DORNER®

Set-up, Operation & Maintenance Manual

3100 & LPZ Series
Bottom Mount Drive Package
for Light & Standard Load 60 Hz Gearmotors

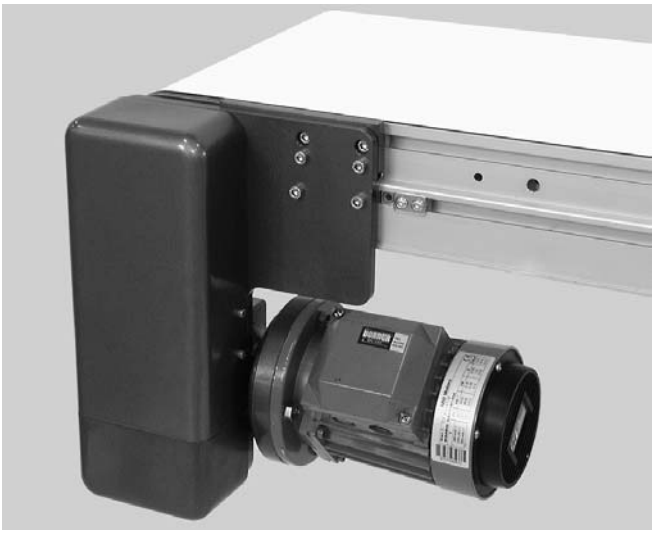


Table of Contents

Warnings – General Safety 2
Introduction 2
Product Description 3
Specifications 3
Installation 5
  Required Tools 5
  Mounting 5
Preventative Maintenance & Adjustment 8
  Required Tools 8
  Timing Belt Tensioning 8
  Timing Belt Replacement 8
  Drive or Driven Pulley Replacement 9
  Gear Reducer Replacement 9
  Motor Replacement 11
Service Parts 13
Return Policy 14

Warnings – General Safety

WARNING

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

DANGER

Climbing, sitting, walking or riding on conveyor will cause severe injury.

KEEP OFF CONVEYORS.

DANGER

Do NOT OPERATE CONVEYORS IN AN EXPLOSIVE ENVIRONMENT.

WARNING

Exposed moving parts can cause severe injury.

LOCK OUT POWER before removing guards or performing maintenance.

WARNING

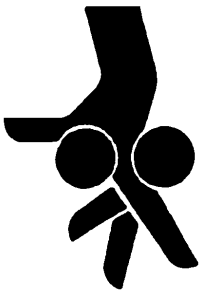
Gearmotors may be HOT.

DO NOT TOUCH Gearmotors.

WARNING

Exposed moving parts can cause severe injury.

REPLACE ALL GUARDS BEFORE RUNNING CONVEYOR.



WARNING

Dorner cannot control the physical installation and application of conveyors. Taking protective measures is the responsibility of the user.

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.

Introduction

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 3100 Series conveyors are covered by patent numbers 5156260, 5156261, 5203447, 5265714 and patent applications in other countries.

Dorner LPZ Series conveyors are covered by patent numbers 5156260, 5156261, 5203447, 5265714, 5875883 and patent applications in other countries.

Dorner's Limited Warranty applies.

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

Dorner has convenient, pre–configured kits of Key Service Parts for all conveyor products. These time saving kits are easy to order, designed for fast installation, and guarantee you will have what you need when you need it. Key Parts and Kits are marked in the Service Parts section of this manual with the Performance Parts Kits logo .

Product Description

Refer to Figure 1 for typical components.

Typical Components	
A	Conveyor
B	Mounting Bracket
C	Gearmotor
D	Timing Belt Tensioner
E	Cover
F	Timing Belt
G	Drive Pulley
H	Driven Pulley

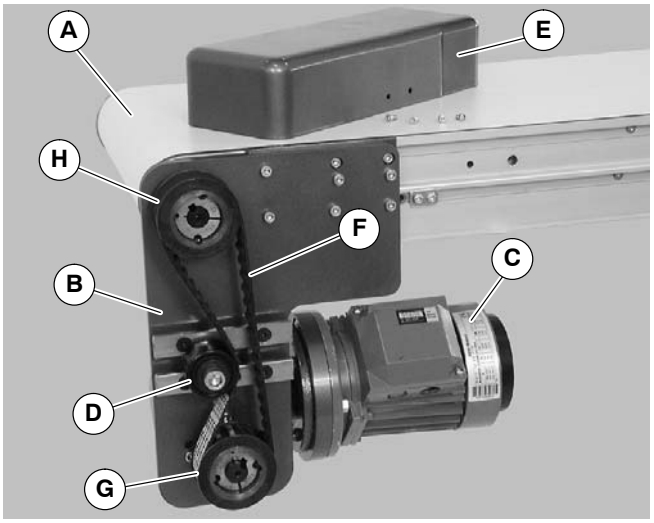


Figure 1

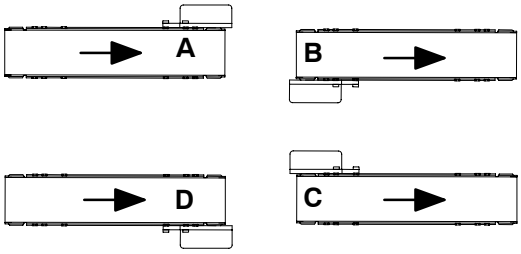
Specifications

Gearmotor Mounting Package Models:

Example:

3 M B H L WW A – 16 16

- **16** — Driven Pulley (see Tables 2, 3 & 4)
- **16** — Drive Pulley (see Tables 2, 3 & 4)
- **A** — Belt Type: – = flat belt, A through J = cleated belt
- **WW** — Mount Position = A, B, C or D (see detail to the right)
- **L** — Conveyor Width Reference*
- **H** — Gearmotor Type: L = Light Load, S = Standard Load
- **B** — Output Shaft Type = 90°
- **M** — Mount Style = Bottom Mount
- **3** — Language Code = U.S. English



*** See "Ordering and Specifications" Catalog for details.**

Table 1: Gearmotor Specifications

Item	Light Load Gearmotor			Standard Load Gearmotor			
	Single-Phase	Three Phase	DC Variable Speed	Single-Phase	Three Phase	VFD Variable Speed	DC Variable Speedd
Output Power	0.25 hp (0.19 kw)			0.5 hp (0.37 kw)			
Input Voltage	115VAC	208 – 230/460 VAC	130VDC	115VAC	208 – 230/460 VAC	230 VAC	90VDC
Input Frequency	60Hz		N/A	60Hz		10 – 60Hz	N/A
Input Current (Amperes)	5.0	1.2/0.6	2.2	7.4	2.1 – 2/1	1.6	5.0
Gearmotor Ratios	5:1, 10:1, 20:1, 40:1, 60:1			5:1, 10:1, 20:1, 40:1, 60:1			
Frame Size	NEMA 42CZ			NEMA 56C			
Motor Type	Totally enclosed, Fan cooled			Totally enclosed, Fan cooled			

Specifications

Table 2: Belt Speeds for Fixed Speed 90° 60 Hz Gearmotors

Light Load Gearmotors				Standard Load Gearmotors				Belt Speed		Drive Pulley	Driven Pulley
Part Number	RPM	In-lb	N-m	Part Number	RPM	In-lb	N-m	Ft/min	M/min		
32M060HL4(vp)FN	29	226	25.5	32M060HS4(vp)FN	29	226	25.5	23	7.0	16	16
32M040HL4(vp)FN	43	237	26.8	32M040HS4(vp)FN	43	247	27.9	34	10.4	16	16
32M040HL4(vp)FN	43	237	26.8	32M040HS4(vp)FN	43	247	27.9	52	15.8	24	16
32M020HL4(vp)FN	86	142	16	32M020HS4(vp)FN	86	248	27.9	69	21.0	16	16
32M020HL4(vp)FN	86	142	16	32M020HS4(vp)FN	86	248	27.9	103	31.4	24	16
32M010HL4(vp)FN	173	78	8.8	32M010HS4(vp)FN	173	156	17.6	137	41.8	16	16
32M010HL4(vp)FN	173	78	8.8	32M010HS4(vp)FN	173	156	17.6	172	52.4	20	16
32M010HL4(vp)FN	173	78	8.8	32M010HS4(vp)FN	173	156	17.6	206	62.8	24	16
N/A	N/A	N/A	N/A	32M005HS4(vp)FN	345	81	9.1	275	83.8	16	16
N/A	N/A	N/A	N/A	32M005HS4(vp)FN	345	81	9.1	343	104.5	20	16
N/A	N/A	N/A	N/A	32M005HS4(vp)FN	345	81	9.1	412	125.6	24	16

(vp) = voltage and phase
11 = 115 V, 1-phase
23 = 208 – 230/460 V, 3-phase

Table 3: Belt Speeds for Variable Speed 90° DC Gearmotors

Light Load Gearmotors				Standard Load Gearmotors				Belt Speed		Drive Pulley	Driven Pulley
Part Number	RPM	In-lb	N-m	Part Number	RPM	In-lb	N-m	Ft/min	M/min		
32M060HLD3DEN	42	198	22.4	32M060HSD9DEN	42	198	22.4	4.0 – 33	1.2 – 10	16	16
32M040HLD3DEN	63	163	18.4	32M040HSD9DEN	63	215	24.3	6.0 – 50	1.8 – 15	16	16
32M040HLD3DEN	63	163	18.4	32M040HSD9DEN	63	215	24.3	9.0 – 75	2.7 – 23	24	16
32M020HLD3DEN	125	98	11.1	32M020HSD9DEN	125	196	22.1	12 – 100	3.6 – 30	16	16
32M020HLD3DEN	125	98	11.1	32M020HSD9DEN	125	196	22.1	18 – 150	5.5 – 45	24	16
32M010HLD3DEN	250	54	6.1	32M010HSD9DEN	250	108	12.2	24 – 200	7.3 – 61	16	16
32M010HLD3DEN	250	54	6.1	32M010HSD9DEN	250	108	12.2	30 – 250	9.1 – 76	20	16
32M010HLD3DEN	250	54	6.1	32M010HSD9DEN	250	108	12.2	36 – 300	11 – 92	24	16

Table 4: Belt Speeds for Fixed Speed 90° VFD Gearmotors

Standard Load Gearmotors				Belt Speed		Drive Pulley	Driven Pulley
Part Number	RPM	In-lb	N-m	Ft/min	M/min		
32M060HS423EN	29	226	25.5	2.3 – 22.9	0.7 – 7.0	16	16
32M040HS423EN	43	247	27.9	3.4 – 34.3	1.0 – 10.5	16	16
32M040HS423EN	43	247	27.9	5.1 – 51.5	1.6 – 15.7	24	16
32M020HS423EN	86	248	27.9	6.9 – 68.6	2.1 – 20.9	16	16
32M020HS423EN	86	248	27.9	10.3 – 103.0	3.1 – 31.4	24	16
32M010HS423EN	173	156	17.6	13.7 – 137.3	4.2 – 41.9	16	16
32M010HS423EN	173	156	17.6	17.2 – 171.6	5.2 – 52.3	20	16
32M010HS423EN	173	156	17.6	20.6 – 205.9	6.3 – 62.8	24	16
32M005HS423EN	345	81	9.1	27.5 – 274.6	8.4 – 83.7	16	16
32M005HS423EN	345	81	9.1	34.3 – 343.2	10.5 – 104.6	20	16
32M005HS423EN	345	81	9.1	41.2 – 411.9	12.6 – 125.6	24	16

NOTE: For belt speed other than those listed, contact factory for details.

Required Tools

- Hex key wrenches:
  2 mm, 2.5 mm, 3 mm, 5 mm
- Straight edge
- Torque wrench

Mounting

WARNING

Exposed moving parts can cause severe injury.

LOCK OUT POWER before removing guards or performing maintenance.

Installation Component List	
I	Bottom Mount Assembly
J	Drive Pulley
K	Cover
L	M4 Socket Head Screws (4x)
M	Driven Pulley
N	Key
O	M6 Socket Head Screws (6x)
P	Timing Belt

1. Typical components (Figure 2)

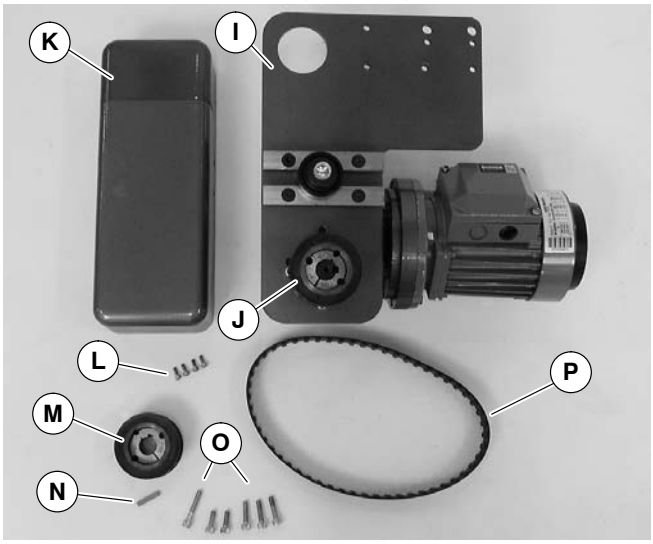


Figure 2

NOTE: Flat belt mounting package shown, cleated belt mounting package similar.

NOTE: Gearmotor position on Flat Belt conveyor shown below left, Figure 3. Gearmotor position on Cleated Belt conveyor shown below right, Figure 3.

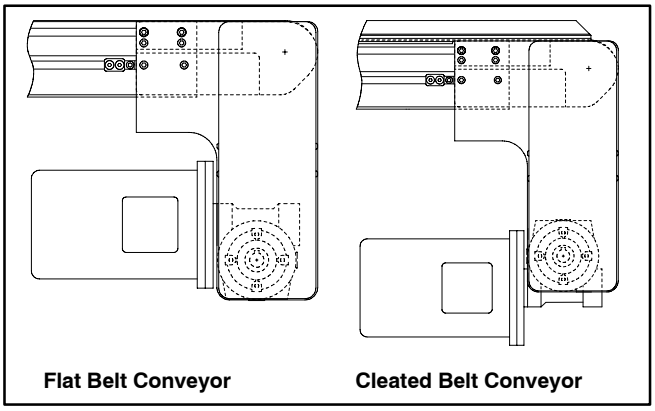


Figure 3

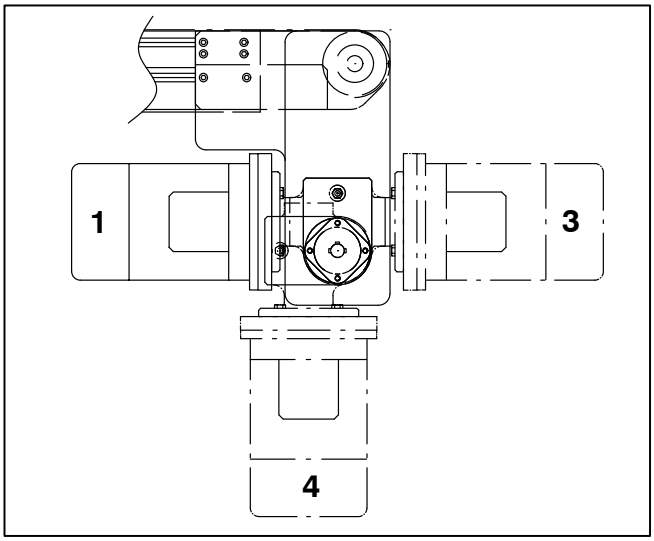


Figure 4

NOTE: Gearmotor may be operated in positions 1, 3 or 4 (Figure 4).

2. If required, change gearmotor position by removing four (4) screws (Q of Figure 5). Rotate gearmotor to other position and replace screws (Q). Tighten to 110 in-lb (12 Nm).

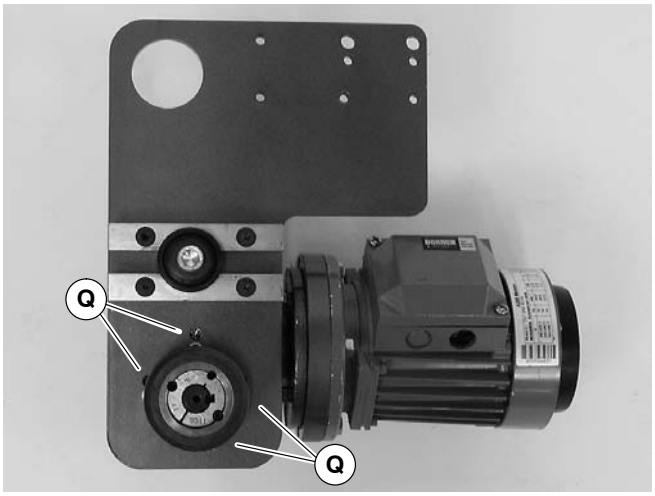


Figure 5

3. Locate drive output shaft (R of Figure 6) and remove screws (S).

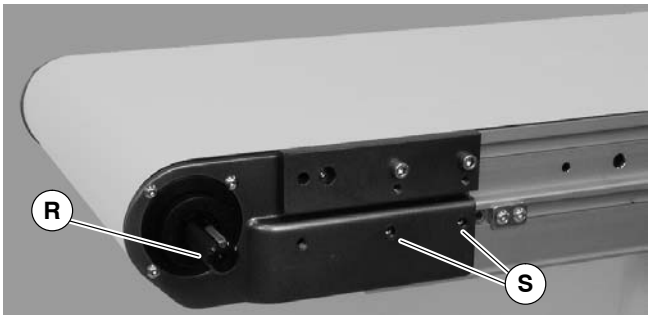


Figure 6

4. Attach mount assembly (I of Figure 7) with screws (O). Install medium length screws on bottom, long screw upper left, short screws upper right. Tighten screws to 110 in-lb (9 Nm).

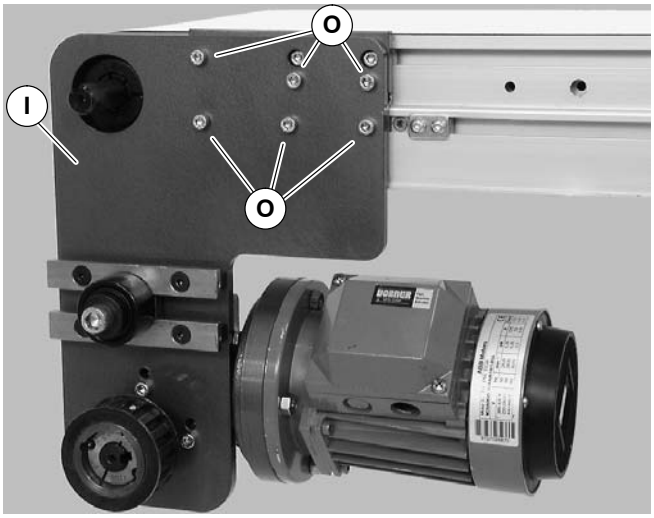


Figure 7

5. Install key (N of Figure 8).

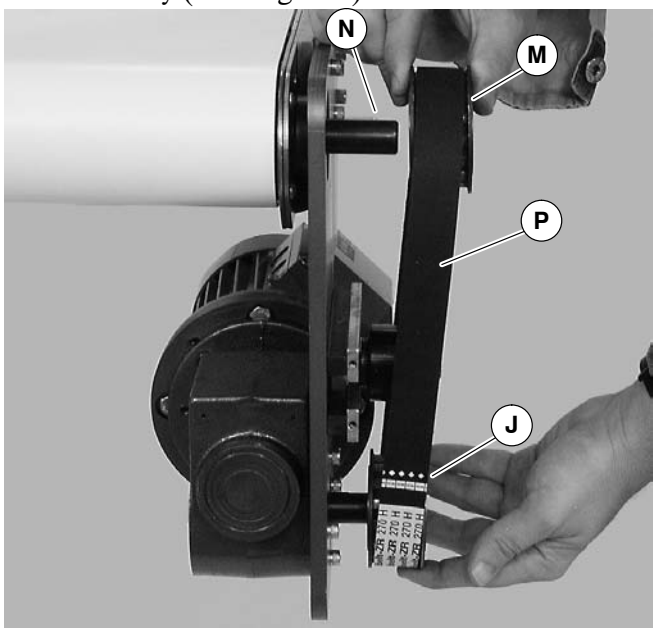


Figure 8

6. Wrap timing belt (P) around driven pulley (M) and drive pulley (J). Install driven pulley (M) onto conveyor shaft.

7. Using a straight edge (T of Figure 9), align driven pulley (M) with drive pulley (J). Tighten driven pulley taper-lock screws (U).

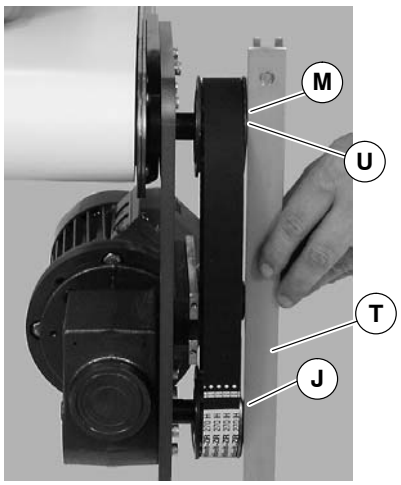


Figure 9

8. Depending on conveyor belt travel (direction 1 or 2), locate timing belt tensioner (V of Figure 10) as shown. Tension timing belt to obtain 1/8" (3 mm) deflection for 6 lb (3 Kg) of force at timing belt mid-point (W). Tighten tensioner screw to 110 in-lb (12 Nm).

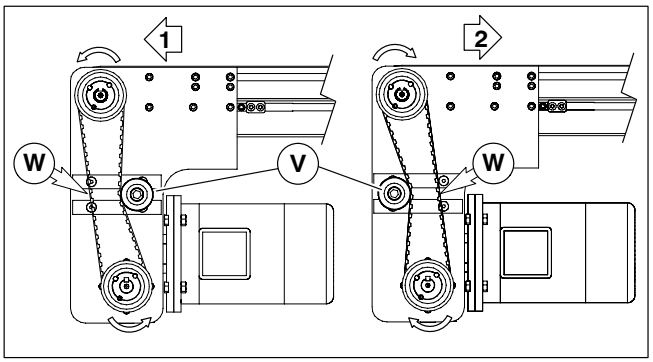


Figure 10

9. Install cover (K of Figure 11) with four (4) screws (L). Tighten screws to 35 in-lb (4 Nm).

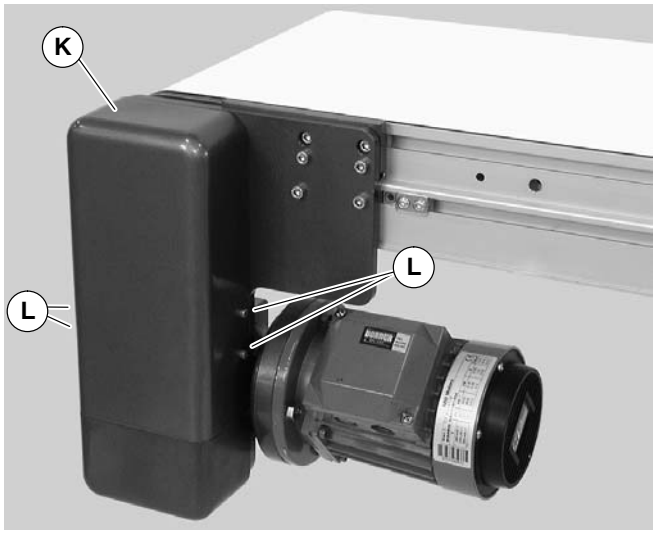


Figure 11

Required Tools

- Hex key wrenches:

  2 mm, 2.5 mm, 3 mm, 5 mm
- Adjustable wrench (for hexagon head screws)
- Straight edge
- Torque wrench

Timing Belt Tensioning

WARNING

Exposed moving parts can cause severe injury.

LOCK OUT POWER before removing guards or performing maintenance.

1. Remove four (4) screws (L of Figure 11) and remove cover (K).
2. Loosen tensioner (V of Figure 12).

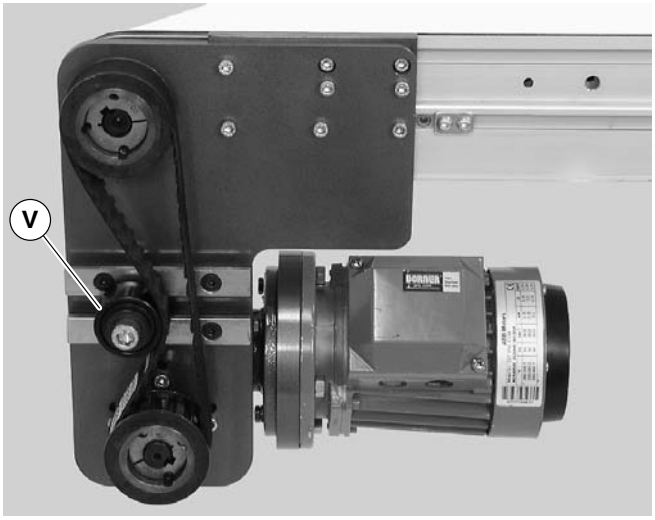


Figure 12

3. Depending on conveyor belt travel (direction 1 or 2), locate timing belt tensioner (V of Figure 10) as shown. Tension timing belt to obtain 1/8" (3 mm) deflection for 6 lb (3 Kg) of force at timing belt mid-point (W). Tighten tensioner screw to 110 in-lb (12 Nm).
4. Install cover (K of Figure 11) with four (4) screws (L). Tighten screws to 35 in-lb (4 Nm).

Timing Belt Replacement

WARNING

Exposed moving parts can cause severe injury.

LOCK OUT POWER before removing guards or performing maintenance.

1. Remove four (4) screws (L of Figure 11) and remove cover (K).
2. Loosen tensioner (V of Figure 12).
3. Remove timing belt (P of Figure 13).

NOTE: If timing belt does not slide over pulley flange, loosen driven pulley taper-lock screws (U of Figure 13) and remove pulley with belt (P). For re-installation, see steps 6 and 7 on beginning on page 6.

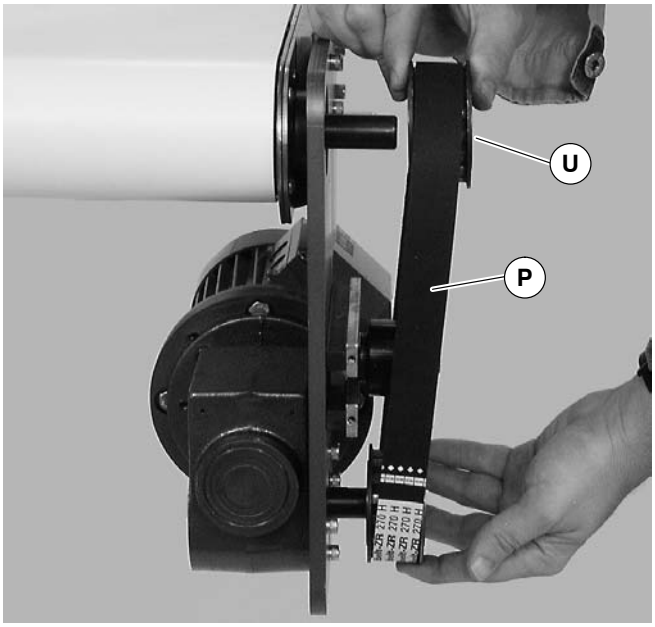


Figure 13

4. Install new timing belt.
5. Depending on conveyor belt travel (direction 1 or 2), locate timing belt tensioner (V of Figure 10) as shown. Tension timing belt to obtain 1/8" (3 mm) deflection for 6 lb (3 Kg) of force at timing belt mid-point (W). Tighten tensioner screw to 110 in-lb (12 Nm).
6. Install cover (K of Figure 11) with four (4) screws (L). Tighten screws to 35 in-lb (4 Nm).

Drive or Driven Pulley Replacement

WARNING

Exposed moving parts can cause severe injury.

LOCK OUT POWER before removing guards or performing maintenance.

1. Complete steps 1 through 3 of "Timing Belt Replacement" section on page 8.
2. Loosen taper-lock screws and remove drive or driven pulley.

NOTE: If drive pulley (J of Figure 14) is replaced, wrap timing belt around drive pulley and complete step 3.

3. Complete steps 6 through 9 of "Installation" section beginning on page 6.

Gear Reducer Replacement

WARNING

Exposed moving parts can cause severe injury.

LOCK OUT POWER before removing guards or performing maintenance.

NOTE: The gear reducer and output shaft are permanently fixed with Loctite® Adhesive. Both components must be replaced. See "Service Parts" Section for part numbers.

1. Remove four (4) screws (L of Figure 11) and remove cover (K).
2. Loosen tensioner (V of Figure 12).
3. Loosen drive pulley taper-lock screws (X of Figure 14). Remove drive pulley (J) and timing belt (P).

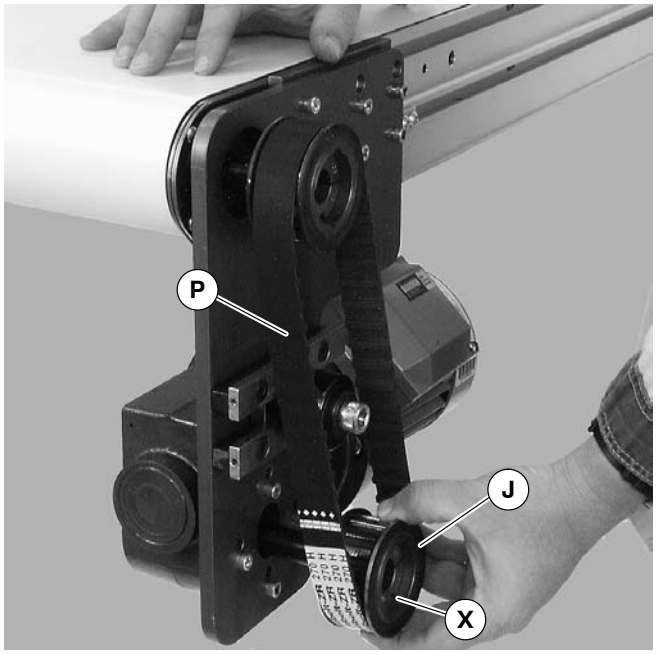


Figure 14

4. Remove four (4) gear reducer mounting screws (Q of Figure 15). Remove gearmotor.

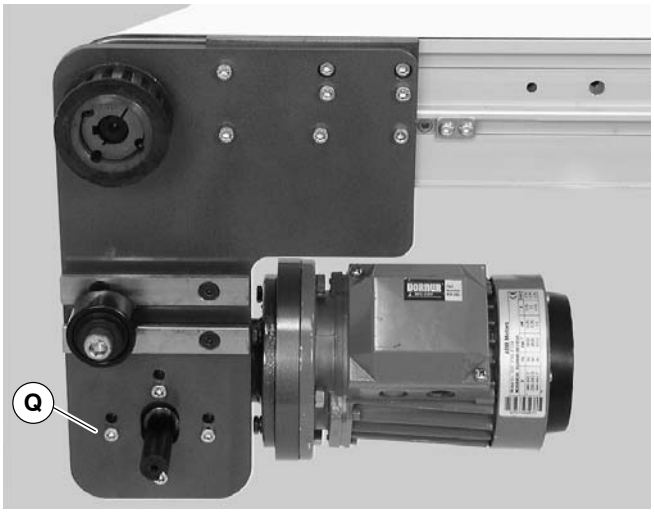


Figure 15

5. Remove four screws (Y of Figure 16). Detach motor (Z) from gear reducer (AA). Retain motor output shaft key (AB).

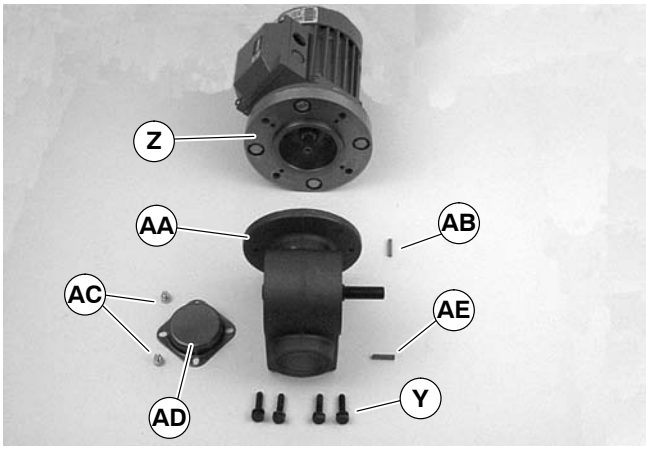


Figure 16

6. Remove two (2) screws (AC) and detach output shaft cover (AD).
7. Remove gear reducer output shaft key (AE).
8. Apply Loctite® 680 Adhesive (AI of Figure 17) to new shaft.

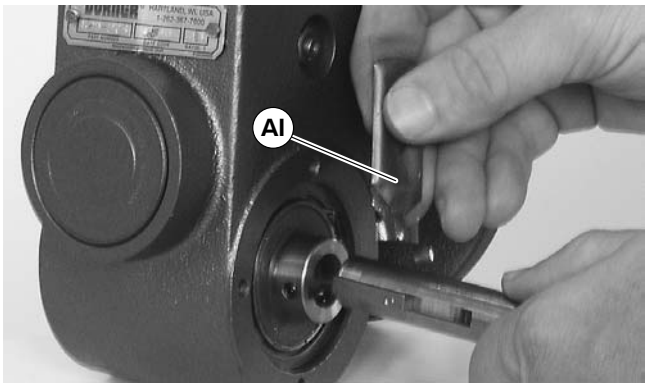


Figure 17

9. Insert the new shaft with adhesive (AG of Figure 18) and key (AH) into new gear reducer. Tighten set screws (AF) to 35 in-lb (4 Nm).

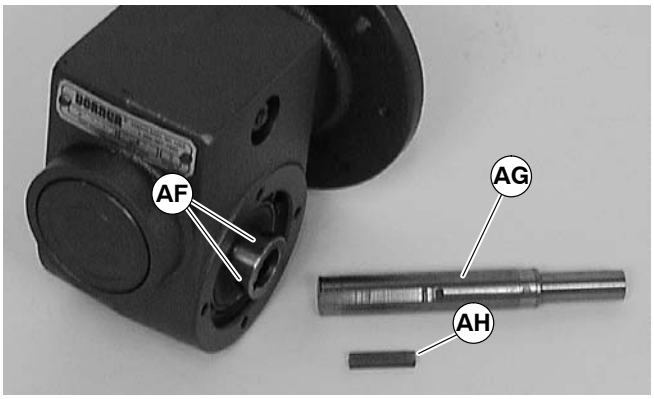


Figure 18

NOTE: Allow Loctite® Adhesive to cure for one (1) hour prior to starting conveyor.

IMPORTANT: Be extremely careful when coupling motor to gear reducer. Avoid misalignment and forcing the connection causing possible permanent gear reducer seal damage.

10. With key (AB of Figure 16) in keyway, slide motor (Z) and gear reducer (AA) together. Install screws (Y) and tighten.

NOTE: Gearmotor position on Flat Belt conveyor shown below left, Figure 19. Gearmotor position on Cleated Belt conveyor shown below right, Figure 19.

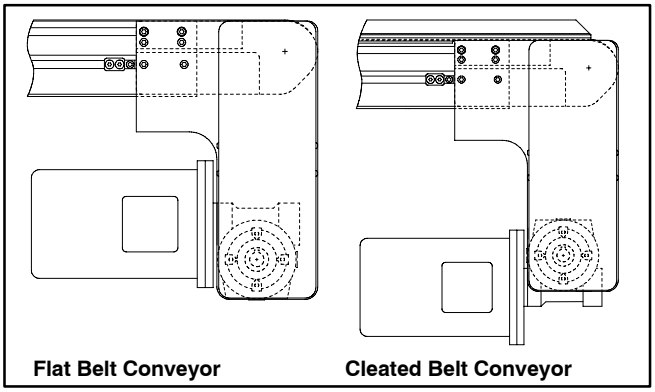


Figure 19

11. Install gearmotor to mounting bracket and tighten screws (Q of Figure 15) to 110 in-lb (12 Nm).

NOTE: Drive pulley (J of Figure 14) is removed. Wrap timing belt around drive pulley and complete step 12.

12. Complete steps 6 through 9 of "Installation" section beginning on page 6.

Motor Replacement

WARNING

Exposed moving parts can cause severe injury.

LOCK OUT POWER before removing guards or performing maintenance.

DANGER

Hazardous voltage will cause severe injury or death.

LOCK OUT POWER BEFORE WIRING.

1. For single phase motor, unplug power cord from outlet.

2. For three phase and VFD variable speed motor:

a. Loosen terminal box screws (AJ of Figure 20) and remove cover (AK).

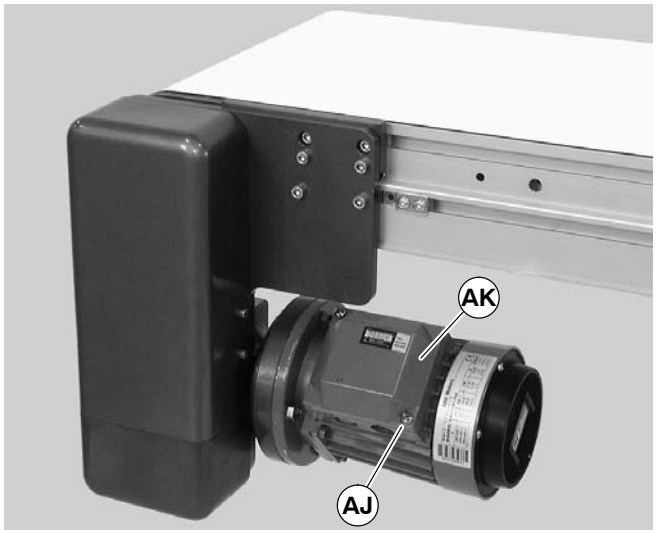


Figure 20

b. Record wire colors on terminals 1, 2 and 3. Loosen wire nuts and remove wires 1, 2 and 3.

c. Loosen cord grip and remove cord.

3. For DC variable speed motor, unplug motor cord at disconnect (AL of Figure 21).

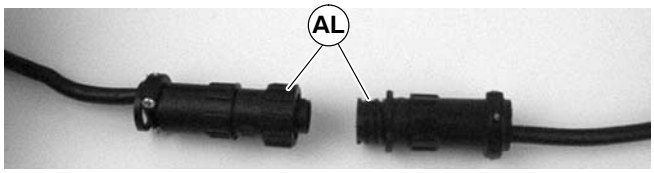


Figure 21

4. Remove four (4) screws (Y of Figure 22). Detach motor (Z) from gear reducer (AA). Retain motor output shaft key (AB).

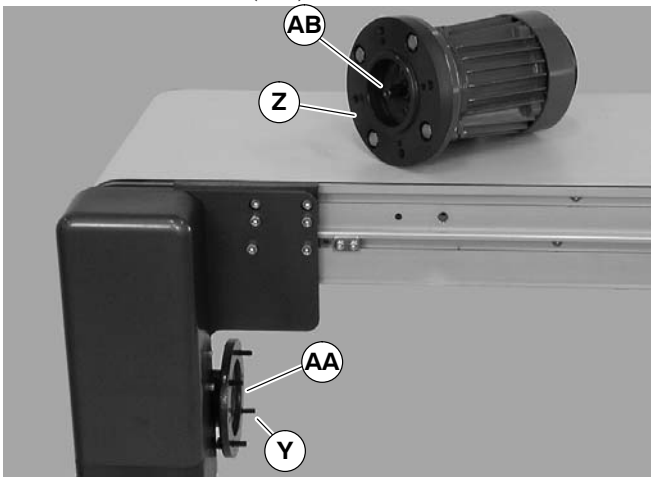


Figure 22

IMPORTANT: Be extremely careful when coupling motor to gear reducer. Avoid misalignment and forcing the connection causing possible permanent gear reducer seal damage.

5. With key (AB of Figure 23) in keyway, slide motor (Z) and gear reducer together. Install screws (Y) and tighten.

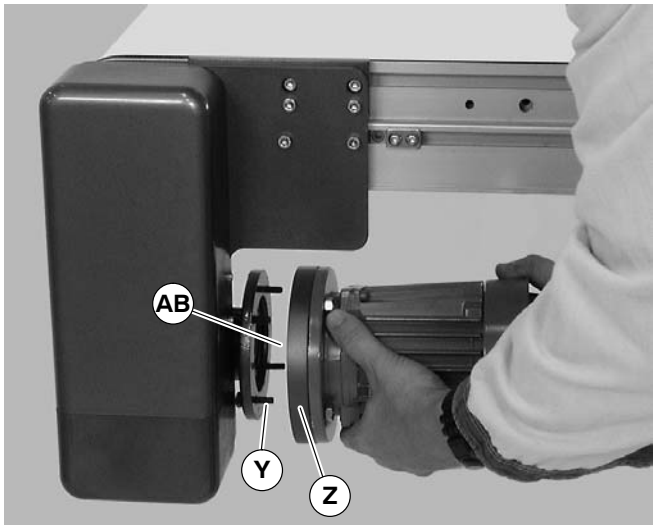


Figure 23

6. Replace wiring:

- For a single phase motor, reverse step 1 on this page.
- For a three phase or VFD variable speed motor, reverse step 2 on this page.
- For a DC variable speed motor, reverse step 3 on this page.

NOTE: For replacement parts other than those shown on this page, contact an authorized Dorner Service Center or the factory. Key Service Parts and Kits are identified by the Performance Parts Kits logo Dorner recommends keeping these parts on hand.

Item	Part No.	Part Description
1	62MS411FN	Motor, 0.25hp (0.19Kw), 115/230 Volts, 60 Hz, 1-Phase
	62MS411FR	Motor, 0.25hp (0.19Kw), 115/230 Volts, 60 Hz, 1-Phase with Reversing
	62MS423	Motor, 0.25hp (0.19Kw), 208–230/460 Volts, 60 Hz, 3-Phase
	62MSD3DEN	Motor, 0.25hp (0.19Kw), 130 VDC
	62MH411FN	Motor, 0.5hp (0.37Kw), 115/230 Volts, 60Hz, 1–Phase
	62MH423	Motor, 0.5hp (0.37Kw) 208–230/460 Volts, 60Hz, 3 Phase
	62MHD9DEN	Motor, 0.5hp (0.37Kw), 90VDC
	32MS423EN	Motor, 0.5hp (0.37Kw), 230 Volts, 3 Phase Inverter Duty
2	32M005HL	Gear Reducer, 5:1, NEMA 42CZ
	32M010HL	Gear Reducer, 10:1, NEMA 42CZ
	32M020HL	Gear Reducer, 20:1, NEMA 42CZ
	32M040HL	Gear Reducer, 40:1, NEMA 42CZ
	32M060HL	Gear Reducer, 60:1, NEMA 42CZ
	32M005HS	Gear Reducer, 5:1, NEMA 56C
	32M010HS	Gear Reducer, 10:1, NEMA 56C
	32M020HS	Gear Reducer, 20:1, NEMA 56C
	32M040HS	Gear Reducer, 40:1, NEMA 56C
	32M060HS	Gear Reducer, 60:1, NEMA 56C
3	814-059	Timing Belt, 1.0” W x 27.0” L
	814-060	Timing Belt, 1.0” W x 28.0” L
4	802-059	Tensioner Bearing
5	811–123	Driven Pulley, 14 Tooth, Taper Lock TL1108
	811–126	Driven Pulley, 16 Tooth, Taper Lock TL1108
6	980018M	Pulley Key, 6 mm x 18 mm (2x)
7	811–126	Drive Pulley, 16 Tooth, Taper Lock TL1108
	811–127	Drive Pulley, 18 Tooth, Taper Lock TL1210
	300049M	Drive Pulley, 19 Tooth
	811–135	Drive Pulley, 20 Tooth, Taper Lock TL1210
	811–136	Drive Pulley, 22 Tooth, Taper Lock TL1610
	811–137	Drive Pulley, 24 Tooth, Taper Lock TL1610
8	300988	Gear Reducer Shaft
9	912–084	Gear Reducer Key, Square, 0.188” x 1.5” L
10	811–204	Taper Lock Bushing, TL1108
	811–205	Taper Lock Bushing, TL1210
	811–206	Taper Lock Bushing, TL1610

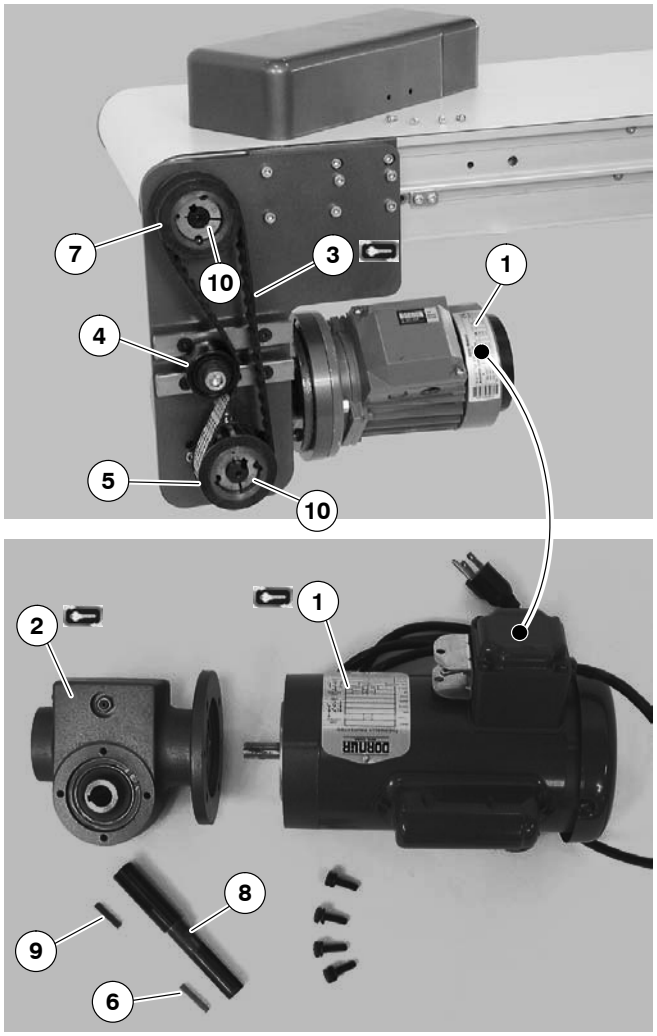


Figure 24

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.

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