Before installing hoist, fill in the information below. Refer to the Hoist and Motor data plates.

Model No. ____________________________
Serial No. ____________________________
Purchase Date ________________________
Voltage ______________________________
Rated Load __________________________

RATED LOADS
1/2 & 1 METRIC TON

SHAW-BOX®
WIRE ROPE ELECTRIC HOISTS
INCLUDING WEIGHT WATCHER OVERLOAD CLUTCH MODELS
FOREWORD

This manual contains important information to help you install, operate, maintain and service your new Series 900 SHAW-BOX electric hoist. We recommend that you study its contents thoroughly before putting the hoist into use. Read ANSI B30.16 safety standard for overhead hoists. Then, with proper installation, application of correct operating procedures, and by practicing the recommended maintenance suggestions you can expect maximum lifting service from the hoist.

It will likely be a long time before the parts information found in Section IX is needed; therefore, after the hoist is installed and operators are completely familiar with operation and preventive maintenance procedures, we suggest that this manual be carefully filed for future reference.

When ordering replacement parts from this manual it will be necessary that you include, in addition to key numbers listed for required parts, the Hoist Serial Number, Catalog Number and Model Number which are found on the nameplate attached to motor side of hoist frame. For your convenience, a space has been provided on the front cover of this manual to record nameplate information. We recommend that you fill it in immediately. If applicable also record the customer hoist identity number and/or location of hoist in your plant, providing a tie between the hoist and this manual. Customer hoist identity numbers can also be useful for identifying future inspection records.

The contents of this manual are of necessity, general in nature and may cover features not incorporated on your hoist; or, you may have ordered features not covered by this manual. Therefore, the user must exercise care in applying instructions given in this manual. If specific information not in this manual is required, contact the factory at Muskegon, Michigan 49443.

THE INFORMATION CONTAINED IN THIS MANUAL IS FOR INFORMATIONAL PURPOSES ONLY AND LIFT-TECH INTERNATIONAL DOES NOT WARRANT OR OTHERWISE GUARANTEE (IMPLIED OR EXPRESS-LY) ANYTHING OTHER THAN THE COMPONENTS THAT LIFT-TECH MANUFACTURES AND ASSUMES NO LEGAL RESPONSIBILITY (INCLUDING, BUT NOT LIMITED TO CONSEQUENTIAL DAMAGES) FOR INFORMATION CONTAINED IN THIS MANUAL.

NOTICE: Information given in this book is subject to change without notice.

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SECTION 1—GENERAL DESCRIPTION

1-1. GENERAL. Series 900 SHAW-BOX electric hoists are precision built wire rope and drum type hoists which are made in two load ratings, 1/2 and 1 metric tons, having various lifting speeds, and electrical service. Equipped with an integral suspension lug, they are designed to be rigidly attached to an overhead structure or mounted on SHAW-BOX rigid mount trolleys for operation on runway beams.

NOTICE

Series 900 SHAW-BOX hoists are available with an optional built-in mechanical overload clutch. Hoists having this device are identified with the words "WEIGHT WATCHER" on the hoist.

The WEIGHT WATCHER overload clutch permits operation of your hoist within its rated load and helps prevent lifting of excessive overloads which could cause permanent deformation of a properly maintained hoist or trolley.

1-2. BASIC CONSTRUCTION. All sizes and models of Series 900 hoists are of the same basic construction, having an alloy aluminum frame which houses a rope drum, three-reduction gear train and automatic load brake. An alloy aluminum gearcase cover encloses gearing and load brake within the frame. An electric driving motor with multiple disc-type motor brake mounts on back of gearcase beside drum. Electrical components, mounted on gearcase cover, control operation and direction of driving motor. A gasketed, removable, cover protects electrical units. An integral suspension lug is cast into top of frame. Hoisting rope wrapped around a grooved drum and a lower block assembly are used for lifting loads. An upper limit stop is used to limit travel of the lower block in the raising direction. A push button control station, for operating hoist, is suspended from the electrical compartment.

1-3. WEIGHT WATCHER overload clutch. This optional clutch is built into the load brake gear. It is a cone-friction clutch that connects the first reduction gear (load brake gear) to the load brake output pinion shaft. A Belleville disc spring provides clutch pressure between the gear and its cone shaped gear center. An excessive overload causes the load brake gear to rotate without turning the gear center and the output pinion shaft. The clutch is located between the load brake and the motor, thus allowing both load brake and motor to function in their normal manner. See paragraph 3-3 for operation.

SECTION II - INSTALLATION

2-1. GENERAL. SHAW-BOX electric hoists are lubricated and tested before shipped from the factory. To place hoist in service, attach to a suitable suspension (par. 2-2), connect to electrical service (par. 2-3) and perform pre-operation tests and checks (par. 2-4).

2-2. SUSPENDING HOIST. Hoist may be suspended in a fixed location servicing only the area directly below the hoist (Lug Mounted). Hoist may be attached to a moveable trolley which in turn may be mounted on an I-beam attached to a building or crane, servicing a larger area (Trolley Mounted).

a. Lug Mounted hoists attach to adequate supports welded or bolted to a building or other structure. The supporting structure must have sufficient strength with adequate margin to support the weight of the hoist and rated load as well as other loads to which the supporting structure may be subjected.

WARNING

Design and installation of hoist support shall be done only by qualified persons.

Steel angles or plates used to suspend hoist should be spaced as close to the hoist suspension lug as possible. Mounting bolts or threaded studs, attaching hoist to mounting structure, must be 5/8" diameter and high strength material such as ASTM-A325 or equivalent is recommended. Make certain that mounting bolts or studs are long enough so that the threads do not engage the mounting support and that mounting bolts or studs are secured with nuts and lockwashers, self-locking nuts or cross bolting, if unthreaded.

b. Trolley Mounted hoists are attached to moveable trolleys. If hoist is mounted on an existing trolley, a qualified person shall determine that the trolley and its supporting structure will support the rated load and weight of the hoist with adequate margin. Hoist/trolley units are shipped from the factory with trolley packaged separately. If the trolley can be installed directly over the end of the supporting beam, assemble trolley to hoist. Be certain that the spacing between wheel flanges, after assembly, is 1/4" greater than exact width of beam flange. (See Figure 2-1 below and instruction sheet furnished with trolley.) Using proper equipment, carefully lift trolley and hoist and install on end of beam.

For trolleys which are to be mounted along the span of a beam not having open ends, measure exact width of beam flange and assemble trolley to hoist so that spacing between wheel flanges is 1/4" (see Figure 2-1) greater than beam width (3/8" if beam has curves). This is accomplished by rearranging the spacer washers on the bolts connecting trolley side plates to hoist mounting lug. If trolley is shipped separate from hoist, see instruction sheets furnished with trolley for orientation and installation.

When proper spacing has been determined, loosen mounting nuts (item 1, Figure 2-1) to allow trolley wheels to spread far enough to pass over edges of beam flange. (Some installations may require complete removal of one trolley side plate.) Using adequate equipment carefully lift the hoist and trolley so the wheel treads will rest on the lower beam flange. Replace side plate and washers if removed for installation. Replace suspension stud nuts.
CAUTION

Recheck spacer washers to make certain that the number of washers between the side plate and hoist suspension lug are equal, and also the number on the outside of each side plate are equal. The suspension stud nuts should only be snugged up on the lockwashers until a load has been applied on the hook. A partial load (approx. 25% rated hoist load) placed on the hook will properly seat hoist in the trolley. Tighten suspension stud nuts only after hoist has been properly seated in the trolley.

WARNING

Mounting of the hoist-trolley unit on the monorail and final preoperation inspection shall be performed only by qualified persons properly supervised.

Figure 2-1. Sectional View of Trolley showing proper wheel and washer spacing.

2-3. CONNECTING HOIST TO ELECTRICAL SERVICE. Electrical service to the hoist may be power cable or a guarded system having sliding shoe or wheel type collectors.

WARNING

Be certain that electrical power supply is off and locked in the open position before attempting any electrical connections to the hoist. This equipment must be effectively grounded according to the National Electric Code, or other applicable codes. If the grounding method used is through the trolley wheels, then each section of track must be grounded by metal-to-metal connection to the building ground. Certain environments may prevent proper grounding by this means. In this case a separate grounding conductor should be provided.

a. Follow National, State and Local Electrical Codes when providing electrical service to the hoist.

CAUTION

Verify that the hoist and/or trolley is the same voltage, frequency and phase as the power supply. 460V./230V. and 230V./115V. dual voltage hoists are reconnnetable for use on either voltage. Check terminal board connections with wiring diagram to make certain that the motor and transformer leads are located on proper terminals.

b. Make electrical connections using the appropriate diagrams shown in Section VIII. All electrical connections, including connections to collectors or power cord, shall be made only by qualified journeyman electricians.

WARNING

The green wire provided in the power supply cable (when furnished) is a grounding wire and must be connected to a proper ground.

2-4. PRE-OPERATION CHECKS.

a. Check Oil Level and Grease Fittings. The gearcase has been filled with oil to proper level and the lower block sheave bearing has been lubricated at the factory. However, this should be checked before operating hoist. Remove and discard felt shipping plug from oil filler at top of hoist. Refer to Figure 4-1. Check oil level by removing oil plug at side of hoist. With hoist in level position, level of oil should be even with bottom of tapped hole. If not, add oil as specified in Section IV. Grease fitting in lower block sheave pin should have evidence of grease.

b. Check Push Button Operation and Phasing.

WARNING

On three phase hoists it is possible to have "Reverse Phasing" causing the lower block to lower when the "Up" button is depressed. When this condition exists, the automatic limit stop switch is inoperative and hoist operation will be dangerous.

To properly check the phase of the hoist, follow the steps below:

(1) With "POWER OFF" operate the "START" (if furnished), "STOP" (if furnished), and "UP" push buttons and determine that they do not bind or stick in any position. DO NOT REMOVE WARNING TAG or test "DOWN" push button at this time.
WARNING

If any push button binds or sticks in any position — DO NOT TURN POWER ON — determine the cause and correct the malfunction before operating.

(2) Temporarily connect hoist to power source.

(3) Operate "UP" button briefly to determine direction of hook travel.

(4) If hook raises, phase is correct. Turn power off and make temporary connections permanent.

(5) If hook lowers, hoist is "Reversed Phased". TURN POWER OFF and correct by interchanging any two leads at power source connection. Do not change internal wiring of hoist.

(6) The WARNING TAG should be removed from the "DOWN" push button after it has been determined that hoist is correctly phased.

Figure 2-3. View showing Limit Stop Switch and Reversing Switch arrangement.

Do not attempt to make above test with hook in a high position near hoist.

d. Check Lower Block and Hoisting Cable. Depress "DOWN" push button and run lower block to its lower position. No less than two wraps shall remain on the drum with the loaded hook in its lowest position, unless hoist is equipped with a lower limit switch in which case no less than one and one half wraps shall remain on the drum. Also check to see that lower block and rope do not twist excessively. If they twist to the extent that two ropes rub against each other, disengage rope from the frame anchor and twist rope four or five turns in a direction opposite to that which the block turns. Reconnect rope to anchor (Fig. 2-4), holding firmly to eliminate rope twisting back to its original position. Operate hoist up and down a few times. If lower block still rotates, repeat process until twisting is corrected.

NOTICE

Under certain conditions, when removing the rope anchor keeper plate at top of hoist, it will be impossible to take out one of the keeper plate bolts due to interference by spacer washers and hex nut on end of suspension cross pin.

To facilitate removal of the keeper plate, when there is this interference and without removing interfering parts, one bolt hole in keeper plate is slotted. This slot allows the plate to be pulled from under the loosened bolt. It will be necessary to back the bolt out as far as it will go against the interfering parts to remove plate. Keeper plate bolts must be tightened securely after reinstalling keeper plate.
3-4. OPERATING PRECAUTIONS.

WARNING

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

Safe operation of an overhead hoist is the operator’s responsibility. Listed below are some basic rules that can make an operator aware of dangerous practices to avoid and precautions to take for his own safety and the safety of others. Observance of these rules in addition to frequent examinations and periodic inspection of the equipment may save injury to personnel and damage to equipment.


2. DO be familiar with hoist operating controls, procedures and warnings.

3. DO make sure hook travel is in the same direction as shown on controls.

4. DO make sure hoist limit switches function properly.

5. DO maintain firm footing when operating hoist.

6. DO make sure that load slings or other approved single attachments are properly sized and seated in the hook saddle.

7. DO make sure that the hook latch, if used, is closed and not supporting any part of the load.

8. DO make sure that load is free to move and will clear all obstructions.

9. DO take up slack carefully, check load balance, lift a few inches and check load holding action before continuing.

10. DO avoid swinging of load or load hook.

11. DO make sure that all persons stay clear of the suspended load.

12. DO warn personnel of an approaching load.

13. DO protect wire rope from weld splatter or other damaging contaminants.

14. DO promptly report any malfunction, unusual performance, or damage of the hoist.

15. DO inspect hoist regularly, replace damaged or worn parts, and keep appropriate records of maintenance.

16. DO use the hoist manufacturer’s recommended parts when repairing a hoist.

17. DO use hook latches wherever possible.

18. DO apply lubricant to the wire rope as recommended.

19. DO NOT lift more than rated load.
20. DO NOT use the hoist load limiting device to measure the load.
21. DO NOT use damaged hoist or hoist that is not working correctly.
22. DO NOT use the hoist with twisted, kinked, damaged or worn wire rope.
23. DO NOT lift a load unless wire rope is properly seated in its groove(s).
24. DO NOT use load rope as a sling or wrap rope around the load.
25. DO NOT lift a load if any binding prevents equal loading on all supporting ropes.
26. DO NOT apply the load to the tip of the hook.
27. DO NOT operate unless load is centered under hoist.
28. DO NOT allow your attention to be diverted from operating the hoist.
29. DO NOT operate the hoist beyond limits of load rope travel.
30. DO NOT use limit switches as routine operating stops unless recommended. They are emergency devices only.
31. DO NOT use hoist to lift, support or transport people.
32. DO NOT lift loads over people.
33. DO NOT leave a suspended load unattended unless specific precautions have been taken.
34. DO NOT allow sharp contact between two hoists or between hoist and obstructions.
35. DO NOT allow the rope or hook to be used as a ground for welding.
36. DO NOT allow the rope or hook to be touched by a live welding electrode.
37. DO NOT remove or obscure the warnings on the hoist.
38. DO NOT adjust or repair a hoist unless qualified to perform hoist maintenance.
39. DO NOT attempt to lengthen the load rope or repair damaged load rope.
40. Personnel not physically fit or properly qualified, shall not operate hoist.
41. Do not operate hoist unless limit stop switch is operating properly.
42. Center hoist over load before operating. Avoid side pulls and swinging of load or load hook when traveling hoist.

**WARNING**

Do not operate the hoist with the hoisting rope out of the drum grooves. Such operation may result in the rope breaking and dropping the load which can cause damage to equipment and injury to operator or other personnel. Hoist rope will remain in the drum grooves during proper operation under normal operating conditions, however, slack or kinked rope, excessive side pulls, swinging or jerking of load, or similar abuse, may cause the rope to leave the grooves.

43. Observe recommended inspection and maintenance procedures.

44. Use common sense and best judgement whenever operating a hoist.

SECTION IV — LUBRICATION

4-1. GENERAL. The lubrication services outlined in paragraphs 4-2 thru 4-6 should be performed at regular intervals to maintain top hoist performance and help insure long life.

4-2. CHANGE GEARCASE OIL. (Figure 4-1, Page 7)

a. Remove oil drain plug from bottom of gearcase and drain out oil.

b. Remove oil level plug from side of gearcase and then flush housing, thru oil filler, using petroleum solvent. Reinstall drain plug.

c. Refill thru oil filler to proper level (bottom of oil level plug hole) using 32 ounces of Automatic Transmission Fluid, DEXRON II Type, suitable for all temperature ranges. Reinstall oil level plug.

![Figure 4-1. View showing location of Oil Filler Oil Level Plug and Oil Drain Plug.](image)

4-3. LUBRICA TE HOISTING CABLE. Hoists are shipped from the factory without an exterior coating on hoisting cable. It is recommended, where conditions permit, that the cable be thoroughly coated at installation and kept well coated with LUBRIPLATE Chain and Cable Fluid, or equal.

4-4. LUBRICATE LOWER BLOCK ASSEMBLY.

a. Lubricate lower block sheave thru grease fitting located in end of sheave pin. Apply (*) NLGI No. 2 grease, for operating temperatures from +50°F to +125°F. For colder temperatures, (-20°F to +50°F) use NLGI No. 1 grease.
b. Apply a few drops of S.A.E. No. 50 oil to hook thrust bearings and shank of hook.

(*) National Lubricating Grease Institute.

4-5. LUBRIFICATE LIMIT STOP LEVER.

a. Apply a few drops of S.A.E. No. 50 oil to pivot points of limit lever arm.

b. Apply a few drops of S.A.E. No. 50 oil to shaft bearing at rear of electrical compartment.

SECTION V — INSPECTION AND PREVENTIVE MAINTENANCE

5-1. GENERAL. All SHAW-BOX, Series 900, hoists are inspected and tested at the factory. Regular in-service inspection and preventive maintenance programs not only help reduce overall maintenance costs but may also prevent serious shutdowns by forewarning of problems that could cause these shutdowns. Regular inspections, periodic minor adjustments, regular cleaning and lubrication and replacement of worn parts can help preserve good performance and operation of your hoist.

Many factors influence the inspection and preventive maintenance program required for your hoist. Frequency and severity of service and material handled, local environmental conditions and various applicable codes are some of the factors that the user must consider to adjust the inspection and maintenance program outlined in this section to meet his specific conditions.

The inspection and maintenance services outlined in this section are considered minimum. Recommended in the schedule are minimum inspection and maintenance intervals based on average daily use in a normal environment. Average daily use is based on 1000 operational hours per year maximum and intermittent operation of the hoist eight hours per day, five days per week with maximum 50% “on” time, a maximum of 300 starts per hour of elapsed time, and the effective load not to exceed 65% of rated load.

Environmental conditions in which the hoist operates are also important considerations for the user when adjusting hoist inspection and maintenance programs to local conditions. Frequency of inspection and maintenance must be increased if hoist is subjected to severe atmospheric environmental conditions, such as corrosive vapors, extreme heat or cold, cement or dust and other air borne contaminants. The user should carefully consider all environmental conditions and adjust frequency and degree of maintenance for his local conditions. Consult Lift-Tech Field Service Department for advice for unusual environmental conditions.

Various codes also regulate inspection and maintenance programs. Attention must be given to applicable Federal Standards, OSHA regulations, National Standards, state and local codes which may include mandatory rules relating to hoist inspection and maintenance. The user should become familiar with all applicable codes for his area and be guided accordingly.

Listed on the Recommended Inspection and Maintenance Schedule are inspection frequencies and requirements. Perform these inspections regularly as scheduled and additional inspections as may be required for activity, service and environment of your hoist. The hoist operator must be responsible for determining the operating conditions and severity of service.

Inspection Schedule, and Maintenance Report Form. Shown in this manual is a recommended Inspection Schedule and Maintenance Report form which lists various components of the hoist. The form also includes trolley components, runway components, and miscellaneous items. This form is suggested as a guide for written inspection reports. Inspections are recommended each month and should be performed thoroughly enough to inform the hoist user of deficiencies for any item listed. This form does not supersede the Inspection and Maintenance Schedule listed below but may be used to record scheduled inspection and maintenance services required.

The user should revise the inspection interval, add additional units or provide a similar form to suit particular conditions which may exist. However, written, dated and signed inspection reports should be maintained particularly on critical items, such as hoist hooks, hoisting ropes, sheaves, drums and brakes. Periodic review of old inspection reports can indicate service life of hoist components, forecasting need for adjustment, repair or replacement of these components.

As a matter of expedience, appointed maintenance personnel inspecting hoist can also take care of minor adjustments, repairs and cleaning, where required. Note column on Inspection Schedule and Maintenance Report form headed Corrective Action and Notes. When corrective action is made during inspection, note condition of part or unit as inspected in appropriate Condition column with a check mark (✔). Note “during inspection” corrective action taken and date in space provided. In this manner, items requiring further attention will be checked (✔) without showing corrective action. This will advise the designated person responsible for hoist operation and safety, who reviews the reports, that deficiencies exist. The designated person will check all deficiencies as listed and re-examine or otherwise determine whether they constitute a safety hazard.

WARNING

Deficiencies may be hazardous to personnel and equipment. Do not operate a hoist having deficiencies unless a designated qualified person has determined that these deficiencies DO NOT constitute a safety hazard.

Written, dated and signed inspection reports for many items are mandatory under OSHA regulations, and many state safety codes. It is strongly recommended that the Inspection Schedule and Maintenance Report, shown herein, be completed by a qualified person designated with the responsibility for hoist operation and safety or an inspector appointed by this person.

Inspection records can show the service life of hoist components and help forecast the need for adjustments, repairs and ordering or replacement parts. File and review these reports after each inspection.
**WARNING**

Do not operate a hoist having unusual vibrations, sounds or other conditions.

Danger may be present that the hoist operator cannot see. Determine and correct cause of unusual conditions and make certain hoist can be operated safely. Be certain to disconnect power to the hoist whenever electrical cover is removed.

---

### RECOMMENDED INSPECTION AND MAINTENANCE SCHEDULE

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<th>TIME INTERVAL</th>
<th>INSPECTION OR MAINTENANCE</th>
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<tr>
<td>Daily or start of each shift</td>
<td>Check operation of all functional mechanisms including limit switch operation, brakes</td>
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<tr>
<td>(Visual)</td>
<td>and control. Check hoist cable for kinks, abrasions, corrosion or broken wires or</td>
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<td></td>
<td>evidence of improper spooling on drum. Inspect hook and lower block and all load</td>
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<tr>
<td></td>
<td>bearing components for damage.</td>
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<tr>
<td>1 Month</td>
<td>* HOIST CABLE — Inspect and lubricate per paragraph 5-8.</td>
</tr>
<tr>
<td>1 – 3 Months</td>
<td>* ELECTRICAL CONTROLS — Inspect per paragraph 5-4. Check hoist gear-case oil level -</td>
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<td>add oil as required per paragraph 4-2c.</td>
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<td>6 Months</td>
<td>* LOWER BLOCK — Inspect per paragraph 5-2.</td>
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<td>Annually</td>
<td>* Motor brake and actuating mechanisms. Inspect per paragraph 5-5. Inspect hooks</td>
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<tr>
<td></td>
<td>with suitable crack detecting procedures per paragraph 5-2. Drain and refill hoist</td>
</tr>
<tr>
<td></td>
<td>gear-case per paragraph 4-2c.</td>
</tr>
<tr>
<td>6 Months or 500 — 750 hours &quot;on&quot; time</td>
<td>* Inspect electrical controls per paragraph 5-4. Lubricate hoist cable per paragraph</td>
</tr>
<tr>
<td></td>
<td>4-3. Lubricate lower hook block per paragraph 4-4. Lubricate limit stop level per</td>
</tr>
<tr>
<td></td>
<td>paragraph 4-5.</td>
</tr>
</tbody>
</table>

* Perform services described by paragraph indicated.
# Inspection Schedule and Maintenance Report

**Hoist Serial No. (MFGRS):**

**Customer Hoist Identity No.:**

**Location in Plant:**

**This Inspection is Monthly ☐ Annual ☐ Semi-Annual ☐**

**Inspected By:***

**Date:***

## Component, Unit or Part and Location on Hoist

<table>
<thead>
<tr>
<th>Component, Unit or Part and Location on Hoist</th>
<th>Recommended Inspection Interval</th>
<th>Condition (Check column best indicating condition when part or unit is inspected. Use note column to the right if condition is not listed below.)</th>
<th>Corrective Action Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor</td>
<td>☐ Monthly</td>
<td>☐ Semi-Annual ☐ Annual ☐ Good ☐ Repair Required ☐ Replacement Required (Loose part or wire) ☐</td>
<td>(Indicate corrective action taken during inspection and note date. For corrective action to be done after inspection, a designated person must determine that the existing deficiency does not constitute a safety hazard before allowing unit to operate. When corrective action is completed, describe and note date in this column.)</td>
</tr>
<tr>
<td>Motor Brake</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Mechanical Load Brake</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Overload Clutch</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Couplings</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Gears, Shafts &amp; Bearings</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Upper Block</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Lower Block</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Hook &amp; Throat Opening</td>
<td>☐</td>
<td>☒ X</td>
<td>Record Hook Throat Opening</td>
</tr>
<tr>
<td>Hoist Rope</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Rope Drum</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Guards</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Limit Switch</td>
<td>☐</td>
<td>☐</td>
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</tr>
<tr>
<td>Pushbutton</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Wiring</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Motor</td>
<td>☐</td>
<td>☐</td>
<td></td>
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<tr>
<td>Brake (when so equipped)</td>
<td>☐</td>
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<td></td>
</tr>
<tr>
<td>Couplings</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Gears, Shafts &amp; Bearings</td>
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<tr>
<td>Frame</td>
<td>☐</td>
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<tr>
<td>Wheels</td>
<td>☐</td>
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<tr>
<td>Bumpers</td>
<td>☐</td>
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<tr>
<td>Guards</td>
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<tr>
<td>Conductors</td>
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<tr>
<td>Collectors</td>
<td>☐</td>
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<tr>
<td>Hoist</td>
<td>☐</td>
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<tr>
<td>Trolley</td>
<td>☐</td>
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<tr>
<td>Monorail Joints</td>
<td>☐</td>
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</tr>
<tr>
<td>Monorail</td>
<td>☐</td>
<td>☐</td>
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</tr>
<tr>
<td>Main Conductors</td>
<td>☐</td>
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<td></td>
</tr>
<tr>
<td>Main Collectors</td>
<td>☐</td>
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</tr>
<tr>
<td>General Condition</td>
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<tr>
<td>Load Attachment Chains</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Rope Slings &amp; Connections</td>
<td>☐</td>
<td>☐</td>
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</tr>
<tr>
<td>Change Gearcase Lub.</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Grounding Faults</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
</tbody>
</table>

* See text for DAILY & WEEKLY REQUIREMENTS.  
☐ Inspection Interval - should not exceed schedule on page 9.  
☒ Signed & Dated Report Required - OSHA.  
☒ Magnetic Particle or Equivalent Examination Required.
5-2. INSPECT LOWER BLOCK.

a. Check lubrication of sheave, hook, thrust washer and shank of the hook which passes through the lower block body.

b. Check sheave to insure rope groove is smooth and free from burns, or other surface defects.

c. Check sheave for freedom of rotation; replace bearing if defective.

d. Make certain that grooved pin, holding the hook nut to the hook, is securely in position.

e. Check to determine that safety latch is in good operating condition.

f. Check throat opening of hook. (Refer to Figure 5-1.) It is recommended that upon receipt of the hoist a measurement be made and recorded of the hook throat opening. OSHA Standards require that the hook be replaced if throat opening exceeds 15 percent of the original opening, or if the hook is twisted more than 10 degrees from the unbent plane. A gage block, properly identified to the hoist, similar to the one shown in Figure 5-1, is suggested to be made for each hook for use in these measurements.

g. Hooks showing signs of cracks must be replaced. Hooks should be inspected at least once per year using dye penetrants, magnetic particle or other suitable crack detecting methods.

h. Check wear of the hook, especially at the saddle and replace if badly worn.

![Figure 5-1. Proper Hook Opening.](image)

NOTE: Hooks and hook openings shown are based on hooks normally furnished with standard hoists. For dimensions of hooks having a special size, shape or material, consult the Muskegon, Michigan factory. For hooks with certain kinds of safety latches it may be necessary to temporarily remove latch to measure hook opening.

5-3. INSPECT ROPE END ANCHOR AND HOIST SUSPENSION.

a. Check rope end anchor at top of frame (Fig. 2-4). Be certain keeper plate bolts are tight and rope swage fitting is securely anchored.

b. Check suspension bolts attaching hoist to overhead structure or trolley. Be certain bolts are secure, properly tightened and free from damage.

<table>
<thead>
<tr>
<th>HOIST RATED LOAD (IN TONS)</th>
<th>HOEK SIZE</th>
<th>CORRECTLY DIMENSION (NEW HOEK)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>G</td>
<td>1-1/8&quot;</td>
</tr>
<tr>
<td>1</td>
<td>G</td>
<td>1-1/8&quot;</td>
</tr>
</tbody>
</table>

5-4. INSPECT ELECTRICAL CONTROLS.

**WARNING**

Do not Operate Hoists Having Worn or Damaged Suspension Bolts.

c. Check suspension lug at top of hoist frame for damage, cracks, or other signs of wear. Lugs with above deficiencies require frame replacement.

5-5. INSPECT MOTOR AND MOTOR BRAKE. These are mounted on the back of the gearcase, adjacent to the rope drum. To remove and inspect, proceed as follows:

a. Disconnect electrical power to hoist. Remove electrical compartment cover and inspect wiring and terminals. Terminals should be securely crimped to wires and electrical insulation should be sound. Terminal screws should be tight.

b. Check condition of contactor assembly, transformer, and limit stop and reverse switches.

c. Disconnect wire nuts on brake rectifier leads.

d. Remove brake mounting plate screws (Fig. 9-6) and lift brake assembly off to gain access to the motor mounting bolts.

e. Remove four thru bolts securing motor assembly and pull motor from gearcase. Inspect helical gear teeth on end of motor shaft for wear or damage. Check interior of motor for evidence of overheating.

f. Check braking surfaces for wear and scoring. Replace badly worn or scored parts.

g. Reinstall parts following procedure in reverse of disassembly.

h. Instructions for adjusting the hoist motor brake are inside the brake cover and are repeated below. Check brake adjustment after first 30 days of service and regularly thereafter during the annual inspection procedure recommended.

1. Examine position of indicating tang located below the solenoid coil.

2. If the tang is below the midway position of the two adjustment points shown on the brake, the brake should be adjusted to bring the tang back up along-side the NORMAL position on the brake.
(3) Remove the hex key (1/8" size) from the holster on the cover mounting stud and carefully turn the ADJUSTING SCREW (located above the solenoid coil) clockwise. The indicating tang will move a large distance for a small turn of the adjusting screw, therefore turn the screw no more than one quarter turn before checking adjustment.

(4) After adjustment operate the brake by hand to assure brake disc running clearance. The outboard brake pad should separate from the brake disc by approximately .010".

(5) Replace hex key in holster.

(6) Replace brake cover.

5-6. INSPECT MECHANICAL LOAD BRAKE AND GEARING.

a. The mechanical load brake and gearing may be inspected and serviced with hoist suspended. To do so, remove lower block and wire rope, electrical compartment cover, electrical panel assembly and limit switch assembly.

NOTE: To remove limit switch assembly, it will be necessary to disengage limit lever arm from limit shaft by driving roll pin from coupling. Refer to Figure 5-3.

b. Drain oil from gearcase; then, remove eight (8) socket head cap screws and lockwashers securing cover to gearcase. Carefully pry off cover.
c. To inspect gearing, pull out intermediate gear and pinion assembly, and load brake assembly (Fig. 5-5). Do not remove drum gear unless visual inspection indicates replacement is necessary.

d. Inspect gears and pinions for signs of tooth wear and damage. Inspect needle bearings in frame and cover for signs of wear or damage. If replacement of parts appears necessary, disassemble drum gear, intermediate gear and pinion assembly, and load brake assembly as directed below.

e. To disassemble drum gear, remove external retaining ring from shaft, using special pliers, and pull off gear.

f. To disassemble intermediate gear and pinion, press pinion shaft from gear using an arbor press.

g. It is recommended that load brake assembly be returned to an Authorized Repair Station for inspection and repair. If it is necessary that you make your own inspection and repair, instructions below must be followed:

(1) Place load brake assembly, flange up, in a vise equipped with brass or copper jaw plates to protect pinion gear teeth. Remove snap ring from end of load brake shaft (Fig. 5-6).

(2) Using a puller tool, remove brake flange from shaft. A groove is provided around outer diameter for this purpose. See Figure 5-7. Remove key from shaft and lift off 2 friction discs, and the pawl and ratchet assembly (Fig. 5-8).

(3) Remove load brake gear. If replacement of spring, spring retainer or cam is necessary, press off shaft (Fig. 5-9).

(4) The load brake pawl and ratchet is a riveted assembly and is not to be disassembled.

(5) Clean all parts thoroughly and inspect for wear and damage. Replace all parts that are excessively worn or damaged. Hard surfaced or glazed friction discs should be replaced.

h. Reassemble gearing and load brake parts following reverse procedure of disassembly. In assembling load brake, observe assembly steps (1) through (4) below:

(1) Before installing spring in its retainer (Fig. 5-9), apply a good grade of ball bearing grease to inside of retainer. Spring must be positioned exactly as illustrated, butted against pin at side of cam.
(1) A steel thrust washer with 5/8" I.D. must be installed on the brake flange end (end opposite pinion) of load brake and the gear cover end of the intermediate gear shaft.

(2) A steel thrust washer with 11/16" I.D. must be installed on the pinion gear end of the intermediate gear shaft.

(3) A bronze thrust washer with a lug on one side goes on pinion end of load brake shaft and it must be installed so that its lug engages the special slot located on the spot face surrounding the load brake bearing bore inside gearcase cover. Use heavy grease to hold it in place on cover as cover is installed.

On hoists with 14 tooth load brake pinion, an 11/16" I.D. steel thrust washer is installed between pinion and bronze thrust washer.

k. At completion of reassembly of gearing and load brake in gearcase, refill gearcase to proper level using correct grade of oil, as outline in Section IV — LUBRICATION.

l. For hoists equipped with an overload clutch (optional) which has been functioning properly, visually inspect clutch adjusting nut and spring washer for signs of damage or looseness. With a small hex allen wrench, make certain two set screws in adjusting nut are tight. DO NOT TURN ADJUSTING NUT OR DISASSEMBLE CLUTCH. If spring washer, adjusting nut or gear is loose or damaged, or the clutch did not function properly before disassembly of hoist for inspection, consult the nearest SHAW-BOX Authorized Repair Station for repair or adjustment.

5-7. INSPECT ROPE DRUM AND SHAFT.

a. To remove drum, remove wire rope, electrical compartment cover (par. 5-5) and electrical panel assembly, gearing and load brake assembly (par. 5-6). Remove woodruff key and spacer from end of drum shaft.

b. Remove four button head cap screws securing drum access plate to hoist frame. Pull assembled access plate, drum and shaft from frame. Tap on end of drum shaft (inside gearcase), using a soft faced hammer, to loosen for removal.

c. Check parts for wear and damage. Replace drum if there are any signs of cracks or other damage.
d. Reinstall parts following a procedure in reverse of disassembly.

5-8. ROPE INSPECTION, MAINTENANCE AND REPLACEMENT.

WARNING

Wire rope improperly handled or abused can create a SAFETY HAZARD. Read and comply with inspection, maintenance and replacement information given herein.

a. Inspection. Wire rope on your hoist is one of the most important components requiring frequent inspection and maintenance. All wire ropes will eventually deteriorate to a point where they are not safe and will require replacement. WIRE ROPE SHOULD BE THOROUGHLY INSPECTED AT REGULAR MONTHLY INTERVALS BY AN AUTHORIZED PERSON AND A DETERMINATION MADE WHEN FURTHER USE OF THE ROPE WOULD CONSTITUTE A SAFETY HAZARD. Each inspection should include a written, dated and signed report of rope condition. Reports should be filed and reviewed each month and any rope deterioration carefully noted. Inspections revealing but not limited to the following conditions should cause inspector to question remaining strength of rope and consider replacement:

(1) Twelve randomly distributed broken wires in one rope lay or four broken wires in one strand.
(2) Wear of one-third of the original diameter of outside individual wires.
(3) Kinking, crushing or bird caging.
(4) Heat damage from any cause.
(5) Reductions from nominal diameter of more than 1/64" on 1/4" diameter rope.
(6) Rope corrosion, internal or external.
(7) Effects from improper lubrication.
(8) Rope idle for month or more due to shutdown. Special attention should be exercised when inspecting rope normally hidden during inspecting procedures.

b. Maintenance. Keep rope well lubricated to help reduce internal friction and prevent corrosion. Lubricant, as described in paragraph 4-3, should be applied as a part of the regular maintenance program. Special attention is required to lubricate sections of rope over equalizing sheaves and other hidden areas. Avoid dragging ropes in dirt or around sharp objects which will scrape, nick, crush or induce sharp bends in the rope.

c. Replacement. When recommended by an authorized inspector, the rope should be replaced. Replacement rope assemblies are shipped from the factory carefully coiled to prevent damage by kinking. Care must be taken to avoid twisting or kinking when uncoiled and handling during reeving. Before replacing rope, check condition of grooves in sheaves and drums to determine if they are excessively worn.

5-9. ROPE REEVING.

a. General. Before unreeling rope from a coil or reel, be sure floor is clean. Dirt picked up by the rope can cause excessive wear and abrasion. Uncoil the rope by rolling the coil or reel along the floor; or, place reel on stand with shaft thru center of reel so rope can be pulled straight out with reel rotating.

CAUTION

It is imperative that rope reel or coil rotate as rope unwinds. If coil or reel does not rotate the wire will be twisted as it is uncoiled and kinking will result. A kinked rope may be unsafe for service.

b. Removing old rope.

(1) Lower the bottom block to a scaffold located 6 to 7 feet below hoist to relieve tension on wire rope. (Bottom block may be lowered to floor if desired; however, to handle less weight and for ease of reeving adequate scaffold below the hoist is recommended.)
(2) Remove side covers from lower block and remove retaining rings from ends of sheave pin. Press out sheave pin and separate rope and sheave from lower block body.
(3) Make certain all personnel are clear of hoist and operate hoist "DOWN" to completely unwind all wire rope from drum. Stop hoist so drum anchor slot is accessible. Remove live rope end swage fitting from drum.
(4) TURN OFF POWER TO HOIST.
(5) Remove two hex head bolts and lockwashers, securing rope end anchor keeper plate at top of hoist frame. (Refer to Figure 2-4 and Notice under paragraph 2-4, d.) Remove rope end from slot in frame and pull from hoist.

c. Installing new rope.

WARNING

Winding rope on rope drum with power can be hazardous. Keep hands safe distance from drum, wear gloves and use extreme care.

(1) Stretch new cable on floor in one continuous length. Make certain there is no twist in rope.
(2) Place one end of rope in drum anchor slot. Be sure end fitting is properly seated.

(3) With all personnel clear of hoist, TURN ON POWER.

(4) Operate hoist in "UP" direction, guiding rope into drum grooves with gloved hand, until about 14' of rope remains unwound.

(5) Pass free end of rope thru hole in limit stop weight, up into bottom of hoist, over partial sheave cast into frame.

(4) Rotate rope near the anchor end several turns in a direction tending to correct block rotation. This rotates rope end fitting in the anchor.

(5) Turn on power; raise and lower the block several times to feed the correcting twist in the rope through the reeving.

(6) If block still tends to twist, repeat the above procedure until block rotation is corrected.

(7) Retighten end anchor keeper plate securely.

5-10. TESTING HOIST.

a. General. Before placing hoist in service or after disassembly and reassembly, hoist should be tested. To test, suspend hoist from an overhead supporting member of sufficient strength to safely support the weight of the hoist and the rated load. Hoists having overload clutches require an overhead supporting structure capable of supporting, with adequate margin, a load equal to 200 percent rated load plus the weight of the hoist. Connect hoist to power supply shown on hoist nameplate and perform the checks listed in b. and c. below.

b. Check hoist as outlined in PRE-OPERATION CHECKS, Section II, paragraph 2-4.

c. Check hoist with capacity load.

(1) Attach rated load to lower hook.

(2) Depress "UP" push button and raise load. When push button is released, hoist should immediately stop and hold load at that level.

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

NOTE: If load drifts downward slowly in step 2 or 3 above, motor brake requires inspection — see paragraph 5-5.

d. Overload Clutch. The overload clutch (optional) must be tested for proper operation before placing hoist in service or after disassembly and reassembly of hoist. For test procedure follow instructions listed below.

**WARNING**

BEFORE ATTEMPTING TO TEST THE OVERLOAD CLUTCH, MAKE CERTAIN THE FOLLOWING PREREQUISITES ARE STRICTLY OBSERVED:

a. An appointed person must determine, before starting, that all structures supporting the hoist are adequately strong to safely withstand the test load of 200% of the rated load, plus the weight of the hoist, whether hoist is tested in installed position or moved to a designated test facility.

b. Loads used for testing must be accurately known.

c. Test must be made ONLY by a qualified operator, thoroughly familiar with the
hoist and the purpose of the test.

d. Adequate and proper rigging must be provided to insure that test loads are securely attached, properly balanced, and lifted level. Failure to provide adequate support could cause injury to personnel and/or damage to equipment.

(1) Using a known load, equal to the hoist rated load, energize hoist to lift the load. Raise the load just high enough to be certain hoist is lifting the entire load. Clutch should not slip with the rated load. Lower load to rest position. If clutch slips with rated load, adjustment is required. (See paragraph 7-4, "OVERLOAD CLUTCH".)

If hoist will lift rated load, proceed to step (2).

(2) Increase load in steps from rated load, TO A MAXIMUM OF 200% of the rated load, attempting to lift with each increase in weight. Hoist Overload Clutch should slip and refuse to lift load before 200% of the rated load is reached. Should hoist lift 200% of the rated load — STOP TEST — A CLUTCH ADJUSTMENT IS REQUIRED. (See paragraph 7-4, "OVERLOAD CLUTCH").

(3) Run hoist with load causing clutch to slip (hoist refusing load) five cycles of approximately 1 second each.

CAUTION

To prevent overheating, do not operate hoist for longer than one second intervals with the hoist refusing to lift the load.

(4) Removes weights added in step (2) and return to hoist rated load. Lift rated load one final time. Clutch should not slip.

WARNING

Do not lift more than rated load except for test purposes.

NOTICE — ALWAYS KNOW LOAD TO BE LIFTED. LIFT-TECH DOES NOT RECOMMEND LIFTING LOADS GREATER THAN THE RATED CAPACITY OF YOUR HOIST.

SECTION VI - TROUBLE SHOOTING

<table>
<thead>
<tr>
<th>Trouble</th>
<th>Probable Cause</th>
<th>Possible Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-1. Hoist Will Not Oper-</td>
<td>a. No power to hoist.</td>
<td>a. Check switches, circuit breakers or fuses, and connections in power supply lines. Check for power collectors.</td>
</tr>
<tr>
<td>ate.</td>
<td>b. Wrong voltage.</td>
<td>b. Check voltage required on motor data plate against power supply.</td>
</tr>
<tr>
<td></td>
<td>c. Loose or broken wire connections in hoist electrical system.</td>
<td>c. Shut off power supply, remove electrical cover on hoist and check wiring connections. Also check connections in push button station and limit switches. Check control circuit fuse.</td>
</tr>
<tr>
<td></td>
<td>d. Contactor assembly not functioning.</td>
<td>d. Check contact points. Replace if excessively burned or pitted. Check for burned out contactor coils. See that necessary jumper wires are properly installed.</td>
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<tr>
<td></td>
<td>e. Defective control transformer.</td>
<td>e. Check transformer coil for signs of overheating. Replace if burned out.</td>
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<tr>
<td></td>
<td>f. Motor burned out.</td>
<td>f. Replace motor. Check input power supply.</td>
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<tr>
<td></td>
<td>g. Brake does not release.</td>
<td>g. Check for defective transformer fuse.</td>
</tr>
<tr>
<td>Trouble</td>
<td>Probable Cause</td>
<td>Possible Remedy</td>
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<tr>
<td>----------------------------------------------</td>
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</tr>
<tr>
<td>6-2 Hook Moves in Wrong Direction.</td>
<td>a. Reverse phasing on three-phase</td>
<td>a. Interchange any two power supply line leads. Refer to Section II, 2-4.</td>
</tr>
<tr>
<td></td>
<td>hoists.</td>
<td>b. Check wiring connections with appropriate wiring diagram.</td>
</tr>
<tr>
<td></td>
<td>b. Hoist wired wrong.</td>
<td></td>
</tr>
<tr>
<td>6-3 Hook Will Raise But Not Lower.</td>
<td>a. Lower electrical circuit open.</td>
<td>a. Check for loose connections. See that necessary jumper wires are properly</td>
</tr>
<tr>
<td></td>
<td>b. Contractor not functioning.</td>
<td>installed on contactor.</td>
</tr>
<tr>
<td></td>
<td>c. Down, push button inoperative.</td>
<td>b. Check for burned or pitted contact points or burned out contactor coil.</td>
</tr>
<tr>
<td>6-4 Hook Will Lower But Not Raise.</td>
<td>a. Excessive load.</td>
<td>c. Check for burned or pitted contact points or burned out solenoid coil.</td>
</tr>
<tr>
<td></td>
<td>b. Hoist electrical circuit open.</td>
<td>d. Check push button contacts and wires.</td>
</tr>
<tr>
<td></td>
<td>c. Contactor not functioning.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. Up, push button inoperative.</td>
<td></td>
</tr>
<tr>
<td>6-5 Hoist Will Not Lift Rated Load.</td>
<td>a. Low voltage.</td>
<td>a. See that power supply current is same voltage listed on motor data plate.</td>
</tr>
<tr>
<td></td>
<td>b. Overload Clutch not properly</td>
<td>Check size of power supply lines.</td>
</tr>
<tr>
<td></td>
<td>adjusted.</td>
<td>b. See Section VII, par. 7-5.</td>
</tr>
<tr>
<td>6-6 Hoist Motor Overheats.</td>
<td>a. Excessive load.</td>
<td>a. Reduce loading to rated load of hoist, as shown on nameplate.</td>
</tr>
<tr>
<td></td>
<td>b. Excessive duty-cycle.</td>
<td>b. Reduce frequency of lifts or amount of jogging.</td>
</tr>
<tr>
<td></td>
<td>c. Wrong voltage or frequency.</td>
<td>c. Check current rating on motor data plate against power supply.</td>
</tr>
<tr>
<td></td>
<td>d. Defective motor or worn bearings</td>
<td>d. Disassemble hoist and inspect for defective, worn or damaged parts.</td>
</tr>
<tr>
<td></td>
<td>in hoist frame.</td>
<td>e. See Section VII, par. 7-5.</td>
</tr>
<tr>
<td></td>
<td>e. Overload Clutch slipping without</td>
<td></td>
</tr>
<tr>
<td></td>
<td>lifting load.</td>
<td></td>
</tr>
</tbody>
</table>
### SECTION VI - TROUBLE SHOOTING (Continued)

<table>
<thead>
<tr>
<th>Trouble</th>
<th>Probable Cause</th>
<th>Possible Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-7. Load Drifts Excessively When Hoist is Stopped.</td>
<td>a. Excessive load.</td>
<td>a. Reduce loading to rated load of hoist, as shown on nameplate.</td>
</tr>
<tr>
<td></td>
<td>b. Motor brake not holding.</td>
<td>b. With No Load, check hoist for drift. If drifting is excessive, remove motor and clean and inspect motor brake linings.</td>
</tr>
<tr>
<td></td>
<td>c. Load brake not holding.</td>
<td>c. After determining that the motor brake is working properly, attach rated load to hook and operate hoist. If the load accelerates during lowering, the load brake is not functioning properly. See section V, par. 5-6 for replacing worn or damaged parts.</td>
</tr>
<tr>
<td>6-8. Hoist Operates Intermittently.</td>
<td>a. Collectors make poor contact.</td>
<td>a. Check collectors for free movement of spring arm, weak spring or electrical connections.</td>
</tr>
<tr>
<td></td>
<td>b. Loose connections.</td>
<td>b. Check all wiring for loose connections.</td>
</tr>
<tr>
<td></td>
<td>c. Temperature activated switch in motor.</td>
<td>c. Check for defective contact or excessive motor heat.</td>
</tr>
</tbody>
</table>

### SECTION VII — ADJUSTMENTS

7-1. MECHANICAL LOAD BRAKE. The mechanical load brake on Series 900 SHAW-BOX hoists is a pawl and ratchet “Weston” type automatic brake. The brake is not adjustable and requires only periodic inspection and occasional replacement of the friction washers.

7-2. MOTOR BRAKE. The hoist motor brake adjustment should be checked after the first 30 days of service and annually thereafter. Instructions are inside the brake cover and also in paragraph 5-5.h.

7-3. BLOCK OPERATED LIMIT SWITCH. The block operated upper limit stop, furnished as standard equipment, is non-adjustable and designed to stop lower block at its high point of travel to eliminate any possibility of double blocking. When high point is reached, limit stop switch automatically stops hook travel. If hook drifts upward slightly after stop switch is actuated, a reversing switch will close and automatically reverse direction of hook travel.

7-4. GEARED ROTARY LIMIT SWITCH. The geared rotary type limit switch is optional equipment. Instructions for adjusting the limit switch are inside the switch cover.

7-5. OVERLOAD CLUTCH. (WEIGHT WATCHER Models). When properly adjusted, the overload device is designed so that the hoist will lift its full rated load but will refuse to lift an excessive overload. The overload clutch is not externally adjustable. It is necessary to remove the overload clutch assembly from the hoist for proper adjustment. Therefore, it is strongly recommended that when adjustment and/or replacement parts are required, a SHAW-BOX Authorized Repair Station be contacted. Consult your SHAW-BOX Distributor for nearest Repair Station.
Figure 8-1. Electrical Diagram for Single Voltage, 3 Phase, Single Speed Hoist with Push Button Control.
Figure 8-2. Electrical Diagram for Single Voltage, 3 Phase, Two Speed Hoist with Push Button Control.
Figure 8-3. Electrical Diagram for 230/460 Volt Reconnectable, 3 Phase, Single Speed Hoist with Push Button Control.
Figure 8-3. Electrical Diagram for 230/460 Volt Reconnectable, 3 Phase, Single Speed Hoist with Push Button Control (Continued).
WIRING DIAGRAM

115 V CONNECTIONS

Figure 8-4. Electrical Diagram for 115/230 Volt Reconnectable, 1 Phase, Single Speed Hoist with Push Button Control and Starting Switch.
Figure 8-4. Electrical Diagram for 115/230 Volt Reconnectable, 1 Phase, Single Speed Hoist with Push Button Control and Starting Switch (Continued).
SECTION IX — PARTS LIST

GENERAL. The parts listed and illustrations in this section of the manual, cover parts of all standard Series 900 SHAW-BOX Electric Hoists. A typical hoist is shown as the basis for the exploded parts illustrations; therefore, certain variations may occur from the information given. For this reason, always give the Hoist Serial Number, Model Number, Motor Horsepower, Voltage, Phase, Frequency, and Rated Load of Hoist when ordering parts.

The numbers assigned to the parts of our various assemblies in our parts list are not the part numbers used in manufacturing the part. They are identification numbers, that when given with the model number, permit us to identify, select or manufacture, and ship the correct part needed.

<table>
<thead>
<tr>
<th>Figure No.</th>
<th>Title</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-1</td>
<td>Frame, Gearcase, and External Parts</td>
<td>27</td>
</tr>
<tr>
<td>9-2</td>
<td>Drum, Shaft, Bearings and Gear Parts</td>
<td>28</td>
</tr>
<tr>
<td>9-3</td>
<td>Gearing and Load Brake Parts</td>
<td>29</td>
</tr>
<tr>
<td>9-4</td>
<td>Three Phase Motor Assembly</td>
<td>30</td>
</tr>
<tr>
<td>9-5</td>
<td>Single Phase Motor Assembly</td>
<td>31</td>
</tr>
<tr>
<td>9-6</td>
<td>Hoist Motor Brake</td>
<td>32</td>
</tr>
<tr>
<td>9-7</td>
<td>Upper Limit Switch Parts</td>
<td>34</td>
</tr>
<tr>
<td>9-8</td>
<td>Electrical Control Equipment - Three Phase Hoists</td>
<td>35</td>
</tr>
<tr>
<td>9-9</td>
<td>Electrical Control Equipment - Single Phase Hoists</td>
<td>36</td>
</tr>
<tr>
<td>9-10</td>
<td>Push Button Station and Conductor Cable Assembly - Single Speed Hoists</td>
<td>37</td>
</tr>
<tr>
<td>9-11</td>
<td>Push Button Station and Conductor Cable Assembly - Two Speed Hoists</td>
<td>38</td>
</tr>
<tr>
<td>9-12</td>
<td>Lower Block Assembly and Wire Rope Parts</td>
<td>40</td>
</tr>
<tr>
<td>9-13</td>
<td>Screw Type Limit Switch</td>
<td>41</td>
</tr>
</tbody>
</table>
Figure 9-1. Frame, Covers and External Parts.

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Part Number</th>
<th>Description</th>
<th>Qty. Req’d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>900-101</td>
<td>Cover Assembly — Electrical Compartment</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>900-102</td>
<td>Gasket — Electrical Compartment Cover</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>900-103</td>
<td>Screw-Cap, Hex socket head</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>900-104</td>
<td>Lockwasher — Spring</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>900-105</td>
<td>Pin — Dowel</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>900-106</td>
<td>Plug — Pipe (Dry Seal)</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>900-107</td>
<td>Strike — Cover Latch</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>900-108</td>
<td>Screw — Drive, round head</td>
<td>3</td>
</tr>
<tr>
<td>9</td>
<td>900-109</td>
<td>Filler — Oil</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>900-110</td>
<td>Plate — Keeper, rope anchor</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>900-111</td>
<td>Screw — Cap, hex head</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>900-112</td>
<td>Lockwasher — Spring</td>
<td>6</td>
</tr>
<tr>
<td>13</td>
<td>900-113</td>
<td>Plate — Access, rope drum</td>
<td>1</td>
</tr>
<tr>
<td>14</td>
<td>900-114</td>
<td>Screw - Cap, button head</td>
<td>4</td>
</tr>
<tr>
<td>16</td>
<td>900-115</td>
<td>Insert — Heli-Coil</td>
<td>2</td>
</tr>
<tr>
<td>17</td>
<td>900-116</td>
<td>Plate — Hoist Data</td>
<td>1</td>
</tr>
<tr>
<td>18</td>
<td>900-117</td>
<td>Screw — Drive</td>
<td>2</td>
</tr>
<tr>
<td>19</td>
<td>900-122</td>
<td>Frame Assembly (with needle bearings)</td>
<td>1</td>
</tr>
<tr>
<td>20</td>
<td>900-119</td>
<td>Pin — Dowel</td>
<td>2</td>
</tr>
<tr>
<td>21</td>
<td>900-120</td>
<td>Gasket — Gear Case Cover</td>
<td>1</td>
</tr>
<tr>
<td>22</td>
<td>200-121</td>
<td>Cover Assembly — Gear Case (with needle bearings)</td>
<td>1</td>
</tr>
</tbody>
</table>
Figure 9-2. Drum, Shaft, Bearings and Gear Parts.

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Part Number</th>
<th>Description</th>
<th>Qty. Req'd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>900-201</td>
<td>Ring — Retaining, external</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>900-202</td>
<td>Bearing Assembly — Ball, drum shaft</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>900-203</td>
<td>Drum — Rope</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>900-204</td>
<td>Shaft — Drum</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>900-205</td>
<td>Key — Woodruff</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>900-206</td>
<td>Seal — Oil</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>900-207</td>
<td>Bearing Assembly — Ball, drum shaft</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>900-208</td>
<td>Ring — Retaining, internal</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>900-209</td>
<td>Spacer — Drum Gear</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>900-210</td>
<td>Gear — Drum (47 tooth)</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>900-211</td>
<td>Ring — Retaining, external</td>
<td>1</td>
</tr>
</tbody>
</table>
Figure 9-3. Gearing and Load Brake Parts (including WEIGHT-WATCHER Overload Clutch).

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Part Number</th>
<th>Description</th>
<th>Qty. Req’d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>900-301</td>
<td>Bearing Assembly — Needle, 5/8” I.D.</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>900-302</td>
<td>Washer — Thrust, 5/8” I.D. (steel)</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>900-303</td>
<td>Ring — Retaining</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>900-304</td>
<td>Gear — Intermediate (65 teeth)</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>900-305</td>
<td>Gear — Intermediate (74 teeth)</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>900-306</td>
<td>Key — Woodruff</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>900-307</td>
<td>Shaft &amp; Integral Pinion — Intermediate (15 teeth)</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>900-308</td>
<td>Washer — Thrust, 11/16” I.D. (Steel)</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>900-309</td>
<td>Bearing Assembly — Needle, 11/16” I.D. (36 rollers, grease retained)</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>900-310</td>
<td>Disc — Friction, load brake</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>900-311</td>
<td>Bushing — Ratchet, load brake</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>900-312</td>
<td>Pawl &amp; Ratchet Assembly — load brake (includes bushing 10)</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>900-313</td>
<td>Key — Woodruff (special)</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>900-314</td>
<td>Flange — Load Brake</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>900-315</td>
<td>Ring — Retaining, load brake flange</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>900-316</td>
<td>Seal — Oil, motor shaft</td>
<td>1</td>
</tr>
<tr>
<td>17</td>
<td>900-317</td>
<td>Bearing Assembly — Ball, motor shaft</td>
<td>1</td>
</tr>
<tr>
<td>18</td>
<td>900-318</td>
<td>Ring — Retaining, internal</td>
<td>1</td>
</tr>
<tr>
<td>19</td>
<td>900-319</td>
<td>Gear &amp; Center Assembly (106 teeth)</td>
<td>1</td>
</tr>
<tr>
<td>20</td>
<td>900-320</td>
<td>Pin — Grooved</td>
<td>2</td>
</tr>
<tr>
<td>21</td>
<td>900-321</td>
<td>Cam — Load Brake</td>
<td>1</td>
</tr>
<tr>
<td>22</td>
<td>900-322</td>
<td>Spring — Load Brake (plain — no color code)</td>
<td>1</td>
</tr>
<tr>
<td>23</td>
<td>900-323</td>
<td>Spring — Load Brake (yellow color code)</td>
<td>1</td>
</tr>
<tr>
<td>24</td>
<td>900-324</td>
<td>Retainer — Spring</td>
<td>1</td>
</tr>
<tr>
<td>25</td>
<td>900-325</td>
<td>Shaft &amp; Integral Pinion — Load Brake (14 teeth)</td>
<td>1</td>
</tr>
<tr>
<td>26</td>
<td>900-326</td>
<td>(23 teeth)</td>
<td>1</td>
</tr>
<tr>
<td>27</td>
<td>900-327</td>
<td>Washer — Thrust, 11/16” I.D. (steel, used on 14 tooth pinion only)</td>
<td>1</td>
</tr>
<tr>
<td>28</td>
<td>900-328</td>
<td>Washer — Thrust, bronze</td>
<td>1</td>
</tr>
<tr>
<td>29</td>
<td>900-329</td>
<td>Bearing Assembly — Needle, 11/16” I.D.</td>
<td>1</td>
</tr>
<tr>
<td>30</td>
<td>900-330</td>
<td>Retainer — Spring (used with item 28 only)</td>
<td>1</td>
</tr>
<tr>
<td>31</td>
<td>900-331</td>
<td>Gear &amp; Clutch Assembly — Load Brake (1/2 ton, 14 rpm hoists)</td>
<td>1</td>
</tr>
<tr>
<td>32</td>
<td>900-332</td>
<td>(1 ton, 14 rpm hoists)</td>
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</tr>
</tbody>
</table>
Figure 9-4. Three Phase Motor Assembly.

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Part Number</th>
<th>Description</th>
<th>Qty. Req'd.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Motor Assembly (Includes Ref. Nos. 1 thru 8)</td>
<td>1</td>
</tr>
<tr>
<td>900-1401</td>
<td></td>
<td>1/2 Horsepower (1 Speed)</td>
<td></td>
</tr>
<tr>
<td>900-1402</td>
<td></td>
<td>200 Volt</td>
<td></td>
</tr>
<tr>
<td>900-1403</td>
<td></td>
<td>230/460 Volt</td>
<td></td>
</tr>
<tr>
<td>900-1404</td>
<td></td>
<td>575 Volt</td>
<td></td>
</tr>
<tr>
<td>900-1405</td>
<td></td>
<td>1 Horsepower (1 Speed)</td>
<td></td>
</tr>
<tr>
<td>900-1406</td>
<td></td>
<td>200 Volt</td>
<td></td>
</tr>
<tr>
<td>900-1407</td>
<td></td>
<td>230/460 Volt</td>
<td></td>
</tr>
<tr>
<td>900-1408</td>
<td></td>
<td>575 Volt</td>
<td></td>
</tr>
<tr>
<td>900-1409</td>
<td></td>
<td>2-1/2 Horsepower (1 Speed)</td>
<td></td>
</tr>
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<td>900-1410</td>
<td></td>
<td>200 Volt</td>
<td></td>
</tr>
<tr>
<td>900-1411</td>
<td></td>
<td>230/460 Volt</td>
<td></td>
</tr>
<tr>
<td>900-1412</td>
<td></td>
<td>575 Volt</td>
<td></td>
</tr>
<tr>
<td>900-1413</td>
<td></td>
<td>1/2 - 1/6 Horsepower (2 Speed)</td>
<td></td>
</tr>
<tr>
<td>900-1414</td>
<td></td>
<td>200 Volt</td>
<td></td>
</tr>
<tr>
<td>900-1415</td>
<td></td>
<td>230 Volt</td>
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</tr>
<tr>
<td>900-1416</td>
<td></td>
<td>460 Volt</td>
<td></td>
</tr>
<tr>
<td>900-1417</td>
<td></td>
<td>575 Volt</td>
<td></td>
</tr>
<tr>
<td>900-1418</td>
<td></td>
<td>1 - 1/3 Horsepower (2 Speed)</td>
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<td>900-1419</td>
<td></td>
<td>200 Volt</td>
<td></td>
</tr>
<tr>
<td>900-1420</td>
<td></td>
<td>230 Volt</td>
<td></td>
</tr>
<tr>
<td>900-1421</td>
<td></td>
<td>460 Volt</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>575 Volt</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Bell — End</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Ring — Retaining</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Bearing — Ball</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Ring — Retaining</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Key — Brake</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Rotor and Shaft Assembly</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Stator Assembly</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>Bolt — Motor Mounting</td>
<td>4</td>
</tr>
</tbody>
</table>

* Furnished only as part of motor assembly.
Figure 9-5. Single Phase Motor Assembly.

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Part Number</th>
<th>Description</th>
<th>Qty. Req'd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>900-1501</td>
<td>Motor Assembly (Includes Ref. Nos. 1 thru 11)</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>900-1502</td>
<td>1/2 Horsepower</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>1 Horsepower</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>Bell — End</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>Ring — Retaining</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>Bearing — Ball</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>4</td>
<td>Ring — Retaining</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>5</td>
<td>Key — Brake</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>6</td>
<td>Rotor and Shaft Assembly</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>7</td>
<td>Stator Assembly</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>8</td>
<td>Bolt — Motor Mounting</td>
<td>4</td>
</tr>
<tr>
<td>12</td>
<td>9</td>
<td>Capacitor Assembly</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>900-1503</td>
<td>1/2 Horsepower</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>900-1504</td>
<td>1 Horsepower</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>10</td>
<td>Capacitor Cover</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>11</td>
<td>Screw</td>
<td>2</td>
</tr>
</tbody>
</table>

* Furnished only as part of motor assembly.

NOTES

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Page 31
Figure 9-6. Hoist Motor Brake.

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Part Number</th>
<th>Description</th>
<th>Qty. Req'd.</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Motor Brake Assembly (Includes Ref. Nos. 1 thru 32)</td>
<td>1</td>
</tr>
<tr>
<td>900-1601</td>
<td>Hst. Spds.</td>
<td>Mtr. HP</td>
<td>Voltage</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>½ &amp; 1</td>
<td>115/230</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2½</td>
<td>575</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1 / ½</td>
<td>200 &amp; 230</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>2½ / ¾</td>
<td>230 &amp; 460</td>
</tr>
<tr>
<td>900-1602</td>
<td>1</td>
<td>½</td>
<td>200 &amp; 230/460</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>1</td>
<td>200, 230/460 &amp; 575</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>½ / ¾</td>
<td>200 &amp; 230</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1 / ⁵∠</td>
<td>460</td>
</tr>
<tr>
<td>900-1603</td>
<td>1</td>
<td>½</td>
<td>575</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>½ / ⁵∠</td>
<td>460 &amp; 575</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1 / ½</td>
<td>575</td>
</tr>
<tr>
<td>900-1604</td>
<td>1</td>
<td>2½</td>
<td>200 &amp; 230/460</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>2½ / ¾</td>
<td>200</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Acorn Nut (# 10-32)</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>900-1605</td>
<td>Brake Cover Assembly (Includes Brake Cover and Label Inside Cover)</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Cover Stud</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Gasket</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Hex Washer Head Thread Forming Screw (#10-32 x 1¾)</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Solenoid Frame Cover Assembly</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Hex Key (½ — ¾ x 2½)</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>Solenoid Coil Assembly</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>Tubing</td>
<td>3</td>
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Figure 9-6. Hoist Motor Brake — Continued.

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<th>Qty. Req’d.</th>
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<tbody>
<tr>
<td>10</td>
<td></td>
<td>Hex Nut (# 10-32 Pltd.)</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>Solenoid Frame</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>Hex Washer Head Thread Forming Screw (#10-32 x ¾”)</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>Rectifier Assembly</td>
<td>1</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>Hex Head Self-locking Nut (#10-24)</td>
<td>2</td>
</tr>
<tr>
<td>15</td>
<td>900-1606</td>
<td>Solenoid Support</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>Hex Washer Head Thread Forming Screw (#10-32 x ¼”)</td>
<td>2</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>Solenoid Plunger</td>
<td>1</td>
</tr>
<tr>
<td>18</td>
<td>900-1607</td>
<td>Hex Socket Head Self-locking Set Screw - Oval Point (¼ - 28 x 1)</td>
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<tr>
<td>19</td>
<td></td>
<td>Cotter Pin (¾ x ½ Pltd.)</td>
<td>1</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>Clevis Pin (¾ x 1¼)</td>
<td>1</td>
</tr>
<tr>
<td>21</td>
<td></td>
<td>Flat Washer</td>
<td>2</td>
</tr>
<tr>
<td>22</td>
<td></td>
<td>Brake Spring</td>
<td>1</td>
</tr>
<tr>
<td>23</td>
<td></td>
<td>Brake Lever Assembly</td>
<td>1</td>
</tr>
<tr>
<td>24</td>
<td></td>
<td>Pressure Pad</td>
<td>2</td>
</tr>
<tr>
<td>25</td>
<td></td>
<td>Brake Disc (Nonasbestos)</td>
<td>1</td>
</tr>
<tr>
<td>26</td>
<td></td>
<td>Brake Support Stud</td>
<td>2</td>
</tr>
<tr>
<td>27</td>
<td></td>
<td>Separating Spring</td>
<td>2</td>
</tr>
<tr>
<td>28</td>
<td></td>
<td>Hex Socket Head Self-locking Set Screw - Cup Point (¼ - 20 x ¾)</td>
<td>2</td>
</tr>
<tr>
<td>29</td>
<td></td>
<td>Brake Hub</td>
<td>1</td>
</tr>
<tr>
<td>30</td>
<td></td>
<td>Hex Socket Head Screw (¾ - 16 x ¾)</td>
<td>2</td>
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<tr>
<td>31</td>
<td>900-1608</td>
<td>Brake Mounting Plate</td>
<td>1</td>
</tr>
<tr>
<td>32</td>
<td></td>
<td>Wire Nuts — Not Shown (No. 22 thru 16 AWG)</td>
<td>4</td>
</tr>
</tbody>
</table>

* Not available as individual parts. See replacement kits listed below. Kits include quantities shown above.

<table>
<thead>
<tr>
<th>Kit Description</th>
<th>Part Number</th>
<th>Ref. Nos. Included</th>
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<tbody>
<tr>
<td>Brake Disc</td>
<td>900-1609</td>
<td>24, 25, 27</td>
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<tr>
<td>Solenoid</td>
<td>900-1610</td>
<td>5, 6, 8, 11, 17</td>
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<tr>
<td></td>
<td>900-1611</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>900-1612</td>
<td>12, 13, 32</td>
</tr>
<tr>
<td></td>
<td>900-1613</td>
<td>18, 19, 20, 21, 22, 23</td>
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<tr>
<td>Rectifier</td>
<td>900-1614</td>
<td>30</td>
</tr>
<tr>
<td>Brake Lever</td>
<td>900-1615</td>
<td>28, 29, Hub Drive Key (Shown Elsewhere)</td>
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<tr>
<td>Brake Hub</td>
<td>900-1616</td>
<td>3, 4, 9, 26, Instruction Label inside cover, Adjust Label, Adjusting Screw Label on brake lever assembly, Power Warning Label on cover</td>
</tr>
<tr>
<td>Special Hardware</td>
<td>900-1617</td>
<td>1, 5, 7, 10, 12, 14, 16, 18, 19, 20, 21, 28, 30</td>
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<tr>
<td>Hardware</td>
<td>900-1618</td>
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</table>
Figure 9-7. Upper Limit Switch Parts.

<table>
<thead>
<tr>
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<th>Part Number</th>
<th>Description</th>
<th>Qty. Req’d.</th>
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<tbody>
<tr>
<td>1</td>
<td>900-701</td>
<td>Pin — Cotter</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>900-702</td>
<td>Washer — Flat</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>900-703</td>
<td>Arm — Lever</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>900-704</td>
<td>Weight — Limit Switch Actuator</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>900-705</td>
<td>Switch Assembly — Upper limit (Complete, includes items 5 thru 16)</td>
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<tr>
<td>6</td>
<td>900-706</td>
<td>Coupling — Shaft</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>900-707</td>
<td>Bearing — Nylon</td>
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<tr>
<td>8</td>
<td>900-708</td>
<td>Screw — Cap, hex socket head</td>
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<tr>
<td>9</td>
<td>900-709</td>
<td>Shaft and cam assembly</td>
<td>1</td>
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<tr>
<td>10</td>
<td>900-710</td>
<td>Switch Assembly — Limit stop (includes wire leads)</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>900-711</td>
<td>Screw — Shoulder, hex socket head</td>
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<tr>
<td>12</td>
<td>900-712</td>
<td>Screw — Round head</td>
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</tr>
<tr>
<td>13</td>
<td>900-713</td>
<td>Switch Assembly — Limit Reversing (includes wire leads)</td>
<td>4</td>
</tr>
<tr>
<td>14</td>
<td>900-714</td>
<td>Insulator — Limit Switch</td>
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<tr>
<td>15</td>
<td>900-715</td>
<td>Bracket Assembly — Mounting</td>
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<tr>
<td>16</td>
<td>900-716</td>
<td>Nut — Self Locking</td>
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<tr>
<td></td>
<td>900-717</td>
<td>Pin — Roll</td>
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Figure 9-8. Electrical Control Equipment.
Three Phase Hoists.

<table>
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<th>Qty. Req’d.</th>
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<tbody>
<tr>
<td>1</td>
<td>900-820</td>
<td>Contactor Assembly</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Pan Head Self-Tapping Screws (#8-32 x ½ Pltd.)</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>900-815</td>
<td>Transformer 200V/115V</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>900-813</td>
<td>230V-460V/115V</td>
<td></td>
</tr>
<tr>
<td></td>
<td>900-821</td>
<td>230V/115V</td>
<td></td>
</tr>
<tr>
<td></td>
<td>900-822</td>
<td>460V/115V</td>
<td></td>
</tr>
<tr>
<td></td>
<td>900-814</td>
<td>575V/115V</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>900-824</td>
<td>Pan Head Self-Tapping Screws (#10-24 x ¼ Pltd.) (Two Speed Hoists Only)</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>900-823</td>
<td>Contactor Assembly (Two Speed Hoists Only)</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Pan Head Self-Tapping Screws (#8-32 x ½ Pltd.) (Two Speed Hoists Only)</td>
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</tr>
<tr>
<td>7</td>
<td>900-811</td>
<td>Terminal Block (Reconnectable Hoists Only)</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>Pan Head Self-Tapping Screws (#8-32 x ½ Pltd.) (Reconnectable Hoists Only)</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>Fuse, Fuse Holder and Wire Assembly (¾A/250V)</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Fuse Only (½A/250V)</td>
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</tr>
<tr>
<td>10</td>
<td></td>
<td>Phillips Round Head Machine Screw (¼-20 x ¾)</td>
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<tr>
<td>11</td>
<td></td>
<td>Flat Washers (¼ Type N)</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>900-808</td>
<td>Mounting Plate</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>Pan Head Self-Tapping Screws (#10-24 x ¾ Pltd.)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pan Head Self-Tapping Grounding Screw — Not Shown (#10-24 x ¼ Pltd.)</td>
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* Not available as individual parts.
Figure 9-9. Electrical Control Equipment.
Single Phase Hoists.

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Part Number</th>
<th>Description</th>
<th>Qty. Req'd.</th>
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<tbody>
<tr>
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<td>900-851</td>
<td>Contactor Assembly</td>
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</tr>
<tr>
<td>2</td>
<td>*</td>
<td>Pan Head Self-Tapping Screws (#8-32 x ½ Pltd.)</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>900-852</td>
<td>Starting Switch 1/2 Horsepower</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>900-853</td>
<td>1 Horsepower</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>*</td>
<td>Phillips Head Machine Screw (#6-32 x ⅛ Pltd.)</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>900-854</td>
<td>Pan Head Self-Tapping Screw (#6-32 x ⅛ Pltd.)</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>900-823</td>
<td>Starting Switch Mounting Bracket</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>*</td>
<td>Terminal Block</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>900-811</td>
<td>Pan Head Self-Tapping Screws (#8-32 x ½ Pltd.)</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>*</td>
<td>Fuse, Fuse Holder and Wire Assembly (½A/250V)</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>*</td>
<td>Fuse Only (½A/250V)</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>*</td>
<td>Phillips Round Head Machine Screw (¼-20 x %)</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>900-808</td>
<td>Flat Washers (¼ Type N)</td>
<td>2</td>
</tr>
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<td>*</td>
<td>*</td>
<td>Mounting Plate</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>900-808</td>
<td>Pan Head Self-Tapping Screws (#10-24 x ⅛ Pltd.)</td>
<td>2</td>
</tr>
<tr>
<td>*</td>
<td>*</td>
<td>Pan Head Self-Tapping Grounding Screw Not Shown (#10-24 x ¼ Pltd.)</td>
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</tbody>
</table>

* Not available as individual parts.
Figure 9-10. Push Button Station and Conductor Cable Assembly.
Single Speed Hoists.

<table>
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<th>Part Number</th>
<th>Description</th>
<th>Qty. Req'd.</th>
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<tbody>
<tr>
<td>900-1051</td>
<td></td>
<td>Push Button Station and Conductor Cable Assembly (Includes Ref. Nos. 1 thru 17)</td>
<td>1</td>
</tr>
<tr>
<td>900-1052</td>
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<td>Push Button Station (Includes Ref. Nos. 1 thru 15)</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Type 1 Pan Head Machine Screw (M 3.5 x 0.6 x 12 Pltd.)</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Lockwasher (M 3.5 Pltd.)</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Rear Cover</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>900-1053</td>
<td>Gasket</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Type 1 Pan Head Thread Cutting Screw (M 4 x 15 Pltd.)</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>900-1054</td>
<td>Contact Assembly</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>900-1055</td>
<td>Button Assembly</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>Type 1 Pan Head Machine Screw (M 6 x 1 x 12 Pltd.)</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>Lockwasher (M 6 Pltd.)</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>Plain Washer (M 6 Pltd.)</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>Type 1 Pan Head Machine Screw (M 3.5 x 1 x 14 Pltd.)</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>Lockwasher (M 3.5 Pltd.)</td>
<td>2</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>Housing Cap</td>
<td>1</td>
</tr>
<tr>
<td>14</td>
<td>900-1056</td>
<td>Grommet</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>Housing</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>900-1057</td>
<td>Conductor Cable Assembly</td>
<td>1</td>
</tr>
<tr>
<td>17</td>
<td>900-1058</td>
<td>Plastic Warning Tag</td>
<td>1</td>
</tr>
</tbody>
</table>

* Not available separately. Order Push Button Station.
Figure 9-11. Push Button Station and Conductor Cable Assembly.  
Two Speed Hoists Only.

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Part Number</th>
<th>Description</th>
<th>Qty. Req'd.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>900-2101</td>
<td>Push Button Station and Conductor Cable Assembly (Includes Ref. Nos. 1 thru 30)</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>900-2102</td>
<td>Anchor Bracket—Strain Cable</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>900-2103</td>
<td>Grip Assembly—Conductor</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>900-2104</td>
<td>Connector—Strain Cable</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>900-2105</td>
<td>Thimble—Strain Cable</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>900-2106</td>
<td>Connector—Conductor to Strain Cable</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>900-2107</td>
<td>Clamp—Conductor</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>900-2108</td>
<td>Conductor Cable</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>900-2109</td>
<td>Strain Cable</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>900-2110</td>
<td>Sleeve—Pressure</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>900-2111</td>
<td>Tie—Conductor</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>900-2112</td>
<td>Operator Warning Label</td>
<td>As Req’d.</td>
</tr>
<tr>
<td></td>
<td>900-2113</td>
<td>Push Button Station (Includes Ref. Nos. 12 thru 30)</td>
<td>1</td>
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</table>

(Continued on following page.)
<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Part Number</th>
<th>Description</th>
<th>Qty. Req'd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>900-2114</td>
<td>Sleeve—Conductor</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>*</td>
<td>Support—Strain Cable</td>
<td>1</td>
</tr>
<tr>
<td>14</td>
<td>*</td>
<td>Screw—Slotted Head</td>
<td>4</td>
</tr>
<tr>
<td>15</td>
<td>*</td>
<td>Lockwasher</td>
<td>4</td>
</tr>
<tr>
<td>16</td>
<td>*</td>
<td>Enclosure—Rear</td>
<td>1</td>
</tr>
<tr>
<td>17</td>
<td>*</td>
<td>Gasket</td>
<td>1</td>
</tr>
<tr>
<td>18</td>
<td>*</td>
<td>Screw—Slotted Head</td>
<td>2</td>
</tr>
<tr>
<td>19</td>
<td>*</td>
<td>Screw—Slotted Head</td>
<td>2</td>
</tr>
<tr>
<td>20</td>
<td>*</td>
<td>Clamp—Conductor</td>
<td>1</td>
</tr>
<tr>
<td>21</td>
<td>*</td>
<td>Contact Block Assembly</td>
<td>1</td>
</tr>
<tr>
<td>22</td>
<td>900-2115</td>
<td>Contact Block (ZB2-BE101)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>900-2116</td>
<td>Contact Block (ZB2-BE201)</td>
<td>2</td>
</tr>
<tr>
<td>*</td>
<td>900-2117</td>
<td>Interlock—Mechanical</td>
<td>1</td>
</tr>
<tr>
<td>*</td>
<td>900-2118</td>
<td>Up Push Button Assembly (Includes 1 Each of Ref. Nos. 23 and 25 thru 29)</td>
<td>1</td>
</tr>
<tr>
<td>*</td>
<td></td>
<td>Down Push Button Assembly (Includes 1 Each of Ref. Nos. 23, 25 thru 28 and 30)</td>
<td>1</td>
</tr>
<tr>
<td>23</td>
<td>*</td>
<td>Ring—Retaining</td>
<td>2</td>
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<tr>
<td>24</td>
<td>*</td>
<td>Enclosure—Front</td>
<td>1</td>
</tr>
<tr>
<td>25</td>
<td>*</td>
<td>Seal—Spring</td>
<td>2</td>
</tr>
<tr>
<td>26</td>
<td>*</td>
<td>Spring</td>
<td>2</td>
</tr>
<tr>
<td>27</td>
<td>*</td>
<td>Seal</td>
<td>2</td>
</tr>
<tr>
<td>28</td>
<td>*</td>
<td>Plate—Push Button</td>
<td>2</td>
</tr>
<tr>
<td>29</td>
<td>*</td>
<td>Push Button—Up</td>
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</tr>
<tr>
<td>30</td>
<td>*</td>
<td>Push Button—Down</td>
<td>1</td>
</tr>
</tbody>
</table>

* Not available separately. Order Push Button Station.
** Not available separately. Order Push Button Assembly.

NOTES
Figure 9-12. Lower Block Assembly and Wire Rope Parts.

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Part Number</th>
<th>Description</th>
<th>Qty. Req'd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>900-1101</td>
<td>Block Assembly — Lower, complete (1/2 ton)</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>900-1102</td>
<td>Block Assembly — Lower, complete (1 ton)</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>900-1103</td>
<td>Screw — Self-Tapping, flat head</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>900-1104</td>
<td>Cover — 1/2 ton (with c'sunk holes)</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>900-1105</td>
<td>Cover — 1 ton (with c'sunk holes)</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>900-1106</td>
<td>Ring — Retaining, external</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>900-1107</td>
<td>Lube Fitting</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>900-1108</td>
<td>Pin — Sheave</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>900-1109</td>
<td>Spacer</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>900-1110</td>
<td>Bearing — Sheave</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>900-1111</td>
<td>Cover — 1/2 Ton (with threaded bolt holes)</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>900-1112</td>
<td>Cover — 1 Ton (with threaded bolt holes)</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>900-1113</td>
<td>Sheave Assembly (includes bearing 7)</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>900-1114</td>
<td>Hook Assembly (includes nut and groove pin)</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>900-1115</td>
<td>Shroud — Thrust Bearing</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>900-1116</td>
<td>Bearing Washer — Thrust</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>900-1117</td>
<td>Body Assembly — Lower Block</td>
<td>1</td>
</tr>
<tr>
<td>14</td>
<td>900-1118</td>
<td>Latch Kit — Lower Hook</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>900-1119</td>
<td>Screw — Self-tapping, flat head</td>
<td>2</td>
</tr>
<tr>
<td>16</td>
<td>900-1120</td>
<td>Rope Assembly — Wire (20' lift)</td>
<td>1</td>
</tr>
</tbody>
</table>
Figure 9-13. Screw Type Limit Switch.

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Part Number</th>
<th>Description</th>
<th>Qty. Req'd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>900-1301</td>
<td>Hex Socket Head Cap Screws (#10-24 x 3/4 Pltd.)</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>O Ring with Washer (#10 Sealing Washer)</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Screw Type Limit Switch</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>900-1302</td>
<td>Yoke</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Hex Socket Head Cap Screw (#10-24 x 3/4)</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Hex Socket Round Head Cap Screws (5/16 - 18 x 3/4)</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Regular Spring Lock Washers (3/16 Pltd.)</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>900-1303</td>
<td>Mounting Plate</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>Spring Roll Pin (3/8 x 1 Pltd.)</td>
<td>1</td>
</tr>
</tbody>
</table>

* Not available as individual parts.
Recommended Spare Parts
for Your SHAW-BOX Hoist

Certain parts of your hoist will, in time, require replacement under normal wear conditions. It is suggested that the following parts be purchased for your hoist as spares for future use.

- One set of load brake friction washers
- Brake discs
- One motor brake solenoid
- One contactor
- Five control circuit fuses
- One transformer
- One wire rope assembly

NOTE: When ordering parts always furnish Hoist Serial Number, Catalog Number, Motor Horsepower, Voltage, Phase, Frequency and Capacity of Hoist on which the parts are to be used.

Parts for your hoist are available from your local authorized SHAW-BOX repair station. For the location of your nearest repair station, write:

**In USA**
Lift-Tech International, Inc.
Crane & Hoist Operations
P.O. Box 769
Muskegon, Michigan 49443

or phone: 616-733-0821

**In Canada**
Lift-Tech International
Cranes & Hoists, Inc.
53-D Cowansview Road
Cambridge, Ontario, N1R 7L2

519-621-3201

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**WARRANTY**

**WARRANTY AND LIMITATION OF REMEDY AND LIABILITY**

A. Seller warrants that its products and parts, when shipped, and its work (including installation, construction and start-up), when performed, will meet applicable specifications, will be of good quality and will be free from defects in material and workmanship. All claims for defective products or parts under this warranty must be made in writing immediately upon discovery and, in any event, within one (1) year from shipment of the applicable item unless Seller specifically assumes installation, construction or start-up responsibility. All claims for defective products or parts when Seller specifically assumes installation, construction or start-up responsibility, and all claims for defective work must be made in writing immediately upon discovery and, in any event, within one (1) year from completion of the applicable work by Seller, provided; however, all claims for defective products and parts must be made in writing no later than eighteen (18) months after shipment. Defective items must be held for Seller’s inspection and returned to the original f.o.b. point upon request. THE FOREGOING IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES WHATSOEVER, EXPRESS, IMPLIED AND STATUTORY, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS.

B. Upon Buyer’s submission of a claim as provided above and its substantiation, Seller shall at its option either (i) repair or replace its product, part or work at either the original f.o.b. point of delivery or at Seller’s authorized service station nearest Buyer or (ii) refund an equitable portion of the purchase price.

C. This warranty is contingent upon Buyer’s proper maintenance and care of Seller’s products, and does not extend to fair wear and tear. Seller reserves the right to void warranty in event of Buyer’s use of inappropriate materials in the course of repair or maintenance, or if Seller’s products have been dismantled prior to submission to Seller for warranty inspection.

D. The foregoing is Seller’s only obligation and Buyer’s exclusive remedy for breach of warranty, and is Buyer’s exclusive remedy hereunder by way of breach of contract, tort, strict liability or otherwise. In no event shall Buyer be entitled to or Seller liable for incidental or consequential damages. Any action for breach of this agreement must be commenced within one (1) year after the cause of action has accrued.

LIFT-TECH INTERNATIONAL, INC.
CRANE AND HOIST OPERATIONS
MUSKEGON, MICHIGAN 49443