

MIL-C-62005A
30 September 1982
SUPERSEDING
MIL-C-62005
9 April 1964

MILITARY SPECIFICATION

COUPLING, AUTOMOTIVE AIR BRAKE LINES:
QUICK-DISCONNECT

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

1. SCOPE

1.1 Scope. This specification covers self-locking coupling halves designed for use on pneumatic hose where rapid coupling and uncoupling is required (see 6.1).

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. Unless otherwise specified, the following specifications, standards, and handbooks, of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation, form a part of this specification to the extent specified herein.

STANDARDS

FEDERAL

FED-STD-H28/8 - Screw Thread Standards for Federal Services.
FED-STD-151 - Metal, Test Methods.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: US Army Tank-Automotive Command, ATTN: DRSTA-GSS, Warren, MI 48090, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document, or by letter.

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| MIL-STD-105 | - Sampling Procedures and Tables for Inspection by Attributes. |
| MIL-STD-130 | - Identification Marking of US Military Property. |
| MIL-STD-202 | - Test Methods for Electronic and Electrical Component Parts. |
| MS35746 | - Coupling, Automotive, Air Brake Lines. |
| MS35748 | - Packing, Preformed, Air Coupling. |

(Copies of specifications, standards, handbooks, drawings, and publications required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity, or as directed by the contracting officer.)

2.1.2 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

3. REQUIREMENTS

3.1 First article (preproduction). The contractor shall furnish sample units for first article inspection and approval (see 4.3 and 6.3). First article samples shall be inspected by the contractor under the surveillance of the Government to determine conformance to quality assurance provisions of this specification: Sample units shall be fully representative of coupling halves to be supplied from production tooling and facilities. Any change or deviation of production units from first article sample shall be subject to the approval of the Government.

3.2 Materials. Materials shall be as specified herein and in referenced specifications, standards and drawings. Material shall be free of defects which adversely affect performance or serviceability of the finished product (see 6.5).

3.2.1 Metals. Metals used in construction of coupling halves shall be corrosion resistant, or shall be protected to resist corrosion during length of service.

3.2.2 Packing material. Packing material used in coupling halves shall conform to MS35748 as applicable.

3.3 Design and construction. Unless otherwise specified (see 6.2), coupling halves and preformed packing used shall be constructed to the form and dimensions specified herein, and on MS35746 and MS35748, as applicable.

3.3.1 Threaded parts. Screw threads shall conform to FED-STD-H28/. The form, number per inch, and class of threads shall be as specified on MS35746.

3.3.2 Interchangeability. Coupling halves shall be functionally interchangeable; any two, when joined together, shall form an airtight coupling and shall be physically and functionally interchangeable with those shown on NATO STANAG 2604 and ABCA QSTAG 310 (see 6.4).

3.4 Performance.

3.4.1 Coupling and uncoupling torque. Coupling and uncoupling torque shall be not more than 75 inch pounds (.8 kg-m) with zero line pressure. With 100 psi (700 kPa) line pressure uncoupling torque shall be not more than 125 inch pounds (1.4 kg-m) and not less than 50 inch pounds (.6 kg-m).

3.4.2 Temperature compatibility. A coupled pair of coupling halves shall meet the requirements of 3.4.1 and 3.4.4 at ambient temperatures of minus 65°F and plus 125°F (-54° and 52°C).

3.4.3 Corrosion resistance. A pair of coupling halves shall meet the requirements of 3.4.1 and 3.4.4 after being subjected to a 20 percent solution of sodium chloride spray for 96 hours.

3.4.4 Leakage. A coupled pair of coupling halves shall show no leakage through any point on the surface of coupling body, or between packing faces, when 150 psi (1050 kPa) air pressure is applied.

3.4.5 Endurance.

3.4.5.1 Coupling and uncoupling ability. A pair of coupling halves shall withstand 5000 cycles of coupling and uncoupling in the normal manner without causing damage. Subsequently, coupling halves shall meet the requirements of 3.4.1 and 3.4.4.

3.4.5.2 Breakaway. A coupled pair of coupling halves, connected to an air line pressure of 100 psi, (700 kPa) shall withstand being pulled apart 500 times, as in a breakaway, under a gradually applied load. Each separation shall occur at not less than 50 pounds (20 kg) and not more than 150 pounds (70 kg). Subsequently, the coupling halves shall meet the requirements of 3.4.1 and 3.4.4.

3.4.5.3 Shock resistance. A coupled pair of coupling halves shall withstand a 100 G shock load after having been conditioned for 24 hours at a temperature of minus 65° + 5°F (-54° + 3°C) without injury. Subsequently, coupling halves shall meet the requirements of 3.4.1 and 3.4.4.

3.4.6 Strength.

3.4.6.1 Thread tensile strength. Coupling halves shall withstand a tensile force of 1000 pounds (450 kg) applied coincident with thread axis while exposed for 24 hours at an ambient temperature of minus 50° + 5°F (-46° + 3°C)

followed by similar exposure at $250^{\circ} + 5^{\circ}\text{F}$ ($121^{\circ} + 3^{\circ}\text{C}$) without causing air pressure leak at threads. Subsequently, coupling halves shall meet the requirements of 3.4.1 and 3.4.4.

3.4.6.2 Compression. Coupling shall withstand a load of 500 pounds (230 kg) applied perpendicular to the sealing face on each locking jaw in the direction of force normally resulting from compression of packing. When loaded in this manner, there shall be no permanent set to the packing and coupling shall continue to operate after 24 hours exposure at minus $50^{\circ} + 5^{\circ}\text{F}$ ($-46^{\circ} + 3^{\circ}\text{C}$) followed by 24 hours exposure at $200^{\circ} + 5^{\circ}\text{F}$ ($93^{\circ} + 3^{\circ}\text{C}$) ambient temperatures. Subsequently, coupling halves shall meet the requirements of 3.4.1 and 3.4.4.

3.5 Marking. Coupling halves shall be marked for identification in accordance with the applicable requirements of MIL-STD-130.

3.6 Workmanship. Workmanship shall conform to high grade commercial practice covering this class of equipment, assuring a product free of burrs, scratches, sharp edges, and chips.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements specified herein. Except as otherwise specified in the contract or purchase order, 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 supplies and services conform to prescribed requirements.

4.1.1 Materials. Contractor's inspection records shall be examined to determine conformance to 3.2.

4.2 Classification of inspections. Classification of inspections shall be as follows:

- a. First article (preproduction) inspection (see 4.3).
- b. Quality conformance inspection (see 4.4.).

4.3 First article (preproduction) inspection. First article inspection shall be performed after award of contract and prior to production (see 3.1). Inspection shall be performed on sample units which have been produced with equipment and procedures normally used in production. First article approval is valid only on the contract under which it is granted, unless extended by the Government to other contracts.

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4.3.1 Inspection procedure. Five mated couplings shall be subjected to first article inspection and test. Inspection shall consist of examination for the defects specified in 4.4.2.2, and tests as specified in table I.

4.3.2 Failure. Failure of a first article sample to conform to any of the requirements specified, or any deficiency of a workmanship or materials nature found as a result of the test, shall be cause for rejection. Further testing shall not be conducted until evidence has been provided by the contractor that corrective action has been taken to eliminate the deficiency.

TABLE I. Classification of tests.

Test	Requirement	First article tests	Acceptance tests	Control tests
Coupling and uncoupling torque	3.4.1	4.5.1	4.5.1	4.5.1
Temperature compatibility	3.4.2	4.5.2		
Corrosion resistance	3.4.3	4.5.3		
Leakage	3.4.4	4.5.4	4.5.4	4.5.4
Coupling and uncoupling ability	3.4.5.1	4.5.5.1		
Breakaway	3.4.5.2	4.5.5.2		4.5.5.2
Shock resistance	3.4.5.3	4.5.5.3		
Thread tensile strength	3.4.6.1	4.5.6.1		
Compression	3.4.6.2	4.5.6.2		

4.4 Quality conformance inspection.4.4.1 Sampling.

4.4.1.1 Lot formation. A lot shall consist of all coupling halves from an identifiable production period, from one manufacturer, submitted at one time for acceptance.

4.4.1.2 Sampling for quality conformance examination. Samples for quality conformance examination shall be selected in accordance with MIL-STD-105.

4.4.1.3 Sampling for acceptance testing. Samples for acceptance testing shall be selected in accordance with inspection level S3 of MIL-STD-105.

4.4.2 Quality conformance examination.

4.4.2.1 Acceptable quality level. Coupling halves selected in accordance with 4.4.1.2 shall be examined for conformance to the following acceptable quality levels (AQL's) on the basis of percent defective:

<u>Classification</u>	<u>AQL</u>
Major	1.0
Minor	2.5

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4.4.2.2 Classification of defects. For examination purposes, defects shall be classified as specified in table II.

TABLE II. Classification of defects.

Category	Defect	Method of inspection
Major:		
101	Incorrect screw threads (see 3.3.1).	SIE ^{1/}
102	Incorrect dimensions affecting interchangeability (see 3.3. and 3.3.2).	SIE
Minor:		
201	Incorrect dimensions not affecting interchangeability (see 3.3 and 3.3.2).	SIE
202	Marking nonconformance (see 3.5).	Visual
203	Workmanship (see 3.6).	Visual

^{1/} SIE = Standard Inspection Equipment.

4.4.3 Classification of tests. Classification of tests shall be as follows:

- a. Acceptance tests (see 4.4.4).
- b. Control tests (see 4.4.5).

4.4.4 Acceptance tests. Samples selected in accordance with 4.4.1.3, shall be subjected to tests specified in table I, in the order listed, using an AQL of 6.5 on the basis of percent defective.

4.4.5 Control tests. Couplings for control testing shall be selected at the rate of two per month or two of each 500 produced, whichever occurs first, except that not more than six couplings shall be selected in any single month. Samples shall be examined as specified in 4.4.2.2 and subsequently subjected to the tests listed in table I, in the order shown.

4.4.6 Failure. Failure of a control test sample to pass any specified examination or test may be cause for the Government to refuse to accept subsequent lots until it has been proven to the satisfaction of the Government that the faults revealed by the examination or test have been corrected.

4.5 Conformance verification.

4.5.1 Coupling and uncoupling torque test. One coupling half shall be placed in a stationary fixture. Another coupling half, with a torque wrench attached, shall be connected to the stationary coupling half (with zero line pressure) and the torque required to make this connection noted. The coupling half shall then be disconnected (using a torque wrench) and the required torque noted to determine conformance to 3.4.1. The pair of coupling halves shall be reconnected, and each half attached to an air source of 100 psi (700 kPa). A torque wrench shall be attached to the moveable coupling half, disconnecting it from the immovable half. Torque required to do this shall be noted to determine conformance to 3.4.1.

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4.5.2 Temperature compatibility test. To determine conformance to 3.4.2, two uncoupled coupling halves shall be placed in a cold chamber at minus $65^{\circ} \pm 5^{\circ}\text{F}$ ($-54^{\circ} \pm 3^{\circ}\text{C}$) for 24 hours. While at that temperature, coupling halves shall be tested as specified in 4.5.1 and 4.5.4. Subsequently, coupling halves shall be placed in a heated chamber at $125^{\circ} \pm 5^{\circ}\text{F}$ ($52^{\circ} \pm 3^{\circ}\text{C}$) for 24 hours. While at that temperature, coupling halves shall be tested as specified in 4.5.1 and 4.5.4.

4.5.3 Corrosion resistance test. A coupling half test sample shall be tested in accordance with method 811 of FED-STD-151, using a 20 percent solution for a period of 96 hours. At completion of test, coupling half shall be subjected to the tests of 4.5.1 and 4.5.4 to determine conformance to 3.4.3.

4.5.4 Leakage test. Two coupling halves shall be connected to each other and each attached to an air source of 150 psi (1050 kPa). They shall then be immersed in water for 5 minutes during which time they shall be examined for leakage through the coupling bodies and between packing faces to determine conformance to 3.4.4.

4.5.5 Endurance.

4.5.5.1 Coupling and uncoupling ability test. Two coupling halves shall be coupled and uncoupled a total of 5000 times. At completion of cycling, coupling shall be tested as specified in 4.5.1 and 4.5.4 to determine conformance to 3.4.5.1.

4.5.5.2 Breakaway test. A coupled pair of coupling halves shall be pulled apart as in a breakaway and then recoupled, while connected to an air line pressure of 100 psi (700 kPa). This cycle shall be repeated 500 times. The force required to do this shall be measured. The coupled pair shall then be tested as specified in 4.5.1 and 4.5.4 to determine conformance to 3.4.5.2.

4.5.5.3 Shock resistance test. After being conditioned for 24 hours at minus $65^{\circ} \pm 5^{\circ}\text{F}$ ($-54^{\circ} \pm 3^{\circ}\text{C}$), a coupled pair of coupling halves shall be subjected to a 100G shock load in accordance with method 213 of MIL-STD-202. Coupling shall be examined for damage and subsequently tested as specified in 4.5.1 and 4.5.4 to determine conformance to 3.4.5.3.

4.5.6 Strength.

4.5.6.1 Thread tensile strength test. A coupling half shall be placed in a vice or other device capable of holding the coupling while a pull of 1000 pounds (450 kg) is applied. An eyebolt with threads compatible to those of the coupling half shall be screwed into the air inlet of the coupling half. The head of the eyebolt shall then be attached to a tensile testing machine or similar device and a tensile load of 1000 pounds (450 kg) applied in the

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direction of the axis of the threads for 24 hours in an ambient temperature of minus $50^{\circ} \pm 5^{\circ}\text{F}$ ($-46^{\circ} \pm 3^{\circ}\text{C}$) followed by similar exposure at $250^{\circ} \pm 5^{\circ}\text{F}$ ($121^{\circ} \pm 3^{\circ}\text{C}$). Eyebolt shall then be removed and coupling threads examined for thread damage. The coupling half shall be attached to another half and the assembled coupling tested as specified in 4.5.1 and 4.5.4 to determine conformance to 3.4.6.1.

4.5.6.2 Compression test. A compression force of 500 pounds (230 Kg) shall be applied as specified in 3.4.6.2 to a coupled pair of coupling halves and the coupling assembly clamped to maintain this compressed condition. Coupling assembly shall then be exposed for 24 hours to an ambient temperature of minus $50^{\circ} \pm 5^{\circ}\text{F}$ ($-46^{\circ} \pm 3^{\circ}\text{C}$) followed by exposure for 24 hours to an ambient temperature of $200^{\circ} \pm 5^{\circ}\text{F}$ ($93^{\circ} \pm 3^{\circ}\text{C}$). Upon completion of the specified temperature exposures, the coupling shall be examined and tested as specified in 4.5.1 and 4.5.4 to determine conformance to 3.4.6.2.

5. PACKAGING

5.1 Cleaning, preservation, packaging, packing and marking. Preservation, packaging and packing shall be in accordance with the applicable packaging standard or data sheet for the desired level of protection.

6. NOTES

6.1 Intended use. Coupling halves covered by this specification are intended for use on vehicles where a low-pressure, quick-disconnect connection for air brake hose is needed.

6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number, and date of this specification.
- b. If design differs from that specified (see 3.3).
- c. Selection of applicable level of preservation and packaging, and level of packing (see 5.1).

6.3 First article. First article samples shall be tested and approved under the appropriate provisions of 7-104.55 of the Defense Acquisition Regulation. The contracting officer should include specific instructions in all procurement instruments regarding arrangements for examination, tests and approval of the first article (see 3.1).

6.4 International agreements. Certain provisions (see 3.3.2, Physical and Functional Interchangeability of Coupling Halves) of this specification are the subject of International Standardization Agreements (ABCA-QSTAG 310, and NATO STANAG 2604). When amendment, revision, or cancellation of this specification is proposed, the departmental custodians will inform their respective Departmental Standardization Offices so that the appropriate action may be taken respecting International Agreement concerned.

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6.5 Recycled materials. The use of recycled materials which meet the requirements of the applicable material specifications without jeopardizing the intended use of the item shall be encouraged (see 3.2).

6.6 Changes from previous issue. Asterisks are not used in this revision, to identify changes with respect to the previous issue, due to the extensiveness of the changes.

Custodians:

Army - AT

Navy - YD

Air Force - 99

Preparing activity:

Army - AT

Project No. 4730-0175

Review activity:

Army - ME

User activity:

Navy - MC

★U.S. GOVERNMENT PRINTING OFFICE: 1982-605-034/5265

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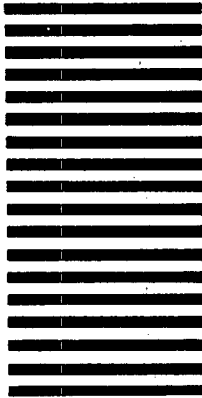


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