

## I. FUNDAMENTAL PRINCIPLES

A. The primary object of this standard is to provide efficient, durable and easily fabricated splines applicable to very nearly all conditions with a minimum of restrictions and limitations. In order to meet special requirements, a deviation from this standard may be necessary.

B. This is a shallow depth side bearing spline featuring a  $30^\circ$  pressure angle and a full radius at the root of the teeth to decrease the stress concentration at the root to a minimum.

C. This standard incorporates a stubbed tooth form. The numerator or basic pitches are 10 in number ranging from 6 to 48. The depth or denominator pitch being twice the basic pitch, ranges from 12 to 96. The table of basic tooth proportions covers from 12 to an indefinite number of teeth for pitches  $6/12$ ,  $8/16$ ,  $10/20$ ,  $12/24$ ,  $16/32$ ,  $20/40$  and  $24/48$  and from 8 to an indefinite number of teeth for pitches  $32/64$ ,  $40/80$  and  $48/96$ . The tables of dimensions cover from 8 to 50 teeth with pitch diameters from .1667 to 8.333. To use a spline with less than 12 teeth for pitches  $24/48$  and larger teeth, it is suggested that the tooth form be laid out to check for possible tool interferences 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 for 50 teeth or as specified in Table I, Basic Tooth Dimensions.

## II. SPLINE TOOTH NOMENCLATURE

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

## III. METHOD OF DIMENSIONING SPLINES

A. Figure 2 contains the required data to be incorporated on the engineering drawing with an illustration to clarify the dimensions. The dimensions and tolerances may be taken from the tables entitled "Dimensions for Splines." The method of calculating the basic chordal space and basic chordal tooth thickness is indicated on Page 2.

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

## IV. BASIC TOOTH PROPORTION

C. Table I is a table of basic tooth proportions. It is to be noted that the amount of land clearance of the teeth is considerably greater than on a gear of corresponding pitch, this being necessary 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 on P. 5)

Page 2 of 15 pages

IV. BASIC TOOTH PROPORTION  
(Continued)

B. The true involute form diameter for the external spline is given in the table as the maximum diameter and is the same as the basic I. D. of the internal spline. This diameter may be decreased to obtain the involute clearance desired. This also applies to the true involute form diameter for the internal spline which is given in the tables as the minimum diameter and is the O.D. of the external spline. In this case the diameter may be increased to give clearance if an exceptionally loose fit is used.

C. 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.

V. DIMENSIONS FOR SPLINES

Tables II to XI inclusive show spline dimensions with tolerances as calculated from the basic tooth dimensions, Table I.

VI. FORMULAEEXTERNAL & INTERNAL SPLINES

CIRCULAR PITCH =  $3.1416 / \text{DIAMETRAL PITCH}^*$   
 ADDENDUM =  $1 / \text{DIAMETRAL PITCH}^{**}$   
 DEDENDUM = ADDENDUM + CLEARANCE  
 CLEARANCE = DETERMINED BY LAYOUT  
 WORKING DEPTH =  $2 \times \text{ADDENDUM}$   
 WHOLE DEPTH = ADDENDUM + DEDENDUM  
 INVOLUTE CLEARANCE & FULL RADIUS IS DETERMINED BY LAYOUT  
 BASIC ARC SPACE & TOOTH THICKNESS =  $1.5708 / \text{DIAMETRAL PITCH}^*$   
 $\left. \begin{array}{l} \text{BASIC CH.T.T.} \\ \text{BASIC CH.S.} \end{array} \right\} = \text{P.D.} \times \sin \frac{90^\circ}{N}$   
 PITCH DIAMETER = NO. OF TEETH / DIAMETRAL PITCH \*

EXTERNAL SPLINES

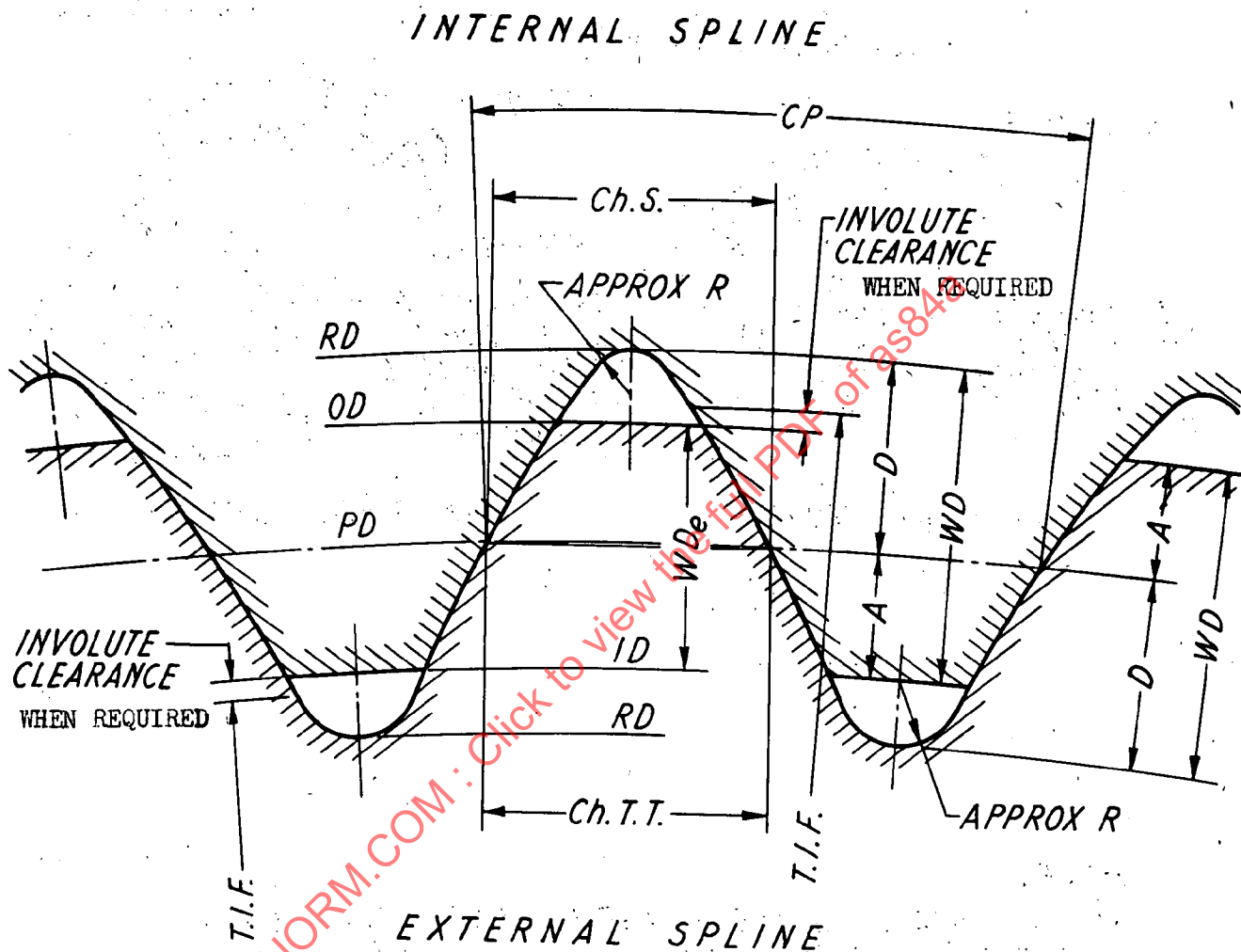
OUTSIDE DIAMETER = PITCH DIAMETER +  $(2 \times \text{ADDENDUM})$   
 ROOT DIAMETER = OUTSIDE DIAMETER -  $(2 \times \text{WHOLE DEPTH})$   
 TRUE INVOLUTE FORM DIAMETER = INTERNAL INSIDE DIAMETER  
 -  $(2 \times \text{INVOLUTE CLEARANCE, WHEN REQUIRED})$

INTERNAL SPLINES

INSIDE DIAMETER = PITCH DIAMETER -  $(2 \times \text{ADDENDUM})$   
 ROOT DIAMETER = INSIDE DIAMETER +  $(2 \times \text{WHOLE DEPTH})$   
 TRUE INVOLUTE FORM DIAMETER = OUTSIDE DIAMETER +  $(2 \times \text{INVOLUTE CLEARANCE, WHEN REQUIRED})$

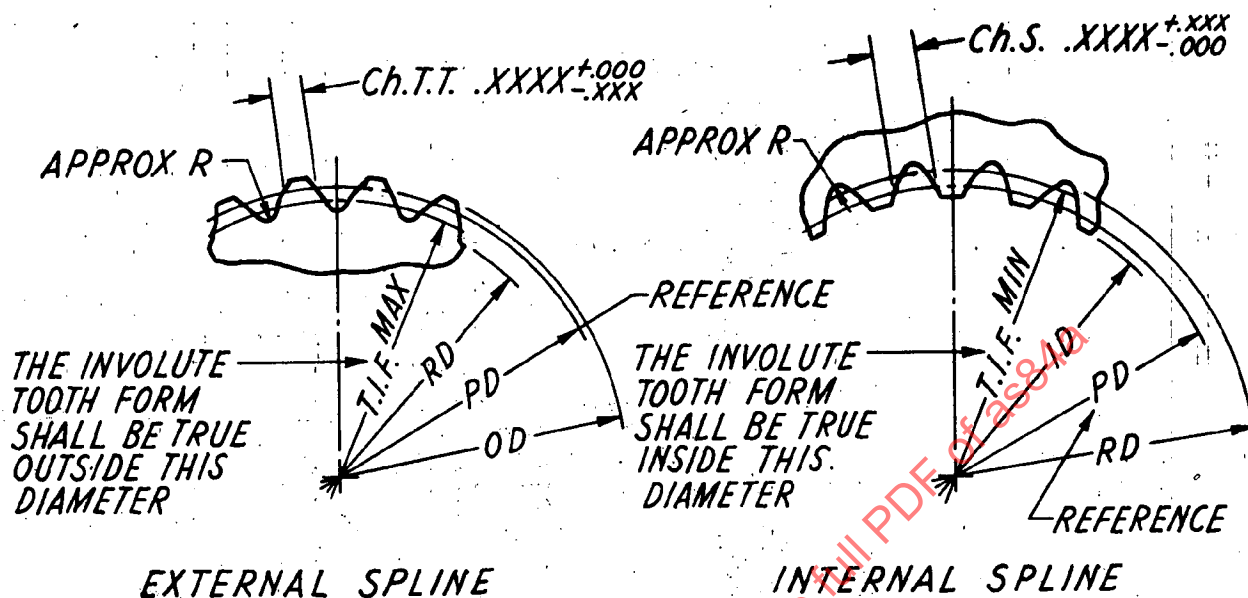
\* Use numerator of the diametral pitch

\*\* Use denominator of the diametral pitch



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

TOOTH NOMENCLATURE  
FIG. 1

**NOTES:**

- (1) THE CHORDAL SPACE OF THE INTERNAL SPLINE (SEE TABLES) IS BASIC WITH A PLUS 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

## METHOD OF DIMENSIONING FIG. 2

TABLE I  
BASIC TOOTH DIMENSIONS

| DIA.<br>PITCH | CIR.<br>PITCH | TYPE | NO. OF<br>TEETH | ADD.  | DED.  | WORKING<br>DEPTH | WHOLE<br>DEPTH | APPROX.<br>FILLET<br>RADIUS |
|---------------|---------------|------|-----------------|-------|-------|------------------|----------------|-----------------------------|
| 6/12          | .5236         | EXT. | 12 to Rack      | .0833 | .1506 | .1666            | .2339          | .080                        |
|               |               |      | 12 to 29        | .0833 | .1370 | .1666            | .2203          | .080                        |
|               |               | INT. | 30 to Rack      | .0833 | .1506 | .1666            | .2339          | .070                        |
| *8/16         | .3927         | EXT. | 12 to 16        | .0625 | .1127 | .1250            | .1752          | .060                        |
|               |               |      | 17 to Rack      | .0625 | .1127 | .1250            | .1752          | .060                        |
|               |               | INT. | 12 to 36        | .0625 | .1050 | .1250            | .1675          | .060                        |
|               |               |      | 37 to Rack      | .0625 | .1127 | .1250            | .1752          | .055                        |
| 10/20         | .3142         | EXT. | 12 to 19        | .0500 | .0901 | .1000            | .1401          | .050                        |
|               |               |      | 20 to Rack      | .0500 | .0901 | .1000            | .1401          | .045                        |
|               |               | INT. | 12 to 41        | .0500 | .0850 | .1000            | .1350          | .045                        |
|               |               |      | 42 to Rack      | .0500 | .0901 | .1000            | .1401          | .040                        |
| 12/24         | .2618         | EXT. | 12 to 20        | .0417 | .0749 | .0834            | .1166          | .040                        |
|               |               |      | 21 to Rack      | .0417 | .0749 | .0834            | .1166          | .035                        |
|               |               | INT. | 12 to 47        | .0417 | .0725 | .0834            | .1142          | .035                        |
|               |               |      | 48 to Rack      | .0417 | .0749 | .0834            | .1166          | .030                        |
| *16/32        | .1964         | EXT. | 12 to Rack      | .0313 | .0625 | .0626            | .0938          | .020                        |
|               |               | INT. | 12 to 59        | .0313 | .0555 | .0626            | .0868          | .020                        |
|               |               |      | 60 to Rack      | .0313 | .0625 | .0626            | .0938          | .015                        |
| 20/40         | .1571         | EXT. | 12 to Rack      | .0250 | .0500 | .0500            | .0750          | .018                        |
|               |               | INT. | 12 to 71        | .0250 | .0425 | .0500            | .0675          | .018                        |
|               |               |      | 72 to Rack      | .0250 | .0500 | .0500            | .0750          | .018                        |
| 24/48         | .1309         | EXT. | 12 to Rack      | .0208 | .0417 | .0416            | .0625          | .015                        |
|               |               | INT. | 12 to 83        | .0208 | .0355 | .0416            | .0563          | .015                        |
|               |               |      | 84 to Rack      | .0208 | .0417 | .0416            | .0625          | .010                        |
| *32/64        | .0982         | EXT. | 8 to Rack       | .0156 | .0313 | .0312            | .0469          | .010                        |
|               |               | INT. | 8 to 111        | .0156 | .0275 | .0312            | .0431          | .010                        |
|               |               |      | 112 to Rack     | .0156 | .0313 | .0312            | .0469          | .010                        |
| 40/80         | .0785         | EXT. | 8 to Rack       | .0125 | .0225 | .0250            | .0350          | .009                        |
|               |               | INT. | 8 to Rack       | .0125 | .0225 | .0250            | .0350          | .009                        |
| 48/96         | .0655         | EXT. | 8 to Rack       | .0104 | .0184 | .0208            | .0288          | .008                        |
|               |               | INT. | 8 to Rack       | .0104 | .0184 | .0208            | .0288          | .008                        |

\*Preferred

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 II**  
**DIMENSIONS FOR SPLINES**  
**6/12 DIAMETRAL PITCH - 30° PRESSURE ANGLE**

| No.<br>Teeth | Pitch<br>Dia. | External         |                  |        |         |         | Internal         |                  |        |                 |         |
|--------------|---------------|------------------|------------------|--------|---------|---------|------------------|------------------|--------|-----------------|---------|
|              |               | O.D.             | R.D.             | T.I.F. | Ch.T.T. | Approx. | I.D.             | R.D.             | T.I.F. | Ch.S.           | Approx. |
|              |               | + .000<br>- .005 | + .000<br>- .020 | Max.   |         | R       | + .005<br>- .000 | + .020<br>- .000 | Min.   | Min.<br>(Basic) | R       |
| 12           | 2.0000        | 2.167            | 1.699            | 1.833  |         | .080    | 1.833            | 2.274            | 2.167  | .2611           | .080    |
| 13           | 2.1667        | 2.333            | 1.866            | 2.000  |         | "       | 2.000            | 2.441            | 2.333  | .2612           | "       |
| 14           | 2.3333        | 2.500            | 2.032            | 2.167  |         | "       | 2.167            | 2.607            | 2.500  | .2613           | "       |
| 15           | 2.5000        | 2.667            | 2.199            | 2.333  |         | "       | 2.333            | 2.774            | 2.667  | "               | "       |
| 16           | 2.6667        | 2.833            | 2.366            | 2.500  |         | "       | 2.500            | 2.941            | 2.833  | .2614           | "       |
| 17           | 2.8333        | 3.000            | 2.532            | 2.667  |         | "       | 2.667            | 3.107            | 3.000  | "               | "       |
| 18           | 3.0000        | 3.167            | 2.699            | 2.833  |         | "       | 2.833            | 3.274            | 3.167  | .2615           | "       |
| 19           | 3.1667        | 3.333            | 2.866            | 3.000  |         | "       | 3.000            | 3.441            | 3.333  | "               | "       |
| 20           | 3.3333        | 3.500            | 3.032            | 3.167  |         | "       | 3.167            | 3.607            | 3.500  | "               | "       |
| 21           | 3.5000        | 3.667            | 3.199            | 3.333  |         | .080    | 3.333            | 3.774            | 3.667  | .2616           | .080    |
| 22           | 3.6667        | 3.833            | 3.366            | 3.500  |         | "       | 3.500            | 3.941            | 3.833  | "               | "       |
| 23           | 3.8333        | 4.000            | 3.532            | 3.667  |         | "       | 3.667            | 4.107            | 4.000  | "               | "       |
| 24           | 4.0000        | 4.167            | 3.699            | 3.833  |         | "       | 3.833            | 4.274            | 4.167  | "               | "       |
| 25           | 4.1667        | 4.333            | 3.866            | 4.000  |         | "       | 4.000            | 4.441            | 4.333  | "               | "       |
| 26           | 4.3333        | 4.500            | 4.032            | 4.167  |         | "       | 4.167            | 4.607            | 4.500  | .2617           | "       |
| 27           | 4.5000        | 4.667            | 4.199            | 4.333  |         | "       | 4.333            | 4.774            | 4.667  | "               | "       |
| 28           | 4.6667        | 4.833            | 4.366            | 4.500  |         | "       | 4.500            | 4.941            | 4.833  | "               | "       |
| 29           | 4.8333        | 5.000            | 4.532            | 4.667  |         | "       | 4.667            | 5.107            | 5.000  | "               | "       |
| 30           | 5.0000        | 5.167            | 4.699            | 4.833  |         | "       | 4.833            | 5.301            | 5.167  | "               | .070    |
| 31           | 5.1667        | 5.333            | 4.866            | 5.000  |         | .080    | 5.000            | 5.468            | 5.333  | .2617           | .070    |
| 32           | 5.3333        | 5.500            | 5.032            | 5.167  |         | "       | 5.167            | 5.635            | 5.500  | "               | "       |
| 33           | 5.5000        | 5.667            | 5.199            | 5.333  |         | "       | 5.333            | 5.801            | 5.667  | "               | "       |
| 34           | 5.6667        | 5.833            | 5.366            | 5.500  |         | "       | 5.500            | 5.968            | 5.833  | "               | "       |
| 35           | 5.8333        | 6.000            | 5.532            | 5.667  |         | "       | 5.667            | 6.135            | 6.000  | "               | "       |
| 36           | 6.0000        | 6.167            | 5.699            | 5.833  |         | "       | 5.833            | 6.301            | 6.167  | "               | "       |
| 37           | 6.1667        | 6.333            | 5.866            | 6.000  |         | "       | 6.000            | 6.468            | 6.333  | "               | "       |
| 38           | 6.3333        | 6.500            | 6.032            | 6.167  |         | "       | 6.167            | 6.635            | 6.500  | "               | "       |
| 39           | 6.5000        | 6.667            | 6.199            | 6.333  |         | "       | 6.333            | 6.801            | 6.667  | "               | "       |
| 40           | 6.6667        | 6.833            | 6.366            | 6.500  |         | "       | 6.500            | 6.968            | 6.833  | "               | "       |
| 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  |         | "       | 6.833            | 7.301            | 7.167  | "               | "       |
| 43           | 7.1667        | 7.333            | 6.866            | 7.000  |         | "       | 7.000            | 7.468            | 7.333  | "               | "       |
| 44           | 7.3333        | 7.500            | 7.032            | 7.167  |         | "       | 7.167            | 7.635            | 7.500  | "               | "       |
| 45           | 7.5000        | 7.667            | 7.199            | 7.333  |         | "       | 7.333            | 7.801            | 7.667  | "               | "       |
| 46           | 7.6667        | 7.833            | 7.366            | 7.500  |         | "       | 7.500            | 7.968            | 7.833  | "               | "       |
| 47           | 7.8333        | 8.000            | 7.532            | 7.667  |         | "       | 7.667            | 8.135            | 8.000  | "               | "       |
| 48           | 8.0000        | 8.167            | 7.699            | 7.833  |         | "       | 7.833            | 8.301            | 8.167  | "               | "       |
| 49           | 8.1667        | 8.333            | 7.866            | 8.000  |         | "       | 8.000            | 8.468            | 8.333  | "               | "       |
| 50           | 8.3333        | 8.500            | 8.032            | 8.167  |         | "       | 8.167            | 8.635            | 8.500  | "               | "       |

SEE NOTE - Fig. 2

TABLE III  
DIMENSIONS FOR SPLINES  
8/16 DIAMETRAL PITCH - 30° PRESSURE ANGLE

| No.<br>Teeth | Pitch<br>Dia. | External         |                  |        |         |         | Internal         |                  |        |                 |         |
|--------------|---------------|------------------|------------------|--------|---------|---------|------------------|------------------|--------|-----------------|---------|
|              |               | O.D.             | R.D.             | T.I.F. | Ch.T.T. | Approx. | I.D.             | R.D.             | T.I.F. | Ch.S.           | Approx. |
|              |               | + .000<br>- .005 | + .000<br>- .020 | Max.   |         | R       | + .005<br>- .000 | + .020<br>- .000 | Min.   | Min.<br>(Basic) | R       |
| 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  |         | "       | 1.500            | 1.835            | 1.750  | .1959           | "       |
| 14           | 1.7500        | 1.875            | 1.525            | 1.625  |         | "       | 1.625            | 1.960            | 1.875  | "               | "       |
| 15           | 1.8750        | 2.000            | 1.650            | 1.750  |         | "       | 1.750            | 2.085            | 2.000  | .1960           | "       |
| 16           | 2.0000        | 2.125            | 1.775            | 1.875  |         | "       | 1.875            | 2.210            | 2.125  | "               | "       |
| 17           | 2.1250        | 2.250            | 1.900            | 2.000  |         | "       | 2.000            | 2.335            | 2.250  | .1961           | "       |
| 18           | 2.2500        | 2.375            | 2.025            | 2.125  |         | "       | 2.125            | 2.460            | 2.375  | "               | "       |
| 19           | 2.3750        | 2.500            | 2.150            | 2.250  |         | "       | 2.250            | 2.585            | 2.500  | "               | "       |
| 20           | 2.5000        | 2.625            | 2.275            | 2.375  |         | "       | 2.375            | 2.710            | 2.625  | "               | "       |
| 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  |         | "       | 2.625            | 2.960            | 2.875  | "               | "       |
| 23           | 2.8750        | 3.000            | 2.650            | 2.750  |         | "       | 2.750            | 3.085            | 3.000  | "               | "       |
| 24           | 3.0000        | 3.125            | 2.775            | 2.875  |         | "       | 2.875            | 3.210            | 3.125  | "               | "       |
| 25           | 3.1250        | 3.250            | 2.900            | 3.000  |         | "       | 3.000            | 3.335            | 3.250  | "               | "       |
| 26           | 3.2500        | 3.375            | 3.025            | 3.125  |         | "       | 3.125            | 3.460            | 3.375  | "               | "       |
| 27           | 3.3750        | 3.500            | 3.150            | 3.250  |         | "       | 3.250            | 3.585            | 3.500  | "               | "       |
| 28           | 3.5000        | 3.625            | 3.275            | 3.375  |         | "       | 3.375            | 3.710            | 3.625  | "               | "       |
| 29           | 3.6250        | 3.750            | 3.400            | 3.500  |         | "       | 3.500            | 3.835            | 3.750  | "               | "       |
| 30           | 3.7500        | 3.875            | 3.525            | 3.625  |         | "       | 3.625            | 3.960            | 3.875  | .1963           | "       |
| 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  |         | "       | 3.875            | 4.210            | 4.125  | "               | "       |
| 33           | 4.1250        | 4.250            | 3.900            | 4.000  |         | "       | 4.000            | 4.335            | 4.250  | "               | "       |
| 34           | 4.2500        | 4.375            | 4.025            | 4.125  |         | "       | 4.125            | 4.460            | 4.375  | "               | "       |
| 35           | 4.3750        | 4.500            | 4.150            | 4.250  |         | "       | 4.250            | 4.585            | 4.500  | "               | "       |
| 36           | 4.5000        | 4.625            | 4.275            | 4.375  |         | "       | 4.375            | 4.710            | 4.625  | "               | "       |
| 37           | 4.6250        | 4.750            | 4.400            | 4.500  |         | "       | 4.500            | 4.850            | 4.750  | "               | .055    |
| 38           | 4.7500        | 4.875            | 4.525            | 4.625  |         | "       | 4.625            | 4.975            | 4.875  | "               | "       |
| 39           | 4.8750        | 5.000            | 4.650            | 4.750  |         | "       | 4.750            | 5.100            | 5.000  | "               | "       |
| 40           | 5.0000        | 5.125            | 4.775            | 4.875  |         | "       | 4.875            | 5.225            | 5.125  | "               | "       |
| 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  |         | "       | 5.125            | 5.475            | 5.375  | "               | "       |
| 43           | 5.3750        | 5.500            | 5.150            | 5.250  |         | "       | 5.250            | 5.600            | 5.500  | "               | "       |
| 44           | 5.5000        | 5.625            | 5.275            | 5.375  |         | "       | 5.375            | 5.725            | 5.625  | "               | "       |
| 45           | 5.6250        | 5.750            | 5.400            | 5.500  |         | "       | 5.500            | 5.850            | 5.750  | "               | "       |
| 46           | 5.7500        | 5.875            | 5.525            | 5.625  |         | "       | 5.625            | 5.975            | 5.875  | "               | "       |
| 47           | 5.8750        | 6.000            | 5.650            | 5.750  |         | "       | 5.750            | 6.100            | 6.000  | "               | "       |
| 48           | 6.0000        | 6.125            | 5.775            | 5.875  |         | "       | 5.875            | 6.225            | 6.125  | "               | "       |
| 49           | 6.1250        | 6.250            | 5.900            | 6.000  |         | "       | 6.000            | 6.350            | 6.250  | "               | "       |
| 50           | 6.2500        | 6.375            | 6.025            | 6.125  |         | "       | 6.125            | 6.475            | 6.375  | "               | "       |

SEE NOTE - Fig. 2

TABLE IV  
DIMENSIONS FOR SPLINES  
10/20 DIAMETRAL PITCH - 30° PRESSURE ANGLE

| No.<br>Teeth | Pitch<br>Dia. | External               |                        |                |         |              | Internal               |                        |                |                          |              |
|--------------|---------------|------------------------|------------------------|----------------|---------|--------------|------------------------|------------------------|----------------|--------------------------|--------------|
|              |               | O.D.<br>+.000<br>-.005 | R.D.<br>+.000<br>-.020 | T.I.F.<br>Max. | Ch.T.T. | Approx.<br>R | I.D.<br>+.005<br>-.000 | R.D.<br>+.020<br>-.000 | T.I.F.<br>Min. | Ch.S.<br>Min.<br>(Basic) | Approx.<br>R |
| 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          |         | "            | 1.200                  | 1.470                  | 1.400          | .1567                    | "            |
| 14           | 1.4000        | 1.500                  | 1.220                  | 1.300          |         | "            | 1.300                  | 1.570                  | 1.500          | .1568                    | "            |
| 15           | 1.5000        | 1.600                  | 1.320                  | 1.400          |         | "            | 1.400                  | 1.670                  | 1.600          | "                        | "            |
| 16           | 1.6000        | 1.700                  | 1.420                  | 1.500          |         | "            | 1.500                  | 1.770                  | 1.700          | "                        | "            |
| 17           | 1.7000        | 1.800                  | 1.520                  | 1.600          |         | "            | 1.600                  | 1.870                  | 1.800          | .1569                    | "            |
| 18           | 1.8000        | 1.900                  | 1.620                  | 1.700          |         | "            | 1.700                  | 1.970                  | 1.900          | "                        | "            |
| 19           | 1.9000        | 2.000                  | 1.720                  | 1.800          |         | "            | 1.800                  | 2.070                  | 2.000          | "                        | "            |
| 20           | 2.0000        | 2.100                  | 1.820                  | 1.900          |         | .045         | 1.900                  | 2.170                  | 2.100          | "                        | "            |
| 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          |         | "            | 2.100                  | 2.370                  | 2.300          | "                        | "            |
| 23           | 2.3000        | 2.400                  | 2.120                  | 2.200          |         | "            | 2.200                  | 2.470                  | 2.400          | .1570                    | "            |
| 24           | 2.4000        | 2.500                  | 2.220                  | 2.300          |         | "            | 2.300                  | 2.570                  | 2.500          | "                        | "            |
| 25           | 2.5000        | 2.600                  | 2.320                  | 2.400          |         | "            | 2.400                  | 2.670                  | 2.600          | "                        | "            |
| 26           | 2.6000        | 2.700                  | 2.420                  | 2.500          |         | "            | 2.500                  | 2.770                  | 2.700          | "                        | "            |
| 27           | 2.7000        | 2.800                  | 2.520                  | 2.600          |         | "            | 2.600                  | 2.870                  | 2.800          | "                        | "            |
| 28           | 2.8000        | 2.900                  | 2.620                  | 2.700          |         | "            | 2.700                  | 2.970                  | 2.900          | "                        | "            |
| 29           | 2.9000        | 3.000                  | 2.720                  | 2.800          |         | "            | 2.800                  | 3.070                  | 3.000          | "                        | "            |
| 30           | 3.0000        | 3.100                  | 2.820                  | 2.900          |         | "            | 2.900                  | 3.170                  | 3.100          | "                        | "            |
| 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          |         | "            | 3.100                  | 3.370                  | 3.300          | "                        | "            |
| 33           | 3.3000        | 3.400                  | 3.120                  | 3.200          |         | "            | 3.200                  | 3.470                  | 3.400          | "                        | "            |
| 34           | 3.4000        | 3.500                  | 3.220                  | 3.300          |         | "            | 3.300                  | 3.570                  | 3.500          | "                        | "            |
| 35           | 3.5000        | 3.600                  | 3.320                  | 3.400          |         | "            | 3.400                  | 3.670                  | 3.600          | "                        | "            |
| 36           | 3.6000        | 3.700                  | 3.420                  | 3.500          |         | "            | 3.500                  | 3.770                  | 3.700          | "                        | "            |
| 37           | 3.7000        | 3.800                  | 3.520                  | 3.600          |         | "            | 3.600                  | 3.870                  | 3.800          | "                        | "            |
| 38           | 3.8000        | 3.900                  | 3.620                  | 3.700          |         | "            | 3.700                  | 3.970                  | 3.900          | "                        | "            |
| 39           | 3.9000        | 4.000                  | 3.720                  | 3.800          |         | "            | 3.800                  | 4.070                  | 4.000          | "                        | "            |
| 40           | 4.0000        | 4.100                  | 3.820                  | 3.900          |         | "            | 3.900                  | 4.170                  | 4.100          | "                        | "            |
| 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          |         | "            | 4.100                  | 4.380                  | 4.300          | "                        | .040         |
| 43           | 4.3000        | 4.400                  | 4.120                  | 4.200          |         | "            | 4.200                  | 4.480                  | 4.400          | "                        | "            |
| 44           | 4.4000        | 4.500                  | 4.220                  | 4.300          |         | "            | 4.300                  | 4.580                  | 4.500          | "                        | "            |
| 45           | 4.5000        | 4.600                  | 4.320                  | 4.400          |         | "            | 4.400                  | 4.680                  | 4.600          | "                        | "            |
| 46           | 4.6000        | 4.700                  | 4.420                  | 4.500          |         | "            | 4.500                  | 4.780                  | 4.700          | "                        | "            |
| 47           | 4.7000        | 4.800                  | 4.520                  | 4.600          |         | "            | 4.600                  | 4.880                  | 4.800          | "                        | "            |
| 48           | 4.8000        | 4.900                  | 4.620                  | 4.700          |         | "            | 4.700                  | 4.980                  | 4.900          | "                        | "            |
| 49           | 4.9000        | 5.000                  | 4.720                  | 4.800          |         | "            | 4.800                  | 5.080                  | 5.000          | "                        | "            |
| 50           | 5.0000        | 5.100                  | 4.820                  | 4.900          |         | "            | 4.900                  | 5.180                  | 5.100          | "                        | "            |

SEE NOTE - Fig. 2

TABLE V  
DIMENSIONS FOR SPLINES  
12/24 DIAMETRAL PITCH - 30° PRESSURE ANGLE

| No.<br>Teeth | Pitch<br>Dia. | External               |                        |                |         |              | Internal               |                        |                |                          |              |
|--------------|---------------|------------------------|------------------------|----------------|---------|--------------|------------------------|------------------------|----------------|--------------------------|--------------|
|              |               | O.D.<br>+.000<br>-.005 | R.D.<br>+.000<br>-.020 | T.I.F.<br>Max. | Ch.T.T. | Approx.<br>R | I.D.<br>+.005<br>-.000 | R.D.<br>+.020<br>-.000 | T.I.F.<br>Min. | Ch.S.<br>Min.<br>(Basic) | Approx.<br>R |
| 12           | 1.0000        | 1.083                  | .850                   | .917           |         | .040         | .917                   | 1.145                  | 1.083          | .1305                    | .035         |
| 13           | 1.0833        | 1.167                  | .934                   | 1.000          |         | "            | 1.000                  | 1.228                  | 1.167          | .1306                    | "            |
| 14           | 1.1667        | 1.250                  | 1.017                  | 1.083          |         | "            | 1.083                  | 1.312                  | 1.250          | "                        | "            |
| 15           | 1.2500        | 1.333                  | 1.100                  | 1.167          |         | "            | 1.167                  | 1.395                  | 1.333          | .1307                    | "            |
| 16           | 1.3333        | 1.417                  | 1.184                  | 1.250          |         | "            | 1.250                  | 1.478                  | 1.417          | "                        | "            |
| 17           | 1.4167        | 1.500                  | 1.267                  | 1.333          |         | "            | 1.333                  | 1.562                  | 1.500          | "                        | "            |
| 18           | 1.5000        | 1.583                  | 1.350                  | 1.417          |         | "            | 1.417                  | 1.645                  | 1.583          | "                        | "            |
| 19           | 1.5833        | 1.667                  | 1.434                  | 1.500          |         | "            | 1.500                  | 1.728                  | 1.667          | .1308                    | "            |
| 20           | 1.6667        | 1.750                  | 1.517                  | 1.583          |         | "            | 1.583                  | 1.812                  | 1.750          | "                        | "            |
| 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          |         | "            | 1.750                  | 1.978                  | 1.917          | "                        | "            |
| 23           | 1.9167        | 2.000                  | 1.767                  | 1.833          |         | "            | 1.833                  | 2.062                  | 2.000          | "                        | "            |
| 24           | 2.0000        | 2.083                  | 1.850                  | 1.917          |         | "            | 1.917                  | 2.145                  | 2.083          | "                        | "            |
| 25           | 2.0833        | 2.167                  | 1.934                  | 2.000          |         | "            | 2.000                  | 2.228                  | 2.167          | "                        | "            |
| 26           | 2.1667        | 2.250                  | 2.017                  | 2.083          |         | "            | 2.083                  | 2.312                  | 2.250          | "                        | "            |
| 27           | 2.2500        | 2.333                  | 2.100                  | 2.167          |         | "            | 2.167                  | 2.395                  | 2.333          | "                        | "            |
| 28           | 2.3333        | 2.417                  | 2.184                  | 2.250          |         | "            | 2.250                  | 2.478                  | 2.417          | "                        | "            |
| 29           | 2.4167        | 2.500                  | 2.267                  | 2.333          |         | "            | 2.333                  | 2.562                  | 2.500          | "                        | "            |
| 30           | 2.5000        | 2.583                  | 2.350                  | 2.417          |         | "            | 2.417                  | 2.645                  | 2.583          | "                        | "            |
| 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          |         | "            | 2.583                  | 2.812                  | 2.750          | "                        | "            |
| 33           | 2.7500        | 2.833                  | 2.600                  | 2.667          |         | "            | 2.667                  | 2.895                  | 2.833          | "                        | "            |
| 34           | 2.8333        | 2.917                  | 2.684                  | 2.750          |         | "            | 2.750                  | 2.978                  | 2.917          | "                        | "            |
| 35           | 2.9167        | 3.000                  | 2.767                  | 2.833          |         | "            | 2.833                  | 3.062                  | 3.000          | .1309                    | "            |
| 36           | 3.0000        | 3.083                  | 2.850                  | 2.917          |         | "            | 2.917                  | 3.145                  | 3.083          | "                        | "            |
| 37           | 3.0833        | 3.167                  | 2.934                  | 3.000          |         | "            | 3.000                  | 3.228                  | 3.167          | "                        | "            |
| 38           | 3.1667        | 3.250                  | 3.017                  | 3.083          |         | "            | 3.083                  | 3.312                  | 3.250          | "                        | "            |
| 39           | 3.2500        | 3.333                  | 3.100                  | 3.167          |         | "            | 3.167                  | 3.395                  | 3.333          | "                        | "            |
| 40           | 3.3333        | 3.417                  | 3.184                  | 3.250          |         | "            | 3.250                  | 3.478                  | 3.417          | "                        | "            |
| 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          |         | "            | 3.417                  | 3.645                  | 3.583          | "                        | "            |
| 43           | 3.5833        | 3.667                  | 3.434                  | 3.500          |         | "            | 3.500                  | 3.728                  | 3.667          | "                        | "            |
| 44           | 3.6667        | 3.750                  | 3.517                  | 3.583          |         | "            | 3.583                  | 3.812                  | 3.750          | "                        | "            |
| 45           | 3.7500        | 3.833                  | 3.600                  | 3.667          |         | "            | 3.667                  | 3.895                  | 3.833          | "                        | "            |
| 46           | 3.8333        | 3.917                  | 3.684                  | 3.750          |         | "            | 3.750                  | 3.978                  | 3.917          | "                        | "            |
| 47           | 3.9167        | 4.000                  | 3.767                  | 3.833          |         | "            | 3.833                  | 4.062                  | 4.000          | "                        | "            |
| 48           | 4.0000        | 4.083                  | 3.850                  | 3.917          |         | "            | 3.917                  | 4.150                  | 4.083          | "                        | .030         |
| 49           | 4.0833        | 4.167                  | 3.934                  | 4.000          |         | "            | 4.000                  | 4.233                  | 4.167          | "                        | "            |
| 50           | 4.1667        | 4.250                  | 4.017                  | 4.083          |         | "            | 4.083                  | 4.317                  | 4.250          | "                        | "            |

SEE NOTE - Fig. 2

TABLE VI  
DIMENSIONS FOR SPLINES  
16/32 DIAMETRAL PITCH - 30° PRESSURE ANGLE

| No.<br>Teeth | Pitch<br>Dia. | External               |                        |                |         |              | Internal               |                        |                |                          |              |
|--------------|---------------|------------------------|------------------------|----------------|---------|--------------|------------------------|------------------------|----------------|--------------------------|--------------|
|              |               | O.D.<br>+.000<br>-.005 | R.D.<br>+.000<br>-.020 | T.I.F.<br>Max. | Ch.T.T. | Approx.<br>R | I.D.<br>+.005<br>-.000 | R.D.<br>+.020<br>-.000 | T.I.F.<br>Min. | Ch.S.<br>Min.<br>(Basic) | Approx.<br>R |
| 12           | .7500         | .813                   | .625                   | .688           |         | .020         | .688                   | .861                   | .813           | .0979                    | .020         |
| 13           | .8125         | .875                   | .687                   | .750           |         | "            | .750                   | .924                   | .875           | "                        | "            |
| 14           | .8750         | .938                   | .750                   | .813           |         | "            | .813                   | .986                   | .938           | .0980                    | "            |
| 15           | .9375         | 1.000                  | .812                   | .875           |         | "            | .875                   | 1.049                  | 1.000          | "                        | "            |
| 16           | 1.0000        | 1.063                  | .875                   | .938           |         | "            | .938                   | 1.111                  | 1.063          | "                        | "            |
| 17           | 1.0625        | 1.125                  | .937                   | 1.000          |         | "            | 1.000                  | 1.174                  | 1.125          | "                        | "            |
| 18           | 1.1250        | 1.188                  | 1.000                  | 1.063          |         | "            | 1.063                  | 1.236                  | 1.188          | .0981                    | "            |
| 19           | 1.1875        | 1.250                  | 1.062                  | 1.125          |         | "            | 1.125                  | 1.299                  | 1.250          | "                        | "            |
| 20           | 1.2500        | 1.313                  | 1.125                  | 1.188          |         | "            | 1.188                  | 1.361                  | 1.313          | "                        | "            |
| 21           | 1.3125        | 1.375                  | 1.187                  | 1.250          |         | .020         | 1.250                  | 1.424                  | 1.375          | .0981                    | .020         |
| 22           | 1.3750        | 1.438                  | 1.250                  | 1.313          |         | "            | 1.313                  | 1.486                  | 1.438          | "                        | "            |
| 23           | 1.4375        | 1.500                  | 1.312                  | 1.375          |         | "            | 1.375                  | 1.549                  | 1.500          | "                        | "            |
| 24           | 1.5000        | 1.563                  | 1.375                  | 1.438          |         | "            | 1.438                  | 1.611                  | 1.563          | "                        | "            |
| 25           | 1.5625        | 1.625                  | 1.437                  | 1.500          |         | "            | 1.500                  | 1.674                  | 1.625          | "                        | "            |
| 26           | 1.6250        | 1.688                  | 1.500                  | 1.563          |         | "            | 1.563                  | 1.736                  | 1.688          | "                        | "            |
| 27           | 1.6875        | 1.750                  | 1.562                  | 1.625          |         | "            | 1.625                  | 1.799                  | 1.750          | "                        | "            |
| 28           | 1.7500        | 1.813                  | 1.625                  | 1.688          |         | "            | 1.688                  | 1.861                  | 1.813          | "                        | "            |
| 29           | 1.8125        | 1.875                  | 1.687                  | 1.750          |         | "            | 1.750                  | 1.924                  | 1.875          | "                        | "            |
| 30           | 1.8750        | 1.938                  | 1.750                  | 1.813          |         | "            | 1.813                  | 1.986                  | 1.938          | "                        | "            |
| 31           | 1.9375        | 2.000                  | 1.812                  | 1.875          |         | .020         | 1.875                  | 2.049                  | 2.000          | .0981                    | .020         |
| 32           | 2.0000        | 2.063                  | 1.875                  | 1.938          |         | "            | 1.938                  | 2.111                  | 2.063          | "                        | "            |
| 33           | 2.0625        | 2.125                  | 1.937                  | 2.000          |         | "            | 2.000                  | 2.174                  | 2.125          | "                        | "            |
| 34           | 2.1250        | 2.188                  | 2.000                  | 2.063          |         | "            | 2.063                  | 2.236                  | 2.188          | "                        | "            |
| 35           | 2.1875        | 2.250                  | 2.062                  | 2.125          |         | "            | 2.125                  | 2.299                  | 2.250          | "                        | "            |
| 36           | 2.2500        | 2.313                  | 2.125                  | 2.188          |         | "            | 2.188                  | 2.361                  | 2.313          | "                        | "            |
| 37           | 2.3125        | 2.375                  | 2.187                  | 2.250          |         | "            | 2.250                  | 2.424                  | 2.375          | "                        | "            |
| 38           | 2.3750        | 2.438                  | 2.250                  | 2.313          |         | "            | 2.313                  | 2.486                  | 2.438          | "                        | "            |
| 39           | 2.4375        | 2.500                  | 2.312                  | 2.375          |         | "            | 2.375                  | 2.549                  | 2.500          | .0982                    | "            |
| 40           | 2.5000        | 2.563                  | 2.375                  | 2.438          |         | "            | 2.438                  | 2.611                  | 2.563          | "                        | "            |
| 41           | 2.5625        | 2.625                  | 2.437                  | 2.500          |         | .020         | 2.500                  | 2.674                  | 2.625          | .0982                    | .020         |
| 42           | 2.6250        | 2.688                  | 2.500                  | 2.563          |         | "            | 2.563                  | 2.736                  | 2.688          | "                        | "            |
| 43           | 2.6875        | 2.750                  | 2.562                  | 2.625          |         | "            | 2.625                  | 2.799                  | 2.750          | "                        | "            |
| 44           | 2.7500        | 2.813                  | 2.625                  | 2.688          |         | "            | 2.688                  | 2.861                  | 2.813          | "                        | "            |
| 45           | 2.8125        | 2.875                  | 2.687                  | 2.750          |         | "            | 2.750                  | 2.924                  | 2.875          | "                        | "            |
| 46           | 2.8750        | 2.938                  | 2.750                  | 2.813          |         | "            | 2.813                  | 2.986                  | 2.938          | "                        | "            |
| 47           | 2.9375        | 3.000                  | 2.812                  | 2.875          |         | "            | 2.875                  | 3.049                  | 3.000          | "                        | "            |
| 48           | 3.0000        | 3.063                  | 2.875                  | 2.938          |         | "            | 2.938                  | 3.111                  | 3.063          | "                        | "            |
| 49           | 3.0625        | 3.125                  | 2.937                  | 3.000          |         | "            | 3.000                  | 3.174                  | 3.125          | "                        | "            |
| 50           | 3.1250        | 3.188                  | 3.000                  | 3.063          |         | "            | 3.063                  | 3.236                  | 3.188          | "                        | "            |

SEE NOTE - Fig. 2

TABLE VII  
DIMENSIONS FOR SPLINES  
20/40 DIAMETRAL PITCH - 30° PRESSURE ANGLE

| No.<br>Teeth | Pitch<br>Dia. | External         |                  |        |         |         | Internal         |                  |        |                 |         |
|--------------|---------------|------------------|------------------|--------|---------|---------|------------------|------------------|--------|-----------------|---------|
|              |               | O.D.             | R.D.             | T.I.F. | Ch.T.T. | Approx. | I.D.             | R.D.             | T.I.F. | Ch.S.           | Approx. |
|              |               | + .000<br>- .005 | + .000<br>- .020 | Max.   |         | R       | + .005<br>- .000 | + .020<br>- .000 | Min.   | Min.<br>(Basic) | R       |
| 12           | .6000         | .650             | .500             | .550   |         | .018    | .550             | .685             | .650   | .0785           | .018    |
| 13           | .6500         | .700             | .550             | .600   |         | "       | .600             | .735             | .700   | "               | "       |
| 14           | .7000         | .750             | .600             | .650   |         | "       | .650             | .785             | .750   | .0784           | "       |
| 15           | .7500         | .800             | .650             | .700   |         | "       | .700             | .835             | .800   | "               | "       |
| 16           | .8000         | .850             | .700             | .750   |         | "       | .750             | .885             | .850   | "               | "       |
| 17           | .8500         | .900             | .750             | .800   |         | "       | .800             | .935             | .900   | "               | "       |
| 18           | .9000         | .950             | .800             | .850   |         | "       | .850             | .985             | .950   | "               | "       |
| 19           | .9500         | 1.000            | .850             | .900   |         | "       | .900             | 1.035            | 1.000  | .0785           | "       |
| 20           | 1.0000        | 1.050            | .900             | .950   |         | "       | .950             | 1.085            | 1.050  | "               | "       |
| 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  |         | "       | 1.050            | 1.185            | 1.150  | "               | "       |
| 23           | 1.1500        | 1.200            | 1.050            | 1.100  |         | "       | 1.100            | 1.235            | 1.200  | "               | "       |
| 24           | 1.2000        | 1.250            | 1.100            | 1.150  |         | "       | 1.150            | 1.285            | 1.250  | "               | "       |
| 25           | 1.2500        | 1.300            | 1.150            | 1.200  |         | "       | 1.200            | 1.335            | 1.300  | "               | "       |
| 26           | 1.3000        | 1.350            | 1.200            | 1.250  |         | "       | 1.250            | 1.385            | 1.350  | "               | "       |
| 27           | 1.3500        | 1.400            | 1.250            | 1.300  |         | "       | 1.300            | 1.435            | 1.400  | "               | "       |
| 28           | 1.4000        | 1.450            | 1.300            | 1.350  |         | "       | 1.350            | 1.485            | 1.450  | "               | "       |
| 29           | 1.4500        | 1.500            | 1.350            | 1.400  |         | "       | 1.400            | 1.535            | 1.500  | "               | "       |
| 30           | 1.5000        | 1.550            | 1.400            | 1.450  |         | "       | 1.450            | 1.585            | 1.550  | "               | "       |
| 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  |         | "       | 1.550            | 1.685            | 1.650  | "               | "       |
| 33           | 1.6500        | 1.700            | 1.550            | 1.600  |         | "       | 1.600            | 1.735            | 1.700  | "               | "       |
| 34           | 1.7000        | 1.750            | 1.600            | 1.650  |         | "       | 1.650            | 1.785            | 1.750  | "               | "       |
| 35           | 1.7500        | 1.800            | 1.650            | 1.700  |         | "       | 1.700            | 1.835            | 1.800  | "               | "       |
| 36           | 1.8000        | 1.850            | 1.700            | 1.750  |         | "       | 1.750            | 1.885            | 1.850  | "               | "       |
| 37           | 1.8500        | 1.900            | 1.750            | 1.800  |         | "       | 1.800            | 1.935            | 1.900  | "               | "       |
| 38           | 1.9000        | 1.950            | 1.800            | 1.850  |         | "       | 1.850            | 1.985            | 1.950  | "               | "       |
| 39           | 1.9500        | 2.000            | 1.850            | 1.900  |         | "       | 1.900            | 2.035            | 2.000  | "               | "       |
| 40           | 2.0000        | 2.050            | 1.900            | 1.950  |         | "       | 1.950            | 2.085            | 2.050  | "               | "       |
| 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  |         | "       | 2.050            | 2.185            | 2.150  | "               | "       |
| 43           | 2.1500        | 2.200            | 2.050            | 2.100  |         | "       | 2.100            | 2.235            | 2.200  | "               | "       |
| 44           | 2.2000        | 2.250            | 2.100            | 2.150  |         | "       | 2.150            | 2.285            | 2.250  | "               | "       |
| 45           | 2.2500        | 2.300            | 2.150            | 2.200  |         | "       | 2.200            | 2.335            | 2.300  | "               | "       |
| 46           | 2.3000        | 2.350            | 2.200            | 2.250  |         | "       | 2.250            | 2.385            | 2.350  | "               | "       |
| 47           | 2.3500        | 2.400            | 2.250            | 2.300  |         | "       | 2.300            | 2.435            | 2.400  | "               | "       |
| 48           | 2.4000        | 2.450            | 2.300            | 2.350  |         | "       | 2.350            | 2.485            | 2.450  | "               | "       |
| 49           | 2.4500        | 2.500            | 2.350            | 2.400  |         | "       | 2.400            | 2.535            | 2.500  | "               | "       |
| 50           | 2.5000        | 2.550            | 2.400            | 2.450  |         | "       | 2.450            | 2.585            | 2.550  | "               | "       |

SEE NOTE - Fig. 2

TABLE VIII  
DIMENSIONS FOR SPLINES  
24/48 DIAMETRAL PITCH - 30° PRESSURE ANGLE

| No.<br>Teeth | Pitch.<br>Dia. | External         |                  |        |         |         | Internal         |                  |        |                 |         |
|--------------|----------------|------------------|------------------|--------|---------|---------|------------------|------------------|--------|-----------------|---------|
|              |                | O.D.             | R.D.             | T.I.F. | Ch.T.T. | Approx. | I.D.             | R.D.             | T.I.F. | Ch.S.           | Approx. |
|              |                | + .000<br>- .005 | + .000<br>- .015 | Max.   |         | R       | + .005<br>- .000 | + .015<br>- .000 | Min.   | Min.<br>(Basic) | R       |
| 12           | .5000          | .542             | .417             | .458   |         | .015    | .458             | .571             | .542   | .0653           | .015    |
| 13           | .5417          | .583             | .458             | .500   |         | "       | .500             | .613             | .583   | "               | "       |
| 14           | .5833          | .625             | .500             | .542   |         | "       | .542             | .654             | .625   | "               | "       |
| 15           | .6250          | .667             | .542             | .583   |         | "       | .583             | .696             | .667   | "               | "       |
| 16           | .6667          | .708             | .583             | .625   |         | "       | .625             | .738             | .708   | "               | "       |
| 17           | .7083          | .750             | .625             | .667   |         | "       | .667             | .779             | .750   | .0654           | "       |
| 18           | .7500          | .792             | .667             | .708   |         | "       | .708             | .821             | .792   | "               | "       |
| 19           | .7917          | .833             | .708             | .750   |         | "       | .750             | .863             | .833   | "               | "       |
| 20           | .8333          | .875             | .750             | .792   |         | "       | .792             | .904             | .875   | "               | "       |
| 21           | .8750          | .917             | .792             | .833   |         | .015    | .833             | .946             | .917   | .0654           | .015    |
| 22           | .9167          | .958             | .833             | .875   |         | "       | .875             | .988             | .958   | "               | "       |
| 23           | .9583          | 1.000            | .875             | .917   |         | "       | .917             | 1.029            | 1.000  | "               | "       |
| 24           | 1.0000         | 1.042            | .917             | .958   |         | "       | .958             | 1.071            | 1.042  | "               | "       |
| 25           | 1.0417         | 1.083            | .958             | 1.000  |         | "       | 1.000            | 1.113            | 1.083  | "               | "       |
| 26           | 1.0833         | 1.125            | 1.000            | 1.042  |         | "       | 1.042            | 1.154            | 1.125  | "               | "       |
| 27           | 1.1250         | 1.167            | 1.042            | 1.083  |         | "       | 1.083            | 1.196            | 1.167  | "               | "       |
| 28           | 1.1667         | 1.208            | 1.083            | 1.125  |         | "       | 1.125            | 1.238            | 1.208  | "               | "       |
| 29           | 1.2083         | 1.250            | 1.125            | 1.167  |         | "       | 1.167            | 1.279            | 1.250  | "               | "       |
| 30           | 1.2500         | 1.292            | 1.167            | 1.208  |         | "       | 1.208            | 1.321            | 1.292  | "               | "       |
| 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  |         | "       | 1.292            | 1.404            | 1.375  | "               | "       |
| 33           | 1.3750         | 1.417            | 1.292            | 1.333  |         | "       | 1.333            | 1.446            | 1.417  | "               | "       |
| 34           | 1.4167         | 1.458            | 1.333            | 1.375  |         | "       | 1.375            | 1.468            | 1.458  | "               | "       |
| 35           | 1.4583         | 1.500            | 1.375            | 1.417  |         | "       | 1.417            | 1.529            | 1.500  | "               | "       |
| 36           | 1.5000         | 1.542            | 1.417            | 1.458  |         | "       | 1.458            | 1.571            | 1.542  | "               | "       |
| 37           | 1.5417         | 1.583            | 1.458            | 1.500  |         | "       | 1.500            | 1.613            | 1.583  | "               | "       |
| 38           | 1.5833         | 1.625            | 1.500            | 1.542  |         | "       | 1.542            | 1.654            | 1.625  | "               | "       |
| 39           | 1.6250         | 1.667            | 1.542            | 1.583  |         | "       | 1.583            | 1.696            | 1.667  | "               | "       |
| 40           | 1.6667         | 1.708            | 1.583            | 1.625  |         | "       | 1.625            | 1.738            | 1.708  | "               | "       |
| 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  |         | "       | 1.708            | 1.821            | 1.792  | "               | "       |
| 43           | 1.7917         | 1.833            | 1.708            | 1.750  |         | "       | 1.750            | 1.863            | 1.833  | "               | "       |
| 44           | 1.8333         | 1.875            | 1.750            | 1.792  |         | "       | 1.792            | 1.904            | 1.875  | "               | "       |
| 45           | 1.8750         | 1.917            | 1.792            | 1.833  |         | "       | 1.833            | 1.946            | 1.917  | "               | "       |
| 46           | 1.9167         | 1.958            | 1.833            | 1.875  |         | "       | 1.875            | 1.988            | 1.958  | "               | "       |
| 47           | 1.9583         | 2.000            | 1.875            | 1.917  |         | "       | 1.917            | 2.029            | 2.000  | "               | "       |
| 48           | 2.0000         | 2.042            | 1.917            | 1.958  |         | "       | 1.958            | 2.071            | 2.042  | "               | "       |
| 49           | 2.0417         | 2.083            | 1.958            | 2.000  |         | "       | 2.000            | 2.113            | 2.083  | "               | "       |
| 50           | 2.0833         | 2.125            | 2.000            | 2.042  |         | "       | 2.042            | 2.154            | 2.125  | "               | "       |

SEE NOTE - FIG. 2