

INSTALLATION AND OPERATION OF BELT DRIVES

STORAGE :

- Belts should be stored in cool and dry place.
- Belts should preferably be hung on crescent-shaped pegs.
- Belts should not be stored in heavy bent and distorted condition.

INSTALLATION :

In assembling a drive, the motor or prime mover should be moved towards the driven unit and the belts should be placed in the grooves by hand. Under no circumstances should belts be forced on to pulley with spanners, screwdrivers or such implements.

BELT TENSIONING :

Measure the belt span-length and calculate the deflection as per conditions 1, or condition 2 (Ref. Fig. 4) Tension the drive so as to match the deflection force as per table below. New drives should be tensioned to the near higher values. After the drive has run for about 24 hours, check the belt tension and adjust if necessary.

Table - 9

Deflection force required for measuring installation tension in wedge and V-belt drives								
Cross-section symbol	Small Pulley diameter range	Condition 1			Condition 2			
		Deflection of 0.02 mm per millimetre of span length if span length is 500 mm or less			Deflection of 0.01 mm per millimetre of span length if span length exceeds 500 mm			
		Required deflection force F at centre of span for belt speed of			Required deflection force F at centre of span for belt speed of			
		0 m/s to 10 m/s N	10 m/s to 20 m/s N	20 m/s to 30 m/s N	0 m/s to 10 m/s N	10 m/s to 20 m/s N	20 m/s to 30 m/s N	
V-belts	A	75 to 140	16 to 24	13 to 19	10 to 16	8 to 12	6.5 to 9.5	5.5 to 8.5
		above 140	24 to 35	19 to 28	16 to 24	12 to 18	9.5 to 4.0	8.0 to 12.0
	B	125 to 200	32 to 48	26 to 38	20 to 32	16 to 24	13.0 to 19.0	10.0 to 16.0
		above 200	48 to 70	38 to 56	32 to 48	24 to 25	19.0 to 29.0	16.0 to 24.0
	C	200 to 400	62 to 92	62 to 76	40 to 62	31 to 46	26.0 to 38.0	20.0 to 31.0
above 400		92 to 140	72 to 116	62 to 92	46 to 70	38.0 to 58.0	31.0 to 46.0	
D	350 to 600	124 to 180	164 to 152	84 to 124	62 to 90	52.0 to 76.0	42.0 to 62.0	
	above 600	180 to 268	152 to 230	124 to 180	90 to 134	76.0 to 115.0	62.0 to 90.0	
E	300 to 900	-	-	-	110 to 160	90.0 to 140.0	75.0 to 110.0	
	above 900	-	-	-	160 to 240	140.0 to 210.0	110.0 to 160.0	
Wedge belts	SPZ	63 to 95	16 to 24	13 to 20	10 to 18	8 to 12	6.50 to 10.0	5.5 to 9.0
		95 and above	24 to 34	20 to 32	18 to 28	12 to 17	10.0 to 16.0	9.0 to 14.0
SPA	90 to 140	140 and above	28 to 40	24 to 34	19 to 28	14 to 20	12.0 to 17.0	9.5 to 14.0
		140 and above	40 to 62	34 to 52	38 to 44	20 to 31	17.0 to 26.0	14.0 to 22.0
SPB	160 to 265	265 and above	50 to 72	40 to 64	36 to 54	26 to 36	20.0 to 32.0	18.5 to 27.0
		265 and above	72 to 92	64 to 82	54 to 74	36 to 46	32.0 to 41.0	27.0 to 37.0
SPC	224 to 355	355 and above	92 to 132	76 to 116	64 to 104	46 to 66	68.0 to 58.0	32.0 to 52.0
		355 and above	132 to 170	116 to 152	104 to 140	66 to 85	58.0 to 76.0	52.0 to 70.0

Condition 1
Deflection 0.02 mm per millimetre of span if span length is 500 mm or less

Condition 2
Deflection 0.01 mm per millimetre of span length if span length exceeds 500 mm

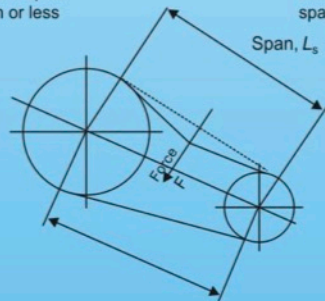


fig. 4

Note : For a two pulley drive as shown, the span L_s , in millimetres, may be calculated from the following formula.

$$L_s = C \left\{ 1 - 0.125 \left(\frac{D_p - d_p}{C} \right)^2 \right\}$$

Where

C is the distance between pulley centres (in mm)

D_p is the pitch diameter of larger pulley.

d_p is the pitch diameter of smaller pulley.

BELT DEFLECTION MEASUREMENT

Idlers :

Grooved or Flat Pulley idlers are used :

- to provide take-up for fixed centre drives.
- to break up long spans where belt whipping is a problem.
- to clear obstruction and to turn corners as in mule pulley drive. Inside idlers must use a grooved pulley, preferably on the slack side of the drive. The idler pulley should at least be of the same diameter as that of the smaller pulley on the drive and should be positioned as close as possible to the larger pulley.

Flat idler pulleys should be at least one and half times that of small pulley diameter and are recommended only with V-belt drives and not with Wedge-belt drives.

INSTALLATION AND TAKE-UP ALLOWANCES :

The limiting values for the adjustment of centres for the two transmission pulleys shall be as follows :

Lower Limiting Value : 1.5% of belt pitch length.

(Slack-off)

Higher Limiting Value : 3% of belt pitch length.

(Take-Up)

ALIGNMENT

Correct alignment of pulleys is important to avoid turn-overs and excessive wear



1. Shafts are not parallel to one another.

2. Shafts are not in correct alignment, although they appear parallel when seen from above.

3. Shafts are parallel and in alignment but pulleys are not in alignment

4. Correct installation both shafts and pulleys are parallel and in alignment.

fig. 3