INCH - POUND

MIL-DTL-13220F
26 May 2015
SUPERSEDING
MIL-DTL-13220E
25 September 2008

DETAIL SPECIFICATION

HOOKS, SLIDING CHOKER (FOR USE WITH WIRE ROPE)

Reactivated after 25 January 2006 and may be used for new and existing designs and acquisitions.

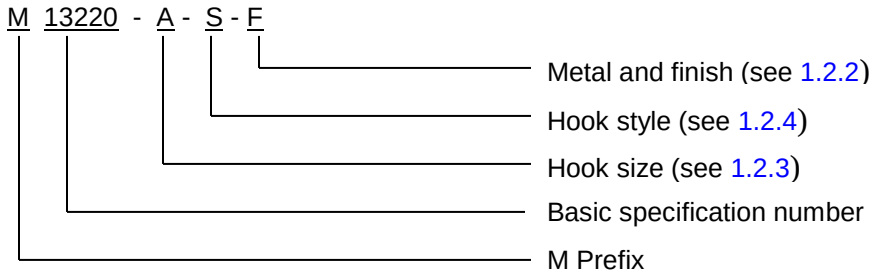
This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers cast steel or drop forged sliding choker hooks for use with wire rope plain end loop and thimbled slings.

1.2 Classification and Part or Identifying Number (PIN).

1.2.1 PIN. The PIN consist of the letter "M", the basic specification number, a dash, a letter for the hook size, a dash, and a letter for the finish.



1.2.2 Metal and finish. PIN codes as follows:
C - Cast or forged steel hooks with zinc finish (see 3.5.1 and 3.5.2).
S - CRES steel hooks with passivation finish (see 3.5.3).

1.2.3 Hook size. PIN codes as follow, (see 3.5.1 and table I):

Size	Code
1/2	A
5/8	B
3/4	D
7/8 – 1	E

Comments, suggestions, or questions on this document should be addressed to: DLA Land and Maritime, Attn: VAI, P.O. Box 3990, Columbus, OH 43218-3990, or emailed to FluidFlow@dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at https://assist.dla.mil.

1.2.4 Hook style. Code as follow: (see 3.4.1)

A - Grab Clevis
B - Slip Clevis
C - Grab Eye
D - Swivel Eye
E - Slip Eye

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended of for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATION

MIl-C-24707 - Castings, Ferrous, General Specification For

(See supplement 1 for list of specification sheets)

(Copies of these documents are available online at https://quicksearch.dla.mil.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

AMERICAN IRON AND STEEL INSTITIUTE (AISI)

AISI 4130 - Steel Products Manual

(Copies of these documents are available online at http://www.steel.org.)

ASTM INTERNATIONAL

ASTM A128/A128M - Austenitic Manganese-Steel Castings
ASTM A693 - Precipitation-Hardening Stainless and Heat-Resisting Steel Plate, Sheet, and Strip
ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus
ASTM B633 - Electrodeposited Coatings of Zinc on Iron and Steel

(Copies of these documents are available online at http://www.astm.org.)

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

SAE-AMS2700	-	Passivation of Corrosion Resistant Steels
SAE-AMS5659	-	Steel, Corrosion-Resistant, Bars, Wire, Forgings, Rings, and Extrusions 15Cr - 4.5Ni - 0.30CB (Nb) - 3.5Cu Consumable Electrode Melted Solution Heat Treated, Precipitation Hardenable
SAE-AMS5826	-	Steel, Corrosion and Heat Resistant, Welding Wire 15Cr - 5.1Ni - 0.30Cb - 3.2Cu (UNS S15500)-UNS S15500
SAE-AMS5862	-	Steel, Corrosion-Resistant, Sheet, Strip, and Plate 15Cr - 4.5Ni - 0.30Cb (Nb) - 3.5Cu Consumable Electrode Remelted, Solution Heat Treated Precipitation-Hardenable-Composition similar to UNS S15500

(Copies of these documents are available from http://www.sae.org.)

2.4 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein (except for related specification sheets), the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Specification sheets. The individual item requirements shall be as specified herein and also in accordance with the applicable specification sheet. In the event of a conflict between the requirements of this specification and the specification sheet, the latter shall govern.

3.2 First article. When specified (see 6.2), a sample shall be subjected to first article inspection in accordance with 4.3.

3.3 Recycled, recovered, environmentally preferable, or biobased materials. Recycled, recovered, or environmentally preferable, or biobased materials should be used to the maximum extent possible, provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.4 General requirements. Sliding choker hooks shall conform to the dimensional limitations and general shape shown on figure 1 or 2. All surfaces over which the wire rope will pass shall be smooth, curved and rounded to prevent damage to the rope. The eye of the stock shall accommodate the size of wire rope specified (see 6.2). Table I or II shows principal limiting dimensions.

3.4.1 Various styles are shown on slash sheet, see MIL-DTL-13220/1 through MIL-DTL-13220/5.

3.5 Material.

3.5.1 Cast steel hooks. Material shall be cast steel, heat treated, clean and sound (see figure 1), and in accordance with MIL-C-24707 (except for low magnetic permeability requirements) or in accordance with ASTM A128/A128M. See table I for dimensions.

3.5.1.1 Classification. Choker hooks should be of the sizes and finishes, as specified in table I (see 6.2).

TABLE I. Hook sliding choker sizes.

Hook size- (wire rope diameter) (metric/decimal)	A		B		C Max. (metric /decimal)	D Min. (metric /decimal)	E Min. (metric /decimal)
	Min. (metric /decimal)	Max. (metric /decimal)	Min. (metric /decimal)	Max. (metric /decimal)			
1/2 - (1.27cm/0.5 in)	3/4 (1.91cm /.75in)	7/8 (2.22cm /.875in)	1-1/16 (2.69cm /1.06in)	15/16 (2.38cm /.937in)	3-1/4 (8.25cm /3.25in)	1 (2.54cm /1.0in)	2-1/16 (5.23cm /2.06in)
5/8 - (1.59cm/.625 in)	15/16 (2.38cm /.937in)	1-1/8 (2.84cm /1.12in)	3/4 (1.91cm /.75in)	1-1/8 (2.84cm /1.12in)	3-15/16 (10cm /3.94in)	1-1/8 (2.84cm /1.12in)	2-11/16 (6.78cm /2.67in)
3/4 - (1.91cm /.75in)	1-1/16 (2.69cm /1.06in)	1-3/8 (3.50cm /1.38in)	1 (2.54cm /1.0in)	1-7/16 (3.66cm /1.44in)	4-1/4 (10.8cm /4.25in)	1-1/2 (3.81cm /1.5in)	3 (7.62cm /3.0in)
7/8 - (2.22cm/.875in) and 1 - (2.54cm/1.0in)	1-5/16 (3.33cm /1.31in)	1-7/16 (3.66cm /1.44in)	1-1/4 (3.17cm /1.25in)	1-7/8 (4.75cm /1.87in)	5-1/2 (13.8cm /5.5in)	1-7/8 (4.75cm /1.87in)	4-1/8 (10.5cm /4.13in)

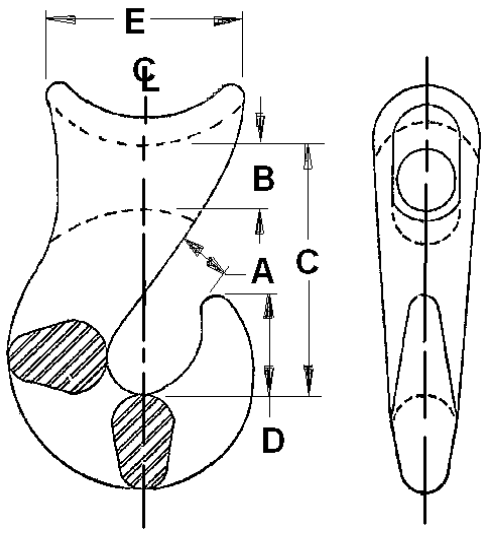


FIGURE 1. Hook sliding choker.

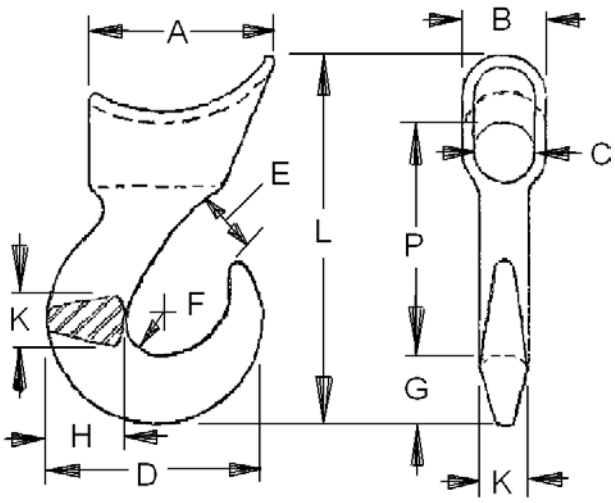


FIGURE 2. Hook sliding choker (drop forged).

3.5.2 Forged steel. Material shall be heat treated, forged alloy steel (see figure 2) in accordance with AISI 4130. See table II for dimensions.

TABLE II. Hook, (drop forged) sliding choker, sizes. 1/

Hook size- (wire rope diameter) (metric/decimal)	Safe working load	A	B	C	D	E	F
1/2 (1.27cm/.5in)	3300	2-1/4 (5.72cm /2.25in)	1-1/16 (2.69cm /1.06in)	3/4 (1.90cm /.75in)	2-61/64 (7.49cm /2.95in)	25/32 (1.98cm /.781in)	1/2 (1.27cm /.5in)
5/8 (1.59cm/.625in)	5000	3-1/16 (7.77 cm /3.06in)	1-3/8 (3.48cm /1.37in)	1 (2.54cm /1.0in)	3-9/16 (9.04cm /3.56in)	29/32 (2.30cm /.906in)	9/16 (1.43cm /.562in)
3/4 (1.90cm/.75in)	8000	3-3/8 (8.53 cm /3.36in)	1-7/8 (4.75cm /1.87in)	1-7/16 (3.66cm /1.44in)	4-1/4 (10.79cm /4.25in)	1-5/32 (2.95cm /1.16in)	5/8 (1.59cm /.625in)

TABLE II. Hook, (drop forged) sliding choker, sizes – Continued. 1/

Hook size- (wire rope diameter) (metric/decimal)	Safe working load	G	H	K	L	P
1/2 (1.27cm/.5in)	3300	31/32 (2.46cm /.969in)	1-1/16 (2.69cm /1.06in)	11/16 (1.74cm /.687in)	4-5/8 (11.75cm /4.625in)	2-15/16 (7.47cm /2.94in)
5/8 (1.59cm/.625in)	5000	1-1/8 (2.86cm /1.125in)	1-5/16 (3.33cm /1.31in)	55/64 (2.18cm /.859in)	6-1/8 (15.57cm /6.13in)	3-9/16 (9.04cm /3.56in)
3/4 (1.90cm/.75in)	8000	1-7/16 (3.66cm /1.44in)	1-5/8 (4.13cm /1.63in)	1-1/16 (2.69cm /1.06in)	7-1/4 (18.41cm /7.25in)	4-9/32 (10.87cm /4.28in)

1/ Metric/decimal units.

3.5.3 Corrosion resistant steel. Material shall be corrosion resistant steel SAE 15-5PH in accordance with SAE-AMS5659, or SAE-AMS5826, or SAE-AMS5862, or ASTM A693.

3.6 Finish.

3.6.1 Steel finish. Steel finish shall be zinc coating in accordance with ASTM B633, type 6.

3.6.2 Corrosion resistant steel. Corrosion resistant steel shall be passivated in accordance with SAE-AMS2700, type 6 or 7.

3.7 Salt spray. When fittings are exposed to salt spray testing specified in 4.8, the plating shall show no corrosion products of zinc or basis metal corrosion products. The appearance of corrosion products visible to the unaided eye at normal reading distance shall be cause for rejection, except white corrosion products at the edges of the specimens shall not constitute a failure.

3.8 Strength. Strength requirements of the hooks shall be as shown in table Ill.

TABLE Ill. Strength requirements.

Hook wire rope diameter Inches-(metric/decimal)	Safe working load Pounds (metric)
1/2-(1.27cm/.05in)	3,300 (1497kg)
6/8-(1.91cm/.75in)	5,000 (2268kg)
3/4-(1.91cm/.75in)	8,000 (3629kg)
7/8- and 1-(2.22cm/.87in)	15,000 (6804kg)

3.9 Identification. The choker hooks shall bear the manufacturer's identification mark and hook size. The identification shall be stamped, or applied by any other method of permanent marking, on the hooks in a clearly visible location.

3.10 Workmanship. Workmanship shall conform to accepted commercial standard practice for this type of equipment. Castings should be clean and high quality. There shall be no fins, spurs, scale, extraneous material, cracks, porosity, sand, inclusions, blowholes, rough edges, or rough surfaces.

3.11 Proof test . Each sample hook selected shall be proof tested in accordance with 4.6

4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. First article inspection (see 4.3).

b. Conformance inspection (see 4.4).

4.2 Inspection conditions. Unless otherwise specified, all inspections shall be performed in accordance with the applicable test procedures.

4.3 First article inspection. First article inspection, if not done by the manufacturer, shall be performed at a laboratory acceptable to the procuring activity on sample units produced with equipment and procedures used in production.

4.3.1 Samples for first article. Samples for first article shall be representative of the products proposed to be furnished to this specification. Sampling shall be in accordance with 4.5.1.

4.3.2 First article inspection routine. All samples shall be subjected to first article testing in table IV.

TABLE IV. First article inspection.

Inspection	Requirement	Test method
Visual and mechanical inspections	3.2	4.10
Proof test	3.11	4.6
Strength test	3.8	4.7
Salt spray test	3.7	4.8

4.3.3 Sample failures. All samples must meet all of the contract requirements. Failure of a sample unit to pass any test shall be cause for rejection of the entire lot and to grant first article approval.

4.3.4 First article samples. Samples shall be representative of the construction workmanship, components, and materials to be used during production. When a manufacturer is in continuous production of hooks from one contract to another, submission of additional first article samples for a new contract may be waived at the discretion of the acquiring activity (see 6.2).

4.3.4.1 Disposition of samples. First article samples shall be furnished to the Government as directed by the contracting officer (see 6.2).

4.3.4.2 First article information. Upon completion of first article inspection, the Government activity responsible for conducting the inspection program (see 6.2), shall report the results of the inspection, with appropriate recommendation, to the contracting officer. Approval of the first article samples or the waiving of first article inspection does not preclude the requirements for performing conformance inspection.

4.3.5 First article inspection waiver. Required first article tests may be eliminated if documented approval has been obtained from the procuring activity. A first article test cannot be waived by DLA unless the contractor has delivered the same item within the last three years, has no unfavorable quality history, and has not proposed changes to the processes or changed any subcontractors. DLA will not accept first article test results outside the stated requirements. All waivers or deviations shall be approved by the procuring activity.

4.4 Conformance inspection.

4.4.1 Group A inspection. For manufacturers that have successfully passed first article inspections and are continuously producing hooks to this specification, on going inspections shall consist of individual inspections (see table V) and sampling and periodic inspections (see table VII). If first article is waived due to prior successful first article inspection the individual inspections and sampling and periodic inspections shall be the manufactures in house inspection procedures.

TABLE V. Group A inspections.

Inspections	Requirement	Inspection	Number of samples
Visual and mechanical	3.2	4.10	100%

4.4.2 Group B inspection. Sampling and periodic inspections shall consist of the inspections specified in table VI. Individual inspections shall be implemented on a continual basis throughout the production of hooks.

TABLE VI. Group B inspections. 1/

Inspections	Requirement paragraph	Inspection paragraph	Number of samples
Minimum strength test	3.8	4.7	4.5.1
Salt spray test	3.7	4.8	4.5.1
Proof test	3.11	4.6	4.5.1

1/ If the manufacturer can demonstrate that the periodic tests have been performed for two consecutive years with zero failures, then the frequency of the periodic test, with the approval of the qualifying activity, can be performed every fourth year.

4.5 Inspection lot.

4.5.1 Lot and sample. The inspection lot shall be product selected at random from the production lot without regard to quality and shall be the sample size specified in table VII.

TABLE VII. Lot and sample size.

Production lot size	Sample size
1 to 90	8
91 to 150	12
151 to 280	19
281 to 500	21
501 to 1200	27
1201 to 3200	35
3201 to 10,000	38
10,001 to 35,000	46

4.5.2 Lot records. Manufacturers shall keep lot records for 3 years minimum. Manufacturers shall monitor for compliance to the prescribed procedures, and observe that satisfactory manufacturing conditions and records on lots are maintained for these hooks. The records, including as a minimum, an attributes summary of all quality conformance inspections conducted on each lot, shall be available to review by customers at all times.

4.6 Proof test. Each sample hook selected in accordance with 4.5.1 shall be proof tested to twice the safe working load. The pull shall be in direct alignment with the centerline of the hook.

4.7 Strength test. Each sample hook selected in accordance with 4.5.1 shall be tested to four times the safe working load specified in table III.

4.8 Salt spray test. Fittings when subjected to corrosion resistance testing in accordance with ASTM B633 and ASTM B117, shall meet the requirements of 3.7.

4.9 Possible test failures.

a. Proof test load. Evidence of deformation, distortion or permanent set, or sign of incipient cracks after subjecting hook to stipulated proof test load.

b. Minimum ultimate strength test. Ultimate strength of hook less than four times the safe working load.

4.10 Visual and mechanical inspection. Hooks shall be examined to ensure conformance with this specification. Continuous examination shall be performed to assure compliance with the following requirements:

a. General requirements (see 3.4).
b. Materials (see 3.5).
c. Design, construction and physical dimensions (see 3.5.1, 3.5.2).
d. Marking (see 3.9).
e. Workmanship (see 3.10).

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the Military Service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

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

6.1 Intended use. Sliding choker hooks are intended for use with single leg plain end loop and thimbled slings. The end item application is for aircraft ground tie down and ground anchor.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.
b. PIN which includes size of choker hook required (see 1.2.1).
c. Whether plane of eye should be parallel or perpendicular to hook opening (see 3.2).
d. Selection of applicable level of preservation, packaging and packing required (see 5.1).
e. First article.

6.3 First article. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results, and disposition of first article samples. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract.

6.4 Subject term (key word) listing.

Tie down
Anchor
Steel
Forged

6.5 Environmentally preferable material. Environmentally preferable materials should be used to the maximum extent possible to meet the requirements of this specification. As of the dating of this document, the U.S. Environmental Protection Agency (EPA) is focusing efforts on reducing 31 priority chemicals. The list of chemicals and additional information is available on their website at http://www.epa.gov/osw/hazard/wastemin/priority.htm. Included in the list of 31 priority chemicals are cadmium, lead, and mercury. Use of these materials should be minimized or eliminated unless needed to meet the requirements specified herein (see Section 3).

6.6 Guidance on use of alternative parts with less hazardous or non-hazardous materials. This specification provides for a number of alternative plating materials via the PIN. Users should select the PIN with the least hazardous material that meets the form, fit, and function requirements of their application.

6.7 Changes from previous issue. The margins of this specification are marked with vertical lines to indicate where changes from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

CONCLUDING MATERIAL

Custodians:
Army - AV
Navy - AS
Air Force - 99
DLA - CC

Preparing activity:
DLA - CC

Review activities:
Army - MI
Navy - CG, MC
Air Force - 50, 70, 71

(Project 4030-2015-003)

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at http://assist.dla.mil.