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INTRODUCTION

The barrel nut traces its origins to applications in wooden structure where strength requirements precluded the use of wood screws, dowels, or other customary attachment methods. In its original form, the barrel nut was nothing more than a piece of round bar stock with a transverse tapped hole. (Fig. 1). The immediate advantages of this design were simplicity of preparation and a much larger "footprint" for bearing loads not attainable under nut or bolt heads.

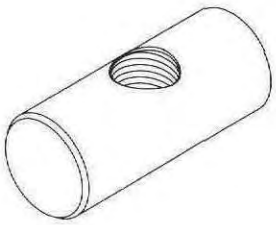


Figure 1

Since being introduced as a fastener for metal structure — principally aluminum forgings — barrel nut design has undergone many refinements. First was the elimination of material not contributing to its performance, (Fig. 2). Next, thread-locking, both metallic and nonmetallic was incorporated as an option, (Fig. 3). The necessity to compensate for hole misalignment resulted in Shur-Lok's design of a barrel nut with a floating nut element, (Fig. 4). Also a formed spring retainer was developed to exert sufficient radial pressure to prevent the part from being accidentally dislodged after insertion, (Fig. 5). A further improved retainer provides an indexing feature which snaps into the overdrilled portion of the bolt entry hole, (Fig. 6).

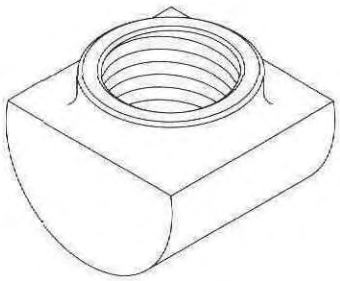


Figure 2

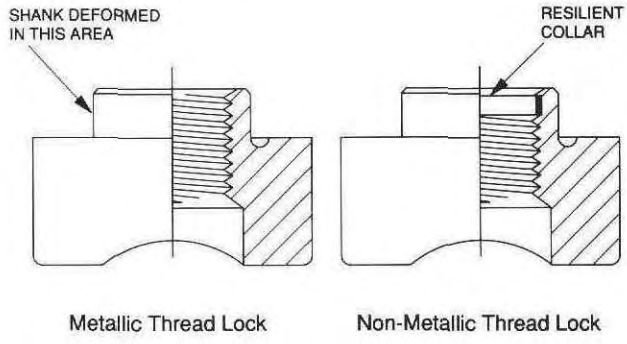


Figure 3

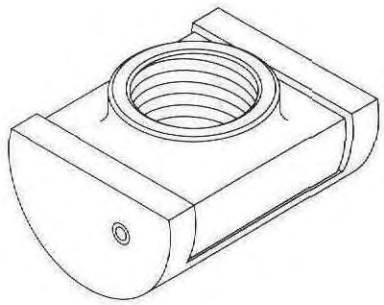


Figure 4

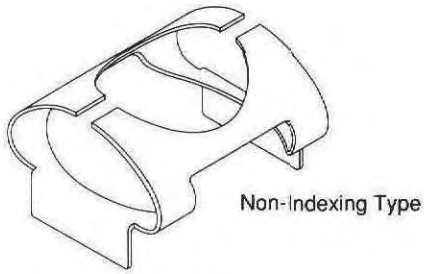


Figure 5

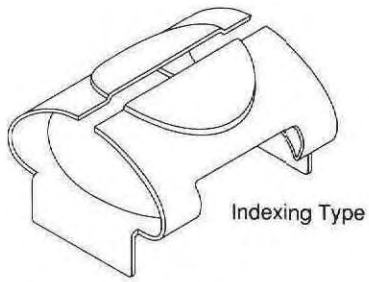


Figure 6

Wider acceptance of the barrel nut has found it used in such critical applications in the aerospace industry as the joining of major load carrying structural members. Landing gear to fuselage, engine pods to wings, and nacelle and fuel tank attachments are typical of the many places where barrel nuts are effectively used.

Today, metallurgical technology has advanced to the point that extremely high bolt strengths must be accommodated, for which reason Shur-Lok offers barrel nut series that are designed for use with 180,000 PSI and 222,000 PSI rated bolts.

Choosing a barrel nut for a specific application involves a number of considerations. First, naturally would be the size as determined by the bolt selected to sustain the applied load. Other choices include thread-locking (see following paragraph), floating nut, tensile rating, material and ambient temperatures. Retainers also involve a choice of indexing or nonindexing types, (Figs. 5 and 6). The indexing type allows less bolt protrusion through the barrel nut, but provides accurate positioning for bolt engagement. The most recent innovation is a special retainer which places two barrel nuts simultaneously in tandem positions in a single hole at a predetermined center distance, functioning as an insertion tool as well as a retainer, (Fig. 7). This development came about to accommodate inaccessible locations occasionally encountered in complex aircraft structure, particularly engine mountings.

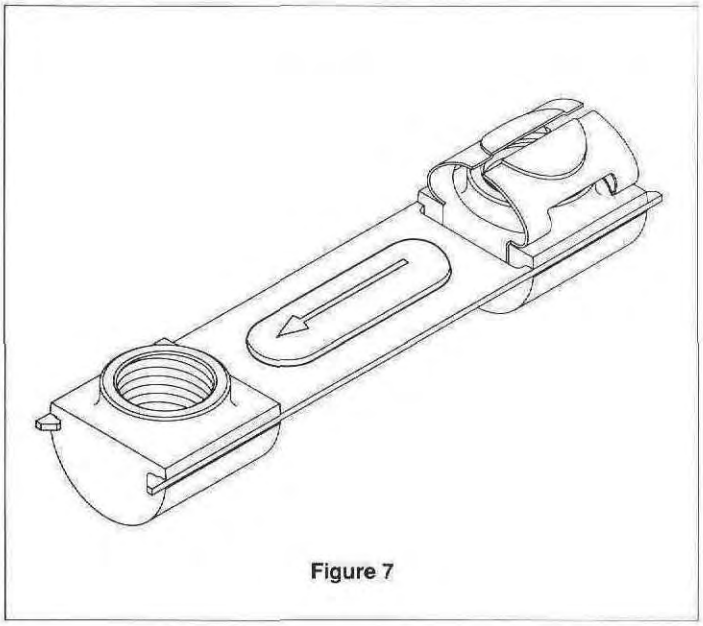


Figure 7

Choice of thread locking type may be governed by the following considerations:

a) Nonmetallic thread lock is provided by the insertion of a VESPEL® collar in the barrel nut. This type provides the advantages of extended reusability with minimal wear on the bolt and performance through an extreme temperature range.* Both alloy and corrosion resistant steel barrel nuts are available.

**VESPEL® is a registered trademark of E.I. du Pont de Nemours Company, Incorporated, and according to the manufacturer's statement, this material will withstand 500°F for sustained periods, and 600°F in an oxygen-free atmosphere with intermittent surges up to 900°F.*

b) For operating conditions in excess of VESPEL limitations, the all-metal barrel nut is recommended. Providing a minimum 15-cycle reusability of the locking feature, dependent on material, they will operate at considerably higher temperatures. Various materials and plating choices are available.

c) It is important to note that the use of anti-gallant lubricants is recommended for use with thread-locking barrel nuts.

The demands of the aerospace industry for fail-safe performance of such critical fasteners as barrel nuts require intensive testing procedures. To this end,

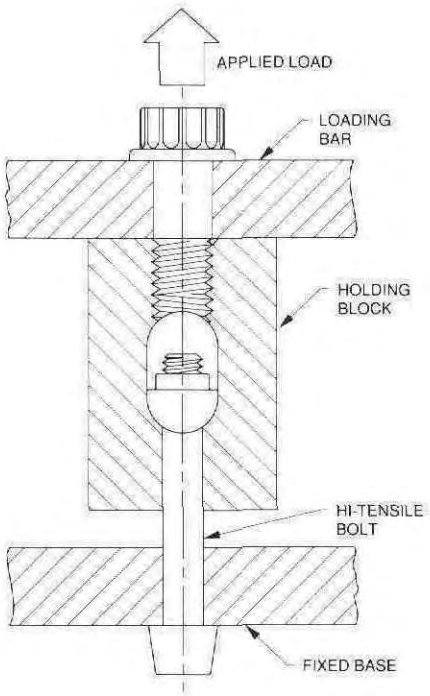


Figure 8

Shur-Lok maintains a fully staffed and equipped test laboratory where our barrel nuts are subjected to exhaustive evaluation. Destructive tensile testing assures development of full bolt strengths, (Fig 8). while cyclic torque testing substantiates repetitive thread locking performance to military standards, (Fig 9). Sustained loading tests demonstrate the absence of embrittlement when a high tensile load is maintained over an extended period, (Fig 10). Other tests are conducted to assure performance at elevated temperatures and other particular ambient conditions for specific applications.

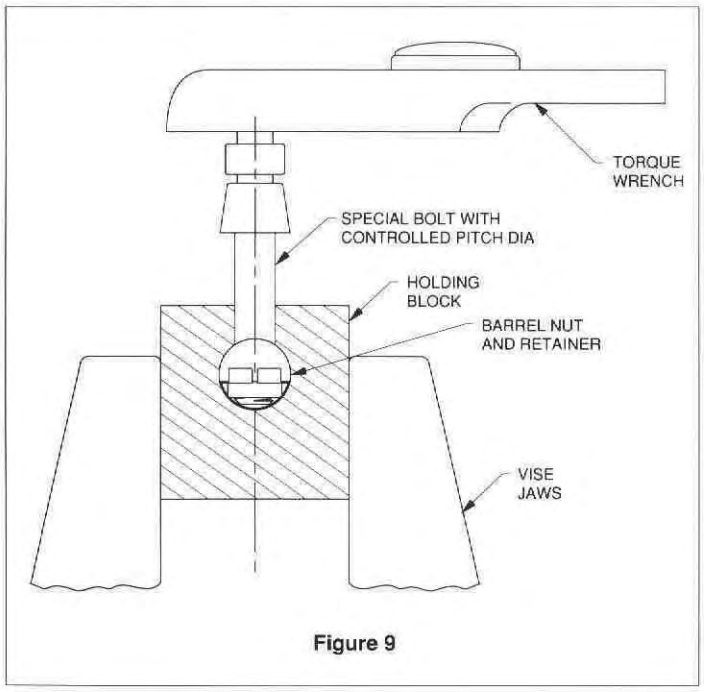


Figure 9

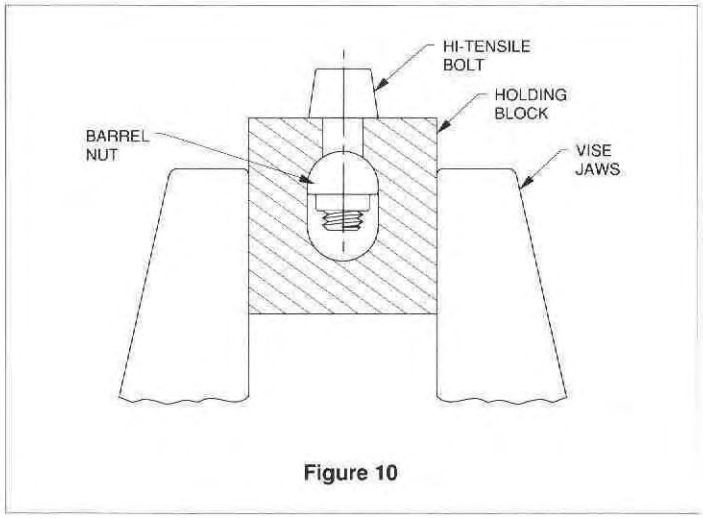
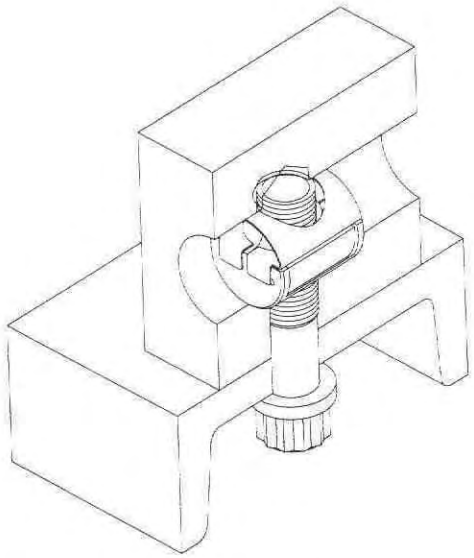


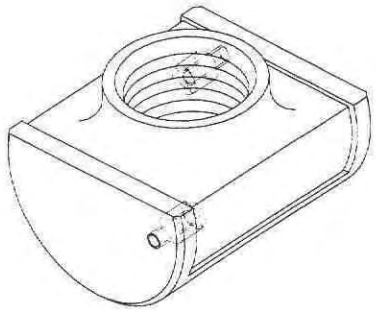
Figure 10

Shur-Lok has provided many custom designed barrel nuts to the aerospace industry for a wide variety of special requirements involving materials, finishes, heat treats, or other considerations not covered by catalog items. Your inquiries are always welcome in this regard. Please call or write Shur-Lok's Technical Services Department for assistance with your particular barrel nut requirement.

IMPORTANT NOTE:

The fasteners presented in this catalog section represent a relatively small selection of the literally hundreds of barrel nut configurations produced by Shur-Lok. Many, if not most, major users of these parts have special design requirements which makes it difficult to present a comprehensive catalog. It is very important that we advise prospective users that even though our barrel nuts are presented as different series, a number of the sizes shown in the tables have never been manufactured, due to the desire for special parts as referred to above. When making a selection of a barrel nut, be sure to contact Shur-Lok as to whether a tooling surcharge might be involved, or whether a previously tooled special part might serve the particular requirement equally well.





FEATURES AND BENEFITS

- Fifteen-cycle thread lock reusability.
- High temperature capability limited only by material or finish.
- Adds strength to joint area and prevents damage to structure.
- Locates and remains in position with use of retainer during installation and removal of joint structure.
- For use with 180 KSI to 220 KSI ultimate tensile strength bolts.

LIMITATIONS

- Secondary lubricant recommended for installation if thread locked.
- Fifteen- cycle reusability may be limited by material / finish combination with metallic thread lock.

STANDARD THREAD SIZE RANGE

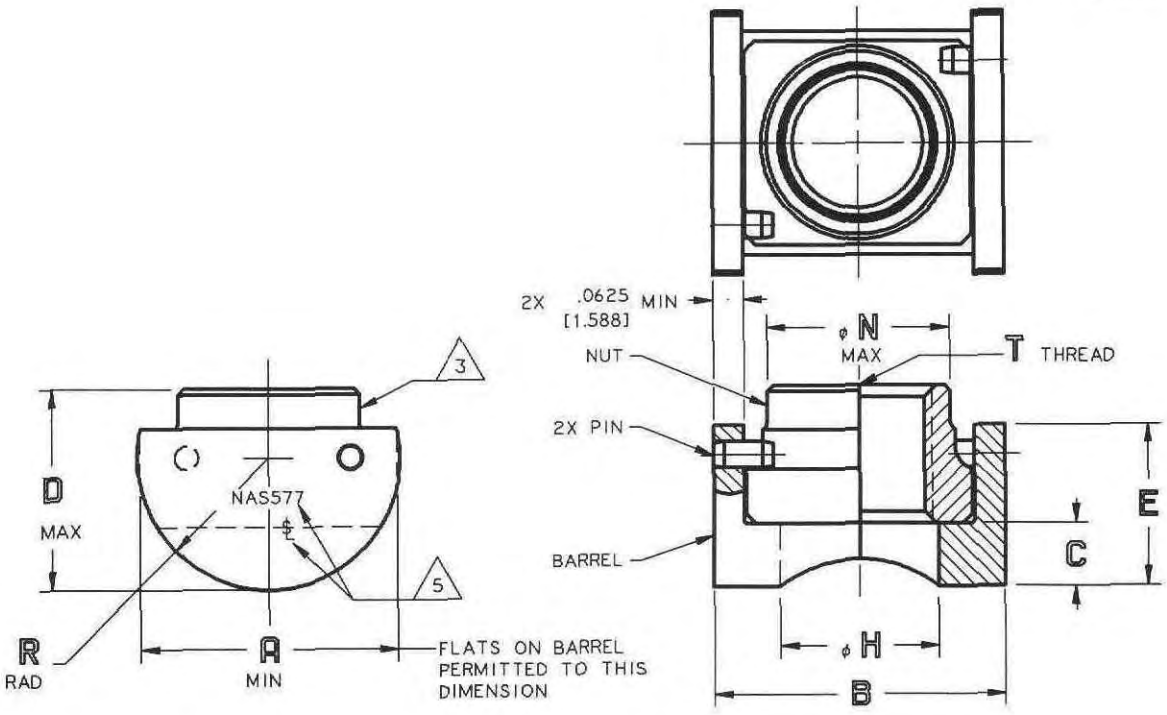
- .2500 through 1.500

SPECIAL OPTIONS

- Offered without thread locking feature.
- Available in alloy steel (4340), corrosion resistant steel (A286) and nickel based alloy Inconel (718). Other materials available on request.
- Finishes:
  Cadmium Plate per AMS-QQ-P-416 type 11, class 2.
  Cadmium Plate per NAS672.
  Nickel Diffused Cadmium Plate per AMS2416.
  Silver Plate per AMS2410 or AMS2411.
  Other finishes available on request.

METRIC SIZES AVAILABLE ON REQUEST

BARREL NUTS



NOTES:

1. THIS PART MEETS THE REQUIREMENT OF NAS577.
2. ALLOY STEEL NUTS SHALL BE MAGNETICALLY INSPECTED 100% WITH THE MAGNETIZED FIELD NORMAL TO AXIS OF NUT THREAD. ALLOY STEEL BARREL SHALL BE 100% MAGNETICALLY INSPECTED WITH THE MAGNETIZED FIELD NORMAL TO THE LONGITUDINAL AXIS OF THE BARREL. ALLOY 718 MATERIAL NUTS AND BARRELS SHALL BE 100% PENETRANT INSPECTED. NUTS SHALL NOT BE DYED AS AN INDICATION OF MAGNETIC OR PENETRANT INSPECTION.
3. NUT SHANK DEFORMED IN THIS AREA TO PRODUCE LOCKING TORQUES PER NASM25207.
4. TOTAL FLOAT:
   TRANSVERSE: .028 [0.71] MIN
   LONGITUDINAL: PERMISSIBLE BUT NOT REQUIRED
   VERTICAL: .016 [0.41] MAX
5. MARKING: PART SHALL BE PERMANENTLY MARKED WITH SHUR-LOK LOGO AND APPLICABLE NAS CODE NUMBER (NAS577B OR NAS577C), DEPRESSED .010 [0.25] MAX DEPTH. LASER MARKING PERMISSIBLE.
6. CONFIGURATION OF NUT ELEMENT AND BARREL WITHIN ENVELOPE IS OPTIONAL.
7. POST PLATE BAKING IS REQUIRED FOR A MINIMUM OF 23 HOURS AT 375° ±25°F WITHIN 2 HOURS AFTER PLATING. PLATING AND BAKING OPERATIONS ARE REQUIRED PRIOR TO ASSEMBLY.
8. REFER TO SLR50 (NAS578) RETAINERS FOR RETAINER DATA.
9. NOT A STANDARD NAS577B OR NAS677C FINISH.
   PART WILL NOT BE MARKED PER NOTE 5
10. FINISH CONFORMS TO NAS577.
11. THE -17 SIZE IS INACTIVE FOR DESIGN AFTER NOV 1982. (REF NAS577 REV 15)
12. ALL ACTIVE FINISH CODES IDENTIFY AN ALL METAL LOCKING DEVICE.

EXAMPLE OF PART CODING

SL50 B 6 A X

- X — NO SOLID FILM LUBRICANT (NUT ONLY)
- A — FINISH CODE (SEE TABLE III, SHEET2)
- 6 — SIZE CODE (SEE TABLE I, SHEET 2)
- B — MATERIAL CODE (SEE TABLE II, SHEET2)
- SL50 — BASIC PART NUMBER

REVISION (F) 26 FEB 2002

UNLESS OTHERWISE SPECIFIED
INTERPRET DIMENSIONS & TOLERANCES PER ANSI Y14.5M. ALL DIMENSIONS APPLY AFTER PLATING AND PRIOR TO THE ADDITION OF SOLID FILM LUBRICANT. 125 [3.2] ALL SURFACES

TOLERANCES				
.XX	.XXX	ANGLES	[X.X]	[X.X.X]
±.03	±.010	±2°	±[0.8]	±[0.25]

DIMENSIONS IN [ ] ARE MILLIMETERS

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SHUR-LOK INTERNATIONAL, S.A.
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TELEPHONE: (32) 87-32.07.11

BARREL NUT, SELF-LOCKING, FLOATING, 180 KSI [1241 MPa]

SL50

SHEET 1 OF 2

BARREL NUTS

TABLE I

SIZE CODE	T THREAD PER MIL-S-8879	A MIN	B	C ±.005 ±[0.13]	D MAX	E +.000 −.010 +[0.00] −[0.25]	⋄ H +.010 −.000 +[0.25] −[0.00]	R RAD +.0015 −.0000 +[0.04] −[0.00]	N MAX	INSTALLATION HOLE SIZE	AXIAL TENSILE STRENGTH MIN LB [NEWTON]	APPROX WEIGHT PER 100 PCS LB [Kg]	MATERIAL HARDNESS RANGES (HRC) ALLOY STEEL NUT MAX	ALLOY STEEL BARREL	NICKEL ALLOY 718 NUT	NICKEL ALLOY 718 BARREL
4	.2500-28 UNJF-3B	.513 [13.03]	.625 [15.88]	.125 [3.18]	.406 [10.31]	.320 [8.13]	.281 [7.14]	.2625 [6.668]	.375 [9.52]	.531 – .535 [13.49] – [13.59]	7,200 [32,027]	1.50 [.680]	41	36-43	28-42	31-45
5	.3125-24 UNJF-3B	.575 [14.60]	.688 [17.48]	.125 [3.18]	.468 [11.89]	.360 [9.14]	.344 [8.74]	.2935 [7.455]	.406 [10.31]	.594 – .599 [15.09] – [15.21]	11,400 [50,710]	2.00 [.907]	43	41-46	31-45	42-47
6	.3750-24 UNJF-3B	.669 [16.99]	.750 [19.05]	.156 [3.96]	.531 [13.49]	.420 [10.67]	.406 [10.31]	.3405 [8.649]	.500 [12.70]	.688 – .693 [17.48] – [17.60]	17,000 [75,620]	3.00 [1.361]	46	41-46	42-47	42-47
7	.4375-20 UNJF-3B	.763 [19.38]	.875 [22.22]	.188 [4.78]	.625 [15.88]	.470 [11.94]	.469 [11.91]	.3875 [9.842]	.563 [14.30]	.781 – .788 [19.84] – [20.02]	23,000 [102,309]	5.10 [2.313]	43	41-46	31-45	42-47
8	.5000-20 UNJF-3B	.857 [21.77]	1.000 [25.40]	.219 [5.56]	.703 [17.86]	.540 [13.72]	.531 [13.49]	.4345 [11.036]	.625 [15.88]	.875 – .882 [22.22] – [22.40]	30,700 [136,560]	8.20 [3.719]	43	41-46	31-45	42-47
9	.5625-18 UNJF-3B	.950 [24.13]	1.094 [27.79]	.250 [6.35]	.765 [19.43]	.590 [14.99]	.594 [15.09]	.4810 [12.217]	.688 [17.48]	.969 – .976 [24.61] – [24.79]	38,900 [173,036]	14.00 [6.350]	43	41-46	31-45	42-47
10	.6250-18 UNJF-3B	1.045 [26.54]	1.125 [28.57]	.281 [7.14]	.844 [21.44]	.650 [16.51]	.656 [16.66]	.5285 [13.424]	.750 [19.05]	1.062 – 1.072 [26.97] – [27.23]	48,700 [216,628]	18.00 [8.165]	43	36-43	31-45	31-45
12	.7500-16 UNJF-3B	1.263 [32.08]	1.500 [38.10]	.344 [8.74]	1.062 [26.97]	.750 [19.05]	.781 [19.84]	.6375 [16.192]	.875 [22.22]	1.281 – 1.291 [32.54] – [32.79]	70,800 [314,934]	23.00 [10.433]	41	36-43	28-42	31-45
14	.8750-14 UNJF-3B	1.403 [35.64]	1.531 [38.89]	.375 [9.52]	1.156 [29.36]	.850 [21.59]	.906 [23.01]	.7150 [18.161]	1.000 [25.40]	1.438 – 1.448 [36.52] – [36.78]	96,600 [429,698]	31.00 [14.061]	41	36-43	28-42	31-45
16	1.0000-12 UNJF-3B	1.544 [39.22]	1.728 [43.89]	.375 [9.52]	1.281 [32.54]	.880 [22.35]	1.032 [26.21]	.7780 [19.761]	1.125 [28.58]	1.562 – 1.572 [39.67] – [39.93]	125,900 [560,031]	44.00 [19.958]	46	36-43	35-47	31-45
⚠11 ~~17~~	~~1.0000-14 UNS-3B~~	~~1.544 [39.22]~~	~~1.728 [43.89]~~	~~.375 [9.53]~~	~~1.281 [32.54]~~	~~.880 [22.35]~~	~~1.032 [26.21]~~	~~.7780 [19.761]~~	~~1.125 [28.57]~~	~~1.562 – 1.572 [39.67] – [39.93]~~	~~128,250 [534,899]~~	~~44.00 [19.958]~~	~~46~~	~~36-43~~		
18	1.1250-12 UNJF-3B	1.857 [47.17]	2.063 [52.40]	.438 [11.12]	1.562 [39.67]	1.230 [31.24]	1.156 [29.36]	.9345 [23.736]	1.250 [31.75]	1.875 – 1.885 [47.62] – [47.88]	161,000 [716,164]	78.00 [35.380]	46	36-43	35-47	31-45
20	1.2500-12 UNJF-3B	2.107 [53.52]	2.352 [59.74]	.500 [12.70]	1.813 [46.05]	1.320 [33.53]	1.281 [32.54]	1.0595 [26.911]	1.375 [34.92]	2.125 – 2.135 [53.98] – [54.23]	201,000 [894,093]	120.00 [54.431]	46	36-43	35-47	31-45
22	1.3750-12 UNJF-3B	2.357 [59.871]	2.646 [67.211]	.562 [14.271]	2.000 [50.801]	1.460 [37.081]	1.406 [35.711]	1.1845 [30.0861]	1.500 [38.101]	2.375 – 2.385 [60.321] – [60.581]	246,000 [1,094,263]	165.00 [74.843]	46	36-43	35-47	31-45
24	1.5000-12 UNJF-3B	2.607 [66.22]	3.000 [76.20]	.625 [15.88]	2.187 [55.55]	1.520 [38.61]	1.531 [38.89]	1.3095 [33.261]	1.625 [41.28]	2.625 – 2.635 [66.68] – [66.93]	295,000 [1,312,225]	215.00 [97.522]	46	36-43	35-47	31-45

TABLE II

MATL CODE	ITEM	MATERIAL	HEAT TREAT
B	NUT	4340 ALLOY STEEL PER AMS6414	HARDNESS IS NOTED IN TABLE I. HEAT TREAT IN ACCORDANCE WITH AMS2759. MIN TEMPERING TEMPERATURE 775° F.
	BARREL		
	PINS	300 SERIES CRES	NONE
C	NUT	NICKEL ALLOY 718 PER AMS5662 OR AMS5663	HARDNESS IS NOTED IN TABLE I
	BARREL		
	PINS	300 SERIES CRES	NONE

TABLE III

FINISH CODE	ITEM	FINISH
A ⚠7 ⚠10	NUT	CADMIUM PLATE PER AMS-QQ-P-416, TYPE II, CLASS 2, PLUS SOLID FILM LUBRICANT PER AS5272, TYPE I.
	BARREL	CADMIUM PLATE PER AMS-QQ-P-416, TYPE II, CLASS 2.
	PIN	NONE
F ⚠7 ⚠10	NUT	CADMIUM FLUOROBORATE PLATED PER NAS672 OR VACUUM DEPOSITED CADMIUN COATED PER AMS-C-8837, TYPE II, CLASS 3, PLUS SOLID FILM LUBRICANT PER AS5272, TYPE I.
	BARREL	CADMIUM FLUOROBORATE PLATED PER NAS672 OR VACUUM DEPOSITED CADMIUN COATED PER AMS-C-8837, TYPE II, CLASS 3
	PIN	NONE
G ⚠7 ⚠10	NUT	SILVER PLATE NUT THREADS PER AMS2410 OR AMS2411, PLUS SOLID FILM LUBRICANT PER AS5272, TYPE I. SILVER PLATING ON REMAINING NUT SURFACES IS OPTIONAL.
	BARREL	PASSIVATE PER AMS-QQ-P-35
	PIN	NONE
P ⚠10	NUT	PASSIVATE PER AMS-QQ-P-35 PLUS SOLID FILM LUBRICANT PER AS5272, TYPE I.
	BARREL	ALUMINUM COAT PER NAS4006
	PIN	NONE
D ⚠10	NUT	PASSIVATE PER AMS-QQ-P-35 PLUS SOLID FILM LUBRICANT PER AS5272, TYPE I.
	BARREL	PASSIVATE PER AMS-QQ-P-35
	PIN	NONE
X ⚠10	NUT	ADD AFTER "A", "F", "G", "P" AND "M" CODES TO INDICATE NO SOLID FILM LUBRICANT.
M ⚠9	NUT	CADMIUM PLATE PER AMS2401 PLUS SOLID FILM LUBRICANT PER AS5272, TYPE I.
	BARREL	CADMIUM PLATE PER AMS2401
	PIN	NONE

NOTE:

PARTS CONFORMING TO NAS577B AVAILABLE WITH THE FOLLOWING FINISH CODES ONLY "F", "FX", "A", AND "AX".

PARTS CONFORMING TO NAS577C AVAILABLE WITH THE FOLLOWING FINISH CODES ONLY "A", "AX", "GX", "M", AND "P".

REVISION (F) 26 FEB 2002

UNLESS OTHERWISE SPECIFIED
INTERPRET DIMENSIONS & TOLERANCES PER ANSI Y14.5M. ALL DIMENSIONS APPLY AFTER PLATING AND PRIOR TO THE ADDITION OF SOLID FILM LUBRICANT. 125 [3.2] ALL SURFACES

TOLERANCES				
.XX	.XXX	ANGLES	[X.X]	[X.XX]
±.03	±.010	±2°	±[0.8]	±[0.25]

DIMENSIONS IN [ ] ARE MILLIMETERS

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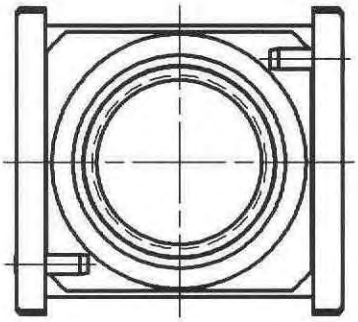
TELEPHONE: (32) 87-32.07.11

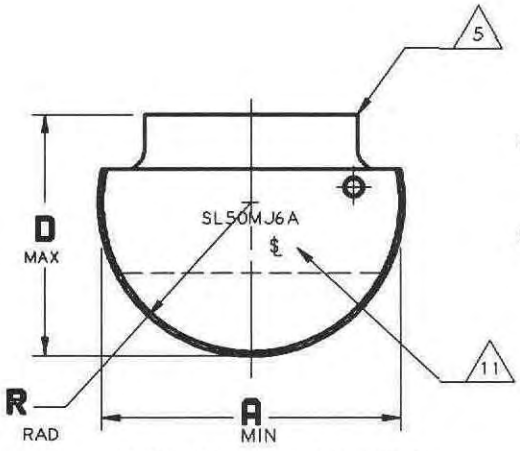
BARREL NUT, SELF-LOCKING, FLOATING. 180 KSI [1241 MPA]

SL50

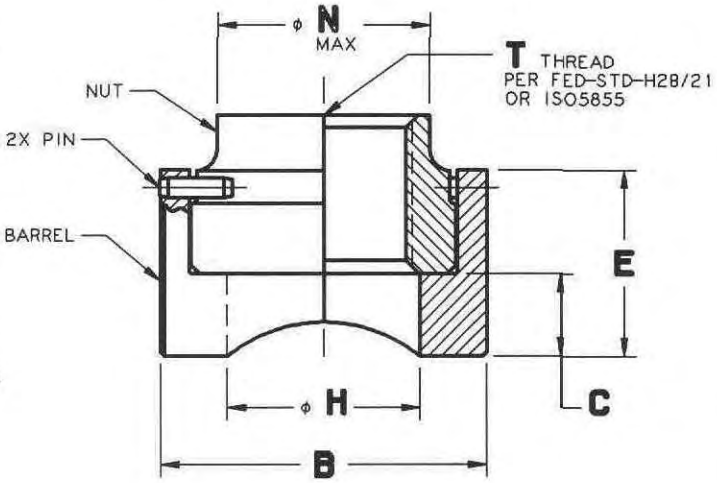
SHEET 2 OF 2

BARREL NUTS





FLATS ON BARREL PERMITTED TO THIS DIMENSION



NOTES:

1. MATERIAL: SEE TABLE II
2. HEAT TREAT: SEE TABLE II
3. FINISH: SEE TABLE III
4. NUT FLOAT IN CRADLE:
   TRANSVERSE – .028 [0.71]MINIMUM
   LENGTHWISE – PERMISSIBLE BUT NOT REQUIRED

△5 NUT SHANK DEFORMED IN THIS AREA TO PROVIDE LOCKING TORQUES PER LN65016.

6. MAGNETIC PARTICLE INSPECT PER ASTM E1444.
7. THE AXIAL TENSILE STRENGTHS SHOWN IN TABLE I SHALL BE MET WITH THE NUT ASSEMBLY INSTALLED IN A CLOSE FITTING STEEL JIG (HARDNESS 41 HRC MIN) WITH A HOLE NO LARGER THAN .003 [0.08] OVER 2 TIMES THE *MAXIMUM "A" RADIUS AND TESTED WITH A BOLT* OF SUFFICIENT STRENGTH TO CAUSE STRIPPING OF THE NUT THREADS.

△8 THE AXIAL TENSILE STRENGTHS SHOWN IN TABLE I HAVE BEEN CALCULATED USING THE TENSILE STRENGTHS OF 180 KSI UTS MIN (1250 MPa) BOLTS. THE CALCULATIONS ARE BASED ON THE FORMULA FOUND IN ANSI B1.1-1989 (FED-STD-H28) WHICH USES THE BASIC PITCH DIAMETER OF THE THREAD.

9. THESE PARTS ARE INTENDED FOR USE WITH 180 KSI [1241 MPa] UTS BOLTS.
10. REFER TO DRAWING SLR50M FOR RETAINERS TO BE USED WITH THESE NUT ASSEMBLIES

△11 MARKING: MARK SHUR-LOK PART NUMBER AND LOGO LASER MARKED PER AS478, METHOD 15B1 OR 15B2.

12. AVAILABLE IN METRIC "M" THREADS.

EXAMPLE OF PART CODING

SL50MJ 10 A N

- N — CODE "N" INDICATES NO THREAD LOCK, OMIT CODE LETTER FOR A THREAD LOCKED PART
- A — FINISH CODE (SEE TABLE II, SHEET 2)
- 10 — SIZE CODE (SEE TABLE I, SHEET 2)
- SL50MJ — BASIC PART NUMBER

REVISION (A) 27FEB02

UNLESS OTHERWISE SPECIFIED
INTERPRET DIMENSIONS & TOLERANCES PER ANSI Y14.5M. ALL DIMENSIONS APPLY AFTER PLATING AND PRIOR TO THE ADDITION OF SOLID FILM LUBRICANT. 125 [3.2] ALL SURFACES

TOLERANCES				
.XX	XXX	ANGLES	[X.X]	[X.X.X]
±.03	±.010	±2°	±[0.8]	±[0.25]

DIMENSIONS IN [ ] ARE MILLIMETERS

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BARREL NUT, SELF LOCKING, FLOATING, 180 KSI [1241 MPa]

SL50MJ

SHEET 1 OF 2

TABLE I

SIZE CODE	T THREAD PER FED-STD-H28/21 OR ISO5855	A MIN	B	C ±.005 ±[0.13]	D MAX	E +.000 −.010 +[0.00] −[0.25]	ϕ H +.010 −.000 +[0.25] −[0.00]	R RAD +.0015 −.0000 +[0.040] −[0.000]	N MAX	AXIAL TENSILE STRENGTH MIN (8) LB [NEWTON]
6	MJ6 X 1.0-4H5H	.513 [13.03]	.625 [15.88]	.125 [3.18]	.406 [10.31]	.320 [8.13]	.268 [6.81]	.2625 [6.668]	.375 [9.52]	5,575 [24,799]
8	MJ8 X 1.0-4H5H	.575 [14.60]	.688 [17.48]	.125 [3.18]	.468 [11.89]	.360 [9.14]	.346 [8.79]	.2935 [7.455]	.406 [10.31]	10,900 [48,486]
10	MJ10 X 1.25-4H5H	.669 [16.99]	.750 [19.05]	.156 [3.96]	.531 [13.49]	.420 [10.67]	.425 [10.80]	.3405 [8.649]	.500 [12.70]	17,000 [75,620]
12	MJ12 X 1.25-4H5H	.857 [21.77]	1.000 [25.40]	.219 [5.56]	.703 [17.86]	.540 [13.72]	.504 [12.80]	.4345 [11.036]	.625 [15.88]	25,700 [114,319]
14	MJ14 X 1.5-4H5H	.950 [24.13]	1.094 [27.79]	.250 [6.35]	.765 [19.43]	.590 [14.99]	.583 [14.81]	.4810 [12.217]	.688 [17.48]	34,700 [154,353]
16	MJ16 X 1.5-4H5H	1.045 [26.54]	1.125 [28.57]	.281 [7.14]	.844 [21.44]	.650 [16.51]	.661 [16.80]	.5285 [13.424]	.750 [19.05]	46,700 [207,732]
18	MJ18 X 1.5-4H5H	1.263 [32.08]	1.500 [38.10]	.344 [8.74]	1.062 [26.97]	.750 [19.05]	.740 [18.80]	.6375 [16.192]	.875 [22.23]	60,400 [268,673]
20	MJ20 X 1.5-4H5H	1.418 [36.02]	1.531 [38.89]	.375 [9.53]	1.156 [29.36]	.850 [21.59]	.819 [20.80]	.7150 [18.161]	1.000 [25.40]	75,800 [337,175]
22	MJ22 X 1.5-4H5H	1.418 [36.02]	1.531 [38.89]	.375 [9.53]	1.156 [29.36]	.850 [21.59]	.898 [22.81]	.7150 [18.161]	1.000 [25.40]	93,100 [414,129]
24	MJ24 X 2.0-4H5H	1.544 [39.22]	1.728 [43.89]	.375 [9.53]	1.281 [32.54]	.880 [22.35]	.976 [24.79]	.7780 [19.761]	1.125 [28.58]	107,300 [477,294]

TABLE II

ITEM	MATERIAL	HEAT TREAT
NUT	4340 ALLOY STEEL PER AMS6414	PER AMS2759/1 OR AMS2759/2 TO MEET THE AXIAL TENSILE STRENGTHS AS SHOWN IN TABLE I.
BARREL		
PINS	300 SERIES CRES	NONE

TABLE III

FINISH CODE	FINISH	
	CRADLE	NUT
A	CADMIUM PLATE PER AMS-QQ-P-416, TYPE II, CLASS 2	CADMIUM PLATE PER AMS-QQ-P-416, TYPE II, CLASS 2 AND DRY-FILM LUBE PER AS5272, TYPE I
F	CADMIUM PLATE PER NAS672	CADMIUM PLATE PER NAS672

REVISION (A) 27FEB02

UNLESS OTHERWISE SPECIFIED
INTERPRET DIMENSIONS & TOLERANCES PER ANSI Y14.5M. ALL DIMENSIONS APPLY AFTER PLATING AND PRIOR TO THE ADDITION OF SOLID FILM LUBRICANT. 125 [3.2] ALL SURFACES

TOLERANCES				
.XX	.XXX	ANGLES	[X.X]	[X.X.X]
±.03	±.010	±2°	±[0.8]	±[0.25]

DIMENSIONS IN [ ] ARE MILLIMETERS

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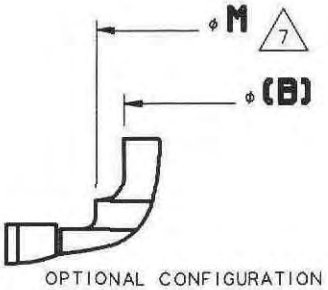
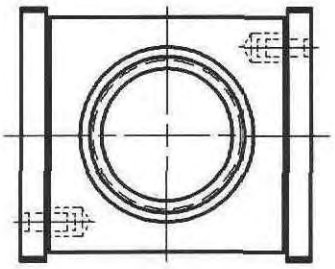
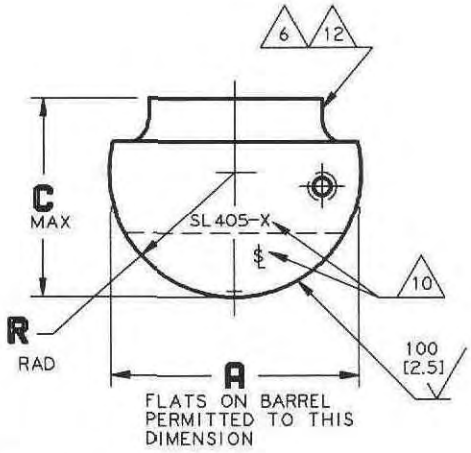
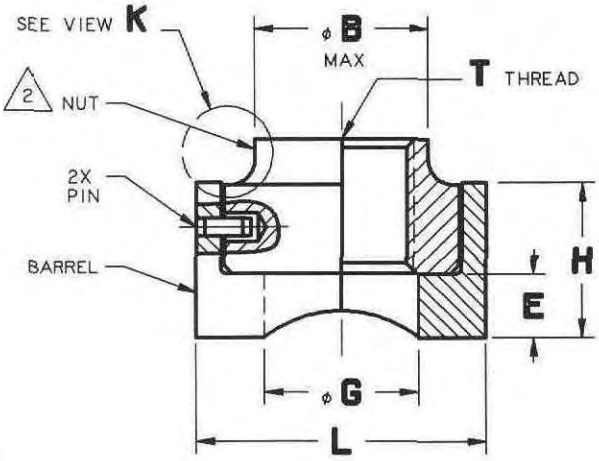
SL50MJ

BARREL NUT, SELF LOCKING, FLOATING, 180 KSI [1241 MPa]









NOTES:

1. TOTAL FLOAT:
   ACROSS BARREL: .028 [0.71] MIN
   LENGTHWISE: PERMISSIBLE BUT NOT REQUIRED

2. PENETRANT INSPECTION PER ASTM E1417, FOR -14,-16 AND -17 NUT ELEMENTS ONLY.

3. REFER TO SLR50 RETAINERS FOR RETAINER DATA.

4. AXIAL TENSILE STRENGTH SHALL BE MET WITH NUT INSTALLED IN A CLOSE FITTING STEEL JIG (HARDNESS 41 HRC MIN) WITH A HOLE NO LARGER THAN .003 [0.08] OVER 2 TIMES THE MAXIMUM "R" RADIUS AND TESTED WITH A 220 KSI [1517 MPa] UTS MIN BOLT.

5. DIAMETER PRIOR TO DEFORMATION FOR THREAD LOCK.

6. SHANK DEFORMED THIS AREA TO PROVIDE THREAD LOCK PER NASM25027 FOR 15 CYCLE REUSEABILITY EXCEPT SIZES -14, -16 AND -17 HAVE THE ADDITION OF EASE-OFF 990 LUBRICANT APPLIED TO NUT AND BOLT BETWEEN EACH CYCLE.

7. SHOULDER MFG OPTION WITHIN "M" DIAMETER. (SEE VIEW "K".

8. ALL DIMENSIONS APPLY PRIOR TO THE APPLICATION OF SOLID FILM LUBE. NOTE: NUT SHALL ALLOW 3/4 TURN ENTRY OF BOLT AFTER APPLICATION OF LUBRICANT.

9. MAGNETIC PARTICLE INSPECTION PER ASTM E1444.

10. MARKING: PARTS ARE PERMANENTLY MARKED WITH SHUR-LOK PART NUMBER AND SHUR-LOK LOGO - ONE END.

11. SAMPLES SHALL BE TAKEN FROM EACH LOT OF PARTS AND SHALL BE TESTED FOR STRESS DURABILITY AT ROOM TEMPERATURE PER NASM1312 TEST METHOD 5.

12. SUFFIX "SPI" INDICATES A NON-LOCKING BARREL.

13. STRESS EMBRITTLEMENT TEST PER PARA 3.4.1.5 OF NAS3350 CLASS V.

14. SUGGESTED INSTALLATION HOLE SIZE .004 [0.10] OVER 2 TIMES THE MAXIMUM "R" RADIUS.

EXAMPLE OF PART CODING

SL405 -16 A SPI (12)

- SPI — FINISH CODE (SEE TABLE II, SHEET 2)
- A — SIZE CODE (SEE TABLE I, SHEET 2)
- -16 — BASIC PART NUMBER
- SL405 — BASIC PART NUMBER

REVISION (AJ) 12 MARCH 2002

UNLESS OTHERWISE SPECIFIED
INTERPRET DIMENSIONS & TOLERANCES PER ANSI Y14.5M. ALL DIMENSIONS APPLY AFTER PLATING AND PRIOR TO THE ADDITION OF SOLID FILM LUBRICANT. 125 [3.2] ALL SURFACES

TOLERANCES				
.XX	.XXX	ANGLES	[X.X]	[X.XX]
±.03	±.010	±2°	±[0.8]	±[0.25]

DIMENSIONS IN [ ] ARE MILLIMETERS

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BARREL NUT, SELF-LOCKING, FLOATING, 220KSI[1517MPa]

SL405

SHEET 1 OF 2

BARREL NUTS

TABLE I

SIZE CODE	T THREAD PER MIL-S-8879	A MIN	◆B MAX ⚠5	C MAX	E ±.005 ±(0.13)	G +.010 −.000 +(0.25) −(0.00)	H +.000 −.010 +(0.00) −(0.25)	L	◆M MAX ⚠7	R +.0000 −.0015 +(0.000) −(0.038)	AXIAL TENSILE STRENGTH MIN ⚠4 LB [NEWTON]	APPROX WEIGHT PER 100 PCS LB [Kg]
-4	.2500-28 UNJF-3B	.513 [13.03]	.375 [9.52]	.406 [10.31]	.125 [3.18]	.281 [7.14]	.320 [8.13]	.625 [15.88]	.400 [10.16]	.2640 [6.706]	8,640 [38,433]	1.70 [.771]
-5	.3125-24 UNJF-3B	.575 [14.60]	.406 [10.31]	.468 [11.89]	.125 [3.18]	.344 [8.74]	.360 [9.14]	.688 [17.48]	.447 [11.35]	.2950 [7.493]	13,680 [60,852]	2.25 [1.021]
-6	.3750-24 UNJF-3B	.669 [16.99]	.500 [12.70]	.531 [13.49]	.156 [3.96]	.406 [10.31]	.420 [10.67]	.750 [19.05]	.541 [13.74]	.3420 [8.687]	20,400 [90,744]	3.30 [1.497]
-7	.4375-22 UNJF-3B	.763 [19.38]	.563 [14.30]	.625 [15.88]	.188 [4.78]	.469 [11.91]	.470 [11.94]	.875 [22.22]	.619 [15.72]	.3890 [9.881]	27,600 [122,771]	5.19 [2.354]
-8	.5000-20 UNJF-3B	.857 [21.77]	.625 [15.88]	.703 [17.86]	.219 [5.56]	.531 [13.49]	.540 [13.72]	1.000 [25.40]	.697 [17.70]	.4360 [11.074]	36,840 [163,872]	7.57 [3.434]
-9	.5625-18 UNJF-3B	.950 [24.13]	.688 [17.48]	.765 [19.43]	.250 [6.35]	.594 [15.09]	.590 [14.99]	1.094 [27.79]	.790 [20.07]	.4825 [12.256]	46,680 [207,643]	10.80 [4.899]
-10	.6250-18 UNJF-3B	1.045 [26.54]	.750 [19.05]	.844 [21.44]	.281 [7.14]	.656 [16.66]	.650 [16.51]	1.125 [28.57]	.885 [22.48]	.5300 [13.462]	58,440 [259,954]	11.96 [5.425]
-12	.7500-16 UNJF-3B	1.263 [32.08]	.875 [22.22]	1.062 [26.97]	.344 [8.74]	.781 [19.84]	.750 [19.05]	1.500 [38.10]	1.088 [27.64]	.6390 [16.231]	84,900 [377,654]	21.33 [9.675]
-14	.8750-14 UNJF-3B	1.418 [36.02]	1.000 [25.40]	1.156 [29.36]	.400 [10.16]	.906 [23.01]	.850 [21.59]	1.531 [38.89]	1.181 [30.00]	.7165 [18.199]	115,920 [515,638]	28.02 [12.710]
-16	1.0000-12 UNJF-3B	1.544 [39.22]	1.125 [28.57]	1.281 [32.54]	.440 [11.18]	1.032 [26.21]	.880 [22.35]	1.728 [43.89]	1.400 [35.56]	.7795 [19.799]	151,080 [672,037]	38.50 [17.463]
-17	1.0000-14 UNJS-3B	1.544 [39.22]	1.125 [28.57]	1.281 [32.54]	.440 [11.18]	1.032 [26.21]	.880 [22.35]	1.728 [43.89]	1.400 [35.56]	.7795 [19.799]	153,330 [682,046]	38.50 [17.463]
-18	1.1250-12 UNJF-3B	1.857 [47.17]	1.250 [31.75]	1.562 [39.67]	.440 [11.18]	1.156 [29.36]	1.230 [31.24]	2.063 [52.40]	1.697 [43.10]	.9360 [23.774]	193,200 [859,396]	78.00 [35.380]
-20	1.2500-12 UNJF-3B	2.107 [53.52]	1.375 [34.92]	1.813 [46.05]	.500 [12.70]	1.281 [32.54]	1.320 [33.53]	2.352 [59.74]	1.916 [48.67]	1.0610 [26.949]	241,200 [1,072,911]	120.00 [54.431]
-22	1.3750-12 UNJF-3B	2.357 [59.87]	1.500 [38.10]	2.000 [50.80]	.562 [14.27]	1.406 [35.71]	1.460 [37.08]	2.646 [67.21]	2.009 [51.03]	1.1860 [30.124]	295,200 [1,313,115]	160.00 [72.575]
-24	1.5000-12 UNJF-3B	2.607 [66.22]	1.625 [41.28]	2.187 [55.55]	.625 [15.88]	1.531 [38.89]	1.520 [38.61]	3.000 [76.20]	2.260 [57.40]	1.3110 [33.299]	354,000 [1,574,670]	215.00 [97.522]

TABLE II

FINISH CODE	ITEM	STANDARD FINISH
D	NUT	CADMIUM PLATE PER AMS2401 AND SOLID FILM LUBE PER AS5272, TYPE I
	BARREL	CADMIUM PLATE PER AMS2401
	PIN	PASSIVATE PER AMS-QQ-P-35
F	NUT	CADMIUM PLATE PER NAS672 AND SOLID FILM LUBE PER AS5272, TYPE I
	BARREL	CADMIUM PLATE PER NAS672
	PIN	PASSIVATE PER AMS-QQ-P-35
A	NUT	CADMIUM PLATE PER AMS-QQ-P-416, TYPE II, CLASS 2 AND SOLID FILM LUBE PER AS5272, TYPE I
	BARREL	CADMIUM PLATE PER AMS-QQ-P-416, TYPE II, CLASS 2
	PIN	PASSIVATE PER AMS-QQ-P-35
FN ⚠13	NUT	NICKEL CADMIUM DIFFUSED PLATE PER AMS2416, OR NAS672 CADMIUM PLATE, AND SOLID FILM LUBE PER AS5272, TYPE I
	BARREL	NICKEL CADMIUM DIFFUSED PLATE PER AMS2416, OR NAS672 CADMIUM PLATE
	PIN	PASSIVATE PER AMS-QQ-P-35

TABLE III

SIZE CODE	ITEM	MATERIAL	HEAT TREAT
-4 THRU -12 AND -18 THRU -24	NUT	4340 ALLOY STEEL PER AMS6414 ⚠9	HEAT TREAT 38-44 HRC PER AMS2759/1
	BARREL		
	PIN	300 SERIES CRES	NONE
-14 -16 AND -17	NUT	INCO 718 PER AMS5662 (CHEMISTRY ONLY) 200 KSI UTS MIN ⚠2	NONE
	BARREL	4340 ALLOY STEEL PER AMS6414 ⚠9	HEAT TREAT 38-44 HRC PER AMS2759/1
	PIN	300 SERIES CRES	NONE

REVISION (AJ) 12 MARCH 2002

UNLESS OTHERWISE SPECIFIED INTERPRET DIMENSIONS & TOLERANCES PER ANSI Y14.5M. ALL DIMENSIONS APPLY AFTER PLATING AND PRIOR TO THE ADDITION OF SOLID FILM LUBRICANT. 125 [3.2] ALL SURFACES

TOLERANCES				
XX	XXX	ANGLES	[X.X]	[X.X.X]
±.03	±.010	±2°	±[0.8]	±[0.25]

DIMENSIONS IN [ ] ARE MILLIMETERS

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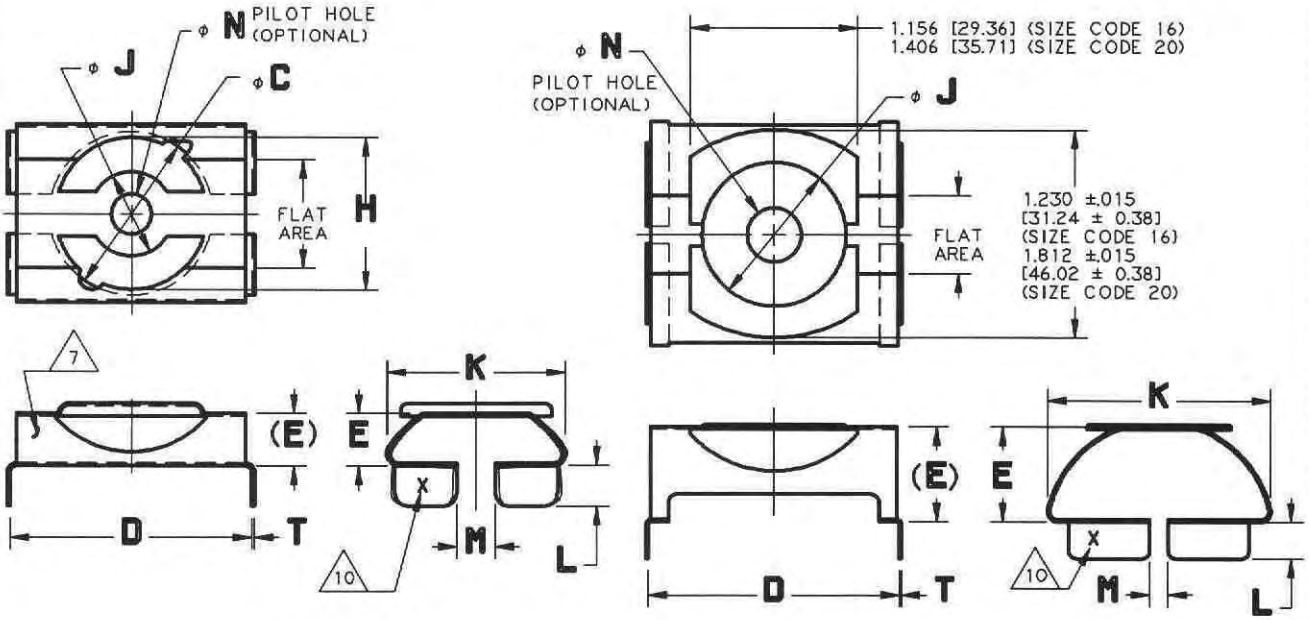
SL405

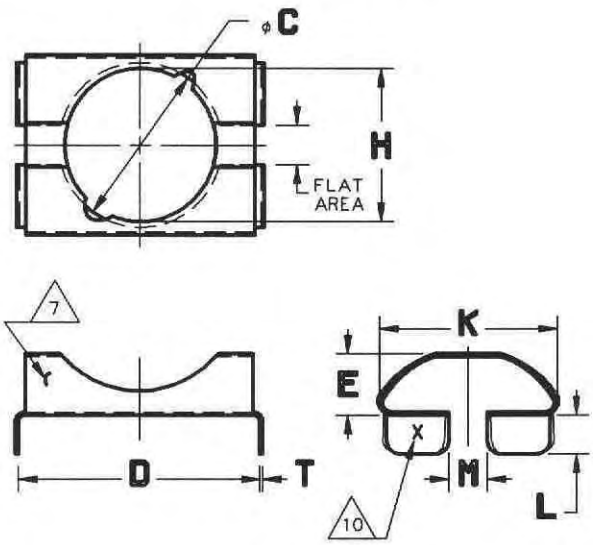
BARREL NUT, SELF-LOCKING, FLOATING, 220 KSI [1517 MPa]

SHEET 2 OF 2

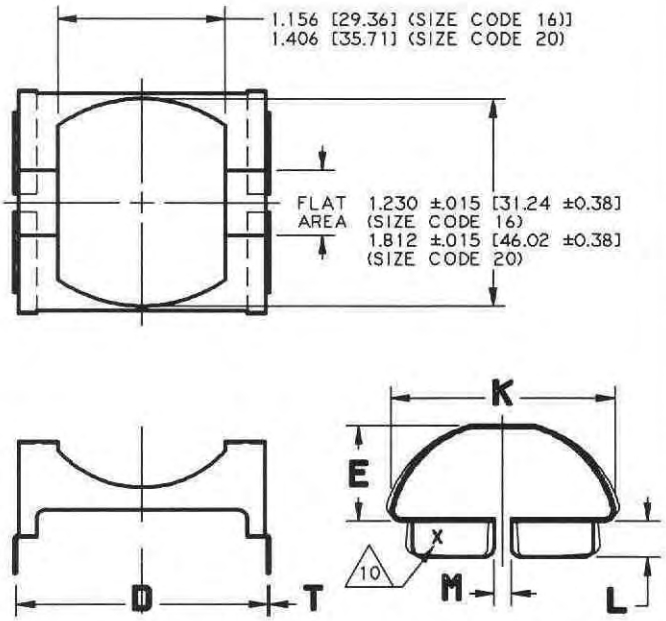


INDEX TYPE "A"

INDEX TYPE "A" – ALTERNATE △9
-16 AND -20 CONFIGURATION



CLEARANCE TYPE "B"



CLEARANCE TYPE "B" – ALTERNATE △9
-16 AND -20 CONFIGURATION

EXAMPLE OF PART CODING

SLR50 C 4 A SP11

- SP11 — INDICATES SPECIAL PART △9
- A — TYPE CODE (INDEX TYPE – "A", CLEARANCE TYPE – "B")
- 4 — SIZE CODE (SEE TABLE I, SHEET 2) △8
- C — MATERIAL CODE (SEE TABLE II, SHEET 2)
- SLR50 — BASIC PART NUMBER

NOTES: SEE SHEET 2.

REVISION (P) 02 APRIL 2002

UNLESS OTHERWISE SPECIFIED
INTERPRET DIMENSIONS & TOLERANCES PER ANSI Y14.5M. ALL DIMENSIONS APPLY AFTER PLATING AND PRIOR TO THE ADDITION OF SOLID FILM LUBRICANT. 125 [3.2] ALL SURFACES

TOLERANCES				
.XX	.XXX	ANGLES	[X.X]	[X.XX]
±.03	±.010	±2°	±[0.8]	±[0.25]

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SLR50

RETAINER, FLOATING BARREL NUT

SHEET 1 OF 2

TABLE I

SIZE CODE	◆C	D +.015 −.000 +[0.38] −[0.00]	E MAX	H ±.015 ±[0.38]	◆J +.000 −.015 +[0.00] −[0.38]	K REF	L ±.030 ±[0.76]	M MIN	◆N OPT	T MIN	MINIMUM PUSH OUT FORCE ⚠11 LB [NEWTON]
3	.375 [9.52]	.548 [13.92]	.152 [3.86]	.346 [8.79]	.200 [5.08]	.400 [10.16]	.090 [2.29]	.060 [1.52]	–	.007 [0.18]	–
C3 SP10	.375 [9.52]	.505 [12.83]	.152 [3.86]	.346 [8.79]	.200 [5.08]	.338 [8.59]	.090 [2.29]	.030 [0.76]	–	.007 [0.18]	– ⚠6 ⚠8
4	.453 [11.51]	.625 [15.88]	.211 [5.36]	.406 [10.31]	.260 [6.60]	.520 [13.21]	.125 [3.18]	.060 [1.52]	–	.007 [0.18]	2 [8.9]
5	.500 [12.70]	.688 [17.48]	.234 [5.94]	.469 [11.91]	.322 [8.18]	.578 [14.68]	.125 [3.18]	.060 [1.52]	–	.009 [0.23]	2 [8.9]
6	.594 [15.09]	.750 [19.05]	.268 [6.81]	.531 [13.49]	.385 [9.78]	.671 [17.04]	.125 [3.18]	.060 [1.52]	–	.009 [0.23]	2 [8.9]
7	.672 [17.07]	.875 [22.22]	.311 [7.90]	.594 [15.09]	.447 [11.35]	.765 [19.43]	.188 [4.78]	.060 [1.52]	–	.012 [0.30]	2 [8.9]
8	.750 [19.05]	1.000 [25.40]	.335 [8.51]	.656 [16.66]	.510 [12.95]	.844 [21.44]	.188 [4.78]	.060 [1.52]	–	.012 [0.30]	2 [8.9]
9	.843 [21.41]	1.094 [27.79]	.379 [9.63]	.719 [18.26]	.572 [14.53]	.938 [23.82]	.250 [6.35]	.095 [2.41]	.188 [4.78]	.012 [0.30]	2 [8.9]
10	.938 [23.82]	1.125 [28.56]	.413 [10.49]	.781 [19.84]	.635 [16.13]	1.031 [26.19]	.250 [6.35]	.095 [2.41]	.250 [6.35]	.012 [0.30]	2 [8.9]
12	1.141 [28.98]	1.500 [38.10]	.531 [13.49]	.906 [23.01]	.760 [19.30]	1.266 [32.16]	.250 [6.35]	.095 [2.41]	.312 [7.92]	.012 [0.30]	2 [8.9]
14	1.234 [31.34]	1.531 [38.89]	.588 [14.94]	1.031 [26.19]	.885 [22.48]	1.406 [35.71]	.250 [6.35]	.095 [2.41]	.344 [8.74]	.015 [0.38]	2 [8.9]
16	1.453 [36.91]	1.728 [43.89]	.683 [17.35]	1.156 [29.36]	1.010 [25.65]	1.547 [39.29]	.250 [6.35]	.095 [2.41]	.375 [9.52]	.015 [0.38]	2 [8.9]
18	1.750 [44.45]	2.063 [52.40]	.645 [16.38]	1.281 [32.54]	1.135 [28.83]	1.781 [45.24]	.250 [6.35]	.095 [2.41]	–	.015 [0.38]	5 [22.2]
20	1.969 [50.01]	2.352 [59.74]	.805 [20.45]	1.406 [35.71]	1.260 [32.00]	2.062 [52.37]	.250 [6.35]	.095 [2.41]	–	.015 [0.38]	6 [26.7]
22	2.062 [52.37]	2.646 [67.21]	.915 [23.24]	1.531 [38.89]	1.385 [35.18]	2.203 [55.96]	.250 [6.35]	.095 [2.41]	–	.015 [0.38]	8 [35.6]
24	2.313 [58.75]	3.000 [76.20]	1.105 [28.07]	1.656 [42.06]	1.510 [38.35]	2.594 [65.89]	.250 [6.35]	.095 [2.41]	–	.015 [0.38]	10 [44.5]

TABLE II

MATL CODE	MATERIAL	HEAT TREAT	FINISH
–	CARBON STEEL[1] AISI 1050 PER AMS5085. ALTERNATE MATL. AISI 1050 PER ASTM-A-684	HEAT TREAT TO 40-49 HRC PER AMS2759	CAD PLATE PER AMS-QQ-P-416, TYPE II, CLASS 2
C	INCONEL X-750 PER AMS5542 ⚠4	PRECIPITATION HARDEN PER AMS5542, (150 KSI UTS MIN)	PASSIVATE PER AMS-QQ-P-35
CA	INCONEL X-750 PER AMS5542 ⚠4	PRECIPITATION HARDEN PER AMS5542, (150 KSI UTS MIN)	CAD PLATE PER AMS-QQ-P-416, TYPE II, CLASS 2 ⚠5

NOTES:

1. THIS PART MEETS THE REQUIREMENTS OF NAS578.
2. RETAINERS UNDER THIS PART NUMBER MUST FUNCTION WITH ALL NUTS FURNISHED UNDER CORRESPONDING SIZE CODES OF DRAWING NUMBERS SL50 (NAS577), SL405, SL4001 AND SL416 FLOATING BARREL NUT. (−16 RETAINER SHALL ALSO FUNCTION WITH −17 NUT).
3. RETAINERS SHALL BE FURNISHED IN THE OPEN POSITION AS SHOWN BY PHANTOM LINES.

⚠4 MAGNETIC PERMEABILITY SHALL BE LESS THAN 2.0 (AIR = 1.0) FOR A FIELD STRENGTH OF H = 200 OERSTEDS. MAGNETIC PERMEABILITY SHALL BE CHECKED PER ASTM A342. (THIS IS NOT A NAS578 REQUIREMENT)

⚠5 NOT A STANDARD NAS578 FINISH.

⚠6 C3 — SP10 FOR USE WITH SL4113-3-BAC (BACN10HC) — A OR B

⚠7 FOR C3 — SP10 ONLY, LASER MARK "BAC" AND SHUR-LOK — A OR B — LOGO THIS SURFACE.

⚠8 SLR50C3 — SP10 IS SIMILAR TO BACR10AL. — A OR B

9. SP11 INDICATES PART WITH ALTERNATE CONFIGURATION FOR −16 AND −20 ONLY.

⚠10 MARKING: MARK LETTER "X" ON ANY TANG DESIGNATES INCONEL PART. MARKING RAISED OR DEPRESSED .005 MAXIMUM.

⚠11 TYPE "B" RETAINERS AND NUT ASSEMBLIES SHALL REQUIRE A PUSH OUT FORCE IN ACCORDANCE WITH THE TABULATED VALUES WHEN INSTALLED IN THE TEST HOLE SPECIFIED IN NAS577.

12. HEAT TREAT WARPAGE MAY OCCUR WHICH CAN CAUSE VARIATIONS IN THE DIMENSIONS SHOWN IN TABLE I. THESE VARIATIONS ARE PERMISSIBLE PROVIDED THE RETAINER WHEN MATED WITH THE CORRESPONDING SIZE BARREL NUT MEETS A SATISFACTORY FUNCTIONAL INSPECTION. A SATISFACTORY FUNCTIONAL INSPECTION IS ONE IN WHICH THE RETAINER/BARREL NUT CAN BE READILY INSTALLED IN THE APPROPRIATE HOLE SIZE AS SPECIFIED IN THE BARREL NUT STANDARD.

REVISION (P) 02 APRIL 2002

UNLESS OTHERWISE SPECIFIED
INTERPRET DIMENSIONS & TOLERANCES PER ANSI Y14.5M. ALL DIMENSIONS APPLY AFTER PLATING AND PRIOR TO THE ADDITION OF SOLID FILM LUBRICANT. 125 [3.2] ALL SURFACES

TOLERANCES				
.XX	.XXX	ANGLES	[X.X]	[X.XX]
±.03	±.010	±2°	±[0.8]	±[0.25]

DIMENSIONS IN [ ] ARE MILLIMETERS

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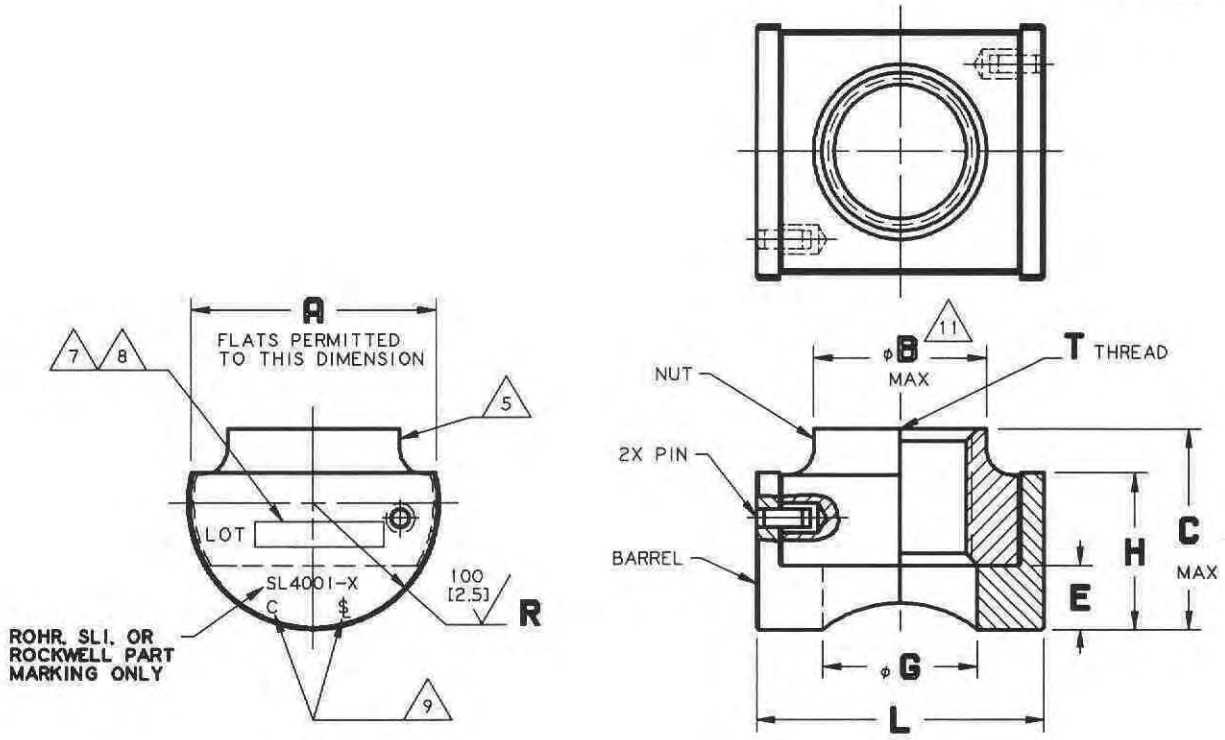
SLR50

RETAINER,
FLOATING BARREL NUT

SHEET 2 OF 2



NOTES:

1. TOTAL FLOAT
   ACROSS BARREL: .028 [0.71] MIN
   LENGTHWISE: PERMISSIBLE BUT NOT REQUIRED
2. PENETRANT INSPECTION PER ASTM E1417.
3. REFER TO SLR4001 SERIES RETAINERS FOR RETAINER DATA.

△4 AXIAL TENSILE STRENGTH VALUES SHALL BE MET WITH NUT INSTALLED IN A CLOSE FITTING STEEL JIG (HARDNESS 41 HRC MIN) WITH A HOLE NO LARGER THAN .003 [0.08] OVER 2 TIMES THE MAXIMUM "R" RADIUS AND TESTED WITH A 220 KSI [1517 MPa] UTS MIN BOLT.

△5 NUT SHANK DEFORMED IN THIS AREA TO PRODUCE LOCKING TORQUES PER NASM25027.

6. MAGNETIC PERMEABILITY TO BE LESS THAN 2.0 (AIR = 1.0) FOR A FIELD STRENGTH OF H = 200 OERSTEDS. MAGNETIC PERMEABILITY PER ASTM A342 OR EQUIVALENT.

△7 FOR PARTS ORDERED BY ROHR CORP OR SLI ONLY MARK BOTH ENDS OF BARREL WITH LOT IDENTIFICATION, SHUR-LOK PART NUMBER, SHUR-LOK LOGO AND MATERIAL IDENT CODE AS SHOWN IN TABLE II. CHARACTER HEIGHT .040 INCH [1.02] MINIMUM. MARKING METHOD ELECTROETCH, METAL STAMP, VIBROETCH OR LASER ETCH.

△8 FOR PARTS ORDERED TO ROCKWELL INTERNATIONAL STANDARD ME114-0032, LASER MARK PER AS478, METHOD 15B2. THE MANUFACTURING LOT NUMBER, AND THE SHUR-LOK PART NUMBER – BOTH ENDS, AND THE SHUR-LOK LOGO AND MATERIAL IDENT CODE AS SHOWN IN TABLE II – ONE END ONLY. IMPRESSION STAMPING PER AS478 MAY BE USED, BUT SHALL BE LIMITED TO THE SHUR-LOK LOGO AND MATERIAL IDENT CODE ONLY. CHARACTER HEIGHT = .040 [1.02] MINIMUM: MARKING TO BE CLEARLY VISIBLE AFTER RETAINER IS ASSEMBLED.

△9 STANDARD MARKING SHALL CONSIST OF THE SHUR-LOK LOGO AND THE MATERIAL IDENT CODE SHOWN IN TABLE II ONLY.

10. SUGGESTED INSTALLATION HOLE SIZE .004 [0.10] OVER 2 TIMES THE MAXIMUM "R" RADIUS.

△11 DIAMETER PRIOR TO DEFORMATION FOR THREAD LOCK.

EXAMPLE OF PART CODING

SL4001 -12 M SP1

- "SP1" INDICATES NO THREAD LOCK; NO CODE INDICATES THREAD LOCK
- FINISH CODE (SEE TABLE III, SHEET 2)
- SIZE CODE (SEE TABLE I, SHEET 2)
- BASIC PART NUMBER

REVISION (AK) 21 MARCH 2002

UNLESS OTHERWISE SPECIFIED
INTERPRET DIMENSIONS & TOLERANCES PER ANSI Y14.5M. ALL DIMENSIONS APPLY AFTER PLATING AND PRIOR TO THE ADDITION OF SOLID FILM LUBRICANT. 125 [3.2] ALL SURFACES

TOLERANCES				
.XX	.XXX	ANGLES	[X.X]	[X.X.X]
±.03	±.010	±2°	±[0.8]	±[0.25]

DIMENSIONS IN [ ] ARE MILLIMETERS

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BARREL NUT, NON MAGNETIC, SELF LOCKING. FLOATING. 220 KSI [1517 MPa]

SL4001

SHEET 1 OF 2

BARREL NUTS

TABLE I

SIZE CODE	T THREAD PER MIL-S-8879	A FLATS MIN	ϕB MAX (11)	C MAX	E ±.005 ±[0.13]	ϕG +.010 −.000 +[0.25] −[0.00]	L	H +.000 −.010 +[0.00] −[0.25]	R +.0000 −.0015 +[0.000] −[0.038]	AXIAL TENSILE STRENGTH MIN (4) LB [NEWTON]	APPROX WEIGHT PER 100 PIECES LB [Kg]
-4	.2500-28 UNJF-3B	.513 [13.03]	.375 [9.53]	.406 [10.31]	.125 [3.18]	.281 [7.14]	.625 [15.88]	.320 [8.13]	.2460 [6.706]	8,870 [39,456]	1.70 [.771]
-5	.3125-24 UNJF-3B	.575 [14.60]	.406 [10.31]	.468 [11.89]	.125 [3.18]	.344 [8.74]	.688 [17.48]	.360 [9.14]	.2950 [7.493]	14,100 [65,720]	2.25 [1.021]
-6	.3750-24 UNJF-3B	.669 [16.99]	.500 [12.70]	.531 [13.49]	.156 [3.96]	.406 [10.31]	.750 [19.05]	.420 [10.67]	.3420 [8.687]	20,900 [92,968]	3.30 [1.497]
-7	.4375-20 UNJF-3B	.763 [19.38]	.563 [14.30]	.625 [15.88]	.188 [4.78]	.469 [11.91]	.875 [22.22]	.470 [11.94]	.3890 [9.881]	28,300 [125,885]	5.19 [2.354]
-8	.5000-20 UNJF-3B	.857 [21.77]	.625 [15.88]	.703 [17.86]	.219 [5.56]	.531 [13.49]	1.000 [25.40]	.540 [13.72]	.4360 [11.074]	37,800 [168,143]	7.57 [3.434]
-9	.5625-18 UNJF-3B	.950 [24.13]	.688 [17.48]	.765 [19.43]	.250 [6.35]	.594 [15.09]	1.094 [27.79]	.590 [14.99]	.4825 [12.256]	47,900 [213,070]	10.80 [4.899]
-10	.6250-18 UNJF-3B	1.045 [26.54]	.750 [19.05]	.844 [21.44]	.281 [7.14]	.656 [16.66]	1.125 [28.57]	.650 [16.51]	.5300 [13.462]	59,900 [266,449]	11.96 [5.425]
-12	.7500-16 UNJF-3B	1.263 [32.08]	.875 [22.22]	1.062 [26.97]	.344 [8.74]	.781 [19.84]	1.500 [38.10]	.750 [19.05]	.6390 [16.231]	86,900 [386,550]	21.33 [9.675]
-14	.8750-14 UNJF-3B	1.418 [36.02]	1.000 [25.40]	1.156 [29.36]	.400 [10.16]	.906 [23.01]	1.531 [38.89]	.850 [21.59]	.7165 [18.199]	119,000 [529,338]	28.02 [12.710]
-16	1.0000-12 UNJF-3B	1.544 [39.22]	1.125 [28.57]	1.281 [32.54]	.440 [11.18]	1.032 [26.21]	1.728 [43.89]	.880 [22.35]	.7795 [19.799]	155,000 [689,474]	38.50 [17.463]
-17	1.0000-14 UNJS-3B	1.544 [39.22]	1.125 [28.57]	1.281 [32.54]	.440 [11.18]	1.032 [26.21]	1.728 [43.89]	.880 [22.35]	.7795 [19.799]	155,000 [689,474]	38.50 [17.463]
-18	1.1250-12 UNJF-3B	1.857 [47.17]	1.250 [31.75]	1.562 [39.67]	.440 [11.18]	1.156 [29.36]	2.063 [52.40]	1.230 [31.24]	.9360 [23.774]	198,000 [880,748]	78.00 [35.380]
-20	1.2500-12 UNJF-3B	2.107 [53.52]	1.375 [34.92]	1.813 [46.05]	.500 [12.70]	1.281 [32.54]	2.352 [59.74]	1.320 [33.53]	1.0610 [26.949]	247,000 [1,098,711]	120.00 [54.431]

TABLE II

SIZE CODE	ITEM	MATERIAL	HEAT TREAT	MATL IDENT CODE (7) (8) (9)
-4 THRU -10	NUT	A286 CRES PER AMS5737 (CHEMISTRY ONLY)	AGE HARDEN 200 KSI [1379 MPa] UTS MIN	C
	BARREL			
	PIN	302 CRES PER AMS5516	NONE	
-12 THRU -20	NUT	INCO 718 PER AMS5662 (CHEMISTRY ONLY)	AGE HARDEN 200 KSI [1379 MPa] UTS MIN	X
	BARREL			
	PIN	302 CRES PER AMS5516	NONE	

TABLE III

FINISH CODE	ITEM	FINISH
M	NUT	PASSIVATE PER AMS-QQ-P-35 AND SOLID FILM LUBE PER AS5272, TYPE I
	BARREL	PASSIVATE PER AMS-QQ-P-35
	PIN	PASSIVATE PER AMS-QQ-P-35
NO LETTER	NUT	SILVER PLATE PER AMS 2410
	BARREL	PASSIVATE PER AMS-QQ-P-35
	PIN	PASSIVATE PER AMS-QQ-P-35
SP2	NUT	CAD PLATE PER AMS-QQ-P-416, TYPE II, CLASS 2 AND SOLID FILM LUBE PER AS5272, TYPE I
	BARREL	CAD PLATE PER AMS-QQ-P-416, TYPE II, CLASS 2
	PIN	PASSIVATE PER AMS-QQ-P-35

REVISION (AK) 21 MARCH 2002

UNLESS OTHERWISE SPECIFIED
INTERPRET DIMENSIONS & TOLERANCES PER ANSI Y14.5M. ALL DIMENSIONS APPLY AFTER PLATING AND PRIOR TO THE ADDITION OF SOLID FILM LUBRICANT. 125 [3.2] ALL SURFACES

TOLERANCES .XX	.XXX	ANGLES	[X.X]	[X.XX]
±.03	±.010	±2°	±[0.8]	±[0.25]

DIMENSIONS IN [ ] ARE MILLIMETERS

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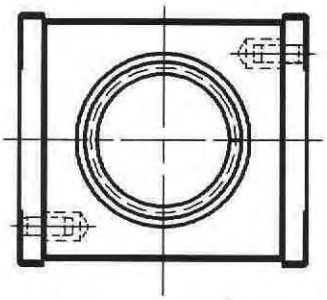
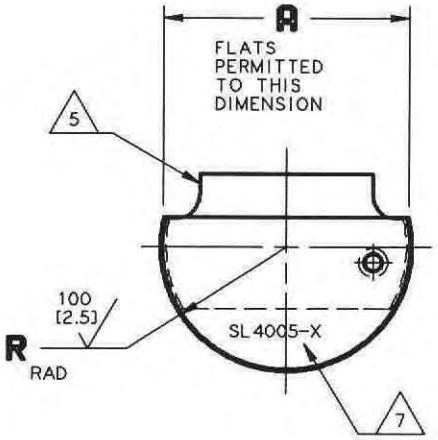
SL4001

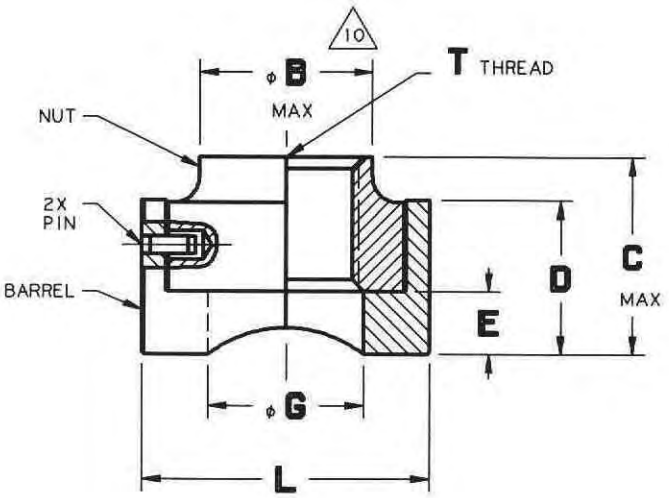
BARREL NUT, NON MAGNETIC, SELF LOCKING. FLOATING. 220 KSI [1517 MPa]

SHEET 2 OF 2

BARREL NUTS







NOTES:

1. TOTAL FLOAT
   ACROSS BARREL .028 [0.71] MIN
   LENGTHWISE: PERMISSIBLE BUT NOT REQUIRED
2. PENETRANT INSPECTION PER ASTM E1417.
3. REFER TO SLR4001 SERIES RETAINERS FOR RETAINER DATA.
   NOTE: THE STANDARD SLR4001 SERIES RETAINERS FOR SIZES -16 AND -20, CREATE AN INTERFERENCE WITH THE NUT ELEMENT AND WILL NOT PERMIT INSTALLATION. USE THE ALTERNATE CONFIGURATION RETAINERS AS SHOWN ON DRAWING SL4001. FOR THESE SIZES, PART NUMBERS SHOULD SPECIFY THE "SP11" SUFFIX.

△4 AXIAL TENSILE STRENGTH VALUES SHALL BE MET WITH NUT INSTALLED IN A CLOSE FITTING STEEL JIG, (HARDNESS 41 HRC MIN), WITH A HOLE NO LARGER THAN .003 [0.08] OVER 2 TIMES THE MAXIMUM "R" RADIUS AND TESTED WITH A 220 KSI [1517 MPa] UTS MIN BOLT.

△5 NUT SHANK DEFORMED IN THIS AREA TO PRODUCE LOCKING TORQUES PER NASM25027.

6. MAGNETIC PERMEABILITY TO BE LESS THAN 2.0 (AIR = 1.0) FOR A FIELD STRENGTH OF H = 200 OERSTEDS. MAGNETIC PERMEABILITY PER ASTM A342 OR EQUIVALENT.

△7 MARKING: PARTS PERMANENTELY MARKED (LASER MARKED AT SHUR-LOK OPTION) WITH SHUR-LOK LOGO - ONE END. RUBBER STAMPED WITH SHUR-LOK PART NUMBER (LASER MARKED AT SHUR-LOK OPTION) OTHER END.

△8 ALTERNATE MATERIAL:
INCONEL 718 PER AMS5662 (CHEMISTRY ONLY).

9. SUGGESTED INSTALLATION HOLE SIZE .004 [0.10] OVER 2 TIMES THE MAXIMUM "R" RADIUS.

△10 DIAMETER PRIOR TO DEFORMATION FOR THREAD LOCK.

EXAMPLE OF PART CODING

SL4005 -6 P SP1

- SP1 - "SP1" INDICATES NO THREAD LOCK
  NO CODE INDICATES THREAD LOCK
- P - FINISH CODE (SEE TABLE III, SHEET 2)
- -6 - SIZE CODE (SEE TABLE I , SHEET 2)
- SL4005 - BASIC PART NUMBER

REVISION (P) 01 MAR 2002

UNLESS OTHERWISE SPECIFIED
INTERPRET DIMENSIONS & TOLERANCES PER ANSI Y14.5M. ALL DIMENSIONS APPLY AFTER PLATING AND PRIOR TO THE ADDITION OF SOLID FILM LUBRICANT. 125 [3.2] ALL SURFACES
TOLERANCES

.XX	.XXX	ANGLES	[X.X]	[X.XX]
±.03	±.010	±2°	±[0.8]	±[0.25]

DIMENSIONS IN [ ] ARE MILLIMETERS

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BARREL NUT, NON-MAGNETIC, LIGHTWEIGHT, SELF-LOCKING, FLOATING, 220 KSI [1517 MPa]

SL4005

SHEET 1 OF 2

TABLE I

SIZE CODE	T THREAD PER MIL-S-8879	⌀A FLATS MIN	⌀B MAX (10)	C MAX	D +.000 −.010 +[0.00] −[0.25]	E ±.005 ±[0.13]	G +.010 −.000 +[0.25] −[0.00]	L	R +.0000 −.0015 +[0.000] −[0.038]	AXIAL TENSILE STRENGTH MIN (4) LB [NEWTON]	APPROX WEIGHT PER 100 PCS LB [Kg]
-4	.2500-28 UNJF-3B	.513 [13.03]	.375 [9.53]	.406 [10.31]	.320 [8.13]	.125 [3.18]	.281 [7.14]	.625 [15.88]	.2640 [6.706]	8,870 [39,456]	1.41 [.640]
-5	.3125-24 UNJF-3B	.575 [14.60]	.406 [10.31]	.468 [11.89]	.360 [9.14]	.125 [3.18]	.344 [8.74]	.688 [17.48]	.2950 [7.493]	14,100 [62,720]	1.86 [.844]
-6	.3750-24 UNJF-3B	.669 [16.99]	.500 [12.70]	.531 [13.49]	.420 [10.67]	.156 [3.96]	.406 [10.31]	.750 [19.05]	.3420 [8.687]	20,900 [92,968]	2.73 [1.238]
-7	.4375-20 UNJF-3B	.763 [19.38]	.563 [14.30]	.625 [15.88]	.470 [11.94]	.188 [4.78]	.469 [11.91]	.875 [22.22]	.3890 [9.881]	28,300 [125,885]	4.30 [1.950]
-8	.5000-20 UNJF-3B	.857 [21.77]	.625 [15.88]	.703 [17.86]	.540 [13.72]	.219 [5.56]	.531 [13.49]	1.000 [25.40]	.4360 [11.074]	37,800 [168,143]	6.27 [2.844]
-9	.5625-18 UNJF-3B	.950 [24.13]	.688 [17.48]	.765 [19.43]	.590 [14.99]	.250 [6.35]	.594 [15.09]	1.094 [27.79]	.4825 [12.256]	47,900 [213,070]	8.94 [4.055]
-10	.6250-18 UNJF-3B	1.045 [26.54]	.750 [19.05]	.844 [21.44]	.650 [16.51]	.281 [7.14]	.656 [16.66]	1.125 [28.57]	.5300 [13.462]	59,900 [266,448]	9.90 [4.490]
-12	.7500-16 UNJF-3B	1.263 [32.08]	.875 [22.22]	1.062 [26.97]	.750 [19.05]	.344 [8.74]	.781 [19.84]	1.500 [38.10]	.6390 [16.231]	86,900 [386,550]	17.66 [8.010]
-14	.8750-14 UNJF-3B	1.418 [36.02]	1.000 [25.40]	1.156 [29.36]	.850 [21.59]	.400 [10.16]	.906 [23.01]	1.531 [38.89]	.7165 [18.199]	119,000 [529,338]	23.20 [10.523]
-16	1.0000-12 UNJF-3B	1.544 [39.22]	1.125 [28.57]	1.281 [32.54]	.880 [22.35]	.440 [11.18]	1.032 [26.21]	1.728 [43.89]	.7795 [19.799]	145,000 [644,992]	31.88 [14.460]
-17	1.0000-14 UNJS-3B	1.544 [39.22]	1.125 [28.57]	1.281 [32.54]	.880 [22.35]	.440 [11.18]	1.032 [26.21]	1.728 [43.89]	.7795 [19.799]	145,000 [644,992]	31.88 [14.460]
-18	1.1250-12 UNJF-3B	1.857 [47.17]	1.250 [31.75]	1.562 [39.67]	1.230 [31.24]	.440 [11.18]	1.156 [29.36]	2.063 [52.40]	.9360 [23.774]	198,000 [880,748]	64.58 [29.293]
-20	1.2500-12 UNJF-3B	2.107 [53.52]	1.375 [34.92]	1.813 [46.05]	1.320 [33.53]	.500 [12.70]	1.281 [32.54]	2.352 [59.74]	1.0610 [26.949]	247,000 [1,098,710]	99.36 [45.069]

TABLE II

SIZE CODE	ITEM	MATERIAL	HEAT TREAT
-4 THRU -10	NUT	A286 CRES PER AMS5737 (CHEMISTRY ONLY) (8)	AGE HARDEN 200 KSI [1379 MPa] UTS MIN
	BARREL	TITANIUM 6AL-4V-TI STA COND PER AMS4965	NONE
	PIN	302 CRES PER AMS5516	NONE
-12 THRU -20	NUT	INCO 718 PER AMS5662 (CHEMISTRY ONLY)	AGE HARDEN 200 KSI [1379 MPa] UTS MIN
	BARREL	TITANIUM 6AL-4V-TI STA COND PER AMS4965	NONE
	PIN	302 CRES PER AMS5516	NONE

TABLE III

FINISH CODE	ITEM	FINISH
P	NUT	SILVER PLATE PER AMS2410
	BARREL	NONE
	PIN	PASSIVATE PER AMS-QQ-P-35
NO LETTER	NUT	PASSIVATE PER AMS-QQ-P-35 AND SOLID FILM LUBE PER AS5272, TYPE I
	BARREL	NONE
	PIN	PASSIVATE PER AMS-QQ-P-35
SP2	NUT	CAD PLATE PER AMS-QQ-P-416, TYPE II, CLASS 2 AND SOLID FILM LUBE PER AS5272, TYPE I
	BARREL	NONE
	PIN	PASSIVATE PER AMS-QQ-P-35

REVISION (P) 07 MAR 2002

UNLESS OTHERWISE SPECIFIED
INTERPRET DIMENSIONS & TOLERANCES PER ANSI Y14.5M. ALL DIMENSIONS APPLY AFTER PLATING AND PRIOR TO THE ADDITION OF SOLID FILM LUBRICANT. 125 [3.2] ALL SURFACES
TOLERANCES

.XX	.XXX	ANGLES	[X.X]	[X.XX]
±.03	±.010	±2°	±[0.8]	±[0.25]

DIMENSIONS IN [ ] ARE MILLIMETERS

SHUR-LOK COPORATION
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SHUR-LOK

SHUR-LOK INTERNATIONAL, S.A.
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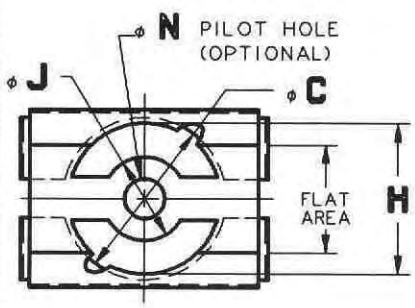
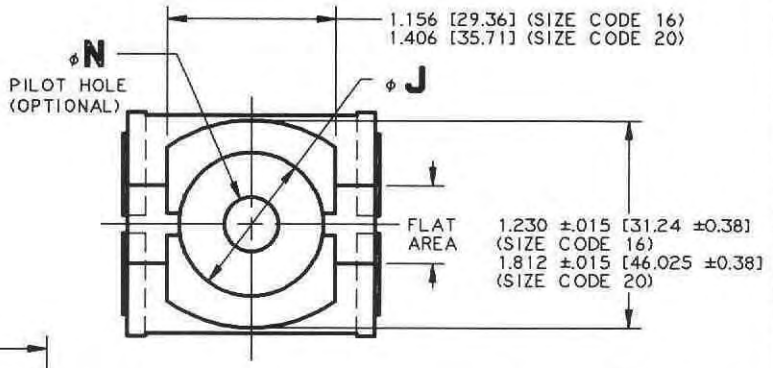
BARREL NUT, NON-MAGNETIC, LIGHTWEIGHT.
SELF-LOCKING, FLOATING, 220 KSI [1517 MPa]

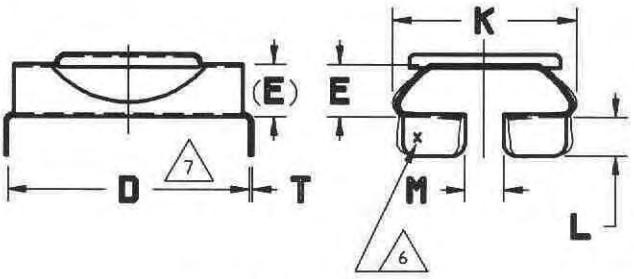
SL4005

SHEET 2 OF 2

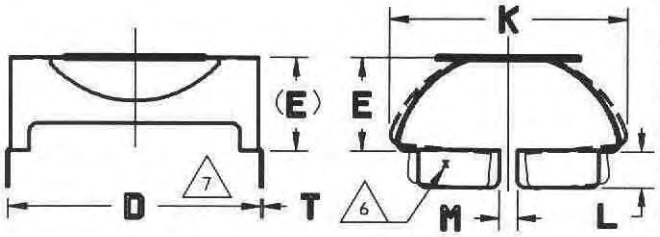
BARREL NUTS



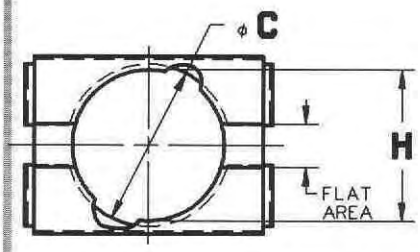


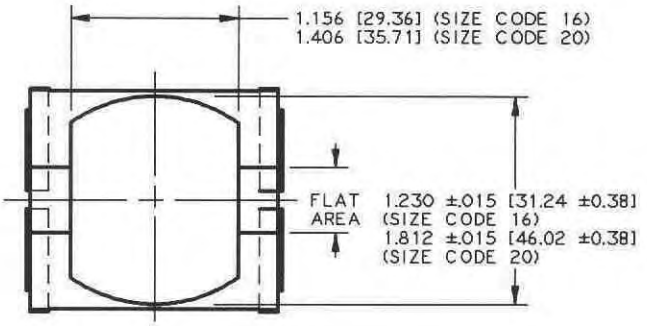


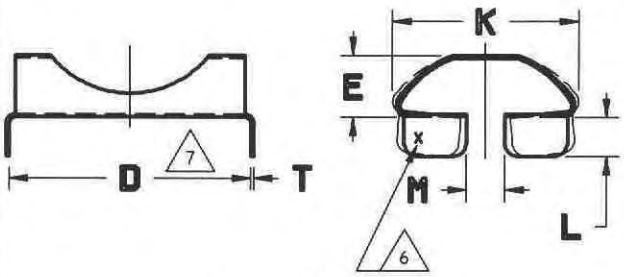
INDEX TYPE "A"



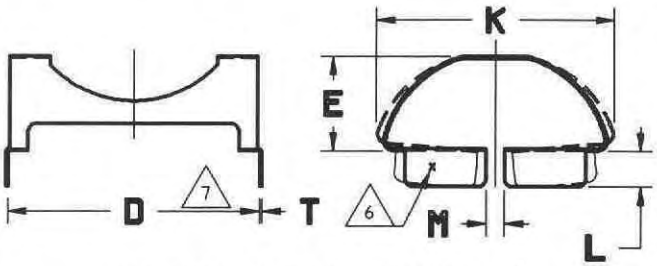
INDEX TYPE "A" – ALTERNATE
-16 AND -20 CONFIGURATION 5







CLEARANCE TYPE "B"



CLEARANCE TYPE "B" – ALTERNATE
-16 AND -20 CONFIGURATION 5

EXAMPLE OF PART CODING

SLR4001 – 4 A SP1

- SP1 — INDICATES SPECIAL PART 4
- A — TYPE CODE – **INDEX TYPE – "A"** **CLEARANCE TYPE – "B"**
- 4 — SIZE CODE (SEE TABLE I, SHEET 2)
- A — MATERIAL CODE (SEE TABLE II, SHEET 2)
- SLR4001 — BASIC PART NUMBER

NOTES: SEE SHEET 2.

REVISION (N) 26 MARCH 2002

UNLESS OTHERWISE SPECIFIED
INTERPRET DIMENSIONS & TOLERANCES PER ANSI Y14.5M. ALL DIMENSIONS APPLY AFTER PLATING AND PRIOR TO THE ADDITION OF SOLID FILM LUBRICANT. 125 [3.2] ALL SURFACES

TOLERANCES				
.XX	.XXX	ANGLES	[X.X]	[X.X.X]
±.03	±.010	±2°	±[0.5]	±[0.25]

DIMENSIONS IN [ ] ARE MILLIMETERS

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RETAINER, FLOATING BARREL NUT

SLR4001

SHEET 1 OF 2

SHUR-LOK

TABLE I

SIZE CODE	◆C ±.015 ±[0.38]	D +.015 −.000 +[0.38] −[0.00]	E MAX	H ±.015 ±[0.38]	◆J +.000 −.015 +[0.00] −[0.38]	K REF	L ±.030 ±[0.76]	M MIN	◆N OPT	T MIN	MINIMUM PUSH-OUT FORCE △8 LB [NEWTON]
4	.453 [11.51]	.625 [15.88]	.211 [5.36]	.406 [10.31]	.260 [6.60]	.520 [13.21]	.125 [3.18]	.060 [1.52]	–	.007 [0.18]	2 [8.9]
5	.500 [12.70]	.688 [17.48]	.234 [5.94]	.469 [11.91]	.322 [8.18]	.578 [14.68]	.125 [3.18]	.060 [1.52]	–	.009 [0.23]	2 [8.9]
6	.594 [15.09]	.750 [19.05]	.268 [6.81]	.531 [13.49]	.385 [9.78]	.671 [17.04]	.125 [3.18]	.060 [1.52]	–	.009 [0.23]	2 [8.9]
7	.672 [17.07]	.875 [22.22]	.311 [7.90]	.594 [15.09]	.447 [11.35]	.765 [19.43]	.188 [4.78]	.060 [1.52]	–	.012 [0.30]	2 [8.9]
8	.750 [19.05]	1.000 [25.40]	.335 [8.51]	.656 [16.66]	.510 [12.95]	.844 [21.44]	.188 [4.78]	.060 [1.52]	–	.012 [0.30]	2 [8.9]
9	.843 [21.41]	1.094 [27.79]	.379 [9.63]	.719 [18.26]	.572 [14.53]	.938 [23.82]	.250 [6.35]	.095 [2.41]	.188 [4.78]	.012 [0.30]	2 [8.9]
10	.938 [23.83]	1.125 [28.58]	.413 [10.49]	.781 [19.84]	.635 [16.13]	1.031 [26.19]	.250 [6.35]	.095 [2.41]	.250 [6.35]	.012 [0.30]	2 [8.9]
12	1.141 [28.98]	1.500 [38.10]	.531 [13.49]	.906 [23.01]	.760 [19.30]	1.266 [32.16]	.250 [6.35]	.095 [2.41]	.312 [7.92]	.012 [0.30]	2 [8.9]
14	1.234 [31.34]	1.531 [38.89]	.588 [14.94]	1.031 [26.19]	.885 [22.48]	1.406 [35.71]	.250 [6.35]	.095 [2.41]	.344 [8.74]	.015 [0.38]	2 [8.9]
△5 16	1.453 [36.91]	1.728 [43.89]	.683 [17.35]	1.156 [29.36]	1.010 [25.65]	1.547 [39.29]	.250 [6.35]	.095 [2.41]	.375 [9.52]	.015 [0.38]	2 [8.9]
18	1.750 [44.45]	2.063 [52.40]	.645 [16.38]	1.281 [32.54]	1.135 [28.83]	1.781 [45.24]	.250 [6.35]	.095 [2.41]	–	.015 [0.38]	5 [22.2]
△5 20	1.969 [50.01]	2.352 [59.74]	.805 [20.45]	1.406 [35.71]	1.260 [32.00]	2.062 [52.37]	.250 [6.35]	.095 [2.41]	–	.015 [0.38]	6 [26.7]
22	2.062 [52.37]	2.646 [67.21]	.915 [23.24]	1.531 [38.89]	1.385 [35.18]	2.203 [55.96]	.250 [6.35]	.095 [2.41]	–	.015 [0.38]	8 [35.6]
24	2.313 [58.75]	3.000 [76.20]	1.105 [28.07]	1.656 [42.06]	1.510 [38.35]	2.594 [65.89]	.250 [6.35]	.095 [2.41]	–	.015 [0.38]	10 [44.5]

TABLE II

MATL CODE	MATERIAL	HEAT TREAT	FINISH
–	INCONEL X-750 PER AMS5542 △3	PRECIPITATION HARDEN PER AMS5542, (150 KSI UTS MIN)	PASSIVATE PER AMS-QQ-P-35

NOTES:

1. RETAINERS UNDER THIS PART NUMBER MUST FUNCTION WITH ALL NUTS FURNISHED UNDER CORRESPONDING DASH NUMBERS OF DRAWING NUMBERS SL50, SL4001 AND SL416 FLOATING BARREL NUT. (−16 RETAINER SHALL ALSO FUNCTION WITH −17 NUT).

2. RETAINERS SHALL BE FURNISHED IN THE OPEN POSITION AS SHOWN BY PHANTOM LINES.

△3 MAGNETIC PERMEABILITY SHALL BE LESS THAN 2.0 (AIR = 1.0) FOR A FIELD STRENGTH OF H = 200 OERSTEDS. MAGNETIC PERMEABILITY SHALL BE CHECKED PER ASTM A342.

△4 ADD SUFFIX SP1 TO PART NUMBER FOR SILVER PLATE PER AMS2410.

ADD SUFFIX SP2 TO PART NUNBER FOR COLOR CODE: DYE BROWN, COLOR NO. 30117 PER FEDERAL SPECIFICATION 595.

ADD SUFFIX SP3 TO PART NUMBER TO INDICATE CADMIUM PLATE PER AMS-QQ-P-416, TYPE II, CLASS 2.

△5 ALTERNATE CONFIGURATION FOR −16 AND −20 SIZES ONLY.

△6 MARKING: MARK LETTER "X" ON ANY TANG DESIGNATES INCONEL PART. MARKING RAISED OR DEPRESSED .005 MAXIMUM.

△7 DIMENSION APPLIES TO BEND RADII TANGENCY POINT.

△8 TYPE "B" RETAINERS AND NUT ASSEMBLIES SHALL REQUIRE A PUSH OUT FORCE IN ACCORDANCE WITH THE TABULATED VALUES WHEN INSTALLED IN A RECOMMENDED INSTALLATION PER SL4001 BARREL NUT.

REVISION (N) 26 MARCH 2002

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TOLERANCES
.XX ±.03 .XXX ±.010 ANGLES ±2° [X.X] ±[0.8] [X.X.X] ±[0.25]
DIMENSIONS IN [ ] ARE MILLIMETERS

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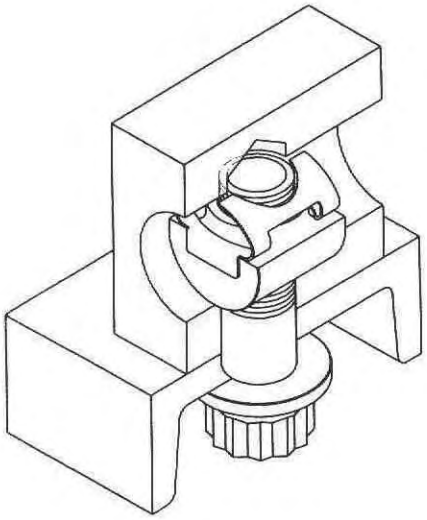
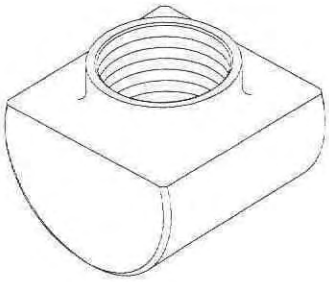
PETIT-RECHAIN, BELGUIM
TELEPHONE: (32) 87-32.07.11

SLR4001

RETAINER,
FLOATING BARREL NUT

SHEET 2 OF 2





FEATURES AND BENEFITS

- One piece design.
- Fifteen-cycle thread lock reusability.
- High temperature capability limited only by material or finish.
- Adds strength to joint area and prevents damage to structure.
- Locates and remains in position with use of retainer during installation and removal of joint structures.
- For use with 180 KSI to 220 KSI ultimate tensile strength bolts.

LIMITATIONS

- Secondary lubricant recommended for installation if thread locked.
- Requires precise alignment of bolt hole and barrel nut installation hole.
- Fifteen-cycle reusability may be limited by material, finish combination with metallic thread lock.

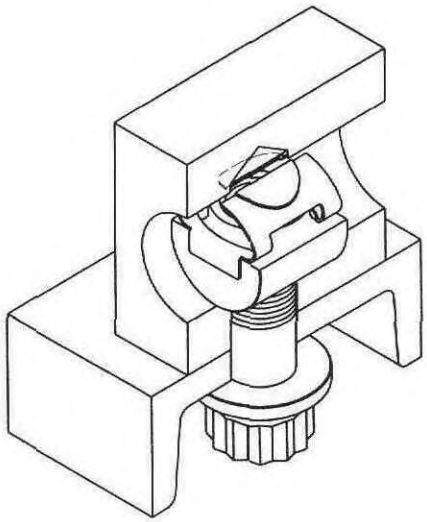
STANDARD THREAD SIZE RANGE

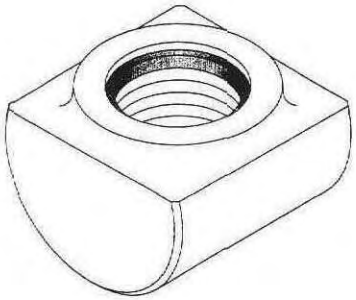
- .1900 through 1.2500

SPECIAL OPTIONS

- Offered without thread locking feature.
- Available in alloy steel (4340), corrosion resistant steel (A286) and nickel based alloy Inconel (718). Other materials available on request.
- Finishes:
  Cadmium Plate per AMS-QQ-P-416 type 11,Class 2.
  Cadmium Plate per NAS672.
  Nickel Diffused Cadmium Plate per AMS2416.
  Silver Plate per AMS2410 or AMS2411.
  Other finishes available on request.

METRIC SIZES AVAILABLE ON REQUEST





FEATURES AND BENEFITS

- Non-Metallic lock ring 35-cycle reusability.
- Adds strength to joint area and prevents damage to structure.
- Locates and remains in position with use of retainer during installation and removal of joint structure.
- For use with 180 KSI to 220 KSI ultimate tensile strength bolts.

LIMITATIONS

- Secondary lubricant required during use to provide consistent locking torque.
- Requires precise alignment of bolt hole and barrel nut installation hole.
- Temperature limited by lock ring material.
  Nylon -------- 250 degrees F
  Polyimide---- 450 degrees F

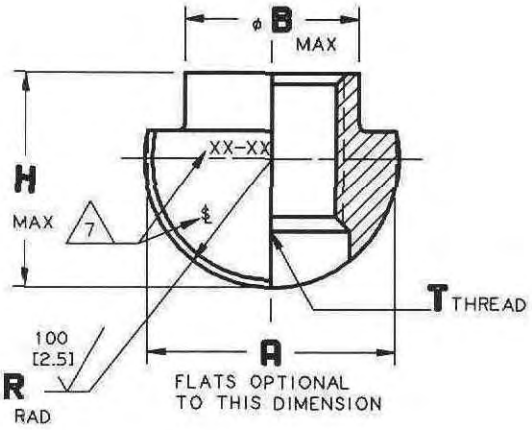
STANDARD THREAD SIZE RANGE

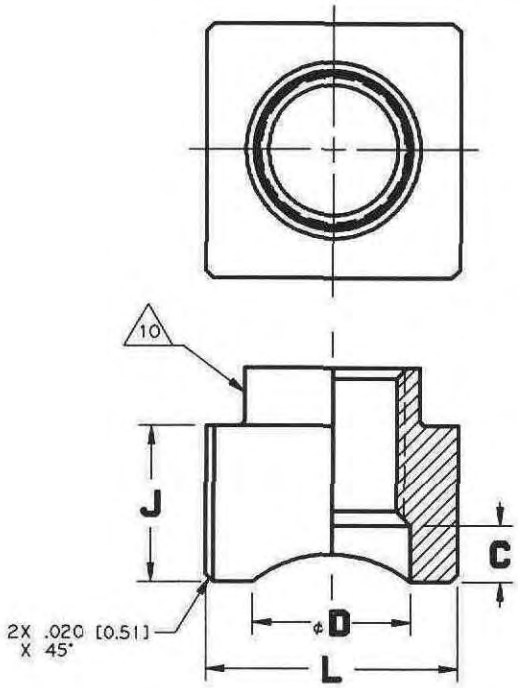
- .2500 through 1.500

SPECIAL OPTIONS

- Available in alloy steel (4340), corrosion resistant steel (A286) and nickel based alloy Inconel (718). Other materials available on request.
- Finishes:
  Cadmium Plate per AMS-QQ-P-416 type 11,class 2.
  Cadmium Plate per NAS672.
  Nickel Diffused Cadmium Plate per AMS2416.
  Silver Plate per AMS2410 or AMS2411.
  Other finishes available on request.

METRIC SIZES AVAILABLE ON REQUEST





NOTES:

1. 100% MAGNETIC PARTICLE INSPECT PER ASTM E1444.
2. AXIAL TENSILE STRENGTH VALUES SHALL BE MET WITH NUT INSTALLED IN A CLOSE FITTING *STEEL JIG (HARDNESS 41 HRC MIN)* WITH A HOLE NO LARGER THAN .003 [0.08] OVER 2 TIMES THE MAXIMUM "R" RADIUS AND TESTED WITH A 220 KSI [1517 MPa] UTS MIN BOLT.
3. FLUORESCENT PENETRANT INSPECT PER ASTM E1417.
4. REFER TO SLR414 FOR RETAINER DATA.
5. NOTED MATERIAL AND FINISH IS NOT INTENDED FOR USE IN ELEVATED TEMPERATURE APPLICATIONS.
6. SUGGESTED INSTALLATION HOLE .004 [0.10] OVER 2 TIMES THE MAXIMUM "R" RADIUS.
7. PART PERMANENTLY MARKED WITH SHUR-LOK LOGO AND AND LOT IDENTIFICATION.
   EXAMPLE OF LOT IDENTIFICATION:
   96-41
   - 41 — LOT NUMBER
   - 96 — YEAR PRODUCED (1996)
8. SOLID FILM LUBE PER AS5272, TYPE I.
9. MATERIAL CODE "CP" AVAILABLE IN SIZES 3 THRU 14 ONLY.
10. NUT SHANK DEFORMED IN THIS AREA TO *PROVIDE LOCKING TORQUES PER NASM25027.*

EXAMPLE OF PART CODING

SL414 – 3 N L

- L = LEFT HAND THREAD
  OMIT FOR RIGHT HAND THREAD
- N = NO INTERNAL THREAD LOCK
  OMIT FOR SELF-LOCKING THREAD
- SIZE CODE (SEE TABLE I, SHEET 2)
- MATERIAL CODE (SEE TABLE II , SHEET 2)
- BASIC PART NUMBER

REVISION (AB) 19 MARCH 2002

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TOLERANCES				
.XX	.XXX	ANGLES	[X.X]	[X.X.X]
±.03	±.010	±2°	±[0.8]	±[0.25]

DIMENSIONS IN [ ] ARE MILLIMETERS

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TELEPHONE: (32) 87-32.07.11

BARREL NUT, SELF-LOCKING, 220 KSI [1517MPa]

SL414

SHEET 1 OF 2

SHUR-LOK

TABLE I

SIZE CODE	T THREAD PER MIL-S-8879	A +.000 -.010 +[0.00] -[0.25]	◆B MAX	C +.010 -.000 +[0.25] -[0.00]	◆D ±.005 ±[0.13]	H MAX	J	L	R RAD +.0000 -.0015 +[0.000] -[0.038]
3	.1900-32 UNJF-3B	.406 [10.31]	.270 [6.86]	.066 [1.68]	.224 [5.69]	.271 [6.88]	.225 [5.71]	.406 [10.31]	.2150 [5.461]
4	.2500-28 UNJF-3B	.484 [12.29]	.355 [9.02]	.090 [2.29]	.286 [7.26]	.385 [9.78]	.297 [7.54]	.484 [12.29]	.2455 [6.236]
5	.3125-24 UNJF-3B	.546 [13.87]	.415 [10.54]	.100 [2.54]	.349 [8.86]	.451 [11.46]	.324 [8.23]	.546 [13.87]	.2765 [7.023]
6	.3750-24 UNJF-3B	.656 [16.66]	.506 [12.85]	.140 [3.56]	.411 [10.44]	.556 [14.12]	.401 [10.19]	.656 [16.66]	.3315 [8.420]
7	.4375-20 UNJF-3B	.750 [19.05]	.585 [14.86]	.140 [3.56]	.474 [12.04]	.633 [16.08]	.453 [11.51]	.750 [19.05]	.3780 [9.601]
8	.5000-20 UNJF-3B	.858 [21.79]	.635 [16.13]	.190 [4.83]	.536 [13.61]	.715 [18.16]	.551 [14.00]	.859 [21.82]	.4330 [10.998]
9	.5625-18 UNJF-3B	.922 [23.42]	.740 [18.80]	.140 [3.56]	.599 [15.21]	.731 [18.57]	.514 [13.06]	.922 [23.42]	.4640 [11.786]
10	.6250-18 UNJF-3B	1.032 [26.21]	.814 [20.68]	.190 [4.83]	.661 [16.79]	.842 [21.39]	.615 [15.62]	1.032 [26.21]	.5190 [13.183]
12	.7500-16 UNJF-3B	1.219 [30.96]	.971 [24.66]	.190 [4.83]	.786 [19.96]	.982 [24.94]	.739 [18.77]	1.219 [30.96]	.6205 [15.761]
14	.8750-14 UNJF-3B	1.344 [34.14]	1.106 [28.09]	.190 [4.83]	.911 [23.14]	1.060 [26.92]	.856 [21.74]	1.500 [38.10]	.6830 [17.348]
16	1.0000-12 UNJF-3B	1.547 [39.29]	1.263 [32.08]	.190 [4.83]	1.036 [26.31]	1.178 [29.92]	.918 [23.32]	1.750 [44.45]	.7770 [19.736]
17	1.0000-14 UNJS-3B	1.547 [39.29]	1.263 [32.08]	.190 [4.83]	1.036 [26.31]	1.178 [29.92]	.918 [23.32]	1.750 [44.45]	.7770 [19.736]
18	1.1250-12 UNJF-3B	1.861 [47.27]	1.375 [34.92]	.245 [6.22]	1.161 [29.49]	1.473 [37.41]	1.165 [29.59]	1.828 [46.43]	.9330 [23.698]
20	1.2500-12 UNJF-3B	2.111 [53.62]	1.500 [38.10]	.245 [6.22]	1.286 [32.66]	1.668 [42.37]	1.365 [34.67]	2.250 [57.15]	1.0580 [26.873]
22	1.3750-12 UNJF-3B	2.361 [59.97]	1.625 [41.27]	.245 [6.22]	1.411 [35.84]	1.794 [45.57]	1.523 [38.68]	2.344 [59.54]	1.1830 [30.048]
24	1.5000-12 UNJF-3B	2.674 [67.92]	1.735 [44.07]	.245 [6.22]	1.536 [39.01]	1.927 [48.95]	1.638 [41.61]	2.750 [69.85]	1.3395 [34.023]

TABLE III

SIZE CODE	AXIAL TENSILE STRENGTH MIN △2 LB [NEWTON]	APPROX WT PER 100 PCS MATERIAL CODE "-" LB [Kg]	APPROX WT PER 100 PCS MATERIAL CODE "CP" LB [Kg]
3	4,980 [22,152]	0.89 [0.404]	0.93 [0.422]
4	8,870 [39,456]	1.30 [0.590]	1.36 [0.619]
5	14,100 [62,720]	1.70 [0.771]	1.78 [0.807]
6	20,900 [92,968]	2.90 [1.315]	3.04 [1.379]
7	28,300 [125,885]	4.20 [1.905]	4.41 [2.000]
8	37,800 [168,143]	6.40 [2.903]	6.72 [3.048]
9	47,900 [213,070]	7.60 [3.447]	7.98 [3.620]
10	59,900 [266,449]	10.00 [4.536]	10.49 [4.758]
12	86,900 [386,550]	17.00 [7.711]	17.84 [8.092]
14	119,000 [529,338]	26.00 [11.793]	27.29 [12.379]
16	155,000 [689,474]	36.00 [16.329]	-
17	157,000 [698,371]	36.00 [16.329]	-
18	198,000 [880,748]	66.00 [29.937]	-
20	247,000 [1,098,711]	100.00 [45.359]	-
22	301,000 [1,338,915]	135.00 [61.235]	-
24	361,000 [1,605,808]	185.00 [83.915]	-

TABLE II

MATL CODE	MATERIAL	HEAT TREAT	FINISH	WEIGHT AND PERFORMANCE REQT
- △5	4340 ALLOY STEEL PER AMS6414 △1	43 HRC MAX	CAD PLATE PER AMS-QQ-P-416, TYPE II, CL 2. △5 △8	△2 SEE TABLE III
CP △9	INCONEL 718 PER AMS5662 (CHEMISTRY ONLY) △3	AGE HARDEN 220 KSI UTS MIN	CAD PLATE PER AMS-QQ-P-416, TYPE II, CL 2.	△2 SEE TABLE III

REVISION (AB) 19 MARCH 2002

UNLESS OTHERWISE SPECIFIED
INTERPRET DIMENSIONS & TOLERANCES PER ANSI Y14.5M. ALL DIMENSIONS APPLY AFTER PLATING AND PRIOR TO THE ADDITION OF SOLID FILM LUBRICANT. 125 [3.2] ALL SURFACES

TOLERANCES				
.XX	.XXX	ANGLES	[X.X]	[X.X.X]
±.03	±.010	±2°	±[0.8]	±[0.25]

DIMENSIONS IN [ ] ARE MILLIMETERS

SHUR-LOK COPORATION
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SHUR-LOK

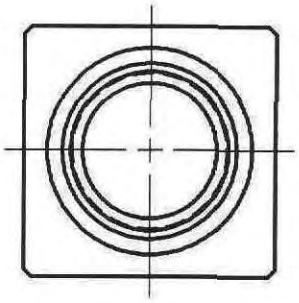
SHUR-LOK INTERNATIONAL, S.A.
PETIT-RECHAIN, BELGIUM
TELEPHONE: (32) 87-32.07.11

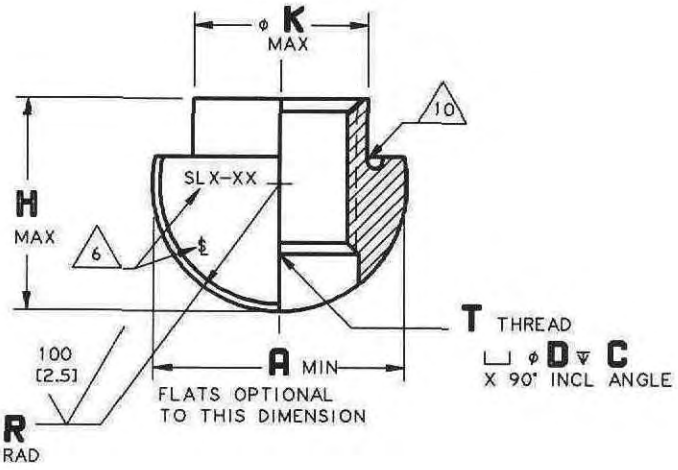
SL414

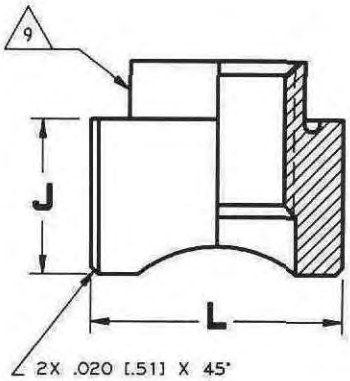
BARREL NUT, SELF-LOCKING,
220 KSI [1517 MPa]

SHEET 2 OF 2

BARREL NUTS







NOTES:

1. AXIAL TENSILE STRENGTH VALUES SHALL BE MET WITH NUT INSTALLED IN A CLOSE FITTING STEEL JIG HARDNESS (41 HRC MIN) WITH A HOLE NO LARGER THAN .003 [0.08] OVER TWO TIMES THE MAXIMUM "R" RAD AND TESTED WITH A 220 KSI [1517 MPa] UTS MIN BOLT.
2. MATERIAL: SEE TABLE II.
3. FINISH: SEE TABLE II.
4. HEAT TREAT:
   CODE "RH" – 43 HRC MAX PER AMS2759/1.
   CODE "HD" – PRECIPITATION HEAT TREATED TO 200 KSI [1379 MPa] UTS MIN.
5. MAGNETIC PARTICLE INSPECTION PER ASTM E1444.
6. PERMANENTLY MARKED WITH SHUR-LOK LOGO AND LOT IDENTIFICATION ONE END, AND SHUR-LOK PART NUMBER OTHER END. MUST BE LEGIBLE AFTER APPLICATION OF FINISH. LASER MARKED AT SHUR-LOK OPTION.
7. SEE DRAWING SLR414 FOR RETAINERS FOR USE WITH THESE PARTS.
8. PENETRANT INSPECT PER ASTM1417.
9. NUT SHANK DEFORMED IN THIS AREA TO PROVIDE THREAD LOCKING TORQUES PER NA0009.
10. ANNULAR RELIEF OPTIONAL.

EXAMPLE OF PART CODING

SL414MJ 10 RH

- RH – MATERIAL/FINISH CODE (SEE TABLE II. SHEET 2)
- 10 – SIZE CODE – THREAD SIZE (SEE TABLE I. SHEET 2)
- SL414MJ – BASIC PART NUMBER

REVISION (C) 28 FEB 2002

UNLESS OTHERWISE SPECIFIED
INTERPRET DIMENSIONS & TOLERANCES PER ANSI Y14.5M. ALL DIMENSIONS APPLY AFTER PLATING AND PRIOR TO THE ADDITION OF SOLID FILM LUBRICANT. 125 [3.2] ALL SURFACES

TOLERANCES				
.XX	.XXX	ANGLES	[X.X]	[X.X.X]
±.03	±.010	±2°	±[0.8]	±[0.25]

DIMENSIONS IN [ ] ARE MILLIMETERS

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BARREL NUT, SELF-LOCKING, 220 KSI [1517 MPa]

SL414MJ

SHEET 1 OF 2

TABLE I

SIZE CODE	T THREAD PER FED-STD-H28/21 OR ISO5855	A MIN	C +.010 −.000 [+0.25] [−0.00]	⌀D ±.005 [±0.131]	H MAX	J	⌀K MAX	L	R RAD +.0000 −.0015 [+0.000] [−0.038]	AXIAL TENSILE STRENGTH MIN (1) LB [NEWTON]	INSTALLATION HOLE SIZE MIN
5	MJ5 X 0.8-4H5H	.415 [10.54]	.023 [0.58]	.224 [5.69]	.271 [6.88]	.225 [5.72]	.270 [6.86]	.406 [10.31]	.2150 [5.461]	4,775 [21,240]	.438 [11.12]
6	MJ6 X 1-4H5H	.476 [12.09]	.095 [2.41]	.286 [7.26]	.385 [9.78]	.297 [7.54]	.355 [9.02]	.484 [12.29]	.2455 [6.236]	6,760 [30,070]	.500 [12.70]
8	MJ8 X 1-4H5H	.538 [13.66]	.105 [2.67]	.349 [8.86]	.451 [11.46]	.324 [8.23]	.415 [10.54]	.546 [13.87]	.2765 [7.023]	13,220 [58,800]	.563 [14.30]
10	MJ10 X 1.25-4H5H	.648 [16.46]	.145 [3.68]	.411 [10.44]	.556 [14.12]	.401 [10.19]	.506 [12.85]	.656 [16.66]	.3315 [8.420]	20,650 [91,850]	.672 [17.07]
12	MJ12 X 1.25-4H5H	.851 [21.62]	.195 [4.95]	.536 [13.61]	.715 [18.16]	.551 [14.00]	.653 [16.59]	.859 [21.82]	.4330 [10.998]	31,140 [138,500]	.875 [22.22]
14	MJ14 X 1.5-4H5H	.913 [23.19]	.145 [3.68]	.599 [15.21]	.731 [18.57]	.514 [13.06]	.740 [18.80]	.922 [23.42]	.4640 [11.786]	42,100 [187,270]	.938 [23.82]
16	MJ16 X 1.5-4H5H	1.023 [25.98]	.195 [4.95]	.661 [16.79]	.842 [21.38]	.615 [15.62]	.814 [20.68]	1.032 [26.21]	.5190 [13.183]	56,630 [251,900]	1.047 [26.59]
18	MJ18 X 1.5-4H5H	1.226 [31.14]	.195 [4.95]	.786 [19.96]	.982 [24.94]	.739 [18.77]	.971 [24.66]	1.219 [30.96]	.6205 [15.761]	73,250 [325,800]	1.250 [31.75]

TABLE II

CODE	MATERIAL	FINISH
RH	ALLOY STEEL 4340 PER AMS6414. (4)(5)	CADMIUM PLATE PER AMS-QQ-P-416, TYPE II, CLASS 2, AND SOLID FILM LUBE PER AS5272, TYPE I
HD	CRES A286 PER AMS5737 (CHEMISTRY ONLY) (4)(8)	SILVER PLATE PER AMS2410, .0002 (5.08um) MINIMUM THICKNESS.

REVISION (C) 28 FEB 2002

UNLESS OTHERWISE SPECIFIED
INTERPRET DIMENSIONS & TOLERANCES PER ANSI Y14.5M. ALL DIMENSIONS APPLY AFTER PLATING AND PRIOR TO THE ADDITION OF SOLID FILM LUBRICANT. 125 [3.2] ALL SURFACES
TOLERANCES
XX ±.03 | XXX ±.010 | ANGLES ±2° | [X.X] ±[0.8] | [X.XX] ±[0.25]
DIMENSIONS IN [ ] ARE MILLIMETERS

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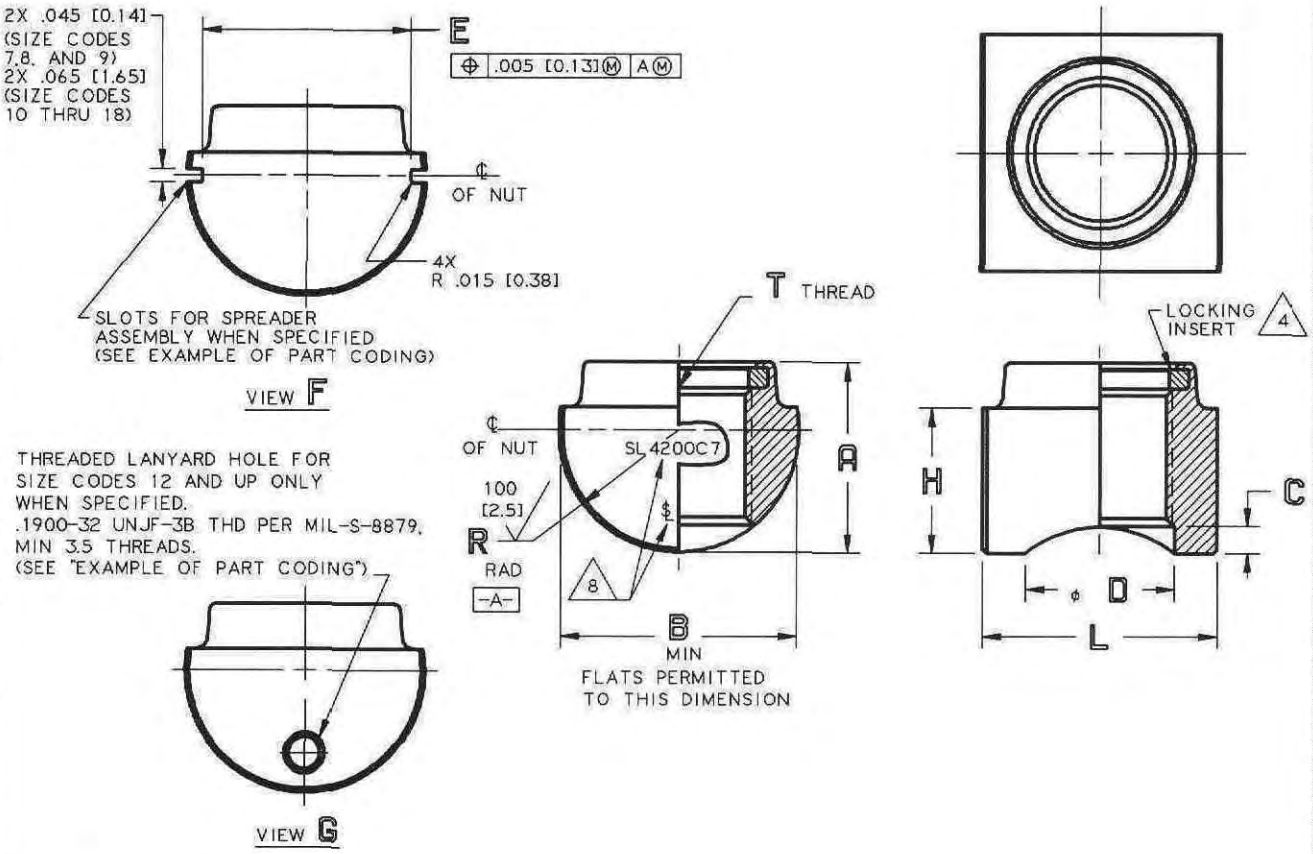
SL414M J

BARREL NUT, SELF-LOCKING,
220 KSI [1517 MPa]

SHEET 2 OF 2

BARREL NUTS



NOTES:

1. MATERIAL: SEE TABLE III.
2. FINISH: PASSIVATE PER AMS-QQ-P-35, TYPE II, AND SILVER PLATE PER AMS2410 OR AMS2411, AT MFR OPTION. .0002 [0.005] MIN THICKNESS ON THREADS. (OTHER SUFACES OPTIONAL).
3. LIQUID PENETRANT INSPECT PER ASTM E1417.

4. LOCKING INSERT MATERIAL: POLYAMIDE VESPEL SP-1, 400° F (DUPONT). PRE-THREADED AT MFR OPTION.

5. THREAD LOCKING TORQUE 15 CYCLE LOT ACCEPTANCE, AND CAPABLE OF 35 CYCLE REUSEABILITY TO TORQUE VALUES LISTED IN TABLE II.

   APPLY NEVER-SEEZ® PURE NICKEL SPECIAL (BOSTIK, MIDDLETON, MA) ON NUT AND BOLT FOR TORQUE TESTING.

6. RETAINER WHEN REQUIRED MUST BE ORDERED SEPARATELY, SEE SPECIFIED DWG FOR MATERIAL, FINISHES, CONFIGURATION AND DIMENSIONS.

7. SP1 = SILVER PLATE THREADS ONLY PER AMS2410 OR AMS2411, .0002 [0.005] MIN THICK. PLATING IN CBORE AND LANDYARD HOLE (IF SPECIFIED) IS OPTIONAL. SOLID FILM LUBE ONLY OUTER ENVELOPE SURFACES PER AS5272, TYPE I, COVERAGE IN SPREADER SLOTS, AND/OR LANYARD HOLE (IF SPECIFIED) AND THREADS IS OPTIONAL.

8. MARKING: PARTS PERMANENTLY MARKED (LASER MARKED AT SHUR-LOK OPTION) WITH SHUR-LOK LOGO AND SHUR-LOK PART NUMBER.

9. AXIAL TENSILE STRENGTH PER TABLE II SHALL BE MET WITH NUT INSTALLED IN A CLOSE FITTING STEEL JIG (HARDNESS 41-43 HRC) WITH A HOLE NO LARGER THAN .003 [0.08] OVER 2 TIMES THE MAX "R" RADIUS.

EXAMPLE OF PART CODING

SL4200 C 7 A SP1 (7)

- CONFIGURATION CODE:
  - NO LETTER = STANDARD CONFIGURATION
  - "A" = WITH SLOTS FOR SPREADER ASSY (SEE VIEW F)
  - "B" = WITH THREADED LANYARD HOLE (SEE VIEW G)
- SIZE CODE (SEE TABLE I, SHEET 2)
- MATERIAL CODE (SEE TABLE III, SHEET 2)
- BASIC PART NUMBER

REVISION NC 28 MAR 1990

UNLESS OTHERWISE SPECIFIED
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TOLERANCES				
.XX	.XXX	ANGLES	[X.X]	[X.XX]
±.03	±.010	±2°	±[0.8]	±[0.25]

DIMENSIONS IN [ ] ARE MILLIMETERS

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SL4200

BARREL NUT, SELF-LOCKING, NON-METALLIC LOCK, 180 KSI [1241 MPa] AND 220 KSI [1517 MPa]

TABLE I

SIZE CODE	T THREAD PER MIL-S-8879	A MAX	B MIN	C	⌀D ±.005 ±[0.13]	E	H	L ±.005 ±[0.13]	R RAD +.0000 −.0015 +[0.000] −[0.038]	MATING RETAINER BASIC PART NUMBER △6
3	.1900-32 UNJF-3B	.334 [8.48]	.419 [10.64]	.033 [0.84]	.212 [5.38]	.293 [7.44]	.225 [5.71]	.406 [10.32]	.2170 [5.512]	SLR4124-3( )
7	.4375-20 UNJF-3B	.633 [16.08]	.746 [18.95]	.084 [2.13]	.464 [11.79]	.620 [15.75]	.453 [11.51]	.750 [19.05]	.3805 [9.665]	SLR4124-7( )
8	.5000-20 UNJF-3B	.718 [18.24]	.856 [21.74]	.094 [2.39]	.526 [13.36]	.720 [18.29]	.551 [14.00]	.859 [21.82]	.4355 [11.062]	SLR4124-8( )
9	.5625-18 UNJF-3B	.761 [19.33]	.919 [23.34]	.110 [2.79]	.590 [14.99]	.790 [20.07]	.514 [13.06]	.922 [23.42]	.4670 [11.862]	SLR4124-9( )
10	.6250-18 UNJF-3B	.863 [21.92]	1.028 [26.11]	.120 [3.05]	.653 [16.59]	.900 [22.86]	.615 [15.62]	1.032 [26.21]	.5215 [13.246]	SLR4124-10( )
12	.7500-16 UNJF-3B	.982 [24.94]	1.231 [31.27]	.142 [3.61]	.779 [19.79]	1.085 [27.56]	.739 [18.77]	1.219 [30.96]	.6230 [15.824]	SLR4124-12( )
14	.8750-14 UNJF-3B	1.104 [28.04]	1.356 [34.44]	.176 [4.47]	.906 [23.01]	1.210 [30.73]	.856 [21.74]	1.500 [38.10]	.6855 [17.412]	SLR4124-14( )
16	1.0000-12 UNJF-3B	1.214 [30.84]	1.544 [39.22]	.201 [5.11]	1.033 [26.24]	1.410 [35.81]	.918 [23.32]	1.750 [44.45]	.7795 [19.799]	SLR4124-16( )
18	1.1250-12 UNJF-3B	1.536 [39.01]	1.856 [47.14]	.206 [5.23]	1.158 [29.41]	1.690 [42.93]	1.160 [29.46]	1.828 [46.43]	.9355 [23.762]	SLR4124-18( )

TABLE II

SIZE CODE	LOCKING TORQUE △5		AXIAL TENSILE STRENGTH MIN △9 △5	
	MAX IN-LBS [N.m]	MIN 35TH CYCLE BREAKAWAY IN-LBS [N.m]	MATL CODE "C" (INCONEL 718) LB [NEWTON]	MATL CODE "CA" (CRES A286) LB [NEWTON]
3	18 [2.03]	2 [0.22]	4,970 [22,108]	4,070 [18,104]
7	100 [11.30]	14 [1.58]	28,300 [125,885]	23,200 [103,199]
8	150 [16.95]	18 [2.03]	37,800 [168,143]	30,900 [137,450]
9	200 [22.60]	24 [2.71]	47,900 [213,070]	39,200 [174,370]
10	300 [33.90]	32 [3.62]	59,900 [266,448]	49,100 [218,408]
12	400 [45.19]	50 [5.65]	86,900 [386,550]	71,000 [315,824]
14	600 [67.79]	70 [7.91]	119,000 [529,338]	97,000 [431,478]
16	800 [90.39]	90 [10.17]	155,000 [698,474]	126,000 [560,476]
18	900 [101.69]	117 [13.22]	198,000 [880,748]	162,000 [720,612]

TABLE III

MATL CODE	MATERIAL
C	INCONEL 718 PER AMS5662 OR AMS5663
CA	CRES A286 PER AMS5737

REVISION (NC) 28 MARCH 2002

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TOLERANCES				
.XX	.XXX	ANGLES	[X.X]	[X.X.X]
±.03	±.010	±2°	±[0.8]	±[0.25]

DIMENSIONS IN [ ] ARE MILLIMETERS

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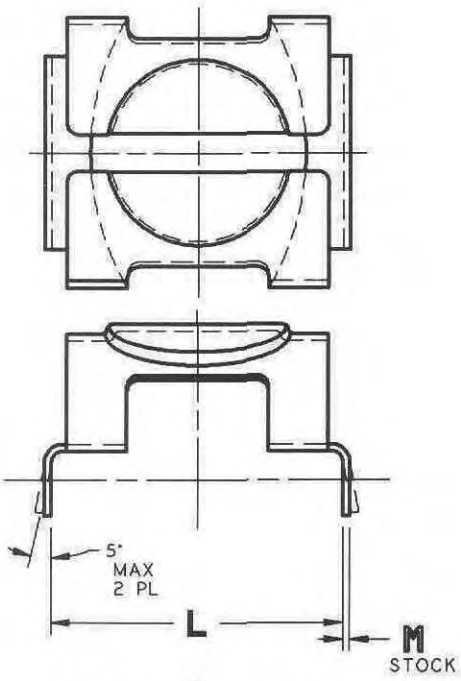
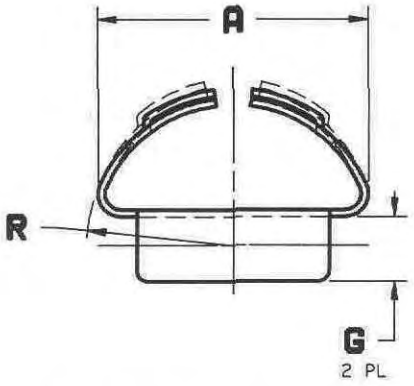
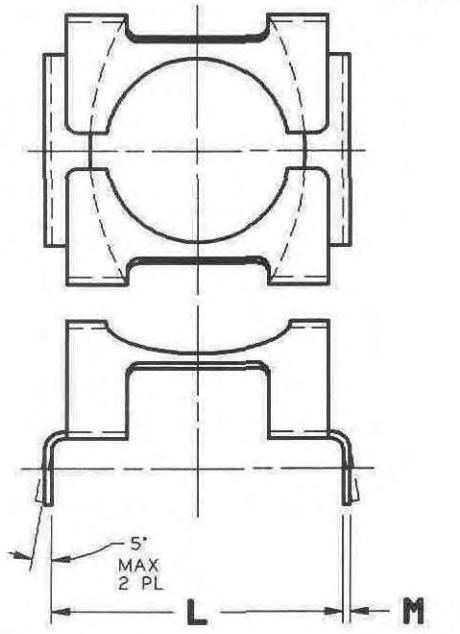
SL4200

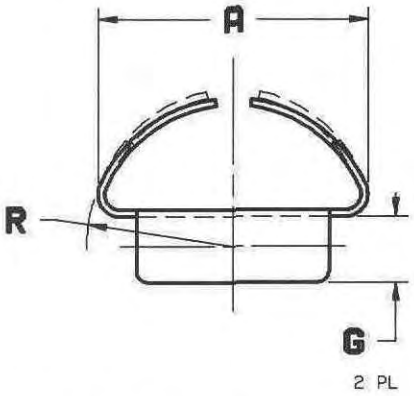
BARREL NUT, SELF-LOCKING, NON-METALLIC LOCK, 180 KSI [1241 MPa] AND 220 KSI [1517 MPa]





INDEX TYPE CODE "NO LETTER"





CLEARANCE TYPE CODE "B"

EXAMPLE OF PART CODING

SLR414 N 3 B SP3

- SP3 — SPECIAL FINISH (SEE TABLE II , SHEET 2)
- B — TYPE CODE "NO LETTER" = INDEX TYPE, "B" = CLEARANCE TYPE
- 3 — SIZE CODE (SEE TABLE I , SHEET 2
- N — MATERIAL CODE (SEE TABLE II , SHEET 2)
- SLR414 — BASIC PART NUMBER

NOTES:

1. RETAINERS SHALL BE FURNISHED IN THE OPEN POSITION AS SHOWN BY PHANTOM LINES.
2. MATERIAL PROCURED TO SPECIFICATION QQ-S-700, MUST HAVE PRODUCT ANALYSIS PER AMS2259.

REVISION (N) 14 MARCH 02

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TOLERANCES				
.XX	.XXX	ANGLES	[X.X]	[X.XX]
±.03	±.010	±2°	±0.8	±0.25

DIMENSIONS IN [ ] ARE MILLIMETERS

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SLR414

RETAINER,
BARREL NUT

SHEET 1 OF 2

TABLE I

SIZE CODE	A MAX	G	L	M ±.003 ±[0.08]	R RAD
3	.425 [10.79]	.069 [1.75]	.416 [10.57]	.012 [0.30]	.218 [5.54]
4	.466 [11.84]	.075 [1.90]	.494 [12.55]	.012 [0.30]	.250 [6.35]
5	.530 [13.46]	.093 [2.36]	.561 [14.25]	.012 [0.30]	.281 [7.14]
6	.623 [15.82]	.093 [2.36]	.668 [16.97]	.012 [0.30]	.336 [8.53]
7	.715 [18.16]	.170 [4.32]	.750 [19.05]	.018 [0.46]	.382 [9.70]
8	.840 [21.34]	.250 [6.35]	.869 [22.07]	.021 [0.53]	.437 [11.10]
9	.840 [21.34]	.144 [3.66]	.932 [23.67]	.021 [0.53]	.469 [11.91]
10	1.000 [25.40]	.174 [4.42]	1.042 [26.47]	.025 [0.64]	.523 [13.28]
12	1.140 [28.96]	.246 [6.25]	1.219 [30.96]	.025 [0.64]	.625 [15.88]
14	1.177 [29.90]	.281 [7.14]	1.510 [38.35]	.025 [0.64]	.687 [17.45]
16	1.420 [36.07]	.312 [7.92]	1.760 [44.70]	.025 [0.64]	.782 [19.86]
17	1.420 [36.07]	.312 [7.92]	1.760 [44.70]	.025 [0.64]	.782 [19.86]
18	1.690 [42.93]	.375 [9.53]	1.838 [46.69]	.025 [0.64]	.937 [23.80]

TABLE II

MATL CODE	MATERIAL	HEAT TREAT	FINISH	SP3 FINISH
-	STEEL 1050 PER AMS5085 (ANNEALED). ALTERNATIVE MATL PER QQ-S-700 △2	HEAT TREAT 40-45 HRC PER AMS2759	CAD PLATE PER AMS-QQ-P-416, TYPE II, CL 2	———
C	17-7PH CRES PER AMS5528	AUSTENITIZE AND PRECIPITATION HEAT TREAT PER AMS2759 38-46 HRC	PASSIVATE PER AMS-QQ-P-35	PASSIVATE PER AMS-QQ-P-35 AND CAD PLATE PER AMS-QQ-P-416, TYPE II, CL 2
N	INCONEL X-750 PER AMS5542	AGE AT 1300° ± 25° F, HOLD AT HEAT FOR 20 HRS ± 1 HR AND AIR COOL	PASSIVATE PER AMS-QQ-P-35	

REVISION (N) 14 MARCH 02

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TOLERANCES				
.XX	.XXX	ANGLES	[X.X]	[X.X.X]
±.03	±.010	±2°	±[0.8]	±[0.25]

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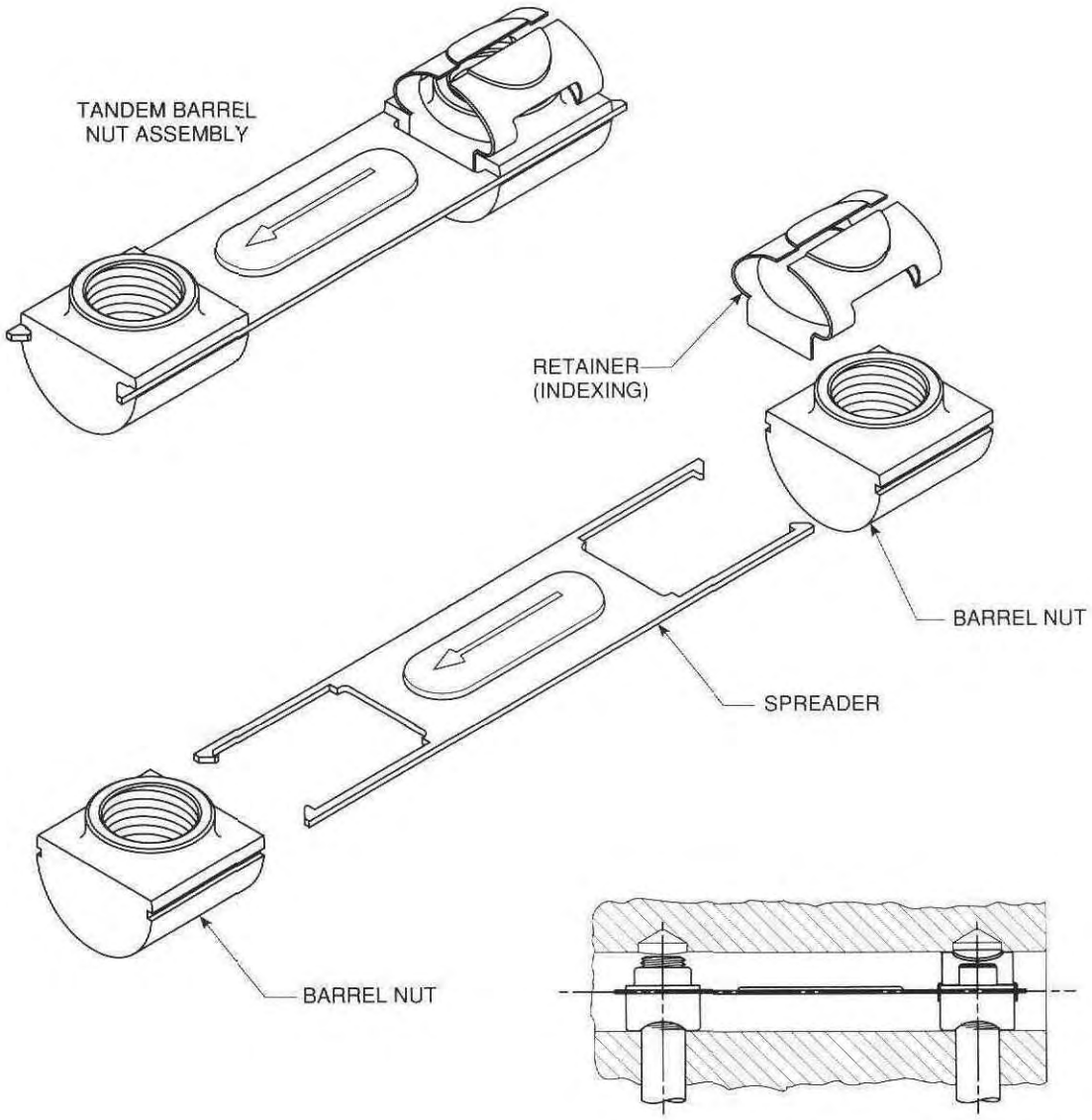
SLR414

RETAINER, BARREL NUT

SHEET 2 OF 2



TANDEM INSTALLATION

APPLICATION:
TANDEM BARREL NUTS PROVIDE A MEANS OF INSTALLING TWO BARREL NUTS AT A PRECISE CENTER SPACING IN A SINGLE HOLE WHERE THE INNER BARREL NUT IS INACCESSIBLE FOR NORMAL MANUAL INSERTION. USED IN VARIOUS AIRCRAFT APPLICATIONS.

FEATURES:
TWO SIMILAR BARREL NUTS CAPTURED BY A SPREADER OF SPECIFIC LENGTH TO PROVIDE CONTROLLED SPACING BETWEEN THE NUTS. AN INDEXING RETAINER ON THE OUTER NUT PROVIDES ACCURATE LOCATION FOR BOTH BARREL NUTS.

ISSUED: JULY 1990

UNLESS OTHERWISE SPECIFIED
INTERPRET DIMENSIONS & TOLERANCES PER *ANSI Y14.5M. ALL DIMENSIONS APPLY AFTER* PLATING AND PRIOR TO THE ADDITION OF SOLID FILM LUBRICANT. 125 [3.2] ALL SURFACES

TOLERANCES				
.XX	.XXX	ANGLES	[X.X]	[X.X.X]
±.03	±.010	±2°	±[0.8]	±[0.25]

DIMENSIONS IN [ ] ARE MILLIMETERS

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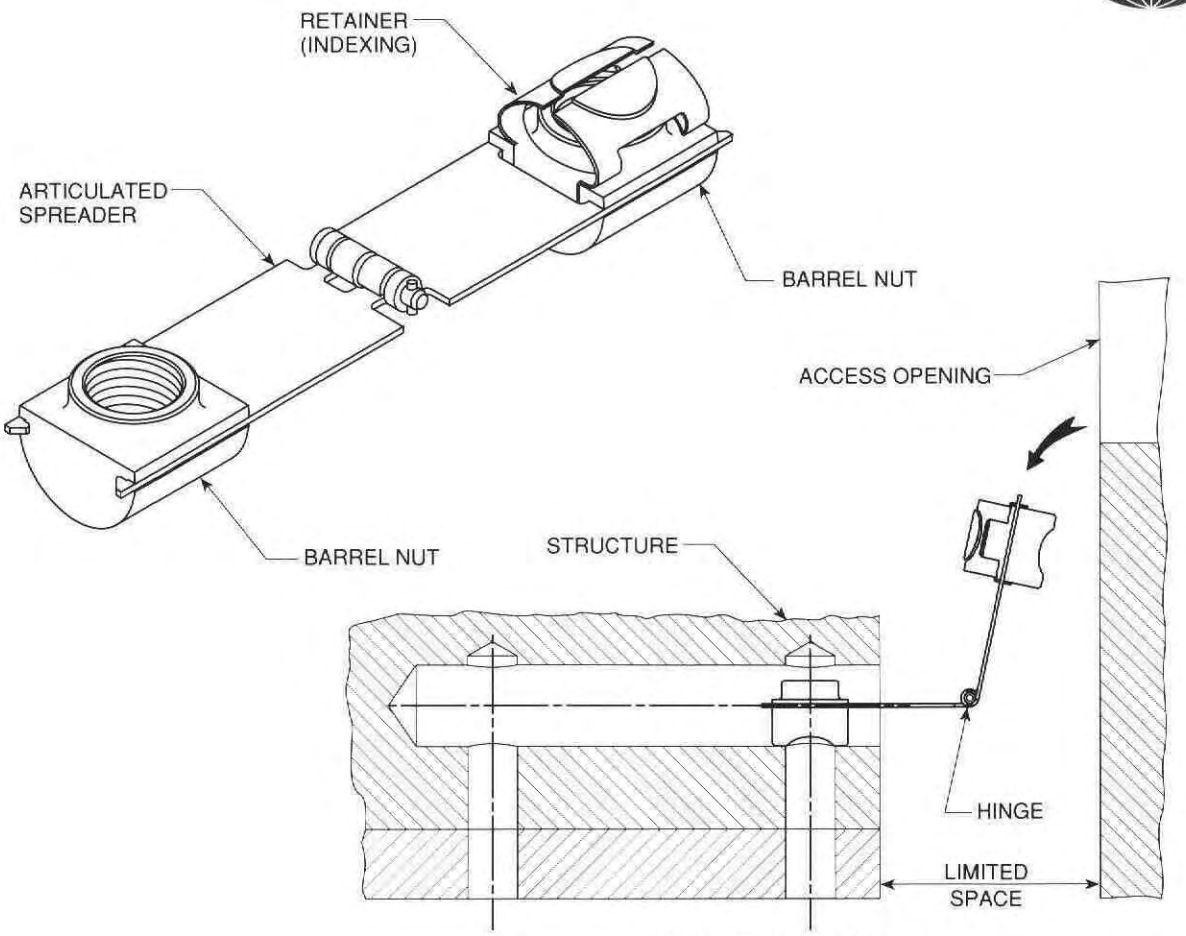
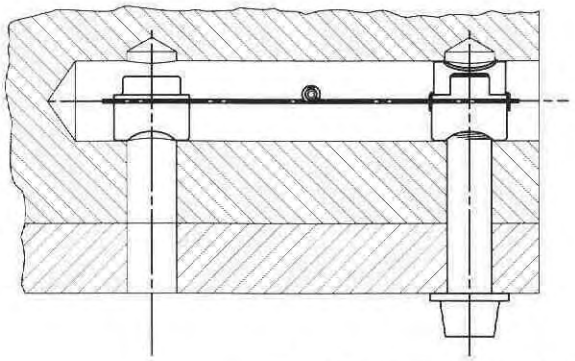
BARREL NUTS
SPECIAL CONCEPTS

TANDEM BARREL NUT

BARREL NUTS, SPECIAL CONCEPTS



INSERTION PROCEDURE



COMPLETED INSTALLATION

APPLICATION:
ARTICULATED TANDEM BARREL NUTS PROVIDE THE SAME BENEFITS AS THE RIGID TYPE BUT WITH THE ADDED ADVANTAGE OF INSERTION IN AREAS OF LIMITED ACCESS. USED IN AIRCRAFT ENGINE MOUNTINGS.

FEATURES:
TWO BARREL NUTS CAPTURED BY A HINGED SPREADER TO ELIMINATE INTERFERENCE WITH CLOSELY ADJACENT STRUCTURE DURING INSERTION. AN INDEXING RETAINER ON THE OUTER BARREL NUT PROVIDES ACCURATE LOCATION FOR BOTH BARREL NUTS.

ISSUED: JULY 1990

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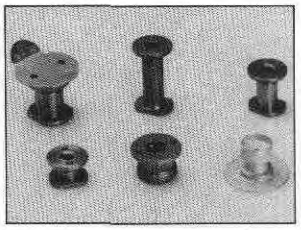
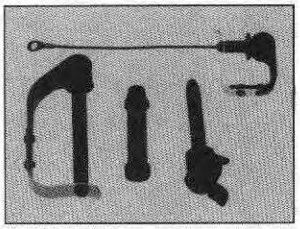
TANDEM BARREL NUT, ARTICULATED

BARREL NUTS
SPECIAL CONCEPTS

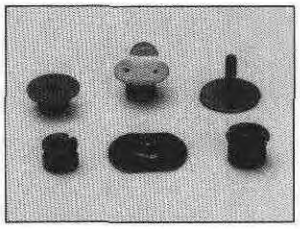
FASTENERS FOR SANDWICH STRUCTURE
Precision machined inserts, made to exacting specifications, are ideal for fastener applications in most sandwich structure material. These inserts are available in either threaded or nonthreaded, through or blind and locking or nonlocking.



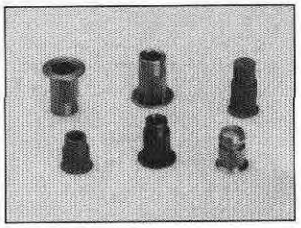
EXPANDABLE DIAMETER FASTENERS
These fasteners are engineered for specific applications and permit fast installation and removal. Composed of split bushings which expand when compressed by a cam or nut, they provide a tight radial fit that resists severe shock, vibration and cyclic shear loads which prevents fretting.

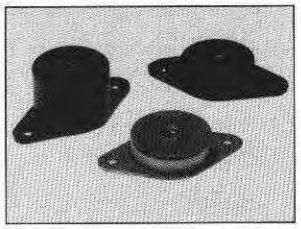


FASTENERS FOR ADVANCED COMPOSITES
Manufactured from metallic and non-metallic materials, these fasteners are specifically designed for use in advanced fiber-reinforced composite materials. Included in this catalog are potted, mechanical and thermally bonded on type fasteners. Advanced thermo-plastic fasteners are compatible with composites and provide substantial weight savings.

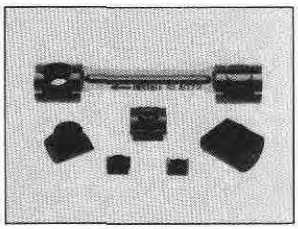


MISCELLANEOUS FASTENERS
This catalog includes a variety of fasteners, including: special nuts, blind fasteners and isolator mounts. Blind fasteners are designed for structural applications requiring positive torque-out resistance and are installed by simple tooling which collapses the part to grip the work piece and isolator mounts designed to dampen vibration, noise and transfer heat. Isolators are available with neoprene or silicone rubber, with threaded or 1/4 turn receptacle.

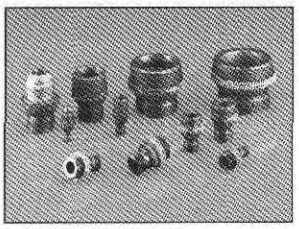




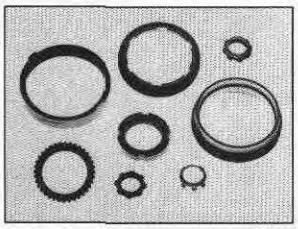
BARREL NUTS
Barrel nuts minimize drilling and eliminate the need for long, expensive bolts when attaching heavy structural members in high-tensile applications. These barrel nuts are available with either a metallic or nonmetallic locking element and in floating or fixed designs. Barrel nut retainers are also listed in this catalog.



HYDRAULIC FITTINGS
Hydraulic Fittings replace MS fluid adaptors that require lock wires to prevent rotation, Sta-Lok® fittings positively secure hydraulic or fuel lines to aircraft engine or gearbox manifolds using a serrated lock ring. They are qualified to SAE or AECMA standard and certified to operate in systems pressurized to 4,000, 5,000 or 8,000 psi.



BEARING LOCKNUTS
The Sta-Lok® Positive Locking System helps eliminate keyway stress and the loss of preloaded torque in shaft or spindle attachment applications. Prevailing torque locknuts can be designed with either internal or external threads and a metallic or nonmetallic locking element.



APPENDIX B

INTERNATIONAL SPECIFICATIONS FOR STEELS

USA	FRANCE	EUROPE		GERMANY	GREAT BRITAIN	COMMERCIAL SPECIFICATION
		AECMA	EN			
STAINLESS STEELS						
303	Z10CNF18.09			1.4305		
304	Z6CN18.09			1.4301		
(AISI 431) MIL-S-18732	Z15CN17-03 AIR 9160	FE-PM 42	2136	1.4044	5S80	A.P.X.
	Z8CND17-04 AIR 9160					A.P.X. 4
15-5 PH AMS 5659		FE-PM 64		1.4546		
17-4 PH AMS 5643	Z6CNU17-0 4 AIR 9160	FE-PM 61		1.4548		X 17 U 4
17-7 PH MIL-S-25043						
13-8 Mo AMS 5629				1.4534		
		FE-PM 66	prEN 2506		2 S 145	
A 286 AMS 5737 (Bars) AMS 5525(Tubes)	E-Z6NCT25 AIR 9165	FE-PA 92 HT	prEN 2303 prEN 2304	1.4944 (Bars)	BS HR 51 DTD 5076	
INCONEL 718 AMS 5662	NC19FeNb AIR 9165	NI-P 100 HT	prEN 2404 prEN 2405	2.4668		
STRUCTURAL STEELS						
	30NCD16 AIR 9160					
	E30NCD16 AIR 9160					
(SAE 4135)	35CD4 AIR 9160	FE-PL 45		1.7220	708H37 ?	
	35NCD16 AIR 9160					
	E 35NCD16 AIR 9160					
SAE 4140 MIL-S-5626	40CD4 AIR 9160					
SAE 4130 MIL-S-6758 (Bars) MIL-S-1872 9(Tubes)	25CD4S AIR 9160	FE-PL 43S	2206	1.7214	S-142(Bars) S-534 (Tubes)	
SAE 4340 MIL-S-8844 AMS 6414	(40NCD7) AIR 9160			1.6944	817M40 ? 3S99 ?	
MACHINING STEELS						
12L14 FED-STD 66 ASTM-A-108				1.0737		9SMnPb36
1117						
1137						
1140				1.0726		35S20