



# AEROSPACE STANDARD

# AS 1301

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

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Revised

## ADAPTER – RING LOCKED TO FLARELESS TUBE, BOSS CONNECTION DESIGN, INSTALLATION AND REMOVAL OF

### 1. PURPOSE AND SCOPE

This Aerospace Standard provides the essential minimum design, installation and removal standard for AS1299 adapters and is applicable when specified on Engineering drawings, or in procurement documents.

### 2. GENERAL DESIGN INFORMATION

- 2.1 These flareless tube end boss adapters provide a semi-permanent male fitting primarily for use in 3000 PSI (20.7 MPa) fluid systems compatible with titanium.
- 2.2 Dimensioning in inches. Metric conversions in millimeters are in parentheses.  $\varnothing$  = Diameter.
- 2.3 Adapters per AS1299 installed per this document into bosses and ports per AS1300 shall have a stand-off per dimension "J" Figure 1 and Table I.

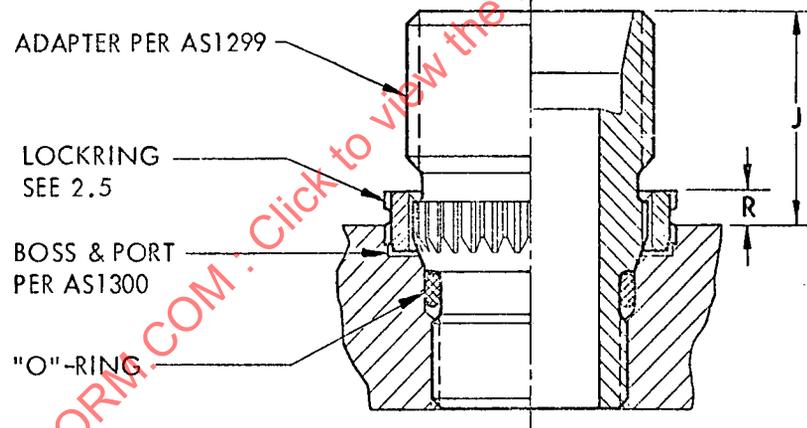


FIGURE 1 INSTALLED ADAPTER

TABLE I

ADAPTER NUMBER	"O"-RING SIZE SEE 2.4	J	R MAX
AS1299-02	AS 568-007	.475-.515 (12.1-13.1)	.124 (3.150)
AS1299-03	AS 568-008	.497-.537 (12.6-13.6)	.124 (3.150)
AS1299-04	AS 568-010	.558-.598 (14.2-15.2)	.124 (3.150)
AS1299-05	AS 568-011	.558-.598 (14.2-15.2)	.124 (3.150)
AS1299-06	AS 568-012	.579-.619 (14.7-15.7)	.130 (3.302)
AS1299-08	AS 568-014	.642-.682 (16.3-17.3)	.130 (3.302)
AS1299-10	AS 568-016	.703-.743 (17.9-18.9)	.130 (3.302)
AS1299-12	AS 568-116	.713-.753 (18.1-19.1)	.140 (3.556)
AS1299-16	AS 568-120	.713-.753 (18.1-19.1)	.140 (3.556)
AS1299-20	AS 568-123	.738-.778 (18.7-19.8)	.140 (3.556)

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- 2.4 "O"-Ring size per Table I must be used. The "O"-Ring compound shall be specified by the using design activity and shall be selected based on system fluid and temperature.
- 2.5 The lockring is driven into the mating port serrations after the adapter has been torqued. This prevents the adapter from rotating in the port during coupling nut assembly or disassembly and also eliminates the necessity of lock wiring the adapter. Only one wrench is required to install or remove the coupling nut.
- 2.6 Adapter removal is accomplished by lifting the lockring out of the port using a lockring puller per Table II

TABLE II

TUBE SIZE REF	ADAPTER NUMBER REF	BOSS PORT NUMBER REF	PROTECTOR BULLET PART NO. OR EQUIV.	COMBINATION WRENCH & DRIVE TOOL	INSTALLATION TORQUE INCH POUNDS (Nm)		LOCKRING PULLER TOOL NO.
					MIN	MAX	
.125 ( 3.175)	AS1299-02	AS1300-02	ORT 216	RF9802 DW	16 (1.81)	21 (2.37)	RF9802 LPD
.188 ( 4.775)	AS1299-03	AS1300-03	ORT 250	RF9803 DW	38 (4.29)	45 (5.08)	RF9803 LPD
.250 ( 6.350)	AS1299-04	AS1300-04	ORT 312	RF9804 DW	60 (6.78)	100 (11.30)	RF9804 LPD
.312 ( 7.925)	AS1299-05	AS1300-05	ORT 375	RF9805 DW	100 (11.30)	120 (13.56)	RF9805 LPD
.375 ( 9.525)	AS1299-06	AS1300-06	ORT 437	RF9806 DW	180 (20.34)	245 (27.68)	RF9806 LPD
.500 (12.700)	AS1299-08	AS1300-08	ORT 562	RF9808 DW	430 (48.58)	510 (57.62)	RF9808 LPD
.625 (15.875)	AS1299-10	AS1300-10	ORT 687	RF9810 DW	600 (67.79)	680 (76.83)	RF9810 LPD
.750 (19.050)	AS1299-12	AS1300-12	ORT 812	RF9812 DW	855 (96.60)	945 (106.77)	RF9812 LPD
1.000 (25.400)	AS1299-16	AS1300-16	ORT 1125	RF9816 DW	1140 (128.80)	1260(142.35)	RF9816 LPD
1.250 (31.750)	AS1299-20	AS1300-20	ORT 1312	RF9820 DW	1520 (171.73)	1680 (189.81)	RF9820 LPD

### 3. DESIGN REQUIREMENTS

#### 3.1 Minimum data to be specified on Engineering drawing or Specification

- 3.1.1 Boss diameter to be at least the minimum specified in AS1300.
- 3.1.2 Location of port.
- 3.1.3 Specific port size per AS1300. If tap drill depth is not thru, then specify control dimensions.
- 3.1.4 Specific adapter size per AS1299.
- 3.1.5 Specific "O"-Ring size and compound (See 2.4).
- 3.1.6 Install adapter per AS1301.
- 3.1.7 Corrosion protection is specified in 4.2.4. If materials or fluids require primer different from zinc chromate primer or if an additional sealant is required, so specify.
- 3.1.8 Pressure testing of individual units is specified in 5.1. Testing other than that shown shall be specified.

3.1.9 The boss material for a 3000 PSI (20.7 M Pa) system must have a minimum shear strength (at maximum system temperature) per Table III to resist the 12000 PSI (82.7 M Pa) burst pressure (based on thread minimum shear engagement area shown). Also see note 5 of AS1300 when selecting boss material.

TABLE III

AS1299 ADAPTER DASH NUMBER REF	A THREAD MINIMUM SHEAR ENGAGEMENT AREA IN. <sup>2</sup> (mm <sup>2</sup> ) <u>1/</u>	B PORT "D" MAX PER AS1300 REF IN.(mm)	C AXIAL LOAD ON FITTING DEVELOPED BY 12000 PSI (82.7 MPa) HYD PRESSURE POUNDS (N) REF <u>2/</u>	D BOSS MATERIAL MIN F <sub>SU</sub> PSI (M Pa) REQUIRED AT SYSTEM MAX TEMP TO RESIST AXIAL LOAD "C" <u>3/</u>
-02	.0417 (26.9)	.256 ( 6.50)	618 ( 2749)	14821 (102.2)
-03	.0802 (51.7)	.288 ( 7.32)	782 ( 3479)	9751 ( 67.2)
-04	.0989 (63.8)	.341 ( 8.66)	1096 ( 4875)	11082 ( 76.4)
-05	.1406 (90.7)	.403 (10.24)	1531 ( 6810)	10889 ( 75.1)
-06	.1734 (111.9)	.466 (11.84)	2047 ( 9106)	11805 ( 81.4)
-08	.2610 (168.4)	.584 (14.83)	3214 (14297)	12315 ( 84.9)
-10	.3807 (245.6)	.727 (18.47)	4981 (22157)	13084 ( 90.2)
-12	.4550 (293.5)	.901 (22.89)	7651 (34033)	16816 (115.9)
-16	.7312 (471.7)	1.164 (29.57)	12770 (56804)	17465 (120.4)
-20	.8559 (552.2)	1.389 (35.28)	18183 (80882)	21245 (146.5)

1/ Minimum Shear Engagement Area shown is the assembled dimensional value for the overall engaged area of mating boss threads (Boss threads full depth of adapter). It does not represent a dimension of either of the members in an unassembled condition.

2/ "C" = Area x Burst Pressure = .7854 x B<sup>2</sup> x Burst Pressure

3/ "D" = C ÷ A

4. INSTALLATION OF ADAPTER AS1299 INTO BOSS PER AS1300.

4.1 "O"-Ring installation

4.1.1 Place the protector bullet (per Table II) over the small thread of the fitting. Submerge the adapter, bullet and "O"-Ring in the fluid to be used in the working system, or a lubricant compatible with the system fluid and all components. Slide the "O"-Ring over the bullet and onto the fitting. Be sure that the "O"-Ring is not twisted and is properly seated in the groove of the fitting. See Figure 2.

4.1.2 Remove the protective bullet.

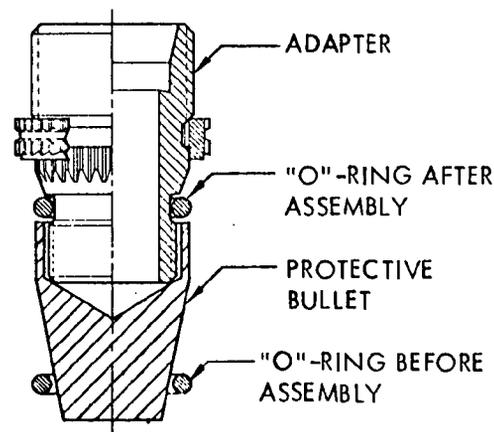


FIGURE 2

#### 4.2 Install adapter assembly into Boss Port

- 4.2.1 Lubricate the internal surfaces of the boss port and the entire adapter assembly using the same fluid or lubricant as specified in 4.1.1. Scratches, dings or rough spots are not allowed in "O"-Ring contact area on the adapter or in the port.
- 4.2.2 Insert the smaller thread of the adapter into boss port by hand using a clockwise rotation until the adapter is seated. To avoid possible "O"-Ring damage, the adapter should not be rotated in a counterclockwise direction.
- 4.2.3. Using the applicable combination wrench and drive tool in Table II, engage the serrations of the tool with those on the external serrations of the adapter locking per Figure 3. Place a torque wrench of the proper size over the hex of the wrench and apply a torque equal to the minimum value specified in Table II. Note the relationship of the serrations of the locking with respect to the prebroached serrations in the port. If they match, proceed to 4.2.4. If the serrations do not match the prebroached serrations in the port, continue to slowly torque the adapter toward the maximum value allowed in Table II until the serrations of the locking match the boss serrations. This will normally take between 3° and 8° of turning and the maximum value need not be reached if the serrations align themselves prior to that value. Do not exceed maximum torque values.
- 4.2.4 Apply enough zinc chromate primer (MIL-P-8585) with a brush or small syringe to the counterbore area of the boss and below the adapter locking so primer will be extruded out between external serrations of the locking and the serrations in the port when locking is installed. Note: Using design activity may specify another primer in place of, or in addition to, zinc chromate (See 3.1.7).

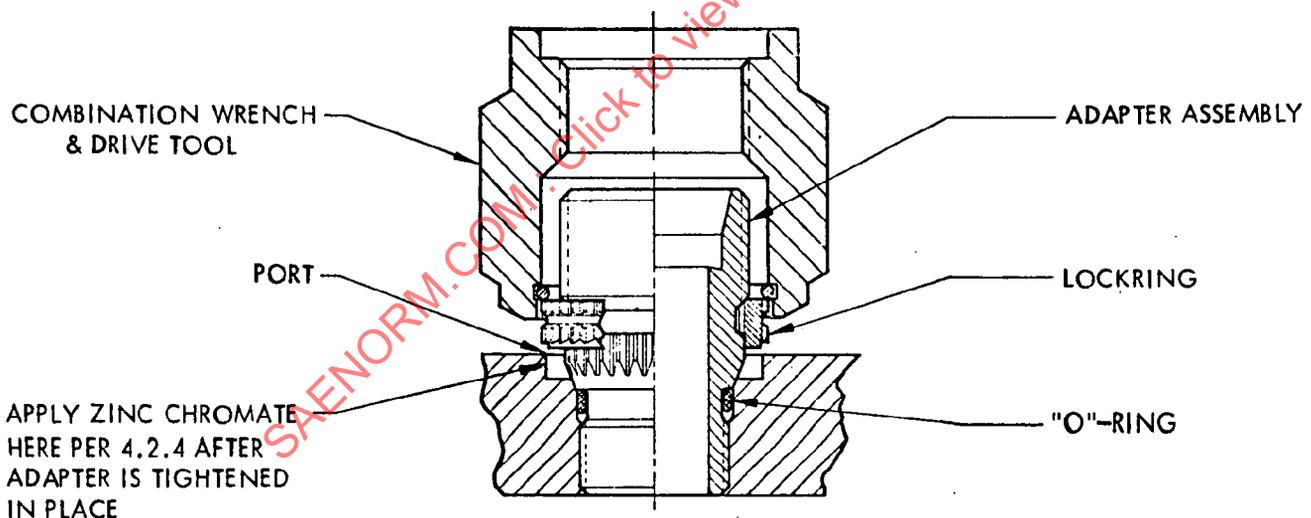


FIGURE 3  
TORQUING ADAPTER ASSEMBLY

- 4.2.5 While the zinc chromate (or other primer) applied per 4.2.4 is still wet, install the locking by rotating the threaded end of the combination wrench and drive tool clockwise onto the adapter assembly until it touches the locking. Using an open end or socket wrench on the tool, turn the tool in a clockwise direction until it bottoms on the boss surface as shown in Figure 4. Visually observe that the tool has bottomed.
- Caution: Any sudden increase in torque prior to bottoming may indicate that the locking serrations and the port serrations are not aligned. If this occurs, remove wrench and drive tool by turning counterclockwise. Lift the locking per paragraph 6.2. Continue to tighten fitting clockwise per paragraph 4.2.3 until serrations in boss and the external serrations on the locking are aligned. Again attempt to install locking. Remove excess primer on surface of boss and locking.