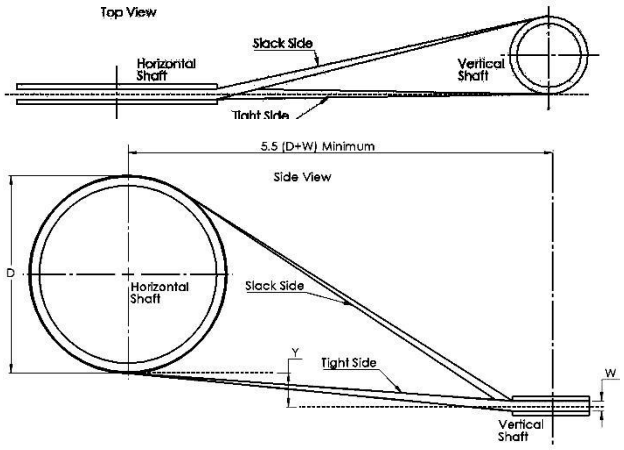
Non-Aligned Drives

V-belts can be used to transmit power between shafts which are not parallel, with limits. Quarter turn drives are commonly used to transmit power from a horizontal shaft to a vertical shaft or vice versa.

The following should be considered when implementing a quarter turn drive:

- Maximum speed ratio is 2.5:1
- Center distance should be equal or greater than 5.5 times the sum of the diameter (D) plus face width (W) of the large sheave. Long centers keep the angle of entry between the belts and sheave under 5°.
- Arc of contact correction factor can be disregarded on quarter turn drives. Use 90% of the basic horsepower rating for a given belt.
- The bottom of the horizontal sheave should be above the center of the vertical shaft sheave. See "Y" on the diagram. The table below indicates some guidelines for "Y" dependent on center distance. This is so that the tight side of the belt, where more wear will occur, has little misalignment and only has to twist.
- Without the use of an idler, the tight side of the belt must be on the bottom of the horizontal sheave and the drive is non-reversible. The idler should be positioned to minimize the entry angle for both sheaves.

Quarter Turn Drive Vertical Offset for Banded Belts					
Center Distance	Offset "Y" for Classical	Offset "Y" for Wedge	Center Distance	Offset "Y" for Classical	Offset "Y" for Wedge
20"	0.2"	0"	120"	1.5"	0.6"
30"	0.2"	0"	140"	2.0"	0.9"
40"	0.4"	0"	160"	2.5"	1.2"
50"	0.4"	0"	180"	3.5"	1.5"
60"	0.5"	0.2"	200"	4.0"	1.8"
80"	0.5"	0.3"	220"	5.0"	2.2"
100"	1.0"	0.4"	240"	6.0"	2.6"



General Non-Aligned Drives

- Center distance should be large enough to keep the entry angle "β" below 5° for any kind of twist or offset.
- High modulus belts are not recommended. A non-aligned drive creates high stress on the tensile members. Belts with a high modulus of elasticity don't allow for the absorption of this stress without causing damage.
- On non-aligned drives, deep groove sheaves are recommended, unless banded belts are being used.
- Cogged or notched belts are generally not recommended.
- The following table shows minimum spans for various **single** belts at 90° of twist. The values for other angles are linearly related. For example, a 60° twist would require only 2/3 of the listed span.

Belt Section	Minimum Span (in)
A	9
B	11
C	14
D	15
3V	9
5V	14
8V	19