1. SCOPE:

   1.1. This provides the minimum design, port preparation and installation and removal requirements for SLAS4200 adapter and is 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 adapters provide a semi-permanent male fitting for use in 8000 psi (24,000 psi burst pressure) fluid systems per table 1:

TABLE 1 - PRESSURE SYSTEMS

SYSTEM WORKING PRESSURE				
Shur-lok Part Number	**Product Description**	**Operating psi**	**Burst psi**	**Sizes**
SLAS4200	Beam Seal Adapter	8,000	24,000	All

   2.2. Adapters per SLAS4200 installed per this document into ports per SLAS4201 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 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 coupling nut.

   2.5. Adapter removal is accomplished by lifting the lockring out of the port using a removal tool see table 4.

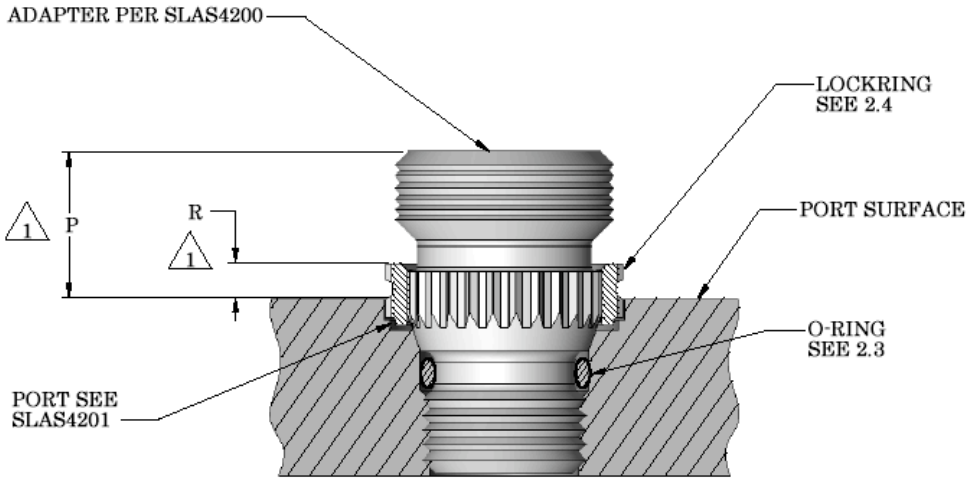

FIGURE - 1 INSTALLED ADAPTER

△1 "P" and "R" dimensions are for design purposes only and represent final stand-off dimensions. Do not use as installation dimensions.

TABLE 2 – DIMENSIONS

Port Number	O-Ring Size See 2.3	⚠1 P ± 0.20	⚠1 R Max
02	AS568-007	0.331	0.124
03	AS568-008	0.362	0.124
04	AS568-010	0.404	0.124
05	AS568-011	0.404	0.124
06	AS568-012	0.430	0.130
07	AS568-013	0.443	0.130
08	AS568-014	0.443	0.130
09	AS568-015	0.507	0.130
10	AS568-016	0.507	0.130
11	AS568-017	0.557	0.140

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 SLAS4201.

3.1.2. Location of port.

3.1.3. Specify port size per SLAS4201. If tap drill depth is not through, then specify control dimensions.

3.1.4. Specify adapter size per SLAS4200.

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

3.1.6. Install adapter per this document.

3.1.7. Corrosion protection is specified in 5.2.4. 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 unit is specified in section 6.1. Testing other than that shown shall be specified.

3.2. The boss material for an 8,000 psi system must have a minimum shear strength of 20 ksi to resist the axial load being generated from a respective burst pressure of 24,000 psi (based on thread minimum shear engagement area shown in table 6).

4. PORT PREPARATION

4.1. Prepare boss and port per SLAS4201. 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 SLAS4201 standard. 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 tool (refer to port preparation tools in Table 3).

4.2. Chip removal is required after broaching and prior to adapter installation

TABLE 3 – PORT PREPARATION TOOLING

Port Number	Porting Tool	Broaching Tool (Select one)				Chip Removal
		Hand Held	Non-Impact	EDM	Wobble	
		[1] (Boss hardness up to 32 HRC)	[2] [3] [4] (Boss hardness up to 40 HRC)	[5] (Boss hardness above 40 HRC)	[6] (Boss hardness up to 40 HRC)	[7] [8]
02	MPT02*	MFOPB5002	MFOPB5002HDB	MFOPB5002ED3	MFOPB5002WBA	MF02CR
03	MPT03*	MFOPB5003	MFOPB5003HDB	MFOPB5003ED3	MFOPB5003WBA	MF03CR
04	MPT04*	MFOPB5004	MFOPB5004HDB	MFOPB5004ED3	MFOPB5004WBA	MF04CR
05	MPT05	MFOPB5005	MFOPB5005HDB	MFOPB5005ED3	MFOPB5005WBA	MF05CR
06	MPT06	MFOPB5006	MFOPB5006HDB	MFOPB5006ED3	MFOPB5006WBA	MF06CR
07	MPT07	MFOPB5007	MFOPB5007HDB	MFOPB5007ED3	MFOPB5007WBA	MFO7CR
08	MPT08	MFOPB5008	MFOPB5008HDB	MFOPB5008ED3	MFOPB5008WBA	MF08CR
09	MPT09	MFOPB5009	MFOPB5009HDB	MFOPB5009ED3	MFOPB5009WBA	MF09CR
10	MPT10	MFOPB5010	MFOPB5010HDB	MFOPB5010ED3	MFOPB5010WBA	MF10CR
11	MPT11	MFOPB5011	MFOPB5011HDB	MFOPB5011ED3	MFOPB5011WBA	MF11CR

* Solid Carbide Porting Tool all others have Carbide Tip

[1] Replacement cutters may be purchased individually MFOPB50( )-3

[2] 2 extra cutters are provided with each tool

[3] Replacement cutters may be purchased individually MFOPB50( )HDB5

[4] Replacement studs may be purchased individually MFOPB50( )HDB4

[5] MFOPB50XXED3 material Copper Tungsten. MFOPB50( )ED2 material is Poco Graphite

[6] Cutter and screw combination can be ordered separately for spares or replacements MFOPB50( )WBA23

[7] Cutter is replaceable and can be ordered separately for spares. One spare cutter is supplied with each tool assembly MF( )CRP-1

[8] MF( )CR can be replaced with MF( )CRP for CNC Machine vs manual operation

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

TABLE 4 – INSTALLATION & REMOVAL TOOLING

Port Number	Installation Tools				Lockring Removal Tool
	O-Ring Tool	Wrench and Lockring Drive Tools [1]			
		Combination Tool	Wrench Part Number	Lockring Drive Tool Number	
02	MORT216	MF5002DW	MF6902W	MF9802DEK	MF02LPDE
03	MORT250	MF5003DW	MF6903W	MF9803DEK	MF03LPDE
04	MORT312	MF5004DW	MF6904W	MF9804DEK	MF04LPDE
05	MORT375	MF5005DW	MF6905W	MF9805DEK	MF05LPDE
06	MORT437	MF5006DW	MF6906W	MF9806DEK	MF06LPDE
07	MORT500	MF5007DW	MF6907W	MF9807DEK	MF07LPDE
08	MORT562	MF5008DW	MF6908W	MF9808DEK	MF08LPDE
09	MORT625	MF5009DW	MF6909W	MF9809DEK	MF09LPDE
10	MORT687	MF5010DW	MF6910W	MF9810DEK	MF10LPDE
11	MORT750	MF5011DW	MF6911W	MF9811DEK	MF11LPDE

[1] Must select Combination Wrench/Drive Tool or both Wrench Tool and Lockring Drive Tool.
Tools are available through McKinnon Industries, a Shur-Lok Company. Tel 949-655-9231

TABLE 5 – INSTALLATION TORQUE VALUES

	Installation Torque lbf-in	
Port Number	Min	Max
02	21	36
03	45	60
04	70	100
05	140	170
06	210	270
07	320	400
08	430	540
09	560	660
10	625	750
11	700	820

TABLE 6 – AXIAL LOAD AND BOSS Fsu MINIMUM

Port Number	[1] Total Thread Minimum Shear Engagement Area, in?	Port "D" Max Per SLAS4201, in	[2] Axial Load on Adapter Developed by 24,000 psi Burst Pressure, lbf
	8000 psi system		
SLAS4201-02	0.0618	0.256	1235
SLAS4201-03	0.0782	0.288	1563
SLAS4201-04	0.1096	0.341	2192
SLAS4201-05	0.1531	0.403	3061
SLAS4201-06	0.2047	0.466	4093
SLAS4201-07	0.2598	0.525	5195
SLAS4201-08	0.3214	0.584	6429
SLAS4201-09	0.4130	0.662	8261
SLAS4201-10	0.4981	0.727	9963
SLAS4201-11	0.5661	0.775	11322

[1] 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.

[2] Axial load = Area x Burst Pressure = $\frac{\pi D^2}{4} \times 24{,}000$

5. INSTALLATION OF ADAPTERS SLAS4200 INTO PORT SLAS4201:

5.1. O-ring installation

5.1.1. Place the O-ring (per table 2) over the port thread of the adapter. Submerge the adapter, 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 adapter. Be sure that the O-ring is not twisted and is properly seated in the groove of the adapter. See figure 2.

5.1.2. Remove the O-ring tool.

5.2. Install adapter assembly into port:

5.2.1. Lubricate the internal surfaces of the port and the entire adapter assembly using the same fluid or lubricant as specified in 5.1.1. Scratches, dings or rough spots are not allowed in O-ring contact area on the adapter or in the port.

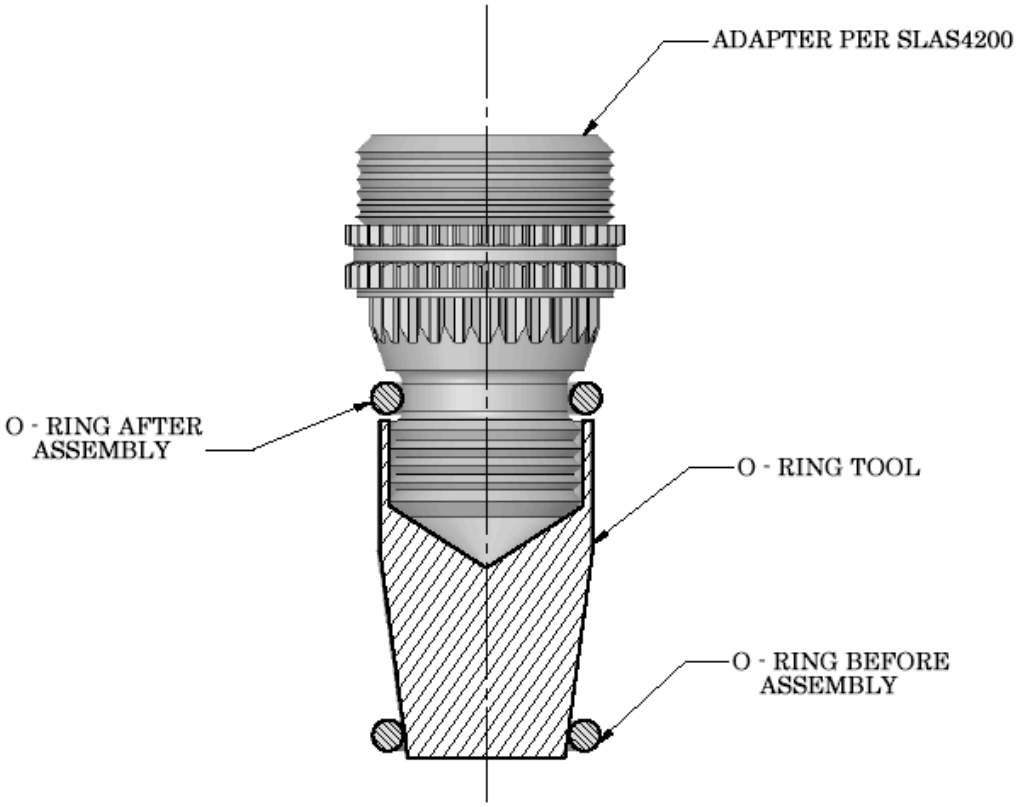

FIGURE - 2 - O - RING INSTALLATION

5.2.2. Insert the port thread of the adapter into port by hand using a clockwise rotation until the adapter is seated. To avoid O-ring damage, the adapter should not be rotated in a counterclockwise direction.

5.2.3. Using the applicable combination wrench and drive tool in table 4, engage the serrations of the tool with the external serrations of the adapter lockring 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 5. Note the relationship of the lockring serrations with respect to the prebroached serrations in the port. If they match, proceed to 5.2.5. If the lockring serrations do not match the prebroached serrations in the port, continue to slowly torque the adapter toward the maximum value allowed in table 5 until the serrations match. This will normally take between 3° and 8° of turning, the maximum value need to be reached if the serrations align themselves prior to that value. Do not exceed maximum torque values.

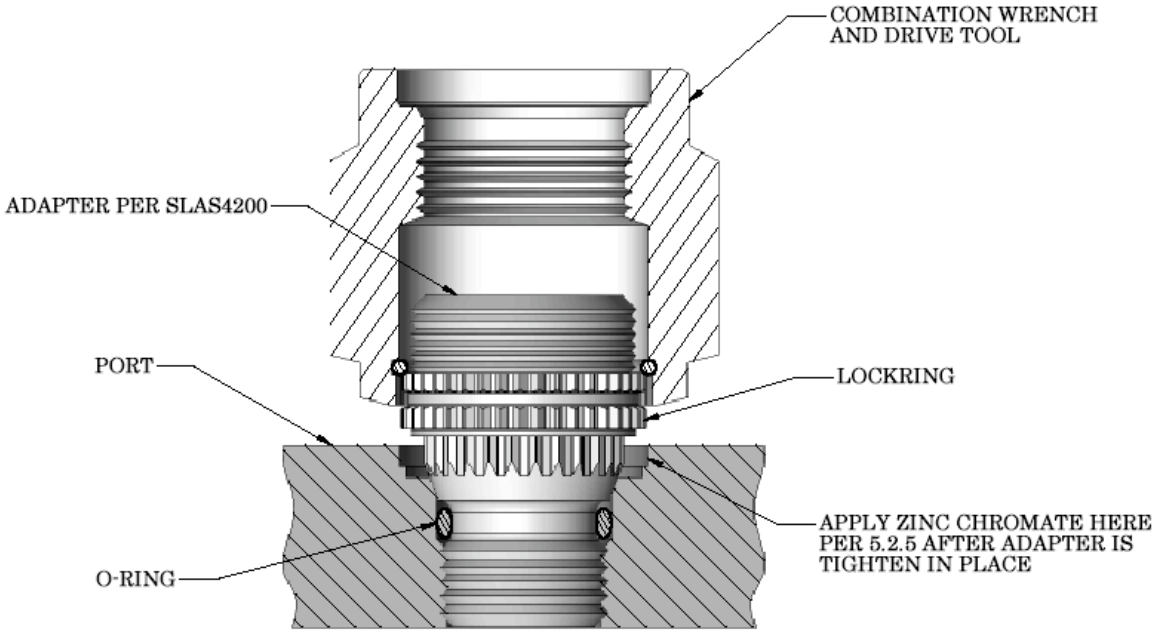

FIGURE - 3 TORQUE ADAPTER ASSEMBLY

5.2.4. Apply enough zinc chromate primer (TT-P-1757) with a brush or small syringe to the counterbore area of the port and below the fitting lockring so primer will be extruded out between external serrations of the lockring and 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).

5.2.5. While the zinc chromate (or other primer) applied per 5.2.4 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 figure 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 7.1. Tighten adapter clockwise per 5.2.3 until serrations in port and the external serrations on the lockring are aligned. Reinstall lockring and remove excess primer from surface of port and lockring.

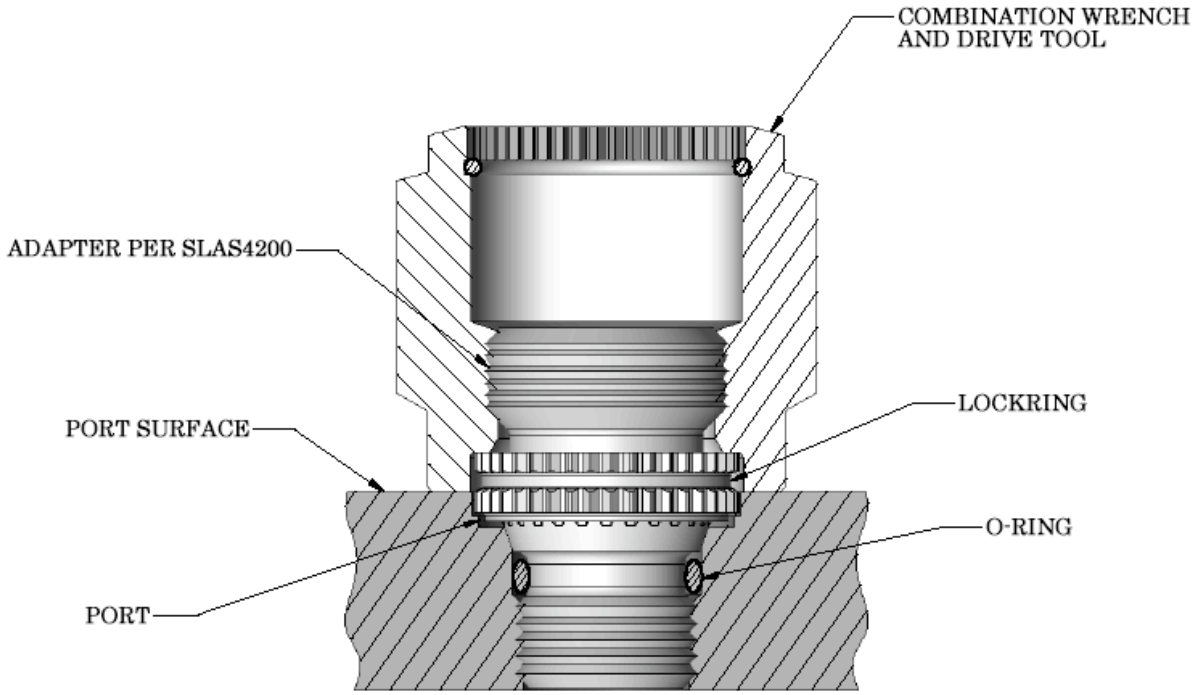

FIGURE - 4 LOCKRING INSTALLATION

6. PRESSURE TESTING:

6.1. A pressure test of unit may be conducted at this point. Place a pressure cap on the adapter. 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. See 3.1.8.

7. REMOVAL OF ADAPTER

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

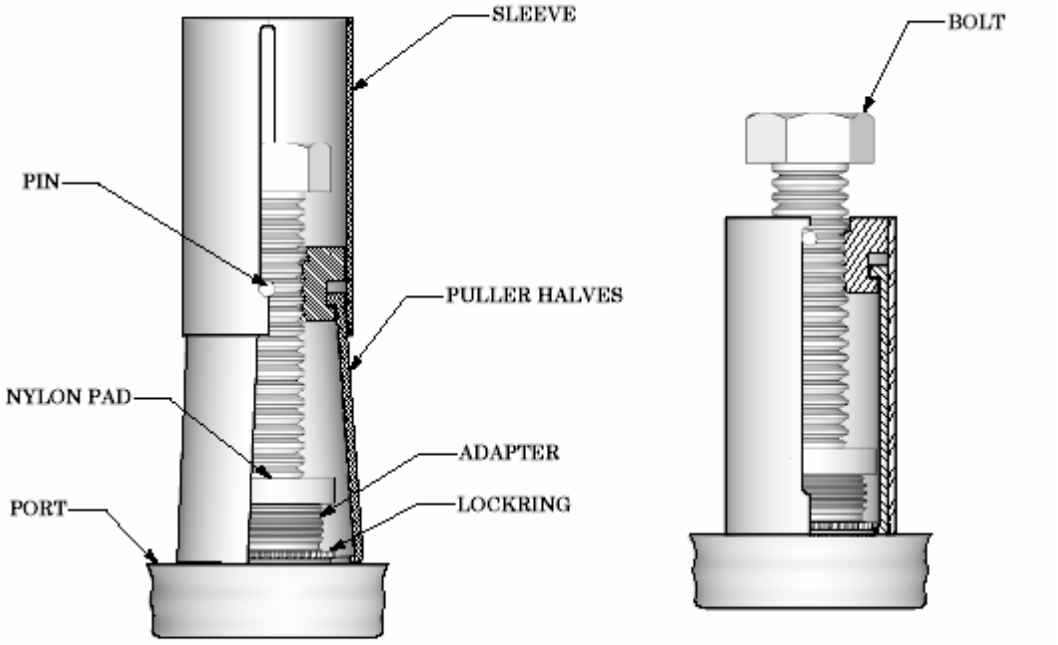

FIGURE 5 · LOCKRING RETRACTION

7.2. Lockring Retraction:

7.2.1. Select the proper size removal tool from table 4.

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 adapter so that the nylon pad rests on the top surface of the adapter. 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.

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

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

7.3. Remove the adapter from Port:

7.3.1. Select the proper size combination wrench and drive tool from table 4. Engage the serrations of the wrench with those of the lockring. Using an open end or socket wrench over hex on wrench, turn in a counterclockwise direction to disengage the adapter from the port. Plug the port minor diameter when cleaning out the cavity to avoid contamination of the fluid system.

8. REINSTALLATION OF ADAPTER:

8.1. Reinstall the adapter per Section 5 using a new O-ring per table 2 section 2.3