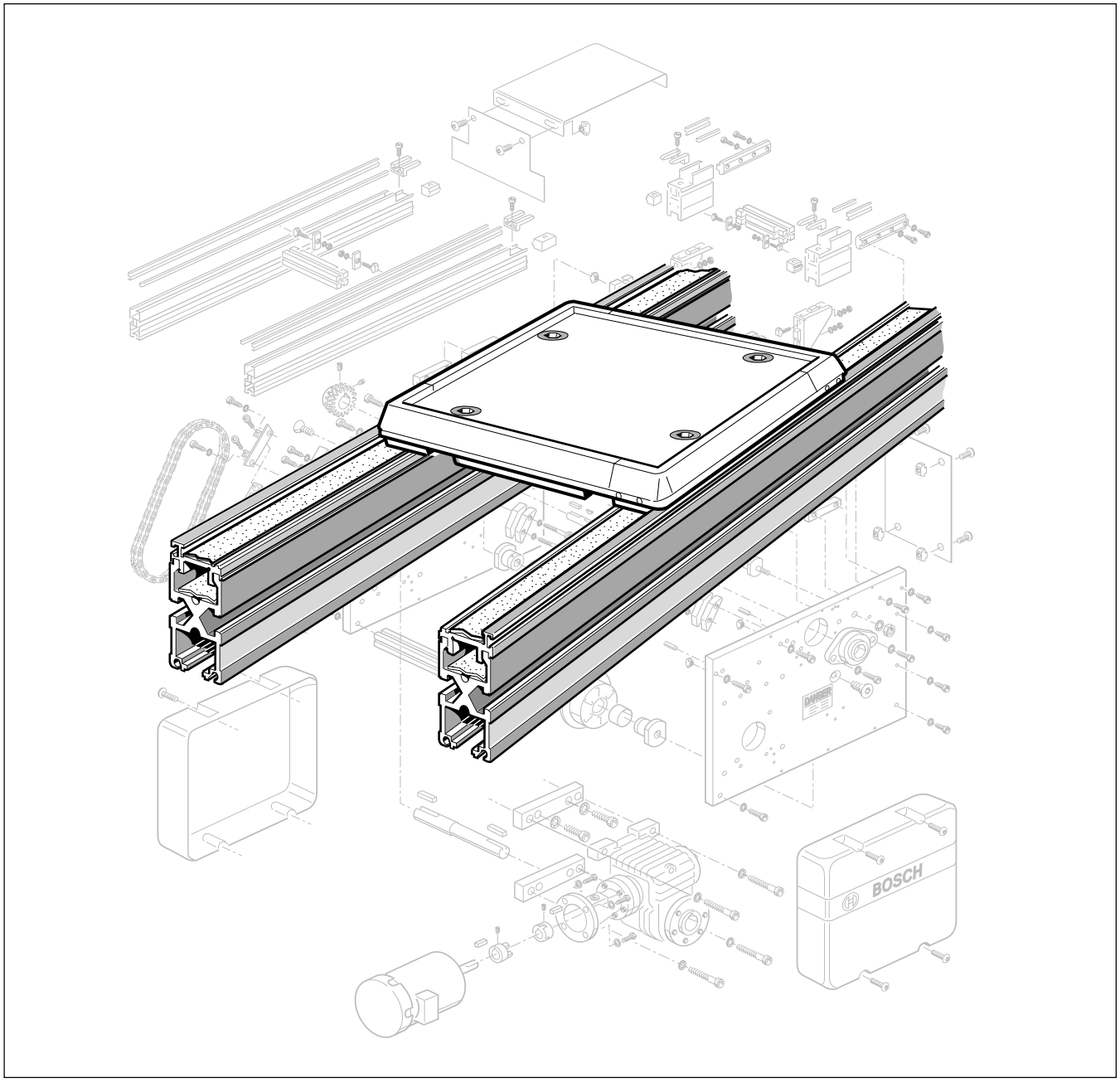
Preventive Maintenance Guide for Bosch Conveyor Systems

Publication No.:
8981500231 7/98



BOSCH
Automation

Preventive Maintenance Guide for Bosch Conveyor Systems

Bosch conveyor modules are designed for durability and a long service life. However, this also requires proper maintenance, including cleaning and the timely replacement of worn or damaged parts. This guide supplements the manuals included with the individual modules, and covers preventative maintenance guidelines for the major types of Bosch conveyors: belt, flat-top chain, and roller chain, as well as some of the most common modules. Following the inspections and procedures included here at the recommended intervals will help to maximize productivity by reducing downtime, as well as extend the life of the conveyor. For repair and advanced maintenance procedures, refer to the actual manual for the conveyor module.

Bosch Conveyor System Maintenance Summary

This guide is intended as a supplement to the Operation and Installation Manuals included with the individual conveyor modules.
Please review the documents included with the individual modules carefully.

DAILY: Inspect and remove any small parts and debris that may accumulate on all conveying belts and chains. Inspect all flat, toothed, and round belts for wear, damage, or separation at the belt welds. Replace or tension stretched belts, any damaged belts should be replaced immediately. Replace any missing flat-top chain caps.

WEEKLY: Wipe down the conveyor and remove all dirt and grease from the conveyor and any modules. Inspect the bottom of the pallets for debris that may be embedded in the plastic. Check the T-bolts on the stop gates and retighten to 25 Nm (18 lb-ft) as needed. Inspect and lubricate power transfer chains, sprockets and flange bearings. Examine drive and idler sprockets and chain tensioner for wear.

NOTE: DO NOT USE ANY SOLVENTS WHICH MAY ATTACK SEALS, UHMW-PE, NYLONS OR WHICH MAY DISSOLVE IMPREGNATED CHAIN LUBRICANTS.

MONTHLY: Lubricate the belts and rollers on Lift Transverse Units and Transverse Conveyors. Use a light oil on a cloth to lubricate the toothed belts. (**Note:** Do not lubricate the main line belts—only the toothed belts.) Check for loose or missing fasteners and tighten or replace as needed. T-bolts/T-nuts should be tightened to 25 Nm (18 lb-ft). Remove the side guards on the drive and return units and clean out any debris that has accumulated. Wipe any accumulated dirt or grime from the fan shrouds of all motors, to maintain proper motor cooling.

QUARTERLY: Inspect flat-top and roller chain for stretching and wear. If necessary, shorten the chain by removing links as described in the basic equipment manual.

Bosch Belt Conveyor Maintenance Procedures

This guide is intended as a supplement to the Operation and Installation Manuals included with the individual conveyor modules.
Please review the documents included with the individual modules carefully.

TIPS FOR MAINTAINING OPTIMUM SYSTEM PERFORMANCE

a. Immediately remove small parts and debris that accumulate on the pallets or the belts. Small parts, such as screws, can fall into the belt and get caught between the belt and the guide profile or the drive and return rollers. Trapped small parts and metal chips can severely damage or break the belt, as well as cause damage to guide profiles, drives and returns.

b. Keep the system clean! Wipe off built-up grease and dirt from the top surfaces of the belt sections, rocker faces, pallet surfaces, stop gates, and from locating pins and pallet support plates on lift-position units. Remove accumulated dirt and grime from motor fan shrouds and cooling fans to maintain proper cooling. Accumulated dirt can lead to increased wear, poor system performance, and premature belt failure.
NOTE: DO NOT USE ANY SOLVENTS WHICH MAY ATTACK SEALS, UHMW-PE, NYLONS OR WHICH MAY DISSOLVE IMPREGNATED CHAIN LUBRICANTS.

c. Regularly inspect the line for loose or missing T-bolts and floor anchor bolts. Retighten bolts to 25 Nm (18 lb-ft) of torque. Replace any missing fasteners immediately. Missing fasteners can result in misalignment, poor pallet movement, and accelerated wear.

d. Inspect the pneumatic system for loose or leaking air lines and fittings. Keep all filter-regulator-lubricator units filled and adjusted. Keep all dirt and moisture traps clean and drained.

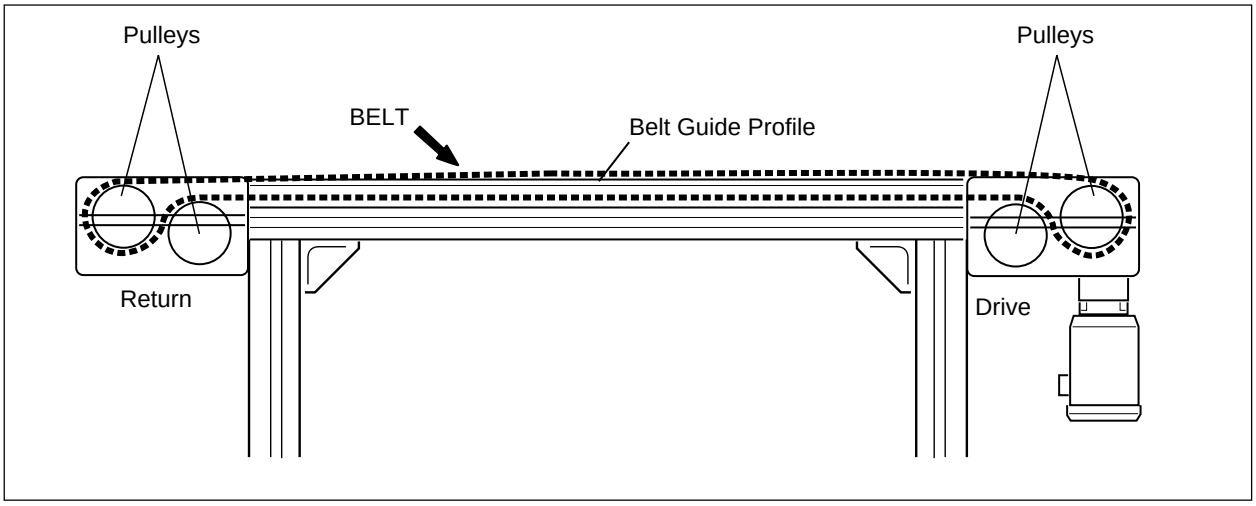
BELT DRIVE AND RETURN UNITS

a. The Drive gearbox is filled at the factory with Klueber Structovis AHD oil. The gearbox is lubricated for life unless the oil is removed for repair of the unit. **DO NOT USE OTHER TYPES OF OIL IN THE GEARBOX!** Using the incorrect oil type can lead to gearbox failure.

b. All other bearings in the drive and return units are sealed and require no additional lubrication.

c. Check for proper belt tracking at the return end of the conveyor. The belt edge must not rub the guide where it exits the return. Remove any and all pallets from the belt section before making any adjustments.

d. General maintenance. Periodically (at least monthly, more often in some environments) clean accumulated dirt from the cooling fan inlet and fins on the motor. Clean accumulated dirt from the inside of the drive side casting and from the faces of the drive and return pulleys. Dirt accumulated on the drive/return pulleys can damage the belts and lead to belt slippage.



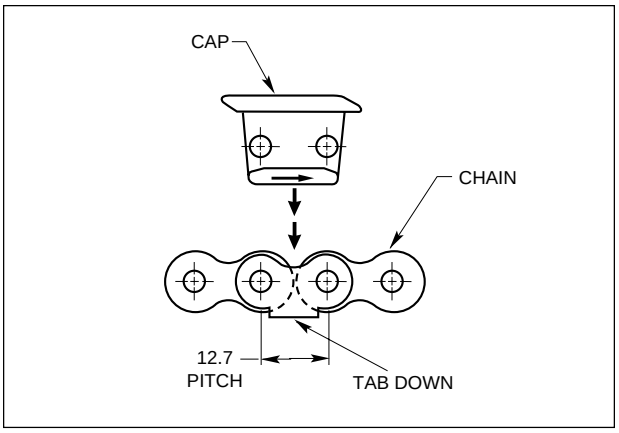
BELT SECTION

a. Inspect the belt for cuts, gouges, or separation at the belt weld. Inspect the belt for damage, excessive wear, or stretching. Damaged or badly worn belts should be replaced immediately. Replace both belts at the same time to maintain proper belt tension and reduce system downtime.

b. Remove built up dirt and grime from the belt guide profiles on a regular basis. Inspect the belt guide profiles for wear and damage, and replace if necessary.

CAUTION: The Bosch belt welding and tensioning kit is designed for installing two belts at once. It is unsafe to use the equipment for installing one belt.

FLAT-TOP CHAIN CAROUSEL DRIVES AND CHAIN SECTIONS



Immediately Upon Occurrence:

a. Replace any missing conveyor chain caps.

b. Replace any missing or damaged chain guide profile.

Weekly:

a. Inspect and lubricate power transfer chain. Inspect upper and lower power transfer sprockets for excessive wear. Replace if necessary.

b. Examine the drive chain tensioner unit for wear and proper operation. Adjust or replace as required.

c. Inspect the chain drive and idler sprockets for broken/bent teeth, excessive wear or improper engagement/disengagement of conveyor chain to the sprockets. Replace sprockets if necessary.

d. Inspect and lubricate the flange bearings.

e. Inspect the idler rollers for wear and improper operation. The rollers should rotate freely. Replace if necessary.

f. Inspect flat-top chain for any signs of loose or missing caps, cracks, or visible damage or wear. Repair or replace if necessary. Always use the press-fit style master link when replacing a segment of base chain.

g. Inspect conveyor chain guide profile for gaps, missing sections, wear, or visible damage. Repair or replace if necessary.

h. The UHMW-PE materials used in all chain guide profiles were specifically chosen for their inherent slipperiness and should not typically require additional lubrication. In some applications and/or operating environments periodic lubrication of the inner chain guide profiles of the curve sections may be required. Experience has shown that a silicone spray lubricant is a simple and effective treatment.

Quarterly:

a. Examine the conveyor chain for stretching. Virtually all chains experience stretching over their working life. As a chain elongates, it and the corresponding drive sprockets wear somewhat in unison. Generally the sprockets will reach the end of their usable life and be replaced prior to the chain. It is expected that new sprockets engaging stretched chain will wear at a progressively faster rate as a result of the “misalignment” of pitch length.

b. For **carousel** drives, the chain slack loop of any drive unit should allow 1.0" to 2.0" of clearance between the chain and the underside of the idler roller. If the chain slack loop is greater than 2.0 inches (about 5 cm), the appropriate number of chain links should be removed and documented in the maintenance log. The manufacturer’s maximum allowable stretching over the life of the chain is 4% of total length. (*Except for initial installation run-in.)* The maintenance log must document the original installed length of the chain and any subsequent adjustments to determine “calculated” elongation. A physical measurement to determine elongation is possible. A representative sample of chain from the system is measured. If measured length divided by nominal length (original length) of a used chain segment of the same number of links as a segment of new chain results in a value of 1.04 or greater, the conveyor chain **and** chain drive/idler sprockets must be replaced.

   If: $\frac{\text{(Length of "X" Links of Used Chain Segment)}}{\text{(Length of "X" Links of New Chain Segment)}}$ is greater than 1.04, replace the chain.

c. If a carousel drive is used with a Multiple Drive Balancer, the chain slack loop length must be maintained as described in the Drive Balancer Operating Instructions. Excessive chain slack loop in a Drive Balancer monitored system will result in conveyor fault signal or shutdown and requires immediate attention prior to restart. Total chain stretch must still be documented and/or measured. The lenses of all drive monitoring sensors should be kept clean and clear of accumulated debris.

d. Wipe down the entire system to remove any accumulated debris and thoroughly inspect all system components, i.e. pallet stops, proximity sensors, pallet lifts and positioners, etc. **NOTE: DO NOT USE ANY SOLVENTS WHICH MAY ATTACK SEALS, UHMW-PE, NYLONS OR WHICH MAY DISSOLVE IMPREGNATED CHAIN LUBRICANTS.**

e. Examine the hardened steel chain guide fingers for wear. These guide fingers are located in the carousel drive unit and guide the chain onto the drive sprockets and off of the idler sprockets. Replace if necessary.

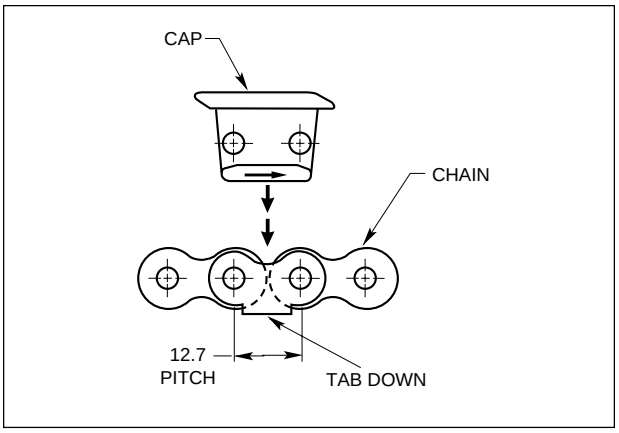
As Needed:

a. Replace power transfer chain and sprockets.

b. Inspect drive and idler sprockets. These sprockets should be replaced if inspection of the sprocket determines sufficient wear to justify replacement, or if the sprockets are damaged.

c. Inspect the motor and gearbox for proper operation. Inspect the gear reducer for any signs of lubricant leakage. Replace if necessary.

FLAT-TOP CHAIN IN-LINE DRIVES, RETURNS AND CHAIN SECTIONS



Immediately Upon Occurrence:

a. Replace any missing conveyor chain caps.

b. Replace any missing or damaged chain guide profile.

Weekly:

a. Examine the chain tensioner unit for wear and proper operation. Adjust or replace as required.

b. Inspect the chain guides for wear and dirt accumulation.

c. Inspect the chain drive and idler sprockets for broken/bent teeth, excessive wear or improper engagement/disengagement of conveyor chain to the sprockets. Replace sprockets if necessary.

d. Inspect and lubricate the flange bearings.

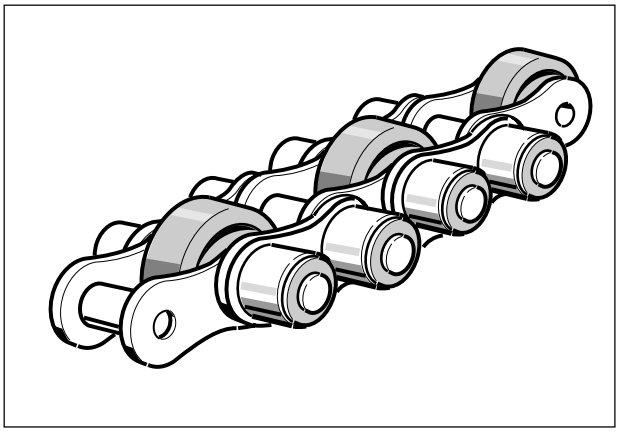
e. Inspect the idler rollers for wear and improper operation. The rollers should rotate freely. Replace if necessary.

f. Inspect flat-top chain for any signs of loose or missing caps, cracks, or visible damage or wear. Repair or replace if necessary. Always use the press-fit style master link when replacing a segment of base chain.

g. Inspect conveyor chain guide profile for gaps, missing sections, wear, or visible damage. Repair or replace if necessary.

h. The UHMW-PE materials used in all chain guide profiles were specifically chosen for their inherent slipperiness and should not typically require additional lubrication. In some applications and/or operating environments periodic lubrication of the inner chain guide profiles of the curve sections may be required. Experience has shown that a silicone spray lubricant is a simple and effective treatment.

ROLLER CHAIN DRIVES, RETURNS, AND CHAIN SECTIONS



Immediately Upon Occurrence:

a. Replace any chain segment with missing or damaged rollers.

b. Replace any missing or damaged chain guide profile.

Weekly:

a. Examine the chain tensioner unit for wear and proper operation. Adjust or replace as required.

b. Inspect the chain drive and idler sprockets for broken/bent teeth, excessive wear or improper engagement/disengagement of conveyor chain to the sprockets. Replace sprockets if necessary.

c. Inspect the chain guides for wear and dirt accumulation. Clean or replace if necessary.

d. Inspect roller chain for any signs of damaged or missing rollers, cracks, or visible damage or wear. Replace damaged chain segments immediately. Always use the press-fit style master link when replacing a segment of chain.

e. Inspect conveyor chain guide profile for gaps, missing sections, wear, or visible damage. Repair or replace if necessary.

f. The UHMW-PE materials used in all chain guide profiles were specifically chosen for their inherent slipperiness and should not typically require additional lubrication.

LIFT-TRANSVERSE UNITS

a. Periodically inspect the toothed belts for breakage or excessive wear. There is no adjustment for belt tracking, however, excessive belt tension will cause the belt to track to the side and cause the belt wear. The belt tension should be adjusted so that the distance between the top of the belt and the top of the lift plate is not more than 5mm (3/16"). This tensioning procedure is outlined in the Bosch Lift Transverse Unit installation manuals.

b. The gearmotor gearbox is filled at the factory with Klueber Structovis AHD oil. The gearbox is lubricated for life unless the oil is removed for repair of the unit. Do not add other types of oil to the gearbox. Failure of the gearbox can result from reactions between incompatible oils.

c. Lubricate the return rollers with one drop of an acid-free 10W oil applied to the roller axle.

d. All other bearings in the lift-transverse units are sealed and require no additional lubrication.

e. Rollers - the rollers on the lift plate should roll when the belts are moving. If the rollers do not move, clean and relubricate with a light oil.

f. General maintenance: Clean accumulated dirt and debris from the cooling fan and fins on the motor and around return rollers weekly.

TRANSVERSE CONVEYORS

a. The gearmotor gearbox is filled at the factory with Klueber Structovis AHD oil. The gearbox is lubricated for life unless the oil is removed for repair of the unit. Do not add other types of oil to the gearbox. Failure of the gearbox can result from reactions between incompatible oils.

b. Check the toothed belts for excessive wear, breaks or tears. Replace the belt using the procedure described in the Bosch assembly and maintenance manual. The belts are lubricated with 10W oil when shipped from the factory. If excessive wear of the belt surface is apparent, re-oil the belts by applying a light coating of oil with an oil soaked cloth held against the moving belt.

c. Apply a small amount of Loctite Anti-seize lubricant to the return roller between the roller side and the bearing housing every 2000 hours of operation. Check for free operation of the return rollers, replace the roller bearing if signs of rust, abrasion of the side of the steel roller, or stiff operation are noted.

LIFT-POSITION UNIT FOR FORCE ABSORPTION

a. Apply a light coating of an EP-2 lithium grease to all sliding surfaces of the unit.

ROLLER CURVES

a. Remove accumulated dirt and grease from the roller surfaces on a weekly basis.

b. Check rollers, drive chains and sprockets for wear and damage. Replace as necessary.

ROUND BELT CURVES (KE 2/90 and KE 2/180)

a. Check the round belt path for trapped objects and debris daily. Vacuum accumulated dirt and particles from the belt path at least once per week.

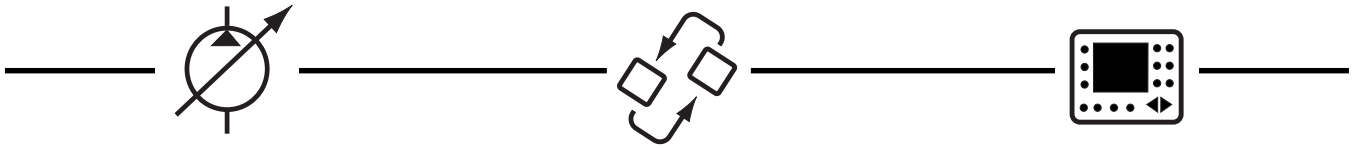
b. Check the round belt and toothed belts (on self-powered curves) for wear and stretching at least weekly. Tension or replace the round belt, as needed. Replace badly worn or loose toothed belts.

c. Remove any dirt or grease build-up from the curve surface as well as the motor cooling fan and fins (on self-powered curves).

BOSCH AUTOMATION TECHNOLOGY

Bosch Automation Technology
Factory Automation Products
816 E. Third St.
Buchanan, MI 49107
www.boschat.com

Customer Service Hotline: (888) 32-**BOSCH** [888-322-6724]
In Canada (800) 88-**BOSCH** [800-882-6724]
Tel.: (616) 695-0151
FAX: (616) 695-5363



Publication No.:
8981500231 7/98

BOSCH
Automation