1. SCOPE

1.1. This provides the minimum design, port preparation and installation and removal requirements for SLMA2119 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 kPa**	**Burst kPa**	**Sizes**
SLMA2119	Beam Seal Adapter Reducer	28,000	112,000	All

2.2. Adapter Reducers per SLMA2119 installed per this document into ports per SLMA2110 shall have a stand-off per dimension “P” in figure 1 and table 2.

2.3. O-ring size per table 2 and per SLMA2010 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.

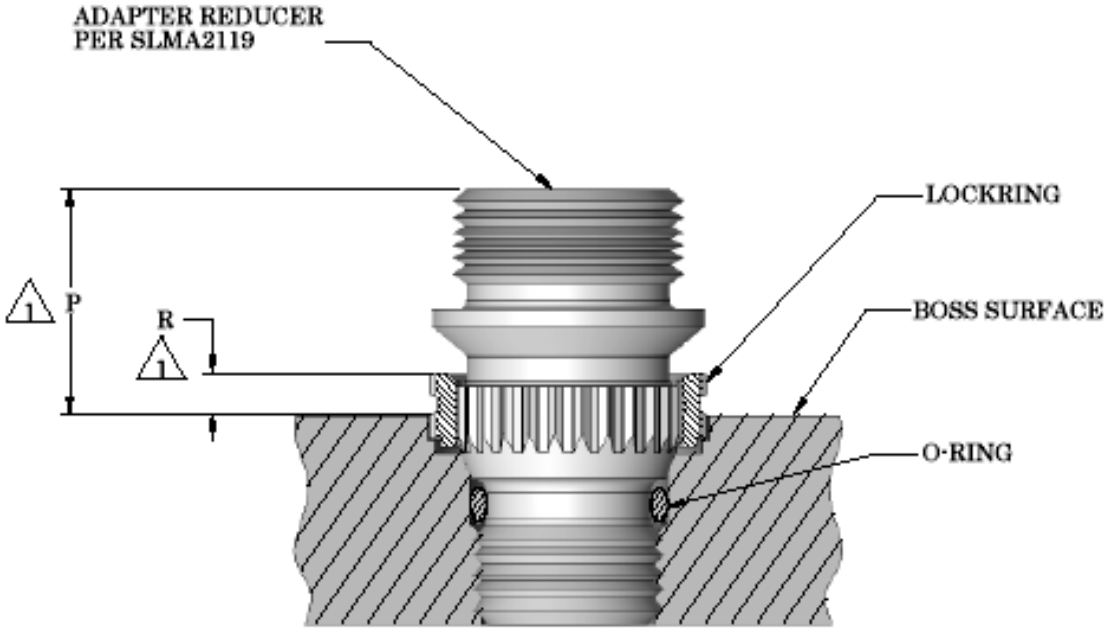

FIGURE - 1 INSTALLED ASSEMBLY

△1 "P" and "R" dimension is for design purposes only and not to be used as installation data.

TABLE 2 – DIMENSIONS & INSTALLATION TORQUE

DASH NUMBER	O-Ring Size See 2.3	△1 P ± 0.50 SLMA2119	△1 R MAX	Installation Torque N.m [1] Min n*m	Max n*m
08-06	A0080	18.50	4.10	20.0	24.0
10-06	A0095	18.50	4.10	34.0	40.0
10-08	A0095	20.30	4.10	34.0	40.0
12-06	A0112	18.55	4.10	48.0	56.0
12-08	A0112	20.35	4.10	48.0	56.0
12-10	A0112	20.35	4.10	48.0	56.0
14-06	A0132	18.55	4.10	58.0	66.5
14-08	A0132	20.35	4.10	58.0	66.5
14-10	A0132	20.35	4.10	58.0	66.5
14-12	A0132	20.35	4.10	58.0	66.5

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 SLMA2110.

3.1.2. Location of port.

3.1.3. Specify port size per SLMA2110. If tap drill depth is not through, then specify control dimensions.

3.1.4. Specify adapter reducer size per SLMA2110.

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

3.1.6. Install adapter per SLMA2114R.

3.1.7. 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.

3.1.8. Pressure testing of individual unit is specified in section 6.1.

3.1.9. The boss material for a 28000 kPa system must have a minimum shear strength per table 6 to resist the axial load being generated from a respective burst pressure of 112000 kPa (based on thread minimum shear engagement area shown).

4. PORT PREPARATION

4.1. Prepare boss and port dimensions per SLMA2110. Drill thru or to depth specified on applicable drawing. Use a drill with a diameter .40 - .70 smaller than that specified as the minor diameter on SLMA2110 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
		Impact	Non-Impact	Wobble	
		[1] (Boss hardness up to 32 HRC)	[2] [3] [4] (Boss hardness up to 40 HRC)	[5] (Boss hardness up to 40 HRC)	[6] [7]
08	MPTM125	MFMOPB125	MFMOPB125HDB	MFMOPB125WBA	MFM125CR
10	MPTM136	MFMOPB136	MFMOPB136HDB	MFMOPB136WBA	MFM136CR
12	MPTM153	MFMOPB153	MFMOPB153HDB	MFMOPB153WBA	MFM153CR
14	MPTM170	MFMOPB170	MFMOPB170HDB	MFMOPB170WBA	MFM170CR

[1] Replacement cutters may be purchased individually MFMOPB50( )-3

[2] 2 extra cutters are provided with each tool

[3] Replacement cutters may be purchased individually MFMOPB50( )HDB5

[4] Replacement studs may be purchased individually MFMOPB50( )HDB4

[5] Cutter and screw combination can be ordered separately for spares or replacements MFMOPB50( )WBA23

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

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

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

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TABLE 4 – INSTALLATION & REMOVAL TOOLING

Port Number	Installation Tools			Lockring Removal Tool	Tool Kits
	O-Ring Tool	Wrench Part Number	Lockring Drive Tool Number		
08	MORTM1010	MFM6828-125W	MFM6828-125D	MFM125LPDE	MMKM11-125
10	MORTM1212	MFM6828-136W	MFM6828-136D	MFM136LPDE	MMKM11-136
12	MORTM1415	MFM6828-153W	MFM6828-153D	MFM153LPDE	MMKM11-153
14	MORTM1615	MFM6828-170W	MFM6828-170D	MFM170LPDE	MMKM11-170

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

TABLE 5 – AXIAL LOAD AND BOSS Fsu MINIMUM

Port Number	K [1] Total Thread Minimum Shear Engagement Area (mm?)	L Port "D" Maximum Per SLMA2110 Ref (mm)	M [2] Axial Load on Adapter Developed by 112000 kPa Burst Pressure (N)	N [3] Boss Material Min Fsu Required at Max System Temperature to Resist Axial Load (kPa)	Boss Dia Minimum
08	102.12	11.39	11412	111749	21.60
10	135.12	13.11	15119	111891	24.15
12	169.92	14.71	19043	112037	26.55
14	219.12	16.69	24503	111825	27.95

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

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

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

5. INSTALLATION OF ADAPTER REDUCER SLMA2119 INTO PORT SLMA2110

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.

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 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 4 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 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 7.1. 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.

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.

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.

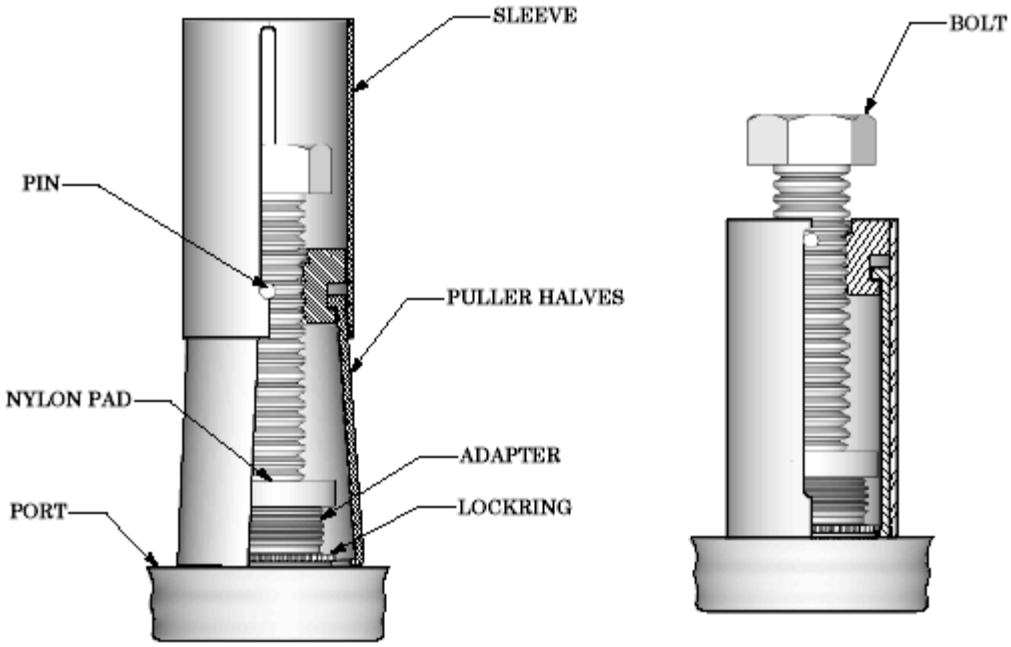

FIGURE 5 · LOCKRING RETRACTION

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