SAE Aerospace
An SAE International Group

AEROSPACE STANDARD

SAE AS6018

Issued 2013-05

Wrench, Spanner

RATIONALE

This standard is an adaptation/update of federal specification GGG-W-665C, dated March 27, 1996.

1. SCOPE

This SAE Aerospace Standard (AS) covers adjustable and non-adjustable spanner wrenches generally used for aerospace machinery maintenance and for tightening and loosening hose couplings and hydrant caps.

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

Spanner wrenches covered by this standard shall be of the following types, classes and styles:

Type I - Adjustable Hook

Class 1 - Fixed Pivot Point

Class 2 - Variable Pivot Point, Heavy Duty

Type II - Pin

Class 1 - Non-adjustable

Class 2 - Adjustable

Type III - Face

Class 1 - Non-adjustable

Class 2 - Adjustable

Type IV - Combination Hydrant and Spanner

Type V - Universal Hose Coupling Wrench

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2. APPLICABLE DOCUMENTS

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 as specified in AMS2350. 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.

2.1 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

2.2 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 E18 Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials, Standard Test Methods for

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

The chemical composition of the materials and the heat treatment employed shall be such as to produce wrenches complying with the physical requirements specified hereinafter.

3.3 Marking

Marking shall be in accordance with AS478N.

3.4 Manufacture and Design

The wrenches shall be suitable for the purpose intended. Handles shall have a comfortable grip. Surfaces shall be smooth and corners shall be broken to approximately a 1/32 inch radius. Fillets having a radius of at least 1/32 inch shall be provided.

3.4.1 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 Tolerance

Dimensions referred to herein as approximate shall be interpreted as allowing a plus or minus tolerance of 15%.

3.6 Hardness

Unless otherwise specified herein, and with the exception of the pin used on Type II and Type III wrenches, spanner wrenches shall be hardened throughout to a Rockwell hardness of not less than 37 nor more than 45 on the "C" scale (HRc). Hardness definitions, nomenclature and procedures used herein can be found in ASTM E18. When grinding is necessary to prepare the test surface, the amount removed must not exceed 0.007 inch on the surface contacted by the indenter.

3.7 Test Loads

The items covered herein shall withstand the test load specified in the applicable tables without injury or permanent deformation which might affect durability or serviceability of the tools. 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.

3.8 Type I, Class 1 - Adjustable Hook, Fixed Pivot Point Spanner Wrenches

Type I, Class 1 wrenches shall be forged with a plain or solid web in the handle. Clearance between the jaw and the handle clevis shall be sufficient to allow for free pivoting of the jaw without excessive looseness. The steel hinge pin shall be peened or otherwise well secured. Wrenches shall be similar to Figure 1 and shall conform to Table 1 for the capacity specified.

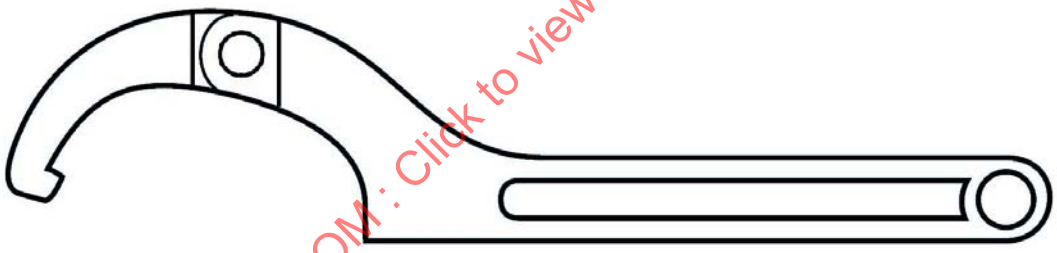

FIGURE 1 - TYPE I, CLASS 1, ADJUSTABLE HOOK, FIXED PIVOT POINT SPANNER WRENCHES

TABLE 1 - TYPE I, CLASS 1, ADJUSTABLE HOOK, FIXED PIVOT POINT, SPANNER WRENCHES

Capacity for Circles Diameter (inches)	Length Overall Approximate (inches)	Handle Approximate (inches)	Hook Approximate (inches)	Depth of Hook +1/32 - 1/64 (inches)	Test Load Minimum (inch-pounds)
3/4 to 2	6-3/8	1/4	11/32	1/8	1000
1-1/4 to 3	8-1/8	9/32	13/32	5/32 (Note 1)	2000
2 to 4-3/4	11-3/8	5/16	15/32	3/16	3000
4-1/2 to 6-1/4	12-1/8	5/16	15/32	1/4	4000
4 to 6-1/4	15-1/2	7/16	9/16	1/4	5000
6-1/8 to 8-3/4	13-3/4	5/16	15/32	5/16	5000

NOTE 1: The wrench shall have a 3/16 inch diameter by 3/16 inch long hook; or hook may be turned to 3/16 inch diameter

3.9 Type I, Class 2 - Adjustable Hook, Variable Pivot Point, Heavy Duty Spanner Wrenches

Type I, Class 2 wrenches shall cover a range of capacities from 5 to 12 inches in diameter. The wrench shall consist of a handle, a bolt and nut, and two interchangeable jaws of nominal thickness 3/8 inch and 3/4 inch. Each jaw shall have a minimum of eleven holes to provide the necessary adjustment. The handle shall have a minimum length of 22 inches. Wrenches shall be similar to Figure 2 and shall conform to Table 2.

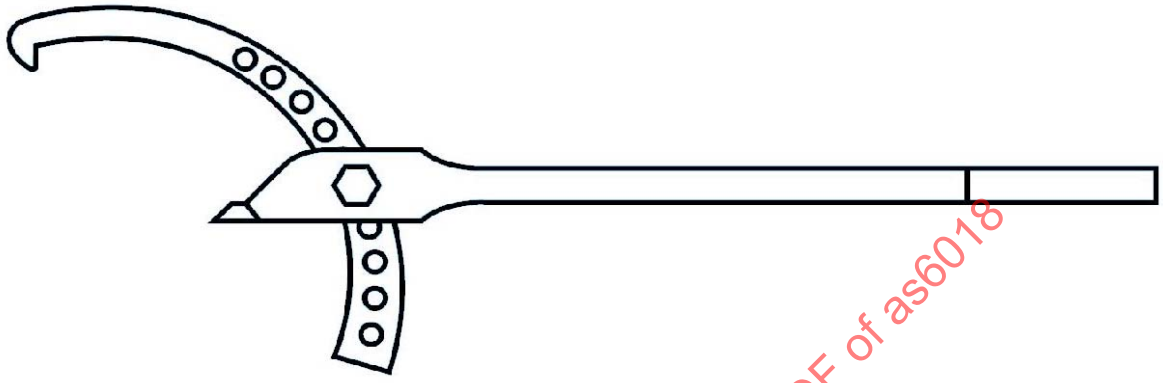

FIGURE 2 - TYPE I, CLASS 2, ADJUSTABLE HOOK, VARIABLE PIVOT POINT, HEAVY DUTY SPANNER WRENCHES

TABLE 2 - TYPE I, CLASS 2, ADJUSTABLE HOOK, FIXED PIVOT POINT, HEAVY DUTY SPANNER WRENCHES

Capacity for Slotted Hose Couplings												
Hose Diameter (inches)							Couplings Diameter (inches)					
Type							Type					
A	B	C	D	E	F		A	B	C	D	E	F
Cotton Rubber Lined	Unlined Linen	Oil Suction and Oil Discharge	Rubber Steam	Water Suction	Wash Deck and Engineers Rubber		Cotton Rubber Lined	Unlined Linen	Oil Suction and Oil Discharge	Rubber Steam	Water Suction	Wash Deck and Engineers Rubber
1-1/2	1-1/2	-	3/4	1-1/2	1-1/2		3	3	-	2-1/4	3-9/16	2-3/4
2/1/2	2-1/2	-		2	-		4-1/8	4-1/8	-	-	4-1/6	-
-	-	-		2/1/2	-		-	-	-	-	4-5/8	-
-	-	4		3	-		-	-	6-3/16	-	5-1/4	-
-	-	-		4	-		-	-	-	-	6-3/8	-

3.10 Type II - Pin Spanner Wrenches

Type II wrenches shall be forged with a plain or solid web in the handle. The pins shall be either integrally forged with the spanner head, then machined; or be of a separate piece that is copper brazed in a reamed hole (or secured in a manner to afford equal retention capacity).

3.10.1 Class 1 - Non-adjustable Pin Spanner Wrenches

Type II, Class 1 wrenches shall be similar to Figure 3 and shall conform to Table 3 for the capacity specified.

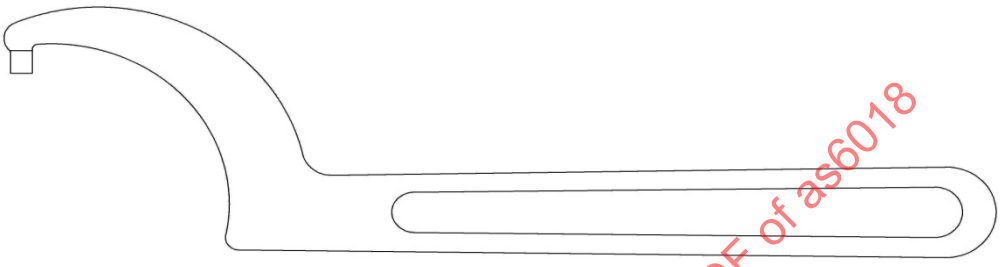

FIGURE 3 - TYPE II, CLASS 1, NON-ADJUSTABLE PIN SPANNER WRENCHES

TABLE 3 - TYPE II, CLASS 1, NON-ADJUSTABLE PIN SPANNER WRENCHES

Capacity for Circle, Diameter (inches)	Diameter of Pin		Pin Length (inches)		Over Length Approximate (inches)	Test Load Minimum (inch-pounds)
	Maximum (inches)	Minimum (inches)	+5/64	-1/64		
1	0.187	0.177	1/8		4	200
1-1/4	0.203	0.192	1/8		4-1/2	500
1-1/2	0.218	0.207	5/32		5	1000
1-3/4	0.234	0.222	5/32		5-1/2	1300
2	0.250	0.237	3/16		6	1600
2-1/4	0.265	0.253	3/16		6-1/2	1800
2-1/2	0.281	0.268	7/32		7	2300
2-3/4	0.296	0.283	7/32		7-1/2	2600
3	0.312	0.299	1/4		8	3400
3-1/4	0.328	0.313	1/4		8-1/2	3700
3-1/2	0.343	0.329	9/32		9	4600
3-3/4	0.359	0.341	9/32		9-1/2	5000
4	0.375	0.357	5/16		10	6000
5	0.437	0.417	3/8		12	7500
6	0.500	0.478	7/16		14	9500

3.10.2 Class 2 - Adjustable Pin Spanner Wrenches

Type II, Class 2 wrenches shall be similar to Figure 4 and shall conform to Table 4.

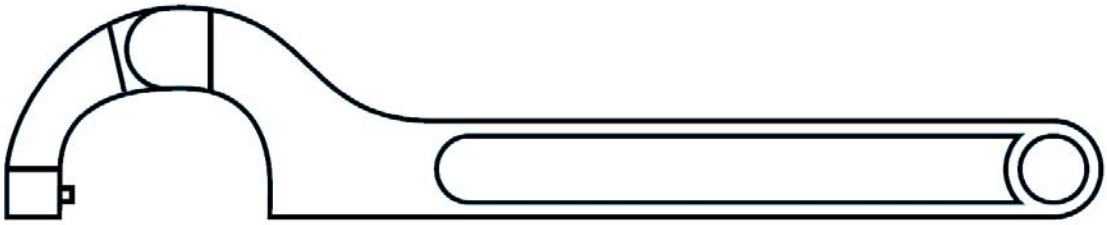

FIGURE 4 - TYPE II, CLASS 2, ADJUSTABLE PIN SPANNER WRENCHES

TABLE 4 - TYPE II, CLASS 2, ADJUSTABLE PIN SPANNER WRENCHES

Capacity for Circles Diameter (inches)	Length Overall Approximate (inches)	Handle Thickness Approximate (inches)	Pin Diameter Approximate (inches)	Pin Length +1/32 -1/64 (inches)	Test Load Minimum (inch-pounds)
3/4 to 2	6-3/8	1/4	1/8	1/8	1000
3/4 to 2	6-3/8	1/4	3/16	5/32	2000
1-1/4 to 3	8-1/8	9/32	3/16	3/16	2000
1-1/4 to 3	8-1/8	9/32	1/4	7/32	3000
2 to 4-3/4	11-3/8	11/32	1/4	1/4	3000
4-1/2 to 6-1/4	12-1/8	11/32	3/8	1/4	4000

3.11 Type III - Face Spanner Wrenches

Type III wrenches shall be forged with a plain or solid web in the handle. The pins shall be either integrally forged with the spanner head, then machined; or be of a separate piece that is copper brazed in a reamed hole (or secured in a manner to afford equal retention capacity).

3.11.1 Class 1 - Non-adjustable Face Spanner Wrenches

Type III, Class 1 wrenches shall be similar to Figure 5 and shall conform to Table 5.

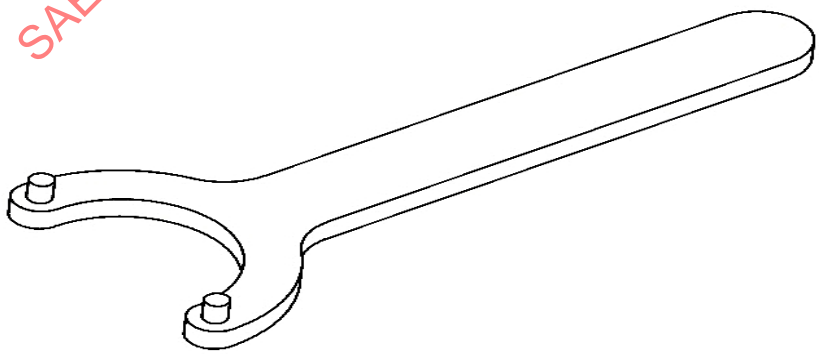

FIGURE 5 - TYPE III, CLASS 1, NON-ADJUSTABLE FACE SPANNER WRENCHES