AEROSPACE STANDARD

AS84	REV. D

Issued 1942-03
Revised 1996-08
Reaffirmed 2004-07
Stabilized 2014-02

Superseding AS84C

Splines, Involute (Full Fillet)

RATIONALE

This document has been determined to contain basic and stable technology which is not dynamic in nature. This standard has been stabilized.

STABILIZED NOTICE

This document has been declared "Stabilized" by the SAE E-25 General Standards for Aerospace and Propulsion Systems Committee and will no longer be subjected to periodic reviews for currency. Users are responsible for verifying references and continued suitability of technical requirements. Newer technology may exist.

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**

SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/AS84D

1. SCOPE:

This SAE Aerospace Standard (AS) defines an involute with a 30° pressure angle and a full radius at the roots thus reducing the stress concentration in the area of the root.

2. REFERENCES:

2.1 SAE Publications:

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

ARP179 Involute Spline Gages (30° Pressure Angle)

3. FUNDAMENTAL PRINCIPLES:

3.1 This involute spline standard was adopted in 1942 for aircraft engine use, based on nearly 15 years of actual practice by one or more engine manufacturers.

3.2 It is a side bearing spline featuring a 30° pressure angle and a full radius at the roots of the teeth to decrease stress concentration at the root to a minimum. The primary object is to provide efficient, durable, and easily fabricated splines applicable to nearly all conditions where power transmitting splines are required in aircraft engines or similar high performance equipment.

3.3 This standard does not recommend specific classes or values of fits between internal and external splines, because these vary widely with the application and are usually selected according to the hardness of the materials, the loads to be transmitted, the assembly requirements, and other related factors.

4. PITCHES:

4.1 This standard incorporates a stubbed tooth form. The numerator or basic pitches are 14 in number, ranging from 2.5 to 48. The depth or denominator pitch being twice the basic pitch, ranges from 5 to 96. The table of basic tooth proportions covers from 8 to an indefinite number of teeth for pitches 2.5/5, 3/6, 4/8, 5/10, 6/12, 8/16, 10/20, 12/24, 16/32, 20/40, 24/48, 32/64, 40/80, and 48/96. The tables of dimensions cover from 8 to 50 teeth with pitch diameters from .1667 to 20.0000. To use a spline with less than 12 teeth, it is suggested that the tooth form be laid out to check for possible tooth interference or interferences with the mating member, and perhaps modifying the tooth to suit. For splines of more than 50 teeth, use the same tooth proportions as specified in the tables of dimensions, or as specified by formulas in Section 9 in conjunction with Table 1.

5. SPLINE TOOTH NOMENCLATURE:

5.1 Figure 1 shows a tooth diagram of splines in mesh. The various elements of the tooth are illustrated and defined.

6. METHOD OF DIMENSIONING SPLINES:

6.1 Figure 2 contains the required data to be incorporated on the engineering drawing with an illustration to clarify the dimensions. The dimensions and tolerances shall be taken from Tables 2 through 15 inclusive. The method of calculating the basic chordal space is indicated in Section 9.

6.2 The information given on the drawing will enable tool and production engineers to design tools, gages, and other equipment necessary for the manufacture of these splines.

6.3 Recommended cutter sizes for manufacturing splines are specified in Table 16. Involute spline gages are shown on ARP179.

7. BASIC TOOTH PROPORTIONS:

7.1 Table 1 specifies the basic tooth proportions. It is to be noted that the dedendum gives an amount of land clearance of the teeth which is considerably greater than on a gear of corresponding pitch. This is necessary in order to accommodate a full radius at the root of the teeth. The internal member does not require as much clearance as the external member; however, when the number of teeth of the internal becomes large enough to incorporate the same generating cutting tool as the external member, the depth of the internal tooth has been increased to equal that of the external, thereby eliminating one cutting tool. (See Note in Table 1.)

7.2 The true involute form diameter for the external spline is given as the maximum diameter and is the same as the basic (minimum) inside diameter of the internal spline. When an involute clearance is required, the true involute form diameter for the external spline must be decreased by twice the amount of the clearance. See Table 17 for this clearance.

7.3 The true involute form diameter for the internal spline is given as the minimum diameter and is the same as the basic (maximum) outside diameter of the external spline. When an involute clearance is required, the true involute form diameter for the internal spline must be increased by twice the amount of the clearance. See Table 17 for this clearance.

7.4 The fillet generated by a full radius tip tool is a curve related to a cycloid for both the internal and the external splines, but for practical purposes an approximate radius tangent to adjacent involutes and root diameter may be specified. The point of tangency must be on or inside the true involute form diameter on external splines, and on or outside the true involute form diameter on internal splines.

8. DIMENSIONS FOR SPLINES:

8.1 Tables 2 through 15 inclusive show spline dimensions with tolerances, calculated from formulas given in Section 9 and in conjunction with Table 1. These tables of dimensions do not include involute clearances mentioned in 7.2 and 7.3.

8.2 Table 17 shows the recommended involute clearances which should be used in order to avoid any possible interference between the mating splines.

9. FORMULAS:

9.1 External and Internal Splines:

$$\text{Circular Pitch} = \frac{3.14159265}{\text{Diametral Pitch}^{1}}$$

$$\text{Addendum} = \frac{1}{\text{Diametral Pitch}^{2}}$$

Dedendum = Addendum + Land Clearance

Land Clearance = Determined by layout

Working Depth = 2 x Addendum

Whole Depth = Addendum + Dedendum

Involute Clearance and Full Radius is determined by layout[3]

N = Number of Teeth

[1] Use numerator of the diametral pitch.
[2] Use denominator of the diametral pitch.
[3] For recommended involute clearance which can be used without requiring layout and special cutters, see Table 17.

9.1 (Continued):

$$\text{Basic Circular Space} = \frac{\text{Circular Pitch}}{2}$$

$$\text{Basic Chordal Space} = \text{Pitch Diameter} \times \frac{\sin 90°}{N}$$

$$\text{Pitch Diameter} = \frac{\text{Number of Teeth}}{\text{Diametral Pitch}^{4}}$$

9.2 External Splines:

Outside Diameter = Pitch Diameter + (2 x Addendum)

Root Diameter = Pitch Diameter - (2 x Dedendum)

True Involute Form Diameter = Inside Diameter of Internal Spline - (2 x Involute Clearance, when required)

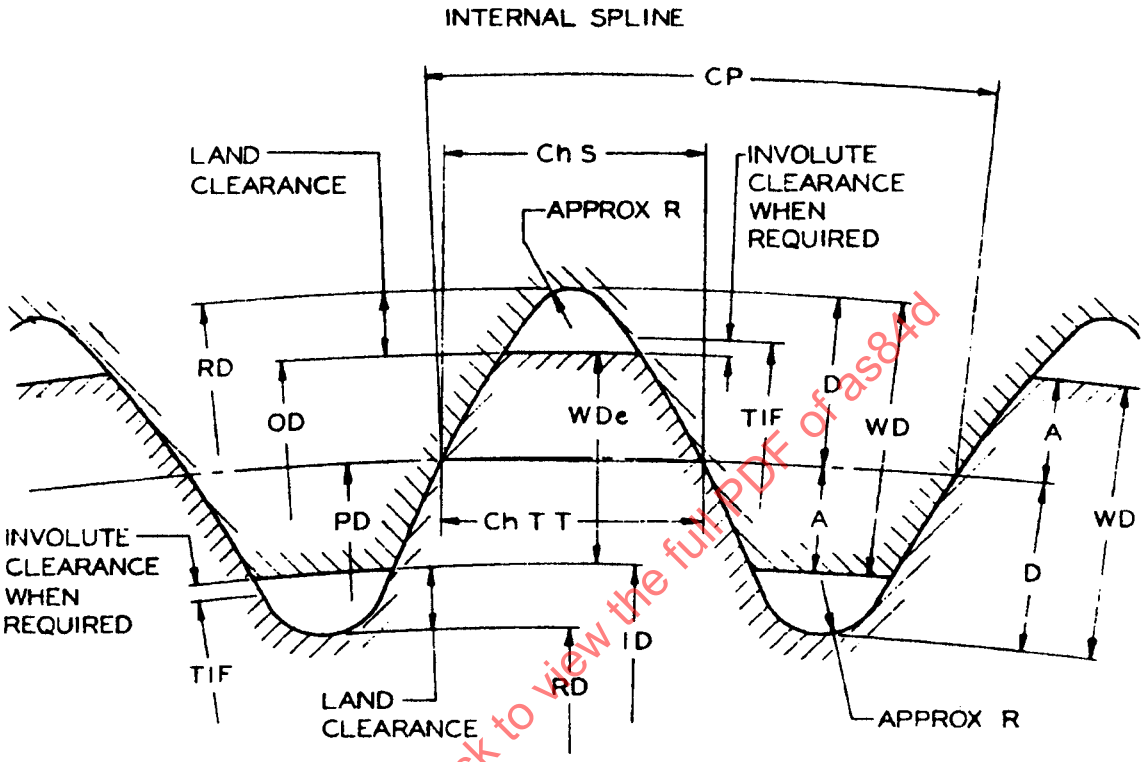
9.3 Internal Splines:

Inside Diameter = Pitch Diameter - (2 x Addendum)

Root Diameter = Pitch Diameter + (2 x Dedendum)

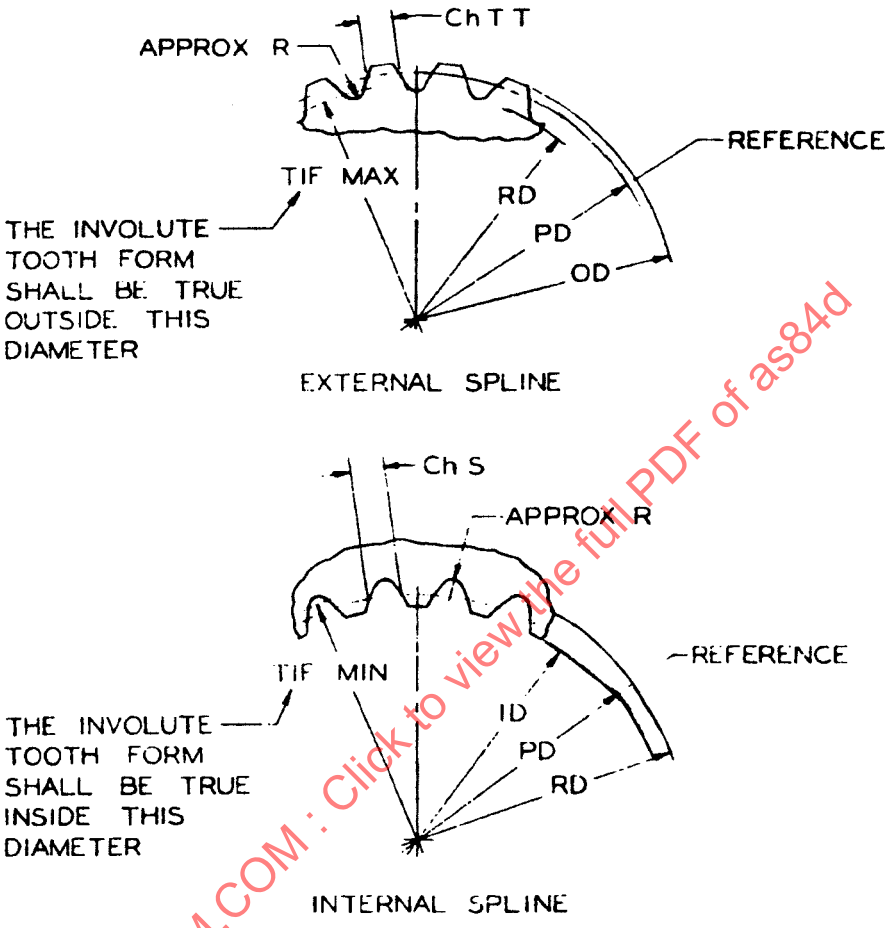
True Involute Form Diameter = Outside Diameter of External Spline + (2 x Involute Clearance, when required)

[4] See Footnote 1.



A = ADDENDUM
D = DEDENDUM
WDe = WORKING DEPTH
WD = WHOLE DEPTH
R = FILLET RADIUS
CP = CIRCULAR PITCH
Ch T T = CHORDAL TOOTH THICKNESS (EXTERNAL)
Ch S = CHORDAL SPACE (INTERNAL)
PD = PITCH DIAMETER
OD = OUTSIDE DIAMETER
RD = ROOT DIAMETER
ID = INSIDE DIAMETER
TIF = TRUE INVOLUTE FORM DIAMETER

FIGURE 1 - Tooth Nomenclature



NOTES:

1. THE CHORDAL SPACE OF THE INTERNAL SPLINE (SEE TABLES) IS BASIC WITH A POSITIVE TOLERANCE.
2 THE CHORDAL TOOTH THICKNESS AND TOLERANCE OF THE EXTERNAL SPLINE SHOULD BE SELECTED TO OBTAIN THE DESIRED FIT.
3. SPLINE DATA:
   30° STUB TOOTH FORM
   XX TEETH XX/XX PITCH

FIGURE 2 - Method of Dimensioning

TABLE 1 - Basic Tooth Proportions

Dia Pitch	Circular Pitch	Type	Number of Teeth	Addendum	Dedendum	Working Depth	Whole Depth	Approximate Fillet Radius
2.5/5	1.2566	External	8 to Rack	.2000	.3500	.4000	.5500	.180
		Internal	8 to 24	.2000	.3300	.4000	.5300	.190
			25 to Rack	.2000	.3500	.4000	.5500	.180
3/6	1.0472	External	8 to Rack	.1667	.2917	.3333	.4584	.150
		Internal	8 to 24	.1667	.2750	.3333	.4417	.160
			25 to Rack	.1667	.2917	.3333	.4584	.150
4/8	.7854	External	8 to Rack	.1250	.2188	.2500	.3438	.110
		Internal	8 to 24	.1250	.2063	.2500	.3313	.120
			25 to Rack	.1250	.2188	.2500	.3438	.110
5/10	.6283	External	8 to Rack	.1000	.1750	.2000	.2750	.090
		Internal	8 to 24	.1000	.1650	.2000	.2650	.100
			25 to Rack	.1000	.1750	.2000	.2750	.090
6/12	.5236	External	8 to Rack	.0833	.1506	.1667	.2339	.080
		Internal	8 to 29	.0833	.1370	.1667	.2203	.080
			30 to Rack	.0833	.1506	.1667	.2339	.070
8/16	.3927	External	8 to Rack	.0625	.1127	.1250	.1752	.060
		Internal	8 to 36	.0625	.1050	.1250	.1675	.060
			37 to Rack	.0625	.1127	.1250	.1752	.055
10/20	.3142	External	8 to 19	.0500	.0901	.1000	.1401	.050
			20 to Rack	.0500	.0901	.1000	.1401	.045
		Internal	8 to 41	.0500	.0850	.1000	.1350	.045
			42 to Rack	.0500	.0901	.1000	.1401	.040
12/24	.2618	External	8 to 20	.0417	.0749	.0833	.1166	.040
			21 to Rack	.0417	.0749	.0833	.1166	.035
		Internal	8 to 47	.0417	.0725	.0833	.1142	.035
			48 to Rack	.0417	.0749	.0833	.1166	.030
16/32	.1963	External	8 to Rack	.0312	.0625	.0625	.0937	.020
		Internal	8 to 59	.0312	.0555	.0625	.0867	.020
			60 to Rack	.0312	.0625	.0625	.0937	.015
20/40	.1571	External	8 to Rack	.0250	.0500	.0500	.0750	.018
		Internal	8 to 71	.0250	.0425	.0500	.0675	.018
			72 to Rack	.0250	.0500	.0500	.0750	.018
24/48	.1309	External	8 to Rack	.0208	.0417	.0417	.0625	.015
		Internal	8 to 83	.0208	.0355	.0417	.0563	.015
			84 to Rack	.0208	.0417	.0417	.0625	.010
32/64	.0982	External	8 to Rack	.0156	.0312	.0312	.0468	.010
		Internal	8 to 111	.0156	.0275	.0312	.0431	.010
			112 to Rack	.0156	.0312	.0312	.0468	.010
40/80	.0785	External	8 to Rack	.0125	.0225	.0250	.0350	.009
		Internal	8 to Rack	.0125	.0225	.0250	.0350	.009
48/96	.0654	External	8 to Rack	.0104	.0184	.0208	.0288	.008
		Internal	8 to Rack	.0104	.0184	.0208	.0288	.008

NOTE: The shallow depth given for the smaller internal splines may be used for the full range of the number of teeth, depending on the size of the cutter.

TABLE 2 - Dimensions for 2.5/5 Diametral Pitch Splines
30° Pressure Angle

No. of Teeth	Pitch Dia	External OD +.000 −.020	External RD +.000 −.040	External TIF Max /1/	External CH T T	External Approx R	Internal ID +.020 −.000	Internal RD +.040 −.000	Internal TIF Min /1/	Internal CH S Min (Basic)	Internal Approx R
8	3.2000	3.600	2.500	2.800		.180	2.800	3.860	3.600	.6243	.190
9	3.6000	4.000	2.900	3.200		.180	3.200	4.260	4.000	.6251	.190
10	4.0000	4.400	3.300	3.600		.180	3.600	4.660	4.400	.6257	.190
11	4.4000	4.800	3.700	4.000		.180	4.000	5.060	4.800	.6262	.190
12	4.8000	5.200	4.100	4.400		.180	4.400	5.460	5.200	.6265	.190
13	5.2000	5.600	4.500	4.800		.180	4.800	5.860	5.600	.6268	.190
14	5.6000	6.000	4.900	5.200		.180	5.200	6.260	6.000	.6270	.190
15	6.0000	6.400	5.300	5.600		.180	5.600	6.660	6.400	.6272	.190
16	6.4000	6.800	5.700	6.000		.180	6.000	7.060	6.800	.6273	.190
17	6.8000	7.200	6.100	6.400		.180	6.400	7.460	7.200	.6274	.190
18	7.2000	7.600	6.500	6.800		.180	6.800	7.860	7.600	.6275	.190
19	7.6000	8.000	6.900	7.200		.180	7.200	8.260	8.000	.6276	.190
20	8.0000	8.400	7.300	7.600		.180	7.600	8.660	8.400	.6277	.190
21	8.4000	8.800	7.700	8.000		.180	8.000	9.060	8.800	.6278	.190
22	8.8000	9.200	8.100	8.400		.180	8.400	9.460	9.200	.6278	.190
23	9.2000	9.600	8.500	8.800		.180	8.800	9.860	9.600	.6278	.190
24	9.6000	10.000	8.900	9.200		.180	9.200	10.260	10.000	.6279	.190
25	10.0000	10.400	9.300	9.600		.180	9.600	10.700	10.400	.6279	.180
26	10.4000	10.800	9.700	10.000		.180	10.000	11.100	10.800	.6280	.180
27	10.8000	11.200	10.100	10.400		.180	10.400	11.500	11.200	.6280	.180
28	11.2000	11.600	10.500	10.800		.180	10.800	11.900	11.600	.6280	.180
29	11.6000	12.000	10.900	11.200		.180	11.200	12.300	12.000	.6280	.180
30	12.0000	12.400	11.300	11.600		.180	11.600	12.700	12.400	.6280	.180
31	12.4000	12.800	11.700	12.000		.180	12.000	13.100	12.800	.6281	.180
32	12.8000	13.200	12.100	12.400		.180	12.400	13.500	13.200	.6281	.180
33	13.2000	13.600	12.500	12.800		.180	12.800	13.900	13.600	.6281	.180
34	13.6000	14.000	12.900	13.200		.180	13.200	14.300	14.000	.6281	.180
35	14.0000	14.400	13.300	13.600		.180	13.600	14.700	14.400	.6281	.180
36	14.4000	14.800	13.700	14.000		.180	14.000	15.100	14.800	.6281	.180
37	14.8000	15.200	14.100	14.400		.180	14.400	15.500	15.200	.6281	.180
38	15.2000	15.600	14.500	14.800		.180	14.800	15.900	15.600	.6281	.180
39	15.6000	16.000	14.900	15.200		.180	15.200	16.300	16.000	.6281	.180
40	16.0000	16.400	15.300	15.600		.180	15.600	16.700	16.400	.6282	.180
41	16.4000	16.800	15.700	16.000		.180	16.000	17.100	16.800	.6282	.180
42	16.8000	17.200	16.100	16.400		.180	16.400	17.500	17.200	.6282	.180
43	17.2000	17.600	16.500	16.800		.180	16.800	17.900	17.600	.6282	.180
44	17.6000	18.000	16.900	17.200		.180	17.200	18.300	18.000	.6282	.180
45	18.0000	18.400	17.300	17.600		.180	17.600	18.700	18.400	.6282	.180
46	18.4000	18.800	17.700	18.000		.180	18.000	19.100	18.800	.6282	.180
47	18.8000	19.200	18.100	18.400		.180	18.400	19.500	19.200	.6282	.180
48	19.2000	19.600	18.500	18.800		.180	18.800	19.900	19.600	.6282	.180
49	19.6000	20.000	18.900	19.200		.180	19.200	20.300	20.000	.6282	.180
50	20.0000	20.400	19.300	19.600		.180	19.600	20.700	20.400	.6282	.180

See Note 2 on Page 6

/1/ Does not include involute clearance. See 7.2, 7.3, and Table 17.

TABLE 3 - Dimensions for 3/6 Diametral Pitch Splines
30° Pressure Angle

No. of Teeth	Pitch Dia	External OD +.000 −.015	External RD +.000 −.035	External TIF Max /1/	External CH T T	External Approx R	Internal ID +.015 −.000	Internal RD +.035 −.000	Internal TIF Min /1/	Internal CH S Min (Basic)	Internal Approx R
8	2.6667	3.000	2.083	2.333		.150	2.333	3.217	3.000	.5202	.160
9	3.0000	3.333	2.417	2.667		.150	2.667	3.550	3.333	.5209	.160
10	3.3333	3.667	2.750	3.000		.150	3.000	3.883	3.667	.5214	.160
11	3.6667	4.000	3.083	3.333		.150	3.333	4.217	4.000	.5218	.160
12	4.0000	4.333	3.417	3.667		.150	3.667	4.550	4.333	.5221	.160
13	4.3333	4.667	3.750	4.000		.150	4.000	4.883	4.667	.5223	.160
14	4.6667	5.000	4.083	4.333		.150	4.333	5.217	5.000	.5225	.160
15	5.0000	5.333	4.417	4.667		.150	4.667	5.550	5.333	.5226	.160
16	5.3333	5.667	4.750	5.000		.150	5.000	5.883	5.667	.5228	.160
17	5.6667	6.000	5.083	5.333		.150	5.333	6.217	6.000	.5229	.160
18	6.0000	6.333	5.417	5.667		.150	5.667	6.550	6.333	.5229	.160
19	6.3333	6.667	5.750	6.000		.150	6.000	6.883	6.667	.5230	.160
20	6.6667	7.000	6.083	6.333		.150	6.333	7.217	7.000	.5231	.160
21	7.0000	7.333	6.417	6.667		.150	6.667	7.550	7.333	.5231	.160
22	7.3333	7.667	6.750	7.000		.150	7.000	7.883	7.667	.5231	.160
23	7.6667	8.000	7.083	7.333		.150	7.333	8.217	8.000	.5232	.160
24	8.0000	8.333	7.417	7.667		.150	7.667	8.550	8.333	.5232	.160
25	8.3333	8.667	7.750	8.000		.150	8.000	8.917	8.667	.5233	.150
26	8.6667	9.000	8.083	8.333		.150	8.333	9.250	9.000	.5233	.150
27	9.0000	9.333	8.417	8.667		.150	8.667	9.583	9.333	.5233	.150
28	9.3333	9.667	8.750	9.000		.150	9.000	9.917	9.667	.5233	.150
29	9.6667	10.000	9.083	9.333		.150	9.333	10.250	10.000	.5233	.150
30	10.0000	10.333	9.417	9.667		.150	9.667	10.583	10.333	.5234	.150
31	10.3333	10.667	9.750	10.000		.150	10.000	10.917	10.667	.5234	.150
32	10.6667	11.000	10.083	10.333		.150	10.333	11.250	11.000	.5234	.150
33	11.0000	11.333	10.417	10.667		.150	10.667	11.583	11.333	.5234	.150
34	11.3333	11.667	10.750	11.000		.150	11.000	11.917	11.667	.5234	.150
35	11.6667	12.000	11.083	11.333		.150	11.333	12.250	12.000	.5234	.150
36	12.0000	12.333	11.417	11.667		.150	11.667	12.583	12.333	.5234	.150
37	12.3333	12.667	11.750	12.000		.150	12.000	12.917	12.667	.5234	.150
38	12.6667	13.000	12.083	12.333		.150	12.333	13.250	13.000	.5234	.150
39	13.0000	13.333	12.417	12.667		.150	12.667	13.583	13.333	.5235	.150
40	13.3333	13.667	12.750	13.000		.150	13.000	13.917	13.667	.5235	.150
41	13.6667	14.000	13.083	13.333		.150	13.333	14.250	14.000	.5235	.150
42	14.0000	14.333	13.417	13.667		.150	13.667	14.583	14.333	.5235	.150
43	14.3333	14.667	13.750	14.000		.150	14.000	14.917	14.667	.5235	.150
44	14.6667	15.000	14.083	14.333		.150	14.333	15.250	15.000	.5235	.150
45	15.0000	15.333	14.417	14.667		.150	14.667	15.583	15.333	.5235	.150
46	15.3333	15.667	14.750	15.000		.150	15.000	15.917	15.667	.5235	.150
47	15.6667	16.000	15.083	15.333		.150	15.333	16.250	16.000	.5235	.150
48	16.0000	16.333	15.417	15.667		.150	15.667	16.583	16.333	.5235	.150
49	16.3333	16.667	15.750	16.000		.150	16.000	16.917	16.667	.5235	.150
50	16.6667	17.000	16.083	16.333		.150	16.333	17.250	17.000	.5235	.150

See Note 2 on Page 6

/1/ Does not include involute clearance. See 7.2, 7.3, and Table 17.

TABLE 4 - Dimensions for 4/8 Diametral Pitch Splines
30° Pressure Angle

No. of Teeth	Pitch Dia	External OD +.000 −.010	External RD +.000 −.030	External TIF Max /1/	External CH T T	External Approx R	Internal ID +.010 −.000	Internal RD +.030 −.000	Internal TIF Min /1/	Internal CH S Min (Basic)	Internal Approx R
8	2.0000	2.250	1.562	1.750		.110	1.750	2.413	2.250	.3902	.120
9	2.2500	2.500	1.812	2.000		.110	2.000	2.663	2.500	.3907	.120
10	2.5000	2.750	2.062	2.250		.110	2.250	2.913	2.750	.3911	.120
11	2.7500	3.000	2.312	2.500		.110	2.500	3.163	3.000	.3914	.120
12	3.0000	3.250	2.562	2.750		.110	2.750	3.413	3.250	.3916	.120
13	3.2500	3.500	2.812	3.000		.110	3.000	3.663	3.500	.3917	.120
14	3.5000	3.750	3.062	3.250		.110	3.250	3.913	3.750	.3919	.120
15	3.7500	4.000	3.312	3.500		.110	3.500	4.163	4.000	.3920	.120
16	4.0000	4.250	3.562	3.750		.110	3.750	4.413	4.250	.3921	.120
17	4.2500	4.500	3.812	4.000		.110	4.000	4.663	4.500	.3921	.120
18	4.5000	4.750	4.062	4.250		.110	4.250	4.913	4.750	.3922	.120
19	4.7500	5.000	4.312	4.500		.110	4.500	5.163	5.000	.3923	.120
20	5.0000	5.250	4.562	4.750		.110	4.750	5.413	5.250	.3923	.120
21	5.2500	5.500	4.812	5.000		.110	5.000	5.663	5.500	.3923	.120
22	5.5000	5.750	5.062	5.250		.110	5.250	5.913	5.750	.3924	.120
23	5.7500	6.000	5.312	5.500		.110	5.500	6.163	6.000	.3924	.120
24	6.0000	6.250	5.562	5.750		.110	5.750	6.413	6.250	.3924	.120
25	6.2500	6.500	5.812	6.000		.110	6.000	6.688	6.500	.3924	.110
26	6.5000	6.750	6.062	6.250		.110	6.250	6.938	6.750	.3925	.110
27	6.7500	7.000	6.312	6.500		.110	6.500	7.188	7.000	.3925	.110
28	7.0000	7.250	6.562	6.750		.110	6.750	7.438	7.250	.3925	.110
29	7.2500	7.500	6.812	7.000		.110	7.000	7.688	7.500	.3925	.110
30	7.5000	7.750	7.062	7.250		.110	7.250	7.938	7.750	.3925	.110
31	7.7500	8.000	7.312	7.500		.110	7.500	8.188	8.000	.3925	.110
32	8.0000	8.250	7.562	7.750		.110	7.750	8.438	8.250	.3925	.110
33	8.2500	8.500	7.812	8.000		.110	8.000	8.688	8.500	.3925	.110
34	8.5000	8.750	8.062	8.250		.110	8.250	8.938	8.750	.3925	.110
35	8.7500	9.000	8.312	8.500		.110	8.500	9.188	9.000	.3926	.110
36	9.0000	9.250	8.562	8.750		.110	8.750	9.438	9.250	.3926	.110
37	9.2500	9.500	8.812	9.000		.110	9.000	9.688	9.500	.3926	.110
38	9.5000	9.750	9.062	9.250		.110	9.250	9.938	9.750	.3926	.110
39	9.7500	10.000	9.312	9.500		.110	9.500	10.188	10.000	.3926	.110
40	10.0000	10.250	9.562	9.750		.110	9.750	10.438	10.250	.3926	.110
41	10.2500	10.500	9.812	10.000		.110	10.000	10.688	10.500	.3926	.110
42	10.5000	10.750	10.062	10.250		.110	10.250	10.938	10.750	.3926	.110
43	10.7500	11.000	10.312	10.500		.110	10.500	11.188	11.000	.3926	.110
44	11.0000	11.250	10.562	10.750		.110	10.750	11.438	11.250	.3926	.110
45	11.2500	11.500	10.812	11.000		.110	11.000	11.688	11.500	.3926	.110
46	11.5000	11.750	11.062	11.250		.110	11.250	11.938	11.750	.3926	.110
47	11.7500	12.000	11.312	11.500		.110	11.500	12.188	12.000	.3926	.110
48	12.0000	12.250	11.562	11.750		.110	11.750	12.438	12.250	.3926	.110
49	12.2500	12.500	11.812	12.000		.110	12.000	12.688	12.500	.3926	.110
50	12.5000	12.750	12.062	12.250		.110	12.250	12.938	12.750	.3926	.110

See Note 2 on Page 6

/1/ Does not include involute clearance. See 7.3 and Table 17.

TABLE 5 - Dimensions for 5/10 Diametral Pitch Splines
30° Pressure Angle

No. of Teeth	Pitch Dia	External OD +.000 −.008	External RD +.000 −.025	External TIF Max /1/	External CH T T	External Approx R	Internal ID +.008 −.000	Internal RD +.025 −.000	Internal TIF Min /1/	Internal CH S Min (Basic)	Internal Approx R
8	1.6000	1.800	1.250	1.400		.090	1.400	1.930	1.800	.3121	.100
9	1.8000	2.000	1.450	1.600		.090	1.600	2.130	2.000	.3126	.100
10	2.0000	2.200	1.650	1.800		.090	1.800	2.330	2.200	.3129	.100
11	2.2000	2.400	1.850	2.000		.090	2.000	2.530	2.400	.3131	.100
12	2.4000	2.600	2.050	2.200		.090	2.200	2.730	2.600	.3133	.100
13	2.6000	2.800	2.250	2.400		.090	2.400	2.930	2.800	.3134	.100
14	2.8000	3.000	2.450	2.600		.090	2.600	3.130	3.000	.3135	.100
15	3.0000	3.200	2.650	2.800		.090	2.800	3.330	3.200	.3136	.100
16	3.2000	3.400	2.850	3.000		.090	3.000	3.530	3.400	.3137	.100
17	3.4000	3.600	3.050	3.200		.090	3.200	3.730	3.600	.3137	.100
18	3.6000	3.800	3.250	3.400		.090	3.400	3.930	3.800	.3138	.100
19	3.8000	4.000	3.450	3.600		.090	3.600	4.130	4.000	.3138	.100
20	4.0000	4.200	3.650	3.800		.090	3.800	4.330	4.200	.3138	.100
21	4.2000	4.400	3.850	4.000		.090	4.000	4.530	4.400	.3139	.100
22	4.4000	4.600	4.050	4.200		.090	4.200	4.730	4.600	.3139	.100
23	4.6000	4.800	4.250	4.400		.090	4.400	4.930	4.800	.3139	.100
24	4.8000	5.000	4.450	4.600		.090	4.600	5.130	5.000	.3139	.100
25	5.0000	5.200	4.650	4.800		.090	4.800	5.350	5.200	.3140	.090
26	5.2000	5.400	4.850	5.000		.090	5.000	5.550	5.400	.3140	.090
27	5.4000	5.600	5.050	5.200		.090	5.200	5.750	5.600	.3140	.090
28	5.6000	5.800	5.250	5.400		.090	5.400	5.950	5.800	.3140	.090
29	5.8000	6.000	5.450	5.600		.090	5.600	6.150	6.000	.3140	.090
30	6.0000	6.200	5.650	5.800		.090	5.800	6.350	6.200	.3140	.090
31	6.2000	6.400	5.850	6.000		.090	6.000	6.550	6.400	.3140	.090
32	6.4000	6.600	6.050	6.200		.090	6.200	6.750	6.600	.3140	.090
33	6.6000	6.800	6.250	6.400		.090	6.400	6.950	6.800	.3140	.090
34	6.8000	7.000	6.450	6.600		.090	6.600	7.150	7.000	.3140	.090
35	7.0000	7.200	6.650	6.800		.090	6.800	7.350	7.200	.3140	.090
36	7.2000	7.400	6.850	7.000		.090	7.000	7.550	7.400	.3141	.090
37	7.4000	7.600	7.050	7.200		.090	7.200	7.750	7.600	.3141	.090
38	7.6000	7.800	7.250	7.400		.090	7.400	7.950	7.800	.3141	.090
39	7.8000	8.000	7.450	7.600		.090	7.600	8.150	8.000	.3141	.090
40	8.0000	8.200	7.650	7.800		.090	7.800	8.350	8.200	.3141	.090
41	8.2000	8.400	7.850	8.000		.090	8.000	8.550	8.400	.3141	.090
42	8.4000	8.600	8.050	8.200		.090	8.200	8.750	8.600	.3141	.090
43	8.6000	8.800	8.250	8.400		.090	8.400	8.950	8.800	.3141	.090
44	8.8000	9.000	8.450	8.600		.090	8.600	9.150	9.000	.3141	.090
45	9.0000	9.200	8.650	8.800		.090	8.800	9.350	9.200	.3141	.090
46	9.2000	9.400	8.850	9.000		.090	9.000	9.550	9.400	.3141	.090
47	9.4000	9.600	9.050	9.200		.090	9.200	9.750	9.600	.3141	.090
48	9.6000	9.800	9.250	9.400		.090	9.400	9.950	9.800	.3141	.090
49	9.8000	10.000	9.450	9.600		.090	9.600	10.150	10.000	.3141	.090
50	10.0000	10.200	9.650	9.800		.090	9.800	10.350	10.200	.3141	.090

See Note 2 on Page 6

/1/ Does not include involute clearance. See 7.2, 7.3, and Table 17.

TABLE 6 - Dimensions for 6/12 Diametral Pitch Splines
30° Pressure Angle

No. of Teeth	Pitch Dia	External OD +.000 −.005	External RD +.000 −.020	External TIF Max /1/	External CH T T	External Approx R	Internal ID +.005 −.000	Internal RD +.020 −.000	Internal TIF Min /1/	Internal CH S Min (Basic)	Internal Approx R
8	1.3333	1.500	1.032	1.167		.080	1.167	1.607	1.500	.2601	.080
9	1.5000	1.667	1.199	1.333		.080	1.333	1.774	1.667	.2605	.080
10	1.6667	1.833	1.365	1.500		.080	1.500	1.941	1.833	.2607	.080
11	1.8333	2.000	1.532	1.667		.080	1.667	2.107	2.000	.2609	.080
12	2.0000	2.167	1.699	1.833		.080	1.833	2.274	2.167	.2611	.080
13	2.1667	2.333	1.865	2.000		.080	2.000	2.441	2.333	.2612	.080
14	2.3333	2.500	2.032	2.167		.080	2.167	2.607	2.500	.2613	.080
15	2.5000	2.667	2.199	2.333		.080	2.333	2.774	2.667	.2613	.080
16	2.6667	2.833	2.365	2.500		.080	2.500	2.941	2.833	.2614	.080
17	2.8333	3.000	2.532	2.667		.080	2.667	3.107	3.000	.2614	.080
18	3.0000	3.167	2.699	2.833		.080	2.833	3.274	3.167	.2615	.080
19	3.1667	3.333	2.865	3.000		.080	3.000	3.441	3.333	.2615	.080
20	3.3333	3.500	3.032	3.167		.080	3.167	3.607	3.500	.2615	.080
21	3.5000	3.667	3.199	3.333		.080	3.333	3.774	3.667	.2616	.080
22	3.6667	3.833	3.365	3.500		.080	3.500	3.941	3.833	.2616	.080
23	3.8333	4.000	3.532	3.667		.080	3.667	4.107	4.000	.2616	.080
24	4.0000	4.167	3.699	3.833		.080	3.833	4.274	4.167	.2616	.080
25	4.1667	4.333	3.865	4.000		.080	4.000	4.441	4.333	.2616	.080
26	4.3333	4.500	4.032	4.167		.080	4.167	4.607	4.500	.2617	.080
27	4.5000	4.667	4.199	4.333		.080	4.333	4.774	4.667	.2617	.080
28	4.6667	4.833	4.365	4.500		.080	4.500	4.941	4.833	.2617	.080
29	4.8333	5.000	4.532	4.667		.080	4.667	5.107	5.000	.2617	.080
30	5.0000	5.167	4.699	4.833		.080	4.833	5.301	5.167	.2617	.070
31	5.1667	5.333	4.865	5.000		.080	5.000	5.468	5.333	.2617	.070
32	5.3333	5.500	5.032	5.167		.080	5.167	5.635	5.500	.2617	.070
33	5.5000	5.667	5.199	5.333		.080	5.333	5.801	5.667	.2617	.070
34	5.6667	5.833	5.365	5.500		.080	5.500	5.968	5.833	.2617	.070
35	5.8333	6.000	5.532	5.667		.080	5.667	6.135	6.000	.2617	.070
36	6.0000	6.167	5.699	5.833		.080	5.833	6.301	6.167	.2617	.070
37	6.1667	6.333	5.865	6.000		.080	6.000	6.468	6.333	.2617	.070
38	6.3333	6.500	6.032	6.167		.080	6.167	6.635	6.500	.2617	.070
39	6.5000	6.667	6.199	6.333		.080	6.333	6.801	6.667	.2617	.070
40	6.6667	6.833	6.365	6.500		.080	6.500	6.968	6.833	.2617	.070
41	6.8333	7.000	6.532	6.667		.080	6.667	7.135	7.000	.2617	.070
42	7.0000	7.167	6.699	6.833		.080	6.833	7.301	7.167	.2617	.070
43	7.1667	7.333	6.865	7.000		.080	7.000	7.468	7.333	.2617	.070
44	7.3333	7.500	7.032	7.167		.080	7.167	7.635	7.500	.2617	.070
45	7.5000	7.667	7.199	7.333		.080	7.333	7.801	7.667	.2617	.070
46	7.6667	7.833	7.365	7.500		.080	7.500	7.968	7.833	.2618	.070
47	7.8333	8.000	7.532	7.667		.080	7.667	8.135	8.000	.2618	.070
48	8.0000	8.167	7.699	7.833		.080	7.833	8.301	8.167	.2618	.070
49	8.1667	8.333	7.865	8.000		.080	8.000	8.468	8.333	.2618	.070
50	8.3333	8.500	8.032	8.167		.080	8.167	8.635	8.500	.2618	.070

See Note 2 on Page 6

/1/ Does not include involute clearance. See 7.2, 7.3, and Table 17.

TABLE 7 - Dimensions for 8/16 Diametral Pitch Splines
30° Pressure Angle

No. of Teeth	Pitch Dia	External OD +.000 −.005	External RD +.000 −.020	External TIF Max /1/	External CH T T	External Approx R	Internal ID +.005 −.000	Internal RD +.020 −.000	Internal TIF Min /1/	Internal CH S Min (Basic)	Internal Approx R
8	1.0000	1.125	.775	.875		.060	.875	1.210	1.125	.1951	.060
9	1.1250	1.250	.900	1.000		.060	1.000	1.335	1.250	.1954	.060
10	1.2500	1.375	1.025	1.125		.060	1.125	1.460	1.375	.1955	.060
11	1.3750	1.500	1.150	1.250		.060	1.250	1.585	1.500	.1957	.060
12	1.5000	1.625	1.275	1.375		.060	1.375	1.710	1.625	.1958	.060
13	1.6250	1.750	1.400	1.500		.060	1.500	1.835	1.750	.1959	.060
14	1.7500	1.875	1.525	1.625		.060	1.625	1.960	1.875	.1959	.060
15	1.8750	2.000	1.650	1.750		.060	1.750	2.085	2.000	.1960	.060
16	2.0000	2.125	1.775	1.875		.060	1.875	2.210	2.125	.1960	.060
17	2.1250	2.250	1.900	2.000		.060	2.000	2.335	2.250	.1961	.060
18	2.2500	2.375	2.025	2.125		.060	2.125	2.460	2.375	.1961	.060
19	2.3750	2.500	2.150	2.250		.060	2.250	2.585	2.500	.1961	.060
20	2.5000	2.625	2.275	2.375		.060	2.375	2.710	2.625	.1961	.060
21	2.6250	2.750	2.400	2.500		.060	2.500	2.835	2.750	.1962	.060
22	2.7500	2.875	2.525	2.625		.060	2.625	2.960	2.875	.1962	.060
23	2.8750	3.000	2.650	2.750		.060	2.750	3.085	3.000	.1962	.060
24	3.0000	3.125	2.775	2.875		.060	2.875	3.210	3.125	.1962	.060
25	3.1250	3.250	2.900	3.000		.060	3.000	3.335	3.250	.1962	.060
26	3.2500	3.375	3.025	3.125		.060	3.125	3.460	3.375	.1962	.060
27	3.3750	3.500	3.150	3.250		.060	3.250	3.585	3.500	.1962	.060
28	3.5000	3.625	3.275	3.375		.060	3.375	3.710	3.625	.1962	.060
29	3.6250	3.750	3.400	3.500		.060	3.500	3.835	3.750	.1962	.060
30	3.7500	3.875	3.525	3.625		.060	3.625	3.960	3.875	.1963	.060
31	3.8750	4.000	3.650	3.750		.060	3.750	4.085	4.000	.1963	.060
32	4.0000	4.125	3.775	3.875		.060	3.875	4.210	4.125	.1963	.060
33	4.1250	4.250	3.900	4.000		.060	4.000	4.335	4.250	.1963	.060
34	4.2500	4.375	4.025	4.125		.060	4.125	4.460	4.375	.1963	.060
35	4.3750	4.500	4.150	4.250		.060	4.250	4.585	4.500	.1963	.060
36	4.5000	4.625	4.275	4.375		.060	4.375	4.710	4.625	.1963	.060
37	4.6250	4.750	4.400	4.500		.060	4.500	4.850	4.750	.1963	.055
38	4.7500	4.875	4.525	4.625		.060	4.625	4.975	4.875	.1963	.055
39	4.3750	5.000	4.650	4.750		.060	4.750	5.100	5.000	.1963	.055
40	5.0000	5.125	4.775	4.875		.060	4.875	5.225	5.125	.1963	.055
41	5.1250	5.250	4.900	5.000		.060	5.000	5.350	5.250	.1963	.055
42	5.2500	5.375	5.025	5.125		.060	5.125	5.475	5.375	.1963	.055
43	5.3750	5.500	5.150	5.250		.060	5.250	5.600	5.500	.1963	.055
44	5.5000	5.625	5.275	5.375		.060	5.375	5.725	5.625	.1963	.055
45	5.6250	5.750	5.400	5.500		.060	5.500	5.850	5.750	.1963	.055
46	5.7500	5.875	5.525	5.625		.060	5.625	5.975	5.875	.1963	.055
47	5.8750	6.000	5.650	5.750		.060	5.750	6.100	6.000	.1963	.055
48	6.0000	6.125	5.775	5.875		.060	5.875	6.225	6.125	.1963	.055
49	6.1250	6.250	5.900	6.000		.060	6.000	6.350	6.250	.1963	.055
50	6.2500	6.375	6.025	6.125		.060	6.125	6.475	6.375	.1963	.055

See Note 2 on Page 6

/1/ Does not include involute clearance. See 7.2, 7.3, and Table 17.

TABLE 8 - Dimensions for 10/20 Diametral Pitch Splines
30° Pressure Angle

No. of Teeth	Pitch Dia	External OD +.000 −.005	External RD +.000 −.020	External TIF Max /1/	External CH T T	External Approx R	Internal ID +.005 −.000	Internal RD +.020 −.000	Internal TIF Min /1/	Internal CH S Min (Basic)	Internal Approx R
8	.8000	.900	.620	.700		.050	.700	.970	.900	.1561	.045
9	.9000	1.000	.720	.800		.050	.800	1.070	1.000	.1563	.045
10	1.0000	1.100	.820	.900		.050	.900	1.170	1.100	.1564	.045
11	1.1000	1.200	.920	1.000		.050	1.000	1.270	1.200	.1565	.045
12	1.2000	1.300	1.020	1.100		.050	1.100	1.370	1.300	.1566	.045
13	1.3000	1.400	1.120	1.200		.050	1.200	1.470	1.400	.1567	.045
14	1.4000	1.500	1.220	1.300		.050	1.300	1.570	1.500	.1568	.045
15	1.5000	1.600	1.320	1.400		.050	1.400	1.670	1.600	.1568	.045
16	1.6000	1.700	1.420	1.500		.050	1.500	1.770	1.700	.1568	.045
17	1.7000	1.800	1.520	1.600		.050	1.600	1.870	1.800	.1569	.045
18	1.8000	1.900	1.620	1.700		.050	1.700	1.970	1.900	.1569	.045
19	1.9000	2.000	1.720	1.800		.050	1.800	2.070	2.000	.1569	.045
20	2.0000	2.100	1.820	1.900		.045	1.900	2.170	2.100	.1569	.045
21	2.1000	2.200	1.920	2.000		.045	2.000	2.270	2.200	.1569	.045
22	2.2000	2.300	2.020	2.100		.045	2.100	2.370	2.300	.1569	.045
23	2.3000	2.400	2.120	2.200		.045	2.200	2.470	2.400	.1570	.045
24	2.4000	2.500	2.220	2.300		.045	2.300	2.570	2.500	.1570	.045
25	2.5000	2.600	2.320	2.400		.045	2.400	2.670	2.600	.1570	.045
26	2.6000	2.700	2.420	2.500		.045	2.500	2.770	2.700	.1570	.045
27	2.7000	2.800	2.520	2.600		.045	2.600	2.870	2.800	.1570	.045
28	2.8000	2.900	2.620	2.700		.045	2.700	2.970	2.900	.1570	.045
29	2.9000	3.000	2.720	2.800		.045	2.800	3.070	3.000	.1570	.045
30	3.0000	3.100	2.820	2.900		.045	2.900	3.170	3.100	.1570	.045
31	3.1000	3.200	2.920	3.000		.045	3.000	3.270	3.200	.1570	.045
32	3.2000	3.300	3.020	3.100		.045	3.100	3.370	3.300	.1570	.045
33	3.3000	3.400	3.120	3.200		.045	3.200	3.470	3.400	.1570	.045
34	3.4000	3.500	3.220	3.300		.045	3.300	3.570	3.500	.1570	.045
35	3.5000	3.600	3.320	3.400		.045	3.400	3.670	3.600	.1570	.045
36	3.6000	3.700	3.420	3.500		.045	3.500	3.770	3.700	.1570	.045
37	3.7000	3.800	3.520	3.600		.045	3.600	3.870	3.800	.1570	.045
38	3.8000	3.900	3.620	3.700		.045	3.700	3.970	3.900	.1570	.045
39	3.9000	4.000	3.720	3.800		.045	3.800	4.070	4.000	.1570	.045
40	4.0000	4.100	3.820	3.900		.045	3.900	4.170	4.100	.1570	.045
41	4.1000	4.200	3.920	4.000		.045	4.000	4.270	4.200	.1570	.045
42	4.2000	4.300	4.020	4.100		.045	4.100	4.380	4.300	.1570	.040
43	4.3000	4.400	4.120	4.200		.045	4.200	4.480	4.400	.1570	.040
44	4.4000	4.500	4.220	4.300		.045	4.300	4.580	4.500	.1570	.040
45	4.5000	4.600	4.320	4.400		.045	4.400	4.680	4.600	.1570	.040
46	4.6000	4.700	4.420	4.500		.045	4.500	4.780	4.700	.1570	.040
47	4.7000	4.800	4.520	4.600		.045	4.600	4.880	4.800	.1570	.040
48	4.8000	4.900	4.620	4.700		.045	4.700	4.980	4.900	.1570	.040
49	4.9000	5.000	4.720	4.800		.045	4.800	5.080	5.000	.1570	.040
50	5.0000	5.100	4.820	4.900		.045	4.900	5.180	5.100	.1571	.040

See Note 2 on Page 6

/1/ Does not include involute clearance. See 7.2, 7.3, and Table 17.

TABLE 9 - Dimensions for 12/24 Diametral Pitch Splines
30° Pressure Angle

No. of Teeth	Pitch Dia	External OD +.000 −.005	External RD +.000 −.020	External TIF Max /1/	External CH T T	External Approx R	Internal ID +.005 −.000	Internal RD +.020 −.000	Internal TIF Min /1/	Internal CH S Min (Basic)	Internal Approx R
8	.6667	.750	.517	.583		.040	.583	.812	.750	.1301	.035
9	.7500	.833	.600	.667		.040	.667	.895	.833	.1302	.035
10	.8333	.917	.684	.750		.040	.750	.978	.917	.1304	.035
11	.9167	1.000	.767	.833		.040	.833	1.062	1.000	.1305	.035
12	1.0000	1.083	.850	.917		.040	.917	1.145	1.083	.1305	.035
13	1.0833	1.167	.934	1.000		.040	1.000	1.228	1.167	.1306	.035
14	1.1667	1.250	1.017	1.083		.040	1.083	1.312	1.250	.1306	.035
15	1.2500	1.333	1.100	1.167		.040	1.167	1.395	1.333	.1307	.035
16	1.3333	1.417	1.184	1.250		.040	1.250	1.478	1.417	.1307	.035
17	1.4167	1.500	1.267	1.333		.040	1.333	1.562	1.500	.1307	.035
18	1.5000	1.583	1.350	1.417		.040	1.417	1.645	1.583	.1307	.035
19	1.5833	1.667	1.434	1.500		.040	1.500	1.728	1.667	.1308	.035
20	1.6667	1.750	1.517	1.583		.040	1.583	1.812	1.750	.1308	.035
21	1.7500	1.833	1.600	1.667		.035	1.667	1.895	1.833	.1308	.035
22	1.8333	1.917	1.684	1.750		.035	1.750	1.978	1.917	.1308	.035
23	1.9167	2.000	1.767	1.833		.035	1.833	2.062	2.000	.1308	.035
24	2.0000	2.083	1.850	1.917		.035	1.917	2.145	2.083	.1308	.035
25	2.0833	2.167	1.934	2.000		.035	2.000	2.228	2.167	.1308	.035
26	2.1667	2.250	2.017	2.083		.035	2.083	2.312	2.250	.1308	.035
27	2.2500	2.333	2.100	2.167		.035	2.167	2.395	2.333	.1308	.035
28	2.3333	2.417	2.184	2.250		.035	2.250	2.478	2.417	.1308	.035
29	2.4167	2.500	2.267	2.333		.035	2.333	2.562	2.500	.1308	.035
30	2.5000	2.583	2.350	2.417	See Note 2 on Page 6	.035	2.417	2.645	2.583	.1308	.035
31	2.5833	2.667	2.434	2.500		.035	2.500	2.728	2.667	.1308	.035
32	2.6667	2.750	2.517	2.583		.035	2.583	2.812	2.750	.1308	.035
33	2.7500	2.833	2.600	2.667		.035	2.667	2.895	2.833	.1308	.035
34	2.8333	2.917	2.684	2.750		.035	2.750	2.978	2.917	.1308	.035
35	2.9167	3.000	2.767	2.833		.035	2.833	3.062	3.000	.1309	.035
36	3.0000	3.083	2.850	2.917		.035	2.917	3.145	3.083	.1309	.035
37	3.0833	3.167	2.934	3.000		.035	3.000	3.223	3.167	.1309	.035
38	3.1667	3.250	3.017	3.083		.035	3.083	3.312	3.250	.1309	.035
39	3.2500	3.333	3.100	3.167		.035	3.167	3.395	3.333	.1309	.035
40	3.3333	3.417	3.184	3.250		.035	3.250	3.478	3.417	.1309	.035
41	3.4167	3.500	3.267	3.333		.035	3.333	3.562	3.500	.1309	.035
42	3.5000	3.583	3.350	3.417		.035	3.417	3.645	3.583	.1309	.035
43	3.5833	3.667	3.434	3.500		.035	3.500	3.728	3.667	.1309	.035
44	3.6667	3.750	3.517	3.583		.035	3.583	3.812	3.750	.1309	.035
45	3.7500	3.833	3.600	3.667		.035	3.667	3.895	3.833	.1309	.035
46	3.8333	3.917	3.684	3.750		.035	3.750	3.978	3.917	.1309	.035
47	3.9167	4.000	3.767	3.833		.035	3.833	4.062	4.000	.1309	.035
48	4.0000	4.083	3.850	3.917		.035	3.917	4.150	4.083	.1309	.030
49	4.0833	4.167	3.934	4.000		.035	4.000	4.233	4.167	.1309	.030
50	4.1667	4.250	4.017	4.083		.035	4.083	4.316	4.250	.1309	.030

/1/ Does not include involute clearance. See 7.2, 7.3, and Table 17.

TABLE 10 - Dimensions for 16/32 Diametral Pitch Splines
30° Pressure Angle

No. of Teeth	Pitch Dia	External OD +.000 −.005	External RD +.000 −.020	External TIF Max /1/	External CH T T	External Approx R	Internal ID +.005 −.000	Internal RD +.020 −.000	Internal TIF Min /1/	Internal CH S Min (Basic)	Internal Approx R
8	.5000	.562	.375	.438		.020	.438	.611	.562	.0975	.020
9	.5625	.625	.438	.500		.020	.500	.674	.625	.0977	.020
10	.6250	.688	.500	.562		.020	.562	.736	.688	.0978	.020
11	.6875	.750	.562	.625		.020	.625	.798	.750	.0978	.020
12	.7500	.812	.625	.688		.020	.688	.861	.812	.0979	.020
13	.8125	.875	.688	.750		.020	.750	.924	.875	.0979	.020
14	.8750	.938	.750	.812		.020	.812	.986	.938	.0980	.020
15	.9375	1.000	.812	.875		.020	.875	1.048	1.000	.0980	.020
16	1.0000	1.062	.875	.938		.020	.938	1.111	1.062	.0980	.020
17	1.0625	1.125	.938	1.000		.020	1.000	1.174	1.125	.0980	.020
18	1.1250	1.188	1.000	1.062		.020	1.062	1.236	1.188	.0981	.020
19	1.1875	1.250	1.062	1.125		.020	1.125	1.298	1.250	.0981	.020
20	1.2500	1.312	1.125	1.188		.020	1.188	1.361	1.312	.0981	.020
21	1.3125	1.375	1.188	1.250		.020	1.250	1.424	1.375	.0981	.020
22	1.3750	1.438	1.250	1.312		.020	1.312	1.486	1.438	.0981	.020
23	1.4375	1.500	1.312	1.375		.020	1.375	1.548	1.500	.0981	.020
24	1.5000	1.562	1.375	1.438		.020	1.438	1.611	1.562	.0981	.020
25	1.5625	1.625	1.438	1.500		.020	1.500	1.674	1.625	.0981	.020
26	1.6250	1.688	1.500	1.562		.020	1.562	1.736	1.688	.0981	.020
27	1.6875	1.750	1.562	1.625		.020	1.625	1.798	1.750	.0981	.020
28	1.7500	1.812	1.625	1.688		.020	1.688	1.861	1.812	.0981	.020
29	1.8125	1.875	1.688	1.750		.020	1.750	1.924	1.875	.0981	.020
30	1.8750	1.938	1.750	1.812		.020	1.812	1.986	1.938	.0981	.020
31	1.9375	2.000	1.812	1.875		.020	1.875	2.048	2.000	.0981	.020
32	2.0000	2.062	1.875	1.938		.020	1.938	2.111	2.062	.0981	.020
33	2.0625	2.125	1.938	2.000		.020	2.000	2.174	2.125	.0981	.020
34	2.1250	2.188	2.000	2.062		.020	2.062	2.236	2.188	.0981	.020
35	2.1875	2.250	2.062	2.125		.020	2.125	2.298	2.250	.0981	.020
36	2.2500	2.312	2.125	2.188		.020	2.188	2.361	2.312	.0981	.020
37	2.3125	2.375	2.188	2.250		.020	2.250	2.424	2.375	.0981	.020
38	2.3750	2.438	2.250	2.312		.020	2.312	2.486	2.438	.0981	.020
39	2.4375	2.500	2.312	2.375		.020	2.375	2.548	2.500	.0982	.020
40	2.5000	2.562	2.375	2.438		.020	2.438	2.611	2.562	.0982	.020
41	2.5625	2.625	2.438	2.500		.020	2.500	2.674	2.625	.0982	.020
42	2.6250	2.688	2.500	2.562		.020	2.562	2.736	2.688	.0982	.020
43	2.6875	2.750	2.562	2.625		.020	2.625	2.798	2.750	.0982	.020
44	2.7500	2.812	2.625	2.688		.020	2.688	2.861	2.812	.0982	.020
45	2.8125	2.875	2.688	2.750		.020	2.750	2.924	2.875	.0982	.020
46	2.8750	2.938	2.750	2.812		.020	2.812	2.986	2.938	.0982	.020
47	2.9375	3.000	2.812	2.875		.020	2.875	3.048	3.000	.0982	.020
48	3.0000	3.062	2.875	2.938		.020	2.938	3.111	3.062	.0982	.020
49	3.0625	3.125	2.938	3.000		.020	3.000	3.174	3.125	.0982	.020
50	3.1250	3.188	3.000	3.062		.020	3.062	3.236	3.188	.0982	.020

See Note 2 on Page 6

/1/ Does not include involute clearance. See 7.2, 7.3, and Table 17.

TABLE 11 - Dimensions for 20/40 Diametral Pitch Splines
30° Pressure Angle

No. of Teeth	Pitch Dia	External OD +.000 −.005	External RD +.000 −.020	External TIF Max /1/	External CH T T	External Approx R	Internal ID +.005 −.000	Internal RD +.020 −.000	Internal TIF Min /1/	Internal CH S Min (Basic)	Internal Approx R
8	.4000	.450	.300	.350		.018	.350	.485	.450	.0780	.018
9	.4500	.500	.350	.400		.018	.400	.535	.500	.0781	.018
10	.5000	.550	.400	.450		.018	.450	.585	.550	.0782	.018
11	.5500	.600	.450	.500		.018	.500	.635	.600	.0783	.018
12	.6000	.650	.500	.550		.018	.550	.685	.650	.0783	.018
13	.6500	.700	.550	.600		.018	.600	.735	.700	.0783	.018
14	.7000	.750	.600	.650		.018	.650	.785	.750	.0784	.018
15	.7500	.800	.650	.700		.018	.700	.835	.800	.0784	.018
16	.8000	.850	.700	.750		.018	.750	.885	.850	.0784	.018
17	.8500	.900	.750	.800		.018	.800	.935	.900	.0784	.018
18	.9000	.950	.800	.850		.018	.850	.985	.950	.0784	.018
19	.9500	1.000	.850	.900		.018	.900	1.035	1.000	.0785	.018
20	1.0000	1.050	.900	.950		.018	.950	1.085	1.050	.0785	.018
21	1.0500	1.100	.950	1.000		.018	1.000	1.135	1.100	.0785	.018
22	1.1000	1.150	1.000	1.050		.018	1.050	1.185	1.150	.0785	.018
23	1.1500	1.200	1.050	1.100		.018	1.100	1.235	1.200	.0785	.018
24	1.2000	1.250	1.100	1.150		.018	1.150	1.285	1.250	.0785	.018
25	1.2500	1.300	1.150	1.200		.018	1.200	1.335	1.300	.0785	.018
26	1.3000	1.350	1.200	1.250		.018	1.250	1.385	1.350	.0785	.018
27	1.3500	1.400	1.250	1.300		.018	1.300	1.435	1.400	.0785	.018
28	1.4000	1.450	1.300	1.350		.018	1.350	1.485	1.450	.0785	.018
29	1.4500	1.500	1.350	1.400		.018	1.400	1.535	1.500	.0785	.018
30	1.5000	1.550	1.400	1.450	See Note 2 on Page 6	.018	1.450	1.585	1.550	.0785	.018
31	1.5500	1.600	1.450	1.500		.018	1.500	1.635	1.600	.0785	.018
32	1.6000	1.650	1.500	1.550		.018	1.550	1.685	1.650	.0785	.018
33	1.6500	1.700	1.550	1.600		.018	1.600	1.735	1.700	.0785	.018
34	1.7000	1.750	1.600	1.650		.018	1.650	1.785	1.750	.0785	.018
35	1.7500	1.800	1.650	1.700		.018	1.700	1.835	1.800	.0785	.018
36	1.8000	1.850	1.700	1.750		.018	1.750	1.885	1.850	.0785	.018
37	1.8500	1.900	1.750	1.800		.018	1.800	1.935	1.900	.0785	.018
38	1.9000	1.950	1.800	1.850		.018	1.850	1.985	1.950	.0785	.018
39	1.9500	2.000	1.850	1.900		.018	1.900	2.035	2.000	.0785	.018
40	2.0000	2.050	1.900	1.950		.018	1.950	2.085	2.050	.0785	.018
41	2.0500	2.100	1.950	2.000		.018	2.000	2.135	2.100	.0785	.018
42	2.1000	2.150	2.000	2.050		.018	2.050	2.185	2.150	.0785	.018
43	2.1500	2.200	2.050	2.100		.018	2.100	2.235	2.200	.0785	.018
44	2.2000	2.250	2.100	2.150		.018	2.150	2.285	2.250	.0785	.018
45	2.2500	2.300	2.150	2.200		.018	2.200	2.335	2.300	.0785	.018
46	2.3000	2.350	2.200	2.250		.018	2.250	2.385	2.350	.0785	.018
47	2.3500	2.400	2.250	2.300		.018	2.300	2.435	2.400	.0785	.018
48	2.4000	2.450	2.300	2.350		.018	2.350	2.485	2.450	.0785	.018
49	2.4500	2.500	2.350	2.400		.018	2.400	2.535	2.500	.0785	.018
50	2.5000	2.550	2.400	2.450		.018	2.450	2.585	2.550	.0785	.018

/1/ Does not include involute clearance. See 7.2, 7.3, and Table 17.

TABLE 12 - Dimensions for 24/48 Diametral Pitch Splines
30° Pressure Angle

No. of Teeth	Pitch Dia	External OD +.000 −.005	External RD +.000 −.015	External TIF Max /1/	External CH T T	External Approx R	Internal ID +.005 −.000	Internal RD +.015 −.000	Internal TIF Min /1/	Internal CH S Min (Basic)	Internal Approx R
8	.3333	.375	.250	.292		.015	.292	.404	.375	.0650	.015
9	.3750	.417	.292	.333		.015	.333	.446	.417	.0651	.015
10	.4167	.458	.333	.375		.015	.375	.488	.458	.0652	.015
11	.4583	.500	.375	.417		.015	.417	.529	.500	.0652	.015
12	.5000	.542	.417	.458		.015	.458	.571	.542	.0653	.015
13	.5417	.583	.458	.500		.015	.500	.613	.583	.0653	.015
14	.5833	.625	.500	.542		.015	.542	.654	.625	.0653	.015
15	.6250	.667	.542	.583		.015	.583	.696	.667	.0653	.015
16	.6667	.708	.583	.625		.015	.625	.738	.708	.0653	.015
17	.7083	.750	.625	.667		.015	.667	.779	.750	.0654	.015
18	.7500	.792	.667	.708		.015	.708	.821	.792	.0654	.015
19	.7917	.833	.708	.750		.015	.750	.863	.833	.0654	.015
20	.8333	.875	.750	.792		.015	.792	.904	.875	.0654	.015
21	.8750	.917	.792	.833		.015	.833	.946	.917	.0654	.015
22	.9167	.958	.833	.875		.015	.875	.988	.958	.0654	.015
23	.9583	1.000	.875	.917		.015	.917	1.029	1.000	.0654	.015
24	1.0000	1.042	.917	.958		.015	.958	1.071	1.042	.0654	.015
25	1.0417	1.083	.958	1.000		.015	1.000	1.113	1.083	.0654	.015
26	1.0833	1.125	1.000	1.042		.015	1.042	1.154	1.125	.0654	.015
27	1.1250	1.167	1.042	1.083		.015	1.083	1.196	1.167	.0654	.015
28	1.1667	1.208	1.083	1.125		.015	1.125	1.238	1.208	.0654	.015
29	1.2083	1.250	1.125	1.167		.015	1.167	1.279	1.250	.0654	.015
30	1.2500	1.292	1.167	1.208		.015	1.208	1.321	1.292	.0654	.015
31	1.2917	1.333	1.208	1.250		.015	1.250	1.363	1.333	.0654	.015
32	1.3333	1.375	1.250	1.292		.015	1.292	1.404	1.375	.0654	.015
33	1.3750	1.417	1.292	1.333		.015	1.333	1.446	1.417	.0654	.015
34	1.4167	1.458	1.333	1.375		.015	1.375	1.488	1.458	.0654	.015
35	1.4583	1.500	1.375	1.417		.015	1.417	1.529	1.500	.0654	.015
36	1.5000	1.542	1.417	1.458		.015	1.458	1.571	1.542	.0654	.015
37	1.5417	1.583	1.458	1.500		.015	1.500	1.613	1.583	.0654	.015
38	1.5833	1.625	1.500	1.542		.015	1.542	1.654	1.625	.0654	.015
39	1.6250	1.667	1.542	1.583		.015	1.583	1.696	1.667	.0654	.015
40	1.6667	1.708	1.583	1.625		.015	1.625	1.738	1.708	.0654	.015
41	1.7083	1.750	1.625	1.667		.015	1.667	1.779	1.750	.0654	.015
42	1.7500	1.792	1.667	1.708		.015	1.708	1.821	1.792	.0654	.015
43	1.7917	1.833	1.708	1.750		.015	1.750	1.863	1.833	.0654	.015
44	1.8333	1.875	1.750	1.792		.015	1.792	1.904	1.875	.0654	.015
45	1.8750	1.917	1.792	1.833		.015	1.833	1.946	1.917	.0654	.015
46	1.9167	1.958	1.833	1.875		.015	1.875	1.988	1.958	.0654	.015
47	1.9583	2.000	1.875	1.917		.015	1.917	2.029	2.000	.0654	.015
48	2.0000	2.042	1.917	1.958		.015	1.958	2.071	2.042	.0654	.015
49	2.0417	2.083	1.958	2.000		.015	2.000	2.113	2.083	.0654	.015
50	2.0833	2.125	2.000	2.042		.015	2.042	2.154	2.125	.0654	.015

See Note 2 on Page 6

/1/ Does not include involute clearance. See 7.2, 7.3, and Table 17.