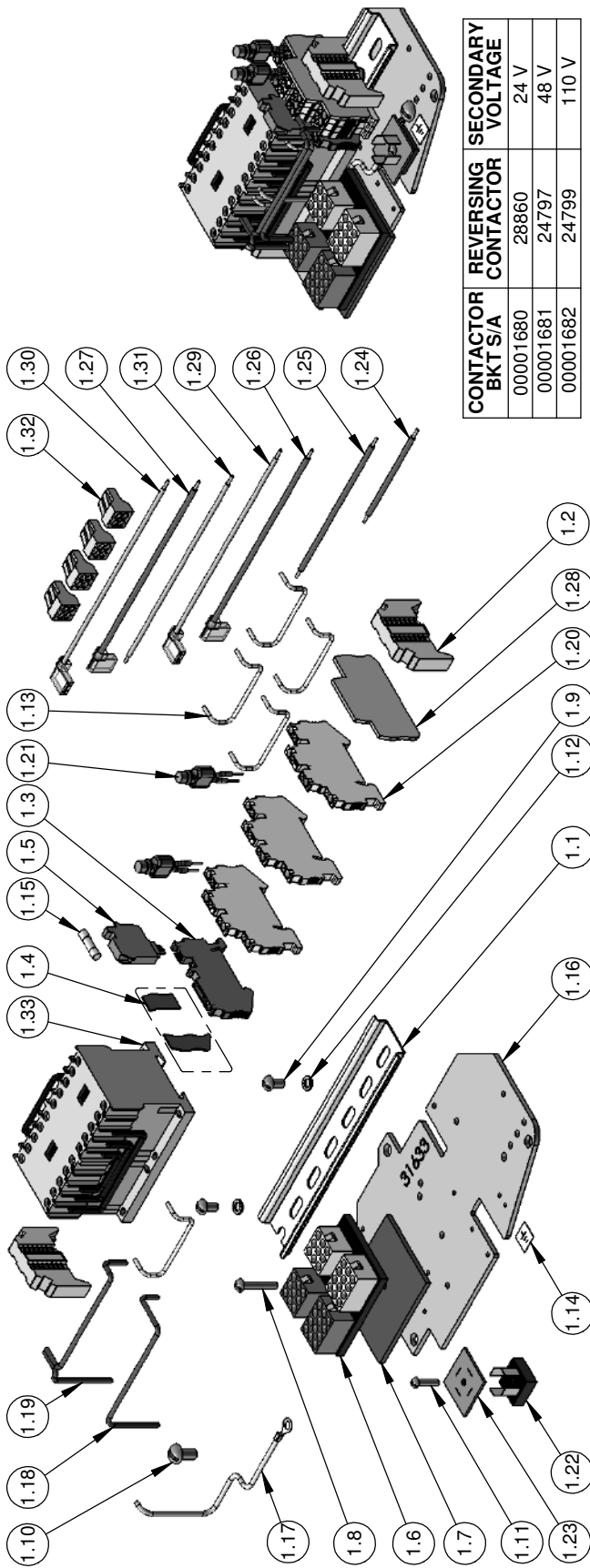
V1 CONTACTOR PLATE ASSEMBLY
 FOR USE WITH DC BRAKE
 1-SPEED UNITS
 220/230-1-50/60
 MODELS A, AA, B, C, E, F & H

CONTACTOR BKT S/A	REVERSING CONTACTOR	SECONDARY VOLTAGE
00001677	28860	24 V
00001678	24797	48 V
00001679	24799	110V

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	CONTACTOR PLATE S/A	1
1.1	31633	CONTACTOR PLATE	1
1.2	29312	DIN-RAIL 5.00" LONG	1
1.3	982686	SCREW #10-32 UNF-2A X 3/8" SL	2
1.4	987873	LOCKWASHER #10 ASA MEDIUM	2
1.5	29015	TERMINAL STRIP END CLAMP	1
1.6	29018	FUSIBLE TERMINAL STRIP	1
1.7	00000398	TERMINAL STRIP COVER SEGMENT	1
1.8	29019	TERMINAL STRIP CARTRIDGE	1
1.9	00000393	FUSE-5MM X 20MM-500MA	1
1.10	27716	CAPACITOR	1
1.11	29910	CAPACITOR CAP	1
1.12	27910	CAPACITOR MOUNTING BRACKET	2
1.13	982696	SCREW 10-32 UNF-2A X 3/8 LG	4
1.14	987827	SCREW 1/4-20 UNC-2A X 1/2"	1
1.15	27189	JUMPER-G/Y-#16 AWG	1
1.16	20940	GROUND LABEL	1
1.17	27925	SOLID STATE SWITCH CAP	1
1.18	27257	REVERSE SWITCH	1
1.19	51847	JUMPER	8
1.20	51845	JUMPER	2
1.21	27156	JUMPER R14	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1.22	29911	JUMPER R5	1
1.23	29912	JUMPER R6	1
1.24	29913	JUMPER R7	1
1.25	29914	JUMPER R8	1
1.26	SEE TABLE	REVERSING CONTACTOR	1
1.27	00001506	TERMINAL STRIP	2
1.28	00001507	TERMINAL STRIP PARTITION	1
1.29	00000535	SURGE SUPPRESSOR	2
1.30	70246	RECTIFIER	1
1.31	70274	RECTIFIER INSULATOR	1
1.32	957854	ROUND HEAD MACHINE SCREW	1
1.33	00001500	B3-JUMPER	1
1.34	00001501	B4-JUMPER	1
1.35	00001504	JUMPER-B7	1
1.36	00001502	JUMPER-B1	1
1.37	00000376	B5 JUMPER	1
1.38	00000205	B6 JUMPER	1
1.39	00000537	B8 JUMPER	1
1.40	00000538	B9 JUMPER	1
1.41	11782704	CONNECTOR PUSHWIRE ORANGE	7
1.42	29014	TERMINAL STRIP	1
1.43	00001503	JUMPER-B2	1

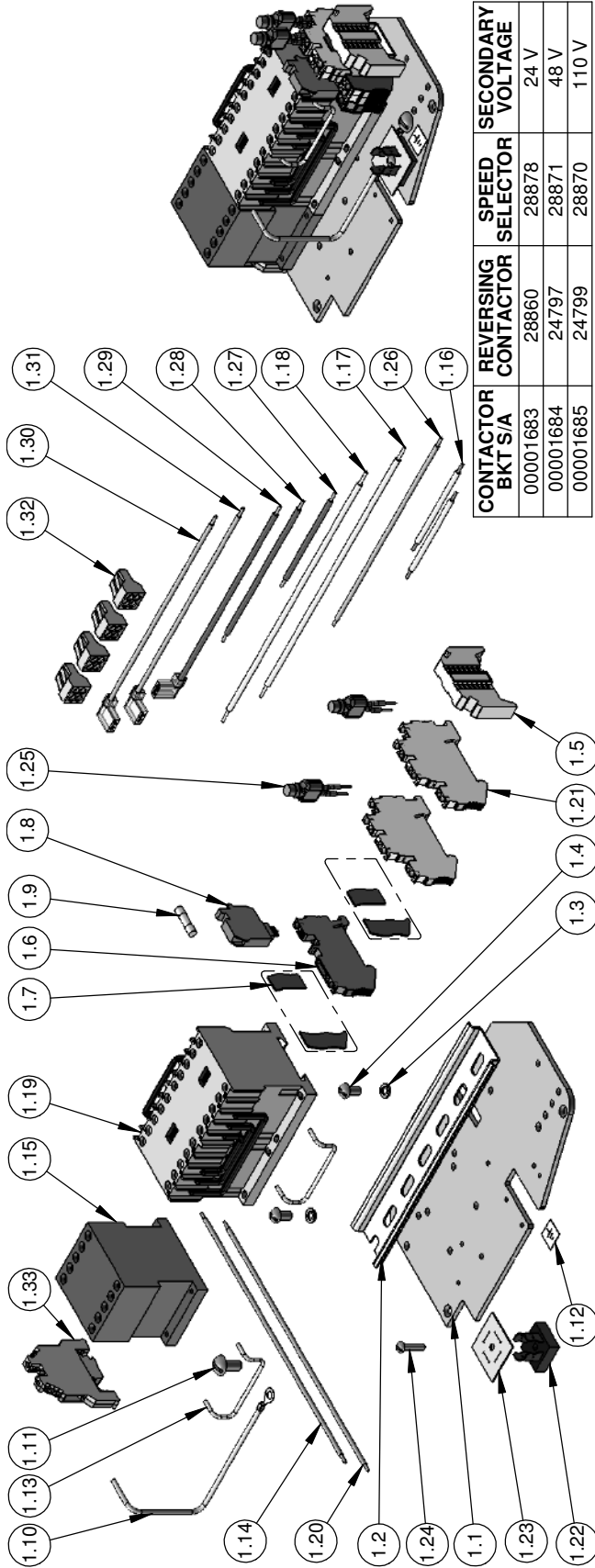
V1 CONTACTOR PLATE ASSEMBLY
FOR USE WITH DC BRAKE
1-SPEED UNITS
220/230-1-50/60
MODELS A, AA, B, C, E, F & H



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	CONTACTOR BKT S/A BHSE	1
1.1	29010	DIN-RAIL 6.50" LONG	1
1.2	29015	TERMINAL STRIP END CLAMP	2
1.3	29018	FUSIBLE TERMINAL STRIP	1
1.4	00000398	TERMINAL STRIP COVER SEGMENT	1
1.5	29019	TERMINAL STRIP CARTRIDGE	1
1.6	27672	VOLTAGE CHANGE BOARD	1
1.7	27685	VOLTAGE CHANGE BOARD INSULATOR	1
1.8	987862	SCREW #8-32UNC-2A X 1"	1
1.9	982686	SCREW #10-32 UNF-2A X 3/8" SL	2
1.10	987827	SCREW 1/4-20 UNC-2A X 1/2"	1
1.11	957854	SCREW #6-32 NC-2 X 5/8" ROUND	1
1.12	987873	LOCKWASHER #10 ASA MEDIUM	2
1.13	51847	JUMPER	5
1.14	20940	GROUND LABEL	1
1.15	00000393	FUSE-5MM X 20MM-500MA	1
1.16	31633	CONTACTOR PLATE	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1.17	27189	JUMPER-G/Y-#16 AWG	1
1.18	00000750	JUMPER WIRE	1
1.19	00000751	JUMPER WIRE	1
1.20	00001506	TERMINAL STRIP	3
1.21	00000535	SURGE SUPPRESSOR	2
1.22	70246	RECTIFIER	1
1.23	70274	RECTIFIER INSULATOR	1
1.24	00000537	B8 JUMPER	1
1.25	00000538	B9 JUMPER	1
1.26	00000376	B5 JUMPER	1
1.27	00000205	B6 JUMPER	1
1.28	00001507	TERMINAL STRIP PARTITION	1
1.29	00001501	B4-JUMPER	1
1.30	00001500	B3-JUMPER	1
1.31	00001504	JUMPER-B7	1
1.32	11782704	CONNECTOR PUSHWIRE ORANGE	4
1.33	SEE TABLE	REVERSING CONTACTOR	1

V1 CONTACTOR PLATE ASSEMBLY
 FOR USE WITH DC BRAKE
 1-SPEED, DUAL VOLTAGE UNITS
 220/230-380/415/460-3-50/60
 MODELS A, AA, B, C, E, F & H



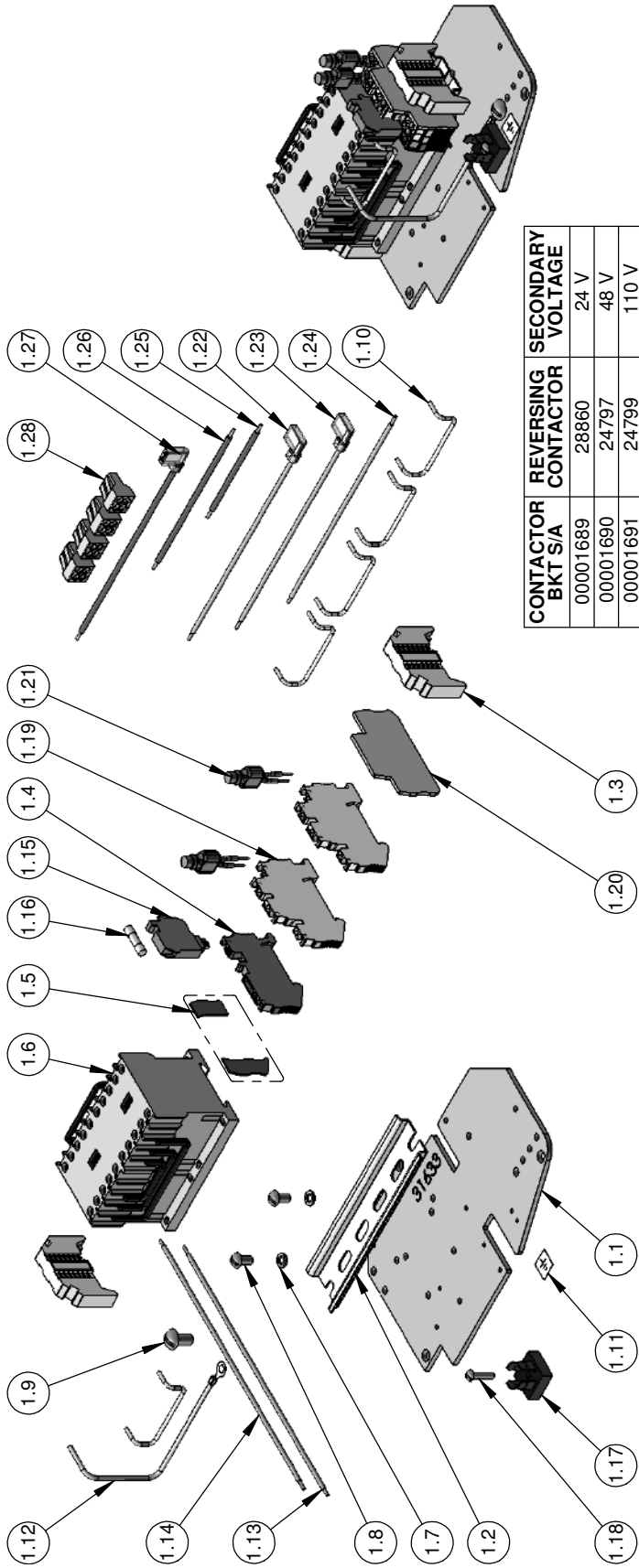
CONTACTOR BKT S/A	REVERSING CONTACTOR	SPEED SELECTOR	SECONDARY VOLTAGE
00001683	28860	28878	24 V
00001684	24797	28871	48 V
00001685	24799	28870	110 V

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	CONTACTOR PLT S/A 2-SPEED	1
1.1	31633	CONTACTOR PLATE	1
1.2	29010	DIN-RAIL 6.50" LONG	1
1.3	987873	LOCKWASHER #10 ASA MEDIUM	2
1.4	982686	SCREW #10-32 UNF-2A X 3/8" SL	2
1.5	29015	TERMINAL STRIP END CLAMP	1
1.6	29018	FUSIBLE TERMINAL STRIP	1
1.7	00000398	TERMINAL STRIP COVER SEGMENT	2
1.8	29019	TERMINAL STRIP CARTRIDGE	1
1.9	00000393	FUSE-5MM X 20MM-500MA	1
1.10	27189	JUMPER-GY-#16 AWG	1
1.11	987827	SCREW 1/4-20 UNC-2A X 1/2"	1
1.12	20940	GROUND LABEL	1
1.13	51847	JUMPER	6
1.14	00001503	JUMPER-B2	1
1.15	SEE TABLE	CONTACTOR	1
1.16	51845	JUMPER	2

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1.17	27609	JUMPER	1
1.18	27610	JUMPER	1
1.19	SEE TABLE	REVERSING CONTACTOR	1
1.20	00001502	JUMPER-B1	1
1.21	00001506	TERMINAL STRIP	2
1.22	70246	RECTIFIER	1
1.23	70274	RECTIFIER INSULATOR	1
1.24	957854	ROUND HEAD MACHINE SCREW	1
1.25	00000535	SURGE SUPPRESSOR	2
1.26	00001504	JUMPER-B7	1
1.27	00000537	B8 JUMPER	1
1.28	00000538	B9 JUMPER	1
1.29	00000205	B6 JUMPER	1
1.30	00001500	B3-JUMPER	1
1.31	00001501	B4-JUMPER	1
1.32	11782704	CONNECTOR PUSHWIRE ORANGE	4
1.33	00000396	EARTH GROUNDING BLOCK	1

V1 CONTACTOR PLATE ASSEMBLY
 FOR USE WITH DC BRAKE
 2-SPEED UNITS
 220/230-3-50/60

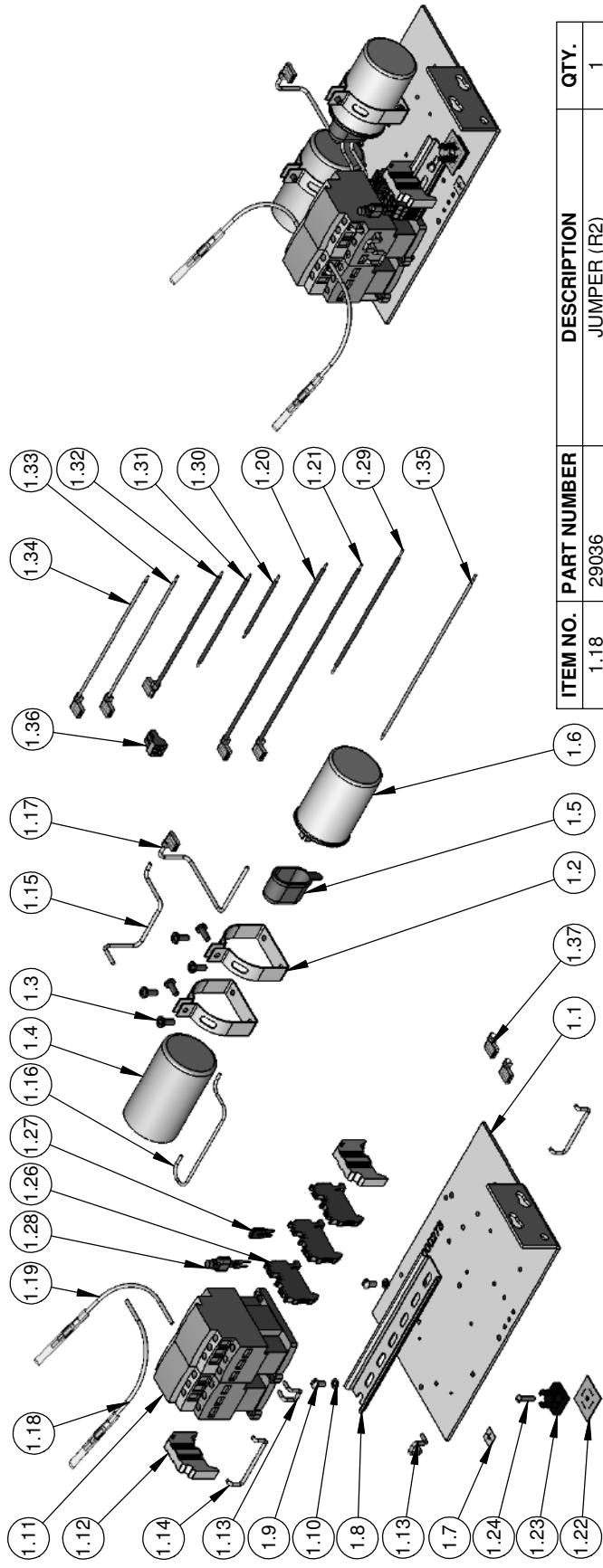
MODELS A-2, AA-2, B-2, C-2, E-2, F-2 & H-2



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	CONTACTOR PLT S/A	1
1.1	31633	CONTACTOR PLATE	1
1.2	29312	DIN-RAIL 5.00" LONG	1
1.3	29015	TERMINAL STRIP END CLAMP	2
1.4	29018	FUSIBLE TERMINAL STRIP	1
1.5	00000398	TERMINAL STRIP COVER SEGMENT	1
1.6	SEE TABLE	REVERSING CONTACTOR	1
1.7	987873	LOCKWASHER #10 ASA MEDIUM	2
1.8	982686	SCREW #10-32 UNF-2A X 3/8" SL	2
1.9	987827	SCREW 1/4-20 UNC-2A X 1/2"	1
1.10	51847	JUMPER	5
1.11	20940	GROUND LABEL	1
1.12	27189	JUMPER-G/Y-#16 AWG	1
1.13	00001502	JUMPER-B1	1
1.14	00001503	JUMPER-B2	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1.15	29019	TERMINAL STRIP CARTRIDGE	1
1.16	00000393	FUSE-5MM X 20MM-500MA	1
1.17	00001551	RECTIFIER	1
1.18	957854	ROUND HEAD MACHINE SCREW	1
1.19	00001506	TERMINAL STRIP	2
1.20	00001507	TERMINAL STRIP PARTITION	1
1.21	00001505	SURGE SUPPRESSOR	2
1.22	00001500	B3-JUMPER	1
1.23	00001501	B4-JUMPER	1
1.24	00001504	JUMPER-B7	1
1.25	00000537	B8 JUMPER	1
1.26	00000538	B9 JUMPER	1
1.27	00000205	B6 JUMPER	1
1.28	11782704	CONNECTOR PUSHWIRE ORANGE	4

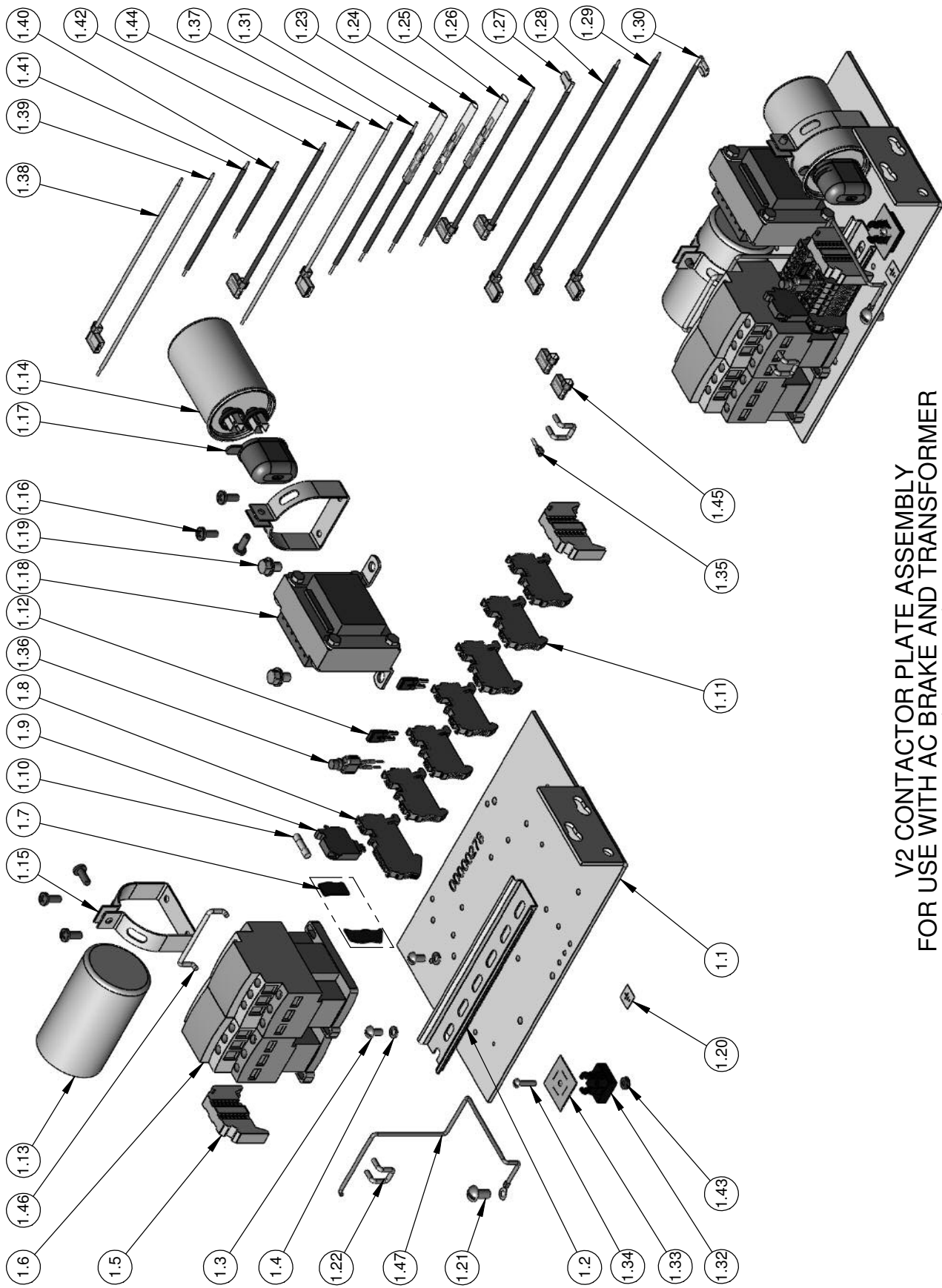
V1 CONTACTOR PLATE ASSEMBLY
 FOR USE WITH DC BRAKE
 550/575-3-50/60
 MODELS A, AA, B, C, E, F & H



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1.18	29036	JUMPER (R2)	1
1.19	29037	JUMPER (R3)	1
1.20	0000755	JUMPER V2 1 PHASE (R7)	1
1.21	0000757	JUMPER V2 1 PHASE (R6)	1
1.22	70274	RECTIFIER INSULATOR	1
1.23	70246	RECTIFIER	1
1.24	957854	ROUND HEAD MACHINE SCREW	1
1.25	982470	HEX HEAD MACHINE NUT	1
1.26	29014	TERMINAL STRIP	3
1.27	29047	TERMINAL STRIP BRIDGE	1
1.28	0000535	SURGE SUPPRESSOR	1
1.29	0000336	JUMPER (R12)	1
1.30	0000537	B8 JUMPER	1
1.31	0000538	B9 JUMPER	1
1.32	0000376	B5 JUMPER	1
1.33	0001500	B3-JUMPER	1
1.34	0001501	B4-JUMPER	1
1.35	0001503	JUMPER-B2	1
1.36	11782704	CONNECTOR PUSHWIRE ORANGE	1
1.37	983197	WIRING TERMINAL	2

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	0001695	CONTACTOR BRACKET S/A	1
1.1	0000278	CONTACTOR BRACKET	1
1.2	35268	CLAMP	2
1.3	982873	MACHINE SCREW PAN HEAD	6
1.4	35279	START CAPACITOR	1
1.5	35285	RUN CAPACITOR INSULATOR	1
1.6	35278	CAPACITOR, RUN	1
1.7	20940	GROUND LABEL	1
1.8	29010	DIN-RAIL 6.50" LONG	1
1.9	982686	SCREW #10-32 UNF-2A X 3/8" SL	2
1.10	987873	LOCKWASHER #10 ASA MEDIUM	2
1.11	28905	REVERSING CONTACTOR	1
1.12	29015	TERMINAL STRIP END CLAMP	2
1.13	51845	JUMPER	2
1.14	51847	JUMPER	2
1.15	29034	JUMPER (R10)	1
1.16	29035	JUMPER (R4)	1
1.17	0000758	JUMPER V2 1 PHASE (R9)	1

V2 CONTACTOR PLATE ASSEMBLY
FOR USE WITH DC BRAKE
110/115-1-50/60
MODELS J, L, R & RT



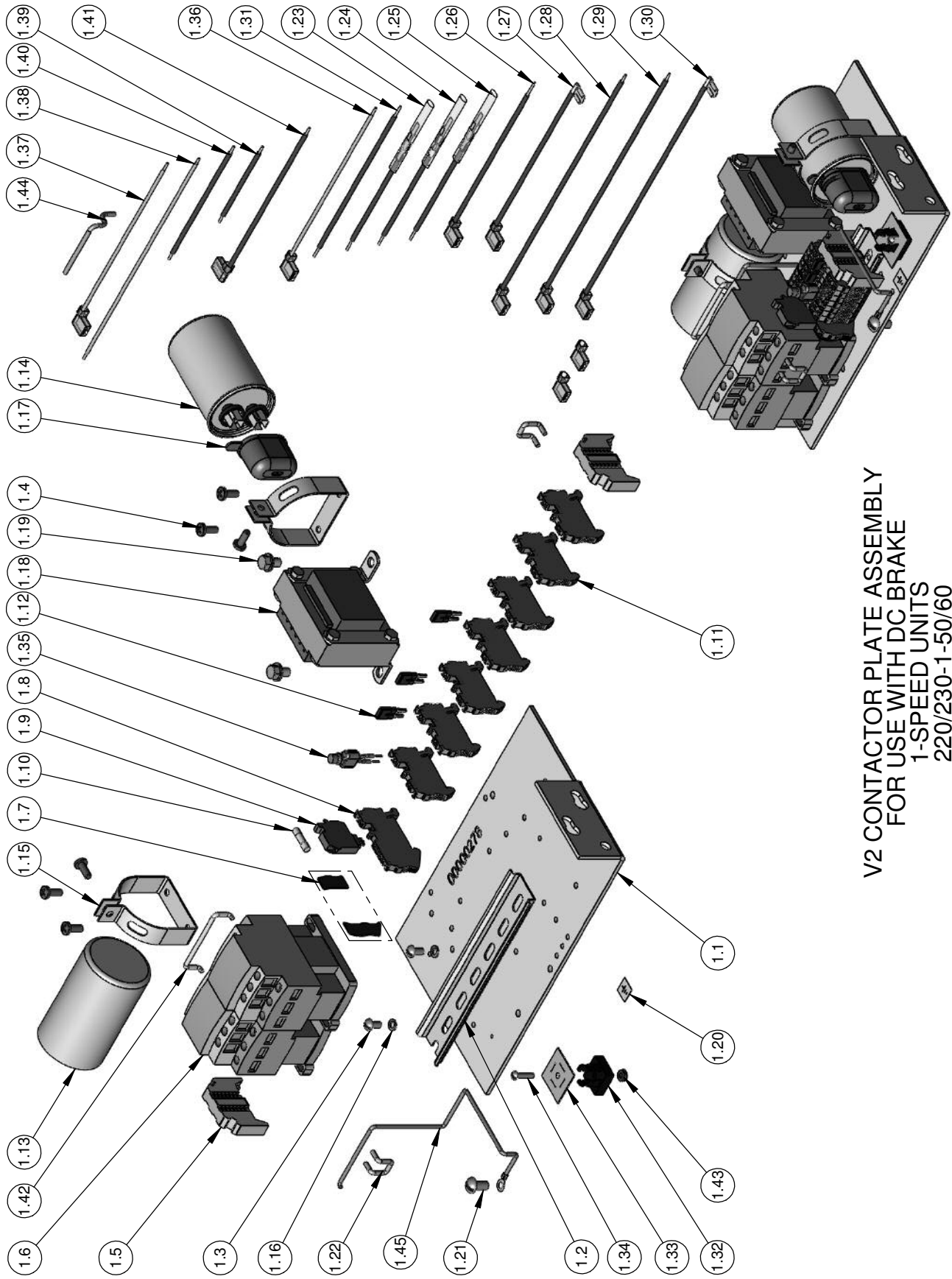
V2 CONTACTOR PLATE ASSEMBLY
 FOR USE WITH AC BRAKE AND TRANSFORMER
 110/115-1-50/60
 MODELS J, L, R & RT

CONTACTOR BRACKET S/A	REVERSING CONTACTOR P/N	TRANSFORMER P/N	SECONDARY VOLTAGE
00001696	24791	00000592	24V
00001697	28906	00000593	48V

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	CONTACTOR BKT S/A	1
1.1	00000278	CONTACTOR BRACKET	1
1.2	29010	DIN-RAIL 6.50" LONG	1
1.3	982686	SCREW #10-32 UNF-2A X 3/8" SL	2
1.4	987873	LOCKWASHER #10 ASA MEDIUM	2
1.5	29015	TERMINAL STRIP END CLAMP	2
1.6	SEE TABLE	REVERSING CONTACTOR	1
1.7	00000398	TERMINAL STRIP COVER SEGMENT	1
1.8	29018	FUSIBLE TERMINAL STRIP	1
1.9	29019	TERMINAL STRIP CARTRIDGE	1
1.10	00000393	FUSE-5MM X 20MM-500MA	1
1.11	29014	TERMINAL STRIP	6
1.12	29047	TERMINAL STRIP BRIDGE	2
1.13	35279	START CAPACITOR	1
1.14	35278	CAPACITOR, RUN	1
1.15	35268	CLAMP	2
1.16	982873	MACHINE SCREW PAN HEAD	6
1.17	35285	RUN CAPACITOR INSULATOR	1
1.18	SEE TABLE	TRANSFORMER-V2-110/115 PRIMARY	1
1.19	25861	SCREW 1/4-20 UNC-2A X 3/8" HEX	2
1.20	20940	GROUND LABEL	1
1.21	987827	SCREW 1/4-20 UNC-2A X 1/2"	1
1.22	51845	JUMPER	2
1.23	29038	JUMPER (R5)	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1.24	29037	JUMPER (R3)	1
1.25	29036	JUMPER (R2)	1
1.26	29034	JUMPER (R10)	1
1.27	29035	JUMPER (R4)	1
1.28	00000755	JUMPER V2 1 PHASE (R7)	1
1.29	00000757	JUMPER V2 1 PHASE (R6)	1
1.30	00000758	JUMPER V2 1 PHASE (R9)	1
1.31	00000336	JUMPER (R12)	1
1.32	70246	RECTIFIER	1
1.33	70274	RECTIFIER INSULATOR	1
1.34	957854	ROUND HEAD MACHINE SCREW	1
1.35	982237	DUAL ENTRY WIRE FERRULE	1
1.36	00000535	SURGE SUPPRESSOR	1
1.37	00001501	B4-JUMPER	1
1.38	00001500	B3-JUMPER	1
1.39	00001737	JUMPER 'B6'	1
1.40	00000537	B8 JUMPER	1
1.41	00000538	B9 JUMPER	1
1.42	00000376	B5 JUMPER	1
1.43	982470	HEX HEAD MACHINE NUT	1
1.44	00001503	JUMPER-B2	1
1.45	983197	WIRING TERMINAL	2
1.46	51847	JUMPER	1
1.47	GROUND JUMPER	JUMPER-G/Y-#16 AWG	1

V2 CONTACTOR PLATE ASSEMBLY
FOR USE WITH AC BRAKE AND TRANSFORMER
110/115-1-50/60
MODELS J, L, R & RT



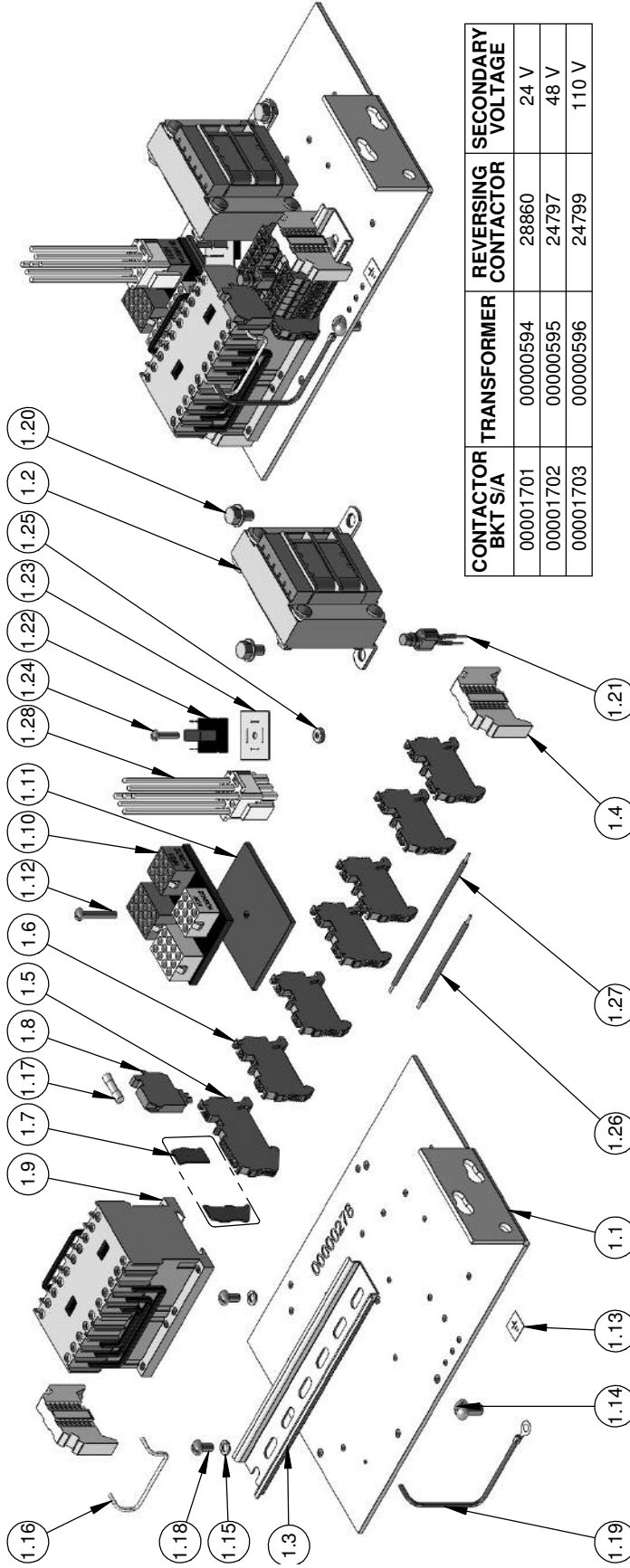
V2 CONTACTOR PLATE ASSEMBLY
 FOR USE WITH DC BRAKE
 1-SPEED UNITS
 220/230-1-50/60
 MODELS J, L, R & RT

CONTRACTOR BRACKET S/A	REVERSING CONTACTOR P/N	TRANSFORMER P/N	SECONDARY VOLTAGE
00001698	24791	00000594	24V
00001699	28906	00000595	48V
00001700	28905	00000596	115V

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	CONTACTOR BKT S/A	1
1.1	00000278	CONTACTOR BRACKET	1
1.2	29010	DIN-RAIL 6.50" LONG	1
1.3	982686	SCREW #10-32 UNF-2A X 3/8" SL	2
1.4	982673	MACHINE SCREW PAN HEAD	6
1.5	29015	TERMINAL STRIP END CLAMP	2
1.6	SEE TABLE	REVERSING CONTACTOR	1
1.7	00000398	TERMINAL STRIP COVER SEGMENT	1
1.8	29018	FUSIBLE TERMINAL STRIP	1
1.9	29019	TERMINAL STRIP CARTRIDGE	1
1.10	00000393	FUSE-5MM X 20MM-500MA	1
1.11	29014	TERMINAL STRIP	7
1.12	29047	TERMINAL STRIP BRIDGE	3
1.13	35279	START CAPACITOR	1
1.14	35278	CAPACITOR, RUN	1
1.15	35268	CLAMP	2
1.16	987873	LOCKWASHER #10 ASA MEDIUM	2
1.17	35285	RUN CAPACITOR INSULATOR	1
1.18	SEE TABLE	TRANSFORMER-V2-230/460 PRIMARY	1
1.19	25861	SCREW 1/4-20 UNC-2A X 3/8" HEX	2
1.20	20940	GROUND LABEL	1
1.21	987827	SCREW 1/4-20 UNC-2A X 1/2"	1
1.22	51845	JUMPER	2
1.23	29038	JUMPER (R5)	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1.24	29037	JUMPER (R3)	1
1.25	29036	JUMPER (R2)	1
1.26	29034	JUMPER (R10)	1
1.27	29035	JUMPER (R4)	1
1.28	00000755	JUMPER V2 1 PHASE (R7)	1
1.29	00000757	JUMPER V2 1 PHASE (R6)	1
1.30	00000758	JUMPER V2 1 PHASE (R9)	1
1.31	00000336	JUMPER (R12)	1
1.32	70246	RECTIFIER	1
1.33	70274	RECTIFIER INSULATOR	1
1.34	957854	ROUND HEAD MACHINE SCREW	1
1.35	00000535	SURGE SUPPRESSOR	1
1.36	00001501	B4-JUMPER	1
1.37	00001500	B3-JUMPER	1
1.38	00001737	JUMPER 'B6'	1
1.39	00000537	B8 JUMPER	1
1.40	00000538	B9 JUMPER	1
1.41	00000376	B5 JUMPER	1
1.42	51847	JUMPER	1
1.43	982470	HEX HEAD MACHINE NUT	1
1.44	00000321	JUMPER-R13	1
1.45	27190	JUMPER-G/Y-#16 AWG	1
1.46	983197	WIRING TERMINAL	2

V2 CONTACTOR PLATE ASSEMBLY
FOR USE WITH DC BRAKE
1-SPEED UNITS
220/230-1-50/60
MODELS J, L, R & RT

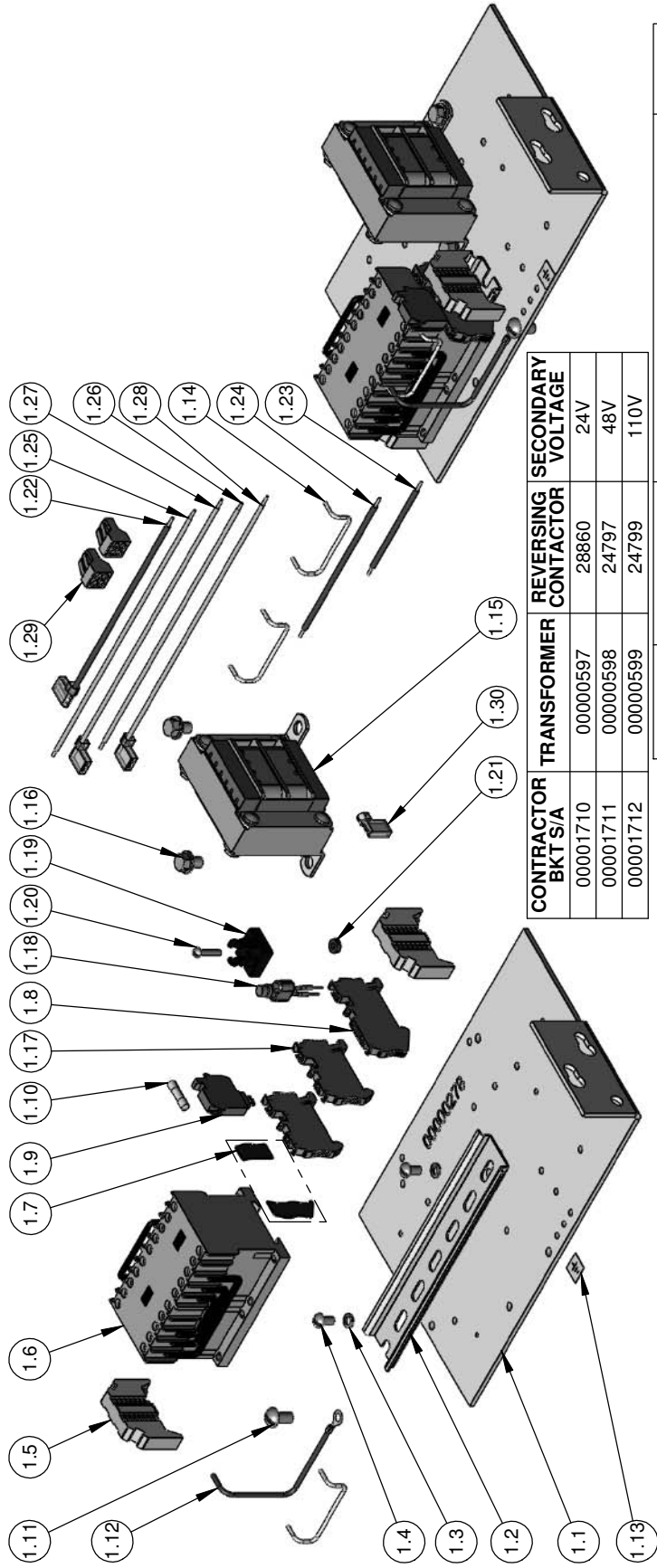


CONTACTOR BKT S/A	TRANSFORMER	REVERSING CONTACTOR	SECONDARY VOLTAGE
00001701	00000594	28860	24 V
00001702	00000595	24797	48 V
00001703	00000596	24799	110 V

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	CONTACTOR BKT S/A BHSE	1
1.1	00000278	CONTACTOR BRACKET	1
1.2	SEE TABLE	TRANSFORMER-V2-230/460	1
1.3	29010	DIN-RAIL 6.50" LONG	1
1.4	29015	TERMINAL STRIP END CLAMP	2
1.5	29018	FUSIBLE TERMINAL STRIP	1
1.6	29014	TERMINAL STRIP	6
1.7	00000398	TERMINAL STRIP COVER SEGMENT	1
1.8	29019	FUSIBLE TERMINAL STRIP	1
1.9	SEE TABLE	REVERSING CONTACTOR	1
1.10	27672	VOLTAGE CHANGE BOARD	1
1.11	27685	VOLTAGE CHANGE BOARD INSULATOR	1
1.12	987862	SCREW #8-32UNC-2A X 1"	1
1.13	20940	GROUND LABEL	1
1.14	987827	SCREW 1/4-20 UNC-2A X 1/2"	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1.15	987873	LOCKWASHER #10 ASA MEDIUM	2
1.16	51847	JUMPER	1
1.17	00000393	FUSE-5MM X 20MM-500MA	1
1.18	982686	SCREW #10-32 UNF-2A X 3/8" SL	2
1.19	27189	JUMPER-G/Y-#16 AWG	1
1.20	25861	SCREW 1/4-20 UNC-2A X 3/8" HEX	2
1.21	00000535	SURGE SUPPRESSOR	1
1.22	70246	RECTIFIER	1
1.23	70274	RECTIFIER INSULATOR	1
1.24	957854	SCREW #6-32 NC-2 X 5/8" ROUND	1
1.25	982470	NUT #6-32 UNC-2A HEX MACHINE	1
1.26	00000537	B8 JUMPER	1
1.27	00000538	B9 JUMPER	1
1.28	00000204	HARNES V2/CONTACTOR	1

V2 CONTACTOR PLATE ASSEMBLY
 FOR USE WITH DC BRAKE
 1-SPEED, DUAL VOLTAGE UNITS
 220/230-380/415/460-3-50/60
 MODELS J, JJ, L, LL, R, RR, RT & RRT



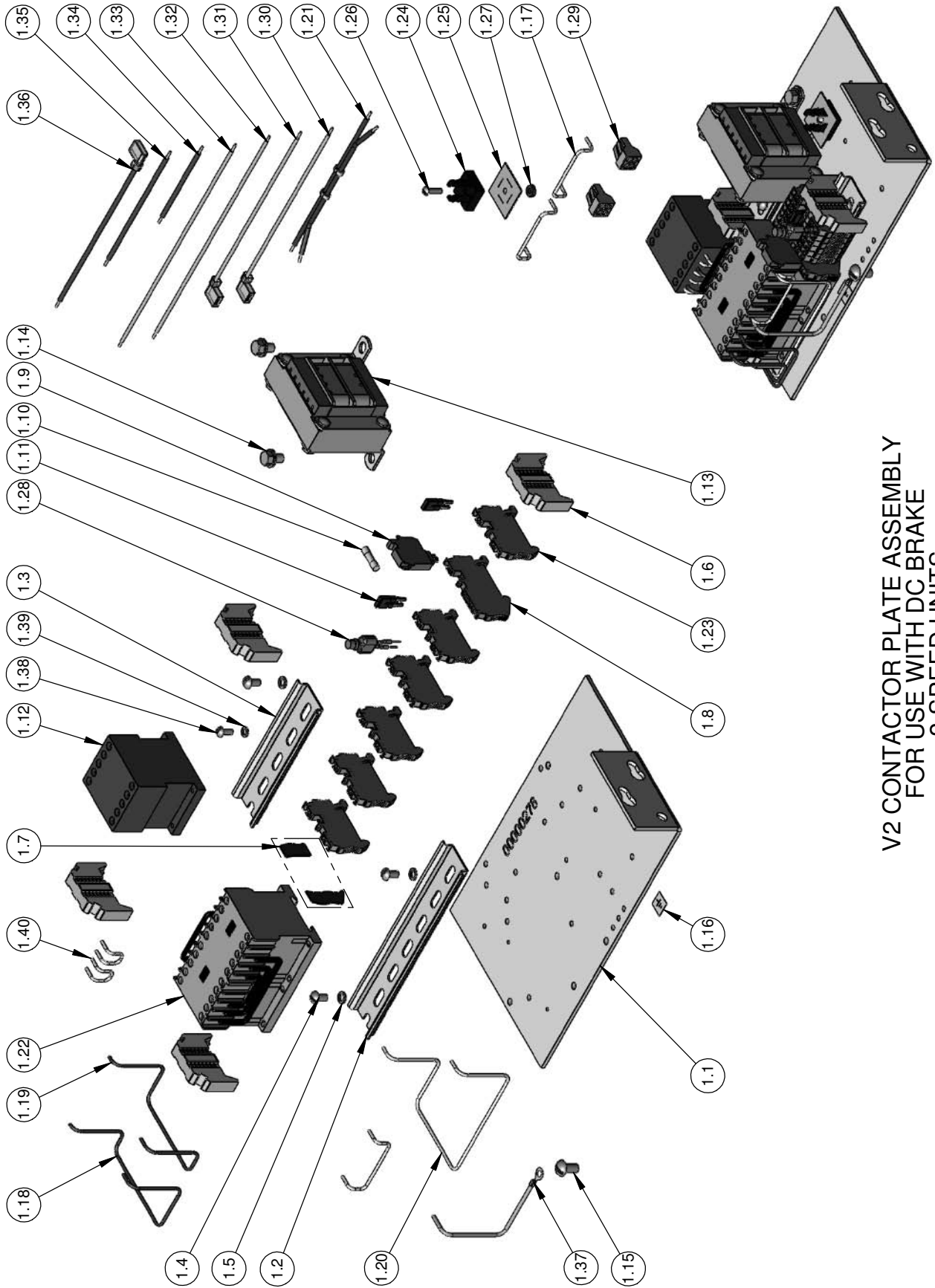
CONTRACTOR BKT S/A	TRANSFORMER	REVERSING CONTACTOR	SECONDARY VOLTAGE
00001710	00000597	28860	24V
00001711	00000598	24797	48V
00001712	00000599	24799	110V

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1.15	SEE TABLE	TRANSFORMER-V2-575V PRIMARY	1
1.16	25861	SCREW 1/4-20 UNC-2A X 3/8" HEX	2
1.17	29014	TERMINAL STRIP	2
1.18	00001505	SURGE SUPPRESSOR	1
1.19	00001551	RECTIFIER	1
1.20	957854	ROUND HEAD MACHINE SCREW	1
1.21	982470	HEX HEAD MACHINE NUT	1
1.22	00000376	B5 JUMPER	1
1.23	00000537	B8 JUMPER	1
1.24	00000538	B9 JUMPER	1
1.25	00001502	JUMPER-B1	1
1.26	00001503	JUMPER-B2	1
1.27	00001535	JUMPER 'B4'	1
1.28	00001536	JUMPER 'B3'	1
1.29	11782704	CONNECTOR PUSHWIRE ORANGE	2
1.30	983197	WIRING TERMINAL	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	CONTACTOR BKT S/A	1
1.1	00000278	CONTACTOR BRACKET	1
1.2	29010	DIN-RAIL 6.50" LONG	1
1.3	987873	LOCKWASHER #10 ASA MEDIUM	2
1.4	982686	SCREW #10-32 UNF-2A X 3/8" SL	2
1.5	29015	TERMINAL STRIP END CLAMP	2
1.6	SEE TABLE	REVERSING CONTACTOR	1
1.7	00000398	TERMINAL STRIP COVER SEGMENT	1
1.8	29018	FUSIBLE TERMINAL STRIP	1
1.9	29019	TERMINAL STRIP CARTRIDGE	1
1.10	00000393	FUSE-5MM X 20MM-500MA	1
1.11	987827	SCREW 1/4-20 UNC-2A X 1/2"	1
1.12	27189	JUMPER-G/Y-#16 AWG	1
1.13	20940	GROUND LABEL	1
1.14	51847	JUMPER	3

V2 CONTACTOR PLATE ASSEMBLY
FOR USE WITH DC BRAKE
550/575-3-50/60

MODELS J, JJ, L, LL, R, RR, RT & RRT



V2 CONTACTOR PLATE ASSEMBLY
 FOR USE WITH DC BRAKE
 2-SPEED UNITS
 220/230-3-50/60

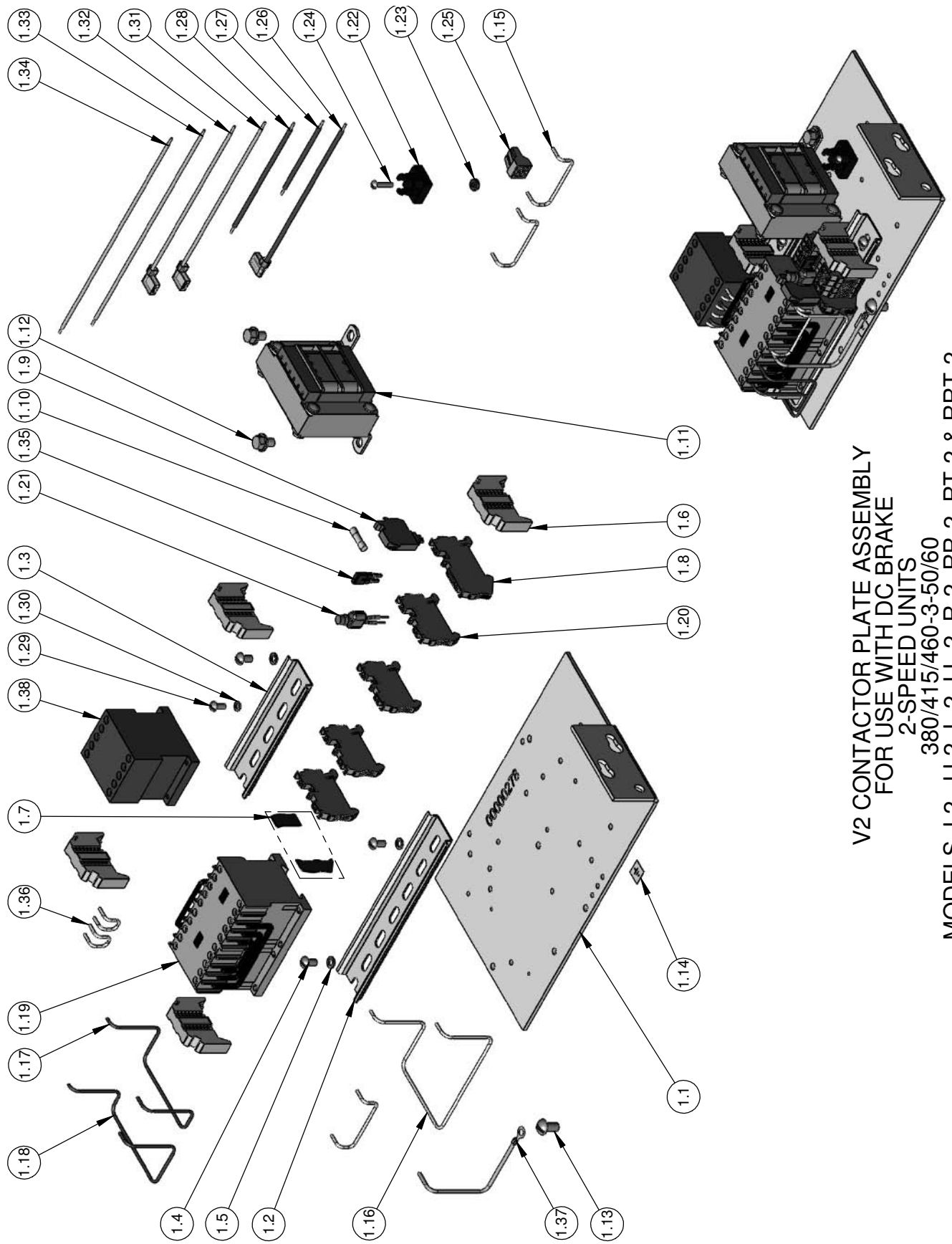
MODELS J-2, JJ-2, L-2, LL-2, R-2, RR-2, RT-2 & RRT-2

CONTACTOR BKT S/A	TRANSFORMER	REVERSING CONTACTOR	SPEED SELECTING CONTACTOR	SECONDARY VOLTAGE
00001704	00000594	28860	28878	24V
00001705	00000595	24797	28871	48V
00001706	00000596	24799	28870	110V

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	CONTACTOR BKT S/A	1
1.1	00000278	CONTACTOR BRACKET	1
1.2	29010	DIN-RAIL 6.50" LONG	1
1.3	29009	DIN-RAIL 4.50" LONG	1
1.4	982686	SCREW #10-32 UNF-2A X 3/8" SL	3
1.5	987873	LOCKWASHER #10 ASA MEDIUM	3
1.6	29015	TERMINAL STRIP END CLAMP	4
1.7	00000398	TERMINAL STRIP COVER SEGMENT	1
1.8	29018	FUSIBLE TERMINAL STRIP	1
1.9	29019	TERMINAL STRIP CARTRIDGE	1
1.10	00000393	FUSE-5MM X 20MM-500MA	1
1.11	29047	TERMINAL STRIP BRIDGE	2
1.12	SEE TABLE	CONTACTOR	1
1.13	SEE TABLE	TRANSFORMER-V2-230/460	1
1.14	25861	SCREW 1/4-20 UNC-2A X 3/8" HEX	2
1.15	987827	SCREW 1/4-20 UNC-2A X 1/2"	1
1.16	20940	GROUND LABEL	1
1.17	51847	JUMPER	3
1.18	27652	JUMPER (R4)	1
1.19	27657	JUMPER (R5)	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1.20	27736	JUMPER (W5)	1
1.21	00000327	'H5/H6' JUMPER HARNESS	1
1.22	SEE TABLE	REVERSING CONTACTOR	1
1.23	29014	TERMINAL STRIP	6
1.24	70246	RECTIFIER	1
1.25	70274	RECTIFIER INSULATOR	1
1.26	957854	ROUND HEAD MACHINE SCREW	1
1.27	982470	HEX HEAD MACHINE NUT	1
1.28	00000535	SURGE SUPPRESSOR	1
1.29	11782704	CONNECTOR PUSHWIRE ORANGE	2
1.30	00001500	B3-JUMPER	1
1.31	00001501	B4-JUMPER	1
1.32	00001502	JUMPER-B1	1
1.33	00001503	JUMPER-B2	1
1.34	00000537	B8 JUMPER	1
1.35	00000538	B9 JUMPER	1
1.36	00000376	B5 JUMPER	1
1.37	27189	GROUND JUMPER	1
1.38	982683	SCREW #8-32 UNC-2A X 3/8"	1
1.39	957844	LOCKWASHER #8 ASA MEDIUM	1
1.40	27662	JUMPER	2

V2 CONTACTOR PLATE ASSEMBLY
FOR USE WITH DC BRAKE
2-SPEED UNITS
220/230-3-50/60
MODELS J-2, JJ-2, L-2, LL-2, R-2, RR-2, RT-2 & RRT-2



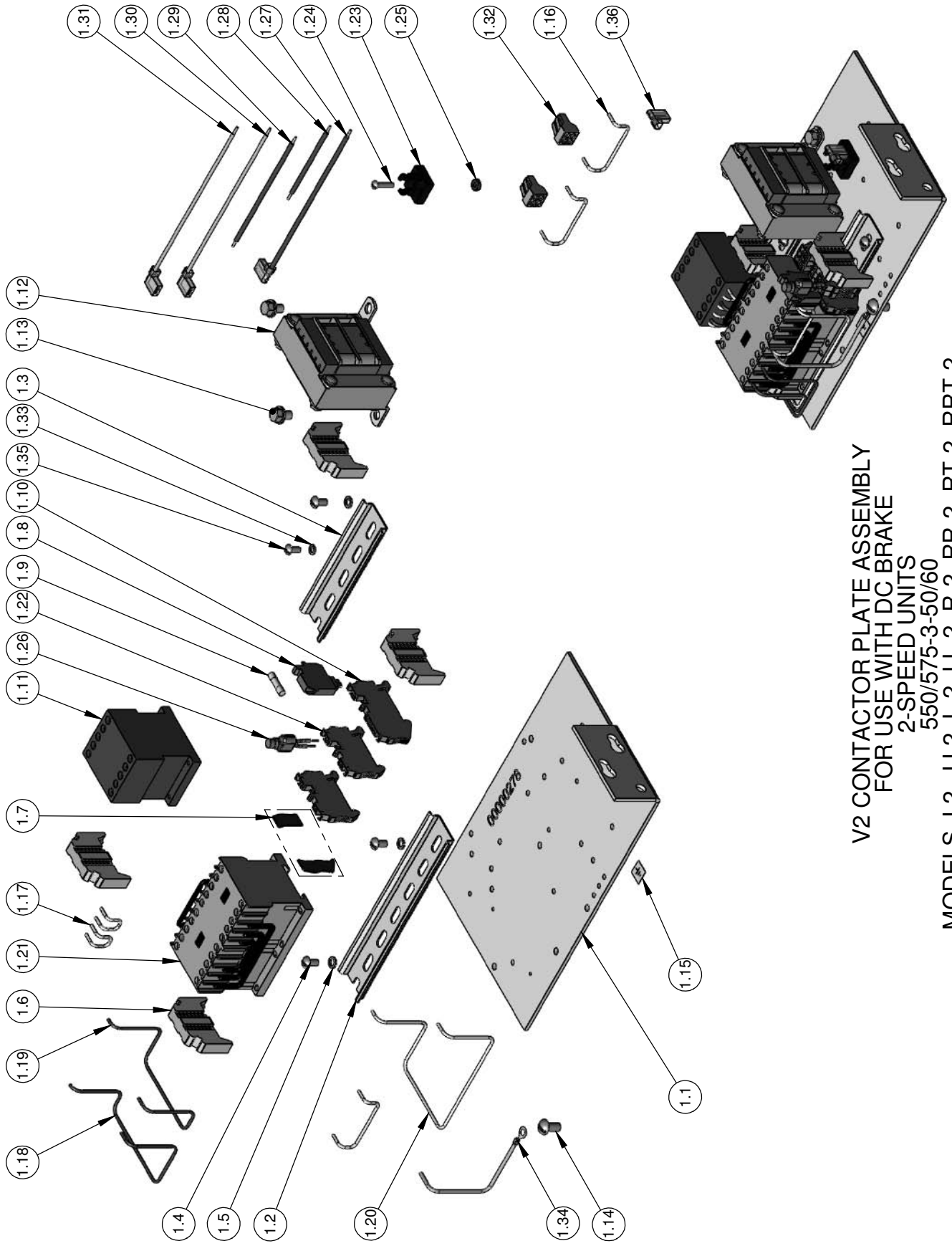
V2 CONTACTOR PLATE ASSEMBLY
 FOR USE WITH DC BRAKE
 2-SPEED UNITS
 380/415/460-3-50/60
 MODELS J-2, JJ-2, L-2, LL-2, R-2, RR-2, RT-2 & RRT-2

CONTACTOR BKT S/A	TRANSFORMER	REVERSING CONTACTOR	SPEED SELECTING CONTACTOR	SECONDARY VOLTAGE
00001707	00000594	28860	28878	24V
00001708	00000595	24797	28871	48V
00001709	00000596	24799	28870	110V

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	CONTACTOR BKT S/A	1
1.1	00000278	CONTACTOR BRACKET	1
1.2	29010	DIN-RAIL 6.50" LONG	1
1.3	29009	DIN-RAIL 4.50" LONG	1
1.4	982686	SCREW #10-32 UNF-2A X 3/8" SL	3
1.5	987873	LOCKWASHER #10 ASA MEDIUM	3
1.6	29015	TERMINAL STRIP END CLAMP	4
1.7	00000398	TERMINAL STRIP COVER SEGMENT	1
1.8	29018	FUSIBLE TERMINAL STRIP	1
1.9	29019	TERMINAL STRIP CARTRIDGE	1
1.10	00000393	FUSE-5MM X 20MM-500MA	1
1.11	SEE TABLE	TRANSFORMER-V2-230/460	1
1.12	25861	SCREW 1/4-20 UNC-2A X 3/8" HEX	2
1.13	987827	SCREW 1/4-20 UNC-2A X 1/2"	1
1.14	20940	GROUND LABEL	1
1.15	51847	JUMPER	3
1.16	27736	JUMPER (W5)	1
1.17	27657	JUMPER (R5)	1
1.18	27652	JUMPER (R4)	1
1.19	SEE TABLE	REVERSING CONTACTOR	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1.20	29014	TERMINAL STRIP	4
1.21	00001505	SURGE SUPPRESSOR	1
1.22	00001551	RECTIFIER	1
1.23	982470	HEX HEAD MACHINE NUT	1
1.24	957854	ROUND HEAD MACHINE SCREW	1
1.25	11782704	CONNECTOR PUSHWIRE ORANGE	1
1.26	00000376	B5 JUMPER	1
1.27	00000537	B8 JUMPER	1
1.28	00000538	B9 JUMPER	1
1.29	982683	SCREW #8-32 UNC-2A X 3/8"	1
1.30	957844	LOCKWASHER #8 ASA MEDIUM	1
1.31	00001500	B3-JUMPER	1
1.32	00001501	B4-JUMPER	1
1.33	00001502	JUMPER-B1	1
1.34	00001503	JUMPER-B2	1
1.35	29047	TERMINAL STRIP BRIDGE	1
1.36	27662	JUMPER	2
1.37	27189	GROUND JUMPER	1
1.38	LC1K09 Contactor	CONTACTOR	1

V2 CONTACTOR PLATE ASSEMBLY
FOR USE WITH DC BRAKE
2-SPEED UNITS
380/415/460-3-50/60
MODELS J-2, JJ-2, L-2, LL-2, R-2, RR-2, RT-2 & RRT-2



V2 CONTACTOR PLATE ASSEMBLY
 FOR USE WITH DC BRAKE
 2-SPEED UNITS
 550/575-3-50/60

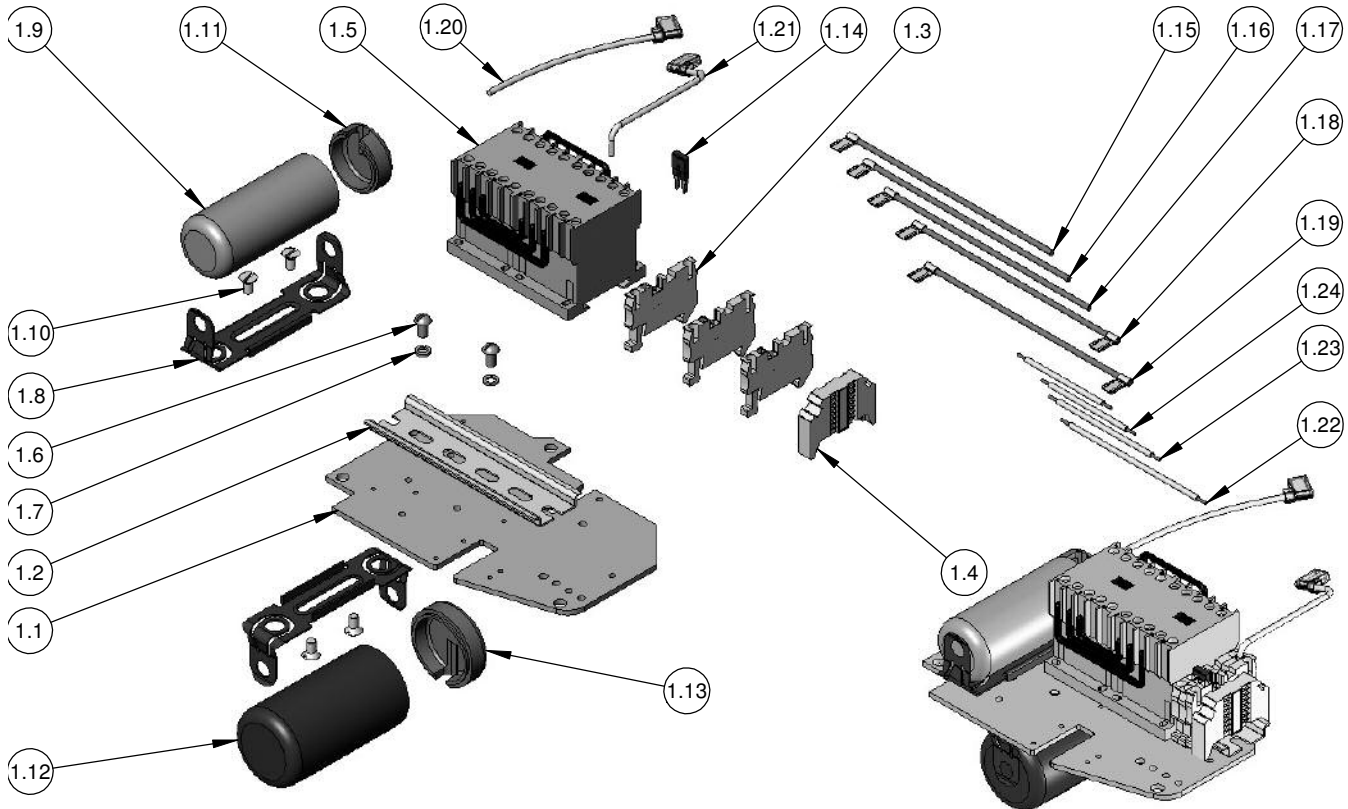
MODELS J-2, JJ-2, L-2, LL-2, R-2, RR-2, RT-2, RRT-2

CONTACTOR BKT S/A	TRANSFORMER	REVERSING CONTACTOR	SPEED SELECTING CONTACTOR	SECONDARY VOLTAGE
00001713	00000597	28860	28878	24V
00001714	00000598	24797	28871	48V
00001715	00000599	24799	28870	110V

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	CONTACTOR BKT S/A	1
1.1	00000278	CONTACTOR BRACKET	1
1.2	29010	DIN-RAIL 6.50" LONG	1
1.3	29009	DIN-RAIL 4.50" LONG	1
1.4	982686	SCREW #10-32 UNF-2A X 3/8" SL	3
1.5	987873	LOCKWASHER #10 ASA MEDIUM	3
1.6	29015	TERMINAL STRIP END CLAMP	4
1.7	00000398	TERMINAL STRIP COVER SEGMENT	1
1.8	29019	TERMINAL STRIP CARTRIDGE	1
1.9	00000393	FUSE-5MM X 20MM-500MA	1
1.10	29018	FUSIBLE TERMINAL STRIP	1
1.11	SEE TABLE	CONTACTOR	1
1.12	SEE TABLE	TRANSFORMER-V2-230/460	1
1.13	25861	SCREW 1/4-20 UNC-2A X 3/8" HEX	2
1.14	987827	SCREW 1/4-20 UNC-2A X 1/2"	1
1.15	20940	GROUND LABEL	1
1.16	51847	JUMPER	3
1.17	27662	JUMPER	2

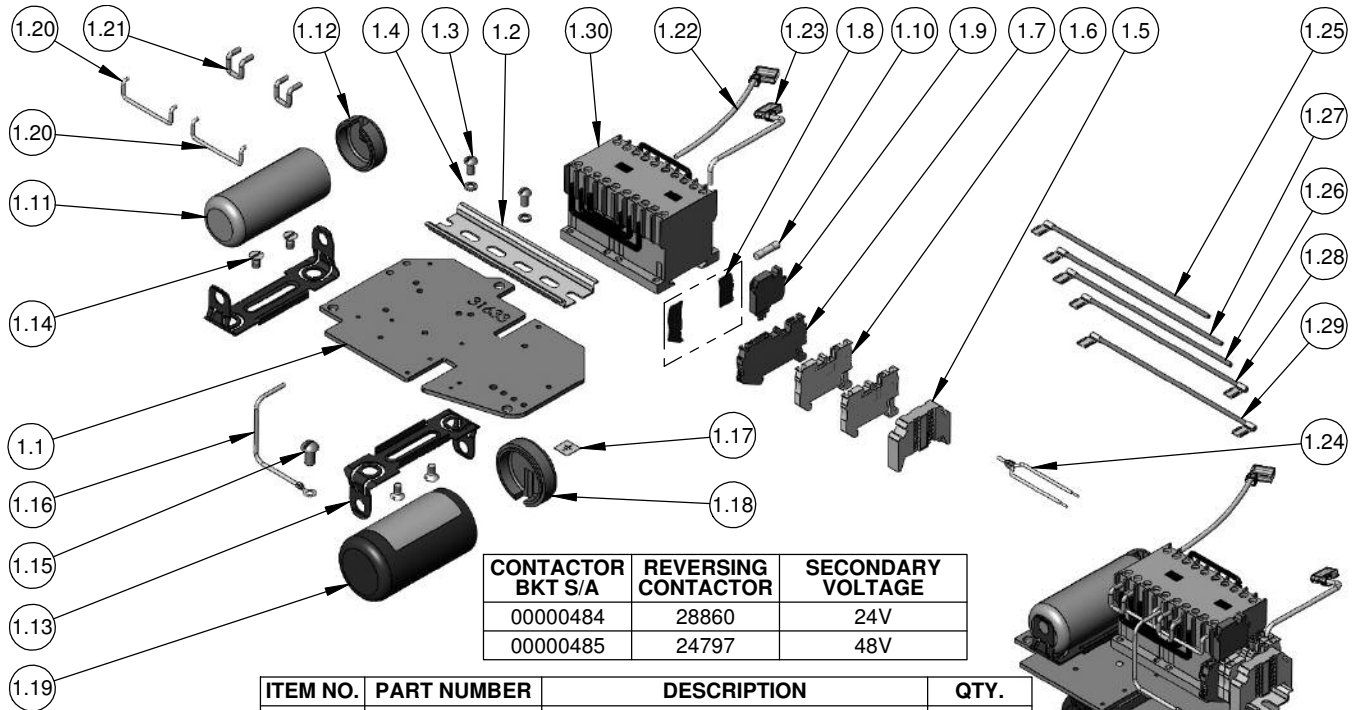
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1.18	27652	JUMPER (R4)	1
1.19	27657	JUMPER (R5)	1
1.20	27736	JUMPER (W5)	1
1.21	SEE TABLE	REVERSING CONTACTOR	1
1.22	29014	TERMINAL STRIP	2
1.23	00001551	RECTIFIER	1
1.24	957854	ROUND HEAD MACHINE SCREW	1
1.25	982470	HEX HEAD MACHINE NUT	1
1.26	00001505	SURGE SUPPRESSOR	1
1.27	00000376	B5 JUMPER	1
1.28	00000537	B8 JUMPER	1
1.29	00000538	B9 JUMPER	1
1.30	00001500	B3-JUMPER	1
1.31	00001501	B4-JUMPER	1
1.32	11782704	CONNECTOR PUSHWIRE ORANGE	2
1.33	957844	LOCKWASHER #8 ASA MEDIUM	1
1.34	27189	GROUND JUMPER	1
1.35	982683	SCREW #8-32 UNC-2A X 3/8"	1
1.36	983197	WIRING TERMINAL	1

V2 CONTACTOR PLATE ASSEMBLY
FOR USE WITH DC BRAKE
2-SPEED UNITS
550/575-3-50/60
MODELS J-2, JJ-2, L-2, LL-2, R-2, RR-2, RT-2, RRT-2



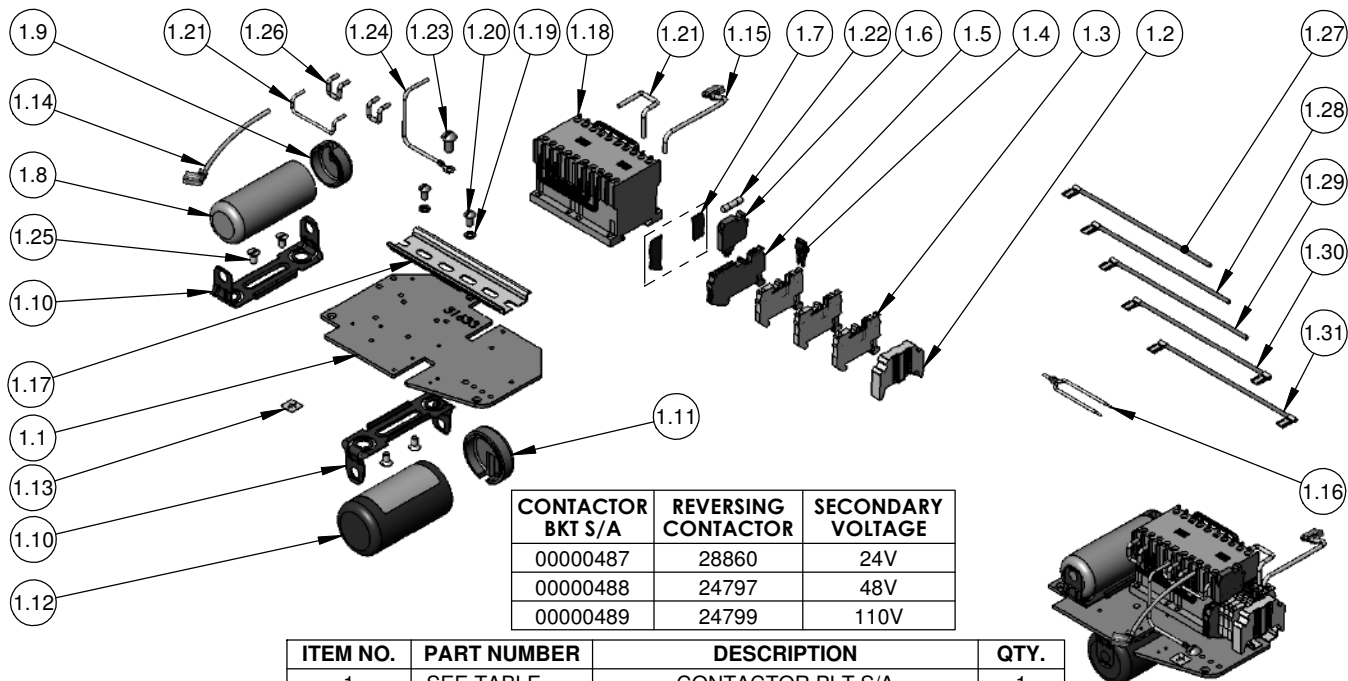
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	29917	CONTACTOR PLATE SUB-ASSEMBLY	1
1.1	31633	CONTACTOR PLATE	1
1.2	29312	DIN-RAIL 5.00" LONG	1
1.3	29014	TERMINAL STRIP	3
1.4	29015	TERMINAL STRIP END CLAMP	1
1.5	24799	REVERSING CONTACTOR 110V	1
1.6	982686	SCREW #10-32 UNF-2A X 3/8" SL	2
1.7	987873	LOCKWASHER #10 ASA MEDIUM	2
1.8	27910	CAPACITOR MOUNTING BRACKET	2
1.9	27716	CAPACITOR	1
1.10	982696	SCREW 10-32 UNF-2A X 3/8 LG	4
1.11	29910	CAPACITOR CAP	1
1.12	27257	REVERSE SWITCH	1
1.13	27925	SOLID STATE SWITCH CAP	1
1.14	29047	TERMINAL STRIP BRIDGE	1
1.15	27156	JUMPER R14	1
1.16	29911	JUMPER R5	1
1.17	29912	JUMPER R6	1
1.18	29914	JUMPER R8	1
1.19	29913	JUMPER R7	1
1.20	29915	JUMPER B1	1
1.21	29916	JUMPER B2	1
1.22	51847	JUMPER	1
1.23	51846	JUMPER	1
1.24	51845	JUMPER	2

V1 CONTACTOR PLATE ASSEMBLY
FOR USE WITH AC BRAKE
SINGLE PHASE
110/115-1-50/60
MODELS A, AA, B, C, E, F & H



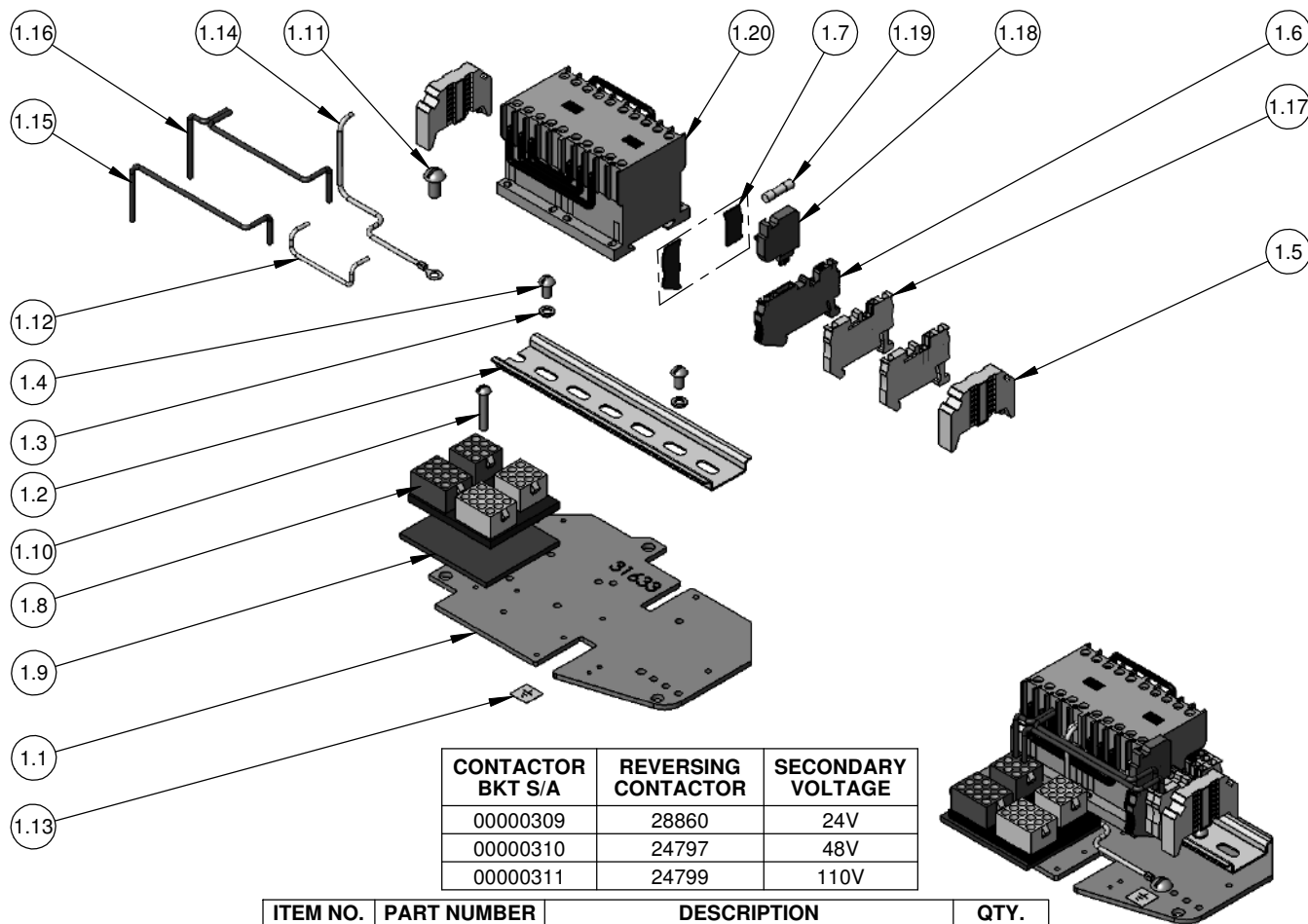
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	CONTACTOR PLT S/A	1
1.1	31633	CONTACTOR PLATE	1
1.2	29312	DIN-RAIL 5.00" LONG	1
1.3	982686	SCREW #10-32 UNF-2A X 3/8" SL	2
1.4	987873	LOCKWASHER #10 ASA MEDIUM	2
1.5	29015	TERMINAL STRIP END CLAMP	1
1.6	29014	TERMINAL STRIP	2
1.7	29018	FUSIBLE TERMINAL STRIP	1
1.8	00000398	TERMINAL STRIP COVER SEGMENT	1
1.9	29019	TERMINAL STRIP CARTRIDGE	1
1.10	00000393	FUSE-5MM X 20MM-500MA	1
1.11	27716	CAPACITOR	1
1.12	29910	CAPACITOR CAP	1
1.13	27910	CAPACITOR MOUNTING BRACKET	2
1.14	982696	SCREW 10-32 UNF-2A X 3/8 LG	4
1.15	987827	SCREW 1/4-20 UNC-2A X 1/2"	1
1.16	27189	JUMPER-G/Y-#16 AWG	1
1.17	20940	GROUND LABEL	1
1.18	27925	SOLID STATE SWITCH CAP	1
1.19	27257	REVERSE SWITCH	1
1.20	51847	JUMPER	2
1.21	51845	JUMPER	2
1.22	29915	JUMPER B1	1
1.23	29916	JUMPER B2	1
1.24	29929	JUMPER ASSEMBLY	1
1.25	27156	JUMPER R14	1
1.26	29911	JUMPER R5	1
1.27	29912	JUMPER R6	1
1.28	29913	JUMPER R7	1
1.29	29914	JUMPER R8	1
1.30	SEE TABLE	REVERSING CONTACTOR	1

V1 CONTACTOR PLATE ASSEMBLY
FOR USE WITH AC BRAKE AND TRANSFORMER
110/115-1-50/60
MODELS A, AA, B, C, E, F & H



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	CONTACTOR PLT S/A	1
1.1	31633	CONTACTOR PLATE	1
1.2	29015	TERMINAL STRIP END CLAMP	1
1.3	29014	TERMINAL STRIP	3
1.4	29047	TERMINAL STRIP BRIDGE	1
1.5	29018	FUSIBLE TERMINAL STRIP	1
1.6	29019	TERMINAL STRIP CARTRIDGE	1
1.7	00000398	TERMINAL STRIP COVER SEGMENT	1
1.8	27716	CAPACITOR	1
1.9	29910	CAPACITOR CAP	1
1.10	27910	CAPACITOR MOUNTING BRACKET	2
1.11	27925	SOLID STATE SWITCH CAP	1
1.12	27257	REVERSE SWITCH	1
1.13	20940	GROUND LABEL	1
1.14	29915	JUMPER B1	1
1.15	29916	JUMPER B2	1
1.16	29929	JUMPER ASSEMBLY	1
1.17	29312	DIN-RAIL 5.00" LONG	1
1.18	28860	REVERSING CONTACTOR 24V	1
1.19	987873	LOCKWASHER #10 ASA MEDIUM	2
1.20	982686	SCREW #10-32 UNF-2A X 3/8" SL	2
1.21	51847	JUMPER	2
1.22	00000393	FUSE-5MM X 20MM-500MA	1
1.23	987827	SCREW 1/4-20 UNC-2A X 1/2"	1
1.24	27189	JUMPER-G/Y-#16 AWG	1
1.25	982696	SCREW 10-32 UNF-2A X 3/8 LG	4
1.26	51845	JUMPER	2
1.27	27156	JUMPER R14	1
1.28	29911	JUMPER R5	1
1.29	29912	JUMPER R6	1
1.30	29913	JUMPER R7	1
1.31	29914	JUMPER R8	1

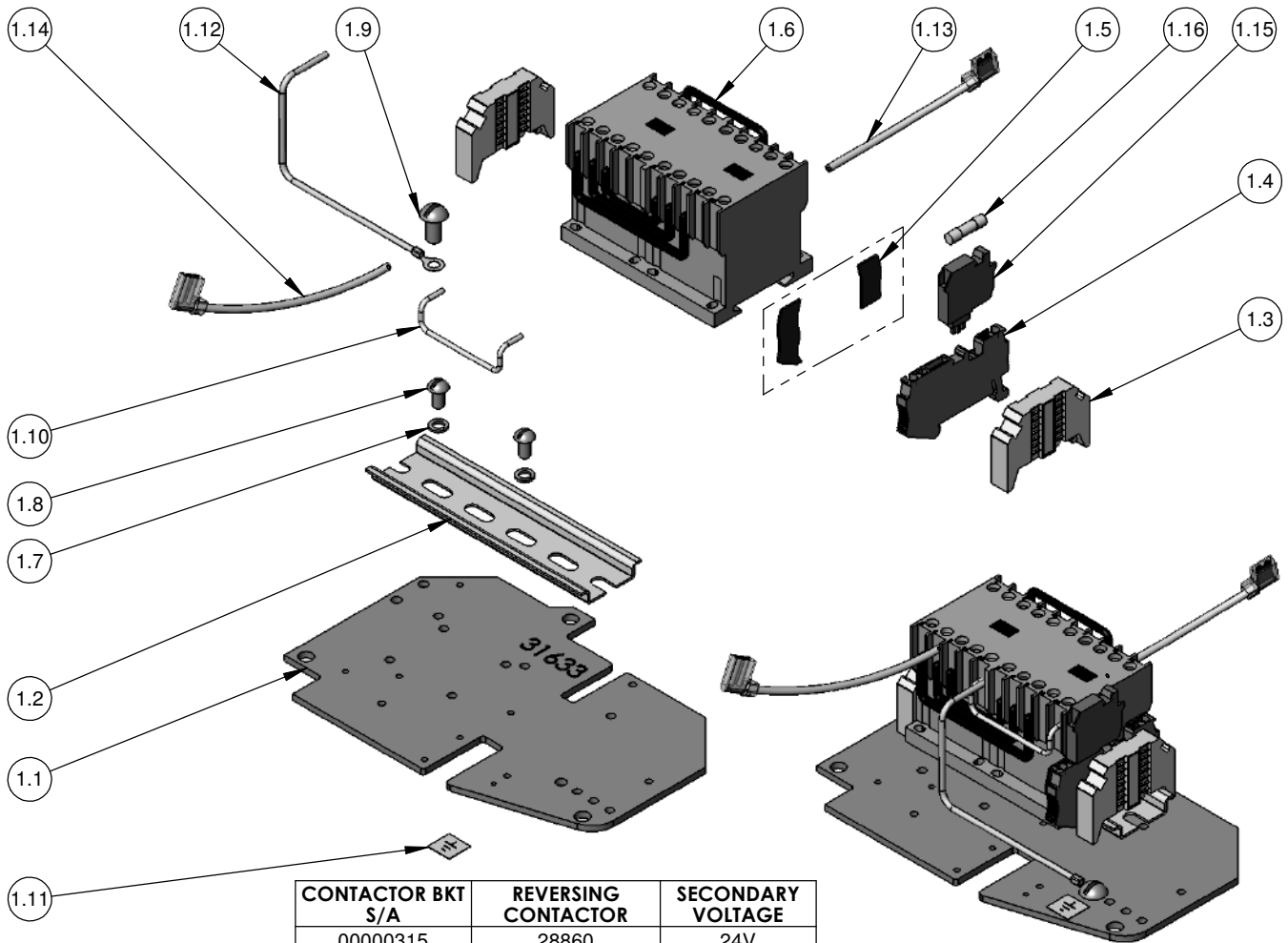
V1 CONTACTOR PLATE ASSEMBLY
220/230-1-50-60
1-SPEED UNITS
MODELS A, AA, B, C, E, F & H



CONTACTOR BKT S/A	REVERSING CONTACTOR	SECONDARY VOLTAGE
00000309	28860	24V
00000310	24797	48V
00000311	24799	110V

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	CONTACTOR PLT S/A	1
1.1	31633	CONTACTOR PLATE	1
1.2	29010	DIN-RAIL 6.50" LONG	1
1.3	987873	LOCKWASHER #10 ASA MEDIUM	2
1.4	982686	SCREW #10-32 UNF-2A X 3/8" SL	2
1.5	29015	TERMINAL STRIP END CLAMP	2
1.6	29018	FUSIBLE TERMINAL STRIP	1
1.7	00000398	TERMINAL STRIP COVER SEGMENT	1
1.8	27672	VOLTAGE CHANGE BOARD	1
1.9	27685	VOLTAGE CHANGE BOARD INSULATOR	1
1.10	987862	SCREW #8-32UNC-2A X 1"	1
1.11	987827	SCREW 1/4-20 UNC-2A X 1/2"	1
1.12	51847	JUMPER	1
1.13	20940	GROUND LABEL	1
1.14	27189	JUMPER-G/Y-#16 AWG	1
1.15	00000750	JUMPER WIRE	1
1.16	00000751	JUMPER WIRE	1
1.17	29014	TERMINAL STRIP	2
1.18	29019	TERMINAL STRIP CARTRIDGE	1
1.19	00000393	FUSE-5MM X 20MM-500MA	1
1.20	SEE TABLE	REVERSING CONTACTOR	1

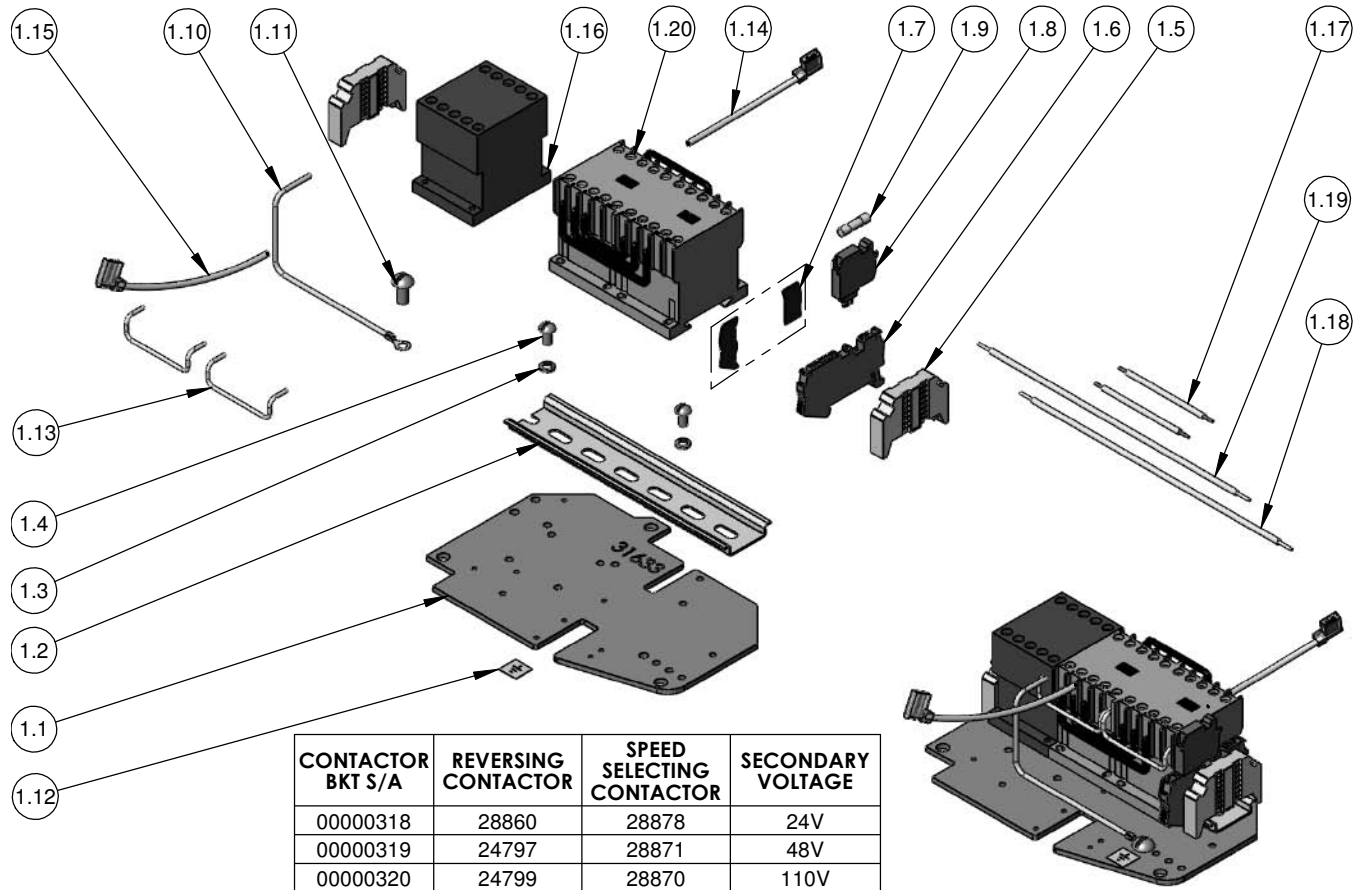
**V1 CONTACTOR PLATE ASSEMBLY
FOR USE WITH AC BRAKE
1-SPEED, DUAL VOLTAGE UNITS
220/230-380/415/460-3-50/60
MODELS A, AA, B, C, E, F & H**



CONTACTOR BKT S/A	REVERSING CONTACTOR	SECONDARY VOLTAGE
00000315	28860	24V
00000316	24797	48V
00000317	24799	110V

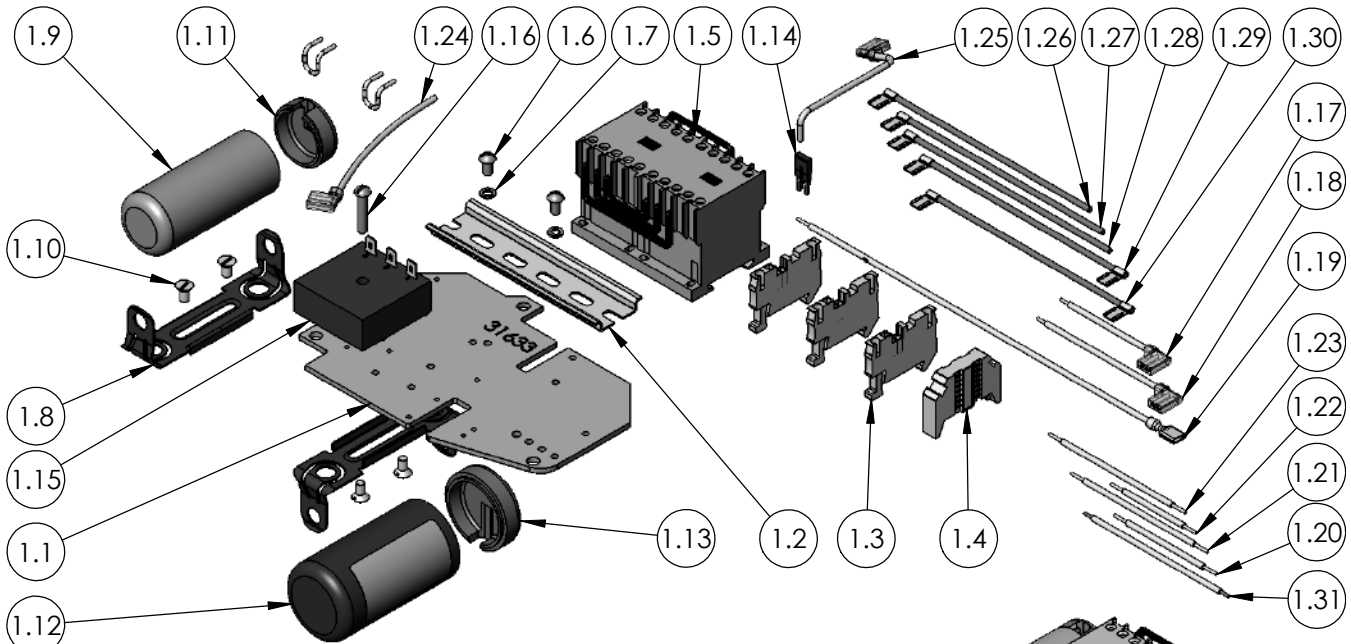
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	CONTACTOR PLT S/A	1
1.1	31633	CONTACTOR PLATE	1
1.2	29312	DIN-RAIL 5.00" LONG	1
1.3	29015	TERMINAL STRIP END CLAMP	2
1.4	29018	FUSIBLE TERMINAL STRIP	1
1.5	00000398	TERMINAL STRIP COVER SEGMENT	1
1.6	SEE TABLE	REVERSING CONTACTOR	1
1.7	987873	LOCKWASHER #10 ASA MEDIUM	2
1.8	982686	SCREW #10-32 UNF-2A X 3/8" SL	2
1.9	987827	SCREW 1/4-20 UNC-2A X 1/2"	1
1.10	51847	JUMPER	1
1.11	20940	GROUND LABEL	1
1.12	27189	JUMPER-G/Y-#16 AWG	1
1.13	29915	JUMPER B1	1
1.14	29916	JUMPER B2	1
1.15	29019	TERMINAL STRIP CARTRIDGE	1
1.16	00000393	FUSE-5MM X 20MM-500MA	1

V1 CONTACTOR PLATE ASSEMBLY
 FOR USE WITH AC BRAKE
 550/575-3-50/60
 MODELS A, AA, B, C, E, F & H

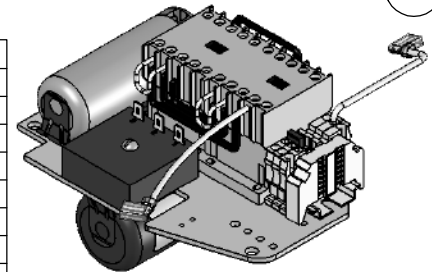


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	CONTACTOR PLT S/A 2-SPEED	1
1.1	31633	CONTACTOR PLATE	1
1.2	29010	DIN-RAIL 6.50" LONG	1
1.3	987873	LOCKWASHER #10 ASA MEDIUM	2
1.4	982686	SCREW #10-32 UNF-2A X 3/8" SL	2
1.5	29015	TERMINAL STRIP END CLAMP	2
1.6	29018	FUSIBLE TERMINAL STRIP	1
1.7	00000398	TERMINAL STRIP COVER SEGMENT	1
1.8	29019	TERMINAL STRIP CARTRIDGE	1
1.9	00000393	FUSE-5MM X 20MM-500MA	1
1.10	27189	JUMPER-G/Y-#16 AWG	1
1.11	987827	SCREW 1/4-20 UNC-2A X 1/2"	1
1.12	20940	GROUND LABEL	1
1.13	51847	JUMPER	2
1.14	29915	JUMPER B1	1
1.15	29916	JUMPER B2	1
1.16	SEE TABLE	CONTACTOR	1
1.17	51845	JUMPER	2
1.18	27609	JUMPER	1
1.19	27610	JUMPER	1
1.20	SEE TABLE	REVERSING CONTACTOR	1

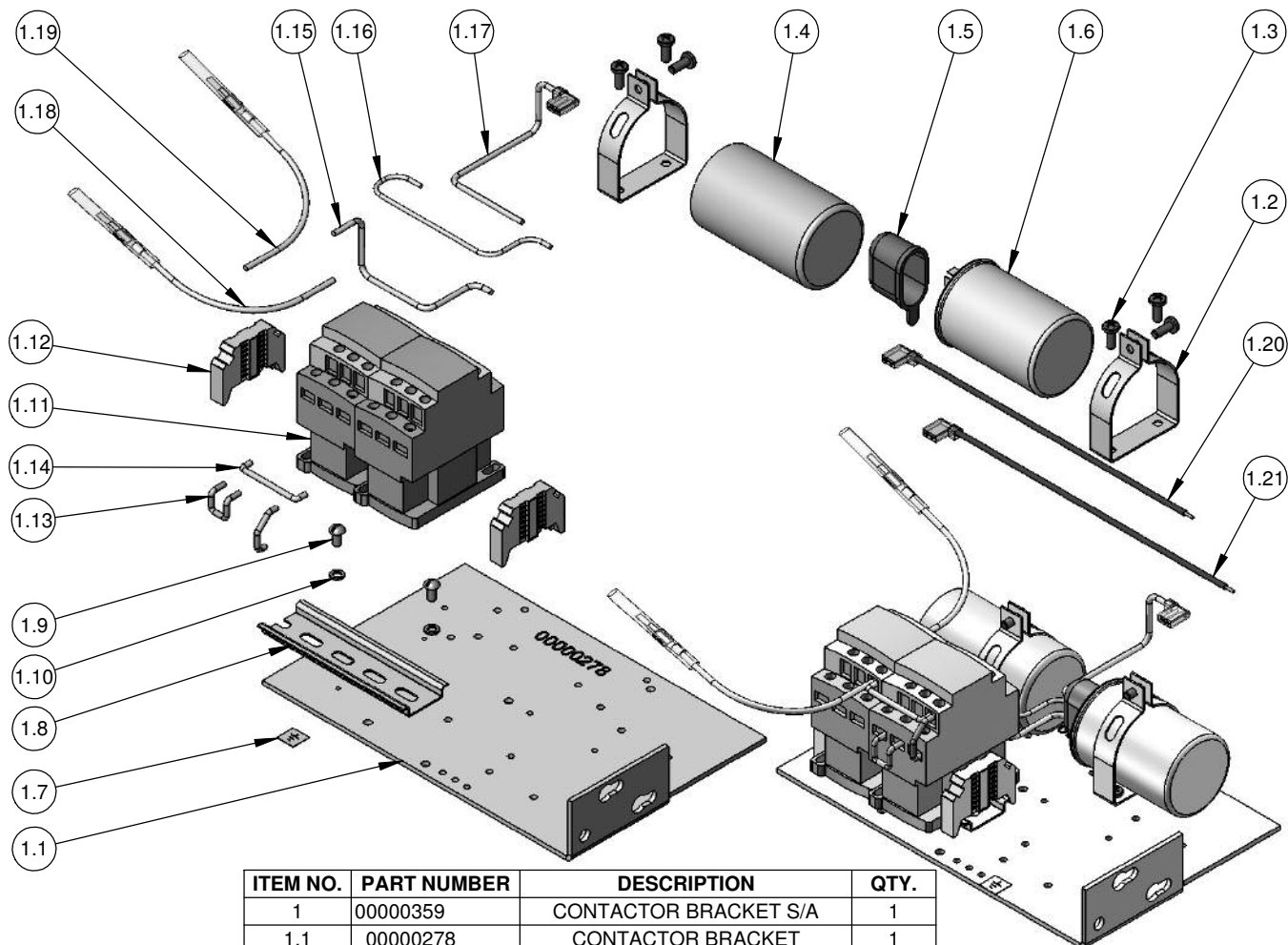
V1 CONTACTOR PLATE ASSEMBLY
FOR USE WITH AC BRAKE
2-SPEED UNITS
220/230-3-50/60, 380/415/460-3-50/60 & 550/575-3-50/60
MODELS A-2, AA-2, B-2, C-2, E-2, F-2 & H-2



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	27419	CONTACTOR PLATE ASSEMBLY	1
1.1	31654	CONTACTOR PLATE	1
1.2	29312	DIN-RAIL 5.00" LONG	1
1.3	29014	TERMINAL STRIP	3
1.4	29015	TERMINAL STRIP END CLAMP	1
1.5	28553	REVERSING CONTACTOR 110V	1
1.6	982686	SCREW #10-32 UNF-2A X 3/8" SL	2
1.7	987873	LOCKWASHER #10 ASA MEDIUM	2
1.8	27910	CAPACITOR MOUNTING BRACKET	2
1.9	27716	CAPACITOR	1
1.10	982696	SCREW 10-32 UNF-2A X 3/8 LG	4
1.11	29910	CAPACITOR CAP	1
1.12	27257	REVERSE SWITCH	1
1.13	27925	SOLID STATE SWITCH CAP	1
1.14	29047	TERMINAL STRIP BRIDGE	1
1.15	28558	TIMER	1
1.16	987817	SCREW #10-24 UNC-2A X 1"	1
1.17	27416	JUMPER (W8) WITH TERMINAL	1
1.18	27415	JUMPER (W7) WITH TERMINAL	1
1.19	27412	JUMPER W5-WITH TERMINAL 982159	1
1.20	27413	JUMPER-W4-3" LG.	1
1.21	27414	JUMPER-W5-4" LG.	1
1.22	27420	JUMPER-W9-2.50" LONG	1
1.23	27421	W6-JUMPER-4" LONG	1
1.24	29915	JUMPER B1	1
1.25	29916	JUMPER B2	1
1.26	27156	JUMPER R14	1
1.27	29911	JUMPER R5	1
1.28	29912	JUMPER R6	1
1.29	29913	JUMPER R7	1
1.30	29914	JUMPER R8	1
1.31	51847	JUMPER	1

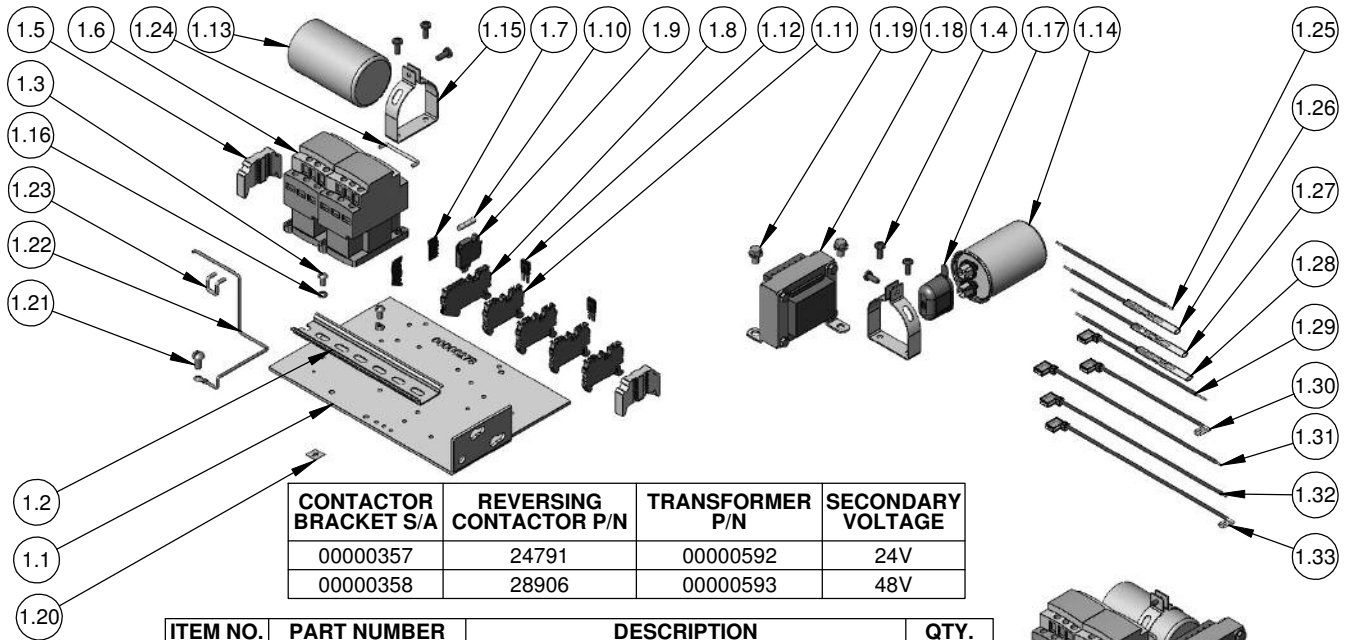


**V1 CONTACTOR PLATE ASSEMBLY
FOR USE WITH AC BRAKE
DOWN CREEP CONTROL
110/115-1-50/60
MODELS A, AA, B, C, E, F & H**

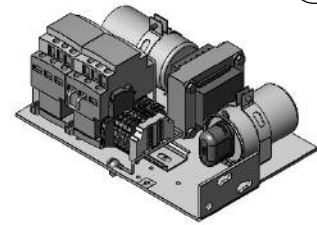


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	00000359	CONTACTOR BRACKET S/A	1
1.1	00000278	CONTACTOR BRACKET	1
1.2	35268	CLAMP	2
1.3	982873	MACHINE SCREW PAN HEAD	6
1.4	35279	START CAPACITOR	1
1.5	35285	RUN CAPACITOR INSULATOR	1
1.6	35278	CAPACITOR, RUN	1
1.7	20940	GROUND LABEL	1
1.8	29009	DIN-RAIL 4.50" LONG	1
1.9	982686	SCREW #10-32 UNF-2A X 3/8" SL	2
1.10	987873	LOCKWASHER #10 ASA MEDIUM	2
1.11	28905	REVERSING CONTACTOR	1
1.12	29015	TERMINAL STRIP END CLAMP	2
1.13	51845	JUMPER	1
1.14	51847	A2 TO A2	1
1.15	29034	JUMPER (R10)	1
1.16	29035	JUMPER (R4)	1
1.17	00000758	JUMPER V2 1 PHASE (R9)	1
1.18	29036	JUMPER (R2)	1
1.19	29037	JUMPER (R3)	1
1.20	00000755	JUMPER V2 1 PHASE (R7)	1
1.21	00000757	JUMPER V2 1 PHASE (R6)	1
1.22	51845	JUMPER	1

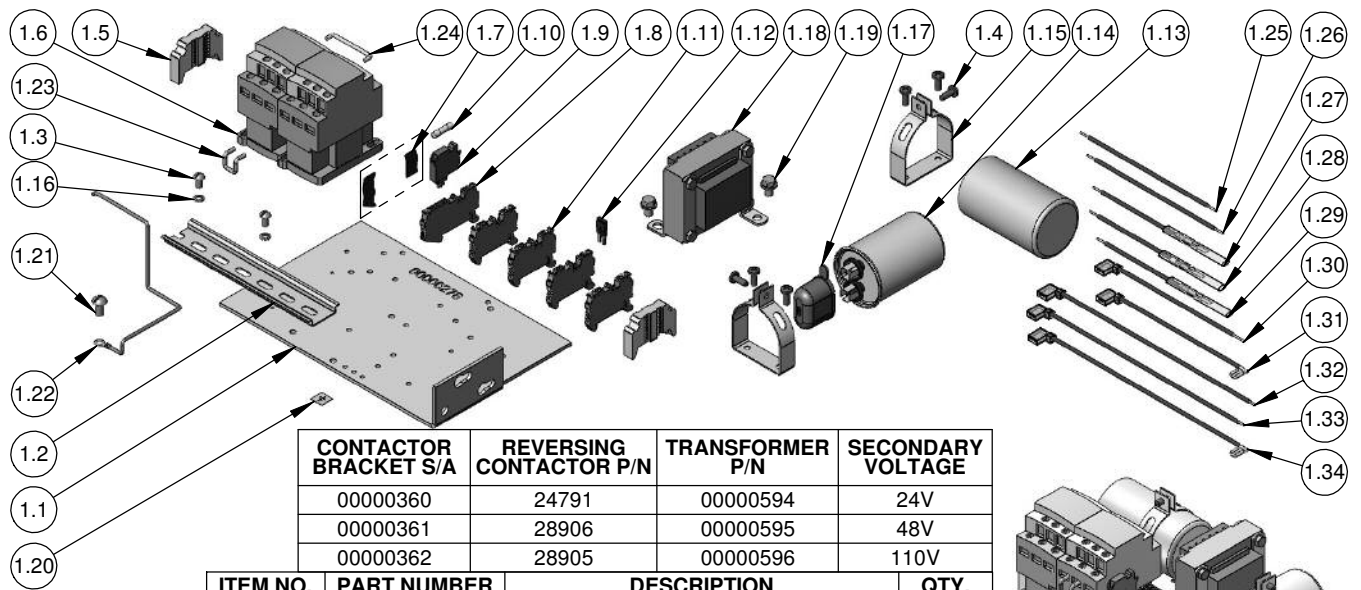
V2 CONTACTOR PLATE ASSEMBLY
 FOR USE WITH AC BRAKE
 110/115-1-50/60
 MODELS J, L, R & RT



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	CONTACTOR BKT S/A	1
1.1	00000278	CONTACTOR BRACKET	1
1.2	29010	DIN-RAIL 6.50" LONG	1
1.3	982686	SCREW #10-32 UNF-2A X 3/8" SL	2
1.4	982873	MACHINE SCREW PAN HEAD	6
1.5	29015	TERMINAL STRIP END CLAMP	2
1.6	SEE TABLE	REVERSING CONTACTOR	1
1.7	00000398	TERMINAL STRIP COVER SEGMENT	1
1.8	29018	FUSIBLE TERMINAL STRIP	1
1.9	29019	TERMINAL STRIP CARTRIDGE	1
1.10	00000393	FUSE-5MM X 20MM-500MA	1
1.11	29014	TERMINAL STRIP	4
1.12	29047	TERMINAL STRIP BRIDGE	2
1.13	35279	START CAPACITOR	1
1.14	35278	CAPACITOR, RUN	1
1.15	35268	CLAMP	2
1.16	987873	LOCKWASHER #10 ASA MEDIUM	2
1.17	35285	RUN CAPACITOR INSULATOR	1
1.18	SEE TABLE	TRANSFORMER-V2-110/115 PRIMARY	1
1.19	25861	SCREW 1/4-20 UNC-2A X 3/8" HEX	2
1.20	20940	GROUND LABEL	1
1.21	987827	SCREW 1/4-20 UNC-2A X 1/2"	1
1.22	27190	JUMPER-G/Y-#16 AWG	1
1.23	51845	JUMPER	1
1.24	51847	A2 TO A2	1
1.25	00000321	JUMPER (R12)	1
1.26	29038	JUMPER (R5)	1
1.27	29037	JUMPER (R3)	1
1.28	29036	JUMPER (R2)	1
1.29	29034	JUMPER (R10)	1
1.30	29035	JUMPER (R4)	1
1.31	00000755	JUMPER V2 1 PHASE (R7)	1
1.32	00000757	JUMPER V2 1 PHASE (R6)	1
1.33	00000758	JUMPER V2 1 PHASE (R9)	1

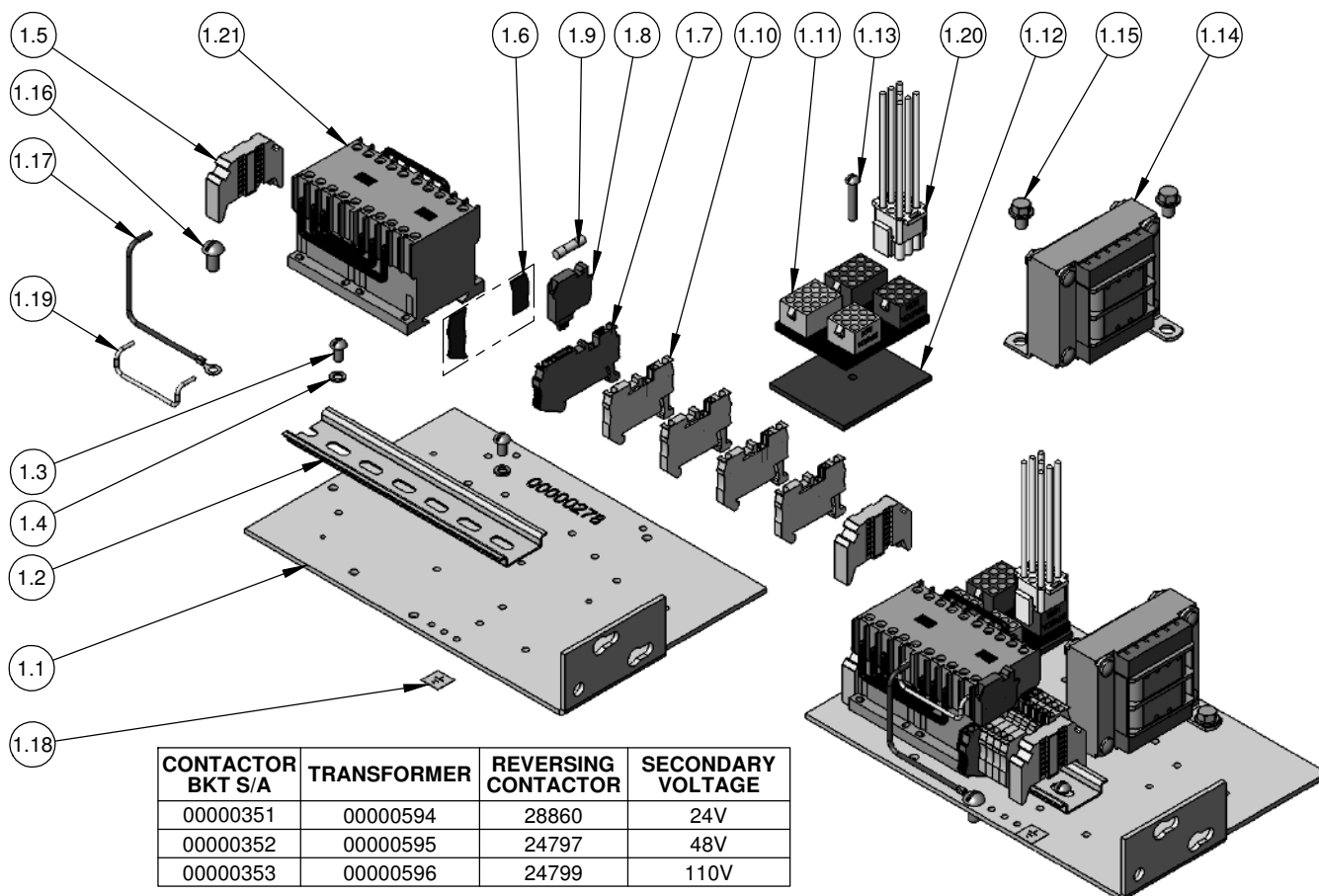


V2 CONTACTOR PLATE ASSEMBLY
FOR USE WITH AC BRAKE AND TRANSFORMER
110/115-1-50/60
MODELS J, L, R & RT



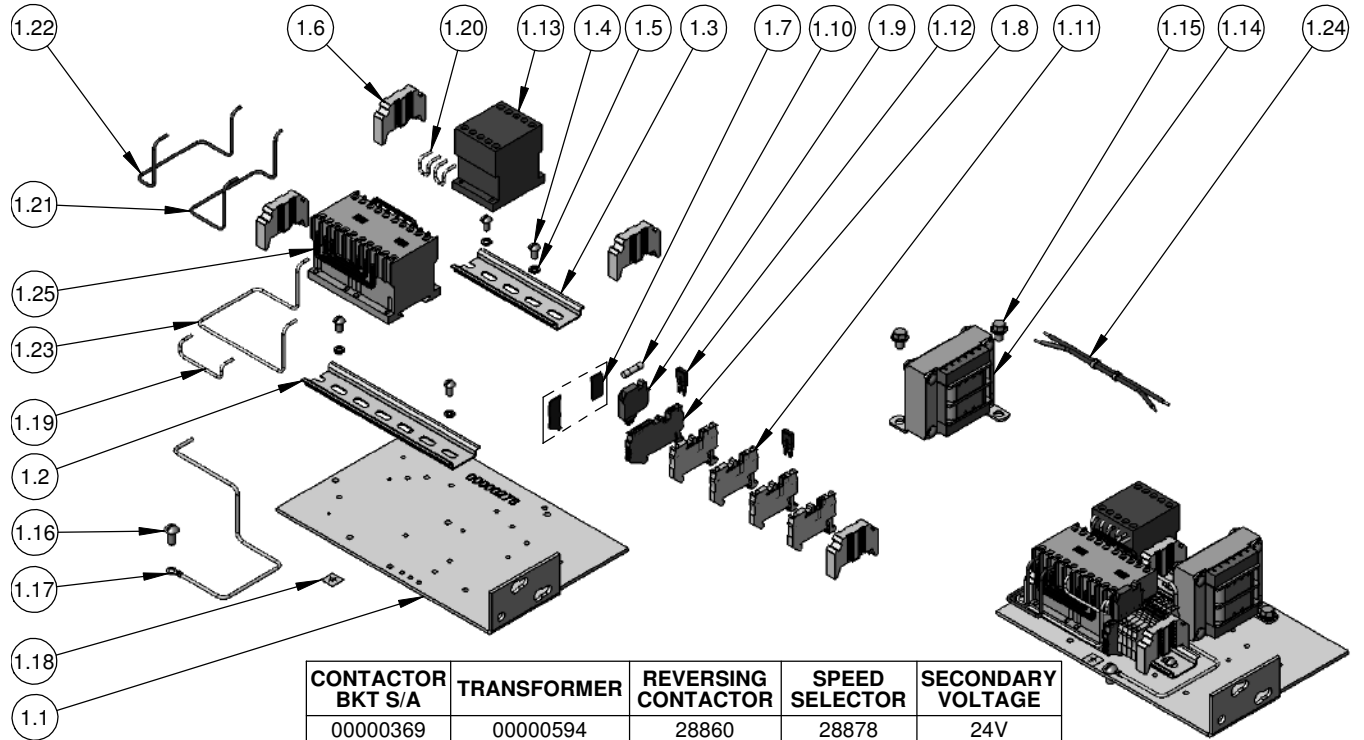
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	CONTACTOR BKT S/A	1
1.1	00000278	CONTACTOR BRACKET	1
1.2	29010	DIN-RAIL 6.50" LONG	1
1.3	982686	SCREW #10-32 UNF-2A X 3/8" SL	2
1.4	982873	MACHINE SCREW PAN HEAD	6
1.5	29015	TERMINAL STRIP END CLAMP	2
1.6	SEE TABLE	REVERSING CONTACTOR	1
1.7	00000398	TERMINAL STRIP COVER SEGMENT	1
1.8	29018	FUSIBLE TERMINAL STRIP	1
1.9	29019	TERMINAL STRIP CARTRIDGE	1
1.10	00000393	FUSE-5MM X 20MM-500MA	1
1.11	29014	TERMINAL STRIP	4
1.12	29047	TERMINAL STRIP BRIDGE	1
1.13	35279	START CAPACITOR	1
1.14	35278	CAPACITOR, RUN	1
1.15	35268	CLAMP	2
1.16	987873	LOCKWASHER #10 ASA MEDIUM	2
1.17	35285	RUN CAPACITOR INSULATOR	1
1.18	SEE TABLE	TRANSFORMER-V2-230/460 PRIMARY	1
1.19	25861	SCREW 1/4-20 UNC-2A X 3/8" HEX	2
1.20	20940	GROUND LABEL	1
1.21	987827	SCREW 1/4-20 UNC-2A X 1/2"	1
1.22	27190	JUMPER-G/Y-#16 AWG	1
1.23	51845	JUMPER	1
1.24	51847	A2 TO A2	1
1.25	00000321	JUMPER (R12)	1
1.26	00000336	JUMPER (R12)	1
1.27	29038	JUMPER (R5)	1
1.28	29037	JUMPER (R3)	1
1.29	29036	JUMPER (R2)	1
1.30	29034	JUMPER (R10)	1
1.31	29035	JUMPER (R4)	1
1.32	00000755	JUMPER V2 1 PHASE (R7)	1
1.33	00000757	JUMPER V2 1 PHASE (R6)	1
1.34	00000758	JUMPER V2 1 PHASE (R9)	1

**V2 CONTACTOR PLATE ASSEMBLY
FOR USE WITH AC BRAKE
1-SPEED UNITS
220/230-1-50/60
MODELS J, L, R & RT**



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	CONTACTOR BKT S/A	1
1.1	00000278	CONTACTOR BRACKET	1
1.2	29010	DIN-RAIL 6.50" LONG	1
1.3	982686	SCREW #10-32 UNF-2A X 3/8" SL	2
1.4	987873	LOCKWASHER #10 ASA MEDIUM	2
1.5	29015	TERMINAL STRIP END CLAMP	2
1.6	00000398	TERMINAL STRIP COVER SEGMENT	1
1.7	29018	FUSIBLE TERMINAL STRIP	1
1.8	29019	TERMINAL STRIP CARTRIDGE	1
1.9	00000393	FUSE-5MM X 20MM-500MA	1
1.10	29014	TERMINAL STRIP	4
1.11	27672	VOLTAGE CHANGE BOARD	1
1.12	27685	VOLTAGE CHANGE BOARD INSULATOR	1
1.13	987862	SCREW #8-32UNC-2A X 1"	1
1.14	SEE TABLE	TRANSFORMER-V2-230/460	1
1.15	25861	SCREW 1/4-20 UNC-2A X 3/8" HEX	2
1.16	987827	SCREW 1/4-20 UNC-2A X 1/2"	1
1.17	27189	JUMPER-G/Y-#16 AWG	1
1.18	20940	GROUND LABEL	1
1.19	51847	JUMPER	1
1.20	00000746	HARNESS-V2-CONTACTOR/XFORMER	1
1.21	SEE TABLE	REVERSING CONTACTOR	1

**V2 CONTACTOR PLATE ASSEMBLY
FOR USE WITH AC BRAKE
1-SPEED, DUAL VOLTAGE UNITS
220/230-380/415/460-3-50/60
MODELS J, JJ, L, LL, R, RR, RT & RRT**

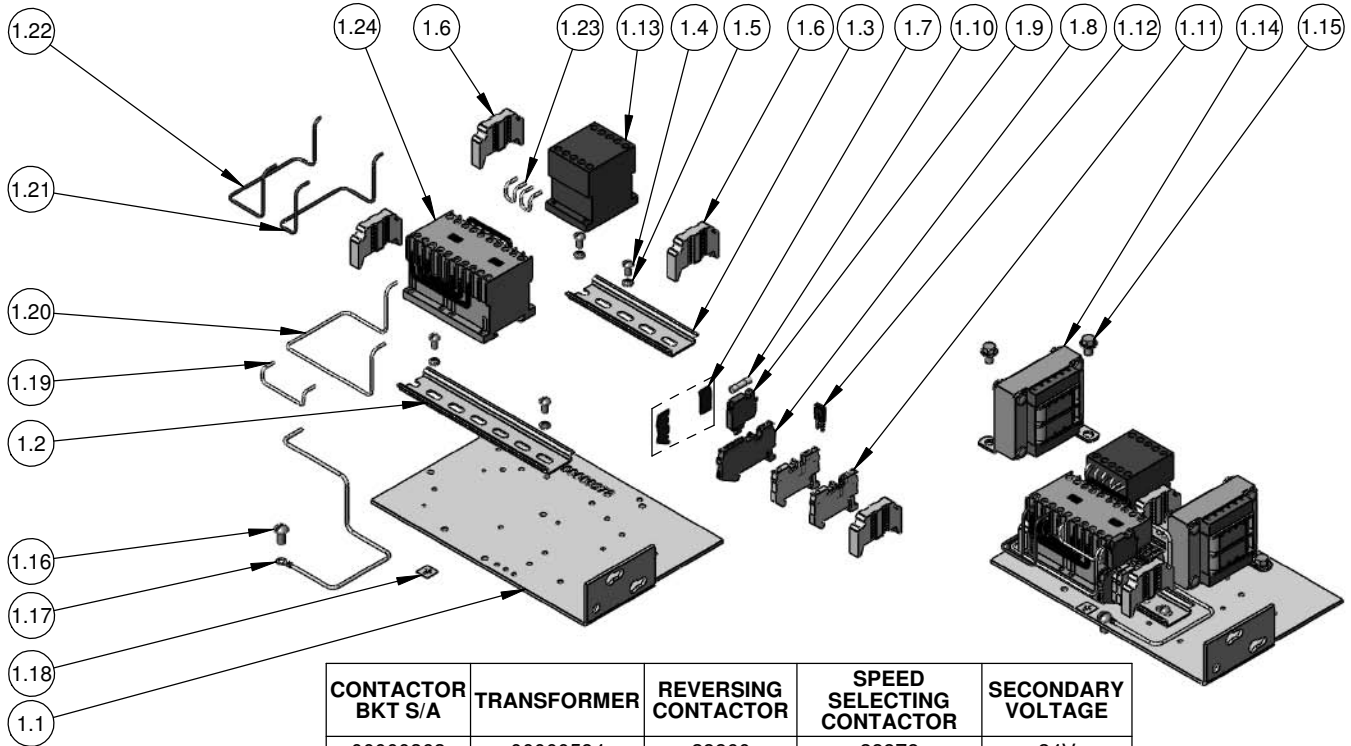


CONTACTOR BKT S/A	TRANSFORMER	REVERSING CONTACTOR	SPEED SELECTOR	SECONDARY VOLTAGE
00000369	00000594	28860	28878	24V
00000370	00000595	24797	28871	48V
00000371	00000596	24799	28870	110V

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	CONTACTOR BKT S/A	1
1.1	00000278	CONTACTOR BRACKET	1
1.2	29010	DIN-RAIL 6.50" LONG	1
1.3	29009	DIN-RAIL 4.50" LONG	1
1.4	982686	SCREW #10-32 UNF-2A X 3/8" SL	4
1.5	987873	LOCKWASHER #10 ASA MEDIUM	4
1.6	29015	TERMINAL STRIP END CLAMP	4
1.7	00000398	TERMINAL STRIP COVER SEGMENT	1
1.8	29018	FUSIBLE TERMINAL STRIP	1
1.9	29019	TERMINAL STRIP CARTRIDGE	1
1.10	00000393	FUSE-5MM X 20MM-500MA	1
1.11	29014	TERMINAL STRIP	4
1.12	29047	TERMINAL STRIP BRIDGE	2
1.13	SEE TABLE	CONTACTOR	1
1.14	SEE TABLE	TRANSFORMER-V2-230/460	1
1.15	25861	SCREW 1/4-20 UNC-2A X 3/8" HEX	2
1.16	987827	SCREW 1/4-20 UNC-2A X 1/2"	1
1.17	27189	JUMPER-G/Y-#16 AWG	1
1.18	20940	GROUND LABEL	1
1.19	51847	JUMPER	1
1.20	51845	JUMPER	2
1.21	27652	JUMPER (R4)	1
1.22	27657	JUMPER (R5)	1
1.23	27736	JUMPER (W5)	1
1.24	00000327	'H5/H6' JUMPER HARNESS	1
1.25	SEE TABLE	REVERSING CONTACTOR	1

**V2 CONTACTOR PLATE ASSEMBLY
FOR USE WITH AC BRAKE
2-SPEED UNITS
220/230-3-50/60**

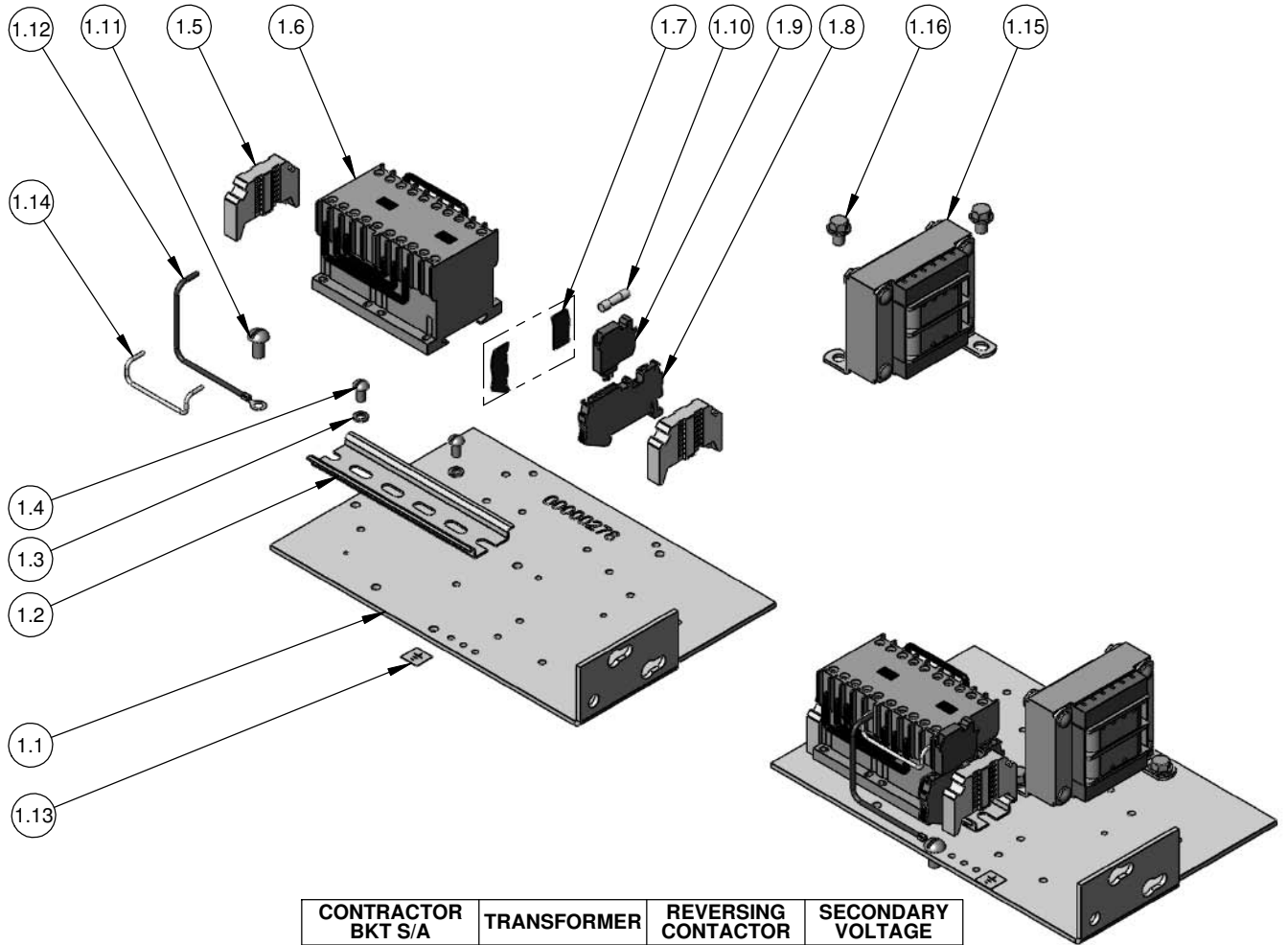
MODELS J-2, JJ-2, L-2, LL-2, R-2, RR-2, RT-2 & RRT-2



CONTACTOR BKT S/A	TRANSFORMER	REVERSING CONTACTOR	SPEED SELECTING CONTACTOR	SECONDARY VOLTAGE
00000363	00000594	28860	28878	24V
00000364	00000595	24797	28871	48V
00000365	00000596	24799	28870	110V

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	CONTACTOR BKT S/A	1
1.1	00000278	CONTACTOR BRACKET	1
1.2	29010	DIN-RAIL 6.50" LONG	1
1.3	29009	DIN-RAIL 4.50" LONG	1
1.4	982686	SCREW #10-32 UNF-2A X 3/8" SL	4
1.5	987873	LOCKWASHER #10 ASA MEDIUM	4
1.6	29015	TERMINAL STRIP END CLAMP	4
1.7	00000398	TERMINAL STRIP COVER SEGMENT	1
1.8	29018	FUSIBLE TERMINAL STRIP	1
1.9	29019	TERMINAL STRIP CARTRIDGE	1
1.10	00000393	FUSE-5MM X 20MM-500MA	1
1.11	29014	TERMINAL STRIP	2
1.12	29047	TERMINAL STRIP BRIDGE	1
1.13	SEE TABLE	CONTACTOR	1
1.14	SEE TABLE	TRANSFORMER-V2-230/460	1
1.15	25861	SCREW 1/4-20 UNC-2A X 3/8" HEX	2
1.16	987827	SCREW 1/4-20 UNC-2A X 1/2"	1
1.17	27189	JUMPER-G/Y-#16 AWG	1
1.18	20940	GROUND LABEL	1
1.19	51847	JUMPER	1
1.20	27736	JUMPER (W5)	1
1.21	27657	JUMPER (R5)	1
1.22	27652	JUMPER (R4)	1
1.23	51845	JUMPER	2
1.24	SEE TABLE	REVERSING CONTACTOR	1

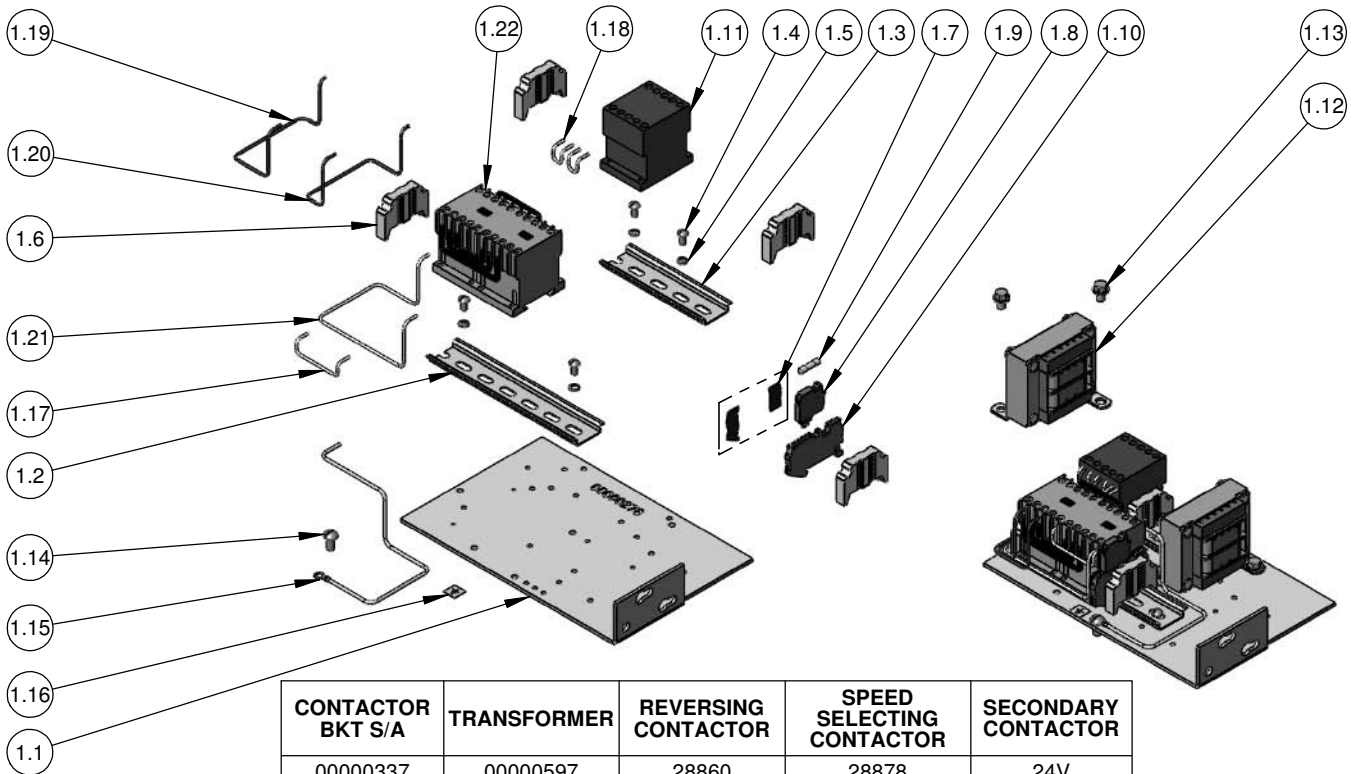
V2 CONTACTOR PLATE ASSEMBLY
FOR USE WITH AC BRAKE
2-SPEED UNITS
380/415/460-3-50/60
MODELS J-2, JJ-2, L-2, LL-2, R-2, RR-2, RT-2 & RRT-2



CONTRACTOR BKT S/A	TRANSFORMER	REVERSING CONTACTOR	SECONDARY VOLTAGE
00000354	00000597	28860	24V
00000355	00000598	24797	48V
00000356	00000599	24799	110V

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	CONTACTOR BKT S/A	1
1.1	00000278	CONTACTOR BRACKET	1
1.2	29312	DIN-RAIL 5.00" LONG	1
1.3	987873	LOCKWASHER #10 ASA MEDIUM	2
1.4	982686	SCREW #10-32 UNF-2A X 3/8" SL	2
1.5	29015	TERMINAL STRIP END CLAMP	2
1.6	SEE TABLE	REVERSING CONTACTOR	1
1.7	00000398	TERMINAL STRIP COVER SEGMENT	1
1.8	29018	FUSIBLE TERMINAL STRIP	1
1.9	29019	TERMINAL STRIP CARTRIDGE	1
1.10	00000393	FUSE-5MM X 20MM-500MA	1
1.11	987827	SCREW 1/4-20 UNC-2A X 1/2"	1
1.12	27189	JUMPER-G/Y-#16 AWG	1
1.13	20940	GROUND LABEL	1
1.14	51847	JUMPER	1
1.15	SEE TABLE	TRANSFORMER-V2-575V PRIMARY	1
1.16	25861	SCREW 1/4-20 UNC-2A X 3/8" HEX	2

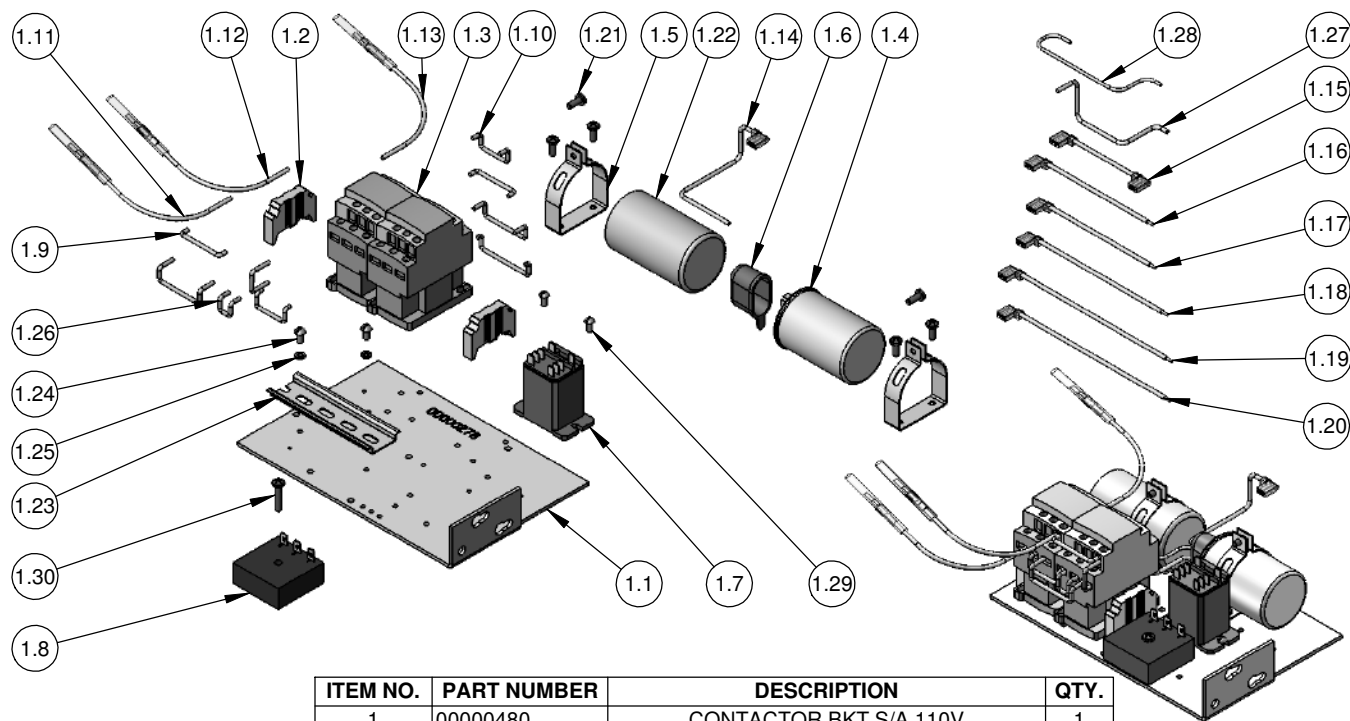
V2 CONTACTOR PLATE ASSEMBLY
FOR USE WITH AC BRAKE
550/575-3-50/60
MODELS J, JJ, L, LL, R, RR, RT & RRT



CONTACTOR BKT S/A	TRANSFORMER	REVERSING CONTACTOR	SPEED SELECTING CONTACTOR	SECONDARY CONTACTOR
00000337	00000597	28860	28878	24V
00000338	00000598	24797	28871	48V
00000339	00000599	24799	28870	110V

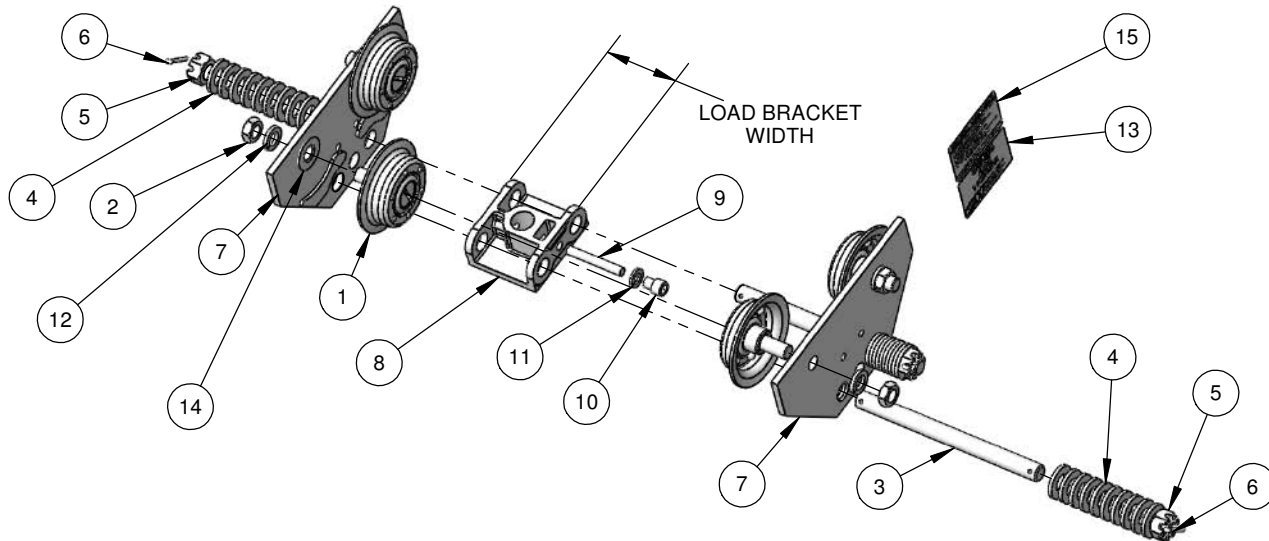
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SEE TABLE	CONTACTOR BKT S/A	1
1.1	00000278	CONTACTOR BRACKET	1
1.2	29010	DIN-RAIL 6.50" LONG	1
1.3	29009	DIN-RAIL 4.50" LONG	1
1.4	982686	SCREW #10-32 UNF-2A X 3/8" SL	4
1.5	987873	LOCKWASHER #10 ASA MEDIUM	4
1.6	29015	TERMINAL STRIP END CLAMP	4
1.7	00000398	TERMINAL STRIP COVER SEGMENT	1
1.8	29019	TERMINAL STRIP CARTRIDGE	1
1.9	00000393	FUSE-5MM X 20MM-500MA	1
1.10	29018	FUSIBLE TERMINAL STRIP	1
1.11	SEE TABLE	CONTACTOR	1
1.12	SEE TABLE	TRANSFORMER-V2-230/460	1
1.13	25861	SCREW 1/4-20 UNC-2A X 3/8" HEX	2
1.14	987827	SCREW 1/4-20 UNC-2A X 1/2"	1
1.15	27189	JUMPER-G/Y-#16 AWG	1
1.16	20940	GROUND LABEL	1
1.17	51847	JUMPER	1
1.18	51845	JUMPER	2
1.19	27652	JUMPER (R4)	1
1.20	27657	JUMPER (R5)	1
1.21	27736	JUMPER (W5)	1
1.22	SEE TABLE	REVERSING CONTACTOR	1

V2 CONTACTOR PLATE ASSEMBLY
FOR USE WITH AC BRAKE
2-SPEED UNITS
550/575-3-50/60
MODELS J-2, JJ-2, L-2, LL-2, R-2, RR-2, RT-2 & RRT-2



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	00000480	CONTACTOR BKT S/A 110V	1
1.1	00000278	CONTACTOR BRACKET	1
1.2	29015	TERMINAL STRIP END CLAMP	2
1.3	28905	REVERSING CONTACTOR	1
1.4	35278	CAPACITOR, RUN	1
1.5	35268	CLAMP	2
1.6	35285	RUN CAPACITOR INSULATOR	1
1.7	82804	MONITOR RELAY	1
1.8	28558	TIMER	1
1.9	51847	A2 TO A2	2
1.10	51846	JUMPER	6
1.11	29037	JUMPER (R3)	1
1.12	29036	JUMPER (R2)	1
1.13	29038	JUMPER R5	1
1.14	00000758	JUMPER V2 1 PHASE (R9)	1
1.15	27436	JUMPER W6	1
1.16	27437	JUMPER W7	1
1.17	27438	JUMPER W8	1
1.18	27439	JUMPER W9	1
1.19	27440	JUMPER W10	1
1.20	27443	JUMPER W13	1
1.21	982873	MACHINE SCREW PAN HEAD	6
1.22	35279	START CAPACITOR	1
1.23	29009	DIN-RAIL 4.50" LONG	1
1.24	982686	MACHINE SCREW SLOTTED ROUND HD	2
1.25	987873	LOCKWASHER #10 ASA MEDIUM	2
1.26	51845	JUMPER	1
1.27	29034	JUMPER (R10)	1
1.28	29035	JUMPER (R4)	1
1.29	982683	MACHINE SCREW SLOTTED ROUND HD	2
1.30	987817	MACHINE SCREW PAN HEAD	1

V2 CONTACTOR PLATE ASSEMBLY
FOR USE WITH AC BRAKE
DOWN CREEP CONTROL
110/115-1-50/60
MODELS J, L, R & RT



ITEM NO.	DESCRIPTION	PART NUMBER		QTY.	
		1 TON UNITS	2 TON UNITS	1 TON UNITS	2 TON UNITS
1	TRACK WHEEL	35774	50762	4	4
2	TRACK WHEEL STUD NUT	982520	948804	4	4
3	SUSPENSION BOLT (SPECIAL ALLOY STEEL BOLT)				
	*9 5/32" LONG	35450	-	2	-
	**10 1/4" LONG	35407	-	2	-
	† 10" LONG	-	35445	-	2
4	TROLLEY SPACER WASHERS				
	* 0.165" THICK	35782	-	40	-
	**0.125" THICK	958822	-	38	-
	† 0.165" THICK	-	35783	-	32
5	SUSPENSION NUT	948803	958818	4	4
6	SUSPENSION COTTER PIN	988343	988368	4	4
7	***SIDE FRAME, PLAIN SIDE, W/O TROLLEY GUARDS	35640	35654	2	2
	***SIDE FRAME, PLAIN SIDE, W/ TROLLEY GUARDS	35635	35636	2	2
	***SIDE FRAME, I.D. PLATE SIDE, W/ TROLLEY GUARDS	35640	35654	2	2
	***SIDE FRAME, I.D. PLATE SIDE, W/O TROLLEY GUARDS	35635	35636	2	2
8	LOAD BRACKET				
	* 3 7/16" WIDE	35019	-	1	-
	**5 13/32" WIDE	35024	-	1	-
	† 4 3/16" WIDE	-	35033	-	1
9	VERTICAL LOAD BAR PIN (SPECIAL ALLOY STEEL PIN)				
	*2 11/16" LONG	35371	-	1	-
	**2 7/8" LONG	-	35413	-	1
	† 3 3/4" LONG	-	35400	-	1
10	VERTICAL LOAD BAR PIN SCREW				
	*1/2" LONG	982383	-	1	-
	**1 1/4" LONG	982386	-	1	-
	† 3/4" LONG	-	982433	-	1
11	VERTICAL LOAD BAR PIN SCREW LOCKWASHER	983548	983547	1	1
12	TRACK WHEEL STUD NUT LOCKWASHER	987923	987924	4	4
13	IDENTIFICATION LABEL	36916	36917	1	1
14	TRACK WHEEL WASHER	-	987903	-	4
15	WARNING LABEL	936984		1	1

* THESE ITEMS ARE FOR THE 1-TON TROLLEY FOR OPERATION ON 2.66" THRU 5.64" FLANGE WIDTHS

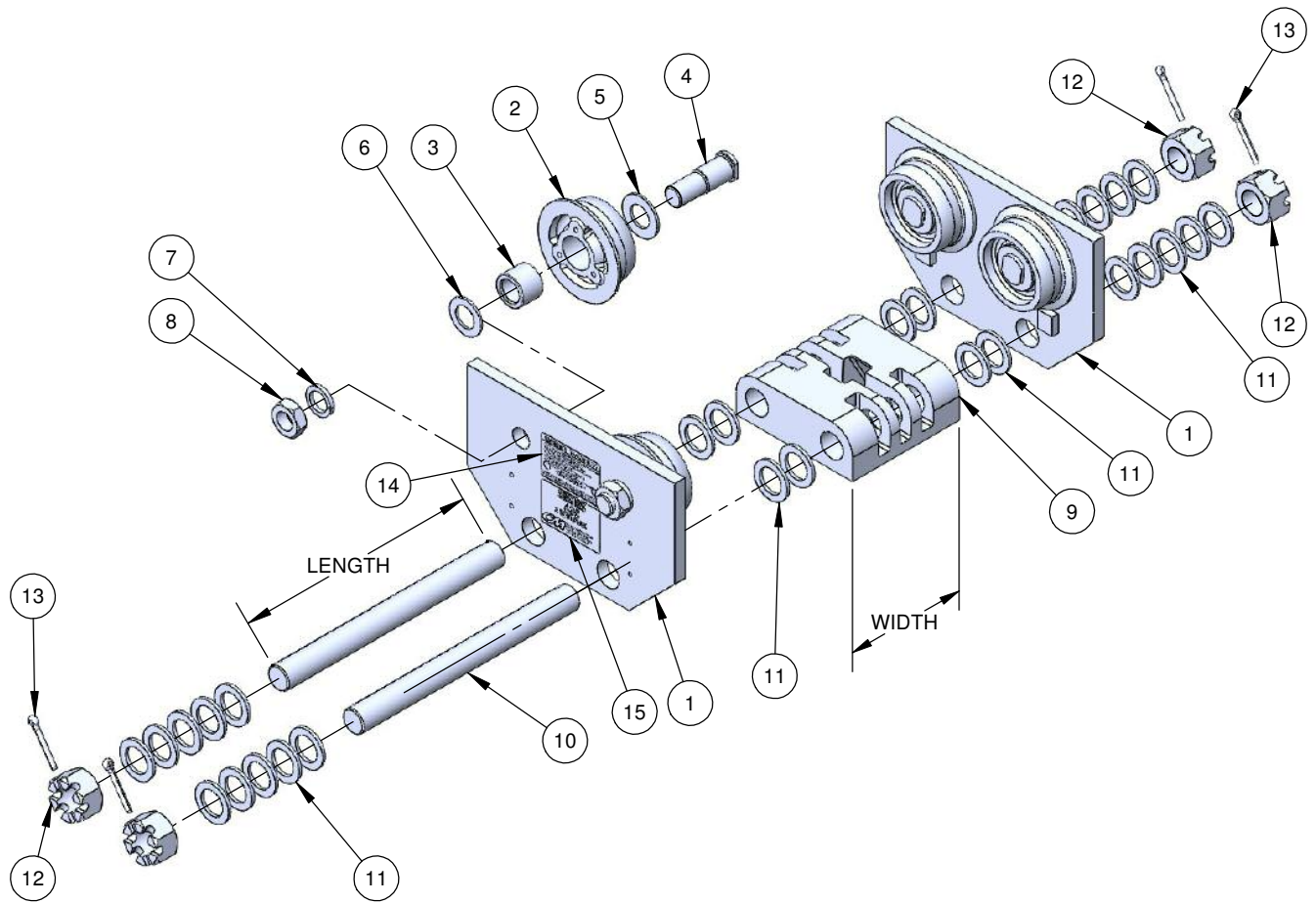
** THESE ITEMS ARE FOR THE 1-TON TROLLEY FOR OPERATION ON OVER 5.64" THRU 7.00" FLANGE WIDTHS

*** IF SIDE FRAME IS EQUIPPED WITH SPACER BLOCK, CONTACT FACTORY

+ THESE ITEMS ARE FOR THE 2-TON TROLLEY FOR OPERATION ON 3.33" THRU 6.00" FLANGE WIDTHS

++ THESE ITEMS ARE FOR THE 2-TON TROLLEY FOR OPERATION ON OVER 6.00" THRU 8.25" FLANGE WIDTHS

1 AND 2 TON 635 LOW HEADROOM TROLLEYS



ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
1	SIDE FRAME-PLAIN SIDE (DOES NOT INCLUDE WHEELS)		2
	4.00" THRU 5.63" FLANGE WIDTH	36696	
	5.63" THRU 7.25" FLANGE WIDTH	36629	
	FLANGE OVER 7.25"	CONTACT FACTORY	
	IF FRAME IS EQUIPPED WITH TROLLEY GUARDS	CONTACT FACTORY	
2	TRACKWHEEL	39002	4
3	TRACKWHEEL BEARING	82113	4
4	TRACKWHEEL STUD	36361	4
5	TRACKWHEEL WASHER-STEEL	81014	4
6	TRACKWHEEL WASHER-OILITE	82046	4
7	TRACKWHEEL STUD LOCKWASHER	987926	4
8	TRACKWHEEL STUD NUT	988155	4
9	LOAD BRACKET		1
	4 13/16" WIDE	36012	
	6 7/16" WIDE	36021	
10	SUSPENSION BOLT		2
	10 31/32" LONG, FOR 4.0" THRU 5.63" FLANGE	36367	
	13 3/32" FOR OVER 5.63" THRU 7.25" FLANGE	36380	
	FLANGE OVER 7.25"	CONTACT FACTORY	
11	SPACER WASHER	936827	30
12	SUSPENSION NUT	945835	4
13	SUSPENSION COTTER PIN	988382	4
14	WARNING LABEL	936984	1
15	IDENTIFICATION LABEL	936829	1

3 TON 635 LOW HEADROOM TROLLEY

LUBRICANTS

Part Number for Packaged Lubricants Used in the Lodestar Electric Chain Hoists (Refer to page 21 for Lubrication Instructions)		
Lubricant Usage	Type of Lubricant	Part Numbers and Packaged Quantity of Lubricants
Hoist Gears	Grease (Special)	Contact Factory
Load Chain	Oil	28608 for 1 Pint Can 28619 for 1 Gal Can
Limit Switch Shaft Threads	*Oil	"3 in 1" or Light Machine Oil-obtain locally
Lower Hook Thrust Bearing	*Oil	Heavy Machine Oil-obtain locally

*These oils are not furnished by CM in Packaged Quantities. When ordering lubricants, specify the type of lubricant, part number and packages quantity required.

Touch-up Paints for Lodestar Electric Chain Hoists:

Hoist Order *(1) case (12-12 oz. Aerosol Cans) of **Black** Touch-up paints Part Number 84189.

Hoist Order *(1) case (12-12 oz. Aerosol Cans) of **Orange** Touch-Up paint Part Number 84190.

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

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

RECOMMENDED SPARE PARTS

To insure continued service of the Lodestar Hoist, 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.

Part Description	Models A-H	Models J-RRT	Qty Required for Each Hoist
Limit Switch Kit	31631	31636	1
Brake Coil (AC Brake Only)	See Page 94	See Page 95	1
Brake Friction Disc/Rotor	See Pages 92 & 94	See Pages 93 & 95	1 or 2
Solid State Reverse Switch (Single Phase Units Only)	27257	35499	1
Start Capacitor (Single Phase Units Only)	27716	35279	1
Run Capacitor (Single Phase Units Only)	-	35278	
Transformer	See Pages 76-79	See Pages 108-119, 128-134	0 or 1
Control Station Hardware Kit w/ Gasket	See Pages 96-98	See Pages 96-98	1
Control Station Button Insert Kit	See Pages 96-98	See Pages 96-98	1
Contactors	See Pages 99-106, 120-126	See Pages 107-119, 127-135	1
Fuse - 500mA	00000393	00000393	
Speed Selector Relay (2-Speed Units Only)	See Contactor Plate Details: Pages 99-106, 120-126	See Contactor Plate Details: Pages 107-119, 127-135	1
CM Terminal Pin-Extraction Tool (Dual Voltage Only)	27163	27163	1

NOTES

WARRANTY INFORMATION

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 occurs.

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 CM replacement parts

For the name of the nearest parts or service center, visit our website or call our customer service department.



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