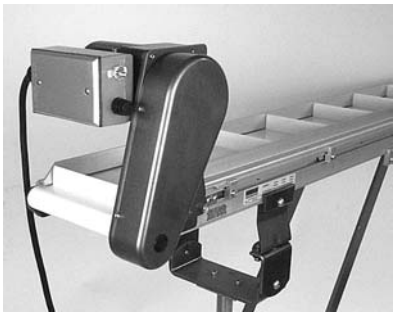
2100, 2200, 4100, 6200 and MPB Series Top Mount Drive Package for Light Load 60 Hz Gearmotors

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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851-261 Rev. K

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 and MPB Series conveyors are covered by patent number 5,174,435, 6,422,382 and corresponding patents and patent applications in other countries.

Dorner 4100 Series conveyors are covered by patent number 3,923,148, 5,131,529 and corresponding patents and patent applications in other countries.

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

⚠ 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.

⚠ DANGER

Hazardous voltage will cause severe injury or death.

LOCK OUT POWER BEFORE WIRING.

⚠ WARNING

Gearmotors may be HOT.

DO NOT TOUCH Gearmotors.

⚠ WARNING

Exposed moving parts can cause severe injury.

LOCK OUT POWER before removing guards or performing maintenance.

⚠ 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 startup.

⚠ WARNING

MPB Series Conveyors are not reversible. Reversing creates pinch points which can cause severe injury.

DO NOT REVERSE MPB SERIES CONVEYORS.

Product Description

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

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

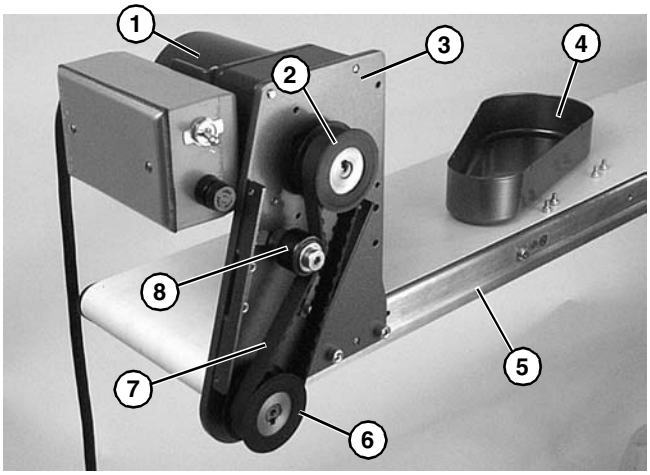


Figure 1

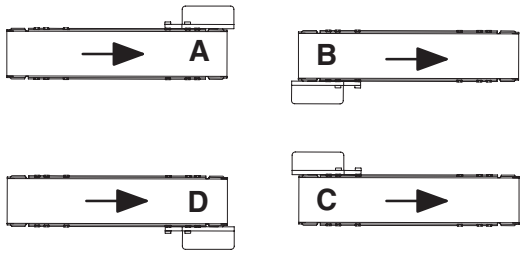
Specifications

Gearmotor Mounting Package Models:

Example:

2 M T P L WW A – 32 32

- **Driven Pulley (see Belt Speed Tables)**
- **Drive Pulley (see Belt Speed Tables)**
- **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 = Fixed Speed**
  - **V = Variable Speed**
  - **A = Brushless DC**
- **Output Shaft Type = Parallel Shaft**
- **Mount Style = Top Mount**
- **Language Code = U.S. English**
- **2 = 2100 Series Conveyor**
  22 = 2200 Series Conveyor
  4 = 4100 Series Conveyor
  6 = 6200 Series Conveyor
  2P = MPB Series Conveyor



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

* See "Ordering and Specifications" Catalog for details.

Table 1: Gearmotor Specifications

	Single Phase	DC Variable Speed	Brushless DC
Output Power	0.03 hp (0.025 kw)	0.06 hp (0.04 kw)	0.083 hp (0.06 kw)
Input Voltage	115 Volts A.C.	130 Volts D.C.	*115/230 Volts D.C.
Input Frequency	60 Hz	N/A	60 Hz
Full Load Amperes	0.49 Amperes	0.48 Amperes	4.5/1.5 Amperes
Gearmotor Ratios	15:1 and 36:1	18:1 and 60:1	15:1, 20:1 and 50:1

* Controller Inputs

Table 2: RPM/Torque for Light Load Fixed Speed Parallel Shaft 60 Hz Gearmotors

Gearmotors*				
Part Number	**Gear Ratio**	**RPM**	**In-lb**	**N-m**
62M036PL4FN	36:1	42	36	4.1
62M015PL4FN	15:1	100	15	1.7

* 115V, 1 phase, non-reversing

Table 3: RPM/Torque for Light Load Variable Speed Parallel Shaft DC Gearmotors

Gearmotors*				
Part Number	**Gear Ratio**	**RPM**	**In-lb**	**N-m**
62M060PLD3DEN	60:1	5-42	65	7.4
62M018PLD3DEN	18:1	17-139	21	2.4

* 130VDC

Table 4: RPM/Torque for Light Load Brushless DC Gearmotors

Gearmotors*				
Part Number	**Gear Ratio**	**RPM**	**In-lb**	**N-m**
62M050PLBDDEN	50:1	2-60	76	8.6
62M020PLBDDEN	20:1	5-150	31	3.6
62M015PLBDDEN	15:1	7-200	23	2.7

* 130VDC

Specifications

Table 5: Pulley Ratio/Timing Belt Number

Motor (Drive) Pulley Teeth	Conveyor (Driven) Pulley Teeth	Pulley Ratio	Timing Belt	
			2200/MB/ MPB	4100/ 6200
19	32	0.59	N/A	814-104
22	32	0.69	N/A	814-105
28	22	1.27	N/A	814-104
28	28	1.00	814-105	N/A
28	32	0.88	814-105	814-065
32	19	1.68	814-104	814-104
32	22	1.45	814-104	814-105
32	28	1.14	814-105	814-065
44	19	2.32	814-065	814-101
44	22	2.00	814-101	814-101
44	28	1.57	814-101	814-101
44	32	1.38	N/A	814-064

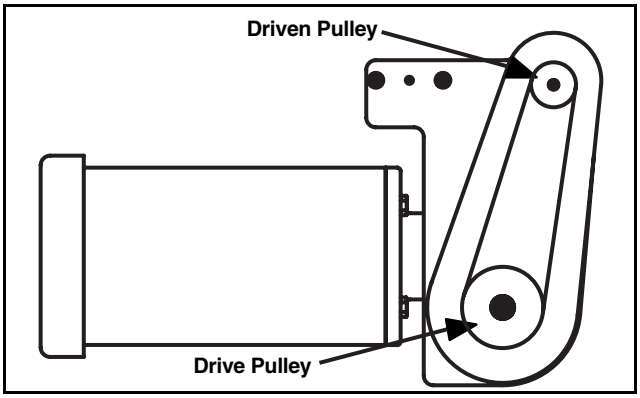


Figure 2

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 light load variable speed 60:1 gearmotor with 22 tooth sprocket on gearmotor (Drive) and 32 tooth sprocket on the conveyor output shaft (Driven).

Gearmotor =	62M060PL3DEN	= 5 - 42 RPM
Pulley Kit =	22 t mtr. - 32 t conv.	= 0.69
Speed Factor =	2200 Series	= 0.350 ft/min per RPM
Minimum Belt Speed =	5 x 0.69 x 0.350	= 1.2 Ft/min
Maximum Belt Speed =	42 x 0.69 x 0.350	= 10.1 Ft/min

Required Tools

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

Installation Component List:

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

Mounting

⚠ WARNING

Exposed moving parts can cause severe injury.

LOCK OUT POWER before removing guards or performing maintenance.

⚠ WARNING

MPB Series Conveyors are not reversible. Reversing creates pinch points which can cause severe injury.

DO NOT REVERSE MPB SERIES CONVEYORS.

1. Typical components **(Figure 3)**

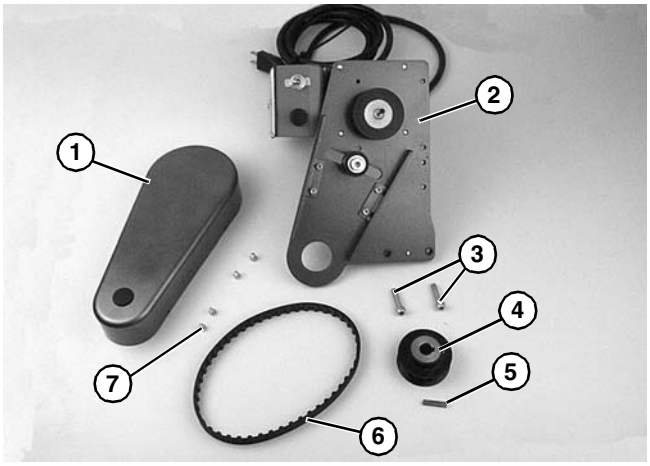


Figure 3

NOTE

6200 conveyor shown, other Series similar.

2. Locate drive output shaft **(Figure 4, item 1)** and remove two screws **(Figure 4, item 2)**.

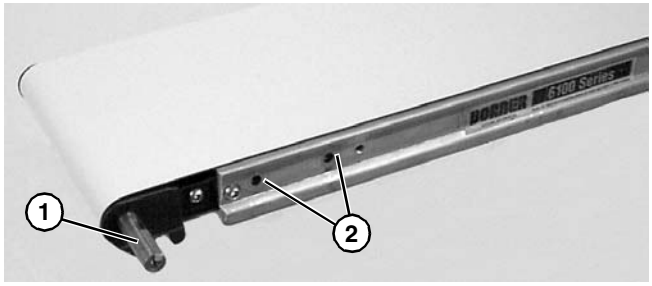


Figure 4

3. Install M6x8 socket head screw **(Figure 5, item 1)** and washer.

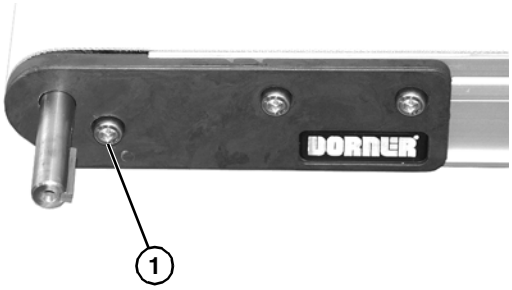
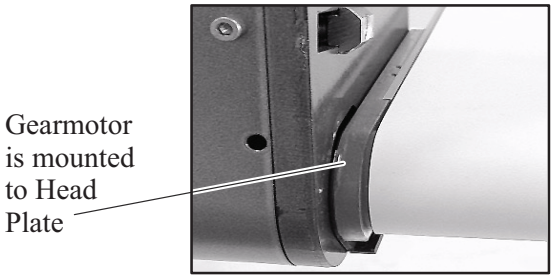


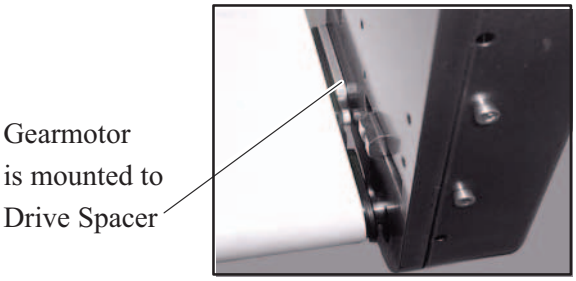
Figure 5

4. For your reference, the following five figures show the attachment area of complete mounting packages for various conveyor series.



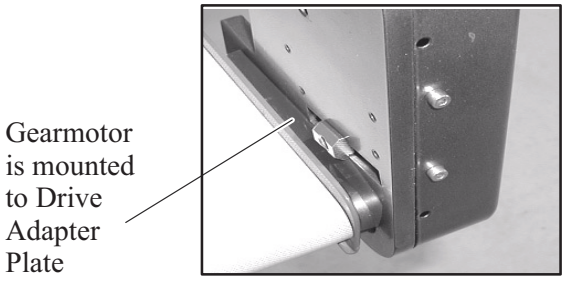
2200 Series

Figure 6



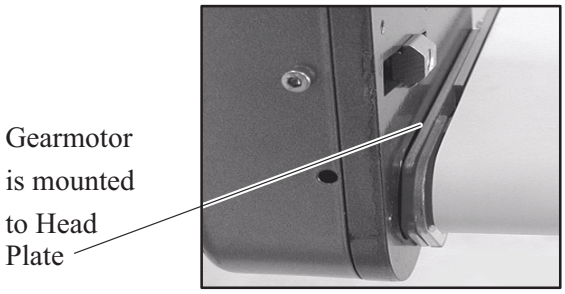
6100 Series

Figure 7



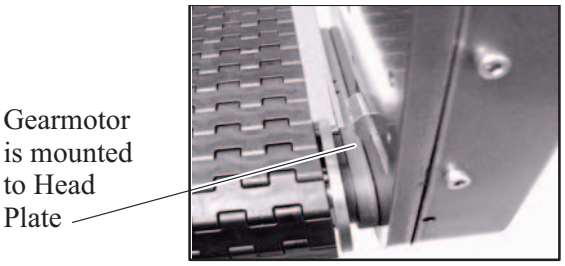
4100 Series

Figure 8



2100 Series

Figure 9



MPB Series

Figure 10

5. Attach mount assembly **(Figure 11, item 1)** with two screws **(Figure 11, item 2)**. Tighten screws to 80 in-lb (9 Nm).

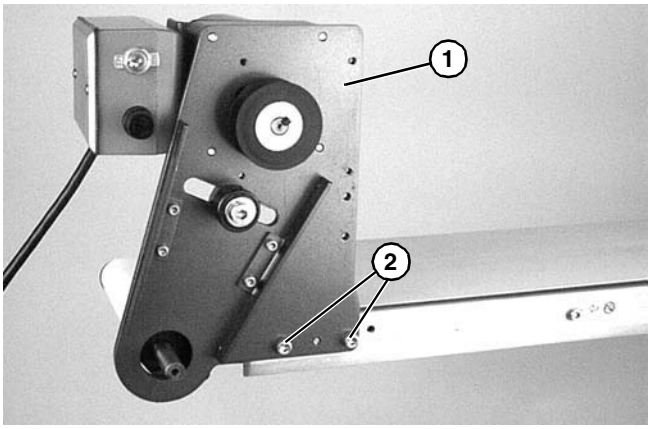


Figure 11

⚠ WARNING

Drive shaft keyway may be sharp.
HANDLE WITH CARE.

6. Install key **(Figure 12, item 1)**.

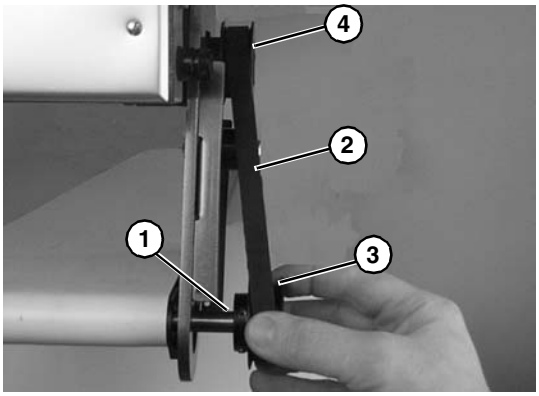


Figure 12

7. Wrap timing belt **(Figure 12, item 2)** around driven pulley **(Figure 12, item 3)** and drive pulley **(Figure 12, item 4)**. Install driven pulley **(Figure 12, item 3)** onto conveyor shaft.
8. Remove cam bearing and spacer **(Figure 14, item 1)**.

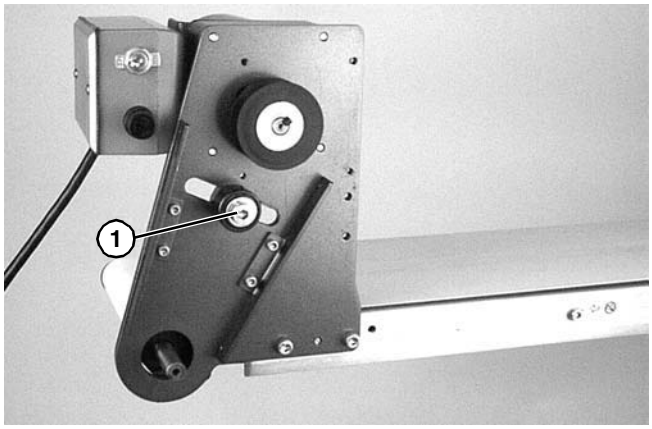


Figure 13

9. Place the cam bearing and spacer **(Figure 14, item 1)** next to the driven pulley **(Figure 14, item 1)**. Ensure the flanges of the driven pulley are aligned with the cam bearing. Tighten set screws on driven pulley (J). This will allow for proper belt alignment while conveyor is in use. Install cam bearing and spacer (U).

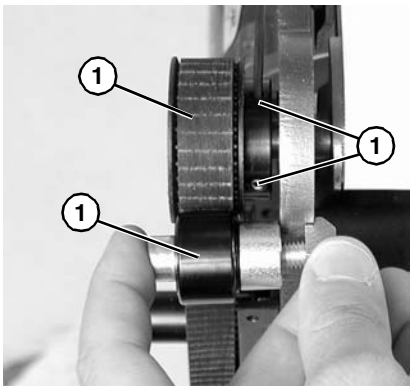


Figure 14

10. Depending on direction of conveyor belt travel (1 or 2 of **Figure 15**), position timing belt tensioner **(Figure 15, item 3)** as shown. Tension timing belt to obtain 1/8" (3 mm) deflection for 1 lb (456 grams) of force at timing belt mid-point **(Figure 15, item 4)**. Tighten tensioner screw to 106 in-lb (12 Nm).

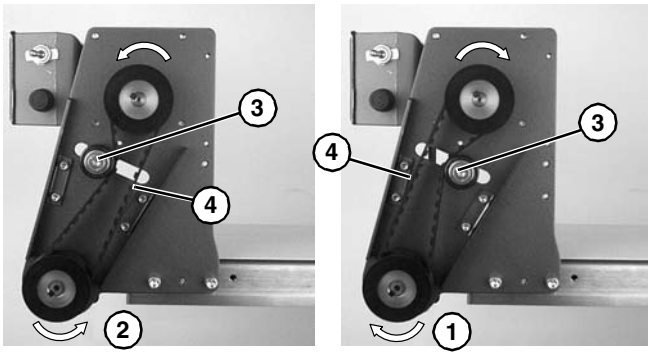


Figure 15

11. Install cover **(Figure 16, item 1)** with four (4) screws **(Figure 16, item 2)**. Tighten to 35 in-lb (4 Nm).

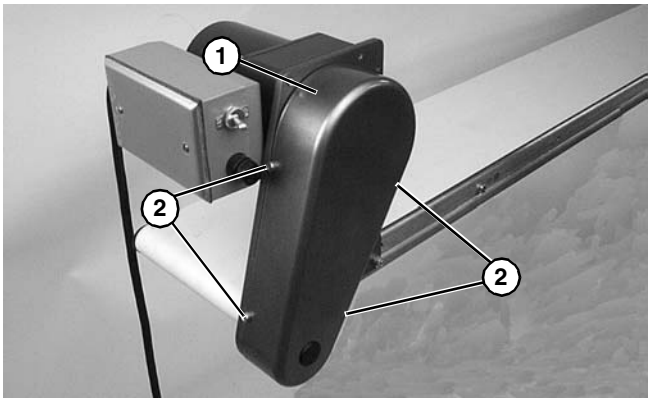


Figure 16

Required Tools

- Hex key wrenches:
  2.5 mm, 3 mm, 5 mm
- Screwdriver (for terminal box screws)
- 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 screws **(Figure 17, item 1)** and remove cover **(Figure 17, item 2)**.

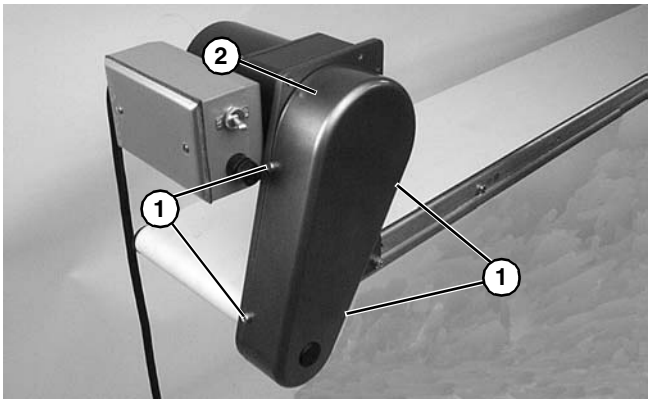


Figure 17

2. Loosen tensioner **(Figure 18, item 1)**.

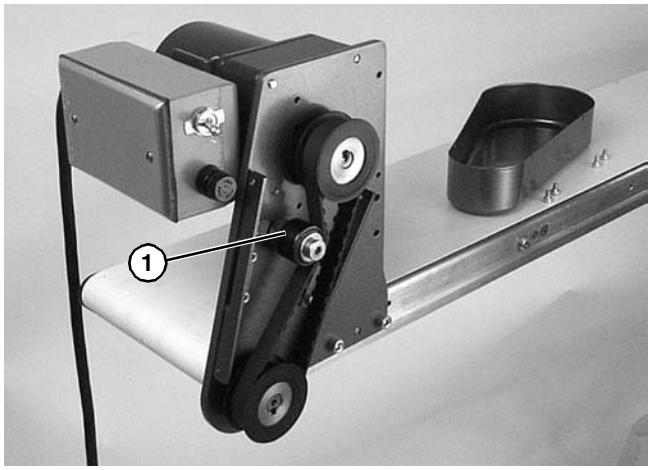


Figure 18

3. Depending on direction of conveyor belt travel (1 or 2 of **Figure 19**), position timing belt tensioner **(Figure 19, item 3)** as shown. Tension timing belt to obtain 1/8" (3 mm) deflection for 1 lb (456) grams of force at timing belt mid-point **(Figure 19, item 4)**. Tighten tensioner screw to 106 in-lb (12 Nm).

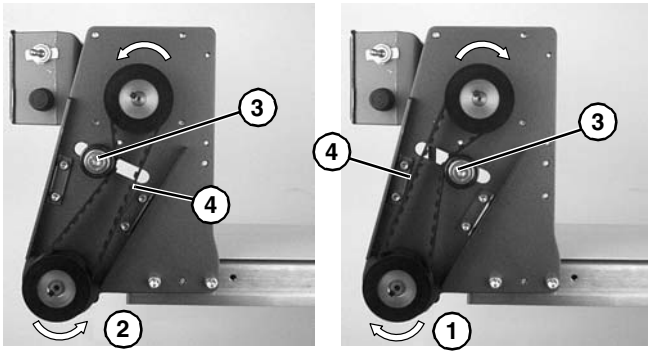


Figure 19

4. Install cover **(Figure 17, item 2)** with four (4) screws **(Figure 17, 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 17, item 1)** and remove cover **(Figure 17, item 2)**.
2. Loosen tensioner **(Figure 18, item 1)**.

3. Remove timing belt (**Figure 20, item 1**).

NOTE

*If timing belt does not slide over driven pulley flange **(Figure 20, item 2)**, loosen driven pulley set screws **(Figure 20, item 3)** and remove pulley with belt. For re-installation, see steps 6 through 9 on page 9.*

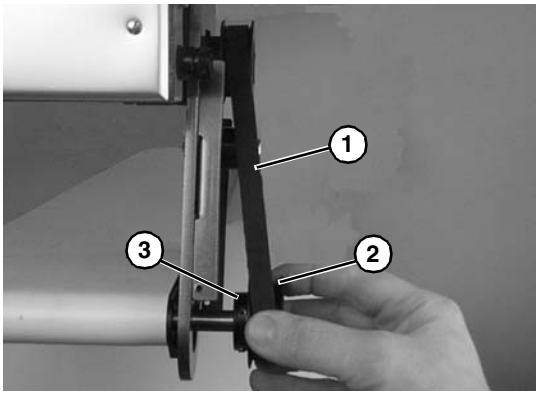


Figure 20

4. Install new timing belt.
5. Depending on direction of conveyor belt travel (1 or 2 of **Figure 19**), position timing belt tensioner **(Figure 19, item 3)** as shown. Tension timing belt to obtain 1/8" (3 mm) deflection for 1 lb (456 grams) of force at timing belt mid-point **(Figure 19, item 4)**. Tighten tensioner screw to 106 in-lb (12 Nm).
6. Install cover **(Figure 17, item 2)** with four (4) screws **(Figure 17, item 1)**. 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 10.
2. Loosen set screws and remove drive or driven pulley.

NOTE

*If drive pulley **(Figure 21, item 1)** is replaced, wrap timing belt **(Figure 21, item 2)** around drive pulley and complete step 3.*

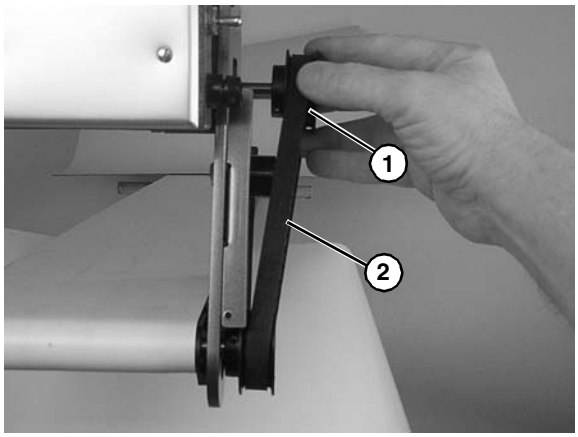


Figure 21

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

Gearmotor 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.

Single Phase Motor

1. Unplug power cord from outlet.

DC Variable Speed Motor

1. For DC variable speed motor, unplug motor cord at disconnect **(Figure 22, item 1)**.

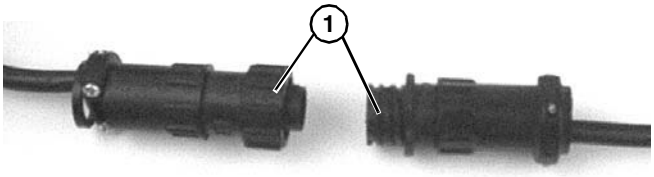


Figure 22

Brushless DC Motor

1. Twist covers **(Figure 23, item 1)** apart.

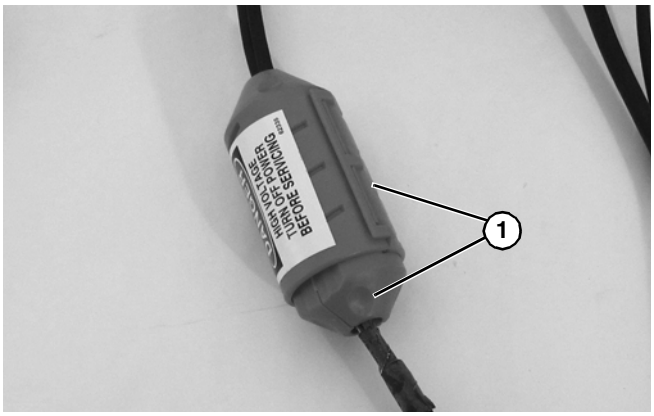


Figure 23

2. Remove outer cord cover **(Figure 24, item 1)** from inner cord cover **(Figure 24, item 2)**.

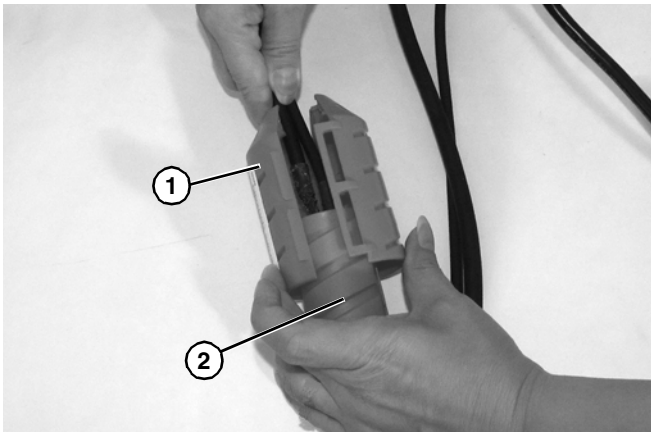


Figure 24

3. Open inner cord cover **(Figure 25, item 1)**.

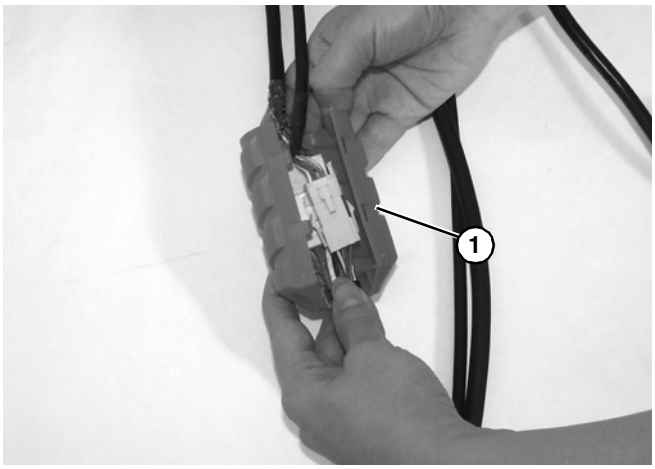


Figure 25

4. Unplug motor cord connectors **(Figure 26, item 1)** and signal cable connectors **(Figure 26, item 2)**.

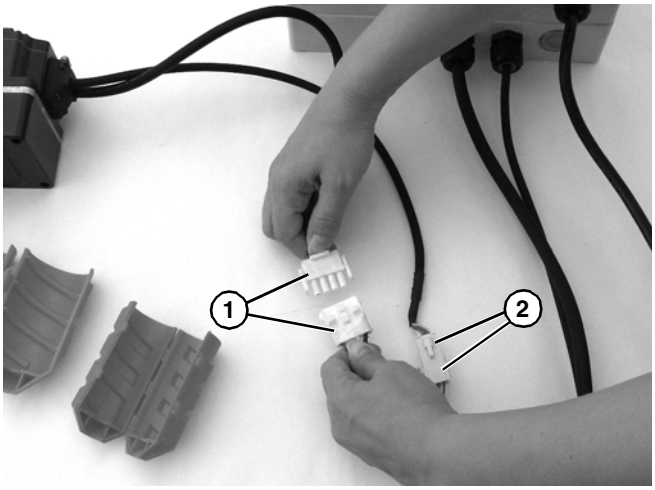


Figure 26

All Models

1. Remove four (4) screws **(Figure 27, item 1)** and remove cover **(Figure 27, item 2)**.

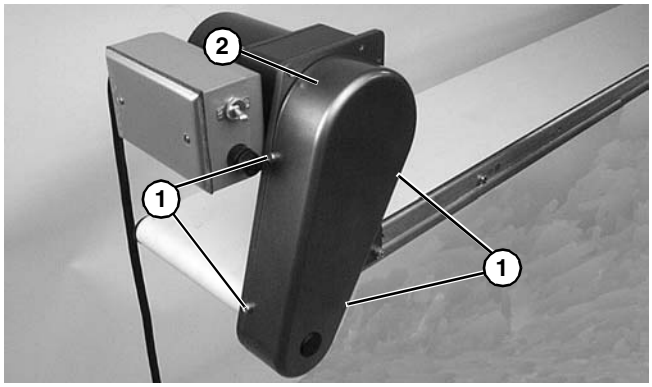


Figure 27

2. Loosen tensioner **(Figure 28, item 1)**.

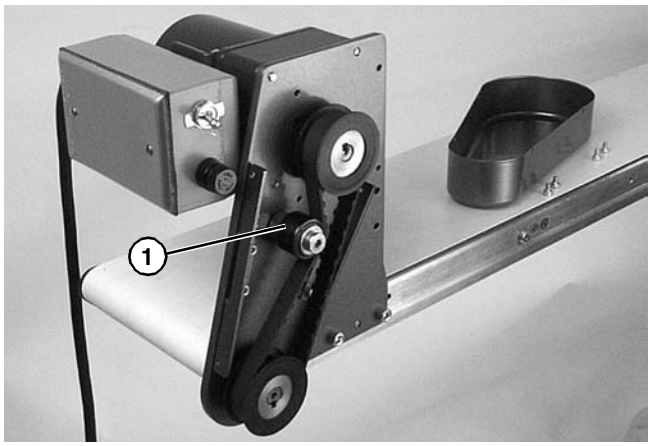


Figure 28

3. Remove timing belt **(Figure 29, item 1)**.

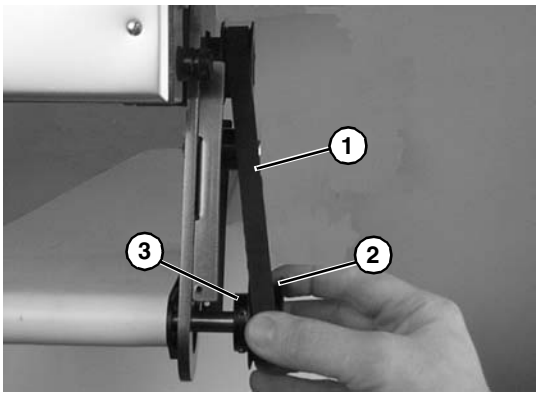


Figure 29

NOTE

*If timing belt does not slide over drive pulley flange **(Figure 29, item 2)**, loosen driven pulley set screws **(Figure 29, item 3)** and remove pulley with belt **(Figure 29, item 1)**. For re-installation, see steps 6 through 9 on page 9.*

4. Loosen two (2) set screws **(Figure 30, item 1)**. Remove drive pulley **(Figure 30, item 2)**.

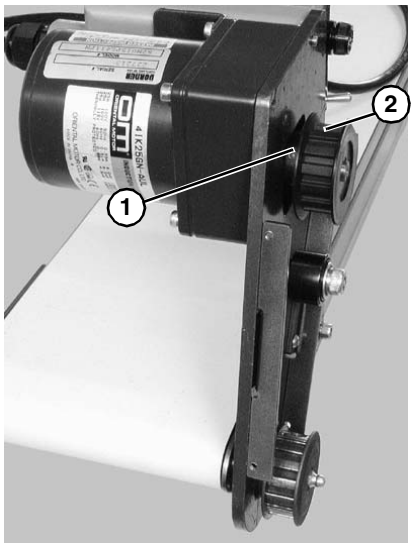


Figure 30

5. Remove four (4) screws **(Figure 31, item 1)** and detach gearmotor.

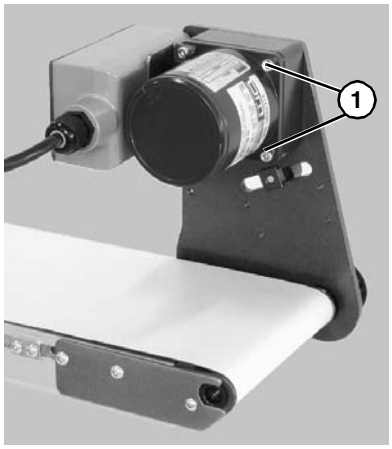


Figure 31

6. Mount new gearmotor with four (4) screws **(Figure 31, item 1)**. Tighten to 45 in-lb (5 Nm).
7. Replace drive pulley **(Figure 30, item 2)** and tighten set screws **(Figure 30, item 1)**.
8. Complete steps 6 through 9 of "Installation" section on page 9.
9. Replace wiring:

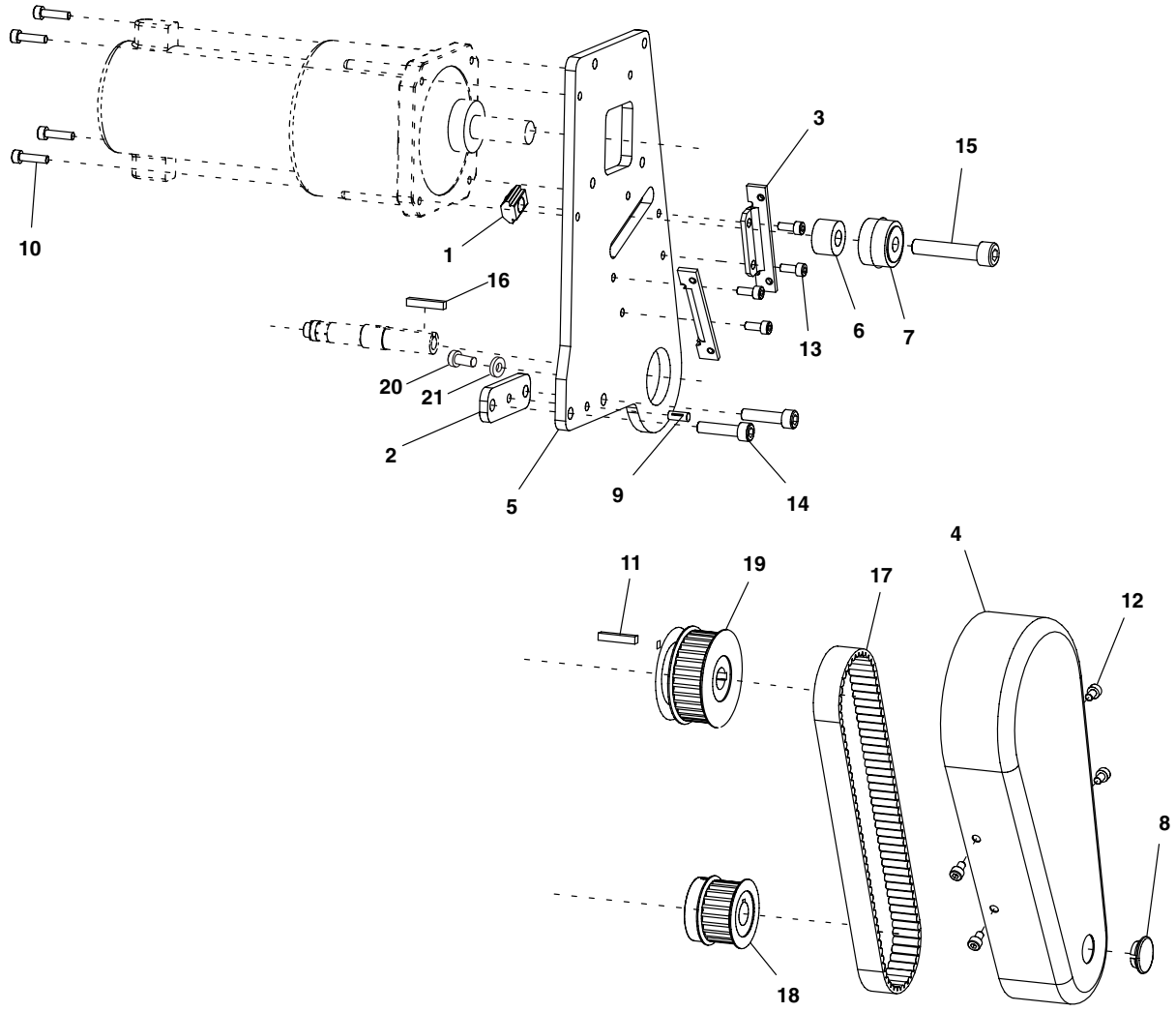
- For a single phase motor, reverse step 1 in "Single Phase Motor" on page 11.
- For a DC variable speed motor, reverse step 1 on "DC Variable Speed Motor" on page 12.
- For a brushless motor, reverse steps 1-2 on "Brushless DC Motor" on page 12.

Service Parts

NOTE

For replacement parts other than those shown in this section, contact an authorized Dorner Service Center or the factory.

2100, 2200, 4100, 6200 and MPB Series Top Mount Drive Package



Item	Part Number	Description
1	202390M	Nut, Cam Follower
2	450027M	Drive Spacer (2100, 6200 Only)
	450377M	Drive Spacer (4100 Only)
3	450375M	Cover Mounting Bracket
4	450376M	Drive Guard
5	450026M	Light Duty Motor Mount Plate
6	450445	Spacer, Cam Follower (Fixed Speed Gearmotors only)
	450195	Spacer, Cam Follower (Variable Speed Gearmotors only)
7	802-046	Bearing
8	807-226	Snap-out Plastic Plug
9	807-952	Groove Pin (2100, 4100, 6200 Only)
10	920545M	Socket Head Screw M5x45mm - 15:1 Gearhead (Fixed Speed Gearmotor Only)
	920555M	Socket Head Screw M5x55mm - 36:1 Gearhead (Fixed Speed Gearmotor Only)
	920416M	Socket Head Cap Screw M4x16mm (Variable Speed Gearmotor Only)
	920560M	Socket Head Cap Screw M5x60mm (Brushless DC Gearmotor Only)
11	980422M	Square Key, 0.4mm x 22mm (Fixed Speed Gearmotor Only)
	912-084	Square Key, 0.125" x 0.75" (Variable Speed Gearmotor Only)
12	920481M	Socket Head Screw M4 x 8mm
13	920408M	Socket Head Screw M4 x 8mm
14	920625M	Socket Head Screw M6 x 25mm (2100)
	920622M	Socket Head Screw M6 x 22mm (2200)
	920618M	Socket Head Screw M6 x 18mm(4100)
	920630M	Socket Head Screw M6 x 30mm (6200)
15	920840M	Socket Head Screw M8 x 40mm
16	980422M	Square Key 4mm x 22mm
	912-084	Square Key, 0.125" x 0.75"(1" Wide Conveyor - 4100 Only)
17	814-105	Timing Belt, 15mm W x 460mm L
	814-065	Timing Belt, 15mm W x 475mm L
	814-101	Timing Belt, 15mm W x 500mm L
	814-108	Timing Belt, 15mm W x 520mm L
18	450366MP	Driven Pulley, 22Tooth, 12mm bore
	450367MP	Driven Pulley, 28Tooth, 12mm bore
	450368MP	Driven Pulley,32Tooth, 12mm bore
19	450384MP	Drive Pulley, 22Tooth, 10mm bore
	450385MP	Drive Pulley, 28Tooth, 10mm bore
	450386MP	Drive Pulley, 32Tooth, 10mm bore
	450387MP	Drive Pulley, 44Tooth, 10mm bore
	450556P	Drive Pulley, 22Tooth, 0.5" bore
	450556P	Drive Pulley, 28Tooth, 0.5" bore
	450556P	Drive Pulley, 32Tooth, 0.5" bore
	450556P	Drive Pulley, 44Tooth, 0.5" bore
20	920608M	Socket Head Screw, M6-1.00 x 8 mm
21	807-2092	Washer

Pulley Ratio/Timing Belt Combinations

Motor (Drive) Pulley Teeth	Conveyor (Driven) Pulley Teeth	Pulley Ratio	Timing Belt	
			2200/MB/ MPB	4100/6200
19	32	0.59	N/A	814-104
22	32	0.69	N/A	814-105
28	22	1.27	N/A	814-104
28	28	1.00	814-105	N/A
28	32	0.88	814-105	814-065
32	19	1.68	814-104	814-104
32	22	1.45	814-104	814-105
32	28	1.14	814-105	814-065
44	19	2.32	814-065	814-101
44	22	2.00	814-101	814-101
44	28	1.57	814-101	814-101
44	32	1.38	N/A	814-064

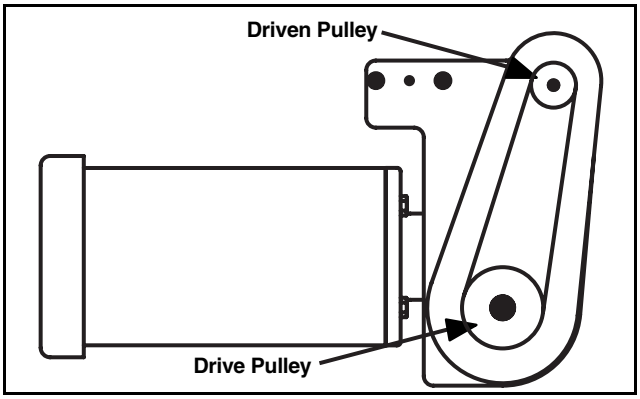
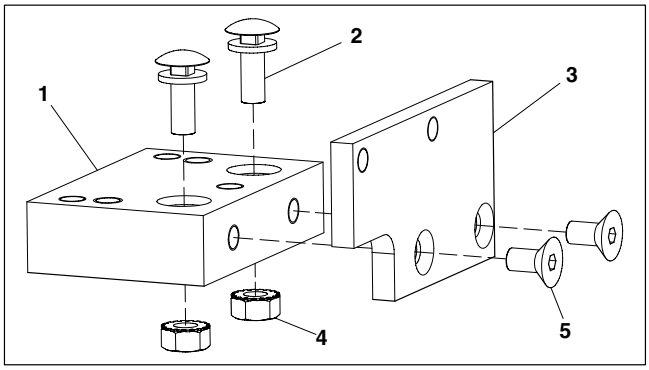


Figure 32

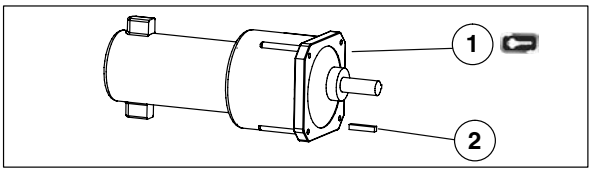
Service Parts

4100 Series Adapter Package



Item	Part Number	Description
1	609486	Mounting Block 1” (25mm)
	609487	Mounting Block 2” (51mm)
	609488	Mounting Block 3” (76mm)
	609479	Mounting Block 4” (102mm)
	609480	Mounting Block 5” (127mm)
	609481	Mounting Block 6” (152mm)
	609482	Mounting Block 7” (178mm)
	609483	Mounting Block 8” (203mm)
	609484	Mounting Block 10” (254mm)
	609485	Mounting Block 12” (305mm)
2	613602P	Bolt & Flat Washer Assembly
3	450374	Drive Adapter Plate
4	910-126	Hex Nut with Lock Washer
5	930612M	Flat Head Screw, M6 x 12mm

Gearmotors



Item	Part Number	Part Description
1	62M036PL411FN	Gearmotor, 0.03 hp, 115 Volts,42 RPM, 60 Hz, 1-Phase, 36:1
	62M015PL411FN	Gearmotor, 0.03 hp, 115 Volts, 100 RPM, 60 Hz, 1-Phase, 15:1
	62M060PLD3DEN	Gearmotor, 0.06 hp, 130 Volts, 42 RPM, DC, 60:1
	62M018PLD3DEN	Gearmotor, 0.06 hp, 130 Volts, 139 RPM, DC, 18:1
	62M036PL423FN	Gearmotor, 0.03 hp, 230 Volts, 42 RPM, 60 Hz, 3-Phase, 36:1
	62M015PL423FN	Gearmotor, 0.03 hp, 230 Volts, 100 RPM, 60 Hz, 3-Phase, 15:1
	62M036PL423EN	Gearmotor, 0.03 hp, 230 Volts, 7-42 RPM, 60 Hz, 3-Phase, 36:1
	62M015PL423EN	Gearmotor, 0.03 hp, 230 Volts, 17-100 RPM, 60 Hz, 3-Phase, 15:1
	62M050PLBDDEN	Gearmotor, 0.083 hp, 60 RPM, Brushless DC, 50:1
	62M020PLBDDEN	Gearmotor, 0.083 hp, 150 RPM, Brushless DC, 20:1
	62M015PLBDDEN	Gearmotor, 0.083 hp, 200 RPM, Brushless DC, 15:1
2	980422M	Key, 4mm x 22mm, 10mm Bore
	912-052	Key, 1/8” x 5/8”, 1/2” Bore

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