



SHUR-LOK CORPORATION
TECHNICAL SALES BULLETIN

TSB 0026

**TITLE: SLAS1959 – PORT PREPARATION, INSTALLATION AND
REMOVAL OF FLUID BOSS INSERT**

Rev: N/C

Page 1 of 10

1. SCOPE

1.1. This provides the minimum design, port preparation, installation and removal requirements for SLAS3078 insert and SLAS3077 lockring. These are applicable when specified on engineering drawings. These instructions are not intended to supersede or supplement any specific instructions that are provided by the Design Activity or responsible customer unless indicated as such.

2. GENERAL DESIGN INFORMATION

2.1. These inserts provide a semi-permanent fluid port for use in fluid systems per table 1:

TABLE 1 - PRESSURE SYSTEMS

SYSTEM WORKING PRESSURE				
Shur-lok Part Number Series	Product Description	Operating psi	Burst psi	Sizes
SLAS3078	Fluid Boss Insert	3,000	12,000	All

2.2. Inserts per SLAS3078 installed per this document into ports per SLAS1958 shall have a stand-off per dimension “P” in figure 1 and table 2.

2.3. O-ring size per table 2 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 port after the insert has been torqued. This prevents the insert from rotating in the port during the mating component assembly and disassembly.

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



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TECHNICAL SALES BULLETIN

TSB 0026

TITLE: SLAS1959 – PORT PREPARATION, INSTALLATION AND
 REMOVAL OF FLUID BOSS INSERT

Rev: N/C

Page 2 of 10

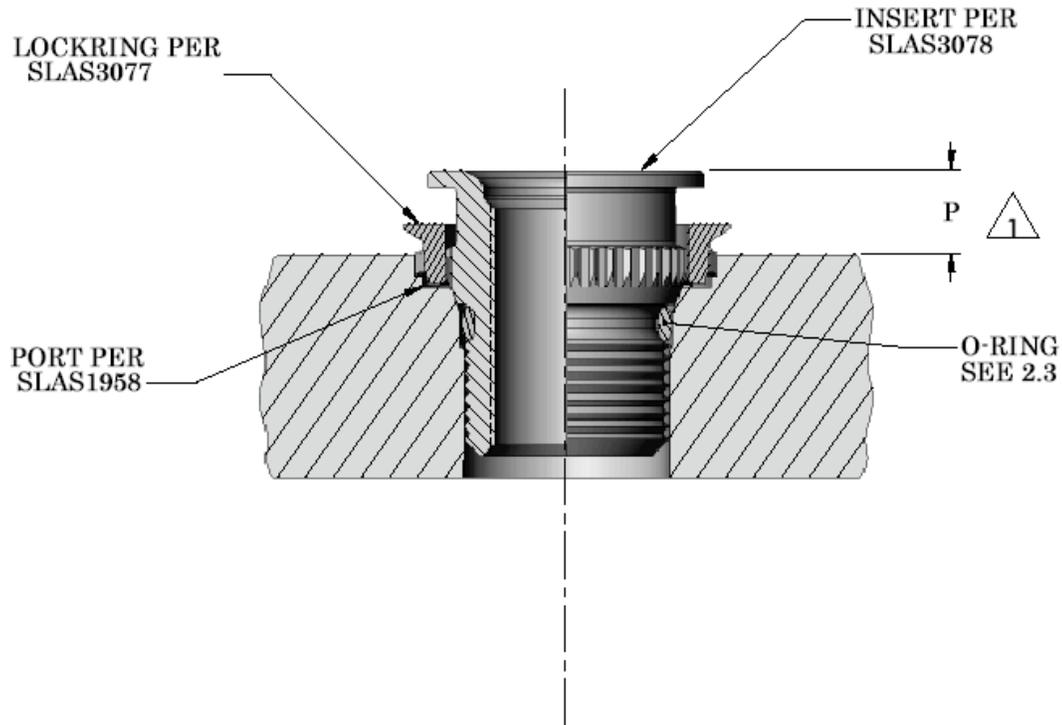


FIGURE 1 - INSTALLED INSERT AND LOCKRING

△ “P” dimension is for design purpose only.

TABLE 2

PORT NUMBER	INSERT NUMBER	LOCKRING NUMBER	O-Ring Size	△ P +0.000 -0.045	INSTALLATION TORQUE lbf - in
SLAS1958-02	SLAS3078-02	SLAS3077-02	AS568-012	0.255	40-50
SLAS1958-03	SLAS3078-03	SLAS3077-03	AS568-013	0.255	65-84
SLAS1958-04	SLAS3078-04	SLAS3077-04	AS568-014	0.255	80-105
SLAS1958-05	SLAS3078-05	SLAS3077-05	AS568-015	0.255	120-150
SLAS1958-06	SLAS3078-06	SLAS3077-06	AS568-016	0.255	145-185
SLAS1958-08	SLAS3078-08	SLAS3077-08	AS568-019	0.255	350-400
SLAS1958-10	SLAS3078-09	SLAS3077-09	AS568-021	0.265	500-600
SLAS1958-12	SLAS3078-12	SLAS3077-12	AS568-024	0.280	700-800
SLAS1958-16	SLAS3078-16	SLAS3077-16	AS568-028	0.280	1200-1300
SLAS1958-20	SLAS3078-20	SLAS3077-20	AS568-132	0.280	1800-2000



SHUR-LOK CORPORATION
TECHNICAL SALES BULLETIN

TSB 0026

**TITLE: SLAS1959 – PORT PREPARATION, INSTALLATION AND
 REMOVAL OF FLUID BOSS INSERT**

Rev: N/C

Page 3 of 10

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 SLAS1958.

3.1.2. Location of port.

3.1.3. Specify port size and dimensions per SLAS1958.

3.1.4. Specify insert size per SLAS3078.

3.1.5. Specify lockring size per SLAS3077

3.1.6. Specify O-ring size and compound (see section 2.3)

3.1.7. Install insert per SLAS1959.

3.1.8. Corrosion protection is specified in 5.2.5. If materials or fluids require primer different from zinc chromate primer or if an additional sealant is required, so specify.

3.1.9. Pressure testing of individual unit is specified in section 6.0.

3.1.10. The boss material for a 3,000 psi system must have a minimum shear strength per table 3 to resist the axial load being generated from a respective burst pressure of 12,000 psi (based on thread minimum shear engagement area shown).

TABLE 3 – PARENT MATERIAL SHEAR STRENGTH

System Pressure psi	Parent Material Shear Strength (at operating temp.) psi Fsu Min	Tubing O.D. Ref	Insert Size
3000	12000	1/4 Thru 1	04 Thru 16
3000	14000	1/8 Thru 1-1/4	02 Thru 20

4. PORT PREPARATION

4.1. Prepare boss and port dimensions per SLAS1958. Drill thru or to depth specified on applicable drawing. Use a drill with a diameter .015 - .030 smaller than that specified as the minor diameter on SLAS1958. This will allow the McKinnon MPT porting tool to finish the minor diameter of the port thread to the sizes required for piloting of the broach too (refer to port preparation tools in table 4).



SHUR-LOK CORPORATION
TECHNICAL SALES BULLETIN

TSB 0026

**TITLE: SLAS1959 – PORT PREPARATION, INSTALLATION AND
 REMOVAL OF FLUID BOSS INSERT**

Rev: N/C

Page 4 of 10

- 4.2. After initial drill prepare counterbore, countersink, radius and the tap drill diameter using McKinnon MPT porting tool from table 4.
- 4.3. Tap threads with a bottoming tap tool from table 4. Pre-broaching is not required with these fluid boss inserts.

TABLE 4 – PORT PREPARATION TOOLING

Port Number	Porting Tool	Bottoming Tap
02	MPT9502	PS40-02BT
03	MPT9503	PS40-03BT
04	MPT9504	PS40-04BT
05	MPT9505	PS40-05BT
06	MPT9506	PS40-06BT
08	MPT9508	PS40-08BT
10	MPT9510	PS40-10BT
12	MPT9512	PS40-12BT
16	MPT9516	PS40-16BT
20	MPT9520	PS40-20BT

Tools are available through McKinnon Industries, a Shur-Lok Company. 949-655-9231

TABLE 5 – INSTALLATION & REMOVAL TOOLING

Port Number	Installation Tools			Lockring Removal Tool	Insert Removal Tool	Tool Kit Number
	O-Ring Tool	Wrench Drive Tool	Lockring Drive Tool			
02	MORT95-437	MF8502WA	MF9502DA	MF9502LPD	MF9502RT	MKM52RF9502
03	MORT95-500	MF8503WA	MF9503DA	MF9503LPD	MF9503RT	MKM52RF9503
04	MORT95-562	MF8504WA	MF9504DA	MF9504LPD	MF9504RT	MKM52RF9504
05	MORT95-625	MF8505WA	MF9505DA	MF9505LPD	MF9505RT	MKM52RF9505
06	MORT95-687	MF8506WA	MF9506DA	MF9506LPD	MF9506RT	MKM52RF9506
08	MORT95-937	MF8508WA	MF9508DA	MF9508LPD	MF9508RT	MKM52RF9508
10	MORT95-1062	MF8510WA	MF9510DA	MF9510LPD	MF9510RT	MKM52RF9510
12	MORT95-1250	MF8512WA	MF9512DA	MF9512LPD	MF9512RT	MKM52RF9512
16	MORT95-1500	MF8516WA	MF9516DA	MF9516LPD	MF9516RT	MKM52RF9516
20	MORT95-1875	MF8520WA	MF9520DA	MF9520LPD	MF9520RT	MKM52RF9520

Tools are available from McKinnon Industries, a Shur-Lok Company. 949-655-9231



5. INSTALLATION OF FLUID BOSS INSERT INTO PORT SLAS1958

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).

5.2. O-ring installation

- 5.2.1. Place the O-ring tool (per table 2) over the external thread of the insert. Submerge the insert, O-ring tool 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 O-ring tool and onto the insert. Be sure that the O-ring is not twisted and is properly seated in the groove of the insert. See figure 2.

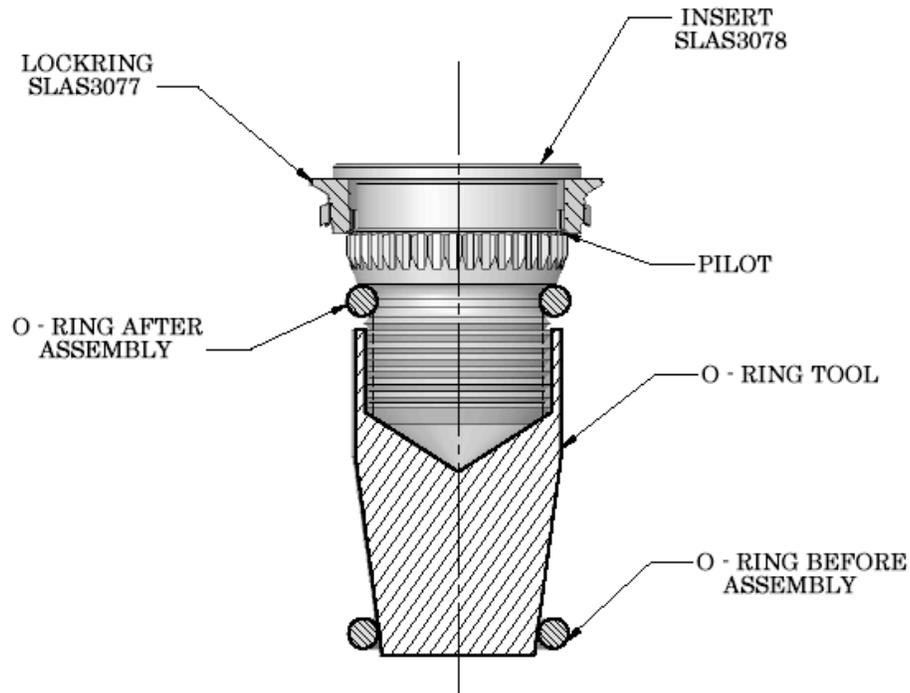


FIGURE - 2 - O - RING INSTALLATION

- 5.2.2. Remove the O-ring tool.

5.3. Install insert assembly into port:



SHUR-LOK CORPORATION
TECHNICAL SALES BULLETIN

TSB 0026

TITLE: SLAS1959 – PORT PREPARATION, INSTALLATION AND
REMOVAL OF FLUID BOSS INSERT

Rev: N/C

Page 6 of 10

- 5.3.1. Lubricate the internal surfaces of the port and the entire insert assembly using the same fluid or lubricant as specified in 5.2.1. Scratches, dings or rough spots are not allowed in O-ring contact area on the insert or in the port.
- 5.3.2. Insert the external thread end of the insert into port by hand using a clockwise rotation until the insert is seated. To avoid O-ring damage, the insert should not be rotated in a counterclockwise direction.
- 5.3.3. Screw the drive wrench tool from table 5 into the thread of the insert until the plastic collar touches the surface of the insert per figure 3. Place a torque wrench of the proper size into the square of the drive wrench and apply a torque equal to the minimum value specified in table 2.
- 5.3.4. Remove the torque wrench.

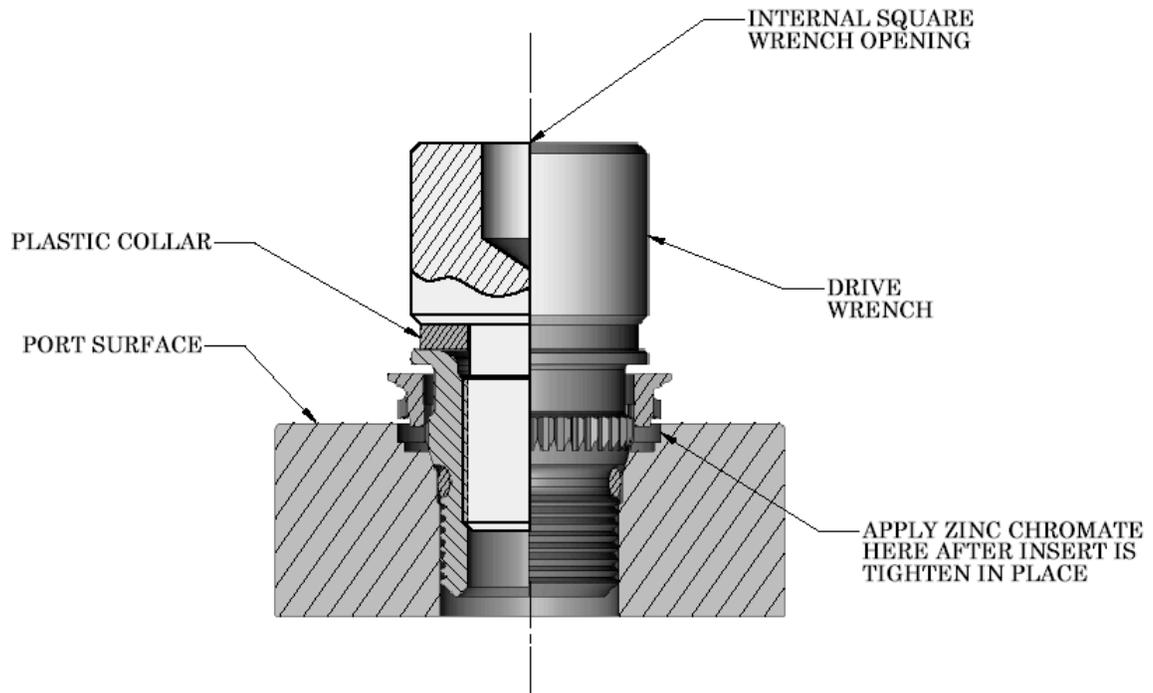


FIGURE - 3 INSERT INSTALLATION

- 5.3.5. Apply enough zinc chromate primer (TT-P-1757) with a brush or small syringe to the counterbore area of the port and below the insert locking so primer will be extruded out between external serrations of the locking and in the port where locking is installed.



SHUR-LOK CORPORATION
TECHNICAL SALES BULLETIN

TSB 0026

**TITLE: SLAS1959 – PORT PREPARATION, INSTALLATION AND
REMOVAL OF FLUID BOSS INSERT**

Rev: N/C

Page 7 of 10

Note: Using design activity may specify another primer in place of, or in addition to, zinc chromate (see 3.1.8).

- 5.3.6. While the zinc chromate (or other primer) applied per 5.3.5 is still wet, place the lockring drive tool over the drive wrench and let it rest on the lockring top surface. Apply a downward force to drive lockring into the surface of port counterbore until the face of the lockring drive tool touches the port surface per figure 4. It may be necessary to support the port to prevent deformation of the internal configuration of the component.

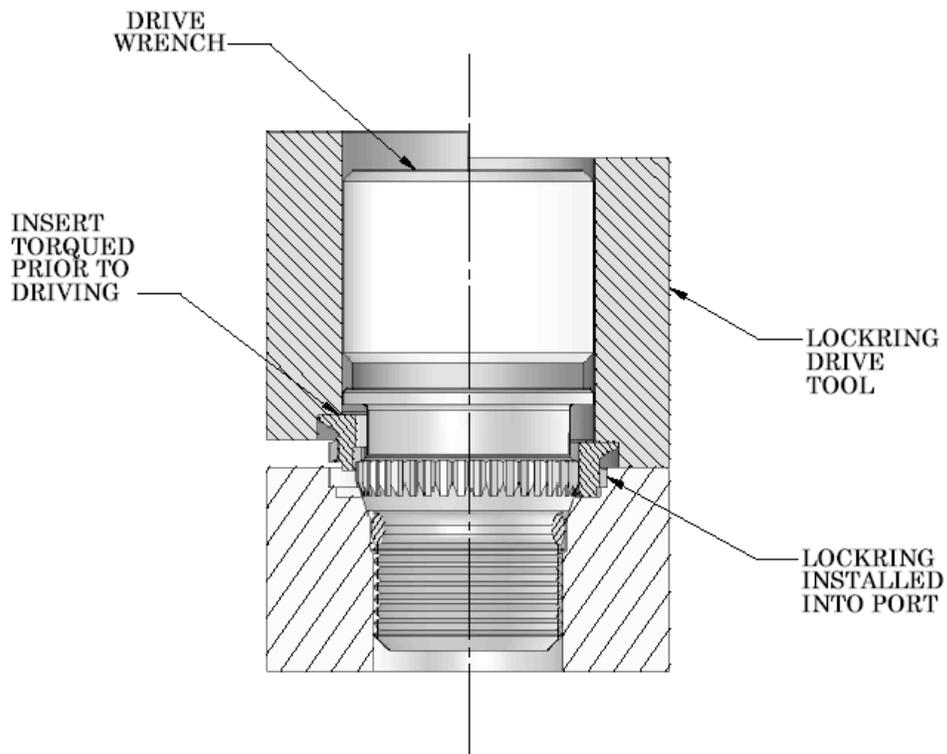


FIGURE - 4 INSTALLED LOCKRING

6. PRESSURE TESTING:

- 6.1. A pressure test of unit may be conducted at this point. Attach a pressure plug on top of the insert. Pressurize the unit to 1.5 times the operating pressure for 3 minutes. There shall be zero leakage. Note that the using design activity may require testing other than that shown.

7. REMOVAL OF INSERT



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

7.2. Lockring Retraction:

7.2.1. Select the proper size lockring removal tool from table 5.

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 per figure 5. Holding the puller halves apart, place tool over protruding insert so that 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.

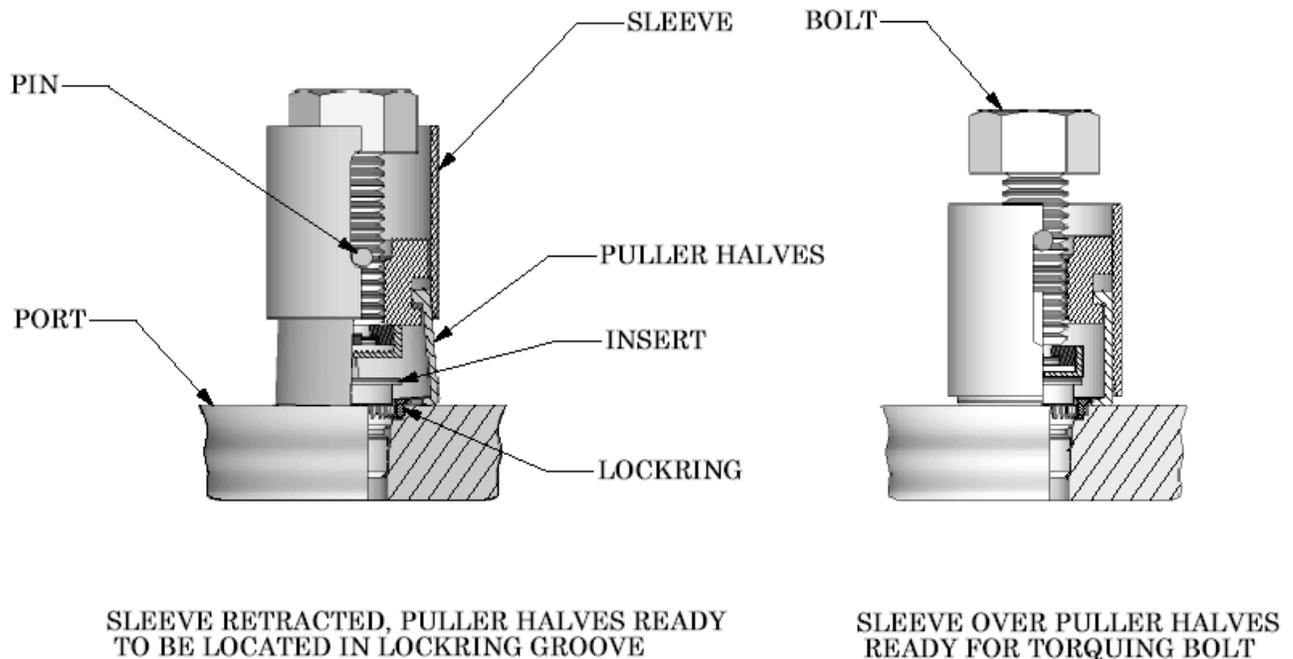


FIGURE 5 - LOCKRING RETRACTION

7.2.3. Place wrench on the bolt head of the removal tool and turn in a clockwise direction while holding the sleeve with the other hand. This action will cause the lockring to be jacked out of the port counterbore. When the external serrations of the lockring are clear of the boss



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TECHNICAL SALES BULLETIN

TSB 0026

TITLE: SLAS1959 – PORT PREPARATION, INSTALLATION AND
REMOVAL OF FLUID BOSS INSERT

Rev: N/C

Page 9 of 10

surface, the turning may be stopped. Remove the tool from the insert by loosening the bolt and lifting the sleeve to free the puller halves.

7.3. Remove the insert from Port:

- 7.3.1. For damaged inserts, place shims between the locking and the port surface. Drive a screw extractor into the internal threads and remove the insert.
- 7.3.2. For non-damaged and reusable inserts, screw the insert removal tool into the insert threads such that the threads are below the top surface of the insert. Assemble the left hand thread nut onto the tool stud. The hexagon drive socket in the stud should be held to prevent the stud from backing out. Place shims between the locking and the port surface to prevent locking from dropping back down into the port serration. Seat the nut firmly against the top surface of the insert. Continue to tighten nut. The insert will break away from its seat at about half the installation torque value (see Fig. 6).

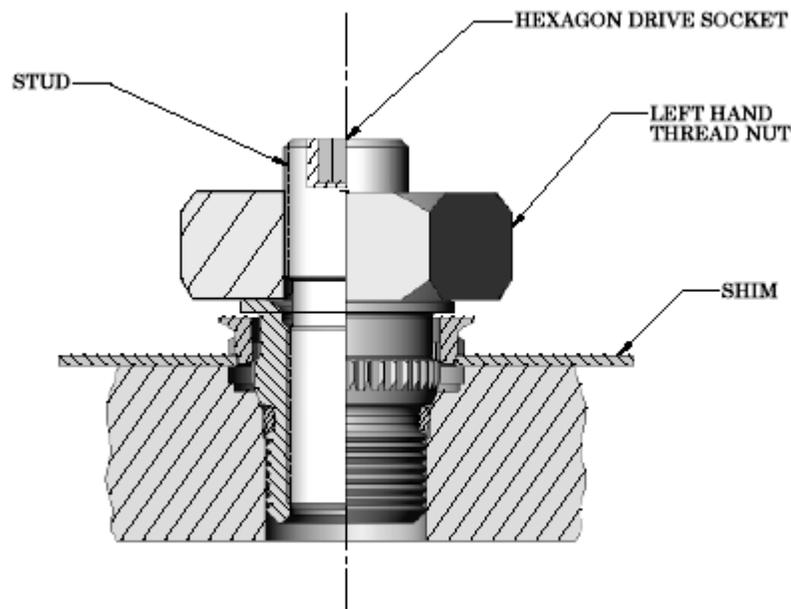


FIGURE - 6 INSERT REMOVAL

8. REINSTALLATION OF INSERT:

- 8.1. Reinstall the locking as described in 5.1



SHUR-LOK CORPORATION
TECHNICAL SALES BULLETIN

TSB 0026

TITLE: SLAS1959 – PORT PREPARATION, INSTALLATION AND
REMOVAL OF FLUID BOSS INSERT

Rev: N/C

Page 10 of 10

- 8.2. Install a new O-Ring as described in 5.2 per Table 1 and section 3.1.6.
- 8.3. Reinstall insert assembly into port as described in 5.3 except a shim shall be used between the locking and the broached surface to prevent premature engagement of serrations.
- 8.4. Torque to the minimum value specified in Table 2. If the locking serrations are not aligned with the port serrations, continue to slowly torque the insert towards the maximum value allowed in Table 2 until the serrations of the locking are aligned with the port serrations, then remove shim before driving locking.