INSTRUCTIONS

"V" BELT DRIVE OIL PUMPS

SHEAVE AND PULLEY ALIGNMENT

AND BELT ADJUSTMENT

FACTORY ASSEMBLY AND FIELD SERVICE

1. DEFINITIONS

a) The variable pitch pulley mounted on the motor is called the drive sheave, and the fixed pulley mounted on the pump is called the driven pulley. Our material lists, SDS sheets and literature follow this description.

2. MOUNTING SHEAVE AND PULLEY - TUTHILL PUMPS - "L" SERIES

a) The pulleys and sheaves are to have accurate bores and keyways for proper shaft fits. No bushings, sleeves or loose fitting bores in the pulleys or sheaves are to be allowed.

b) The pump pulley is to be mounted with the hub facing outwards. The 7/16" shaft of the "L" Series Tuthill Pumps has a Woodruff Keyseat positioned 90° counterclockwise to a flat surface. The pulley has a keyway and a setscrew hole in a matching position and is supplied with a hand push fit bore. Place a No. 204 Woodruff key in the keyseat of the shaft and a Teflon coated knurled end socket type setscrew in the pulley hub. Slide the pulley on the shaft until the hub is flush with the end of the shaft. Tighten the set screw firmly against the flat on the shaft. Be sure setscrew hole has been fully tapped all the way through.

c) The sheet metal pulleys may have a slight run out when new. The total indicated runout is to be checked by hand turning the pulley and measuring the runout from a fixed reference point. The acceptable total indicated runout shall not exceed 1/8" or $\pm$ 1/16" from either side or face of the pulley. Any pulleys showing a greater runout are to be rejected.

d) Mount the variable pitch sheave on the motor shaft with the adjustable hub portion facing outward. Be sure the hub does not scrape the guard. Rotate the adjustable hub to the left to permit access to the fixed hub setscrew. Tighten this setscrew firmly against the shaft key. With the motor mounting bolts loose the motor may be moved to allow the belt to be slipped over the sheave and pulley. First set the adjustable sheave hub at the maximum pitch diameter and tighten the setscrew against one of the flats on the threaded

portion of the main hub. Take up the belt slack and tighten the motor mounting temporarily. Place a long straight edge against the face of the pump pulley and move either or both pulley and sheave to bring the belt parallel to the staightedge. Also be sure that the motor shaft is located 90° to the belt. Matched sets of belts must be used for any pumps using (2) belts.

e) The tolerance for parallelism of the belts to the side of the pulley shall be $\pm$ 1/16" over the distance between the pulley and sheave center lines.

f) Operate the pump set and check the R.P.M. of the pump. Make final adjustments of the variable pitch sheave to show the proper pump R.P.M. called for on Specification Data Sheet 6-10-2.31.

3. MOUNTING SHEAVE AND PULLEY - VIKING SERIES 195 PUMPS

a) The procedure outlined on Section 2. is to be followed with the exception that Viking Pump shafts do not have a Woodruff Keyseat. Model GG195 has a 1/2" shaft with a flat upon, which the pulley setscrew bears. Models HJ195 and HL195 have 3/4" shafts with Standard 3/16" x 3/32" Keyways, as do the pulley hubs. The setscrew must be Teflon coated having knurled end and is to be tightened firmly to bear on the key.

4. BELT ADJUSTMENT - TENSION

a) Even though the oil pumps have a ball bearing at the shaft end holding the overhanging pulleys care must be taken not to exert excessive pull or tension on the belt after the "run in period." The belts should be tightened to the lowest tension at which the belts will not slip under the highest load conditions required by the pump. The lbs. force required to tension a drive is to be determined using the "Browning" Belt Tension Checker. This device measures the actual force required to deflect the belt at the midpoint of the belt span or distance between the pulley and sheave centers.

b) HOW TO USE THE BELT TENSION CHECKER

1. Determine force required to deflect one belt 1/64" per inch of span length.

2. Measure the span length (L) of the drive at the center of the span (L).

3. Divide belt span by 64 to get belt deflection needed to check tension.

4. Set large "O" ring on span scale at required belt deflection.
DEFLECTION = $\frac{\text{BELT SPAN}}{64}$

5. Set small "O" ring at zero on the "Force Scale" (plunger).

6. Pass the checker through the hole provided in the top of the belt guard with the larger end placed squarely on one belt at the center of the belt span. Apply force on the plunger 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 paralled to the top of the belt.

7. Read the force scale under the small "O" ring to determine force required to give the needed deflection.

8. Compare the force scale reading with the correct value for the belt style and cross section used in the table. The force should be between the minimum and maximum values shown or the average.

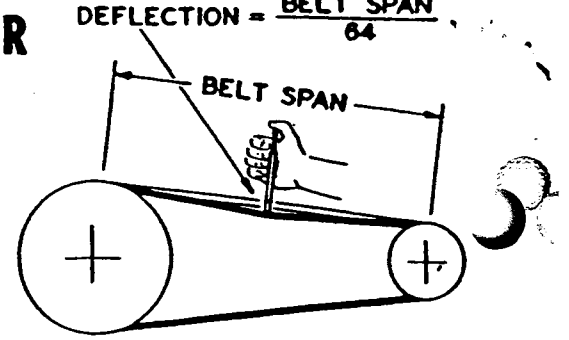
TABLE OF DEFLECTION FORCES

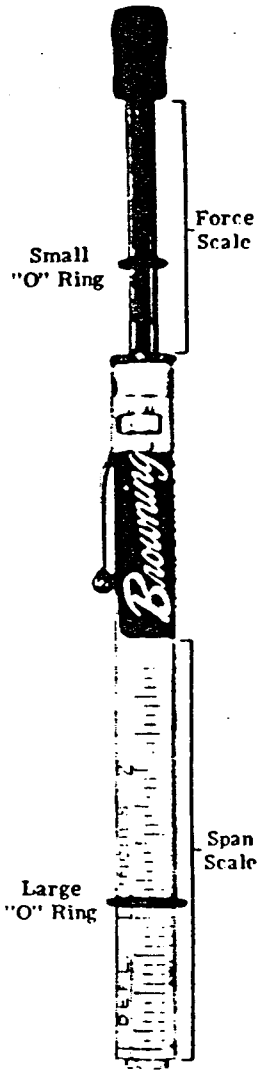
BELT CROSS SECTION	DRIVE SHEAVE PITCH DIA. RANGE	DEFLECTION FORCE LBS. MIN.	MAX.	AVER.
A	3.0 - 3.6	3.0	4.25	3.625
	3.8 - 4.8	3.5	5.0	4.25
	5.0 - 7.0	4.0	5.5	4.75
B	3.4 - 4.2	4.0	5.5	4.75
	4.4 - 5.6	5.125	7.125	6.125
	5.8 - 8.6	6.375	8.75	7.562

c) The above information, paragraph b) has been taken from the Browning Belt Tension Checker instruction sheet Form No. 5453 D. The belt cross section sizes referred to are A and B based on Browning Super Grip belts.

5. Operating Manual information for "V" belt drive oil pumps should include this published Sheet 901004-8400 and Browning Form No. 5453 D mentioned in paragraph 4c.

Browning BELT TENSION CHECKER





INSTRUCTIONS

To determine the lbs. force required to tension a drive with the BROWNING Belt Tensioner you simply do the following:

1. Meosure the Belt Span os shown
2. Divide belt span by 64 to get belt deflection needed to check tension
3. Set large "O" ring on span scale at required belt deflection. This scale is in 1/16" increments
4. Set small "O" ring at zero on the "Force Scale" (plunger)
5. Place the larger end of the tension checker squarely on one belt at the center of the belt span. Apply force on the plunger 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
6. Read the force scale under the small "O" ring to determine the force required to give the needed deflection
7. Compare the force scale reading with the correct value for the belt style ond cross section used as given in table below. The force should be between the minimum and maximum values shown.
8. If there is too little deflection force, the belts should be tightened. If there is too much deflection force, the belts should be loosened.

EXAMPLE:

1. Belt Span 64" (Small Sheave is 6.0 P.D. with B Super Gripbelts).
2. 64" / 64 = 1" Deflection Needed
3. Set large "O" ring at 1" on span scale
4. Set small "O" ring at zero on plunger
5. Press down on plunger until the bottom on the large "O" ring is even with top of the next belt in the set or with the bottom of a straight edge
6. Check the lbs. force required for a 1" deflection of the belt
7. "B" Super Gripbelt table shows a "B" belt used with 6.0" P.D. Small sheave should have a deflection force between 6 3/8 lbs. and 8 3/4 lbs.
8. Increase or decreose the tension on belts until the deflection force is between 6 3/8 lbs. and 8 3/4 lbs.

NOTE:

Tension new drives at the maximum deflection force recommended. Check the tension ot least two times during the first day's operation os there normally will be a rapid decrease in belt tension until belts have run in. Check the tension periodically after the first day's operation and keep tension in recommended orea. The correct operating tension for a V-belt drive is the lowest tension at which the belts will not slip under the peak load conditions. **Shafts must be adequate for the tensions required.**

IMPORTANT:

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 BROWNING Catalog. For drives with service factor greater than 1.5 consult the BROWNING Engineers for proper tension techniques.

Super Gripbelts, Gripnotch Belts and Steel Cable Gripbelts

Belt Cross Section	Small P.D. Range	DEFLECTION FORCE — LBS.					
		Super Gripbelts		Gripnotch Belts		Steel Cable Gripbelts	
		Min.	Max.	Min.	Max.	Min.	Max.
A	3.0 - 3.6	3	4 1/4	3 7/8	5 1/2	3 1/4	4
	3.8 - 4.8	3 1/2	5	4 1/2	6 1/4	3 3/4	4 3/4
	5.0 - 7.0	4	5 1/2	5	6 7/8	4 1/4	5 1/4
B	3.4 - 4.2	4	5 1/2	5 3/8	8	4 1/2	5 1/2
	4.4 - 5.6	5 1/8	7 1/8	6 1/2	9 1/8	5 3/8	7 1/8
	5.8 - 8.6	6 3/8	8 3/4	7 3/8	10 1/8	7	8 3/4
C	7.0 - 9.4	11 1/4	14 3/8	13 3/4	17 7/8	11 1/4	14
	9.6 - 16.0	14 1/8	18 1/2	15 1/4	20 1/4	14 1/4	17 3/8
D	12.0 - 16.0	23 5/8	30 1/8	23 3/4	30 1/2		
	18.0 - 27.0	29 3/4	39 1/2	30 1/8	39 3/4		
E	20.0 - 32.0						

358 Gripbelts

Belt Cross Section	Small O.D. Range	DEFLECTION FORCE LBS.	
		Min.	Max.
3V	2.65 - 3.65	3 1/2	5
	4.12 - 6.90	4 3/4	6 7/8
5V	7.1 - 10.9	10 1/2	15 3/4
	11.8 - 16.0	13	19 1/2
8V	12.5 - 17.0	27	40 1/2
	18.0 - 22.4	30	45

FHP Belts

Belt Cross Section	Small P.D. Range	DEFLECTION FORCE LBS.	
		Min.	Max.
3L	1.25 - 1.75	1/2	5/8
	2.00 - 2.25	3/4	7/8
	2.50 - 3.00	3/4	1 1/8
4L	2.1 - 2.8	1 1/8	1 5/8
	3.0 - 3.5	1 1/2	2 1/8
	3.7 - 5.0	1 7/8	2 3/8
5L	3.0 - 4.2	2	2 7/8
	4.5 - 5.2	2 3/8	3 3/8

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