SAE International	SURFACE VEHICLE STANDARD	SAE J1313 AUG2012
		Issued 1980-10 Cancelled 2012-08 Superseding J1313 JUN1986

Automotive Synchronous Belt Drives

RATIONALE

Document is out of date. Other appropriate industry standards for this scope include ISO 254, ISO 5288, ISO 9010, ISO 9011, ISO 10917, ISO 12046.

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: http://www.sae.org

Foreword—This Reaffirmed Document has been changed only to reflect the new SAE Technical Standards Board Format.

1. Scope—The following information applies to automotive camshaft drives, distributor drives, or other underhood drives that may require synchronization. For other power transmission drives requiring synchronization, refer to Specifications for Drives using Synchronous Belts (MXL, XL, L, H, XH, and XXH belt sections) (IP 24/1978), published jointly by the Rubber Manufacturers Association (RMA), the Mechanical Power Transmission Association (MPTA), and the Rubber Association of Canada (RAC).

2. References

2.1 Applicable Publications—The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply.

2.1.1 SAE PUBLICATION—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J1278—SI (Metric) Synchronous Belts and Pulleys

2.1.2 OTHER PUBLICATION

IP 24/1978—Published jointly by the Rubber Manufacturers Association (RMA), the Mechanical Power Transmission Association (MPTA), and the Rubber Association of Canada (RAC)

3. Pulleys

3.1 Minimum Pulley Diameters—Minimum recommended pulley diameters are shown in Table 1.

TABLE 1—MINIMUM RECOMMENDED PULLEY DIAMETERS (MM)

Pulley Section	Pitch	Minimum Grooves	Minimum Pitch Diameter	Minimum Outside Diameter
ST	9.525	10	30.32	29.56
SU	12.700	14	56.60	55.23
STA	9.525	19	57.61	56.23

3.2 Minimum Pulley Width—The minimum pulley width between flanges (Figure 1) is determined by Equation 1:

$$1.5 \text{ (belt plus side tolerance)} + \text{ nominal width} \quad \text{(Eq. 1)}$$

NOTE—Stack up tolerances should be handled between pulley manufacturer and the user.

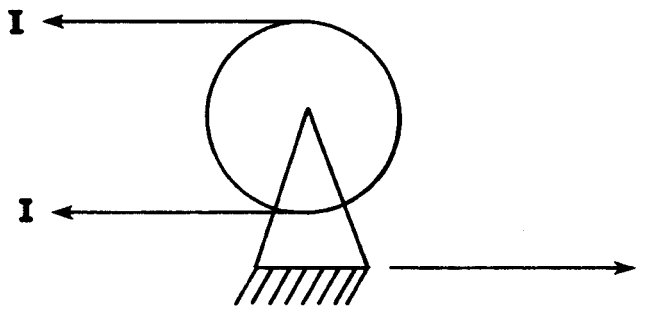

FIGURE 1—MINIMUM PULLEY WIDTH

3.3 Pulley Finish—A maximum surface finish of 2 μm Ra is normally satisfactory for standard drives. However, a maximum of 1 μm Ra finish is strongly recommended for crankshaft and other critical drive pulleys.

3.4 Flanging—Since a synchronous belt will have a tendency to ride to one side similar to a flat belt, it is necessary to contain it. Due to an inextensible tensile member, it is impossible to utilize a crown as is typical with flat belts. Therefore, flanges are used to guide the belt on the pulleys. The direction of track is controlled by the direction of rotation. (Any given belt will track opposite to its original track when the direction of rotation is reversed.) Since the direction of rotation is not usually furnished, and because of reversal applications, smaller driving pulleys are generally furnished with flanges on both sides.

3.5 Flanged Pulleys—Recommended flange dimensions are shown in Table 2 and Figure 2.

TABLE 2—FLANGE DIMENSIONS (mm)

Pulley Section	Minimum Flange Thickness	Minimum Flange Height
ST	1.3	1.6
SU	1.3	2.0
STA	1.3	2.4

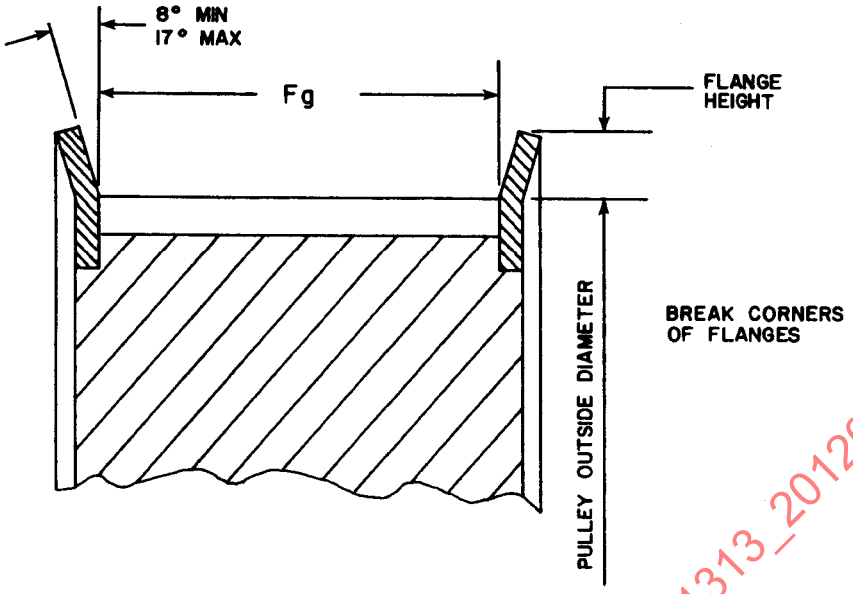

FIGURE 2—PULLEY FLANGES

3.6 Selection of Flanged Pulleys—On all two-pulley drives, the minimum flanging requirements are: two flanges on one pulley, or one flange on each pulley on opposite sides.

On drives where the center distance is more than eight times the diameter of the small pulley, both pulleys should be flanged on both sides. On vertical shaft drives, it is usually advisable to flange the bottom side of the larger pulley as well as both sides of the smaller pulley. This is a function of center distance, speed ratio, and belt width, and will vary with respective applications.

On multipoint drives, the minimum flanging requirements are two flanges on every other pulley, or one flange on every pulley alternating sides around the system.

4. Recommended Use of Idlers—The use of idlers should be restricted to those cases in which they are functionally necessary. The usual cases are:

a. As a means of applying tension when pulley centers are not adjustable.
b. To increase the number of teeth in mesh on the small pulley of relatively high ratio drives.

Idlers should be located on the slack side of the belt. For inside idlers, grooved pulleys are recommended up to 40 grooves. On larger diameters, flat uncrowned pulleys may be used. Outside idlers should be flat, uncrowned pulleys. Idler diameters should not be smaller than the smallest pulley diameter in the system.

Fixed idlers are recommended.

5. Belts

5.1 Maximum Belt Width—Belt width should not exceed the small pulley diameter in order to avoid excessive belt side thrust.