Americrane & Hoist Corp. 1-800-652-1932

COFFING

WIRE ROPE
ELECTRIC HOISTS

OPERATING
AND
MAINTENANCE
INSTRUCTIONS AND
PARTS LISTS FOR
WR SERIES

Publication
PART NO.
WR–680–5

IMPORTANT – CAUTION

This manual contains important information for the correct installation, operation, and maintenance of this equipment. All persons involved in the installation, operation, and maintenance of this equipment should be thoroughly familiar with the contents of this manual. To safeguard against the possibility of personal injury or property damage, follow the recommendations and instructions of this manual. Keep this manual for reference and further use.

Duff-Norton

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WARRANTY

Unless otherwise stated herein, Seller will repair or replace, without charge f.o.b. point of shipment any parts proven to Seller's satisfaction and upon Seller's examination to have been defective in material or workmanship when furnished, provided claim is made within one year after date of shipment. Deterioration or wear occasioned by abuse, severe eccentric loading, overloading, chemical or abrasive action or excessive heat shall not constitute defects. Equipment and accessories not of the Seller's manufacture are warranted only to the extent that they are warranted by the manufacturers, and this warranty is applicable only if the defect was the result of normal use, application and service, and is void if the product or any part thereof was tampered with, repaired or altered by any person other than the factory or authorized repair station. THERE ARE NO OTHER WARRANTIES, EXPRESS, STATUTORY, OR IMPLIED, INCLUDING THAT OF MERCHANTABILITY AND OF FITNESS.

Authorization for return must be received from the Duff-Norton Company before returning any equipment for inspection or warranty repair.

SECTION I
INTRODUCTION

1–1. GENERAL INFORMATION.

1–2. This manual provides necessary and proper information for persons engaged in the operation and maintenance of this Coffing WR Hoist. Any person operating or maintaining this hoist must be familiar with the information contained herein. Adherance to the precautions, procedures and maintenance practices described herein should ensure long and satisfactory use of your hoist with minimum danger to life, limb and property. Major overhaul efforts are not within the scope of this manual; such repairs should be made at an approved service center or by us. If any operating or maintenance information herein seems inadequate for your particular problem, please call or write our service engineers. We solicit your suggestions for improvements to this manual.

1–3. All persons concerned with the installation, operation, inspection, and maintenance of this hoist are urged to read American National Standard ANSI B30.16. That standard contains important rules (some mandatory and some of an advisory nature) designed primarily to prevent or minimize injury and otherwise protect life, limb and property. You should especially be aware of the mandatory rules pertaining to inspection requirements and the advisability of maintaining written, dated, and signed inspection reports and records.

1–4. HOIST CONSTRUCTION.

1–5. This Coffing Hoist has a strong, lightweight, aluminum alloy or malleable iron frame and housing for portability. On single speed hoists both the push-button and the magnetic controller are mechanically interlocked to prevent shorting the circuit and causing serious damage. On all two speed hoist push-buttons the elements are electrically interlocked. No mechanical interlock is furnished. In all hoists, regardless of the motor voltage, the push-button station operates on reduced voltage. The operator is further protected by the insulating push-button station.

1–6. A strain cable is built into the push-button cable and is securely anchored to the push-button station and the hoist housing. The neoprene push–button station may be used to pull the hoist when mounted on a free moving trolley. However, it is recommended that a hand geared or motorized trolley be used when the pulling effort required to move the hoist exceeds 100 pounds or when the application requires frequent horizontal movement of the hoist.

1–7. Automatic limit switches are built into the hoist to protect it against damage resulting from overtravel in either direction. When these switches are properly maintained and adjusted, the operator need not be overly concerned about damaging the hoist due to exceeding the functional travel limits of the hoist. The operator should bear in mind, however, that the limit switches are safety devices, and routine or constant use of them to stop hoist travel must be avoided.

1–8. LEADING PARTICULARS.

1–9. The operator should be aware of the capabilities and capacity of his hoist. He must refrain from overloading. Overloading not only can cause damage to the hoist, but presents serious threats to persons around the hoist. The following are some leading particulars with which the operator should be familiar.

TABLE I. LEADING PARTICULARS

Model	Capacity (lbs)	Single-speed hoist lifting speed (ft/min)	Two-speed hoist lifting speed (ft/min)	Motor HP	Net weight (lbs)	Model	Capacity (lbs)	Single-speed hoist lifting speed (ft/min)	Two-speed hoist lifting speed (ft/min)	Motor HP	Net weight (lbs)
WR-0228-1	250	28		1/4	140	WR-1028-3	1000	28	28-9	1	160
WR-0228-3	250	28	28-9	1/4	140	WR-1028-5	1000	28	28-9	1	160
WR-0228-5	250	28	28-9	1/4	140	WR-1042-3	1000	42	42-14	1-1/2	160
WR-0256-1	250	56		1/2	140	WR-1042-5	1000	42	42-14	1-1/2	160
WR-0256-3	250	56	56-19	1/2	140	WR-2010-3	2000	10		3/4	160
WR-0256-5	250	56	56-19	1/2	140	WR-2010-5	2000	10		3/4	160
WR-0528-1	500	28		1/2	140	WR-2014-1	2000	14		1	160
WR-0528-3	500	28	28-9	1/2	140	WR-2014-3	2000	14	14-5	1	160
WR-0528-5	500	28	28-9	1/2	140	WR-2014-5	2000	14	14-5	1	160
WR-0542-3	500	42	42-14	3/4	140	WR-2021-3	2000	21	21-7	1-1/2	160
WR-0542-5	500	42	42-14	3/4	140	WR-2021-5	2000	21	21-7	1-1/2	160
WR-1021-1	1000	21		3/4	160	WR-4014-3	4000	14	14-5	2	340
WR-1021-3	1000	21	21-7	3/4	160	WR-4014-5	4000	14	14-5	2	340
WR-1021-5	1000	21	21-7	3/4	160	WR-4021-3	4000	21	21-7	3	340
WR-1028-1	1000	28		1	160	WR-4021-5	4000	21	21-7	3	340

SECTION II
PREPARATION FOR USE

2–1. INSPECTION PRIOR TO INITIAL USE.

2–2. Any new or repaired hoist, as well as the working area, shall be carefully inspected prior to initial installation and use. The inspection shall be made by or under the direction of a person familiar with hoist operations and industrial safety standards.

2–3. The following inspection criteria are recommended prior to initial installation and use. Additional inspection items should be added to satisfy local usage and safety requirements. All inspections of any kind should be logged or recorded, dated, signed, and filed for reference.

a. Ensure that the facility power supply is adequate to furnish voltage at the hoist within 10 percent of that specified for the hoist. Also, that the facility power is properly fused to protect the hoist from power surges.

b. Ensure that no live part of the electrical system, either facility or hoist, will be exposed to accidental contact under normal operating conditions.

c. Ensure that the hoist is effectively grounded and that the circuit supplying power to the hoist is equipped with a suitable overcurrent device and disconnecting means. If in doubt, reference National Electrical Code ANSI C1.

d. Ensure that the supporting structures are strong enough to carry the intended loads. The supporting structure shall have a safe load rating at least equal to that of the hoist. The supporting structure must be rigid and not subject to weakening due to repeated stresses from the hoist.

e. Ensure that there is adequate working space to permit hoist operation in the hanging position only. Normal operation should not require pulling or tugging around corners or obstructions. Also, there must be adequate space to permit the operator to stand clear of the load and adjacent structures.

f. Watch out for makeshift or compromising practices either during installation or subsequent operation of the hoist. Sometimes the "temporary" fix remains until an accident occurs.

g. Perform both the daily and the periodic inspections specified herein on a repaired hoist prior to initial use. Perform the daily inspections specified herein on a new hoist prior to initial use.

2–4. INSTALLATION.

2–5. Secure the hoist to a suitable supporting structure through mounting holes provided in the suspension frame. On Trolley Mounted Hoists, the trolley should be properly mounted to allow for clearance between trolley wheels and beam flange to avoid binding. The beam should be free of any obstructions, dirt, or grease, providing a free and level plane of movement. See figure 2–2. See figure 2–3 if hoist is to be mounted at a right angle to beam.

2–6. OIL LEVEL.

2–7. Your hoist was lubricated before shipping; however the oil level should be checked before operating. To check oil level on 1/8 thru 1 ton hoists, remove brake cover (1, figure 7–1A) and remove oil level plug (3, figure 7–6A or 7–6B). To check oil level on 2 ton hoists, remove oil level plug (42, figure 7–1B). The oil level should be up to the oil level plug. If additional oil is required see paragraph 4–23.b.

2–8. LOAD HOOK DIRECTION (PHASING).

2–9. Connect hoist to electrical power source as follows:

NOTE: Proceed with step c. or d. for single voltage hoists. Dual-voltage Single-phase hoists (115/230V) are shipped wired for 115V and 3-phase hoists are shipped wired for the higher voltage unless otherwise specified. If single-phase hoists are to be connected to 230V or three-phase hoists are to be connected to the lower voltage power supply, proceed with steps a. and b. If single-phase hoists are to be connected to 115V or three-phase hoists are to be connected to the higher voltage, proceed with steps c. or d.

a. Remove the control cover (8, figure 7–1A or 25, figure 7–1B).

b. Note that each dual-voltage hoist has a terminal block with two parallel rows of terminals adjacent to the center barrier and designated according to voltage. See figure 2–1. Convert voltage by transfering the leads adjacent to the center barrier across the barrier to the corresponding terminal. See appropriate wiring diagram in Section VI. DO NOT MOVE ANY OTHER WIRES OR MAKE ANY OTHER CHANGES TO THE ELECTRICAL CIRCUIT. Replace control cover.

c. After ascertaining that voltages of the power source and the hoist are the same, make permanent connections at the power source for SINGLE-PHASE models.

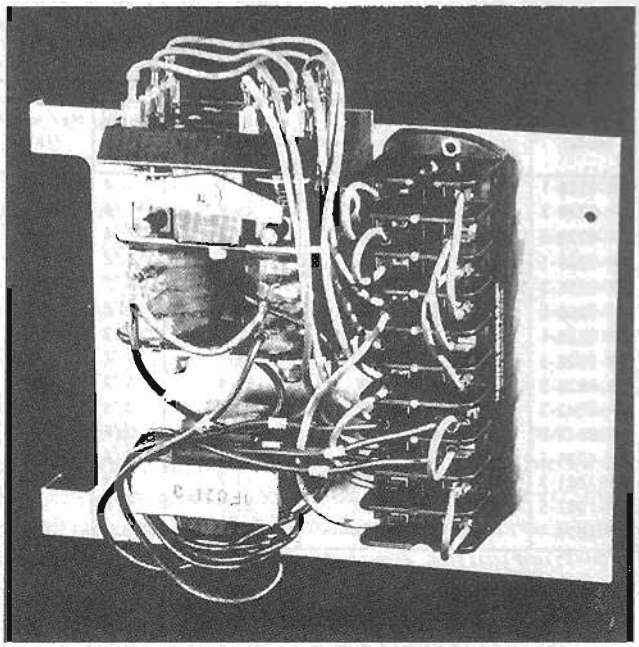


FIGURE 2–1. TERMINAL BLOCK

d. After ascertaining that voltages of the power source and the hoist are the same, make only temporary connections at the power source for THREE-PHASE models. Push the "UP" button and observe the direction of the load block. If the load block raises, the phasing is correct and permanent connections may be made at the power source. If the load block lowers, release the button immediately, since the limit switches will not operate to prevent hoist overtravel. To correct the load block direction (phasing), reverse any two wires (except the green ground wire) at the power source only. DO NOT CHANGE CONNECTIONS AT ANY OTHER LOCATION.

2–10. After electrical connections are completed, secure all protective covers over exposed wiring. Test the hoist operation as specified below prior to release for use.

2–11. TESTING.

2–12. Before placing hoist in operation, check for proper limit switch operation as follows:

WARNING: Use a safety stick to actuate the upper limit and overwrap switches to prevent injury to the hand.

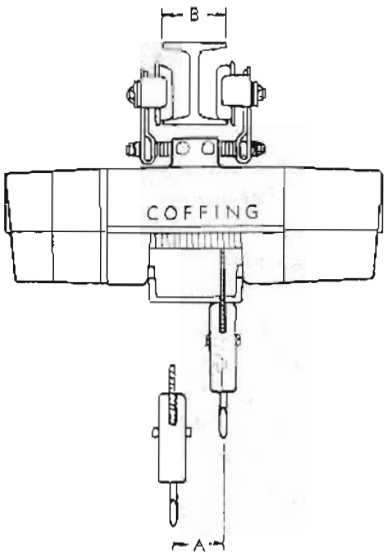
a. Check for proper upper limit switch operation by pushing up on the upper limit paddle (18, figure 7–1A or 30, figure 7–1B) with a safety stick while the load block is moving in the up direction. The paddle should actuate the upper limit switch (3, figure 7–3). This switch is a plugging type switch which should automatically reverse direction of travel when pushed beyond the stop limit.

b. Check for proper overwrap limit switch operation by cautiously raising the paddle assembly (30, figure 7–1A or 13, figure 7–1B) with the safety stick while the load block is moving. The limit switch must operate to stop the load block before the paddle bottoms out on the inside of the suspension frame (6, figure 7–1A or 19, figure 7–1B).

c. Check for proper lower limit switch operation by lowering the load block until the lower limit switch actuates and stops the load block. This should occur when 1-1/2 wraps of wire rope are left on the drum.

d. If any of the limit switches fails to operate properly see paragraph 4–6 for adjustment.

2–13. Attach a light load to the hook and check the hoist through a few lifting and lowering cycles. Check for hook drift. The hook shall not drift more than one inch. If brake operation is normal with a light load, test the hoist for operation with rated load, and then with 125 percent of rated load. The hoist shall operate smoothly and the brake shall prevent hook drift in excess of one inch at both rated load and 125 percent of rated load. See paragraph 4–1 if brake adjustment is required.



Hoist Capacity (Tons)	Standard Lift (Ft.)	Over-wrap (Ft.)	A Side to Side Travel of Load Block	B Minimum Flange Width (Inches)
⅛ and ¼	15	25	3¼"	4.660
½ and 1	15	25	3¼"	4.660
2	20	35	4½"	5.500

Care is to be taken to insure maximum stability when mounting the wire rope hoist at right angle to a beam. The load block travels from side to side, as shown at "A" left, as the wire rope pays off or is taken up by the drum. At no time should the load point be outside the suspension point of the trolley wheel either left or right. All mountings are to be on I beams in good condition, properly supported, and hanging absolutely plumb. Side pull should be avoided where possible.

FIGURE 2–3. RIGHT ANGLE SUSPENSION

SECTION III
OPERATION

3–1. SAFETY CONSIDERATIONS.

3–2. This hoist is designed for proper operation within the limits of its rated capacity. The hoist has features designed to minimize the potential for injury due to the failure of the hoist itself. However, here are some additional pointers which should be followed in order to ensure proper operation.

a. Do not overload the hoist.

b. Do not make extreme side pulls with the hoist. On trolley mounted hoists always position hoist directly over the load before lifting.

c. Operate the hoist only in a hanging position with adequate support. Make sure that the load does not contact any obstructions.

d. Before raising a load, always check to see that it is held securely in the hook or sling chains, etc. Raise the load only until the wire rope is taut and then double check the rigging before continuing to raise the load. Never use the hoist wire rope in sling fashion around the load. Be sure there are no twists in the wire rope as it travels into the hoist housing.

e. Make sure that the slings and other rigging have sufficient capacity to support the load, and are in good condition.

f. DO NOT STAND OR WALK BENEATH A LOAD. Do not move the load in such a manner as to endanger personnel.

g. Never leave a suspended load unattended.

h. Do not lower the load into areas where visibility is obscured unless someone else is guiding the operation.

i. Use common sense at all times when operating a hoist.

j. DO NOT USE THE HOIST TO LIFT, SUPPORT OR TRANSPORT HUMANS.

3–3. OPERATION.

3–4. The hoist should be operated by qualified personnel only. Be sure to perform the daily inspections specified herein prior to first use each day. Pay particular attention to the limit switch operation, the brakes, and rope travel onto the drum. Avoid excessive inching and quick reversals as these can cause accelerated brake wear and unnecessary stresses. Do not routinely move the hook so as to actuate the limit switches, as these are safety devices only. Remember though, that upon actuation of the upper limit switch the hoist automatically reverses the load and moves it a short distance to a safe position. Avoid swinging the load or hook if the hoist is mounted on a trolley. Do not operate the hoist if it is functioning improperly, has been inadvertently overloaded, or is in obvious need of repair. Always afix a warning or "Out-of-Order" tag to the control station of a suspect hoist until the proper inspection/repair has been made.

3–5. LOWERING WITHOUT POWER.

3–6. If the power fails with a load suspended, the hoist will stop automatically. In an emergency on 1/8 and 1/4 ton hoists equipped with disc brake only, the load can be lowered without power as follows:

a. Remove the brake cover(1, figure 7–1A) which will expose the brake.

b. Pull on the back of armature plate assembly (24, figure 7–6B) in order to eliminate spring tension from brake discs. The load should be lowered in short increments (approximately three inches) by pulling and releasing the armature plate assembly.

CAUTION: DO NOT ALLOW THE LOAD TO DESCEND RAPIDLY. This causes the motor to race and serious damage may result. Do not exceed normal lowering speed.

SECTION IV
MAINTENANCE, REPAIR, AND LUBRICATION

4–1. BRAKE MAINTENANCE.

4–2. When properly maintained and adjusted the brake will release promptly when energized, and will smoothly stop and securely hold any load up to the rated capacity of the hoist. If the hoist develops either: (a) undesirable overtravel after the push button is released (this condition is most noticeable in the lowering direction), or (b) hesitates to move the load promptly when the push button is actuated (this condition is most noticeable in the lifting direction) the brake should be adjusted or checked for deficient parts.

4–3. DRUM TYPE MOTOR BRAKE. The drum type motor brake used in this hoist is a simply designed brake with shoes bonded directly to the solenoid laminations. The brake is self-adjusting and is located on the end opposite the motor. The release coil is connected directly across the motor terminals and is energized automatically when the motor is running. With the coil energized the offset armature arms are pulled into the coil, holding the attached shoes away from the drum. When current to the brake solenoid coil is interrupted, the armature's shoes are freed and the brake is applied automatically by a spring compressed between the two shoes. To inspect or replace the shoes or other components, proceed as follows:

a. Remove brake cover (1, figure 7–1A or 3, figure 7–1B) which will expose the brake drum (12, figure 7–6A).

b. Remove brake drum by loosening two hub screws located on inside end of drum hub on 1/8 thru 1 ton models. Remove brake drum by removing one snap ring (4) on 2 ton models.

c. Remove brake shoes (8 and 9) and spring (10) by removing mounting stud (11).

d. Remove coil (6) and shoe stop (5) by removing four screws (7).

e. After inspecting and replacing defective parts, reassemble in reverse order of disassembly being sure to center the shoe stop.

f. Before placing hoist in use, test per paragraph 2–13.

4–4. DISC TYPE MOTOR BRAKE. The disc type motor brake used in this hoist is a direct acting, electro magnetically released, spring set unit that utilizes rotating and stationary disc contact to supply positive braking action and retain quick release and setting capabilities at all times. With the coil energized the armature plate assembly is pulled against the magnet assembly which allows the friction discs to turn freely between the stationary discs. When current to the coil is interrupted, the brake is applied automatically by springs which exert pressure causing the stationary discs to hold the friction discs. To adjust or repair the brake, remove brake cover (1, figure 7–1A or 3, figure 7–1B) and proceed as follows:

a. GAP ADJUSTMENT. Turn two adjustment screws until magnet gap (A, figure 4–1) measures .040 to .045 inch at narrowest gap for one disc models or measures .050 to .055 inch at narrowest gap for three disc models. Any delay in adjusting an improperly set gap will result in eventual loss of torque.

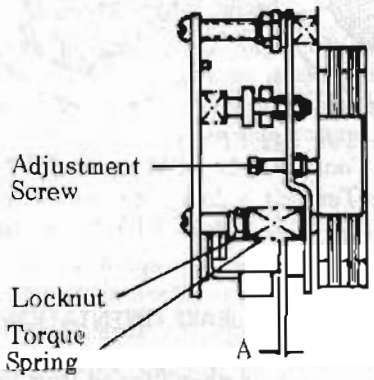


FIGURE 4–1. DISC TYPE MOTOR BRAKE

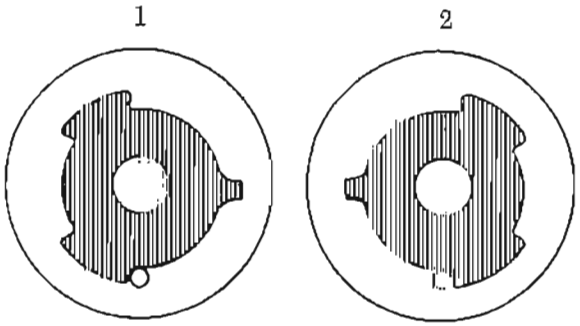
b. TORQUE ADJUSTMENT. The disc brake is factory set. To increase stopping time and lower torque, turn two locknuts (see figure 4–1) above torque springs counterclockwise, increasing spring length. Each full turn decreases torque approximately 10%. Do not adjust brakes for higher torque, as this will cause premature coil burnout.

c. INSPECTION AND REPLACEMENT OF FRICTION DISC(S). Remove three screws (10, figure 7–6B) and remove operator assembly (12) as a unit. Spring (11) is a loose part, so take care to avoid loss. Remove stationary discs (7) and friction disc(s) (8). Replace friction disc(s) which have been worn to a thickness of .160 inch or less. Reassemble in reverse order and adjust gap per paragraph a.

d. MAGNET ASSEMBLY REPLACEMENT. Remove two flat head screws (13, figure 7–6B), shoulder nuts (14), and rubber washers (15). Remove and replace magnet assembly (16) and reassemble parts in reverse order. Magnet and armature faces must be clean and parallel to insure quiet operation. Adjust gap per paragraph a. above.

e. Before placing hoist in use, replace brake cover and test per paragraph 2–13.

4–5. LOAD BRAKE (1/2, 1, & 2 TON HOISTS ONLY). The function of the load brake is to govern the speed of the load during lowering. This assembly consists of an uni-directional clutch, a pair of brake discs, pressure plate, and a load brake cam connected to the drive train through gearing and is located in the transmission. This brake is self adjusting and should last indefinitely under normal operation; however, anytime during repair the discs show excessive wear they should be replaced. See figures 5A, 5B, and 5C and note the reverse assembly of the clutch spring and the load brake cam for speeds as indicated. See figure 4–2 for the proper orientation of the cam with relation



1. ½ Ton (42 FPM)
   2 Ton (14 & 21 FPM)
2. ½ Ton (21 & 28 FPM)
   1 Ton (10, 14 & 21 FPM)

FIGURE 4–2. LOAD BRAKE ORIENTATION

to the load brake cam gear when viewed from the motor brake end.

4–6. LIMIT SWITCH ADJUSTMENT.

4–7. When properly operating the limit switches will stop the hoist in the "Up" direction when the load block moves up against the upper limit paddle or when more than two wraps of rope piles up on the drum. The lower limit switch will stop the hoist in the "Down" direction when all but one and one-half turns of wire rope has been unwound from the drum. To adjust or replace the limit switches, DISCONNECT THE HOIST FROM THE POWER SUPPLY, and remove the control cover (8, figure 7–1A or 25, figure 7–1B). Remove the control panel (20, figure 7–3) and check that all six limit switch mounting screws are tight. Check to see that wiring is secure. If the mounting and wiring is secure and the upper limit switch (3, figure 7–3) is inoperative, replace the switch. To adjust the remaining switches, proceed as follows:

4–8. LOWER LIMIT SWITCH. The lower limit switch (2, figure 7–3) is located to the right of the limit switch operator (1) when looking at the hoist from the control cover end. Adjustment is accomplished by moving the adjusting pin (9) which actuates the limit switch. Loosen set screw (7) which holds the pin in place and move the adjusting pin in the required direction. Moving the adjusting pin toward the switch will actuate the switch earlier, leaving more rope on the drum. Tighten the set screw, connect power supply and test switch operation.

4–9. OVERWRAP LIMIT SWITCH. The overwrap limit switch (2, figure 7–3) is located to the left of the limit switch operator (1) when looking at the hoist from the control cover end. Adjustment is accomplished by moving the adjusting pin (9) which actuates the switch. Loosen set screw (7) which holds the pin in place and move the adjusting pin in the required direction. Moving the adjusting pin toward the switch will actuate the switch with less rope overwrap. Tighten the set screw, connect power supply and test switch operation.

4–10. REPLACEMENT OF WIRE ROPE.

4–11. Leave power supply on and proceed as follows to replace the wire rope.

a. Place paper on floor to protect the wire rope from dirt and grit. Stretch the new wire rope out on the paper with the sleeve fitting end toward the hoist.

b. Push "Down" button and run rope out until stopped by lower limit switch. Use a safety stick to raise the limit switch paddle assembly (30, figure 7–1A or 13, figure 7–1B). While holding the paddle up, jog "Down" button until all rope is run off and the insert opening in the drum is facing straight out.

c. Remove the old rope and insert the new rope sleeve fitting end in the drum making sure the fitting is properly seated.

d. Use the safety stick to raise the limit switch paddle assembly and push the "Up" button until about half of the new rope is wound onto the drum. Apply tension to the rope while it is being wound on the drum.

e. Disconnect old rope dead end eye by removing dead end pin (24, figure 7–1A or 32, figure 7–1B) and attach new rope dead end eye while making sure there are no twists in the rope and that the rope passes through the "U" portion of the upper limit paddle (18, figure 7–1A or 30, figure 7–1B).

f. Disassemble the load block and inspect the block, hook, sheave, bearings, and pin for wear, etc. Replace parts as necessary. Reassemble load block onto new wire rope. See figure 7–4B or 7–4C for aid in disassembly and assembly.

g. Push "Up" button and wind the remainder of wire rope on drum while checking to be sure the rope is not twisted. If a twist is observed, disconnect dead end eye and twist rope in the opposite direction and reconnect dead end eye.

h. Test the hoist per paragraph 2–11.

4–12. INSPECTIONS.

4–13. A planned inspection routine should be established for this hoist based upon frequency of use, severity of use, and environmental conditions. (Reference American National Standard ANSI B30.16.) Some inspections should be made frequently (daily to monthly) and others periodically (monthly to yearly). It is strongly recommended that an Inspection and Maintenance Check List and an Inspector's Report similiar to those shown in Figures 4–3 and 4–4 be used and filed for reference. All inspections should be made by, or under the direction of, a designated inspector. Special inspections should be made following any significant repairs or any operating occurance leading one to suspect that the hoist's capabilities may have been impaired.

4–14. FREQUENT INSPECTIONS.

4–15. Perform the following inspections daily prior to

to initial use of the hoist.

CAUTION: Any unsafe condition disclosed by the inspection shall be corrected before operation of the hoist is resumed. Adjustments and repairs shall be done only by designated personnel.

a. Check the operating controls for proper operation.

b. Check the limit switches for proper operation.

c. Check the brakes for proper operation.

d. Inspect the hook for deformations, chemical damage, or cracks. Hooks damaged from chemicals, deformation or cracks or having throat openings greater than those listed in Table II must be replaced.

NOTE: Any hook that is twisted more than 10 degrees from the plane of the unbent hook or has throat openings in excess of those listed in Table II indicates abuse or overloading of the hoist. Other load bearing components should be inspected accordingly.

e. Check that the hook swivels freely.

f. Check hook latch to see that latch performs function of closing off the hook throat in a secure manner when load is attached.

g. Check wire rope for wear, twist, distortion or improper dead-ending.

4–16. PERIODIC INSPECTIONS.

4–17. It is recommended that the following inspections be performed at one to 12 month intervals. The exact period of inspection will depend on frequency and type of usage. Determination of this period will be based on the user's experience. It is recommended that the user begin with a monthly inspection and extend the periods to quarterly, semi-annually or annually based on his monthly experience.

CAUTION: Any unsafe condition disclosed by the inspection shall be corrected before operation of the hoist is resumed. Adjustments and repairs shall be done only by designated personnel.

a. Perform all the frequent inspections listed in paragraph 4–15.

b. Check nuts, bolts, rivets, and other hardware for looseness, stripped or damaged threads, and corrosion.

c. Check sheave and drum for distortion, cracks, and excessive wear.

d. Check housings and load block for cracks (resulting from collision, dropping, etc.) and abnormal openings between housing sections (resulting from overloading).

e. Check for worn, corroded, cracked or distorted parts such as pins, bearings, bushings, shafts (including keyways), couplings, gears, rollers, and locking and clamping devices.

f. Check brakes for glazing, contamination or excessive wear.

g. Make a thorough inspection of the wire rope at least once each month and keep a written, dated and signed report of rope condition on file. Any deterioration, resulting in appreciable loss of original strength, such as described below, shall be carefully noted and determination made as to whether further use of the rope would constitute a safety hazard.

(1) Reduction of rope diameter below nominal due to loss of core support, internal or external corrosion or wear of outside wires.

(2) A number of broken outside wires and the degree or distribution or concentration of such broken wires.

(3) Worn outside wires.

(4) Sections of rope which are normally hidden during inspection or maintenance procedures, such as parts passing over sheaves, should be given close inspection as these are points most subject to deterioration.

(5) Corroded or broken wires at end connections.

(6) Corroded, cracked, bent, worn or improperly applied end connections.

(7) Kinking, crushing, cutting or unstranding.

No precise rules can be given for determination of exact time for replacement of wire rope, since many variable factors are involved. Safety in this respect depends largely upon the use of good judgment by an appointed or designated person in evaluating remaining strength in the used rope after allowance for deterioration disclosed by inspection. Safety of rope operation depends upon this remaining strength. Conditions such as the following should be sufficient reason for questioning rope safety and consideration of replacement.

(1) Twelve randomly distributed broken wires in one rope lay, or four broken wires in one strand in one rope lay.

(2) Wear of one-third of the original diameter of outside individual wires.

(3) Kinking, crushing, birdcaging or any other damage resulting in distortion of the rope structure.

(4) Evidence of any heat damage from any cause.

(5) Reductions from nominal diameter as follows½

1/8 & 1/4 Ton Hoists–11/64 inch (nominal is 3/16 inch)
1/2 & 1 Ton Hoists–15/64 inch (nominal is 1/4 inch)
2 Ton Hoists–19/64 inch (nominal is 5/16 inch)

CAUTION: Use only wire rope supplied by our company since replacement rope must be the same size, grade and construction as the original rope.

A rope which has been idle for a period of a month or more due to shutdown or storage of the hoist, shall be given a thorough inspection before it is placed in service.

h. Check wire rope end fastenings. When two wires are broken adjacent to the end fastenings, the rope should be resocketed or replaced. Resocketing shall not be attempted if the resulting rope length will be insufficient for proper operation.

i. Inspect hook for cracking, checking, extreme

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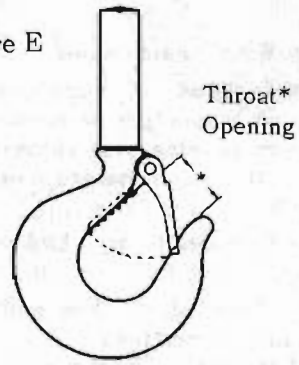
wear and spreading. Replace hooks showing these signs. Use dye penetrant, magnetic particle or other suitable crack detecting method. If the throat opening is spread wider than those listed in Table II, the hook has been overstressed and must be replaced.

TABLE II. HOOK THROAT OPENING

Figure E



Hoist Capacity Tons	Maximum Hook Opening	Safety Hook Latch Kit No.
1/8, 1/4, 1/2 & 1	1-1/4	H-7540
2	1-3/8	H-7540

*Dimension of throat opening with internal latch. NOTE: Add 1/16" to these dimensions if measured without hook latch.

j. Inspect hook connections for cracks, bending, stripped threads, and other damage.

k. Inspect limit switches for signs of pitting or deterioration. Ensure that they are securely mounted and that electrical connections are tight.

l. Inspect all wiring and terminals for fraying and defective insulation. Check connections for tightness.

m. Inspect the supporting structure for continued ability to carry the rated loads.

n. Inspect all nameplates, decals, and warning labels for security of attachment and legibility.

4-18. INSPECTION OF HOIST NOT IN REGULAR USE.

4-19. If a hoist has been idle for one month or more, but not more than six months, perform the inspections listed in paragraph 4-14 prior to use. If the hoist has been idle more than six months, perform the inspections listed in paragraph 4-16..

4-20. CLEANING.

4-21. Nonelectrical parts may be cleaned with a pressure spray of acid-free dry cleaning solvent and dried with compressed air or a clean, lintless cloth. Wipe switches, wiring, and other electrical components with a clean cloth dampened with dry cleaning solvent. Do not immerse any electrical part or brake linings or discs in cleaning solutions. Stubborn deposits of dirt and grease may be removed from gears, housings, and other mechanical parts by using a stiff-bristled brush dipped in the dry cleaning solvent.

CAUTION: Ensure that adequate ventilation is provided when using cleaning solutions. Wear protective clothing and avoid prolonged contact with solvents.

4-22. LUBRICATION.

4-23. Proper lubrication is necessary for a long and relatively trouble-free hoist operation. Refer to the following and to figure 4-5, Recommended Lubrication Schedule, for lubrication points, type of lubricant and frequency of lubrication.

a. WIRE ROPE. Lubrication of the wire rope is important. The action within the rope as it moves over the drum or around the sheave is for the strands to slide one against the other. Lubrication will reduce this friction and prevent the entrance of moisture which can cause corrosion. Frequent light applications of lubricant is better than infrequent heavy applications. For unusual conditions or a contaminated or dirty atmosphere consult us for a recommendation. Use heavy motor oil or wire rope lubricant.

b. GEAR CASE. Gear case oil should be maintained at a level up to the oil level plug (3, figure 7-6A or 7-6B for 1/4 thru one ton models or 42, figure 7-1B for two ton models). The oil should be changed during periodic inspections or when repair work is necessary in the gear box. Use an SAE 90 standard commercial non-detergent high quality machine oil for normal operating conditions and ambient temperatures. Consult our engineers for lubrication under abnormal conditions. To change the gear case oil, proceed as follows:

(1) Move the hoist to a work bench and stand it on the motor end. This will allow all the oil to drain into the cavity next to the suspension frame.

(2) Remove screws and lock washers (22 and 11, figure 7-1A or 1 and 2, figure 7-1B) and remove brake cover.

(3) Remove four hex head bolts, lock washers and seal washers (36, 35 and 34, figure 7-1B) or four allen head bolts and lock washers (21 and 11, figure 7-1A).

(4) Remove the section of the hoist containing brake, transmission housing and transmission cover.

(5) The oil can now be dumped and cavity flushed to remove any foreign matter and residue.

(6) Reassemble the hoist (except for brake cover on 1/8 thru one ton models). Using two quarts of oil for 1/8 thru one ton models or four quarts for two ton models, refill the gear case with new oil thru the oil filler and breather plug hole. Replace oil filler and breather plug. Replace brake cover on 1/8 thru one ton models.

c. LOAD HOOK BEARING. Invert the load block and allow a few drops of oil to run down the hook on and into the swivel bearing. Use SAE 20-30 gear oil.

d. LIMIT SWITCH PADDLES. Apply a few drops of SAE 20-30 gear oil to the pivot pins of paddles (18 and 30, figure 7-1A or 13 and 30, figure 7-1B).

INSPECTION AND MAINTENANCE CHECK LIST*
ELECTRIC POWERED OVERHEAD WIRE ROPE HOIST

TYPE OF HOIST _____ CAPACITY _____
LOCATION _____ ORIGINAL INSTALLATION DATE _____
MANUFACTURER _____ MANUFACTURERS'S SERIAL NO. _____

ITEM	FREQUENCY OF INSPECTION			POSSIBLE DEFICIENCIES	OK	ACTION REQUIRED
	FREQUENT		PERIODIC			
	DAILY	MONTHLY	1-12 MO.			
Operating Controls	•	•	•	Any deficiency causing improper operation		
Limit Switches	•	•	•	Any deficiency causing improper operation		
			•	Pitting or deterioration		
Hook	•	•	•	Excessive throat opening, bent or twisted more than 10 degrees, damaged hook latch, wear, chemical damage, worn hook bearing		
			•	Cracks (use dye penetrant, magnetic particle or other suitable detection method)		
Wire Rope	•	•	•	Inadequate lubrication, wear, twist, distortion, improper dead-ending, deposits of foreign substance		
		•	•	Deterioration or wear resulting in appreciable loss of original strength		
Hook Connections			•	Cracks, bending, stripped threads		
Pins, Bearings, Bushings, Shafts, Couplings, Gears,			•	Excessive wear, corrosion, cracks, distortion		
Nuts, Bolts, Rivets			•	Looseness, stripped and damaged threads, corrosion		
Sheave, Drum			•	Distortion, cracks, excessive wear		
Brakes			•	Glazing, contamination, excessive wear		
Housings, Load Block			•	Cracks, distortion		
Wiring, Terminals			•	Fraying, defective insulation		
Contact Block, Magnetic Hoist Control Switch, Other Electrical Apparatus			•	Loose connections, burned or pitted contacts		
Supporting Structure Trolley(if used)			•	Damage or wear which restricts ability to support imposed loads		
Nameplates, Decals, Warning Labels			•	Missing, damaged or illegible		

NOTE: Refer to Maintenance and Inspection Sections of the Hoist Maintenance Manual for further details.

FREQUENCY OF INSPECTION

Frequent – Indicates items requiring inspection daily to monthly. Daily inspections may be performed by the operator if properly designated.

Periodic – Indicates items requiring inspection monthly to yearly. Inspections to be performed by or under the direction of a properly designated person. The exact period of inspection will depend on frequency and type of usage. Determination of this period will be based on the user's experience. It is recommended that the user begin with a monthly inspection and extend the periods to quarterly, semi-annually or annually based on his monthly experience.

FIGURE 4–3. RECOMMENDED INSPECTION AND MAINTENANCE CHECK LIST

NOTE: This inspection and maintenance check list is in accordance with our interpretation of the requirements of the safety standard for overhead hoists ANSI B30.16-73. It is, however, the ultimate responsibility of the employer/user to interpret and adhere to the applicable requirements of this safety standard.

INSPECTOR'S REPORT			
ITEM	REMARKS (LIST DEFICIENCIES AND RECOMMENDED ACTION)		
INSPECTORS SIGNATURE	DATE INSPECTED	APPROVED BY	DATE

FIGURE 4–4. RECOMMENDED INSPECTOR'S REPORT

RECOMMENDED LUBRICATION SCHEDULE*
MODEL WR ELECTRIC POWERED WIRE ROPE HOIST

FIGURE AND INDEX NO.	COMPONENT	TYPE OF LUBRICANT	TYPE OF SERVICE AND FREQUENCY OF LUBRICATION		
			HEAVY	NORMAL	INFREQUENT
28, Figure 7-1A or 41, Figure 7-1B	Wire Rope	Heavy motor oil or wire rope lubricant	Weekly	Monthly	Monthly
Figures 7-5A, 7-5B, 7-5C, 7-5D	Gear Case	SAE 90 machine oil	At periodic inspection (see figure 4–3)		
12, Figure 7-4B or 8, Figure 7-4C	Load Hook Bearing	SAE 20 – 30 gear oil	Weekly	Monthly	Yearly
18 & 30, Figure 7-1A or 13 & 30, Figure 7-1B	Limit Switch Paddle Pivot Points	SAE 20 – 30 gear oil	Weekly	Monthly	Yearly

*This lubrication schedule is based on a hoist operating in normal environmental conditions. Hoists operating in adverse atmospheres containing excessive heat, corrosive fumes or vapors, abrasive dust, etc., should be lubricated more frequently.

FIGURE 4–5. RECOMMENDED LUBRICATION SCHEDULE

SECTION V
TROUBLESHOOTING

5–1. GENERAL.

5–2. Use the following table as an aid to troubleshoot the hoist. If you do not have an experienced machinist-electrician to do your repair work, we recommend that you send your hoist to an approved service center or to us for repairs.

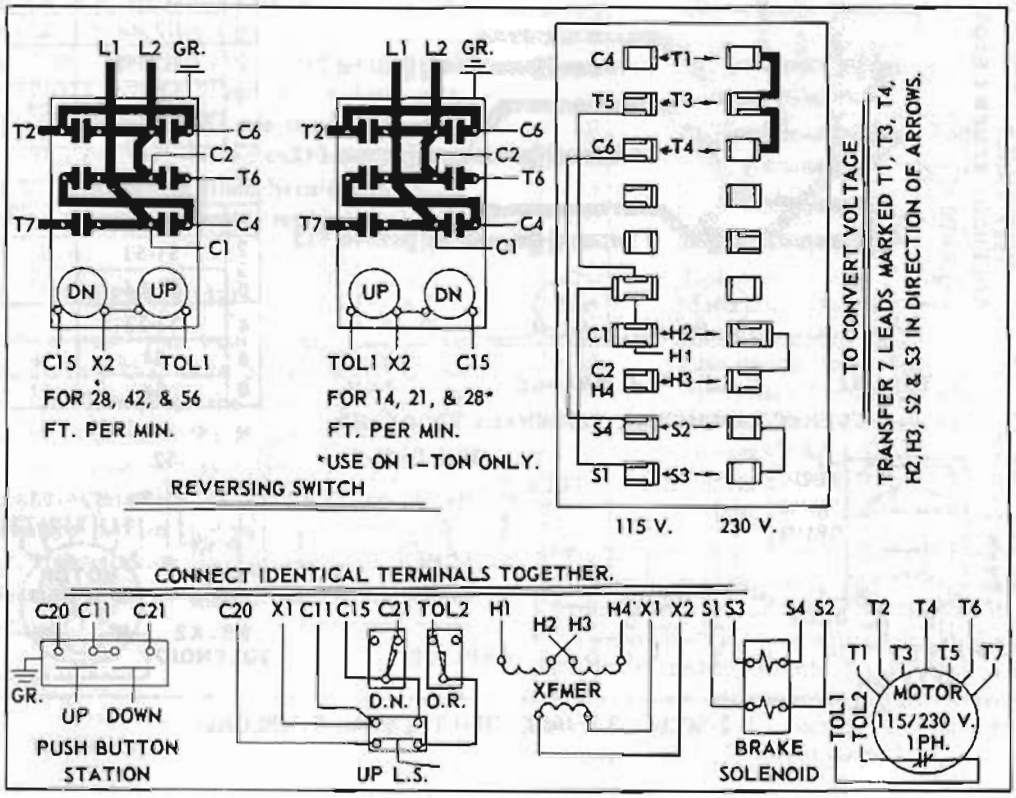
TROUBLE	REMEDY
Hook Fails to Stop at End of Travel	
1) Limit switch does not open circuit.	1) Check limit switch for defective operator contacts. Replace if necessary.
2) 3 Phase Reversal.	2) Reverse any two wires (except the green ground wire at the power source.
Hoist Does Not Respond to Push Button	
1) Power failure in supply lines	1) Check circuit breakers, switches and connections in power supply lines.
2) Wrong voltage or frequency	2) Check voltage and frequency of power supply against rating on name plate of hoist.
3) Improper connections in hoist or push-button	3) Check all connections at line connectors and on terminal block. Check terminal block on dual-voltage hoists for proper voltage connections.
4) Brake does not release	4) Drum Type – Check connections to brake shoe coil. Check for open or short circuit. Check mounting stud. Disc Type – Check brake visually for broken or damaged parts. Check for broken leadwire or bad electrical connections. Check for burned out coil.
5) Faulty magnetic hoist control switch	5) Check coils for open or short circuit. Check all connections in control circuit. Check for burned contacts. Replace as needed.
Hook Does Not Stop Promptly	
1) Hoist Overloaded	1) Reduce load to rated capacity of hoist.
2) Motor brake not holding	2) Drum Type – Remove load from hoist. Remove Brake End Cover and brake drum, check for worn or dirty shoes. Clean or replace as necessary. Disc Type – Check brake visually for broken or damaged parts. Check for proper magnet gap adjustment (See paragraph 4–4a.). Make certain that rotating discs are fully engaged on hub.
Hook Moves in Wrong Direction	
1) Three-phase reversal	1) Reverse any two wires (except the green ground wire) at the power source.
2) Improper connections	2) Check all connections against wiring diagram.
3) Faulty Instant-Reversing switch (Single-phase only)	3) Check contacts and springs of instant-reversing switch inside motor. Replace if necessary.
Hook Raises But Will Not Lower	
1) Down circuit open	1) Check circuit for loose connections. Check "Down" limit switch for malfunction.
2) Broken conductor in push button cable	2) Check each conductor in the cable. If one is broken, replace entire cable.
3) Faulty magnetic hoist control switch	3) Check coils for open or short circuit. Check all connections in control circuit. Check for burned contacts. Replace as needed.

TROUBLE	REMEDY
4) Lower limit switch malfunction	4) Check lower limit switch adjustment, worn insert or switch.
Hook Lowers But Will Not Raise	
1) Hoist overloaded	1) Reduce load within rated capacity.
2) Low voltage	2) Determine cause of low voltage and bring up to plus or minus 10% of the voltage specified on the hoist.
3) "Up" circuit open	3) Check circuit for loose connections. Check "Up" limit switch for malfunction.
4) Broken conductor in push-button cable	4) Check each conductor in the cable. If one is broken, replace entire cable.
5) Faulty magnetic hoist control switch	5) Check coils for open or short circuit. Check all connections in control circuit. Check for burned contacts. Replace as needed.
6) Faulty capacitor (single phase hoists only)	6) Check starting capacitor in motor. Replace if necessary.
7) Overwrap Limit Switch operated.	7) Disconnect power and check.
Lack of Proper Lifting Speed	
1) Hoist overloaded	1) Reduce load to rated capacity of hoist.
2) Low Voltage	2) Bring voltage up to at least minus 10% of voltage specified on hoist.
Excessive Wire Rope Wear	
1) Lack of lubrication	1) Lubricate wire rope.
2) Excessive side loading	2) Reduce side loading to allow wire rope to wind smoothly on drum.

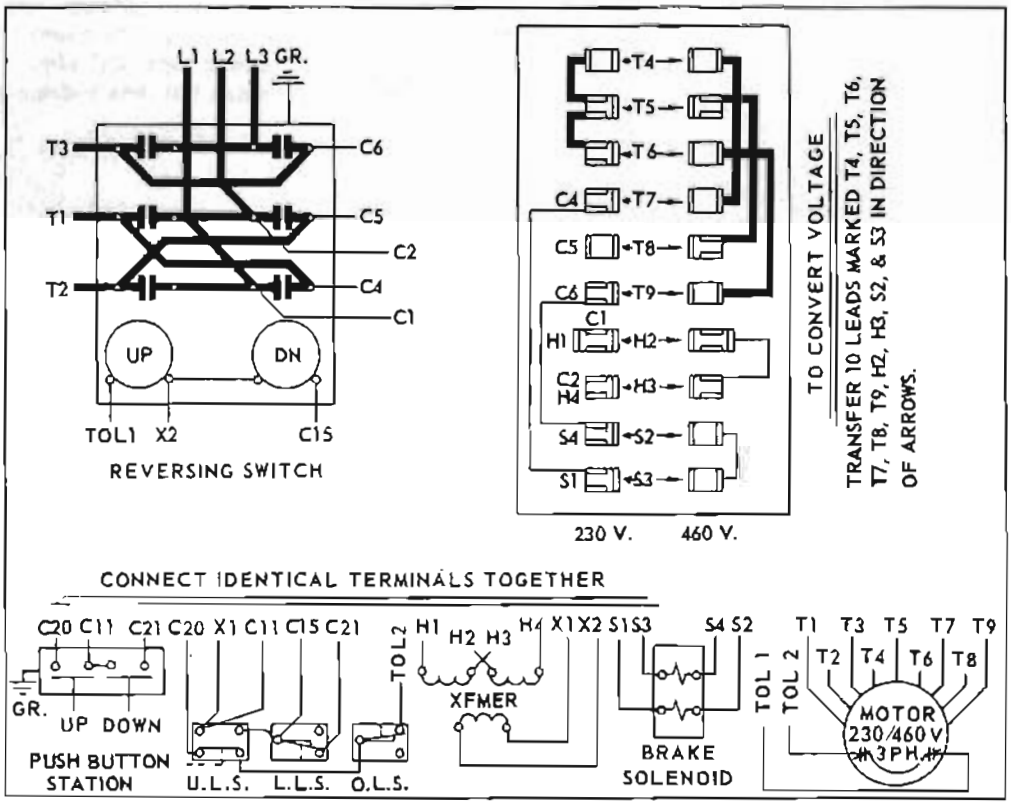
SECTION VI
WIRING DIAGRAMS

6–1. GENERAL

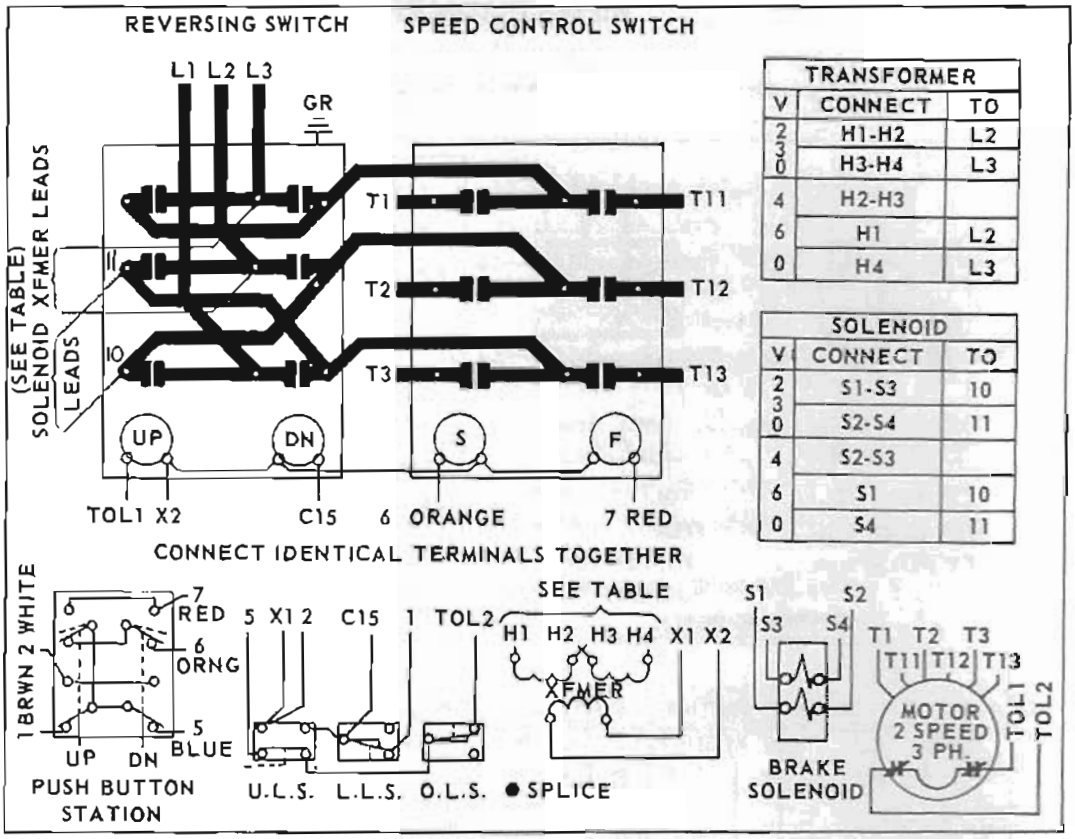
6–2. The wiring diagrams are designed to assist you in identifying electrical malfunctions of your hoist.



1 SPEED. 1 PHASE WITH THERMAL OVERLOAD



1 SPEED, 3 PHASE WITH THERMAL OVERLOAD



TRANSFORMER		
V	CONNECT	TO
230	H1-H2	L2
	H3-H4	L3
4	H2-H3	
6	H1	L2
0	H4	L3

SOLENOID		
V	CONNECT	TO
230	S1-S3	10
	S2-S4	11
4	S2-S3	
6	S1	10
0	S4	11

2 SPEED, 3 PHASE WITH THERMAL OVERLOAD

SECTION VII
ILLUSTRATED PARTS BREAKDOWN

7–1. GENERAL.

7–2. The illustrated parts lists that follow are designed to help you identify the parts of your Coffing hoist. However, these lists do not contain part numbers. All part numbers will be found in the parts list. Several different models of hoists are covered by this manual and differences will be noted between your hoist and the illustrations contained herein. However, the parts list will show the correct replacement part for your model hoist.

7–3. HOW TO USE THE PARTS LIST.

7–4. To identify a part from your hoist, locate the figure which illustrates that area of the hoist where your part is located. Example: the rotor and shaft of the motor would be located in the Motor Parts Figure. At this time, it may be necessary to take into consideration certain characteristics of your hoist. Due to configuration changes within the basic hoist, motors, suspension area, transmission, brake, and push button areas of the hoist it was necessary to divide these areas as follows:

FIGURE	TITLE
7—1A	Basic Hoist (⅛, ¼, ½ & 1 Ton)
7—1B	Basic Hoist (2 Ton)
7—2A	Motor Parts (3 Phase)
7—2B	Motor Parts (Single Phase)
7—4A	Suspension Area
7—4B	Bottom Block (½, 1 & 2 Ton)
7—4C	Bottom Block (⅛ & ¼ Ton)
7—5A	Transmission (½ Ton)
7—5B	Transmission (½ & 1 Ton)
7—5C	Transmission (2 Ton)
7—5D	Transmission (⅛ & ¼ Ton)
7—6A	Motor Brake Area (Drum)
7—6B	Motor Brake Area (Disc)
7—7A	Push Button (Single Speed Hoists)
7—7B	Push button (Two Speed Hoists)
7—7C	Push Button (Single Speed Hoists) (Square D Type)
8A	Trolleys (WRT 1 Ton)
8B	Trolleys (WRPT 1 Ton)
8C	Trolleys (WRPT 2 Ton)

Therefore, when determining the figure in which your part would be illustrated, take the above into consideration. Study the illustration and locate the part you wish to find. A number will be located adjacent to the part; this number, which is the index number, will be found in the accompanying parts list with the part name. To obtain the correct part number for your part see page 2 of the current parts list.

When ordering parts, please give the following information:
(1) Model and serial number of your hoist
(2) Total lift and reach of your hoist
(3) Your power supply (voltage, phase, cycles)
(4) Desired part number and part name

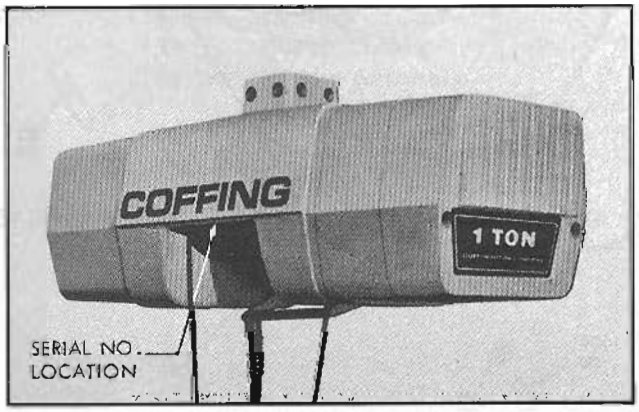


FIGURE 7–1A. BASIC HOIST
(1/8, 1/4 1/2 & 1 TON)

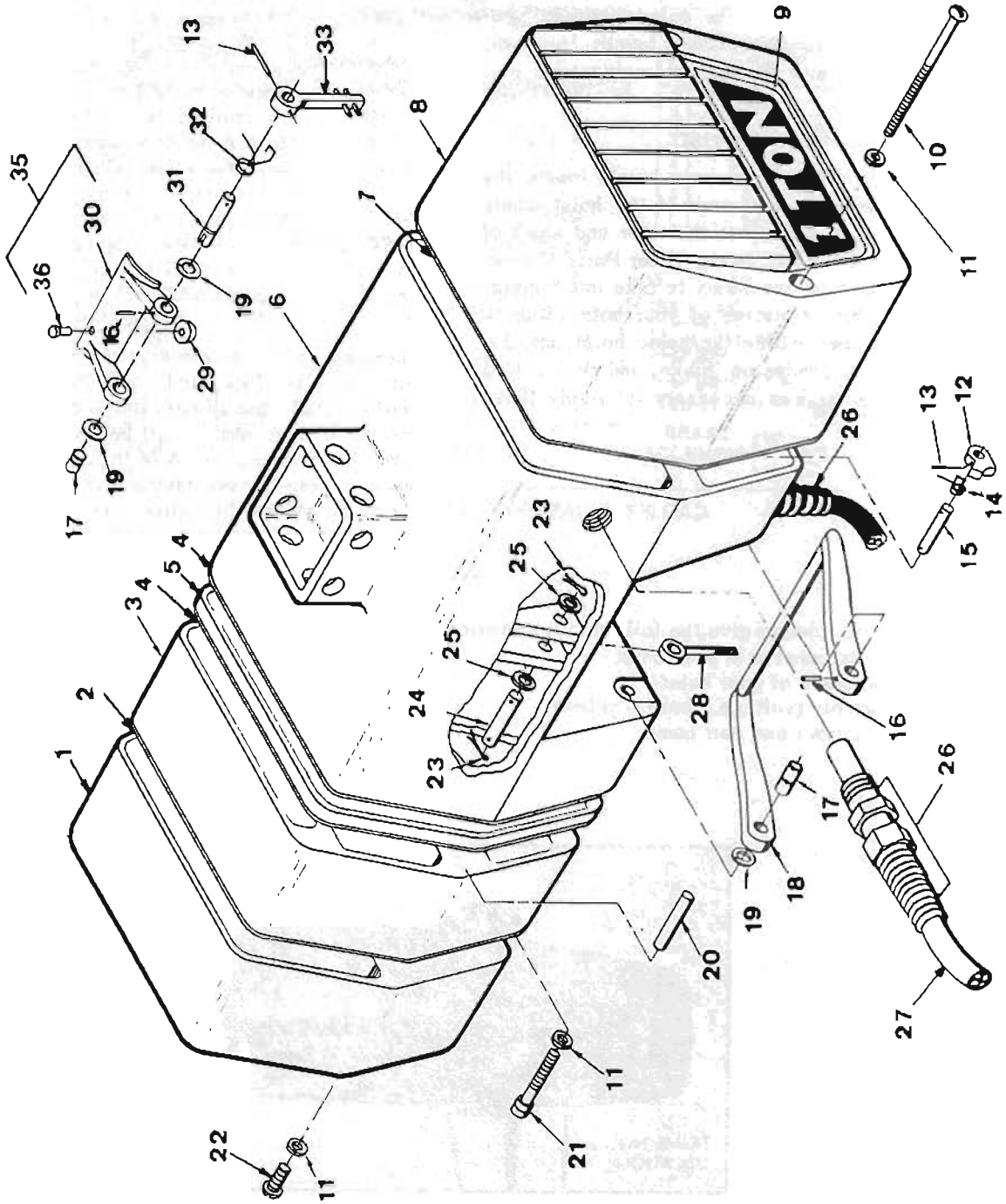


FIGURE 7–1A. BASIC HOIST (1/8, 1/4, 1/2 & 1 TON)

INDEX NO.	PART NAME
1	Brake Cover
2	Gasket
3	Transmission Housing
4	Gasket
5	Transmission Cover
6	Suspension Frame
7	Gasket
8	Control Cover
9	Decal
10	Screw
11	Lock Washer
12	Operator Shaft
13	Spring Pin
14	Spring
15	Operator
16	Spring Pin
17	Pivot Pin
18	Paddle
19	Retaining Ring
20	Dowel Pin
21	Allen Hd. Bolt
22	Screw
23	Cotter Pin
24	Dead End Pin
25	Washer.
26	Cord Grip
27	Power Cord
28	Cable Assembly
29	Wear Insert
30	Paddle
31	Operator Shaft
32	Spring
33	Operator
*34	Decal, Coffing
35	Paddle Assembly (Includes Index Nos. 29,30 and rivet)
36	Rivet

*Not Illustrated

Note: If Index No. 29 needs to be replaced we recommend using Paddle Assembly, Index No. 35.

FOR PART NUMBERS SEE FIGURE 7–1A OF CURRENT PARTS LIST.

FIGURE 7–1B. BASIC HOIST
(2 TON)

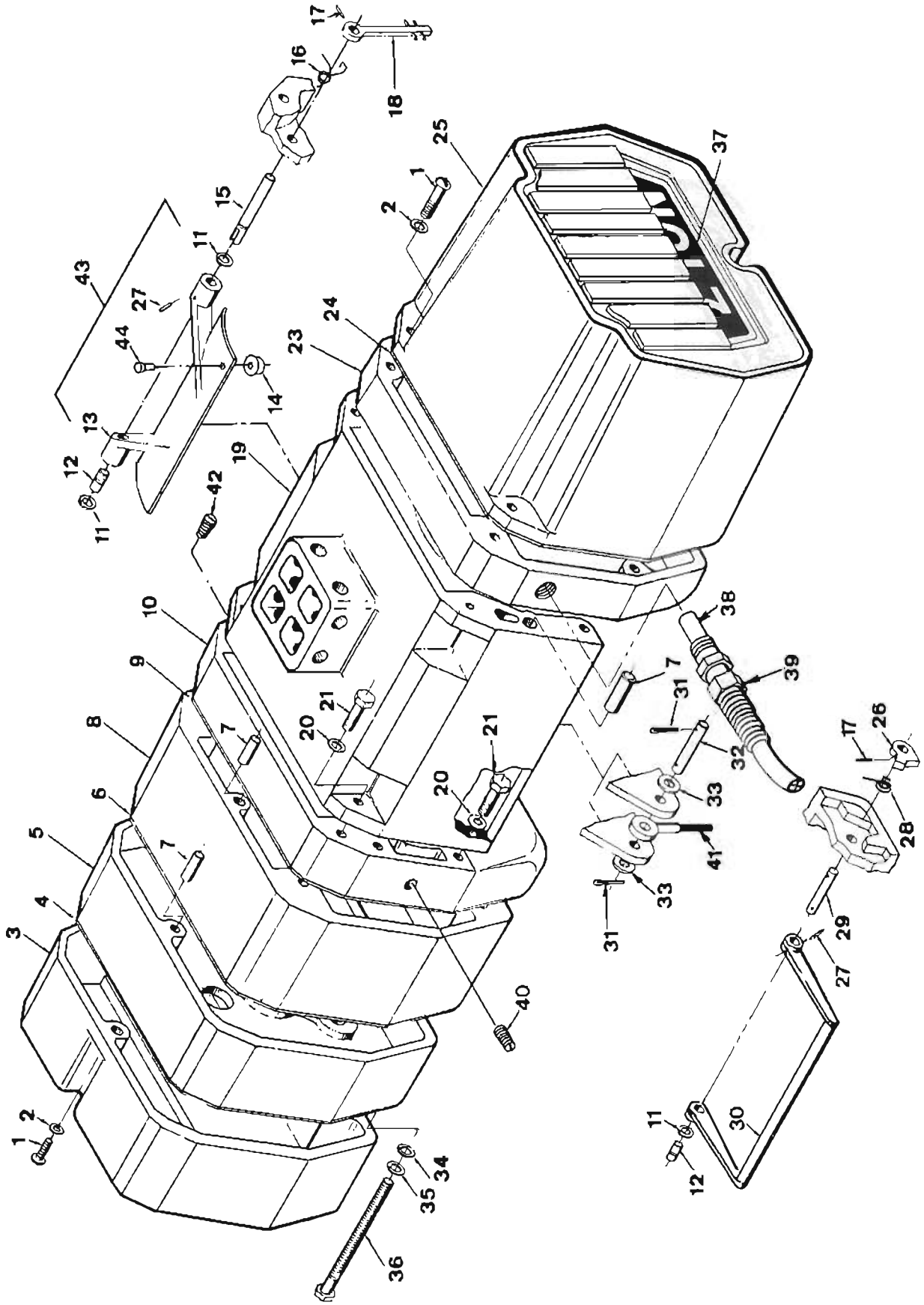


FIGURE 7–1B. BASIC HOIST
(2 TON)

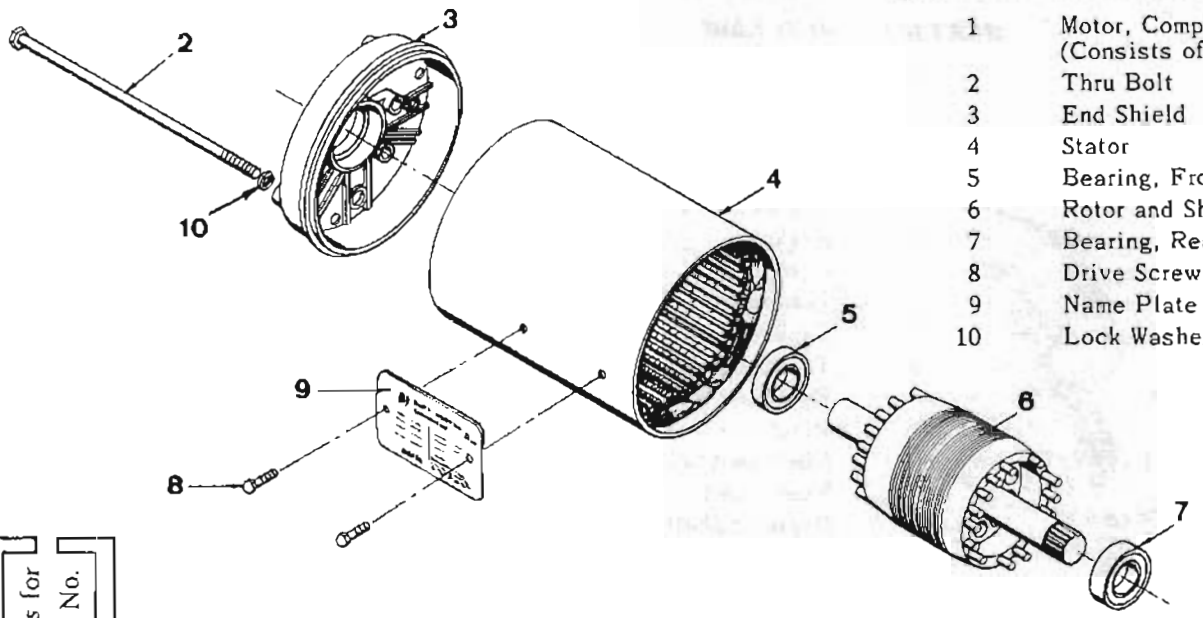
INDEX NO.	PART NAME
1	Screw
2	Lock Washer
3	Brake Cover
4	Gasket
5	Transmission Cover
6	Gasket
7	Dowel Pin
8	Transmission Housing
9	Gasket
10	Transmission Adapter
11	Retaining Ring
12	Pivot Pin
13	Limit Switch Paddle
14	Wear Insert
15	Operator Shaft
16	Spring
17	Spring Pin
18	Operator
19	Suspension Frame
20	Lock Washer
21	Hex Bolt
*22	Decal, Coffing
23	Motor Adapter
24	Gasket
25	Control Cover
26	Operator
27	Spring Pin
28	Spring
29	Operator Shaft
30	Paddle
31	Cotter Pin
32	Dead End Pin
33	Washer
34	Seal Washer
35	Lock Washer
36	Hex Head Bolt
37	Decal
38	Power Cord
39	Cord Grip
40	Oil Filler & Breather Plug
41	Cable Assembly
42	Oil Level Plug
43	Paddle Assembly (Includes Index Nos. 13, 14 and rivet)
44	Rivet

*Not Illustrated

Note: If Index No. 14 needs to be replaced we recommend using Paddle Assembly, Index No. 43.

FOR PART NUMBERS SEE FIGURE 7–1B OF CURRENT PARTS LIST.

FIGURE 7–2A. MOTOR PARTS
(3 PHASE)

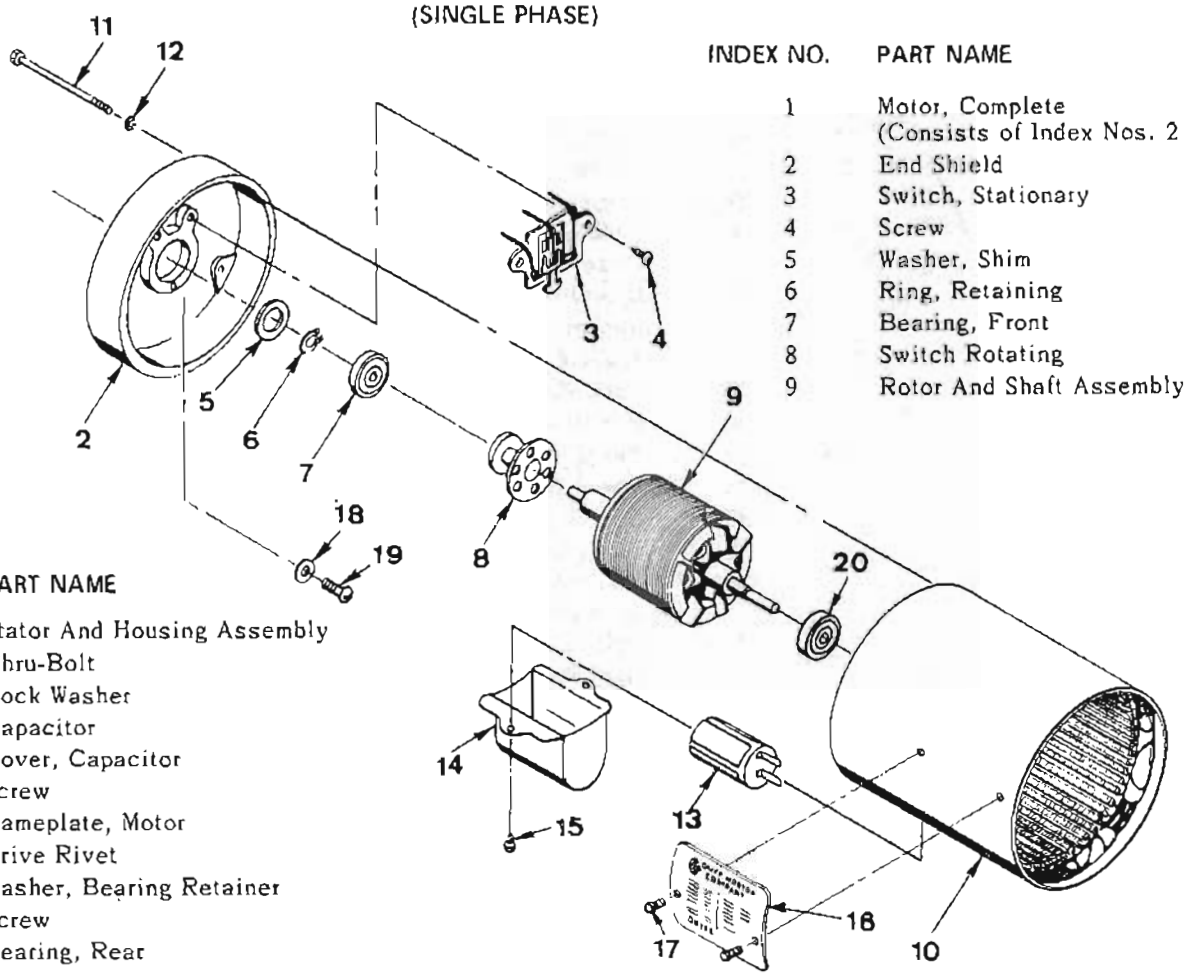


INDEX NO.	PART NAME
1	Motor, Complete (Consists of Index Nos. 2 Thru 10)
2	Thru Bolt
3	End Shield
4	Stator
5	Bearing, Front
6	Rotor and Shaft Assembly
7	Bearing, Rear
8	Drive Screw
9	Name Plate
10	Lock Washer

FOR PART NUMBERS SEE FIGURE 7–2A OF CURRENT PARTS LIST.

When ordering repair parts for motors, give Motor Model No.

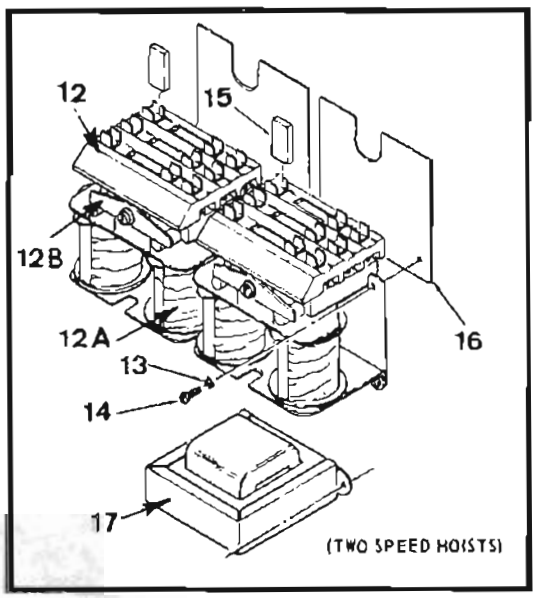
FIGURE 7–2B. MOTOR PARTS
(SINGLE PHASE)

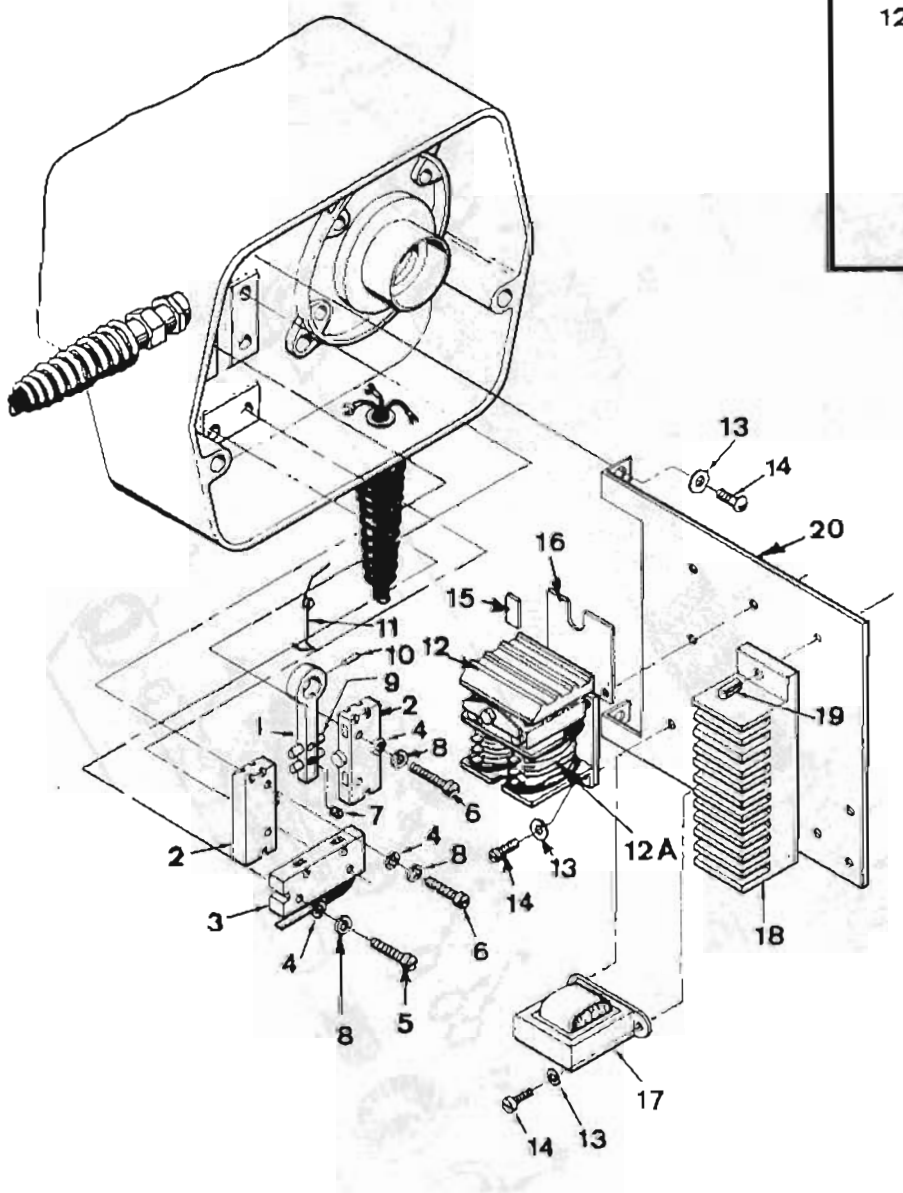


INDEX NO.	PART NAME
1	Motor, Complete (Consists of Index Nos. 2 Thru 17)
2	End Shield
3	Switch, Stationary
4	Screw
5	Washer, Shim
6	Ring, Retaining
7	Bearing, Front
8	Switch Rotating
9	Rotor And Shaft Assembly
10	Stator And Housing Assembly
11	Thru-Bolt
12	Lock Washer
13	Capacitor
14	Cover, Capacitor
15	Screw
16	Nameplate, Motor
17	Drive Rivet
18	Washer, Bearing Retainer
19	Screw
20	Bearing, Rear

FOR PART NUMBERS SEE FIGURE 7–2B OF CURRENT PARTS LIST.

FIGURE 7-3. LIMIT SWITCH AND CONTROLLER





INDEX NO.	PART NAME
1	Limit Switch Operator
2	Switch
3	Switch
4	Washer
5	Screw
6	Screw
7	Set Screw
8	Lock Washer
9	Adjusting Pins
10	Spring Pin
11	Spring
12	Contactor, Reversing Magnetic (Complete)
12-A	Contactor, Coil
12-B	Contactor, Service Parts Kit
13	Lock Washer
14	Screw
15	Terminal Insulator
16	Insulator
17	Transformer
18	Terminal Block
19	Eyelet
20	Control Panel

FOR PART NUMBERS SEE FIGURE 7-3 OF CURRENT PARTS LIST.

FIGURE 7–4A. SUSPENSION AREA

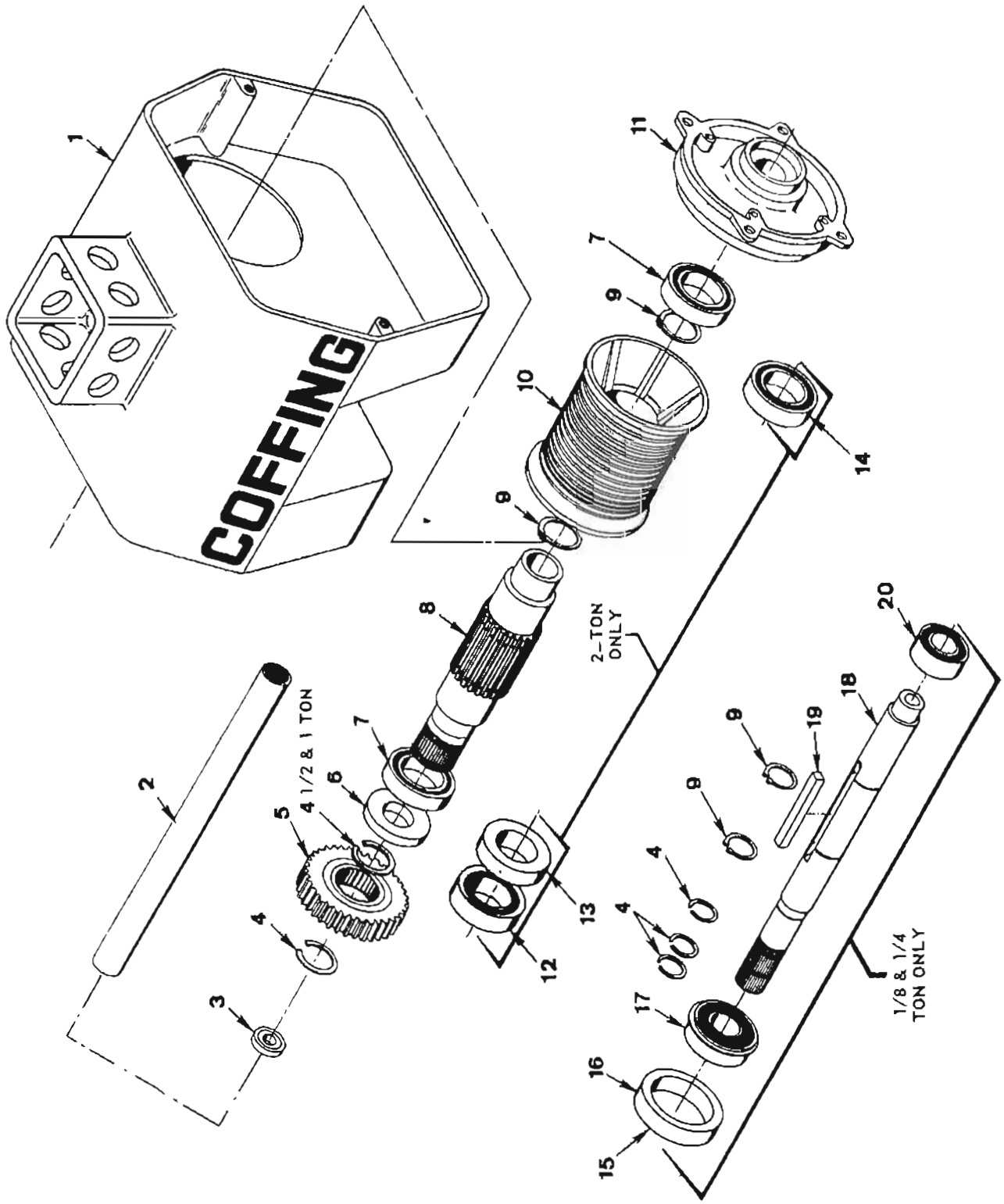
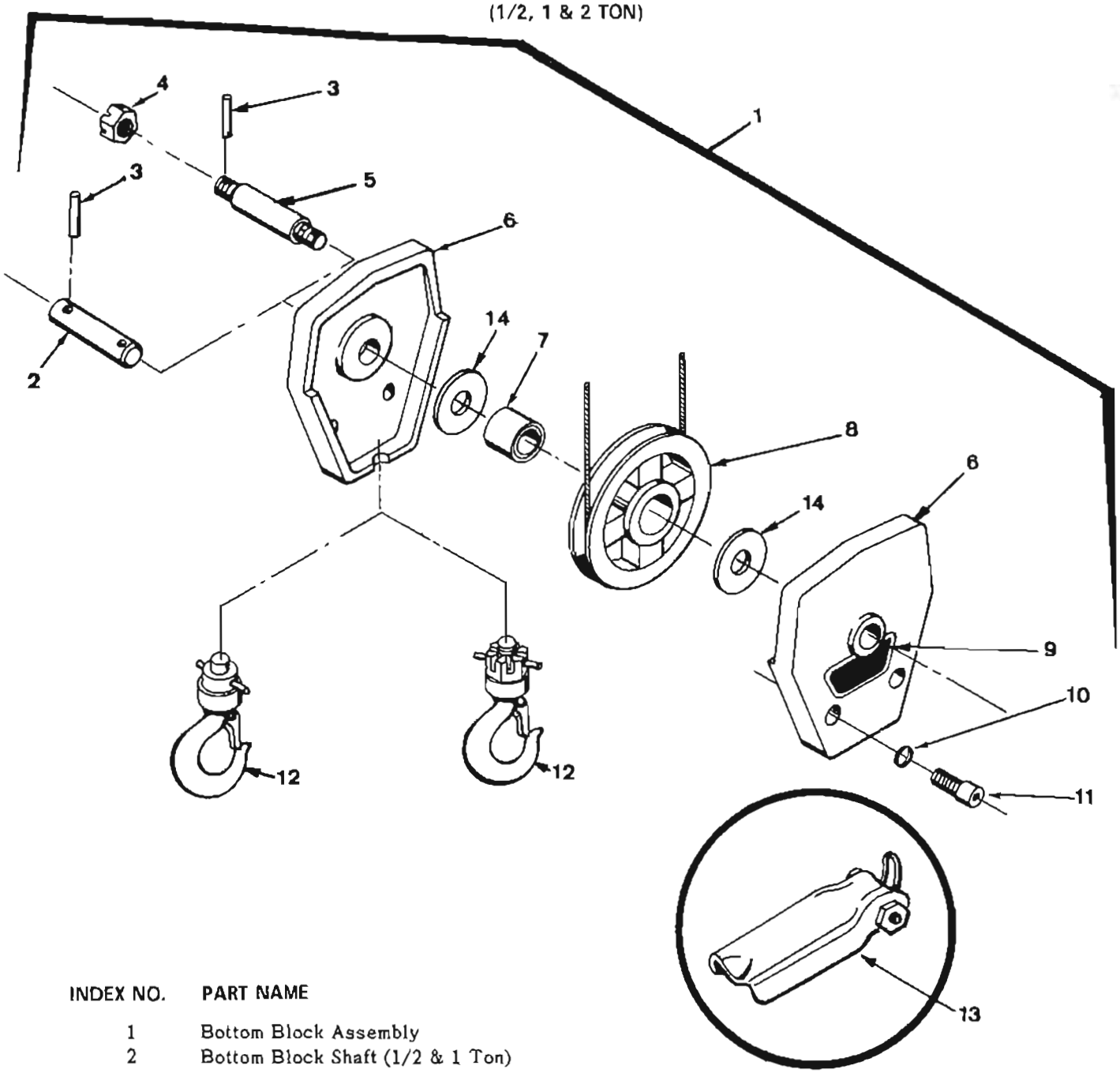


FIGURE 7–4A. SUSPENSION AREA

INDEX NO.	PART NAME
1	Suspension Frame (Illus. Applicable to 1/8, 1/4, 1/2 & 1 Ton)
2	Drive Coupling
3	Seal
4	Snap Ring
5	Gear
6	Seal
7	Bearing
8	Drum Shaft
9	Snap Ring
10	Drum
11	Motor Adapter (Illus. Applicable to 1 Ton Only)
12	Bearing (2 Ton)
13	Seal (2 Ton)
14	Bearing (2 Ton)
15	Liquid Gasket (1/8 & 1/4 Ton)
16	Sleeve (1/8 & 1/4 Ton)
17	Bearing (1/8 & 1/4 Ton)
18	Drum Shaft (1/8 & 1/4 Ton)
19	Key (1/8 & 1/4 Ton)
20	Bearing (1/8 & 1/4 Ton)

FOR PART NUMBERS SEE FIGURE 7–4A OF CURRENT PARTS LIST.

FIGURE 7–4B. BOTTOM BLOCK
(1/2, 1 & 2 TON)

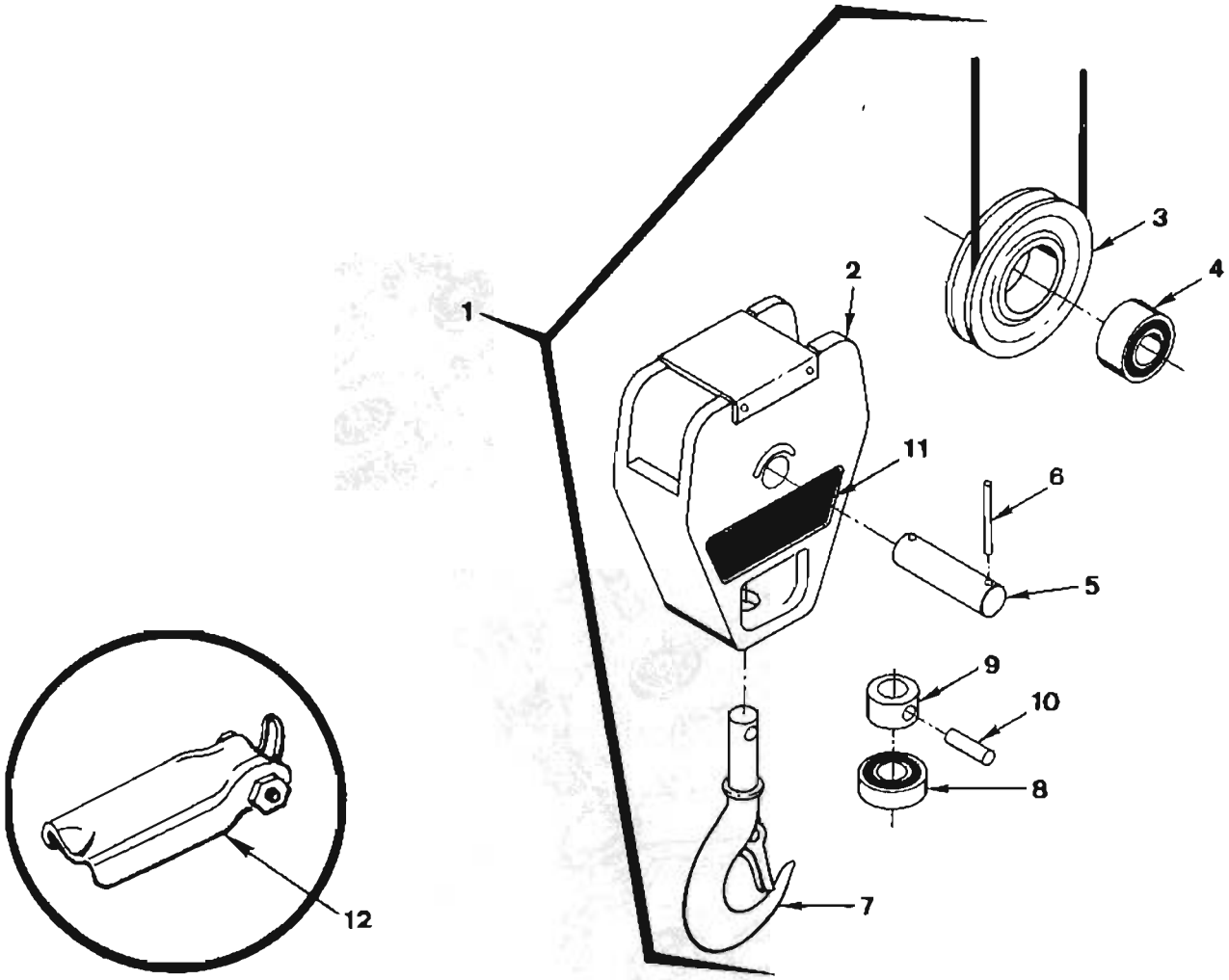


LATCH KIT

INDEX NO.	PART NAME
1	Bottom Block Assembly
2	Bottom Block Shaft (1/2 & 1 Ton)
3	Spring Pin
4	Nut (Slotted Hex) (2 Ton)
5	Bottom Block Shaft (2 Ton)
6	Side Frame
7	Bearing
8	Sheave
9	Capacity Plate
10	Lock Washer
11	Allen Head Screw
12	Hook Assembly with Latch
13	Latch Kit
14	Spacer

FOR PART NUMBERS SEE FIGURE 7–4B OF CURRENT PARTS LIST.

FIGURE 7–4C. BOTTOM BLOCK
(1/8 & 1/4 TON)



INDEX NO.	PART NAME
1	Bottom Block Assembly
2	Side Frame
3	Sheave
4	Sheave Bearing
5	Bottom Block Shaft
6	Spring Pin
7	Hook with Latch
8	Hook Bearing
9	Hook Collar
10	Lock Pin
11	Capacity Plate
12	Latch Kit

FOR PART NUMBERS SEE FIGURE 7–4C OF CURRENT PARTS LIST.

FIGURE 7–5A. TRANSMISSION
(1/2 TON– 42 FPM)

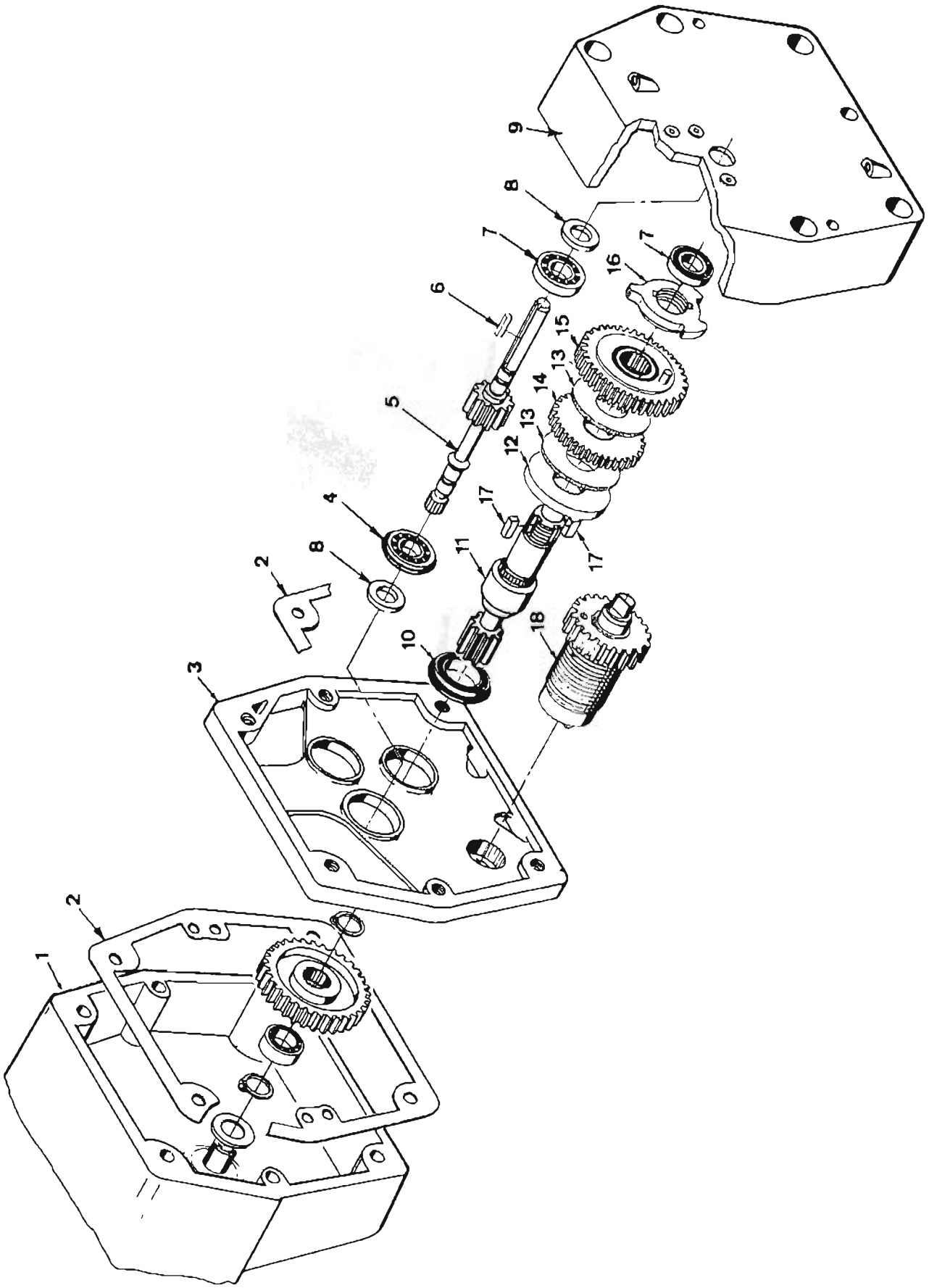


FIGURE 7–5A. TRANSMISSION
(1/2 TON–42 FPM)

INDEX NO.	PART NAME
1	Suspension Frame (Ref. Index No. 6, Figure 7–1A)
2	Gasket (Ref. Index No. 4, Figure 7–1A)
3	Transmission Cover (Ref. Index No. 5, Figure 7–1A)
4	Bearing With Retainer Ring
5	Pinion
6	Key
7	Bearing
8	Seal
9	Transmission Housing
10	Bearing With Retainer Ring
11	Pinion
12	Pressure Plate
13	Brake Disc
14	Ratchet Gear Assembly
15	Gear Assembly
16	Cam Load Brake
17	Key
18	Over Running Clutch

FOR PART NUMBERS SEE FIGURE 7–5A OF CURRENT PARTS LIST.

FIGURE 7–6B. TRANSMISSION
(1/2 TON–21 & 28 FPM)
(1 TON–10, 14 & 21 FPM)

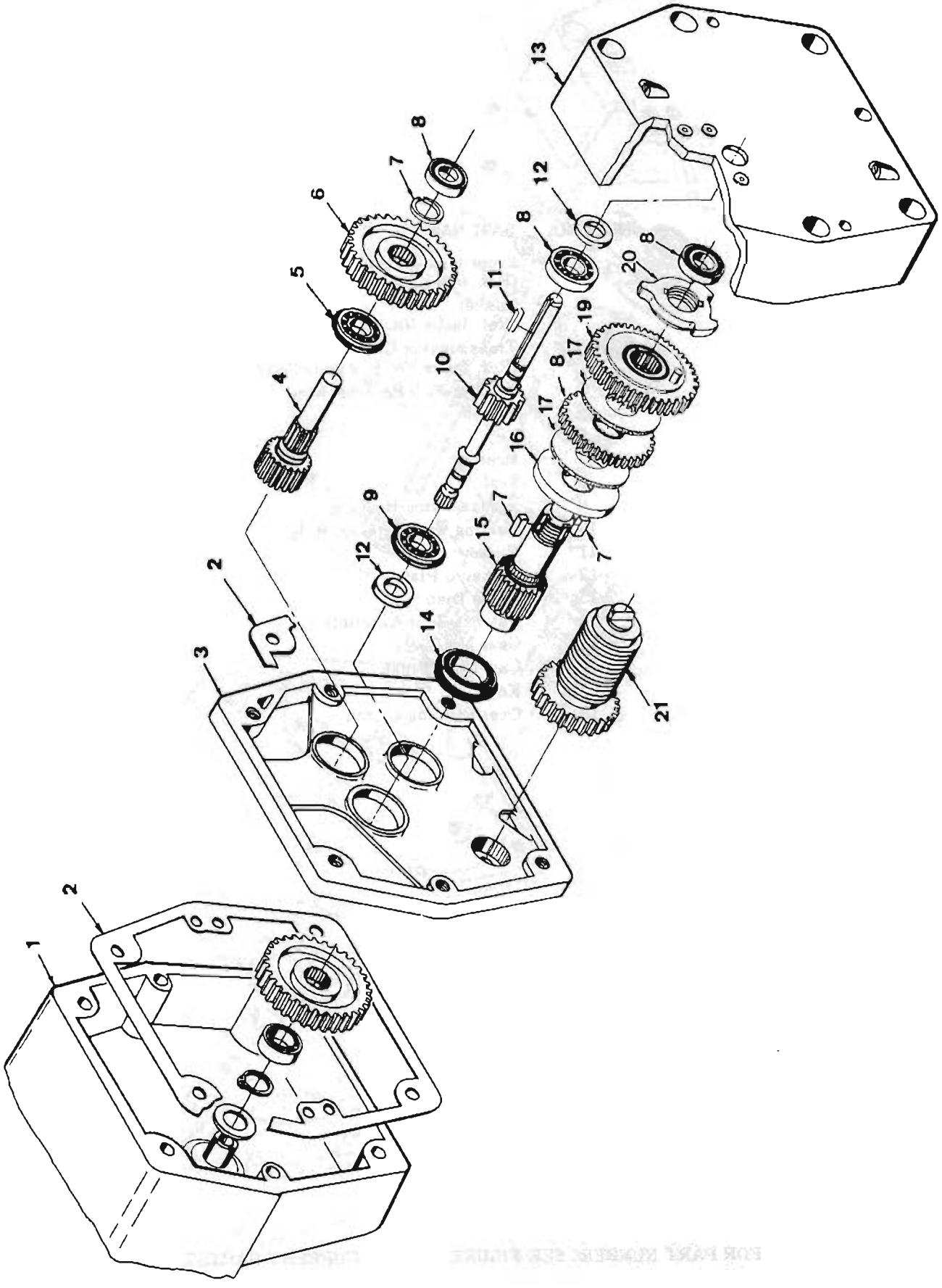


FIGURE 7-5B. TRANSMISSION
(1/2 TON-21 & 28 FPM)
(1 TON-10, 14 & 21 FPM)

INDEX NO.	PART NAME
1	Suspension Frame (Ref. Index No. 6, Figure 7-1A)
2	Cover Gasket (Ref. Index No. 4, Figure 7-1A)
3	Transmission Cover (Ref. Index No. 5, Figure 7-1A)
4	Pinion
5	Bearing With Retainer Ring
6	Gear
7	Key
8	Bearing
9	Bearing With Retainer Ring
10	Pinion
11	Key
12	Seal
13	Transmission Housing
14	Bearing With Retainer Ring
15	Inter Pinion
16	Pressure Plate
17	Brake Disc
18	Ratchet Gear Assembly
19	Gear Assembly
20	Cam Load Brake
21	Over Running Clutch

FOR PART NUMBERS SEE FIGURE 7-5B OF CURRENT PARTS LIST.

FIGURE 7–5C. TRANSMISSION
(2 TON–14 & 21 FPM)

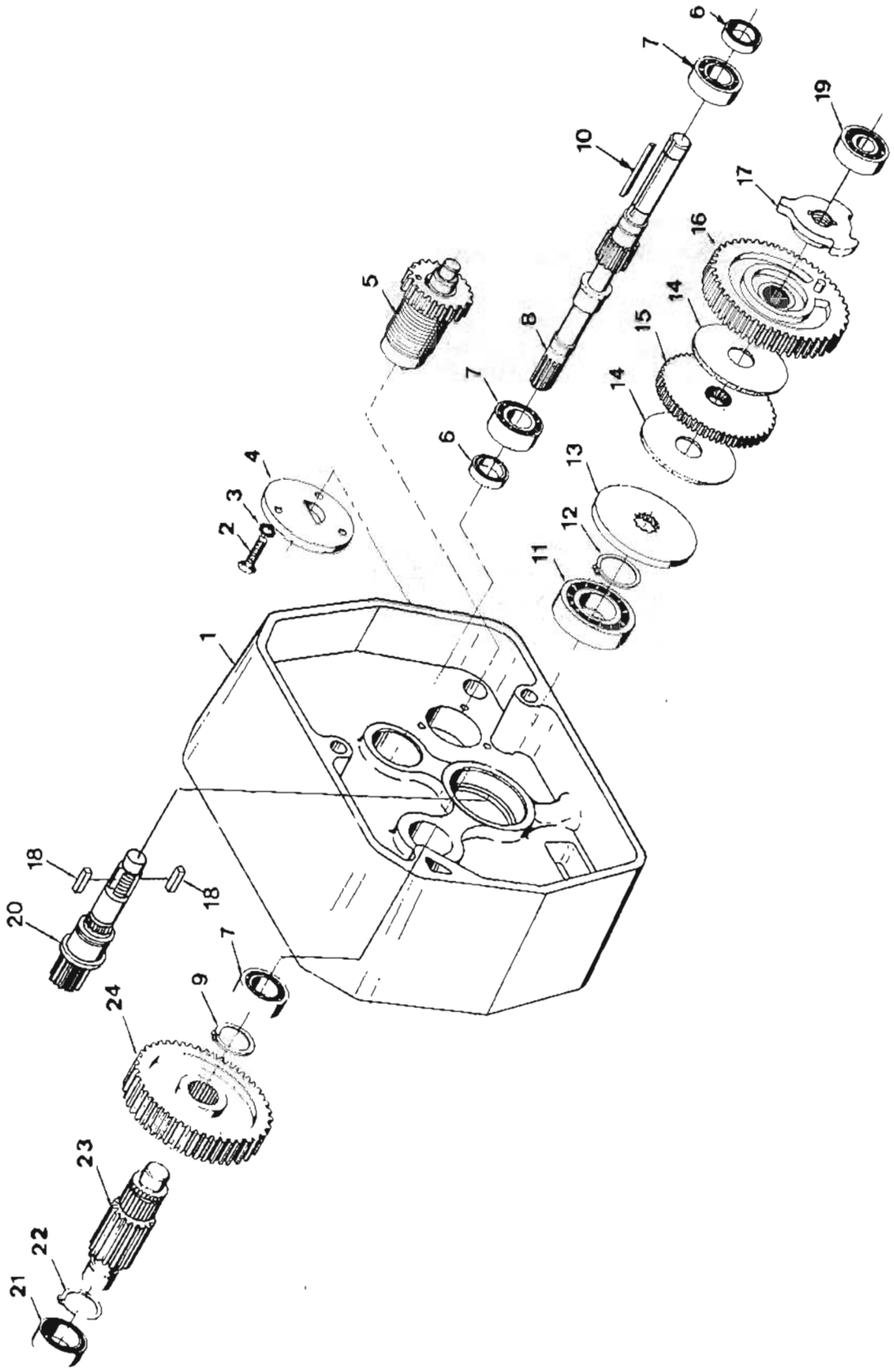


FIGURE 7–5C. TRANSMISSION
(2 TON–14 & 21 FPM)

INDEX NO.	PART NAME
1	Transmission Housing (Ref. Index No. 8, Figure 7–1B)
2	Machine Screw
3	Lock Washer
4	Clutch Plate
5	Over Running Clutch
6	Seal (Ref. Index No. 3, Figure 7–4A)
7	Bearing
8	Driving Pinion
9	Snap Ring
10	Key
11	Bearing
12	Snap Ring
13	Pressure Plate
14	Brake Disc
15	Ratchet Gear Assembly
16	Gear Assembly
17	Cam Load Brake
18	Key
19	Bearing
20	Pinion
21	Bearing
22	Snap Ring
23	Output Pinion
24	Gear

FOR PART NUMBERS SEE FIGURE 7–5C OF CURRENT PARTS LIST.

FIGURE 7-5D. TRANSMISSION
(1/8 & 1/4 TON-28, 42 & 56 FPM)

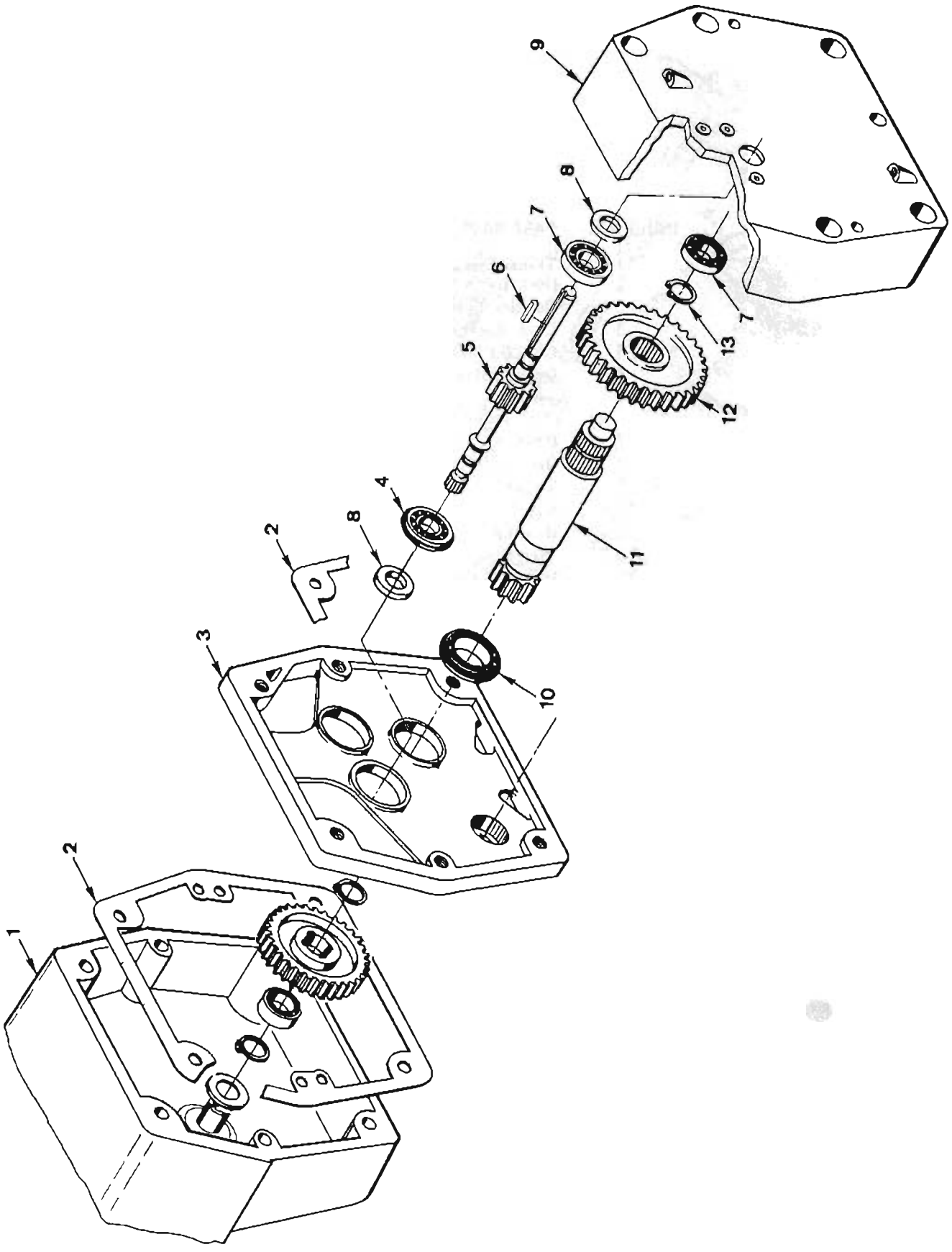
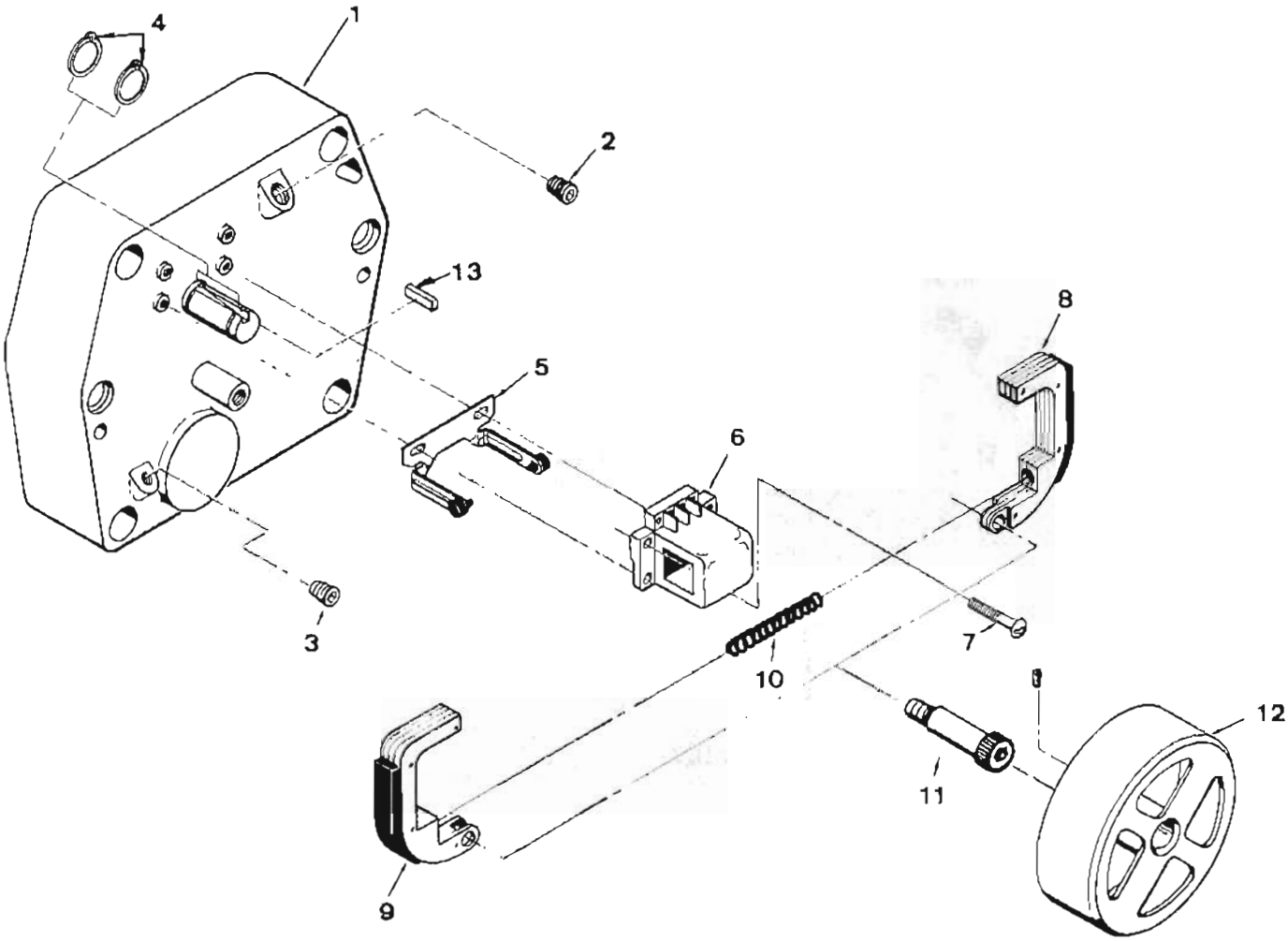


FIGURE 7-5D. TRANSMISSION
(1/8 & 1/4 TON--28, 42 & 56 FPM)

INDEX NO.	PART NAME
1	Suspension Frame (Ref. Index No. 6, Figure 7–1A)
2	Gasket (Ref. Index No. 4, Figure 7–1A)
3	Transmission Cover (Ref. Index No. 5, Figure 7–1A)
4	Bearing With Retainer Ring
5	Pinion
6	Key
7	Bearing
8	Seal
9	Transmission Housing
10	Bearing With Retainer Ring
11	Pinion
12	Gear
13	Retainer Ring

FOR PART NUMBERS SEE FIGURE 7–5D OF CURRENT PARTS LIST.

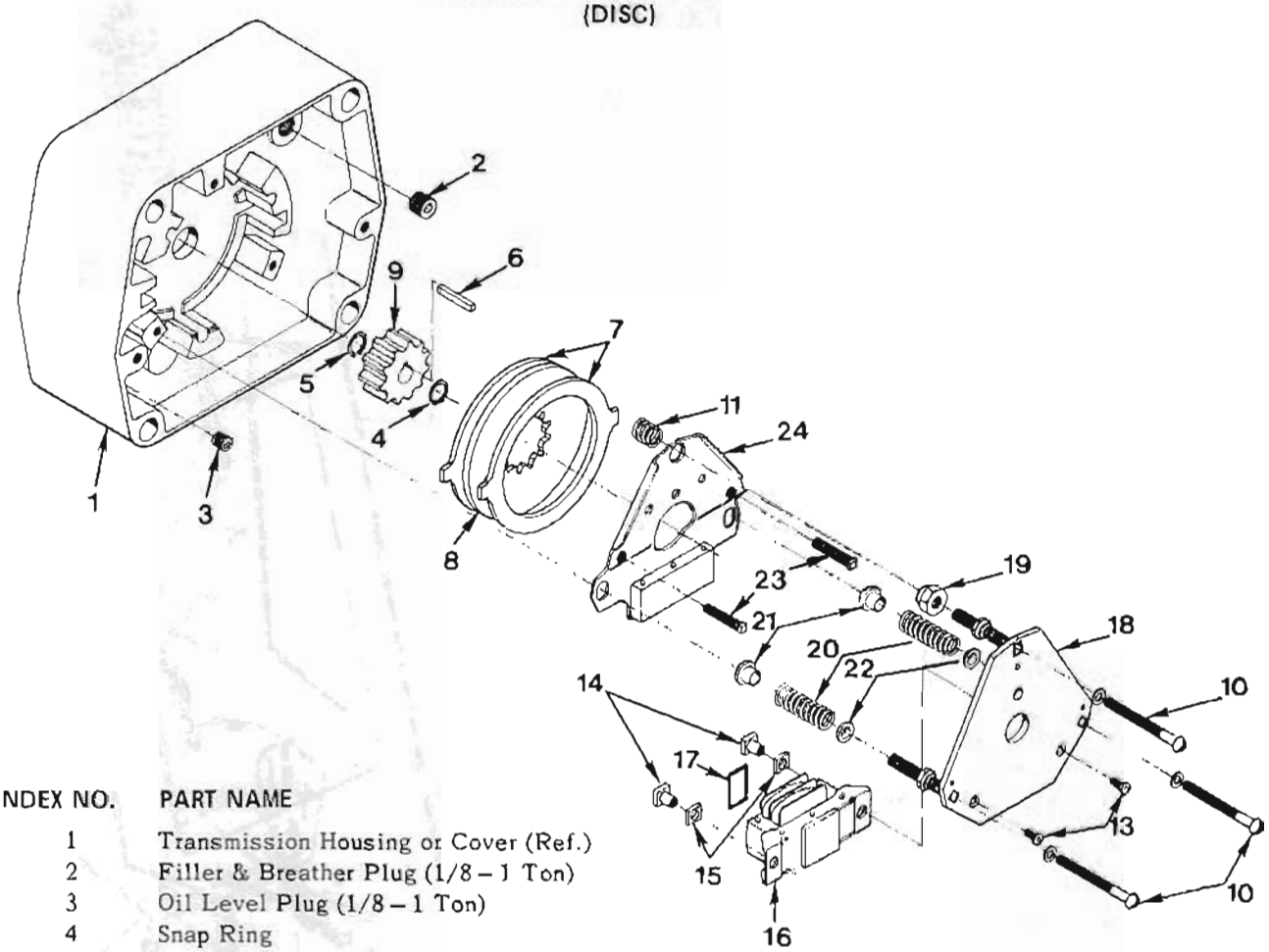
FIGURE 7–6A. MOTOR BRAKE AREA
(DRUM)



INDEX NO.	PART NAME
1	Transmission Housing or Cover (Ref.)
2	Filler & Breather Plug (1/8 – 1 Ton)
3	Oil Level Plug (1/8 – 1 Ton)
4	Snap Ring (2 Ton)
5	Shoe Stop
6	Coil W/Screws
7	Screw
8	Brake Shoe – RH
9	Brake Shoe – LH
10	Spring
11	Mounting Stud
12	Brake Drum W/Set Screw (1/8 – 1 Ton)
13	Key (Square)

FOR PART NUMBERS SEE FIGURE 7–6A OF CURRENT PARTS LIST.

FIGURE 7–6B. MOTOR BRAKE AREA
(DISC)



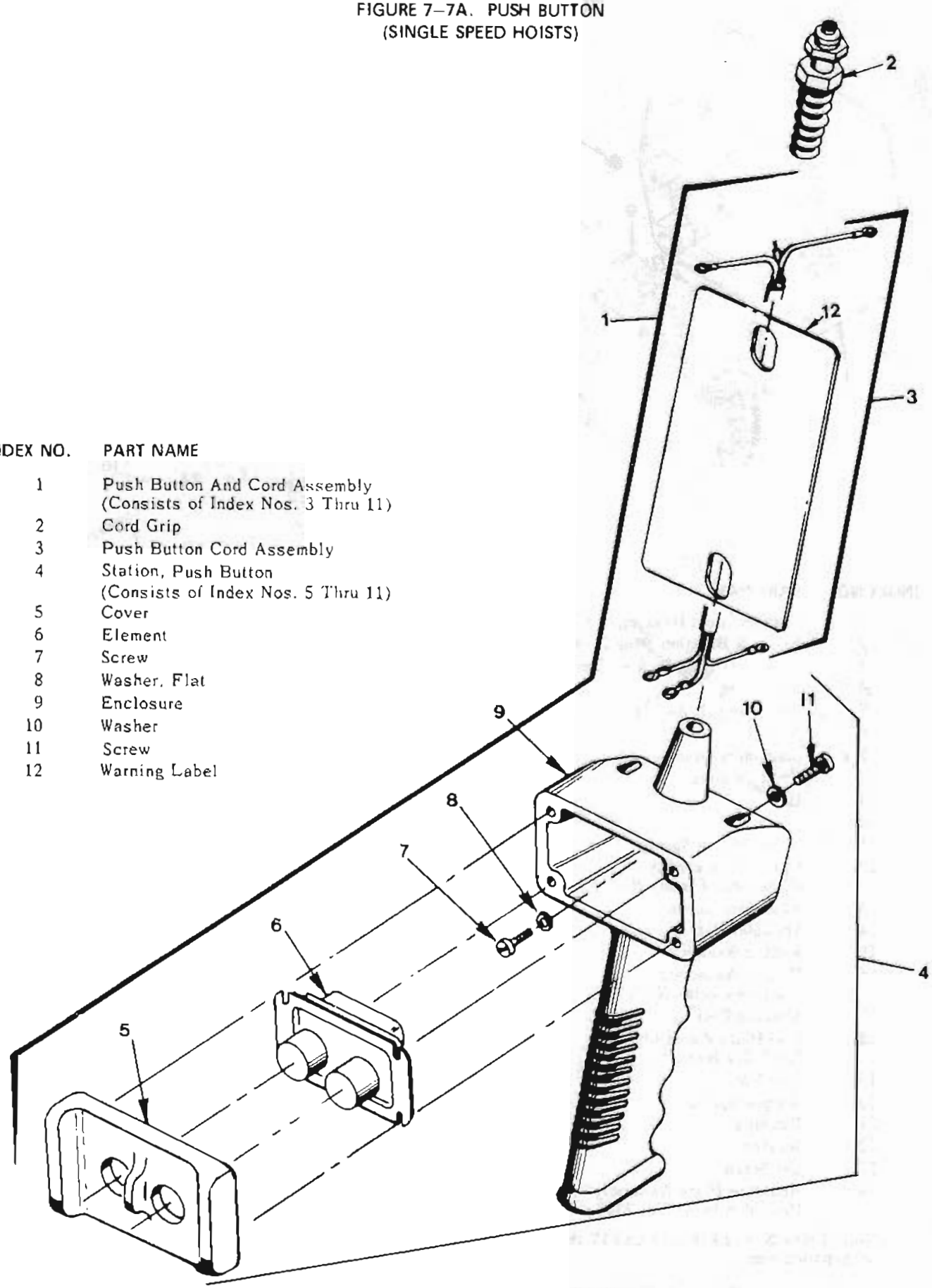
INDEX NO.	PART NAME
1	Transmission Housing or Cover (Ref.)
2	Filler & Breather Plug (1/8 – 1 Ton)
3	Oil Level Plug (1/8 – 1 Ton)
4	Snap Ring
5	Snap Ring (1/8 – 1 Ton)
6	Key
7	Stationary Disc
8	Friction Disc
9	Hub
10	Screw
11	Compression Spring
12	Operator Assembly (Consists of Index Nos. 13 Thru 24)
13	Flat Head Screw
14	Shoulder Nut
15	Rubber Washer
16	Magnet Assembly (Includes Index No. 17)
17	Shading Coil
18	End Plate Assembly (Includes Index No. 19)
19	Jam Nut
20	Torque Spring
21	Bushing
22	Washer
23	Set Screw
24	Armature Plate Assembly (Includes Index No. 23)

Note: Index Nos. 13 thru 15 and 17 thru 24 should be ordered as sub-assemblies. They are not handled as separate items.

FOR PART NUMBERS SEE FIGURE 7–6B OF CURRENT PARTS LIST.

FIGURE 7–7A. PUSH BUTTON
(SINGLE SPEED HOISTS)

INDEX NO.	PART NAME
1	Push Button And Cord Assembly (Consists of Index Nos. 3 Thru 11)
2	Cord Grip
3	Push Button Cord Assembly
4	Station, Push Button (Consists of Index Nos. 5 Thru 11)
5	Cover
6	Element
7	Screw
8	Washer, Flat
9	Enclosure
10	Washer
11	Screw
12	Warning Label

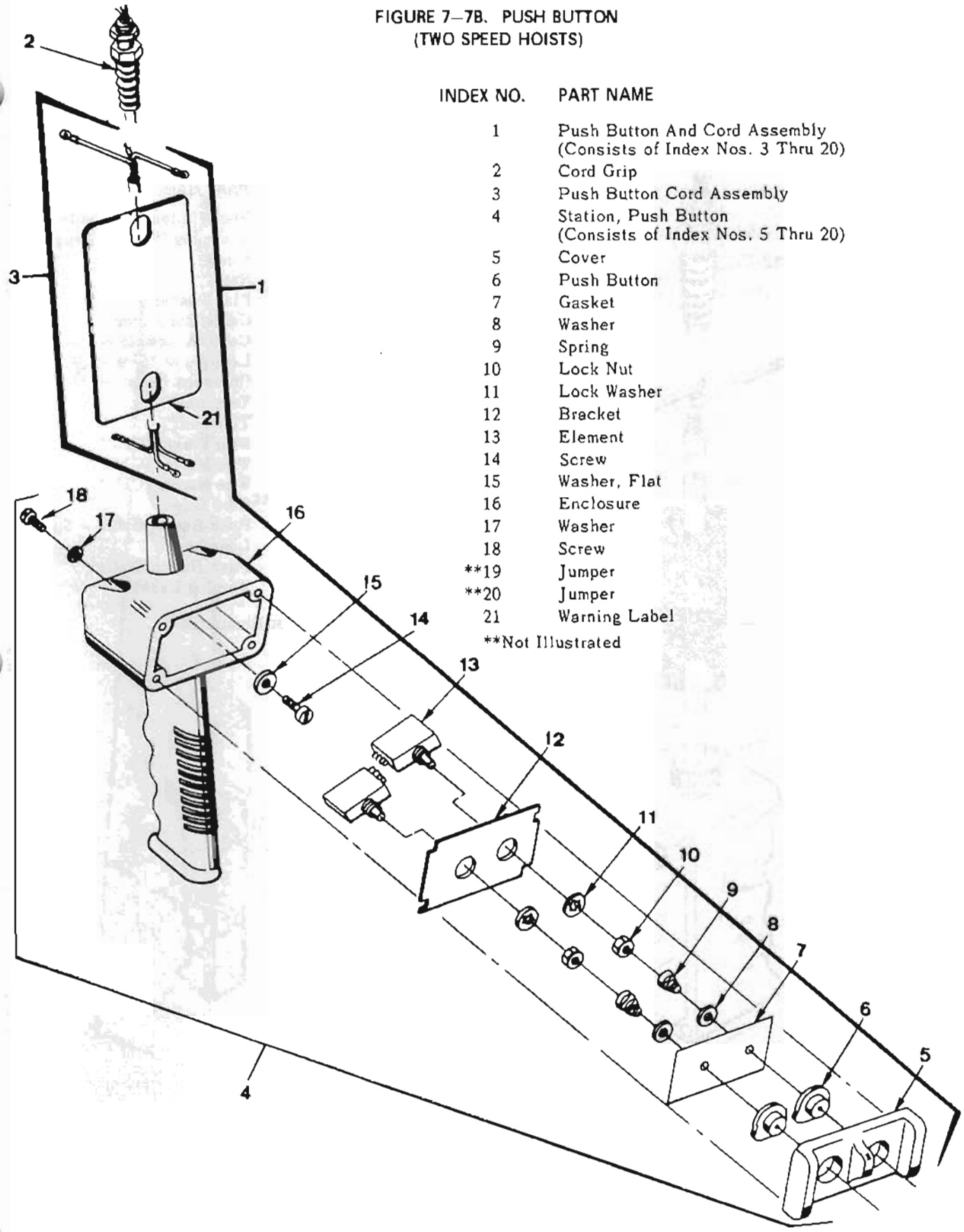


FOR PART NUMBERS SEE FIGURE 7–7A OF CURRENT PARTS LIST.

FIGURE 7–7B. PUSH BUTTON
(TWO SPEED HOISTS)

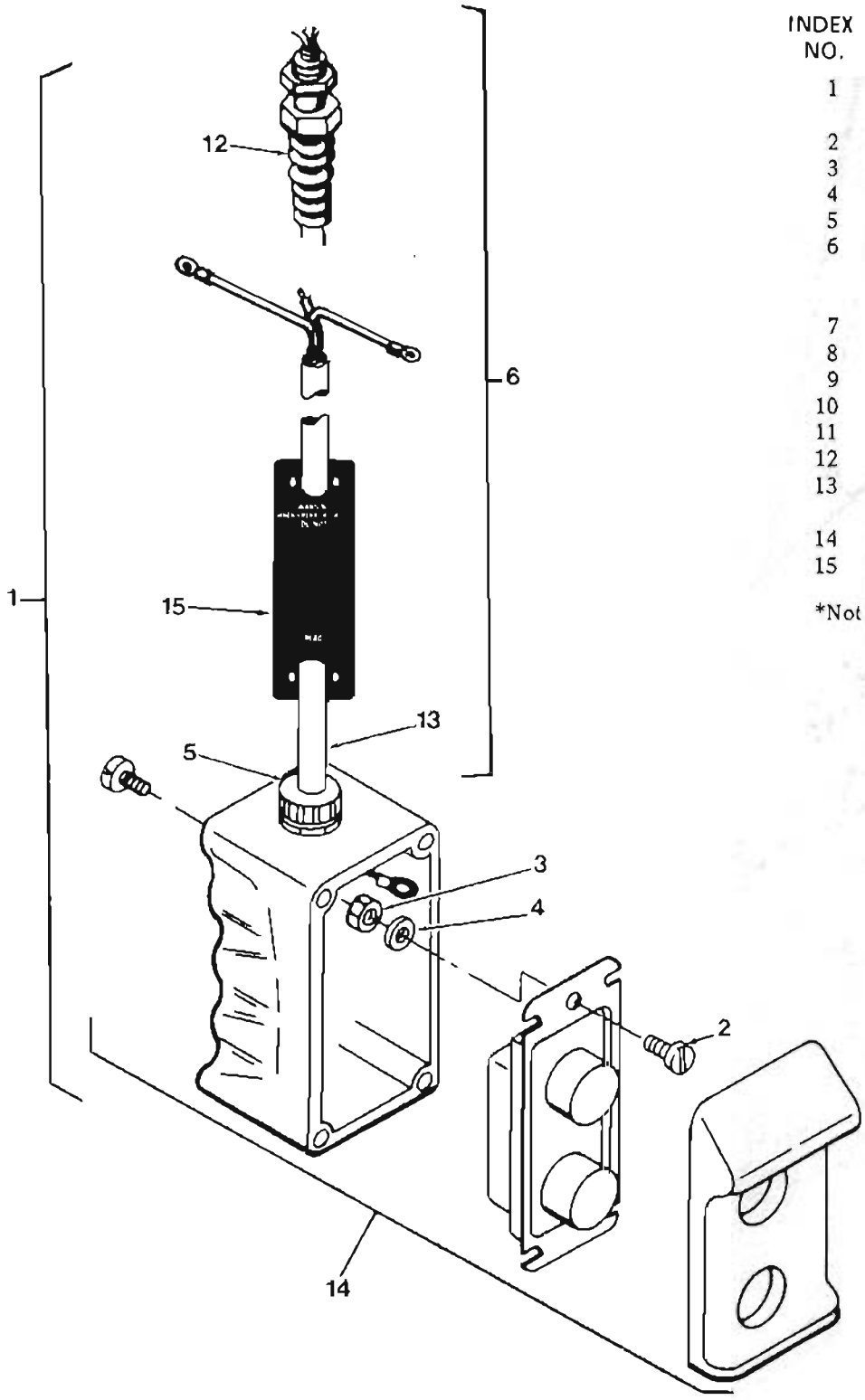
INDEX NO.	PART NAME
1	Push Button And Cord Assembly (Consists of Index Nos. 3 Thru 20)
2	Cord Grip
3	Push Button Cord Assembly
4	Station, Push Button (Consists of Index Nos. 5 Thru 20)
5	Cover
6	Push Button
7	Gasket
8	Washer
9	Spring
10	Lock Nut
11	Lock Washer
12	Bracket
13	Element
14	Screw
15	Washer, Flat
16	Enclosure
17	Washer
18	Screw
**19	Jumper
**20	Jumper
21	Warning Label

**Not Illustrated



FOR PART NUMBERS SEE FIGURE 7–7B OF CURRENT PARTS LIST.

FIGURE 7–7C. PUSH BUTTON
(SINGLE SPEED HOISTS)
(SQUARE D TYPE)

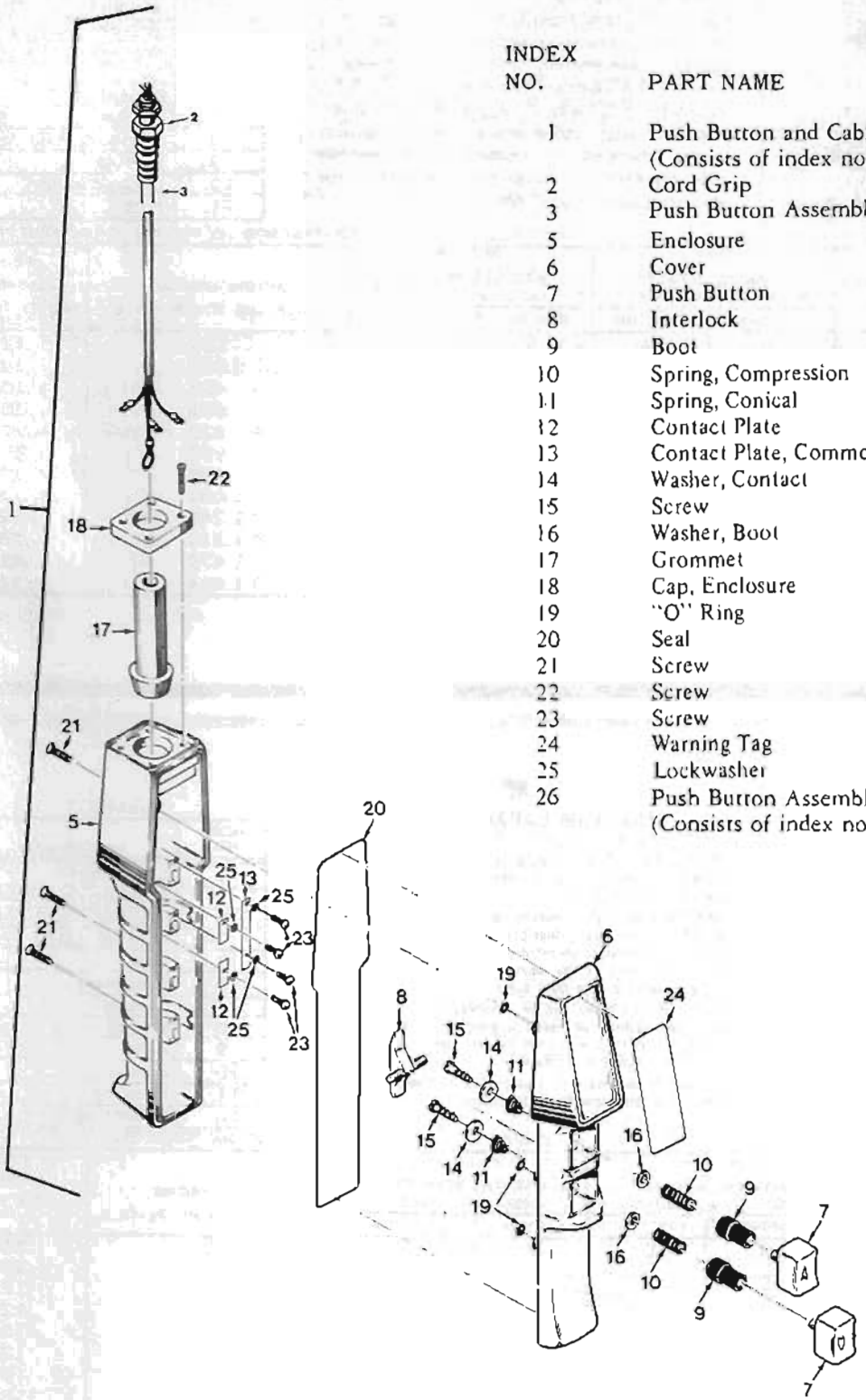


INDEX NO.	PART NAME
1	Push Button And Cable Assembly (Specify Length)
2	Screw
3	Nut
4	Flat Washer
5	Cable Connector
6	Cable Assembly – Standard Lengths of 15' and 20' (Includes items 7–13)
7	Terminal*
8	Terminal*
9	Wire Marker (C20)*
10	Wire Marker (C21)*
11	Wire Marker (C11)*
12	Cord Grip
13	Push Button Cable – Special Lengths
14	Push Button Station
15	Warning Label

*Not Illustrated

FOR PART NUMBERS SEE FIGURE 7–7C OF CURRENT PARTS LIST.

FIGURE 7—7D. PUSH BUTTON (SINGLE SPEED HOISTS)



INDEX NO.	PART NAME
1	Push Button and Cable Assembly (Consists of index nos. 2 thru 25)
2	Cord Grip
3	Push Button Assembly
5	Enclosure
6	Cover
7	Push Button
8	Interlock
9	Boot
10	Spring, Compression
11	Spring, Conical
12	Contact Plate
13	Contact Plate, Common
14	Washer, Contact
15	Screw
16	Washer, Boot
17	Grommet
18	Cap, Enclosure
19	"O" Ring
20	Seal
21	Screw
22	Screw
23	Screw
24	Warning Tag
25	Lockwasher
26	Push Button Assembly (Consists of index nos 5 thru 25)

FOR PART NUMBERS SEE FIGURE 7-7D OF CURRENT PARTS LIST

TROLLEYS

A

MAXIMUM CAPACITY 1 TON

FIGURE 8A
WRT TROLLEY

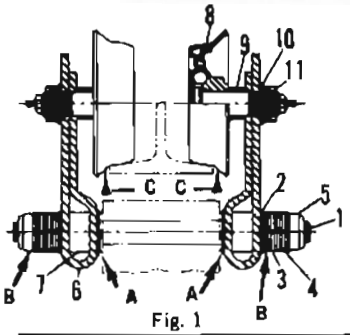


Fig. 1

These trolleys can be mounted on standard "I" beams from 6 to 18 inches. This is accomplished by properly locating the spacer washers as shown in Figures 1 and 2. The normal placement of washers is given in Charts 2, 4 and 6. "I" beam manufacturing tolerances may require slight changes to recommended washer distribution. See Charts 1, 3 and 5 for identification of part names.

CHART 1

INDEX NO.	PART NAME *
1	Load Pin
2	Washer (⅛" Thick)
3	Washer (.135 THK)
4	Washer (.075 THK)
5	Nut
6	Sideplate
7	Sleeve
8	Wheel & Axle Assy.
9	Spacer
10	Lock Washer
11	Nut

*FOR PART NOS. SEE FIGURE 8A OF CURRENT PARTS LIST.

CHART 2

I BEAM SIZE & WT.*	FLANGE WIDTH	POINT A WASHERS BETWEEN SUSP. LUG & SIDEPLATE		POINT B WASHERS BETWEEN SIDEPLATE & NUT		ACTUAL SPACING SUSP. LUG TO SIDEPLATE	POINT C CLEARANCE WHEEL TO BEAM
		.135 THK	.075 THK	.135 THK	.075 THK		
6" - 12.5	3.330	0	2	7	7	.150	.122
6" - 17.25	3.565	2	0	5	9	.269	.124
8" - 18.4	4.000	2	3	5	6	.493	.130
8" - 23.0	4.171	1	6	6	3	.582	.133
10" - 25.4	4.660	5	2	2	7	.822	.129
10" - 35.0	4.944	6	2	1	7	.956	.121
12" - 31.8	5.000	4	6	3	3	.986	.123
12" - 35.0	5.078	6	3	1	6	1.031	.129
15" - 42.9	5.500	7	4	0	5	1.240	.127
15" - 50.0	5.640	7	5	0	4	1.316	.133
18" - 54.7	6.000	6	9	1	0	1.479	.116
18" - 70.0	6.251	7	9	0	0	1.614	.125

*American Standard I Beam size

B

MAXIMUM CAPACITY 1 TON

FIGURE 8B
WRPT TROLLEY

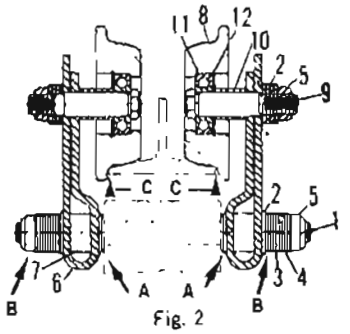


Fig. 2

MAINTENANCE Trolley should be inspected periodically for evidence of excess wear or overload. Parts should be replaced as required.

LUBRICATION: WRPT Trolley wheels are equipped with sealed lifetime lubricated precision ball bearings which should not require relubrication for the normal service of the trolley. WRT Trolley wheels should be lubricated with a high quality grease once a month for normal service.

NOTE: These trolleys can be mounted on radius as small as 5 feet. Slightly increased spacing is required when the trolley is mounted on curved beams. The radius will determine the amount of increase.

It may be necessary to change the number of adjusting washers to suit specific installations.

CHART 3

INDEX NO.	PART NAME *
1	Load Pin
2	Washer (⅛" Thick)
3	Washer (.135 THK)
4	Washer (.075 THK)
5	Nut
6	Sideplate
7	Sleeve
8	Wheel
9	Axle
10	Spacer
11	Bearing
12	Retaining Ring

*FOR PART NOS. SEE FIGURE 8B OF CURRENT PARTS LIST.

CHART 4

I BEAM SIZE & WT.*	FLANGE WIDTH	POINT A WASHERS BETWEEN SUSP. LUG & SIDEPLATE		POINT B WASHERS BETWEEN SIDEPLATE & NUT		ACTUAL SPACING SUSP. LUG TO SIDEPLATE	POINT C CLEARANCE WHEEL TO BEAM
		.135 THK	.075 THK	.135 THK	.075 THK		
6" - 12.5	3.330	0	0	7	9	0	.113
6" - 17.25	3.565	1	0	6	9	.135	.130
8" - 18.4	4.000	2	1	5	8	.344	.122
8" - 23.0	4.171	1	4	6	5	.433	.126
10" - 25.4	4.660	4	2	3	7	.688	.136
10" - 35.0	4.944	5	2	2	7	.822	.128
12" - 31.8	5.000	3	6	4	3	.852	.130
12" - 35.0	5.078	5	3	2	6	.897	.136
15" - 42.9	5.500	6	4	1	5	1.106	.134
15" - 50.0	5.640	6	5	1	4	1.181	.139
18" - 54.7	6.000	5	9	2	0	1.345	.123
18" - 70.0	6.251	6	9	1	0	1.480	.132

*American Standard I Beam size

FIGURE 8C
WRPT TROLLEY

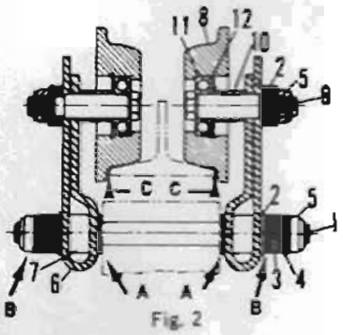


Fig. 2

C

MAXIMUM CAPACITY 2 TON

MAINTENANCE. Trolley should be inspected periodically for evidence of excess wear or overload. Parts should be replaced as required.

LUBRICATION: WRPT Trolley wheels are equipped with sealed lifetime lubricated precision ball bearings which should not require relubrication for the normal service of the trolley. WRT Trolley wheels should be lubricated with a high quality grease once a month for normal service.

NOTE: These trolleys can be mounted on radius as small as 5 feet. Slightly increased spacing is required when the trolley is mounted on curved beams. The radius will determine the amount of increase.

It may be necessary to change the number of adjusting washers to suit specific installations.

CHART 5

INDEX NO.	PART NAME *
1	Load Pin
2	Washer (⅛" Thick)
3	Washer (.135 THK)
4	Washer (.075 THK)
5	Nut
6	Sideplate
7	Sleeve
8	Wheel
9	Axle
10	Spacer
11	Bearing
12	Retaining Ring

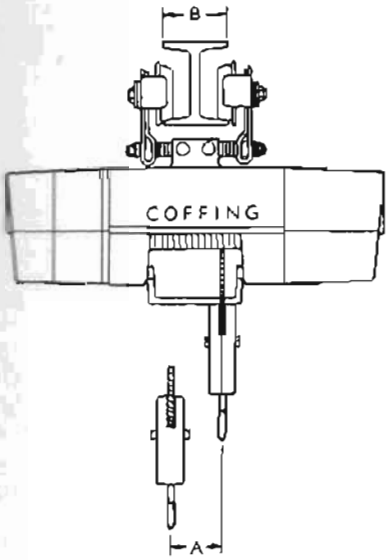
*FOR PART NOS. SEE FIGURE 88 OF CURRENT PARTS LIST.

CHART 6

I BEAM SIZE & WT.*	FLANGE WIDTH	POINT A WASHERS BETWEEN SUSP. LUG & SIDEPLATE		POINT B WASHERS BETWEEN SIDEPLATE & NUT		ACTUAL SPACING SUSP. LUG TO SIDEPLATE	POINT C CLEARANCE WHEEL TO BEAM
		.135 THK	.075 THK	.135 THK	.075 THK		
8" - 18.4	4.000	2	1	5	8	.344	.122
8" - 23.0	4.171	1	4	6	5	.433	.126
10" - 25.4	4.660	4	2	3	7	.688	.136
10" - 35.0	4.944	5	2	2	7	.822	.128
12" - 31.8	5.000	3	6	4	3	.852	.130
12" - 35.0	5.078	5	3	2	6	.897	.136
15" - 42.9	5.500	6	4	1	5	1.106	.134
15" - 50.0	5.640	6	5	1	4	1.181	.139
18" - 54.7	6.000	5	9	2	0	1.345	.123
18" - 70.0	6.251	6	9	1	0	1.480	.132

*American Standard I Beam size

FIGURE 8D. RIGHT ANGLE SUSPENSION



Hoist Capacity (Tons)	Standard Lift (Ft.)	Over-wrap (Ft.)	A Side to Side Travel of Load Block	B Minimum Flange Width (Inches)
⅛ and ¼	15	25	3¼"	4.660
½ and 1	15	25	3¼"	4.660
2	20	35	4½"	5.500

Care is to be taken to insure maximum stability when mounting the wire rope hoist at right angle to a beam. The load block travels from side to side, as shown at "A" left, as the wire rope pays off or is taken up by the drum. At no time should the load point be outside the suspension point of the trolley wheel either left or right. All mountings are to be on I beams in good condition, properly supported, and hanging absolutely plumb. Side pull should be avoided where possible.