

RAM-TYPE BLOWOUT PREVENTERS

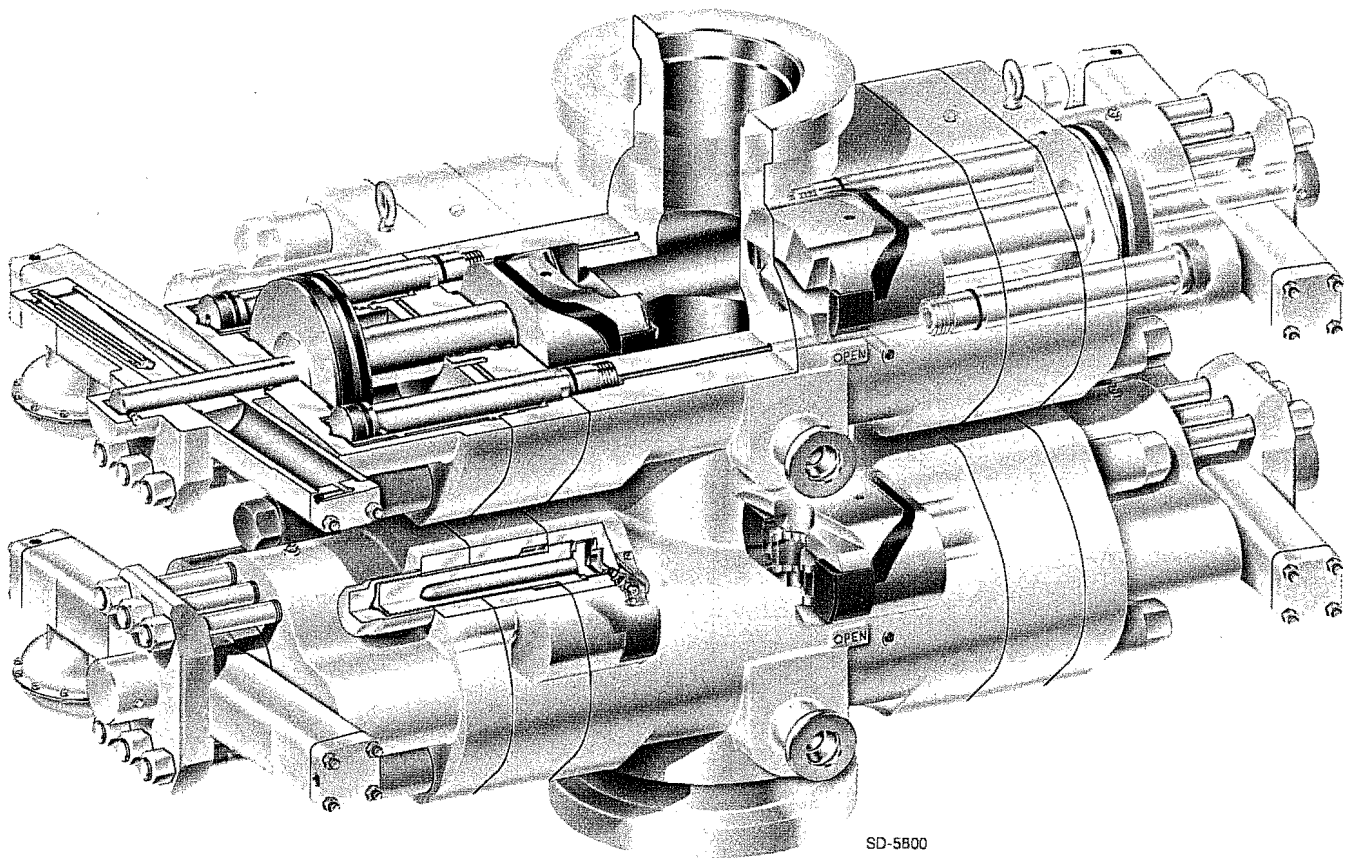
U II BOP

The U II blowout preventer provides a BOP system (including CAMRAM™ elastomer sealing) that meets the API 6A rating of 250°F service. The U II includes an internally ported hydraulic bonnet stud tensioning system, a short stroke bonnet, bore-type bonnet seals, and the proven advantages of the U BOP design described on page 926.

- The introduction of the CAMRAM packer has set a new industry standard in meeting the 250°F API 6A rating for metal BOP components. CAMRAM packers provide sustained service at 250°F and withstand excursions to 300°F. Presently, the API standard excludes these critical sealing elements from the rating, which covers only the metal components of the BOP system. For more information on the CAMRAM packer, see pages 918 and 934.
- CAMRAM packers and top seals made with CAMLAST™ are available for high temperature and high H₂S service.
- The bonnets of the U II preventer are opened and closed hydraulically. The bonnet studs are hydraulically stretched to the correct preload by

pressure applied behind a piston which acts on a load rod in the stud. Then the nut is tightened and pressure is released. Pressure is supplied by an air-powered hydraulic pump via internal porting in each end of the BOP body.

- The short stroke bonnet reduces the opening stroke by about 30%, reduces the overall length of the preventer, and reduces the weight supported by the ram change pistons.
- The bore-type bonnet seal fits into a seal counterbore in the body and has metal anti-extrusion rings.
- The U II blowout preventer wedgelocks act directly on the operating piston tailrod. The operating system can be interlocked using sequence caps to ensure that the wedgelock is opened before pressure is applied to open the preventer.
- A ram bearing pad can be attached to the bottom of each ram to reduce ram bore wear.
- All Cameron U II BOP's are manufactured to comply with NACE and all regulatory body specifications.



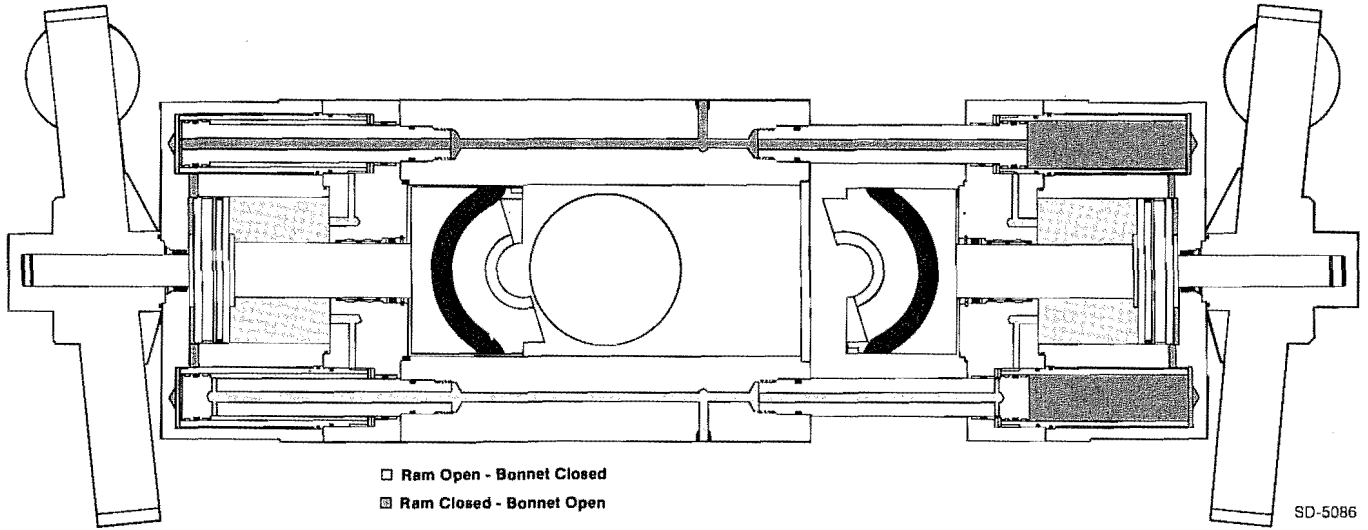
SD-5800

Double U II BOP

NOTE: A Periodic Inspection Manual is available for the U II Blowout Preventer. To order specify, part number 644900-01.

RAM-TYPE BLOWOUT PREVENTERS

U II BOP HYDRAULIC CONTROL SYSTEM



U II Blowout Preventer Hydraulic Control System

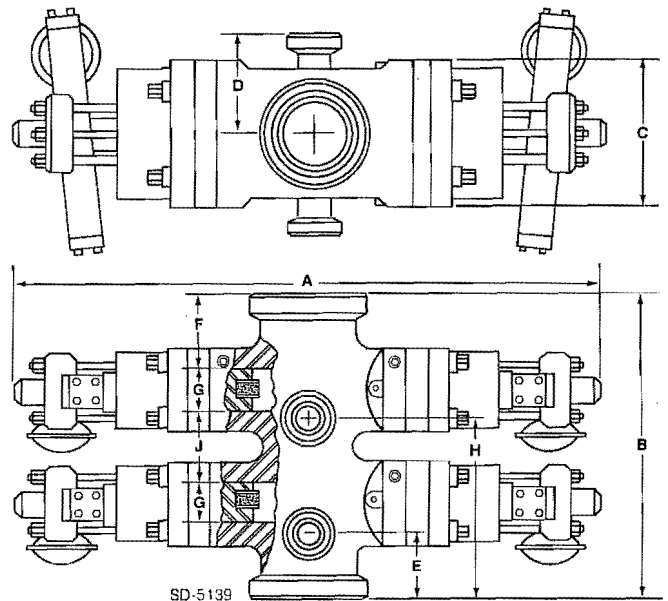
U II OPERATING DATA AND FLUID REQUIREMENTS

Bore Size and Working Pressure	Gallons to Open Pipe Rams (1 Set)	Gallons to Close Pipe Rams (1 Set)	Gallons to Open Bonnets (1 Set)	Gallons to Close Bonnets (1 Set)	Closing Ratio	Opening Ratio	Gallons to Unlock Wedgelock	Gallons to Lock Wedgelock
18 3/4" 10,000 psi	22.3	24.7	31.42	27.10	6.7:1	2.5:1	5.75	0.32
18 3/4" 15,000 psi	32.3	34.7	43.52	40.10	9.3:1	3.5:1	5.75	0.32

DIMENSIONS

The following designations refer to the dimensional drawing:

- A-1 Length—bonnets closed, with wedgelocks
- A-2 Length—bonnets opened, with wedgelocks
- B-1 Height—flanged
- B-2 Height—Cameron clamp hubs
- B-3 Height—studded x flanged
- 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 (outlet below rams in double) to bottom flange face
- E-2 Centerline of side outlet (outlet below rams in double) 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

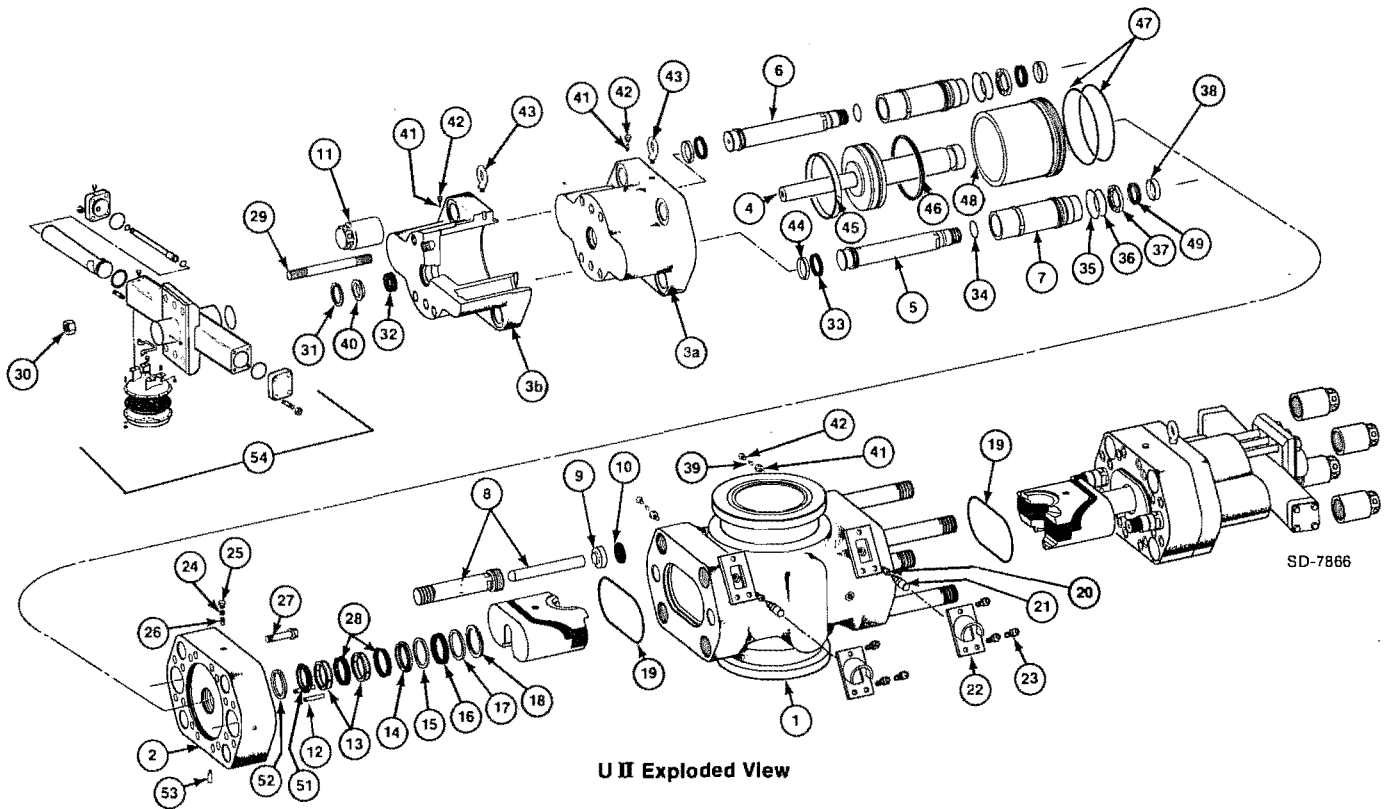


U II BLOWOUT PREVENTER DIMENSIONS

BOP Size, Working Pressure, and Body Style	A-1	A-2	B-1	B-2	B-3	C	E-1	E-2	F-1	F-2	G	H-1	H-2	J
18 3/4" 10,000 Single	147.000"	185.500"	—	43.125"	—	42.500"	20.500"	13.938"	22.250"	15.688"	11.500"	—	—	—
18 3/4" 10,000 Double	147.000"	185.500"	87.125"	74.000"	—	42.500"	20.500"	13.938"	22.250"	15.688"	11.500"	51.625"	45.062"	19.625"
18 3/4" 15,000 Single	148.375"	186.875"	64.750"	53.125"	—	47.250"	23.875"	18.062"	26.625"	20.812"	11.500"	—	—	—
18 3/4" 15,000 Double	148.375"	186.875"	98.875"	87.250"	84.500"	47.250"	23.875"	18.062"	26.625"	20.812"	11.500"	58.000"	52.188"	22.625"

RAM-TYPE BLOWOUT PREVENTERS

U II BOP PART NUMBERS



SD-7866

U II Exploded View

U II BLOWOUT PREVENTER PART NUMBERS

Item No.	Description	Qty Sgl	Qty Dbl	18 1/2" 10,000 psi WP	18 1/2" 15,000 psi WP	Item No.	Description	Qty Sgl	Qty Dbl	18 1/2" 10,000 psi WP	18 1/2" 15,000 psi WP	Item No.	Description	Qty Sgl	Qty Dbl	18 1/2" 10,000 psi WP	18 1/2" 15,000 psi WP
1	Body, Clamped	1	1	644102-02	615239-03	19	Bonnet, Seal	2	4	644169-01	644169-01	37	Bearing Gland, Intermediate Flg	8	16	615727-01	615727-01
2	Intermediate Flange	2	4	615303-01	614722-01	20	Connector, Tbg	2	4	707276	707276	38	Seal Ring, Ram Change Piston Rod to Int Flg	4	8	707233	707233
3a	Bonnet	2	4	615302-01	---	21	Quick Disconnect, Male	2	4	708490-01	708490-01	39	Connector, Tbg	2	4	707159	707159
3b	Bonnet	2	4	---	614621-01	22	Protective Cover	2	4	615627-01	615627-02	40	Retainer Ring, Lip Seal Tail Rod	2	4	614672-04	614672-04
4	Piston, Operating (Super Trim)	2	4	615304-01	614623-01	23	Cap Screw	6	12	702500-16-00-10	702500-16-00-10	41	Gland, Bleeder	6	12	17454-08	17454-08
5	Piston, Ram Change Open	2	4	614618-02	614618-02	24	Screw, Plastic Packing	2	4	5940-09	5940-09	42	Plug, Bleeder	6	12	17454-09	17454-09
6	Piston, Ram Change Close	2	4	614618-01	614618-01	25	Pipe Plug, Plastic Packing	2	4	5930-05	5930-05	43	Lifting Eye	2	2	11849	11849
7	Cylinder, Ram Change	4	8	30273-16	30273-16	26	Check Valve, Plastic Packing	2	4	680645-01	680645-01	44	Seal Ring, Ram Change Piston Head	4	8	707231	707231
8	Stud, Bonnet	8	16	644031-18-10	615450-18-15	27	Capscrew, Int Flg to Bonnet	16	32	702585-36-00-93	702585-36-00-93	45	Wear Ring, Operating Piston	2	4	49223-16	49223-16
9	Piston, Bonnet Stud	8	16	615453-18-10	615453-18-15	28	Ring, Seal Sec Conn Rod	6	12	706787	706787	46	Lip Seal, Operating Piston	2	4	706789	706900
10	Seal, Bonnet Stud	8	16	615452-18-10	615452-18-15	29	Stud, Wedglock	12	24	44854-12	44854-12	47	O-Ring	*	**	30101-63-13-85	18492-60
11	Nut, Bonnet Stud	8	16	644018-18-10	615451-18-10	30	Nut, Wedglock	12	24	12955-16	12955-16	48	Cylinder, Operating	2	---	30274-15	---
12	Pin, Ram Guide	4	8	30313-11	30313-11	31	Retainer Ring, Tail Rod	2	4	33186-47	33186-47	49	Bearing Retainer Ring, Seal	4	8	614348-10	614348-10
13	Lantern Ring	4	8	615332-01	615332-01	32	Seal Ring, Tail Rod	1	2	707232	707232	50	Plastic Packing	10	20	7650-08	7650-08
14	Ring Retainer, Back-Up Ring	2	4	614672-03	614672-03	33	Wear Ring, Ram Change Piston Head	2	4	614742-03	614742-03	51	Ring, Seal Operating Piston	2	4	706244	---
15	Ring, Back Up	2	4	610108-15	610108-15	34	O-Ring, Ram Change Piston to Body	4	8	6227-46-13-85	6227-46-13-85	52	Ring, Back-Up	2	4	610108-28	---
16	Seal Ring, Connecting Rod	2	4	706790	706790	35	O-Ring, Ram Change Cylinder to Bonnet	4	8	6227-69-13-85	6227-69-13-85	53	Check Valve, Weep Hole	---	---	709493	---
17	Retainer Plate	2	4	615210-01	615210-01	36	O-Ring, Ram Change Cylinder to Int Flg	4	8	6227-67-13-85	6227-63-13-85	54	Wedglock w/ Pressure Bal Cham	2	4	615402-01	615402-01
18	Retainer Ring	2	4	41008-08-00-52	41008-08-00-52												

*4 Required 18 1/2" 10,000 psi WP BOP, 2 Required 18 1/2" 15,000 psi WP BOP

**8 Required 18 1/2" 10,000 psi WP BOP, 4 Required 18 1/2" 15,000 psi WP BOP

***Not required for 15,000 psi WP BOP

RAM-TYPE BLOWOUT PREVENTERS

U II BOP RAMS

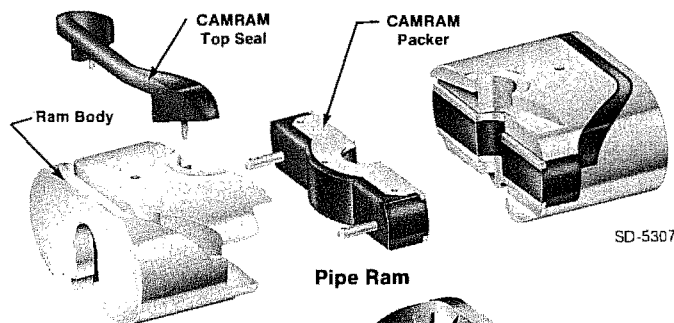
U II CAMRAM™ PART NUMBERS

Pipe Size	18 3/4" 10,000 and 15,000 psi WP U II Top Seal 644246-01		
	Assembly	Ram	Packer
Blind	644248-01	615407-01	644247-01
2 7/8"	644248-02	614770-01	644247-02
2 7/8"	644248-03	614770-02	644247-03
3 1/2"	644248-04	644742-01	644247-04
3 1/2" Aluminum	644248-05	614770-04	644247-05
4"	644248-06	614770-05	644247-06
4 1/2"	644248-07	644742-02	644247-07
4 1/2" Aluminum	644248-08	614770-07	644247-08
4 3/4"	644248-09	614770-08	644247-09
5"	644248-10	644742-03	644247-10
5 1/2"	644248-11	614770-10	644247-11
6"	644248-12	614770-12	644247-12
6 5/8"	644248-13	614770-13	644247-13
7"	644248-14	614770-14	644247-14
7 5/8"	644248-15	614770-15	644247-15
8 5/8"	644248-16	614770-16	644247-16
9"	644248-17	614770-17	644247-17
9 5/8"	644248-18	614770-18	644247-18

Cameron blind rams, pipe rams, shearing blind rams, and variable bore rams are available for U II blowout preventers. High-performance CAMRAM™ packers are standard for U II pipe rams. See page 918 for detailed features on new CAMRAM rubber products.

U II rams are similar in design to U blowout preventer rams and incorporate the same design features stated on pages 934 through 938.

The new NACE certified shearing blind rams are standard on all Cameron T BOP's and are available to fit most sizes of Cameron U and U II BOP's.

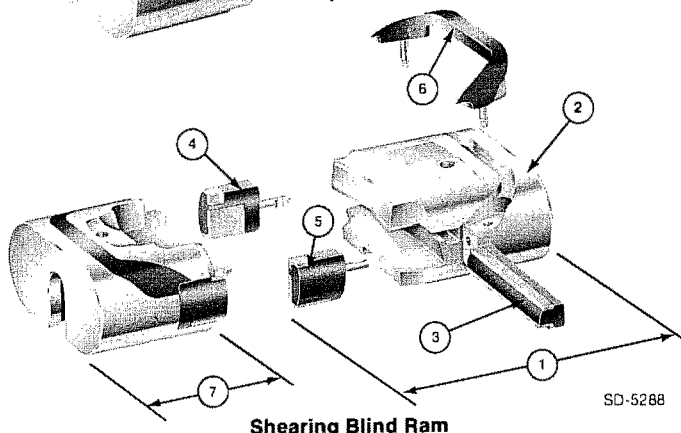


SHEARING BLIND RAM ASSEMBLIES

Item	Description	18 3/4" 10,000 and 15,000 psi WP
1	Upper Ram Subassembly	614775-01
2	Ram	614773-01
3	Blade Packer	46910-05
4	Packer	615567-01
5	Packer	615568-01
6**	Top Seal	644246-01
7	Lower Ram Subassembly	614775-02
8*	Ram	614774-01
9*	Packer	615567-01
10*	Packer	615568-01

*Part of lower ram subassembly, item 7.

**Part of upper and lower ram subassembly, items 1 and 7.

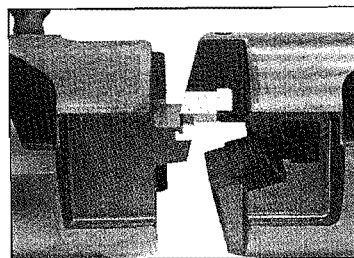


Shearing Blind Ram

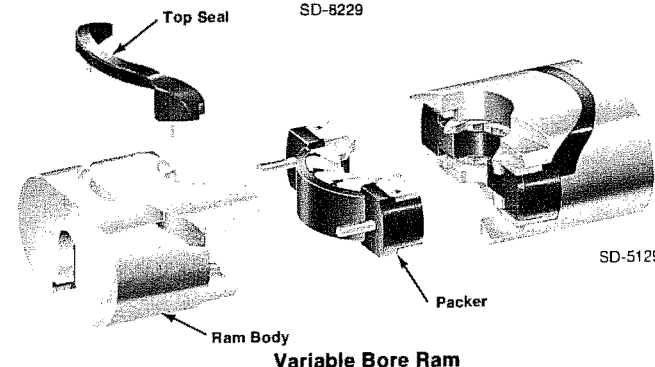
SHEARING BLIND RAM (NACE SPECIFICATIONS)

Item	Description	18 3/4" 10,000 and 15,000 psi WP
1	Upper Ram Subassembly	644759-01
2	Ram	644752-01
3	Blade Insert	644519-01
4	Cap Screw	644524-01
5	Lower Ram Subassembly	644759-02
6	Ram	644752-02
7	Blade Insert	644519-02
8	Pin	200231

Note: All Packers and Top Seals are the same as the Shearing Blind Ram shown above.



Detail of NACE Certified Blade Insert for Shearing Blind Rams.
NOTE: Photo depicts details of a new shearing blind ram design which incorporates a fully NACE certified blade insert material of a hardened high alloy. The new design is particularly advantageous when high concentrations of sour gas exist.



Variable Bore Ram

VARIABLE BORE RAM ASSEMBLIES

BOP Size and Working Pressure	Pipe Size Range	Ram Subassembly	Ram Body	Packer	Top Seal
18 3/4" 10,000 psi U II	7 5/8" to 3 1/2"	614879-01	614846-01	615569-01	644246-01
18 3/4" 10,000 psi U II	5" to 2 7/8"	614878-01	644748-01	615570-01	644246-02
18 3/4" 15,000 psi U II	7 5/8" to 5"	614879-01	614846-01	615569-01	644246-01
18 3/4" 15,000 psi U II	5" to 3 1/2"	614878-01	615845-01	615570-01	644246-02