



Door Operator Conversion Package

Operating instructions

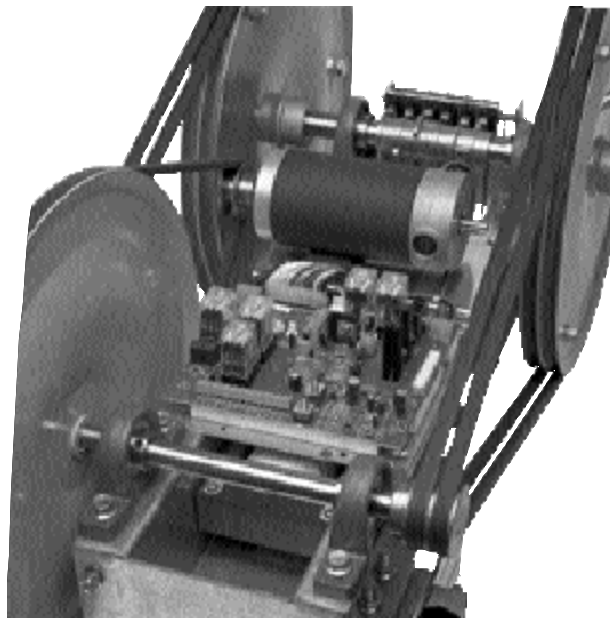
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Version 01.24.2003
Approved SS/MM
Elevator Solutions Intl Inc.

Door Operator Conversion Package:

Type M to Standard Range or High Performance with SSC Board

01.2003

D20CMUS



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1 General information prior to installation

1.1 Purpose

This product instruction provides a brief description of the features and components of the Type M door operator conversion package. This product instruction also provides Field Personnel with information on installation procedures, operation checks, and adjustments.

1.2 Liability and guarantee

This instruction booklet is written for people who are familiar with elevator servicing and installation. Competent knowledge of elevators is essential.

WITTUR accepts no responsibility for damage caused as a result of actions other than those stated in these operation instructions.

The WITTUR guarantee may be void if parts other than those described in these instructions are installed. Always consider safety first and follow your company's safety and installation procedures.



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2 Equipment description

2.1 Equipment description

The Standard Range is a standard performance door operator, most commonly used with a speed of 1FPS to 2 FPS (average 1.5 FPS, peak 2.5 FPS). The Standard Range door operator with SSC Board has the following operations and features:

- > Door control power
- > Current control
- > Speed & travel limits
- > Acceleration & deceleration
- > Diagnostics & switch adjusting
- > Auxiliary piloting

Door control power. The Standard Range door operator control uses a low voltage permanent magnet DC motor. The DC motor is powered by pulse width modulated power (high speed switching - 20,000 hz). The motor responds to average voltage of high frequency pulses, and not individual pulses.

Current control. The Standard Range door operator control has a current sensing circuit in both open and closed directions to supply feedback to the speed control circuit. This current sensing circuit regulates closing door force, and open/stall current caused by a hooked interlock. The current sensing circuit also guarantees that the Standard Range door operator control relay contacts do not break or make when motor armature current is present—helping to prevent damage to relay contacts. Motor direction is controlled by reversing the armature connection using a conventional relay system.

Speed & travel limits. The Standard Range door operator control selects speed and travel limits with cam operated microswitches. These microswitches operate relays tied into the speed direction circuits.

Acceleration & deceleration. The Standard Range door operator control has an internal soft-start circuit which regulates smooth acceleration and deceleration.

Soft-start circuit allows average motor voltage to change gradually when speeds change.

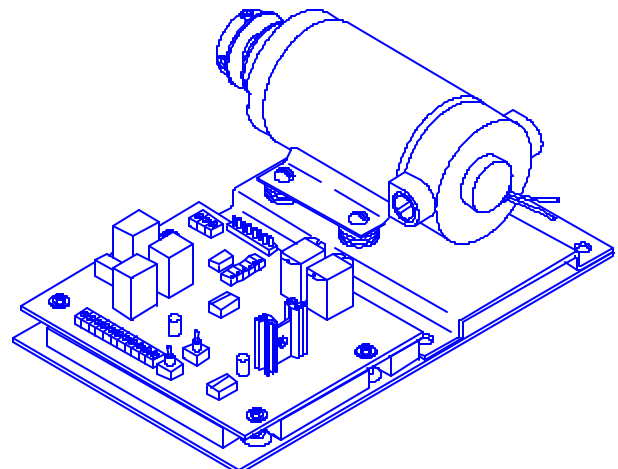
Diagnostics & adjusting switches. The Standard Range door operator control has two small toggle switches mounted on the common circuitboard. The TEST/RUN switch and O-OFF-C switch are used to:

- > Signal door opening or closing from the car top during diagnostics and adjusting
- > Disconnect the door open and close signals
- > De-activate the internal shutdown timer

Auxiliary piloting. The Standard Range door operator control also has a Form "C" Open and a Form "C" Closed relay contact for auxiliary piloting.

The Type M to the Standard Range door operator conversion kit contains the following.

- > Door control with SSC Board/motor assembly
- > Standard Range bottom cover
- > Cover (top)
- > 13 connector cable for wiring microswitches
- > Mounting hardware



Door control with SSC Board/ motor assembly



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3 Converting door operator components

3.1 Converting door operator components

Complete the following to convert Type M door operator components to the Standard Range Board 1Ø4® door operator components.

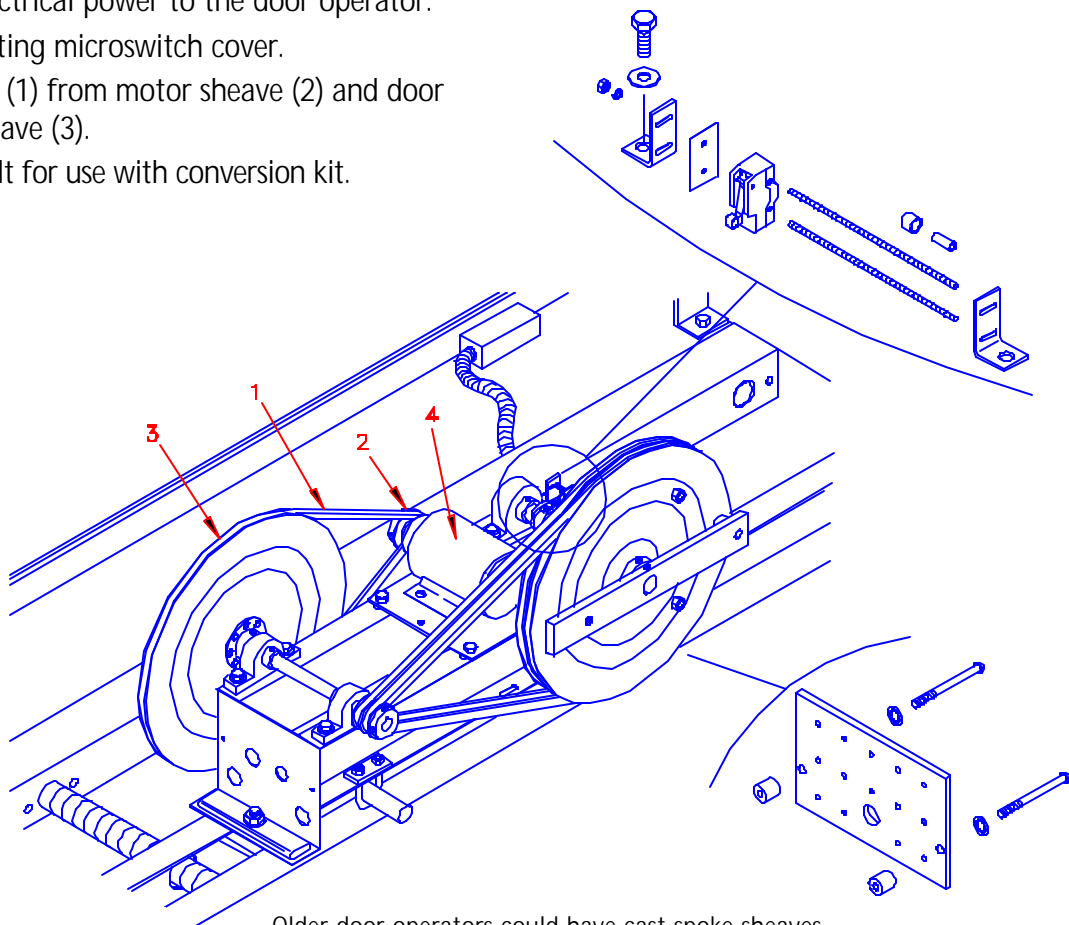
- > Removing Type M components
- > Installing SSC Board components
- > Wiring SSC Board components
- > Installing new cover

4. Remove motor mounting hardware and remove old motor (4) and mounting plate.
5. Disconnect controller wires at door operator, and tag the wires for identification. Remove terminal board.
6. Remove all wiring to the microswitches - including jumpers.
7. Disconnect wires at controller, and tag the wires for identification.

Make sure the identification tags at the door operator and controller match.

3.2 Remove Type M components

1. Turn OFF electrical power to the door operator.
 2. Remove existing microswitch cover.
 3. Remove belt (1) from motor sheave (2) and door operator sheave (3).
- > Save belt for use with conversion kit.



Older door operators could have cast spoke sheaves



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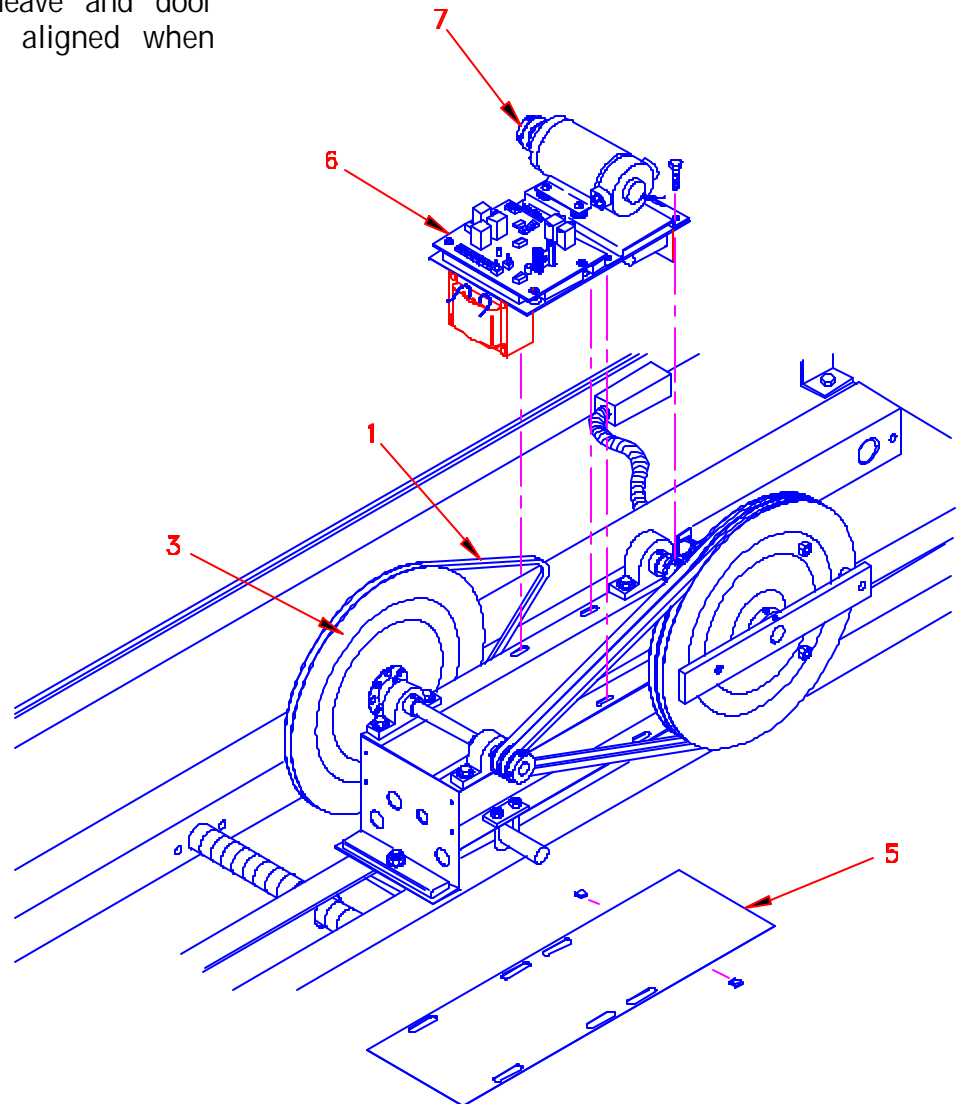
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3 Converting door operator components

3.3 Install SSC Board components

1. Install bottom cover (5).
2. Install SSC Board conversion kit assembly (6) with mounting hardware provided.
3. Install belt (1) on motor sheave (7) and door operator sheave (3),

Make sure motor sheave and door operator sheave are aligned when installing belt.





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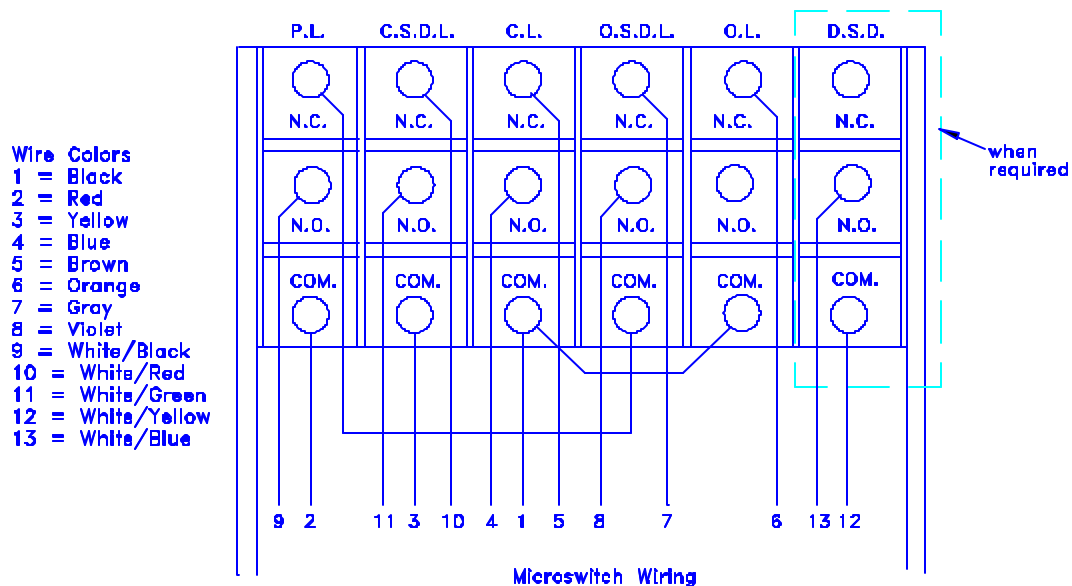
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3 Converting door operator components

3.4 Wire SSC Board components

1. Plug moxex end of new 13 connector cable into CN1 on SSC Board.
2. Route cable under cams and wire into microswitch terminals.
 - If DSD is required, add DSD switch connections.
 - If DSD is not required, tape off connectors 12 and 13.



Input & Output Terminals

Required for door to operate		Optional	
L1A to L2A	120VAC @ 500VA input. If one of input lines is grounded, it should be connected to L1A.	DO4 to DO7	Reduced speed closing signal. When doors have a signal to close, and a relay contact across these terminals makes up, door speed is controlled by "N" potentiometer.
DO3 to L1A	Open limit signal. A relay across these terminals de-energizes when open limit microswitch is actuated. Relay is energized at all other times.	<u>F NC NO</u> C	Auxiliary C relay switching contact. Designates a Form "C" contact on a 1-C relay.
DO7 to L1A	Signal to close. When a relay contact across these terminals makes up, doors should close.	<u>F NC NO</u> O	Auxiliary O relay switching contact. Designates a Form "C" contact on 1-O relay.
DO10 to L1A	Signal to open. When a relay contact across these terminals makes up, the doors should open.	DSD to SS	Optional - Used on some projects for load balancing or other customer requirement.
DO17 to L1A	Close limit signal. A relay across these terminals de-energizes when close limit microswitch is actuated. Relay is energized at all other times.		



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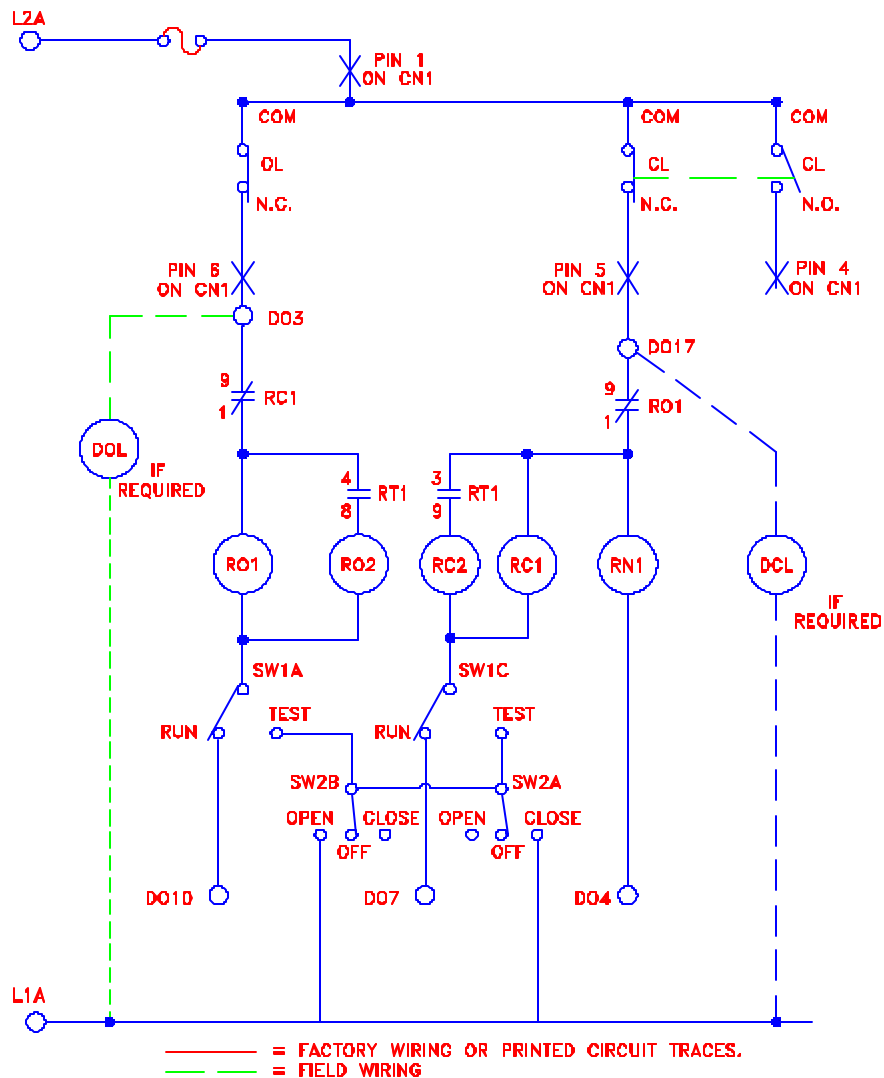
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3 Converting door operator components

3.4 Wire SSC Board components

3. If a Miprom controller is used,
 - > DO3, DO4, DO7, DO10, DO17, and optional DSD, SS terminals on TB1 connect to the same terminals on Miprom controller.
 - > power terminals L1A and L2A are also connected to like terminals on Miprom controller.
4. If controller is other than a Miprom,
 - > follow signal requirements outlined in Input & Output Terminals chart.



DOL and DCL are not required if Miprom control is used.
They MAY be required if any other type of control is used.



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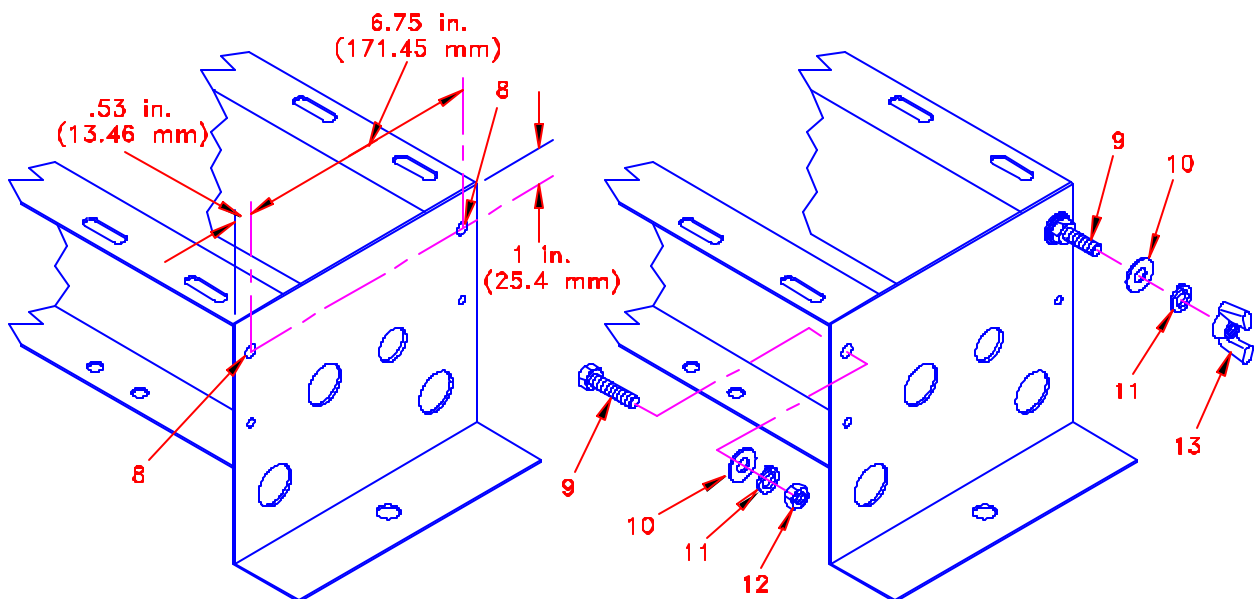
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3 Converting door operator components

3.5 Install new cover

1. Drill two 21/64 inch [8.3 mm] diameter holes (8) in each end of the base assembly. (Two holes in each end of base assembly for a total of four holes.)
 - > Centers of holes are located 1 inch [25.4 mm] down from top of end plate and .53 inch [13.5 mm] from side of end plate.
 - > Center to center of holes is 6-3/4 inches [171.5 mm]
2. With the threaded end to the inside, install four 5/16-18 x 1-1/4 inch hex head cap screws (9) through the 21/64 inch [8.3 mm] diameter holes.
3. Secure screws with four 5/16 inch flat washers (10), four 5/16 inch lock washers (11), and 5/16 inch hex nuts (12).
4. Position new cover on 5/16-18 x 1-1/4 inch hex head cap screws (9) and secure cover with four 5/16 inch flat washers (10), four 5/16 inch lock washers (11), and 5/16 inch wing nuts (13).





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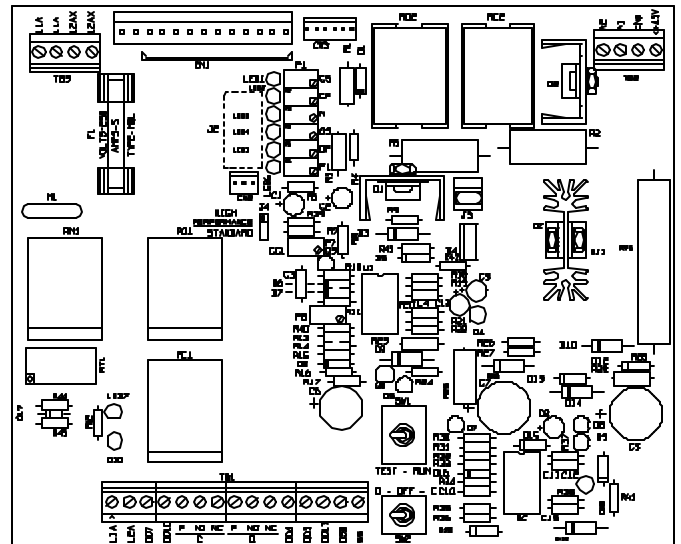
4 Adjusting door operator control SSC Board

4.1 Adjusting door operator overview

Adjust door operator control SSC Board as follows:

- Measure current (optional)
- Set potentiometers
- Adjust door speeds
- Adjust door closing force
- Adjust nudge speed
- Set microswitch cams

The SSC Board could be damaged if adjustment instructions are not followed carefully. If you cannot complete any of the procedures as described, stop and request assistance.



Toggle switches

To adjust and service door control, use two toggle switches on door operator control SSC Board – TEST-RUN switch and O-OFF-C switch.

- > TEST-RUN. TEST-RUN switch is normally in RUN position. When TEST-RUN switch is in TEST position, it disconnects normal open and close input signals from door control, and switches the O-OFF-C toggle switch into the circuit.
- > O-OFF-C. O-OFF-C switch is normally in OFF (center) position. OFF position does not indicate input power has been removed. It only indicates no signal to open or close when TEST-RUN switch is in TEST position.



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4 Adjusting door operator control SSC Board

4.2 Measure current (optional)

CAUTION: Do not install an ammeter in power supply line.

Current measurements are not required to adjust door operator control SSC Board. If necessary, measure current as follows.

1. Connect a voltmeter to resistor R2 (.1 Ohm 5 watt resistor) located between heat sinks Q2 and D2.
Viewing from TB1 side of control board, right side of resistor R2 is (-) and left side of resistor R2 is (+).
2. Set voltmeter to a low range -- 1 volt or 2.5 volt.
3. Read measurement with following in mind.
 - 1 volt on meter indicates 10 amps of current.
 - .5 volt on meter indicates 5 amps of current.

4.3 Set potentiometers

Make sure all potentiometers are set to ZERO, except P8. Do not set potentiometer P*. It is factory-set and sealed.

These multi-turn potentiometers require 25 turns to traverse their complete range.



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4 Adjusting door operator control SSC Board

4.4 Adjust door speeds

1. Disconnect and tag-out power.
2. Remove door operator cover and close doors.
3. Set switches and potentiometer in following positions.
 - > All speed control potentiometers - fully counter-clockwise.
 - > C.C.L. potentiometer - Fully clockwise.
 - > TEST-RUN switch - TEST position.
 - > O-OFF-C switch - OFF (center) position.
 - > Two position jumper J4 - just to right, and slightly above, R01 relay. (Standard position if one pair of wires is present at TB3. High Performance if two pairs of wires are present at TB3.)
4. Apply power. Toggle O-OFF-C switch to "O" position. LED6 next to "PL" potentiometer illuminates, indicating doors are in PL zone.
5. Turn "PL" potentiometer clockwise until doors begin to open. When "PL" microswitch drops, LED next to "PL" potentiometer goes out, and LED next to "OF" potentiometer illuminates.
6. Turn "OF" potentiometer clockwise, just enough to move doors through "OF" speed zone. When "OSDL" microswitch drops, LED next to "OF" potentiometer goes out, and LED next to "OS" potentiometer illuminates.
7. Turn "OS" potentiometer, just enough to move door through "OS" speed zone. When "OL" cam activates "OL" microswitch, LED next to "OS" potentiometer goes out. Doors should be fully open.
8. Toggle O-OFF-C switch to C position. LED next to "CF" potentiometer comes on.
9. Turn "CF" potentiometer clockwise until doors begin to move. When "CSDL" microswitch is dropped by its cam, LED next to "CF" potentiometer goes out and LED next to "CS" potentiometer illuminates.
10. Turn "CS" potentiometer clockwise until "CL" microswitch is actuated by its CAM. LED next to "CS" potentiometer goes out. Doors should open and close at slow speed.
 - > If doors do not fully open or close within 20 to 30 seconds, internal timer removes motor power and LED 7 is lit.
 - > If board senses over 5 amps, power shuts down and LED 7 is lit.
11. Using speed zone potentiometer and CAM settings, adjust door speeds for desired performance. Green LED's indicate which speed control potentiometer is controlling door speed.
 - > Increase door speed — turn potentiometer clockwise
 - > Decrease door speed — turn potentiometer counterclockwise

Do not set potentiometer P8. It is factory-set and sealed.

TIP: If doors do not operate smoothly, particularly on slower moving door, it may help to remove jumper J3. This eliminates dynamic braking, and allows a smoother transition between speeds.



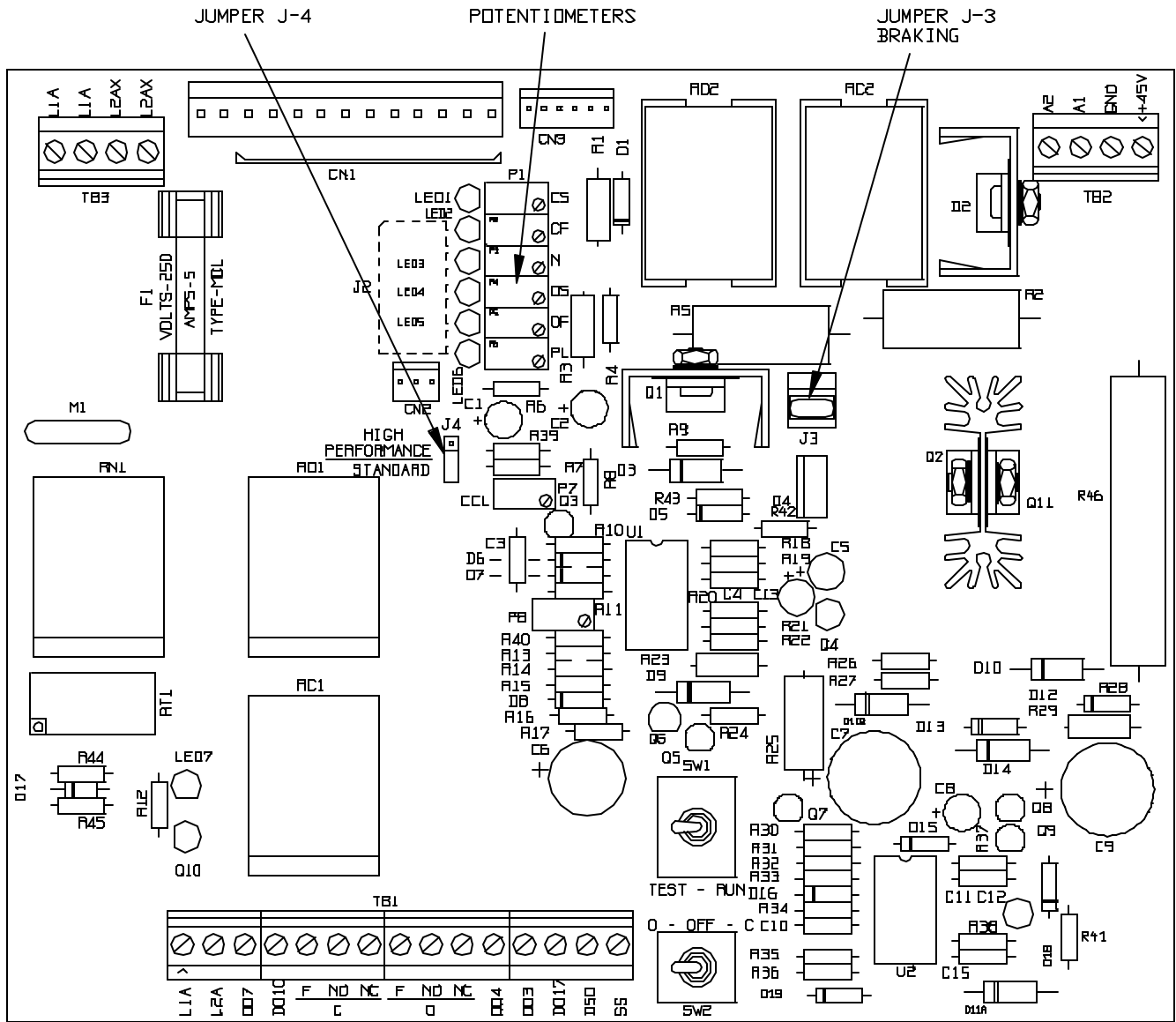
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4 Adjusting door operator control SSC Board

4.4 Adjust door speeds





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4 Adjusting door operator control SSC Board

4.5 Adjust door closing force

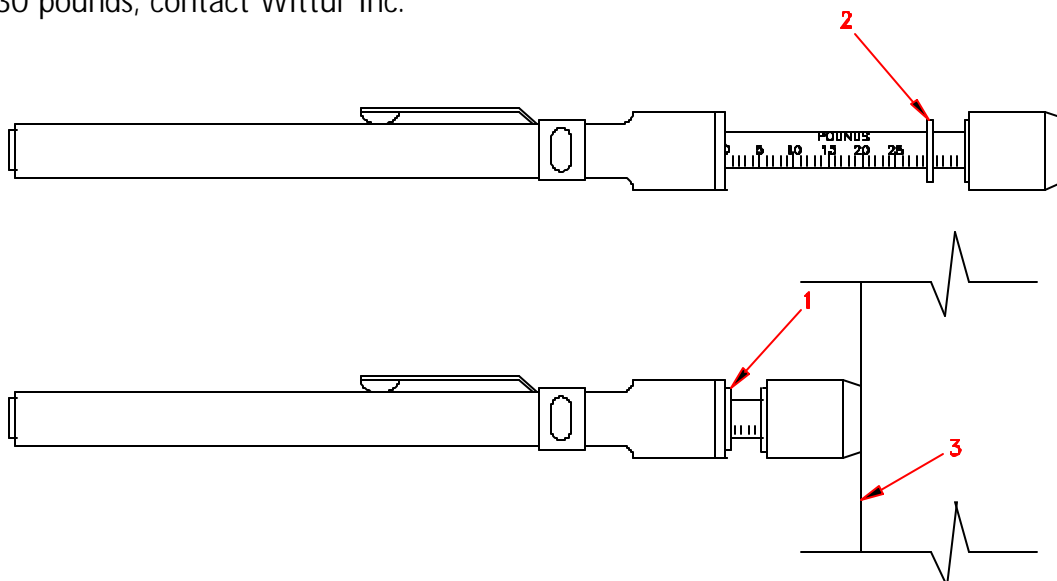
1. Toggle TEST-RUN switch to TEST position.
2. Stop doors at mid-point in closing direction by toggling O-OFF-C switch to OFF position.
3. Turn CCL (close current limit) potentiometer fully counter-clockwise until doors stall.
4. Turn CCL potentiometer clockwise until desired door close operation is achieved. Door closing force should be less than 30 pound maximum allowed by Code.
5. To check door pressure, physically stall door at midpoint in closing direction.
6. Place rubber end of a pressure gauge (1) on edge of power-driven car door (3). Read pounds of force (2) on gauge and record results.
7. Open and close doors with O-OFF-C switch several times.
8. Physically stall doors again in closing direction and re-check door closing force with pressure gauge.

If door closing force CANNOT be kept under 30 pounds, contact Wittur Inc.

4.6 Adjust nudge speed

1. Simulate a nudge signal by placing a jumper on terminal strip TB-1 between L1A and DO4.
2. Set the TEST-RUN switch to TEST position.
3. Set O-OFF-C switch to C position. Doors should close at nudge speed.
4. Turn the N potentiometer clockwise to desired nudging speed.
5. Remove jumper between L1A and DO4 before returning the TEST-RUN switch to RUN.

When all adjustments are complete, place O-OFF-C switch in OFF position, and TEST-RUN switch in RUN position.
Replace door operator cover.





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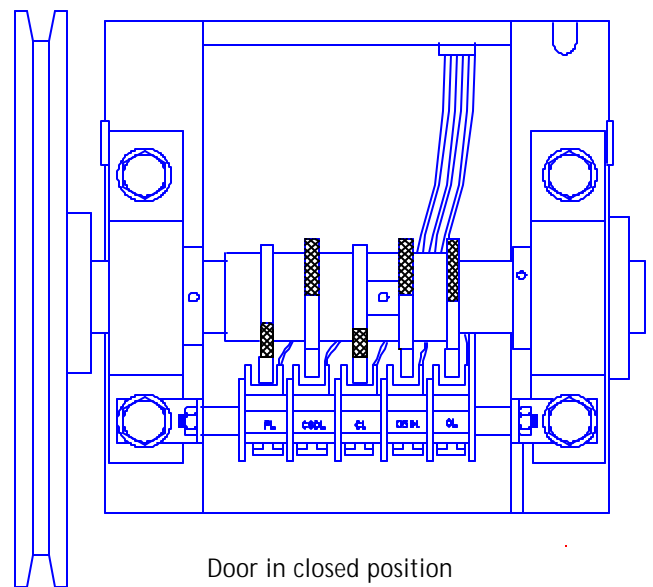
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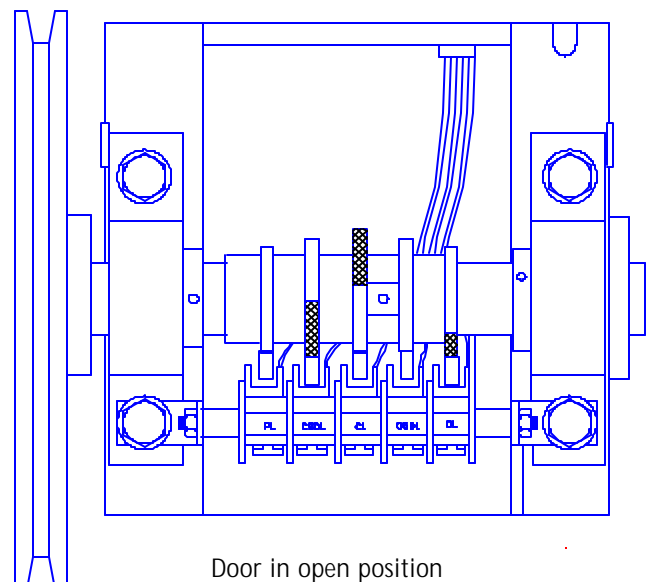
4.7 Set microswitch cams

The Standard Duty door operator microswitch cams determine where changes in door speed occur. Factory settings are approximate. Set microswitch cams, if necessary, per individual job requirements.

- CL CAM actuates CL microswitch when doors are in their desired fully closed position.
- PL Initial opening CAM drops microswitch when car door clutch has just engaged both hoist-way door rollers, but should not drop microswitch if door interlock hangs up.
- OSDL CAM drops OSDL microswitch when doors are approximately half open.
- CSDL CAM drops CSDL microswitch when doors are approximately 4 inches [10.2 mm] from their fully closed position.
- OL CAM actuates OL microswitch when doors are in fully open position.
- DSD (optional) CAM actuates DSD microswitch when doors are approximately 4 to 6 inches [10.2 to 15.2 mm] from fully closed position. CAM can also be set for other customer requirements.



Door in closed position



Door in open position



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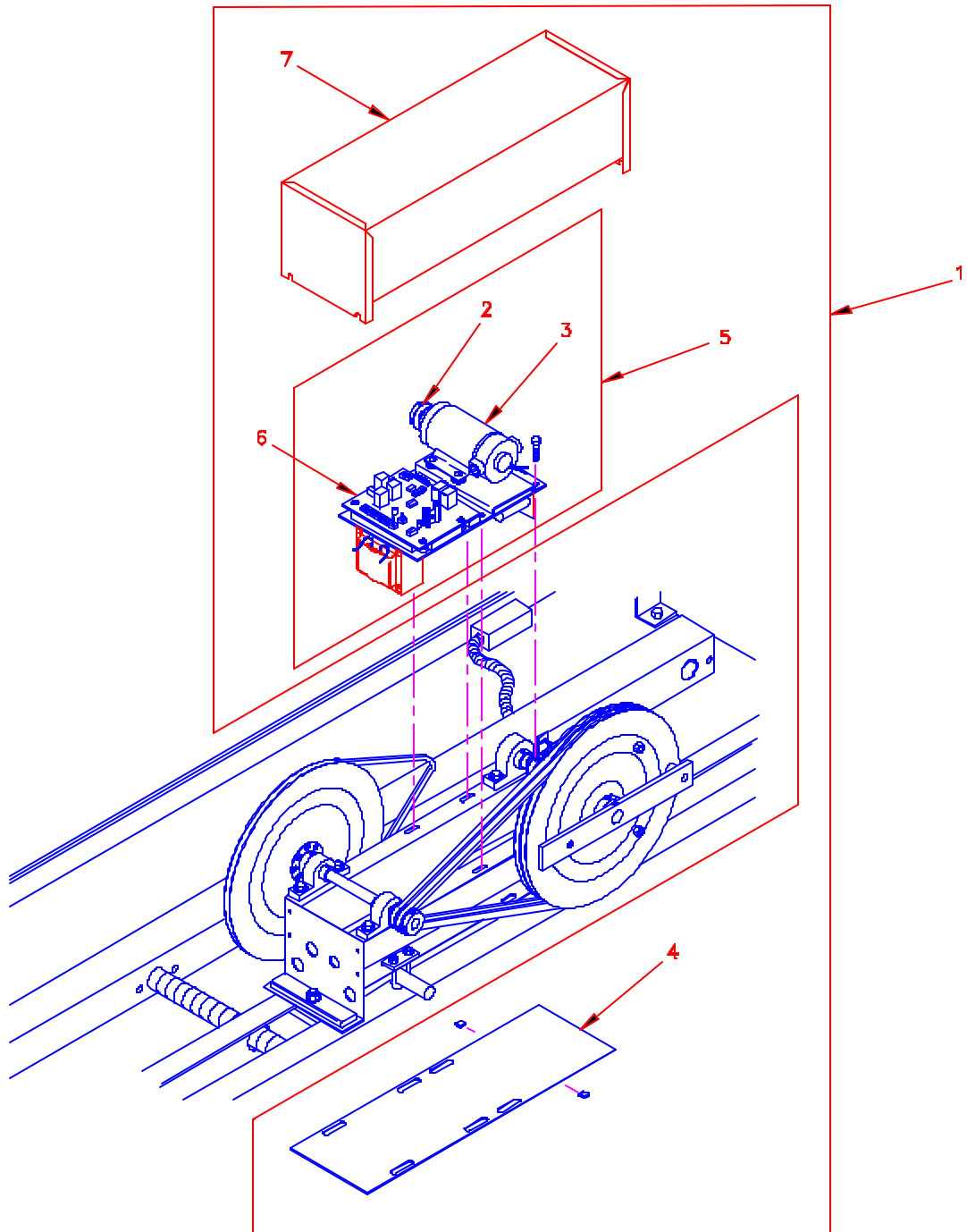
Converting door operator components

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5 Replacement Parts

5.1 Door operator conversion kit





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5 Replacement Parts

5.1 Door operator conversion kit

<u>KEY</u>	<u>PART NUMBER</u>	<u>PART NAME</u>	<u>REMARK</u>
1	P00-022267-001	Kit,door conversion to solid state	RH, To convert type M to Standard Range; Includes motor, door control w/SSC Board, & cover
	P00-022267-002	Kit,door conversion to solid state	LH, To convert type M to Standard Range; Includes motor, door control w/SSC Board, & cover
NS	P00-022337-001	Kit,door conversion to solid state	RH, To convert type M to High Performance; Includes motor, door control w/SSC Board, & cover
NS	P00-022337-002	Kit,door conversion to solid state	LH, To convert type M to High Performance; Includes motor, door control w/SSC Board, & cover
2	000-019502-031	Sheave, single	1.7 in. pitch for reduction
3	000-101849-000	Motor, permanent magnet	1/6 HP, 1140 RPM, 24 VDC
4	000-049744-000	Cover, bottom	Standard Range
5	P00-022248-000	Door control SSC Board	Standard Range door control w/ SSC Board
6	P00-024783-000	PC board, door operator	Standard Range SSC Board
7	P00-024186-000	Cover, door operator	Standard Range
NS	000-046208-000	Transformer	32V 250VA, located on bottom of P00-22248-000 door control
NS	000-046217-020	Rectifier, bridge	25V 200VA, located on bottom of P00-22248-000 door control
NS	000-046218-000	Capacitor, electrolytic	Used with Kit P00-022267-***, 45000 uF, 50 WV, located on bottom of P00-022248 door control
NS	000-049732-000	Capacitor, electrolytic	Used with Kit P00-022337-***, 41000 uF, 50 WV for high performance power supply, located on bottom of P00-022249-000 door control
NS	000-090527-022	Cable	13 connector, 18 AWG, MLX/FRK

The following kits are also available to convert MAXIMUM DUTY door operators to MAXIMUM DUTY HIGH PERFORMANCE door operators.

NS	P00-022268-001	Kit,door conversion to solid state	RH, To convert type WM to Heavy Duty (WMHPPM); Includes motor, door control w/ SSC Board, & cover
NS	P00-022268-002	Kit,door conversion to solid state	LH, To convert type WM to Heavy Duty (WMHPPM); Includes motor, door control w/ SSC Board, & cover

NS = Not Shown

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