Specification for Subsurface Sucker Rod Pumps and Fittings

API SPECIFICATION 11AX
TENTH EDITION, MARCH 1996

EFFECTIVE DATE: OCTOBER 31, 1996

American Petroleum Institute

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FOREWORD

This recommended practice is under the jurisdiction of the API Subcommittee on Standardization of Field Operating Equipment.

This recommended practice shall become effective on the date printed on the cover but may be used voluntarily from the date of distribution.

Note: Conversions of English units to International System (SI) metric units are provided throughout the text of this specification in parentheses, e.g., 6 in. *(152.4 mm)*. SI equivalents have also been included in all tables. English units are in all cases preferential and shall be the standard in this specification. Products are to be marked in the units in which ordered unless there is an agreement to the contrary between the purchaser and the manufacturer. The factors used for conversion of English units to SI units were taken from API Publication 2564, and are listed below:

1 inch (in.) = 25.4 millimeters (mm) exactly
1 foot (ft) = 0.3048 meters (m) exactly

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CONTENTS

Tables (Continued)

Tables (Continued)

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

2.1 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 *Specification for Threading, Gaging, and Thread Inspection of Casing, Tubing, and Line Pipe Threads*

RP 11AR *Recommended Practice for Care and Handling Sucker Rod Pumps*

ASME[1]

B1.1 *Unified Inch Screw Threads (UN and UNR Thread Form)* (1989 Edition)

ASNT[2]

SNT-TC-1A *Personnel Qualifications and Certification in Nondestructive Testing* (1988 Edition)

ASTM[3]

A 370 *Standard Test Methods and Definitions for Mechanical Testing of Steel Products* (1992 Edition)

E 18 *Standard Methods of Tests for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials* (1992 Edition)

E 165 *Standard Practice for Liquid Penetrant Inspection Method* (1991 Edition)

E 384 *Standard Test Method for Microhardness of Materials* (1989 Edition)

Military Standard

105E *Single Sampling Plan for Normal Inspection*

NACE[4]

MR-01-76 *Standard Recommended Practice Sulfide Stress Cracking Resistant Metallic Materials for Oilfield Equipment* (1992 Edition)

[1]American Society of Mechanical Engineers, 1950 Stemmons Freeway, Dallas, Texas 75207-3109.
[2]American Society for Nondestructive Testing, 1711 Arlingate Lane, Columbus, Ohio 43228-0518.
[3]ASTM, 100 Barr Harbor Drive, West Conshohocken, Pennsylvania 19428.
[4]National Association of Corrosion Engineers, P. O. Box 218340, Houston, Texas 77218-8340.

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:

a. Nominal tubing size.
b. Basic bore diameter.
c. Type of pump, including type of barrel and location and type of seating assembly.
d. Barrel length.
e. Plunger length.
f. Total length of extensions 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) of extensions, 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

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:

a. Barrel material.
b. Plunger material.
c. Plunger clearance (fit).
d. Valve material.
e. Length of each extension.

Table 1—Pump Designations

(1)	(2)	(3)	(4)	(5)
	Letter Designation			
	Metal Plunger Pumps		Soft-Packed Plunger Pumps	
Type of Pump	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
Traveling Barrel, Bottom Anchor	RHT	RWT	—	RST
Tubing Pumps	TH	—	TP	—

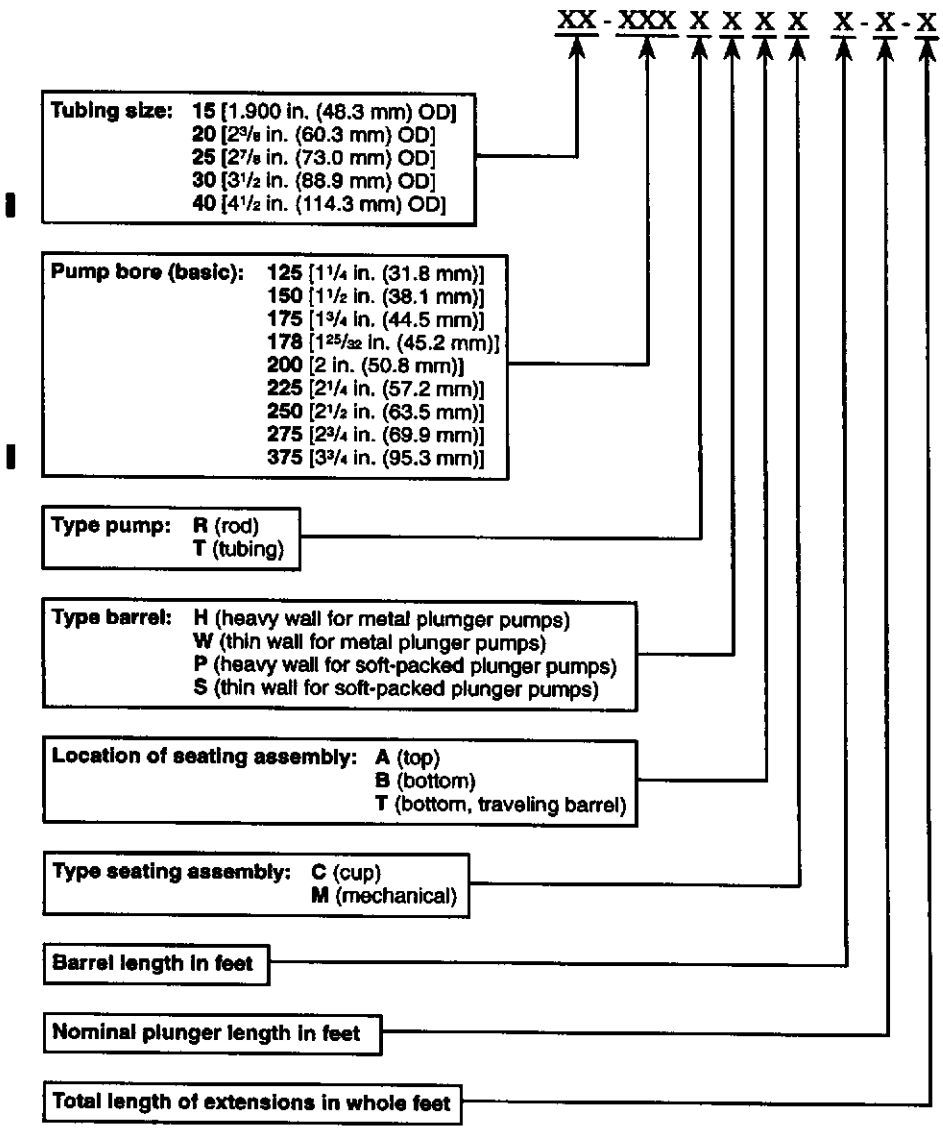


Figure 1—Pump Designations

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.

4.2 DESIGN DEVELOPMENT

4.2.1 Design shall conform to the requirements of this specification and any other referenced specifications.

4.2.2 Assumptions, methods, formulae, calculations, and testing as required to show design conforms to this specification.

4.3 DESIGN DOCUMENTATION

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

4.3.2 Design requirements and acceptance criteria shall be documented.

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

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

4.4 DESIGN VERIFICATION

Verification shall consist of verifying and testing of design to conform to requirements of this specification.

4.5 DESIGN REVIEW

Design 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.

4.6 DESIGN CHANGES

Design 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.

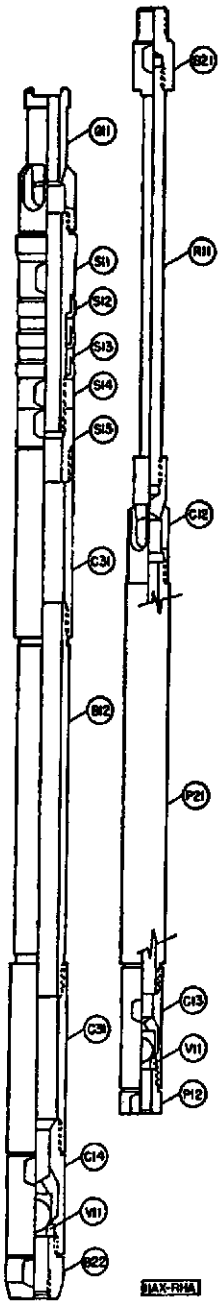
a. Valve rod or pull tube (insert pump only).
b. One piece or assembled metal plungers of basic diameter, less clearance.
c. Valves.
d. Heavy-wall or thin-wall barrels.
e. Seating assemblies.

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 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 have 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.

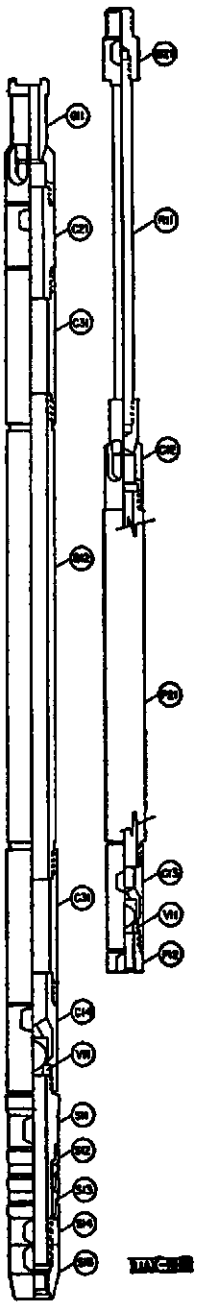
5.5 Marking of pump assemblies shall be per Section 8. However, when API monogrammed assemblies are specified, marking shall be per Appendix A.



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

(1)	(2)	(3)	(4)	(5)	(6)
		Standard Pump Size			
		$2^3/_8 \times 1^1/_4$ *(60.3 × 31.8)*	$2^7/_8 \times 1^1/_2$ *(73.0 × 38.1)*	$2^7/_8 \times 1^3/_4$ *(73.0 × 44.5)*	$3^1/_2 \times 2^1/_4$ *(88.9 × 57.2)*
		Complete Pump Designation			
		20-125 RHAC [a, b, c]	25-150 RHAC [a, b, c]	25-175 RHAC [a, b, c]	30-225 RHAC [a, b, c]
Symbol	Description	Part Number			
B12	Barrel, Heavy Wall	B12-125[a]	B12-150[a]	B12-175[a]	B12-225[a]
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
C133	Cage, Closed Plunger	C13-125	C13-150	C14-25	C14-30
C14	Cage, Closed Barrel	C14-20	C14-25	C14-25	C14-30
C31	Coupling, Extension	C31-125[c]	C31-150[c]	C31-175[c]	C31-225[c]
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[d]	P21-125[b]	921-150[b]	P21-175[b]	P21-225[b]
R11	Rod, Valve	R11-20[e]	R11-25[e]	R11-25[e]	R11-30[e]
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	S15-30
S3	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

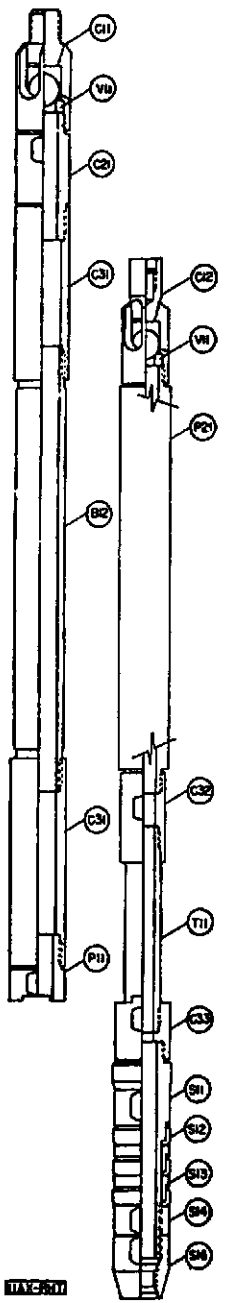
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]Specify barrel length in feet (meters). Standard lengths are: 8 ft (2.438m) through 30 ft (9.144m) in 2 ft (0.610m) increments.
[b]Specify nominal plunger length in feet (meters) and clearance (fit) in thousandths of an inch (hundredths of a millimeter).
[c]Specify total length of extension couplings in whole feet (thousandths of meters). Standard lengths are in increments of $^1/_2$ ft (0.152 m).
[d]A seat must be used between C12 and P21 if an optional F1A pin thread is present on P21 plunger, see component P21.
[e]See part number R11 for valve rod length.



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

(1)	(2)	(3)	(4)	(5)	(6)
		Standard Pump Size			
		$2^3/_8 \times 1^1/_4$ *(60.3 × 31.8)*	$2^7/_8 \times 1^1/_2$ *(73.0 × 38.1)*	$2^7/_8 \times 1^3/_4$ *(73.0 × 44.5)*	$3^1/_2 \times 2^1/_4$ *(88.9 × 57.2)*
		Complete Pump Designation			
		20-125 RHBC[a, b, c]	20-150 RHBC[a, b, c]	25-175 RHBC[a, b, c]	30-225 RHBC[a, b, c]
Symbol	Description	Part Number			
B12	Barrel, Heavy Wall	B12-125[a]	B12-150[a]	B12-175[a]	B12-225[a]
B21	Brushing, Valve Rod	B21-20	B21-25	B21-25	B21-30
C12	Cage, Top Plunger	C12-125	C12-150-25	C12-175	C12-225
C13	Cage, Closed Plunger	C13-125	C13-150	C13-175	C13-225
C14	Cage, Closed Barrel	C14-20	C14-25	C14-25	C14-30
C21	Connector, Upper Barrel	C21-20	C21-25	C21-25	C21-30
C31	Coupling, Extensions	C31-125[c]	C31-150[c]	C31-175[c]	C31-225[c]
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[d]	P21-125[b]	P21-150[b]	P21-175[b]	P21-225[b]
R11	Rod, Valve	R11-20[e]	R11-25[e]	R11-25[e]	R11-30[e]
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
S16	Seating Cup Coupling	S16-20	S16-25	S16-25	S16-30
V11	Valve, Ball and Seat				
	Traveling	V11-125	V11-150	V11-175	V11-175
	Standing	V11-175	V11-225	V11-225	V11-250

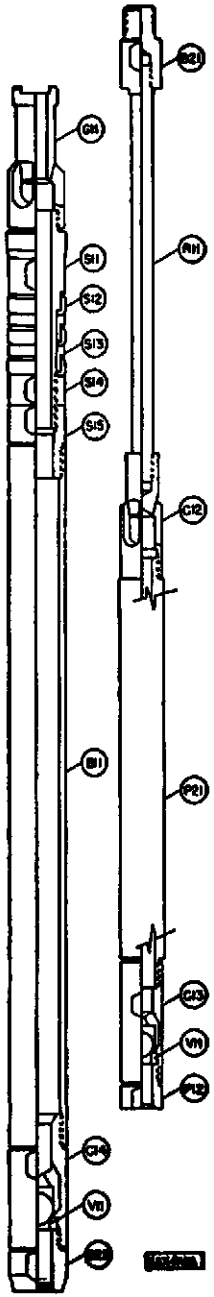
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]Specify barrel length in feet (meters). Standard lengths are: 8 ft (2.438m) through 30 ft (9.144m) in 2 ft (0.610m) increments.
[b]Specify nominal plunger length in feet (meters), and clearance (fit) in thousandths of an inch (hundredths of a millimeter).
[c]Specify total length of extension couplings in whole feet (thousandths of meters). Standard lengths are in increments of $^1/_2$ ft (0.152 m).
[d]A seat must be used between C12 and P21 if an optional F1A pin thread is present on P21 plunger, see component P21.
[e]See part number R11 for valve rod length.



RHT
Rod, Traveling Heavy Wall Barrel, Bottom Anchor Pump (See Note)

(1)	(2)	(3)	(4)	(5)	(6)
		Standard Pump Size			
		$2^3/_8 \times 1^1/_4$ *(60.3 × 31.8)*	$2^7/_8 \times 1^1/_2$ *(73.0 × 38.1)*	$2^7/_8 \times 1^3/_4$ *(73.0 × 44.5)*	$3^1/_2 \times 2^1/_4$ *(88.9 × 57.2)*
		Complete Pump Designation			
		20-125 RHT[a, b, c]	25-150 RHT[a, b, c]	25-175 RHT[a, b, c]	30-225 RHT[a, b, c]
Symbol	Description	Part Number			
B12	Barrel, Heavy Wall	B12-125[a]	B12-150[a]	B12-175[a]	B12-225[a]
C11	Cage, Top Open	C11-20	C11-25	C11-25	C11-30
C12	Cage, Top Plunger	C12-125	C12-150-25	C12-175	C12-225
C21	Connector, Upper Barrel	C21-20	C21-25	C21-25	C21-30
C31	Coupling, Extension	C31-125[c]	C31-150[c]	C31-175[c]	C31-225[c]
C32	Coupling, Pull Tube, Upper	C32-125	C32-150	C32-175	C32-225
C33	Coupling, Pull Tube, Lower	C33-125	C33-150-25	C33-175	C33-225
P11	Plug, Pull	P11-125	P11-150-25	P11-175	P11-225
P21	Plunger, One Piece	P21-125[b]	P21-150[b]	P21-175[b]	P21-225[b]
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
S16	Seating Cup Coupling	S16-20	S16-25	S16-25	S16-30
T11	Tube, Pull	T11-125[d]	T11-150[d]	T11-175[d]	T11-225[d]
V11	Valve, Ball and Seat				
	Traveling	V11-175	V11-225	V11-225	V11-250
	Standing	V11-125	V11-150	V11-175	V11-225

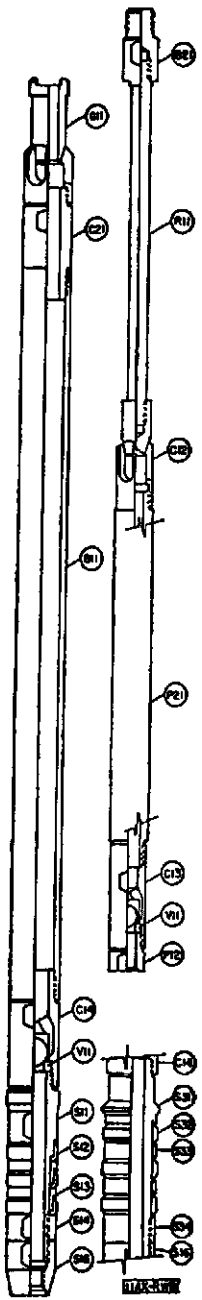
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]Specify barrel length in feet (meters). Standard lengths are: 8 ft (2.438m) through 30 ft (9.144m) in 2 ft (0.610m) increments.
[b]Specify nominal plunger length in feet (meters), and clearance (fit) in thousandths of an inch (hundredths of a millimeter).
[c]Specify total length of extension couplings in whole feet (thousandths of meters). Standard lengths are in increments of $^1/_2$ ft (0.152 m).
[d]See part number T11 for pull tube length.



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

(1)	(2)	(3)	(4)	(5)	(6)
		Standard Pump Size			
		$2^3/_8 \times 1^1/_4$ *(60.3 × 31.8)*	$2^7/_8 \times 1^1/_2$ *(60.3 × 38.1)*	$2^7/_8 \times 2$ *(73.0 × 50.8)*	$3^1/_2 \times 2^1/_4$ *(88.9 × 63.5)*
		Complete Pump Designation			
		20-125 RWAC[a, c]	20-150 RWAC[a, c]	25-200 RWAC[a, c]	30-250 RWAC[a, c]
Symbol	Description	Part Number			
B11	Barrel, Thin Wall	B11-125[a]	B11-150[a]	B11-200[a]	B11-250[a]
B21	Brushing, Valve Rod	B21-20	B21-20	B21-25	B21-30
B22	Brushing, 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[b]	P21-125[c]	P21-150[c]	P21-200[c]	P21-250[c]
R11	Rod, Valve	R11-20[d]	R11-20[d]	R11-25[d]	R11-30[d]
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 Brushing	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

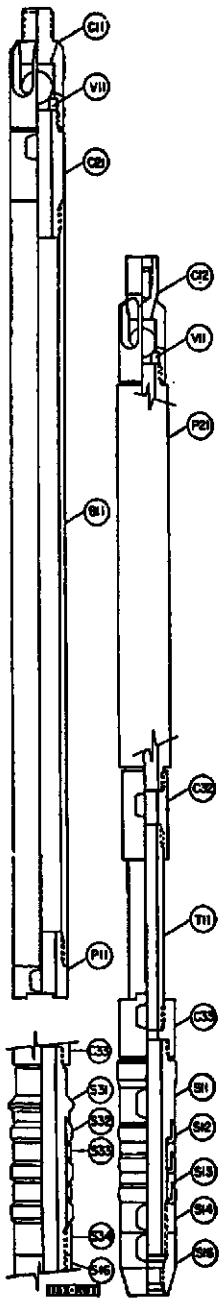
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]Specify barrel length in feet (meters). Standard lengths are: 8 ft (2.438m) through 30 ft (9.144m) in 2 ft (0.610m) increments.
[b]A seat must be used between C12 and P21 if an optional F1A pin thread is present on P21 plunger, see component P21.
[c]Specify nominal plunger length in feet (meters), and clearance (fit) in thousandths of an inch (hundredths of a millimeter).
[d]See part number R11 for valve rod length.



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

(1)	(2)	(3)	(4)	(5)	(6)	(7)
		Standard Pump Size				
		1.900 × 1¼ *(48.3 × 31.8)*	2⅜ × 1¼ *(60.3 × 31.8)*	2⅜ × 1½ *(60.3 × 38.1)*	2⅞ × 2 *(73.0 × 50.8)*	3½ × 2½ *(88.9 × 63.5)*
		Complete Pump Designation				
		15-125 RWBC[a, c]	20-125 RWBC[a, c]	20-150 RWBC[a, c]	25-200 RWBC[a, c]	30-250 RWBC[a, c]
Symbol	Description	Part Number				
B11	Barrel, Thin Wall	B11-125[a]	B11-125[a]	B11-150[a]	B11-200[a]	B11-250[a]
B21	Brushing, Valve Rod B21-15	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[b]	P21-125[c]	P21-125[c]	P21-150[c]	P21-200[c]	P21-250[c]
R11	Rod, Valve	R11-20[d]	R11-20[d]	R11-20[d]	R11-25[d]	R11-30[d]
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

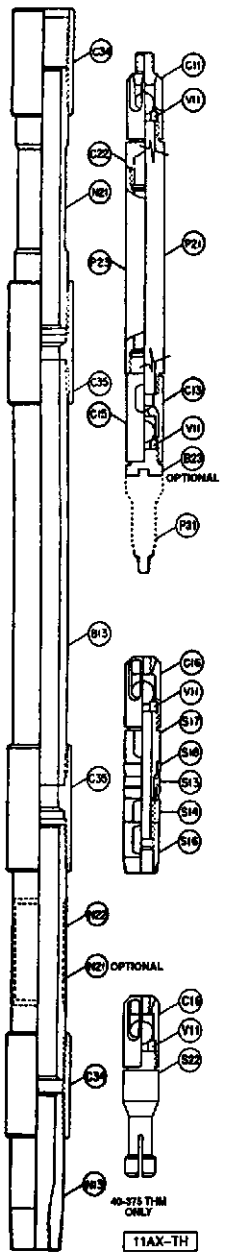
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]Specify barrel length in feet (meters). Standard lengths are: 8 ft (2.438m) through 30 ft (9.144m) in 2 ft (0.610m) increments.
[b]A seat must be used between C12 and P21 if an optional F1A pin thread is present on P21 plunger, see component P21.
[c]Specify nominal plunger length in feet (meters), and clearance (fit) in thousandths of an inch (hundredths of a millimeter).
[d]See part number R11 for valve rod length.



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

(1)	(2)	(3)	(4)	(5)	(6)	(7)
		Standard Pump Size				
		$1.900 \times 1^{1}/_{4}$ *(48.3 × 31.8)*	$2^{3}/_{8} \times 1^{1}/_{4}$ *(60.3 × 31.8)*	$2^{3}/_{8} \times 1^{1}/_{2}$ *(60.3 × 38.1)*	$2^{7}/_{8} \times 2$ *(73.0 × 50.8)*	$3^{1}/_{2} \times 2^{1}/_{2}$ *(88.9 × 63.5)*
		Complete Pump Designation				
		15-125 RWTC[a, b]	20-125 RWTC[a, b]	20-150 RWTC[a, b]	25-200 RWTC[a, b]	30-250 RWTC[a, b]
Symbol	Description	Part Number				
B11	Barrel, Thin Wall	B11-125[a]	B11-125[a]	B11-150[a]	B11-200[a]	B11-250[a]
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[b]	P21-125[b]	P21-150[b]	P21-200[b]	P21-250[b]
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[c]	T11-125[c]	T11-150[c]	T11-200[c]	T11-225[c]
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

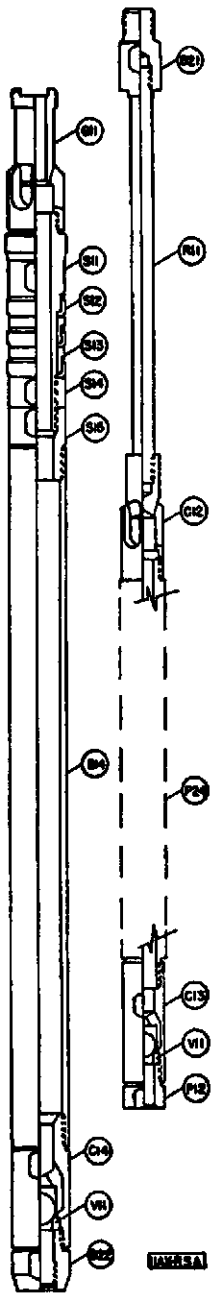
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]Specify barrel length in feet (meters). Standard lengths are: 8 ft (2.438m) through 30 ft (9.144m) in 2 ft (0.610m) increments.
[b]Specify nominal plunger length in feet (meters), and clearance (fit) in thousandths of an inch (hundredths of a millimeter).
[c]See part number T11 for valve rod length.



TH
Tubing, Heavy Wall Barrel Pump (See Note)

(1)	(2)	(3)	(4)	(5)	(6)
		Standard Pump Size			
		$2^3/_8 \times 1^3/_4$ *(60.3 × 44.5)*	$2^7/_8 \times 2^1/_4$ *(73.0 × 57.2)*	$3^1/_2 \times 2^3/_4$ *(88.9 × 69.9)*	$4^1/_2 \times 3^3/_4$ *(114.3 × 95.3)*
		Complete Pump Designation			
		20-175 THC[a, b, c]	25-225 THC[a, b, c]	30-275 THC[a, b, c]	40-375 THM[a, b, c, e]
Symbol	Description	Part Number			
B23	Bushing, Optional[d]	-------	-------	-------	B23-40
B13	Barrel, Heavy Wall	B13-175[a]	B13-225[a]	B13-275[a]	B13-375[a]
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
N13	Nipple, Seating	N13-20	N13-25	N13-30	N13-40
N21	Nipple, Extension, Upper	N21-20[c]	N21-25[c]	N21-30[c]	N21-40[c]
N22	Nipple, Extension, Lower	N22-20[c]	N22-25[c]	N22-30[c]	N22-40[c]
P21	Plunger, One Piece	P21-175[b]	P21-225[b]	P21-275[b]	P21-375[b]
P31	Puller, Standing Valve	P31-175	P31-225	P31-275	P31-375[e]
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	P23-175[b]	P23-225[b]	P23-275[b]	P23-375[b]

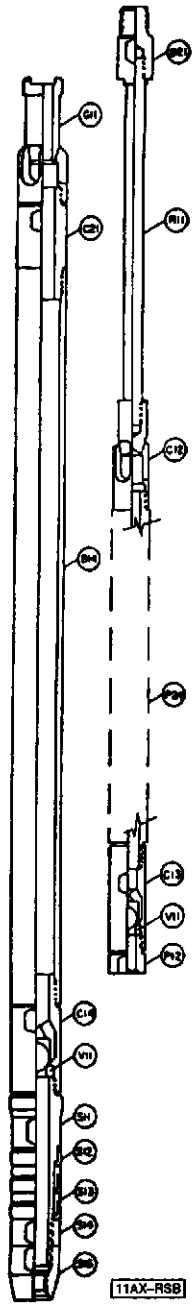
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]Specify barrel length in feet (meters). Standard lengths are: 6 ft (1.829m) through 16 ft (4.877m) in 1 ft (0.305m) increments. 18 ft (5.486m) through 30 ft (9.144m) in 2 ft (0.610m) increments.
[b]Specify nominal plunger length in feet (meters), and clearance (fit) in thousandths of an inch (hundredths of a millimeter).
[c]Specify total length of extensions (extension nipples) in feet (meters). Standard lengths are 2 and 3 ft (0.610 and 0.914 m).
[d]For $4^1/_2$ x $3^3/_4$ only use P31-275 Puller in place of P31-375 Puller.
[e]P31-275 optional with use of B23-40 Bushing.



RSA
Rod, Stationary Thin Wall Barrel, Top Anchor, Soft-Packed Plunger Pump (See Note)

(1)	(2)	(3)	(4)	(5)	(6)
		Standard Pump Size			
		$2^3/_8 \times 1^1/_4$ *(60.3 × 31.8)*	$2^3/_8 \times 1^1/_2$ *(60.3 × 38.1)*	$2^7/_8 \times 2$ *(73.0 × 50.8)*	$3^1/_2 \times 2^1/_2$ *(88.9 × 63.5)*
		Complete Pump Designation			
		20-125 RSAC[a, b]	20-150 RSAC[a, b]	25-200 RSAC[a, b]	30-250 RSAC[a, b]
Symbol	Description	Part Number			
B14	Barrel, Soft-Packed Rod Pump	B14-125[a]	B14-150[a]	B14-200[a]	B14-250[a]
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
P24	Plunger, Soft-Packed	P24-125[b]	P24-150[b]	P24-200[b]	P24-250[b]
R11	Rod, Valve	R11-20[c]	R11-20[c]	R11-25[c]	R11-30[c]
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

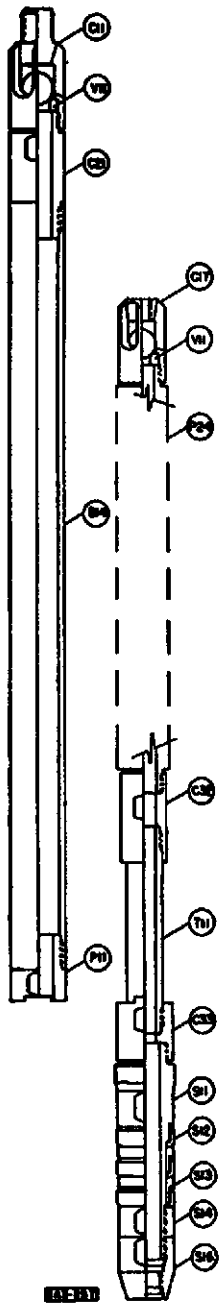
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]Specify barrel length in feet (meters). Standard lengths are: 8 ft (2.438m) through 30 ft (9.144m) in 2 ft (0.610m) increments.
[b]Specify nominal plunger length in nearest whole or half feet (thousandths of meters), and packing requirements. P24 cups of rings or combination, customer option.
[c]See part number R11 for valve rod length.



RSB
Rod, Stationary Thin Wall Barrel, Bottom Anchor, Soft-Packed Plunger Pump (See Note)

(1)	(2)	(3)	(4)	(5)	(6)
		Standard Pump Size			
		$2^3/_8 \times 1^1/_4$ *(60.3 × 31.8)*	$2^3/_8 \times 1^1/_2$ *(60.3 × 38.1)*	$2^7/_8 \times 2$ *(73.0 × 50.8)*	$3^1/_2 \times 2^1/_2$ *(88.9 × 63.5)*
		Complete Pump Designation			
		20-125 RSBC[a, b]	20-150 RSBC[a, b]	25-200 RSBC[a, b]	30-250 RSBC[a, b]
Symbol	Description	Part Number			
B14	Barrel, Soft-Packed Rod Pump	B14-125[a]	B14-150[a]	B14-200[a]	B14-250[a]
B21	Bushing, Valve Rod	B21-20	B21-20	B21-25	B21-30
C12	Cage, Top Plunger	B12-125	B12-150-20	B12-200	B12-250
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
C21	Connector, Upper Barrel	C21-20-125	C21-20	C21-25	C21-30
G11	Guide, Valve Rod	G11-20	G11-20	G11-25	G11-30
P12	Plug, Seat	P12-125	P12-150	P12-200	P12-250
P24	Plunger, Soft-Packed	P24-125[b]	P24-150[b]	P24-200[b]	P24-250[b]
R11	Rod, Valve	R11-20[c]	R11-20[c]	R11-25[c]	R11-30[c]
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
V11	Valve, Ball and Seat				
	Traveling	V11-125	V11-150	V11-200	V11-250
	Standing	V11-175	V11-175	V11-225	V11-250

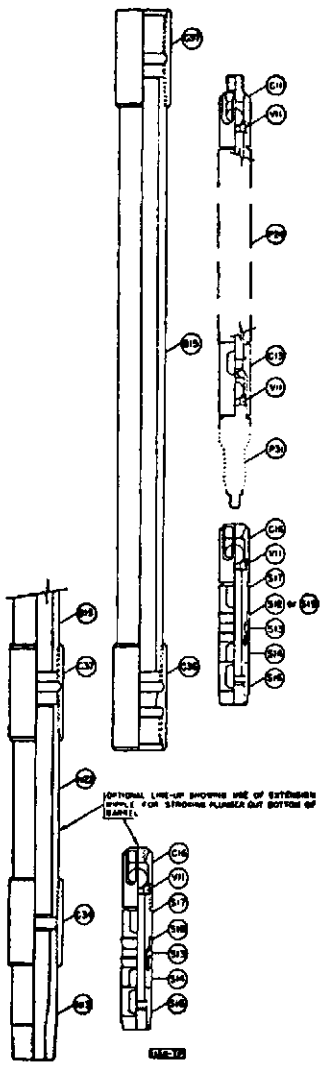
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]Specify barrel length in feet (meters). Standard lengths are: 8 ft (2.438m) through 30 ft (9.144m) in 2 ft (0.610m) increments.
[b]Specify nominal plunger length in nearest whole or half feet (thousandths of meters), and packing requirements. P24 cups of rings or combination, customer option.
[c]See part number R11 for valve rod length.



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

(1)	(2)	(3)	(4)	(5)	(6)
		Standard Pump Size			
		$2^3/_8 \times 1^1/_4$ *(60.3 × 31.8)*	$2^3/_8 \times 1^1/_2$ *(60.3 × 38.1)*	$2^7/_8 \times 2$ *(73.0 × 50.8)*	$3^1/_2 \times 2^1/_2$ *(88.9 × 63.5)*
		Complete Pump Designation			
		20-125 RSTC[a, b]	20-150 RSTC[a, b]	25-200 RSTC[a, b]	30-250 RSTC[a, b]
Symbol	Description	Part Number			
B14	Barrel, Soft-Packed Rod Pump	B14-125[a]	B14-150[a]	B14-200[a]	B14-250[a]
C11	Cage, Top Open	C11-20	C11-25	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[b]	P24-150[b]	P24-200[b]	P24-250[b]
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[c]	T11-150[c]	T11-200[c]	T11-225[c]
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).
[a]Specify barrel length in feet (meters). Standard lengths are: 8 ft (2.438m) through 30 ft (9.144m) in 2 ft (0.610m) increments.
[b]Specify nominal plunger length in nearest whole or half feet (thousandths of meters), and packing requirements. P24 cups of rings or combination, customer option.
[c]See part number T11 for pull tube length.



TP
Tubing, Heavy Wall Barrel, Soft-Packed Plunger Pump (See Note)

(1)	(2)	(3)	(4)	(5)
		Standard Pump Size		
		$2^3/_8 \times 1^{25}/_{32}$ *(60.3 × 45.2)*	$2^7/_8 \times 2^1/_4$ *(73.0 × 57.2)*	$3^1/_2 \times 2^3/_4$ *(88.9 × 69.9)*
		Complete Pump Designation		
		20-178 TPC[a, b, c]	25-225 TPC[a, b, c]	30-275 TPC[a, b, c]
Symbol	Description	Part Number		
B15	Barrel, Heavy Wall	B15-178[a]	B15-225[a]	B15-275[a]
C11	Cage, Top Open	C11-20	C11-25	C11-30
C13	Cage, Closed Plunger	C13-175	C13-225	C13-275
C16	Cage, Standing Valve	C16-175	C16-225	C16-275
C36	Coupling, Barrel Lower	C36-20	C36-25	C36-30
C37	Coupling, Barrel	C37-20	C37-25	C37-30
P24	Plunger, Soft-Packed	P24-178[b]	P24-225[b]	P24-275[b]
P31	Puller, Standing Valve	P31-175	P31-225	P31-275
S12	Seating Cup (Type HR)	S12-20		
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
S19	Seating Cup (Type HR)		S19-25	S19-30
V11	Valve, Ball and Seat			
	Traveling	V11-175	V11-225	V11-250
	Standing	V11-175	V11-225	V11-250
	For optional line-up using extension nipple at bottom of barrel, delete part numbers C36 and S12 or S19, and add the following:			
C34	Coupling, Tubing	C34-20	C34-25	C34-30
N13	Nipple, Seating	N13-20	N13-25	N13-30
N22	Nipple, Extension, Lower	N22-20[c]	N22-25[c]	N22-30[c]
S18	Seating Cup (Type HR)	S18-20	S18-25	S18-30

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

[a]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.

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

[c]Specify total length of extensions (extension nipples) in feet (meters). Standard lengths are 2 and 3 ft (0.610 and 0.914m).

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. (6.250 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

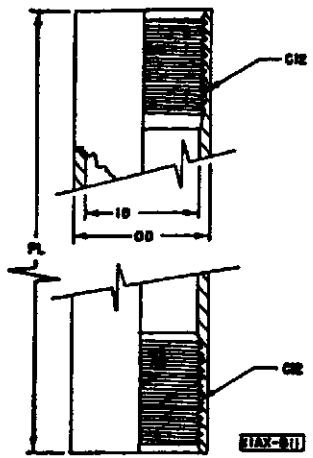
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Pump Bore Size, in. *(mm)*									Tubing Size, in. *(mm)*				
Designation	1¼ *(31.8)* 125	1½ *(38.1)* 150	1¾ *(44.5)* 175	1²⁵/₃₂ *(45.2)* 178	2 *(50.8)* 200	2¼ *(57.2)* 225	2½ *(63.5)* 250	2¾ *(69.9)* 275	3¾ *(95.3)* 375	1.900 *(48.3)* 15	2⅜ *(60.3)* 20	2⅞ *(73.0)* 25	3½ *(88.9)* 30	4½ *(114.3)* 40
B														
1. Barrel														
1. Thin Wall	B11-125[a]	B11-150[a]	-------	-------	B11-200[a]	-------	B11-250[a]	-------	-------	-------	-------	-------	-------	-------
2. Heavy Wall, Rod	B12-125[a]	B12-150[a]	B12-175[a]	-------	-------	B12-225[a]	-------	-------	-------	-------	-------	-------	-------	-------
3. Heavy Wall, Tubing	-------	-------	B13-175[a]	-------	-------	B13-225[a]	-------	B13-275	B13-375	-------	-------	-------	-------	-------
4. Thin Wall, S.P.[e]	B14-125[a]	B14-150[a]	-------	-------	B14-200[a]	-------	B14-250[a]	-------	-------	-------	-------	-------	-------	-------
5. Heavy Wall, S.P.[e]	-------	-------	-------	B15-175	-------	B15-225	-------	B15-275	-------	-------	-------	-------	-------	-------
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
C														
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	C1 3-125	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.[e]	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[c]	C31-150[c]	C31-175[c]	-------	-------	C31-225[c]	-------	-------	-------	-------	-------	-------	-------	-------
	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
2. Pull Tube, Up.	C32-125	C32-150	C32-175	-------	C32-200	C32-225	C32-250	-------	-------	-------	-------	-------	-------	-------
3. Pull Tube, Lr.	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
6. Barrel Lower, S.P.[e]	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	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	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	N21-20[c]	N21-25[c]	N21-30[c]	N21-40[c]
2. Lower	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	N22-20[c]	N22-25[c]	N22-30[c]	N22-40[c]

(Continued next page, footnotes at end of table)

Master Part Numbering System (Continued)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Pump Bore Size, in. *(mm)*									Tubing Size, in. *(mm)*				
Designation	1¼ *(31.8)* 125	1½ *(38.1)* 150	1¾ *(44.5)* 175	1 25/32 *(45.2)* 175	2 *(50.8)* 200	2¼ *(57.2)* 225	2½ *(63.5)* 250	2¾ *(69.9)* 275	3¾ *(95.3)* 375	1.900 *(48.3)* 15	2⅜ *(60.3)* 20	2⅞ *(73.0)* 25	3½ *(88.9)* 30	4½ *(114.3)* 40
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[b]	P21-150[b]	P21-175[b]	-------	P21-200[b]	P21-225[b]	P21-250[b]	P21-275[b]	P21-375[b]	-------	-------	-------	-------	-------
2. Assembled Pin	P22-125[b]	P22-150[b]	P22-175[b]	-------	P22-200[b]	P22-225[b]	P22-250[b]	P22-275[b]	-------	-------	-------	-------	-------	-------
3. One Piece, Box	-------	-------	P23-175[b]	-------	-------	P23-225[b]	-------	P23-275[b]	P23-375[b]	-------	-------	-------	-------	-------
4. Soft-packed	P24-125[b]	P24-150[b]	-------	P24-178[b]	P24-200[b]	P24-225[b]	P24-250[b]	P24-275[b]	-------	-------	-------	-------	-------	-------
3. Puller														
1. Standing Valve	-------	-------	P31-175	-------	-------	P31-225	-------	P31-275	P31-375	-------	-------	-------	-------	-------
R														
1. Rod														
1. Valve	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	R11-20[d]	R11-25[d]	R11-30[d]	-------
S														
1. Seating Assy., Type HR, Cup														
1. Mandrel, Rod	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	S11-20	S11-25	S11-30	-------
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.[e]	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	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[d]	T11-150[d]	T11-175[d]	-------	T11-200[d]	T11-225[d]	-------	-------	-------	-------	-------	-------	-------	------
V														
1. Valve														
1. Ball and Seat	V11-125	V11-150	V11-175	-------	V11-200	V11-225	V11-250	V11-250	V11-350	-------	-------	-------	-------	-------

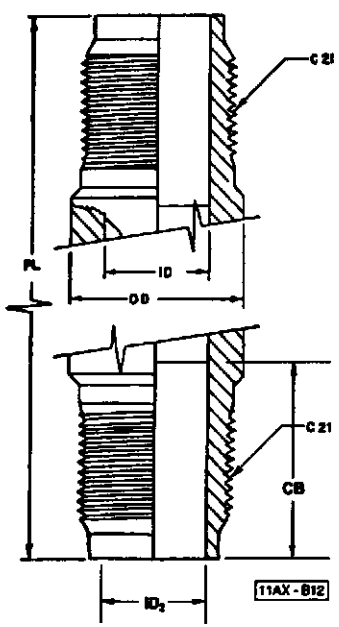
[a]Length of barrel
[b]Length of plunger
[c]Length of extension couplings or nipples.
[d]Length of valve rod or pull tube.
[e]S.P. — For soft-packed plunger pump.



B11
Barrel, Thin Wall (See Note)

(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	B11-125[a]	B11-150[a]	B11-200[a]	B11-250[a]
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[b] *(+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)*[a]				

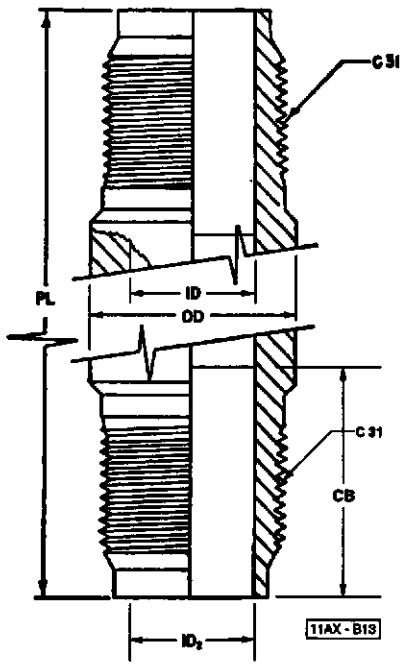
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]Specify barrel length (PL). Standard lengths are: 8 ft (2.438m) through 30 ft (9.144m) in 2 ft (0.610m) increments.
[b]ID tolerance to be +0.300/–0.000 up to 8 in. (+7.62/–0.00 up to 203.2mm) from each end.



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

(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	B12-125[a]	B12-150[a]	B12-175[a]	B12-225[a]
C21	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 /–0.000 *(+25.40/–0.00)*	1.500 *(38.10)*	1.500 *(38.10)*	1.500 *(38.10)*	1.500 *(38.10)*
ID_1 +0.002 /–0.000[b] *(+0.05/–0.00)*	1.250 *(31.75)*	1.500 *(38.10)*	1.750 *(44.45)*	2.250 *(57.15)*
ID_2 ±0.015 *(±0.38)*	1.275 *(32.39)*	1.525 *(38.74)*	1.775 *(45.09)*	2.275 *(57.79)*
OD max./min.	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)*[a]				

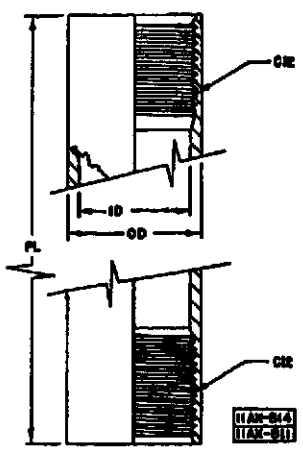
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]Specify barrel length (PL). Standard lengths are: 8 ft (2.438m) through 30 ft (9.144m) in 2 ft (0.610m) increments.
[b]ID tolerance to be +0.300/–0.000 up to 8 in. (+7.62/–0.00 up to 203.2mm) from each end.



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

(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	B13-175[a]	B13-225[a]	B13-275[a]	B13-375[a]
C31	2.2380-11½ *(56.845-11½)*	2.7380-11½ *(69.545-11½)*	3.2380-11½ *(82.245-11½)*	4.2380-11½ *(107.645-11½)*
ID +0.002/–0.000[b] *(+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/–0.000 *(+25.40/–0.00)*	1.500 *(38.10)*	1.500 *(38.10)*	1.500 *(38.10)*	2.250 *(63.50)*
ID_2 ±0.015 *(±0.38)*	1.775 *(45.09)*	2.275 *(57.79)*	2.775 *(70.49)*	3.775 *(95.89)*

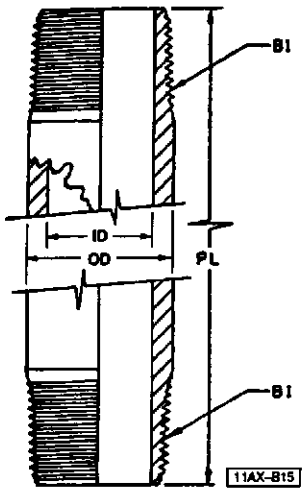
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]Specify barrel length (PL). Standard lengths are: 8 ft (2.438m) through 30 ft (9.144m) in 2 ft (0.610m) increments.
[b]ID tolerance to be +0.300/–0.000 up to 8 in. (+7.62/–0.00 up tp 203.2mm) from each end.



B14
Barrel, Heavy Wall (Soft-Packed Rod Pump) (See Note)

(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	B14-125[a]	B14-150[a]	B14-200[a]	B14-250[a]
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[b] *(+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)* [a]				

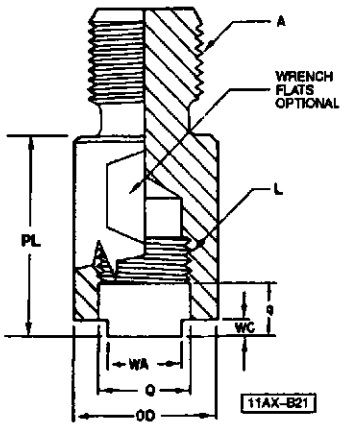
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]Specify barrel length (PL). Standard lengths are: 8 ft (2.438m) through 30 ft (9.144m) in 2 ft (0.610m) increments.



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

(1)	(2)	(3)	(4)
Dimensional Symbol	Part Number		
	B15-178[a]	B15-225[a]	B15-275[a]
B1	178-11½	225-11½	275-11½
ID +0.0062/–0.0022 *(+0.16/–0.06)*	1.7812 *(45.24)*	2.2500 *(57.15)*	2.7500 *(60.85)*
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)* [a]			

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

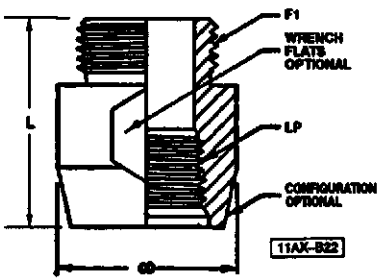


B21
Bushing Valve Rod (See Note)

(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	B21-15	B21-20	B21-25	B21-30
A[a]	⅝ *(15.9)*	¾ *(19.1)*	¾ *(19.1)*	¾ *(19.1)*
L nom.[b]	⅜ *(9.6)*	⅜ *(9.6)*	½ *(12.7)*	¾ *(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 ± 0.031 *(±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)*	1¾ *(31.8)*	1½ *(38.1)*	1⅝ *(41.3)*	1⅝ *(41.3)*
PL ± 1.000 *(±25.40)*	2.750 *(69.85)*	2.750 *(69.85)*	2.750 *(69.85)*	2.750 *(69.85)*
WA	0.562 *(14.27)* +0.000/–0.031 *(+0.00/–0.79)*	0.688 *(17.48)* ± 0.031 *(±0.79)*	0.750 *(19.05)* ± 0.031 *(±0.79)*	0.875 *(22.23)* ± 0.031 *(±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).
[a]Sucker rod thread. See API Spec 11B for details.
[b]Modified line pipe thread. See Table L for details.

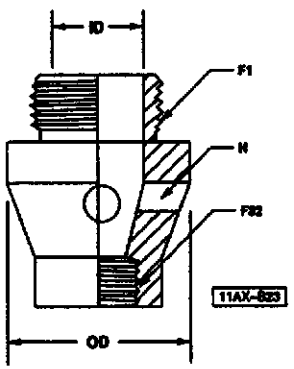
B22
Bushing, Seat, Barrel Cage (See Note)



(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	B22-15	B22-20	B22-25	B22-30
F1	1.2500-15 *(31.750-14)*	1.4704-14 *(37.348-14)*	1.8024-14 *(45.781-14)*	2.1095-11½ *(53.581-11½)*
LP[a]	¾ nom. *(19.1)*	1 nom. *(25.4)*	1¼ nom. *(31.8)*	1½ 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)*

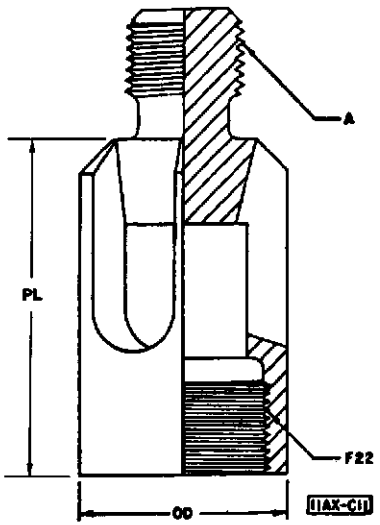
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]Line pipe thread. See API Specification 5B for details.

B23
Bushing, Cage to Puller (See Note)



(1)	(2)
Dimensional Symbol	Part Number
	B23-40
F1	3.175-11½ *(80.645-11½)*
F32	2.1095-11½ *(53.581-11½)*
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)*

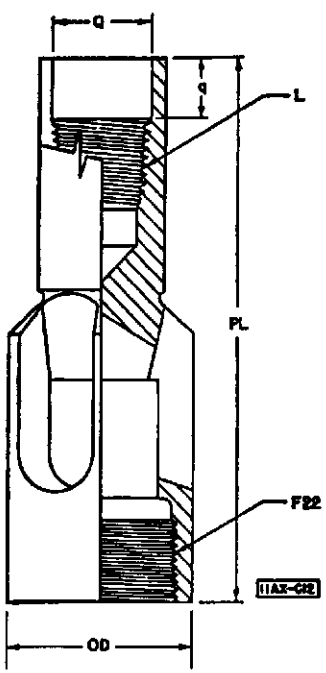
Note: All dimensions in inches (followed by equivalent in millimeters).



C11
Cage, Top Open (See Note)

(1)	(2)	(3)	(4)	(5)	(6)
Dimensional Symbol	Part Number				
	C11-15	C-11-20	C11-25	C11-30	C11-40
A[a]	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 1/2 *(53.581-11 1/2)*	3.1715-11 1/2 *(80.556-11 1/2)*
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.
[a]Sucker rod thread. See API Specification 11B for details.

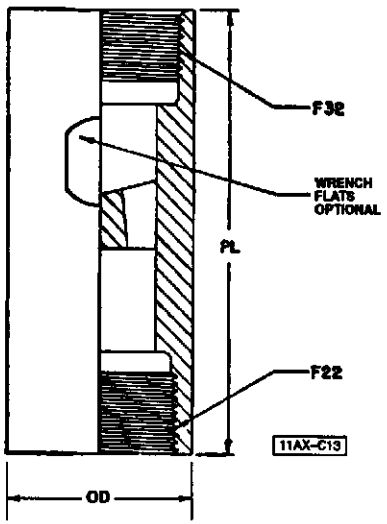


C12
Cage, Top Plunger (See Note)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dimensional Symbol	Part Number						
	C12-125	C12-150-20	C12-150-25	C12-175	C12-200	C12-225	C12-250
F22	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 *(45-78114)*	2.1095-11 1/2 *(53.581-11 1/2)*
L nom.[a]	3/8 *(9.6)*	3/8 *(9.6)*	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)*	0.877 *(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)*
PL ± 0.031 *(±0.79)*	4 1/2 *(114.3)*	5 *(127.0)*	5 *(127.0)*	5 3/8 *(136.5)*	5 3/8 *(136.5)*	6 1/8 *(155.6)*	6 3/8 *(161.9)*
OD ± 0.031 *(±0.79)*	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.
[a]Modified line pine thread. See Table L for details.

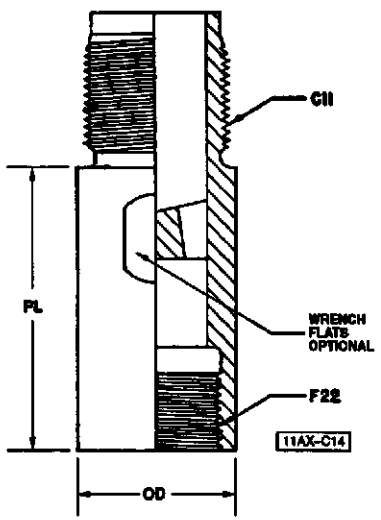
Note to figure: Top portion of cage may be reduced (as shown) or not at manufacturer's option; however, if it is reduced it shall be of such dimensions to permit free entry into the bore of the upper barrel connector (C21) and the top anchor seating cup bushing (S15).



C13
Cage, Closed, Pin Plunger (See Note)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dimensional Symbol	Part Number							
	C13-125	C13-150	C13-175	C13-200	C13-225	C13-250	C13-250	C13-375
F22	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)*	2.1095-11½ *(53.581-11½)*	2.1095-11½ *(53.581-11½)*	3.1715-11½ *(80.556-11½)*
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)*	2.1095-11½ *(53.581-11½)*	2.1095-11½ *(53.581-11½)*	3.1715-11½ *(80.556-11½)*
PL ±0.062 *(±1.57)*	3½ *(33.9)*	4⅛ *(104.8)*	4¾ *(120.7)*	5 *(127.0)*	5¼ *(133.4)*	5½ *(139.7)*	5½ *(139.7)*	8.000 *(203.2)*
OD ±0.031 *(±0.79)*	1.2000 *(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)*

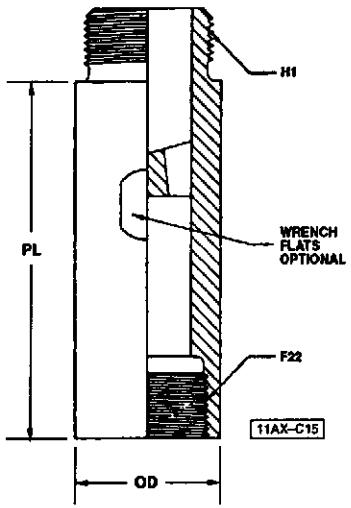
Note 1: All dimensions in inches (followed by equivalent in millimeters).
Note 2: Dimensions and configuration of ball chamber shall be such as to provide adequate ball clearance and fluid passage.



C14
Cage, Closed Barrel (See Note)

(1)	(2)	(3)	(4)	(5)	(6)
Dimensional Symbol	Part Number				
	C14-15	C-14-20-125	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)*	2.1095-11½ (53.581-11½)
OD ±0.010 *(±25.40)*	1.440 *(36.58)*	1.750 *(44.45)*	1.750 *(44.45)*	2.250 *(57.15)*	2.750 *(69.85)*
PL ±1.000 *(±0.25)*	3.750 *(95.25)*	3.750 *(95.25)*	3.750 *(95.25)*	4.000 *(101.60)*	4.500 *(114.30)*

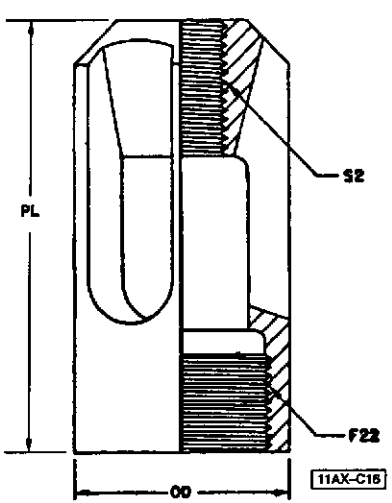
Note 1: All dimensions in inches (followed by equivalent in millimeters).
Note 2: Dimensions and configuration of ball chamber shall be such as to provide adequate ball clearance and fluid passage.



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)*	2.3755-11½ *(60.338-11½)*	3.3825-11½ *(85.916-11½)*
F22	1.4704-14 *(37.348-14)*	1.8024-14 *(45.781-14)*	2.1095-11½ *(53.581-11½)*	3.1715-11½ *(80.556-11½)*
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)*

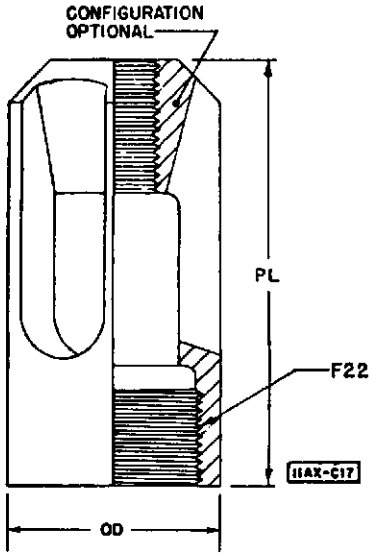
Note 1: All dimensions in inches (followed by equivalent in millimeters).
Note 2: Dimensions and configuration of ball chamber shall be such as to provide adequate ball clearance and fluid passage.



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)*	2.1095-11½ *(53.581-11½)*	3.1715-11½ *(80.556-11½)*
S2[a]	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	2.168± 0.020	2.688/2.600	3.710/3.600
	(42.37±0.51)	*(55.07±0.51)*	*(68.28/66.04)*	*(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)*

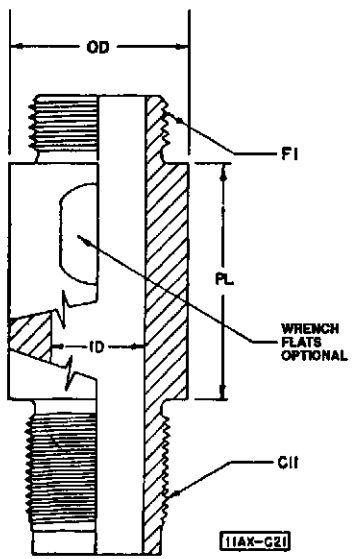
Note 1: All dimensions in inches (followed by equivalent in millimeters).
Note 2: Dimensions and configuration of ball chamber shall be such as to provide adequate clearance and fluid passage.
[a]See Table S for thread dimensions.



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)*	2.1095-11½ *(53.581-11½)*
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)*	2⅝ *(66.7)*	2¾ *(69.9)*	3⅜ *(85.7)*	4¼ *(108.0)*

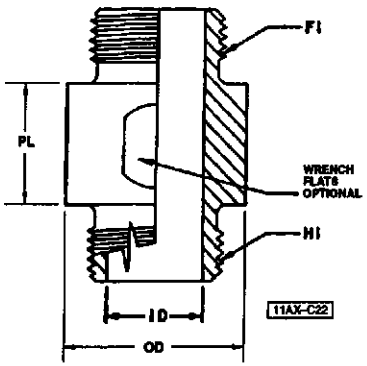
Note: All dimensions in inches (followed by equivalent in millimeters).



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)*	2.1095-11½ *(53.581-11½)*
ID	0.938±0.015 *(23.83± 0.38)*	1.000±0.062 *(25.40± 1.57)*	1.000±0.062 *(25.40± 1.57)*	1.250±0.062 *(31.75± 1.57)*	1.500±.062 *(38.10± 1.57)*
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)*	2½ *(63.5)*	2½ *(63.5)*	2½ *(63.5)*	3 *(76.2)*	3 *(76.2)*

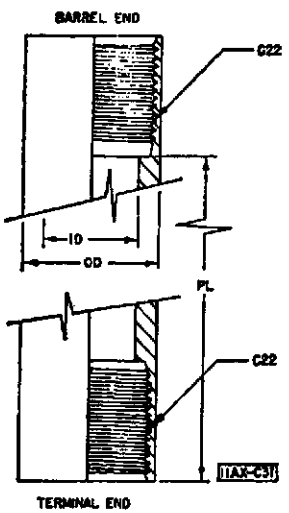
Note: All dimensions in inches (followed by equivalent in millimeters).



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)*	2.1095-11½ *(53.581-11½)*	3.1715-11½ *(80.556-11½)*
H1	1.5084-14 *(38.313-14)*	1.9864-14 *(50.455-14)*	2.3755-11½ *(60.338-11½)*	3.3825-11½ *(85.916-11½)*
ID	1.000 ±0.062 *(25.40 ±1.57)*	1.250 ±0.062 *(31.75 ±1.57)*	1.500 ±0.062 *(38.10 ±1.57)*	2.312 ±0.250 *(58.72 ±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)*

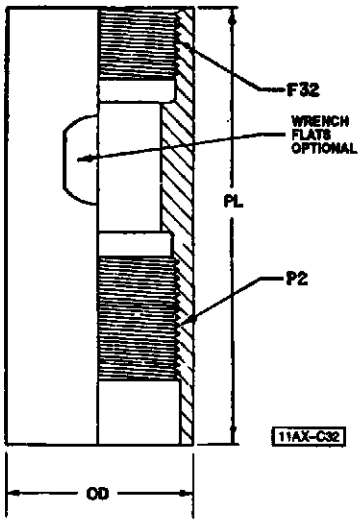
Note: All dimensions in inches (followed by equivalent in millimeters).



C31
Coupling, Extension (See Note)

(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	C31-125[a]	C31-150[a]	C31-175[a]	C31-225[a]
C22[b]	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[c]	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)*	1.312 *(33.32)*	1.593 *(40.46)*	1.812 *(46.02)*	2.312 (58.72)
OD +0.010/–0.030 *(+0.25/–0.76)*	1.750 *(44.45)*	2.260/2.063 *(57.40/52.40)*	2.250 *(57.15)*	2.750 *(69.85)*
PL ± 0.250 *(±6.35)* [a]	Specify length (PL) in inches (millimeters)			

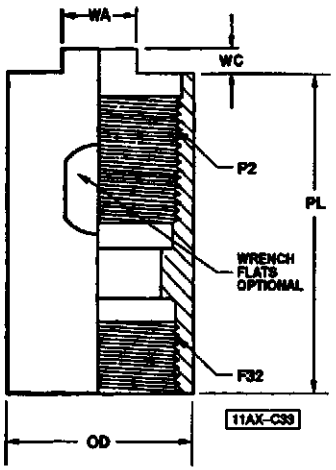
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]Standard coupling lengths are 6, 12, 18, 24, 36 in., etc. (152.4, 304.8, 457.2, 609.6, 914.4 mm, etc.).
[b]Barrel end.
[c]Terminal end.



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 ½ *(53.581-11 ½)*
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 3/16 *(106.4)*	4 3/8 *(111.1)*	5 3/8 *(136.5)*	5 3/8 *(136.5)*

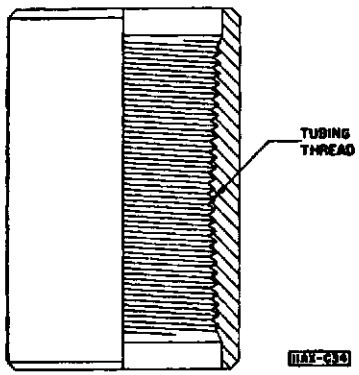
Note: All dimensions in inches (followed by equivalent in millimeters).



C33
Coupling, Pull Tube, Lower (See Note)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dimensional Symbol	Part Number						
	C33-125-14	C33-125	C33-150-20	C33-150-25	C33-175	C33-200	C33-225[a]
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)*	2.1095-11½ *(53.581-11½)*
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 ±0.031 *(±0.79)*	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)*

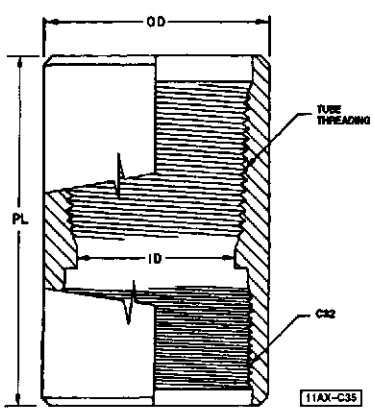
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]Used on 2¼ in. (57.2 mm) and 2½ in. (63.5 mm) bore pumps.



C34
Coupling, Tubing (See Notes)

(1)	(2)	(3)	(4)	(5)	(6)
Dimensional Symbol	Part Number				
	C34-15[b]	C34-20	C34-25	C34-30	C34-40
Tubing Thread[a]	1.900-10IJ *(48.3-10IJ)*	$2^{3}/_{8}$-8EU *(60.3-8EU)*	$2^{7}/_{8}$-8EU *(73.0-8EU)*	$3^{1}/_{2}$-8EU *(88.9-8EU)*	$4^{1}/_{2}$-8EU *(114.3-8EU)*

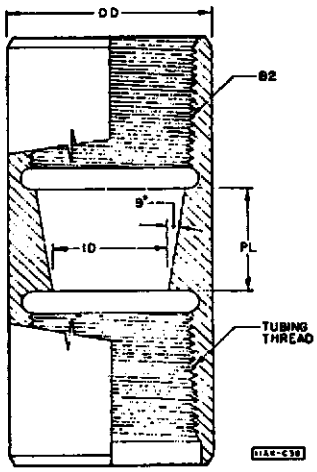
Note 1: All dimensions in inches (followed by equivalent in millimeters).
Note 2: See API Specification 5CT for dimensions.
[a]See API Specification 5B for thread details.
[b]OD of C34-15 coupling shall be 2.110 in (53.6 mm).



C35
Coupling, Barrel (See Note)

(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	C35-20	C35-25	C35-30	C35-40
Tubing Thread[a]	$2^{3}/_{8}$-8EU *(60.3-8EU)*	$2^{7}/_{8}$-8EU *(73.0-8EU)*	$3^{1}/_{2}$-8EU *(88.9-8EU)*	$4^{1}/_{2}$-8EU *(114.3-8EU)*
C32	2.2380-$11^{1}/_{2}$ *(56.845-$11^{1}/_{2}$)*	2.7380-$11^{1}/_{2}$ *(69.545-$11^{1}/_{2}$)*	3.2380-$11^{1}/_{2}$ *(82.245-$11^{1}/_{2}$)*	4.2380-$11^{1}/_{2}$ *(107.645-$11^{1}/_{2}$)*
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)	$3^{5}/_{8}$ (92.1)	$4^{1}/_{2}$ (114.3)	5.563 *(141.30)*
PL ±1.000 *(±25.40)*	5.000 *(127.00)*	5.250 *(133.35)*	5.500 *(139.70)*	6.500 *(165.10)*

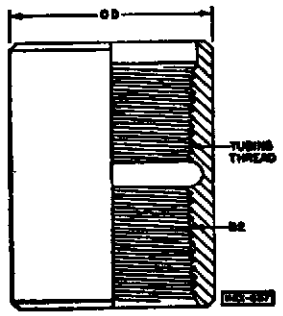
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]See API Specification 5B for tubing thread details.



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[a]	2 3/8-8EU *(60.3-8EU)*	2 7/8-8EU *(73.0-8EU)*	3 1/2-8EU *(88.9-8EU)*
B2	178-11 1/2	225-11 1/2	275-11 1/2
ID ±0.020 *(±0.51)*	1.391 *(35.33)*	1.852 *(47.04)*	2.312 *(58.72)*
OD ±0.031 *(±0.79)*	3 *(76.2)*	3 5/8 *(92.1)*	4 1/2 *(114.3)*
PL ±0.062 *(±1.57)*	1 *(25.4)*	1 1/8 *(28.6)*	1 1/4 *(31.8)*

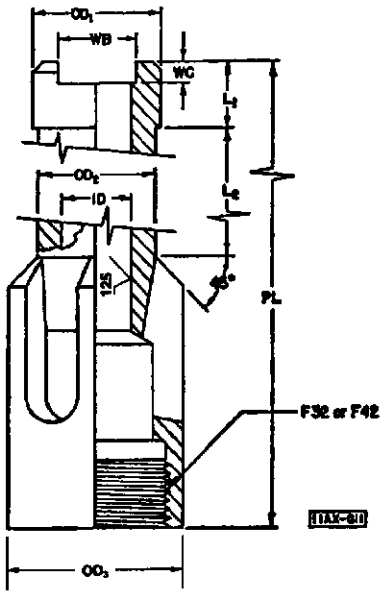
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]See API Specification 5B for tubing thread details.



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[a]	2 3/8-8EU *(60.3-8EU)*	2 7/8-8EU *(73.0-8EU)*	3 1/2-8EU *(88.9-8EU)*
B2	178-11 1/2	225-11 1/2	275-11 1/2
OD ± 0.062 *(±1.57)*	3 *(76.2)*	3 5/8 *(92.1)*	4 1/2 *(114.3)*

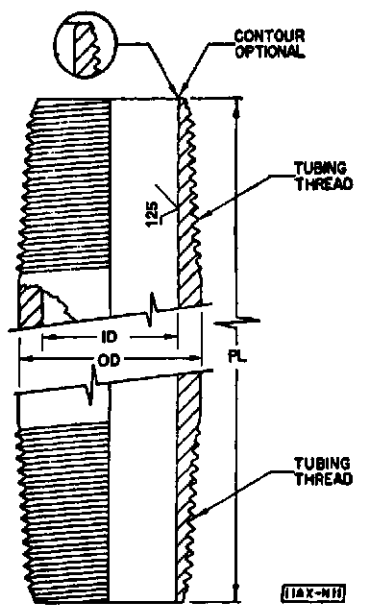
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]See API Specification 5B for tubing thread details.



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)*	2.1095-11½ *(53.581-11½)*
ID ±0.062 *(±1.57)*	0.766 *(19.46)*	0.766 *(19.46)*	0.953 *(24.21)*	1.141 *(28.98)*
L_1 ±0.031 *(±0.79)*	¾ *(19.1)*	¾ *(19.1)*	¾ *(19.1)*	¾ *(19.1)*
L_2 +0.062/–0.000 *(+1.57/–0.00)*	2⅛ *(54.0)*	2⅛ *(54.0)*	2⅜ *(60.3)*	2½ *(63.5)*
OD_1 ±0.005 *(± 0.13)*	1.250 *(31.75)*	1.500 *(38.10)*	1.625 *(41.28)*	1.625 *(41.28)*
OD_2 +0.000/–0.031 *(+0.00/–0.79)*	1⅛ *(28.6)*	1⅜ *(34.9)*	1½ *(38.1)*	1½ *(38.1)*
OD_3 ±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 +0.031/–0.000 *(+0.79/–0.00)*	0.250 *(6.35)*	0.250 *(6.35)*	0.250 *(6.35)*	0.250 *(6.35)*
PL ±0.031 *(±0.79)*	5½ *(139.7)*	5½ *(139.7)*	6 *(152.4)*	6¼ *(158.8)*

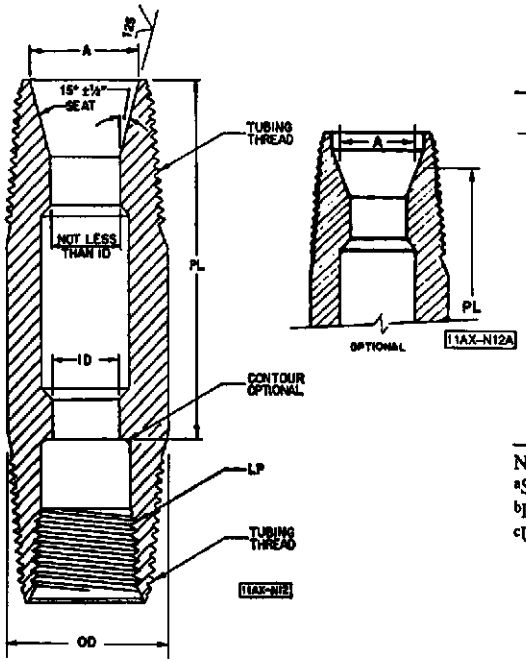
Note: All dimensions in inches (followed by equivalent in millimeters).



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[a]	1.900-10IJ[b] *(48.3-10IJ)*	2⅜-8EU *(60.3-8EU)*	2⅞-8EU *(73.0-8EU)*	3½-8EU *(88.9-8EU)*
ID +0.010/–0.000 *(+0.25/–0.00)*	1.460 *(37.03)*	1.780 *(43.21)*	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/–0.000 *(+1.57/–0.00)*	2.094 *(53.19)*	2.594 *(65.89)*	3.094 *(78.59)*	3.750 *(95.25)*

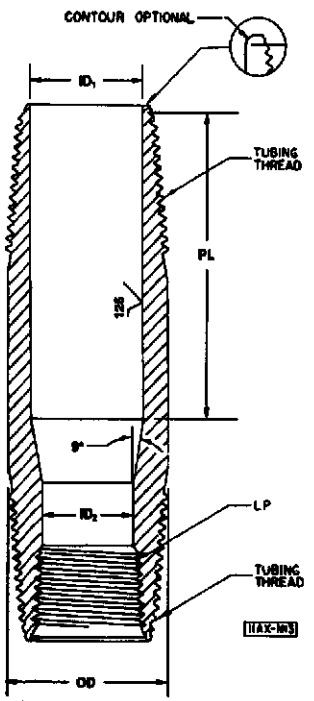
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]See API Specification 5B for tubing thread details.
[b]Upper connection may be 1.900-10IJ *(48.3-10IJ)* box thread, thus eliminating need for C34-15 coupling.



N12
Nipple, Seating, Mechanical Bottom Lock (See Note)

(1)	(2)	(3)	(4)	(5)	(6)
Dimensional Symbol	Part Number				
	N12-15	N12-20	N12-25	N12-30	N12-40
Tubing Thread[a]	1.900-10IJ[c] *(48.3-10IJ)*	2⅜-8EU *(60.3-8EU)*	2⅞-8EU *(73.0-8EU)*	3½-8EU *(88.9-8EU)*	4½-8EU *(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)*	6.6 *(156.75)*	6.188 *(157.18)*
LP nom.[b]	1 *(25.4)*	1½ *(38.1)*	2 *(50.8)*	2½ *(63.5)*	3 *(76.2)*
OD +0.062/–0.000 *(+1.57/–0.00)*	2.094 *(53.19)*	2.594 *(65.89)*	3.094 *(78.59)*	3.750 *(95.25)*	4.750 *(120.65)*

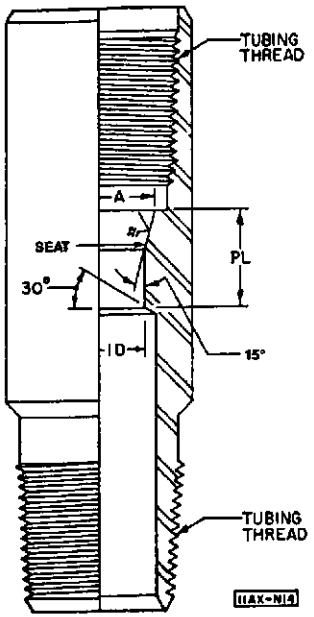
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]See API Specification 5B for tubing thread details.
[b]Line pipe threads. See API Specification 5B for details.
[c]Upper connection may be 1.900-10IJ *(48.3-10IJ)* box thread, thus eliminating need for C34-15 coupling.



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[a]	2⅜-8EU *(60.3-8EU)*	2⅞-8EU *(73.0-8EU)*	3½-8EU *(88.9-8EU)*
ID_1 +0.010/–0.000 *(+0.25/–0.00)*	1.710 *(43.43)*	2.210 *(56.13)*	2.710 *(68.83)*
ID_2 +0.040/–0.000 *(+1.02/–0.00)*	1.371 *(34.82)*	1.832 *(46.53)*	2.292 *(58.22)*
PL ±⅜ *(±9.5)*	5¼ *(133.4)*	5¾ *(146.1)*	5½ *(139.7)*
OD +0.062/–0.000 *(+1.57/–0.00)*	2.594 *(65.89)*	3.094 *(78.59)*	3.750 *(95.25)*
LP nom.[b]	1½ *(38.1)*	2 *(50.8)*	2 *(50.8)*

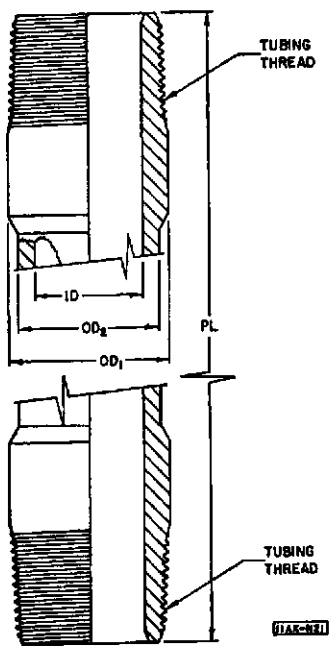
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]See API Specification 5B for tubing thread details.
[b]Line pipe thread. See API Specification 5B for details.



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

(1)	(2)	(3)	(4)
Dimensional Symbol	Part Number		
	N14-20	N14-25	N14-30
Tubing Thread[a]	2⅜-8EU *(60.3-8EU)*	2⅞-8EU *(73.0-8EU)*	3½-8EU *(88.9-8EU)*
A ±0.002 *(±0.05)*	1.875 *(47.63)*	2.344 *(59.54)*	2.844 *(72.24)*
ID +0.010/–0.000 *(+0.25/–0.00)*	1.780 *(45.21)*	2.280 *(57.91)*	2.780 *(70.61)*
PL +0.000/–0.005 *(+0.00/–0.13)*	0.973 *(24.71)*	0.918 *(23.32)*	0.918 *(23.32)*

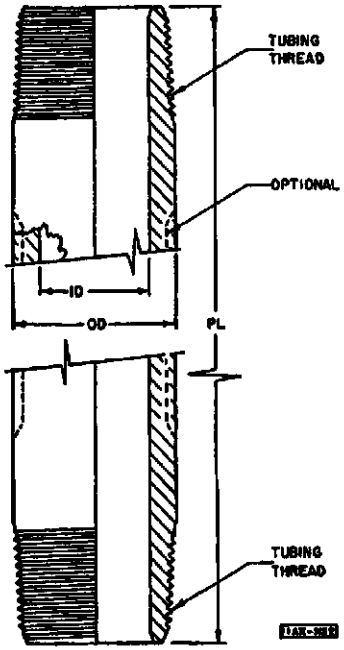
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]See API Specification 5B for tubing thread details.



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[a]	2⅜-8EU *(60.3-8EU)*	2⅞-8EU *(73.0-8EU)*	3½-8EU *(88.9-8EU)*	4½-8EU *(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_1 +0.062/–0.000 *(+1.57/–0.00)*	2.594 *(65.89)*	3.094 *(78.59)*	3.750 *(93.25)*	4.750 *(120.65)*
OD_2 ±0.031 *(±0.79)*	2⅜ *(60.3)*	2⅞ *(73.0)*	3½ *(88.9)*	4.500 *(114.30)*
PL ±0.250 *(±6.35)*	24, 36 *(609.6, 914.4)*	24, 36 *(609.6, 914.4)*	24, 36 *(609.6, 914.4)*	24, 36 *(609.6, 914.4)*

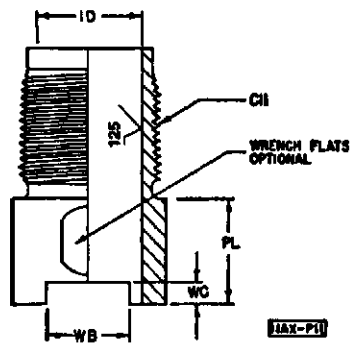
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]See API Specification 5B for tubing thread details.



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[a]	2⅜-8EU *(60.3-8EU)*	2⅞-8EU *(73.0-8EU)*	3½-8EU *(88.9-8EU)*	4½-8EU *(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/–0.000 *(+1.57/–0.00)*	2.594 *(65.89)*	3.094 *(78.59)*	3.750 *(93.25)*	4.750 *(120.65)*
PL ±0.250 *(±6.35)*	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).
See API Specification 5B for tubing thread details.

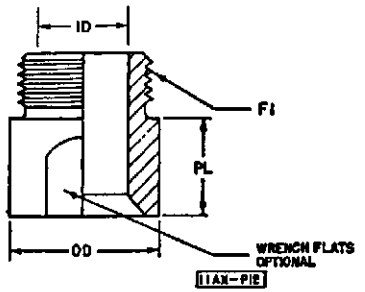


P11
Plug, Pull (See Note)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dimensional Symbol	Part Number						
	P11-125-15	P11-125	P11-150-25	P11-150-25	P11-175	P11-200	P11-225[a]
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 *(63.354-16)*
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)*
PL ±0.031 *(±0.79)*	1⅜ *(34.9)*	1⅜ *(34.9)*	1⅜ *(34.9)*	1⅜ *(34.9)*	1⅜ *(34.9)*	1⅜ *(34.9)*	1⅜ *(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)*

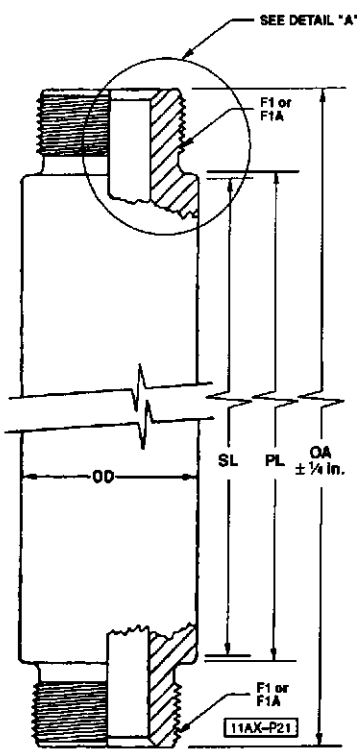
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]Used on 2¼ in. (57.2 mm) and 2½ in. (63.5) bore pumps.

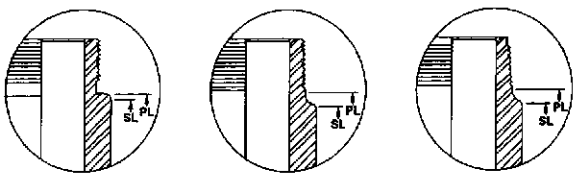
P12
Plug, Seat (See Note)



(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dimensional Symbol	Part Number					
	P12-125	P12-150	P12-175	P12-200	P12-225	P12-250
F1	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)*	2.1095-11½ *(53.581-11½)*
OD ±0.031 *(±0.79)*	1 3/16 *(30.2)*	1 7/16 *(36.5)*	1 11/16 *(42.9)*	1 15/16 *(49.2)*	2 3/16 *(55.6)*	2 7/16 *(61.9)*
ID ±0.062 *(±1.57)*	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)*

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



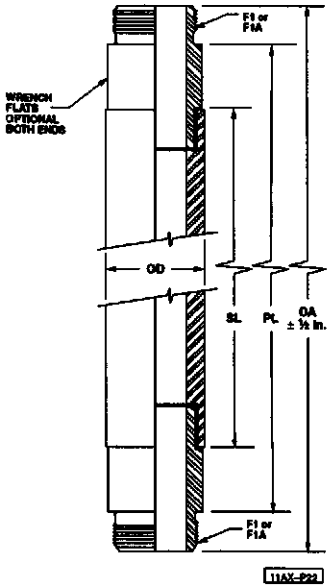


DETAIL "A"—OPTIONAL CONFIGURATION

P21
Plunger, One Piece (See Notes)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dimensional Symbol	Part Number							
	P21-125	P21-150	P21-175	P21-200	P21-225	P21-250	P21-275	P21-375
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)*	2.1095-11½ *(53.581-11½)*	2.1095-11½ *(53.581-11½)*	3.1715-11½ *(80.556-11½)*
OD[a]	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).							

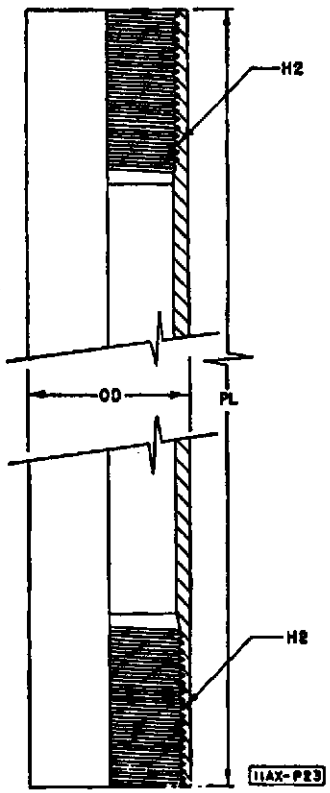
Note 1: All dimensions in inches (followed by equivalent in millimeters).
Note 2: Straightness to be 0.001 in. (0.03mm) T.I.R. or less per foot of length measured over the seal length, up to a maximum of 0.007 in. (0.18mm) T.I.R. for plungers 7 ft (2.137m) and longer in length.
[a]Outside diameter shall be basic size minus the specified clearance (fit), with a tolerance of +0.0000/–0.0005 in. (+0.000/–0.013 mm).



P22
Plunger, Assembled (See Notes)

(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)*	2.1095-11½ *(53.581-11½)*	2.1095-11½ *(53.581-11½)*
OD[a]	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)						

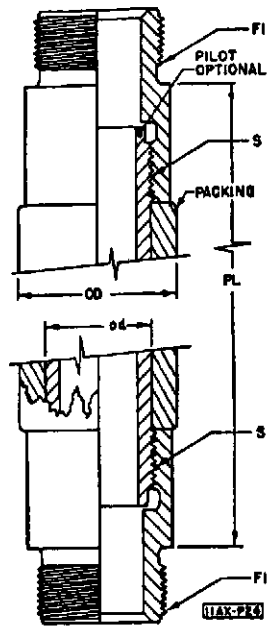
Note 1: All dimensions in inches (followed by equivalent in millimeters).
Note 2: Construction of assembled plungers is optional with the manufacturer; however, they must be made of metal and must be compatible with one piece plungers.
Note 3: Straightness to be 0.001 in. (0.03mm) T.I.R. or less per 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 (2.137mm) and longer in length.
[a]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).



P23
Plunger, Box End (Tubing Pump) (See Notes)

(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)*	2.3755-11½ *(60.338-11½)*	3.3825-11½ *(85.916-11½)*
OD[a]	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 to be 0.001 in. (0.03mm) T.I.R. or less per foot of length measured over the pitch length, up to a maximum of 0.007 in. (0.18mm) T.I.R. for plungers 7 ft (2.137m) and longer in length.
[a]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).

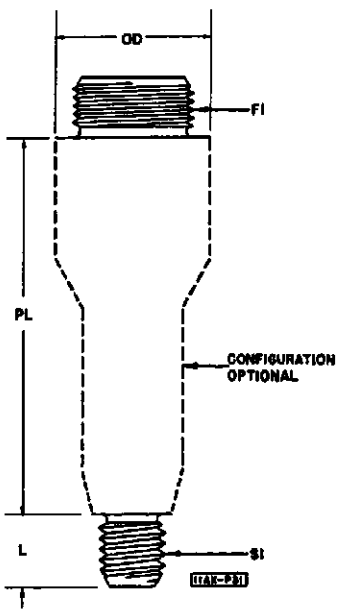


P24
Plunger, Soft-Packed (See Notes)

(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
FI	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)*	2.1095-11½ *(53.581-11½)*	2.1095-11½ *(53.581-11½)*
OD (nom.)	1¼ *(31.8)*	1½ *(38.1)*	1 25/32 *(45.2)*	2 *(50.8)*	2¼ *(57.2)*	2½ *(63.5)*	2¾ *(69.9)*
S[a]	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)*	2.0035-11½ *(50.889-11½)*
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.

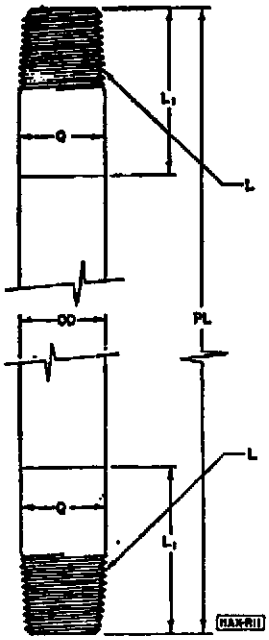
Note 1: All dimensions in inches (followed by equivalent in millimeters).
Note 2: The design and construction of packing for soft-packed plungers have not been standardized. Specify size, type, and number of packing elements, according to manufacturer's catalog.
[a]See Table S for thread dimensions.



P31
Puller, Standing Value (See Note)

(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Part Number			
	P31-175	P31-225	P31-275	P31-375
FI	1.4704-14 *(37.348-14)*	1.8024-14 *(45.781-14)*	2.1095-11½ *(53.581-11½)*	3.1715-11½ *(80.556-11½)*
S1[a]	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 *(±50.40)*	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).
[a]See Table S for thread dimensions.



R11
Rod, Valve (See Note)

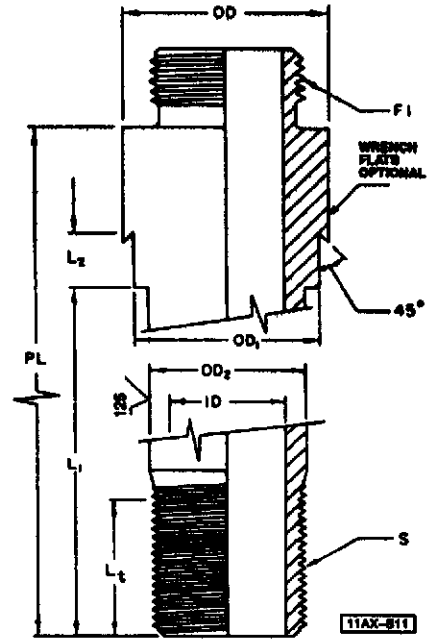
(1)	(2)	(3)	(4)
Dimensional Symbol	Part Number		
	R11-20	R11-25	R11-20
L nom.[a]	3/8 *(9.5)*	1/2 *(12.7)*	3/4 *(19.1)*
L_1 ±0.062 *(±1.57)*	1 3/4 *(44.5)*	2 *(50.8)*	2 *(50.8)*
Q +0.000/–0.005 *(+0.00/–0.13)*	0.688 *(17.48)*	0.875 *(22.23)*	1.063 *(27.00)*
OD +0.000/–0.005 *(+0.00/–0.13)*	11/16 *(17.5)*	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).
[a]Modified line pipe thread. See Table L for details.

Valve Rod Length PL

(1)	(2)	(3)	(4)	(5)
Nominal Barrel Length[a] Minus Nominal Plunger Length, ft *(m)*	For Pumps Run in 1.900, 2 3/8, and 2 7/8 in. *(48.3, 60.3, and 73.0 mm)* OD Tubing		For Pumps Run in 3 1/2 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)*

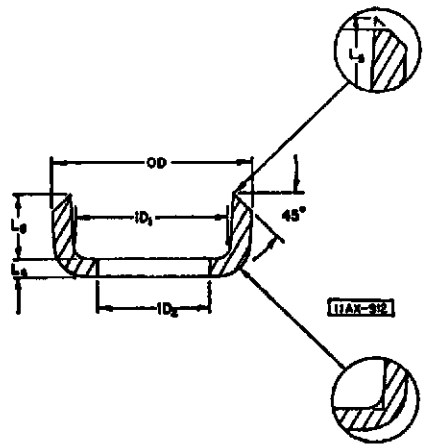
[a]Including extensions on heavy wall barrels.



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)*	2.1095-11½ *(53.581-11½)*
S	1.894-14 *(30.211-14)*	1.5604-14 *(39.634-14)*	2.0035-½ *(50.889-11½)*
PL ±0.062 *(±1.57)*	7⅝ *(193.7)*	8⅛ *(206.4)*	8⅛ *(206.4)*
ID min.	⅞ *(22.2)*	1 3/16 *(30.2)*	1 7/16 *(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_1 +0.000/–0.016 *(+0.00/–0.41)*	1.406 *(35.71)*	1.844 *(46.84)*	2.344 (59.54)
OD_2 +0.000/–0.010 *(+0.00/–0.25)*	1.187 *(30.15)*	1.562 *(39.67)*	2.000 (50.80)
L_1 ±0.062 *(±1.57)*	4 3/8 *(111.1)*	4⅞ *(123.8)*	5 *(127.0)*
L_2 +0.016/–0.000 *(+0.41/–0.00)*	0.672 *(17.07)*	0.703 *(17.86)*	0.703 *(17.86)*
L_t min.	2¼ *(57.2)*	2⅜ *(60.3)*	2⅜ *(60.3)*

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



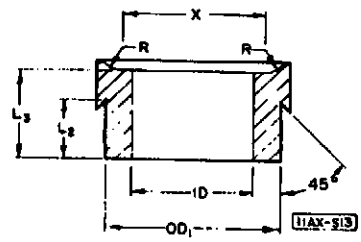
S12
Seating Cup (Type HR) (Rod Pump) (See Note)

(1)	(2)	(3)	(4)
Dimensional Symbol	Part Number		
	S12-20	S12-25	S12-30
ID_1 +0.016/–0.000 *(+0.41/–0.00)*	1.411 *(35.84)*	1.805 *(46.99)*	2.350 *(59.69)*
ID_2 +0.005/–0.000 *(+0.13/–0.00)*	1.187 *(30.15)*	1.562 *(39.67)*	2.000 *(50.80)*
OD ±0.055 *(±0.13)* [a]	1.800 *(45.72)*	2.310 *(58.67)*	2.810 *(71.37)*
L_4 +0.30/–0.015 *(+0.76/–0.38)*	0.165 *(4.19)*	0.185 *(4.70)*	0.185 *(4.70)*
L_5 +0.000/–0.016[b] *(+0.76/–0.41)*	0.656 *(16.66)*	0.688 *(17.48)*	*0.688 *(17.48)*

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

[a]Unless otherwise specified outside diameter of cups furnished to this specification shall be as shown for +0.030 in. (0.76mm) cups.

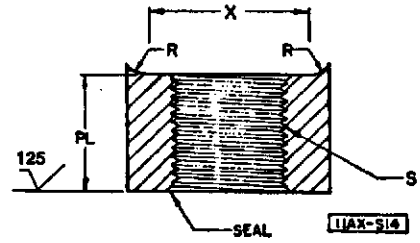
[b]Tolerance for Dimension L_5 on part no. S12-30 is +0.000, –0.015 in. (+0.00, –0.38 mm).



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

(1) Dimensional Symbol	(2) Part Number S13-20	(3) Part Number S13-25	(4) Part Number S13-30
ID +0.006/–0.000 *(+0.15/–0.00)*	1.192 *(30.28)*	1.567 *(39.80)*	2.005 *(50.93)*
OD_1 +0.000/–0.016 *(+0.00/–0.41)*	1.406 *(35.71)*	1.844 *(46.84)*	2.344 *(59.54)*
L_2 +0.016/–0.000 *(+0.41/–0.00)*	0.672 *(17.07)*	0.703 *(17.86)*	0.703 *(17.86)*
L_3 +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)*

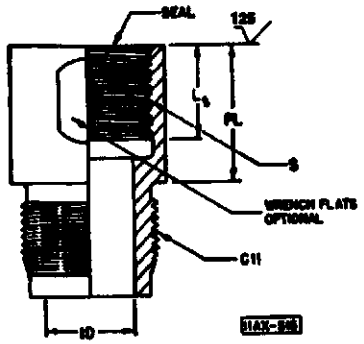
Note: All dimensions in inches (followed by equivalent in millimeters).



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

(1) Dimensional Symbol	(2) Part Number S14-20	(3) Part Number S14-25	(4) Part Number S14-30
S	1.1894-14 *(30.211-14)*	1.5604-14 *(39.634-14)*	2.0035-11½ *(50.889-11½)*
PL ±0.031 *(±0.79)*	1 *(25.4)*	1⅛ *(28.6)*	1¼ *(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)*

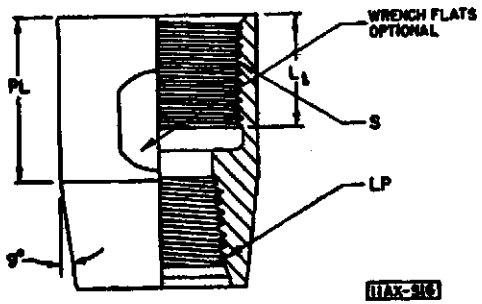
Note: All dimensions in inches (followed by equivalent in millimeters).



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)*	2.0035-11½ *(50.889-11½)*
L_1 min.	1⅛ *(28.6)*	1⅛ *(28.6)*	1¼ *(31.8)*	1¼ *(31.8)*
ID ±1/16 *(±1.59)*	1 *(25.40)*	1 *(25.40)*	1¼ *(31.75)*	1½ *(38.10)*
PL ± 0.031 *(±0.79)*	1⅞ *(47.6)*	1⅞ *(47.6)*	2 *(50.8)*	2 *(50.8)*

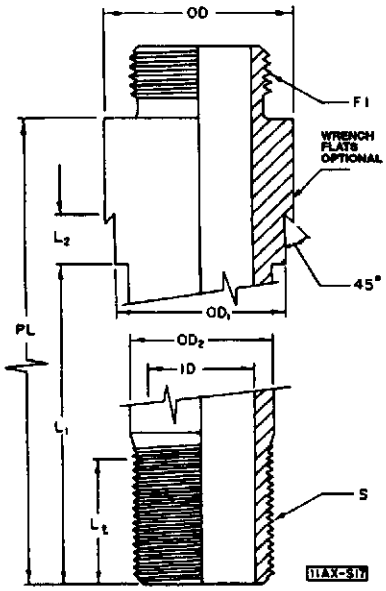
Note: All dimensions in inches (followed by equivalent in millimeters).



S16
Seating Coupling, Bottom Anchor (See Notes)

(1)	(2)	(3)	(4)
Dimensional Symbol	Part Number		
	S16-20	S16-25	S16-30
S	1.1894-14 *(30.211-14)*	1.5604-14 *(39.634-14)*	2.0035-11½ *(50.889-11½)*
LP nom.	1	1¼	1½
L_1 min.	1⅛ *(28.6)*	1¼ *(31.8)*	1¼ *(31.8)*
PL ±0.062 *(±1.57)*	2 3/16 *(55.6)*	2¼ *(57.2)*	1 15/16 *(49.2)*

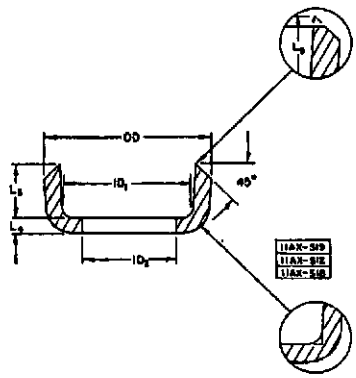
Note 1: All dimensions in inches (followed by equivalent in millimeters).
Note 2: Line pipe thread. See API Specification 5B for details.



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

(1) Dimensional Symbol	(2) Part Number S17-20	(3) Part Number S17-25	(4) Part Number S17-30
F1	1.4704-14 *(37.348-14)*	1.8024-14 *(45.781-14)*	2.1095-11½ *(53.581-11½)*
S	1.1894-14 *(30.211-14)*	1.5604-14 *(39.634-14)*	2.0035-11½ *(50.889-11½)*
PL ±0.062 *(±1.57)*	6½ *(165.1)*	6 13/16 *(173.0)*	6 13/16 *(173.0)*
ID min.	7/8 *(22.2)*	1 3/16 *(30.2)*	1 7/16 *(36.5)*
OD max.	1 11/16 *(42.9)*	2 3/16 *(55.6)*	2 11/16 *(68.3)*
OD_1 +0.000/–0.016 *(+0.00/–0.41)*	1.406 *(35.71)*	1.844 *(46.84)*	2.344 *(59.54)*
OD_2 +0.000/–0.010 *(+0.00/–0.25)*	1.187 *(30.15)*	1.562 (39.67)	2.000 *(50.80)*
L_1 ±0.031 *(±0.79)*	3 5/16 *(84.1)*	3½ *(88.9)*	3 5/8 *(92.1)*
L_2 +0.016/–0.000 *(+0.41/–0.00)*	0.672 *(17.07)*	0.703 *(17.86)*	0.703 *(17.86)*
L_t min.	2¼ *(57.2)*	2 3/8 *(60.3)*	2 3/8 *(60.3)*

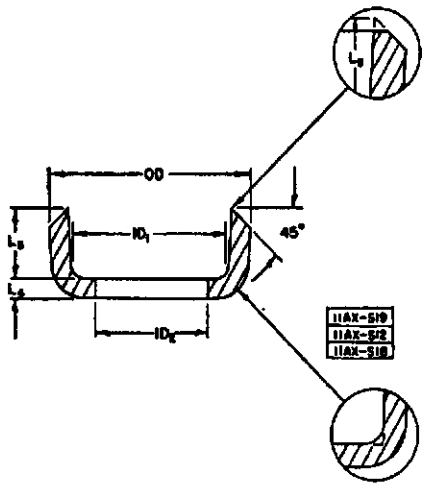
Note: All dimensions in inches (followed by equivalent in millimeters).



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

(1) Dimensional Symbol	(2) Part Number S18-20	(3) Part Number S18-25	(4) Part Number S18-30
ID_1 +0.016/–0.000 *(+0.41/–0.00)*	1.411 *(35.84)*	1.805 *(46.99)*	2.350 *(59.69)*
ID_2 +0.005/–0.000 *(+0.13/–0.00)*	1.187 *(30.15)*	1.562 *(39.67)*	2.000 *(50.80)*
OD[a] ±0.005 *(±0.13)*	1.730 *(43.94)*	2.230 *(56.64)*	2.730 *(69.34)*
L_4 +0.030/–0.015 *(+0.76/–0.38)*	0.165 *(4.19)*	0.185 *(4.70)*	0.185 *(4.70)*
L_5 +0.000/–0.016 *(+0.00/–0.41)*	0.656 *(16.66)*	0.688 *(17.48)*	0.688 *(17.48)*

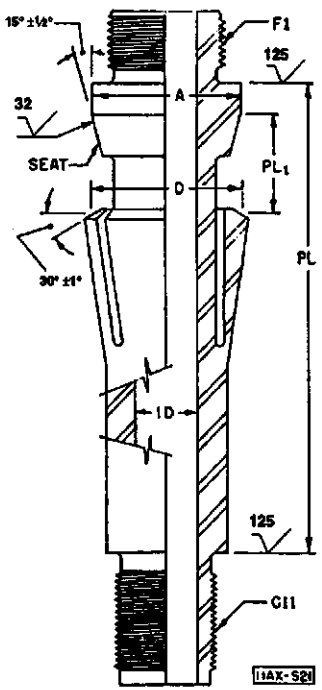
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]Unless otherwise specified outside diameter of cups furnished to this specification shall be as shown.



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

(1) Dimensional Symbol	(2) Part Number S19-25	(3) Part Number S19-30
ID_1 +0.016/–0.000 *(+0.41/–0.00)*	1.805 *(46.99)*	2.350 *(59.69)*
ID_2 +0.005/–0.000 *(+0.13/–0.00)*	1.562 *(39.67)*	2.000 *(50.80)*
OD[a] ±0.005 *(±0.13)* [a]	2.270 *(57.66)*	2.770 *(70.36)*
L_4 +0.030/–0.015 *(+0.76/–0.38)*	0.185 *(4.70)*	0.185 *(4.70)*
L_5 +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).
[a]Unless otherwise specified outside diameter of cups furnished to this specification shall be as shown.



S21
Seating Assembly, Mechanical Top Lock (See Note)

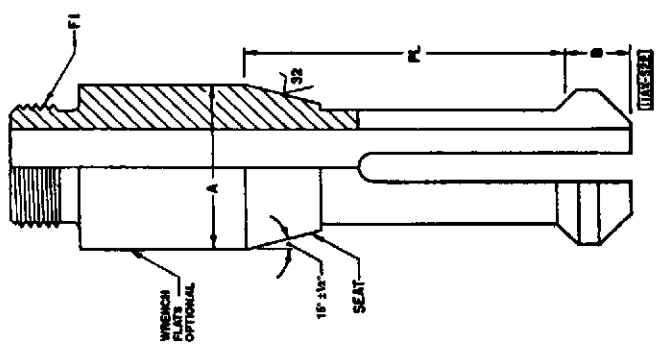
(1) Dimensional Symbol	(2) Part Number S21-20-125	(3) Part Number S21-25	(4) Part Number S21-25	(5) Part Number S21-30
C11	1.3330-16 *(33.858-16)*	1.5730-16 *(39.954-16)*	2.0870-16 *(53.010-16)*	2.5730-16 *(65.354-16)*
F1	1.4704-14 *(37.348-14)*	1.4704-14 *(37.348-14)*	1.8024-14 *(45.781-14)*	2.1095-11½ *(53.581-11½)*
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)*
PL_1 +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)*	8½ *(215.9)*	8½ *(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).

S22
Seating Assembly, Mechanical Bottom Lock (See Note)

(1) Dimensional Symbol	(2) Part Number S22-15	(3) Part Number S22-20	(4) Part Number S22-25	(5) Part Number S22-30	(6) Part Number S22-40
F1	1.4704-14 (37.348-14)	1.4704-14 (37.348-14)	1.8024-14 (45.781-14)	1.1095-11½ (53.581-11½)	3.1715-11½ (80.536-11½)
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 (110.34)	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)

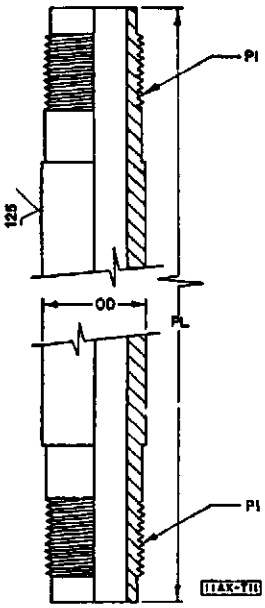
Note: All dimensions in inches (followed by equivalent in millimeters).



T11
Tube, Pull (See Note)

(1)	(2)	(3)	(4)	(5)	(6)
Dimensional Symbol	Part Number				
	T11-125	T11-150	T11-175	T11-200	T11-225[a]
PI	0.9375-16 *(23.813-16)*	1.1250-16 *(28.575-16)*	1.3125-16 *(33.3338-16)*	1.5000-16 *(38.100-16)*	1.8750-16 *(47.625-16)*
OD ±0.010 *(±0.25)*	15/16 *(23.8)*	1 1/8 *(33.3)*	1 5/16 *(38.1)*	1 1/2 *(47.6)*	1 7/8 *(47.6)*
PL ±0.125 *(±3.18)*	Specify length (PL) as actual length in inches (meters). See table below.				

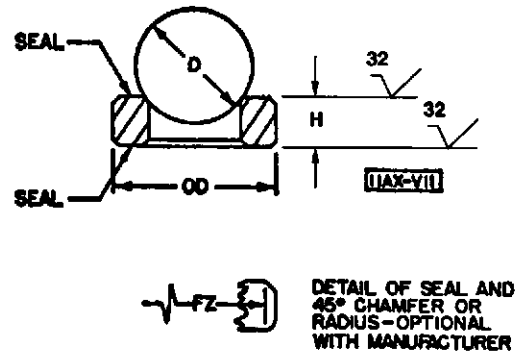
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]Used on 2 1/4 in. (57.2 mm) and 2 1/2 in. (63.5 mm) bore pumps.



Pull Tube Length, PL

(1)	(2)	(3)	(4)
	Actual Length		
Nominal Barrel Length[a] Minus Nominal Plunger Length ft *(m)*	For 1 1/4 in. *(31.8 mm)* Bore Pumps in. *(m)*	For 1 1/2, 1 3/4 and 2 in. *(38.1, 44.5 and 50.8 mm)* Bore Pumps in. *(m)*	For 2 1/4 and 2 1/2 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)*

[a]Including extensions on heavy wall barrels.



V11
Valve, Ball and Seat (See Notes)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dimensional Symbol	Part Number						
	V11-125	V11-150	V11-175	V11-200	V11-225	V11-250	V11-375
D ±0.0005 *(±0.013)*	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)*	0.750 *(19.05)*
FZ +0.000/–0.016 *(+0.00/–0.41)*	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)*
OD +0.000/–0.005 *(+0.00/–0.13)*	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)*

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 sphericity range to be 0.0001 in. (0.003mm), maximum; ball surface roughness: 5RA, maximum; grade of ball: Grade 100 or better.

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.

7.1.2 Calibration

7.1.2.1 Measurement standards such as thread wires, gauge blocks, and master gauges used to calibrate working gauges and measuring equipment shall be checked and approved at least once a year by a certification agency such as NIST or an 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 Component parts shall be inspected for conformance to both this specification and manufacturer's drawings and written specifications.

7.3.1.2 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 Mil. Std. 105E, *Single Sampling Plan for Normal Inspection,* General Inspection Level I, Acceptance Quality Level = 4.0%.

Table 3—Sampling Procedures (See Note)

(1)	(2)	(3)	(4)
Lot Size	Sample Size	No. of Parts, Accept Lot	Out of Spec., Reject Lot[a]
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 Mil. Std. 105E, *Single Sampling Plan for Normal Inspection,* General Inspection Level I, Acceptable Quality Level = 4.0%.
[a]100% inspection (sort) of rejected parts is acceptable practice.

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 of barrels shall be 100% dimensionally inspected with an air micrometer or 3-point mechanical micrometer.

7.3.2.3 Barrels shall be 100% drift tested with a –0.001 in. (–0.025mm) fit, 4 ft (1.219m) or longer drift plunger.

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 of plungers shall be 100% dimensionally inspected with micrometers.

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 12 psi minimum vacuum with no leakage for a minimum of 3 seconds.

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 4 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

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

Example: 1¼ in. 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	XXXXXXX	A2	492

8.1.2 Assembly Marking

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

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

Example: 2⅜ × 1¼ in. rod, stationary thin-wall barrel, bottom anchor pump, 20-ft barrel, 4 ft 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

Tables 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	Minimum Yield Strength, ksi
A1	Chrome plate on steel	0.003 in. (0.076mm) min. thickness, Rc 67-71	Rb 90-Rc 23	10XX Steel	60
A2	Chrome plate on brass	0.003 in. (0.076mm) min. thickness, Rc 67-71	Rb 80-Rb 100	Inhibited Admiralty Brass	50
A3	Chrome plate on 4/6 chrome steel	0.003 in. (0.076mm) min. thickness, Rc 67-71	Rb 90-Rc 23	501 steel, 4% to 6% chrome	70
A4	Chrome plate on Ni/Cu alloy	0.003 in. (0.076mm) min. thickness, Rc 67-71	Rb 90-Rc 23	Ni/Cu alloy	55
A5	Chrome plate on low alloy steel	0.003 in. (0.076mm) min. thickness, Rc 67-71	Rb 90-Rc 23	4XXX low alloy steel	50
A6	Heavy chrome plate on steel	0.006 in. (0.152mm) min. thickness, Rc 67-71	Rb 90-Rc 23	10XX Steel	60
E1	Nickel Carbide composite on steel	0.0013 in. (0.033mm) min. thickness	Rb 90-Rc 23	10XX Steel	60
E2	Nickel Carbide composite on low alloy steel	0.0013 in. (0.033mm) min. thickness	Rb 90-Rc 23	4XXX low alloy steel	50
E3	Nickel Carbide composite on brass	0.0013 in. (0.033mm) min. thickness	Rb 80-Rb 100	Inhibited Admiralty Brass	50
E4	Nickel Carbide composite on steel	0.003 in. (0.076mm) min. thickness	Rb 90-Rc 23	10XX Steel	60
E5	Nickel Carbide composite on 4/6 chrome	0.003 in. (0.076mm) min. thickness	Rb 90-Rc 23	501 steel, 4% to 6% chrome	70

Table B
Pump Barrel Materials
Case Hardened

Identification Symbol	Description	Inside Surface Condition	Base Core Hardness	Base Material	Minimum Yield Strength, ksi
B1	Carbonitrided Steel	Rc 58 min. for 0.010 in. (0.254mm) min. depth	Rb 23 max.	10XX Steel	60
B2	Carburized Steel	Rc 58 min. for 0.010 in. (0.254mm) min. depth	Rc 23 max.	10XX Steel	60
B3	Carbonitrided 4/6 chrome steel	Rc 58 min. for 0.010 in.(0.254mm) min. depth	Rc 23 max.	501 steel, 4% to 6% chrome	70
B5	Nitrided low alloy steel	Rc 58 min. for 0.005 in.(0.127mm) min. depth	Rc 23 max.	4XXX low alloy steel	50
B6	Induction Case Hardened	Rc 58 min. for 0.010 in. (0.254mm) min. depth	Rc 23 max.	10XX Steel	60

Table C
Pump Barrel Materials
Nonhardened

Identification Symbol	Description	Inside Surface Condition	Base Core Hardness	Base Material	Minimum Yield Strength, ksi
D1	Non-Hardened Steel	Oiled	Rb 90-Rc 23	10XX Steel	60
D2	Brass	Oiled	Rb 80-Rb 100	Inhibited Admiralty Brass	50
D3	Ni/Cu alloy	Oiled	Rb 90-Rc 23	Ni/Cu alloy	55
D4	Non-Hardened low alloy steel	Oiled	Rb 90-Rc 23	4XXX low alloy steel	50

Table D
Pump Materials For Balls And Seats

Identification Symbol	Description	Hardness	Material
A1	Stainless Steel	Ball: Rc 58-65 Seat: Rc 52-56	AISI 410-440 Stainless Steel
B1	Cobalt Alloy	Ball: Rc 58-61 Seat: Rc 52-56	Cobalt, chromium, and tungsten alloy
C1	Carbide	Ball: Ra 88-89.5 Seat: Ra 88-89.5	Tungsten with Cobalt binder

Table E
Pump Cage Materials

Identification Symbol	Description	Hardness	Material	Minimum Yield Strength, ksi
A1	Steel	Rb 90-Rc 23	AISI 1018-1215 Steel	50
A2	Low alloy steel, 4XXX series	Rb 90-Rc 23	AISI 4130-4145 low alloy steel	50
A3	Low alloy steel, 8XXX series	Rb 90-Rc 23	AISI 8620-8645 low alloy steel	75
A4	Ni/Cu Alloy	Rb 85-Rc 23	Ni/Cu Alloy	55
A5	Brass	Rb 68-Rb 90	AISI 360-464 free cutting brass	40
A6	Stainless Steel	Rb 75-Rc 23	Austenitic stainless steel, AISI 302-347	35

Table F
Pump Materials For Pull Tubes, Valve Rods And Fittings

Identification Symbol	Description	Hardness	Material	Minimum Yield Strength, ksi
A1	Steel	Rb 90-Rc 23	AISI 1018-1144 Steel	50
A2	Low alloy steel, 4XXX series	Rb 90-Rc 23	AISI 4130-4145 low alloy steel	50
A3	Low alloy steel, 8XXX series	Rb 90-Rc 23	AISI 8620-8645 low alloy steel	75
A4	Ni/Cu Alloy	Rb 85-Rc 23	Ni/Cu Alloy	55
A5	Brass	Rb 68-Rb 90	AISI 360-464 free cutting brass	40
A6	Stainless Steel	Rb 75-Rc 23	Austenitic stainless steel, AISI 302-347	35

Table G
Pump Materials For Seating Cups

Identification Symbol	Description	Hardness	Material
A1	Seating Cup	Shore Durometer D65/92	Nylon

Table H
Pump Plunger Materials
Spray Metal Coated

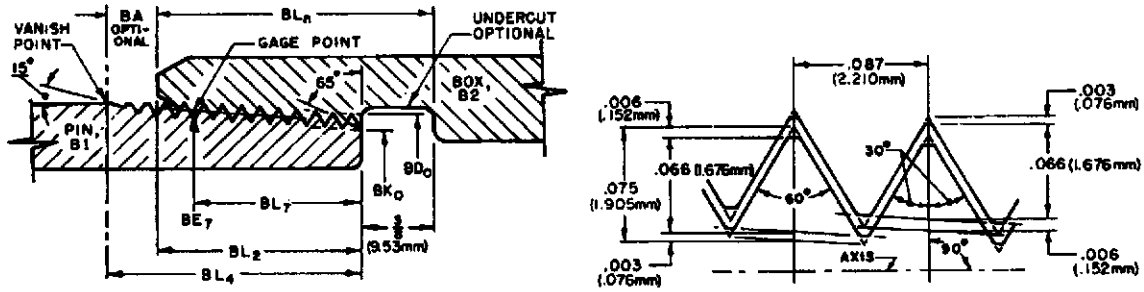
Identification Symbol	Description	Inside Surface Condition	Base Core Hardness	Base Material	Minimum Yield Strength, ksi
B1	Spray Metal	0.010 in. (0.254mm) min. thickness, Rc 48 min. hardness	Rb 70-Rc 23	1018-1045, 4XXX, or 8XXX Steel	40
B2	Spray Metal	0.010 in. (0.254mm) min. thickness, Rc 58 min. hardness	Rb 70-Rc 23	1018-1045, 4XXX, or 8XXX Steel	40
B3	Spray Metal with Ni/Cu alloy ends	0.010 in. (0.254mm) min. thickness, Rc 58 min. hardness	Rb 70-Rc 23	1018-1045, 4XXX, or 8XXX Steel	40
B4	Spray Metal with Nickel plated pin ends	0.010 in. (0.254mm) min. thickness, Rc 48 min. hardness; Nickel plating on pins 0.0013 in. (0.033mm) min. thickness	Rb 70-Rc 23	1018-1045, 4XXX, or 8XXX Steel	40

Table I
Pump Plunger Materials
Plated

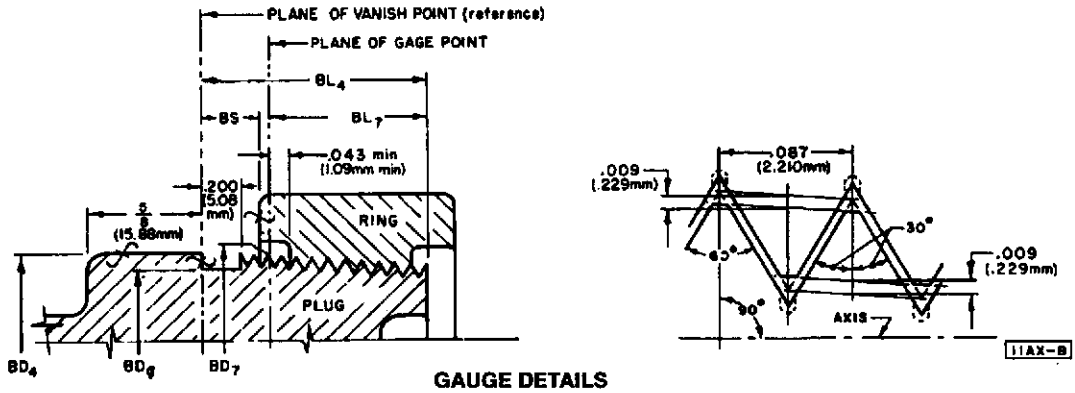
Identification Symbol	Description	Inside Surface Condition	Base Core Hardness	Base Material	Minimum Yield Strength, ksi
A1	Chrome Plated	0.006 in. (0.152mm) min. thickness, Rc 67-71	Rb 85-Rc 23	1018-1045, 4XXX, or 8XXX Steel	50
A2	Double chrome Plated	0.012 in. (0.305mm) min. thickness, Rc 67-71	Rb 85-Rc 23	1018-1045, 4XXX, or 8XXX Steel	50

10 Threaded Connections

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



PRODUCT THREAD DETAILS

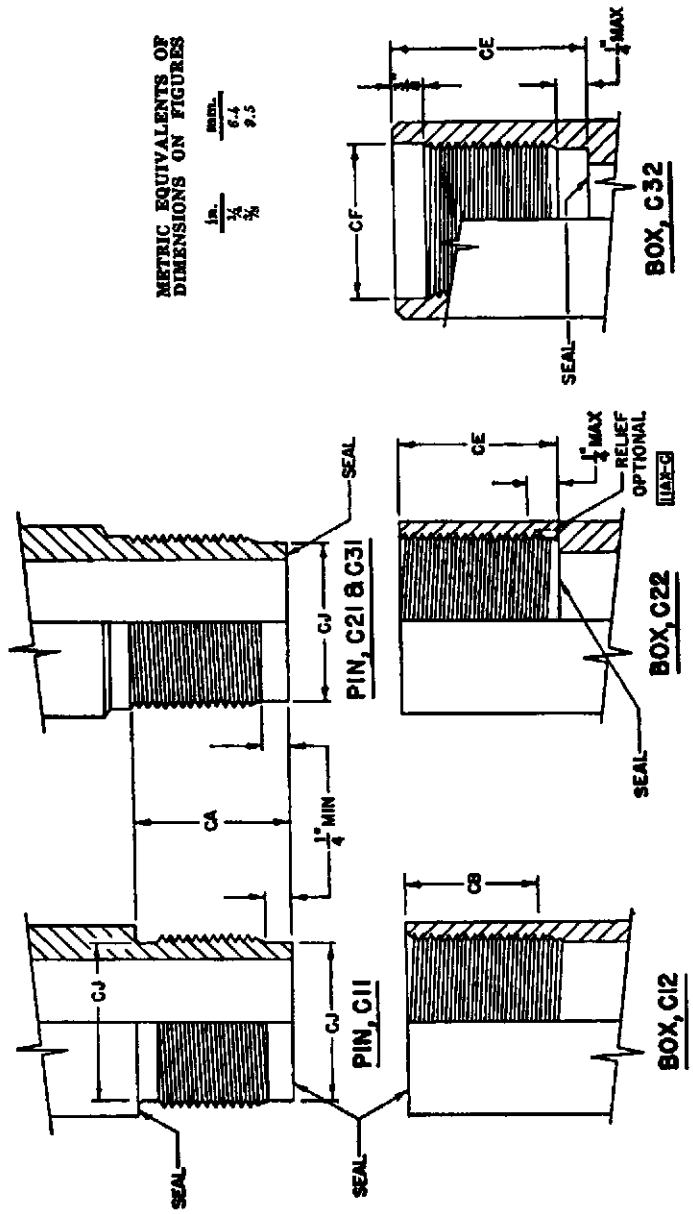


GAUGE DETAILS

B Thread Connection Gauge Details (See Notes)

(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Definition	Thread Size P31-225	Thread Size P31-275	Thread Size P31-375
BD_8	Diameter of notch on plug gauge	2.050 *(52.07)*	2.550 *(64.77)*	3.050 *(77.47)*
BD_0	Major thread diameter at end of barrel	2.2137 *(56.228)*	2.6687 *(67.785)*	3.050 *(77.47)*
BD_4	Diameter of collar on plug gauge	2.250 *(57.15)*	2.750 *(69.85)*	3.250 *(82.55)*
BD_7	Major diameter of plug gauge at gauge point	2.23835 *(56.854)*	2.73835 *(69.554)*	3.23835 *(82.254)*
BE_7	Pitch diameter at gauge point	2.18043 *(55.383)*	2.68043 *(68.083)*	3.18043 *(80.783)*
BK_0	Thread root diameter at end of barrel	2.0815 *(52.87)*	2.5365 *64.43)*	3.0365 *(77.13)*
BL_n	Total depth of box (including undercut, if any)	1.875 *(47.63)*	1.875 *(47.63)*	1.875 *(47.63)*
BL_2	Length of effective thread (on barrel)	1.1262 *(28.61)*	1.3885 *(35.27)*	1.3558 *(35.27)*
BL_4	Total length of thread (to vanish point)	1.375 *(34.93)*	1.625 *(41.23)*	1.625 *(41.28)*
BL_7	Length from gauge point to end of barrel	0.9402 *(23.88)*	1.1902 *(30.23)*	1.1902 *(7.620)*
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)*

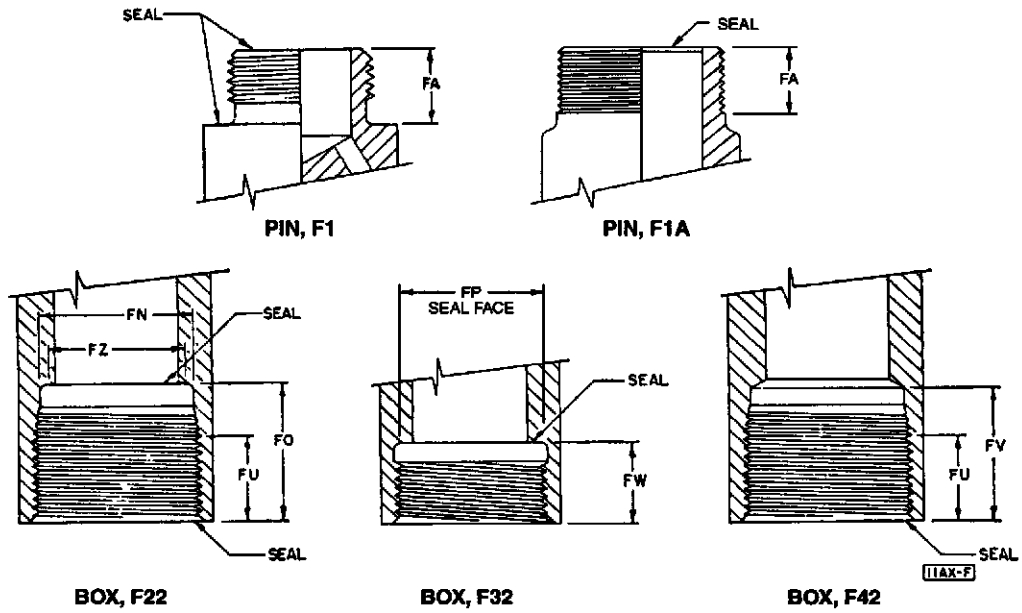
Note 1: All dimensions in inches (followed by equivalent in millimeters).
Note 2: Tolerances are the same as for corresponding API line pipe threads and gauges. See API Specification 5B.



C Thread Connection (See Note)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dimensional Symbol	Thread Size[a]								
	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 ½ (56.845-11½)	2.5730-16 (65.345-16)	2.7380-11½ (65.545-11½)	3.2380-11½ (82.245-11½)	4.2380-11½ (107.645-11½)
CA	1¼ (31.8)	1½ (38.1)	1½ (38.1)	1½ (38.1)	1½ (38.1)	1½ (38.1)	1½ (38.1)	1½ (38.1)	2.250 (57.2)
CB min.	1 (25.4)	1¼ (31.8)	1¼ (31.8)	1¼ (31.8)	1.250 (31.8)	1¼ (31.8)	1.250 (31.8)	1.250 (31.8)	-------
CE	1³/₁₆ (30.2)	1⁷/₁₆ (36.5)	1⁷/₁₆ (36.5)	1⁷/₁₆ (36.5)	1⁷/₈ (47.6)	1⁷/₁₆ (36.5)	1⁷/₈ (47.6)	1⁷/₈ (47.6)	2.375 (60.3)
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[b] +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)

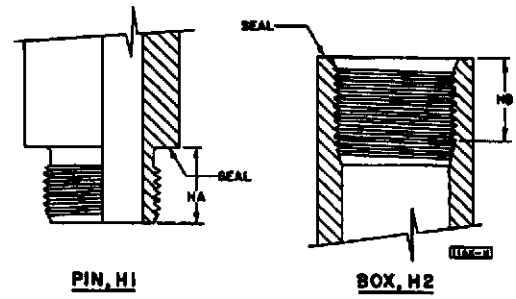
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]See Table S for thread dimensions.
[b]See Table S for pin relief diameters.



F Thread Connection (See Note)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dimensional Symbol	Thread Size[a]						
	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)*	2.1095-11½ *(53.581-11½)*	3.1715-11½ *(80.556-11½)*
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)*	1.1727 *(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)*	0.800 *(22.61)*	0.890 *(22.61)*	0.953 *(24.21)*	1.188 *(30.18)*
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)*
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)*
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)*	3.090 *(78.49)*
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)*	3.159 *(80.24)*

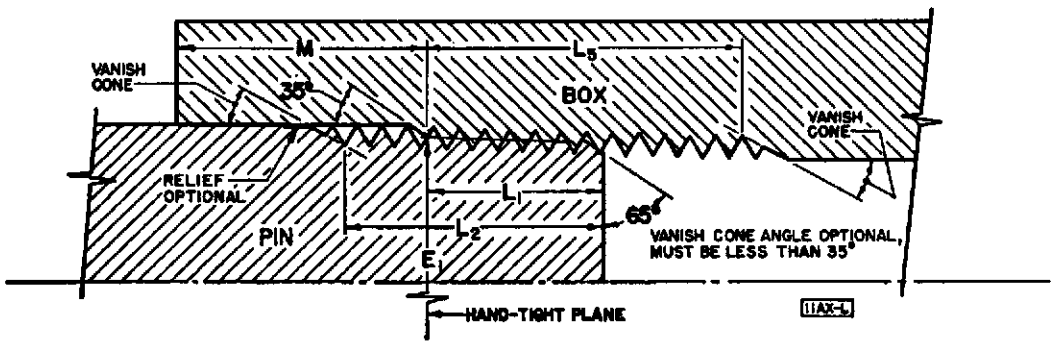
Note: All dimensions in inches (followed by equivalent in millimeters).
[a]See Table S for thread dimensions.



H Thread Connection (See Note)

(1)	(2)	(3)	(4)	(5)
Dimensional Symbol	Thread Size[a]			
	1.5084-14 *(38.313-14)*	1.9864-14 *(50.455-14)*	2.37755-11½ *(60.338-11½)*	3.3825-11½ *(85.916-11½)*
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).
[a]See Table S for thread dimensions.

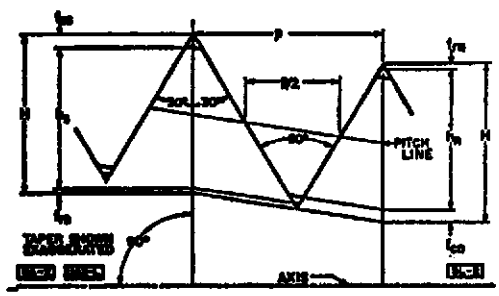


L Thread Connection (Modified API Line Pipe) (See Notes)

(1)		(2)	(3)	(4)
Dimensional Symbol		Thread Size (Nominal)[a]		
		3/8	1/2	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.
[a]See API Specification 5B for tolerances and other details.

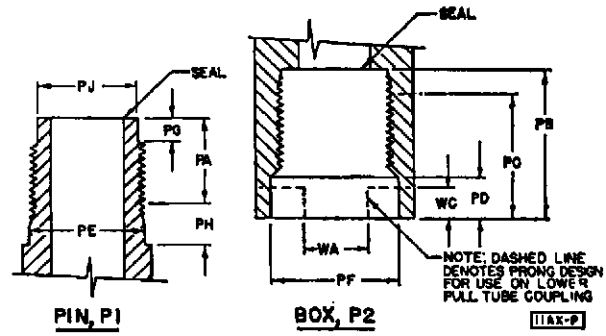
THREAD FORM



Thread Height Dimensions (See Note)

(1)	(2)	(3)
Thread Element	18 Threads Per Inch p = 0.0556 *(1.412)*	14 Threads Per Inch p = 0.0714 *(1.814)*
H=0.866p	0.0481 *(1.222)*	0.0619 *(1.571)*
hs=hn=0.760p	0.0422 *(1.072)*	0.0543 *(1.379)*
frs=frn=0.033p	0.0018 *(0.047)*	0.0024 *(0.060)*
fcs=fcn=0.073	0.0041 *(0.103)*	0.0052 *(0.132)*

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



P Thread Connection (See Note)

(1)	(2)	(3)	(4)	(5)	(6)
Dimensional Symbol	Thread Size[a]				
	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 (28.15)	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 *(28.15)*	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[b]					
WA max.	0.688 *(17.48)*	0.688 *(17.48)*	0.750 *(19.05)*	0.0750 *(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).
[a]See Table S for thread dimensions.
[b]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)
		Pin Thread Dimensions			Box Thread Dimensions			Relief Diameters[e]	
Basic Major Diameter	Number Threads Per Inch	Major Diameter	Pitch Diameter	Minor Diameter[a] (Maximum)	Minor Diameter	Pitch Diameter	Major Diameter[a] (Minimum)	Pin (Maximum)	Box (Minimum)
0.7500 *(19.050)*[b]	10	0.7500 *(19.050)* +0.0000 *(+0.000)* −0.0128 *(−0.325)*	0.6850 *(17.399)* +0.0000 *(+0.000)* −0.0045 *(−0.114)*	0.6273 *(15.933)*	0.6417 *(16.299)* +0.0136 *(+0.345)* −0.0000 *(−0.000)*	0.6850 *(17.399)* +0.0045 *(+0.114)* −0.0000 *(−0.000)*	0.7500 *(19.050)*	0.615 *(15.62)*	0.769 *(19.53)*
0.7500 *(19.050)*[c]	16	0.7500 *(19.050)* +0.0000 *(+0.000)* −0.0090 *(−0.229)*	0.7094 *(18.019)* +0.0000 *(+0.000)* −0.0032 *(−0.081)*	0.6733 *(17.102)*	0.6823 *(17.330)* +0.0080 *(+0.203)* −0.0000 *(−0.000)*	0.7094 *(18.019)* +0.0032 *(+0.081)* −0.0000 *(−0.000)*	0.7500 *(19.050)*	0.665 *(16.89)*	0.763 *(19.38)*
0.8750 *(22.225)*[c]	14	0.8750 *(22.225)* +0.0000 *(+0.000)* −0.0098 *(−0.249)*	0.8286 *(21.046)* +0.0000 *(+0.000)* −0.0036 *(−0.091)*	0.7874 *(20.000)*	0.7977 *(20.262)* +0.0085 *(+0.216)* −0.0000 *(−0.000)*	0.8286 *(21.046)* +0.0036 *(+0.091)* −0.0000 *(−0.000)*	0.8750 *(22.225)*	0.778 *(19.76)*	0.889 *(22.58)*
0.9375 *(23.813)*	16	0.9375 *(23.813)* +0.0000 *(+0.000)* −0.0090 *(−0.229)*	0.8969 *(22.781)* +0.0000 *(+0.000)* −0.0036 *(−0.091)*	0.8608 *(21.864)*	0.8698 *(22.093)* +0.0068 *(+0.173)* −0.0000 *(−0.000)*	0.8969 *(22.781)* +0.0036 *(+0.091)* −0.0000 *(−0.000)*	0.9375 *(23.813)*	0.852 *(21.64)*	0.951 *(24.16)*
1.0000 *(25.400)*	14	1.0000 *(25.400)* +0.0000 *(+0.000)* −0.0098 *(−0.249)*	0.9536 *(24.221)* +0.0000 *(+0.000)* −0.0036 *(−0.091)*	0.9124 *(23.175)*	0.9227 *(23.437)* +0.0085 *(+0.216)* −0.0000 *(−0.000)*	0.9536 *(24.221)* +0.0036 *(+0.091)* −0.0000 *(−0.000)*	1.0000 *(25.400)*	0.903 *(22.94)*	1.014 *(25.76)*
1.1250 *(28.575)*	16	1.1250 *(28.575)* +0.0000 *(+0.000)* −0.0090 *(−0.229)*	1.0844 *(27.544)* +0.0000 *(+0.000)* −0.0040 *(−0.102)*	1.0483 *(26.627)*	1.0573 *(26.855)* +0.0068 *(+0.173)* −0.0000 *(−0.000)*	1.0844 *(27.544)* +0.0040 *(+0.102)* −0.0000 *(−0.000)*	1.1250 *(28.575)*	1.039 *(26.39)*	1.138 *(28.91)*
1.1894 *(30.211)*	14	1.1870 *(30.150)* +0.0000 *(+0.000)* −0.0100 *(−0.254)*	1.1430 *(29.032)* +0.0000 *(+0.000)* −0.0040 *(−0.102)*	1.1018 *(27.986)*	1.1121 *(28.247)* +0.0077 *(+0.196)* −0.0000 *(−0.000)*	1.1430 *(29.032)* +0.0040 *(+0.102)* −0.0000 *(−0.000)*	1.1894 *(30.211)*	1.092 *(27.74)*	1.204*(30.58)*
1.2500 *(31.750)*	14	1.2500 *(31.750)* +0.0000 *(+0.000)* −0.0098 *(−0.249)*	1.2036 *(30.571)* +0.0000 *(+0.000)* −0.0040 *(−0.102)*	1.1624 *(29.525)*	1.1727 *(29.787)* +0.0077 *(+0.196)* −0.0000 *(−0.000)*	1.2036 *(30.571)* +0.0040 *(+0.102)* −0.0000 *(−0.000)*	1.2500 *(31.750)*	1.153 *(29.29)*	1.265 *(32.13)*
1.3125 *(33.338)*	16	1.3125 *(33.338)* +0.0000 *(+0.000)* −0.0090 *(−0.229)*	1.2719 *(32.306)* +0.0000 *(+0.000)* −0.0040 *(−0.102)*	1.2358 *(31.389)*	1.2448 *(31.618)* +0.0068 *(+0.173)* −0.0000 *(−0.000)*	1.2719 *(32.306)* +0.0040 *(+0.102)* −0.0000 *(−0.000)*	1.3125 *(33.338)*	1.227 *(31.17)*	1.326 *(33.68)*
1.3330 *(33.858)*	16	1.3330 *(33.858)* +0.0000 *(+0.000)* −0.0090 *(−0.229)*	1.2924 *(32.827)* +0.0000 *(+0.000)* −0.0040 *(−0.102)*	1.2563 *(31.910)*	1.2653 *(32.139)* +0.0068 *(+0.173)* −0.0000 *(−0.000)*	1.2924 *(32.827)* +0.0040 *(+0.102)* −0.0000 *(−0.000)*	1.3330 *(33.858)*	1.247 *(31.67)*	1.346 *(34.19)*
1.3750 *(34.925)*	14	1.3750 *(34.925)* +0.0000 *(+0.000)* −0.0098 *(−0.249)*	1.3286 *(33.746)* +0.0000 *(+0.000)* −0.0040 *(−0.102)*	1.2874 *(32.700)*	1.2977 *(32.962)* +0.0077 *(+0.196)* −0.0000 *(−0.000)*	1.3286 *(33.746)* +0.0040 *(+0.102)* −0.0000 *(−0.000)*	1.3750 *(34.925)*	1.278 *(32.46)*	1.390 *(35.31)*
1.4704 *(37.348)*	14	1.4704 *(37.348)* +0.0000 *(+0.000)* −0.0098 *(−0.249)*	1.4240 *(36.170)* +0.0000 *(+0.000)* −0.0040 *(−0.102)*	1.3828 *(35.123)*	1.3931 *(35.358)* +0.0077 *(+0.196)* −0.0000 *(−0.000)*	1.4240 *(36.170)* +0.0040 *(+0.102)* −0.0000 *(−0.000)*	1.4704 *(37.348)*	1.373 *(34.87)*	1.484 *(37.69)*
1.5000 *(38.100)*	16	1.5000 *(38.100)* +0.0000 *(+0.000)* −0.0090 *(−0.229)*	1.4594 *(37.069)* +0.0000 *(+0.000)* −0.0040 *(−0.102)*	1.4233 *(36.152)*	1.4323 *(36.380)* +0.0068 *(+0.173)* −0.0000 *(−0.000)*	1.4594 *(37.069)* +0.0040 *(+0.102)* −0.0000 *(−0.000)*	1.5000 *(38.100)*	1.414 *(35.92)*	1.513 *(38.43)*
1.5084 *(38.313)*	14	1.5084 *(38.313)* +0.0000 *(+0.000)* −0.0098 *(−0.249)*	1.4620 *(37.135)* +0.0000 *(+0.000)* −0.0062 *(−0.157)*	1.4208 *(36.088)*	1.4311 *(36.350)* +0.0077 *(+0.196)* −0.0000 *(−0.000)*	1.4620 *(37.135)* +0.0062 *(+0.157)* −0.0000 *(−0.000)*	1.5084 *(38.313)*	1.409 *(35.79)*	1.525 *(38.74)*

(Continued next page, footnotes at end of table)

Table S (Continued)
Details of All Straight Threads Used in API Subsurface Pumps and Fittings

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		Pin Thread Dimensions			Box Thread Dimension			Relief Diameters[c]	
Basic Major Diameter	Number Threads Per Inch	Major Diameter	Pitch Diameter	Minor Diameter[a] (Maximum)	Minor Diameter	Pitch Diameter	Major Diameter[a] (Minimum)	Pin (Maximum)	Box (Minimum)
1.5604 *(39.634)*	14	1.5604 *(39.634)* +0.0000 *(+0.000)* −0.0098 *(−0.249)*	1.5140 *(38.456)* +0.0000 *(+0.000)* −0.0062 *(−0.157)*	1.4728 *(37.409)*	1.4831 *(37.671)* +0.0077 *(+0.196)* −0.0000 *(−0.000)*	1.5140 *(38.456)* +0.0062 *(+0.157)* −0.0000 *(−0.000)*	1.5604 *(39.634)*	1.461 *(37.11)*	1.577 *(40.06)*
1.5730 *(39.954)*	16	1.5730 *(39.954)* +0.0000 *(+0.000)* −0.0090 *(−0.229)*	1.5324 *(38.923)* +0.0000 *(+0.000)* −0.0061 *(−0.155)*	1.4963 *(38.006)*	1.5053 *(38.235)* +0.0068 *(+0.173)* −0.0000 *(−0.000)*	1.5324 *(38.923)* +0.0061 *(+0.155)* −0.0000 *(−0.000)*	1.5730 *(39.954)*	1.485 *(37.72)*	1.589 *(40.36)*
1.7500 *(44.450)*	14	1.7500 *(44.450)* +0.0000 *(+0.000)* −0.0098 *(−0.249)*	1.7036 *(43.271)* +0.0000 *(+0.000)* −0.0062 *(−0.157)*	1.6624 *(42.225)*	1.6727 *(42.487)* +0.0077 *(+0.196)* −0.0000 *(−0.000)*	1.7036 *(43.271)* +0.0062 *(+0.157)* −0.0000 *(−0.000)*	1.7500 *(44.450)*	1.651 *(41.94)*	1.767 *(44.88)*
1.8024 *(45.781)*	14	1.8024 *(45.781)* +0.0000 *(+0.000)* −0.0098 *(−0.249)*	1.7560 *(44.602)* +0.0000 *(+0.000)* −0.0062 *(−0.157)*	1.7148 *(43.556)*	1.7251 *(43.818)* +0.0077 *(+0.196)* −0.0000 *(−0.000)*	1.7560 *(44.602)* +0.0062 *(+0.157)* −0.0000 *(−0.000)*	1.8024 *(45.781)*	1.703 *(43.26)*	1.819 *(46.20)*
1.8750 *(47.625)*	16	1.8750 *(47.625)* +0.0000 *(+0.000)* −0.0090 *(−0.229)*	1.8344 *(46.594)* +0.0000 *(+0.000)* −0.0061 *(−0.155)*	1.7983 *(45.677)*	1.8073 *(45.905)* +0.0068 *(+0.173)* −0.0000 *(−0.000)*	1.8344 *(46.594)* +0.0061 *(+0.155)* −0.0000 *(−0.000)*	1.8750 *(47.625)*	1.787 *(45.39)*	1.891 *(48.03)*
1.9864 *(50.455)*	14	1.9864 *(50.455)* +0.0000 *(+0.000)* −0.0098 *(−0.249)*	1.9400 *(49.276)* +0.0000 *(+0.000)* −0.0062 *(−0.157)*	1.8988 *(48.230)*	1.9091 *(48.491)* +0.0077 *(+0.196)* −0.0000 *(−0.000)*	1.9400 *(49.276)* +0.0062 *(+0.157)* −0.0000 *(−0.000)*	1.9864 *(50.455)*	1.887 *(47.93)*	2.003 *(50.88)*
2.0035 *(50.889)*	11½	[d]2.0000 *(50.800)* +0.0000 *(+0.000)*	1.9470 *(49.454)* +0.0000 *(+0.000)*	1.8968 *(48.179)*	1.9094 *(48.499)* +0.0094 *(+0.239)*	1.9470 *(49.454)* +0.0092 *(+0.234)*	2.0035 *(50.839)*	1.881 *(47.78)*	2.026 *(51.46)*
2.0870 *(53.010)*	16	2.0870 *(53.010)* +0.0000 *(+0.000)* −0.0090 *(−0.229)*	2.0464 *(51.979)* +0.0000 *(+0.000)* −0.0067 *(−0.170)*	2.0103 *(51.062)*	2.0193 *(51.290)* +0.0068 *(+0.173)* −0.0000 *(−0.000)*	2.0464 *(51.979)* +0.0067 *(+0.170)* −0.0000 *(−0.000)*	2.0870 *(53.010)*	1.999 *(50.77)*	2.094 *(53.19)*
2.1095 *(53.581)*	11½	2.1095 *(53.581)* +0.0000 *(+0.000)* −0.0115 *(−0.292)*	2.0530 *(52.146)* +0.0000 *(+0.000)* −0.0069 *(−0.175)*	2.0028 *(50.871)*	2.0154 *(51.191)* +0.0094 *(+0.239)* −0.0000 *(−0.000)*	2.0530 *(52.146)* +0.0069 *(+0.175)* −0.0000 *(−0.000)*	2.1095 *(53.581)*	1.989 *(50.52)*	2.129 *(54.08)*
2.2380 *(56.845)*	11½	2.2380 *(56.845)* +0.0000 *(+0.000)* −0.0115 *(−0.292)*	2.1815 *(55.410)* +0.0000 *(+0.000)* −0.0069 *(−0.175)*	2.1313 *(54.135)*	2.1439 *(54.455)* +0.0094 *(+0.239)* −0.0000 *(−0.000)*	2.1815 *(55.410)* +0.0069 *(+0.175)* −0.0000 *(−0.000)*	2.2380 *(56.845)*	2.118 *(53.80)*	2.258 *(57.35)*
2.3755 *(60.338)*	11½	2.3755 *(60.338)* +0.0000 *(+0.000)* −0.0115 *(−0.292)*	2.3190 *(58.903)* +0.0000 *(+0.000)* −0.0069 *(−0.175)*	2.2688 *(57.628)*	2.2814 *(57.948)* +0.0094 *(+0.239)* −0.0000 *(−0.000)*	2.3190 *(58.903)* +0.0069 *(+0.175)* −0.0000 *(−0.000)*	2.3755 *(60.338)*	2.255 *(57.28)*	2.395 *(60.83)*
2.5625 *(65.088)*	11½	2.5625 *(65.088)* +0.0000 *(+0.000)* −0.0115 *(−0.292)*	2.5060 *(63.652)* +0.0000 *(+0.000)* −0.0092 *(−0.234)*	2.4558 *(62.377)*	2.4684 *(62.697)* +0.0094 *(+0.239)* −0.0000 *(−0.000)*	2.5060 *(63.652)* +0.0092 *(+0.234)* −0.0000 *(−0.000)*	2.5625 *(65.088)*	2.440 *(61.98)*	2.585 *(65.66)*
2.5730 *(65.354)*	16	2.5730 *(65.354)* +0.0000 *(+0.000)* −0.0090 *(−0.229)*	2.5324 *(64.323)* +0.0000 *(+0.000)* −0.0090 *(−0.229)*	2.4963 *(63.406)*	2.5053 *(63.635)* +0.0068 *(+0.173)* −0.0000 *(−0.000)*	2.5324 *(64.323)* +0.0090 *(+0.229)* −0.0000 *(−0.000)*	2.5730 *(65.354)*	2.483 *(63.07)*	2.591 *(65.81)*
2.7380 *(69.545)*	11½	2.7380 *(69.545)* +0.0000 *(+0.000)* −0.0115 *(−0.292)*	2.6815 *(68.110)* +0.0000 *(+0.000)* −0.0069 *(−0.175)*	2.6313 *(66.835)*	2.6439 *(67.155)* +0.0094 *(+0.239)* −0.0000 *(−0.000)*	2.6815 *(68.110)* +0.0069 *(+0.175)* −0.0000 *(−0.000)*	2.7380 *(69.545)*	2.618 *(66.50)*	2.758 *(70.05)*
3.1715 *(80.556)*	11½	3.1715 *(80.556)* +0.0000 *(+0.000)* −0.0115 *(−0.292)*	3.1150 *(79.121)* +0.0000 *(+0.000)* −0.0099 *(−0.251)*	3.0648 *(77.846)*	3.0774 *(78.166)* +0.0094 *(+0.239)* −0.0000 *(−0.000)*	3.1150 *(79.121)* +0.0099 *(+0.251)* −0.0000 *(−0.000)*	3.1715 *(80.556)*	3.052 *(77.52)*	3.192 *(81.08)*

(Continued next page, footnotes at end of table)

Table S (Continued)
Details of All Straight Threads Used in API Subsurface Pumps and Fittings

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		Pin Thread Dimensions			Box Thread Dimensions			Relief Diameters[e]	
Basic Major Diameter	Number Threads Per Inch	Major Diameter	Pitch Diameter	Minor Diameter[a] (Maximum)	Minor Diameter	Pitch Diameter	Major Diameter[a] (Minimum)	Pin (Maximum)	Box (Minimum)
3.1875 *(80.963)*	11½	3.1875 *(80.963)* +0.0000 *(+0.000)* –0.0115 *(–0.292)*	3.1310 *(79.527)* +0.0000 *(+0.000)* –0.0099 *(–0.251)*	3.0808 *(78.252)*	3.0934 *(78.572)* +0.0094 *(+0.239)* –0.0000 *(–0.000)*	3.1310 *(79.527)* +0.0099 *(+0.251)* –0.0000 *(–0.000)*	3.1875 *(80.963)*	3.064 *(77.83)*	3.210 *(81.53)*
3.2380 *(82.245)*	11½	3.2380 *(82.245)* +0.0000 *(+0.000)* –0.0115 *(–0.292)*	3.1815 *(80.810)* +0.0000 *(+0.000)* –0.0069 *(–0.175)*	3.1313 *(79.535)*	3.1439 *(79.855)* +0.0094 *(+0.239)* –0.0000 *(–0.000)*	3.1815 *(80.810)* +0.0069 *(+0.175)* –0.0000 *(–0.000)*	3.2380 *(82.245)*	3.118 *(79.20)*	3.258 *(82.75)*
3.3825 *(85.916)*	11½	3.3825 *(85.916)* +0.0000 *(+0.000)* –0.0115 *(–0.292)*	3.3260 *(84.480)* +0.0000 *(+0.000)* –0.0099 *(–0.251)*	3.2758 *(83.205)*	3.2884 *(83.525)* +0.0094 *(+0.239)* –0.0000 *(–0.000)*	3.3260 *(84.480)* +0.0099 *(+0.251)* –0.0000 *(–0.000)*	3.3825 *(85.916)*	3.263 *(82.88)*	3.403 *(86.44)*
3.6875 *(93.663)*	11½	3.6875 *(93.663)* +0.0000 *(+0.000)* –0.0115 *(–0.292)*	3.6310 *(92.227)* +0.0000 *(+0.000)* –0.0099 *(–0.251)*	3.5808 *(90.952)*	3.5934 *(91.272)* +0.0094 *(+0.239)* –0.0000 *(–0.000)*	3.6310 *(92.227)* +0.0099 *(+0.251)* –0.0000 *(–0.000)*	3.6875 *(93.663)*	3.564 *(90.53)*	3.710 *(94.23)*
4.2380 *(107.645)*	11 ½	4.2380 *(107.645)* +0.0000 *(+0.000)* –0.0115 *(–0.292)*	4.1815 *(106.210)* +0.0000 *(+0.000)* –0.0099 *(–0.251)*	4.1313 *(104.935)*	4.1439 *(105.255)* +0.0094 *(+0.239)* –0.0000 *(–0.000)*	4.1815 *(105.210)* +0.0099 *(+0.251)* –0.0000 *(–0.000)*	4.238 *(107.645)*	4.118 *(104.60)*	4.258 *(108.15)*

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

Note 2: Unified Screw Threads in accordance with National Bureau of Standards Handbook II28 are acceptable and will not affect interchangeability or strength of product.

[a]Tolerances not given, as these dimensions are not gauged and do not affect interchangeability.

[b]From American National Coarse Thread Series, Class 3 Fit.

[c]From American National Fine Thread Series, Class 3 Fit.

[d]Deviation from standard major diameter to accommodate dimension OD_2 of seating mandrel.

[e]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)
	Size Designation							
Dimension	125	150	175[b]	200	225[b]	250	275[b]	375[b]
Distance Between Flats	1.062 *(26.97)* +0.000 *(+0.00)* –0.016 *(–0.41)*	1.312 *(33.32)* +0.000 *(+0.00)* –0.025 *(–0.64)*	1.500 *(38.10)* +0.000 *(+0.00)* –0.025 *(–0.64)*	1.688 *(42.88)* +0.000 *(+0.00)* –0.025 *(–0.64)*	2.000 *(50.80)* +0.000 *(+0.00)* –0.025 *(–0.64)*	2.188 *(55.58)* +0.000 *(+0.00)* –0.031 *(–0.79)*	2.375 *(60.33)* +0.000 *(+0.00)* –0.031 *(–0.79)*	3.375 *(85.73)* +0.000 *(+0.00)* –0.031 *(–0.79)*
Length of Flats, min.[a]	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).

[a]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.

[b]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 —MARKING REQUIREMENTS FOR MONOGRAM LICENSEES

1 General

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.

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.

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 paragraph 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: 1½ in. heavy-wall (B12-150), nonhardened steel, manufactured in December 1992 by a licensed manufacturer (License No. 01234.00):

Manufacturer's Name or Mark	Monogram	License No.	Manufacturer's Part No.	Material ID Symbol	Date of Manufacture
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: 2⅞ × 1½ in. rod, stationary heavy-wall barrel, top anchor pump, 24-ft barrel, 6-ft plunger, 4-ft extensions total, assembled in October 1993 by a licensed manufacturer (License No. 45678.00):

Manufacturer's Name or Mark	Monogram	License No.	Pump Designation	Date of Assembly
XXXX	Ⓐ	11AX-45678.00	25-150 RHAC-24-6-4	10/93

3 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. The manufacturer's license number shall be affixed either to each product, to each container, or marked on the documents for each shipment.

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