

MODEL JH

JACKSHAFT INDUSTRIAL DOOR OPERATOR INSTALLATION MANUAL

OSCO

OPERATOR SPECIALTY COMPANY, INC.

P.O. Box 128 • Casnovia, MI 49318



OSCO requires the use of a reversing edge or photoelectric control for pedestrian protection on all automatic or remotely controlled gate or door operators.

GENERAL PRODUCT INFORMATION

PRODUCT APPLICATION

OSCO's Model JH jackshaft operator will electrically operate service doors, rolling grilles, sectional vertical-lift doors, and sectional high-lift doors (minimum 24 inches of high lift).

MECHANICAL FEATURES

All Model JH jackshaft operators may be mounted in a variety of positions (see Figure 1). The operator may be equipped with an optional hand chain hoist mechanism for manual operation of the door in case of power failure. The hand chain should be pre-installed and will operate in the vertical mounting position. A disconnect cable is supplied for engaging the hand hoist from the floor level. This pull cable also electrically disconnects the control circuit.

The motor may be removed without affecting either the limit switch adjustment or optional hand chain operation.

A standard operator is supplied with 5 feet of #41 roller chain, a 14-tooth drive sprocket, and a 36-, 48- or 60-tooth sprocket. Other drive sprockets are available.

REDUCTION. The speed reduction is achieved by means of heavy-duty sprockets and a roller chain, which has been prelubricated at the factory. The output speed is 53 RPM.

LIMIT SWITCHES. The limit switches are actuated by rotary motion of a shaft driving a threaded limit nut and are fully adjustable over a wide range.

ELECTRICAL FEATURES

The standard operator is wired for control by an OPEN-CLOSE-STOP push-button station with momentary contact on the OPEN, CLOSE and STOP buttons, or can be controlled either open or closed by optional 24V, 3-wire radio, pull cord, or single-button station.

INSTALLATION INSTRUCTIONS

PREPARATION

Unpack the carton, checking for possible damage during shipping. Damage claims must be filed with the freight carrier. The following parts are included in the carton:

- (1) Model JH Operator
- (2) Spreader Arms
- (1) Cable-Retaining Bracket
- (1) #41 Chain, 5'
- (1) #41 Master Link
- (1) Set Collar, 1"
- (1) Hand Chain (length to order)
- (1) Cable (length to order)
- (1) Door Sprocket, 41 B 60, 1" Bore, with Key and Set Screw (size to order)
- (1) Door Sprocket, 41 B 48, 1" Bore, with Key and Set Screw (size to order)
- (1) Door Sprocket, Standard, 41 B 36, with Key and Set Screw (size to order)
- (1) Key, 1/4" x 1/4" x 1"

Check to make sure that the power supply to be used is of the same voltage, phase, frequency and wattage as indicated on the nameplate of the operator.

LEFT-HAND INSTALLATION

RIGHT-HAND INSTALLATION

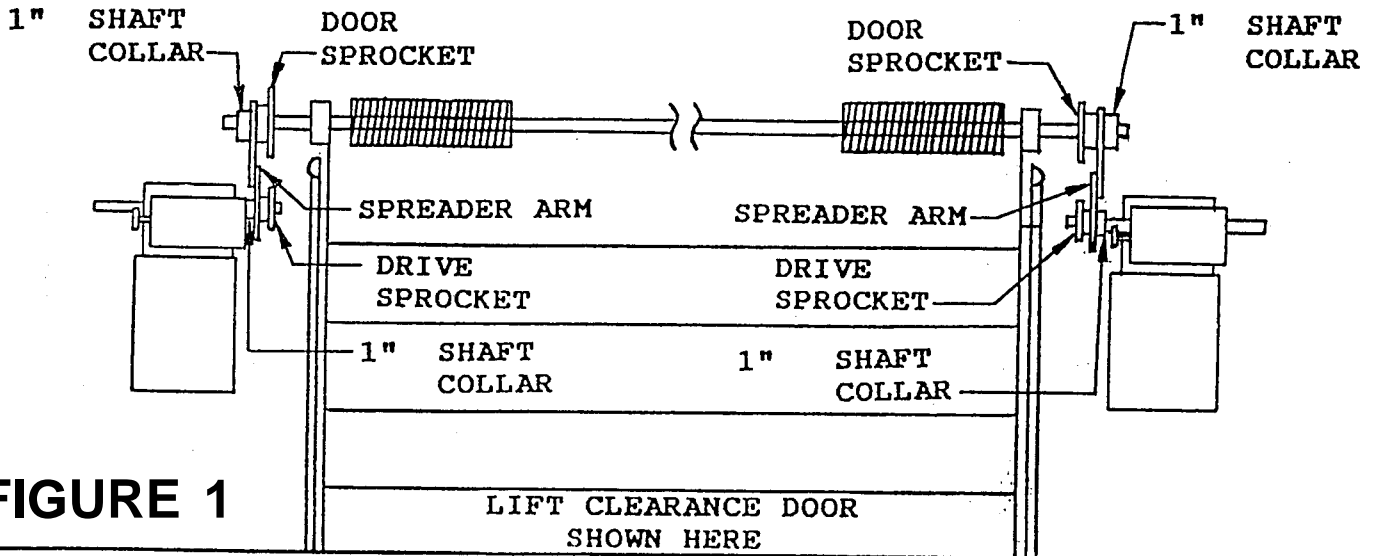
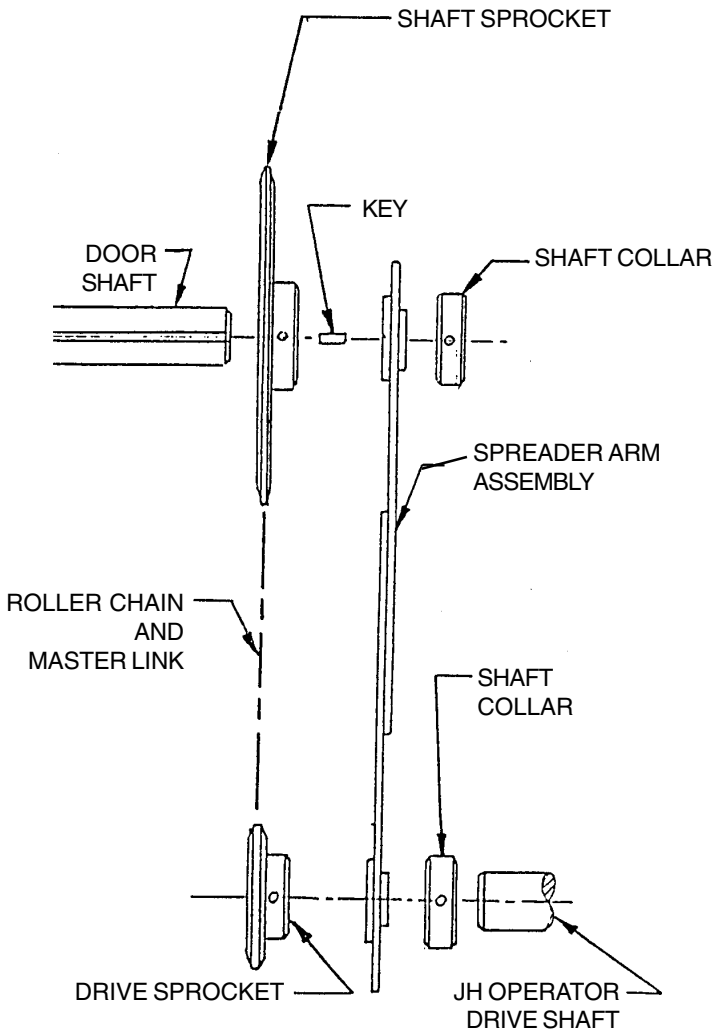


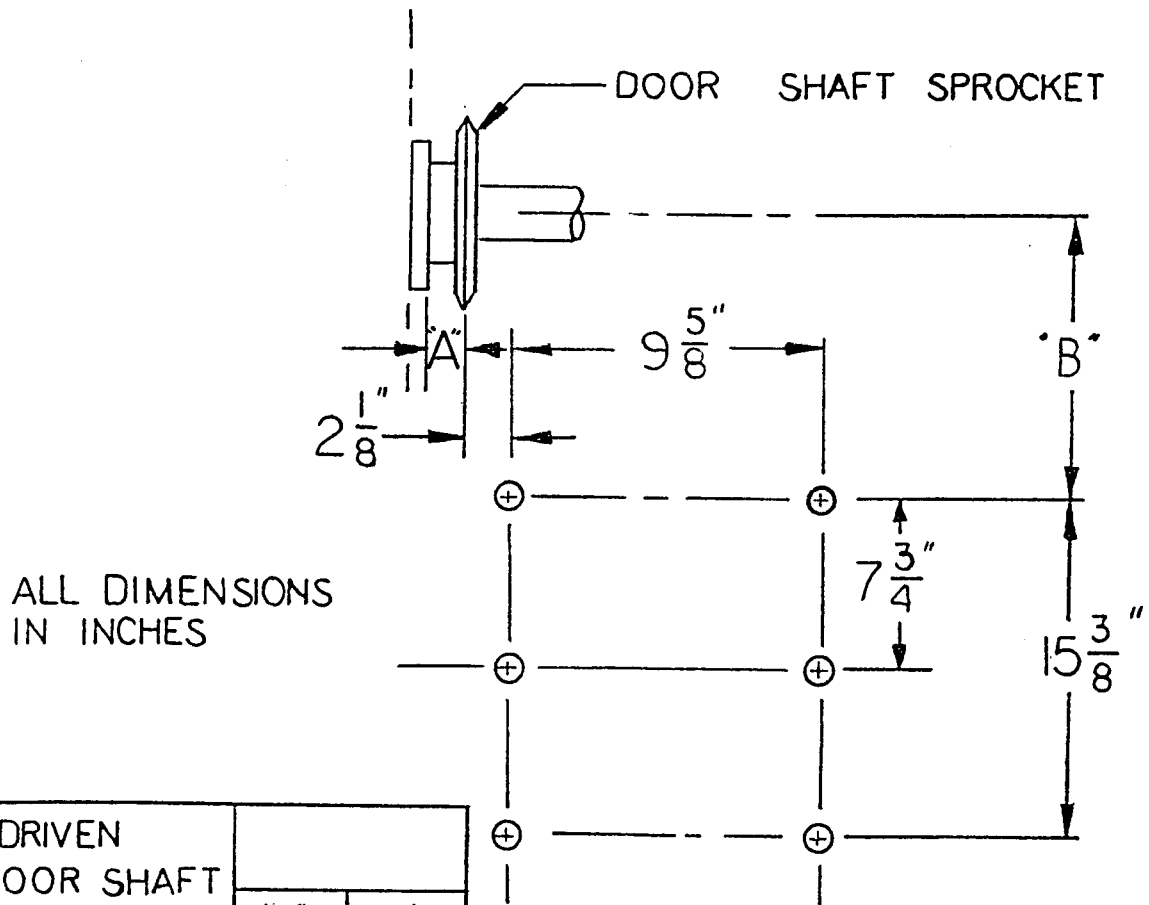
FIGURE 1

INSTRUCTIONS FOR ATTACHMENT OF SPREADER ARM AND DOOR SPROCKET



1. Remove drive sprocket from JH operator drive shaft.
2. Slide proper door shaft sprocket onto door shaft, with key inserted into key way.
3. Slide spreader arm assembly onto the door shaft.
4. Make any necessary adjustments in spreader arm so lower end will slide onto operator drive shaft.
5. Slide drive sprocket onto drive shaft and tighten set screw securely.
6. Now position door shaft sprocket so it is exactly in line with the drive sprocket and tighten set screw securely.
7. Slide 1" shaft collar onto door shaft and tighten.
8. Place roller chain around sprockets and attach master link.
9. Attach wall retainer bracket onto wall for securing disconnect cable.

FIGURE 3 - OPERATOR MOUNTING



DRIVEN DOOR SHAFT SPROCKET		
	"A"	"B"
41-B-36	1 1/4"	21 1/4"
41-B-48	1 1/4"	18 3/4"
41-B-60	1 1/4"	15 3/8"

OPERATOR MOUNTING: RIGHT/LEFT CONVERSION

The Model JH may be mounted on either the right or left side of the door. If you need to move the optional hand hoist mechanism to the opposite hand, remove the 3/4" shaft collar on the end of the disconnect shaft, move the chain guide assembly and chain wheel to the opposite side, and replace the shaft collar.

WALL MOUNTING

Generally, the operator should be installed below the door shaft (see Figure 1) and as close to the door as possible. The optimum distance between the door shaft and the operator output shaft is 12-15 inches. A greater distance can be allowed if conditions prevent installation as prescribed.

1. Using the center line of the door shaft as a reference point, locate six mounting holes as shown in Figure 3.
2. For a secure installation, the operator should be mounting using 1/2" through bolts. If the wall construction prohibits the use of through bolts, lag bolts and shields of sufficient size may be used. At this point, hand-tighten the bolts only.

DRIVE CHAIN INSTALLATION

1. Slide the door sprocket and key over the end of door shaft, then slide the bearing in the spreader over the door shaft. Slide the shaft collar over the door shaft. Align the drive sprocket on the operator with the spreader arm. Tighten set screws in both sprockets and shaft collars.
2. Connect the two sprockets with #41 drive chain. If the chain supplied is too long, shorten it to the proper length using a chain tool or by using a punch to drive out the necessary rivets. Lock the chain with the master link.
3. Adjust the chain so there is no more than 1/4" of slack when the chain is depressed between the sprockets.
4. Tighten all mounting bolts.

CABLE-RETAINING BRACKET

Mount the cable-retaining bracket on the wall at a location near the free-hanging pull chain.

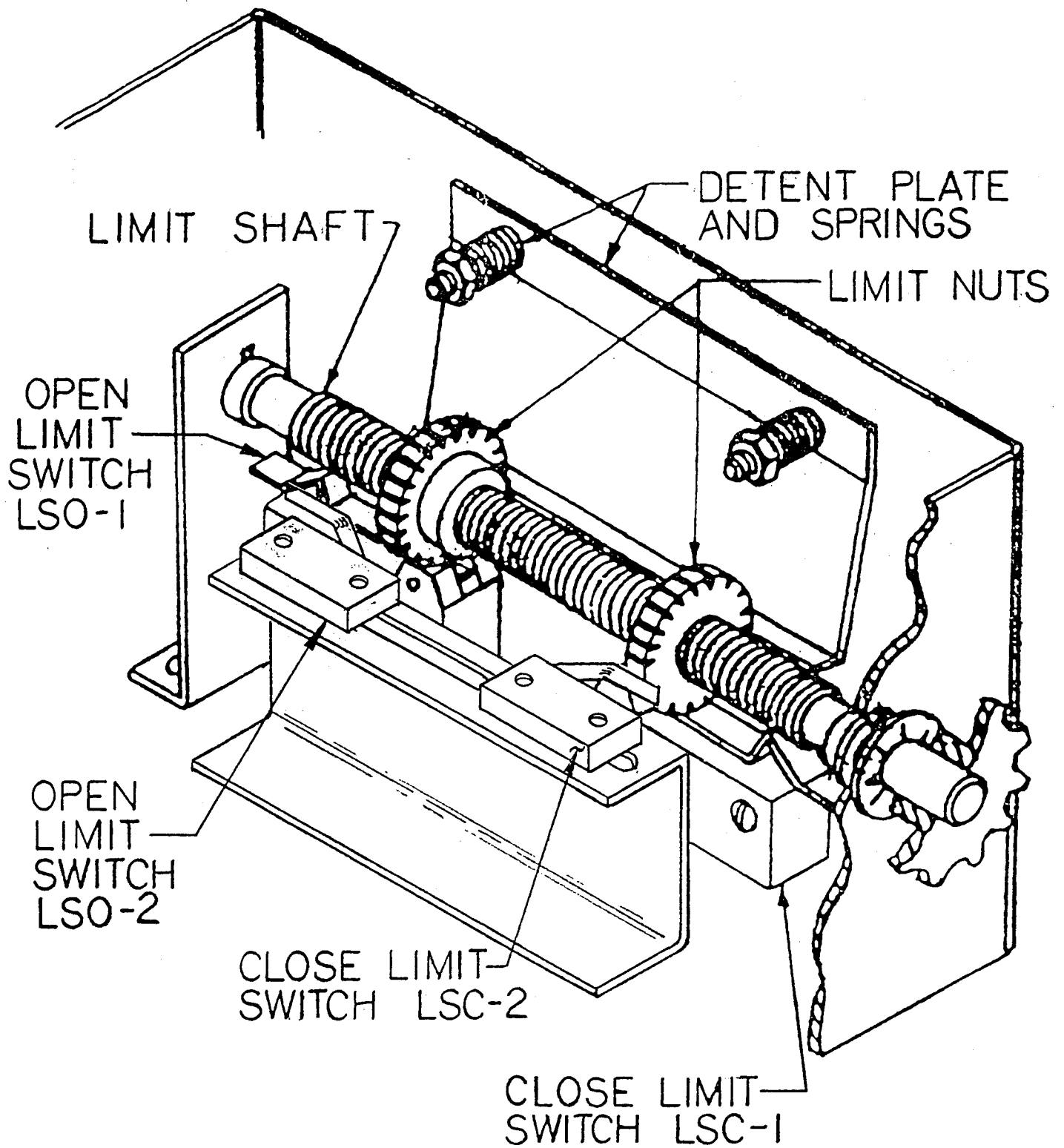
LIMIT SWITCH ADJUSTMENT

IMPORTANT: To avoid danger of possible damage to the door and operator, limit switches must be adjusted to their approximate positions before using the hand chain to operate the door and before applying power to the operator.

1. Open the cover on the electrical enclosure (see Figure 4). There are two limit nuts on the threaded shaft that move along the shaft as the operator opens and closes the door. When a limit nut nears the end of the shaft, it activates a switch(es). The switch on the left is the open limit switch. The switch on the right is the close limit switch. Auxiliary limit switches to control other functions may also be present. These are on a mounting bracket and should not be confused with the open and close limit switches, which are mounted to the back of the electrical enclosure and are partially hidden from view.
2. Manually raise the door to a nearly-open position (see Manual Operation later in this manual).
3. Depress the detent retaining bracket away from the slots in the limit nuts and manually rotate the left (open) limit nut until it depresses the open limit switch lever. (You can hear the switch click when the switch contacts transfer.) Release the retaining bracket and be sure that it engages in the slots of both limit nuts.
4. Manually lower the door to a nearly closed position and repeat Step 3 with the right (close) limit nut.
5. Manually move the door to a midway position to avoid door damage due to incorrect power supply phasing. On three-phase units, when power is applied, the motor may run in the wrong direction, causing the door to open when the limit nuts are traveling in the direction of the close limit switch or vice-versa. In either instance, the limit nuts will travel past the limit switch and may cause damage to both the door and operator (see Step 3 in the section Wiring Instructions, for correction of this problem). With the door in a midway position, there will be time to stop it if incorrect phasing is encountered.

FIGURE 4 - LIMIT ADJUSTMENT

ELECTRICIAN TO ADJUST LIMITS UPON COMPLETION OF WIRING.



WIRING INSTRUCTIONS

IMPORTANT

- A. Power supply must be of correct voltage and phase.
- B. Always disconnect power from operator before servicing.
- C. Keep clear of door during operation.

1. Consult local electrical codes for permanent wiring requirements at your installation site.
2. Remove the cover from the electrical enclosure. Refer to the wiring diagram supplied inside for all electrical connections described below.
3. Bring the power supply to the electrical enclosure and connect wires according to the wiring diagram. On three-phase operators, incorrect phasing of the power supply will cause the motor to rotate in the wrong direction (open when CLOSE button is pressed, and vice-versa). To correct this, interchange any two of the incoming three-phase leads.

NOTE: This unit must be properly grounded. A green grounding wire is supplied for connection to the power supply grounding lead.

4. Connect the three-button control station, using four wires, 14 gauge or larger, to the terminal block in the electrical enclosure (see Figure 5 and the wiring diagram). Connection of other types of control stations is shown in Figure 6.
5. The methods of installation for any passive auxiliary control equipment, such as treadles or pull switches, are at the discretion of the installer. Interconnections between these devices and the operator should be to the terminal block inside the electrical enclosure. For electrical connection points, refer to your wiring diagram.

IMPORTANT NOTICE

This operator is supplied with a three-button station (OPEN-CLOSE-STOP) accompanied by a precautionary sign:

WARNING
TO PREVENT ENTRAPMENT
DO NOT START DOOR
DOWNWARD UNLESS DOORWAY
IS CLEARED

It is vital that the three-button station be mounted within sight of the door and that the warning sign be mounted adjacent to the three-button station.

The 3-button station must be connected so the STOP circuit between terminals #2 & #4 is not bypassed. Also, if additional 3-button stations are to be connected, the STOP buttons must be wired in series.

NOTE: A STOP button must be used when the installation has radio controls or a single button.

Desired Function	Connecting Terminals
OPENING DEVICE	#1 & #4
STOP	#2 & #4
CLOSE	#3 & #4
OPEN & CLOSE	#4 & #5
SAFETY TO REVERSE	#1 & #6
24VAC POWER	#2 & #10

FIGURE 5 - WIRING DIAGRAM (STANDARD)

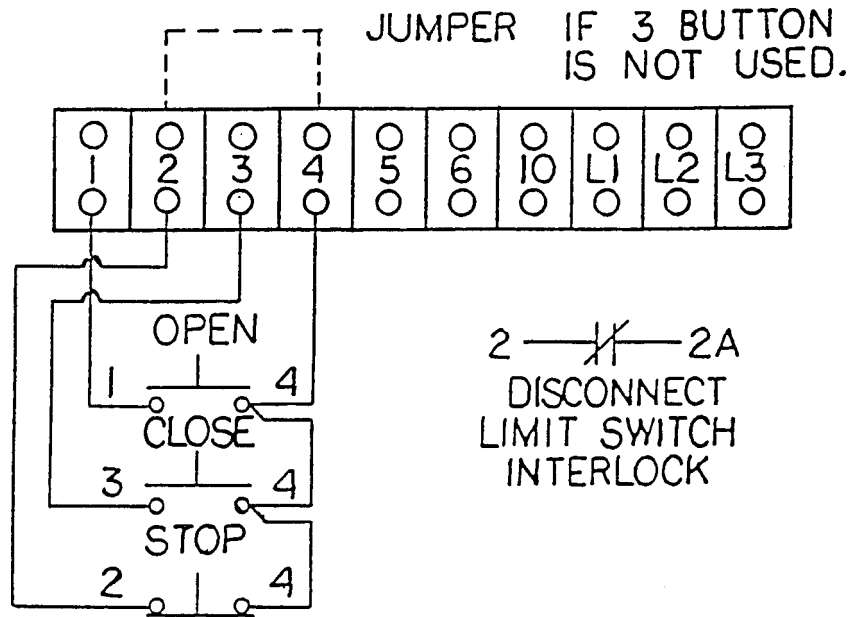
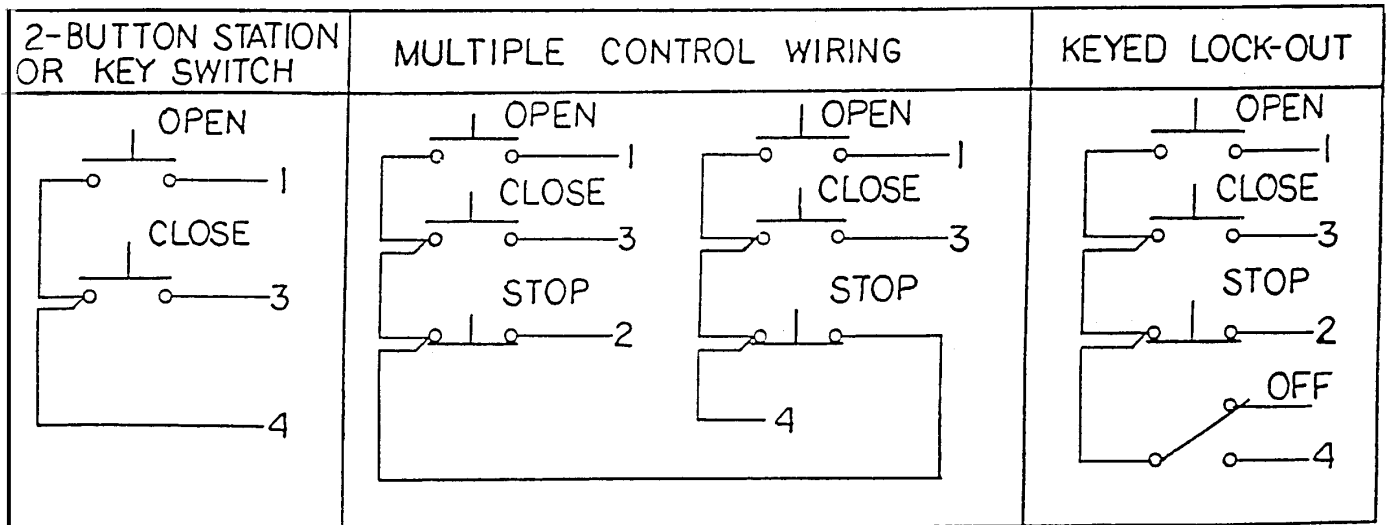


FIGURE 6 - OPTIONAL CONTROL WIRING



CONNECTION OF AN EXTERNAL INTERLOCK DEVICE

Circuitry is provided on all standard Model JH operators for the connection of a two-wire external interlock device that, when actuated, prevents the door from being electrically operated. This should be wired into the terminal block in the electrical enclosure (see Figure 5 and the wiring diagram).

NON-STANDARD WIRING

If your operator is supplied with a non-standard wiring type (see Wiring Specifications), for your particular application, refer to your wiring diagram for connection of all control equipment. If the wiring diagram is missing or has been lost, call the factory for replacement. Do not install any wiring or attempt to run this operator without consulting the wiring diagram.

OPERATING INSTRUCTIONS

ELECTRICAL OPERATION

The Model JH is designed to provide years of trouble-free electrical operation of your door. The door can be operated by means of the three-button control station or by other controls, when provided. If a reversing edge is wired into the operator, the door will reverse to the fully-open position when it hits an obstruction during downward travel.

The motor is protected by an automatic-reset thermal overload protector which will trip when the motor temperature is too hot or when the motor is overloaded. **DO NOT ATTEMPT TO BYPASS THIS UNIT!** The overload protector will trip only under abnormal conditions. An out-of-balance door or one that is binding in the tracks can produce such a condition. An incorrect installation may also cause such a problem. If a protector continues to trip, consult a serviceman or the factory.

MANUAL OPERATION (optional)

The Model JH may be used to operate the door manually if necessary. An electrical interlock will disable the motor when the operator is used in such a fashion. To manually operate the door:

1. Pull the small disconnect cable to disengage the motor. This cable may be locked in position by slipping the end through the cable-retaining bracket mounted on the wall.
2. Operate the door by hand.
3. The cable must be released from the retaining bracket before the door will operate electrically.

SERVICE AND TROUBLESHOOTING

A properly-installed Model JH will operate for many years with minimal service and maintenance. It is important to note, however, that an improperly-balance or defective door can severely reduce the life of the operator. The door should be checked and lubricated periodically as recommended by the manufacturer. All bearings are oil impregnated or lifetime sealed anti-friction bearings. The motor is factory lubricated and requires no additional lubrication.

A few drops of oil should be applied periodically to the moving parts of the manual disconnect mechanisms.

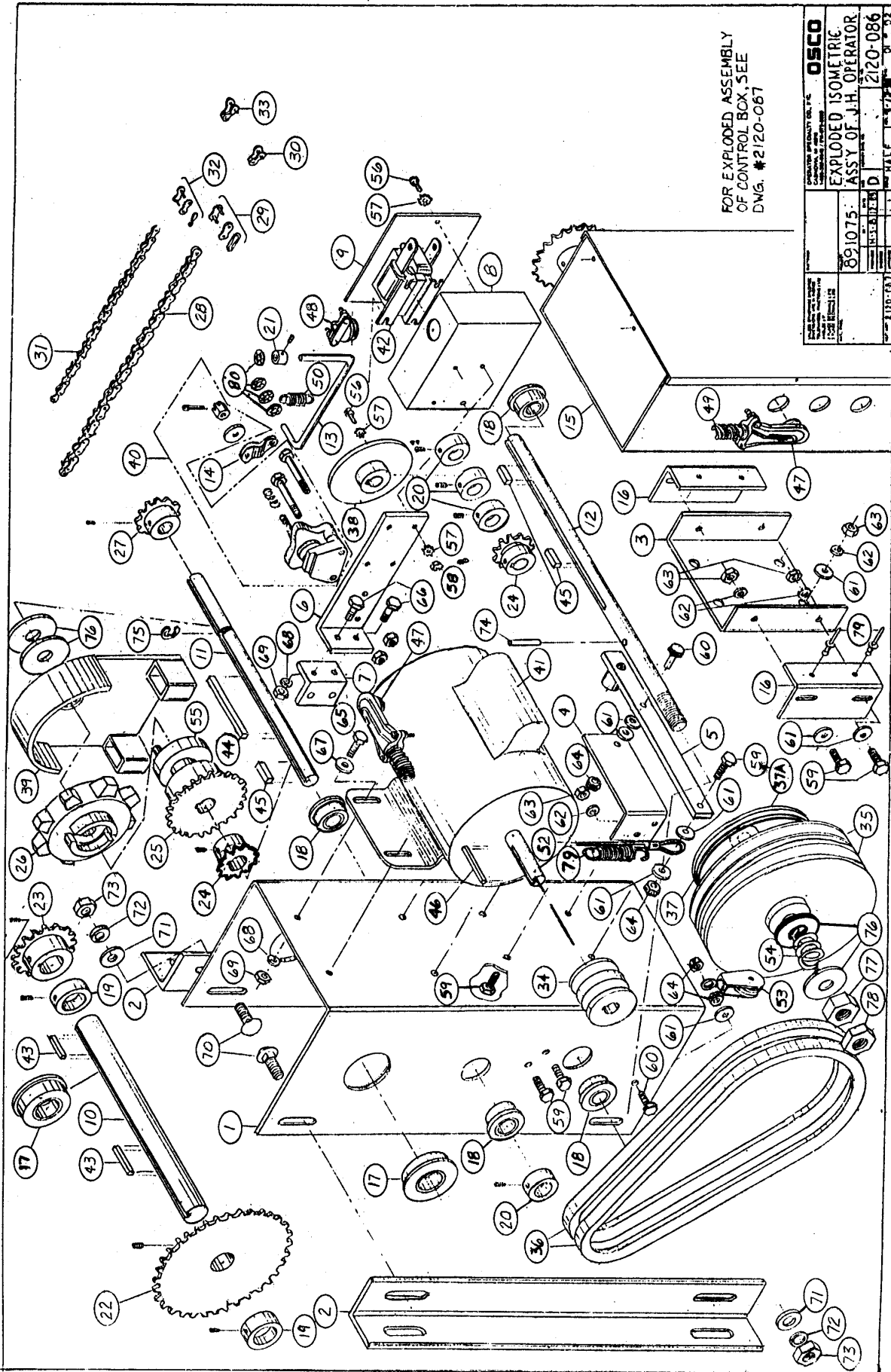
Should electrical malfunction occur, consult the Troubleshooting Chart on the following page.

TROUBLESHOOTING CHART

SYMPTOM	POSSIBLE CAUSE	REMEDY
Motor does not run when OPEN or CLOSE button is pressed.	<ol style="list-style-type: none">1. Building fuse blown or circuit breaker tripped.2. Overload protector tripped.3. Disconnect lever in position for manual operations.	<ol style="list-style-type: none">1. Replace fuse or reset breaker and check for cause.2. Reset and check for cause.3. Return lever to position for electrical operation.4. Check transformer secondary voltage. Check contactor coils for possible burnout. Check limit switches and interlock switch. Inspect control station and all field wiring.
Door closes when OPEN button pressed and limit switches do not function.	<ol style="list-style-type: none">1. Three-phase power supply is connected out of phase.2. Operator is mounted upside-down.	<ol style="list-style-type: none">1. Interchange any two incoming power supply leads.2. Consult factory.
Operator does not shut off at fully-opened or fully-closed position.	<ol style="list-style-type: none">1. Limit nuts not properly adjusted.2. Limit drive chain broken or inoperative.3. Limit switch damaged.	<ol style="list-style-type: none">1. See "Limit Switch Adjustment."2. Replace chain, check mechanism.3. Check limit switch operation and replace if necessary.

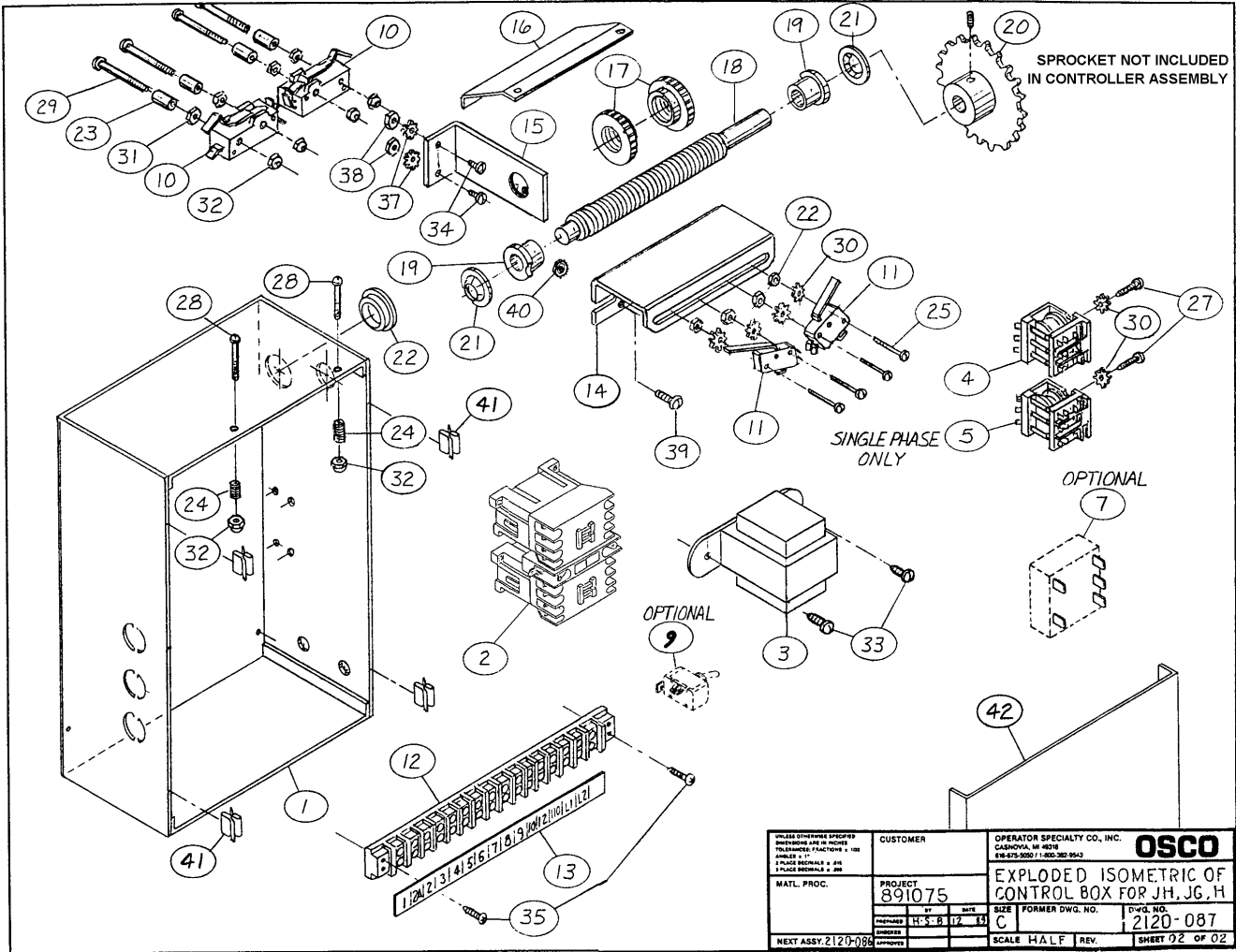
Model JH
Parts List #114 (Mechanical)
OSCO Drawing #2120-086

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
1	2100-793	Main Frame			Disconnect Assembly
2	2100-350	Mounting Angles	4	2100-281	Disconnect Bracket
3	2100-860	Control Box Bracket	5	2110-065	Disconnect Handle
10	2100-176	Output Shaft, 1"		2200-363	Disconnect Spring (not shown)
11	2100-290	Intermediate Shaft	52	2200-285	Disconnect Cable, per foot
12	2100-920	Clutch Shaft, 5/8"	53	2200-412	Pulley Swivel
17	2200-001	Radial Bearing, 1"	55	2200-444	Shifter Block
18	2200-215	Radial Bearing, 5/8"	79	2200-361	Disconnect Return Spring
19	2200-015	Shaft Collar, 1"			
20	2200-233	Shaft Collar, 5/8"			Chain Hoist
21	2400-150	Shaft Collar, 1/4"	26	2110-142	Chain Wheel
22	2500-051	Sprocket, 41 B 36, 1" Bore	39	2100-280	Chain Guide
23	2200-105	Sprocket, 41 B 16, 1" Bore		2200-191	Hand Chain, per foot
24	2200-213	Sprocket, 41 B 9, 5/8" Bore			
25	2100-284	Sprocket, 41 B 21, 5/8" Bore		2500-033	3-Button Station
	2200-127	Bearing for 41 B 21 Sprocket, 5/8"		2120-154	Spreader Arm
27	2200-218	Sprocket, 48 B 10, 5/8" Bore		2200-475	#41 Chain, 5 feet
28	2200-058	#41 Roller Chain, 21 Links		2200-051	Output Sprocket, 41 B 36, door
29	2200-027	#41 Master Link			
30	2400-128	#41 Half-Link			Brake Assemblies
31	2200-414	#48 Roller Chain, 23 Links		2510-097	115V
32	2200-010	#48 Master Link		2510-098	230V
33	2200-438	#48 Half-Link		2510-313	460V
34	2200-207	Double Pulley, 2"	6	2100-550	Brake Mounting Bracket
35	2220-026	Double Pulley, 7" with Bearing	8	2110-028	Solenoid Box without Cover
	2200-230	Bearing, 7/8 OD, 5/8 ID, 1 1/2 LTB	9	2100-132	Solenoid Box Cover only
36	2300-117	V-Belt, 4L38	13	2100-726	Brake Rod
37	2300-168	Clutch Disc (facing)	40	2220-004	Brake and Puck
37A	2110-600	Clutch Hub	42	2500-178	Solenoid, 115VAC
38	2100-547	Hub, Brake		2500-177	Solenoid, 230VAC
54	2200-306	Clutch Spring		2500-1351	Solenoid, 460VAC
76	2400-066	Flat Washer, 5/8"	50	2200-243	Brake Spring
77	2400-061	Hex Nut, 5/8"			
78	2400-062	Jam Nut, 5/8"	7	2100-338	Brake Angle Bracket
			14	2100-614	Brake Lever
43	2400-004	Key, 1/4" x 1/4" x 1"			
44	2100-297	Key, 3/16" x 3/16" x 2 3/4"			
45	2400-222	Key, 3/16" x 3/16" x 1"			Motors
46	2400-134	Key, 3/16" x 3/16" x 1 3/8"	41	2500-2160	1/2 HP, 115/230V, 1 Phase
				2500-2161	3/4 HP, 115/230V, 1 Phase
47	2200-035	90-Degree Connector		2500-2162	1 HP, 115/230V, 1 Phase
48	2400-180	Cord Grip Connector		2500-1600	1/2 HP, 208/230/460V, 3 Phase
49	2200-044	Conduit, per foot		2500-1601	3/4 HP, 208/230/460V, 3 Phase
22	2200-051	Sprocket, 41 B 36		2500-1602	1 HP, 208/230/460V, 3 Phase



FOR EXPLODED ASSEMBLY
OF CONTROL BOX, SEE
DWG. #2120-067

OPERATOR PRESENTATION CO., INC.		OSCO	
1200 BROADWAY		EXPLODED ISOMETRIC	
NEW YORK, N.Y. 10013		ASSY. OF J.H. OPERATOR	
891075	D	2120-086	
DATE	REV.	BY	CHK.



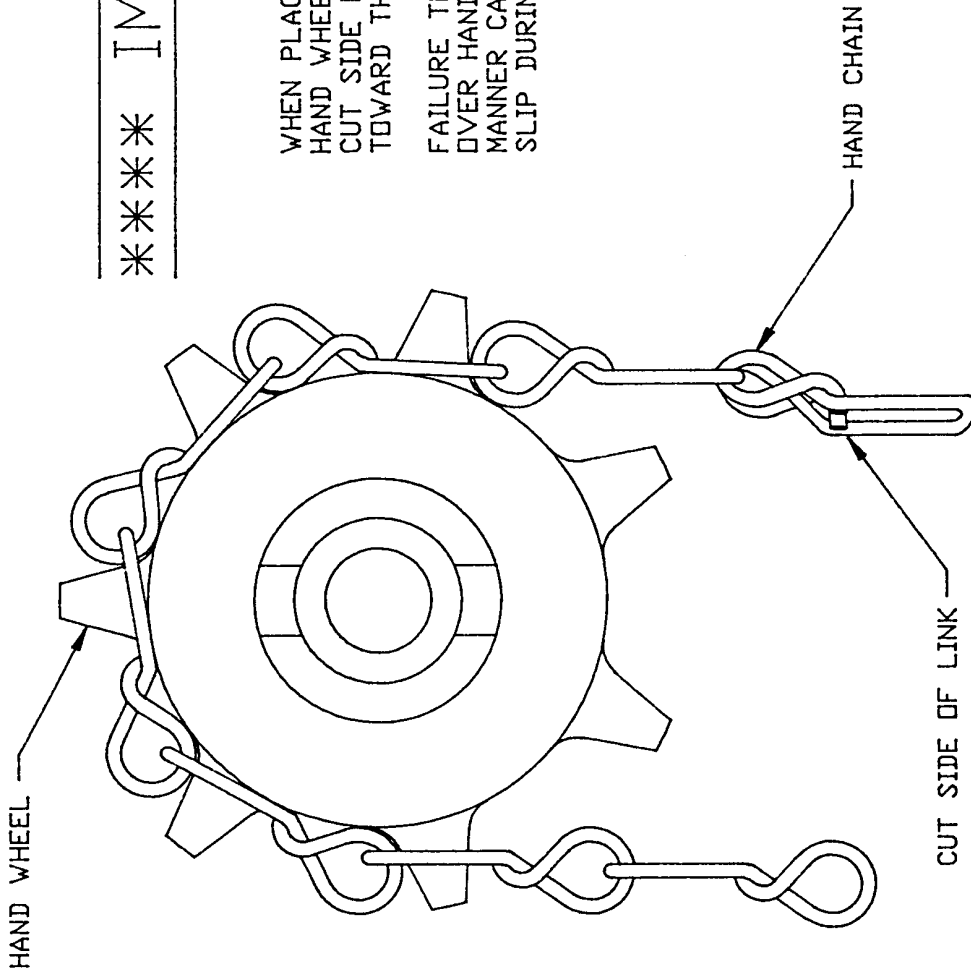
**Models H, HB, JH, and JG
Parts List #147 (Electrical)
OSCO Drawing #2120-087**

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
	2520-231	Complete Controller, 115V, 1 Ph (WD #2600-177)	21	2400-029	Push Nut
1	2110-675	Controller Enclosure without Cover	22	1600-088	Bushing
2	2500-2084	Contactor, 24VAC, 4-Pole	23	2100-060	Spacer
3	2500-766	Transformer, 115/24VAC, 75VA	24	2200-028	Detent Spring
4	2500-541	Relay, 24VAC, 3PDT	41	2400-001	S-clip
5	2500-542	Relay, 115VAC, 3PDT	42	2100-1701	Controller Enclosure Cover only
7	2500-1366	Timer (optional)	2500-442	Terminal Strip 3	
9	2500-001	Timer Switch (optional)	2520-232	Complete Controller, 208/230V, 1 Ph (WD #2600-178)	
10	2500-030	Open Limit Switch SP	3	2500-767	Transformer, 208/230/24VAC, 75VA
11	2500-440	Close Limit Switch SP	5	2500-543	Relay, 115VAC
12	2500-071	Terminal Strip, 16-141	2520-233	Complete Controller, 208/230V, 3 Ph (WD #2600-144)	
13	2300-052	Terminal Strip Label	3	2500-767	Transformer, 208/230/24VAC, 75VA
14	2100-339	Limit Switch Bracket	2520-234	Complete Controller, 460V, 3 Ph (WD #2600-144)	
15	2100-058	Limit Shaft Bracket	3	2500-768	Transformer, 460/24VAC, 75VA
16	2100-056	Detent Plate			
17	2200-030	Limit Nut			
18	2100-057	Limit Shaft			
19	2200-029	Flange Bearing, 1/2"			
20	2200-276	Limit Sprocket, 48 B 20, 1/2" Bore			

***** IMPORTANT *****

WHEN PLACING HAND CHAIN ON HAND WHEEL, BE SURE THAT THE CUT SIDE OF THE LINKS FALL TOWARD THE HAND WHEEL.

FAILURE TO PLACE HAND CHAIN OVER HAND WHEEL IN THIS MANNER CAN CAUSE CHAIN TO SLIP DURING USE.



OPERATOR SPECIALTY CO, INC CASNOVIA, MI 49318 1-800-333-1717 / 616-675-5050		OSCO	
INSTALLATION INSTRUCTIONS OF HAND CHAIN ONTO HAND WHEEL			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONS $\pm 1/32$ ANGLES $+ 1'$ 2 PLACE DECIMALS $\pm .015$ 3 PLACE DECIMALS $\pm .005$		CUSTOMER	SIZE
MAYL. PROC.		PROJECT	FORMER DVG. NO.
PREPARED	BY	DATE	DWG. NO.
CHECKED	R.S.	9-23-94	2700-231
APPROVED			SCALE
NEXT ASSY.			REV.
			SHEET
			OF

WIRING SPECIFICATIONS

1. Select from the chart at right the section corresponding to the phase, voltage, and horsepower of your operator.
2. The distance shown on the chart is measured in feet from the operator to the power source. **DO NOT EXCEED THE MAXIMUM DISTANCE.**
3. When large-gauge wire is used, a separate junction box (not supplied) may be needed for the operator power connection.
4. Select the gauge for control wiring from the top chart below. If a greater distance is required, our remote station interface is suggested. Call the factory.
5. Wire run calculations are based on the National Electrical Code, Article 430, allowing 5 percent voltage drop.
6. Supply voltage must be within 10 percent of the operator rating under load conditions.
7. Connect power in accordance with local codes.
8. The wire tables are based on standard copper wire. Wire insulation must be suitable to the application.

NOTE: If the power run is over 500 feet, consult your power utility company about possible power drops overhead or underground.

CONTROL WIRING		
Volts	Max Distance (ft)	Wire Gauge
24V	250	14
	350	12
Over 350 ft, see interface chart.		

CONTROL WIRING w/INTERFACE		
Volts	Distance Over (ft)	Wire Gauge
24V	350	14

USE COPPER WIRE ONLY

POWER WIRING												
	Max Distance (ft)		Wire Gauge	Volts & HP	Max Distance (ft)		Wire Gauge					
	Single Unit	Dual Unit			Single Unit	Dual Unit						
Single Phase	115V	120	60	12	208V	475	240	12				
		190	95			10	230V		760	380		
		305	150						8	1200	600	8
	1/3HP	485	240	6	1/3HP			1915			960	6
		115V	125			60	12	208V			370	
			200			100			10	230V	585	
	315		160	8	935	465					8	
	1/2HP	500	250			6	1/2HP	1485			740	6
		115V	65					30	12	208V	260	
			105	50	10			230V			415	
	165		80	8		665	330				8	
	3/4HP	265	130				6		3/4HP	1055	600	6
115V		55	30		12			208V		225	115	
		85	45	10		230V				360	180	
	140	70	8				570		285	8		
1HP	225	115			6			1HP	910	455	6	
	208V	650		325		12			460V	2850		1425
		230V	1035	515			10					4535
1645			825	8	7210			3605			8	
1/3HP	2615		1310			6		1/3HP	11465		5730	6
	208V	620	305				12		460V	2705	1350	
		230V	985	490	10						4305	
1565			780	8		6850		3425			8	
1/2HP	2485		1240				6	1/2HP	10895		5445	6
	208V	440	220		12				460V	1935	965	
		230V	700	350		10					3075	
1115			558	8			4890	2445			8	
3/4HP	1775		885		6			3/4HP	7780		3890	6
	208V	345	170			12			460V	1595	795	
		230V	545	275			10				2535	
870			435	8	4030			2015			8	
1HP	1380		690			6		1HP	6405		3205	6
	208V	235	120				12		460V	1040	520	
		230V	380	190	10						1655	
600			300	8		1 1/2 HP		2635			1315	
1 1/2 HP	955		480				6	1 1/2 HP	4190		2095	6
	208V	180	90		12				460V	795	400	
		230V	290	145		10					1265	
460			230	8			2015	1005			8	
2HP	730		365		6			2HP	3205		1600	6