

Type U & UM BOP[™] Replacement Parts Catalog

Simplicity. Power. Savings. Performance.



About this Catalog

The purpose of this catalog is to serve as a quick reference for our customers. However, many of Cameron's products are designed to customer specific requirements.

All the information contained in this catalog is generic, weights, dimensions, part numbers, etc. should be confirmed for your specific equipment.

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RAM Availability Chart

Description	TL/T BOP	U/UM BOP	U II BOP
Pipe Rams Available to Fit Standard Pipe Sizes	Yes	Yes	Yes
Variable Bore Rams Available	Yes	Yes	Yes
FLEXPACKER Rams Available	In Some BOP Sizes	In Some BOP Sizes	In Some BOP Sizes
Shearing Blind Rams Available	In Some BOP Sizes	Yes	Yes
DVS Shear Rams Available	In Some BOP Sizes	In Some BOP Sizes	In Some BOP Sizes
ISR Shear Ram Available	In Some BOP Sizes	In Some BOP Sizes	In Some BOP Sizes
Super Shear Casing Ram	Yes	Yes (Through 16-3/4")	No
Grip and Seal Rams Available	No	In Some BOP Sizes	No
CAMRAM Top Seals Standard	Yes	Yes (through 18-3/4")	Yes (through 18-3/4")
CAMRAM Packers Standard	Yes	In Some BOP Sizes	In Some BOP Sizes
CAMRAM 350 Packers and Top Seals Available	Yes	Yes	Yes
Rams Suitable for H2S Service	Yes	Yes	Yes
Ram Wear Pads Standard	Yes	Available	Available

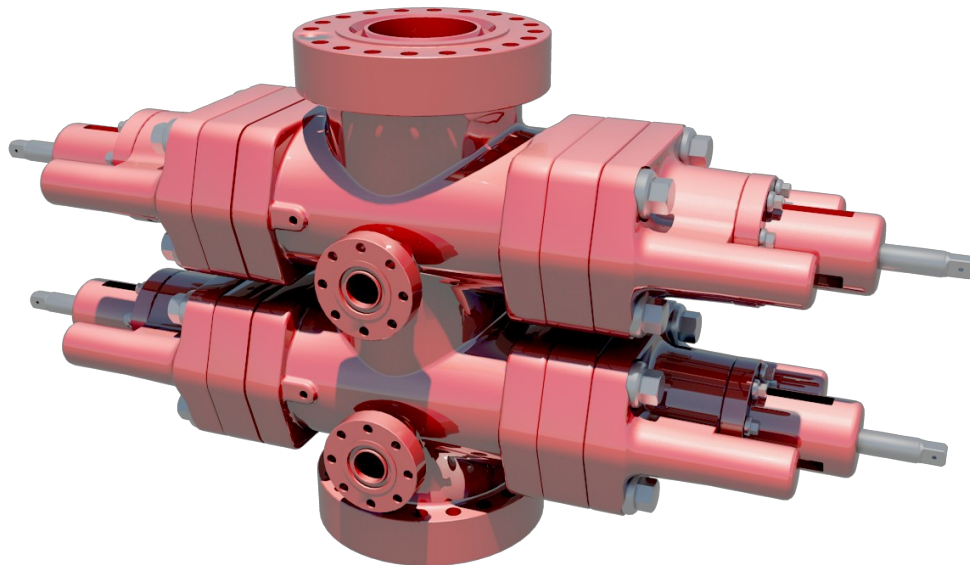
Type U BOP Overview

The Cameron U BOP blowout preventer is the most widely used ram-type BOP for land, platform and subsea applications worldwide. Like all other Cameron preventers, the rams in the U BOP are pressure-energized. Well bore pressure acts on the rams to increase the sealing force and maintain the seal in case of hydraulic pressure loss. Seal integrity is actually improved by increased well bore pressure.

Other features of the U BOP include:

- Bonnet seal carrier is available to eliminate the need for high makeup torque on bonnet bolts and nuts. The new 13-5/8" bodies have a bore seal. Therefore you can add the seal carrier without additional re-work. All other sizes require modification to accept the seal carrier.
- Manual or Hydraulic operating systems available.
- Hydraulically operated locking mechanisms, wedgelocks, lock the ram hydraulically and hold the rams mechanically closed even when actuating pressure is released. The operating system can be interlocked using sequence caps to ensure that the wedgelock is retracted before pressure is applied to open the BOP.
- For subsea applications, a pressure balance chamber is used with the wedgelocks to eliminate the possibility of the wedgelock becoming unlocked due to hydrostatic pressure.
- Retrofit to UM Bonnet is available to provide more shearing force without the need for shear bonnets, large bore bonnets, or tandem boosters.

Other features include hydraulically opening bonnets, forged body and a wide selection of rams to meet all applications. See page 46-50 for rams available to fit the U BOP.

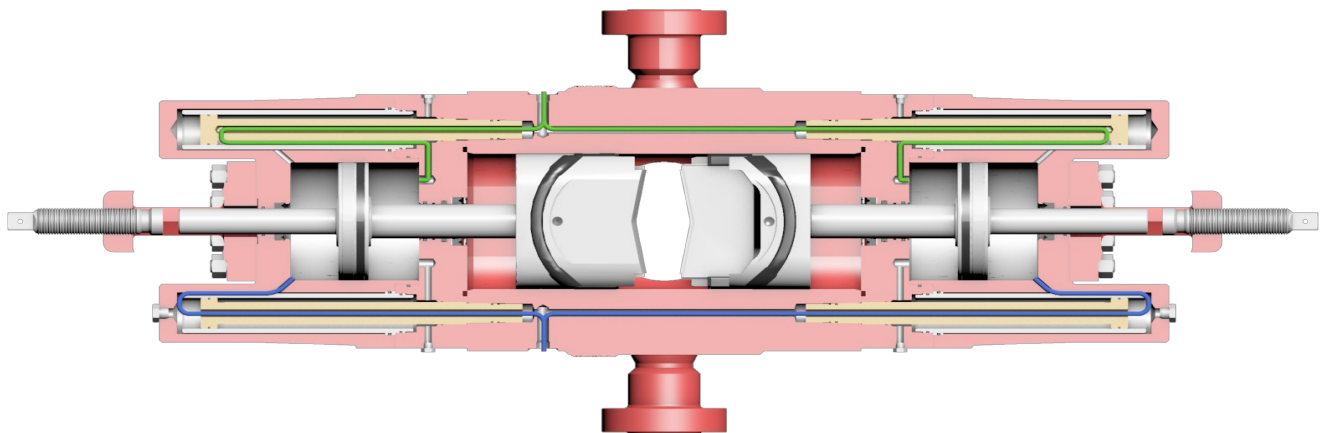




U Blowout Preventer

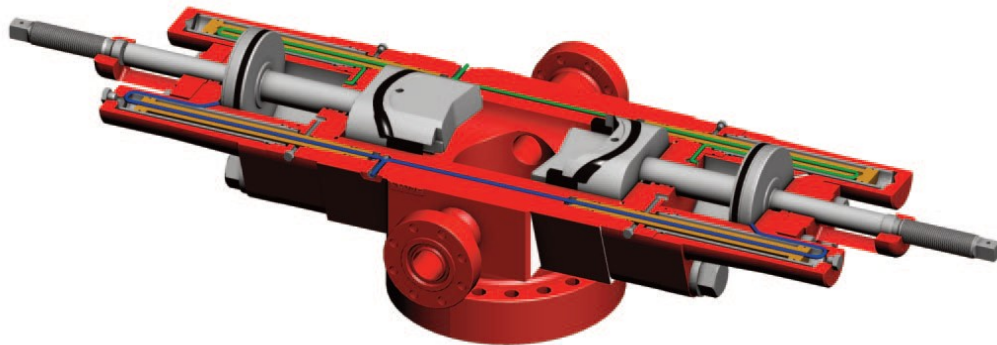
U BOP Hydraulic Control System

The U blowout preventer is designed so that hydraulic pressure opens and closes the rams and provides the means for quick ram change-out. Ram closing pressure closes the rams. When the bonnet bolts are removed, closing pressure opens the bonnet. After the bonnet has moved to the fully extended position, the ram is clear of the body. An eyebolt can be installed in the top of each ram to lift it out of the preventer. Ram opening pressure opens the rams. Following ram change-out, this pressure closes the bonnets. The rams are pulled outward, near the bonnets, before the bonnets begin moving toward the preventer body. This assures that the rams never obstruct the bore or interfere with the pipe in the hole. Hydraulic pressure draws the bonnets tightly against the preventer body and the bonnet bolts are reinstalled to hold the bonnets closed.

U BOP Preventer Hydraulic Control System



-  Ram Open, Bonnet Closed
-  Ram, Closed, Bonnet Open



Operating Data & Fluid Requirements

Bore Size and Working Pressure	Gals to Open Pipe Rams (1 Set)	Gals to Close Pipe Rams (1 Set)	Locking Screw Turns (Each End)	Closing Ratio	Opening Ratio
7-1/16" All WP	1.3	1.3	18	6.9:1	2.2:1
11" Except 15,000 psi	3.4	3.5	27	7.3:1	2.5:1
11" 15,000 psi	5.7	5.8	32	9.8:1	2.2:1
13-5/8" Except 15,000 psi	5.5	5.8	32	7.0:1	2.3:1
13-5/8" 15,000 psi Model B	10.4	10.6	45	10.6:1	3.6:1
16-3/4" 3,000 psi Model B	9.8	10.6	38	6.8:1	2.3:1
16-3/4" 5,000 psi Model B	9.8	10.6	38	6.8:1	2.3:1
16-3/4" 10,000 psi	11.6	12.5	45	6.8:1	2.3:1
18-3/4" 10,000 psi	21.3	23.1	54	7.4:1	3.7:1
20-3/4" 3,000 psi	8.1	8.7	46	7.0:1	1.3:1
21-1/4" 2,000 psi	9.0	8.7	46	7.0:1	1.3:1
21-1/4" 5,000 psi	27.3	30.0	54	7.2:1	4.0:1
21-1/4" 10,000 psi	24.5	26.9	51	7.2:1	4.0:1
26-3/4" 3,000 psi	10.1	10.8	58	7.0:1	1.0:1

Large Bore Shear Bonnet Operating Data and Fluid Requirements

Bore Size and Working Pressure	Gals to Open Pipe Rams (1 Set)	Gals to Close Pipe Rams (1 Set)	Locking Screw Turns (Each End)	Closing Ratio	Opening Ratio
7-1/16" All WP					
11" Except 15,000 psi	6.8	7.0	27	12.0:1	4.8:1
11" 15,000 psi	8.9	9.0	32	15.2:1	3.7:1
13-5/8" Except 15,000 psi	10.5	10.9	32	10.8:1	4.5:1
13-5/8" 15,000 psi Model B	16.0	16.2	45	16.2:1	6.0:1
16-3/4" 3,000 psi Model B	18.2	19.0	38	10.4:1	4.4:1
16-3/4" 5,000 psi Model B	18.2	19.0	38	10.4:1	4.4:1
16-3/4" 10,000 psi	18.2	19.1	45	10.4:1	4.4:1
18-3/4" 10,000 psi	-----	-----	-----	-----	-----
20-3/4" 3,000 psi	14.3	14.9	46	10.8:1	1.7:1
21-1/4" 2,000 psi	14.3	14.9	46	10.8:1	1.7:1
21-1/4" 5,000 psi	-----	-----	-----	-----	-----
21-1/4" 10,000 psi	-----	-----	-----	-----	-----
26-3/4" 3,000 psi	-----	-----	-----	-----	-----

U BOP Specifications

The following specifications apply to typical Cameron U type BOPs. Your Cameron representative can provide information on non-standard BOP assemblies.

- ♦ Side outlets to 4-1/16" (7-1/16" on 26-3/4" BOPs) can be provided beneath each set of rams on either or both sides of U BOPs. Side outlets can be studded, open-face flange or clamp hub with the same pressure rating as the vertical run connections.
- ♦ Flanges conform to API standard 6A and/or 16A. Hubs conform to API 16A or applicable standards. Type 6BX flanges are standard for 10,000 and 15,000 psi working pressures and for 5,000 psi for 13-5/8" and larger bore BOPs.

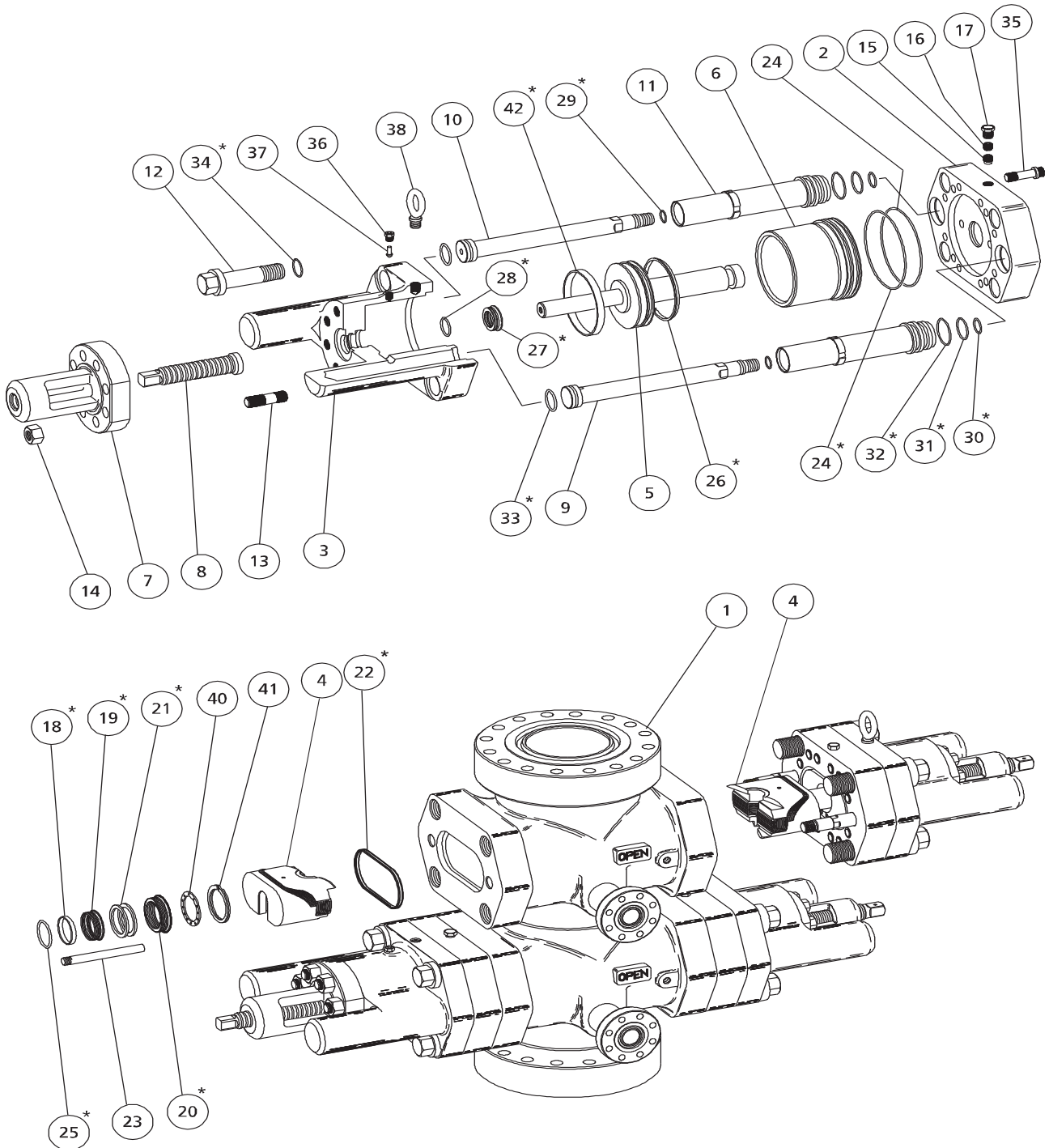
Hydraulic control connections for operation of rams and bonnets are 1" NPT. There are two connections for each set of rams. Wedgelock connections are 1/2" NPT.

The capital letters in the following designations refer to the U BOP dimensional views and dimensional charts shown on the following pages.

- A-1 Length - bonnets closed, locking screws locked
- A-2 Length - bonnets opened, locking screws unlocked
- A-3 Length - bonnets closed, with wedgelocks
- A-4 Length - bonnets opened, with wedgelocks
- B-1 Height - flanged
- B-2 Height - clamp hubs
- B*** Height - added height if 30" spacing is required for double
- C Width - no side outlets
- D Centerline of preventer to outlet flange or hub face. This distance is variable and must be determined per individual specifications
- E-1 Centerline of side outlet below rams to bottom flange face
- E-2 Centerline of side outlet below rams to bottom hub face
- F-1 Top of upper ram to top flange face
- F-2 Top of upper ram to top hub face
- G Height of ram
- H-1 Centerline of side outlet between rams to bottom flange face
- H-2 Centerline of side outlet between rams to bottom hub face
- J Top of lower ram to bottom of upper ram

Note: All weights listed are based on utilizing closed die forgings.

Double U BOP



U BOP Part Numbers 7-1/16" 3,000 - 7-1/16" 15,000 psi WP

Item	Description	Qty	Qty	7-1/16"	7-1/16"	7-1/16"	7-1/16"
No.	Model II	Sgl	Dbl	3,000 psi	5,000 psi	10,000 psi	15,000 psi
1	Body	1	1	----	----	----	----
2	Intermediate Flange	2	4	030266-03-00-01	030266-03-00-01	030266-01-01	030266-01-01
3	Bonnet	2	4	030278-04	030278-03-00-01	030278-02	030278-01
4	Ram Assembly	2	4	644216-()	644216-()	644216-()	644216-()
5	Piston, Operating	2	4	2010520-02	2010520-02	2010520-02	2010520-02
6	Cylinder, Operating	2	4	030274-02-70	030274-02-70	030274-02-70	030274-02-70
7	Housing, Locking Screw	2	4	030308-01	030308-01	030308-01	030308-01
8	Locking Screw	2	4	030326	030326	030326	030326
9	Piston, Ram Change/Open	2	4	030324-03	030324-03	030324-03	030324-03
10	Piston, Ram Change/Close	2	4	030325-03	030325-03	030325-03	030325-03
11	Cylinder, Ram Change	4	8	030273-02-70	030273-02-70	030273-02-70	030273-02-70
12	Bolt, Bonnet	8	16	030312-06-00-01	030312-02	030312-07	030312-01-00-01
13	Stud, Locking Screw Housing	16	32	219065-10-04-41	219065-10-04-41	219065-10-04-41	219065-10-04-41
14	Nut, Locking Screw Housing	16	32	2709000-10-01	2709000-10-01	2709000-10-01	2709000-10-01
15	Check Valve, Plastic Packing	2	4	M517988	M517988	M517988	M517988
16	Screw, Plastic Packing	2	4	005940-09	005940-09	005940-09	005940-09
17	Pipe Plug, Plastic Packing	2	4	005930-05-10	005930-05-10	005930-05-10	005930-05-10
18	Ring, Plastic Packing	1	2	2010178-01	2010178-01	2010178-01	2010178-01
19	Ring, Plastic Energizing	1	2	018586-12	018586-12	018586-12	018586-12
20	Seal Ring, Connecting Rod	1	2	212741-37-00-01	212741-37-00-01	212741-37-00-01	212741-37-00-01
21	Ring Back-Up	2	4	021792-21	021792-21	021792-21	021792-21
22	Seal, Bonnet	2	4	644197-01-00-01	644197-01-00-01	644197-01-00-01	644197-01-00-01
23	Pin, Ram Guide	4	8	030313-02	030313-02	030313-02	030313-02
24	O-Ring, Operating Cylinder	2	4	702645-44-61	702645-44-61	702645-44-61	702645-44-61
25	O-Ring, Operating Piston Rod to Int Flg	1	2	018492-92	018492-92	018492-92	018492-92
26	Lip Seal, Operating Piston	1	2	710541	710541	710541	710541
27	Seal Ring, Tail Rod	1	2	212741-32	212741-32	212741-32	212741-32
28	O-Ring, Wiping	1	2	702645-33-11	702645-33-11	702645-33-11	702645-33-11
29	O-Ring, Ram Change Piston to Body	2	4	702645-32-41	702645-32-41	702645-32-41	702645-32-41
30	O-Ring, Ram Change Piston Rod to Int Flg	2	4	702645-32-91	702645-32-91	702645-32-91	702645-32-91
31	O-Ring, Ram Change Cylinder to Int Flg	2	4	702645-33-81	702645-33-81	702645-33-81	702645-33-81
32	O-Ring, Ram Change Cylinder to Bonnet	2	4	702645-34-21	702645-34-21	702645-34-21	702645-34-21
33	O-Ring, Ram Change Piston	2	4	702645-33-21	702645-33-21	702645-33-21	702645-33-21
34	O-Ring, Bonnet Bolt Retainer	4	16	702645-22-31	702645-22-51	702645-22-91	702645-23-21
35	Cap Screw, Int Flange to Bonnet	16	32	702585-22-00-50	702585-22-00-50	702585-22-00-50	702585-22-00-50
36	Gland, Bleeder	2	4	017454-08	017454-08	017454-08	017454-08
37	Plug, Bleeder	2	4	017454-09	017454-09	017454-09	017454-09
38	Lifting Eye	2	2	011849-01	011849-01	011849-01	011849-01
39	Packing, Plastic	2	4	007650-25	007650-25	007650-25	007650-25
40	Washer	2	4	689523-04	689523-04	689523-04	689523-04
41	Ring, Retainer	2	4	018572-83	018572-83	018572-83	018572-83
42	Wear Ring, Operating Piston	1	2	049223-03	049223-03	049223-03	049223-03
43	Spacer, Shear	--	--	687117-01	687117-01	687117-01	687117-01
44	O-Ring, Cross Section	1	2	018492-84	018492-84	018492-84	018492-84

* A large bore shear bonnet is available for these sizes. For part numbers, see page 18.

11" 3,000 - 11"15,000 psi WP U BOP Part Numbers

Item No.	Description	Qty Sgl	Qty Dbl	*11" 3,000 psi Model II	*11" 5,000 psi Model II	*11" 10,000 psi Model II	*11" 15,000 psi Model 79
1	Body	1	1	----	----	----	----
2	Intermediate Flange	2	4	144114-02-00-02	144114-02-00-02	144114-02-00-02	163151-01
3	Bonnet	2	4	030268-01	030268-02	030268-03	031241
4	Ram Assembly	2	4	644219-()	644219-()	644219-()	2010456-()
5	Piston, Operating	2	4	2245160-01-01	2245160-01-01	2245160-01-01	163153-02
6	Cylinder, Operating	2	4	030274-03-70	030274-03-70	030274-03-70	030274-01-70
7	Housing, Locking Screw	2	4	030308-02	030308-02	030308-02	030308-03
8	Locking Screw	2	4	30365	30365	30365	030846
9	Piston, Ram Change/Open	2	4	30362-03	30362-03	30362-03	031239-03
10	Piston, Ram Change/Close	2	4	30363-03	030312-03	030312-05	031238-03
11	Cylinder, Ram Change	4	8	030273-03-70	030273-03-70	030273-03-70	030273-01-70
12	Bolt, Bonnet	8	16	030312-04	030312-03-00-01	030312-05-00-01	2010181-06-01
13	Stud, Locking Screw Housing	16	32	219065-12-05-01	219065-12-05-01	219065-12-05-01	219065-14-07-51
14	Nut, Locking Screw Housing	16	32	2709000-12-01	2709000-12-01	2709000-12-01	2709000-14-01
15	Check Valve, Plastic Packing	2	4	M517988	M517988	M517988	M517988
16	Screw, Plastic Packing	2	4	005940-09	005940-09	005940-09	005940-09
17	Pipe Plug, Plastic Packing	2	4	005930-05-10	005930-05-10	005930-05-10	005930-05-10
18	Ring, Plastic Packing	2	4	2010178-02	2010178-02	2010178-02	2010178-02
19	Ring, Plastic Energizing	2	4	018586-13	018586-13	018586-13	018586-13
20	Seal Ring, Connecting Rod	2	4	212741-38-00-01	212741-38-00-01	212741-38-00-01	212741-38-00-01
21	Ring Back-Up	4+	8+	021792-22	021792-22	021792-22	021792-22
22	Seal, Bonnet	2	4	644197-02-00-01	644197-02-00-01	644197-02-00-01	049272-03-00-01
23	Pin, Ram Guide	4	8	030313-03	030313-03	030313-03	030313-01
24	O-Ring, Operating Cylinder	4	8	702645-45-11	702645-45-11	702645-45-11	702645-45-51
25	O-Ring, Operating Piston Rod to Int Flg	2	4	018492-91	018492-91	018492-91	018492-91
26	Lip Seal, Operating Piston	2	4	710539	710539	710539	710538
27	Seal Ring, Tail Rod	2	4	212741-33-00-01	212741-33-00-01	212741-33-00-01	212741-34-00-01
28	O-Ring, Wiping	2	4	702645-33-51	702645-33-51	702645-33-51	702645-33-71
29	O-Ring, Ram Change Piston to Body	4	8	702645-32-61	702645-32-61	702645-32-61	702645-32-81
30	O-Ring, Ram Change Piston Rod to Int Flg	4	8	702645-33-11	702645-33-11	702645-33-11	702645-33-31
31	O-Ring, Ram Change Cylinder to Int Flg	4	8	031423-25-13-85	031423-25-13-85	031423-25-13-85	702645-34-61
32	O-Ring, Ram Change Cylinder to Bonnet	4	8	2010180-02	2010180-02	2010180-02	702645-42-51
33	O-Ring, Ram Change Piston	4	8	702645-33-51	702645-33-51	702645-33-51	702645-33-81
34	O-Ring, Bonnet Bolt Retainer	8	16	702645-22-71	702645-22-91	702645-23-41	702645-23-91
35	Cap Screw, Int Flange to Bonnet	16**	32**	702585-25-00-50	702585-25-00-50	702585-25-00-50	702585-25-00-54
36	Gland, Bleeder	2	4	017454-08	017454-08	017454-08	017454-08
37	Plug, Bleeder	2	4	017454-09	017454-09	017454-09	017454-09
38	Lifting Eye	2	2	011849-01	011849-01	011849-01	011849-01
39	Packing, Plastic	10	20	007650-25	007650-25	07650-25	007650-25
40	Washer	2	4	689523-05	689523-05	689523-05	689523-05
41	Ring, Retainer	2	4	018572-84	018572-84	018572-84	018572-84
42	Wear Ring, Operating Piston	2	4	049223-02	049223-02	049223-02	049223-01
43	Spacer, Shear	--	--	687117-02	687117-02	687117-02	687117-03

* A large bore shear bonnet is available for these sizes. For part numbers, see page 18.

** Required on all 11" 15,000 psi and 16-3/4" 10,000 psi BOP's with manual locking screws.

+ 11" 15,000 psi requires 8 for single, 16 for double.

U BOP Part Numbers 13 -5/8" 3,000 - 13-5/8" 15,000 psi WP

Item No.	Description	Qty Sgl	Qty Dbl	*13-5/8" 3,000 psi Model II	*13-5/8" 5,000 psi Model II	*13-5/8" 10,000 psi Model II	*13-5/8" 15,000 psi Model B
1	Body	1	1	----	----	----	----
2	Intermediate Flange	2	4	030270-01-00-02	030270-01-00-02	236499-34-11-02	2113728-01
3	Bonnet	2	4	030284-02	615143-01	031241	691849
4	Ram Assembly	2	4	644225-()	644225-()	644225-()	644228-()
5	Piston, Operating	2	4	679816	2245199-01-01	2245074-01-01	698996-05
6	Cylinder, Operating	2	4	030274-01-70	030274-01-70	030274-01-70	030274-06-70
7	Housing, Locking Screw	2	4	030308-03	030308-03	030308-03	030308-06
8	Locking Screw	2	4	030307	030307	030307	695234
9	Piston, Ram Change/Open	2	4	030310-03	030310-03	031239-03	038847-03
10	Piston, Ram Change/Close	2	4	030309-03	030309-03	031238-03	038848-03
11	Cylinder, Ram Change	4	8	030273-01-70	030273-01-70	030273-01-70	030273-06-70
12	Bolt, Bonnet	8	16	201081-06-01	030312-01-00-01	2010181-06-01	030312-25-00-01
13	Stud, Locking Screw Housing	16	32	219065-14-06-01	219065-14-06-01	219061-14-06-01	219065-14-07-51
14	Nut, Locking Screw Housing	16	32	2709000-14-01	2709000-14-01	2709000-14-01	2709000-14-01
15	Check Valve, Plastic Packing	2	4	M517988	M517988	M517988	M517988
16	Screw, Plastic Packing	2	4	005940-09	005940-09	005940-09	005940-09
17	Pipe Plug, Plastic Packing	2	4	005930-05-10	005930-05-10	005930-05-10	005930-05-10
18	Ring, Plastic Packing	2	4	012469-24	012469-24	012469-24	012469-24
19	Ring, Plastic Energizing	2	4	018586-01	018586-01	018586-01	018586-01
20	Seal Ring, Connecting Rod	2	4	212741-36-00-01	212741-36-00-01	212741-36-00-01	212741-36-00-01
21	Ring Back-Up	4	8	----	----	021792-26	021792-26
22	Seal, Bonnet	2	4	644197-03-00-01	644197-03-00-01	644197-03-00-01	2010146-01
23	Pin, Ram Guide	4	8	030313-01	030313-01	030313-01	030313-08
24	O-Ring, Operating Cylinder	4	8	702645-45-51	702645-45-51	702645-45-51	702645-46-11
25	O-Ring, Operating Piston Rod to Int Flg	2	4	018492-90	018492-90	018492-90	018492-90
26	Lip Seal, Operating Piston	2	4	710538	710538	710538	710542
27	Seal Ring, Tail Rod	2	4	212741-34-00-01	212741-34-00-01	212741-34-00-01	212741-45
28	O-Ring, Wiping	2	4	702645-33-71	702645-33-71	702645-33-71	702645-34-21
29	O-Ring, Ram Change Piston to Body	4	8	702645-32-81	702645-32-81	702645-32-81	702645-33-21
30	O-Ring, Ram Change Piston Rod to Int Flg	4	8	702645-33-31	702645-33-31	702645-33-31	031423-21-13-85
31	O-Ring, Ram Change Cylinder to Int Flg	4	8	702645-34-61	702645-34-61	702645-34-61	702645-35-41
32	O-Ring, Ram Change Cylinder to Bonnet	4	8	702645-42-51	702645-42-51	702645-42-51	702645-43-41
33	O-Ring, Ram Change Piston	4	8	702645-33-81	702645-33-81	702645-33-81	702645-34-41
34	O-Ring, Bonnet Bolt Retainer	8	16	702645-23-11	702645-23-21	702645-23-91	702645-24-51
35	Cap Screw, Int Flange to Bonnet	24	48	702585-25-00-44	702585-25-00-44	702585-25-00-54	702585-31-00-54
36	Gland, Bleeder	2	4	017454-08	017454-08	017454-08	017454-08
37	Plug, Bleeder	2	4	017454-09	017454-09	017454-09	017454-09
38	Lifting Eye	2	2	011849-01	011849-01	011849-01	011849-01
39	Packing, Plastic	10	20	007650-25	007650-25	07650-25	007650-25
40	Washer	2	4	689523-01	689523-01	689523-01	689523-01
41	Ring, Retainer	2	4	018572-85	018572-85	018572-85	018572-85
42	Wear Ring, Operating Piston	2	4	049223-01	049223-01	049223-01	049223-04
43	Spacer, Shear	--	--	687117-03	687117-03	687117-03	687117-05

* A large bore shear bonnet is available for these sizes. For part numbers, see page 18.

U BOP Part Numbers 16 -3/4" 3,000 - 18-3/4" 10,000 psi WP

Item No.	Description	Qty Sgl	Qty Dbl	*16-3/4" 3,000 psi Model B	*16-3/4" 5,000 pai Model B	*16-3/4" 10,000 pai Model II	18-3/4" 10,000 psi Model II
1	Body	1	1	----	----	----	----
2	Intermediate Flange	2	4	038944	038844-03	691848	041458
3	Bonnet	2	4	038843-02	038843-01	691849	041459
4	Ram Assembly	2	4	644231-()	644231-()	644231-()	644234-()
5	Piston, Operating	2	4	614374-01	689562-01-00-01	692828	265501-54-11-03
6	Cylinder, Operating	2	4	030274-06	030274-06-70	041365-06	030274-13
7	Housing, Locking Screw	2	4	030308-06	030308-06	030308-06	030308-09
8	Locking Screw	2	4	038901	038901	695234	041085
9	Piston, Ram Change/Open	2	4	038946-03	038847-03	692756	040961-03
10	Piston, Ram Change/Close	2	4	038947-03	038848-03	692759	040960-03
11	Cylinder, Ram Change	4	8	030273-07	030273-06-70	030273-13	030273-09
12	Bolt, Bonnet	8	16	030312-17	030312-16	030312-24	030312-23
13	Stud, Locking Screw Housing	16	32	005918-78-10	219065-14-04-71	219065-14-06-01	005919-38-10
14	Nut, Locking Screw Housing	16	32	2709000-14-01	2709000-14-01	2709000-14-01	2709000-18-01
15	Check Valve, Plastic Packing	2	4	M517988	M517988	M517988	M517988
16	Screw, Plastic Packing	2	4	005940-09	005940-09	005940-09	005940-09
17	Pipe Plug, Plastic Packing	2	4	005930-05-10	005930-05-10	005930-05-10	005930-05-10
18	Ring, Plastic Packing	2	4	012469-52	012469-52	012469-52	012469-72
19	Ring, Plastic Energizing	2	4	018586-14	018586-14	018586-14	018586-19
20	Seal Ring, Connecting Rod	2	4	212741-44	212741-44	212741-44	212741-60
21	Ring Back-Up	4	8	----	----	021792-34	021793-40+
22	Seal, Bonnet	2	4	644197-04-00-01	644197-04-00-01	644197-04-00-01	644197-05-00-01
23	Pin, Ram Guide	4	8	030313-06	030313-06	030313-06	030313-07
24	O-Ring, Operating Cylinder	4	8	702645-46-11	702645-46-11	702645-46-11	702645-46-91
25	O-Ring, Operating Piston Rod to Int Flg	2	4	2708811-01	2708811-01	2708811-01	041602-04-13-85
26	Lip Seal, Operating Piston	2	4	710542	710542	710542	710543
27	Seal Ring, Tail Rod	2	4	212741-45	212741-45	212741-45	212741-36-00-01
28	O-Ring, Wiping	2	4	702645-34-21	702645-34-21	702645-34-21	702645-34-51
29	O-Ring, Ram Change Piston to Body	4	8	702645-33-21	702645-33-21	702645-33-21	702645-34-01
30	O-Ring, Ram Change Piston Rod to Int Flg	4	8	031423-21-13-85	031423-21-13-85	31423-21-13-85	2010180-02
31	O-Ring, Ram Change Cylinder to Int Flg	4	8	702645-35-41	702645-35-41	702645-35-41	702645-43-51
32	O-Ring, Ram Change Cylinder to Bonnet	4	8	702645-43-41	702645-43-41	702645-43-41	702645-43-81
33	O-Ring, Ram Change Piston	4	8	702645-34-41	702645-34-41	702645-34-41	030101-83-13-85
34	O-Ring, Bonnet Bolt Retainer	8	16	702645-23-21	702645-23-71	702645-24-51	702645-24-71
35	Cap Screw, Int Flange to Bonnet	24**	48**	702585-31-00-44	702585-31-00-54	702585-31-00-72	702585-36-00-76
36	Gland, Bleeder	2	4	017454-08	017454-08	017454-08	017454-08
37	Plug, Bleeder	2	4	017454-09	017454-09	017454-09	017454-09
38	Lifting Eye	2	2	011849-01	011849-01	011849-01	011849-01
39	Packing, Plastic	10	20	007650-25	007650-25	007650-25	007650-25
40	Washer	2	4	689523-02	689523-02	689523-02	689523-03
41	Ring, Retainer	2	4	033186-85	033186-85	033186-35	033186-01-04
42	Wear Ring, Operating Piston	2	4	049223-04	049223-04	049223-04	049223-07
43	Spacer, Shear	--	--	----	687117-05	687117-05	----

* A large bore shear bonnet is available for these sizes. For part numbers, see page 18.

** The 18 3/4" requires 32 for single and 64 for double.

U BOP Part Numbers 20-3/4" 3,000 - 26-3/4" 3,000 psi WP

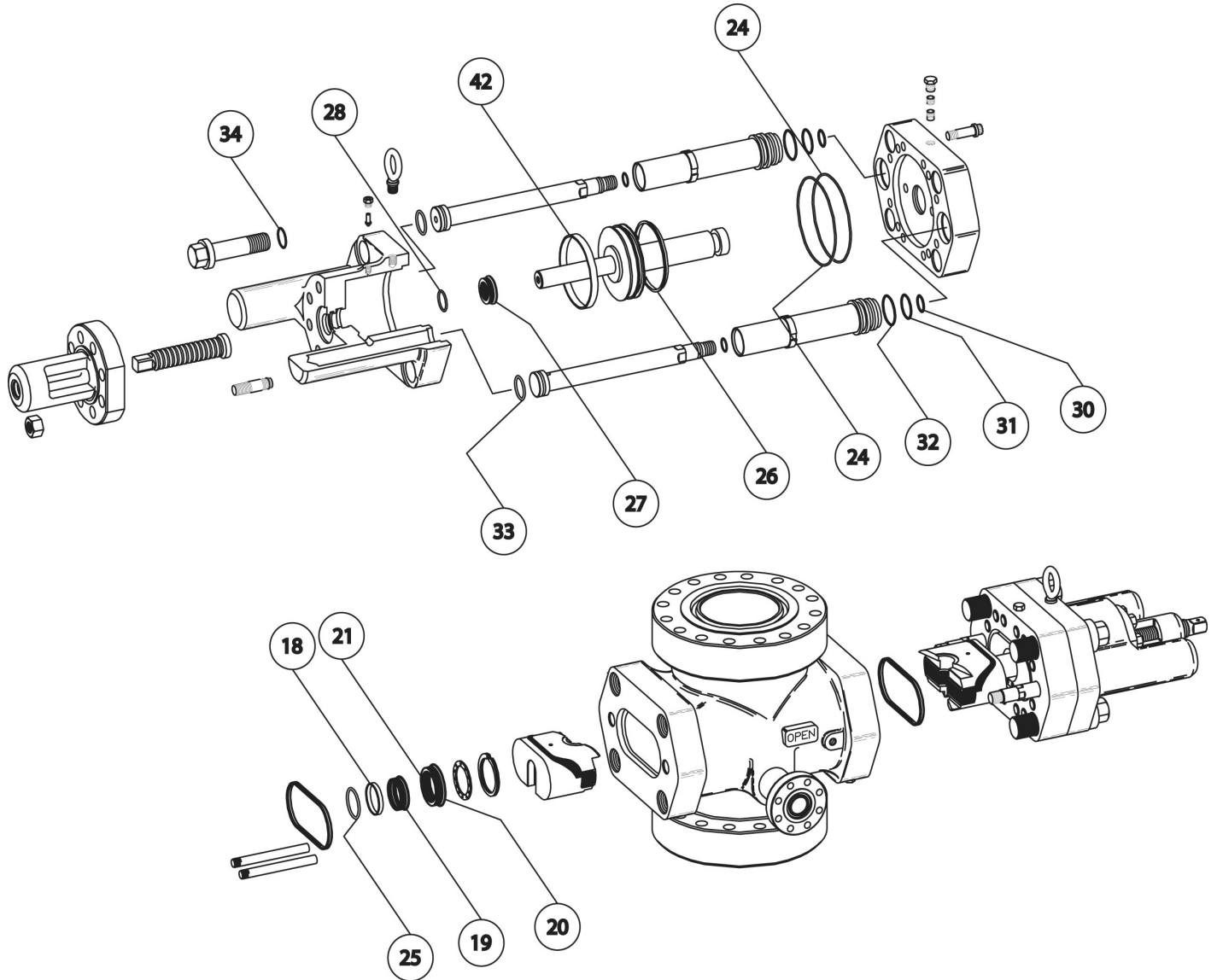
Item No.	Description	Qty Sgl	Qty Dbl	*20-3/4" 3,000 psi Model II	*21-1/4" 2,000 psi Model II	21-1/4" 5,000 psi Model II	21-1/4" 10,000 psi Model II	26-3/4" 3,000 psi Model II
1	Body	1	1	----	----	----	----	----
2	Intermediate Flange	2	4	236499-71-11-03	236499-71-11-03	049955-01-00-01	615369-01-00-01	038327-02
3	Bonnet	2	4	030835-01	030835-02	049963-01	041357-01-00-01	038326
4	Ram Assembly	2	4	044256-()	044256-()	044262-()	044262-()	044260-()
5	Piston, Operating	2	4	2245183-01-01	2245183-01-01	049954-01-00-01	41356-01-00-01	2113510-01
6	Cylinder, Operating	2	4	030274-04-70	030274-04-70	030274-11-70	030274-11-70	030274-05-70
7	Housing, Locking Screw	2	4	030308-04	030308-04	030308-08	030308-08	030308-05
8	Locking Screw	2	4	030846	030846	041085	041085	034233
9	Piston, Ram Change/Open	2	4	030848-03	030848-03	041064-03	041064-03	038174-03
10	Piston, Ram Change/Close	2	4	030849-03	030849-03	041065-03	041065-03	038324-03
11	Cylinder, Ram Change	4	8	030273-04-70	030273-04-70	030273-11-70	030273-11-70	030273-05-70
12	Bolt, Bonnet	8	16	030312-10-00-01	030312-11	030312-26-00-01	2010181-21	030312-13-00-01
13	Stud, Locking Screw Housing	16	32	219065-14-06-01	219065-14-06-01	219065-18-08-41	219065-18-08-41	219065-14-06-01
14	Nut, Locking Screw Housing	16	32	2709000-14-01	2709000-14-01	2709000-18-01	2709000-18-01	2709000-14-01
15	Check Valve, Plastic Packing	2	4	M517988	M517988	M517988	M517988	M517988
16	Screw, Plastic Packing	2	4	005940-09	005940-09	005940-09	005940-09	005940-09
17	Pipe Plug, Plastic Packing	2	4	005930-05-10	005930-05-10	005930-05-10	005930-05-10	005930-05-10
18	Ring, Plastic Packing	2	4	012469-24	012469-24	012469-70	012469-70	012469-24
19	Ring, Plastic Energizing	2	4	018586-01	018586-01	018586-18	018586-18	018586-01
20	Seal Ring, Connecting Rod	2	4	212741-36-00-01	212741-36-00-01	011741-58-00-01	011741-58-00-01	212741-36-00-01
21	Ring Back-Up	4	8	----	----	021793-39	021793-39	----
22	Seal, Bonnet	2	4	046613-16-00-01	046613-16-00-01	644197-08-00-01	644197-08-00-01	644197-09-00-01
23	Pin, Ram Guide	4	8	030313-04	030313-04	030313-07	030313-07	030313-05
24	O-Ring, Operating Cylinder	4	8	702645-45-51	702645-45-51	702645-46-91	702645-46-91	702645-45-51
25	O-Ring, Operating Piston Rod to Int Flg	2	4	018492-90	018492-90	030101-88-13-85	030101-88-13-85	018492-90
26	Lip Seal, Operating Piston	2	4	710538	710538	710544	710544	710538
27	Seal Ring, Tail Rod	2	4	212741-34-00-01	212741-34-00-01	212741-36-00-01	212741-36-00-01	212741-34-00-01
28	O-Ring, Wiping	2	4	702645-33-71	702645-33-71	702645-34-51	702645-34-51	702645-33-71
29	O-Ring, Ram Change Piston to Body	4	8	702645-33-61	702645-33-61	702645-34-31	702645-34-31	702645-34-41
30	O-Ring, Ram Change Piston Rod to Int Flg	4	8	702645-34-11	702645-34-11	702645-35-11	702645-35-11	702645-34-91
31	O-Ring, Ram Change Cylinder to Int Flg	4	8	702645-43-71	702645-43-71	702645-44-01	702645-44-01	702645-43-91
32	O-Ring, Ram Change Cylinder to Bonnet	4	8	702645-43-91	702645-43-91	702645-44-21	702645-44-21	702645-44-11
33	O-Ring, Ram Change Piston	4	8	702645-42-51	702645-42-51	702645-43-11	702645-43-11	702645-42-91
34	O-Ring, Bonnet Bolt Retainer	8	16	702645-22-91	702645-22-71	702645-24-71	702645-24-81	702645-23-91
35	Cap Screw, Int Flange to Bonnet	24**	48**	702585-28-00-50	702585-28-00-50	702585-36-00-93	702585-36-00-93	702585-31-00-70
36	Gland, Bleeder	2	4	017454-08	017454-08	017454-08	017454-08	017454-08
37	Plug, Bleeder	2	4	017454-09	017454-09	017454-09	017454-09	017454-09
38	Lifting Eye	2	2	011849-01	011849-01	011849-01	011849-01	011849-01
39	Packing, Plastic	10	20	007650-25	007650-25	007650-25	007650-25	007650-25
40	Washer	2	4	689523-01	689523-01	002353-46	002353-46	689523-01
41	Ring, Retainer	2	4	018572-85	018572-85	033186-92	033186-92	018572-85
42	Wear Ring, Operating Piston	2	4	049223-10	049223-10	049223-11	049223-08	049223-10
43	Spacer, Shear	--	--	687117-03	687117-03	----	----	----

* A large bore shear bonnet is available for these sizes. For part numbers, see page 18.

Bonnet Rebuild Softgoods Kits & Components

For popular size U BOP's a bonnet rebuild softgoods kit is available to provide all parts required to reseal the operating system. Kit parts are shrink-firm packed to prevent loss and assure long shelf life. All parts in each kit are identified with part numbers and parts list index numbers.

U BOP Bonnet Softgoods Components



SD 017515

If you require parts certified to API 16A, please verify part numbers with your local Cameron representative.

U BOP Bonnet Rebuild Softgoods Kit Components

Item Number* See page 15	Description
18	Ring, Plastic Packing
19	Ring, Plastic Energizing
20	Seal Ring, Connecting Rod
21	Ring, Backup
24	O-Ring, Operating Cylinder
25	O-Ring, Operating Piston Rod to Intermediate Flange
26	Lip Seal, Operating Piston
27	Seal Ring, Tail Rod
28	O-Ring, Wiping
29	O-Ring, Ram Change Piston to Body
30	O-Ring, Ram Change Piston Rod to Intermediate Flange
31	O-Ring, Ram Change Cylinder to Intermediate Flange
32	O-Ring, Ram Change Piston to Bonnet
33	O-Ring, Ram Change Piston
34	O-Ring, Bonnet Bolt Retainer
39	Packing, Plastic**
42	Wear Ring, Operating Piston
44	O-Ring (not shown)

Kit Part Numbers

BOP Size (in.)	Pressure Rating/Bonnet Type	Kit Part Number*
7-1/16	3,000, 5,000, 10,000 and 15,000 psi All **	644909-01
11	3,000, 5,000 and 10,000 psi Pipe **	644909-02
11	15,000 psi All	644831-08
13-5/8	3,000, 5,000 and 10,000 psi Pipe **	644909-03
13-5/8	15,000 psi All	644831-12
16-3/4"	3,000 psi all	644831-13
16-3/4	5,000 psi Pipe	644831-14
16-3/4	10,000 psi All	644831-15
18-3/4	10,000 psi All	644909-04
20-3/4	3,000 psi Pipe	644831-17
21-1/4	2,000 psi Pipe or Shear **	644831-18
21-1/4	5,000 psi All	644831-19
21-1/4	10,000 psi Pipe or Shear	644831-21
26-3/4	3,000 psi All	644831-22

* One kit contains softgoods for one bonnet.

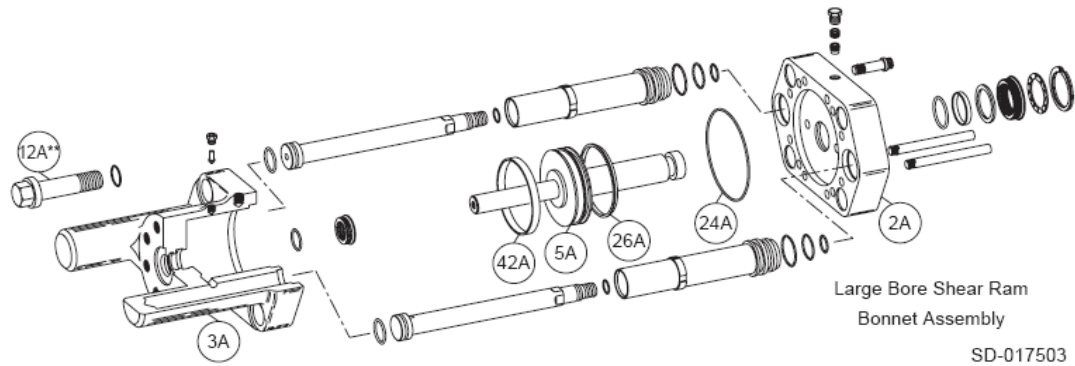
** Except Large Bore Shear Bonnets

Drill Pipe Shearing Requirements

Refer to EB702D for shearing information and requirements or contact your Cameron representative for different pipe sizes and grades.

U BOP Lifting Plates			
BOP Size (in.)	Pressure Rating	Lifting Plate Assy	Rating (Tons)
7-1/16	3,000, 5,000, 10,000 and 15,000 psi	644930-07	60
11	3,000, 5,000 and 10,000 psi	644930-03	50
11	15,000 psi	644930-02	50
13-5/8	3,000, 5,000, 10,000 and 15,000 psi	644930-01	50
13-5/8	3,000, 5,000 10,000 and 15,000 psi	644930-05	100
16-3/4	3,000 and 5,000 psi	644930-04	50
16-3/4	10,000 psi	644930-01	50
16-3/4	3,000, 5,000 and 10,000 psi	644930-05	100
18-3/4	10,000 psi	644930-06	100
18-3/4	10,000 psi	2011800-01	100
20-3/4	3,000 psi	644930-01	50
20-3/4	3,000 psi	644930-05	100
21-1/4	2,000 psi	644930-01	50
21-1/4	2000 psi	644930-05	100
21-1/4	5,000 psi	644930-06	100
21-1/4	5,000 psi	2011800-01	100
21-1/4	5,000 and 10,000 psi (Special)	644852-03	180

Large Bore Shear Bonnets



Item No.	Description (2 Required per Cavity)	11"	11"	11"	11"	13-5/8"	13-5/8"
		3,000 psi Model II	5,000 psi Model II	10,000 psi Model II	15,000 psi Model 79	3,000 psi Model 11	5,000 psi Model 11
*	Bonnet Assembly (Right)	-	615194-01-00-70	614596-01-00-05	2245316-00-01	-	615191-01-70
*	Bonnet Assembly (Left)	-	615194-02-00-70	614596-02-00-05	2245316-00-02	-	615191-02-70
2A	Intermediate Flange/Shear	144114-01-00-01	144114-01-00-01	144114-01-00-01	2245318-01	163220-01	163220-01
3A	Bonnet/Shear	615189-03	615189-02	615189-01	615640-01	615143-02	615143-01
5A	Operating Piston/Shear	2245160-02-01	2245160-02-01	2245160-02-01	163150-02	2245199-02-01	2245199-02-01
24A	O-Ring, Int Flg to Bonnet Lip	702645-45-51	702645-45-51	702645-45-51	702645-45-81	702645-45-81	702645-45-81
26A	Lip Seal, Operating Piston/Shear	710586	710586	710586	710542	710542	710542
42A	Wear Ring, Operating Piston/Shear	049223-15	049223-15	049223-15	049223-04	049223-04	049223-04

Item No.	Description (2 Required per Cavity)	13-5/8"	13-5/8"	16-3/4"	16-3/4"	20-3/4"	21-1/4"
		10,000 psi Model 11	15,000 psi Model B	5,000 psi Model B	10,000 psi Model II	3,000 psi Model II	2,000 psi Model II
*	Bonnet Assembly (Right)	614498-01-70-01	2113727-01-70	615530-01-00-01	-	-	-
*	Bonnet Assembly (Left)	614498-02-70-01	2113727-02-70	615530-02-00-01	-	-	-
2A	Intermediate Flange/Shear	236499-34-21-03	2113729-01	615528-01-00-01	615535-01	615523-03	615523-03
3A	Bonnet/Shear	614772-01	615448-01	615527-01	615534-01	615522-01	615522-02
5A	Operating Piston/Shear	2245074-02-01	236501-35-21-03	615529-02-00-01	615536-01	615524-03	615524-03
24A	O-Ring, Int Flg to Bonnet Lip	702645-45-81	702645-46-51	702645-46-51	702645-46-51	702645-45-81	702645-45-81
26A	Lip Seal, Operating Piston/Shear	710542	710588	710588	710588	710542	710542
42A	Wear Ring, Operating Piston/Shear	049223-04	049223-17	049223-17	049223-17	049223-14	049223-14

* Two shear bonnet assemblies one right and one left are required per cavity

If you require parts certified to API 16A, please verify part numbers with your local Cameron representative.

U BOP Large Bore Shear Bonnet Rebuild Softgoods Kit Components

Item Number See Page 15	Description
18	Ring, Plastic Packing
19	Ring, Plastic Energizing
20	Seal Ring, Connecting Rod
21*	Ring, Backup
24	O-Ring, Operating Cylinder
25	O-Ring, Operating Piston Rod to Intermediate Flange
26	Lip Seal, Operating Piston
27	Seal Ring, Tail Rod
28	O-Ring, Wiping
29	O-Ring, Ram Change Piston to Body
30	O-Ring, Ram Change Piston Rod to Intermediate Flange
31	O-Ring, Ram Change Cylinder to Intermediate Flange
32	O-Ring, Ram Change Piston to Bonnet
33	O-Ring, Ram Change Piston
34	O-Ring, Bonnet Bolt Retainer
39	Packing, Plastic
42	Wear Ring, Operating Piston

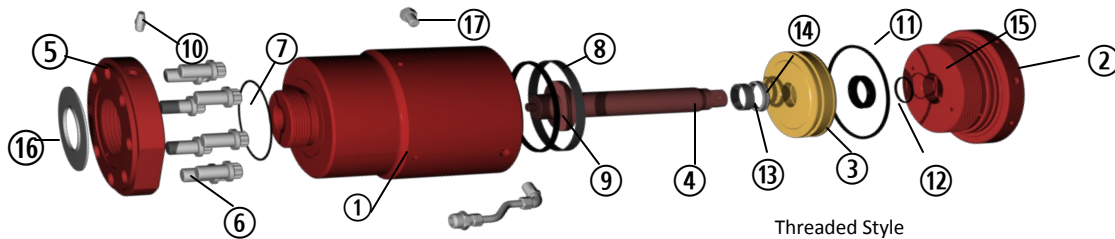
Large Bore Shear Bonnet Softgoods Kit Part Numbers

BOP Size (in.)	Pressure Rating	Kit Part Number*
11	3,000	644860-01
11	5,000	644860-02
11	10,000	644860-03
11	15,000	644860-04
13-5/8	3,000	644860-05
13-5/8	5,000	644860-06
13-5/8	10,000	644860-07
13-5/8	15,000	644860-08
16-3/4	5,000	644860-09
16-3/4	10,000	644860-10
20-3/4	3,000	644860-11
21-1/4	2,000	644860-11

* One kit contains softgoods for one bonnet.

Tandem Boosters For Threaded U BOP's

A BOP equipped with tandem boosters can deliver increased shearing force, while not increasing the wear and tear on the packers. Tandem boosters approximately double the force available to shear the pipe. Since the tail rod of the tandem booster has the same stroke as the BOP's operating piston, the standard shear locking mechanism can be installed on the outside end of the booster. For information on lock screws and the required spacers, see pages 9-13. For information concerning application where a tandem booster is required, consult your Cameron representative.



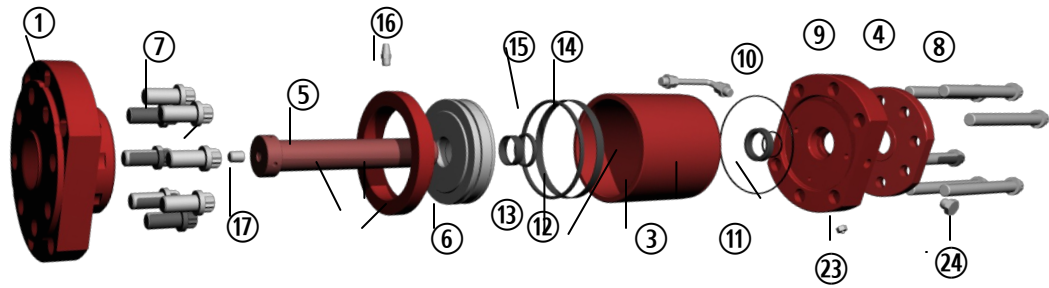
Item Number	Description	7 - 1/6" 3,000, 5,000, 10,000 & 15,000 psi		11" 3,000, 5,000 & 10,000 psi		20 - 3/4" 3,000 psi & 21 - 1/4" 2,000 psi	
		Qty	Part No.	Qty	Part No.	Qty	Part No.
**	Tandem Booster Assembly	1	645414-01	1	645219-01	1	645251-01
1	Cylinder	2	644959-01	2	645113-01	2	645113-04
---	Retainer Ring	---	---	---	033186-76 ***	---	---
---	Spacer	---	---	---	2032367-01***	---	---
2	Cylinder Head	2	645413-01	2	645171-01	2	645171-03
3	Piston	2	644961-01	2	2032370-02	2	645172-03
4	Tail Rod	2	644962-01	2	645173-01	2	645173-04
5	Adapter Plate	2	644963-01	2	645115-01	2	645115-03
6	Screw SDC HD Cap	16	018541-34	16	018542-13	16	K250405
7	O-Ring	2	702645-24-91	2	702640-36-11	2	702640-37-11
8	Seal Ring	2	710541	2	712352	2	704772
9	Wear Ring, Operating Ring	2	049223-03	2	049223-21	2	049223-01
10	Filter, Muffler	2	710621	2	710621	2	710417
11	Seal, Lip	2	011741-32	2	011741-33	2	011741-34
12	Seal Ring	2	710620	2	712351	2	710419
13	Wear Ring, Cylinder	2	644443-02	2	644443-03	2	645215-01
14	Seal Ring	2	705955	2	712445	2	710418
15	O-Ring	2	702640-33-11	2	702640-33-51	2	702640-33-71
16	Alignment Ring	2	645116-02	2	645116-01	2	645116-03
17	Pipe Plug	2	201018	2	201018	2	005930-05
18	Connector, Tubing	1	675029-09			4	20488710-06-57
19	Cross	1	006347-08	1	675029-52	2	675029-23
20	Nipple, Pipe Regular	1	685904--06-00-30	1	685902-07-00-30	1	685902-07-00-30
21	Hose Assembly	2	2708020	2	2708021	2	711374
22	Connector, Tubing	2	678046-17	2	204887-10-05-56		-
23	Stud Double Ended	16	219065-10-04-41	16	219065-12-05-01		-
24	Connector, Tubing	1	204888-08-05-56	--		--	-
25	Nipple, Pipe	1	685902-06-01	--		--	-
26	Connector, Tubing	1	675027-65	2	204887-10-06-56		-
27	Adapter Pipe	--	--	2	675029-01	--	-
	Repair Kit		2164148-01		2164148-03		2164148-10

The 7 1/16" tandem booster is a part of the standard land and platform shear configuration for 7 1/16" U BOP's.

** One assembly includes two tandem boosters.

*** On 11" - 3/5/10M# piston, remove retainer ring & spacer, install seal item no. 14 and replace spacer and retainer ring.

Tandem Boosters For Composite U BOP's



Composite Style

Item Number	Description	11" 15,000 psi 13-5/8" 3,000, 5,000 & 10,000 psi	
		Qty	Part No.
**	Tandem Booster Assembly	1	2010886-01
1	Adapter Plate	2	2010885-01
2	Pipe Plug	2	2010881-01
3	Cylinder	2	2010884-01
4	Cylinder Head	2	2010882-01
5	Tail Rod	2	2010880-01
6	Piston	2	645172-03
7	Screw, Cap	16	702585-31-00-30
8	Screw, Cap	12	702585-34-01-64
9	O-Ring	2	702645-33-71
10	Seal, Lip	2	011741-34
11	O-Ring	2	702645-38-12
12	Seal Ring	2	710418
13	Wear Ring	2	645215-01
14	Wear Ring	2	049223-01
15	Seal Ring	2	704772
16	Filter, Quiet Muffler	2	710621
17	Stud, Double Ended	2	702533-09-10-22
18	Connector, Tubing	2	204887-10-06-57
19	Cross	1	675029-23
20	Nipple, Pipe Regular	1	685902-07-00-30
21	Hose Assembly	2	2724538
22	Connector, Tubing	2	-
23	Gland, Tubing	2	017454-08
24	Blind Plug	2	017454-09
25	Elbow	2	714407
26	Pipe Plug	2	002504-28
---	Repair Kits	--	2164148-02

** One assembly includes two tandem

Tandem Boosters For Composite U BOP's

Item Number	Description	11" 3,000, 5,000 and 10,000 psi	
		Qty	Part No.
**	Assembly, Tandem Shear Booster	1	2254944-02
1	Cylinder	1	2254942-01
2	Cylinder Head	1	2254943-01
3	Piston	1	2032370-02
4	Tail Rod	1	2254940-01
5	Stud Cont Thd	1	702533-09-10-21
6	Screw, 12 Pt. Cap	8	702585-25-00-24
7	Adapter Spacer	1	2254941-01
8	Seal Ring	1	712352
9	Wear Ring, Operating Piston	1	049223-21
10	Filter, Muffler	1	710621
11	Seal, Lip	1	011741-33
12	O-Ring	1	702645-38-02
13	Wear Ring, Cylinder	1	644443-03
14	Seal Ring	1	7122445
15	O-Ring	1	702645-33-51
16	Gland, Tubing	1	017454-08
17	Pipe Threaded Plug	1	201018
18	Screw, SDC, HD Cap	6	702585-31-01-54
19	O-Ring	1	702645-27-62
20	--	--	--
21	--	--	--
22	Bushing Pipe	1	K194489
23	Stud Double Ended	8	219065-12-05-01
24	--	--	--
25	Blind Plug	1	017454-09
26	Connector, Tubing	2	204887-08-05-22
27	Adapter Pipe	1	675029-01
28	Stn Stl Hydr	1	718566
29	Housing, Locking Screw	1	030308-02
30	Locking Screw	1	046628-01
31	Nut, Hvy Hex	8	2709000-12-01
---	Repair Kit	---	2164148-03-01

Tandem Boosters For Composite U BOP's

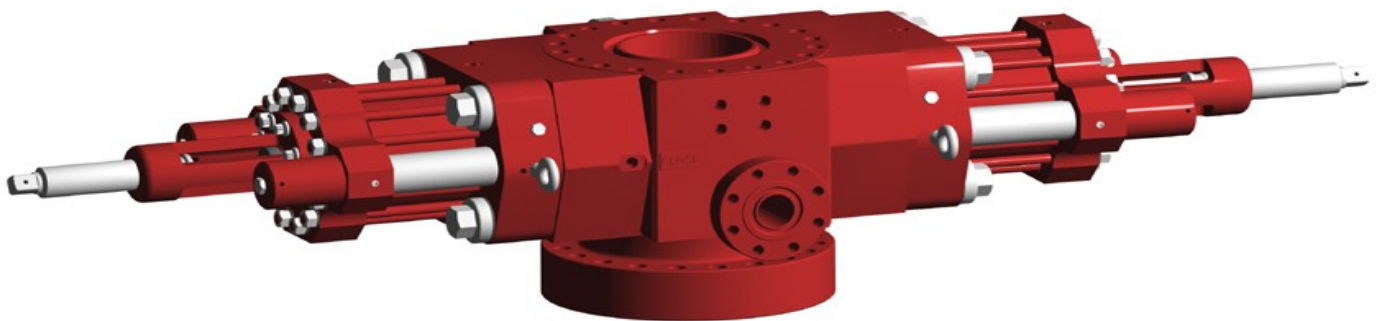
Item Number	Description	7-1/16" 3,000, 5,000, 10,000	
		Qty	Part No.
**	Assembly, Tandem Shear Booster		2232393-01
1	Adapter	2	223288-01
2	Adapter Spacer	2	2232389-01
3	Cylinder	2	2232390-01
4	Cylinder Head	2	2232391-01
5	Tail Rod	2	644962-01
6	Piston	2	644961-01
7	Stud	12	2232392-01
8	Nut, Hvy Hex	12	2709000-10-01
9	Screw Soc Hd Cap	16	018541-42
10	Filter, Muffler	2	710621
11	Plug Pipe Threaded Plug	4	203444
12	Seal Ring	2	710541
13	Wear Ring, Operating Piston	2	049223-03
14	Seal, Lip	2	011741-32
15	Wear Ring	2	644443-02
16	Seal Ring	2	705955
17	O-Ring	2	702645-33-11
18	O-Ring		702645-37-02
21	Elbow	4	204890-06-04-12
22	Stn Stl Hydr	3	706112
---	Repair Kit	---	2232403-01

UM BOP's

The Cameron type UM BOP is a lightweight blowout preventer designed for easy maintenance and long life. The UM compliments the existing line of U preventers with interchangeable bonnets that can be installed on any comparable size type U BOP. The shearing capabilities of the UM BOP bonnet is achieved by simply reversing the operating piston. The UM features a patented, reversible piston that converts standard pipe ram operating pistons to a larger piston designed for shearing. This feature reduces weight and length for the preventer and eliminates the need for external plumbing. The UM replaces the UL since the UM bonnet features full stroke operation that allows for one-step ram removal. For individual Cameron Ram BOP shearing characteristics, including the UM BOP, refer to Engineering Bulletins EB571D, EB685D, EB691D and EB702D. Other features of the UM BOP include:

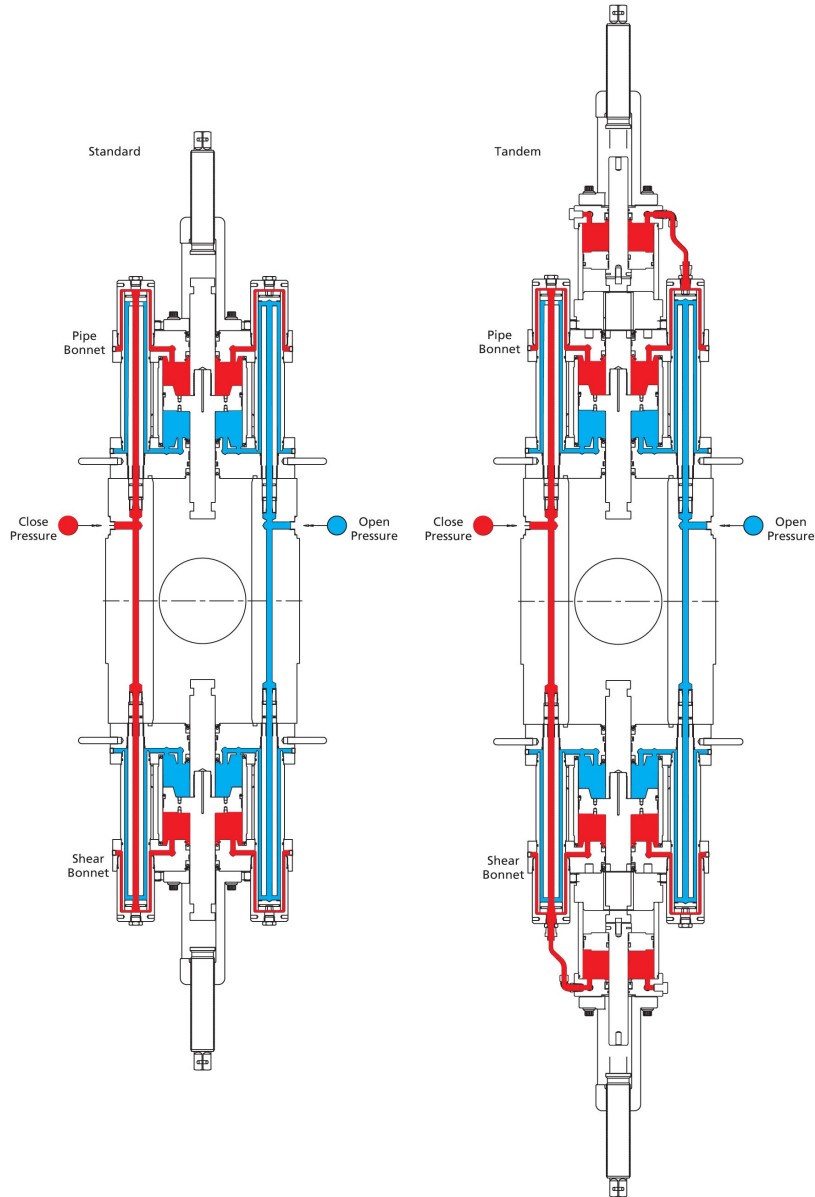
- Bonnet seal carrier an available option to eliminate the need for high makeup torque on bonnet studs and nuts.
- Same bonnet used for both shear and pipe rams. The internal shear booster can be reversed to act as a stroke-limiting device
- Internal reversible piston provides additional force necessary for shearing a wide variety of pipe and at the same time provides a reduced sealing force for long ram seal life.
- Hydraulically operated locking mechanisms, wedgelocks are available for subsea applications.
- Most operating system seals can be replaced with the bonnet in the ram-change position without removing the bonnets.
- UM utilizes the same rams as the U BOP.

Other features include hydraulically opening bonnets, forged body and bonnet construction with a wide section of rams to meet all applications



UM Blowout Preventer

UM BOP Open and Close Hydraulics (13-5/8" 10,000 Shown)



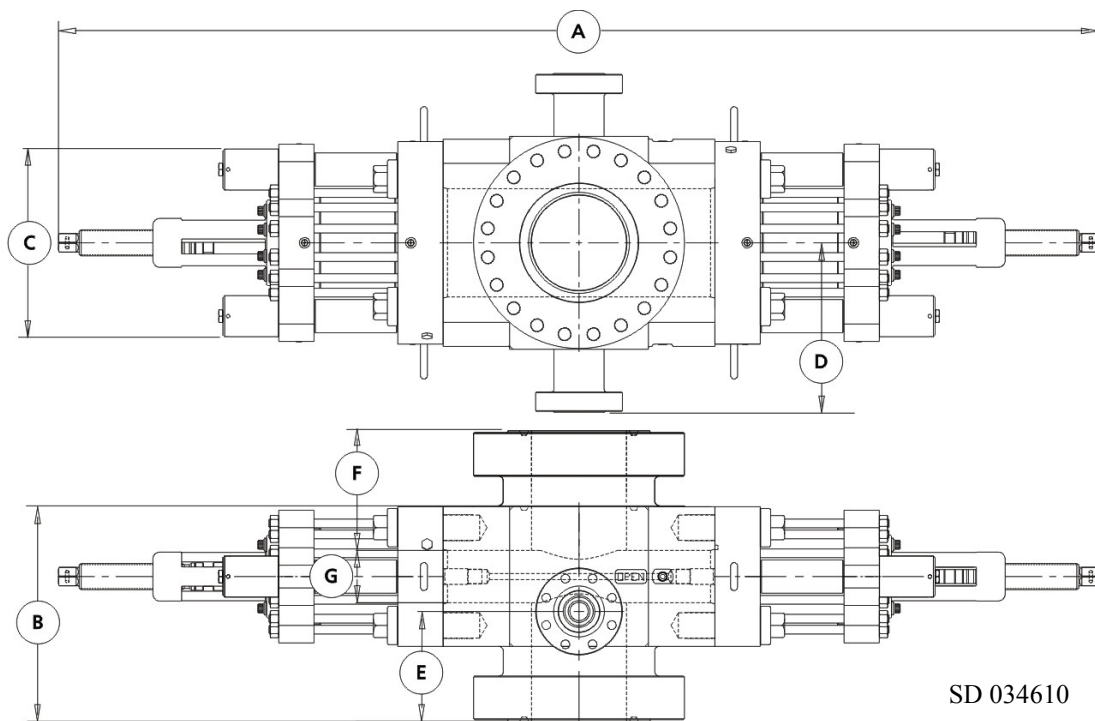
UM BOP Operating Data and Fluid Requirements

Bore Size and Working Pressure	Gals to Open Pipe Rams (1 Set)	Gals to Close Pipe Rams (1 Set)	Gals to Close Shear Rams (1 set)	Closing Area (Sq. inches)	Locking Screw Turns (Each End)	Closing Ratio	Opening Ratio	Gals to Close Tandem Boosters (1 Set)	Tandem Booster Closing Area (Sq. Inches)
7-1/16" All WP	2.2	2.3	2.4	67.3	18	11.7:1	3.8:1	1.5	3.8:1
11" Except 15,000 psi	6.2	6.2	7.4	113.8	27	13.7:1	3.7:1	5.3	3.7:1
11" 15,000 psi	7.3	7.3	7.3	110.2	32	8.8:1	6.9:1	5.4	6.9:1
13-5/8" Except 15,000 psi	7.5	7.5	8.8	110.15	32	8.7:1	2.3:1	6	2,3

Single UM BOP Specifications and Dimensions

The capital letters in the following designations refer to the UM BOP dimensional views and dimensional chart shown below.

- A-1 Length – bonnets closed, locking screws locked
- A-2 Length – bonnets opened, locking screws unlocked
- B-1 Height – flanged
- B-2 Height – studded
- C Width – no side outlets
- D Centerline of preventer to outlet flange or hub face. This distance is variable and must be determined per individual specifications.
- E Centerline of side outlet to bottom flange face
- F Top of ram to top of flange face
- G Height of ram



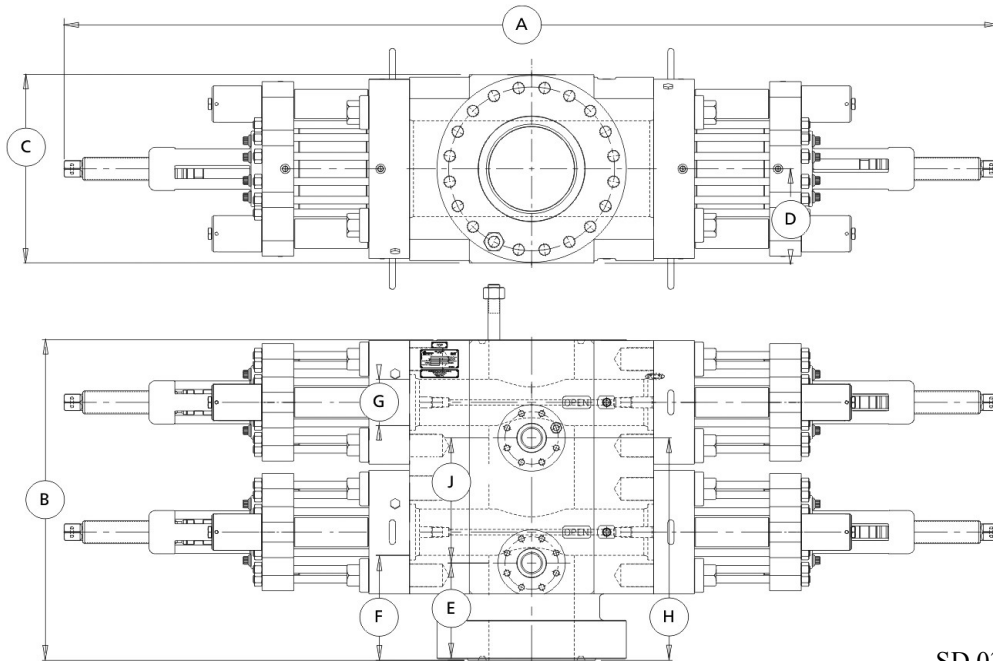
Single Open-Face Flange or Studded UM BOP Dimensions

Size	Pressure Rating (psi)	Vertical Bore (in.)	A-1	A-2	B-1	B-2	C	E	F	G	Approx Weight (lb.) FigXFlg	Approx Weight (lb.) StdXStd	Approx Weight (lb.) FlgXStd
7-1/16"	3,000	7-1/16"	78.250"	116.500"	24.062"	18.38"	20.250"	8.750"	7.844"	5.50"	2,600	2,354	2,477
7-1/16"	5,000	7-1/16"	78.250"	116.500"	27.500"	19.75"	20.250"	10.406"	9.625"	5.50"	2,652	2,302	2,477
7-1/16"	10,000	7-1/16"	78.250"	116.500"	30.562"	23.53"	20.625"	11.062"	12.031"	5.50"	3,275	2,375	2,825
7-1/16"	15,000	7-1/16"	78.250"	116.500"	31.812"	23.79"	20.625"	11.688"	12.656"	5.50"	3,525	2,125	2,825
11"	10,000	11"	96.250"	146.875"	35.688"	26.94"	25.750"	13.125"	13.844"	6.75"	6,400	5,400	5,900
11"	15,000	11"	130.75"	197.00"	46.26"	32.25"	30.500"	17.100"	17.48"	9.25"	15,899	14,929	15,414
13-5/8"	5,000	13-5/8"	134.500"	201.000"	34.32"	25.82"	29.00"	12.23"	13.34"	7.50"	9,855	8,565	9,210
13-5/8"	10,000	13-5/8"	134.500"	201.000"	41.688"	30.88"	30.250"	15.125"	17.094"	7.50"	10,300	9,760	10,030

Double UM BOP Specifications and Dimensions

The capital letters in the following designations refer to the UM BOP dimensional views and dimensional chart shown below.

- A-1 Length – bonnets closed, locking screws locked
- A-2 Length – bonnets opened, locking screws unlocked
- B-1 Height – flanged
- B-2 Height – Studded
- B Height—with 30" Spacer
- C Width – no side outlets
- D Centerline of preventer to outlet flange or hub face. This distance is variable and must be determined per individual specifications.
- E Centerline of side outlet below rams to bottom flange face
- F Top of upper am to top of flange face
- G Height of ram
- H Centerline of side outlet between rams to bottom flange face
- I Top of lower ram to bottom of upper ram



SD 034560

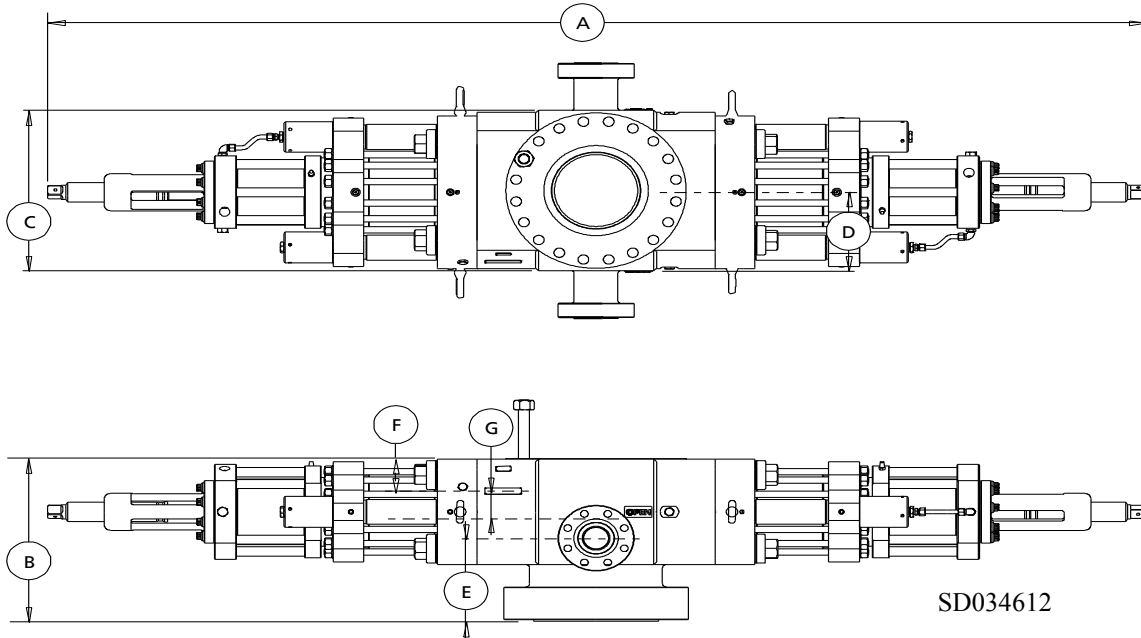
Double Open-Face Flange or Studded UM BOP Dimensions

Size	Pressure Rating (psi)	Vertical Bore (in.)	A-1	A-2	B-1	B-2	C	E	F	G	H	J	Approx. Weight (lb.) FlgXFlg	Approx. Weight (lb.) StdXStd	Approx. Weight (lb.) FlgXStd
7-1/16"	3,000	7-1/16"	78.250"	116.500"	41.000"	32.12"	20.250"	8.750"	7.844"	5.50"	25.688"	11.438"	5,100	4,950	5,025
7-1/16"	5,000	7-1/16"	78.250"	116.500"	44.188"	33.50"	20.250"	10.406"	9.625"	5.50"	27.094"	11.188"	4,904	4,729	4,817
7-1/16"	10,000	7-1/16"	78.250"	116.500"	48.625"	39.12"	20.625"	11.062"	12.031"	5.50"	29.125"	12.562"	5,850	5,500	5,675
7-1/16"	15,000	7-1/16"	78.250"	116.500"	49.875"	41.86"	20.625"	11.688"	12.656"	5.50"	29.750"	12.562"	6,100	5,500	5,800
11"	10,000	11"	96.250"	146.875"	55.875"	47.12"	25.750"	13.125"	13.844"	6.75"	33.312"	13.438"	13,200	11,300	12,250
11"	15,000	11"	130.75"	197.00"	65.20"	53.25"	30.500"	17.10"	17.48"	9.25"	37.35"	11.75"	23,810	20,190	22,000
13-5/8"	5,000	13-5/8"	134.500"	201.000"	53.52"	44.82"	29.000"	12.23"	13.34"	7.50"	30.48"	11.50"	19,425	18,075	18,750
13-5/8"	10,000	13-5/8"	134.500"	201.000"	66.625"	51.88"	30.250"	15.125"	17.094"	7.50"	40.062"	17.438"	20,388	17,612	19,000

Single UM BOP with Tandem Specifications and Dimensions

The capital letters in the following designations refer to the UM BOP dimensional views and dimensional chart shown below.

- A-1 Length – bonnets closed, locking screws locked.
- A-2 Length – bonnets opened, locking screws unlocked.
- B-1 Height – flanged.
- B-2 Height – Studded.
- C Width—no side outlets
- C Width – no side outlets.
- D Centerline of preventer to outlet flange or hub face. This distance is variable and must be determined per individual specifications.
- E Centerline of side outlet below rams to bottom flange face.
- F Top of upper am to top of flange face.
- G Height of ram.



Single UM BOP with Tandem Boosters Dimensions

Size	Pressure Rating	Vertical Bore (in.)	A-1	A-2	B-1	B-2	C	E	F	G	Approx. Weight (lb.)	Approx. Weight (lb.)	Approx. Weight (lb.) FlgXStd
7-1/16"	3,000	7-1/16"	116.33"	154.70"	24.062"	18.38"	20.625"	8.750"	7.844"	5.50"	3,760	3,514	3,637
7-1/16"	5,000	7-1/16"	116.33"	154.70"	27.500"	19.75"	20.625"	10.406"	9.625"	5.50"	3,812	3,462	3,637
7-1/16"	10,000	7-1/16"	116.33"	154.70"	30.562"	23.53"	20.625"	11.062"	12.031"	5.50"	4,435	3,535	3,985
7-1/16"	15,000	7-1/16"	116.33"	154.70"	31.812"	23.79"	20.625"	11.688"	12.656"	5.50"	4,685	3,285	3,985
11"	15,000	11"	161.88"	234.38"	46.250"	32.25"	30.500"	17.100"	17.480"	9.25"	17,059	16,089	16,574
13-5/8"	10,000	13-5/8"	169.125"	235.875"	41.688"	30.88"	30.50"	15.125"	17.094"	7.50"	11,600	11,060	11,330

7-1/16" 5,000 - 15,000 psi UM BOP Part Numbers

Item No.	Description	Qty	Qty	7-1/16"	7-1/16"	7-1/16"
		Sgl	Dbf	5,000 psi	10,000 psi	15,000 psi
				Model II	Model II	Model II
1	Body	1	1	----	----	----
2	Bonnet	2	4	2010585-01	2010584-01	2010515-03
3	Operating Piston	2	4	2010559-01	2010559-01	2010559-01
4	Ram Change Piston, Open	2	4	2011075-01	2011075-01	2011075-01
5	Ram Change Piston, Close	2	4	2011073-01	2011073-01	2011073-01
6	Ram Change Cylinder	4	8	2011074-01	2011074-01	2011074-01
10	Pin, Ram Guide	4	8	030313-02	030313-02	030313-02
11	Check Valve	2	4	M517988	M517988	M517988
12	Screw, Socket Head Set	2	4	005940-09	005940-09	005940-09
13	Pipe Plug, Heavy Hex Head	2	4	005930-05-10	005930-05-10	005930-05-10
*14	Retainer Ring, Plastic Packing	2	4	2010178-01	2010178-01	2010178-01
*15	Energizing Ring	2	4	018586-12	018586-12	018586-12
*16	Lip Seal	2	4	212741-37-00-01	212741-37-00-01	212741-37-00-01
*17	O-Ring	2	4	018492-92	018492-92	018492-92
18	Retainer, Lip Seal	2	4	689523-04	689523-04	689523-04
19	Retaining Ring, Spirolox	2	4	018572-83	018572-83	018572-83
20	Locking Screw	2	4	2010519-01	2010519-01	2010519-01
21	Ring Gasket	4	8	----	021792-21	----
22	Locking Screw Housing	2	4	2010530-01	2010530-01	2010530-01
23	Operating Cylinder	2	4	2010529-02	2010529-02	2010529-02
24	Cylinder Head Weldment	2	4	2011328-01	2011328-01	2011328-01
25	Stud, Double Ended	8	16	2010189-22	2010189-22	2010189-22
26	Nut, Heavy Hex	8	16	2709000-13-01	2709000-13-01	2709000-13-01
*27	Seal Ring	2	4	2708749-01	2708749-01	2708749-01
28	Retainer Ring, Tail Rod	2	4	2010527-01	2010527-01	2010527-01
29	Retaining Ring, Spirolox	2	4	041008-02-93-32	041008-02-93-32	041008-02-93-32
*30	Seal Ring	2	4	2710280	2710280	2710280
*31	O-Ring	4	8	702645-37-61	702645-37-61	702645-37-61
*32	O-Ring	2	4	702645-26-91	702645-26-91	702645-26-91
*33	Seal Ring	4	8	2724047	2724047	2724047
34	Wear Ring, Ram Change Piston	4	8	049223-28	049223-28	049223-28
*35	O-Ring	8	16	702645-33-71	702645-33-71	702645-33-71
*36	O-Ring	4	8	702645-32-81	702645-32-81	702645-32-81
*37	O-Ring	8	16	702645-32-41	702645-32-41	702645-32-41
38	Stud, Double Ended	16	32	219065-08-03-61	219065-08-03-61	219065-08-03-61
39	Nut, Heavy Hex	16	32	2709000-08-01	2709000-08-01	2709000-08-01
40	Lifting Eye	4	8	011849	011849	011849
41	Split Retainer Ring	2	4	2010599-01	2010599-01	2010599-01
42	Concentric Booster Ring	2	4	2010600-01	2010600-01	2010600-01
*43	Seal Ring	2	4	710541	710541	710541
*44	Plastic Packing	10	20	007650-08	007650-08	007650-08
46	Blind Plug	4	8	017454-09	---	017454-09
47	Pipe Plug	4	8	002504-04	---	002504-04
48	Tubing Gland	4	8	017454-08	---	017454-08
66	Name Plate	1	1	2032175-03	2032175-03	----
67	Name Plate	1	---	025950	025950	----
50	Bonnet Bolt	8	16	2010514-02	2010514-03	----
51	Bonnet Seal (Carrier Type)	4	8	----	----	----
51A	Bonnet Seal (Face Type)	2	4	644197-01-00-01	644197-01-00-01	644197-01-00-01
52	Stud, Double Ended	12	---	----	219067-14-07-41	----
53	Nut, Heavy Hex	12	---	----	2709000-14-01	----
54	Stud, Double Ended	---	---	----	----	----
55	Nut, Heavy Hex	---	---	----	----	----
56	Name Plate	1	1	----	236606-01	----
66	Name Plate	1	1	2032175-03	2032175-03	----
67	Name Plate	1	1	025950	025950	----

*These items included in Bonnet Rebuild Kit.

7-1/16" UM BOP Part Numbers

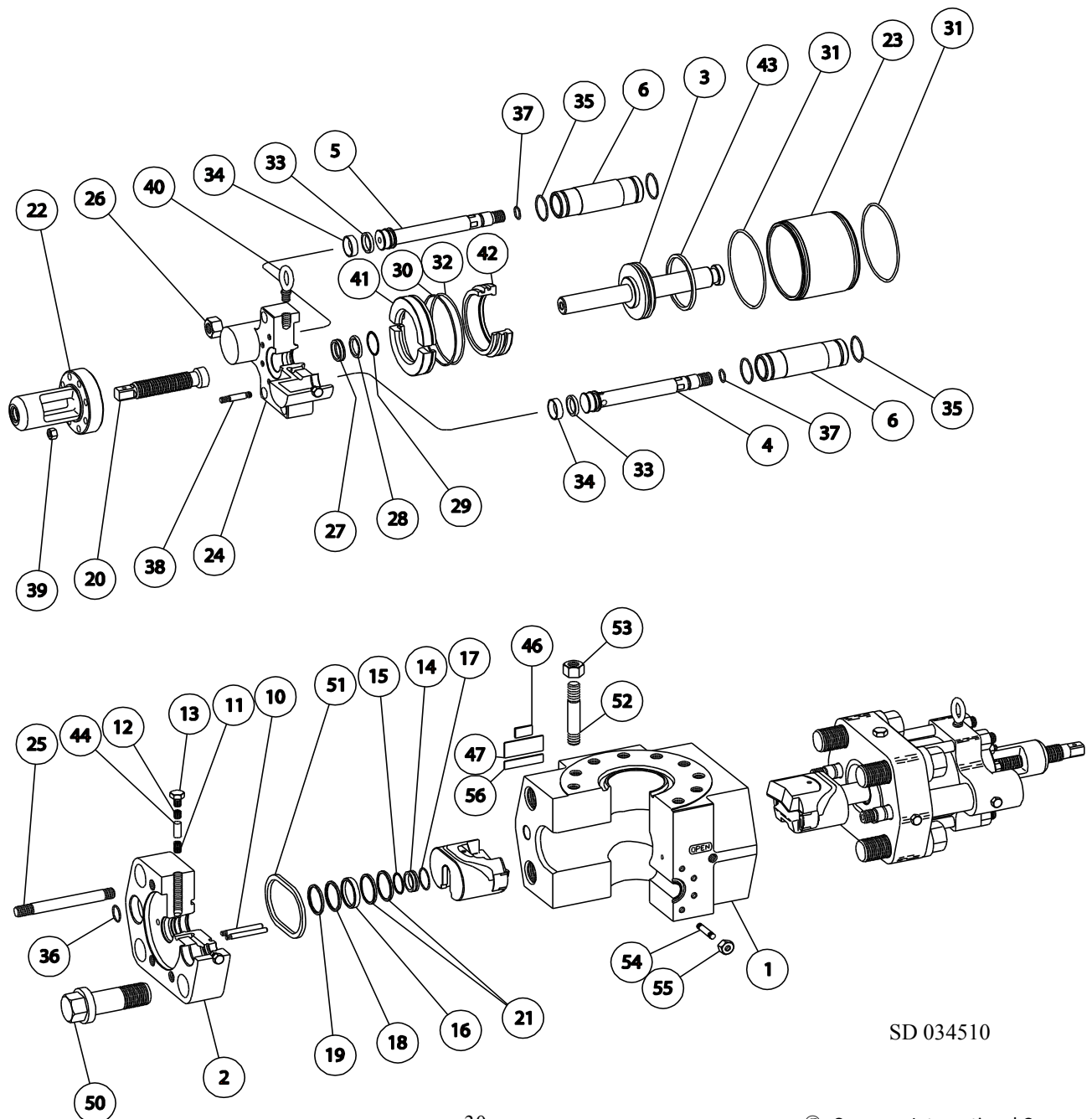
Accessory Items

Ram Change Piston Cover	2	4	645046-17	645046-17	645046-17
Standard Accessory Items	1	1	697149-01	697149-02	697149-02
Locking Screw Accessory Items	2	4	-----	697150-01	697150-01

Expendable Items

Ring Gasket	2	4	702002-03-52	702003-15-22	702003-15-22
Ring Gasket	2	4	702002-04-62	702003-15-62	702003-15-62
Bonnet Rebuild Kit	2	4	2010733-01	2010733-01	2010733-01

7-1/16" UM BOP



SD 034510

11" 5,000 & 10,000 UM BOP Part Numbers

Item No.	Description	Qty Sgl	Qty Dbl	11" 5,000 psi	11" 10,000 psi
1	Body	1	1	----	----
2	Bonnet (Seal Carrier)	2	4	2113870-01	2164126-03
3	Piston Subassembly	2	4	2245211-01	2245211-01
4	Ram Change Piston - Open	2	4	2011155-03-70	2011155-03-70
5	Ram Change Piston - Close	2	4	2011144-03-70	2011144-03-70
6	Ram Change Cylinder	4	8	2011154-01-70	2011154-01-70
8	O-Ring	----	----	702645-34-81	702645-34-81
9	Ram Change Piston Cap	----	----	2231350-01	2231350-01
10	Ram Guide Pin	4	8	030313-03	030313-03
11	Check Valve	2	4	M517988	M517988
12	Set Screw, Socket Head	2	4	005940-09	005940-09
13	Pipe Plug	2	4	005930-05-10	005930-05-10
*14	O-Ring	2	4	2010178-02	2010178-02
*15	Energizing Ring	2	4	018586-13	018586-13
*16	Lip Seal	2	4	212741-38-00-01	212741-38-00-01
*17	O-Ring	6	12	018492-91	018492-91
18	Retainer, Lip Seal	2	4	689523-05	689523-05
19	Retaining Ring, Spirolox	2	4	018572-84	018572-84
20	Locking Screw	2	4	046628-01	046628-01
*21	O-Ring	4	8	702645-38-21	702645-38-21
22	Locking Screw Housing	2	4	2011168-01	2011168-01
23	Operating Cylinder	2	4	2011172-01	2011172-01
24	Cylinder Head Weldment	2	4	2011167-01	2011167-01
25	Stud, Double Ended	8	16	219065-17-20-01	219065-17-20-01
26	Nut	8	16	2164777-01	2164777-01
*28	O-Ring	4	8	702645-33-31	702645-33-31
*29	Plastic Packing	10	20	007650-08	007650-08
*30	Seal Ring	2	4	2724061	2724061
31	Wear Ring	2	4	049223-31	049223-31
32	Wear Ring	4	8	049223-32	049223-32
*33	O-Ring	8	16	702645-33-91	702645-33-91
*34	O-Ring	4	8	702645-33-01	702645-33-01
*35	O-Ring	8	16	702645-32-61	702645-32-61
36	Stud, Double Ended	16	32	219065-12-05-01	219065-12-05-01
37	Nut	16	32	2709000-12-01	2709000-12-01
38	Lifting Eye	2	4	011849	011849
40	Blind Plug	4	8	017454-09	017454-09
41	Plug, Pipe Threaded	4	8	002504-04	002504-04
42	Tubing Gland	4	8	017454-08	017454-08
*43	Ring Gasket	4	8	021792-22	021792-22
52	Bonnet Bolt	8	16	2010962-01	2164128-01
62	Bonnet Seal Carrier	2	4	645464-02-00-01	645464-02-00-01
62A	Bonnet Seal (Face Type)	2	4	644197-02-00-01	644197-02-00-01
62B	Bonnet Seal (Carrier Type)	2	4	645484-02-00-01	645484-02-00-01
62C	Retainer Ring (use with Seal Carrier)	2	4	702645-27-61	702645-27-61
74	O-Ring	8	16	702645-22-91	702645-22-91
78	Lifting Eye	2	2	011849	011849
96	Name Plate	1	1	2032175-03	2032175-03
97	Name Plate	1	1	025950	025950

11" 5,000 & 10,000 UM BOP Part Numbers

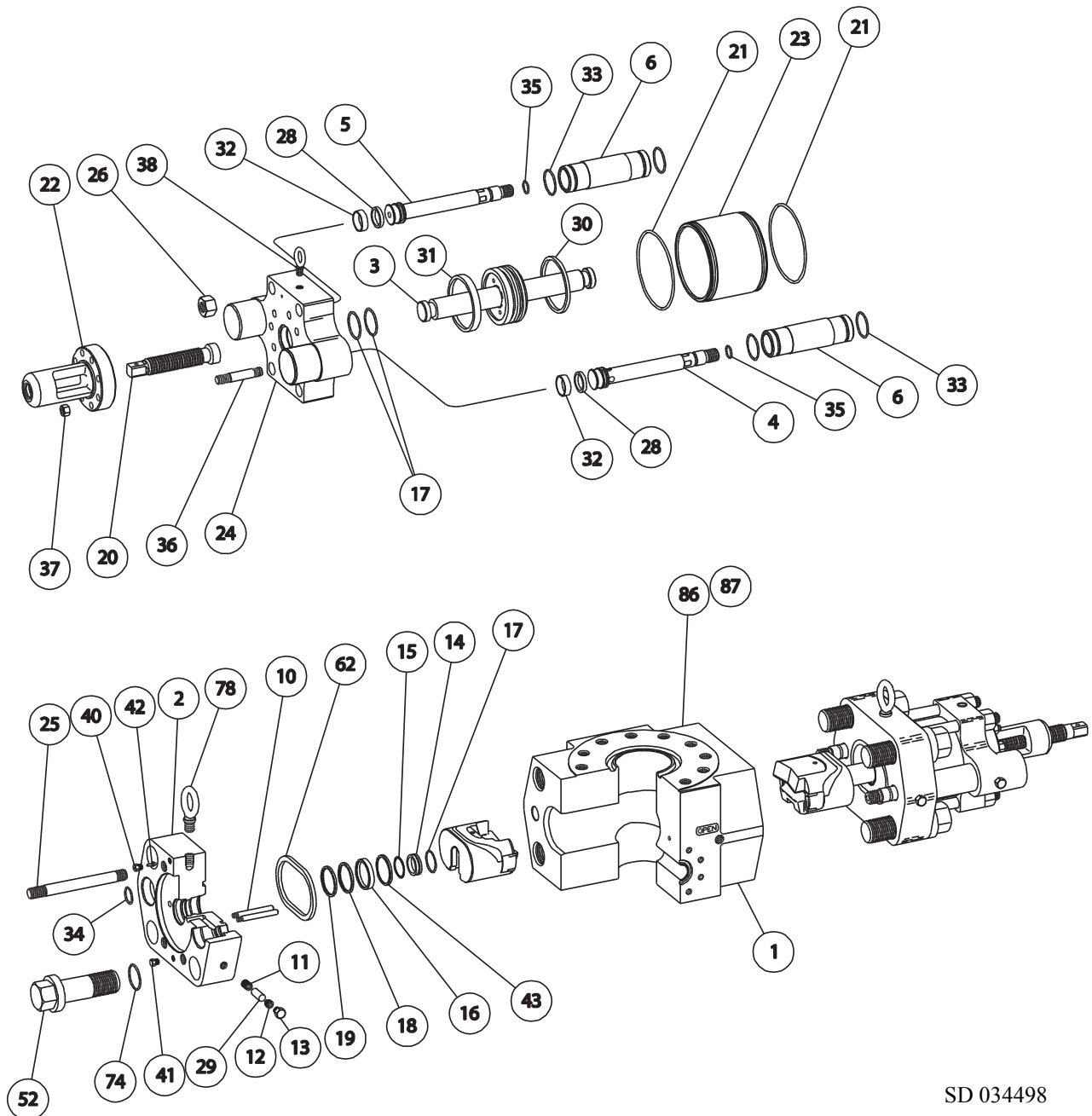
Accessory Items

Standard Accessories	1	1	697149-02	697149-02
Locking Screw Accessories	2	4	697150-02	697150-02
Cover, Ram Change Piston	2	2	645046-18	645046-18

Expendable Items

Ring Gaskets (Top & Bottom Conn.)	2	2	702002-05-42	702003-15-82
Bonnet Rebuild Kit	2	4	2010733-02	2010733-02

UM BOP 11" 5,000 and 10,000 psi WP



SD 034498

11" 15,000 UM BOP Part Numbers

Item		Qty	Qty	11"
No.	Description	Sgl	Dbl	15,000 psi
1	Body	1	1	----
2	Bonnet (Seal Carrier)	2	4	2231079-01
3	Piston Subassembly	2	4	2231105-01
4	Ram Change Piston - Open	2	4	2164854-03-70
5	Ram Change Piston - Close	2	4	2164853-03-70
6	Ram Change Cylinder	4	8	2164347-02-70
*7	Ring, Wear	4	8	049223-38
*8	O-Ring	4	8	702645-35-71
9	Ram Change Piston Cap	4	8	2164855-01
10	Ram Guide Pin	4	8	030313-01
11	Ring, Retaining	8	16	708758
12	Retainer, Polypak	8	16	689523-06
*14	O-Ring	8	16	2724613-01
*15	Ring, Ram Change Piston Wear	2	4	2164449-01
16	Valve, Check	2	4	M51788-02
17	Screw, Socket Head	2	4	005940-09
18	Plug, Pipe	2	4	005930-05-10
*19	Packing, Plastic	2	4	007650-25
20	Locking Screw	2	4	695234
22	Locking Screw Housing	2	4	2164346-01
23	Operating Cylinder	2	4	2164348-02
24	Cylinder Head Weldment	2	4	2164852-01
25	Stud, Double Ended	12	24	2164361-01
26	Nut	12	24	2709000-12-21
*27	Ring, Plastic Packing	2	4	012469-24
*28	Ring, Energizing	2	4	018586-01
*29	Ring, Operating Piston Wear	2	4	049223-31
*30	Seal Ring	2	4	2724061
*31	O-Ring	4	8	702645-38-21
32	Washer	24	48	K220607
33	Washer, Bonnet Bolt	8	16	2164450-01
*35	O-Ring	4	8	702645-33-81
*36	O-Ring	8	16	702645-34-61
*37	O-Ring	8	16	702645-32-81
*38	O-Ring	4	8	702645-33-31
39	Screw	16	32	702585-25-00-30
40	Lifting Eye	4	8	11849
42	Plug, Bleeder	4	8	2028834-01
43	Plug, Pipe	8	16	002504-14
45	Plug, Pipe	4	8	203682
50	Bonnet Bolt	8	16	2164362-01
*51	O-Ring	8	16	2164718-01
66	Plug, Pipe	2	4	201019
69	Bonnet Seal Carrier	2	4	2231081-01
83	Bonnet Seal Carrier Seal Mold	4	8	2231080-01

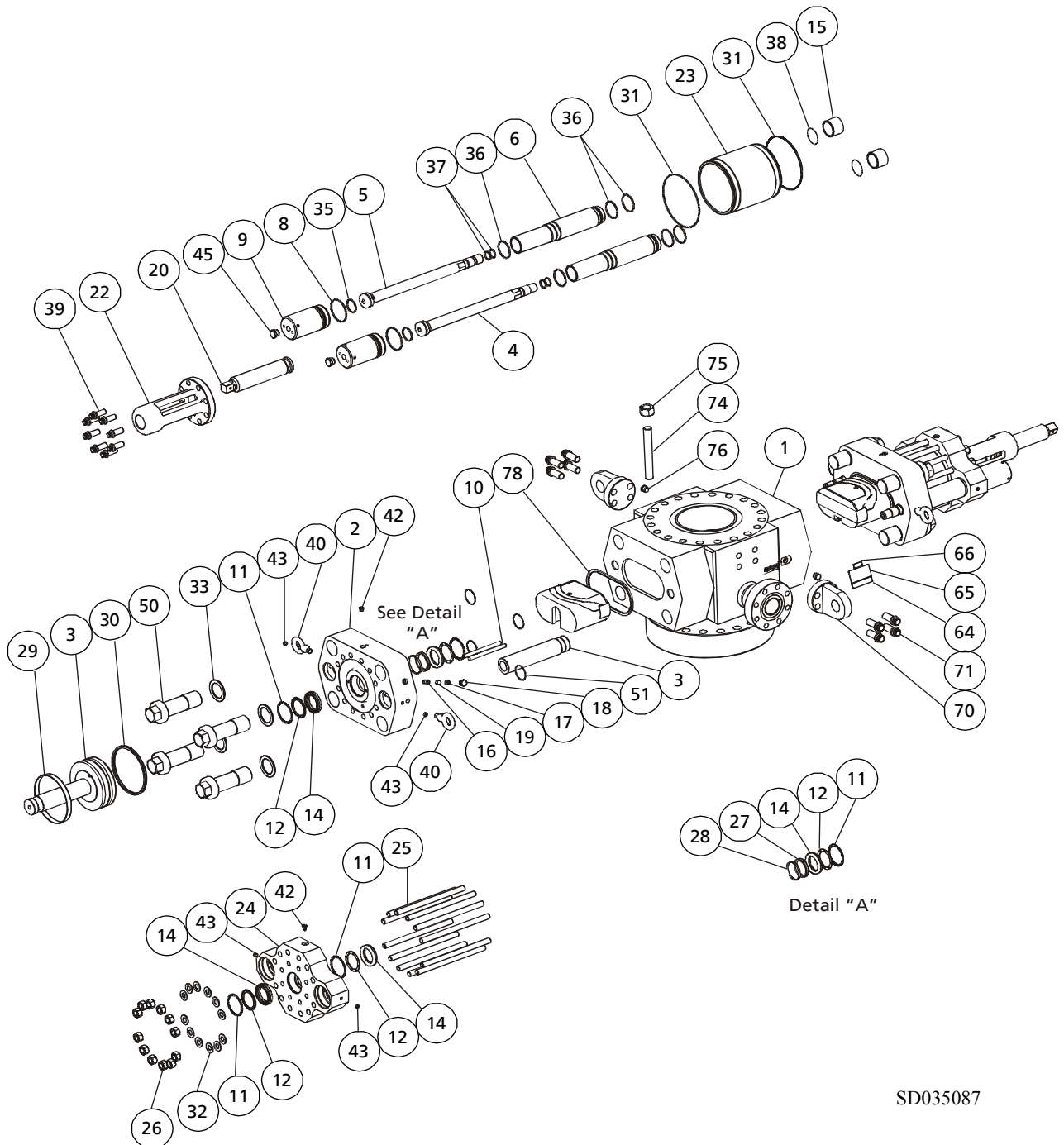
* These items included in Bonnet Rebuild Kit.

UM BOP, 11" 15,000 UM BOP Part Numbers

Accessory Items

Standard Accessories	1	1	697149-12
Locking Screw Accessories	2	4	697150-02
Protector, Bride	1	1	236177-42
Expendable Items			
Ring Gaskets (Top & Bottom Conn.)	2	2	702003-15-82
Bonnet Rebuild Kit	2	4	2010733-03

UM BOP, 11" 15,000 psi WP



SD035087

UM BOP 13-5/8" 5,000 & 10,000 psi Part Numbers

Item No.	Description	Qty Sgl	Qty Dbl	13-5/8" 5,000 psi	13-5/8" 10,000 psi
1	Body	1	1	----	----
2	Bonnet (Seal Carrier)	2	4	2231830-01	2164340-01(02)
2A	Bonnet (Face Seal)	2	4	----	2164343-01(02)
3	Piston Subassembly	(2)	(4)	2164345-03	2164345-01
4	Ram Change Piston - Open	2	4	2164854-01	2164433-02
4A	Ram Change Piston - Open, Special	2	4	----	2164433-01
5	Ram Change Piston - Close	2	4	2164853-01	2164434-02
5A	Ram Chage Piston - Close, Special	2	4	----	2164434-01
6	Ram Change Cylinder	4	8	2164347-02	2164347-02-70
6A	Ram Change Cylinder,Special	4	8	----	2164347-01
7*	Wear Ring	4	8	049223-38	049223-38
8*	O-Ring	4	8	702645-35-71	702645-35-71
9	Ram Change Piston Cap	4	8	2164855-01	2164855-01
9A	Ram Change Piston Cap,Special	4	8	----	2164855-01
10	Ram Guide Pin	4	8	030313-01	030313-01
11*	Retainer Ring, Spirolox, Operating Piston	8	16	708758	708758
12*	Retainer, Polypak	8	16	689523-06	689523-06
14*	Seal, Polypak	8	16	2724613-01	2724613-01
15*	Wear Ring, Ram Change Piston	4	8	2164449-01	2164449-01
16	Check Valve	2	4	M517988-02	M517988-02
17	Screw, Socket Head	2	4	005940-09	005940-09
18	Pipe Plug	2	4	005930-05-10	005930-05-10
19*	Packing, Plastic	2	4	007650-25	007650-25
20**	Locking Screw	2	4	695234	695234
22**	Locking Screw Housing	2	4	2164346-01	2164346-01
23	Operating Cylinder	2	4	2164348-02	2164348-02
23	Operating Cylinder,Special	2	4	----	2164348-01
24	Cylinder Head	2	4	2231831-01	2164341-02
24	Cylinder Head,Special	2	4	----	2164341-01
25	Cylinder Stud	24	48	2232903-01	2232903-01
26	Nut, Cylinder	24	48	2709000-12-22	2709000-12-22
27*	Retainer Ring, Plastic Packing	2	4	012469-24	012469-24
28*	Energizing Ring	2	4	018586-01	018586-01
29*	Wear Ring, Operating Piston	2	4	049223-31	049223-31
30*	Seal Ring	2	4	2724061	2724061
31*	O-Ring	4	8	702645-38-21	702645-38-21
32	Washer, Cylinder Stud	24	48	K220607	K220607
33	Washer, Bonnet bolt	8	16	----	2164450-01
35*	O-Ring	8	16	702645-33-81	702645-33-81
36*	O-Ring	8	16	702645-34-61	702645-34-61
37*	O-Ring	8	16	702645-32-41	702645-32-41
37A	O-Ring, Special for V Thdd Ram Chg Piston	8	16	702645-32-81	702645-32-81
38*	O-Ring	4	8	702645-33-31	702645-33-31
39**	Screw	16	32	702585-25-00-30	702585-25-00-30
40	Lifting Eye	4	8	011849	011849
41	Tubing Gland	4	8	----	017454-08
42	Blind Plug	4	8	2028834-01	017454-09
43	Pipe Plug, Pressure	12	24	002504-14	002504-14
45	Pipe Plug, Threaded	4	8	203682	203682
50	Bonnet Bolt	8	16	2231829-01	2164362-01
51*	O-Ring	8	16	702645-33-43	2164718-01
64	Name Plate	1	1	025950	025950
65	Name Plate	1	1	2032175-03	2032175-03

* These items included in Bonnet Rebuild Kit P/N 2010733-03. Two required for single, Four required for double.

** Not required when using Wedgelocks or Tandem Boosters.

***Optional Tandem Boosters

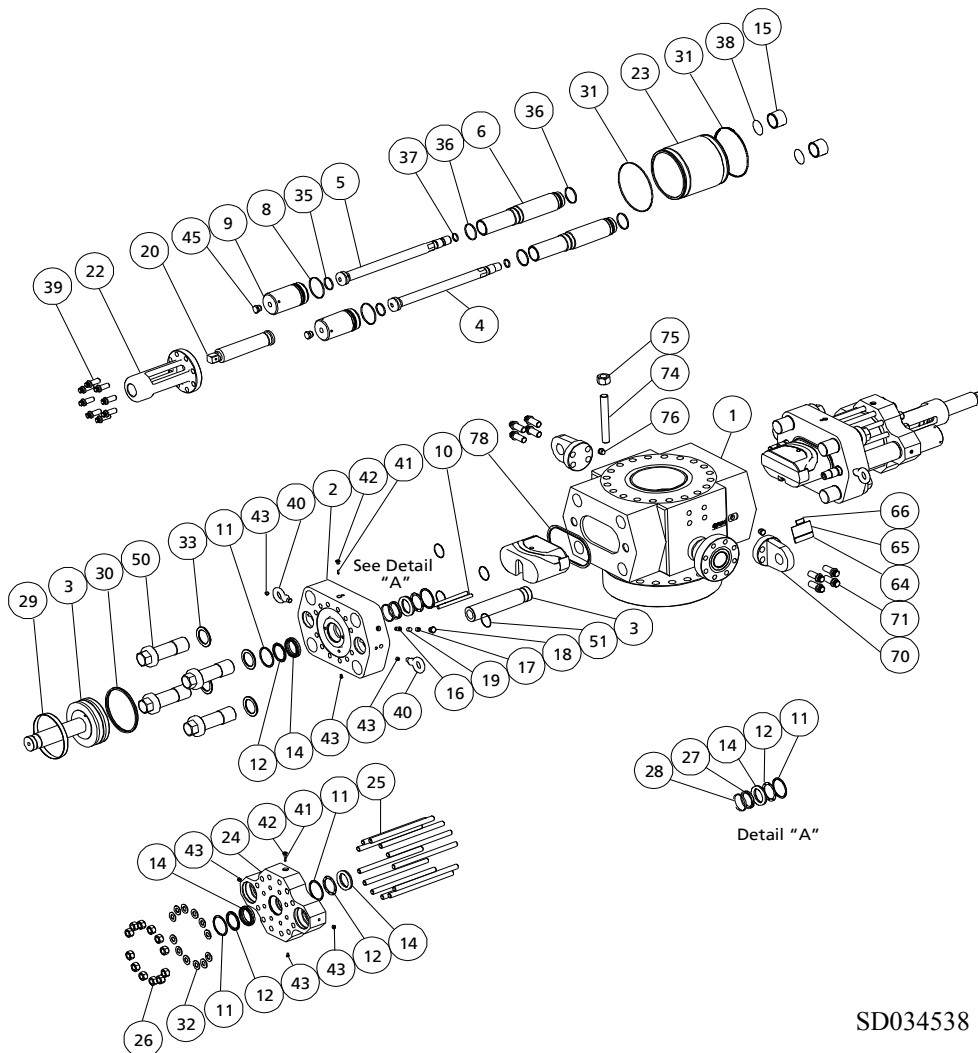
UM BOP 13-5/8" 5,000 & 10,000 psi Part Numbers (continued)

Accessory Items				
Standard Accessories	1	1	697149-02	697149-12
Locking Screw Accessories	2	4	697150-02	697150-02
Ram Change Piston Cover	2	2	645046-04	
Spanner Wrench	1	1	----	2164429-01
Expendable Items				
Ring Gaskets (Top & Bottom Connec-	2	2	702003-16-02	702003-15-92
Eyebolt	2	2	----	700734
Paste	1	1	----	705444
Loctite Adhesive	1	1	----	708740
Thread Sealant	1	1	----	711706
Bonnet Rebuild Kit	2	4	2164148-08	2010733-03

* These items included in Bonnet Rebuild Kit P/N 2010733-03. Two required for single, Four required for double.

** Not required when using Wedgelocks or Tandem Boosters.

UM BOP, 13" 5/8" psi WP



SD034538

* These items included in Bonnet Rebuild Kit P/N 2010733-03. Two required for single, Four required for double.

** Not required when using Wedgelocks or Tandem Boosters.

***Optional Tandem Boosters

Tandem Boosters for UM BOP's

A BOP equipped with tandem boosters can deliver increased shearing force without increasing the wear and tear on the packers. Tandem boosters approximately double the force available to shear pipe. Since the Tail Rod of the tandem booster has the same stroke as the BOP's operating piston, the standard shear locking mechanism can be installed on the outside end of the booster.

For information concerning applications where a tandem booster is required, refer to EB702D or con-

UM Tandem Booster 7-1/16" 3,000 - 15,000 psi WP

Item No.	Description	Quantity	Part Number
1	Cylinder	2	644959-01
2	Cylinder Head	2	2231474-01
3	Piston	2	644961-01
4	Tail Rod	2	2231207-01
5	Adapter	2	2231475-01
6	Screw, 12 Pt Cap	16	702585-16-00-22
7*	O-Ring	2	702645-24-91
8*	Seal Ring	2	710541
9*	Wear Ring	2	049223-03
10*	Filter, Muffler	2	710621
11*	Lip Seal	2	011741-32
12*	Seal Ring	2	710620
13*	Wear Ring	2	644443-02
14*	Seal Ring	2	705955
15*	O-Ring	2	702645-33-11
16	Centralizing Ring	2	236488-01
17	Plug, Pipe-Threaded Hex Socket	2	002504-14
18	Elbow, 90 Degree, Male	4	204890-06-04-12
19	Tubing, Hydraulic	2	2711865-08-09
20	Pipe Bushing	2	704492

Optional Items

	Repair Kit	1	2164148-01
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* These items are included in the repair kit. One repair kit required per unit

UM Tandem Booster 11" 15,000 and 13-5/8" 10,000 psi WP

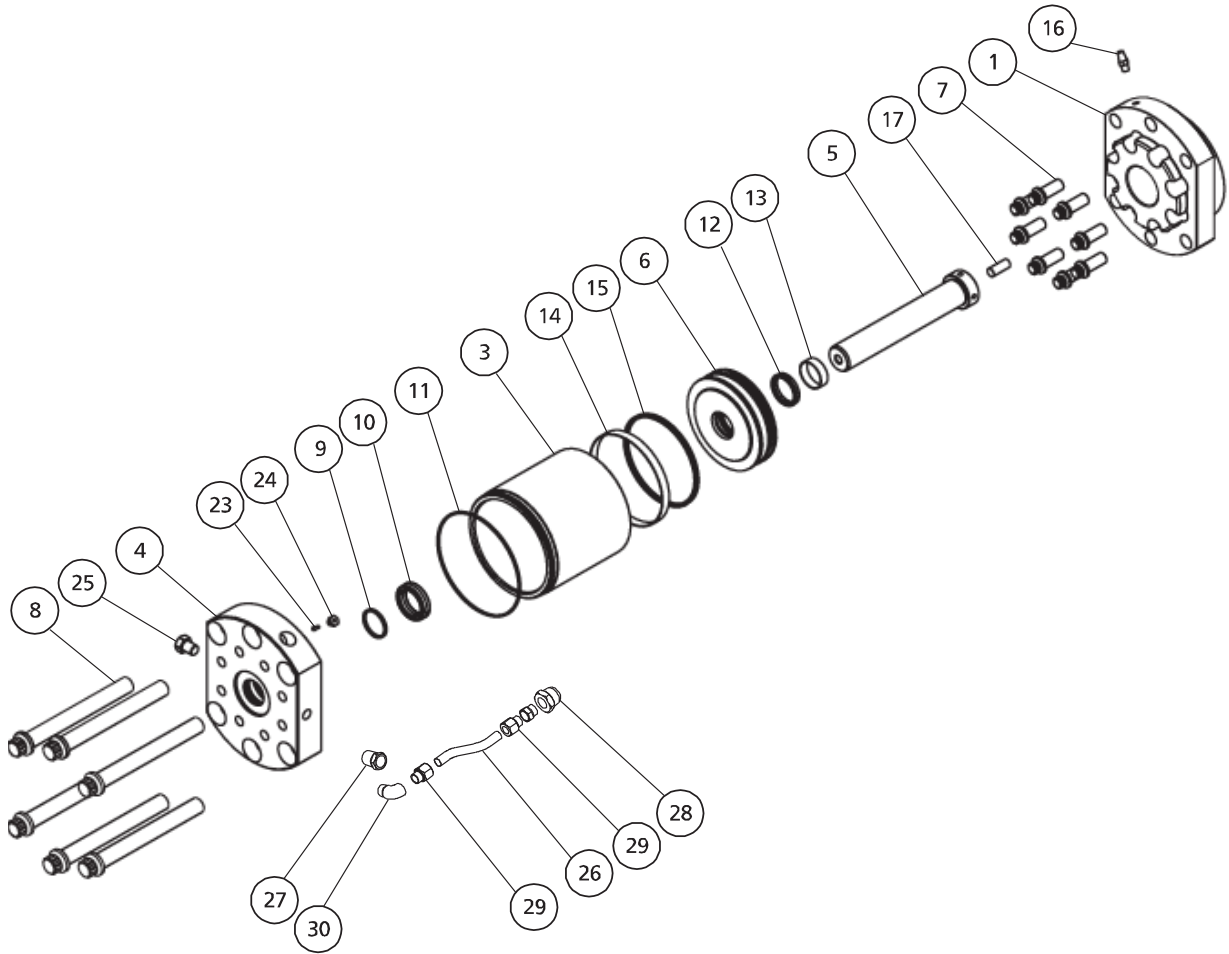
Item No.	Description	11" 15,000 psi WP		13-5/8" 10,000 psi WP	
		Quantity	Part Number	Quantity	Part Number
1	Adapter	2	2164650-01	2	2164650-01
3	Cylinder	2	2010884-03	2	2010884-01
4	Cylinder Head	2	2010882-02	2	2010882-02
5	Tail Rod	2	2010880-04	2	2010880-01
6	Piston	2	645172-03	2	645172-03
7	Screw, 12 Pt Cap	16	702585-25-00-30	16	702585-25-00-30
8	Screw, 12 Pt Cap	12	702585-34-01-40	12	702585-34-01-54
9*	O-Ring	2	702645-33-71	2	702645-33-71
10*	Lip Seal	2	011741-34	2	011741-34
11*	O-Ring	2	702645-38-12	2	702645-38-12
12*	Seal Ring	2	710418	2	710418
13*	Wear Ring	2	645215-01	2	645215-01
14*	Wear Ring	2	049223-01	2	049223-01
15*	Seal Ring	2	710538	2	710538
16*	Filter, Muffler, Quiet Flow	2	710621	2	710621
17	Stud, Continuous Thread	2	702533-09-10-22	2	702533-09-10-22
23	Tubing Gland	2	017454-08	2	017454-08
24	Blind Plug	2	017454-09	2	017454-09
25	Plug, Pipe-Threaded Hex Socket	2	002504-28	2	002504-28
26	Tubing, Hydraulic	2	2711865-12-11	2	2711865-12-11
27	Pipe Bushing	2	K194489	2	K194489
28	Pipe Bushing	2	203098	2	203098
29	Connector, Tubing, Male	2	204887-08-05-17	4	204887-08-05-17
30	Elbow, 90 Degree, Male	2	204890-08-05-17	2	204890-08-05-17
31	Locking Screw	2	695234		
32	Screw	16	702585-25-00-30		
33	Housing, Locking Screw	2	2231104-01		

Optional Items

	Repair Kit	1	2164148-02	1	2164148-02
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* These items are included in the repair kit. One repair kit required per unit

Tandem Booster Assembly



SD034536

U and UM BOP Standard Accessories

Size and Working Pressure	Ram Lube*	Cameron Box Wrench*	Allen Wrench* Packing Screw	Hand-wheel**	Universal Joint**	Extension Wrench*
7-1/16" 3,000 psi	713878	713114-08	008721-01	005457	006018-01	005652
7-1/16" 5,000 psi	713878	713114-08	008721-01	005457	006018-01	005652
7-1/16" 10,000 & 15,000 psi	713878	713114-10	008721-01	005457	006018-01	005652
11" 3,000, 5,000 & 10,000 psi	713878	713114-10	008721-01	005298	006018-03	005526
11" 15,000 psi	713878	713114-13	008721-01	005298	006018-03	005526
13-5/8" 3,000 & 5,000 psi	713878	713114-10	008721-01	005298	006018-03	005526
13-5/8" 10,000 psi	713878	713114-13	008721-01	005298	006018-03	005526
13-5/8" 15,000 psi	713878	***	008721-01	005298	006018-03	005526
16-3/4" 3,000 & 5,000 psi	713878	713114-13	008721-01	005298	006018-03	005526
16-3/4" 10,000 psi	713878	***	008721-01	005298	006018-03	005526
18-3/4" 10,000 psi	713878	***	008721-01	005298	006018-03	005526
20-3/4" 3,000 psi	713878	713114-08	008721-01	005298	006018-03	005526
21-1/4" 2000 psi	713878	713114-10	008721-01	005298	006018-03	005526
21-1/4" 5,000 psi	713878	***	008721-01	005298	006018-03	005526
21-1/4" 10,000 psi	713878	***	008721-01	005298	006018-03	005526
26-3/4" 3,000 psi	713878	713114-13	008721-01	005298	006018-03	005526

* One required

** Two required for single preventer, four for double preventer

*** Commercially available sockets are recommended

U AND UM BOP Pipe Rams

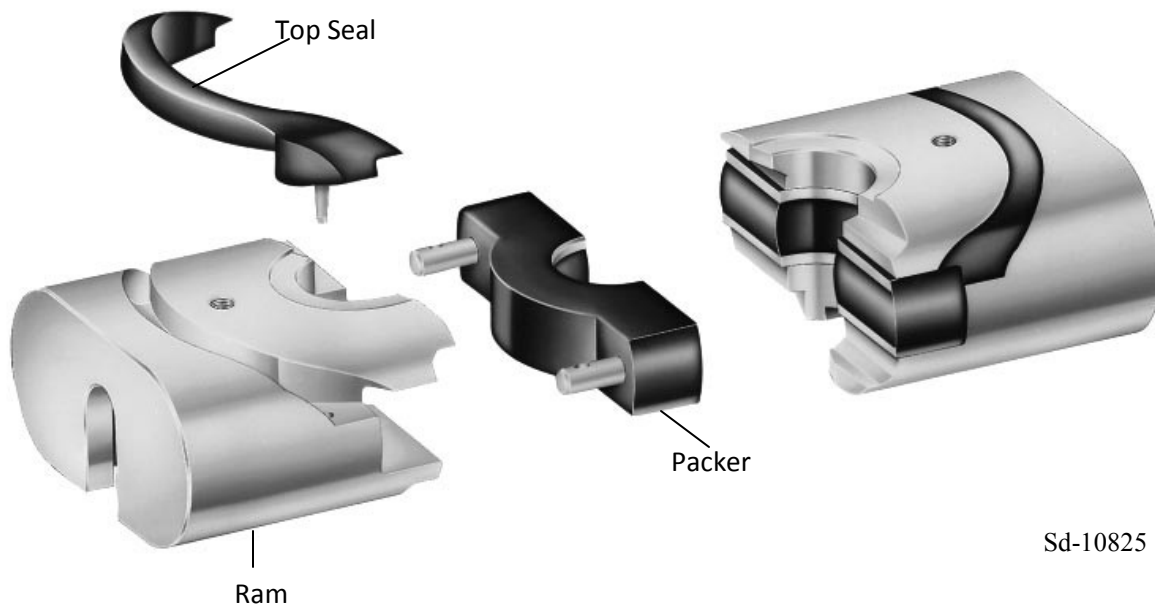
The standard “U” BOP pipe rams are interchangeable for the U and UM BOP’s.

Pipe rams are available for use in Cameron U, and UM BOP’s to fit all commonly used sizes of tubing, drill pipe, drill collar or casing within the ranges in the charts of the following pages. Cameron pipe rams include the following features:

- Cameron pipe rams are self-feeding and incorporate a large reservoir of packer rubber to ensure a long-lasting seal under all conditions.
- Ram packers lock into place and are not dislodged by well flow.
- All Cameron pipe rams are suitable for H₂S service per NACE MR-01-75.
- CAMRAM™ top seals are standard for all U and UM BOP pipe rams from 7-1/16” through 18-3/4” sizes. Packer part numbers beginning with 644xxx indicate the CAMRAM lipped-plate design. Other part numbers may use standard elastomer material and reinforced plates. Verify this with your Cameron representative.

CAMRAM 350™ packers and top seals are available for high temperature service and for service in which concentrations of H₂S are expected.

U and UM BOP Pipe Ram



Part Numbers for U & UM BOP Pipe Rams

	7-1/16"			11"		
Pipe Size (in.)	3,000, 5,000, 10,000 and 15,000 psi WP Top Seal 644214-01-00-01			3,000, 5,000 and 10,000 psi WP Top Seal 644217-01-00-01		
	Assembly	Ram	Packer	Assembly	Ram	Packer
Blind	644216-01-00-02	644500-01-00-02	644215-01-00-01	236510-00-04-01	236510-00-04	644218-01-00-01
1.050	644216-02	-----	-----	-----	-----	-----
1.315	644216-03-00-01	044102-02-00-01	644215-03	644219-02		
1.660	644216-04-00-01	044102-03-00-01	644215-04-00-01	644219-03-00-01	044218-02-00-01	644218-03-00-01
1.900	644216-05-00-01	044102-04-00-01	644215-05-00-01	644219-04-00-01	044118-03-00-01	644218-04-00-01
2.062	644216-06			644219-04-00-01	044118-03-00-01	644218-04-00-01
2.375	644216-07-00-02	044102-05-00-02	644215-07-00-01	644219-06-00-02	044118-05-00-02	644218-06-00-01
2.875	644216-08			644219-07-00-03	044118-06-00-03	644218-07-00-01
3.500	644216-09-00-01	644502-01-00-01	644215-09-00-01	644219-08-00-04	644835-01-00-02	644218-08-00-01
4.000	644216-11		644215-11-00-01	644219-10-00-01	044119-02-00-01	644218-10-00-01
4.500	644216-12-00-01	644503-03-00-01	644215-12-00-01	644219-11-00-03	644835-02-00-03	644218-11-00-01
4.750	-----	-----	-----	644219-13		
5.000	644216-14-00-01	644503-05-00-01	644215-14-00-01	644219-14-00-01	644835-03-00-01	644218-14-00-01
5.500	644216-15	-----	644215-15-00-01	644219-16-00-02	644835-05-00-01	644218-16-00-01
5.750	-----	-----	-----	644219-17	-----	-----
5.875	-----	-----	-----	-----	-----	-----
6.000	-----	-----	-----	236510-19-04-01	236510-19-04	644218-18-00-01
6.625	-----	-----	-----	644219-19-00-01	644835-04-00-01	644218-19-00-01
7.000	-----	-----	-----	644219-20-00-01	044120-11	644218-20-00-01
7.625	-----	-----	-----	644219-21-00-01	044120-05-00-01	644218-21-00-01
7.750	-----	-----	-----	644219-22	-----	644218-22-00-01
8.625	-----	-----	-----	644219-23	-----	644218-23-00-01
9.000	-----	-----	-----	-----	-----	-----
9.625	-----	-----	-----	-----	-----	-----
10.750	-----	-----	-----	-----	-----	-----
11.750	-----	-----	-----	-----	-----	-----
1.250	644216-17-00-01	644502-08-00-01	644215-17-00-01	-----	-----	-----
1.500	644216-18-00-01	644502-09-00-01	644215-18-00-01	-----	-----	-----
1.750	644216-19-00-01	644502-10-00-01	644215-19-00-01	-----	-----	-----
2.250	644216-16-00-01	044102-12-00-01	644215-16-00-01	644219-24-00-01	044118-08-00-01	644218-24-00-01
3.650	644216-20-00-01	644502-02-00-01	644215-20	-----	-----	-----
3.500 Aluminum	644216-10	-----	-----	644219-09	-----	-----
4.500 Aluminum	644216-13	-----	-----	644219-12	-----	-----
5.000 Aluminum	-----	-----	-----	644219-15	-----	-----

For High Temp. see
2245597-*

For High Temp. see
236510-*

Part Numbers for U & UM BOP Pipe Rams

Pipe Size (in.)	11" 15,000 psi WP (*) Top Seal 2010453-01			13-5/8" 3,000, 5,000 and 10,000 psi WP Top Seal 644223-01-00-01			
	Assembly	Ram	Packer	Assembly		Ram	Packer
Blind	2245650-01	2245649-01	644221-01	644225-01-00-01	B	044147-01-00-01	644224-01-00-01
1.050	-----	-----	-----	-----		-----	-----
1.315	-----	-----	-----	644225-02		-----	-----
1.660	644222-02	-----	-----	644225-03		-----	-----
1.900	644222-03	-----	-----	644225-04		-----	-----
2.062	644222-04	-----	-----	644225-05		-----	644224-05-00-01
2.375	2010456-05	-----	2010454-05	644225-06-00-01	B	044148-01-00-01	644224-06-00-01
2.875	2010456-06	-----	2010454-06	644225-07-00-01	B	044148-02-00-01	644224-07-00-01
3.000	-----	-----		644225-28-00-01		044148-08-00-01	644224-31-00-01
3.500	2245650-09	2245649-09	2010454-07	644225-08-00-01	C	644738-01-00-01	644224-08-00-01
4.000	2245650-11	2245649-11	2010454-08	644225-10-00-01	B	044149-02-00-01	644224-10-00-01
4.500	2245650-12	2245649-12	2010454-09	644225-11-00-01		644738-02-00-01	644224-11-00-01
4.750	-----	-----	-----	644225-13		644225-17	644224-13-00-01
5.000	2245650-13	2245649-13	2010454-10	644225-14-00-01	C	644738-03-00-01	644224-14-00-01
5.500	2245650-14	2245649-14	2010454-11	644225-16-00-04	C	644738-05-00-02	644224-16-00-01
5.750	-----	-----	-----	644225-34-00-01		644738-08-00-01	644224-30-00-01
5.875	-----	-----	-----	644225-30		644738-06-00-01	644224-29-00-01
6.000	644222-12	-----		044244-13			644224-17-00-01
6.250	2010456-14	-----	2010454-15	-----		-----	-----
6.625	2010456-13	-----	2010454-13	644225-18-00-02	C	644738-04-00-02	644224-18-00-01
7.000	2245650-18	2245649-18	2010454-14	644225-19-00-01	E	044151-01-00-01	644224-19-00-01
7.625	2245650-19	2245649-19	2010454-17	644225-20-00-01	B	044151-02-00-01	644224-20-00-01
7.750	-----	-----	-----	644225-21		-----	644224-21-00-01
8.125	2010456-12	-----	2010454-16	-----		-----	-----
8.625	-----	-----	-----	644225-22		-----	644224-22-00-01
9.000	-----	-----	-----	044244-24-00-01		044151-04-00-01	644224-23-00-01
9.625	-----	-----	-----	644225-24-00-01	C	044151-05-00-01	644224-24-00-01
9.875	-----	-----	-----	644225-27-00-01		044151-09-00-01	644224-27-00-01
10.750	-----	-----	-----	644225-25-00-01		044152-01-00-02	644224-25-00-01
11.750	-----	-----	-----	644225-26-00-01	B	614208-01-00-01	644224-26-00-01
3.500 Aluminum	-----	-----	-----	644225-09		-----	-----
4.500 Aluminum	-----	-----	-----	644225-12		-----	-----
5.000 Aluminum	-----	-----	-----	644225-15		-----	-----

(*) Should be with wear pads—For high temp see10.

For High Temp. see B: -02, C: -03, E: -04

Part Numbers for U & UM BOP Pipe Rams

13-5/8"				16-3/4"		
15,000 psi				3,000, 5,000 and 10,000 psi		
Top Seal 644226-01-00-01				Top Seal 644229-01-00-01		
Pipe Size (in.)	Assembly	Ram	Packer	Assembly	Ram	Packer
Blind	644228-01-00-02	044143-01-00-02	644227-01-00-01	644231-01-00-01	044179-02	644230-01-00-01
1.050	----	----	----	----	----	----
1.315	----	----	----	----	----	----
1.660	----	----	----	----	----	----
1.900	----	----	----	644231-02		644230-02-00-01
2.062	644228-02	----	----	----	----	----
2.375	644228-03-00-01	2724029-08	644227-03-00-01	644231-03		644230-03-00-01
2.875	644228-04-00-01	2724029-09	644227-04-00-01	644231-04-0-01	44180-02-00-01	644230-04-00-01
3.500	644228-05	----	644227-05-00-01	644231-05-00-01	2724030-01	644230-05-00-01
4.000	644228-07-00-01	----	644227-07-00-01	644231-06	----	644230-06-00-01
4.500	644228-08-00-01	2724029-02	644227-08-00-01	644231-07	2724030-02	644230-07-00-01
4.750	644228-10	----		644231-08	----	644230-08-00-01
5.000	644228-11-00-03	2724029-03	644227-11-00-01	644231-09-00-01	2724030-03	644230-09-00-01
5.500	644228-12-00-01	2724029-04	644227-12-00-01	644231-10-00-01	2724030-04	644230-10-00-01
5.750	----	----	----	----	----	----
5.875	2164172-07	2724029-06	644227-24-00-01	644231-22-00-01	2724030-06	644230-23
6.000	644228-13	----	----	644231-11	----	----
6.625	644228-14-00-01	2724029-05-01	644227-14-00-01	644231-12	----	644230-12-00-01
7.000	644228-15-00-02	044146-01-00-02	644227-15-00-01	644231-13-00-01	49291-03-00-01	644230-13-00-01
7.625	644228-16		644227-16-00-01	644231-14-00-01	49291-04-00-01	644230-14-00-01
7.750	644228-17-00-01	044146-02-00-01	644227-17-00-01	----	----	----
8.625	644228-18-00-01	044146-03-00-01	644227-18-00-01	644231-15	----	644230-15-00-01
9.000	644228-19	----	----	644231-16	----	644230-16-00-01
9.625	644228-20-00-02	044146-05-00-02	644227-20-00-01	644231-17-00-01	049292-01-00-01	644230-17-00-01
9.875	644228-22	044146-08-00-01	644227-22-00-01	644231-25-00-1	049292-08-00-01	644230-25-00-01
10.750	644228-21-00-01	044146-06-00-01	644227-21-00-01	644231-18		644230-18-00-01
10.875	----	----	----	644231-24-00-01	049292-06-00-01	644230-22-00-01
11.750	----	----	----	644231-19	----	644230-19-00-01
13.375	----	----	----	644231-20-00-01	049292-04-00-01	644230-20-00-01
13.625	----	----	----	----	----	----
13.750	----	----	----	----	----	----
16.000	----	----	----	----	----	----
3.500 Aluminum	644228-06			----	----	----
4.500 Aluminum	644228-09	----	----	----	----	----
5.000 Aluminum	----	----	----	----	----	----

Part Numbers for U & UM BOP Pipe Rams

18-3/4"				21-1/4"		
10,000 psi (*)				5,000 and 10,000 psi (*)		
Top Seal 644232-01-00-01				Top Seal 2010939-01		
Pipe Size (in.)	Assembly	Ram	Packer	Assembly	Ram	Packer
Blind	644234-01		644233-01-00-01	044262-01-00-01	044214-02	2010851-19
1.050	----	----	----	----	----	----
1.315	----	----	----	----	----	----
1.660	----	----	----	----	----	----
1.900	----	----	----	----	----	----
2.062	----	----	----	----	----	----
2.375	644234-02-00-01	44185-01-00-01	644233-02-00-01	044262-02		2010851-01
2.875	644234-03	----	644233-03-00-01	044262-03	----	2010851-02
3.500	2245344-01	644741-01-00-01	644233-04-00-01	044262-04-00-01	2724033-01	2010851-03
4.000	644234-06	----	644233-06-00-01	044262-06	----	----
4.500	644234-07	----	644233-07-00-01	044262-07-00-01	2724033-02	2010851-05
4.750	644234-09	----		044262-09	----	----
5.000	2245344-10	644741-03-00-01	644233-10-00-01	044262-10-00-01	2724033-03	2010851-07
5.500	644234-11-00-01	----	644233-11-00-01	044262-11-00-01	2724033-04	2010851-08
5.750	----	----	----	----	----	----
5.875	644234-21	----	644233-21-00-01	044262-32	2724033-06	2010851-29
6.000	644234-12	----	----	044262-13	----	----
6.625	2245344-14	2724031-05	644233-13-00-01	044262-14-00-01	2724033-05	031228-10-00-02
7.000	644234-14		644233-14-00-01	044262-15-00-01	2724033-07	2010851-11
7.625	644234-15	----	----	044262-16	----	----
7.750	----	----	----	----	----	----
8.625	644234-16	----	----	044262-17	----	----
9.000	644234-17			044262-18		
9.625	2091689-18-00-01	044185-18-01	644233-18-00-01	044262-19-00-01	2724033-09	2010851-15
10.750	644234-19	----	644233-19-00-01	044262-20-00-01	2010096-01	2010851-20
11.750	----	----	----	044262-21		2010851-20
11.875	644234-25	044185-25-00-01	644233-25-00-01	----	----	----
12.000	644234-22		644233-22-00-01			
13.375	644234-20	----	644233-20-00-01	044262-22-00-01	2010096-03	2010851-22
13.625	644234-24	----	----	044262-24-00-01	2010096-05	2010851-24
13.750	----	----	----	----	----	----
14.000	644234-23	----	644233-23-00-01	44262-30-00-01	2010096-05	2010851-27
16.000	----	----	----	044262-23-00-01	2010096-04	2010851-23
3.500 Aluminum	644234-05	----	----	044262-05	----	----
4.500 Aluminum	644234-08	----	----	044262-08	----	----
5.000 Aluminum	----	----	----	----	----	----

(*) Should be with wear pads

Part Numbers for U & UM BOP Pipe Rams

21-1/4" Bore 2000 psi 20-3/4" Bore 3,000 psi (*) Top Seal 2163621-01				26-3/4" Bore 2000 and 3,000 psi (*) Top Seal 2163566-01			
Pipe Size (in.)	Assembly	Ram	Packer	Assembly		Ram	Packer
Blind	044256-01-00-02	044191-05	2163612-01	044260-01-00-01	B	044209-01-00-01	2163561-01
1.050	-----	-----	-----	-----		-----	-----
1.315	-----	-----	-----	-----		-----	-----
1.660	-----	-----	-----	-----		-----	-----
1.900	-----	-----	-----	-----		-----	-----
2.062	-----	-----	-----	-----		-----	-----
2.375	-----	-----	-----	044260-02			2163559-01
2.875	2010278-01-01	2010261-02-01	2163613-02	044260-03			2163559-02
3.500	044256-02		2163613-03	044260-04			2163559-03
4.000	044256-03		2163613-04	044260-05			2163559-04
4.500	044256-04		2163613-05	044260-06			2163559-05
4.750	044256-05			-----		-----	-----
5.000	044256-06-00-01	645328-03-00-01	2163613-06	044260-07-00-01	B	614018-04-00-01	2163559-06
5.500	044256-07-00-04	044193-02-00-01	2163613-07	044260-08-00-01	B	614018-05-00-01	2163559-07
5.750	-----	-----	-----	-----		-----	-----
5.875	044256-32-00-01	645328-05-00-01	2163613-18	044260-24-00-01		614019-07-00-01	2163559-23
6.000	236534-20-04-01	236534-20-04	031228-10-00-02	044260-09			2163559-08
6.625	236534-20-04-01		2163613-08	044260-10-00-01		614019-02-00-01	2163559-09
7.000	236534-21-04-01		2163613-09	044260-11			2163559-10
7.625	044256-11		2163613-10	044260-12			2163559-11
7.750	-----	-----	-----	-----		-----	-----
8.625	044256-13		2010583-14	-----		-----	-----
9.000	044256-14			044260-14			2163559-13
9.625	044256-15			044260-15			2163559-14
10.750	044256-16		2010583-17	044260-16			2163559-15
11.750	044256-17			044260-17			2163559-16
13.375	044256-18-00-02	044194-03-00-02	2163613-15	044260-18-00-01	B	614020-04-00-01	2163559-17
13.625	044256-21-00-01	044194-05-00-01	2163613-20	-----		-----	-----
13.750	044256-19		2010583-19	-----		-----	-----
16.000	044256-20-00-01	44195-01-00-01	2010583-21	044260-19			2163559-18
18.625	044256-22-00-01	614459-01-00-01	2163613-17	044260-22-00-01	B	614021-04-00-01	2163559-19
20.000	-----	-----	-----	044260-20-00-01		614021-02-00-01	2163559-21
17.000	044256-25			044260-25-00-01		614021-06-00-01	2163559-24
22.000	-----	-----	-----	044260-23-00-01		614021-05-00-01	2163559-22

(*) Should be with wear pads.

For High Temp. see B: -02

Hang-Off Weights

Hang-off-weights are estimated capacities with hardened top corners of the hang-off-rams. This enable the rams to dig into the tool joint and provide superior hang-off capacity while still meeting NACE requirements.

For variable bore rams (VBR's) and FLEXPACKER Rams hang-off data, refer to Cameron Engineering Bulletin 859D.

HANG-OFF WEIGHTS (See Cameron Engineering Bulletin EB636D)

Paper Size	Pipe Rams
3-1/2"	425,000 lb
4-1/2"	550,000 lb
5"	600,000 lb
5-1/2"	600,000 lb
6-5/8"	600,000 lb

U BOP Shearing Blind Rams

Cameron shearing blind rams shear the pipe in the hole, then bend the lower section of sheared pipe to allow the rams to close and seal. Shearing blind rams can be used as blind rams during normal drilling operations.

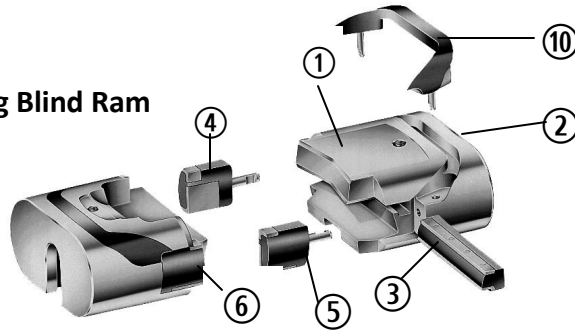
The DS shearing blind ram can cut large diameter tubulars or multiple tubing strings regardless of their orientation to the centerline of the ram. A blade seal between the upper and lower faces eliminates the need for moving pipe after shearing.

Features of shearing blind rams and DS rams include:

- Large frontal area on the blade face seal reduces pressure on the rubber and increases service life.
- Cameron SBRs can cut pipe numerous times without damage to the cutting edge.
- The single-piece body incorporates an integrated cutting edge.
- CAMRAM™ top seals are standard for all U BOP shearing blind rams through 18-3/4".
- For U and UII BOPs through 18-3/4", part numbers beginning with 644XXX indicate the CAMRAM lipped-plate design. Other part numbers may use standard elastomer material and reinforced plates. Verify this with your, Cameron representative.
- Cameron SBR's, both with inserted and integral blades, meet the H2S requirements of both API 16A and NACE MR-0175. Sulfide stress cracking susceptible materials are used for the blades; however, the main body of the SBR's are made of sulfide stress cracking resistant materials.

U and UM BOP Shearing Blind Ram Part Numbers

U BOP Shearing Blind Ram



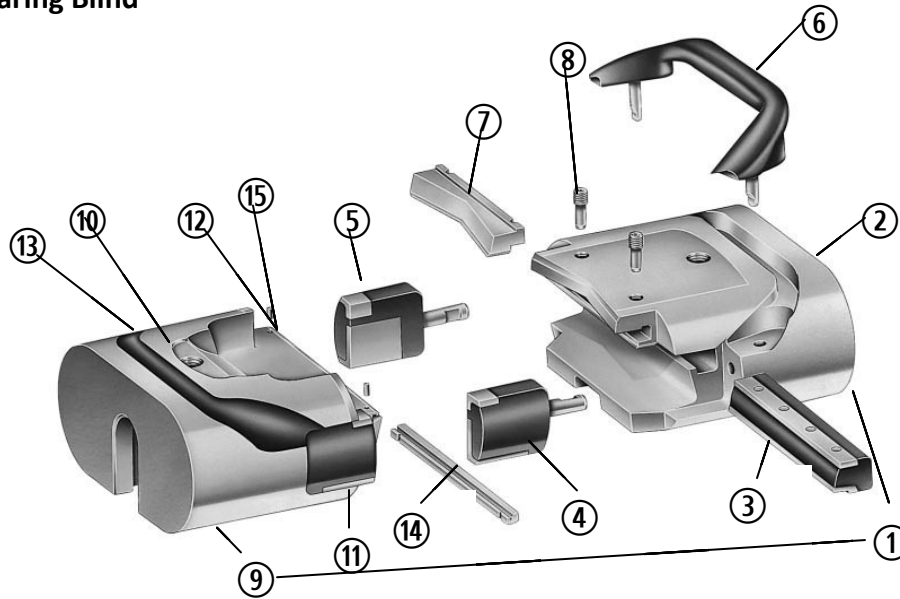
Description and Item Number					
BOP Bore Size and Working Pressure	1 Upper Ram Subassy	2 Body*	3 Blade Packer*	4 Side Packer*	5 Side Packer*
7-1/16" 5,000, 10,000, 15,000 psi	046792-01-00-03	046210-01-00-04	-----	2010873-02	2010873-01
11" 5,000, 10,000 psi	049392-01-00-02	049009-01-00-02	046910-04-00-01	046751-04-00-01	046752-04-00-01
11" 15,000 psi	2245650-41	2245649-41	046910-04-00-01	2010460-07	2040461-07
13-5/8" 5,000, 10,000 psi	046748-01-00-01	046749-01-00-01	644435-01-00-01	046751-01-00-02	046752-01-00-02
13-5/8" 15,000 psi	614004-01-00-02	2010291-01	644435-01-00-01	046751-05-00-01	046752-05-00-01
16-3/4" 5,000 psi	046766-01-00-01	049006-01-00-01	046910-03-00-01	046751-03-00-01	046752-03-00-01
16-3/4" 10,000 psi	046773-01-00-01	046774-01-00-01	046910-03-00-01	046751-03-00-01	046752-03-00-01
18-3/4" 10,000 psi	2010704-01	2010702-01	2010192-01	2010191-01	2010190-01
20-3/4" 3,000 psi	046783-01-00-02	046784-01-00-02	615235-01-00-02	615235-01-00-02	-----
21-1/4" 2000 psi	046783-01-00-02	046784-01-00-02	615235-01-00-02	615235-01-00-02	-----
21-1/4" 5,000 psi **	049983-01-00-01	049981-01-00-01	046910-05-00-01	046751-06-00-01	046752-06-00-01
21-1/4" 7500 & 10,000 psi	046788-01-00-01	049012-01-00-01	046910-05-00-01	046751-06-00-01	046752-06-00-01
Description and Item Number					
BOP Bore Size and Working Pressure	6 Lower Ram Subassy	7 Body	8 Side Packer	9 Side Packer	10 Top Seal (2 Required)
7-1/16" 5,000, 10,000 & 15,000 psi	046792-02-00-03	046212-01-00-04	2010872-01	-----	644214-01-00-01
11" 5,000 & 10,000 psi	049392-02-00-02	049010-01-00-02	046751-04-00-01	046752-04-00-01	644217-01-00-01
11" 15,000 psi **	2245650-40	2245649-40	2010461-07	2010461-07	2010453-01
13-5/8" 5,000 & 10,000 psi	046748-02-00-01	046750-01-00-01	046751-01-00-02	046752-01-00-02	644223-01-00-01
13-5/8" 15,000 psi	614004-02-00-02	2010292-01	046751-05-00-01	046752-05-00-01	644226-01-00-01
16-3/4" 5,000 psi	046766-02-00-01	049007-01-00-01	046751-03-00-01	046752-03-00-01	644229-01-00-01
16-3/4" 10,000 psi	046773-02-00-01	046775-01-00-01	046751-03-00-01	046752-03-00-01	644229-01-00-01
18-3/4" 10,000 psi **	2010703-01	2010701-01	2010191-01	2010190-01	2010193-01
20-3/4" 3,000 psi	046783-02-00-02	046785-01-00-02	615247-01-00-02	615247-02-00-02	2163621-01
21-1/4" 2,000 psi	046783-02-00-02	046785-01-00-02	615247-01-00-02	615247-02-00-02	2163621-01
21-1/4" 5,000 psi **	049983-02-00-01	049982-01-00-01	046751-06-00-01	046752-06-00-01	645478-01-00-01
21-1/4" 7,500 & 10,000 psi	046788-02-00-01	049011-01-00-01	046751-06-00-01	046752-06-00-01	645478-01-00-01

*Part of upper ram assembly

** Should be with wear pads

H₂S Shearing Blind Ram

U BOP H₂S Shearing Blind



U and UM BOP H₂S Shearing Blind Ram Part Numbers

BOP Bore Size and Working Pressure (psi)	1 Upper Ram Subassy	2 Ram	3 Blade Packer	4 Packer	5 Packer	6 Top Seal	7 Blade Insert	8 Set Screw (QTY 2 Req'd)
11" 5,000 & 10,000	645011-03-00-01	645009-01-00-01	046910-04-00-01	046751-04-00-01	046752-04-00-01	644217-01-00-01	645010-01-00-01	644582-01
13-5/8" 5,000 & 10,000	644781-01-00-01	644780-01-00-01	644435-01-00-01	046751-01-00-02	046752-01-00-02	644223-01-00-01	644581-01-00-01	644582-01
13-5/8" 15,000	2163019-01-01	2163017-01-01	644435-01-00-01	046751-05-00-01	046752-05-00-01	644226-01-00-01	2164281-01	644582-01
18-3/4" 10,000 **	2245297-01	2245298-01	2010192-01	2010191-01	2010190-01	2010193-01	2010182-01	644524-01
21-1/4" 10,000 **	2057307-01	2057302-01	046910-05-00-01	046751-06-00-01	046752-06-00-01	645478-01-00-01	2057304-01	644349-01

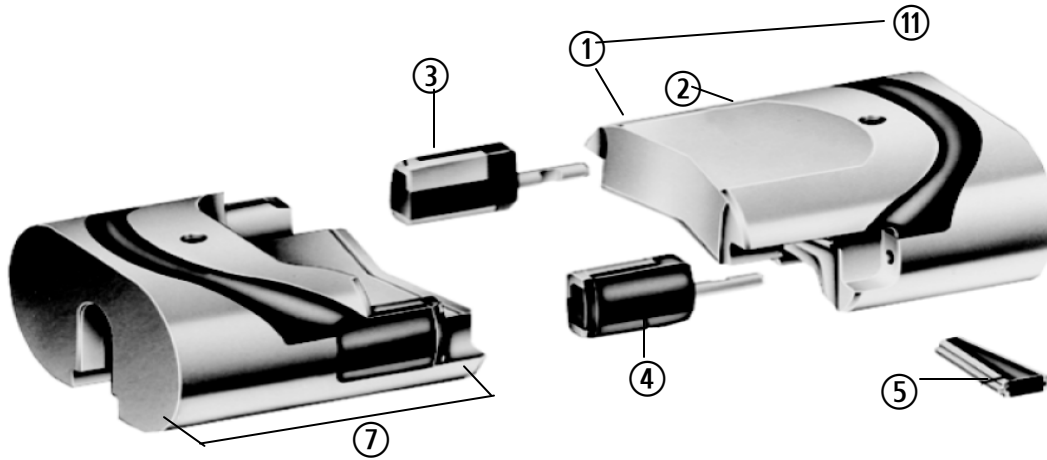
BOP Bore Size and Working Pressure (psi)	9 Lower Ram Subassy	10 Ram	11 Packer	12 Packer	13 Top Seal	14 Blade Insert	15 Pin (QTY 2 req'd)
11" 5,000 & 10,000	645011-04-00-01	645009-02-00-01	046751-04-00-01	046752-04-00-01	644217-01-00-01	645010-02-00-01	200231
13-5/8" 5,000 & 10,000	644781-02-00-01	644780-02-00-01	046751-01-00-02	046752-01-00-02	644223-01-00-01	644581-02-00-01	200231
13-5/8" 15,000	2163019-02-01	2163018-01-01	046751-05-00-01	046752-05-00-01	644226-01-00-01	644581-02-00-01	200231
18-3/4" 10,000 **	2245295-01	2245296-01	2010191-01	2010190-01	2010193-01	2010183-01	200231
21-1/4" 10,000 **	2057306-01	2057303-01	046751-06-00-01	046752-06-00-01	645478-01-00-01	2057305-01	200231

** Should be with wear pads.

Severe Service U and UM BOP H₂S Shearing Blind Ram Part Numbers

BOP Bore	1	2	3	4	5	6	7	8
Size and Working Pressure (psi)	Upper Ram Subassy	Ram	Blade Packer	Side Packer	Side Packer	Top Seal	Blade Insert	Set Screw (QTY 2 Req'd)
11" 10,000	--	645009-01-00-01	644834-04-00-01	2164284-04	2164285-04	644703-01-00-01	645010-01-00-01	644582-01
13-5/8" 5,000 and 10,000	644781-03-00-01	644780-01-00-01	644834-01-00-01	645427-01-00-01	645428-01-00-01	644707-01-00-01	644581-01-00-01	644582-01
13-5/8" 15,000	2163019-01-02	2163017-01-01	644834-02-00-01	644832-03-00-01	644833-01-00-01	644709-01-00-01	2164281-01	644582-01
BOP Bore Size and Working Pressure (psi)	9 Lower Ram Subassy	10 Ram	11 Packer	12 Packer	13 Top Seal	14 Blade Insert	15 Pin (QTY 2 Req'd)	
11" 10,000	--	645009-02-00-01	2164284-04	2164285-04	644703-01-00-01	645010-02-00-01	200231	
13-5/8" 5,000 and 10,000	644781-04-00-01	644780-02-00-01	645427-01-00-01	645428-01-00-01	644707-01-00-01	644581-02-00-01	200231	
13-5/8" 15,000	2163019-02-02	2163018-01-01	644832-03-00-01	644833-03-00-01	644709-01-00-01	644581-02-00-01	200231	

U & UM BOP DS Shearing Blind Ram



DS Shearing Blind Ram

U BOP DS Shearing Blind Ram

BOP Bore Size and Working Pressure (psi)	Description and Item Number					
	1* Upper Ram Subassy	2* Body	3* Side Packer	4* Side Packer	5* Blade Seal	6* Blade Seal
11" 5,000 and 10,000	645078-01-00-04	645079-01-00-04	645080-02-00-01	645080-01-00-01	645031-02-00-01	645031-02-00-01

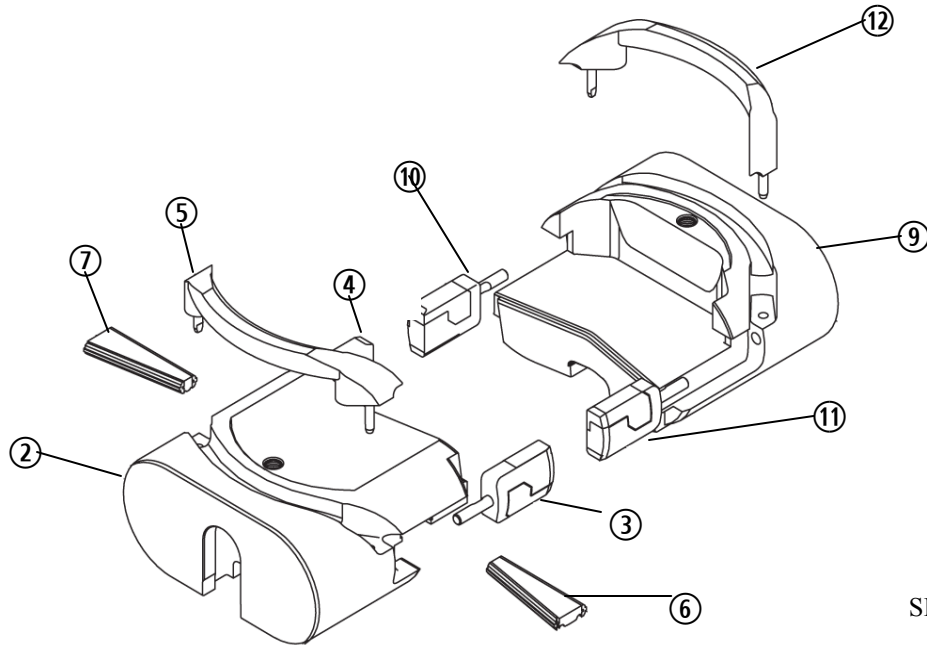
BOP Bore Size and Working Pressure (psi)	Description and Item Number				
	7** Lower Ram Subassy	8** Body	9** Side Packer	10** Side Packer	11 Top Seal (2 Required)
11" 5,000 and 10,000	645078-02-00-04	645079-02-00-04	645080-02-00-01	645080-01-00-01	644217-02-00-01

* Part of Upper Ram Assembly

** Part of Lower Ram Assembly

ISR Shearing Blind Ram

Interlocking Shear Ram (ISR) is available for the U Type BOP line. The ISR rams provide an improved shearing capacity alternative to the standard SBR rams, and should only be used when the standard rams cannot handle the desired shearing load. Since the geometry of the ISR ram incorporates a “V” shape and is designed as wide as possible, it can shear multiple strings and drill pipe as large as 6-5/8” O.D. Also, ISR Rams do not have to fold over the lower fish. This means less force is required to shear and, by leaving the fish open, kill mud can be pumped down the severed drill string. The interlocking mechanism incorporated in the ISR means that these rams can be utilized in an oversized cavity without fear of a leak at low wellbore pressures.



SD 034603

U and UM BOP ISR Shearing Blind Ram

BOP Bore Size and Working Pressure (psi)	Description and Item Number						
	2-7 Upper Ram Subassembly	2 Body	3 Side Packer	4 Side Packer	5 Top Seal	6 Blade Seal	7 Blade Seal
13-5/8" 3,000, 5,000 and 10,000 *	2164775-03	2164773-01	2010985-01	2010985-02	645033-01-00-01	2010986-01	2010986-02
11" 15,000	2056941-01	2056944-01	2056950-01	2056951-01	2056951-02	2056946-01	2056946-02

BOP Bore Size and Working Pressure (psi)	Description and Item Number				
	9-12 Lower Ram Subassembly	9 Body	10 Side Packer	11 Side Packer	12 Top Seal
13-5/8" 3,000, 5,000 and 10,000	2164776-03	2164774-01	2010985-01	2010985-02	645033-01-00-01
11" 15,000 *	2056942-01	2056945-01	2056952-01	2056953-01	2056951-02

* Should be with wear pads.

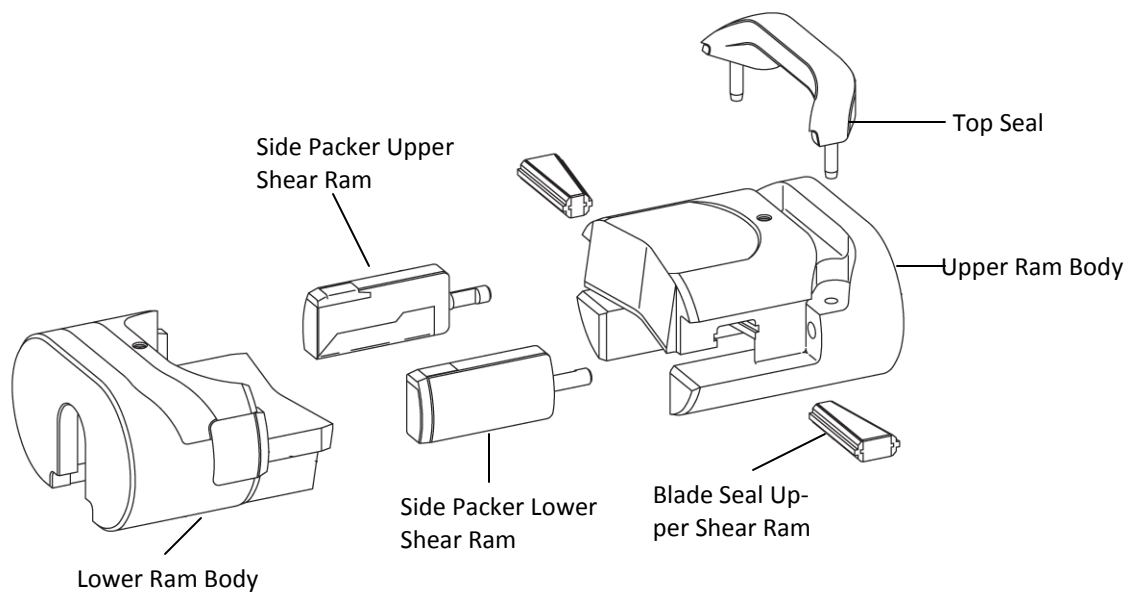
U and UM BOP DSI and DVS Shear Rams

Dual string interlocking (DSI) shear rams and double V shear (DVS) rams are also available for the U and UM BOP's. The interlocking feature of these rams provides the capability of shearing wireline and braided cable with zero tension in the line, while still maintaining a seal. The blades are interlocking by using pockets in the lower ram and arms on the upper ram to prevent any gap between blade surfaces.

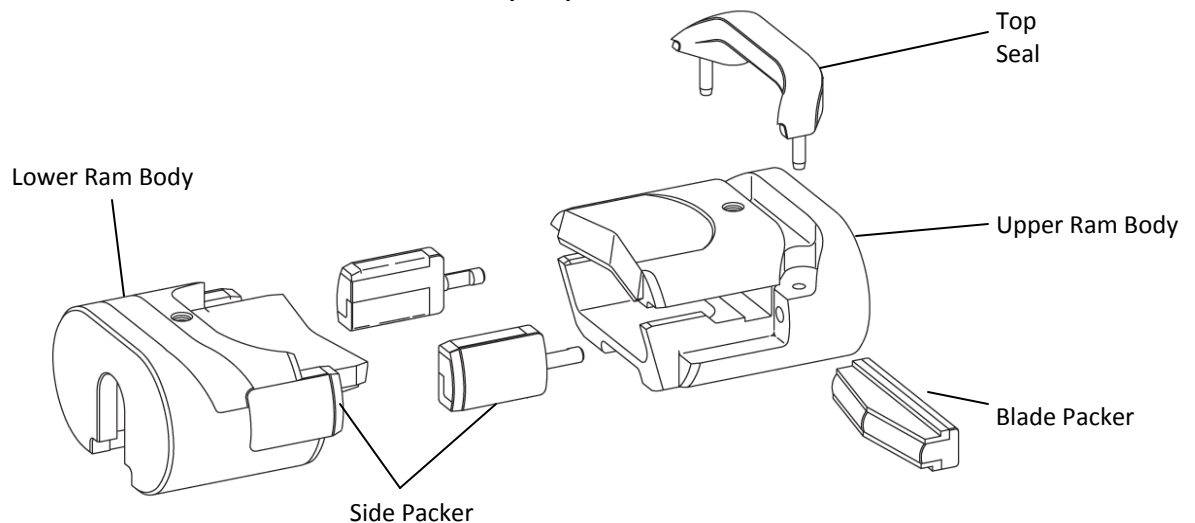
DSI rams are similar to standard DS shear rams except for the interlock feature. DSI shear rams are capable of shearing tubing, small pipe, braided cable, slick line and solid sinker bar.

DVS rams are similar in design to the standard shearing blind rams expect that both blades are V shaped and interlocked. The DVS rams are capable of shearing tubing, small pipe, braided cable, slick line and solid sinker bar.

Dual String Interlocking (DSI) Rams

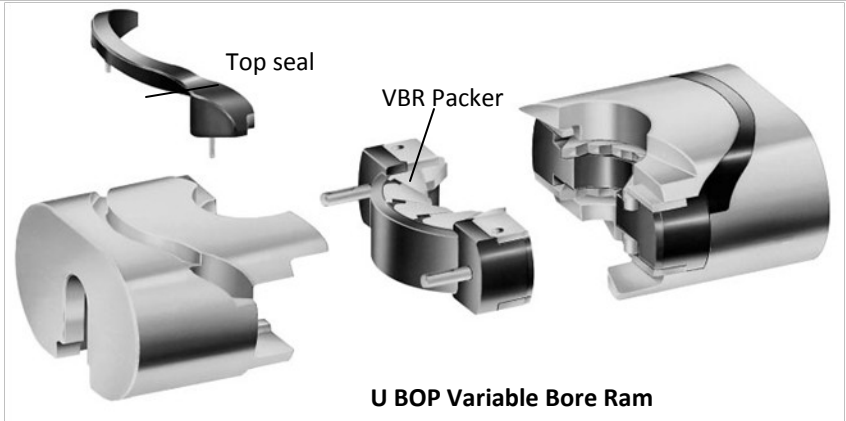


Dual V Shear (DVS) Rams



U and UM BOP Variable Bore Rams (VBR™ and VBR-II™)

The Cameron VBR-II is the next generation of highly popular Cameron variable bore ram (VBR) packer. The VBR-II accommodates a range of pipe sizes and may be used in existing Cameron variable bore rams. The VBR-II seals on a range of drill pipe sizes as well as hexagonal kellys and provides uniform sealing pressure with virtual elimination of extrusion paths.



As indicated in the chart below, the VBR-III is the standard VBR in most common sizes. In sizes where the VBR-II is not specified in the chart, the popular Cameron VBR is the standard offering. VBR-II packers for other size BOP's and other pipe size ranges are available upon request.

U and UM BOP Variable Bore Ram Part Numbers

BOP Size and Working Pressure (psi)	Pipe Size Range	Ram Subassembly	Ram Body	Packer	Top Seal
7-1/16" 3,000, 5,000, 10,000 and 15,000	3-1/2" to 2-3/8"	615066-01-00-01	615065-01-00-01	614616-02-00-03	644214-02-00-01
7-1/16" 3,000, 5,000, 10,000 and 15,000	4" to 2-7/8"	644901-01	614605-01	614616-02	644214-02-00-01
11" 3,000, 5,000 and 10,000 VBR-II	5" to 2-7/8"	046674-01-00-02	644836-01-00-02	644926-02	644217-01-00-01
11" 15,000	5" to 2-7/8"	2245650-30	2245649-30	2010464-02	2010453-02
13-5/8" 3,000, 5,000 and 10,000 VBR-II	7" to 4-1/2"	046675-01-00-02	046671-01-00-02	644924-03	644223-02-00-01
13-5/8" 3,000, 5,000 and 10,000 VBR-II	5-7/8" to 3-1/2"	2164664-01	2164404-01	2164599-01	644223-02-00-01
13-5/8" 3,000, 5,000 and 10,000 VBR-II	5-1/2" to 3-1/2"	2163945-01	2011438-01	645089-02-00-01	644223-02-00-01
13-5/8" 3,000, 5,000 and 10,000 VBR-II	5" to 2-7/8"	645166-02	644744-01-00-04	645089-02-00-01	644223-02-00-01
13-5/8" 15,000	7" to 5"	614104-01-00-01	614146-01-00-01	644924-02	644226-02-00-01
13-5/8" 15,000	5-7/8" to 3-1/2"	614129-03-00-02	644745-03-00-02	645089-03	644226-02-00-01
13-5/8" 15,000	5" to 3-1/2"	614129-01-00-02	644745-01-00-02	645089-03	644226-02-00-01
16-3/4" 3,000 and 5,000	7" to 3-1/2"	046676-01	046672-01	644920-01-00-01	644229-01-00-01
16-3/4" 10,000	7" to 5"	046676-01	046672-01	644920-01-00-01	644229-01-00-01
16-3/4" 10,000	5" to 2-7/8"	2163175-01	644746-01-00-01	2164605-01	644229-02-00-01
16-3/4" 10,000	5-1/2" to 3-1/2"	2164605-01	2164603-01	645128-01-00-01	644229-02-00-01
18-3/4" 10,000 VBR-II	7-5/8" to 3-1/2"	2232782-01	046673-04	644927-02	644232-03-00-01
21-1/4" 5,000 and 10,000	5-7/8" to 2-7/8"	2164444-01	2164408-01	2164423-01	2164440-01

U and UM BOP Extended Range High Temperature VBR-II

BOP Size and Working Pressure (psi)	Pipe Size Range	Ram Subassembly	Ram Body	Packer	Top Seal
13-5/8" 3,000, 5,000 and 10,000	5-7/8" to 3-1/2"	2164806-01	2164404-01	2164765-01	2164807-01

U and UM BOP FLEXPACKER™ and FLEXPACKER-NR™

The Cameron Flexpacker™ ram is the latest development in multiple-bore sealing. Each Flexpacker™ ram is designed to close and seal around several diameters of tubing and pipe. The Cameron Flexpacker-NR™ is a narrow variable bore ram packer designed for use with tapered drill strings. These packers are designed to fit standard fixed bore Cameron pipe rams.



FLEXPACKER™



FLEXPACKER-NR™

FLEXPACKER™ Sizes and Part Numbers

Bore Size and Working Pressure (psi)	Pipe Size Range	Packer Part Number	Top Seal Part Number
11" 3,000, 5,000 and 10,000	2-3/8" to 3-1/2"	*2011740-01	644217-01-00-01
13-5/8" 3,000, 5,000 and 10,000	2-3/8" to 3-1/2"	*2011716-01	644223-01-00-01
18-3/4" 10,000	2-7/8" to 5"	645346-01	644232-04
20-3/4" 3,000	5" to 7"	645353-01	2163621-01
21-1/4" 2,000	5" to 7"	645353-01	2163621-01

* Flexpacker-NR™

FLEXPACKER-NR™ Sizes and Part Numbers

Bore Size and Working Pressure (psi)	Pipe Size Range	Part Number
11" 3,000, 5,000 and 10,000	2-3/8" x 3-1/2"	2011740-01
11" 3,000, 5,000 and 10,000	3-1/2" x 5"	2163445-01
13-5/8" 3,000, 5,000 and 10,000	2-3/8" x 3-1/2"	2011716-01
13-5/8" 3,000, 5,000 and 10,000	3-1/2" x 5"	2011673-01
13-5/8" 3,000, 5,000 and 10,000	5" x 6-5/8"	2011688-01
18-3/4" 10,000	5" x 6-5/8"	2011907-01
18-3/4" 10,000	3-1/2" x 5"	2011701-01

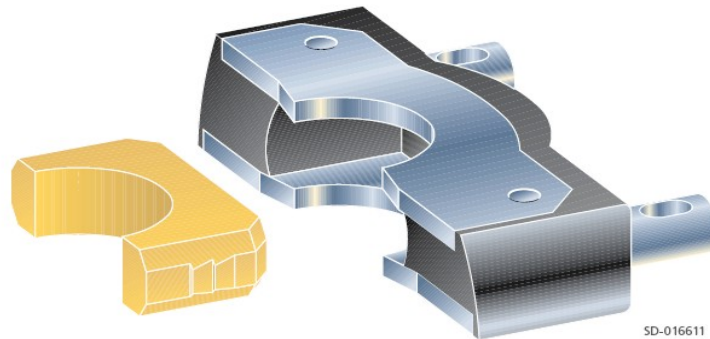
U and UM BOP Rams for Multiple Completions

Cameron offers non-selling rams centralizing and companion subsea dual rams for use with two strings. For more information on these rams, please contact your local Cameron representative.

Inserted Packers

The Cameron inserted packer for stripping/snubbing service is designed with a field replaceable, wear-resistant, non-rotating insert block. The insert block is fabricated from a specially formulated ultra-high molecular weight polyethylene (UHMW-PE) which extends service life. The insert block is designed to be self-locking in the packer and should not require screws or other fasteners to hold it in place. The Cameron design eliminates the major causes of failure for inserted packers using semicircular inserts held in place with screws, including rapid insert wear out and insert rotation resulting in permanent packer damage.

Cameron Inserted Packer



Inserted Packer Sizes and Part Numbers

Bore Size and Working Pressure (psi)	Pipe Size	Packer Assembly Part Number	Insert Part Number	Modified Packer Part Number
7-1/16" 15,000	2-3/8"	2010833-04	2010771-04	2010813-04
7-1/16" 15,000	2-7/8"	2010833-05	2010771-05	2010813-05
7-1/16" 15,000	3-1/2"	2010833-06	2010771-06	2010813-06
7-1/16" 15,000	4"	2010833-08	2010771-08	2010832-02
7-1/16" 15,000	4-1/2"	2010833-07	2010771-07	2010832-01
11" 10,000	2-3/8"	2010952-01	2010938-01	2010937-01
11" 10,000	2-7/8"	2010952-02	2010938-02	2010937-02
11" 10,000	3-1/2"	2010952-03	2010938-03	2010937-03
11" 10,000	4"	2010952-06	2010938-06	2010937-06
11" 10,000	4-1/2"	2010952-04	2010938-04	2010937-04
11" 10,000	5"	2010952-05	2010938-05	2010937-05

Initial Ordering—Order packer assembly, which includes plastic wear insert. When insert wears out and elastomer portion of packer is still in serviceable condition, order insert only. Modified packer part number is for reference only and is used to define the insert pocket machined in already molded packer. The insert is fit into this pocket.

Insert Removal—Carefully pry worn insert from cavity in packer using appropriate tool such as large screwdriver. Once removed, install new insert using a soft mallet to drive the insert into the pocket. Note, the insert has a pair of locking devices on the side of the insert, which engages the packer elastomer and prevents insert loss.

Insert Information—The insert is designed for use in flat plate packers only. They will not fit CAMRAM packers with top and bottom lipped plates.

CAMRAM 350 Packers and Top Seals for U BOP's

CAMRAM 350 U BOP pipe ram packers and top seals are available for applications which require high temperature capabilities and greater H²S resistance than standard CAMRAM packers and top seals.

CAMRAM 350 is available in all UBOP sizes in which standard CAMRAM packers and top seals are offered.

CAMRAM packers in drill pipe sizes feature the Cameron patented lipped plate design. All packers also have chamfered ends on the top and bottom reinforcing plates to prevent ram bore scoring and reduce elastomer extrusion.

All packers and top seals are molded using CAMLAST™ high performance elastomer from Cameron Elastomer Technology.

U BOP CAMRAM 350 Part Numbers

Pipe Size (in.)	7-1/16"	11"	11"	13-5/8"
	3,000-15,000 psi Top Seal 644214-01-00-03 Packer	3,000-10,000 psi Top Seal 644703-01-00-01 Packer	15,000 psi Top Seal 644705-01-00-01 Packer	3,000-10,000 psi Top Seal 644707-01-00-01 Packer
Blind	644700-01-00-01	644702-01	644704-01-00-01	644706-01-00-01
1.660	644700-04-00-01	-----	644704-02	644706-03
1.900	644700-05-00-01	-----	644704-03	644706-04
2.062	644700-06-00-01	-----	644704-04-00-01	644706-05
2.375	644700-07-00-01	644702-06	644704-05-00-01	644706-06-00-01
2.875	644700-08-00-01	644702-07	644704-06-00-01	644706-07-00-01
3.500	644700-09-00-01	644702-08-00-01	644704-07-00-01	644706-08-00-01
4.000	644700-11	644702-10	644704-08-00-01	644706-10-00-01
4.500	644700-12	644702-11	644704-09-00-01	644706-11-00-01
5.000	644700-14	644702-14-00-01	644704-10-00-01	644706-14-00-01
5.500	644700-15	644702-16-00-01	644704-11-00-01	644706-16-00-01
5.750	-----	644702-17	-----	644706-35-00-01
5.875	-----	-----	-----	644706-29-00-01
6.000	-----	644702-18	644704-12	644706-17
6.625	-----	644702-19	644704-13	644706-18-00-01
7.000	-----	644702-20-00-01	644704-14-00-01	644706-19-00-01
7.250	-----	-----	-----	644706-32-00-01
7.625	-----	644702-21	644704-15-00-01	644706-20-00-01
7.750	-----	644702-22	-----	644706-21-00-01
8.625	-----	644702-23	-----	644706-22
9.000	-----	-----	-----	644706-36-00-01
9.625	-----	-----	-----	644706-24-00-01
9.875	-----	-----	-----	644706-30-00-01
10.250	-----	-----	-----	644706-31-00-01
10.750	-----	-----	-----	644706-25-00-01
11.750	-----	-----	-----	644706-26-00-01
13.375	-----	-----	-----	-----

Note: 20" and 21" packers are "Severe Service" and are technically not CAMRAM 350. They do not incorporate the lipped plate design.

U BOP CAMRAM 350 Part Numbers (continued)

13-5/8" 15,000 psi Top Seal 644709-01-00-01 Packer	16-3/4" 3,000-10,000 psi Top Seal 644711-01 Packer	18-3/4" 10,000 psi Top Seal 644713-01-00-01 Packer	20-3/4" 3,000 psi 21-1/4" 2000 psi Top Seal 2164113-01 Packer
644708-01-00-01	644710-01	644712-01	2164105-01
-----	-----	-----	
-----	644710-02	-----	
644708-02-00-01	-----	-----	
644708-03-00-01	644710-03	644712-02	2164105-02
644708-04-00-01	644710-04	644712-03	2164105-03
644708-05-00-01	644710-05	644712-04-00-01	2164105-04
644708-07-00-01	644710-06	644712-06-00-01	2164105-05
644708-08-00-01	644710-07	644712-07-00-01	2164105-06
644708-11-00-01	644710-09	644712-10	2164105-07
644708-12-00-01	644710-10	644712-11	2164105-08
-----	-----	-----	
644708-24-00-01	644710-21	644712-21-00-01	2164105-09
644708-13-00-01	644710-11	644712-12	
644708-14-00-01	644710-12	644712-13	2164105-10
644708-15-00-01	644710-13	644712-14-00-01	2164105-11
-----	-----	-----	
644708-16-00-01	644710-14	644712-15	2164105-12
644708-17-00-01	-----	-----	
644708-18-00-01	644710-15	644712-16	2164105-13
644708-19-00-01	644710-16	644712-17	
644708-20-00-01	644710-17	644712-18-00-01	2164105-14
644708-22-00-01	-----	-----	
-----	-----	-----	
644708-21-00-01	644710-18	644712-19	2164105-15
-----	644710-19	-----	2164105-16
-----	644710-20	644712-20-00-01	2164105-17

Type U & UM BOP Ram—Optional Ram Wear Pads*

Bore Size and Working Pressure	Left Part Number	Qty. Per Assembly	Right Part Number	Qty. Per Assembly	Screw Part Number	Qty Per Assembly
7-1/6" 3,000-15,000	2010071-02	2	Both pads included	---	---	---
11" 3,000-10,000	2011278-01	2	Both pads included	---	644349-03	2
11" 15,000	---	---	---	---	---	---
13-5/8" 3,000-10,000	2011277-01	1	20112277-02	1	644349-01	4
13-5/8" 15,000	644348-04	2	Both pads included		644349-01	4
16-3/4" 10,000	2011281-03	1	2011281-04	1	644349-02	2
18-3/4" 10,000	2011280-01	1	2011280-02	1	2010506-01	2
20-3/4" 3,000	2011281-05	1	2011281-06	1	644349-02	2
21-1/4" 2,000	2011281-05	1	2011281-06	1	644349-02	2
21-1/4" 5,000-10,000	2231763-01	1	2231764-01	1	644349-01	4

* Note: Ram block medications is required to enable the addition of the optional ram wear pads.

Bonnet Seals and Connecting Rod Seals

For application where only bonnet and/or connecting rod seals are required, Cameron offers individually packaged components. Connecting rod seals are nitrile rubber.

When high temperature and/or high concentrations of H₂S are expected, Cameron recommends the use of CAMLAST bonnet and connecting rod seals along with CAMRAM 350 packers and top seals.

U BOP CAMLAST Bonnet and Connecting Rod Seals

BOP Size	Pressure Rating (psi)	Nitrile		CAMLAST	
		Bonnet Seal	Conn. Rod Seal	Bonnet Seal	Conn. Rod Seal
7-1/16"	3,000, 5,000, 10,000 and 15,000	644197-01-00-01	212741-37-00-01	644573-01-00-01	645077-37-00-01
11"	3,000, 5,000 and 10,000	644197-02-00-01	212741-38-00-01	644573-02-00-01	645077-38-00-01
11"	15,000 Model 79	049272-03-00-01	212741-38-00-01	644898-01-00-01	645077-38-00-01
13-5/8"	3,000, 5,000 and 10,000	644197-03-00-01	212741-36-00-01	644573-03-00-01	645077-36-00-01
13-5/8"	15,000	644196-01-00-01	212741-36-00-01	644898-02-00-01	645077-36-00-01
16-3/4"	3,000 and 5,000 Model B	644197-04-00-01	212741-44-00-01	644573-04-00-01	645077-44-00-01
16-3/4"	10,000 Model II	644197-04-00-01	212741-44-00-01	644573-04-00-01	645077-44-00-01
18-3/4"	10,000	644197-05-00-01	212741-60-00-01	644573-05-00-01	645077-60-00-01
20-3/4"	3,000	046613-16-00-01	212741-36-00-01	046613-26-00-01	645077-36-00-01
21-1/4"	2,000	046613-16-00-01	212741-36-00-01	046613-26-00-01	645077-36-00-01
21-1/4"	5,000 and 10,000 Model 79	644197-08-00-01	011741-58-00-01	644573-08-00-01	645077-58-00-01
21-1/4"	7,500 and 10,000 Model II	644197-07	011741-58-00-01	644573-07-00-01	645077-36-00-01
26-3/4"	2,000 and 3,000	644197-09-00-01	212741-36-00-01	644573-09-00-01	645077-58-00-01

Bonnet Seal Carriers for U, UM and U II BOP's

The bonnet seal carrier is a bore-type sealing assembly which replaces the face seal used as the previous bonnet seal. Sealing capability is not dependant upon bonnet bolt torque. One seal is captured in a machined bore in the BOP body while the other seal is captured in a machined bore in the intermediate flange.

The seal carrier was designed, developed and performance-verified for use in newly manufactured BOP's or as a replacement seal assembly for BOP's where either the BOP body or the intermediate flange requires weld repair on the sealing surfaces.



Part Numbers for Bonnet Seal Carriers for U, UM and U II BOP's

BOP Type	BOP Size	Seal Carrier		Retainer Ring		Bonnet Seals	
		Qty.	Part Number	Qty.	Part Number	Qty.	Part Number
U, UM	11" 3,000, 5,000 and 10,000 psi	2	645464-02-00-01	2	702645-27-61	4	645484-02-00-01
U, UM	13-5/8" 10,000 psi	2	645507-01-00-02	2	702645-27-91	4	645509-01-00-01
U, UM	13-5/8" 15,000 psi	2	2010145-01	2	702645-27-71	4	2010146-01
U, UM	18-3/4" 10,000 psi	2	2010185-01	2	702645-28-31	4	2010184-01
U II	18-3/4" 10,000 and 15,000 psi	2	645464-01-00-02	2	645485-01-00-01	4	645484-01-00-01

TERMS & CONDITIONS

1. CONTRACT ACCEPTANCE:

Any written or oral purchase order received from Buyer by Seller shall be construed as a written acceptance of Seller's offer to sell and shall be filled in accordance with the terms and conditions of sale set forth herein. SELLER'S ACCEPTANCE OF THIS ORDER IS EXPRESSLY CONDITIONED ON BUYER'S ASSENT TO THE TERMS CONTAINED HEREIN. The terms and conditions of Seller's proposal (if any) and acknowledgement shall prevail over any conflicting or different terms in Buyer's order unless Buyer notifies Seller in writing of its objections thereto within fifteen (15) days from receipt of Seller's acknowledgement. Buyer's standard terms of purchase will not be considered a counteroffer to Seller's terms and conditions of sale. The failure of Seller to object to any provision in conflict herewith whether contained on Buyer's purchase order or otherwise shall not be construed as a waiver of the provisions hereof nor as an acceptance thereof.

2. QUOTATIONS AND PRICES:

Any product, service capability or manufacturing capability which may be available at the time a quotation is made is subject to prior sale. Prices quoted are subject to change without notice. The price in effect at the time of shipment including any escalation formula will apply, unless a valid quotation or written agreement to the contrary exists between Buyer and Seller. All prices shown are in U.S. dollars and are F.O.B. Seller's shipping point. Seller reserves the right to place a service charge on past due accounts at the highest rate permitted by law. Any documentation pertaining to traceability requirements for raw materials or products or documentation required for any routine or special processes must be identified by the Buyer at the time of quotation (if any) or at the time of order placement.

3. TAXES:

Any tax or other charge imposed by law on the sale or production of goods or the performance of services shall be paid by the Buyer, unless the law specifically provides that such payment must be made by Seller, in which case Buyer shall reimburse Seller for such payment as part of the purchase price. Custom duties, consular fees, insurance charges and other comparable charges will be borne by Buyer.

4. SHIPPING SCHEDULE AND DELIVERY:

Shipment schedules are given as accurately as conditions permit and every effort will be made to make shipments as scheduled. Seller will not be responsible for deviations in meeting shipping schedules nor for any losses or damages to Buyer (or any third party) occasioned by deviations in the shipping schedule, whether due to Acts of God, orders bearing priority ratings established pursuant to law, differences with workmen, local labor shortages, fire, flood, shortages or failure of raw materials, supplies, fuel, power or transportation, breakdown of equipment or any other causes beyond Seller's reasonable control, whether of similar or dissimilar nature than those enumerated. Seller shall have additional time within which to perform as may be reasonably necessary under the circumstances and shall have the right to apportion its production among its customers in such a manner as it may consider to be equitable. Seller reserves the right to furnish commercially equivalent or better substitutes for materials or to subcontract the Buyer's order or portions thereof as Seller deems necessary. In no event shall Seller be liable for any consequential damages resulting from failure or delay in shipment. If Buyer requires drawings, procedures, standards or similar material for approval, shipping schedules will be calculated from the time such approvals are received by Seller, since shipping schedules are based on Seller having all required information and a firm order from Buyer which is enterable into production. Any hold points, witness points or the need for inspection by Buyer's representatives must be identified by Buyer at the time of quotation (if any) and/or order placement in order that the effect on the prices or shipping schedules (if any) can be taken into account. Additional inspection or testing required by Buyer which affects normal production sequence will be considered as extending the shipping dates accordingly.

5. TERMS OF PAYMENT:

Terms of payment are 30 days from date of invoice unless otherwise stated in the quotation or Seller's order acknowledgment.

6. CANCELLATIONS AND RETURNS:

Purchase orders once placed by Buyer and accepted by Seller can be canceled only with Seller's written consent and upon terms which will save Seller from loss. No products may be returned for credit or adjustment without written permission from Seller's office authorized to issue such permission.

7. WARRANTIES:

All products of Seller's manufacture except for its Orbit product are warranted against defects of material and workmanship for a period of twelve (12) months from the date of installation or eighteen (18) months from date of shipment, whichever period first expires while its Orbit product is warranted for thirty six (36) months from date of shipment, when all such products are used in the service and within the pressure range for which they were manufactured. In the case of products or parts not wholly of Seller's manufacture, Seller's liability shall be limited to the extent of its recovery from the manufacturer of such products or parts under its liability to Seller. Any repair work performed by Seller is warranted for one year from completion of such repairs and applies only to work performed. If, within these specified periods, Seller receives notice from Buyer of any alleged defect in or nonconformance of any product or repair and if in the Seller's sole judgment the product or repair does not conform or is found to be defective in material or workmanship, then, Buyer shall, at Seller's request, return the part or product F.O.B. to Seller's designated plant or service location. Seller has no liability for removal or reinstallation of products or equipment. Seller, at its option and expense, shall repair or replace the defective part or product, or repay to Buyer the full price paid by Buyer for such defective part, repair or product. Any repayment of purchase price shall be without interest. Seller's warranty liability, including defects caused by Seller's negligence, shall be limited to such repair, replacement or refund, and shall not include claims for labor costs, expenses of Buyer resulting from such defects, recovery under general tort law or strict liability or for damages resulting from delays, loss of use, or other direct, indirect, incidental or consequential damages of any kind. Seller will not be responsible for failures of products which have been in any way tampered with or altered by anyone other than an authorized representative of Seller. Failures due to lack of compliance with recommended maintenance procedures or products which have been repaired or altered in such a way (in Seller's judgment) as to affect the products adversely. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, STATUTORY OR IMPLIED, INCLUDING THE WARRANTY OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE WHICH EXCEED THE FOREGOING WARRANTY.

8. ENGINEERING AND SERVICE:

Upon request, Seller will provide engineering and/or technical information regarding its products and their uses and, if feasible, will provide personnel to assist Buyer in effecting field installations and/or field service. Any such information, service or assistance so provided, whether with or without charge, shall be advisory only.

9. LABOR STANDARDS:

Seller hereby certifies that these products were produced in accordance with all applicable requirements of Section 6, 7 and 12 of the Fair Labor Standards Act as amended and of regulations and orders of the United States Department of Labor issued under Section 14 thereof.

10. INSPECTION:

Unless otherwise agreed in writing, final inspection and acceptance of products must be made at Seller's plant or other shipping or receiving point designated by Seller and shall be conclusive except as regards latent defects. Buyer's representatives may inspect at the Seller's plant or shipping point during working hours prior to shipment in such manner as will not interfere with operations.

11. DELIVERY AND ACCEPTANCE:

Delivery shall be in accordance with the requirements in the Purchase Contract, provided, in the event Buyer is unable to accept delivery upon completion of the manufacture of the Goods in accordance with such requirements, Buyer agrees that (i) title and risk of ownership shall pass to Buyer on date of Seller's invoice, and (ii) Buyer will make payments within thirty days after date of such invoice. Seller shall retain custodial risk of loss until delivery is made in accordance with such requirements.

12. EXPORT COMPLIANCE:

The Buyer shall provide the Seller with relevant end-use, end-user and country of end-use information with respect to the goods, services, software or technology to be supplied hereunder (collectively, .Items.). Based on and in reliance on such information, the Seller will supply such Items in compliance with applicable trade and customs laws including that of the United States of America. The Seller

and the Buyer acknowledges that any change in end-use, end-user or country of end-use (including a shipment between countries other than the U.S.) may be restricted or prohibited by applicable trade and customs law, whether it be of the U.S. or other country. The Parties shall comply with all trade and customs laws (including U.S. Export Controls) except for any such laws which conflict with or are otherwise penalized under the laws of the U.S., which in the event of such conflict, Seller shall notify Buyer. The Buyer agrees in particular that it shall not use and shall not permit any third Party to use such items in connection with the design, production, use, or storage of chemical, biological or nuclear weapons or missiles of any kind.

13. TRANSPORTATION CHARGES, ALLOWANCES, CLAIMS:

All prices are F.O.B. Seller's plant or other designated shipping point. No freight is allowed unless stated in Seller's quotation (if any) or in a written contract which may exist between Seller and Buyer at the time of shipment. If Seller's quotation or a written contract states that all or a portion of freight is allowed, all prices are F.O.B. Seller's plant or other designated shipping point, with most economical surface transportation allowed. If the quoted or contractual price includes transportation, Seller reserves the right to designate the common carrier and to ship in the manner it deems most economical. Added costs due to special routing requested by the Buyer are chargeable to the Buyer. Under no circumstances is any freight allowance which is absorbed by Seller to be deducted from the selling price. If the quoted price or contract includes transportation, no deduction will be made in lieu thereof whether Buyer accepts shipment at plant, warehouse, freight station, or otherwise supplies its own transportation. When sales are made from the Seller's warehouse, Seller reserves the right to charge either actual or pro-rated freight from Seller's principle point of manufacture to Seller's warehouse. Buyer assumes risk of loss upon delivery to the carrier, regardless of who pays shipping costs. Seller endeavors to pack or prepare all shipments so that they will not break, rust or deteriorate in transit, but does not guarantee against such damage. Unless requested in writing by the Buyer, no shipments are insured by Seller against damage or loss in transit. Seller will place insurance as nearly as possible in accordance with Buyer's written instructions but in such case Seller acts only as agent between the insurance company and the Buyer and assumes no liability whatsoever. Any claims for shipping loss, breakage or damage (obvious or concealed) are Buyer's responsibility and should be made to the carrier. All claims regarding shortages must be made within thirty (30) days from receipt of shipment and must be accompanied by the packing list(s) covering the shipment.

14. INDEMNIFICATION AND LIMITATION OF LIABILITY:

A. INDEMNIFICATION:

Buyer Group, means: Buyer, its parent (if any), subsidiaries, affiliates, co-owners, co-venturers, partners and any entity with whom Buyer has an economic interest with respect to the Work including Buyer's customer and its and their respective employees, personnel, directors, officers, borrowed servants, representatives, agents, contractors and subcontractors (respectively and of any tier or level and who are not included within the Seller Group). Seller Group, means: Seller, its parent (if any), subsidiaries, affiliates, co-owners and its and their respective employees, personnel, directors, officers, borrowed servants, representatives, agents, contractors and subcontractors (respectively and of any tier or level and who are not included within the Buyer Group). Negligence, means: sole, joint or concurrent, active, passive, gross or willful misconduct.

(1) Seller shall release, defend, save, indemnify (collectively .Indemnify.) and hold Buyer Group harmless from and against all claims, demands, losses, damages and causes of action of whatever kind or nature (collectively .Claims.), for loss of or damage to the property of the members of the Seller Group even if such Claims arise from or attributable to the Negligence of the members of Buyer Group.

(2) Seller shall Indemnify and hold Buyer Group harmless from and against all Claims for the death(s) of or personal injury(ies) to members of the Seller Group even if such Claims arise from or attributable to the Negligence of the members of Buyer Group.

(3) Buyer shall Indemnify and hold Seller Group harmless from and against all Claims for loss of or damage to the property (including the Work) of the members of the Buyer Group even if such Claims arise from or attributable to the Negligence of the members of Seller Group.

(4) Buyer shall Indemnify and hold Seller Group harmless from and against all Claims for the death(s) of or personal injury(ies) to members of the Buyer Group even if such Claims arise from or attributable to the Negligence of the members of Seller Group.

(5) Buyer (on its own behalf and on behalf of Buyer Group) and Seller (on its own behalf and on behalf of Seller Group) shall Indemnify and hold each other harmless from and against any and all Claims asserted against them by or on behalf of any third party for the death(s) of or personal injury (ies) to such a third party, as well as loss(es) of or damage(s) to the property of such a third party. A third party is a person or entity not included in Buyer Group or Seller Group. It is agreed by Buyer and Seller that their respective duty of indemnity to each other with respect to Claims asserted against them by a third party pursuant to this Article 14 (A) (5) shall be limited to their respective degree of Negligence.

(6) Notwithstanding any other provision contained in this Agreement, Buyer shall Indemnify and hold the members of Seller Group harmless from and against all Claims (including clean-up costs and loss (es) of oil, gas or hydrocarbons) arising from pollution, contamination, dumping or spilling of any substance and even if arising out of or attributable to the Negligence of the members of the Seller Group.

B. INDEMNITY FOR CONSEQUENTIAL DAMAGES:

UNDER NO CIRCUMSTANCES SHALL SELLER BE LIABLE FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, EXEMPLARY OR PUNITIVE DAMAGES (collectively .CONSEQUENTIAL.), AS DEFINED BY THE LAWS GOVERNING THIS PURCHASE ORDER, NOR FOR ANY LOSS OF ANTICIPATED PROFITS, LOSS OF BUSINESS OPPORTUNITY, LOSS OF USE OF EQUIPMENT OR OF ANY INSTALLATION, SYSTEM OR FACILITY INTO WHICH SELLER'S EQUIPMENT MAY BE LOCATED OR AT WHICH MEMBERS OF THE SELLER GROUP MAY BE PERFORMING WORK AND BUYER AGREES TO .INDEMNIFY. AND HOLD SELLER GROUP HARMLESS FROM AND AGAINST ANY .CLAIMS. FOR SUCH .CONSEQUENTIAL. DAMAGES EVEN IF ARISING OUT OF OR ATTRIBUTABLE TO THE .NEGLECTANCE. OF THE MEMBERS OF THE SELLER GROUP.

C. LIMITATION OF LIABILITY:

EXCEPT AS OTHERWISE EXPRESSLY LIMITED IN THIS AGREEMENT IT IS THE EXPRESS INTENTION OF THE PARTIES HERETO THAT ALL INDEMNITY OBLIGATIONS AND/OR LIABILITIES HEREBY ASSUMED BY THE PARTIES SHALL BE: (i) SUPPORTED BY INSURANCE; (ii) WITHOUT LIMIT; (iii) AND WITHOUT REGARD TO THE CAUSE OR CAUSES THEREOF, INCLUDING, BUT NOT LIMITED TO, PREEXISTING CONDITIONS (WHETHER SUCH CONDITIONS BE PATENT OR LATENT); THE UNSEAWORTHINESS OF ANY VESSEL OR VESSELS (WHETHER OR NOT PREEXISTING); THE UNAIRWORTHINESS OF ANY AIRCRAFT; BREACH OF REPRESENTATION OR WARRANTY (EXPRESS OR IMPLIED); BREACH OF CONTRACT; BREACH OF DUTY (STATUTORY, CONTRACTUAL, COMMON LAW OR OTHERWISE); STRICT LIABILITY; CONDITION OF RUIN OR DEFECTIVE PREMISES, EQUIPMENT, FACILITIES, OR APPURTENANCES OF ANY PARTY UNDER ANY CODE, LAW OR (WHETHER OR NOT SAID CONDITION IS PREEXISTING AND/OR LATENT, PATENT OR OTHERWISE); THE LOADING OR UNLOADING OF PERSONS OR CARGO; TORT; OR THE NEGLIGENCE OR FAULT OF ANY PARTY (AS DEFINED AT THE BEGINNING OF THIS ARTICLE 14; OR ANY OTHER THEORY OF LEGAL LIABILITY. Seller's total responsibility for any claims, damages, losses or liability arising out of or related to its performance of this contract or the products or services covered hereunder shall not exceed the purchase price.

15. MODIFICATION, RESCISSION & WAIVER:

The terms herein may not be modified or rescinded nor any of its provisions waived unless such modification, rescission or waiver is in writing and signed by an authorized employee of Seller at its office in Houston, Texas. Failure of Seller to insist in any one or more instances upon the performance of any of the terms and conditions of the contract or the failure of Seller to exercise any of its rights hereunder shall not be construed as a waiver or relinquishment of any such term, condition, or right hereunder and shall not affect Seller's right to insist upon strict performance and compliance with regard to any unexecuted portions of this contract or future performance of these terms and conditions. All orders must be accepted by an authorized employee of Seller. The rights and duties of the parties and construction and effect of all provisions hereof shall be governed by and construed according to the internal laws of the State of Texas. Any disputes which arise under this agreement shall be venued in the District Court of Harris County, Texas or in the Southern District of Texas.

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