

Commercial Operator Troubleshooting Basics

! CAUTION:

ALWAYS BE ALERT TO ELECTRICAL AND MECHANICAL HAZARDS WHEN SERVICING AN OPERATOR. REMOVE MAIN POWER TO OPERATOR BEFORE MAKING ANY ELECTRICAL CONNECTIONS IN CONTROL BOX OR MOTOR. KEEP HANDS AWAY FROM MOVING PARTS UNLESS MAIN ELECTRICAL POWER TO OPERATOR IS TURNED OFF.

Before Starting

Remove power to the unit before starting the troubleshooting process.
Disconnect operator from door and check door for proper operation.
Secure the work area.

Check for the Basics

Is input voltage present? Is it the proper voltage? Are all phases present?
Is the operator voltage correct for the input voltage (208 VAC vs. 230 VAC)?
Has the circuit breaker tripped? Check operator circuit breaker and main supply breaker.
Excessive voltage drop on main voltage when operator is running.
Are the limits set properly? Have the limits been overrun for some reason?
Any visible irregularities or odd smells?

Isolate the problem

Remove all external control inputs and operate with test pushbuttons.
Check wires, pushbuttons, reversing devices, radio controls, etc. by reconnecting one at a time.
Is the problem internal to the operator or external to the operator?
Radio receivers can malfunction and short control transformer.
Reversing (electric) edges can short and cause the operator to always go in the open direction.

Does the problem affect both open and close circuits?

Move door and operator to mid position and test operation.
Check components that affect both directions.
Check the control transformer. Is there low or no voltage output from transformer?
Is the stop button or stop circuit open?
Is the hoist interlock switch open?
External interlock switch is open (pass doors or dock leveler switches).
Check the interlock relay on single-phase operators. It should make a snap sound when power is applied.
Check the motor or motor start switch on single-phase operators.

Is there any response from the pushbutton?

Transformer is ok; control circuit ok, then problem may be with high voltage circuit.
The motor may have a problem with the start switch mechanism.
Bad contact on the starter (more probable if problem is in one direction only).

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Does the problem only affect the open circuit?

- Check the components that affect the open direction.
- Open pushbutton.
- Open coil on starter.
- Open limit switch.
- Interlock relay.

Does the problem only affect the close circuit?

- Check the components that affect the close direction.
- Close pushbutton.
- Close coil on starter.
- Close limit switch.

The table below lists common symptoms, causes and procedures that can be used to trouble shoot most commercial operator installations.

SYMPTOMS	POSSIBLE CAUSES	PROCEDURE
<p>Operator does not respond to pushbuttons.</p> <p>Motor will not run when starter is worked manually.</p>	<p>No main AC power to operator.</p> <p>Overload protector is open.</p> <p>3-phase overload relay is open.</p>	<p>Measure AC voltage at operator terminals.</p> <p>Reset overload protector.</p> <p>By-pass overload protector for test only.</p>
<p>Starter Chatters when energized.</p> <p>Overload protector may trip.</p> <p>Starter may latch-in intermittently.</p> <p>Motor does not run normally when starter is worked manually.</p>	<p>Low main AC line voltage.</p> <p>Low voltage on transformer secondary. Should be 24-30VAC.</p> <p>Too many accessories connected (such as radio controls, photo beams, electric edges).</p> <p>Long pushbutton runs. Multiple pushbutton stations. Old or undersize wire used for pushbutton circuit.</p> <p>Overload protector is not working properly.</p>	<p>Measure AC line voltage at operator terminals, under load (manually operator starter).</p> <p>Measure the secondary voltage under load.</p> <p>Disconnect accessories and measure the secondary voltage.</p> <p>Use separate transformer for accessories.</p> <p>Remove pushbutton wires from operator terminals and test with substitute pushbutton station.</p> <p>Replace wires or use long distance module.</p> <p>By-pass overload protector for test only.</p>

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SYMPTOMS	POSSIBLE CAUSES	PROCEDURE
<p>Operator does not respond to pushbutton in either direction.</p> <p>Motor runs when starter is worked manually.</p> <p>Starter will not hold in when worked manually.</p>	<p>Low or no voltage on transformer secondary.</p> <p>Hoist interlock switch is open.</p> <p>Open circuit through STOP button.</p> <p>Old or undersize wire used for pushbutton circuit.</p> <p>External interlock is open (pass door or dock leveler).</p>	<p>Measure the secondary voltage of transformer.</p> <p>Temporarily jumper hoist interlock terminals and test. Readjust mechanical release or replace switch.</p> <p>Temporarily jumper the stop and common terminals at the operator and test.</p> <p>Remove pushbutton wires from operator terminals and test with substitute pushbutton station. Replace wires or use long distance module.</p> <p>Temporarily jumper the interlock terminals at the operator.</p>
<p>Operator does not respond to pushbutton in one direction</p> <p>Motor will run in that direction when starter is worked manually but starter does not hold in.</p>	<p>Open contact on limit switch in affected direction.</p> <p>Open interlock relay contact in affected direction.</p> <p>Pushbutton in affected direction is not working.</p> <p>Open coil winding in starter.</p>	<p>Temporarily jumper normally closed contacts on limit switch in affected direction for test only or replace limit switch.</p> <p>Temporarily jumper normally open contacts on interlock relay in affected direction for test only. Replace interlock relay.</p> <p>Temporarily jumper open and common or close and common terminals at the operator and test. Replace pushbutton station.</p> <p>Check started coil continuity with multi-meter.</p>
<p>Overload protector trips when operator is started in one direction. Operation is normal in other direction</p>	<p>Contacts on starter not making good electrical contact.</p> <p>Motor starting capacitor is going bad.</p> <p>Door problem. Unbalanced, jammed, broken springs.</p>	<p>Run motor in operator with direct power from extension cord or test motor on bench.</p> <p>Replace capacitor (and bleed resistor). Replacement must have the same voltage and microfarad rating.</p> <p>Test operator with door disconnected.</p>

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SYMPTOMS	POSSIBLE CAUSES	PROCEDURE
<p>Overload protector trips when operator is started in either direction. It may move door a short distance.</p>	<p>Incorrect AC line voltage.</p> <p>Open winding in motor.</p> <p>Brake is not releasing. Brake misadjusted. Brake solenoid is not working.</p> <p>Motor starting capacitor is going bad.</p> <p>Start switch in motor is not working properly. Motor not reaching rated RPM.</p> <p>Door problem. Unbalanced, jammed, broken springs or locked.</p>	<p>Measure line voltage at operator terminals under load.</p> <p>Check motor windings for continuity with multi-meter.</p> <p>Observe brake operation when operator is activated. Re-adjust brake. If necessary, replace solenoid and re-adjust brake.</p> <p>Replace capacitor (and bleed resistor). Replacement must have the same voltage and microfarad rating.</p> <p>Check belt tension (motor to clutch shaft pulley). Test operator with door disconnected.</p>
<p>Operator does not respond to pushbuttons in either direction.</p> <p>Motor runs when starter is worked manually.</p> <p>Starter holds in when worked manually.</p>	<p>Interlock relay contacts are open.</p> <p>Problem with external wires to pushbuttons.</p>	<p>Temporarily jumper normally open contacts on interlock relay for test only. Replace interlock relay.</p> <p>Disconnect pushbutton wires at operator terminal strip and test with substitute pushbutton station. Check external wires for continuity and shorts with multi-meter. Replace external wires or pushbuttons.</p>
<p>Constant pressure required on the pushbutton to run the operator in one direction.</p>	<p>Auxiliary holding contact on one side of starter not making good electrical contact or wire to switch is loose.</p>	<p>Check wire to auxiliary holding contact.</p> <p>Check for proper mechanical action of starter.</p> <p>Temporarily jumper auxiliary holding contact for test only. Replace starter.</p>
<p>Operator does not respond to pushbutton in one direction only. Starter holds in and motor runs when starter worked manually. Operation completely normal in other direction.</p>	<p>Problem with external wires to pushbuttons.</p>	<p>Disconnect pushbutton wires at operator terminal strip and test with substitute pushbutton station. Check external wires for continuity and shorts with multi-meter. Replace external wires or pushbuttons.</p>

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Starter pulls in when pushbuttons are actuated. Motor runs in one direction but not in the other direction without manual assist.	Contacts on starter not making good electrical contact.	Run motor in operator with direct power from extension cord or test motor on bench. Replace starter.
Starter pulls in when actuated from either pushbutton. Motor will not run in either direction without manual assist. Overload protector may trip.	Open winding on motor. Motor start capacitor.	Test motor windings for continuity with multi-meter. Note: Start winding on single-phase motor will normally show surge on the multi-meter then drop as capacitor charges. Replace capacitor (and bleed resistor). Replacement must have the same voltage and microfarad rating.
Motor runs but door does not move.	Loose clutch. Fiber disc worn or glazed. Loose or worn drive belt from motor to clutch pulley. Sprocket key missing or drive chain broken. Door jammed or obstructed. Door is manually locked. Door too heavy for operator.	Check clutch material and adjustment. Replace if required. Check drive belt for proper tension and replace if required. Check drive train for operation. Disconnect door from operator and check manual operation of door.
Operator runs past limit switch settings. Limit switches do not hold their settings.	Limit nuts not adjusted properly. Chain skipping teeth on drive sprocket or door sprocket. Limit nuts binding on limit shaft causing them to jump position on retaining bracket. Limit nut retaining bracket not engaging notches in limit nuts. Limit switch is loose. Lever on limit switch does not fully engage limit nut.	Adjust limit nuts. Check for worn sprockets and proper chain tension. Use chain support/spreader bracket. Check for free rotation on limit shaft. Lubricate. Replace limit nuts and/or shaft if threads are damaged. Set limit nuts and be sure bracket is in notch on each limit nut. Tighten limit switch hardware. Adjust lever on limit switch.

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SYMPTOMS	POSSIBLE CAUSES	PROCEDURE
Operator does not shut off at fully open or closed position.	<p>Limit nuts not adjusted properly.</p> <p>Limit switch is not properly working.</p> <p>On 3-phase operators power is connected out of phase.</p> <p>Limit drive chain/sprockets are broken or inoperative.</p> <p>Single phase operator, stuck pushbutton or short in external wiring.</p>	<p>Adjust limit nuts.</p> <p>Operate limit switch manually while door is moving to determine if switch is working. Replace limit switch.</p> <p>Motor is running backwards. Interchange any two main AC power leads.</p> <p>Replace chain/sprockets. Check limit shaft for proper rotation.</p> <p>If door overrides open limit check close button circuit. If door overrides close limit check open button circuit.</p>
Operator closes door when open button is pressed and limit switches do not function properly.	<p>On 3-phase operators power supply is connected out of phase.</p> <p>Pushbutton wired backwards.</p> <p>Operator mounted wrong.</p>	<p>Motor is running backwards. Interchange any two main AC power leads.</p> <p>Reverse leads to open and close buttons.</p> <p>Correct mounting or reverse open and close limit switch wiring and reverse wiring to motor.</p>
Door drifts when operator shuts off.	<p>Inoperative or improperly adjusted brake.</p> <p>Brake material worn or glazed.</p> <p>Door not properly balanced.</p>	<p>Adjust brake and check operation.</p> <p>Replace brake.</p> <p>Disconnect operator and manually check door operation.</p>
Motor hums, does not run.	<p>Dead phase on 3-phase operators.</p> <p>Brake does not release.</p> <p>Door locked or jammed.</p>	<p>Measure AC voltage at operator terminals.</p> <p>Check wires to brake solenoid.</p> <p>Check brake adjustment.</p> <p>Disconnect operator and manually check door operation.</p>
Interlock relay chatters when operator stops.	<p>Open or missing resistor on motor start capacitor.</p>	<p>Replace resistor.</p>
Brake solenoid makes a buzzing sound when operator is running.	<p>Brake adjustment does not allow solenoid plunger to fully seat.</p>	<p>Adjust brake and check operation.</p> <p>Replace solenoid.</p>