

SHAW-BOX

LIFTTECH 

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CRANE AND HOIST OPERATIONS

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INSTALLATION INSTRUCTIONS

SHAW-BOX® SERIES 700 and DMR HOIST

RETROFIT KIT FOR D.C. MOTOR BRAKE

The trademark SHAW-BOX has replaced the trademark LOAD LIFTER on Series 700 hoists. Parts and instruction literature for this product also applies to similar products sold under the trademark LOAD LIFTER.

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SECTION I — GENERAL DESCRIPTION

1-1. This kit provides the materials to replace an A.C. actuated motor brake with a D.C. actuated motor brake on SHAW-BOX Series 700 Size 2 or DMR-1 and Size 3 or DMR-2 thru DMR-5 wire rope hoists with 115 volt controls.

1-2. KIT SIZE.

a. The proper retrofit kit for your hoist is:

Hoist Size	Kit Number
Series 700 Size 2 or DMR-1	509546
Series 700 Size 3 or DMR-2 thru DMR-5	509547

b. To determine the size of your hoist, measure the width of the hoist at the gearcase cover (see Figure 1-1). If the width is 23¾ inches the hoist is a Size 2 or DMR-1; if 34¾ inches, it is a Size 3 or DMR-2 thru DMR-5.

c. The standard retrofit kit must not be used on a hoist with 24 volt control. 24 volt control requires the brake controller in the standard retrofit kit be replaced. For 24 volt control, consult factory.

CAUTION

If the standard retrofit kit is used on a hoist with 24 volt control, the motor brake cannot be released.

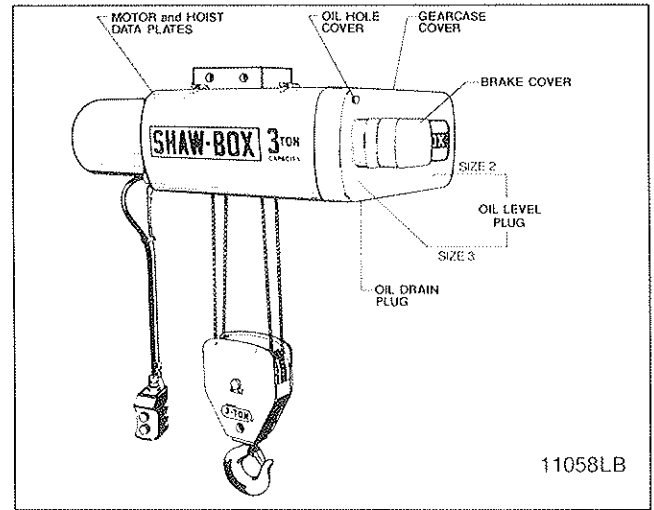


Figure 1-1. Hoist Arrangement.

SECTION II — INSTALLATION

2-1. REMOVAL OF A.C. ACTUATING MECHANISM.

- Remove any loads from lower block.
- Shut off power to hoist.

WARNING

Before attempting installation of retrofit kit the main power switch must be locked in the open (power off) position.

c. Drain oil from gearcase (8 quarts in Size 2 or DMR-1 hoist and 18 to 22 quarts in Size 3 or DMR-2 thru DMR-5 hoist).

d. Disconnect electrical leads from existing A.C. motor brake actuating mechanism at terminal board in electrical compartment. These leads enter the electrical compartment on the right side (facing compartment).

information given herein subject to change without notice

e. Remove hex head cap screws securing gearcase cover to gearcase (17 for Size 2 or DMR-1 and 24 for Size 3 or DMR-2 thru DMR-5).

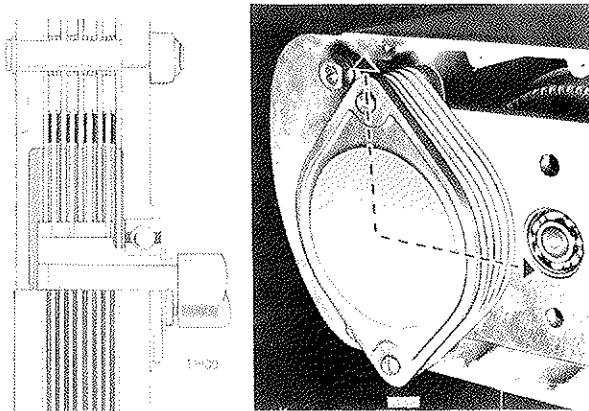
f. Remove gearcase cover (includes attached A.C. motor brake actuating mechanism and brake cover) and gasket.

g. For a Size 3 or 5 DMR-2 thru DMR-5 hoist only, remove the two screws securing the brake cover and lift off brake cover. Check the color of the spring the the A.C. motor brake actuating mechanism for future reference.

2-2. PRE-INSTALLATION

It is recommended that motor brake friction surfaces be checked while gearcase cover is removed.

a. To check motor brake friction surfaces (Figure 2-1), remove retaining rings from the brake pilot studs and lift off the compression plate. Lift off washer and lining assemblies, release springs, and motor brake plates. (Note for reassembly, that two of the washer and lining assemblies have friction surfaces on one side only and must be replaced at each end. Three washer and lining assemblies, with friction surfaces on both sides and release springs, are replaced between the motor brake plates; see Figure 2-1*). Check motor brake plates for warping, scoring or other signs of deterioration. Also check spline fit of motor brake plates to the brake hub for gouging, mushrooming of the plates or other signs of distress or wear. Replace plates if these conditions are found. Brake plates which are replaced because of spline wear should also receive a replacement brake hub. Check condition of friction material on the washer and lining assemblies, and replace assemblies if required.



**Figure 2-1. Motor Brake Friction Plates.
(Size 2 or DMR-1 Hoist Shown)**

b. Clean and flush gearcase.

c. Reinstall brake plates, release springs, and lining assemblies in sequence shown in Figure 2-1 and replace retaining rings. On the Size 3 or DMR-2 thru DMR-5 hoists it is possible to get the lining assemblies misoriented. When installed properly the friction linings will be on a horizontal line (not vertical).*

*Conditions and illustration shown describe recent model hoists. Older model hoists have three brake plate assemblies with continuous linings on both sides with two friction plates.

2-3. INSTALLATION OF NEW PARTS.

a. Lubricate "O" ring from retrofit kit with DEXRON automatic transmission fluid and insert into slot in hole in gearcase cover.

b. Install new gearcase cover gasket, new gearcase cover, and drain plug.

c. Fill gearcase with DEXRON automatic transmission fluid (8 quarts in a Size 2 or DMR-1 hoist and 22 in a Size 3 or DMR-2 thru DMR-5 hoist). If preferred, gearcase may be filled through threaded actuator hole in cover instead of through oil filler hole, if care is taken not to damage "O" ring.

d. On the Size 3 or DMR-2 thru DMR-5 hoist, three springs are furnished for the brake actuating mechanism; white, red, and green. The proper spring to use is the same color as the spring used on the A.C. mechanism checked earlier (see paragraph 2-1.g.). If the color of the spring used on the A.C. could not be determined, use the following:

<u>Motor HP</u>	<u>Spring Color</u>
7½ and 10	Green
15	Red
20 and 25	White

e. See Figure 6-2. Remove boot from threads of brake actuating assembly. Slide plunger out and add proper spring (as determined in paragraph 2-3.d.) and, if required, spacer washers (Ref. No 7). Replace plunger. Greasing plunger will facilitate assembly.

f. With plunger and proper spring (and washers, if required) in place, carefully thread actuator into gearcase cover (**be very careful not to cross thread**). A little pressure on the end of the actuator may be necessary to start threads. Turn brake actuating assembly, by hand, until brake adjustment indicator pin (Ref. No. 12) is flush with the end of the body assembly (Ref. No. 9).

g. Place brass rod (Ref. No. 2) and self locking hex socket head set screw (Ref. No. 1) into threaded hole on bottom side of actuator hole in gearcase cover. Do not tighten set screw at this time.

NOTE: Do not overtighten set screw. Damage to actuator or gearcase cover threads may occur.

h. Remove backing from brake cover gasket and press gasket into recess in gearcase cover. Do not attach cover at this time.

i. If possible, mount the brake controller and transformer that came with your retrofit kit inside the hoist electrical enclosure. If this is not possible it will be necessary for the customer to furnish a separate electrical enclosure to contain these components.

j. Wire all components, including brake actuator mechanism, per wiring diagram, Figure 5-1 or 5-2.

k. Paint new covers to match existing paint on hoist.

l. Peel backing from SHAW-BOX label and press onto gearcase cover next to brake cover.

SECTION III — TESTING OF HOIST

3-1. Before placing hoist in service, hoist should be tested to insure safe operation. To test, suspend hoist from an overhead supporting member of sufficient strength to support the weight of the hoist plus the rated load if the hoist has no overload clutch or the weight of the hoist plus twice the rated load for a hoist with overload clutch. Connect hoist to power supply shown on hoist nameplate and perform the following checks and adjustments.

3-2. Check oil level. Remove plug located on side of gearcase adjacent to the embossed words "OIL LEVEL." (See Figure 1-1.) When properly filled, oil should be level with bottom of tapped hole. Fill to this level with DEXRON automatic transmission fluid.

3-3. Adjust brake using instructions found inside brake cover or refer to paragraphs 4-1.c. thru 4-1.f.

3-4. CHECK HOIST WITH RATED LOAD.

a. Attach rated load to lower block.

b. Depress "UP" push button and raise load. When push button is released, hoist should immediately stop and hold load at that level. If hoist has overload clutch, slips and refuses to lift the load, check overload clutch adjustment per paragraph 3-4.

c. Depress "DOWN" push button, lower load a short distance and release button. Hoist should stop immediately and hold load at that level.

3-5. If your hoist is equipped with an overload clutch (WEIGHT WATCHER), continue testing per paragraph 4-2.

SECTION IV — ADJUSTMENT

4.1 MOTOR BRAKE ADJUSTMENT.

Brake adjustment should not be needed, however, if new brake friction discs are installed with this brake kit, readjustment may be necessary after a 2 to 4 month break-in period.

In addition to the adjustment instructions below motor brake adjustment instructions may also be found inside the brake cover. Refer to Figure 6-2 and proceed as follows:

- a. Remove one hex socket button head cap screw from brake cover and then remove brake cover.
- b. Loosen set screw at gearcase cover (Ref. No. 1 in Figure 6-2).
- c. Turn brake actuating assembly, by hand, until brake adjustment indicator pin (Ref. No. 12) is flush with the end of the body assembly (Ref. No. 9).
- d. Retighten set screw.

NOTE: Do not overtighten set screw. Damage to actuator or gearcase cover threads may occur.

- e. Replace brake cover.
- f. If, after above adjustment, the load hook continues to "drift" downward more than normal for this hoist, make a complete inspection of motor brake mechanism including friction surfaces.

4.2. OVERLOAD CLUTCH ADJUSTMENT AND TESTING.

a. When your hoist is equipped with an overload clutch, minor clutch adjustments can be made with your hoist suspended. Clutch adjustment shall be supervised by an authorized person familiar with the hoist and the purpose of the adjustment and test. To test clutch operation and make minor adjustments, proceed as follows:

WARNING

Before attempting to adjust and test an overload clutch, an appointed person shall determine that the trolley and/or other supporting structure is capable of safely supporting a load equal to 175 percent of the hoist rated load plus the weight of the hoist. Failure to provide adequate support could cause injury to equipment and personnel.

With the hoist in position for testing as determined by an appointed person, attach a known load, equal to the rated load of the hoist, to the lower hook. Adequate and proper rigging shall be provided to insure test loads are securely attached, properly balanced and lifted level.

b. Energize hoist to lift rated load. Raise this load just high enough to be certain hoist is lifting entire load. **Clutch should not slip with this rated load.** Lower load to rest position. If hoist will not lift rated load, clutch adjustment is required — proceed with step c.

c. Lock main power switch in open position.

d. Provide an adequate and safe means to support workmen who are to make adjustments.

e. Remove brake cover.

f. Remove two pipe plugs from gearcase. (See Figure 4-1.)

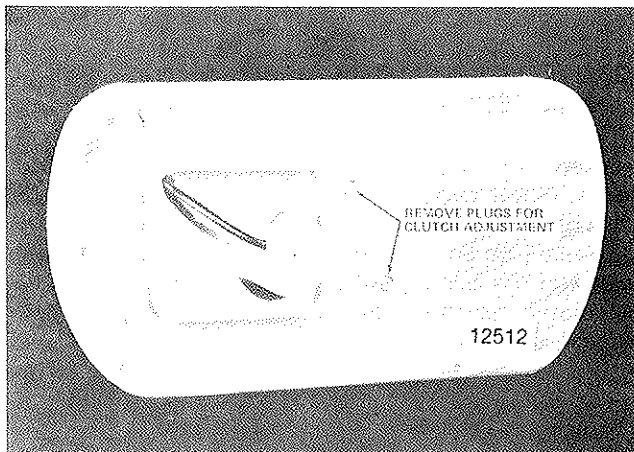


Figure 4-1. View Showing Clutch Adjustment Plug Location

g. Remove motor brake actuating mechanism and rotate motor shaft.

NOTE: On some hoists motor shaft can be rotated by hand; others may require the use of plumber's strap wrench to rotate motor shaft. (DO NOT USE REGULAR PIPE WRENCH WHICH COULD SCAR SHAFT SURFACE AND REDUCE SHAFT STRENGTH.)

h. Rotate motor shaft until the two hex socket head bolts on clutch are visible through pipe plug openings in gearcase. A small flashlight may be helpful to see hex socket head bolts.

i. Insert T-type allen wrench thru opening in gearcase and spider into clutch bolt socket.

j. Rotate each clutch adjusting bolt clockwise $\frac{1}{4}$ turn. Be certain each bolt is rotated an equal amount for every adjustment.

k. Replace lower pipe plug finger tight.

l. Replace motor brake actuating mechanism and adjust per paragraphs 4-1.c thru 4-1.f.

m. Make certain all workmen are clear of hoist and plumber's strap wrench has been removed from motor shaft. Turn on power and energize hoist to raise rated load. Only one adjustment should be required; however, if further adjustment is required repeat steps f thru m making certain **POWER** is **OFF** for each adjustment.

With clutch adjusted to lift rated load, your hoist can now be tested for maximum load at which clutch slips. **This load should not be greater than 175% of rated load.** (Rated load multiplied by 1.75.)

WARNING

Never lift more than hoist rated load except for clutch adjustment and testing as described in this paragraph.

To determine load at which clutch slips proceed as follows:

n. Increase load in steps from rated load to a maximum of 175% of rated load, lifting load with each increase in weight. Hoist should slip and refuse to lift load **before** 175% of rated load is reached. Should hoist lift 175% of rated load — **STOP TEST** — clutch adjustment is required.

o. Repeat steps c thru i above. Rotate each clutch adjusting bolt counterclockwise approximately $\frac{1}{16}$ turns ($22\frac{1}{2}^\circ$).

p. Repeat step m with less than 175% of load. Clutch should slip. Readjust as described in step o until clutch slips before reaching 175% of load.

q. Run hoist with load causing clutch to slip (hoist refusing to load) ten cycles of approximately 1 second each, to insure that hoist will **not** lift 175% of load.

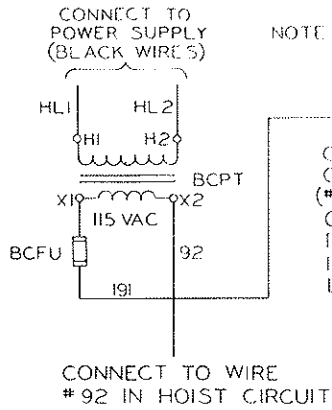
r. Remove weight added in step n and return to rated load. Lift rated load one final time. Clutch should not slip.

s. Replace pipe plugs in gearcase. Replace brake cover. Remove ladders or other equipment used to reinforce hoist support and used by workmen.

WARNING

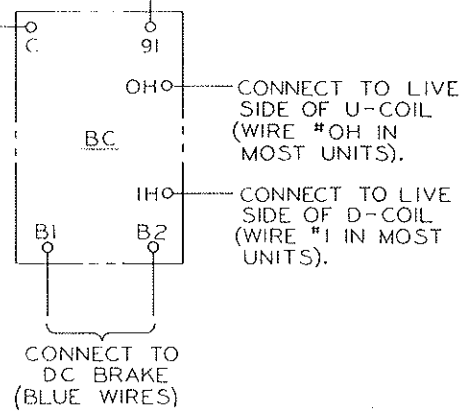
Equipment covered herein is not designed or suitable as a power source for lifting or lowering persons.

SECTION V — WIRING DIAGRAMS



NOTE: CONNECT BCPT TO MATCH POWER SUPPLY.
(FOR 208V SUPPLY USE 230V TAP)
USE RED WIRE UNLESS SPECIFIED.

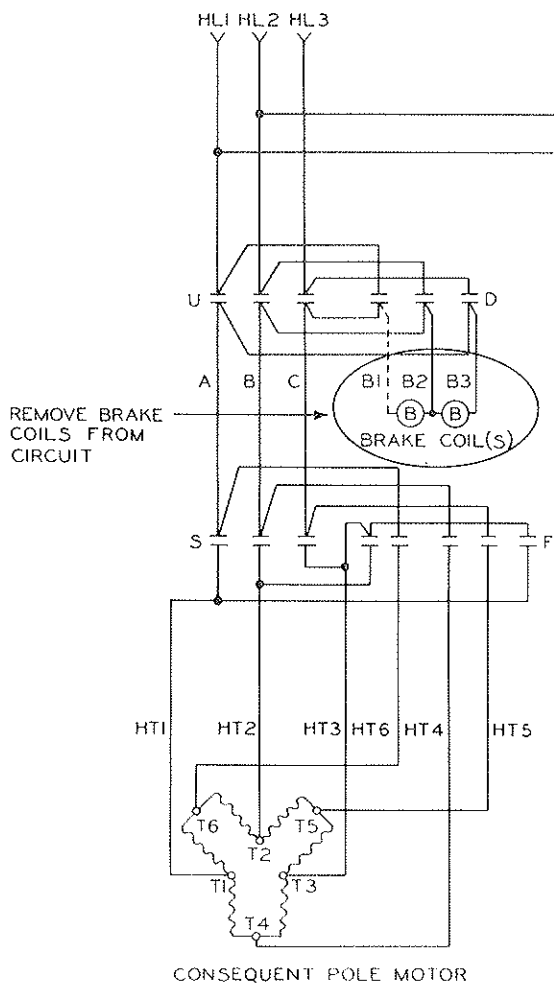
CONNECT TO U-D
COIL COMMON WIRE
(#92 IN UNITS WITH-
OUT OVERLOAD
RELAYS AND WIRE #19
IN UNITS WITH OVER-
LOAD RELAYS).



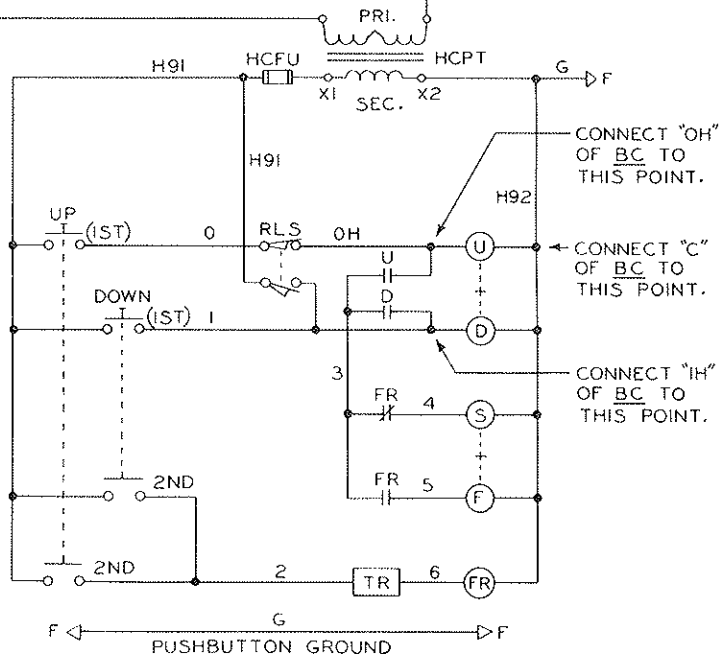
SYMBOL DESIGNATIONS

- BC BRAKE CONTROL
- BCFU BRAKE CONTROL FUSE
- BCPT BRAKE CONTROL POWER TRANSFORMER

EXAMPLE



ELEMENTARY DIAGRAM



Eng. Dwg. 328563

Figure 5-1. Wiring Diagram for Series 700 Hoists

SECTION V — WIRING DIAGRAMS (Cont.)

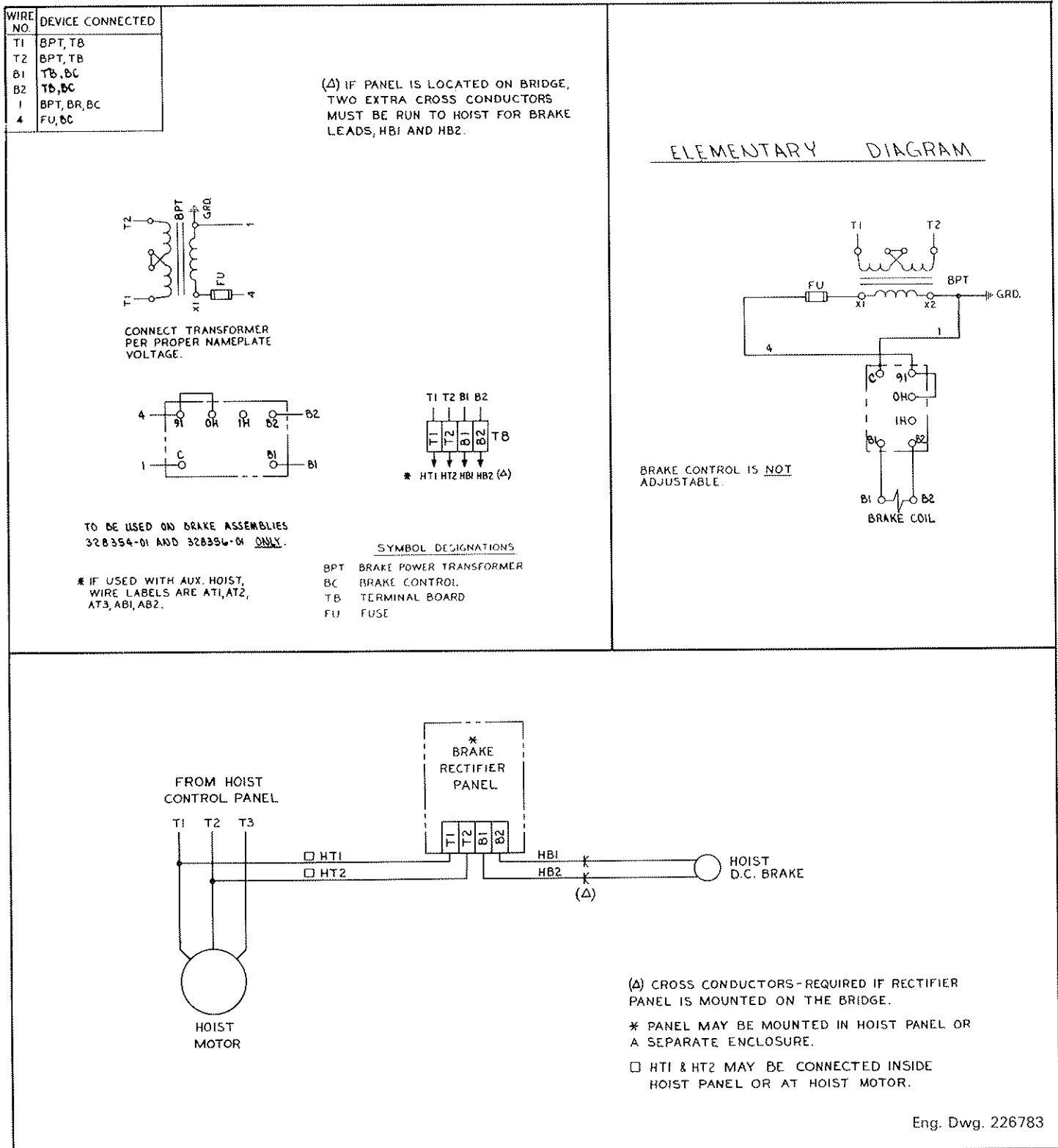


Figure 5-2. Wiring Diagram for DMR Hoists.

SECTION VI — PARTS LISTS

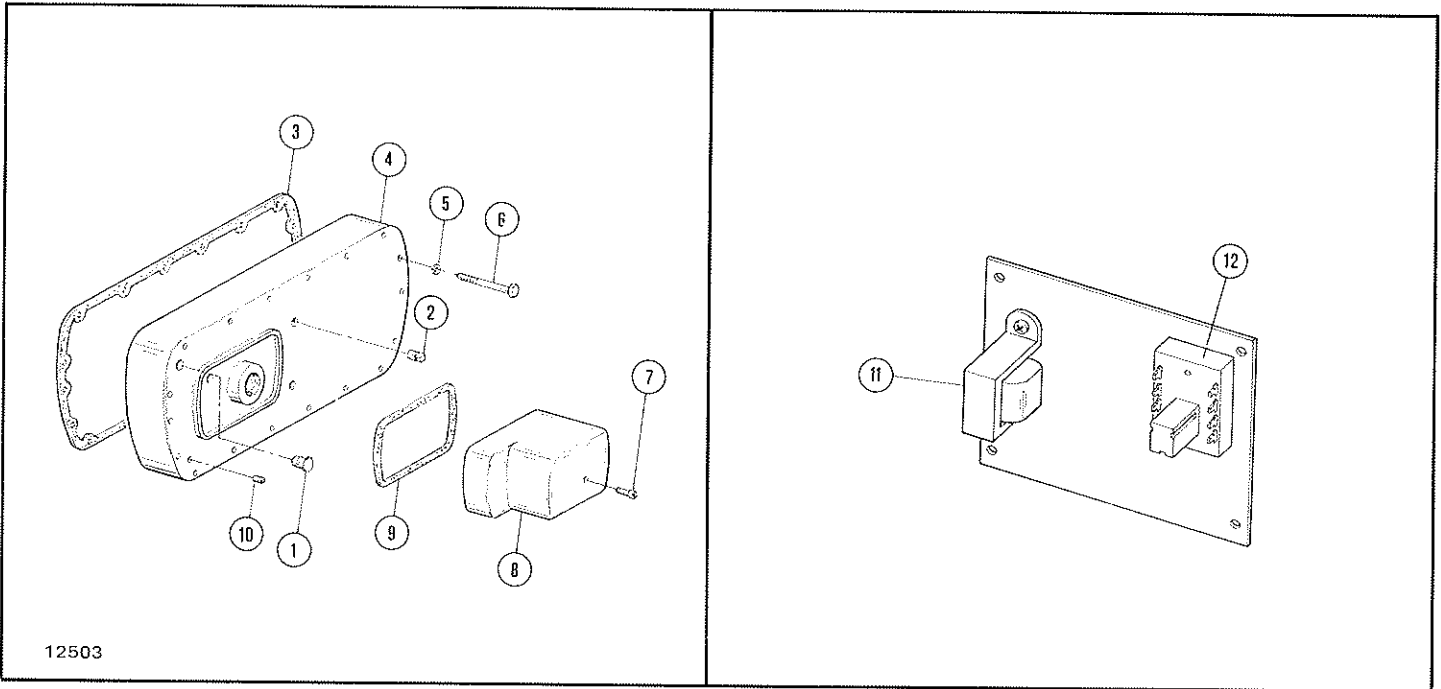


Figure 6-1. Covers and Electrical Control Equipment.

Ref. No.	Part Number	Description	Quan. Required	
			Size 2 Hoist	Size 3 Hoist
1	700-180	Cover — Oil Hole	1	1
2	700-154	Plug — Pipe (Functional with Overload Clutch Only)	2	2
3	700-131	Gasket — Gearcase Cover	1	1
4	700-181	Cover — Gearcase	1	1
5	700-126	Lockwasher	17	24
6	700-182	Screw — Hex. Head Cap	17	24
7	700-183	Screw — Hex. Socket Head Cap	1	1
8	700-184	Cover — Brake	1	1
9	700-185	Gasket — Brake Cover	1	1
10	700-129	Plug — Pipe	1	1
11	700-1092	Transformer	1	1
12†	700-1084	Controller — Brake	1	1

SECTION VI — PARTS LISTS (Cont.)

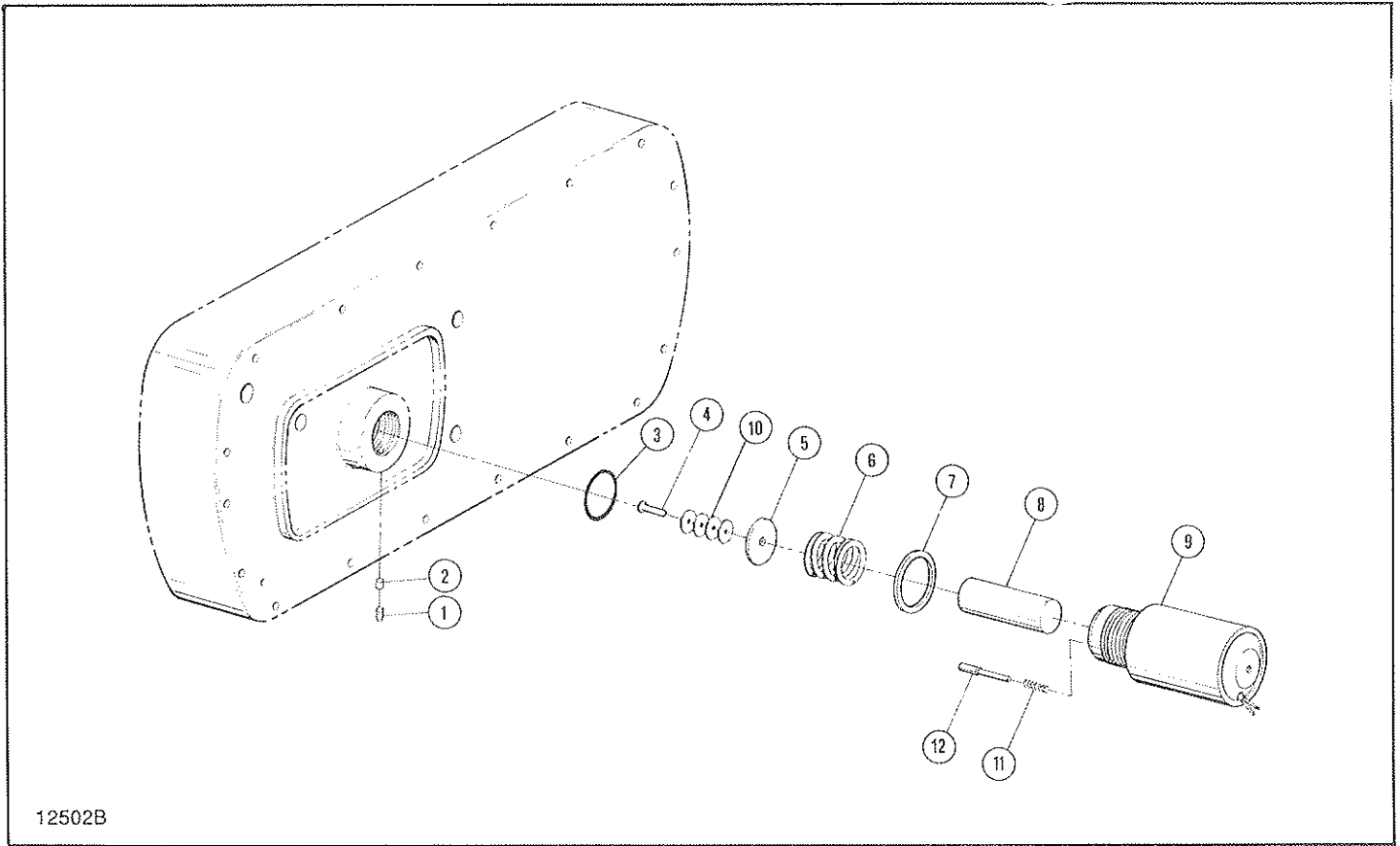


Figure 6-2. Motor Brake Actuating Mechanism.

Ref. No.	Description	Size 2 Hoist		Size 3 Hoist	
		Part Number	Quan. Req'd.	Part Number	Quan. Req'd.
1	Screw — Hex Socket Head Set	700-673	1	700-673	1
2	Rod — Brass	700-674	1	700-674	1
3†	Seal — "O" Ring	700-675	1	700-676	1
	*Brake Actuating Assembly (includes Ref. No.'s 4,5, 8, and 9)	700-677	1	700-678	1
4	Screw — Hex. Socket Button Head Cap Short	700-679	1	700-679	1
	Long**	700-691	1	700-691	1
5	Washer — Spring Stop	700-680	1	700-681	1
6†	Spring				
	Natural Color	700-682	1	—	—
	White	—	—	700-683	1
	Red	—	—	700-684	1
	Green	—	—	700-685	1
7	Washer — Spacer (Used with Red or Green Springs Only)				
	With Red Spring Only	—	—	700-686	1
	With Green Spring Only	—	—	700-686	2
8	Plunger	700-687	1	700-688	1
9	Body Assembly	700-689	1	700-690	1
10	Washer — Spacer**	700-694	4	700-694	4
11	Spring — Brake Pin	700-693	1	700-693	1
12	Indicator Pin — Brake Adjustment	700-691	1	700-692	1

*When Ref. No.'s 4, 5, 8, and 9 require replacement, the factory recommends use of the above assembly instead of individual parts.

**Use only when hoist has two stationary brake discs.

†Recommended spares.