1. SCOPE:

1.1. This provides the minimum design, port preparation and installation and removal requirements for SLAS4383-XX-XX, SLF2002-XX-XX and SLF3004-XX-XX adapter reducer 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 adapter reducer provide a semi-permanent male fitting 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**
SLAS4383-XX-XX	Beam Seal Adapter Reducer	5,000	20,000	05-04, 06-04, 08-04, 08-06, 10-04, 10-06, 10-08, 12-06, 12-08, 12-10, 16-10, and 16 12
SLAS4383-XX-XX	Beam Seal Adapter Reducer	4,000	16,000	20-12, 20-16, 24-12, 24-16
SLF2002-XX-XX	Flareless Adapter Reducer	3,000	12,000	All
SLF3004-XX-XX	Flared Adapter Reducer	3,000	12,000	All

2.2. Adapter Reducers per SLAS4383-XX-XX, SLF2002-XX-XX and SLF3004-XX-XX installed per this document into ports per SLAS1300 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 reducer has been torqued. This prevents the adapter reducer from rotating in the port during coupling nut assembly and disassembly and also eliminates the necessity of lock wiring the adapter reducer. Only one wrench is required to install or remove coupling nut.

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

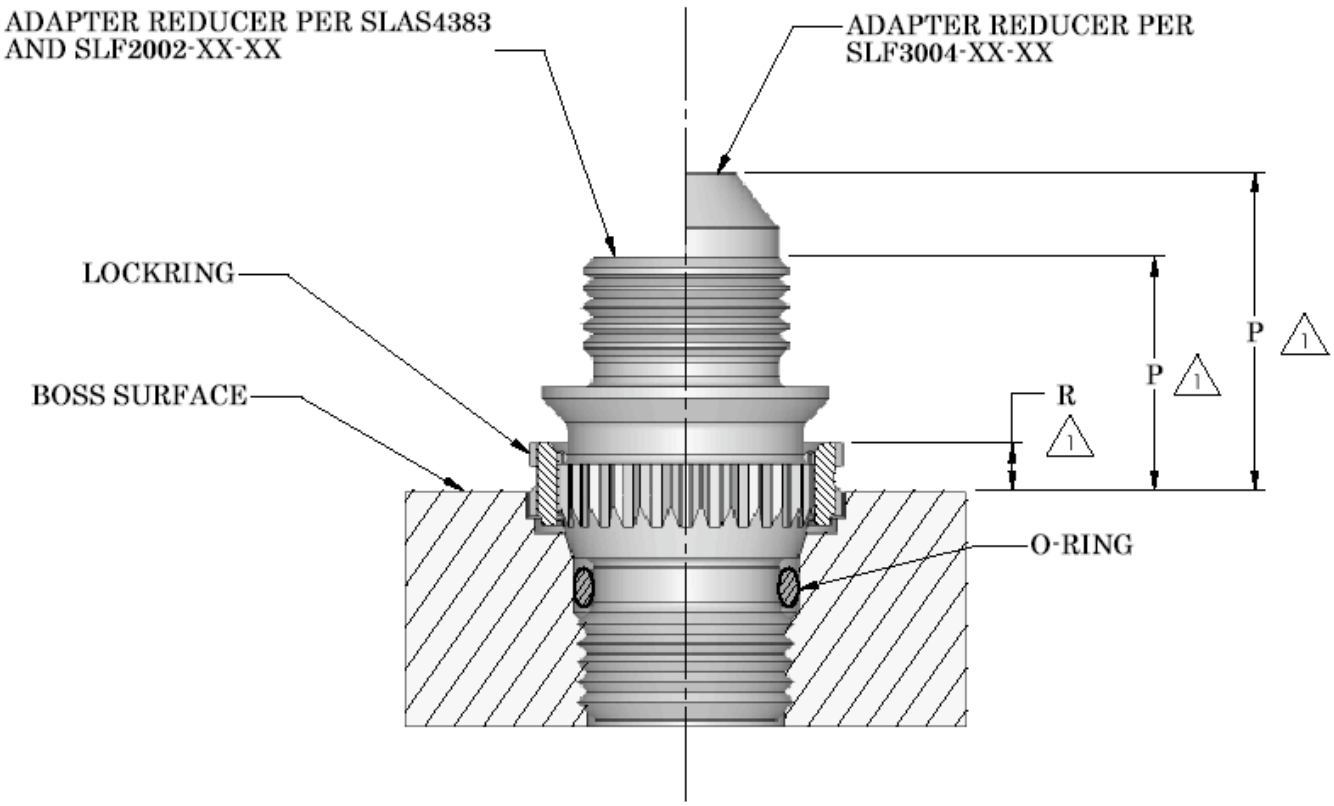

FIGURE - 1 INSTALLED ASSEMBLY

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

O-Ring Size see 2.3	⚠1 P ± 0.20			⚠1 R MAX
	SLAS4383-XX-XX	SLF2002-XX-XX	SLF3004-XX-XX	
AS568-010	---	0.628	0.701	0.124
	---	0.675	0.732	
AS568-011	0.536	0.717	0.814	
AS568-012	---	0.704	0.761	0.130
	0.553	0.735	0.830	
AS568-014	---	0.704	0.761	
	0.554	0.735	0.830	
	0.574	0.751	0.838	
AS568-016	0.558	0.735	0.830	
	0.578	0.751	0.838	
	0.591	0.845	0.940	
AS568-116	0.551	0.735	0.830	0.140
	0.571	0.751	0.838	
	0.584	0.845	0.940	
	0.648	0.904	1.037	
AS568-118	---	---	1.020	
AS568-120	0.564	0.744	0.841	
	0.661	0.916	1.049	
	0.701	0.979	1.155	
	---		---	
AS568-123	0.544	0.724	0.821	
	0.681	0.959	1.135	
	0.729	0.959	1.182	
AS568-128	0.750	0.980	1.203	
	0.747	0.980	1.250	

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 SLAS1300.

3.1.2. Location of port.

3.1.3. Specify port size per SLAS1300. If tap drill depth is not through, then specify control dimensions.

3.1.4. Specify adapter reducer size per SLAS4383-XX-XX, SLF2002-XX-XX and SLF3004-XX-XX.

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

3.1.6. Install adapter reducer per SLAS1301R.

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 6.0.

3.1.9. The boss material for a 3,000, 4000 and 5000 psi system must have a minimum shear strength per table 6 to resist the axial load being generated from a respective burst pressure of 12,000, 16000 and 20000 psi (based on thread minimum shear engagement area shown).

4. PORT PREPARATION

4.1. Prepare boss and port dimensions per SLAS1300. 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 SLAS1300 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 reducer installation.

5. INSTALLATION OF ADAPTER REDUCER SLAS4383-XX-XX, SLF2002-XX-XX or SLF3004-XX-XX INTO PORT SLAS1300:

5.1. O-ring installation

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

5.1.2. Remove the O-ring tool.

5.2. Install adapter reducer assembly into port:

5.2.1. Lubricate the internal surfaces of the port and the entire adapter reducer 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 reducer or in the port.

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]
04	MPT04	MFOPB5004	MFOPB5004HDB	MFOPB5004ED2	MFOPB5004WBA	MF04CR
05	MPT05	MFOPB5005	MFOPB5005HDB	MFOPB5005ED3	MFOPB5005WBA	MF05CR
06	MPT06	MFOPB5006	MFOPB5006HDB	MFOPB5006ED3	MFOPB5006WBA	MF06CR
08	MPT08	MFOPB5008	MFOPB5008HDB	MFOPB5008ED3	MFOPB5008WBA	MF08CR
10	MPT10	MFOPB5010	MFOPB5010HDB	MFOPB5010ED3	MFOPB5010WBA	MF10CR
12	MPT12	MFOPB5012	MFOPB5012HDB	MFOPB5012ED3	MFOPB5012WBA	MF12CR
14	MPT14	MFOPB5014	MFOPB5014HDB	MFOPB5014ED3	MFOPB5014WBA	MF14CR
16	MPT16	MFOPB5016	MFOPB5016HDB	MFOPB5016ED3	MFOPB5016WBA	MF16CR
20	MPT20	MFOPB5020	MFOPB5020HDB	MFOPB5020ED3	MFOPB5020WBA	MF20CR
24	MPT24	MFOPB5024	MFOPB5024HDB	MFOPB5024ED3	MFOPB5024WBA	MF24CR

* 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 from McKinnon Industries, a Shur-Lok Company. Tel (949) 655-9231

TABLE 4 – INSTALLATION & REMOVAL TOOLING

Port Number	Installation Tools			Lockring Removal Tool	Kit Part Numbers
	O-Ring Tool	Wrench Part Number	Lockring Drive Tool Number		
04	MORT312	MF6904W	MF9804DEK	MF04LPDE	MKM18
05	MORT375	MF6905W	MF9805DEK	MF05LPDE	MKM29
06	MORT437	MF6906W	MF9806DEK	MF06LPDE	MKM30
08	MORT562	MF6908W	MF9808DEK	MF08LPDE	MKM13
10	MORT687	MF6910W	MF9810DEK	MF10LPDE	MKM19
12	MORT812	MF6912W	MF9812DEK	MF12LPDE	MKM31
14	MORT937	MF6914W	MF9814DEK	MF14LPDE	MKM32
16	MORT1125	MF6916W	MF9816DEK	MF16LPDE	MKM14
20	MORT1312	MF6920W	MF9820DEK	MF20LPDE	MKM15
24	MORT1625	MF6924W	MF9824DEK	MF24LPDE	MKM28

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

TABLE 5 – INSTALLATION TORQUE VALUES

Port Number	Installation Torque lbf-in	
	Min	Max
04	60	100
05	100	120
06	180	245
08	430	510
10	600	680
12	855	945
16	1140	1260
20	1520	1680
24	1900	2100

TABLE 6 – AXIAL LOAD AND BOSS Fsu MINIMUM

Port Dash Number	K [1] Total Thread Minimum Shear Engagement Area in ?	L Port "D" Maximum Per SLAS1300 Ref in	M [2] Axial Load on Adapter Reducer			N [3] Boss Material Min Fsu (psi) Required to Resist Axial Load		
			Developed by 12,000 psi Burst Pressure lbf	Developed by 16,000 psi Burst Pressure lbf	Developed by 20,000 psi Burst Pressure lbf			
			3000 psi system	4000 psi system	5000 psi system	3000 psi system	4000 psi system	5000 psi system
04	0.0989	0.341	1096	1461	1827	11082	14773	18473
05	0.1406	0.403	1531	2041	2551	10889	14517	18143
06	0.1734	0.466	2047	2729	3411	11805	15739	19671
08	0.2610	0.584	3214	4286	5357	12315	16422	20525
10	0.3807	0.727	4981	6642	8302	13084	17447	21807
12	0.4550	0.901	7651	10201	12752	16816	22420	28026
16	0.7312	1.164	12770	17026	21283	17465	23285	29107
20	0.8559	1.389	18183	24245	--	21245	28327	--
24	1.2328	1.666	26159	34879	--	21220	28293	--

[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 reducer). It does not represent a dimension of either of the members in an unassembled condition.

[2] Axial Load = Area X Burst Pressure = $\frac{\square L? \text{ x } B\square rst \text{ Pressure}}{4}$

[3] Fsu Min = Axial Load ÷ Area = M ÷ K

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

5.2.3. Using the applicable wrench tool from table 4, engage the serrations of the tool with the external serrations of the adapter reducer lockring. 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 5.2.4. 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.

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 adapter 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, place the proper size applicable drive tool over the tube end of the adapter reducer. When it is properly located it will rest on the lockring. A hammer, arbor or hydraulic press may be used to press the lockring into the boss. Installation is complete when the tool bottoms on the surface of the boss.

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 7.2. 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.

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 REDUCER

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 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 2. Holding the puller halves apart, place tool over protruding adapter reducer 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 reducer by loosening the bolt and lifting the sleeve to free the puller halves.

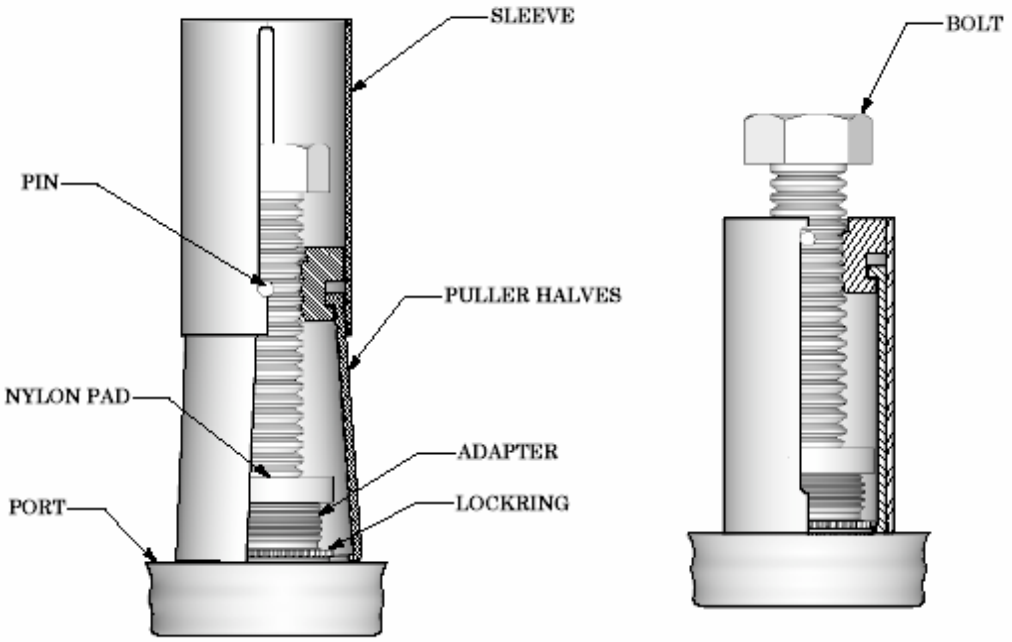

FIGURE 5 - LOCKRING RETRACTION

7.3. Remove the adapter reducer from Port:

7.3.1. Select the proper size wrench 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 reducer from the port. Plug the port minor diameter when cleaning out the cavity to avoid contamination of the fluid system.

8. REINSTALLATION OF ADAPTER REDUCER:

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