



SURFACE VEHICLE RECOMMENDED PRACTICE

J1596™

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Superseded by J2342

Automotive V-Ribbed Belt Drives and Test Methods

RATIONALE

SAE J2432 is the current standard that covers the testing and measuring of multi-V belts. The specification is also owned by this Committee.

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This Technical Report has been declared "CANCELLED" as of September, 2019, and has been superseded by SAE J2432. By this action, this document will remain listed in the respective index, if applicable. Cancelled Technical Reports are available from SAE.

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Foreword—This Document has not changed other than to put it into the new SAE Technical Standards Board Format.

- 1. Scope**—The following information covers engine accessory drive layout details and testing methods and includes test configurations, pulley diameters, power loads, and guidance for interpreting test data. This information has been prepared from existing literature, including standards and data supplied by both producers and users of V-ribbed belts.

When the engine is used to drive an external unit equipped with industrial type V-pulleys and belts, it is recommended that the power takeoff pulley on the engine be grooved according to the appropriate industrial standard. These standards are published by RMA-MPTA (Rubber Manufacturers Association - Mechanical Power Transmission Association); ISO (International Standards Organization) and ASAE (American Society of Agricultural Engineers). The grooves in those standards differ from each other in the reference dimensions, and they are not interchangeable with SAE grooves, which are standardized for engine accessory drives as covered in SAE J636 and J1459.

- 1.1 Purpose**—This recommended practice is intended as a guide to be used for evaluating V-ribbed belt construction, source approval, or quality audit.

2. References

- 2.1 Applicable Publications**—The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest version of SAE publications shall apply.

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

SAE J636—V-belts and Pulleys

SAE J1459—V-ribbed Belts and Pulleys

3. General Drive Layout Considerations

- 3.1 Belt Speed**—It is recommended that the pulley diameters be as large as possible without exceeding 50 m/s belt speed.

3.2 Pulley Sizes—The inside pulleys should never be smaller than the tension pulley diameter specified in Tables 1 and 2 of this standard; however, belt life is directly related to pulley diameter. A more practical minimum pulley diameter, for increased belt life, would be 50 mm. (See 3.5 for backside pulley diameter recommendations.)

3.3 Belt Length—The calculation of the belt effective length (E.L.) for a specific drive involves several design considerations, including provision for adequate installation and take-up.

To allow for belt installation and take-up, one pulley should be adjustable from its initial position with the mean length belt at installation tension. This formula gives the minimum allowance for easy installation of the belt without prying or otherwise forcing it over the sides of the grooves.

3.3.1 The following formula can be used to calculate the recommended minimum belt E.L. for installation:

- "K" Section: Inside pulleys
Min. Belt E.L. = $1.003(L_1) + L_2 + 0.77 + 6.28(h)$
- "K" Section: Flat backside pulley
Min. Belt E.L. = $1.003(L_1) + L_2 + 6.28(h)$
- "L" Section: Inside pulleys
Min. Belt E.L. = $1.005(L_1) + L_2 + 1.15 + 6.28(h)$
- "L" Section: Flat backside pulley
Min. Belt E.L. = $1.005(L_1) + L_2 + 6.28(h)$

NOTE—The last pulley, over which the belt can be installed, should be considered and the appropriate belt installation formula used.

L_1 - The effective belt length (addition of span lengths and effective arc lengths on the pulleys) around the drive with the tensioning pulley in the minimum position. The 1.003 ("K" section) and 1.005 ("L" section) factors provide for length change from slack to measuring tension.

L_2 - The 2 X negative belt manufacturing center distance tolerance (Tables 3A and 3B, SAE J1459).

h - The flange height.

This formula also allows for full contact belt rib height for V-ribbed pulleys - 0.77 ("K" section) and 1.15 ("L" section).

The metric formulas are the same with the following exception:

"K" section - 0.77 value is 20

"L" section - 1.15 value is 29

The belt length, flange height, and manufacturing tolerance are in inches in the English system and millimeters in the metric system.

3.3.2 Select a belt to be used that has a nominal effective length equal to or greater than the recommended minimum E.L.