



# SURFACE VEHICLE STANDARD

**J744™****OCT2021**

Issued 1952-01  
Revised 2016-10  
Reaffirmed 2021-10

Superseding J744 OCT2016

## Hydraulic Pump and Motor Mounting and Drive Dimensions

### RATIONALE

SAE J744 has been reaffirmed to comply with the SAE Five-Year Review policy.

#### 1. SCOPE

This SAE Standard applies to hydraulic pumps and motors used on off-road self-propelled work machines as described in SAE J1116.

##### 1.1 Purpose

To provide a progression of standard mounting flanges and shafts that are dimensionally compatible.

#### 2. REFERENCES

##### 2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

##### 2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), [www.sae.org](http://www.sae.org).

SAE J390 Dual Dimensioning Engineering Drawings

SAE J1116 Categories of Off-Road Self-Propelled Work Machines

SAE TSB 003 Rules for SAE Use of SI (Metric) Units

SAE Executive Standards Committee Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be revised, reaffirmed, stabilized, or cancelled. SAE invites your written comments and suggestions.

Copyright © 2021 SAE International

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of SAE.

**TO PLACE A DOCUMENT ORDER:** Tel: 877-606-7323 (inside USA and Canada)  
Tel: +1 724-776-4970 (outside USA)  
Fax: 724-776-0790  
Email: [CustomerService@sae.org](mailto:CustomerService@sae.org)  
<http://www.sae.org>

SAE WEB ADDRESS:

**For more information on this standard, visit**  
[https://www.sae.org/standards/content/J744\\_202110](https://www.sae.org/standards/content/J744_202110)

## 2.2 ANSI Publications

Copies of these documents are available online at <http://webstore.ansi.org/>

ANSI B1.1 Screw Threads

ANSI B92.1-1996 Involute Splines and Inspection

## 3. UNITS

3.1 The International System of Units (SI) is used herein in accordance with Reference 7.1.

3.2 Customary U.S. units are given for information purposes, and these appear in parentheses next to their SI counterpart.

## 4. IDENTIFICATION CODE

4.1 Flange identification codes are found in Table 1.

4.1.1 The number preceding the dash (—) is an approximation, in millimeters, of the mounting flange pilot diameter.

4.1.2 The number following the dash (—) states the number of mounting holes in the flange.

**Table 1 - Dimensions of 2 and 4 bolt pump and motor mounting flanges**

| Identification Code | Pilot Dimensions A Noted | Pilot Dimensions W Noted | Pilot Dimensions X Min | Pilot Dimensions Y Max | 2 Bolt Type B Cast Dim. | 2 Bolt Type J | 2 Bolt Type K | 2 Bolt Type M Noted | 2 Bolt Type P <sub>1</sub> Cast Dim. | 4 Bolt Type S | 4 Bolt Type R Noted | 4 Bolt Type P <sub>2</sub> Cast Dim. |
|---------------------|--------------------------|--------------------------|------------------------|------------------------|-------------------------|---------------|---------------|---------------------|--------------------------------------|---------------|---------------------|--------------------------------------|
| 50— <sup>(1)</sup>  | 50.80                    | 6.4                      | —                      | 0.8                    | 64                      | 14            | 82.6          | 10.3                | 10                                   | —             | —                   | —                                    |
| (A—A)               | (2.000)                  | (0.250)                  | —                      | (0.03)                 | (2.50)                  | (0.56)        | (3.250)       | (0.406)             | (0.38)                               | —             | —                   | —                                    |
| 82— <sup>(1)</sup>  | 82.55                    | 6.4                      | —                      | 0.8                    | 95                      | 18            | 106.4         | 11.1                | 12                                   | —             | —                   | —                                    |
| (A)                 | (3.250)                  | (0.250)                  | —                      | (0.03)                 | (3.75)                  | (0.72)        | (4.188)       | (0.438)             | (0.47)                               | —             | —                   | —                                    |
| 101— <sup>(1)</sup> | 101.60                   | 9.7                      | 51                     | 1.5                    | 120                     | 25            | 146.0         | 14.3                | 14                                   | 89.8          | 14.3                | 14                                   |
| (B)                 | (4.000)                  | (0.380)                  | (2.00)                 | (0.06)                 | (4.75)                  | (0.99)        | (5.750)       | (0.562)             | (0.56)                               | (3.536)       | (0.562)             | (0.56)                               |
| 127— <sup>(1)</sup> | 127.00                   | 12.7                     | 64                     | 1.5                    | 148                     | 31            | 181.0         | 17.5                | 16                                   | 114.5         | 14.3                | 16                                   |
| (C)                 | (5.000)                  | (0.500)                  | (2.50)                 | (0.06)                 | (5.81)                  | (1.22)        | (7.125)       | (0.688)             | (0.62)                               | (4.508)       | (0.562)             | (0.62)                               |
| 152— <sup>(1)</sup> | 152.40                   | 12.7                     | 70                     | 1.5                    | 200                     | 40            | 228.6         | 20.6                | 19                                   | 161.6         | 20.6                | 19                                   |
| (D)                 | (6.000)                  | (0.500)                  | (2.75)                 | (0.06)                 | (7.88)                  | (1.55)        | (9.000)       | (0.812)             | (0.75)                               | (6.364)       | (0.812)             | (0.75)                               |
| 165— <sup>(1)</sup> | 165.10                   | 15.9                     | 70                     | 2.3                    | 270                     | 55            | 317.5         | 27.0                | 25                                   | 224.5         | 20.6                | 19                                   |
| (E)                 | (6.500)                  | (0.625)                  | (2.75)                 | (0.09)                 | (10.62)                 | (2.15)        | (12.500)      | (1.062)             | (1.00)                               | (8.839)       | (0.812)             | (0.75)                               |
| 177— <sup>(1)</sup> | 177.80                   | 15.9                     | 70                     | 2.3                    | 300                     | 60            | 350.0         | 27.0                | 25                                   | 247.5         | 27.0                | 25                                   |
| (F)                 | (7.000)                  | (0.625)                  | (2.75)                 | (0.09)                 | (11.75)                 | (2.37)        | (13.781)      | (1.062)             | (1.00)                               | (9.745)       | (1.062)             | (1.00)                               |

1. —2 2 Bolt, —4 4 Bolt Flange

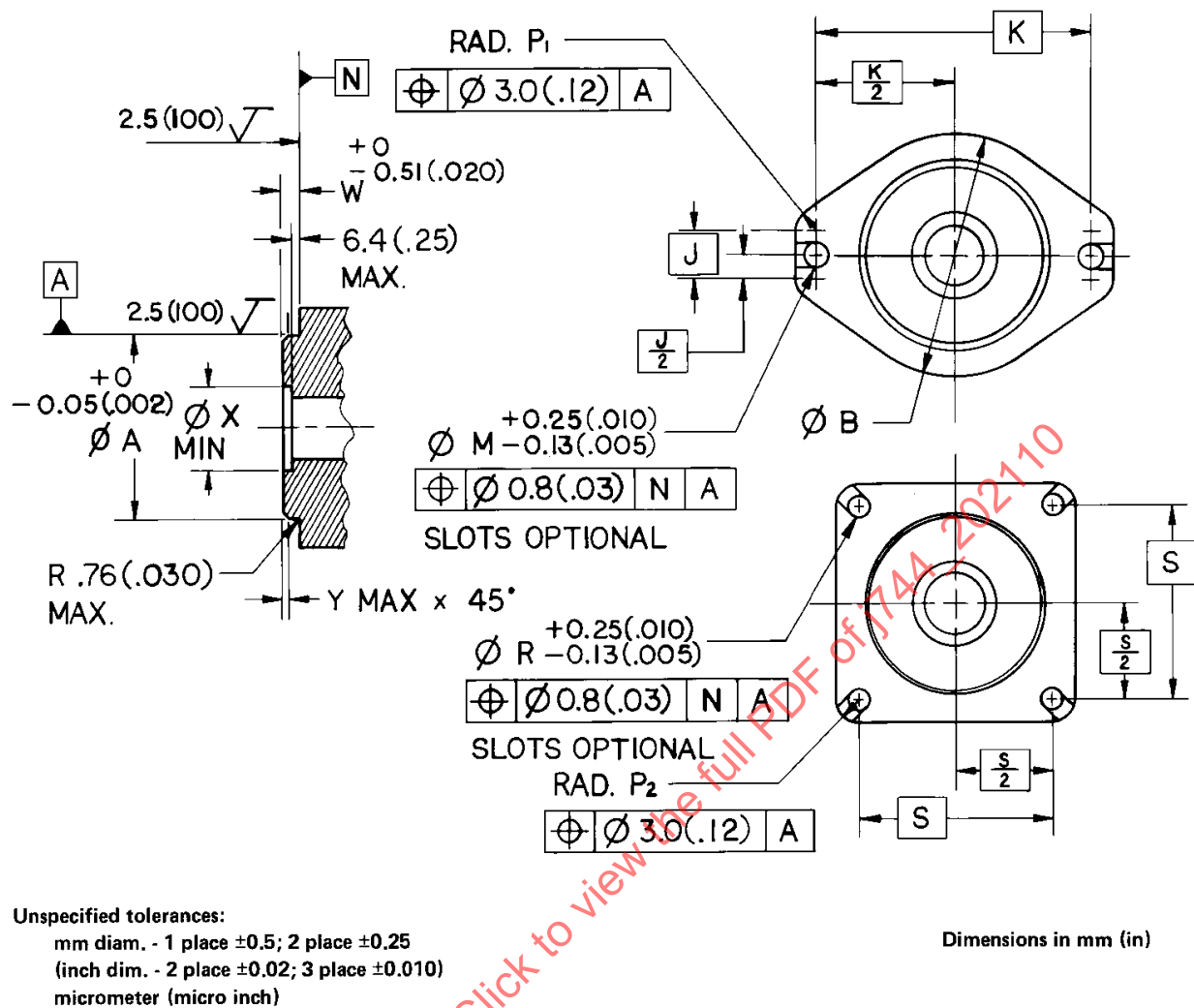


**Figure 1 - Dimensions of 2 and 4 bolt pump and motor mounting flanges**

4.2 Shaft identification codes are found in Tables 2, 3, and 4 and Figures 2, 3, and 4.

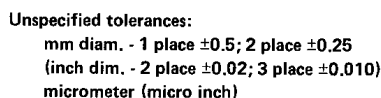
4.2.1 The number preceding the dash (—) is an approximation, in millimeters, of the shaft major diameter.

4.2.2 The number following the dash (—) is arbitrarily assigned as follows:

- Straight Shaft without Thread—1
- Straight Shaft with Thread—2
- Tapered Shaft with Thread—3
- 30 degrees Involute Spline—4

**Figure 2 - Dimensions of straight shafts - without and with thread**

1. —1 without thread, —2 with thread



Dimensions in mm (in)

**Table 3 - Dimensions of taper shaft ends with thread - 3**

| Identification Code | D <sub>S3</sub> | D <sub>T</sub><br>ANSI B1.1 | D <sub>G</sub> Gauge Diameter | C Noted | L <sub>CT</sub> | L <sub>ST</sub> | L <sub>T</sub> | L <sub>G</sub><br>Gauge Length | E Noted  | Z Max   | Z Min   |
|---------------------|-----------------|-----------------------------|-------------------------------|---------|-----------------|-----------------|----------------|--------------------------------|----------|---------|---------|
| 13—3                | 12.70           | 5/16—32                     | 12.00                         | 2.0     | 7.52            | 17.48           | 12.70          | 11.88                          | 3.18     | 1.63    | 1.37    |
| (A—A)               | (0.500)         | UNF 2A                      | (0.472)                       | (0.078) | (0.296)         | (0.688)         | (0.500)        | (0.468)                        | (0.125)  | (0.064) | (0.054) |
| 16—3                | 15.88           | 1/2—20                      | 15.00                         | 3.2     | 10.31           | 17.48           | 18.26          | 10.44                          | 3.97     | 2.13    | 1.88    |
| (A)                 | (0.625)         | UNF 2A                      | (0.591)                       | (0.125) | (0.406)         | (0.688)         | (0.719)        | (0.412)                        | (0.1563) | (0.084) | (0.074) |
| 19—3                | 19.05           | 1/2—20                      | 18.00                         | 3.2     | 10.31           | 23.83           | 18.26          | 15.43                          | 4.78     | 2.54    | 2.29    |
|                     | (0.750)         | UNF 2A                      | (0.709)                       | (0.125) | (0.406)         | (0.938)         | (0.719)        | (0.607)                        | (0.188)  | (0.100) | (0.090) |
| 22—3                | 22.22           | 5/8—18                      | 20.00                         | 4.0     | 14.30           | 28.58           | 23.01          | 10.77                          | 6.35     | 3.33    | 3.07    |
| (B)                 | (0.875)         | UNF 2A                      | (0.787)                       | (0.156) | (0.563)         | (1.125)         | (0.906)        | (0.424)                        | (0.250)  | (0.131) | (0.121) |
| 25—3                | 25.40           | 3/4—16                      | 23.00                         | 4.0     | 14.30           | 34.92           | 26.97          | 15.72                          | 6.35     | 3.33    | 3.07    |
| (B—B)               | (1.00)          | UNF 2A                      | (0.906)                       | (0.156) | (0.563)         | (1.375)         | (1.062)        | (0.619)                        | (0.250)  | (0.131) | (0.121) |
| 32—3                | 31.75           | 1—12                        | 30.00                         | 4.0     | 14.30           | 34.92           | 30.96          | 20.92                          | 7.94     | 4.11    | 3.86    |
| (C)                 | (1.25)          | UNF 2A                      | (1.181)                       | (0.156) | (0.563)         | (1.375)         | (1.219)        | (0.824)                        | (0.3125) | (0.162) | (0.152) |
| 38—3                | 38.10           | 1-1/8—12                    | 35.00                         | 4.0     | 14.30           | 47.62           | 34.92          | 22.82                          | 9.52     | 4.93    | 4.67    |
| (C—C)               | (1.50)          | UNF 2A                      | (1.378)                       | (0.156) | (0.563)         | (1.875)         | (1.375)        | (0.899)                        | (0.375)  | (0.194) | (0.184) |
| 44—3                | 44.45           | 1-1/4—12                    | 41.00                         | 4.0     | 17.45           | 53.98           | 39.67          | 26.38                          | 11.11    | 5.72    | 5.46    |
| (D & E)             | (1.75)          | UNF 2A                      | (1.614)                       | (0.156) | (0.687)         | (2.125)         | (1.562)        | (1.038)                        | (0.4375) | (0.225) | (0.215) |
| 50—3                | 50.80           | 1-1/4—12                    | 46.00                         | 4.0     | 17.45           | 73.02           | 39.67          | 34.62                          | 12.70    | 6.50    | 6.25    |
| (F)                 | (2.00)          | UNF 2A                      | (1.811)                       | (0.156) | (0.687)         | (2.875)         | (1.562)        | (1.363)                        | (0.500)  | (0.256) | (0.246) |

SAENORM.COM : Click to view the full PDF of J744-2021-10

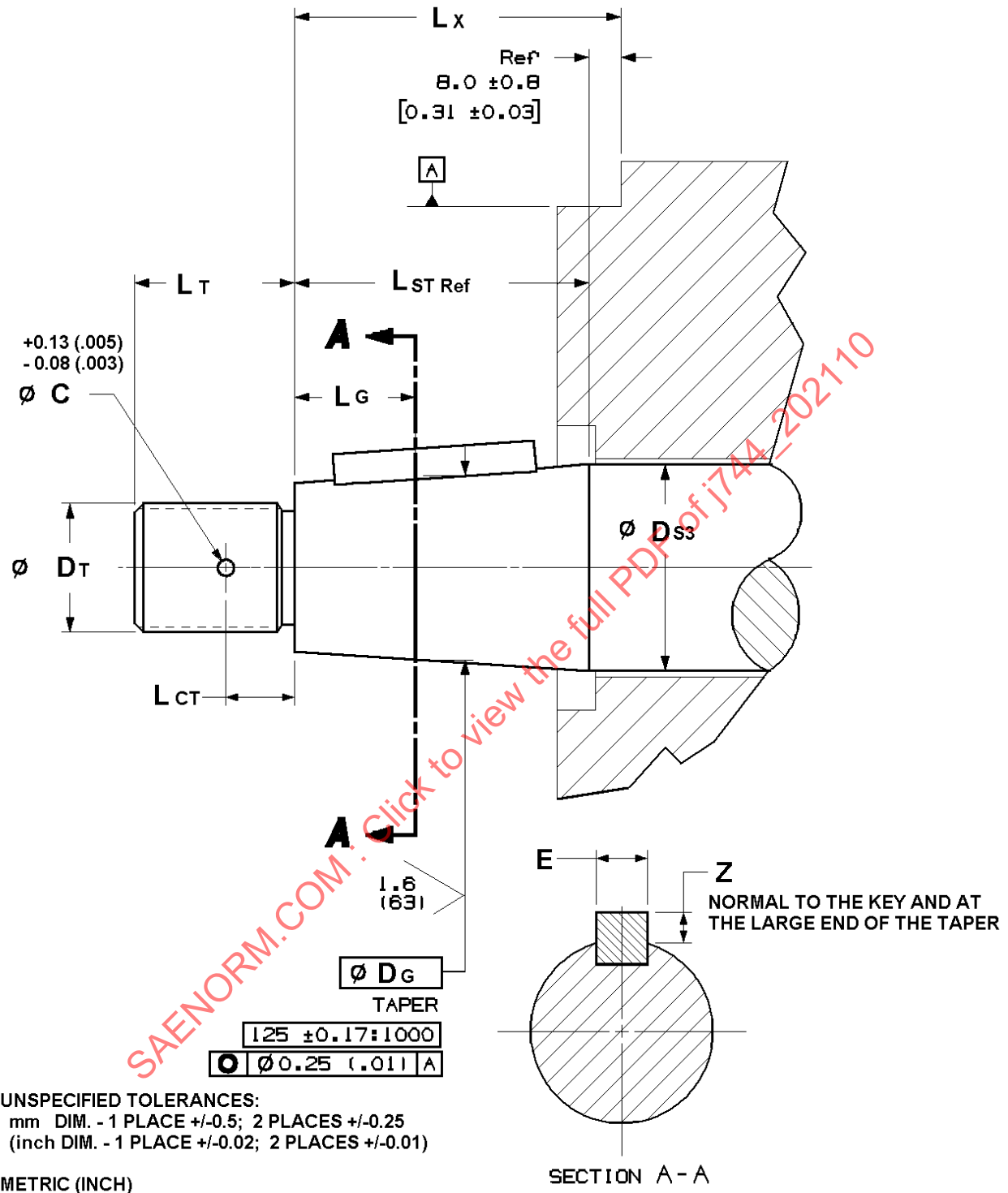


Figure 3 - Dimensions of taper shaft ends with thread - 3