

SEALMASTER[®]

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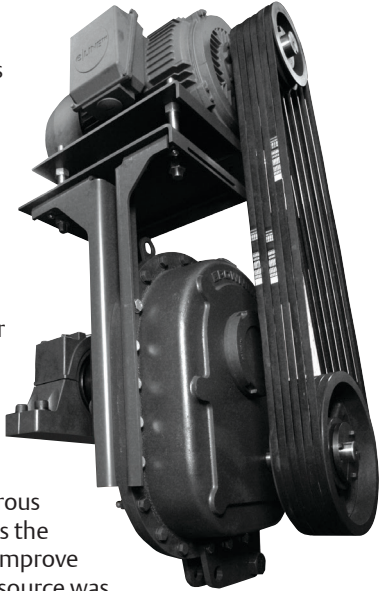


Bulk Material Handling Reference Guide

REGAL

Power Transmission and Bearing Solutions for the Aggregate Industry

The demand for sand and gravel products increases your need for reliable, industrial grade components that provide maximum protection from downtime. Regal Power Transmission Solutions offers bearings, gearboxes and other components with superior sealing technology for extended life in aggregate production facilities. Through customer relationships, we have developed numerous solutions that help address the tough environments and improve plant productivity. This resource was designed to serve as a guide to assist with field questions regarding installation, maintenance, and quick selection of our products.



Improved, Innovative Sealing Technology

The Sealmaster family of mounted bearings has a proven history of performance with innovative seal design specific for challenging applications.

Simplified Designs, Easier Installation

The Browning® TorqTaper® Plus shaft mount speed reducer uses a patented, single mounting bushing and requires no special tools for installation.

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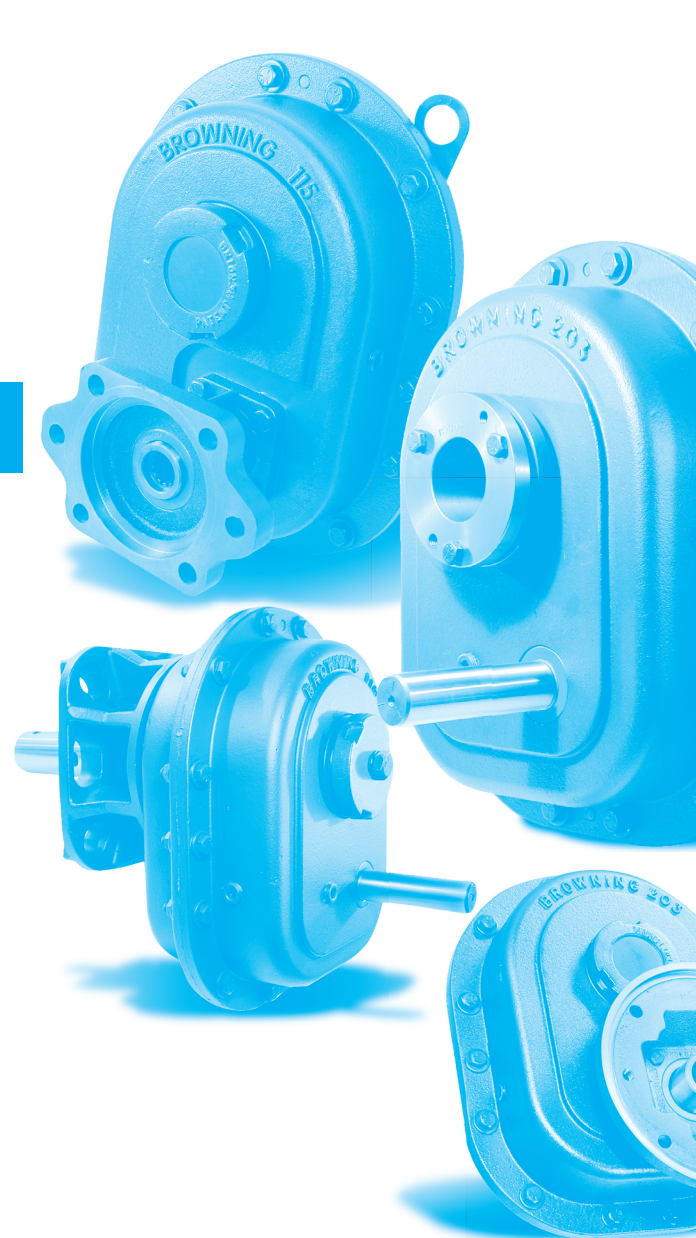
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Helical Shaft Mounts

Browning®

Helical Shaft Mounts

Browning® gearboxes are designed with a systematic approach for maximum life in rugged industrial environments.

Heavy-Duty Components The Browning TorqTaper® Plus speed reducer is built around AGMA class 12 gearing and employs tapered roller bearings on all shafts.

Enhanced Sealing System Since contaminants are constantly on the attack against oil seals and lubricants, the TorqTaper Plus is protected by a patented triple seal system that extends the life of the bearings and gears.

Patented Mounting System The TorqTaper Plus mounting system is based on a single tapered bushing for straightforward, error-free installation and removal. This system requires no special tools and is designed for simplicity in limited work spaces. These design features work in concert to help provide you with maximum uptime and minimal maintenance.

Innovative Input Configurations TorqTaper Plus shaft mounted speed reducers are also available with c-face and hydraulic input configurations for use in a variety of applications.

Quick-Find Reference

Product Overview

A-2

Installation & Maintenance

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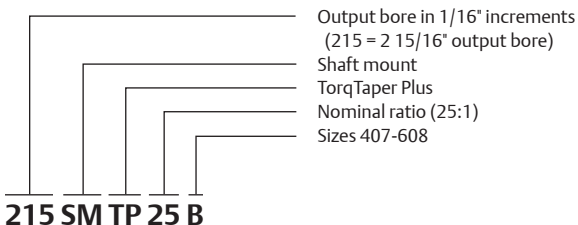
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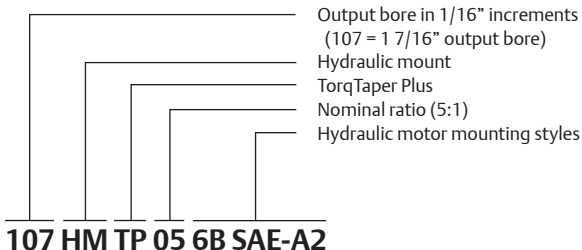
Product Overview

Nomenclature

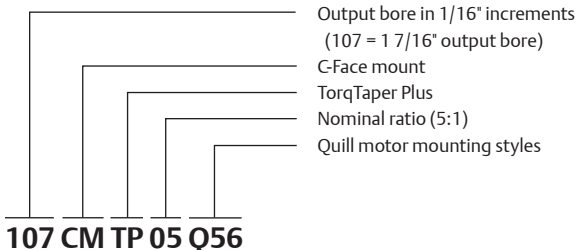
Part Number Explanation — Shaft Mount



Part Number Explanation — Hydraulic Mount

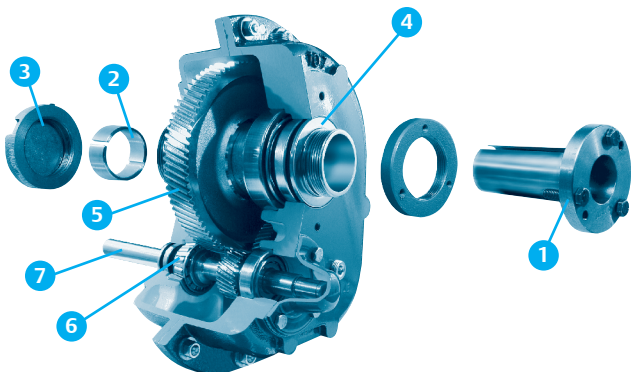


Part Number Explanation — C-Face Mount



Product Overview

Features & Benefits



Check Out These Additional Features of TorqTaper Plus Reducers

1. Unique, patented single bushing mounting system
 - Tapered bushing mounts from either side on the 107-315
2. Tapered stabilizer ring minimizes wobble and resists fretting corrosion
3. End cap seals quill end from contamination
4. Industrial strength seal systems
 - Patented barrier seal system includes standard double lip oil seals with v-ring face seal, grease packed labyrinth and external flinger
5. Carburized and ground gearing throughout
 - AGMA class 12 minimum
6. Tapered roller bearings on all shafts
7. Increased shaft diameters; higher overhung load ratings

Plus...

- Depending upon size, available ratios include 5, 9, 15, 25 and new 35:1 ratio
- Increased horsepower ratings, allows downsizing on many applications
- Pre-drilled and tapped face mount holes

Product Overview

Reducer Interchange Selection

Table 1: Reducer Interchange Selection

Motor HP	Motor kW	Reducer Case Size													
		107		115		203		207		215		307			
		Min Output RPM	Max Output RPM	Min Output RPM	Max Output RPM	Min Output RPM	Max Output RPM	Min Output RPM	Max Output RPM	Min Output RPM	Max Output RPM	Min Output RPM	Max Output RPM		
1/4	0.19	5	400												
1/3	0.25	5	400												
1/2	0.38	5	400												
3/4	0.57	8	400	6	7	5	5								
1	0.76	10	400	7	9	5	6								
1-1/2	1.14	16	400	11	15	6	10	5	5						
2	1.51	21	400	15	20	9	14	5	8						
3	2.27	32	400	23	31	13	22	8	12	5	7				
5	3.79	55	400	39	54	22	38	14	21	8	13	5	7		
7-1/2	5.68	84	400	59	83	34	58	21	33	13	20	7	12		
10	7.57	115	400	81	114	47	80	28	46	17	27	10	16		
15	11.4			131	400	81	130	43	80	26	42	15	25		
20	15.1			245	400	121	244	61	120	35	61	20	34		
25	18.9			338	400	160	337	81	159	45	80	25	44		
30	22.7					215	400	104	215	56	103	31	55		
40	30.3					328	400	247	327	90	246	44	89		
50	37.9							341	400	131	340	59	130		
60	45.4									241	400	75	240		
75	56.8	CONTACT APPLICATION ENGINEERING AT 1-800-626-2093 FOR A GEAR REDUCER SELECTION IN THIS RANGE.										338	400	103	200
100	75.7													281	400
125	94.6													395	400
150	114														
200	151														
250	186														
300	224														
350	261														
400	298														
450	336														
500	373														
600	447														

Require Fan Kits

Product Overview

Reducer Interchange Selection Continued

Table 2: Part Numbers

Reducer Case Size	Reducer Complete part number by adding ratio (05, 09, 15, 25, 35)	Bushing Complete part number by adding shaft size ex. 107 = 1-7/16)	Torque Arm	Backstop	Motor Base Height
107	107SMTP--	107TBP---	107TAP-H	107BSP	High Base
					Low Base
115	115SMTP--	115TBP---	115TAP-H	115-203BSP	High Base
					Low Base
203	203SMTP--	203TBP---	203TAP-H	115-203BSP	High Base
					Low Base
207	207SMTP--	207TBP---	207TAP-H	207BSP	High Base
					Low Base
215	215SMTP--	215TBP---	215TAP-H	215-307BSP	High Base
					Low Base
307	307SMTP--	307TBP---	307TAP-H	215-307BSP	High Base
					Low Base
315	315SMTP--	315TBP---	315TAP-H	315BSP	High Base
					Low Base
407	407SMTP--B	407TBP--B	407TAP-HB	407BSP	High Base
415	415SMTP--B	415TBP--B	415TAP-HB	415BSP	High Base
507	507SMTP--B	507TBP--B	507TAP-HB	507BSP	High Base
608	608SMTP--B	608TBP--B	608TAP-HB	608BSP	High Base
800	800SMTP--	800TBP---	800TAP-H	800BSP	High Base

Product Overview

Motor Mount	Fan Kit	Input Shaft Diameter for Driven Bushing	Replaces Falk* Quadrive* Complete part number by adding ratio (05, 09, 15, 25, 35)	Replaces Dodge* TXT Complete part number by adding ratio (05, 09, 15, 25, 35)
MMS107H; MMA107-115; MB107-115		0.750	4107J--	TXT1--
MMS107L; MMA107-115; MB107-115				
MMS115H; MMA107-115; MB107-115		1.125	4115JR--	TXT2--
MMS115L; MMA107-115; MB107-115				
MMS203H; MMA203; MB203-207		1.250	4203JR--	TXT3--
MMS203L; MMA203; MB203-207				
MMS207H; MMA207; MB203-207		1.438	4207JR--	TXT4--
MMS207L; MMA207; MB203-207				
MMS215H; MMA215; MB215-307		1.875	4215JR--	TXT5--
MMS215L; MMA215; MB215-307				
MMS307H; MMA307; MB215-307	307FKP	2.000	4307JR--	TXT6--
MMS307L; MMA307; MB215-307				
MMS315H; MMA315; MB315	315FKP	2.125	4315JR--	TXT7--
MMS315L; MMA315; MB315				
MMS407H; MMA407-415; MB407-415	407FKPB	2.125	4407JR--	TXT8--
MMS415H; MMA407-415; MB407-415	415FKPB	2.375	4415JR--	TXT9--
MMS507H; MMA507-608; MB507-608	507FKPB	2.625	407JR--	TXT10--
MMS507H; MMA507-608; MB507-608	608FKPB	2.688	4608JR--	TXT12--
MMS800H; MMA800; MB800	800FKP	2.938		TXT14--

*The following trade names, trademarks and/or registered trademarks are used in this material by Regal Power Transmission Solutions for comparison purposes only, are NOT owned or controlled by Regal Power Transmission Solutions and are believed to be owned by the following parties: Falk and Quadrive: Rexnord Industries, Inc.; Dodge: Reliance Electric Industrial Company.

Installation & Maintenance

Helical Shaft Mount Reducers and Components

⚠ WARNING

- Read and follow all instructions carefully.
- Disconnect and lock-out power before installation and maintenance. Working on or near energized equipment can result in severe injury or death.
- Do not operate equipment without guards in place. Exposed equipment can result in severe injury or death.
- Never lift the reducer by the input shaft. Lifting lug should only be used to lift the weight of the reducer. Do not use lifting lug to lift attached assemblies.
- Reducer shipped without oil. Fill to proper level before operation to avoid damage and/or personal injury. Do not use lubricants with anti-wear/extreme pressure additives in units with internal backstops – these additives decrease the backstop's ability to prevent reverse rotation and will result in backstop failure which could cause personal injury.

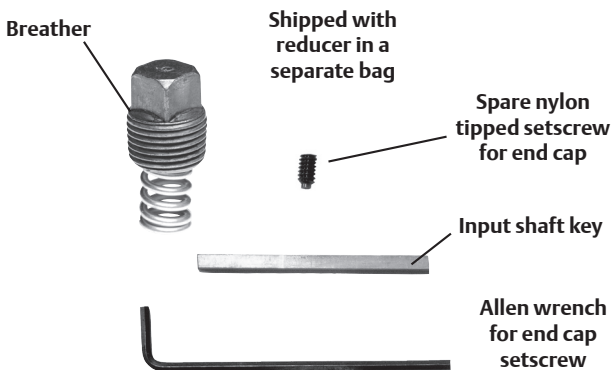
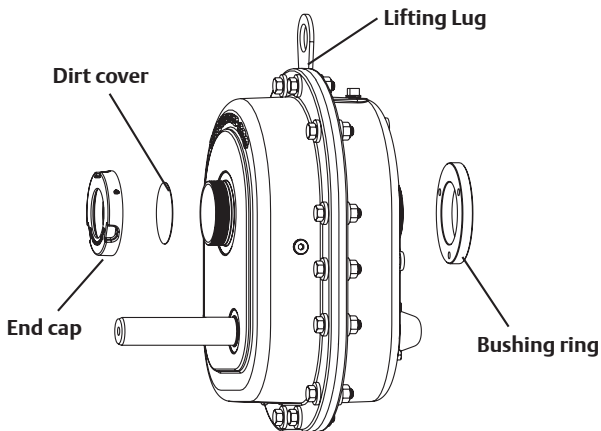
⚠ CAUTION

- Periodic inspections should be performed. Failure to perform proper maintenance can result in premature product failure and personal injury.
- All electrical work should be performed by qualified personnel and compliant with local and national electrical codes.

Available TorqTaper Plus Accessory Kits

- Torque Arm Kit..... A-38
- Motor Mount Kit A-44
- Backstop Kit..... A-50
- Belt Guard Kit..... A-56
- Fan Kit..... A-60
- Vertical Breather Kit A-62
- Filtered Breather Kit A-64
- Pump and Cooler Kit A-66
- Screw Conveyor Drive Shaft Kit A-70

Installation & Maintenance



Note: Bushing ring, end cap and dirt cover are installed on the reducer prior to shipment.

Installation & Maintenance

Helical Shaft Mount Reducers and Components Continued

1. Shaft Mount Reducer Installation Instructions

For long service and dependable performance, a shaft mount reducer must be rigidly supported and accurately aligned. The following instructions are a step-by-step guide to meeting these requirements for a Browning® TorqTaper Plus shaft mounted reducer. If there is a need to vary from any of these installation instructions, contact the Application Engineering Department at 1-800-626-2093 before completing the installation.

CAUTION: Shaft mounted reducers use bushings to mount the reducer to various driven shaft sizes. When the driven shaft is smaller than the maximum bushing size for the reducer, check the driven shaft and key stresses per ANSI/AGMA Std. 6001-D97 for the application.

1.1 Reducer and Driven Shaft Preparation

- 1.1.1 The driven shaft diameter is to be within the commercial tolerances for turned and polished round bars. The key and keyseat in the driven shaft are to be in accordance with commercial standards for size, depth, offset, lead and parallelism.
- 1.1.2 The driven shaft on which the reducer is to be mounted must be straight, clean and free of burrs.
- 1.1.3 Rotate the driven shaft on which the reducer is to be mounted so the shaft keyseat is in the upward position.
- 1.1.4 A lifting lug is provided to lift the reducer into position. The lifting lug may be repositioned onto any one of the housing flange bolts as required. After repositioning, all housing flange bolts must be reinstalled to the recommended torque. See bolt torque specifications section.

CAUTION: Do not apply grease, oil or an anti-seize compound to the taper bore of the reducer, barrel of the bushing, driven shaft or bushing bore. If any of these substances are applied, equipment failure and personal injury may result.

Installation & Maintenance

Figure 1-1: Bushing Types

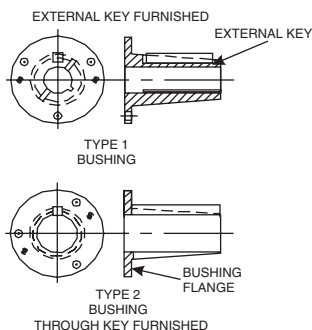
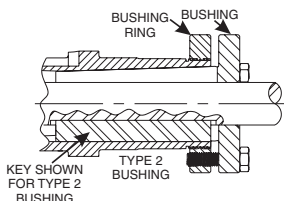


Figure 1-2: Cross Section of Bushing Assembly



1.2 Determine Mounting Configuration - Bushed Bore Models

Due to its unique design, the Browning TorqTaper Plus shaft mounted reducer may be mounted to a driven shaft in a variety of configurations. The following instructions will help determine the correct mounting configuration based on the available driven shaft and key length.

- 1.2.1 Measure the available driven shaft length “H” (in inches) starting from the end of the driven shaft to the first obstruction or point of interference.
- 1.2.2 Measure the length of the available keyseat “K” in the driven shaft (in inches) starting from the end of the driven shaft to the end of the usable keyseat.
- 1.2.3 The following Sections - 1.3, 1.4 and 1.5, show the three standard mounting configurations for the Browning TorqTaper Plus shaft mounted reducer. Refer to the following sections in sequence to determine the optimum mounting configuration for the application.

Table 1-2: Shaft Diameter Tolerances for Inch Shafts

Shaft diameter, in	Maximum undersize variation, in ¹
To 1.50	0.004
Over 1.50 to 2.50	0.005
Over 2.50 to 4.00	0.006
Over 4.00 to 6.00	0.007
Over 6.00 to 8.00	0.008

Note:

¹) Keys and keyways in supporting shaft should be in accordance with ANSI B17.1 for size, depth, offset, lead and parallelism.

Installation & Maintenance

Helical Shaft Mount Reducers and Components Continued

- 1.2.4 Using the appropriate reducer size in the Tables 1-3, 1-4 and 1-5, compare the measured values for H and K to the tabulated values of H and K. If the measured values for H and K are greater than the tabulated values, the mounting configuration shown in the figure may be used. If the measured values for H and K are less than the tabulated values, proceed to the next figure and repeat this step.

NOTICE: If the measured values for H and K are less than the tabulated values shown in Table 1-5, contact the Application Engineering Department at 1-800-626-2093.

1.3 Front Mounting Configuration with Stabilizer Ring (107 through 315)

Figure 1-3:

Front Mounting Configuration with Stabilizer Ring (107 through 315)

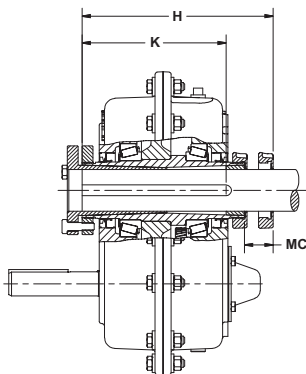


Table 1-3: Dimensions for Front Mounting Configuration with Stabilizer Ring (107 through 315)

Unit Size	MINIMUM CLEARANCE	MINIMUM SHAFT MOUNTING LENGTH	MINIMUM KEY CONNECTION LENGTH
	MC	H	K
107	0.97	8.06	3.69
115	1.03	8.59	3.88
203	1.15	9.78	4.32
207	1.21	10.16	4.81
215	1.31	11.36	5.25
307	1.44	13.04	6.31
315	1.69	15.20	7.38

Installation & Maintenance

- 1.3.1 On the input shaft side, thread the bushing ring onto the hollow quill until the bushing ring is flush with the end of the quill.
- 1.3.2 Place the endcap on the driven shaft with the threaded bore facing the end of the shaft. Slide the stabilizer ring on the driven shaft with the small end of the taper toward the end of the shaft.
- 1.3.3 Install Key(s)

Type 1 Bushing (2 Keys):

- Install the external bushing key into the bushing as shown in Fig 1-1 (External bushing key is supplied with the Bushing Kit)
 - Install driven shaft key (customer supplied) into the driven shaft keyseat. Position the end of the driven shaft key even with the end of driven shaft. Retain this key to prevent movement.
- 1.3.4 Install Reducer

Type 1 Bushing

- Mount the reducer on the driven shaft with the bushing ring facing outward toward the end of the driven shaft.
- Locate the reducer on the driven shaft such that approximately .500 inch of the driven shaft extends out beyond the end of the reducer quill.
- Start the bushing (small end first) by aligning the keyway in the bushing with the key previously installed in the driven shaft.
- Continue moving the bushing into position and rotate the input shaft as required to align the external bushing key with the keyway in the reducer quill.
- Rotate the bushing ring clockwise to align the clearance holes in the bushing with the threaded holes in the bushing ring. (This will require less than ½ turn of the bushing ring).
- Install the bushing capscrews and hand tighten. Reposition the reducer until the end of the driven shaft is even with the end of quill.
- Slide the stabilizer ring into the reducer quill and thread the endcap on hand tight
- See bolt torque specifications section.
- Tighten the bushing capscrews evenly around the bushing flange to the recommended torque as shown in Table 6-1.
- Tighten the endcap again until hand tight. Tighten the setscrew in the endcap to the recommended torque as shown in Table 6-1.

Installation & Maintenance

Helical Shaft Mount Reducers and Components Continued

Type 2 Bushing

- Position the reducer on the driven shaft with the bushing ring facing out toward the end of the shaft.
- Move the reducer into position by rotating the input shaft as required to align the driven shaft key with the keyway in the reducer quill.
- Locate the reducer on the driven shaft such that approximately .500 inch of the driven shaft extends out beyond the end of the reducer quill.
- Start the bushing (small end first) by aligning the keyway in the bushing with the key previously installed in the driven shaft.
- Rotate the bushing ring clockwise to align the clearance holes in the bushing with the threaded holes in the bushing ring. (This will require less than ½ turn of the bushing ring).
- Install the bushing capscrews and hand tighten. Reposition the reducer until the end of the driven shaft is even with the end of quill.
- Slide the stabilizer ring into the reducer quill and thread the endcap on hand tight.
- Tighten the bushing capscrews evenly around the bushing flange to the recommended torque as shown in Table 1-6B.
- Tighten the endcap again until hand tight. Tighten the setscrew in the endcap to the recommended torque as shown in Table 1-6B.

NOTICE: The key length must be sufficient to engage the full length of the bushing. The shaft must engage the full length of the bushing.

NOTICE: There are three (3) series of bushing keys used in the Type 2 bushing system: rectangular, square and offset. In most cases, the key supplied will be rectangular or offset. Use caution when installing rectangular keys as some may visually appear to be square. The key should install in the bushing keyway with a sliding type fit. The key in the driven shaft keyseat should be retained to prevent movement.

WARNING! The capscrews must thread into the bushing ring and not the bushing. Threaded holes in the bushing are for removal only. If assembled incorrectly, equipment failure and personal injury may result.

Installation & Maintenance

1.4 Rear Mounting Configuration With Stabilizer Ring (107 through 800)

Figure 1-4: Rear Mounting Configuration With Stabilizer Ring (107 through 800)

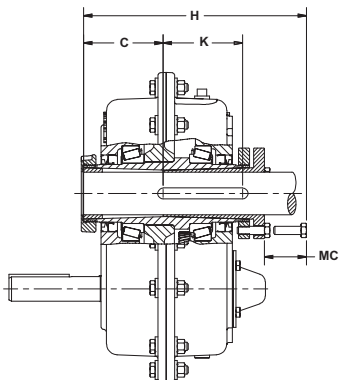


Table 1-4: Dimensions for Rear Mounting Configuration With Stabilizer Ring (107 through 800)

REDUCER SIZE	BOLT CLEARANCE	MINIMUM SHAFT MOUNTING LENGTH	MINIMUM KEY CONNECTION LENGTH	REMAINING SHAFT FOR STABILIZER RING
	MC	H	K	C
107	1.75	9.53	3.69	3.40
115	1.88	10.13	3.88	3.62
203	1.88	11.19	4.32	4.19
207	1.88	11.52	4.81	4.01
215	1.88	12.62	5.25	4.61
307	2.25	14.64	6.31	5.01
315	2.75	17.07	7.38	5.76
407	2.75	16.42	6.91	5.54
415	3.25	19.76	8.53	6.51
507	3.75	21.27	9.66	6.27
608	4.25	25.93	10.15	9.68
800	4.50	28.62	10.73	11.12

Installation & Maintenance

Helical Shaft Mount Reducers and Components Continued

- 1.4.1 For Type 1 bushings which require an external key and a shaft key: Install the key (supplied with the bushing) in the external keyseat of the bushing as shown in Figure 1-1. Install a shaft key (not supplied) in the shaft keyseat and retain to prevent movement. Install the bushing on the shaft, flanged end first, align the bushing keyway with the shaft key and position the bushing over the key.

NOTICE: Key length must be sufficient to engage the full length of the bushing. The shaft must engage the full length of the bushing.

- 1.4.2 For Type 2 bushings which require one through key: Install the bushing on the shaft, flanged end first. Align the keyway in the bushing with the keyseat in the shaft and install the shaft key. Position the shaft key flush against the inside flange surface of the bushing. See Figure 1-2 Shaft Key and Bushing Location.

NOTICE: There are three (3) series of bushing keys used in the Type 2 bushing system: rectangular, square and offset. In most cases, the key supplied will be rectangular or offset. Use caution when installing rectangular keys as some may appear to be square. The key should install in the bushing keyway with a sliding type fit. The key in the shaft keyseat should be retained to prevent movement.

NOTICE: The shaft must engage the full length of the bushing.

- 1.4.3 On the side opposite of the input shaft, thread the bushing ring onto the hollow quill until the bushing ring is flush with the end of the hollow quill. Rotate the reducer input shaft to align the keyway in the hollow quill with the bushing/shaft key. Position the reducer on the shaft with the bushing ring toward the bushing.
- 1.4.4 Slide the stabilizer ring onto the driven shaft with the small end of the taper toward the reducer. Insert the stabilizer ring into the quill.
- 1.4.5 Thread the endcap and dirt cover (not used if driven shaft extends beyond the end of the hollow quill) onto the hollow quill until hand tight. Do not over tighten the endcap.
- 1.4.6 Rotate the bushing ring clockwise until the tapped holes align with the drilled holes in the bushing flange. Prior to tightening the capscrews, make sure the bushing key is as close as possible to the inside flange of the bushing as shown in Figure 1-2 and the bushing is positioned on the shaft as required in Table 1.4 Dimensions for rear mounting configuration with stabilizer ring.

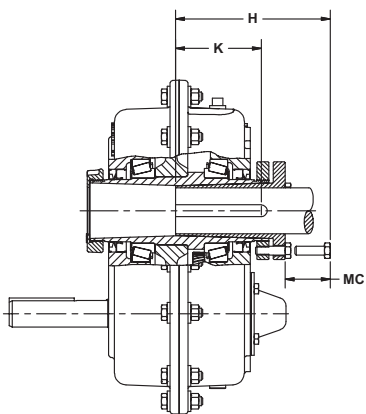
Installation & Maintenance

- 1.4.7 Install the bushing capscrews and tighten all capscrews evenly around the bushing flange to the recommended torque as shown in Table 6-1.
- 1.4.8 Tighten the endcap again until hand tight. Tighten the setscrew in the endcap to the recommended torque as shown in Table 1-6B.

WARNING! Capscrews must thread into the bushing ring and not the bushing. Threaded holes in the bushing are for removal only. If assembled incorrectly, equipment failure and personal injury may result.

1.5 Rear Mounting Configuration Without Stabilizer Ring (107 through 800)

Figure 1-5: Rear Mounting Configuration Without Stabilizer Ring (107 through 800)



Installation & Maintenance

Helical Shaft Mount Reducers and Components Continued

Table 1-5: Dimensions for Rear Mounting Configuration

REDUCER SIZE	BOLT CLEARANCE	MINIMUM SHAFT MOUNTING LENGTH	MINIMUM KEY CONNECTION LENGTH
	MC	H	K
107	1.75	6.12	3.69
115	1.88	6.50	3.88
203	1.88	7.00	4.32
207	1.88	7.50	4.81
215	1.88	8.00	5.25
307	2.25	9.63	6.31
315	2.75	11.31	7.38
407	2.75	10.88	6.91
415	3.25	13.25	8.53
507	3.75	15.00	9.66
608	4.25	16.25	10.15
800	4.50	17.50	10.73

- 1.5.1 For Type 1 bushings which require an external key and a shaft key: Install the key (supplied with the bushing) in the external keyseat of the bushing as shown in Figure 1-1. Install a shaft key (not supplied) in the shaft keyseat and retain to prevent movement. Install the bushing on the shaft, flanged end first, align the bushing keyway with the shaft key and position the bushing over the key.

NOTICE: The key length must be sufficient to engage the full length of the bushing. The shaft must engage the full length of the bushing.

- 1.5.2 For Type 2 bushings which require one through key: Install the bushing on the shaft, flanged end first. Align the keyway in the bushing with the keyseat in the shaft and install the shaft key. Position the shaft key flush against the inside flange surface of the bushing. See Figure 1-2 shaft key and bushing location.

NOTICE: There are three (3) series of bushing keys used in the Type 2 bushing system: rectangular, square and offset. In most cases, the key supplied will be rectangular or offset. Use caution when installing rectangular keys as some may appear to be square. The key should install in the bushing keyway with a sliding type fit. The key in the shaft keyseat should be retained to prevent movement.

NOTICE: The shaft must engage the full length of the bushing.

Installation & Maintenance

- 1.5.3 On the side opposite of the input shaft, thread the bushing ring onto the hollow quill until the bushing ring is flush with the end of the hollow quill. Rotate the reducer input shaft to align the keyway in the hollow quill with the bushing/shaft key. Position the reducer on the shaft with the bushing ring toward the bushing.
- 1.5.4 Thread the endcap and dirt cover onto the hollow quill until it bottoms out. Tighten the setscrew to the recommended torque as shown in Table 1-6B. Do not overtighten.
- 1.5.5 Rotate the bushing ring clockwise until the tapped holes align with the drilled holes in the bushing flange. Prior to tightening the capscrews, make sure the bushing key is as close as possible to the inside flange of the bushing as shown in Figure 1-2 and the bushing is positioned on the shaft as required in Table 1-5 dimensions for rear mounting configuration.

Install the bushing capscrews and tighten all capscrews evenly around the bushing flange to the recommended torque as shown in Table 1-6B.

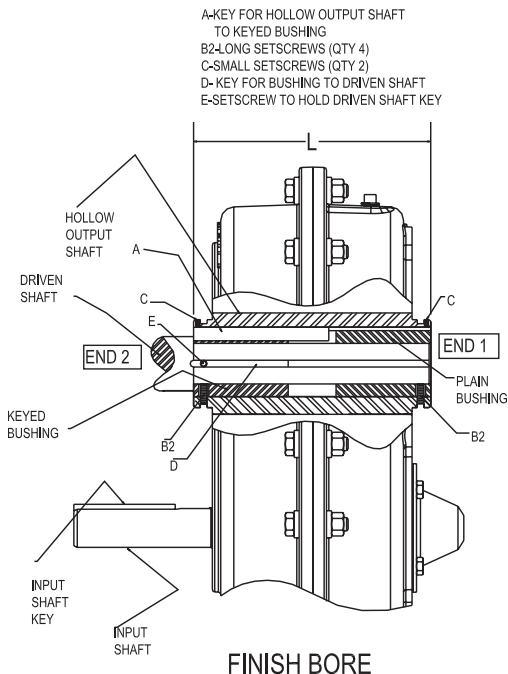
1.6 Installation Instructions Finished Bore Model

- 1.6.1 The shaft on which the reducer is to be mounted must be straight, clean and free of burrs. Lubricate the shaft to ease the mounting of the reducer. (Anti-fretting grease is recommended for finished bore only.) A lifting lug is provided to lift the reducer into position.

Installation & Maintenance

Helical Shaft Mount Reducers and Components Continued

Figure 1-6A: Finished Bore Bushing With Bushing Kit (107 through 315)



WARNING! Straight bushing kits adapt the gearbox to smaller shafts, which increases the stress on the shaft and the key. To avoid possible damage to the gearbox and attached equipment, the driven shaft and key must be designed in accordance with ANSI/AGMA 6001-D97.

1.6.2 Installation with Finished Bore Bushing Kit

The following items are included with the Finished Bore Bushing Kit:

- One - keyed bushing
- One - plain bushing (no keyways)
- Four - long setscrews
- One - key for connection of keyed bushing to driven shaft
- One - setscrew for holding key to driven shaft

Refer to Figure 1-6A for illustrations of where each of these items are used.

Installation & Maintenance

1.6.3 Installation Finished Bore with Bushing Kit

1.6.3.1 Refer to Figure 1-6A “Finish Bore with Bushing Kit” for the following procedure.

Install the key “D” in driven shaft with the end of key against the shoulder on the driven shaft. If there is no shoulder, position this end of the key a distance L from end 1 (value of L from Table 1-6A).

1.6.3.2 Place the keyed bushing on the driven shaft with the setscrews near end 2 and move the keyed bushing against the driven shaft shoulder or a distance L from end 1. Tighten the setscrew “E” to hold the keyed bushing and key in place.

1.6.3.3 Install the key “A” in the keyseat on the outside of the keyed bushing. The end of this key should be even with the end of the keyed bushing at end 2 (This key is shipped with the gearbox, not in the bushing kit).

1.6.3.4 Rotate the input shaft until the keyway in the hollow output shaft is aligned with the key “A”, then move the gearbox into position with end of the hollow output shaft against shoulder on driven shaft.

1.6.3.5 Align the clearance holes in the plain bushing with the setscrews in the hollow output shaft. Remove the four setscrews from the hollow output shaft. Insert the plain bushing into the hollow output shaft until the end of the bushing is even with the end of the hollow output shaft at end 1.

1.6.3.6 Remove setscrew “C” on end 1. Tighten setscrew “C” on end 2 to torque as shown in Table 1-6B. Insert the four setscrews that came in bushing kit (shown as “B2”). Confirm that these 4 setscrews are through the bushings and pressing on the driven shaft, then tighten these 4 setscrews to torque as shown in Table 1-6B.

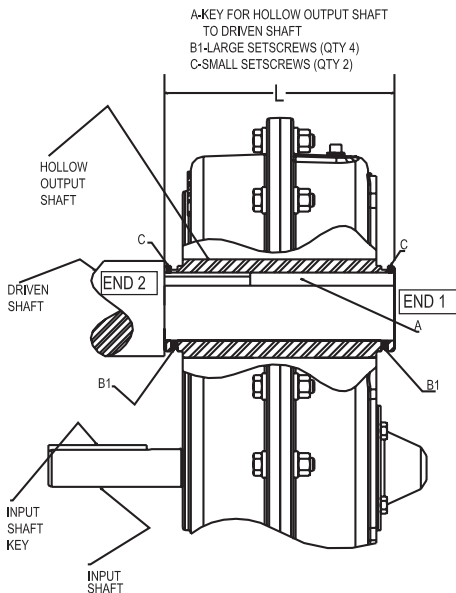
1.6.4 Installation Finished Bore without Bushing Kit

Refer to Figure 1-6B “Finish Bore No Bushings” for the following procedure.

Installation & Maintenance

Helical Shaft Mount Reducers and Components Continued

Figure 1-6B: Finished Bore Bushing Without Bushing Kit (107 through 315)



- 1.6.4.1 Insert the key "A" into the driven shaft with the end of the key even with the end of the hollow output shaft at end 1.
- 1.6.4.2 Rotate the input shaft until the keyway in the hollow output shaft is aligned with the key in the driven shaft, then slide the gearbox on the shaft until the hollow output shaft is against the shoulder on the driven shaft. If the driven shaft has no shoulder, position the gearbox with the end of the driven shaft even with the end of the hollow output shaft at end 1.
- 1.6.4.3 Tighten the setscrew "C" at end 1 to the torque as shown in Table 1-6B.
- 1.6.4.4 Remove the setscrew "C" at end 2.
- 1.6.4.5 Tighten the four setscrews "B1" to torque as shown in Table 1-6B.

Installation & Maintenance

Table 1-6A:

Reducer Size	Minimum Shaft Length "L"
107	6.52
115	7.13
203	8.45
207	8.77
215	10.25
307	11.7
315	13

Table 1-6B:

Setscrew Size (Dia.)	Tightening Torque (in-lbs)
#8 (.164)	20
#10 (.190)	33
1/4 (.250)	87
3/8 (.375)	288
1/2 (.500)	624

2. Lubrication Instructions

Browning TorqTaper Plus reducers are shipped without oil. Before operating, the reducer must be filled with oil to the proper level to avoid equipment and/or personal injury. Do not use oils containing EP additives when a backstop is to be used.

Petroleum based mineral lubricants or synthetic lubricants can be used in Browning TorqTaper Plus reducers. Synthetic lubricants can extend oil change intervals to as much as 8,000 to 10,000 hours based on operating temperatures and lubricant contamination. If temperatures vary by season, the oil should be changed to suit the ambient operating temperature.

Refer to Tables 2-3A and 2-3B to determine proper AGMA viscosity grade oil based on the reducer's ambient operating temperature. Contact a lubrication manufacturer's representative for assistance in choosing a lubricant.

NOTICE: TorqTaper seals are grease-packed at assembly. Some purging of grease from around the rotating flingers during initial hours of operation is normal and should be expected.

WARNING! Reducer shipped without oil. Fill to proper level before operation to avoid damage and/or personal injury. Do not use lubricants with anti-wear/ extreme pressure additives in units with internal backstops - these additives decrease the backstop's ability to prevent reverse rotation and will result in backstop failure which could cause personal injury.

Browning TorqTaper Plus reducers may be operated in the horizontal or vertical mounting position

When mounting reducer in the vertical mounting position, a Vertical Breather Kit is required.

Vertical Breather Kit for SMTP 107-800, Browning Part Number 107-800 SMTP VBK

Installation & Maintenance

Helical Shaft Mount Reducers and Components Continued

2.1 Oil Level

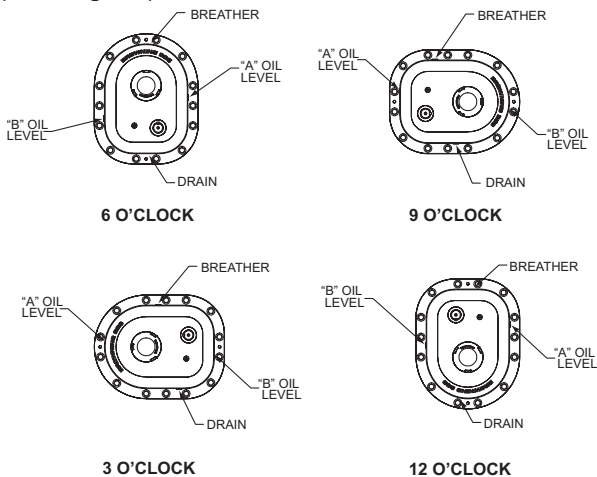
2.1.1 Shaft mount reducers require different amounts of oil in the various mounting positions. For the convenience of having enough oil at the installation site, Tables 2-2A and 2-2B show the approximate amounts of oil needed for each common mounting position.

2.1.2 Figures 2-1A and 2-1B show breather, magnetic drain and oil level plug locations for the four standard horizontal mounting positions. Figures 2-2A and 2-2B show breather, magnetic drain and oil level plug locations for the two standard vertical mounting positions. The breather is installed in the fill hole in the top and the magnetic drain plug is installed in the bottom of the reducer in its relative position. In the horizontal mounting position use oil level "A" for speeds at or below those shown in Table 2-1. Use oil level "B" for speeds above those shown in Table 2-1. For reducers mounted in other positions, refer to steps 2.1.4 or, if the reducer is to be installed with the input shaft in the vertical position, refer to the Vertical Breather Kit instructions.

When Browning TorqTaper Plus reducers operate in areas with a dusty atmosphere, a Filtered Breather Kit is recommended.

Filtered Breather Kit for SMTP 107-800, Browning Part Number 107-800 SMTP FBK.

Figure 2-1A: Oil Levels A and B, Drain and Breather Locations (107 through 608)



Installation & Maintenance

Figure 2-1B: Oil Levels A and B, Drain and Breather Locations (800 only)

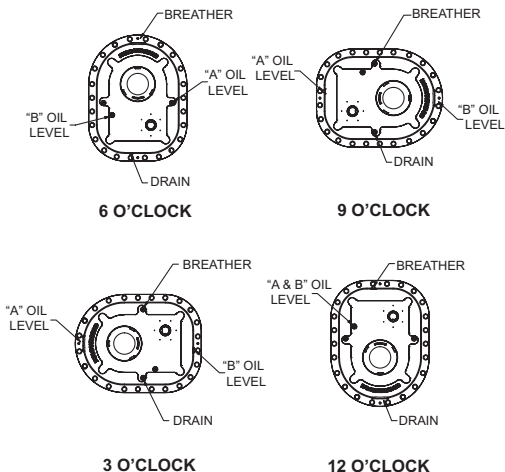
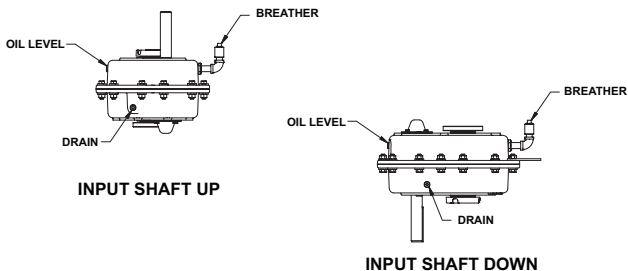


Figure 2-2 A: Vertical Mount Oil levels, Drain and Breather Locations (107 through 608)



Installation & Maintenance

Helical Shaft Mount Reducers and Components Continued

Figure 2-2 B: Vertical Mount Oil levels, Drain and Breather Locations (800 only)

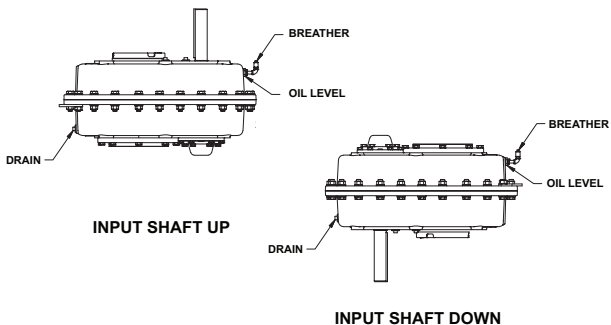


Table 2-1: Use Oil Level “B” for Speeds Above Those Shown Below

REDUCER SIZE	OUTPUT RPM FOR REDUCER RATIOS				
	5:1	9:1	15:1	25:1	35:1
107	400	184	120	70	40
115	382	173	120	70	40
203	326	128	113	70	40
207	275	112	99	70	40
215	236	97	85	70	40
307	204	90	79	70	40
315	202	85	62	70	40
407	176	-	63	55	-
415	156	-	53	46	-
507	-	-	47	41	-
608	-	-	46	40	-
800	-	-	-	40	-

Installation & Maintenance

- 2.1.3 To fill reducer with oil, remove the proper oil plug and breather. Fill with oil through the breather hole until oil begins to run out of the oil level hole. Replace the oil level plug and install breather as shown in Figures 2-1 and 2-2.

CAUTION: Petroleum based and synthetic lubricants which contain anti-wear/ extreme pressure additives must not be used in units with internal backstops. These additives decrease the backstop's ability to prevent reverse rotation. Consequently, backstop failure will occur.

- 2.1.4 Operating positions may vary as much as 10° from the four positions shown in Figure 2-1 and still have adequate oil by using the indicated oil levels. If it is necessary to vary the operating position less than 10° from these positions, complete the following steps. For reducers operating more than 10° from standard position, contact the Application Engineering Department at 800-626-2093.

WARNING! See torque arm installation instructions section before releasing the torque arm.

- 2.1.4.1 Release the torque arm.
- 2.1.4.2 Rotate the reducer to the nearest of these standard positions.
- 2.1.4.3 Fill to the proper level.
- 2.1.4.4 Replace oil level plug.
- 2.1.4.5 Rotate the reducer back to its operating position and reconnect the torque arm.

NOTICE: Reducers operating other than standard position should have a stand pipe or sight glass installed and marked at proper oil level in order to monitor oil level while in operating position. Contact the Application Engineering Department for assistance in selecting and installing required components.

Installation & Maintenance

Helical Shaft Mount Reducers and Components Continued

Table 2-2 A: Approximate Oil Capacities in Quarts – Horizontal Input Shaft

Output Orientation	Horizontal															
	5:1						9,15,25,35:1									
	A			B			A			B						
Mounting Position	3	6	9	12	3	6	9	12	3	6	9	12	3	6	9	12
107	2.0	2.0	2.5	2.0	1.0	1.0	1.5	1.5	2.0	2.0	2.0	2.0	1.0	1.0	1.5	1.5
115	3.0	3.0	3.0	3.0	1.5	2.0	2.0	2.0	3.0	3.0	3.0	3.0	1.5	2.0	2.0	2.0
203	5.0	5.0	6.0	5.0	2.5	3.0	3.5	3.5	4.5	4.5	5.5	5.0	2.5	3.0	3.5	3.5
207	6.5	7.0	7.5	7.0	3.0	4.0	4.5	4.5	6.0	6.5	7.5	7.0	3.0	4.0	4.5	4.5
215	9.0	10.0	11.5	10.5	4.0	5.5	7.0	6.0	8.0	9.0	11.0	10.0	4.0	5.0	7.0	6.0
307	13.0	13.5	13.0	14.0	9.5	8.5	10.0	9.5	12.0	12.5	12.5	14.0	9.5	8.0	10.0	9.5
315	16.5	19.5	16.5	17.5	12.5	12.5	13.0	11.0	15.0	18.0	16.0	17.0	12.0	11.5	13.0	11.0
407	19.5	20.5	24.5	19.5	8.5	12.5	13.5	13.0	16.5	17.5	22.5	20.0	8.0	10.5	14.0	13.0
415	33.0	35.0	40.0	35.0	15.5	21.0	24.0	22.0	28.0	31.0	37.5	34.0	14.5	18.0	24.5	22.0
507	-	-	-	-	-	-	-	-	38.5	40.5	53.0	49.5	20.0	23.5	35.0	33.0
608	-	-	-	-	-	-	-	-	55.0	63.5	65.5	68.5	40.5	37.0	50.5	42.5
800	-	-	-	-	-	-	-	-	82.0	90.0	96.0	100.0	66.0	62.5	80.0	100.0

Installation & Maintenance

Table 2-2 B: Approximate Oil Capacities in Quarts – Vertical Input Shaft

Output Orientation Ratio Mounting Position	Vertical					
	5:1			9, 15, 25, 35:1		
	Input Shaft Up	Input Shaft Down	Input Shaft Up	Input Shaft Down	Input Shaft Up	Input Shaft Down
107	2.5	2.5	2.5	2.5	2.5	2.5
115	3.5	4.0	3.5	4.0	3.5	4.0
203	6.0	7.0	6.0	7.0	6.0	7.0
207	8.5	9.0	8.5	9.0	8.5	9.0
215	13.0	12.5	12.0	12.5	12.0	12.0
307	20.0	20.5	19.0	20.5	19.0	19.5
315	26.5	26.5	25.0	26.5	25.0	25.5
407	29.5	29.5	27.0	29.5	27.0	27.0
415	49.5	52.0	45.5	52.0	45.5	48.0
507	-	-	63.5	-	63.5	67.5
608	-	-	92.0	-	92.0	97.0
800	-	-	151.0	-	151.0	154.0

Installation & Maintenance

Helical Shaft Mount Reducers and Components Continued

2.2 Relubrication Maintenance Schedule

2.2.1 Regularly Scheduled Oil Changes

Refer to Tables 2-3A to determine proper AGMA viscosity grade oil based on the reducer's ambient operating temperature.

2.2.2 Petroleum Based Mineral Lubricants – Under normal operating conditions oil should be changed every 2,500 hours or six months, whichever occurs first. If temperatures vary by season, the oil should be changed to suit the ambient operating temperature.

2.2.3 Synthetic Lubricants – Some types of synthetic lubricants can be used in shaft mount reducers. These lubricants can extend oil change intervals to as much as 8,000 to 10,000 hours based on operating temperatures and lubricant contamination. If temperatures vary by season, the oil should be changed to suit the ambient operating temperature.

CAUTION: Certain mineral oils and synthetics are not compatible. Please contact the lubricant supplier for information regarding lubricant miscibility and proper cleansing procedures.

WARNING! Petroleum-based and synthetic lubricants which contain anti-wear/extreme pressure additives must not be used in units with internal backstops. These additives decrease the backstop's ability to prevent reverse rotation and will result in backstop failure.

2.3 Lubrication Section

Installation & Maintenance

Table 2-3 A:

Output RPM	AGMA Oil Viscosity Grades for Ambient Operating Temperatures between 14 °F and 49 °F													
	Reducer Size													
	107_MTP	115_MTP	203_MTP	207_MTP	215_MTP	307_MTP	315_MTP	407SMTP	415SMTP	507SMTP	608SMTP	800SMTP		
5-20	5	5	5	5	5	5	5	5	5	5	5	5	5	5
21-40	5	5	5	5	5	5	5	5	5	5	5	5	5	5
41-60	5	5	5	5	5	5	5	5	5	5	5	5	5	5
61-80	5	5	5	5	5	5	5	5	5	5	5	5	5	5
81-100	5	5	5	5	5	5	5	5	5	5	5	5	5	5
101-120	5	5	5	5	5	5	5	5	5	5	5	5	5	5
121-140	5	5	5	5	5	5	5	5	5	5	5	5	5	5
141-160	5	5	5	5	5	5	5	5	5	5	5	5	5	5
161-180	5	5	5	5	5	5	5	5	5	5	5	5	5	5
181-200	5	5	5	5	5	5	5	5	5	5	5	5	5	5
201-220	5	5	5	5	5	5	5	5	5	5	5	5	5	5
221-240	5	5	5	5	5	5	5	5	5	5	5	5	5	5
241-260	5	5	5	5	5	5	5	5	5	5	5	5	5	5
261-280	5	5	5	5	5	5	5	5	5	5	5	5	5	5
281-300	5	5	5	5	5	5	5	5	5	5	5	5	5	5
301-320	5	5	5	5	5	5	5	5	5	5	5	5	5	5
321-340	5	5	5	5	5	5	5	5	5	5	5	5	5	5
341-360	5	5	5	5	5	5	5	5	5	5	5	5	5	5
361-380	5	5	5	5	5	5	5	5	5	5	5	5	5	5
381-400	5	5	5	5	5	5	5	5	5	5	5	5	5	5

Installation & Maintenance

Helical Shaft Mount Reducers and Components Continued

Table 2-3 B:

Output RPM	AGMA Oil Viscosity Grades for Ambient Operating Temperatures between 50 °F and 95 °F												
	Reducer Size												
	107_MTP	115_MTP	203_MTP	207_MTP	215_MTP	307_MTP	315_MTP	407_MTP	415_MTP	507_MTP	608_MTP	800_MTP	800_SMTP
5-20	6	6	6	6	6	6	6	6	6	6	6	6	6
21-40	6	6	6	6	6	6	6	6	6	6	6	6	6
41-60	6	6	6	6	6	6	6	6	6	6	6	6	6
61-80	6	6	6	6	6	6	6	6	6	6	6	6	6
81-100	6	6	6	6	6	6	6	6	6	6	6	6	6
101-120	6	6	6	6	6	6	6	6	6	6	6	6	6
121-140	6	6	6	6	6	6	6	6	6	6	6	6	6
141-160	6	6	6	6	6	6	6	6	6	6	6	6	6
161-180	6	6	6	6	6	6	6	6	6	6	6	6	6
181-200	6	6	6	6	6	6	6	6	6	6	6	6	6
201-220	6	6	6	6	6	6	6	6	6	6	6	6	6
221-240	6	6	6	6	6	6	6	6	6	6	6	6	6
241-260	6	6	6	6	6	6	6	6	6	6	6	6	6
261-280	6	6	6	6	6	6	6	6	6	6	6	6	6
281-300	6	6	6	6	6	6	6	6	6	6	6	6	6
301-320	6	6	6	6	6	6	6	6	6	6	6	6	6
321-340	6	6	6	6	6	6	6	6	6	6	6	6	6
341-360	6	6	6	6	6	6	6	6	6	6	6	6	6
361-380	6	6	6	6	6	6	6	6	6	6	6	6	6
381-400	6	6	6	6	6	6	6	6	6	6	6	6	6

Installation & Maintenance

3. Hydraulic and C-face Motor Mount Installation Instructions

3.1.1 Before installing the hydraulic motor, measure dimensions A, B, and spline length (SL) on the hydraulic motor. (See Figure 3-1).

Three conditions must be met:

Condition 1: Dimension A on the motor must be less than the A1 as shown in Table 3-1.

CAUTION: Failure to meet this condition will damage the hydraulic motor, the gearbox, or both.

Condition 2:

Dimension B measured from the motor must be less than the B1 value shown in Table 3-1.

CAUTION: Failure to meet this condition will damage the hydraulic motor, the gearbox, or both. (Important: Dimension B is to the location where the spline tooth is full depth see Figure 3-1).

Condition 3:

Subtract spline length (SL) from motor dimension A. The result of this calculation must be greater than dimension B1 shown in Table 3-1.

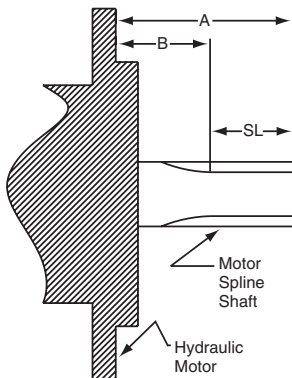
CAUTION: Failure to meet this condition reduces the length of spline engagement and will cause early spline failure.

3.1.2 Lubricate the splined motor shaft with a non-fretting grease. Pre-assemble the hydraulic motor to the gearbox and hand-tighten the bolts holding the motor. There must be zero gap between the motor flange and the gearbox flange.

CAUTION: Failure to meet this condition will damage the hydraulic motor, the gearbox, or both.

3.1.3 Tighten the motor bolts to the torque recommended by the motor's manufacturer.

Figure 3-1:
Hydraulic Motor
Spline Length



Installation & Maintenance

Helical Shaft Mount Reducers and Components Continued

Table 3-1: Hydraulic Motor Spline Data

	6B		9T		13T		14T	
	A1	B1	A1	B1	A1	B1	A1	B1
107	2.38	0.78	1.89	0.58	-	-	-	-
115	2.36	0.76	1.87	0.56	2.15	0.9	-	-
203	2.37	0.68	1.98	0.73	2.12	0.87	2.92	1.15
207	2.41	0.72	-	-	2.16	0.91	2.91	1.14
215	2.39	0.64	-	-	2.1	0.85	2.94	1.05
307	2.43	0.68	-	-	-	-	2.98	1.09
315	2.5	0.75	-	-	-	-	3.05	1.16

3.2 C-Face Motor Installation Instructions

- 3.2.1 Gearboxes designed for C-face installations are supplied with an anti-fretting plastic quill liner. Do not use any lubrication on the shaft or this insert.
- 3.2.2 Align the key slot in the plastic quill liner with the keyway in the reducer's input shaft.
- 3.2.3 Insert the plastic quill liner into the reducer's input shaft until the flange on the quill liner snaps into the groove in the input shaft.
- 3.2.4 Place the motor key in the motor shaft and assemble the motor to the gearbox by hand tightening the motor bolts. There must be zero gap between the motor flange and the gearbox flange.
- CAUTION:** Failure to meet this condition will damage the electric motor, the gearbox, or both
- 3.2.5 Tighten mounting bolts to motor manufacturers torque specification.

4. Installation Checklist

- ✓ Make sure the input shaft rotates properly prior to starting drive.
- ✓ Never use oils of the EP (extreme pressure) type or those which contain slippery additives, if an internal backstop has been installed.
- ✓ Make sure the reducer is filled with correct lubricant and quantity.
- ✓ Make sure all drive guards are in place.
- ✓ Breather location
- ✓ Torque arm or anti-rotation device

5. Shaft Mount Removal Instructions

Carefully support the reducer by lifting lug. (Lifting lug should only be used to lift the weight of the reducer. Do not use the lifting lug to lift the attached assemblies to avoid overloading the lifting lug).

5.1 Bushed Bore Model

- 5.1.1 Front Mounting Configuration with Stabilizer Ring 107-315 (see Figure 1-3)

Installation & Maintenance

- 5.1.1.1 Loosen the setscrew in the endcap. Remove the endcap from the output quill.
- 5.1.1.2 Remove the capscrews from the bushing and install them in the tapped holes in the bushing flange.
- 5.1.1.3 Tighten the capscrews uniformly until the reducer releases from the bushing taper.
- 5.1.1.4 Remove the reducer from the shaft.

NOTICE: A slight rocking movement may be required to release the unit from the stabilizer ring, if used.

- 5.1.2 Rear Mounting Configuration with Stabilizer Ring 107-800 (see Figure 1-4)

Notice: When removing a reducer mounted in the rear mounting configuration with stabilizer ring, make sure the stabilizer ring is removed before removing the reducer.

- 5.1.2.1 Loosen the setscrew in the endcap. Remove the endcap from the output quill.
- 5.1.2.2 Remove the capscrews from the bushing and install them in the tapped holes in the bushing flange.
- 5.1.2.3 Tighten the capscrews uniformly until the reducer releases from the bushing taper.
- 5.1.2.4 Remove the reducer from the shaft.

NOTICE: A slight rocking movement may be required to release the unit from the stabilizer ring, if used.

5.2 Finished Bore Model 107-315 (see Figures 1-6A and 1-6B)

- 5.2.1 Remove the setscrews in the output shaft.
- 5.2.2 Remove the reducer from the shaft.

Table 6-1: Bolt Torque Specifications

REDUCER SIZE	HOUSING FLANGE GRADE 5		TORQTAPER BUSHING		ENDCAP SETSCREW NYLON TIPPED	
	BOLT SIZE	FT. LBS.	BOLT SIZE	FT. LBS.	SETSCREW SIZE	IN-LBS.
107	5/16-18	16	5/16-18	16	1/4-20	60
115	3/8-16	25	3/8-16	29	1/4-20	60
203	7/16-14	40	3/8-18	29	1/4-20	60
207	1/2-13	65	3/8-16	29	1/4-20	60
215	1/2-13	65	3/8-16	29	1/4-20	60
307	5/8-11	125	1/2-13	70	1/4-20	60
315	5/8-11	125	1/2-13	70	1/4-20	60
407	5/8-11	125	1/2-13	70	3/8-16	200
415	3/4-10	220	5/8-11	140	3/8-16	200
507	3/4-10	220	3/4-10	250	3/8-16	200
608	3/4-10	220	3/4-10	250	3/8-16	200
800	1-8	525	7/8-9	400	3/8-16	200

Installation & Maintenance

TorqTaper® Plus Torque Arm Kit

⚠ WARNING

- Read and follow all instructions carefully.
- Disconnect and lock-out power before installation and maintenance. Working on or near energized equipment can result in severe injury or death.
- Do not operate equipment without guards in place. Exposed equipment can result in severe injury or death.

⚠ CAUTION

- Periodic inspections should be performed. Failure to perform proper maintenance can result in premature product failure and personal injury.

Top Motor Mount:

The torque arm brackets mount in either Position 1 or Position 2 (shown in Figure 1). Remove the housing flange bolts and attach the torque arm brackets to the gearbox. (Do not reinstall flat washers on the bolts).

Tighten the flange bolts to the recommended torque as shown in Table 2.

Thread the jam nut onto the rod end with the right hand threads, and then thread this rod end into the turnbuckle. Thread the rod end with left hand threads into the opposite end of the turnbuckle.

CAUTION: Both rod ends must extend into the opening of the turnbuckle a minimum of 1/2 inch during installation and when the gearbox is operating.

Mount the reducer to the shaft following the procedures as described in the installation instructions for the reducer and bushing kits.

Bolt the torque arm foot to a rigid foundation. (Foot bolts are customer supplied Grade 5 or stronger). Note: The torque arm foot must be in-line with torque arm brackets within 1/2 inch per foot of torque arm length.

CAUTION: Mount the torque arm foot in a location such that the torque arm is in tension when the gearbox is operating under load. The torque arm foot in Figure 1 is correctly mounted for a clockwise output shaft rotation. A counter-clockwise rotation of the output shaft requires mounting the torque arm foot to the right side of the mounting brackets.

Installation & Maintenance

Figure 1: Torque Arm Standard Mounting

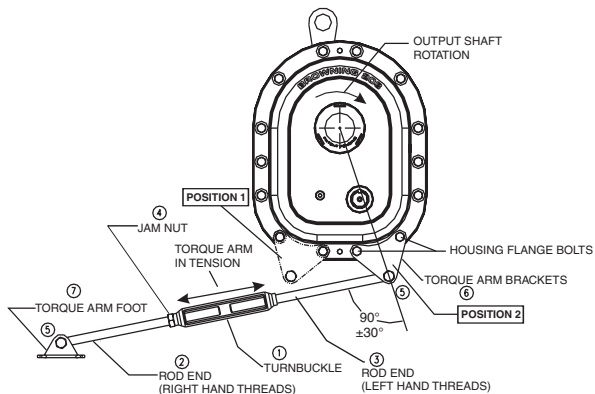


Table 1: Torque Arm Kit Parts List

Item	Quantity	Description
1	1	Turnbuckle
2	1	Rod End – Right Hand Threads
3	1	Rod End – Left Hand Threads
4	1	Jam Nut – Right Hand threads
5	2	Bolts / Lock Washers / Nuts
6	1 Pair	Torque Arm Brackets
7	1	Torque Arm Foot
8	1	Jam Nut – Left Hand Threads
9	2, 3 or 4	Bolts / Nuts

Installation & Maintenance

TorqTaper® Plus Torque Arm Kit Continued

Install the torque arm between the torque arm brackets and the torque arm foot using the supplied bolts. Before installing the lock washers and nuts apply a thread lock compound to the bolts. Install lock washers and nuts, tighten the nuts. A line through the hollow output shaft and the center of the torque arm bracket must be at an angle of 90° to the centerline of the torque arm within 30° (as shown in Figure 1).

Adjust the turnbuckle to position the gearbox in the correct position, and then tighten both jam nuts against the turnbuckle.

Reverse Load Mounting:

Two torque arms are installed so that one or the other of the torque arms is in tension for either direction of loading. Figure 2 shows this mounting arrangement. Install the torque arm at Position 1 as described in “Standard Mounting”. Mount the second torque arm and tighten the turnbuckle by hand until clearance is eliminated from torque arm assemblies. Rotate turnbuckle 2 an additional one-quarter turn tighter and tighten jam nuts on both torque arm 1 and 2.

Figure 2:

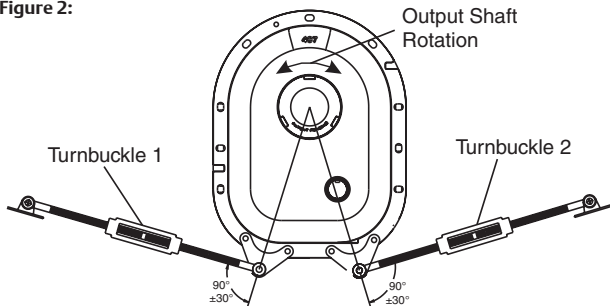
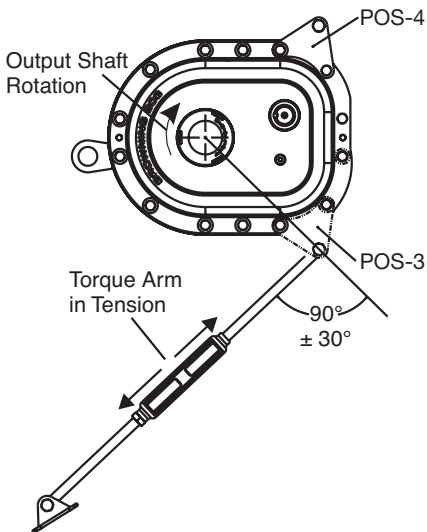


Table 2: Bolt Torque Specifications

Reducer Size	Flange Bolt		Foot to Foundation	CUSTOMER SUPPLIED GRADE 5 MINIMUM ↑↓
	Bolt Size	Ft-Lbs	Bolt Size	
107	5/16-18	16	3/8-16	
115	3/8-16	25	3/8-16	
203	7/16-14	40	3/8-16	
207	1/2-13	65	7/16-14	
215	1/2-13	65	7/16-14	
307	5/8-11	125	1/2-13	
315	5/8-11	125	5/8-11	
407	5/8-11	125	5/8-11	
415	3/4-10	220	3/4-10	
507	3/4-10	220	3/4-10	
608	3/4-10	220	1-8	
800	1-8	525	1 1/4-7	

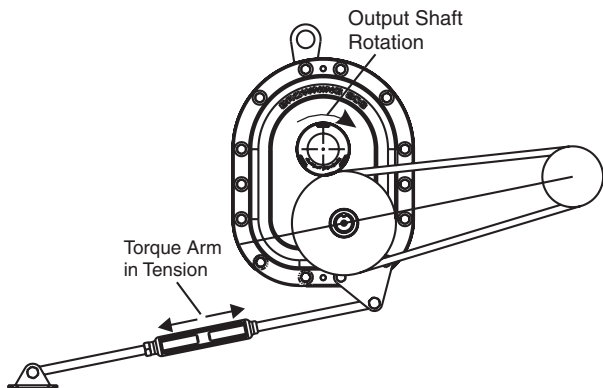
Installation & Maintenance

Figure 3:



Position 3 or Position 4, as shown in Figure 3, is required for side mounting of a motor mount kit to provide clearance for the motor mount supports.

Figure 4: Belt Tensioning Mounting:



Installation & Maintenance

TorqTaper® Plus Torque Arm Kit Continued

The mounting configuration, as shown in Figure 4, uses the torque arm for adjustment of the belt drive.

Mount the torque arm as described in “Standard Mounting.”

Locate the centerline of the belt drive within 30 degrees of the centerline of the torque arm and on the opposite side (as shown in Figure 4).

Using the torque arm, adjust the belt tension per the belt manufacturer’s instructions.

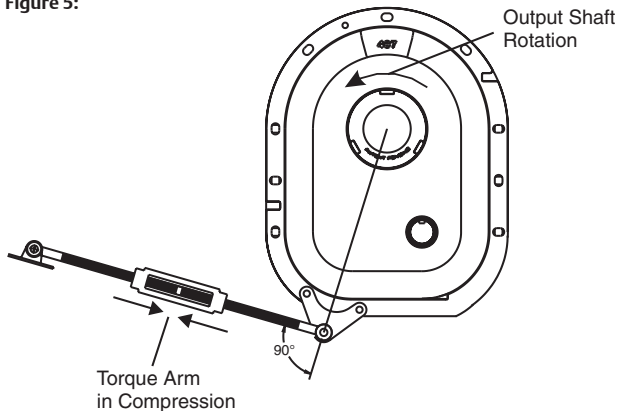
NOTICE: Sheaves for the input shaft of the reducer must not be smaller than the diameter shown in the selection table from which the reducer was selected. Smaller diameter sheaves may result in reduced bearing life.

Adjust the turnbuckle to position gearbox, then tighten both jam nuts against the turnbuckle. (Note: Each rod end must extend a minimum of 1.50 inches into the opening in the turnbuckle.)

Compression Mounting:

Application limited to light shock loading and/or reversing loads not exceeding catalog ratings. Applications with medium shock loading and full reversing loads use the reverse load mounting as shown in Figure 2. This Compression Mounting method requires more precise mounting alignment and reduced torque arm length adjustment.

Figure 5:



Installation & Maintenance

Remove housing flange bolts and attach torque arm brackets to gearbox using bolts supplied in the torque arm kit.

Tighten the flange bolts to the recommended torque as shown in Table 2.

Thread the right handed jam nut onto the rod end with the right handed threads, then thread this rod end into the turnbuckle. Thread the left handed jam nut onto the rod end with the left handed threads. Thread this left handed rod end into the turnbuckle on the end with the left handed threads.

CAUTION: Both rod ends must extend into the opening of the turnbuckle a minimum of 1.50 inches on each end at installation when gearbox is operating. Maintain a minimum of 1/4 inch between rod ends.

Mount the reducer to the shaft following the procedures as described in the installation instructions for the reducer and bushing kits.

Bolt the torque arm foot to a rigid foundation. Use the heavy duty flat washers supplied with the torque arm kit. Confirm the foundation or frame will withstand the loads. (Foot bolts are customer supplied and must be Grade 5 or stronger).

NOTICE: The torque arm foot must be mounted in line with the torque arm brackets within 1/4 inch per foot of the torque arm length.

Install the torque arm between the torque arm brackets and the torque arm foot using the supplied bolts. Before installing the lock washers and nuts, apply a thread lock compound to the bolts. Install lock washers and nuts, tighten the nuts. A line through the hollow output shaft and the center of the torque arm bracket must be at an angle of 90 degrees to the centerline of the torque arm within 5 degrees (as shown in Figure 5).

Adjust the turnbuckle to position gearbox, then tighten both jam nuts against the turnbuckle. (Note: Each rod end must extend a minimum of 1.50 inches into the opening in the turnbuckle.)

Installation & Maintenance

TorqTaper® Plus Motor Mount

⚠ WARNING

- Read and follow all instructions carefully.
- Disconnect and lock-out power before installation and maintenance. Working on or near energized equipment can result in severe injury or death.
- Do not operate equipment without guards in place. Exposed equipment can result in severe injury or death.

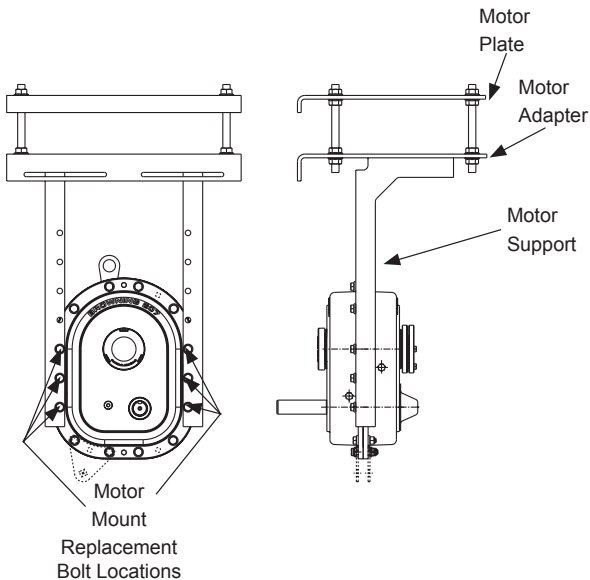
⚠ CAUTION

- Periodic inspections should be performed. Failure to perform proper maintenance can result in premature product failure and personal injury.

1. Motor Mount Installation Instructions

1.1 Top (6 O'clock) or Bottom (12 O'clock) Motor Mount Installation Instructions (Size 107 through 315)

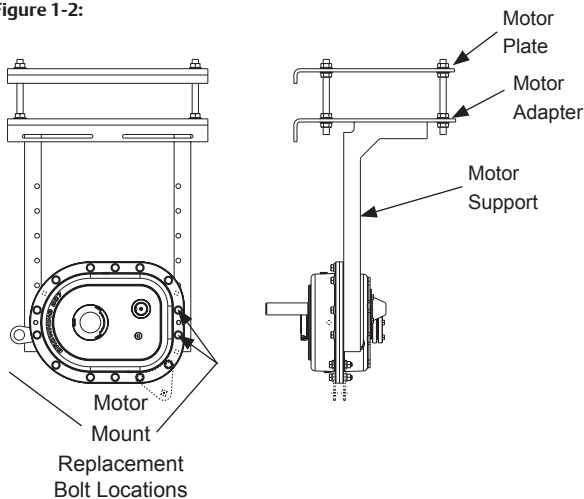
Figure 1-1:



Installation & Maintenance

- 1.1.1 Remove the three housing flange bolts and washers on each side as shown in Figure 1-1.
- 1.1.2 Install the motor supports, using the longer bolts furnished with the motor mount kit. One support is used on each side of the unit on the input shaft side of flange. Additional holes are provided for various center distances.
- 1.1.3 Install all flange bolts and washers against flange at this time but do not tighten.
- 1.1.4 Install the motor adapter; using the capscrews provided, tightening the capscrews to the recommended torque. (See bolt torque specifications in Table 1.)
- 1.1.5 Tighten the reducer flange bolts to the recommended torque. (See bolt torque specifications in Table 1.)
- 1.2 **Side Motor Mount Installation Instruction**
(3 O'clock or 9 O'clock)
(Size 107 through 315)

Figure 1-2:



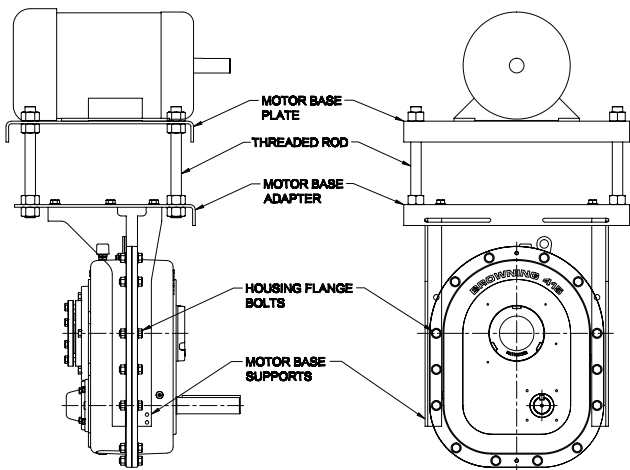
- 1.2.1 Remove the housing flange bolts as shown in Figure 1-2.
- 1.2.2 Install the motor supports, using the longer bolts furnished with the motor base adapter. One support is used on each side of the unit on the side of flange opposite the input shaft.

Installation & Maintenance

TorqTaper® Plus Motor Mount Continued

- 1.2.3 Install all flange bolts at this time but do not tighten.
- 1.2.4 Install the motor adapter; using the capscrews provided, tighten the capscrews to the recommended torque. (See bolt torque specifications section 2.)
- 1.2.5 Tighten the reducer flange bolts to the recommended torque. (See bolt torque specifications in Table 1.)
- 1.3 Top (6 O'clock) or Bottom (12 O'clock) Motor Mount Installation Instructions (Size 407 through 800)**
 - 1.3.1 Remove the housing flange bolts along the sides only of the reducer.
 - 1.3.2 Install the motor base supports, using the longer bolts furnished with the motor base adapter. Two supports are used on each side unit of the 407 - 608 reducers. (See Figure 1-3.)

Figure 1-3:



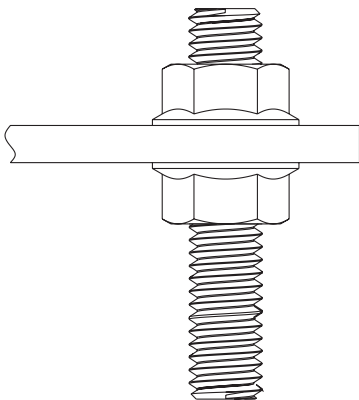
Installation & Maintenance

- 1.3.3 Install all flange bolts at this time but do not tighten.
- 1.3.4 Install the motor base adapter; using the capscrews provided, tightening the capscrews to the recommended torque. (See Table 1).
- 1.3.5 After completing step 1.3.4, tighten the reducer flange bolts to the recommended torque. (See Table 1)

1.4 Motor Plate Installation Instructions

- 1.4.1 Install a nut on each end of the four threaded rods and position nuts approximately 2" from each rod end. (Refer to Figure 1-4 for correct installation of flange nuts.)

Figure 1-4: Detail of flanged nut installation on threaded rod.



Installation & Maintenance

TorqTaper® Plus Motor Mount Continued

- 1.4.2 Insert threaded rods in the four corner holes of the motor base adapter that match holes in motor base plate and install bottom nut flange end first on each rod but do not tighten.
- 1.4.3 Position motor base plate over threaded rods and install top nuts, flange end but do not tighten.
- 1.4.4 Mount motor using holes in motor base plate that match the holes in the base of the motor following motor manufacturer's recommendations.
- 1.4.5 Using adjusting nuts, lower motor to its lowest position. This can be done by either letting the threaded rods extend above the motor base plate or below the motor base adapter. Either way is acceptable, but nearly equal amounts of threads should be showing.
- 1.4.6 Mount and align sheaves on motor and input shaft of reducer.

Note: The sheave should be positioned as closely to the reducer housing as possible to reduce overhung load on the input bearings.
- 1.4.7 Adjust the belt alignment by sliding the motor base plate to the correct position. Mount and adjust belts to the recommended tension by raising the motor equally at all four adjusting rods to assure that the motor base plate remains parallel to the input shaft at the final adjustment. Tighten the flanged nuts.
- 1.4.8 Recheck to be sure all nuts and bolts are tight, sheaves are in alignment and belts are properly tensioned.

2. Bolt Torque Specifications

Table 1: Bolt Torque Specifications

REDUCER SIZE	HOUSING FLANGE		MOTOR ADAPTOR	
	BOLT SIZE	FT. LBS	BOLT SIZE	FT. LBS
107	5/16-18	16	5/16-18	16
115	3/8-16	29	3/8-16	29
203	7/16-14	46	7/16-14	46
207	1/2-13	70	1/2-13	70
215	1/2-13	70	1/2-13	70
307	5/8-11	140	1/2-13	70
315	5/8-11	140	1/2-13	70
407	5/8-11	140	3/4-10	250
415	3/4-10	250	3/4-10	250
507	3/4-10	250	3/4-10	250
608	3/4-10	250	3/4-10	250
800	1-8	600	3/4-10	250

Notes

Installation & Maintenance

TorqTaper® Plus Backstop Kit

⚠ WARNING

- Read and follow all instructions carefully.
- Disconnect and lock-out power before installation and maintenance. Working on or near energized equipment can result in severe injury or death.
- Do not operate equipment without guards in place. Exposed equipment can result in severe injury or death.

⚠ CAUTION

- Periodic inspections should be performed. Failure to perform proper maintenance can result in premature product failure and personal injury.
- All electrical work should be performed by qualified personnel and be compliant with local and national electrical codes.

1. Backstop Kit Installation Instructions

- Gearboxes equipped with a backstop must be mounted in the 6 o'clock through 9 o'clock positions. (Shown in Figure 1-4.) Call the Application Engineering Department for any other mounting position at 1-800-626-2093.
- Do not use a backstop on a gearbox mounted with the input shaft vertical down.
- Before installing the backstop, 'jog' the motor to determine the direction of rotation. Reverse motor direction of rotation if necessary to keep from starting against the backstop.
- If the motor is wired incorrectly and started against the backstop, correct the wiring and replace the backstop.
- Petroleum based and synthetic lubricants, which contain anti-wear extreme pressure additives, must not be used in gearboxes with internal backstops. These additives decrease the backstop's ability to prevent reverse rotation resulting in backstop failure.
- Do not disassemble the cam and outer race subassembly.

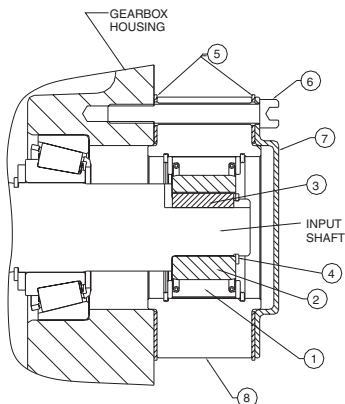
1.1 Installation (107 Through 307SMTP):

The 107BSP through 307BSP backstop kit contains the following:

- 1 – Cam assembly
- 2 – Inner race
- 3 – Key
- 4 – Snap ring
- 5 – Gaskets
- 6 – Outer race mounting bolts
- 7 – Backstop cover
- 8 – Outer race

Installation & Maintenance

Figure 1-1: 107SMTP through 307SMTP



- 1.1.1 Remove the capscrews from the input cover and remove the cover and gasket from the gearbox housing.
- 1.1.2 Clean the gearbox housing surface where the backstop outer race mounts.
- 1.1.3 Insert the key (Item 3) into the keyseat of the input shaft.
- 1.1.4 Install the inner race (Item 2) onto the input shaft as shown in Figure 1-1.
- 1.1.5 Install the snap ring (Item 4).
- 1.1.6 Determine the desired direction of rotation of the input shaft.
- 1.1.7 Install the gasket on the outer race.

NOTICE: Remove adhesive backing (if included) before installing gasket.
- 1.1.8 Position the backstop outer race (Item 8) and cam assembly (Item 1) onto the inner race (Item 2), making sure the arrow on the label attached to the outer race is pointing in the desired direction of rotation of the input shaft.
- 1.1.9 Install the cover plate with capscrews supplied in the kit and tighten to the recommended value. (See bolt torque specifications Table 1-1.)
- 1.1.10 Rotate the input shaft by hand to confirm the correct direction of rotation.

Installation & Maintenance

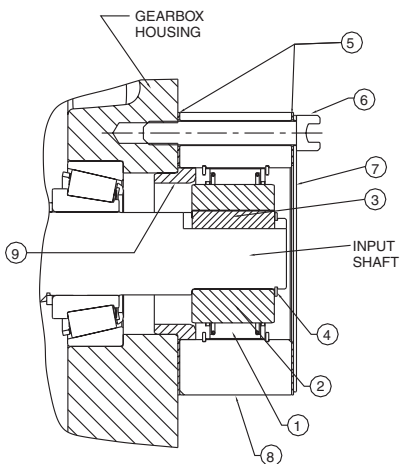
TorqTaper® Plus Backstop Kit Continued

1.2 Installation (315SMTP):

The 315BSP backstop kit contains the following:

- 1 – Cam assembly
- 2 – Inner race
- 3 – Key
- 4 – Snap ring
- 5 – Gaskets
- 6 – Outer race mounting bolts
- 7 – Backstop cover
- 8 – Outer race
- 9 – Adapter ring

Figure 1-2:



- 1.2.1 Remove the capscrews from the input cover and remove the cover and gasket from the gearbox housing.
- 1.2.2 Clean the gearbox housing surface where the backstop outer race mounts.
- 1.2.3 Insert the key (Item 3) into the keyseat of the input shaft.
- 1.2.4 Install the inner race (Item 2) onto the input shaft as shown in Figure 1-2.
- 1.2.5 Install the snap ring (Item 4).
- 1.2.6 Install the adapter ring (Item 9) as shown in Figure 1-2.

Installation & Maintenance

- 1.2.7 Determine the desired direction of rotation of the input shaft.
- 1.2.8 Install the gasket on the outer race.
- Note: Remove adhesive backing (if included) before installing gasket.
- 1.2.9 Position the backstop outer race (Item 8) and cam assembly (Item 1) onto the inner race (Item 2), making sure the arrow on the label attached to the outer race is pointing in the desired direction of rotation of the input shaft.
- 1.2.10 Install the cover plate and second gasket with the capscrews supplied in the kit and tighten to the recommended value. (See bolt torque specifications Table 1-1.)
- 1.2.11 Rotate the input shaft by hand to confirm the correct direction of rotation.

1.3 Installation (407 through 800SMTP):

The 407BSP through 608BSP backstop kit contains the following:

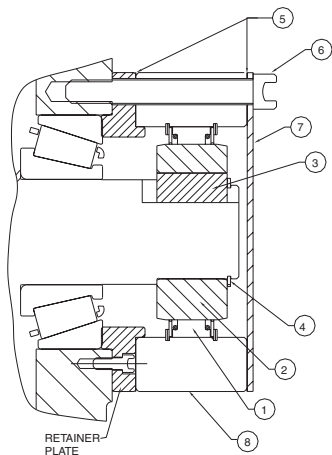
- 1 – Cam assembly
- 2 – Inner race
- 3 – Key
- 4 – Snap ring
- 5 – Gaskets
- 6 – Outer race mounting bolts
- 7 – Backstop cover
- 8 – Outer race

- 1.3.1 Remove the capscrews from the input cover and remove the cover and gasket from the gearbox housing. (Do not remove retainer plate.)
- 1.3.2 Clean the surface where the backstop outer race mounts.
- 1.3.3 Insert the key (Item 3) into the keyseat of the input shaft.
- 1.3.4 Install the inner race (Item 2) onto the input shaft as shown in Figure 1-3.

Installation & Maintenance

TorqTaper® Plus Backstop Kit Continued

Figure 1-3:



1.3.5 Install the snap ring (Item 4).

1.3.6 Determine the desired direction of rotation of the input shaft.

1.3.7 Install the gasket on the outer race.

Note: Remove adhesive backing (if included) before installing gasket.

1.3.8 Position the backstop outer race (Item 8) and cam assembly (Item 1) onto the inner race (Item 2), making sure the arrow on the label attached to the outer race is pointing in the desired direction of rotation of the input shaft.

1.3.9 Install the cover plate and second gasket with the capscrews supplied in the kit and tighten to the recommended value (See bolt torque specifications Table 1-1).

1.3.10 Rotate the input shaft by hand to confirm the correct direction of rotation.

Installation & Maintenance

Figure 1-4:

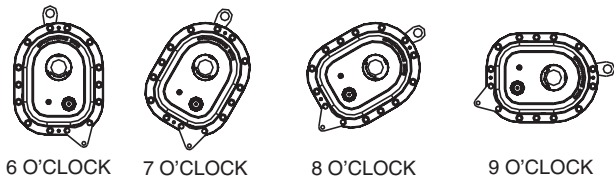


Table 1-1: Backstop Bolt Torque Specifications

Reducer Size	Bolt Size	TORQUE (FT-LBS)
107	1/4 - 20	8
115	1/4 - 20	8
203	1/4 - 20	8
207	3/8 - 16	29
215	3/8 - 16	29
307	3/8 - 16	29
315	1/2 - 13	70
407	1/2 - 13	70
415	1/2 - 13	70
507	5/8 - 11	140
608	5/8 - 11	140
800	3/4 - 10	250

Installation & Maintenance

TorqTaper® Plus V-Belt Guard

⚠ WARNING

- Read and follow all instructions carefully.
- Disconnect and lock-out power before installation and maintenance. Working on or near energized equipment can result in severe injury or death.
- Do not operate equipment without guards in place. Exposed equipment can result in severe injury or death.

⚠ CAUTION

- Periodic inspections should be performed. Failure to perform proper maintenance can result in premature product failure and personal injury.
- All electrical work should be performed by qualified personnel and compliant with local and national electrical codes.

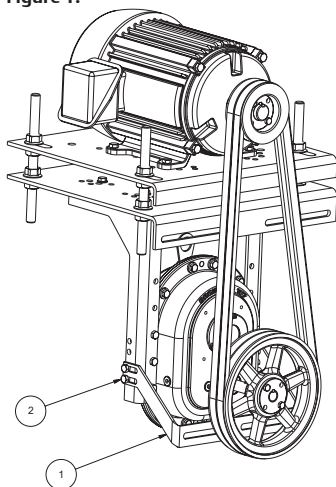
1. V-Belt Guard Installation

Table 1: Belt Guard Parts List

Item Number	Description
1	Belt Guard Bracket
2	Bracket Fasteners*
3	Belt Guard Back LH
4	Belt Guard Back RH
5	Slot Filler
6	Slot Filler Nuts (not visible)
7	Guard back Fasteners*
8	Guard Front
9	Hinge Pins
10	Lock Screw

* Hex head cap screws, washers and nuts supplied

Figure 1:

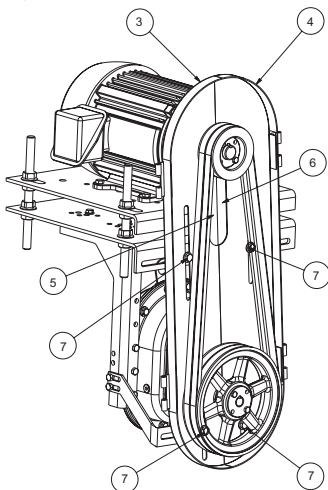


NOTICE: Motor mount and motor must be installed before starting v-belt guard installation.

Installation & Maintenance

- 1.1 Bolt the belt guard lower mounting bracket (Item 1) to the motor mount supports using the cap screws, washers and nuts provided (Items 2). Tighten the cap screws finger tight.
- 1.2 SMTP 307 through 800. If a fan is to be utilized in this application, install the fan kit.
- 1.3 Mount the sheaves and belts. Align and adjust the tension per the belt manufacturer's instructions.
- 1.4 Attach the left hand and right hand guard backs (Items 3 and 4) to the motor base adaptor and the lower mounting bracket as shown with the fasteners provided (Items 7). Tighten the bolts finger tight. If a fan is installed, adjust the position of the lower mounting bracket for 1/8 inch minimum clearance between the fan cover bolts and the guard backs.
- 1.5 Loosen the slot filler mounting nuts (Item 6) located on the guard backs until they are finger tight.
- 1.6 Position the guard backs and slot filler (Items 5) such that the motor shaft is centered in the cutouts provided and the reducer's input shaft is centered in the cutout provided.

Figure 2:

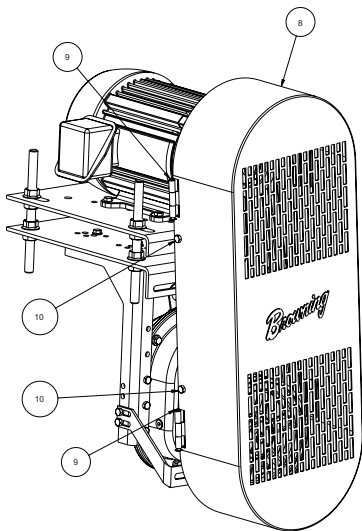


Installation & Maintenance

TorqTaper® Plus V-Belt Guard Continued

- 1.7 Tighten the lower mounting bracket cap screws and the motor base adaptor cap screws to the recommended value (see Bolt Torque Specification Table). Tighten the slot filler nuts.
- 1.8 Using the hinge pins provided (Item 9), attach the guard front (Item 8) to the guard back.
- 1.9 Install guard front locks (Item 10).

Figure 3:



Installation & Maintenance

Table 2: Bolt Torque Specifications

Reducer Size	Bracket Hex Head Screws		Guard Back Hex Head Screws	
	Screw Size	Ft Lbs	Screw Size	Ft Lbs
107	5/16-18	16	3/8-16	29
115	5/16-18	16	3/8-16	29
203	5/16-18	16	3/8-16	29
207	3/8-16	29	3/8-16	29
215	3/8-16	29	3/8-16	29
307	3/8-16	29	3/8-16	29
315	3/8-16	29	3/8-16	29
407	3/8-16	29	1/2-13	70
415	3/8-16	29	1/2-13	70
507	1/2-13	70	1/2-13	70
608	1/2-13	70	1/2-13	70
800	1/2-13	70	1/2-13	70

Installation & Maintenance

TorqTaper® Plus Fan Kit

⚠ WARNING

- Read and follow all instructions carefully.
- Disconnect and lock-out power before installation and maintenance. Working on or near energized equipment can result in severe injury or death.
- Do not operate equipment without guards in place. Exposed equipment can result in severe injury or death.

⚠ CAUTION

- Periodic inspections should be performed. Failure to perform proper maintenance can result in premature product failure and personal injury.
- All electrical work should be performed by qualified personnel and be compliant with local and national electrical codes.

1. Fan Kit Installation

- 1.1 Attach the fan housing to the reducer with the flat head screws provided. Reducers are furnished with tapped holes surrounding the input shaft for this purpose. Tighten the flat head screws to the recommended value (see Bolt Torque Specification Table).
- 1.2 Rotate the reducer's input shaft until the keyway is in the 'up' position.
- 1.3 Place the key into the keyway of the input shaft and slide the fan blade into position with the hub away from the housing. Make sure the fan blade seats against the shaft shoulder. Attach the fan blade to the input shaft with the setscrews provided. Tighten the setscrews to the recommended value (see Bolt Torque Specification Table).
- 1.4 Attach the fan cover to the fan housing with the cap screws provided. Tighten the cap screws to the recommended value (see Bolt Torque Specification Table).

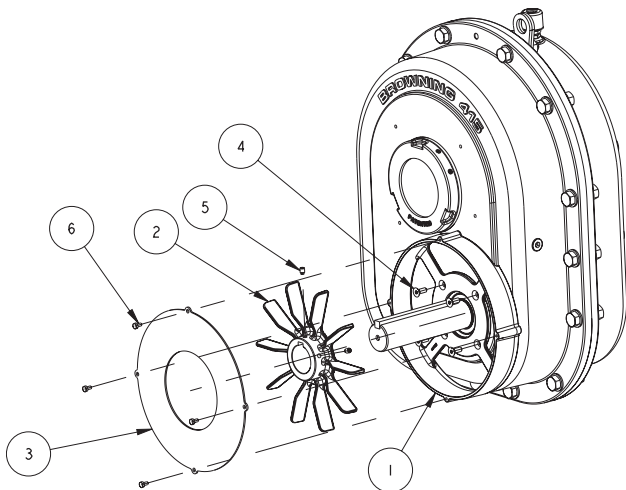
Table 1: Fan Kit Parts Description

Item Number	Description
1	Fan Housing
2	Fan Blade
3	Fan Cover
4	Flat Head Cap Screws
5	Socket Setscrews
6	Hex Head Cap Screws

Installation & Maintenance

Table 2: Bolt Torque Specification Table

Reducer Size	Fan Housing		Fan Blade		Fan Cover	
	Flat Head Bolt Size	Ft Lbs	Setscrew Size	Ft Lbs	Cap Screw Size	Ft Lbs
307	3/8-16	29	3/8-16	24	1/4-20	12
315	3/8-16	29	3/8-16	24	1/4-20	12
407	3/8-16	29	3/8-16	24	1/4-20	12
415	3/8-16	29	3/8-16	24	1/4-20	12
507	3/8-16	29	3/8-16	24	1/4-20	12
608	3/8-16	29	3/8-16	24	1/4-20	12
800	3/8-16	29	3/8-16	24	1/4-20	12



Installation & Maintenance

TorqTaper® Plus Vertical Breather Kit

▲ WARNING

- Read and follow all instructions carefully.
- Disconnect and lock-out power before installation and maintenance. Working on or near energized equipment can result in severe injury or death.
- Do not operate equipment without guards in place. Exposed equipment can result in severe injury or death.

▲ CAUTION

- Periodic inspections should be performed. Failure to perform proper maintenance can result in premature product failure and personal injury.
- All electrical work should be performed by qualified personnel and compliant with local and national electrical codes.

1. Vertical Shaft Mounting

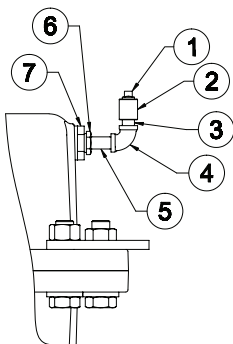
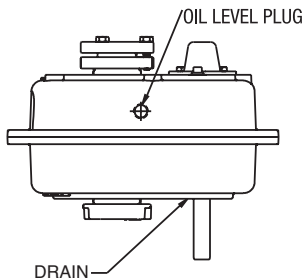


Figure 1



The vertical mounting kit for sizes 107 through 608 SMTP shaft mount reducers consists of six parts:

Installation & Maintenance

Table 1: Vertical Breather Kit Parts List

Item	Part Description
1	Breather – Included with the reducer
2	3/8 NPT Coupling
3	3/8 NPT Close Nipple
4	3/8 NPT Elbow
5	3/8 NPT X 2 1/2" Nipple
6*	3/4 NPT X 3/8 NPT Reducer Bushing
7**	1 1/2 NPT X 3/4 NPT Reducer Bushing

* Required on SMTP 207 through 800

** Required on SMTP 800

Refer to figure 1 for assembly of parts.

Installation & Maintenance

TorqTaper® Plus Filtered Breather Kit

⚠ WARNING

- Read and follow all instructions carefully.
- Disconnect and lock-out power before installation and maintenance. Working on or near energized equipment can result in severe injury or death.
- Do not operate equipment without guards in place. Exposed equipment can result in severe injury or death.

⚠ CAUTION

- Periodic inspections should be performed. Failure to perform proper maintenance can result in premature product failure and personal injury.
- All electrical work should be performed by qualified personnel and compliant with local and national electrical codes.

1. Filtered Breather Kit

The filtered breather kit (107-800SMTP FBK) uses a standard automotive oil filter (FRAM Part number P1654A or equivalent). The kit fits all sizes of SMTP reducers from a 107SMTP through the 800SMTP.

Sizes 107SMTP through 203SMTP use a pipe bushing (Item 5, included in the kit), to adapt the 3/8 NPT in the gearbox housing to a 3/4 NPT. The filter adapter can then be threaded into this bushing. The bushing is not required on 207SMTP through 800SMTP. Size 800SMTP uses a reducer bushing (Item 6, included in the kit), to adapt the 1 1/2 NPT in the gearbox housing to a 3/4 NPT.

NOTICE: Change the filter canister after each 500 hours of operation. When operated in heavily contaminated areas, the replacement frequency should be every 250 hours.

- 1.1 Figure 1 shows the Filtered Breather Kit mounted to a reducer in the horizontal shaft mounting position. When mounting the Filtered Breather Kit to a reducer in the vertical shaft mounting position, thread Item 5, the 3/8 NPT male X 3/4 NPT female hex bushing into the Vertical Breather Kit's 3/8" coupling.
- 1.2 Refer to lubrication specifications for the proper viscosity of oil. Remove the oil level plug and fill through the breather location until it begins to run out the oil level hole. Install the oil level plug and the breather.

Installation & Maintenance

Figure 1:

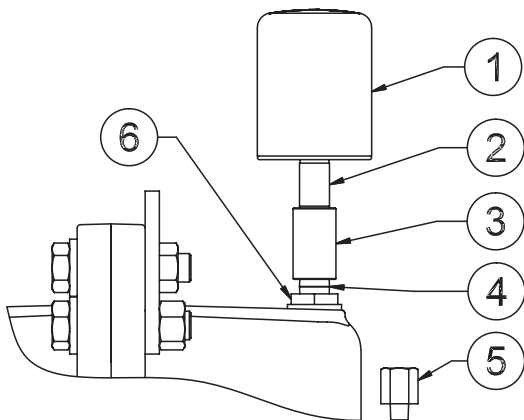


Table 1: Filtered Breather Kit Parts List

Filtered Breather Kit Parts List	
Item	Part Description
1	Fram Oil Filter P1654A
2	Filter Adapter
3	3/4 NPT Coupling
4	3/4 NPT Close Nipple
5*	3/8 NPT Male X 3/4 NPT Female Hex Bushing
6**	1 1/2 - 3/4 Reducer Bushing

* Required on SMTP 107 through 203

** Required on SMTP 800

Installation & Maintenance

TorqTaper® Plus Pump and Cooler Kit

⚠ WARNING

- Read and follow all instructions carefully.
- Disconnect and lock-out power before installation and maintenance. Working on or near energized equipment can result in severe injury or death.
- Do not operate equipment without guards in place. Exposed equipment can result in severe injury or death.

⚠ CAUTION

- Periodic inspections should be performed. Failure to perform proper maintenance can result in premature product failure and personal injury.
- All electrical work should be performed by qualified personnel and compliant with local and national electrical codes.

1. Pump and Cooler Installation Instructions

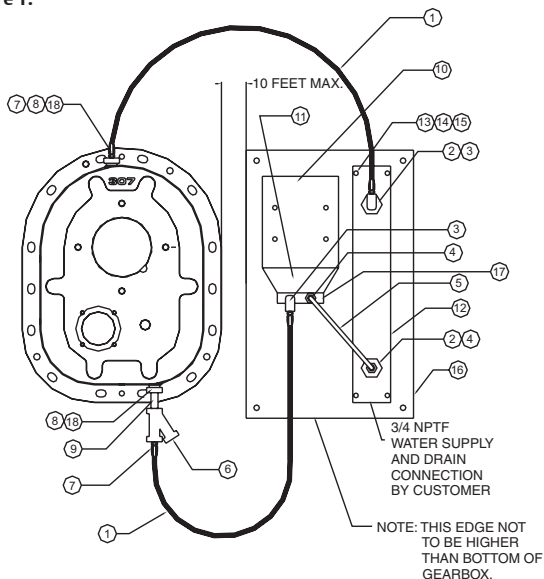
307SMTP through 800SMTP

Applications requiring cooling beyond the capability of a fan can use a pump and cooler as indicated in the selection tables. The following instructions are a step-by-step guide for installation of the pump and cooler kit available for the Browning TorqTaper Plus shaft mounted gearbox.

Note: Use of a pipe thread sealant can reduce the possibility of a leak.

The heat exchanger, pump and motor are factory installed on a 16" x 26" mounting plate (as shown).

Figure 1:



Installation & Maintenance

- 1.1.1 Attach this subassembly to equipment with four 3/8" mounting bolts (customer supplied). The pattern of these mounting bolts is 14.00" x 23.63". The maximum distance between the reducer and the mounting plate is 10 feet. (Hoses are supplied by the customer.)

NOTICE: The bottom edge of the mounting plate should not be mounted higher than the bottom of the gearbox.

- 1.1.2 Remove the bottom drain plug from the reducer and replace with 3/4" to 3/8" pipe reducer bushing (Item 8*). Use 1 1/2" to 3/4" Reducer Bushing on 800SMTP.
- 1.1.3 Install the 3 inch long pipe nipple (Item 9) into the reducer bushing.
- 1.1.4 Attach the strainer (Item 6) to the pipe nipple and turn the strainer to a position where the strainer screen can be removed for cleaning without interference with the gearbox.
- 1.1.5 Install the adapter (Item 7) in the bottom of the strainer.
- 1.1.6 Connect one hose between adapter (Item 7) and adapter (Item 3) at the inlet of the pump.
- 1.1.7 Install 3/4" to 3/8" pipe reducer bushing (Item 8) at the top of the gearbox, as shown. (Use 1 1/2" to 3/4" on 800SMTP).
- 1.1.8 Install adapter (Item 7) into the reducer bushing.
- 1.1.9 Connect the second hose between the adapter (Item 7) at the top of the gearbox and the adapter (Item 3) at the outlet of the heat exchanger.
- 1.1.10 Secure hoses so that there are no sharp bends that would restrict oil flow. Hoses must also be secured to prevent interference with moving machine components.
- 1.1.11 A motor starter is required for the pump motor and must be connected such that the pump motor and the gearbox motor start at the same time. The motor furnished with this kit has the rating shown on the motor nameplate. The proper pump motor overload protection must be selected per local and national electrical codes. The wiring diagram for the pump motor is also shown on the motor nameplate.

Installation & Maintenance

TorqTaper® Plus Pump and Cooler Kit Continued

Table 1: 307 through 800SMTP

Item Number	Quantity	Description
1	2	Hose Assembly - customer supplied
2	2	1" x 1/2" Reducer Bushing
3	2	Male Elbow Adapter -1/2" NPT to 9/16" JIC
4	2	Male Connector 1/2" NPT to 3/8" tube
5	1	3/8" DOM Hydraulic Tubing
6	1	Strainer
7	2	Male Adapter -3/8" NPT to 9/16" JIC
8	2	Reducer Bushing -3/4 NPT to 3/8 NPT
9	1	3/8" NPT x 3" pipe nipple
10	1	1/2 HP 1800 RPM 3PH 230/460 AC motor
11	1	Oil Pump Bracket
12	1	Shell and Tube Heat Exchanger
13	8	Hexagon Head Cap Screws 3/8" - 16 x 1 inch
14	8	3/8" Split Lock Washer
15	8	3/8" - 16 Hex Nut
16	1	Mounting Plate (bolt hole pattern 14.00 x 23.63)
17	1	Pump
18*	2	1 1/2 - 3/4 Reducer Bushing

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- 1.1.12 Attach the water supply and drain lines to the bottom of the heat exchanger. Minimum water flow is 2.2 GPM and the maximum water flow is 13 GPM. Maximum inlet water temperature is 80°F.
- 1.1.13 Fill the gearbox with the oil type and amount per the “Lubrication Instructions.” Additional oil is required for the hoses and heat exchanger. Check and fill to the oil level, as described in the instructions supplied with the gearbox.
- 1.1.14 Start the water flow.
- 1.1.15 Start the pump motor and confirm that the oil is circulating correctly. If no oil flows within 20 seconds, stop the pump motor and contact Application Engineering at 1-800-626-2093.
- 1.1.16 Inspect for oil or water leaks.
- 1.1.17 After the gearbox has operated for five minutes, refill with oil to the correct level. (See lubrication Instructions.)
- 1.1.18 Adjust the water flow for an oil temperature of 110 to 170° F.

Installation & Maintenance

TorqTaper® Plus Screw Conveyor Drive

⚠ WARNING

- Read and follow all instructions carefully.
- Disconnect and lock-out power before installation and maintenance. Working on or near energized equipment can result in severe injury or death.
- Do not operate equipment without guards in place. Exposed equipment can result in severe injury or death.

⚠ CAUTION

- Periodic inspections should be performed. Failure to perform proper maintenance can result in premature product failure and personal injury.

1. Screw Conveyor Drive Installation Instructions

A shaft mount reducer can be converted to a screw conveyor drive by installing a screw conveyor drive shaft and adapter as follows:

1.1 Screw Conveyor Drive Adapter and Shaft

Installation Instructions Sizes 107 through 407

1.1.1 Remove the bushing ring, endcap and dirt cover from the hollow output shaft.

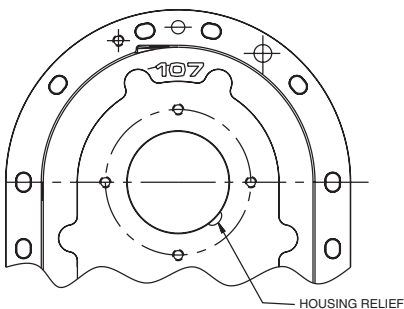
NOTICE: The endcap and dirt cover may be discarded. Do not discard the bushing ring.

1.1.2 On the side opposite of the input shaft, place a straight blade screwdriver in the housing relief next to the metal shield of the “Barrier” sealing system. Tap the screwdriver blade into the side of the metal shield. Pry the metal shield out of the reducer. Refer to Figure 1-1.

NOTICE: Do not drive the screwdriver into the metal shield more than 1/4”.

NOTICE: The 407 does not include a metal shield. Do not remove the factory installed v-ring. Proceed to step 1.1.4.”

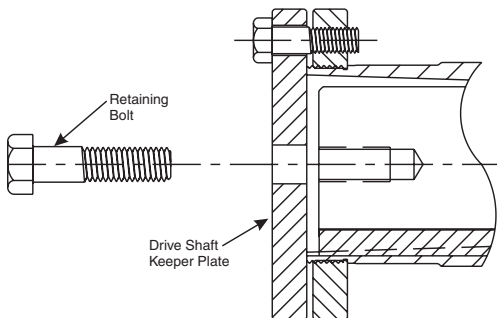
Figure 1-1: Metal Shield Removal Detail



Installation & Maintenance

- 1.1.3 Remove the v-ring from the metal shield. Discard the metal shield. Re-install the v-ring into the same location. When re-installed properly, the lip of the v-ring will contact the face of the oil seal.
- 1.1.4 Install the ring seal plate supplied with the adapter or optional seal cartridge in the screw conveyor adapter. See section 1.2 lip seal/waste pack seal cartridge instructions or section 1.3 lip seal/packing gland seal cartridge instructions for optional sealing installation instructions.
- 1.1.5 Position screw conveyor adapter with the small pilot end toward the reducer and align the adapter bolt holes to the bolt holes in the housing face.
- 1.1.6 Install the capscrews supplied with the screw conveyor adapter kit. Tighten the capscrews to the recommended torque. See bolt torque specifications section 2.
Note: These capscrews have a coating near the end which will provide positive locking of the fastener.
- 1.1.7 Place shaft key (supplied with kit) in keyseat of screw conveyor drive shaft. Insert the drive shaft into the hollow output shaft of reducer, making sure the shaft key aligns with the keyway in the reducer.
- 1.1.8 On the input shaft side, thread the bushing ring onto the hollow quill one to two turns past the end of the quill.

Figure 1-2: Drive Shaft Keeper Plate Installation
Sizes 107 through 407

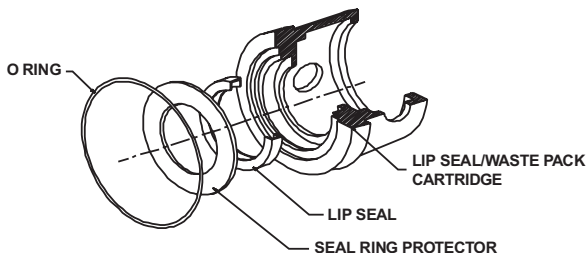


Installation & Maintenance

TorqTaper® Plus Screw Conveyor Drive Continued

- 1.1.9 On the input shaft side of the hollow output shaft, install drive shaft keeper plate and tighten the retaining bolt (supplied with kit) securely after applying thread lock compound to the retaining bolt's threads. Insert bolts through keeper plate and thread into bushing ring for future removal.
- 1.1.10 Attach the screw conveyor drive assembly to the trough end using the four (4) flat head capscrews, flat washers, lock washers and nuts supplied with the trough end. On 6 and 9-inch conveyors, install the trough end to the screw conveyor drive before mounting the trough end to the trough.
- #### 1.2 Lip Seal/Waste Pack Seal Cartridge Instructions
- 1.2.1 Install the lip seal (supplied) or the felt seal (optional) in the front chamber of the seal cartridge.
- NOTICE:** Install the lip seal with the spring side of the seal toward the reducer.
- 1.2.2 Install seal cartridge into the screw conveyor adapter. Align the anti-rotation pin on the seal cartridge to the slot in the screw conveyor adapter.
- 1.2.3 Install seal protector over shaft even if the lip seal or the felt seal is not used.
- 1.2.4 Install o-ring in the groove provided on the seal cartridge housing. (Grease or sealant can be used to hold o-ring in place during installation to trough end.)
- 1.2.5 Proceed with step 1.1.5.
- 1.2.6 When step 1.1.8 has been completed, fill seal cartridge cavity with waste packing, if so desired.
- Note:** Waste packing not supplied.

Figure 1-3: Lip Seal/Waste Pack Assembly

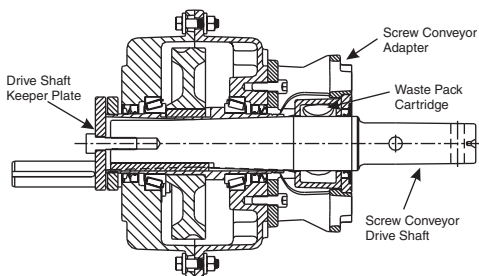


Installation & Maintenance

1.3 Lip Seal/Packing Gland Seal Cartridge Instructions

- 1.3.1 Assemble the packing gland piston and the packing gland cartridge with the bolts provided. The pilot of the packing gland piston fits inside the packing gland cartridge bore. Do not tighten the bolts at this time.
- 1.3.2 Install the packing gland piston and the packing gland cartridge assembly into the adapter housing. Align the anti-rotation pin on the packing gland cartridge to the slot in the adapter housing.
- 1.3.3 Install the lip seal (supplied) or the felt seal (optional) in the front chamber of the packing gland cartridge housing.
- 1.3.4 Wrap the packing gland material (supplied) around the seal diameter of the drive shaft and cut the packing to length. Two (2) pieces are required. See Figure 1-6.
NOTICE: Install the lip seal with the spring side of the seal toward the reducer.
- 1.3.5 Install the o-ring in the groove provided on the seal cartridge housing. (Grease can be used to hold the o-ring in place during installation to the trough end.)
- 1.3.6 Install the front seal protector ring and proceed with step 1.1.5 of the screw conveyor drive installation instructions.

Figure 1-4: Waste Pack Assembly



Installation & Maintenance

TorqTaper® Plus Screw Conveyor Drive Continued

- 1.3.7 When step 1.1.8 has been completed, remove the bolts in the packing gland piston cartridge assembly.
- 1.3.8 Install the two (2) cut-to-length packing materials on the shaft in the packing gland chamber of the seal cartridge housing.
- 1.3.9 Secure the packing gland piston to the seal cartridge housing with the supplied screws. Tighten screws lightly, allowing the packing to compress on the shaft. Do not over tighten the packing gland.
- 1.3.10 Under normal material handling operations, observe the packing gland for leakage. Should the packing gland show signs of leakage, shut the reducer drive assembly off and tighten the packing gland screws evenly to compress the packing material to the shaft. Do not over tighten packing gland. Repeat the above procedures until the leakage has been stopped.

NOTICE: Over-tightening of the packing gland can cause excessive temperatures and premature shaft wear.

Figure 1-5: Packing Gland Assembly

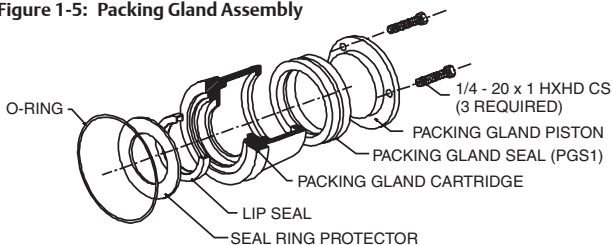
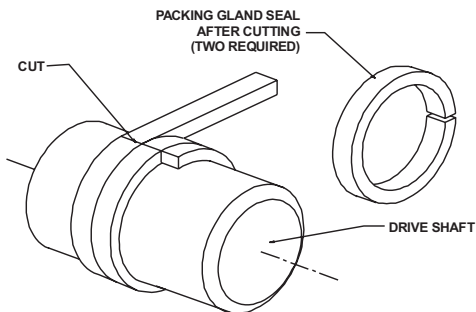


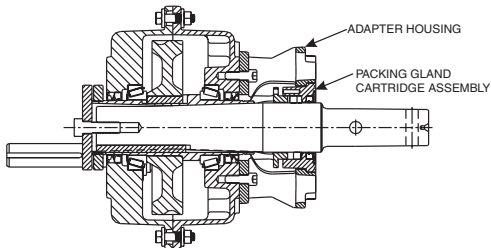
Figure 1-6: Packing Gland Assembly

Wrap the packing gland seal around the seal dia. of the drive shaft and cut as shown



Installation & Maintenance

Figure 1-7: Packing Gland Assembly



2.0 Bolt Torque Specifications

Table 2-1: Bolt Tightening Torque

REDUCER SIZE	SCREW CONVEYOR ADAPTOR GRADE 8	
	BOLT SIZE	FT-LBS
107	5/16 - 18	23
115	3/8 - 16	41
203	7/16 - 14	65
207	1/2 - 13	99
215	1/2 - 13	99
307	5/8 - 11	200
315	5/8 - 11	200
407	5/8 - 11	200

Installation & Maintenance

Shaft Mount Reducers Oil Seal Replacement Procedure

⚠ WARNING

- Read and follow all instructions carefully.
- Disconnect and lock-out power before installation and maintenance. Working on or near energized equipment can result in severe injury or death.
- Do not operate equipment without guards in place. Exposed equipment can result in severe injury or death.

⚠ CAUTION

- Periodic inspections should be performed. Failure to perform proper maintenance can result in premature product failure and personal injury.

1. Lower the oil to a level below the bottom of the seal that is being replaced.

NOTICE: Thoroughly clean all debris from the area around the oil seal being replaced in order to keep contamination out of the gearbox when the old seal is removed.

2. If the oil seal being replaced has a flinger/v-ring installed outside of the seal, pry the flinger out using a sharp-bladed screwdriver.
3. Using a punch with a sharp point, place two or more small holes equally spaced in the face of the seal to be removed. Take care not to damage the shaft or housing.
4. Insert sheet metal screws in the punched holes, leaving the screw heads sufficiently exposed so they can be pried or grasped with pliers.
5. Work the seal loose. After removal, be careful to prevent metal or dirt particles from entering unit.
6. Remove any burrs or sharp edges from the seal bore in the housing, keyway, or shaft shoulder, as applicable, using an abrasive pad

NOTICE: Do not use abrasive pad on the shaft's seal surface.

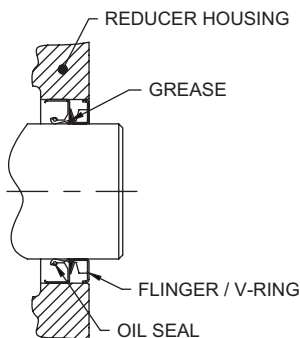
7. Clean the seat in housing and seal surface of shaft with soft cloth.
8. Cover the keyway, threads or shaft shoulder with electrical tape. Starting at the shoulder of the shaft's seal journal, wrap the tape in a spiral pattern progressing away from the shoulder leaving enough electrical tape extending outward to allow for easy removal after the seal is installed.
9. Apply a generous amount of grease over the taped shaft.
10. Protect seal lips from damage during handling. Apply grease to the rubber lip of the new seal. If the seal casing is metal, apply a thin bead of silicone around the outside diameter of the seal just prior to installation. If the seal casing is rubber, do not apply sealant to the outside diameter of the seal.

Installation & Maintenance

11. Start the seal over the shaft with the seal spring toward the reducer and apply just enough pressure with a slight turning rotation to position the seal on the shaft. Verify that no part of the seal lip is rolled inward.
12. Newer style reducers utilizing a v-ring and flinger (see Figure 1), proceed to step 15. Oil seals being pressed-in flush with the housing face (see Figure 2) proceed to step 13.
13. Using a seal installation tool (customer supplied) made from a square faced pipe or tube that fits against the oil seal's face with an outside diameter larger than the seal's outside diameter (see Figure 4 but do not use dimension A or B), evenly drive or press the seal until fully seated. Verify seal casing is not bent and the seal is not misaligned in the bore.

If dual seals are being utilized (see Figure 3), press the first seal in to a depth equal to the seal's width using a special installation tool similar to the one described in step 15 with dimension B equaling the seal width. Apply a good quality NLGI #2 grease over the first seal so when the second seal is installed the cavity between the seals is approximately 2/3 filled with grease. Press a second seal over the first so it is flush with the housing face.

Figure 1: Oil seal with flinger and v-ring

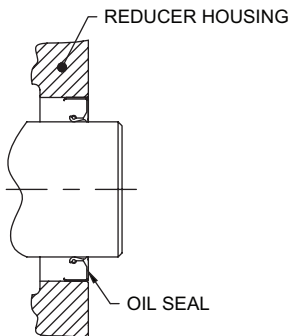


Installation & Maintenance

Shaft Mount Reducers Oil Seal Replacement Procedure Continued

14. Wipe any excess sealant from the outside diameter of the seal and remove the electrical tape from the shaft. Proceed to step 20.
15. Oil seals being installed on reducers utilizing a v-ring and flinger (see Figure 1) must be pressed in past the housing face using a special installation tool (customer supplied) made from a square faced pipe or tube (see Figure 4). This stepped tool's small diameter must be smaller than the oil seal's outside diameter and fits against the seal's face and its larger diameter must be larger than the seal's outside diameter. The tool's step length is specified in Table 1. Evenly drive or press the seal to its proper depth until the tool's larger diameter is fully seated against the face of the housing. Verify seal casing is not bent and the seal is not misaligned in the bore.
16. Wipe any excess sealant from the outside diameter of the seal bore and remove the electrical tape from the shaft.

Figure 2: Oil seal pressed in flush with housing face



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Figure 3: Two oil seals

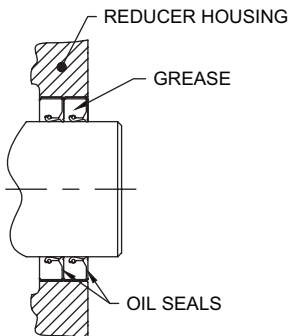


Table 1

Oil Seal Press Depth, Dimension 'B'		
Reducer	Input	Output
107	0.28	0.30
115	0.28	0.30
203	0.28	0.37
207	0.30	0.37
215	0.30	0.37
307	0.30	0.43
315	0.30	0.43
407	0.30	0.43
415	0.30	0.47
507	0.32	0.47
608	0.32	0.81
800	0.46	0.87

Installation & Maintenance

Shaft Mount Reducers Oil Seal Replacement Procedure Continued

17. Install the v-ring onto the flinger as shown in Figure 5.
18. Using your finger, place a small bead of a good quality NLGI #2 grease on the oil seal's surface near the shaft where the v-ring's lip will ride. Try to keep excess grease off the seal area outside of where the v-ring contacts the seal.
19. Press the flinger/v-ring in, flush with the face of the housing.
20. Replace drain plug and fill oil to the proper level.

Figure 4: Installation Tool

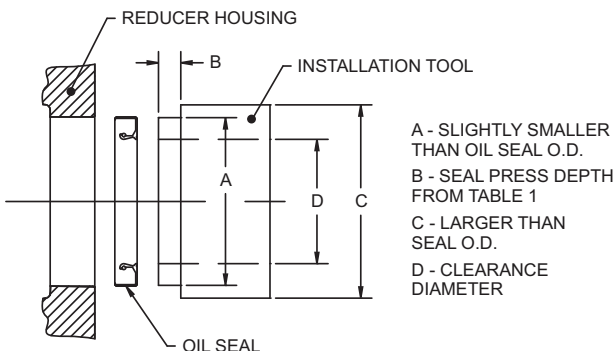


Figure 5: V-ring installed into Flinger



Installation & Maintenance

Lubrication Specifications

Mineral Oils			
AGMA Viscosity Grade @ 104°F (40°C) SSU cST	4 625-765 135-165	5 918-1122 198-242	6 1335-1631 288-352
Mobil* Oil Corporation	DTE Oil Extra Heavy	DTE-Oil BB	DTE Oil AA

Mineral Oils with EP Additives			
AGMA Viscosity Grade @ 104°F (40°C) SSU cST	4 EP 625-765 135-165	5 EP 918-1122 198-242	6 EP 1335-1631 288-352
Mobil* Oil Corporation	Mobil Gear 629	Mobil Gear 630	Mobil Gear 632

Synthetic Oils			
AGMA Viscosity Grade @ 104°F (40°C) SSU cST	4 625-765 135-165	5 918-1122 198-242	6 1335-1631 288-352
Mobil* Oil Corporation	Mobil SHC 629	Mobil SHC 630	Mobil SHC 632

Synthetic Oils with EP Additives			
AGMA Viscosity Grade @ 104°F (40°C) SSU cST	4 EP 625-765 135-165	5 EP 918-1122 198-242	6 EP 1335-1631 288-352
Mobil* Oil Corporation	Mobil Gear SHC 150	Mobil Gear SHC 220	Mobil Gear SHC 320

NOTE: For ambient temperatures -40 F° to 14°F, AGMA #3 Synthenetic Oil should be used (Mobil SHC627 or equivalent).

Reducer shipped without oil. Fill to proper level before operating to avoid equipment damage and/or personal injury. Do not use lubricants with anti-ear/extreme pressure additives, in units with internal backstops-these additives decrease the backstop's ability to prevent reverse rotation and will result in backstop failure which could cause personal injury.

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Maintenance Table

TYPES OF MAINTENANCE	WHEN TO DO	WHAT TO DO
Lubrication	Initial change after first 100 hours. At least once per year thereafter. More often if atmosphere is damp or dusty	Drain used oil from box. Flush box if oil has become contaminated. Refill to proper level with new lubricant.
Lubrication level check	Initial inspection-24 hours. Second inspection-100 hours. Third inspection-500 hours. Periodically thereafter	Check oil level. Add oil if necessary. If oil is required, check for leakage
Torque Arm	Initial inspection-24 hours. Second inspection-100 hours. Third inspection-500 hours. Periodically thereafter	Tighten bolts and nuts that hold the torque arm in place on the reducer and on the mounting surface.
Torque Taper bushing and finished bore bushing	Initial inspection-24 hours. Second inspection-100 hours. Third inspection-500 hours. Periodically thereafter	Check setscrews or capscrews for tightness. Retighten to recommended torque, if necessary.

Troubleshooting

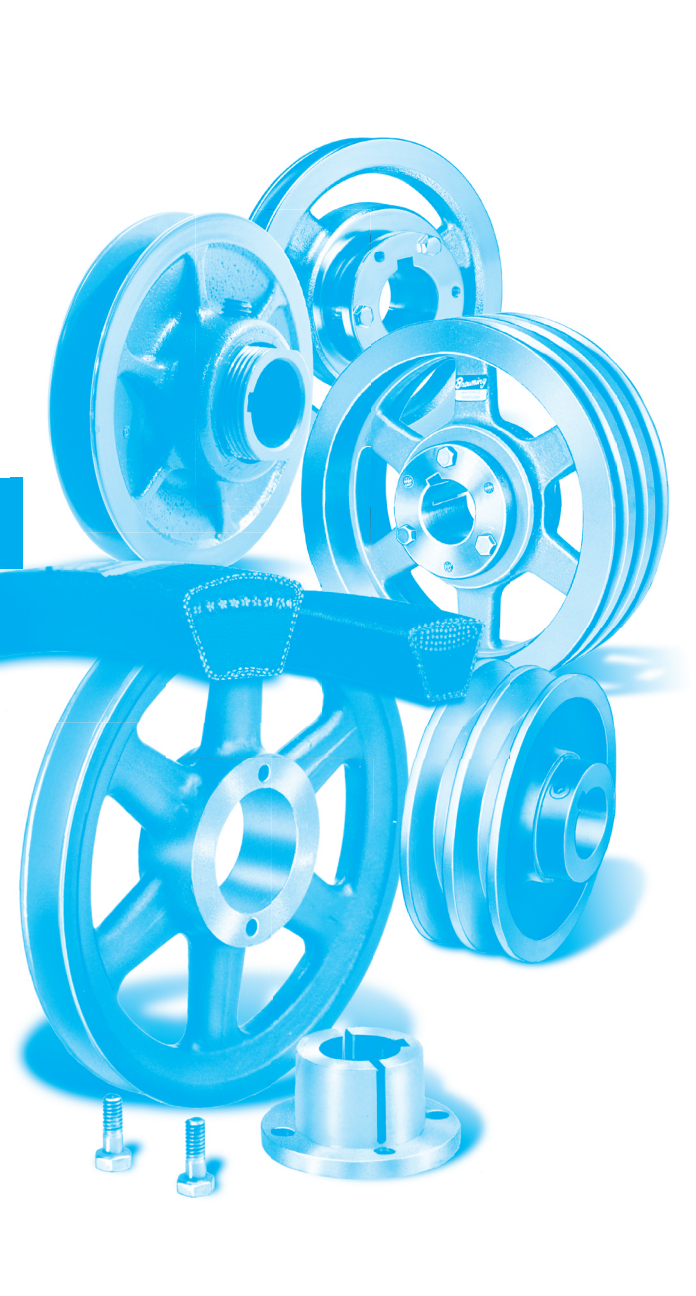
WHAT HAPPENED	PROBABLE CAUSE	WHAT TO DO
Overheating (over 200 F° oil temperature)	Load exceeds reducer's mechanical and/or thermal capacity.	Decrease load. Check catalog rating of the drive. Redesign drive and replace unit with one of sufficient capacity or add a fan to the unit
	Insufficient oil level.	Check oil level. Adjust oil level as indicated by the Shaft Mount Reducers "important instructions" sheet or as specified on the reducer nameplate.
	Too much oil. Excessive heat generated by the fluid friction of the churning action of the oil.	Check oil level. Adjust oil level as indicated by the Shaft Mount Reducers "important instructions" sheet or as specified on the reducer nameplate.
	Wrong grade of Oil.	Flush reducer and refill as indicated by the Shaft Mount Reducers "important instructions" sheet or as specified on the reducer nameplate.
	Excessive input speed.	Consult Browning relating all particulars including mounting position. May be able to lower oil level or change to lower ratio reducer.
	Reducer located near a heat source.	Shield the reducer from the heat source or move reducer away from it.

Troubleshooting (Continued)

WHAT HAPPENED	PROBABLE CAUSE	WHAT TO DO
Excessive noise and vibration	Improper installation of torque arm.	Check mounting instructions and correct. Check mounting bolts and tighten.
	Worn bearings.	Check bearings for wear and replace worn bearings. Replace all seals Flush reducer and refill with oil. Check thrust loads and overhung loads. If excessive, correct these conditions or replace with a larger unit.
	Drive underdesigned causing premature excessive gear wear.	Redesign drive and replace with a drive of sufficient capacity.
	Insufficient oil level.	Check oil level. Adjust oil level as indicated by the Shaft Mount Reducers "Important Instructions" Sheet or as specified on the reducer nameplate.
	Bent driven shaft.	Inspect runout of driven shaft. Straighten or replace shaft.
	Driven shaft undersize.	Turn driven shaft down to next standard bushing size and use bushing.
	Driven shaft not extending far enough into the TorqTaper bushing or the hollow output shaft of finished bore reducers.	Replace driven shaft with a shaft of sufficient length or, if possible, move reducer farther onto shaft.
Excessive shaft end play	Worn bearings	Check bearings for wear and replace worn bearings. Replace all seals. Flush reducer and refill with oil
	Loose and cover bolts.	Check and cover capscrews and tighten where necessary.
Excessive backlash	Worn gears.	Replace worn gears. Always replace both gears of a mating pair.
	Worn keys.	Replace worn keys. Inspect keyways for wear. An oversize key may be required.
	Loose bearings.	Check bearings for wear and replace worn bearings. Always replace seals. Check end covers for loose bolts.
	Excessive backlash in driven machinery.	Check driven machinery.

Troubleshooting (Continued)

WHAT HAPPENED	PROBABLE CAUSE	WHAT TO DO
Oil leakage	Oil level too high causing oil leakage out of breather plug.	Check oil level. Adjust oil level as indicated by the Shaft Mount Reducers "Important Instructions" Sheet or as specified on the reducer nameplate.
	Clogged breather plug	Remove and clean breather plug.
	Seal damaged	Replace seal
	Loose bolts	Tighten bolts.
	Breather plug in wrong hole	Refer to Shaft Mount Reducers "Important Instructions" Sheet for proper location of breather plug.
	Vertical mounted reducer without vertical mount breather kit.	Install vertical mount breather kit.
Reducer shafts will not turn when drive is actuated.	Backstop installed for reverse shaft rotation.	Remove backstop, turn end and reinstall
	Driven machinery binding or locked up.	Check for free operation of driven machinery and correct if necessary
Backstops wear out prematurely.	Reducer mounted so that back stop is not flooded with oil.	Change reducer mounting so that backstop is flooded with oil
	Backstop overloaded.	Reduce load or replace with a larger drive
Premature input bearing failure.	Excessive overhung load.	Check minimum sheave diameter and replace with a larger sheave. Check to insure that sheave is mounted as close to housing as possible. Check to insure that belts are not over tensioned.
Premature output bearing failure.	Excessive overhung load.	Check minimum sprocket diameter and replace with a larger sprocket. Check to insure that sprocket is mounted as close to the housing as possible. Check to insure that drive is not over tensioned.



Browning®

Belt Drives & Sheaves

Browning® Sheaves

Product range:

- Cast iron sheaves available in over 3000 AK/BK size and bore combinations from stock
- Multiple groove sheaves in classical (A, B, C, D) and narrow groove 358 (3V, 5V, 8V)
- Patented combination groove Browning B5V which allows interchangeable, torque dense drive designs that serve 90% of all 10-150 HP applications with cost savings of up to 40%
- Precision balanced variable speed sheaves from 1-2 groove VP sheaves to 2-10 groove MVP® (Multi-Variable Pitch) sheaves thru 750 Hp

Browning Belts

Product range:

- Unique design Browning brand V-Belts for demanding applications such as short center distance and/or low vibration
- Full range of FHP (2L-5L), Classical (A, B, C, D), narrow groove (3V, 5V, 8V), wide range VS and synchronous belts
- Single fabric wrapped belts for increased flexibility and to help reduce vibration
- Ground form raw edge cogged belts to help reduce center distance variation and drive vibration while improving efficiency

Quick-Find Reference

Product Overview

Installation and Maintenance

Troubleshooting

Page

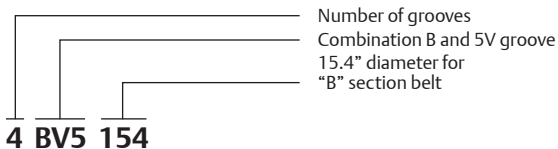
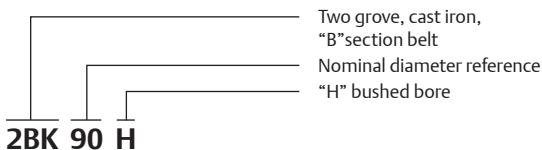
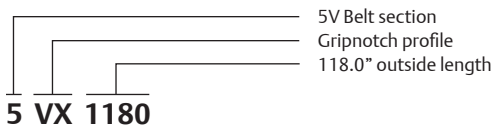
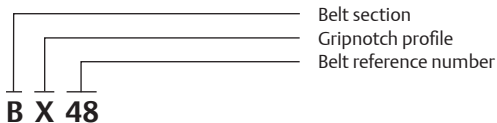
B-2

B-18

B-28

Nomenclature

Part Number Explanation — Belts & Sheaves



Product Overview

Gripnotch - Raw Edge Cogged

- Ground form design
 - Reduces vibration
 - Increases belt and bearing life
- Greater belt sidewall area
 - 15 - 20% more contact area than competitors
 - Higher horsepower
- Cover on top and bottom of belt
 - Increased stability
 - Lower cord stresses

Exclusive Design



Exclusive Design



Gripbelts - Wrapped

- Single wrap design
 - Greater flexibility when using small diameter sheaves
 - Less fabric overlap which reduces vibration
 - Better cord adhesion and flexibility



Patented B5V Sheaves

- Patented design provides the power of 5V belts in the economy of a B section sheave
- Serves 90% of all applications from 10 to 150 HP
- Increases HP by 40% (or reduces cost by 40%)



"B"
21/32" x 7/16"



5V
5/8 x 17/32"

Product Overview

Super Gripbelts

Table 1: Super Gripbelts are Static Conducting

Belt No.	Length		Wt. Lbs.	Belt No.	Length		Wt. Lbs.
	Outside	Pitch			Outside	Pitch	
B25	28.0	26.8	0.3	B63	66.0	64.8	0.7
B26	29.0	27.8	0.3	B64	67.0	65.8	0.7
B28	31.0	29.8	0.3	B65	68.0	66.8	0.7
B29	32.0	30.8	0.3	B66	69.0	67.8	0.7
B30	33.0	31.8	0.3	B67	70.0	68.8	0.7
B31	34.0	32.8	0.3	B68	71.0	69.8	0.7
B32	35.0	33.8	0.3	B69	72.0	70.8	0.8
B33	36.0	34.8	0.4	B70	73.0	71.8	0.8
B34	37.0	35.8	0.4	B71	74.0	72.8	0.8
B35	38.0	36.8	0.4	B72	75.0	73.8	0.8
B36	39.0	37.8	0.4	B73	76.0	74.8	0.8
B37	40.0	38.8	0.4	B74	77.0	75.8	0.8
B38	41.0	39.8	0.4	B75	78.0	76.8	0.8
B39	42.0	40.8	0.4	B76	79.0	77.8	0.8
B40	43.0	41.8	0.5	B77	80.0	78.8	0.8
B41	44.0	42.8	0.5	B78	81.0	79.8	0.8
B42	45.0	43.8	0.5	B79	82.0	80.8	0.8
B43	46.0	44.8	0.5	B80	83.0	81.8	0.9
B44	47.0	45.8	0.5	B81	84.0	82.8	0.9
B45	48.0	46.8	0.5	B82	85.0	83.8	0.9
B46	49.0	47.8	0.5	B83	86.0	84.8	0.9
B47	50.0	48.8	0.5	B84	87.0	85.8	0.9
B48	51.0	49.8	0.5	B85	88.0	86.8	0.9
B49	52.0	50.8	0.6	B86	89.0	87.8	1.0
B50	53.0	51.8	0.6	B87	90.0	88.8	1.0
B51	54.0"	52.8"	0.6	B88	91.0	89.8	1.0
B52	55.0	53.8	0.6	B89	92.0	90.8	1.0
B53	56.0	54.8	0.6	B90	93.0	91.8	1.0
B54	57.0	55.8	0.6	B91	94.0	92.8	1.0
B55	58.0	56.8	0.6	B92	95.0	93.8	1.0
B56	59.0	57.8	0.6	B93	96.0	94.8	1.0
B57	60.0	58.8	0.7	B94	97.0	95.8	1.0
B58	61.0	59.8	0.7	B95	98.0	96.8	1.0
B59	62.0	60.8	0.7	B96	99.0	97.8	1.1
B60	63.0	61.8	0.7	B97	100.0	98.8	1.1
B61	64.0	62.8	0.7	B98	101.0	99.8	1.1
B62	65.0	63.8	0.7	B99	102.0	100.8	1.1

Product Overview

- Precision molded raw edge construction
- More horsepower in less space
- Notches are molded extra deep
- Oil and heat resistant
- Static conducting

Super Gripbelts

Table 1: Super Gripbelts are Static Conducting Continued

Belt No.	Length		Wt. Lbs.	Belt No.	Length		Wt. Lbs.
	Outside	Pitch			Outside	Pitch	
B100	103.0	101.8	1.1	B360	361.5	360.3	4.0
B101	104.0	102.8	1.1	C51	55.2	53.9	1.0
B103	106.0	104.8	1.1	C55	59.2	57.9	1.1
B105	108.0	106.8	1.1	C60	64.2	62.9	1.2
B106	109.0	107.8	1.1	C68	72.2	70.9	1.3
B108	111.0	109.8	1.2	C72	76.2	74.9	1.4
B111	114.0	112.8	1.2	C75	79.2	77.9	1.4
B112	115.0	113.8	1.2	C78	82.2	80.9	1.5
B116	119.0	117.8	1.3	C81	85.2	83.9	1.6
B120	123.0	121.8	1.3	C85	89.2	87.9	1.6
B123	126.0	124.8	1.3	C90	94.2	92.9	1.7
B124	127.0	125.8	1.3	C96	100.2	98.9	1.8
B126	129.0	127.8	1.4	C97	101.2	99.9	1.8
B128	131.0	129.8	1.4	C99	103.2	101.9	1.9
B133	136.0	134.8	1.5	C100	104.2	102.9	1.9
B136	139.0	137.8	1.5	C101	105.2	103.9	1.9
B140	143.0	141.8	1.6	C105	109.2	107.9	2.0
B144	147.0	145.8	1.6	C108	112.2	110.9	2.0
B148	151.0	149.8	1.6	C109	113.2	111.9	2.0
B150	153.0	151.8	1.6	C111	115.2	113.9	2.1
B154	157.0	155.8	1.7	C112	116.2	114.9	2.1
B158	161.0	159.8	1.7	C115	119.2	117.9	2.1
B162	165.0	163.8	1.7	C120	124.2	122.9	2.3
B173	176.0	174.8	1.9	C124	128.2	126.9	2.4
B180	183.0	181.8	1.9	C128	132.2	130.9	2.4
B190	193.0	191.8	2.0	C136	140.2	138.9	2.6
B191	194.0	192.2	2.0	C144	148.2	146.9	2.8
B195	198.0	196.8	2.0	C148	152.2	150.9	2.8
B205	208.0	206.9	2.2	C150	154.2	152.9	2.9
B210	213.0	211.8	2.3	C158	162.2	160.9	3.0
B225	226.5"	225.3"	2.5	C162	166.2	164.9	3.1
B240	241.5	240.3	2.6	C173	177.2	175.9	3.3
B255	256.5	255.3	2.8	C180	184.2	182.9	3.4
B270	271.5	270.3	2.9	C195	199.2"	197.9"	3.7
B285	286.5	285.3	3.1	C210	214.2	212.9	4.0
B300	301.5	300.3	3.2	C225	227.2	225.9	4.3
B315	316.5	315.3	3.4	C240	242.2	240.9	4.6

Super Gripbelts

Table 1: Super Gripbelts are Static Conducting Continued

Belt No.	Length		Wt. Lbs.	Belt No.	Length		Wt. Lbs.
	Outside	Pitch			Outside	Pitch	
C255	257.2	255.9	4.9	D240	242.7	240.8	7.7
C270	272.2	270.9	5.2	D255	257.7	255.8	8.1
C285	287.2	285.9	5.4	D270	272.7	270.8	8.9
C300	302.2	300.9	5.7	D285	287.7	285.8	9.8
C315	317.2	315.9	6.0	D300	302.7	300.8	10.5
C330	332.2	330.9	6.3	D315	317.7	315.8	10.8
C345	347.2	345.9	6.6	D330	332.7	330.8	10.6
C360	362.2	360.9	6.9	D345	347.7	345.8	11.7
C390	392.2	390.9	7.5	D360	362.7	360.8	11.5
C420	422.2	420.9	8.0	D390	392.7	390.8	12.4
D120	125.2	123.3	4.0	D420	422.7	420.8	13.4
D128	133.2	131.3	4.4	D450	452.7	450.8	16.3
D144	149.2	147.3	5.0	D480	482.7	480.8	15.8
D158	163.2	161.3	5.3	D540	542.7	540.8	19.9
D162	167.2	165.3	5.5	D600	602.7	600.8	21.6
D173	178.2	176.3	5.8				
D180	185.2	183.3	6.0				
D195	200.2	198.3	6.3				
D210	215.2	213.3	6.8				
D225	227.7	225.8	7.1				

- Precision molded raw edge construction
- More horsepower in less space
- Notches are molded extra deep
- Oil and heat resistant
- Static conducting

Gripnotch Belts

Table 2: Gripnotch Belts

Belt No.	Length		"Wt. Lbs."	Belt No.	Length		"Wt. Lbs."
	Outside	Pitch			Outside	Pitch	
BX27	30.0	28.8	0.4	BX69	72.0	70.8	0.8
BX28	31.0	29.8	0.4	BX70	73.0	71.8	0.8
BX29	32.0	30.8	0.4	BX71	74.0	72.8	0.8
BX30	33.0	31.8	0.4	BX72	75.0	73.8	0.8
BX31	34.0	32.8	0.4	BX73	76.0	74.8	0.8
BX32	35.0	33.8	0.4	BX74	77.0	75.8	0.8
BX33	36.0	34.8	0.4	BX75	78.0	76.8	0.9
BX34	37.0	35.8	0.4	BX76	78.0	77.8	0.9
BX35	38.0	36.8	0.4	BX77	80.0	78.8	0.9
BX36	39.0	37.8	0.4	BX78	81.0	79.8	0.9
BX37	40.0	38.8	0.4	BX79	82.0	80.8	0.9
BX38	41.0	39.8	0.4	BX80	83.0	81.8	0.9
BX39	42.0	40.8	0.5	BX81	84.0	82.8	0.9
BX40	43.0	41.8	0.5	BX82	85.0	83.8	0.9
BX41	44.0	42.8	0.5	BX83	86.0	84.8	1.0
BX42	45.0	43.8	0.5	BX84	87.0	85.8	1.0
BX43	46.0	44.8	0.5	BX85	88.0	86.8	1.0
BX44	47.0	45.8	0.5	BX86	89.0	87.8	1.0
BX45	48.0	46.8	0.5	BX87	90.0	88.8	1.0
BX46	49.0	47.8	0.5	BX88	91.0	89.8	1.0
BX47	50.0	48.8	0.5	BX89	92.0	90.8	1.0
BX48	51.0	49.8	0.6	BX90	93.0	91.8	1.1
BX49	52.0	50.8	0.6	BX91	94.0	92.8	1.1
BX50	53.0	51.8	0.6	BX92	95.0	93.8	1.1
BX51	54.0	52.8	0.6	BX94	97.0	95.8	1.1
BX52	55.0	53.8	0.6	BX95	98.0	96.8	1.1
BX53	56.0	54.8	0.6	BX96	99.0	97.8	1.1
BX54	57.0	55.8	0.6	BX97	100.0"	98.8"	1.1
BX55	58.0	56.8	0.6	BX98	101.0	99.8	1.1
BX56	59.0"	57.8"	0.6	BX99	102.0	100.8	1.2
BX57	60.0	58.8	0.6	BX100	103.0	101.8	1.2
BX58	61.0	59.8	0.6	BX103	106.0	104.8	1.2
BX59	62.0	60.8	0.7	BX105	108.0	106.8	1.2
BX60	63.0	61.8	0.7	BX106	109.0	107.8	1.2
BX61	64.0	62.8	0.7	BX108	111.0	109.8	1.3
BX62	65.0	63.8	0.7	BX112	115.0	113.8	1.3
BX63	66.0	64.8	0.7	BX113	116.0	114.8	1.3
BX64	67.0	65.8	0.7	BX115	118.0	116.8	1.4
BX65	68.0	66.8	0.8	BX116	119.0	117.8	1.4
BX66	69.0	67.8	0.8	BX120	123.0	121.8	1.4
BX67	70.0	68.8	0.8	BX123	126.0	124.8	1.4
BX68	71.0	69.8	0.8	BX124	127.0	125.8	1.4

- Precision molded raw edge construction
- More horsepower in less space
- Notches are molded extra deep
- Oil and heat resistant
- Static conducting

Gripnotch Belts

Table 2: Gripnotch Belts Continued

Belt No.	Length		"Wt. Lbs."	Belt No.	Length		"Wt. Lbs."
	Outside	Pitch			Outside	Pitch	
BX126	129.0	127.8	1.4	CX100	104.2	102.2	2.0
BX128	131.0	129.8	1.5	CX101	105.2	103.9	2.0
BX133	136.0	134.8	1.5	CX105	109.2	107.9	2.0
BX136	139.0	137.8	1.6	CX109	113.2	111.9	2.1
BX140	143.0	141.8	1.6	CX111	115.2	113.9	2.2
BX144	147.0	145.8	1.7	CX112	116.2	114.9	2.2
BX148	151.0	149.8	1.7	CX115	119.2	117.9	2.3
BX150	153.0	151.8	1.8	CX120	124.2	122.9	2.4
BX154	157.0	155.8	1.8	CX128	132.2	130.9	2.6
BX158	161.0	159.8	1.8	CX136	140.2	138.9	2.7
BX162	165.0	163.8	1.9	CX144	148.2	146.9	2.9
BX173	176.0	174.8	2.0	CX150	154.2	152.9	3.0
BX180	183.0	181.8	2.1	CX158	162.2	160.9	3.0
BX191	194.0	192.8	2.2	CX162	166.2	164.9	3.1
BX195	198.0	196.8	2.3	CX173	177.2	175.9	3.1
BX210	213.0	211.8	2.5	CX180	184.2	182.9	3.2
BX225	228.0	226.8	2.7	CX195	199.2	197.9	3.5
BX240	241.5	240.3	2.8	CX210	214.2	212.9	4.0
BX255	256.5	255.3	3.0	CX225	229.2	227.9	4.2
BX270	271.5	270.3	3.2	CX240	242.2	240.9	4.3
BX300	301.5	300.3	3.6	CX255	259.2	257.9	4.6
CX51	55.2	53.9	1.0	CX270	272.2	270.9	5.0
CX55	59.2	57.9	1.1	CX300	304.2	302.9	5.4
CX60	64.2	62.9	1.2	CX330	334.2	332.9	5.9
CX68	72.2	70.9	1.4	CX360	364.2	362.9	6.3
CX72	76.2"	74.9"	1.4	DX120	125.2	123.3	4.3
CX75	79.2	77.9	1.5	DX128	133.2	131.2	4.4
CX78	82.2	80.9	1.6	DX158	163.2	161.3	5.4
CX81	85.2	83.9	1.6	DX162	167.2	165.3	5.6
CX85	89.2	87.9	1.7	DX180	185.2	183.2	6.2
CX90	94.2	92.9	1.8	DX360	362.7	360.8	12.3
CX96	100.2	98.9	1.9				

- More horsepower in less space
- Oil and heat resistant
- Static conducting

“358” Gripbelts and Gripnotch

Table 3: “358” Gripbelts and Gripnotch

Part No.	Outside Length	Wt. Lbs.	Part No.	Outside Length	Wt. Lbs.	Part No.	Outside Length	Wt. Lbs.
3VX250	25.0	1	5VX580	58.0	6	5VX1900	1900.	2.3
3VX265	26.5	1	5VX590	59.0	6	5VX2000	2000.	24
3VX280	28.0	1	5VX600	60.0	7	5V2120	212.0	2.4
3VX300	30.0	1	5VX610	61.0	7	5V2240	224.0	2.6
3VX315	31.5	1	5VX630	63.0	7	5V2360	236.0	2.8
3VX335	33.5	1	5VX650	65.0	7	5V2500	250.0	2.9
3VX355	35.5	2	5VX660	66.0	8	5V2650	265.0	32
3VX375	37.5	2	5VX670	67.0	8	5V2800	280.0	3.3
3VX400	40.0	2	5VX680	68.0	8	5V3000	300.0	3.
3VX425	42.5	2	5VX690	69.0	8	5V3150	315.0	3.9
3VX450	45.0	2	5VX710	71.0	8	5V3350	335.0	4.0
3VX475	47.0	2	5VX730	73.0	8	5V3550	355.0	4.3
3VX500	50.0	2	5VX740	74.0	8	8V1000	100.0	33
3VX530	53.0	2	5VX750	75.0	8	8V1120	112.0	36
3VX560	56.0	2	5VX780	78.0	8	8V1180	118.0	38
3VX600	60.0	3	5VX800	80.0	9	8V1250	125.0	39
3VX630	63.0	3	5VX810	81.0	9	8V1320	132.0	4.3
3VX670	67.0	3	5VX830	83.0	9	8V1400	140.0	45
3VX710	71.0	3	5VX840	84.0	9	8V1500	150.0	48
3VX750	75.0	3	5VX850	85.0	9	8V1600	160.0	5.1
3VX800	80.0	4	5VX860	86.0	9	8V1700	170.0	56
3VX850	85.0	4	5VX880	88.0	9	8V1800	180.0	60
3VX900	90.0	4	5VX900	90.0	1.0	8V1900	1900.	63
3VX950	95.0	4	5VX930	93.0	1.0	8V2000	200.0	6,
3VX1000	100.0	4	5VX950	95.0	1.0	8V2120	212.0	69
3VX1060	106.0	4	5VX960	96.0	1.0	8V2240	224.0	72
3VX1120	112.0	5	5VX1000	100.0	1.1	8V2360	236.0	76
3VX1180	118.0	5	5VX1030	103.0	1.1	8V2500	250.0	80
3VX1250	125.0	6	5VX1060	106.0	12	8V2650	265.0	85
3VX1320	132.0	6	5VX1080	108.0	12	8V2800	280.0	89
3VX1400	140.0	6	5VX1120	112.0	1.3	8V3000	300.0	96
5VX450	45.0	4	5VX1150	115.0	1.3	8V3150	315.0	10.3
5VX470	47.0	5	5VX1180	118.0	14	8V3350	335.0	114
5VX490	49.0	5	5VX1230	123.0	1 A	8V3550	355.0	124
5VX500	50.0	6	5VX1250	125.0	1.4	8V4000	400.0	13.0
5VX510	51.0	6	5VX1320	132.0	1.5	8V4500	450.0	14.4
5VX530	53.0	6	5VX1400	140.0	1.6	8V5000	500.0	17.0
5VX540	54.0	6	5VX1500	150.0	1.8			
5VX550	55.0	6	5VX1600	160.0	1.8			
5VX560	56.0	6	5VX1700	170.0	2.0			
5VX570	57.0	6	5VX1800	180.0	2.1			

Product Overview

Cast Iron Sheaves

Single Groove Sheaves Combination Groove for "4L" or "A" Belts and "5L" or "B" Belts

Table 4: Stock Sizes with Split Taper Bushings

Part No.	Diameters			Wt. Lbs.
	O.D.	Datum "A"	B Less Bush.	Less Bush.
BK30H	3.15"	2.40"	2.80"	1.2
BK32H	3.35	2.60	3.00	1.4
BK34H	3.55	2.80	3.20	1.6
BK36H	3.75	3.00	3.40	1.2
BK40H	3.95	3.20	3.60	1.4
BK45H	4.25	3.50	3.90	1.8
BK47H	4.45	3.70	4.10	2.2
BK50H	4.75	4.00	4.40	2.0
BK52H	4.95	4.20	4.60	2.1
BK55H	5.25	4.50	4.90	2.7
BK57H	5.45	4.70	5.10	2.7
BK60H	5.75	5.00	5.40	2.5
BK62H	5.95	5.20	5.60	2.6
BK65H	6.25	5.50	5.90	2.8
BK67H	6.45	5.70	6.10	2.9
BK70H	6.75	6.00	6.40	2.8
BK72H	6.95	6.20	6.60	3.1
BK75H	7.25	6.50	6.90	3.3
BK77H	7.45	6.70	7.10	3.8
BK80H	7.75	7.00	7.40	3.4
BK85H	8.25	7.50	7.90	3.8
BK90H	8.75	8.00	8.40	4.3
BK95H	9.25	8.50	8.90	5.0
BK100H	9.75	9.00	9.40	5.2
BK105H	10.25	9.50	9.90	5.5
BK110H	10.75	10.00	10.40	6.0
BK115H	11.25	10.50	10.90	6.4
BK120H	11.75	11.00	11.40	6.9
BK130H	12.75	12.00	12.40	6.9
BK140H	13.75	13.00	13.40	8.5
BK150H	14.75	14.00	14.40	9.5
BK160H	15.75	15.00	15.40	9.8
BK190H	18.75	18.00	18.40	12.8

Table 2: Stock "H" Bushings

Inch Bores		Millimeter Bores		Stock Spline Bores	
Stock Bores	Keyseat	Stock Bores	Keyseat	Stock Bores	Keyseat
3/8", 7/16	None	10 mm,	None	.978 -10 Inv.	X
1/2, 9/16	1/8" x 1/16"	11, 12	None	1 1/8 -6B	X
5/8, 11/16, 3/4	3/16 x 3/32	14, 16	5 x 2.5	1 3/8 -6B	X
7/8 13/16,	3/16 x 3/32	18, 19, 20, 22	6 x 3	1 3/8 -21 Inv.	X
15/16, 1, 1 1/16	1/4 x 1/8	24, 25, 28, 30	8 x 3.5		
1 1/8, 1 3/16	1/4 x 1/8	32, 35, 36, 38	10 x 4		
1 1/4	1/4 x 1/16*				
1 5/16, 1 3/8	5/16 x 1/16*				
1 3/8, 1 7/16, 1 1/2	3/8 x 1/16*				

Part numbers are specified by "H" and bore size. Example: "H-1 1/8"

*These sizes are furnished with special keys to fit standard depth keyseats.

Product Overview

Cast Iron Sheaves

Two Groove Sheaves Combination Groove for “4L” or “A” Belts and “5L” or “B” Belts

Table 4: Stock Sizes with Split Taper Bushings Continued

Part No.	Diameters			Wt. Lbs Less Bush
	O. D.	Datum “A”	Datum “B”	
2BK32H	3.35”	2.60”	3.00”	2.1
2BK34H	3.55	2.80	3.20	2.4
2BK36H	3.75	3.00	3.40	2.0
2BK40H	3.95	3.20	3.60	2.4
2BK45H	4.25	3.50	3.90	3.0
2BK47H	4.45	3.70	4.10	2.8
2BK50H	4.75	4.00	4.40	3.3
2BK52H	4.95	4.20	4.60	3.6
2BK55H	5.25	4.50	4.90	3.9
2BK57H	5.45	4.70	5.10	4.3
2BK60H	5.75	5.00	5.40	4.4
2BK62H	5.95	5.20	5.60	4.5
2BK65H	6.25	5.50	5.90	4.5
2BK67H	6.45	5.70	6.10	5.0
2BK70H	6.75	6.00	6.40	5.1
2BK80H	7.75	7.00	7.40	6.4
2BK90H	8.75	8.00	8.40	7.6
2BK100H	9.75	9.00	9.40	8.4
2BK110H	10.75	10.00	10.40	9.3
2BK120H	11.75	11.00	11.40	11.0
2BK130H	12.75	12.00	12.40	13.1
2BK140H	13.75	13.00	13.40	14.8
2BK160H	15.75	15.00	15.40	17.5
2BK190H	18.75	18.00	18.40	21.5

Table 2: Stock “H” Bushings

Inch Bores		Millimeter Bores		Stock Spline Bores	
Stock Bores	Keyseat	Stock Bores	Keyseat	Stock Bores	Keyseat
3/8” ,7/16	None	10 mm,	None	.978 -10 Inv.	X
1/2, 9/16	1/8” x 1/16”	11, 12	None	1 1/8 -6B	X
5/8, 11/16, 3/4	3/16 x 3/32	14, 16	5 x 2.5	1 3/8 -6B	X
7/8, 13/16,	3/16 x 3/32	18, 19, 20, 22	6 x 3	1 3/8 -21 Inv.	X
15/16, 1, 1 1/16	1/4 x 1/8	24, 25, 28, 30	8 x 3.5		
1 1/8, 1 3/16	1/4 x 1/8	32, 35, 36, 38	10 x 4		
1 1/4	1/4 x 1/16*				
1 5/16, 1 3/8	5/16 x 1/16*				
1 3/8, 1 7/16, 1 1/2	3/8 x 1/16*				

Part numbers are specified by “H” and bore size. Example: “H-1 1/8”

*These sizes are furnished with special keys to fit standard depth keyseats.

Product Overview

Stock Sheave Interchange

Table 5: Sheaves for “4L”, “A”, “5L” or “B” Belts

4L or A	5L or B	Browning	Other Manufacturers			
			Maurey*	T. B. Wood's*	Dodge*	Maska*
2.4	2.8	BK 30H	-	HB 31 QT	BK 30H	MBL 31
2.6	3.0	BK 32H	-	HB 33 QT	BK 32H	MBL 33
2.8	3.2	BK 34H	-	HB 35 QT	BK 34H	MBL 35
3	3.4	BK 36H	-	HB 37 QT	BK 36H	MBL 37
3.2	3.6	BK 40H	BH 40	HB 39 QT	BK 40H	MBL 39
3.5	3.9	BK 45H	BH 42	HB 42 QT	BK 45H	MBL 42
3.7	4.1	BK 47H	BH 44	HB 44 QT	BK 47H	MBL 44
-	-	BK 49H	BH 48	HB 47 QT	BK 49H	MBL 47
4.2	4.6	BK 52H	BH 50	HB 49 QT	BK 52H	MBL 49
4.5	4.9	BK 55H	BH 52	HB 52 QT	BK 55H	MBL 52
4.7	5.1	BK 57H	BH 54	HB 54 QT	BK 57H	MBL 54
5.0	5.4	BK 60H	BH 58	HB 57 QT	BK 60H	MBL 57
5.2	5.6	BK 62H	BH 60	HB 59 QT	BK 62H	MBL 59
5.5	5.9	BK 65H	BH 66	HB 62 QT	BK 65H	MBL 62
5.7	6.1	BK 67H	BH 68	HB 64 QT	BK 67H	MBL 64
6.0	6.4	BK 70H	BH 70	HB 67 QT	BK 70H	MBL 67
6.2	6.6	BK 72H	BH 72	HB 69 QT	BK 72H	MBL 69
6.5	6.9	BK 75H	-	HB 72 QT	BK 75H	MBL 72
6.7	7.1	BK 77H	-	HB 74 QT	BK 77H	MBL 74
7.0	7.4	BK 80H	BH 78	HB 77 QT	BK 80H	MBL 77
7.5	7.9	BK 85H	-	HB 82 QT	BK 85H	MBL 82
8.0	8.4	BK 90H	-	HB 87 QT	BK 90H	MBL 87
8.5	8.9	BK 95H	-	HB 92 QT	BK 95H	MBL 92
9.0	9.4	BK 100H	BH 98	HB 97 QT	BK 100H	MBL 97
9.5	9.9	BK 105H	-	HB 102 QT	BK 105H	MBL 102
10.0	10.4	BK 110H	BH 108	HB 107 QT	BK 110H	MBL 107
10.5	10.9	BK 115H	-	HB 112 QT	BK 115H	MBL 112
16.0	11.4	BK 120H	BH 118	HB 117 QT	BK 120H	MBL 117
12.0	12.4	BK 130H	BH 128	HB 127 QT	BK 130H	MBL 127
13.0	13.4	BK 140H	-	HB 137 QT	BK 140H	MBL 137
15.0	15.4	BK 160H	BH 158	HB 157 QT	BK 160H	MBL 157
18.0	18.4	BK 190H	BH 188	HB 187 QT	BK 190H	MBL 187

* The following trade names, trademarks and/or registered trademarks are used in this material by Regal Power Transmission Solutions for comparison purposes only, are NOT owned or controlled by Regal Power Transmission Solutions and are believed to be owned by the following parties: Maurey: Maurey Manufacturing Corporation; TB Wood's: TB Wood's Incorporated.; Dodge: Reliance Electric Company; Maska: Maska Inc.

Product Overview

Gripbelt Sheaves with Split Taper Bushings

Table 6: Specifications Stock "B5V" Sheaves

Part Number		DIAMETERS				Wt. (lbs.)
Sheave	Bushing	Datum "A" Belts	Datum "B" Belts	Pitch "5V" Belts	Outside	Less Bush.
2 GROOVE F = 1 23/32						
2B5V42	P1	3.8	4.2	4.3	4.48	3.7
2B5V44	P1	4.0	4.4	4.5	4.68	4.1
2B5V46	B	4.2	4.6	4.7	4.88	3.3
2B5V48	B	4.4	4.8	4.9	5.08	3.9
2B5V50	B	4.6	5.0	5.1	5.28	4.6
2B5V52	B	4.8	5.2	5.3	5.48	5.3
2B5V54	B	5.0	5.4	5.5	5.68	6.0
2B5V56	B	5.2	5.6	5.7	5.88	6.7
2B5V58	B	5.4	5.8	5.9	6.08	7.4
2B5V60	B	5.6	6.0	6.1	6.28	8.2
3B5V62	B	5.8	6.2	6.3	6.48	9.2
2B5V64	B	6.0	6.4	6.5	6.68	8.4
2B5V66	B	6.2	6.6	6.7	6.88	11.4
2B5V68	B	6.4	6.8	6.9	7.08	10.2
2B5V70	B	6.6	7.0	7.1	7.28	12.3
2B5V74	B	7.0	7.4	7.5	7.68	14.2
2B5V80	B	7.6	8.0	8.1	8.28	11.3
2B5V86	B	8.2	8.6	8.7	8.88	10.6
2B5V90	B	8.6	9.0	9.1	9.28	11.1
2B5V94	B	9.0	9.4	9.5	9.68	11.6
2B5V110	B	10.6	11.0	11.1	11.28	14.4
2B5V124	B	12.0	12.4	12.5	12.68	17.1
2B5V136	B	13.2	13.6	13.7	13.88	19.3
2B5V154	B	15.0	15.4	15.5	15.68	23.2
2B5V160	B	15.6	16.0	16.1	16.28	24.2
2B5V184	B	18.0	18.4	18.5	18.68	33.2
2B5V200	B	19.5	20.0	20.1	20.28	34.8
2B5V234	B	22.9	23.4	23.5	23.68	37.9
2B5V250	B	24.5	25.0	25.1	25.28	47.0
2B5V278	B	27.3	27.8	27.9	28.08	55.9

Gripbelt Sheaves with Split Taper Bushings

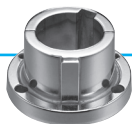
Table 6: Specifications Stock “B5V” Sheaves Continued

Part Number		DIAMETERS				Wt. (lbs.) Less Bush.
Sheave	Bushing	Datum “A” Belts	Datum “B” Belts	Pitch “5V” Belts	Outside	
3 Grooves, Face Width = 2 7/16						
3B5V42	P1	3.8	4.2	4.3	4.48	4.8
3B5V44	P1	4.0	4.4	4.5	4.68	5.2
3B5V46	B	4.2	4.6	4.7	4.88	4.9
3B5V48	B	4.4	4.8	4.9	5.08	5.5
3B5V50	B	4.6	5.0	5.1	5.28	6.1
3B5V52	B	4.8	5.2	5.3	5.48	6.7
3B5V54	B	5	5.4	5.5	5.68	7.4
3B5V56	B	5.2	5.6	5.7	5.88	8.4
3B5V58	B	5.4	5.8	5.9	6.08	9.5
3B5V60	B	5.6	6.0	6.1	6.28	10.6
3B5V62	B	5.8	6.2	6.3	6.48	9.8
3B5V64	B	6	6.4	6.5	6.68	10.5
3B5V66	B	6.2	6.6	6.7	6.88	10.4
3B5V68	B	6.4	6.8	6.9	7.08	10.9
3B5V70	B	6.6	7.0	7.1	7.28	11.5
3B5V74	B	7	7.4	7.5	7.68	12.6
3B5V80	B	7.6	8.0	8.1	8.28	14.2
3B5V86	B	8.2	8.6	8.7	8.88	13.7
3B5V90	B	8.6	9.0	9.1	9.28	14.5
3B5V94	B	9	9.4	9.5	9.68	17.0
3B5V110	B	10.6	11.0	11.1	11.28	19.8
3B5V124	B	12	12.4	12.5	12.68	22.1
3B5V136	B	13.2	13.6	13.7	13.88	24.9
3B5V154	B	15	15.4	15.5	15.68	30.4
3B5V160	B	15.6	16.0	16.1	16.28	31.7
3B5V184	B	18	18.4	18.5	18.68	40.9
3B5V200	B	19.5	20.0	20.1	20.28	47.6
3B5V234	B	22.9	23.4	23.5	23.68	61.5
3B5V250	B	24.5	25.0	25.1	25.28	66.6
3B5V278	B	27.3	27.8	27.9	28.08	79.1

Gripbelt Sheaves with Split Taper Bushings

Table 6: Specifications Stock "B5V" Sheaves Continued

Part Number		DIAMETERS				Wt. (lbs.) Less Bush.
Sheave	Bushing	Datum "A" Belts	Datum "B" Belts	Pitch "5V" Belts	Outside	
4 Grooves, Face Width = 3 5/32						
4B5V42	P1	3.8	4.2	4.3	4.48	5.9
4B5V44	P1	4.0	4.4	4.5	4.65	6.3
4B5V46	B	4.2	4.6	4.7	4.88	6.1
4B5V48	B	4.4	4.8	4.9	5.08	6.7
4B5V50	B	4.6	5.0	5.1	5.28	7.4
4B5V52	B	4.8	5.2	5.3	5.48	8.0
4B5V54	B	5.0	5.4	5.5	5.68	8.9
4B5V56	B	5.2	5.6	5.7	5.88	9.5
4B5V58	B	5.4	5.8	5.9	6.08	10.3
4B5V60	B	5.6	6.0	6.1	6.28	11.0
4B5V62	B	5.6	6.2	6.3	6.48	11.3
4B5V64	B	6.0	6.4	6.5	6.68	12.1
4B5V66	B	6.2	6.6	6.7	6.88	12.0
4B5V68	B	6.4	6.8	6.9	7.08	12.6
4B5V70	B	6.6	7.0	7.1	7.28	13.2
4B5V74	B	7.0	7.4	7.5	7.68	14.5
4B5V80	B	7.6	8.0	8.1	8.28	15.2
4B5V86	B	8.2	8.6	8.7	8.88	16.6
4B5V90	B	8.6	9.0	9.1	9.28	17.6
4B5V94	B	9.0	9.4	9.5	9.68	20.0
4B5V110	B	10.6	11.0	11.1	11.28	22.8
4B5V124	B	12.0	12.4	12.5	12.68	26.5
4B5V136	B	13.2	13.6	13.7	13.88	30.7
4B5V154	B	15.0	15.4	15.5	15.68	37.9
4B5V160	B	15.6	16.0	16.1	16.28	40.5
4B5V184	B	18.0	18.4	18.5	18.68	50.7
4B5V200	B	19.5	20.0	20.1	20.28	58.5
4B5V234	B	22.9	23.4	23.5	23.68	73.9
4B5V250	B	24.5	25.0	25.1	25.28	83.8
4B5V278	B	27.3	27.8	27.9	28.08	94.3



Split Taper Bushings

Table 7: Bushing Specifications

Bushing Size	Dimensions		Bore Range		Cap Screws		Avg. Wt.	Wrench Torque
	D		Type 1	Type 2	No.	Size		
	Large End	Small End						
G	1.172"	1.133"	3/8" to 15/16"	1"	2	1/4 x 5/8"	.5	95
H	1.625	1.570	3/8 to 1-3/8	1-7/16 to 1-1/2	2	1/4 x 3/4	.8	95
P1	1.9375	1.8555	1/2 to 1-7/16	1-1/2 to 1-3/4	3	5/16 x 1	1.3	192
P2	1.9375	1.7930	3/4 - 1 7/16	1-1/2 to 1-3/4	3	5/16 x 1	1.5	192
P3	1.9375	1.6993	1-3/8 to 1-1/8	1-5/8	3	5/16 x 1	2	192
B	2.625	2.5567	1/2 to 1-15/16	2 to 2-7/16	3	5/16 x 1-1/4	1.8	192
Q1	2.875	2.7657	3/4 to 2-1/16	2-1/8 to 2-11/16	3	3/8 x 1-1/4	3.5	348
Q2	2.875	2.7032	1 to 2-1/16	2-1/8 to 2-5/8	3	3/8 x 1-1/4	4.5	348
Q3	2.875	2.6094	1/16 to 1-3/8	2-1/8 to 2-1/2	3	3/8 x 1-1/4	5.5	348
R1	2.875	3.8750	1-1/8 to 2-13/16	2-7/8 to 3-3/4	3	3/8 x 1-3/4	7.5	348
R2	4.000	3.7500	1 3/8 to 2-13/16	2-7/8 to 3-5/8	3	3/8 x 1-3/4	11	348
S1	4.000	4.4180	1-11/16 to 3-3/16	3-1/4 to 4-1/4	3	1/2 x 2-1/4	13.5	840
S2	4.625	4.2696	1-7/16 to 3-3/16	3-1/4 to 4-3/16	3	1/2 x 2-1/4	19	840
U0	6.000	5.7656	2 3/8 to 4-1/4	4 3/8 to 5 1/2	3	5/8 x 2-3/4	27	1680
U1	6.000	5.6485	2-3/8 to 4-1/4	4 3/8 to 5 1/2	3	5/8 x 2-3/4	40	1680
U2	6.000	5.4610	2 7/16 to 4-1/4	4 3/8 to 5	3	5/8 x 2-3/4	50	1680
W1	6.000	8.1016	3 3/8 to 6-3/16	6-1/4 to 7-7/16	4	3/4 x 3	104	3000
W2	8.500	7.9141	3 3/8 to 6-3/16	6-1/4 to 7-7/16	4	3/4 x 3	133	3000
Y0*	8.500	11.4688	6 to 7-15/16	8 to 10	4	1 x 5	270	7200

S1 - 1 11/16, S1 - 1 3/4, and S2 - 1 7/8" to 2 1/8" bushings are steel. U0 and U1 - 2 3/8" to 3 3/16" and U2 - 2 7/16" to 3 3/16" are cast iron. "W" and "Y" bushings are cast iron. All other bushings on this page are either sintered steel, malleable iron or ductile iron.

Contact factory for clarification.

Note: Taper on all Browning bushings is 3/4" per foot on diameter. *Y bushings are made-to-order.

Installation & Maintenance

V-Belt Drives

▲ WARNING

- Read and follow all instructions carefully.
- Disconnect and lock-out power before installation and maintenance. Working on or near energized equipment can result in severe injury or death.
- Do not operate equipment without guards in place. Exposed equipment can result in severe injury or death.

▲ CAUTION

- Periodic inspections should be performed. Failure to perform proper maintenance can result in premature product failure and personal injury.

You will notice reference key numbers (such as A-1) appear throughout this section. These refer to a more detailed discussion with illustrations relating to the subject on pages (B-33 to B-47 Corrective Maintenance and Troubleshooting).

1. Select Replacement Belts (B-1, B-2, B-3, B-4)

After you have made any necessary corrections in your V-belt drive elements, the next step is the selection of the correct replacement belts.

When replacing sets of V-belts, here are some very important reminders:

- Never mix new and used belts on a drive.
- Never mix belts from more than one manufacturer.
- Always replace with the right type of V-belt.
- Always observe V-belt matching limits.

2. Remove Belt Guard (A-1)

Clean and inspect belt guard thoroughly. After removing the drive guard, loosen the drive take-up and move the sheaves closer together to facilitate the removal of any old belts, and to ensure installation of the new belts without damage.

3 Inspect Drive Elements (A-1, A-6)

This is a good time to service the take-up rails by removing any rust, debris, or dirt. Lubricate the bearings as necessary so tensioning of the new belts will go smoothly and easily. This is also an excellent opportunity to inspect and replace faulty or damaged machine elements such as worn bearings and bent shafts.

These maintenance procedures not only reduce the likelihood of future mechanical trouble, but also ensure maximum service from the new belts.

Figure 1: Belt Inspection

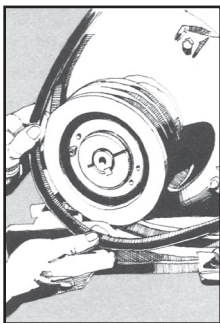
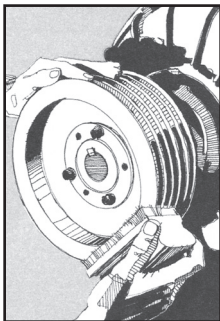


Figure 2: Sheave Inspection



4. Inspect Sheaves (A-4, A-9)

Sheave condition and alignment are vital to V-belt life and performance. New V-belts should never be installed without a careful and thorough inspection of the sheaves involved.

Particular attention should be given to these conditions. Replace sheaves if worn:

- A. Worn groove sidewalls. See Figure 3.
- B. Shiny sheave groove bottom. See Figure 4.
- C. Wobbling sheaves. See Figure 5.
- D. Damaged sheaves. See Figure 6.

Sheaves should be carefully cleaned of any rust and foreign material. A wire brush followed up by wiping with a shop cloth will usually do the job.

Figure 3: Worn Groove Sidewalls



Figure 4: Shiny Sheave Groove Bottom

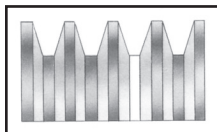


Figure 5: Wobbling Sheaves

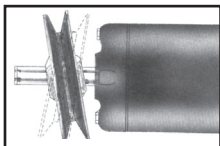


Figure 6: Damaged Sheaves

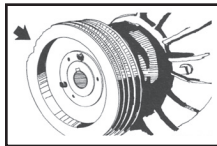
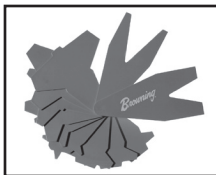


Figure 7: Groove Gage



V-Belt Drives Continued

5. Check Sheave Alignment A-3

One of the great advantages of V-belt drives is the fact that perfect alignment of sheaves is not critical to the operation of the drive. However, the better the alignment, the better the performance. Refer pages B-33 to B-47, A-3, for information on proper alignment procedures and tolerances.

NOTE: Sheaves should always be mounted as close to the bearings as practical to avoid excessive loads on bearings and shafts.

6. Installing New Belts (A-1)

Place the new belts on the sheaves, and be sure that the slack of each belt is on the same side. You can do this by pressing the belts with your hand to bring the slack on one side of the drive. Loosening the drive take-up in advance makes this easy.

Do not force the belts on the sheaves by using a pry bar or by rolling the sheaves. Move sheaves apart until the belts are seated in the grooves. Tighten drive until slack is taken up. (Tensioning suggestions follow in Step 8).

7. Apply Tension (A-7, A-8)

All V-belt drives must operate under proper tension to produce the wedging action of the belt against the groove sidewall. A well-established rule of thumb is that the best tension for a V-belt drive is the **LEAST** tension at which the drive will not slip under peak load. Browning recommends using a belt tension checker to properly tension belts.

Figure 7A: Installing New Belts

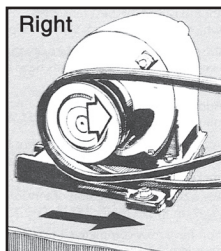


Figure 7B: Installing New Belts

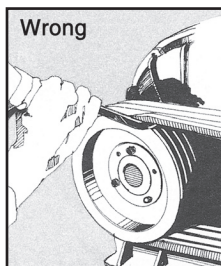


Figure 11: Belt Tension Checker



Installation & Maintenance

8. Recheck Sheave Alignment (A-3)

Anytime sheaves have moved, recheck sheave alignment. Refer to Pages B-33 to B-47, A-3, for information on proper alignment procedures and tolerances.

9. Replace Guard

Start drive. (Look and listen) Check tension after 8, 24 and 100 hours and periodically thereafter.

10. Start Drive (A-7)

Properly designed V-belt drives should not squeal under peak load conditions. If necessary, stop the drive, then start it again. If a squeal is heard, the belts should be tightened to the point where they do not squeal under peak load. Newly installed belts require about 24 hours to become fully seated in the groove. Retension after 3 minutes, 8 hours, 24 hours, 100 hours, and periodically thereafter.

V-Belt Installation Check List

1. Turn off and lock out power source Observe all other safety procedures
2. Select proper replacement belts
3. Remove belt guard
4. Inspect drive elements—bearings, shaft, etc.
5. Inspect sheave grooves for wear
6. Check sheave alignment
7. Install new belts
8. Tension belts
9. Check sheave alignment (final)
10. Replace guard

Start drive (look & listen)

Design and Installation Suggestions

Browning Gripbelt "V" Drives are primarily intended for the transmission of power with relatively high speed driving units. Their acceptance by industry covers a broad field of applications including installations on a wide variety of different types of equipment, including speed increasing drives, V-flat drives, quarter-turn drives, multiple shaft drives and conveyors. Many such applications are regularly being designed and installed using stock parts.

Regardless of whether drives consist of stock or special items there are certain primary conditions to consider with respect to the design of satisfactory drives. Those most commonly encountered are:

1. Drives should always be installed with provision for center distance adjustment. This is essential, because an adjustment is necessary after the belt has set and seated properly in the groove of the sheave. If centers must be fixed, idlers should be used.
2. If possible, centers should not exceed 3 times the sum of the sheave diameters nor be less than the diameter of the large sheave.
3. If possible, the arc of contact of the belt on the smaller sheave should not be less than 120°.
4. Belt speeds with cast iron sheaves cannot exceed 6500 feet per minute. Another type of drive is usually more desirable for speeds under 1000 feet per minute.
5. Special or dynamic balance may need consideration for belts speeds exceeding 5000 feet per minute.
6. Full consideration and allowance for overload capacity in drives increases belt life and improves operation. Study the Overload Service Factors in this section carefully.
7. Severe temperature can have a major effect on belt life. There should be a full and free circulation of air around the drive. All drives operating in explosive atmospheres should be well grounded and use static conducting belts.

Watch these points particularly when installing drives:

8. Be sure that shafts are parallel and sheaves are in proper alignment. Check after eight hours of operation.
9. Do not drive sheaves on or off shafts. Be sure shaft and keyway are smooth and that bore and key are of correct size. Remove burrs by dressing lightly with finishing file. Wipe shaft, key and bore clean with oil. Tighten screws carefully. Recheck and re-tighten after eight hours of operation.
10. Belts should never be forced over sheaves. More belts are broken from this cause than from actual failure in service.

11. In mounting belts, be sure that the slack in each and every belt is on the same side of the drive. This should be the slack side of the drive.
11. Belt tension should be reasonable. When in operation the tight side of belts should be in a straight line from sheave to sheave and with a slight bow on the slack side. Check belt tension after eight hours of operation. All drives should be inspected periodically to be sure belts are under proper tension and not slipping.
For more detailed tensioning instructions and an inexpensive tension checker, see page B-26.
12. Do not install new sets of belts in drives where the sheaves have worn grooves. Such sheaves should be replaced with new sheaves to insure a proper fit of the belts in the grooves, thus elimination possibility of premature belt failure.
13. Keep belts clean. Do not use belt dressing.
14. When making replacement of belts on a drive, be sure to replace the entire set with a new set of matched belts. Failure to do this will probably result in premature breakage of new (and probably shorter) belts mixed with old ones.
15. Keep extra belts stored in a cool, dark, dry place.
CAUTION: Install guards according to local and national codes.

Center Distance and Belt Length

Interpolation

For every inch of belt length difference there is approximately 1/2 inch center distance change. All belt numbers reflect a relation if it is pitch length, outside length or inside length. An A26 belt is 2" longer than an A24 belt; a B105 belt is 15" longer than a B90 belt; a 3V335 belt is 8.5" longer than a 3V250 belt, etc.

Interpolation example:

If an A128 belt gives 50.0" C.D. and an A96 gives 34.0 C.D. , then an A112 belt gives 42.0 C.D.

If a 5V1200 belt gives 83.1" C.D. and a 5V1600 gives 63.1 C.D., then a 5V1800 belt gives 73.1 C.D.

Center distance and belt lengths determined by interpolation are usually close enough as all drives should provide for take-up as indicated on pages 38 and 39. If closer calculation is necessary for any reason use the following formula:

$$L = 2C + 1.57 (D + d) + \frac{(D - d)^2}{4C}$$

where:

- L = Pitch Length of Belt
- C = Center Distance
- D = Datum or Pitch Diameter of Large Sheave
- d = Datum or Pitch Diameter of Small Sheave

Driven Speed Variations

All V-Belt Drives will vary slightly from the speeds shown in the Drive Selection Tables. These variations are due to different motor speeds depending on load, changing frequencies (on A.C. Motors) or voltage (on D.C. Motors), varying tensions and resulting slip, and allowable manufacturing tolerances in belts and sheaves. Also, actual sheave pitch diameters and actual belt pitch lines have been changed slightly over the years by all manufactures but catalog data has not been changed to reflect this.

In the few instances where very close speed tolerances are required use the Browning Edge Selection Program.

Speed-Up, Quarter-Turn, and V-Flat Drives

These drives occur infrequently and should be referred to Browning for special design considerations.

Belt Section Selection Chart

Table 2: Belt Section Selection

HP	Belt Section			
1/2	A	AX		
3/4	A	AX		
1	A	AX		
1 1/2	A	AX		
2	A	AX		
3	AX	A	BX	
5	BX	AX	B	A
7 1/2	BX	B	5VX	3VX
10	5VX, BX	B	3VX	AX
15	5VX, BX	B	3VX	AX
20	5VX	BX	B	3VX
25	5VX	BX	B	3VX
30	5VX	BX	B	3VX
40	5VX, 5V	BX	B	
50	5VX, 5V	BX	B	CX
60	5VX, 5V	BX	B	CX
75	5VX, 5V	CX	BX	C
100	5VX, 5V	CX	C	
125	5VX, 5V	CX	C	
150	5VX, 5V	CX	C	
200	5VX, 5V	CX		
250	5VX, 5V	CX		

The best drive will usually be found by using Belt Section from the first column. If, for any reason, such as sheave shortage, this drive is not suitable, go to the next column.

"AX" drives are found in the "A" Drive Selection Tables; "BX" in the "B" Tables, etc.

Tensioning V-Belt Drives

General rules of tensioning.

1. Ideal tension is the lowest tension at which the belt will not slip under peak load conditions.
2. Check tension frequently during the first 24 - 48 hours of operation.
3. Over tensioning shortens belt and bearing life.
4. Keep belts free from foreign material which may cause slip.
5. Make V-drive inspection on a periodic basis. Tension when slipping. Never apply belt dressing as this will damage the belt and cause early failure.



Table 3: FHP Belts Deflection Force

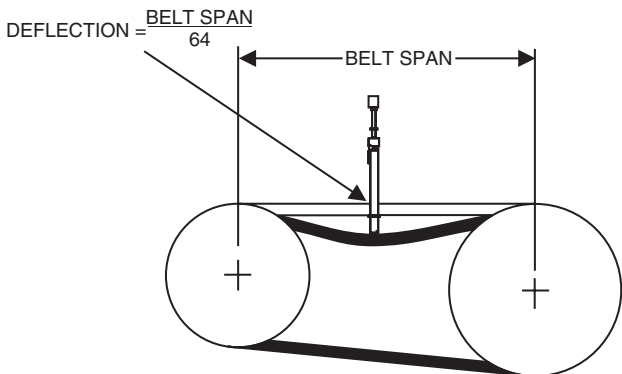
Cross Section	Small P.D. Range	Lbs.	
		Min.	Max.
3L	1.25 -1.75	1/2	5/8
	2.00 -2.25	5/8	7/8
	2.50 -3.00	3/4	1 1/8
4L	2.10 -2.80	1 1/8	1 5/8
	3.00 -3.50	1 1/2	2 1/8
	3.70 -5.00	1 7/8	2 5/8
5L	3.00 -4.20	2	2 7/8
	4.50 -5.20	2 3/8	3 3/8

Tension Measurement Procedure

Tension Measurement Procedures

1. Measure the belt span (see illustration below).
2. Position bottom of the large o-ring on the span scale at the measured belt span.
3. Set the small o-ring on the deflection force scale to zero.
4. Place the tension checker squarely on one belt at the center of the belt span. Apply a force on the plunger and perpendicular to the belt span until the bottom of the large o-ring is even with the top of the next belt or with the bottom of a straight edge laid across the sheaves.
5. Remove the tension checker and read the force applied from the bottom of the small o-ring on the deflection force scale.
6. Compare the force you have applied with the values given in Table 2 on page B-28 and B-29. The force should be between the minimum and maximum shown. The maximum value is shown for "New Belt" and new belts should be tensioned at this value to allow for expected tension loss. Used belts should be maintained at the minimum value as indicated.

NOTE: The ratio of deflection to belt span is 1:64.



The above method of tensioning belt drives is to be used when a drive has been selected in accordance with the suggestions listed in the drive selection tables of the HVAC catalog. For drives with service factor greater than 1.5, consult Application Engineering. For exact tension calculations use the Edge Selection Program.

Installation & Maintenance

Table No. 2 Sheave Diameter - Inches

Cross Section	Smallest Sheave Diameter Range	RPM Range
A, AX	3.0 - 3.6	1000-2500
		2501-4000
	3.8 - 4.8	1000-2500
		2501-4000
	5.0 - 7.0	1000-2500
		2501-4000
B, BX	3.4 - 4.2	860-2500
		2501-4000
	4.4 - 5.6	860-2500
		2501-4000
	5.8 - 8.6	860-2500
		2501-4000
C, CX	7.0 - 9.0	500-1740
		1741-3000
	9.5 - 16.0	500-1740
		1741-3000
D	12.0 - 16.0	200-850
		851-1500
	18.0 - 20.0	200-850
		851-1500
3V, 3VX	2.2 - 2.4	1000-2500
		2501-4000
	2.65 - 3.65	1000-2500
		2501-4000
	4.12 - 6.90	1000-2500
		2501-4000
5V, 5VX	4.4 - 6.7	500-1749
		1750-3000
		3001-4000
	7.1 - 10.9	500-1740
		1741-3000
	11.8 - 16.0	500-1740
1741-3000		
8V	12.5 - 17.0	200-850
		851-1500
	18.0 - 22.4	200-850
		851 - 1500



Installation & Maintenance

Deflection Force - Lbs.

Belt Deflection Force			
Super Gripbelts and Unnotched Gripbands		Gripnotch™ Belts and Notched Gripbands	
Used Belt	New Belt	Used Belt	New Belt
3.7	5.5	4.1	6.1
2.8	4.2	3.4	5.0
4.5	6.8	5.0	7.4
3.8	5.7	4.3	6.4
5.4	8.0	5.7	9.4
4.7	7.0	5.1	7.6
-	-	4.9	7.2
-	-	4.2	6.2
5.3	7.9	7.1	10.5
4.5	6.7	7.1	9.1
6.3	9.4	8.5	12.6
6.0	8.9	7.3	10.9
11.5	17.0	14.7	21.8
9.4	13.8	11.9	17.5
14.1	21.0	15.9	23.5
12.5	18.5	14.6	21.6
24.9	37.0	-	-
21.2	31.3	-	-
30.4	45.2	-	-
25.6	38.0	-	-
-	-	3.3	4.9
-	-	2.9	4.3
3.6	5.1	4.2	6.2
3.0	4.4	3.8	5.6
4.9	7.3	5.3	7.9
4.4	6.6	4.9	7.3
-	-	10.2	15.2
-	-	8.8	13.2
-	-	5.6	8.5
12.7	18.9	14.8	22.1
11.2	16.7	13.7	20.1
15.5	23.4	17.1	25.5
14.6	21.8	16.8	25.0
33.0	49.3	-	-
26.8	39.9	-	-
39.6	59.2	-	-
35.3	52.7	-	-

Corrective Maintenance and Troubleshooting of V-Belt Drives

		SECTIONS A1-D5 ON PAGES B-32 to B-47									
POSSIBLE CURES	A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	B-1	B-2
POSSIBLE CAUSES	Belts Piled On or Misplaced Stack										
	Belts Rubbing Guard										
SYMPTOMS	Sheaves Misaligned										
	Worn or damaged Sheaves										
	Sheaves Too Far From Bearing										
	Poor Bearing or Shaft Condition										
	Insufficient Tension										
	Excessive Tension										
	Improper Sheave Installation										
	Belts Worn (Normal Service Life)										
	Wrong Belt Cross-Section or Type										
Rapid Sidewall Wear		•	*	*			•				•
Worn Cover On Back	*										
Belt Turns Over Or Jumps Off Sheave	•						•				•
Belt Soft, Swollen											
Belt Slips, Squeals (Spin Burn)				*			*				•
Belt Cover Split	*										
Underside Cracked			•								
Tie-Band Damaged		•	•	*							
Repeated Breakage	•						•				
Belts Ride Too High											*
Belts Bottoming				*						•	•
Repeated Take-up Necessary				•			•				•
Belts Vibrate Excessively or Appear Mismatched			•	•			•	•			
Bearings Are Hot				•	•	•		*			
Shafts Whip Or Bend				•	•	•		*			
Cracked Bushings				•				*			
Sheave Wobble				•		•		*			

*: Indicates most common causes

•: Indicates other possible causes

Corrective Maintenance and Troubleshooting of V-Belt Drives

SECTIONS A1-D5 ON PAGES B-32 to B-47

	B-3	B-4	C-1	C-2	C-3	C-4	C-5	C-6	C-7	D-1	D-2	D-3	D-4	D-5
Mismatched Belts or Mixed Brands														
Machine-Induces Impulse or Shock														
Improper or Prolonged Storage			•											
Excessive Heat				•										
Excessive Oil or Grease					•									
Use of Belt Dressing						•								
Abrasive Environment							•							
Foreign Objects in Grooves								•						
Excessive Moisture									•					
Overloaded Drive Underbelting										•				
Drive Seriously Overbelted											•			
Sheaves Too Small												•		
Insufficient Wrap on Small Sheave													•	
Backside Idler														•

V-Belt Drives

The previous pages of this Pocket Reference Guide outlined a step-by-step procedure for the installation of replacement V-belts to help you prevent V-belt maintenance problems.

The reason behind these steps is also fundamental in the daily inspection and maintenance of V-belt drives. Watching and listening will alert you to warning signs of trouble, since one of the greatest advantages of V-belt drives is the fact that belts and sheaves wear gradually. You can spot potential problems in time to arrange short, scheduled maintenance downtime instead of experiencing a longer, costly interruption of production when unexpected trouble occurs.

You can compare V-belts to an electrical fuse – their unexpected failure is usually a signal that something else in the system is wrong. Even their patterns of gradual wear often indicate conditions needing corrections or improvements.

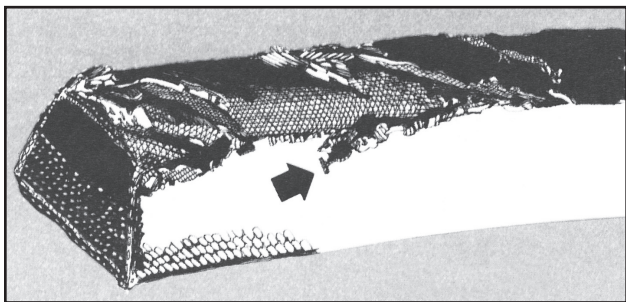
As pointed out in this manual, preventive maintenance by using proper installation techniques is important for long, trouble-free V-belt service.

Occasionally, however, you will find it necessary to correct problems caused by improper installation. This section deals with these problems and troubleshooting procedures.

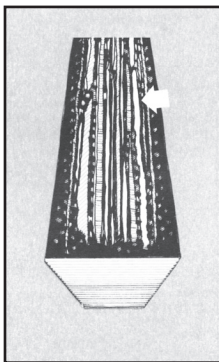
Corrective Maintenance and Troubleshooting

A-1 Prying or forcing V-belts onto the sheaves can, and usually does, break some of the load-carrying tensile cords. When this happens, the belt may either break or turn over in the groove, usually within the first few minutes of operation. This method of installation may be evidenced by a rupture or split in the wrapped cover of the belt, caused by the prying tool or sheave edge. Broken cords are easily identifiable on raw-edge V-belts because it is usually the edge cords that break first.

Misplaced slack can also cause belt breakage, again usually on startup. This occurs on multiple-belt drives when all of the belt slack is not brought to the same side of the drive before tensioning. If some belts are tight on one side, and others are tight on the other side, the heavy shock load of starting will be borne by only some of the belts, thus weakening or breaking the load-carrying cords.



A-2 Belts rubbing against the metal guard or other obstruction will be evidenced by cut or worn fabric on the back or upper edge of the V-belt. Often just replacing missing bolts in guard brackets will remedy this situation.

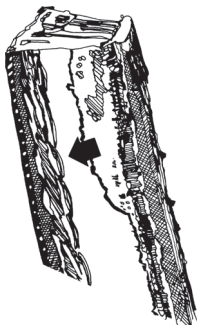


Corrective Maintenance and Troubleshooting Continued

A-3 Misaligned sheaves can cause rapid wear of the V-belt sidewalls, considerably shortening service life of both belts and sheaves. Misalignment can also cause separation of the tie-band on banded belts, or apparent mismatching of individual belts. V-belt sheave alignment should be within a tolerance of $1/2^\circ$ on notched belts and $\pm 2^\circ$ on wrapped belts.

The three basic types of sheave and shaft misalignment are shown below. Suggested methods for checking and correcting each type are found on page B-35.

NOTICE: All three types may be present at the same time. Alignment should be checked and corrected in the order given.



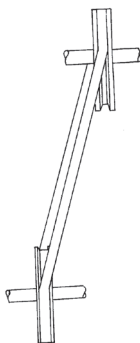
Sidewall Wear



Horizontal
Angular



Vertical
Angular



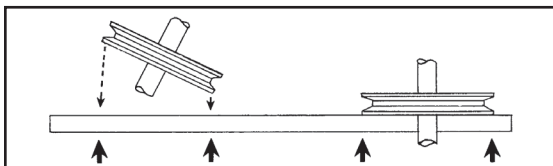
Parallel

Troubleshooting

1. Horizontal Angular (shafts in same horizontal plane but not parallel)

To Check: Use straightedge or string near sheave centers.

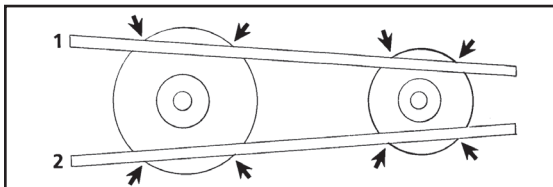
To Correct: Loosen motor mounting bolts and rotate motor until all four points touch straightedge.



2. Vertical Angular (shafts not in the same plane and not parallel)

To Check: Place straightedge about 1/4 radius from the outside diameter of both sheaves as shown. Repeat on opposite side of shaft 2. Straightedge should touch four points indicated in each position.

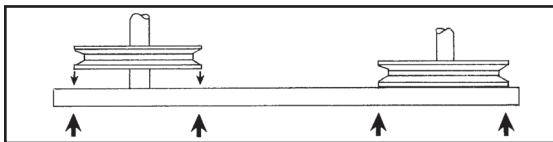
To Correct: Use shims under motor base in front or rear of motor, depending on type of correction required.



3. Parallel (shafts are parallel; sheaves not in line)

To Check: Use straightedge or string near sheave centers.

To Correct: Loosen sheave so it slides easily on shaft until all four points touch straightedge. Retighten sheave in position. Important: Sheave should be mounted as close to bearing as possible to reduce overhung load on bearing. Relocate equipment if necessary.

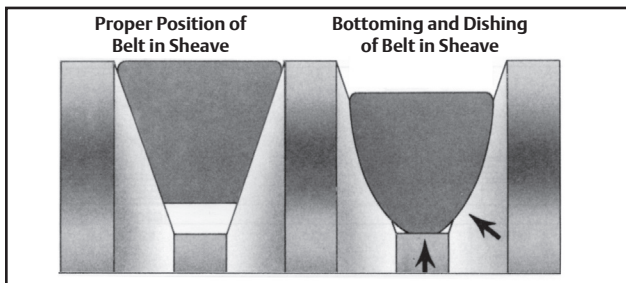
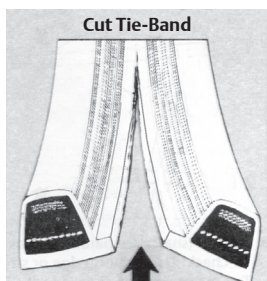
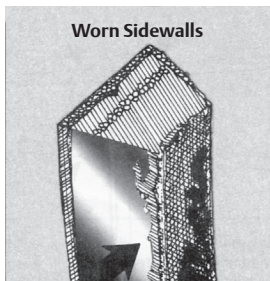


Corrective Maintenance and Troubleshooting Continued

A-4 Worn or damaged sheaves are an even greater cause of rapid belt wear, slippage and vibration. Badly worn sheaves can cause over-tensioning of the drive to prevent slippage, indirectly causing over-heated bearings and shaft damage. If pieces of the sheave flange are missing, it will result in badly worn sidewalls of the belt, and the resulting sheave imbalance can damage bearings and create a safety hazard. When only some of the grooves are worn more than others, the effect is that the belts appear to be mismatched. It also causes “differential driving,” where only some of the belts are carrying the entire load of the drive.

In the case of banded belts, worn grooves cause the belts to ride too low in the grooves, thus causing the tie-band to wear against the sheave flanges between the grooves. In severe cases, this can have the same effect as a circular blade, cutting the band and separating the belts.

Sheave templates are available from your distributor, which can be used to check grooves accurately for wear. A flashlight held behind the template when placed in the groove will help you to observe the amount of wear. “Dishing”



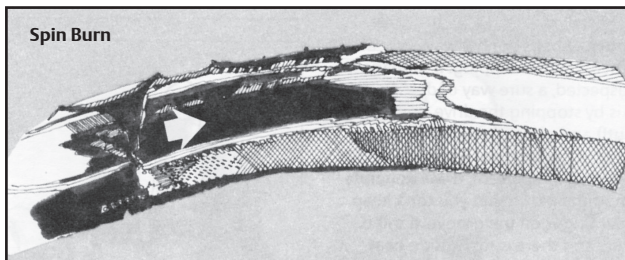
should not exceed $1/32$ " for individual sheave sidewalls. A shiny groove bottom is a sign that the belt or sheave, or both are badly worn and the belt is bottoming in the groove. Worn sheaves or shiny sheave groove bottoms will show up first on the smaller sheave.

The cost of replacing a worn sheave will be more than recovered in longer V-belt life, reduced maintenance and downtime.

A-5 Sheaves mounted too far from the bearing cause excessive overhung load on the bearing and overheating. This can also cause shafting to whip, bend or break. Sheaves should be mounted as close as possible to the bearing. If this affects alignment severely, it may be necessary to relocate the equipment to stay within alignment limits of $1/16$ " per 12" of shaft center-to-center distance.

A-6 Bearing condition and normal wear may well be the cause of overheating, rather than belt tension. They should be inspected for proper lubrication and wear according to the specifications of the bearing or equipment manufacturer. Shaft condition should also be checked and replaced if necessary, as bent shafts can be detrimental to bearings, belts and sheaves, as well as being a safety hazard due to the imbalance created. Sheave "wobble" may be caused by bent shafts.

A-7 Insufficient belt tension it's the leading cause of V-belt slippage and premature belt failure. This is often evidenced by "spin burn". The easiest and most practical way for maintenance personnel to judge proper belt tension is by use of a Browning belt tension checker.



Corrective Maintenance and Troubleshooting Continued

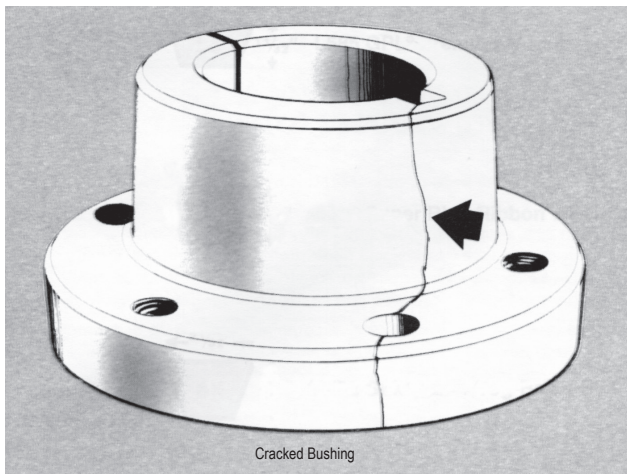
A-8 Excessive tension on V-belts can be even more detrimental than too little tension, affecting not only the belts, but also bearings and shafts. Again, the best rule is to apply only enough tension on the belts to keep them from slipping during startup or peak loading. Some indicators of excessive tensioning (but not always) are:

- Repeated belt breakage
- Excessive vibration
- Overheated bearings
- Whipping or bent shafts

A-9 Improper sheave and bushing installation can result in sheave “wobble” as well as causing sheave hubs to crack. When installing split-tapered bushings always follow manufacturer’s instructions.

It is important to never lubricate the tapered surfaces before installing. The lubrication will permit recommended torque wrench values to increase the actual force on the bushing and hub. This usually results in cracking of the hub at the bolt hole or keyway.

On flanged bushing types, proper installation should result in a gap between the bushing flange and the hub face. The absence of a gap may indicate a problem. When removing split-tapered bushings, start at the jack-screw hole opposite the split to avoid cracking the bushing.



Cracked Bushing

Corrective Maintenance and Troubleshooting Continued SELECTION

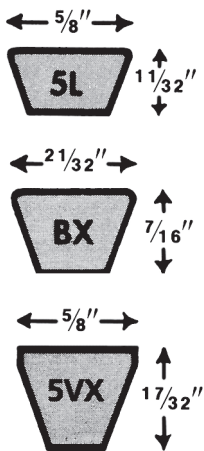
The array of V-belt types, cross-sections and lengths on the market today are all part of technological efforts to provide more efficient, cost-saving answers to your drive requirements.

This category is intended to point out how you can be sure of applying the best V-belt type to your applications.

B-1 Worn V-belts may have gotten that way simply because they have delivered the service life built into them. Browning, strives to design V-belts with a “balanced” construction, so each element of the belt will last as long as all other elements. But the wide variety of industrial applications, environmental conditions and maintenance practices makes this impossible to achieve. However, the expected life of an industrial V-belt on a properly designed and maintained drive is three to five years.

B-2 Using the wrong V-belt cross-section or type can create problems for you... and it's not hard to do, since many belts have similar dimensions. For example, the following V-belts have approximately the same top width (5/8") and length (85" outside circumference).

And yet, the horsepower ratings of these belts range from as little as 2.2 HP per belt to as much as 11.9 HP per belt on a 5" diameter sheave and a 1750 RPM motor!



Corrective Maintenance and Troubleshooting Continued SELECTION

B-3 Mismatched belts or mixed brands from different manufacturers should not be matched together, and will not deliver the expected service life.

Although all manufacturers use similar belt numbering systems, different brands with the same number will differ slightly in dimensions and are not capable of being mixed in a set. Also, construction differences cause them to ride differently in the grooves, and to stretch differently.

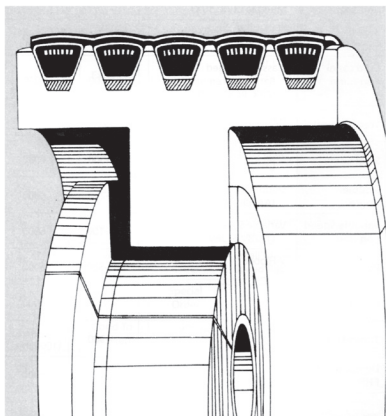
It should be noted that the majority of complaints regarding belt matching are due to other causes, such as misalignment and sheave wear. These factors should always be checked if belts seem to be mismatched.

B-4 Machine-induced vibration or shock loads frequently can cause V-belts to whip or even jump off the drive, creating a safety hazard, and of course, damaging the belts.

On multiple-belt drives, this whipping can be reduced or eliminated by using banded V-belts. A banded V-belt consists of from two to five individual V-belts joined together with a bonded, reinforced tie-band (see illustration).

These belts ride slightly higher in the sheave grooves to provide clearance between the band and the sheave flange. Because of this, sheave grooves should not be worn or “dished-out” more than 1/64”. Also, because the belts are banded together, alignment of the sheaves is more critical.

(The chart on the next page will be helpful in selecting the best belt for an application.)



V-Belt Selection Guide

Table 1: V-Belt Selection Guide

Generic Belt Type (Cross Sections)	Normal HP Range	Maximum Belt Speed (FT/Min) ⁽¹⁾	Normal Temp. Range (°F)		Oil/Heat Resistance	Static Dissipating	General Application
			Min.	Max.			
Super Gripbelts (A, B, C, D)	1-500	6500	-35	140	Good	✓	General-Purpose Heavy Duty Industrial Drives
Gripnotch Multiple (AX, BX, CX)	1-500	6500	-35	140	Excellent	✓	Longer Life, High Efficiency, Small Diameters
358 Gripbelts (3V, 5V, 8V)	1-1000	6500	-35	140	Very Good	✓	High-Performance, Compact Industrial Drives, Long C.D.
358 Gripnotch (3VX, 5VX)	1-600	6500	-35	140	Excellent	✓	High-Performance, Compact Industrial Drives, Short C.D.
Double-V Belts (AA, BB, CC, DD)	1-200	6500	-35	140	Good	Special Order	Serpentine Drives
FHP (2L, 3L, 4L, 5L)	Light Duty	6500	-35	140	Fair	Special Order	Light Duty Drives Using a Single Belt

Notes: (1) Normally limited by sheave materials.

Corrective Maintenance and Troubleshooting Continued ENVIRONMENTAL

“Environmental Protection” can be as important for a V-belt as for humans. This section deals with the effect of adverse environmental conditions on V-belts and how you can minimize these effects.

C-1 Improper or prolonged storage can reduce service life considerably. V-belts should be stored in a cool, dry place with no direct sunlight. On shelves, in boxes or piles, the stack should be small enough to avoid excess weight and distortion on the bottom belts. On pegs, the longer belts should be coiled in loops of suitable size to prevent distortion from the weight of the belt.

The following guide provided by the RMA should be followed for optimum conditions:

Table 2: Guide to Maximum Number of Coilings of V-Belts in Storage

Belt Cross Section	Belt Length (Inches)	Number of Coilings*	Number of Loops*
A, AA, **3V an B	Under 60.0	None	1
	60.0 to 120.0	1	3
	120.0 to 180.0	2	5
	180.0 and up	3	7
BB, **C, and 5V	Under 75.0	None	1
	75.0 to 144.0	1	3
	144.0 to 240.0	2	5
	240.0 and up	3	7
D	Under 120.0	None	1
	120.0 to 240.0	1	3
	240.0 to 330.0	2	5
	330.0 to 420.0	3	7
	420.0 and up	4	9
E and 8V	Under 180.0	None	1
	180.0 to 270.0	1	3
	270.0 to 390.0	2	5
	390.0 to 480.0	3	7
	480.0 and up	4	9

*One coiling results in three loops; two coilings result in five loops, etc.

**“AA” and “BB” are know as “double angle” or “hexagonal” V-belts.

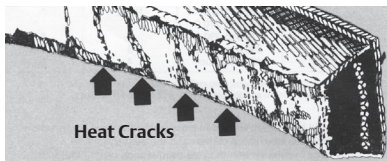
The pegs should be crescent shaped in cross-section to avoid compression set dents in the belts from sharp corners and the pegs should be sufficiently large in cross-section to avoid compression setting to sharp bends resulting from the weight of the hanging belts.

It is recognized that belts are sometimes coiled in smaller loops than indicated in the above table, for packaging for shipment, but such packaging should not be for prolonged storage.

C-2 Excessive heat. Standard construction V-belts are compounded for moderate heat resistance and should give adequate service under normal conditions. Belt temperature (not ambient or surrounding air temperature) is the determining factor when heat is a suspected cause of short belt life. As a general rule service life of a V-belt is cut in half for every 35°F raise in belt temperature above 85°F. Evidence of heat may be the appearance of small cracks on the underside of the belt.

What to do about excessive heat:

1. Check for slippage (see key number A-7)
2. Ventilate the drive or shield from heat source
3. Check to make sure the proper belt size is installed
4. Check the horsepower capacity of the drive



C-3 Excessive oil or grease. Standard construction V-belts are compounded for moderate grease and oil resistance. However, an excessive amount can cause softening, swelling and deterioration of the rubber compounds, as well as slippage.

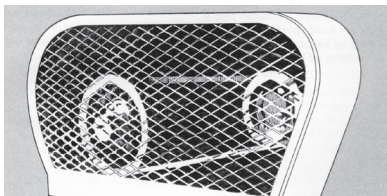
What to do about oil or grease:

1. When there is occasional exposure from spillage or leakage, the belts and sheave grooves should be cleaned with a mixture of detergent and water—after the drive has been turned off and locked out and the cause of the leakage corrected.
2. When belts cannot be protected from oil, specially compounded oil-resistant V-belts should be used.

Corrective Maintenance and Troubleshooting Continued ENVIRONMENTAL

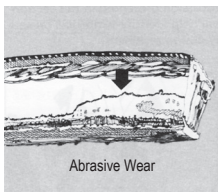
C-4 Never apply so-called “belt dressings” to V-belts. These compounds are usually made from a petroleum derivative and can have a destructive effect on rubber compounds and other components of the belt. If belts slip, check for adequate tension and/or worn sheave grooves (see A-4, A-7).

C-5 Abrasive conditions from sand, dust or grit can accelerate wear of both belts and sheaves. This is especially true when slippage is present. Belt selection can be an important factor. Experience has shown that raw-edge constructions reduce this wear because they reduce the “sandpaper-effect” caused by slippage. Drive should be well-shielded against excessive abrasive particles as much as possible.



used, but ventilation is some-times sacrificed, possibly requiring additional induced cooling. Banding belts are often effective, since they eliminate belt turn-over.

C-7 Excessive moisture can penetrate the fabric covering of a V-belt, causing deterioration. In addition, a large amount of water can reduce friction and cause slippage. Belt drives should be protected as much as possible when used outside or when subject to spray from washdown hoses, etc. Belt tension should be inspected regularly.



C-6 Foreign objects, such as wood chips, can create havoc with V-belt drives. Belt breakage and turnover are the most common symptoms. Shielding the drive is a necessity. Belt guards with expanded metal screening are often

Corrective Maintenance and Troubleshooting Continued DESIGN

When normal corrective measures, as presented in the previous sections, do not seem to produce the desired results, an inherent design problem may be the culprit. The solutions to these are best left up to the Application Engineering Department or a Certified Drive Specialist. However, the discussion presented in this section will help identify symptoms caused by design problems.

D-1 Underbelting a drive, (using fewer belts than recommended by good design practice) results in excessive tension in each belt on the drive.

This is commonly evidenced by excessive stretching which requires frequent take-ups to prevent slippage. Another warning sign can be repeated belt breakage.

In many cases, underbelting can be corrected simply by using raw edge, cogged V-belts which have a higher horsepower rating. When these are used, drives should be identified to assure that future replacements are made with this type of belt. (Drive labels are available for this purpose.)

D-2 Drive overbelting, while usually resulting in longer V-belt life, can be just as serious as underbelting. The symptoms most commonly found are overheated bearings and bent shafts. This is especially true if belt tensioning devices are used without regard to design factors.

These devices, called tension-checkers, are quite helpful in determining proper belt tension, but tension values taken from published tables do not apply to all drives. Therefore, when these devices are used the deflection force values should be calculated, rather than taken from such tables. Contact Application Engineering, 800-626-2093, for proper tensioning values.

Tensioning devices measure the individual belt tensions; so, when too many belts are on the drive, the total tension can be excessive when “table” values are used. On the other hand, when too few belts are on the drive, tension values from these tables may be inadequate.

Most design handbooks contain the formulas and procedures for making these simple calculations.

Another not-so-common symptom is belt vibration, resulting from tension harmonics. Since induced vibration can be caused by several factors, this should be referred to Application Engineering.



Corrective Maintenance and Troubleshooting Continued DESIGN

D-3 When sheaves are too small for the belt cross-section, the belt flexes beyond its normal limits. This is usually evidenced by cracks on the underside of the belt. Table 3 indicates the minimum recommended sheave diameter for flexing each belt cross-section. In most cases, use of a raw-edge cogged belt will improve service life greatly, due to its greater flexibility.

Table 3: Minimum Recommended Sheave and Idler Diameters.

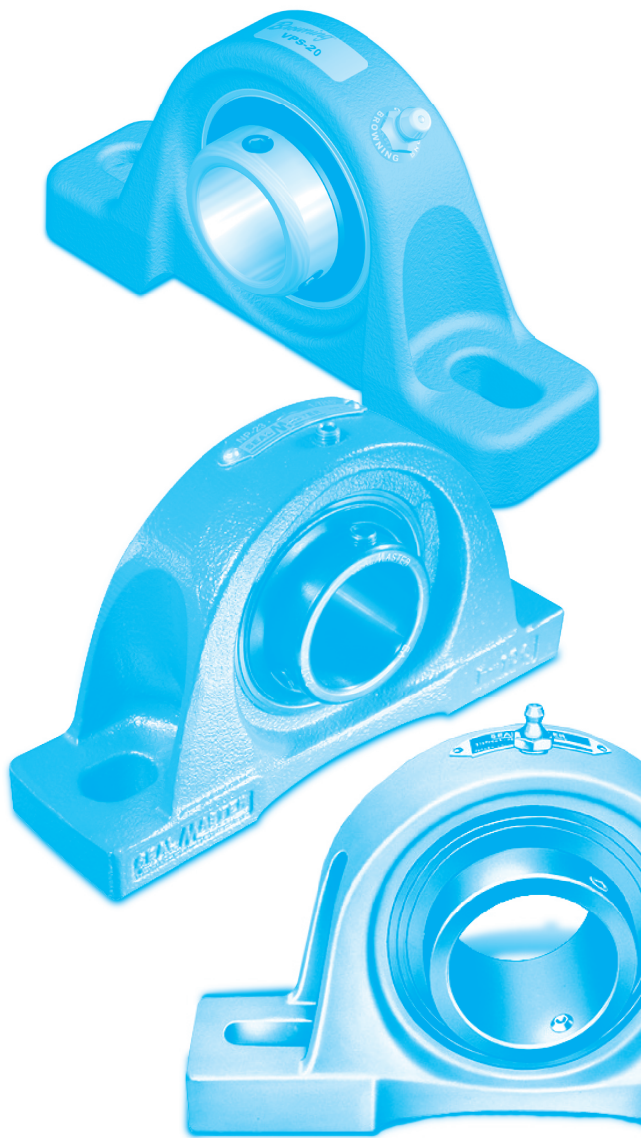
V-Belt Cross Section	Minimum P.D. Sheave or Inside Idler	Minimum O.D. Flat Backside Idler*
A	3	4.5
B	5	7.5
C	9	13.5
D	13	19.5
E	21	31.5
AX	2.6	4
BX	4	6
CX	7	10.5
3V	2.6	-
5V	7	-
5VX	4.3	-
8V	12.4	-
8VX	11.2	-

*NOTE: Backside idlers are detrimental to V-belt service life.

Another problem caused by sheaves that are too small is overheating of motor bearings, or even bent shafts. NEMA publishes minimum recommended sheave diameters for use with electric motors to avoid excessive bearing loads. Table 4 in section E shows these minimums for the most common motor types.

D-4 Insufficient wrap on the small sheave can require excessive belt tension to prevent slippage. This condition may require redesign, either using more belts, increasing the center distance or using a backside idler with longer belts. This is again a matter for Browning Application Engineering.

D-5 Backside idlers can create problems because they cause V-belts to bend opposite to the way they were designed. Care must be taken to see that a backside idler is large enough in diameter to reduce harmful stresses, which often cause cracks on the underside of the belt. Table 3 (under D-3) also shows these minimum recommended diameters.



SEALMASTER[®]

Browning[®]

Mounted Ball Bearings

We have mounted ball bearing solutions for some of the toughest applications. We have the solution whether you need a high performance bearing like Sealmaster or industry leading highly featured normal duty bearing like Browning. Offered in a wide variety of housing configurations, bore sizes and locking mechanisms.

Sealmaster Gold Mounted Ball Bearings

Offers a host of unique and patented technologies with years of proven performance in the toughest of environments.

Browning Mounted Ball Bearings

Designed with many of the same attributes as the Sealmaster Gold, this competitively priced - feature rich product based is interchangeable to competitive standard products.

Quick-Find Reference

Product Overview

Installation and Maintenance

Troubleshooting

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Product Overview

Features & Benefits

Sealmaster Gold Mounted Ball Bearings



Wide Outer Race

Sealmaster has the industry's widest outer ring. The black oxidized outer ring is 20 to 30% wider than industry standard outer rings. This feature results in increased grease capacity, and room for improved sealing options. A wider outer ring has increased surface area contact with the housing to better absorb shock load.



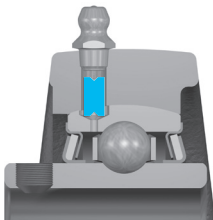
Felt Seal with Flinger

The standard felt seal provides a tight labyrinth seal which retains lubrication and acts as a filter to exclude contamination. The external stamping is a flinger which shields the felt from large contaminants and directs them away from the sealing surface. The design operates with less drag and less heat generation than rubber contact seals.



Land Riding Retainer

The Sealmaster unique land riding metal retainer design provides superior pocket clearance that allows for 360° grease circulation around the rolling elements resulting in better retained and utilized lubrication. The land riding design of the retainer minimizes wear on both Ball and retainer, while maximizing stability, which is especially important in applications involving vibration, shock loading or high operating speeds.



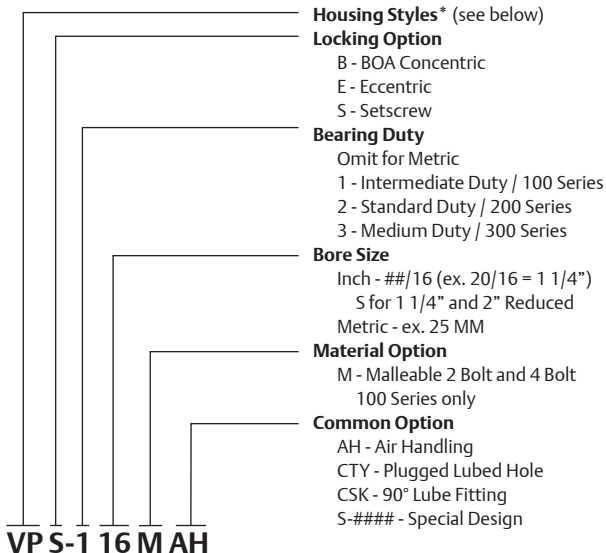
Exclusive Locking Pin and Dimple System

The Sealmaster exclusive locking pin and dimple system provides a direct lubricant path into the bearing cavity & ball path instead of around a lubrication groove. The pin also prevents outer ring rotation (sometimes referred to as "creep"), and allows $\pm 2^\circ$ static misalignment of the bearing insert.

Product Overview

Nomenclature

Browning Mounted Ball - Housings



Housing	Housing Style	Material
RUBR	Grommet	Rubber
SSF2	Two Bolt Flange	Stamped Steel
SSF3	Three Bolt Flange	Stamped Steel
SSF3T	Three Bolt Flange	Stamped Steel
SSF4	Four Bolt Flange	Stamped Steel
SSP	Pillow Block	Stamped Steel
SSRP	Pillow Block	Stamped Steel / Rubber
VF2	Two Bolt Flange	Cast Iron
VF3	Three Bolt Flange	Cast Iron
VF4	Four Bolt Flange	Cast Iron
VFB	Flange Bracket	Cast Iron
VFC	Piloted Flange Cartridge	Cast Iron
VP	Pillow Block - High Base	Cast Iron
VPD	Pillow Block - Alternate Base	Cast Iron
VPL	Pillow Block - Low Base	Cast Iron
VTB	Tapped Base Pillow Block	Cast Iron
VTW	Wide Slot Take Up	Cast Iron

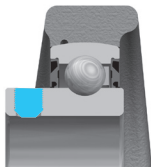
Product Overview

Features & Benefits

Browning Mounted Ball Bearings

Setscrew Locking

120° spaced, balanced three point contact minimizes inner ring distortion vibration, reduces noise, and improves reliability. Precision manufactured diamond faceted setscrews contribute to improved clamping and resistance to back out. BOA Concentric Locking and Eccentric options are available in select sizes.



Anti-Rotation Rivet

An Anti-rotation rivet prevents outer ring creep, or rotation, within the housing.



Sealing

Positive molded Nitrile rubber contact seal with an auxiliary flinger element standard on 200 and 300 series units. Contact seal only 100 series units. The contact seal allows grease purge and helps keep contamination out of the bearing while the flinger provides a rotating shield that directs contamination away from the seal.



Semi-Solid Cast Iron Base

The rugged base design provides an excellent mounting foundation. This is integral to prevent sheet metal "buckling".



Installation Information

Mounted Ball Bearings Installation

NOTICE

• These bearings are designed for maximum permissible static misalignment. Installation, handling or operation of the bearing in excess of the maximum can cause reduction in bearing performance and may lead to equipment failure.

Static Misalignment Capabilities:

Sealmaster Gold $\pm 2^\circ$

Browning $\pm 1.5^\circ$

• Do not strike or hammer on any component of the bearing and/or shaft. Impact can result in damage to the bearing that may cause reduction in bearing performance and may lead to equipment failure.



Step 1: Inspect Shaft and Bore

Shaft should be within tolerance range shown in Table 1, clean and free of nicks and burrs. Mount bearings on unused section of shafting or repair/replace shafting as required. Inspect both the shaft and bearing bore for debris or contaminants. Wipe clean as necessary.



Table 1

Recommended Shaft Tolerances	
Nominal Bore Diameter	Tolerance (inch)
1 3/16 - 2	+0.000 / -0.0005
2 3/16 - 4	+0.000 / -0.0010
4 7/16 - 5	+0.000 / -0.0015

Step 2: Check Support Surfaces

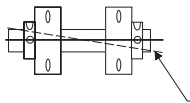
Make sure the base of the housing and the support surfaces are clean and free from burrs. If the housing elevation is adjusted with shims these must cover the entire contact area between the housing and the support surface.

Step 3: Install Unit

To aid installation, keep weight off bearing during mounting. Slide unit onto shaft by pushing on the inner ring. If it is difficult to mount bearing on shaft, use a piece of emery cloth to reduce any high spots on the shaft.

Step 4: Fasten Unit in Place

Install housing mounting bolts and check bearing alignment. Align the bearing units as closely as possible. Tighten mounting bolts to recommended fastener torques. Check the shaft for freedom of rotation by rotating shaft with hand in both directions.



Step 5: Position Insert

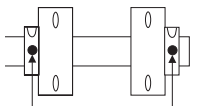
If expansion units are used (available as option on Sealmaster Gold), the insert must be located in the housing to allow for axial shaft expansion and/or contraction. Position bearing insert to obtain the required axial expansion in desired directions. It may be necessary to unload the bearing while moving the assembly.

Installation Information

Step 6: Tighten Locking Mechanism

a. Setscrew Locking Inserts

Setscrews in multiple bearing applications should be aligned as shown.



Tighten bearing units to the shaft as follows:

- i. Torque the first setscrew "A" to one half of the recommended torque in Table 2.
- ii. Torque the second setscrew "B" to the full recommended torque. Go back to the first setscrew "A" and tighten to the full recommended torque.

If the bearing unit has setscrew locking on both sides of the inner ring (Double Lock Setscrew), repeat the same procedure for the second pair of setscrews. Check shaft again for freedom of rotation and then tighten the second bearing unit in the same fashion. When all bearings are tightened, perform a final check to the shaft for freedom of rotation.

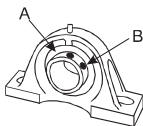


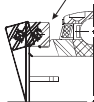
Table 2

Setscrew Torque		
Screw Size	Hex Size	Inch-Pounds
1/4-28	1/8	65 - 85
5/16-24	5/32	125 - 165
3/8-24	3/16	230 - 300
7/16-20	7/32	350 - 450
1/2-20	1/4	500 - 650
5/8-18	5/16	1100 - 1440

b. Concentric Locking Inserts

- i. Be sure that the concentric collar is fitted square and snug against the shoulder on the inner ring as shown.

Push Locking Collar Tightly Against Inner Ring Shoulder



- ii. Torque the concentric collar cap screw to the full recommended torque in Table 3.

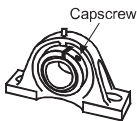


Table 3

Concentric Locking Collar Cap Screw Torque		
Screw Size	Torx Size	Inch-Pounds
# 8-32	T-25	70
# 10-24	T-27	100
1/4-20	T-30	240
5/16-18	T-45	495

Check shaft again for freedom of rotation and then tighten the second bearing unit in the same fashion. When all bearings are tightened, perform a final check to the shaft for freedom of rotation.

Installation & Maintenance

Mounted Ball Bearings Continued

All Mounted Ball Bearings are delivered with a high quality lithium complex grease with an EP additive. The bearing is ready for use with no initial lubrication required. The grease consists of a lithium complex thickener, mineral oil, and NLGI grade 2 consistency. Compatibility of grease is critical; therefore consult with Application Engineering and your grease supplier to insure greases are compatible. For best performance it is recommended to relubricate with lithium complex thickened grease with a comparable NLGI consistency and base oil properties.

Relubricatable bearings are supplied with grease fittings or zerks for ease of lubrication with hand or automatic grease guns. Always wipe the fitting and grease nozzle clean.

Re-Lubrication Procedure:

Stop rotating equipment. Add one half of the recommended amount shown in Table 1 or 3. Start the bearing and run for a few minutes. Stop the bearing and add the second half of the recommended amount. A temperature rise after lubrication, sometimes 30°F (17°C), is normal. Bearing should operate at temperatures less than 200°F (94°C) and should not exceed 250° (121°C) for intermittent operation. For lubrication guidelines, see Tables 2 or 4.

Note: Tables 2 and 4 are general recommendations. Experience and testing may be required for specific applications.

Note: Grease charges in Table 1 and 3 are based on the use of lithium complex thickened grease with a NLGI grade 2 consistency.

Note: The Maximum Operational Speeds listed in Table 2 and 4 are based on the use of a single lock setscrew insert with standard seals. For maximum operational speeds of other locking mechanisms and seals, refer to speed rating section or consult Application Engineering.

Table 1 / Sealmaster Grease Charge for Relubrication

Series	Bore Diameter		Grease Charge (Mass - Ounces)	Bore Diameter Material Handling Bearing	Grease Charge (Mass - Ounces)
	Gold - Performance				
	Standard Duty	Medium Duty			
2-012	1/2 - 3/4	-	0.03	-	-
2-015	13/16 - 1	-	0.04	1	0.03
2-13	1 1/16 - 1 1/4R	15/16 - 1	0.09	1 1/16 - 1 1/4R	0.06
2-17	1 1/4 - 1 7/16	1 3/16	0.13	1 1/4 - 1 7/16	0.09
2-19	1 1/2 - 1 9/16	1 7/16	0.18	1 1/2 - 1 9/16	0.14
2-111	1 5/8 - 1 3/4	1 1/2	0.20	1 5/8 - 1 3/4	0.16
2-115	1 13/16 - 2R	1 11/16 - 1 3/4	0.22	1 13/16 - 2R	0.18
2-23	2 - 2 3/16	1 15/16	0.30	2 - 2 3/16	0.25
2-27	2 1/4 - 2 7/16	2 3/16	0.38	-	-
2-211	2 1/2 - 2 11/16	2 7/16 - 2 1/2	0.53	-	-
2-215	2 13/16 - 2 15/16	2 11/16	0.62	-	-
2-33	3 - 3 3/16	2 15/16	0.88	-	-
2-37	3 1/4 - 3 7/16	3 3/16	1.11	-	-
2-38	3 1/2	3 7/16	1.37	-	-
2-43	3 15/16 - 4 3/16	3 15/16 - 4	2.50	-	-
2-47	5	4 7/16 - 4 15/16	3.91	-	-

Installation & Maintenance

Table 2 / Sealmaster Gold Relubrication Recommendations

Environment	Temperature (°F)	Speed (% Catalog Max)	Frequency
Dirty	-20 to 250	0 - 100%	Daily to 1 Week
Clean	-20 to 125	0 - 25%	4 to 10 Months
		26 - 50%	1 to 4 Months
		51 - 75%	1 Week to 1 Month
		76 - 100%	Daily to 1 Week
	125 to 175	0 - 25%	2 to 6 Weeks
		26 - 50%	1 Week to 1 Month
		51 - 75%	Daily to 1 Week
		76 - 100%	
175 to 250	0 - 100%	Daily to 1 Week	

Table 3 / Browning Grease Charge for Relubrication

Series	Shaft Size		Grease Charge (Mass - Ounces)
	100 & 200 Series	300 Series	
	Intermediate & Standard Duty	Medium Duty	
L-10	1/2 - 5/8	x	0.02
2-012	3/4	x	0.03
2-015	13/16 - 1	x	0.03
2-13	1 1/16 - 1 1/4S	15/16 - 1	0.06
2-17	1 1/4 - 1 7/16	1 3/16	0.09
2-19	1 1/2 - 1 9/16	1 7/16	0.14
2-111	1 5/8 - 1 3/4	1 1/2	0.16
2-115	1 13/16 - 2S	1 11/16 - 1 3/4	0.18
2-23	2 - 2 3/16	1 15/16	0.25
2-27	2 1/4 - 2 7/16	2 3/16	0.35
2-211	2 1/2 - 2 11/16	2 7/16 - 2 1/2	0.46
2-215	2 13/16 - 2 15/16	2 11/16	0.48
2-33	x	2 15/16 - 3	0.65
2-38	x	3 7/16 - 3 1/2	1.05
2-43	x	3 15/16	1.77

Table 4 / Browning Relubrication Recommendations

Environment	Temperature (°F)	Speed (% Catalog Max)	Frequency
Dirty	-20 to 250	0 - 100%	Daily to 1 Week
Clean	-20 to 125	0 - 25%	4 to 10 Months
		26 - 50%	1 to 4 Months
		51 - 75%	1 Week to 1 Month
		76 - 100%	Daily to 1 Week
	125 to 175	0 - 25%	2 to 6 Weeks
		26 - 50%	1 Week to 1 Month
		51 - 75%	Daily to 1 Week
		76 - 100%	
175 to 250	0 - 100%	Daily to 1 Week	

Troubleshooting

SYMPTOMS POSSIBLE CAUSES	Bearing gets excessively hot	Excessive Vibration	Noise (High Pitch)	Noise (Intermittent rumbles and rattles)	Noise (Low Pitch)	Shaft binds when rotated	Shaft rotation in bearing bore	Wear of shaft seat
	Rotation interference						X	
Eccentric locking collar initially tightened in wrong direction							X	
Bent shaft		X				X		
Loose machine parts		X		X				
First start after relubrication (grease redistribution)	X							
Setscrew loose							X	
No lubrication	X							
Poor base flatness						X		
Poor shaft finish								X
Bearing located near a heat source	X							
Bearing brinelled		X			X			
Bearing over misaligned	X							
Misalignment			X			X		
Improper shaft to bearing bore fit		X					X	
Dirt in bearing				X		X		
Excessive speed	X							
Unbalanced machine parts		X						
Excessive load	X							
Too much shaft to bearing bore clearance				X				X
Over lubrication	X							
Infrequent relubrication	X							

Troubleshooting

POSSIBLE CURES

Check clearance of rotating parts.

Tighten eccentric locking collar in the direction of shaft rotation.

Straighten or replace shaft.

Check and tighten machine parts.

Allow machine parts to cool and restart.

Tighten setscrews.

Add Lubricant.

Check base flatness, If required repair or replace.

Correct shaft finish. If necessary, use new shaft.

Shield the bearing or move it away from the heat source.

Replace bearing.

Correct alignment.

Correct alignment.

Check shaft size, if necessary use new shaft.

Purge bearing with grease, if necessary replace unit.

Check Bearing Ratings and Speed Limitations. Replace With a Unit That Is Capable of High Speed Operation.

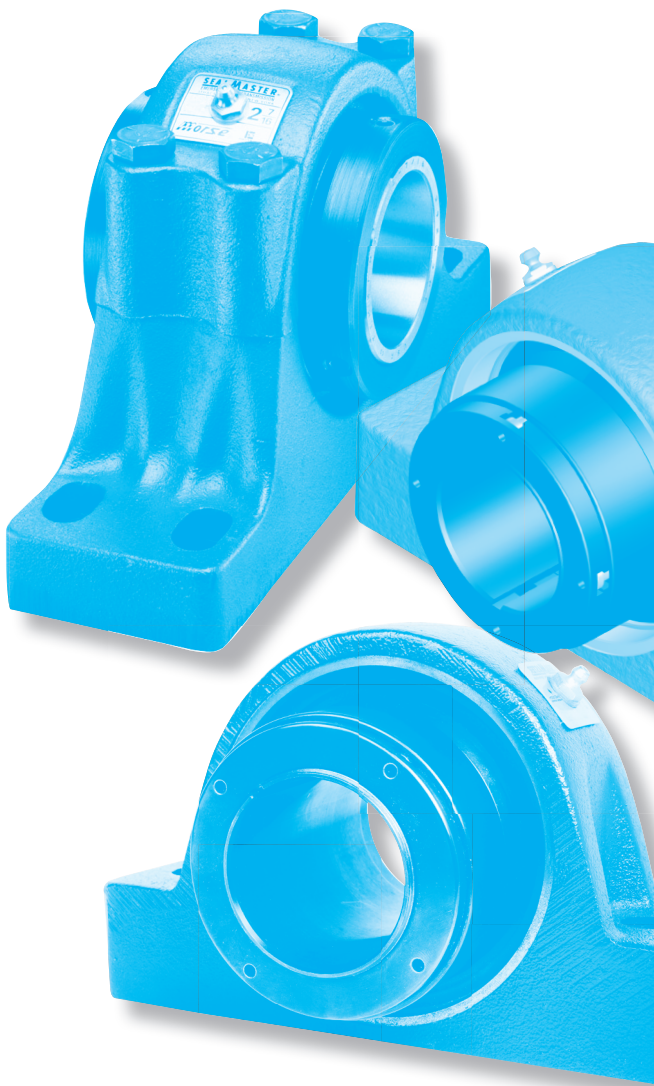
Balance machine parts.

Check bearing loads. Replace with a larger unit. If thrust load is caused by shaft expansion, an expansion type bearing should be used.

Correct shaft fit. Use new shaft.

Use less lubricant or decrease relubrication frequency. If necessary, replace unit.

Add Lubrication and Increase Relubrication Intervals.



Mounted Roller Bearings

SEALMASTER[®]

Browning[®]

Mounted Roller Bearings

Regal Power Transmission Solutions mounted roller bearings has a solution for every application. This complete line of bearings has what you need to keep your operation running. Whether you need a high performance bearing without compromise or a normal duty bearing that is featured versus the competition. A wide range of housing configurations, bore sizes, and locking mechanisms.

Sealmaster Mounted Roller Bearings

Offers a host of unique and patented technologies with years of proven performance in the toughest of environments.

Browning Mounted Roller Bearings

An Industry Interchangeable platform for a more traditional solution to everyday applications.

Quick-Find Reference

Product Overview

Installation and Maintenance

Page

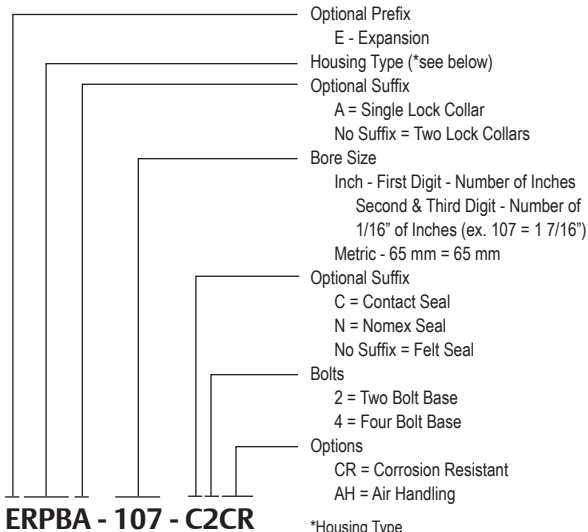
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Product Overview

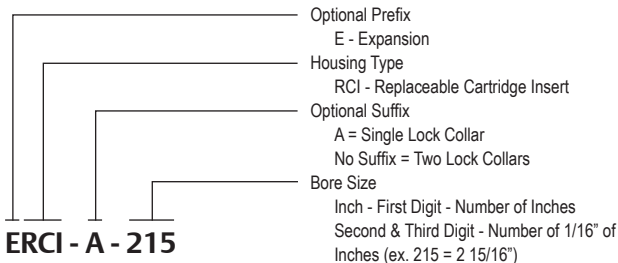
Nomenclature

Sealmaster RPB and RPBXT Tapered Roller Bearings



- *Housing Type
 RPB - Roller Pillow Block
 DRPB - Roller Pillow Block (DI)
 RPBXT - Roller Pillow Block (SAF Mnt. Dim.)
 SPB - Steel Pillow Block
 RFB - Roller Flange Block
 RFP - Roller Flange Pilot

Inserts:



Product Overview

Features & Benefits

Sealmaster RPB and RPBXT Tapered Roller Bearings

- Heavy duty tapered roller bearings
- 1 3/16 to 5 inch bore sizes

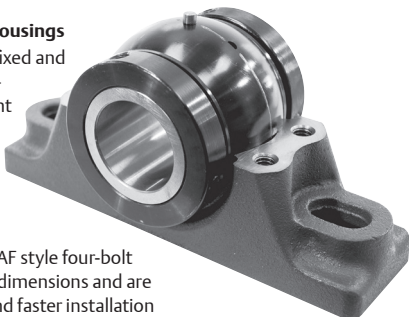


Replaceable Cartridge Insert (RCI)

The heart of the RPB is the unitized, self-aligning cartridge insert with integral seals and double locking collars. The replaceable cartridge insert can accommodate +/- 3° static misalignment and is factory sealed and lubricated. The cartridges fit all housing styles and are field replaceable for quick change out. RCI outer races are black oxide treated.

Durable Cast-Iron Split Housings

- Housing base remains fixed and aligned with the shaft – quick insert replacement
- Standard RPB units are interchangeable with industry Type E mounting dimensions
- RPBXT bearings are interchangeable with SAF style four-bolt pillow block mounting dimensions and are shaft ready for easier and faster installation



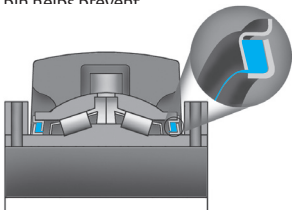
Positive Lubrication System

Positive lubrication system provides direct grease path to the bearing. The unit is designed with two lubrication ports in the cartridge OD so that one of lube holes in cartridge lines up with grease fitting regardless of insert orientation in the housing. A rubber grommet in housing top recess directs lubricant into bearing cavity.

Extra lubrication ports help prevent seal damage by venting excess pressure from over greasing. Sealmaster alignment pin helps prevent outer race rotation.

Felt Lined Flinger Seal

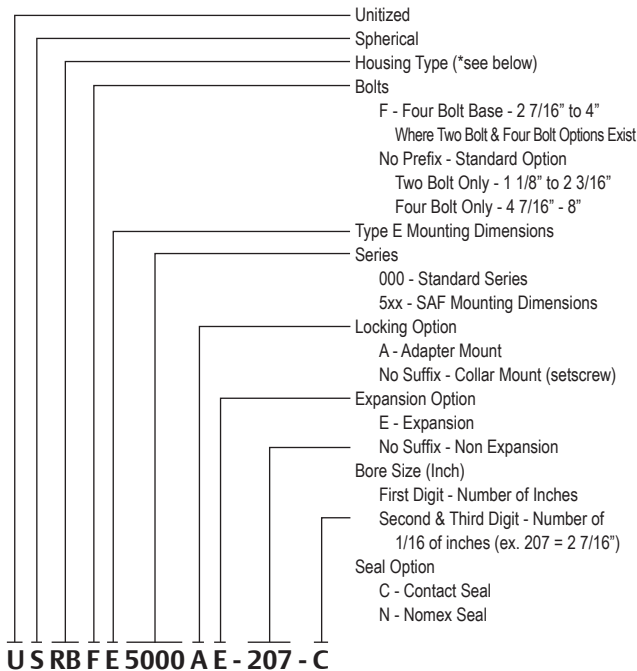
- Filters out contaminants in dry, dusty, dirty conditions
- Mounted between the races – not subject to misalignment distortion
- Contact seal available for wet moist conditions



Product Overview

Nomenclature

Sealmaster Unitized Spherical Roller Bearings (USRB)



- *Housing Type
- RB - Roller (Pillow) Block
 - FB - Flange Block
 - FC - Flange Cartridge
 - TU - Take-Up
 - BF - Flange Bracket
 - I - Insert

Product Overview

Features & Benefits

Sealmaster Unitized Spherical Roller Bearing (USRB)

Split Cast Iron Housing

Durable split housings (USRB5500 series) designed to the industry standard SAF footprint and replaceable cartridge inserts from 1 7/16" - 8" are shaft ready for easy installation.

Seals

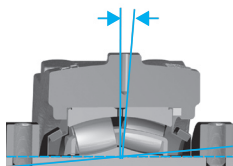
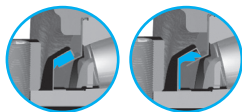
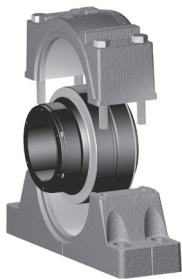
The Sealmaster felt seal with flinger, mounted between races, can accommodate $\pm 2^\circ$ of misalignment. The outer member rotates with the inner race to help direct contamination away from the seal. Due to the unique spherical geometric design of the seal contact areas, sealing effectiveness is maintained throughout the entire specified range of misalignment. This design provides a tight labyrinth seal, which acts as a filter to help exclude foreign material and has low friction.

Misalignment

The arrangement of rolling elements and races in Sealmaster Mounted Spherical Roller Bearings can accommodate ± 2 degrees of misalignment – up to twice an SAF – while maintaining catalog load ratings and sealing effectiveness. The spherical bearing design can accommodate both static and dynamic misalignment which may exist due to structure mounting irregularities, shaft deflection, or other application conditions.

Wide Outer Race

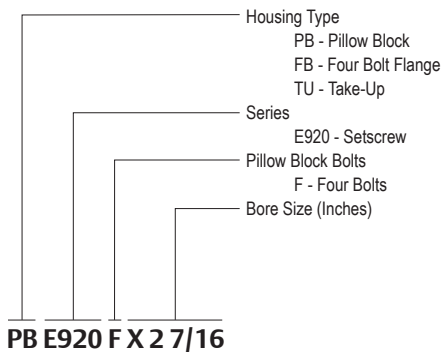
The wide outer race, coupled with innovative rolling element geometries, provides increased load capacity. The wide outer race also allows for race mounted seals and creates a large internal grease chamber, for more grease capacity.



Product Overview

Nomenclature

Browning E920 Series Tapered Roller Bearings



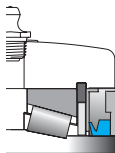
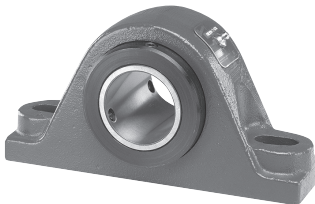
Product Overview

Features & Benefits

Browning E920 Series Tapered Roller Bearings

E920 Series

- Dimensional Interchange with Most Type E Units
- Durable one-piece cast iron housings provide support load.
- Rubber contact face riding seals rotate with the shaft to help retain lubricant and help exclude contaminants.



Installation Information

Sealmaster RPB Tapered Roller Bearing Installation

⚠ WARNING

- Read and follow all instructions carefully.
- Disconnect and lock-out power before installation and maintenance. Working on or near energized equipment can result in severe injury or death.
- Do not operate equipment without guards in place. Exposed equipment can result in severe injury or death.

⚠ CAUTION

- Periodic inspections should be performed. Failure to perform proper maintenance can result in premature product failure and personal injury.
- All electrical work should be performed by qualified personnel and compliant with local and national electrical codes.

Mounting Lock Collar Units:

NOTICE

- These bearings are designed for maximum permissible static misalignment of ± 3 degrees. Installation, handling or operation of the bearing in excess of the maximum of ± 3 degrees can cause reduction in bearing performance and may lead to equipment failure.
- Do not strike or hammer on any component of the bearing and/or shaft. Impact can result in damage to the bearing that may cause reduction in bearing performance and may lead to equipment failure.

**Step 1: Inspect Shaft and Bore**

Shaft should be within tolerance range shown in Table I, clean and free of nicks and burrs. Mount bearings on unused section of shafting or repair/replace shafting as required. Inspect both the shaft and bearing bore for debris or contaminants. Wipe clean as necessary.

**Table I**

Recommended Shaft Tolerances	
Nominal Bore Diameter	Tolerance (inch)
1 3/16 - 2	+0.000 / -0.0005
2 3/16 - 4	+0.000 / -0.001
4 7/16 - 5	+0.000 / -0.0015

Installation Information

Step 2: Check Support Surfaces

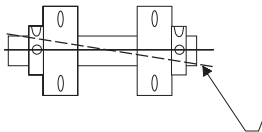
Make sure the base of the housing and the support surfaces are clean and free from burrs. If the housing elevation is adjusted with shims these must cover the entire contact area between the housing and the support surface.

Step 3: Install Unit

To aid installation, keep weight off bearing during mounting. Slide unit onto shaft by pushing on the inner ring. If it is difficult to mount bearing on shaft, use a piece of emery cloth to reduce any high spots on the shaft.

Step 4: Fasten Unit in Place

Install housing mounting bolts and check bearing alignment. Align the bearing units as closely as possible. Tighten mounting bolts to recommended fastener torques. Check the shaft for freedom of rotation by rotating shaft with hand in both directions.



Step 5: Position Insert

If expansion units are used, the insert must be located in the housing to allow for axial shaft expansion and/or contraction. Position bearing insert to obtain the required axial expansion in desired directions. It may be necessary to unload the bearing while moving the assembly.

Step 6: Tighten Setscrews

Setscrews in multiple bearing applications should be aligned as shown in Figure 1.

Tighten bearing units to the shaft as follows:

- Torque the first setscrew to one half of the recommended torque in Table II.
- Torque the second setscrew to the full recommended torque. Go back to the first setscrew and tighten to the full recommended torque.

Installation Information

Sealmaster RPB Tapered Roller Bearing Installation Continued

If the bearing unit has two lock collars, repeat the same procedure for the second lock collar. Check shaft again for freedom of rotation and then tighten the second bearing unit in the same fashion. When all bearings are tightened, perform a final check to the shaft for freedom of rotation.

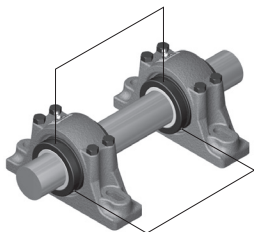


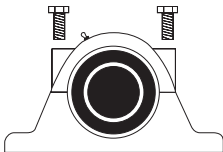
Table II

Lock Collar Setscrew Torque			
Bore Size		Hex Size	Foot-Pounds
inch	mm		
1 3/16 - 1 11/16	35 - 40	5/32	12
1 3/4 - 2 1/2	45 - 65	3/16	19
2 11/16 - 3 1/2	70 - 95	1/4	43
3 15/16 - 4	100 - 105	5/16	83
4 7/16 - 5	110 - 125	3/8	155

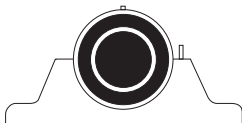
Replacing Existing Sealmaster Inserts:

Note: Replacement Sealmaster bearing inserts are intended for use in Sealmaster housings only.

Step 1: Remove Housing Cap Bolts



Step 2: Remove Top Half of Housing



Step 3: Remove Bearing from Shaft

Loosen the setscrews and slide the bearing off the shaft.

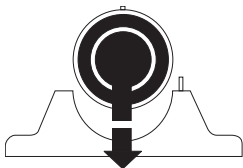
Step 4: Inspect Shaft and Bore

Shaft should be within tolerance range shown in Table I, clean and free of nicks and burrs. Mount bearings on unused section of shafting or repair/replace shafting as required. Inspect both the shaft and bearing bore for debris or contaminants. Also be sure to inspect the housing for damages. Wipe housing bore clean as necessary and check that the lubrication hole is clean and free of debris.

Installation Information

Step 5: Load New Insert

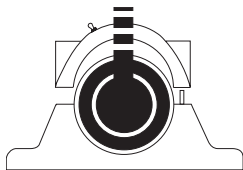
Slide bearing onto shaft and seat the bearing in the housing base.



Step 6: Install Top Half of Housing

Check to assure that the rubber grommet is properly seated in the lube hole in the top half of the housing. Position the insert so that the lock pin lines up with the lock pin slot in the top half of the housing. Be sure that the lock pin is not positioned in the lube hole.

Be sure to check the bearing inserts for proper alignment. Align the bearings.



Install the top half of the housing. Tighten down the cap bolts to the recommended torque in Tables III, IV, V, or VI, based on the housing type. Rotate the shaft by hand to check for freedom of rotation.

Step 7: Refer to Steps 5 and 6 from the Previous Installation Section

Table III

Pillow Block Housing		
Bore Size		Housing Cap Tightening Torque (Foot-Pounds)
inch	mm	
1 3/16 - 1 1/4	-	17
1 3/8 - 2 3/16	35 - 55	30
2 1/4 - 3	60 - 75	75
3 3/16 - 4 1/2	80 - 115	265
4 15/16 - 5	120 - 125	390

Table IV

Flange Bearing Housing		
Bore Size		Housing Cap Tightening Torque (Foot-Pounds)
inch	mm	
1 3/16 - 2	35 - 50	30
2 3/16 - 3	55 - 75	75
3 3/16 - 4	80 - 105	150

Table V

Piloted Flange Housing			
Bore Size		Outside Bolts Tightening Torque (ft/lbs)	Inside Bolts Tightening Torque (ft/lbs)
inch	mm		
1 3/16 - 2	35-50	17	4
2 3/16 - 3	55-75	50	8
3 3/16 - 4	80-105	75	17
4 7/16 - 5	110-125	150	75

Table VI

Expansion Pillow Block Housing		
Bore Size		Housing Cap Tightening Torque (Foot-Pounds)
inch	mm	
1 3/16 - 1 1/4	-	17
1 3/4 - 2 3/16	35 - 55	30
2 1/4 - 3	60 - 75	75
3 3/16 - 3 1/2	80 - 95	265
3 15/16 - 4 1/2	100 - 115	150
4 15/16 - 5	120 - 125	265

Installation Information

Sealmaster RPB Tapered Roller Bearing Lubrication

Pre-Mounting Checklist:

All Sealmaster RPB Mounted Tapered Roller Bearings are delivered with a high quality lithium complex grease with an EP additive. The bearing is ready for use with no initial lubrication required. The grease consists of a lithium complex thickener, mineral oil, and NLGI grade 2 consistency.

Compatibility of grease is critical; therefore consult with Application Engineering and your grease supplier to insure greases are compatible. For best performance it is recommended to relubricate with lithium complex thickened grease with a comparable NLGI consistency and base oil properties.

Relubricatable Sealmaster bearings are supplied with grease fittings or zerks for ease of lubrication with hand or automatic grease guns. Always wipe the fitting and grease nozzle clean.

Caution: If possible, it is recommended to lubricate the bearing while rotating, until grease purge is observed from the seals. If this is not an option due to safety reasons, follow the alternate lubrication procedure below.

Alternate Lubrication Procedure:

Stop rotating equipment. Add one half the recommended amount shown in Table VII. Start the bearing and run for a few minutes. Stop the bearing and add the second half of the recommended amount. A temperature rise after lubrication, sometimes 30°F (17°C), is normal. Bearing should operate at temperatures less than 200°F (94°C) and should not exceed 250° (121°C) for intermittent operation. For lubrication guidelines, see Tables VIII.

Note: Table VIII are general recommendations. Experience and testing may be required for specific applications.

Note: Grease charges in Table VII are based on the use of lithium complex thickened grease with a NLGI grade 2 consistency.

Table VII

Grease Charge for Relubrication		
Bore Size		Grease Charge (Mass - Ounces)
inch	mm	
1 3/16 - 1 1/4	-	0.10
1 3/8 - 1 7/16	35	0.20
1 1/2 - 1 11/16	40	0.30
1 3/4 - 2	45 - 50	0.50
2 3/16	55	0.55
2 1/4 - 2 1/2	60 - 65	0.65
2 11/16 - 3	70 - 75	0.85
3 3/16 - 3 1/2	80 - 95	1.25
3 15/16 - 4	100 - 105	2.50
4 7/16 - 4 1/2	110 - 115	3.00
4 15/16 - 5	120 - 125	4.75

Installation Information

Expansion Bearing Applications:

Before installation, make certain proper expansion is accounted for. Expansion units should be placed in a location where relative movement between the bearing insert and the housing can be tolerated. For most applications using expansion type units, the fixed unit (non-expansion unit) is placed at the drive end of the shaft. Use Table IX to review the total available bearing expansion. If the application requires additional expansion, consult Application Engineering.

Table VIII

Relubrication Recommendations			
Environment	Temperature (°F)	Speed (% Catalog Max)	HI Suffix
Dirty	-20 to 250	0 - 100%	Daily to 1 Week
Clean	-20 to 125	0 - 25%	4 to 10 Months
		26 - 50%	1 to 4 Months
		51 - 75%	1 Week to 1 Month
		76 - 100%	Daily to 1 Week
	125 to 175	0 - 25%	2 to 6 Weeks
		26 - 50%	1 Week to 1 Month
		51 - 75%	Daily to 1 Week
		76 - 100%	
	175 to 250	0 - 100%	Daily to 1 Week

Table IX

Total Available Pillow Block Housing Expansion			
Bore Size		Expansion	
inch	mm	inch	mm
1 3/16 - 2 3/16	35 - 55	3/16	4.76
2 1/4 - 2 1/2	60 - 65	1/4	6.35
2 11/16 - 3 1/2	70 - 95	5/16	7.94
3 15/16 - 5	100 - 125	3/8	9.53

Installation Information

Browning E920 Tapered Roller Bearing Installation

⚠ WARNING

- Read and follow all instructions carefully.
- Disconnect and lock-out power before installation and maintenance. Working on or near energized equipment can result in severe injury or death.
- Do not operate equipment without guards in place. Exposed equipment can result in severe injury or death.

⚠ CAUTION

- Periodic inspections should be performed. Failure to perform proper maintenance can result in premature product failure and personal injury.
- All electrical work should be performed by qualified personnel and compliant with local and national electrical codes.

Mounting Lock Collar Units:

NOTICE

- Do not strike or hammer on any component of the bearing and/or shaft. Impact can result in damage to the bearing that may cause reduction in bearing performance and may lead to equipment failure.



Step 1: Inspect Shaft and Bore

Shaft should be within tolerance range shown in Table I, clean and free of nicks and burrs. Mount bearings on unused section of shafting or repair/replace shafting as required. Inspect both the shaft and bearing bore for debris or contaminants. Wipe clean as necessary.

**Table I**

Recommended Shaft Tolerances	
Nominal Bore Diameter	Tolerance (inch)
1 3/16 - 2	+0.000 / -0.0005
2 3/16 - 4	+0.000 / -0.001
4 7/16 - 5	+0.000 / -0.0015

Step 2: Check Support Surfaces

Make sure the base of the housing and the support surfaces are clean and free from burrs. If the housing elevation is adjusted with shims these must cover the entire contact area between the housing and the support surface.

Installation Information

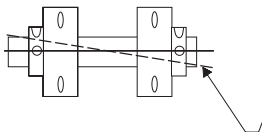
Step 3: Install Unit

To aid installation, keep weight off bearing during mounting. Slide unit onto shaft by pushing on the inner ring. If it is difficult to mount bearing on shaft, use a piece of emery cloth to reduce any high spots on the shaft.

Step 4: Fasten Unit in Place

Install housing mounting bolts and check bearing alignment. Align the bearing units as closely as possible.

Tighten mounting bolts to recommended fastener torques. Check the shaft for freedom of rotation by rotating shaft with hand in both directions.



Step 5: Tighten Setscrews

Setscrews in multiple bearing applications should be aligned as shown in Figure 1. Tighten bearing units to the shaft as follows:

- Torque the first setscrew to one half of the recommended torque in Table II.
- Torque the second setscrew to the full recommended torque. Go back to the first setscrew and tighten to the full recommended torque.

Repeat the same procedure for the second lock collar. Check shaft again for freedom of rotation and then tighten the second bearing unit in the same fashion. When all bearings are tightened, perform a final check to the shaft for freedom of rotation.

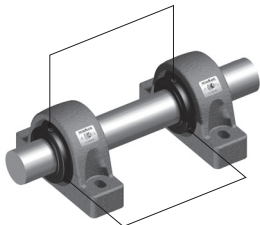


Table II

Lock Collar Setscrew Torque	
Bore Size	Foot-Pounds
inch	
1 3/16 - 1 11/16	12
1 3/4 - 2 1/2	19
2 11/16 - 3 1/2	43
3 15/16 - 4	83
4 7/16 - 5	155

Installation Information

Browning E920 Tapered Roller Bearing Lubrication

Pre-Mounting Checklist:

All Browning E920 Tapered Roller Bearings are delivered with a high quality lithium grease with an EP additive. The bearing is ready for use with no initial lubrication required. The grease consists of a lithium thickener, mineral oil, and NLGI grade 2 consistency.

Compatibility of grease is critical; therefore consult with Application Engineering and your grease supplier to insure greases are compatible. For best performance it is recommended to relubricate with lithium thickened grease with a comparable NLGI consistency and base oil properties.

Relubricatable Browning bearings are supplied with grease fittings or zerks for ease of lubrication with hand or automatic grease guns. Always wipe the fitting and grease nozzle clean.

CAUTION: If possible, it is recommended to lubricate the bearing while rotating, until grease purge is observed from the seals. If this is not an option due to safety reasons, follow the alternate lubrication procedure below.

Alternate Lubrication Procedure:

Stop rotating equipment. Add one half of the recommended amount shown in Table III. Start the bearing and run for a few minutes. Stop the bearing and add the second half of the recommended amount. A temperature rise after lubrication, sometimes 30°F (17°C), is normal. Bearing should operate at temperatures less than 200°F (94°C) and should not exceed 250° (121°C) for intermittent operation. For lubrication guidelines, see Table IV.

Note: Table IV are general recommendations. Experience and testing may be required for specific applications.

Note: Grease charges in Table III are based on the use of lithium thickened grease with a NLGI grade 2 consistency.

Table III

Grease Charge for Relubrication	
Bore Size	Grease Charge (Mass - Ounces)
1 3/16 - 1 1/4	0.26
1 3/8 - 1 7/16	0.30
1 1/2 - 1 11/16	0.36
1 3/4 - 2	0.42
2 3/16	0.69
2 1/4 - 2 1/2	0.75
2 11/16 - 3	0.92
3 3/16 - 3 1/2	1.50
3 15/16 - 4	1.92
4 7/16 - 4 1/2	2.79
4 15/16 - 5	4.17

Installation Information

Table IV

Relubrication Recommendations			
Environment	Temperature (°F)	Speed (% Catalog Max)	Frequency
Dirty	-20 to 250	0 - 100%	Daily to 1 Week
Clean	-20 to 125	0 - 25%	4 to 10 Months
		26 - 50%	1 to 4 Months
		51 - 75%	1 Week to 1 Month
		76 - 100%	Daily to 1 Week
	125 to 175	0 - 25%	2 to 6 Weeks
		26 - 50%	1 Week to 1 Month
		51 - 75%	Daily to 1 Week
		76 - 100%	
	175 to 250	0 - 100%	Daily to 1 Week

Table V

Maximum Operational Speed	
Bore Size	Speed (RPM)
1 3/16 - 1 1/4	3500
1 3/8 - 1 7/16	3000
1 1/2 - 1 11/16	2500
1 3/4 - 2 3/16	2000
2 1/4 - 2 1/2	1750
2 11/16 - 3	1500
3 3/16 - 4	1000
4 7/16 - 5	750

Installation Information

Sealmaster USRB Spherical Roller Bearing Installation

⚠ WARNING

- Disconnect and lock-out power before installation and maintenance. Working on or near energized equipment can result in severe injury or death.
- Do not operate equipment without guards in place. Exposed equipment can result in severe injury or death.
- Read and follow all instructions carefully.
- The lifting lug threaded hole at the top of the housing is designed for lifting only the bearing assembly. Lifting additional weight attached to the bearing may break the housing and result in personal injury or death, and product damage.

NOTICE

- Do not strike or hammer on any component of the bearing and/or shaft. Impact can result in damage to the bearing that may cause reduction in bearing performance and may lead to equipment failure.
- These bearings are designed for maximum permissible misalignment of ± 2 degrees. Installation handling or operation of the bearing in excess of the maximum permissible misalignment of ± 2 degrees can cause reduction in bearing performance and may lead to equipment failure.
- Periodic inspections should be performed. Failure to perform proper maintenance can result in premature product failure.

Mounting Lock Collar Units:

NOTICE

- These bearings are designed for maximum permissible misalignment of ± 2 degrees. Installation, handling or operation of the bearing in excess of the maximum of ± 2 degrees can cause reduction in bearing performance and may lead to equipment failure.
- Do not strike or hammer on any component of the bearing and/or shaft. Impact can result in damage to the bearing that may cause reduction in bearing performance and may lead to equipment failure.



Step 1: Inspect Shaft and Bore

Shaft should be within tolerance range shown in Table I, clean and free of nicks and burrs. Mount bearings on unused section of shafting or repair/replace shafting as required. Inspect both the shaft and bearing bore for debris or contaminants. Wipe clean as necessary.



Table I

Recommended Shaft Tolerances	
Nominal Bore Diameter	Tolerance (inch)
1 1/8 - 2	+0.000 / -0.0005
2 3/16 - 4	+0.000 / -0.001
4 7/16 - 5	+0.000 / -0.0015

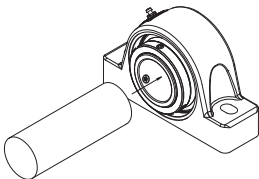
Installation Information

Step 2: Check Support Surfaces

Make sure the base of the housing and the support surfaces are clean and free from burrs. If the housing elevation is adjusted with shims these must cover the entire contact area between the housing and the support surface.

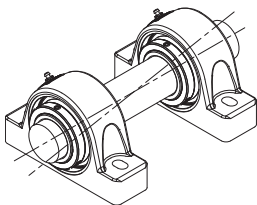
Step 3: Install Unit

To aid installation, keep weight off bearing during mounting. Slide unit onto shaft by pushing on the inner ring. If it is difficult to mount bearing on shaft, use a piece of emery cloth to reduce any high spots on the shaft.



Step 4: Fasten Unit in Place

Install housing mounting bolts and check bearing alignment. Align the bearing units as closely as possible.



Tighten mounting bolts to recommended fastener torques. Check the shaft for freedom of rotation by rotating shaft with hand in both directions.

Step 5: Position Insert

If expansion units are used, the insert must be located in the housing to allow for axial shaft expansion and/or contraction. Position bearing insert to obtain the required axial expansion in desired directions. It may be necessary to unload the bearing while moving the assembly.

Installation Information

Sealmaster USRB Spherical Roller Bearing Installation

Step 6: Tighten Setscrews

Setscrews in multiple bearing applications should be aligned as shown in Figure 1. Tighten bearing units to the shaft as follows:

- Torque the first setscrew to one half of the recommended torque in Table II.
- Torque the second setscrew to the full recommended torque. Go back to the first setscrew and tighten to the full recommended torque.

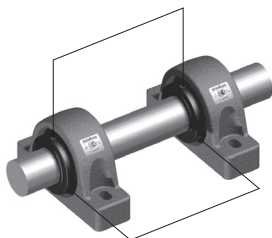


Table II

Lock Collar Setscrew Torque		
Bore Size	Hex Size	Foot-Pounds
1 1/8 - 1 3/4	5/32	14
1 15/16 - 2 1/2	3/16	25
2 11/16 - 3 1/2	1/4	55
3 11/16 - 4 1/2	5/16	120
4 15/16	3/8	180

If the bearing unit has two lock collars, repeat the same procedure for the second lock collar. Check shaft again for freedom of rotation and then tighten the second bearing unit in the same fashion. When all bearings are tightened, perform a final check to the shaft for freedom of rotation.

Installation Information

Mounting Adapter Lock Units:

Step 1: Inspect Shaft and Bore

Shaft should be within tolerance range shown in Table I, clean and free of nicks and burrs. Mount bearings on unused section of shafting or repair/replace shafting as required. Inspect both the shaft and bearing bore for debris or contaminants. Wipe clean as necessary.



NOTICE: Do not apply any additional lubricant (ex. Grease, oil, or anti-seize) to bearing tapered surfaces, bore or shafting. Bearing components have a light oil, rust preventative coating that should not be removed. Application of additional lubricant may cause reduction in bearing performance and may lead to equipment failure.

Table III

Recommended Shaft Tolerances (Adapter Lock)	
Nominal Bore Diameter	Tolerance (inch)
1 1/8 - 2	+0.000 / -0.003
2 3/16 - 4	+0.000 / -0.004
4 7/16 - 5	+0.000 / -0.005

Step 2: Check Support Surfaces

Make sure the base of the housing and the support surfaces are clean and free from burrs. If the housing elevation is adjusted with shims these must cover the entire contact area between the housing and the support surface.

Step 3: Install Unit

NOTICE: One expansion unit is to be used in conjunction with one non-expansion unit for applications using adapter lock units. Failure to utilize one expansion and one non-expansion unit is likely to result in reduced bearing performance.

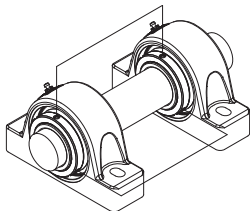
To aid installation, keep weight off bearing during mounting. Slide unit onto shaft by pushing on the inner ring. If it is difficult to mount bearing on shaft, use a piece of emery cloth to reduce any high spots on the shaft.

Installation Information

Sealmaster USRB Spherical Roller Bearing Installation

Step 4: Fasten Unit in Place

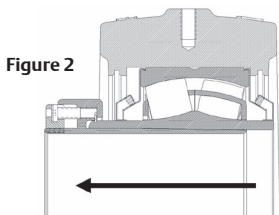
Install housing mounting bolts and check bearing alignment. Align the bearing units as closely as possible.



Tighten mounting bolts to recommended fastener torques. Check the shaft for freedom of rotation by rotating shaft with hand in both directions.

Step 5: Position Insert

Expansion inserts must be located in the housing to allow for axial shaft expansion and/or contraction. If the direction of shaft expansion or contraction is in the direction shown in Figure 2, locate the bearing insert as shown. If the direction of shaft expansion or contraction is opposite to that shown in Figure 2, center the insert in the housing.



Step 6: Tighten Cap Screws

Tighten bearing units to the shaft as follows:

- Tighten the cap screws in the specified order, as shown in Figure 3. Continue tightening until all cap screws have become snug.
- Using a torque wrench, tighten each cap screw in the specified order to one half of the recommended torque in Table IV.

Installation Information

- c) In the same order, repeat the procedure tightening each cap screw to the full recommended torque. Once complete, follow the same pattern and verify that each cap screw has met the full recommended torque value and all cap screws have achieved equivalent resistance.

Check shaft for freedom of rotation and then tighten the second bearing unit in the same fashion. When all bearings are tightened, perform a final check to the shaft for freedom of rotation.

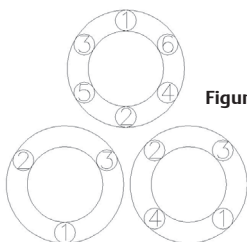


Figure 3

Table IV

Adapter Lock Cap Screw Information			
Bore Size	Torque (inch - pounds)	Hex Size	# Cap Screws
1 1/8 - 1 1/2	45	1/8	3
1 11/16 - 1 3/4	40	1/8	3
1 15/16 - 2	30	1/8	3
2 3/16	45	1/8	3
2 7/16 - 2 1/2	60	1/8	4
2 11/16 - 3	55	1/8	4
3 3/16 - 3 1/2	80	3/16	4
3 11/16 - 4	80	3/16	4
4 7/16 - 4 1/2	115	3/16	4
4 15/16 - 5	130	3/16	6

Installation Information

Sealmaster USRB Spherical Roller Bearing Installation

Replacing Existing Sealmaster Inserts:

Step 1: Loosen and Remove Housing Mounting Bolts

Step 2: Remove Bearing from Shaft

For lock collar units, loosen the setscrews. For adapter lock units, loosen the cap screws in the specified order as shown in Figure 3. Once locking mechanism is loosened, slide the bearing off the shaft.

Step 3: Remove the Bearing Insert from the Housing

Carefully remove retaining ring and spacer (non-expansion units) from the housing bore. Clean rings before reuse. Remove insert from housing.

Step 4: Inspect and Prepare Housing

Housings should be inspected for damage prior to installation. Wipe housing bore clean as necessary and check that the lubrication hole is clean and free of debris. Wetting of the housing bore with oil or grease may be done to ease installation of bearing insert.

Step 5: Load New Insert

Slide the bearing insert into the housing.

Step 6: Secure Bearing in Housing

Replace the spacer into housing (non-expansion units only). Install retaining rings into the grooves in the housing bore.

Step 7: Refer to Steps 1 - 6 from the Previous Installation Sections for the Respective Locking Mechanism

Installation Information

Sealmaster USRB Spherical Roller Bearing Lubrication

Pre-Mounting Checklist:

All Sealmaster Spherical Roller Bearings are delivered with a high quality lithium complex grease with an EP additive. The bearing is ready for use with no initial lubrication required. The grease consists of a lithium complex thickener, mineral oil, and NLGI grade 2 consistency.

Compatibility of grease is critical; therefore consult with Application Engineering and your grease supplier to insure greases are compatible. For best performance it is recommended to relubricate with lithium complex thickened grease with a comparable NLGI consistency and base oil properties.

Relubricatable Sealmaster bearings are supplied with grease fittings or zerks for ease of lubrication with hand or automatic grease guns. Always wipe the fitting and grease nozzle clean.

Caution: If possible, it is recommended to lubricate the bearing while rotating, until grease purge is observed from the seals. If this is not an option due to safety reasons, follow the alternate lubrication procedure below.

Installation Information

Sealmaster USRB Spherical Roller Bearing Lubrication

Alternate Lubrication Procedure:

Stop rotating equipment. Add one half the recommended amount shown in Table V. Start the bearing and run for a few minutes. Stop the bearing and add the second half of the recommended amount. A temperature rise after lubrication, sometimes 30°F (17°C), is normal. Bearing should operate at temperatures less than 200°F (94°C) and should not exceed 250° (121°C) for intermittent operation. For lubrication guidelines, see Table VI.

Table V

Grease Charge for Relubrication	
Bore Size	Grease Charge (Mass - Ounces)
1 1/8 - 1 1/2	0.20
1 11/16 - 1 3/4	0.20
1 15/16 - 2	0.25
2 3/16	0.40
2 7/16 - 2 1/2	0.60
2 11/16 - 3	0.75
3 3/16 - 3 1/2	1.25
3 11/16 - 4	2.00
4 7/16 - 4 1/2	2.75
4 15/16 - 5	4.00

Table VI

Relubrication Recommendations			
Environment	Temperature (°F)	Speed (% Catalog Max)	Frequency
Dirty	-20 to 250	0 - 100%	Daily to 1 Week
Clean	-20 to 125	0 - 25%	4 to 10 Months
		26 - 50%	1 to 4 Months
		51 - 75%	1 Week to 1 Month
		76 - 100%	Daily to 1 Week
	125 to 175	0 - 25%	2 to 6 Weeks
		26 - 50%	1 Week to 1 Month
		51 - 75%	Daily to 1 Week
		76 - 100%	
175 to 250	0 - 100%	Daily to 1 Week	

Installation Information

Note: Table VI are general recommendations. Experience and testing may be required for specific applications.

Note: Grease charges in Table V are based on the use of lithium complex thickened grease with a NLGI grade 2 consistency.

Expansion Bearing Applications:

Before installation, make certain proper expansion is accounted for. Expansion units should be placed in a location where relative movement between the bearing insert and the housing can be tolerated. For most applications using expansion type units, the fixed unit (non-expansion unit) is placed at the drive end of the shaft. Use Table VIII to review the total available bearing expansion. If the application requires additional expansion, consult Application Engineering.

NOTICE: One expansion unit is to be used in conjunction with one non-expansion unit for applications using adapter lock units. Failure to utilize one expansion and one non-expansion unit is likely to result in reduced bearing performance.

Table VII

Maximum Operational Speed		
Bore Size	Felt Seal (RPM)	Contact Seal (RPM)
1 1/8 - 1 1/2	4000	3000
1 11/16 - 1 3/4	4000	2750
1 15/16 - 2	4000	2500
2 3/16	3750	2200
2 7/16 - 2 1/2	3250	1750
2 11/16 - 3	3000	1600
3 3/16 - 3 1/2	2500	1350
3 11/16 - 4	2250	1200
4 7/16 - 4 1/2	2000	1100
4 15/16 - 5	1750	900

Table VIII

Total Available Housing Expansion (inch)		
Bore Size	Setscrew	Adapter Lock
1 1/8 - 1 1/2	3/16	5/32
1 11/16 - 3 1/2	1/4	7/32
3 11/16 - 4	5/16	1/4
4 7/16 - 5	3/8	9/32

Installation Information

Sealmaster USRB Spherical Roller Bearing Split Pillow Block Housing Installation

Mounting Lock Collar Units:

NOTICE

- These bearings are designed for maximum permissible misalignment of ± 2 degrees. Installation, handling or operation of the bearing in excess of the maximum of ± 2 degrees can cause reduction in bearing performance and may lead to equipment failure.
- Do not strike or hammer on any component of the bearing and/or shaft. Impact can result in damage to the bearing that may cause reduction in bearing performance and may lead to equipment failure.



Step 1: Inspect Shaft and Bore

Shaft should be within tolerance range shown in Table I, clean and free of nicks and burrs. Mount bearings on unused section of shafting or repair/replace shafting as required. Inspect both the shaft and bearing bore for debris or contaminants. Wipe clean as necessary.



Table I

Recommended Shaft Tolerances	
Nominal Bore Diameter	Tolerance (inch)
1 1/8 - 2	+0.0000 / -0.0005
2 7/16 - 4	+0.000 / -0.001
4 7/16 - 5 15/16	+0.0000 / -0.0015
6 7/16 - 7	+0.000 / -0.002

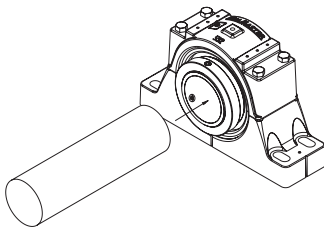
Step 2: Check Support Surfaces

Make sure the base of the housing and the support surfaces are clean and free from burrs. If the housing elevation is adjusted with shims these must cover the entire contact area between the housing and the support surface.

Installation Information

Step 3: Install Unit

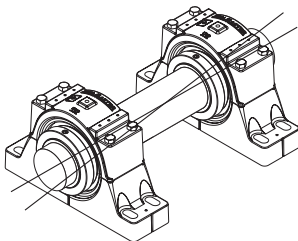
To aid installation, keep weight off bearing during mounting. Slide unit onto shaft by pushing on the inner ring. If it is difficult to mount bearing on shaft, use a piece of emery cloth to reduce any high spots on the shaft.



Step 4: Fasten Unit in Place

Install housing mounting bolts and check bearing alignment. Align the bearing units as closely as possible.

Tighten mounting bolts to recommended fastener torques. Check the shaft for freedom of rotation by rotating shaft with hand in both directions.



Step 5: Position Insert

Expansion units must be located in the housing to allow for axial shaft expansion and/or contraction. Position bearing insert to obtain the required axial expansion in desired directions. It may be necessary to unload the bearing while moving the assembly.

Installation Information

Sealmaster USRB Spherical Roller Bearing Split Pillow Block Housing Installation

Step 6: Tighten Setscrews

Setscrews in multiple bearing applications should be aligned as shown in Figure 1. Tighten bearing units to the shaft as follows:

- Torque the first setscrew to one half of the recommended torque in Table II.
- Torque the second setscrew to the full recommended torque. Go back to the first setscrew and tighten to the full recommended torque.

If the bearing unit has two lock collars, repeat the same procedure for the second lock collar. Check shaft again for freedom of rotation and then tighten the second bearing unit in the same fashion. When all bearings are tightened, perform a final check to the shaft for freedom of rotation.

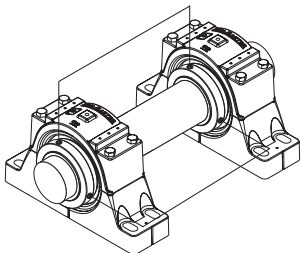


Table II

Lock Collar Setscrew Torque		
Bore Size	Hex Size	Foot-Pounds
1 3/8 - 1 3/4	5/32	14
1 15/16 - 2 1/2	3/16	25
2 15/16 - 3 1/2	1/4	55
3 15/16 - 4 1/2	5/16	120
4 15/16 - 5 15/16	3/8	180
6 7/16 - 7	1/2	428

Installation Information

Mounting Adapter Lock Units:

Step 1: Inspect Shaft and Bore

Shaft should be within tolerance range shown in Table III, clean and free of nicks and burrs. Mount bearings on unused section of shafting or repair/re-place shafting as required. Inspect both the shaft and bearing bore for debris or contaminants. Wipe clean as necessary.

NOTICE: Do not apply any additional lubricant (ex. Grease, oil, or anti-seize) to bearing tapered surfaces, bore or shafting. Bearing components have a light oil, rust preventative coating that should not be removed. Application of additional lubricant may cause reduction in bearing performance and may lead to equipment failure.



Table III

Recommended Shaft Tolerances	
Nominal Bore Diameter	Tolerance (inch)
1 3/8 - 2	+0.000 / -0.003
2 7/16 - 4	+0.000 / -0.004
4 7/16 - 5 15/16	+0.000 / -0.005
6 7/16 - 8	+0.000 / -0.006

Step 2: Check Support Surfaces

Make sure the base of the housing and the support surfaces are clean and free from burrs. If the housing elevation is adjusted with shims these must cover the entire contact area between the housing and the support surface.

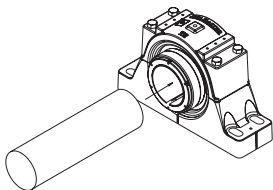
Step 3: Install Unit

NOTICE: One expansion unit is to be used in conjunction with one non-expansion unit for applications using adapter lock units. Failure to utilize one expansion and one non-expansion unit is likely to result in reduced bearing performance.

Installation Information

Sealmaster USRB Spherical Roller Bearing Split Pillow Block Housing Installation

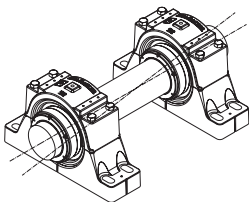
To aid installation, keep weight off bearing during mounting. Slide unit onto shaft by pushing on the inner ring. If it is difficult to mount bearing on shaft, use a piece of emery cloth to reduce any high spots on the shaft.



Step 4: Fasten Unit in Place

Install housing mounting bolts and check bearing alignment. Align the bearing units as closely as possible.

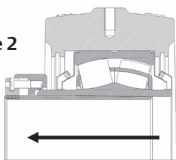
Tighten mounting bolts to recommended fastener torques. Check the shaft for freedom of rotation by rotating shaft with hand in both directions.



Step 5: Position Insert

Expansion inserts must be located in the housing to allow for axial shaft expansion and/or contraction. If the direction of shaft expansion or contraction is in the direction shown in Figure 2, locate the bearing insert as shown. If the direction of shaft expansion or contraction is opposite to that shown in Figure 2, center the insert in the housing.

Figure 2



Installation Information

Step 6: Tighten Cap Screws

Tighten bearing units to the shaft as follows:

- Tighten the cap screws in the specified order, as shown in Figure 3. Continue tightening until all cap screws have become snug.
- Using a torque wrench, tighten each cap screw in the specified order to one half of the recommended torque in Table IV.
- In the same order, repeat the procedure tightening each cap screw to the full recommended torque. Once complete, follow the same pattern and verify that each cap screw has met the full recommended torque value and all cap screws have achieved equivalent resistance.

Check shaft for freedom of rotation and then tighten the second bearing unit in the same fashion. When all bearings are tightened, perform a final check to the shaft for freedom of rotation.

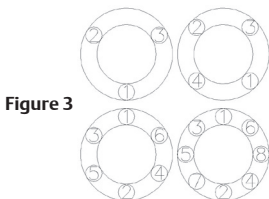


Figure 3

Table IV

Adapter Lock Cap Screw Information			
Bore Size	Torque (inch - pounds)	Hex Size	# Cap Screws
1 7/16 - 1 1/2	45	1/8	3
1 15/16 - 2	30	1/8	3
2 7/16 - 2 1/2	60	1/8	4
2 15/16 - 3	55	1/8	4
3 7/16 - 3 1/2	80	3/16	4
3 15/16 - 4	80	3/16	4
4 7/16 - 4 1/2	115	3/16	4
4 15/16 - 5	130	3/16	6
5 7/16 - 5 1/2	115	3/16	6
5 15/16	175	3/16	8
6 7/16 - 7	225	1/4	8
7 1/2 - 8	275	1/4	8

Installation Information

Sealmaster USRB Spherical Roller Bearing Split Pillow Block Housing Installation

Replacing Existing Sealmaster Inserts:

Step 1: Remove Housing Cap Bolts

Step 2: Remove Top Half of Housing

Step 3: Remove Bearing from Shaft

For lock collar units, loosen the setscrews. For adapter lock units, loosen the cap screws in the specified order as shown in Figure 3. Once locking mechanism is loosened, slide the bearing off the shaft.

Step 4: Inspect Shaft and Bore

Shaft should be within tolerance range shown in Table III, clean and free of nicks and burrs. Mount bearings on unused section of shafting or repair/replace shafting as required. Inspect both the shaft and bearing bore for debris or contaminants. Also be sure to inspect the housing for damages. Wipe housing bore clean as necessary and check that the lubrication hole is clean and free of debris.

Step 5: Load New Insert

Slide bearing onto shaft and seat the bearing in the housing base.

Step 6: Install Top Half of Housing

Be sure to check the bearing inserts for proper alignment. Align the bearings.

Install the top half of the housing. Tighten down the cap bolts to the recommended torque in Tables V. Rotate the shaft by hand to check for freedom of rotation.

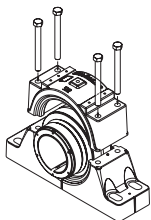


Table V

Cap Bolt Tightening Torque		
Casting	Bore Size	Foot-Pounds
509	1 7/16 - 1 1/2	31
511	1 15/16 - 2	31
515	2 7/16 - 2 1/2	75
517	2 15/16 - 3	75
520	3 7/16 - 3 1/2	109
522	3 15/16 - 4	150
526	4 7/16 - 4 1/2	150
528	4 15/16 - 5	266
532	5 7/16 - 5 1/2	266
534	5 15/16	266
536	6 7/16 - 6 1/2	266
538	6 15/16 - 7	600
544	7 1/2 - 8	600

Step 7: Refer to Steps 5 and 6 from the Previous Installation Sections for the Respective Locking Mechanism

Installation Information

Sealmaster USRB Spherical Roller Bearing Split Pillow Block Housing Lubrication

Pre-Mounting Checklist:

Lubrication:

All Sealmaster Spherical Roller Bearings are delivered with a high quality lithium complex grease with an EP additive. The bearing is ready for use with no initial lubrication required. The grease consists of a lithium complex thickener, mineral oil, and NLGI grade 2 consistency.

Compatibility of grease is critical; therefore consult with Application Engineering and your grease supplier to insure greases are compatible. For best performance it is recommended to relubricate with lithium complex thickened grease with a comparable NLGI consistency and base oil properties.

Relubricatable Sealmaster bearings are supplied with grease fittings or zerks for ease of lubrication with hand or automatic grease guns. Always wipe the fitting and grease nozzle clean.

Caution: If possible, it is recommended to lubricate the bearing while rotating, until grease purge is observed from the seals. If this is not an option due to safety reasons, follow the alternate lubrication procedure below.

Installation Information

Sealmaster USRB Spherical Roller Bearing Split Pillow Block Housing Installation

Alternate Lubrication Procedure:

Stop rotating equipment. Add one half the recommended amount shown in Table VI. Start the bearing and run for a few minutes. Stop the bearing and add the second half of the recommended amount. A temperature rise after lubrication, sometimes 30°F (17°C), is normal. Bearing should operate at temperatures less than 200°F (94°C) and should not exceed 250° (121°C) for intermittent operation. For lubrication guidelines, see Table VII.

Note: Table VII are general recommendations. Experience and testing may be required for specific applications.

Note: Grease charges in Table VI are based on the use of lithium complex thickened grease with a NLGI grade 2 consistency.

Expansion Bearing Applications:

Before installation, make certain proper expansion is accounted for. Expansion units should be placed in a location where relative movement between the bearing insert and the housing can be tolerated. For most applications using expansion type units, the fixed unit (non-expansion unit) is placed at the drive end of the shaft. Use Table IX to review the total available bearing expansion. If the application requires additional expansion, consult Application Engineering.

NOTICE: One expansion unit is to be used in conjunction with one non-expansion unit for applications using adapter lock units. Failure to utilize one expansion and one non-expansion unit is likely to result in reduced bearing performance.

Table VI

Grease Charge for Relubrication	
Bore Size	Grease Charge (Mass - Ounces)
1 7/16 - 1 1/2	0.20
1 15/16 - 2	0.30
2 7/16 - 2 1/2	0.60
2 15/16 - 3	0.80
3 7/16 - 3 1/2	1.20
3 15/16 - 4	2.00
4 7/16 - 4 1/2	2.75
4 15/16 - 5	4.00
5 7/16 - 5 1/2	6.10
5 15/16	10.60
6 7/16 - 7	13.90
7 1/2 - 8	17.60

Installation Information

Table VII

Relubrication Recommendations			
Environment	Temperature (°F)	Speed (% Catalog Max)	HI Suffix
Dirty	-20 to 250	0 - 100%	Daily to 1 Week
Clean	-20 to 125	0 - 25%	4 to 10 Months
		26 - 50%	1 to 4 Months
		51 - 75%	1 Week to 1 Month
		76 - 100%	Daily to 1 Week
	125 to 175	0 - 25%	2 to 6 Weeks
		26 - 50%	1 Week to 1 Month
		51 - 75%	Daily to 1 Week
		76 - 100%	
	175 to 250	0 - 100%	Daily to 1 Week

Table VIII

Maximum Operational Speed		
Bore Size	Felt Seal (RPM)	Contact Seal (RPM)
1 7/16 - 1 1/2	4000	3000
1 15/16 - 2	4000	2500
2 7/16 - 2 1/2	3250	1750
2 15/16 - 3	3000	1600
3 7/16 - 3 1/2	2500	1350
3 15/16 - 4	2250	1200
4 7/16 - 4 1/2	2000	1100
4 15/16 - 5	1750	900
5 7/16 - 5 1/2	1500	900
5 15/16	1300	800
6 7/16 - 7	1200	750
7 1/2 - 8	1100	750

Table IX

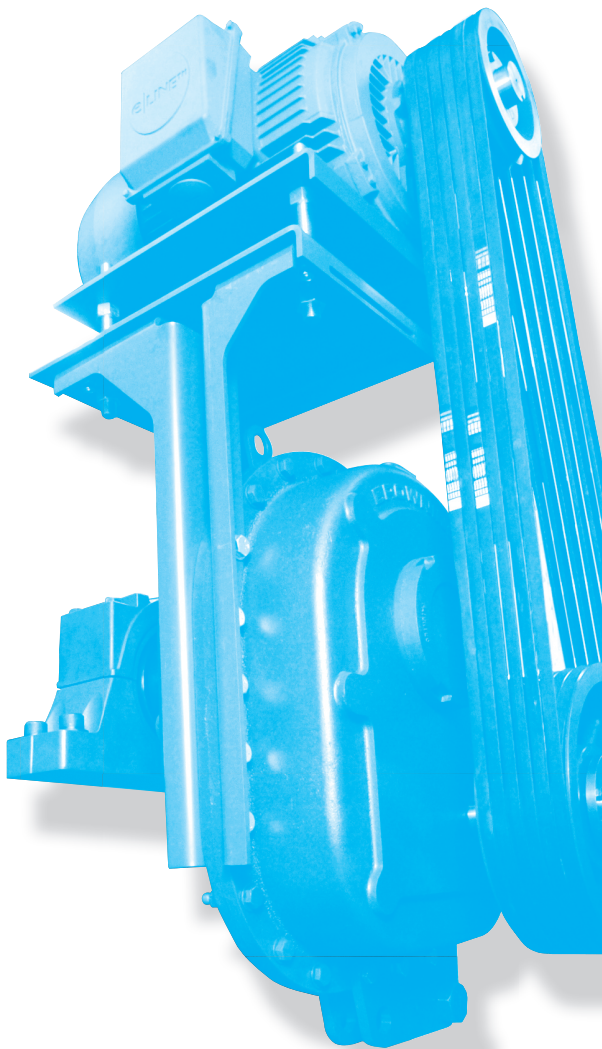
Total Available Housing Expansion (inch)			
Casting	Bore Size	Setscrew	Adapter Lock
509	1 7/16 - 1 1/2	7/32	3/16
511	1 15/16 - 2	1/4	7/32
515	2 7/16 - 2 1/2	5/16	9/32
517	2 15/16 - 3	3/8	11/32
520	3 7/16 - 3 1/2	3/8	11/32
522	3 15/16 - 4	3/8	5/16
526	4 7/16 - 4 1/2	3/8	9/32
528	4 15/16 - 5	3/8	9/32
532	5 7/16 - 5 1/2	3/8	9/32
534	5 15/16	3/8	9/32
536	6 7/16 - 6 1/2	3/8	9/32
538	6 15/16 - 7	3/8	9/32
544	7 1/2 - 8	3/8	9/32

Browning

KOP-FLEX

Morse

SEALMASTER



General Information

Regal PTS Systems Solutions for Bulk Material Handling

The demand for sand and gravel products increases your need for reliable, industrial grade components that provide maximum protection from downtime. Regal Power Transmission Solutions offers bearings, gearboxes and other components with superior sealing technology for extended life in aggregate production facilities.

Coupling Application Guide

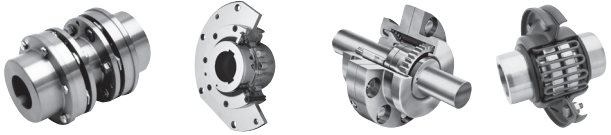
**Material Handling,
Aggregate,
Mining and Grain**



Major Applications	Max-C Resilient	Elastomeric
Conveyors		x
Crushers	x	
Cranes, Hoists, Winches*		
Diesel Engines	x	
Fans	x	
Feeders	x	
Pumps - Rotary, Gear, Lope, Vane		
Pumps - Slurry - Centrifugal		x
Fan, Blowers, Dryers		x
Mixers	x	
Jaw Plants	x	
Pug Mills	x	
Impact Hammer Mills	x	
Screw Compressors		
Features and Benefits	Cushions Shock Loads - Torsional Dampening	Replacement of Element Without Moving Equipment
	Resilient Material in Compression, Not Shear	Aluminum Hubs for Corrosion Resistance
	High Torque Couplings for Heavy Duty Applications	Pre-Compressed Rubber Element Always in Compression, Not Shear
	Larger Bore Capacity	Cushions Shock Loads
		ANSI Pump Shaft Separations

*Check Crane Pro Parts for Legal Warning

**With use of KOP-FLEX Specialized Coupling Grease



KD Disc Couplings	Jaure Barrel Couplings	Fast's Gear Couplings	Grid Coupling
		X	X
X			
X	X	X	X
X		X	
X		X	
X		X	
X		X	X
X		X	
		X	X
		X	
			X
		X	X
X		X	X
Designed for Infinite Life	High Load Capacity	Three Times the Life of a O-Ring Design Coupling	Fully Interchangeable With Falk
5 year Warranty	Limited Axial Displacement	** 3 Year Warranty	Replacement of Flex Element Without Moving Hubs
Good Inherent Balance AGMA Class 9 off the Shelf for API 610	Sealed to Eliminate Dust and Grime	Lifetime Metallic Lube Seal	Provides Torsional Damping
Unitized Disc Pack - No Assembly Required	Long Life w/ Alloy Barrels	Largest Lube Reservoir of all Gear Couplings	Absorbs Medium Shock Loads
Scalloped Disc Design Optimized for Torque Capacity and Life	Wear Indicator	Over 80 Years of Design and Manufacturing Technology Perfection	

For additional information on the Couplings or Applications, please contact your local sales rep.



A Guide to NEMA Standards

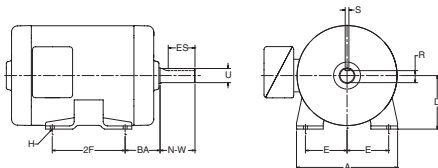


Table 1: Motor Frames and Shaft Dimensions

NEMA FRAME No.	DIMENSIONS (in.)							
	A Max	D	E	2F	BA	H	U	N-W
FRACTIONAL HORSEPOWER MOTORS								
48	-	3.00	2.12	2.75	2.50	0.34♦	0.500	1.50
56	-	3.50	2.44	3.00	2.75	0.34♦	0.625	1.88
INTEGRAL HORSEPOWER MOTORS								
143T	7.0	3.50	2.75	4.00	2.25	0.34	0.875	2.25
145T	7.0	3.50	2.75	5.00	2.25	0.34	0.875	2.25
182T	9.0	4.50	3.75	4.50	2.75	0.41	1.125	2.75
184T	9.0	4.50	3.75	5.50	2.75	0.41	1.125	2.75
213T	10.5	5.25	4.25	5.50	3.50	0.41	1.375	3.38
215T	10.5	5.25	4.25	7.00	3.50	0.41	1.375	3.38
254T	12.5	6.25	5.00	8.25	4.25	0.53	1.625	4.00
256T	12.5	6.25	5.00	10.00	4.25	0.53	1.625	4.00
284T	14.0	7.00	5.50	9.50	4.75	0.53	1.875	4.62
284TS*	14.0	7.00	5.50	9.50	4.75	0.53	1.625	3.25
286T	14.0	7.00	5.50	11.00	4.75	0.53	1.875	4.62
286TS*	14.0	7.00	5.50	11.00	4.75	0.53	1.625	3.25
324T	16.0	8.00	6.25	10.50	5.25	0.66	2.125	5.25
324TS*	16.0	8.00	6.25	10.50	5.25	0.66	1.875	3.75
326T	16.0	8.00	6.25	12.00	5.25	0.66	2.125	5.25
326TS*	16.0	8.00	6.25	12.00	5.25	0.66	1.875	3.75
364T	18.0	9.00	7.00	11.25	5.88	0.66	2.375	5.88
364TS*	18.0	9.00	7.00	11.25	5.88	0.66	1.875	3.75
365T	18.0	9.00	7.00	12.25	5.88	0.66	2.375	5.88
365TS*	18.0	9.00	7.00	12.25	5.88	0.66	1.875	3.75
404T	20.0	10.00	8.00	12.25	6.62	0.81	2.875	7.25
404TS*	20.0	10.00	8.00	12.25	6.62	0.81	2.125	4.25
405T	20.0	10.00	8.00	13.75	6.62	0.81	2.875	7.25
405TS*	20.0	10.00	8.00	13.75	6.62	0.81	2.125	4.25
444T	22.0	11.00	9.00	14.50	7.50	0.81	3.375	8.50
444TS*	22.0	11.00	9.00	14.50	7.50	0.81	2.375	4.75
445T	22.0	11.00	9.00	16.50	7.50	0.81	3.375	8.50
445TS*	22.0	11.00	9.00	16.50	7.50	0.81	2.375	4.75

*** Standard short shaft for direct coupled connection.

♦ Indicates slots rather than holes.

The motor dimensions and ratings shown in the table below are for “General Purpose Motors”. They are shown as a guide only and are subject to change without notice. Before finalizing a drive system design, consult with the motor manufacturer to obtain current motor dimensions.

	KEYSEAT			APPROX. MAX HP FOR TEFC MOTORS AT VARIOUS RPM			
	ES Min	S	R	3600	1800	1200	900
	-	FLAT	0.453	0.5	0.333	0.167	-
	1.41	0.188	0.517	1	1	0.5	-
	1.41	0.188	0.771	1.5	1	.75	.5
	1.41	0.188	0.771	2	2	1	.75
	1.78	0.250	0.986	3	3	1.5	1
	1.78	0.250	0.986	5	5	2	1.5
	2.41	0.312	1.201	7.5	7.5	3	2
	2.41	0.312	1.201	10	10	5	3
	2.91	0.375	1.416	15	15	7.5	5
	2.91	0.375	1.416	20	20	10	7.5
	3.28	0.500	1.591	-	25	15	10
	1.91	0.375	1.416	25	-	-	-
	3.28	0.500	1.591	-	30	20	15
	1.91	0.375	1.416	30	-	-	-
	3.91	0.500	1.845	-	40	25	20
	2.03	0.500	1.591	40	-	-	-
	3.91	0.500	1.845	-	50	30	25
	2.03	0.500	1.591	50	-	-	-
	4.28	0.625	2.021	-	60	40	30
	2.03	0.500	1.591	60	60	-	-
	4.28	0.625	2.021	-	75	50	40
	2.03	0.500	1.591	75	75	-	-
	5.65	0.750	2.45	-	-	60	50
	2.78	0.500	1.845	-	-	-	-
	5.65	0.750	2.45	-	100	75	60
	2.78	0.500	1.845	100	100	-	-
	6.91	0.875	2.88	-	125	100	75
	3.03	0.625	2.021	125	125	-	-
	6.91	0.875	2.88	-	150	125	100
	3.03	0.625	2.021	150	150	-	-

A Guide to NEMA Standards

Table 2: Decimal-Millimeter Equivalents

Fractional	Decimal	M.M.	Fractional	Decimal	M.M.			
	1/64 ____	.015625	0.397	33/64 ____	.515625	13.097		
1/32	_____	.03125	.794	17/32	_____	.53125	13.494	
	3/64	_____	.046875	1.191	35/64	_____	.546875	13.891
1/16	_____	.0625	1.588	9/16	_____	.5625	14.288	
	5/64	_____	.078125	1.985	37/64	_____	.578125	14.684
	3/32	_____	.09375	2.381	19/32	_____	.59375	15.081
	7/64	_____	.109375	2.778	39/64	_____	.609375	15.478
1/8	_____	.125	3.175	5/8	_____	.625	15.875	
	9/64	_____	.140625	3.572	41/64	_____	.640625	16.272
	5/32	_____	.15625	3.969	21/32	_____	.65625	16.669
	11/64	_____	.171875	4.366	43/64	_____	.671875	17.066
3/16	_____	.1875	4.763	11/16	_____	.6875	17.463	
	13/64	_____	.203125	5.159	45/64	_____	.703125	17.859
	7/32	_____	.21875	5.556	23/32	_____	.71875	18.256
	15/64	_____	.234375	5.953	47/64	_____	.734375	18.653
1/4	_____	.250	6.350	3/4	_____	.750	19.050	
	17/64	_____	.265625	6.747	49/64	_____	.765625	19.447
	9/32	_____	.28125	7.144	25/32	_____	.78125	19.844
	19/64	_____	.296875	7.541	51/64	_____	.796875	20.241
5/16	_____	.3125	7.938	13/16	_____	.8125	20.638	
	21/64	_____	.328125	8.334	53/64	_____	.828125	21.034
	11/32	_____	.34375	8.731	27/32	_____	.84375	21.431
	23/64	_____	.359375	9.128	55/64	_____	.859375	21.828
3/8	_____	.375	9.525	7/8	_____	.875	22.225	
	25/64	_____	.390625	9.922	57/64	_____	.890625	22.622
	13/32	_____	.40625	10.319	29/32	_____	.90625	23.019
	27/64	_____	.421875	10.716	59/64	_____	.921875	23.416
7/16	_____	.4375	11.113	15/16	_____	.9375	23.813	
	29/64	_____	.453125	11.509	61/64	_____	.953125	24.209
	15/32	_____	.46875	11.906	31/32	_____	.96875	24.606
	31/64	_____	.484375	12.303	63/64	_____	.984375	25.003
1/2	_____	.500	12.700	1	_____	1.000	25.400	

1 HP = 54" lbs. @ 1160 RPM

1 HP = 36" lbs. @ 1750 RPM

$$HP = \frac{\text{FORCE} \times \text{FPM}}{33,000}$$

$$HP = \frac{T \text{ " lbs.} \times \text{RPM}}{63,025}$$

$$HP = \frac{T \text{ ' lbs.} \times \text{RPM}}{5,252}$$

$$T \text{ " lbs.} = \frac{63,025 \times \text{HP}}{\text{RPM}}$$

$$T \text{ ' lbs.} = \frac{5,252 \times \text{HP}}{\text{RPM}}$$

$$\text{FPM} = .2618 \times \text{DIA.} \times \text{RPM}$$

$$\text{RPM} = \frac{63,025 \times \text{HP}}{\text{TORQUE}}$$

$$T = \text{FORCE} \times \text{LEVER ARM}$$

$$F = \frac{\text{TORQUE}}{\text{RADIUS}}$$

$$\text{RPM} = \frac{\text{FPM}}{.2618 \times \text{DIA.}}$$

$$OL = \frac{2TK}{D}$$

K= 1.0 for Chain Drives

1.25 for Gear Drives

1.25 for Gearbelt Drives

1.50 for V-Belt Drives

2.50 for Flat Belt Drives

LINEAL SHAFT EXPANSION

$$= .0000063 \times \text{length in inches} \times \text{temperature inc. in degrees F}$$

$$\text{KW} = \text{HP} \times .7457$$

One Kilowatt = 1.34 H.P.

$$\text{IN.} = \text{MM}/25.4$$

$$\text{TEMP } ^\circ\text{C} = (^\circ\text{F}-32) .556$$

$$\text{Kg} = \text{LBS} \times 2.205$$

The information on these two pages are included for technical support in figuring non-standard drives.

Table 3: Torque at One HP

RPM	In-Lbs.	RPM	In-Lbs.	RPM	In-Lbs.	RPM	In-Lbs.
3500	18	580	109	90	700	14	4502
3000	21	500	126	80	788	12	5252
2400	26	400	158	70	900	10	6300
2000	32	300	310	60	1050	8	7878
1750	36	200	315	50	1260	6	10504
1600	39	180	350	40	1576	5	12605
1200	53	160	394	30	2101	4	15756
1160	54	140	450	20	3151	3	21008
1000	63	120	525	18	3501	2	31513
870	72	100	630	16	3939	1	63025

A Guide to NEMA Standards

NEMA Standards

The National Electrical Manufacturers Association recommends certain limitations on sheave diameter and width for satisfactory motor operation. The selected sheave diameter should not be smaller nor the width greater than the dimensions below. These dimensions are from NEMA Standard MG1-14.42.

Table 4: Minimum Sheave Sizes

Frame	Horsepower at				V-Belt Sheave (Inches)			
					Conventional		358	
	Sync, Speed, Rpm				A, B, C, D, and E Sections		3V, 5V, and 8V Sections	
	3600	1800	1200	900	Min. Pitch Dia.	Max Width	Min. Outside Dia	Max. Width
143T	1 1/2	1	3/4	1/2	2.2	4.25	2.2	2.25
145T	2-3	1 1/2-2	1	3/4	2.4	4.25	2.4	2.25
182T	3	3	1 1/2	1	2.4	5.25	2.4	2.75
182T	5	-	-	-	2.6	5.25	2.4	2.75
184T	-	-	2	1 1/2	2.4	5.25	2.4	2.75
184T	5	-	-	-	2.6	5.25	2.4	2.75
184T	7 1/2	5	-	-	3.0	5.25	3.0	2.75
213T	7 1/2-10	7 1/2	3	2	3.0	6.51	3.0	3.38
215T	10	-	5	3	3.0	6.51	3.0	3.38
215T	15	10	-	-	3.8	6.45	3.8	3.35
254T	15	-	7 1/2	5	3.8	7.75	3.8	4.00
254T	20	15	-	-	4.4	7.75	4.4	4.00
256T	20-25	-	10	7 1/2	4.4	7.75	4.4	4.00
256T	-	20	-	-	4.6	7.75	4.4	4.00
284T	-	-	15	10	4.6	8.99	4.4	4.62
284T	-	25	-	-	5.0	8.99	4.4	4.62
286T	-	30	20	15	5.4	8.99	5.2	4.62
324T	-	40	25	20	6.0	10.25	6.0	5.25
326T	-	50	30	25	6.8	10.25	6.8	5.25
364T	-	-	40	30	6.8	11.51	6.8	5.88
364T	-	60	-	-	7.4	11.51	7.4	5.88
365T	-	-	50	40	8.2	11.51	8.2	5.88
365T	-	75	-	-	9.0	11.51	8.6	5.88
404T	-	-	60	-	9.0	14.25	8.0	7.25
404T	-	-	-	50	9.0	14.25	8.4	7.25
404T	-	100	-	-	10.0	14.25	8.6	7.25
405T	-	-	75	60	10.0	14.25	10.0	7.25
405T	-	100	-	-	10.0	14.25	8.6	7.25
405T	-	125	-	-	11.5	14.25	10.5	7.25
444T	-	-	100	-	11.0	16.75	10.0	8.50
444T	-	-	-	75	10.5	16.75	9.5	8.50
444T	-	125	-	-	11.0	16.75	9.5	8.50
444T	-	150	-	-	-	-	10.5	8.50
445T	-	-	125	-	12.5	16.75	12.0	8.50
445T	-	-	-	100	10.5	16.75	12.0	8.50
445T	-	150	-	-	-	-	10.5	8.50
445T	-	200	-	-	-	-	13.2	8.50

SEALMASTER[®]

Morse

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Regal Power Transmission Solutions

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Florence, KY 41042

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