



AEROSPACE STANDARD

Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AS 683 A

Issued 4-20-64
Revised 9-20-76

INSTALLATION PROCEDURES AND TORQUES FOR FLUID CONNECTIONS

S. A. E.
LIBRARY

1. PURPOSE: To establish the installation procedures for fluid connection parts listed here.
2. SCOPE: These procedures cover the following:
 - Par. 3 - Cone end connections for flared tube and brazed ferrule.
 - Par. 4 - Boss end connections, positioned type, with back-up ring.
 - Par. 5 - Boss end connections, positioned type, without back-up ring.
 - Par. 6 - Boss end connections, non-positioned type.
 - Par. 7 - Bulkhead connections.
- 2.1 All parts with lockwire holes shall be lockwired per AS 567.

SAE Technical Board rules provide that: "All technical reports, including standards approved and practices recommended, are advisory only. Their use by anyone engaged in industry or trade is entirely voluntary. There is no agreement to adhere to any SAE standard or recommended practice, and no commitment to conform to or be guided by any technical report. In formulating and approving technical reports, the Board and its Committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the report are responsible for protecting themselves against liability for infringement of patents."

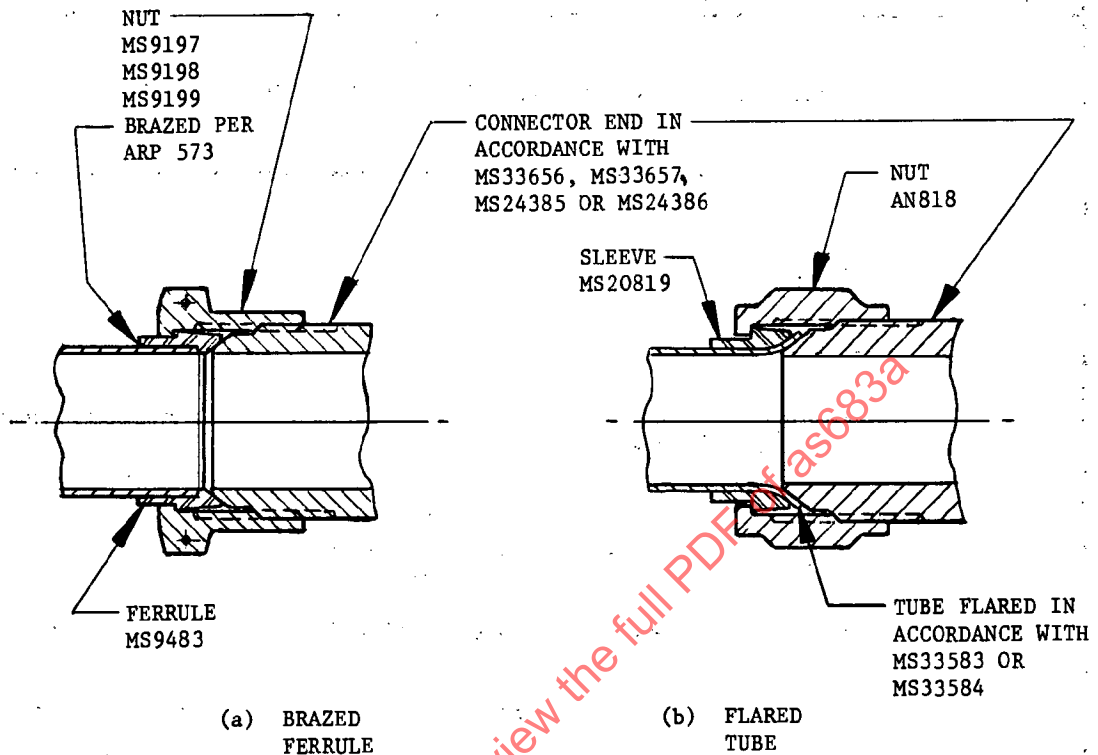
3. CONE END CONNECTIONS FOR FLARED TUBE AND BRAZED FERRULE:

FIGURE 1

3.1 Installation Procedures:3.1.1 Step One:

Coat threads at cone end of connector sparingly with lubricant as listed in Table 1.

3.1.2 Step Two:

Assemble the flared tube or brazed ferrule to the connector cone and tighten the nut in accordance with Table 2.

3.1.3 Leaking Joints: Do not attempt to correct any leakage or misalignment of the joint by overtightening. Instead, disassemble and check for nicks, burrs, dirt, etc. Reassemble, using new parts if necessary.

4. BOSS END CONNECTIONS, POSITIONED TYPE, WITH BACK-UP RING:

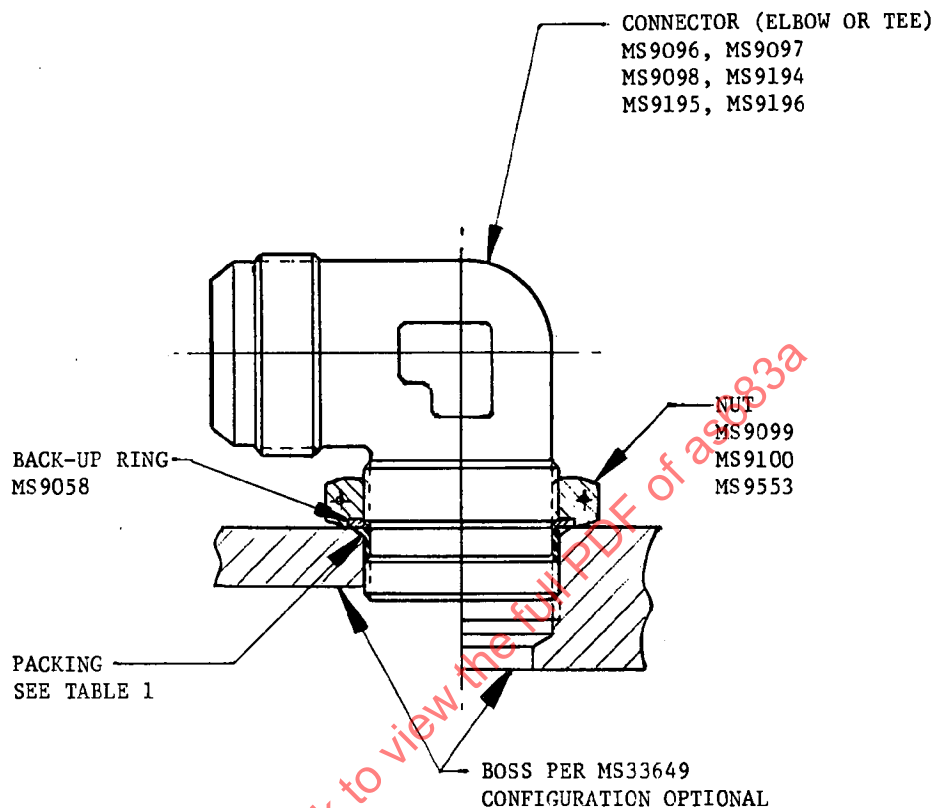


FIGURE 2

4.1 Installation Procedures:

4.1.1 Step One:

Coat male threads of connector, back-up ring and packing sparingly with lubricant as listed in Table 1. Work back-up ring into counterbore of the nut, and assemble packing in groove. Turn the nut down until the packing is firmly seated against the lower threaded portion of the connector.

4.1.2 Step Two:

Install the connector into the boss. At the same time keep the nut turning with the connector until the packing contacts the boss. A sudden increase in torque will determine the contact. Apply wrench to the nut to prevent its turning and then turn the connector 1.5 turns into the boss. Complete the assembly and positioning by turning into the boss not more than one additional turn.

4.1.3 Step Three:

Hold the connector in the required position and tighten the nut in accordance with Table 3.

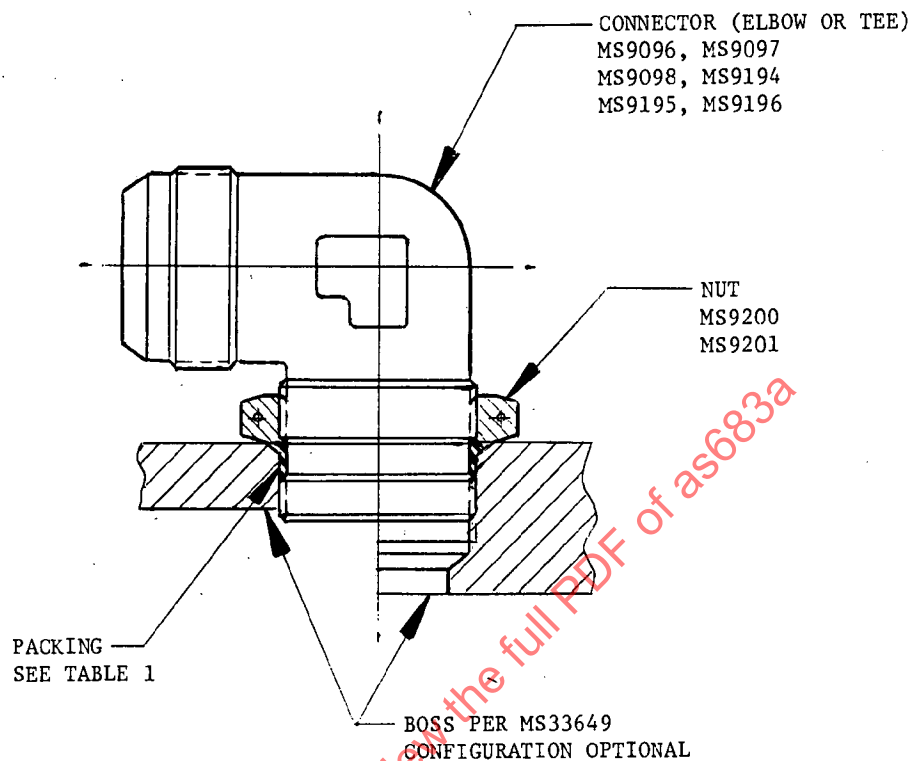
5. BOSS END CONNECTIONS, POSITIONED TYPE, WITHOUT BACK-UP RING:

FIGURE 3

5.1 Installation Procedures:5.1.1 Step One:

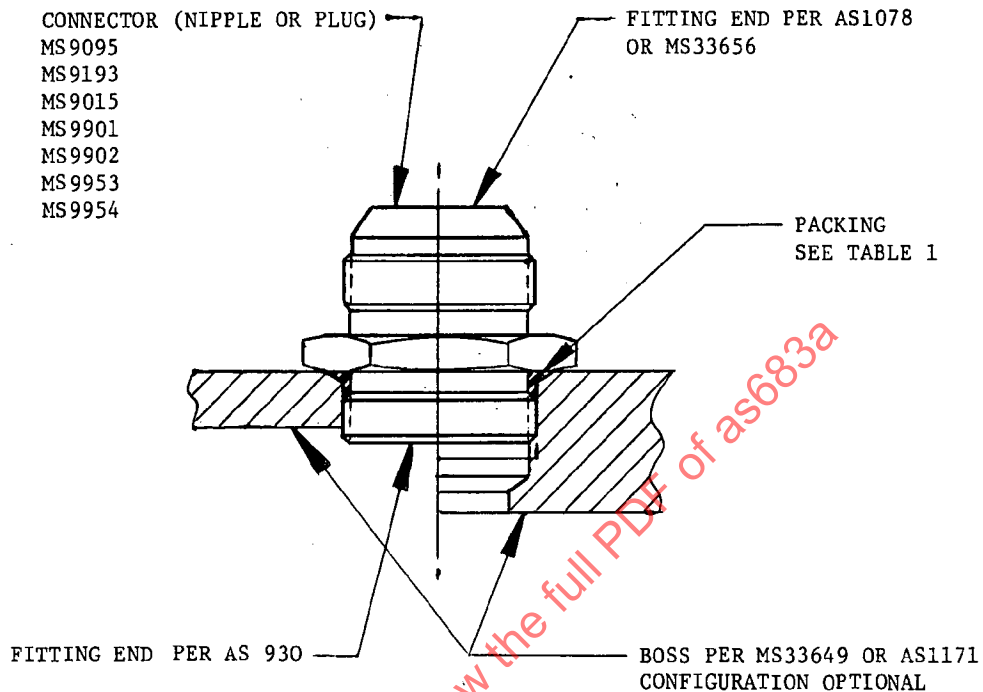
Coat male threads of connector and packing sparingly with lubricant as listed in Table 1 and assemble packing in groove. Turn the nut down until packing is firmly seated against lower threaded portion of the connector.

5.1.2 Step Two:

Install the connector into the boss. At the same time keep the nut turning with the connector until the packing contacts the boss. A sudden increase in torque will determine the contact. Apply wrench to the nut to prevent its turning, and then turn the connector 1.5 turns into the boss. Complete the assembly and positioning by turning into the boss not more than one additional turn.

5.1.3 Step Three:

Hold the connector in the required position and tighten the nut in accordance with Table 3.

6. BOSS END CONNECTIONS, NON-POSITIONED TYPE:6.1 Installation Procedures:6.1.1 Step One:

Coat male thread of connector and packing sparingly with lubricant as listed in Table 1, and assembly packing in groove.

6.1.2 Step Two:

Install the connector into the boss and tighten the connector in accordance with Table 3.

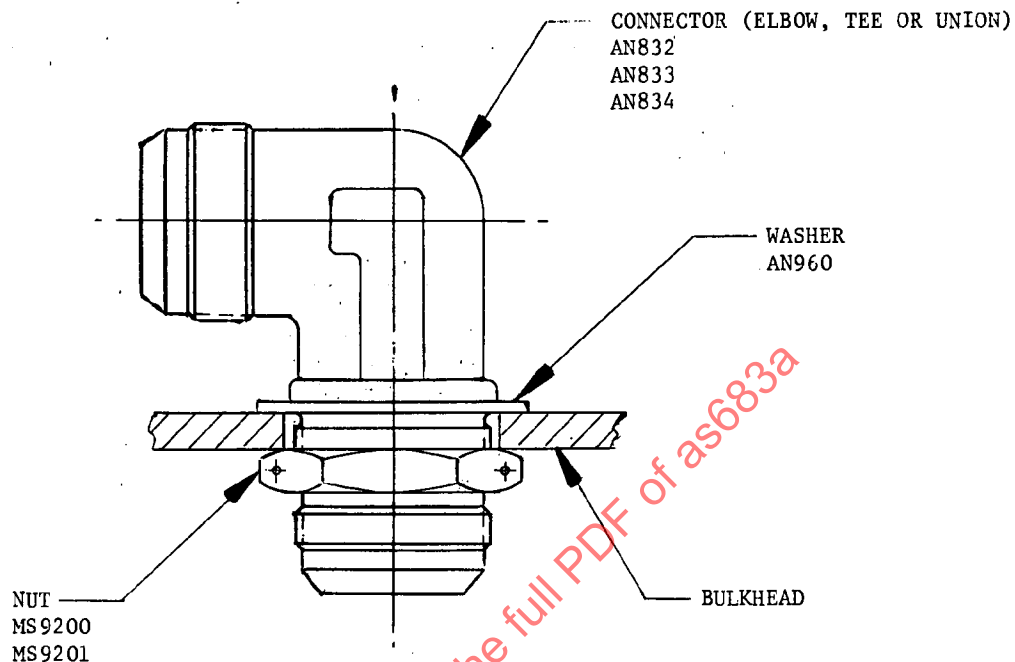
7. BULKHEAD CONNECTIONS:

FIGURE 5

7.1 Fittings:7.1.1 Style S (Shouldered):

- a. Size - 6 and smaller may be used through bulkheads up to .250 max. thickness.
- b. Size - 8 and larger may be used through bulkheads up to .375 max. thickness.

7.1.2 Style E (Hex):

- a. Unions (AN832) may be used through bulkheads up to .375 max. thickness.

7.2 Washer (AN960):7.2.1 Style S Connectors (Shouldered):

- a. Connector size - 6 and smaller may be used when bulkhead is .188 thick or less, provided that a .062 thick washer is also used.
- b. Connector size - 8 and larger may be used when bulkhead is .188 thick or less, provided that a .094 thick washer is also used.
- c. Washer is not required when bulkhead is thicker than .188, provided hole in bulkhead is equal to the hole in applicable washer.

7.2.2 Style E Connectors (Hex):

- a. Washer is not required provided hole in bulkhead is equal to the hole in applicable washer.

7.3 Installation Procedures:

7.3.1 Step One:

Coat threads on bulkhead end of connector sparingly with lubricant as listed in Table 1.

7.3.2 Step Two:

Hold the connector in the required position and tighten the nut in accordance with Table 4.

8. REFERENCE RING SEAL DATA:

- 8.1 Table 1 lists typical ring seal data applicable to the boss type connection installation

TABLE 1

REFERENCE PACKING APPLICATION		
APPLICATION	PACKING, PREFORMED	TYPICAL INSTALLATION LUBRICANT
HYDRAULIC	MS9355 MS9387 AS3084	Hydraulic Oil MIL-H-5606 or Petrolatum (VV-P-236)*
ENGINE OIL	MS9355 MS9387 MS9966 AS3084	Applicable Engine Oil
FUEL	MS9020 MS9387 MS9966 AS3084	Applicable Fuel or Petrolatum (VV-P-236)*
PNEUMATIC	MS9385	Lubricating Grease MIL-L-4343 or Petrolatum (VV-P-236)*
WATER	MS9385	Petrolatum (VV-P-236)
*Use in proximity to control valve not recommended. Petrolatum not compatible with MIL-L-7808.		

9. TORQUE VALUES:

- 9.1 The following tables list torque data applicable to the aforementioned connections. Reducer fluid fitting torques shall be in accordance with the applicable threaded end.

TABLE 2

TORQUE VALUES FOR TUBE FITTINGS						
NOM TUBE OD		THREAD T MIL-S-8879	TORQUE (A)		TORQUE (B)	
inch	(mm)		LBF-IN	N.m	LBF-IN	N.m
.125	3.18	.3125-24UNJF-3B	22-30	2.48-3.39	35-50	3.95-5.65
.188	4.78	.375-24UNJF-3B	30-45	3.39-5.08	75-100	8.47-12.98
.250	6.35	.4375-20UNJF-3B	40-60	4.52-6.78	115-150	12.99-16.95
.312	7.92	.500-20UNJF-3B	55-75	6.21-8.47	150-200	16.95-22.60
.375	9.52	.5625-18UNJF-3B	75-115	8.47-12.99	250-300	28.25-33.90
.438	11.13	.625-18UNJF-3B	95-140	10.73-15.82	300-350	33.90-39.54
.500	12.70	.750-16UNJF-3B	150-225	16.95-25.42	450-500	50.84-56.49
.562	14.27	.8125-16UNJF-3B	175-270	19.77-30.51	550-600	62.14-67.79
.625	15.88	.875-14UNJF-3B	200-315	22.60-35.59	650-700	73.44-79.09
.688	17.48	1.000-12UNJF-3B	260-405	29.38-45.76	800-900	90.39-101.7
.750	19.05	1.0625-12UNJ-3B	300-450	33.90-50.84	900-1000	101.7-113.0
.875	22.22	1.1875-12UNJ-3B	360-540	40.67-61.01	1050-1200	118.6-135.6
1.000	25.40	1.3125-12UNJ-3B	500-630	56.49-71.18	1200-1400	135.6-158.2
1.125	28.58	1.500-12UNJF-3B	540-745	61.01-86.17	1400-1700	158.2-192.1
1.250	31.75	1.625-12UNJ-3B	600-810	67.79-91.52	1500-1800	169.5-203.4
1.500	38.10	1.875-12UNJ-3B	700-1000	79.09-113.0	1900-2200	214.7-248.6
1.750	44.45	2.250-12UNJ-3B	800-1150	90.39-129.9	2200-2700	248.6-305.1
2.000	50.80	2.500-12UNJ-3B	850-1300	96.04-146.9	2500-3000	282.5-338.9

(A) These values apply when flared tube, connector or nut are aluminum.

(B) These values apply when flared tube or brazed ferrule and connector are steel.