

MIL-DTL-32108

[INCH-POUND]
MIL-DTL-32108
11 June 2004
Superseding
FF-S-2874

DETAIL SPECIFICATION

Spreader Bars for Lifting Slings

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

1. SCOPE

1.1 Scope. This specification covers spreader bars and multiple leg sling sets for lifting older military vehicles and large equipment. Military vehicles designed to current standards should not require spreader-bars.

1.2 Classification. Sling set spreader bars will be of the following sizes, as specified (see 6.2).

1.2.1 Size. Sizes of the spreader bars are as follows:

Size 30/9 9-foot bar, 60,000 pound rated capacity [30-STON (27-MTON)]

Size 40/18 18-foot bar, 80,000 pound rated capacity [40-STON (36-MTON)]

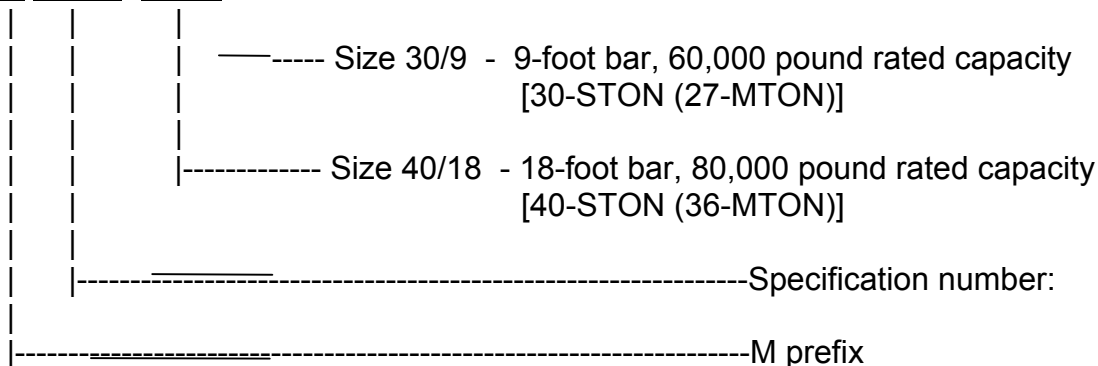
1.3 Part Identifying Number (PIN). The following PIN procedure is for government purposes and does not constitute a requirement for the contractor. The PIN to be used for sling set spreader bars acquired to this specification are created as follows:

Comments, suggestions, or questions on this document should be addressed to Director, SDDC Transportation Engineering Agency, ATTN: SDTE-DPE, 720 Thimble Shoals Blvd - Suite 130, Newport News, VA 23606-4537 or emailed to DPEmail@tea.army.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at www.dodssp.daps.mil.

AMSC N/A

FSC 3940

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M 32108- 40/18

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 of this specification. This section does not include documents cited in other sections of this specification or recommended 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, 4, or 5 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.

Federal Specifications

FF-T-276 Thimbles, Rope
RR-C-271 Chain and Attachments, Welded and Weldless
RR-W-410 Wire Rope and Strand

(Copies of these documents are available online at <http://assist.daps.dla.mil/quicksearch/> or www.dodssp.daps.mil or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

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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 Society for Testing and Materials (ASTM)

ASTM A36/A36M	Specification for Carbon Structural Steel
ASTM A53/A53M	Specification for Pipe, Steel Black and Hot-Dipped Zinc-Coated, Welded and Seamless
ASTM A123/A123M	Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

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

American Welding Society (AWS)

AWS D1.1/D1.1M Structural Welding Code, Steel

(Copies of this document are available at <http://www.aws.org>.)

2.4 Order of Precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedent. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Sling Assembly. The sling assembly, as used in this specification, shall consist of upper, lower, and extension wire rope (cable) legs, thimbles, spreader bar, shackles, master-links, and bolts. Spreader bar shall be constructed as shown in figures 1 and 2 or 3 through 5. Spreader bars shall be primed and painted to commercial standard for marine environment. Recommended color is given in 6.2.

3.2 First Article. When specified (see 6.2), a sample sling assembly shall be subjected to first article inspection in accordance with 4.2.

3.3 Materials. The supplier shall select materials that are capable of meeting all of the operational requirements specified herein. Materials not specified herein shall be of the same quality used for the intended purpose in commercial practice.

3.4 Engineering Sketches. Figures 1 through 5 are engineering design sketches. Preparation of shop drawings is the responsibility of the manufacturer. Where prescribed tolerances could cumulatively result in incorrect fits, the supplier shall adjust his manufacturing tolerances to insure correct fit, assembly and operation of the items. No deviation from the prescribed dimensions is permissible without approval of the contracting officer.

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3.5 Design. The sling assembly shall be fabricated and assembled as shown in figures 1 through 5. The sling assemblies and spreader bars shall be designed to a load factor of five-times the breaking strength (rated capacity is 1/5 of breaking strength). The sling assembly shall be able to withstand a pull test of two-times the rated capacity without permanent deformation or failure (see 4.6).

3.5.1 Shackles. Shackles shall conform to RR-C-271, Type IVA, Class 3 (Safety Anchor Shackle {bolt/nut}), Grade-B (high strength alloy). The 1-1/2-inch shackles will be marked 'WLL 25 tons' or greater. [WLL: Working Load Limit – STON] Shackles shall be hot-dip zinc-coated (galvanized). Following commercial manufacturing practice, mechanical properties may exceed RR-C-271 table values.

3.5.2 Thimbles. Thimbles for wire rope ends shall conform to FF-T-276, Type III. The thimbles shall be heavy-duty hot-dip zinc-coated (galvanized).

3.5.3 Steel Pipe. Steel pipe shall conform to ASTM A53/A53M. Pipe shall be seamless, standard weight (schedule 40).

3.5.4 Steel Plate. Steel plate shall conform to ASTM A36/A36M.

3.5.5 Wire Rope. Wire rope shall be stranded, uncoated, extra-improved plow steel, with regular lay. The wire rope shall be preformed with independent wire rope core (IWRC) and conform to RR-W-410, Type I, Class 2, or Class 3, improved plow steel, wire strand core or IWRC.

3.5.6 Master Link. Master links shall conform to commercial practice. Master link WLL for Size 30/9 shall be 30 STON or greater and Size 40/18, 40 STON or greater.

3.6 Wire Rope Assemblies. All wire rope assemblies shall have the rope ends mechanically spliced or swaged with a seamless carbon steel sleeve over a Flemish-eye splice.

3.7 Galvanizing. All galvanizing shall conform to ASTM A123/A123M.

3.8 Workmanship

3.8.1 Sling Fabrication. The material used in fabricating slings shall be free from kinks, sharp bends, and other conditions or defects that would be deleterious to the finished product. Manufacturing processes shall be done neatly and accurately and not reduce the material strength.

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3.8.2 Welding. Welding procedures shall be in accordance with AWS D1.1/D1.1M. The surface of parts to be welded shall be free from rust, scale, paint, grease, or other foreign matter. Welds shall be of sufficient size and shape to develop the full strength of the parts connected by the welds. Welds shall transmit stress without permanent deformation or failure when the parts connected by the weld are subjected to proof and service loadings.

3.9 Identification Markings

3.9.1 Spreader Bar. Identification marking shall be permanently and legibly marked directly on the spreader bar or on a corrosion-resisting metal plate securely attached to the spreader bar by the manufacturer. Identification marking shall include the size (see 1.2.1), date of manufacture, and the manufacturer's model and serial number (if applicable). An example of spreader bar indelible marking is shown in figure 6.

3.9.2 Sling Assembly. Sling assembly identification markings shall be on a corrosion-resisting metal plate securely attached to the sling set. Identification marking shall include the size (see 1.2), date of manufacture, and the manufacturer's model and serial number (if applicable).

4. VERIFICATION

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

- a. First article inspection (see 4.2).
- b. Quality conformance inspection (see 4.3).

4.2 First Article Inspection. When required by 3.2 (noted in 6.2) a first article inspection shall include the examination of 4.5 and the tests of 4.6. The first article may be either a first production item or a standard production item from the supplier's current inventory, provided the item meets the requirements of the specification and is representative of the design, construction, and manufacturing technique applicable to the remaining items to be furnished under the contract.

4.3 Quality Conformance Inspection. The quality conformance inspection shall include examination of 4.5 and the proof load test of 4.6.

4.4 Inspections. Unless otherwise specified in the contract, the supplier is responsible for the performance of all required tests and inspections. With Government approval, the contractor may use any facility suitable for performing the tests and inspections. The Government reserves the right to conduct tests and inspections.

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4.5 Examination. Each spreader bar/sling assembly shall be examined for compliance with the requirements of section 3 of this document. Any redesign or modification of the supplier's standard product to comply with the specified requirements or modification following failure to meet the specified requirements shall receive particular attention for adequacy and suitability. This element of inspection shall include all visual examinations and dimensional measurements. Noncompliance with any specified requirements or presence of one or more defects preventing or lessening maximum efficiency shall constitute cause for rejection.

4.6 Tests

4.6.1 Proof Testing Sling-Legs. All sling-legs shall be proof load tested to twice rated capacity. Test loads required for proof loading are in table 1. The load given for the sling legs above the spreader bar (upper sling legs) is a resolved load that accounts for sling leg angle. The load shall be held for not less than 5 minutes. Any evidence of permanent deformation other than normal thimble deformation shall be cause for rejection of the sling-leg assembly.

Table 1. Sling-Leg Proof Loads
Pounds (kN)

Size 30/9	Upper Sling Legs	78,320 (348)
Size 30/9	Lower Sling Legs	60,000 (267)
Size 40/18	Upper Sling Legs	113,140 (503)
Size 40/18	Single Lower Sling Legs	80,000 (356)
Size 40/18	Two Lower Sling Legs	40,000 (178)

4.6.2 Proof Testing Assemblies. When specified (see 6.2), sling assemblies shall be proof load tested to twice rated capacity. Test loads required for proof loading are in table 2. The load shall be held for not less than 5 minutes. Any evidence of permanent deformation other than normal thimble deformation shall be cause for rejection of the sling assembly.

Table 2. Assembly Proof Loads
Pounds (kN)

Size 30/9	120,000 (534)
Size 40/18	160,000 (712)

5. PACKAGING

5.1 Packaging. Preservation, packing and marking shall be as specified in the contract or order (see 6.2).

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

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6.1 Intended Use. The spreader bar/sling assemblies covered by this specification are intended for use in cargo handling for shipboard and other loading operations in lifting vehicles and large pieces of equipment. The Size 40/18 spreader bar (with 6-foot minimum lower slings) is suitable for top lifting 20-foot ISO containers or flatracks. Size 30/9 spreader bars (with sufficient length lower slings and commercial bottom-lifting-adaptors) are suitable for bottom lifting 20- and 40-foot ISO containers or flatracks.

6.2 Acquisition Requirements. Acquisition documents must specify the following:

- a. Title, number, and date of the specification.
- b. Size of spreader bar assembly required (see 1.2.1). Quantity and length of lower legs for 30/9 or 40/18 (see figure 4). The lower legs for both the 30/9 and the 40/18 should be of equal length between 10 to 12 feet and ending in a thimble eye. Appropriately sized shackles/hooks/ choker-cables will be added in the field as needed.
- c. Suggested color: 30/9 Spreader bar: Yellow.
40/18 Spreader bar: Blue.
Shackles, Bolts and other parts: Galvanized or factory finish.
- d. When required, the quantity and size of Storage Racks (Appendix A and B).
- e. When first article is required for inspection and approval (see 3.2 and 4.2), the contracting officer shall include specific instructions in acquisition documents regarding arrangements for examination, test, and approval of the first article. The contracting officer shall specify proof testing, when deemed necessary, of the sling-legs (see 4.6.1) or the complete assemblies (see 4.6.2).
- f. Packing requirements (see 5.1).

6.3 Supersession information. This specification replaces Federal Specification FF-S-2874, dated 16 December 1997, which replaced Military Specification MIL-S-22824E, dated 14 September 1993.

6.4 Subject term (key word) list

Shackle
Spreader bar
Wire rope

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Military Interests: Civil Agency Coordination Activity
GSA-FSS

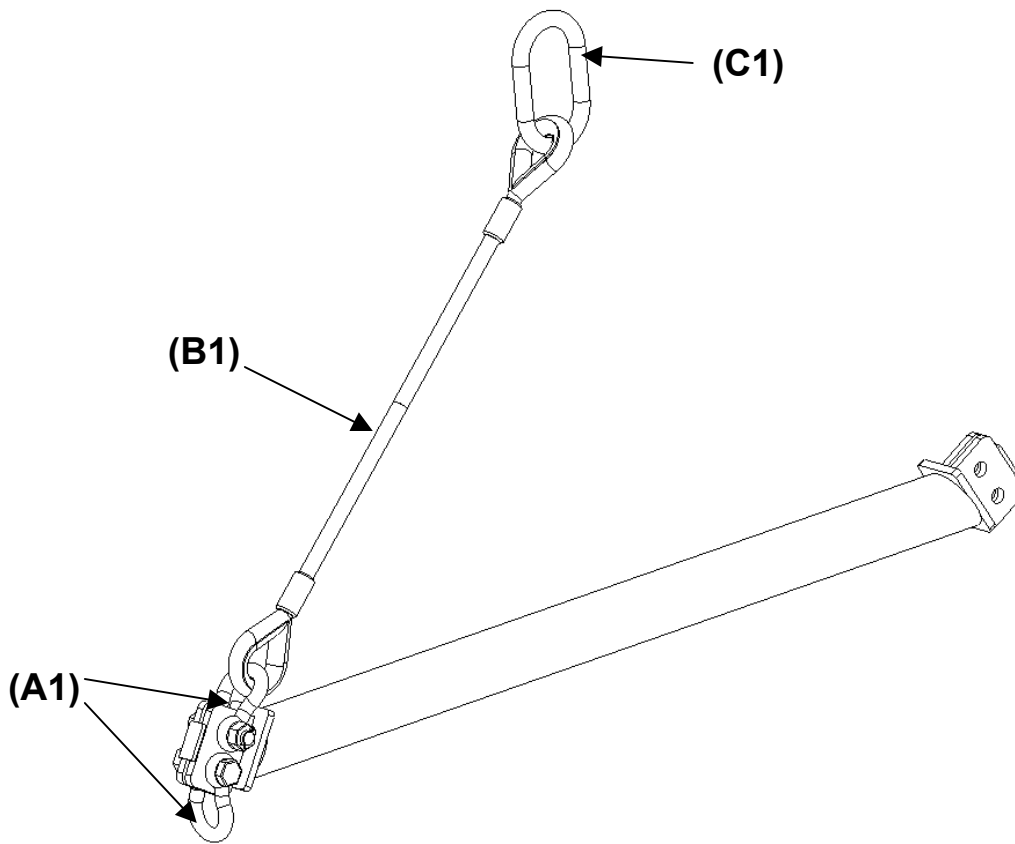
Custodian: Army – MT
Air Force – Code 99

Preparing Activity:
Army – MT
(Project: 3940-0065)

Review Activity:
Navy – YD1, MC, SH, CG
DLA – GS
Air Force – Code 84

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 www.dodssp.daps.mil.

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(A1) 1-1/2-inch, Grade-B, Safety Anchor Shackles – four required

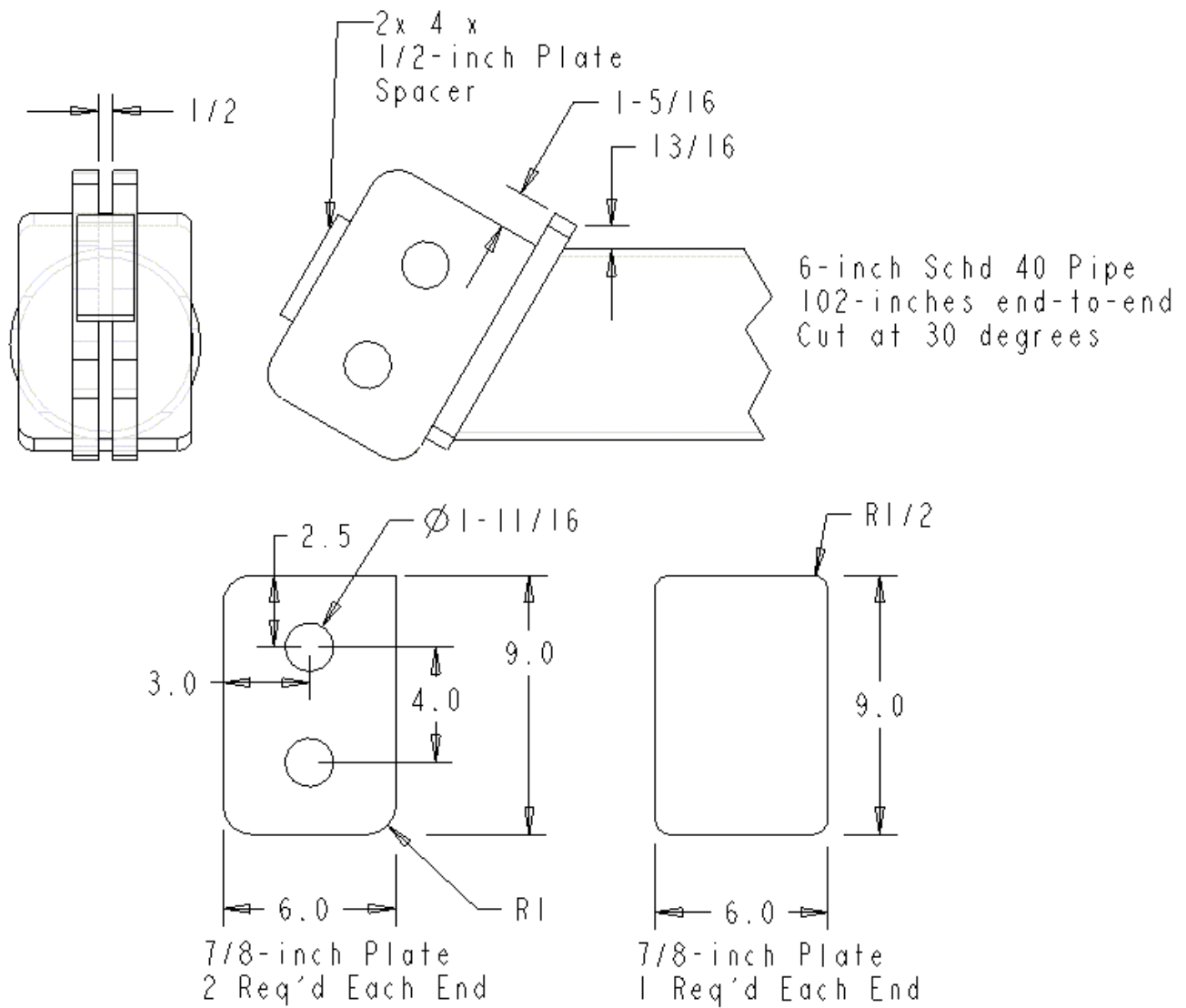
(B1) 1-5/8-inch Wire Rope – upper slings 70 inches (- 0/ +2")
(sling length measured from Thimble contact with shackle to
Thimble contact with Master-Link)
One upper sling shown – two required

(C1) 1-3/4-inch bar Master-Link (WLL \geq 30 STON) – one required

Lower Slings (Not Shown) 1-3/8-inch Wire Rope – two required
Lower sling lengths as specified in 6.2 b

Figure 1. Size 30/9

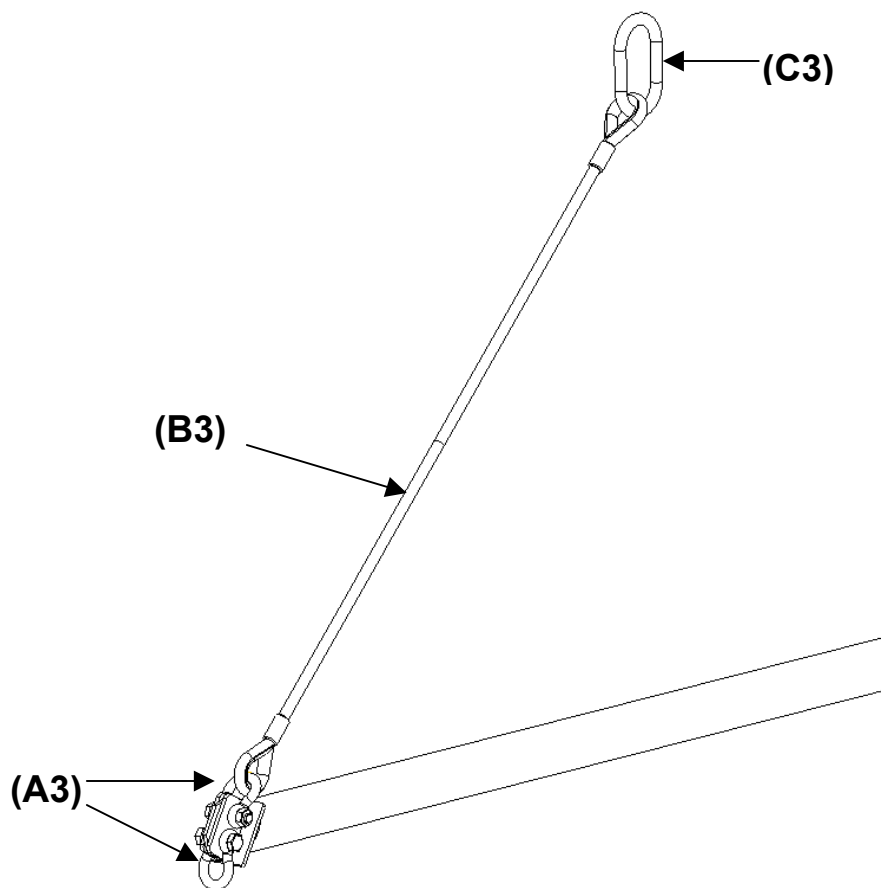
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Construction Details

Figure 2. Size 30/9

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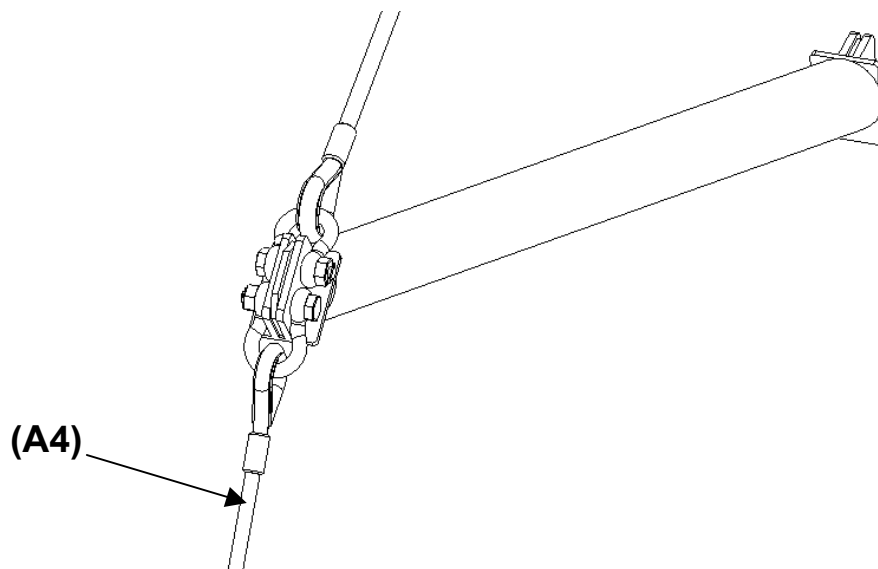
(A3) 1-5/8-inch, Grade-B, Safety Anchor Shackles – four required

**(B3) 1-7/8-inch Wire Rope – upper slings 140 inches (- 0/ +3")
(sling length measured from Thimble contact with shackle to
Thimble contact with Master-Link)
One upper sling shown – two required**

(C3) 2-inch bar Master-Link (WLL= \geq 40 STON) – one required

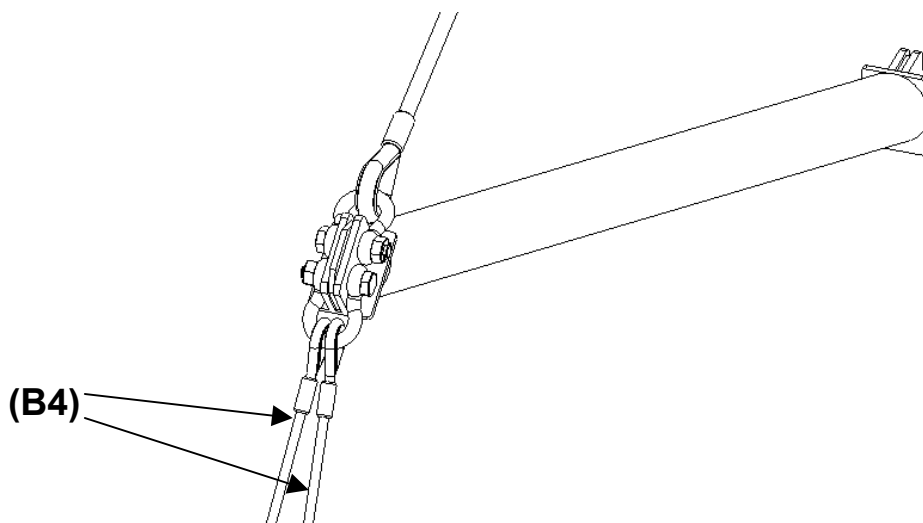
Figure 3. Size 40/18

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[upper slings as shown in Figure 3]

**(A4) Rigged with 1-5/8-inch lower slings – two required
Lower sling lengths as specified in 6.2 b**

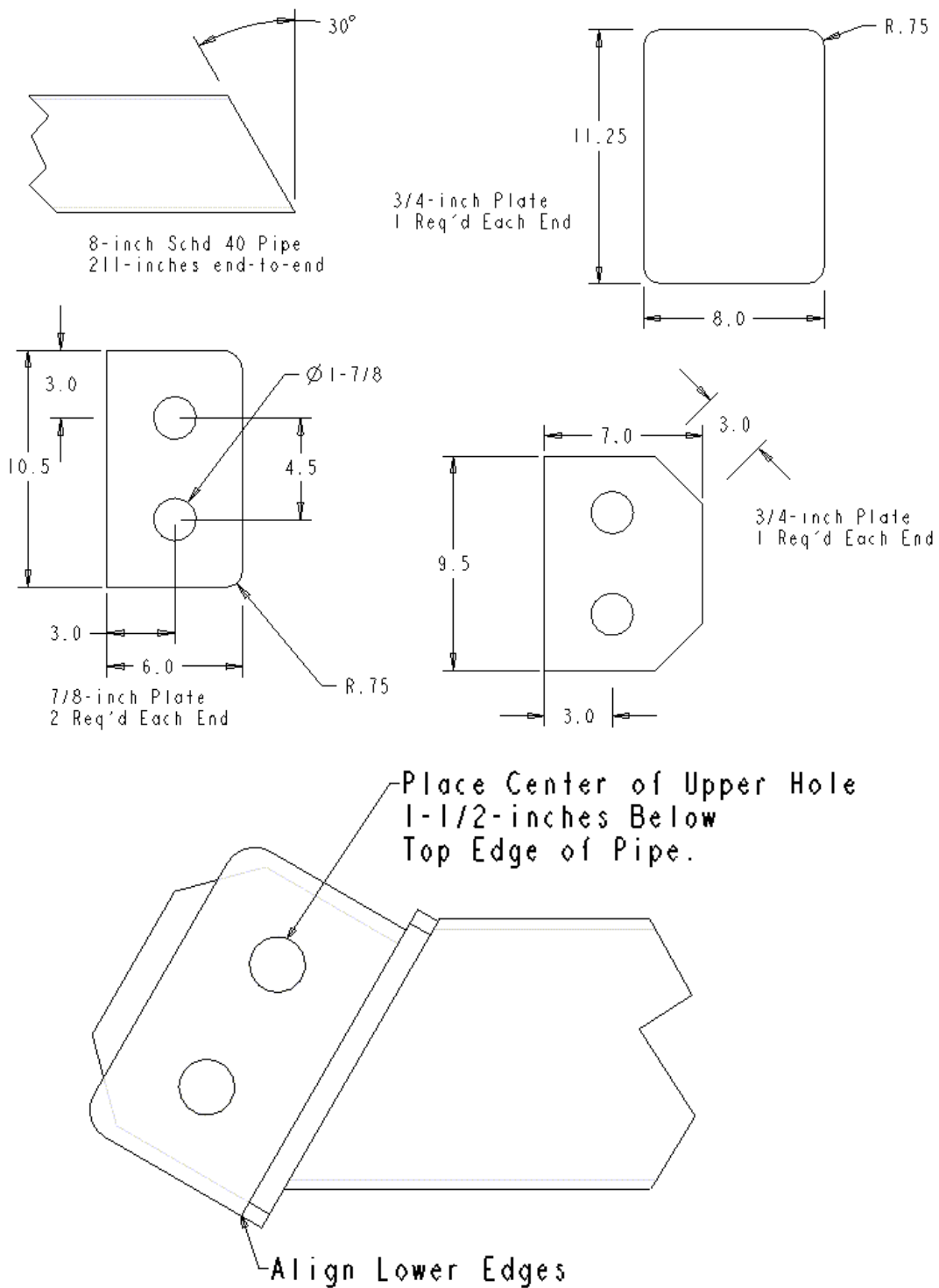


OR

**(B4) 1-1/8-inch Lower Slings – four required
Lower sling lengths as specified in 6.2 b**

Figure 4. Size 40/18

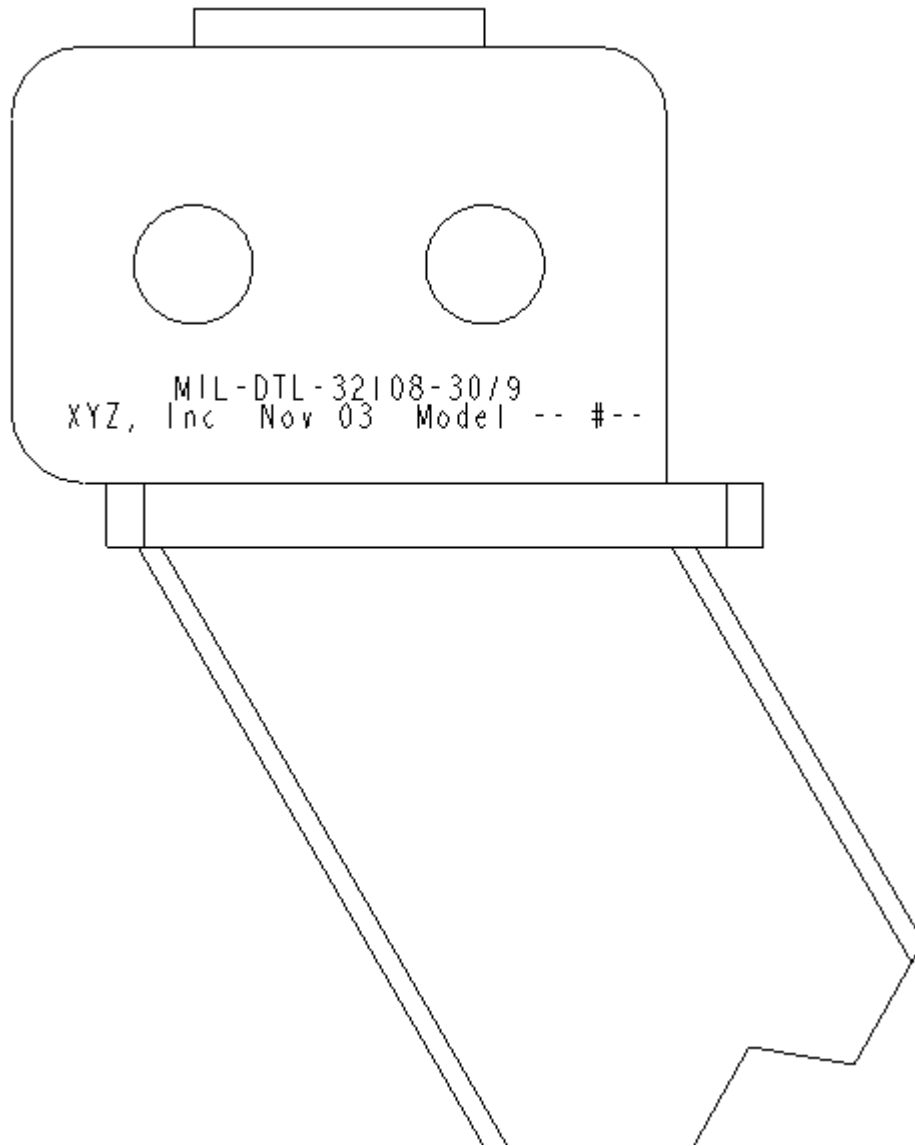
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Construction Details

Figure 5. Size 40/18

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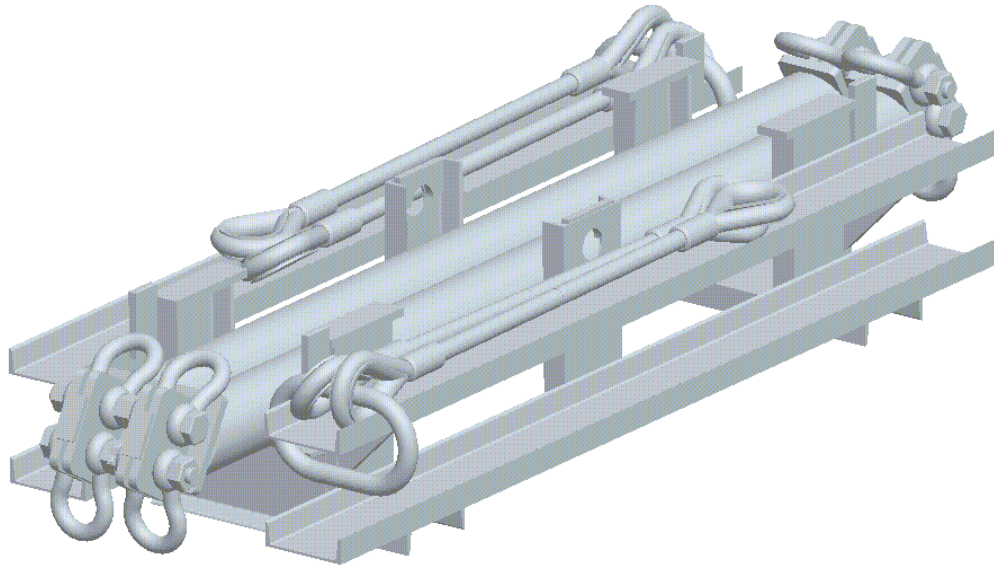


1/2 to 3/8-inch Steel-Stamp Marking

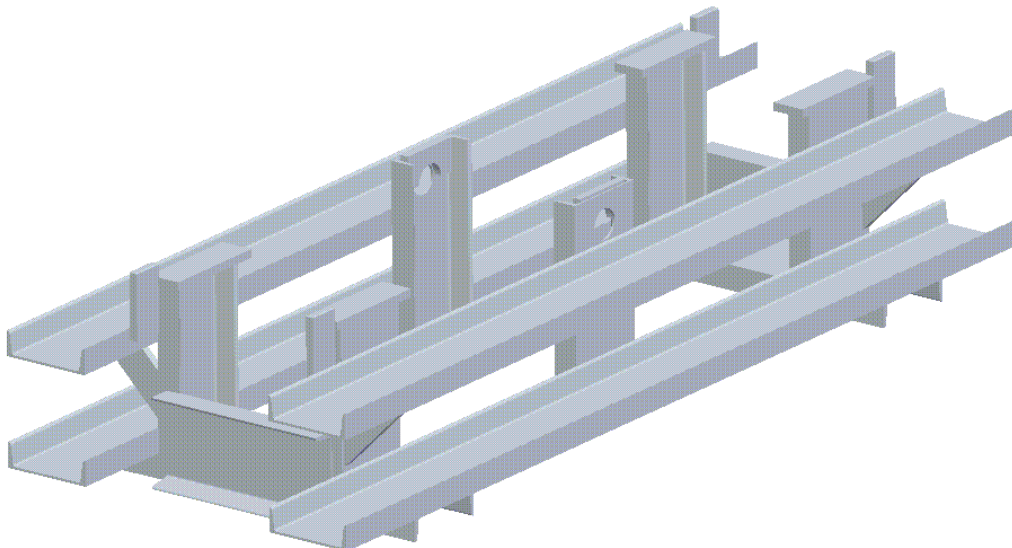
Figure 6. Size Marking

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**Appendix A
30/9 Storage Rack**



**Storage Rack for two 30/9 Spreader-Bars
Loaded Stackable Storage Rack Shown; Empty Trays
for Lower Sling-Legs**

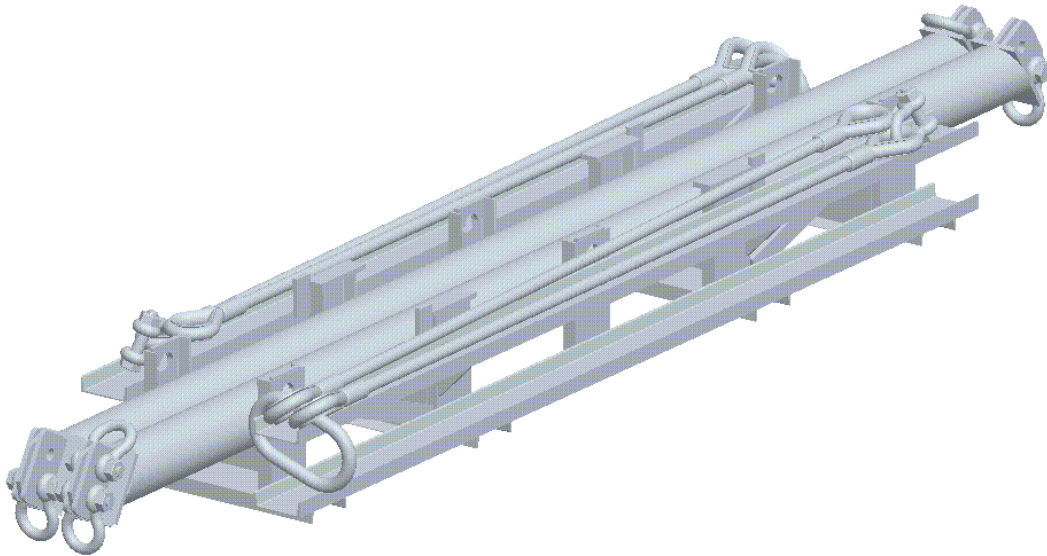


**Storage Rack for two 30/9 Spreader-Bars
Empty Rack Shown ~600 pounds**

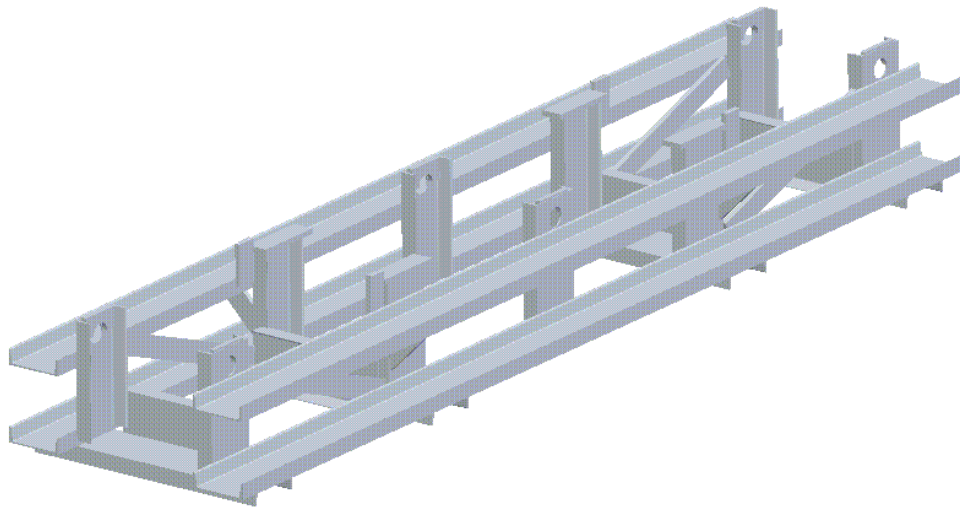
Figure A-1 30/9

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**Appendix B
40/18 Storage Rack**



**Storage Rack for two 40/18 Spreader-Bars
One Stackable Storage Rack Shown; Empty Tray
for Lower Sling-Legs**



**Storage Rack for two 40/18 Spreader-Bars
Empty Stackable Storage Rack Shown ~1,170 pounds**

Figure B-1 40/18

Contact SDDC Transportation Engineering Agency, (email DPEmail@tea.army.mil) for construction details.