

# MAINTENANCE INSTRUCTION

## LEVER-TYPE HAND BRAKE

### DESCRIPTION

The hand brake, Fig. 1, is a gear-type device which operates in conjunction with the basic brake system, delivering a force equal to or greater than the service air brake. This is accomplished by mechanical advantage through the use of a chain connected directly to the brake rigging. During hand brake application, chain assembly movement activates a device which sets the brakes. A weighted trip mechanism releases brake tension. Various combinations of lever sizes, chain lengths, and right-hand or left-hand applications are used for different models. (See Service Data.)

### OPERATION

#### SETTING BRAKE

Using a pumping motion, move hand lever until brake is set.

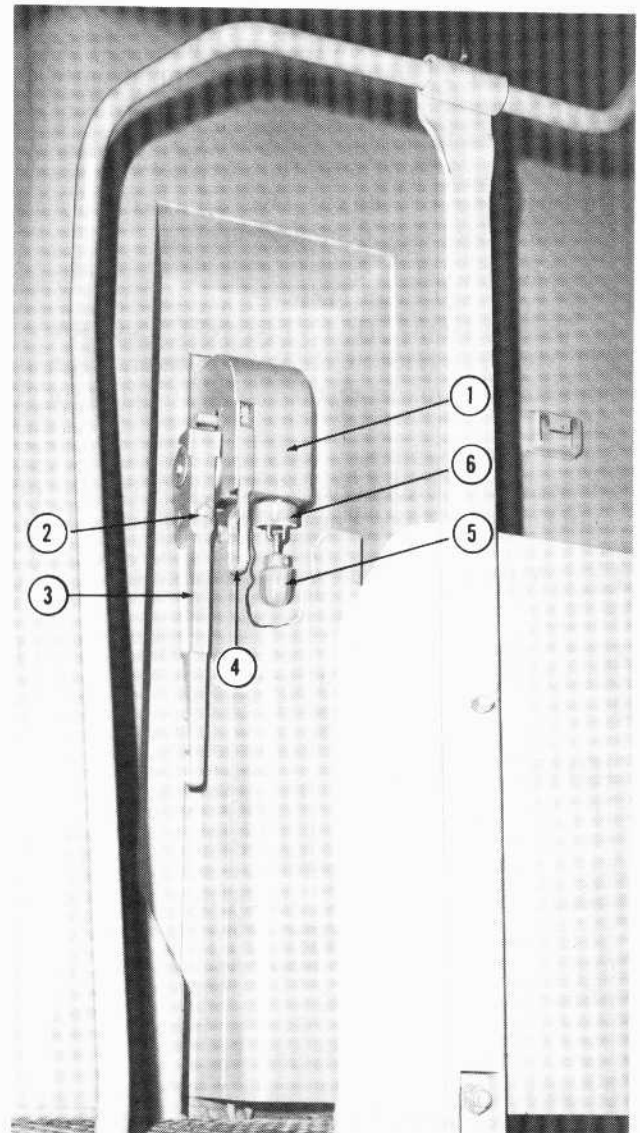
#### RELEASING BRAKE

Return hand lever to retainer spring clip (if used). If not, position hand lever as far back as possible. Next, pull trip lever upward and outward until chain weight and rubber snubber, Fig. 1, contact base of brake housing.

After releasing brake, a visual inspection should be made to ensure proper position of chain weight and rubber snubber. If full release has not been accomplished, brake should again be fully set and then released.

#### CAUTION

Ensure brake rigging is equipped with a suitable return spring to effect a full release of hand brake, and to prevent chain from jamming.



- |                    |                   |
|--------------------|-------------------|
| 1. Housing         | 4. Trip Lever     |
| 2. Adjusting Screw | 5. Chain Weight   |
| 3. Hand Lever      | 6. Rubber Snubber |

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Fig.1 - Typical Hand Brake Installation

\*This bulletin is revised and supersedes previous issues of this number.

Areas of change are indicated by vertical bars in the margins.

# MAINTENANCE

## INSPECTION

1. Brakes and rigging should be periodically checked for proper functioning at intervals specified in the Scheduled Maintenance Program.
2. Ensure adequate grease lubrication of bearing sheave pins and bushings.
3. Check for loose screws, nuts, or bolts.
4. Check clearance between handle and carbody. A minimum clearance of 92 mm (3-5/8") must be maintained around brake lever. The top front edge of hand lever is equipped with an adjusting screw, Fig. 1, which increases or decreases the lever clearance between the handle and the carbody. Turning the screw clockwise increases the clearance, and counterclockwise decreases it.

**NOTE**

IT IS SELDOM, IF EVER, NECESSARY TO MOVE THIS SCREW. However, if an adjustment is made, restake screw to maintain setting.

5. Check hand brake release – failure to release, or sticking condition indicates a lack of lubrication.

## CLEANING

Remove housing, Fig. 1, to expose internal mechanism. If dirt or rust has accumulated, blow out with compressed air.

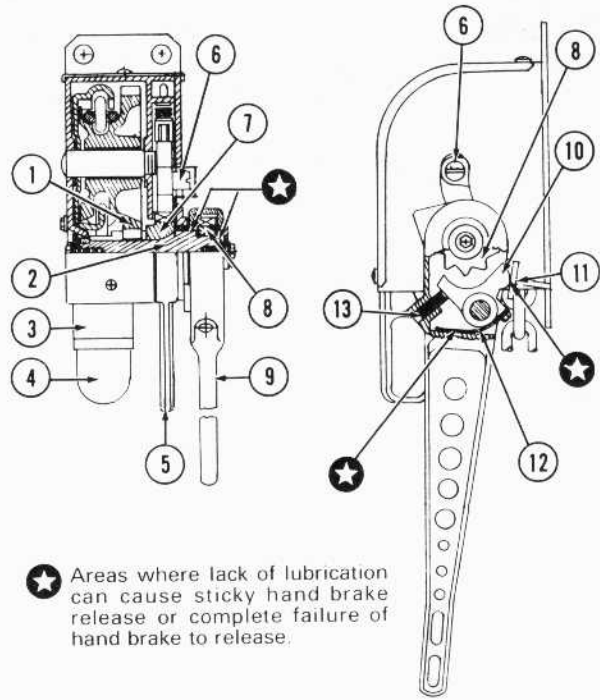
## LUBRICATION

After cleaning, lubricate all rotating or moving parts using a normal grade of oil for interior mounted brakes, and an extremely light grade of oil or kerosene (or a combination of both), for exterior mounted brakes. Spray lubricant directly onto rotating points in housing.

**CAUTION**

Areas where lack of lubrication will result in sticky hand brake release, or complete failure of hand brake to release are indicated in Fig. 2. Ensure adequate lubrication at these points.

Frequency of cleaning and lubrication is dependent on usage and operating conditions. Perform these procedures as often as required.



★ Areas where lack of lubrication can cause sticky hand brake release or complete failure of hand brake to release.

- |                     |                            |
|---------------------|----------------------------|
| 1. Chain Drum       | 8. Hand Lever Ratchet      |
| 2. Pinion Shaft     | 9. Hand Lever              |
| 3. Rubber Snubber   | 10. Hand Lever Pawl        |
| 4. Chain Weight     | 11. Bumper                 |
| 5. Trip Lever       | 12. Hand Lever Pawl Spring |
| 6. Holding Pawl Pin | 13. Adjusting Screw        |
| 7. Holding Ratchet  |                            |

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Fig.2 – Hand Brake Lubrication

## CHAIN REPLACEMENT, (Fig. 3)

### Refer To Fig. 3 (A)

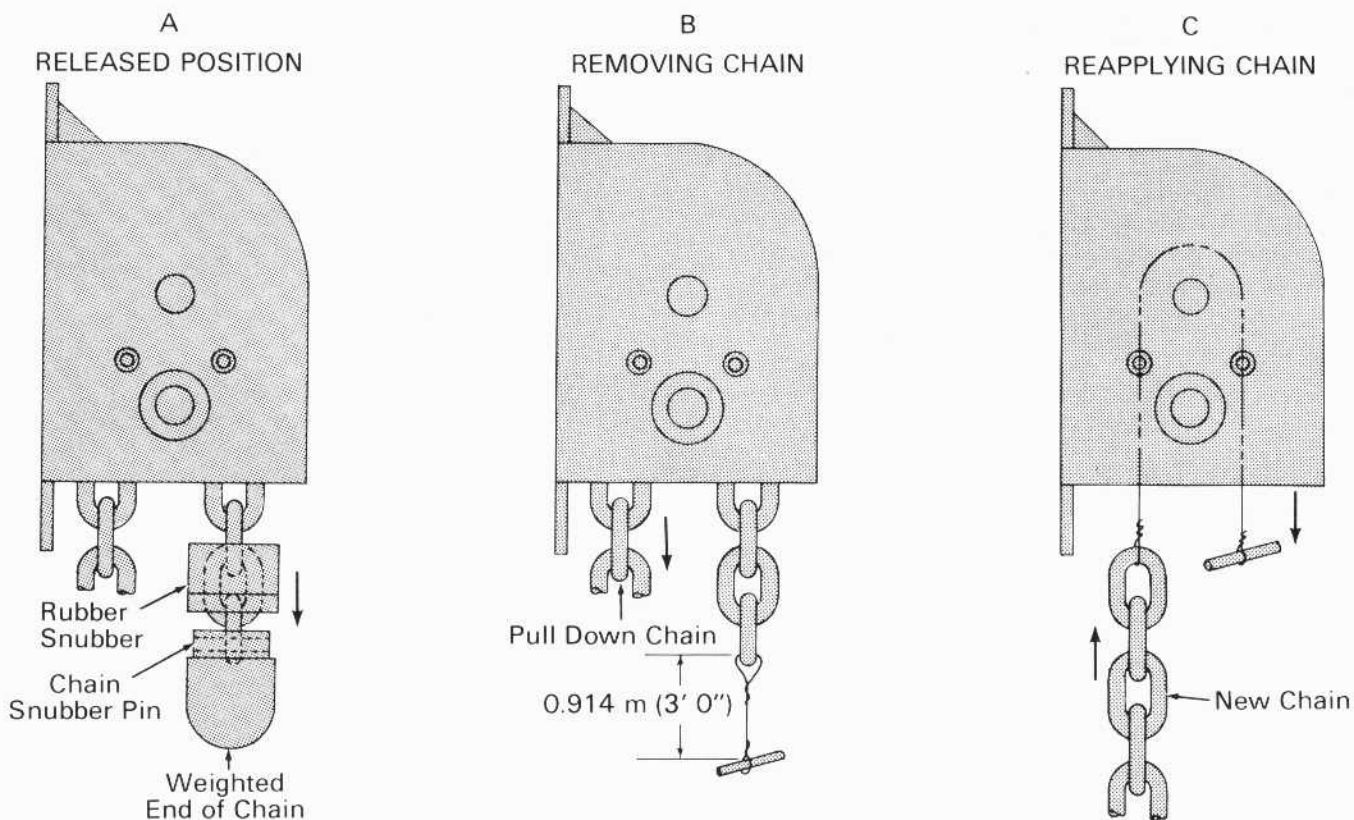
1. Pull down weighted end of chain.
2. Slide rubber snubber up chain as shown.
3. Remove chain snubber pin.

### Refer To Fig. 3 (B)

4. Attach a 1 m (3') long piece of wire to loose end of chain using a loop or other means for preventing the wire from passing through the housing.
5. Pull down on chain until the wire hangs evenly on both sides of the drum.

### Refer To Fig. 3 (C)

6. Disconnect wire from old chain and attach new chain.



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Fig.3 - Chain Replacement

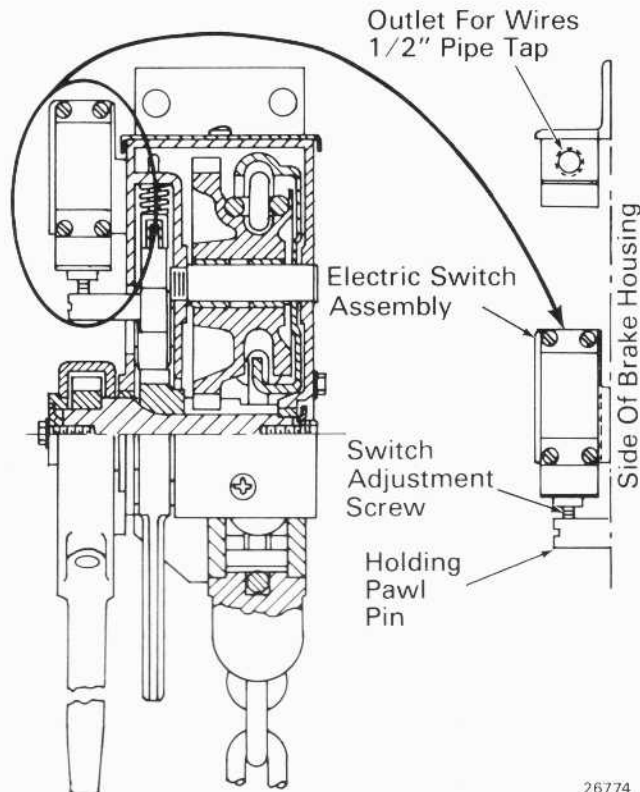
7. Pull down on handle end of wire while simultaneously raising chain up and starting it through the bottom of housing. Continue this operation until chain has been drawn entirely through housing, and is hanging as shown in (A).

### Refer To Fig. 3 (A)

8. Slide snubber up chain.
9. Attach weight by inserting chain snubber pin.
10. Slide snubber down over the end of the weight, and connect far end of chain to brake rigging.

## HAND BRAKE WITH HOUSING-MOUNTED ELECTRIC CONTROL SWITCH

Electric locomotives equipped with the lever type hand brake are provided with a housing-mounted electrical switch, Fig. 4. This switch is connected to a remote hand brake indicator light.



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Fig.4 - Hand Brake With Housing-Mounted Electric Control Switch

The switch is a double-throw, single-pole design having two normally open, and two normally closed contacts, Fig. 5.

To adjust the switch, Fig. 4, depress switch plunger 3 mm (1/8") when the holding pawl pin is in the upper-most position. Extend or retract adjusting screw as required. After adjustment has been made, move locking nut toward switch and tighten securely.

### CAUTION

To avoid damage to electric switch if hand brake is to be removed from car, first remove switch from brake assembly.

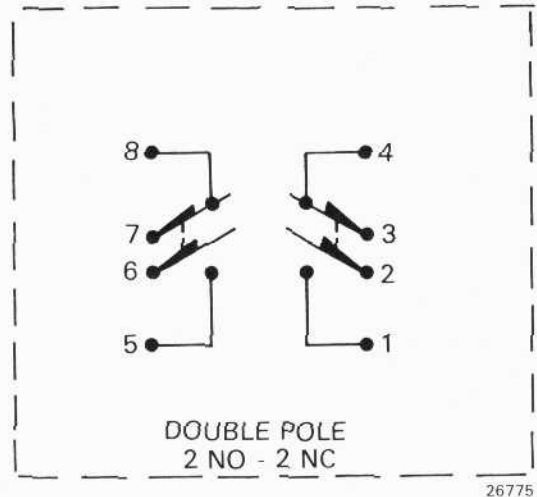


Fig.5 - Switch Assembly Terminal Diagram

## SERVICE DATA TABULATION OF BRAKES

### CHAIN LENGTH

EMD Part No.	Hand Lever Length	Over-All	B.H.L.F.
6915708	457.2 mm (18")	3.78 m (12' 5")	3.30 m (10' 10")
8191508	508.0 mm (20")	3.45 m (11' 4")	2.97 m (9' 9")
8191509	508.0 mm (20")	2.93 m (9' 7")	2.43 m (8' 0")
8191510	508.0 mm (20")	4.57 m (15' 0")	4.1 m (13' 5")
8194043	508.0 mm (20")	3.45 m (11' 4")	2.97 m (9' 9")
8205706	457.2 mm (18")	4.8 m (15' 9")	4.31 m (14' 2")
8210795	457.2 mm (18")	5.48 m (18' 0")	5.1 m (16' 5")
8220762	457.2 mm (18")	5.1 m (16' 5")	4.52 m (14' 10")
8251742	406.4 mm (16")	3.58 m (11' 9")	3.1 m (10' 2")
8286683	406.4 mm (16")	6.4 m (21' 0")	5.91 m (19' 5")
8291703	508.0 mm (20")	3.33 m (10' 11")	2.84 m (9' 4")
8292620	406.4 mm (16")	5.63 m (18' 6")	5.15 m (16' 11")
8295925	406.4 mm (16")	3.66 m (12' 0")	3.18 m (10' 5")
8301114	406.4 mm (16")	3.86 m (12' 8")	3.38 m (11' 1")
8303000	508.0 mm (20")	3.15 m (10' 4")	2.67 m (8' 9")
8308388	304.8 mm (12")	4.36 m (14' 4")	3.88 m (12' 9")
8310532	406.4 mm (16")	3.78 m (12' 5")	3.3 m (10' 10")
8311923	406.4 mm (16")	3.94 m (12' 11")	3.45 m (11' 4")
8311928	609.6 mm (24")	4.52 m (14' 10")	4.03 m (13' 3")
8317329	304.8 mm (12")	6.4 m (21' 0")	5.91 m (19' 5")
8322496	406.4 mm (16")	5.1 m (16' 5")	4.53 m (14' 10")
8324413	609.6 mm (24")	3.63 m (11' 11")	3.15 m (10' 4")
8325693	609.6 mm (24")	4.87 m (16' 0")	4.39 m (14' 5")
8336064	406.4 mm (16")	4.27 m (14' 0")	3.78 m (12' 5")
8341606	609.6 mm (24")	2.84 m (9' 4")	2.36 m (7' 9")
8347255	304.8 mm (12")	5.95 m (19' 6")	5.47 m (17' 11")
8350901	406.4 mm (16")	6.6 m (21' 8")	6.13 m (20' 1")
8354115	558.8 mm (22")	2.28 m (7' 6")	1.81 m (5' 11")
8358724	508.0 mm (20")	5.13 m (16' 10")	4.64 m (15' 3")
8360807	609.6 mm (24")	3.2 m (10' 6")	2.72 m (8' 11")
8364644	609.6 mm (24")	4.6 m (15' 1")	4.11 m (13' 6")
8364779	609.6 mm (24")	2.54 m (8' 4")	2.06 m (6' 9")
8374508	406.4 mm (16")	4.5 m (14' 9")	4.02 m (13' 2")
8377424	609.6 mm (24")	3.12 m (10' 3")	2.65 m (8' 8")
8383750	406.4 mm (16")	4.57 m (15' 0")	4.09 m (13' 5")
8392480	457.2 mm (18")	4.29 m (14' 1")	3.8 m (12' 6")

<u>EMD Part No.</u>	<u>Hand Lever Length</u>	<u>Over-All</u>	<u>B.H.L.F.</u>
8404811	508.0 mm (20")	3.23 m (10' 7")	2.75 m (9' 0")
8411604	609.6 mm (24")	4.02 m (13' 2")	3.53 m (11' 7")
8414410	508.0 mm (20")	3.69 m (12' 1")	3.2 m (10' 6")
8420622	508.0 mm (20")	3.65 m (11' 11-1/2")	3.17 m (10' 4-1/2")
8422348	508.0 mm (20")	2.67 m (8' 9")	2.18 m (7' 2")
8430369	406.4 mm (16")	4.2 m (13' 9")	3.7 m (12' 2")
8435045	508.0 mm (20")	2.21 m (7' 3")	1.73 m (5' 8")
8439513	508.0 mm (20")	2.14 m (7' 0")	1.66 m (5' 5")
8441341	508.0 mm (20")	2.69 m (8' 9")	2.18 m (7' 2")
8446352	508.0 mm (20")	4.27 m (14' 0")	3.78 m (12' 5")
8456413	406.4 mm (16")	3.69 m (12' 1")	3.2 m (10' 6")
8462264	609.6 mm (24")	2.26 m (7' 5")	1.66 m (5' 5")
8463618	508.0 mm (20")	3.51 m (11' 6")	3.02 m (9' 11")
8469326	508.0 mm (20")	4.21 m (13' 10")	3.74 m (12' 3")
8472393	508.0 mm (20")	4.42 m (14' 6")	3.94 m (12' 11")
8473310	508.0 mm (20")	4.72 m (15' 6")	4.25 m (13' 11")
8486797	609.6 mm (24")	4.14 m (13' 7")	3.66 m (12' 0")
8492880	406.4 mm (16")	4.21 m (13' 10")	3.74 m (12' 3")
8493013	609.6 mm (24")	3.66 m (12' 0")	3.18 m (10' 5")
9080455	508.0 mm (20")	3.92 m (12' 10")	3.43 m (11' 3")
9084659	508.0 mm (20")	2.14 m (7' 0")	1.66 m (5' 5")
9088290	609.6 mm (24")	3.73 m (12' 2-1/2")	3.23 m (10' 7-1/2")
9093201	508.0 mm (20")	4.14 m (13' 7")	3.66 m (12' 0")
9098390	609.6 mm (24")	5.48 m (18' 0")	5.0 m (16' 5")
9505042	558.8 mm (22")	6.78 m (22' 3")	6.3 m (20' 8")
9513630	508.0 mm (20")	4.0 m (13' 3")	3.56 m (11' 8")
9524308	558.8 mm (22")	3.48 m (11' 5")	2.3 m (9' 10")
9537103	508.0 mm (20")	5.66 m (18' 7")	5.18 m (17' 0")
9539566	508.0 mm (20")	6.78 m (22' 3")	6.3 m (20' 8")
9540271	558.8 mm (22")	5.99 m (19' 8")	5.5 m (18' 1")
9541183	558.8 mm (22")	2.11 m (6' 11")	1.63 m (5' 4")

## MATERIAL

Bearing Grease 15.9 kg (35 lb) pail . . . . .	8249819
Bearing Grease 54.4 kg (120 lb) drum . . . . .	8249820

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