



<b>SURFACE VEHICLE STANDARD</b>	<b>J501</b>	<b>JUN2014</b>
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Superseding J501 MAY1948		
Shaft Ends		

#### RATIONALE

This document has been determined to contain basic and stable technology which is not dynamic in nature. Expertise on this subject is no longer available.

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**1. Scope****2. References**

**2.1 Applicable Publication**—The following publication forms 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 PUBLICATION—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J498—Involute Splines, Serrations, and Inspections

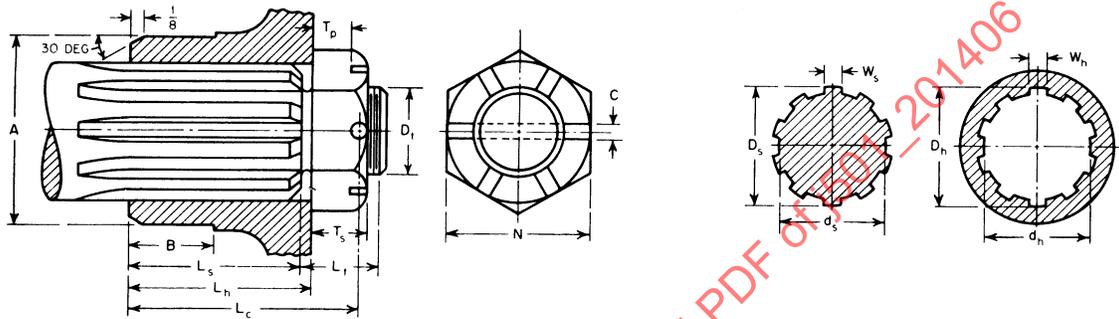


FIGURE 1—PERMANENT FIT SPLINE SHAFT ENDS (SEE TABLE 1)

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TABLE 1A—PERMANENT FIT SPLINE SHAFT ENDS FOR UNIVERSAL JOINTS AND SIMILAR APPLICATIONS

Nominal Shaft Dia	10-Spline Shaft <sup>(1)</sup>		10-Spline Shaft <sup>(1)</sup>		10-Spline Shaft <sup>(1)</sup>		10-Spline Hole <sup>(1)</sup>		10-Spline Hole <sup>(1)</sup>		Hub Dimensions		Hub Dimensions	
	D <sub>g</sub> +0.000 -0.001	W <sub>g</sub> +0.000 -0.0015	d <sub>g</sub> +0.000 -0.010	D <sub>h</sub>	W <sub>h</sub> +0.000 -0.0015	d <sub>h</sub> +0.010 -0.000	L <sub>c</sub>	L <sub>h</sub>	L <sub>c</sub>	L <sub>h</sub>	L <sub>c</sub>	L <sub>h</sub>	L <sub>c</sub>	L <sub>h</sub>
3/4	0.749	0.1170	0.632	{ 0.751 { 0.749	0.1170	0.682	1-11/32	15/16	1					
7/8	0.874	0.1370	0.745	{ 0.876 { 0.874	0.1370	0.795	1-11/16	1-1/8	1-1/4					
1	0.999	0.1560	0.859	{ 1.001 { 0.999	0.1560	0.909	1-15/16	1-3/8	1-1/2					
1-1/8	1.124	0.1760	0.973	{ 1.126 { 1.124	0.1760	1.023	1-15/16	1-3/8	1-1/2					
1-1/4	1.249	0.1950	1.087	{ 1.251 { 1.249	0.1950	1.137	1-15/16	1-3/8	1-1/2					
1-3/8	1.374	0.2150	1.200	{ 1.376 { 1.374	0.2150	1.250	2-7/16	1-7/8	2					
1-1/2	1.499	0.2340	1.304	{ 1.501 { 1.499	0.2340	1.364	2-7/16	1-7/8	2					
1-5/8	1.624	0.2540	1.347	{ 1.627 { 1.624	0.2540	1.397	2-13/16	2-1/8	2-1/4					
1-3/4	1.749	0.2730	1.454	{ 1.752 { 1.749	0.2730	1.504	2-13/16	2-1/8	2-1/4					
2	1.999	0.3120	1.668	{ 2.002 { 1.999	0.3120	1.718	3-9/16	2-7/8	3					
2-1/4	2.249	0.3510	1.883	{ 2.252 { 2.249	0.3510	1.933	3-9/16	2-7/8	3					
2-1/2	2.499	0.3900	2.098	{ 2.502 { 2.499	0.3900	2.148	4-9/32	3-3/8	3-1/2					
3	2.999	0.4680	2.528	{ 3.002 { 2.999	0.4680	2.578	4-25/32	3-7/8	4					

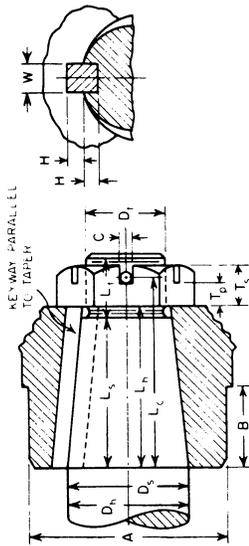
1. SAE Standard, Involute Splines, Serrations, and Inspection—SAE J498 optional.

**TABLE 1B—PERMANENT FIT SPLINE SHAFT ENDS FOR UNIVERSAL JOINTS AND SIMILAR APPLICATIONS (CONTINUED)**

Nominal Shaft Dia	Hub Dimensions					Hub Threads per in.	Hub Dimensions				A <sup>(1)</sup>	B
	Hub Dimensions L <sub>t</sub>	Hub Dimensions D <sub>t</sub>	Hub Dimensions T <sub>8</sub>	Hub Dimensions T <sub>p</sub>	Hub Dimensions N		Hub Dimensions C					
3/4	17/32	1/2	7/16	1/4	13/16	28	1/8	1-1/8	5/8			
7/8	11/16	5/8	1/2	5/16	15/16	24	5/32	1-1/4	3/4			
1	11/16	3/4	1/2	5/16	1-1/16	20	5/32	1-3/8	7/8			
1-1/8	11/16	7/8	1/2	5/16	1-1/4	20	5/32	1-1/2	7/8			
1-1/4	11/16	1	1/2	5/16	1-7/16	20	5/32	1-3/4	7/8			
1-3/8	11/16	1	1/2	5/16	1-7/16	20	5/32	2	1			
1-1/2	13/16	1-1/4	5/8	7/16	1-13/16	18	5/32	2-1/4	1			
1-5/8	13/16	1-1/4	5/8	7/16	1-13/16	18	5/32	2-3/8	1-1/4			
1-3/4	13/16	1-1/4	5/8	7/16	2-3/16	18	5/32	2-1/2	1-1/4			
2	13/16	1-1/4	5/8	7/16	2-3/16	18	5/32	2-3/4	1-1/2			
2-1/4	13/16	1-1/2	5/8	7/16	2-3/8	18	5/32	3	1-1/2			
2-1/2	1-1/4	2	1	5/8	3-1/8	16	7/32	3-1/2	1-3/4			
3	1-1/4	2	1	5/8	3-1/8	16	7/32	4	2			

1. Tolerance for ground finish, nominal +0.003, -0.002; and when specified, the maximum eccentricity with respect to the hole shall be 0.002 (indicator reading 0.004). Tolerance for lathe finish, nominal +1/32, -0.

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Taper per foot =  $1.500 \pm 0.002$  in. Dimension H is measured normal to the key and at the large end of the taper.  
 C = cotter pin hole or slot. The centerline of the cotter pin hole shall be 90 deg from the position of the keyway, as shown in Fig. 2.

FIGURE 2—TAPER SHAFT END (SEE TABLE 2)

TABLE 2A—TAPER SHAFT END

Nominal Shaft Dia	D <sub>g</sub> Shaft Diameter		D <sub>h</sub> Hole Diameter		L <sub>c</sub>	L <sub>h</sub>	L <sub>t</sub>	D <sub>t</sub>	Threads per in.
	Max	Min	Max	Min					
1/4	0.250	0.249	0.248	0.247	9/16	3/8	5/16	#10	40
3/8	0.375	0.374	0.373	0.372	47/64	1/2	23/64	5/16	32
1/2	0.500	0.499	0.498	0.497	63/64	3/4	23/64	5/16	32
5/8	0.625	0.624	0.623	0.622	1-3/32	3/4	17/32	1/2	28
3/4	0.750	0.749	0.748	0.747	1-11/32	1	17/32	1/2	28
7/8	0.875	0.874	0.873	0.872	1-11/16	1-1/4	11/16	5/8	24
1	1.001	0.999	0.997	0.995	1-15/16	1-1/2	11/16	3/4	20
1-1/8	1.126	1.124	1.122	1.120	1-15/16	1-1/2	11/16	7/8	20
1-1/4	1.251	1.249	1.247	1.245	1-15/16	1-1/2	11/16	1	20
1-3/8	1.376	1.374	1.372	1.370	2-7/16	2	11/16	1	20
1-1/2	1.501	1.499	1.497	1.495	2-7/16	2	11/16	1	20
1-5/8	1.626	1.624	1.622	1.620	2-13/16	2-1/4	13/16	1-1/4	18
1-3/4	1.751	1.749	1.747	1.745	2-13/16	2-1/4	13/16	1-1/4	18
1-7/8	1.876	1.874	1.872	1.870	3-1/16	2-1/2	13/16	1-1/4	18
2	2.001	1.999	1.997	1.995	3-9/16	3	13/16	1-1/4	18
2-1/4	2.252	2.248	2.245	2.242	3-9/16	3	13/16	1-1/2	18
2-1/2	2.502	2.498	2.495	2.492	4-9/32	3-1/2	1-1/4	2	16
2-3/4	2.752	2.748	2.745	2.742	4-9/32	3-1/2	1-1/4	2	16
3	3.002	2.998	2.995	2.992	4-25/32	4	1-1/4	2	16
3-1/4	3.252	3.248	3.245	3.242	5-1/32	4-1/4	1-1/4	2	16
3-1/2	3.502	3.498	3.495	3.492	5-7/16	4-1/2	1-3/8	2-1/2	16
4	4.002	3.998	3.995	3.992	6-7/16	5-1/2	1-3/8	2-1/2	16