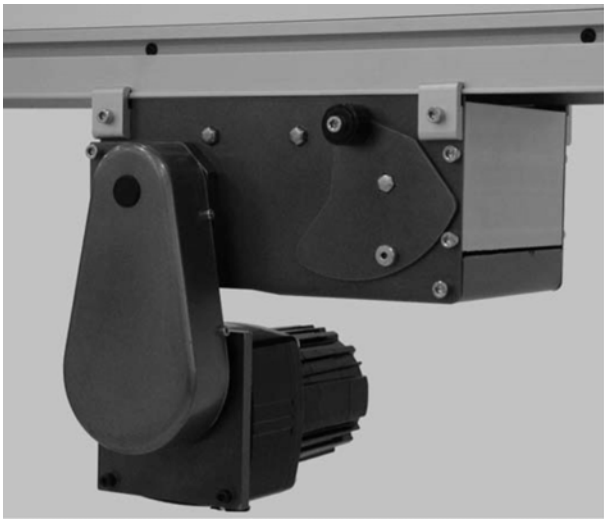
2100, 2200 & 6200 Series Center Mount Drive Package for Standard Load 60 Hz Parallel Shaft Gearmotors

Installation, Maintenance & Parts Manual



DORNER MFG. CORP.
P.O. Box 20 • 975 Cottonwood Ave.
Hartland, WI 53029-0020 USA

INSIDE THE USA
TEL: 1-800-397-8664
FAX: 1-800-369-2440

OUTSIDE THE USA
TEL: 262-367-7600
FAX: 262-367-5827

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851-424 Rev. E

Table of Contents

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 2100 Series conveyors are covered by the following patent numbers: 5,131,529, 5,174,435 and corresponding patents and patent applications in other countries.

Dorner 2200 Series conveyors are covered by the following patent numbers: 5,174,435, 6,422,382 and corresponding patents and patent applications in other countries.

Dorner 6200 Series conveyors are covered by patent number 5,174,435, 6,109,427, 6,298,981, 6,685,009 and corresponding patents 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  .

⚠ 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.

Product Description

Refer to **Figure 1** for typical components.

1	Cover
2	Conveyor
3	Mounting Bracket
4	Gearmotor
5	Timing Belt Tensioner
6	Drive Pulley
7	Timing Belt
8	Driven Pulley

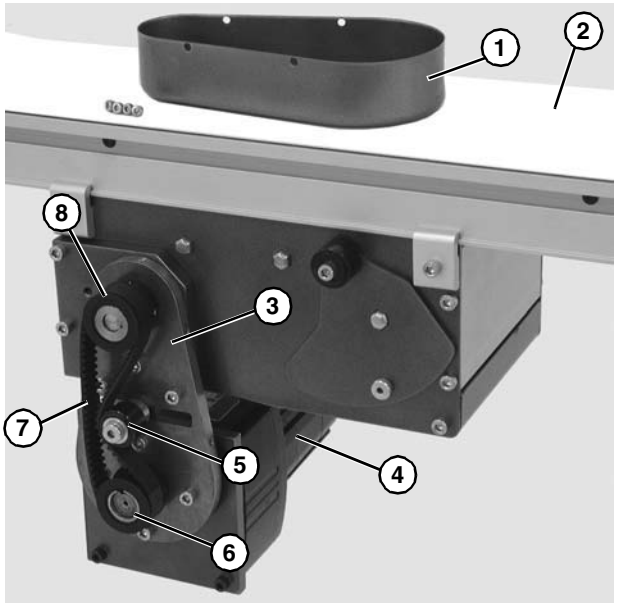
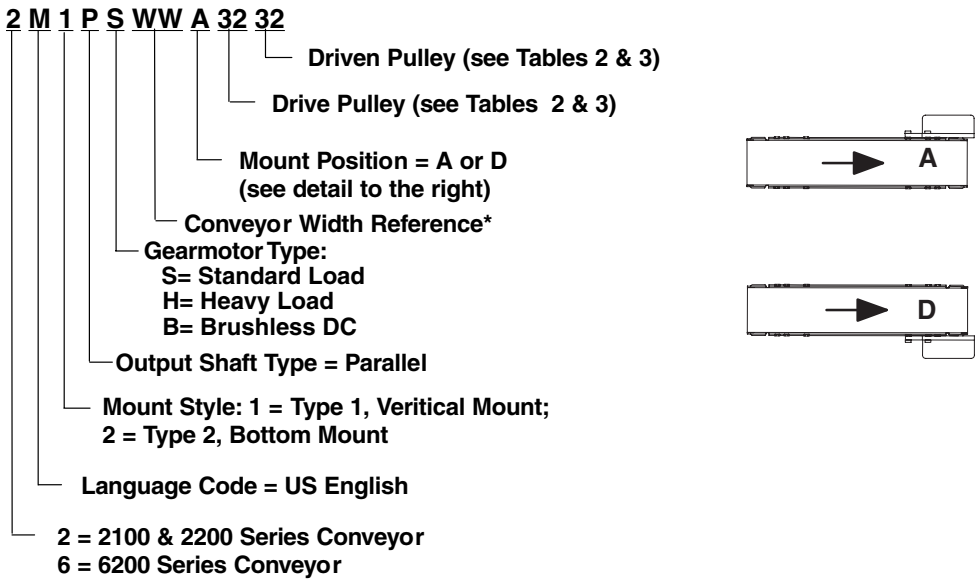


Figure 1

Gearmotor Mounting Package Models:

Example:



* See "Ordering and Specifications" Catalog for details.

Table 1: Gearmotor Specifications

	Single Phase	Three Phase	DC Variable Speed	Brushless DC
Output Power	0.17 hp (0.13 kw)		0.25 hp (0.19 kw)	0.25 hp (0.19 kw)
Input Voltage	115 Volts A.C.	230 Volts A.C.	130 Volts D.C.	*115/230 Volts D.C.
Input Frequency	60 Hz		N/A	60 Hz
Input Current	1.9 Amperes	1.2 Amperes	1.8 Amperes	8.8 / 3.4 Amperes
Motor RPM	1725		2500	3000
Gearmotor Ratios	5:1, 10:1, 20:1, 30:1, 60:1, 180:1			10:1, 20:1, 50:1
Frame Size	NEMA 42 CZ			
Motor Type	Totally enclosed, Fan-cooled		Totally enclosed, Non-ventilated	

* Controller Inputs

Specifications

Table 2: Belt Speeds for Standard Load Fixed Speed Parallel Shaft 60 Hz Gearmotors

Standard Load Gearmotors			
Part Number	**RPM**	**In-lb**	**N-m**
62M180PS411F(n)	10	341	38.5
62M060PS4(vp)F(n)	29	270	30.5
62M030PS4(vp)F(n)	58	135	15.3
62M020PS411F(n)	86	90	10.2
62M010PS4(vp)F(n)	173	45	5.1
62M005PS411F(n)	345	25	2.8

(vp) = voltage and phase

11 = 115 V, 1-phase

23 = 208 – 230/460 V, 3-phase

(n) = Reversing Capability

N = No reversing switch

R = With reversing switch (115V, 1 phase only)

Table 3: Belt Speeds for Standard Load Variable Speed Parallel Shaft DC Gearmotors

Standard Load Gearmotors			
Part Number	**RPM**	**In-lb**	**N-m**
62M180PSD3DEN	2-14	341	38.5
62M060PSD3DEN	5-42	270	30.5
62M030PSD3DEN	10-83	135	15.3
62M020PSD3DEN	16-125	90	10.2
62M010PSD3DEN	31-250	72	8.1
62M005PSD3DEN	63-500	25	2.8

Table 4: RPM/Torque for Brushless DC Gearmotors

Gearmotors				
Part Number	**Gear Ratio**	**RPM**	**In-lb**	**N-m**
62M050PSBDDEN	50:1	2-60	240	28
62M020PSBDDEN	20:1	5-150	103	11.7
62M010PSBDDEN	10:1	10-300	52	5.9

NOTE

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

Table 5: Pulley Ratio / Timing Belt Number

Motor	Conveyor	Pulley	Timing Belt
19	32	0.59	814-103
22	28	0.79	814-103
22	32	0.69	814-100
28	22	1.27	814-103
28	32	0.88	814-096
32	19	1.68	814-103
32	22	1.45	814-100
32	28	1.14	814-096
32	32	1.00	814-096
44	19	2.32	814-096
44	22	2.00	814-096
44	28	1.57	814-105
44	32	1.38	814-105
48	19	2.53	814-104
48	22	2.18	814-105
48	28	1.71	814-105
48	32	1.50	814-105

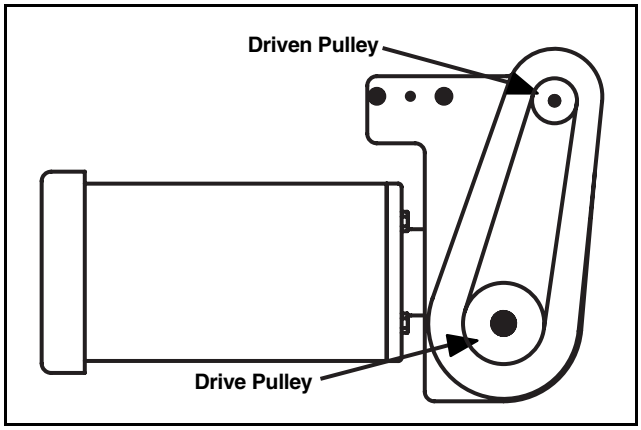


Figure 2

Table 6: Conveyor Belt Speed Factor

Series	Ft/revolution	M/revolution
2200 / 2300	0.350	0.107
2100 / 4100 / 6100 / 6200	0.278	0.085
2200 MPB	0.590	0.180
2200 Precision Move	0.394	0.120
2200 / 2300 Modular Belt	0.394	0.120

Belt Speed Calculation:

How to Calculate Belt Speed

1. Determine gearmotor RPM from tables 2-4.
2. Determine the pulley kit ratio. Count the number of teeth on the drive and driven pulleys following figure 2. Using table 5, look up pulley ratio based on pulley combinations.
3. Determine conveyor speed factor using table 6. Based on your conveyor type, select the appropriate factor.
4. Calculate belt speed:

Example: Belt Speed = Gearmotor RPM (tables 2-4) x Pulley Kit Ratio (table 5) x Conveyor Speed Factor (table 6)

2200 Series parallel shaft DC variable speed 20:1 gearmotor with 44 tooth sprocket on gearmotor (Drive) and 28 tooth sprocket on the conveyor output shaft (Driven).

Gearmotor =	62M020PSD3DEN	= 16 - 125 RPM
Pulley Kit =	44 t mtr. - 28 t conv.	= 1.57
Speed Factor =	2200 Series	= 0.350 ft/min per RPM
Minimum Belt Speed =	16 x 1.57 x 0.350	= 8.8 Ft/min
Maximum Belt Speed =	125 x 1.57 x 0.350	= 69 Ft/min

Installation

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.

NOTE

*Type 1 mounting package shown below left **(Figure 3)**. Type 2 mounting package shown below right **(Figure 3)**.*

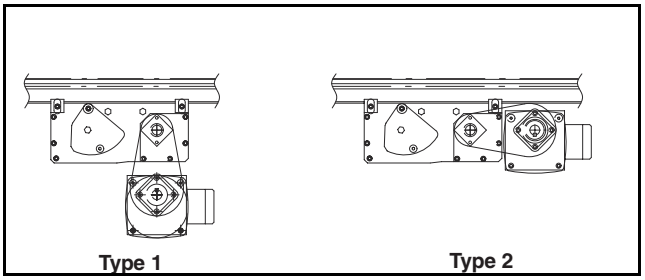


Figure 3

Installation Component List:

1	Mount Assembly
2	Drive Pulley
3	M4 Socket Head Screws (4x)
4	Cover
5	Timing Belt
6	Key
7	Driven Pulley
8	M6 Socket Head Screws (2x)

1. Gather components **(Figure 4)**

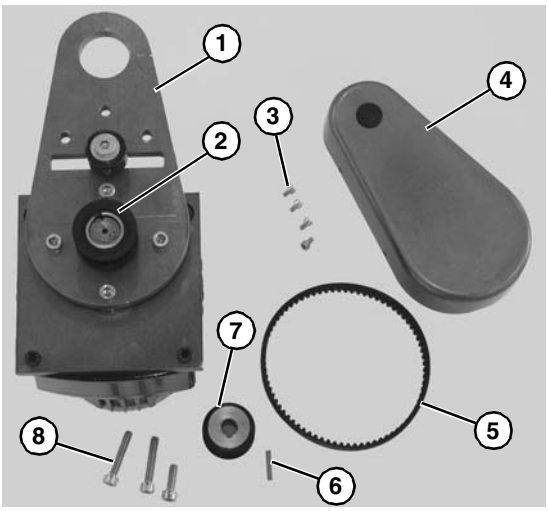


Figure 4

NOTE

*Type 1 mounting package shown **(Figure 4)**, Type 2 mounting package similar.*

2. Locate drive output shaft **(Figure 5, item 1)** and remove two (2) screws **(Figure 5, item 2)**.

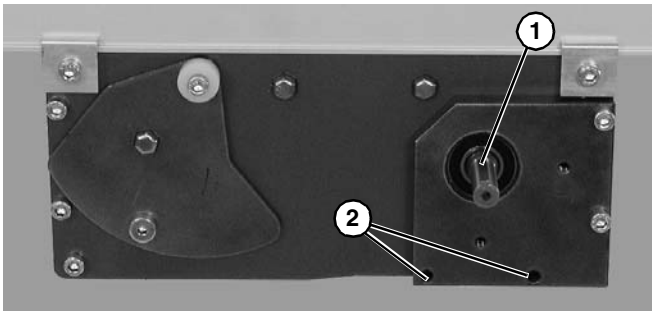


Figure 5

3. Attach mount assembly **(Figure 6, item 1)** with screws **(Figure 6, item 2)**. Install long screws on bottom. Tighten screws to 80 in-lb (9 Nm.).

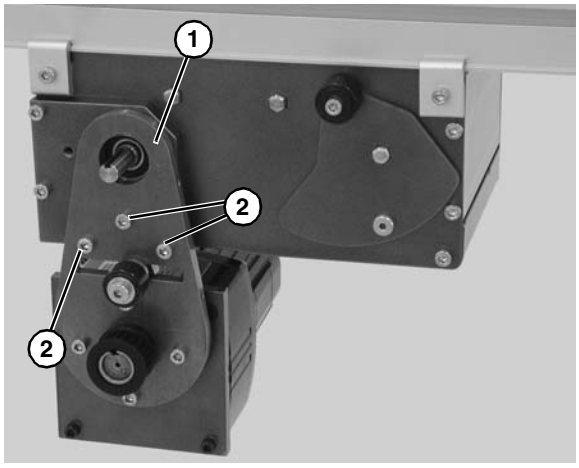


Figure 6

⚠ WARNING

Drive shaft keyway may be sharp.
HANDLE WITH CARE.

4. Install key **(Figure 7, item 1)**.

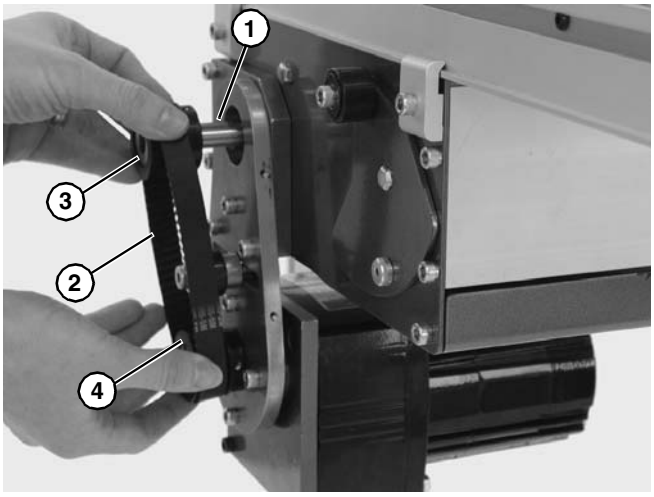


Figure 7

5. Wrap timing belt **(Figure 7, item 2)** around driven pulley **(Figure 7, item 3)** and drive pulley **(Figure 7, item 4)**. Install driven pulley (M) onto conveyor shaft.

6. Using a straight edge **(Figure 8, item 1)**, align driven pulley **(Figure 8, item 2)** with drive pulley **(Figure 8, item 3)**. Tighten driven pulley set screws **(Figure 8, item 4)**.

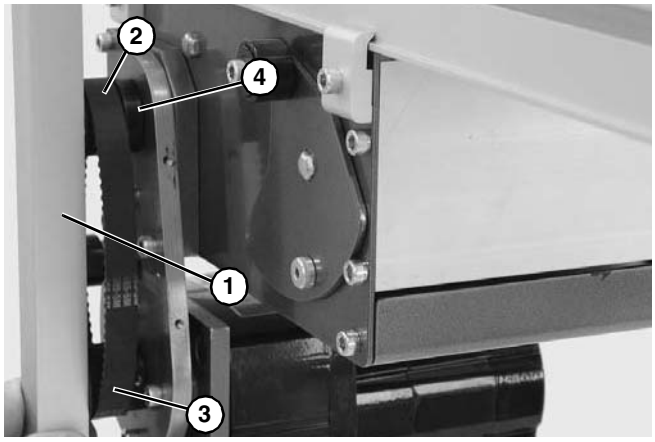


Figure 8

7. Depending on direction of conveyor belt travel (1 or 2 of **Figure 9**), position belt tensioner **(Figure 9, item 3)** as shown. Tension belt to obtain 0.125" (3 mm) deflection for 1.0 lb (456 grams) of force at belt mid-point **(Figure 9, item 4)**. Tighten tensioner screw to 103 in-lb (12 Nm).

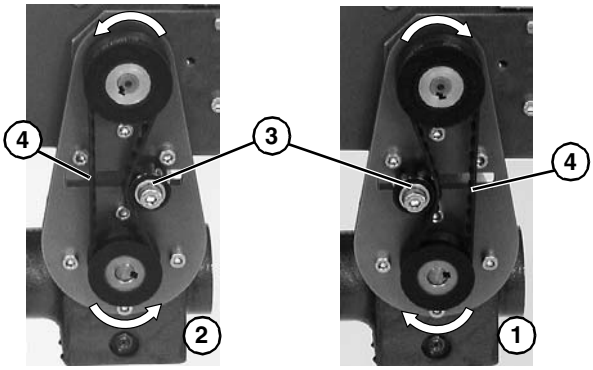


Figure 9

8. Install cover **(Figure 10, item 1)** with four (4) screws **(Figure 10, item 2)**. Tighten screws to 35 in-lb (4 Nm).

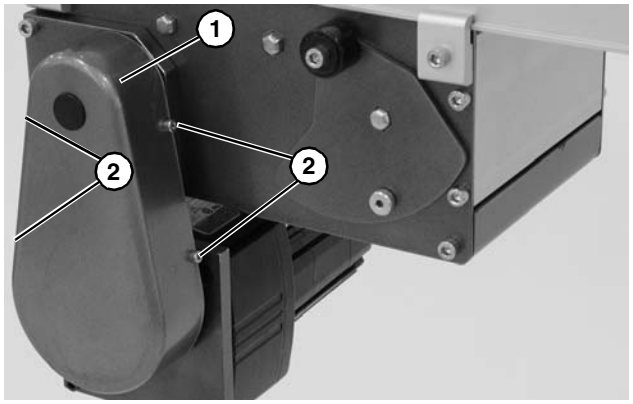


Figure 10

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 **(Figure 11, item 1)** and remove cover **(Figure 11, item 2)**.

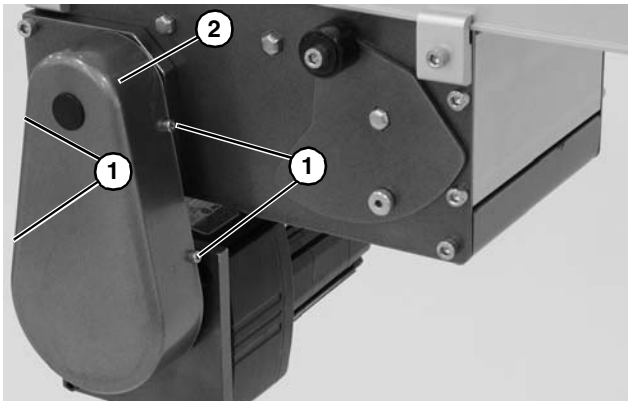


Figure 11

2. Loosen tensioner **(Figure 12, item 1)**.

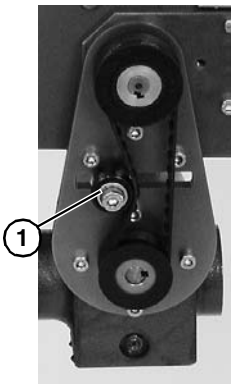


Figure 12

3. Depending on direction of conveyor belt travel (1 or 2 of **Figure 13**), position belt tensioner **(Figure 13, item 3)** as shown. Tension belt to obtain 0.125" (3 mm) deflection for 1.0 lb (456 grams) of force at belt mid-point **(Figure 13, item 4)**. Tighten tensioner screw to 103 in-lb (12 Nm).

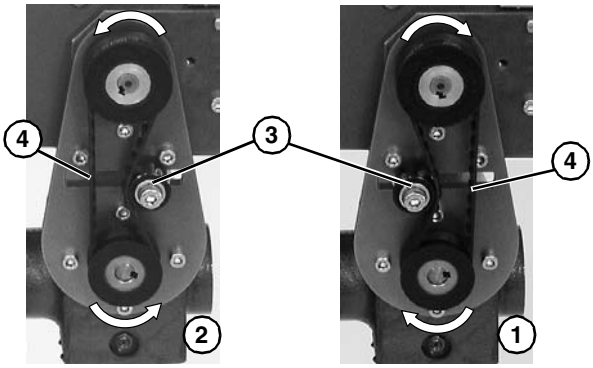


Figure 13

4. Install cover **(Figure 11, item 2)** with four (4) screws **(Figure 11, item 1)**. 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 **(Figure 14, item 1)** and remove cover **(Figure 14, item 2)**.

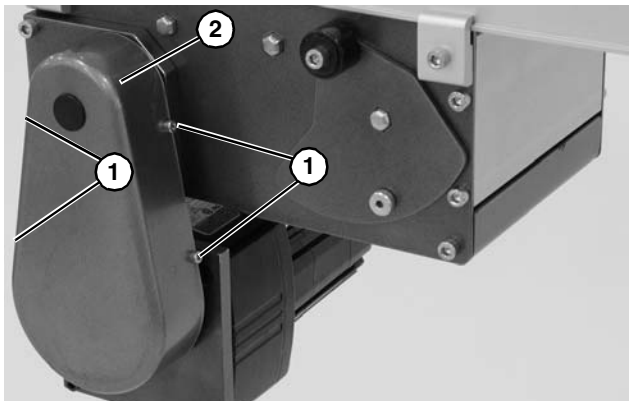


Figure 14

2. Loosen tensioner **(Figure 15, item 1)**.
3. Remove timing belt **(Figure 15, item 2)**.

NOTE

*If timing belt does not slide over pulley flange, loosen driven pulley set screws **(Figure 15, item 3)** and remove pulley **(Figure 15, item 4)** with belt **(Figure 15, item 2)**. For re-installation, see steps 5 and 6 on page 9.*

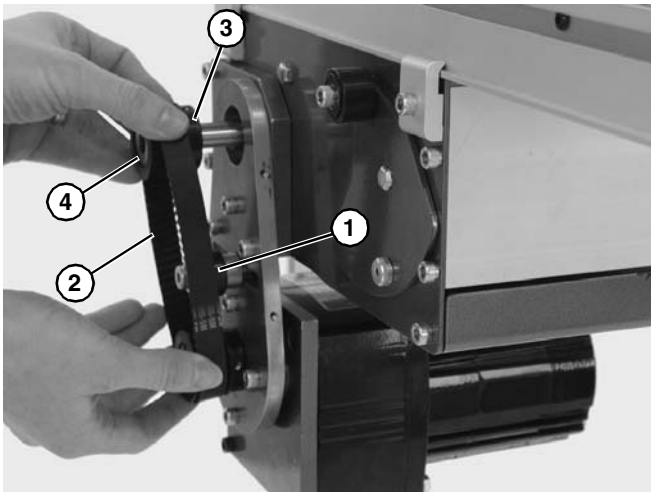


Figure 15

4. Install new timing belt.
5. Depending on direction of conveyor belt travel (1 or 2 of **Figure 16**), position belt tensioner **(Figure 16, item 3)** as shown. Tension belt to obtain 0.125" (3 mm) deflection for 1.0 lb (456 grams) of force at belt mid-point **(Figure 16, item 4)**. Tighten tensioner screw to 103 in-lb (12 Nm).

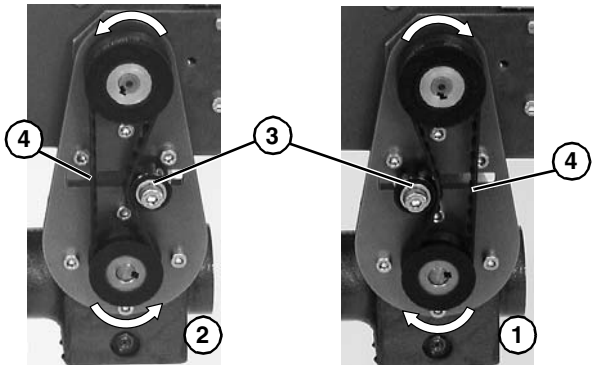


Figure 16

6. Install cover **(Figure 17, item 1)** with four (4) screws **(Figure 17, item 2)**. Tighten screws to 35 in-lb (4 Nm).

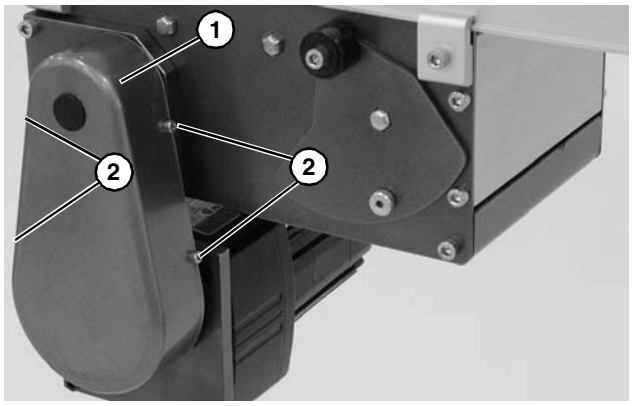


Figure 17

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 10.
2. Loosen set screws and remove drive or driven pulley.

NOTE

*If drive pulley **(Figure 26, item** J) is replaced, wrap timing belt around drive pulley and complete step 3.*

3. Complete steps 5 through 8 of "Installation" section on page 9.

Gear Motor Replacement

⚠ WARNING

Exposed moving parts can cause severe injury.

LOCK OUT POWER before removing guards or performing maintenance.

Preventive Maintenance and Adjustment

⚠ DANGER

Hazardous voltage will cause severe injury or death.

LOCKOUT POWER BEFORE before wiring.

Single Phase Motor

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

Three Phase Motor

1. Loosen terminal box screws **(Figure 18, item 1)** and remove cover **(Figure 18, item 2)**.

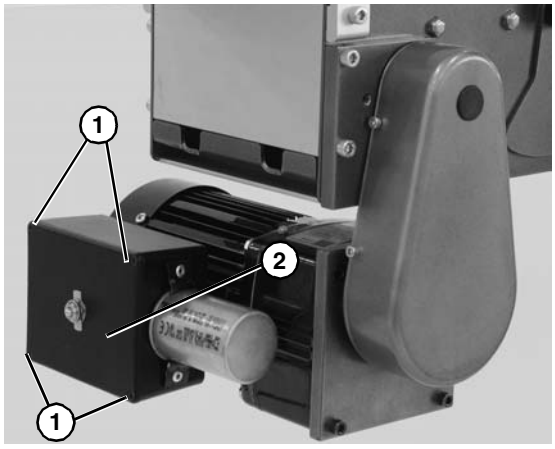


Figure 18

2. Record incoming wire colors on red, black and blue leads. Loosen wire nuts and remove incoming wires.
3. Loosen cord grip and remove cord.

DC Variable Speed Motor

1. For DC variable speed motor, unplug motor cord at disconnect **(Figure 19, item 1)**.

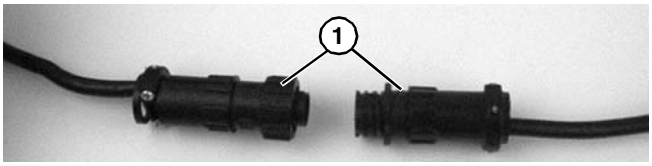


Figure 19

Brushless Motor

1. Twist covers **(Figure 20, item 1)** apart.

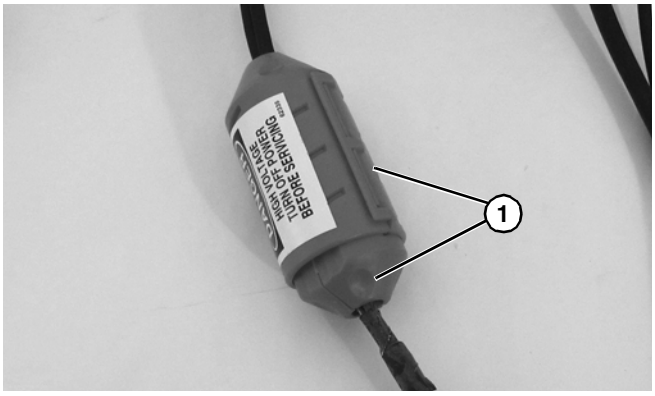


Figure 20

2. Remove outer cord cover **(Figure 21, item 1)** from inner cord cover **(Figure 21, item 2)**.

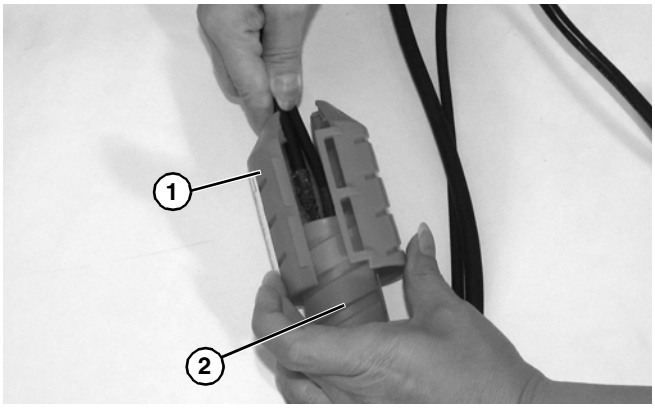


Figure 21

3. Open inner cord cover **(Figure 22, item 1)**.

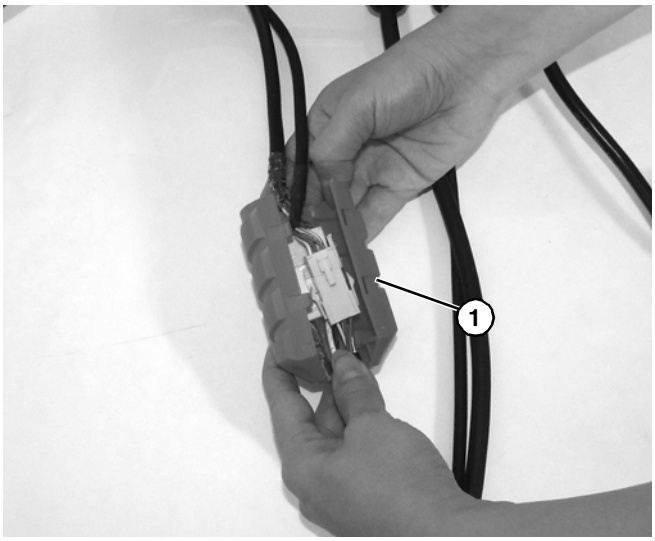


Figure 22

4. Unplug motor cord connectors **(Figure 23, item 1)** and signal cable connectors **(Figure 23, item 2)**.

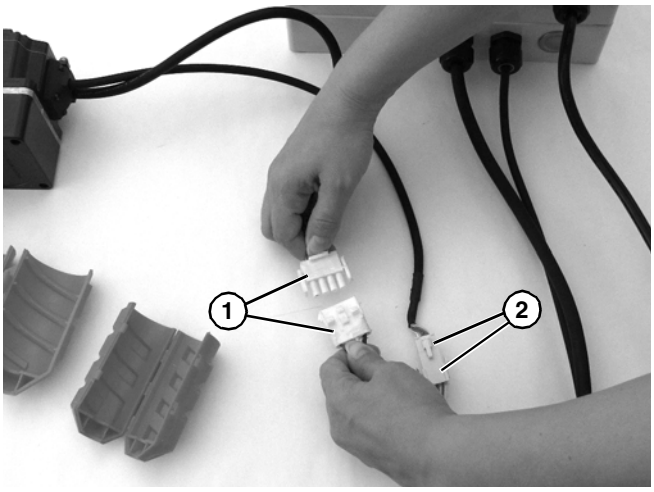


Figure 23

All Models

1. Remove four (4) screws **(Figure 24, item 1)** and remove cover **(Figure 24, item 2)**.

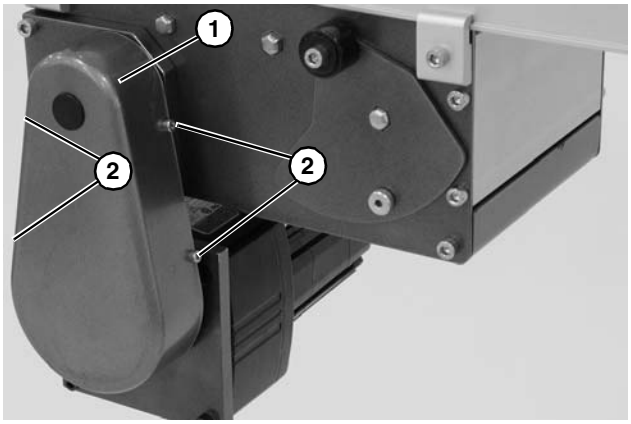


Figure 24

2. Loosen tensioner **(Figure 25, item 1)**.

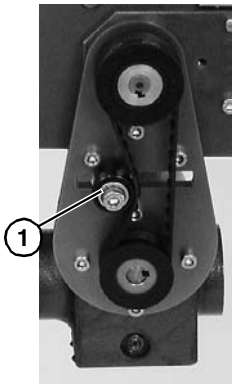


Figure 25

3. Loosen drive pulley set screws **(Figure 26, item 1)**. Remove drive pulley **(Figure 26, item 2)** and timing belt **(Figure 26, item 3)**.

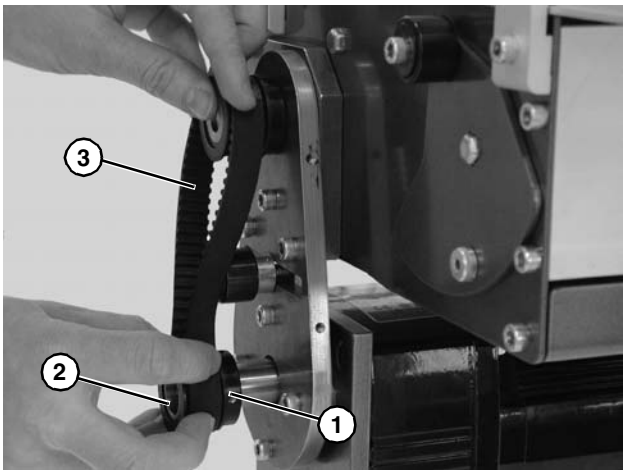


Figure 26

4. Remove four (4) gearmotor mounting screws **(Figure 27, item 1)**. Remove gearmotor **(Figure 27, item 2)** with adapter plate.

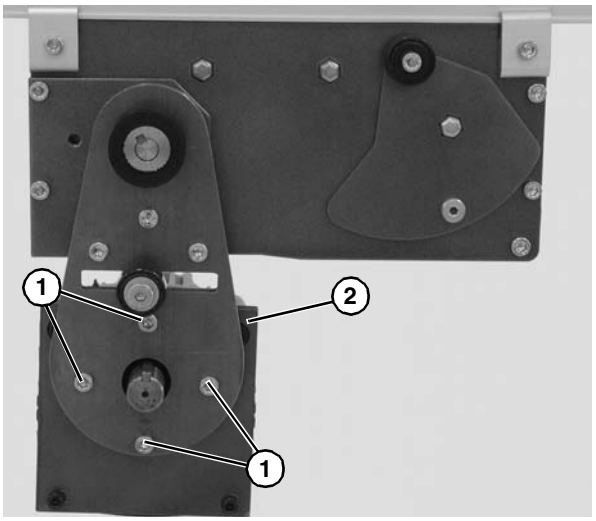


Figure 27

5. Remove four (4) adapter plate screws **(Figure 28, item 1)**. Remove adapter plate **(Figure 28, item 2)**.

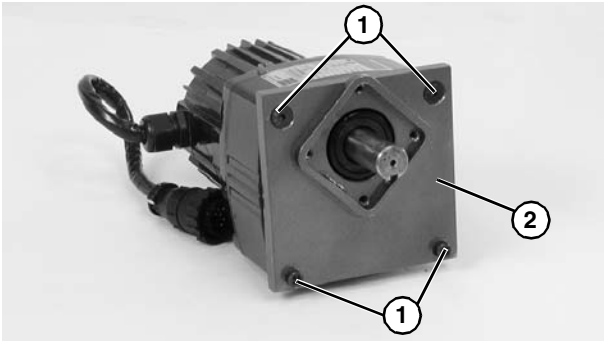


Figure 28

6. Install new gearmotor to adapter plate **(Figure 28, item 2)** and mounting bracket **(Figure 29, item 1)**. Tighten screws **(Figure 27, item 1)** to 103 in-lb (12 Nm).
7. Wrap timing belt **(Figure 29, item 2)** around drive pulley **(Figure 29, item 3)** and driven pulley **(Figure 29, item 4)**. Attach drive pulley **(Figure 29, item 3)** to drive shaft.

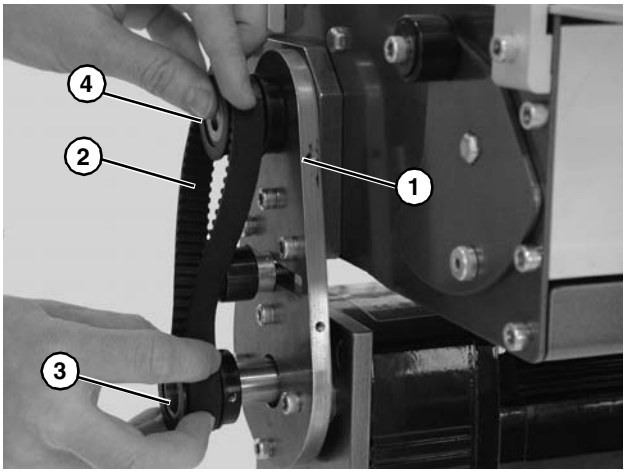


Figure 29

8. Using a straight edge **(Figure 30, item 1)**, align drive pulley **(Figure 30, item 2)** with driven pulley **(Figure 30, item 3)**. Tighten drive pulley set screws **(Figure 30, item 4)**.

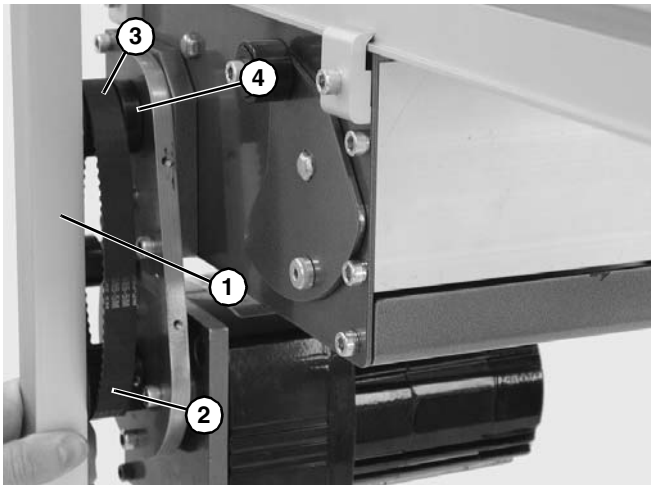


Figure 30

9. Depending on direction of conveyor belt travel (1 or 2 of **Figure 31**), position belt tensioner **(Figure 31, item 3)** as shown. Tension belt to obtain 0.125" (3 mm) deflection for 1.0 lb (456 grams) of force at belt mid-point **(Figure 31, item 4)**. Tighten tensioner screw to 103 in-lb (12 Nm).

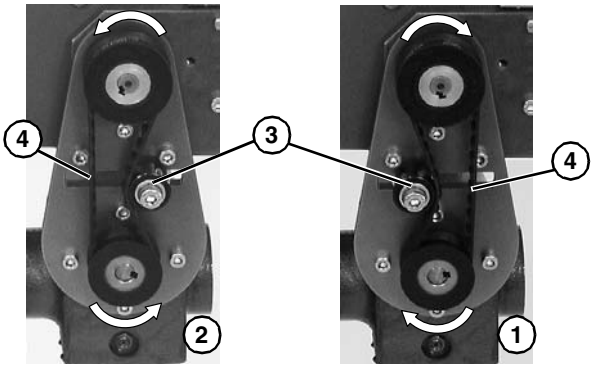


Figure 31

10. Install cover **(Figure 32, item 1)** with four (4) screws **(Figure 32, item 2)**. Tighten screws to 35 in-lb (4 Nm).

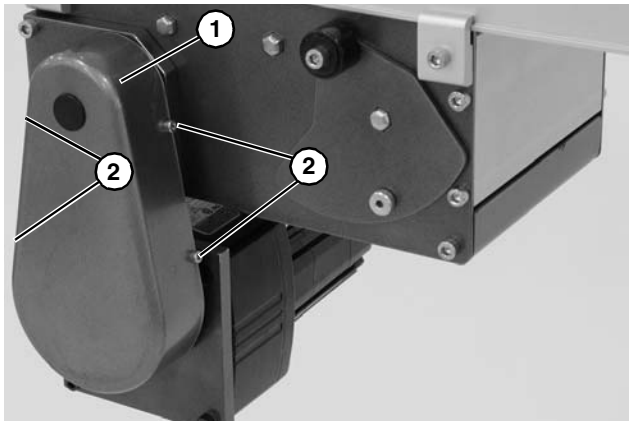


Figure 32

11. Replace wiring:

- For a single phase motor, reverse step 1 in "Single Phase Motor" on page 12.
- For a three phase motor, reverse steps 1-3, in "Three Phase Motor" on page 12.
- For a DC variable speed motor, reverse step 1 on "DC Variable Speed Motor" on page 12.
- For a brushless motor, reverse steps 1-2 on "Brushless Motor" on page 12.

Service Parts

NOTE

For replacement parts other than those shown in this section, 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 Number	Part Description
1	62M180PS411FN	Motor, 0.08hp (0.06Kw), 10 RPM, 115VAC, 60Hz, 1-Phase
	62M180PS411FR	Motor, 0.08hp (0.06Kw), 10 RPM, 115VAC, 60Hz, 1-Phase with reversing switch
	62M060PS411FN	Motor, 0.17hp (0.13Kw), 29 RPM, 115VAC, 60Hz, 1-Phase
	62M060PS411FR	Motor, 0.17hp (0.13Kw), 29 RPM, 115VAC, 60Hz, 1-Phase with reversing switch
	62M060PS423FN	Motor, 0.25hp (0.19Kw), 29 RPM, 230VAC, 60Hz, 3-Phase
	62M030PS411FN	Motor, 0.17hp (0.13Kw), 58 RPM, 115VAC, 60Hz, 1-Phase
	62M030PS411FR	Motor, 0.17hp (0.13Kw), 58 RPM, 115VAC, 60Hz, 1-Phase with reversing switch
	62M030PS423FN	Motor, 0.25hp (0.19Kw), 58 RPM, 230VAC, 60Hz, 3-Phase
	62M020PS411FN	Motor, 0.17hp (0.13Kw), 86 RPM, 230VAC, 60Hz, 1-Phase
	62M020PS411FR	Motor, 0.17hp (0.13Kw), 86 RPM, 115VAC, 60Hz, 1-Phase with reversing switch
	62M010PS411FN	Motor, 0.17hp (0.13Kw), 173 RPM, 115VAC, 60Hz, 1-Phase
	62M010PS411FR	Motor, 0.17hp (0.13Kw), 173 RPM, 115VAC, 60Hz, 1-Phase with reversing switch
	62M010PS423FN	Motor, 0.25hp (0.19Kw), 173 RPM, 230VAC, 60Hz, 3-Phase
	62M005PS411FN	Motor, 0.17hp (0.13Kw), 345 RPM, 230VAC, 60Hz, 1-Phase
	62M005PS411FR	Motor, 0.17hp (0.13Kw), 345 RPM, 115VAC, 60Hz, 1-Phase with reversing switch
	62M180PSD3DEN	Motor, 0.12hp (0.09Kw), 14 RPM, 130VDC
	62M060PSD3DEN	Motor, 0.25hp (0.19Kw), 42 RPM, 130VDC
	62M050PSBDDEN	Motor, 0.25hp (0.19Kw), 60 RPM, Brushless DC
	62M020PSBDDEN	Motor, 0.25hp (0.19Kw), 150 RPM, Brushless DC
	62M010PSBDDEN	Motor, 0.25hp (0.19Kw), 300 RPM, Brushless DC
	62M005PSD3DEN	Motor, 0.25hp (0.19Kw), 500 RPM, 130VDC
	62M020PSD3DEN	Motor, 0.25hp (0.19Kw), 125 RPM, 130VDC
	62M010PSD3DEN	Motor, 0.25hp (0.19Kw), 250 RPM, 130VDC
	62M005PSD3DEN	Motor, 0.25hp (0.19Kw), 500 RPM, 130VDC

Item	Part Number	Part Description
2	814-103	Timing Belt, 15mm W x 385mm L
	814-100	Timing Belt, 15mm W x 400mm L
	814-096	Timing Belt, 15mm W x 425mm L
	814-105	Timing Belt, 15mm W x 460mm L
3	802-046	Tensioner Bearing
4	450365MP	Driven Pulley, 19 Tooth
	450366MP	Driven Pulley, 22 Tooth
	450367MP	Driven Pulley, 28 Tooth
	450368MP	Driven Pulley, 32 Tooth
5	980422M	Square Key, 4 mm x 22 mm (2x)
6	450434	Drive Pulley, 22 Tooth
	450435	Drive Pulley, 28 Tooth
	450436	Drive Pulley, 32 Tooth
	450437	Drive Pulley, 44 Tooth
	450438	Drive Pulley, 48 Tooth
	450439	Drive Pulley, 60 Tooth
7	912-078	Square Key, 0.188" x 0.75" Lg

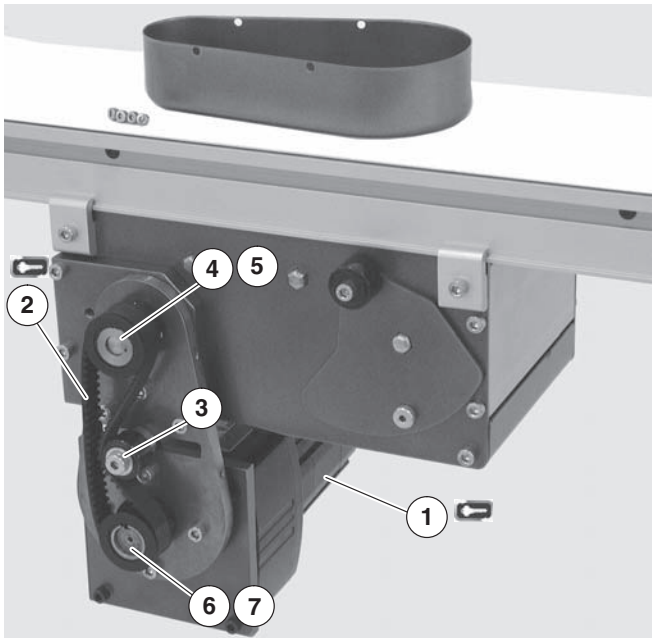


Figure 33

Service Parts

Pulley Ratio / Timing Belt Combinations

Motor	Conveyor	Pulley	Timing Belt
19	32	0.59	814-103
22	28	0.79	814-103
22	32	0.69	814-100
28	22	1.27	814-103
28	32	0.88	814-096
32	19	1.68	814-103
32	22	1.45	814-100
32	28	1.14	814-096
32	32	1.00	814-096
44	19	2.32	814-096
44	22	2.00	814-096
44	28	1.57	814-105
44	32	1.38	814-105
48	19	2.53	814-104
48	22	2.18	814-105
48	28	1.71	814-105
48	32	1.50	814-105

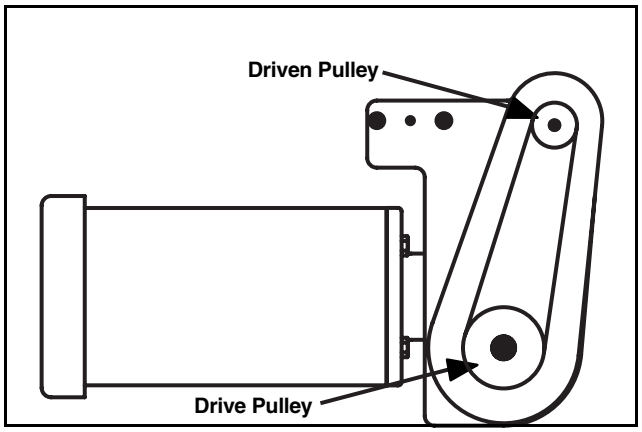


Figure 34

Notes

Return Policy

Returns must have prior written factory authorization or they will not be accepted. Items that are returned to Dorner without authorization will not be credited nor returned to the original sender. 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. Dorner part number(s) of 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 (if available, part serial number).

A representative will discuss action to be taken on the returned items and provide a Returned Goods Authorization (RMA) number for reference. RMA will automatically close 30 days after being issued. To get credit, items must be new and undamaged. There will be a return charge on all items returned for credit, where Dorner was not at fault. It is the customer's responsibility to prevent damage during return shipping. Damaged or modified items will not be accepted. The customer is responsible for return freight.

Conveyors and conveyor accessories

Standard catalog conveyors	30%
MPB, 7200, 7300 Series, cleated and specialty belt	50%
AquaGard & AquaPruf Series conveyors	non-returnable items
Engineered to order products	case by case
Drives and accessories	30%
Sanitary stand supports	non-returnable items

Parts

Standard stock parts	30%
Plastic chain, cleated and specialty belts	non-returnable items

Returns will not be accepted after 60 days from original invoice date. The return charge covers inspection, cleaning, disassembly, disposal and reissuing of components 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. Contact Dorner for the name of your local representative. Our Customer Service Team will gladly help with your questions on Dorner products.

For a copy of Dorner's 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 MFG. CORP.
975 Cottonwood Ave., PO Box 20
Hartland, WI 53029-0020 USA
TEL 1-800-397-8664 (USA)
FAX 1-800-369-2440 (USA)
Internet: www.dorner.com

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

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