SAE The Engineering Society For Advancing Mobility Land Sea Air and Space®
INTERNATIONAL
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SURFACE VEHICLE RECOMMENDED PRACTICE

An American National Standard

SAE J371

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Superseding J371 JUL85

DRAIN, FILL, AND LEVEL PLUGS FOR OFF-ROAD, SELF-PROPELLED WORK MACHINES

***Foreword*—**This Document has not changed other than to put it into the new SAE Technical Standards Board Format.

Plugs are extensively used in off-road, self-propelled work machines as defined in SAE J1116. Loss of these plugs, stripping of the threads, or failure to tighten because of difficulty in finding the right tool can result in serious damage and/or increased down time. All the plugs listed are nominal inch sizes pending the development of metric plug standards.

1. ***Scope*—**This SAE Recommended Practice applies to off-road, self-propelled work machines as defined in SAE J1116, Categories 1, 2, 4, and 5.

1.1 **Purpose—**The purpose of this document is to standardize and, therefore, minimize the number of sizes and types of drain, fill, and level plugs required. It also establishes types and sizes of pipe thread and straight thread plugs requiring commercially available hand tools for removal and installation. It is not intended to establish dimensions and materials.

2. ***References***

2.1 **Applicable Publications—**The following publications form a part of the specification to the extent specified herein. Unless otherwise indicated the lastest revision of SAE publications shall apply.

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

SAE J48—Guidelines for Liquid Level Indicators
SAE J476—Dry Seal Pipe Threads
SAE J531—Automotive Pipe, Filler, and Drain Plugs
SAE J1116—Categories of Off-Road, Self-Propelled Work Machines

2.1.2 ISO PUBLICATION—Available from ANSI, 11 West 42nd Street, New York, NY 10036-8002.

ISO 6302—Earth-moving machinery—Drain, fill, and level plugs

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3. ***Application—***It is recommended that the plugs listed in Table 1, Types A, B, C, and D be used as follows:

3.1 Tables 2 and 3 and Figures 1 to 4 list the type and principal dimensions of the recommended plugs which are suggested to ease maintenance. Common tools can be used, a minimum number of tools are needed and the plugs are easily distinguished. All plugs and tools herein are nominal inch sizes.

TABLE 1—PLUG TYPE APPLICATIONS

Application	Use Type
Physical Damage Likely	A, C (C Preferred)
Clearance Problems	A, C (C Preferred)
Frequent Removal and Reassembly	D
Minimal Removal and Reassembly	B

TABLE 2—PIPE THREAD PLUGS DIMENSIONS MM (IN)

Taper Pipe Thread d	Type A Socket Drive Size s1	Type A Socket Depth t1 (min)	Type B Wrench Size s2	Type B Head Height k1
1/8-27 NPTF	—	—	7/16	5 (0.19)
1/4-18 NPTF	—	—	9/16	5 (0.19)
3/8-18 NPTF	—	—	11/16	6 (0.22)
1/2-14 NPTF	—	—	7/8	6 (0.22)
3/4-14 NPTF	1/2	8 (0.31)	1-1/8	8 (0.31)
1-11 1/2 NPTF	1/2	10 (0.38)	1-5/16	8 (0.31)
1 1/4-11 1/2 NPTF	3/4	12 (0.50)	1-7/8	10 (0.38)
1 1/2-11 1/2 NPTF	3/4	12 (0.50)	1-7/8	10 (0.38)
Hand Tools To Use	Socket Wrench Handles	Socket Wrench Handles	Commercially Available Hand Tools	Commercially Available Hand Tools

TABLE 3—STRAIGHT THREAD PLUGS DIMENSIONS MM (IN)

Thread d	Type C Socket Drive Size s3	Type C Socket Depth t2 (min)	Type D Wrench Size s4	Type D Head Height k2
5/16–24 UNF	—	—	9/16	5 (0.19)
3/8–24 UNF	—	—	5/8	5 (0.19)
1/2–20 UNF	—	—	3/4	5 (0.19)
5/8–18 UNF	—	—	7/8	7 (0.25)
3/4–16 UNF	—	—	1–1/8	7 (0.25)
1–14 UNF	1/2	8 (0.31)	1–5/16	7 (0.25)
1 1/16–12 UN	1/2	8 (0.31)	1–5/16	8 (0.31)
1 1/4–12 UNF	3/4	12 (0.50)	1–1/2	8 (0.31)
1 5/16–12 UN	3/4	12 (0.50)	1–1/2	10 (0.38)
1 1/2–12 UNF	3/4	12 (0.50)	1–7/8	10 (0.38)
1 5/8–12 UN	3/4	12 (0.50)	1–7/8	10 (0.38)
1 3/4–12 UNF	3/4	12 (0.50)	2–1/16	10 (0.38)
1 7/8–12 UN	3/4	12 (0.50)	2–1/4	10 (0.38)
2–12 UNF	3/4	12 (0.50)	2-1/4	10 (0.38)
Hand Tools To Use	Socket Wrench Handles	Socket Wrench Handles	Commercially Available Hand Tools	Commercially Available Hand Tools

NOTE—The figures given in s1, s2, s3, and s4 columns are nominal tool sizes and not plug dimensions. Pipe threads are US standards dry seal pipe thread-B2.2.

References: SAE J531, SAE J476, SAE J48, and ISO J6302.

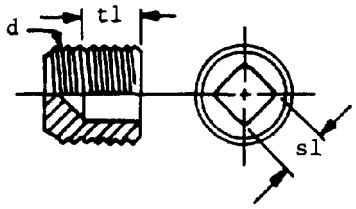

FIGURE 1—TYPE A SQUARE COUNTERSUNK HEADLESS PLUGS

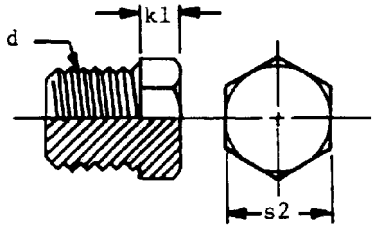

FIGURE 2—TYPE B HEXAGON OUTSIDE HEAD PLUGS

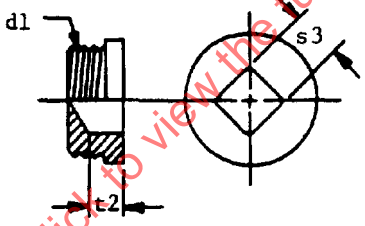

FIGURE 3—TYPE C SQUARE SOCKET HEAD PLUGS

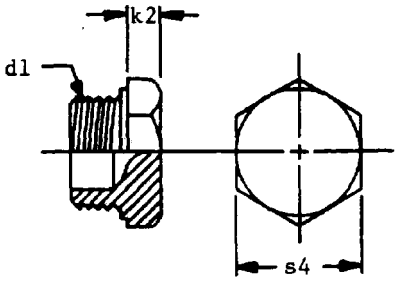

FIGURE 4—TYPE D HEXAGON OUTSIDE HEAD PLUGS

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