

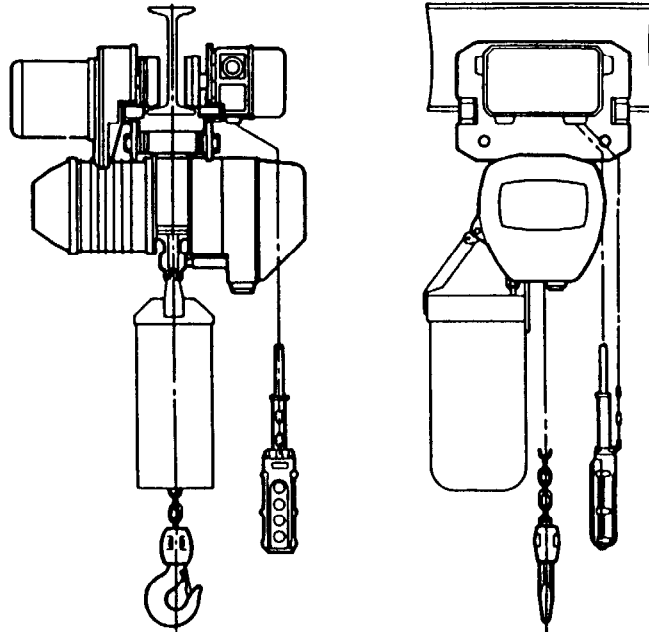
OPERATION AND MAINTENANCE MANUAL

for

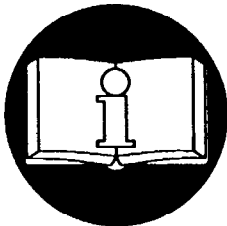
HARD-WIRED

MODEL LE ELECTRIC CHAIN HOIST

MANUAL SUPPLEMENT*



* This supplement should be used in conjunction with the "Lectra Link" LE Series Electric Chain Hoist Operation and Maintenance Manual Form MHD56022.



READ THIS SUPPLEMENT BEFORE USING THESE PRODUCTS. This supplement contains important safety, installation, operation and maintenance information. Make this supplement available to all persons responsible for the operation, installation and maintenance of these products.

▲ WARNING

Do not use this hoist for lifting, supporting, or transporting people or lifting or supporting loads over people.

Always operate, inspect and maintain this Hoist in accordance with American National Standards Institute Safety Code (B30.16) and any other applicable safety codes and regulations.

Refer all communications to the nearest Ingersoll-Rand Material Handling Products Office or Distributor.

Form MHD56013
Edition 3
71078398
July 1992

© 1992 Ingersoll-Rand Company

INGERSOLL-RAND®
MATERIAL HANDLING

SAFETY INFORMATION

This manual provides important information for all personnel involved with the safe operation, installation and proper maintenance of this product. Even if you feel you are familiar with this or similar equipment, you must read and understand this manual before operating the product.

Danger, Warning, Caution and Notice

Throughout this manual, there are steps and procedures which, if not followed, may result in a hazard. The following signal words are used to identify the level of potential hazard.

⚠ DANGER Danger is used to indicate the presence of a hazard which *will* cause *severe* personal injury, death, or substantial property damage if the warning is ignored.

⚠ WARNING Warning is used to indicate the presence of a hazard which *can* cause *severe* personal injury, death, or substantial property damage if the warning is ignored.

⚠ CAUTION Caution is used to indicate the presence of a hazard which *will* or can cause *minor* personal injury or property damage if the warning is ignored.

NOTICE Notice is used to notify people of installation, operation, or maintenance information which is important but not hazard-related.

Safety Summary

⚠ WARNING

- Do not use this hoist for lifting, supporting, or transporting people or lifting or supporting loads over people.
- The supporting structures and load-attaching devices used in conjunction with this hoist must provide an adequate safety factor to handle the rated load, plus the weight of the hoist. If in doubt, consult a qualified structural engineer.
- Electrical installation should be performed by licensed electricians in accordance with the latest edition of the National Electric Code (ANSI/NFPA 70) and any applicable local, state and national electrical codes and ordinances.

The National Safety Council, Accident Prevention Manual for Industrial Operations, Eighth Edition, and other recognized safety sources make a common point: Employees who work near cranes or assist in hooking on or arranging a load should be instructed to keep out from under the load.

From a safety standpoint, one factor is paramount: conduct all lifting operations in such a manner that if there were an equipment failure, no personnel would be injured. This means keep out from under a raised load and keep out of the line of force of any load.

To our interpretation, INGERSOLL-RAND Material Handling hoists are manufactured in accordance with the latest ASME B30.16 standards.

However, contrary to common belief, the Occupational Safety and Health Act of 1970, as we understand it, generally places the burden of compliance with the user, not the manufacturer. Many OSHA requirements are not concerned or connected with the manufactured product but are, rather, connected with the final installation: "It is the owner's responsibility and user's responsibility to determine the suitability of a product for any particular use. Check all applicable industry, trade association, federal, state and local regulations. Read all operating instructions and warnings before operation."

Rigging: It is the responsibility of the operator to exercise caution, use common sense and be familiar with proper rigging techniques. See ANSI/ASME B30.9 for rigging information, American National Standards Institute, 1430 Broadway, New York, NY 10018.

NOTICE

- Using other than genuine INGERSOLL-RAND Material Handling Products parts will result in the void of warranty.
- Hoists returned with opened, bent or twisted hooks, or without chain and hooks, will not be repaired or replaced under warranty.

ELECTRICAL CONNECTIONS FOR INSTALLING HOIST TO TROLLEY

⚠ WARNING

• Before connecting, read safety instructions in *Operation and Maintenance manual*.

Wires (leads) can be identified by color, or in the case of motor wires, by numbers taped to each wire. Terminals are identified by raised letters or labels on the terminal blocks. Cables need crimp terminals, ring tongue type, on the end of each wire.

Some terminals have more than one wire attached. When changing the connections of wires, it is recommended that only one wire be changed at a time to avoid confusion. See the appropriate wiring diagram for specific connections.

To make the electrical connections for hoist and/or trolley, perform the following steps:

1. If a motorized trolley is used, connect the two trolley cables, which provide hoist power and hoist control, to the hoist. See "Hoist to Motorized Trolley Electrical Connections." See the cabling diagram for the general layout of the cables.
2. Connect the power supply. See "Power Supply Connection."

Hoist to Motorized Trolley Electrical Connections

The power and control cables for the hoist must be hard-wired from the trolley connecting station into the hoist controller.

Hoist Control Connection: (See Trolley Control Station Parts in this Addendum)

1. Remove the socket bolts attaching the hoist controller cover. Remove the controller cover.

2. Insert cable 5C (10) into the pendant hole on the hoist body. When facing the trolley connecting station cover, the control cable is the upper cable on the left side.
3. Connect the control cable 5C (10) wires to the appropriate terminals on the electromagnetic contactor and transformer. See the appropriate wiring diagram.

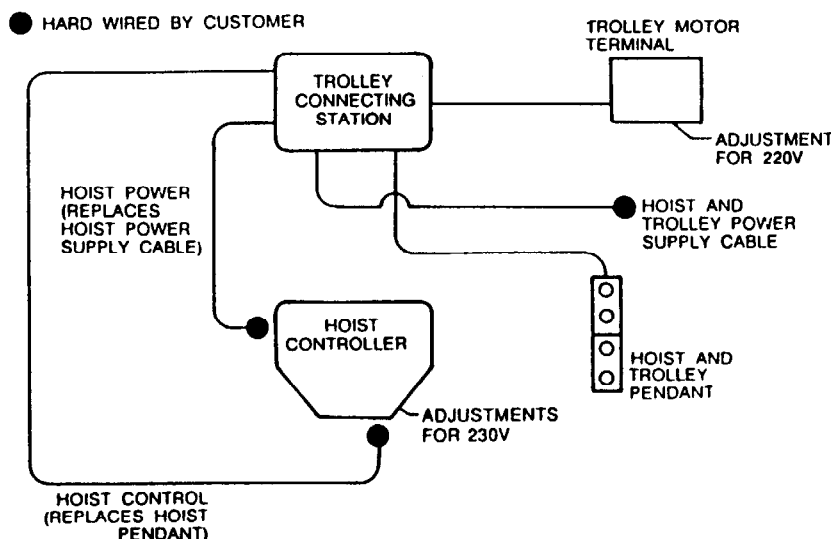
NOTICE

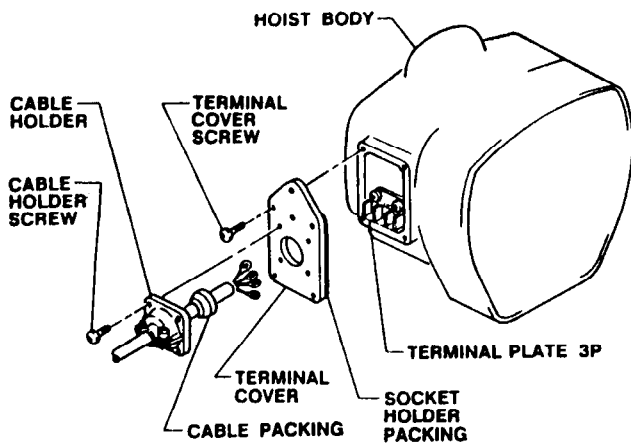
• If it becomes necessary to increase the length of the wires, loosen and slide clamp (14) down cable 5C (10). Cut the outer insulation of cable 5C (10) back to free the enclosed wires. Retighten clamp (14).

4. Align the screw holes in the socket holder packing B (20, Hoist Control Station Parts) and the cable holder ((15) for LE1 to LE3 or (18) for LE4 and LE5).
5. Position cable holder (15 or 18) on hoist body and secure with machine screws (21).

Hoist Power Connection: (See Trolley Control Station Parts in this Addendum and "Power Supply Connection.")

1. Installing the hoist power supply cable requires accessing terminal plate 3P. Unscrew terminal cover machine screws. Remove the terminal cover.
2. Insert cable 4C (5) through the terminal cover. Place the socket holder packing over the end of cable 4C (5).
3. Connect wires of cable 4C (5) to terminal plate 3P. See the appropriate wiring diagram.
4. Position cable holder (7) of cable 4C on terminal cover. Attach with cable holder machine screws (20).
5. Position terminal cover and socket holder packing on the hoist body. Secure by installing terminal cover screws.





Power Supply Connection

⚠ CAUTION

- When installing the power cable, make sure it does not become twisted.

On a straight beam less than 50 feet (15 m) long, install a messenger wire system to support the power supply cable. On geared trolleys, install the messenger wire on the opposite side of the trolley as the trolley hand chain. An 1/8 to 1/4 inch (3 to 6 mm) wire rope is usually used to support the power supply cable hangers. On long straight beams or curved beams where the wire cannot be attached to the beam, install a cable trolley system to support the power supply cable.

Connect the hoist to the power supply in accordance with National Electric Code (ANSI/NFPA 70) and any applicable local, state and national electrical codes and ordinances.

1. Make sure you have the right power supply for the unit. If it becomes necessary to change the unit's voltage, see "Hoist Conversion between 230 V and 460 V Power Supply."
2. Make sure there are adequate circuit breakers or fuses.
3. Make sure all junction boxes and the disconnect switch enclosure are adequately sealed and protected for its environmental conditions.
4. Connect and ground the pig-tailed end of the power supply cable.

NOTICE

- The power supply cable has four wires. Red, black and white for power. Green and yellow striped for ground.

A special non-reversing relay protects the hoist from damage due to incorrect connections of the power supply. If the three power wires are connected incorrectly or if the motor is wired single phase (only two power wires are connected), the motor will not start. Make sure all three power wires are connected. If the hoist still does not start, reverse any two of the three power wires for a correct three phase connection.

Hoist Conversion between 230 V and 460 V Power Supply

⚠ CAUTION

- At the factory, either the hoist and trolley combination is wired to operate on 460 V, 60 Hz, 3 Phase power or the hoist and trolley combination is wired to operate on 230 V, 60 Hz, 3 Phase. Use the hoist only with the type of power it is wired for.

To convert the hoist and trolley from 230 V to 460 V or 460 V to 230 V, follow the procedure below. With the power disconnected:

For steps 1 through 4 below, refer to the appropriate wiring diagram.

1. Reconnect hoist motor leads:
For single speed hoists: U2, V2, W2, Y1 and Z1.
For dual speed hoists: U2, V2, W2, Y1 and Z1. Also reconnect: U4, V4, W4, Y3 and Z3.
 2. Reconnect transformer leads U1 and V.
 3. Reconnect white lead from nonreverse relay on transformer.
- For motorized trolley, also:
4. Reconnect trolley motor leads U2, V2, W2, Y1 and Z1.

Hoist or Trolley Pendant Cord Modification

To shorten or install new pendant cord:

⚠ WARNING

- Disconnect electric power before performing any maintenance.

1. Remove the pendant cord and strain relief cable from the hoist.
2. Cut the pendant cord and strain relief cable one foot longer than the desired cord length.
3. Strip back one foot of the outer insulation, exposing the colored wires.
4. Position each colored wire at its correct terminal and cut to required length. Strip back the insulation, exposing the inner copper wire 1/4 in. (7 mm). See the appropriate wiring diagram.
5. Crimp new ring connectors on the copper end of each colored wire and fasten to the correct terminals. See the appropriate wiring diagram.
6. Strip back the strain relief cable 3-1/8 in. (80 mm).
7. Slip a fixing sleeve (38, Trolley Control Station Parts) over the exposed end of the strain relief cable. Insert the end of the strain relief cable into the fixing sleeve until the end of the strain relief cable is flush with the end of the fixing sleeve to create a 1-1/4 in. (32 mm) loop. Crimp the fixing sleeve.

⚠ CAUTION

- To avoid damaging the pendant cord, make sure the strain relief cable, not the pendant cord, is supporting the weight of the pendant.

⚠ WARNING

- Never perform maintenance on the hoist while it is supporting a load.
- Before performing maintenance, tag controls: **DANGER - DO NOT OPERATE - EQUIPMENT BEING REPAIRED.**
- Disconnect electric power before performing maintenance.
- Only allow qualified personnel to perform maintenance.
- Hoist should be operated with no load in both directions before being returned to service.

Pendant Replacement

If the pendant contactors or inserts need replacement, the entire pendant body will have to be replaced.

1. Remove screws and spring washers attaching back of pendant.
2. Remove screws connecting all wires to contactor.

⚠ CAUTION

• Do not remove the screws which attach the contactor to the pendant.

3. Loosen or remove the two screws securing the cable clamp, located inside the pendant.
4. Remove the screws attaching the top of pendant to pendant body.
5. Slide top of pendant off bottom of packing.
6. Pull the pendant off the pendant cord.

NOTICE

• If the pendant top and packing is not going to be replaced, the pendant can now be attached.

7. Slide the pendant top and packing off the cord, if they are going to be replaced.
8. Remove the split pin and chain pin attaching the strain relief cable to the pendant top.
9. Remove the back, top and cord packing of the new pendant.
10. Slide pendant top over the packing.
11. Insert pendant cord through the narrow end of the cord packing.

NOTICE

• If it is difficult to slide the cord through the packing, lubricate the cord with bar soap.

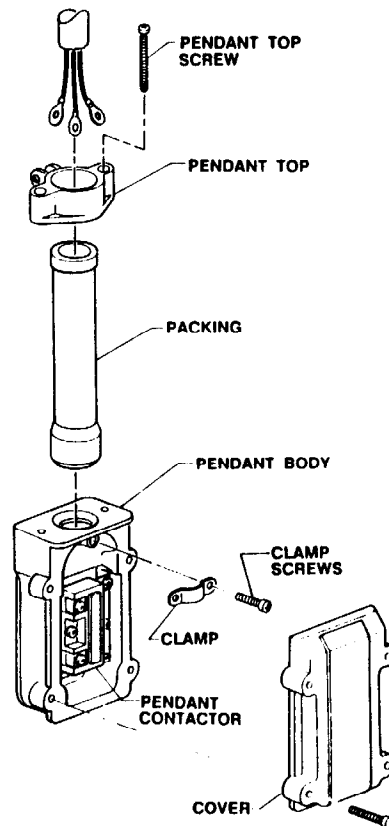
⚠ CAUTION

• Do not use oil as a lubricant as it will damage the rubber packing.

12. Connect wires to contactor. See appropriate wiring diagram.
13. Seat the cord on the inside of the pendant. Secure cord to pendant by installing clamp with the two clamp screws.
14. Slide pendant top down cable packing onto top of pendant and secure with the two pendant top screws.
15. Position back of pendant. Secure with screws.
16. Secure strain relief cable to pendant top with chain pin. Insert split pin into chain pin and bend ends back.

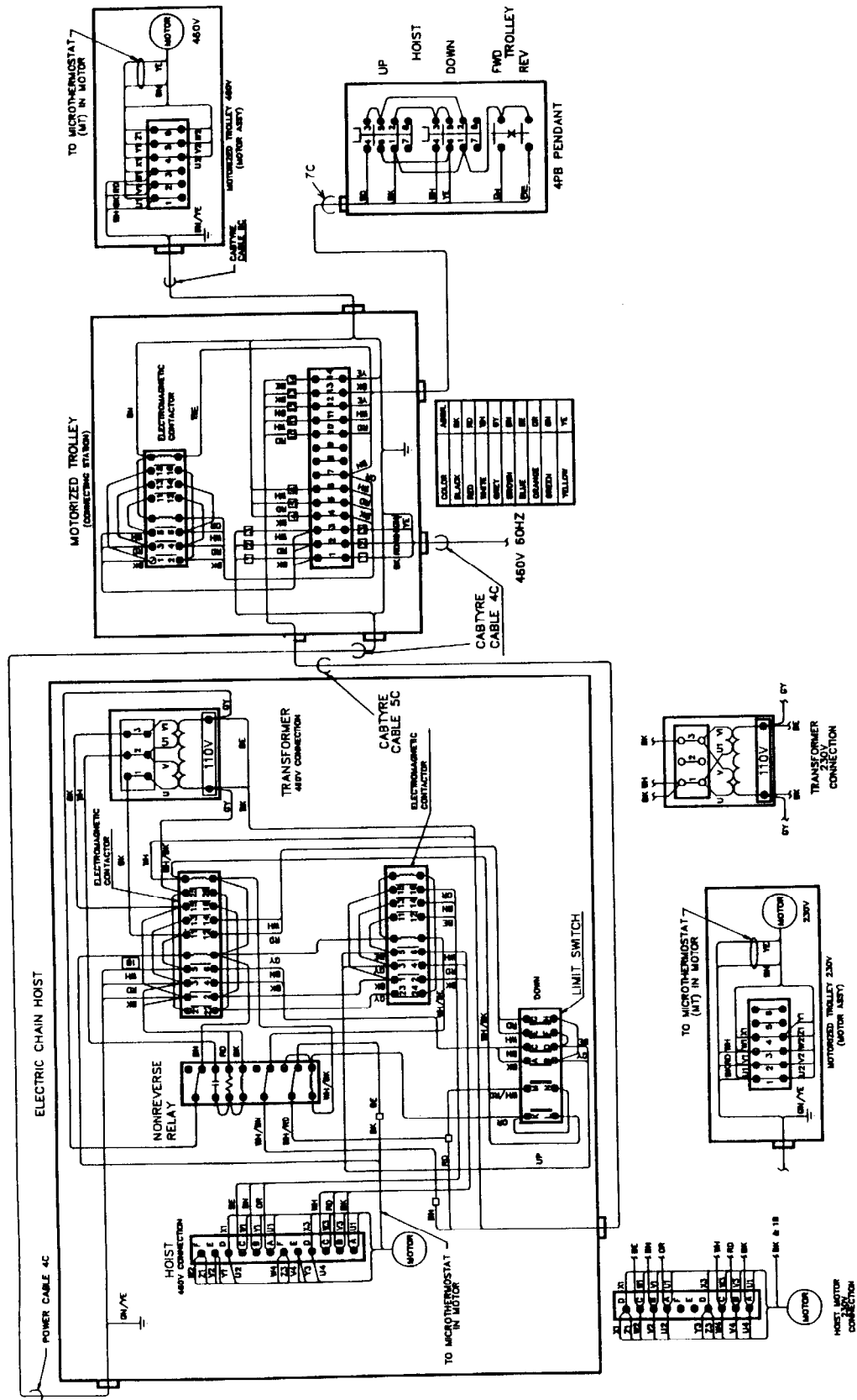
⚠ CAUTION

• To avoid damaging the pendant cord, make sure the strain relief cable, not the pendant cord, is supporting the weight of the pendant.



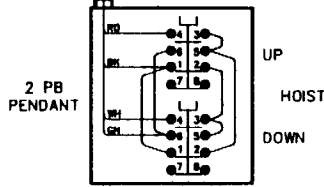
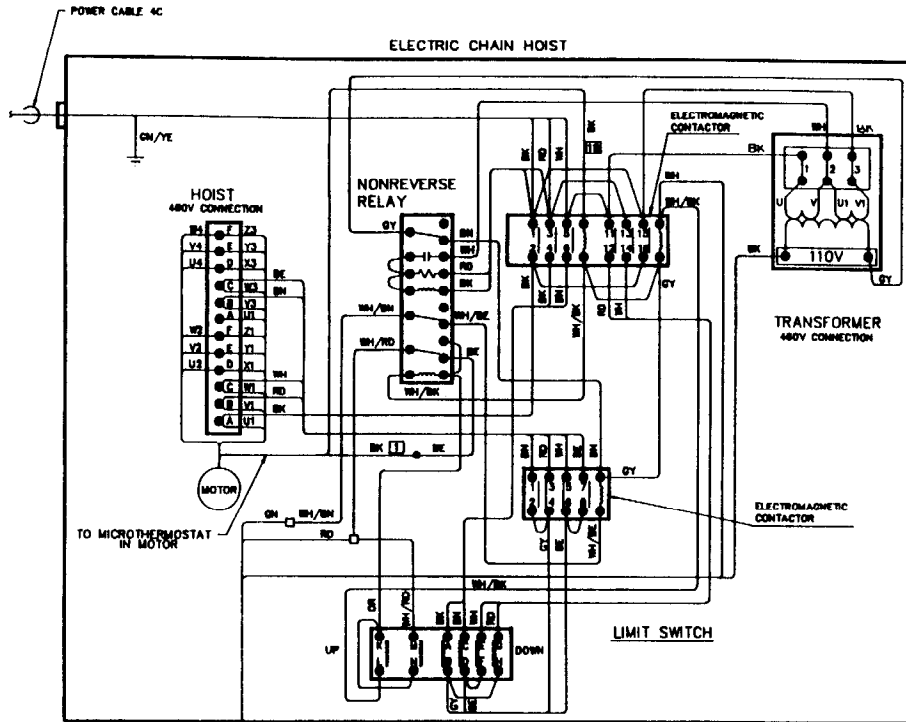
(Dwg. MHTPB0005)

WIRING DIAGRAM

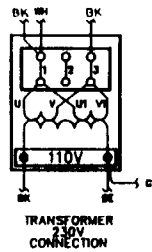
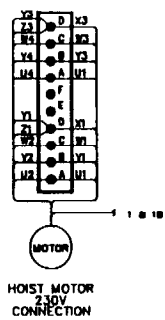


For Dual Speed Hoist, Sizes LE4D-LE5D with Motorized trolley (DWG. STPB12565D)

WIRING DIAGRAM

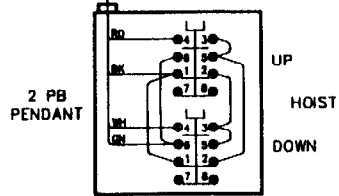
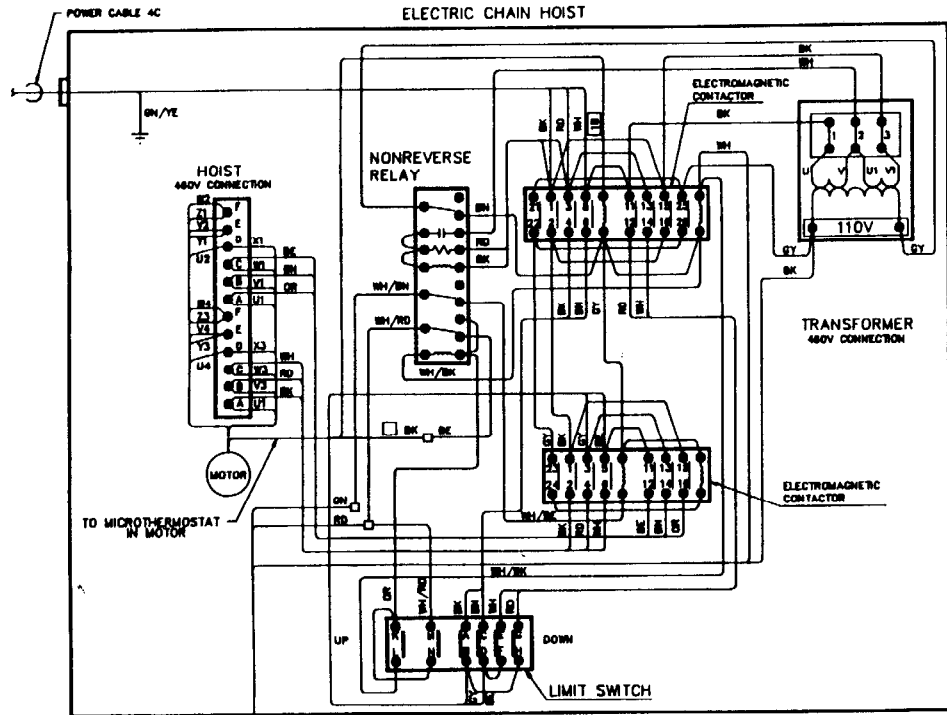


COLOR	ABBR.
BLACK	BK
RED	RD
WHITE	WH
GREY	GY
BROWN	BN
BLUE	BE
ORANGE	OR
GREEN	GN
YELLOW	YE

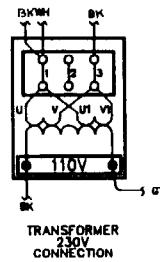
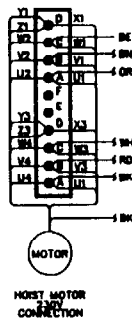


For Dual Speed Hoist, Sizes LE1D-LE3D (DWG. STPB13195C)

WIRING DIAGRAM

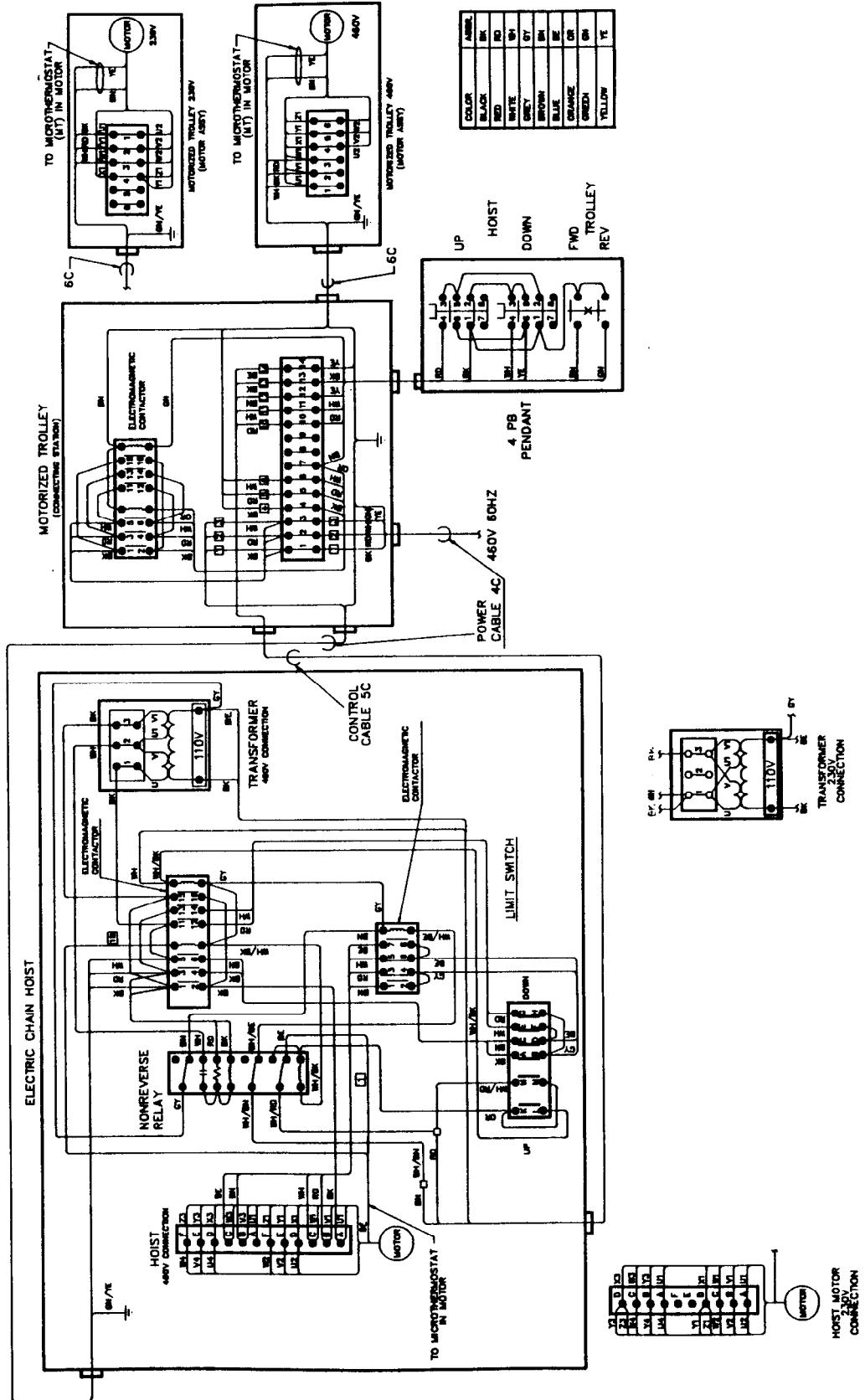


COLOR	ABBR.
BLACK	BK
RED	RD
WHITE	WH
GREY	GY
BROWN	BN
BLUE	BE
ORANGE	OR
GREEN	GN
YELLOW	YE



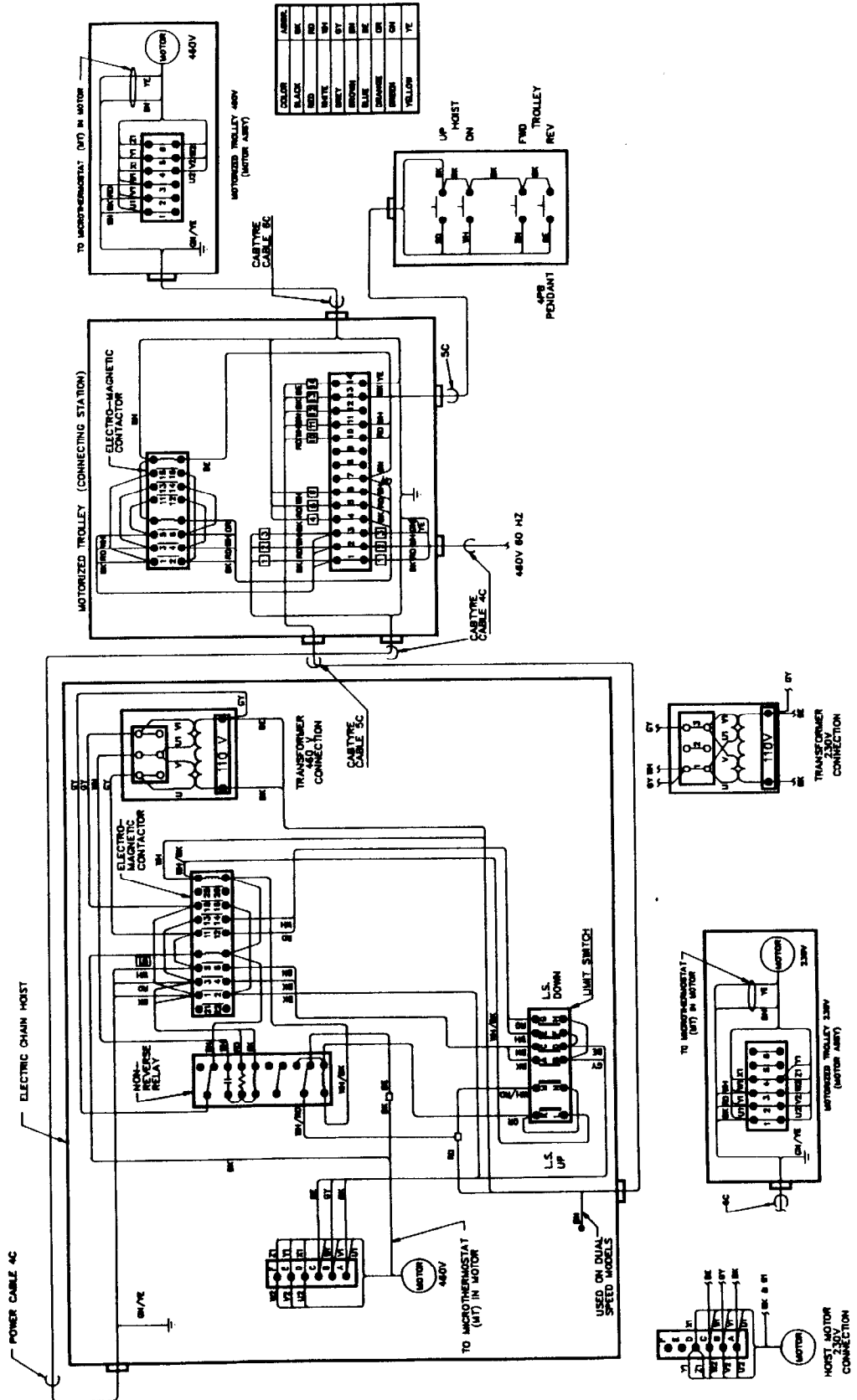
For Dual Speed Hoist, Sizes LE4D-LE5D (DWG. STPB18190A)

WIRING DIAGRAM



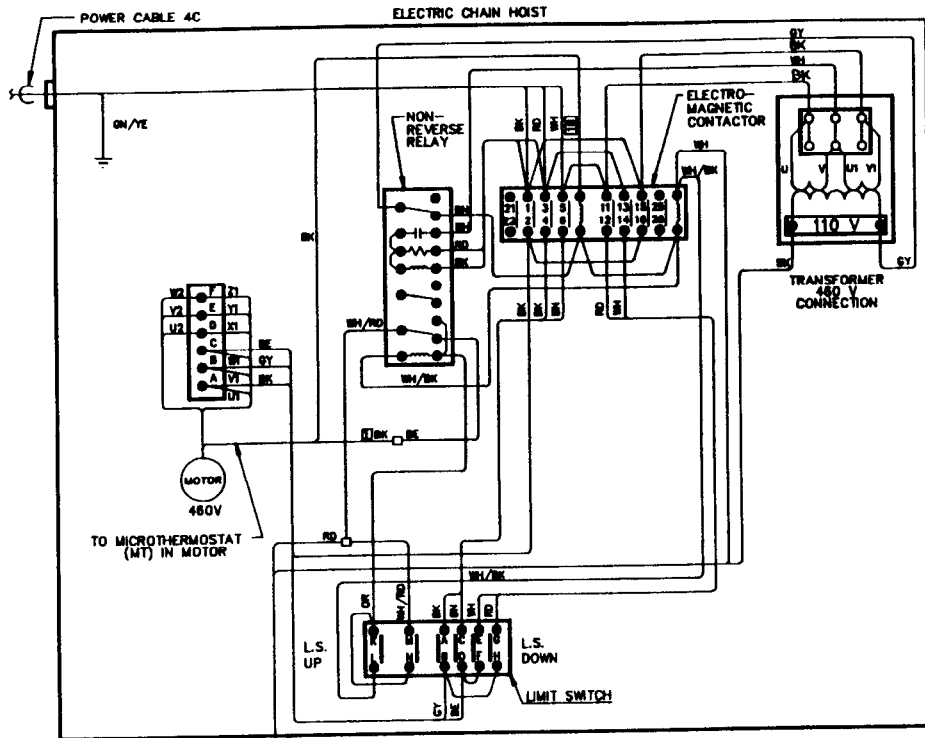
For Dual Speed Hoist, Sizes LE1D-LE3D with Motorized Trolley (DWG. STPB18192B)

WIRING DIAGRAM

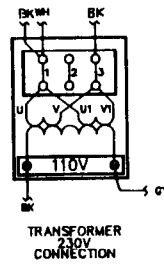
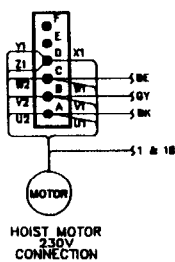
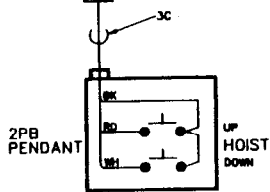


For Single Speed Hoist, Sizes LE1S-LE5S with Motorized Trolley (DWG. STPB17610D)

WIRING DIAGRAM

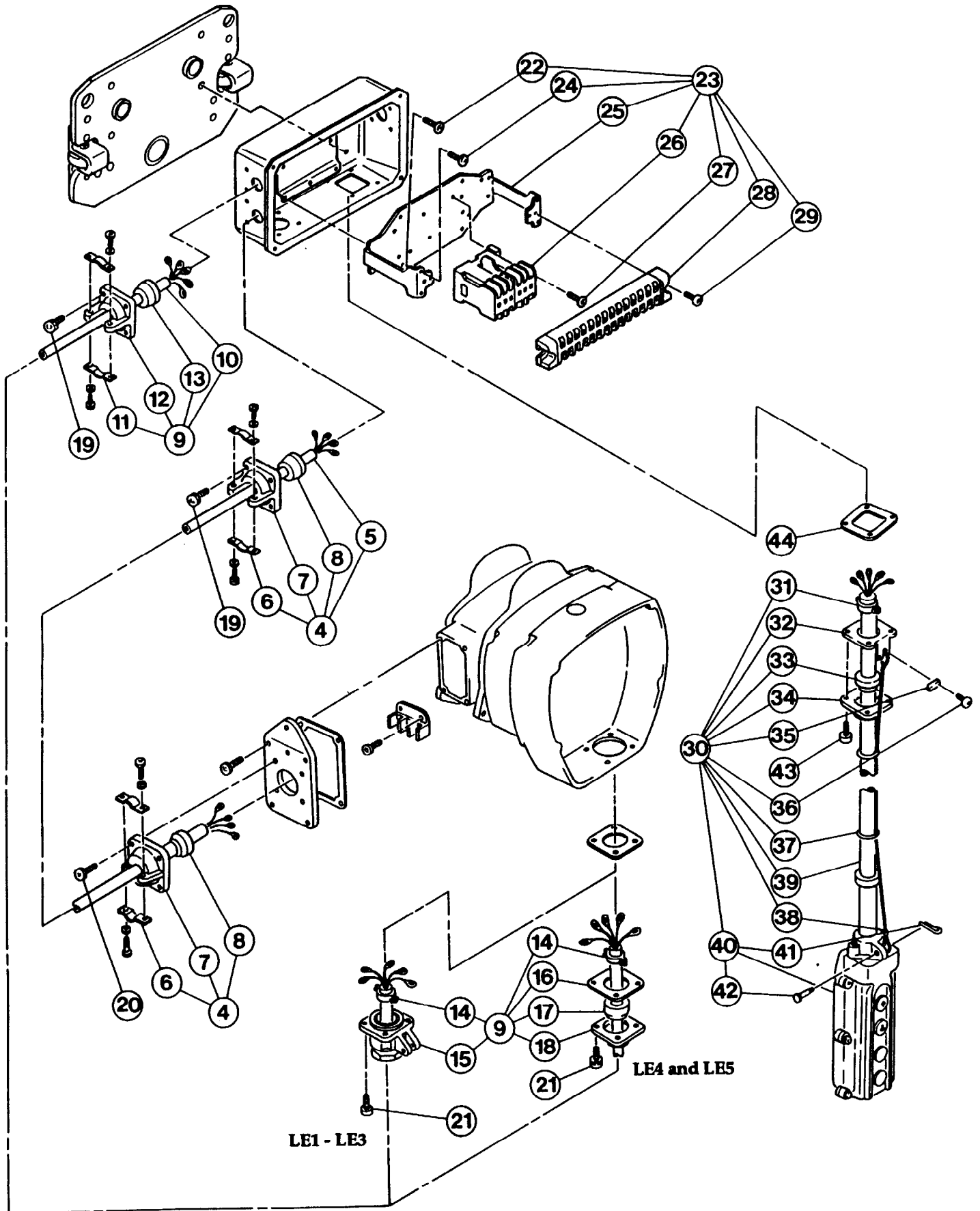


COLOR	ABBR.
BLACK	BK
RED	RD
WHITE	WH
GREY	GY
BROWN	BR
BLUE	BL
ORANGE	OR
GREEN	GN
YELLOW	YE



For Single Speed Hoist, Sizes LE1S-LE5S (DWG. STPB18188B)

TROLLEY CONTROL STATION ASSEMBLY



TROLLEY CONTROL STATION PARTS LIST

ITEM NO.	DESCRIPTION OF PART	QTY. TOTAL	PART NO.				
			LE1	LE2	LE3	LE4	LE5
4	Cable 4C Complete Set (Includes items 5,6,7 & 8)	1		73282			73283
5	Cable 4C	1		73284			73285
6	Cable Clamp 14 Assembly	1					70757
7	Cable Holder M	1					70756
8	Cable Packing 14	1					70755
9	Cable 5C Complete Set (Includes items 10 thru 18)	1		73278			73279
10	Cable 5C	1		73280			73281
11	Cable Clamp 18 Assembly	1					70781
12	Cable Holder M	1					70756
13	Cable Packing 18	1		70782			70782
14	Cable Clamp 19 Assembly	1					73303
15	Cord Holder A Assembly	1		73304			---
16	Holder Plate 42	1		---			73305
17	Packing 18	1		---			73306
18	Cable Holder 42	1		---			73307
19	Machine Screw with Spring Washer	8					70758
20	Machine Screw with Spring Washer	4					73223
21	Machine Screw with Spring Washer	4		73221			73222
22	Machine Screw with Spring Washer	4					73287
23	Plate Complete Set (Includes items 24 thru 29)	1					73286
24	Machine Screw with Spring Washer	3					70759
25	Plate Assembly	1					73288
26	Electromagnetic Contactor	1					73289
27	Machine Screw with Spring Washer	2					73290
28	Terminal Plate 14P	1					73291
29	Machine Screw with Spring Washer	2					70748
30	4 Push Button Pendant and Cord Complete Set (Includes items 31 thru 42)	1					73292
31	Cable Clamp 14 Assembly	1					73293
32	Cord Holder Support 42	1					73294
33	Packing 14	1					73295
34	Cable Holder 42	1					73296
35	Cord Chain Stopper	1					73297
36	Machine Screw with Spring Washer	2					73298
37	Lock-Belt	2					73218
38	Fixing Sleeve	2					73217
39	Push Button Cord 5C	1					73299
40	4 Push Button Pendant Assembly (Includes items 41 & 42)	1					73300
41	Split Pin	1					70557
42	Cord Chain Pin	1					70558
43	Machine Screw with Spring Washer	4					73301
44	Cord Holder Support Packing	1					73302

Part numbers for single speed hoist and trolley only.
Contact the factory for parts on dual speed hoist.

SERVICE NOTES

HOIST AND WINCH LIMITED WARRANTY

Ingersoll-Rand Company (I-R) warrants to the original user its Hoists and Winches (Products) to be free of defects in material and workmanship for a period of one year from the date of purchase. I-R will repair, without cost, any Product found to be defective, including parts and labor charges, or at its option, will replace such Products or refund the purchase price less a reasonable allowance for depreciation, in exchange for the Product. Repairs or replacements are warranted for the remainder of the original warranty period.

If any Product proves defective within its original one year warranty period, it should be returned to any Authorized Hoist and Winch Service Distributor, transportation prepaid with proof of purchase or warranty card.

This warranty does not apply to Products which I-R has determined to have been misused or abused, improperly maintained by the user, or where the malfunction or defect can be attributed to the use of non-genuine I-R parts.

I-R makes no other warranty, and all implied warranties including any warranty of merchantability or fitness for a particular purpose are limited to the duration of the expressed warranty period as set forth above. I-R's maximum liability is limited to the purchase price of the Product and in no event shall I-R be liable for any consequential, indirect, incidental, or special damages of any nature rising from the sale or use of the Product, whether based on contract, tort, or otherwise.

Note: Some states do not allow limitations on incidental or consequential damages or how long an implied warranty lasts so that the above limitations may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which may vary from state to state.

IMPORTANT NOTICE

It is our policy to promote safe delivery of all orders.

This shipment has been thoroughly checked, packed and inspected before leaving our plant and receipt for it in good condition has been received from the carrier. Any loss or damage which occurs to this shipment while enroute is not due to any action or conduct of the manufacturer.

VISIBLE LOSS OR DAMAGE

If any of the goods called for on the bill of lading or express receipt are damaged or the quantity is short, do not accept them until the freight or express agent makes an appropriate notation on your freight bill or express receipt.

CONCEALED LOSS OR DAMAGE

When a shipment has been delivered to you in

apparent good condition, but upon opening the crate or container, loss or damage has taken place while in transit, notify the carrier's agent immediately.

DAMAGE CLAIMS

You must file claims for damage with the carrier. It is the transportation company's responsibility to reimburse you for repair or replacement of goods damaged in shipment. Claims for loss or damage in shipment must not be deducted from the Ingersoll-Rand invoice, nor should payment of Ingersoll-Rand invoice be withheld awaiting adjustment of such claims as the carrier guarantees safe delivery.

You may return products damaged in shipment to us for repair, which services will be for your account and form your basis for claim against the carrier.

United States Office Locations

For Order Entry and Order Status:

INGERSOLL-RAND Distribution Center

510 Hester Drive
P.O. Box 618
White House, TN 37188
Phone (615) 672-0321
Telex: 786573
Fax: (615) 672-0801

For Technical Support:

INGERSOLL-RAND Material Handling

2724 Sixth Avenue South
P.O. Box 24046
Seattle, WA 98124-0046
Phone (206) 624-0466
Telex: 328795
Fax: (206) 624-6265

Atlanta, GA
111 Ingersoll-Rand Drive
Chamblee, GA 30341
(404) 936-6230

Detroit, MI
23192 Commerce Drive
Farmington Hills, MI 48335
Phone (313) 476-6677
Fax: (313) 476-6670

Houston, TX
2500 East T.C. Jester
Suite 150
Houston, TX 77008
(713) 864-3700

Los Angeles, CA
5533 East Olympic Blvd.
Los Angeles, CA 90022
(213) 725-2826

Milwaukee, WI
12311 W. Silver Spring Dr.
Milwaukee, WI 53225
(414) 461-0973

Philadelphia, PA
900 E. 8th Ave., Suite 103
King of Prussia, PA 19406
(215) 337-5930

International

Office and distributors in principal cities throughout the world. Contact the nearest Ingersoll-Rand office for the name and address or the distributor in your country or write to:
**Ingersoll-Rand
Material Handling
P.O. Box 24046 Seattle,
WA 98124-0046 USA**

**Canada
Ingersoll-Rand Material
Handling Division
123 Bowser Avenue
North Vancouver, British
Columbia V7P 3H1
Phone (604) 985-4470
Fax: (604) 985-0160**

**Canada
National Sales Office
Power Tool Division
Toronto, Ontario
51 Worcester Road
Rexdale, Ontario
M9W 4K2
Phone (416) 675-5611
Fax: (416) 675-6920**

**Calgary, Alberta
333 11th Avenue S.W.
Calgary, Alberta
T2R 0C7
(403) 261-8652**

**Montreal, Quebec
3501 St. Charles Blvd.
Kirkland, Quebec
H9H 4S3
(514) 695-9040**

**British Columbia
201-6351 Westminster Hwy
Richmond, B.C.
V7C 5C7
(604) 278-0459**

**Latin America Operations
Ingersoll-Rand Co.
Power Tool Division
Latin America Operations
730 N.W. 107 Avenue
Suite 300, Miami, FL
33172-3107
Phone (305) 559-0500
Telex: 441617TLS UI
Fax: (305) 559-7505**

**Europe, Middle East and
Africa
Ingersoll-Rand Interna-
tional Sales
P.O. Box 23 Southmoor Rd
Wythenshawe
Manchester M23 9LN
United Kingdom
Phone (44) 61-902 9098
Fax: (44) 61-946 6375**