2100 Series
Cleated Belt
End Drive Conveyors

Set-up, Operation & Maintenance Manual

Conveyor with Bottom Mounted End Drive

Conveyor with Top Mounted End Drive

Conveyor with Side Mounted End Drive
Safe Practices

The safety alert symbol, black triangle with white exclamation, is used to alert you to potential personal injury hazards.

When conveyors are used in conjunction with other equipment or as part of a multiple conveyor system, check for potential pinch points and other mechanical hazards before system start-up. Because Dorner Mfg. Corp. cannot control the physical installation and applications of multiple conveyor systems, taking protective measures is the responsibility of the user.

Standing on a conveyor or transporting people is prohibited.

NEVER operate equipment without guards or other protective devices properly secured in place. In addition, to prevent injury, make sure all electrical power sources have been disconnected and locked-out before you perform any maintenance, make any adjustments or replace any components.

Operating Dorner conveyors in an explosive environment is prohibited.

These gearmotors operate at an elevated temperature which may cause people to be startled if they accidentally touch the motor housing.

Foreword

By following the maintenance and adjustment instructions in this manual, you will prolong the life of your conveyor and maintain its maximum efficiency.

When ordering replacement parts, always give the serial and model numbers. These numbers are on the plate (Figure 1) which is located on the conveyor side rail. Record these numbers, in the spaces provided, for future reference.

Specified “MAX. LOAD” is based on conveyor being in a horizontal position with a non-accumulating and evenly distributed load.

Serial Number (Fill In)

Model Number (Fill In)

The Timing Belt has a length designation stamped onto it. Also, Gear Reducer and Electric Drive Motor have Dorner part number tags affixed to them. Use spaces provided to record these numbers:

Timing Belt (___ ___ L)

Gear Reducer (820- ___ ___ )

Electric Drive Motor (826- ___ ___ )

For pictorial clarity, some illustrations in this manual may show guards or other protective devices open or removed. Under no circumstances should the conveyor be operated without these devices securely in place.

NOTE: All technical data in this publication is based on the product information available at time of printing. Dorner reserves the right to make changes at any time without notice or obligation to install these changes on units previously delivered.
Using appropriate lifting means, carefully remove the conveyor assembly or section from the shipping container and place it in its correct operating position and direction. Use Dorner stands and compatible mounting hardware, or your own mounting provisions, to securely mount the conveyor. Refer to the Support Stands Set-up, Operation & Maintenance Manual for appropriate mounting details.

The conveyor must be mounted straight, flat and level, within the confines of the conveyor. Use a straight edge and a level for initial set up (Figure 2).

**IMPORTANT:** Do not bend or twist the conveyor frame when mounting the conveyor.

Refer to separate Mounting Package Re-assembly Instructions, included with the gearmotor mounting package, to attach the gearmotor.

**NOTE:** An end drive gearmotor package must be mounted to the non-tensioning end of the conveyor. In addition, for maximum load carrying, the gearmotor should be mounted so that the conveyor belt is pulled towards the drive.

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**Maintenance**

**Lubrication**

**WARNING**

To prevent injury, make sure all electrical power sources have been disconnected and locked-out before you perform any maintenance, make any adjustments or replace any components.

**Pulley Bearings**

**NOTE:** When lubricating pulley bearings, use a conventional hand grease gun, with a maximum of one pump per application, unless otherwise specified. Do not over-lubricate. To prevent damage to the bearing, do not use a power grease gun. This creates pressure that may unseat the bearing. In addition, 44 mm wide conveyors use shielded ball bearings and do not require lubrication.

Use Dorner Red Grease 397 gram cartridge, part number 829-002, or 397 gram can, part number 829-003. Lubricate pulley bearings every 750 hours or more frequently, depending on operating conditions.

All non-driven positions have a plastic plug (A of Figure 3) installed into the ends of the pulley retaining sleeves (B). Use a small flat screwdriver to remove this plug.

Make sure the adapter shoulder (E) is seated against the conveyor tail plate. Proper seating assures alignment of the internal lubrication passages (D).

When lubrication is finished, the grease adapter (C) can be left in place or can be replaced with the plastic plug (A of Figure 3).

**Driven Positions for 70 mm and Wider Conveyors**

**Conveyor with a Side Mounting Package**

For 70 mm and wider conveyors, lubricate the pulley bearing on the drive side through the outboard drive shaft grease fitting (F of Figure 5).

Remove the coupling guard (G) to access the set screws on the helical flex coupling (H). Loosen the set screws on the end of the coupling (H) closest to the conveyor.

Remove screws (I) and slide the gearmotor (J) with coupling (H) off the outboard drive shaft to access the grease fitting (F). Be careful not to lose the key (K).

When lubricating the pulley bearings for the first time the outboard shaft assembly must be filled with grease before the bearings will get any lubrication. Use a maximum of two pumps. Do not over-lubricate.

When lubricating any of the pulley bearings, anytime after the initial lubrication, use a maximum of one pump per application. Do not over-lubricate.

Use Dorner greasing adapter, part number 200046M (C of Figure 4).
Conveyor Belt

Inspection

NOTE: When a problem is identified, be sure to perform the necessary corrective maintenance.

Inspect the conveyor belt for:
- Surface cuts or wear
- Tracking problems
- Worn edges
- Stalling or slipping
- Stretching or breaking
- Belts that walk to one side
- Non-uniform movement of the conveyor belt
- Lines or rough edges on belt

Problem Identification

Belts that walk to one side indicate:
- Belt tracking incorrectly. Refer to “Conveyor Belt Tracking” topic beginning on page 6.
- Twisted or damaged conveyor frame
- Dirt accumulating on the outside diameter of the pulleys
- Side load on belt.

Non-uniform movement indicates:
- Excessive load on conveyor belt
- Intermittent jam or drive train problems
- Conveyor belt or drive timing belt, when applicable, are not properly tensioned

Lines or rough edges on belt could indicate:
- Belt tracking incorrectly. Refer to “Conveyor Belt Tracking” topic on page 6.
- Jammed part
- Foreign material inside the conveyor
- Improperly positioned accessories

Cleaning

IMPORTANT: Do not use belt cleaners that contain alcohol, acetone, Methyl Ethyl Ketone (MEK) or other harsh chemicals.

For most conveyor belts, use Dorner Belt Cleaner, part number 625619, or equivalent. Mild soap and water may also be used. Do not soak the belt.

Component Replacement and Adjustments

Conveyor Repair

Preparations

Tools

Use Dorner Tool Kit Part Number 2500M-ENG for proper maintenance. Follow instructions accompanying the tool kit.

Checklist

To avoid costly delays in repair, use the following checklist:
- Have complete pulley assemblies, replacement belts, return roller assemblies, drive components, gearmotors and fasteners in stock and ready for use.
- Inspect the entire conveyor while it is disassembled.
- Thoroughly clean the conveyor inside and outside during repair. Remove any impacted dirt from the knurls on the outside diameter of the pulley.
- Replace all worn and damaged parts.
- Check all bearings for smooth operation.
- To minimize downtime when multiple conveyors of the same size are used, stock a complete conveyor that can be exchanged for the damaged conveyor. The damaged conveyor can then be repaired as needed.

Conveyor Belt Replacement Procedure

Belt Removal for Conveyor Without Stands or Gearmotor Mounting Package

Begin by loosening (but not removing) the screws which secure the guide clamps (G of Figure 7) on the side of the conveyor opposite the drive package. Remove the belt guide(s) (A) from the conveyor.

If engaged, loosen the belt tracking cam assemblies (C) on both sides of the tensioning end (B), identified with a label (D), and slide them toward the middle of conveyor.

Loosen the tail cover plate screws (E) on both sides at the tensioning end.

Position the tensioning end (B) of conveyor by pushing it back into the conveyor frame using the heel of your hand. This sufficiently loosens the conveyor belt for removal.

Remove the old belt by sliding it sideways (F) from the conveyor.
Belt Removal for Conveyor With Stands and Gearmotor Mounting Package

**WARNING**

To prevent injury, make sure all electrical power sources have been disconnected and locked-out before you perform any maintenance, make any adjustments or replace any components.

In addition, the weight of the gearmotor is all on one end of the conveyor. This could cause the conveyor to tip off the stands when the mounting clamps are removed. Be sure to provide some form of support (H of Figure 8) underneath the gearmotor while the belt is being changed.

Disconnect and lock-out the electrical power source. To facilitate re-assembly, mark critical locations on conveyor frame before removing guiding, controls, stops and other attached accessories which would interfere with belt removal.

Begin by loosening (but not removing) the screws which secure the guide clamps (G of Figure 7) on the side of the conveyor opposite the drive package. Remove the belt guide(s) (A) from the conveyor.

If engaged, loosen the belt tracking cam assemblies (C), on both sides of the tensioning end (B), identified with a label (D), and slide them toward the middle of the conveyor.

Loosen the tail cover plate screws (E) on both sides at the tensioning end. Next, re-position the tensioning end (B) of conveyor by pushing it back into the conveyor frame using the heel of your hand. This loosens the belt sufficiently for removal.

Loosen the mounting clamp plate screws (I of Figure 8), on both sides of the conveyor. The screws only need to be loosened far enough to allow the conveyor to clear the mounting clamp plates.

**WARNING**

To prevent injury from the support stand tipping-over when conveyor is uncoupled, be sure to anchor the stand to the floor or otherwise properly stabilize the stand before it is detached from the conveyor.

Remove the old belt by sliding it sideways from the conveyor frame away from the drive side of the conveyor.

To install a new conveyor belt, proceed to the “Belt Replacement” topic.

**Belt Replacement**

Orient the replacement belt so the belt splice leading fingers (K of Figure 9) point in the direction of belt travel (J) and that the outside fingers (L) are positioned as shown.

Begin a new conveyor belt installation on the same end of the conveyor from which the old belt was last removed. Install the new belt by sliding it sideways onto the conveyor frame, from the non-drive side. Once into position, the conveyor can be lowered into contact with the clamp blocks while being careful not to pinch the conveyor belt. With the conveyor in position, replace and fully tighten the screws (I of Figure 8) to secure the mounting clamp plates to the clamp blocks.

Make sure all the hardware you removed or loosened is fully tightened, except the tail cover plate screws (E) on the tensioning end of the conveyor.

Refer to the following “Conveyor Belt Tension Adjustment” procedure and set the conveyor belt tension.

Replace guiding, controls, stops and other attached accessories referring to the positions previously marked.

Re-connect the electrical power source.

**Conveyor Belt Tension Adjustment**

The following procedure is used to tension the conveyor belt on all end drive conveyors.

To adjust belt tension:

Locate the tension end (A of Figure 10) of the conveyor, identified with a label (C).

If engaged, loosen and slide belt tracking cam assemblies (B) towards the center of the conveyor on both sides of the tension end (B).

Loosen tail cover plate screws (E) on both sides of the tension end (A).

Insert a 5 mm hex key wrench (M) into either end of the pinion (N).

Rotate the pinion (N) to extend the tensioning end until the gap (O), between the pulley plate and the conveyor frame, measures 30 mm for a new belt or as required to stop the drive pulley slippage.

**NOTE:** Over-tensioning adds unnecessary loading to the pulley bearings.

While holding the pinion (N) in the tensioned position, tighten the cover plate screws (E) on both sides of the conveyor. Torque screws to approximately 2 Nm.

Position the belt tracking cam against the slide bar while making sure groove is correctly oriented (see Figure 11 on page 6). Proceed to the “Preliminary Belt Tracking Check” information, on page 6, before conveyor startup.
Preliminary Belt Tracking Check

**IMPORTANT:** Stop the conveyor immediately if the belt does not track properly. Refer to the following “Conveyor Belt Tracking” topic.

Make sure the conveyor belt tension is set properly. Refer to the “Conveyor Belt Tension Adjustment” topic on page 5.

Energize the power to the conveyor drive motor. Then, proceed as follows:

**On fixed speed conveyors**, jog the conveyor on and off in very short cycles, a maximum of 6 starts per minute. Observe the belt tracking on both ends. Gradually increase the run cycle.

**On variable speed conveyors**, set the control at its lowest speed. Run the conveyor and observe the belt tracking at both ends. Gradually increase the speed.

**IMPORTANT:** Stop the conveyor immediately if the belt does not track properly. Refer to the following “Conveyor Belt Tracking” topic. In addition, long conveyors may require a person at each end to observe the belt tracking and a person to control the drive.

Make tracking adjustments per the following “Conveyor Belt Tracking” topic.

Conveyor Belt Tracking

Make sure the belt is properly tensioned and that the conveyor is straight and level in all directions within the confines of the conveyor.

This conveyor is equipped with an articulating linkage which allows the pulley to be positioned at a slight angle to facilitate belt tracking. Check both ends of the conveyor for proper belt tracking. The belt should track centered between the tail plates on both ends of the conveyor. **Conveyor belt tracking should always be adjusted on the discharge end of conveyor first**, as indicated by the direction of belt travel arrow (J of Figure 11). Then, check the tracking on the opposite (infeed) end of the conveyor and readjust, if necessary.

Before proceeding to adjust the belt tracking, make sure the cover plate screws (D), on both sides of the conveyor, are tightly secured. Then, adjust belt tracking as follows:

Loosen (but do not remove) the two (2) cam clamping plate screws (R) on both sides of the conveyor discharge.

Slide both belt tracking cam assemblies (B of Figure 11) as far as they can be toward the end of the conveyor.

The belt tracking cam (P of Figure 11) must be set to the low point at the point of contact as illustrated. The slot (Q), in the belt tracking cam, indicates the low point and should be pointing towards the end of the conveyor.

Tighten the two (2) cam clamping plate screws (R), on both sides of the conveyor.

**IMPORTANT:** Rotate belt tracking cam very slowly and in small increments, to prevent the belt from moving beyond the desired centered position.

Tighten the tail cover plate clamp screws (D) and re-check the belt tracking.

Recheck belt tracking, on opposite end of the conveyor, and adjust if needed.

**NOTE:** Carefully feel the conveyor ends for “hot spots” and belt edge wear which would indicate that the conveyor belt is rubbing against the conveyor frame and thus tracking improperly. Repeat the tracking adjustment, if necessary.
Outboard Drive Shaft Replacement

Removal

Removal of the outboard drive shaft (U of Figure 12) requires use of Dorner hex key wrench extension tool (T).

For replacement of hex key wrench extension tool use part number #25-08 for conveyors 44 mm to 305 mm wide, or part number #25-08A for conveyors wider than 305 mm.

Remove the outboard drive shaft (U) by inserting the blunt end (S) of the hex key wrench extension tool (T) into the pulley (X) end opposite the outboard drive shaft (U).

While pushing in the spring-loaded plunger (V) with the hex key wrench extension tool (T), pull out the outboard drive shaft assembly (U).

![WARNING](Keyway may be sharp!)

Installation

For outboard drive shaft (U) installation, the pulley (X) may have to be turned around in the conveyor frame.

The hex bore (Y) is off center on pulleys for conveyors measuring 127 mm and wider. If necessary, remove the pulley following the “Pulley Removal Procedure” on this page, turn it around, and replace it according to the following “Pulley Replacement Procedure”.

![Figure 12](Pulley Hex Bore Orientation)

Conveyor Hex Bore Orientation

<table>
<thead>
<tr>
<th>Conveyor Width</th>
<th>Insert Shaft at Pulley End</th>
</tr>
</thead>
<tbody>
<tr>
<td>44 mm to 95 mm</td>
<td>Either</td>
</tr>
<tr>
<td>127 mm &amp; Wider</td>
<td>Closest to Hex Bore</td>
</tr>
</tbody>
</table>

Install the outboard bearing retaining sleeve in the desired drive location. Be sure the pulley hex bore (Y) is properly located as indicated in the previous chart.

Insert the blunt end (S) of the hex key wrench extension tool (T) into the end of the pulley (X) opposite the outboard bearing retaining sleeve (W).

Exert inward pressure on the hex key wrench extension tool (T) to release the spring-loaded plunger (V), at the same time push inward on the outboard drive shaft assembly (U) until it is fully seated.

The hex key wrench extension tool (T) may now be removed. Make sure outboard drive shaft (U) is locked in position by pulling outward on the assembly.

Pulley Removal Procedure

Remove conveyor belt. Refer to the “Conveyor Belt Replacement Procedure” procedure, that begins on page 4.

Remove the tail cover plate screws (Z of Figure 13) and tail cover plates (AA) on both sides of the conveyor.

![Figure 13](Pulley Replacement Procedure)

NOTE: If outboard drive shaft is being replaced, be sure the hex broach, in the pulley, is oriented correctly. Refer to “Outboard Drive Shaft Installation” topic.

Insert the special threaded bolt (AH of Figure 15), part number #906-278, through the bearing anvil/sleeve removal tool (AG) and into the retaining sleeve (AB).

Tighten the bolt (AH) until the retaining sleeve (AB) is free of the tail pulley plate (AD).

Remove the retaining sleeve (AB) from the bolt (AH) and repeat for the other side.

Take pulley (AC) out of the conveyor frame.

Pulley Replacement Procedure

Refer to Figure 13 and re-install pulleys as follows:

![Figure 15](Pulley Replacement Procedure)

Insert pulley (AC of Figure 13) between the tail pulley plates (AD).

Secure the tail cover plates (AA of Figure 13) to the conveyor with tail cover plate screws (Z).

Install the conveyor belt. Refer to the “Conveyor Belt Replacement” procedure, beginning on page 4, the “Conveyor Belt Tension Adjustment” procedure, beginning on page 5, and the “Conveyor Belt Tracking Adjustment” procedure, beginning on page 6.

- Part of Tool Kit, Part Number 2500M-ENG.
- Shipped with conveyors wider than 305 mm.
Timing Belt Tension Adjustment for Top & Bottom Mounting Packages

WARNING

To prevent injury, make sure all electrical power sources have been disconnected and locked-out before you perform any maintenance, make any adjustments or replace any components.

NOTE: The following information applies to both top (Figures 17 & 18) mounting and bottom mounting (Figures 19 & 20) packages. The position of the tensioning bearing assembly (AL) with respect to the timing belt (AM) is dictated by the direction of conveyor belt travel (J).

Disconnect power. Then, remove the screws (AI of Figure 16) securing the belt guard (AJ). Then, remove the belt guard.

Check the timing belt for wear and replace it if worn.

Loosen the cap screw (AK) which secures the tensioning bearing assembly (AL).

Slide the tensioning bearing assembly (AL) against the timing belt (AM), until the deflection of the belt at the midpoint of the section of belt (AN) (opposite the tensioning bearing assembly) is 3 mm for a 0.5 kg force applied at that point. For optimum performance, the timing belt should be tensioned so as to prevent jumping of teeth under the most severe conditions which the drive will encounter.

NOTE: Over-tensioning the timing belt may cause reduced belt life or bearing and drive damage.

Tighten the tensioning bearing assembly cap screw (AK of Figure 16) with 24 Nm of torque.

Re-assemble the belt guard (AJ) and belt guard screws (AI).
Replacement Component Part Numbers

<table>
<thead>
<tr>
<th>Item</th>
<th>Part No.</th>
<th>Part Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8</td>
<td>See Chart Pulley Assembly</td>
</tr>
<tr>
<td>2</td>
<td>200035</td>
<td>Pulley Retaining Sleeve</td>
</tr>
</tbody>
</table>

NOTE:
For replacement parts, other than those shown on this page, contact the factory.

Adapter Assembly (2) [Includes Outboard Bearing Retaining Sleeve 200223 (4), Shaft (3) (see Table) & Fitting (5) (see Table)]

For replacement Drive Belt Tensioning Idler Bearing (9), order part number 802-046. See (AL) on page 8, for access and disassembly details.

Configuring Conveyor Belt Part Number

To configure a part number for ordering an identical replacement conveyor belt, refer to your serial and model number plate and fill-in all of the same original “WW”, “LL”, “TT” & “SSSS” numbers.

24– _ _ _ _ _ _ _ _ _ _

(Fill In)

The following information is stamped onto the conveyor serial number and model number plate which you should have also recorded on page 2 of this manual.
RETURN POLICY

No returns will be accepted without prior written factory authorization. When calling for authorization, please have the following information ready for the Dorner Factory representative or your local distributor:

1. Name and address of customer.
2. Item(s) being returned.
3. Reason for return.
4. Customer’s original order number used when ordering the item(s).
5. Dorner or distributor invoice number.

A representative will discuss action to be taken on the Returned items and provide a Returned Goods Authorization Number to reference.

There will be a 15% restocking charge on all new items returned for credit where Dorner was not at fault. These will not be accepted after 60 days from original invoice date. The restocking charge covers inspection, cleaning, disassembly, and reissuing to inventory.

If a replacement is needed prior to evaluation of returned item, a purchase order must be issued. Credit (if any) is issued only after return and evaluation is complete.

- Dorner has representatives throughout the world. Feel free to contact Dorner for the name of your local representative. Our technical sales and service staff will gladly help with your questions on Dorner products.