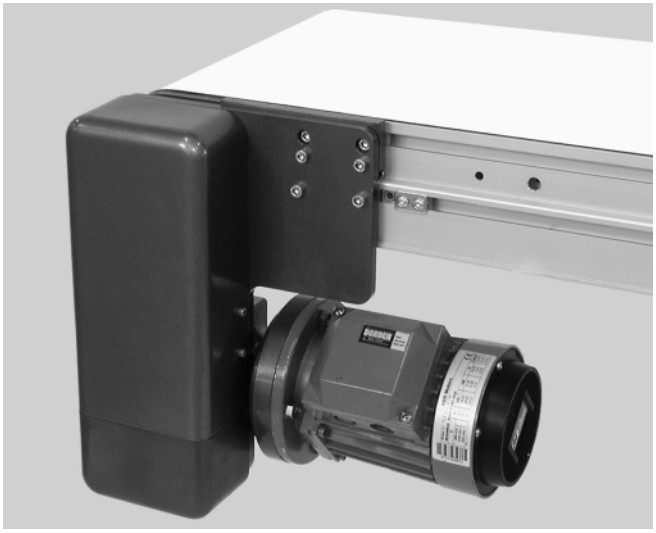
DORNER®

# Set-up, Operation & Maintenance Manual

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



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# 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**

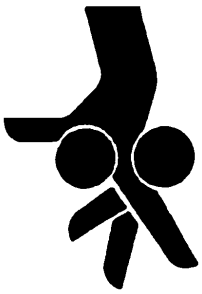
**Gearmotors may be HOT.**

**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.

# 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 |

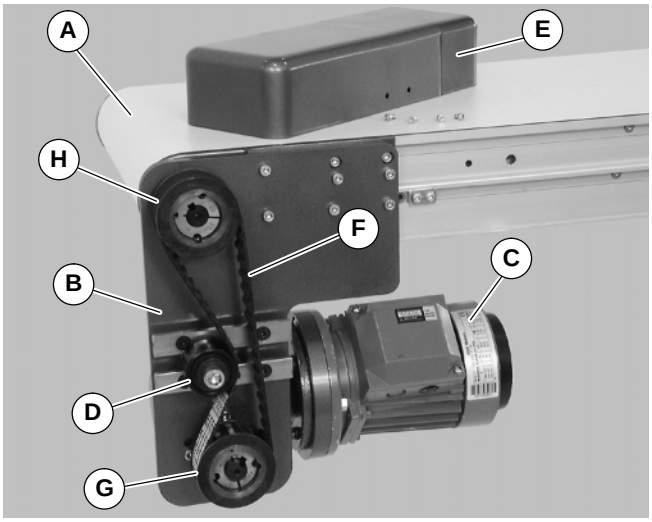



***Figure 1***

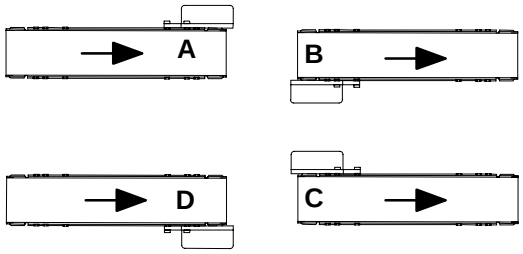
# Specifications

## Gearmotor Mounting Package Models:

### Example:

**3 M B H L WW A – 16 16**

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

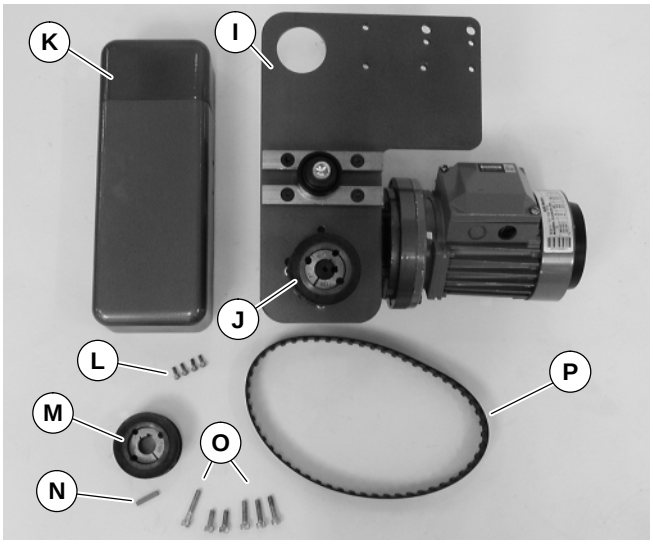



***Figure 2***

**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.**

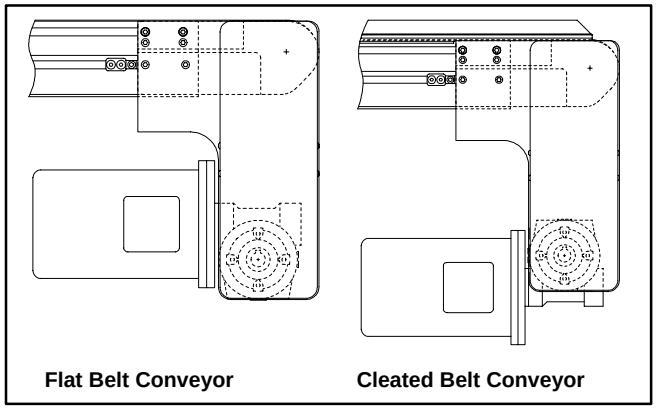



***Figure 3***

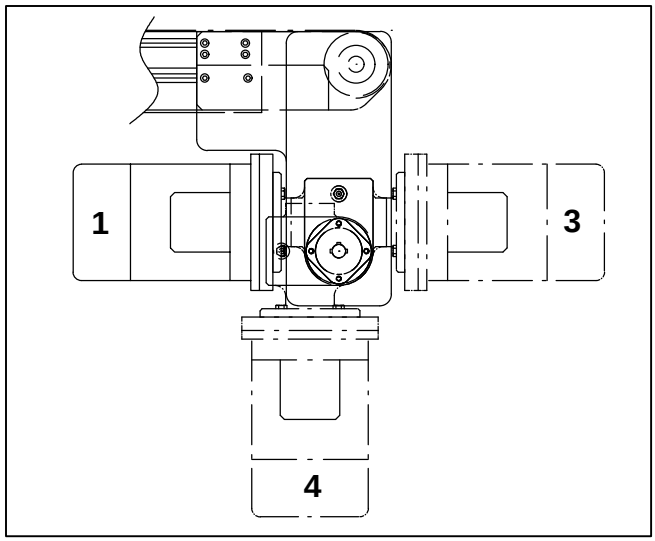



***Figure 4***

**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).

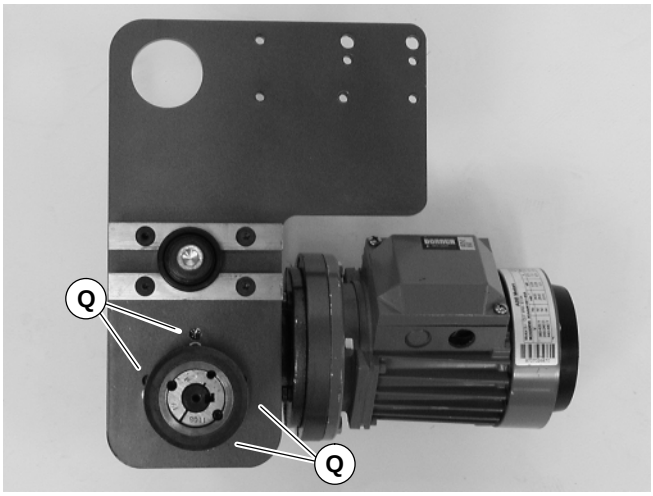



*Figure 5*

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

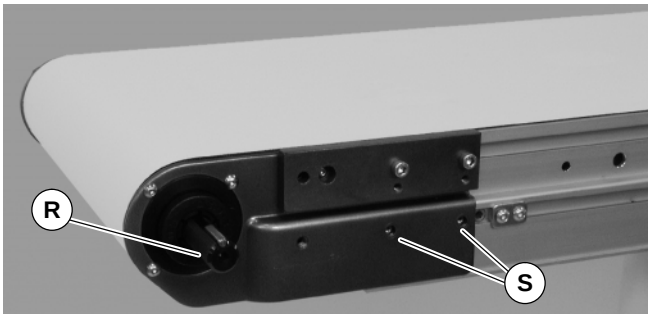



*Figure 6*

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).

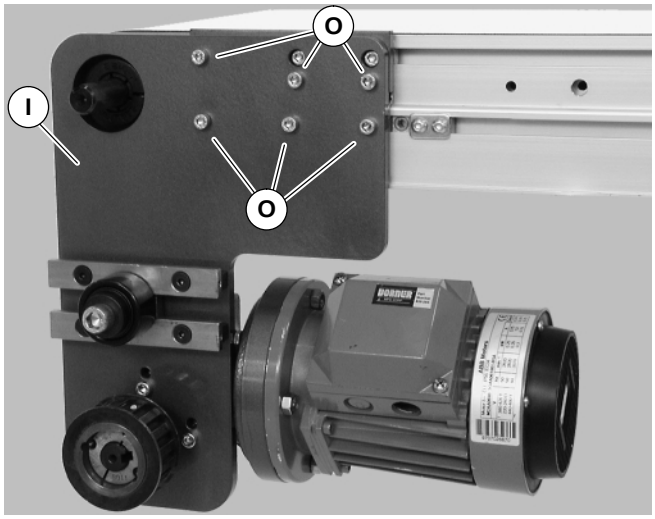



*Figure 7*


5. Install key (N of Figure 8).

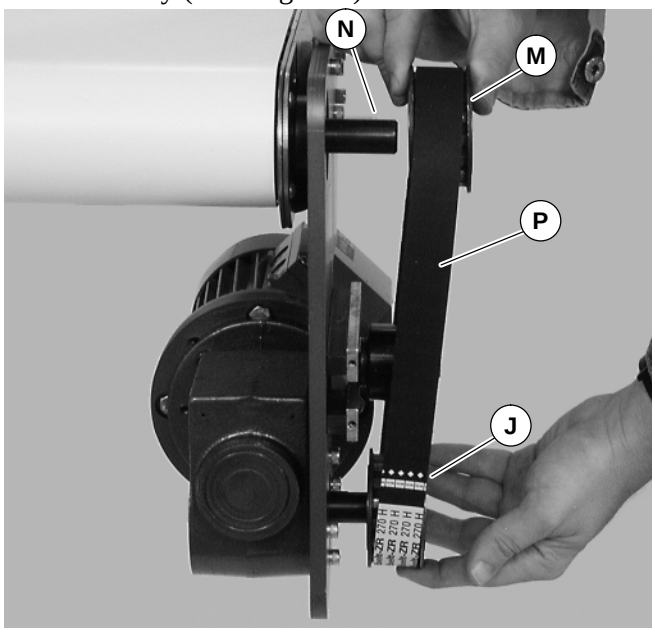



*Figure 8*

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).

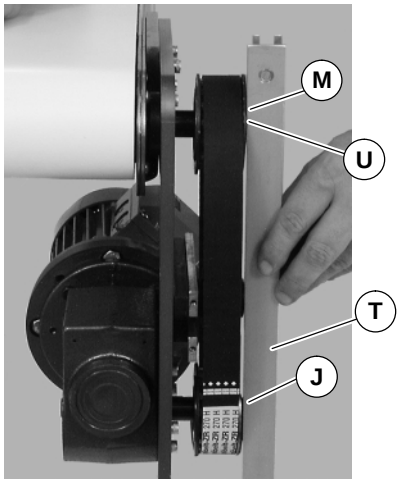



***Figure 9***

**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).

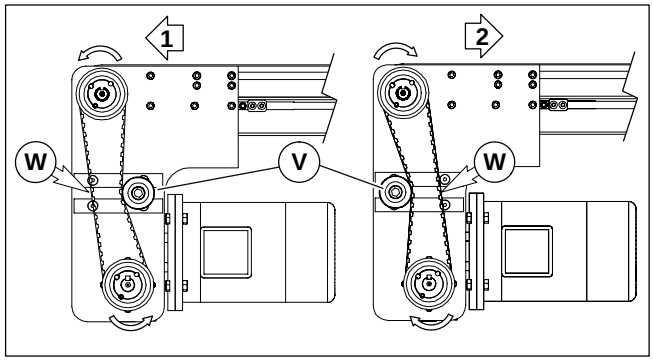



***Figure 10***

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

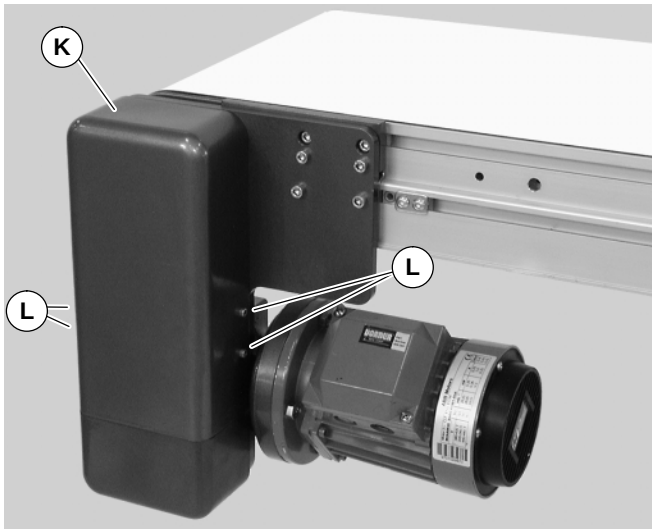



***Figure 11***

## 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).

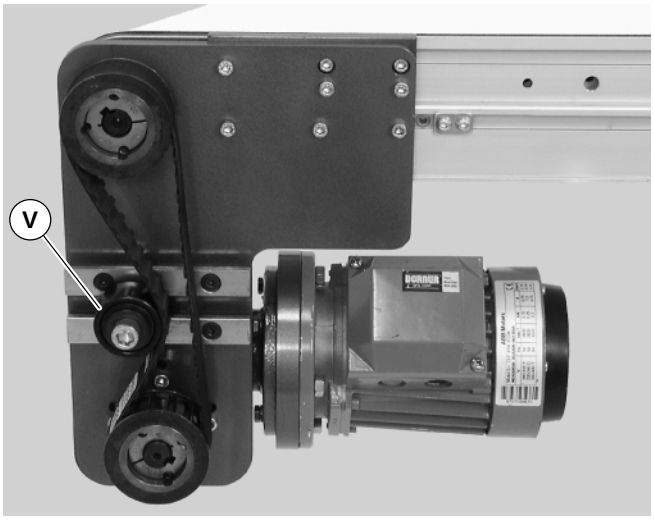



*Figure 12*

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.**

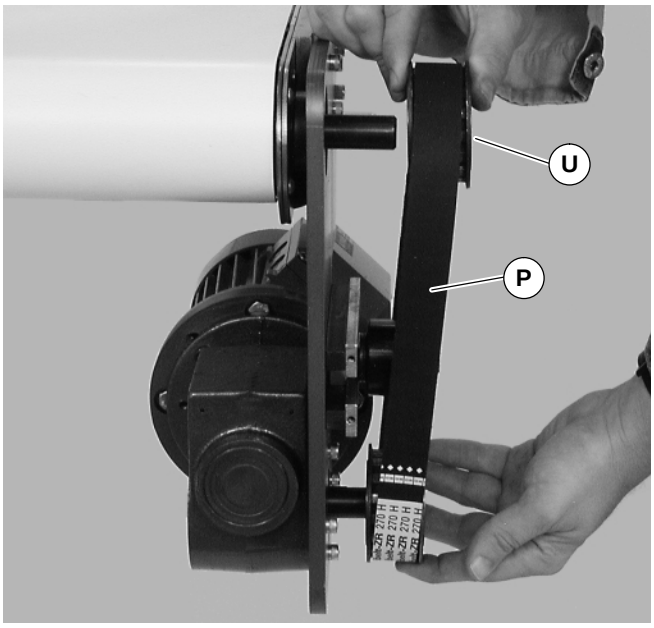



*Figure 13*

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.

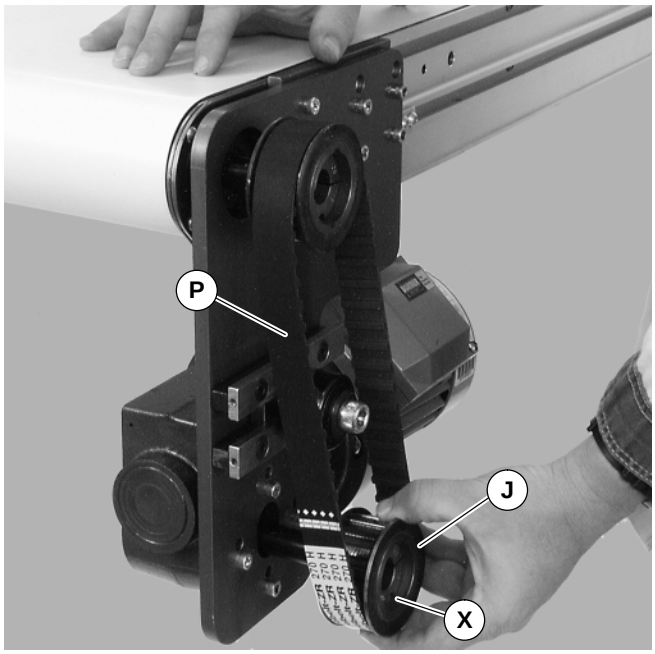



*Figure 14*

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

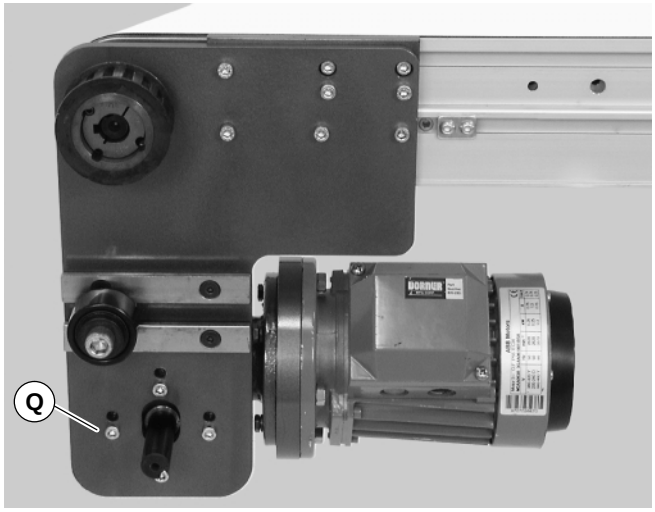



*Figure 15*

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

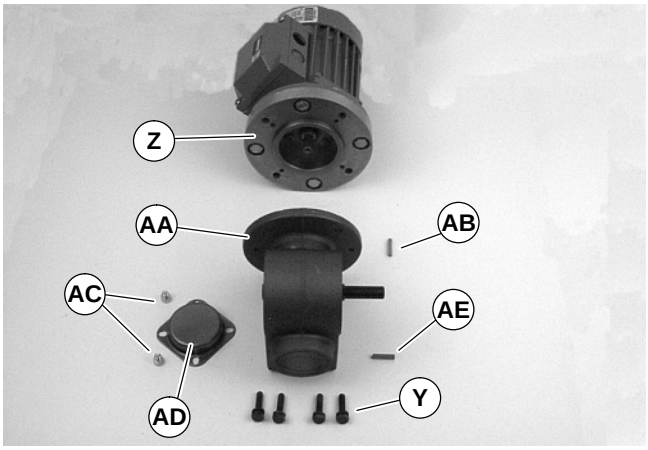



***Figure 16***

**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.

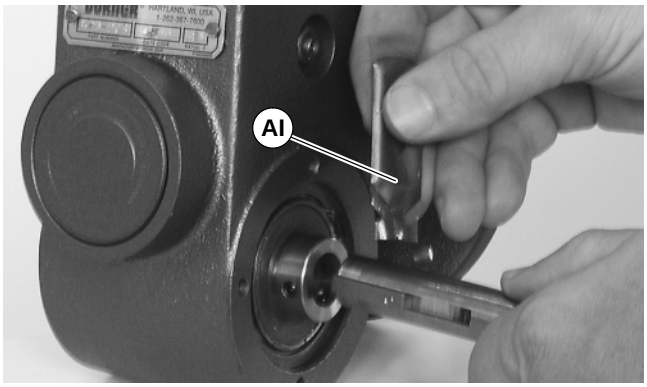



***Figure 17***

**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).

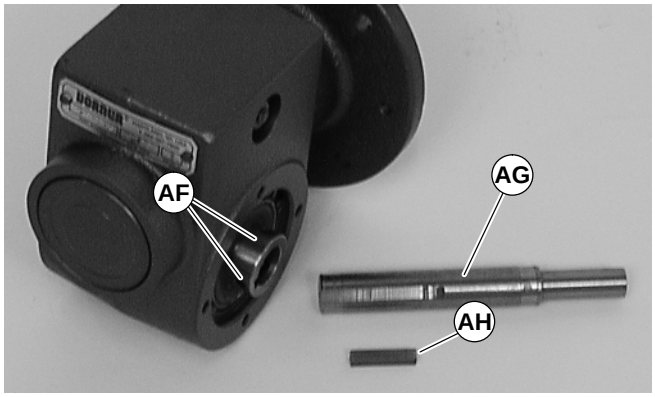



***Figure 18***

**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.**

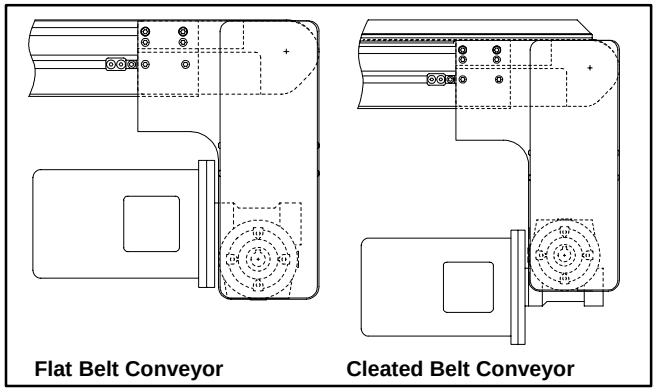



***Figure 19***

**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).

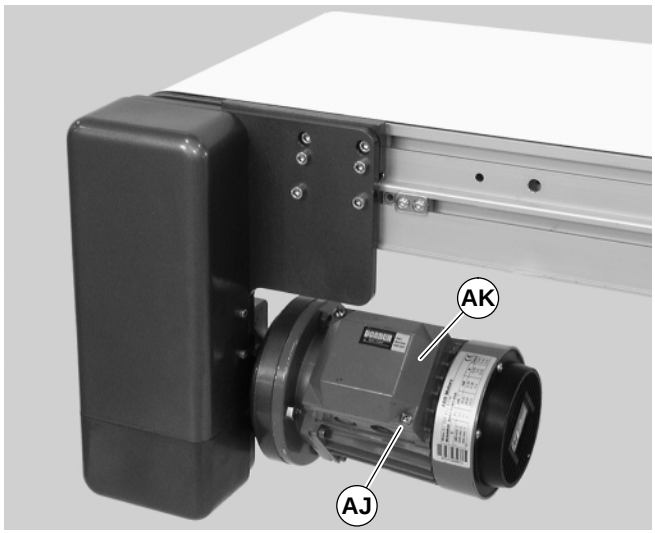



*Figure 20*

**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).

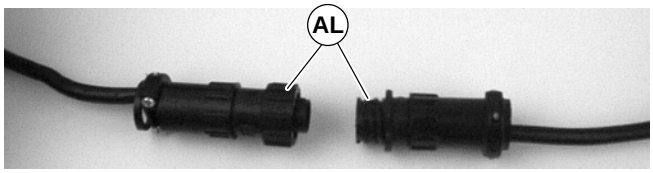



*Figure 21*

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

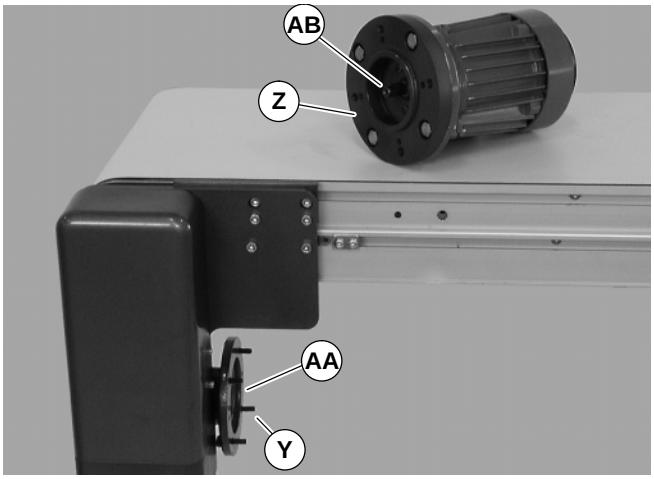



***Figure 22***

**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.

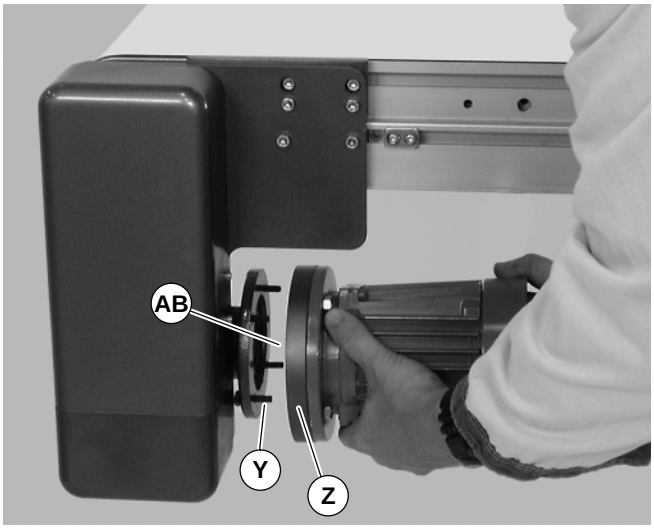



***Figure 23***

**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.**

| Item | Part No. | Part Description |
|---|---|---|
| 1 | 826-328 | Motor, 0.25hp (0.19Kw), 115/230 Volts, 60 Hz, 1-Phase |
| | 826-337 | Motor, 0.25hp (0.19Kw), 115/230 Volts, 60 Hz, 1-Phase with Reversing |
| | 826-330 | Motor, 0.25hp (0.19Kw), 208–230/460 Volts, 60 Hz, 3-Phase |
| | 826-332 | Motor, 0.25hp (0.19Kw), 130 VDC |
| | 826–017 | Motor, 0.5hp (0.37Kw), 115/230 Volts, 60Hz, 1–Phase |
| | 826–025 | Motor, 0.5hp (0.37Kw) 208–230/460 Volts, 60Hz, 3 Phase |
| | 826–333 | Motor, 0.5hp (0.37Kw), 90VDC |
| | 826–249 | 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 |

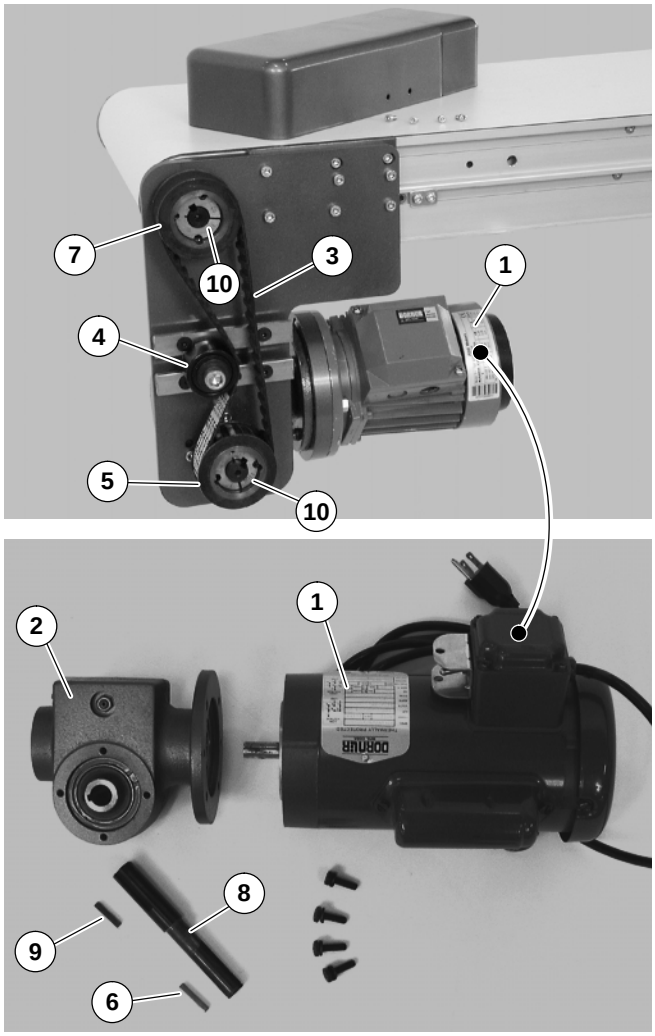



***Figure 24***

# 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.



**DORNER MFG. CORP.**
975 Cottonwood Ave. PO Box 20
Hartland, WI 53029-0020 USA
USA
TEL 1-800-397-8664 (USA)
FAX 1-800-369-2440 (USA)

Outside the USA:
TEL 1-262-367-7600, FAX 1-262-367-5827

**DORNER**
Arnold-Sommerfeld-Ring 2
D-52499 Baesweiler
Germany
TEL (02401) 80 52 90
FAX (02401) 80 52 93

Internet: www.dorner.com