

Field Manual
High-Speed Skew Conveyor
Installation Procedures, Maintenance, and
Parts Identification



To contact Intelligrated:
For service: Customer Service and Support (CSS)
Hotline 1-877-315-3400
On the World Wide Web: www.intelligrated.com

By mail:

Intelligrated
7901 Innovation Way
Mason, OH 45040

(513) 701-7300

Read these documents thoroughly before attempting to perform maintenance or repairs to the applicable Intelligrated conveyor system components or devices. Exercise extreme caution when working around moving and rotating conveyor equipment. Wear the proper clothing and safety equipment. DO NOT attempt to perform any maintenance until the equipment is de-energized, locked out and tagged out in accordance with established company procedures.

The information presented in these documents are correct at the time of publication. Intelligrated has made every effort to ensure that the information presented is correct and free from error. However, some errors or misprints may occur. Please contact Intelligrated with any corrections.

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Direct questions and comments concerning the information contained in this manual to:

Documentation Department
Intelligrated
7901 Innovation Way
Mason, OH 45040

Ph (513) 701-7300

Fax (513)701-7349

customerservice@intelligrated.com

Package Conveyor Safety Signs



Package Conveyors



 <p>Do Not Climb, Sit, Stand, Walk, Ride, or Touch the Conveyor at Any Time</p>	 <p>Do Not Perform Maintenance on Conveyor Until Electrical, Air, Hydraulic and Gravity Energy Sources Have Been Locked Out or Blocked</p>	 <p>Operate Equipment Only With All Approved Covers and Guards in Place</p>
 <p>Do Not Load a Stopped Conveyor or Overload a Running Conveyor</p>	 <p>Ensure That All Personnel Are Clear of Equipment Before Starting</p>	 <p>Allow Only Authorized Personnel To Operate or Maintain Material Handling Equipment</p>
 <p>Do Not Modify or Misuse Conveyor Controls</p>	 <p>Keep Clothing, BodyParts, and Hair Away from Conveyors</p>	 <p>Remove Trash, Paperwork, and Other Debris Only When Power is Locked Out and Tagged Out</p>
 <p>Ensure That ALL Controls and Pull Cords are Visible and Accessible</p>	 <p>Know the Location and Function of All Stop and Start Controls</p>	 <p>Report All Unsafe Conditions Jams should be cleared ONLY BY Authorized, Trained, Personnel</p>

POST IN PROMINENT AREA

Field Manual Issue and Revision Date(s)

1st Issue	2003-03
1st Revision	2006-03
2nd Revision	2007-05

Field Manual Revision Summary

Revision Date	Manual Section(s)	Revision Summary
2006-03	Title Page	Update Title Page
	Section G	Added reference to "Adjusting Drive Belt Tension" , page G-4 and G-6.
	Section H	<ul style="list-style-type: none">- Deleted Axle Locks from Table H-1, page H-4.- Insert new illustration (Figure H-1) Drive Belt Tension Adjustment, page H-7.- Deleted axle lock item, page H-7.- Deleted axle lock statements in Troubleshooting Procedures, page H-20.
	Section I	Updated roller part number, Key #s 8, 9, 10 and 11, page I-2.
2006-08	Section I	Update Part Numbers
2007-05	Section I	Update roller part numbers

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SECTION G: INSTALLATION PROCEDURES

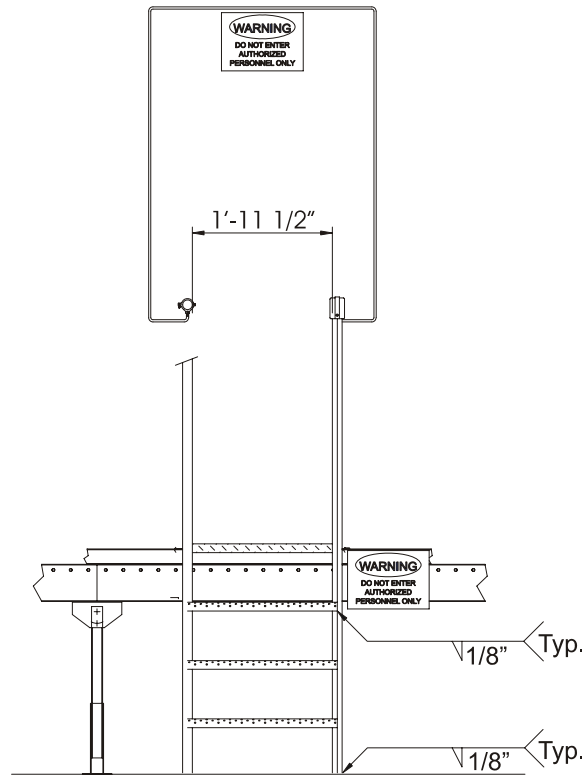
Accepting Shipment

For instructions on accepting shipment, see “Accepting Shipment” in “Section D – How To Use The Shipping List Summary,” Product Manual number CS1200, *Order Acknowledgement Manual*.

Warning Signs

Do not remove, paint over, or alter at any time the warning signs or labels posted on or near the conveyor equipment. Regularly test all safety devices, warning lights, and alarms associated with the conveyor system for proper operation and service as needed. If the original safety items become defective or damaged, refer to the conveyor parts lists or bills-of-materials for replacement part numbers.

WARNING: For conveyors installed at floor level in an “Authorized Personnel Access Area Only”, fixed rollers (3” centers) may be used in conjunction with an emergency pull cord. The area must be apart from normal working areas and access must be marked with a sign, “Warning - Do Not Enter - Authorized Personnel Only”. Part Number for ordering Warning Sign is 957305. The illustration below shows the location for installation of the sign.



TO ORDER LADDER SUPPORTS PER CROSSOVER:		
QNTY:	PART DESCRIPTION:	PART DESCRIPTION:
1	957173	X-OVER SIGN FRAME
2	957174	3/8" DIA NYLON LOOP CLAMP (TO ATTACH SIGN TO FRAME)
4	957175	1 1/4" DIA PIPE RING W/BOLT (TO ATTACH SIGN TO LADDERS)
4	957305	SIGN_WARN BY-WS10 SETON M2540

Safety Instructions

- Turn off conveyor power sources and affix appropriate lock-out and tag-out devices to operating controls before servicing the equipment. Only trained and qualified personnel who are aware of the safety hazards should perform equipment adjustments or required maintenance while the conveyor is in operation.
- Observe all warning signs, lights, and alarms associated with the conveyor operation and maintenance, and be alert at all times to automatic operations of adjacent equipment.
- Exercise extreme caution near moving conveyor parts to avoid the hazard of hands, hair, and clothing being caught.
- Do not sit on, stand on, walk, ride, or cross (over or under) the conveyor at any time except where suitable catwalks, gates, or bridges are provided for personnel travel.
- Do not attempt to repair any equipment while the conveyor is running, replace any conveyor component without appropriate replacement parts, or modify the conveyor system without prior approval by the manufacturer.
- Do not operate the conveyor until all safety guards are securely in place, all tools and non-product materials are removed from or near the conveying surfaces, and all personnel are in safe positions.
- Do not remove or modify any safety devices provided on or with the conveyor.
- Do not clear jams or reach into any unit before first turning off the equipment power sources and affixing appropriate lock-out and tag-out devices.

CAUTION: There is a risk of injury with the roller conveyors with trapped rollers. Turn off conveyors before handling product or servicing. Limit access to maintenance personnel.

Note: Some live roller conveyors are designed to allow the carrier rollers to pop out should some object accidentally become caught between the carrier roller and the drive belt. This feature is required whenever the conveyor is installed in an area that is readily accessible to general plant personnel. However, when the conveyor is installed overhead, take provisions to prevent this feature from becoming a hazard to personnel below (due to falling rollers). Use the following guidelines to properly install the conveyors.

- For conveyors not installed overhead (below 8'-0" elevation):
All carrier rollers must be free to pop out (an exception to this is the carrier rollers installed at 2" centers).
- For conveyors installed overhead (8'-0" or higher) with no access (no catwalk, walkway, platform, etc.):
Prevent carrier rollers from falling on personnel below. If the side guides are mounted directly to the side rails (such as arrangements "A" and "C"), then the side guide serves to trap the rollers in place.
- For conveyors mounted overhead (8'-0" or higher), but accessible to operators by a platform:
Carrier rollers must be free to "pop out" as described above (assuming conveyors are less than 8'-0" above platform). However, if the platform does not provide a surface which would suffice as a spill guard, then provide a spill guard. The spill guard must protect personnel below from carrier rollers that may "pop out" of the frame.

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- For conveyors installed overhead (8'-0" or higher), but accessible by catwalk or walkways:
Prevent carrier rollers from falling on personnel below. Do not consider the walkways or catwalks to be operator platforms, but post signs limiting access to maintenance personnel. The signs must also warn against the danger of pinch points caused by trapped rollers. In addition, provide an emergency stop pull cord for stopping the conveyor while clearing jams or performing maintenance.
 - For all conveyors installed overhead:
Provide spill guards if product may fall off the conveyor for any reason and if personnel would be endangered. In any overhead installation, if the conveyed material is likely to fall (i.e., loose bottles in trays, poorly packaged products, etc.), install spill guards where the conveyor is above aisles or work spaces.
 - For conveyors mounted overhead:
If the conveyor is mounted overhead, additional guarding is recommended to prevent injury

Parts Replacement

To minimize production downtime, selected conveyor spare parts should be stocked for replacement of defective components when required. Refer to the equipment bill(s)-of-materials where quantity requirements or code numbers are not indicated on the conveyor parts list. For added convenience, a list of selected spare parts for standard products is included in this manual (see Section I).

Factory Assistance

Contact Customer Service for installation, operation, or maintenance assistance, or replacement parts.

Direction of Conveyor

The High-Speed Skew conveyor is designed to travel in a specific direction and this direction is not reversible. To ensure that installation is correct, the power unit of the conveyor is mounted toward the infeed end with the motor pointing towards the discharge end.

Note: The top flanges of the side rails are not punched for mounting side guides. If direct-mounted or space-side guides are required, the top side rail flanges must be drilled or punched in the field.

Conveyor Set Up

22" Conveyor

The 22" wide High-Speed Skew conveyor is shipped in one piece with the power unit already attached. To set-up the conveyor:

1. Attach floor supports onto unit (one needed at each end).
2. Ensure that the unit is level and aligned with appropriate adjoining equipment.
3. Manually rotate the drive pulley to walk the drive belt and ensure the belt tracks properly.
4. Check the drive belt tension and adjust as needed.
5. Check the timing belt tension and adjust as needed.
6. Connect power, conduct test run and adjust as needed.

28" Conveyor

The 28" wide High-Speed Skew conveyor is shipped in two pieces with the power unit attached on the infeed end. There is also a shipping brace mounted to the skew-side - side rail of the infeed section that connects the cross channel mounted to the power unit guard assembly to the side rail. The drive belt is already attached to the infeed section.

To set-up the conveyor:

1. Before removing the shipping brace, support the drive guard.
2. Remove shipping brace.
3. Verify the direction of product travel.
4. Attach floor supports onto each piece (one is needed at each end and one is needed immediately downstream of the power unit).
5. Connect sections together.
6. Ensure that the unit is level and aligned with appropriate adjoining equipment.
7. Install the drive belt to discharge end piece.
8. Manually rotate the drive pulley to walk the drive belt and ensure the belt tracks properly.
9. Check the drive belt tension and adjust as needed. See "Adjusting Drive Belt Tension" in Section H.
10. Check the timing belt tension and adjust as needed.
11. Check the drive belt in the discharge section and adjust as needed.
12. Install rollers as needed.
13. Connect power.
14. Conduct test run and adjust as needed.

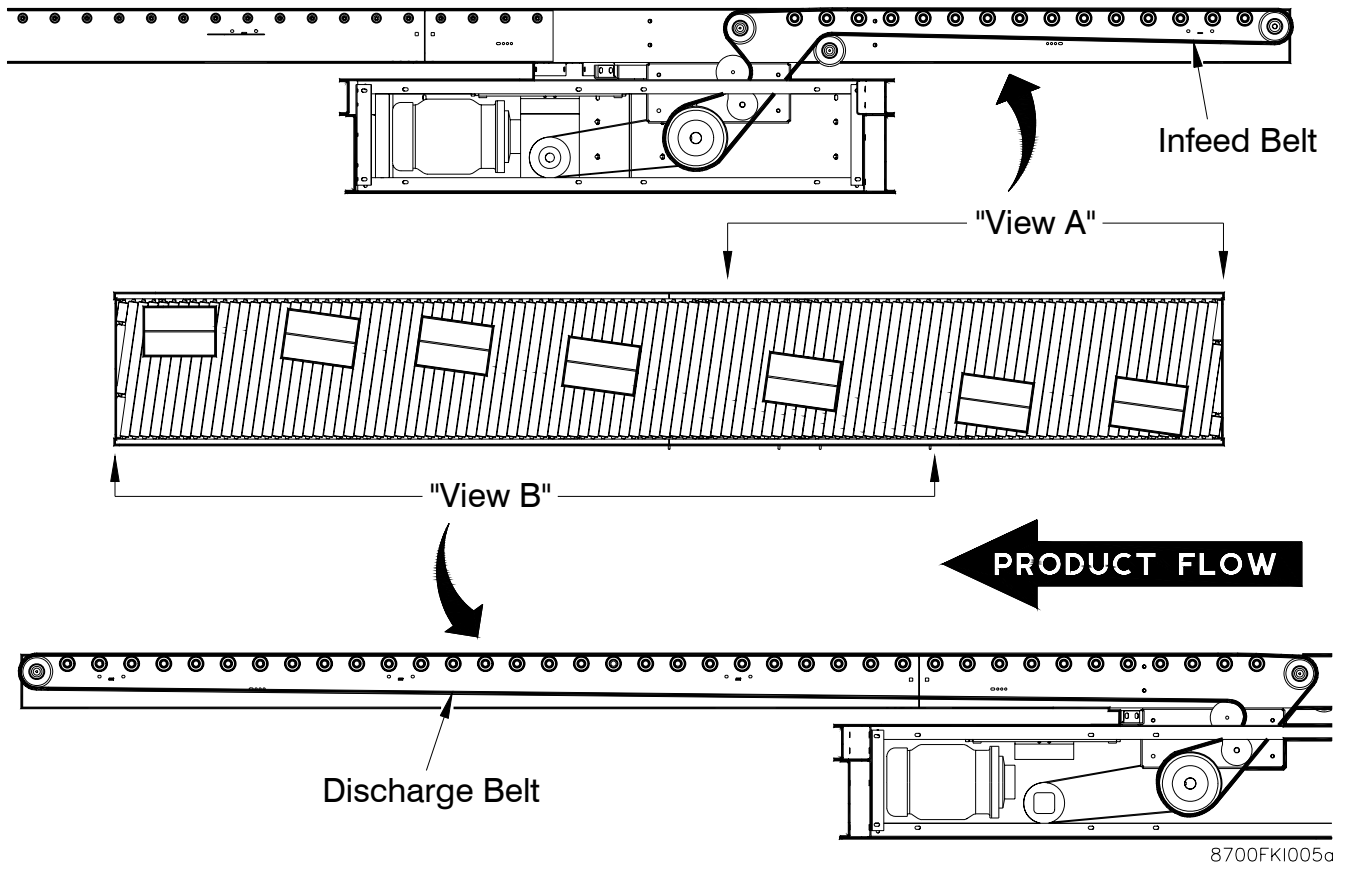


Figure G - 1 Belt Routing Between the Two Conveyors

34" Conveyor

The 34" wide High-Speed Skew conveyor is shipped in two pieces with the power unit already attached on the infeed end. The drive belt is already attached to the infeed piece.

To set-up the conveyor:

1. Verify the direction of the product travel.
2. Attach floor supports onto each piece (one is needed at each end and one is needed at splice).
3. Connect sections together.
4. Attach locator plate at the junction of the two pieces (it is found on the discharge end of the infeed piece). This locates the pressure rail.
5. Ensure that the unit is level and aligned with appropriate adjoining equipment.
6. Attach the drive belt to the discharge end piece.
7. Manually rotate the drive pulley to walk the drive belt and ensure the belt tracks properly.
8. Check the drive belt tension and adjust as needed. See "Adjusting Drive Belt Tension" in Section H.
9. Check the timing belt tension and adjust as needed.
10. Check the drive belt in the discharge section and adjust as needed.
11. Install rollers as needed.
12. Connect power.
13. Conduct test run and adjust as needed.

Initial Start-Up and Run-in Period

Perform the following tasks before starting the High-Speed Skew conveyor, and take corrective actions as needed:

- Check the general structure and all safety guards and devices to ensure that the unit has been installed properly.
- Ensure that all fasteners are tightened securely.
- Note that the gear reducer has been furnished with the appropriate lubricant installed at the factory.
- Ensure that the flange bearing has been lubricated.
- Check that the set screws of all sprockets, hubs, sheaves and pulleys are tight.
- Check the timing-belt tension.
- Check the “endless” flat-belt tension.

During the initial start-up and run-in period:

- Spend ample time watching and listening to the conveyor system.
- Be familiar with the sounds of ordinary operation. (Most problems make distinctive sounds, such as thumps, rattles and squeaks.)

For the first week of operation, check the listed items daily and take corrective action as necessary. For the second through fourth weeks of operation, check items listed in the Maintenance Procedures section, see Table H-1. After the first four weeks of operation, follow the recommended maintenance schedule described in the Maintenance Procedures section of this manual.

SECTION H: MAINTENANCE PROCEDURES

Introduction

Recommended service checks and equipment maintenance are outlined in this section for typical, intermittent-duty conveyor applications. Additional maintenance and servicing schedule adjustments may be required for continuous-duty operation or extreme environmental conditions.

CAUTION: Before performing maintenance on a conveyor, make certain that the conveyor's power disconnect is locked in the "Open" position and tagged to prevent the accidental or unexpected application of power.
Do not perform maintenance while the conveyor is running unless specifically instructed to do so in this manual.
Maintenance must be performed only by qualified personnel who are trained in normal and emergency operations of the conveyor, and who are knowledgeable about all safety devices, their locations and functions.

Before restarting a conveyor:

- Remove all foreign objects from the conveyor;
- Be sure that all guards and safety devices are properly installed and working.
- Make certain that all persons are clear of the conveyor and are aware that the conveyor is about to be restarted.

Safety Instructions

- Turn off conveyor power sources and affix appropriate lock-out and tag-out devices to operating controls before servicing the equipment. Only trained and qualified personnel who are aware of the safety hazards should perform equipment adjustments or required maintenance while the conveyor is in operation.
- Observe all warning signs, lights, and alarms associated with the conveyor operation and maintenance, and be alert at all times to automatic operations of adjacent equipment.
- Exercise extreme caution near moving conveyor parts to avoid the hazard of hands, hair, and clothing being caught.
- Do not sit on, stand on, walk, ride, or cross (over or under) the conveyor at any time except where suitable catwalks, gates, or bridges are provided for personnel travel.
- Do not attempt to repair any equipment while the conveyor is running, replace any conveyor component without appropriate replacement parts, or modify the conveyor system without prior approval by the manufacturer.
- Do not operate the conveyor until all safety guards are securely in place, all tools and non-product materials are removed from or near the conveying surfaces, and all personnel are in safe positions.
- Do not remove or modify any safety devices provided on or with the conveyor.
- Do not clear jams or reach into any unit before first turning off the equipment power sources and affixing appropriate lock-out and tag-out devices.

CAUTION: There is a risk of injury with live roller conveyors with trapped rollers. Turn off conveyors before handling product or servicing. Limit access to maintenance personnel.

Note: Some live roller conveyors are designed to allow the carrier rollers to pop out should some object accidentally become caught between the carrier roller and the drive belt. This feature is required whenever the conveyor is installed in an area that is readily accessible to general plant personnel. However, when the conveyor is installed overhead, take provisions to prevent this feature from becoming a hazard to personnel below (due to falling rollers). Use the following guidelines to properly install the conveyors.

- For conveyors not installed overhead (below 8'-0" elevation):
All carrier rollers must be free to pop out (an exception to this is the carrier rollers installed at 2" centers).
- For conveyors installed overhead (8'-0" or higher) with no access (no catwalk, walkway, platform, etc.):
Prevent carrier rollers from falling on personnel below. If the side guides are mounted directly to the frame (such as arrangements "A" and "C"), then the side guide serves to trap the rollers in place.
- For conveyors mounted overhead (8'-0" or higher), but accessible to operators by a platform:
Carrier rollers must be free to "pop out" as described above (assuming conveyors are less than 8'-0" above platform). However, if the platform does not provide a surface which would suffice as a spill guard, then provide a spill guard. The spill guard must protect personnel below from carrier rollers that may "pop out" of the frame.
- For conveyors installed overhead (8'-0" or higher), but accessible by catwalk or walkways:
Prevent carrier rollers from falling on personnel below. Do not consider the walkways or catwalks to be operator platforms, but post signs limiting access to maintenance personnel. The signs must also warn against the danger of pinch points caused by trapped rollers. In addition, provide an emergency stop pull cord for stopping the conveyor while clearing jams or performing maintenance.
- For all conveyors installed overhead:
Provide spill guards if product may fall off the conveyor for any reason and if personnel would be endangered. In any overhead installation, if the conveyed material is likely to fall (i.e., loose bottles in trays, poorly packaged products, etc.), install spill guards where the conveyor is above aisles or work spaces.
- For conveyors mounted overhead:
If the conveyor is mounted overhead, additional guarding is recommended to prevent injury.

Parts Replacement

To minimize production downtime, selected conveyor spare parts should be stocked for replacement of defective components when required. Refer to the equipment bill(s)-of-materials where quantity requirements or code numbers are not indicated on the conveyor parts list. For added convenience, a list of selected spare parts for standard products is included in this manual (see Section I).

Factory Assistance

Contact Customer Service for installation, operation, or maintenance assistance, or replacement parts.

Preventive Maintenance

Table H - 1 Scheduled Maintenance Summary

Interval	Components	Unusual Noises	Lubrication	Oil Level	Tension	Wear	Alignment	Fasteners	Set Screw	Proper Position	Physical Condition	Operation
Daily (8 Hours)	General Walk-Through	X									X	X
	Electrical Devices							X				
Weekly (40 Hours)	General Structure										X	
	Safety Guards and Devices										X	
Monthly (160 Hours)	Gear Reducer		X	X							X	
	Sprockets, Hubs and Pulleys						X		X			
	Timing Belts				X	X	X				X	
	Flat Belts				X	X	X				X	
	Supports							X				
Semiannually (1040 Hours)	Bearings		X					X				
	Drive Motor		X					X				
	Gear Reducer		X	X				X				

Daily Inspections

At the beginning of every shift, conduct a general walk-through inspection of the entire conveyor system while it is running. Walk slowly and listen attentively for unusual noise. Keep a sharp eye for unusual movement of any conveyor component. If any irregularity is detected, inspect the conveyor to identify the cause.

- If product has spilled or fallen out of its packaging and become lodged in the conveyor, stop the conveyor and remove the product. Liquids collecting on an endless belt can cause slippage.
- If a conveyor component has been damaged, determine whether the damage jeopardizes safe operation. If the damage does jeopardize safety, interrupt conveyor operation immediately, and correct the problem before resuming conveyor operation. If the damage does not jeopardize safety, make a note of the damage, and schedule repairs in accordance with company policy. It may be useful to mark the location of the problem in order to find it again at the time for repair.
- If any problem is the result of failure to follow established procedures (such as loading cartons containing glass jars up-side-down), make certain that the persons responsible understand and follow the proper procedures. If the established procedures have been followed, discuss the problem with the appropriate supervisor to determine whether procedures should be revised.

Inspect electrical devices such as optical and proximity sensors, limit switches, etc. Make certain that they are positioned and aligned properly. Clean lenses and reflectors of optical devices daily. For additional maintenance measures, refer to the technical literature provided by the manufacturer of the device.

Weekly Inspections (Every 40 hours of operation)

Check the physical condition of the conveyor for loose fasteners, damaged or wearing components, buildup of dust and product spillage. Note that carton dust entering bearings can cause them to deteriorate and shorten the service life of rollers. Make certain that all guards and safety devices are intact and that all fasteners are tight. Check for signs of oil leakage on the floor. If leakage persists or the amount of leakage is significant, repair or replace the gear reducer.

Check that the conveyed product travels along the length of the conveyor without obstruction or hesitation. Check that the travel of conveyed product is skewed completely to the appropriate side.

Monthly Inspections (Every 160 hours of operation)

Check that all mounting bolts, set screws, etc., are tightened securely, and that no lubricant is coming out of the seals.

Remove any buildup of dirt or dust from around the motor and gear reducer. Make certain that the vent button in the side of the gear reducer is not obstructed. Check that all mounting bolts are tightened securely and that the motor lead wires are connected securely.

Make certain that the timing belt is in good condition; replace it if necessary. Check the timing-belt tension and the alignment of the drive sprockets. Make adjustments as necessary

Semiannual Inspections (Every 1040 hours of operation)

On the High-Speed Skew conveyor, there are two flange bearings, one mounted to each of the drive plates, which are adjacent to the gear reducer. The flange bearings support the drive shaft, which supports the 8" diameter crowned pulleys. If the flange bearings do not have grease fittings, they are "lubricated for life," and do not require relubrication. If the flange bearings are furnished with grease fittings, they do require relubrication.

To lubricant the flange bearings, use a lithium-based ball-bearing grease or a compatible grease confirming to NLG1 Grade 2 consistency. Add the grease slowly and sparingly while the shaft is rotating until a slight showing of grease forms around the seals. do not over-lubricate. Too much grease may damage the seals. If a bearing is over-lubricated, remove the fitting to allow the excess grease to escape. Replace the fitting and wipe the bearing clean before putting the conveyor back into operation.

Selected Procedures

Adjusting Drive-Belt Tension

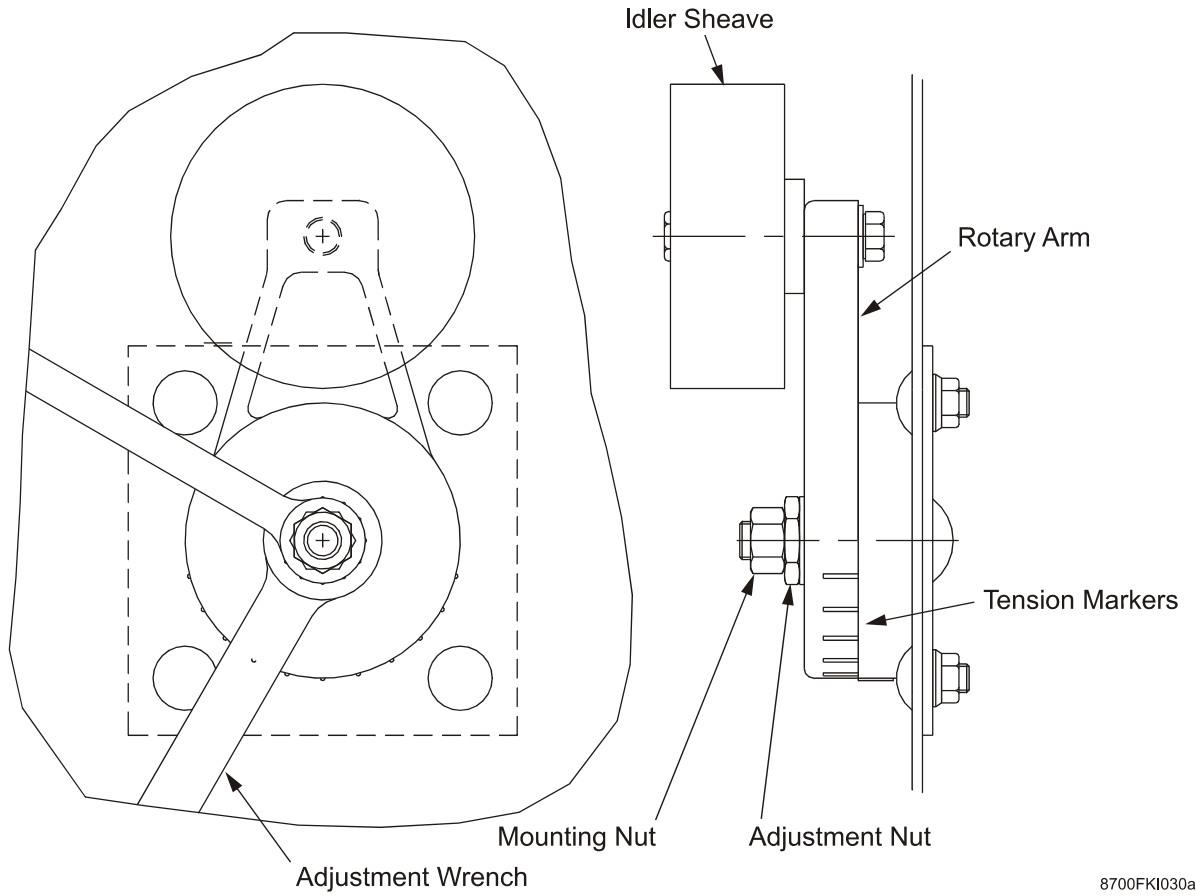
The drive-belt tensioner consists of a round base, a rotary arm, and a flat-face idler sheave mounted to the end of the rotary arm with a shoulder bolt. The cast-aluminum rotary arm incorporates a round shoulder with an arm extending from one side. The rotary-arm shoulder is mounted to the base, with an adjustment nut secured to a bolt that passes through the center of the base, shoulder and adjustment nut (see Figure H - 1).

To adjust belt tension, determine the direction in which the arm must be rotated. Place a box-end wrench on the adjustment nut, and a box-end wrench on the mounting nut. Loosen the mounting nut, but do not remove it. Turn the adjustment nut in the same direction that the tensioner arm must be rotated until the drive belt is taut. As tension is established, the point on the tensioner base should be pointing midway between the two sets of markings on the tensioner shoulder. Continue turning the adjustment nut and increasing tension until the pointer aligns with the third marker on the tensioner shoulder from the gap between two sets of markers. While maintaining torque on the adjustment wrench, tighten the mounting nut. Remove both wrenches.

Adjusting Axle Locks

Located between a pair of roller axles, each axle lock secures both axles. The axle lock consists of a spring-steel bow secured to the side rail by a bolt through the center. Tightening the bolt increases the force that the axle lock applies against the axles.

Note: Do not over torque the axle lock bolt. This may cause the axle lock to permanently be deformed.



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Figure H - 1 Drive-Belt Tension Adjustment

Adjusting Pressure Sheaves

A pressure sheave is located below and between each pair of roller (see Figure H - 2). The flat belt rides on the pressure sheaves, and the pressure sheaves are mounted to the drive channel. The position of the pressure sheave determines the degree of contact between the flat belt and the underside of the rollers. The shaft of the sheave is set in an eccentric washer, which in turn is set in a hole through the drive channel. Rotating the shaft of the sheave turns the washer, which raises or lowers the sheave accordingly.

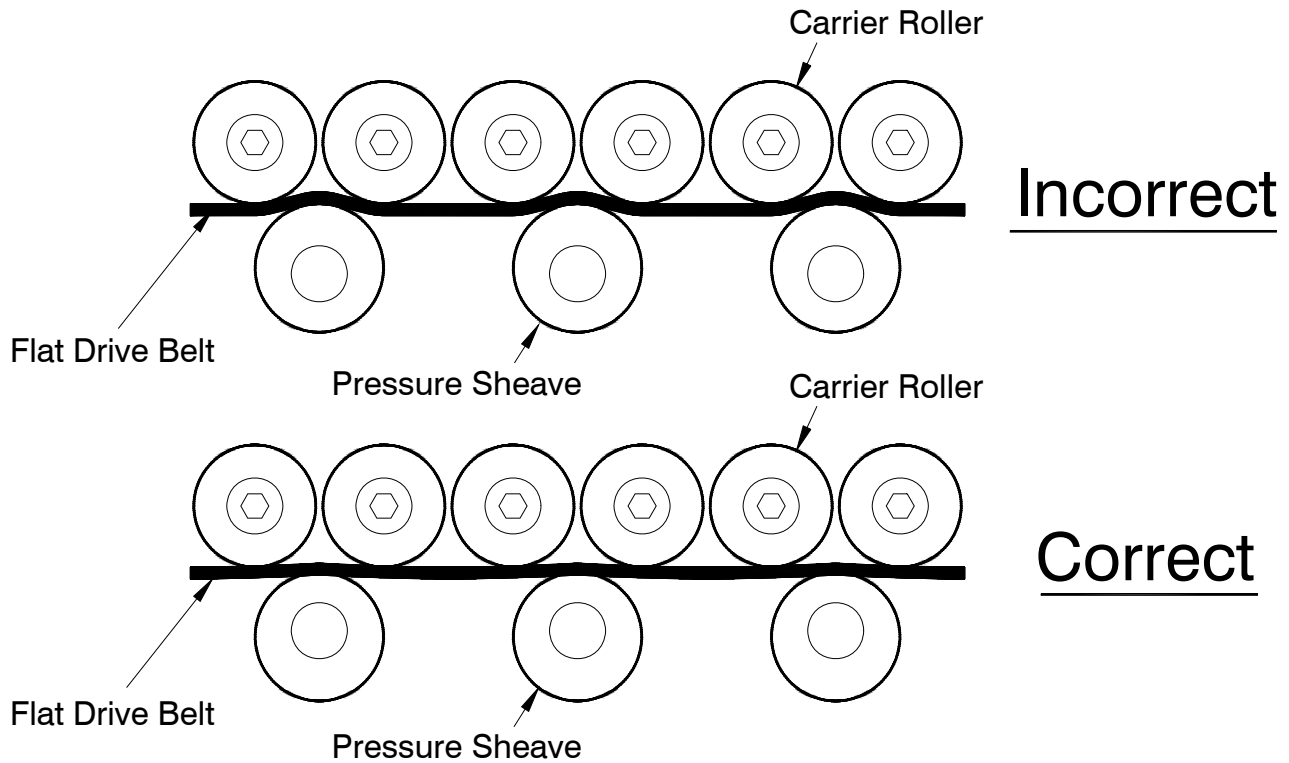
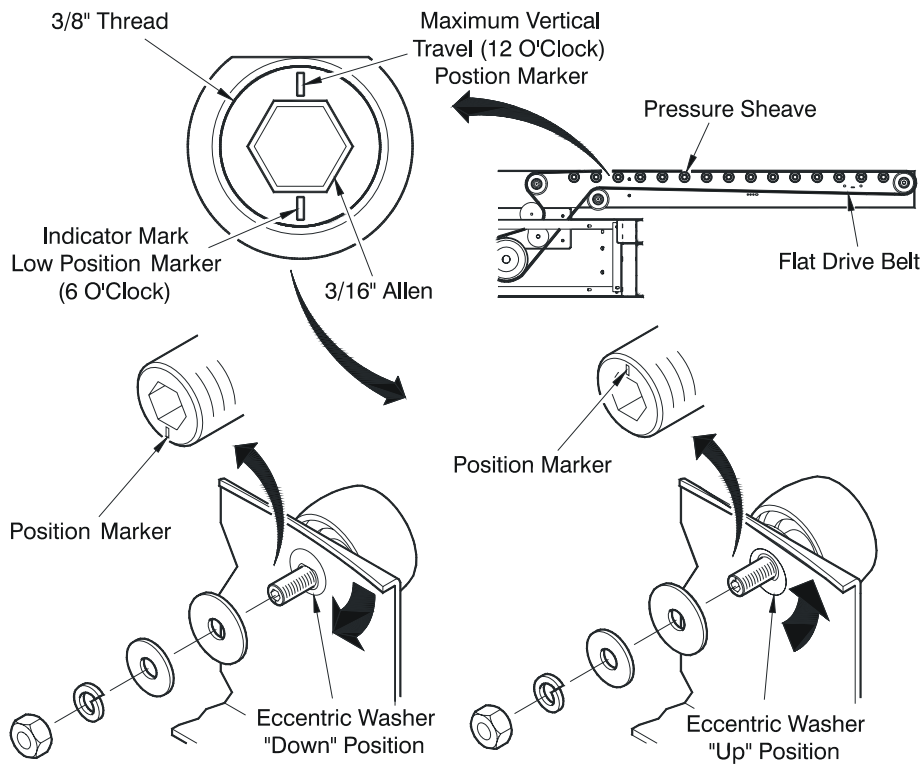


Figure H - 2 Contact Between Flat Belt and Rollers

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Passing between the rollers and the pressure sheaves, the flat belt should be virtually straight, just touching the underside of the rollers enough to make contact (see Figure H - 3). During conveyor operation, contact between the flat belt and the underside of unburdened rollers should be just sufficient to turn the rollers continuously. When product is placed on the rollers, the weight of the product pushes the rollers down slightly, increasing friction between the rollers and the flat belt. As a result, drive power is transmitted to the rollers effectively.



Note: For Adjustment Loosen but do not remove

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Figure H - 3 Eccentric Stud Adjustment Indicator and Adjusting the Pressure Sheaves

If an individual pair of rollers is not turning, the position of the pressure sheave between the rollers must be raised. If the belt path arches over a pressure sheave when the rollers are not burdened, the pressure sheave must be lowered.

To adjust a pressure sheave, loosen (but do not remove) the locking nut, and use 3/16" Allen wrench to turn the eccentric shaft as necessary to adjust the sheave height. the shaft rotates 360°. Note that a mark on the end of the shaft indicates sheave position. when the mark is oriented upward, the sheave is in the fully "up" position, and when the mark is oriented downward, the sheave is in the fully "down" position. When the adjustment is complete, use the Allen wrench to keep the shaft from turning, and tighten the locking nut.

Adjusting Overall Flat-Belt Tension

When flat-belt tension is properly adjusted throughout the conveyor, each roller turns easily when the drive is operating, but stops turning when it is held with a slight gripping force. with

insufficient tension, many rollers will fail to turn. Excessive tension, however, will overburden the drive components and cause premature wear.

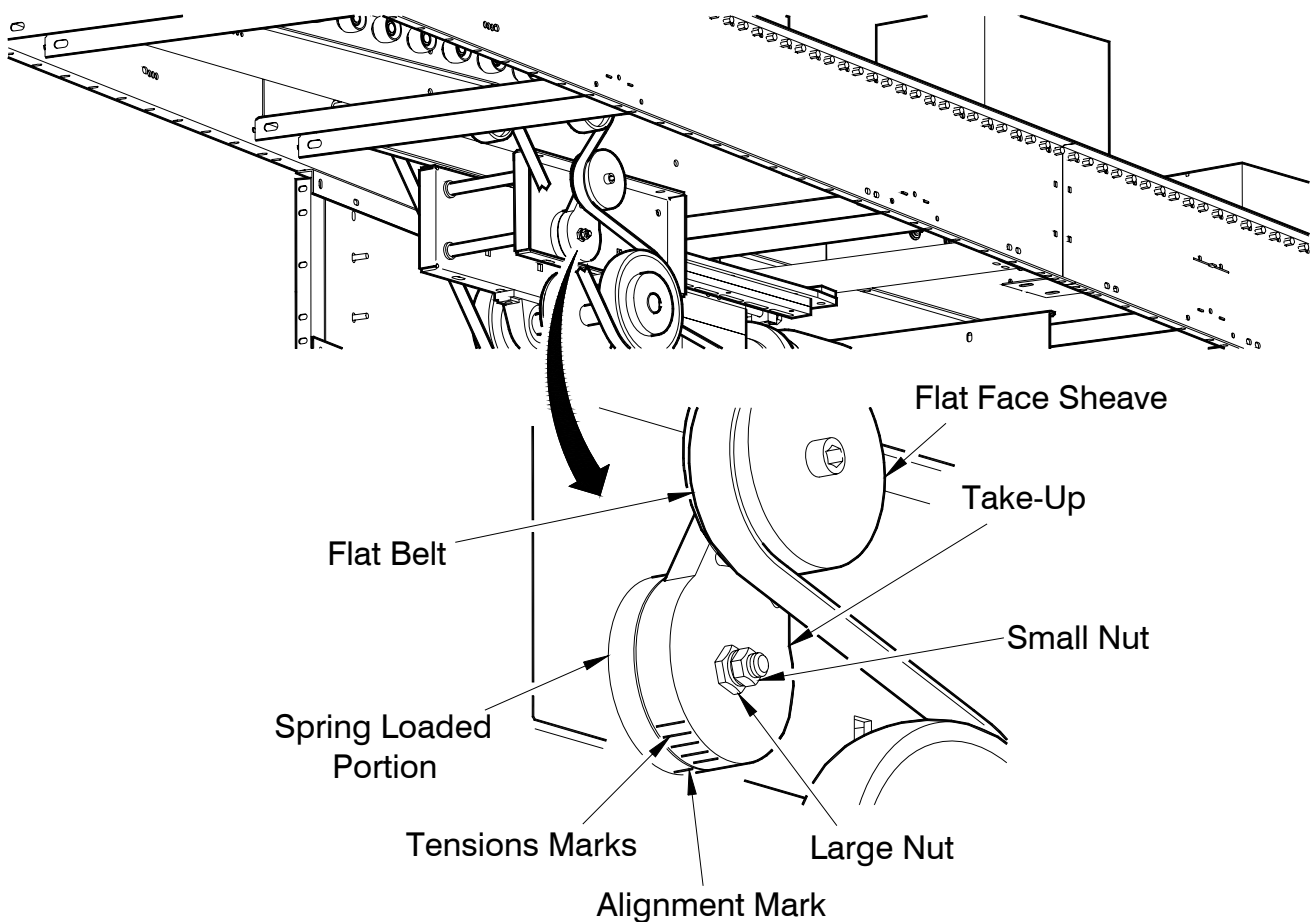
The high-speed skew conveyor incorporates two flat belts. One belt drives the rollers to the infeed end of the unit, and the other belt drives rollers at the discharge end. The overall tension of each flat belt is independently adjustable.

Adjust the flat-belt tension as follows:

1. Ensure the pressure sheaves are adjusted properly.
2. Ensure the flat-belt is tracked properly.

Note: Failure to check the pressure sheaves and the belt tracking before adjusting the tension could impact the operation of the conveyor.

3. Set rotary tensioner as described in the Adjusting Drive-Belt Tension section.
4. Conduct test run.
5. Shut-off and recheck drive-belt tension and tracking to ensure proper operation.
6. Proceed with operation.



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Figure H - 4 Adjusting Overall Endless Flat-Belt Tension

Adjust End Idlers

There is an end idler located at each end of the High-Speed Skew conveyor. Each end idler is mounted to an adjustment plate, which sets the position (up or down) of the end idler (see Figure H - 5). Proper end idler tension is needed to ensure proper drive: if the end idler is too low, the conveyor will loose drive; if the end idler is too high, the belt and roller will suffer premature wear.

The end idler is properly adjusted when the second-to last roller turns when the conveyor is operating but stops turning when the roller is light gripped by hand.

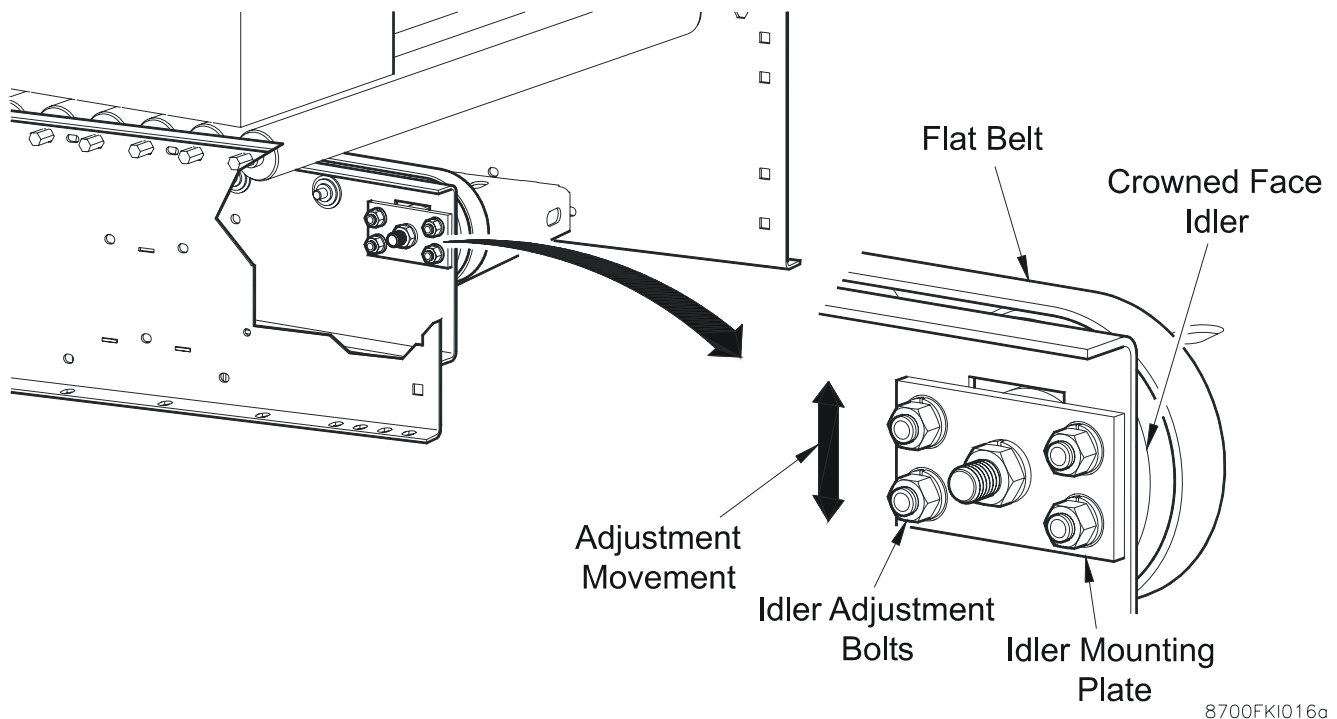


Figure H - 5 Adjusting End Idlers

Adjust the end idlers as follows:

1. Remove the side rail cover plate.
2. Loosen the idler adjustment bolts.
3. With the nuts loose, raise or lower the end idler until contact is made with the carrier rollers.
4. Tighten the nuts while holding the plate in position.
5. Conduct test run and repeat adjustments if necessary.

Replacing Endless Flat Belts

If an endless flat belt is worn or frayed, or if the belt has been stretched beyond the adjustment range for proper belt tension, the belt must be replaced. The endless flat belts are readily accessible and very easy to replace.

Replace an endless flat belt as follows:

1. Remove the corresponding drive guard.
2. Loosen the retaining nut on the rotary tensioner.

3. Remove the flat belt from around the idlers and the pulley, and remove it from between the pressure sheaves and the rollers.
4. Install the new endless flat belt, beginning at the end idler and routing it between the pressure sheaves and the rollers. Make certain that the green side is in contact with the underside of the rollers and the black side is in contact with the pressure sheaves. Make certain that the belt is routed over - not under - the return sheaves. Route the belt around the idlers and finally around the drive pulley.
5. Adjust the drive belt tensioner per instructions described in the Adjusting the Drive Belt Tension section.
6. Make certain that the flat-belt path is straight between the pressure sheaves and the undersides of the rollers. Perform the procedures outlined under the heading "Adjusting Pressure Sheaves" as necessary.
7. Check overall flat-belt tension. Perform the procedures outlined under the heading "Adjusting Overall Flat-Belt tension" as necessary.
8. Turn the power to the High-Speed Skew conveyor "On," and operate the unit sufficiently to check belt tension. Make certain that the second-last roller turns when the conveyor is operating, but stops turning when gripped lightly by hand. If belt tension or the end idler requires adjustment, turn power "Off," and make the adjustments.
9. When all adjustments are completed, reinstall the drive guard, turn the power to the High-Speed Skew conveyor "On," and return the conveyor to service.

Checking Timing-Belt Tension

Timing belts must be properly tensioned. If the belt is too loose, it may jump teeth when heavier loads are applied. If the belt is too tight, belt life will suffer, and bearings will be unnecessarily overloaded. Improper belt tension can also cause excessive drive noise.

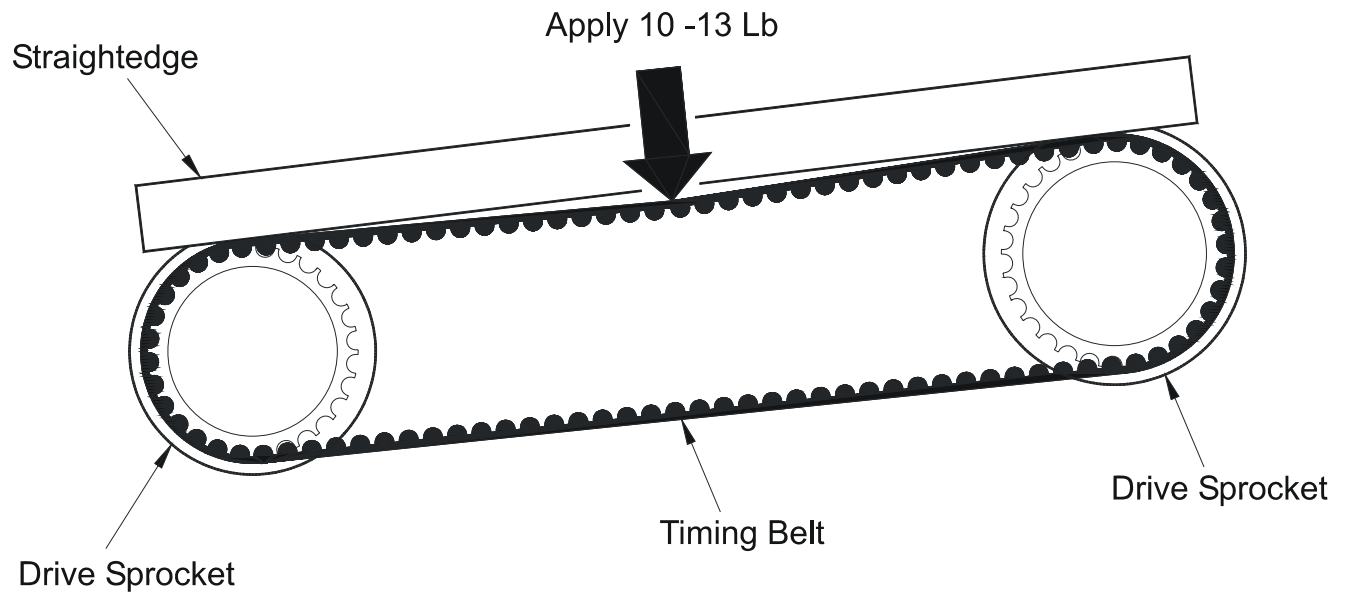
Rule of Thumb

If you can twist the timing belt 90° at the center of the span, the tension is appropriate.

If the belt cannot be twisted 90°, the tension is too tight and must be loosened. If the belt twists more than 90°, the tension is too loose and must be tightened.

To check the timing belt tension with a straight edge:

1. Lay the straight edge along the belt span, touching against the belt at both sprockets.
2. Apply pressure to the straight edge at the center of the span (Using a pencil-type tension tester may be helpful.)
3. Measure the belt deflection between the straight edge and the belt. Deflection should be $5/16" \pm 1/16"$ to indicate proper tension.



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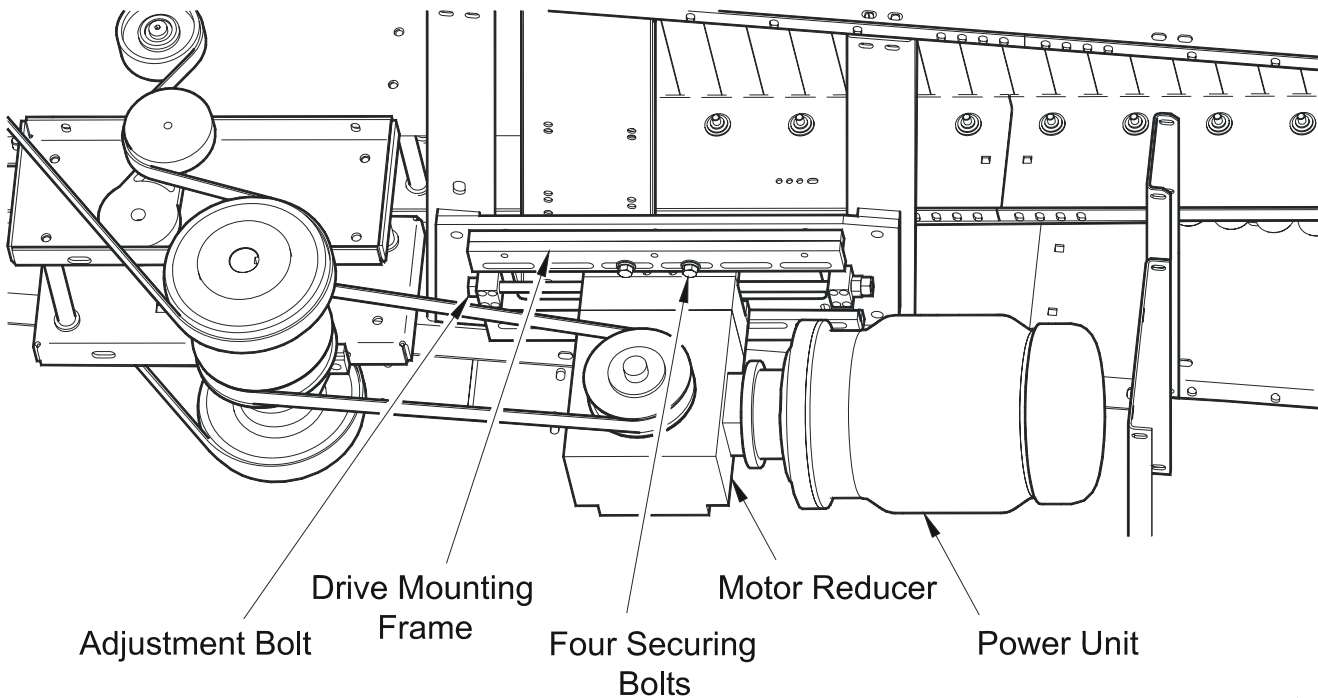
Figure H - 6 Checking Timing-Belt Tension

Belt tension is adjusted by shifting the mounting position of the gear reducer. To increase belt tension, shift the gear reducer away from the drive shaft. To decrease belt tension, shift the gear reducer closer to the drive shaft. If belt deflection is outside the specified range, adjust timing-belt tension as follows (see Figure H - 7).

1. Loosen (but do not remove) the four bolts securing the base plate (to which the gear reducer is mounted) to the drive frame.
2. To move the gear-reducer mounting position, rotate the adjustment bolt as necessary.

Note: For large adjustments, four bolts may need to be located within alternate threaded holes.

3. Tighten the four bolts securing the base plate to the drive-mounting frame.
4. Make certain that the sprockets are properly aligned.



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Figure H - 7 Adjusting Timing-Belt Tension

Replacing the Timing Belt

If the timing belt is worn or frayed, it must be replaced. Replace the timing belt as follows (see Figure H - 8).

1. Relieve flat-belt tension, and remove the endless flat belt from the drive pulley on one side of the conveyor.
2. Shift the gear-reducer mounting position toward the drive shaft as necessary to relieve tension on the timing belt. Remove the timing belt from the drive sprocket.
3. Using a pencil, mark pillow block location on right and left.
4. Remove bolts holding one pillow block to bottom of drive plate.
5. Move the drive shaft down until the belt can be passed between the pillow block and the drive frame. Remove the old belt. It is not necessary to disassemble the drive pulleys or bearings from the drive shaft.
6. Place the new timing belt around the drive shaft sprocket.
7. Move the drive shaft and pillow block into position and replace the bolts in the pillow blocks.
8. Use the pencil marks for pillow block location to ensure that the shaft is square.
9. Tighten the bolts.
10. Make certain that the teeth of the timing belt are seated properly in both drive sprockets.
11. Adjust timing-belt tension as necessary.
12. Replace the endless flat belt on the drive pulley, and restore flat-belt tension.

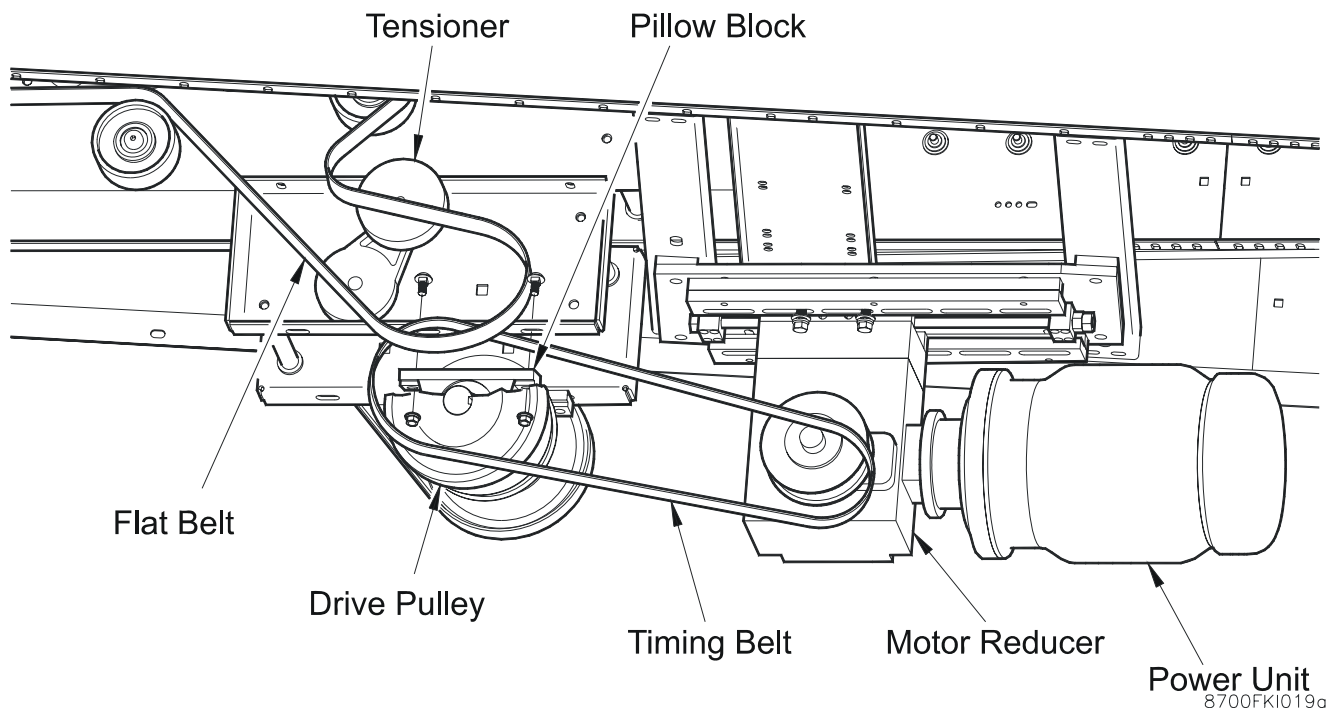


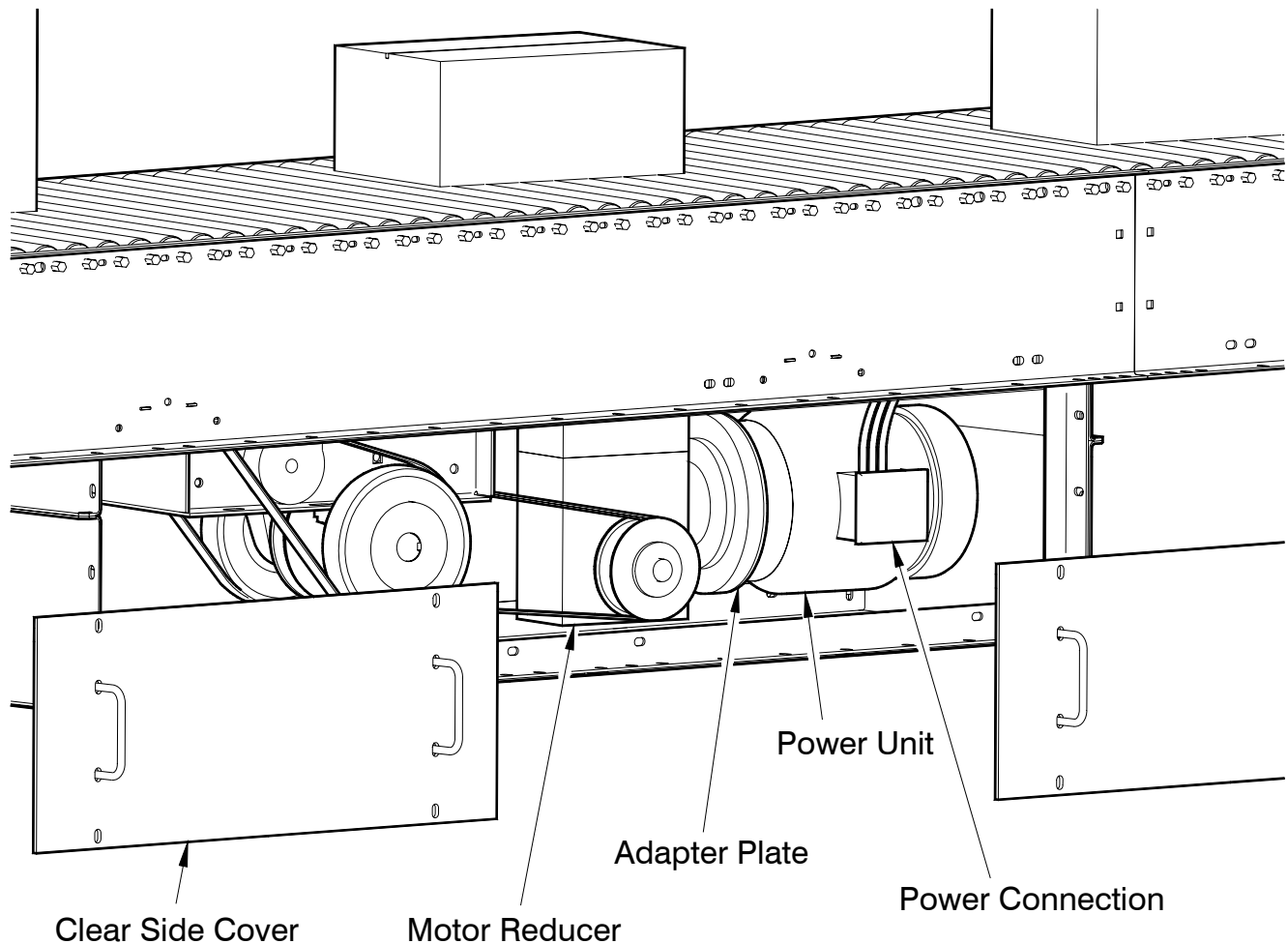
Figure H - 8 Replacing the Timing Belt

Replacing Pressure Sheaves

To replace a pressure sheave, remove the 3/8" nut from the pressure sheave and remove the sheave. Put new pressure sheave on end and replace nut. Re-adjust as necessary. Make sure to note the location of all hardware, and washers while disassembling so that everything can be replaced properly.

Removing the Motor

Before doing any maintenance to the motor, refer to the Safety section of this manual. To remove the motor, first shut down the power. Remove the clear side guard cover on the power unit. If additional space is needed to remove the motor, remove the back guard cover as well. Disconnect the power leads from the motor and remove the four bolts connecting the motor to the gear box. Pull out the motor and remove the adapter plate from the motor, if so equipped.

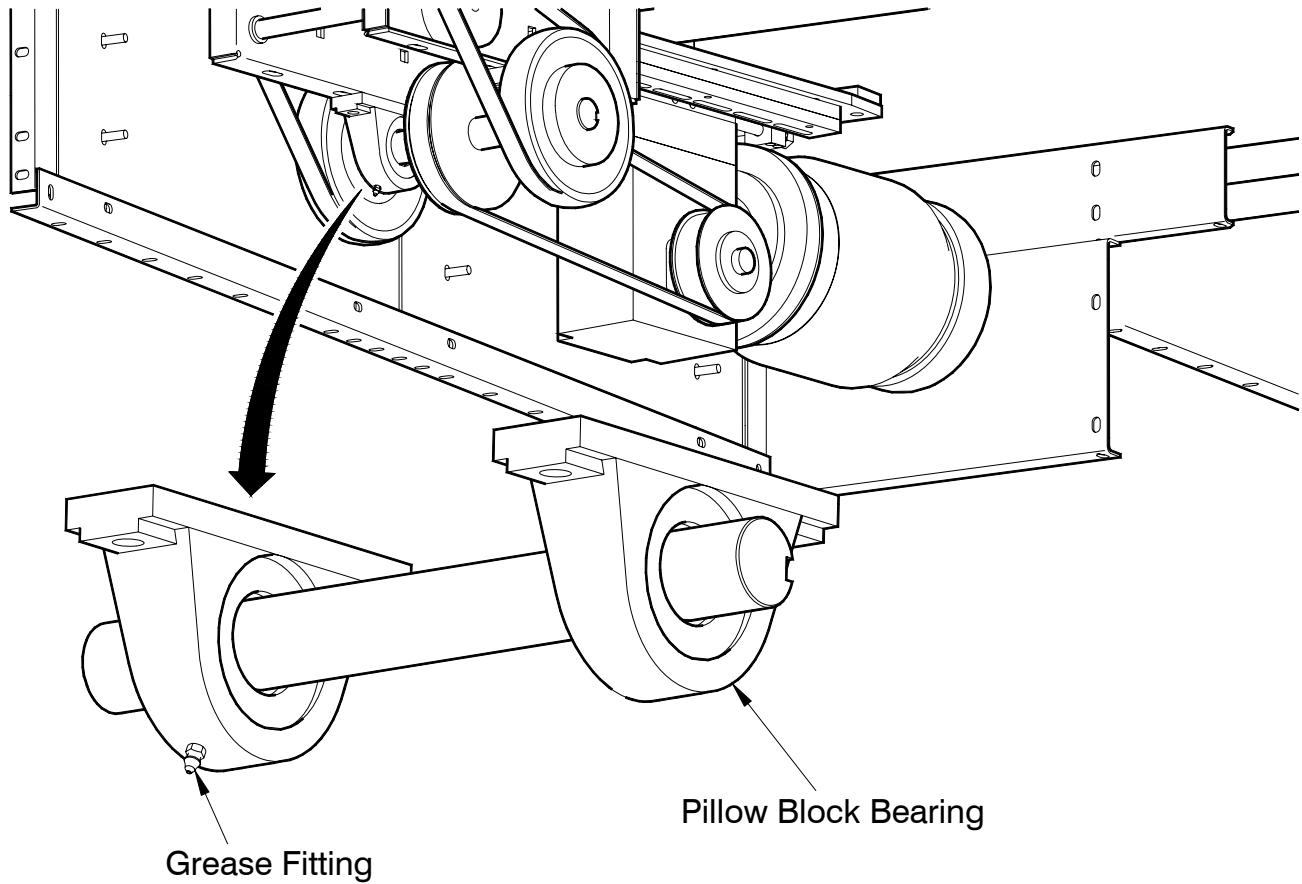


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Figure H - 9 Removing the Motor

Greasing Pillow Block Bearings

There are two grease fittings, one on each bearing. To grease the pillow block bearing, use a grease gun and insert on the zerk fitting. Pump grease into the pillow block bearing until grease can be seen coming out of the bearing. Wipe off any excess grease. Do not over grease the bearing.



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Figure H - 10 Pillow Block Bearings

Troubleshooting

Basic troubleshooting is summarized in Table H - 2.

CAUTION: Do not clear jams or reach into any unit before first turning off the equipment power source(s) and making certain that all moving parts are fully stopped. To avoid personal injury, lock out and tag out the conveyor operation controls before attempting to correct any malfunction.

Table H - 2 Troubleshooting Summary

Problems	Cause	Solution
Squealing of rollers	Worn roller bearings.	Replace rollers
Squealing of idler sheave	Worn idler-sheave bearings.	Replace sheave bearings or replace idler sheave assembly
Worn timing-belt	Improper tension. Misaligned sprockets.	Replace belt and check belt alignment.
Worn drive belt	Belt is rubbing or misaligned.	If the belt is stretched, retension the belt. Adjust the snub rollers. Replace the belt.
Drive belt off of sheaves		Check belt for deformation. Put drive belt back on sheaves. check belt tension. Check pressure sheaves.
The conveyor does not start	Electrical power is shut off, or the control circuit is not energized.	Check that the system control panels are energized.
	System control devices are out of adjustment or defective.	Adjust or replace the devices.
	Emergency stop devices are activated.	Make certain that any malfunction is corrected, and reset the emergency stop devices.
	A motor overload is open.	Check the conveyor drive system and overload sizing before resetting.

Problems	Cause	Solution
The conveyor shuts off.	A photo eye or other control device has been activated or is defective.	Clear any obstruction in the conveyor. If this does not resolve the problem, check that the control device is operating properly. If the device is defective, replace it.
	A power or component at the system control center has failed.	Refer to the technical literature provided by the manufacturer of the failed equipment.
	An emergency stop has been activated.	Correct the error condition and reset the emergency stop according to control logic.
	The motor is overloaded.	Check the conveyor for oversized loads or for obstructions that would overload the motor. Check the motor for faults.
Conveyor rollers fail to turn.	A roller is obstructed.	Remove the obstruction and inspect the roller for damage.
	A roller bearing has failed.	Replace the roller.
	Pressure sheaves are out of adjustment.	Adjust the pressure sheaves.
The conveyor is making excessive noise.	Roller axles are vibrating in side rails.	If axle wear is evident, replace the roller.
Metal dust is collecting on bottom flange of side rail.	Excessive wear of roller axle due to vibration.	If axle wear is evident, replace roller. Check side rail. If axle holes are excessively worn, replace side rails.
The gear reducer is unusually noisy.	The gear reducer mounting bolts are loose.	Retighten the gear reducer's mounting bolts.
	The gear reducer is misaligned.	Realign the gear reducer and make certain that the drive sprockets are aligned.
	The gear reducer is defective.	Replace the gear reducer.
An endless flat belt is excessively worn or is breaking.	The conveyor is sustaining shock loads or heavy starting loads.	Replace the endless flat belt if necessary. Adjust belt tension, and verify that drive components are functioning properly.
	A sheave is obstructed or frozen.	If the sheave is obstructed, clear the obstruction. If the sheave is frozen, replace the sheave.
	The endless flat belt slips.	Adjust the overall endless flat belt tension.
	A sheave is out of alignment.	Realign the sheave.

Problems	Cause	Solution
A carton hesitates or stops.	Insufficient drive power is being transmitted to the rollers.	Adjust the pressure sheaves at the point where the package is hesitating.
	The endless flat belt is slipping.	Adjust the overall tension of the endless flat belt so that the heaviest carton does not slip.

SECTION I: PARTS IDENTIFICATION

General Information

The purpose of this section is to provide a list of common spare parts for a preventive maintenance program and also to minimize the chances for extended DOWNTIME.

The following pages illustrate the location of these recommended spare parts as they apply to each particular unit. Keep in mind that these illustrations apply to the STANDARD product line and to project specific parts. These items will show up on the Bill of Material as a “coded” item.

Miscellaneous Spare Parts

Key	Description	Part Number	Page Location
1	Bearing 6203-ZZ-5/8 Shielded 40mm O.D.	350920	5
2	Pillow Block Dodge SC 1 7/16	400360	5
3	HRS Infeed Roller Drive Belt	190411	5
4	Pulley Crown-Face 8.0" Dia. X 1.5", 2517	682020	8
5	HRS Crown-Face Idler Pulley	685045	5
6	HRS Flat-Face Idler Pulley	685046	6
7*	RLR G196 A1 N 03 05.19 NC	7505390	7
8*	RLR G196 A1 P 01 19.75 NC	7504896	7
9*	RLR G196 A1 P 01 22.13 NC	7502273	7
10*	RLR G196 A1 P 01 28.19 NC	7502280	7
11*	RLR G196 A1 P 01 34.25 NC	7502285	7
12	Sheave, Idler, Flat Face, 2" O.D. Assembly	568694	5
15	Efson Rotary Tension RT2003	005043	6
16	Drive Shaft	690003	8

*Roller Description Explanation

(Example) RLR G 196 C1 N 01 22.13 NC

NC = No Cover
 22.13 = Roller Width "W"
 01 = Spring Loaded Axle; Fixed Roller w/o Grooves
 03 = NO Axle, Roller w/o Grooves
 P = Plain Steel Axle
 N = NO Axle
 A1 = (Bearing type) ABEC Precision Bearing
 C1 = (Bearing type) ABEC Cartridge Tapered Hex
 196 = (Roller Tube) 1.90" dia x 16 gage (.065" wall)
 G = (Roller Tube Material/Finish) Galvanized Steel
 RLR = Roller

Spare Parts Related by Width

Key	Description	22"	28"	34"	Page Location
18	HRS Discharge Roller Drive Belt	190412	190414	190415	5

Spare Parts Related by Gear Reducers

Key	Ratio	Description	Skew Hand	Part Number	Page Location
19	5:1	Reducer, Reliance (Dodge) 262 5:1 180TC K1	RH	2003740	5
		Reducer, Reliance (Dodge) 262 5:1 180TC L1	LH	2004740	
	7.5	Reducer, Reliance (Dodge) 262 7.5:1 140TC K1	RH	2003737	
		Reducer, Reliance (Dodge) 262 7.5:1 1480TC L1	LH	2004737	
	10:1	Reducer, Reliance (Dodge) 262 10:1 140TC K1	RH	810893	
		Reducer, Reliance (dodge) 262 10:1 140TC L1	LH	810894	

Spare Parts Related by Motors

Key	HP	Description	Part Number	Page Location
20	2	Baldor - Standard - MRBC 2 145TC 460-60-3	331335	5
		Baldor - Premium - MRBC 2 PE 145TC 460-60-3	331344	
		Baldor - Premium - MRBC 2 PE 145TC 575-60-3	331353	
	3	Baldor - Standard - MRBC 3 182TC 460-60-3	331336	
		Baldor - Standard - MRBC 3 PE 182TC 460-60-3	331345	
		Baldor - Premium - MRBC PE3 PE 182TC 575-60-3	331354	
	2	Reliance - Standard - MRRC 2 145TC 460-60-3	330613	
		Reliance - E-Master - MRRC 2 EM 145TC 460-60-3	331259	
		Reliance - Premium - MRRC 2 PE 145TC 460-60-3	331268	
		Reliance - E-Master - MRRC 2 EM 145TC 575-60-3	331277	
		Reliance - Premium - MRRC 2 PE 182TC 575-60-3	331286	
	3	Reliance - Standard - MRRC 3 182TC 460-60-3	330617	
		Reliance - E-Master - MRRC 3 E-M 182TC 460-60-3	331260	
		Reliance - Premium - MRRC 3 PE 182TC 460-60-3	331269	
		Reliance - E-Master - MRRC 3 E-M 182TC 575-60-3	331278	
Reliance - Premium - MRRC 3 PE 182TC 575-60-3		331287		

Spare Parts Related by Hubs, Sprockets, Belts

Key	Description	Part Number	
21	Hub 2517 x 1 7/16" Bore	230791	8
	Hub 1210 x 1 1/8" Bore w/Key	230918	
	Hub 1610 x 1 1/8" Bore w/Key	230948	
	Hub 2012 x 1 1/8" Bore w/Key	230978	
	Hub 2012 x 1 7/16" Bore w/Key	230981	
22	HT Sprocket P32-8M-30-1210	740414	8
	HT Sprocket P34-8M-30-1610	740415	
	HT Sprocket P38-8M-30-1610	740417	
	HT Sprocket P40-8M-30-2012	740418	
	HT Sprocket P44-8M-30-2012	740419	
	HT Sprocket P48-8M-30-2012	740421	
	HT Sprocket P64-8M-30-2517	740425	
23	Timing Belt - HT 150 Belt 1280-8M-30	190302	8
	Timing Belt - HT 150 Belt 1440-8M-30	190303	

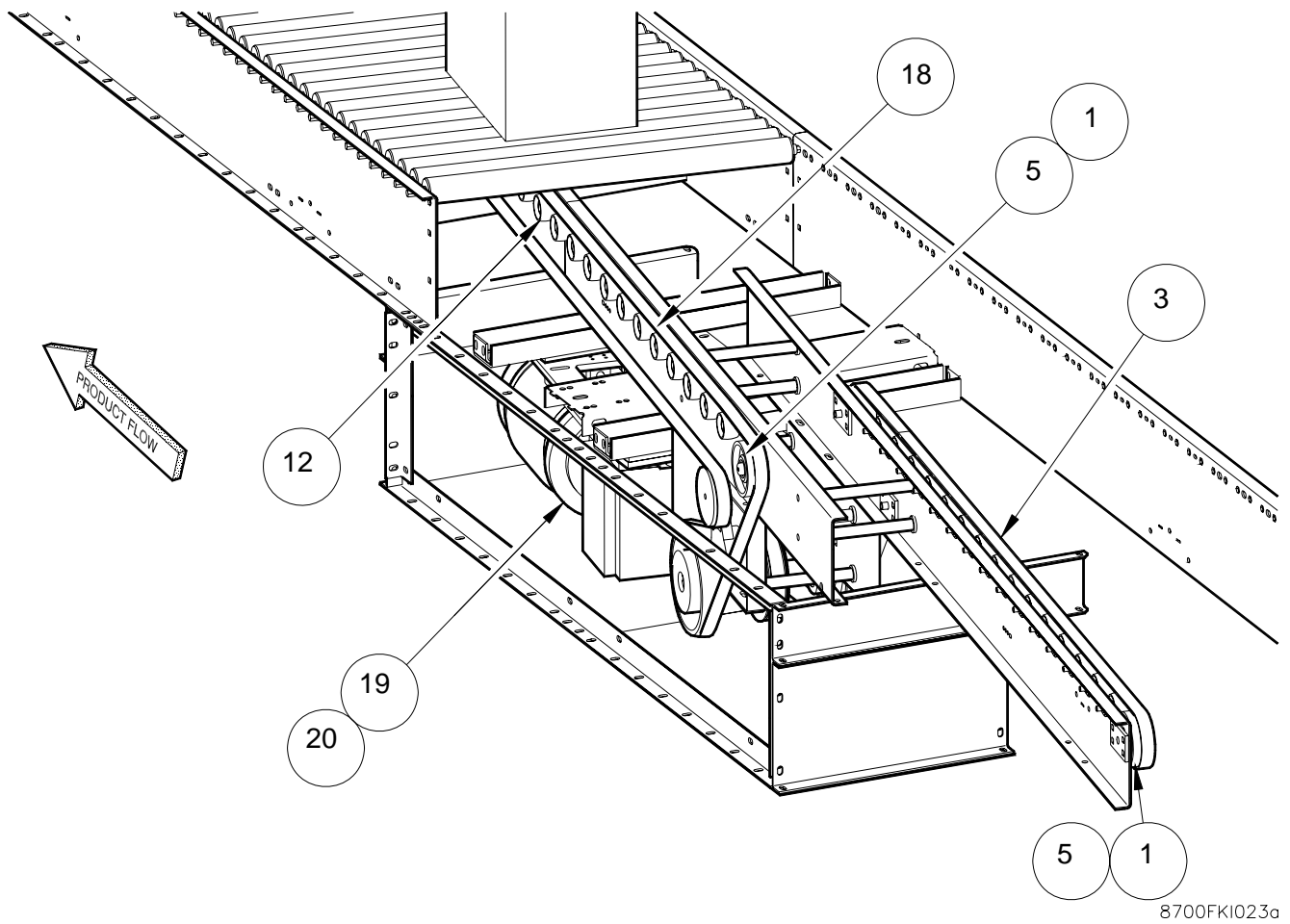
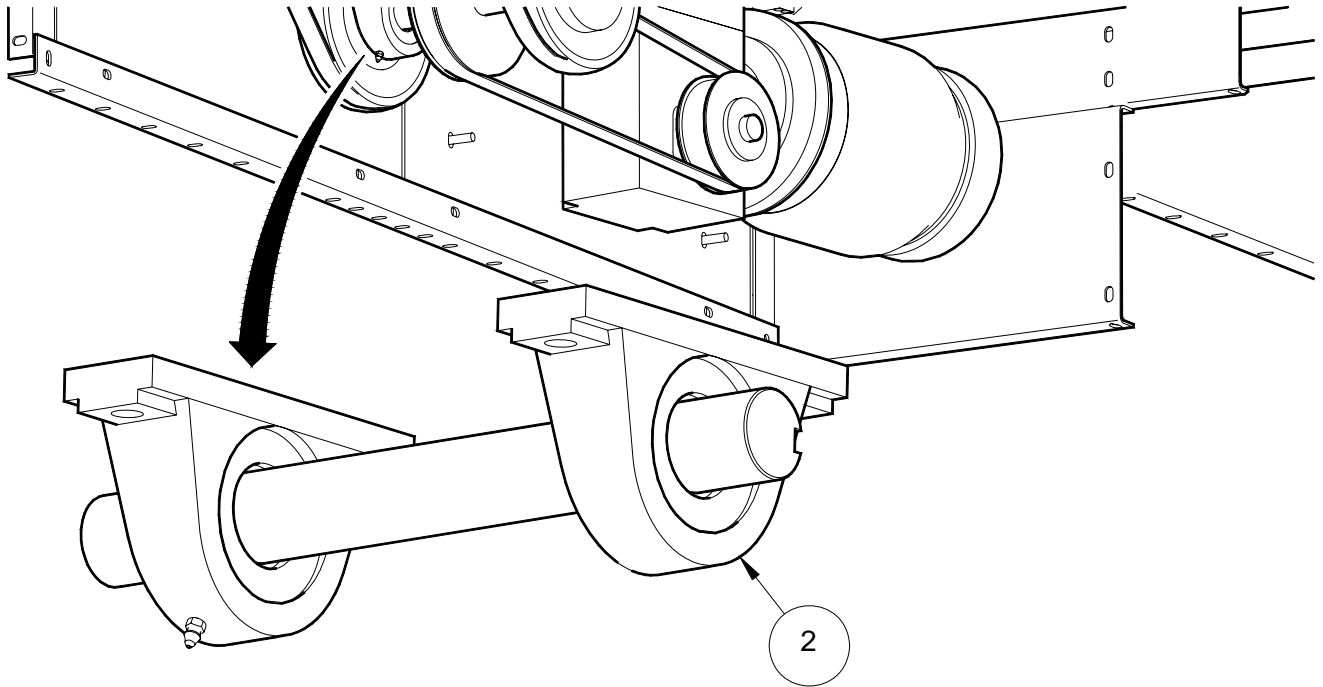
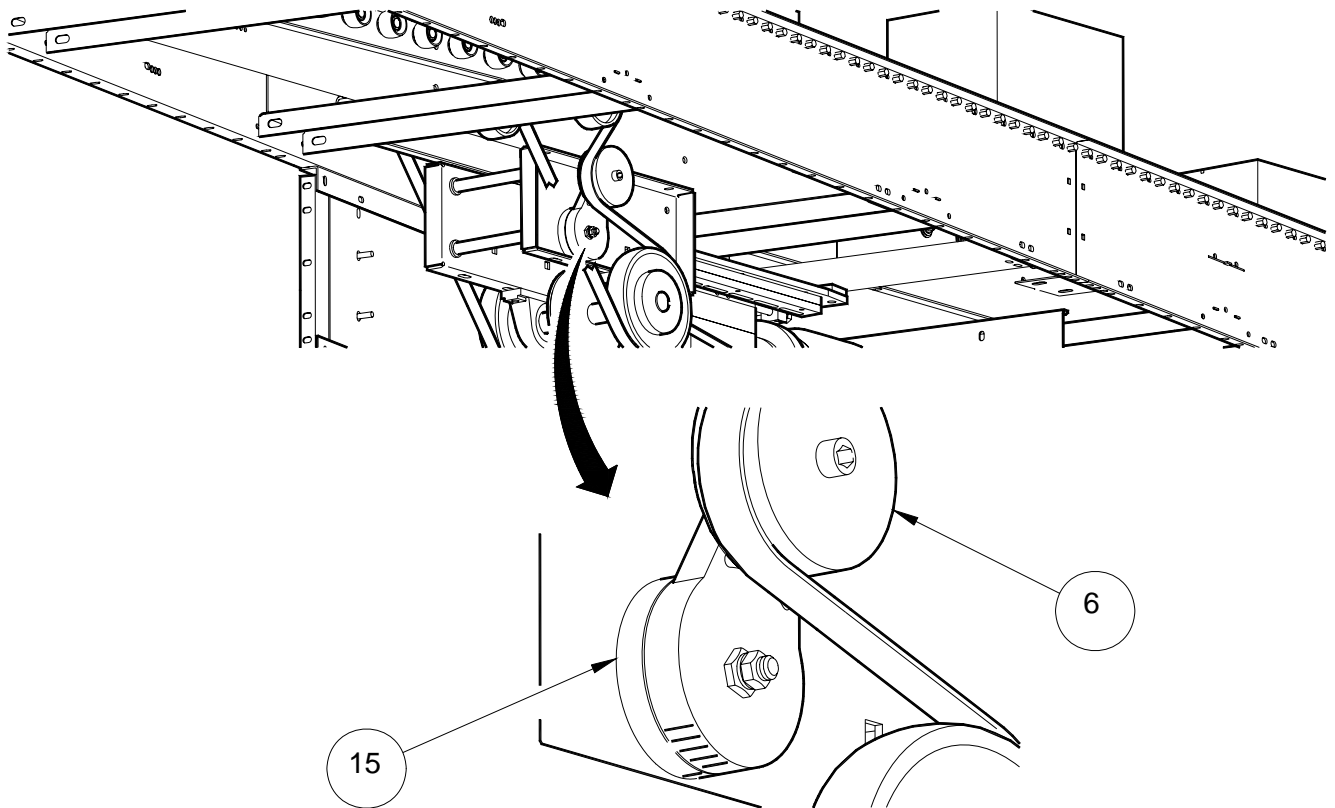


Figure I - 1 Flat Belt/Idler Pressure Rollers



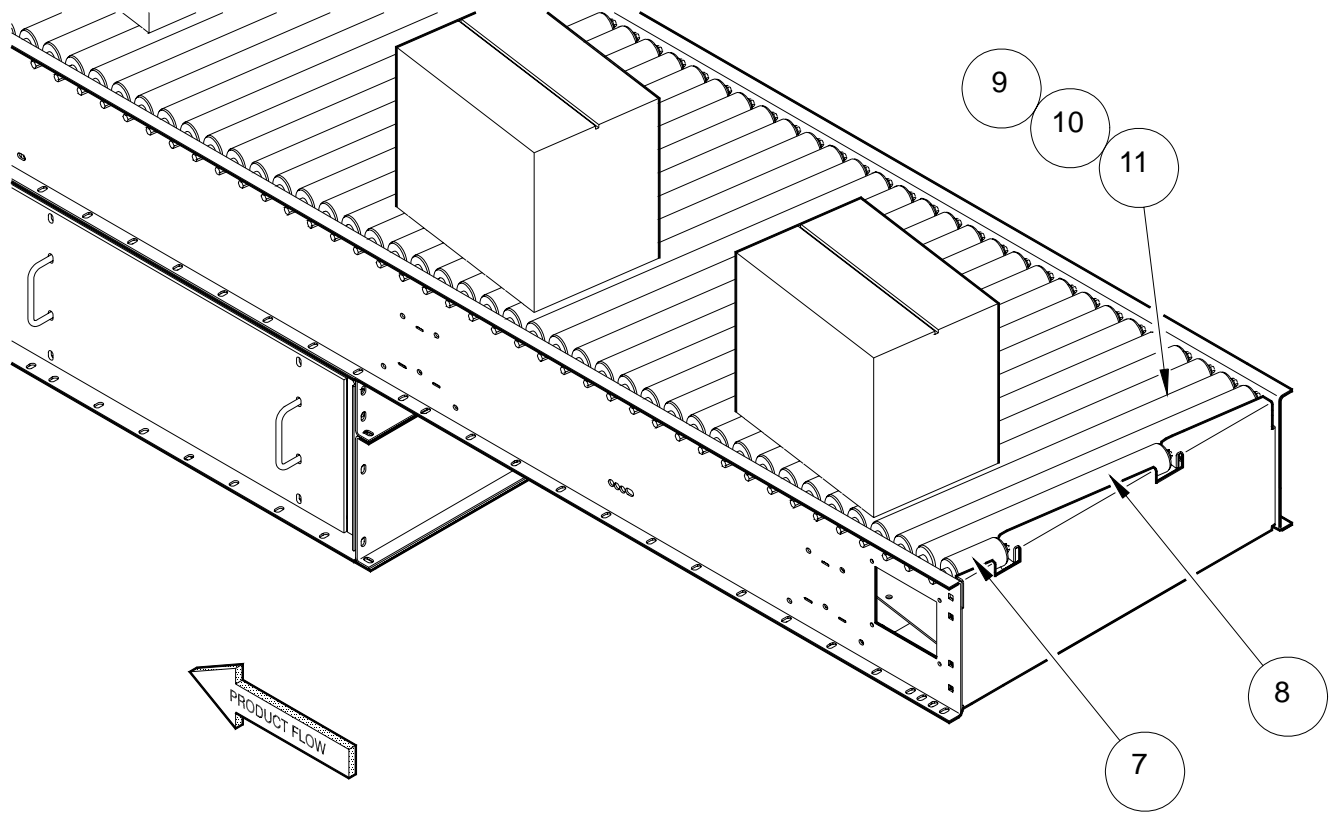
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Figure I - 2 Pillow Block Bearings/Drive Shaft



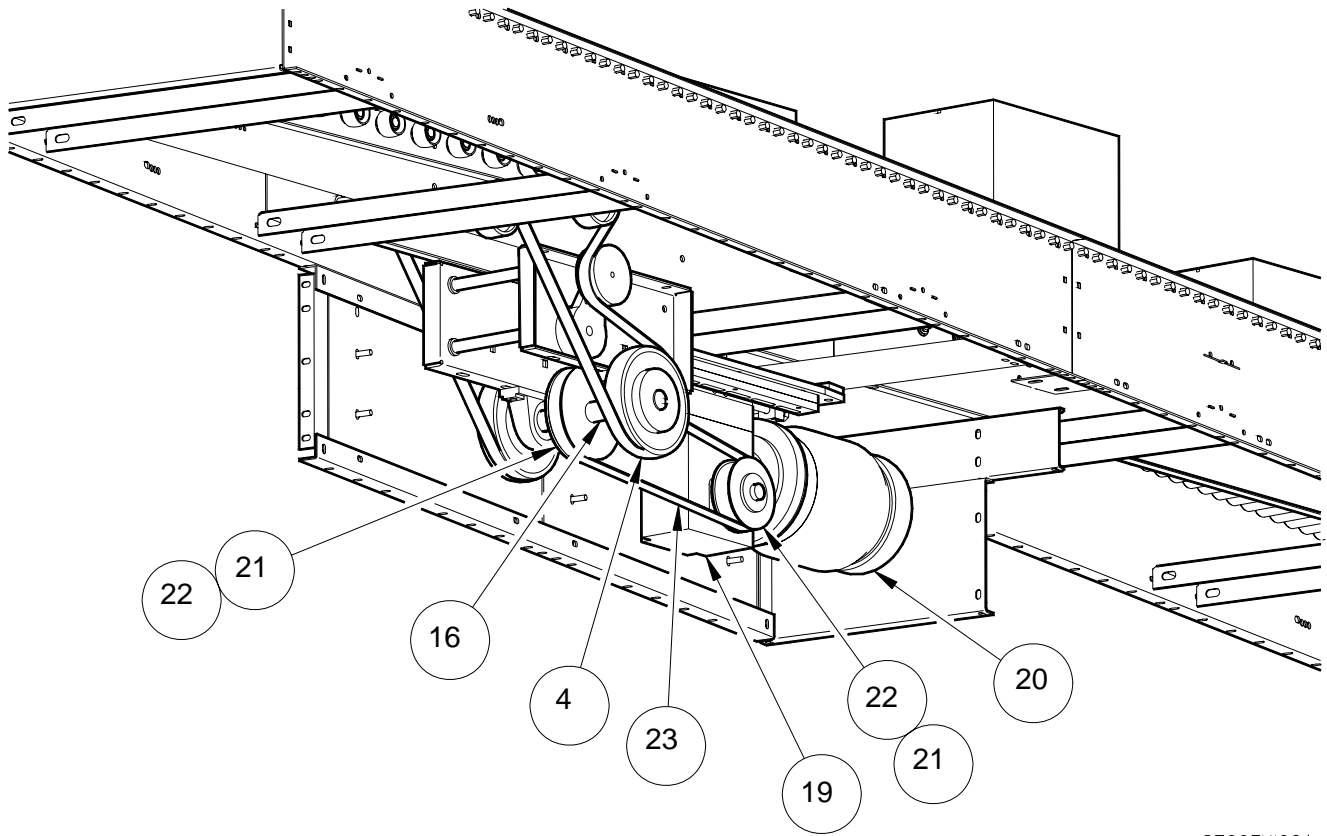
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Figure I - 3 Rotary Tensioner



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Figure I - 4 Idler Rollers



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Figure I - 5 Timing Belt, Drive Pulley, Drive Sprocket, and Drive Shaft