

**IMPORTANT!  
DO NOT DESTROY**



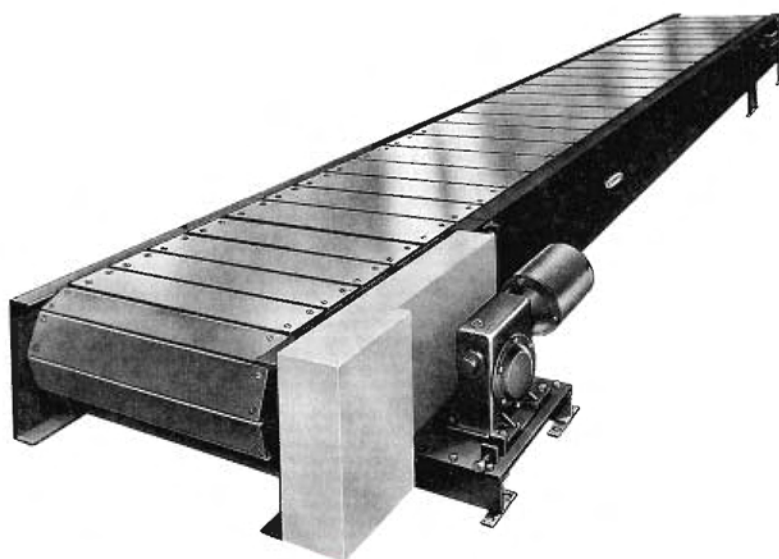
# Installation and Maintenance Manual

with **Safety Information**  
and Parts List

RECOMMENDED SPARE PARTS HIGHLIGHTED IN GRAY

**Model SL**

Bulletin No. 357 (1008)  
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**HYTROL CONVEYOR CO., INC.**

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## ● Warning Signs

In an effort to reduce the possibility of injury to personnel working around HYTROL conveying equipment, warning signs are placed at various points on the equipment to alert them of potential dangers. Please check equipment and note

all warning signs. Make certain your personnel are alerted to and obey these warnings. Shown below are typical signs that are attached to this equipment.



PLACED ON ALL  
POWERED CONVEYORS NEAR  
DRIVE AND/OR CONTROLS.



PLACED ON TERMINATING ENDS



PLACED NEXT TO DRIVE, BOTH SIDES.



PLACED ON ALL CHAIN GUARDS.



PLACED ON 20 FT. INTERVALS, BOTH SIDES.



PLACED AT DRIVE OF ALL POWERED CONVEYORS.



# INTRODUCTION



This manual provides guidelines and procedures for installing, operating, and maintaining your conveyor. A complete parts list is provided with recommended spare parts highlighted in gray. Important safety information is also provided throughout

the manual. For safety to personnel and for proper operation of your conveyor, it is recommended that you read and follow the instructions provided in this manual.

## ● Receiving and Uncrating

1. . . Check the number of items received against the bill of lading.
2. . . Examine condition of equipment to determine if any damage occurred during shipment.
3. . . Move all crates to area of installation.
4. . . Remove crating and check for optional equipment that may be fastened to the conveyor. Make sure these parts (or any foreign pieces) are removed.

**NOTE:** If damage has occurred or freight is missing, see the "Important Notice" attached to the crate.

# INSTALLATION

## ● Installation Safety Precautions for Conveyors and Related Equipment

### GUARDS AND GUARDING

**Interfacing of Equipment.** When two or more pieces of equipment are interfaced, special attention shall be given to the interfaced area to insure the presence of adequate guarding and safety devices.

**Guarding Exceptions.** Wherever conditions prevail that would require guarding under these standards, but such guarding would render the conveyor unusable, prominent warning means shall be provided in the area or on the equipment in lieu of guarding.

**Guarded by Location or Position.** Where necessary for the protection of employees from hazards, all exposed moving machinery parts that present a hazard to employees at their work station shall be mechanically or electrically guarded, or guarded by location or position.

When a conveyor passes over a walkway, roadway, or work station, it is considered guarded solely by location or position if all moving parts are at least 8 ft. (2.44 m) above the floor or walking surface or are otherwise located so that the employee cannot inadvertently come in contact with hazardous moving parts.

Although overhead conveyors may be guarded by location, spill guard, pan guards, or equivalent shall be provided if the product may fall off the conveyor for any reason and if personnel would be endangered.

### HEADROOM

When conveyors are installed above exit passageways, aisles, or corridors, there shall be provided a minimum clearance of 6 ft. 8 in. (2.032 m) measured vertically from the floor or walking surface to the lowest part of the conveyor or guards. Where system function will be impaired by providing the minimum clearance of 6 ft. 8 in. (2.032 m) through an emergency exit, alternate passageways shall be provided.

It is permissible to allow passage under conveyors with less than 6 ft. 8 in. (2.032 m) clearance from the floor for other than emergency exits if a suitable warning indicates low headroom.

## ● Conveyor Set-Up

- 1... Determine direction of product flow. Figure 4A indicates the flow as related to the drive.
- 2... Refer to "Match-Mark" numbers on ends of conveyor sections. Position them in this sequence near area of installation.
- 3... Mark a chalk line on floor to locate centerline of the conveyor.
- 4... Attach supports to all conveyor sections as shown in Figures 4A and 4B.
- 5... During installation, check to make sure each bed section is square. Measure the diagonals from corner to corner of the frame. If they are not equal, the frame must be squared. Attach a come-along or some other suitable pulling device across longest corners and pull until the section is square.
- 6... Place the drive section in position.
- 7... Install remaining sections. Fasten together with butt couplings (Figure 4B). Hand tighten bolts only.
- 8... Check to see that conveyor is level across the width and length of unit. Shim supports as necessary to level.
- 9... After all sections have been squared and levelled, tighten all butt couplings, bolts and lag supports to floor.
- 10... Install electrical controls and wire motor. Verify correct motor rotation at this time. See Page 6.
- 11... Install belt per instructions on Page 5.

FIGURE 4A

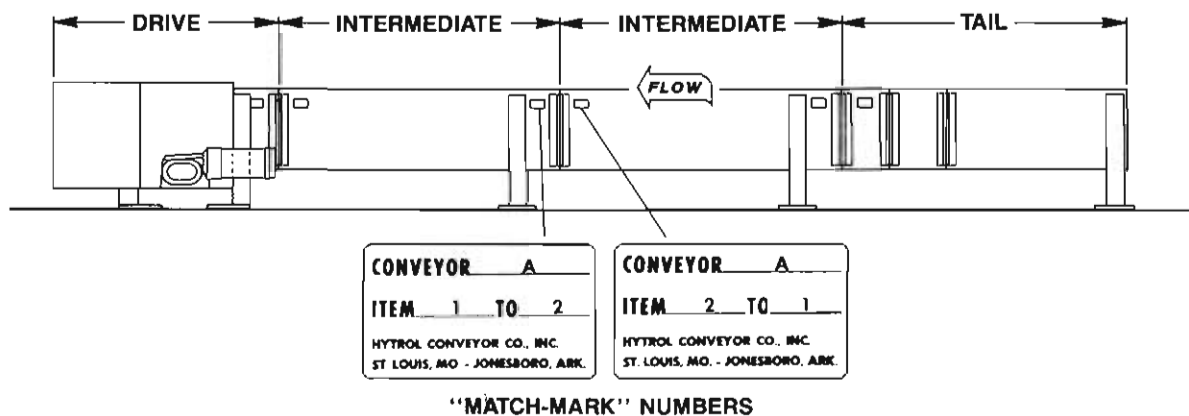
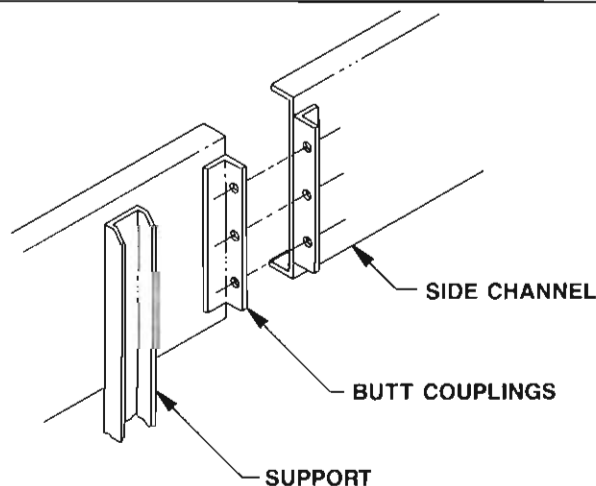


FIGURE 4B

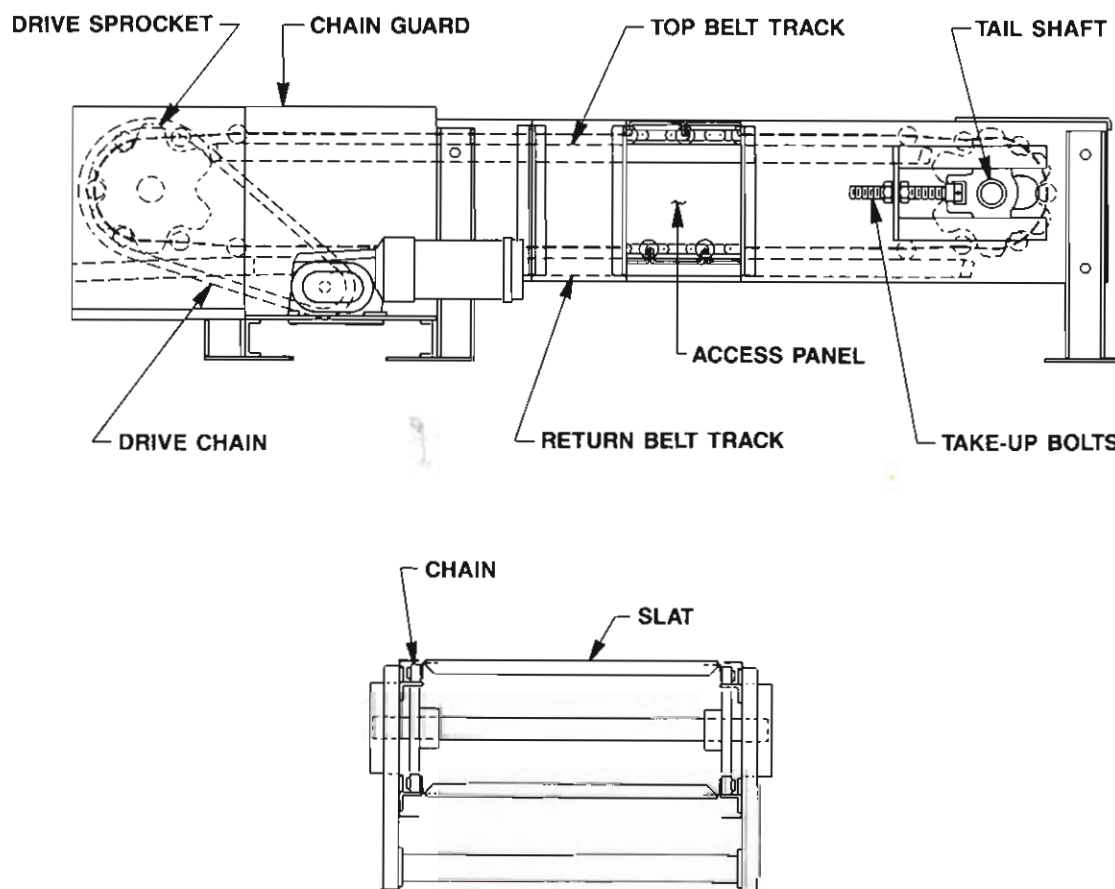


## ● Belt (Chain & Slat) Installation

The Model SL Conveyor Belt consists of two pieces of MSR6018-A2 roller chain with 5-3/4" x 1-1/2" x 7 ga. formed steel slats bolted to the chain attachments. This belt is assembled at the factory and is shipped in ten foot lengths. Steps for installing are as follows:

- 1... Remove chain guard and drive chain to allow drive sprockets to turn freely during belt installation (Figure 5A).
- 2... Remove access panels from tail section of conveyor.
- 3... Lay 10' sections of belt on top of belt track. Connect chains by lifting ends and inserting chain connecting pins thru access opening.
- 4... Pull belt over drive sprockets and feed back into return belt track.
- 5... Continue to add 10' sections of belt and pull return belt toward tail sprockets.
- 6... Pull return belt around tail sprockets and place end above access panel opening.
- 7... Connect ends of belt by inserting chain connecting pins thru access opening.
- 8... Replace drive chain, chain guard, and access panels that were removed in steps 1 & 2 above.
- 9... Adjust belt tension with take-up bolts at tail shaft. Keep shaft square by moving both take-up bolts an equal amount.

FIGURE 5A







## ● Electrical Equipment

### WARNING!

Electrical controls shall be installed and wired by a qualified electrician. Wiring information for the motor and controls are furnished by the equipment manufacturer.

### CONTROLS

Electrical Code: All motor controls and wiring shall conform to the National Electrical Code (Article 670 or other applicable articles) as published by the National Fire Protection Association and as approved by the American Standards Institute, Inc.

### CONTROL STATIONS

**A)** Control stations should be so arranged and located that the operation of the equipment is visible from them, and shall be clearly marked or labeled to indicate the function controlled.

**B)** A conveyor which would cause injury when started shall not be started until employees in the area are alerted by a signal or by a designated person that the conveyor is about to start.

When a conveyor would cause injury when started and is automatically controlled or must be controlled from a remote location, an audible device shall be provided which can be clearly heard at all points along the conveyor where personnel may be present. The warning device shall be actuated by the controller device starting the conveyor and shall continue for a required period of time before the conveyor starts. A flashing light or similar visual warning may be used in conjunction with or in place of the audible device if more effective in particular circumstances.

Where system function would be seriously hindered or adversely affected by the required time delay or where the intent of the warning may be misinterpreted (i.e., a work area with many different conveyors and allied devices), clear, concise, and legible warning shall be provided. The warning shall indicate that conveyors and allied equipment may be started at any time, that danger exists, and that personnel must keep clear. The warnings shall be provided along the conveyor at areas not guarded by position or location.

**C)** Remotely and automatically controlled conveyors, and conveyors where operator stations are not manned

or are beyond voice and visual contact from drive areas, loading areas, transfer points, and other potentially hazardous locations on the conveyor path not guarded by location, position, or guards, shall be furnished with emergency stop buttons, pull cords, limit switches, or similar emergency stop devices.

All such emergency stop devices shall be easily identifiable in the immediate vicinity of such locations unless guarded by location, position, or guards. Where the design, function, and operation of such conveyor clearly is not hazardous to personnel, an emergency stop device is not required.

The emergency stop device shall act directly on the control of the conveyor concerned and shall not depend on the stopping of any other equipment. The emergency stop devices shall be installed so that they cannot be overridden from other locations.

**D)** Inactive and unused actuators, controllers, and wiring should be removed from control stations and panel boards, together with obsolete diagrams, indicators, control labels, and other material which serve to confuse the operator.

### SAFETY DEVICES

**A)** All safety devices, including wiring of electrical safety devices, shall be arranged to operate in a "Fail-Safe" manner, that is, if power failure or failure of the device itself would occur, a hazardous condition must not result.

**B)** *Emergency Stops and Restarts.* Conveyor controls shall be so arranged that, in case of emergency stop, manual reset or start at the location where the emergency stop was initiated, shall be required of the conveyor(s) and associated equipment to resume operation.

**C)** Before restarting a conveyor which has been stopped because of an emergency, an inspection of the conveyor shall be made and the cause of the stoppage determined. The starting device shall be locked out before any attempt is made to remove the cause of stoppage, unless operation is necessary to determine the cause or to safely remove the stoppage.

Refer to ANSI Z244.1-1982, American National Standard for Personnel Protection – Lockout/Tagout of Energy Sources – Minimum Safety Requirements and OSHA Standard Number 29 CFR 1910.147 "The Control of Hazardous Energy (Lockout/Tagout)."

## ● Operation Safety Precautions

- A)** Only trained employees shall be permitted to operate conveyors. Training shall include instruction in operation under normal conditions and emergency situations.
- B)** Where employee safety is dependent upon stopping and/or starting devices, they shall be kept free of obstructions to permit ready access.
- C)** The area around loading and unloading points shall be kept clear of obstructions which could endanger personnel.
- D)** No person shall ride the load-carrying element of a conveyor under any circumstances unless that person is specifically authorized by the owner or employer to do so. Under those circumstances, such employee shall only ride a conveyor which incorporates within its supporting structure, platforms or control stations specifically designed for carrying personnel. Under no circumstances shall any person ride on any element of a vertical conveyor. Owners of conveyors should affix warning devices to the conveyor reading **Do Not Ride Conveyor**.
- E)** Personnel working on or near a conveyor shall be instructed as to the location and operation of pertinent stopping devices.
- F)** A conveyor shall be used to transport only material it is capable of handling safely.
- G)** Under no circumstances shall the safety characteristics of the conveyor be altered if such alterations would endanger personnel.
- H)** Routine inspections and preventive and corrective maintenance programs shall be conducted to insure that all safety features and devices are retained and function properly.
- I)** Personnel should be alerted to the potential hazard of entanglement in conveyors caused by items such as long hair, loose clothing, and jewelry.
- J)** As a general rule, conveyors should not be cleaned while in operation. Where proper cleaning requires the conveyor to be in motion and a hazard exists, personnel should be made aware of the associated hazard.

## ● Conveyor Start-Up

Before conveyor is turned on, check for foreign objects that may have been left inside conveyor during installation. These objects could cause serious damage during start-up.

After conveyor has been turned on and is operating, check motors, reducers, and moving parts to make sure they are working freely.

### CAUTION!

Because of the many moving parts on the conveyor, all personnel in the area of the conveyor need to be warned that the conveyor is about to be started.



# MAINTENANCE



## ● Maintenance Safety Precautions

**A)** Maintenance, such as lubrication and adjustments, shall be performed only by qualified and trained personnel.

**B)** It is Important that a maintenance program be established to insure that all conveyor components are maintained in a condition which does not constitute a hazard to personnel.

**C)** When a conveyor is stopped for maintenance purposes, starting devices or powered accessories shall be locked or tagged out in accordance with a formalized procedure designed to protect all person or groups involved with the conveyor against an unexpected start.

**D)** Replace all safety devices and guards before starting equipment for normal operation.

**E)** Whenever practical, **DO NOT** lubricate conveyors while they are in motion. Only trained personnel who are aware of the hazard of the conveyor in motion shall be allowed to lubricate.

### **SAFETY GUARDS**

Maintain all guards and safety devices **IN POSITION** and **IN SAFE REPAIR**.

### **WARNING SIGNS**

Maintain all warning signs in a legible condition and obey all warnings. See Page 2 of this manual for examples of warning signs.

## ● Lubrication

### **BEARINGS**

**A) NO GREASE FITTING** - Prelubricated - No lubrication required.

**B) WITH GREASE FITTING** - Relubricate approximately every 10 to 12 weeks with lithium base grease suitable for ball bearing service.

### **REDUCER**

See recommendations by manufacturer



## ● Drive Chain Alignment and Tension

The drive chain and sprockets should be checked periodically for proper tension and alignment. Improper adjustment will cause extensive wear to the drive components.

### TO MAKE ADJUSTMENTS

1. . . Remove chain guard.
2. . . Check sprocket alignment by placing a straightedge across the face of both sprockets. (Figure 9A.) Loosen set screws and adjust as needed. Re-tighten set screws.
3. . . To adjust chain tension, loosen reducer mounting bolts. Tighten take-up bolts until desired chain tension is reached. (Figures 9B & 9C). Re-tighten mounting bolts.
4. . . Lubricate chain per lubrication instructions.
5. . . Replace chain guard so that it does not interfere with drive.

### WARNING!

Never remove chain guards while the conveyor is running. Always replace guards after adjustments are made.

FIGURE 9A

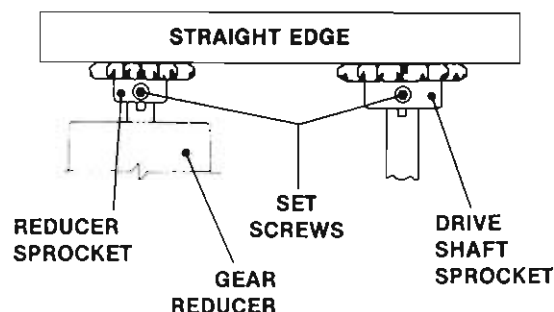


FIGURE 9B

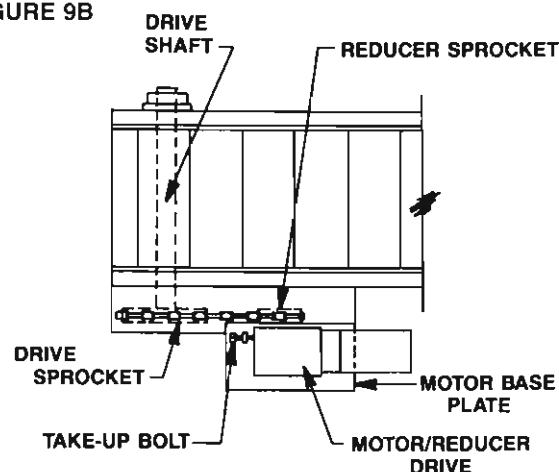
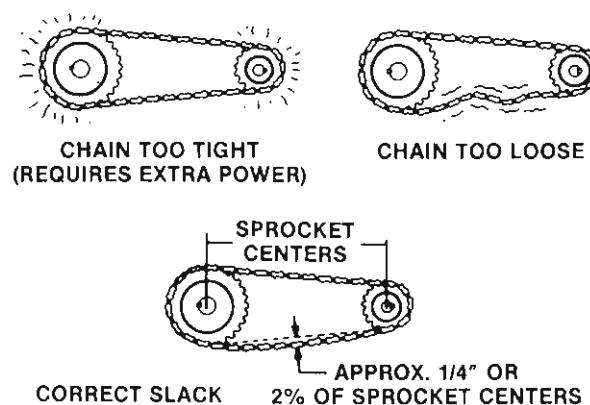


FIGURE 9C





## ● Trouble Shooting

The following charts list possible problems that may occur in the operation of a powered conveyor.

### TROUBLE SHOOTING DRIVES

TROUBLE	CAUSE	SOLUTION
Conveyor will not start or motor quit frequently.	1) Motor is overloaded or drawing too much current.	1) Check for overloading of conveyor. 2) Check heater or circuit breaker and change if necessary.
Drive chain and sprockets wear excessively.	1) Lack of lubrication on chain causing chain stretch which creates improper chain to sprocket mesh. 2) Sprockets are out of alignment. 3) Loose chain.	1) Replace chain and sprockets. Provide adequate lubrication. NOTE: If problem reoccurs, a chain take-up may be required. 2) Align sprockets. See "Drive Chain Alignment and Tension" in this manual. 3) Tighten chain.
Loud popping or grinding noise.	1) Defective bearing. 2) Loose set screws in bearing. 3) Loose drive chain.	1) Replace bearing. 2) Tighten set screw. 3) Tighten chain.
Motor or reducer overheating.	1) Conveyor is overloaded. 2) Low voltage to motor. 3) Low lubricant level in reducer.	1) Check capacity of conveyor and reduce load to recommended level. 2) Have electrician check and correct as necessary. 3) Relubricate per manufacturer's recommendations. For HYTROL reducer, refer to separate manual.

### TROUBLE SHOOTING BELT

TROUBLE	CAUSE	SOLUTION
Belt dragging side of conveyor.	1) Sprockets not set properly. 2) Tail or drive shaft not square with conveyor frame.	1) Set sprockets so belt is centered in conveyor frame 2) Adjust as necessary—(Both end of shaft should be equal distance from end of bed).



## ● Preventive Maintenance Checklist

The following is a general maintenance checklist which covers the major components of your conveyor.

This will be helpful in establishing a standard maintenance schedule.

COMPONENT	SUGGESTED ACTION	SCHEDULE		
		Weekly	Monthly	Quarterly
MOTOR	Check Noise			
	Check Temperature			
	Check Mounting Bolts			
REDUCER	Check Noise			
	Check Temperature			
	Check Oil Level			
BELT (Chain & Slats)	Check Tension			
	Lubricate Chain			
BEARINGS	Check Noise			
	Check Lubrication			
	Check Mounting Bolts			
DRIVE CHAIN	Check Tension			
	Lubricate			
	Check For Wear			
SPROCKETS	Check For Wear			
	Check Set Screws & Keys			
STRUCTURAL	General Check: All loose bolts, etc., tightened			

## ● How to Order Replacement Parts

Included in this manual are parts drawings with complete replacement parts lists. Minor fasteners, such as nuts and bolts, are not included.

When ordering replacement parts:

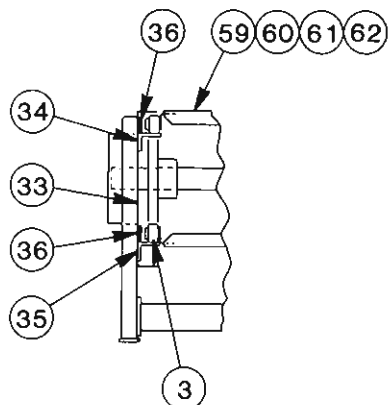
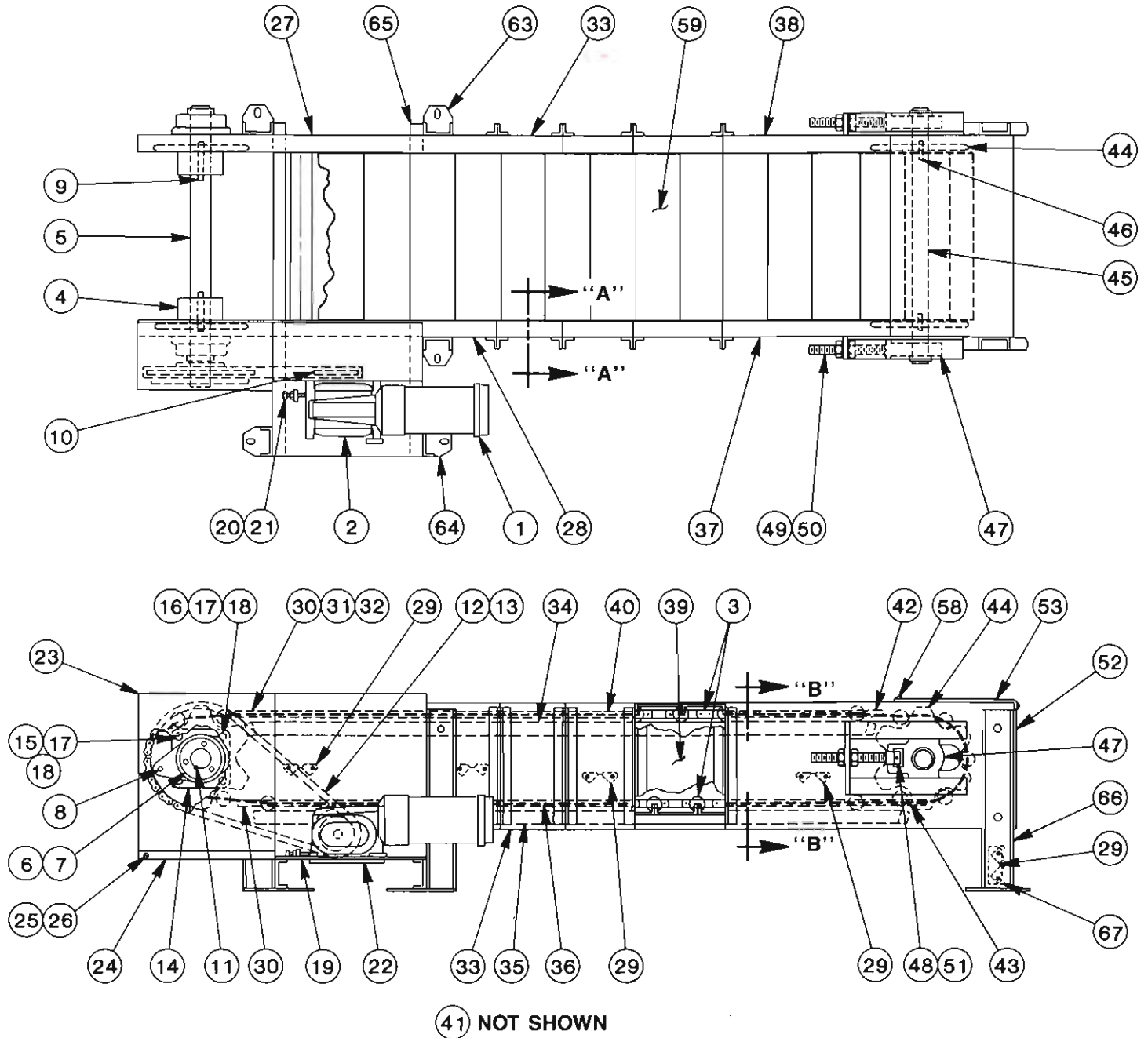
- 1) Contact Dealer from whom conveyor was purchased or nearest HYTROL Distributor.
- 2) Give Conveyor Model Number and Serial Number or HYTROL Factory Order Number.
- 3) Give Part Number and complete description from Parts List.
- 4) If you are in a breakdown situation, tell us.



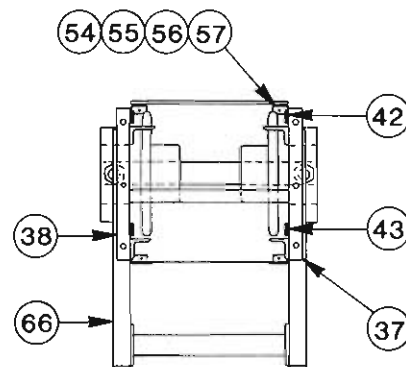
HYTROL Serial Number  
(Located near Drive  
on Powered Models)



# ● Model SL Parts Drawing

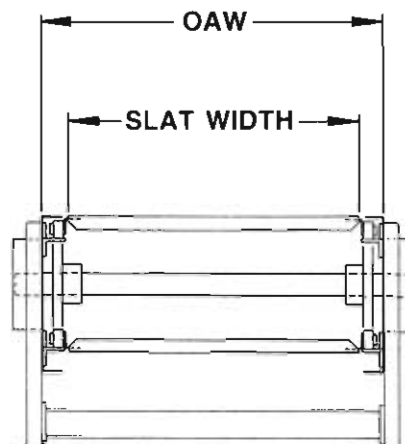


SECTION "A-A"



SECTION "B-B"

# ● Model SL Parts List



See Page 11 For Information On  
How to Order Replacement Parts

## Recommended Spare Parts List Highlighted in Gray

Ref. No.	Part No.	Description
1	-	Motor-C-Face
-	30.7534	2 HP-230/460VAC-3 Ph.-60 Hz.-TEFC
-	30.764	3 HP-230/460VAC-3 Ph.-60 Hz.-TEFC
2	-	C-Flange Speed Reducer-RH
-	55.0939	CM-16-60:1 Ratio
-	55.0949	CM-21-60:1 Ratio
3	29.250	Bushed Steel Roller Chain-6 In. Pitch
4	29.361	Sprocket-6 Tooth, 12 In. P.D. x 2-15/16 In. Bore
5	B-8287	Drive Shaft-2-15/16 In. Dia. (Specify OAW)
6	29.370	Shear Pin Hub-2-15/16 In. Bore
7	29.371	Sprocket-100A36 x 7-1/2 In. Bore
8	-	Shear Pin
-	29.372	2 HP Motor
-	29.373	3 HP Motor
9	B-10449-4	Shaft Key-3/4 In. Sq. x 4 In. Long
10	-	Sprocket-100B13
-	28.40005	1-1/8 In. Bore-2 HP Motor
-	28.400	1-1/2 In. Bore-3 HP Motor
11	B-10449-3	Shaft Key-3/4 In. Sq. x 3 In. Long
12	29.105	#100 Riveted Roller Chain
13	29.2031	Connector Link-#100 Roller Chain
14	10.207	4-Bolt Bearing-2-15/16 In. Bore
15	B-14748	Bearing Mounting Bolt
16	40.6005	Hex Head Cap Screw-3/4-10 x 2 In. Long
17	43.205	Split Lockwasher-3/4
18	41.106	Hex Nut-3/4-10
19	-	Motor Base Ass.
-	B-8283-2	2 HP
-	B-8283-3	3 HP
20	40.405	Take-Up Bolt-1/2-13 x 2-1/2 In. Long
21	41.201	Hex Jam Nut-1/2-13
22	-	Reducer Attachment Bar
-	B-8290-2	2 HP
-	B-8290-3	3 HP
23	B-8315	Chain Guard Top
24	B-8316-R	Chain Guard Bottom
25	42.200	Round Head Screw-5/16-18 x 3/4 In. Long
26	41.909	U-Type Speed Nut-5/16-18
27	B-8250	Drive Channel-RH
28	B-8251	Drive Channel-LH
29	B-8262	Bed Spacer (Specify OAW)
30	B-2550	Drive Section Wearstrip-35 In. Long
31	42.2072	Flat Head Screw-#10-24 x 5/8 In. Long
32	41.802	Hex Locknut-Nylon Insert-#10-24
33	-	Intermediate Channel

Ref. No.	Part No.	Description
-	B-8252	5 Ft. Long Section
-	B-8253	10 Ft. Long Section
34	-	Forward Track
-	B-8277	5 Ft. Long Section
-	B-8279	10 Ft. Long Section
35	-	Return Track
-	B-8278	5 Ft. Long Section
-	B-8280	10 Ft. Long Section
36	-	Intermediate Wearstrip
-	B-2551	5 Ft. Long Section
-	B-2552	10 Ft. Long Section
37	B-8254	Tall Channel-RH
38	B-8255	Tall Channel-LH
39	B-8312	Access Hole Cover
40	B-2304	Tall Section Wearstrip-10 In. L.
41	B-2305	Tall Section Wearstrip-12 In. L.
42	B-2306	Tall Section Wearstrip-20 In. L.
43	B-2359	Tall Section Wearstrip-26 In. L.
44	29.360	Sprocket-6-Tooth, 12 In. P.D. x 2-7/16 In. Bore
45	B-8286	Tall Shaft-2-7/16 In. Dia. (Specify OAW)
46	B-10450	Shaft Key-5/8 In. Sq. x 4 In. Long
47	10.556	Take-up Bearing-2-7/16 In. Bore
48	B-8294	Take-up Bearing Block
49	B-8295	Threaded Take-up Rod-1-3/8 - 6
50	41.111	Hex Nut-1-3/8 - 6
51	49.108	Spring Lock Pin-1/4 In. Dia. x 2 In. Long
52	B-10443	End Guard (Specify OAW)
53	B-10444	Top Guard (Specify OAW)
54	B-8339	Formed Clip
55	42.300	Truss Head Screw-1/4-20 x 1/2 In. Long
56	43.200	Split Lockwasher-1/4 In. I.D.
57	49.310	U-Type Speed Nut-1/4-20
58	42.306	Truss Head Screw-1/4-20 x 3/4 In. Long
59	B-8282	Formed Metal Slat (Specify OAW)
60	42.2009	Flat Head Screw-5/16-18 x 1 In. Long
61	41.101	Hex Nut-5/16-18
62	43.201	Split Lockwasher-5/16 In. I.D.
63	B-8266-25	Drive Support Assy.-25 In. Elevation
64	B-14679-25	Drive Support Leg-25 In. Elevation
65	B-8267	Drive Support Brace (Specify OAW)
66	B-8263-25	Iner/Tail Support-25 In. Elevation
67	B-8296	Spacer Plate



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