SAE The Engineering Society For Advancing Mobility Land Sea Air and Space®
INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

SURFACE VEHICLE STANDARD

SAE J1170 | REV. FEB93

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Submitted for recognition as an American National Standard

Superseding J1170 JUN91

(R) FRONT AND REAR POWER TAKE-OFF FOR AGRICULTURAL TRACTORS

1. Scope

1.1 This SAE Standard establishes the specifications and dimensions that are essential in order that 540 r/min and 1000 r/min power take-off driven machines may be operated with any make of tractor equipped with the corresponding power take-off drive.

1.2 This document does not, in itself, insure adequate telescoping of the power line or safety shielding.

1.3 This document provides dimensions relating to the tractor power take-off shield.

2. References

2.1 Applicable Documents—The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply.

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

SAE J208 AUG86—Safety for Agricultural Equipment
SAE J721 FEB93—Operating Requirements for Tractors and Power Take-Off Driven Implements
SAE J1548 FEB93—Drawbars—Agricultural Wheel Tractors

3. Specifications

3.1 The rear power take-off shaft (except belt-pulley shafts) for power take-off drives extending from the tractor to the rear shall have the dimensions shown in Figures 1, 2, 3, and 4 and Table 1. The front power take-off shaft shall have the dimensions shown in Figures 1 and 3 and only the Type II portion of Table 1.

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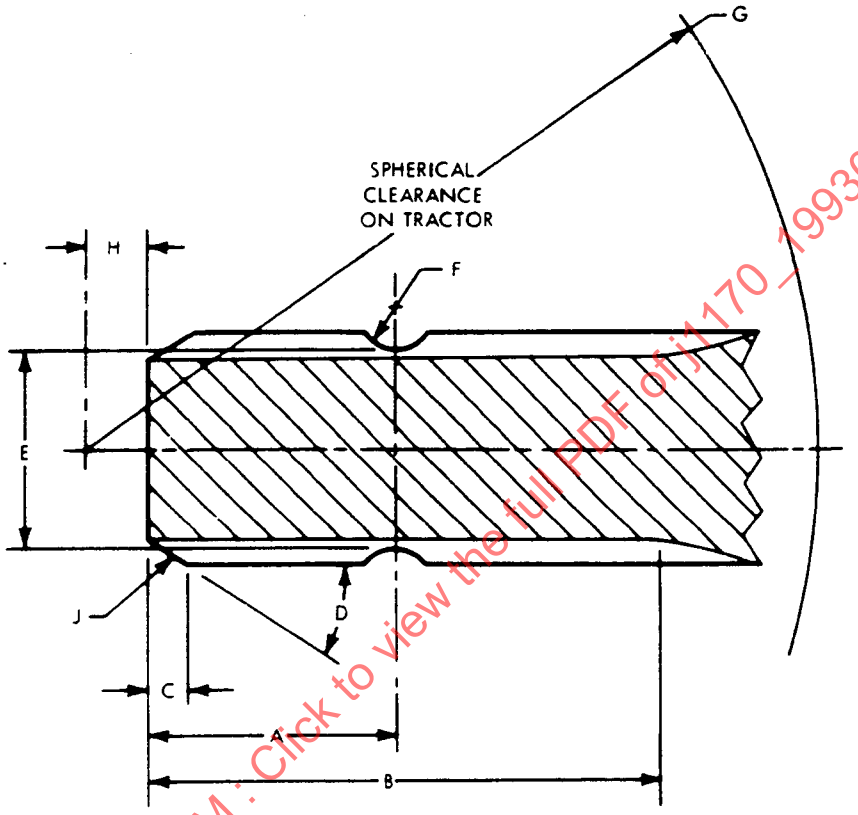


The circumferential groove is provided for a locking means in the implement hub.

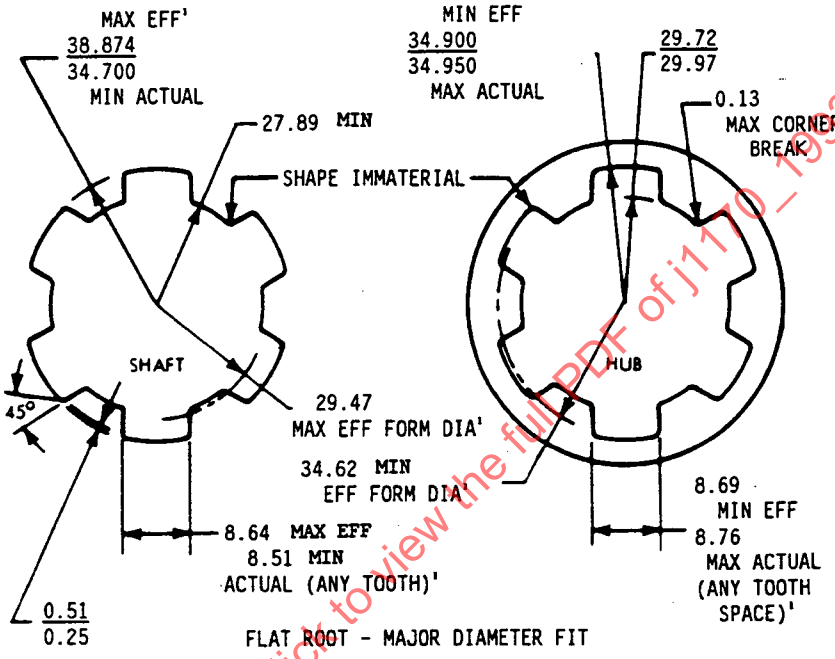
Effective spline length, B, to be heat-treated for surface durability (within Rockwell C48-56)

FIGURE 1—POWER TAKE-OFF SHAFT (SEE TABLE 1)

TABLE 1—POWER TAKE-OFF SHAFT DIMENSIONS[1] (SEE FIGURE 1)

		Type I 35 mm Dia 540 rpm	Type II 35 mm Dia 1000 rpm	Type III 45 mm Dia 1000 rpm
A	Groove to end of shaft	38.1	25.4	38.1
B	Effective spline length with relation gage, min	76.2	63.5	88.9
C	Chamfer	7.1	4.8	7.6
D	Chamfer angle	0.5 rad (30 degree)	0.5 rad (30 degree)	0.5 rad (30 degree)
E	ID of groove	$\frac{29.46}{29.26}$	$\frac{29.46}{29.26}$	$\frac{37.34}{37.13}$
F	Radius of groove	6.86 ± 0.25	6.86 ± 0.25	8.38 ± 0.25
G	Spherical clearance radius on tractor min	82.6	82.6	101.6
H	Location of center of clearance radius	0	12.7	0
J	Break sharp corner or chamfer	Yes	Optional	Optional

[1] Dimensions are in mm



' THE MAJOR DIAMETER AND EFFECTIVE SPLINE MUST BE CONCENTRIC AT THE MAXIMUM MATERIAL CONDITION (CHECKED WITH RELATION GAGE)

FIGURE 2—TYPE 1 POWER TAKE-OFF 540 rpm (35 mm) DIAMETER STRAIGHT SIDE SPLINE DIMENSIONS

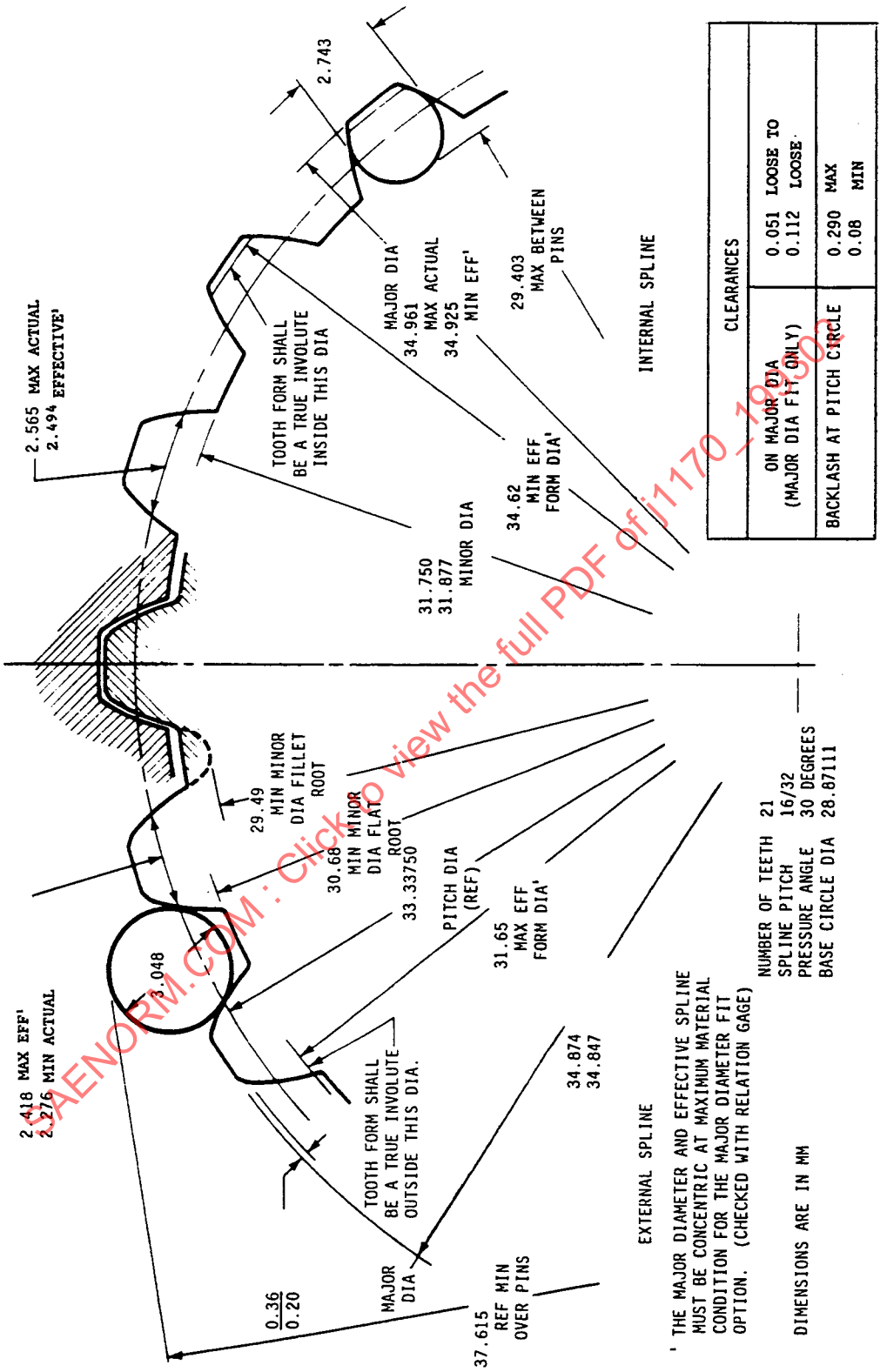


FIGURE 3—TYPE II 1000 rpm POWER TAKE-OFF (35 mm DIAMETER) INVOLUTE SPLINE DIMENSIONS
FRONT AND REAR POWER TAKE-OFF FOR AGRICULTURAL TRACTORS

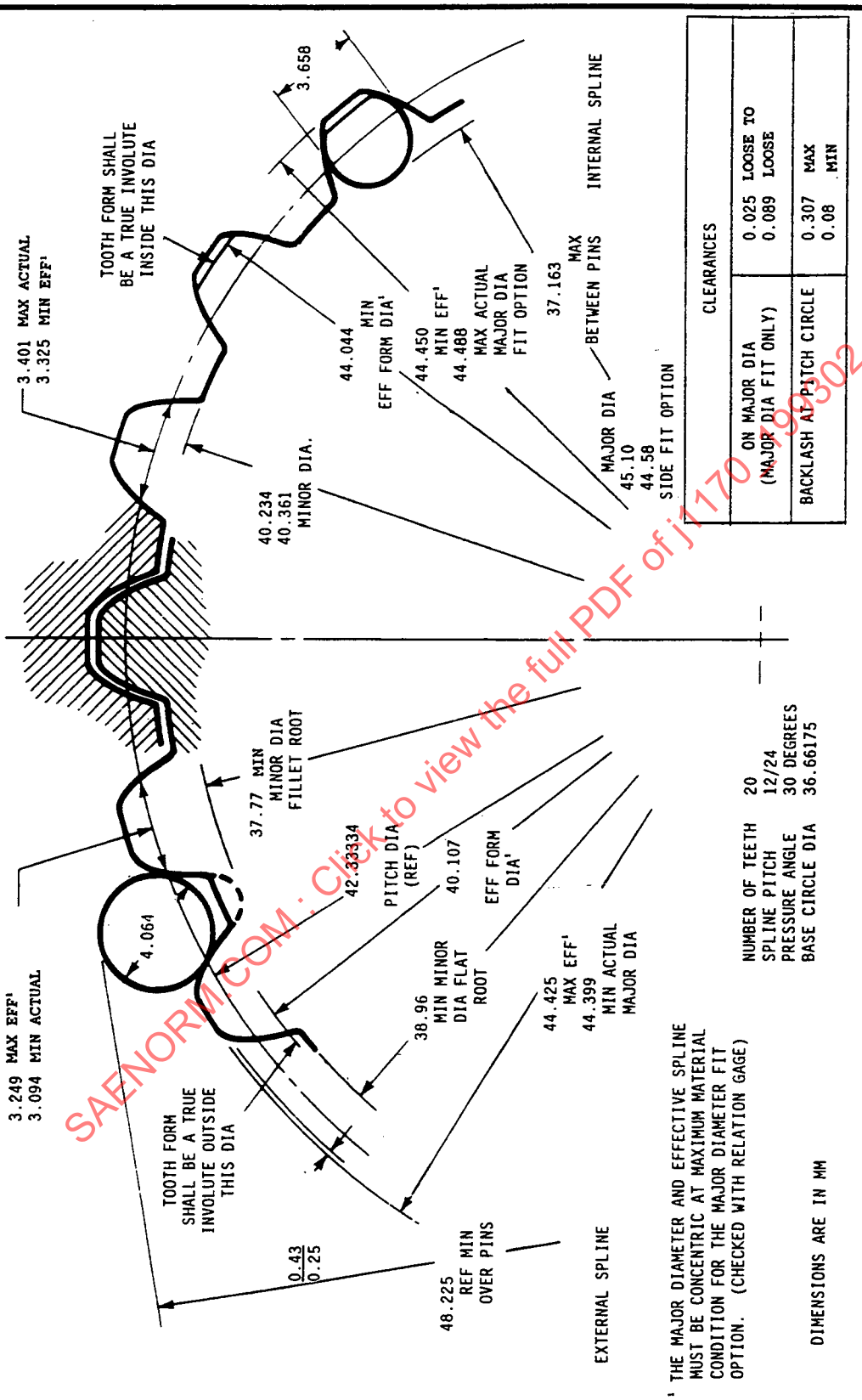


FIGURE 4—TYPE III 1000 rpm POWER TAKE-OFF (45 mm DIAMETER) INVOLUTE SPLINE DIMENSIONS
REAR POWER TAKE-OFF FOR AGRICULTURAL TRACTORS

3.2 Dimensions associated with the drawbar shall conform to SAE J1548.

3.3 The rated operating speeds of the power take-off shaft when under normal load shall be as follows:

3.3.1 The rear power take-off shafts

a. 540 rpm ± 10 rpm
b. 1000 rpm ± 25 rpm

3.3.2 The front power take-off shaft (Type II only)

a. 1000 rpm ± 25 rpm

3.3.3 The direction of PTO shaft rotation shall be:

a. Rear PTO—clockwise when facing in the direction of forward travel
b. Front PTO—clockwise when facing the projecting end of the shaft

3.4 A means to indicate when the power take-off is operating at normal speed shall be provided on tractors capable of driving the 540 rpm shaft in excess of 600 rpm and the 1000 rpm shaft in excess of 1100 rpm.

3.5 Tractors capable of driving the 540 rpm shaft in excess of 630 rpm and the 1000 rpm shaft in excess of 1170 rpm shall also include a suitable warning of operation in excess of those speeds.

3.5.1 If a shiftable PTO is provided, for future designs, a means shall be employed on the tractor to prevent overspeeding a Type I tractor PTO shaft in excess of 630 rpm, or a Type II or Type III tractor PTO shaft in excess of 1170 rpm.

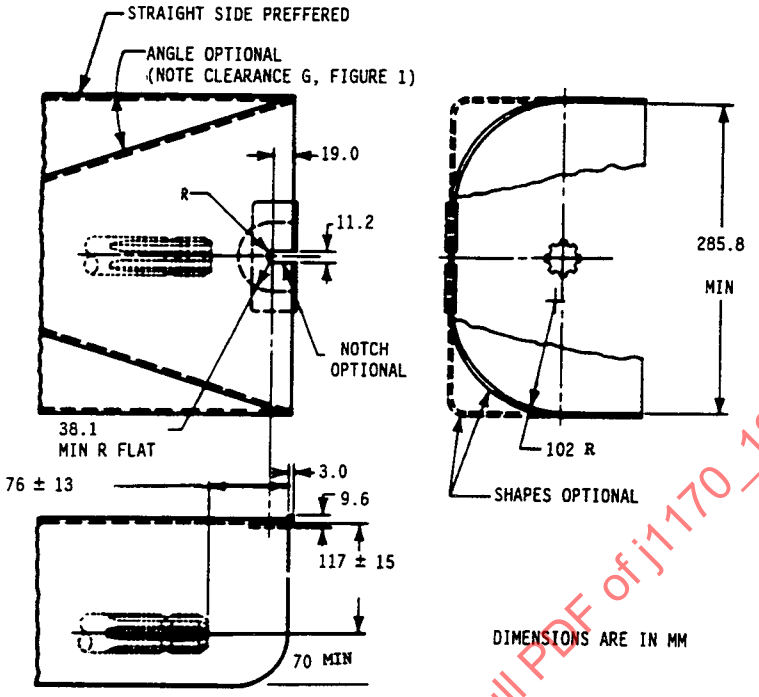
3.6 Power drive line shielding and tractor master shield shall conform to SAE J208. Tractor master shield dimensions shall conform to Figure 5.

3.7 If removal of the tractor shield is required for integral PTO driven implements, shielding shall be provided with the implement to provide protection as specified in SAE J208.

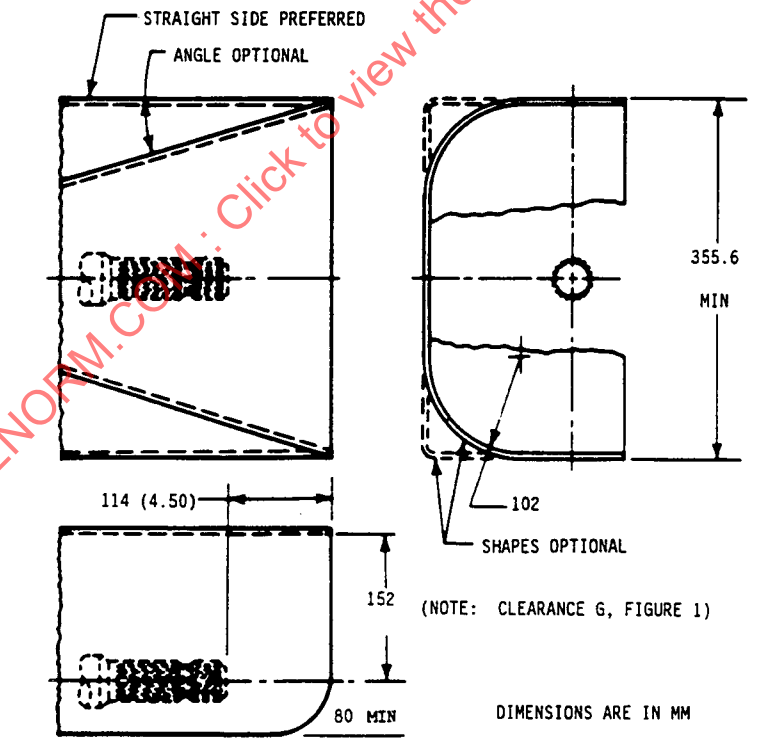
3.8 The tractor power take-off shaft shall be covered at all times, either by a master shield or other protective means, when not connected to a drive assembly.

3.9 Dimensional association between the tractor power take-off shaft, drawbar, and implement input connection (IIC) shall conform to SAE J721.

3.10 The front and rear tractor power take-off shaft shall be located within the limits defined in Figure 6 and Table 2.



SHIELD FOR TRACTOR WITH TYPES I OR II PTO SHAFT



SHIELD FOR TRACTOR WITH TYPE III PTO SHAFT

FIGURE 5—POWER TAKE-OFF SHIELD