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Superseding AS4283A

Handles and Attachments for Hand Socket Wrenches

RATIONALE

Standard is being reviewed due to 5 year cycle; in addition, to incorporate customer requirements.

1. SCOPE

This SAE International Standard covers handles and attachments for use with sockets and crowfoot wrenches in aerospace applications involving high torque, limited clearances, and generally clean conditions. This document provides additional requirements beyond ASME B107.10 appropriate for aerospace use.

Inclusion of dimensional data in this document is not intended to imply all of the products described therein are stock production sizes. Consumers are requested to consult with manufacturers concerning lists of stock production sizes.

1.1 Classification

This document covers handles and attachments for socket wrenches and shall be of the following types, classes, and styles as specified:

Type I Handles:

Class 1 – Hinged Handles

Class 2 - Ratchet, reversible

Style A - Coarse action

Style B - Fine action

Class 3 - Speeder, brace type

Type II Attachments:

Class 1 Universal joint

Class 2 Bar, extension, solid

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on this Technical Report, please visit
<http://www.sae.org/technical/standards/AS4283B>**

2. APPLICABLE DOCUMENTS

2.1 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 International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

AS478N Identification Marking Methods

AS4984A Coating Requirements for Aerospace Hand Tools

2.1.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM E 18 Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials, Standard Test Methods for

2.1.3 ASME Publications

Available from American Society of Mechanical Engineers, 22 Law Drive, P.O. Box 2900, Fairfield, NJ 07007-2900, Tel: 973-882-1170, www.asme.org.

ASME B107.4 Driving and Spindle Ends for Portable Hand, Air and Electric Tools

ASME B107.10 Handles and Attachments for Hand Socket Wrenches - Inch and Metric Series

3. TECHNICAL REQUIREMENTS

3.1 Illustrations

The illustrations shown herein are descriptive and not restrictive and are included for the convenience of requisitioning and purchasing officers and manufacturers and are not intended to preclude the purchase of handles and attachments, which are otherwise in accordance with this document.

3.2 Materials

Unless otherwise specified hereinafter, the materials used in load bearing components in the manufacture of handles and attachments shall be steel, the chemical composition and heat treatment of which shall be such as to produce handles and attachments conforming to the physical requirements specified herein. Powdered metal pawls may be used.

3.3 Marking

Marking shall be in accordance with ASME B107.10 and AS478N.

3.4 Manufacture and Design

3.4.1 General Design

Unless otherwise specified herein, all dimensions and attributes shall be in conformance with ASME B107.10

3.4.2 Drive End Dimensions

Male and female drive end dimensions shall conform to ASME B107.4.

3.4.2.1 Retention Ball and Spring

Minimum pull off force shall be in accordance with ASME B107.4

3.4.3 Finish

Finish shall be as specified in ASME B107.10.

3.4.4 Coating

Wrenches shall be protected with one of the following three types as specified within AS4984A

Type I - Nickel Chromium coating

Type II – Black Oxide or Black Phosphate or other black finish coatings

Type III – Alternate coating (Used in lieu of Nickel chromium plating)

3.5 Type I, Class 1, Handles, Hinged

Hinged handles shall conform to Figure 1.

3.6 Type I, Class 2, Handles, Ratchet, Reversible

Ratchets shall conform to Figure 2. All screws shall be securely retained by means of either lock washers, nylon inserts, or oil resistant adhesive. The ratchet shall ratchet with equal ease and similar sound in both directions. It shall be free of any neutral, or disengaged, position in which it may easily come to rest. There may be a moment during the reversing process when the ratchet is not engaged in either direction, but it shall not have a tendency to stop in this position during normal ratcheting or reversing. It is not required that the ratchet be open for servicing or cleaning. Ratchet gears integral with the drive tang shall be 42 to 56 Rc.

3.7 Type I, Class 3, Handles, Speeder, Brace Type

Speeder handles shall conform to Figure 3. The axis of the top and bottom portions of the speeder handle shall be aligned within 0.3 in. (See Figure 6).

3.8 Type II, Class 1, Attachments, Universal Joint

Universal joints shall conform to Figure 4.

3.9 Type II, Class 2, Attachments, Bar Extension, Solid

The bar extension shall conform to Figure 5.

3.10 Workmanship

All items covered herein shall be free from fins, burrs, external sharp or rough edges, corners or surfaces and other defects which may impair their serviceability or durability.

3.10.1 Foreign Object Damage

It is important to avoid damage to aircraft engines due to foreign objects. Rips, tears, broaching slugs, burrs, slivers, and/or any material which could be removed during gaging, load testing, or normal use and/or any indication of rust shall be unacceptable.

4. TEST PROCEDURES

Testing for requirements contained in the applicable tables herein and the applicable tables in ASME B107.10 shall be conducted in accordance with ASME B107.10 unless otherwise specified. Adequate safeguards for personnel and property shall be employed in conducting all tests. Approved eye protection shall be worn at all times and equipment safety shields shall be in place when tests are in progress.

4.1 Testing

4.2 Hardness Testing

Hardness definitions, nomenclature, and procedures used herein can be found in ASTM E 18. When grinding is necessary to prepare the test surface, the amount removed must not exceed 0.007 in on the surface contacted by the indenter.

4.3 Qualification Tests

To qualify the design and processes a sample tool shall be subjected to the following qualification tests. The manufacturer shall maintain a record of compliance with the cyclic torque test for each reversible ratchet handle. Retest shall be required whenever the design or method of manufacture is changed.

4.3.1 Ratchet Cycle Test

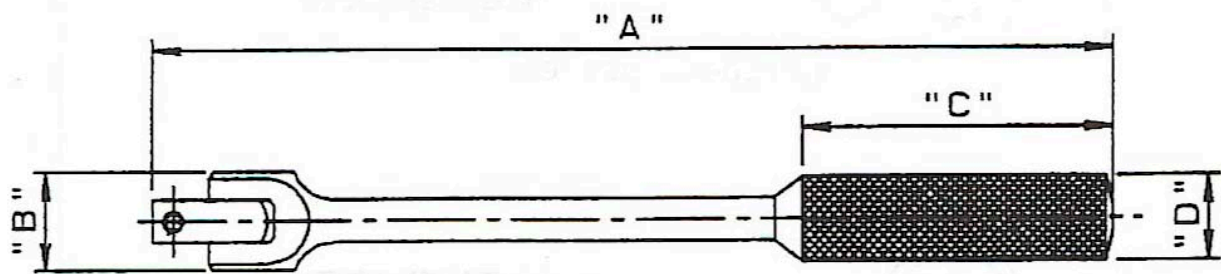
The ratchet mechanism shall withstand a cycle test of 50 000 cycles using the cycle test torque as specified in Figure 2 without failure of the ratchet mechanism or loosening of screws or other parts of the ratchet handle. Following the cyclic test, the ratchet handle shall carry the test torque specified in Figure 2 and shall reverse 12 times without jamming or other evidence of malfunction. Cycle tests shall be run at a speed not exceeding 30 load cycles per minute. The ratchet shall advance by at least 1 tooth or 10 degrees on each cycle. The torque shall be measured from the square drive by a strain gage or other device capable of detecting peak torque.

4.4 Speeder Straightness Test

Straightness shall be measured by placing a straight edge so as to make contact with the stem close to the grip and wherever else it touches the stem in the vicinity of the crank or square. The straight edge shall be approximately in the plane of the crank sweep. If the straight edge fails to touch the stem adjacent to the square or adjacent to the end of the crank toward the square, the gap shall not exceed 0.3 in. This test shall be repeated with the straight edge at approximately 90 degrees to the plane of the crank and the gap shall again not exceed 0.3 in. See Figure 6.

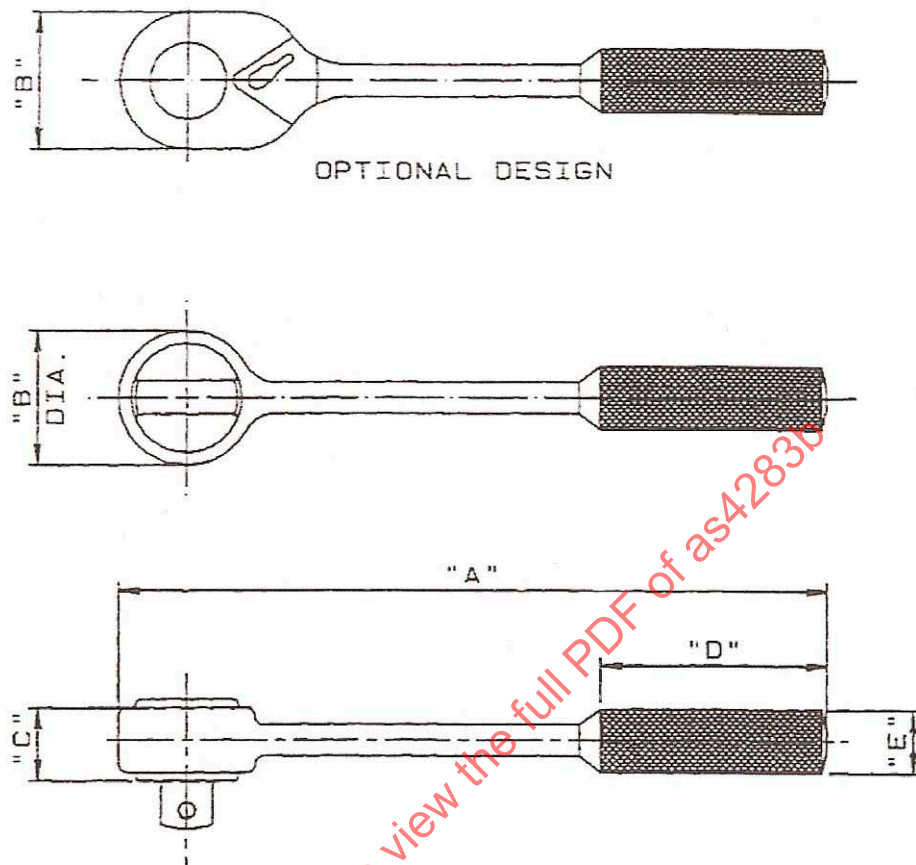
5. NOTES

- 5.1 A change bar (I) located in the left margin is for the convenience of the user in locating areas where technical revisions, not editorial changes, have been made to the previous issue of this document. An (R) symbol to the left of the document title indicates a complete revision of the document, including technical revisions. Change bars and (R) are not used in original publications, nor in documents that contain editorial changes only.



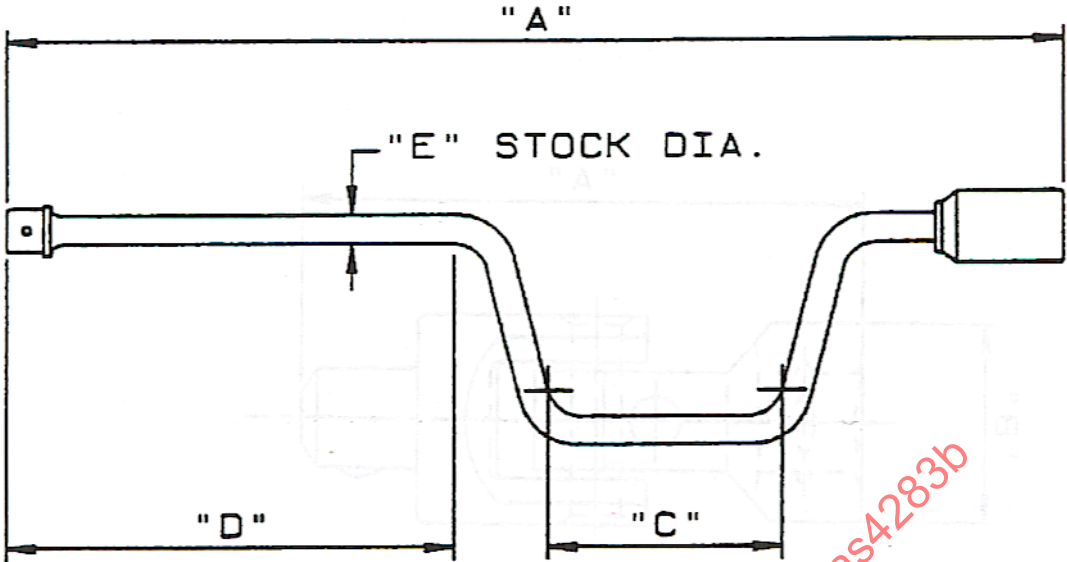
Drive, in	Overall Length, in "A" Min	Overall Length, in "A" Max	Dimension Across Hinge, in "B" Max	Handgrip Length, in "C" Min	Handgrip Diameter or Width, in "D" Min	Test Load in-lb Min
1/4	4.9	6.2	0.625	2.00	0.400	550
3/8	7.8	8.8	0.938	2.50	0.615	2 000
3/8	9.5	10.5	0.938	2.50	0.615	2 000
1/2	12.7	15.9	1.250	3.50	0.750	5 000
1/2	17.5	19.0	1.250	3.50	0.750	5 000
1/2	23.5	24.5	1.300	3.50	0.750	5 000
3/4	18.2	23.0	1.940	3.50	0.750	14 000

FIGURE 1 - TYPE I, CLASS 1, HANDLES, HINGED



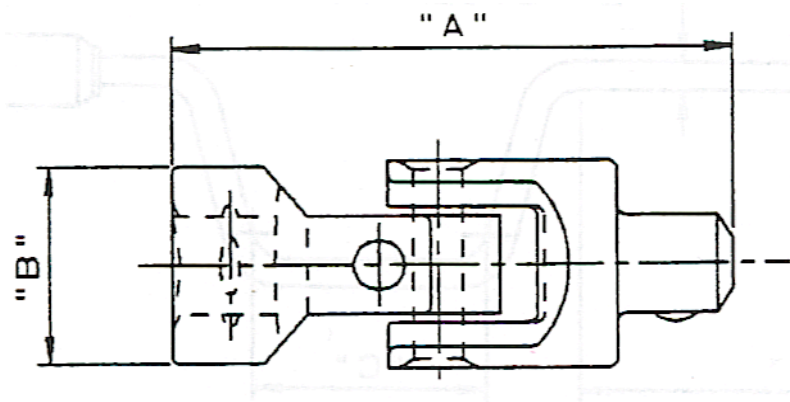
Drive in.	Overall Length in. "A" Min	Overall Length in. "A" Max	Head Dimensions Width in. "B" Max	Head Dimensions Head Thick Less Tang & Rev. Lever, in. "C" Max	Handgrip Length in. "D" Min	Handgrip Diameter Or Width in. "E" Min	Style A Course Action Number of Teeth In Gear Range	Style B Fine Action Number of Teeth In Gear Min	Test Torque lbf-in. Min	Cycle Test Torque lbf-in. Min
1/4	4.62	5.50	0.975	0.593	2.000	0.370	20-35	36	550	138
3/8	6.87	7.87	1.375	0.875	2.500	0.530	24-35	36	2.000	500
3/8	10.00	10.50	1.375	0.875	2.500	0.530	24-35	36	2.000	500
1/2	10.00	10.87	1.937	1.000	3.500	0.680	24-35	36	5.000	1250
1/2	14.87	16.12	1.937	1.000	3.500	0.680	24-35	36	5.000	1250
3/4	19.75	24.25	2.750	1.375	3.500	0.790	24-35	36	14.000	--

FIGURE 2 - TYPE I, CLASS 2, HANDLES, RATCHET, REVERSIBLE, STYLE A AND STYLE B



Drive, in	Overall Length, in "A" Min	Overall Length, in "A" Max	Grip Length "C" Min	Length, in Extension "D" Min	Diameter of Rod, in "E" Max
1/4	15.2	16.5	3.5	6.4	0.437
3/8	14.2	17.5	3.5	6.4	0.500
1/2	16.5	20.0	3.5	7.0	0.562

FIGURE 3 - TYPE I, CLASS 3, HANDLES, SPEEDER, BRACE TYPE



Drive, in	Overall Length, in "A" Max	Diameter, in "B" Max	Test Load in-lb Min
1/4	1.375	0.551	300
3/8	2.188	0.790	1 250
1/2	2.781	1.010	3 000
3/4	4.250	1.625	10 000

FIGURE 4 - TYPE II, CLASS 1, ATTACHMENTS, UNIVERSAL JOINT