

# **Specification for Subsurface Sucker Rod Pumps and Fittings**

API SPECIFICATION 11AX  
TWELFTH EDITION, MAY 2006

EFFECTIVE DATE: OCTOBER 2006





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## **Upstream Segment**

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# Specification for Subsurface Sucker Rod Pumps and Fittings

## 1 Scope

This specification covers rod pumps and tubing pumps in commonly used bore sizes. Sufficient dimensional requirements are provided to assure interchangeability and standardization of all component parts; however, details of design are not specified. Standard materials are specified.

The formulation and publication of API specifications and the API monogram program are not intended in any way to inhibit the purchase of products from companies not licensed to use the API monogram.

## 2 References

This specification includes by reference, either in total or in part, the most recent editions of the following API, industry, and government standards, unless a specific edition is listed:

### API

Spec 5B	<i>Specification for Threading, Gaging, and Thread Inspection of Casing, Tubing, and Line Pipe Threads</i>
RP 11AR	<i>Recommended Practice for Care and Handling Sucker Rod Pumps</i>

### ASME<sup>1</sup>

B1.1	<i>Unified Inch Screw Threads (UN and UNR Thread Form)</i> (1989 Edition)
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### ASNT<sup>2</sup>

SNT-TC-1A	<i>Personnel Qualifications and Certification in Nondestructive Testing</i> (1988 Edition)
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### ASTM<sup>3</sup>

A 370	<i>Standard Test Methods and Definitions for Mechanical Testing of Steel Products</i> (1992 Edition)
E 18	<i>Standard Methods of Tests for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials</i> (1992 Edition)
E 165	<i>Standard Practice for Liquid Penetrant Inspection Method</i> (1991 Edition)
E 384	<i>Standard Test Method for Microhardness of Materials</i> (1989 Edition)

### Military Standard

ANSI/ASQC Z1.4	<i>Single Sampling Plan for Normal Inspection</i>
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### NACE<sup>4</sup>

MR-01-76	<i>Standard Recommended Practice Sulfide Stress Cracking Resistant Metallic Materials for Oilfield Equipment</i> (1992 Edition)
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Note: Section 9 conforms to the 1994 edition of MR-01-76 although this does not preclude a manufacturer's use of material which may conform to a more recent edition of MR-01-76. In such case, the manufacturer shall maintain documentation data in their product design file to support such conformance.

## 3 Pump Designation

**3.1** The basic types of pumps and letter designation covered by this specification are shown in Table 1.

**3.2** Complete pump designations, as shown in Figure 1, include:

- Nominal tubing size.
- Basic bore diameter.
- Type of pump, including type of barrel and location and type of seating assembly.
- Barrel length.

<sup>1</sup>American Society of Mechanical Engineers, 345 East 47th Street, New York, NY 10017-2392.

<sup>2</sup>American Society for Nondestructive Testing, 1711 Arlingate Lane, Columbus, Ohio 43228-0518.

<sup>3</sup>ASTM, 100 Barr Harbor Drive, West Conshohocken, Pennsylvania 19428.

<sup>4</sup>National Association of Corrosion Engineers, P. O. Box 218340, Houston, Texas 77218-8340.

Table 1—Pump Designations

(1)	(2)	(3)	(4)	(5)
Type of Pump	Letter Designation			
	Metal Plunger Pumps		Soft-Packed Plunger Pumps	
	Heavy-Wall Barrel	Thin-Wall Barrel	Heavy-Wall Barrel	Thin-Wall Barrel
Rod Pumps				
Stationary Barrel, Top Anchor	RHA	RWA	—	RSA
Stationary Barrel, Bottom Anchor	RHB	RWB	—	RSB
Stationary Barrel, Bottom Anchor	RXB	—	—	—
Traveling Barrel, Bottom Anchor	RHT	RWT	—	RST
Tubing Pumps	TH	—	TP	—

e. Plunger length.

f. Length of each extension when used.

Example: A 1¼ in. (31.8 mm) bore rod type pump with a 10 ft (3.048 m) heavy wall barrel and 2 ft (0.610 m) upper extension, 2 ft (0.610 m) lower extension, a 4 ft (1.219 m) plunger, and a bottom cup type seating assembly for operation in 2⅜ in. (60.3 mm) tubing, would be designated as follows:

20-125 RHBC 10-4-2-2

Note: Metallic materials for subsurface sucker rod pumps for hydrogen sulfide environments are listed in NACE MR-01-76.

**3.3** In addition to the pump designation described in 3.2, the purchaser must provide the following additional information:

- Barrel material.
- Plunger material.
- Plunger clearance (fit).
- Valve material.
- Fittings materials.

## 4 Design Control

### 4.1 GENERAL

**4.1.1** Sucker rod pumps shall be identified per Section 3 and assembled in accordance with Section 5.

**4.1.2** Component parts designed and manufactured in accordance with this specification shall comply with the dimensions given in Section 6 and be constructed of materials listed in Section 9.

**4.1.3** The following applies to all specified limits in this standard: For purposes of determining conformance with this specification, an observed value or a calculated value shall be rounded “to the nearest unit” in the last right-hand digit used in expressing the specification limit.

### 4.2 DESIGN DOCUMENTATION

**4.2.1** Documentation shall include drawings, specifications, procedures, and, if applicable, assumptions, methods, formulae, calculations and test results.

**4.2.2** Requirements and acceptance criteria shall be documented.

**4.2.3** The method used to determine stroke length for pump assemblies shall be documented.

**4.2.4** Documentation shall be prepared on a medium that is legible, reproducible, and retrievable.

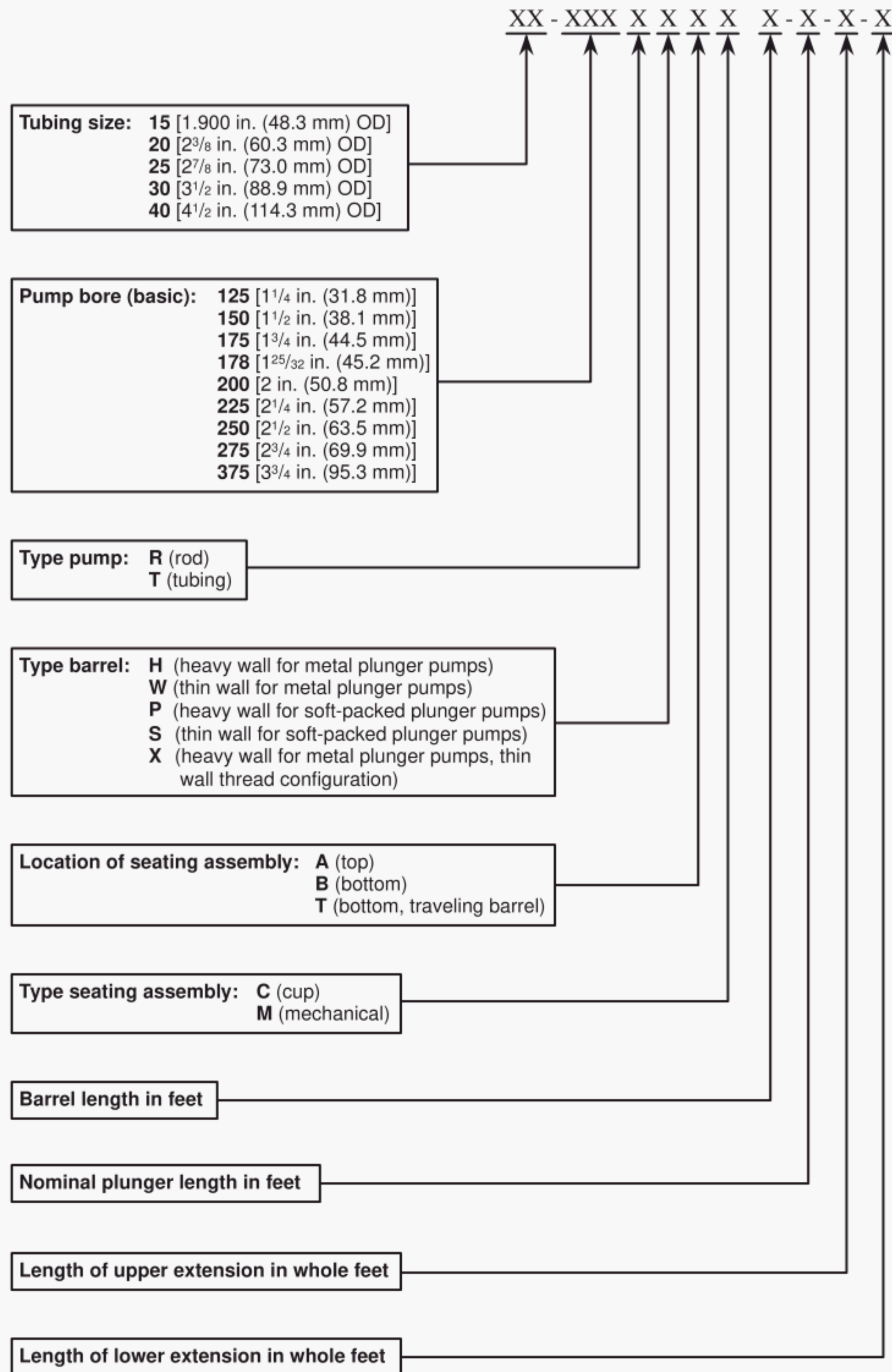


Figure 1—Pump Designations

### **4.3 DESIGN VERIFICATION**

Verification shall consist of assuring that design conforms to requirements of this specification.

### **4.4 DESIGN REVIEW**

Documentation shall be reviewed and verified by a qualified individual(s) other than the individual(s) who developed the original design, if such additional qualified individual(s) are employed by the manufacturer.

### **4.5 DESIGN CHANGES**

Changes shall be identified, documented, reviewed, and approved by authorized personnel.

## **5 Pump Assemblies**

**5.1** Sucker rod pump assemblies shall be furnished as per the line-ups in this section using component parts defined in Section 6.

**5.2** Metal plunger pumps are equipped with the following basic components from Section 6.

- a. Valve rod or pull tube (insert pump only).
- b. One piece or assembled metal plungers of basic diameter, less clearance.
- c. Valves.
- d. Heavy-wall or thin-wall barrels.
- e. Seating assemblies.

1. Cup type assemblies with “plus 30” cups [0.030 in. (0.76 mm) larger than ID of seating nipple] for rod pumps, and “plus 10” cups [0.010 in. (0.25 mm) larger than ID of seating nipple] for tubing pumps. The letter “C” is to be used in the pump designation, as described in Section 3.

2. Mechanical seating assemblies may be furnished when so specified, in which case the letter “M” is used in the pump designation in lieu of the letter “C”. See part numbers S21 and S22 for details of the mechanical seating assemblies.

**5.3** The design and construction of packing for soft-packed plungers has not been standardized. Specify size, type, and number of packing elements, according to the manufacturer’s catalog.

**5.4** Pump assemblies as described in this section shall be assembled and functionally tested per Section 7.

**5.5** Marking of pump assemblies shall be per Section 8. However, when API monogrammed assemblies are specified, marking shall be per Appendix A.

Table RHA—Rod, Stationary Heavy Wall Barrel, Top Anchor Pump (See Note)

(1)	(2)	(3)	(4)	(5)	(6)
Standard Pump Size					
		$2\frac{3}{8} \times 1\frac{1}{4}$ (60.3 x 31.8)	$2\frac{7}{8} \times 1\frac{1}{2}$ (73.0 x 38.1)	$2\frac{7}{8} \times 1\frac{3}{4}$ (73.0 x 44.5)	$3\frac{1}{2} \times 2\frac{1}{4}$ (88.9 x 57.2)
Complete Pump Designation					
		20-125 RHAC <sup>a,b,c</sup>	25-150 RHAC <sup>a,b,c</sup>	25-175 RHAC <sup>a,b,c</sup>	30-225 RHAC <sup>a,b,c</sup>
Symbol	Description	Part Number			
B12	Barrel, Heavy Wall	B12-125 <sup>a</sup>	B12-150 <sup>a</sup>	B12-175 <sup>a</sup>	B12-225 <sup>a</sup>
B21	Bushing, Valve Rod	B21-20	B21-25	B21-25	B21-30
B22	Bushing, Barrel Cage	B22-20	B22-25	B22-25	B22-30
C12	Cage, Top Plunger	C12-125	C12-150-25	C12-175	C12-225
C13	Cage, Closed Plunger	C13-125	C13-150	C13-25	C13-225
C14	Cage, Closed Barrel	C14-20	C14-25	C14-25	C14-30
C31	Coupling, Extension	C31-125 <sup>c</sup>	C31-150 <sup>c</sup>	C31-175 <sup>c</sup>	C31-225 <sup>c</sup>
G11	Guide, Valve Rod	G11-20	G11-25	G11-25	G11-30
P12	Plug, Seat	P12-125	P12-150	P12-175	P12-225
P21	Plunger, One Piece <sup>d</sup>	P21-125 <sup>b</sup>	P21-150 <sup>b</sup>	P21-175 <sup>b</sup>	P21-225 <sup>b</sup>
R11	Rod, Valve	R11-20 <sup>e</sup>	R11-25 <sup>e</sup>	R11-25 <sup>e</sup>	R11-30 <sup>e</sup>
S11	Seating Mandrel, Cup (Type HR)	S11-20	S11-25	S11-25	S11-30
S12	Seating Cup (Type HR)	S12-20	S12-25	S12-25	S12-30
S13	Seating Cup Ring (Type HR)	S13-20	S13-25	S13-25	S13-30
S14	Seating Cup Nut (Type HR)	S14-20	S14-25	S14-25	S14-30
S15	Seating Cup Bushing	S15-20	S15-25	S15-25	S15-30
V11	Valve, Ball and Seat				
	Traveling	V11-125	V11-150	V11-175	V11-225
	Standing	V11-175	V11-225	V11-225	V11-250

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>Specify barrel length in feet (meters). Standard lengths are: 8 ft (2.438m) through 30 ft (9.144m) in. 2 ft (0.610m) increments.

<sup>b</sup>Specify nominal plunger length in. feet (meters) and clearance (fit) in. thousandths of an inch (hundredths of a millimeter).

<sup>c</sup>Specify length of extension couplings in whole feet (thousandths of meters). Standard lengths are in increments of  $\frac{1}{2}$  ft (0.152 m).

<sup>d</sup>A seat must be used between C12 and P21 if an optional F1A pin thread is present on P21 plunger, see component P21.

<sup>e</sup>See part number R11 for valve rod length.

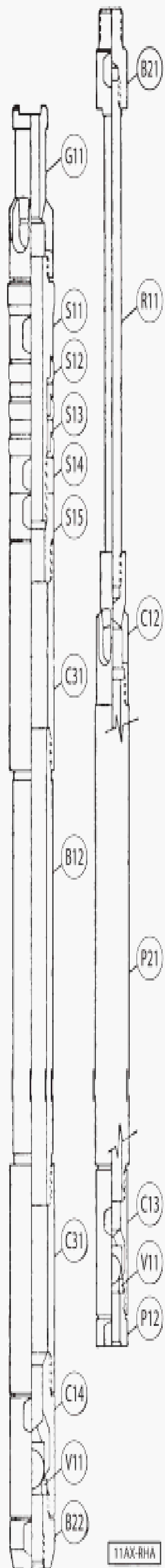
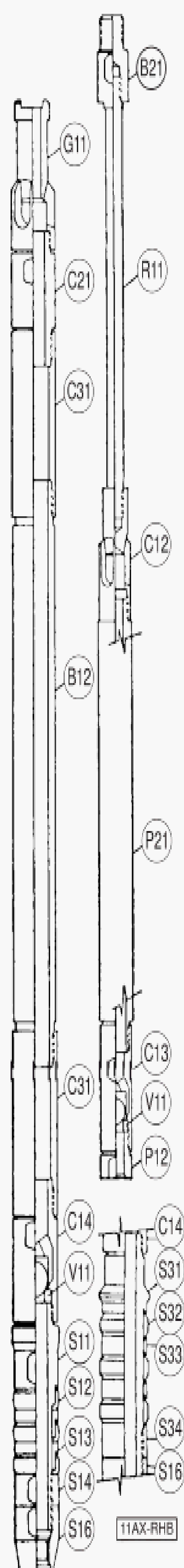




Table RHB—Rod, Stationary Heavy Wall Barrel, Bottom Anchor Pump (See Note)

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Standard Pump Size							
		1.900 x 1 <sup>1</sup> / <sub>16</sub> (48.3 x 27.0)	2 <sup>3</sup> / <sub>8</sub> x 1 <sup>1</sup> / <sub>16</sub> (60.3 x 27.0)	2 <sup>3</sup> / <sub>8</sub> x 1 <sup>1</sup> / <sub>4</sub> (60.3 x 31.8)	2 <sup>7</sup> / <sub>8</sub> x 1 <sup>1</sup> / <sub>2</sub> (73.0 x 38.1)	2 <sup>7</sup> / <sub>8</sub> x 1 <sup>3</sup> / <sub>4</sub> (73.0 x 44.5)	3 <sup>1</sup> / <sub>2</sub> x 2 <sup>1</sup> / <sub>4</sub> (88.9 x 57.2)
Complete Pump Designation							
		15-106 RHBC <sup>a,b,c</sup>	20-106 RHBC <sup>a,b,c</sup>	20-125 RHBC <sup>a,b,c</sup>	25-150 RHBC <sup>a,b,c</sup>	25-175 RHBC <sup>a,b,c</sup>	30-225 RHBC <sup>a,b,c</sup>
Symbol	Description	Part Number					
B12	Barrel, Heavy Wall	B12-106 <sup>a</sup>	B12-106 <sup>a</sup>	B12-125 <sup>a</sup>	B12-150 <sup>a</sup>	B12-175 <sup>a</sup>	B12-225 <sup>a</sup>
B21	Bushing, Valve Rod	B21-15	B21-20	B21-20	B21-25	B21-25	B21-30
C12	Cage, Top Plunger	C12-106	C12-100	C12-125	C12-150-25	C12-175	C12-225
C13	Cage, Closed Plunger	C13-106	C13-106	C13-125	C13-150	C13-175	C13-225
C14	Cage, Closed Barrel	C14-15	C14-20	C14-20	C14-25	C14-25	C14-30
C21	Connector, Upper Barrel	C21-15	C21-20	C21-20	C21-25	C21-25	C21-30
C31	Coupling, Extension	C31-106-15 <sup>c</sup>	C31-106 <sup>c</sup>	C31-125 <sup>c</sup>	C31-150 <sup>c</sup>	C31-175 <sup>c</sup>	C31-225 <sup>c</sup>
G11	Guide, Valve Rod	G11-15	G11-20	G11-20	G11-25	G11-25	G11-30
P12	Plug, Seat	P12-106	P12-106	P12-125	P12-150	P12-175	P12-225
P21	Plunger, One Piece <sup>d</sup>	P21-106 <sup>b</sup>	P21-106 <sup>b</sup>	P21-125 <sup>b</sup>	P21-150 <sup>b</sup>	P21-175 <sup>b</sup>	P21-225 <sup>b</sup>
R11	Rod, Valve	R11-20 <sup>e</sup>	R11-20 <sup>e</sup>	R11-20 <sup>e</sup>	R11-25 <sup>e</sup>	R11-25 <sup>e</sup>	R11-30 <sup>e</sup>
S11	Seating Mandrel, Cup (Type HR)	—	S11-20	S11-20	S11-25	S11-25	S11-30
S12	Seating Cup (Type HR)	—	S12-20	S12-20	S12-25	S12-25	S12-30
S13	Seating Cup Ring (Type HR)	—	S13-20	S13-20	S13-25	S13-25	S13-30
S14	Seating Cup Nut (Type HR)	—	S14-20	S14-20	S14-25	S14-25	S14-30
S16	Seating Cup Coupling	S16-15	S16-20	S16-20	S16-25	S16-25	S16-30
S31	Seating Mandrel, Cup (Type O)	S31-15	—	—	—	—	—
S32	Seating Cup (Type O)	S32-15	—	—	—	—	—
S33	Seating Cup Ring (Type O)	S33-15	—	—	—	—	—
S34	Seating Cup Nut (Type O)	S34-15	—	—	—	—	—
V11	Valve, Ball and Seat						
	Traveling	V11-106	V11-106	V11-125	V11-150	V11-175	V11-225
	Standing	V11-150	V11-175	V11-175	V11-225	V11-225	V11-250

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>Specify barrel length in feet (meters). Standard lengths are: 8 ft (2.438m) through 30 ft (9.144m) in 2 ft (0.610m) increments.<sup>b</sup>Specify nominal plunger length in feet (meters), and clearance (fit) in thousandths of an inch (hundredths of a millimeter).<sup>c</sup>Specify length of extension couplings in whole feet (thousandths of meters). Standard lengths are in increments of 1/2 ft (0.152 m).<sup>d</sup>A seat must be used between C12 and P21 if an optional F1A pin thread is present on P21 plunger, see component P21.<sup>e</sup>See part number R11 for valve rod length.



Table RWA—Rod, Stationary Thin Wall Barrel, Top Anchor Pump (See Note)

(1)	(2)	(3)	(4)	(5)	(6)
Standard Pump Size					
		$2\frac{3}{8} \times 1\frac{1}{4}$ (60.3 x 31.8)	$2\frac{3}{8} \times 1\frac{1}{2}$ (60.3 x 38.1)	$2\frac{7}{8} \times 2$ (73.0 x 50.8)	$3\frac{1}{2} \times 2\frac{1}{2}$ (88.9 x 63.5)
Complete Pump Designation					
		20-125 RWAC <sup>a,c</sup>	20-150 RWAC <sup>a,c</sup>	25-200 RWAC <sup>a,c</sup>	30-250 RWAC <sup>a,c</sup>
Symbol	Description	Part Number			
B11	Barrel, Thin Wall	B11-125 <sup>a</sup>	B11-150 <sup>a</sup>	B11-200 <sup>a</sup>	B11-250 <sup>a</sup>
B21	Bushing, Valve Rod	B21-20	B21-20	B21-25	B21-30
B22	Bushing, Barrel Cage	B22-20	B22-20	B22-25	B22-30
C12	Cage, Top Plunger	C12-125	C12-150-20	C12-200	C12-250
C13	Cage, Closed Plunger	C13-125	C13-150	C13-200	C13-250
C14	Cage, Closed Barrel	C14-20-125	C14-20	C14-25	C14-30
G11	Guide, Valve Rod	G11-20	G11-20	G11-25	G11-30
P12	Plug, Seat	P12-125	P12-150	P12-200	P12-250
P21	Plunger, One Piece <sup>b</sup>	P21-125 <sup>c</sup>	P21-150 <sup>c</sup>	P21-200 <sup>c</sup>	P21-250 <sup>c</sup>
R11	Rod, Valve	R11-20 <sup>d</sup>	R11-20 <sup>d</sup>	R11-25 <sup>d</sup>	R11-30 <sup>d</sup>
S11	Seating Mandrel, Cup (Type HR)	S11-20	S11-20	S11-25	S11-30
S12	Seating Cup (Type HR)	S12-20	S12-20	S12-25	S12-30
S13	Seating Cup Ring (Type HR)	S13-20	S13-20	S13-25	S13-30
S14	Seating Cup Nut (Type HR)	S14-20	S14-20	S14-25	S14-30
S15	Seating Cup Bushing	S15-20-125	S15-20	S15-25	S15-30
V11	Valve, Ball and Seat				
	Traveling	V11-125	V11-150	V11-200	V11-250
	Standing	V11-175	V11-175	V11-225	V11-250

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>Specify barrel length in feet (meters). Standard lengths are: 8 ft (2.438m) through 30 ft (9.144m) in 2 ft (0.610m) increments.

<sup>b</sup>A seat must be used between C12 and P21 if an optional F1A pin thread is present on P21 plunger, see component P21.

<sup>c</sup>Specify nominal plunger length in feet (meters), and clearance (fit) in thousandths of an inch (hundredths of a millimeter).

<sup>d</sup>See part number R11 for valve rod length.



11AX-RWA

Table RWB—Rod, Stationary Thin Wall Barrel, Bottom Anchor Pump (See Note)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Standard Pump Size						
		1.900 x 1 <sup>1</sup> / <sub>4</sub> (48.3 x 31.8)	2 <sup>3</sup> / <sub>8</sub> x 1 <sup>1</sup> / <sub>4</sub> (60.3 x 31.8)	2 <sup>3</sup> / <sub>8</sub> x 1 <sup>1</sup> / <sub>2</sub> (60.3 x 38.1)	2 <sup>7</sup> / <sub>8</sub> x 2 (73.0 x 50.8)	3 <sup>1</sup> / <sub>2</sub> x 2 <sup>1</sup> / <sub>2</sub> (88.9 x 63.5)
Complete Pump Designation						
		15-125 RWBC <sup>a,c</sup>	20-125 RWBC <sup>a,c</sup>	20-150 RWBC <sup>a,c</sup>	25-200 RWBC <sup>a,c</sup>	30-250 RWBC <sup>a,c</sup>
Symbol	Description	Part Number				
B11	Barrel, Thin Wall	B11-125 <sup>a</sup>	B11-125 <sup>a</sup>	B11-150 <sup>a</sup>	B11-200 <sup>a</sup>	B11-250 <sup>a</sup>
B21	Bushing, Valve Rod	B21-15	B21-20	B21-20	B21-25	B21-30
C12	Cage, Top Plunger	C12-125	C12-125	C12-150-20	C12-200	C12-250
C13	Cage, Closed Plunger	C13-125	C13-125	C13-150	C13-200	C13-250
C14	Cage, Closed Barrel	C14-15	C14-20-125	C14-20	C14-25	C14-30
C21	Connector, Upper Barrel	C21-15	C21-20-125	C21-20	C21-25	C21-30
G11	Guide, Valve Rod	G11-15	G11-20	G11-20	G11-25	G11-30
P12	Plug, Seat	P12-125	P12-125	P12-150	P12-200	P12-250
P21	Plunger, One Piece <sup>b</sup>	P21-125 <sup>c</sup>	P21-125 <sup>c</sup>	P21-150 <sup>c</sup>	P21-200 <sup>c</sup>	P21-250 <sup>c</sup>
R11	Rod, Valve	R11-20 <sup>d</sup>	R11-20 <sup>d</sup>	R11-20 <sup>d</sup>	R11-25 <sup>d</sup>	R11-30 <sup>d</sup>
S11	Seating Mandrel, Cup (Type HR)	—	S11-20	S11-20	S11-25	S11-30
S12	Seating Cup (Type HR)	—	S12-20	S12-20	S12-25	S12-30
S13	Seating Cup Ring (Type HR)	—	S13-20	S13-20	S13-25	S13-30
S14	Seating Cup Nut (Type HR)	—	S14-20	S14-20	S14-25	S14-30
S16	Seating Cup Coupling	S16-15	S16-20	S16-20	S16-25	S16-30
S31	Seating Mandrel, Cup (Type O)	S31-15	—	—	—	—
S32	Seating Cup (Type O)	S32-15	—	—	—	—
S33	Seating Cup Ring (Type O)	S33-15	—	—	—	—
S34	Seating Cup Nut (Type O)	S34-15	—	—	—	—
V11	Valve, Ball and Seat					
	Traveling	V11-125	V11-125	V11-150	V11-200	V11-250
	Standing	V11-150	V11-175	V11-175	V11-225	V11-250

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>Specify barrel length in feet (meters). Standard lengths are: 8 ft (2.438m) through 30 ft (9.144m) in 2 ft (0.610m) increments.

<sup>b</sup>A seat must be used between C12 and P21 if an optional F1A pin thread is present on P21 plunger, see component P21.

<sup>c</sup>Specify nominal plunger length in feet (meters), and clearance (fit) in thousandths of an inch (hundredths of a millimeter).

<sup>d</sup>See part number R11 for valve rod length.

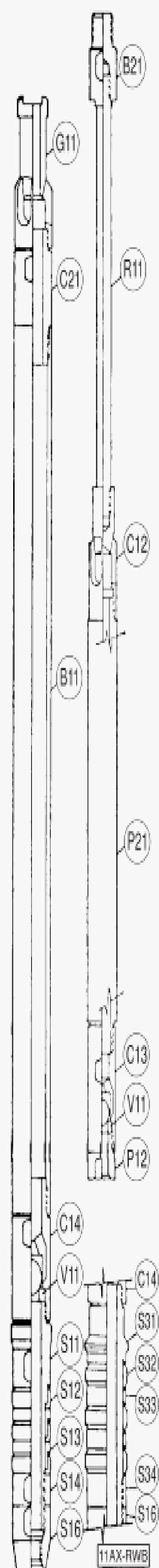


Table RWT—Rod, Traveling Thin Wall Barrel, Bottom Anchor Pump (See Note)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
		Standard Pump Size				
		1.900 x 1 <sup>1</sup> / <sub>4</sub> (48.3 x 31.8)	2 <sup>3</sup> / <sub>8</sub> x 1 <sup>1</sup> / <sub>4</sub> (60.3 x 31.8)	2 <sup>3</sup> / <sub>8</sub> x 1 <sup>1</sup> / <sub>2</sub> (60.3 x 38.1)	2 <sup>7</sup> / <sub>8</sub> x 2 (73.0 x 50.8)	3 <sup>1</sup> / <sub>2</sub> x 2 <sup>1</sup> / <sub>2</sub> (88.9 x 63.5)
		Complete Pump Designation				
		15-125 RWBC <sup>a,c</sup>	20-125 RWBC <sup>a,c</sup>	20-150 RWBC <sup>a,c</sup>	25-200 RWBC <sup>a,c</sup>	30-250 RWBC <sup>a,c</sup>
Symbol	Description	Part Number				
B11	Barrel, Thin Wall	B11-125 <sup>a</sup>	B11-125 <sup>a</sup>	B11-150 <sup>a</sup>	B11-200 <sup>a</sup>	B11-250 <sup>a</sup>
C11	Cage, Top Open	C11-15	C11-20	C11-20	C11-25	C11-30
C12	Cage, Top Plunger	C12-125	C12-125	C12-150-20	C12-200	C12-250
C21	Connector, Upper Barrel	C21-15	C21-20-125	C21-20	C21-25	C21-30
C32	Coupling, Pull Tube, Upper	C32-125	C32-125	C32-150	C32-200	C32-250
C33	Coupling, Pull Tube, Lower	C33-125-15	C33-125	C33-150-20	C33-200	C33-225
P11	Plug, Pull	P11-125-15	P11-125-15	P11-150-20	P11-200	P11-225
P21	Plunger, One Piece	P21-125 <sup>b</sup>	P21-125 <sup>b</sup>	P21-150 <sup>b</sup>	P21-200 <sup>b</sup>	P21-250 <sup>b</sup>
S11	Seating Mandrel, Cup (Type HR)	—	S11-20	S11-20	S11-25	S11-30
S12	Seating Cup (Type HR)	—	S12-20	S12-20	S12-25	S12-30
S13	Seating Cup Ring (Type HR)	—	S13-20	S13-20	S13-25	S13-30
S14	Seating Cup Nut (Type HR)	—	S14-20	S14-20	S14-25	S14-30
S16	Seating Cup Coupling	S16-15	S16-20	S16-20	S16-25	S16-30
S31	Seating Mandrel, Cup (Type O)	S31-15	—	—	—	—
S32	Seating Cup (Type O)	S32-15	—	—	—	—
S33	Seating Cup Ring (Type O)	S33-15	—	—	—	—
S34	Seating Cup Nut (Type O)	S34-15	—	—	—	—
T11	Tube, Pull	T11-125 <sup>c</sup>	T11-125 <sup>c</sup>	T11-150 <sup>c</sup>	T11-200 <sup>c</sup>	T11-225 <sup>c</sup>
V11	Valve, Ball and Seat					
	Traveling	V11-150	V11-175	V11-175	V11-225	V11-250
	Standing	V11-125	V11-125	V11-150	V11-200	V11-250

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>Specify barrel length in feet (meters). Standard lengths are: 8 ft (2.438m) through 30 ft (9.144m) in 2 ft (0.610m) increments.

<sup>b</sup>Specify nominal plunger length in feet (meters), and clearance (fit) in thousandths of an inch (hundredths of a millimeter).

<sup>c</sup>See part number T11 for pull tube length.

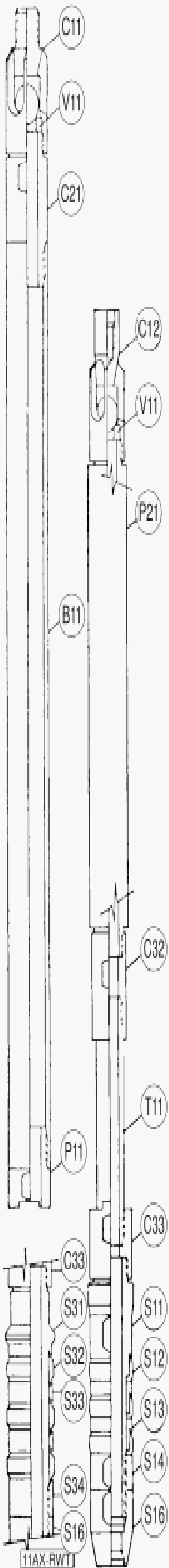


Table RXB—Rod, Stationary Heavy Wall Barrel, Bottom Anchor Pump (See Note)

(1)	(2)	(4)	(5)	(6)
		Standard Pump Size		
		2 <sup>3</sup> / <sub>8</sub> x 1 <sup>1</sup> / <sub>4</sub> (60.3 x 31.8)	2 <sup>3</sup> / <sub>8</sub> x 1 <sup>1</sup> / <sub>2</sub> (60.3 x 38.1)	2 <sup>7</sup> / <sub>8</sub> x 2 (73.0 x 50.8)
		Complete Pump Designation		
		20-125 RXBC <sup>a,c</sup>	20-150 RXBC <sup>a,c</sup>	25-200 RXBC <sup>a,c</sup>
Symbol	Description	Part Number		
B16	Barrel, Heavy Wall	B16-125 <sup>a</sup>	B16-150 <sup>a</sup>	B16-200 <sup>a</sup>
B21	Bushing, Valve Rod	B21-20	B21-20	B21-25
C12	Cage, Top Plunger	C12-125	C12-150-20	C12-200
C13	Cage, Closed Plunger	C13-125	C13-150	C13-200
C14	Cage, Closed Barrel	C14-20-125	C14-20	C14-25
C21	Connector, Upper Barrel	C21-20-125	C21-20	C21-25
G11	Guide, Valve Rod	G11-20	G11-20	G11-25
P12	Plug, Seat	P12-125	P12-150	P12-200
P21	Plunger, One Piece <sup>b</sup>	P21-125 <sup>c</sup>	P21-150 <sup>c</sup>	P21-200 <sup>c</sup>
R11	Rod, Valve	R11-20 <sup>d</sup>	R11-20 <sup>d</sup>	R11-25 <sup>d</sup>
S11	Seating Mandrel, Cup (Type HR)	S11-20	S11-20	S11-25
S12	Seating Cup (Type HR)	S12-20	S12-20	S12-25
S13	Seating Cup Ring (Type HR)	S13-20	S13-20	S13-25
S14	Seating Cup Nut (Type HR)	S14-20	S14-20	S14-25
S16	Seating Cup Coupling	S16-20	S16-20	S16-25
V11	Valve, Ball and Seat			
	Traveling	V11-125	V11-150	V11-200
	Standing	V11-175	V11-175	V11-225

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>Specify barrel length in feet (meters). Standard lengths are: 8 ft (2.438m) through 30 ft (9.144m) in 2 ft (0.610m) increments.

<sup>b</sup>A seat must be used between C12 and P21 if an optional F1A pin thread is present on P21 plunger, see component P21.

<sup>c</sup>Specify nominal plunger length in feet (meters), and clearance (fit) in thousandths of an inch (hundredths of a millimeter).

<sup>d</sup>See part number R11 for valve rod length.

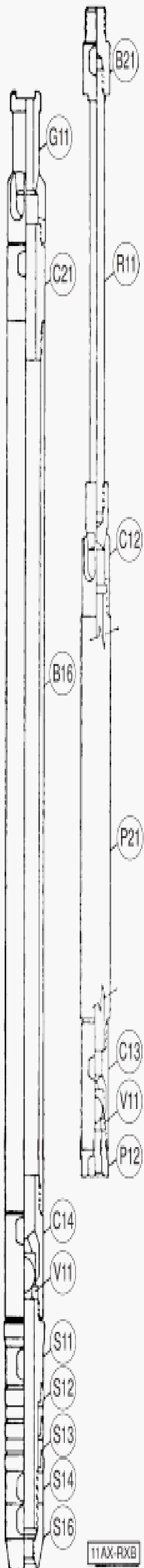


Table TH—Tubing, Heavy Wall Barrel Pump (See Note)

(1)	(2)	(3)	(4)	(5)	(6)
Symbol	Description	Standard Pump Size			
		$2\frac{3}{8} \times 1\frac{3}{4}$ (60.3 x 44.5)	$2\frac{7}{8} \times 2\frac{1}{4}$ (73.0 x 57.2)	$3\frac{1}{2} \times 2\frac{3}{4}$ (88.9 x 69.9)	$4\frac{1}{2} \times 3\frac{3}{4}$ (114.3 x 95.3)
		Complete Pump Designation			
		20-175 THC <sup>a,b,c</sup>	25-225 THC <sup>a,b,c</sup>	30-275 THC <sup>a,b,c</sup>	40-375 THM <sup>a,b,c,e</sup>
Part Number					
B23	Bushing, Optional <sup>d</sup>	—	—	—	B23-40
B13	Barrel, Heavy Wall	B13-175a	B13-225a	B13-275a	B13-375a
C11	Cage, Top Open	C11-20	C11-20	C11-30	C11-40
C13	Cage, Closed Plunger	C13-175	C13-225	C13-275	C13-375
C16	Cage, Standing Valve	C16-175	C16-225	C16-275	C16-375
C34	Coupling, Tubing	C34-20	C34-25	C34-30	C34-40
C35	Coupling, Barrel	C35-20	C35-25	C35-30	C35-40
N12	Nipple, Seating, Mech.	—	—	—	N12-40
N13	Nipple, Seating	N13-20	N13-25	N13-30	—
N21	Nipple, Extension, Upper	N21-20c	N21-25c	N21-30c	N21-40c
N22	Nipple, Extension, Lower	N22-20c	N22-25c	N22-30c	N22-40c
P21	Plunger, One Piece	P21-175b	P21-225b	P21-275b	P21-375b
P31	Puller, Standing Valve	P31-175	P31-225	P31-275	P31-375e
S13	Seating Cup Ring (Type HR)	S13-20	S13-25	S13-30	—
S14	Seating Cup Nut (Type HR)	S14-20	S14-25	S14-30	—
S16	Seating Cup Coupling	S16-20	S16-25	S16-30	—
S17	Seating Mandrel, Cup (Type HR)	S17-20	S17-25	S17-30	—
S18	Seating Cup (Type HR)	S18-20	S18-25	S18-30	—
V11	Valve, Ball and Seat				
	Traveling	V11-175	V11-225	V11-250	V11-350
	Standing	V11-175	V11-225	V11-250	V11-350
S22		—	—	—	S22-40
	Optional Plunger Assembly				
C15	Cage, Closed, Box Plunger	C15-175	C15-225	C15-275	C15-375
C22	Connector, Box Plunger	C22-175	C22-225	C22-275	C22-375
P23	Plunger, Box End	P23-175b	P23-225b	P23-275b	P23-375b

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>Specify barrel length in feet (meters). Standard lengths are: 6 ft (1.829m) through 16 ft (4.877m) in 1 ft (0.305m) increments. 18 ft (5.486m) through 30 ft (9.144m) in 2 ft (0.610m) increments.

<sup>b</sup>Specify nominal plunger length in feet (meters), and clearance (fit) in thousandths of an inch (hundredths of a millimeter).

<sup>c</sup>Specify length of extensions (extension nipples) in feet (meters). Standard lengths are 2 and 3 ft (0.610 and 0.914 m).

<sup>d</sup>For  $4\frac{1}{2} \times 3\frac{3}{4}$  only use P31-275 Puller in place of P31-375 Puller.

<sup>e</sup>P31-275 optional with use of B23-40 Bushing.

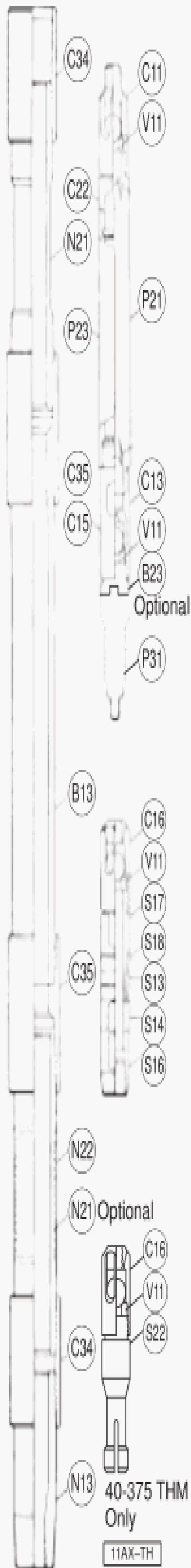


Table RST—Rod, Traveling Thin Wall Barrel, Bottom Anchor, Soft-Packed Plunger Pump (See Note)

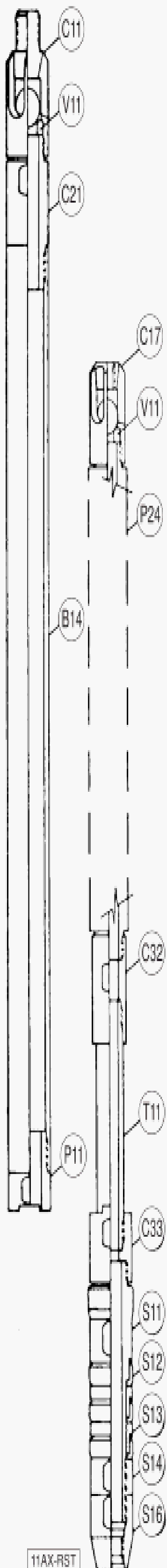
(1)	(2)	(3)	(4)	(5)	(6)
Standard Pump Size					
		$2\frac{3}{8} \times 1\frac{1}{4}$ (60.3 x 31.8)	$2\frac{3}{8} \times 1\frac{1}{2}$ (60.3 x 38.1)	$2\frac{7}{8} \times 2$ (73.0 x 50.8)	$3\frac{1}{2} \times 2\frac{1}{2}$ (88.9 x 63.5)
Complete Pump Designation					
		20-125 RSTC <sup>a,b</sup>	20-150 RSTC <sup>a,b</sup>	25-200 RSTC <sup>a,b</sup>	30-250 RSTC <sup>a,b</sup>
Symbol	Description	Part Number			
B14	Barrel, Soft-Packed Rod Pump	B14-125 <sup>a</sup>	B14-150 <sup>a</sup>	B14-200 <sup>a</sup>	B14-250 <sup>a</sup>
C11	Cage, Top Open	C11-20	C11-20	C11-25	C11-30
C17	Cage, Top Plunger	C17-125	C17-150	C17-200	B17-250
C21	Connector, Upper Barrel	C21-20-125	C21-20	C21-25	C21-30
C32	Coupling, Pull Tube, Upper	C32-125	C32-150	C32-200	C32-250
C33	Coupling, Pull Tube, Lower	C33-125	C33-150-20	C33-200	C33-225
P11	Plug, Pull	P11-125-15	P11-150-20	P11-200	P11-225
P24	Plunger, Soft-Packed	P24-125 <sup>b</sup>	P24-150 <sup>b</sup>	P24-200 <sup>b</sup>	P24-250 <sup>b</sup>
S11	Seating Mandrel, Cup (Type HR)	S11-20	S11-20	S11-25	S11-30
S12	Seating Cup (Type HR)	S12-20	S12-20	S12-25	S12-30
S13	Seating Cup Ring (Type HR)	S13-20	S13-20	S13-25	S13-30
S14	Seating Cup Nut (Type HR)	S14-20	S14-20	S14-25	S14-30
S16	Seating Cup Coupling	S16-20	S16-20	S16-25	S16-30
T11	Tube, Pull	T11-125 <sup>c</sup>	T11-150 <sup>c</sup>	T11-200 <sup>c</sup>	T11-225 <sup>c</sup>
V11	Valve, Ball and Seat				
	Traveling	V11-175	V11-175	V11-225	V11-250
	Standing	V11-125	V11-150	V11-200	V11-250

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>Specify barrel length in feet (meters). Standard lengths are: 8 ft (2.438m) through 30 ft (9.144m) in 2 ft (0.610m) increments.

<sup>b</sup>Specify nominal plunger length in nearest whole or half feet (thousandths of meters), and packing requirements. P24 cups or rings or combination, customer option.

<sup>c</sup>See part number T11 for pull tube length.



## 6 Pump Component Parts

- 6.1** Sucker rod pump component parts shall conform to the dimensions in this section.
- 6.2** Sucker rod pump component parts shall be constructed of materials in accordance with Section 9.
- 6.3** The Master Part Numbering System is designed to provide a systematic method to easily identify parts and for ordering parts for interchangeability.
- 6.4** In order to provide freedom of design, only those dimensional requirements affecting interchangeability are specified for component parts. Wrench flats are optional, but when parts are provided with flats, the dimensions shall conform to the requirements of Table X, Section 10.
- 6.5** All dimensions are given in inches (followed by millimeter values in parentheses) unless otherwise noted.
- 6.6** Surface finishes shall be 250 Ra maximum unless otherwise noted.
- 6.7** Where tolerance are not noted, Table 2 applies.

Table 2—Default Tolerances

(1)	(2)	(3)
Dimensions in Inches	X	± 0.250 in. (6.350 mm)
	X.X	± 0.100 in. (2.540 mm)
	X.XX	± 0.020 in. (0.508 mm)
	X.XXX	± 0.005 in. (0.127 mm)
Dimensions in Feet	X	± 1.5 in. (38.1 mm)
	X.X	± 1.5 in. (38.1 mm)

## Master Part Numbering System

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Designation	Pump Bore Size, in. (mm)									Tubing Size, in. (mm)				
	1 <sup>1</sup> / <sub>4</sub> (31.8)	1 <sup>1</sup> / <sub>2</sub> (38.1)	1 <sup>3</sup> / <sub>4</sub> (44.5)	1 <sup>25</sup> / <sub>32</sub> (45.2)	2 (50.8)	2 <sup>1</sup> / <sub>4</sub> (57.2)	2 <sup>1</sup> / <sub>2</sub> (63.5)	2 <sup>3</sup> / <sub>4</sub> (69.9)	3 <sup>3</sup> / <sub>4</sub> (95.3)	1.900 (48.3)	2 <sup>3</sup> / <sub>8</sub> (60.3)	2 <sup>7</sup> / <sub>8</sub> (73.0)	3 <sup>1</sup> / <sub>2</sub> (88.9)	4 <sup>1</sup> / <sub>2</sub> (114.3)
	125	150	175	178	200	225	250	275	375	15	20	25	30	40
<b>B</b>														
1. Barrel														
1. Thin Wall	B11-125 <sup>a</sup>	B11-150 <sup>a</sup>	—	—	B11-200 <sup>a</sup>	—	B11-250 <sup>a</sup>	—	—	—	—	—	—	—
2. Heavy Wall, Rod	B12-125 <sup>a</sup>	B12-150 <sup>a</sup>	B12-175 <sup>a</sup>	—	—	B12-225 <sup>a</sup>	—	—	—	—	—	—	—	—
3. Heavy Wall, Tubing	—	—	B13-175 <sup>a</sup>	—	—	B13-225 <sup>a</sup>	—	B13-275	B13-375	—	—	—	—	—
4. Thin Wall, S.P. <sup>c</sup>	B14-125 <sup>a</sup>	B14-150 <sup>a</sup>	—	—	B14-200 <sup>a</sup>	—	B14-250 <sup>a</sup>	—	—	—	—	—	—	—
5. Heavy Wall, S.P. <sup>c</sup>	—	—	—	B15-178	—	B15-225	—	B15-275	—	—	—	—	—	—
6. Heavy Wall, Rod	B16-125	B16-150	—	—	B16-200	—	—	—	—	—	—	—	—	—
2. Bushing														
1. Valve Rod	—	—	—	—	—	—	—	—	—	B21-15	B21-20	B21-25	B21-30	—
2. Barrel Cage	—	—	—	—	—	—	—	—	—	B22-15	B22-20	B22-25	B22-30	—
3. Plunger	—	—	—	—	—	—	—	—	—	—	—	—	—	B23-40
<b>C</b>														
1. Cage														
1. Top Open	—	—	—	—	—	—	—	—	—	C11-15	C11-20	C11-25	C11-30	C11-40
2. Top Plunger	C12-125	C12-150-20	C12-175	—	C12-200	C12-225	C12-250	—	—	—	—	—	—	—
	—	C12-150-25	—	—	—	—	—	—	—	—	—	—	—	—
3. Closed Plunger Pin	C13-125	C13-150	C13-175	—	C13-200	C13-225	C13-250	C13-275	C13-375	—	—	—	—	—
4. Closed Barrel	—	—	—	—	—	—	—	—	—	C14-15	C14-20	C14-25	C14-30	—
	—	—	—	—	—	—	—	—	—	—	C14-20-125	—	—	—
5. Closed Plunger Box	—	—	C15-175	—	—	C15-225	—	C15-275	—	—	—	—	—	—
6. Standing Valve	—	—	C16-175	—	—	C16-225	—	C16-275	C16-375	—	—	—	—	—
7. Top Plunger, S.P. <sup>c</sup>	C17-125	C17-150	—	—	C17-200	—	C17-250	—	—	—	—	—	—	—
2. Connector														
1. Upper Barrel	—	—	—	—	—	—	—	—	—	C-21-15	C21-20	C21-25	C21-30	—
	—	—	—	—	—	—	—	—	—	—	C21-20-125	—	—	—
2. Plunger, Box	—	—	C22-175	—	—	C22-225	—	C22-275	C22-375	—	—	—	—	—
3. Coupling														
1. Extension	C31-125 <sup>c</sup>	C31-150 <sup>c</sup>	C31-175 <sup>c</sup>	—	—	C31-225 <sup>c</sup>	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2. Pull Tube, Up.	C32-125	C32-150	C32-175	—	C32-200	C32-225	C32-250	—	—	—	—	—	—	—
3. Pull Tube, Lt.	C33-125	C33-150-20	C33-175	—	C33-200	C33-225	—	—	—	—	—	—	—	—
	C33-125-15	C33-150-25	—	—	—	—	—	—	—	—	—	—	—	—
4. Tubing	—	—	—	—	—	—	—	—	—	C34-15	C34-20	C34-25	C34-30	C34-40
5. Barrel	—	—	—	—	—	—	—	—	—	—	C35-20	C35-25	C35-30	C35-40



# Master Part Numbering System (Continued)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Designation	Pump Bore Size, in. (mm)									Tubing Size, in. (mm)				
	1¼ (31.8)	1½ (38.1)	1¾ (44.5)	1 <sup>25</sup> / <sub>32</sub> (45.2)	2 (50.8)	2¼ (57.2)	2½ (63.5)	2¾ (69.9)	3¾ (95.3)	1.900 (48.3)	2¾ (60.3)	2 <sup>7</sup> / <sub>8</sub> (73.0)	3½ (88.9)	4½ (114.3)
	125	150	175	178	200	225	250	275	375	15	20	25	30	40
6. Barrel Lower, S.P. <sup>e</sup>	—	—	—	—	—	—	—	—	—	—	C36-20	C36-25	C36-30	—
7. Barrel, S.P.e	—	—	—	—	—	—	—	—	—	—	C37-20	C37-25	C37-30	—
G														
1. Guide														
1. Valve Rod	—	—	—	—	—	—	—	—	—	G11-15	G11-20	G11-25	G11-30	—
N														
1. Nipple Seating														
1. Cup Type, Rod	—	—	—	—	—	—	—	—	—	N11-15	N11-20	N11-25	N11-30	—
2. Mech. Bottom	—	—	—	—	—	—	—	—	—	N12-15	N12-20	N12-25	N12-30	N12-40
3. Cup Type, Tubing	—	—	—	—	—	—	—	—	—	—	N13-20	N13-25	N13-30	—
4. Mech. Top	—	—	—	—	—	—	—	—	—	—	N14-20	N14-25	N14-30	—
2. Nipple Extension														
1. Upper	—	—	—	—	—	—	—	—	—	—	N21-20e	N21-25e	N21-30e	N21-40 <sup>e</sup>
2. Lower	—	—	—	—	—	—	—	—	—	—	N22-20e	N22-25e	N22-30e	N22-40 <sup>e</sup>
P														
1. Plug														
1. Pull	P11-125	P11-150-20	P11-175	—	P11-200	P11-225	—	—	—	—	—	—	—	—
	P11-125-15	P11-150-25	—	—	—	—	—	—	—	—	—	—	—	—
2. Seat	P12-125	P12-150	P12-175	—	P12-200	P12-225	P12-250	—	—	—	—	—	—	—
2. Plunger														
1. One Piece, Pin	P21-125 <sup>b</sup>	P21-150 <sup>b</sup>	P21-175 <sup>b</sup>	—	P21-200 <sup>b</sup>	P21-225 <sup>b</sup>	P21-250 <sup>b</sup>	P21-275 <sup>b</sup>	P21-375 <sup>b</sup>	—	—	—	—	—
2. Assembled Pin	P22-125 <sup>b</sup>	P22-150 <sup>b</sup>	P22-175 <sup>b</sup>	—	P22-200 <sup>b</sup>	P22-225 <sup>b</sup>	P22-250 <sup>b</sup>	P22-275 <sup>b</sup>	—	—	—	—	—	—
3. One Piece, Box	—	—	P23-175 <sup>b</sup>	—	—	P23-225 <sup>b</sup>	—	P23-275 <sup>b</sup>	P23-375 <sup>b</sup>	—	—	—	—	—
4. Soft-packed	P24-125 <sup>b</sup>	P24-150 <sup>b</sup>	—	P24-178 <sup>b</sup>	P24-200 <sup>b</sup>	P24-225 <sup>b</sup>	P24-250 <sup>b</sup>	P24-275 <sup>b</sup>	—	—	—	—	—	—
3. Puller														
1. Standing Valve	—	—	P31-175	—	—	P31-225	—	P31-275	P31-375	—	—	—	—	—
R														
1. Rod														
1. Valve	—	—	—	—	—	—	—	—	—	—	R11-20 <sup>d</sup>	R11-25 <sup>d</sup>	R11-30 <sup>d</sup>	—
S														
1. Seating Assy., Type HR, Cup														
1. Mandrel, Rod	—	—	—	—	—	—	—	—	—	—	S11-20	S11-25	S11-30	—

# Master Part Numbering System (Continued)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Designation	Pump Bore Size, in. (mm)									Tubing Size, in. (mm)				
	1 <sup>1</sup> / <sub>4</sub> (31.8)	1 <sup>1</sup> / <sub>2</sub> (38.1)	1 <sup>3</sup> / <sub>4</sub> (44.5)	1 <sup>25</sup> / <sub>32</sub> (45.2)	2 (50.8)	2 <sup>1</sup> / <sub>4</sub> (57.2)	2 <sup>1</sup> / <sub>2</sub> (63.5)	2 <sup>3</sup> / <sub>4</sub> (69.9)	3 <sup>3</sup> / <sub>4</sub> (95.3)	1.900 (48.3)	2 <sup>3</sup> / <sub>8</sub> (60.3)	2 <sup>7</sup> / <sub>8</sub> (73.0)	3 <sup>1</sup> / <sub>2</sub> (88.9)	4 <sup>1</sup> / <sub>2</sub> (114.3)
	125	150	175	178	200	225	250	275	375	15	20	25	30	40
2. Cup, Rod	—	—	—	—	—	—	—	—	—	—	S12-20	S12-25	S12-30	—
3. Ring	—	—	—	—	—	—	—	—	—	—	S13-20	S13-25	S13-30	—
4. Nut	—	—	—	—	—	—	—	—	—	—	S14-20	S14-25	S14-30	—
5. Bushing, Top	—	—	—	—	—	—	—	—	—	S15-15	S15-20	S15-25	S15-30	—
	—	—	—	—	—	—	—	—	—	—	S15-20-125	—	—	—
6. Coupling, Bottom	—	—	—	—	—	—	—	—	—	S16-15	S16-20	S16-25	S16-30	—
7. Mandrel Tubing	—	—	—	—	—	—	—	—	—	—	S17-20	S17-25	S17-30	—
8. Cup, Tubing	—	—	—	—	—	—	—	—	—	—	S18-20	S18-25	S18-30	—
9. Cup, S.P. <sup>e</sup>	—	—	—	—	—	—	—	—	—	—	—	S19-25	S19-30	—
2. Seating Assy., Mech.														
1. Top Lock	—	—	—	—	—	—	—	—	—	—	S21-20	S21-25	S21-30	—
	—	—	—	—	—	—	—	—	—	—	S21-20-125	—	—	—
2. Bottom Lock	—	—	—	—	—	—	—	—	—	S22-15	S22-20	S22-25	S22-30	S22-40
3. Seating Assy., Type O, Cup														
1. Mandrel	—	—	—	—	—	—	—	—	—	S31-15	—	—	—	—
2. Cup	—	—	—	—	—	—	—	—	—	S32-15	—	—	—	—
3. Ring	—	—	—	—	—	—	—	—	—	S33-15	—	—	—	—
4. Nut	—	—	—	—	—	—	—	—	—	S34-15	—	—	—	—
T														
1. Tube														
1. Pull	T11-125 <sup>d</sup>	T11-150 <sup>d</sup>	T11-175 <sup>d</sup>	—	T11-200 <sup>d</sup>	T11-225 <sup>d</sup>	—	—	—	—	—	—	—	—
V														
1. Valve														
1. Ball and Seat	V11-125	V11-150	V11-175	—	V11-200	V11-225	V11-250	V11-250	V11-350	—	—	—	—	—

<sup>a</sup>Length of barrel.

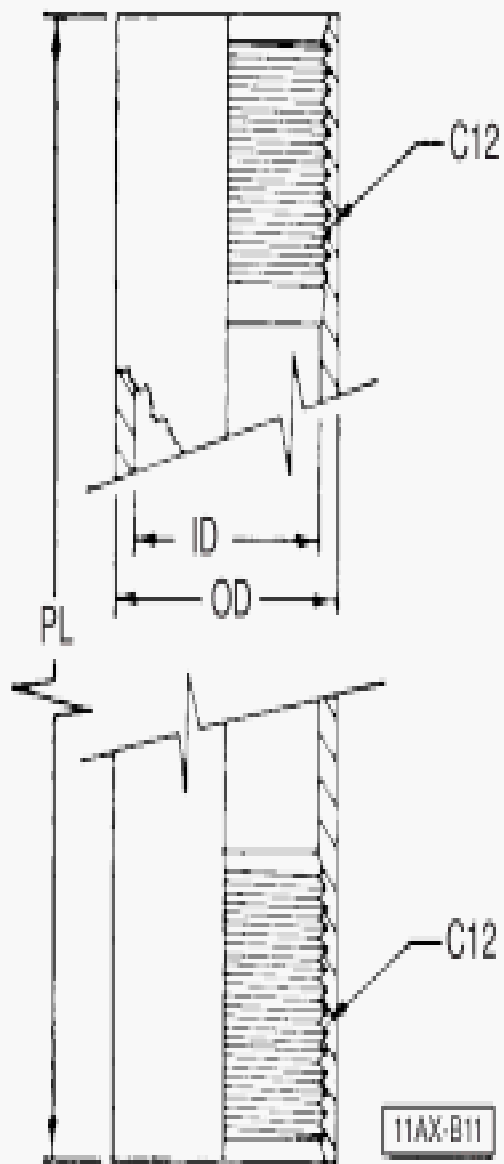
<sup>b</sup>Length of plunger.

<sup>c</sup>Length of extension couplings or nipples.

<sup>d</sup>Length of valve rod or pull tube.

<sup>e</sup>S.P.—For soft-packed plunger pump.

Table B11—Barrel, Thin Wall (See Note)



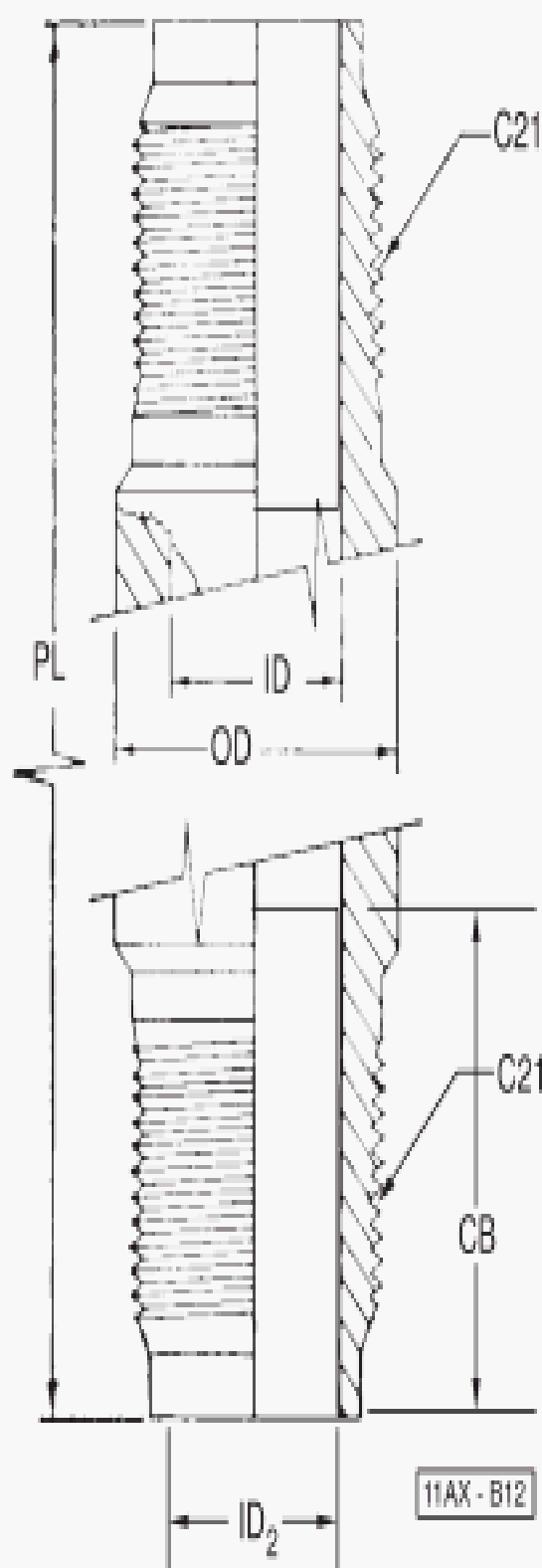
(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	B11-125 <sup>a</sup>	B11-150 <sup>a</sup>	B11-200 <sup>a</sup>	B11-250 <sup>a</sup>
C12	1.3330-16 (33.858-16)	1.5730-16 (39.954-16)	2.0870-16 (53.010-16)	2.5730-16 (65.354-16)
ID+0.002/-0.000 <sup>b</sup> (+0.05/-0.00)	1.250 (31.75)	1.500 (38.10)	2.000 (50.80)	2.500 (63.50)
OD ± 0.010 (± 0.25)	1.500 (38.10)	1.750 (44.45)	2.250 (57.15)	2.750 (69.85)
PL ± 0.250 (± 6.35) <sup>a</sup>				

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>Specify barrel length (PL). Standard lengths are: 8 ft (2.438m) through 30 ft (9.144m) in 2 ft (0.610m) increments.

<sup>b</sup>ID tolerance to be +0.003/-0.000 up to 8 in. (+0.076/-0.00 up to 203.2mm) from barrel face (PL dimension).

Table B12—Barrel, Heavy Wall (Rod Pump) (See Note)



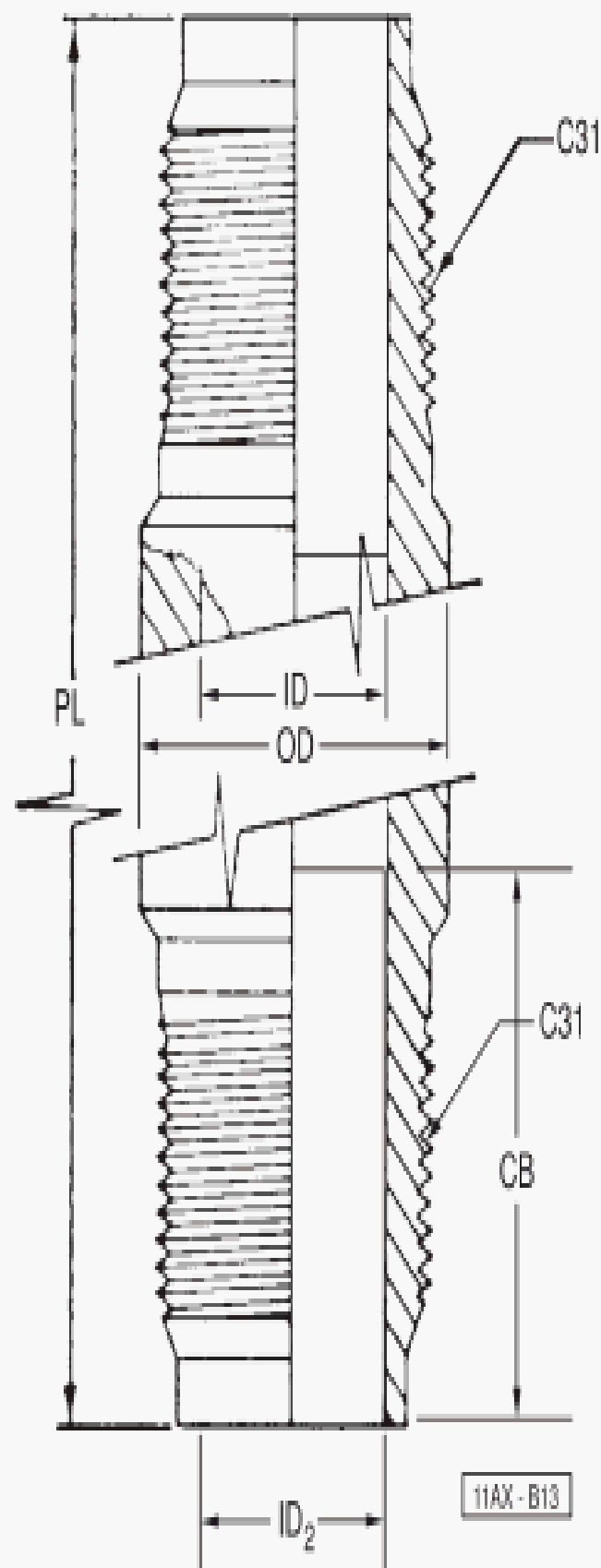
(1)	(2)	(3)	(4)	(5)	(6)
Dimensional Symbol	Part Number				
	B12-106 <sup>a</sup>	B12-125 <sup>a</sup>	B12-150 <sup>a</sup>	B12-175 <sup>a</sup>	B12-225 <sup>a</sup>
C21	1.3125-16 (33.338-16)	1.5730-16 (39.954-16)	1.8750-16 (47.625-16)	2.0870-16 (53.010-16)	2.5730-16 (65.354-16)
CB +1.000 /-0.750 (+25.40/-19.1)	1.500 (38.10)	1.500 (38.10)	1.500 (38.10)	1.500 (38.10)	1.500 (38.10)
ID+0.002 /-0.000 <sup>b</sup> (+0.05/-0.00)	1.0625 (26.99)	1.250 (31.75)	1.500 (38.10)	1.750 (44.45)	2.250 (57.15)
ID <sub>2</sub> +0.062/-0.015 (+1.57/-0.38)	1.088 (27.64)	1.275 (32.39)	1.525 (38.74)	1.775 (45.09)	2.275 (57.79)
OD max./min.	1.438/1.310 (36.52/33.27)	1.760/1.600 (44.70/40.64)	2.260/1.850 (57.40/46.99)	2.260/2.100 (57.40/53.34)	2.760/2.600 (70.10/66.04)
PL ± 0.250 (± 6.35) <sup>a</sup>					

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>Specify barrel length (PL). Standard lengths are: 8 ft (2.438m) through 30 ft (9.144m) in 2 ft (0.610m) increments.

<sup>b</sup>ID tolerance to be +0.003/-0.000 up to 8 in. (+0.076/-0.00 up to 203.2mm) from barrel face (PL dimension).

Table B13—Barrel, Heavy Wall (Tubing Pump) (See Note)



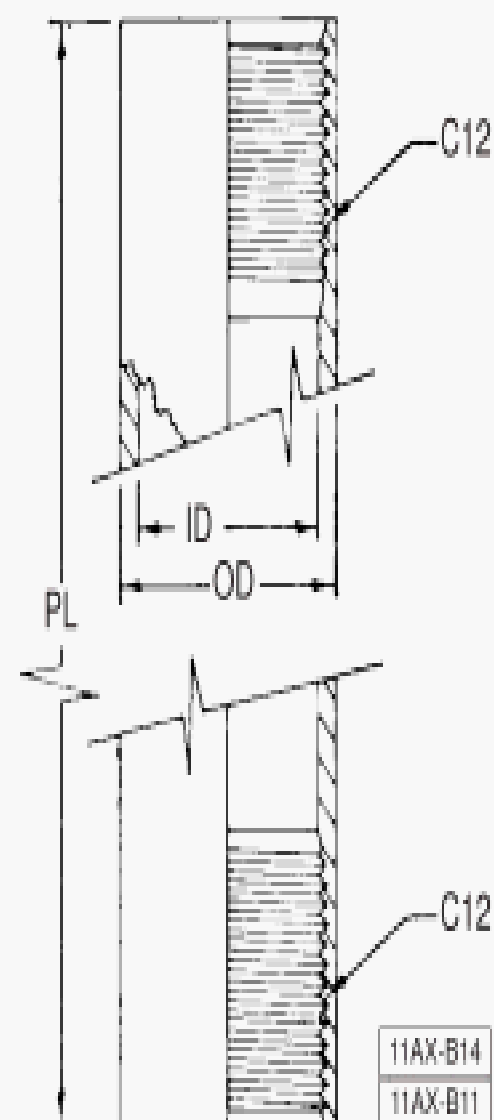
(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	B13-175 <sup>a</sup>	B13-225 <sup>a</sup>	B13-275 <sup>a</sup>	B13-375 <sup>a</sup>
C31	2.2380-11 <sup>1</sup> / <sub>2</sub> (56.845-11 <sup>1</sup> / <sub>2</sub> )	2.7380-11 <sup>1</sup> / <sub>2</sub> (69.545-11 <sup>1</sup> / <sub>2</sub> )	3.2380-11 <sup>1</sup> / <sub>2</sub> (82.245-11 <sup>1</sup> / <sub>2</sub> )	4.2380-11 <sup>1</sup> / <sub>2</sub> (107.645-11 <sup>1</sup> / <sub>2</sub> )
ID+0.002/-0.000 <sup>b</sup> (+0.05/-0.00)	1.750 (44.45)	2.2500 (57.15)	2.7500 (69.85)	3.750 (95.25)
OD max./min.	2.260/2.230 (57.40/56.64)	2.760/2.730 (70.10/69.34)	3.260/3.230 (82.80/82.04)	4.260/4.230 (108.20/107.44)
PL± 0.250 (± 6.35)				
CB+1.000/-0.750 (+25.40/-19.05)	1.500 (38.10)	1.500 (38.10)	1.500 (38.10)	2.250 (57.15)
ID <sub>2</sub> + 0.062/-0.015 (+1.57/-0.38)	1.775 (45.09)	2.275 (57.79)	2.775 (70.49)	3.775 (95.89)

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>Specify barrel length (PL). Standard lengths are: 8 ft (2.438m) through 30 ft (9.144m) in 2 ft (0.610m) increments.

<sup>b</sup>ID tolerance to be +0.003/-0.000 up to 8 in. (+0.076/-0.00 up to 203.2mm) from barrel face (PL dimension).

Table B14—Barrel, Thin Wall (Soft-Packed Rod Pump) (See Note)

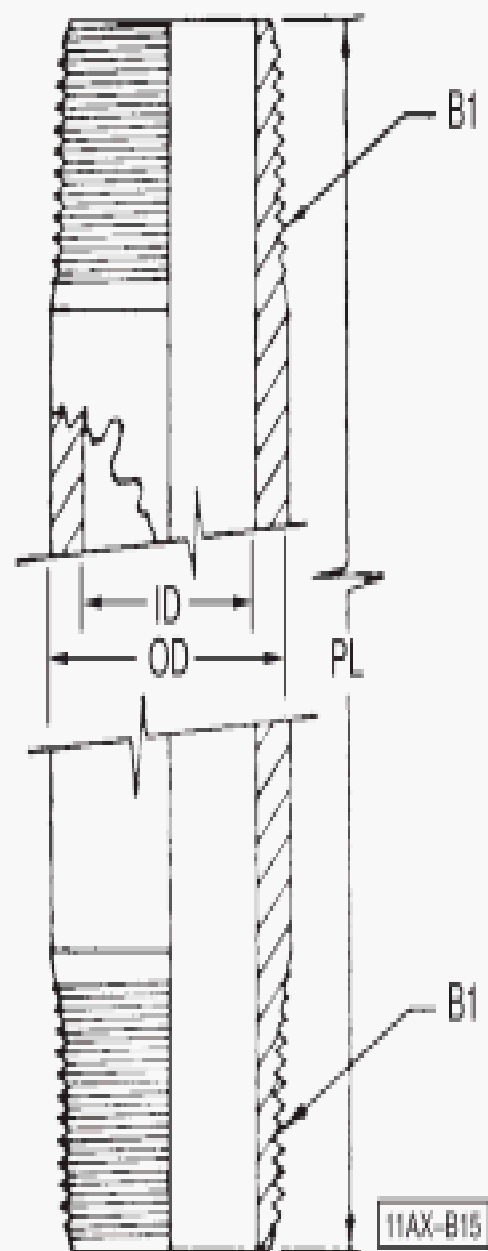


(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	B14-125 <sup>a</sup>	B14-150 <sup>a</sup>	B14-200 <sup>a</sup>	B14-250 <sup>a</sup>
C12	1.3330-16 (33.858-16)	1.5730-16 (39.954-16)	2.0870-16 (53.010-16)	2.5730-16 (63.354-16)
ID +0.0062/-0.0022 <sup>b</sup> (+0.16/-0.06)	1.250 (31.75)	1.500 (38.10)	2.000 (50.80)	2.500 (63.50)
OD ± 0.010 (± 0.25)	1.500 (38.10)	1.750 (44.45)	2.250 (57.15)	2.750 (69.85)
PL ±0.250 (±6.35) <sup>a</sup>				

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>Specify barrel length (PL). Standard lengths are: 8 ft (2.438m) through 30 ft (9.144m) in 2 ft (0.610m) increments.

Table B15—Barrel, Heavy Wall (Soft-Packed Tubing Pump) (See Note)

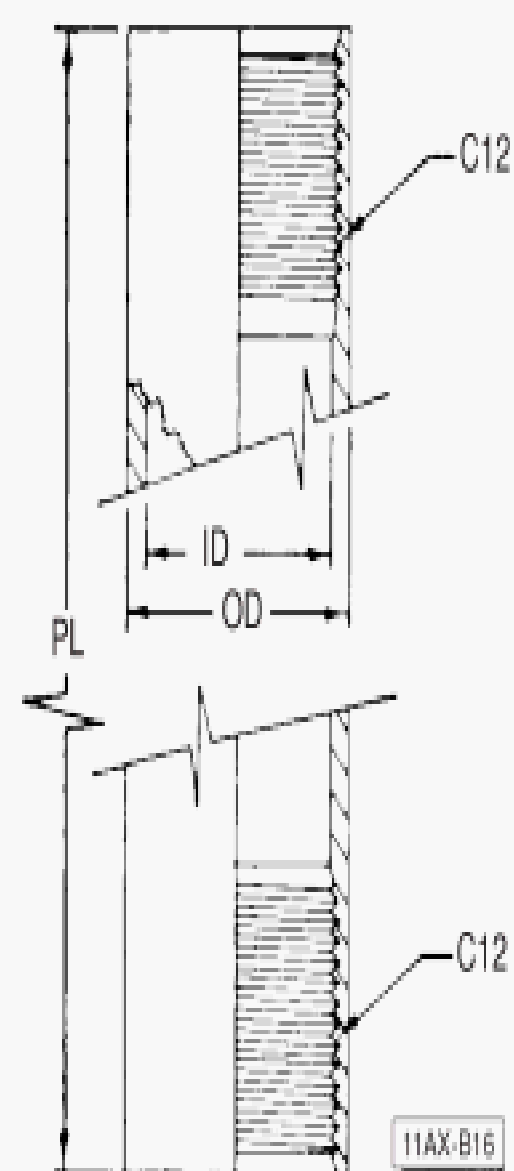


(1)	(2)	(3)	(4)
Dimensional Symbol	Part Number		
	B15-178 <sup>a</sup>	B15-225 <sup>a</sup>	B15-275 <sup>a</sup>
B1	178-11 <sup>1</sup> / <sub>2</sub>	225-11 <sup>1</sup> / <sub>2</sub>	275-11 <sup>1</sup> / <sub>2</sub>
ID+0.0062/-0.0022 (+0.16/-0.06)	1.7812 (45.24)	2.2500 (57.15)	2.7500 (69.85)
OD max./min.	2.270/2.230 (57.66/56.64)	2.770/2.730 (70.36/69.34)	3.270/3.230 (83.06/82.04)
PL ± 0.250 (± 6.35) <sup>a</sup>			

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>Specify barrel length (PL). Standard lengths are: 6 ft (1.829m) through 16 ft (4.877m) in 1 ft (0.305m) increments, 18 ft (5.486m) through 30 ft (9.144m) in 2 ft (0.610m) increments.

Table B16—Barrel, Heavy Wall (Rod Pump) (See Note)



(1)	(2)	(3)	(4)
Dimensional Symbol	Part Number		
	B16-125 <sup>a</sup>	B16-150 <sup>a</sup>	B16-200 <sup>a</sup>
C12	1.3330-16 (33.858-16)	1.5730-16 (39.954-16)	2.0870-16 (53.010-16)
ID+0.002/-0.000 <sup>b</sup> (+0.05/-0.00)	1.250 (31.75)	1.500 (38.10)	2.000 (50.80)
OD ± 0.010 (± 0.25)	1.625 (41.27) or 1.750 (44.45)	1.875 (47.62)	2.312 (58.72)
PL ± 0.250 (± 6.35) <sup>a</sup>			

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>Specify barrel length (PL). Standard lengths are: 8 ft (2.438m) through 30 ft (9.144m) in 2 ft (0.610m) increments.

<sup>b</sup>ID tolerance to be +0.003/-0.000 up to 8 in. (+0.076/-0.00 up to 203.2mm) from barrel face (PL dimension).

Table B21—Bushing Valve Rod (See Note)

(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	B21-15	B21-20	B21-25	B21-30
A <sup>a</sup>	$\frac{5}{8}$ (15.9)	$\frac{3}{4}$ (19.1)	$\frac{3}{4}$ (19.1)	$\frac{3}{4}$ (19.1)
L nom. <sup>b</sup>	$\frac{3}{8}$ (9.5)	$\frac{3}{8}$ (9.5)	$\frac{1}{2}$ (12.7)	$\frac{3}{4}$ (19.1)
$Q+0.003/-0.000$ (+0.08/-0.00)	0.690 (17.53)	0.690 (17.53)	0.877 (22.28)	1.065 (27.05)
$q \pm 0.031$ ( $\pm 0.79$ )	0.750 (19.1)	0.750 (19.1)	0.750 (19.1)	0.750 (19.1)
$OD+0.031/-0.010$ (+0.79/-0.25)	$1\frac{1}{4}$ (31.8)	$1\frac{1}{2}$ (38.1)	$1\frac{5}{8}$ (41.3)	$1\frac{5}{8}$ (41.3)
$PL \pm 1.000$ ( $\pm 25.40$ )	2.750 (69.85)	2.750 (69.85)	2.750 (69.85)	2.750 (69.85)
WA	0.562 (14.27)	0.688 (17.48)	0.750 (19.05)	0.875 (22.23)
	+0.000/-0.031 (+0.00/-0.79)	$\pm 0.031$ ( $\pm 0.79$ )	$\pm 0.031$ ( $\pm 0.79$ )	$\pm 0.031$ ( $\pm 0.79$ )
WC +0.062/-0.000 (+1.57/-0.00)	0.250 (6.35)	0.250 (6.35)	0.250 (6.35)	0.250 (6.35)

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>Sucker rod thread. See API Spec 11B for details.

<sup>b</sup>Modified line pipe thread. See Table L for details.

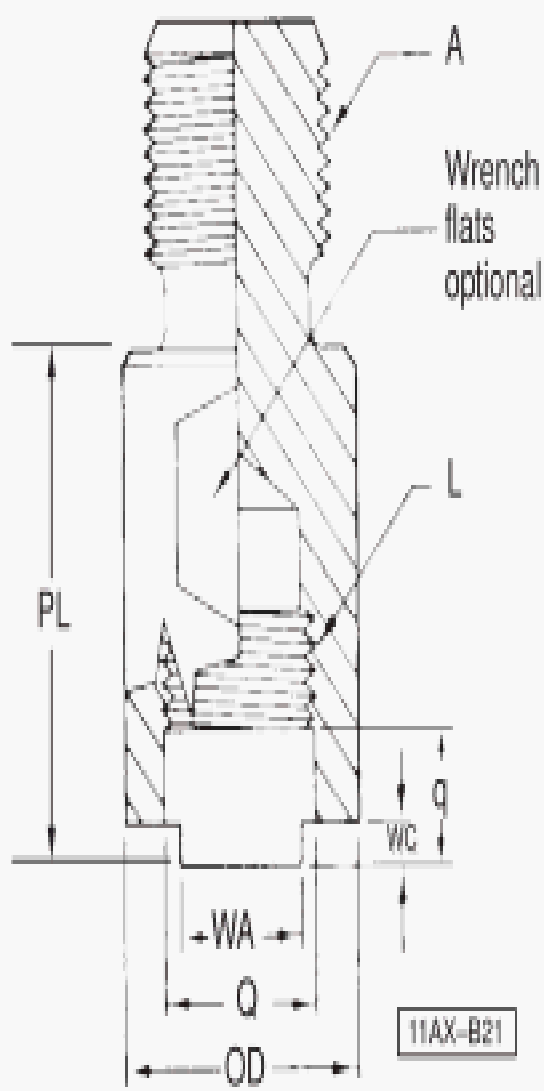
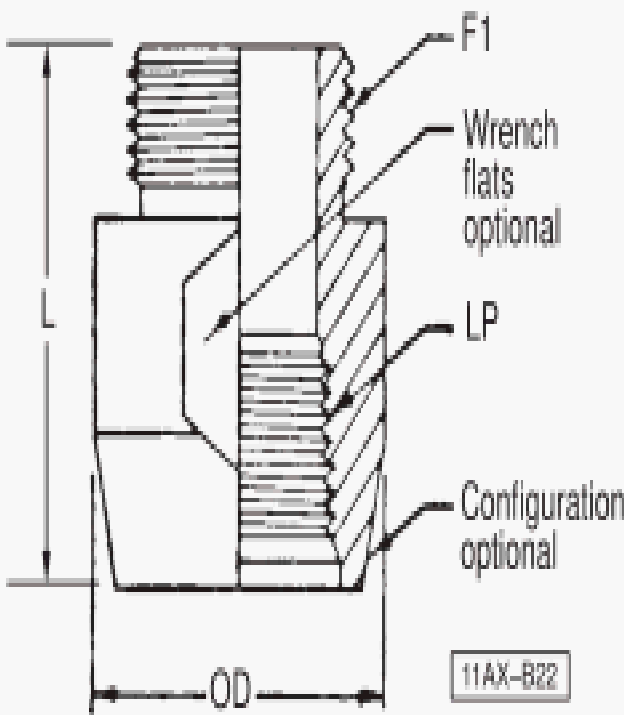


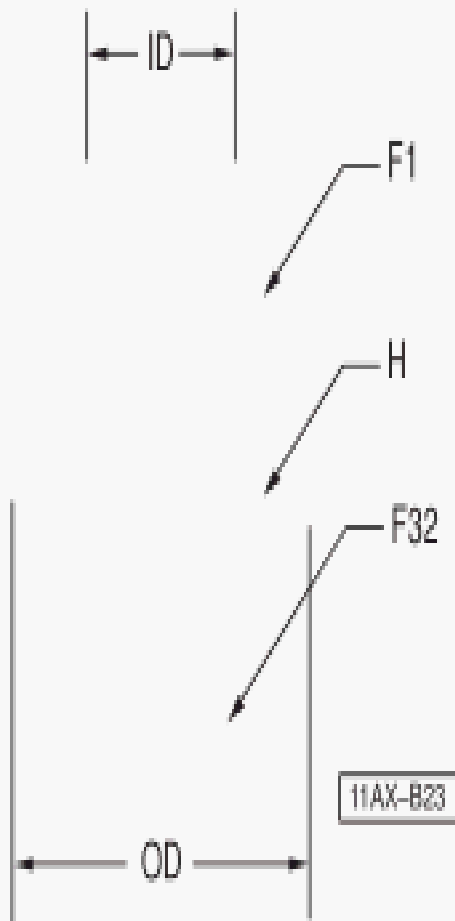
Table B22—Bushing, Seat, Barrel Cage (See Note)



(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	B22-15	B22-20	B22-25	B22-30
F1	1.2500-14 (31.750-14)	1.4704-14 (37.348-14)	1.8024-14 (45.781-14)	2.1095-11 <sup>1</sup> / <sub>2</sub> (53.581-11 <sup>1</sup> / <sub>2</sub> )
LP <sup>a</sup>	<sup>3</sup> / <sub>4</sub> nom. (19.1)	1 nom. (25.4)	1 <sup>1</sup> / <sub>4</sub> nom. (31.8)	1 <sup>1</sup> / <sub>2</sub> nom. (38.1)
OD max./min.	1.438/1.375 (36.53/34.93)	1.750/1.625 (44.45/41.28)	2.250/2.125 (57.15/53.98)	2.750/2.563 (69.85/65.10)
L ± 1.000 (± 25.40)	2.250 (57.15)	2.500 (57.15)	2.750 (69.85)	3.000 (76.20)

Note: All dimensions in inches (followed by equivalent in millimeters).  
<sup>a</sup>Line pipe thread. See API Specification 5B for details.

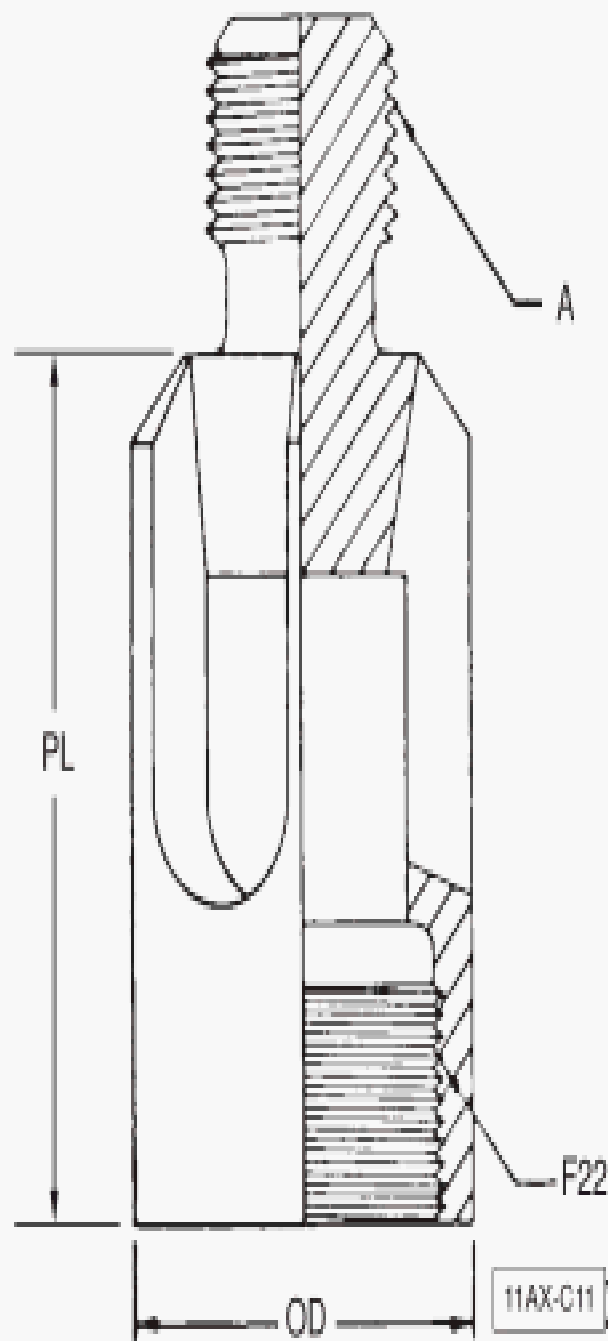
Table B23—Bushing, Cage to Puller (See Note)



(1)	(2)
Dimensional Symbol	Part Number
	B22-15 <sup>a</sup>
F1	3.1715-11 <sup>1</sup> / <sub>2</sub> (80.556-11 <sup>1</sup> / <sub>2</sub> )
F32	2.1095-11 <sup>1</sup> / <sub>2</sub> (53.581-11 <sup>1</sup> / <sub>2</sub> )
OD	3.625 ± 0.031 (92.08 ± 0.79)
ID	1.750 ± 0.031 (44.45 ± 0.79)
H	1.125 ± 0.031 (28.58 ± 0.79)

Note: All dimensions in inches (followed by equivalent in millimeters).

Table C11—Cage, Top Open (See Note)



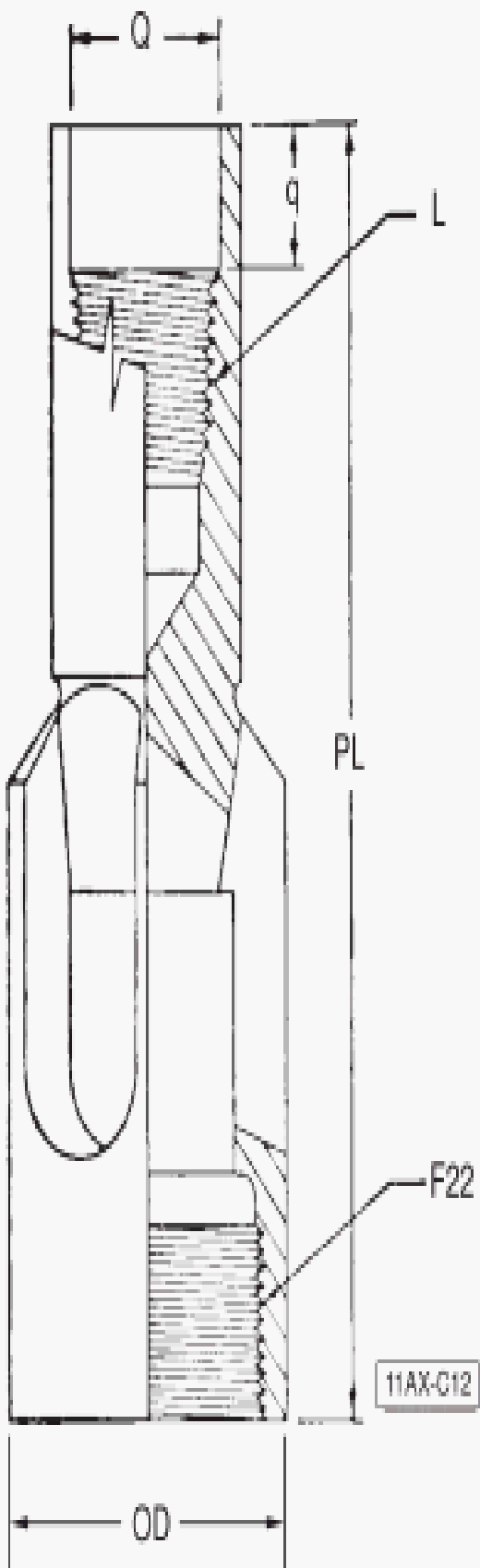
(1)	(2)	(3)	(4)	(5)	(6)
Dimensional Symbol	Part Number				
	C11-15	C11-20	C11-25	C11-30	C11-40
A <sup>a</sup>	5/8 (15.9)	3/4 (19.1)	3/4 (19.1)	3/4 (19.1)	1 (25.4)
F22	1.2500-14 (31.750-14)	1.4704-14 (37.348-14)	1.8024-14 (45.781-14)	2.1095-11 <sup>1</sup> / <sub>2</sub> (53.581-11 <sup>1</sup> / <sub>2</sub> )	3.1715-11 <sup>1</sup> / <sub>2</sub> (80.556-11 <sup>1</sup> / <sub>2</sub> )
OD ± 0.031 (± 0.79)	1.438 (36.53)	1.688 (42.88)	2.188 (55.58)	2.625 (66.68)	3.625 (92.08)
PL ± 1.000 (± 25.40)	3.000 (76.20)	3.500 (88.90)	4.000 (101.60)	4.500 (114.30)	5.750 (146.05)

Note 1: All dimensions in inches (followed by equivalent in millimeters).

Note 2: Dimensions and configuration of ball chamber shall be such as to provide adequate clearance and fluid passage.

<sup>a</sup>Sucker rod thread. See API Specification 11B for details.

Table C12—Cage, Top Plunger (See Note)



(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dimensional Symbol	Part Number							
	C12-106	C12-125	C12-150-20	C12-150-25	C12-175	C12-200	C12-225	C12-250
F22	0.875-14 (22.22-14)	1.0000-14 (25.400-14)	1.2500-14 (31.750-14)	1.2500-14 (31.750-14)	1.4704-14 (37.348-14)	1.5604-14 (39.634-14)	1.8024-14 (45.781-14)	2.1095-11 <sup>1</sup> / <sub>2</sub> (53.581-11 <sup>1</sup> / <sub>2</sub> )
L nom. <sup>a</sup>	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	3/4 (19.1)	3/4 (19.1)
Q+0.003/-0.000 (+0.08/-0.00)	0.690 (17.53)	0.690 (17.53)	0.690 (17.53)	0.877 (22.28)	0.877 (22.28)	0.877 (22.28)	1.065 (27.05)	1.065 (27.05)
q ± 0.031 (± 0.79)	3/4 (19.1)	3/4 (19.1)	3/4 (19.1)	3/4 (19.1)	3/4 (19.1)	3/4 (19.1)	3/4 (19.1)	3/4 (19.1)
PL ± 0.031 (± 0.79)	4 <sup>1</sup> / <sub>2</sub> (114.3)	4 <sup>1</sup> / <sub>2</sub> (114.3)	5 (127.0)	5 (127.0)	5 <sup>3</sup> / <sub>8</sub> (136.5)	5 <sup>3</sup> / <sub>8</sub> (136.5)	6 <sup>1</sup> / <sub>8</sub> (155.6)	6 <sup>3</sup> / <sub>8</sub> (161.9)
OD ± 0.031 (± 0.79)	1.036 ± 0.005	1.200 (30.48)	1.450 (36.83)	1.450 (36.83)	1.700 (43.18)	1.950 (49.53)	2.200 (55.88)	2.450 (62.23)

Note 1: All dimensions in inches (followed by equivalent in millimeters).

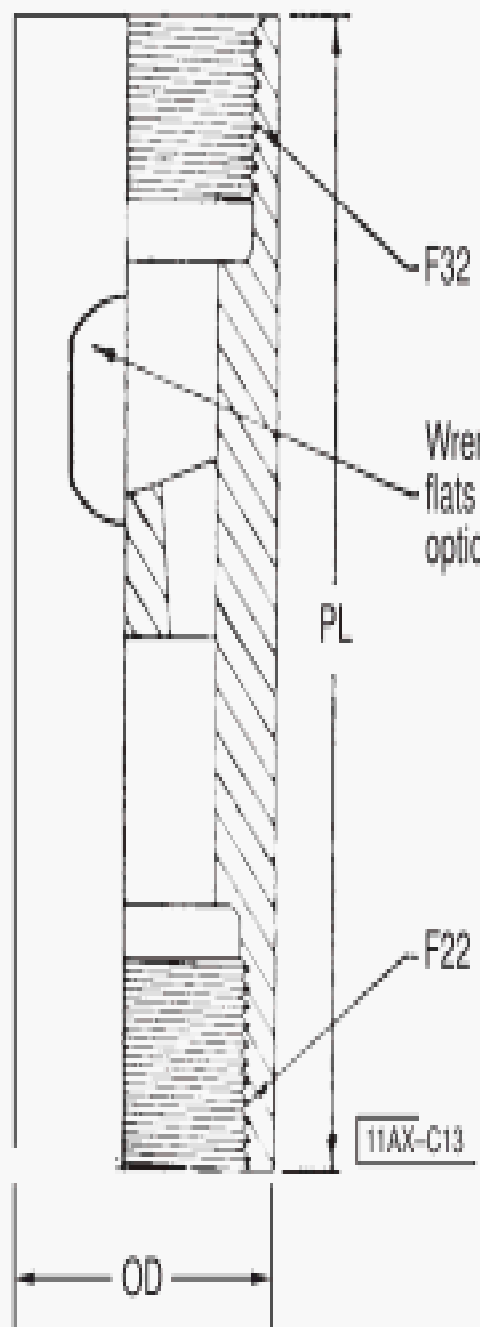
Note 2: Dimensions and configuration of ball chamber shall be such as to provide adequate ball clearance and fluid passage.

<sup>a</sup>Modified line pipe thread. See Table L for details.

Note to figure: Top portion of cage may be reduced (as shown) or not at manufacturer's option; however, if it is reduced it shall be of such dimensions to permit free entry into the bore of the upper barrel connector (C21) and the top anchor seating cup bushing (S15).



Table C13—Cage, Closed, Pin Plunger (See Note)

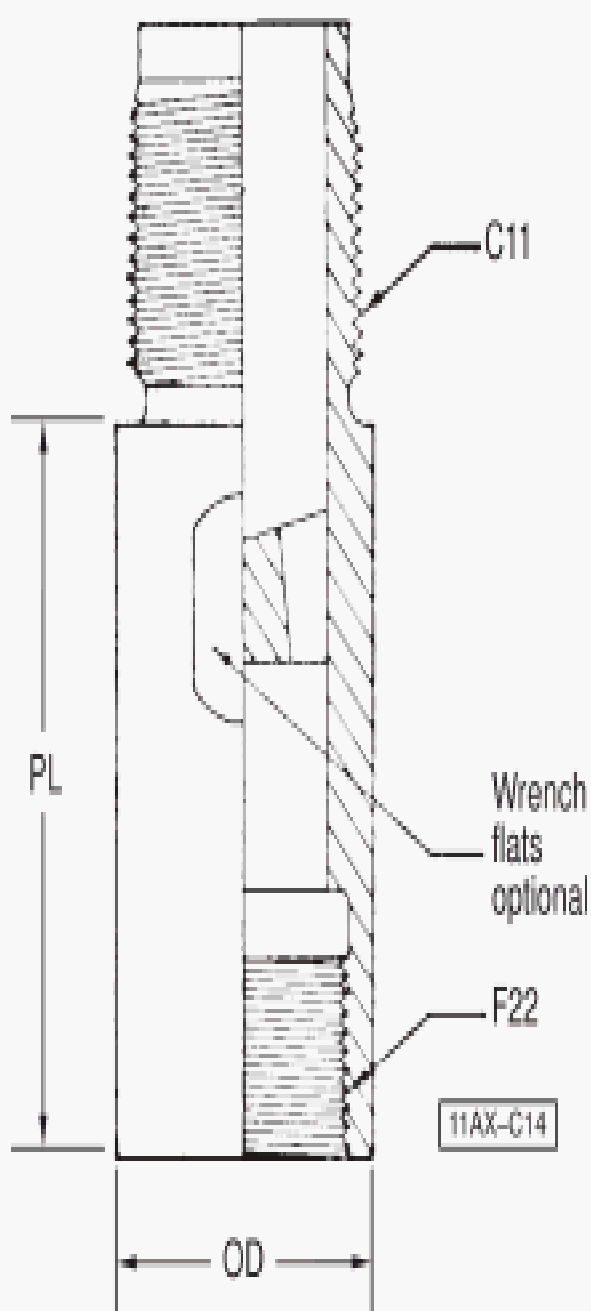


(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
Dimensional Symbol	Part Number								
	C13-106	C13-125	C13-150	C13-175	C13-200	C13-225	C13-250	C13-275	C13-375
F22	0.8750-14	1.0000-14	1.2500-14	1.4704-14	1.5604-14	1.8024-14	2.1095-11 <sup>1</sup> / <sub>2</sub>	2.1095-11 <sup>1</sup> / <sub>2</sub>	3.1715-11 <sup>1</sup> / <sub>2</sub>
	(22.22-14)	(25.400-14)	(31.750-14)	(37.348-14)	(39.634-14)	(45.781-14)	(53.581-11 <sup>1</sup> / <sub>2</sub> )	(53.581-11 <sup>1</sup> / <sub>2</sub> )	(80.556-11 <sup>1</sup> / <sub>2</sub> )
F32	0.8750-14	1.0000-14	1.2500-14	1.4704-14	1.5604-14	1.8024-14	2.1095-11 <sup>1</sup> / <sub>2</sub>	2.1095-11 <sup>1</sup> / <sub>2</sub>	3.1715-11 <sup>1</sup> / <sub>2</sub>
	(22.22-14)	(25.400-14)	(31.750-14)	(37.348-14)	(39.634-14)	(45.781-14)	(53.581-11 <sup>1</sup> / <sub>2</sub> )	(53.581-11 <sup>1</sup> / <sub>2</sub> )	(80.556-11 <sup>1</sup> / <sub>2</sub> )
PL ± 0.062 (± 1.58)	3 <sup>1</sup> / <sub>2</sub> (88.9)	3 <sup>1</sup> / <sub>2</sub> (88.9)	4 <sup>1</sup> / <sub>8</sub> (104.8)	4 <sup>3</sup> / <sub>4</sub> (120.7)	5 (127.0)	5 <sup>1</sup> / <sub>4</sub> (133.4)	5 <sup>1</sup> / <sub>2</sub> (139.7)	5 <sup>1</sup> / <sub>2</sub> (139.7)	8.000 (203.2)
OD ± 0.031 (± 0.79)	1.036 ± 0.005	1.200 (30.48)	1.450 (36.83)	1.700 (43.18)	1.950 (49.53)	2.200 (55.88)	2.450 (62.23)	2.650 (67.31)	3.650 (92.71)

Note 1: All dimensions in inches (followed by equivalent in millimeters).

Note 2: Dimensions and configuration of ball chamber shall be such as to provide adequate ball clearance and fluid passage.

Table C14—Cage, Closed Barrel (See Note)



(1)	(2)	(3)	(4)	(5)	(6)
Dimensional Symbol	Part Number				
	C14-15	C14-20-125	C14-20	C14-25	C14-30
C11	1.3330-16 (33.858-16)	1.3330-16 (33.858-16)	1.5730-16 (39.954-16)	2.0870-16 (53.010-16)	2.5730-16 (65.354-16)
F22	1.2500-14 (31.750-14)	1.4704-14 (37.348-14)	1.4704-14 (37.348-14)	1.8024-14 (45.781-14)	2.1095-11 <sup>1</sup> / <sub>2</sub> (53.581-11 <sup>1</sup> / <sub>2</sub> )
OD ± 0.010 (± 0.254)	1.440 (36.58)	1.750 (44.45)	1.750 (44.45)	2.250 (57.15)	2.750 (69.85)
PL ± 1.000 (± 25.4)	3.750 (95.25)	3.750 (95.25)	3.750 (95.25)	4.000 (101.60)	4.500 (114.30)

Note 1: All dimensions in inches (followed by equivalent in millimeters).

Note 2: Dimensions and configuration of ball chamber shall be such as to provide adequate ball clearance and fluid passage.

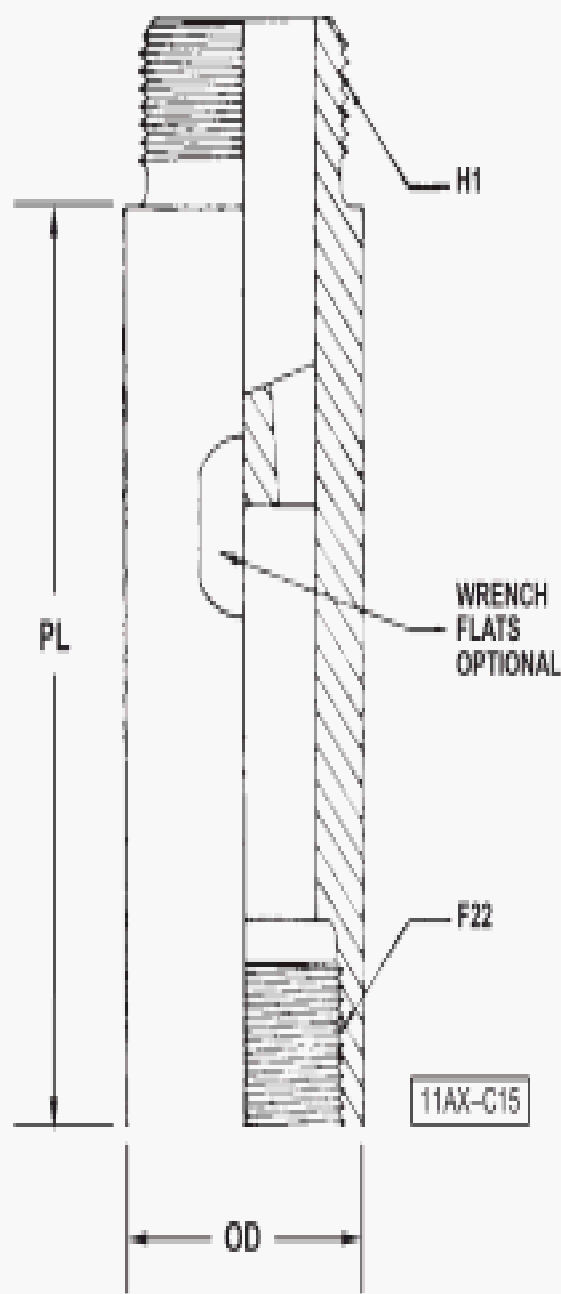


Table C15—Cage, Closed, Box Plunger (See Note)

(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	C15-175	C15-225	C15-275	C15-375
H1	1.5084-14 (38.313-14)	1.9864-14 (50.455-14)	2.3755-11 <sup>1</sup> / <sub>2</sub> (60.338-11 <sup>1</sup> / <sub>2</sub> )	3.3825-11 <sup>1</sup> / <sub>2</sub> (85.916-11 <sup>1</sup> / <sub>2</sub> )
F22	1.4704-14 (37.348-14)	1.8024-14 (45.781-14)	2.1095-11 <sup>1</sup> / <sub>2</sub> (53.581-11 <sup>1</sup> / <sub>2</sub> )	3.1715-11 <sup>1</sup> / <sub>2</sub> (80.556-11 <sup>1</sup> / <sub>2</sub> )
OD ±0.031 (±0.79)	1.700 (43.18)	2.200 (55.88)	2.650 (67.31)	3.650 (92.71)
PL ±1.000 (±25.40)	4.750 (120.65)	5.250 (133.35)	5.250 (133.35)	6.250 (158.75)

Note 1: All dimensions in inches (followed by equivalent in millimeters).

Note 2: Dimensions and configuration of ball chamber shall be such as to provide adequate ball clearance and fluid passage.

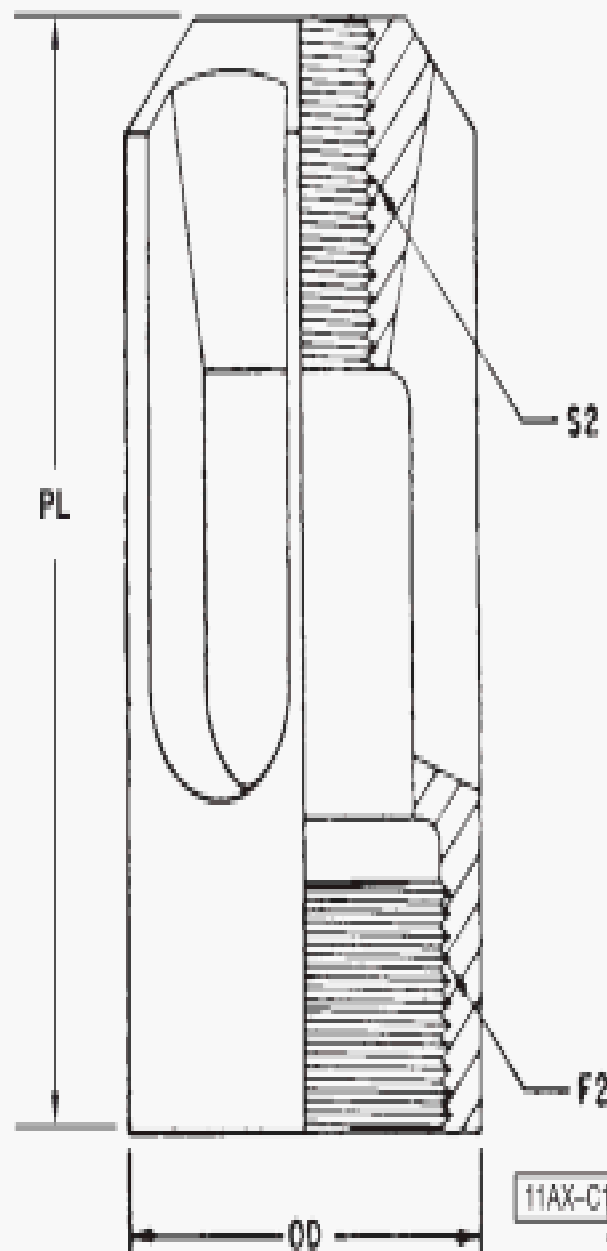


Table C16—Cage, Standing Valve (See Note)

(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	C16-175	C16-225	C16-275	C16-375
F22	1.4704-14 (37.348-14)	1.8024-14 (45.781-14)	2.1095-11 <sup>1</sup> / <sub>2</sub> (53.581-11 <sup>1</sup> / <sub>2</sub> )	3.1715-11 <sup>1</sup> / <sub>2</sub> (80.556-11 <sup>1</sup> / <sub>2</sub> )
S2 <sup>a</sup>	0.750-10 (19.050-10)	0.750-10 (19.050-10)	0.750-10 (19.050-10)	0.750-10 (19.050-10)
OD	1.668 ±0.020 (42.37 ±0.51)	2.168 ±0.020 (55.07 ±0.51)	2.688/2.600 (68.28/66.04)	3.710/3.600 (94.23/91.44)
PL ±1.000 (±25.40)	3.750 (95.25)	4.000 (101.60)	4.500 (114.30)	6.250 (158.75)

Note 1: All dimensions in inches (followed by equivalent in millimeters).

Note 2: Dimensions and configuration of ball chamber shall be such as to provide adequate ball clearance and fluid passage.

<sup>a</sup>See Table S for thread dimensions.

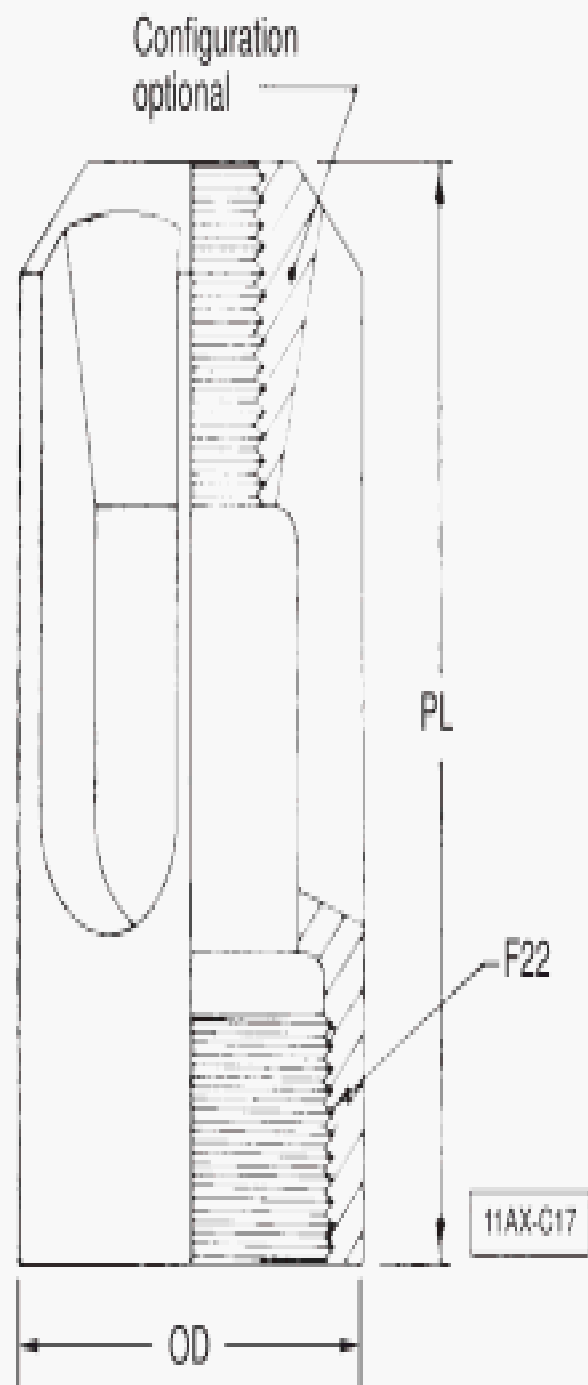


Table C17—Cage, Top Plunger (See Note)

(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	C17-125	C17-150	C17-200	C17-250
F22	1.0000-14 (25.400-14)	1.2500-14 (31.750-14)	1.5604-14 (39.634-14)	2.1095-11 <sup>1</sup> / <sub>2</sub> (53.581-11 <sup>1</sup> / <sub>2</sub> )
OD ± 0.031 (± 0.79)	1.200 (30.48)	1.450 (36.83)	1.950 (49.53)	2.450 (62.23)
PL ± 0.031 (± 0.79)	2 <sup>5</sup> / <sub>8</sub> (66.7)	2 <sup>3</sup> / <sub>4</sub> (69.9)	3 <sup>3</sup> / <sub>8</sub> (85.7)	4 <sup>1</sup> / <sub>4</sub> (108.0)

Note: All dimensions in inches (followed by equivalent in millimeters).

Table C21—Connector, Upper Barrel (See Note)

(1)	(2)	(3)	(4)	(5)	(6)
Dimensional Symbol	Part Number				
	C21-15	C21-20-125	C21-20	C21-25	C21-30
C11	1.3330-16 (33.858-16)	1.3330-16 (33.858-16)	1.5730-16 (39.954-16)	2.0870-16 (53.010-16)	2.5730-16 (65.354-16)
F1	1.2500-14 (31.750-14)	1.4704-14 (37.348-14)	1.4704-14 (37.348-14)	1.8024-14 (45.781-14)	2.1095-11 <sup>1</sup> / <sub>2</sub> (53.581-11 <sup>1</sup> / <sub>2</sub> )
ID	0.938 ± 0.015 (23.83 ± 0.38)	1.000 ± 0.062 (25.40 ± 1.58)	1.000 ± 0.062 (25.40 ± 1.58)	1.250 ± 0.062 (31.75 ± 1.58)	1.500 ± 0.062 (38.10 ± 1.58)
OD ± 0.010 (± 0.25)	1.440 (36.58)	1.750 (44.45)	1.750 (44.45)	2.250 (57.15)	2.750 (69.85)
PL ± 0.031 (± 0.79)	2 <sup>1</sup> / <sub>2</sub> (63.5)	2 <sup>1</sup> / <sub>2</sub> (63.5)	2 <sup>1</sup> / <sub>2</sub> (63.5)	3 (76.2)	3 (76.2)

Note: All dimensions in inches (followed by equivalent in millimeters).

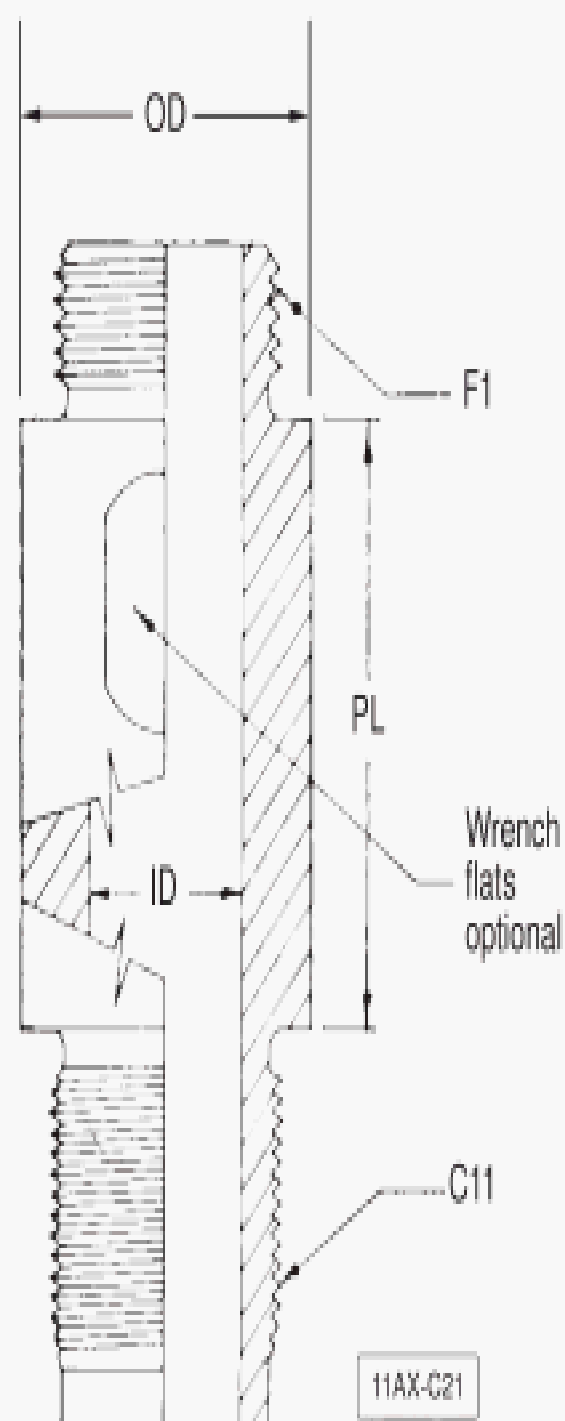
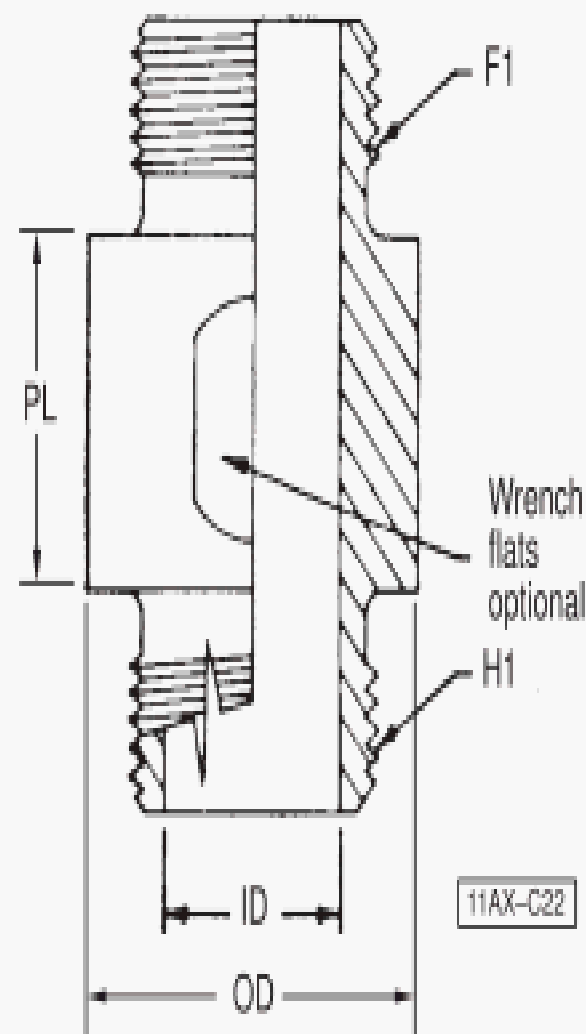


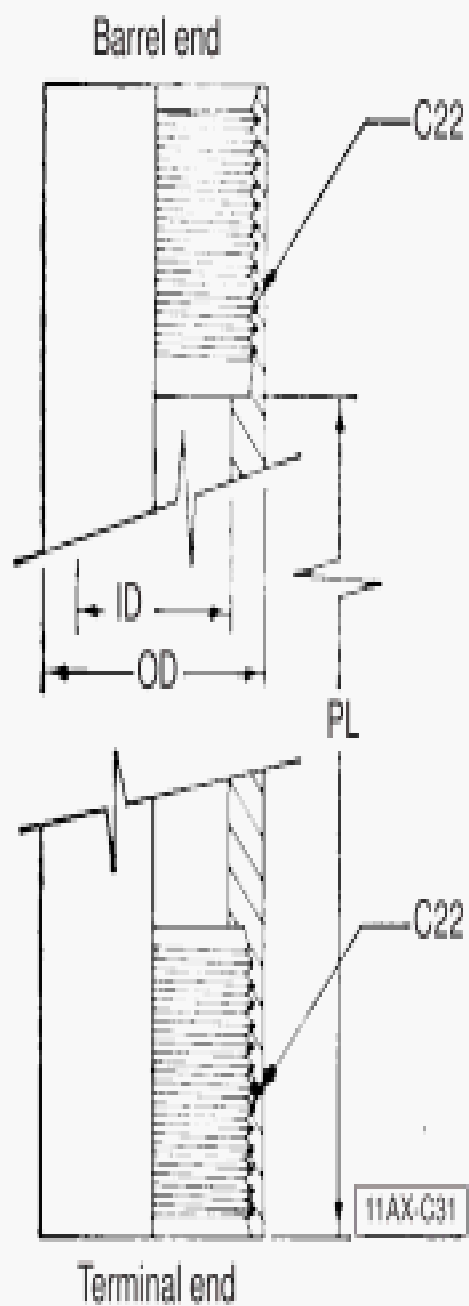
Table C22—Connector, Box Plunger (See Note)



(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	C22-175	C22-225	C22-275	C22-375
F1	1.4704-14 (37.348-14)	1.8024-14 (45.781-14)	2.1095-11 <sup>1</sup> / <sub>2</sub> (53.581-11 <sup>1</sup> / <sub>2</sub> )	3.1715-11 <sup>1</sup> / <sub>2</sub> (80.556-11 <sup>1</sup> / <sub>2</sub> )
H1	1.5084-14 (38.313-14)	1.9864-14 (50.455-14)	2.3755-11 <sup>1</sup> / <sub>2</sub> (60.338-11 <sup>1</sup> / <sub>2</sub> )	3.3825-11 <sup>1</sup> / <sub>2</sub> (85.916-11 <sup>1</sup> / <sub>2</sub> )
ID	1.000 ± 0.062 (25.40 ± 1.58)	1.250 ± 0.062 (31.75 ± 1.58)	1.500 ± 0.062 (38.10 ± 1.58)	2.312 ± 0.250 (58.73 ± 6.35)
OD ± 0.031 (± 0.79)	1.700 (43.18)	2.200 (55.88)	2.650 (67.31)	3.650 (92.71)
PL ± 0.500 (± 12.70)	1.500 (38.10)	1.500 (38.10)	1.500 (38.10)	1.750 (44.45)

Note: All dimensions in inches (followed by equivalent in millimeters).

Table C31—Coupling, Extension (See Note)



(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dimensional Symbol	Part Number					
	C31-106-15 <sup>a</sup>	C31-106 <sup>a</sup>	C31-125 <sup>a</sup>	C31-150 <sup>a</sup>	C31-175 <sup>a</sup>	C31-225 <sup>a</sup>
C22 <sup>b</sup>	1.3125-16 (33.338-16)	1.3125-16 (33.338-16)	1.5730-16 (39.954-16)	1.8750-16 (47.625-16)	2.0870-16 (53.010-16)	2.5730-16 (65.354-16)
C22 <sup>c</sup>	1.3330-16 (33.858-16)	1.5730-16 (39.954-16)	1.5730-16 (39.954-16)	2.0870-16 (53.010-16)	2.0870-16 (53.010-16)	2.5730-16 (65.354-16)
ID ± 0.031 (± 0.79)	1.093 min. (27.76)	1.093 min. (27.76)	1.312 (33.32)	1.593 (40.46)	1.812 (46.02)	2.312 (58.72)
OD + 0.010/-0.030 (+0.25/-0.76)	1.450 max. (36.83)	1.760 max. (44.70)	1.750 (44.45)	2.250 (57.15)	2.250 (57.15)	2.750 (69.85)
PL ± 0.250 (± 6.35) <sup>a</sup>	Specify length (PL) in inches (millimeters)					

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>Standard coupling lengths are 6, 12, 18, 24, 36 in., etc. (152.4, 304.8, 457.2, 609.6, 914.4 mm, etc.).

<sup>b</sup>Barrel end.

<sup>c</sup>Terminal end.

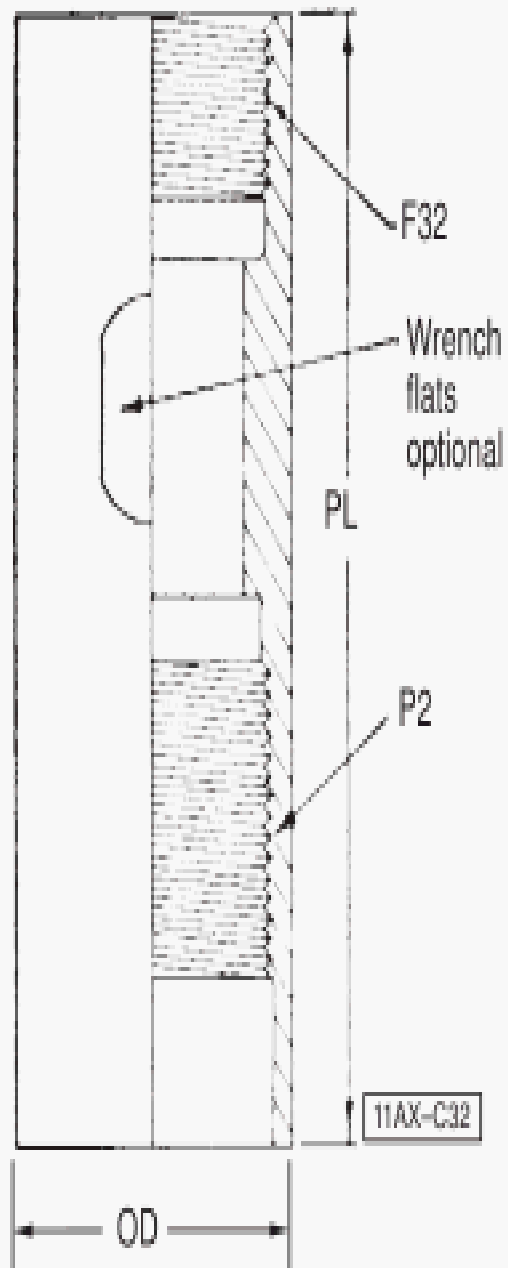
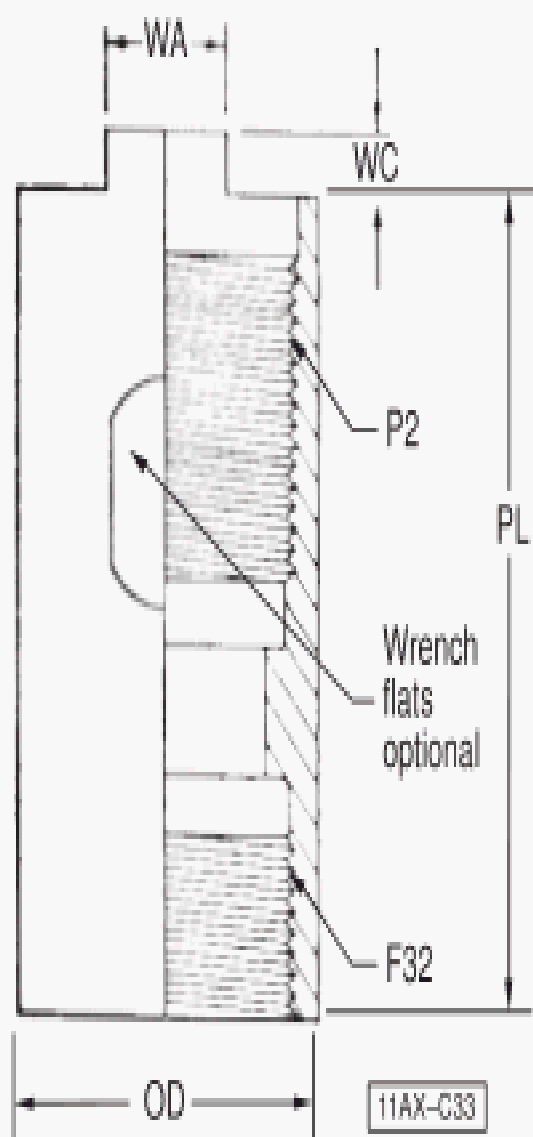


Table C32—Coupling, Pull Tube, Upper (See Note)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dimensional Symbol	Part Number					
	C32-125	C32-150	C32-175	C32-200	C32-225	C32-250
F32	1.0000-14 (25.400-14)	1.2500-14 (31.750-14)	1.4704-14 (37.348-14)	1.5604-14 (39.634-14)	1.8024-14 (45.781-14)	2.1095-11 <sup>1</sup> / <sub>2</sub> (53.581-11 <sup>1</sup> / <sub>2</sub> )
P2	0.9375-16 (23.813-16)	1.1250-16 (28.575-16)	1.3125-16 (33.338-16)	1.5000-16 (38.100-16)	1.8750-16 (47.625-16)	1.8750-16 (47.625-16)
OD ± 0.031 (± 0.79)	1.200 (30.48)	1.450 (36.83)	1.700 (43.18)	1.950 (49.53)	2.200 (55.88)	2.450 (62.23)
PL ± 0.031 (± 0.79)	4 (101.6)	4 (101.6)	4 <sup>3</sup> / <sub>16</sub> (106.4)	4 <sup>3</sup> / <sub>8</sub> (111.1)	5 <sup>3</sup> / <sub>8</sub> (136.5)	5 <sup>3</sup> / <sub>8</sub> (136.5)

Note: All dimensions in inches (followed by equivalent in millimeters).

Table C33—Coupling, Pull Tube, Lower (See Note)



(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dimensional Symbol	Part Number						
	C33-125-15	C323-125	C33-150-20	C33-150-25	C33-175	C33-200	C33-225 <sup>a</sup>
F32	1.2500-14 (31.750-14)	1.4704-14 (37.348-14)	1.4704-14 (37.348-14)	1.8024-14 (45.781-14)	1.8024-14 (45.781-14)	1.8024-14 (45.781-14)	2.1095-11 <sup>1</sup> / <sub>2</sub> (53.581-11 <sup>1</sup> / <sub>2</sub> )
P2	0.9375-16 (22.813-16)	0.9375-16 (22.813-16)	1.1250-16 (28.575-16)	1.1250-16 (28.575-16)	1.3125-16 (33.338-16)	1.5000-16 (38.100-16)	1.8750-16 (47.625-16)
WA ± 0.031 (± 0.79)	0.688 (17.48)	0.688 (17.48)	0.688 (17.48)	0.750 (19.05)	0.750 (19.05)	0.750 (19.05)	0.875 (22.23)
WC +0.062/-0.000 (+1.57/-0.00)	0.250 (6.35)	0.250 (6.35)	0.250 (6.35)	0.250 (6.35)	0.250 (6.35)	0.250 (6.35)	0.250 (6.35)
OD	1.440 ± 0.010 (36.58 ± 0.25)	1.750 ± 0.062 (44.45 ± 1.58)	1.750 ± 0.062 (44.45 ± 1.58)	2.200 ± 0.062 (55.88 ± 1.58)	2.200 ± 0.062 (55.88 ± 1.58)	2.200 ± 0.125 (55.88 ± 3.18)	2.700 ± 0.125 (68.58 ± 3.18)
PL ± 0.500 (± 12.70)	2.875 (73.03)	2.875 (73.03)	3.000 (76.20)	3.125 (79.38)	3.250 (82.55)	3.250 (82.55)	3.500 (88.90)

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>Used on 2<sup>1</sup>/<sub>4</sub> in. (57.2 mm) and 2<sup>1</sup>/<sub>2</sub> in. (63.5 mm) bore pumps.

Table C34—Coupling, Tubing (See Note)

(1)	(2)	(3)	(4)	(5)	(6)
Dimensional Symbol	Part Number				
	C34-15 <sup>b</sup>	C34-20	C34-25	C34-30	C34-40
Tubing Thread <sup>a</sup>	1.900-10IJ (48.3-10IJ)	2 <sup>3</sup> / <sub>8</sub> -8EU (60.3-8EU)	2 <sup>7</sup> / <sub>8</sub> -8EU (73.0-8EU)	3 <sup>1</sup> / <sub>2</sub> -8EU (88.9-8EU)	4 <sup>1</sup> / <sub>2</sub> -8EU (114.3-8EU)

Note 1: All dimensions in inches (followed by equivalent in millimeters).

Note 2: See API Specification 5CT for dimensions.

<sup>a</sup>See API Specification 5B for thread details.

<sup>b</sup>OD of C34-15 coupling shall be 2.110 in (53.6 mm).

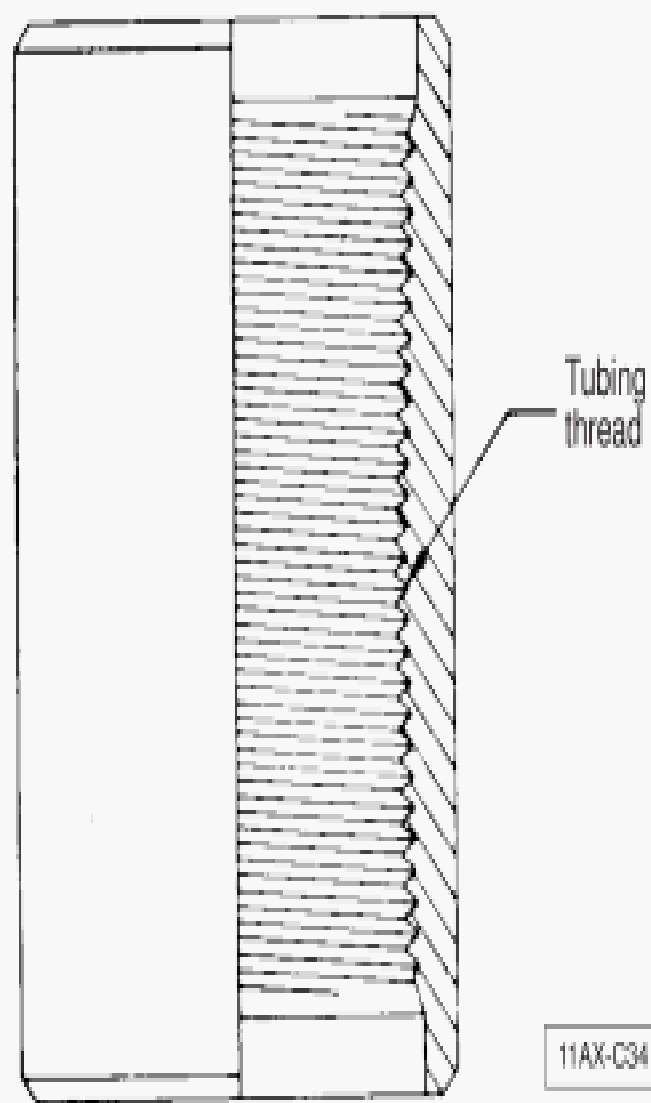


Table C35—Coupling, Barrel (See Note)

(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	C35-20	C35-25	C35-30	C35-40
Tubing Thread <sup>a</sup>	2 <sup>3</sup> / <sub>8</sub> -8EU (60.3-8EU)	2 <sup>7</sup> / <sub>8</sub> -8EU (73.0-8EU)	3 <sup>1</sup> / <sub>2</sub> -8EU (88.9-8EU)	4 <sup>1</sup> / <sub>2</sub> -8EU (114.3-8EU)
C32	2.2380-11 <sup>1</sup> / <sub>2</sub> (56.845-11 <sup>1</sup> / <sub>2</sub> )	2.7380-11 <sup>1</sup> / <sub>2</sub> (69.545-11 <sup>1</sup> / <sub>2</sub> )	3.2380-11 <sup>1</sup> / <sub>2</sub> (82.245-11 <sup>1</sup> / <sub>2</sub> )	4.2380-11 <sup>1</sup> / <sub>2</sub> (107.645-11 <sup>1</sup> / <sub>2</sub> )
ID ±0.031 (±0.79)	1.843 (46.81)	2.343 (59.51)	2.843 (72.21)	3.843 (97.61)
OD ±0.062 (±1.57)	3 (76.2)	3 <sup>5</sup> / <sub>8</sub> (92.1)	4 <sup>1</sup> / <sub>2</sub> (114.3)	5 <sup>9</sup> / <sub>16</sub> (141.30)
PL ±1.000 (±25.40)	5.000 (127.00)	5.250 (133.35)	5.500 (139.70)	6.500 (165.10)

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>See API Specification 5B for tubing thread details.

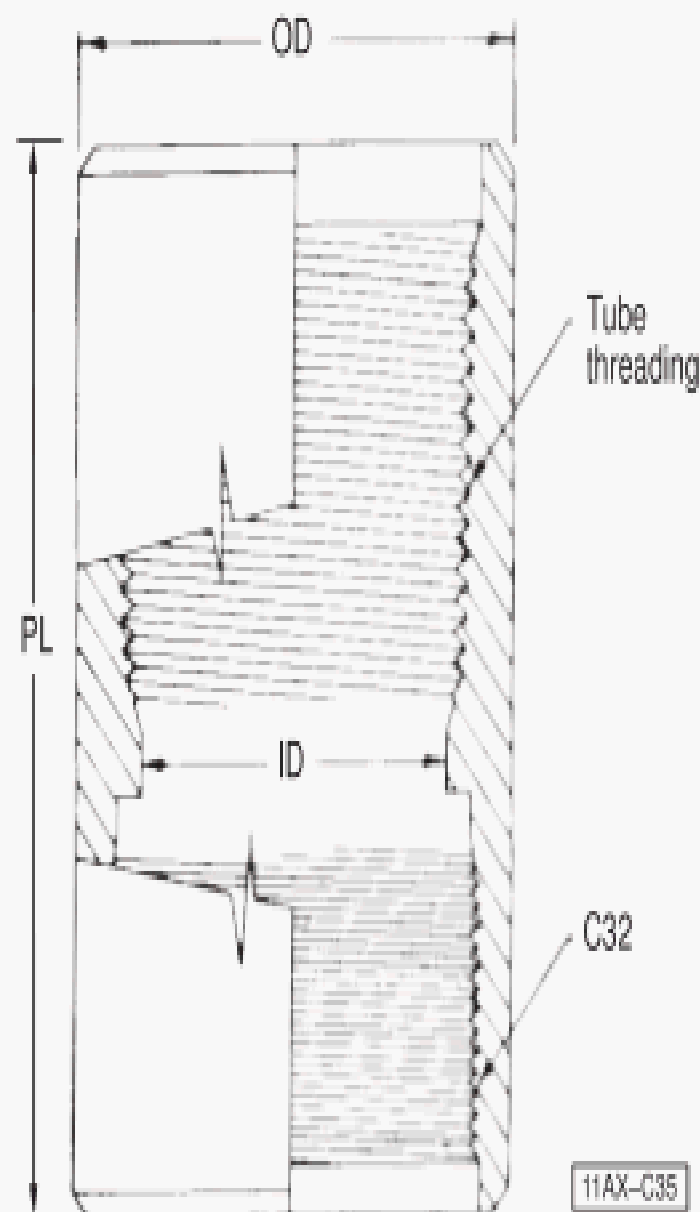
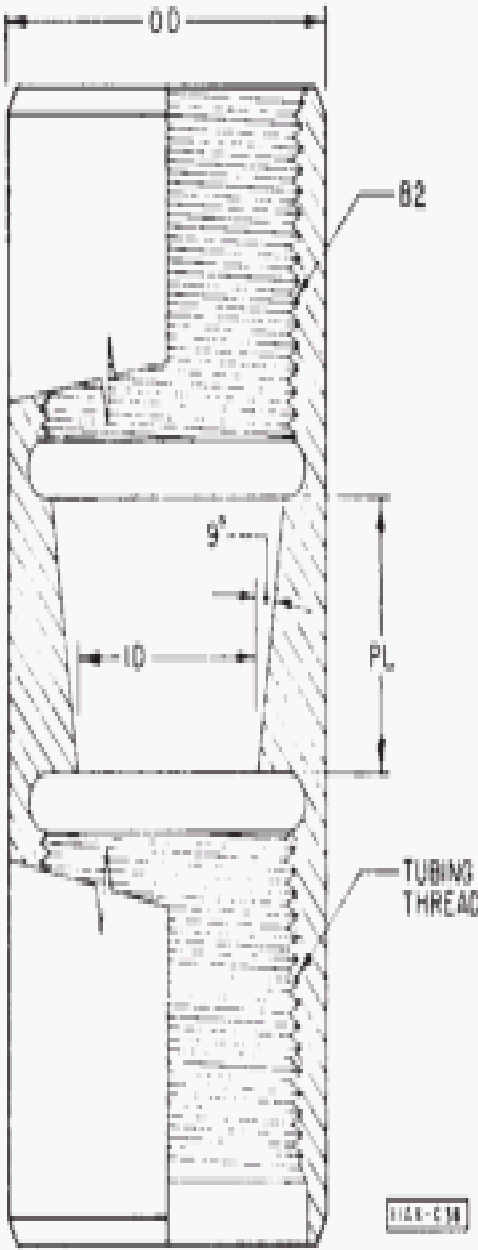


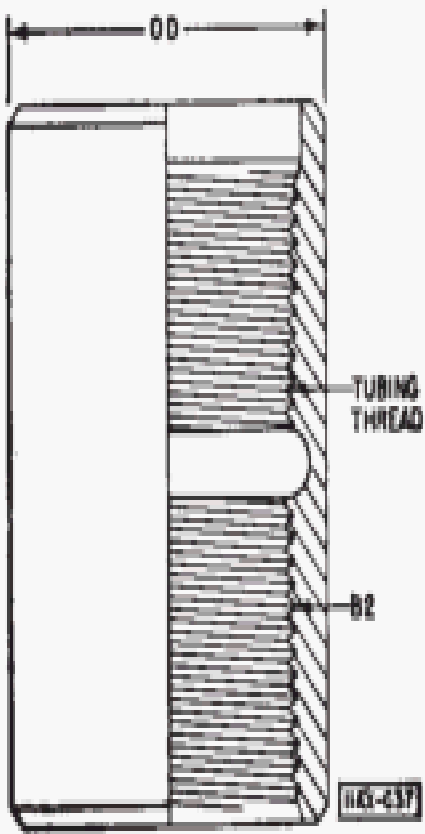
Table C36—Coupling, Barrel, Lower (Soft-Packed Tubing Pump) (See Note)



(1)	(2)	(3)	(4)
Dimensional Symbol	Part Number		
	C36-20	C36-25	C36-30
Tubing Thread <sup>a</sup>	2 <sup>3</sup> / <sub>8</sub> -8EU (60.3-8EU)	2 <sup>7</sup> / <sub>8</sub> -8EU (73.0-8EU)	3 <sup>1</sup> / <sub>2</sub> -8EU (88.9-8EU)
B2	178-11 <sup>1</sup> / <sub>2</sub>	225-11 <sup>1</sup> / <sub>2</sub>	275-11 <sup>1</sup> / <sub>2</sub>
ID $\pm$ 0.020 ( $\pm$ 0.51)	1.391 (35.33)	1.852 (47.04)	2.312 (58.72)
OD $\pm$ 0.031 ( $\pm$ 0.79)	3 (76.2)	3 <sup>5</sup> / <sub>8</sub> (92.1)	4 <sup>1</sup> / <sub>2</sub> (114.3)
PL $\pm$ 0.062 ( $\pm$ 1.57)	1 (25.4)	1 <sup>1</sup> / <sub>8</sub> (28.6)	1 <sup>1</sup> / <sub>4</sub> (31.8)

Note: All dimensions in inches (followed by equivalent in millimeters).  
<sup>a</sup>See API Specification 5B for tubing thread details.

Table C37—Coupling, Barrel (Soft-Packed Tubing Pump) (See Note)



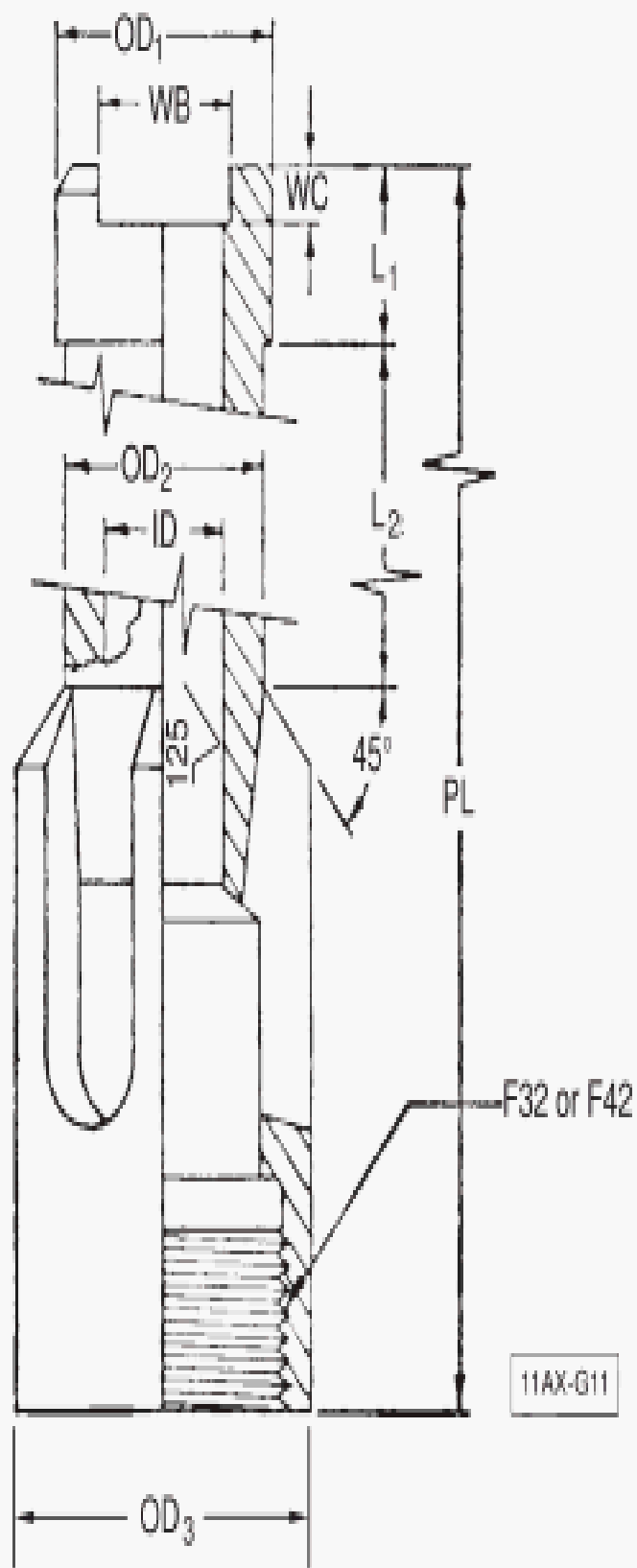
(1)	(2)	(3)	(4)
Dimensional Symbol	Part Number		
	C37-20	C37-25	C37-30
Tubing Thread <sup>a</sup>	2 <sup>3</sup> / <sub>8</sub> -8EU (60.3-8EU)	2 <sup>7</sup> / <sub>8</sub> -8EU (73.0-8EU)	3 <sup>1</sup> / <sub>2</sub> -8EU (88.9-8EU)
B2	178-11 <sup>1</sup> / <sub>2</sub>	225-11 <sup>1</sup> / <sub>2</sub>	275-11 <sup>1</sup> / <sub>2</sub>
OD $\pm$ 0.062 ( $\pm$ 1.57)	3 (76.2)	3 <sup>5</sup> / <sub>8</sub> (92.1)	4 <sup>1</sup> / <sub>2</sub> (114.3)

Note: All dimensions in inches (followed by equivalent in millimeters).  
<sup>a</sup>See API Specification 5B for tubing thread details.

Table G11—Guide, Valve Rod (See Note)

(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	G11-15	G11-20	G11-25	G11-30
F32, F42	1.2500-14 (31.750-14)	1.4704-14 (37.348-14)	1.8024-14 (45.781-14)	2.1095-11 <sup>1</sup> / <sub>2</sub> (53.581-11 <sup>1</sup> / <sub>2</sub> )
ID±0.062 (±1.57)	0.766 (19.46)	0.766 (19.46)	0.953 (24.21)	1.141 (28.98)
L <sub>1</sub> ±0.031 (±0.79)	<sup>3</sup> / <sub>4</sub> (19.1)	<sup>3</sup> / <sub>4</sub> (19.1)	<sup>3</sup> / <sub>4</sub> (19.1)	<sup>3</sup> / <sub>4</sub> (19.1)
L <sub>2</sub> +0.062/-0.000 (+1.57/-0.00)	2 <sup>1</sup> / <sub>8</sub> (54.0)	2 <sup>1</sup> / <sub>8</sub> (54.0)	2 <sup>3</sup> / <sub>8</sub> (60.3)	2 <sup>1</sup> / <sub>2</sub> (63.5)
OD <sub>1</sub> ±0.005 (±0.13)	1.250 (31.75)	1.500 (38.10)	1.625 (41.28)	1.625 (41.28)
OD <sub>2</sub> +0.000/-0.031 (+0.00/-0.79)	1 <sup>1</sup> / <sub>8</sub> (28.6)	1 <sup>3</sup> / <sub>8</sub> (34.9)	1 <sup>1</sup> / <sub>2</sub> (38.1)	1 <sup>1</sup> / <sub>2</sub> (38.1)
OD <sub>3</sub> ±0.031 (±0.79)	1.500 (38.10)	1.750 (44.45)	2.250 (57.15)	2.750 (69.85)
WB+0.062/-0.000 (+1.57/-0.00)	0.625 (15.88)	0.812 (20.62)	1.000 (25.40)	1.000 (25.40)
WC+0.062/-0.000 (+1.57/-0.00)	0.250 (6.35)	0.250 (6.35)	0.250 (6.35)	0.250 (6.35)
PL±0.031 (±0.79)	5 <sup>1</sup> / <sub>2</sub> (139.7)	5 <sup>1</sup> / <sub>2</sub> (139.7)	6 (152.4)	6 <sup>1</sup> / <sub>4</sub> (158.8)

Note: All dimensions in inches (followed by equivalent in millimeters).





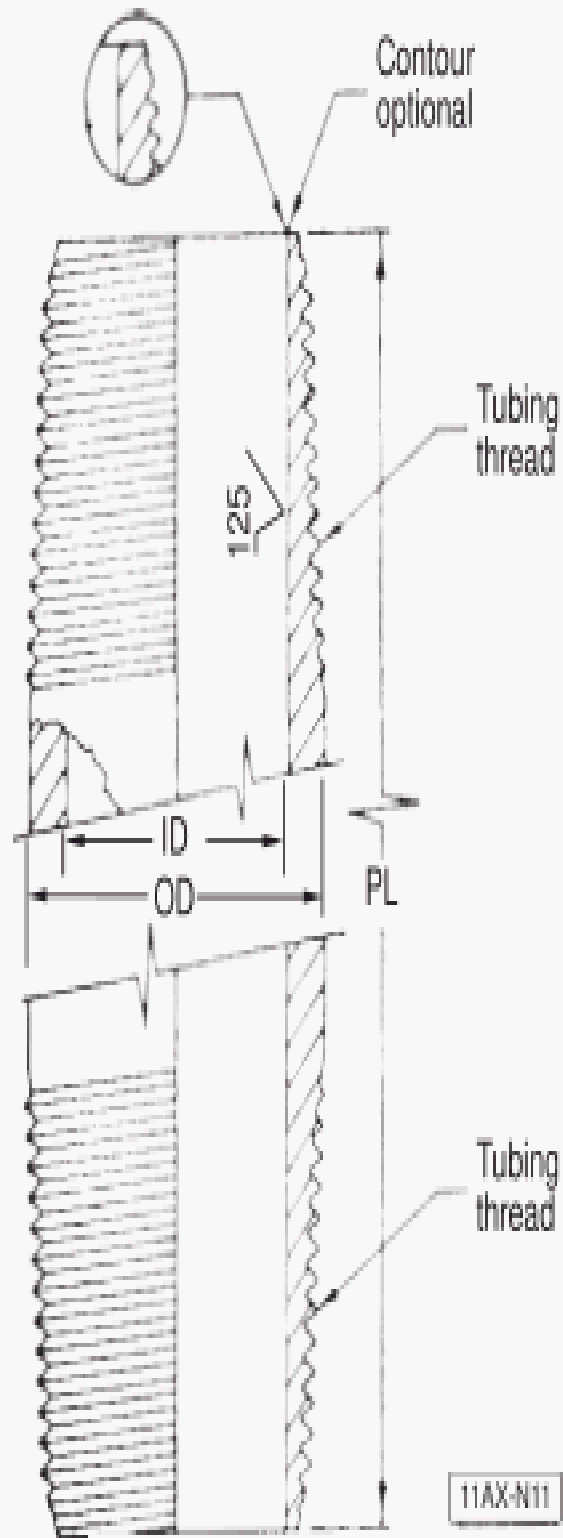


Table N11—Nipple, Seating, Cup Type (Rod Pump) (See Note)

(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	N11-15	N11-20	N11-25	N11-30
Tubing Thread <sup>a</sup>	1.900-10IJ <sup>b</sup> (48.3-10IJ)	2 <sup>3</sup> / <sub>8</sub> -8EU (60.3-8EU)	2 <sup>7</sup> / <sub>8</sub> -8EU (73.0-8EU)	3 <sup>1</sup> / <sub>2</sub> -8EU (88.9-8EU)
ID+0.010/-0.000 (+0.25/-0.00)	1.460 (37.08)	1.780 (45.21)	2.280 (57.91)	2.780 (70.61)
PL min	6 (152.4)	6 (152.4)	6 (152.4)	6 (152.4)
OD+0.062/-0.015 (+1.57/-0.38)	2.094 (53.19)	2.594 (65.89)	3.094 (78.59)	3.750 (95.25)

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>See API Specification 5B for tubing thread details.

<sup>b</sup>Upper connection may be 1.900-10IJ (48.3-10IJ) box thread, thus eliminating need for C34-15 coupling.

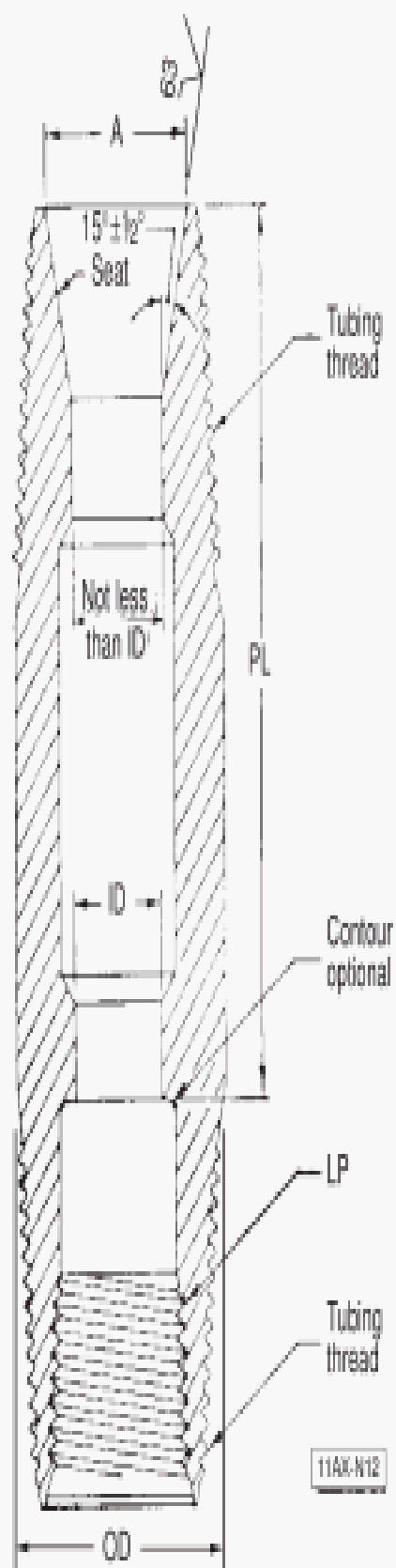


Table N12—Nipple, Seating, Mechanical Bottom (See Note)

(1)	(2)	(3)	(4)	(5)	(6)
Dimensional Symbol	Part Number				
	N12-15	N12-20	N12-25	N12-30	N12-40
Tubing Thread <sup>a</sup>	1.900-10IJ <sup>c</sup> (48.3-10IJ)	2 <sup>3</sup> / <sub>8</sub> -8EU (60.3-8EU)	2 <sup>7</sup> / <sub>8</sub> -8EU (73.0-8EU)	3 <sup>1</sup> / <sub>2</sub> -8EU (88.9-8EU)	4 <sup>1</sup> / <sub>2</sub> -8EU (114.3-8EU)
A±0.005 (±0.13)	1.475 (37.47)	1.688 (42.88)	2.188 (55.58)	2.688 (68.28)	3.688 (93.68)
ID±0.005 (±0.13)	1.125 (28.58)	1.375 (34.93)	1.750 (44.45)	2.250 (57.15)	3.000 (76.20)
PL+0.000/-0.016 (+0.00/-0.41)	3.656 (92.86)	4.352 (110.54)	5.102 (129.59)	6.164 (156.57)	6.188 (157.18)
LP nom. <sup>b</sup>	1 (25.4)	1 <sup>1</sup> / <sub>2</sub> (38.1)	2 (50.8)	2 <sup>1</sup> / <sub>2</sub> (63.5)	3 (76.2)
OD+0.062/-0.015 (+1.57/-0.38)	2.094 (53.19)	2.594 (65.89)	3.094 (78.59)	3.750 (95.25)	4.750 (120.65)

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>See API Specification 5B for tubing thread details.

<sup>b</sup>Line pipe threads. See API Specification 5B for details.

<sup>c</sup>Upper connection may be 1.900-10IJ (48.3-10IJ) box thread, thus eliminating need for C34-15 coupling.

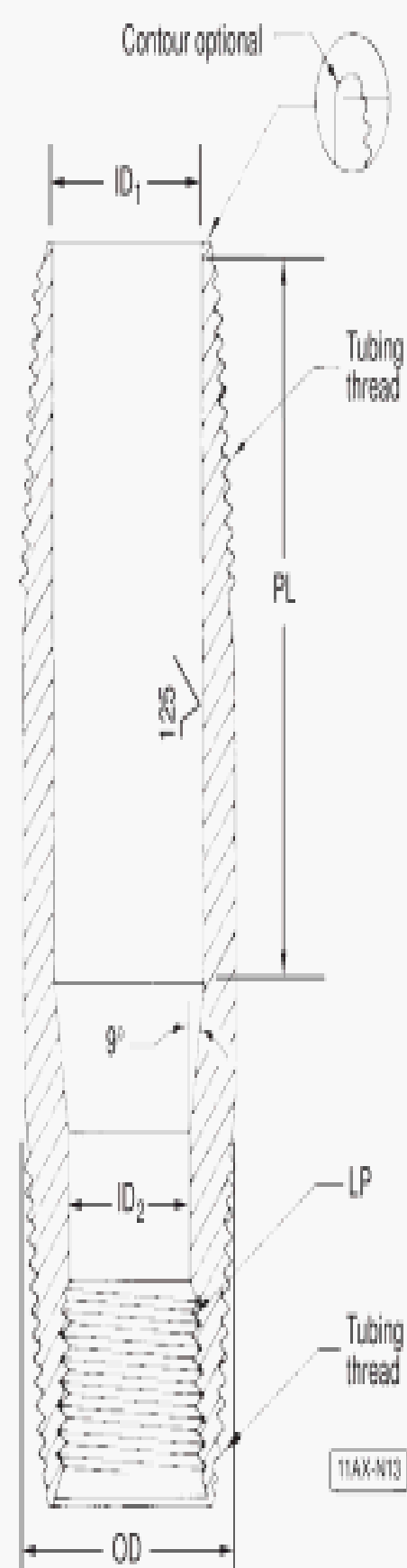


Table N13—Nipple, Seating, 2 Cup Type (Tubing Pump) (See Note)

(1)	(2)	(3)	(4)
Dimensional Symbol	Part Number		
	N13-20	N13-25	N13-30
Tubing Thread <sup>a</sup>	2 <sup>3</sup> / <sub>8</sub> -8EU (60.3-8EU)	2 <sup>7</sup> / <sub>8</sub> -8EU (73.0-8EU)	3 <sup>1</sup> / <sub>2</sub> -8EU (88.9-8EU)
ID <sub>1</sub> +0.010/-0.000 (+0.25/-0.00)	1.710 (43.43)	2.210 (56.13)	2.710 (68.83)
ID <sub>2</sub> +0.040/-0.000 (+1.02/-0.00)	1.371 (34.82)	1.832 (46.53)	2.156 (54.76)
PL± <sup>3</sup> / <sub>8</sub> (±9.5)	5 <sup>1</sup> / <sub>4</sub> (133.4)	5 <sup>3</sup> / <sub>4</sub> (146.1)	6 (152.4)
OD+0.062/-0.015 (+1.57/-0.38)	2.594 (65.89)	3.094 (78.59)	3.750 (95.25)
LP nom. <sup>b</sup>	1 <sup>1</sup> / <sub>2</sub> (38.1)	2 (50.8)	2 (50.8)

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>See API Specification 5B for tubing thread details.

<sup>b</sup>Line pipe threads. See API Specification 5B for details.

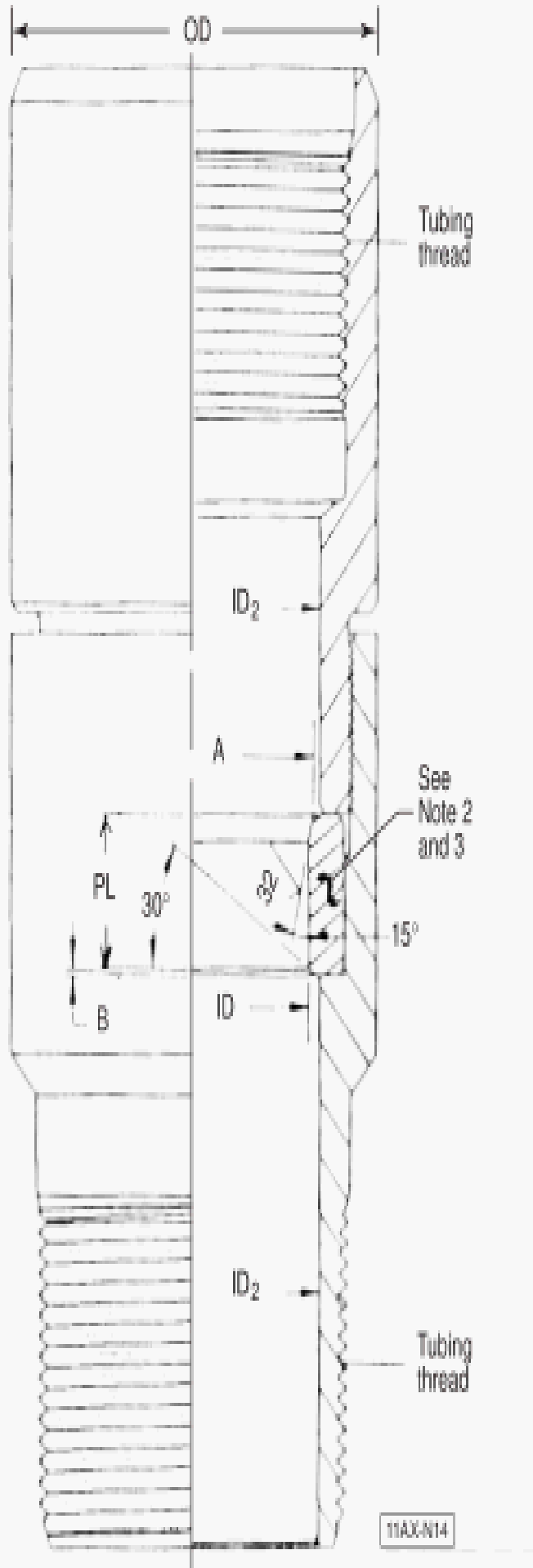


Table N14—Nipple, Seating, Mechanical Top Lock (See Note)

(1)	(2)	(3)	(4)
Dimensional Symbol	Part Number		
	N14-20	N14-25	N14-30
Tubing Thread <sup>a</sup>	2 <sup>3</sup> / <sub>8</sub> -8EU (60.3-8EU)	2 <sup>7</sup> / <sub>8</sub> -8EU (73.0-8EU)	3 <sup>1</sup> / <sub>2</sub> -8EU (88.9-8EU)
A ±0.002 (±0.05)	1.875 (47.63)	2.344 (59.54)	2.844 (72.24)
B ±0.005 (±0.13)	0.030 (0.76)	0.030 (0.76)	0.030 (0.76)
ID +0.010/−0.000 (+0.25/−0.00)	1.780 (45.21)	2.280 (57.91)	2.780 (70.61)
ID <sub>2</sub> +0.165/−0.000 (+4.19/−0.00)	1.902 (48.29)	2.350 (59.69)	2.867 (72.82)
PL +0.000/−0.005 (+0.00/−0.13)	0.973 (24.71)	0.918 (23.32)	0.918 (23.32)
OD ±0.062	3 (76.2)	3 <sup>5</sup> / <sub>8</sub> (92.1)	4 <sup>1</sup> / <sub>2</sub> (114.30)

Note 1: All dimensions in inches (followed by equivalent in millimeters).

Note 2: Hardness of center piece shall be in range of HRC 40/58.

Note 3: These three parts may not be interchangeable between manufacturers. Care should be taken when replacing interior ring to assure a proper fit.

<sup>a</sup>See API Specification 5B for tubing thread details.

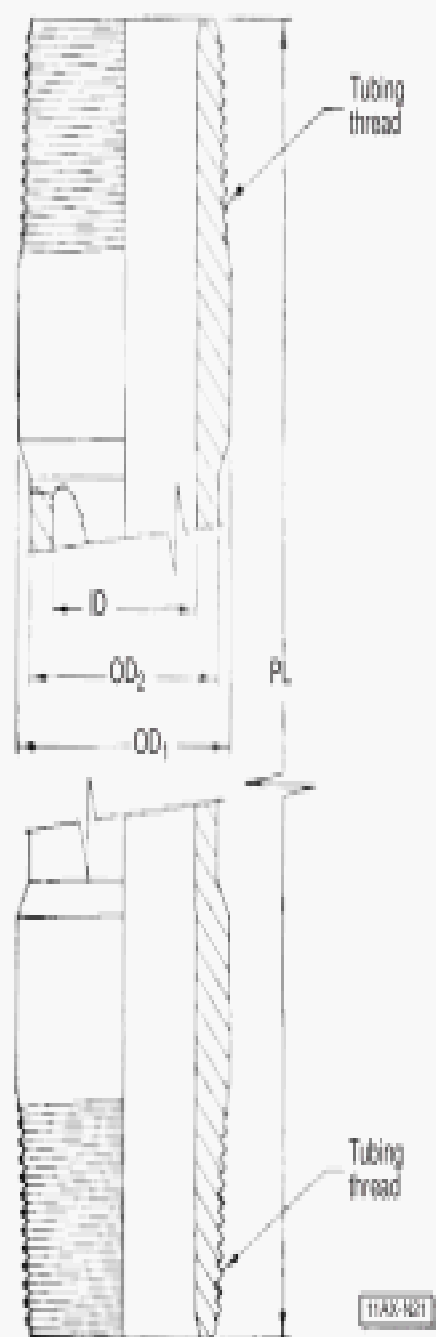


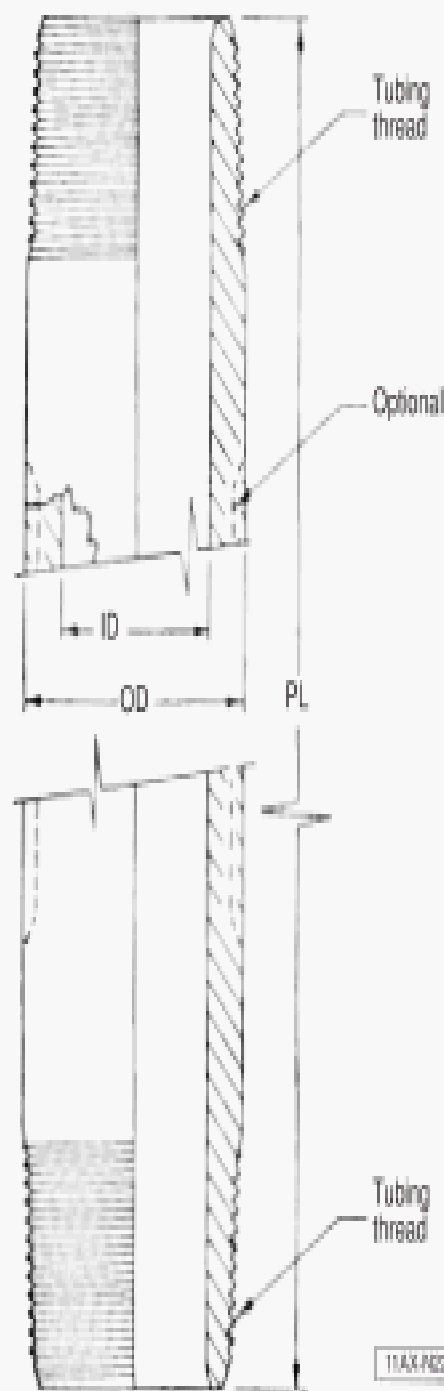
Table N21—Nipple, Extension, Upper (See Note)

(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	N21-20	N21-25	N21-30	N21-40
Tubing Thread <sup>a</sup>	2 <sup>3</sup> / <sub>8</sub> -8EU (60.3-8EU)	2 <sup>7</sup> / <sub>8</sub> -8EU (73.0-8EU)	3 <sup>1</sup> / <sub>2</sub> -8EU (88.9-8EU)	4 <sup>1</sup> / <sub>2</sub> -8EU (114.3-8EU)
ID +0.165/−0.000 (+4.19/−0.00)	1.902 (48.31)	2.350 (59.69)	2.867 (72.82)	3.835 (97.41)
OD <sub>1</sub> +0.062/−0.015 (+1.57/−0.38)	2.594 (65.89)	3.094 (78.59)	3.750 (95.25)	4.750 (120.65)
OD <sub>2</sub> ±0.031 (±0.79)	2 <sup>3</sup> / <sub>8</sub> (60.3)	2 <sup>7</sup> / <sub>8</sub> (73.0)	3 <sup>1</sup> / <sub>2</sub> (88.9)	4 <sup>1</sup> / <sub>2</sub> (114.30)
PL ±0.500 (±12.70)	24, 36 (609.6, 914.4)	24, 36 (609.6, 914.4)	24, 36 (609.6, 914.4)	24, 36 (609.6, 914.4)

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>See API Specification 5B for tubing thread details.

Table N22—Nipple, Extension, Lower (See Note)

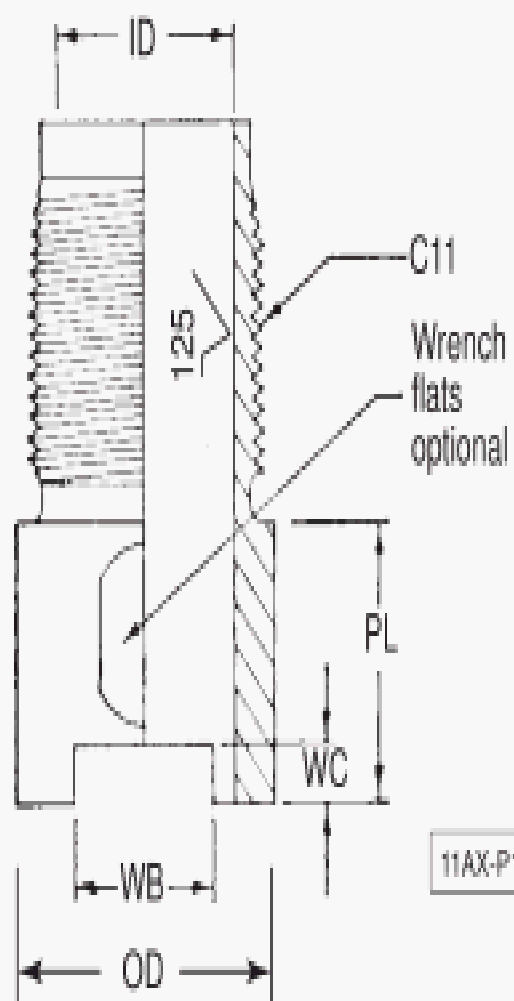


(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	N22-20	N22-25	N22-30	N22-40
Tubing Thread <sup>a</sup>	2 <sup>3</sup> / <sub>8</sub> -8EU (60.3-8EU)	2 <sup>7</sup> / <sub>8</sub> -8EU (73.0-8EU)	3 <sup>1</sup> / <sub>2</sub> -8EU (88.9-8EU)	4 <sup>1</sup> / <sub>2</sub> -8EU (114.3-8EU)
ID+0.165/-0.000 (+4.19/-0.00)	1.902 (48.31)	2.350 (59.69)	2.867 (72.82)	3.835 (97.41)
OD+0.062/-0.015 (+1.57/-0.38)	2.594 (65.89)	3.094 (78.59)	3.750 (95.25)	4.750 (120.65)
PL±0.500 (±12.70)	24, 36 (609.6, 914.4)	24, 36 (609.6, 914.4)	24, 36 (609.6, 914.4)	24, 36 (609.6, 914.4)

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>See API Specification 5B for tubing thread details.

Table P11—Plug, Pull (See Note)

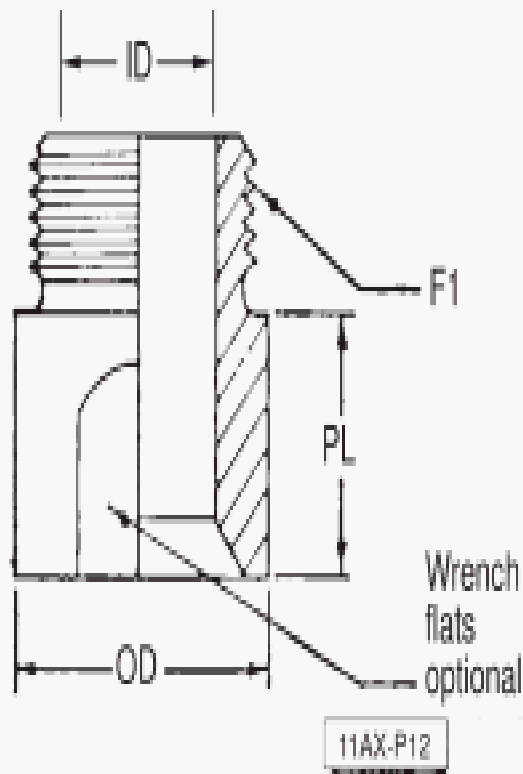


(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dimensional Symbol	Part Number						
	P11-125-15	P11-125	P11-150-20	P11-150-25	P11-175	P11-200	P11-225 <sup>a</sup>
C11	1.3330-16 (33.858-16)	1.5730-16 (39.954-16)	1.5730-16 (39.954-16)	2.0870-16 (53.010-16)	2.0870-16 (53.010-16)	2.0870-16 (53.010-16)	2.5730-16 (65.354-14)
ID+0.031/-0.000 (+0.79/-0.00)	1.000 (25.40)	1.000 (25.40)	1.188 (30.18)	1.188 (30.18)	1.375 (34.93)	1.562 (39.67)	1.937 (49.20)
OD ±0.031 (±0.79)	1 <sup>1</sup> / <sub>2</sub> (38.1)	1 <sup>3</sup> / <sub>4</sub> (44.45)	1 <sup>3</sup> / <sub>4</sub> (44.45)	2 <sup>1</sup> / <sub>4</sub> (57.15)	2 <sup>1</sup> / <sub>4</sub> (57.15)	2 <sup>1</sup> / <sub>4</sub> (57.15)	2 <sup>3</sup> / <sub>4</sub> (69.85)
PL±0.031 (±0.79)	1 <sup>3</sup> / <sub>8</sub> (34.9)	1 <sup>3</sup> / <sub>8</sub> (34.9)	1 <sup>3</sup> / <sub>8</sub> (34.9)	1 <sup>3</sup> / <sub>8</sub> (34.9)	1 <sup>3</sup> / <sub>8</sub> (34.9)	1 <sup>3</sup> / <sub>8</sub> (34.9)	1 <sup>3</sup> / <sub>8</sub> (34.9)
WB+0.062/-0.000 (+1.57/-0.00)	0.812 (20.62)	0.812 (20.62)	0.812 (20.62)	1.000 (25.40)	1.000 (25.40)	1.000 (25.40)	1.000 (25.40)
WC+0.031/-0.000 (+0.79/-0.00)	0.250 (6.35)	0.250 (6.35)	0.250 (6.35)	0.250 (6.35)	0.250 (6.35)	0.250 (6.35)	0.250 (6.35)

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>Used on 2<sup>1</sup>/<sub>4</sub> in. (57.2 mm) and 2<sup>1</sup>/<sub>2</sub> in. (63.5 mm) bore pumps.

Table P12—Plug Seat (See Note)



(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dimensional Symbol	Part Number						
	P12-106	P12-125	P12-150	P12-175	P12-200	P12-225	P12-250
F1	0.875-14 (22.22)	1.000-14 (25.400-14)	1.250-14 (31.750-14)	1.4704-14 (37.348-14)	1.5604-14 (39.634-14)	1.8024-14 (45.781-14)	2.1095-11 <sup>1</sup> / <sub>2</sub> (53.581-11 <sup>1</sup> / <sub>2</sub> )
OD ± 0.031 (±0.79)	1 (25.4)	1 <sup>3</sup> / <sub>16</sub> (30.2)	1 <sup>7</sup> / <sub>16</sub> (36.5)	1 <sup>11</sup> / <sub>16</sub> (42.9)	1 <sup>15</sup> / <sub>16</sub> (49.2)	2 <sup>3</sup> / <sub>16</sub> (55.6)	2 <sup>7</sup> / <sub>16</sub> (61.9)
ID ± 0.062 (±1.57)	0.562 (14.27)	0.625 (15.88)	0.875 (22.23)	1.000 (25.40)	1.000 +0.093/-0.062 (25.40 +2.36/-1.57)	1.250 +0.093/-0.062 (31.75 +2.36/-1.57)	1.500 (38.10)
PL ± 0.031 (±0.79)	1 (25.4)	1 (25.4)	1 (25.4)	1 (25.4)	1 (25.4)	1 (25.4)	1 (25.4)

Note: All dimensions in inches (followed by equivalent in millimeters).

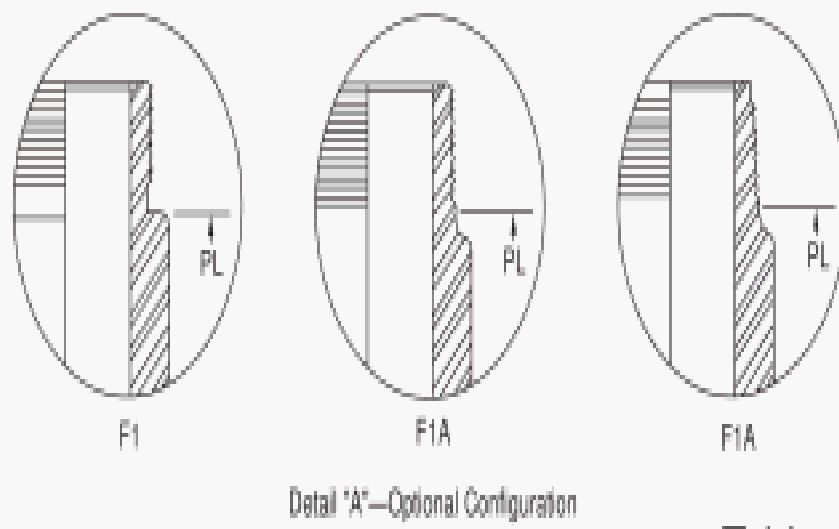
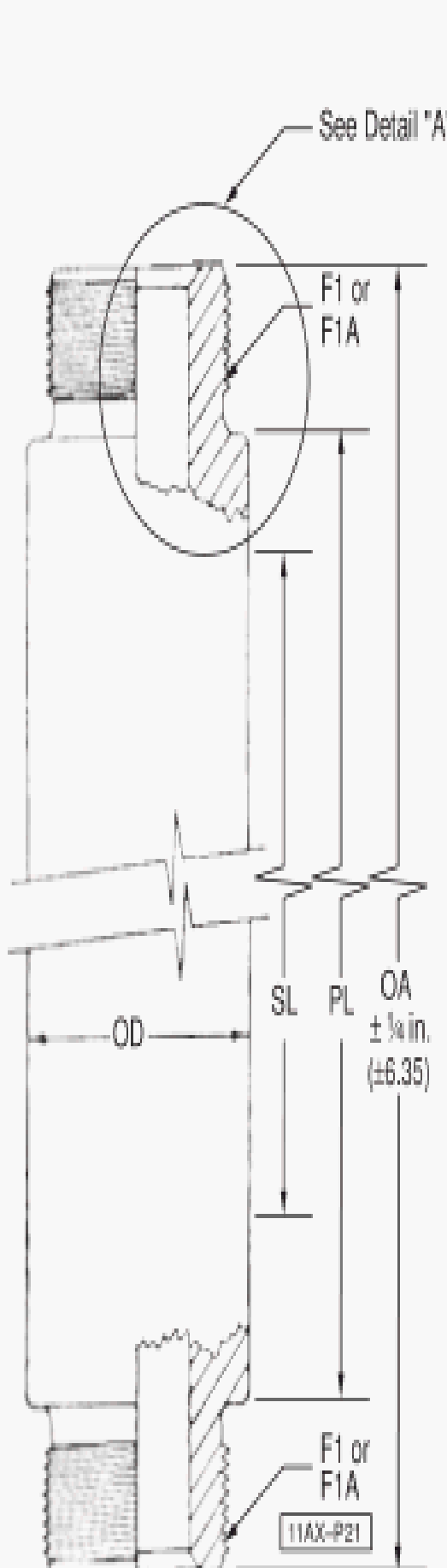


Table P21—Plunger, One Piece (See Note)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dimensional Symbol	Part Number								
	P21-106	P21-125	P21-150	P21-175	P21-200	P21-225	P21-250	P21-275	P21-375
F1	0.8750-14 (22.22-14)	1.000-14 (25.400-14)	1.2500-14 (31.750-14)	1.4704-14 (37.348-14)	1.5604-14 (39.634-14)	1.8024-14 (45.781-14)	2.1095-11 <sup>1</sup> / <sub>2</sub> (53.581-11 <sup>1</sup> / <sub>2</sub> )	2.1095-11 <sup>1</sup> / <sub>2</sub> (53.581-11 <sup>1</sup> / <sub>2</sub> )	3.1715-11 <sup>1</sup> / <sub>2</sub> (80.556-11 <sup>1</sup> / <sub>2</sub> )
OD <sup>a</sup>	1.0625 (26.99)	1.2500 (31.75)	1.5000 (38.10)	1.7500 (44.45)	2.000 (50.80)	2.2500 (57.15)	2.5000 (63.50)	2.7500 (69.85)	3.7500 (95.25)
SL	Specify seal length in whole feet increments [2 ft (0.610m) min seal length].								
PL	Seal length plus 3 in. (76.2mm).								
OA	PL plus (F1 thread length x 2).								

Note 1: All dimensions in inches (followed by equivalent in millimeters).

Note 2: Straightness shall be 0.001 in. (0.03mm) T.I.R. or less per foot of length measured over the seal length, up to a maximum of 0.007 in. (0.18mm) T.I.R. for plungers 7 ft (2.134m) and longer in length.

<sup>a</sup>Outside diameter shall be basic size minus the specified clearance (fit), with a tolerance of +0.0000/-0.0005 in. (+0.000/-0.013 mm).

Table P22—Plunger, Assembled (See Note)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dimensional Symbol	Part Number						
	P22-125	P22-150	P22-175	P22-200	P22-225	P22-250	P22-275
F1	1.000-14 (25.400-14)	1.2500-14 (31.750-14)	1.4704-14 (37.348-14)	1.5604-14 (39.634-14)	1.8024-14 (45.781-14)	2.1095-11 <sup>1</sup> / <sub>2</sub> (53.581-11 <sup>1</sup> / <sub>2</sub> )	2.1095-11 <sup>1</sup> / <sub>2</sub> (53.581-11 <sup>1</sup> / <sub>2</sub> )
OD <sup>a</sup>	1.2500 (31.75)	1.5000 (38.10)	1.7500 (44.45)	2.000 (50.80)	2.2500 (57.15)	2.5000 (63.50)	2.7500 (69.85)
SL	Specify seal length in whole feet increments						
PL	Seal length plus 3 in. (76.2mm)						
OA	PL plus (F1 thread length x 2)						

Note 1: All dimensions in inches (followed by equivalent in millimeters).

Note 2: Construction of assembled plungers is optional with the manufacturer; however, they must be made of metal and must be compatible with one piece plungers.

Note 3: Straightness shall be 0.001 in. (0.03mm) T.I.R. or less per foot of length measured over the seal length, up to a maximum of 0.007 in. (0.18mm) T.I.R. for plungers 7 ft (2.134mm) and longer in length.

<sup>a</sup>Outside diameter shall be basic size minus the specified clearance (fit), with a tolerance of +0.0000/-0.0005 in. (+0.000/-0.013 mm).

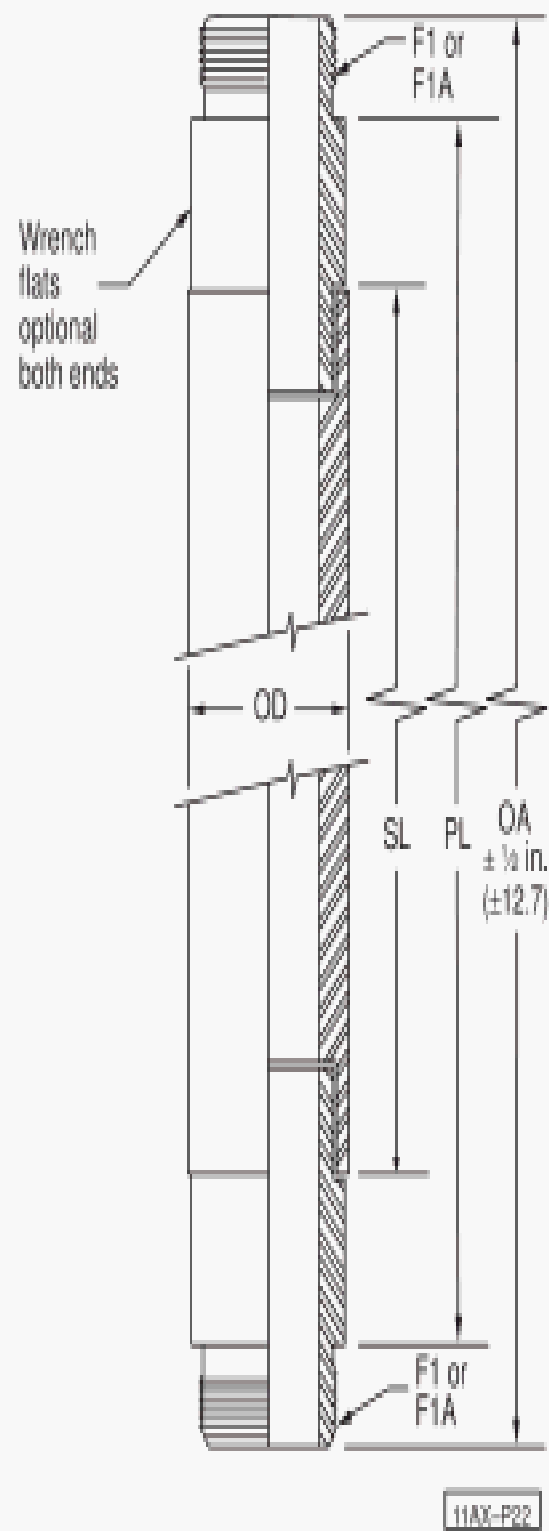


Table P23—Plunger, Box End (Tubing Pump) (See Note)

(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	P23-175	P23-225	P23-275	P23-375
H2	1.5084-14 (38.313-14)	1.9864-14 (50.455-14)	2.3755-11 <sup>1</sup> / <sub>2</sub> (60.338-11 <sup>1</sup> / <sub>2</sub> )	3.3825-11 <sup>1</sup> / <sub>2</sub> (85.916-11 <sup>1</sup> / <sub>2</sub> )
OD <sup>a</sup>	1.7500 (44.45)	2.2500 (57.15)	2.7500 (69.850)	3.7500 (95.250)
PL	Specify nominal length in whole feet (thousandths of meters)			

Note 1: All dimensions in inches (followed by equivalent in millimeters).

Note 2: Straightness shall be 0.001 in. (0.03mm) T.I.R. or less per foot of length measured over the seal length, up to a maximum of 0.007 in. (0.18mm)

T.I.R. for plungers 7 ft (2.134mm) and longer in length.

<sup>a</sup>OD shall be basic size, or basic size minus 0.040 in. (-1.02 mm), minus the specified clearance (fit), with a tolerance of +0.0000/-0.0005 in. (+0.000/-0.013 mm).

Note 3: End relief is optional, however if used it must comply with dimensions shown.

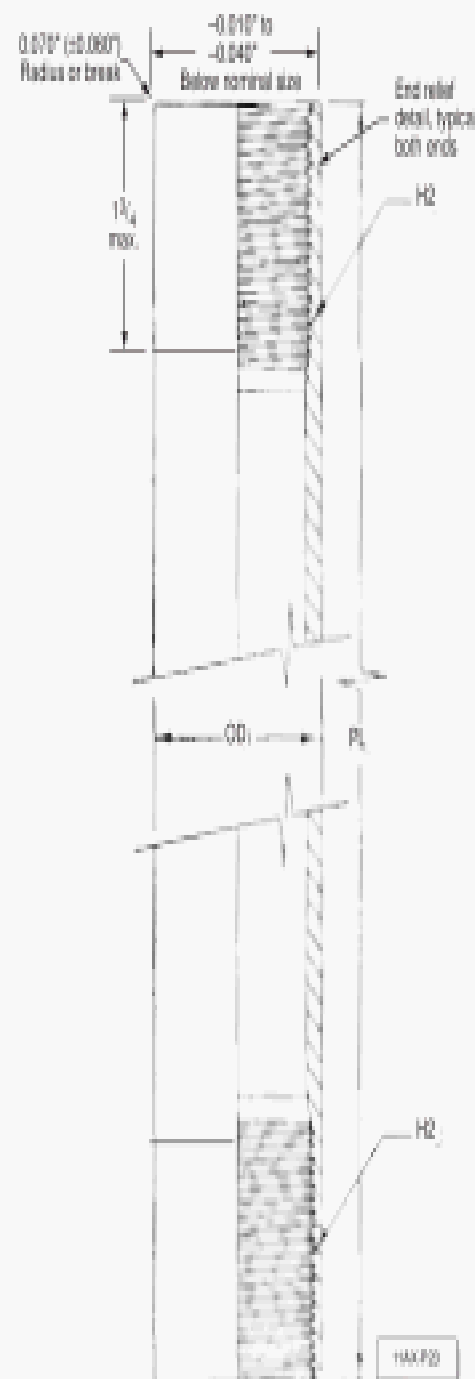
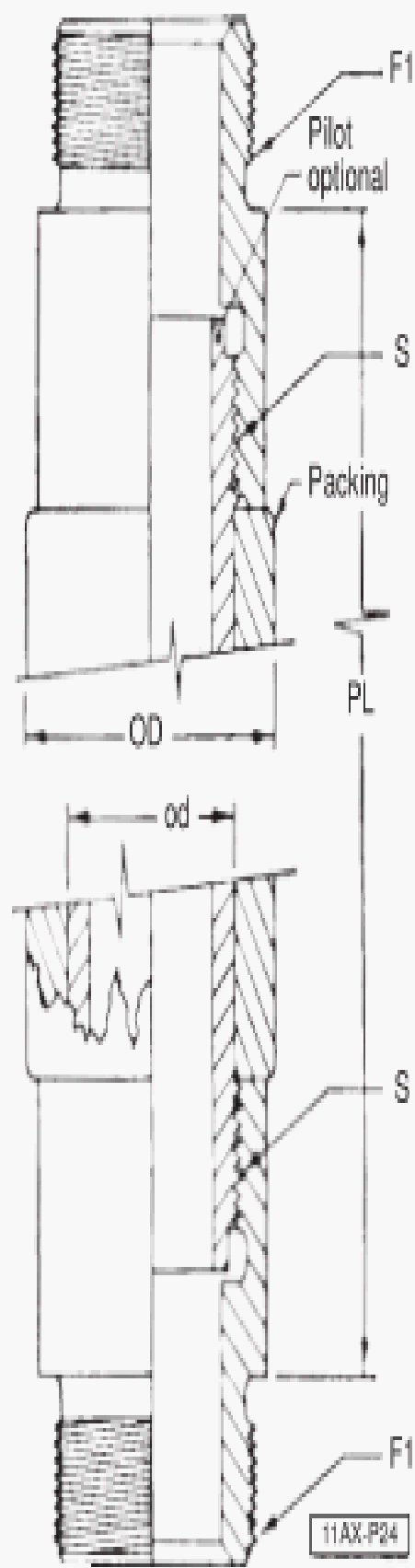


Table P24—Plunger, Soft-Packed (See Note)



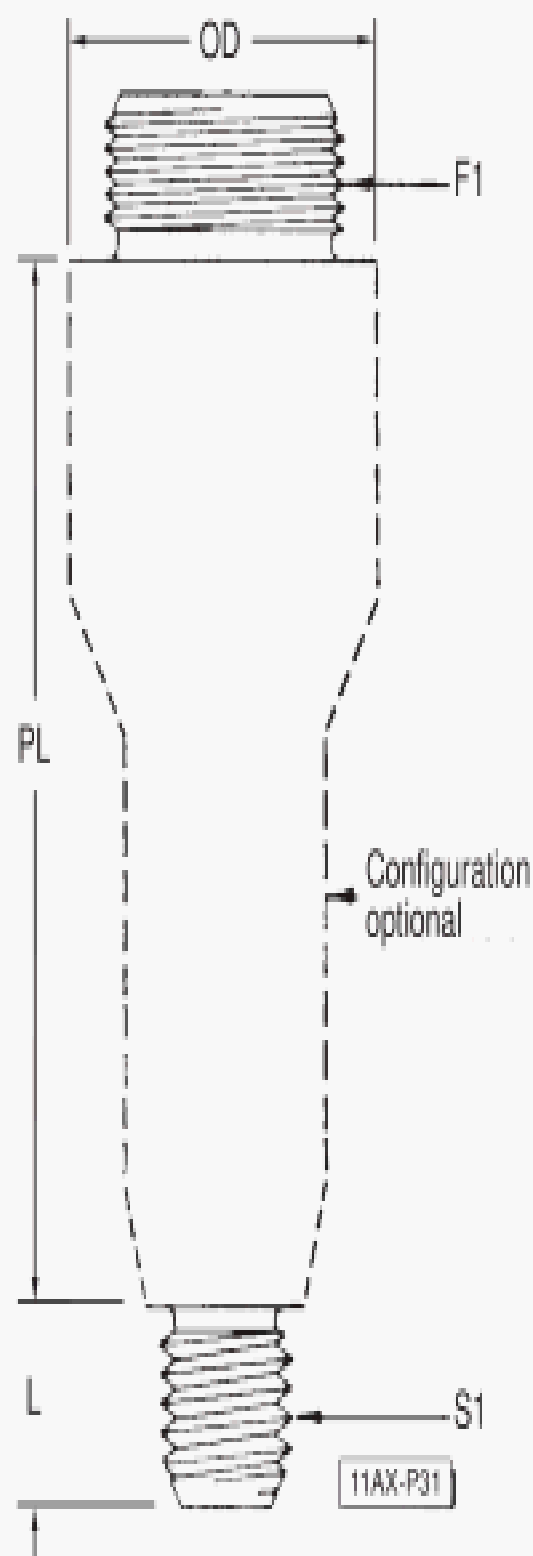
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dimensional Symbol	Part Number						
	P24-125	P24-150	P24-178	P24-200	P24-225	P24-250	P24-275
F1	1.000-14 (25.400-14)	1.2500-14 (31.750-14)	1.4704-14 (37.348-14)	1.5604-14 (39.634-14)	1.8024-14 (45.781-14)	2.1095-11 <sup>1</sup> / <sub>2</sub> (53.581-11 <sup>1</sup> / <sub>2</sub> )	2.1095-11 <sup>1</sup> / <sub>2</sub> (53.581-11 <sup>1</sup> / <sub>2</sub> )
OD (nom.)	1 <sup>1</sup> / <sub>4</sub> (31.8)	1 <sup>1</sup> / <sub>2</sub> (38.1)	1 <sup>25</sup> / <sub>32</sub> (45.2)	2 (50.8)	2 <sup>1</sup> / <sub>4</sub> (57.2)	2 <sup>1</sup> / <sub>2</sub> (63.5)	2 <sup>3</sup> / <sub>4</sub> (69.9)
S <sup>a</sup>	0.7500-16 (19.050-16)	0.8750-14 (22.225-14)	1.1894-14 (30.211-14)	1.3750-14 (34.925-14)	1.5604-14 (39.634-14)	1.7500-14 (44.450-14)	2.0035-11 <sup>1</sup> / <sub>2</sub> (50.889-11 <sup>1</sup> / <sub>2</sub> )
od +0.000/-0.005 (+0.00/-0.13)	0.750 (19.05)	0.875 (22.23)	1.187 (30.15)	1.375 (34.93)	1.562 (39.67)	1.750 (44.45)	2.000 (50.80)
PL	Specify nominal plunger length in nearest whole or half feet (thousandths of meters) Actual pitch length (PL) shall be nominal length plus 3-in. (76.2mm).						
	Actual Pitch Length						
Nominal Length (NL) ft (m) –	2 (0.610)	3 (0.914)	4 (1.219)	etc.			
Pitch Length (PL) in. (mm) –	27 (685.8)	39 (990.6)	51 (1295.4)	etc.			

Note 1: All dimensions in inches (followed by equivalent in millimeters).

Note 2: The design and construction of packing for soft-packed plungers have not been standardized. Specify size, type, and number of packing elements, according to manufacturer's catalog.

<sup>a</sup>See Table S for thread dimensions.

Table P31—Puller, Standing Valve (See Note)



(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	P31-175	P31-225	P31-275	P31-375
F1	1.4704-14 (37.348-14)	1.8024-14 (45.781-14)	2.1095-11 <sup>1</sup> / <sub>2</sub> (53.581-11 <sup>1</sup> / <sub>2</sub> )	3.1715-11 <sup>1</sup> / <sub>2</sub> (80.556-11 <sup>1</sup> / <sub>2</sub> )
S1 <sup>a</sup>	0.750-10 (19.050-10)	0.750-10 (19.050-10)	0.750-10 (19.050-10)	0.750-10 (19.050-10)
PL±2.000 (±50.80)	5.500 (139.70)	6.000 (152.40)	7.000 (177.80)	9.000 (228.60)
L max./min.	0.938/0.625 (23.83/15.88)	0.938/0.625 (23.83/15.88)	0.938/0.625 (23.83/15.88)	0.938/0.625 (23.83/15.88)
OD±0.031 (±0.79)	1.688 (42.88)	2.188 (55.58)	2.625 (66.68)	3.650 (92.71) +0.031/-0.312 (+0.79/-7.92)

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>See Table S for thread dimensions.

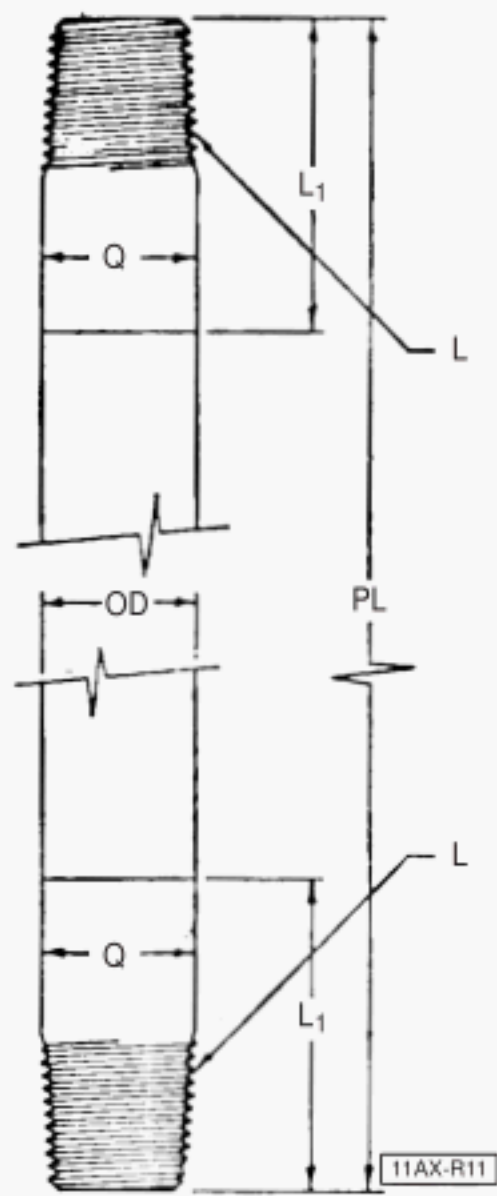


Table R11—Rod, Valve (See Note)

(1)	(2)	(3)	(4)
Dimensional Symbo	Part Number		
	R11-20	R11-25	R11-30
L nom. <sup>a</sup>	3/8 (9.5)	1/2 (12.7)	3/4 (19.1)
L <sub>1</sub> +1.500/−0.062 (+38.1/−1.57)	1 3/4 (44.5)	2 (50.8)	2 (50.8)
Q+0.000/−0.005 (+0.00/−0.13)	0.688 (17.48)	0.875 (22.23)	1.063 (27.00)
OD+0.000/−0.005 (+0.00/−0.13)	1 1/16 (17.5)	7/8 (22.2)	1 1/16 (27.0)
PL±0.125 (±3.18)	Specify length (PL) in inches (meters). See table below.		

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>Modified line pipe thread. See Table L for details.



## Valve Rod Length PL

(1)	(2)	(3)	(4)	(5)
Nominal Barrel Length <sup>a</sup> Minus Nominal Plunger Length, ft (m)	For Pumps Run in 1.900, 2 <sup>3</sup> / <sub>8</sub> , and 2 <sup>7</sup> / <sub>8</sub> in. (48.3, 60.3, and 73.0 mm) OD Tubing		For Pumps Run in 3 <sup>1</sup> / <sub>2</sub> in. (88.9 mm) OD Tubing	
	Top Anchor, in. (m)	Bottom Anchor, in. (m)	Top Anchor, in. (m)	Bottom Anchor, in. (m)
1 (0.305)	13 (0.330)	7 (0.178)	12 (0.305)	6 (0.152)
2 (0.610)	25 (0.635)	19 (0.483)	24 (0.610)	18 (0.457)
3 (0.914)	37 (0.940)	31 (0.787)	36 (0.914)	30 (0.762)
4 (1.219)	49 (1.245)	43 (1.092)	48 (1.219)	42 (1.067)
5 (1.524)	61 (1.549)	55 (1.397)	60 (1.524)	54 (1.372)
6 (1.829)	73 (1.854)	67 (1.702)	72 (1.829)	66 (1.676)
7 (2.134)	85 (2.159)	79 (2.007)	84 (2.134)	78 (1.981)
8 (2.438)	97 (2.464)	91 (2.311)	96 (2.438)	90 (2.286)
9 (2.743)	109 (2.769)	103 (2.616)	108 (2.743)	102 (2.591)
10 (3.048)	121 (3.073)	115 (2.921)	120 (3.048)	114 (2.896)
11 (3.353)	133 (3.378)	127 (3.226)	132 (3.353)	126 (3.200)
12 (3.658)	145 (3.683)	139 (3.531)	144 (3.658)	138 (3.505)
13 (3.962)	157 (3.988)	151 (3.835)	156 (3.962)	150 (3.810)
14 (4.267)	169 (4.293)	163 (4.140)	168 (4.267)	162 (4.115)
15 (4.572)	181 (4.597)	175 (4.445)	180 (4.572)	174 (4.420)
16 (4.877)	193 (4.902)	187 (4.750)	192 (4.877)	186 (4.724)
17 (5.182)	205 (5.207)	199 (5.055)	204 (5.182)	198 (5.029)
18 (5.486)	217 (5.512)	211 (5.359)	216 (5.486)	210 (5.334)
19 (5.791)	229 (5.817)	223 (5.664)	228 (5.791)	222 (5.639)
20 (6.096)	241 (6.121)	235 (5.969)	240 (6.096)	234 (5.944)
21 (6.401)	253 (6.426)	247 (6.274)	252 (6.401)	246 (6.248)
22 (6.706)	265 (6.731)	259 (6.579)	264 (6.706)	258 (6.553)
23 (7.010)	277 (7.036)	271 (6.883)	276 (7.010)	270 (6.858)
24 (7.315)	289 (7.341)	283 (7.188)	288 (7.315)	282 (7.163)
25 (7.620)	301 (7.645)	295 (7.493)	300 (7.620)	294 (7.468)
26 (7.925)	313 (7.950)	307 (7.800)	312 (7.925)	306 (7.772)
27 (8.230)	325 (8.255)	319 (8.103)	324 (8.230)	318 (8.077)
28 (8.534)	337 (8.560)	331 (8.407)	336 (8.534)	330 (8.382)
29 (8.839)	349 (8.865)	343 (8.712)	348 (8.839)	342 (8.687)
30 (9.144)	361 (9.169)	355 (9.017)	360 (9.144)	354 (8.992)

<sup>a</sup>Including extensions on heavy wall barrels.

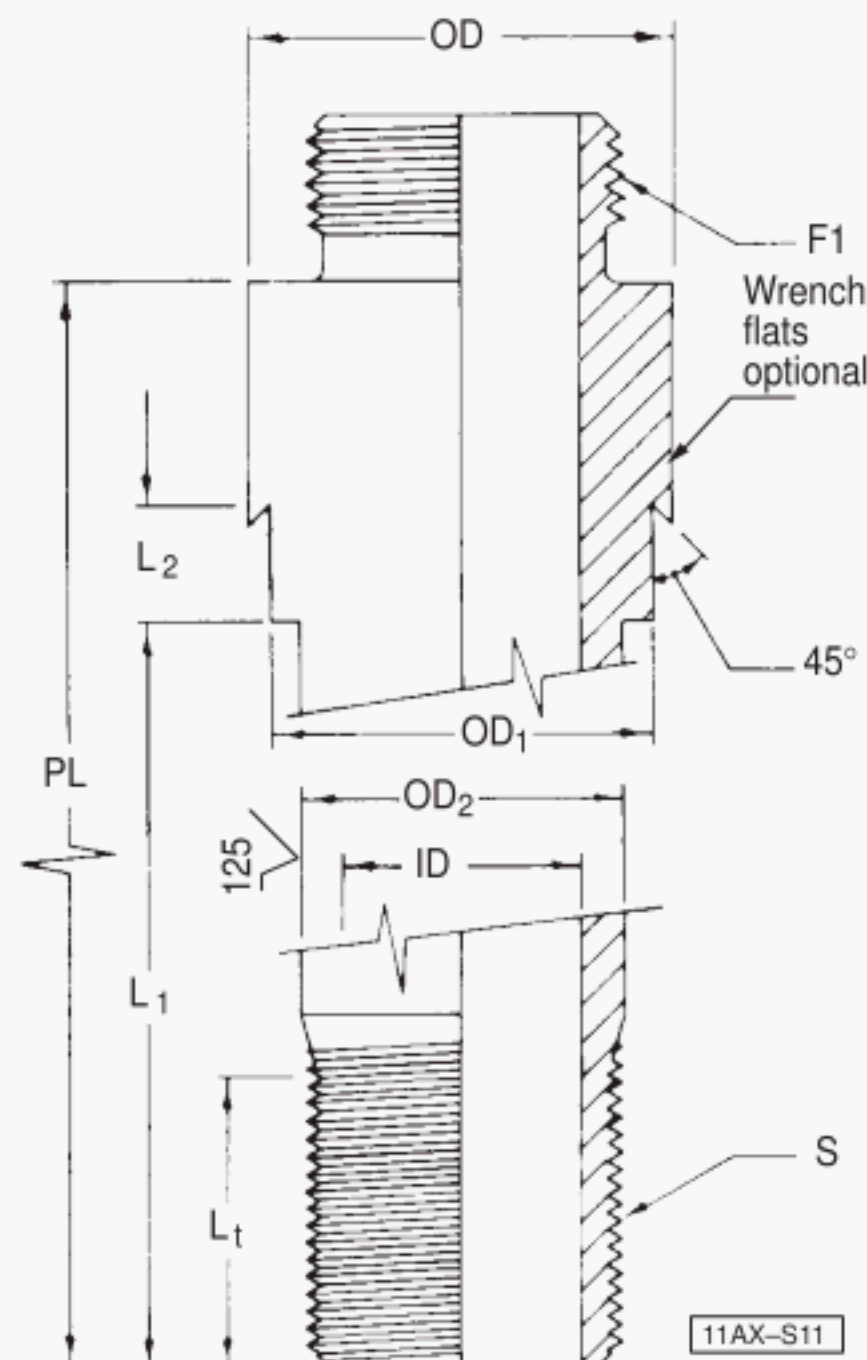


Table S11—Seating Mandrel, Cup (Type HR) (Rod Pump and Fittings) (See Note)

(1)	(2)	(3)	(4)
Dimensional Symbol	Part Number		
	S11-20	S11-25	S11-30
F1	1.4704 -14 (37.348-14)	1.8024-14 (45.781-14)	2.1095-11 <sup>1</sup> / <sub>2</sub> (53.581-11 <sup>1</sup> / <sub>2</sub> )
S	1.1894-14 (30.211-14)	1.5604-14 (39.634-14)	2.0035-11 <sup>1</sup> / <sub>2</sub> (50.889-11 <sup>1</sup> / <sub>2</sub> )
PL ±0.062 (±1.57)	7 <sup>5</sup> / <sub>8</sub> (193.7)	8 <sup>1</sup> / <sub>8</sub> (206.4)	8 <sup>1</sup> / <sub>8</sub> (206.4)
ID min.	7 <sup>7</sup> / <sub>8</sub> (22.2)	1 <sup>3</sup> / <sub>16</sub> (30.2)	1 <sup>7</sup> / <sub>16</sub> (36.5)
OD max.	1.901 (48.29)	2.344 (59.54)	2.844 (72.24)
min.	1.840 (46.74)	2.330 (59.18)	2.830 (71.88)
OD <sub>1</sub> +0.000/-0.016 (+0.00/-0.41)	1.406 (35.71)	1.844 (46.84)	2.344 (59.54)
OD <sub>2</sub> +0.000/-0.010 (+0.00/-0.25)	1.187 (30.15)	1.562 (39.67)	2.000 (50.80)
L <sub>1</sub> ±0.062 (±1.57)	4 <sup>3</sup> / <sub>8</sub> (111.1)	4 <sup>7</sup> / <sub>8</sub> (123.8)	5 (127.0)
L <sub>2</sub> +0.016/-0.000 (+0.41/-0.00)	0.672 (17.07)	0.703 (17.86)	0.703 (17.86)
L <sub>t</sub> min.	2 <sup>1</sup> / <sub>4</sub> (57.2)	2 <sup>3</sup> / <sub>8</sub> (60.3)	2 <sup>3</sup> / <sub>8</sub> (60.3)

Note: All dimensions in inches (followed by equivalent in millimeters).

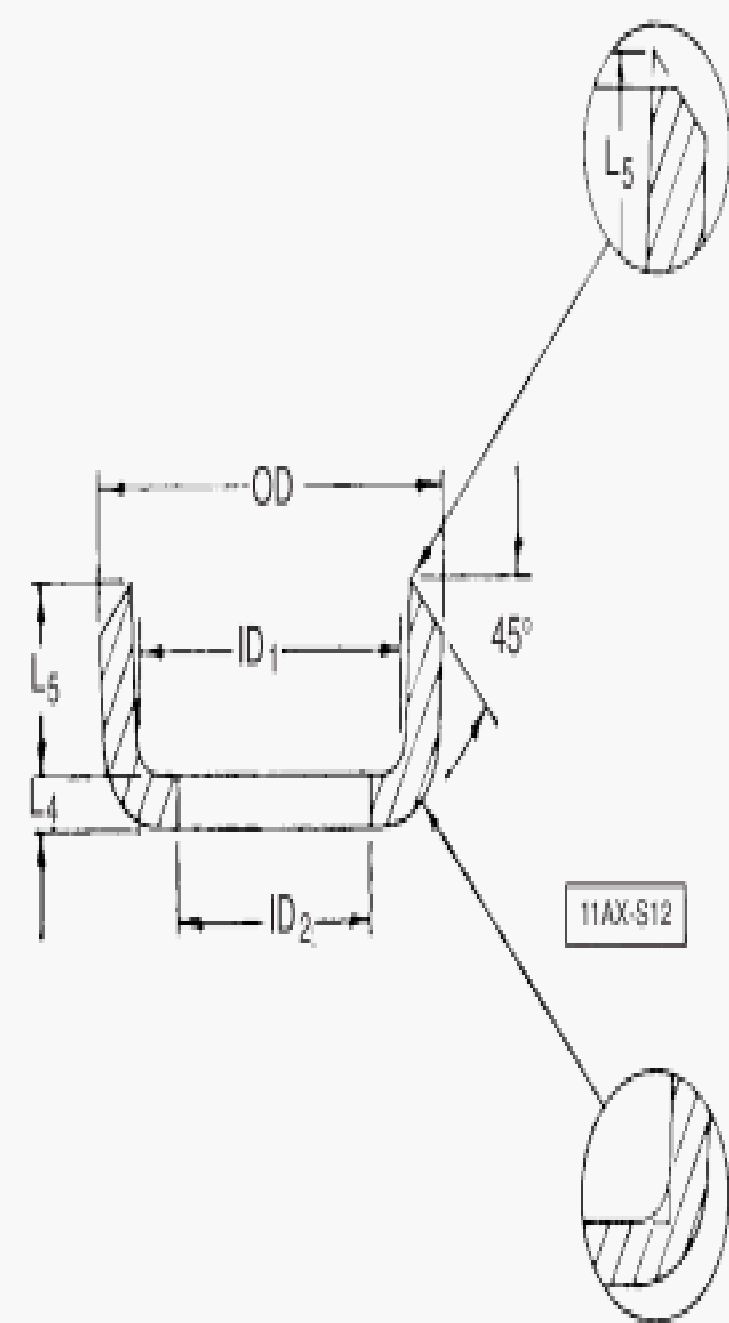


Table S12—Seating Cup (Type HR) (Rod Pump) (See Note)

(1)	(2)	(3)	(4)
Dimensional Symbol	Part Number		
	S12-20	S12-25	S12-30
ID <sub>1</sub> +0.016/−0.000 (+0.41/−0.00)	1.411 (35.84)	1.850 (46.99)	2.350 (59.69)
ID <sub>2</sub> +0.005/−0.000 (+0.13/−0.00)	1.187 (30.15)	1.562 (39.67)	2.000 (50.80)
OD ±0.005 (±0.13)	1.800 (45.72)	2.310 (58.67)	2.810 (71.37)
Industry Designation	1 <sup>25</sup> / <sub>32</sub> + 30	2 <sup>1</sup> / <sub>4</sub> + 70	2 <sup>3</sup> / <sub>4</sub> + 70
L <sub>4</sub> +0.030/−0.015 (+0.76/−0.38)	0.165 (4.19)	0.185 (4.70)	0.185 (4.70)
L <sub>5</sub> +0.000/−0.016 (+.00/−0.41)	0.656 (16.66)	0.688 (17.48)	0.688 (17.48)

Note: All dimensions in inches (followed by equivalent in millimeters).

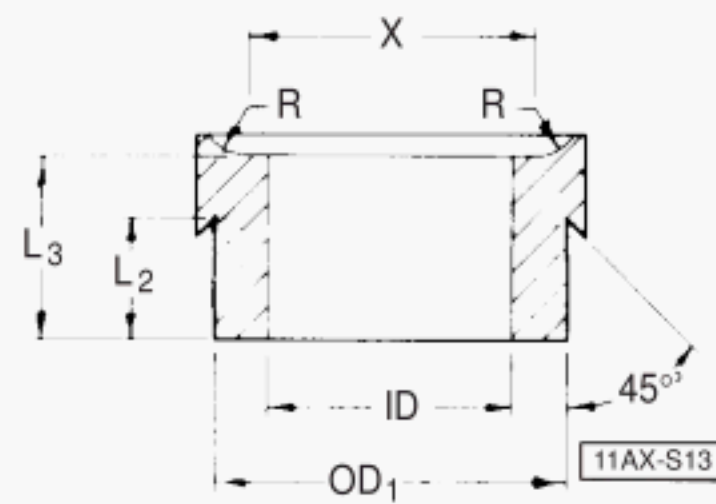


Table S13—Seating Cup Ring (Type HR) (See Note)

(1)	(2)	(3)	(4)
Dimensional Symbol	Part Number		
	S13-20	S13-25	S13-30
ID +0.006/−0.000 (+0.15/−0.00)	1.192 (30.28)	1.567 (39.80)	2.005 (50.93)
OD <sub>1</sub> +0.000/−0.016 (+0.00/−0.41)	1.406 (35.71)	1.844 (46.84)	2.344 (59.54)
L <sub>2</sub> +0.016/−0.000 (+0.41/−0.00)	0.672 (17.07)	0.703 (17.86)	0.703 (17.86)
L <sub>3</sub> +0.016/−0.000 (+0.41/−0.00)	0.938 (23.83)	1.109 (28.17)	1.156 (29.36)
R ±0.010 (±0.25)	0.250 (6.35)	0.281 (7.14)	0.281 (7.14)
X ±0.010 (±0.25)	1.250 (31.75)	1.688 (42.88)	2.188 (55.58)

Note: All dimensions in inches (followed by equivalent in millimeters).

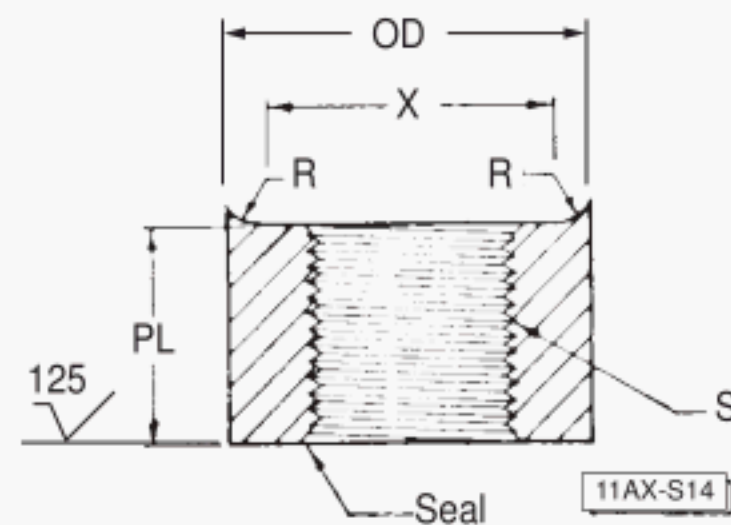
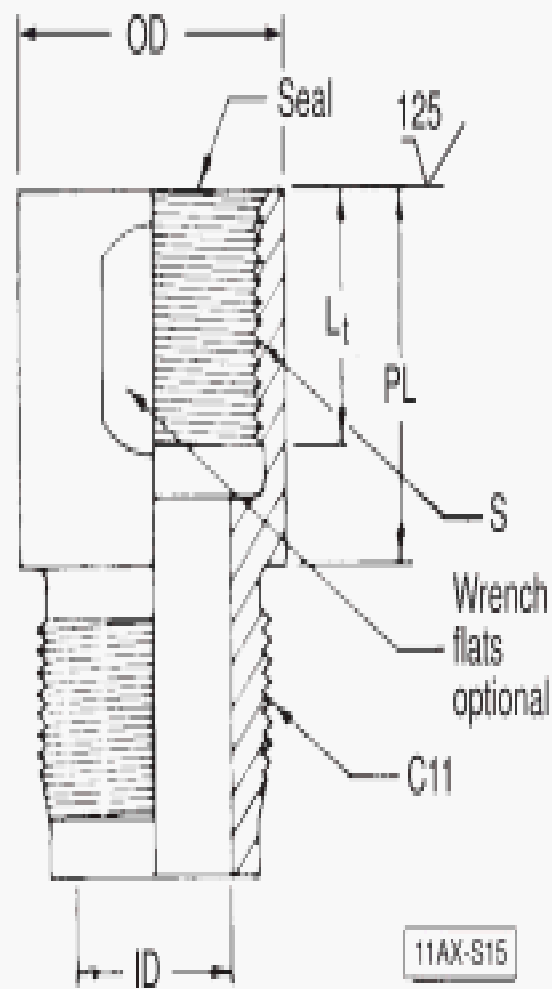


Table S14—Seating Cup Nut (Type HR) (See Note)

(1)	(2)	(3)	(4)
Dimensional Symbol	Part Number		
	S14-20	S14-25	S14-30
S	1.1894-14 (30.211-14)	1.5604-14 (39.634-14)	2.0035-11 <sup>1</sup> / <sub>2</sub> (50.889-11 <sup>1</sup> / <sub>2</sub> )
PL ±0.031 (±0.79)	1 (25.4)	1 <sup>1</sup> / <sub>8</sub> (28.6)	1 <sup>1</sup> / <sub>4</sub> (31.8)
R ±0.010 (±0.25)	0.250 (6.35)	0.281 (7.14)	0.281 (7.14)
X ±0.010 (±0.25)	1.250 (31.75)	1.688 (42.88)	2.188 (55.58)
OD +0.010/−0.031 (+0.25/−0.33)	1 <sup>11</sup> / <sub>16</sub> (42.87)	2 <sup>3</sup> / <sub>16</sub> (55.57)	2 <sup>5</sup> / <sub>8</sub> (66.67)

Note: All dimensions in inches (followed by equivalent in millimeters).

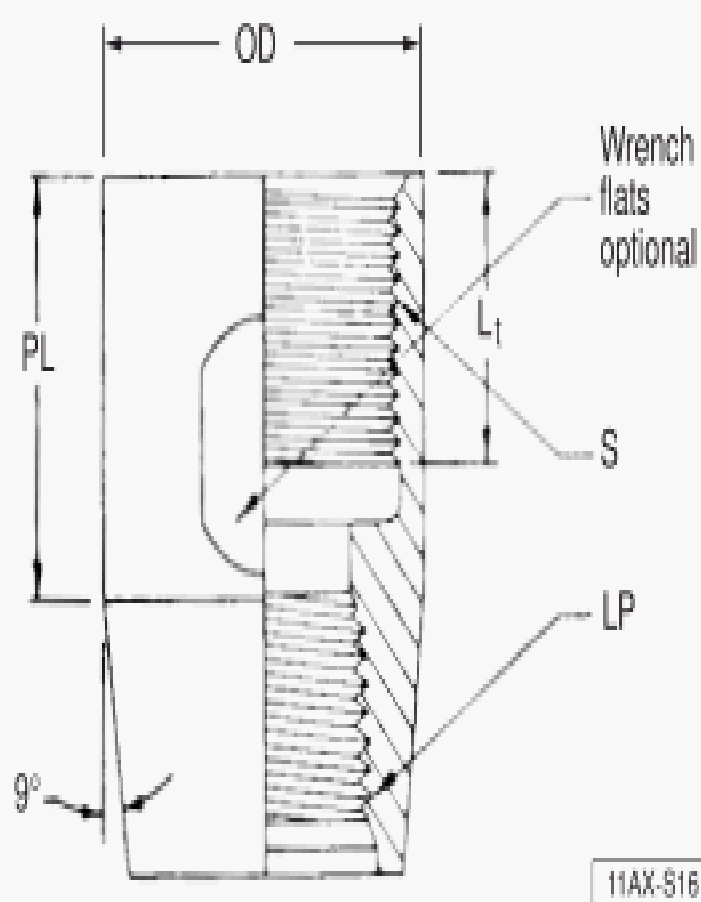
Table S15—Seating Cup Bushing, Top Anchor (See Note)



(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	S15-20-125	S15-20	S15-25	S15-30
C11	1.3330-16 (33.858-16)	1.5730-16 (39.954-16)	2.0870-16 (53.010-16)	2.5730-16 (65.354-16)
S	1.1894-14 (30.211-14)	1.1894-14 (30.211-14)	1.5604-14 (39.634-14)	2.0035-11 <sup>1</sup> / <sub>2</sub> (50.889-11 <sup>1</sup> / <sub>2</sub> )
L <sub>1</sub> min.	1 <sup>1</sup> / <sub>8</sub> (28.6)	1 <sup>1</sup> / <sub>8</sub> (28.6)	1 <sup>1</sup> / <sub>4</sub> (31.8)	1 <sup>1</sup> / <sub>4</sub> (31.8)
ID ± 1/16 (±1.59)	1 (25.40)	1 (25.40)	1 <sup>1</sup> / <sub>4</sub> (31.75)	1 <sup>1</sup> / <sub>2</sub> (38.10)
OD ± 1/32 (±0.78)	1 <sup>3</sup> / <sub>4</sub> (44.45)	1 <sup>3</sup> / <sub>4</sub> (44.45)	2 <sup>1</sup> / <sub>4</sub> (57.15)	2 <sup>3</sup> / <sub>4</sub> (69.85)
PL ± 0.031 (±0.79)	1 <sup>7</sup> / <sub>8</sub> (47.6)	1 <sup>7</sup> / <sub>8</sub> (47.6)	2 (50.8)	2 (50.8)

Note: All dimensions in inches (followed by equivalent in millimeters).

Table S16—Seating Coupling, Bottom Anchor (See Note)



(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	S16-15	S16-20	S16-25	S16-30
S	1.1894-14 (30.21)	1.1894-14 (30.211-14)	1.5604-14 (39.634-14)	2.0035-11 <sup>1</sup> / <sub>2</sub> (50.889-11 <sup>1</sup> / <sub>2</sub> )
LP nom.	3/4 (19.05)	1	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>
L <sub>1</sub> min.	1 <sup>1</sup> / <sub>8</sub> (28.57)	1 <sup>1</sup> / <sub>8</sub> (28.6)	1 <sup>1</sup> / <sub>4</sub> (31.8)	1 <sup>1</sup> / <sub>4</sub> (31.8)
OD +0.010/-0.031 (+0.25/-0.33)	1 <sup>7</sup> / <sub>16</sub> (36.52)	1 <sup>11</sup> / <sub>16</sub> (42.87)	2 <sup>3</sup> / <sub>16</sub> (55.57)	2 <sup>5</sup> / <sub>8</sub> (66.67)
PL ± 0.062 (± 1.57)	1 <sup>3</sup> / <sub>4</sub> (44.45)	2 <sup>3</sup> / <sub>16</sub> (55.6)	2 <sup>1</sup> / <sub>4</sub> (57.2)	1 <sup>15</sup> / <sub>16</sub> (49.2)

Note 1: All dimensions in inches (followed by equivalent in millimeters).

Note 2: Line pipe thread. See API Specification 5B for details.



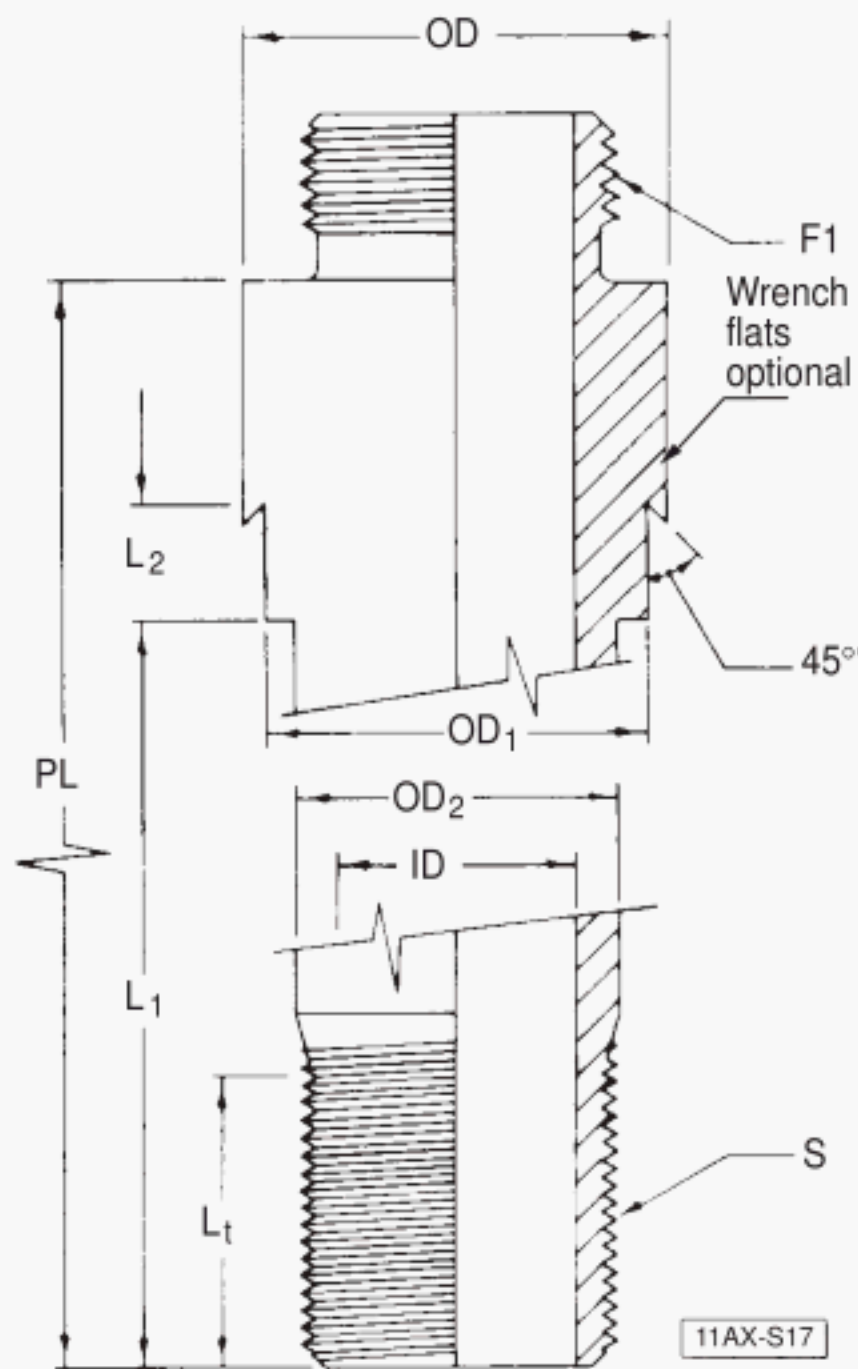


Table S17—Seating Mandrel, Cup (Type HR) (Tubing Pump) (See Note)

(1)	(2)	(3)	(4)
Dimensional Symbol	Part Number		
	S17-20	S17-25	S17-30
F1	1.4704-14 (37.348-14)	1.8024-14 (45.781-14)	2.1095-11 <sup>1</sup> / <sub>2</sub> (53.581-11 <sup>1</sup> / <sub>2</sub> )
S	1.1894-14 (30.211-14)	1.5604-14 (39.634-14)	2.0035-11 <sup>1</sup> / <sub>2</sub> (50.889-11 <sup>1</sup> / <sub>2</sub> )
PL ± 0.062 (± 1.57)	6 <sup>1</sup> / <sub>2</sub> (165.1)	6 <sup>13</sup> / <sub>16</sub> (173.0)	6 <sup>13</sup> / <sub>16</sub> (173.0)
ID min.	7/8 (22.2)	1 <sup>3</sup> / <sub>16</sub> (30.2)	1 <sup>7</sup> / <sub>16</sub> (36.5)
OD max.	1 <sup>11</sup> / <sub>16</sub> (42.9)	2 <sup>3</sup> / <sub>16</sub> (55.6)	2 <sup>11</sup> / <sub>16</sub> (68.3)
OD <sub>1</sub> +0.000/−0.016 (+0.00/−0.41)	1.406 (35.71)	1.844 (46.84)	2.344 (59.54)
OD <sub>2</sub> +0.000/−0.010 (+0.00/−0.25)	1.187 (30.15)	1.562 (39.67)	2.000 (50.80)
L <sub>1</sub> ± 0.031 (± 0.79)	3 <sup>5</sup> / <sub>16</sub> (84.1)	3 <sup>1</sup> / <sub>2</sub> (88.9)	3 <sup>5</sup> / <sub>8</sub> (92.1)
L <sub>2</sub> +0.016/−0.000 (+0.41/−0.00)	0.672 (17.07)	0.703 (17.86)	0.703 (17.86)
L <sub>t</sub> min.	2 <sup>1</sup> / <sub>4</sub> (57.2)	2 <sup>3</sup> / <sub>8</sub> (60.3)	2 <sup>3</sup> / <sub>8</sub> (60.3)

Note: All dimensions in inches (followed by equivalent in millimeters).

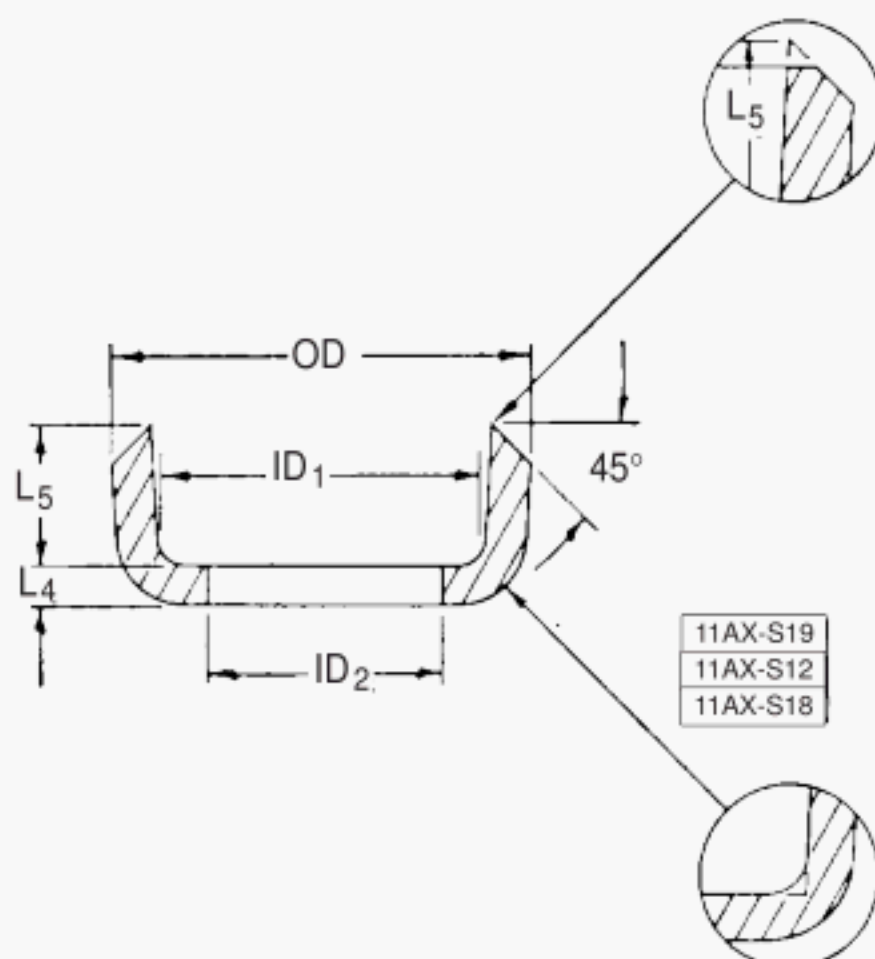


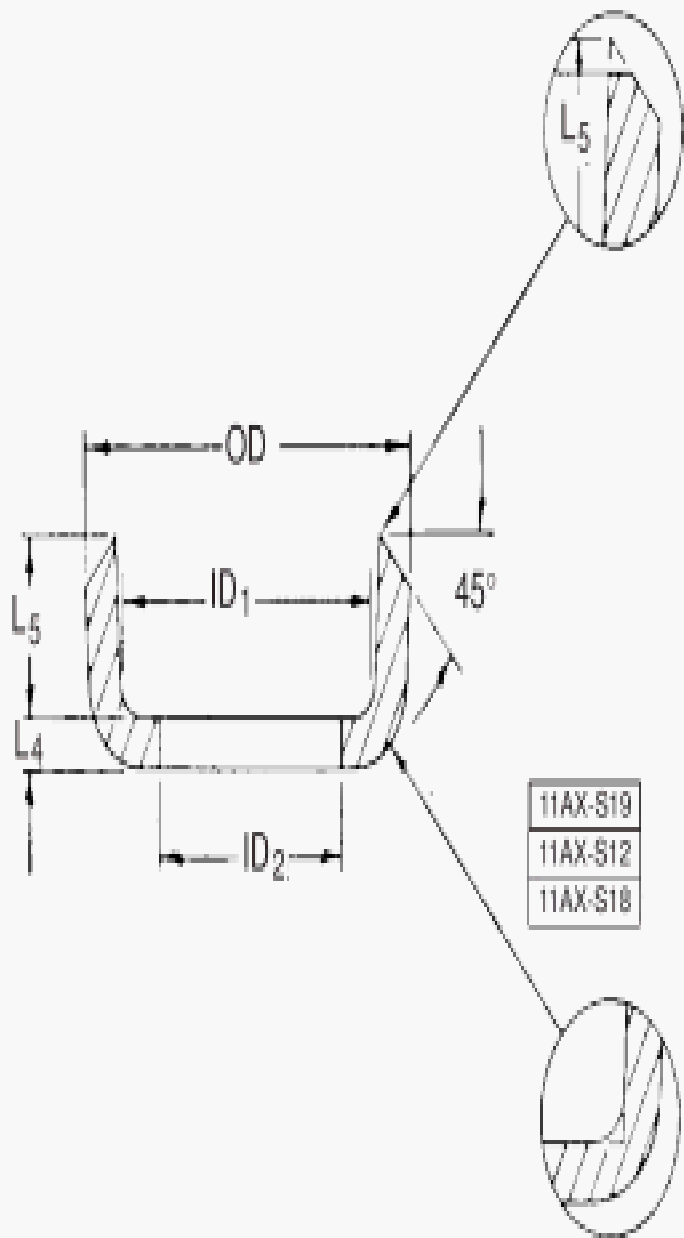
Table S18—Seating Cup (Type HR) (Tubing Pump) (See Note)

(1)	(2)	(3)	(4)
Dimensional Symbol	Part Number		
	S18-20	S18-25	S18-30
ID <sub>1</sub> +0.016/−0.000 (+0.41/−0.00)	1.411 (35.84)	1.850 (46.99)	2.350 (59.69)
ID <sub>2</sub> +0.005/−0.000 (+0.13/−0.00)	1.187 (30.15)	1.562 (39.67)	2.000 (50.80)
OD <sup>a</sup> ± 0.005 (± 0.13)	1.730 (43.94)	2.230 (56.64)	2.730 (69.34)
L <sub>4</sub> +0.030/−0.015 (+0.76/−0.38)	0.165 (4.19)	0.185 (4.70)	0.185 (4.70)
L <sub>5</sub> +0.000/−0.016 (+0.00/−0.41)	0.656 (16.66)	0.688 (17.48)	0.688 (17.48)

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>Unless otherwise specified outside diameter of cups furnished to this specification shall be as shown, for +0.030 in. (+0.76 mm) cups.

Table S19—Seating, Cup (Type HR) (Soft-Packed Tubing Pump) (See Note)



(1)	(2)	(3)
Dimensional Symbol	Part Number	
	S19-25	S19-30
ID <sub>1</sub> +0.016/−0.000 (+0.41/−0.00)	1.850 (46.99)	2.350 (59.69)
ID <sub>2</sub> +0.005/−0.000 (+0.13/−0.00)	1.562 (39.67)	2.000 (50.80)
OD <sup>a</sup> ± 0.005 (± 0.13) <sup>a</sup>	2.270 (57.66)	2.770 (70.36)
L <sub>4</sub> +0.030/−0.015 (+0.76/−0.38)	0.185 (4.70)	0.185 (4.70)
L <sub>5</sub> +0.000/−0.016 (+0.00/−0.41)	0.688 (17.48)	0.688 (17.48)

Note: All dimensions in inches (followed by equivalent in millimeters).  
<sup>a</sup>Unless otherwise specified outside diameter of cups furnished to this specification shall be as shown, for +0.030 in. (+0.76 mm) cups.

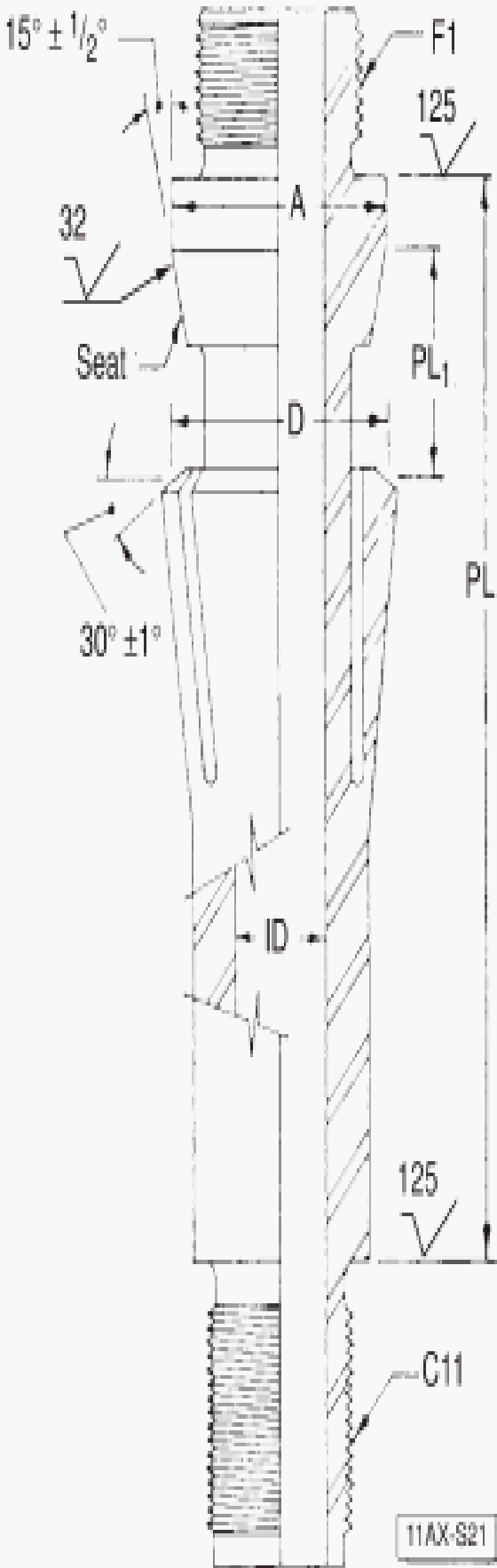


Table S21—Seating Assembly, Mechanical Top Lock (See Note)

(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	S21-20-125	S21-20	S21-25	S21-30
C11	1.3330-16 (33.858-16)	1.5730-16 (39.954-16)	2.0870-16 (53.010-16)	2.5730-16 (65.354-16)
F1	1.4704-14 (37.348-14)	1.4704-14 (37.348-14)	1.8024-14 (45.781-14)	2.1095-11 1/2 (53.581-11 1/2)
A +0.000/-0.005 (+0.00/-0.13)	1.875 (47.63)	1.875 (47.63)	2.344 (59.54)	2.844 (72.24)
ID ± 1/16 (± 1.59)	1.000 (25.40)	1.000 (25.40)	1.250 (31.75)	1.500 (38.10)
PL1 +0.020/-0.000 (+0.51/-0.00)	0.931 (23.65)	0.931 (23.65)	0.887 (22.53)	0.887 (22.53)
PL ± 0.062 (± 1.57)	8 1/2 (215.9)	8 1/2 (215.9)	9 (228.6)	9 (228.6)
D ± 0.031 (± 0.79)	1.780 (45.21)	1.780 (45.21)	2.280 (57.91)	2.780 (70.61)

Note: All dimensions in inches (followed by equivalent in millimeters).



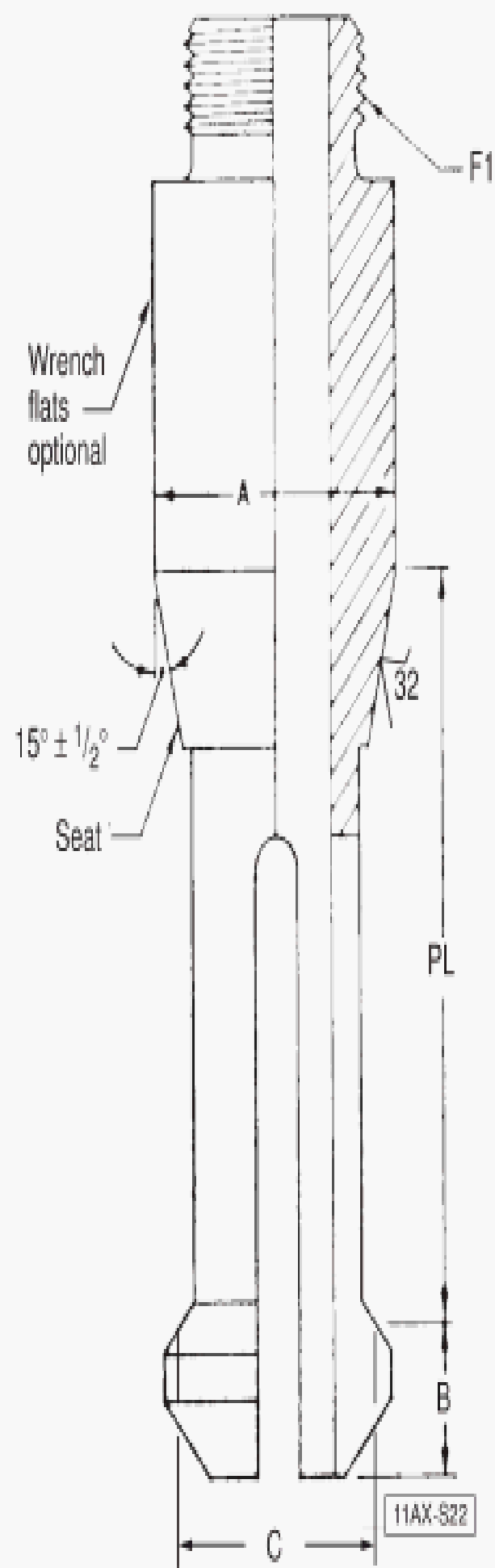


Table S22—Seating Assembly, Mechanical Bottom Lock (See Note)

(1)	(2)	(3)	(4)	(5)	(5)
Dimensional Symbol	Part Number				
	S22-15	S22-20	S22-25	S22-30	S22-40
F1	1.2500-14 (31.750-14)	1.4704-14 (37.348-14)	1.8024-14 (45.781-14)	2.1095-11½ (53.581-11½)	3.1715-11½ (80.556-11½)
A +0.000/–0.010 (+0.00/–0.25)	1.475 (37.47)	1.688 (42.88)	2.188 (55.58)	2.688 (68.28)	3.656 (92.86)
B ± 0.250 (± 6.35)	1.000 (25.40)	1.000 (25.40)	1.125 (28.58)	1.250 (31.75)	1.250 (31.75)
PL +0.000/–0.016 (+0.00/–0.41)	3.656 (92.86)	4.352 (110.54)	5.102 (129.59)	6.164 (156.57)	6.188 (157.18)
C ± 0.031 (± 0.79)	1.125 (28.58)	1.375 (34.93)	1.750 (44.45)	2.250 (57.15)	3.000 (76.20)

Note: All dimensions in inches (followed by equivalent in millimeters).

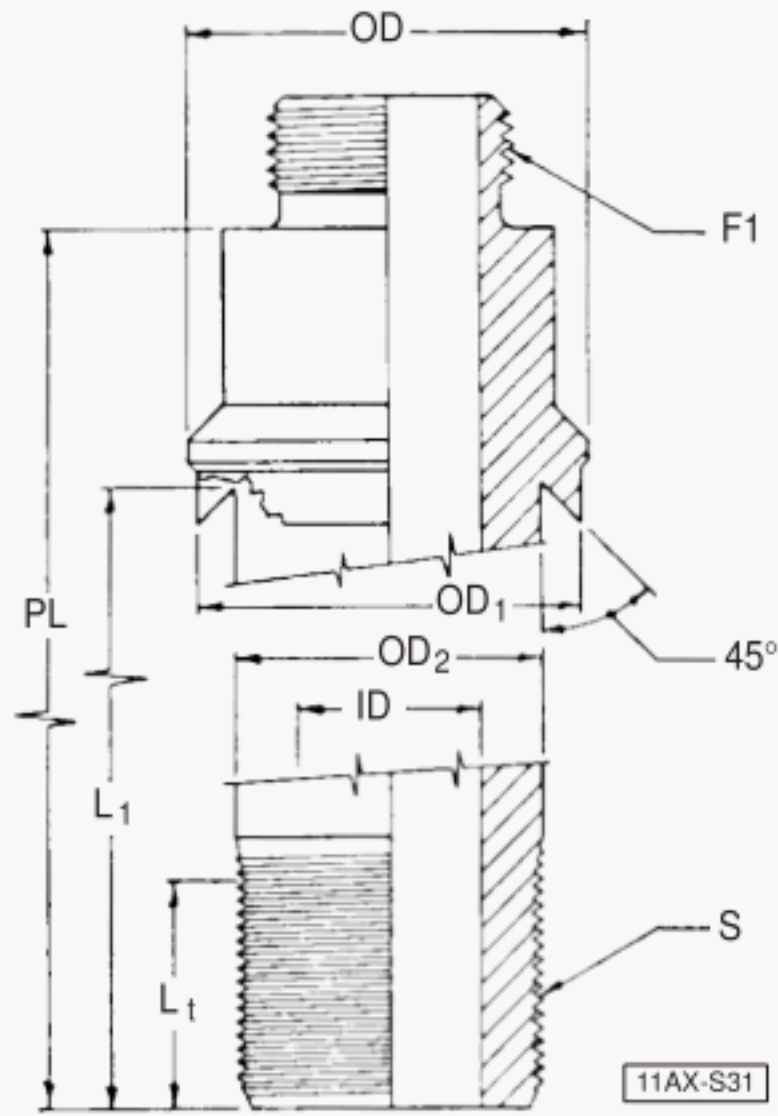


Table S31—Seating Mandrel, Cup (Type O)

(1)	(2)
Dimensional Symbol	Part Number
	S31-15
F1	1.2500-14 (31.75-14)
S	1.1894-14 (30.211-14)
PL ± 0.062 (± 1.57)	7 <sup>5</sup> / <sub>8</sub> (193.68)
ID min.	7 <sup>7</sup> / <sub>8</sub> (22.23)
OD	1.516/1.505 (38.51/38.23)
OD <sub>1</sub> +0.000/-0.010 (+0/-0.254)	1 <sup>7</sup> / <sub>16</sub> (36.53)
OD <sub>2</sub> +0.000/-0.010 (+0/-0.254)	1.187 (30.15)
L <sub>1</sub> ± 0.031 (± 0.78)	4 <sup>1</sup> / <sub>4</sub> (107.95)
L <sub>t</sub> min.	2 <sup>1</sup> / <sub>4</sub> (57.15)

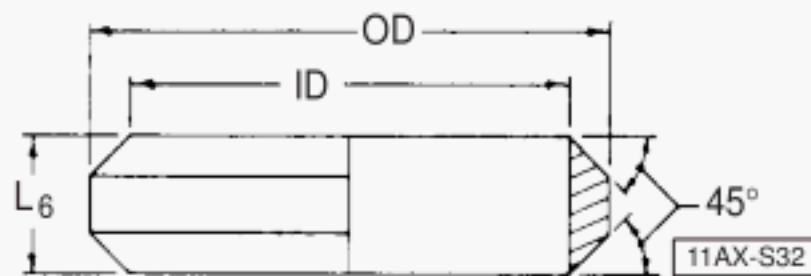


Table S32—Seating Cup (Type O)

(1)	(2)
Dimensional Symbol	Part Number
	S32-15
ID +0.010/-0.000 (+0.254/-0)	1.188 (30.18)
OD ± 0.005 (± 0.13)	1.490 (37.85)
L <sub>6</sub> ± 0.031 (± 0.78)	0.625 (15.88)

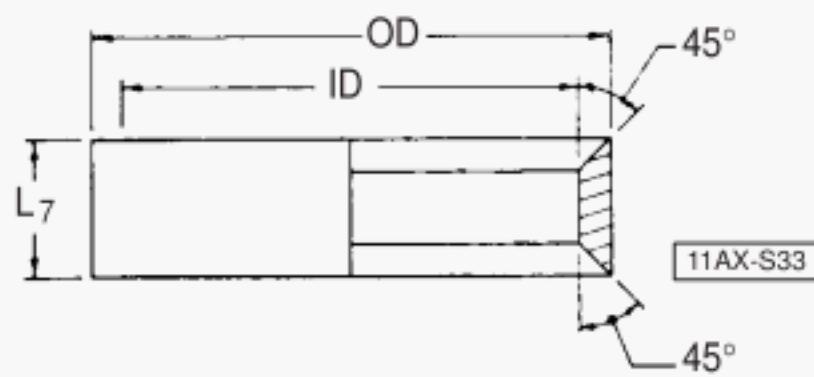


Table S33—Seating Cup Ring (Type O)

(1)	(2)
Dimensional Symbol	Part Number
	S33-15
ID ± 0.010 (± 0.254)	1.200 (30.48)
OD +0.000/-0.010 (+0/-0.254)	1 <sup>7</sup> / <sub>16</sub> (36.53)
L <sub>7</sub> ± 0.031 (± 0.78)	3 <sup>3</sup> / <sub>8</sub> (9.53)

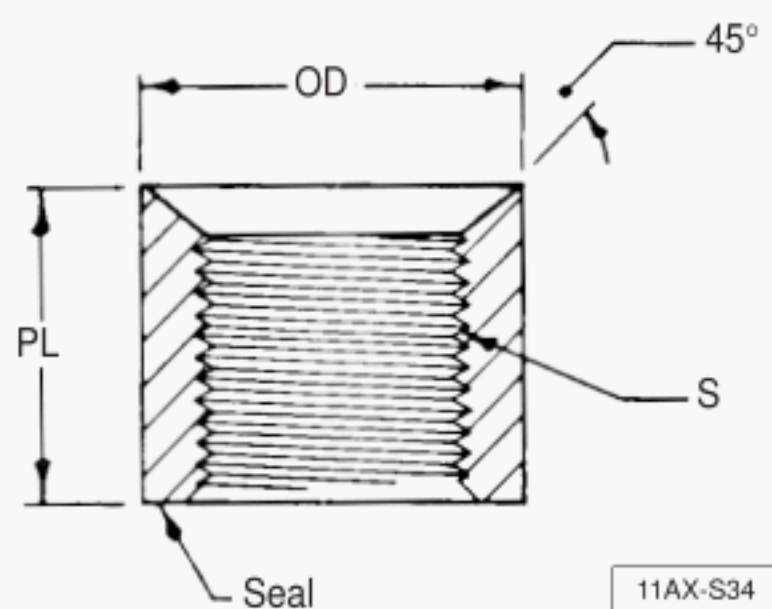


Table S34—Seating Cup Nut (Type O)

(1)	(2)
Dimensional Symbol	Part Number
	S34-15
S	1.1894-14 (30.211-14)
OD +0.000/-0.005 (+0/-0.13)	1 <sup>7</sup> / <sub>16</sub> (36.53)
PL ± 0.031 (± 0.78)	1 (25.4)

Table T11—Tube, Pull (See Note)

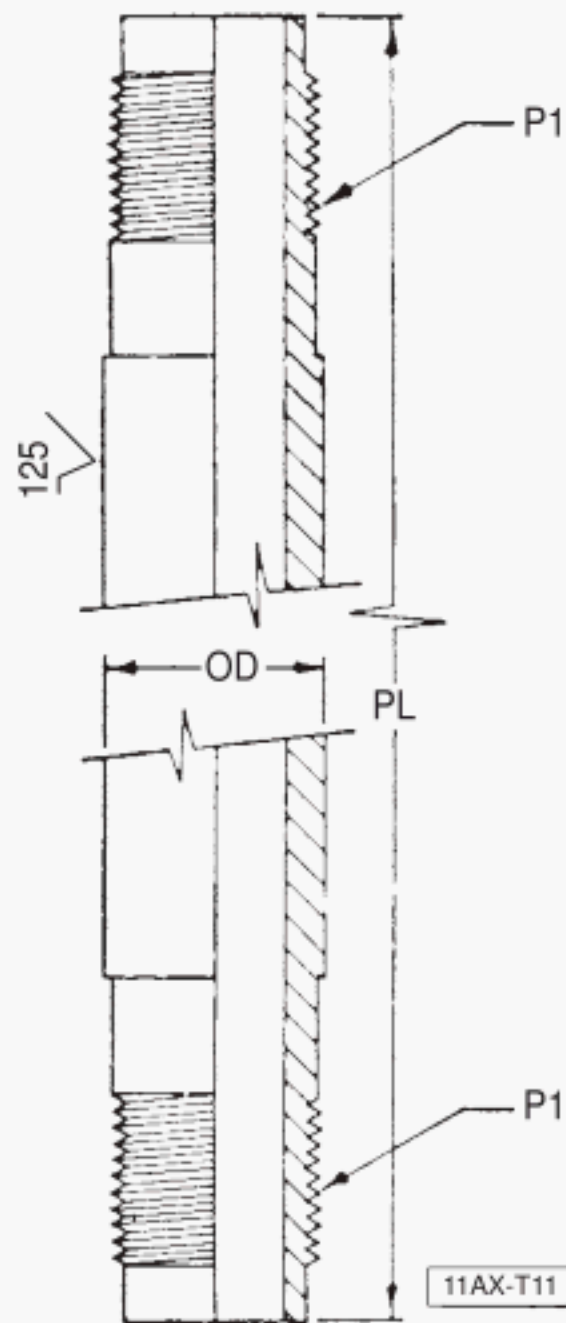
(1)	(2)	(3)	(4)	(5)	(5)
Dimensional Symbol	Part Number				
	T11-125	T11-150	T11-175	T11-200	T11-225 <sup>a</sup>
P1	0.9375-16 (23.813-16)	1.1250-16 (28.575-16)	1.3125-16 (33.338-16)	1.5000-16 (38.100-16)	1.8750-16 (47.625-16)
OD+0.010/−0.009 (+0.25/−0.23)	1 <sup>5</sup> / <sub>16</sub> (23.8)	1 <sup>1</sup> / <sub>8</sub> (28.6)	1 <sup>5</sup> / <sub>16</sub> (33.3)	1 <sup>1</sup> / <sub>2</sub> (38.1)	1 <sup>7</sup> / <sub>8</sub> (47.6)
PL ± 0.125 (± 3.18)	Specify length (PL) as actual length in inches (meters). See table below.				

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>Used on 2<sup>1</sup>/<sub>4</sub> in. (57.2 mm) and 2<sup>1</sup>/<sub>2</sub> in. (63.5 mm) bore pumps.

Pull Tube Length, PL

(1)	(2)	(3)	(4)
Nominal Barrel Length <sup>a</sup> Minus Nominal Plunger Length ft (m)	Actual Length		
	For 1 <sup>1</sup> / <sub>4</sub> in. (31.8 mm) Bore Pumps in. (m)	For 1 <sup>1</sup> / <sub>2</sub> , 1 <sup>3</sup> / <sub>4</sub> , and 2 in. (38.1, 44.5, and 50.8 mm) Bore Pumps in. (m)	For 2 <sup>1</sup> / <sub>4</sub> and 2 <sup>1</sup> / <sub>2</sub> in. (57.2 and 63.5 mm) Bore Pumps in. (m)
1 (0.305)	—	—	—
2 (0.610)	15 (0.381)	14 (0.356)	12 (0.305)
3 (0.914)	27 (0.686)	26 (0.660)	24 (0.610)
4 (1.219)	39 (0.991)	38 (0.965)	36 (0.914)
5 (1.524)	51 (1.295)	50 (1.270)	48 (1.219)
6 (1.829)	63 (1.600)	62 (1.575)	60 (1.524)
7 (2.134)	75 (1.905)	74 (1.880)	72 (1.829)
8 (2.438)	87 (2.210)	86 (2.184)	84 (2.134)
9 (2.743)	99 (2.515)	98 (2.489)	96 (2.438)
10 (3.048)	111 (2.819)	110 (2.794)	108 (2.743)
11 (3.353)	123 (3.124)	122 (3.099)	120 (3.048)
12 (3.658)	135 (3.429)	134 (3.404)	132 (3.353)
13 (3.962)	147 (3.734)	146 (3.708)	144 (3.658)
14 (4.267)	159 (4.039)	158 (4.013)	156 (3.962)
15 (4.572)	171 (4.343)	170 (4.318)	168 (4.267)
16 (4.877)	183 (4.648)	182 (4.623)	180 (4.572)
17 (5.182)	195 (4.953)	194 (4.928)	192 (4.877)
18 (5.486)	207 (5.258)	206 (5.232)	204 (5.182)
19 (5.791)	219 (5.563)	218 (5.537)	216 (5.486)
20 (6.096)	231 (5.867)	230 (5.842)	228 (5.791)
21 (6.401)	243 (6.172)	242 (6.147)	240 (6.096)
22 (6.706)	255 (6.477)	254 (6.452)	252 (6.401)
23 (7.010)	267 (6.782)	266 (6.756)	264 (6.706)
24 (7.315)	279 (7.087)	278 (7.061)	276 (7.010)
25 (7.620)	291 (7.391)	290 (7.366)	288 (7.315)
26 (7.925)	303 (7.696)	302 (7.671)	300 (7.620)
27 (8.230)	315 (8.001)	314 (7.976)	312 (7.925)
28 (8.534)	327 (8.306)	326 (8.280)	324 (8.230)
29 (8.839)	339 (8.611)	338 (8.585)	336 (8.534)
30 (9.144)	351 (8.915)	350 (8.890)	348 (8.839)



<sup>a</sup>Including extensions on heavy wall barrels.



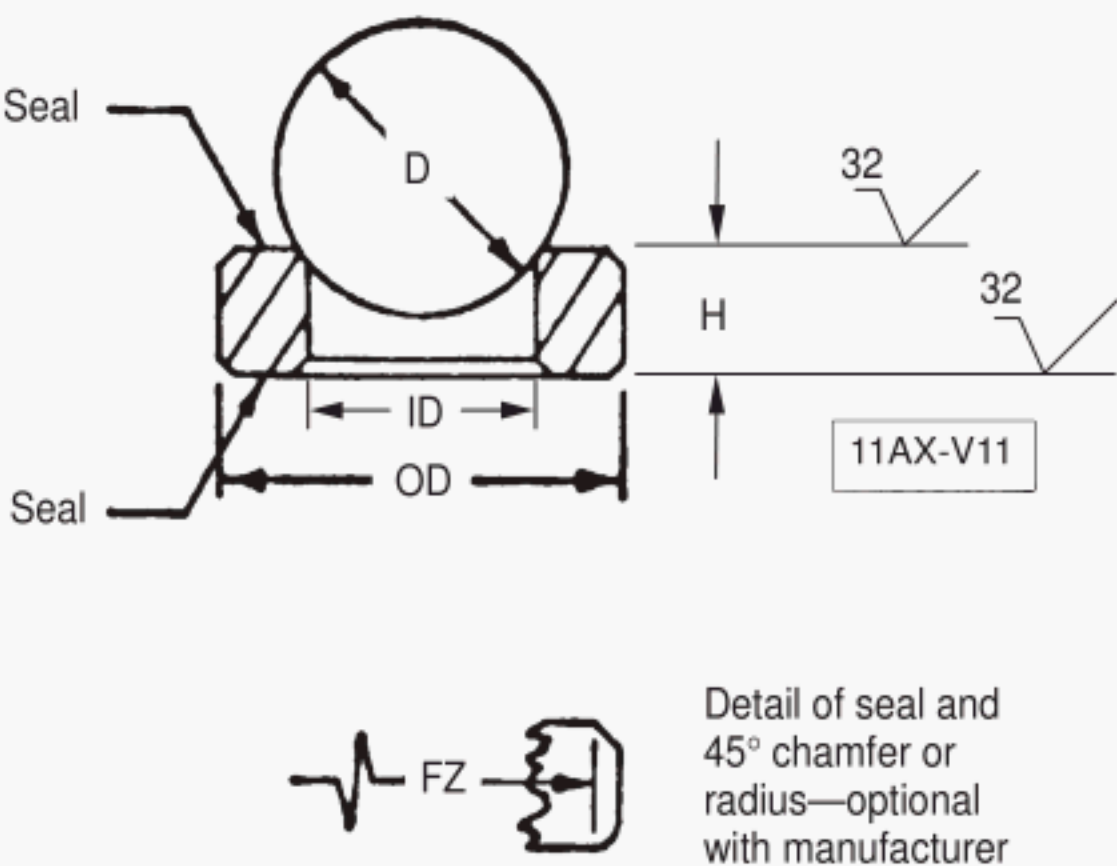


Table V11—Valve, Ball, and Seat (See Note)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dimensional Symbol	Part Number							
	V11-106	V11-125	V11-150	V11-175	V11-200	V11-225	V11-250	V11-375
D See Note 3	0.625 (15.88)	0.750 (19.05)	0.938 (23.83)	1.125 (28.58)	1.250 (31.75)	1.375 (34.93)	1.688 (42.88)	2.250 (57.15)
H +0.020/−0.010 (+0.51/−0.25)	0.500 (12.70)	0.500 (12.70)	0.500 (12.70)	0.500 (12.70)	0.500 (12.70)	0.500 (12.70)	0.500 (12.70)	0.750 (19.05)
FZ +0.000/−0.031 (+0.00/−0.78)	0.767 (19.48)	0.892 (22.66)	1.11 (28.22)	1.331 (33.81)	1.421 (36.09)	1.631 (41.43)	1.921 (48.79)	2.950 (74.93)
OD +0.000/−0.005 (+0.00/−0.13)	0.793 (20.14)	0.918 (23.32)	1.168 (29.67)	1.388 (35.26)	1.478 (37.54)	1.720 (43.69)	2.010 (51.05)	3.072 (78.03)
ID ± 0.050 (± 1.27)	0.460 (11.68)	0.550 (13.97)	0.670 (17.02)	0.825 (20.96)	0.960 (24.38)	1.060 (26.92)	1.310 (33.27)	1.700/1.880 (43.18/47.75)

Note 1: All dimensions in inches (followed by equivalent in millimeters).

Note 2: API ball and seat valves are designed to operate in F22 boxes.

Note 3: Additional ball specifications: ball roundness range to be 0.0001 in. (0.003 mm), maximum; ball surface roughness: 5RA, maximum; ball OD tolerance shall be ± 0.001 in. (± 0.025 mm) for all balls less than 2-inch diameter and ± 0.002 in. (± 0.050 mm) for all balls 2 inches diameter and over.

## **7 Measurement, Testing, and Gauging**

### **7.1 EQUIPMENT**

#### **7.1.1 General**

Equipment used to measure, test, and inspect products covered by this specification shall be identified, controlled, calibrated, and adjusted as necessary at specified intervals in accordance with the original equipment manufacturer's specifications to maintain accuracy required by this specification.

**7.1.1.1** Measurements of dimensions contained within this specification shall be rounded to the closest specified decimal point.

**7.1.1.2** Definition: "100% Inspection" means inspect each part in the lot.

#### **7.1.2 Calibration**

**7.1.2.1** Measurement standards such as thread wires and gauge blocks used to calibrate measuring equipment shall be checked and approved at least once a year by an outside agency with traceability to a certification agency such as the National Institute of Standards and Technology, Gaithersburg, Maryland (NIST). Master gauges shall be checked and approved at least once every two years of use by an outside agency with traceability to a certification agency such as NIST.

**7.1.2.2** Working gauges, such as thread gauges, shall be calibrated at least once per month of use against certified measurement standards using approved procedures.

**7.1.2.3** Measuring equipment, such as micrometers, shall be calibrated at least once every 6 months of use against certified measurement standards using approved procedures.

**7.1.2.4** Testing equipment shall be calibrated at least once a year using approved procedures.

**7.1.2.5** Pressure gauges or transducers shall be accurate to at least 3% of full-scale range. These devices shall be calibrated at least once a year with a master measuring device or a deadweight tester at 25%, 50%, and 75% of full scale using approved procedures.

### **7.2 PERSONNEL**

**7.2.1** Personnel performing visual examination shall have an annual eye examination in accordance with ASNT SNT-TC-1A.

### **7.3 INSPECTION AND TESTING**

#### **7.3.1 Component Parts**

**7.3.1.1** Material test report or certificate of compliance shall be considered as evidence of compliance with material requirements.

**7.3.1.2** Component parts shall be dimensionally inspected for conformance to both this specification and manufacturer's drawings and written specifications.

**7.3.1.3** The frequency of dimensional inspections for components shall be accomplished according to the random single sampling plan in Table 3. This is based on acceptance of inspection per ANSI/ASQC Z1.4, *Single Sampling Plan for Normal Inspection*, General Inspection Level I, Acceptance Quality Level = 4.0%.

#### **7.3.2 Barrels**

Barrels shall be additionally inspected according to the following:

**7.3.2.1** Barrel inside surface finish shall be visually inspected 100%.

**7.3.2.2** The inside diameter sealing surface of barrels shall be inspected with appropriate equipment, and in such a manner, that assures the specified tolerances are maintained through the entire length of the barrel. Appropriate equipment shall consist of an air micrometer or three point mechanical micrometer. Reference Sections 6 and 7.1.1.

**7.3.2.3** Barrels, except soft-packed barrels, shall be 100% drift tested with a  $-0.0010$  in.,  $+0.0000/-0.0005$  ( $-0.025$  mm,  $+0.00/-0.013$ ) fit, 4 ft (1.219 m) or longer drift plunger.

Table 3—Sampling Procedures (See Note)

(1)	(2)	(3)	(4)
Lot Size	Sample Size	No. of Parts, Accept Lot	Out of Spec., Reject Lot <sup>a</sup>
2 to 8	2	0	1
9 to 15	2	0	1
16 to 25	3	0	1
26 to 50	5	0	1
51 to 90	5	0	1
91 to 150	8	1	2
151 to 280	13	1	2
281 to 500	20	2	3
501 to 1,200	32	3	4
1,201 to 3,200	50	5	6
3,201 to 10,000	80	7	8
10,001 to 35,000	125	10	11

Note: Excerpt from ANSI/ASQC Z1.4, *Single Sampling Plan for Normal Inspection*, General Inspection Level I, Acceptable Quality Level = 4.0%.

<sup>a</sup>100% inspection (sort) of rejected parts is acceptable practice.

**7.3.2.4** Barrel coating, plating, or case hardening hardness and thickness shall be controlled according to manufacturer's process or nondestructive testing procedures. The finished product coating, plating, or case hardening hardness and thickness is specified in Section 9.

### 7.3.3 Plungers

Plungers shall be additionally inspected according to the following:

**7.3.3.1** Plunger outside surface finish shall be visually inspected 100%.

**7.3.3.2** The outside diameter sealing surface of plungers shall be inspected with appropriate equipment, and in such a manner, that assures the specified tolerances are maintained along the entire length of the plunger. Appropriate equipment shall be capable of measuring to a 0.0005 in. (0.013 mm) dimension. Reference Sections 6 and 7.1.1.

**7.3.3.3** Plunger coating or plating hardness and thickness shall be controlled according to manufacturer's process or nondestructive testing procedures. The finished product coating or plating hardness and thickness is specified in Section 9.

### 7.3.4 Ball and Seat Assemblies

Ball and seat assemblies shall be additionally inspected according to the following:

**7.3.4.1** Ball and seat assemblies shall be vacuum tested 100%, with dry sealing surfaces, at 19 in. Hg minimum vacuum with no leakage for a minimum of 3 seconds after vacuum source is isolated.

**7.3.4.2** Ball hardness shall be certified by the applicable ball manufacturer with a certification accompanying each lot of material.

### 7.3.5 Pump Assemblies

**7.3.5.1** Pump assemblies as described in Section 5 shall be assembled and functionally tested per the pump manufacturer's written procedures, which shall include, as a minimum, handling of components, torque values, lubricants, acceptance tests, and other necessary assembly information.

**7.3.5.2** Acceptance testing shall verify, as a minimum, that the pump strokes properly, and that the valves operate properly.

## 8 Marking

### 8.1 PRODUCT MARKING

Parts and assemblies conforming to the requirements given herein shall be marked as follows as a minimum:

#### 8.1.1 Component Part and Subassembly Marking

- Manufacturer's name or mark.
- API Specification 11AX.
- Manufacturer's part number.
- Material identification symbol as per Section 9.
- Date of manufacture (month/year).

Example: 1<sup>1</sup>/<sub>4</sub> in. (31.75 mm) thin-wall barrel (B11-125), chrome plate on brass, manufactured in April 1992:

Manufacturer's Name or Mark	Spec	Manufacturer's Part No.	Material ID Symbol	Date of Manufacture
XXXX	11AX	XXXXXXXX	A2	492

#### 8.1.2 Assembly Marking

The minimum required information to be supplied with the pump assembly shall be as follows:

- Manufacturer's name or mark.
- API Specification 11AX.
- Pump designation, per Section 3.
- Date of assembly (month/year).

Example: 2<sup>3</sup>/<sub>8</sub> × 1<sup>1</sup>/<sub>4</sub> in. (60.3 × 31.75 mm) rod, stationary thin-wall barrel, bottom anchor pump, 20-ft (6.1-m) barrel, 4-ft (1.22-m) plunger, assembled in May 1992:

Manufacturer's Name or Mark	Spec	Pump Designation	Date of Assembly
XXXX	11AX	20-125 RWBC-20-4	592

## 8.2 METHOD OF MARKING

The complete marking shall be permanently affixed to each product by stamp or etch, except balls (V11), seating cups (S32), and cup rings (S33). These parts may be marked so as not to damage, by stencil, label, tag, or other legible medium that can be attached to the shipped product.

## 8.3 MONOGRAMMED PARTS OR ASSEMBLIES

Marking requirements in 8.1 shall be superseded by Appendix A of this specification, when API monogrammed parts or assemblies are specified.



## 9 Materials

Table A-I presents material requirements for pump components.

Table A—Pump Barrel Materials, Plated Barrels

Identification Symbol	Description	Inside Surface Condition	Base Core Hardness	Base Material	Base Material Minimum Yield Strength, ksi
A1	Chrome plate on steel	0.003 in. (0.076 mm) min. thickness, 900 to 1160 HV <sub>100</sub>	55 to 62 HRA	UNS G10XX0 Steel	60
A2	Chrome plate on brass	0.003 in. (0.076 mm) min. thickness, 900 to 1160 HV <sub>100</sub>	HRB 80-HRB 100	Inhibited Admiralty Brass	50
A3	Chrome plate on 4/6 chrome steel	0.003 in. (0.076 mm) min. thickness, 900 to 1160 HV <sub>100</sub>	55 to 62 HRA	UNS S50100 steel, 4% to 6% chrome	70
A4	Chrome plate on Ni/Cu alloy	0.003 in. (0.076 mm) min. thickness, 900 to 1160 HV <sub>100</sub>	55 to 62 HRA	Ni/Cu alloy	55
A5	Chrome plate on low alloy steel	0.003 in. (0.076 mm) min. thickness, 900 to 1160 HV <sub>100</sub>	55 to 62 HRA	UNS G4XXX0 low alloy steel	50
A6	Heavy chrome plate on steel	0.006 in. (0.152 mm) min. thickness, 900 to 1160 HV <sub>100</sub>	55 to 62 HRA	UNS G10XX0 Steel	60
E1	Nickel Carbide composite on steel	0.0013 in. (0.033 mm) min. thickness	55 to 62 HRA	UNS G10XX0 Steel	60
E2	Nickel Carbide composite on low alloy steel	0.0013 in. (0.033 mm) min. thickness	55 to 62 HRA	UNS G4XXX0 low alloy steel	50
E3	Nickel Carbide composite on brass	0.0013 in. (0.033 mm) min. thickness	HRB 80-HRB 100	Inhibited Admiralty Brass	50
E4	Nickel Carbide composite on steel	0.003 in. (0.076 mm) min. thickness	55 to 62 HRA	UNS G10XX0 Steel	60
E5	Nickel Carbide composite on 4/6 chrome	0.003 in. (0.076 mm) min. thickness	55 to 62 HRA	UNS S50100 steel, 4% to 6% chrome	70

Note: "Thickness" is "per side" as used in Table A.



Table B—Pump Barrel Materials, Case Hardened

Identification Symbol	Description	Inside Surface Condition	Base Core Hardness	Base Material	Base Material Minimum Yield Strength, ksi
B1	Carbonitrided Steel	690 Knoop min. for 0.005 in. per side with 466 Knoop min. at 0.010 in. per side	HRC 23 max.	UNS G10XX0	60
B2	Carburized Steel	690 Knoop min. for 0.005 in. per side with 466 Knoop min. at 0.010 in. per side	HRC 23 max.	UNS G10XX0	60
B3	Carbonitrided 4/6 chrome steel	690 Knoop min. for 0.005 in. per side with 466 Knoop min. at 0.010 in. per side	HRC 23 max.	UNS S50100	70
B5	Nitrided low alloy steel	690 Knoop min. at surface with 466 Knoop min. at 0.005 in. per side	HRC 23 max.	UNS G4XXX0	50
B6	Induction Case Hardened	690 Knoop min. for 0.005 in. per side with 466 Knoop min. at 0.010 in. per side	HRC 23 max.	UNS G10XX0	60
B7	Carbonitrided Steel	510 Knoop min. for .005 in. per side with 351 Knoop min. at .010 in. per side	HRC 23 max.	UNS G10XX0	60

Note: Recommended Load for Knoop hardness testing is 500 grams.

Table C—Pump Barrel Materials, Nonhardened

Identification Symbol	Description	Inside Surface Condition	Base Core Hardness	Base Material	Base Material Minimum Yield Strength, ksi
D1	Non-Hardened Steel	Oiled	55 to 62 HRA	UNS G10XX0 Steel	60
D2	Brass	Oiled	HRB 80-HRB 100	Inhibited Admiralty Brass	50
D3	Ni/Cu alloy	Oiled	55 to 62 HRA	Ni/Cu alloy	55
D4	Non-Hardened low alloy steel	Oiled	55 to 62 HRA	UNS G4XXX0 low alloy steel	50

Table D—Pump Materials for Balls and Seats

Symbol	Description	Hardness	Material
A1	Stainless Steel	Ball: HRC 58-65 Seat: HRC 52-56	UNS 41000–UNS 44000
B1	Cobalt Alloy, Cast	Ball: HRC 56-63 Seat: HRC 50-56	Cobalt, chromium, and tungsten alloy
B2	Cobalt Alloy, Powder Metal	Ball: HRC 53-60 Seat: HRC 51-57	Cobalt, chromium, and tungsten alloy
C1	Tungsten Carbide	Ball: HRA 88-89 Seat: HRA 88-89.5	Tungsten with Cobalt binder
C2	Nickel Carbide	Ball: HRA 89-90.5 Seat: HRA 87.5-89	Tungsten with nickel binder
C3	Titanium Carbide	Ball: HRA 89-90.5 Seat: HRA 89-90.5	Tungsten and titanium carbide with cobalt binder

Table E—Pump Cage Materials

Identification Symbol	Description	Hardness	Material	Base Material Minimum Yield Strength, ksi
A1	Steel	55 to 62 HRA	UNS G1XXX0 steel	50
A2	Low alloy steel	55 to 62 HRA	UNS G41XX0 low alloy steel	50
A3	Low alloy steel	55 to 62 HRA	UNS G86XX0 low alloy steel	50
A4	Ni/Cu Alloy	52 to 62 HRA	Ni/Cu Alloy	50
A5	Brass	43 to 55 HRA	UNS C36000–UNS C46400 free cutting brass	40
A6	Stainless Steel	46 to 62 HRA	Austenitic stainless steel, UNS S3XXX0	35

Note: “L” grades of material are acceptable for A1, A2, A3, and A6.

Table F—Pump Materials for Pull Tubes, Valve Rods, and Fittings

Identification Symbol	Description	Hardness	Material	Base Material Minimum Yield Strength, ksi
A1	Steel	55 to 62 HRA	UNS G1XXX0 steel	50
A2	Low alloy steel	55 to 62 HRA	UNS G41XX0 - UNS G43XX0 low alloy steel	50
A3	Low alloy steel	55 to 62 HRA	UNS G86XX0 low alloy steel	50
A4	Ni/Cu Alloy	52 to 62 HRA	Ni/Cu Alloy	50
A5	Brass	43 to 55 HRA	UNS C36000–UNS C46400 free cutting brass	40
A6	Stainless Steel	46 to 62 HRA	Austenitic stainless steel, UNS S3XXX0	35

Note: “L” grades of material are acceptable for A1, A2, A3, and A6.

Table G—Pump Materials for Seating Cups

Symbol	Description	Hardness	Material
A1	Seating Cup	Shore Durometer D65/92	Nylon
A2	Seating Cup	Per Manufacturer’s Specification	Composition

Table H—Pump Plunger Materials, Spray Metal Coated

Identification Symbol	Description	Outside Surface Condition	Base Core Hardness	Base Material	Base Material Minimum Yield Strength, ksi
B1	Spray Metal	.008 in. (0.254mm) min. thickness, 484 Vickers <sub>200</sub> min. hardness	44 to 62 HRA	UNS G10XX0, G4XXX0, G8XXX0 steel	40
B2	Spray Metal	.008 in. (0.254mm) min. thickness, 595 Vickers <sub>200</sub> min. hardness	44 to 62 HRA	UNS G10XX0, G4XXX0, G8XXX0 steel	40
B3	Spray Metal with Ni/Cu alloy ends	.008 in. (0.254mm) min. thickness, 595 Vickers <sub>200</sub> min. hardness	44 to 62 HRA	UNS G10XX0, G4XXX0, G8XXX0 steel	40
B4	Spray Metal with Nickel plated pin ends	.008 in. (0.254mm) min. thickness, 484 Vickers <sub>200</sub> min. hardness; Nickel plating on pins 0.0013 in. (0.033mm) min. thickness	44 to 62 HRA	UNS G10XX0, G4XXX0, G8XXX0 steel	40

Note: “Thickness” is “per side” as used in Table H.

Table I—Pump Plunger Materials, Plated

Identification Symbol	Description	Outside Surface Condition	Base Core Hardness	Base Material	Base Material Minimum Yield Strength, ksi
A1	Chrome Plated	0.006 in. (0.152mm) min. thickness, 832 to 1160 HV <sub>100</sub>	55 to 62 HRA	UNS G10XX0, G4XXX0, G8XXX0 steel	50
A2	Double chrome Plated	0.012 in. (0.305mm) min. thickness, 832 to 1160 HV <sub>100</sub>	55 to 62 HRA	UNS G10XX0, G4XXX0, G8XXX0 steel	50

Note: “Thickness” is “per side” as used in Table I.

## 10 Threaded Connections

This section contains details for threaded connections and all straight threads used in API subsurface pumps and fittings.

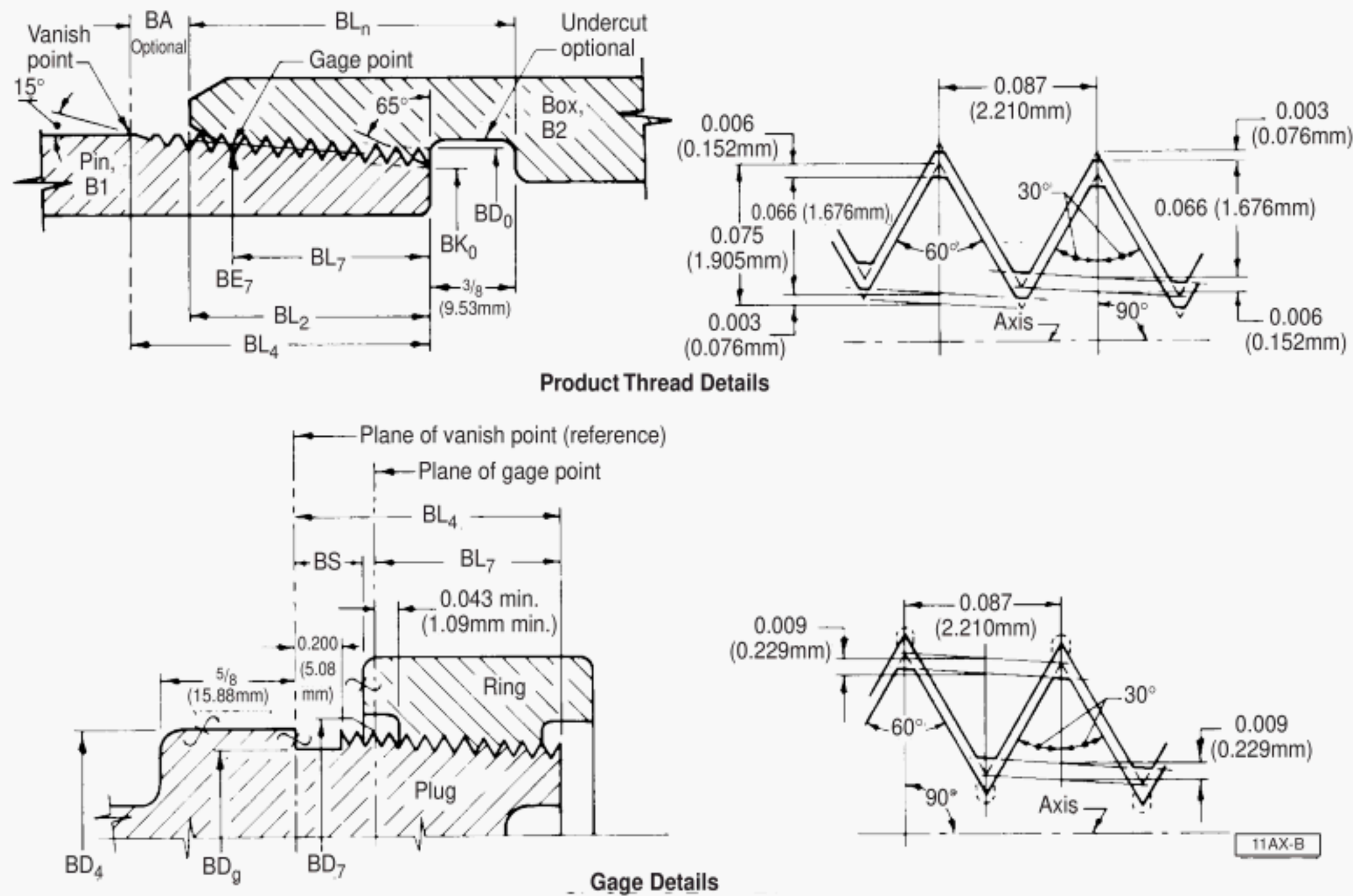


Table B1—Thread Connection Gauge Details (See Notes)

(1) Dimensional Symbol	(2) Definition	(3) Thread Size		
		178-11 <sup>1</sup> / <sub>2</sub>	225-11 <sup>1</sup> / <sub>2</sub>	275-11 <sup>1</sup> / <sub>2</sub>
BD <sub>g</sub>	Diameter of notch on plug gauge	2.050 (52.07)	2.550 (64.77)	3.050 (77.47)
BD <sub>0</sub>	Major thread diameter at end of barrel	2.2137 (56.228)	2.6687 (67.785)	3.1687 (80.49)
BD <sub>4</sub>	Diameter of collar on plug gauge	2.250 (57.15)	2.750 (69.85)	3.250 (82.55)
BD <sub>7</sub>	Major diameter of plug gauge at gauge point	2.23835 (56.854)	2.73835 (69.554)	3.23835 (82.254)
BE <sub>7</sub>	Pitch diameter at gauge point	2.18043 (55.383)	2.68043 (68.083)	3.18043 (80.783)
BK <sub>0</sub>	Thread root diameter at end of barrel	2.0815 (52.87)	2.5365 (64.43)	3.0365 (77.13)
BL <sub>n</sub>	Total depth of box (including undercut, if any)	1.875 (47.63)	1.875 (47.63)	1.875 (47.63)
BL <sub>2</sub>	Length of effective thread (on barrel)	1.1262 (28.61)	1.3885 (35.27)	1.3885 (35.27)
BL <sub>4</sub>	Total length of thread (to vanish point)	1.375 (34.93)	1.625 (41.28)	1.625 (41.28)
BL <sub>7</sub>	Length from gauge point to end of barrel	0.9402 (23.88)	1.1902 (30.23)	1.1902 (30.23)
BS	Gauge standoff	0.300 (7.620)	0.300 (7.620)	0.300 (7.620)
Included taper of thread cone (inches per foot) (mm/m)		3/8 (31.3)	3/4 (62.5)	3/4 (62.5)

Note 1: All dimensions in inches (followed by equivalent in millimeters).

Note 2: Tolerances are the same as for corresponding API line pipe threads and gauges. See API Specification 5B.

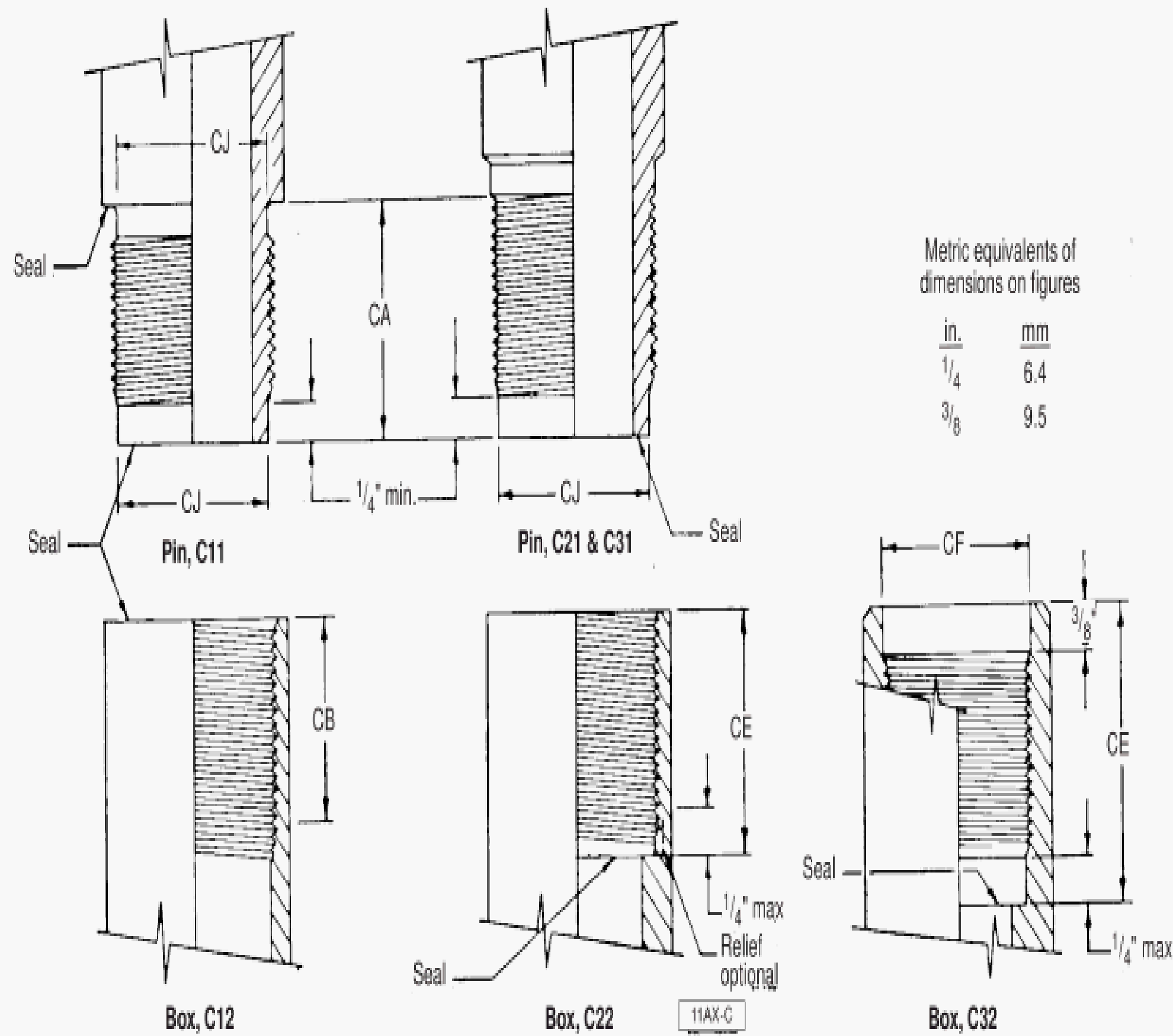


Table C—Thread Connection (See Notes)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dimensional Symbol	Thread Size <sup>a</sup>								
	1.3330-16 (33.858-16)	1.5730-16 (39.954-16)	1.8750-16 (47.625-16)	2.0870-16 (53.010-16)	2.2380-11 <sup>1</sup> / <sub>2</sub> (56.845-11 <sup>1</sup> / <sub>2</sub> )	2.5730-16 (65.345-16)	2.7380-11 <sup>1</sup> / <sub>2</sub> (65.545-11 <sup>1</sup> / <sub>2</sub> )	3.2380-11 <sup>1</sup> / <sub>2</sub> (82.245-11 <sup>1</sup> / <sub>2</sub> )	4.2380-11 <sup>1</sup> / <sub>2</sub> (107.645-11 <sup>1</sup> / <sub>2</sub> )
CA min.	1 <sup>1</sup> / <sub>4</sub> (31.8)	1 <sup>1</sup> / <sub>2</sub> (38.1)	1 <sup>1</sup> / <sub>2</sub> (38.1)	1 <sup>1</sup> / <sub>2</sub> (38.1)	1 <sup>1</sup> / <sub>2</sub> (38.1)	1 <sup>1</sup> / <sub>2</sub> (38.1)	1 <sup>1</sup> / <sub>2</sub> (38.1)	1 <sup>1</sup> / <sub>2</sub> (38.1)	1 <sup>1</sup> / <sub>2</sub> (38.1)
CB min.	1 (25.4)	1 <sup>1</sup> / <sub>4</sub> (31.8)	1 <sup>1</sup> / <sub>4</sub> (31.8)	1 <sup>1</sup> / <sub>4</sub> (31.8)	1 <sup>1</sup> / <sub>4</sub> (31.8)	1 <sup>1</sup> / <sub>4</sub> (31.8)	1 <sup>1</sup> / <sub>4</sub> (31.8)	1 <sup>1</sup> / <sub>4</sub> (31.8)	—
CE ± .031 (± .79)	1 <sup>3</sup> / <sub>16</sub> (30.2)	1 <sup>7</sup> / <sub>16</sub> (36.5)	1 <sup>7</sup> / <sub>16</sub> (36.5)	1 <sup>7</sup> / <sub>16</sub> (36.5)	1 <sup>7</sup> / <sub>8</sub> (47.6)	1 <sup>7</sup> / <sub>16</sub> (36.5)	1 <sup>7</sup> / <sub>8</sub> (47.6)	1 <sup>7</sup> / <sub>8</sub> (47.6)	1 <sup>7</sup> / <sub>8</sub> (47.6) min.
CF+0.010/−0.000 (+0.25/−0.00)	1.346 (34.19)	1.589 (40.36)	1.891 (48.03)	2.094 (53.19)	2.258 (57.35)	2.591 (65.81)	2.758 (70.05)	3.258 (82.75)	4.243 (107.77)
CJ <sup>b</sup> +0.000/−0.010 (+0.00/−0.25)	1.247 (31.67)	1.485 (37.72)	1.787 (45.39)	1.999 (50.77)	2.118 (53.80)	2.483 (63.07)	2.618 (66.50)	3.118 (79.20)	4.118 (104.60)

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>See Table S for thread dimensions.

<sup>b</sup>See Table S for pin relief diameters.



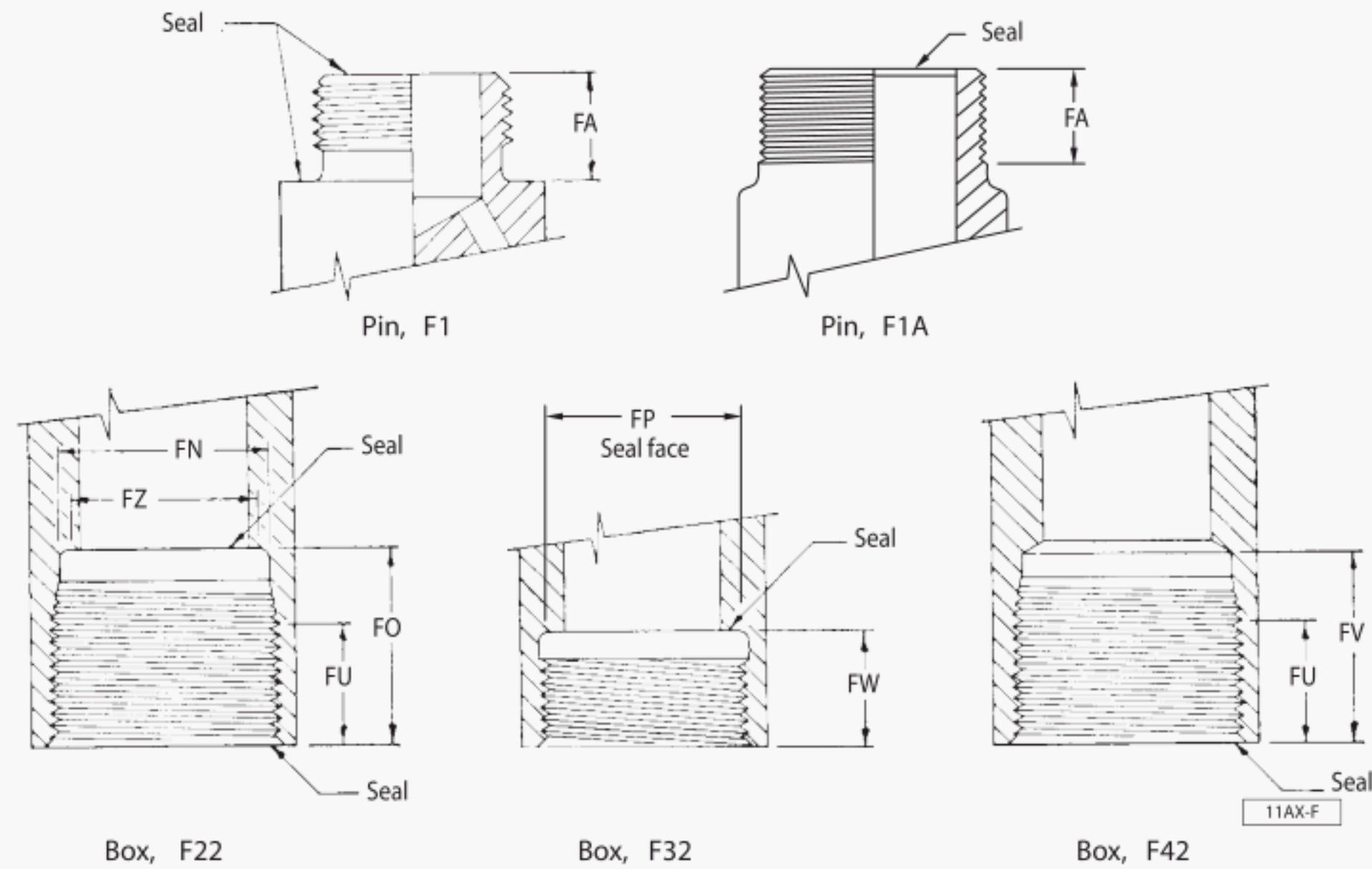


Table F—Thread Connection (See Note)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Thread Size <sup>a</sup>							
Dimensional Symbol	1.000-14 (25.400-14)	1.2500-14 (31.750-14)	1.4704-14 (37.348-14)	1.5604-14 (39.634-14)	1.8024-14 (45.781-14)	2.1095-11 <sup>1</sup> / <sub>2</sub> (53.581-11 <sup>1</sup> / <sub>2</sub> )	3.1715-11 <sup>1</sup> / <sub>2</sub> (80.556-11 <sup>1</sup> / <sub>2</sub> )
FA	0.750 (19.05) ± 0.016 (± 0.41)	0.750 (19.05) ± 0.016 (± 0.41)	0.812 (20.62) ± 0.016 (± 0.41)	0.875 (22.23) +0.016 (± 0.41)	0.875 (22.23) ± 0.016 (± 0.41)	0.938 (23.83) ± 0.016 (± 0.41)	1.125 (28.58) ± 0.016 (± 0.41)
FN	0.9227 (23.437) +0.0085 (+0.216) -0.0000 (-0.000)	1.17027 (29.787) +0.0077 (+0.196) -0.0000 (-0.000)	1.3931 (35.385) +0.0077 (+0.196) -0.0000 (-0.000)	1.4831 (37.671) +0.0077 (+0.196) -0.0000 (-0.000)	1.7251 (43.818) +0.0077 (+0.196) -0.0000 (-0.000)	2.0154 (51.191) +0.0094 (+0.239) -0.0000 (-0.000)	3.0770 (78.156) +0.0094 (+0.239) -0.0000 (-0.000)
FO	1.125 (28.58) ± 0.016 (± 0.41)	1.125 (28.58) ± 0.016 (± 0.41)	1.188 (30.18) ± 0.016 (± 0.41)	1.250 (31.75) ± 0.016 (± 0.41)	1.250 (31.75) ± 0.016 (± 0.41)	1.312 (33.32) ± 0.016 (± 0.41)	1.750 (44.45) ± 0.016 (± 0.41)
FU min.	0.766 (19.46)	0.766 (19.46)	0.828 (21.03)	0.890 (22.61)	0.890 (22.61)	0.953 (24.21)	1.188 (30.18)
FU max.	0.875 (22.23)	0.875 (22.23)	0.938 (23.83)	1.000 (25.40)	1.000 (25.40)	1.062 (26.97)	1.312 (33.32)
FV min.	0.938 (23.83)	0.938 (23.83)	1.000 (25.40)	1.062 (26.97)	1.062 (26.97)	1.125 (28.58)	1.375 (34.93)
FV max.	1.000 (25.40)	1.000 (25.40)	1.125 (28.58)	1.188 (30.18)	1.188 (30.18)	1.250 (31.73)	1.625 (41.28)

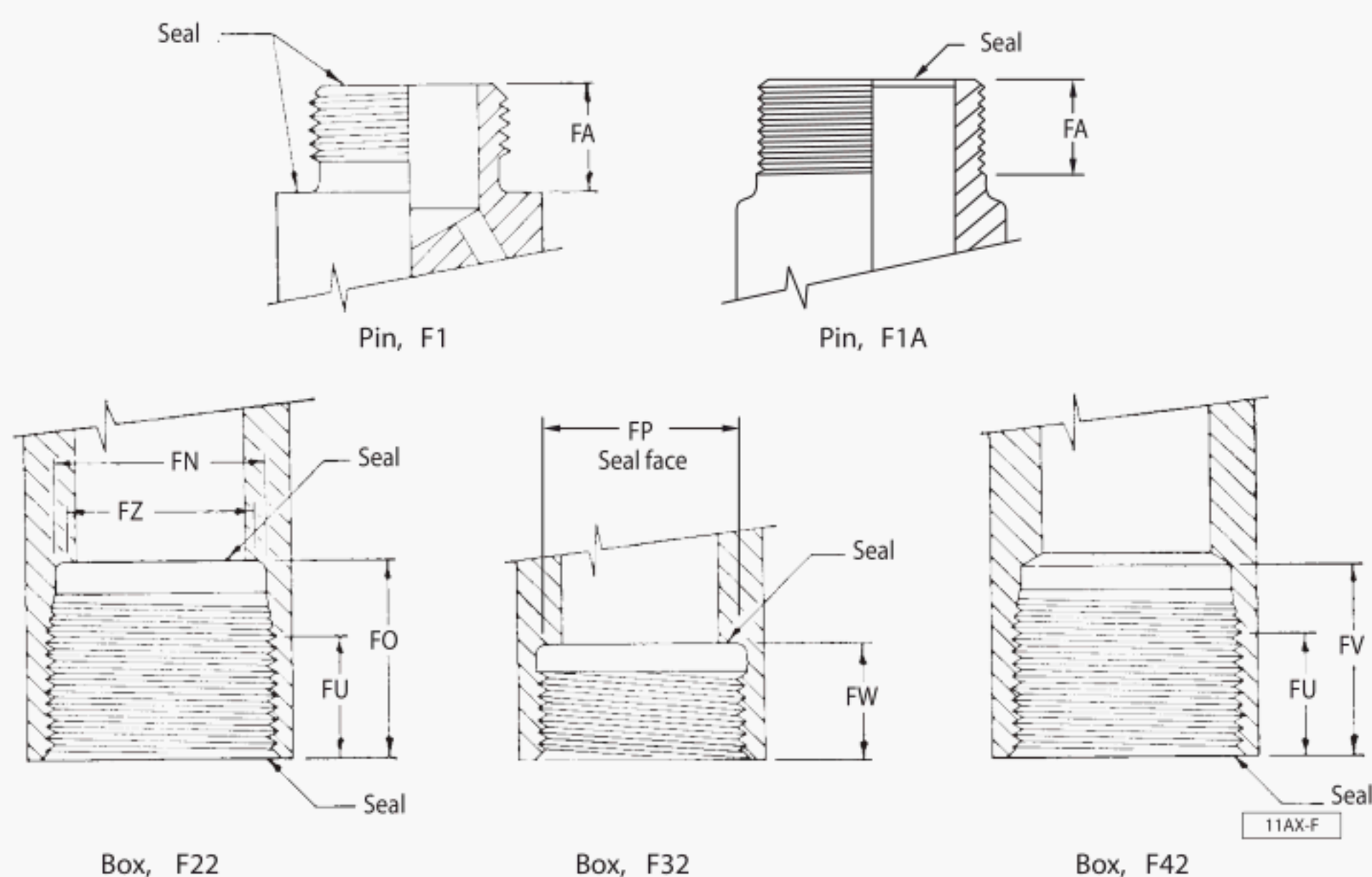


Table F—Thread Connection (See Note) (Continued)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Thread Size <sup>a</sup>							
Dimensional Symbol	1.000-14 (25.400-14)	1.2500-14 (31.750-14)	1.4704-14 (37.348-14)	1.5604-14 (39.634-14)	1.8024-14 (45.781-14)	2.1095-11 <sup>1</sup> / <sub>2</sub> (53.581-11 <sup>1</sup> / <sub>2</sub> )	3.1715-11 <sup>1</sup> / <sub>2</sub> (80.556-11 <sup>1</sup> / <sub>2</sub> )
FW min.	0.625 (15.88)	0.625 (15.88)	0.688 (17.48)	0.750 (19.05)	0.750 (19.05)	0.812 (20.62)	1.000 (25.40)
max.	0.688 (17.48)	0.688 (17.48)	0.750 (19.05)	0.812 (20.62)	0.812 (20.62)	0.875 (22.23)	1.062 (26.97)
FZ min.	0.892 (22.66)	1.111 (28.22)	1.331 (33.81)	1.421 (36.09)	1.631 (41.43)	1.921 (48.79)	2.950 (74.93)
max.	0.922 (23.42)	1.172 (29.77)	1.393 (35.38)	1.483 (37.67)	1.725 (43.82)	2.015 (51.18)	3.077 (78.16)
FP min.	0.900 (22.86)	1.150 (29.21)	1.370 (34.80)	1.460 (37.08)	1.700 (43.18)	1.980 (50.29)	3.050 (77.47)
max.	1.020 (25.91)	1.270 (32.26)	1.485 (37.72)	1.580 (40.13)	1.820 (46.23)	2.130 (54.10)	3.195 (81.15)

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>See Table S for thread dimensions.



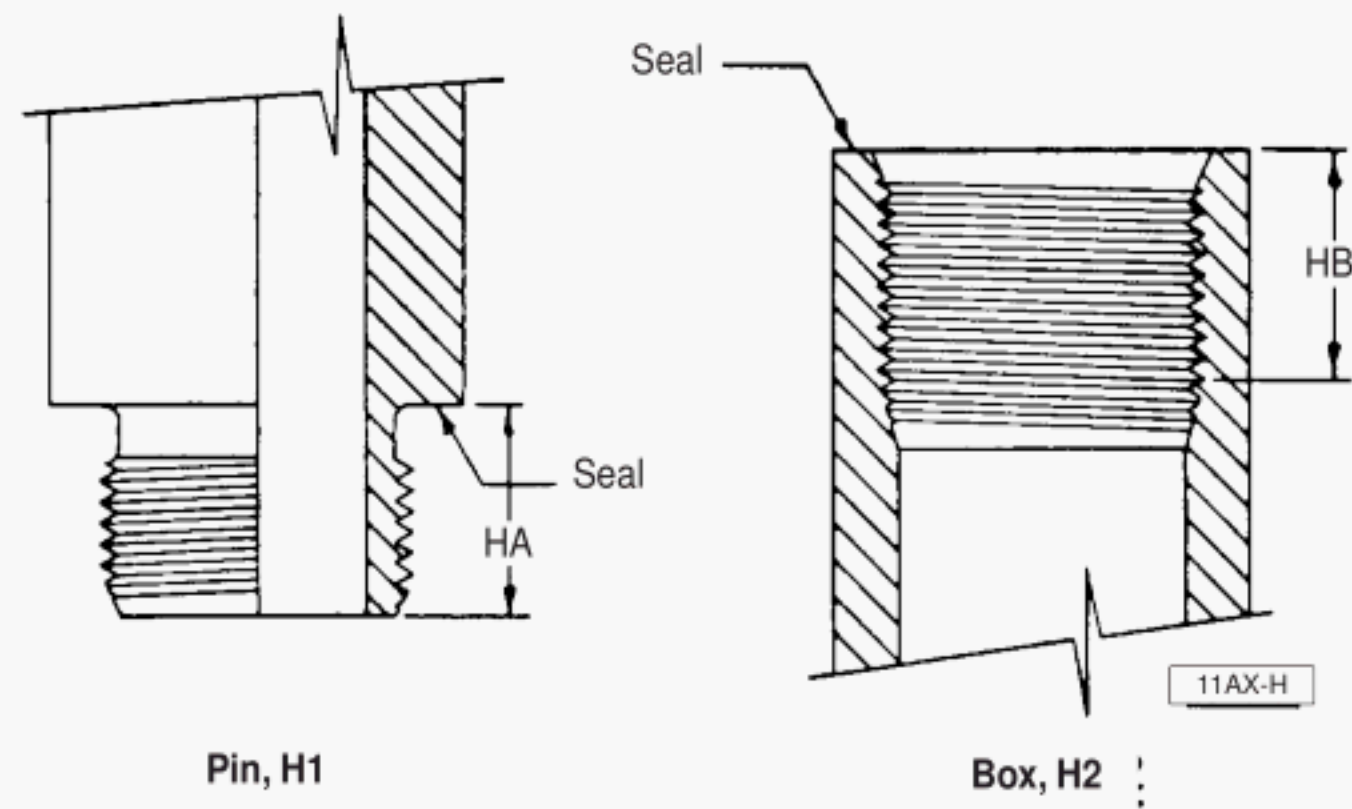


Table H—Thread Connection (See Notes)

(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Thread Size <sup>a</sup>			
	1.5084-14 (38.313-14)	1.9864-14 (50.455-14)	2.3755-11 <sup>1</sup> / <sub>2</sub> (60.338-11 <sup>1</sup> / <sub>2</sub> )	3.3825-11 <sup>1</sup> / <sub>2</sub> (85.916-11 <sup>1</sup> / <sub>2</sub> )
HA	0.875 ± 0.031 (22.23 ± 0.79)	0.938 ± 0.031 (23.83 ± 0.79)	1.000 ± 0.031 (25.40 ± 0.79)	1.250 ± 0.031 (31.75 ± 0.79)
HB	0.938 min. (23.83 min.)	1.000 min. (25.40 min.)	1.062 min. (26.97 min.)	1.312 min. (33.32 min.)

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>See Table S for thread dimensions.

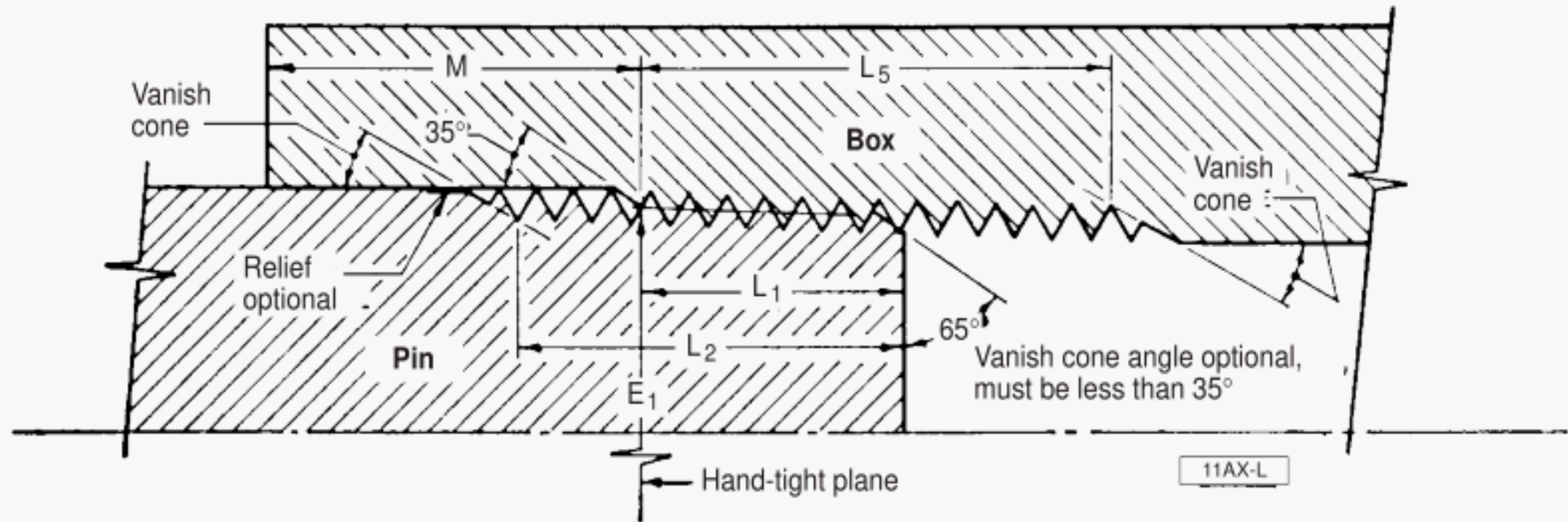
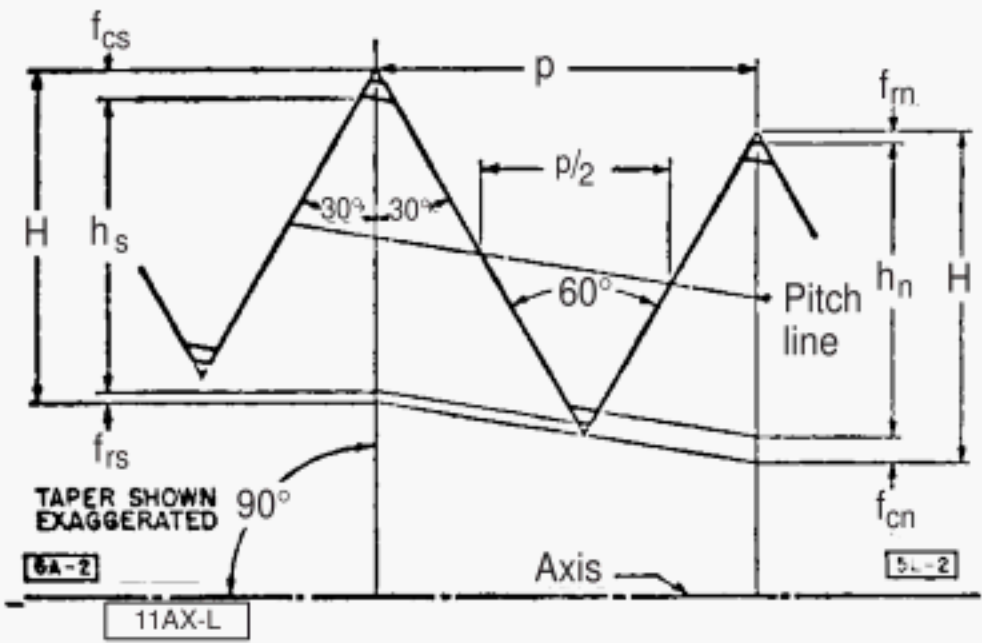


Table L—Thread Connection (Modified API Line Pipe) (See Notes)

(1)		(2)	(3)	(4)
Dimensional Symbol		Thread Size		
		$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
$E_1$	Pitch: Diameter at hand-tight plane.	0.62701 (15.926)	0.77843 (19.772)	0.98887 (25.117)
$L_1$	Length: End of rod to hand-tight plane	0.407 (10.34)	0.534 (13.56)	0.553 (14.05)
$L_2$	Length: Effective threads, pin.	0.5746 (14.595)	0.7479 (18.997)	0.7599 (19.301)
$L_5$	Length: Effective threads, box, min.	0.6858 (17.419)	0.8907 (22.624)	0.9027 (22.929)
$M$	Length: Face to hand-tight plane.	0.7932 (20.147)	0.8190 (20.803)	0.8190 (20.803)
TPI	Threads per inch.	18	14	14

Note 1: All dimensions in inches (followed by equivalent in millimeters).  
Note 2: Included taper, all sizes, 0.0625 in. per inch (62.5 mm/m).  
Note 3: This connection is a modification of standard API line pipe threads by the addition of approximately three threads at the small end of both box and pin members.  
<sup>a</sup>See API Specification 5B for tolerances and other details.



Thread Height Dimensions (See Note)

(1)	(2)	(3)
Thread Element	18 Threads per inch $p = 0.0556$ (1.412)	14 Threads per inch $p = 0.00714$ (1.814)
$H = 0.866p$	0.0481 (1.222)	0.0619 (1.571)
$h_s = h_n = 0.760p$	0.0422 (1.072)	0.0543 (1.379)
$f_{rs} = f_{mn} = 0.033p$	0.0018 (0.047)	0.0024 (0.060)
$f_{cs} = f_{cn} = 0.073p$	0.0041 (0.103)	0.0052 (0.132)

Note: All dimensions in inches (followed by equivalent in millimeters).

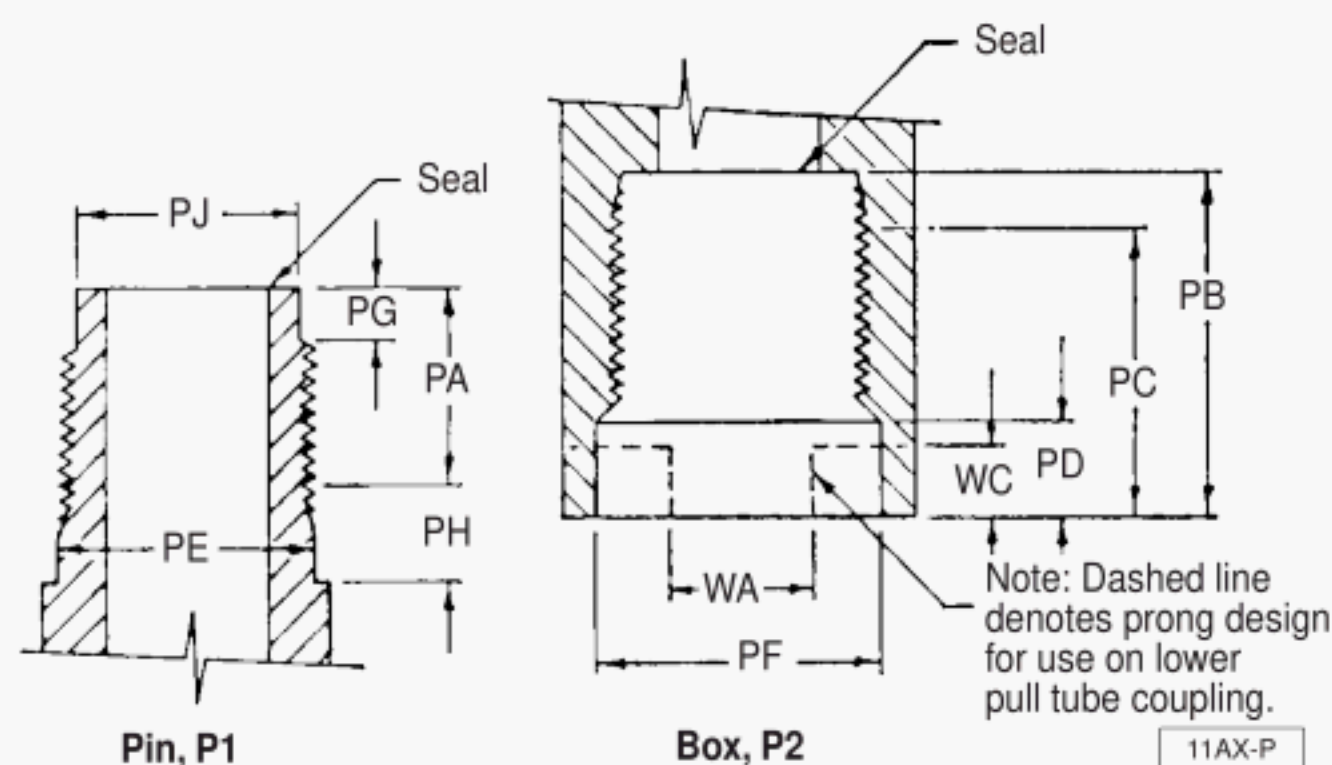


Table P—Thread Connection (See Note)

(1)	(2)	(3)	(4)	(5)	(6)
Dimensional Symbol	Thread Size <sup>a</sup>				
	0.9375-16 (23.813-16)	1.1250-16 (28.575-16)	1.3125-16 (33.338-16)	1.5000-16 (38.100-16)	1.8750-16 (47.625-16)
PA min.	1.000 (25.40)	1.125 (28.58)	1.250 (31.75)	1.375 (34.93)	1.625 (41.28)
PB max.	1.688 (42.88)	1.812 (46.02)	1.938 (49.23)	2.062 (52.37)	2.312 (58.72)
PC min.	1.500 (38.10)	1.625 (41.28)	1.750 (44.45)	1.875 (47.63)	2.125 (53.98)
PD min.	0.750 (19.05)	0.750 (19.05)	0.750 (19.05)	0.750 (19.05)	0.750 (19.05)
PE+0.000/−0.005 (+0.00/−0.13)	0.939 (23.85)	1.127 (28.63)	1.314 (33.38)	1.502 (38.15)	1.877 (47.68)
PF+0.005/−0.000 (+0.13/−0.00)	0.939 (23.85)	1.127 (28.63)	1.314 (33.38)	1.502 (38.15)	1.877 (47.68)
PG min.	0.250 (6.35)	0.250 (6.35)	0.250 (6.35)	0.250 (6.35)	0.250 (6.35)
PH min.	0.750 (19.05)	0.750 (19.05)	0.750 (19.05)	0.750 (19.05)	0.750 (19.05)
PJ <sup>b</sup>					
WA max.	0.688 (17.48)	0.688 (17.48)	0.750 (19.05)	0.750 (19.05)	0.875 (22.23)
WC min.	0.250 (6.35)	0.250 (6.35)	0.250 (6.35)	0.250 (6.35)	0.250 (6.35)

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>See Table S for thread dimensions.

<sup>b</sup>See Table S for pin relief dimensions.

Table S—Details of All Straight Threads Used in API Subsurface Pumps and Fittings  
(American National Special Threads, Class 3 Fit, Except as Noted) (See Notes)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Basic Major Diameter	Number Threads Per Inch	Pin Thread Dimensions			Box Thread Dimensions			Relief Diameters <sup>c</sup>	
		Major Diameter	Pitch Diameter	Minor Diameter <sup>a</sup> (Maximum)	Minor Diameter	Pitch Diameter	Major Diameter <sup>a</sup> (Minimum)	Pin (Maximum)	Box (Minimum)
0.7500 (19.050) <sup>b</sup>	10	0.7500 (19.050)	0.6850 (17.399)	0.6273 (15.933)	0.6417 (16.299)	0.6850 (17.399)	0.7500 (19.050)	0.615 (15.62)	0.769 (19.53)
		+0.0000 (+0.000)	+0.0000 (+0.000)		+0.0136 (+0.345)	+0.0045 (+0.114)			
		−0.0128 (−0.325)	−0.0045 (−0.114)		−0.0000 (−0.000)	−0.0000 (−0.000)			
0.7500 (19.050) <sup>c</sup>	16	0.7500 (19.050)	0.7094 (18.019)	0.6733 (17.102)	0.6823 (17.330)	0.7094 (18.019)	0.7500 (19.050)	0.665 (16.89)	0.763 (19.38)
		+0.0000 (+0.000)	+0.0000 (+0.000)		+0.0080 (+0.203)	+0.0032 (+0.081)			
		−0.0090 (−0.229)	−0.0032 (−0.081)		−0.0000 (−0.000)	−0.0000 (−0.000)			
0.8750 (22.225) <sup>c</sup>	14	0.8750 (22.225)	0.8286 (21.046)	0.7874 (20.000)	0.7977 (20.262)	0.8286 (21.046)	0.8750 (22.225)	0.778 (19.76)	0.889 (22.58)
		+0.0000 (+0.000)	+0.0000 (+0.000)		+0.0085 (+0.216)	+0.0036 (+0.091)			
		−0.0098 (−0.249)	−0.0036 (−0.091)		−0.0000 (−0.000)	−0.0000 (−0.000)			
0.9375 (23.813)	16	0.9375 (23.813)	0.8969 (22.781)	0.8608 (21.864)	0.8698 (22.093)	0.8969 (22.781)	0.9375 (23.813)	0.852 (21.64)	0.951 (24.16)
		+0.0000 (+0.000)	+0.0000 (+0.000)		+0.0068 (+0.173)	+0.0036 (+0.091)			
		−0.0090 (−0.229)	−0.0036 (−0.091)		−0.0000 (−0.000)	−0.0000 (−0.000)			
1.0000 (25.400)	14	1.0000 (25.400)	0.9536 (24.221)	0.9124 (23.175)	0.9227 (23.437)	0.9536 (24.221)	1.0000 (25.400)	0.903 (22.94)	1.014 (25.76)
		+0.0000 (+0.000)	+0.0000 (+0.000)		+0.0085 (+0.216)	+0.0036 (+0.091)			
		−0.0098 (−0.249)	−0.0036 (−0.091)		−0.0000 (−0.000)	−0.0000 (−0.000)			
1.1250 (28.575)	16	1.1250 (28.575)	1.0844 (27.544)	1.0483 (26.627)	1.0573 (26.855)	1.0844 (27.544)	1.1250 (28.575)	1.039 (26.39)	1.138 (28.91)
		+0.0000 (+0.000)	+0.0000 (+0.000)		+0.0068 (+0.173)	+0.0040 (+0.102)			
		−0.0090 (−0.229)	−0.0040 (−0.102)		−0.0000 (−0.000)	−0.0000 (−0.000)			
1.1894 (30.211)	14	1.1870 (30.150)	1.1430 (29.032)	1.1018 (27.986)	1.1121 (28.247)	1.1430 (29.032)	1.1894 (30.211)	1.092 (27.74)	1.204 (30.58)
		+0.0000 (+0.000)	+0.0000 (+0.000)		+0.0077 (+0.196)	+0.0040 (+0.102)			
		−0.0100 (−0.254)	−0.0040 (−0.102)		−0.0000 (−0.000)	−0.0000 (−0.000)			
1.2500 (31.750)	14	1.2500 (31.750)	1.2036 (30.571)	1.1624 (29.525)	1.1727 (29.787)	1.2036 (30.571)	1.2500 (31.750)	1.153 (29.29)	1.265 (32.13)
		+0.0000 (+0.000)	+0.0000 (+0.000)		+0.0077 (+0.196)	+0.0040 (+0.102)			
		−0.0098 (−0.249)	−0.0040 (−0.102)		−0.0000 (−0.000)	−0.0000 (−0.000)			
1.3125 (33.338)	16	1.3125 (33.338)	1.2719 (32.306)	1.2358 (31.389)	1.2448 (31.618)	1.2719 (32.306)	1.3125 (33.338)	1.227 (31.17)	1.326 (33.68)
		+0.0000 (+0.000)	+0.0000 (+0.000)		+0.0068 (+0.173)	+0.0040 (+0.102)			
		−0.0090 (−0.229)	−0.0040 (−0.102)		−0.0000 (−0.000)	−0.0000 (−0.000)			
1.3330 (33.858)	16	1.3330 (33.858)	1.2924 (32.827)	1.2563 (31.910)	1.2653 (32.139)	1.2924 (32.827)	1.3330 (33.858)	1.247 (31.67)	1.346 (34.19)
		+0.0000 (+0.000)	+0.0000 (+0.000)		+0.0068 (+0.173)	+0.0040 (+0.102)			
		−0.0090 (−0.229)	−0.0040 (−0.102)		−0.0000 (−0.000)	−0.0000 (−0.000)			
1.3750 (34.925)	14	1.3750 (34.925)	1.3286 (33.746)	1.2874 (32.700)	1.2977 (32.962)	1.3286 (33.746)	1.3750 (34.925)	1.278 (32.46)	1.390 (35.31)
		+0.0000 (+0.000)	+0.0000 (+0.000)		+0.0077 (+0.196)	+0.0040 (+0.102)			
		−0.0098 (−0.249)	−0.0040 (−0.102)		−0.0000 (−0.000)	−0.0000 (−0.000)			
1.4704 (37.348)	14	1.4704 (37.348)	1.4240 (36.170)	1.3828 (35.123)	1.3931 (35.385)	1.4240 (36.170)	1.4704 (37.348)	1.373 (34.87)	1.484 (37.69)
		+0.0000 (+0.000)	+0.0000 (+0.000)		+0.0077 (+0.196)	+0.0040 (+0.102)			
		−0.0098 (−0.249)	−0.0040 (−0.102)		−0.0000 (−0.000)	−0.0000 (−0.000)			

Table S—Details of All Straight Threads Used in API Subsurface Pumps and Fittings  
(American National Special Threads, Class 3 Fit, Except as Noted) (See Notes) (Continued)

(1)	(2)	(3)		(4)		(5)	(6)		(7)		(8)	(9)	(10)	
Basic Major Diameter	Number Threads Per Inch	Pin Thread Dimensions				Box Thread Dimensions				Relief Diameters <sup>c</sup>				
		Major Diameter		Pitch Diameter	Minor Diameter <sup>a</sup> (Maximum)	Minor Diameter		Pitch Diameter	Major Diameter <sup>a</sup> (Minimum)	Pin (Maximum)	Box (Minimum)			
1.5000 (38.100)	16	1.5000	(38.100)	1.4594	(37.069)	1.4233 (36.152)		1.4323	(36.380)	1.4594	(37.069)	1.5000 (38.100)	1.414 (35.92)	1.513 (38.43)
		+0.0000	(+0.000)	+0.0000	(+0.000)			+0.0068	(+0.173)	+0.0040	(+0.102)			
		−0.0090	(−0.229)	−0.0040	(−0.102)			−0.0000	(−0.000)	−0.0000	(−0.000)			
1.5084 (38.313)	14	1.5084	(38.313)	1.4620	(37.135)	1.4208 (36.088)		1.4311	(36.350)	1.4620	(37.135)	1.5084 (38.313)	1.409 (35.79)	1.525 (38.74)
		+0.0000	(+0.000)	+0.0000	(+0.000)			+0.0077	(+0.196)	+0.0062	(+0.157)			
		−0.0098	(−0.249)	−0.0062	(−0.157)			−0.0000	(−0.000)	−0.0000	(−0.000)			
1.5604 (39.634)	14	1.5604	(39.634)	1.5140	(38.456)	1.4728 (37.409)		1.4831	(37.671)	1.5140	(38.456)	1.5604 (39.634)	1.461 (37.11)	1.577 (40.06)
		+0.0000	(+0.000)	+0.0000	(+0.000)			+0.0077	(+0.196)	+0.0062	(+0.157)			
		−0.0098	(−0.249)	−0.0062	(−0.157)			−0.0000	(−0.000)	−0.0000	(−0.000)			
1.5730 (39.954)	16	1.5730	(39.954)	1.5324	(38.923)	1.4963 (38.006)		1.5053	(38.235)	1.5324	(38.923)	1.5730 (39.954)	1.485 (37.72)	1.589 (40.36)
		+0.0000	(+0.000)	+0.0000	(+0.000)			+0.0068	(+0.173)	+0.0061	(+0.155)			
		−0.0090	(−0.229)	−0.0061	(−0.155)			−0.0000	(−0.000)	−0.0000	(−0.000)			
1.7500 (44.450)	14	1.7500	(44.450)	1.7036	(43.271)	1.6624 (42.225)		1.6727	(42.487)	1.7036	(43.271)	1.7500 (44.450)	1.651 (41.94)	1.767 (44.88)
		+0.0000	(+0.000)	+0.0000	(+0.000)			+0.0077	(+0.196)	+0.0062	(+0.157)			
		−0.0098	(−0.249)	−0.0062	(−0.157)			−0.0000	(−0.000)	−0.0000	(−0.000)			
1.8024 (45.781)	14	1.8024	(45.781)	1.7560	(44.602)	1.7148 (43.556)		1.7251	(43.818)	1.7560	(44.602)	1.8024 (45.781)	1.703 (43.26)	1.819 (46.20)
		+0.0000	(+0.000)	+0.0000	(+0.000)			+0.0077	(+0.196)	+0.0062	(+0.157)			
		−0.0098	(−0.249)	−0.0062	(−0.157)			−0.0000	(−0.000)	−0.0000	(−0.000)			
1.8750 (47.625)	16	1.8750	(47.625)	1.8344	(46.594)	1.7983 (45.677)		1.8073	(45.905)	1.8344	(46.594)	1.8750 (47.625)	1.787 (45.39)	1.891 (48.03)
		+0.0000	(+0.000)	+0.0000	(+0.000)			+0.0068	(+0.173)	+0.0061	(+0.155)			
		−0.0090	(−0.229)	−0.0061	(−0.155)			−0.0000	(−0.000)	−0.0000	(−0.000)			
1.9864 (50.455)	14	1.9864	(50.455)	1.9400	(49.276)	1.8988 (48.230)		1.9091	(48.491)	1.9400	(49.276)	1.9864 (50.455)	1.887 (47.93)	2.003 (50.88)
		+0.0000	(+0.000)	+0.0000	(+0.000)			+0.0077	(+0.196)	+0.0062	(+0.157)			
		−0.0098	(−0.249)	−0.0062	(−0.157)			−0.0000	(−0.000)	−0.0000	(−0.000)			
2.0035 (50.889)	11½	<sup>d</sup> 2.0000	(50.800)	1.9470	(49.454)	1.8968 (48.179)		1.9094	(48.499)	1.9470	(49.454)	2.0035 (50.889)	1.881 (47.78)	2.026 (51.46)
		+0.0000	(+0.000)	+0.0000	(+0.000)			+0.0094	(+0.239)	+0.0092	(+0.234)			
2.0870 (53.010)	16	2.0870	(53.010)	2.0464	(51.979)	2.0103 (51.062)		2.0193	(51.290)	2.0464	(51.979)	2.0870 (53.010)	1.999 (50.77)	2.094 (53.19)
		+0.0000	(+0.000)	+0.0000	(+0.000)			+0.0068	(+0.173)	+0.0067	(+0.170)			
		−0.0090	(−0.229)	−0.0067	(−0.170)			−0.0000	(−0.000)	−0.0000	(−0.000)			
2.1095 (53.581)	11½	2.1095	(53.581)	2.0530	(52.146)	2.0028 (50.871)		2.0154	(51.191)	2.0530	(52.146)	2.1095 (53.581)	1.989 (50.52)	2.129 (54.08)
		+0.0000	(+0.000)	+0.0000	(+0.000)			+0.0094	(+0.239)	+0.0069	(+0.175)			
		−0.0115	(−0.292)	−0.0069	(−0.175)			−0.0000	(−0.000)	−0.0000	(−0.000)			
2.2380 (56.845)	11½	2.2380	(56.845)	2.1815	(55.410)	2.1313 (54.135)		2.1439	(54.455)	2.1815	(55.410)	2.2380 (56.845)	2.118 (53.80)	2.258 (57.35)
		+0.0000	(+0.000)	+0.0000	(+0.000)			+0.0094	(+0.239)	+0.0069	(+0.175)			
		−0.0115	(−0.292)	−0.0069	(−0.175)			−0.0000	(−0.000)	−0.0000	(−0.000)			
2.3755 (60.338)	11½	2.3755	(60.338)	2.3190	(58.903)	2.2688 (57.628)		2.2814	(57.948)	2.3190	(58.903)	2.3755 (60.338)	2.255 (57.28)	2.395 (60.83)
		+0.0000	(+0.000)	+0.0000	(+0.000)			+0.0094	(+0.239)	+0.0069	(+0.175)			



Table S—Details of All Straight Threads Used in API Subsurface Pumps and Fittings  
(American National Special Threads, Class 3 Fit, Except as Noted) (See Notes) (Continued)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)				
Basic Major Diameter	Number Threads Per Inch	Pin Thread Dimensions				Box Thread Dimensions				Relief Diameters <sup>c</sup>			
		Major Diameter	Pitch Diameter	Minor Diameter <sup>a</sup> (Maximum)	Minor Diameter	Pitch Diameter	Major Diameter <sup>a</sup> (Minimum)	Pin (Maximum)	Box (Minimum)				
2.5625 (65.088)	11½	−0.0115	(−0.292)	−0.0069	(−0.175)	−0.0000	(−0.000)	−0.0000	(−0.000)				
		2.5625	(65.088)	2.5060	(63.652)	2.4558 (62.377)	2.4684	(62.697)	2.5060	(63.652)	2.5625 (65.088)	2.440 (61.98)	2.585 (65.66)
		+0.0000	(+0.000)	+0.0000	(+0.000)		+0.0094	(+0.239)	+0.0092	(+0.234)			
		−0.0115	(−0.292)	−0.0092	(−0.234)		−0.0000	(−0.000)	−0.0000	(−0.000)			
2.5730 (65.354)	16	2.5730	(65.354)	2.5324	(64.323)	2.4963 (63.406)	2.5053	(63.635)	2.5324	(64.323)	2.5730 (65.354)	2.483 (63.07)	2.591 (65.81)
		+0.0000	(+0.000)	+0.0000	(+0.000)		+0.0068	(+0.173)	+0.0090	(+0.229)			
		−0.0090	(−0.229)	−0.0090	(−0.229)		−0.0000	(−0.000)	−0.0000	(−0.000)			
2.7380 (69.545)	11½	2.7380	(69.545)	2.6815	(68.110)	2.6313 (66.835)	2.6439	(67.155)	2.6815	(68.110)	2.7380 (69.545)	2.618 (66.50)	2.758 (70.05)
		+0.0000	(+0.000)	+0.0000	(+0.000)		+0.0094	(+0.239)	+0.0069	(+0.175)			
		−0.0115	(−0.292)	−0.0069	(−0.175)		−0.0000	(−0.000)	−0.0000	(−0.000)			
3.1715 (80.556)	11½	3.1715	(80.556)	3.1150	(79.121)	3.0648 (77.846)	3.0774	(78.166)	3.1150	(79.121)	3.1715 (80.556)	3.052 (77.52)	3.192 (81.08)
		+0.0000	(+0.000)	+0.0000	(+0.000)		+0.0094	(+0.239)	+0.0099	(+0.251)			
		−0.0115	(−0.292)	−0.0099	(−0.251)		−0.0000	(−0.000)	−0.0000	(−0.000)			
3.1875 (80.963)	11½	3.1875	(80.963)	3.1310	(79.527)	3.0808 (78.252)	3.0934	(78.572)	3.1310	(79.527)	3.1875 (80.963)	3.064 (77.83)	3.210 (81.53)
		+0.0000	(+0.000)	+0.0000	(+0.000)		+0.0094	(+0.239)	+0.0099	(+0.251)			
		−0.0115	(−0.292)	−0.0099	(−0.251)		−0.0000	(−0.000)	−0.0000	(−0.000)			
3.2380 (82.245)	11½	3.2380	(82.245)	3.1815	(80.810)	3.1313 (79.535)	3.1439	(79.855)	3.1815	(80.810)	3.2380 (82.245)	3.118 (79.20)	3.258 (82.75)
		+0.0000	(+0.000)	+0.0000	(+0.000)		+0.0094	(+0.239)	+0.0069	(+0.175)			
		−0.0115	(−0.292)	−0.0069	(−0.175)		−0.0000	(−0.000)	−0.0000	(−0.000)			
3.3825 (85.916)	11½	3.3825	(85.916)	3.3260	(84.480)	3.2758 (83.205)	3.2884	(83.525)	3.3260	(84.480)	3.3825 (85.916)	3.263 (82.88)	3.403 (86.44)
		+0.0000	(+0.000)	+0.0000	(+0.000)		+0.0094	(+0.239)	+0.0099	(+0.251)			
		−0.0115	(−0.292)	−0.0099	(−0.251)		−0.0000	(−0.000)	−0.0000	(−0.000)			
3.6875 (93.663)	11½	3.6875	(93.663)	3.6310	(92.227)	3.5808 (90.952)	3.5934	(91.272)	3.6310	(92.227)	3.6875 (93.663)	3.564 (90.53)	3.710 (94.23)
		+0.0000	(+0.000)	+0.0000	(+0.000)		+0.0094	(+0.239)	+0.0099	(+0.251)			
		−0.0115	(−0.292)	−0.0099	(−0.251)		−0.0000	(−0.000)	−0.0000	(−0.000)			
4.2380 (107.645)	11½	4.2380	(107.645)	4.1815	(106.210)	4.1313 (104.935)	4.1439	(105.255)	4.1815	(106.210)	4.238 (107.645)	4.118 (104.60)	4.258 (108.15)
		+0.0000	(+0.000)	+0.0000	(+0.000)		+0.0094	(+0.239)	+0.0099	(+0.251)			
		−0.0115	(−0.292)	−0.0099	(−0.251)		−0.0000	(−0.000)	−0.0000	(−0.000)			

Note 1: All dimensions in inches (followed by equivalent in millimeters).

Note 2: Unified Screw Threads in accordance with National Bureau of Standards Handbook H28 are acceptable and will not affect interchangeability or strength of product.

<sup>a</sup>Tolerances not given, as these dimensions are not gauged and do not affect interchangeability.

<sup>b</sup>From American National Coarse Thread Series, Class 3 Fit.

<sup>c</sup>From American National Fine Thread Series, Class 3 Fit.

<sup>d</sup>Deviation from standard major diameter to accommodate dimension OD<sub>2</sub> of seating mandrel.

<sup>e</sup>Relief diameters shown are recommended unless otherwise specified elsewhere in this specification. The maximum and minimum relief diameters are given without regard for manufacturing method or concentricity of thread to relief. Each manufacturer shall adjust these values and apply a tolerance that conforms with good practice and is in keeping with his facilities and methods.

Table X—Wrench Flat Dimensions (See Note)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dimension	Size Designation							
	125	150	175 <sup>b</sup>	200	225 <sup>b</sup>	250	275 <sup>b</sup>	375 <sup>b</sup>
Distance Between Flats	1.062 (26.97)	1.312 (33.32)	1.500 (38.10)	1.688 (42.88)	2.000 (50.80)	2.188 (55.58)	2.375 (60.33)	3.375 (85.73)
	+0.000 (+0.00)	+0.000 (+0.00)	+0.000 (+0.00)	+0.000 (+0.00)	+0.000 (+0.00)	+0.000 (+0.00)	+0.000 (+0.00)	+0.000 (+0.00)
	−0.016 (−0.41)	−0.025 (−0.64)	−0.025 (−0.64)	−0.025 (−0.64)	−0.025 (−0.64)	−0.031 (−0.79)	−0.031 (−0.79)	−0.031 (−0.79)
Length of Flats, min. <sup>a</sup>	0.688 (17.48)	0.812 (20.62)	0.938 (23.83)	0.938 (23.83)	1.125 (28.58)	1.125 (28.58)	1.188 (30.18)	1.250 (31.75)

Note: All dimensions in inches (followed by equivalent in millimeters).

<sup>a</sup>Minimum length of flats specified herein is the actual length of flat surface independent of any fillets or chamfers. Where full length flats are impractical, at least one end of the flats shall extend to the end of the part, thus allowing overhang of a wrench of standard thickness.

<sup>b</sup>Wrench flats for pump bore size designations 175, 225, 275, and 375 are also applicable to tubing size designations 20, 25, 30, and 40.



## APPENDIX A—MARKING REQUIREMENTS FOR MONOGRAM LICENSEES

### A.1 General

**A.1.1** This appendix is applicable only when API monogrammed component parts or assemblies are specified and shall be followed by those manufacturers licensed to use the API Monogram. The marking requirements of this section supersede the marking requirements of Section 8.

**A.1.2** The API Monogram shall be applied only by licensed manufacturers. API Specification Q1, *Specification for Quality Programs*, 4.12.4, gives the requirements for marking products using the API Monogram.

### A.2 Marking Requirements for Monogrammed Parts and Assemblies

The following marking requirements apply to licensed manufacturers using the API Monogram on the products covered by this specification. Parts and assemblies conforming to the requirements given herein shall be marked with the information listed below as a minimum, per the methods given in Section A.3.

a. Component parts and subassemblies:

1. Manufacturer's name or mark.
2. API Monogram 11AX license no.
3. Manufacturer's part no.
4. Material identification symbol as per Section 9.
5. Date of Manufacture (month/year).

Example: 1<sup>1</sup>/<sub>2</sub> in. heavy-wall (B12-150), nonhardened steel, manufactured in December 1992 by a licensed manufacturer (License No. 01234.00):

XXXX 11AX-01234.00 XXXXXX D1 1292

b. Assemblies:

1. Manufacturer's name or make.
2. API Monogram 11AX license no. (license no. of facility used for the assembly).
3. Pump designation per Section 3.
4. Date of Assembly (month/year).

Example: 2<sup>7</sup>/<sub>8</sub> × 1<sup>1</sup>/<sub>2</sub> in. rod, stationary heavy-wall barrel, top anchor pump, 24-ft barrel, 6-ft plunger, 4-ft extensions total (2' top, 2' bottom), assembled in October 1993 by a licensed manufacturer (License No. 45678.00):

XXXX 11AX-45678.00 25-150 RHAC24-6-2-2 10/93

### A.3 Method of Marking

The complete marking:

1. shall be permanently affixed to each separate product by stamp or etch, except balls (V11), seating cups (S32), and cup rings (S33).
2. or, when marking of the product is impractical due to part size or potential damage to the part, these parts shall be marked by stencil, label, tag, or other legible medium that can be attached to the shipped product or product packaging.
3. The complete marking shall be permanently affixed to each product, allowing for the exceptions above, but the manufacturer's license number shall have the option of being affixed to each bundle or container, or marked on the documents for each shipment.





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