



2100 Series End Drive Conveyors







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	WARNING	
<p>The safety alert symbol, black triangle with white exclamation, is used to alert you to potential personal injury hazards.</p>		

		WARNING
<p>Gearmotors may be HOT.</p> <p>DO NOT TOUCH Gearmotors.</p>		

		DANGER
<p>Climbing, sitting, walking or riding on conveyor will cause severe injury.</p> <p>KEEP OFF CONVEYORS.</p>		

		WARNING
<p>Dorner cannot control the physical installation and application of conveyors. Taking protective measures is the responsibility of the user.</p> <p>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.</p>		

		DANGER
<p>DO NOT OPERATE CONVEYORS IN AN EXPLOSIVE ENVIRONMENT.</p>		

		WARNING
<p>Exposed moving parts can cause severe injury. LOCK OUT POWER before removing guards or performing maintenance.</p>		

		WARNING
<p>Loosening stand height or angle adjustment screws may cause conveyor sections to drop down, causing severe injury. SUPPORT CONVEYOR SECTIONS PRIOR TO LOOSENING STAND HEIGHT OR ANGLE ADJUSTMENT SCREWS.</p>		

Introduction

Warnings – General Safety

IMPORTANT: Some illustrations may show guards removed. Do NOT operate equipment without guards.

Upon receipt of shipment:

- Compare shipment with packing slip. Contact factory regarding discrepancies.
- Inspect packages for shipping damage. Contact carrier regarding damage.
- Accessories may be shipped loose. See accessory instructions for installation.

Dorner's Limited Warranty applies.

Dorner 2100 Series conveyors are covered by Patent No. 5,174,435, 5,131,529 and corresponding patents and patent applications in other countries.

Dorner reserves the right to make changes at any time without notice or obligation.

General Instructions for All Conveyors

1. 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.

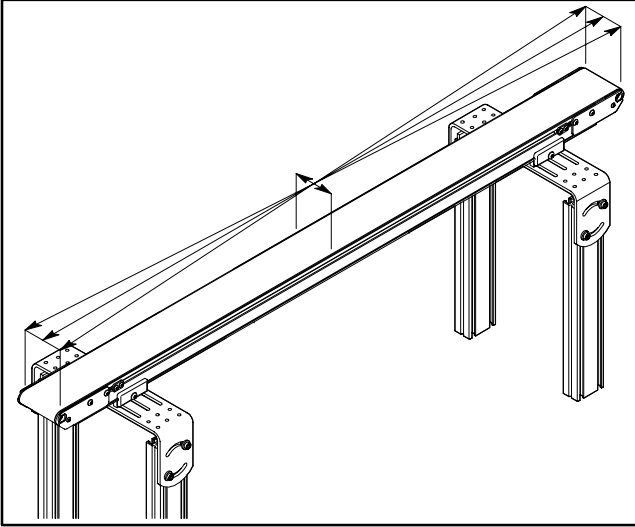


Figure 1

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

4. Refer to the Mounting Package Re-assembly Instructions, included with the gearmotor mounting package, to attach the gearmotor. For maximum load carrying, locate the gearmotor so that the product, being conveyed, moves toward the drive (or so that the conveyor belt is pulled towards the drive). In addition, some gearmotors may require some customer-provided electrical wiring. Follow all applicable local electrical codes and the wiring diagrams, supplied with the gearmotors. The wiring diagram for a three-phase gearmotor is located inside the terminal box which is attached to the gearmotor. The

2. Use Dorner stands and compatible mounting hardware (or mounting provided by the user) to securely mount the conveyor. Refer to the Metric Support Stands Parts, Assembly & Maintenance Manual for appropriate mounting details.
3. Conveyor must be mounted straight, flat and level, within confines of conveyor. Use a straight edge and a level for initial set up (Figure 1).

wiring diagram for a variable speed gearmotor is located inside the control box.

NOTE: End drive gearmotor package must be mounted to non-tensioning end of conveyor.

5. **All low side conveyors without optional guiding**, have factory installed belt tracking guides (A of Figure 2) installed on both ends of conveyor. Each guide is a 3.5" (89 mm) long piece of formed plastic which snaps onto the portion of the conveyor sidewall (B) above the T-slot channel.
 - a. **To remove the guide** from the conveyor sidewall, apply a slight outward and downward finger-pressure on one of the top corners of the

Installation

guide and gradually peel it off the portion of the conveyor sidewall (B).

- b. **To install the guide** onto the conveyor sidewall, first place the lower lip (C) of the guide against the upper edge of the conveyor sidewall T-slot channel. Then, apply inward and upward pressure to completely snap it into place.

NOTE: Use belt tracking guides (A of Figure 2) during initial conveyor start-up for tracking conveyor belt, as necessary. Guides may be left on or removed, after start-up. Be sure to save belt tracking guides for start-up after belt cleaning or replacement.

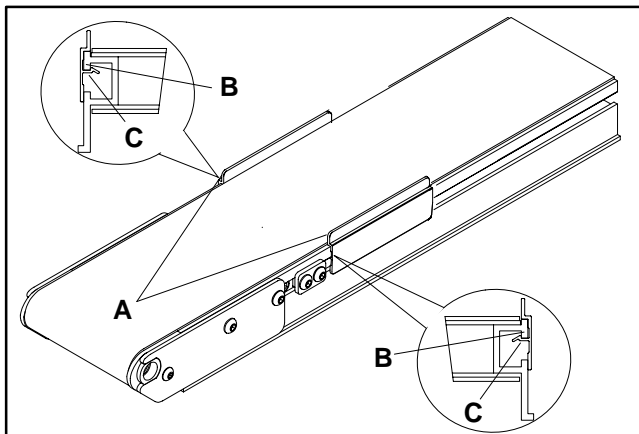


Figure 2: Conveyor Low Side Belt Tracking Guide Installation Detail

Flat Belt Mounting Brackets

SAE Hardware Illustration References

- | | |
|---|--|
| D | 5/16 x 3/4 Button Head Cap Screw (2x) |
| E | 1/4 x 3/4 Socket Head Cap Screw & Hard Washer (4x) |

Metric Hardware Illustration References

- | | |
|---|--|
| D | M8 x 18 Button Head Cap Screw (2x) |
| E | M6 x 18 Socket Head Cap Screw & Hard Washer (4x) |

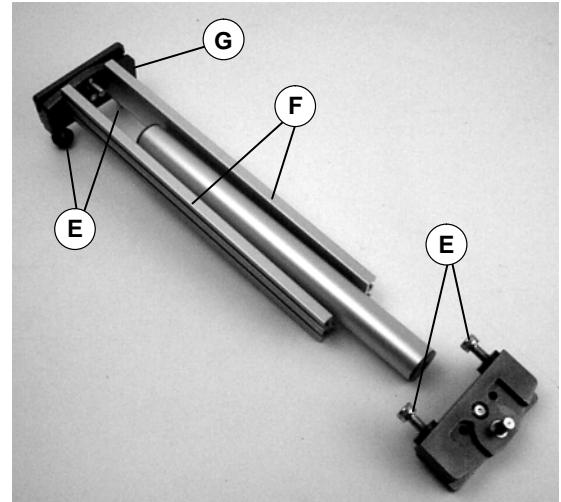


Figure 3

1. Typical Components (Figure 3).

NOTE: Roller Guards (F) are shipped fastened to block (G) only. Do NOT fasten to other block.

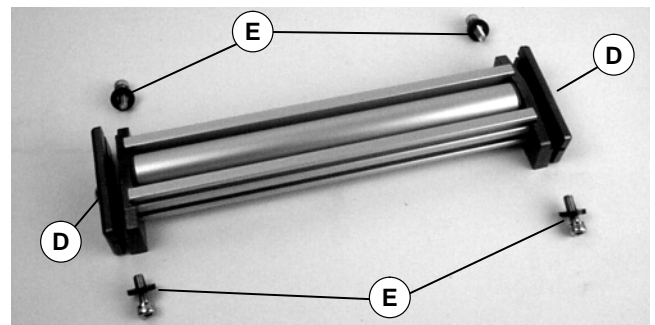


Figure 4

2. Assemble components as shown (Figure 4). Loosen (but do not remove) screws (D) and remove screws and washers (E).

Installation

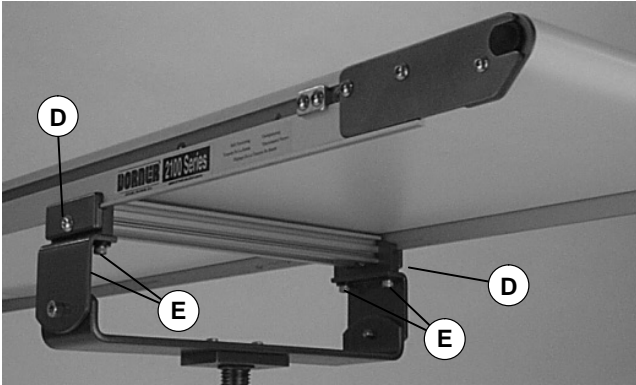


Figure 5

3. Attach clamp plates on each side of conveyor (Figure 5). Align assembly perpendicular to conveyor frame. Secure the 5/16 button head screws (D) with 150 in-lb (17 Nm) torque or the M8 button head screws (D) with 80 in-lb (9 Nm) torque.
4. Mount to support stand. Secure the 1/4 or M6 socket head screws (E) with 80 in-lb (9 Nm) torque. Make sure belt is free to move.

Cleated Belt Mounting Brackets

SAE Hardware Illustration References

- | | |
|---|--|
| D | 5/16 x 3/4 Button Head Cap Screw (2x) |
| E | 1/4 x 3/4 Socket Head Cap Screw & Hard Washer (4x) |

Metric Hardware Illustration References

- | | |
|---|--|
| D | M8 x 18 Button Head Cap Screw (2x) |
| E | M6 x 18 Socket Head Cap Screw & Hard Washer (4x) |

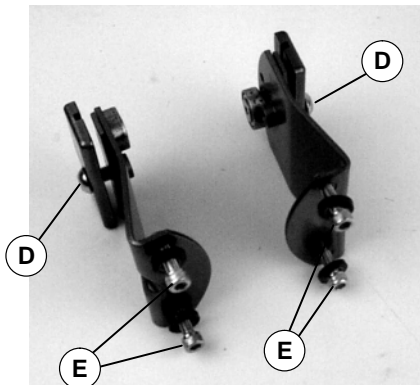


Figure 6

1. Typical Components (Figure 6)

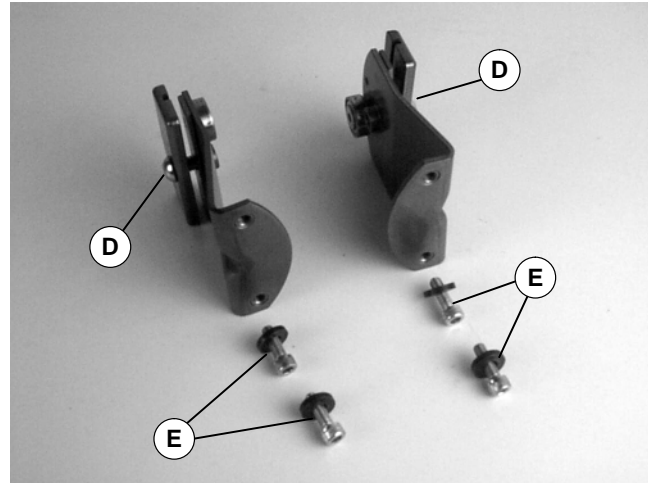


Figure 7

2. Loosen (but do not remove) screws (D) and remove screws and washers (E) (Figure 7).

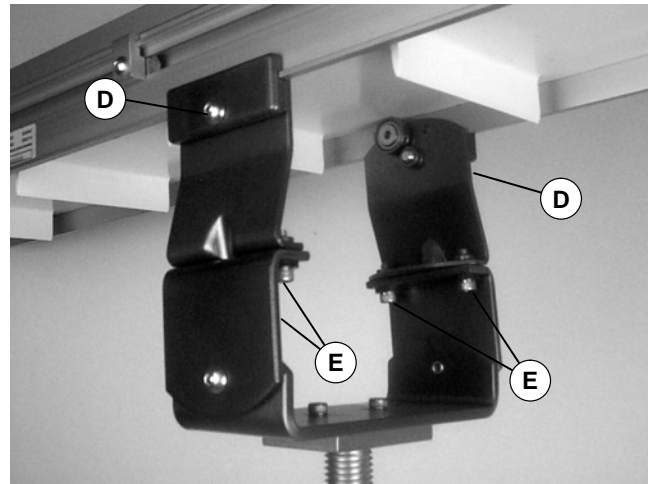


Figure 8

3. Attach clamp plates on each side of conveyor (Figure 8). Secure the 5/16 button head screws (D) with 150 in-lb (17 Nm) torque or the M8 button head screws (D) with 80 in-lb (9 Nm) torque.
4. Mount to support stand. Secure the 1/4 or M6 socket head screws (E) with 80 in-lb (9 Nm) torque. Make sure belt is free to move.

Start-up & Preliminary Belt Tracking Check

IMPORTANT:

Stop the conveyor immediately if the belt does not track properly. Refer to “Conveyor Belt Tracking Adjustment” topic on page 14.

1. Make sure the conveyor belt tension is set properly. Refer to “Conveyor Belt Tension for End Drive Conveyors or Conveyor Belt Slack Take-up for Center Drive Conveyors” topic beginning on page 13.
2. If not already installed, install the belt tracking guides on both ends of low side conveyors. Refer to Figure 2 on page 5.
3. Energize the power to the conveyor drive motor and, on

center-driven conveyors only, turn on the supply air to the take-up cylinder. Then, proceed as follows:

- a. **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.
 - b. **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 belt speed.
-
-

IMPORTANT:

Stop the conveyor immediately if the belt does not track properly. Refer to “Conveyor Belt Tracking Adjustment” topic beginning on page 14. In addition, long conveyors may require a person at each end to observe the belt tracking and a person to control the drive.

4. Make tracking adjustments following information under the “Conveyor Belt Tracking Adjustment” topic on page 14.

Maintenance

Lubrication



WARNING



To prevent injury, make sure all electrical and pneumatic 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, 2" (44 mm) wide conveyors use shielded ball bearings and do not require lubrication.

Use Dornier Red Grease 14 oz. cartridge, part number 829-002, or 14 oz. 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 9) installed into the ends of the pulley retaining sleeves (B). Use a small flat-bladed screwdriver to remove this plug.

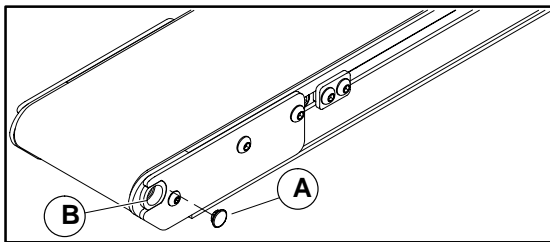


Figure 9

Non-driven Positions

1. Install Dornier greasing adapter part number 200046 (C of Figure 10).

2. Make sure the adapter shoulder (E) is seated against the conveyor tail plate. Proper seating assures alignment of the internal lubrication passages (D).
3. When lubrication is finished, the grease adapter (C) can be left in place or can be replaced with the plastic plug (A of Figure 9).

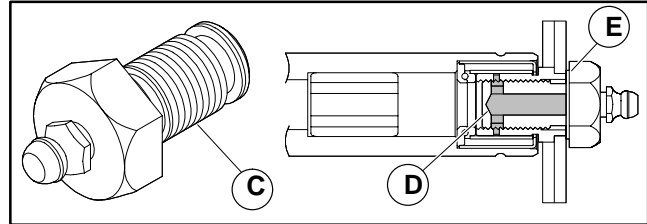


Figure 10

Driven Positions

Top or Bottom Mounting Package

1. On 3" (70 mm) and wider conveyors, lubricate the pulley bearing on the drive side through the outboard drive shaft grease fitting (N of Figure 11).

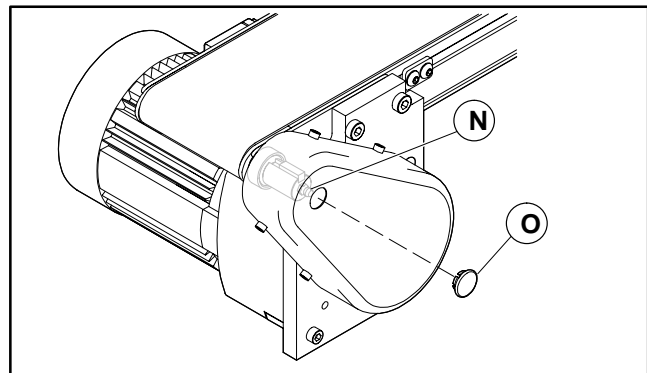


Figure 11: End Drive with Bottom Mounting Package

2. Remove the cap (O) from the drive belt guard.
3. 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.*
4. When lubricating any of the pulley bearings anytime after the initial lubrication, use a maximum of one pump per application. *Do not over-lubricate.*
5. Replace the cap (O), removed in step 2.

Standard Load Flat Belt Side Mounting Package

1. Locate the drive shaft grease fitting (F of Figure 12). Lubricate the pulley bearings through the grease fitting.

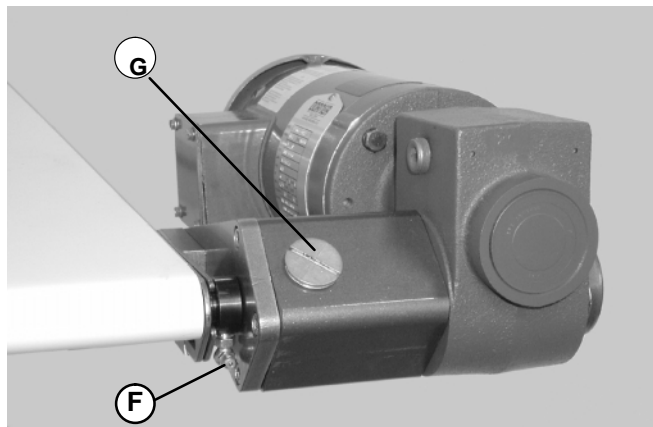


Figure 12

2. When lubricating the pulley bearings for the first time the outboard retaining sleeve must be filled with grease before the bearings will get any lubrication. Use a maximum of two pumps. **Do not over-lubricate.**
3. When lubricating any of the pulley bearings, anytime after the initial lubrication, use a maximum of one pump per application. **Do not over-lubricate.**

Standard Load Cleated Belt Side Mounting Package

1. With a flat bladed screwdriver, remove the cap (G of Figure 13).
2. Loosen (2) set screws on the coupling.

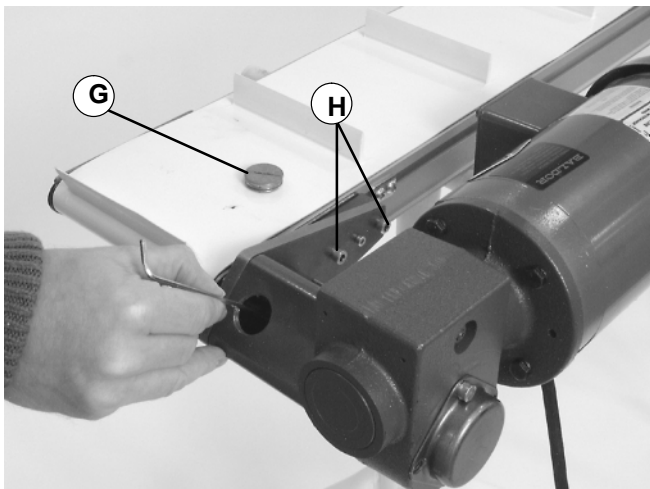


Figure 13

3. Remove (2) motor mounting screws (H of Figure 13).

4. Remove motor and mounting package. Lubricate the pulley bearing on the drive side through the drive shaft grease fitting (I of Figure 14).

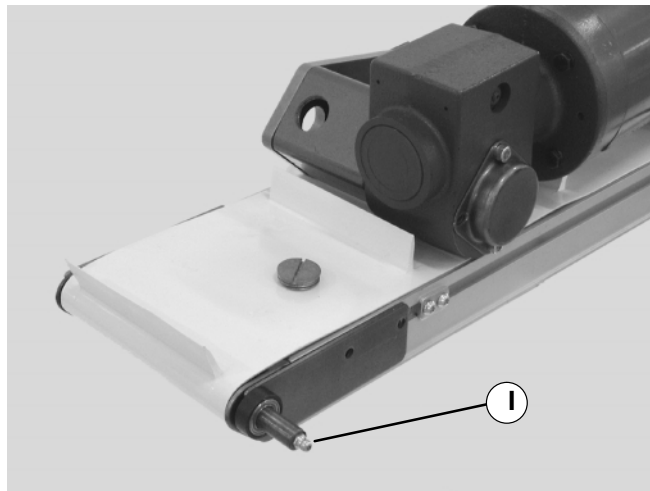


Figure 14

5. 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.**
6. When lubricating any of the pulley bearings, anytime after the initial lubrication, use a maximum of one pump per application. **Do not over-lubricate.**
7. Reinstall side mount package by following steps 4 through 1 in reverse order.

Light Load Side Mounting Package

1. Remove (4) motor mounting screws (J of figure 15).

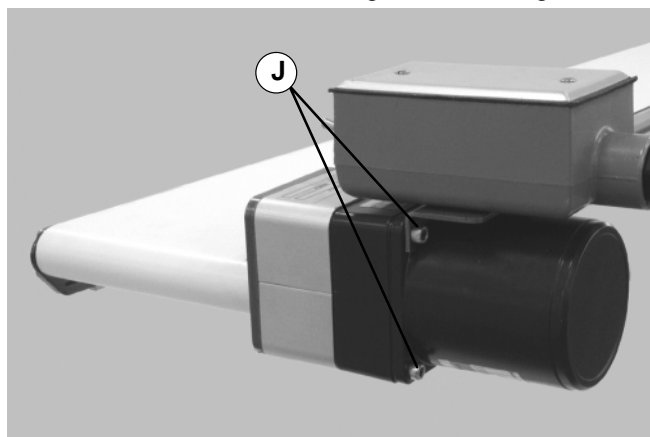


Figure 15

2. Loosen (2) set screws (K of Figure 16) on timing belt pulley (L).

Maintenance

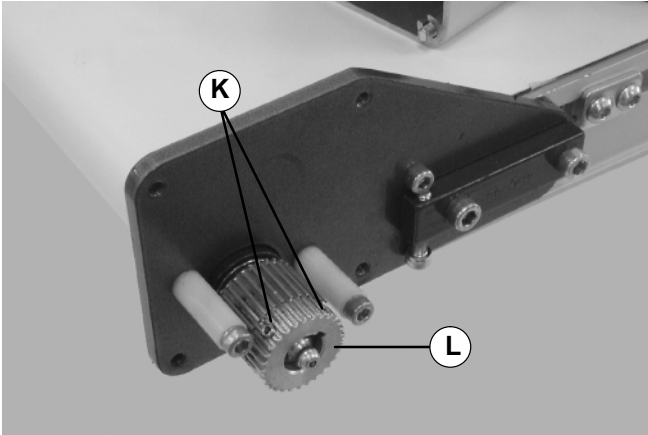


Figure 16

3. Remove timing belt pulley (L).

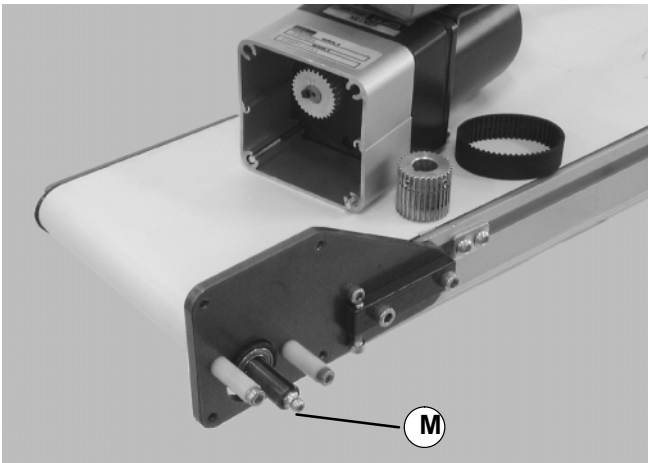


Figure 17

4. Lubricate the pulley bearing on the drive side through the drive shaft grease fitting (M of Figure 17).
5. 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.**
6. When lubricating any of the pulley bearings, anytime after the initial lubrication, use a maximum of one pump per application. **Do not over-lubricate.**
7. Reinstall side mount package by following steps 4 through 1 in reverse order.

Conveyor Belts

Inspection

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

NOTE:

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

Belts that walk to one side indicate:

- Belt tracking incorrectly. Refer to “Conveyor Belt Tracking Adjusting” topic beginning on page 14.
- 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 Adjustment” topic on page 14.
- Jammed part
- Accumulated dirt in wipers
- Foreign material inside the conveyor
- Improperly positioned accessories

NOTE:

Refer to Troubleshooting Guide on page 20.

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.

Due to the texture of woven polyester and black anti-static belts, use a small semi-stiff bristled brush to improve cleaning.

Component Replacement and Adjustments

Conveyor Repair Preparations

Tools

Use Dorner Tool Kit Part Number 2500M-for metric conveyors and 2500 for SAE conveyors.

Checklist

To avoid costly delays in repair, use the following checklist:

- Have complete pulley assemblies, replacement belts, return rollers, 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 at your convenience.

Conveyor Belt Replacement Procedure

Belt Removal for Conveyor Only (No Stands or Gearmotor Mounting Package)

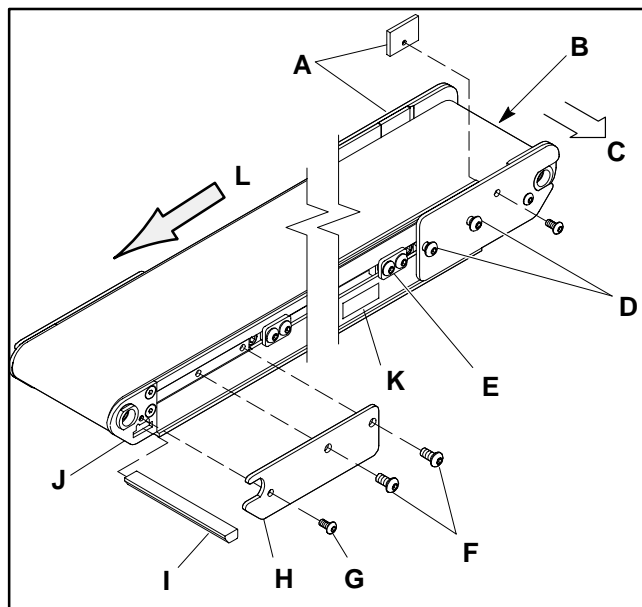




Figure 18

1. If you are working on a high-side conveyor, remove filler plates (A of Figure 18).
2. If engaged, loosen the belt tracking cam assemblies (E) on both sides of the tensioning end (B), identified with a label (K), and slide them toward the middle of the conveyor.
3. Loosen the tail cover plate screws (D) on both sides of the tensioning end of the conveyor.
4. 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.
5. Find the bottom wiper (I) at the discharge end of the conveyor. Remove the tail cover plate screws (F and G) on one side of the conveyor. Remove the tail cover plate (H) and slide out the bottom wiper (I) through hole in the tail plate (J).
6. Remove the old belt by sliding it sideways (C) from the conveyor.

Belt Removal for End Drive Conveyors with Gearmotors and/or Support Stands

	WARNING	
<p>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.</p> <p>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 (P of Figure 20) underneath the gearmotor while the belt is being changed.</p>		

NOTE:

For a conveyor under 4 ft (1,220 mm) long, it may be more convenient to completely detach the conveyor from the support stands and remove the entire assembly to clean workbench for conveyor belt replacement.

1. Disconnect and lockout the electrical power source.
2. To facilitate re-assembly, mark critical locations on conveyor frame and remove guiding, controls, stops and other attached accessories which would interfere with belt removal on the side opposite (R of Figure 20) the drive assembly.
3. If you are working on a high-side conveyor, remove filler plates (A of Figure 18).
4. If engaged, loosen the belt tracking cam assemblies (E) on both sides of the tensioning end (B), identified with

Component Replacement and Adjustments

a label (K), and slide them toward the middle of conveyor.

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

NOTE: For conveyor with a Heavy Load Bottom or Top Mount Package, bracket (N of Figure 19) must be removed.

- Remove two (2) M6 x 16 mm socket head screws (M).
- Remove two (2) M6 x 12 mm socket head screws (O).
- Remove bracket (N).

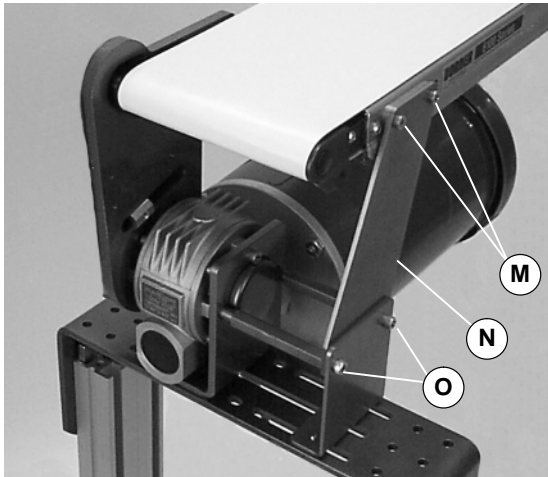


Figure 19

- Find and remove the bottom wiper (I of Figure 18) at the discharge end of the conveyor. Remove the tail cover plate screws (F and G) on one side of the conveyor. Remove the tail cover plate (H) and slide out the bottom wiper (I) through hole in the tail plate (J).
- Loosen the mounting clamp plate screws (Q of Figure 20) on the side of the conveyor opposite the drive assembly. The screws only need to be loosened far enough to allow the conveyor to clear the mounting clamp plates.

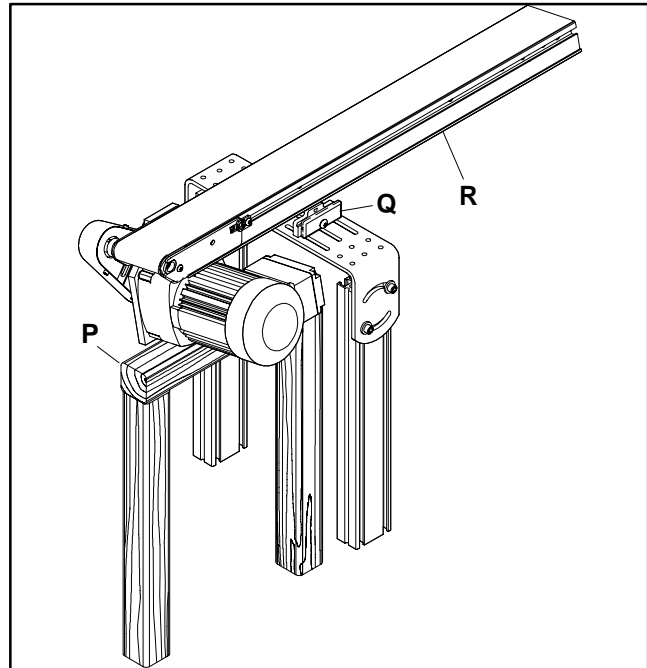


Figure 20

WARNING

To prevent injury from the support stand tipping-over when the 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.

- Carefully loosen the mounting clamp plate screws on the drive side of the conveyor. Loosen them just far enough to allow the conveyor to be safely tipped for belt removal.
- Remove the old belt by sliding it off the side opposite the drive assembly.
- Continue with the following “Belt Replacement for All End Drive Conveyors” topic.

Belt Replacement for All End Drive Conveyors

- Orient the replacement belt so the belt splice leading fingers (T of Figure 21) point in the direction of belt travel (L), towards the bottom wiper end (U) of the conveyor, and that the outside fingers (V) are positioned as shown.

Component Replacement and Adjustments

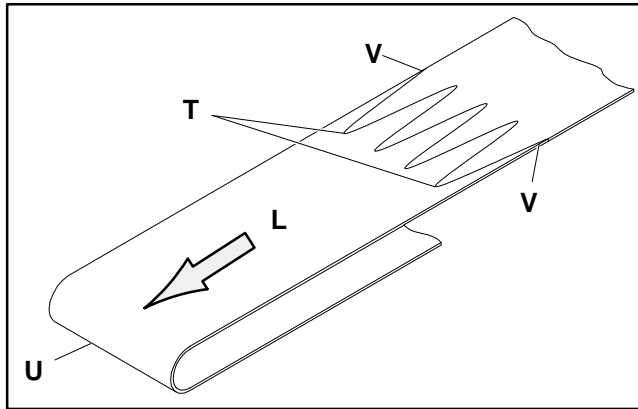


Figure 21: Replacement Belt Orientation Detail

2. Install the new belt by sliding it sideways onto the conveyor frame assembly onto the side opposite the drive assembly (R of Figure 20). Push the conveyor back down onto the mounting clamp blocks being careful not to pinch the conveyor belt. Fully tighten the clamp plate screws to secure the mounting clamp plate (Q of Figure 20) to the clamp block.
3. Re-install bottom wiper (I of Figure 18) and the tail cover plate (H).
4. Make sure all the hardware you removed or loosened is fully tightened, except the tail cover plate screws (F) on the tensioning end of the conveyor.
5. Refer to “Conveyor Belt Tension for End Drive Conveyors,” page 13, and set the conveyor belt tension.
6. If you are working on a high-side conveyor, replace filler plates (A of Figure 18).
7. Replace guiding, controls, stops and other attached accessories referring to the positions previously marked.
8. Re-connect the electrical power source.
9. Refer to the “Start-up & Preliminary Belt Tracking Check” section on page 5.

Conveyor Belt Tension for End Drive Conveyors

1. Locate the tension end (X of Figure 22) of the conveyor, identified with a label (AB).

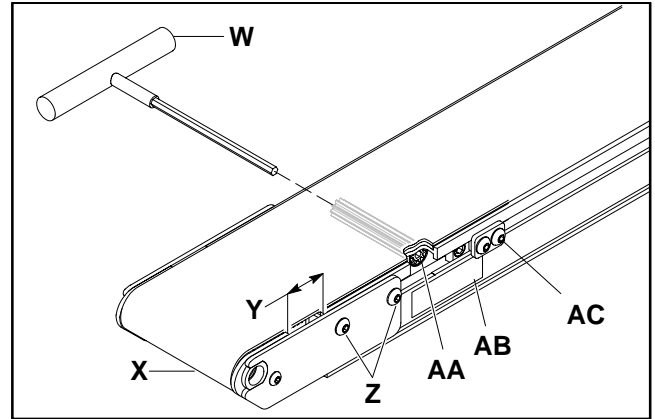


Figure 22

2. If engaged, loosen and slide belt tracking cam assemblies (AC) towards the center of the conveyor on both sides of the tension end (X).
3. Loosen tail cover plate screws (Z) on both sides of the tension end (X).
4. Insert a hex key wrench (W) into either end of the pinion (AA).
5. Rotate the pinion (AA) to extend the tensioning end until the gap (Y) between the pulley plate and the conveyor frame measures 1.19” (30 mm) for a new end-driven belt or any center driven belt, or as required to stop the drive pulley slippage.
6. Refer to the Troubleshooting Guide on page 20 for additional belt slippage information.

NOTE:

Over-tensioning adds unnecessary loading to the pulley bearings.

7. While holding the pinion (AA) in the tensioned position, tighten the cover plate screws (Z) on both sides of the conveyor. Torque screws to approximately 18 in/lb (2.03 Nm).
8. If you are working on a high side conveyor, replace the filler plates. Refer to Figure 18 under the “Belt Removal for Conveyor Only (No Stands or Gearmotor Mounting Package)” on page 11.
9. Position the belt tracking cam against the slide bar while making sure groove is correctly oriented. See Figure 23 on page 14. Then, secure the belt tracking cam assemblies into position on both sides of the conveyor.
10. Refer to the “Start-up & Preliminary Belt Tracking Check” section on page 5.

Component Replacement and Adjustments

Conveyor Belt Tracking Adjustment

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 articular linkage which allows the pulley to be positioned at a slight angle to facilitate belt tracking.

If you are working on a low side conveyor, re-install the belt tracking guide assemblies following the details on page 5.

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, as determined by the direction of belt travel (L of Figure 23) of conveyor first. Then, check the tracking on the opposite (infeed) end of the conveyor and readjust it, if necessary.

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

1. Loosen (but do not remove) the two (2) cam clamping plate screws (AD) on both sides of the conveyor discharge.
2. Slide both belt tracking cam assemblies (AC) as far as they can be toward the end of the conveyor.
3. The belt tracking cam (AE) must be set to the low point at the point of contact as illustrated. The slot (AF) in the belt tracking cam should be horizontal and pointing towards the end of the conveyor.
4. Tighten the two (2) cam clamping plate screws (AD), on both sides of the conveyor.
5. **Only loosen the two tail cover plate screws (Z of Figure 23) on the side of the conveyor that the belt is tracking toward.**
6. With the conveyor running, use the 5 mm hex key wrench (W of Figure 22) to slowly rotate the belt tracking cam (AE of Figure 23). Rotate the cam in small increments, in either direction to cause the belt to track away from the conveyor side, until the belt tracks in the center of the conveyor. Always allow the conveyor belt to make several revolutions between adjustments.

IMPORTANT:

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

7. Tighten the tail cover plate clamp screws (Z) and re-check the belt tracking.
8. Re-check 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.

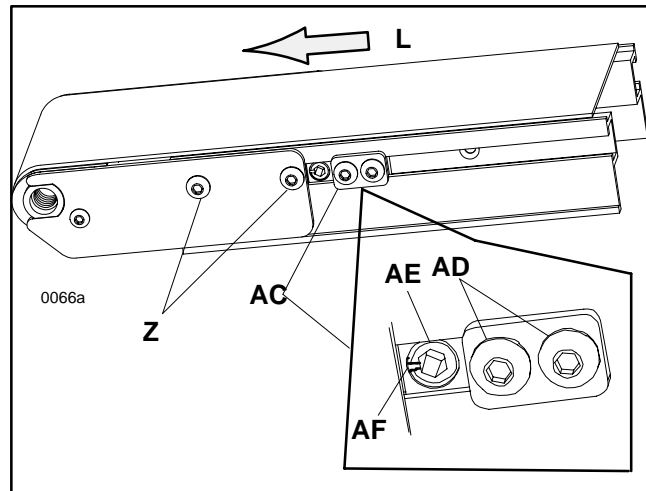


Figure 23

Outboard Drive Shaft Replacement

Removal

Removal of the outboard drive shaft (C of Figure 24 and M of Figure 25) requires use of Dorner hex key wrench extension tool (A of Figure 24 and L of Figure 25).

For replacement of hex key wrench extension tool use part number ★25-08 for conveyors 2" (44 mm) to 12" (305 mm) wide, or part number ◇25-08A for conveyors wider than 12" (305 mm).

Type 1 Outboard Drive Shaft

For 2" through 12" Wide Conveyors

1. Insert the small end (B of Figure 24) of hex key wrench extension tool (A) into the spindle (H) end opposite the outboard drive shaft assembly (C) and remove special spindle screw (D) and washers (E and F).
2. Pull the outboard drive shaft assembly (C) out from the outboard bearing retaining sleeve (G).

Component Replacement and Adjustments

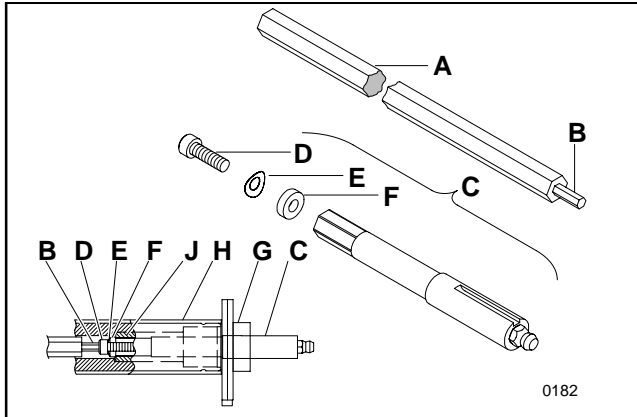


Figure 24: Type 1 for 2 to 12\"
(44 to 305 mm) Wide Conveyors

Type 2 Outboard Drive Shaft

For 18\" through 24\" Wide Conveyors

- Remove the outboard drive shaft assembly (M of Figure 25) by inserting the blunt end (K) of the hex key wrench extension tool (L) into the spindle (Q) end opposite the outboard drive shaft assembly (M).
- While pushing in the spring loaded plunger (N) with the hex key wrench extension tool (L), pull out the outboard drive shaft assembly (M).

Installation

For outboard drive shaft assembly (C of Figure 24 and M of Figure 25) installation, the spindle (H of Figure 24 and Q of Figure 25) may have to be turned around in the conveyor frame. The hex bore (J of Figure 24 and R of Figure 25) is off center on spindles for conveyors measuring 5\" (127 mm) and wider. If necessary, remove the spindle following the "Spindle Removal Procedure" on page 16, turn it around, and replace it following the "Spindle Replacement Procedure" on page 17.

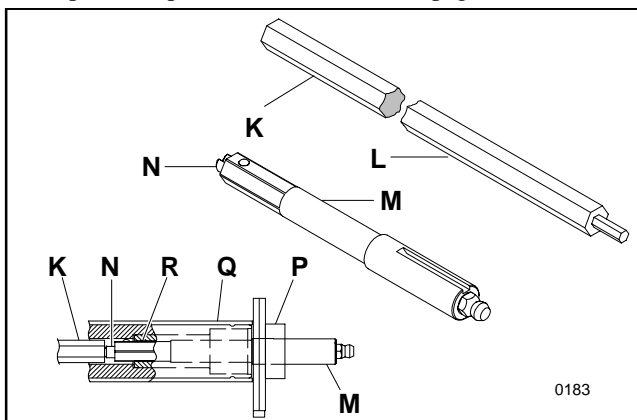


Figure 25: Type 2 for 15 to 25\"
(381 to 610 mm) Wide Conveyors

Conveyor Width	Insert Shaft at Spindle End
2\" (44 mm) to 4\" (95mm)	Either
5\" (127mm) and wider	Closest to hex bore

Install the outboard bearing retaining sleeve in the desired drive location. Be sure the spindle hex bore (J of Figure 24 and R of Figure 25) is properly located as indicated in the previous chart.

Type 1 Outboard Drive Shaft

For 2\" through 12\" Wide Conveyors

- Push the outboard drive shaft assembly (C of Figure 24) into the outboard bearing retaining sleeve (G).
- Place the curved spring washer (E), then the flat hard washer (F) onto the special spindle screw (D). Turn the screw/washer set into the outboard drive shaft assembly (C) using the small end (B) of hex key wrench extension tool (A). Tighten the screw until it is just seated in the shaft [20 in/lb (2.26 Nm) maximum] which fully compresses the spring washer. Then, back off the screw 1/2 turn (180°).

NOTE:

Replace the screw after it has been removed and replaced several times.

Type 2 Outboard Drive Shaft

For 18\" through 24\" Wide Conveyors

- Insert the blunt end (K of Figure 25) of the hex key wrench extension tool (L) into the end of the spindle (Q) opposite the outboard bearing retaining sleeve (P).
- Exert inward pressure on the hex key wrench extension tool (L) to release the spring loaded plunger (N), at the same time push inward on the outboard drive shaft assembly (M) until it is fully seated.
- The hex key wrench extension tool (L) may now be removed. Make sure outboard drive shaft assembly (M) is locked in position by pulling outward on the assembly.

☆ - Part of Tool Kit, Part Number 2500.

◇ - Shipped with conveyors wider than 12\" (305 mm).

Component Replacement and Adjustments

Pulley Removal Procedure

1. Remove conveyor belt. Refer to the “Conveyor Belt Replacement Procedure” topic beginning on page 11 for your type of gearmotor mounting package.
2. Remove the tail cover plate screws (S of Figure 26) and tail cover plates (T) on both sides of the conveyor.

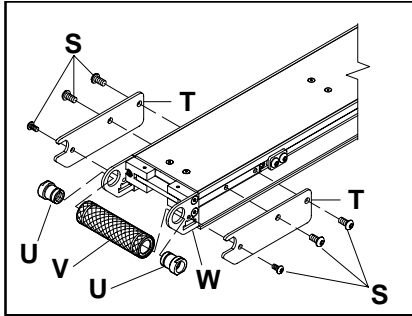


Figure 26

3. Remove the retaining sleeves (U) and pulley (V). If retaining sleeves are frozen, continue with the next step.
4. All non-driven positions have a plastic plug (X of Figure 27) installed into the ends of the pulley retaining sleeves (Y). Use a small flat screwdriver to remove this plug.

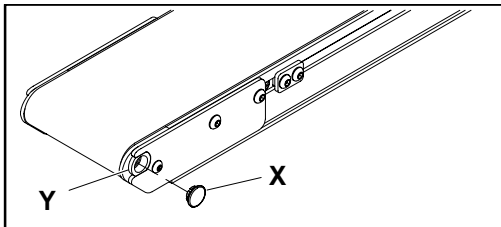


Figure 27

5. Position the bearing anvil/sleeve removal tool (AE of Figure 28), part number ☆25-09, over the retaining sleeve (U of Figure 26 or AB of Figure 28).

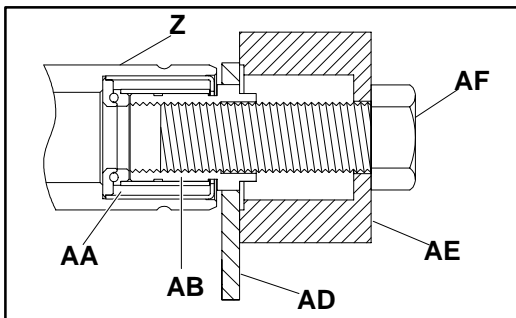


Figure 28

6. Insert the special threaded bolt (AF of Figure 28), part number ☆906-278, through the bearing anvil/sleeve removal tool (AE) and into the retaining sleeve (AB).
7. Tighten the bolt (AF) until the retaining sleeve (AB) is free of the tail pulley plate (AD).

8. Remove the retaining sleeve (AB) from the bolt (AF) and repeat for the other side.
9. Take pulley (Z) out of the conveyor frame.

Pulley Bearing Replacement

Bearings in the pulleys on the 2" (44 mm) wide conveyor cannot be replaced. If the bearings are worn, the entire pulley must be replaced. Refer to Pulley Assembly chart on page 22 for the correct part number for your conveyor.

Bearings in pulleys on the 3" (70 mm) and wider conveyors can be removed with Dorner Bearing Removal Tool (AG of Figure 29), part number ☆25-05.

Removal

Use procedure below to remove pulley bearings:

1. Make sure that the flair (AI) on the bearing removal tool is completely closed. If it is slightly open it may not fit into the bearing (AL of Figure 30). Use the hex key wrench extension tool (AJ, either part number ☆25-08 or ◇25-08A and loosen the tapered screw (AH of Figure 29) while compressing the flair (AI) inward to make sure that the tool is completely closed.

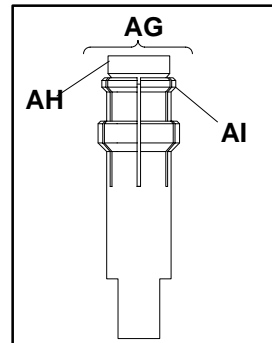


Figure 29

2. Insert bearing removal tool (AK of Figure 30) into the pulley (AM) through bearing (AL).

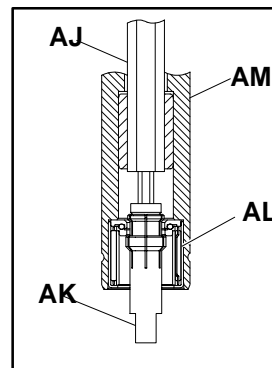


Figure 30

☆ - Part of Tool Kit, Part Number 2500M-ENG.

◇ - Shipped with conveyors wider than 12" (305 mm).

Component Replacement and Adjustments

While holding the hex key wrench extension tool (AV of Figure 31), part number ☆25-08 or ◇25-08A, rotate bearing removal tool using flats (AQ) to tighten the bearing removal tool's tapered screw (AT) until the flair (AN) of the tool is completely spread open behind the bearing (AS).

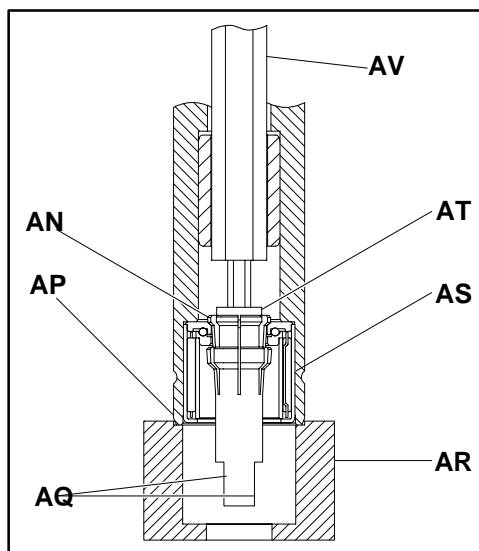


Figure 31

3. Support pulley end (AP) with bearing anvil/sleeve removal tool (AR), part number ☆25-09. Using an arbor press or drill press, press bearing (AS) out of the pulley into bearing anvil/sleeve removal tool (AR).

IMPORTANT:

Heavy tapping or hammering will damage the hex key wrench extension tool (AV) and/or bearing (AS).

Installation

Use the following procedure to install pulley bearings (AX of Figure 32).

1. Hold the pulley (BA) in an upright position with "V" block or other means. Support the bottom end of pulley (BA) using the bearing anvil/sleeve removal tool (AR of Figure 31), part number ☆25-09.
2. Install the bearing insertion tool (AW of Figure 32), part number ☆25-10 in an arbor press or drill press. Then, align bearing insertion tool (AW) with pulley bore (AZ).
3. Slide bearing (AX) onto the bearing insertion tool (AW).

NOTE:

Keep bearings (AX) and pulley (BA) aligned when installing. Misalignment tilts the bearing and may result in bearing damage.

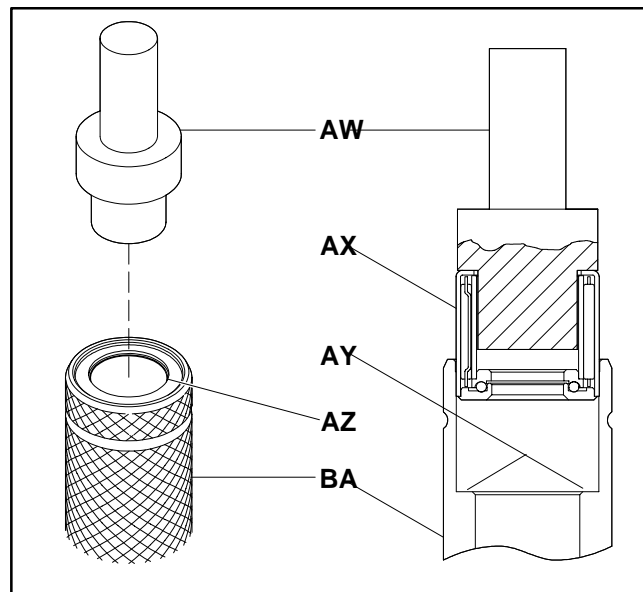


Figure 32

4. Press bearing (AX) firmly and slowly into pulley (BA) until it bottoms out on pulley shoulder (AY). If bearing fits too loosely in the pulley bore (AZ) or if the bore is out of round, the pulley must be replaced.

Pulley Replacement Procedure

Refer to Figure 26 on page 16 to install pulleys as described below:

NOTE:

If the outboard drive shaft is being replaced, be sure the hex broach, in the pulley, is oriented correctly. Refer to "Outboard Drive Shaft Replacement" topic on page 14.

1. Insert pulley (V of Figure 26) between the tail pulley plates (W).
2. Slide the retaining sleeves (U) through openings in the tail pulley plates (W) and into the pulley (V) on each side.
3. Install the plastic plug (X of Figure 27) into the ends of the pulley retaining sleeves (Y).
4. Secure the tail cover plates (T of Figure 26) to the conveyor with tail cover plate screws (S).
5. Install the conveyor belt. Refer to the "Conveyor Belt Replacement" topic beginning on page 11, the "Conveyor Belt Tension for End Drive Conveyors or Conveyor Belt Slack Take-up for Center Drive Conveyors" topic on page 13, and the "Conveyor Belt Tracking" procedure beginning on page 14.

☆ - Part of Tool Kit, Part Number 2500M-ENG.

◇ - Shipped with conveyors wider than 12" (305 mm).

Component Replacement and Adjustments

Timing Belt Tension Adjustment



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.

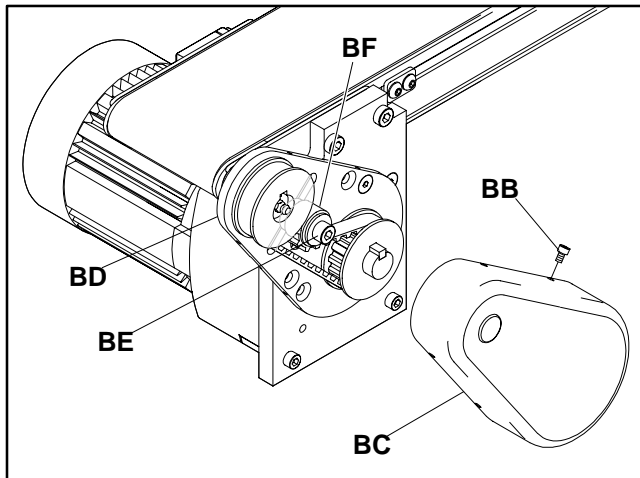


Figure 33

NOTE:

The following information applies to both top (Figures 34 & 35) mounting and bottom mounting (Figures 36 & 37) packages. The position of the tensioning bearing assembly (BF) with respect to the timing belt (BG) is dictated by the direction of conveyor belt travel (L).

6. Disconnect power. Then, remove the screws (BB of Figure 33) securing the belt guard (BC). Then, remove the belt guard.
7. Check the timing belt for wear. Replace if worn.
8. Loosen the cap screw (BE) which secures the tensioning bearing assembly (BF).
9. Slide the tensioning bearing assembly (BF) against the timing belt (BG), until the deflection of the belt at the midpoint of the section of belt (BH) (opposite the tensioning bearing assembly) is 1/8" (3 mm) for a 1 lb (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 and early failure.

10. Tighten the tensioning bearing assembly cap screw (BE of Figure 33) with 18 ft-lb (24 Nm) of torque.
11. Re-assemble the belt guard (BC) and belt guard screws (BB) to the back guard plate (BD).

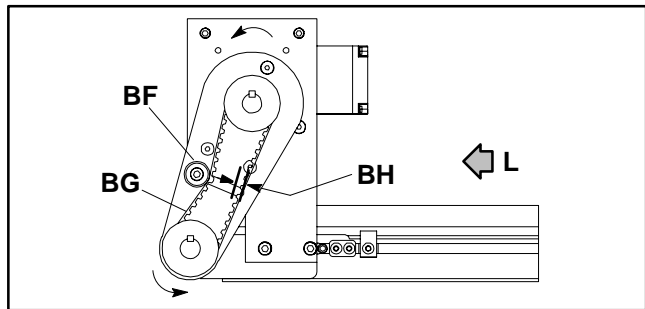


Figure 34: Top Mount Package

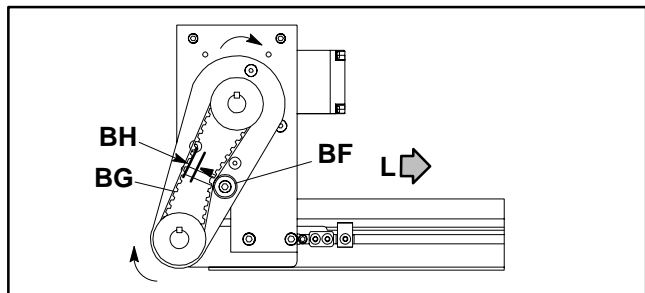


Figure 35: Top Mount Package

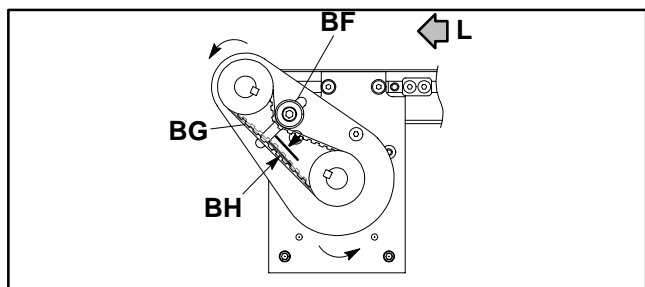


Figure 36: Bottom Mount Package

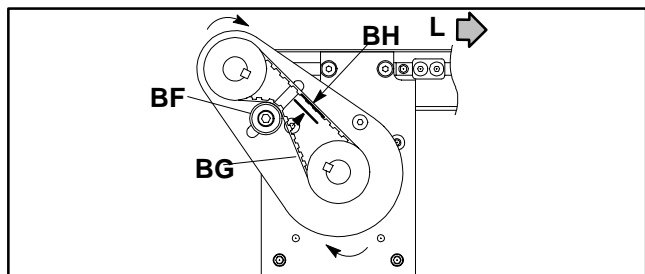


Figure 37: Bottom Mount Package

Bearings

Problem	Possible Cause	Solution
Bearing failure	Grit getting into bearing.	Side wipers and bottom wiper may be needed along with increased frequency of lubrication.
	Solvent getting into bearings.	Same as above. Keep greasing adapters in retaining sleeves. Install guards and tilt conveyor to reduce amount of solvent on conveyor.
	Drive shaft misaligned or excessive side force on shaft and couplings.	Be sure spindle, sleeves and bearings are correctly installed and shaft is aligned. Flexible or Universal couplings may be required.
	Excessive heat in application.	Increase frequency of lubrication.
	Damage due to improper re-assembly.	Use tool kit for proper re-assembly.
Bearing seizure.	Grit getting into bearings. Failure to lubricate bearings periodically.	Lubricate bearings periodically.

Gearmotors

	WARNING	
Remove power before attempting to re-wire motor or system electrical control.		

Problem	Possible Cause	Solution
Motor cuts out intermittently.	Overloading.	Check conveyor load. Use torque wrench to determine input torque. Check for guides or accessories rubbing on belt. Check belt tracking.
	Improper cooling.	Check motor operation and ambient temperature.
Motor running hot, above 170°F (77°C).	Overloading.	Check amperage draw, replace motor, reduce conveyor load.
	Jammed part.	Remove jam.
	Incorrect voltage/wiring.	Check wiring diagram. Replace motor or change wiring.
	Improper cooling.	Reduce excessive ambient temperature.
Conveyor runs in wrong direction.	Improper wiring.	Check wiring diagram.

Troubleshooting

Guide

Conveyor Belt

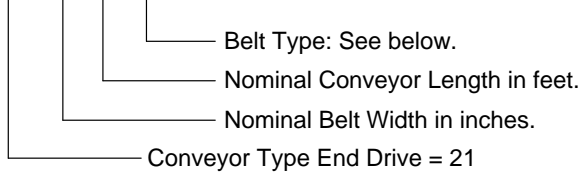
Problem	Possible Cause	Solution
Belt slipping.	Belt is too loose.	Adjust belt tension. If belt is still loose, replace belt. Note: Belt may have stretched. See “Belt stretching” problem below.
	Dirt impacted in knurl on end of driven spindle.	Clean spindle.
	Knurl worn on spindle.	Replace spindle.
	Excessive weight on conveyor. Note: May be a combination of drive “pushing” belt or magnets too strong for application.	Reduce weight on conveyor by reducing production rate, or increasing belt speed.
	Drive is “pushing” belt. Note: May be a combination of this and excessive weight on conveyor.	Move end drive to discharge end of conveyor. Turn center drive 180° so gearmotor and driven spindle are towards discharge end.
	Magnets too strong for application.	Increase belt speed or replace magnetic bedplate.
	Debris wedged in belt path or in conveyor.	Clean conveyor and install chute and/or wipers.
Belt stretching.	Solvent or chemical reaction with belt.	Remove solvent or try a different belt material. Test solvent with belt sample. Note: A belt-type conveyor may not be applicable.
	Belt repeatedly stalled, causing spindle to wear or “burn” in to backside of belt.	Replace belt and identify reason for stalling.
Cuts on belt surface.	Parts getting caught in bottom wiper	Replace wiper.
	Bottom wiper is damaged, missing or on wrong end of the conveyor.	Replace wiper. Note: Conveyor belt should always be run towards bottom wiper.
	Parts getting under belt. Wiper shears top surface leaving marks in belt surface.	High sides, side wipers or side deflectors may be needed.
	Side wipers damaged or missing which is allowing material to get under belt.	Replace or add wipers, as needed.
	Sharp parts penetrating belt surface.	Install baffle to reduce energy of falling part.
	Guides or accessories rubbing on belt.	Re-adjust guides, as necessary.
Worn belt edges.	Debris impacted on spindles causing belt tracking problems.	Clean spindles. Correct source of contamination. See “Belt tracking incorrectly” problem below.
	Belt tracking incorrectly.	Refer to the “Conveyor Belt Tracking” topic beginning on page 14.
Belt breaking at splice.	Solvent or chemical reaction with belt.	Remove solvent or try a different belt material. Test solvent with belt sample. Note: A belt-type conveyor may not be applicable.
Belt tracking incorrectly.	Spindles not perpendicular to conveyor center line.	Inspect spindles and/or sleeves. Reposition spindles or reinstall sleeves, if necessary.
	Frame misalignment. Note: Frame mounting surface may be misaligned.	Frame mounting must be straight and in same plane. Check this with a straight edge and level.
	Frame distortion due to damage.	Repair or replace frame components and/or bed plate. Check with a straight edge.
	Side force being applied to belt.	Check for jammed part or mechanical pusher force on belt.
	Belt tracking cam incorrectly adjusted.	Refer to the “Conveyor Belt Tracking” topic beginning on page 14.

Timing Belt

Problem	Possible Cause	Solution
Intermittent conveyor belt travel.	Timing belt is too loose.	Adjust belt tension. Refer to “Timing Belt Tension Adjustment for Top or Bottom Mounting Packages” topic on page 18.
	Worn or damaged timing (drive) belt.	Replace defective timing belt.

Conveyor Belt Part Number

DD- WWLL/BB



EXAMPLE: #2 Standard Urethane replacement belt for an end drive conveyor measuring 4" (102 mm) wide x 8 ft (2,438 mm) long would be Part Number 21-0408/02.

Belt Type - **BB**

- /01 Accumulator Top FDA Approved** 80-90 Durometer surface hardness. Products may be accumulated on the low friction surface of this belt. Maximum part temperature is 176 °F (80 °C). Smooth, thermally welded zig-zag splice*. Belt thickness about 0.063" (1.6 mm).
- /02 Standard Urethane** 75-85 Durometer surface hardness. This is our standard belting, very durable and works well in most applications. Maximum part temperature is 212 °F (100 °C). Smooth, thermally welded zig-zag splice*. Belt thickness about 0.071" (1.8 mm).
- /03 Soft Urethane FDA Approved** 70-80 Durometer surface hardness. This belt provides more surface friction and is more resistant to chemicals than /01 or /02. Maximum part temperature is 176 °F (80 °C). Smooth, thermally welded zig-zag splice*. Belt thickness about 0.063" (1.6 mm).
- /05 Woven Polyester Belt** Offers advantages in low friction product accumulation. Maximum part temperature is 212 °F (100 °C). Smooth, thermally welded zig-zag splice*. Belt thickness about 0.047" (1.2 mm).
- /06 Black Anti-Static Belt** Is a carbon impregnated polyester belt used where an anti-static/conductive belt is required. Belt should be tested per application for resistance to ground. Maximum part temperature

is 230 °F (110 °C). Smooth, thermally welded zig-zag splice*. Belt thickness about 0.063" (1.6 mm).

- /07 Heat Resistant Belt** This belt resists product temperatures up to 358 °F (180 °C). Smooth, thermally welded zig-zag splice*. Belt thickness about 0.051" (1.3 mm).
- /08 High Friction Belt** This belt provides a high degree of surface traction when clean and dry. It can be used to convey parts up inclines or in other applications where parts must not slide on the belt surface. This belt should not be used with very small or sharp parts. Maximum part temperature is 158 °F (70 °C). Smooth, thermally welded zig-zag splice*. Belt thickness about 0.083" (2.1 mm).

NOTE:

08 High Friction Belt cannot be used with 03 and/or 06 Side Profiles.

NOTE:

All belts include a thermally welded finger splice. If Clipper® spliced belt is required, add a "-C" suffix.

EXAMPLE: Part No 21-0408/02-C

NOTE:

For replacement belting on vacuum, cleated and specially modified conveyors, contact factory with model & order numbers for replacement information.

IMPORTANT:

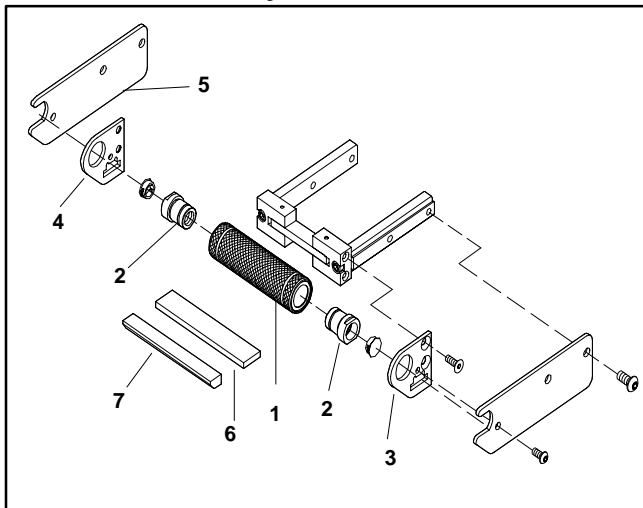
If switching from Belt Types 01, 02, 05 or 07 to Belt Types 03, 04 or 06 you must remove and the original Bottom Wiper, Item 7 on page 22 and replace it with a Bottom Bar, Item 6 on page 22.

Replacement Parts

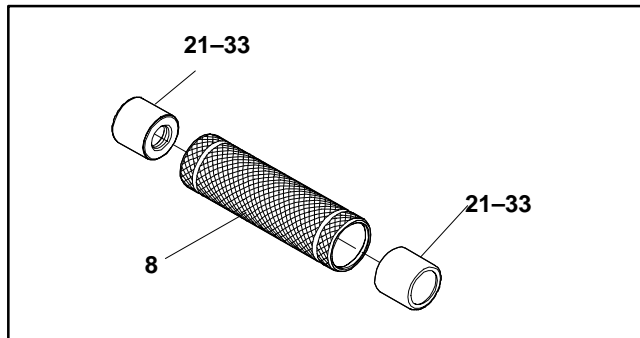
NOTE:

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

Drive / Idler Pulleys

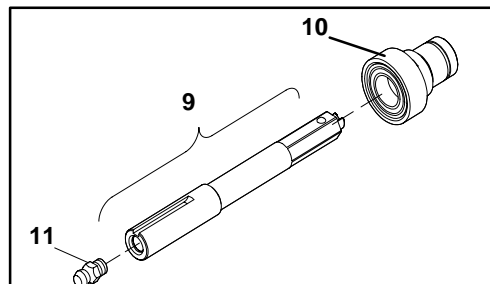


Item	Part No.	Part Description
1	See Chart	Pulley Assembly
2	200035	Retaining Sleeve
3	200027	Tail Plate, Low Side, SAE
	200027M	Tail Plate, Low Side, Metric
4	200028	Tail Plate, Low Side, SAE
	200028M	Tail Plate, Low Side, Metric
5	200030	Cover Plate, SAE
	200030M	Cover Plate, Metric
6	203602	Bottom Bar, 2" Wide
	203603	Bottom Bar, 3" Wide
	203604	Bottom Bar, 4" Wide
	203605	Bottom Bar, 5" Wide
	203606	Bottom Bar, 6" Wide
	203608	Bottom Bar, 8" Wide
	203610	Bottom Bar, 10" Wide
	203612	Bottom Bar, 12" Wide
	203618	Bottom Bar, 18" Wide
	203621	Bottom Bar, 21" Wide
	203624	Bottom Bar, 24" Wide
7	203502	Bottom Wiper, 2" Wide
	203503	Bottom Wiper, 3" Wide
	203504	Bottom Wiper, 4" Wide
	203505	Bottom Wiper, 5" Wide
	203506	Bottom Wiper, 6" Wide
	203508	Bottom Wiper, 8" Wide
	203510	Bottom Wiper, 10" Wide
	203512	Bottom Wiper, 12" Wide
	203518	Bottom Wiper, 18" Wide
	203521	Bottom Wiper, 21" Wide
	203524	Bottom Wiper, 24" Wide



Nominal Conveyor Width	Part Number	
	Drive/Idler Pulley Assembly (1) with 21-33 Bearings	Drive/Idler Pulley Only (8)
1.75" (44 mm)	204802	Not Applicable
2.75" (70 mm)	204803	204703
3.75" (95 mm)	204804	204704
5" (127 mm)	204805	204705
6" (152 mm)	204806	204706
7" (203 mm)	204808	204708
8" (254 mm)	204810	204710
10" (305 mm)	204812	204712
18" (457 mm)	204818	204718
21" (533 mm)	204821	204721
24" (610 mm)	204824	204724

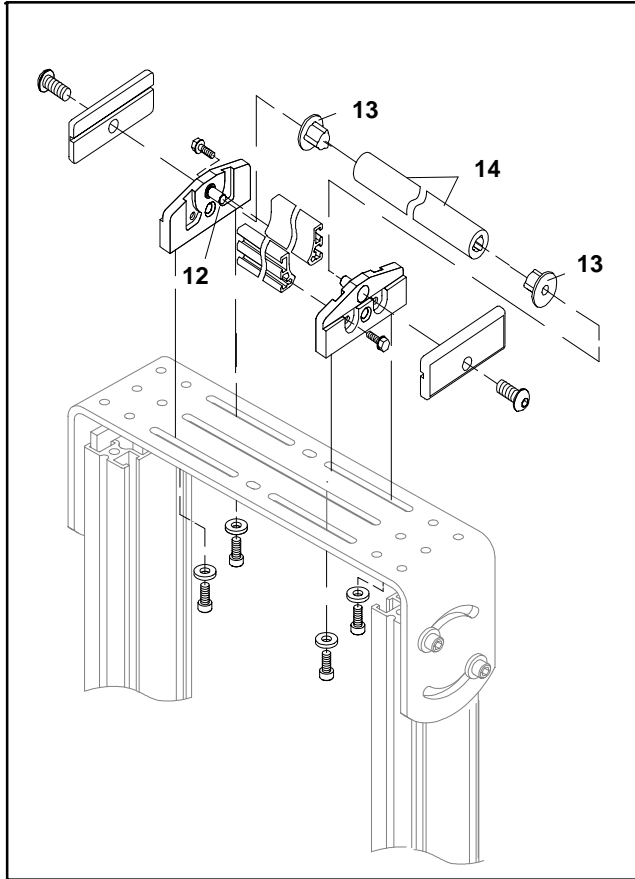
Hex to Round Adapter Assembly



Conveyor-Width	Part Number		
	Drive Shaft Assembly (9)	Outboard Bearing Retaining Sleeve (10)	Grease Fitting (11)
1.75" (44mm)	216202M	200223	N/A
2.75" (70mm)	216203M	200223	810-292
3.75" to 12" (95-305mm)	216204M	200223	810-292
18" to 24" (457-610mm)	216205M	200223	810-292

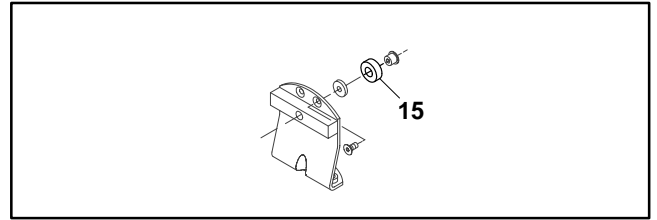
Replacement Parts

Flat Belt Return Rollers



Item	Part No.	Part Description
12	202348P	Bearing Pin
13	202311P	Return Roller Bearing
14	207702	Return Roller Tube, 2" (44 mm) Long
	207703	Return Roller Tube, 3" (70 mm) Long
	207704	Return Roller Tube, 4" (95 mm) Long
	207705	Return Roller Tube, 5" (127 mm) Long
	207706	Return Roller Tube, 6" (152 mm) Long
	207708	Return Roller Tube, 8" (203 mm) Long
	207710	Return Roller Tube, 10" (254 mm) Long
	207712	Return Roller Tube, 12" (305 mm) Long
	207718	Return Roller Tube, 18" (457 mm) Long
207724	Return Roller Tube, 24" (610 mm) Long	

Cleated Belt Return Rollers



Item	Part No.	Part Description
15	802-027	Sealed Ball Bearing

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.

For a copy of Dorner's Limited Warranty, contact factory, distributor, service center or visit our website at www.dorner.com.

**For replacement parts, contact an authorized
Dorner Service Center or the factory.**

DORNER[®]

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