SAE The Engineering Society For Advancing Mobility Land Sea Air and Space®

400 COMMONWEALTH DRIVE, WARRENDALE, PA 15096

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AEROSPACE STANDARD

AS1301

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REV. A

ADAPTER - PORT CONNECTION, RING LOCKED DESIGN, INSTALLATION AND REMOVAL OF

1. PURPOSE AND SCOPE:

This SAE Aerospace Standard provides the essential minimum design, installation and removal standard for AS1299, AS1985, AS1986 and AS4099 adapters and is applicable when specified on engineering drawings, or in procurement documents.

2. GENERAL DESIGN INFORMATION:

2.1 These adapters provide a semi-permanent male fitting primarily for use in 3000 lbf/in^2 (for AS1299 and AS4099) and 4000 lbf/in^2 (for AS1985 and AS1986) fluid systems compatible with titanium.

2.2 Adapters per AS1299, AS1985, AS1986 and AS4099 installed per this document into ports per AS1300 shall have a stand-off per dimension "P" Fig. 1 and Table I.

2.3 O-ring size per Table I and per AS568 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.

2.4 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 and disassembly and also eliminates the necessity of lock wiring the adapter. Only one wrench is required to install or remove the coupling nut.

2.5 Adapter removal is accomplished by lifting the lockring out of the port using a removal tool per Table II.

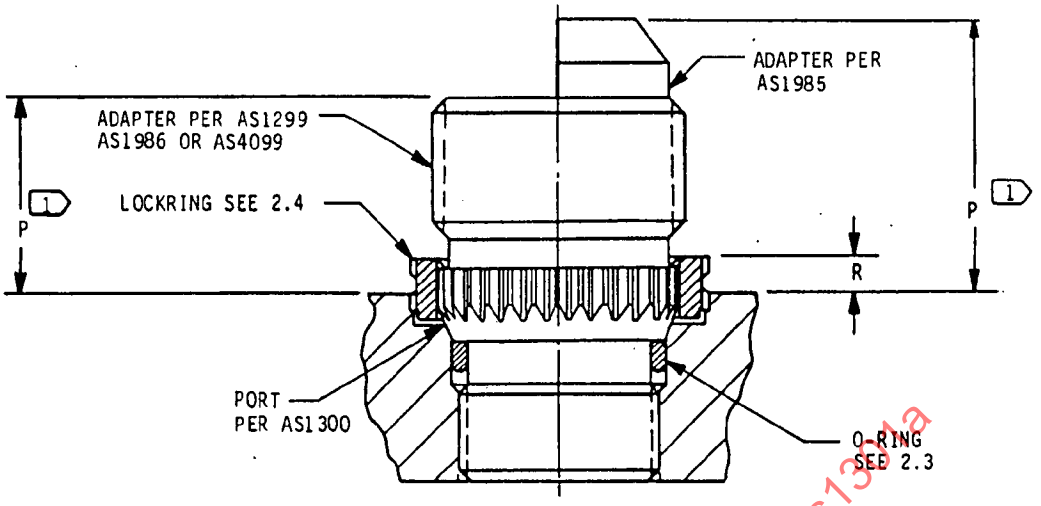

FIGURE 1 - Installed Adapter

TABLE I

AS1300 PORT DASH NUMBER	ADAPTER DASH NUMBER				O-RING SIZE SEE 2.3	P±.020 (1)			R
	AS1299	AS1985	AS1986	AS4099		AS1299	AS1985	AS1986	AS4099	MAX
02	02	02	02	02	AS568-007	.495	.577	.358	.509	.124
03	03	03	03	03	AS568-008	.517	.608	.389	.556	.124
04	04	04	04	04	AS568-010	.578	.679	.431	.587	.124
05	05	05	05	05	AS568-011	.578	.679	.431	.587	.124
06	06	06	06	06	AS568-012	.599	.691	.457	.609	.130
08	08	08	08	08	AS568-014	.662	.792	.470	.702	.130
10	10	10	10	10	AS568-016	.723	.893	.534	.765	.130
12	12	12	12	12	AS568-116	.733	1.009	.584	.838	.140
14	–	–	14	–	AS568-118	–	–	.602	–	.140
16	16	16	16	16	AS568-120	.733	1.056	.632	.838	.140
20	20	20	20	20	AS568-123	.758	1.103	.629	.838	.140
24	24	24	24	24	AS568-128	.768	1.228	.714	.838	.140
32	32	32	–	32	AS568-137	.847	1.478	–	.838	.140

(1) "P" dimension is for design purpose only and represents a final stand-off dimension. Do not use "P" as an installation dimension.

TABLE II

ADAPTER DASH NUMBER	PORTING TOOL NUMBER	BASIC BROACH TOOL NUMBER	O-RING TOOL NUMBER	COMBINATION WRENCH AND DRIVE TOOL		INSTALLATION TORQUE lbf·in		REMOVAL TOOL
				AS1299, AS1985 AND AS4099	AS1986	AS1299, AS1985 AND AS4099	AS1986	
02	RPT02	RFOPB5002	ORT216	RF9802DW	RF5002DW	16-21	15-20	RF02LPDE
03	RPT03	RFOPB5003	ORT250	RF9803DW	RF5003DW	38-45	29-36	RF03LPDE
04	RPT04	RFOPB5004	ORT312	RF9804DW	RF5004DW	60-100	50-65	RF04LPDE
05	RPT05	RFOPB5005	ORT375	RF9805DW	RF5005DW	100-120	100-125	RF05LPDE
06	RPT06	RFOPB5006	ORT437	RF9806DW	RF5006DW	180-245	140-200	RF06LPDE
08	RPT08	RFOPB5008	ORT562	RF9808DW	RF5008DW	430-515	270-375	RF08LPDE
10	RPT10	RFOPB5010	ORT687	RF9810DW	RF5010DW	600-680	620-700	RF10LPDE
12	RPT12	RFOPB5012	ORT812	RF9812DW	RF5012DW	855-945	855-945	RF12LPDE
14	RPT14	RFOPB5014	ORT937	–	RF5014DW	–	995-1105	RF14LPDE
16	RPT16	RFOPB5016	ORT1125	RF9816DW	RF5016DW	1140-1260	1140-1260	RF16LPDE
20	RPT20	RFOPB5020	ORT1312	RF9820DW	RF5020TDW	1520-1680	1520-1680	RF20LPDE
24	RPT24	RFOPB5024	ORT1625	RF9824DW	RF5024TDW	1900-2100	1900-2100	RF24LPDE
32	RPT32	RFOPB5032	ORT2125	RF9832DW	–	2660-2940	–	RF32LPDE

NOTE : These adapters require special tooling for proper installation. Tooling is available from Rosan Products, Santa Ana, CA - FSCM83324.

3. DESIGN REQUIREMENTS:

3.1 Minimum data to be specified on engineering drawing or specification.

3.1.1 Port 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, AS1985, AS1986 or AS4099.

3.1.5 Specific o-ring size and compound (see 2.3).

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 port material for a 3000 lbf/in^2 or 4000 lbf/in^2 system must have a minimum shear strength (at maximum system temperature) per Table III to resist the 12 000 lbf/in^2 or 16 000 lbf/in^2 burst pressure (based on thread minimum shear engagement area shown).

TABLE III

PORT NUMBER	K (2)	L	M (3)		N (4)	
	TOTAL THREAD MINIMUM SHEAR ENGAGEMENT AREA IN^2	PORT "D" MAX PER AS1300 REF IN	AXIAL LOAD ON ADAPTER: DEVELOPED BY 12000 PSI BURST PRESSURE lbf	AXIAL LOAD ON ADAPTER: DEVELOPED BY 16000 PSI BURST PRESSURE lbf	BOSS MATERIAL MINIMUM Fsu REQUIRED AT MAXIMUM SYSTEM TEMPERATURE TO RESIST AXIAL LOAD (PSI): FOR 12000 PSI	BOSS MATERIAL MINIMUM Fsu REQUIRED AT MAXIMUM SYSTEM TEMPERATURE TO RESIST AXIAL LOAD (PSI): FOR 16000 PSI
AS1300-02	.0417	.256	618	824	14821	19760
AS1300-03	.0802	.288	782	1042	9751	13005
AS1300-04	.0989	.341	1096	1461	11082	14773
AS1300-05	.1406	.403	1531	2041	10889	14517
AS1300-06	.1734	.466	2047	2729	11805	15739
AS1300-08	.2610	.584	3214	4286	12315	16422
AS1300-10	.3807	.727	4981	6642	13084	17447
AS1300-12	.4550	.901	7651	10201	16816	22420
AS1300-14	.6132	1.032	10037	13384	16369	21827
AS1300-16	.7312	1.164	12770	17026	17465	23285
AS1300-20	.8559	1.389	18183	24245	21245	28327
AS1300-24	1.2328	1.666	26159	34879	21220	28293
AS1300-32	2.1634	2.204	45782	61043	21162	28216

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

(3) "M" = Area x Burst Pressure = $\pi/4(L^2)$(Burst Pressure)

(4) "N" = M ÷ K

4. INSTALLATION OF ADAPTER AS1299, AS1985, AS1986 OR AS4099 INTO PORT PER AS1300:

4.1 O-ring installation.

4.1.1 Place the o-ring tool (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 Fig. 2.

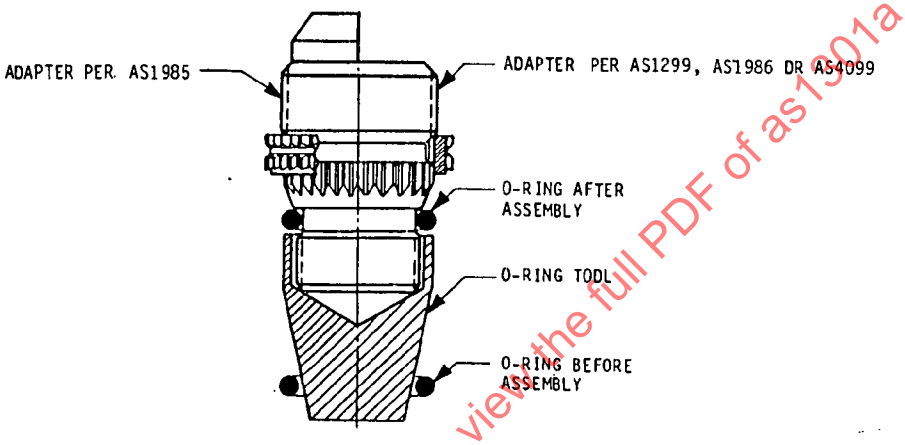

FIGURE 2

4.1.2 Remove the o-ring tool.

4.2 Install adapter assembly into port.

4.2.1 Lubricate the internal surfaces of the 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 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 lockring per Fig. 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 lockring 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 lockring match the port serrations. This will normally take between 3 and 8 deg 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 (TT-P-1757) with a brush or small syringe to the counterbore area of the port and below the adapter lockring so primer will be extruded out between external serrations of the lockring and the serrations in the port when lockring is installed.
Note: Using design activity may specify another primer in place of, or in addition to, zinc chromate (see 3.1.7).

4.2.5 While the zinc chromate (or other primer) applied per 4.2.4 is still wet, install the lockring by rotating the threaded end of the combination wrench and drive tool clockwise onto the adapter assembly until it touches the lockring. Using an open end or socket wrench on the tool, turn the tool in a clockwise direction until it bottoms on the port surface as shown in Fig. 4. Visually observe that the tool has bottomed.

Caution: Any sudden increase in torque prior to bottoming may indicate that the lockring serrations and the port serrations are not aligned. If this occurs, remove wrench and drive tool by turning counterclockwise. Lift the lockring per 6.2. Tighten fitting clockwise per 4.2.3 until serrations in port and the external serrations on the lockring are aligned. Again attempt to install lockring. Remove excess primer on surface of port and lockring.

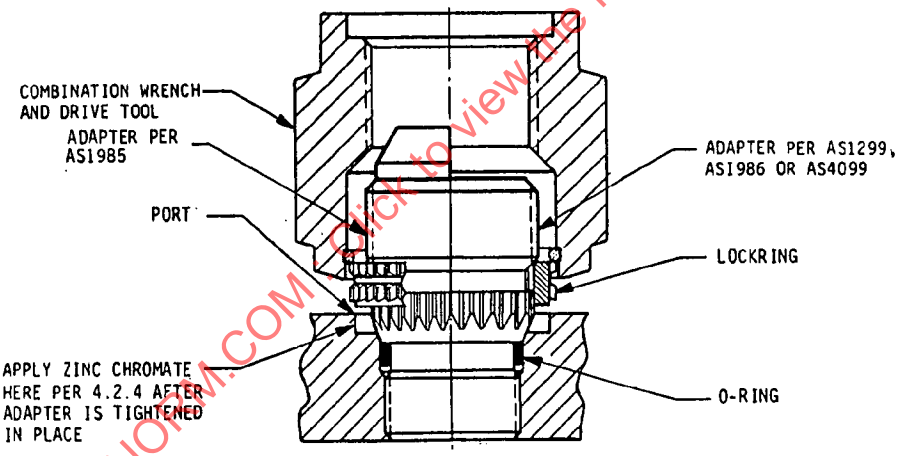

FIGURE 3 -Torquing Adapter Assembly

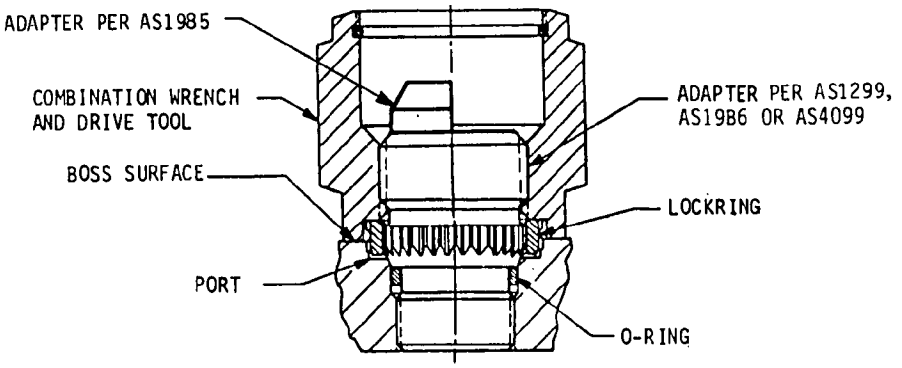

FIGURE 4 - Lockring Installation