AEROSPACE STANDARD

AS1959™	REV. A

Issued 1988-01
Reaffirmed 2004-07
Stabilized 2023-07

Superseding AS1959

Insert - Ring Locked, Fluid Connection Port Design, Installation and Removal of

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.

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1. PURPOSE AND SCOPE:

This aerospace standard provides the essential design, installation and removal standard for AS 3078 inserts and AS 3077 lockrings and is applicable when specified on engineering drawings, or in procurement documents.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications and Aerospace Standards shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications:

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

2.1.1 Aerospace Standards:

AS 568	Aerospace Size Standard for O-Rings
AS 1958	Port-Fluid Connection, Ring Locked Insert, Standard Dimensions for
AS 3077	Lockring - Fluid Connection Boss Insert, Internal Straight Thread
AS 3078	Insert - Fluid Connection Boss, Internal Straight Thread

2.2 U.S. Government Publications:

Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.2.1 Federal Specifications:

TT-P-1757	Primer Coating, Zinc Chromate, Low-Moisture-Sensitivity

3. GENERAL DESIGN INFORMATION:

3.1 These inserts and lockrings provide a semi-permanent hydraulic port primarily for use in 3000 psi fluid systems.

3.2 Inserts as in AS 3078 and lockrings as in AS 3077 installed per this document into ports as in AS 1958 shall have for design purposes a stand-off per dimension "S" in Table I.

3.3 O-ring size as in Table I and AS 568 must be used. The O-ring compound shall be specified by the using activity and shall be selected based on system fluid and temperature.

3.4 The lockring shall be preassembled to the insert and driven into the mating port after the insert has been torqued to the values in Table I. This prevents the insert from rotating in the port during assembly and disassembly of a fitting and also eliminates the necessity of lock wiring the insert.

3.5 Insert removal is accomplished by lifting the lockring out of the port using a removal tool.

4. DESIGN REQUIREMENTS:

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

4.1.1 Location of port.

4.1.2 Specify port size and dimensions per AS 1958.

4.1.3 Specify insert size per AS 3078.

4.1.4 Specify lockring size per AS 3077.

4.1.5 Specify O-ring size and compound (see 3.3).

4.1.6 Install insert per AS 1959.

4.1.7 Corrosion protection is specified in 5.3.6. If materials or fluids require primer different from zinc chromate primer or if an additional sealant is required, it shall be specified.

4.1.8 Leakage testing is specified in 6.1. When testing other than that shown, it shall be specified.

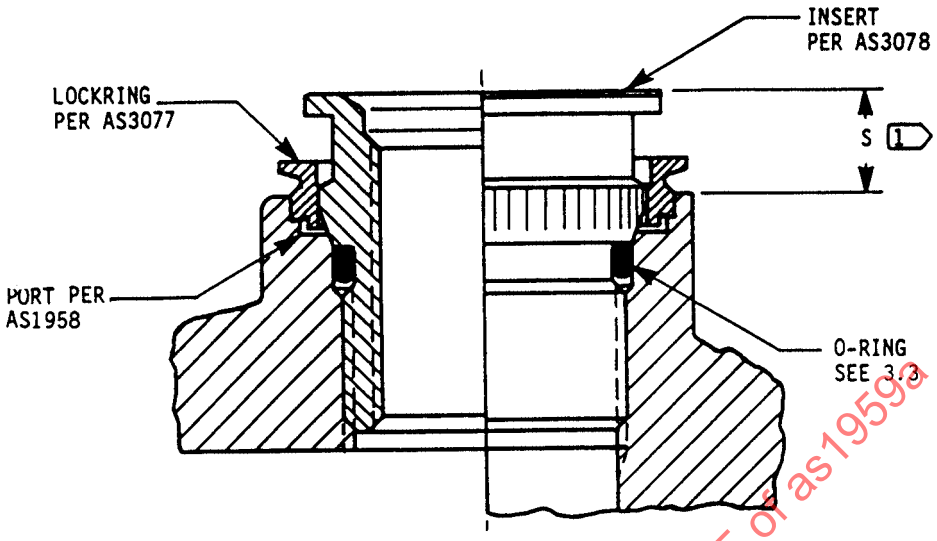

FIGURE 1 - Installed Insert and Lockring

TABLE I

PORT NUMBER	INSERT NUMBER	LOCKRING NUMBER	O-RING SIZE SEE 3.3	S 1 +.000 -.045	INSTALLATION TORQUE 2 lbf·in
AS1958-02	AS3078-02	AS3077-02	AS568-012	.255	40-50
AS1958-03	AS3078-03	AS3077-03	AS568-013	.255	65-84
AS1958-04	AS3078-04	AS3077-04	AS568-014	.255	80-105
AS1958-05	AS3078-05	AS3077-05	AS568-015	.255	120-150
AS1958-06	AS3078-06	AS3077-06	AS568-016	.255	145-185
AS1958-08	AS3078-08	AS3077-08	AS568-019	.255	350-400
AS1958-10	AS3078-10	AS3077-10	AS568-021	.265	500-600
AS1958-12	AS3078-12	AS3077-12	AS568-024	.280	700-800
AS1958-16	AS3078-16	AS3077-16	AS568-028	.280	1200-1300
AS1958-20	AS3078-20	AS3077-20	AS568-132	.280	1800-2000

1 "S" dimension is for design purpose only.

2 These inserts require special tooling for proper installation. Tooling may be obtained from insert supplier.

5. INSTALLATION OF INSERT AS 3078 AND LOCKRING AS 3077 INTO PORT AS 1958:

5.1 Lockring installation.

5.1.1 Slide the lockring over the insert thread and engage into insert serrations such that the pilot of the lockring faces the thread (see Fig. 2).

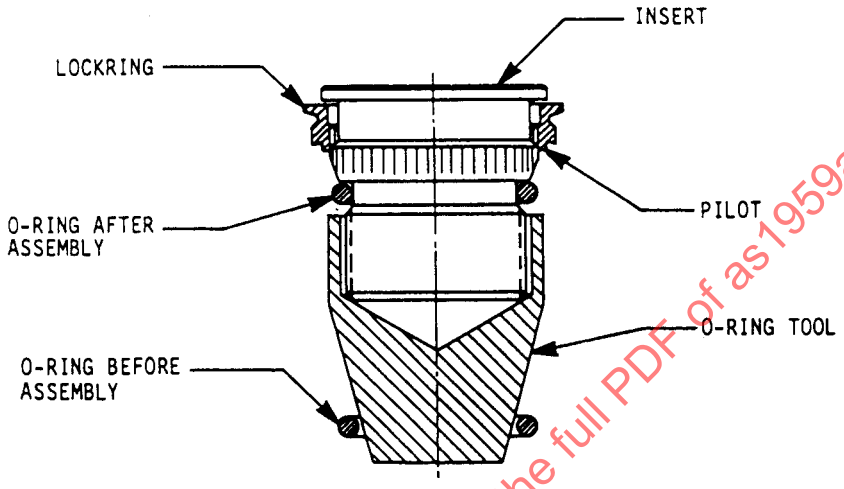

FIGURE 2

5.2 O-ring installation.

5.2.1 Submerge the insert, the lockring, the O-ring and the O-ring tool in the fluid to be used in the working system, or a lubricant compatible with the system fluid and all components.

5.2.2 Place the O-ring tool over the thread of the insert.

5.2.3 Slide the O-ring over the O-ring tool and onto the insert. Be sure that the O-ring is not twisted and is properly seated in the thread undercut of the insert (see Fig. 2).

5.2.4 Remove the O-ring tool.

5.3 Installation of insert assembly into port.

5.3.1 Lubricate the internal surfaces of the port using the same fluid or lubricant as specified in 5.2.1. Scratches or rough spots are not allowed in O-ring contact area on the insert or in the port.

5.3.2 Screw the drive wrench into the thread of the insert until the plastic collar touches the surface of the insert (see Fig. 3).

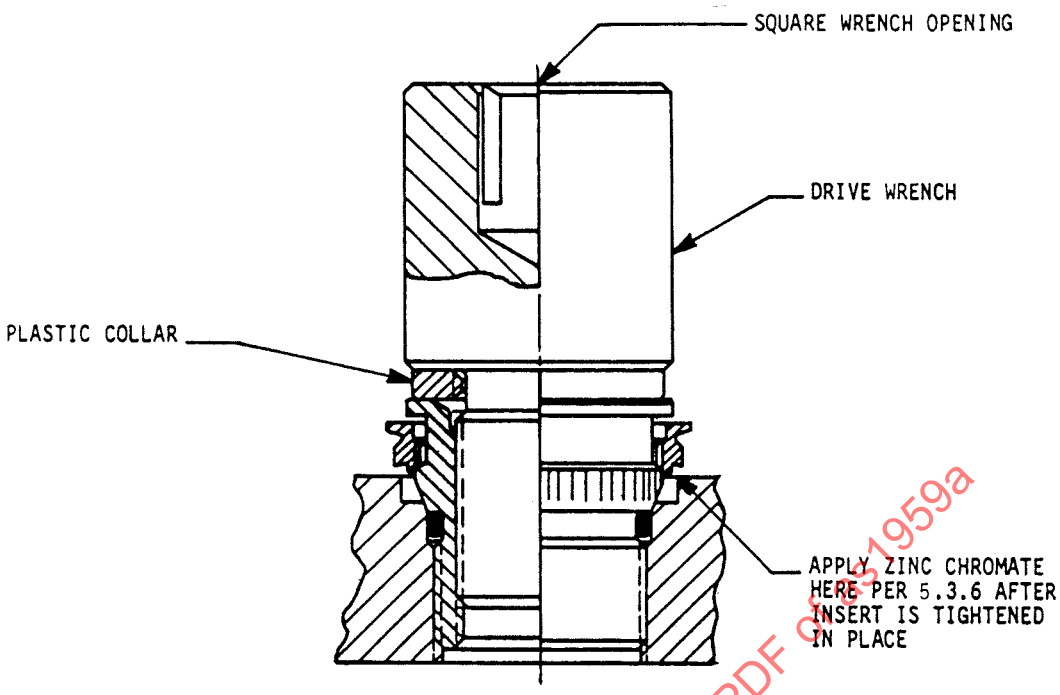

FIGURE 3

5.3.3 Screw the insert assembly into the port by hand using a clockwise rotation until the assembly is firmly set (see Fig. 3). To avoid possible O-ring damage, the insert should not be rotated in a counterclockwise direction. If this has been done, replace the O-ring.

5.3.4 Place a torque wrench of the proper size into the square of the drive wrench and apply a torque equal to the value specified in Table I.

5.3.5 Remove the torque wrench.

5.3.6 Apply enough zinc chromate primer (TT-P-1757) with a brush or small syringe to the counterbore area of the port by lifting the lockring slightly by hand so primer will be extruded out between external serrations of the lockring and the port counterbore when lockring is installed.

Note: Design activity may specify another primer in place of, or in addition to, zinc chromate (see 4.1.7).

5.3.7 While the zinc chromate (or other primer) applied per 5.3.6 is still wet, place the lockring drive tool over the drive wrench and let it rest on the lockring top surface. Apply a sufficient downward force to drive lockring into the surface of port counterbore until the face of the lockring drive tool touches the port surface (see Fig. 4).

Note: Depending upon the component configuration, it may be necessary to support the port in order not to deform the internal configuration of the component.

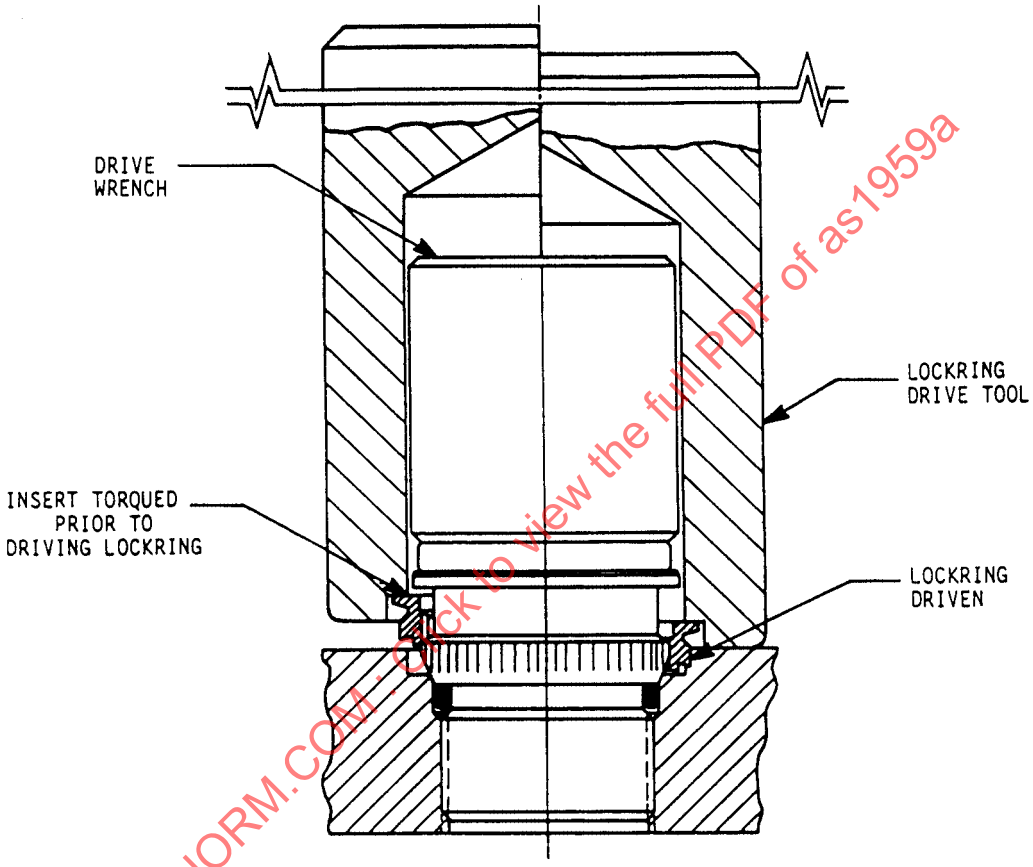

FIGURE 4

5.3.8 Remove the tools and excess zinc chromate (or other primer) that has formed on the surface of port and lockring.

6. LEAKAGE TESTING:

6.1 A leakage test of unit may be conducted at this point. Place a pressure plug in the insert. Pressurize the unit from another location on the unit to 1.5 times the operating pressure for three minutes. There shall be zero leakage.

Note: The design activity may require testing other than shown (see 4.1.8).

7. REMOVAL OF INSERT:

7.1 If an additional sealant has been used to cover lockring, carefully remove sealant to expose lockring.

7.2 Lockring Retraction:

7.2.1 Select the proper size lockring removal tool.

7.2.2 Spread the puller halves apart by retracting the sleeve from the tool until the pin bottoms in the groove of the sleeve (see Fig. 5). Holding the puller halves apart, place tool over protruding insert so the nylon pad rests on the top surface of the insert. Release the puller halves and locate in the groove of the lockring. Adjustment up or down is achieved by rotating the bolt head. Slide the sleeve over the puller halves and check for proper engagement of the puller halves in the lockring groove.

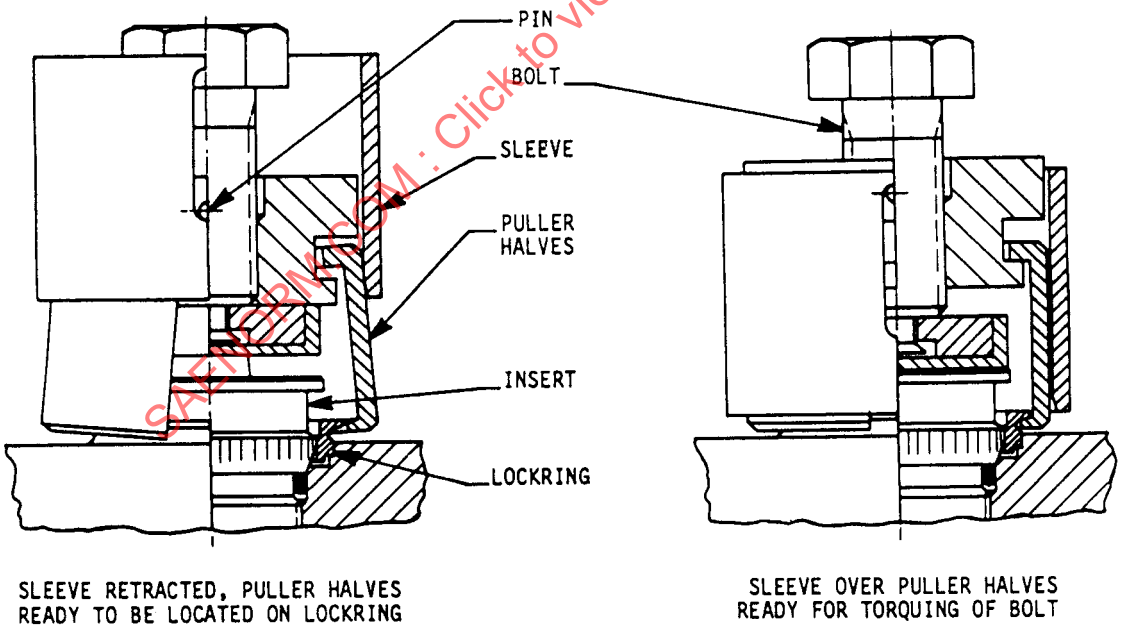

FIGURE 5