AEROSPACE RECOMMENDED PRACTICE

ARP600™	REV. C

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Superseding ARP600B

Torque Determination, Method of, For Tube or Hose End Fitting Connections, Flared, Flareless, or Miscellaneous Screw Thread Style

RATIONALE

This technical report is being stabilized because it covers technology, products, or processes which are mature and not likely to change in the foreseeable future.

STABILIZED NOTICE

This document has been declared “STABILIZED” by SAE G-3 Committee and will no longer be subjected to periodic reviews for currency. Users are responsible for verifying references and continued suitability of technical requirements. Newer technology may exist.

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1. SCOPE:

This SAE Aerospace Recommended Practice (ARP) defines a method for determining a torque value (range) for threaded fluid connections.

1.1 Purpose:

The purpose of this document is to identify the variables impacting torque determination and limit to which a determined value(s) may be applied to other components.

2. 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 SAE Publications:

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

ARP908 Torque Requirements, Installation and Qualification Test, Hose and Tube Fittings

3. TECHNICAL REQUIREMENTS:

3.1 Selection of Materials:

Torques to be determined for tube or hose end connections shall be specific for a material combination; however, they may vary upon consideration of variables for a given tube size. These variables include tube material, fitting material, testing medium, required proof pressure and lubricant used. Resultant torques from substitution of listed variables will vary for a given tube size. Therefore, a developed torque is satisfactory only for the specific combination used in its formulation. These values are to be used for connecting tubing and hose assemblies to each other and/or to related equipment. See ARP908 for an example of application.

3.2 Torque Determination Procedure (Minimum):

a. Assemble thirty (30) specimens of a given tube size and material combination and lubricate to the degree and type which will not be deleterious to the end system use or application.

b. Group into six (6) categories of five (5) assemblies each and tighten each category to estimated values in arithmetical increments of inch pounds or foot pounds. That is, X + 10 lb-in, X + 20 lb-in, X + 30 lb-in, etc.

c. Pressurize with the applicable testing medium to required pressure and record sample leakage for each category. Evaluate results and select the minimum torque of which all five (5) samples of a given category showed no leakage.

d. Loosen all thirty (30) assemblies and retighten to the above (3.2c) established minimum torque. Pressurize to required proof pressure and observe for leakage. If there is no leakage, then the torque value shall be termed "MINIMUM TORQUE". In the event leakage occurs on any one sample of the thirty (30), select the next highest value from c. and repeat above sequence.

3.3 Torque Determination (Ultimate Failure):

a. Tighten one assembly group (5 assemblies) to the approximate extent that ultimate failure of the joint will probably occur at the operating environment. Record all five values of torque. Tests of the group shall be made to produce ultimate failure at the simulated operating environment. Repeat the foregoing on two (2) more categories using the lowest ultimate failure torque from the first group. The ultimate failure torque shall be that torque with which the fitting is no longer considered satisfactory for system usage in the system environment.

b. Loosen and retorque the two (2) categories from above for a total of nine (9) times, pressurizing after each three (3) tightenings to the required proof pressure. In the event of leakage, decrease lowest recorded yielding torque on each successive category of assemblies until such time that a category will successfully pass the "overtightened torque test". The final torque shall be termed "overtightened torque".