[INCH-POUND]
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March 27, 1996
SUPERSEDING
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October 30, 1963

FEDERAL SPECIFICATION

WRENCH, SPANNER

The General Services Administration has authorized the use of this Federal Specification by all Federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers adjustable and nonadjustable spanner wrenches generally used for machinery maintenance and for tightening and loosening hose couplings and hydrant caps.

1.1.1 Federal specification coverage. Federal specifications do not cover all varieties of the commodity indicated by the title of the specification, or which are commercially available, but are intended to cover only those generally used by the Federal Government.

1.2 Classification.

1.2.1 Types, classes, and styles. Spanner wrenches shall be of the following types, classes, and styles, as specified (see 6.1):

Type I - Adjustable hook

- Class 1 - Fixed pivot point
- Class 2 - Variable pivot point
- Class 3 - Heavy duty

Type II - Pin

- Grade A - Hardened and tempered steel
- Grade B - Casehardened steel or malleable iron

Type III - Face

- Class 1 - Adjustable
- Class 2 - Nonadjustable

Beneficial comments, recommendations, additions, deletions, clarifications, etc., and any other data which may improve this document should be sent to: General Services Administration, Federal Supply Service, Tools and Appliances Commodity Center (6FETE-CO), Washington, DC 20406.

Type IV - Combination hydrant and spanner

Type V - Universal, hose coupling

Type VI - Double eye

Type VII - Nonadjustable hook, for spring grip couplings

2. APPLICABLE DOCUMENTS

2.1 Government documents. The following documents, of the issues in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein:

Federal Specification:

PPP-P-40 - Preservation and Packing of Hand Tools and Tool Accessories for Power Driven, Metal and Woodworking Machinery

Federal Standard:

FED-STD-151 - Metal, Test Methods

(Activities outside the Federal Government may obtain copies of Federal specifications, standards, and Commercial Item Descriptions as outlined under General Information in the Index of Federal Specifications, Standards and Commercial Item Descriptions. The Index, which includes cumulative bimonthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

(Single copies of this specification, and other Federal specifications and Commercial Item Descriptions required by activities outside the Federal Government for bidding purposes are available without charge from General Services Administration Business Service Centers in Boston, MA; New York, NY; Philadelphia, PA; Washington, DC; Atlanta, GA; Chicago, IL; Kansas City, MO; Fort Worth, TX; Houston, TX; Denver, CO; San Francisco, CA; Los Angeles, CA; and Seattle, WA.)

(Federal Government activities may obtain copies of Federal standardization documents and the Index of Federal Specifications, Standards and Commercial Item Descriptions from established distribution points in their agencies.)

Military Standard:

MIL-STD-130 - Identification Marking of U.S. Military Property

(Copies of military specifications and standards required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Non-Government publications. The following documents form a part of this specification to the extent specified herein. Unless a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply.

American National Standards Institute (ANSI)/American Society of Quality Control (ASQC):

ANSI/ASQC Z1.4 - Sampling Procedures and Tables for Inspection by Attributes

(Application for copies should be addressed to the American Society for Quality Control, P.O. Box 3005, 611 E. Wisconsin Avenue, Milwaukee, WI 53201-4606.)

American Society for Testing and Materials (ASTM):

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

(Applications for copies should be addressed to the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

3. REQUIREMENTS

3.1 Illustrations. Illustrations herein are descriptive and not restrictive and are not intended to preclude the purchase of spanner wrenches otherwise conforming to this specification.

3.2 Material. 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 for each type.

3.3 Design and manufacture. 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 1/82-inch radius. Fillets having a radius of at least 1/32 inch shall be provided.

3.3.1 Tolerance. Dimensions referred to herein as approximate shall be interpreted as allowing a plus or minus tolerance of 15 percent from such dimensions.

3.4 Marking. Each item shall be marked with the manufacturer's name or identifying symbol and the state or country of manufacture. The marking shall be engraved, etched, or stamped in such a manner that it will be permanent to the extent that it will remain clear and legible throughout the life of the item.

3.4.1 Military agencies. Wrenches shall be marked for identification as specified in MIL-STD-130.

3.5 Finish.

3.5.1 Surface roughness. All surfaces shall be thoroughly cleaned and free from pits, nodules, forged flash marks, cast flash marks, burrs, cracks, or other detrimental defects. All forge or cast flash marks shall be completely removed to blend smoothly with the adjacent surfaces. Determination with this paragraph shall be made on the finished product (after the required coating is applied).

3.5.2 Coatings. Unless otherwise specified (see 6.1), the wrenches shall have one of the following coatings (see 6.1) which shall be adherent, smooth, continuous, and free from uncoated areas, pits, blisters, nodules, and any other defects which would interfere with their protective value and serviceability. The minimum thickness of the coating shall be as specified in 3.5.2.1 through 3.5.2.4 on all surfaces which can be touched by a ball 0.750 inch in diameter.

3.5.2.1 Bright chromium plate. The coating shall be electrodeposited metals consisting of nickel, followed by chromium, the minimum thickness being 0.0002 inch for nickel and 0.000007 inch for chromium. When chrome or nickel coatings are specified, but are restricted by Government order, another coating, as listed, shall be substituted.

3.5.2.2 Zinc plate. The coating shall be electrodeposited zinc not less than 0.003 inch thick, and shall be subjected to a chemical or electrochemical chromating.

3.5.2.3 Hot phosphating. The coating shall consist of a chemically-produced phosphate followed with a coating of polar type, thin film, rust-preventative compound.

3.5.2.4 Oxide coating. The coating shall consist of a chemically-produced oxide followed with a coating of polar type, thin film, rust-preventive compound.

3.5.2.5 Enamel. The enamel shall be of good quality suitable for applying to a metal surface. The coating shall not be tacky nor flake off easily. When specified (see 6.1), the wrenches shall be furnished with either olive drab or gray enamel.

3.5.2.6 Lacquer. The lacquer coating shall be of good quality suitable for applying to bare metal surfaces to deter rusting in transit or short-term storage.

3.6 Type I, adjustable hook. The adjustable hook(s) or type I spanner wrenches shall be of steel and heat treated to possess a hardness of 37 to 45 on the Rockwell C scale (see 4.4.1).

3.6.1 Class 1, fixed pivot point. 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 drop-forged steel with a plain or solid web in the handle. Class 1 wrenches shall conform to Table I for the capacity specified (see 6.1), and shall be similar to Figure 1.

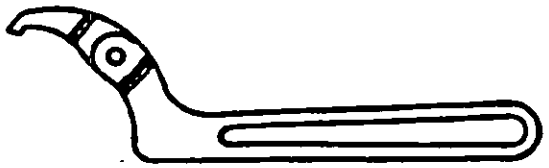

Figure 1. Type I, class 1, adjustable hook, fixed pivot point, spanner wrenches.

3.6.2 Class 2, variable pivot point. The class 2 wrench 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 and 3/4 inch. Each jaw shall have a minimum of eleven holes to provide the necessary adjustment. The handle shall be a minimum length of 22 inches. Class 2 wrenches shall have a minimum weight of 10 pounds and be similar to Figure 2.

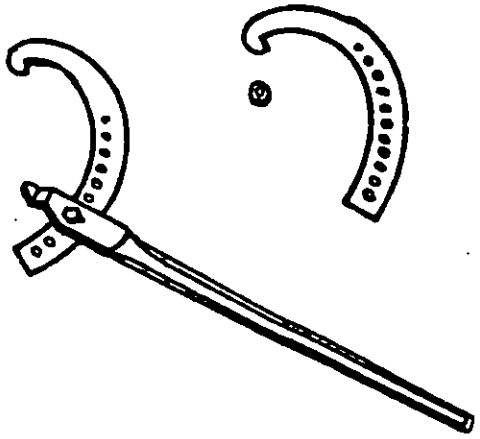

Figure 2. Type I, class 2, adjustable hook, variable pivot point, spanner wrenches.

TABLE I. Type I, class 1, adjustable hook, fixed pivot point, spanner wrenches

Capacity for circles, diameter (Inches)	Length overall (approximate) (Inches)	Thickness: Handle (approximate) (Inch)	Thickness: Hook (approximate) (Inch)	Depth of hook + 1/32 - 1/64 (Inch)	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 2/	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

Capacity for slotted hose couplings

Hose diameter, Hose types 1/						Couplings diameter, Hose types 1/					
A (Inches)	B (Inches)	C (Inches)	D (Inch)	E (Inches)	F (Inches)	A (Inches)	B (Inches)	C (Inches)	D (Inches)	E (Inches)	F (Inches)
----	----	----	----	----	----	----	----	----	----	----	----
----	----	----	----	----	----	----	----	----	----	----	----
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	----
----	----	----	----	----	----	----	----	----	----	----	----

1/ Designations for hose types are as follows:
A - Cotton rubber-lined hose
B - Unlined linen hose
C - Oil-suction and oil-discharge hose
D - Rubber steam hose
E - Water-suction hose
F - Wash deck and engineers' rubber hose

2/ The wrench shall have a 3/16 inch diameter by 3/16 inch long pin; or hook may be turned to 3/16 inch diameter.

3.6.3 Class 3, heavy duty. The class 3 wrench shall be suitable for use on turret-adjusting nuts, packing-gland nuts, and other turret-type nuts. The wrench shall have a self-adjusting jaw which will provide adjustments from 1-1/2 to 4 inches. The wrench shall have an overall length of not less than 19 inches and a weight of approximately 3 pounds. The wrench shall be of drop-forged steel with a plain or solid web in the handle and shall be similar to Figure 3.

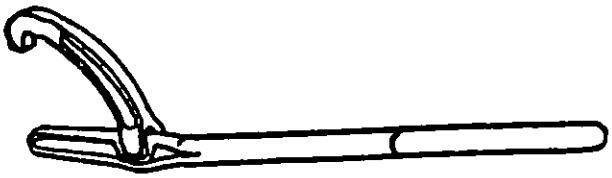

Figure 3. Type I, class 3, adjustable hook, heavy-duty, spanner wrench.

3.7 Type II, pin. Type II wrenches shall have the pins forged integral with the spanner head and shall be machined or be of a separate piece, copper brazed into a reamed hole, or secured in a manner to afford equal retention capacity.

TABLE II. Type II, grade A, pin spanner wrenches

Capacity for circle, diameter (Inches)	Diameter of pin		Pin length + 5/64 - 1/64 (Inch)	Overall length (approximate) (Inches)	Test load (minimum) (Inch-Pounds)
	Maximum (Inch)	Minimum (Inch)			
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

3.7.1 Grade A, hardened and tempered steel. Grade A wrenches shall be of steel and heat treated to possess a hardness of 37 to 45 on the Rockwell C scale (see 4.4.1). Wrenches shall be drop-forged with a plain or solid web in the handle, shall conform to Table II for the capacity specified (see 6.1), and shall be similar to Figure 4.

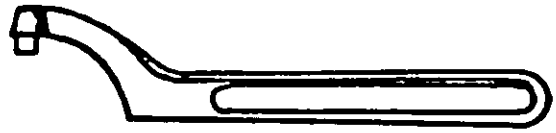

Figure 4. Type II, pin spanner wrenches.

3.7.2 Grade B, casehardened steel or malleable iron. Grade B wrenches shall be of casehardened steel or malleable iron and shall be suitable for use on hole-type couplings for hoses 3/4 and 1 inch in diameter. The pin diameter shall be not less than 1/4 nor more than 5/16 inch. The wrenches shall have an overall length of not less than 7 inches and a weight of not less than 8 ounces. The wrenches shall be similar to Figure 4.

3.8 Type III, face. Type III wrenches shall be of steel, shall be drop-forged with a plain or solid web in the handle, and shall be heat treated to possess a hardness of 37 to 45 on the Rockwell C scale (see 4.4.1).

3.8.1 Class 1, adjustable. Class 1 wrenches shall have the pins forged integral with the handles and shall be machined, or be of a separate piece, copper brazed into a reamed hole, or secured in a manner to afford equal retention capacity. The hinge pin shall be peened or otherwise well secured in a manner to hold the handles in any set position and permit smooth movement and operation. Class 1 wrenches shall conform to Table III for the capacity specified (see 6.2), and shall be similar to Figure 5.

TABLE III. Type III, adjustable face spanner wrenches

Maximum capacity (Inches)	Diameter of pin		Pin length + 3/32 - 1/64 (Inch)	Overall length (approximate) (Inches)	Test load (minimum) (Inch-Pounds)
	Maximum (Inch)	Minimum (Inch)			
2	0.187	0.177	1/8	6-3/8	2000
3	0.250	0.237	3/16	8-1/4	3000
4	0.312	0.299	1/4	10-3/8	5000

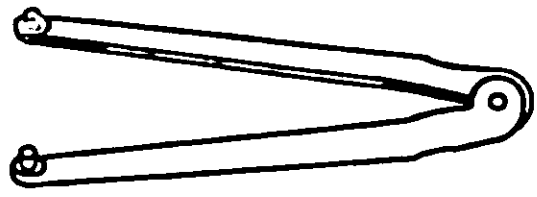

Figure 5. Type III, class 1, adjustable-face spanner wrenches.

3.8.2 Class 2, nonadjustable. Class 2 wrenches shall have the pins forged integral with spanner head and shall be machined or be of a separate piece, copper brazed into a reamed hole or secured in a manner to afford equal retention capacity. Class 2 wrenches shall conform to Table IV for distance, center- to-center, as specified (see 6.1), and shall be similar to Figure 6.

TABLE IV. Type III, class 2, nonadjustable-face spanner wrenches

Distance center-to-center ±0.005 (Inches)	Pins Diameter Maximum (Inch)	Pins Diameter Minimum (Inch)	Pins Length ±1/64 (Inch)	Span of jaws in clear (approximate)	Length from center of pin to end of handle (approximate) (Inches)	Test load (minimum) (Inch-Pounds)
1	0.187	0.177	3/16	11/16	4-1/2	1200
1-1/4	0.218	0.207	7/32	7/8	5	1500
1-1/2	0.218	0.207	7/32	1-1/8	5-7/16	2000
1-3/4	0.218	0.207	7/32	1-3/8	5-7/8	2500
2	0.250	0.237	1/4	1-19/32	6-3/8	3000
2-1/4	0.250	0.237	1/4	1-27/32	6-7/8	4000
2-1/2	0.281	0.268	9/32	2-1/32	7-1/4	5000
2-3/4	0.281	0.268	9/32	2-9/32	7-13/16	6000
3	0.312	0.299	5/16	2-1/2	8-1/4	7000
3-1/4	0.312	0.299	5/16	2-3/4	9	8000
3-1/2	0.312	0.299	516	3	9-1/2	9000
3-3/4	0.375	0.357	3/8	3-3/16	10	11,300
4	0.375	0.357	3/8	3-7/16	10-1/2	12,400

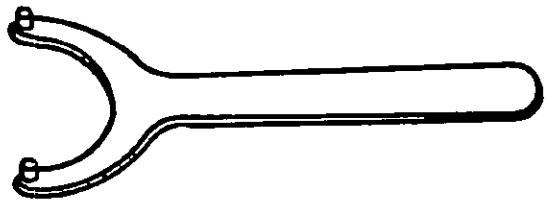

Figure 6. Type III, class 2, nonadjustable-face spanner wrenches.

3.9 Type IV, combination hydrant and spanner. The type IV wrenches shall be suitable for use on pin-lug, guard-lug, slot, and rocker-lug type couplings for hoses of 2, 2-1/2, and 3 inches in diameter. The wrenches shall be adjustable and suitable for use on any size hydrant cap up to 1-3/4 inch, pentagon, point to flat, and 1-1/4 inch square nut. The type IV wrenches shall be similar to Figure 7.

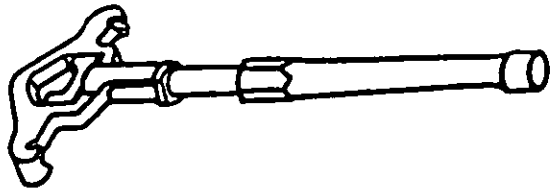

Figure 7. Type IV, combination hydrant and spanner wrench.

3.10 Type V, universal, hose coupling. The type V wrenches shall be suitable for use on pin-lug, guard-lug, rocker-lug, and other type couplings for hoses from 1 to 3 inches in diameter. The handle of the wrench shall be shaped so that it can be used as a jimmy or forcible-entry tool and shall be cored to fit standard gas-cock shut-offs. One end of the wrench shall be furnished with a belt-hook eyelet. The wrench shall have an overall length of not less than 11 inches and a weight of not less than 8 ounces. The wrench shall be capable of withstanding a test load of 1200 inch-pounds. The wrenches shall be of either casehardened forged steel, cast malleable iron, or aluminum alloy, and shall be similar to Figure 8.

Figure 8. Type V, universal hose coupling wrench.

3.11 Type VI, double eye. The type VI wrenches shall be suitable for use on pin-lugtype couplings for hoses 4-1/2 inches in diameter. The wrenches shall have an overall length of not less than 16 inches and a weight of not less than 3-1/2 pounds and be either casehardened forged steel or cast malleable iron. The wrenches shall be capable of withstanding a test load of 20,000 inch-pounds. The type VI wrenches shall be similar to Figure 9.

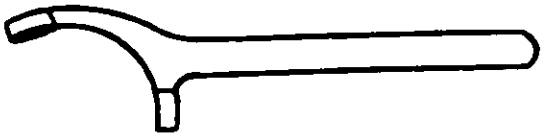

Figure 9. Type VI, double-eye wrench.

3.12 Type VII, nonadjustable hook for spring grip coupling. The type VII wrenches shall be of cast malleable iron. The wrenches shall be designed for use on 2-1/2 inch spring grip couplings. The wrenches shall conform to Table V and shall be similar to Figure 10.

TABLE V. Type VII, nonadjustable hook for spring grip couplings

Capacity for circle diameter (nominal) (Inches)	Thickness of handle and hook (approximate) (Inch)	Length of handle (approximate) (Inches)	Overall length (approximate) (Inches)	Test load Minimum (Inch-Pounds)
3-11/16	9/32	4-5/8	8-3/16	1000

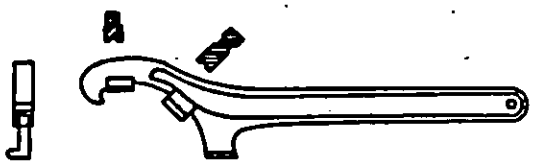

Figure 10. Type VII, nonadjustable hook for spring grip couplings.

3.13 Metric products. Products manufactured to metric dimensions will be considered on an equal basis with those manufactured using inch-pound units, provided they fall within the tolerances specified and all other requirements of this document are met. If a product is manufactured to metric dimensions and those dimensions exceed the tolerances specified in the inch-pound units, a request should be made to the specification preparing activity for change to this document.

3.14 Workmanship. Details of workmanship shall be in accordance with the best commercial standards and practices. Paints, coatings, platings, and finishes shall be smooth, dry, adherent, continuous, and not stained or discolored. Fasteners shall be firmly secured and show no evidence of deformation, cross threading, or hazardous burrs. Adhesives and lubricants adequate for their intended purpose shall be properly and neatly applied. Adhesives shall be adequately cured. Wires and cables shall be neatly dressed and shall not be frayed or in contact with sharp edges. Wire and cable insulation shall show no evidence of burns, abrading, or pinch marks. There shall be no interference, binding, or galling of parts. External and bearing surfaces shall be free of tool and gouge marks, nicks, or other surface imperfections. The item shall be clean and free of corrosion and debris (e.g., chips, shavings, slivers) or other foreign material. The item shall be free from manufacturing workmanship defects (e.g., loose, missing, binding or misaligned parts, sharp or rough external edges, corners, or surfaces) and material workmanship defects (e.g., pits, rips, fins, burrs, tears, nodules, cracks, blisters) which may adversely impact the item's serviceability, durability, safety, or appearance.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure that supplies and services conform to prescribed requirements.

4.1.1 Component and material inspection. In accordance with 4.1 above, the supplier is responsible for insuring that components and materials used were manufactured, tested, and inspected in accordance with the requirements of referenced subsidiary specification and standards to the extent specified, or, if none, in accordance with this specification.

4.2 Sampling procedures. Unless otherwise specified, sampling for inspection shall be performed in accordance with ANSI/ASQC Z1.4.

4.2.1 Inspection lot. All wrenches of the same type, size, grade, and class presented at one time shall be considered a lot for purposes of quality conformance inspection.

4.2.2 Sampling for examination. A random sample of wrenches shall be selected from each lot for examination in accordance with ANSI/ASQC Z1.4 at inspection level III for lots of 40 and under, inspection level II for lots of 41 to 300, and level I for lots of 301 and over. The acceptable quality level (AQL) shall be equal to 1.5 percent defective.

4.2.3 Sampling for hardness and load test. A random sample of wrenches shall be selected from each lot for test in accordance with ANSI/ASQC Z1.4 at inspection level L8. The AQL shall be equal to 4.0 percent defective. However, the sample sizes shall be the number associated with the letters in the table for inspection level L8, and the AQL shall be zero until the AQL permits one or greater.

TABLE VI. Classification of defects

Examine	Defect	Classification Major	Minor
Construction and workmanship	Type, class, size, and grade and (if applicable) capacity of spanner wrench not as specified	101	
	Surfaces not free of cracks, pits, or nodules; material not as specified	102	
	Hook defective, not clearly defined, or working surfaces not finished as required (type I only)	103	
	Movable jaw not free pivoting; jaw sticks, binds, or evidences excessive looseness; hinge pin not well secured (type I, class 2 only)	104	
	Hooks not of the required thickness, number of holes not as required, bolt and nut missing, or bolt not of sufficient size (type 1, class 2 only)	105	
	Depth of hook not within the specified tolerance (type I, class 1 only)	106	
	Pins defective, not integral with handle or not copper brazed in place (types II and III only)	107	
	Diameter of pins not within the specified maximum and minimum values (types II and III only)	108	
	Length of pins not within the specified tolerance (type II, grade A and type III, classes 1 and 2 only)	109	
	Handles stick, bind, or evidence excessive play; hinge pin not well secured (type III, class 1 only)	110	
	Distance (center-to-center) between pins not within the specified tolerance (type III, class 2 only)	111	
	Span of jaws in the clear not as required (type III, class 2 only)	112	
	Working surfaces not clearly defined or not finished as required (types IV, V, and VI only)	113	
	Wrench not adjustable; adjusting mechanism sticks, binds, or evidences of excessive looseness (type IV only)	114	
	Handle not shaped so that it can be used as a jimmy, not cored to fit a standard gas-cock shut-off, or one end of wrench not furnished with a belt eyelet (type V only)	115	
	Surface not free of fins, burrs, rust, rough surfaces, or sharp edges; corners not broken as required		201

TABLE VI. Classification of defects (cont'd)

Examine	Defect	Classification Major	Minor
Construction and workmanship (cont'd)	Coating (chrome plate or lacquer) missing, defective, incomplete, or not as specified; coating not smooth, continuous, or not free of pits, blisters, nodules, or uncoated areas		202
	Overall length less than the specified minimum		203
	Marking, manufacturer's name or trademark missing, illegible, incorrect, or not permanent		204
	Weight of wrench not as specified		205

4.3.2 Quality conformance tests. Each of the sample wrenches selected in accordance with 4.2.3 shall be tested in accordance with the applicable hardness paragraph and the applicable table for test loads to verify conformance with this specification. Any sample wrench which does not meet the requirements for any of these characteristics shall be rejected, and if the number of nonconforming wrenches in any one sample exceeds the acceptance number for that sample the lot represented by the sample shall be rejected.

4.4 Test procedures.

4.4.1 Hardness tests. Rockwell hardness tests shall be conducted in accordance with method 243 of FED-STD-151. Surfaces shall be suitably ground for testing, particularly to remove the plating and decarburization.

4.4.2 Test load for type I, class 2; type II, grade A; type III, classes 1 and 2; and types IV, V, VI, and VII. Test loads shall be conducted on the sample wrenches to determine conformance with applicable test load requirements.

4.4.2.1 Reference lines for determining permanent deformation. In order to prepare the sample for test, suitable reference lines shall be scribed on the jaws and handles of the wrenches. After the application of the test load, the scribed lines shall be examined for permanent deformation.

4.4.2.2 Test procedure. The sample wrenches shall be mounted on a suitable mandrel or clamping device and the test load shall be applied either with a suitable torque-producing machine lever with dead weight, testing machine, or other suitable device. The test load shall be applied as near as practicable to the handle end and in such a manner that the effective lever arm can be measured. The test load shall be the product of the effective lever arm, in inches, and the applied load in pounds.

4.4.2.3 Test failure. Any wrench which shall develop cracks, remain with perceptible deformation, or otherwise develop defects rendering the wrench unserviceable after test shall be considered as having failed the load test.

4.5 Inspection for preparation for delivery. Inspection to determine compliance with preparation for delivery shall be made in accordance with PPP-P-40.

5. PREPARATION FOR DELIVERY

(Civil agencies should refer to FED-STD-102 for definitions of the various levels of packaging protection for supplies and equipment.)

5.1 Preservation, packaging, packing, and marking. Preservation, packaging, packing, and marking shall be in accordance with PPP-P-40. The level of preservation, packaging, and packing shall be A, B, or Commercial, as specified (see 6.1).

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful but is not mandatory.)

6.1 Acquisition requirements. Acquisition documents must specify the following:

a. Title, number, and date of this specification.
b. Type, class, and grade of wrench required (see 1.2).
c. If a specific color is desired, state requirements (see 3.5.2.7).
d. Capacity or center-to-center of pins as applicable (see 3.6.1, 3.7.1, 3.8.1, and 3.8.2).
e. If a specific coating is required, state type desired (see 3.5.2).
f. Levels of packaging and packing required (see 5.1 and 5.2).