

PROPELLER SHAFT ENDS — SINGLE ROTATION

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PAGE 1 OF 10

SHAFT ROTATION—EITHER DIRECTION
(SAME REQUIREMENTS APPLY)

APPLIES ONLY WHEN C DIA
IS LESS THAN G DIA

INCOMPLETE THREAD MUST NOT
GO BEYOND THIS SHOULDER

THREAD T NS
PITCH DIA S
SEE ALSO FIG. 2

DRILL W THRU
8 HOLES EQUALLY SPACED
CIRCUMFERENTIALLY
WITHIN .010 OF TRUE
LOCATION

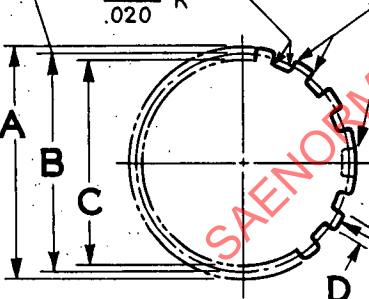
CENTER OPTIONAL
WITH MFR

CHAMFER 45° x .062

TAPER NOTE:
SURFACES AT DIA G AND H
NOT TO TAPER MORE THAN
.0005 PER INCH OF LENGTH

POINT OF TANGENCY (RADIUS AND SIDE OF
SPLINE) MUST BE ON OR INSIDE THIS DIA

.015
.005
.046
.020
CHAMFER OR RADIUS
R



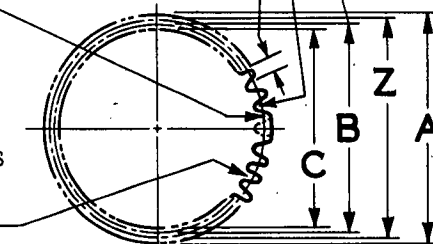
SECTION A-A
STRAIGHT SPLINES

WIDE SPLINE OR BLANKED
SLOT ON DIRECT DRIVE ENGINES.
SLOT MUST COME ON ϕ OF FIRST
THROW OF CRANKSHAFT
WITHIN 2 DEGREES.
WIDE SPLINE OR BLANKED SLOT
OPTIONAL ON ALL OTHER ENGINES
BUT NOT RECOMMENDED UNLESS
REQUIRED FOR SOME PHASING PURPOSES

X— SPLINES EQUALLY SPACED, OR SO
THAT ACCUMULATED ERRORS IN
SPACING, INVOLUTE FORM, AND
PARALLELISM ARE ABSORBED
WITHIN THE LIMITS SPECIFIED
FOR CHORDAL THICKNESS D

INVOLUTE TOOTH FORM MUST BE
TRUE OUTSIDE THIS DIA

CHORDAL
THICKNESS D



SECTION A-A
INVOLUTE SPLINES

CONCENTRICITY NOTE:

WITH SHAFT MOUNTED ON DIA G AND REAR BEARING SURFACE,
DIA H, OTHER BEARING SURFACES AND DIA A ON STRAIGHT
SPLINES SHALL BE CONCENTRIC WITHIN .001 FIR., THREAD T— PITCH
DIA S SHALL BE CONCENTRIC WITHIN .005 FIR., AND DIA Z ON INVOLUTE
SPLINES SHALL BE CONCENTRIC WITHIN .002 FIR.

FOR SINGLE ROTATION PROPELLER SHAFT ENDS FOR NO. 41, 51, 51A,
90 AND 100 INVOLUTE SPLINES, AND 50A STRAIGHT
SPLINES, SEE ARP 374

BREAK SHARP EDGES .016

FIG. 1

SHAFT SPLINE DATA:
X TEETH INVOLUTE FORM
Y DIAMETRAL PITCH
Z PITCH DIA (THEO)
30° PRESSURE ANGLE

SEE FIG. 2, 3, 4, 5, 6, 7 AND 8 FOR OTHER
APPLICABLE DIMENSIONS.
SEE TABLE 1 FOR FIG. 1

UNLESS OTHERWISE SPECIFIED	
ALLOWABLE TOLERANCE ON:	
LINEAR DIMENSIONS	±.01
ANGULAR DIMENSIONS	±2°

- 2 -

LET	STRAIGHT SPLINES							INVOLUTE SPLINES			
	TOL	N0.7 $\frac{1}{2}$	N0.10	N0.20	N0.30	N0.40	N0.50	TOL	N0.60 N0.60A	N0.70	N0.80
A	$\begin{smallmatrix} +.000 \\ -.002 \end{smallmatrix}$	1.625	1.992	2.367	2.617	3.117	3.804	$\begin{smallmatrix} +.000 \\ -.005 \end{smallmatrix}$	4.680	5.539	6.411
B	MAX	1.474	1.781	2.156	2.406	2.875	3.554	MAX	4.436	5.294	6.151
C	MIN	1.382	1.689	2.064	2.314	2.783	3.462	$\begin{smallmatrix} +.010 \\ -.020 \end{smallmatrix}$	4.321	5.179	6.036
D	$\pm .0008$	.1590	.1940	.2310	.2570	.3040	.3750	$\begin{smallmatrix} +.0000 \\ -.0030 \end{smallmatrix}$	.2233	.2233	.2233
E	$\begin{smallmatrix} +.000 \\ -.004 \end{smallmatrix}$	1.370	1.682	2.057	2.307	2.807	3.432	$\begin{smallmatrix} +.000 \\ -.004 \end{smallmatrix}$	4.245	5.120	5.995
F	$\begin{smallmatrix} +.000 \\ -.005 \end{smallmatrix}$	1.250	1.562	1.938	2.188	2.688	3.312	$\begin{smallmatrix} +.000 \\ -.005 \end{smallmatrix}$	4.062	4.938	5.812
G	$\begin{smallmatrix} +.000 \\ -.002 \end{smallmatrix}$	1.375	1.687	2.062	2.312	2.812	3.500	$\begin{smallmatrix} +.000 \\ -.002 \end{smallmatrix}$	4.296	5.156	6.011
H	$\begin{smallmatrix} +.000 \\ -.002 \end{smallmatrix}$	1.636	2.000	2.375	2.625	3.125	3.812	$\begin{smallmatrix} +.000 \\ -.002 \end{smallmatrix}$	4.687	5.562	6.426
I	$\pm .030$	1.375	1.375	2.094	2.087	2.125	2.062	$\pm .030$	3.312	3.312	3.312
J	$\pm .040$	1.875	1.875	2.625	2.618	2.656	2.562	$\pm .040$	3.812	3.812	3.812
K	$\pm .020$	4.375	4.688	5.500	5.868	5.469	5.875	$\pm .020$	7.359	8.188	8.938
L	$\pm .025$	—	—	—	—	5.781	6.188	—	—	—	—
M	$\begin{smallmatrix} +.010 \\ - * \end{smallmatrix}$	5.402	5.402	6.715	7.115	6.778	7.152	$\begin{smallmatrix} +.010 \\ - * \end{smallmatrix}$	8.860	10.360	11.922
N	$\begin{smallmatrix} +.010 \\ -.030 \end{smallmatrix}$	6.068	6.068	7.548	7.948	7.611	8.318	$\begin{smallmatrix} +.010 \\ -.030 \end{smallmatrix}$	10.235	11.735	13.297
O	$\pm .015$	6.375	6.375	7.875	8.243	7.906	8.562	$\pm .015$	10.500	12.125	13.750
P	$\pm .020$	6.625	6.625	8.125	8.493	8.156	8.812	$\pm .020$	10.750	12.375	14.000
Q	$\pm .020$	5.312	5.312	6.625	7.025	6.688	7.062	$\pm .020$	8.750	10.250	11.812
R	MAX	1.530	1.530	1.530	1.530	1.530	1.530	MAX	2.030	2.030	2.030
	MIN	1.125	1.125	1.125	1.125	1.125	1.125	MIN	1.125	1.125	1.125
S	$\begin{smallmatrix} +.000 \\ -.003 \end{smallmatrix}$	1.319	1.631	2.006	2.256	2.756	3.381	$\begin{smallmatrix} +.000 \\ -.005 \end{smallmatrix}$	4.1668	5.0418	5.9168
T	—	1.375-12	1.6875-12	2.0625-12	2.3125-12	2.8125-12	3.4375-12	—	4.250-8	5.125-8	6.000-8
U	$\pm .030$	.170	.170	.170	.170	.170	.170	$\pm .030$	.250	.250	.250
V	—	—	—	—	—	—	—	APPROX	.068	.068	.068
W	—	.199	.2656	.2656	.2656	.2656	.2656	—	.2656	.2656	.2656
X	—	16	16	16	16	16	16	—	32	38	44
Y	—	—	—	—	—	—	—	—	$\frac{7}{16}$	$\frac{7}{16}$	$\frac{7}{16}$
Z	—	—	—	—	—	—	—	THEO	4.5714	5.4286	6.2857

M DIMENSION MAX LIMIT GIVES MIN FULL THREAD* MINUS VALUE DEPENDS ON METHOD OF THREADING AND
THREAD RUNOUT RELATION TO SHOULDER **Q**TO OBTAIN DIMENSION FOR FULL NUMBER OF PITCHES, WHEN
DESIRED, DEDUCT BASIC **M** FROM BASIC **N****M** DIMENSION DOES NOT APPLY WHEN UNDERCUT IS USED

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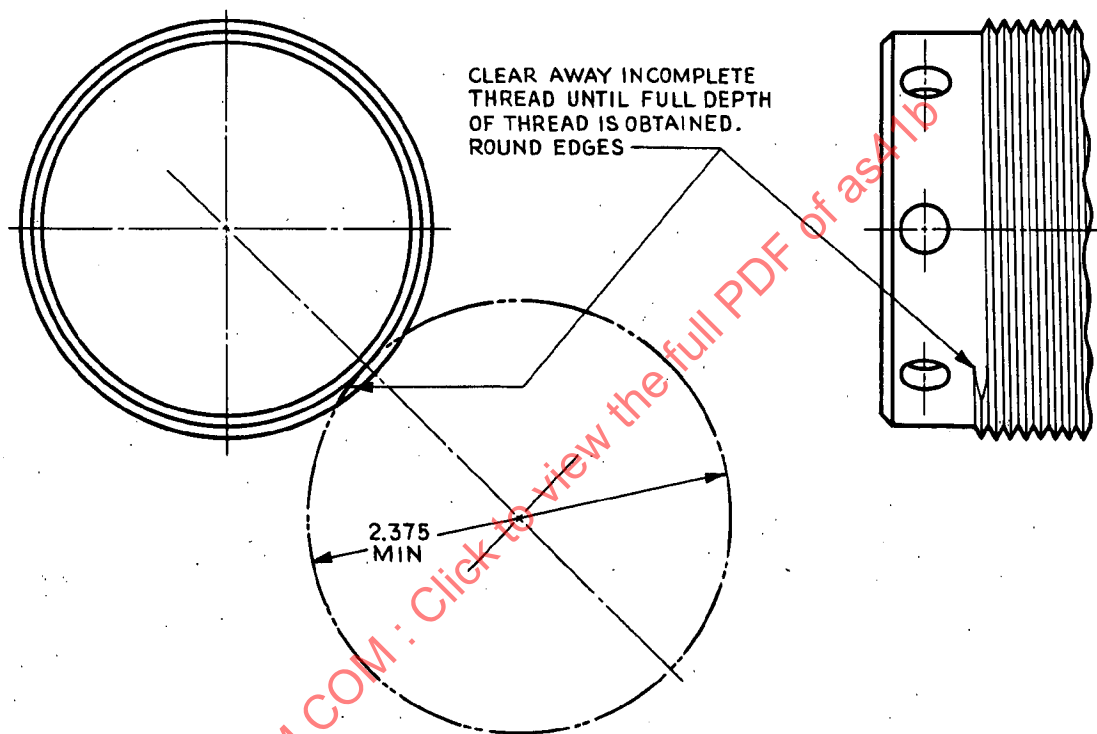
TABLE I FOR FIG. I

UNLESS OTHERWISE SPECIFIED

ALLOWABLE TOLERANCE ON:-

 LINEAR DIMENSIONS $\pm .01$
 ANGULAR DIMENSIONS $\pm 2^\circ$

- 3 -



REMOVAL OF INCOMPLETE THREAD
METHOD OF REMOVAL OPTIONAL

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FIG. 2

UNLESS OTHERWISE SPECIFIED	
ALLOWABLE TOLERANCE ON:-	
LINEAR DIMENSIONS	$\pm .01$
ANGULAR DIMENSIONS	$\pm 2^\circ$

- 4 -

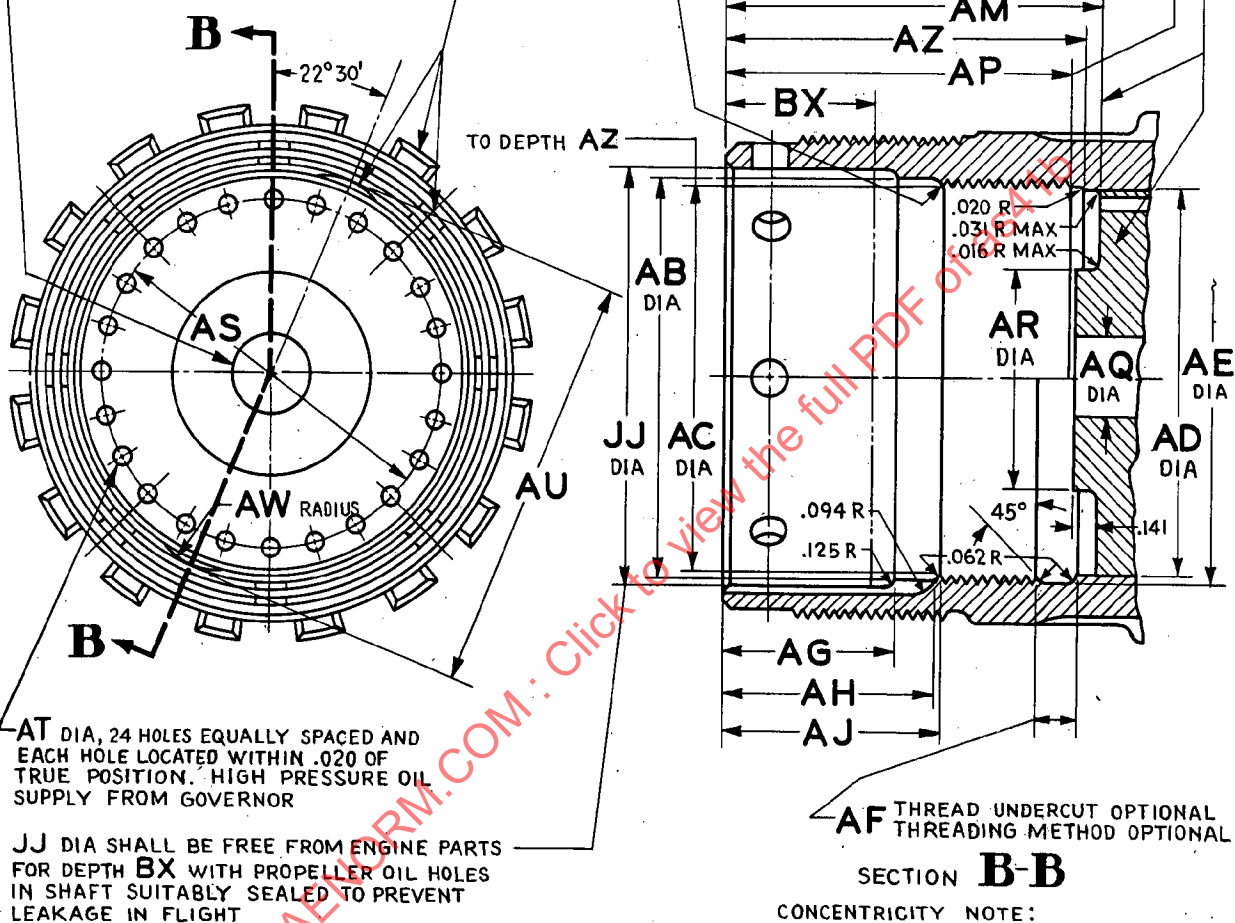
HOLE FOR PROPELLER OIL,
CONNECTED AS PRESCRIBED BY
DETAIL ENGINE SPECIFICATION

ANGULAR LOCATION OF LOCKING PIN
HOLES WITH SPLINE AND SLOTS IS
UNIMPORTANT PROVIDING SLOTS ARE
HALF WAY BETWEEN ANY TWO HOLES

REMAINING PART OF DESIGN TO
SUIT ENGINE MFR

MAX IS FULL OR IMPERFECT THD
MIN IS FULL THD

THD AK NS-3, PITCH DIA AL.
CHAMFER OR REMOVE FIRST INCOMPLETE
THD, REMOVE SHARP EDGES



SEE TABLE 2 FOR FIG. 3

FIG. 3

UNLESS OTHERWISE SPECIFIED	
ALLOWABLE TOLERANCE ON:-	
LINEAR DIMENSIONS	±.01
ANGULAR DIMENSIONS	±2°

- 5 -

WHEN OIL TRANSFER PLUG IS NOT USED
ENGINE MFR TO PLUG SHAFT
TO PREVENT LEAKAGE IN EITHER
DIRECTION UNDER 12 INCH HEAD OF SAE
NO.10 OIL. FRONT SURFACES OF THIS
PLUG TO BE WITHIN THIS LENGTH

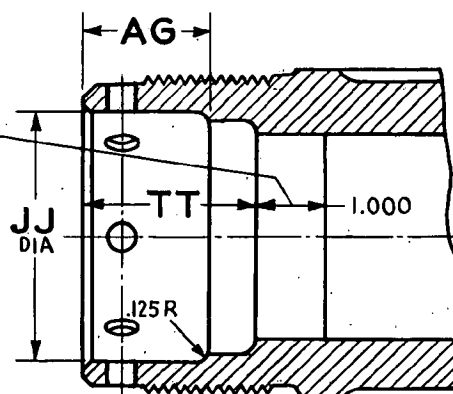


FIG. 4

LET	TOL	NO. 7 $\frac{1}{2}$ NO. 10	NO. 20	NO. 30	NO. 40	NO. 50	NO. 60 NO. 60A	NO. 70	NO. 80
AB	$\begin{smallmatrix} +.020 \\ -.000 \end{smallmatrix}$	—	1.516	1.766	2.266	2.891	3.516	—	—
AC	$\begin{smallmatrix} +.005 \\ -.000 \end{smallmatrix}$	—	1.435	1.685	2.185	2.810	3.413	—	—
AD	$\begin{smallmatrix} +.005 \\ -.000 \end{smallmatrix}$	—	1.430	1.680	2.180	2.805	3.408	—	—
AE	$\begin{smallmatrix} +.020 \\ -.000 \end{smallmatrix}$	—	1.516	1.766	2.266	2.891	3.516	—	—
AF	$\pm .030$	—	.125	.156	.156	.250	.250	—	—
AG	—	—	.500	.562	.562	1.219	1.219	1.219	1.219
AH	—	—	.656	.781	.781	1.531	1.344	—	—
AJ	—	—	.688	.812	.812	1.562	1.375	—	—
AK	—	—	1.500 -16	1.750 -16	2.250 -16	2.875 -16	3.500 -12	—	—
AL	—	—	1.4594 $\begin{smallmatrix} +.0040 \\ -.0000 \end{smallmatrix}$	1.7094 $\begin{smallmatrix} +.0041 \\ -.0000 \end{smallmatrix}$	2.2094 $\begin{smallmatrix} +.0044 \\ -.0000 \end{smallmatrix}$	2.8344 $\begin{smallmatrix} +.0046 \\ -.0000 \end{smallmatrix}$	3.4459 $\begin{smallmatrix} +.0053 \\ -.0000 \end{smallmatrix}$	—	—
AM	$\pm .015$	—	1.500	1.666	1.656	2.719	2.500	—	—
AZ	—	—	1.375	1.531	1.531	2.594	2.375	—	—
AP	MAX	—	1.365	1.520	1.520	2.580	2.365	—	—
	MIN	—	1.265	1.420	1.420	2.480	2.240	—	—
AQ	MIN	—	.375	.438	.547	.594	.594	—	—
AR	$\begin{smallmatrix} +.000 \\ -.002 \end{smallmatrix}$	—	.609	.734	1.047	1.483	1.859	—	—
AS	BASIC	—	1.100	1.350	1.800	2.400	2.920	—	—
AT	—	—	.082	.082	.125	.1405	.1405	—	—
AU	—	—	1.688	1.938	2.438	3.062	3.688	—	—
AW	—	—	.375	.375	.500	.500	.500	—	—
BX	MIN	—	.500	.562	.562	.810	.810	—	—
JJ	$\begin{smallmatrix} +.005 \\ -.000 \end{smallmatrix}$	—	1.625	1.875	2.375	3.062	3.625	4.375	5.156
TT	$\pm .030$	—	2.000	2.000	2.000	3.000	3.000	3.000	3.000

AP DIMENSION MAX LIMIT GIVES MAX FULL OR IMPERFECT THREAD.
MIN LIMIT GIVES MIN FULL THREAD

AP DIMENSION DOES NOT APPLY WHEN UNDERCUT IS USED (ALL THREADS FULL)

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TABLE 2 FOR FIG. 3 AND FIG. 4

UNLESS OTHERWISE SPECIFIED
ALLOWABLE TOLERANCE ON:-
LINEAR DIMENSIONS $\pm .01$
ANGULAR DIMENSIONS $\pm 2^\circ$

- 6 -

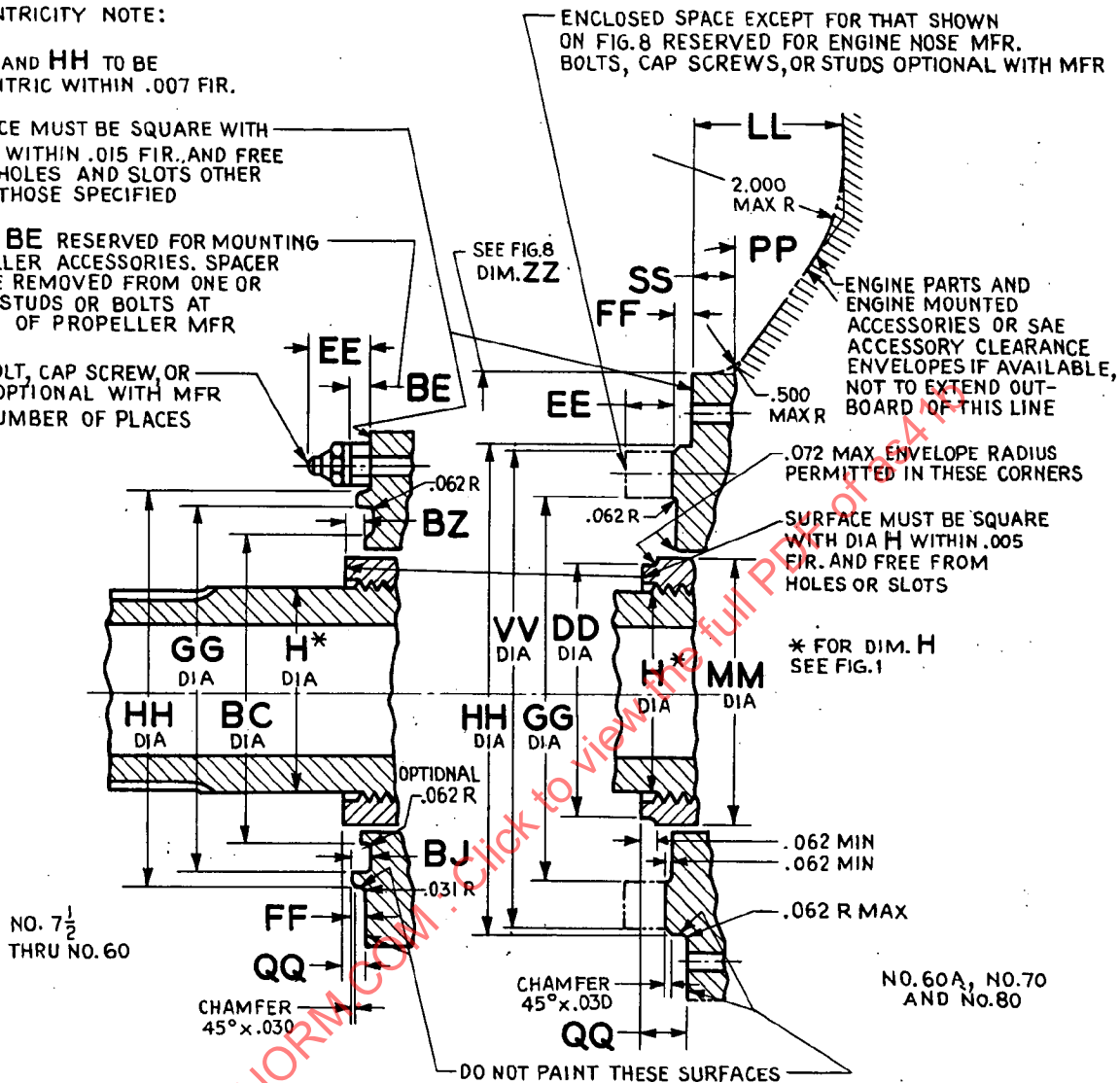
CONCENTRICITY NOTE:

DIA H AND HH TO BE
CONCENTRIC WITHIN .007 FIR.

SURFACE MUST BE SQUARE WITH
DIA H WITHIN .015 FIR. AND FREE
FROM HOLES AND SLOTS OTHER
THAN THOSE SPECIFIED

SPACE BE RESERVED FOR MOUNTING
PROPELLER ACCESSORIES. SPACER
MAY BE REMOVED FROM ONE OR
MORE STUDS OR BOLTS AT
OPTION OF PROPELLER MFR

BK BOLT, CAP SCREW, OR
STUD OPTIONAL WITH MFR
BL NUMBER OF PLACES



SEE FIG. 6, 7 AND 8 FOR OTHER APPLICABLE DIMENSIONS. SEE TABLE 3 FOR FIG. 5

REFER TO ARP 166 FOR RECOMMENDED PROPELLER CLEARANCE ENVELOPE FOR SIZES 7 1/2 THROUGH 50
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FIG. 5

- 7 -

LET	TOL	NO. 7 $\frac{1}{2}$ NO. 10	NO. 20	NO. 30	NO. 40	NO. 50	NO. 60 *	NO. 60A	NO. 70	NO. 80
BC	MAX	—	4.250	4.250	4.750	6.000	6.312	—	—	—
BE		.188	.312	.312	.375	.375	.375	—	—	—
BJ	MIN	.115	.250	.250	.125	.344	.219	—	—	—
BK	—	.3125	.375	.375	.375	.375	.4375	OPTIONAL	OPTIONAL	OPTIONAL
BL	—	4	6	7	6 OR 12	10	8 OR 16	OPTIONAL	OPTIONAL	OPTIONAL
BZ	MIN	.031	.031	.031	.031	.031	.320	—	—	—
DD		—	—	—	—	—	—	5.812	6.688	7.562
EE	MAX	.938	.938	.938	1.000	1.000	1.016	.750	.750	.750
FF		.188	.188	.188	.188	.250	.250	.312	.312	.312
GG	MIN	3.750	4.750	4.750	5.875	6.812	7.312	7.750	8.750	9.625
HH	$\pm .001$	3.998	4.998	4.998	6.248	7.248	7.748	10.123	11.123	12.625
LL	MIN	—	—	—	—	—	—	2.062 †	2.062 †	2.062 †
MM	MAX	—	—	—	—	—	—	6.188	7.062	7.938
PP	MIN	—	—	—	—	—	—	35° †	35° †	35° †
QQ	$\pm .025$	.312	.344	.025	.172	.406	.625	.938	.938	.938
SS	MIN	—	—	—	—	—	—	.500	.500	.500
VV	MAX	—	—	—	—	—	—	10.102	11.072	12.574

* INACTIVE FOR DESIGN PURPOSES

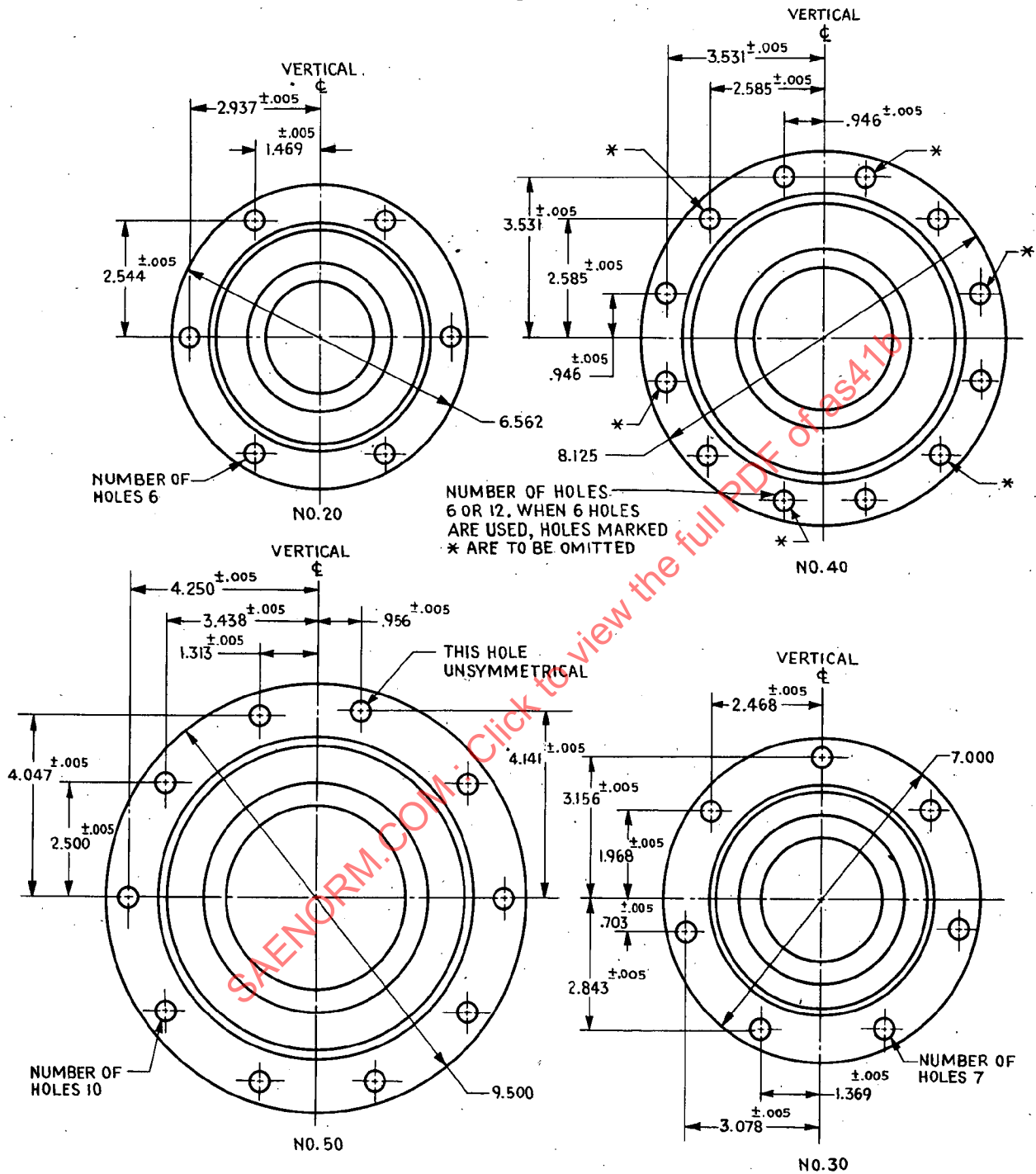
† LL TO BE 4.000 AND PP TO BE 45° WHEN PRACTICABLE

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TABLE 3 FOR FIG. 5

 UNLESS OTHERWISE SPECIFIED
 ALLOWABLE TOLERANCE ON :—
 LINEAR DIMENSIONS $\pm .01$
 ANGULAR DIMENSIONS $\pm 2^\circ$

-8-



SEE FIG. 5 AND TABLE 3 FOR OTHER APPLICABLE DIMENSIONS

HOLES ARE DIMENSIONED IN RELATION TO CENTER OF DIA HH (FIG. 5)

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FIG. 6

UNLESS OTHERWISE SPECIFIED	
ALLOWABLE TOLERANCE ON:-	
LINEAR DIMENSIONS	$\pm$.01
ANGULAR DIMENSIONS	$\pm$ 2°