



AEROSPACE STANDARD

AS5356™**REV. B**

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Superseding AS5356A

Coupling, Fuel Line, Flexible, 125 psi General Specification for

RATIONALE

This document has been determined to contain basic and stable technology which is not dynamic in nature.

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1. SCOPE:

1.1 Scope:

This specification covers flexible couplings for joining tubing with AS5131 Type A beaded ends for use in aircraft fuel and vent systems (see 6.1).

1.2 Classification:

Couplings shall be of the following size, material, and type as specified.

1.2.1 Size: The size of couplings shall be as specified in Table 2.

1.2.2 Material: The material shall be in accordance with Table 1. The basic material of the coupling is designated by the following code letters:

CODE D - Aluminum

CODE C - Corrosion-resistant steel

CODE T - Titanium

1.2.3 Type: The coupling shall consist of the following types:

Type 1 - Standard coupling with no electrical bonding

Type 2 - Coupling with electrical bonding

TABLE 1 - Coupling Material

Materials Type	Materials Specification	Finish Specification
Aluminum alloy 2024-T6, 6061-T6	AMS-QQ-A-225/6 AMS-QQ-A-225/8	Anodized per MIL-A-8625 Type II Class 2
Corrosion-resistant steel (Cres)	AMS 5643, AMS 5659 or equivalent	Passivated per AMS-QQ-P-35
Titanium 6AL-4V	AMS 4921 AMS 4965 AMS-T-9046	None None Condition AB-1

2. REFERENCES:

2.1 Applicable Documents:

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 4921	Titanium, Bars, Forgings and Rings, Annealed, 70,000 psi (485 mPa) Yield Strength
AMS 4965	Titanium Alloy, Bars, Forgings and Rings, 6.0Al - 4.0V Solution and Precipitation Heat Treated
AMS 5643	Steel Bars, Forgings, Tubing, and Rings, Corrosion Resistant 16Cr - 4.0Ni - 0.30 (Cb+Ta) - 4.0Cu Solution Heat Treated
AMS 5659	Bar, Forgings and Rings, and Extrusions Corrosion Resistant 15Cr - 45Ni - 0.30 (Cb+Ta) - 3.5Cu Consumable Electrode Melted Solution Heat Treated, Precipitation Hardenable
AMS 5687	Nickel Alloy, Corrosion and Heat Resistant, Wire 74Ni - 15.5Cr - 8.0Fe Annealed
AMS-T-9046	Titanium, Titanium Alloy, Sheet, Strip and Plate
AMS-QQ-P-35	Passivation Treatment for Corrosion Resistant Steel

2.1.1 (Continued):

AMS-QQ-A-225/6	Aluminum Alloy Bar, Rod, and Wire, Rolled, Drawn, or Cold Finished 2024
AMS-QQ-A-225/8	Aluminum Alloy 6061, Bar, Rod, Wire and Special Shapes: Rolled, Drawn or Cold Finished
AS567	Safety Cable, Safety Wire, Key Washers and Cotter Pins, for Propulsion Systems General Practices for Use of
AS1710	Coupling, Fuel, Flexible, Variable Cavity Threaded Type with Ferrules
AS1720	Ferrule End, Coupling, Flexible, Variable, Cavity Threaded, Ferrule Type, Design Standard
AS5131	Tubing End, Design Standard
AS29513	Packing, Preformed, Hydrocarbon Fuel Resistant O-Ring

2.1.2 ASTM Publications: Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM D 471	Standard Test Method for Rubber Property-Effects of Liquid
ASTM D 3951	Commercial Packaging

2.1.3 ANSI Publications: Available from ANSI, 25 West 43rd Street, New York, NY 10036-8002.

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

2.1.4 U.S. Government Publications: Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

FED-STD-H28/2	Screw Thread Standards for Federal Services Section 2 Unified Inch Screw Threads-UN and UNR Threads Form
MIL-DTL-5624	Turbine Fuel, Aviation, Grades JP-4, JP-5, and JP-5/JP-8 ST
MIL-A-8625	Anodic Coatings for Aluminum and Aluminum Alloys
MIL-STD-129	Marking for Shipment and Storage
MIL-STD-464	Interface Standard Electromagnetic Effects Requirements for Systems
MIL-HDBK-470	Designing and Developing Maintainable Products and Systems
MIL-HDBK-471	Maintainability Verification, Demonstration and Evaluation
MIL-STD-810	Department of Defense Test Method Standard for Engineering Guidelines
MIL-STD-889	Dissimilar Metals

2.2 Definitions:

CONNECTOR: Connector as used herein is defined as a replaceable component, which connects one coupling halve to another coupling halve.

EXCESSIVE WEAR: If original dimensions have been changed or altered by 5% or more.

FAILURE: Failure as used herein is defined as any deformation that would contribute to seal leakage or would promote premature fatigue breakage, unless otherwise determined to be due to a tubing defect.

LEAKAGE: Leakage as used herein is defined as the escape of fluid (gaseous or liquid) from any point of the coupling assembly including the coupling tube junction.

LOT: A lot is defined as products consisting of all parts of a given part number made from the same batch of material and processed at the same time.

TORQUE: Torque as used in this specification is defined as the necessary loads (or assembly stresses) to assure the sealing of fluid at the coupling tube junction without causing damage.

3. REQUIREMENTS:

3.1 First Article:

When specified (see 6.2d), a sample shall be subjected to first article inspection (see 6.4) in accordance with 4.2.

3.2 Materials:

Materials shall conform to applicable specifications and shall be as specified in Table 1. Materials which are not covered by applicable specifications, or which are not specifically described herein, shall be of the lightest practicable weight and compatible with aircraft fuel. All materials shall be resistant to fluids conforming to ASTM Reference Fuels and MIL-DTL-5624 to assure satisfactory operation.

3.2.1 Metals: Metals shall be of a corrosion-resisting material or treated in a manner to render them adequately resistant to corrosion when exposed to climatic and environmental conditions encountered during the service life of the equipment. The use of any protective coating that will crack, chip, or scale with age or extremes of climatic and environmental conditions shall be avoided.

3.2.1.1 Aluminum Alloy Parts: All aluminum alloy parts shall be in accordance with Table 1 and shall be anodized in accordance with MIL-A-8625, Type II, class 2.

- 3.2.1.2 Steel Parts: All steel parts shall be of corrosion-resistant steel in accordance with Table 1.
- 3.2.1.3 Titanium: Titanium shall be in accordance with Table 1.
- 3.2.1.4 Magnesium and Copper: Magnesium and copper shall not be used.
- 3.2.2 Fungus-Proof Materials: Materials which are not nutrients for fungi shall be used to the greatest extent practicable. In cases where materials that are nutrients for fungi must be used, such materials shall be treated with fungicidal agent as approved by the contracting activity or procuring activity.
- 3.2.3 Dissimilar Metals: Combinations of tubing and all contacting coupling parts shall be compatible in accordance with MIL-STD-889.
- 3.3 Design and Construction:

The coupling shall be designed for connection of AS5131 type A beaded tube ends and shall meet the requirements of Figure 1 and Table 2.

 - 3.3.1 Threads: Screw threads shall conform to FED-STD-H28/2. All threaded parts shall be securely locked in such a manner as to prevent loosening under test conditions specified herein and under normal service usage. Safety wire per AMS 5687 shall be installed in accordance with AS567. Wrenching features shall conform to Figure 1. Pipe threads shall not be used.
 - 3.3.2 Angular Misalignment: The coupling shall be capable of being installed with a maximum tubing installation misalignment of 3° in any direction.
 - 3.3.3 Flexure: The coupling shall provide for 1° flexure in any direction from any installed position. The coupling shall provide for a variation in space between tubing ends of 0.062 to 0.188 inch.
 - 3.3.4 Permanent Deformation: Installation of the coupling on tubing ends under conditions specified herein shall not produce a permanent deformation of the coupling.
 - 3.3.5 Tubing: The coupling shall be capable of connecting tubing having an outside diameter and wall thickness as specified in Table 3.

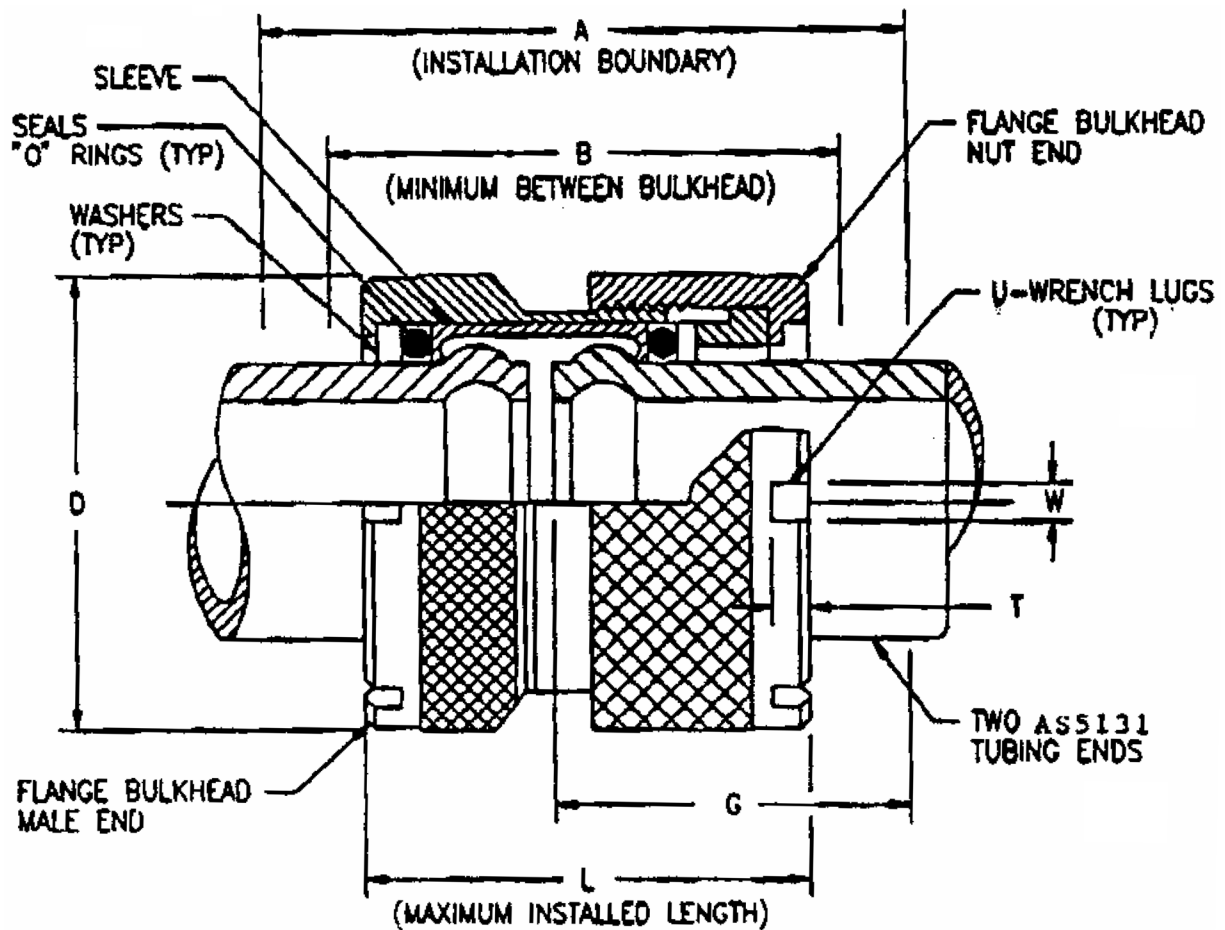


FIGURE 1 - Wrenching Features Typical Installation of Type 1 Fuel Coupling
(Two AS5131 Tubing Ends)

TABLE 2 - Dimension and Weight Requirements for Type 1 and Type 2 Couplings

Dash No.	Tube OD Ref	A ±0.010	B Min	D Max	G Min	L Max	U Qty	Seal MS29513 Ref ¹
-04	0.250	3.390	1.810	0.890	1.220	1.762	--	-010
-06	0.375	3.610	2.62	1.100	1.289	1.954	4	-110
-08	0.500	3.610	2.62	1.230	1.291	1.954	4	-112
-10	0.625	3.610	2.62	1.360	1.291	1.954	4	-114
-12	0.750	3.840	2.62	1.480	1.300	2.230	4	-210
-16	1.000	4.010	2.840	1.730	1.430	2.350	8	-214
-20	1.250	4.010	2.840	1.980	1.430	2.350	8	-218
-24	1.500	4.500	3.130	2.470	1.580	2.600	8	-325
-28	1.750	4.500	3.130	2.720	1.580	2.600	8	-327
-32	2.000	4.500	3.130	2.970	1.580	2.600	8	-329
-40	2.500	4.500	3.130	3.470	1.580	2.600	12	-333
-48	3.000	4.500	3.130	3.970	1.580	2.600	12	-337
-56	3.500	4.610	3.190	4.600	1.580	2.650	16	-341
-64	4.000	4.610	3.190	5.100	1.580	2.650	16	-345
-72	4.500	4.740	3.190	5.660	1.710	2.650	16	-349
-80	5.000	5.270	3.470	6.231	1.800	2.930	16	-429
-88	5.500	5.270	3.470	6.680	1.800	2.930	16	-433
-96	6.000	5.980	3.700	7.230	1.920	3.160	16	-437

¹ See the detail dimensions on AS29513 for the corresponding sizes.