

AEROSPACE INFORMATION REPORT

SAE AIR18

REV. A

Issued 1947-12
Revised 1996-08
Reaffirmed 2012-10
Superseding AIR18

Propeller Shaft Ends - Dual Rotation
(Engine Supplied Bearing)

RATIONALE

AIR18A has been reaffirmed to comply with the SAE five-year review policy.

1. SCOPE:

- 1.1 This SAE Aerospace Information Report (AIR) records the results of an investigation of a dual rotation propeller shaft standard for an engine supplied bearing and the reason for deciding that such a bearing is impracticable.
- 1.2 For reference purposes the appended data and figures record the dimensions of the space considered available and the tentative requirements which were proposed for an engine supplied bearing at the time of origin May 25, 1945.

2. REFERENCES:

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

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AS91	Propeller Shaft Ends, Dual Rotation (Propeller Supplied Bearing)
ARP375	Propeller Shaft Ends - Dual Rotation (Propeller Supplied Bearing)

4. CONCLUSION:

- 4.1 An engine supplied bearing seemed to offer some advantage in space and weight-saving but design studies showed the problem of supplying and sealing lubricant to such a bearing was so difficult that the engine supplied bearing was abandoned as impracticable.

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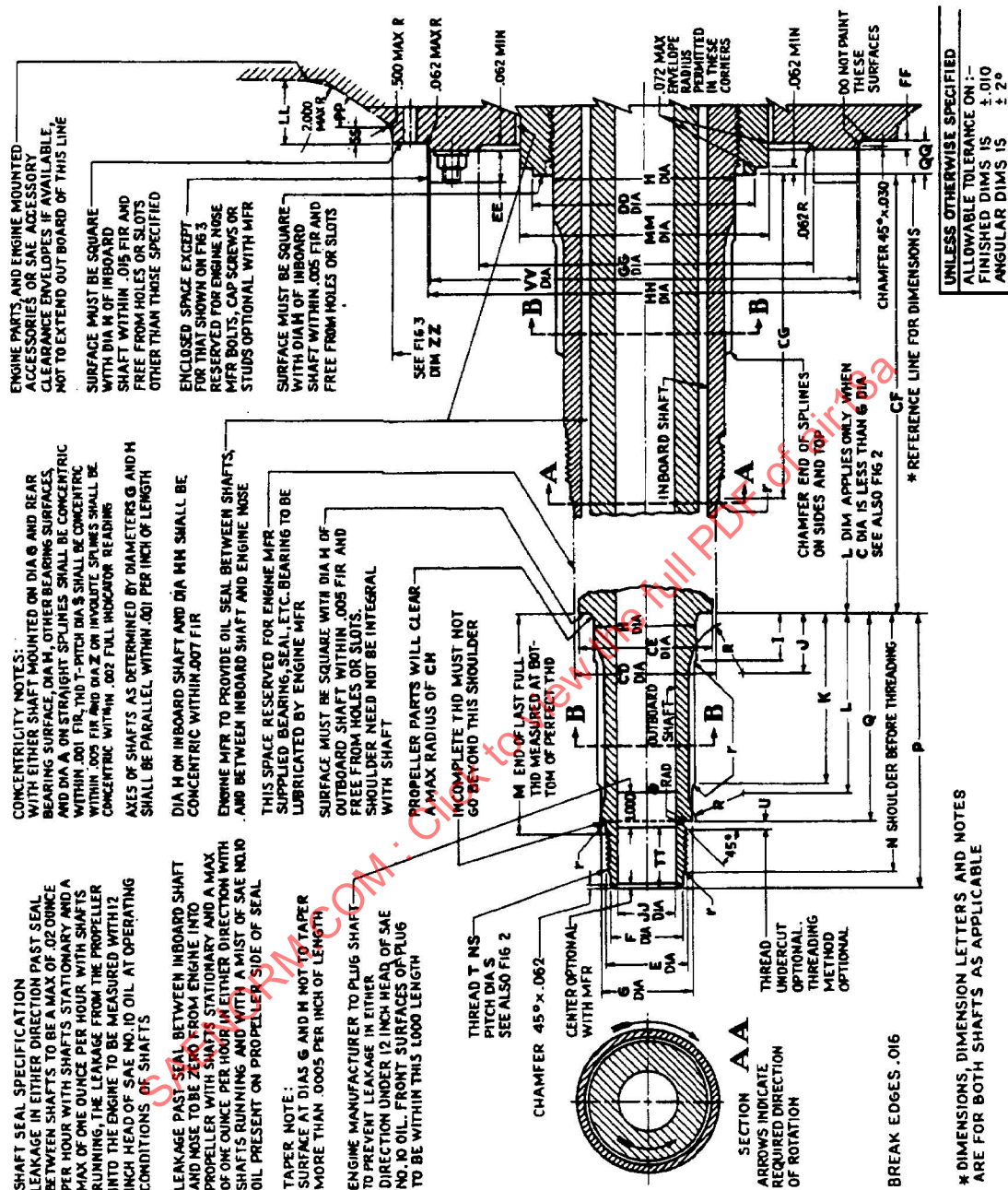


FIGURE 1

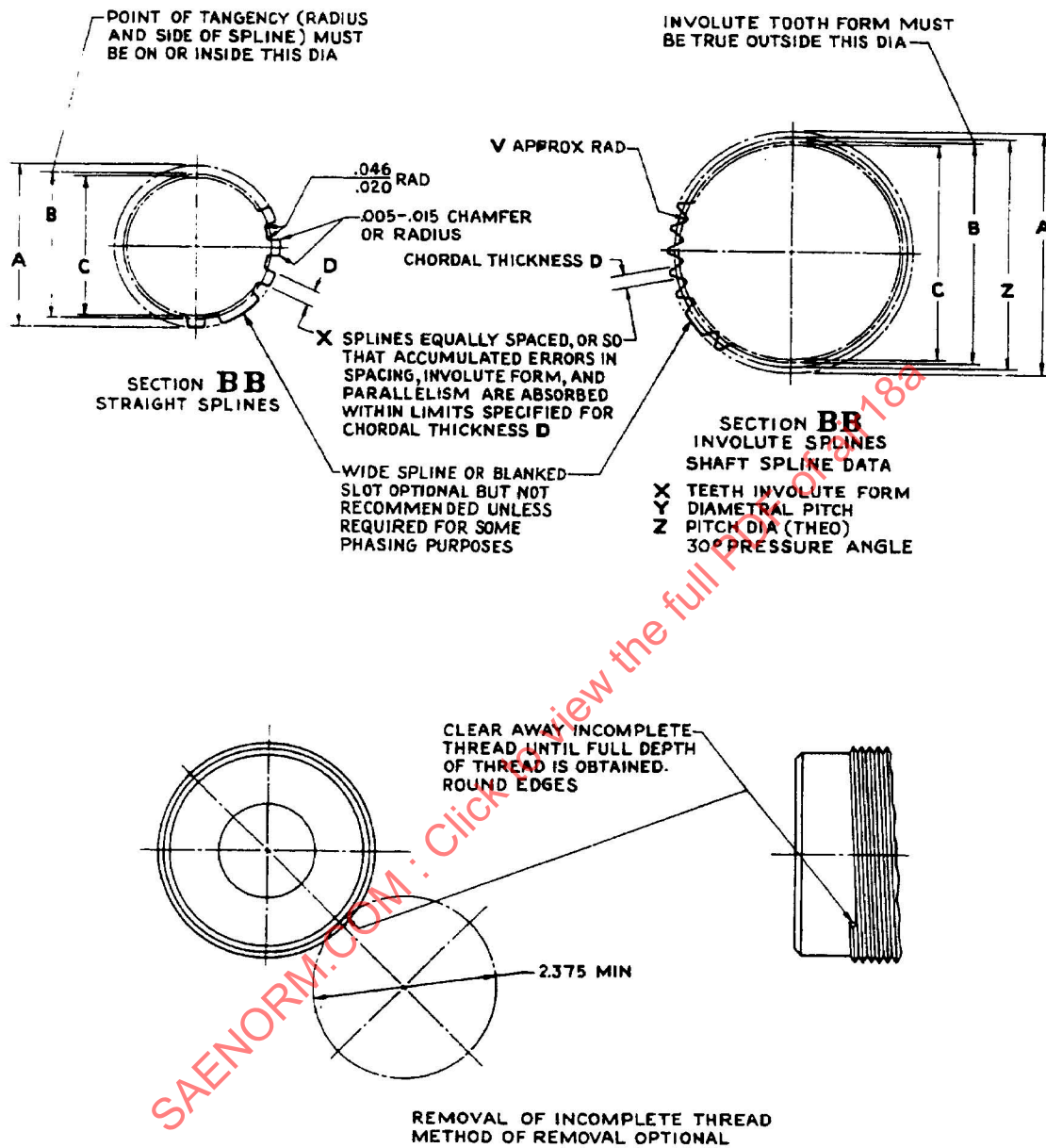


FIGURE 1 (Continued)

TABLE 1 - Table for Figure 1

Letter	Tolerance Out- Board Shaft	Tolerance In- Board Shaft	40-60 Straight Splines	40-60 Involute Splines	50-70 Straight Splines	50-70 Involute Splines	60-80 Involute Splines	60-80 Involute Splines	60L-80 Involute Splines	60L-80 Involute Splines
A	+0.000	-.002	3.117	—	3.804	—	—	—	—	—
	+0.000	-.005	—	4.680	—	5.539	4.680	6.411	4.680	6.411
B	Max	Max	2.875	4.436	3.554	5.294	4.436	6.151	4.436	6.151
C	Min	Min	2.783	—	3.462	—	—	—	—	—
	+0.010	-.020	—	4.321	—	5.179	4.321	6.036	4.321	6.036
D	±.0008	±.0008	.3040	—	.3750	—	—	—	—	—
	+0.0000	-.0030	—	.2233	—	.2233	.2233	.2233	.2233	.2233
E	+0.000	-.004	2.807	4.245	3.432	5.120	4.245	5.995	4.245	5.995
F	+0.000	-.005	2.688	4.062	3.312	4.938	4.062	5.812	4.062	5.812
G	+0.000	-.002	2.812	4.296	3.500	5.156	4.296	6.011	4.296	6.011
H	+0.000	-.002	3.125	4.687	3.812	5.562	4.687	6.426	4.687	6.426
I	±.025	±.025	2.062	1.812	5.000	1.812	3.312	3.250	3.312	3.250
J	±.040	±.040	2.562	2.312	5.500	2.312	3.812	3.750	3.812	3.750
K	±.020	±.020	5.875	5.375	8.812	5.375	7.359	7.400	7.359	7.400
L	±.030	—	6.000	—	8.938	—	—	—	—	—
M	+0.010*	+0.010*	7.100	8.360	10.037	8.360	8.870	10.360	8.870	10.360
N	+0.010	+0.010	8.266	9.735	11.203	9.735	10.245	11.610	10.245	11.610
	-.030	-.030	—	—	—	—	—	—	—	—
P	±.020	—	8.938	—	11.875	—	10.750	—	10.750	—
Q	±.020	±.020	7.000	8.250	9.938	8.250	8.750	10.250	8.750	10.250
R	Max	Max	1.530	2.030	1.530	2.030	2.030	2.030	2.030	2.030
	Min	Min	1.125	1.125	1.125	1.125	1.125	1.125	1.125	1.125
r	+0.030	-.000	.062	.062	.062	.062	.062	.062	.062	.062
S	+0.0000	-.0030	2.7560	—	3.3810	—	—	—	—	—
	+0.0000	-.0050	—	4.1668	—	5.0418	4.1668	5.9168	4.1668	5.9168
T	—	—	2.8125-12	4.250-8	3.4375-12	5.125-8	4.250-8	6.000-8	4.250-8	6.000-8
U	±.030	±.030	.170	.250	.170	.250	.250	.250	.250	.250
V	Approx	Approx	—	.068	—	.068	.068	.068	.068	.068
X	—	—	16	32	16	38	32	44	32	44
Y	—	—	—	7/16	—	7/16	7/16	7/16	7/16	7/16
Z	Theo	Theo	—	4.5714	—	5.4286	4.5714	6.2857	4.5714	6.2857
CD	Max	Max	4.032	4.032	4.908	4.908	5.782	5.782	5.782	5.782
CE	Min	—	3.972	—	4.843	—	5.718	—	5.718	—
CF	±.040	±.040	13.062	13.062	13.062	13.062	17.500	17.500	22.500	22.500
CG	—	±.030	—	10.312	—	10.312	—	12.188	—	12.188
CH	Max	—	.062	—	.188	—	.188	—	.188	—
DD	—	—	5.812	5.812	6.688	6.688	7.562	7.562	7.562	7.562
EE	Max	Max	.750	.750	.750	.750	.750	.750	.750	.750
FF	—	—	.312	.312	.312	.312	.312	.312	.312	.312
GG	Min	Min	7.750	7.750	8.750	8.750	9.625	9.625	9.625	9.625
HH	±.001	±.001	10.123	10.123	11.123	11.123	12.625	12.625	12.625	12.625
JJ	+0.005	—	2.188	—	2.812	—	3.562	—	3.562	—
	-.000	—	—	—	—	—	—	—	—	—
LL	Min**	Min**	2.062	2.062	2.062	2.062	2.062	2.062	2.062	2.062
MM	Max	Max	6.188	6.188	7.062	7.062	7.938	7.938	7.938	7.938
PP	Min**	Min**	35°	35°	35°	35°	35°	35°	35°	35°
QQ	±.025	±.025	.938	.938	.938	.938	.938	.938	.938	.938
SS	Min	Min	.500	.500	.500	.500	.500	.500	.500	.500
TT	±.030	—	3.000	—	3.000	—	3.000	—	3.000	—
VV	Max	Max	10.102	10.102	11.072	11.072	12.574	12.574	12.574	12.574