



# V-BELT Installation Instructions

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**FORM**  
**8658**  
**Revised**  
**January 2011**

### ⚠ 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

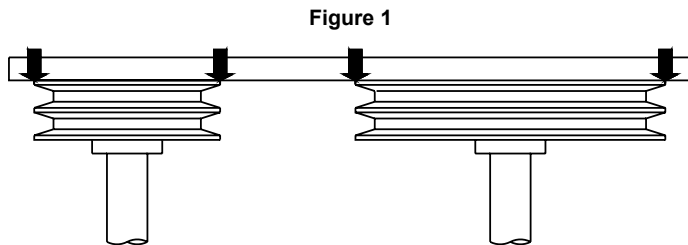
- Periodic inspections should be performed. Failure to perform proper maintenance can result in premature product failure and personal injury.

### NOTICE

- Do not pry or otherwise force belts onto sheave. Doing so may result in permanent damage to the belt.

## V-Belt Alignment

Before installing the bushings, refer to Form No. F20-23 for Q-D® instructions and Form No. 4013 for Browning Split Taper® instructions. After installing the bushings in the sheaves and the resulting assemblies onto the shafts, use a straight edge, piano wire or string placed on the outside face of both sheaves to adjust parallel offset and angular alignments. The straight edge, piano wire or string should be close to the shafts and contact each sheave in two places. The objective is to have the shafts parallel and the center lines of the two sheaves in line. See Figure 1 below.



Belt drives should be aligned as perfect as possible to maximize drive life. The practical maximum misalignment is stated as the angle at which the belt enters the sheave. This angle is a result of both angular and parallel offset misalignment, and is 1/2 degree.

## V-Belt Sheave Installation

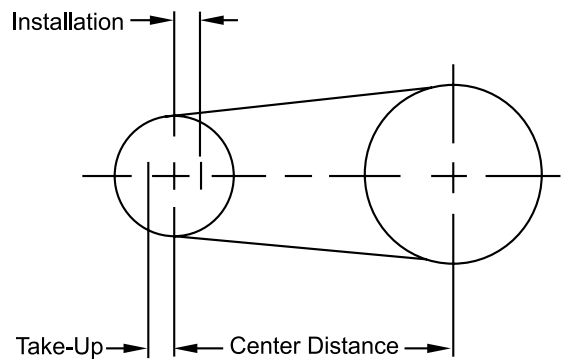
- Step 1: Loosen moveable base bolts (or motor base bolts) and move sheaves close to facilitate installation of belt. See Table 1 for minimum installation allowance.  
If the design has fixed, non-moveable centers (not a recommended design) do the following:
- Mount one sheave onto the shaft loosely and put the belt on it.
  - Put the other sheave into the belt loop and slip it onto the other shaft (bushing loosely installed).
  - Align the drive and tighten the bushings.
- Step 2: Move all the slack in multiple belt drives to one side, then remove the slack (increase centers). Then rotate sheaves several revolutions by hand to equalize belt tensions.
- Step 3: Tension belts as outlined on reverse side of this page.

**Note:** If BROWNING Tension Checker is used, only 35 lbs maximum force (F) can be obtained. If higher forces are required, use other means such as dead weights or hydraulic pressure to apply a known force.

TABLE 1: CENTER DISTANCE ALLOWANCE

Belt No.	Allowance for Installation				Allowance for Initial Tensioning and Subsequent Take-Up
	4L, A	5L, B	C	D	All Sections
26 - 35	.8	1.0	-	-	1.0
38 - 55	.8	1.0	1.5	-	1.5
60 - 85	.8	1.3	1.5	-	2.0
90 - 112	1.0	1.3	1.5	-	2.5
120 - 144	1.0	1.3	1.5	2.0	3.0
158 - 180	-	1.3	2.0	2.0	3.5
195 - 210	-	1.5	2.0	2.0	4.0
240	-	1.5	2.0	2.5	4.5
220 - 300	-	1.5	2.0	2.5	5.0
330 - 390	-	-	2.0	2.5	6.0
420 and over	-	-	2.3	3.0	1 1/2% of Belt Length
	<b>3V</b>	<b>5V</b>	<b>8V</b>	<b>All Sections</b>	
250 - 475	.5	-	-	1.0	
500 - 710	.8	1.0	-	1.2	
750 - 1060	.8	1.0	1.5	1.5	
1120 - 1250	.8	1.0	1.5	1.8	
1320 - 1700	.8	1.0	1.5	2.2	
1800 - 2000	-	1.0	1.8	2.5	
2120 - 2240	-	1.2	1.8	2.8	
2360	-	1.2	1.8	3.0	
2500 - 2650	-	1.2	1.8	3.2	
2800 - 3000	-	1.2	1.8	3.5	
3150	-	1.2	1.8	4.0	
3350 - 3550	-	1.5	2.0	4.0	
3750	-	-	2.0	4.5	
4000 - 5000	-	-	2.0	5.5	
5600	-	-	2.0	6.0	

Figure 2



## Tensioning V-Belts

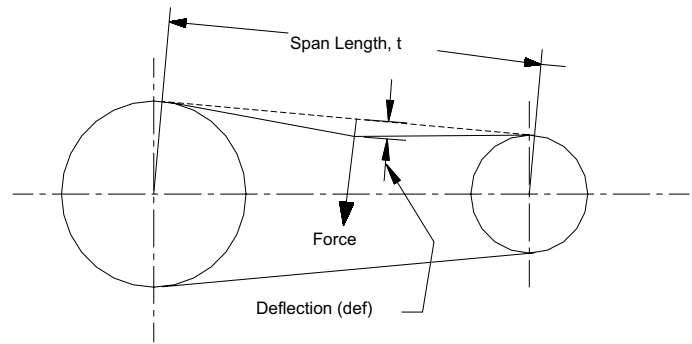
Calculate or measure the belt span length as shown in Figure 3. Calculate the required deflection by multiplying this number by 1/64. For example, if the belt span is 32 inches,  $32 \times 1/64 = 1/2$  inch deflection. Increase the belt tension by increasing the center distance (or adjusting the idler, if present). Apply the force listed in Table 2 evenly across the width of the belt at the center of the belt span. A strip of keystone or similar material may be used to help distribute the force evenly across the belt width. Drives with shock loading or other unusual conditions may require increased tension. Always check to be sure bearings can handle the loads. Excessively high or low tensions will affect belt life. Recheck belt tensions after jog start of 1-3 minutes of operation, or 8 hours, 24 hours, 100 hours, and periodically thereafter.

**TABLE 2**  
**SHEAVE DIAM - INCHES**  
**DEFLECTION FORCE - LBS.**

Belt Cross Section	Smallest Sheave Diameter Range	RPM Range	Belt Deflection Force			
			Super Gripbelts and Unnotched Gripbands		Gripnotch Belts and Notched Gripbands	
			Used Belt	New Belt	Used Belt	New Belt
A,AX	3.0 - 3.6	1000-2500	3.7	5.5	4.1	6.1
		2501-4000	2.8	4.2	3.4	5.0
	3.8 - 4.8	1000-2500	4.5	6.8	5.0	7.4
		2501-4000	3.8	5.7	4.3	6.4
	5.0 - 7.0	1000-2500	5.4	8.0	5.7	8.4
		2501-4000	4.7	7.0	5.1	7.6
B,BX	3.4 - 4.2	860-2500	-	-	4.9	7.2
		2501-4000	-	-	4.2	6.2
	4.4 - 5.6	860-2500	5.3	7.9	7.1	10.5
		2501-4000	4.5	6.7	6.1	9.1
	5.8 - 8.6	860-2500	6.3	9.4	8.5	12.6
		2501-4000	6.0	8.9	7.3	10.9
C,CX	7.0 - 9.0	500-1740	11.5	17.0	14.7	21.8
		1741-3000	9.4	13.8	11.9	17.5
	9.5 - 16.0	500-1740	14.1	21.0	15.9	23.5
		1741-3000	12.5	18.5	14.6	21.6
D	12.0 - 16.0	200-850	24.9	37.0	-	-
		851-1500	21.2	31.3	-	-
	18.0 - 20.0	200-850	30.4	45.2	-	-
		851-1500	25.6	38.0	-	-
3V,3VX	2.2 - 2.4	1000-2500	-	-	3.3	4.9
		2501-4000	-	-	2.9	4.3
	2.65 - 3.65	1000-2500	3.6	5.1	4.2	6.2
		2501-4000	3.0	4.4	3.8	5.6
	4.12 - 6.90	1000-2500	4.9	7.3	5.3	7.9
		2501-4000	4.4	6.6	4.9	7.3
5V,5VX	4.4 - 6.7	500-1749	-	-	10.2	15.2
		1750-3000	-	-	8.8	13.2
		3001-4000	-	-	5.6	8.5
	7.1 - 10.9	500-1740	12.7	18.9	14.8	22.1
		1741-3000	11.2	16.7	13.7	20.1
	11.8 - 16.0	500-1740	15.5	23.4	17.1	25.5
		1741-3000	14.6	21.8	16.8	25.0
8V	12.5 - 17.0	200-850	33.0	49.3	-	-
		851-1500	26.8	39.9	-	-
	18.0 - 22.4	200-850	39.6	59.2	-	-
		851-1500	35.3	52.7	-	-

Belt Cross Section	Smallest Sheave Diameter Range	Belt Deflection Force	
		Used Belt	New Belt
3L	1.25 - 1.75	3/8	5/8
	2.00 - 2.25	3/4	1 1/4
	2.50 - 3.00	1	1 1/2
4L	2.10 - 2.80	5/8	1
	3.00 - 3.50	1 5/8	2 1/2
	3.70 - 5.00	2	3
5L	3.00 - 4.20	1 1/2	2 5/8
	4.50 - 5.20	2 1/2	3 1/2

Figure 3



**Note:** For gripbands (multiple or banded belts), the belt deflection force in the above tables must be multiplied by the number of ribs in the gripband. Lay a narrow steel bar such as keystone across the gripband belt and apply the belt deflection force to the bar such that all the individual ribs are deflected evenly.

**General Notes**

Do not install new belts in worn sheave grooves. Such sheaves should be replaced with new ones to insure a proper fit of the belts in the grooves.

Keep belts clean. Do not use belt dressing.

When replacing belts on a drive, be sure to replace the entire set with a new set of matched belts. Failure to do this may result in premature breakage of new (and probably shorter) belts.

Keep extra belts stored in a cool, dark, dry place.

For additional assistance please contact  
Application Engineering at 1-800-626-2093.