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SAE J1508 JUN87

Worm Gear Hose Clamps

SAE Standard
Issued June 1987

Submitted for Recognition as
an American National Standard

SAE The Engineering Society For Advancing Mobility Land Sea Air and Space

400 COMMONWEALTH DRIVE, WARRENDALE, PA 15096

MATERIALS STANDARD

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WORM GEAR HOSE CLAMPS

1. GENERAL SPECIFICATIONS:

1.1 Scope: This standard covers complete dimensional and general specifications for three types of worm gear drive hose clamps intended for general application on ground based vehicles and industrial equipment. Also included, where appropriate are performance requirements tests and installation recommendations for other than worm gear hose clamps see SAE J536, Hose Clamps.

This standard is not intended to imply that all sizes shown are stock production items nor that all variations of the respective clamp types are described herein. Users should consult clamp manufacturers relative to the availability of sizes and clamps having features other than those specified.

1.2 Selection: Choice of type should be made on the considerations paramount to the user, such as: weight, clearance limitations at installation, corrosion resistance, and sealing and torque capability.

1.3 General Description: Worm drive clamps are clamps with tangentially mounted worm screws, enclosed in a housing which is securely fastened to the band, which in turn is suitably prepared to engage with the worm screw.

1.3.1 Type F: Standard duty clamps, for use on general applications.

1.3.2 Type I: Intermediate duty clamps, a general application clamp, lighter in weight and with smaller envelope dimensions than Type F.

1.3.3 Type M: Miniature size clamps for small diameter hoses and/or restricted clearance applications, lightest in weight.

1.4 General Dimensions: The following specifications shall supplement the dimensional data contained in the tables and illustrations for the respective clamp types.

1.4.1 Type F, I, and M: Clamps shall be supplied at "A" diameter open dimension as shown in Tables 1, 2, and 3.

1.5 Identification: Clamps shall be permanently and legibly marked with size and/or manufacturer's identification as designated below.

1.5.1 Clamps shall be marked with manufacturer's identification on either housing or band.

1.5.2 Clamps shall be marked with SAE size number on band for Types F and I only.

1.6 Screws: Screw components of clamps shall conform to the specifications designated below and in Figs. 1 and 2 except for unspecified details intentionally left to the discretion of the manufacturer.

1.6.1 The recognized standard screws recommended for original equipment applications shall be as designated below. It should be noted, however, that other screw sizes and head styles are available and, where required, shall be as agreed upon between the manufacturer and purchaser.

1.6.2 Type F: The standard screw shall have the 5/16 in. hex collar head slotted screw as specified in Fig. 2. Style 4.

1.6.3 Type I: The standard screw shall have the 1/4 in. hex collar head slotted screw as specified in Fig. 2. Style 4.

1.6.4 Type M: The standard screw shall have the 1/4 in. hex head slotted screw as specified in Fig. 2. Style 6.

1.7 Threads: Threads on Types F, I, and M screws shall be modified buttress external threads standard with manufacturer.

1.8 Material: Clamps and/or components thereof shall be fabricated from materials conforming to the following:

1.8.1 Bands, housings and screws shall be carbon steel or corrosion resistant stainless steel standard with manufacturer or as specified by purchaser.

1.8.2 Stainless steel and carbon steel may be used together in a clamp only where the band and housing are stainless steel and the screw is carbon steel with a finish as specified in paragraph 1.9.

1.9 Finish: Carbon steel components of clamps normally shall be furnished with a corrosion preventative finish as indicated below, or as designated by purchaser. It is recommended, however, that a latitude be allowed in the inspection of finish on screws and components fabricated from precoated steel and the overlapping areas on clamps treated subsequent to assembly of component parts.

Clamps subjected to finish processes which produce hydrogen embrittlement shall be baked or otherwise treated to obviate such embrittlement.

1.9.1 Unless otherwise specified, clamps shall, when made from carbon steel componentry, be zinc plated to a minimum thickness of 0.0002 in. and followed by a chromate treatment. Use of this finish is not recommended in areas where corrosion protection is a primary concern.

2. WORKMANSHIP: All clamps and components thereof shall be free from burrs, seams, loose scale, and all other defects that might affect their serviceability.

3. TESTS AND TEST PROCEDURES FOR EVALUATION OF HOSE CLAMP PERFORMANCE:

3.1 General: Acceptability of clamps shall be further determined by compliance with the applicable performance tests and inspection procedures set forth herein.

3.2 Clamping Diameter Test:

3.2.1 Clamps shall assemble over and close tight upon round mandrels of diameters equal to the corresponding open and closed diameters specified in the dimensional table for the respective clamp type and size. Diameters smaller than the closed diameters shown are allowable.

3.2.2 Clamps must meet the open diameter requirement with all threads engaged.

3.3 Ductility Tests:

3.3.1 Bands shall be subjected to a 180 deg. bend around a 0.188 in. diameter mandrel, at the perforated portion of the band, and then restraightened. The band shall at no time during or after the test exhibit breaking, cracks, or other indications of failure.

3.4 Free Running Torque:

3.4.1 Torque applied to the adjusting screw shall not exceed 4 lb-in. during the clamping diameter test run as specified in paragraph 3.2.1.

3.5 Clamp Durability Test:

3.5.1 Clamps shall be tightened once, over a round steel mandrel of open diameter less 0.06 in. with a hand applied torque to the value listed below for the respective type. There shall be no failure occuring in the clamp nor evidence of deformation of the threads on screw and/or slots in band.

3.5.2 Type F: Min test torque for both carbon steel and stainless steel screws shall be 50 lb-in. For assembly installation considerations see Section 4 below.

3.5.3 Type I: Minimum test torque for both carbon steel and stainless steel screws shall be 45 lb-in. For assembly considerations see Section 4 below.

3.5.4 Type M: Minimum test torque for both carbon steel and stainless steel screws shall be 20 lb-in. For assembly installation considerations see Section 4 below.

3.6 Stress Cracking Test:

3.6.1 General: When specified by purchaser stainless steel clamps shall be subjected to a sodium chloride immersion stress cracking test.

4. ASSEMBLY CONSIDERATION AND RECOMMENDATIONS FOR HOSE CLAMPS:

4.1 General: The following information is intended to provide the users of hose clamps guidance which will promote proper installation and optimum performance of the various types.

4.2 Installation Torques: The suggested installation torques for a particular application must be established by the user, giving due consideration to the physical configurations, properties of the materials involved and assembly tools (see paragraph 4.3) to be used. However, adequate sealing capability should be reached at or less than the torque values listed below for the respective types.

4.2.1 Type F: 30 lb-in. for all sizes and material types shown in this standard.

4.2.2 Type I: 20 lb-in. for all sizes and material types shown in this standard.

4.2.3 Type M: 10 lb-in. for all sizes and material types shown in this standard.

4.3 Assembly Tools: It is advised that when using power tools to install worm gear type band hose clamps that the tool be of a stall torque type. Use of clutch type or impact type assembly tools is not recommended.

TABLE 1 - DIMENSIONS OF TYPE F HOSE CLAMPS (FIG. 1)

SAE Size No.	A Dia a Open	Closed	R[b] Radius Over Screw
06	0.78 in.	0.44 in.	1.17 in.
08	0.91	0.50	1.22
10	1.06	0.56	1.26
12	1.25	0.69	1.32
16	1.50	0.81	1.42
20	1.75	0.81	1.52
24	2.00	1.06	1.63
28	2.25	1.31	1.75
32	2.50	1.56	1.86
36	2.75	1.81	1.97
40	3.00	2.06	2.09
44	3.25	2.31	2.20
48	3.50	2.56	2.32
52	3.75	2.81	2.44
56	4.00	3.06	2.56
60	4.25	3.31	2.68
64	4.50	3.56	2.80
72	5.00	4.06	3.04
80	5.50	4.62	3.28
88	6.00	5.12	3.53
96	6.50	5.56	3.77
104	7.00	6.18	4.01

[a]Diameters shall be determined by assembly over mandrels as stated in paragraph 3.2.1.
[b]Reference dimensions for clearance purposes only.

TABLE 2 - DIMENSIONS OF TYPE I HOSE CLAMPS (FIG. 1)

SAE Size No.	A Dia a Open	Closed	R[b] Radius Over Screw
06	0.78 in.	0.44 in.	1.00 in.
08	0.91	0.50	1.03
10	1.06	0.56	1.09
12	1.25	0.69	1.12
16	1.50	0.81	1.25
20	1.75	0.81	1.38
24	2.00	1.06	1.50
28	2.25	1.31	1.62
32	2.50	1.56	1.75
36	2.75	1.81	1.87

[a]Diameters shall be determined by assembly over mandrels as stated in paragraph 3.2.1.
[b]Reference dimensions for clearance purposes only.

TABLE 3 - DIMENSIONS OF TYPE M HOSE CLAMPS (FIG. 1)

SAE Size No.	A Dia [a] Open	A Dia [a] Closed	R[b] Radius Over Screw
04	0.62 in.	0.25 in.	0.77 in.
06	0.78	0.44	0.91
08	0.91	0.50	0.96
10	1.06	0.56	1.03
12	1.25	0.69	1.09

[a]Diameters shall be determined by assembly over mandrels as stated in paragraph 3.2.1.
[b]Reference dimensions for clearance purposes only.

TABLE 3 - DIMENSIONS OF CLAMPS (FIGS. 1 & 2)

	DIMENSION	TYPE F	TYPE I	TYPE M
A	HSG Length (Ref.)	0.76 in.	0.64	0.42
B	Thickness	0.021/0.031	0.019/0.030	0.019/0.026
C	HSG Width (Ref.)	0.81	0.53	0.60
D	Band Width	0.495/0.569	0.395/0.442	0.305/0.325
E	Max @ Open Dia.	0.75	0.50	0.44
F	Height (Ref.)	0.56	0.40	0.38
G	Collar Diameter	0.370/.425	0.295/0.375	a
H	Across Flats	0.305/.312	0.244/0.250	0.244/0.250
I	Across Corners (Min.)	0.340	0.270	0.270
J	Lg. of Screw (Max.)	1.35	1.13	0.80
K	Hex Height	0.140/0.250	0.140/0.175	0.150/0.185
L	Slot Depth	0.077/0.120	0.074/0.105	0.052/0.105
M	Slot Width	0.056/0.076	0.042/0.060	0.042/0.060

[a]Type M Clamps do not have collars as standard. See Style 6 in Fig. 2.

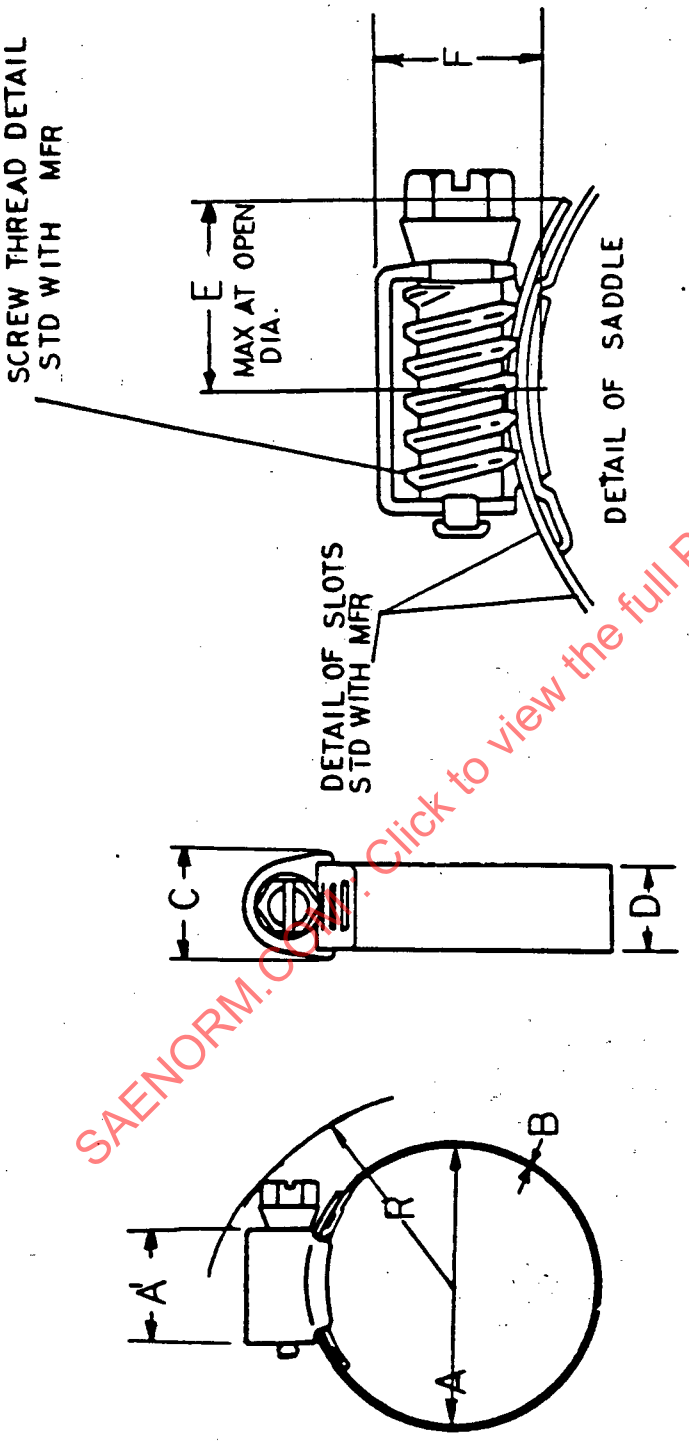

FIG. 1