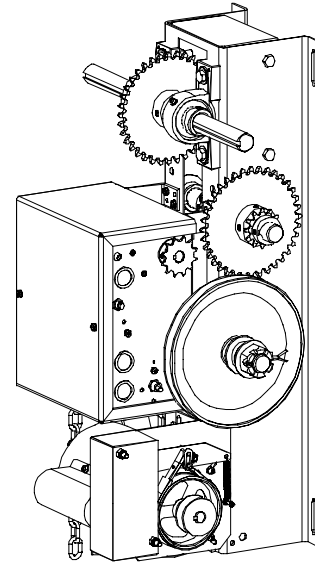




INSTALLATION AND INSTRUCTION MANUAL

MSJ



IMPORTANT: READ THIS MANUAL CAREFULLY BEFORE INSTALLING THE OPERATOR

Note: Place installation manual in an accessible place near the operator. For future reference record:

Model # _____
Serial # _____
Date _____
Wiring Diagram # _____



 **WARNING**

DO NOT CONNECT TO POWER SUPPLY WHILE INSTALLING, SERVICING OR ADJUSTING
THE ELECTRIC OPERATOR

IMPORTANT SAFETY INSTRUCTIONS**WARNING**

TO REDUCE THE RISK OF SEVERE INJURY OR DEATH, READ AND FOLLOW ALL INSTRUCTIONS.

1. Never allow children to operate or play with or near door.
2. Check to see that the operator is proper for the type, size of door and frequency of use per the operator specifications.
3. If the door system is near a residential area, or pedestrian traffic is expected near the door system, additional equipment such as electric reversing edges, photocells, or similar devices must be installed as part of the system to prevent entrapment.
4. Reversing devices appropriate to the application must be installed as part of the system.
5. Outdoor or easily accessible controls must be of the security type to prevent unauthorized use of the system.
6. Place controls far enough from the door so that a user cannot touch the door when operating the controls.
7. Controls should be placed so the user has full view of the door when operating.
8. Always keep moving door in sight and away from people or vehicles until it is completely opened or closed. **NO ONE SHOULD CROSS THE PATH OF THE MOVING DOOR.**
9. If a person is trapped under the door, push the "OPEN" control button or use the emergency floor level disconnect mechanism.
10. Do not over tighten a clutch to compensate for a damaged door.
11. Test door and service monthly. If adjusting limit travel, retest the door opener. Failure to adjust the door may cause death or injury.
12. **KEEP DOORS PROPERLY BALANCED.** See door owner's manual. An improperly balanced door could cause severe injury. Have a qualified service person make repairs to cables, spring assemblies and other hardware.
13. Use emergency manual operation mechanism only when operator has been electrically disconnected.
14. If possible, use the emergency release only when the door is closed. Use caution when using this release with the door open. Weak or broken springs may cause the door to fall rapidly, causing injury or death.
15. You are responsible for assuring that the owner of the door system understands its basic operation and safety. In particular, be sure the owner/end-user understands the location and operation of the manual disconnect.
16. Point out to the owner/end-user of the door system that children or pets should not be allowed to play on or near the door or any part of the system, and that the safety instructions supplied with this operator are the responsibility of the owner/end-user.
17. Leave the installation and maintenance manual for this operator as well as any additional information supplied with this operator or other components of the door system with the owner/end-user.
18. If you have any questions about the safety of the door operating system, do not install this operator.

**WARNING**

IMPORTANT: PLEASE READ CAREFULLY THE ANNEX INSTRUCTION MANUAL WHEN OPERATOR IS SUPPLIED WITH AN ELECTRONIC CONTROL BOARD

TABLE OF CONTENTS

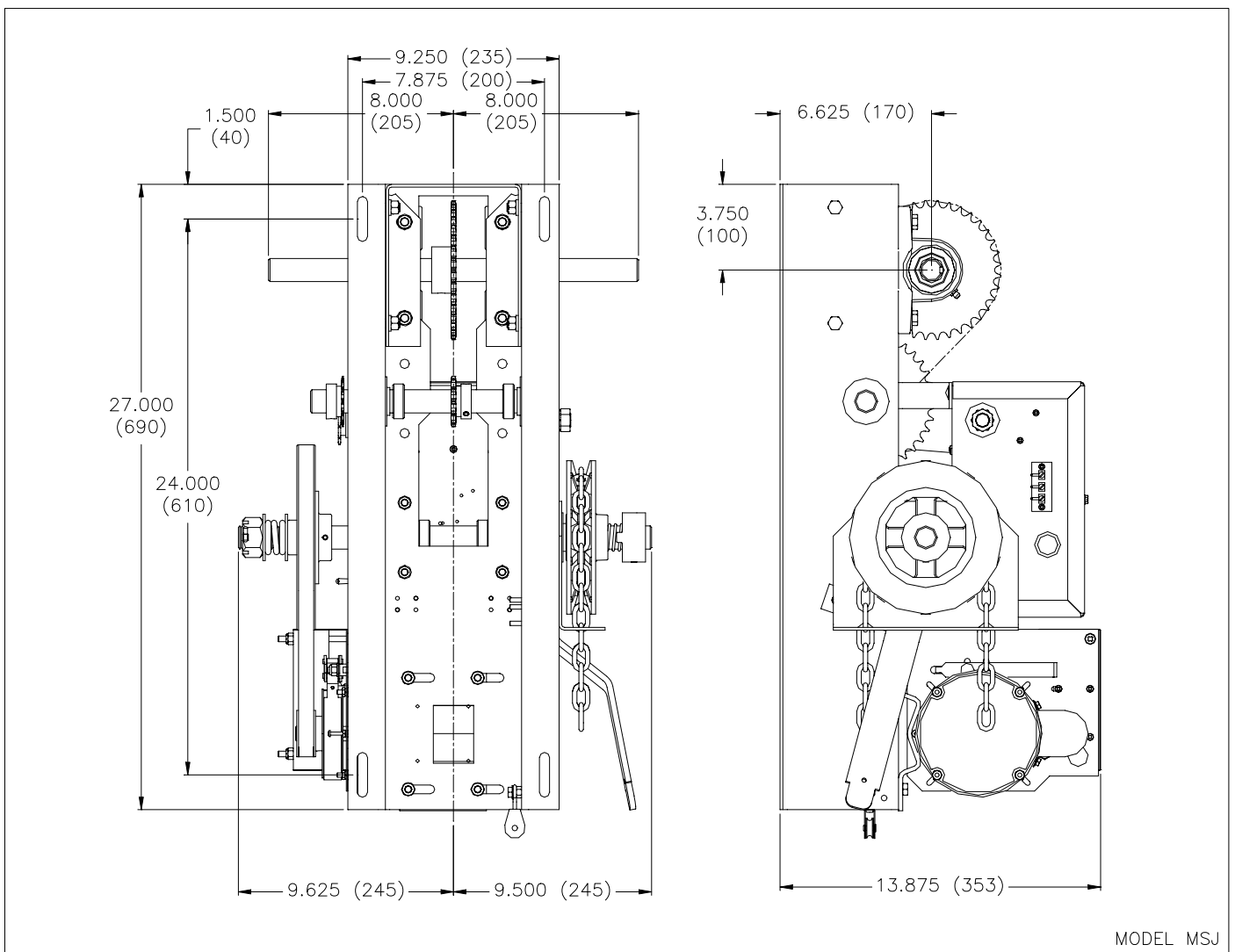
	Page
SPECIFICATIONS	4
WEIGHT AND DIMENSIONS	4
PRODUCT APPLICATION	5
DELIVERY OF OPERATOR	5
HARDWARE	5
INSTALLATION	6
OPERATOR START-UP AND TESTING GUIDE	15
TROUBLE-SHOOTING GUIDE	16
SCHEDULED MAINTENANCE	18
MSJ EXPLODED VIEW	20
MSJ SINGLE PHASE ELECTRICAL DIAGRAM	21
MSJ THREE PHASE ELECTRICAL DIAGRAM	22
NOTES	23

SPECIFICATIONS

GENERAL

SUPPLY VOLTAGE.....	115, 230 VAC single phase 208, 460, 575 VAC three phase
CONTROL VOLTAGE.....	24VAC class 2 transformer, 2 amp fuse type ACG
MOTOR	Continuous duty 1/3, 1/2, 3/4, 1 Horsepower
OPERATOR OUTPUT SPEED.....	48 RPM
NET WEIGHT* (Operator only).....	89 Lbs (33.3 Kg) *For 1/2HP 115V model
STANDARD WIRING TYPE.....	C2-momentary contact to open and stop and constant pressure to close.

DIMENSIONS



MSJ: HEAVY DUTY JACKSHAFT OPERATOR

IMPORTANT: UPON COMPLETION OF OPERATOR INSTALLATION THIS MANUAL MUST BE GIVEN TO THE END-USER.

1. PRODUCT APPLICATION

The model MSJ heavy-duty jackshaft operator is designed for use on commercial or industrial doors of all types provided that the door has a shaft as basic driving element (doors with high lift, vertical lift, rolling doors and grilles). The MSJ door operator is designed and constructed in accordance with UL and CSA standards.

2. DELIVERY OF OPERATOR

Upon delivery of your heavy-duty jackshaft operator, inspect the unit immediately for transport damage. Verify that you have received all the hardware parts mentioned in TABLE 1 and shown in Figure 1. Other items may be present, such as radio controls or other types of optional equipment, if ordered. If any item is missing or if there is evidence of damage, call the transport company first.

* Check to make sure that the available power supply to be connected to the operator is of the same voltage, frequency, phase and amperage as indicated on the nameplate of the operator.

3. HARDWARE

TABLE 1 STANDARD PARTS LIST FOR MSJ JACKSHAFT OPERATOR

PART #	QTY	DESCRIPTION
1	1	Floor level disconnect lever
2	1	3-button open/close/stop push-button station
3	1	#50 connecting link
4	1	#50 roller chain x 4'(1.2m)
5	1	** Sprocket 50B__ x 1__ I.D. c/w set screws for door shaft
6	1	Sprocket 50B12 x 1.0" I.D. c/w set screws for MSJ output shaft
7	2	Square shaft keys 1/4" x 1-1/2" L for MSJ output shaft
8	1	Roll pin 1/4" x 1-1/2"
9	4	3/8" x 1-1/4" bolts
10	4	3/8" washers
11	4	3/8" lock washers
12	4	3/8" nuts
13	1	Cable 3/32" (door height less 4' (1.2m))
14	1	U-bolt
15	1	Pocket wheel hand chain (2 x door height less 4ft (1.2m))

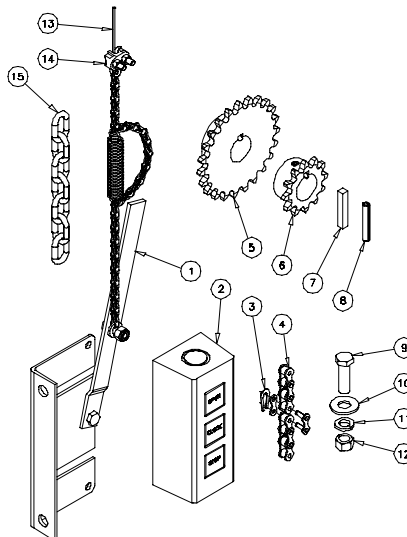


Figure 1 Hardware

3 INSTALLATION

All heavy-duty jackshaft operators are tested and adjusted at the factory. When installing your unit, please note that the cams are resting in the center of the camshaft.

The MSJ operator has a dual output shaft and may be mounted on either the left or right hand side of the door (see Figure 2 and Figure 3). Place sprocket on either the right or the left end of the output shaft according to the desired handing.

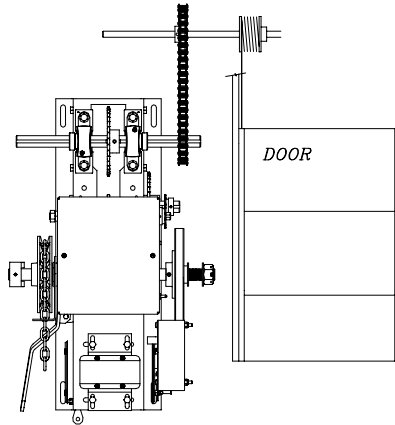


Figure 2 Left hand

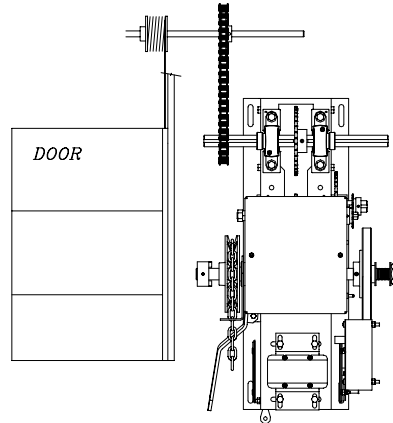


Figure 3 Right hand

3.1 IMPORTANT INSTALLATION INSTRUCTIONS



WARNING

TO REDUCE THE RISK OF SEVERE INJURY OR DEATH, READ AND FOLLOW ALL INSTALLATION INSTRUCTIONS.

1. Installation of this door operator must be done by a qualified installer.
2. Insure that the door is properly installed and works freely in both directions. Do not install the operator until all door problems have been corrected. If necessary, oil all moving parts (chains, rollers, guides, etc.).
3. Remove all old accessories (locks, bolts, etc.) before installing door operator.
4. Do not connect the operator to a source of power until instructed to do so.
5. Locate control push-button station within sight of the door, at a minimum height of 5 ft. (1.53 m) so small children cannot reach it, and away from all moving parts of the door.

3.2 INSTALLATION OF MSJ OPERATOR

IMPORTANT NOTE: THIS OPERATOR MUST BE INSTALLED A MINIMUM OF 8 FT (2.4m) ABOVE FLOOR

1. Using the center of the door shaft drive as a reference point, locate four mounting holes. The optimum distance between the door shaft and operator drive shaft is between 12" and 15". Mount the MSJ unit by fastening it to the wall, bench or hood with 3/8" or 1/2" thru-bolts or if the wall is of such construction so as to prohibit use of thru-bolts, lag bolts and shields of sufficient size may be used. Do not tighten.
2. For mounting Dimension refer SPECIFICATIONS on page 4



MAKE CERTAIN THAT OPERATOR IS PERFECTLY ALIGNED WITH DOOR SHAFT OTHERWISE DAMAGE CAN OCCUR

- Place the driven sprocket on the door shaft loosely and align it with the drive sprocket of the operator.

NOTE: If a chain spreader has been ordered along with your operator, see Figure 4 and Figure 5 below for installation.

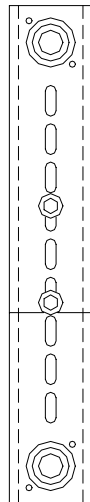


Figure 4 Chain spreader

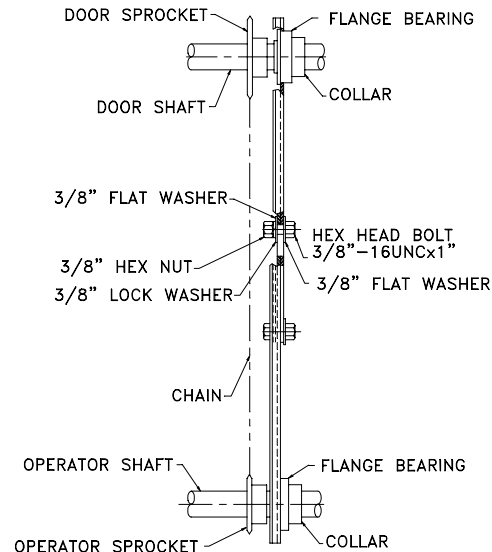


Figure 5 Chain spreader mounted on door and operator shafts

- Lock the drive and driven sprockets in place by inserting the keys and tightening their respective set screws. (Note: if no keyway exists in door shaft, drill a 1/4" hole through sprocket hub and door shaft, insert 1/4" spring pin through hole).
- Connect the sprockets with the drive chain, shorten to a suitable length and join together with the chain link provided in the hardware bag. To shorten the chain, punch out the pin that will leave an inside link nearest to the desired length. Connect the chain around the sprockets using the chain link (Figure 6).

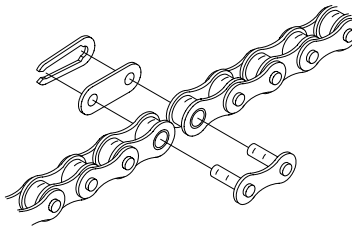


Figure 6 Chain link

- Slide the operator to tighten the drive chain and then firmly tighten the mounting bolts. Check the tension on the chain and the set screws on the sprockets (there should be no more than 1/4" slack when chain is depressed between sprockets).
- Run hand chain through the pocket wheel and chain guide outside the frame, allow both ends to hang down toward the ground and cut hand chain, if necessary, so that both ends are approximately 2 feet (0.6 m) from floor. Connect both ends of hand chain. Attach the cable to the chain hoist engaging lever (Figure 7) then pass it through the small pulley at the bottom of the frame. Allow the cable to hang down toward the ground and cut the cable, if necessary, so that cable end is approximately 4 feet (1.2m) from the floor. Connect the cable end to the disconnect lever and secure it with the U-bolt (Figure 8). Mount the floor level disconnect lever to the wall so as to allow the cable to be slightly loose when the lever is in the engaged position (upwards).

CAUTION

BEFORE PULLING HAND CHAIN THROUGH POCKET WHEEL, DEPRESS CAM PLATE AND SPIN CAM NUTS TO CENTER OF LIMIT SHAFT SO AS TO BE SURE THE CAMS ARE NOT BEING MECHANICALLY DRIVEN THROUGH THEIR NORMAL LIMIT SWITCH END POSITIONS.

NOTE: Floor level disconnect may serve as a chain keeper: Pull downward on disconnect lever and insert chain in upper slot as shown in Figure 8 below.

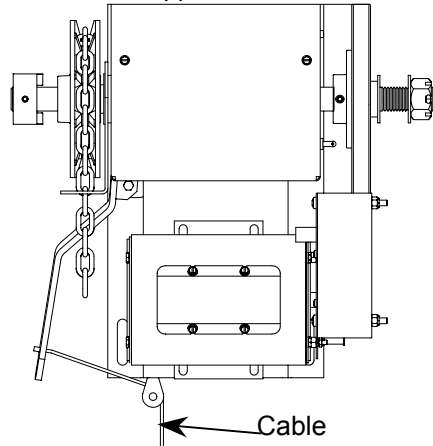


Figure 7 Installing cable on MSJ operator

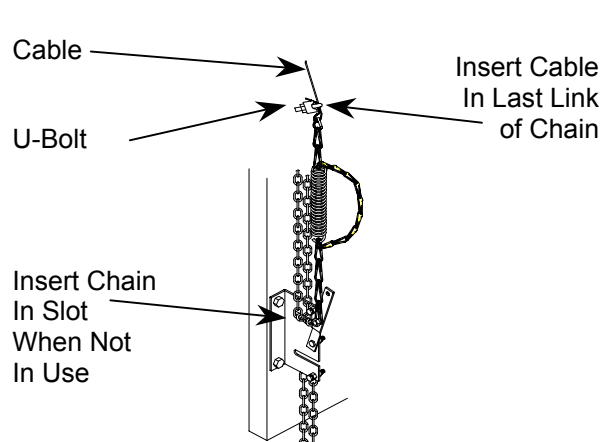


Figure 8 Floor disconnect for MSJ operator

LIMIT SWITCHES

WARNING

TO AVOID THE DANGER OF POSSIBLE DAMAGE TO THE DOOR AND OPERATOR, TRAVELLING CAMS MUST BE ADJUSTED TO THEIR APPROXIMATE POSITIONS BEFORE MANUALLY OPERATING THE DOOR OR BEFORE APPLYING POWER TO THE OPERATOR.

There are 4 limit switches. Two are used as end of travel, one is for radio-control or one-button operation and one is for reversing devices. These switches are activated by the rotary cams travelling on a threaded shaft (Figure 9).

- The *Open* limit switch is the end of travel in the open position. Adjust the cam so that the door stops in the open position at the desired location.
- The *Advanced Open* limit switch is used for radio-control and for a one-button (open/close) device. This limit switch is set to be activated slightly before the *Open* limit switch when opening.
- The *Close* limit switch is the end of travel in the closed position. Adjust the cam so that the door stops in the closed position at the desired location.
- The *Advanced Close* limit switch is used in the operation of the reversing edge or other reversing devices. This limit switch deactivates any reversing devices slightly before the door reaches its closed position to prevent the door from reversing when fully closed.

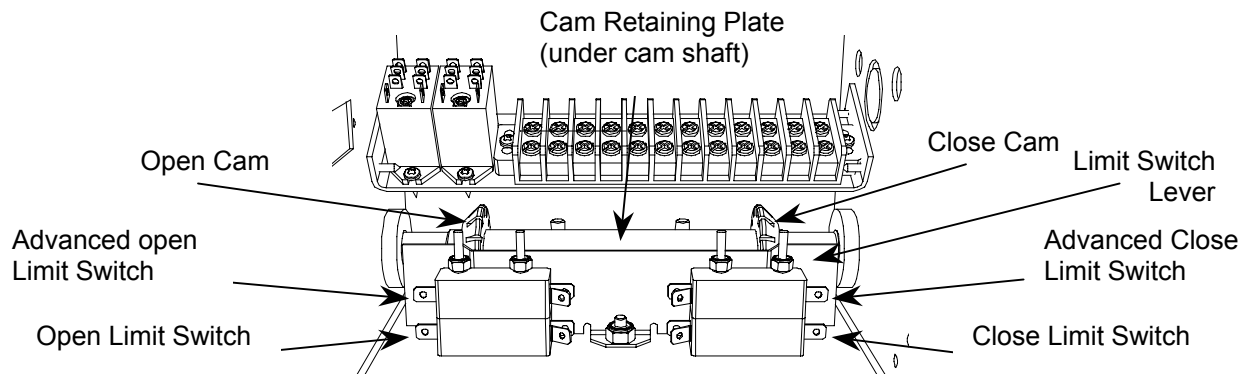


Figure 9 Limit switches

ADJUSTMENT OF LIMIT SWITCHES



WARNING

NEVER PLACE HANDS OR TOOLS INSIDE OPERATOR OR NEAR DRIVE MECHANISM UNLESS POWER IS OFF.

1. Remove the cover of the electrical enclosure.
2. Manually raise the door to a nearly opened position
3. Depress the travelling cam retaining bracket and rotate the *Open* cam (Figure 10).

Note: Turning the cam towards the center of the shaft increases door travel.
Turning the cam towards the switch decreases door travel.
4. Manually rotate the *Open* cam until it depresses the *Open* limit switch sufficiently so as to hear the switch click.
5. Release retaining bracket. Make sure that the bracket engages in the slots of both limit cams after each adjustment.
6. Manually lower the door to a nearly closed position and repeat steps 3 through 5 with the *Close* cam.
7. Upon completion of all wiring connections (section 3.4, 3.5 and 3.6), repeat steps 2 through 6 using the "Stop" button for adjustments of limit switches to their final, exact positions.

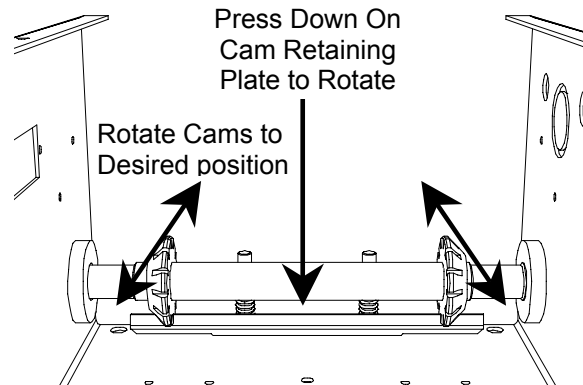


Figure 10 Adjusting the limit cams

3.3 MINIMUM SUGGESTED WIRE SIZE FOR CONTROL CIRCUIT

The control circuit operates at 24 VAC. Due to the resistance in the wire used to carry the control circuit voltage, it is important to use the appropriate wire size with respect to the distance between the operator and the push-button station.

Below is a chart (TABLE 2) indicating the minimum recommended wire size with respect to the total distance between the operator and the push-button station. DO NOT exceed the maximum distance. If there are several push-button stations in series you must ADD all these distances before selecting the appropriate wire gauge for your operator.

If the wire gauge is not suitable for the distance, problems in operation will be encountered such as chattering relays, premature wear of the contacts and possible tripping of the motor's thermal protection.

If a greater distance is required, a long distance interface module is suggested (consult factory).

When large gauge wire is used, a separate junction box will be needed for operator power connection (not supplied).

All power wiring to the operator should be installed by a qualified electrician and may vary with respect to conduit size and type as specified in the National Electrical Code, Article 430, allowing 5% voltage drop. Power must also be connected in accordance with local codes.

TABLE 2 WIRE SIZE vs. DISTANCE


24 VAC CONTROL WIRING	
Minimum suggested Wire gauge (AWG)	Maximum distance between operator and all push-button stations feet (meters)
22	50 (15)
20	100 (30)
18	150 (45)
16	250 (75)
14	350 (105)
12	450 (135)

3.4 WIRING OF THE MSJ OPERATOR

Do NOT connect any accessory controls until the limit switch adjustments have been completed and the operator is functioning properly.

Refer to the electrical diagrams on pages 21 and 22, the wiring specifications in TABLE 2 and the terminal input connections of Figure 17.

NOTE: For wiring of operators with Electronic Control Board, please consult the specific manual.



WARNING

EXERCISE CAUTION WHEN OPERATING MACHINE. THE DRIVE CHAIN AND LIMIT CHAIN, WHEN EXPOSED AND TURNING, COULD CAUSE SEVERE INJURY.

NOTE: Wiring diagrams will be found inside the control box cover. If the diagram is missing or has been lost, call the factory for a replacement. DO NOT INSTALL ANY WIRING OR ATTEMPT TO RUN THIS OPERATOR WITHOUT CONSULTING THE WIRING DIAGRAM.

Main Power Supply

Power to the operator is of the permanent connection type. Connect according to local electrical code. Ground the unit using the ground lug inside the control box.

For single phase operators, connect the power supply to terminals L (line) and N (neutral) on the main terminal strip.

For single phase operators, connect the power supply to terminals L1, L2, L3 on the main terminal strip.

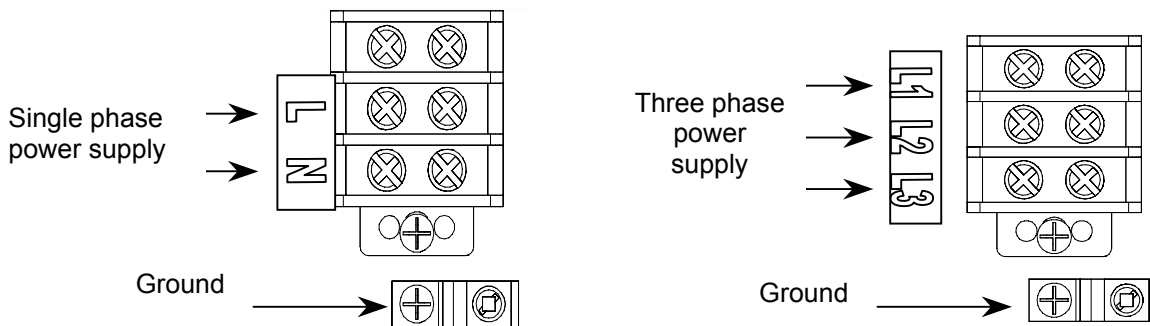


Figure 11 Power supply connection



WARNING

GROUND THE UNIT CORRECTLY USING THE COPPER GROUND LUG LOCATED INSIDE THE OPERATOR CONTROL BOX.

Note: All other connections on the terminal strip (1 to 9) are low voltage class II 24 VAC.

- External interlock between terminals 1 and 2. A jumper is factory installed between these two terminals. If an external interlock is used (such as interlocking between two doors), remove the jumper between 1 and 2 and wire the interlock between these two terminals.

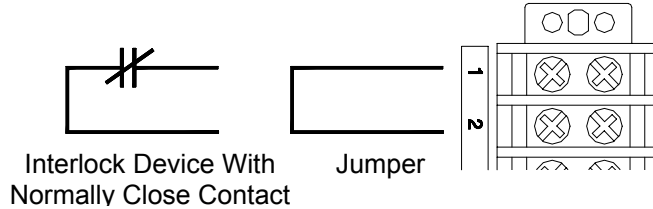


Figure 12 External interlock

- A 3 button push-button station (open/close/stop) can be wired to terminals 2, 3, 4 and 5. Two push-button stations can be wired to these same terminals by following the wiring diagrams on pages 21 and 22

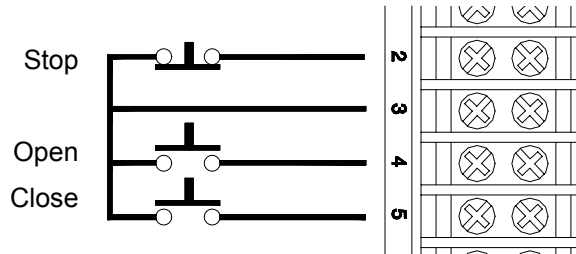


Figure 13 Three button push-button station

- Three terminals are provided for the wiring of a radio-control receiver. Terminal #9 is Ground, #7 is 24 VAC (common) and #8 is the relay contact provided by the radio-control receiver to activate the door to open or close. Furthermore, terminals 7, 8 and 9 are doubly available on the terminal strip inside and on a separate small terminal strip located on the side of the unit. This terminal makes it convenient to wire-up a standard single button radio receiver on the side of the unit. When the transmitter is activated, the door will open to the fully open position. From the fully open position, the door will close. If transmitter is activated while closing, the door will reverse to the fully open position.

NOTE: It may be required to reverse connections to 7 and 9 for other types or radio receivers (Allstar, Linear, Pulsar ...).

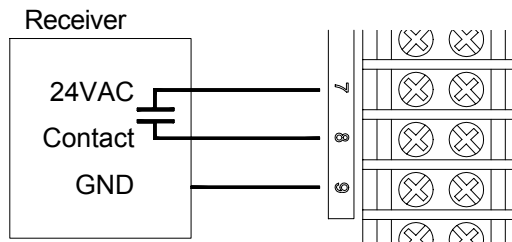


Figure 14 Radio-control

- A single button open/close door device can be wired to terminals 7 and 8 to behave in the same way as the radio control receiver.

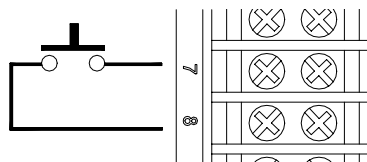


Figure 15 Single button device

NOTE: If several control devices are to be used, connect one and check for proper operation before connecting the next device.

- A reversing edge can be wired up to terminals 3 and 6 (see also section 3.6). These terminals can also be used for any other reversing devices such as loop detectors and photocells.

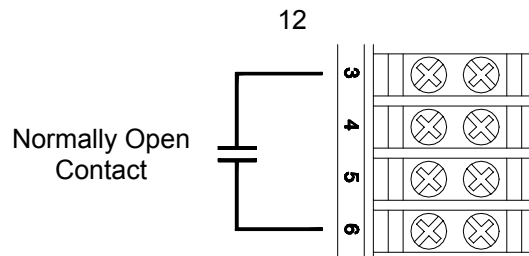


Figure 16 Reversing edge or other device

IMPORTANT: Upon completion of all wiring connections, readjust limits using "Open", "Close" and "Stop" buttons.

3.5 OPTIONAL CONTROL ACCESSORIES

- **Radio Controls:** Consists of a radio receiver unit and remote transmitters. These controls consist of an RF signal being emitted on a "pulse" basis to a mated receiver tuned to the same "pulse" rate. Once the receiver accepts the code, a relay is activated closing a set of contacts.
- **Photo-electric units:** Can be used as opening and reversing devices. An infra red light is emitted from the control to a reflector and back. If, during closing travel of the door, the light beam is broken, the door will reverse to the fully open position.
- **Digital Keypad:** Consists of a control head which is pedestal mounted. Similar to a telephone touch pad it allows the selective coding of a four number series. Once the programmed series of numbers is received in their set order, a relay closes and completes a circuit.
- **Card Reader:** A magnetic-mechanical device which accepts sealed and coded cards. The cards trigger magnets to raise in the cartridge head, releasing a lock mechanism which allows a deeper insertion of the card. The card then contacts a switch that closes the circuit.
- **Key Switch:** Momentary contact will open door. Can be wall or post mounted for interior or exterior use.

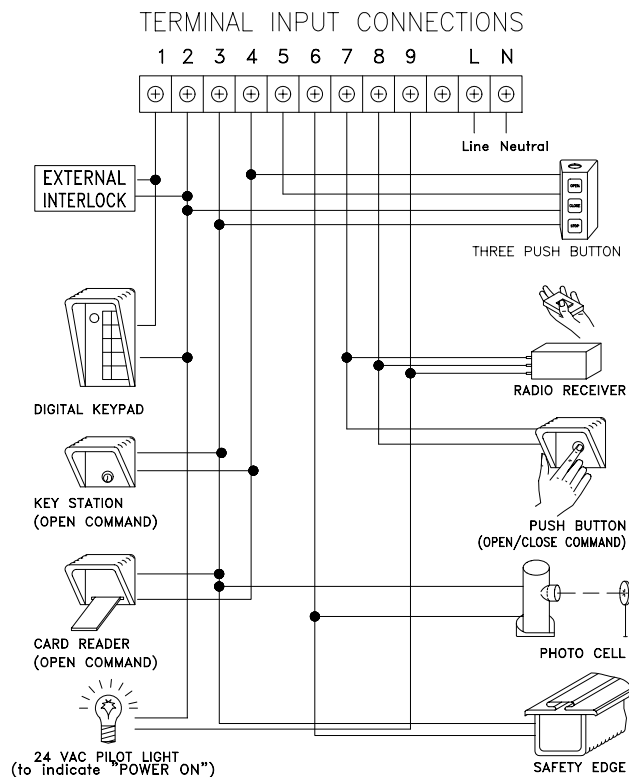


Figure 17 Terminal Input Connections

3.6 CONNECTION OF A REVERSING EDGE DEVICE

IMPORTANT NOTE: If the door is controlled by any device other than a constant pressure push-button station, a reversing edge must be connected.



CAUTION: Connect reversing device appropriate to installation.

Connection and installation of a reversing edge device is provided with the edge (see also Figure 18). Any such device that uses a normally open contact may be connected to terminals 3 and 6 on the low voltage terminal block (Figure 16). When the door comes in contact with an object during downward travel, the circuit will cause the motor to reverse the door to the fully open position. In addition, there is a cut-off limit switch (*advanced close limit switch*) that will de-activate the reversing edge during the last few inches of the door's downward travel.

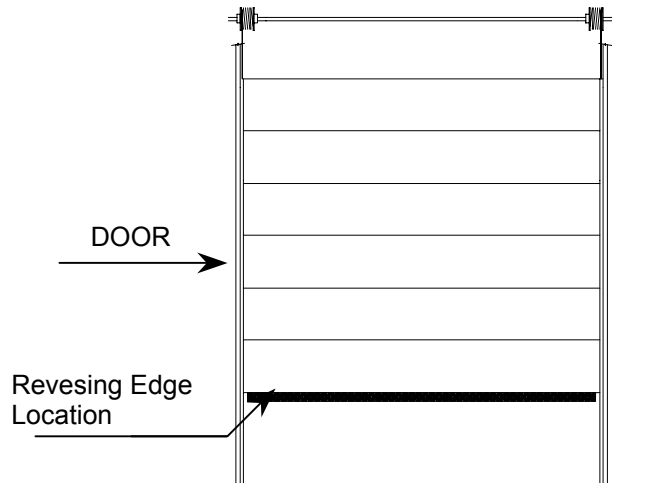


Figure 18 Reversing Edge

3.7 CLUTCH ADJUSTMENT

1. Remove cotter pin. When installing for the first time the cotter pin is found taped on the pulley (Figure 19).
2. Rotate clutch adjustment nut counter-clockwise until there is insufficient tension on clutch to drive door.
3. Rotate the nut clockwise gradually until there is just enough tension on clutch to permit operator to move door smoothly, but to allow clutch to slip if door is obstructed. When clutch is properly adjusted it should be possible to stop door by hand during travel.
4. Insert cotter pin inside the shaft hole in order to lock the clutch nut into place.



WARNING

THE FRICTION CLUTCH IS DESIGNED TO PROTECT VEHICLES AND DOOR HARDWARE AGAINST DAMAGE. IT IS NOT INTENDED TO PROTECT PEOPLE. ALL DOORS SERVING PERSONNEL ARE TO BE FITTED WITH AN APPROPRIATE REVERSING DEVICE OR REVERSING EDGE TO PREVENT INJURY OR DEATH.

We strongly recommend the use of an automatic reversing device. Several types are available as accessories.

Consult your dealer for a recommendation.

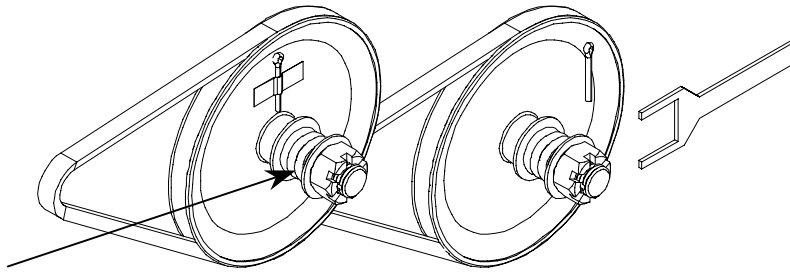


Figure 19 Clutch adjustment

3.8 BRAKE ADJUSTMENT

- The brake is factory set. However, after extensive use the brake may need to be adjusted.
- In order to obtain best performance and maximum life, the brake must be adjusted for:
 - Proper clearance between the brake band and the brake drum when the solenoid is energized.
 - Correct brake tensioning when the solenoid is de-energized.

TO ADJUST THE BRAKE SYSTEM:

1. Remove the solenoid cover (Figure 20).
2. Slightly unscrew the pivot nut (Figure 20).
3. To adjust the brake band tension, move the adjustment lever. To increase tension, move the lever away from the motor. To decrease tension, move the lever toward the motor (Figure 21).
4. Tighten the pivot nut
5. Check clearance but manually holding the solenoid plunger. The brake drum should rotate easily by hand.
6. After adjustment is done, re-install the solenoid cover.

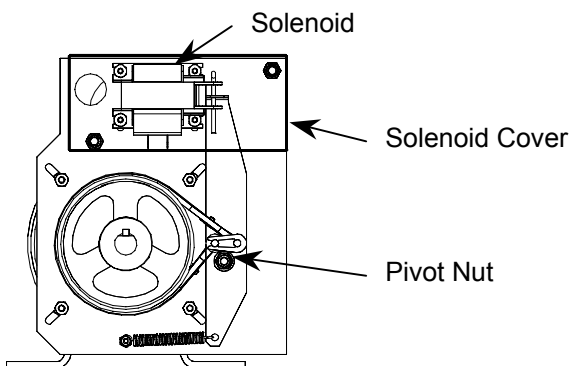


Figure 20 Brake system

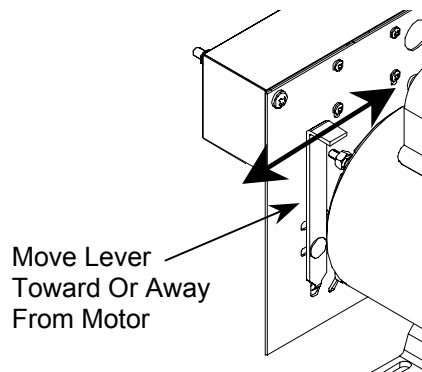


Figure 21 Brake adjustment

4. MANUAL OPERATION OF MSJ OPERATOR



WARNING

STAND CLEAR OF DOOR AND VERIFY THAT DOOR-WAY IS CLEAR, THEN PULL EMERGENCY RELEASE DISCONNECT LEVER TO DISCONNECT OPERATOR FOR MANUAL OPERATION OF DOOR.

The MSJ operator is equipped with an emergency chain hoist and floor level disconnect mechanism to operate the door manually, if necessary. To manually operate the door:

1. Pull the disconnect lever downwards to the "disengaged" position (Figure 22). A positive engaging coupling disengages the initial drive mechanism from electrical operation and transfers it to manual chain hoist drive. A switch disconnects the electrical controls to prevent injuries.
2. Operate the door manually by pulling downward on one side of the chain. Pulling the other side will cause door to move in the opposite direction. (See Figure 23).
3. To return to electrical operation merely pull lever upwards to the "engaged" position (Figure 24).

**WARNING**

DO NOT ATTEMPT TO DISENGAGE THE OPERATOR WHILE OPERATOR IS RUNNING. DO NOT ATTEMPT TO MANUALLY FORCE A MALFUNCTIONING DOOR TO OPEN OR CLOSE. THIS IS AN EMERGENCY DEVICE AND IS NOT DESIGNED TO OPERATE A DOOR WITH SERIOUS MECHANICAL PROBLEMS.

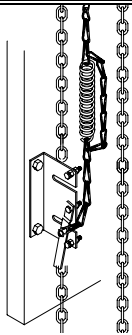


Figure 22 Disengaged position

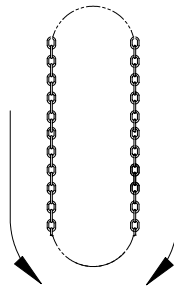


Figure 23 Operating chain to open and close door

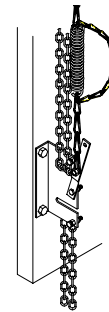


Figure 24 Engaged position

5. OPERATOR START-UP AND TESTING GUIDE

This guide is a procedure you can follow to test every feature of your jackshaft operator.

If a 3 button push-button station is wired to the operator, disconnect it and then place a normally-closed contact between terminals 2 and 3 to simulate a "Stop" push-button (use a spare limit switch or any such device). Interrupting the power between these terminals will stop the operator.

Using a small wire jumper, momentarily jump (short-circuit) the following terminals:

- A. Momentarily jump terminals 3 and 4.
The door will open instantly. Allow it open completely.
- B. Momentarily jump terminals 3 and 5.
The door will close instantly. Allow it close completely.
- C. Momentarily jump terminals 7 and 8.
The door will open instantly. Allow it to open completely.
- D. Momentarily jump terminals 7 and 8.
The door will close instantly. While closing, go to step E.
- E. Momentarily jump terminals 7 and 8 again.
The door will reverse to open. Allow it to open completely.
- F. Momentarily jump terminals 7 and 8.
The door will close. While closing, go to step G.
- G. Momentarily jump terminals 3 and 6.
The door will reverse to open. Allow it to open completely.
- H. Momentarily jump terminals 7 and 8 again.
The door will close. Allow it to close completely.
- I. Momentarily jump terminals 3 and 6.
The door should remain still.

This procedure can be repeated using the radio-control terminal strip located on the outside of the control box by using terminals "24VAC" and "CONTACT" instead of terminals 7 and 8.

6. TROUBLE-SHOOTING GUIDE

All operators are thoroughly tested and adjusted before shipping. In most cases, a problem will arise after installation and hook-up to external devices.

If after connecting external devices to the operator, you encounter problems, the trouble often lies in the external devices or in the wiring leading to the external devices. Verify all external wiring making certain that there are no wires pinched anywhere shorting to ground and that there are no voltages being sent into the control circuit. The operator functions ONLY with dry contacts: all voltages necessary for proper functioning are generated by the operator transformer.

The following trouble-shooting guide (TABLE 3) will help you identify the source of the problem given a particular symptom.

TABLE 3 TROUBLE-SHOOTING GUIDE

SYMPTOM	PROBABLE CAUSE	SUGGESTED ACTION
Door will not respond to "open" or "close" push-buttons.	Motor has overworked and the overload thermal protection has tripped.	Reset the overload protection: press reset button located on the side of the unit for a single phase operator. For a three-phase operator, the thermal switch is inside the motor, let the motor cool and restart operator. Is the door unbalanced?
	Circuit breaker tripped (if used).	Reset circuit breaker.
	Fuse is blown.	Replace fuse. If control circuit fuse keeps blowing: Disconnect all external devices. Leave power terminals connected. (Remove power to power terminals). Run the operator artificially by using jumpers and shorting out the appropriate terminals as indicated in the Start-Up and Testing Guide. Then reconnect the various external devices one by one until you find the one causing the short to ground. OR: If you have an ohm-meter, use it to check all incoming wires for continuity to ground. The meter should read infinity in all instances. If there is conduction between any control circuit wire and ground, this indicates a leak to ground and this is why the control circuit fuse blows when power is applied. In some cases, the trouble is intermittent: i.e. the fuse only blows at certain times. This problem is more difficult to detect, but again: disconnect all wires going to external devices, and run the operator: if the fuse does not blow, this indicates that the trouble resides outside the operator.
	Transformer defective.	Replace.
	Defective "stop" push-button.	Replace.
	Loose connection in one of the push-buttons.	Verify, tighten or replace.
	Defective "open" or "close" push-button.	Replace.
Door will not respond to "open" command, but will respond to "close" command.	Defective "open" push-button.	Replace.
	Defective "open" limit switch.	Replace
	Loose wire on "open" push-button, "open" limit switch or coil of open contactor.	Verify, tighten or replace.
Door will not respond to "close" command, but will respond to "open" command.	Defective "close" push-button.	Replace.
	Defective "close" limit switch .	Adjust
	Loose wire on close push-button, close limit switch or coil of close contactor.	Verify, tighten or replace.
Door moves in wrong direction with a three phase motor	Incorrect phasing.	Interchange any two power leads.
Door closes by itself and operator does not shut-off at the end of closing travel.	"close" contactor is defective.	Verify and replace.

Door opens by itself and operator does not shut-off at the end of opening travel.	"close" limit switch defective	Verify and replace.
	"open" contactor is defective.	Verify and replace.
Door coasts when stopped at any position.	Brake pad is worn out or requires adjustment.	Replace or adjust.
Sensing edge does not reverse door.	Pneumatic hose broken, electrical wiring not connected.	Contact a qualified installer.
Reversing devices will open the door when the door is closed.	The <i>advanced close</i> limit switch is defective.	Replace.
	The <i>advanced close</i> limit switch is not being engaged by travelling cam.	The <i>advanced close</i> limit switch needs to be adjusted just slightly ahead of the end of travel <i>Close</i> limit switch.
When door closes it reverses to fully open after it hits the floor.	The <i>advanced close</i> limit switch is defective.	Replace.
	The <i>advanced close</i> limit switch is not being engaged by travelling cam.	The <i>advanced close</i> limit switch needs to be adjusted just slightly ahead of the end of travel <i>Close</i> limit switch.
	A "Close" command is being given.	Check "Close" push-button or any closing device for short-circuit.
Radio-control does not function or hesitates for 10 seconds before working.	It is normal for a radio receiver to take up to 10 seconds to "warm-up" before being fully operational. Therefore, when applying power for the first time, the radio-control will take 10 seconds before becoming fully operational.	Check protocol code pins of the transmitter and receiver: they must be the same. Press on the transmitter and listen to the receiver: you should hear a faint click. The transmitter battery may be dead or your receiver may need servicing. To test for radio-control function, short out momentarily terminals 7 and 8 on the terminal strip. Operator should function normally. Have the radio-control verified: the mini-relay inside the receiver may be defective.
Motor hums, starts when spun.	Capacitor defective.	Replace
Motor fails to shut off at fully closed or opened positions.	Defective limit switch.	Operate limit switch manually while door is moving. If door does not stop, replace switch.
	Limit cams are not adjusted.	Verify and adjust.
	Limit drive chain broken.	Replace.
	Loose sprocket on limit shaft.	Tighten set screw.
	Limit shaft does not rotate.	Verify and replace accordingly.
Motor turns but door does not move.	Sprocket key is missing.	Replace.
	Drive chain is broken.	Replace.
	Clutch is slipping.	Adjust clutch tension.
Motor hums or does not run.	Door locked or jammed.	Verify manual operation of door.
	Dead phase (three phase supply).	Check power supply, fuses on each phase.
	Brake does not release.	Check wires to brake solenoid. Verify and adjust brake tension.
Limit switches do not hold their setting.	Loose drive or limit chain allows chain to jump sprocket teeth.	Adjust chain to proper tension
	Limit cam retainer not engaging slots in limit cams.	Be sure retainer is in slots of BOTH cams.
	Limit cams are binding on shaft threads which allows them to jump position on retainer.	Lubricate shaft threads. Limit cams should turn freely.

Radio-control opens and reverses the door, but when the door is fully opened, will close the door a little and bounce back to the open position again. Door cannot be closed except by the "close" push-button.	The <i>Advanced Open</i> limit switch is insufficiently advanced from the full <i>Open</i> limit switch. The contact of the radio-control receiver is maintained for 1.5 seconds when a command is issued by the radio transmitter. Therefore, when the door is fully opened, and a pulse is sent from the transmitter, the receiver maintains the contact closed for 1.5 seconds. If the door has closed and the <i>Advanced Open</i> limit switch has returned to its normal state, the reversing relay will be activated, and the door bounces back to the open position.	Adjust the <i>Advanced Open</i> limit switch by bending the switch arm away from the <i>Open</i> limit switch arm and more towards the travelling cam.
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7. SCHEDULED MAINTENANCE

Inspection and service should be performed anytime a malfunction is observed or suspected.



WARNING

WHEN SERVICING - ALWAYS DISCONNECT OPERATOR FROM POWER SUPPLY

7.1 MECHANICAL

The door area should always be kept clear of dirt, rocks or any other substance to insure proper operation.

EVERY 3 MONTHS	- Check and adjust the clutch, if necessary.
EVERY 6 MONTHS	<ul style="list-style-type: none"> - Lubricate all moving parts, Bushing are oil impregnated and are lubricated for life. - Verify that all mechanical parts function properly. - Inspect the V-belt and adjust or replace if necessary. - Manually operate the door. If the door does not open or close freely, correct the cause of the malfunction.
ONCE A YEAR	<ul style="list-style-type: none"> - Inspect all bolts and screws and tighten if necessary. - Check for any excessive slack in chains and adjust or replace them if necessary. The limit switches may have to be reset after a chain adjustment. - Inspect the door for wear and damage. - Run the operator a few cycles: <ul style="list-style-type: none"> Make sure that the door rollers are rolling smoothly on the track. Listen to the motor: The motor should hum quietly and smoothly. Verify that the limit operates quietly and smoothly: investigate any unusual noise. - Verify that the mooring bolts are holding the unit securely. - Inspect the unit for evidence of corrosion.

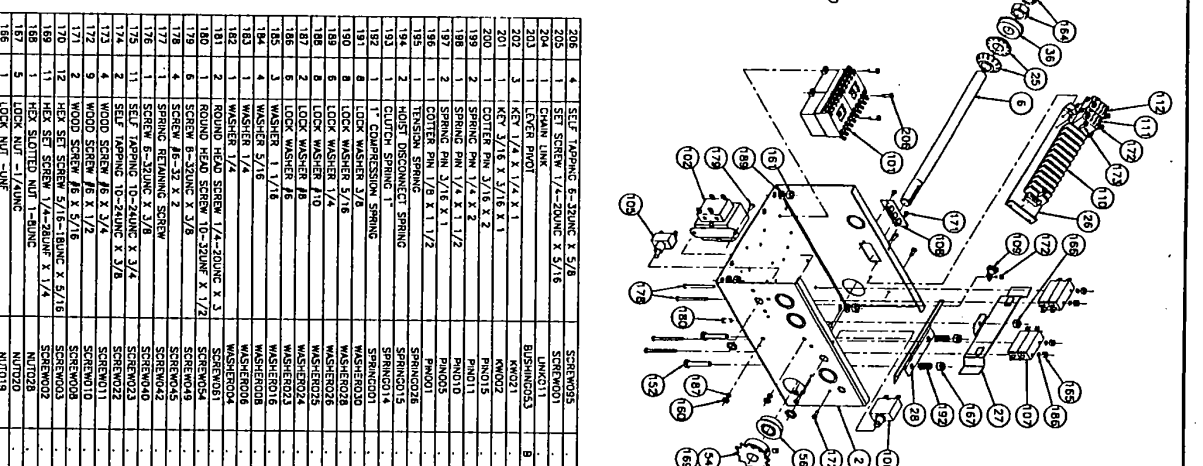
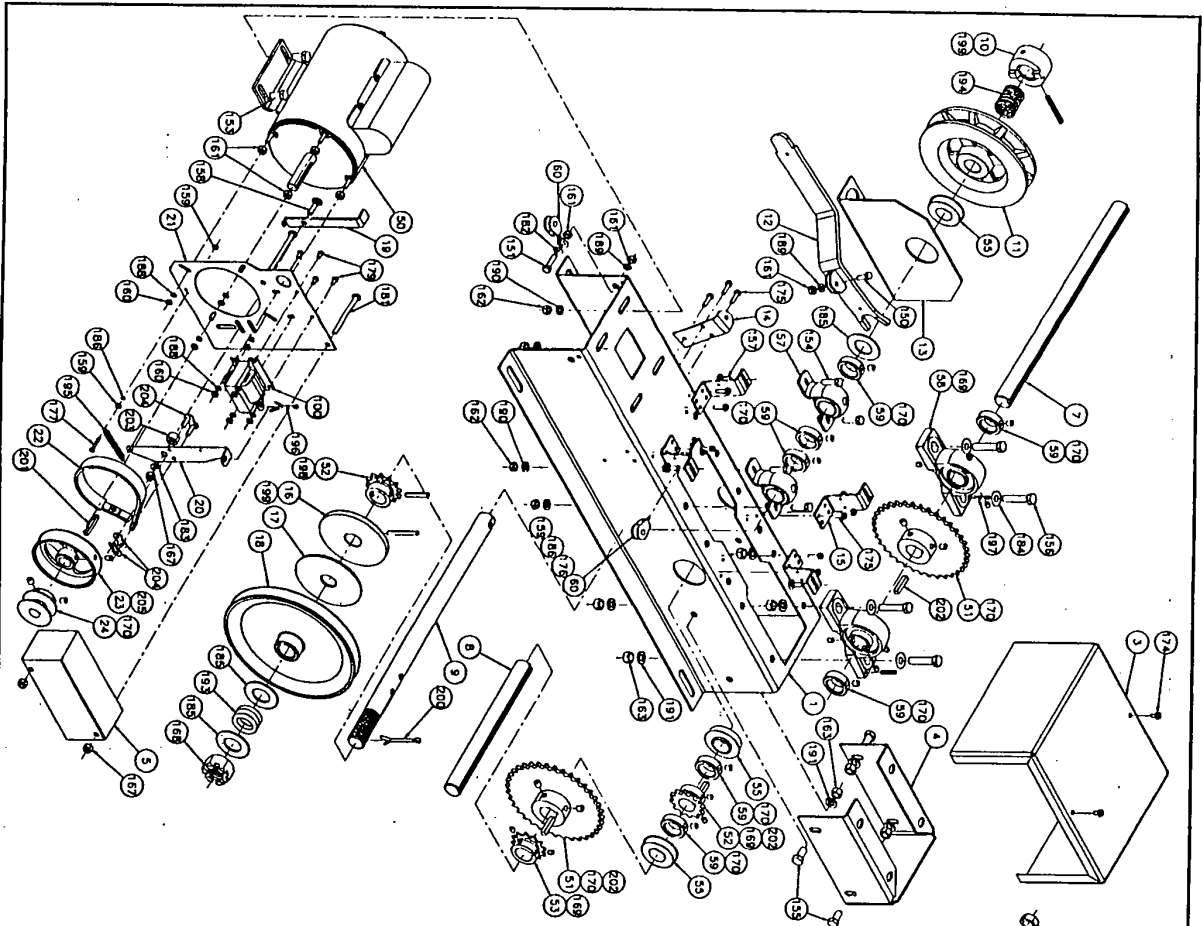
7.2 ELECTRICAL



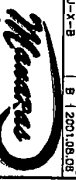
WARNING

BEFORE OPENING THE CONTROL BOX COVER, DISCONNECT OPERATOR FROM POWER SUPPLY

- Inspect the wiring compartment and remove any dirt from the control units.
- Verify all the grounding wires and terminations for corrosion. Be particularly careful to check the ground wires.
- Check the terminal strip to insure that all the screws are tight.
- Verify that the safety edge or other safety device installed on the operator are fully operational.
- Verify the voltage at the input terminals while the operator is running. The voltage must not drop more than 10% momentarily. If the voltage drop is too deep when running, the relays may chatter, the contact points will wear prematurely and may eventually weld. Verify the power terminations for corrosion.
- Verify the current consumption of the unit with an amp-meter. The value of current should be consistent with the name-plate specifications. Investigate any anomaly.



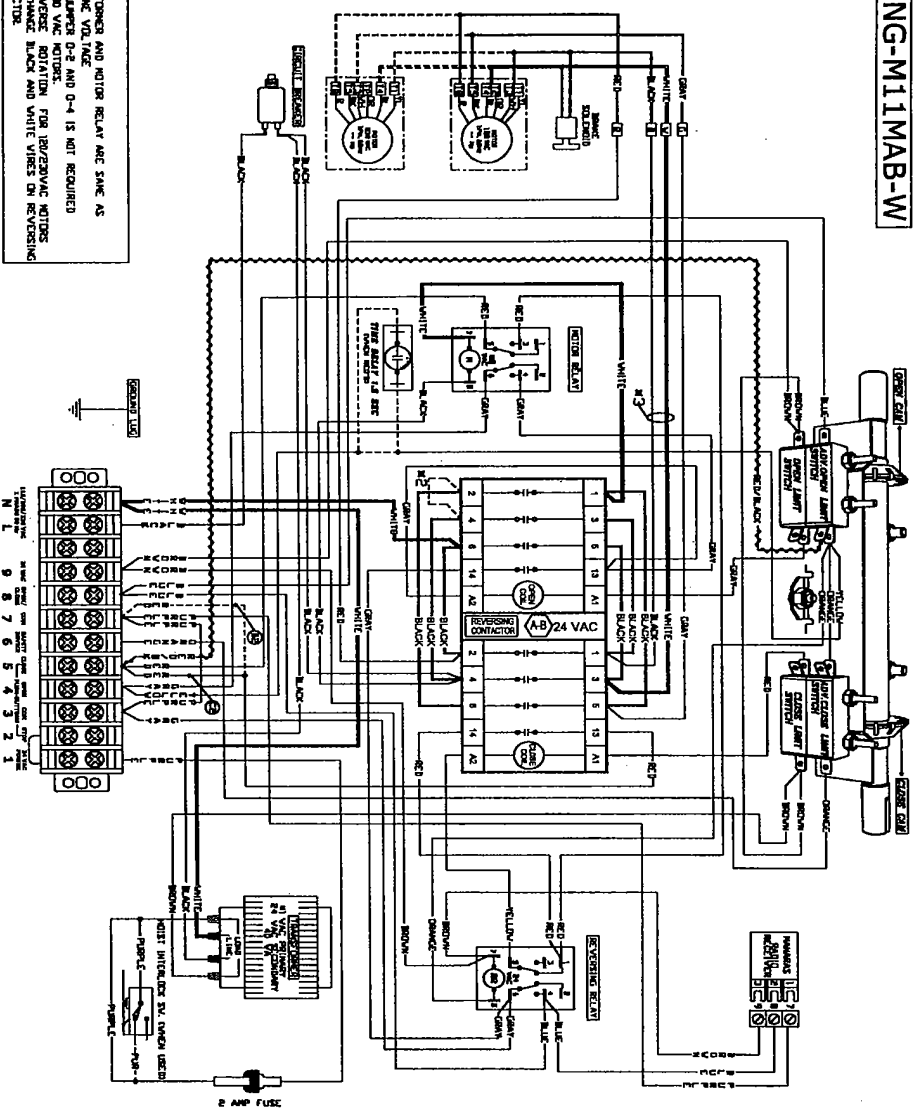
PARTS IDENTIFICATION			
#	QTY	DESCRIPTION	MANUFACTURER
1	1	FLANGE	RAYBROD 3
2	1	CONTROL BOX COVER	RAYBROD 3
3	1	BRACKET	RAYBROD 3
4	1	SOLENOID COCKER	RAYBROD 3
5	1	SOLENOID COCKER	RAYBROD 3
6	1	SOLENOID COCKER	RAYBROD 3
7	1	SOLENOID COCKER	RAYBROD 3
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99	1	SOLENOID COCKER	RAYBROD 3
100	1	SOLENOID COCKER	RAYBROD 3



MSJ
 WARTIME BEAUCHEMIN 3000.01.071 MSJ-X-B B 2007.08.08

DRAWING-M11MAB-W

NOTE:-
 #1 TRANSFORMER AND MOTOR RELAY ARE SAME AS THE LINE VOLTAGE
 #2 BLUE JUMPER 0-2 AND 0-4 IS NOT REQUIRED
 #3 TO REVERSE ROTATION FOR REVERSING MOTORS REMOVE BLACK AND WHITE WIRES ON REVERSING CONTACTS



LINE POWER	24 VAC POWER	EXTERNAL INTERLOCK	SAFETY RESTRICTIONS	OPEN/CLOSE COMMAND

PUSH-BUTTON STATION	TWO PUSH-BUTTON STATION

RADIO CONTROL

ATTENTION- USE 180V OR HIGHER FOR WIRING ALL EXTERNAL CONNECTIONS
--

1 ON STATE MODIFICATIONS

NOTE: C2 ↔ B2
 REMOVE THE RED WIRE WITH RAPID CONNECTOR FROM TERMINAL #5, AND TRANSFER IT TO TERMINAL #7.

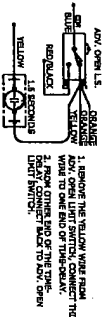
REMOVE THE RED WIRE WITH RAPID CONNECTOR FROM TERMINAL #7, AND TRANSFER IT TO TERMINAL #5.
 B2 ↔ C2

WARNING:
 MOTORIZED DOORS CAN CAUSE SERIOUS INJURIES OR DEATH. MANNARAS STRONGLY RECOMMENDS THE USE OF ENTRAPMENT PROTECTION SYSTEMS, ESPECIALLY IN THE CASES OF MOMENTARY CONTACT TO CLOSE AS IN B2 WIRING OR TIMER TO CLOSE.

2 CONSTANT PRESSURE OPEN
 1. REMOVE THE GRAY WIRE FROM TERMINAL #3 AND PLACE IT ON TERMINAL #4

3 WIRING FOR INSTANT STOP (ON SAFETY EDGE OR DEVICES)
 1. REMOVE THE YELLOW WIRE FROM ADV OPEN LIMIT SWITCH, AND CAP IT.
 2. REMOVE THE BLUE WIRE FROM PIN # 4 OR REVERSING RELAY (RR) AND CAP IT.

4 ADDING A TIME DELAY ON REVERSE



5 CONSTANT PRESSURE OPEN & CLOSE - BI
 PERFORM THE MODIFICATION EXPLAINED IN THE NOTES, 1B 3 AND 3

6 ANY OTHER OPTIONS
 FOR ANY OTHER OPTIONS, THERE TO CLOSE, FOR STOP, REVERSE, LONG DISTANCE MODULE, OR ANY OTHER SPECIAL LOGIC SEQUENCE, PLEASE CONSULT MANNARAS AT 1-800-561-8280/1-888-77-0303(USA).

WIRING DIAGRAM FOR M/MS/MT/MTBH 120/230 VAC, 1 PHASE MOTORS

PROJECT: _____ TITLE: M11MAB-W

DATE: _____

DESIGN: _____

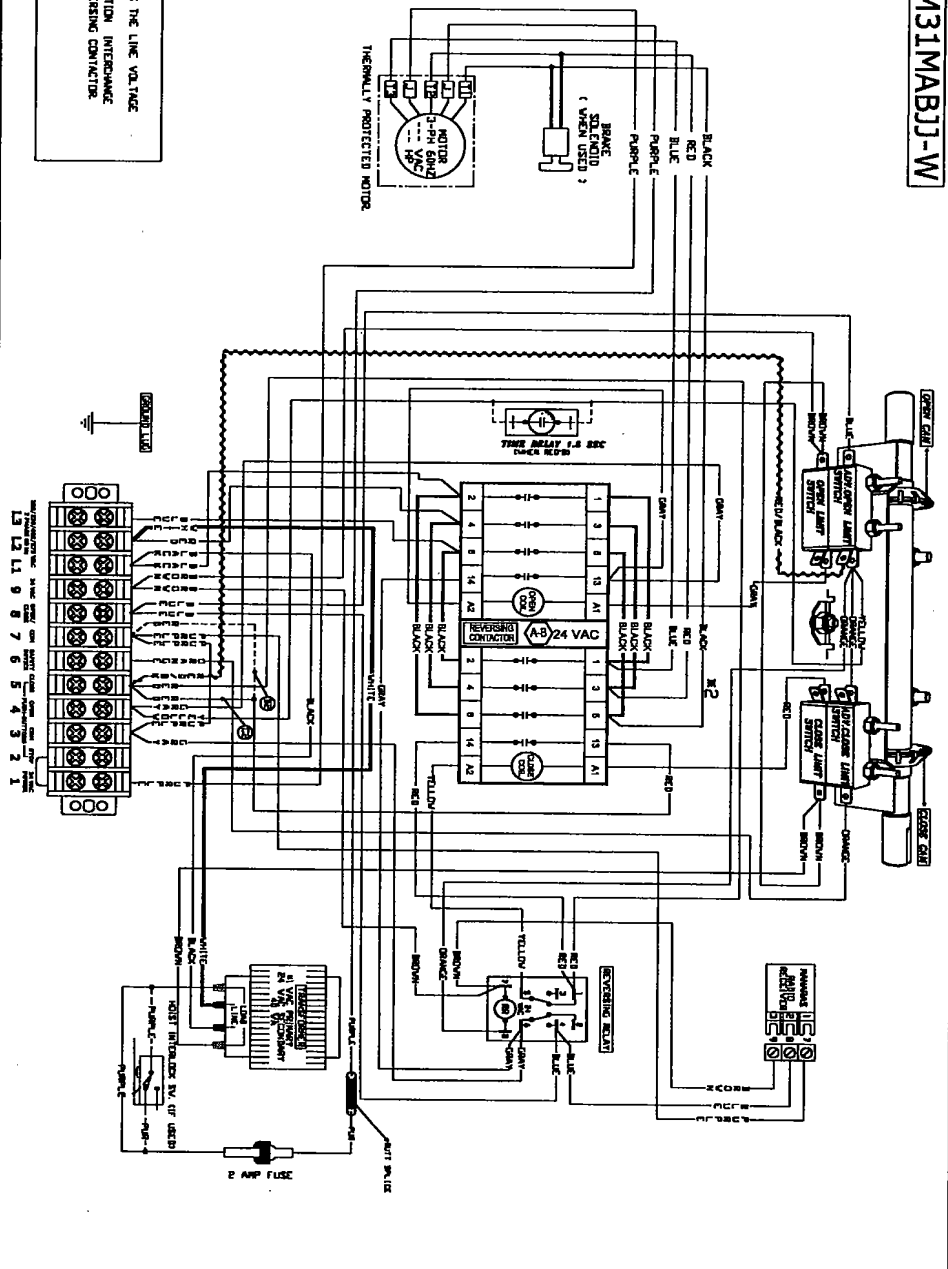
ENGINEER: _____

DISTRIBUTION: _____

M.F.D. BY: MANNARAS AUTO DOORS, INC.

DRAWING-M31MABJ-W

NOTE--
 48 TO REVERSE MOTOR DIRECTION INTERCHANGE
 ANY TWO WIRES ON REVERSING CONTACTOR.



LINE POWER	24 VAC POWER	EXTERNAL INTERLOCK	SAFETY REVERSE	OPEN/CLASS COMMAND	PUSH-BUTTON STATION	TWO PUSH-BUTTON STATION	RADIO CONTROL
L1 L2 L3 	1 9 	1 2 	3 6 	7 8 	2 3 4 5 	2 3 4 5 	7 8 9

ATTENTION-- USE 18AWG OR HIGHER FOR WIRING ALL EXTERNAL CONNECTIONS

PROJECT	TITLE
M31MABJ-W	WIRING DIAGRAM FOR M/WCS/INT/NTSH 208/480/575 VAC, 3 PHASE MOTORS
DATE	REV
REV 01	01
DESIGNER	DISTRIBUTION
	M.P.D. BY MANARAS AUTO DOORS INC.



- ON SITE MODIFICATIONS

NOTE:
 C2 ↔ B2
 [1A] REMOVE THE RED WIRE WITH RAPID CONNECTOR FROM TERMINAL #5, AND TRANSFER IT TO TERMINAL #7.
 B2 ↔ C2
 [1B] REMOVE THE RED WIRE WITH RAPID CONNECTOR FROM TERMINAL #7, AND TRANSFER IT TO TERMINAL #5.

WARNING:
 MOTORIZED DOORS CAN CAUSE SERIOUS INJURIES OR DEATH. MANARAS STRONGLY RECOMMENDS THE USE OF ENTRAPMENT PROTECTION SYSTEMS, ESPECIALLY IN THE CASES OF MOMENTARY CONTACT TO CLOSE AS IN B2 WIRING OR THICK TO CLOSE.

- CONSTANT PRESSURE OPEN
- REMOVE THE GRAY WIRE FROM TERMINAL #3 AND PLACE IT ON TERMINAL #4
- WIRING FOR INSTANT STOP (ON SAFETY STOP OR SERVICE)
 1. REMOVE THE YELLOW WIRE FROM ADV. OPEN LIMIT SWITCH, AND CAP IT.
 2. REMOVE THE BLUE WIRE FROM PIN # 4 OR REVERSING RELAY (RS) AND CAP IT.

ADDING A TIME DELAY ON REVERSE

ADV. OPEN L.S.
 1. REMOVE THE YELLOW WIRE FROM THIS WIRE TO ONE END OF THE TIME-DELAY RELAY.
 2. REMOVE THE OTHER END OF THE TIME-DELAY RELAY AND CONNECT IT TO THE YELLOW WIRE FROM THE STOP LIMIT SWITCH.

- CONSTANT PRESSURE OPEN & CLOSE - DI PERFORM THE MODIFICATION EXPLAINED IN THE NOTES, [1B], [2] AND [3]
- ANY OTHER OPTIONS

FOR ANY OTHER OPTIONS PLEASE CONTACT OUR SALES DEPARTMENT AT 1-800-561-4280/1-800-57-8737 (USA)

NOTES



Customer Service and Technical Support

US Toll Free Number: 1-866-776-7372

CANADA Toll Free Number: 1-800-361-2260