



# CONVEY-IT MODULAR CONVEYOR SYSTEMS

OPERATING MANUAL





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## INTRODUCTION

This manual describes the assembly and operation of Convey-it modular conveyors.

These hydraulically powered machines consist of modules that can be quickly and easily coupled together to yield conveyor systems ranging from 12 feet to several hundred feet in length. They are capable of transporting many tons of materials per hour and can be used to move virtually any substance. Their ease of assembly and ability to function reliably in the presence of corrosive or abrasive materials make them especially well suited to harsh industrial conditions, including the interiors of limekilns and boilers.

## COMPONENTS OF THE CONVEYOR SYSTEM

Convey-it modular conveyor systems are based on a continuous-loop, moving belt whose length can be varied by adding or removing 20-foot sections of belt. This belt is supported in 10-foot long trays and is stretched between 2 large rollers. One of these rollers (the rubber-coated one) is hydraulically powered and is mounted in a drive assembly. The other is not powered and is mounted in a belt-tensioning assembly. The drive assembly is attached to a hydraulic unit, and the hydraulic unit is plugged into a 230-Volt electrical power source.

The toolbox that accompanies the conveyor contains the following:

- a socket wrench for adjusting the belt-tensioning bolt
- a spare drive chain
- spare links for the drive chain
- belt-joining pins
- spare belt lacings (these are the metal fittings that attach to the ends of the belts, making it possible to join them)
- spare rollers (under trays-belt return)





## ASSEMBLY

### **Step 1: Lock out the hydraulic unit**

Put the main switch on the hydraulic unit in the “off” position, and secure it with your personal lock out tag. Similarly, when the conveyor is being disassembled, serviced, or adjusted in any way (including the clearing of jams or the replacement of belts) it should be locked out.



### **Step 2: Position the Drive Assembly**

The belt will run in either direction, so material can be moved either towards the drive assembly (forward) or away from it (reverse) by flicking the forward/neutral/reverse switch on the hydraulic unit. It is, however, possible to pull a heavier load towards the drive assembly than can be pushed away from it. Thus, if the conveyor is to be operated in just one direction, begin the assembly process by locating the drive assembly at the intended destination of the material being moved. If the conveyor is to be operated in both directions, begin by locating the drive assembly where the heaviest loads are to be delivered.





### Step 3: Attach the Trays to the Drive Assembly

Attach as many trays as necessary to the drive assembly using the male/female coupling devices. Each tray has a male end with coupling pins, and a female end with sockets into which the pins fit. In order for the trays to couple to each other (and to the drive assembly and Belt-tensioning assembly) each one must have its male end facing the drive assembly and its female end facing the belt-tensioning assembly.



### Step 4: Attach the Belt-Tensioning Assembly to the Last Tray

When the conveyor is the desired length, attach the belt-tensioning assembly to the last tray.



### Step 5: Slacken off the Belt Tensioning Bolt

On the belt-tensioning assembly, turn the belt-tensioning bolt counter-clockwise until the large roller is as close to the trays as possible.





### Step 6: Install the Belt

Lay two 20-foot sections of belt in the trays, with the smooth side facing up. Join these sections together with a belt-joining pin.



Now, in the same way add additional sections of belt. As the belt is lengthened, feed one end of it around the large roller on the belt-tensioning assembly and under the trays as shown in the left hand picture below.



Then feed the belt around the drive assembly and back into the trays as shown in the picture on the right above.

Continue to add 20-foot sections of belt until the two free ends are within a few feet of meeting. This will require as many 20-foot sections of belt as there are 10-foot trays in the assembled conveyor. Now, after pulling the belt tight (and ensuring that the belt-tensioning bolt is slacked off) add the shortest piece of belt that will just join the two free ends.



## Step 7: Tighten the Belt

Now that the belt forms a continuous loop, turn the belt-tensioning bolt clockwise to tighten the belt. The belt is under the correct tension when it hangs 3-4 inches below the bottom of the trays midway between the small metal rollers.



## Step 8: Install the Safety Guards

Place the safety guards on the drive assembly, and on the belt tensioning assembly.



## Step 9: Plug the “Stop” Button Cord into the Hydraulic Unit

There are two red “stop” buttons on the conveyor: one on the belt-tensioning assembly and one on the hydraulic unit. Ensure that these buttons are pulled out and that the electrical cord from the one on the belt-tensioning assembly is plugged into the socket beside the “stop” button on the hydraulic unit. As a safety measure the conveyor will not run unless the stop buttons are plugged in and in the “on” position.



## Step 10: Connect the Hydraulic Hoses to the Drive Assembly

**Caution:** In connecting and disconnecting the hydraulic hoses it is very important to keep these connections clean. Even a tiny speck of dirt in the hydraulic fluid could cause the hydraulic unit to fail.

Connect the 2 hydraulic hoses from the hydraulic unit to the quick couplers on the bottom of the drive assembly. To do this it is necessary to remove the plastic caps from the ends of the hoses and from the quick couplers. (Be sure to replace these caps immediately when the hoses are disconnected.) The quick couplers are constructed so that it is not possible to connect the hoses to the wrong couplers.





## Step 11: Connect to a 230-Amp Power Source

Plug the free end of the electrical cord on the hydraulic unit into a 230-amp power source. Position the cord where it won't be cut, crushed or otherwise damaged. After inspecting the conveyor to ensure that it has been properly assembled, and that anyone near it is in a safe position remove your lockout tag. The conveyor is now ready to be operated.

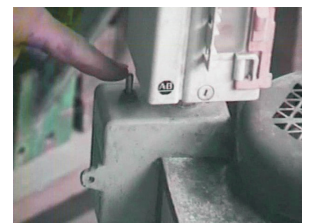


## OPERATION

### The Control Switches

On the hydraulic unit locate the following three switches that are used to control the conveyor during normal operation:

- The main on/off switch. This switch controls the hydraulic pump. It is normally in the “on” position whenever the machine is being used.
- The forward/neutral/reverse switch. This switch is used to make the conveyor operate in either direction (forward or reverse) or to stop it (neutral) when it is expected to be restarted in the near future.
- The speed adjustment lever, which regulates the speed at which the conveyor belt moves. On the speed adjustment lever there is a setscrew that can be used to lock this lever in position.



Also locate three red “stop” buttons: one on the belt-adjustment assembly, one that can be attached magnetically at any point along the trays, and one on the hydraulic unit. Ensure that these buttons are pulled out and that the electrical cords from the first two are plugged into the sockets beside the “stop” button on the hydraulic unit.

**Caution:** Whenever the operation of the conveyor would be unsafe (including when a belt is being changed, a jam is being cleared, or the guards are removed from either the drive assembly or the belt-tensioning assembly) the main on/off switch should be locked out.

Furthermore, everyone working with the conveyor should be familiar with the location of the red “stop” buttons. Pushing one of these will immediately stop the drive and the conveyor belt.

### **Controlling the Speed and Direction of the Belt**

Before operating the conveyor, ensure that it is properly assembled, and that anyone near it is in a safe position and is aware that it is about to be operated.

Put the forward/neutral/reverse switch on the hydraulic unit in the “neutral” position.

Turn the speed adjustment lever to the lowest setting (i.e. put it in the full “up” position).

Put the main switch on the hydraulic unit in the “on” position.

Now, to make the belt move towards the drive assembly, put the forward/neutral/reverse switch in the “forward” position, and then turn the speed adjustment lever clockwise (down) until the belt is moving at the desired speed. Similarly, to make the belt move toward the belt-tensioning assembly, put the forward/neutral/reverse switch in the reverse position. The setscrew on the speed adjustment lever may be used to lock this lever in a certain position if the operator desires.

### **TROUBLE SHOOTING**

**If the drive motor on the hydraulic pump does not run when the on/off switch on the hydraulic unit is turned on (i.e. the hydraulic unit does not make a humming noise when turned on):**

- Be sure that the hydraulic unit is plugged in to a 230-amp power source
- Be sure that the breaker switches on the electrical panel into which the hydraulic unit is plugged are in the “on” position
- Be sure that the reset button on the motor junction box (on the hydraulic unit) is pushed in





- If none of the above solves the problem. There is a slight possibility that the main breaker switch on the motor has been tripped. If this has occurred the motor can be restarted by waiting 5 minutes after it stopped, and then turning the main switch to full “off”, and then to “on”.

**If the drive motor on the hydraulic pump is operating, but the large, rubber-coated roller on the drive assembly does not turn:**

- Be sure that the forward/neutral/reverse switch on the hydraulic unit is not in neutral.
- Be sure that the speed control knob on the hydraulic unit is not turned all the way up.
- Be sure that each of the red “stop” buttons (one on the belt-tensioning assembly and one that can be magnetically attached anywhere along the trays) are pulled out and that the electrical cords that lead away from them are plugged in beside the red “stop” button on the hydraulic unit.
- Be sure that the chain that drives the roller is not broken. If the chain is broken, replace it with the spare chain in the toolbox.
- On three phase powered units, make sure pump is turning counter clockwise. To change direction switch any two of supply power leads.
- Touch the hydraulic fluid tank on the hydraulic unit. If it is too hot to hold your hand on this indicates that the hydraulic fluid has overheated. In the unlikely event that this should occur, contact Convey-It immediately.

**If the large, rubber-coated roller on the drive assembly turns, but the conveyor belt does not move:**

- Lock out the conveyor at the main switch on the hydraulic unit, and then check for jams along the belt. If material has jammed under the belt, clear it. If one of the pins that holds the belt sections together has started to come out and has caught on the edge of the conveyor, then loosen the belt (with the belt-tensioning bolt), insert the pin fully, and re-tighten the belt.
- If there are no jams along the belt, and the drive roller is slipping on the belt, this generally indicates that the belt is too loose. If this is the case, see “Tightening the Belt” below.



### **Tightening the Belt:**

- If the drive roller is slipping on the belt, and the belt is not jammed, then the belt is probably too loose. In this case tighten the belt by turning the belt-tensioning bolt clockwise. (When properly tensioned, the belt usually hangs about 3-4 inches below the bottom of the trays at a point midway between two of the small metal rollers that supports it.)
- If, when the belt-tensioning bolt has been turned as far as it will go (so that the large roller is as far from the tray as it will go) the belt is still too loose, then the belt as a whole is too long. The belt normally consists of several 20-foot sections and a much smaller section that is less than 4 feet long. Lock out the hydraulic unit, locate the small section, give the belt as much slack as possible by turning the belt-tensioning bolt clockwise as far as it will go, remove the small section of belt and replace it with a smaller piece of belt (the smallest piece that will just join the free ends of the belt). If the belt is long enough, join its 2 free ends without inserting one of the small sections. Now remove the lockout from the hydraulic unit and tighten the belt by turning the belt-tensioning bolt clockwise.
- If, after removing all of the small pieces of belt, the belt as a whole is still too loose, it may be necessary to shorten one of the belts. (See “Belt Repairs” below.)

### **Belt Repairs:**

For several reasons it may occasionally be necessary to cut a belt and attach a new lacing to it. (A lacing is the metal fitting on the end of a belt that allows it to be joined to another belt.) Such belt work may be required because a belt has been torn or a lacing has pulled out.

Belt work may also be required if a belt needs to be shortened in order to properly tension the conveyor belt as a whole. Usually it is possible to adjust the length of the conveyor belt as a whole by choosing one of the shorter connector belts to achieve the length required (see “Tightening the Belt” above).

To shorten a belt or replace a damaged lacing, follow these steps:

- With a sharp knife, being careful to make a square cut, cut off the unwanted piece of belt.
- Take a new lacing from the toolbox. Holding the lacing with the rivet heads facing up, and the belt with the smooth side facing up, and insert the free end of the belt into the lacing until it hits the stopper.
- Place the end of the belt, with the lacing on it, on a steel surface. Holding the lacing square to the belt and against the stopper, drive the rivets through the belt with a hammer.
- Turn the lacing over and use the hammer to flatten the rivet ends.



## **CONTACTING CONVEY-IT**

For further assistance with any aspect of a Convey-it product, including parts, repairs, shipping and rentals, contact one of the following:

## **Convey-It Systems**

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