



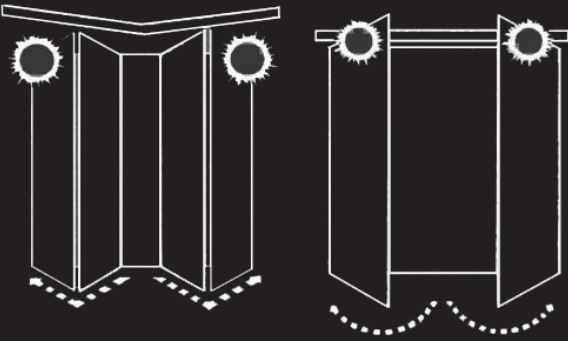
C R O W N
I N D U S T R I A L
O P E R A T O R S

Read
This
FIRST

**GENERAL
INSTALLATION,
OPERATION,
MAINTENANCE,
and PARTS MANUAL
for your**

Aut-o-door

**1500 SLIDE-FOLD-
1501 SWING-
DOOR OPERATORS
Model "F"
HEAVY DUTY & EXTRA HEAVY DUTY**



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Note: We reserve the right to modify or change, without prior notice, any statements or information contained herein. If exact dimensions or specifications are required by the customer certified prints will be furnished without charge upon request to Crown Industrial. This manual covers standard catalogued operators only and does not cover special non-standard equipment.

1. GENERAL INTRODUCTION

A. PURPOSE: This Crown Installation, Operation, Maintenance and Parts Manual has been developed to assist you in the installation, operation and maintenance of your electric operator and thus enable you to utilize it to its maximum efficiency.

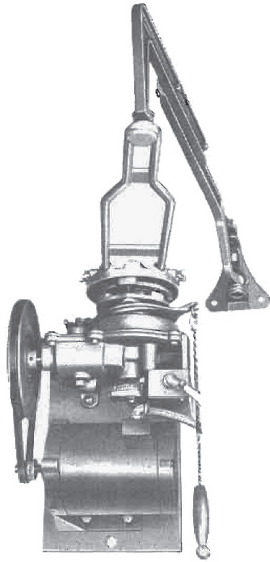


Figure 1. 1500 Standard Duty Slide-Fold Door Operator

B. MODELS COVERED: The manual covers current models 1500 & 1501 Operators in production and contains the latest information available. The part pages have been prepared so that you can easily determine the parts contained in your electric operator.

C. APPLICATION: No. 1500 and 1501 electric door operators are not intended for use on openings less than 7'-0" in height. They are further not intended for use on doors less than 8'-6" in height, unless they have been provided with a weather cover.

D. DESCRIPTION:

(1) **GENERAL.** The standard duty electric operator is built into a compact unit consisting of an instantly reversing motor, a precision made speed reduction mechanism with V-belt and pulleys, safety friction disc clutch, an emergency release, a fully automatic double acting limit switch, and a heavy duty crank and

connecting arm assembly. (Figure 1 and 2). The Extra Heavy Duty Operator is similar but without V-belt and pulleys.

(2) **MOTORS.** The motor has ample reserve power to take occasional overloads and is furnished in 1/2 and

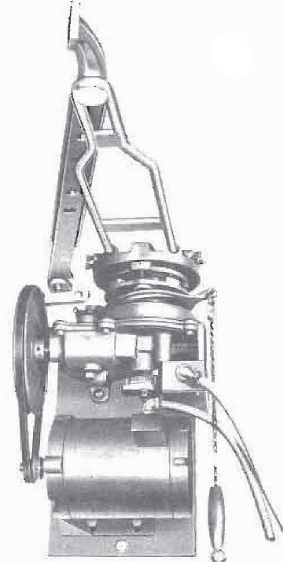


Figure 2. 1501 Standard Duty Swing Door Operator

1 HP sizes for standard doors, and a 1HP (gearhead motor) four extra large and heavy doors. Motors are available in single phase current. However, three-phase current is highly recommended for best all around performance.

(3) **SHAFTS AND GEARS.** Shafts and gears in the standard units are mounted in long life bearings enclosed in a oil tight housing and operate at all times in a bath of grease (extra heavy-duty units are oil filled). The automatic limit switch is built on the reduction unit and stops the door in the desired open or closed position.

(4) **CRANK AND CONNECTING ARMS.** The operating levers consist of a heavy-duty crank and connecting arm. The crank arm is driven by a safety friction disc clutch which protects equipment in case the door comes in contact with an obstruction. A disconnecting device is provided to allow manual operation.

2. INSTALLATION AND OPERATION

A. GENERAL

(1) The Crown Industrial 1500 and 1501 Electric Door Operators are well designed, rugged machines which had been field proven for dependable, trouble-free operation of slide-fold and swing doors. To ensure correct installation and proper operation, follow the instructions listed below:

(2) **SHIPMENT CHECK:** To ensure that all equipment is complete, check the components received with the material specifications sheets included with the installation packet supplied with the door.

(3) REVIEW THE INSTALLATION DRAWINGS: The installation drawings show the layout of the door or doors, template drilling for the door and wall, and general terms used to describe components. Review of the drawings will familiarize you with the equipment.

(4) CHECK THE DOORS:

(a) SLIDE-FOLD TYPE: After installation of the doors and slide-fold track (See Figure 5) and before starting operator installation, inspect to ensure that the doors are in good working condition, are rigidly supported, and have no obstruction to block or retard their slide and fold. Latches, foot bolts, or other devices should be removed from the door to prevent their accidental engagement. When standing in a position facing the closed door and the door slides and folds towards you and to the left to open, the door is considered left-hand. If the door slides and folds towards you and to the right to open, the door is considered right hand. (Figure 3.)

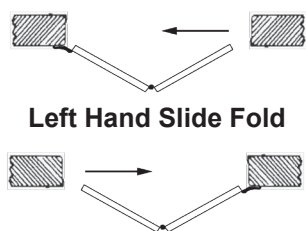


Figure 3. Slide-Fold Door

(b) SWING TYPE: Before starting to install the operators see that the doors are properly hung. 95% of all door operator trouble is caused by the doors not swinging properly. The doors should swing free of the floor and lintel. It is also very important that all hinge pins be properly aligned. When standing in a position facing the closed door and the door swings towards you to open, if the door has its hinge pins to the left, it is considered left-hand. When the door has its hinge pins on the right and opens towards you, it is considered right hand. (Figure 4).

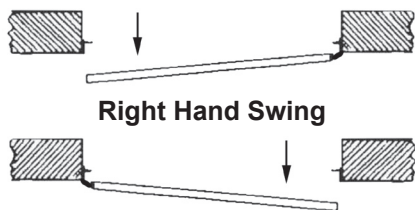


Figure 4. Swing Door

(4) PREPARING THE DOOR AND LINTEL: Drill the door to receive the operator and drill the lintel to receive the jamb bracket following the drilling template dimensions given for the particular installation. (See Figures 5 or 6, or the drawing for your particular installation.

B. MOUNTING THE OPERATOR:

Remove the electric operator from the crate. The door operators are universal and therefore can be used on either hand door. This applies only to standard units. Raise the operator into position on the door and insert the proper fasteners.

NOTE: Extra Heavy Duty units are handed.

C. MOUNTING THE ARMS:

(a) Release the arm late by pulling down on the clutch release chain located on the side of the operator. To keep the arm plate disengaged, insert a wedge of some sort between the clutch yoke the chain is connected to and the bottom of the clutch. Check to see if the arm is free to rotate. (Figure 8)

(b) Mount the crank arm in place by inserting the rod ends into the two holes at the edge of the arm plate on top of the operator. Be sure the pivot stud at the end of the arm is pointing up. By sliding the arm into or out of the arm plate holes, you can adjust the distance between the center point of the arm plate to the pivot stud as shown in figure 5 or 6, or the drawing for your particular installation. Tighten the two set screws securely on each side of the arm plate to secure the crank arm in the arm plate.

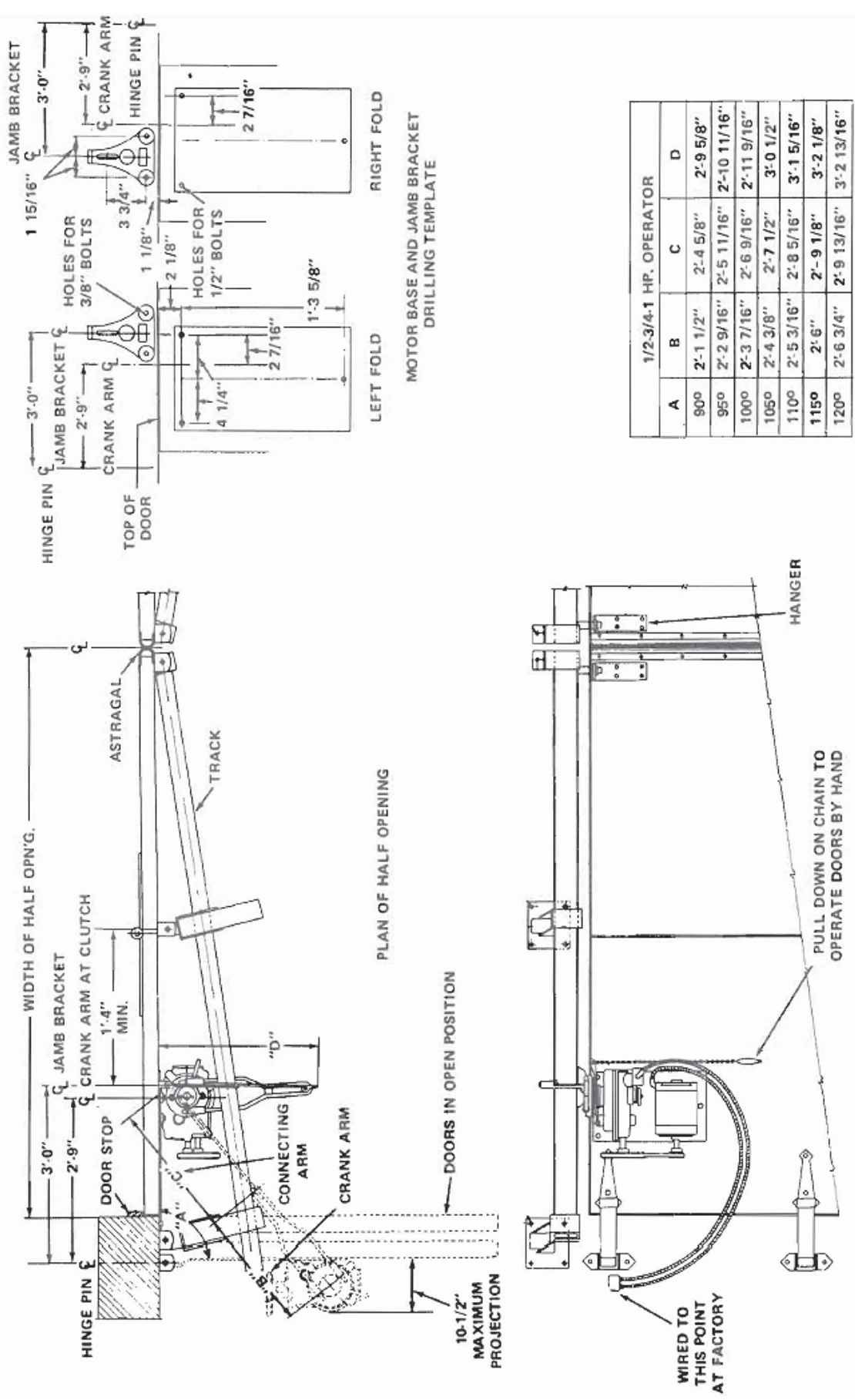
(c) The door at this point should be open to its full open position. Rotate the crank arm until it assumes the position shown by the dotted lines in figure 5 or 6.

(d) Remove the not and washer from the crank arm pivot stud and mount the end of the connecting arm with the 25/32" diameter hole in it to the crank arm. For swing door operators, this is the hooked end and which should fall on the side of the crank arm away from the door pivot.

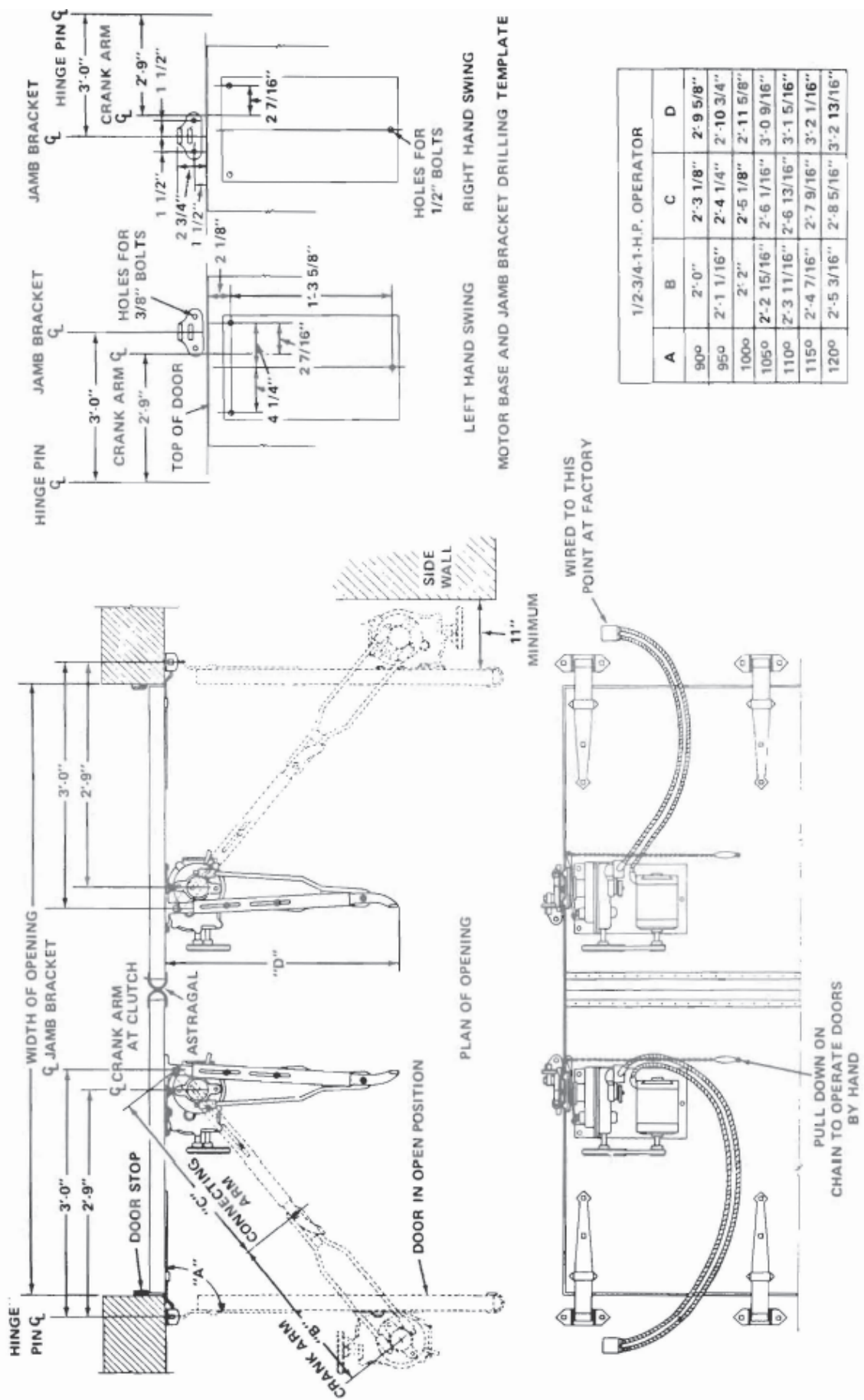
(e) With the door still in the open position, adjust the connecting arm and then attach the jamb bracket end to the lintel above the door. With this accomplished, the adjustment bolts or nut on the connecting arm should be tightened.

(f) The door should then be closed by manually breaking the dead center condition of the crank arm and connecting arm away from the door pivot and then manually close the door.

WARNING: On swing or slide-fold door installation, DO NOT attempt to close the door with the operator arms after breaking their dead center position. Hands can be pinched between the crank and connecting arms as the door reaches the closed position.



ELEVATION OF HALF OPENING
 Figure 5. Installation for 1500 Slide-Fold Door Operator - 1/2 HP & 1 HP



1/2-3/4-1-H.P. OPERATOR			
A	B	C	D
90°	2'-0"	2'-3 1/8"	2'-9 5/8"
95°	2'-1 1/16"	2'-4 1/4"	2'-10 3/4"
100°	2'-2"	2'-5 1/8"	2'-11 5/8"
105°	2'-2 15/16"	2'-6 1/16"	3'-0 9/16"
110°	2'-3 11/16"	2'-6 13/16"	3'-1 5/16"
115°	2'-4 7/16"	2'-7 9/16"	3'-2 1/16"
120°	2'-5 3/16"	2'-8 5/16"	3'-2 13/16"

ELEVATION OF OPENING
Figure 6. Installation for 1501 Swing Door - 1/2 HP & 1 HP

(g) When the door is fully closed, arms should assume the position shown by the solid line in Figure 5 or 6. If the arms reach a locking position before the door is closed, a re-adjustment of the arms is required.

D. WIRING OPERATOR

(1) No. 1500 and 1501 Electric Door Operators are intended for application to motor branch circuits with voltage and current characteristics to meet operator ratings. Branch circuit, branch circuit disconnecting means and branch circuit overcurrent protection are to be proper sized in respect to the operator horsepower rating.

(2) Wire the operator power and control circuits as shown on the wiring diagram provided in the operator packing list envelope. **BEING SURE ALL POWER IS OFF.**

WARNING: Ensure operator branch circuit is disconnected from power source when installing, adjusting, or servicing operator.

E. PHASING OUT MOTORS

(1) Remove the retaining ring from the arm plate and lift the arm plate from the operator. Remove the edge from the clutch.

(2) **THREE PHASE:** Turn power on. Using the left side reversing contactor for counter-clockwise rotation, and the right side contactor for clockwise rotation, press one of the control buttons. Note the direction the top of the operator is rotating. On pair operation, operators should be tested separately. If the top is rotating counter-clockwise, then the left side contactor coil should be energized. If the wrong coil happens to be energized, for the counter-clockwise direction, exchange any two power leads.

(3) **SINGLE PHASE:** The operator and reversing starter are factory prepared for proper rotation.

(4) Check both directions several times to ensure proper phasing of motors. In case the motor continues to run at end of travel and the limit switch does not stop rotation, check the limit switch function and review the proper control circuit wiring.

F. ADAPTING CONTROLS

(1) Using the left side contractor for counter-clockwise rotation of the top of the operator, determine if this rotation will open or close the door. Wire the corresponding open or close

signal to control the left side contactor. On pair operated doors, one operator is to be wired as described and the second operator is wired using the opposite reversing starter coils, i.e. if left contactor coil opens the right hand door, the right contactor coil will open the left hand door.

G. PRELIMINARY LIMIT SWITCH ADJUSTMENT

(1) Loosen the four clutch tension bolts and then drop the arm plate back into place on the clutch. Do not replace any other items at this time.

(2) To adjust the limit switch, (Figure 7), manually open the door to within 6 inches of its fully open position, at the same time allowing the clutch to slip. At this point, determine which snap action switch would shut the operator off. Pull outward on the cam in line with that switch and rotate it toward the switch and over it just far enough to shut operator off. Cam must be rotated in the same direction as the crank arm is rotated to open door. The cam should also be re-engaged with the center pinion at this point.

(3) Manually close the door to within 6 inches of its fully closed position. Pull outward on the other cam and rotate it toward and slightly over the other snap action switch. Cam must be rotated in the same direction as the crank arm is rotated to close door and must be re-engaged with the center pinion.

H. SETTING THE CLUTCH (Figure 8)

(1) Remove the arm plate and tighten down the four clutch tension bolts evenly (see Figure 8) until the friction is sufficient enough to operate the door. Never tighten the bolts so that the clutch cannot be slipped by forcing the end of the crank arm, and never adjust bolts consecutively, but always directly across from each other so as to provide even tension. An equal turn of each bolt is a very important adjustment procedure.

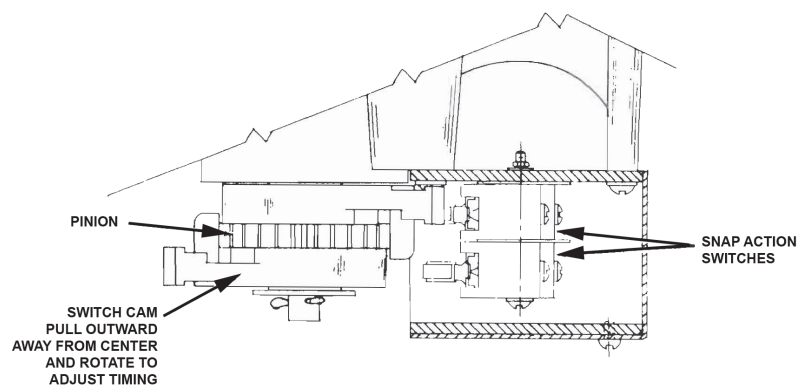


Figure 7. Adjusting Limit Switch

WARNING!! Some electrical door operator control circuits can cause immediate door operation upon applying power. Ensure that the path of the door and operating arms are free from obstructions and personnel.

(2) Replace arm plate being sure the clutch pins are engaged and electrically start door moving until it is half way between open and close position. Cut the power at this point.

(3) If the door can be moved manually from this halfway point, re-adjust the clutch accordingly.

(4) After the clutch is adjusted to suit, replaced the retaining ring.

I. FINAL LIMT SWITCH ADJUSTMENT

(1) With power on, open the door until it stops under its own power. If it stopped short, electrically start door closing and cut power. Pull outward on the opening cycle switch cam and rotate away from the opening cycle snap action switch very slightly and re-engage with center pinion. Turn power on.

(2) Close the door until it stops under its own power. If it stopped short, electrically start door open and cut power. Pull outward on the closing cycle switch cam and rotate away from the closing cycle snap action switch very slightly and re-engage with center pinion. Turn Power On.

(3) Continue cycling the door and make cam adjustments until the door stops in the proper location.

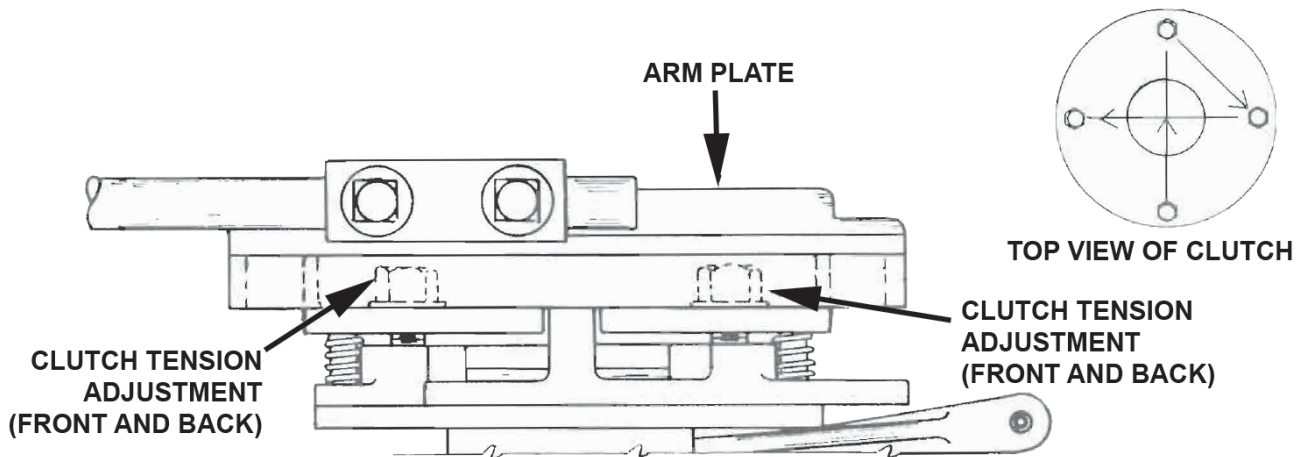


Figure 8. Adjusting Clutch

3. MAINTENANCE

A. GENERAL

To ensure that the electric operator is ready for operation at all times, it must be inspected systematically which will preclude serious damage or failure. Proper adjustment and lubrication must be maintained and checked as recommended below.

WARNING: Ensure operator branch circuit is disconnected from power source when adjusting or servicing operator.

B. LUBRICATION

(1) Lubrication intervals. Lubrication intervals are listed below:

EVERY 6 MONTHS

1. Lubricate pivot points with SAE 10 Oil.
2. Check oil seals for leakage.
3. A) Check grease level {Standard Duty Gear Unit Only}
B) Check oil level {Extra Heavy Duty Gear Unity Only}

EVERY 12 MONTHS

1. Clean limit switch cam and pinion gear and lubricate with SAE 10 oil.
2. Drain gear case and fill with grease - Lubriplate Gease 630-AAA or equal.

3. For EXTRA Heavy Duty Units (1 HP) fill with Mobil SHC 634 Synthetic Lubricant as required.

CAUTION: Do Not Overfill. Do Not Use Machine Oil.

FOR COLD CLIMATE

EVERY FALL - Remove arm plate from operator. Start operator and add 1/2 cup of kerosene to gear case to thin out grease for cold temperature operation. Stop operator and replace arm plate. **STANDARD UNITS ONLY.**

EVERY SPRING - If kerosene was added to teh gear case in the fall as outlined above, the grease must be removed form the gear case and replaced with Lubriplate Grease 630-AAA or equil.

C. PREVENTATIVE MAINTENANCE

To prevent damage or improper operation, the following inspections should be made at least EVERY 6 MONTHS.

1. Check pivot points for wear.
2. Inspect drive belt for wear. (Standard Units Only).
3. Inspect clutch discs for wear.
4. Check clutch for correct tension.
5. Check limit switch cams and pinion for wear.
6. See that all bolts are tight.

4. PARTS

A. TO ORDER REPLACEMENT PARTS

Order all replacement parts using the numbers shown on the following parts list pages.

(1) SEND IN SERIAL NUMBER OF ELECTRIC OPERATOR.

(2) SPECIFY the number of pieces needed.

(3) Order by part number and name of part.

B. PARTS LIST

The following pages list the replacment parts illustrated in Figure 9.

PARTS LIST - 1/2 HP & 1HP 1500 & 1501 OPERATOR

FIGURE NO.	PART NUMBER	DESCRIPTION
9	226-7	Washer
9	440-34	Switch Insulator (2 per Operator)
9	400-95	Snap Action Switch (2 per Operator)
9	1200	Motor per Specification
9	1200-25	Motor Mounting Bracket
9	1251-11	Motor Pulley
9	1300-57	Clutch Collar Key
9	1300-64	Clutch Shaft Bushing
9	1300-180	Handle
9	1500-7	Gear
9	1500-8	Pinion Gear
9	1500-9	Worm Gear
9	1500-10	Clutch Shaft
9	1500-13	Pinion Shaft
9	1500-14	Thrust Bearing (2 per Operator)
9	1500-25	Clutch Shaft Collar
9	1500-26	Clutch Pin (2 per Operator)
9	1500-27	Compression Spring (2 per Operator)
9	1500-28	Pin Shift Collar
9	1500-29	Top Clutch Plate
9	1500-32	Retaining Disc
9	1500-33	Clutch Disc (2 per Operator)
9	1500-34	Bearing (4 per Operator)
9	1500-45	Bearing
9	1500-46	Bearing
9	1500-47	Gasket
9	1500-92	Arm Plate
9	1500-98	Worm Shaft Key
9	1500-99	Clutch Shaft Key
9	1500-114	Clutch Shaft Oil Seal (2 per Operator)
9	1500-115	Worm Shaft Oil Seal
9	1500-116	Worm
9	1500-124	Pinion Shaft Key
9	1500-251	Upper Gear Housing
9	1500-252	Lower Gear Housing
9	1500-255	Release Yoke
9	1500-256	Clutch Bolt
9	1500-257	Bottom Clutch Plate
9	1500-258	Worm Shaft
9	1500-259	Switch Throw Pinion
9	1500-260	Switch Cam (2 per Operator)
9	1500-261	Switch Cam Spring (2 per Operator)
9	1500-262	Closed End Eyelet (2 per Operator)
9	1500-263	Switch Frame
9	1500-264	Switch Cover
9	1500-265	5" PD Pulley (Standard Speed)
9	1500-266	8.7" PD Pulley (Low Speed)
9	1500-384A	Clutch Assembly (Consisting of Parts: 25, 26, 27, 28, 29, 32, 33, 92 & 257)
9	1500-478	Base Plate
9	1M028	28" 4L V Belt (Used with 5" PD Pulley)
9	1M035	35" 4L V Belt (Used with 8.7" PD Pulley)

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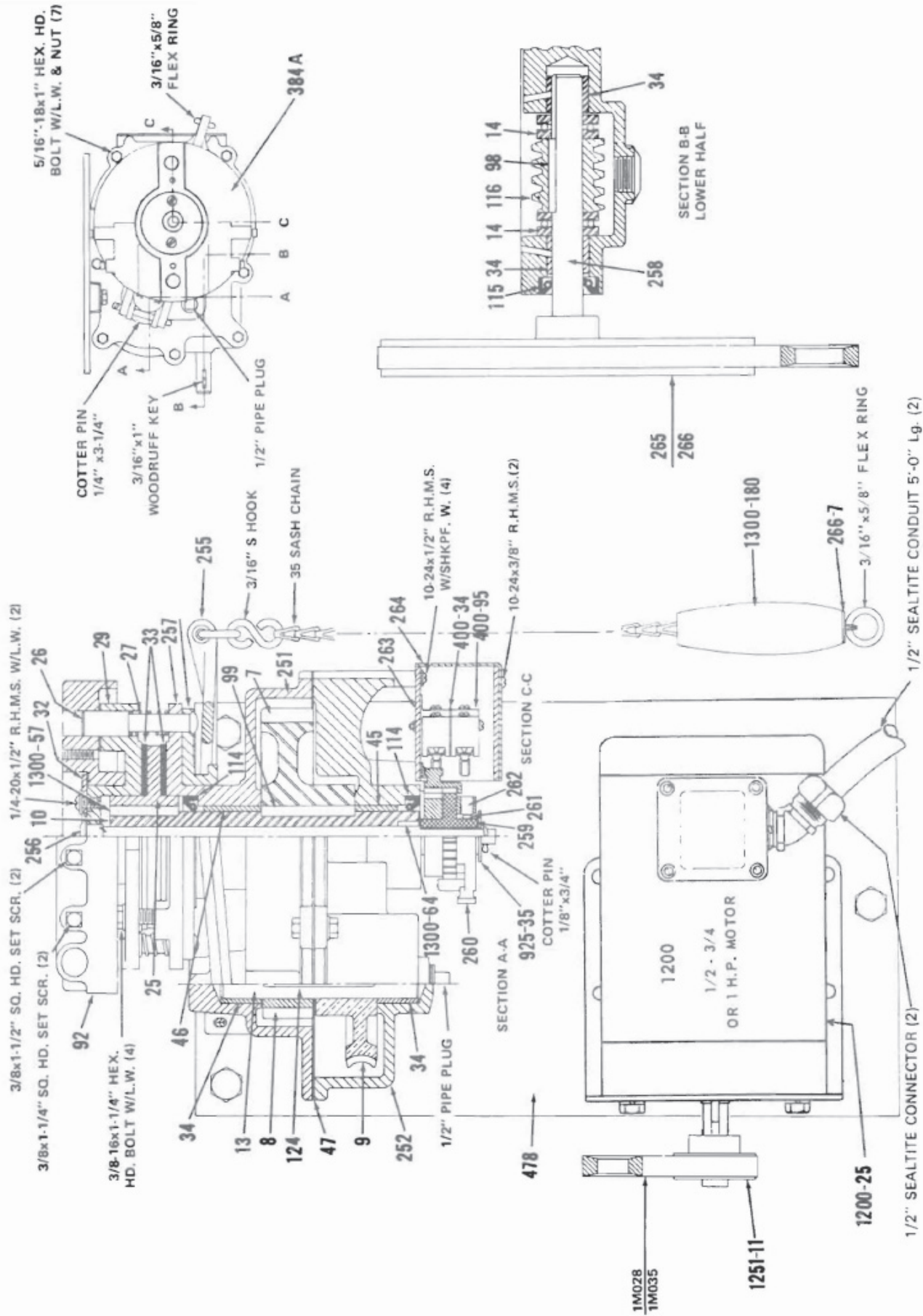


Figure 9. Illustration of Parts - 1/2 - 1 HP 1500 & 1501 Operator.

PARTS LIST - EXTRA HEAVY DUTY 1HP OPERATOR

FIGURE NO.	PART NUMBER	DESCRIPTION
10	400-34	Switch Insulator (2 per Operator)
10	400-95	Snap Action Switch (2 per Operator)
10	405-226	Spring (2 per Operator)
10	649-2120-1	1/4" x 1-1/2" Ring
10	925-35	Washer
10	1300-64	Clutch Shaft Bushing
10	1400-180	Handle
10	1500-64	Arm Plate
10	1500-65	Top Clutch Plate
10	1500-66	Bottom Clutch Plate
10	1500-69	Shift Collar
10	1500-73	Clutch Disc (2 per Operator)
10	1500-75	Retaining Disc
10	1500-77	Pivot Pin (2 per Operator)
10	1500-148	Arm Plate Cap
10	1500-149	Arm Plate Gasket
10	1500-206A	Base Assembly, L.H.
10	1500-207A	Base Assembly, R.H.
10	1500-213	Arm Plate
10	1500-214	Clutch Spacer
10	1500-215A	Clutch Assembly (Consisting of Parts: 64, 65, 66, 69, 73, 75, 77, 213, and 405-226)
10	1500-227A	Top Cover Assembly, L.H.
10	1500-228A	Top Cover Assembly, R.H.
10	1500-229A	Front Cover, L.H.
10	1500-230A	Front Cover, R.H.
10	1500-231	Motor Shim
10	1500-237A	Clutch Lever Assembly
10	1500-238	Release Pivot Pin
10	1500-240	Gearmotor 230/460 - 60 - 3 R.H.
10	1500-241	Gearmotor 230/460 - 60 - 3 L.H.
10	1500-259	Switch Throw Pinion
10	1500-260	Switch Cam (2 per Operator)
10	1500-261	Spring (2 per Operator)
10	1500-262	Closed End Eyelet (2 per Operator)
10	1500-264	Switch Cover
10	1500-385	Clutch Bolt
10	1500-389	Support Stud (4 per Operator)
10	1500-390A	Limit Switch Housing Assembly

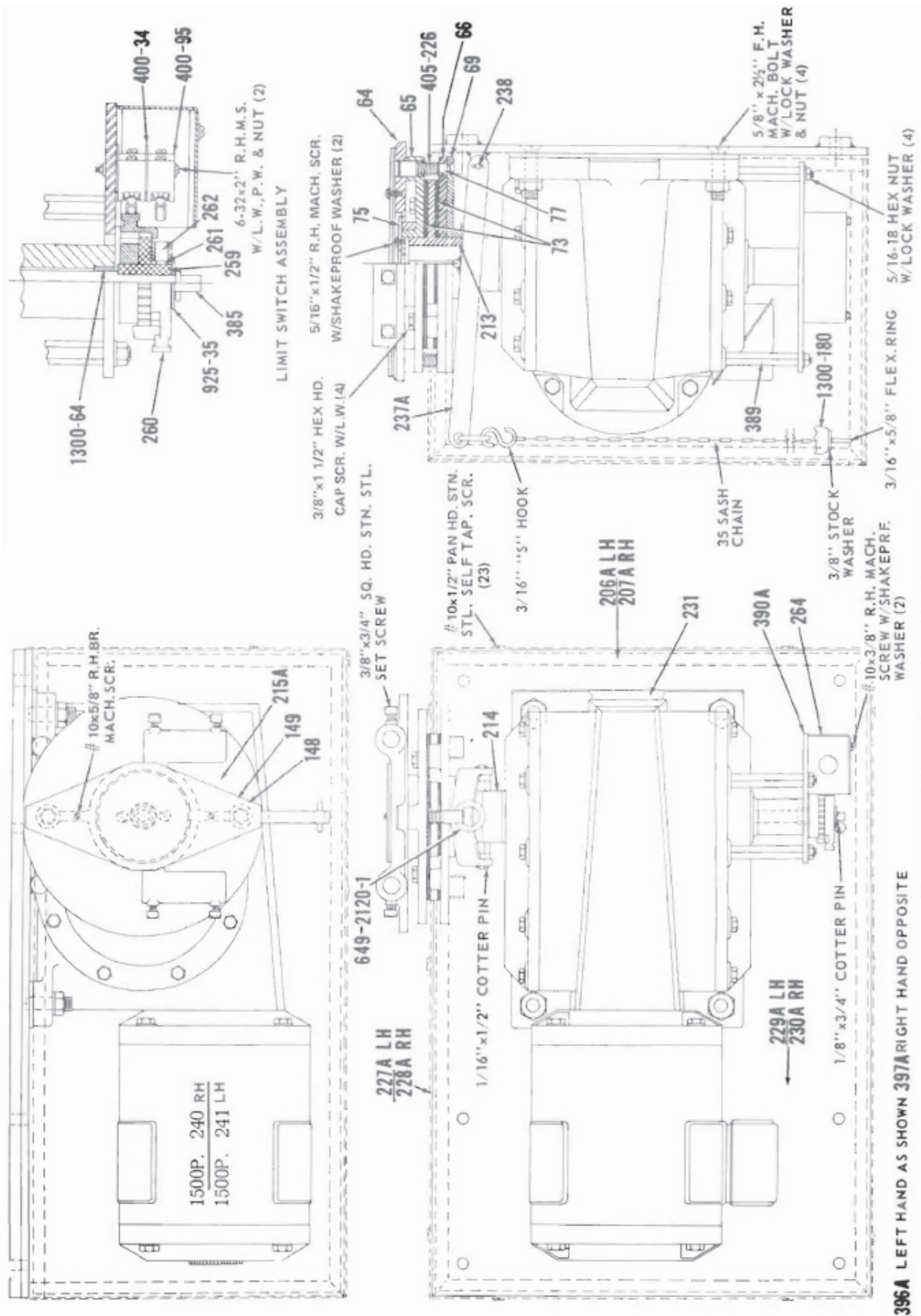


Figure 10. Illustration of Parts - Extra Heavy Duty 1HP Operator

MAINTENANCE INFORMATION

(To Be Filled Out By User)

Operator Serial Number _____ H.P. _____

Supplied on Crown Industrial Operators Order Number _____

Power Supply _____ Volts _____ Hz _____ Phase _____

Installed At _____ Date _____

Notes _____

GUARANTEE

If, within a period of one year from date of shipment, any part of a CIO Electric "Aut-o-doR" Operator is found defective due to poor materials or workmanship, new parts will be furnished free of charge F.O.B. manufacturer's plant, providing the equipment has been given normal and proper usage, lubrication, and maintenance and is still the property of the original purchaser and/or part of the original installation. *THIS WARRANTY IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, AND THE MANUFACTURER MAKES NO IMPLIED WARRANTY OF MERCHANTABILITY BEYOND THE EXPRESSED TERMS HEREOF. MANUFACTURER'S LIABILITY FOR DAMAGES, INCLUDING CONSEQUENTIAL DAMAGES RESULTING FROM ANY SUCH DEFECTIVE PRODUCT IS STRICTLY LIMITED TO THE DELIVERY OF NEW PARTS, AS SET FORTH ABOVE.*



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