

CDLR CONVEYOR

Operation and Maintenance Manual



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Introduction

The management and employees of MC3 Manufacturing Inc. thank you for specifying our equipment.

This manual provides information on how to install, operate, and maintain your new conveyor.

If special circumstances or questions arise please contact MC3 Manufacturing Inc. at: (519) 325-1370 quoting the serial number(s) of the machine(s).

Note: The serial number(s) can be found on a rectangular plate next to the drive unit.

Delivery Inspection

Upon delivery of your Slider Bed conveyor check your packing slip or bill of lading accompanying the unit. If any components are missing contact MC3 Manufacturing Inc. immediately with a description of the missing components and the serial numbers(s) of the machine(s).

If any components have been damaged in transit, note it on the bill of lading and contact the Carrier immediately.

Warranty

- a) Seller warrants that the material and workmanship on the equipment manufactured by MC3 Manufacturing will be free from defects at the time of shipment. If during the first 12 months (or 2000 hours, whichever comes first) of operation after final shipment, the Buyer establishes to the Seller's satisfaction that any part or parts manufactured by MC3 Manufacturing was defective at the time of shipment, MC3 Manufacturing, at its own expense, will repair or replace (but not install) replacement parts. Buyer must contact MC3 Manufacturing within 12 months after delivery to user to allow any warranty coverage to be applied. Seller's liability under this warranty is limited to replacement parts only and the Seller will make no allowance for corrective work done

unless agreed to in writing by MC3 Manufacturing. Charges for correction of defects by others will not be accepted unless agreed to in writing, prior to work being performed, by an officer of the company. Damage or deterioration due to extraordinary or ordinary wear and tear (including, but not limited to, use of equipment to handle product of sizes, or weights and shapes or at speeds or methods which differ from information originally provided to Seller), chemical action, wear caused by abrasive materials or by improper maintenance and lubrication, or by improper storage and handling shall not constitute defects. Failure to install or assemble equipment properly shall not constitute defects. Warranty does not cover consumable items.

- b) Seller has made no representation, warranties, or guarantees, expressed or implied, not expressly set forth on above paragraph. Seller shall not be liable hereunder for any consequential damages included but not in limitation, damages which may arise from loss or anticipated profits or production from increased cost or operation of spoilage material.
- c) The components used in manufacture of said equipment, which were manufactured by others, will carry such manufacturer's customary warranty, which Seller will obtain for Buyer upon request.
- d) No representative of MC3 Manufacturing has been conferred with any authority to waive, alter, vary or add to the terms of warranty stated herein, without prior authorization in writing executed by an officer of the company.

Note: To protect warranties on any conveyor components (i.e. gearbox, motor, bearings, belt, etc.) call the Seller's home office for authorization before disassembling, or replacing. Failure to do so will immediately void all warranties.

Safety Considerations

Safety is always an important factor in any working process and due care must be taken to protect your personal safety.

MC3 Manufacturing Inc. will continue its best efforts to design, build and market safe products. MC3 Manufacturing Inc. will continue to advocate and urge safe installation and operation procedures.

Purchaser is required to train and instruct all employees in the safe operation and maintenance of this machine. Instructions must include:

1. Keep all guards in place, at all times, while the conveyor is running.
2. Keep unauthorized persons away from the machine.
3. Lockout all sources of power when carrying out any maintenance work on the machine.
4. Operate, service, and maintain the machine according to safe procedures.
5. Do not start or operate the machine until all guarding is in place and all persons are known to be clear of the equipment.

Safety at Installation

1. Wear safety glasses, safety shoes and gloves.
2. Ensure area around installation site is free of debris.
3. Be aware of any sharp edges while handling conveyor components.

4. Be careful in and around the conveyor(s) during installation and be aware of the location of other personnel.
5. Only allow qualified personnel to assemble and install the equipment.
6. All electrical wiring must be completed by a qualified electrician according to local codes
7. Ensure that the conveyor belt and drive chain are correctly adjusted before starting for the first time and that all adjuster locknuts are tight to prevent slipping.
8. Inspect frame to ensure it is free from protrusions (like welds) and that all added accessories are clear of belt.
9. Check oil level in the gear reducer.
10. Clear all foreign objects (nuts, bolts, tools etc.) from frame and belt before starting conveyor.
11. Double check that all guarding, bearings, locking collars, pulleys, and sprocket set screws are in place and tight before starting the first time.

WARNING

NEVER attempt to free the belt while the conveyor is running as it could suddenly re-start and cause personal injury or damage to the conveyor. Follow steps outlined on page 10 for trouble shooting.

Installation

Before beginning the installation process ensure that you have fully read the following information and that you are comfortable in your abilities to complete the various tasks.

Ensure that you have read all the relevant safety information in the preceding pages in order to protect both yourself and co-workers from injury and to protect the equipment from damage.

Depending upon the type and configuration, some conveyors are supplied fully assembled and only require installing while others are supplied partially assembled and need to be completed on site. Please follow the relevant instructions below for your specific conveyor(s).

Assembled Conveyors

1. Unpack the conveyor and check for damage.
 2. Ensure the installation area is flat and free of debris.
 3. Position conveyor in desired location and ensure that it is level in both directions.
 4. Conveyors are supplied with one of three leg options:
 - a) Fixed
 - I. For fixed legs, drill through the holes in the feet and use suitable anchors to fasten the conveyor to the floor.
 - b) Adjustable
 - I. For adjustable legs, slacken the clamping bolts on the legs and adjust the leg length. Retighten the clamping bolts and check the conveyor for level. Drill through the holes in the feet and use suitable anchors to fasten the conveyor to the floor.
 - c) Castors
 - I. For castors, lock the wheels with the wheel locks (if fitted).
5. Check the oil level in the gear reducer.
 6. If your conveyor is supplied with its own control box this now needs to be wired into a suitable electrical supply. If your conveyor is supplied without a control box then it will need to be wired into the control system of your machine.

Note: All electrical wiring must be completed by a qualified electrician according to local codes.

Operating the Conveyor

The procedures for routine operation of the conveyor will vary depending on whether the conveyor has its own control system or if it is tied into your machine control system.

For stand-alone conveyors press the <Start> button to run the conveyor and the <Stop> button to stop the conveyor. The <Reverse> button (if fitted) will 'jog' the belt in the reverse direction.

For conveyors which are tied into another machine control system, the start and stop commands will have to be issued from that system. In either case it is important that the conveyor is started before any parts can accumulate on the belt and that it is stopped after being allowed to run off any parts it is currently carrying.

Failure to observe these conditions could lead to overloading of the system at start-up causing premature wear on the belt and in the drive. Always start the conveyor before applying its load and stop the conveyor after it has been allowed to clear the belt.

WARNING

NEVER attempt any maintenance unless authorized to do so.

Always disconnect power supply and lock out before removing guarding for correcting problems or for maintenance.

Always re-install guards before starting machine.

Routine Maintenance

Roller Care

1. Check chain tension to be certain the slack span has an approximate 2% mid-span movement
 - a) If the chain is too tight or vise-versa, adjust the links to adjust the slack.

Note: Excess loads may cause increased lacing and belt wear as well as reducing overall belt life.

Motors

1. Cleaning - All motors should be kept free of dirt and grease accumulations. Open motors should be periodically vacuumed to remove dust and dirt from the windings.
2. Ventilation - For best results motors should be operated in an area where adequate ventilation is available.
3. Temperature - Most of the current smooth body, T.E.N.V. and T.E.F.C. motors run hot to the touch. As long as maximum ambient temperatures are not exceeded and the amperage draw is within the allowable range there should not be a problem.

Note: The temperature and amperage limits can be found on the motor name plate.

4. Lubrication - Most electric motors are lubricated for life and under normal operating conditions require no more lubrication. Under severe conditions where additional lubrication is required use the following chart as a guide. See Fig. 1

Condition	Lubricating Frequency
Normal 8 hr Day - Light Loads	2-3 Years
Heavy 24 hr Day - Heavy Loads - Dirty Conditions	1 Year
Extreme - Shock Loads - High Temperature	3-6 Months
Typical Lubricants	
Chevron Oil Co. - SRI #2	Gulf Refining Co. - Precision #2 or #3
Shell Oil Co. - Alvania #2, Dolium R	Mobil Oil Co. - Mobilux Grease #2
Texaco Inc. - Premium RB	Sinclair Refining Co. - AF #2

Fig. 1

Note: The chart above is based on motors with grease lubricated bearings, running at speeds of 1750 RPM or less and operating within an ambient temperature range of between 0°F to 120°F (-18°C to 49°C).

Gear Reducers

1. Ventilation - During normal operation gear reducers build up heat and pressure and must be vented to protect the seals and gears.
2. Cleaning - After approximately two to three weeks of operation the reducer must be drained, flushed out and refilled to the correct level with fresh oil. This is done to remove any brass particles created during the normal wear-in period of the worm gear. From then on the oil should be changed every 2500 hours of operation or every 6 months, whichever comes first.

Note: Where high temperatures and/or a dirty atmosphere exist more frequent changes may be necessary. Periodically check to ensure the correct level of oil is in the reducer. Too little oil will cause accelerated wear on the gears. Too much oil can cause overheating, seal deterioration and leakage.

- Lubrication - The correct oil to use in your reducer depends on the worm's RPM, ambient temperature and the severity of use. The following chart can be referred to for reducers with 1750 RPM worm speed, operating under normal duty and with ambient temperatures from 18°F to 125°F (-8°C to 52°C). See Fig. 2.

Ambient Temperature	
15°F to 60°F (-9°C to 16°C)	50°F to 125°F (10°C to 52°C)
A.G.M.A.#7 Compound	A.G.M.A.#8 Compound
Mobil - Compound #DD	Mobil - #600W Super Cyl. Oil
Shell - Macoma Oil #69	Shell - Valvata Oil J81 & J82
Sinclair - #87 H.D. Oil	Sinclair - Superheat Valve Oil
Sun - Sun EP 1110	Sun - Sun EP 1150
Texaco - Vanguard Cyl. Oil	Texaco - 650 Cyl. Oil
Keystone - WG 1x Oil	Keystone - WG B Oil
Gulf - EP Lubricant #115	Gulf - EP Lubricant #145 P

Fig. 2

Note: For ambient temperatures other than mentioned Or for severe duty please consult with the gear reducer manufacturer.

- General - Inspect weekly to make sure reducer remains securely bolted.

Bearings

- Lubrication - Greasing frequency should be regulated to as many times as necessary to keep a small film of grease leaking at the seals. This will protect against foreign materials entering the bearing. The following list is provided to aid

you in acquiring the correct (or an equivalent) grease. See Fig. 3.

Normal Duty	Heavy Duty
Texaco - Multifak #2	Sun - Prestige 742 EP
Mobil - Mobilux #2	Exxon - Lidok #2 EP
Amoco - Lithium MP	Arco - Litholene HEP2
Shell - Alvania #2	Shell - Alvania #2 EP

Fig. 3

Note: Do not over grease as this can cause blown seals or overheating bearings.

- Replacement - If bearing replacement becomes necessary, remember to clean off the shaft, file smooth any grooves or set screw marks and oil the shaft before slipping on the new bearing.

Note: If the bearing does not slide easily onto the shaft, use a soft metal bar or mallet to tap against the inner race.

- General Maintenance - Set up a weekly check on all bearings to ensure they remain tightly bolted down, set screws remain fastened securely and they are correctly lubricated.

Chain and Sprockets

- Lubrication - For long chain life a constant film of oil is recommended. Use a good quality, non-detergent, petroleum-based oil from the list shown in Fig. 4.

Temperature	Recommended Oil Viscosity
20°F to 40°F (-7°C to 4°C)	SAE 20
40°F to 100°F (4°C to 38°C)	SAE 30
100°F to 120°F (38°C to 49°C)	SAE 40
120°F to 140°F (49°C to 60°C)	SAE 50

Fig. 4

Note: Shut off and lockout the conveyor before removing any guards to apply lubrication.

General Maintenance

Set up a weekly check on all bearings to ensure they remain tightly bolted down, set screws remain fastened securely and they are correctly lubricated.

Note: Shut off and lockout the conveyor before removing guards for general maintenance.

1. When terminating operation of the conveyor make sure that no accumulation of parts is left on the belt. A large force is applied at start-up and any excess weight could cause to the drive to fail. For the same reason always start the conveyor before introducing parts onto the belt.
2. After the machine has been used for a long period of time the belt may lose tension due to elongation of the belt. If this is the case then adjust the belt tension.

Impact Conveyor Maintenance Schedule
<p>Daily Inspection</p> <ol style="list-style-type: none"> a) Check for abnormal sounds around conveyor b) Check for cleanliness c) Check that the conveyor is clear before starting <p>Monthly Inspection</p> <ol style="list-style-type: none"> a) Check belt tension b) Check belt for excessive wear c) Carry out daily checks d) Lubricate the drive chain <p>Annual Inspection</p> <ol style="list-style-type: none"> a) Remove covers and guards and clean inside conveyor b) Inspect and replace any consumable parts c) Check the tightness of all fasteners on the conveyor d) Carry out daily checks e) Carry out monthly checks

TROUBLESHOOTING

TROUBLESHOOTING RULES

Proper troubleshooting is finding the cause of a problem and correcting it in a safe and systematic manner. Often, the troubleshooter's ability to solve the problem quickly benefits the production economically.

The actual steps the troubleshooter uses to achieve the ultimate goal may vary, but there are a few general rules that will make troubleshooting more effective.

A good troubleshooter should follow these general rules:

- Use a clear and logical approach
- Work safely
- Work quickly
- Work efficiently

The Five General Troubleshooting Guidelines

The four general rules mentioned above are broad statements that govern good troubleshooting. Listed below are more specific action items, which are essential in successful troubleshooting:

1. **Verify that a problem exists.** A problem is usually indicated by a change in equipment performance or product quality. Verification of a problem through observation will allow the trouble-shooter to determine if a problem actually exists, or if the reports of trouble are due to a lack of equipment understanding.
2. **Identify and locate the root cause of the trouble.** Trouble is often caused by a change in the system. An understanding of the system, its modes of operation, and how they are supposed to work, will aid in finding the cause of the trouble.
3. **Correct the problem.** It is very important to correct the root of the problem, not just the symptom(s). This often involves replacing or repairing a part or making adjustments. A process or piece of equipment should never be adjusted to compensate for a problem and that action considered finishing the job: Correct the problem!

4. **Verify that the problem has been corrected.** Repeating the same check that originally indicated the problem can often do this. If the fault has been corrected, the system should operate properly.
5. **Follow up to prevent further trouble.** A plan should be suggested that would prevent a future recurrence of this problem.

Experience

There is a way to capture a small part of the experience of personnel so those who have not seen a particular event for themselves can refer to it in the future. Equipment history or an equipment trouble log can tell quite a tale over the life of a piece of equipment.

The trouble log provides a valuable source of information that draws on the experience of past troubles and troubleshooting efforts, to quickly restore the equipment to service. Problems, symptoms, corrective actions, modifications, and preventive maintenance actions should all have entries that can be referenced at a later date.

Step-by-Step Approach

Troubleshooting a problem and is a logical, step-by-step procedure. The approach is much the same for all equipment; only the steps for implementing the approach may differ.

All maintenance personnel can use general troubleshooting procedures. The basic approach is listed below:

- Talk with the operator
- Solve the problem
- Make final checks
- Complete equipment logs and paperwork
- Inform area supervisors/instruct operators

TROUBLESHOOTING TIPS

Conveyor stops running	Roller to Roller Chains	Check all roller chains to ensure they are engaging	
	Drive Chain	Check Drive chain	
	Drive Issues	See Drive Problems below	
Roller Problems	Warped Roller	Check Weight Limit and load conveyor evenly	
Drive problems	Overload trips	Excessive load	Reduce load
		Belt over tensioned	Adjust belt tension
	Drive overheating	Low oil level	Add oil to correct level
		Excessive load	Reduce load
		Belt over tensioned	Adjust belt tension
Abnormal Noises	Squealing	Rollers or Chain rubbing on guarding	Turn off Conveyor and check guarding for any wear
	Clicking	Loose Drive Chain	Re-tension Drive Chain
	Grinding	Check Gear Motor	Replace if Faulty

Replacement Parts

After the conveyor has been used for a long period of time it will become necessary to replace certain parts. The service life of consumable parts varies depending upon the materials carried, the general operating conditions, regular maintenance (or lack of) and the total operating time.

The general condition of the conveyor should be inspected daily (i.e. at the start or end of a shift) and

an in-depth inspection should be carried out during regularly scheduled maintenance procedures.

When you need to procure consumable parts contact MC3 Manufacturing Inc. at (519) 325-1370 quoting the serial number(s) of the machine(s), the part names and quantities of each part required.

Note: Please refer to following page for part description and contact MC3 Manufacturing for specific parts numbers. Reference Serial Number (found near the drive assembly).

Parts List

Item	Part Description
1	Roller – Roller Chain
2	Roller w/ Sprocket Attachments
3	Roller to Motor Chain
4	Driving Sprocket
5	Drive Motor
6	Motor to Gearbox Adapter
7	Gearbox
8	Gearbox Shaft Cover
9	Plug in Shaft
10	Controls (Optional)



Notes: